CENTRAL U.P. GAS LIMITED

(CITY GAS PROJECT IN KANPUR & BAREILLY)

BID DOCUMENT FOR THE ANNUAL RATE CONTRACT FOR ENGAGING CONTRACTOR FOR STEEL & MDPE PIPELINE SHIFTING AND OTHER AGENCIES CONSTRUCTION WORK IN KANPUR FOR 02 YEARS

BID DOCUMENT NO : CUGL/C&P/TEN2425/48

THROUGH E-TENDERING MODE

OPEN DOMESTIC COMPETITIVE BIDDING

TECHNICAL DOCUMENTATION
TECHNICAL, VOL II OF II A

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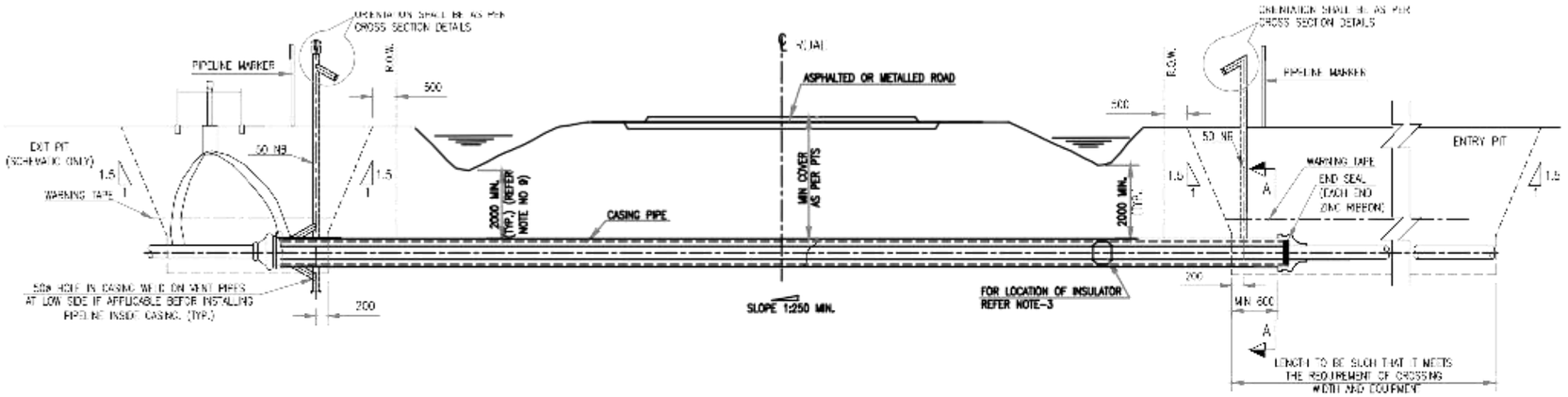
Rev.	D	M	Y	Modifications	Drawn	Checked	Approved	Validated

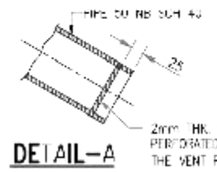
SUBJECT

TYPICAL TRENCH DETAILS

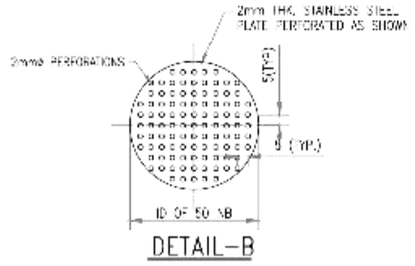
Size	Scale	Sheet		
A3	NTS	01	of	01

Drawing No.	Rev.
GGNG-D-20707-002	0

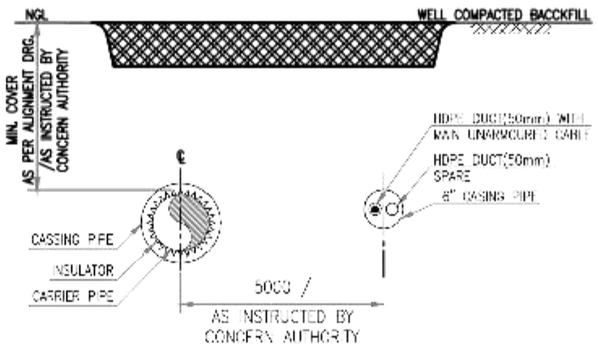




DETAIL–A

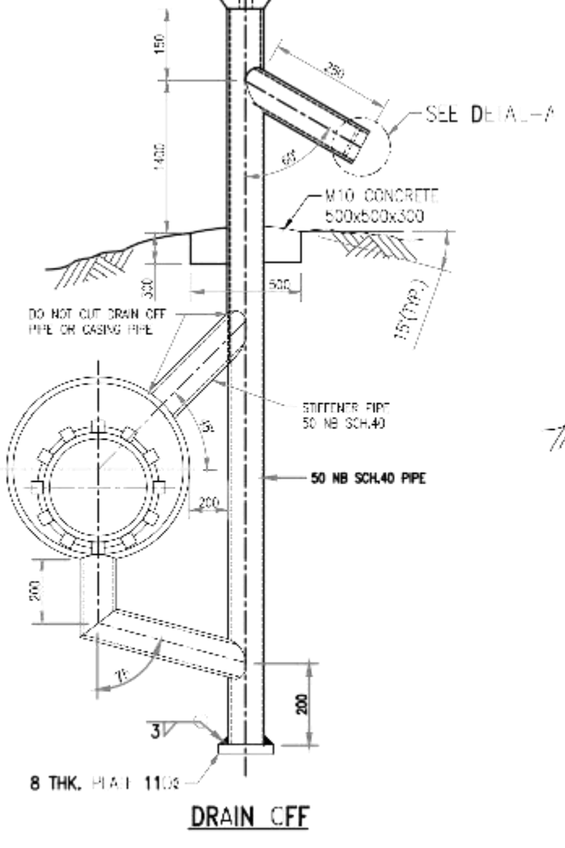


DETAIL–B

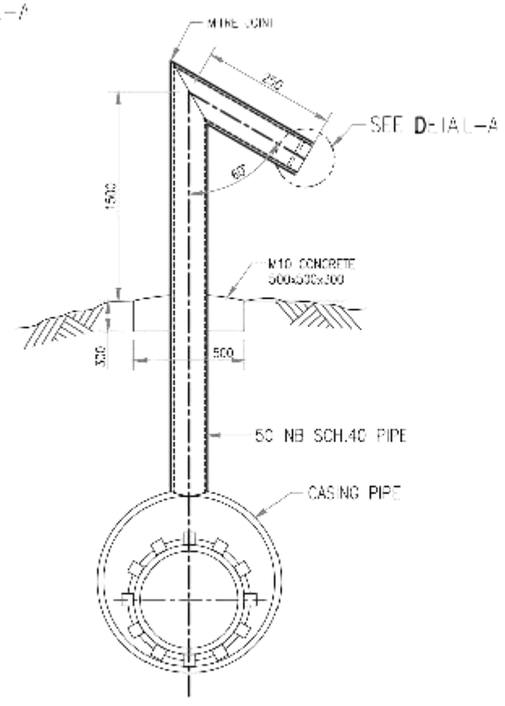


SECTION A–A

TYPICAL BORE PIT EXCAVATION



DRAIN OFF



VENT

S. NO.	SIZE OF CARRIER PIPE (INCH NB)	MINIMUM SIZE OF CASING PIPE (FOR TYPE–I)	MATERIAL
1.	4"	10"	API 5L Gr. B or Equivalent
2.	6"	12"	API 5L Gr. B or Equivalent
3.	8"	14"	API 5L Gr. B or Equivalent
4.	10"	16"	API 5L Gr. B or Equivalent
5.	12"	18"	API 5L Gr. B or Equivalent
6.	16"	22"	API 5L Gr. B or Equivalent
7.	18"	24"	API 5L Gr. B or Equivalent
8.	20"	28"	API 5L Gr. B or Equivalent
9.	24"	30"	API 5L Gr. B or Equivalent
10.	30"	36"	API 5L Gr. B or Equivalent
11.	36"	42"	API 5L Gr. B or Equivalent
12.	42"	48"	API 5L Gr. B or Equivalent
13.	48"	54"	API 5L Gr. B or Equivalent

NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
2. THE CROSSING WORKS SHALL BE EXECUTED IN ACCORDANCE WITH API RECOMMENDED PRACTICE 1102 (LATEST EDITION).
3. 500mm AWAY FROM BOTH ENDS, TWO NOS. INSULATORS SHALL BE PLACED. IN BALANCE LENGTH MAX. SPACING OF INSULATORS SHALL BE 2000 mm.
4. ELECTRICAL INSULATION BETWEEN THE CASING AND CARRIER PIPE SHALL BE CHECKED WITH A SUITABLE MEGGER.
5. MATERIAL OF THE CASING INSULATORS SHALL BE HDPE. END SEALS SHALL BE HEAT SHRINKABLE TYPE (MAKE RAYCHEM OR EQUIVALENT), CONTRACTOR SHOULD TAKE PRIOR APPROVAL OF MATERIAL OF CONSTRUCTION FOR END SEAL & SHALL SUBMIT MATERIAL CERTIFICATES TO OWNER/ CONSULTANT FOR APPROVAL.
6. 1:25L SLOPE TO BE PROVIDED FOR DRAINING DURING INSTALLATION OF CASING PIPE.
7. CASING PIPE SHOULD EXTEND MIN. 500mm BEYOND THE TOE OF THE SLOPE OR TOP GRADE, OR MIN 300mm BEYOND THE BOTTOM OF THE DRAINAGE DITCH, WHICHEVER IS MORE.
8. CONTRACTOR SHOULD SUBMIT DETAILED WORK PROCEDURE ALONG WITH SKETCHES AND MATERIAL TEST CERTIFICATES FOR APPROVAL.
9. THE CROSSING SHALL BE CARRIED OUT WITH PIPE SIZE AND MINIMUM THICKNESS GIVEN IN THE PTS & DESIGN BASIS, THE SIZES GIVEN IN THIS SHEET ARE MINIMUM INDICATIVE ONLY.
17. FILLING OF ANNULAR SPACE BETWEEN CASING AND CARRIER PIPE SHALL BE AS PER PROJECT SPECIFICATION.
18. CROSSING MAY BE CARRIED OUT PRIOR TO MAINLINE ACTIVITIES ADDITIONAL ROW IF REQUIRED FOR APPROACH TO CROSSING PIPELINE STRINGING, HYDROTESTING, WORKING PIT FOR CROSSING, TO AVOID CAVING OF SOIL, SHALL BE PROCURED BY CONTRACTOR WITHOUT ANY COST IMPLICATION.
19. CATHODIC PROTECTION :– ALL CASING PIPES FOR RAILWAY CROSSING SHALL BE C.P. PROTECTED, USING SACRIFICIAL ANODE.
20. TEST STATION ON BOTH SIDE OF CROSSING.
21. THE LOCATION OF ENTRY AND EXIT PIT SHALL BE DECIDED AT SITE TO SUIT THE SITE REQUIREMENT.
22. AT EACH CROSSING PIPELINE CROSSING WARNING SIGN SHALL BE INSTALLED ON EITHER SIDE OF CROSSING THE WARNING PLATE MAY BE MOUNTED ON THE VENT/DRAIN OFF PIPE.
23. ALL CARRIER PIPELINE JOINTS SHALL BE RADIOGRAPHED.
24. PIPELINE SECTION SHALL BE PRETESTED HYDROSTATICALLY SEPARATELY FROM THE MAIN LINE TESTING WHEN REQUIRED BY CONCERNED AUTHORITIES OR AS DIRECTED BY CLIENT.
25. THE CASING PIPE SHALL BE PROVIDED WITH MINIMUM 50 MM DIAMETER VENT PIPE FOR FILLING THE FILTER MATERIAL IF REQUIRED AS PER PROJECT SPECIFICATION. AFTER FILLING VENT PIPE AT BOTH ENDS SHALL BE TRIMMED AND PLUGGED/SEALED WITH END CAPS.
26. IN ANY CASE, THE MINIMUM LENGTH OF CASING PIPE SHALL BE 72M FOR NATIONAL HIGHWAY CROSSING, AND 60M FOR ALL STATE HIGHWAY/MDR CROSSING.
27. THICKNESS OF CARRIER PIPE SHALL BE CALCULATED AS PER API RP 1102 AND SUBMITTED FOR APPROVAL.

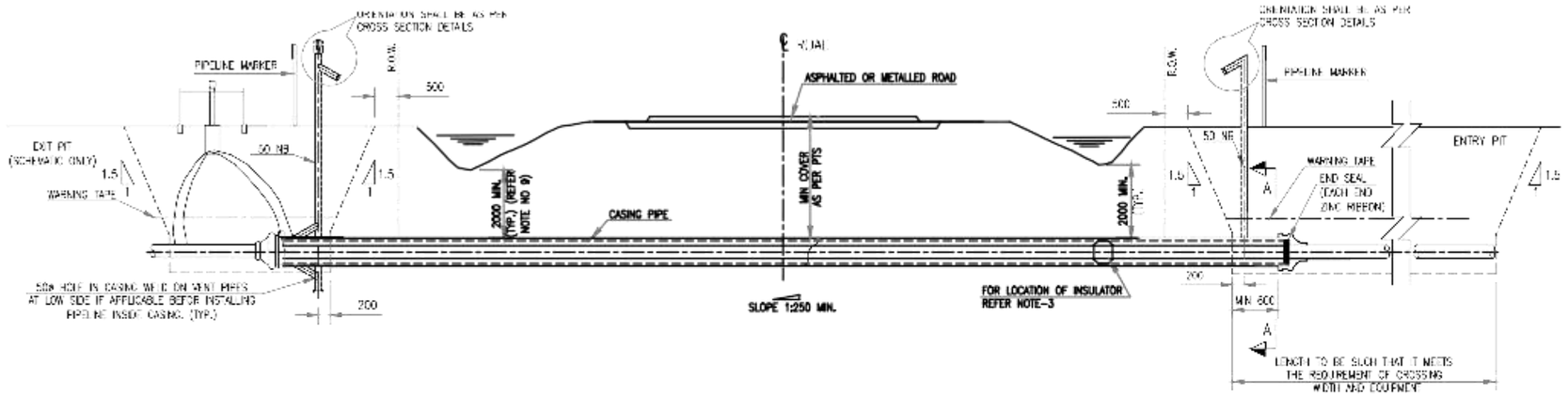
Rev.	DMY	Modifications	Drawn	Checked	Approved	Validated
1	16.04.21	REVISED AND RE–ISSUED.	KS	MKS	MS	KNS
0	29.09.16	APPROVED FOR CONSTRUCTION.	JV	MS	NC	SKH

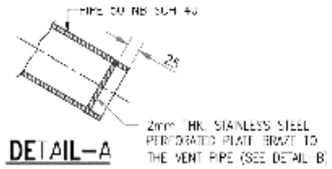
SUBJECT

TYPICAL ROAD CASED CROSSING (B+C)
TYPE - I
SEPARATE CASING FOR CARRIER AND OFC

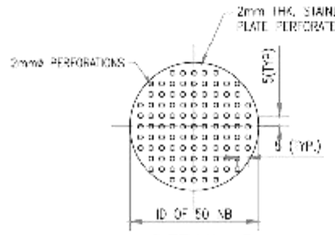
Size A3 | Scale NTS | Sheet 01 of 01

Drawing No. GGNG-D-20707-004-A | Rev. 1

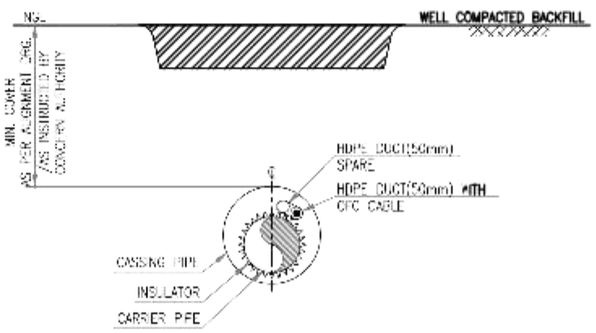




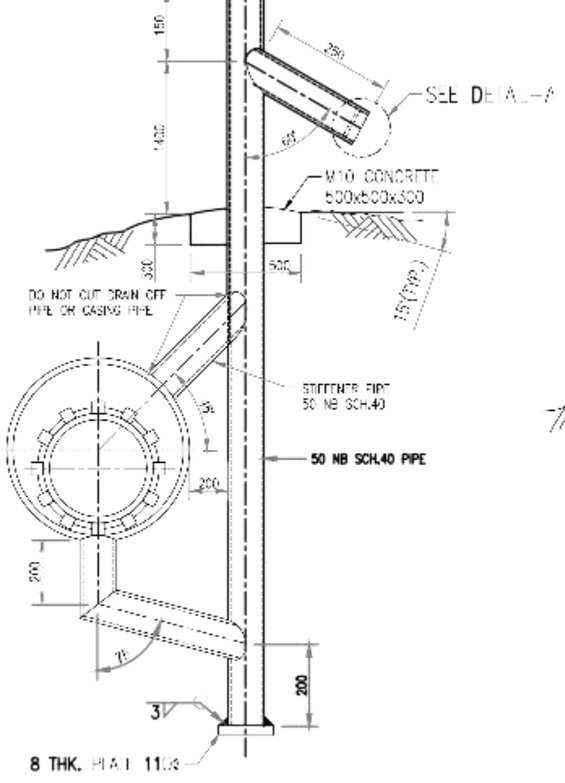
DETAIL-A



DETAIL-B



SECTION A-A
(APPLICABLE FOR TYPE-II)
TYPICAL BORE PIT EXCAVATION



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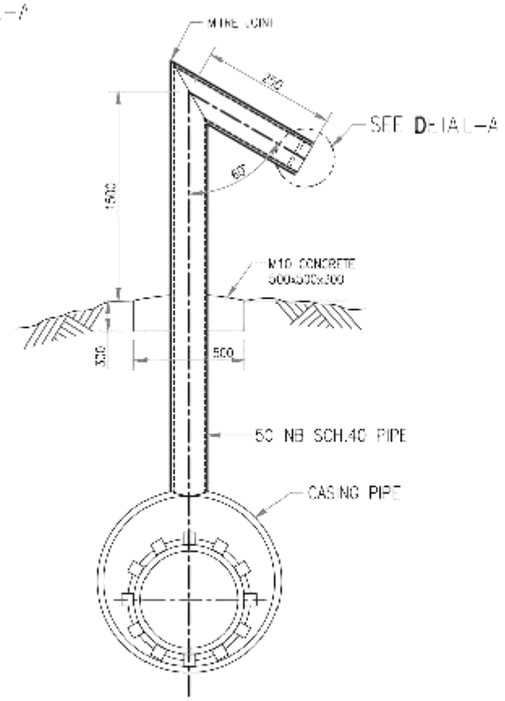


VENT

S. NO.	SIZE OF CARRIER PIPE (INCH NB)	MINIMUM SIZE OF CASING PIPE (FOR TYPE-II)	MATERIAL
1.	4"	10"	API 5L Gr. B or equivalent
2	6"	12"	API 5L Gr. B or equivalent
3	8"	14"	API 5L Gr. B or equivalent
4	10"	16"	API 5L Gr. B or equivalent
5	12"	18"	API 5L Gr. B or equivalent
6.	16"	22"	API 5L Gr. B or equivalent
7	18"	24"	API 5L Gr. B or equivalent
8	20"	28"	API 5L Gr. B or equivalent
9.	24"	30"	API 5L Gr. B or equivalent
10.	30"	36"	API 5L Gr. B or equivalent
11.	36"	42"	API 5L Gr. B or equivalent
12.	42"	48"	API 5L Gr. B or equivalent
13	48"	54"	API 5L Gr. B or equivalent

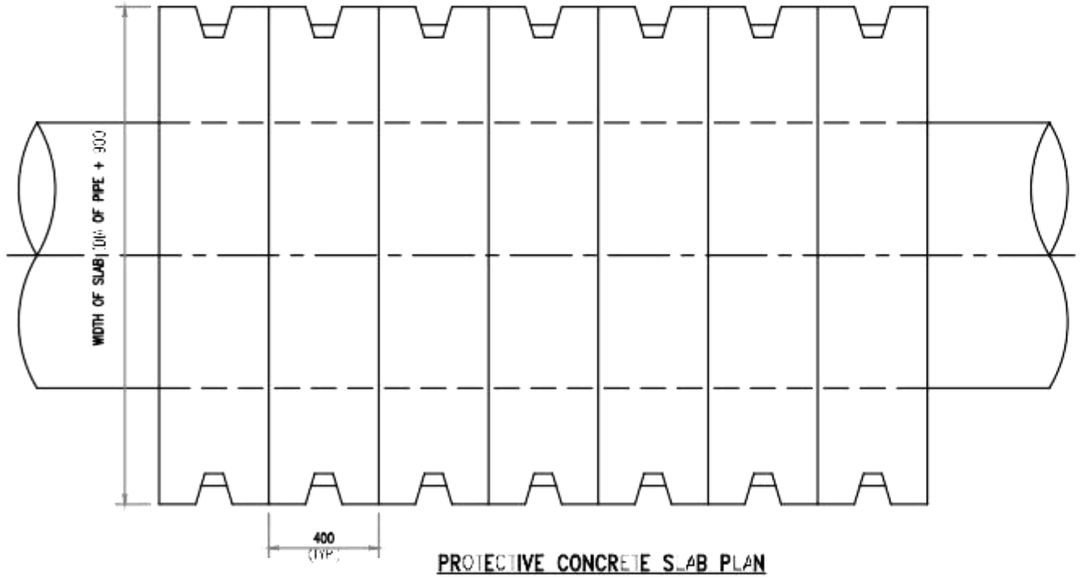
NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
2. THE CROSSING WORKS SHALL BE EXECUTED IN ACCORDANCE WITH API RECOMMENDED PRACTICE 1102 LATEST EDITION.
3. 500mm AWAY FROM BOTH ENDS, TWO NOS. INSULATORS SHALL BE PLACED. IN BALANCE LENGTH MAX. SPACING OF INSULATORS SHALL BE 2000 mm.
4. ELECTRICAL INSULATION BETWEEN THE CASING AND CARRIER PIPE SHALL BE CHECKED WITH A SUITABLE MEGGER.
5. MATERIAL OF THE CASING INSULATORS SHALL BE HDPE. END SEALS SHALL BE HEAT SHRINKABLE TYPE (MAKE RAYCHEM OR EQUIVALENT), CONTRACTOR SHOULD TAKE PRIOR APPROVAL FOR MATERIAL OF CONSTRUCTION FOR END SEAL & SHALL SUBMIT MATERIAL CERTIFICATES TO OWNER/ CONSULTANT FOR APPROVAL.
6. 1:250 SLOPE TO BE PROVIDED FOR DRAINING DURING INSTALLATION OF CASING PIPE.
7. CASING PIPE SHOULD EXTEND MIN. 600mm BEYOND THE TOE OF THE SLOPE OR RAIL GRADE, OR MIN 900 mm BEYOND THE BOTTOM OF THE DRAINAGE DITCH, WHICHEVER IS MORE.
8. CONTRACTOR SHOULD SUBMIT DETAILED WORK PROCEDURE ALONG WITH SKETCHES AND MATERIAL TEST CERTIFICATES FOR APPROVAL.
9. THE CROSSING SHALL BE CARRIED OUT WITH PIPE SIZE AND MINIMUM THICKNESS GIVEN IN THE PTS & DESIGN BASIS, THE SIZES GIVEN IN THIS SHEET ARE MINIMUM INDICATIVE ONLY.
17. FILLING OF ANNULAR SPACE BETWEEN CASING AND CARRIER PIPE SHALL BE AS PER PROJECT SPECIFICATION.
18. CROSSING MAY BE CARRIED OUT PRIOR TO MAINLINE ACTIVITIES ADDITIONAL ROW IF REQUIRED FOR APPROACH TO CROSSING PIPELINE SERVICING. HYDROTESTING, WORKING PIT FOR CROSSING TO AVOID CAVING OF SOIL, SHALL BE PROCURED BY CONTRACTOR WITHOUT ANY COST IMPLICATION.
19. CATHODIC PROTECTION :- ALL CASING PIPES FOR RAILWAY CROSSING SHALL BE C.P. PROTECTED, USING SACRIFICIAL ANODE.
21. TEST STATION ON BOTH SIDE OF CROSSING.
21. THE LOCATION OF ENTRY AND EXIT PIT SHALL BE DECIDED AT SITE TO SUIT THE SITE REQUIREMENT.
22 AT EACH CROSSING PIPELINE CROSSING WARNING SIGN SHALL BE INSTALLED ON EITHER SIDE OF CROSSING THE WARNING PLATE MAY BE MOUNTED ON THE VENT/DRAIN OFF PIPE.
23. ALL CARRIER PIPELINE JOINTS SHALL BE RADIOGRAPHED.
24 PIPELINE SECTION SHALL BE PRETESTED HYDROSTATICALLY SEPARATELY FROM THE MAIN LINE TESTING WHEN REQUIRED BY CONCERNED AUTHORITIES OR AS DIRECTED BY CLIENT.
25. THE CASING PIPE SHALL BE PROVIDED WITH MINIMUM 50 MM DIAMETER VENT PIPE FOR FILLING THE FILLER MATERIAL IF REQUIRED AS PER PROJECT SPECIFICATION. AFTER FILLING VENT PIPE AT BOTH ENDS SHALL BE TRIMMED AND PLUGGED/SEALED WITH END CAPS.
26. IN ANY CASE, THE MINIMUM LENGTH OF CASING PIPE SHALL BE 72M FOR NATIONAL HIGHWAY CROSSING, AND 60M FOR ALL STATE HIGHWAY/MDR CROSSING.
27. THICKNESS OF CARRIER PIPE SHALL BE CALCULATED AS PER API RP 1102 AND SUBMITTED FOR APPROVAL.

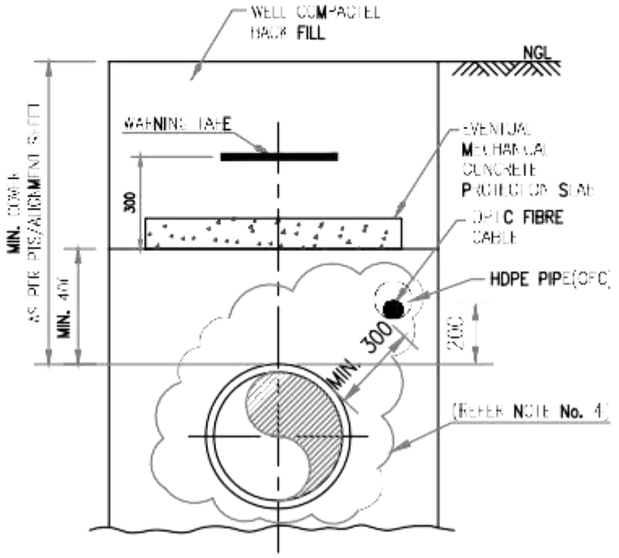
Rev.	Date	Modifications	Drawn	Checked	Approved	Validated
1	15.04.21	REVISED AND RE-ISSUED.	KS	MKS	MS	KKS
0	29.09.16	APPROVED FOR CONSTRUCTION.	JV	MS	NC	SKH

SUBJECT
TYPICAL ROAD CASED CROSSING (B+C)
TYPE II
COMMON CASING - OFC BUNDLED WITH CARRIER (WITHOUT CS CONDUIT)

Size A3 | Scale NTS | Sheet 01 of 01
Drawing No. GGNG-D-20707-004-B | Rev. 1

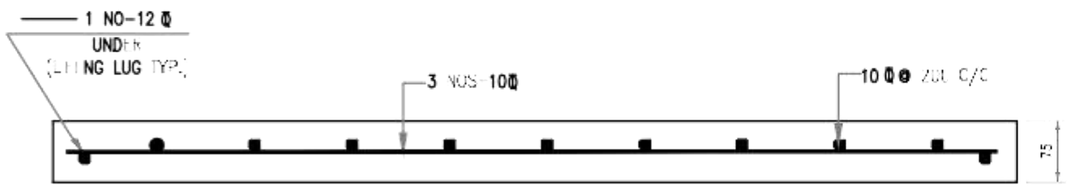


PROTECTIVE CONCRETE SLAB PLAN

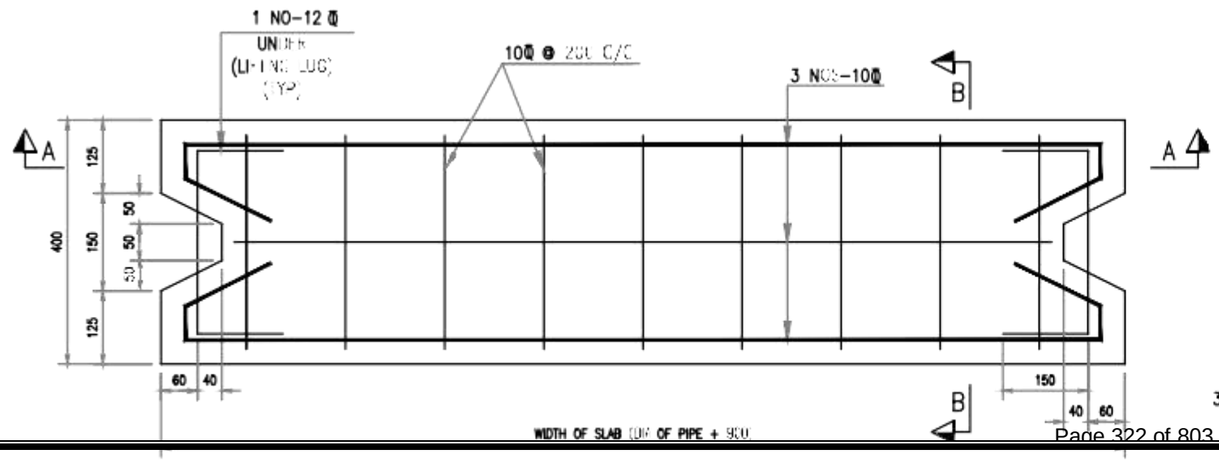


NOTES

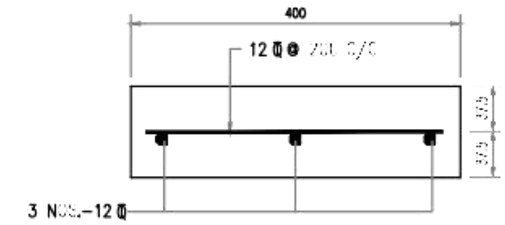
1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
2. MINIMUM COVER OVER LINE PIPE SHALL BE AS PER SPECIFICATIONS AND REQUIREMENT OF CONCERNED AUTHORITIES.
3. THIS SKETCH IS INDICATIVE ONLY.
4. TYPE OF TRENCHING SHALL BE AS PER PTS AND APPROVED PROCEDURE.
5. CONCRETE MIX M20 SHALL BE USED.
6. LENGTH OF THE MECHANICAL PROTECTION SLAB REQUIREMENT SHALL BE AS PER SITE REQUIREMENT.



SECTION A–A
SCALE–1 : 10



REINF. DETAIL PROTECTIVE CONCRETE SLAB



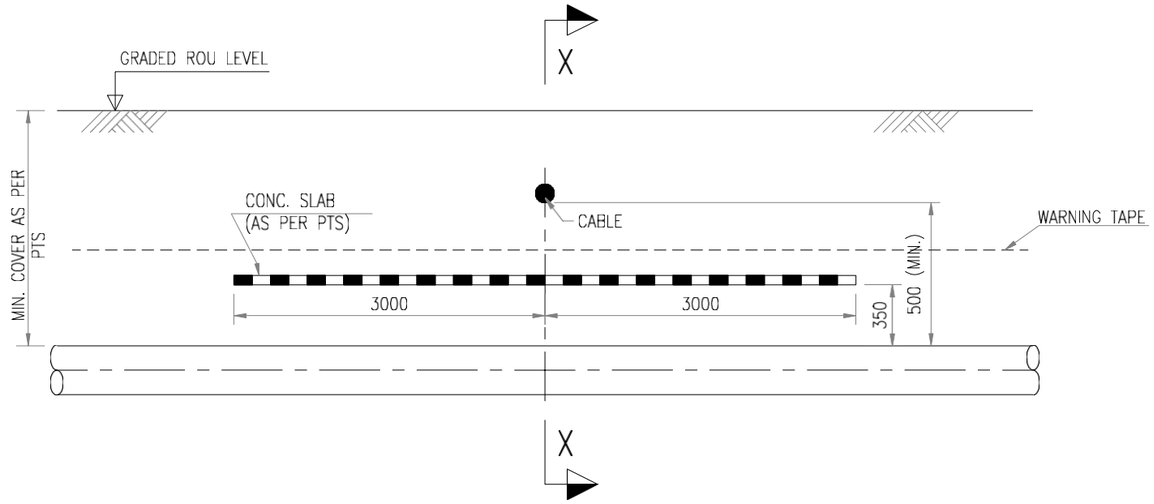
SECTION B–B
1 : 10

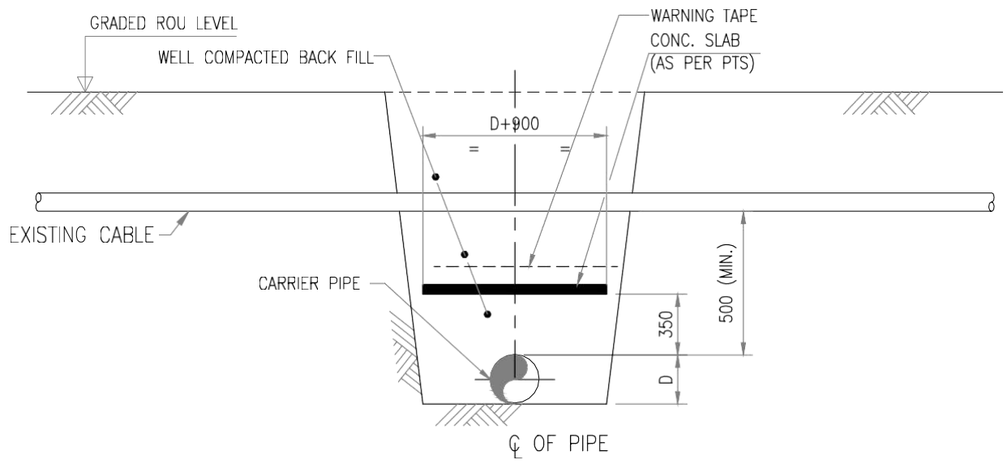
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
0	16.04.21	APPROVED FOR CONSTRUCTION	KS	MKS	MS	KNS

SUBJECT: TYPICAL MECHANICAL PROTECTION CONCRETE SLAB DETAILS

Size: A3 | Scale: NTS | Sheet: 01 of 01

Drawing No.: GGNG-D-20707-007 | Rev.: 0





SECTION X–X

NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
2. A MODIFIED PIPELINE WARNING SIGN SHALL BE INSTALLED CLOSE TO THE CROSSING.
3. IN CASE OF UNARMOURED CABLE, C.P. BONDING IS TO BE PROVIDED BETWEEN PIPELINE AND CABLE ARMOUR. IN CASE OF UNARMOURED CABLE, ARRANGEMENT FOR SHIELDING (BY PROVIDING CASING ON EITHER SIDE OF THE PIPELINE OR CABLE) SHALL BE CONSIDERED.
4. APPROVAL OF THE CROSSING SHALL BE OBTAINED FROM CONCERNED AUTHORITIES.
5. FOR CONCRETE SLAB, REFER STD. DRG No. GGNG–D–20707–007.

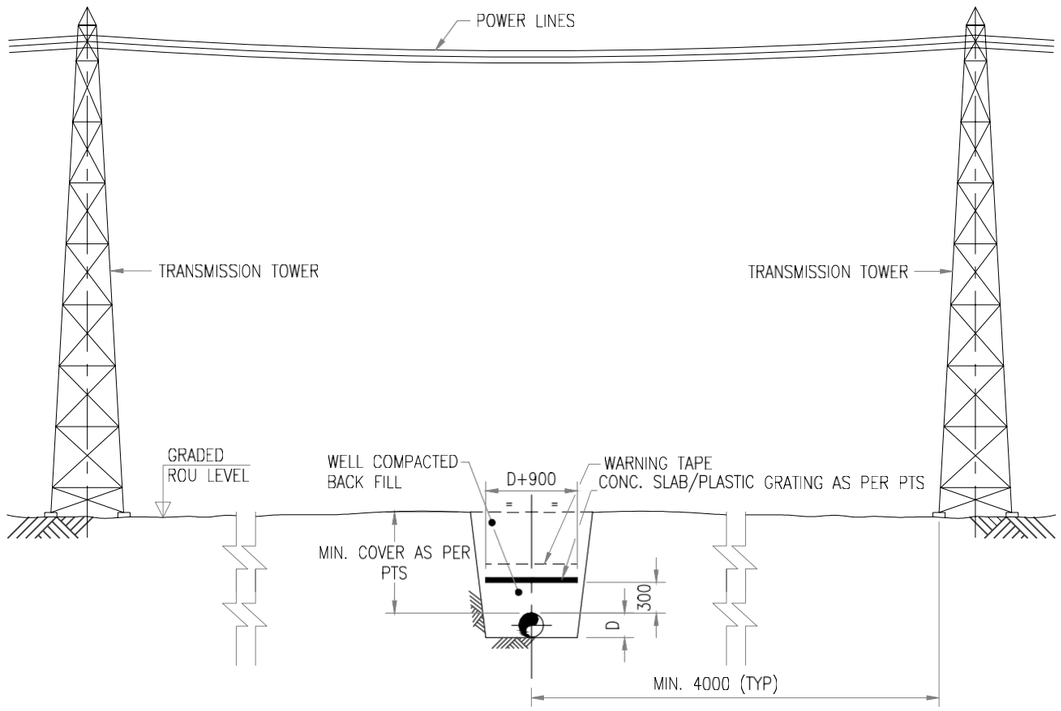
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
0	16.04.21	APPROVED FOR CONSTRUCTION.	KS	MKS	MS	KNS

SUBJECT

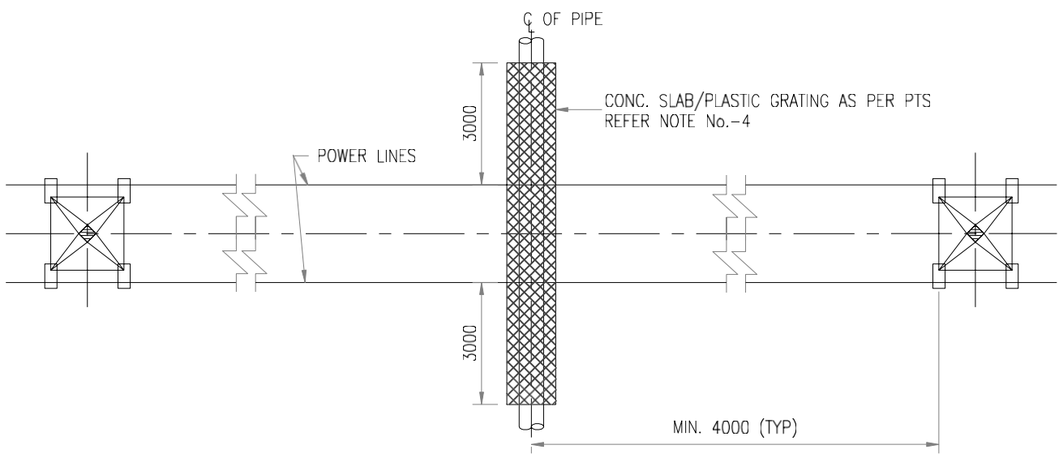
TYPICAL UNDERGROUND
CABLE CROSSING DETAILS

Size	Scale	Sheet
A3	NTS	01 of 01

Drawing No. GGNG-D-20707-008 Rev. 0



SECTION



PLAN

NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
2. SUITABLE MEASURES SHALL BE TAKEN FOR THE PROTECTION OF THE LINE AND SECURITY OF PERSONNEL WHEREVER FOUND NECESSARY.
3. APPROVAL OF THE CROSSING SHALL BE OBTAINED FROM CONCERNED AUTHORITIES.
4. FOR CONCRETE SLAB REFER STD DWG NO. GGNG-D-20707-007.
5. HDPE SHEET SHALL BE PROVIDED FOR HIGH VOLTAGE LINES FROM 11KV TO 66KV. FOR 66KV AND ABOVE CONCRETE SLAB SHALL BE PROVIDED.

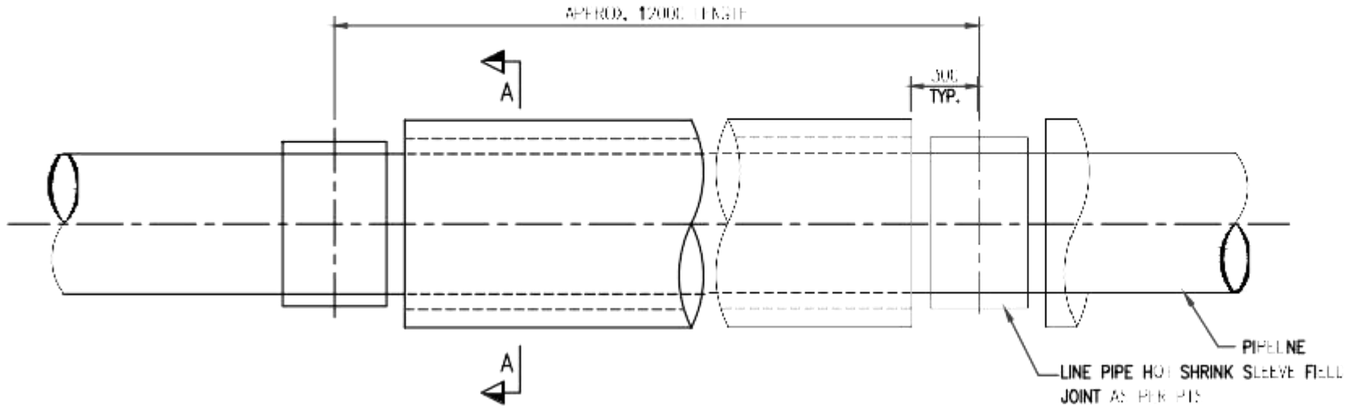
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
0	16.04.21	APPROVED FOR CONSTRUCTION.	KS	MKS	MS	KNS

SUBJECT

OVERHEAD POWER LINE
CROSSING DETAILS

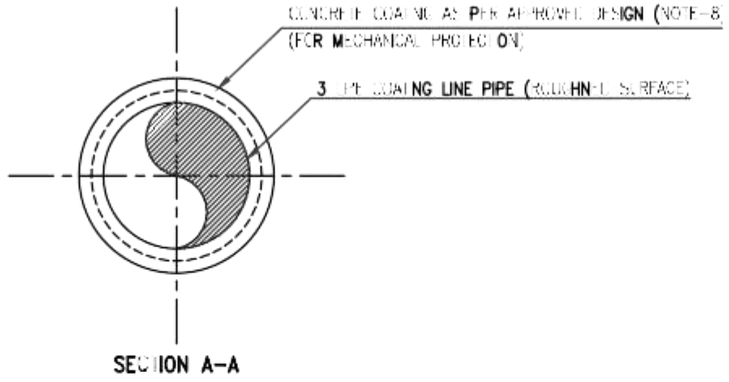
Size	Scale	Sheet
A3	NTS	01 of 01

Drawing No.	Rev.
GGNG-D-20707-009	0



DETAIL OF PIPELINE WITH MECHANICAL PROTECTION CONCRETE COATING

REFER TO ALIGNMENT SHEET FOR LOCATION AND LENGTH OF CONC. COATED PIPE



SECTION A-A

NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
2. REINFORCEMENT SHALL CONSIST OF WELDED STEEL WIRE FABRIC MANUFACTURED IN SLOT SHEETS OR IN ROLLS (RIBBON MESH) AND SHALL CONFORM TO ASTM A-185. WIRES SHALL CONFORM TO ASTM A 82.
3. GALVANIZING OF STEEL WIRE SHALL BE AS PER ASTM.
4. THICKNESS OF STEEL WIRE SIZE SHALL BE 2.4mm AND SPACING OF WIRE SHALL BE 50mm x 100 mm.
5. ANTIBUOYANCY CALCULATION SHALL BE SUBMITTED FOR APPROVAL.
6. MINIMUM THICKNESS OF CONCRETE COATING SHALL BE 75mm.
7. CONCRETE COATING SHALL BE M20 USED.
8. MINIMUM THICKNESS OF CONCRETE COATING SHALL BE AS MAINTAINED IN PTS & ALIGNMENT SHEETS.

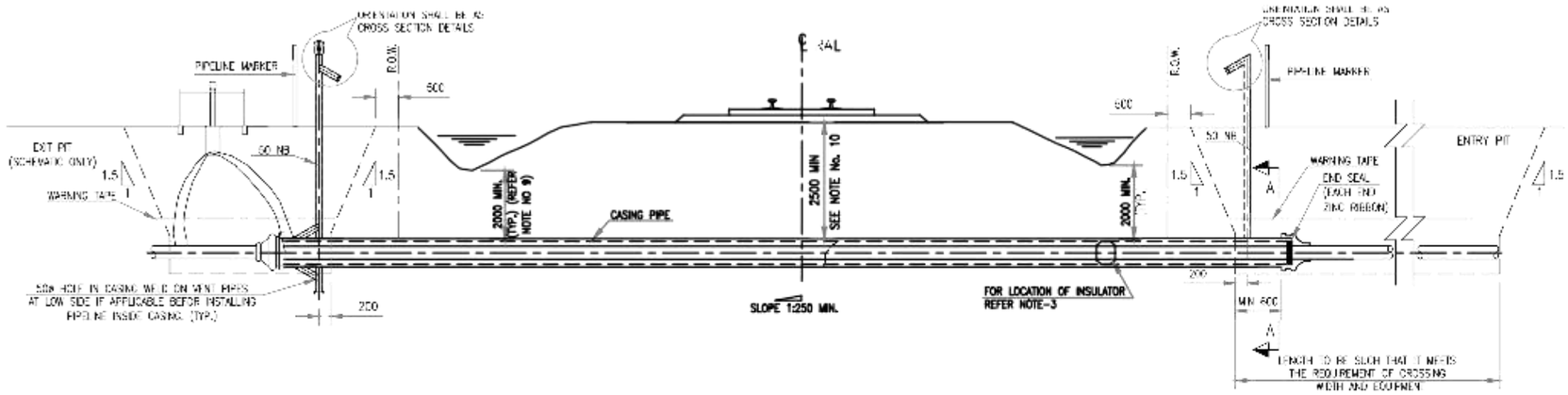
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
0	16.04.21	APPROVED FOR CONSTRUCTION.	KS	MKS	MS	KNS

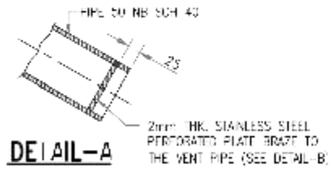
SUBJECT

TYPICAL CONCRETE COATING FOR
MECHANICAL PROTECTION

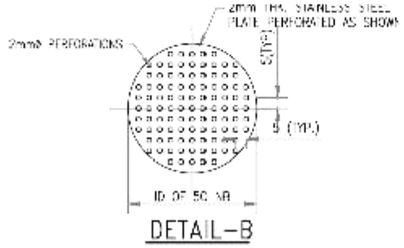
Size	Scale	Sheet
A3	NTS	01 of 01

Drawing No. GGNG-D-20707-010 | Rev. 0

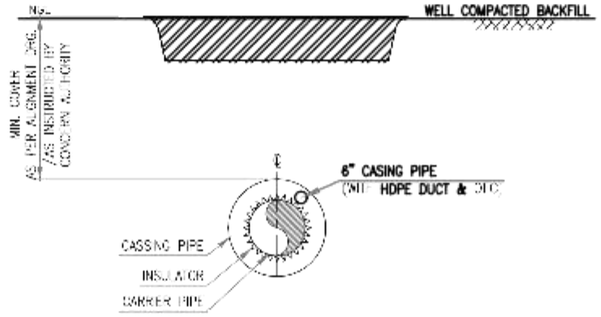




DETAIL-A



DETAIL-B



SECTION A-A

TYPICAL BORE PIT EXCAVATION

DRAIN OFF

VENT

S. NO.	SIZE OF CARRIER PIPE	MINIMUM SIZE OF CASING PIPE WITHOUT HDPE DUCT	MINIMUM THICKNESS OF CASING (MM)	MINIMUM SIZE OF CASING PIPE W.F 6" CASING PIPE FOR HDPE DUCT	MINIMUM THICKNESS OF CASING (MM)
1.	4"	10"	5	15"	6
2.	6"	12"	5	18"	7
3.	8"	14"	5	20"	8
4.	10"	16"	6	22"	8
5.	12"	18"	7	24"	8
6.	16"	22"	8	28"	10
7.	18"	24"	8	30"	11
8.	20"	26"	9	32"	12
9.	24"	30"	11	36"	12
10.	30"	36"	12	42"	15
11.	36"	42"	15	48"	16
12.	42"	48"	16	54"	19
13.	48"	54"	19	60"	21

MATERIAL: API 5L Gr. B PSL1 or IS 3589 (fabricated from steel plates conforming IS-2062)

NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
2. THE CROSSING WORKS SHALL BE EXECUTED IN ACCORDANCE WITH API RECOMMENDED PRACTICE 1102 LATEST EDITION.
3. 500mm AWAY FROM BOTH ENDS, TWO NOS. INSULATORS SHALL BE PLACED, IN BALANCE LENGTH MAX. SPACING OF INSULATORS SHALL BE 2000 mm.
4. ELECTRICAL INSULATION BETWEEN THE CASING AND CARRIER PIPE SHALL BE CHECKED WITH A MEGGER.
5. MATERIAL OF THE CASING INSULATORS SHALL BE HDPE. END SEALS SHALL BE HEAT SHRINKABLE TYPE, CONTRACTOR SHOULD TAKE PRIOR APPROVAL FOR MATERIAL OF CONSTRUCTION FOR END SEAL & SHALL SUBMIT MATERIAL CERTIFICATES TO OWNER/CONSULTANT FOR APPROVAL.
6. 1:250 SLOPE TO BE PROVIDED TOWARDS DRAIN DURING INSTALLATION OF CASING PIPE.
7. CONTRACTOR SHOULD SUBMIT DETAILED WORK PROCEDURE ALONG WITH SKETCHES AND MATERIAL TEST CERTIFICATES FOR APPROVAL.
8. THE MINIMUM 2.5M COVERAGE SHALL BE MAINTAINED BETWEEN TOP SURFACE OF CASING PIPE AND BOTTOM OF RAIL UNLESS OTHERWISE STATED IN PTS OR REQUIRED BY RAILWAY AUTHORITIES.
9. AT EACH CROSSING, PIPELINE CROSSING WARNING SIGN SHALL BE INSTALLED ON EITHER SIDE OF CROSSING. THE WARNING PLATE MAY BE MOUNTED ON THE VENT/DRAIN OFF PIPE.
10. ALL CARRIER PIPELINE JOINTS SHALL BE RADIOGRAPHED.
11. PIPELINE SECTION SHALL BE PRETESTED HYDROSTATICALLY SEPARATELY FROM THE MAIN LINE TESTING WHEN REQUIRED BY CONCERNED AUTHORITIES/OR AS DIRECTED BY CLIENT.
12. CASING PIPE SHOULD EXTEND A MIN OF 600MM BEYOND THE TOE OF THE SLOPE OR BASE GRADE, OR 900MM BYOND THE BOTTOM OF THE DRAINAGE DITCH WHICHEVER IS GREATER.
13. CROSSING SHALL BE CARRIED OUT WITH CASING PIPE SIZE & THICKNESS GIVEN IN PTS & DESIGN BASIS. THE SIZES & THICKNESS GIVEN IN THIS SHEET ARE MINIMUM REQUIREMENT AND INDICATIVE ONLY.
14. CROSSING MAY BE CARRIED OUT PRIOR TO MAINLINE ACTIVITIES ADDITIONAL ROU, IF REQUIRED, FOR APPROACH TO CROSSING, PIPELINE STRING, HYDROTESTING, WORKING PIT FOR CROSSING, TO AVOID CAVING OF SOIL, SHALL BE PROCURED BY CONTRACTOR WITHOUT ANY COST IMPLICATION.
15. CATHODIC PROTECTION :- ALL CASING PIPES FOR RAILWAY CROSSING SHALL BE C.P. PROTECTED.
16. TEST STATION ON BOTH SIDE OF CROSSING.
17. BENTONITE FILLING PROCEDURE SHALL BE DONE AS PER OWNER/ CONSULTANTS INSTRUCTIONS.
18. THE LOCATION OF ENTRY AND EXIT PIT SHALL BE DECIDED AT SITE TO SUIT THE SITE REQUIREMENT.
19. THE CASING PIPE SHALL BE PROVIDED WITH MINIMUM 50 MM DIAMETER VENT PIPE FOR FILLING BENTONITE. AFTER FILLING OF BENTONITE, VENT PIPE AT BOTH ENDS SHALL BE TRIMMED AND PLUGGED/SEALED WITH END CAPS.
20. MINIMUM LENGTH OF THE CASING SHALL BE AS INDICATED IN ALIGNMENT SHEET OR 60M WHICHEVER IS MORE.
21. THICKNESS OF CARING PIPE SHALL BE CALCULATED AS PER API RP 1102 AND SUBMITTED FOR APPROVAL.

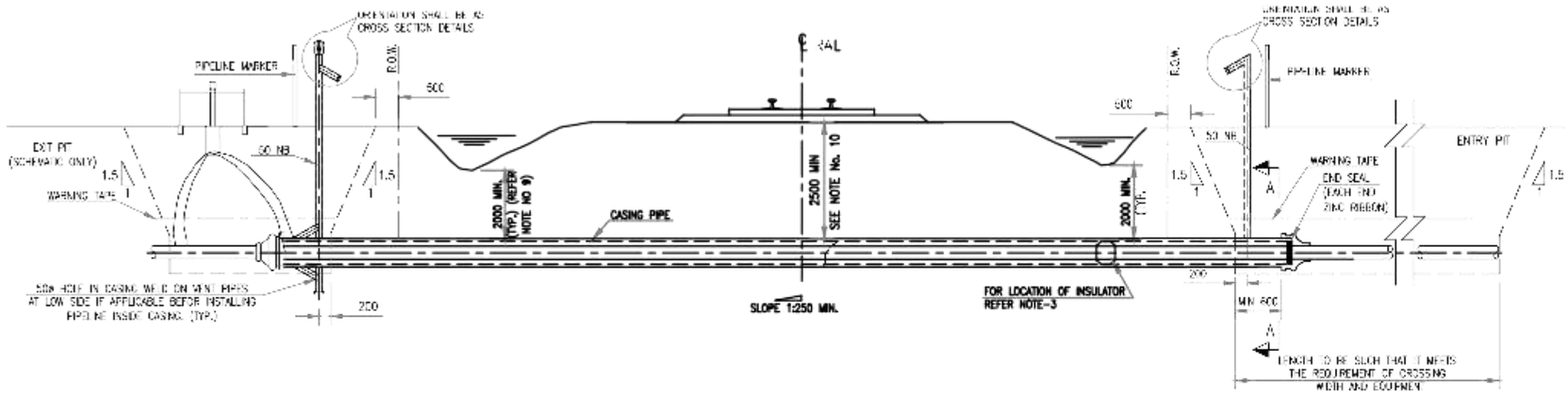
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
1	16.04.21	REVISED AND RE-ISSUED.	KS	MKS	MS	KNS
0	29.09.16	APPROVED FOR CONSTRUCTION.	JV	MS	NC	SKH

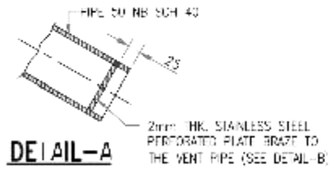
SUBJECT

TYPICAL RAILWAY CASED CROSSING (B+C)
TYPE-I
SEPARATE CSING FOR CARRIER AND OFC

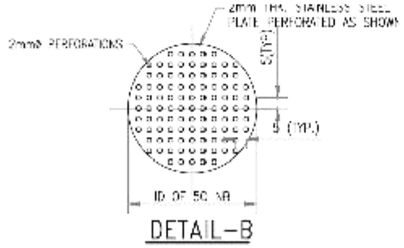
Size	Scale	Sheet
A3	NTS	01 of 01

Drawing No. GGNG-D-20707-012-A | Rev. 1

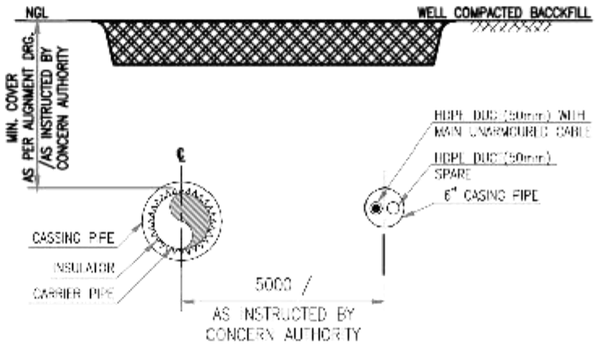




DETAIL-A

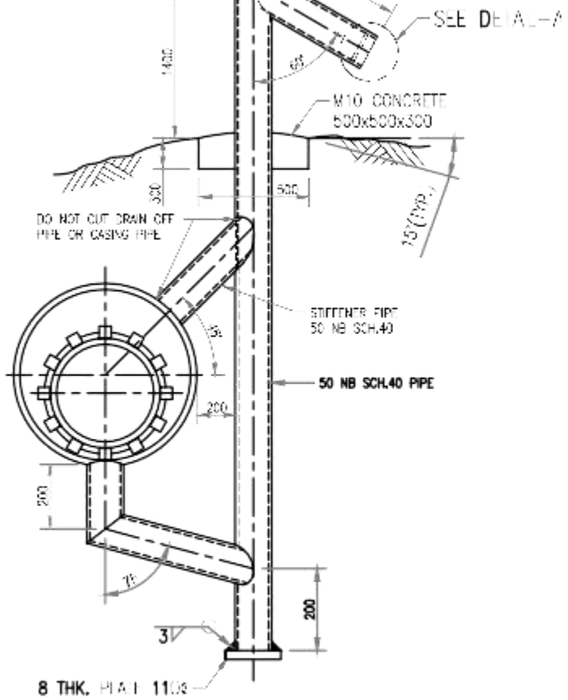


DETAIL-B

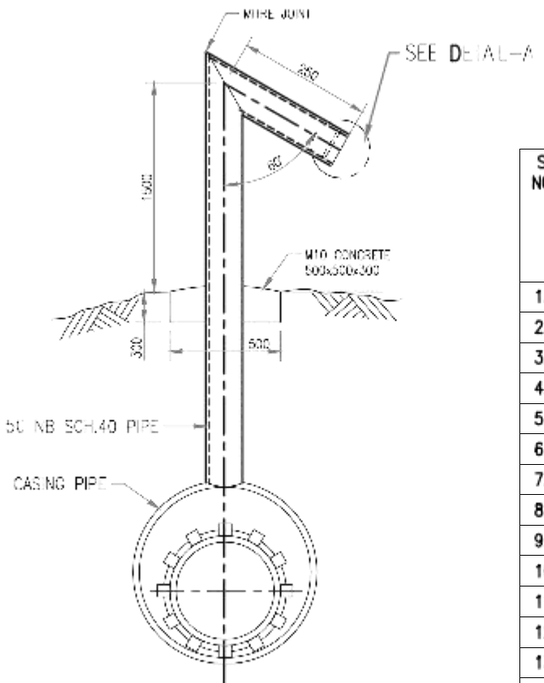


SECTION A-A

TYPICAL BORE PIT EXCAVATION



DRAIN OFF



VENT

S. NO.	SIZE OF CARRIER PIPE	MINIMUM SIZE OF CASING PIPE WITHOUT HDPE DUCT	MINIMUM THICKNESS OF CASING (MM)	MINIMUM SIZE OF CASING PIPE W.R.T 6" CASING PIPE FOR HDPE DUCT	MINIMUM THICKNESS OF CASING (MM)
1.	4"	10"	5	16"	6
2.	6"	12"	5	18"	7
3.	8"	14"	5	20"	8
4.	10"	16"	6	22"	8
5.	12"	18"	7	24"	8
6.	16"	22"	8	28"	10
7.	18"	24"	8	30"	11
8.	20"	26"	9	32"	12
9.	24"	30"	11	36"	12
10.	30"	36"	12	42"	15
11.	36"	42"	15	48"	16
12.	42"	48"	16	54"	19
13.	48"	54"	19	60"	21

MATERIAL: API 5L Gr. B. PSL1 or IS: 3589 (fabricated from steel plates confirming IS-2062)

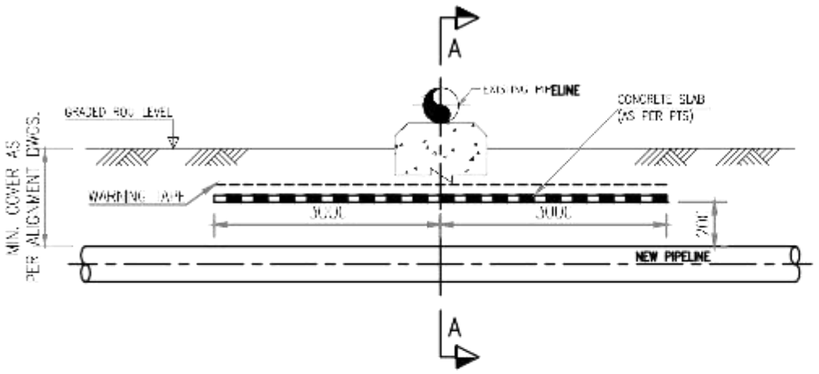
NOTES

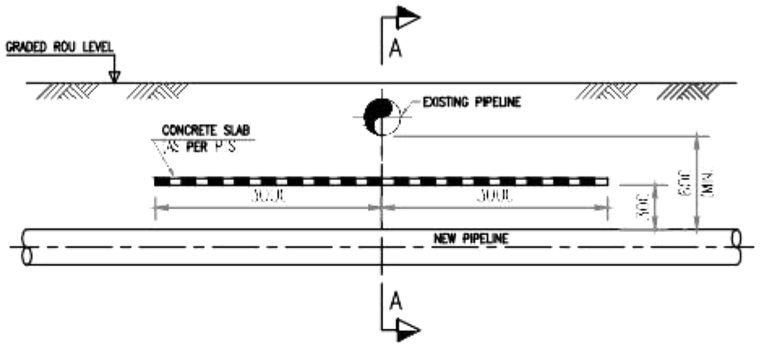
1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
2. THE CROSSING WORKS SHALL BE EXECUTED IN ACCORDANCE WITH API RECOMMENDED PRACTICE 1102 LATEST EDITION.
3. 500mm AWAY FROM BOTH ENDS, TWO NOS. INSULATORS SHALL BE PLACED, IN BALANCE LENGTH MAX. SPACING OF INSULATORS SHALL BE 2000 mm.
4. ELECTRICAL INSULATION BETWEEN THE CASING AND CARRIER PIPE SHALL BE CHECKED WITH A MEGGER.
5. MATERIAL OF THE CASING INSULATORS SHALL BE HDPE. END SEALS SHALL BE HEAT SHRINKABLE TYPE, CONTRACTOR SHOULD TAKE PRIOR APPROVAL FOR MATERIAL OF CONSTRUCTION FOR END SEAL & SHALL SUBMIT MATERIAL CERTIFICATES TO OWNER/CONSULTANT FOR APPROVAL.
6. 1:250 SLOPE TO BE PROVIDED TOWARDS DRAIN DURING INSTALLATION OF CASING PIPE.
7. CONTRACTOR SHOULD SUBMIT DETAILED WORK PROCEDURE ALONG WITH SKETCHES AND MATERIAL TEST CERTIFICATES FOR APPROVAL.
8. THE MINIMUM 2.5M COVERAGE SHALL BE MAINTAINED BETWEEN TOP SURFACE OF CASING PIPE AND BOTTOM OF RAIL UNLESS OTHERWISE STATED IN PTS OR REQUIRED BY RAILWAY AUTHORITIES.
9. AT EACH CROSSING, PIPELINE CROSSING WARNING SIGN SHALL BE INSTALLED ON EITHER SIDE OF CROSSING. THE WARNING PLATE MAY BE MOUNTED ON THE VENT/DRAIN OFF PIPE.
10. ALL CARRIER PIPELINE JOINTS SHALL BE RADIOGRAPHED.
11. PIPELINE SECTION SHALL BE PRETESTED HYDROSTATICALLY SEPARATELY FROM THE MAIN LINE TESTING WHEN REQUIRED BY CONCERNED AUTHORITIES/OR AS DIRECTED BY CLIENT.
12. CASING PIPE SHOULD EXTEND A MIN OF 600MM BEYOND THE TOE OF THE SLOPE OR BASE GRADE, OR 900MM BEYOND THE BOTTOM OF THE DRAINAGE DITCH WHICHEVER IS GREATER.
13. CROSSING SHALL BE CARRIED OUT WITH CASING PIPE SIZE & THICKNESS GIVEN IN PTS & DESIGN BASIS. THE SIZES & THICKNESS GIVEN IN THIS SHEET ARE MINIMUM REQUIREMENT AND INDICATIVE ONLY.
14. CROSSING MAY BE CARRIED OUT PRIOR TO MAINLINE ACTIVITIES ADDITIONAL ROU, IF REQUIRED, FOR APPROACH TO CROSSING, PIPELINE STRING, HYDROTESTING, WORKING PIT FOR CROSSING, TO AVOID CAVING OF SOIL, SHALL BE PROCURED BY CONTRACTOR WITHOUT ANY COST MITIGATION.
15. CATHODIC PROTECTION :- ALL CASING PIPES FOR RAILWAY CROSSING SHALL BE C.P. PROTECTED.
16. TEST STATION ON BOTH SIDE OF CROSSING.
17. BENTONITE FILLING PROCEDURE SHALL BE DONE AS PER OWNER/ CONSULTANTS INSTRUCTIONS.
18. THE LOCATION OF ENTRY AND EXIT PIT SHALL BE DECIDED AT SITE TO SUIT THE SITE REQUIREMENT.
19. THE CASING PIPE SHALL BE PROVIDED WITH MINIMUM 50 MM DIAMETER VENT PIPE FOR FILLING BENTONITE. AFTER FILLING OF BENTONITE, VENT PIPE AT BOTH ENDS SHALL BE TRIMMED AND PLUGGED/SEALED WITH END CAPS.
20. MINIMUM LENGTH OF THE CASING SHALL BE AS INDICATED IN ALIGNMENT SHEET OR 60M WHICHEVER IS MORE.
21. THICKNESS OF CARRIER PIPE SHALL BE CALCULATED AS PER API RP 1102 AND SUBMITTED FOR APPROVAL.

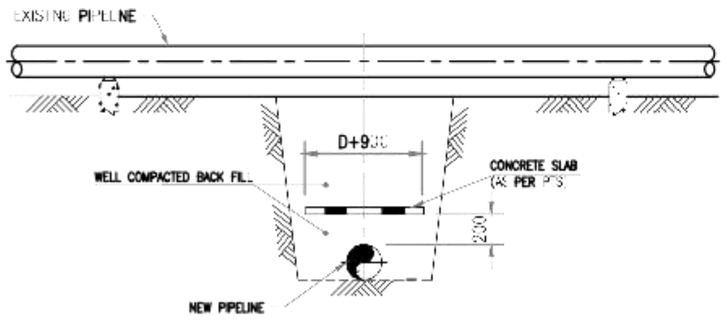
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
1	16.04.21	REVISED AND RE-ISSUED.	KS	MKS	MS	KNS
0	29.09.16	APPROVED FOR CONSTRUCTION.	JV	MS	NC	SKH

SUBJECT: TYPICAL RAILWAY CASED CROSSING (B+C)
TYPE-II
COMMON CSING - OFC BUNDLED WITH CARRIER (WITHOUT CS CONDUIT)

Size: A3 | Scale: NTS | Sheet: 01 of 01
Drawing No.: GGNG-D-20707-012-B | Rev.: 1

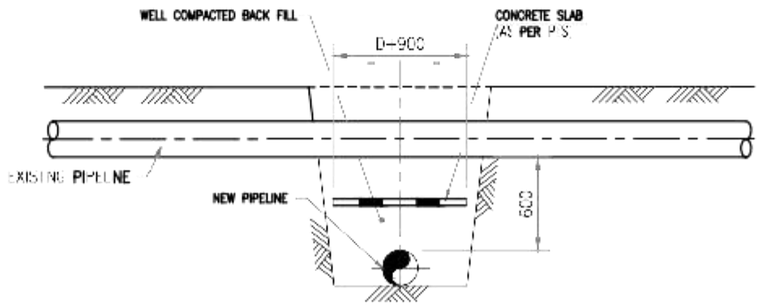






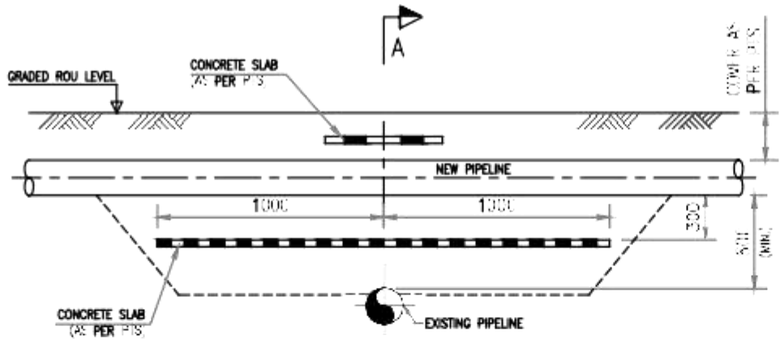
SECTION A–A

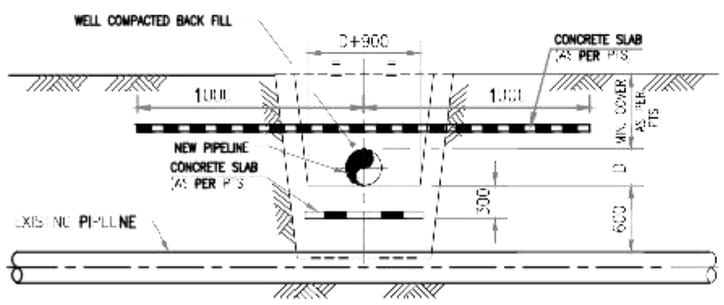
EXISTING ABOVEGROUND PIPE CROSSING



SECTION A–A

EXISTING UNDERGROUND PIPE CROSSING(TYPE–1)





SECTION A–A

EXISTING UNDERGROUND PIPE CROSSING(TYPE–2)

NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. A MODIFIED PIPELINE WARNING SIGN SHALL BE INSTALLED WHERE THE PIPELINE CROSSES AN EXISTING PIPELINE CARRYING HAZARDOUS FLUID.
3. FOR CONCRETE SLAB REFER DWG. No. GGNG-D-20707-007.
4. SUITABLE CATHODIC PROTECTION BONDING SHALL BE PROVIDED BETWEEN CROSSING PIPELINES. IN SOME CASES THE NEW PIPELINE MAY REQUIRE ELECTRICAL ISOLATION.
5. TRENCH DIMENSIONS SHALL BE IN ACCORDANCE WITH RELEVANT STANDARDS/SPECIFICATIONS.
6. APPROVAL OF THE CROSSING SHALL BE OBTAINED FROM CONCERNED AUTHORITIES.

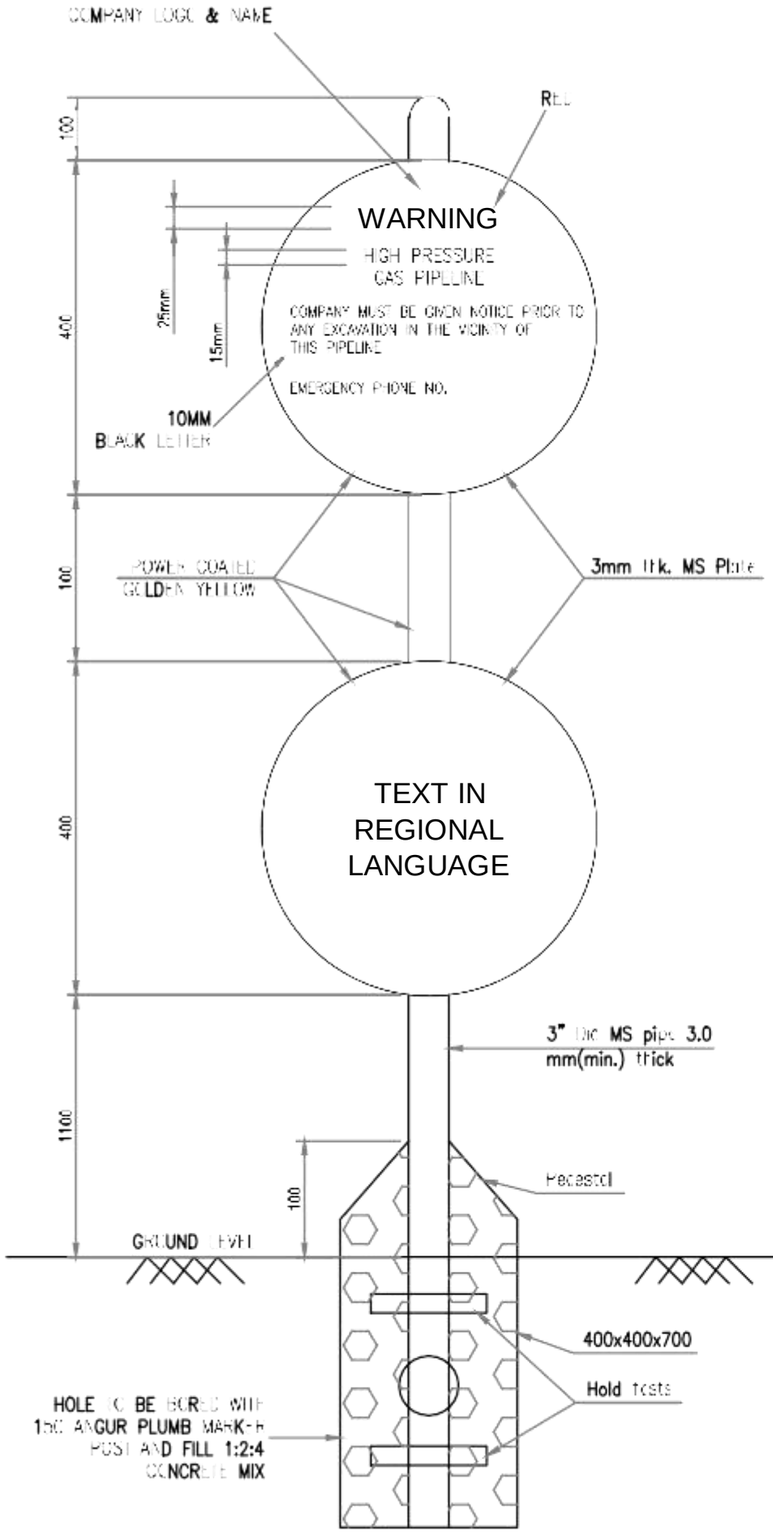
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
0	16.04.10	APPROVED FOR CONSTRUCTION.	KS	MKS	MS	KNS

SUBJECT

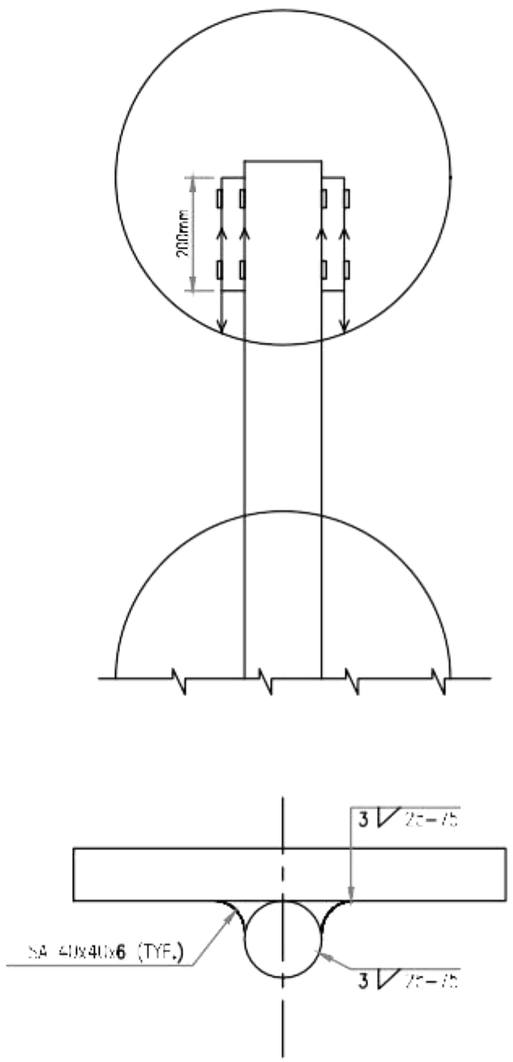
TYPICAL EXISTING PIPE LINE CROSSING

Size	Scale	Sheet
A3	NTS	01 of 01

Drawing No. GGNG-D-20707-014 | Rev. 0



FIXING DETAILS



NOTES

1. THE FULL WORKING AND SIZES ARE ONLY INDICATIVE AND ARE SUBJECT TO THE APPROVAL BY OWNER/OWNER'S REPRESENTATIVE BEFORE FABRICATION.
2. SCHEME FOR POWDER COATING AND COLORING. ONE COAT OF PRIMER & TWO COATS OF SPECIFIED PAINTS. ALL LETTERS EXCEPT 'WARNING' TO BE PAINTED BLACK.
3. ALL DIMENSION ARE IN MM. UNLESS OTHERWISE SPECIFIED.
4. APPROVAL OF WARNING MARKER DESIGN SHALL BE OBTAINED BEFORE THE COMMENCEMENT OF WORK.

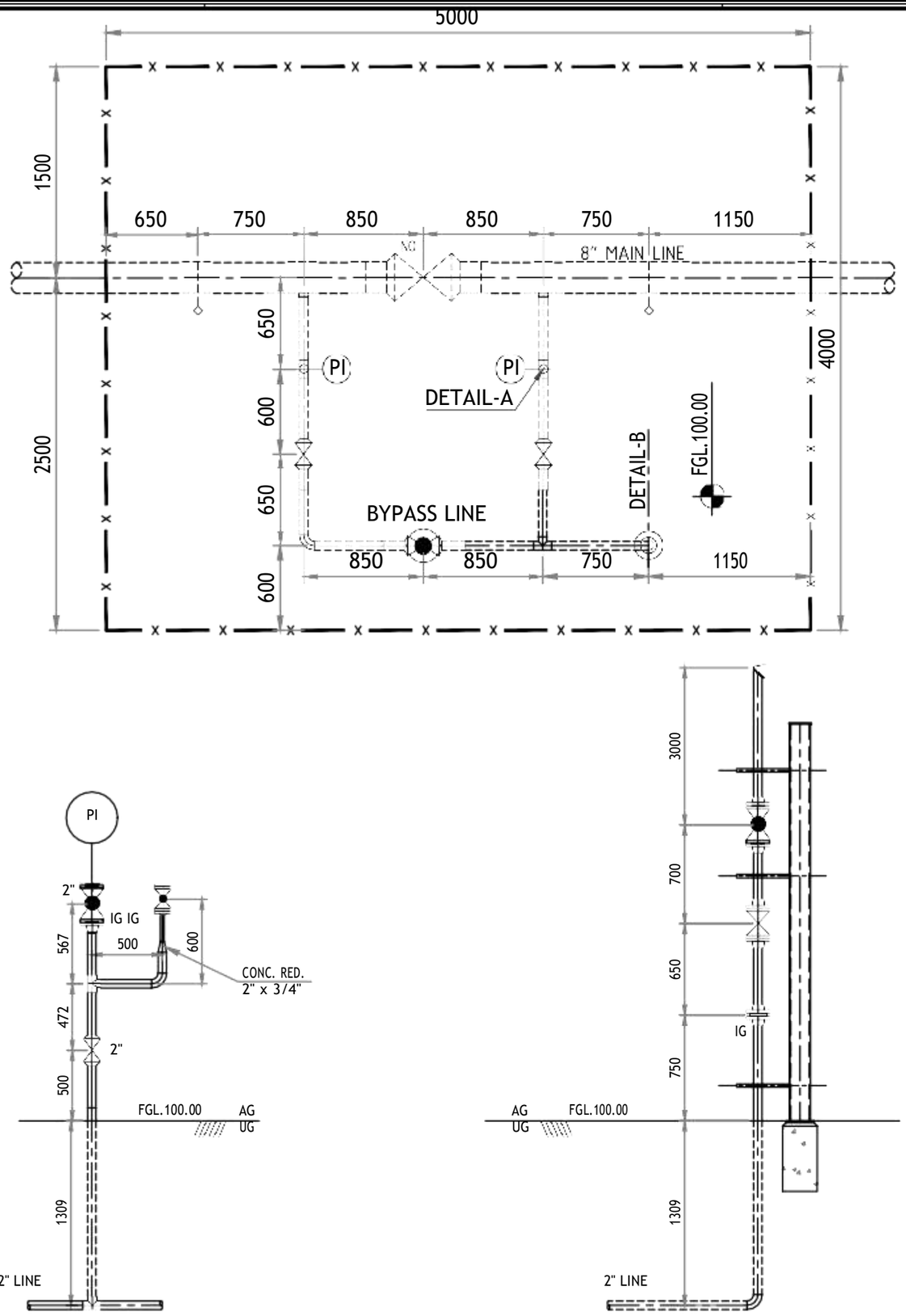
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
0	16.04.21	APPROVED FOR CONSTRUCTION.	KS	MKS	MS	KNS

SUBJECT

POLE MARKER WITH FOUNDATION

Size	Scale	Sheet
A3	NTS	01 of 01

Drawing No. GGNG-D-20707-053 Rev. 0



DETAIL-A

DETAIL-B

REFERENCE DRAWING

S. NO.	DRAWING TITLE	DRAWING NO.
1	-	-

NOTES

1. ALL DIMENSIONS ARE IN MM OR LEVELS ARE IN M.
2. DRAWING ARE INDICATED & SUBJECT TO CHANGE DURING DETAIL ENGG.
3. LAYING OF PIPELINE AND STATION PIPING, VENDOR SHALL MAINTAIN SPECIFIED COVER OF PIPELINE.
4. MAINLINE VALVE IS ACTUATED VALVE.
5. ALL UG VALVE AND BURRIED VALVES WHICH WILL BE OPERATED FROM GROUND LEVEL. HENCE MAINLINE & BYPASS LINE VALVE IS LONG STEM EXTENDED VALVES.

LEGENDS

BALL VALVE
GLOBE VALVE
TIE-IN POINT
CENTER LINE OF PIPE
CENTER LINE OF PIPE

NG - NATURAL GAS
PIPELINE

MAIN LINE	BYPASS LINE	BRANCH CONNECTION	REMARKS
4"	NO BYPASS LINE	-	-
6"	2"	WELDOLET	-
8"	2"	WELDOLET	-
10"	4"	WELDOLET	-
12"	4"	WELDOLET	-
16"	6"	WELDOLET	-

Rev.	D M Y	Modifications	Drawn	Checked	Approved
0	16.04.21	ISSUED FOR APPROVAL.	KS	MKS	KNS

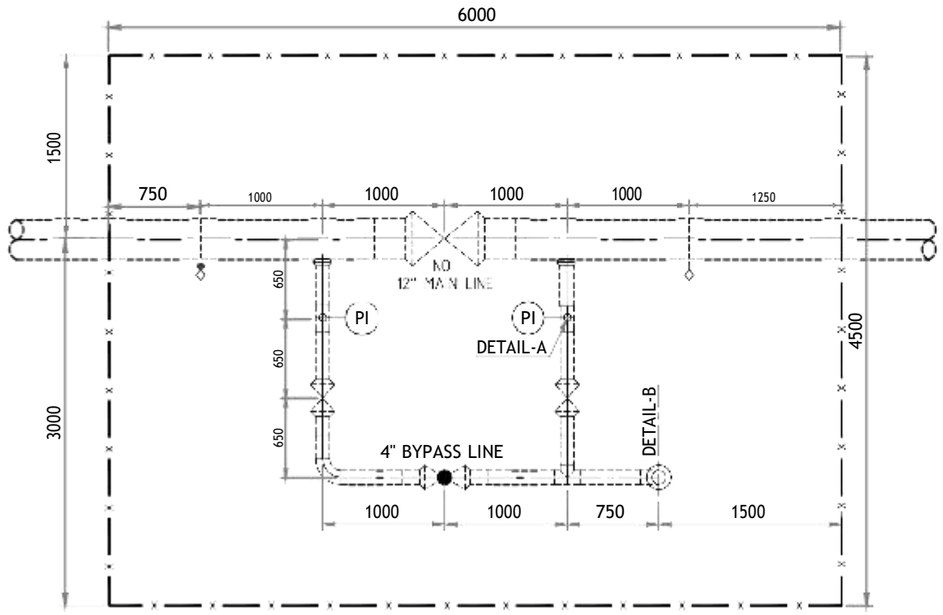
CUSTOMER: CENTRAL U. P. GAS LIMITED

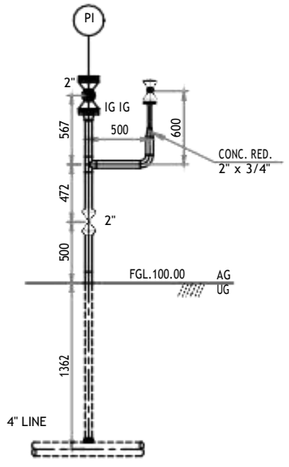
PROJECT: CITY GAS DISTRIBUTION PROJECT

SUBJECT: PIPING GENERAL ARRANGEMENT DRAWING
FOR SV STATION WITH VENTING ARRANGEMENT
(LONG STEM EXTENDED ACTUATED VALVES)

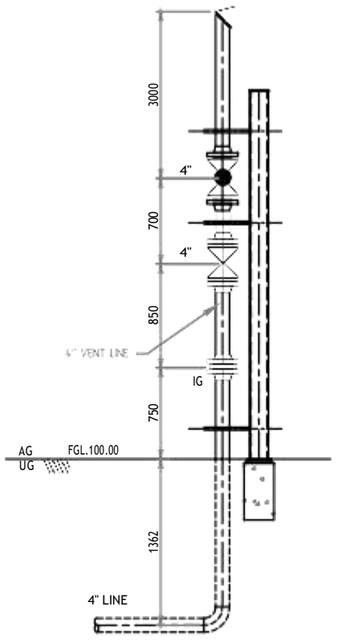
Size	Scale	Sheet	Rev.
A3	1:35	1 of 2	0

Project No.	Discipline Code	System Code	Serial No.
P.014714	G	20749	004





DETAIL-A



DETAIL-B

REFERENCE DRAWING

S. NO.	DRAWING TITLE	DRAWING NO.
1	-	-

NOTES

1. ALL DIMENSIONS ARE IN MM OR LEVELS ARE IN M.
2. DRAWING ARE INDICATED & SUBJECT TO CHANGE DURING DETAIL ENGG.
3. LAYING OF PIPELINE AND STATION PIPING, VENDOR SHALL MAINTAIN SPECIFIED COVER OF PIPELINE.
4. MAINLINE VALVE IS ACTUATED VALVE.
5. ALL UG VALVE AND BURRIED VALVES WHICH WILL BE OPERATED FROM GROUND LEVEL. HENCE MAINLINE & BYPASS LINE VALVE IS LONG STEM EXTENDED VALVES.

LEGENDS

- BALL VALVE
- GLOBE VALVE
- TIE-IN POINT
- CENTER LINE OF PIPE
- CENTER LINE OF PIPE
- NG - NATURAL GAS
- PIPELINE

MAIN LINE	BYPASS LINE	BRANCH CONNECTION	REMARKS
4"	NO BYPASS LINE	-	-
6"	2"	WELDOLET	-
8"	2"	WELDOLET	-
10"	4"	WELDOLET	-
12"	4"	WELDOLET	-
16"	6"	WELDOLET	-

Rev.	D M Y	Modifications	Drawn	Checked	Approved
0	16.04.21	ISSUED FOR APPROVAL.	KS	MKS	KNS

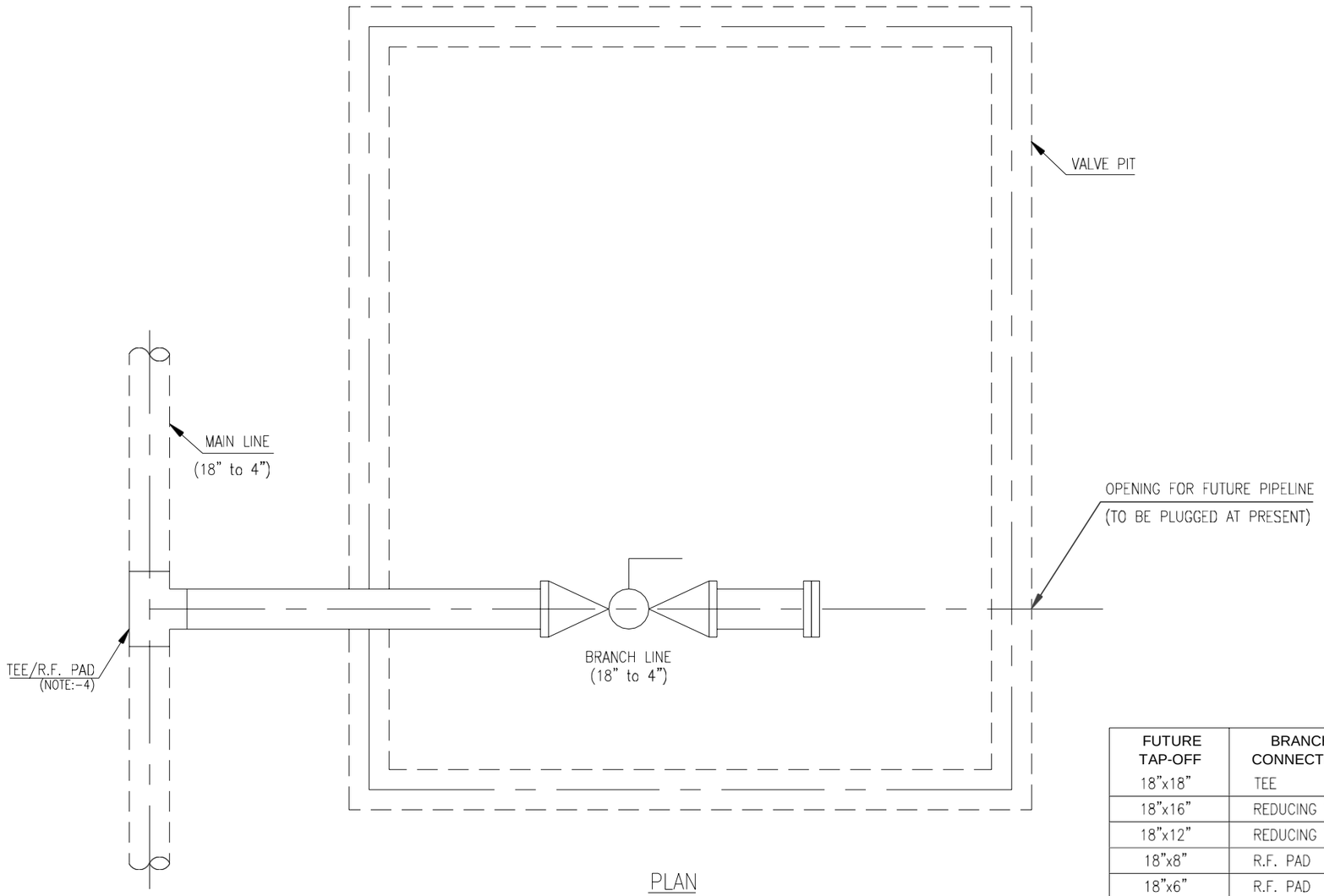
CUSTOMER: CENTRAL U. P. GAS LIMITED

PROJECT: CITY GAS DISTRIBUTION PROJECT

SUBJECT: PIPING GENERAL ARRANGEMENT DRAWING
FOR SV STATION WITH VENTING ARRANGEMENT
(LONG STEM EXTENDED ACTUATED VALVES)

Size	Scale	Sheet	Rev.
A3	1:50	2 of 2	0

Project No.	Discipline Code	System Code	Serial No.
P.014714	G	20749	004



PLAN

FUTURE TAP-OFF	BRANCH CONNECTION
18"x18"	TEE
18"x16"	REDUCING TEE
18"x12"	REDUCING TEE
18"x8"	R.F. PAD
18"x6"	R.F. PAD
16"x16"	TEE
16"x12"	REDUCING TEE
16"x8"	REDUCING TEE
16"x6"	R.F. PAD
12"x12"	TEE
12"x8"	REDUCING TEE
12"x6"	REDUCING TEE
12"x4"	R.F. PAD
8"x8"	TEE
8"x6"	REDUCING TEE
8"x4"	REDUCING TEE
6"x6"	TEE
6"x4"	REDUCING TEE
4"x4"	TEE

REFERENCE DRAWING

S. NO.	DRAWING TITLE	DRAWING NO.
1	-	-

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. FOR DETAIL DRAWINGS OF THE PIT, REFER DRAWING NO. : P.013554-C-21028-001 TO 003
4. BRANCHING CONNECTIONS (TEE/ R.F. PAD) SHALL DEPEND UPON THE MAIN LINE & BRANCH LINE.

LEGEND

BW BALL VALVE

Rev.	D M Y	Modifications	Drawn	Checked	Approved
0	16.04.21	ISSUED FOR TENDER.	KS	MS	KNS

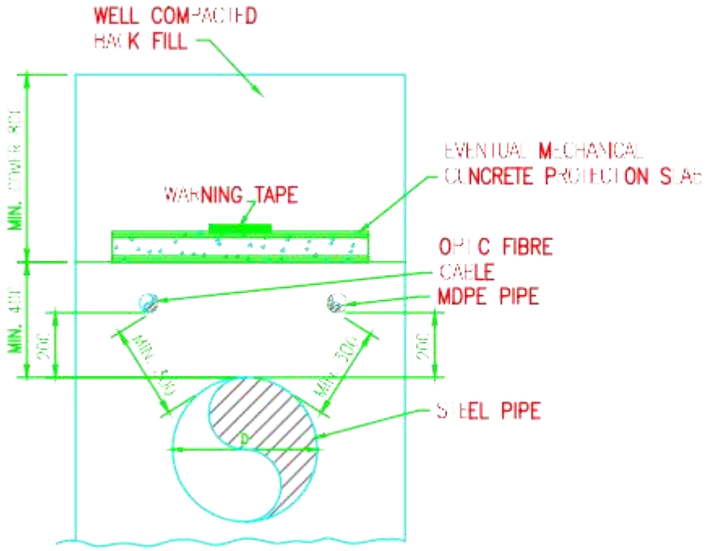
CUSTOMER: CENTRAL U. P. GAS LIMITED

PROJECT: CITY GAS DISTRIBUTION PROJECT

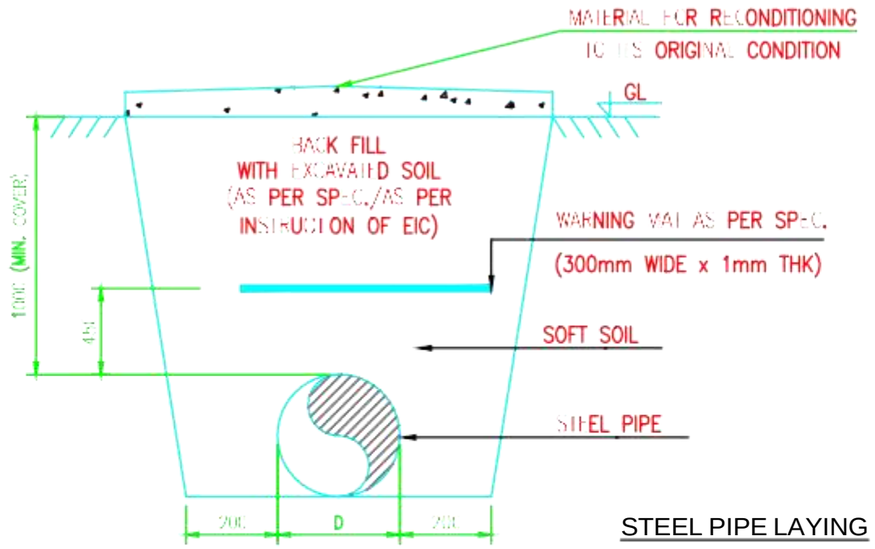
SUBJECT: GENERAL ARRANGEMENT DRAWING
FOR FUTURE TAP-OFF POINTS

Size	Scale	Sheet	Rev.
A3	NTS	1 of 1	0

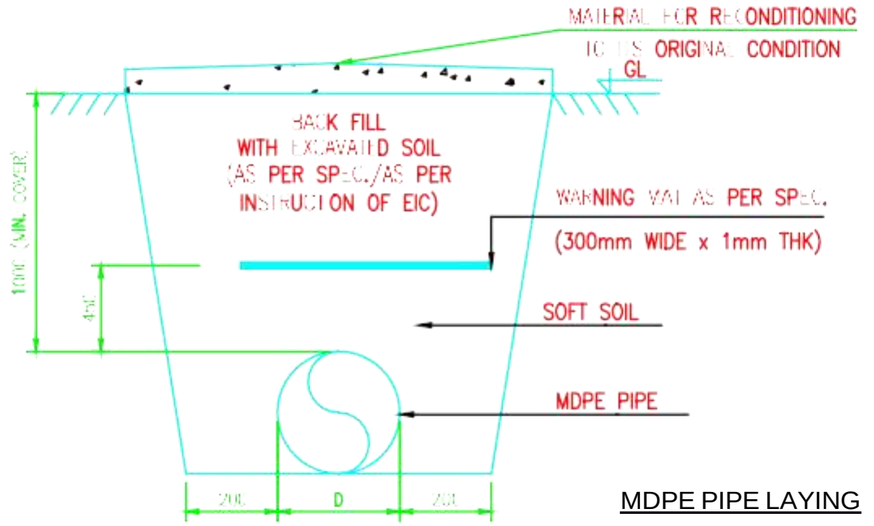
Project No.	Discipline Code	System Code	Serial No.
P.014714	G	20749	001



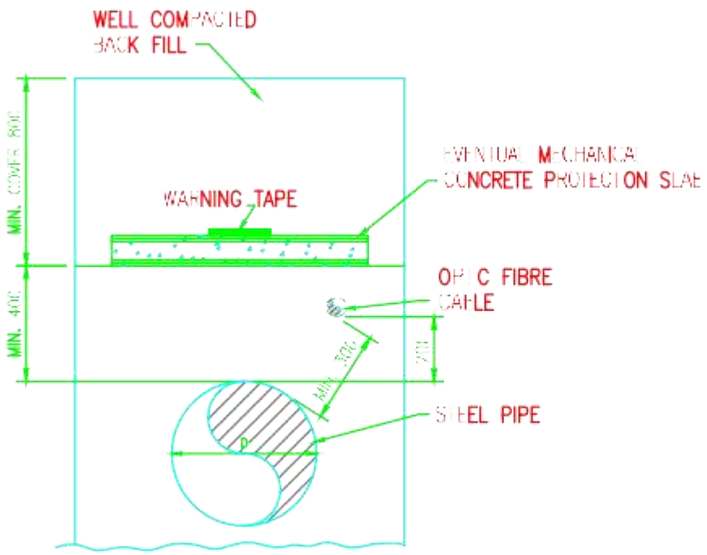
STEEL PIPE LAYING WITH
OFC DUCT & MDPE PIPE



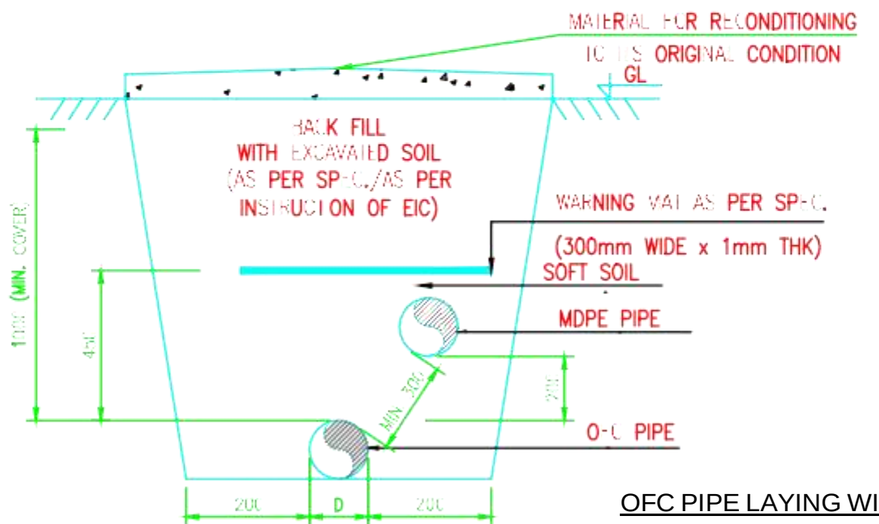
STEEL PIPE LAYING



MDPE PIPE LAYING



STEEL PIPE LAYING WITH OFC DUCT



OFC PIPE LAYING WITH
MDPE DUCT

NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
2. FOLLOW WRITTEN DIMENSION ONLY. DO NOT SCALE.
3. PRECAST SLAB SHALL BE AS PER MIX 1:2:4

Rev.	D M Y	Modifications	Drawn By	Checked By	Approved By
0	16.04.21	ISSUED FOR APPROVAL.	KS	TBS/MKS	MS

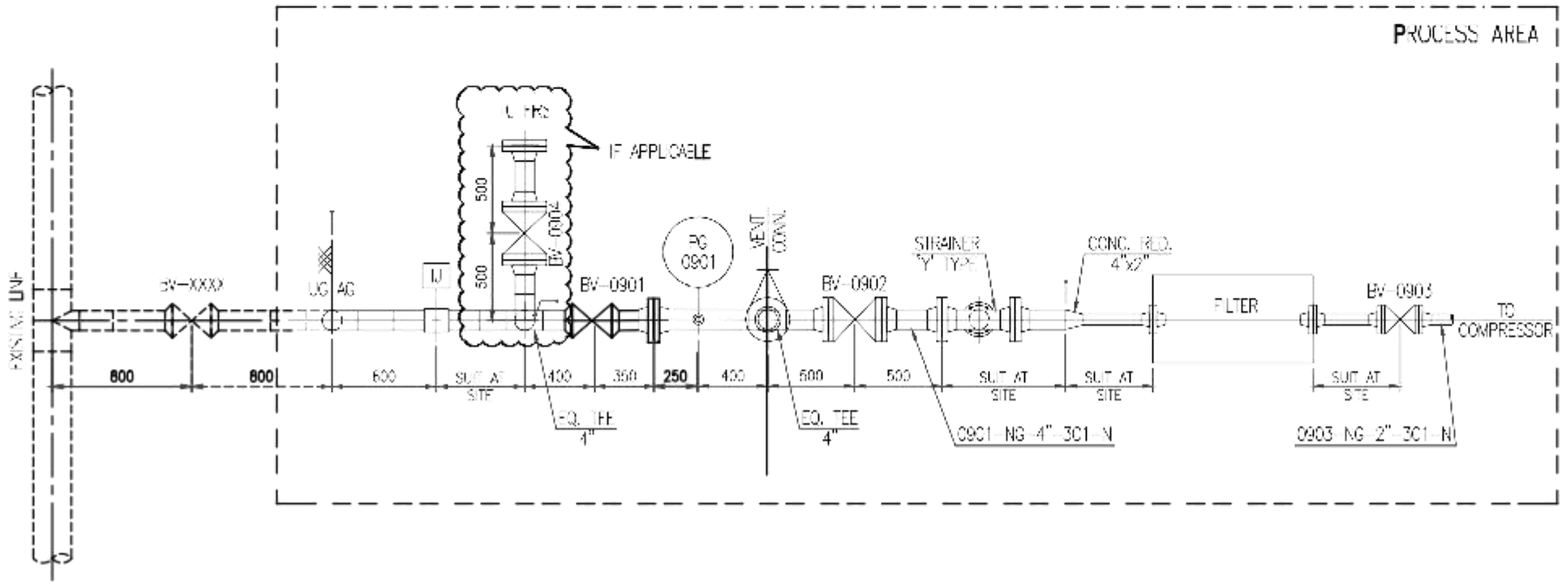
CUSTOMER: CENTRAL U. P. GAS LIMITED

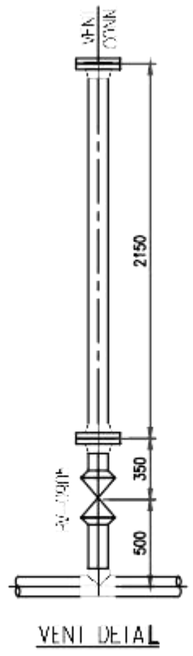
PROJECT: CITY GAS DISTRIBUTION PROJECT

SUBJECT: STANDARD SKETCH FOR TRENCH CROSS STEEL & MDPE PIPE

Size	Scale	Sheet	Rev.
A3	NTS	01 of 01	0

Project No. | Discipline Code | System Code | Serial No.





VENT DETAIL

REFERENCE DRAWING

S. NO.	DRAWING TITLE	DRAWING NO.
1	-	-

NOTES

1 ALL DIMENSIONS ARE IN MILLIMETERS.
2 FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3 VENT SHALL BE LOCATED AT SAFE HEIGHT (3 METER ABOVE THE HIGHEST WORKING PLATFORM) WITH VENT CAP-PUP/ FLANGED END.
4 ELEVATION OF ABOVE GROUND AND UNDER GROUND PIPELINE SHALL BE SUIT AT SITE.

LEGEND

- BALL VALVE
- GLOBE VALVE
- ENDS OF A LINE NUMBER
- CENTER LINE OF PIPE
- NG – NATURAL GAS
- AG – ABOVE GROUND
- UG – UNDER GROUND
- UNDER GROUND PIPE
- ABOVE GROUND PIPE
- PROCESS AREA

Rev.	D M Y	Modifications	Drawn	Checked	Approved
0	16.04.21	ISSUED FOR TENDER.	KS	MKS	KNS

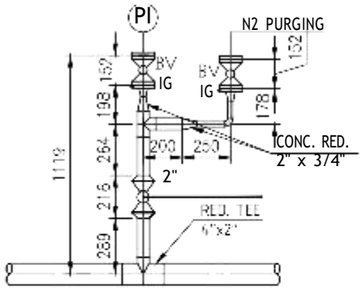
CUSTOMER: CENTRAL U. P. GAS LIMITED

PROJECT: CITY GAS DISTRIBUTION PROJECT

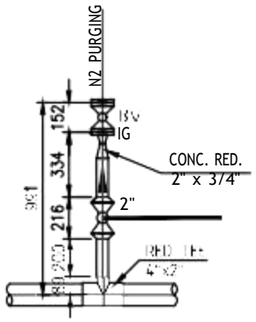
SUBJECT: PIPING GENERAL ARRANGEMENT DRAWING FOR CONNECTIVITY TO RO/ CNG STATIONS

Size	Scale	Sheet	Rev.
A1	1:35	1 of 1	0

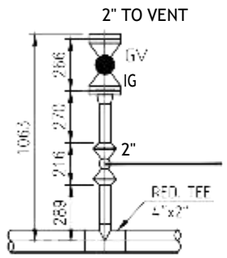
Project No.	Discipline Code	System Code	Serial No.
P.014714	G	20749	002



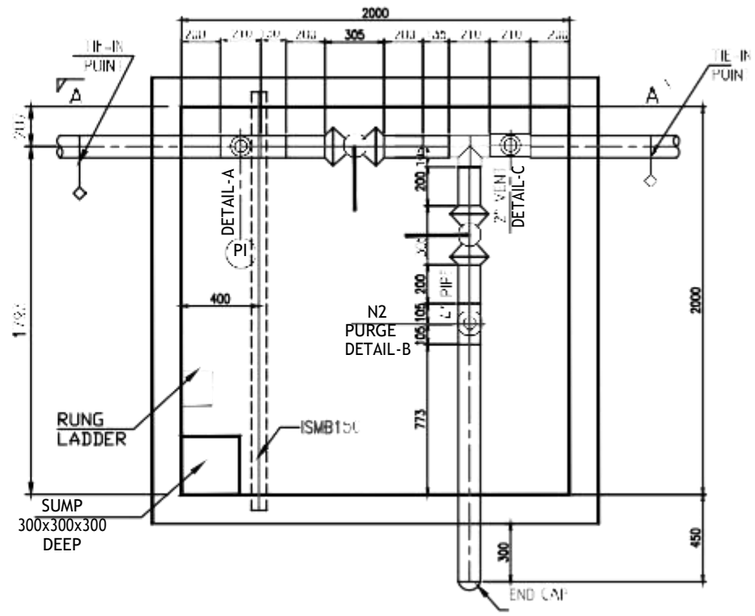
DETAIL-A



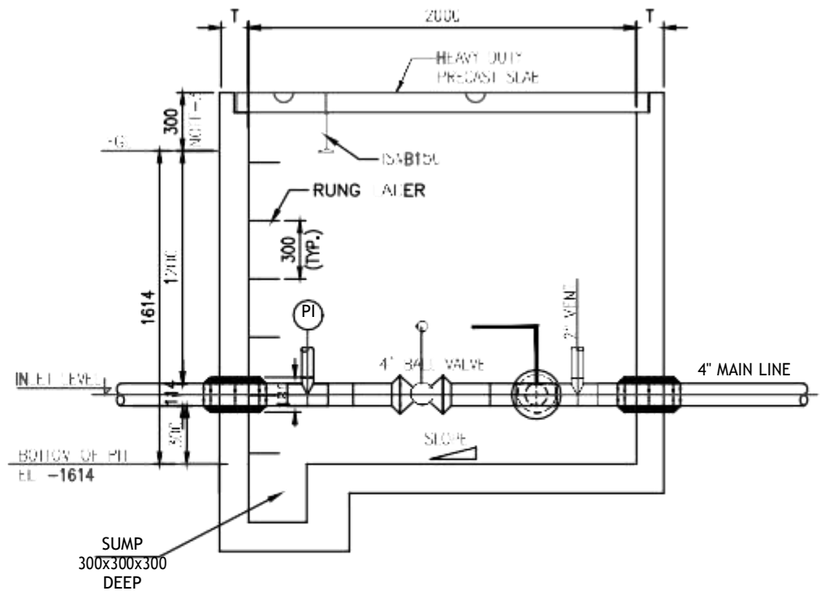
DETAIL - B



DETAIL-C



4" SV VALVE CHAMBER WITH VENT
& WITH TAP-OFF



SECTION-AA

REFERENCE DRAWING

S. NO.	DRAWING TITLE	DRAWING NO.
1	TYPICAL DETAILS FOR 4" SV STATION RCC VALVE CHAMBER	P.014714

NOTES

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M UNLESS OTHERWISE MENTIONED.
2. PIPELINE COVER OR LEVELS SHALL BE MAINTAINED AS MENTIONED IN TENDER.
3. VALVE CHAMBER PROJECTION ABOVE FGL SHALL BE 150MM-300MM SUITED AS PER SITE CONDITIONS.

LEGENDS

BV	BALL VALVE
GV	GLOBE VALVE
IG	INSULATING GASKET
	TIE-IN POINT
	CENTER LINE OF PIPE
NG	NATURAL GAS
	PIPELINE

Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
0	03.06.21	ISSUED FOR TENDER	KS	MKS	MS	KMS

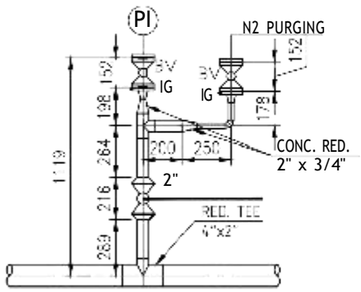
CLIENT: CENTRAL U. P. GAS LIMITED

PROJECT: CITY GAS DISTRIBUTION PROJECT

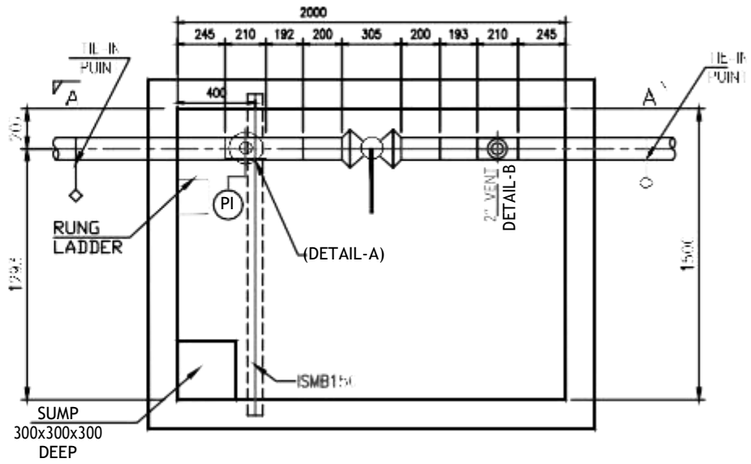
SUBJECT: PIPING GENERAL ARRANGEMENT DRAWING
FOR 4" SV VALVE CHAMBER WITH VENT & WITH TAP-OFF ARRANGEMENT
FOR BAREILLY, KANPUR & UNNAO AND JHANSI GAs

Size	Scale	Sheet		Rev.
A3	1:30	1	of 6	0
Project No.	Discipline Code	System Code	Serial No.	
P.014714	G	20749	M151	

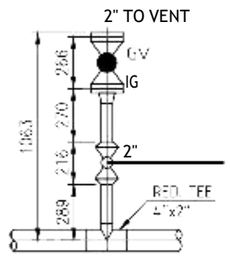
FOR 4" MAIN LINE



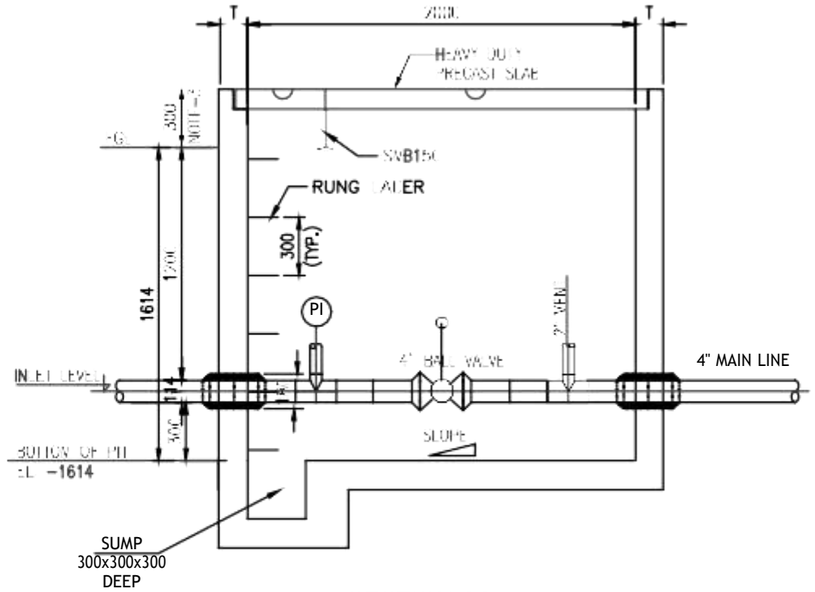
DETAIL-A



4" SV VALVE CHAMBER
WITH VENT & WITHOUT TAP-OFF



DETAIL-B



SECTION-AA

REFERENCE DRAWING

S. NO.	DRAWING TITLE	DRAWING NO.
1	TYPICAL DETAILS FOR 4" SV STATION RCC VALVE CHAMBER	P.014714 [illegible]

NOTES

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M UNLESS OTHERWISE MENTIONED.
2. PIPELINE COVER OR LEVELS SHALL BE MAINTAINED AS MENTIONED IN TENDER.
3. VALVE CHAMBER PROJECTION ABOVE FGL SHALL BE 150MM-300MM SUITED AS PER SITE CONDITIONS.

LEGENDS

BV — BALL VALVE	NG - NATURAL GAS
GV — GLOBE VALVE	PIPELINE
IG — INSULATING GASKET	
TIE-IN POINT	
CENTER LINE OF PIPE	

Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
0	03.06.21	ISSUED FOR TENDER	KS	MKS	MS	KMS

CLIENT: CENTRAL U. P. GAS LIMITED

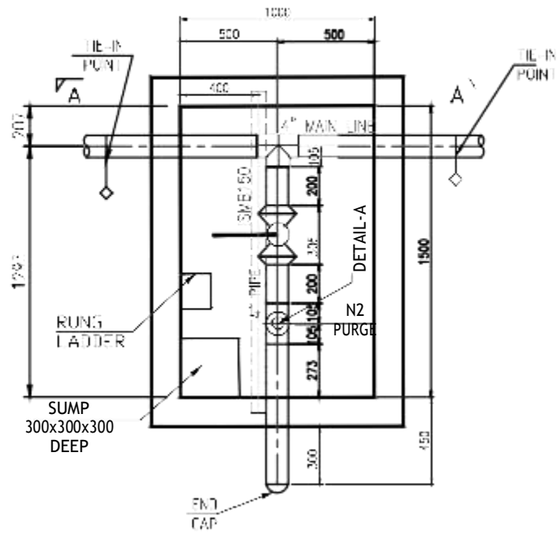
PROJECT: CITY GAS DISTRIBUTION PROJECT

SUBJECT: PIPING GENERAL ARRANGEMENT DRAWING
FOR 4" SV VALVE CHAMBER WITH VENT ARRANGEMENT
ARRANGEMENT FOR BAREILLY, KANPUR & UNNAO AND JHANSI GAs

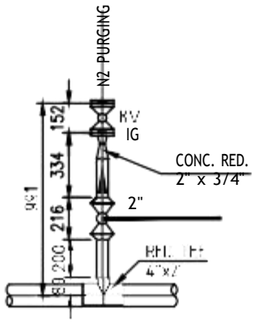
Size	Scale	Sheet	Rev.
A3	1:30	2 of 6	

Project No.	Discipline Code	System Code	Serial No.
P.014714	G	20749	M151

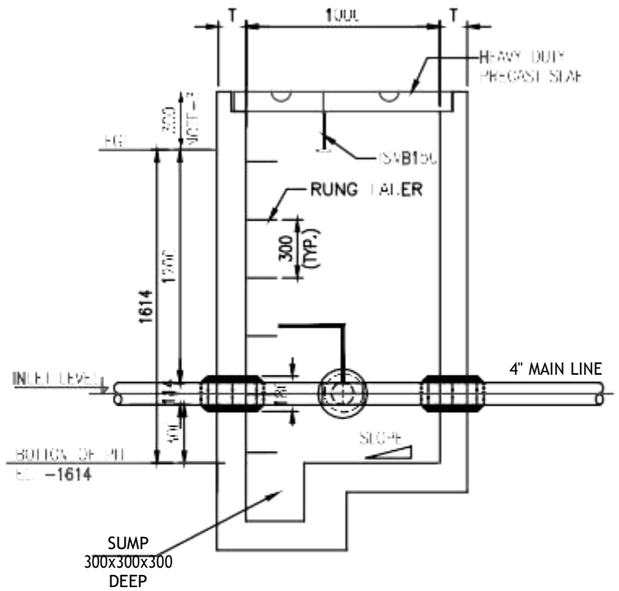
FOR 4" MAIN LINE



4" TAP-OFF CHAMBER



DETAIL - A



SECTION-AA

REFERENCE DRAWING

SL NO.	DRAWING TITLE	DRAWING NO.
1	TYPICAL DETAILS FOR 4" SV STATION RCC VALVE CHAMBER	P.014714-2095-0220 (SHT. 1 OF 2

NOTES

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M UNLESS OTHERWISE MENTIONED.
2. PIPELINE COVER OR LEVELS SHALL BE MAINTAINED AS MENTIONED IN TENDER.
3. VALVE CHAMBER PROJECTION ABOVE FGL SHALL BE 150MM-300MM SUITED AS PER SITE CONDITIONS.

LEGENDS

BV — BALL VALVE
GV — GLOBE VALVE
IG — INSULATING GASKET
TIE-IN POINT
CENTER LINE OF PIPE
NG - NATURAL GAS PIPELINE

Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
0	01.06.21	ISSUED FOR TENDER	KS	MKS	MS	KMS

CLIENT: CENTRAL U. P. GAS LIMITED

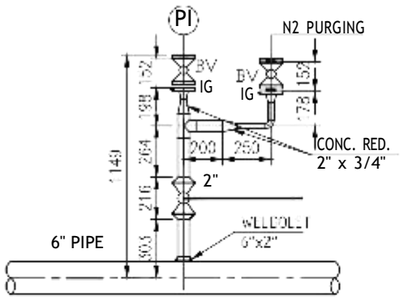
PROJECT: CITY GAS DISTRIBUTION PROJECT

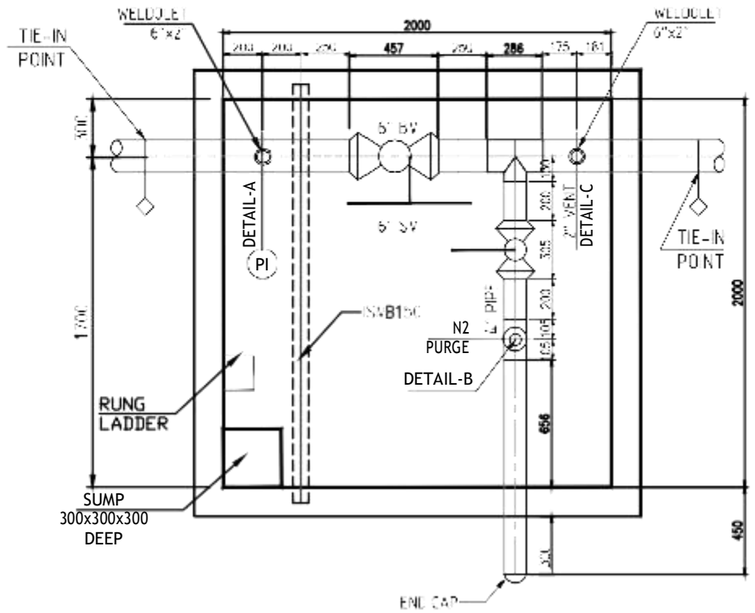
SUBJECT: PIPING GENERAL ARRANGEMENT DRAWING
FOR 4" TAP-OFF CHAMBER ARRANGEMENT
FOR BAREILLY, KANPUR & UNNAO AND JHANSI GAs

Size	Scale	Sheet	Rev.
A3	1:30	3 of 6	0

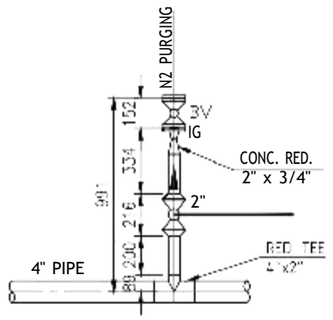
Project No.	Discipline Code	System Code	Serial No.
P.014714	G	20749	M151

FOR 6" MAIN LINE

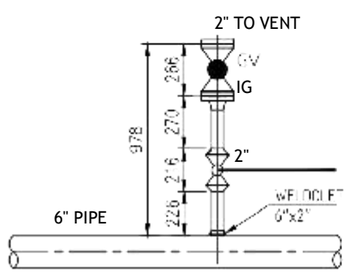




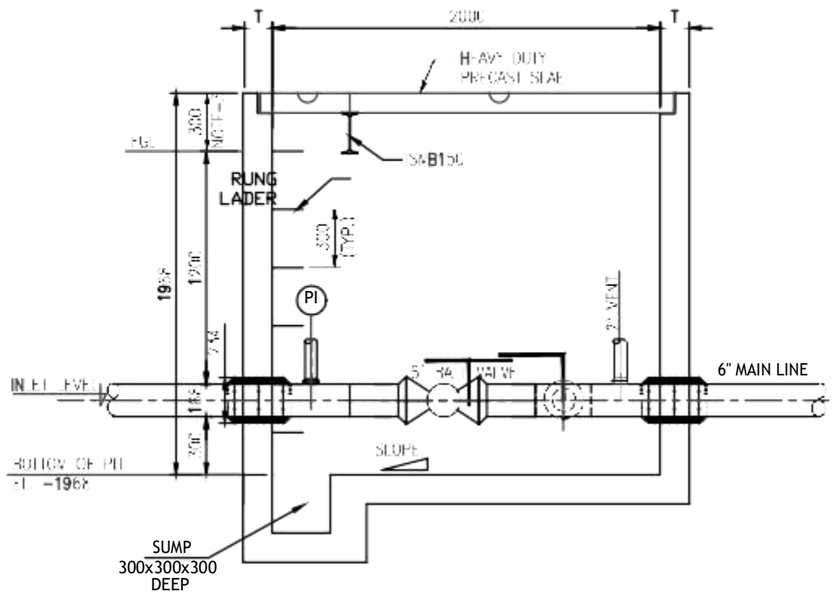
6" SV VALVE CHAMBER WITH VENT
& WITH TAP-OFF



DETAIL-B



DETAIL-C



SECTION-AA

REFERENCE DRAWING

S. NO.	DRAWING TITLE	DRAWING NO.
1	TYPICAL DETAILS FOR 4" SV STATION RCC VALVE CHAMBER	P.014714 G 2099-0020 (SHT. 1 OF 2)

NOTES

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M UNLESS OTHERWISE MENTIONED.
2. PIPELINE COVER OR LEVELS SHALL BE MAINTAINED AS MENTIONED IN TENDER.
3. VALVE CHAMBER PROJECTION ABOVE FGL SHALL BE 150MM-300MM SUITED AS PER SITE CONDITIONS.

LEGENDS

BV	BALL VALVE
GV	GLOBE VALVE
IG	INSULATING GASKET
	TIE-IN POINT
	CENTER LINE OF PIPE
NG	NATURAL GAS
	PIPELINE

Rev.	Date	Modifications	Drawn	Checked	Approved	Validated
0	03.06.21	ISSUED FOR TENDER	KS	MKS	MS	KMS

CLIENT: CENTRAL U. P. GAS LIMITED

PROJECT: CITY GAS DISTRIBUTION PROJECT

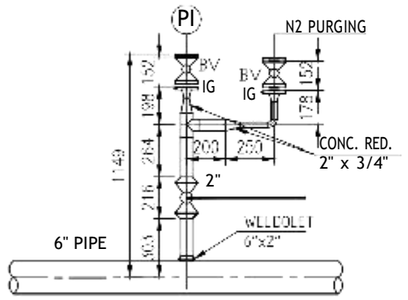
SUBJECT: PIPING GENERAL ARRANGEMENT DRAWING

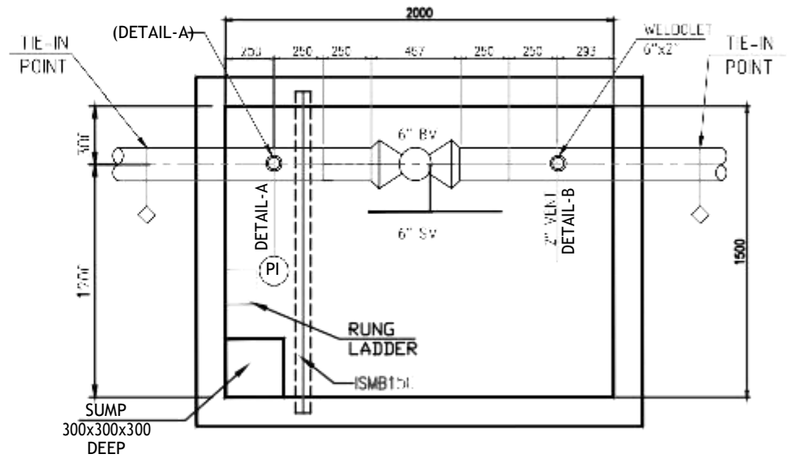
FOR 6" SV VALVE CHAMBER WITH VENT & WITH TAP-OFF ARRANGEMENT FOR BAREILLY, KANPUR & UNNAO AND JHANSI GAs

Size	Scale	Sheet			Rev.
A3	1:30	4	of	6	0

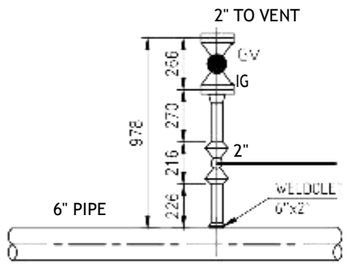
Project No.	Discipline Code	System Code	Serial No.
P.014714	G	20749	M151

FOR 6" MAIN LINE

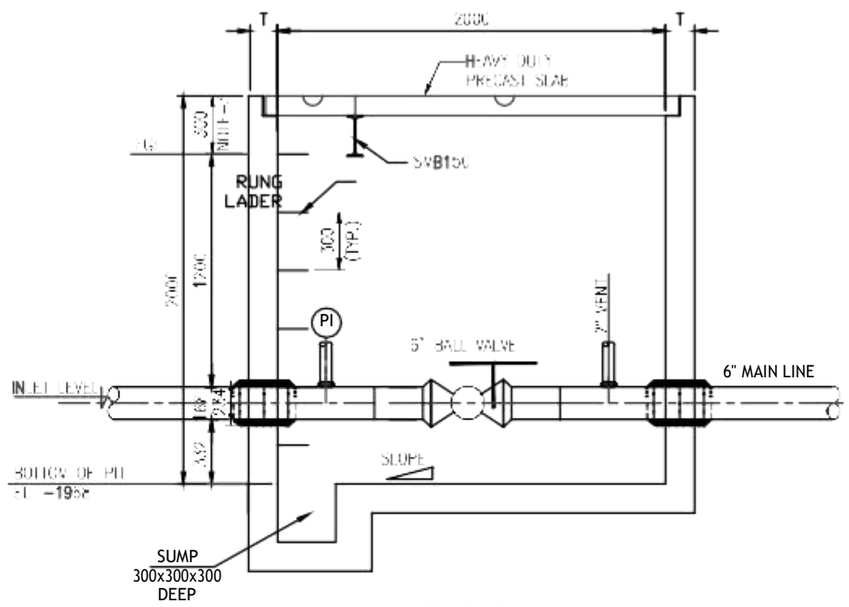




6" SV VALVE CHAMBER
WITH VENT & WITHOUT TAP-OFF



DETAIL-C



SECTION-AA

REFERENCE DRAWING

S. NO.	DRAWING TITLE	DRAWING NO.
1	TYPICAL DETAILS FOR 4" SV STATION RCC VALVE CHAMBER	P.014714 G 2095 0220 (SHT. 1 OF 2)

NOTES

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M UNLESS OTHERWISE MENTIONED.
2. PIPELINE COVER OR LEVELS SHALL BE MAINTAINED AS MENTIONED IN TENDER.
3. VALVE CHAMBER PROJECTION ABOVE FGL SHALL BE 150MM-300MM SUITED AS PER SITE CONDITIONS.

LEGENDS

BV — BALL VALVE	NG - NATURAL GAS
GV — GLOBE VALVE	PIPELINE
IG — INSULATING GASKET	
TIE-IN POINT	
CENTER LINE OF PIPE	

Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
0	03.06.21	ISSUED FOR TENDER	KS	MKS	MS	KMS

CLIENT: CENTRAL U. P. GAS LIMITED

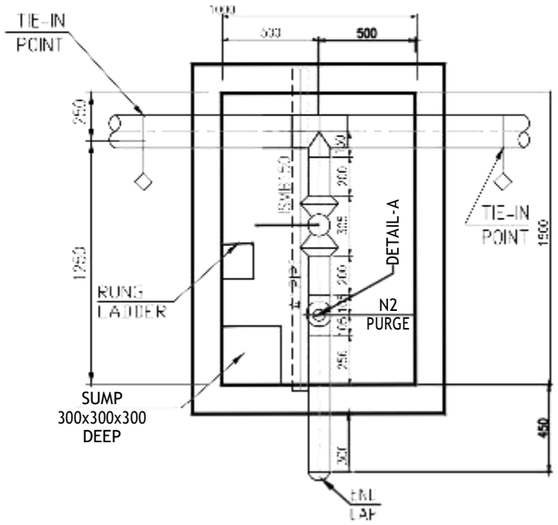
PROJECT: CITY GAS DISTRIBUTION PROJECT

SUBJECT: PIPING GENERAL ARRANGEMENT DRAWING
FOR 6" SV VALVE CHAMBER WITH VENT ARRANGEMENT
FOR BAREILLY, KANPUR & UNNAO AND JHANSI GAs

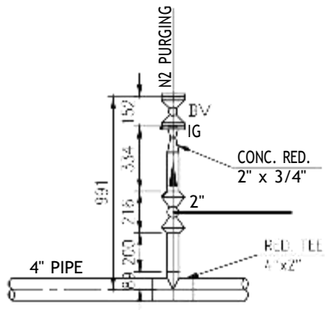
Size	Scale	Sheet	Rev.
A3	1:30	5 of 6	0

Project No.	Discipline Code	System Code	Serial No.
P.014714	G	20749	M151

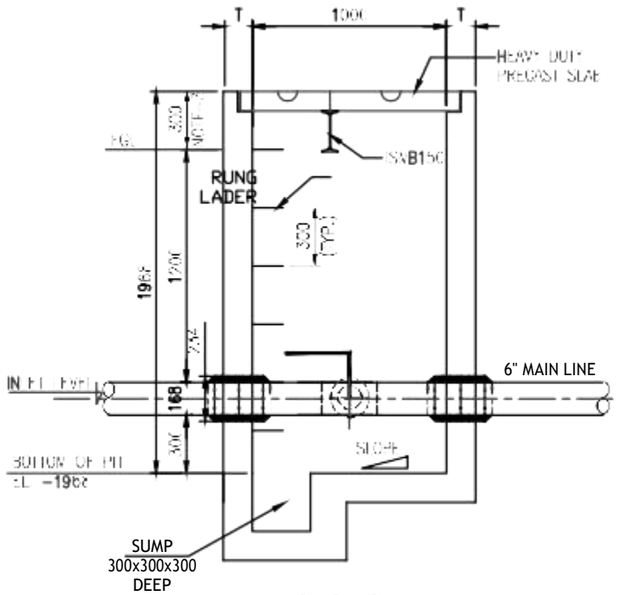
FOR 6" MAIN LINE



6" TAP-OFF CHAMBER



DETAIL-A



SECTION-AA

REFERENCE DRAWING

S. NO.	DRAWING TITLE	DRAWING NO.
1	TYPICAL DETAILS FOR 4" SV STATION RCC VALVE CHAMBER	P.014714 G 2095 0022 (SHT. 1 OF 2

NOTES

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M UNLESS OTHERWISE MENTIONED.
2. PIPELINE COVER OR LEVELS SHALL BE MAINTAINED AS MENTIONED IN TENDER.
3. VALVE CHAMBER PROJECTION ABOVE FGL SHALL BE 150MM-300MM SUITED AS PER SITE CONDITIONS.

LEGENDS

BV	BALL VALVE	NG	NATURAL GAS
GV	GLOBE VALVE		PIPELINE
IG	INSULATING GASKET		
	TIE-IN POINT		
	CENTER LINE OF PIPE		

Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
0	03.06.21	ISSUED FOR TENDER	KS	MKS	MS	KMS

CLIENT: CENTRAL U. P. GAS LIMITED

PROJECT: CITY GAS DISTRIBUTION PROJECT

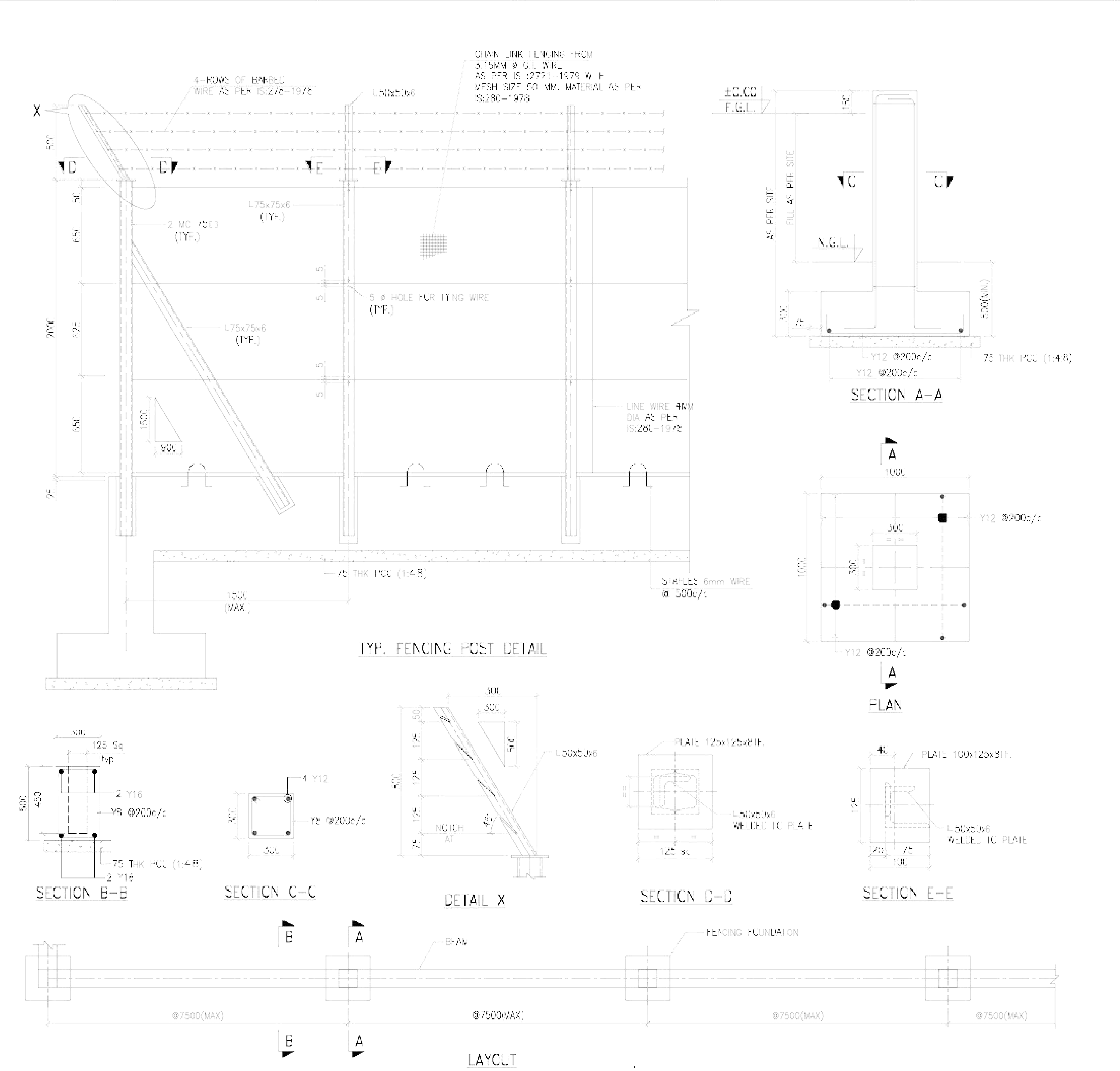
SUBJECT: PIPING GENERAL ARRANGEMENT DRAWING
FOR 6" TAP-OFF CHAMBER ARRANGEMENT
FOR BAREILLY, KANPUR & UNNAO AND JHANSI GAs

Size	Scale	Sheet	Rev.
A3	1:30	6 of 6	

Project No.	Discipline Code	System Code	Serial No.
P.014714	G	20749	M151

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE THE DIMENSIONS.



Rev.	D M Y	Modifications	Drawn By	Checked By	Approved By
0	08.05.19	ISSUED FOR TENDER	SUHS	AMK	MS

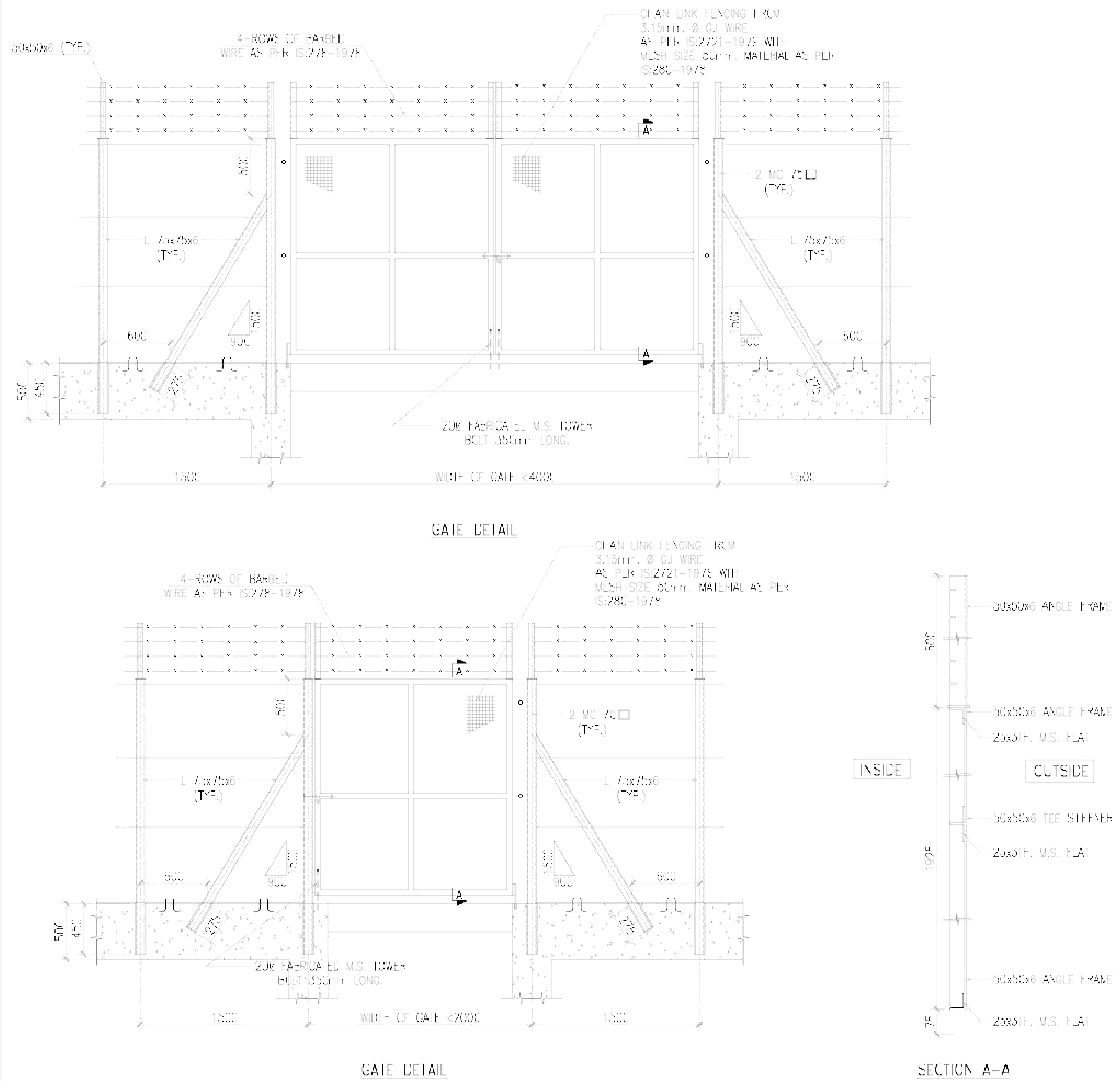
CUSTOMER: CENTRAL U. P. GAS LIMITED

PROJECT: CITY GAS DISTRIBUTION PROJECT

SUBJECT: TYPICAL DETAILS OF FENCING

Size	Scale	Sheet	Rev.
A1	NTS	01 of 01	0

Project No.	Discipline Code	System Code	Serial No.
P.014714	G	21028	004



NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE THE DIMENSIONS.

Rev.	D M Y	Modifications	Drawn By	Checked By	Approved By
0	18.04.19	ISSUED FOR TENDER	KS	MS	NN

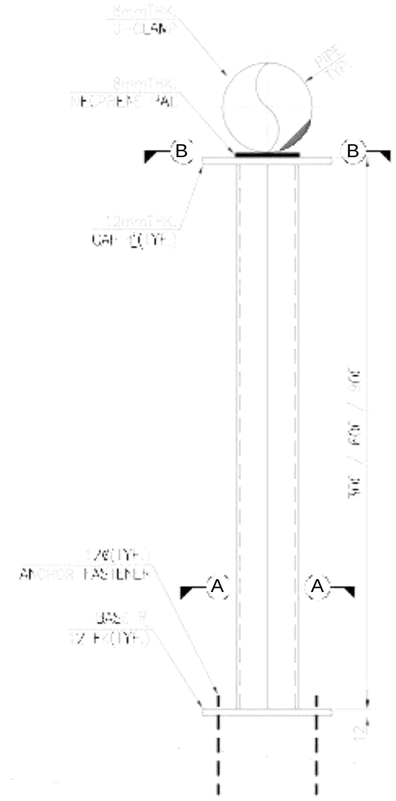
CUSTOMER
CENTRAL U. P. GAS LIMITED

PROJECT
CITY GAS DISTRIBUTION PROJECT

SUBJECT
TYPICAL DETAILS OF GATE

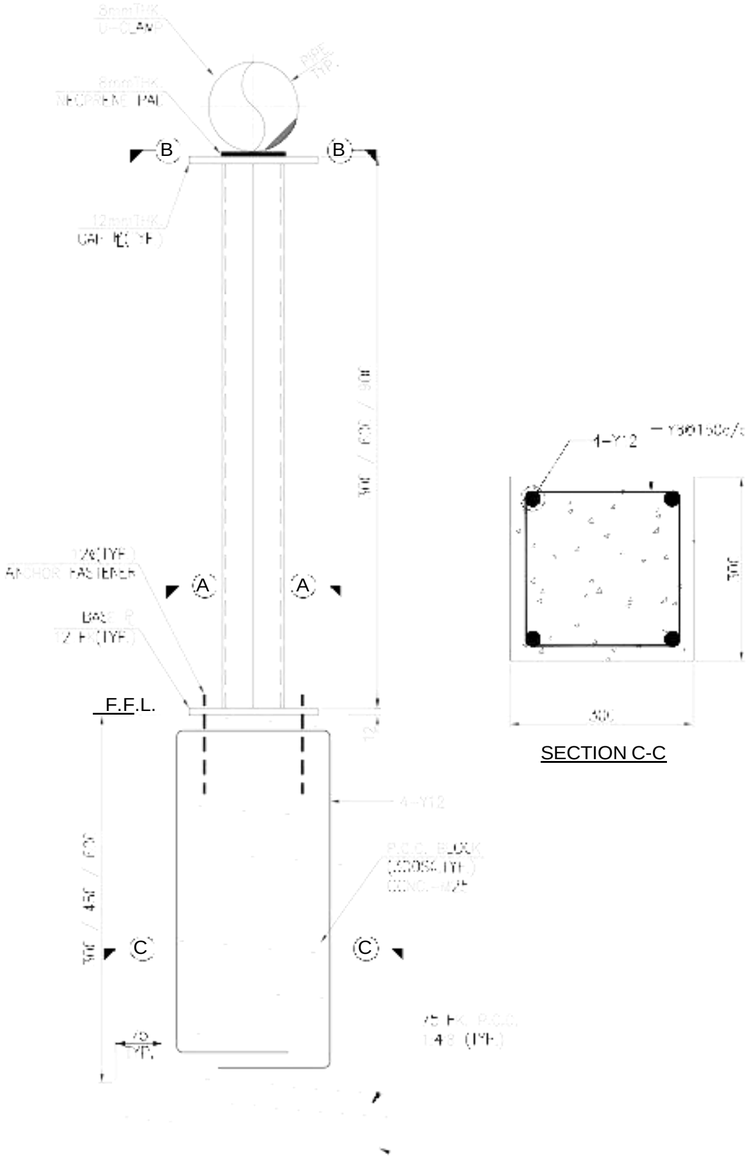
Size	Scale	Sheet	Rev.
A1	NTS	01 of 01	0

Project No.	Discipline Code	System Code	Serial No.
P.014714	G	21028	005



CASE - 1 (WITH R.C.C. PAVING)

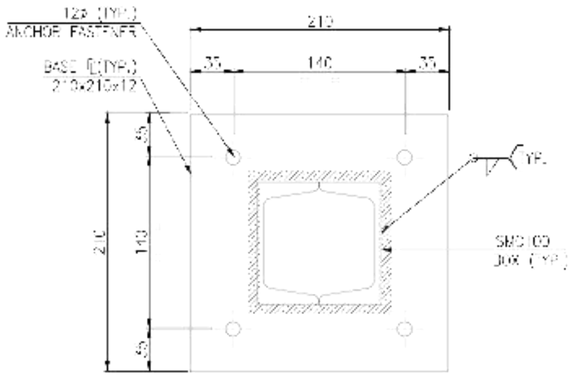
(SCALE : 1:15)



CASE - 2 (WITHOUT R.C.C. PAVING)

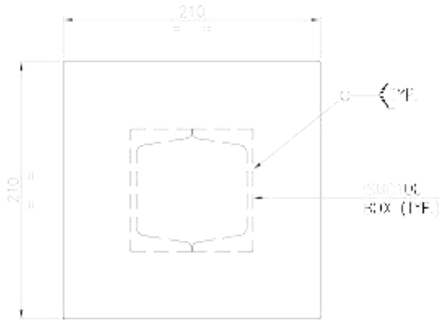
(SCALE : 1:15)

SECTION C-C



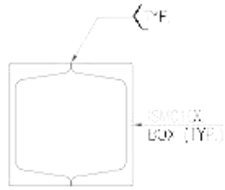
TYP. BASE PLATE DETAIL

(SCALE : 1:5)



SECTION B-B

(SCALE : 1:5)



SECTION A-A

(SCALE : 1:5)

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE THE DIMENSIONS.
3. THE PIPE SUPPORTS (CASE-1 & CASE-2) IS APPLICABLE UP TO 8" PIPE ONLY.

Rev.	D M Y	Modifications	Drawn By	Checked By	Approved By
0	08.03.19	ISSUED FOR TENDER	SUMIT	AMK	MS

CUSTOMER

CENTRAL U. P. GAS LIMITED

PROJECT

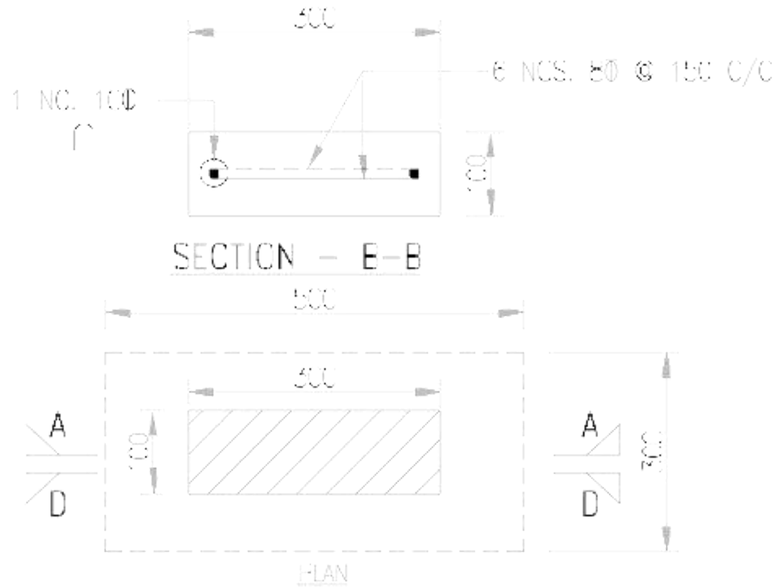
CITY GAS DISTRIBUTION PROJECT

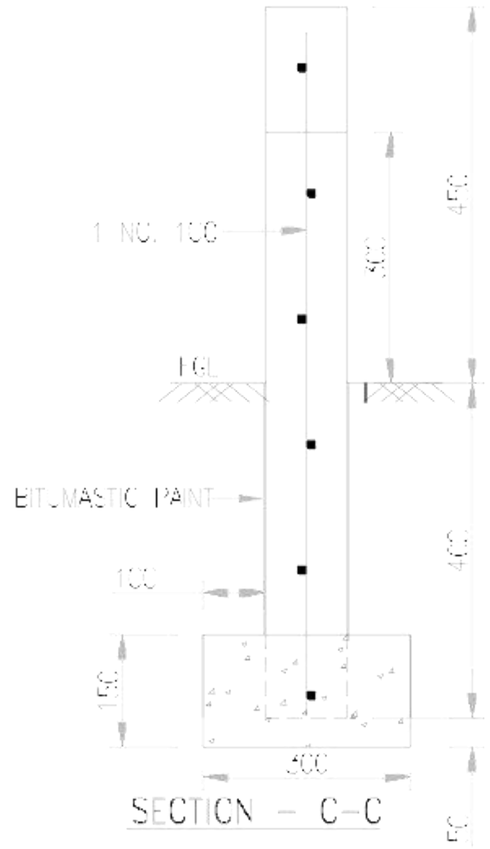
SUBJECT

TYPICAL DETAILS OF PIPE SUPPORT

Size	Scale	Sheet		Rev.
A1	NTS	01	of 01	0

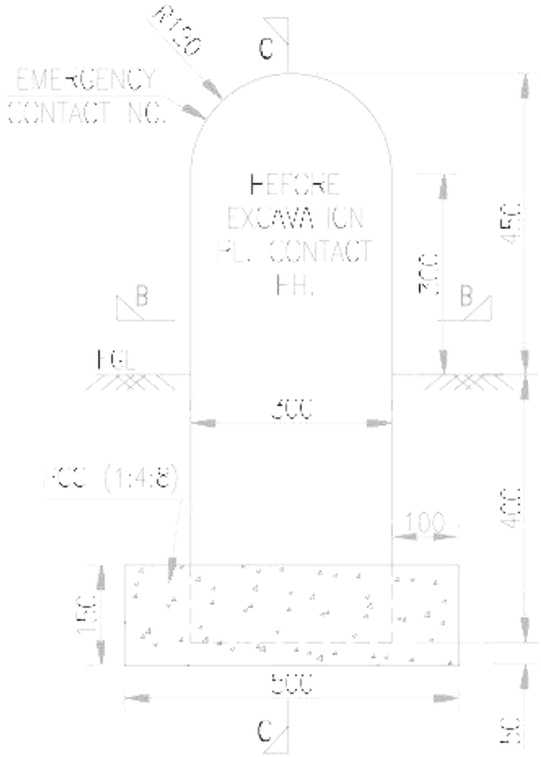
Project No.	Discipline Code	System Code	Serial No.
P.014714	G	21028	006

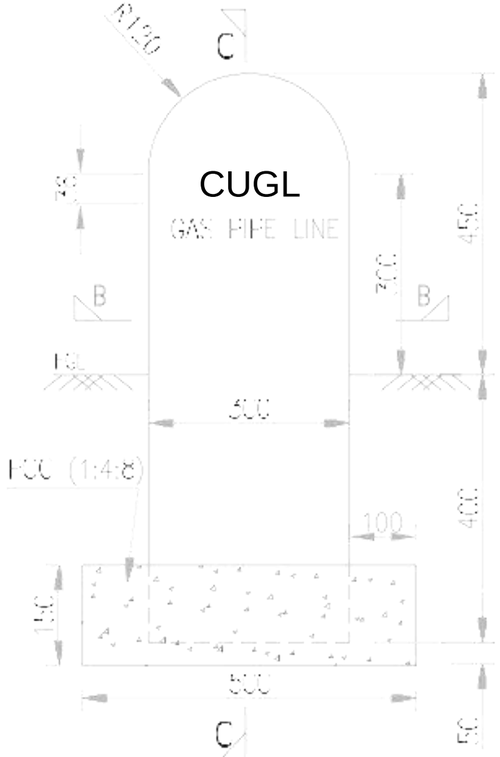


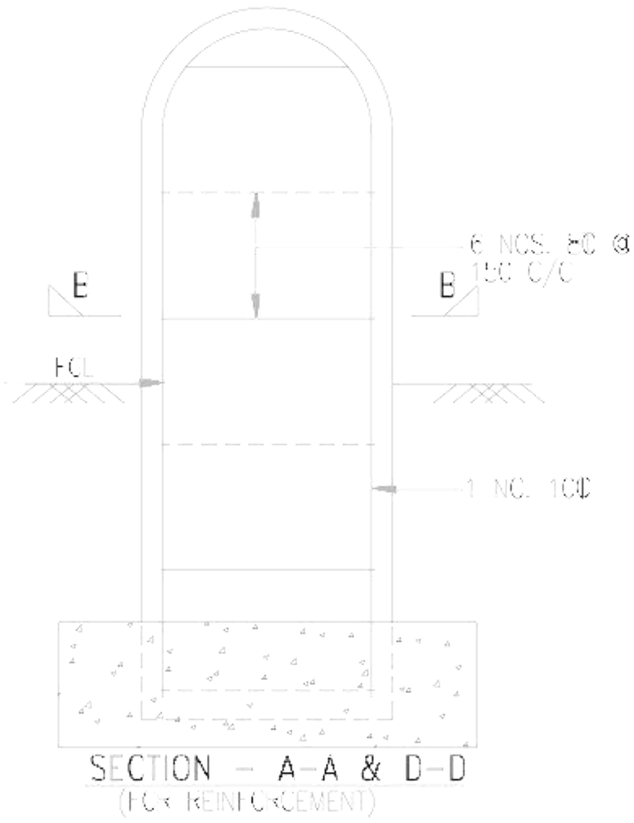


NOTES

1. DRAWING IS NOT TO SCALE.
2. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
3. MARKERS SHALL BE INSTALLED IN EVERY 50 METER INTERVAL AS PER INSTRUCTIONS OF ENGINEER-IN-CHARGE.
4. ALL BOUNDARY MARKERS SHALL BE PRECAST & INSCRIPTIONS SHALL BE ENGRAVED 5mm DEEP IN THE MOULD ON BOTH FACE.
5. CONCRETE FOR BOUNDARY MARKER SHALL BE M – 20.







Rev.	D M Y	Modifications	Drawn By	Checked By	Approved By
0	08.03.19	ISSUED FOR TENDER	Sumit	AMK	NS

CUSTOMER

CENTRAL U. P. GAS LIMITED

PROJECT

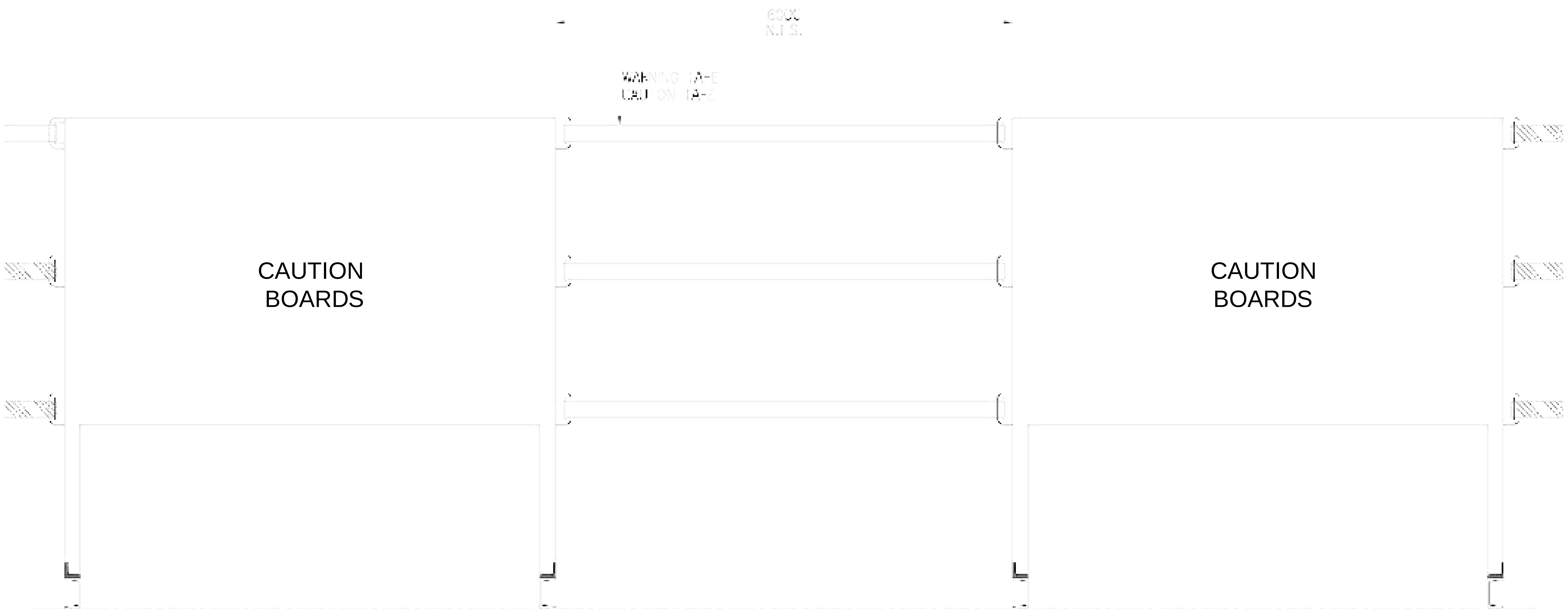
CITY GAS DISTRIBUTION PROJECT

SUBJECT

TYPICAL DETAILS OF RCC ROUTE MARKER

Size	Scale	Sheet			Rev.
A1	NTS	01	of	01	0

Project No.	Discipline Code	System Code	Serial No.
P.014714	G	21028	007



SCHEMATIC LAYOUT OF CAUTION BOARDS AND BARRICADDING

NOTES

1. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED.
2. FOLLOW WRITTEN DIMENSIONS ONLY - DO NOT SCALE

Rev.	D M Y	Modifications	Drawn By	Checked By	Approved By
0	08.03.19	ISSUED FOR TENDER	SUMIT	AMK	MS

CUSTOMER

CENTRAL U. P. GAS LIMITED

PROJECT

CITY GAS DISTRIBUTION PROJECT

SUBJECT

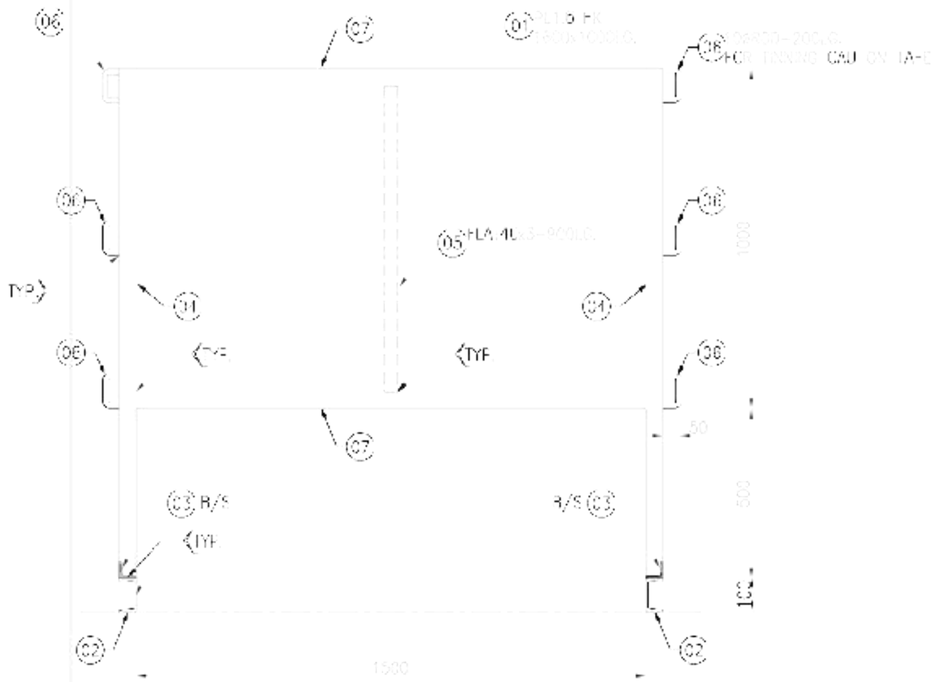
TYPICAL DETAIL OF BARRICADING

Size	Scale	Sheet	Rev.
A1	NTS	01 of 01	0

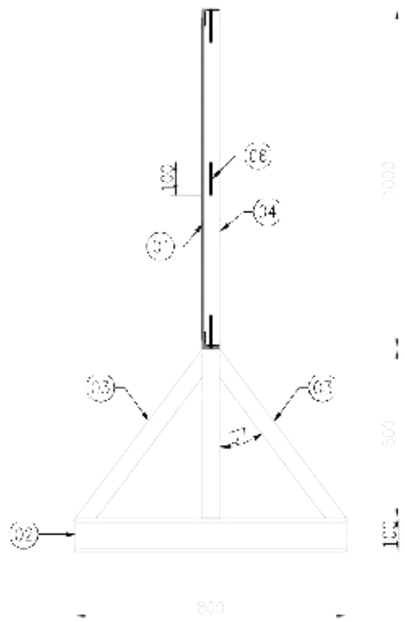
Project No.	Discipline Code	System Code	Serial No.
P.014714	G	21028	009

NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.



ELEVATION A-A



ELEVATION B-B

PLAN VIEW

- CAUTION -

WORK IN PROGRESS

LAYING OF NATURAL GAS PIPELINE

CLIENT : OWNER'S NAME

CONTRACTOR NAME :

DATE OF COMMENCEMENT :

DATE OF COMPLETION :

EMERGENCY PHONE NOS :

(TO BE PRINTED ON BOTH SIDE OF ITEM NO. 01)

BILL OF MATERIAL

Item Mkd.	Section	Width	Length	item Qty.	Weight	In Kgs
				(All Marks)	Kgs./M, M2	Total Weight
1	PL 1.6 Thk.	1600	1000	1	12.56	20.10
2	ISMC 100	--	800	2	9.20	14.72
3	L50x50x6	--	625	4	4.50	11.25
4	L50x50x6	--	1500	2	4.50	13.50
5	Flat 3 Thk.	40	900	1	0.94	0.03
6	10Ø Rod	--	200	6	0.62	0.74
7	L50x50x6	--	1600	2	4.50	14.40
				Grand Total (Kg)		**74.74**

Rev.	D M Y	Modifications	Drawn By	Checked By	Approved By
0	08/03/23	ISSUED FOR TENDER	SUMIT	ANK	MS

CUSTOMER

CENTRAL U. P. GAS LIMITED

PROJECT

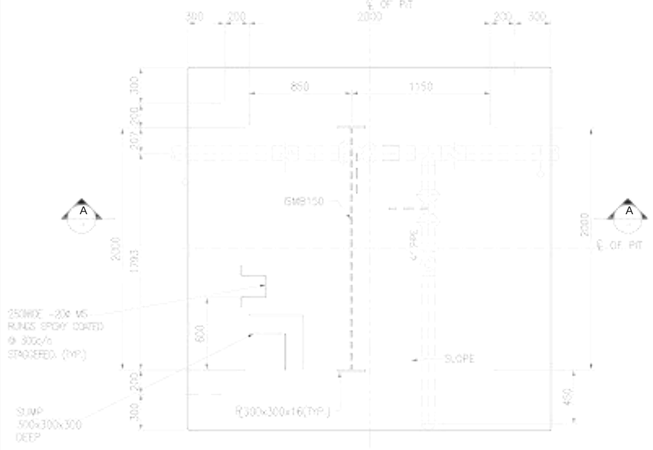
CITY GAS DISTRIBUTION PROJECT

SUBJECT

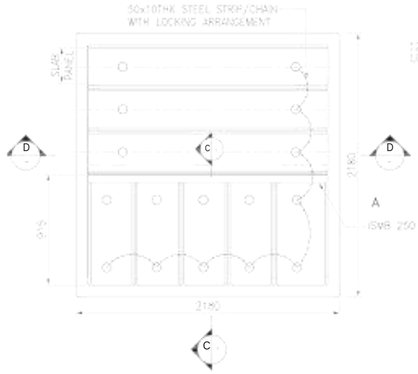
TYPICAL DETAIL OF CAUTION BOARD

Size	Scale	Sheet			Rev.
A1	NTS	01	of	01	0
Project No.		Discipline Code	System Code		Serial No.
P.014714		G	21028		008

FOR 4" SV VALVE CHAMBER WITH VENT
& WITH TAP-OFF



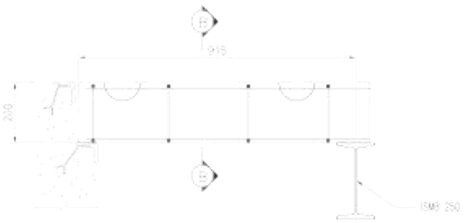
VALVE PIT BOTTOM PLAN
(SCALE 1:25)



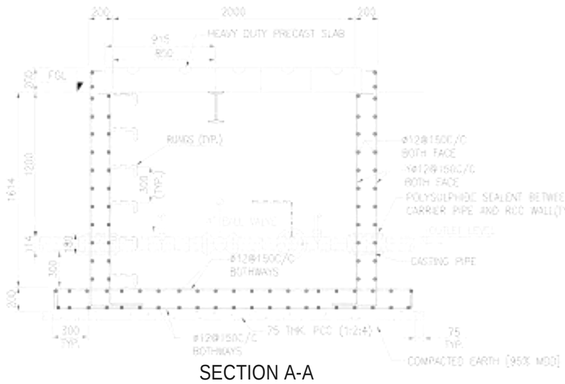
LOCKING ARRANGEMENT OF
PRECAST COVER SLAB
(SCALE 1:25)

DETAIL OF HOOK
(SCALE 1:10)

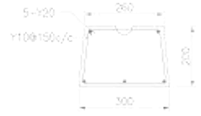
JOINTING DETAIL OF PRECAST
COVER SLAB
(SCALE 1:10)



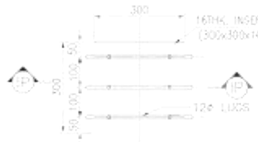
SECTION C-C
(SCALE 1:10)



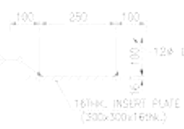
SECTION A-A
(SCALE 1:25)



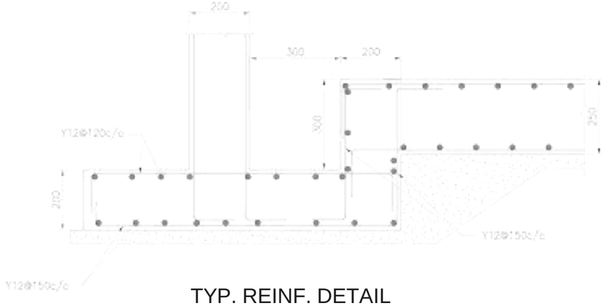
SECTION B-B
(SCALE 1:10)



INSERT PLATE IP1
(SCALE 1:10)

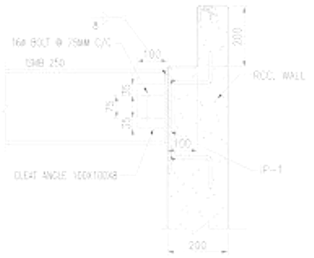


SECTION IP-IP
(SCALE 1:10)



TYP. REINF. DETAIL
FOR SUMP
(SCALE 1:10)

PLAN OF PRECAST COVER SLAB
(FOR VEHICLE MOVING AREA)
(SCALE 1:10)



DETAIL-A

DSECTION D-D

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. DO NOT MEASURE DIMENSIONS ON THE DRAWING, ONLY WRITTEN DIMENSION SHOULD BE FOLLOWED.
3. GRADE OF CONCRETE SHALL M25.
4. ALL REINFORCEMENT SHALL BE HIGH YIELD STRENGTH DEFORMED (HYSD) BAR OF GRADE FE500D CONFORMING TO IS:1786.
5. MIN. NOMINAL COVER TO REINFORCEMENT IS AS FOLLOWS

	BOTTOM	TOP	SIDE
RAFT	–	50	50	50
TOP SLAB	–	30	35	30
WALL	–	50 (OUTER)	30 (INNER)	

6. LAP LENGTH SHALL BE 50 TIME DIA OF THE SMALLER BAR NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY SECTION.
7. DEVELOPMENT LENGTH (Ld) SHALL BE 45 TIMES DIA OF THE BAR.
8. NET SAFE BEARING CAPACITY AT 1.500M BELOW FGL IS CONSIDERED AS 50 kN/M² FROM STRUCTURAL LOADS ONLY.
9. FOR RCC WALL AND BASE SLAB WATER PROOFING COMPOUND SHALL BE WELL MIX WITH DRY CEMENT IN PROPORTION OF 1% BY WEIGHT OF CEMENT OR AS RECOMMENDED BY MANUFACTURER.
10. EXTERNAL SURFACE IN CONTACT WITH SOIL (BELOW NGL) FOR ALL WALL & RAFT SHALL BE PROVIDED WITH MINIMUM TWO COATS OF BITUMINOUS PAINTING OF GRADE 85/25 CONFORMING TO IS:702 @ 1.7 KG/SQ.M. (MINIMUM) FOR WATER/DAMP PROOFING AS PER SPECIFICATION.

ISSUED FOR TENDER

Rev.	D	M	Y	Modifications	Drawn	Checked	Approved	Validated
A	05	05	2020	ISSUED FOR TENDER	JSH	JSH	MS	KKS

CLIENT: CENTRAL U. P. GAS LIMITED

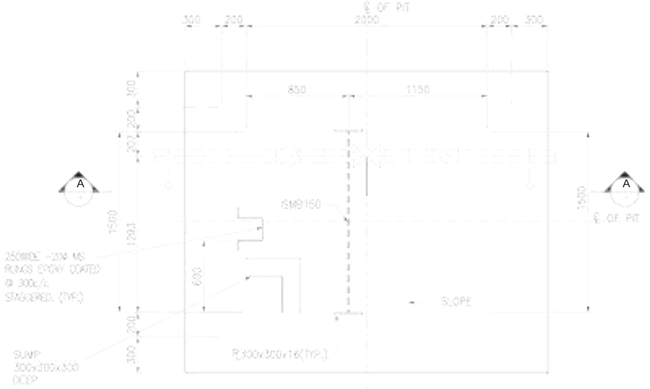
PROJECT: CITY GAS DISTRIBUTION PROJECT

SUBJECT: TYPICAL DETAILS FOR 4"
SV VALVE CHAMBER WITH VENT & WITH TAP-OFF ARRANGEMENT
FOR BAREILLY, KANPUR & UNNAO AND JHANSI GAs

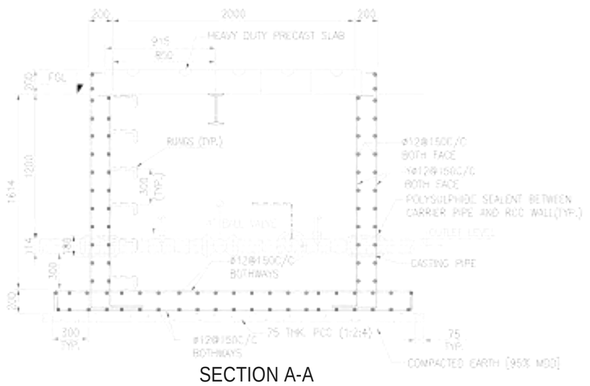
Size	Scale	Sheet			Rev.
A1	1:50	01	of	06	A

Project No.	Discipline Code	System Code	Serial No.
P.014714	G	20730	010

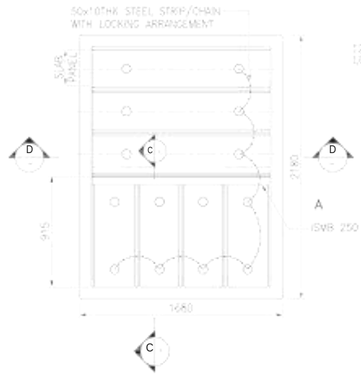
FOR 4" SV VALVE CHAMBER WITH VENT
& WITH TAP-OFF



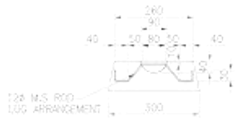
VALVE PIT BOTTOM PLAN
(SCALE 1:25)



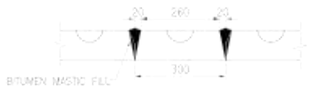
SECTION A-A
(SCALE 1:25)



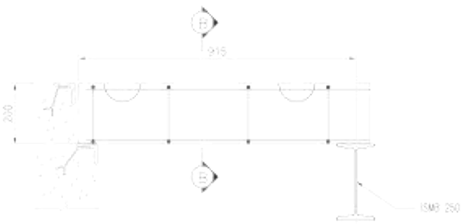
LOCKING ARRANGEMENT OF
PRECAST COVER SLAB
(SCALE 1:25)



DETAIL OF HOOK
(SCALE 1:10)

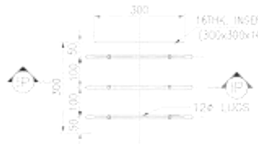


JOINTING DETAIL OF PRECAST
COVER SLAB
(SCALE 1:10)



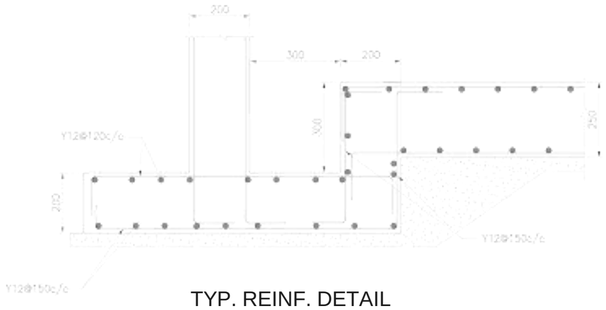
SECTION C-C
(SCALE 1:10)

SECTION B-B
(SCALE 1:10)



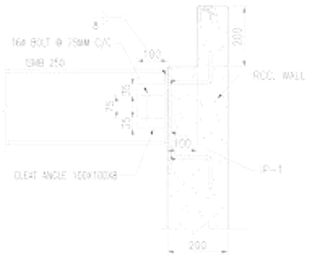
INSERT PLATE IP1
(SCALE 1:10)

SECTION IP-IP
(SCALE 1:10)

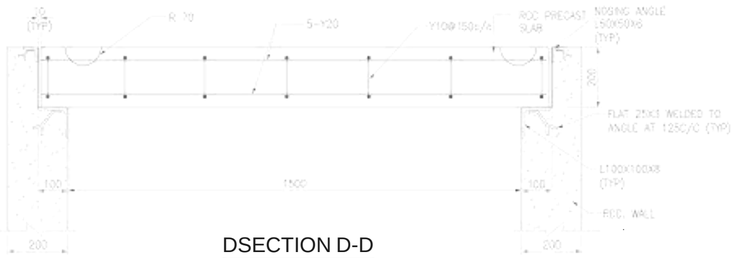


TYP. REINF. DETAIL
FOR SUMP
(SCALE 1:10)

PLAN OF PRECAST COVER SLAB
(FOR VEHICLE MOVING AREA)
(SCALE 1:10)



DETAIL-A



DSECTION D-D

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. DO NOT MEASURE DIMENSIONS ON THE DRAWING, ONLY WRITTEN DIMENSION SHOULD BE FOLLOWED.
3. GRADE OF CONCRETE SHALL M25.
4. ALL REINFORCEMENT SHALL BE HIGH YIELD STRENGTH DEFORMED (HYSD) BAR OF GRADE FE500D CONFORMING TO IS:1786.
5. MIN. NOMINAL COVER TO REINFORCEMENT IS AS FOLLOWS

	BOTTOM	TOP	SIDE
RAFT	–	50	50
TOP SLAB	–	30	30
WALL	–	50 (OUTER)	30 (INNER)

6. LAP LENGTH SHALL BE 50 TIME DIA OF THE SMALLER BAR NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY SECTION.
7. DEVELOPMENT LENGTH (Ld) SHALL BE 45 TIMES DIA OF THE BAR.
8. NET SAFE BEARING CAPACITY AT 1.500M BELOW FGL IS CONSIDERED AS 50 kN/M² FROM STRUCTURAL LOADS ONLY.
9. FOR RCC WALL AND BASE SLAB WATER PROOFING COMPOUND SHALL BE WELL MIX WITH DRY CEMENT IN PROPORTION OF 1% BY WEIGHT OF CEMENT OR AS RECOMMENDED BY MANUFACTURER.
10. EXTERNAL SURFACE IN CONTACT WITH SOIL (BELOW NGL) FOR ALL WALL & RAFT SHALL BE PROVIDED WITH MINIMUM TWO COATS OF BITUMINOUS PAINTING OF GRADE 85/25 CONFORMING TO IS:702 @ 1.7 KG/SQ.M. (MINIMUM) FOR WATER/DAMP PROOFING AS PER SPECIFICATION.

ISSUED FOR TENDER

Rev.	D	M	Y	Modifications	Drawn	Checked	Approved	Validated
A	05	05	2020	ISSUED FOR TENDER	JSH	JSH	MS	KKS

CLIENT: CENTRAL U. P. GAS LIMITED

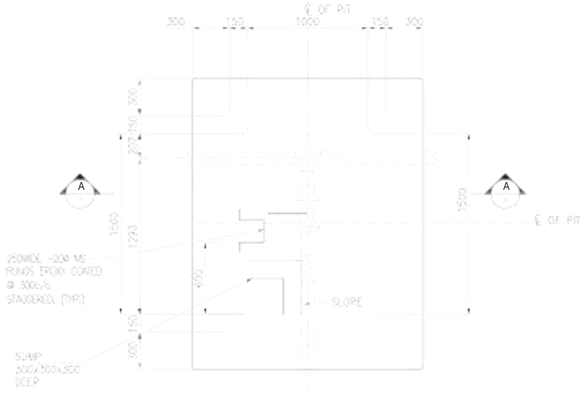
PROJECT: CITY GAS DISTRIBUTION PROJECT

SUBJECT: TYPICAL DETAILS FOR 4"
SV VALVE CHAMBER WITH VENT ARRANGEMENT
FOR BAREILLY, KANPUR & UNNAO AND JHANSI GAs

Size	Scale	Sheet			Rev.
A1	1:50	02	of	06	A

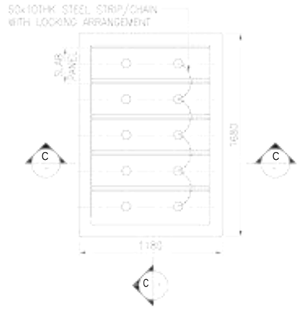
Project No.	Discipline Code	System Code	Serial No.
P.014714	G	20730	011

4" TAP-OFF CHAMBER



VALVE PIT BOTTOM PLAN

(SCALE 1:25)

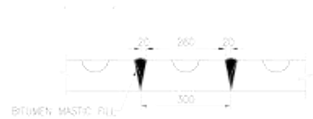


LOCKING ARRANGEMENT OF PRECAST COVER SLAB

(SCALE 1:25)

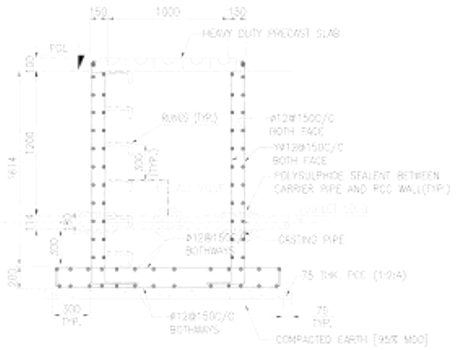
DETAIL OF HOOK

(SCALE 1:10)



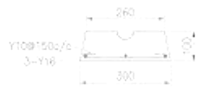
JOINTING DETAIL OF PRECAST COVER SLAB

(SCALE 1:10)



SECTION A-A

(SCALE 1:25)

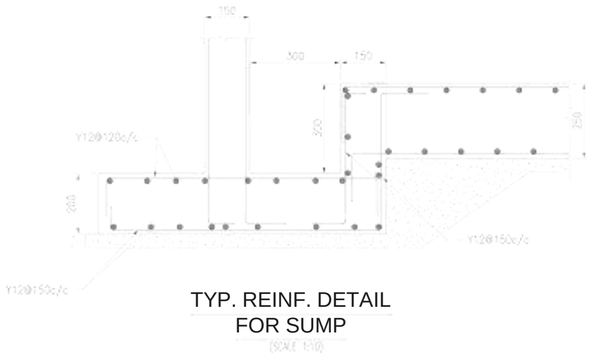


SECTION B-B

(SCALE 1:10)

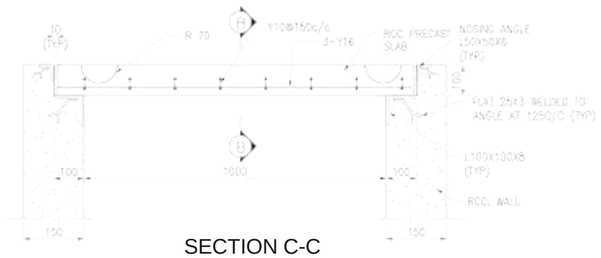
PLAN OF PRECAST COVER SLAB
(FOR VEHICLE MOVING AREA)

(SCALE 1:10)



TYP. REINF. DETAIL FOR SUMP

(SCALE 1:10)



SECTION C-C

(SCALE 1:10)

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. DO NOT MEASURE DIMENSIONS ON THE DRAWING, ONLY WRITTEN DIMENSION SHOULD BE FOLLOWED.
3. GRADE OF CONCRETE SHALL M25.
4. ALL REINFORCEMENT SHALL BE HIGH YIELD STRENGTH DEFORMED (HYSD) BAR OF GRADE FE500D CONFORMING TO IS:1786.
5. MIN. NOMINAL COVER TO REINFORCEMENT IS AS FOLLOWS

	BOTTOM	TOP	SIDE
RAFT	– 50	50	50
TOP SLAB	– 30	35	30
WALL	– 50	(OUTER) 30	(INNER)

6. LAP LENGTH SHALL BE 50 TIME DIA OF THE SMALLER BAR NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY SECTION.
7. DEVELOPMENT LENGTH (Ld) SHALL BE 45 TIMES DIA OF THE BAR.
8. NET SAFE BEARING CAPACITY AT 1.500M BELOW FGL IS CONSIDERED AS 50 kN/M² FROM STRUCTURAL LOADS ONLY.
9. FOR RCC WALL AND BASE SLAB WATER PROOFING COMPOUND SHALL BE WELL MIX WITH DRY CEMENT IN PROPORTION OF 1% BY WEIGHT OF CEMENT OR AS RECOMMENDED BY MANUFACTURER.
10. EXTERNAL SURFACE IN CONTACT WITH SOIL (BELOW NGL) FOR ALL WALL & RAFT SHALL BE PROVIDED WITH MINIMUM TWO COATS OF BITUMINOUS PAINTING OF GRADE 85/25 CONFORMING TO IS:702 @ 1.7 KG/SQ.M (MINIMUM) FOR WATER/DAMP PROOFING AS PER SPECIFICATION.

ISSUED FOR TENDER

Rev.	D	M	Y	Modifications	Drawn	Checked	Approved	Validated
1	06	06	2020	ISSUED FOR TENDER	SGH	GN	MS	KVS

CLIENT: CENTRAL U. P. GAS LIMITED

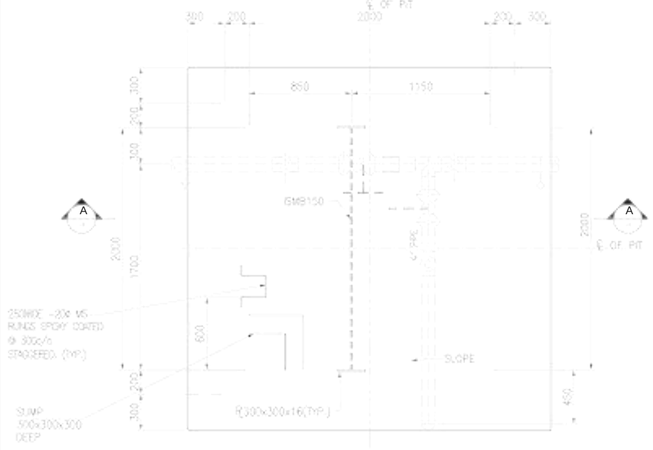
PROJECT: CITY GAS DISTRIBUTION PROJECT

SUBJECT: TYPICAL DETAILS FOR 4" TAP-OFF CHAMBER ARRANGEMENT FOR BAREILLY, KANPUR & UNNAO AND JHANSI GAs

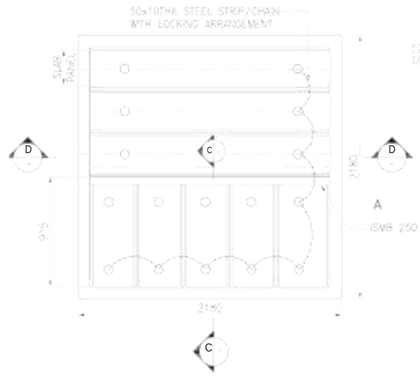
Size	Scale	Sheet			Rev.
A1	1:50	03	of	06	A

Project No.	Discipline Code	System Code	Serial No.
P.014714	G	20730	012

FOR 6" SV VALVE CHAMBER WITH VENT
& WITH TAP-OFF

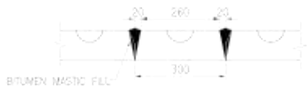


VALVE PIT BOTTOM PLAN
(SCALE 1:25)

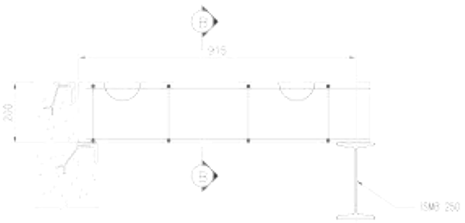


LOCKING ARRANGEMENT OF
PRECAST COVER SLAB
(SCALE 1:25)

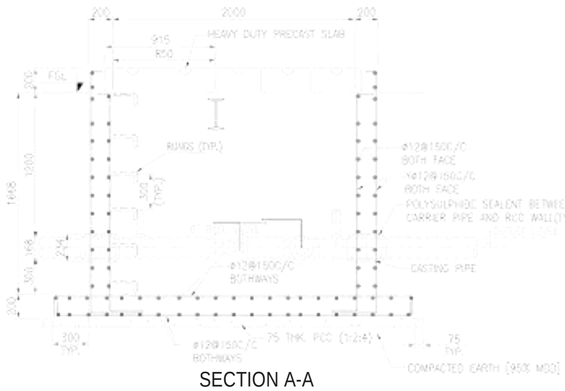
DETAIL OF HOOK
(SCALE 1:10)



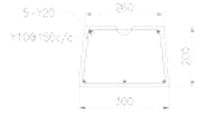
JOINTING DETAIL OF PRECAST
COVER SLAB
(SCALE 1:10)



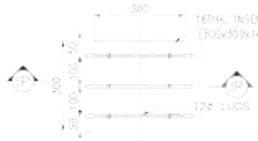
SECTION C-C
(SCALE 1:10)



SECTION A-A
(SCALE 1:25)

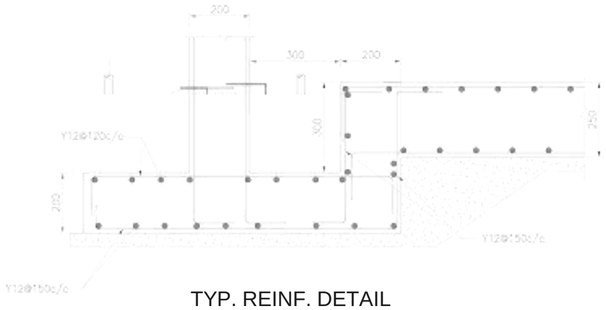


SECTION B-B
(SCALE 1:10)



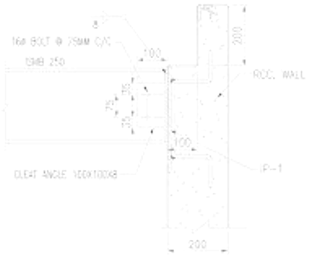
INSERT PLATE IP1
(SCALE 1:10)

SECTION IP-IP
(SCALE 1:10)

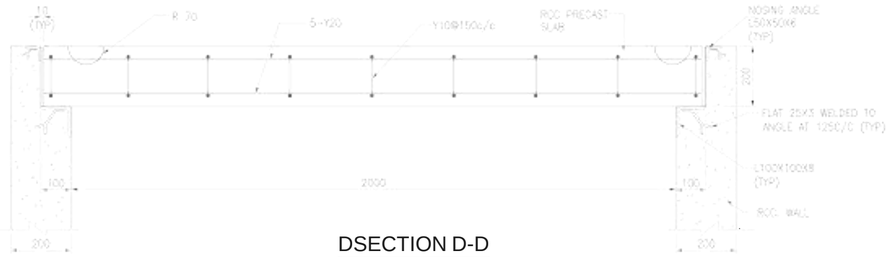


TYP. REINF. DETAIL
FOR SUMP
(SCALE 1:10)

PLAN OF PRECAST COVER SLAB
(FOR VEHICLE MOVING AREA)
(SCALE 1:10)



DETAIL-A



DSECTION D-D

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. DO NOT MEASURE DIMENSIONS ON THE DRAWING, ONLY WRITTEN DIMENSION SHOULD BE FOLLOWED.
3. GRADE OF CONCRETE SHALL M25.
4. ALL REINFORCEMENT SHALL BE HIGH YIELD STRENGTH DEFORMED (HYSD) BAR OF GRADE FE500D CONFORMING TO IS:1786.
5. MIN. NOMINAL COVER TO REINFORCEMENT IS AS FOLLOWS

	BOTTOM	TOP	SIDE
RAFT	–	50	50
TOP SLAB	–	30	30
WALL	–	50 (OUTER)	30 (INNER)

6. LAP LENGTH SHALL BE 50 TIME DIA OF THE SMALLER BAR NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY SECTION.
7. DEVELOPMENT LENGTH (Ld) SHALL BE 45 TIMES DIA OF THE BAR.
8. NET SAFE BEARING CAPACITY AT 1.500M BELOW FGL IS CONSIDERED AS 50 kN/M² FROM STRUCTURAL LOADS ONLY.
9. FOR RCC WALL AND BASE SLAB WATER PROOFING COMPOUND SHALL BE WELL MIX WITH DRY CEMENT IN PROPORTION OF 1% BY WEIGHT OF CEMENT OR AS RECOMMENDED BY MANUFACTURER.
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ISSUED FOR TENDER

Rev.	D	M	Y	Modifications	Drawn	Checked	Approved	Validated
A	05	05	2020	ISSUED FOR TENDER	JSH	JSH	MS	KKS

CLIENT: CENTRAL U. P. GAS LIMITED

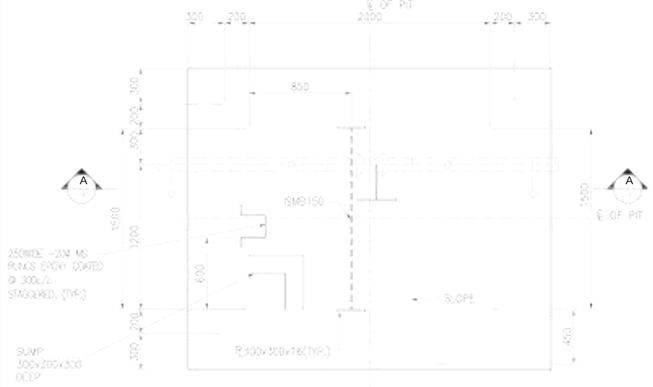
PROJECT: CITY GAS DISTRIBUTION PROJECT

SUBJECT: TYPICAL DETAILS FOR 6"
SV VALVE CHAMBER WITH VENT & WITH TAP-OFF ARRANGEMENT
FOR BAREILLY, KANPUR & UNNAO AND JHANSI GAs

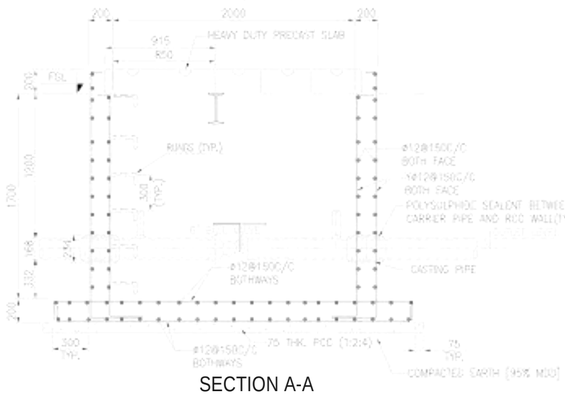
Size	Scale	Sheet			Rev.
A1	1:50	04	of	06	A

Project No.	Discipline Code	System Code	Serial No.
P.014714	G	20730	013

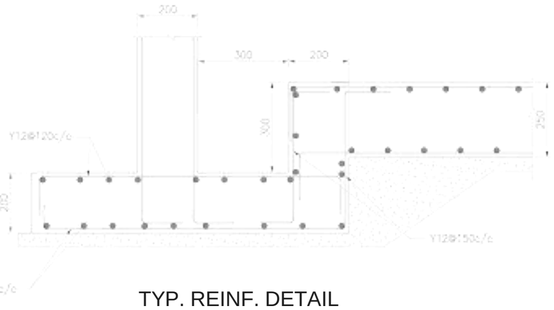
FOR 6" SV VALVE CHAMBER WITH VENT
& WITH TAP-OFF



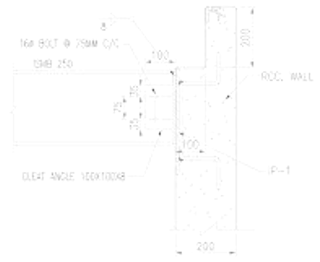
VALVE PIT BOTTOM PLAN
(SCALE 1:25)



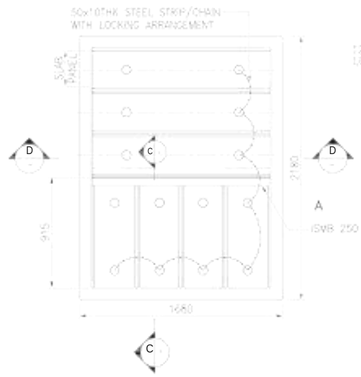
SECTION A-A
(SCALE 1:25)



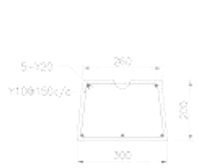
TYP. REINF. DETAIL
FOR SUMP
(SCALE 1:10)



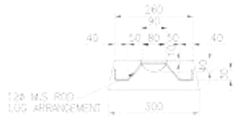
DETAIL-A



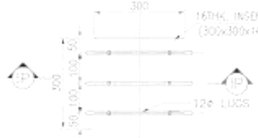
LOCKING ARRANGEMENT OF
PRECAST COVER SLAB
(SCALE 1:25)



SECTION B-B
(SCALE 1:10)



DETAIL OF HOOK
(SCALE 1:10)



INSERT PLATE IP1
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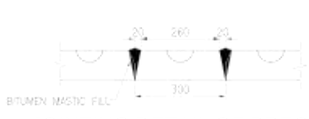
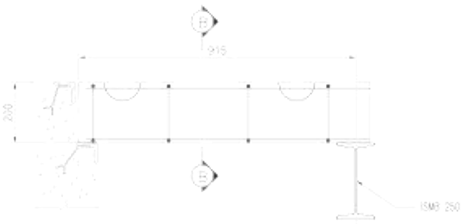


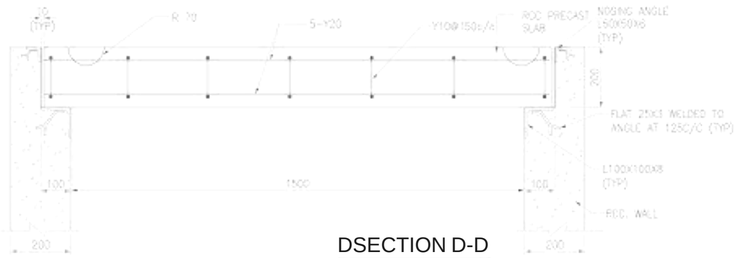
JOINTING DETAIL OF PRECAST
COVER SLAB
(SCALE 1:10)



SECTION C-C
(SCALE 1:10)

SECTION IP-IP
(SCALE 1:10)

PLAN OF PRECAST COVER SLAB
(FOR VEHICLE MOVING AREA)
(SCALE 1:10)



DSECTION D-D

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. DO NOT MEASURE DIMENSIONS ON THE DRAWING, ONLY WRITTEN DIMENSION SHOULD BE FOLLOWED.
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4. ALL REINFORCEMENT SHALL BE HIGH YIELD STRENGTH DEFORMED (HYSD) BAR OF GRADE FE500D CONFORMING TO IS:1786.
5. MIN. NOMINAL COVER TO REINFORCEMENT IS AS FOLLOWS

	BOTTOM	TOP	SIDE
RAFT	–	50	50
TOP SLAB	–	30	30
WALL	–	50	50

(OUTER) 30 (INNER)

6. LAP LENGTH SHALL BE 50 TIME DIA OF THE SMALLER BAR NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY SECTION.
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ISSUED FOR TENDER

Rev.	D	M	Y	Modifications	Drawn	Checked	Approved	Validated
A	06	04	2020	ISSUED FOR TENDER	SGH	GK	MS	KHS

CLIENT: CENTRAL U. P. GAS LIMITED

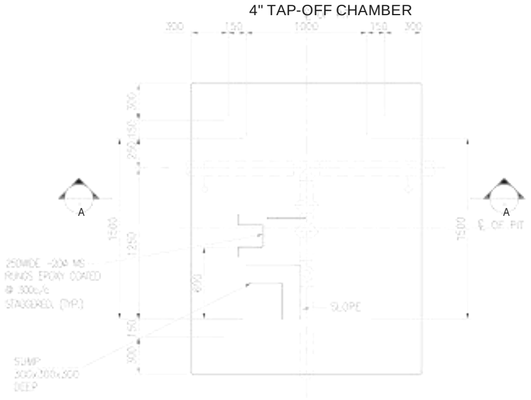
PROJECT: CITY GAS DISTRIBUTION PROJECT

SUBJECT: TYPICAL DETAILS FOR 6"
SV VALVE CHAMBER WITH VENT ARRANGEMENT
FOR BAREILLY, KANPUR & UNNAO AND JHANSI GAs

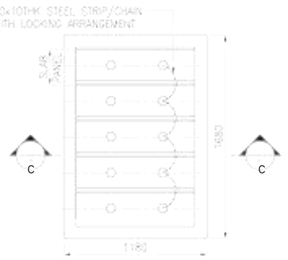
Size	Scale	Sheet			Rev.
A1	1:50	05	of	06	A

Project No.	Discipline Code	System Code	Serial No.
P.014714	G	20730	014

4" TAP-OFF CHAMBER

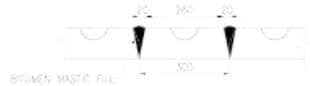


VALVE PIT BOTTOM PLAN

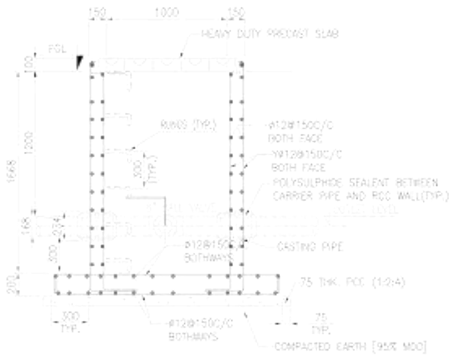


LOCKING ARRANGEMENT OF
PRECAST COVER SLAB

DETAIL OF HOOK



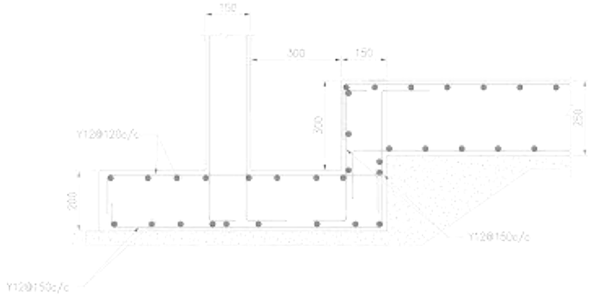
JOINTING DETAIL OF PRECAST
COVER SLAB



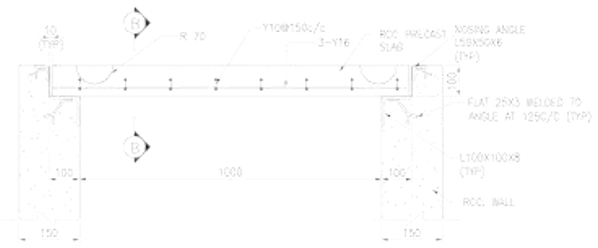
SECTION A-A

SECTION B-B

PLAN OF PRECAST COVER SLAB
(FOR VEHICLE MOVING AREA)



TYP. REINF. DETAIL
FOR SUMP



SECTION C-C

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. DO NOT MEASURE DIMENSIONS ON THE DRAWING. ONLY WRITTEN DIMENSION SHOULD BE FOLLOWED.
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	BOTTOM	TOP	SIDE
RAFT	- 50	50	50
TOP SLAB	- 30	30	30
WALL	- 50 (OUTER)	30 (INNER)	

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ISSUED FOR TENDER

Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
A	05.05.2020	ISSUED FOR TENDER	JSH	ISH	MS	PKS

CLIENT

CENTRAL U. P. GAS LIMITED

PRIJECT

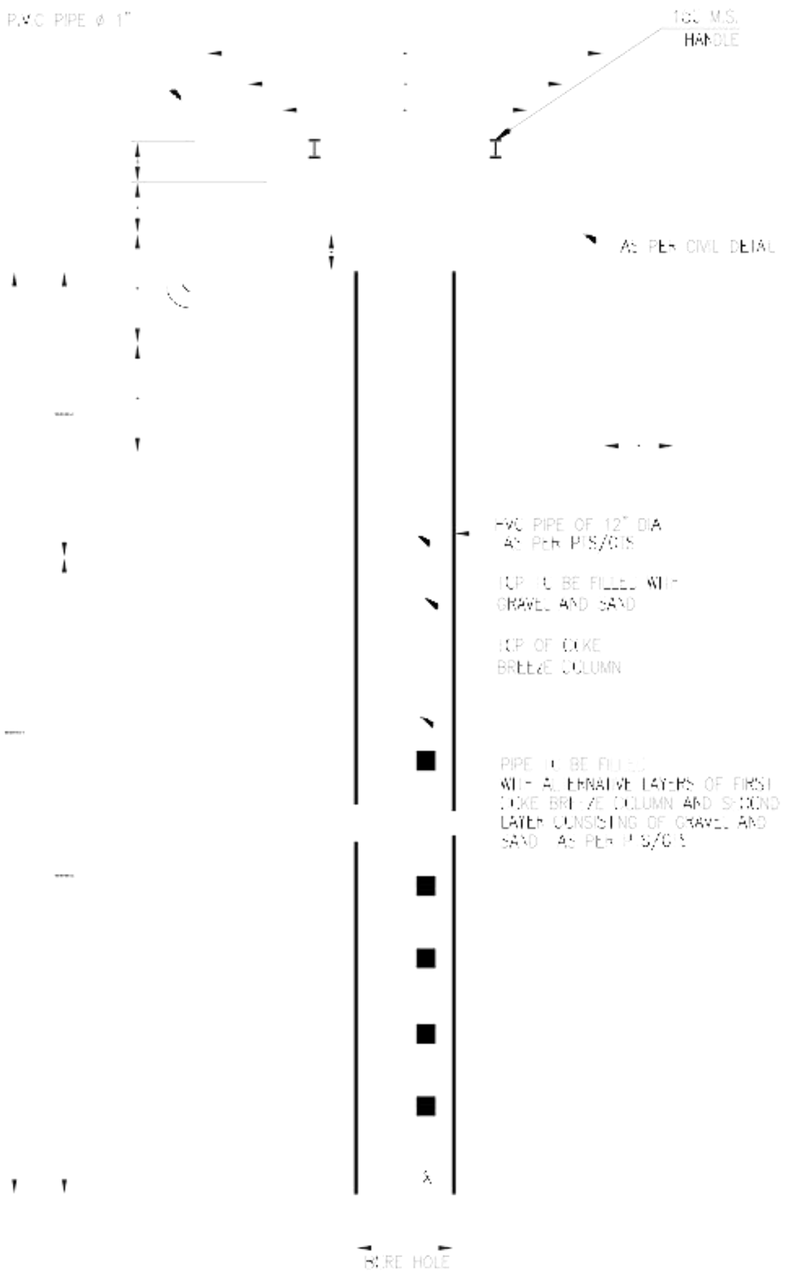
CITY GAS DISTRIBUTION PROJECT

SUBJECT

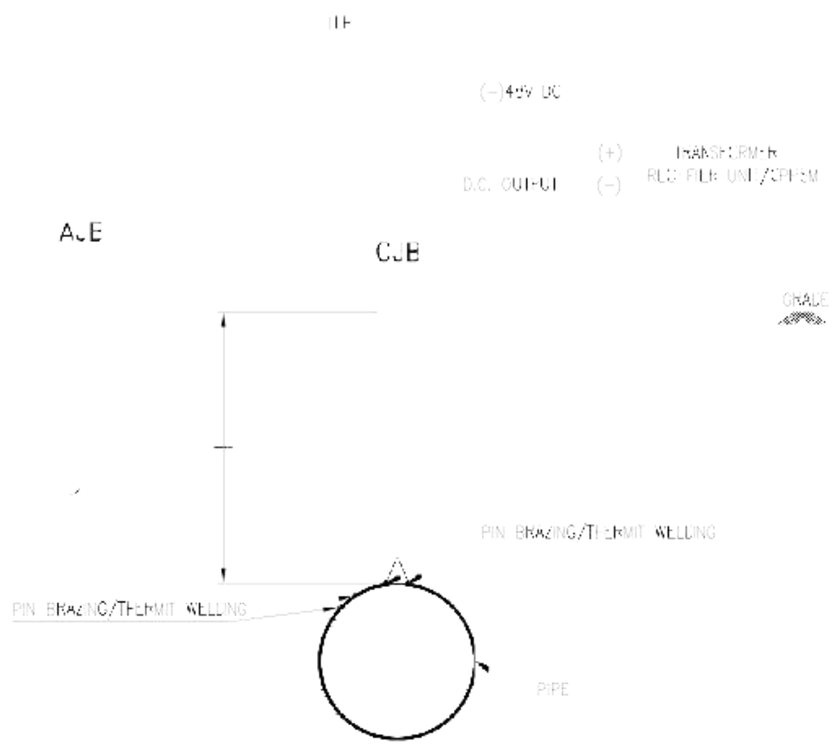
TYPICAL DETAILS FOR 6"
TAP-OFF CHAMBER ARRANGEMENT
PUR & UNNAO AND JHANSI GAs

Size	Scale	Sheet	Rev.
A1	1:50	06 of 06	A

Project No.	Discipline Code	System Code	Serial No.
P.014714	G	20730	015



30 M DEEP ANODE BED
CONSISTING OF 1 STRING ANODES



NOTES

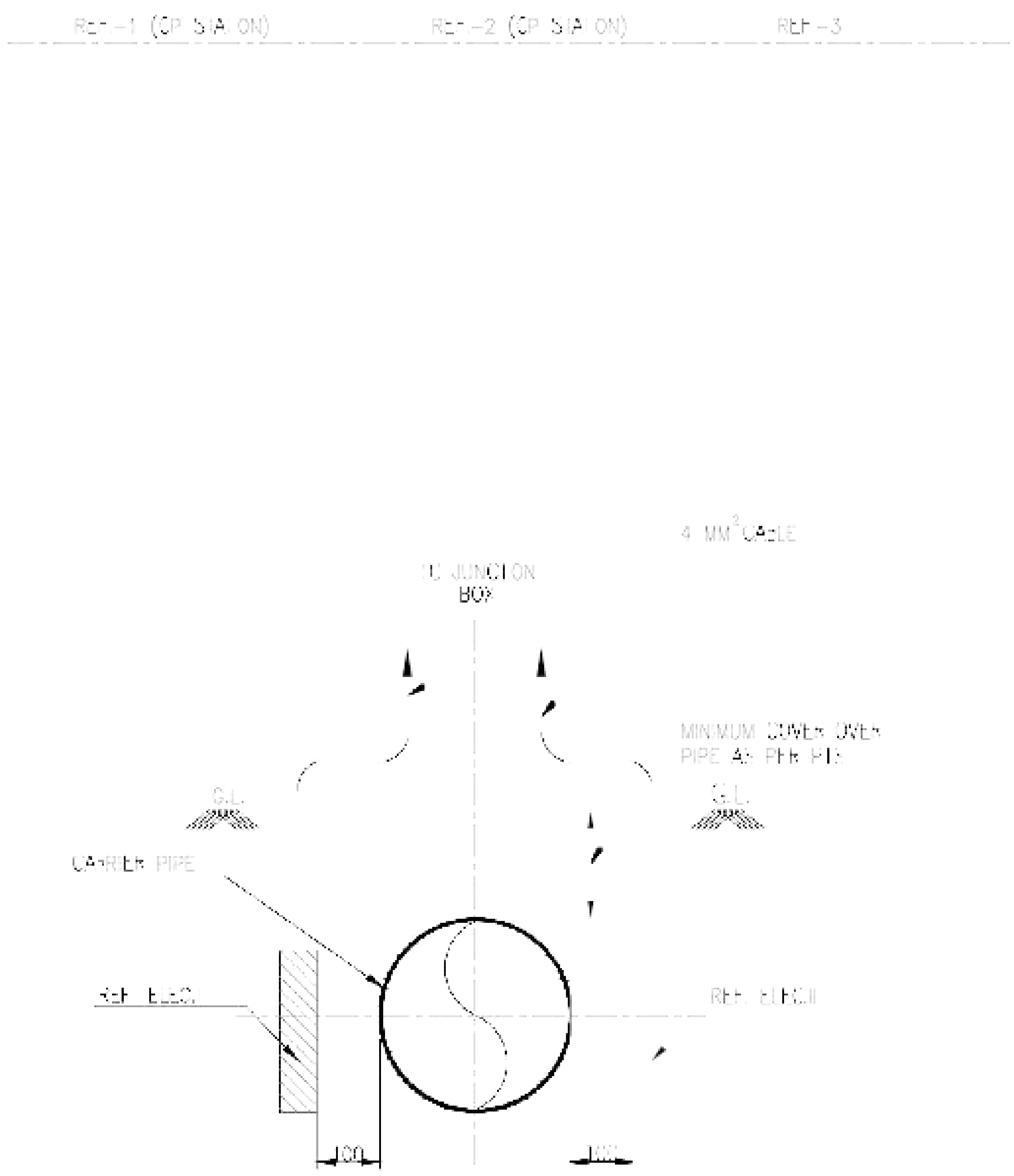
1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3. THESE DIMENSIONS ARE INDICATIVE ONLY. THESE DIMENSIONS MUST BE ALTERED TO SUIT THE SITE REQUIREMENT.
4. THIS DRAWING FOR INFORMATION AND GUIDANCE ONLY. ACTUAL DRAWING AND DOCUMENT TO BE PREPARED BY CONTRACTOR AND APPROVED FROM OWNER/CONSULTANT BEFORE EXECUTION OF SAME.
5. ANODE BED TYPE (DEEP WELL OR HORIZONTAL TYPE) SHALL BE FINALISED DURING DETAIL ENGINEERING SUBJECT TO APPROVAL.

Rev	Dt	By	Modifications	Drawn	Checked	Approved	Validated
				SKS	KS	[illegible]	SKS

SUBJECT
IMPRESSED CURRENT CATHODIC PROTECTION SCHEMATIC

Size	Scale	Sheet
A3	NTS	01 of 01

Drawing No	Rev
GGNGE-20712-327	0



ARRANGEMENT OF TWO REFERENCE ELECTRODES ON PIPE LINE TYPICAL INSTALLATION DETAILS

NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3. THE PIPE ASSEMBLY SHALL BE HOT DIP GALVANISED AFTER FABRICATION.
4. BRICK WORK SHALL BE DONE AFTER COMPACTING THE SOIL.
5. INSTALLED DETAILS FOR PERMANENT CU-CUSO4 REFERENCE CELLS AS MENTIONED IN DRAWING ARE FOR GUIDANCE ONLY.
6. HOWEVER, INSTALLATION PROCEDURE, DESIGN DRAWING ETC SHALL BE DONE AS PER APPROVAL OF OWNER/CONSULTANT.

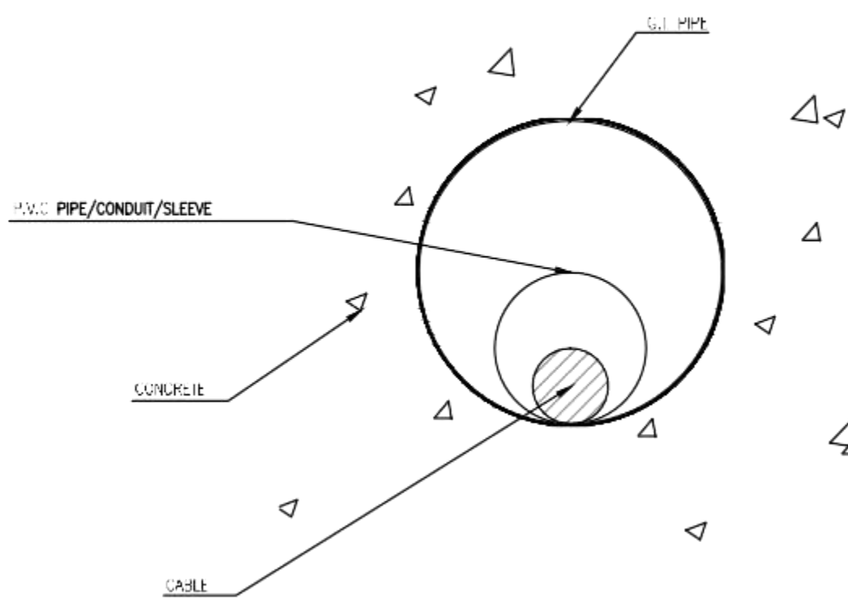
BILL OF MATERIAL

SL. NO.	DESCRIPTION	QTY.
1.	P.V.C PIPE 3 MM THICK	1 No.
2.	SAG WOOD PLUG	1 No.
3.	$CuSO_4$ CRYSTALS	AS REQD.
4.	ELECTROLYTIC COPPER SPIRAL ⌀ 8 MM	1 No.
5.	$CuSO_4$ SATURATED SOLUTION	AS REQD.
6.	BRAZED COPPER JOINT	1 No.
7.	WATER FILLING BOLTED HOLES ⌀ 8 MM	2 Nos.
8.	HYLAM BUSH	1 No.
9.	COPPER LUG	1 No.
10.	BOLTED CABLE CONNECTION	1 No.
11.	CONNECTION CABLE 10 MM^2	AS REQD.
12.	EPOXY FOR SEALING	AS REQD.

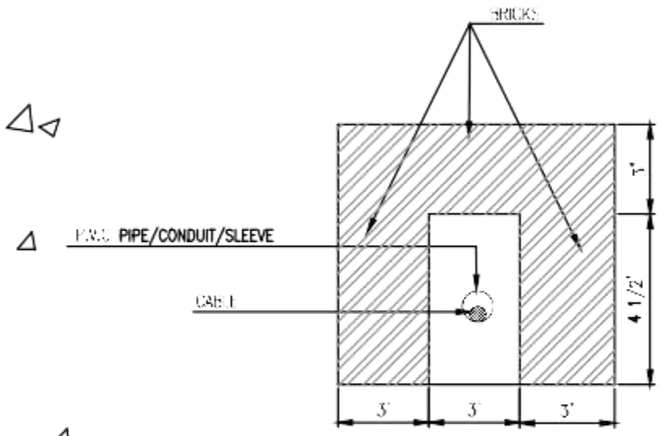
Rev.	Date	Modifications	Drawn	Checked	Approved	Validated

SUBJECT: FABRICATION AND INSTALLATION DETAILS OF CuCuSO4 REFERENCE ELECTRODE

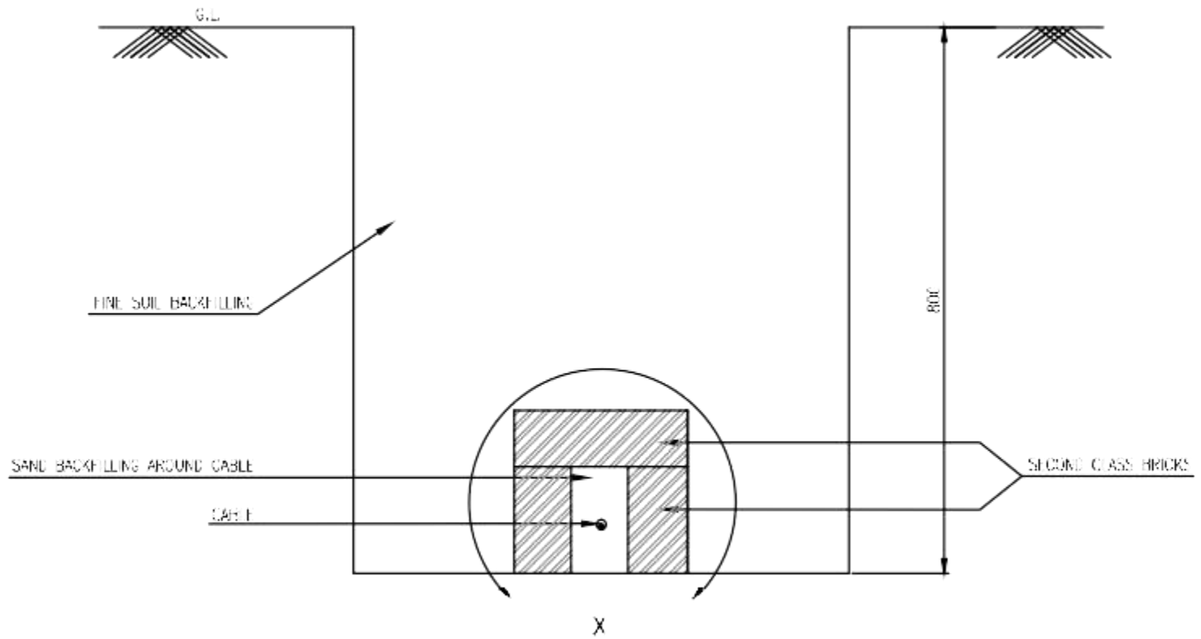
Size	Scale	Sheet	Drawing No.	Rev
A3	NTS	01 of 01	GGNG-E-20712-322	0



SECTION VIEW OF CABLE
LAYOUT IN CONCRETE



ENLARGED DETAIL-X
FOR NORMAL LAYING IN EARTH



TYPICAL CROSS-SECTION OF CABLE LAYING IN EARTH

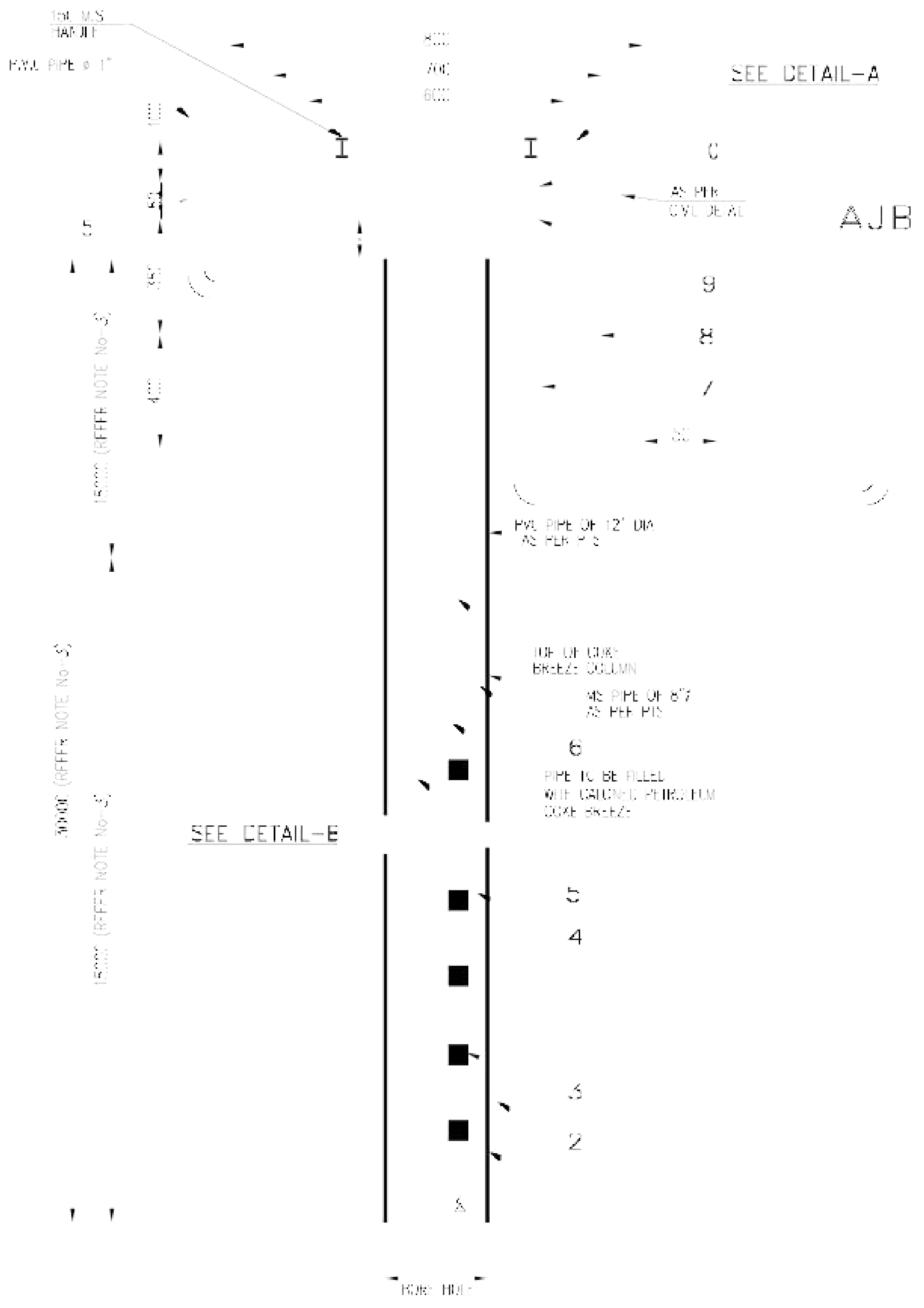
NOTES

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2 FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3 ALL UNDERGROUND CABLE SHALL BE LAID IN BRICK COVERING WITH SAND BACKFILL.
4 FOR MORE THAN ONE CABLE IN THE SAME CABLE TRENCH CABLE SHALL BE LAID SIDE BY SIDE IN SEPARATE BRICK COVERING.
5 AT BOTH ENDS OF CABLE TERMINATION, A LOOP OF ONE METER (MINIMUM) SHALL BE KEPT AS SPARE.
6 WHEREVER TERMINATION IN BETWEEN IS REQUIRED, T JOINTS OR ELBOWS SHALL BE PROVIDED.
7 AT ROAD/NALA CROSSINGS G.I. PIPE CONDUIT SHALL BE USED.

Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
0	05.10.16	APPROVED	RKS	KS	PR	SKH

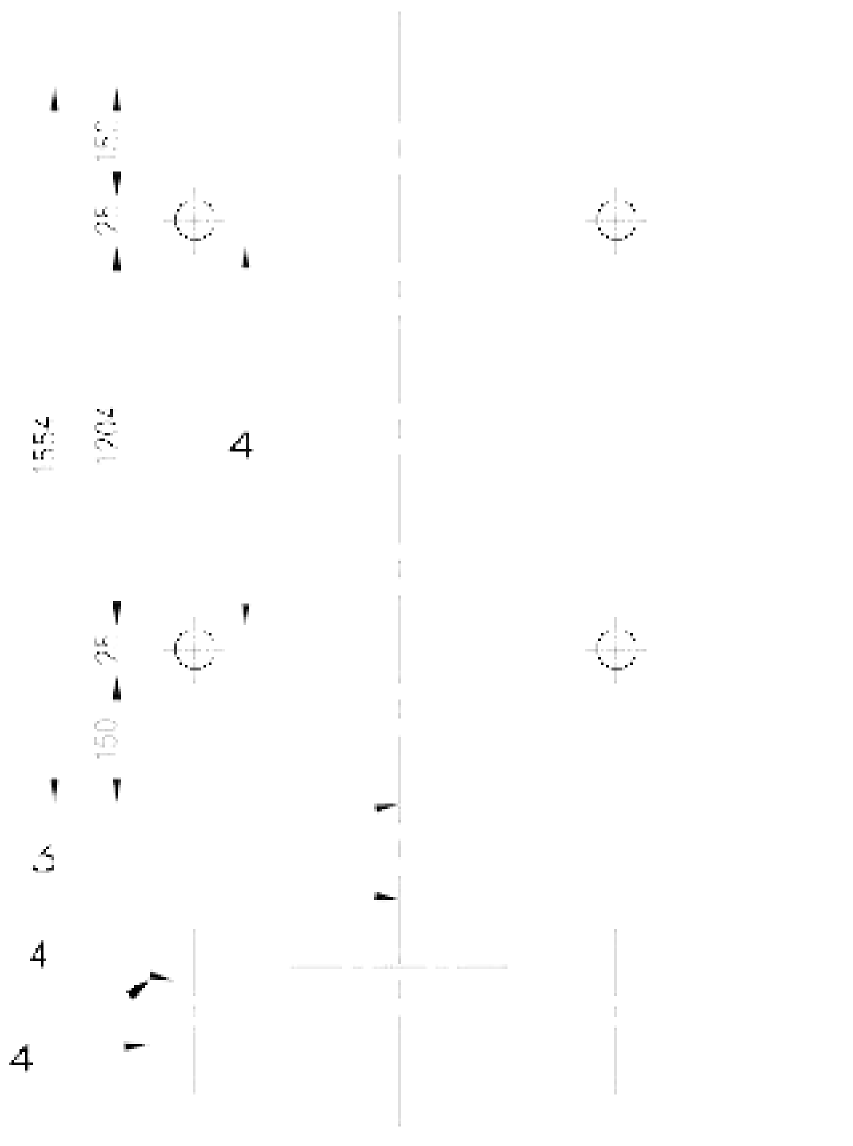
SUBJECT
FABRICATION AND INSTALLATION
DETAILS OF CABLE LAYING (TYPICAL) FOR CATHODIC PROTECTION

Size A3 | Scale NTS | Sheet 01 of 01
Drawing No. GGNG-E-20712-323 | Rev. 0



30 M DEEP ANODE BED (TENTATIVE)
CONSISTING OF 1 STRING ANODES

DETAIL-A
PLAN OF PIT COVER



DETAIL-B
M.S. CENTRALISER CLAMP ARRANGEMENT

NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3. THESE DIMENSIONS ARE INDICATIVE ONLY. THESE DIMENSIONS MUST ALTERED TO SUIT THE SITE REQUIREMENT.
4. THE MMO ANODE STRING SHALL BE DUAL FEED TYPE.
5. ALL WORK SHALL BE CARRIED OUT BY EXPERIENCED AND QUALIFIED PERSONNEL WITH APPROVED DESIGN AND DRAWING FROM OWNER/ CONSULTANT.

BILL OF MATERIAL

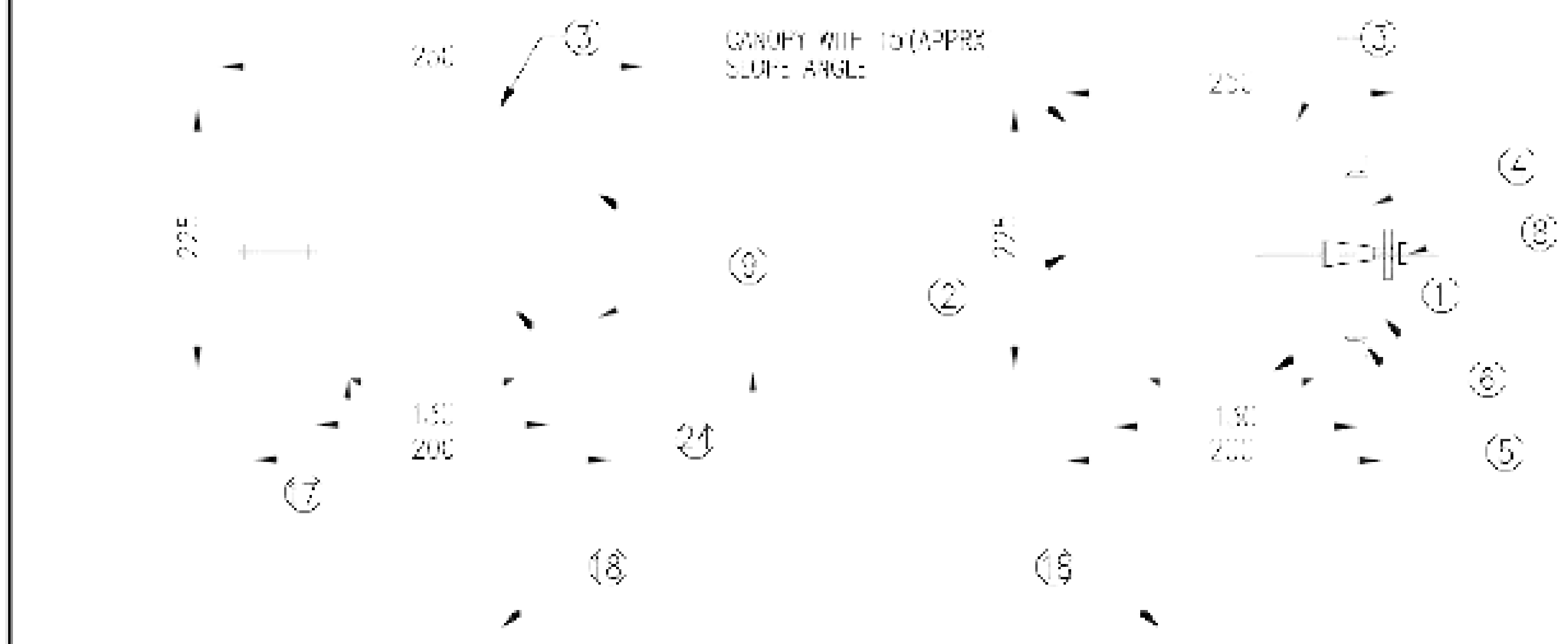
SL. NO.	DESCRIPTION	QTY.
1.	PVC CASING PIPE OF 12" DIA	15 Mtrs.
2.	COKE BREEZE	AS REQD.
3.	ANODE SIZE IS 2.5 MM X 1000 MM, OUTPUT OF 8 Amp.	1 STRING MMO
4.	M.S. CENTRALISER	10 Nos.
5.	P.V.C PERFORATED VENT PIPE 1" ø	AS REQD.
6.	CABLE LEADS	1 No.
7.	P.V.C PIPE 100 MM ø	AS REQD.
8.	CONCRETE WORK FOR TOP OF ANODE BED	AS REQD.
9.	CABLE TIE WITH 1/4" NYLON ROPE	AS REQD.
10.	G.I. PIPE 2" ø FOR SUPPORTING CABLE	1 No.
11.	M.S. PLATE TOP COVER	1 No.
12.	ANODE LEAD JUNCTION BOX	1 No.
13.	M.S. LIFTING HANDLES	2 Nos.
14.	M.S. NUT & BOLT	56 Nos.
15.	P.V.C PIPE 4" ø	AS REQD.

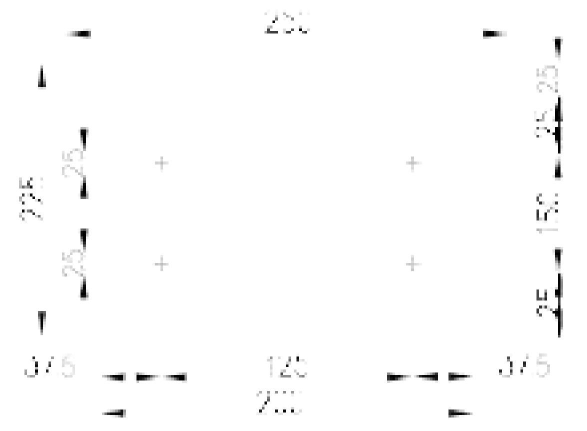
Rev. | Date | By | Modifications | Drawn | Checked | Approved

SUBJECT: FABRICATION AND INSTALLATION DETAILS OF DEEP ANODE GROUND BED

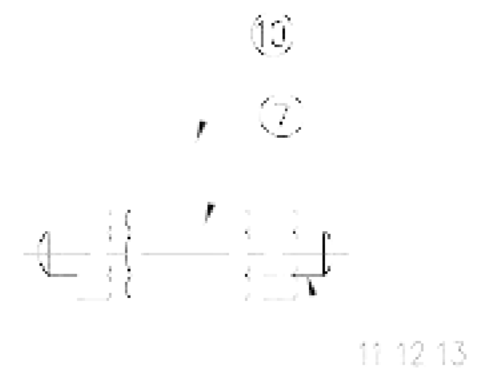
Size: A3 | Scale: NTS | Sheet: 01 of 01

Drawing No.: GGNG E 20712 324 | Rev: 0

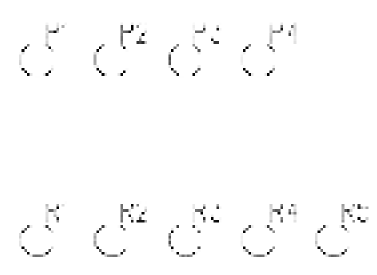




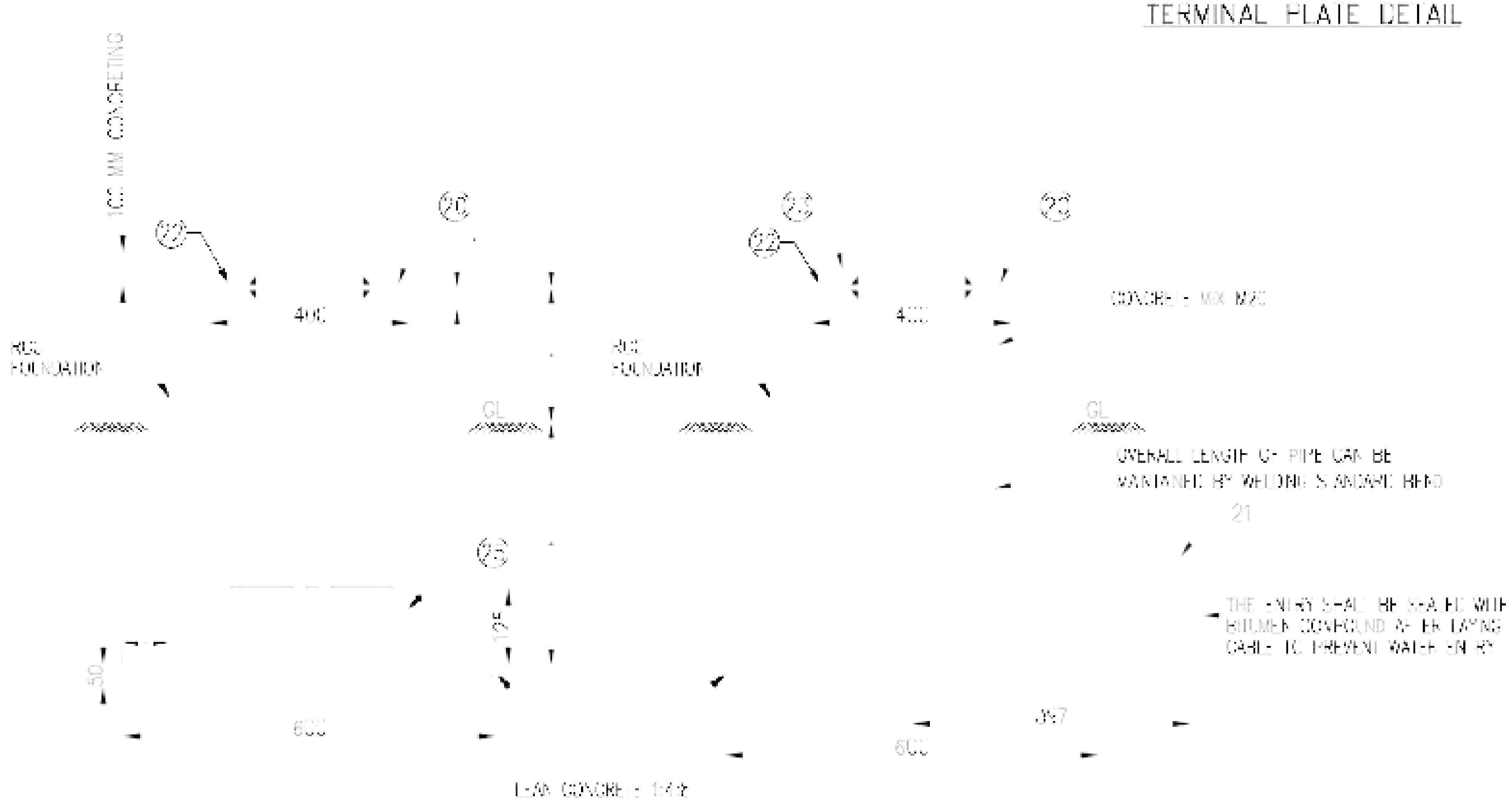
FRONT VIEW DOOR REMOVED



SIDE ELEVATION



TERMINAL PLATE DETAIL



FRONT ELEVATION

SIDE ELEVATION

BILL OF MATERIAL

SL NO	DESCRIPTION	QTY
1.	BOTTOM PLATE, 3 THKx194 MS PLATE	1No
2.	REAR & SIDE, 267x217x704 MS 3MM THK	1No
3.	TOP, 267x250x300 MS 3MM THK	1No
4.	FRONT TOP 267 x130x61 MS	1No
5.	FRONT BOTTOM, 267x130x61 MS	1No
6.	SHUTTER 267x234x234 MS	1No
7.	SPRING WASHER SO. B16	66Nos
8.	CONCEALED LOCK WITH MASTER KEY & SLIDING COVER	1No
9.	HINGE FOR SHUTTER	9Nos
10.	TERMINAL PLATE 6x150x150 PHENOLIC LAM SHT	1No
11.	BRASS STUD M6x60LONG (FOR TERMINALS)	1No
12.	BRASS NUT M6	44Nos
13.	BRASS WASHER	44Nos
14.	MS ANGLE 5THKx50x50x30	4Nos
15.	STEEL SCREW, M6x16	4Nos
16.	LATCH FOR SHUTTER	1No
17.	MS COUPLING PLATE, 6THK0150x150 MS PLATE	1No
18.	MS PIPE, 100 NB x 5.4 THKx 1275MM	1No
19.	NEOPRENE RUBBER GASKET 6 THK	1Set
20.	FOUNDATION PLATE 6THKx400x400	2Nos
21.	RUBBER BUSH	1No
22.	FOUNDATION BOLT M14x125 LONG WITH SPRING WASHER AND NUT	1No
23.	STIFFENER PLATE 6THKx100x100	1No
24.	NAME PLATE ANNODISED AL 0.9x120x160	1No
25.	FOUNDATION CONCRETE M-20 GRAD	1No
27.	DOOR STOPPER PLATE 3MM THK	1No
28.	HANDLE	1No

NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE
3. THE SHUTTER SHALL BE HINGED TYPE WITH CONCEALED LOCK & SHALL HAVE DOOR GASKET TO MAKE THE TEST STATION WEATHER PROOF(IP55)
4. THE INNER & OUTER SURFACE OF THE TEST STATION SHALL BE EPOXY PAINTED TWO COAT OF ZINC RICH EPOXY PRIMER AND THREE COAT OF BATTLE SHIP GRAY COLOURED EPOXY PAINT ACHIEVING TOTAL PAINT THICKNESS NOT LESS THAN 200 MICRON
5. THE NAME PLATE SHALL BE OF ANODISED ALUMINIUM WITH BLACK BACKGROUND & WHITE LETTERS & SHALL BE FIXED TO THE INNER SIDE OF SHUTTER
6. TEST STATION SHALL BE ERECTED WITH THEIR SHUTTERS PARALLEL TO THE LINE OF AXIS AND FACING THE PIPE LINE. THE DIMENSIONS OF THE TEST STATION WILL VARY DEPENDING ON THE TYPE OF THE TEST STATION.
7. THE CHAINAGE OF TEST STATION SHALL BE WRITTEN WITH BLACK PAINT ON THE OUTER SIDE OF THE FRONT SHUTTER.
8. HEIGHT OF THE TEST STATION SHOWN ABOVE GROUND LEVEL IS MINIMUM ONLY. THE ACTUAL HEIGHT SHALL BE DECIDED BASED ON LOCAL FLOOD LEVELS TO BE ASCERTAINED.
9. AFTER INSTALLATION OF FOUNDATION BOLT,4" (100MM) CONCRETING TO BE DONE ABOVE THE PLATES AS AN EXTENSION OF PCC(M-15) FOUNDATION. TOTAL DEPTH OF THE FOUNDATION SHALL BE 900 MM AND 300 MM ABOVE THE GRADED LEVEL.
10. BEFORE FABRICATION, DRAWINGS ARE REQUIRED TO BE APPROVED BY OWNER
11. DIMENSIONS, SPECIFICATIONS AND QUANTITY MENTION HEREIN ARE INDICATIVE AND FOR GUIDANCE ONLY .
12. DOOR SHALL BE HINGED TYPE WITH CONCEALED LOCK AND SHALL HAVE DOOR GASKET TO HAVE TEST STATION WEATHER PROOF AND FLAME PROOF (IF REQUIRED).
13. The name plate of test stations shall in minimum carry following information.
   - (a) Test station number
   - (b) Chainage in km
   - (c) Test station connection scheme type
   - (d) Distance from pipeline in meters
   - (e) Direction of product flow

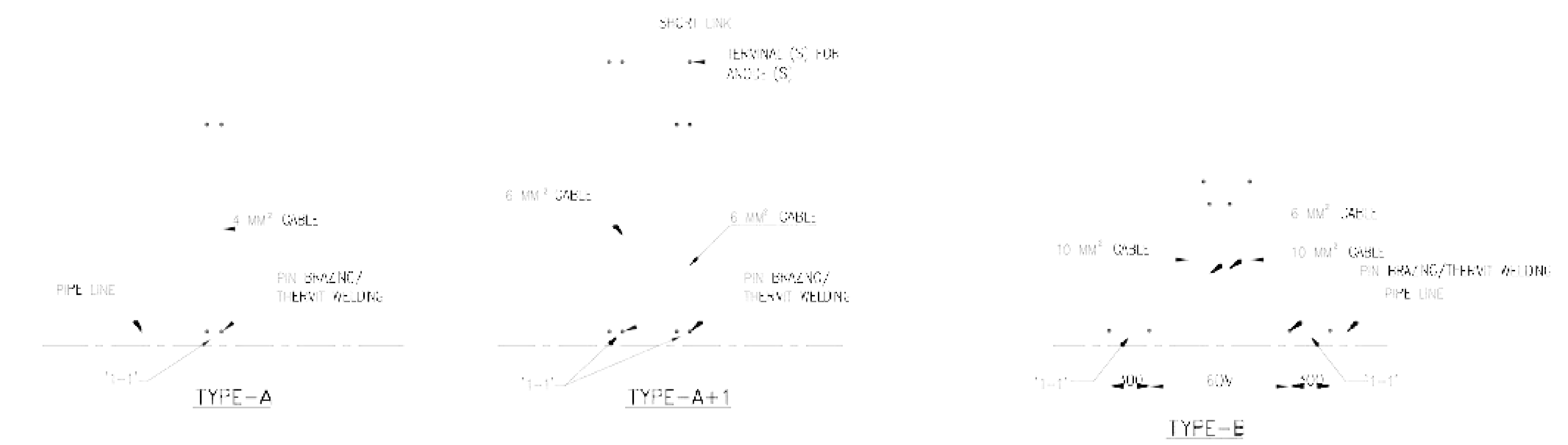
Rev	D M Y	Modifications	Drawn	Checked	Approved	Validated

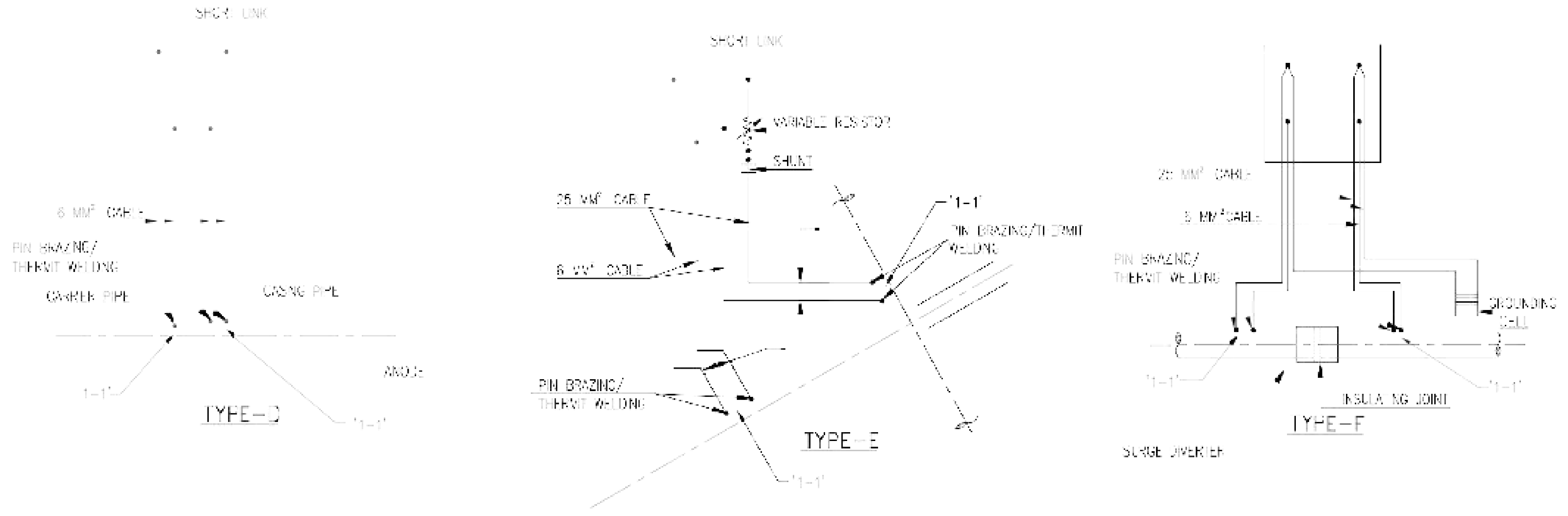
SUBJECT

TEST LEAD POINTS & JUNCTION BOX
WITH FOUNDATION DETAILS

Size	Scale	Sheet
A3	NTS	01 of 01

Drawing No: GGNG-E-20712-325 | Rev: 0





DETAILS OF CONNECTION SCHEME

TYPE A : PSP MONITORING ONLY
TYPE B : LINE CURRENT MEASUREMENT.
TYPE A+1 : ANODE TO PIPE CONNECTION.
TYPE E : PIPE LINE CROSSING.
TYPE D : CASED CROSSING.
TYPE F : ISOLATION JOINT CONNECTION.
TYPE H : HIGH TENSION LINE CONNECTION.

NOTES

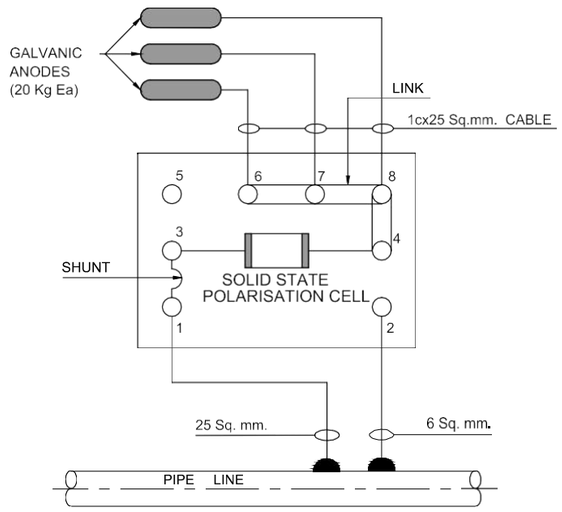
1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3. THIS TEST STATIONS CONNECTION SCHEMES ARE TYPICAL. VENDOR MAY CHANGE/REVISE THE CONNECTION SCHEMES AS PER CUSTOMER EXISTING CP SYSTEM SCHEMES DRAWINGS.
4. REQUIRED CONNECTION SCHEME SHALL BE PROVIDED ON THE TERMINAL PLATE OF TEST LEAD POINT.

Rev	D/M/Y	Modifications	Drawn	Checked	Approved	Validated

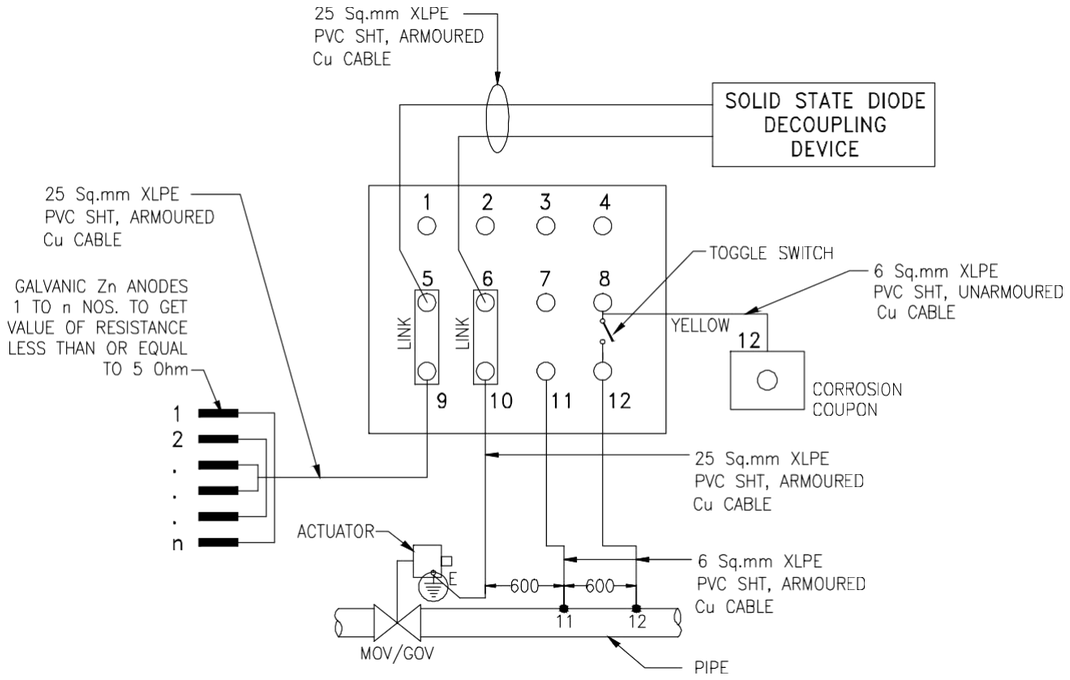
SUBJECT: TEST STATION CONNECTION SCHEME (TYPICAL) DETAILS

Size	Scale	Sheet
A3	NTS	01 of 05

Drawing No.: GGNG-E-20712-326 Rev: 0



TYPE–H



TYPE 'DMV'
(FOR STATION LIMIT MOV
AND MAINLINE MOV/GOV ONLY)

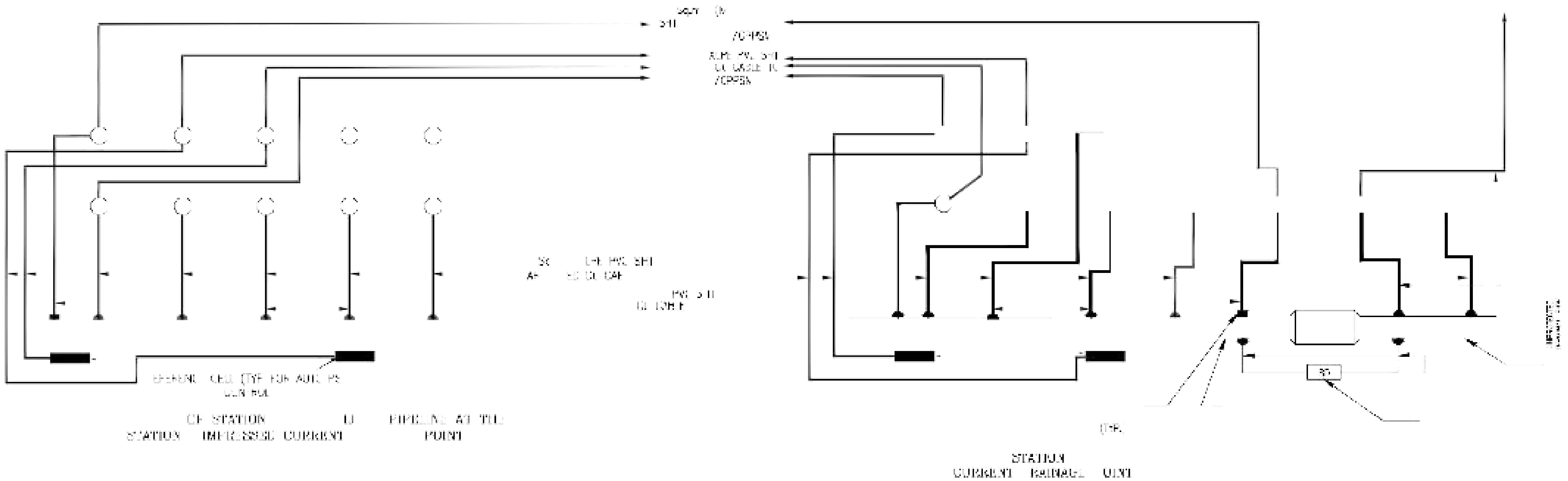
NOTES

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2 FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3 THIS TEST STATIONS CONNECTION SCHEMES ARE TYPICAL. VENDOR MAY CHANGE/REVISE THE CONNECTION SCHEMES AS PER CUSTOMER EXISTING CP SYSTEM SCHEMES DRAWINGS.
4 REQUIRED CONNECTION SCHEME SHALL BE PROVIDED ON THE TERMINAL PLATE OF TEST LEAD POINT.

Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
0	05.10.16	APPROVED	RKS	KS	PR	SKH

SUBJECT
TEST STATION CONNECTION SCHEME
(TYPICAL) DETAILS

Size A3 | Scale NTS | Sheet 02 of 05
Drawing No. GGNG-E-20712-326 | Rev. 0



NOTES

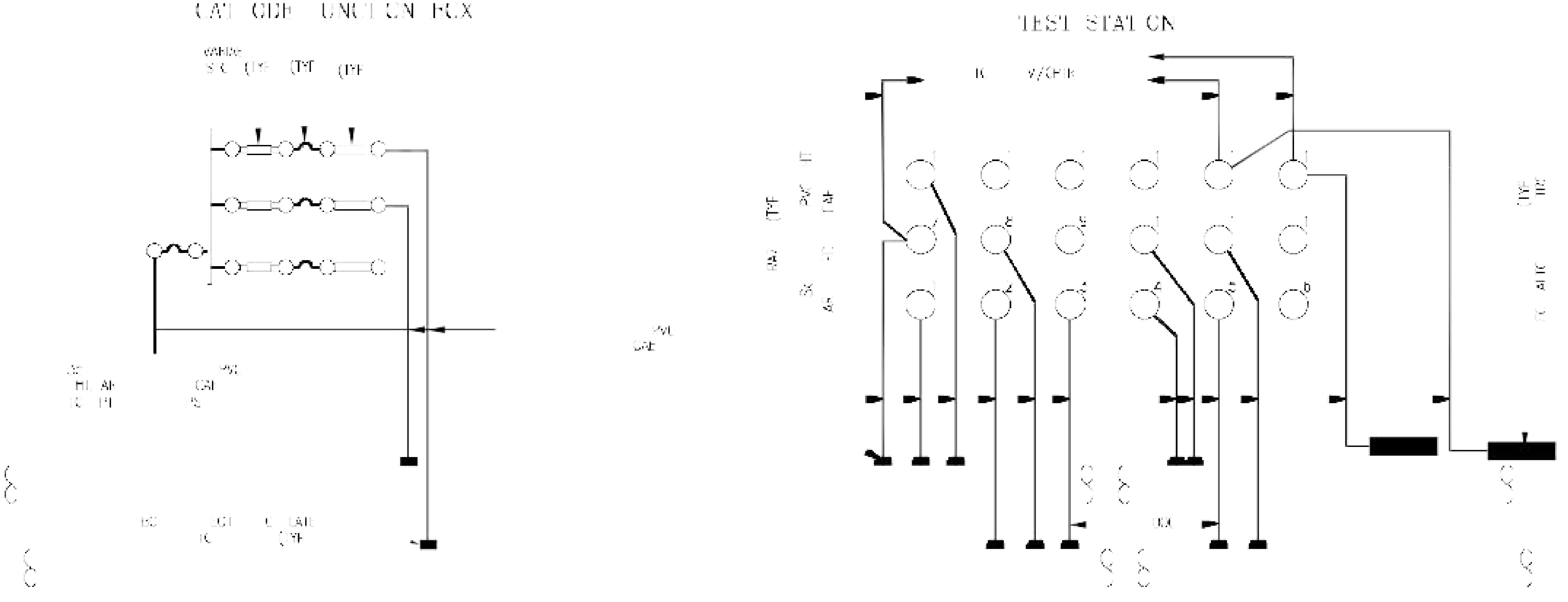
Rev	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT

TEST STATION CONNECTION SCHEME
(TYPICAL) DETAILS

Size	Scale	Sheet
A3	NTS	03 of 05

Drawing No.	Rev
GGNG-E-20712-326	0



NOTES

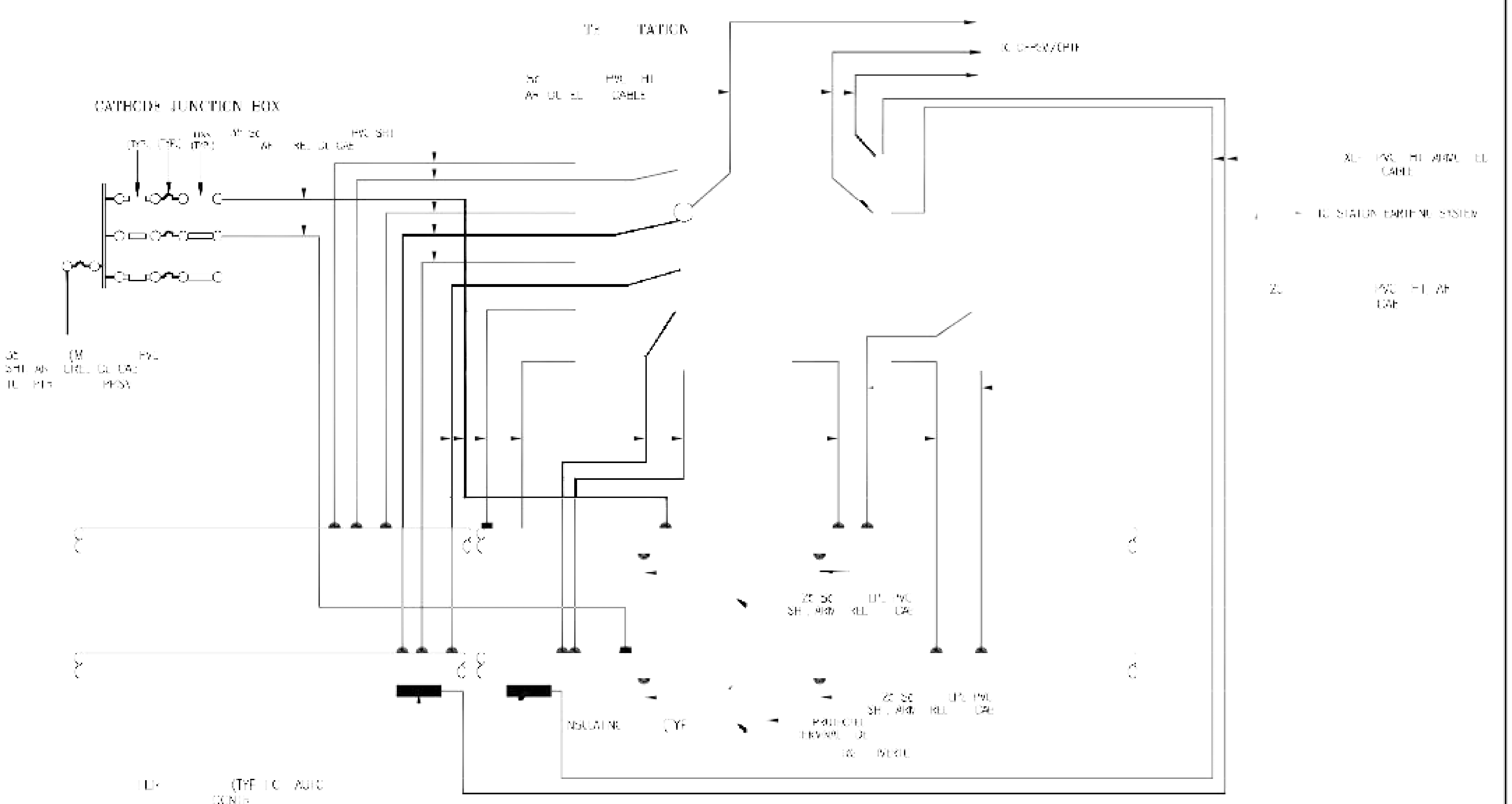
Rev | Date | Modifications | Drawn | Checked | Approved | Validated

SUBJECT

TEST STATION CONNECTION SCHEME (TYPICAL) DETAILS

Size	Scale	Sheet
A3	NTS	04 of 05

Drawing No	Rev
GGNG-E-20712-326	0



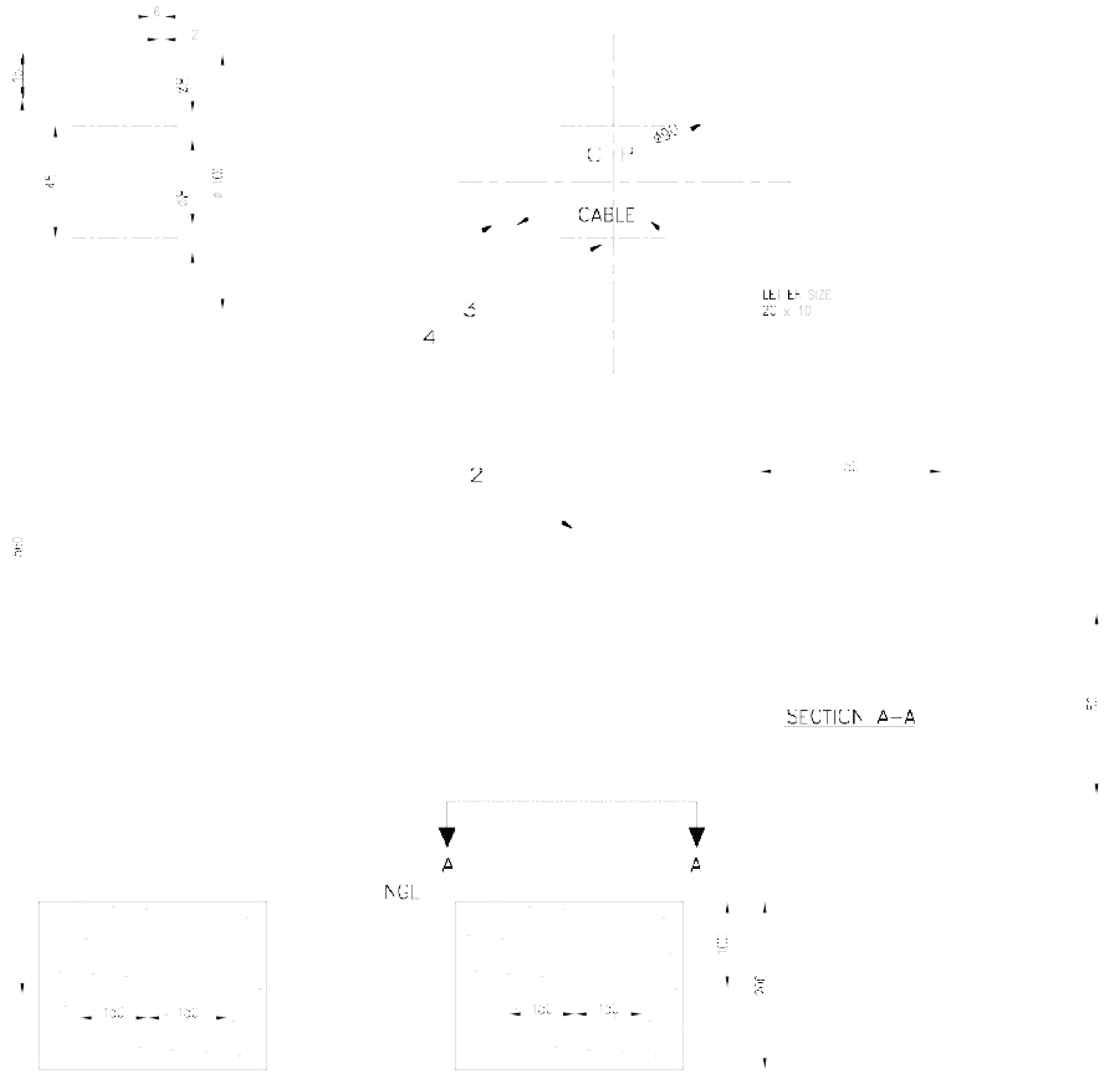
TERMINAL STATION MULTIPLE PIPELINE (TYPE FOR TWO ... POINT)

NOTES

TEST STATION CONNECTION SCHEME
(TYPICAL) DETAILS

Size	Scale	Sheet
A3	NTS	05 of 06

Drawing No: GGNG E 20712 326 — Rev: 0



NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3. IN CASE OF POWER CABLE REPLACE "C.P." WITH "POWER".
4. THE CABLE MARKER SHALL BE PANTED WITH APPROVED GRADE ALUMINIUM [illegible].
5. ALL THE INSCRIPTION /LETTER/ ARROW PROJECTED TYPE AND PAINTED WITH POST OFFICE RED COLOUR ON M.S. PLATE.
6. BEFORE RIVETING, MARKER PLATE IS TO STENCILLED WITH NUMBER /LETTER PUNCH AS PER CABLE TRENCH SECTION NO. GIVEN IN LAYOUT DRAWING.

BILL OF MATERIAL

SL. NO.	DESCRIPTION	QTY.
1.	MARKER PLATE (CAST IRON)	1No.
2.	M.S. ANGLE 25x25x650 LONG	1No.
3.	BOLTS M6x20 LONG	2Nos.
4.	NUTS M6	2Nos.

Rev	Date	Modifications	Drawn	Checked	Approved	Validated

SUBJECT

FABRICATION AND INSTALLATION
DETAILS OF CABLE ROUTE MARKER

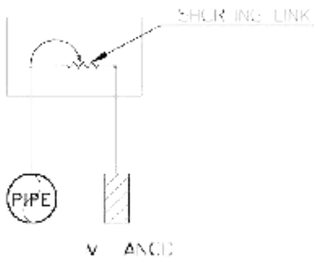
Size	Scale	Sheet
A3	NTS	01 of 01

Drawing No.	Rev
GGNG-E-20712-327	0

TEST LEAD POINTS (TLP) AT EVERY 1.0 Km.

INSULATION MONOBLOCK

TLP CONNECTION DETAILS



VIEW – 'A'

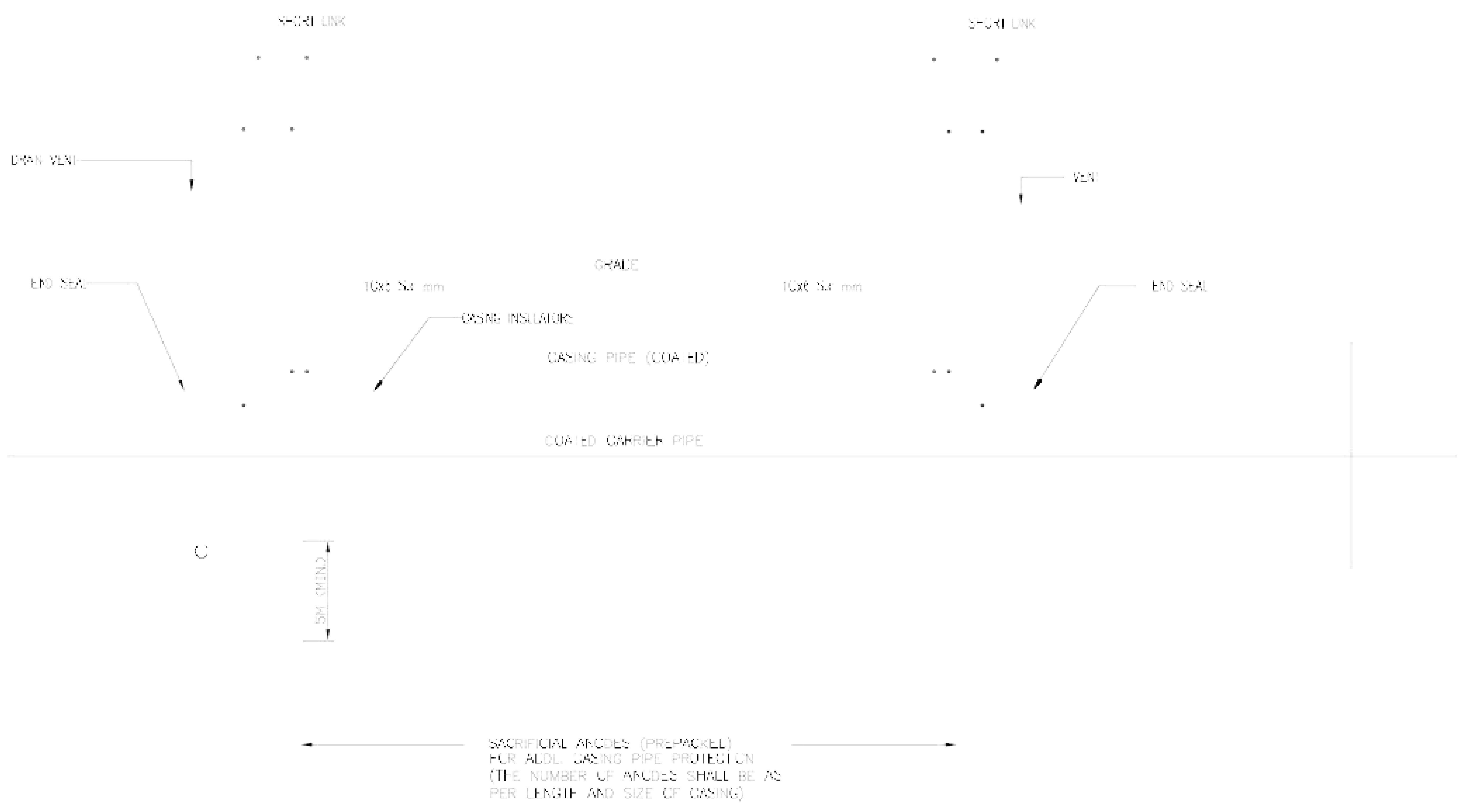
NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3. Mg ANODES TO BE INSTALLED AS PER THE APPROVED DESIGN DOCUMENT.
4. ALL NATIVE BACKFILL SOIL SHALL BE FREE OF ROCKS, GARBAGE, WATERS, PLASTICS ETC.
5. CABLES SHALL BE LAID WITH ENOUGH SLACKNESS TO AVOID DAMAGE TO CABLES DURING BACK FILLING ETC.
6. ANODE TAIL CABLE SHALL NOT BE USED FOR LIFTING THE ANODE. ROPE SLINGS SHALL BE USED FOR LIFTING THE ANODE DURING INSTALLATION IN TO GROUND BED.
7. THE SCHEME/SPECIFICATION ARE FOR GUIDANCE ONLY.
8. ANODE CONFIGURATION SHALL BE CONTINUOUS FORWARD/BACKWARD SEQUENCE (FOR REMOVABLE BONDING) AND TWO ANODE OUT OF CURRENT SHALL NOT BE LESS THAN 90mA.
9. CABLE LOOP OF 0.5M IS TO BE PROVIDED WITH EACH ANODE.
   (a) Mg ANODE WEIGHT AS PER SCOPE OF WORK.
   (b) ALL CABLE-MINIMUM 10 MTR. LENGTH SEALING COMPOUND.
   (c) CUTTON BAG 200Gx200MM VENDOR TO CONFIRM.
   (d) SPECIAL BACK FILL COMPOSITION
      (i) GYPSUM – 75%
      (ii) BENTONITE – 20%
      (iii) SODIUM SULPHATE – 5%
   (e) ANODE UTILIZATION FACTOR – 85%.
10. DRAWING REFERENCES ARE ON CONNECTION SCHEME TYPE A & A+1 DRAWING NO TE-IN-STD-G-E-0326, SH 1 OF 3 REV.

Rev	Date	By	Modifications	Drawn	Checked	Approved	Validated
		AP	Dvs	RKS	KS		

SUBJECT: TEMPORARY CATHODIC PROTECTION SCHEMATIC

Size	Scale	Sheet
A3	NTS	01 of 01
Drawing No.		Rev
GGNG-E-20712-328		0



NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3. CASING PIPE: SACRIFICIAL ANODE SHALL BE PROVIDED AT BOTH ENDS OF CASING PIPE FOR PROTECTION.
4. THE ANNULAR SPACE BETWEEN CASING AND CARRIER PIPE SHOULD BE FILLED WITH DIELECTRIC MATERIAL LIKE PETROLEUM WAX OR PETROLEUM BASED COMPOUNDS AS SPECIFIED IN NACE SP0200-2014.
5. THIS DRAWING FOR GUIDANCE ONLY. HOWEVER, CONTRACTOR TO PREPARE SEPARATE DRAWING, SPECIFICATION AND PROCEDURE FOR APPROVAL FROM OWNER/CONSULTANT.

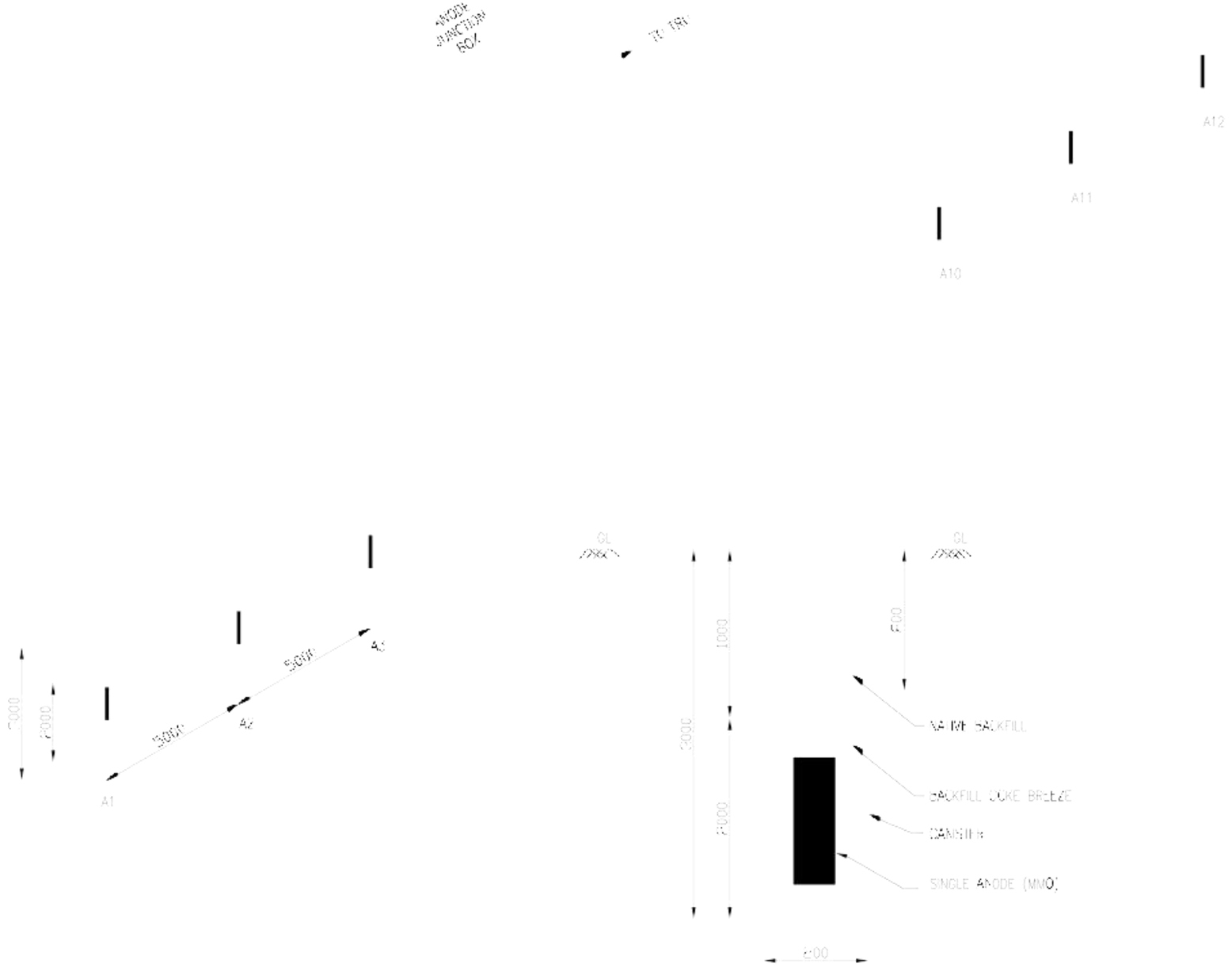
Rev	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT

TYPICAL CATHODIC PROTECTION SCHEME FOR CASED CROSSINGS

Size	Scale	Sheet
A3	NTS	01 of 01

Drawing No.: GGNG-E-20712-329 — Rev: 0



NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3. THESE DIMENSIONS ARE INDICATIVE ONLY. THESE DIMENSIONS MUST BE ALTERED TO SUIT THE SITE REQUIREMENT.
4. QUANTITY OF ANODE SHALL BE FINALISED DURING DETAIL ENGINEERING BY APPROVAL OF OWNER AND CONSULTANT.
5. MMO ANODE SHALL BE INSTALLED IN CASINGS.
6. SPECIFICATION MENTIONED FOR GUIDANCE ONLY.

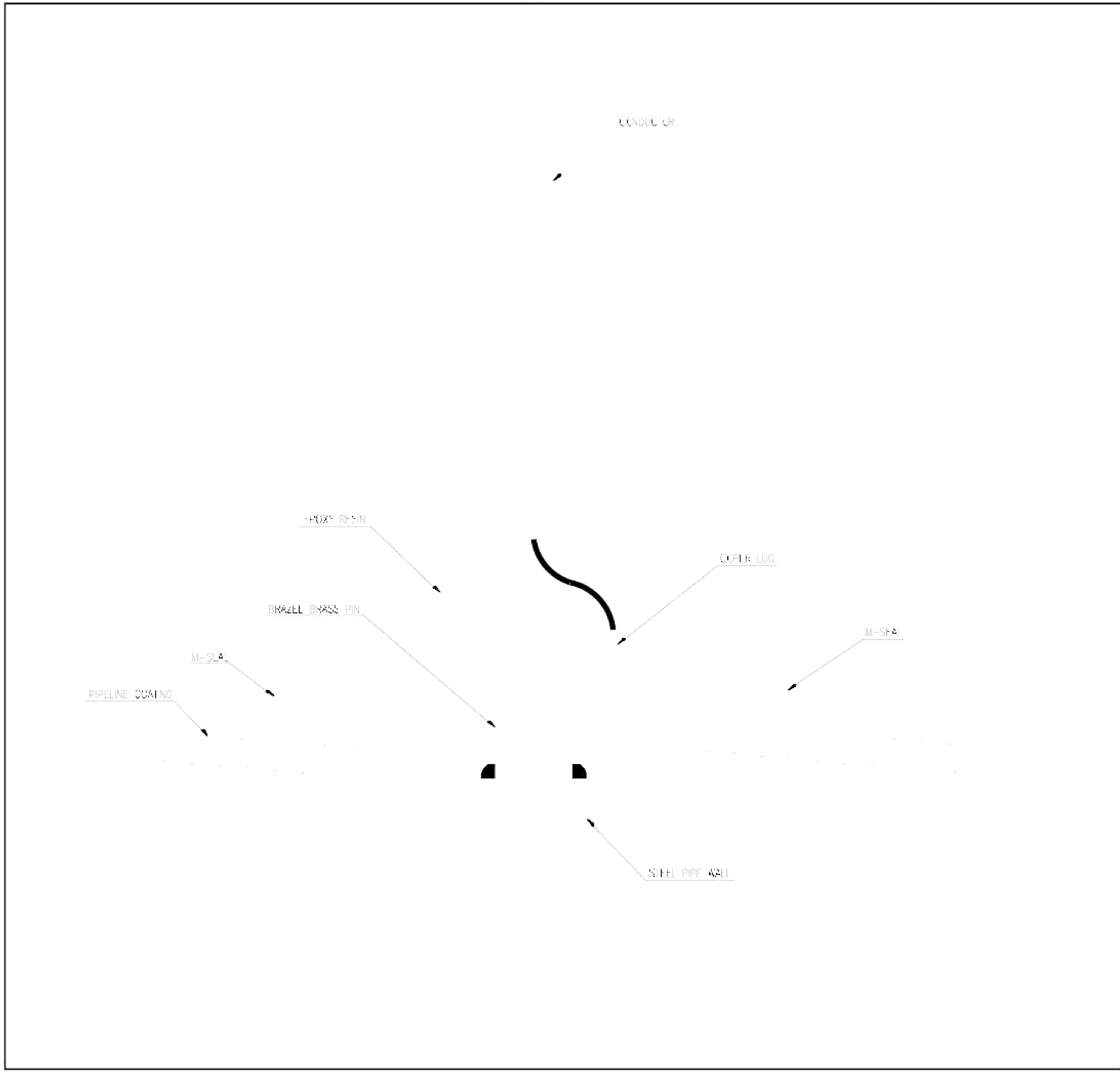
Rev	D/W	Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT

INSTALLATION DETAILS OF VERTICAL SHALLOW ANODE BED

Size	Scale	Sheet
A3	NTS	01 of 01

Drawing No. GGNG E 20712 330 — Rev 0



NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3. THE CABLE WILL BE FIXED TO THE PIPLINE AT AN ANGLE TO FACILITATE LAYING OF THE CABLE ALONG THE PIPELINE.
4. TEST CERTIFICATE & BATCH NOS OF PINS TO BE RECORDED.
5. THE PIN BRAZING TO HAVE THE FOLLOWING CHARACTERISTICS:

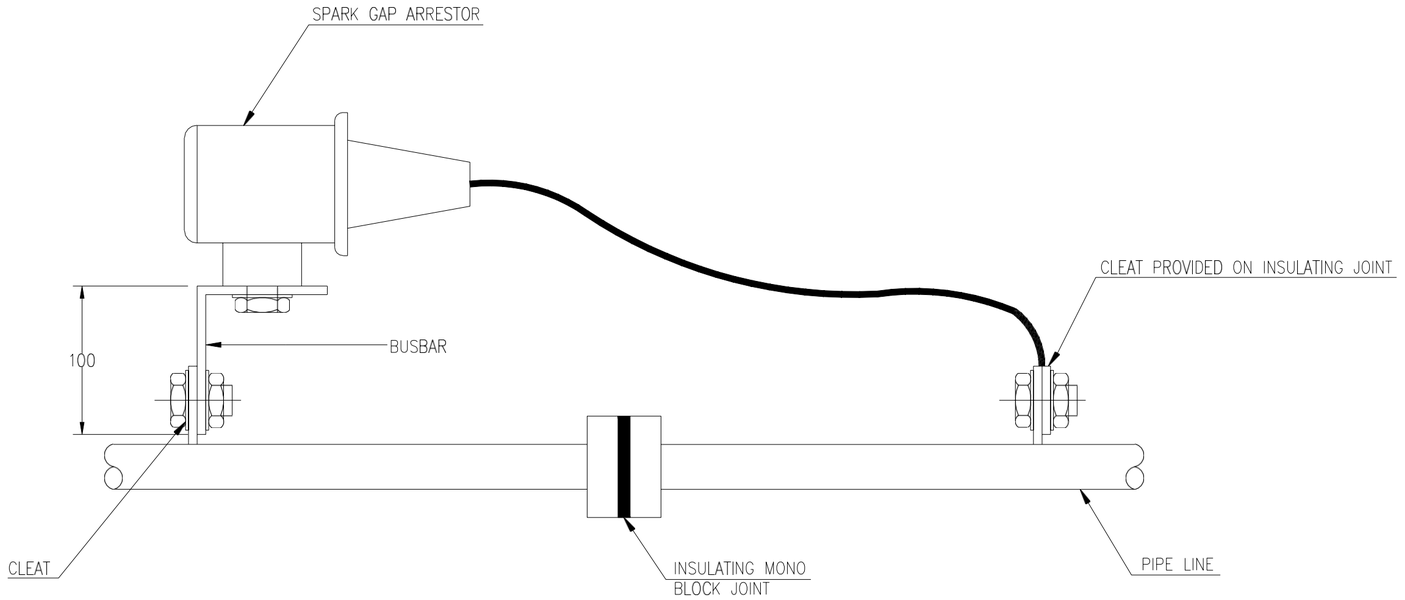
(a) EXTREMELY LOW CONTACT RESISTANCE : ≤ 0.1 Ω.
(b) LOW TRANSITION RESISTANCE : 7.5 TO 14 MΩ PER BRAZED JOINT
(c) HIGH MECHANICAL STRENGTH : BINDING STRENGTH 450 N/MM2
SHEAR STRENGTH 245 N/MM2
(d) BRAZING TEMPERATURE : 650° C
(e) TIME PER BRAZE : 2 SECONDS
(f) WEATHER EFFECT : SUITABLE FOR ALL WEATHER OPERATION
(g) LIFE : 40 YEARS
(h) FIELD TEST : CABLE CONNECTION THROUGH PIN BRAZING TO BE FIELD TESTED FOR CONTACT RESISTANCE & TEMPERATURE ETC.

Rev	Date	Modifications	Drawn	Checked	Approved	Validated

SUBJECT: CABLE TO PIPE CONNECTION BY PIN BRAZING

Size	Scale	Sheet
A3	NTS	01 of 01

Drawing No: GGNG-E-20712-331 Rev: 0



NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3. THIS DRAWING FOR INFORMATION ONLY.

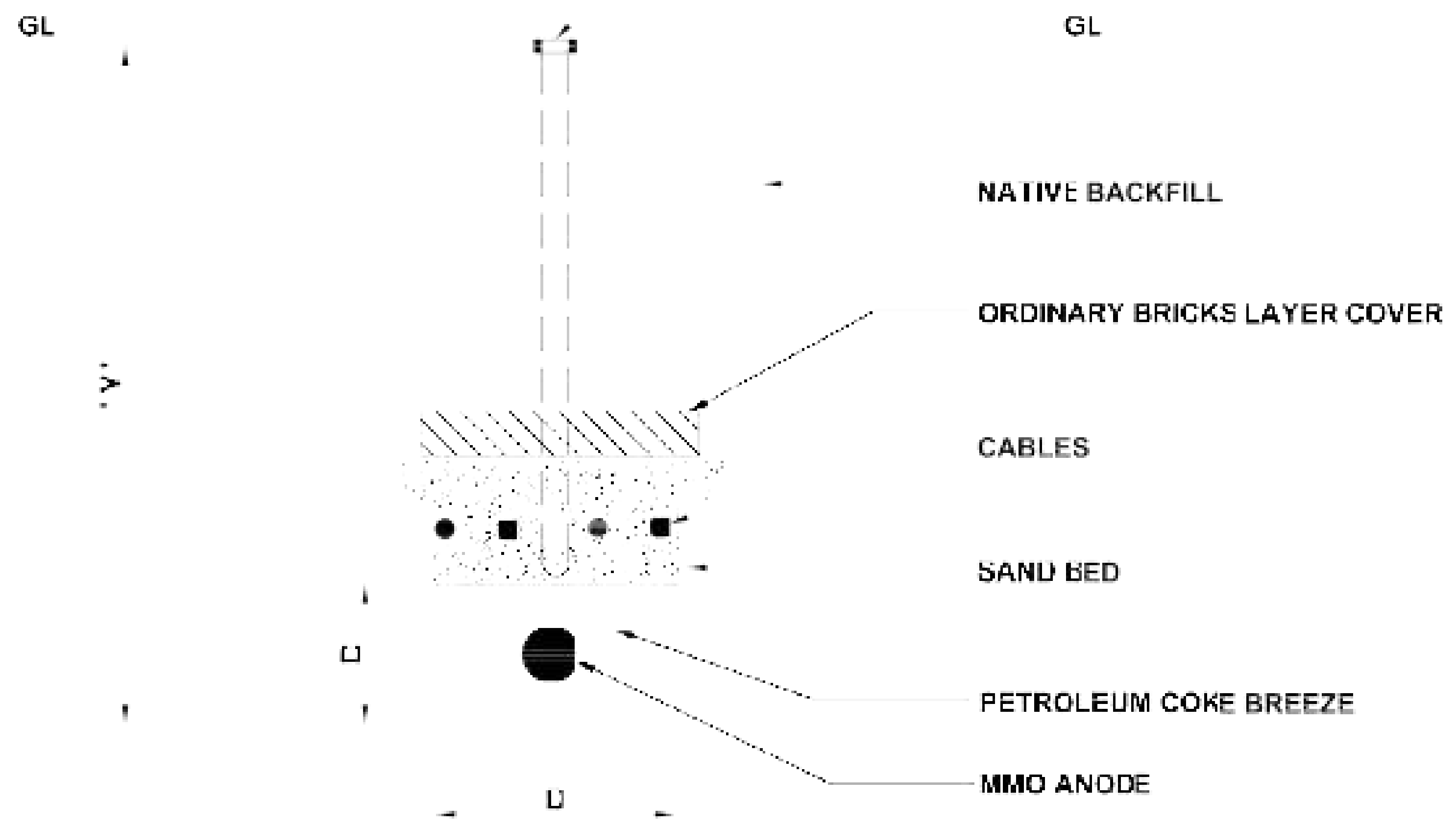
S.No.	DESCRIPTION	QTY.
1	TINNED COPPER BUS BAR 25mm X 3mm THK 550mm LONG 90°SMOOTH BEND AT 100mm AT ONE END BOTH END WILL HAVE M12 HOLES	1
2	TINNED COPPER BUS BAR 25mm X 3mm THK 'L' SHAPE BEND AT CENTER FOR TOTAL LENGTH 200mm TO BE DIVIDED IN TWO PART BOTH END WILL HAVE M12 HOLES	1
3	NOS 10 SIZE BRASS NUT BOLTS, WASHERS NOS NUT BOLTS ARE PROVIDED WITH EACH SPARK GAP ARRESTOR.	2

Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
0	05.10.16	APPROVED	RKS	KS	PR	SKH

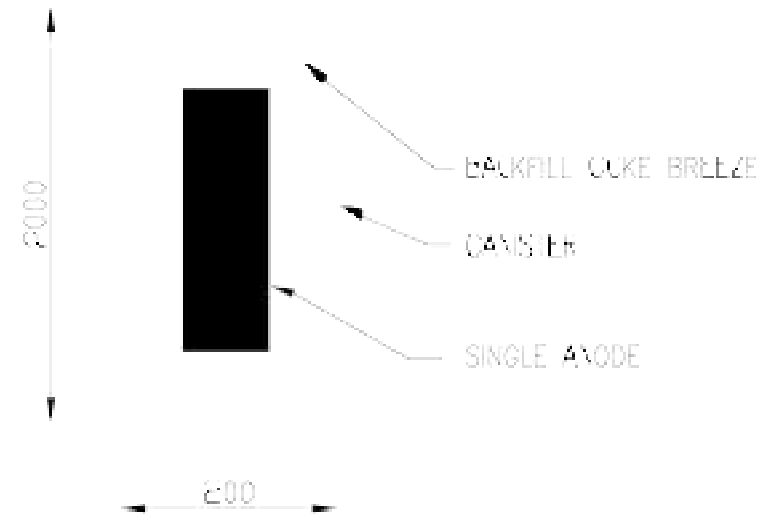
SUBJECT: SPARK GAP ARRESTOR INSTALLATION

Size: A3 | Scale: NTS | Sheet: 01 of 01

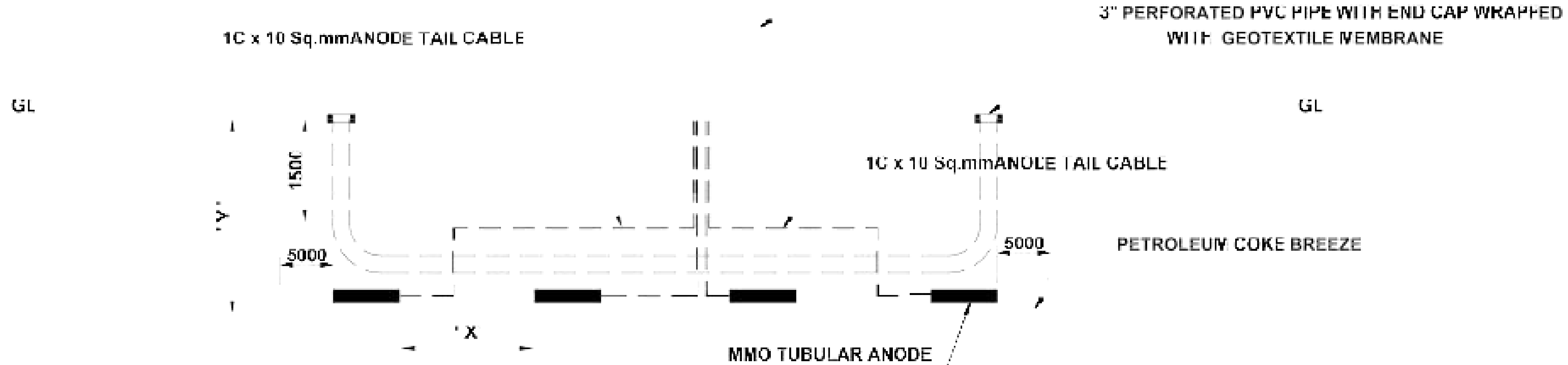
Drawing No.: GGNG-E-20712-332 | Rev.: 0



SIDE VIEW FOR DETAIL FOR HORIZONTAL
ANODE GROUND BED INSTALLATION



PRE PACKAGED CANISTER ANODE



HORIZONTAL ANODE GROUND BED

Y	DEPTH OF ANODE BED(Mtr)
X	DISTANCE BETWEEN ANODE

NOTES

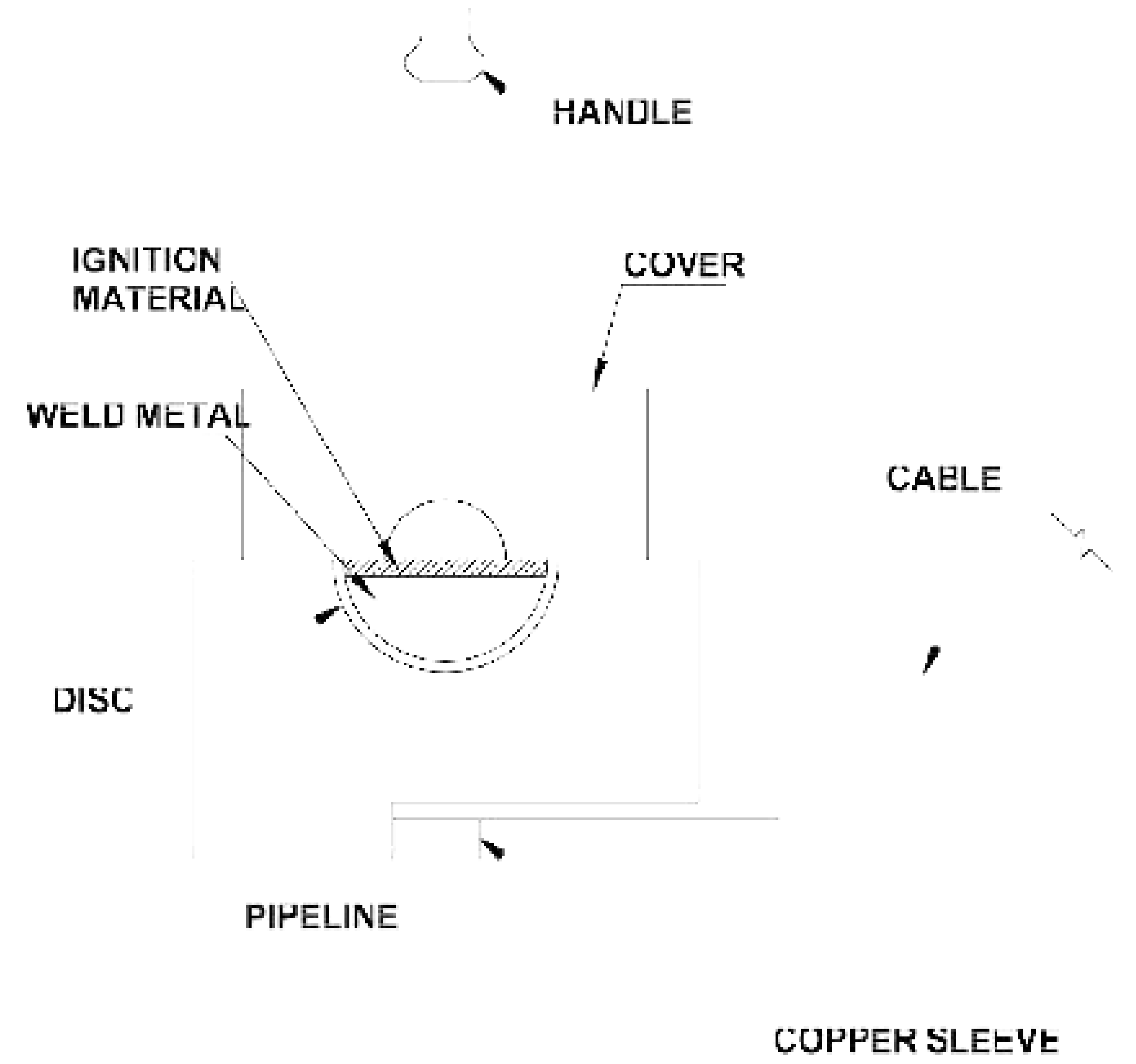
1. DIMENSION ARE IN MM UNLESS SPECIFIED.
2. No. OF ANODE SHALL BE AS PER CP DESIGN REQUIRMENT.
3. DEPTH AREA & LENGTH OF ANODE BED INSTALLATION & ANODE DIMENSIONS SHALL BE IN LINE WITH DESIGN.
4. ALL ANODE SHALL BE INSTALLED WITH CANISTER.
5. AJB SHALL BE KEPT AS PER SITE SUITABILITY & ACCESS & NOT NECESSARILLY AT CENTER OF ANODE BED.
6. DISTANCE BETWEEN ANODE TO ANODE SHALL BE AS PER DESIGN APPROVAL.
4. SHEET STEEL CANISTER SHALL BE 22 SWG, 200 MM DIA AND 2000 MM LONG.
8. DEPTH OF THE ANODE BED SHALL BE AS PER DESIGN APPROVAL ON CASE TO CASE.
9. ANODE TAIL CABLE SHALL BE LAID THROUGH SUITABLE FLEXIBLE PVC PIPE.
10. 3" PERFORATED PVC PIPE WITH CAP WRAPPED WITH GEOTEXTILE MEMBRANE SHALL BE INSTALLED FOR WATERING THE GROUND BED.
11. SPECIFICATION MENTIONED FOR GUIDANCE ONLY.
12. IDENTIFICATION OF ANODE :-
    FIRST FIGURE - No OF Cp. STN
    SECOND FIGURE - No OF ANODE ROW
    THIRD FIGURE - ITS OWN SERIAL STARTING SEQUENTIALLY.

Rev	D M Y	Modifications	Drawn	Checked	Approved	Validated

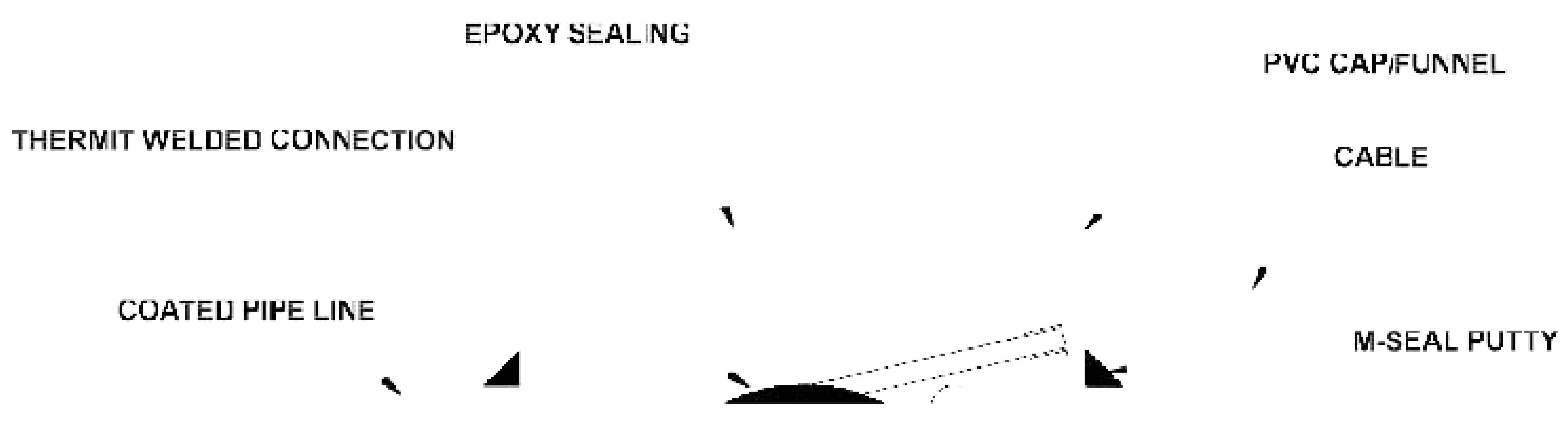
SUBJECT: TYPICAL INSTALLATION DETAILS OF SHALLOW HORIZONTAL ANODE BED

Size	Scale	Sheet
A3	NTS	01 of 01

Drawing No: GGNG-E-20712-333 Rev: 0



WELDED CABLE POSITION



PIPE TO CABLE CONNECTION DETAIL

NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE
3. THE CABLE WILL BE FIXED TO THE PIPELINE AT AN ANGLE TO FACILITATE LAYING OF THE CABLE ALONG THE PIPELINE
4. TEST CERTIFICATE & BATCH NOS OF PINS TO BE RECORDED.
5. AT LOCATION OF THERMIT WELD CONNECTION REMOVE 50mm x 50mm SQUARE OF THE PIPELINE COATING. EXPOSED AREA OF PIPELINE SHALL BE FILLED TO BRIGHT METAL AND BE FREE OF RUST, PAINT, DIRT, GREASE AND MOISTURE.
6. WELD METAL SIZE SHALL DEPEND ON THE SIZE OF CABLE.

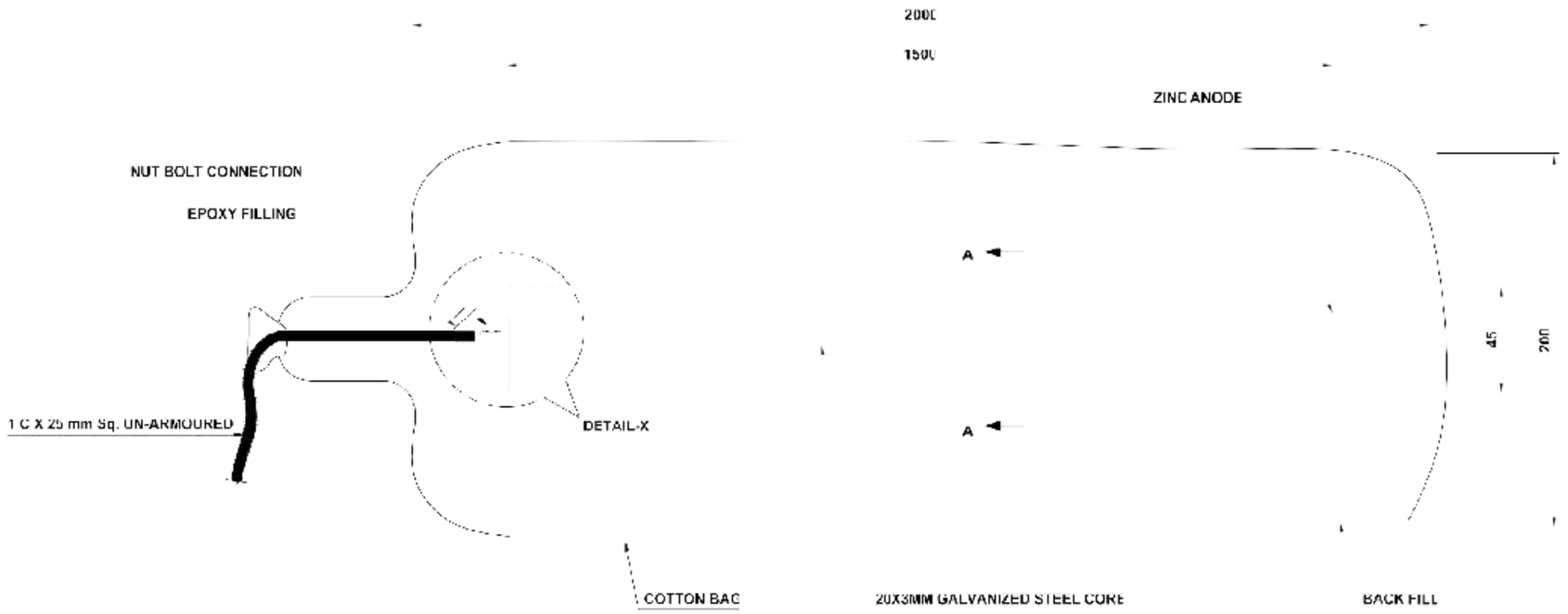
 (a) 4 Sq mm – 16 Sq mm – CA-15
 (b) 16 Sq mm – 50 Sq mm – CA-32

Rev	D M Y	Modifications	Drawn	Checked	Approved	Validated
	AF OVS		RKS	KS		SKP

SUBJECT: **THERMIT WELDING DETAILS**

Size	Scale	Sheet
A3	NTS	01 of 01

Drawing No.	Rev
GGNG-E-20712-324	0



BACKFILL COMPOSITION

GYPSUM	75%
BENTONITE	20%
SODIUM SULPHATE	5%

TOLERANCE	
LENGTH :	+/- 2.5%
WIDTH :	+/- 5%
THICKNESS :	+/- 5%

DETAILS OF BARE ANODE			DETAILS OF PREPACKED ANODE		
NET BARE WEIGHT	LENGTH	SIZE	PREPACKED WEIGHT	LENGTH	DIA
20 Kg	1500mm	45 x 45 mm	110 Kg APPROX.	2000mm	200 mm

NOTES

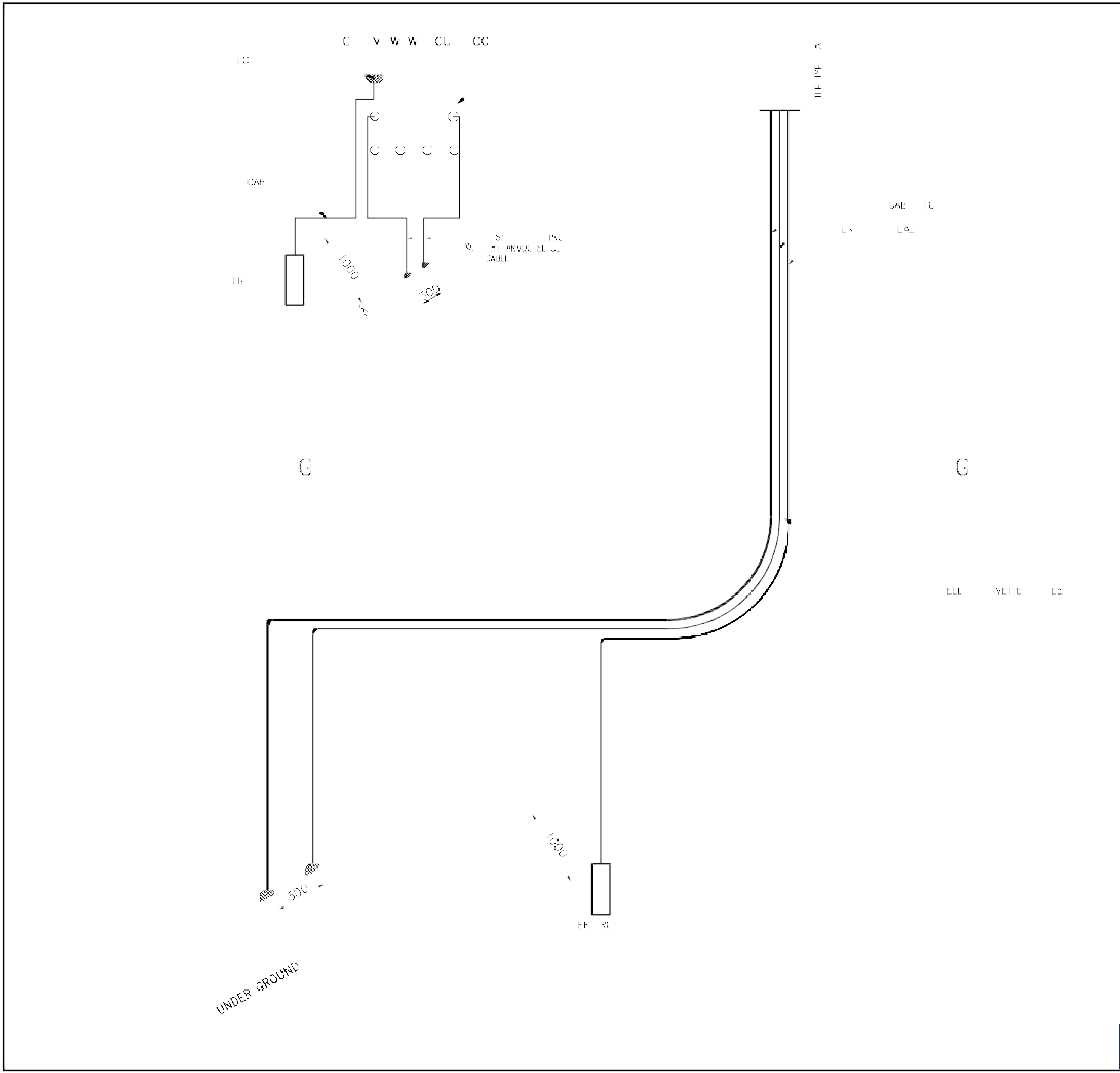
1. THE DIMENSIONS ARE INDICATIVE.
2. PROVIDE BILL OF MATERIAL FOR ZINC GROUNDING CELL AND ACCEPTABLE CHEMICAL COMPOSITION.
3. ZINC ANODE SHALL BE PROVIDED ACROSS INSULATING JOINT AND HIGH TENSION LINE CROSSING.
4. (a) Pre packed weight 110kg.
   (b) open circuit potential -1.05 to -1.11 (w.r.t. Cu-CuSo4)
   (c) Current capacity 750 Amp Hrs/Kg
   (d) Actual consumption 11.2 Kg/Amp Year

Rev	D/W/Y	Modifications	Drawn	Checked	Approved	Validated
	AP 04.2		RKS	KS	KP	

SUBJECT
CONSTRUCTION DETAILS OF
ZINC GROUNDING CELL (20 kg)

Type	Scale	Sheet
AS	NTS	01 of 01

Drawing No.	Rev
GGNG-E-20712-035	0



NOTES

TYPICAL INSTALLATION AND CONNECTION DETAILS OF EXTERNAL ER PROBE WITH TEST STATION

Size	Scale	Sheet
A3	NTS	01 of 01

Drawing No.	Rev
GGNG E 20712 336	0

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