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PERMANENT CATHODIC PROTECTION

STANDARD INSTALLATION DETAILS

FOR UG PIPING

NOTE

REFERENCE DRAWINGS

| DWG. NO. | TITLE |
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|----|-------------|--------------------|-----|-----|-----|-------|
| 06 | 12.Feb.2025 | FINAL ISSUE        | Y.J | S.S | A.H | A.A.H |
| 05 | 01Dec.2024  | FINAL ISSUE        | Y.J | S.S | A.H | A.A.H |
| 04 | 20.Nov.2021 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 03 | 31.Aug.2021 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 02 | 08.Fab.2020 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 01 | 25.Dec.2019 | ISSUE FOR APPROVAL | E.N | F.S | A.H | A.A.H |
| 00 | 03.Dec.2019 | ISSUE FOR APPROVAL | E.N | F.S | A.H | A.A.H |

| REV. | DATE | DESCRIPTION | PREP. BY | CHKD. BY | APPD. BY | AUTH. BY |
|------|------|-------------|----------|----------|----------|----------|
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Southern Adish Gas Condensate Refinery Project

CONTRACT NO.:SCALE: N/S

DRAWING TITLE:

Permanent Cathodic Protection Standard  
Installation Detail for UG Piping  
(Title)

| DWG NO.: | PROJ | PHASE | AREA | DESC | TYPE | SEQ. | SHT No. | CLASS | SIZE |
|----------|------|-------|------|------|------|------|---------|-------|------|
|          | SACR | DE    | GEN  | EL   | DWG  | 0151 | 1/27    | 1     | A3   |



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REVISION INDEX

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|---------------------------------|----|----|-----|----|----|-----|----|----|----|---------------------------------|----|----|----|----|----|----|----|----|----|---------------------------------|
| 1                               | X  | X  |     |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 2                               | X  | X  | X   |    |    | X   | X  |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 3                               | X  | X  | X   |    |    | X   |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 4                               | X  | X  |     |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 5                               | X  | X  | X   |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 6                               | X  | X  |     |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 7                               | X  | X  |     |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 8                               | X  | X  |     |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 9                               | X  | X  | X   |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 10                              | X  | X  |     |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 11                              | X  | X  | X   |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 12                              | X  | X  |     |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 13                              | X  | X  |     |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 14                              | X  | X  |     |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 15                              | X  | X  |     |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 16                              | X  | X  |     | X  | X  |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 17                              | X  | X  |     | X  | X  |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 18                              | X  | X  |     | X  | X  |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 19                              | X  | X  | X   | X  | X  | X   | X  |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 20                              | X  | X  | X   | X  | X  | X   |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 21                              | X  | X  |     |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 22                              | X  | X  |     |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 23                              |    | X  |     |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 24                              |    |    | new | X  | X  |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 25                              |    |    | new | X  | X  |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 26                              |    |    | new | X  | X  |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
| 27                              |    |    |     |    |    | new |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
|                                 |    |    |     |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
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|                                 |    |    |     |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
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|                                 |    |    |     |    |    |     |    |    |    |                                 |    |    |    |    |    |    |    |    |    |                                 |
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NOTE

REFERENCE DRAWINGS

| DWG. NO. | TITLE |
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| 06 | 12.Feb.2025 | FINAL ISSUE        | Y.J | S.S | A.H | A.A.H |
| 05 | 01Dec.2024  | FINAL ISSUE        | Y.J | S.S | A.H | A.A.H |
| 04 | 20.Nov.2021 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 03 | 31.Aug.2021 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 02 | 08.Fab.2020 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 01 | 25.Dec.2019 | ISSUE FOR APPROVAL | E.N | F.S | A.H | A.A.H |
| 00 | 03.Dec.2019 | ISSUE FOR APPROVAL | E.N | F.S | A.H | A.A.H |

| REV.                                                                                  | DATE                                           | DESCRIPTION | PREP. BY | CHKD. BY | APPD. BY                                                                              | AUTH. BY |
|---------------------------------------------------------------------------------------|------------------------------------------------|-------------|----------|----------|---------------------------------------------------------------------------------------|----------|
|  | Southern Adish Gas Condensate Refinery Project |             |          |          |  |          |

CONTRACT NO.:SCALE: N/S

DRAWING TITLE:

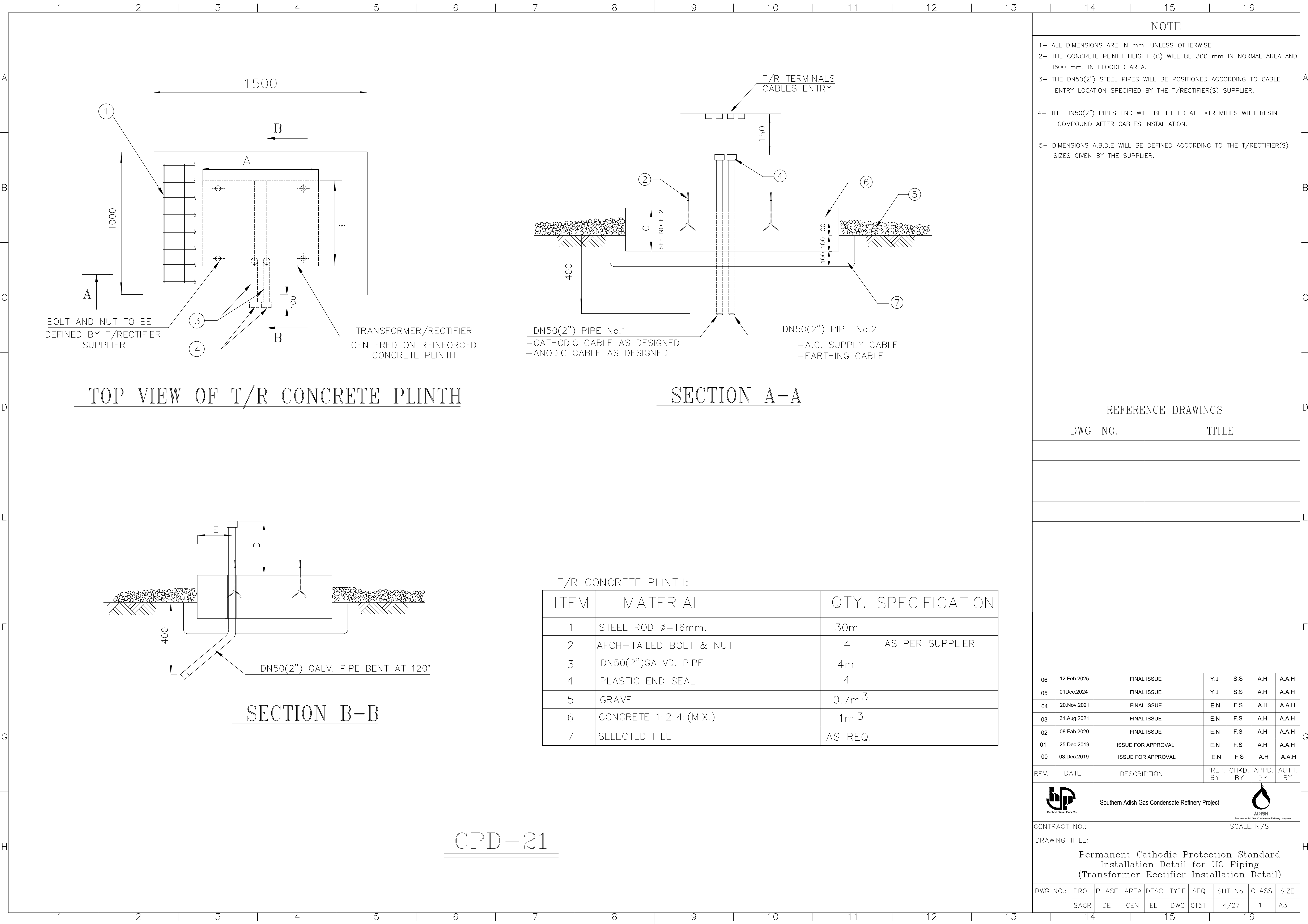
Permanent Cathodic Protection Standard Installation Detail for UG Piping (Revision sheet)

|          |      |       |      |      |      |      |         |       |      |
|----------|------|-------|------|------|------|------|---------|-------|------|
| DWG NO.: | PROJ | PHASE | AREA | DESC | TYPE | SEQ. | SHT No. | CLASS | SIZE |
|          | SACR | DE    | GEN  | EL   | DWG  | 0151 | 2/27    | 1     | A3   |

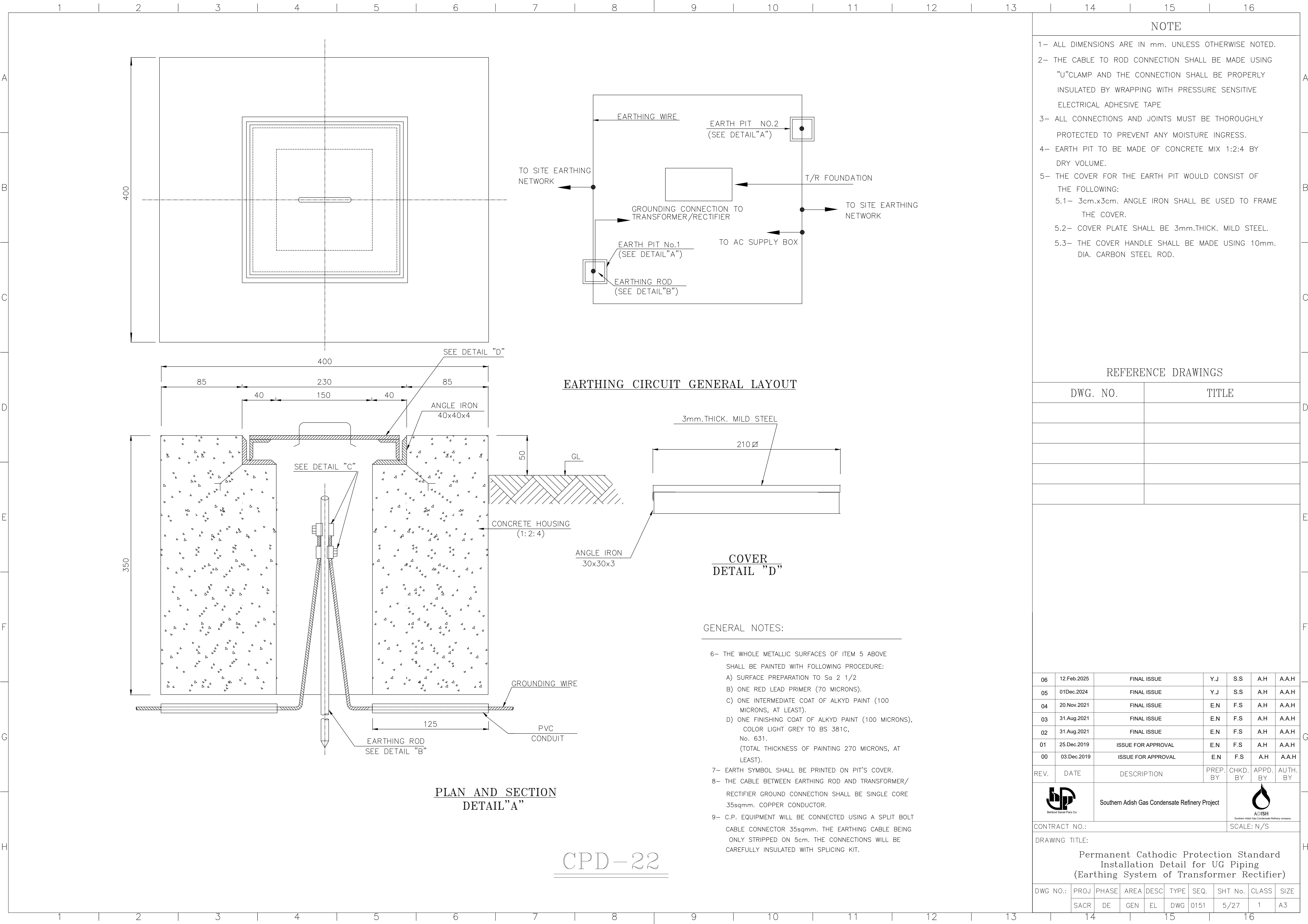


|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
|---------------------------------------------------------------------------------------------------|-------------|------------------------------------------------|-------|-------|------|----------|----------|---------------------------------------------------------------------------------------|----------|------|------------|--|------|--|--|--|--|
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  | NOTE |  |  |  |  |
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
| REFERENCE DRAWINGS                                                                                |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
| DWG. NO.                                                                                          |             |                                                |       | TITLE |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
|                                                                                                   |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
| 06                                                                                                | 12.Feb.2025 | FINAL ISSUE                                    |       |       | Y.J  | S.S      | A.H      | A.A.H                                                                                 |          |      |            |  |      |  |  |  |  |
| 05                                                                                                | 01Dec.2024  | FINAL ISSUE                                    |       |       | Y.J  | S.S      | A.H      | A.A.H                                                                                 |          |      |            |  |      |  |  |  |  |
| 04                                                                                                | 20.Nov.2021 | FINAL ISSUE                                    |       |       | E.N  | F.S      | A.H      | A.A.H                                                                                 |          |      |            |  |      |  |  |  |  |
| 03                                                                                                | 31.Aug.2021 | FINAL ISSUE                                    |       |       | E.N  | F.S      | A.H      | A.A.H                                                                                 |          |      |            |  |      |  |  |  |  |
| 02                                                                                                | 08.Fab.2020 | FINAL ISSUE                                    |       |       | E.N  | F.S      | A.H      | A.A.H                                                                                 |          |      |            |  |      |  |  |  |  |
| 01                                                                                                | 25.Dec.2019 | ISSUE FOR APPROVAL                             |       |       | E.N  | F.S      | A.H      | A.A.H                                                                                 |          |      |            |  |      |  |  |  |  |
| 00                                                                                                | 03.Dec.2019 | ISSUE FOR APPROVAL                             |       |       | E.N  | F.S      | A.H      | A.A.H                                                                                 |          |      |            |  |      |  |  |  |  |
| REV.                                                                                              | DATE        | DESCRIPTION                                    |       |       |      | PREP. BY | CHKD. BY | APPD. BY                                                                              | AUTH. BY |      |            |  |      |  |  |  |  |
|              |             | Southern Adish Gas Condensate Refinery Project |       |       |      |          |          |  |          |      |            |  |      |  |  |  |  |
| CONTRACT NO.:                                                                                     |             |                                                |       |       |      |          |          |                                                                                       |          |      | SCALE: N/S |  |      |  |  |  |  |
| DRAWING TITLE:                                                                                    |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
| Permanent Cathodic Protection Standard<br>Installation Detail for UG Piping<br>(Table of Content) |             |                                                |       |       |      |          |          |                                                                                       |          |      |            |  |      |  |  |  |  |
| DWG NO.:                                                                                          |             | PROJ                                           | PHASE | AREA  | DESC | TYPE     | SEQ.     | SHT No.                                                                               | CLASS    | SIZE |            |  |      |  |  |  |  |
|                                                                                                   |             | SACR                                           | DE    | GEN   | EL   | DWG      | 0151     | 3/27                                                                                  | 1        | A3   |            |  |      |  |  |  |  |









NOTE

- 1- ALL DIMENSIONS ARE IN mm. UNLESS OTHERWISE NOTED.
- 2- THE CABLE TO ROD CONNECTION SHALL BE MADE USING "U"CLAMP AND THE CONNECTION SHALL BE PROPERLY INSULATED BY WRAPPING WITH PRESSURE SENSITIVE ELECTRICAL ADHESIVE TAPE
- 3- ALL CONNECTIONS AND JOINTS MUST BE THOROUGHLY PROTECTED TO PREVENT ANY MOISTURE INGRESS.
- 4- EARTH PIT TO BE MADE OF CONCRETE MIX 1:2:4 BY DRY VOLUME.
- 5- THE COVER FOR THE EARTH PIT WOULD CONSIST OF THE FOLLOWING:
  - 5.1- 3cm.x3cm. ANGLE IRON SHALL BE USED TO FRAME THE COVER.
  - 5.2- COVER PLATE SHALL BE 3mm.THICK. MILD STEEL.
  - 5.3- THE COVER HANDLE SHALL BE MADE USING 10mm. DIA. CARBON STEEL ROD.

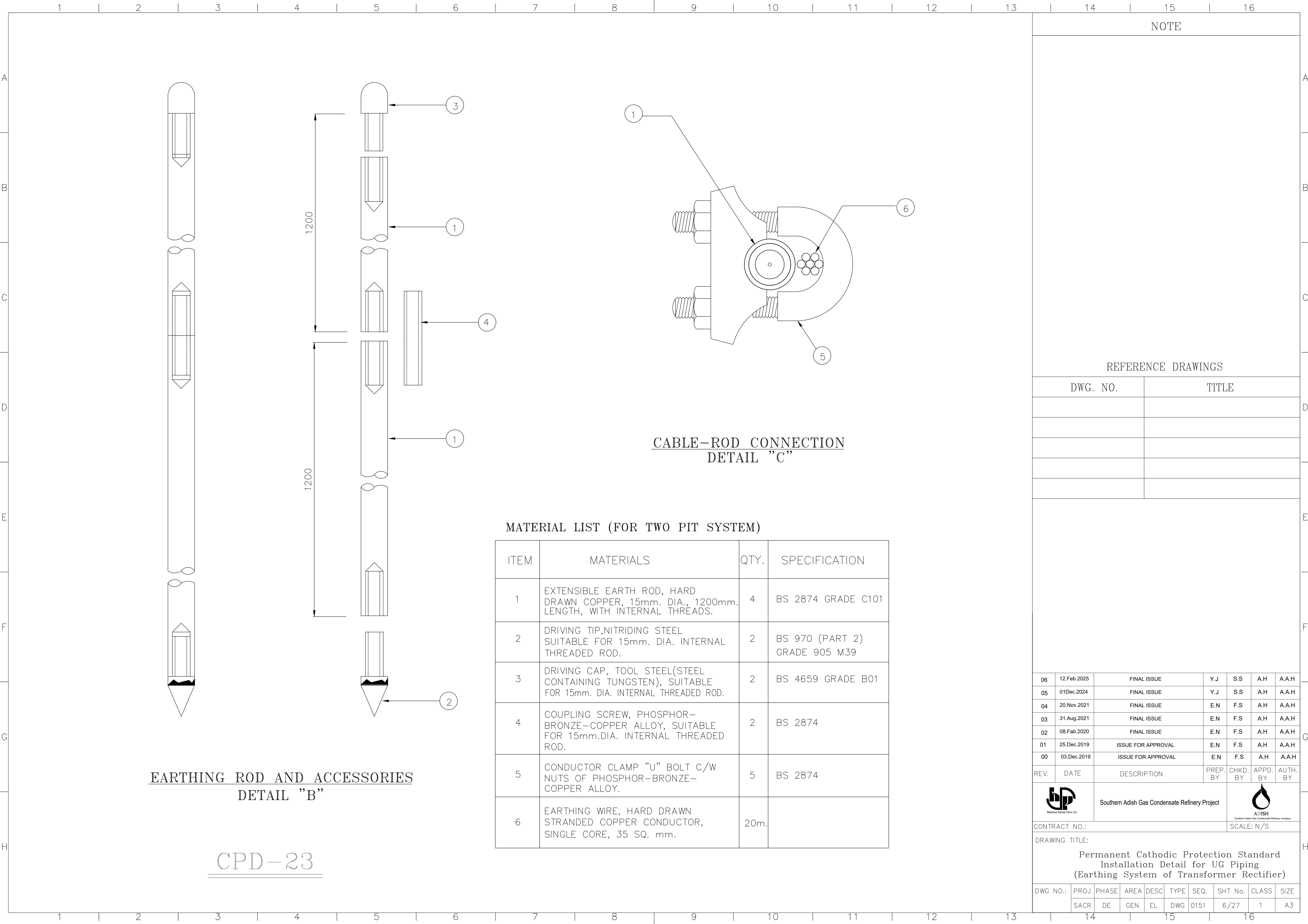
REFERENCE DRAWINGS

| DWG. NO. | TITLE |
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| 06   | 12.Feb.2025 | FINAL ISSUE        | Y.J      | S.S      | A.H      | A.A.H    |
| 05   | 01Dec.2024  | FINAL ISSUE        | Y.J      | S.S      | A.H      | A.A.H    |
| 04   | 20.Nov.2021 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 31   | 31.Aug.2021 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 02   | 31.Aug.2021 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
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| 00   | 03.Dec.2019 | ISSUE FOR APPROVAL | E.N      | F.S      | A.H      | A.A.H    |
| REV. | DATE        | DESCRIPTION        | PREP. BY | CHKD. BY | APPD. BY | AUTH. BY |

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| <br>Southern Adish Gas Condensate Refinery Project |      | <br>ADISH<br>Southern Adish Gas Condensate Refinery Company |      |      |      |      |         |       |      |
| CONTRACT NO.:                                                                                                                           |      | SCALE: N/S                                                                                                                                       |      |      |      |      |         |       |      |
| DRAWING TITLE:                                                                                                                          |      |                                                                                                                                                  |      |      |      |      |         |       |      |
| Permanent Cathodic Protection Standard<br>Installation Detail for UG Piping<br>(Earthing System of Transformer Rectifier)               |      |                                                                                                                                                  |      |      |      |      |         |       |      |
| DWG NO.:                                                                                                                                | PROJ | PHASE                                                                                                                                            | AREA | DESC | TYPE | SEQ. | SHT No. | CLASS | SIZE |
|                                                                                                                                         | SACR | DE                                                                                                                                               | GEN  | EL   | DWG  | 0151 | 5/27    | 1     | A3   |





NOTE

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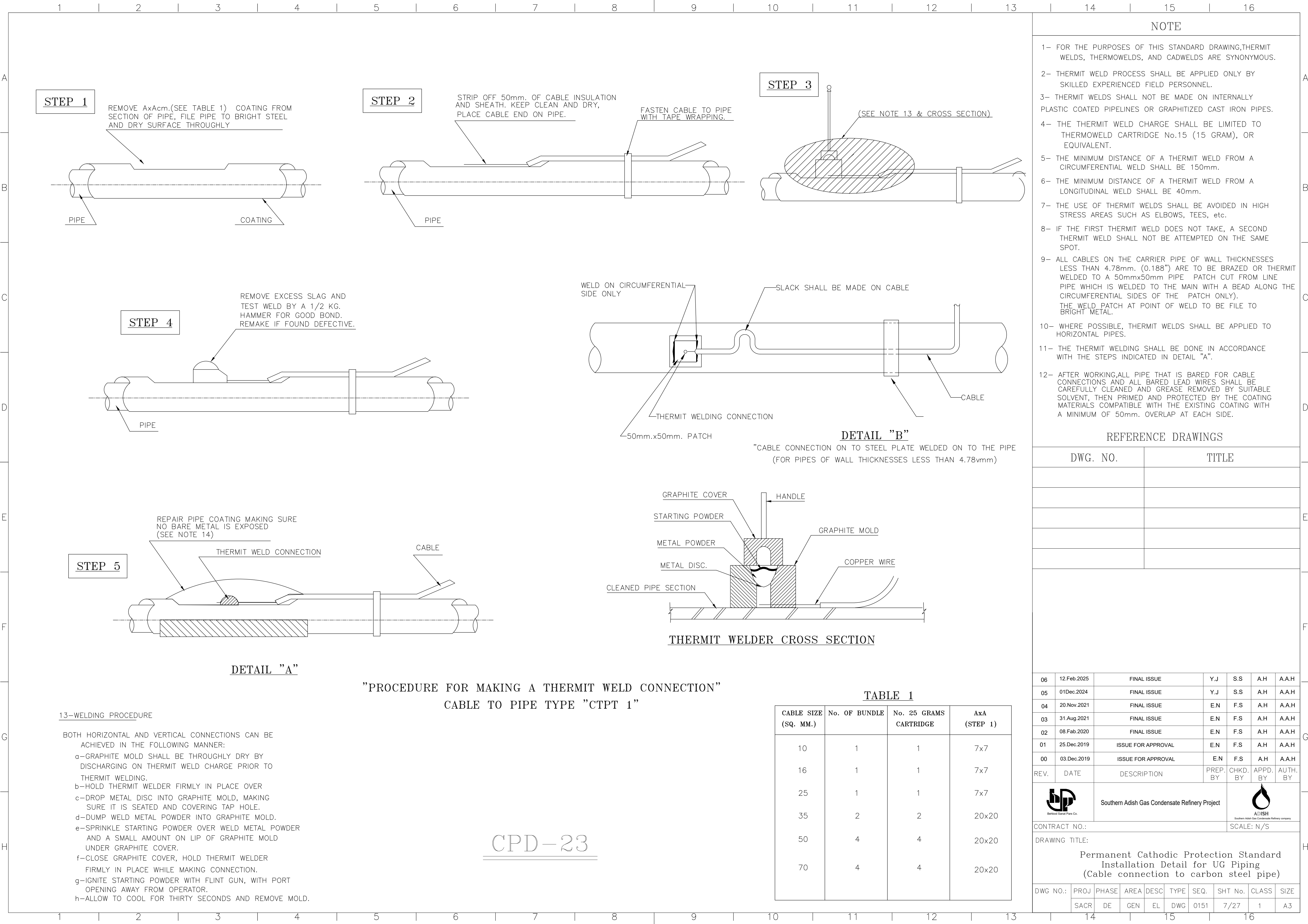
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|----|-------------|--------------------|-----|-----|-----|-------|
| 06 | 12.Feb.2025 | FINAL ISSUE        | Y.J | S.S | A.H | A.A.H |
| 05 | 01Dec.2024  | FINAL ISSUE        | Y.J | S.S | A.H | A.A.H |
| 04 | 20.Nov.2021 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 03 | 31.Aug.2021 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
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| REV. | DATE | DESCRIPTION | PREP. BY | CHKD. BY | APPD. BY | AUTH. BY |
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Southern Adish Gas Condensate Refinery Project

|                                                                                                                           |      |       |      |      |      |      |            |       |      |
|---------------------------------------------------------------------------------------------------------------------------|------|-------|------|------|------|------|------------|-------|------|
| CONTRACT NO.:                                                                                                             |      |       |      |      |      |      | SCALE: N/S |       |      |
| DRAWING TITLE:                                                                                                            |      |       |      |      |      |      |            |       |      |
| Permanent Cathodic Protection Standard<br>Installation Detail for UG Piping<br>(Earthing System of Transformer Rectifier) |      |       |      |      |      |      |            |       |      |
| DWG NO.:                                                                                                                  | PROJ | PHASE | AREA | DESC | TYPE | SEQ. | SHT No.    | CLASS | SIZE |
|                                                                                                                           | SACR | DE    | GEN  | EL   | DWG  | 0151 | 6/27       | 1     | A3   |





| NOTE                                                                                                                                                                                                                                                                                                                     |             |                                                |            |          |                                                                                       |          |         |       |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------|------------|----------|---------------------------------------------------------------------------------------|----------|---------|-------|------|
| 1- FOR THE PURPOSES OF THIS STANDARD DRAWING,THERMIT WELDS, THERMOWELDS, AND CADWELDS ARE SYNONYMOUS.                                                                                                                                                                                                                    |             |                                                |            |          |                                                                                       |          |         |       |      |
| 2- THERMIT WELD PROCESS SHALL BE APPLIED ONLY BY SKILLED EXPERIENCED FIELD PERSONNEL.                                                                                                                                                                                                                                    |             |                                                |            |          |                                                                                       |          |         |       |      |
| 3- THERMIT WELDS SHALL NOT BE MADE ON INTERNALLY PLASTIC COATED PIPELINES OR GRAPHITIZED CAST IRON PIPES.                                                                                                                                                                                                                |             |                                                |            |          |                                                                                       |          |         |       |      |
| 4- THE THERMIT WELD CHARGE SHALL BE LIMITED TO THERMOWELD CARTRIDGE No.15 (15 GRAM), OR EQUIVALENT.                                                                                                                                                                                                                      |             |                                                |            |          |                                                                                       |          |         |       |      |
| 5- THE MINIMUM DISTANCE OF A THERMIT WELD FROM A CIRCUMFERENTIAL WELD SHALL BE 150mm.                                                                                                                                                                                                                                    |             |                                                |            |          |                                                                                       |          |         |       |      |
| 6- THE MINIMUM DISTANCE OF A THERMIT WELD FROM A LONGITUDINAL WELD SHALL BE 40mm.                                                                                                                                                                                                                                        |             |                                                |            |          |                                                                                       |          |         |       |      |
| 7- THE USE OF THERMIT WELDS SHALL BE AVOIDED IN HIGH STRESS AREAS SUCH AS ELBOWS, TEES, etc.                                                                                                                                                                                                                             |             |                                                |            |          |                                                                                       |          |         |       |      |
| 8- IF THE FIRST THERMIT WELD DOES NOT TAKE, A SECOND THERMIT WELD SHALL NOT BE ATTEMPTED ON THE SAME SPOT.                                                                                                                                                                                                               |             |                                                |            |          |                                                                                       |          |         |       |      |
| 9- ALL CABLES ON THE CARRIER PIPE OF WALL THICKNESSES LESS THAN 4.78mm. (0.188") ARE TO BE BRAZED OR THERMIT WELDED TO A 50mmx50mm PIPE PATCH CUT FROM LINE PIPE WHICH IS WELDED TO THE MAIN WITH A BEAD ALONG THE CIRCUMFERENTIAL SIDES OF THE PATCH ONLY). THE WELD PATCH AT POINT OF WELD TO BE FILE TO BRIGHT METAL. |             |                                                |            |          |                                                                                       |          |         |       |      |
| 10- WHERE POSSIBLE, THERMIT WELDS SHALL BE APPLIED TO HORIZONTAL PIPES.                                                                                                                                                                                                                                                  |             |                                                |            |          |                                                                                       |          |         |       |      |
| 11- THE THERMIT WELDING SHALL BE DONE IN ACCORDANCE WITH THE STEPS INDICATED IN DETAIL "A".                                                                                                                                                                                                                              |             |                                                |            |          |                                                                                       |          |         |       |      |
| 12- AFTER WORKING,ALL PIPE THAT IS BARED FOR CABLE CONNECTIONS AND ALL BARED LEAD WIRES SHALL BE CAREFULLY CLEANED AND GREASE REMOVED BY SUITABLE SOLVENT, THEN PRIMED AND PROTECTED BY THE COATING MATERIALS COMPATIBLE WITH THE EXISTING COATING WITH A MINIMUM OF 50mm. OVERLAP AT EACH SIDE.                         |             |                                                |            |          |                                                                                       |          |         |       |      |
| REFERENCE DRAWINGS                                                                                                                                                                                                                                                                                                       |             |                                                |            |          |                                                                                       |          |         |       |      |
| DWG. NO.                                                                                                                                                                                                                                                                                                                 |             |                                                | TITLE      |          |                                                                                       |          |         |       |      |
|                                                                                                                                                                                                                                                                                                                          |             |                                                |            |          |                                                                                       |          |         |       |      |
|                                                                                                                                                                                                                                                                                                                          |             |                                                |            |          |                                                                                       |          |         |       |      |
|                                                                                                                                                                                                                                                                                                                          |             |                                                |            |          |                                                                                       |          |         |       |      |
|                                                                                                                                                                                                                                                                                                                          |             |                                                |            |          |                                                                                       |          |         |       |      |
|                                                                                                                                                                                                                                                                                                                          |             |                                                |            |          |                                                                                       |          |         |       |      |
|                                                                                                                                                                                                                                                                                                                          |             |                                                |            |          |                                                                                       |          |         |       |      |
|                                                                                                                                                                                                                                                                                                                          |             |                                                |            |          |                                                                                       |          |         |       |      |
| 06                                                                                                                                                                                                                                                                                                                       | 12.Feb.2025 | FINAL ISSUE                                    | Y.J        | S.S      | A.H                                                                                   | A.A.H    |         |       |      |
| 05                                                                                                                                                                                                                                                                                                                       | 01Dec.2024  | FINAL ISSUE                                    | Y.J        | S.S      | A.H                                                                                   | A.A.H    |         |       |      |
| 04                                                                                                                                                                                                                                                                                                                       | 20.Nov.2021 | FINAL ISSUE                                    | E.N        | F.S      | A.H                                                                                   | A.A.H    |         |       |      |
| 03                                                                                                                                                                                                                                                                                                                       | 31.Aug.2021 | FINAL ISSUE                                    | E.N        | F.S      | A.H                                                                                   | A.A.H    |         |       |      |
| 02                                                                                                                                                                                                                                                                                                                       | 08.Fab.2020 | FINAL ISSUE                                    | E.N        | F.S      | A.H                                                                                   | A.A.H    |         |       |      |
| 01                                                                                                                                                                                                                                                                                                                       | 25.Dec.2019 | ISSUE FOR APPROVAL                             | E.N        | F.S      | A.H                                                                                   | A.A.H    |         |       |      |
| 00                                                                                                                                                                                                                                                                                                                       | 03.Dec.2019 | ISSUE FOR APPROVAL                             | E.N        | F.S      | A.H                                                                                   | A.A.H    |         |       |      |
| REV.                                                                                                                                                                                                                                                                                                                     | DATE        | DESCRIPTION                                    | PREP. BY   | CHKD. BY | APPD. BY                                                                              | AUTH. BY |         |       |      |
|                                                                                                                                                                                                                                     |             | Southern Adish Gas Condensate Refinery Project |            |          |  |          |         |       |      |
| CONTRACT NO.:                                                                                                                                                                                                                                                                                                            |             |                                                | SCALE: N/S |          |                                                                                       |          |         |       |      |
| DRAWING TITLE:                                                                                                                                                                                                                                                                                                           |             |                                                |            |          |                                                                                       |          |         |       |      |
| Permanent Cathodic Protection Standard<br>Installation Detail for UG Piping<br>(Cable connection to carbon steel pipe)                                                                                                                                                                                                   |             |                                                |            |          |                                                                                       |          |         |       |      |
| DWG NO.:                                                                                                                                                                                                                                                                                                                 | PROJ        | PHASE                                          | AREA       | DESC     | TYPE                                                                                  | SEQ.     | SHT No. | CLASS | SIZE |
|                                                                                                                                                                                                                                                                                                                          | SACR        | DE                                             | GEN        | EL       | DWG                                                                                   | 0151     | 7/27    | 1     | A3   |





SLACK SHALL BE MADE ON CABLE

WELD ON CIRCUMFERENTIAL SIDE ONLY

50

300

CABLE

TAPE WRAPPING FOR CABLE FIXING

FIXING

SLACK SHALL BE MADE ON CABLE

WELD ON CIRCUMFERENTIAL SIDE ONLY

50

300

CABLE

TAPE WRAPPING FOR CABLE FIXING

FIXING

---

## DETAIL METHOD B (CTPT2)

Technical drawing of Detail "C" showing a cross-section of a cable-stayed bridge deck. The drawing illustrates the connection between the cable, the deck, and the bridge piers. Key components labeled include "CABLE", "WELD ON CIRCUMFERENTIAL SIDE ONLY", "SHALL BE BENT", "SEE NOTE 15", "CABLE FIXING", and "TAPE WRAPPING FOR CABLE FIXING". Dimensions are provided: 30, 40, and 200. The drawing shows the cable passing through a pier and being fixed to the deck with a weld on the circumferential side only. The cable is bent at the pier, and the deck is shown with a central section of 200 units. The cable is fixed to the deck with a weld on the circumferential side only. The cable is bent at the pier, and the deck is shown with a central section of 200 units.

### DETAIL "C"

CPD-24

## NOTE

1- FOR STAINLESS STEEL PIPES, TWO PROCEDURES CAN FOLLOWED AT SITE:  
A-THERMIT WELD CONNECTION (AS PER DETAIL A AND NOTE 2)  
B-CABLE LUG, NUT AND BOLT 9 AS PER DETAIL B AND C AND NOTES 12 AND 13

2-FOR THERMIT WELD CONNECTION , SHEET NO.9 SHALL BE GENERALLY CONSIDERED.  
ALSO THE FOLLOWING NOTES SHALL BE CONSIDERED FOR STAINLESS STEEL PIPES.

A) DIRECT CONNECTION USING THERMITE WELD SHALL NOT BE USED.

B) CONNECTION SHALL BE MADE VIA CONNECTING PLATES.

C) TO ENSURE THE MATERIAL COMPATIBILITY WITH THE LINE PIPE MATERIAL AND AVOID ANY GALVANIC EFFECTS, THE CONNECTING PLATE SHALL BE CUT FROM SPARE STOCK OF THE APPLICABLE PIPE MATERIAL.

D) THE CONNECTING PLATE SHALL BE WELDED TO THE PIPE BY THE MMA PROCESS ACCORDING TO APPLICABLE PROJECT WELDING SPECIFICATIONS.

E) THE CONNECTION PLATE SHALL BE CONNECTED AT THE 12 O'CLOCK POSITION AND A MINIMUM OF 200 MM FROM THE NEAREST WELD OR FITTING.

F) THE PLATE SHALL HAVE TYPICAL DIMENSIONS OF 50X50 MM(DETAIL A) AND SHALL HAVE RADIOUS CORNERS. THE PLATE SHALL BE WELDED TO THE PIPE PRIOR TO THE SECTIONAL HYDRAULIC PRESSURE TEST.

G) COATING REMOVAL SHALL EXPOSE THE MINIMUM AREA OF PIPE SURFACE TO ALLOW FOR SUCCESSFUL ATTACHMENT OF THE PLATE ONTO THE PIPE SURFACE.

H) EXPOSED PIPE AND REMOVED COATING SHALL BE REPAIRED BY A METHOD AND USING MATERIALS FULLY IN ACCORDANCE WITH THE APPLICABLE PROJECT FIELD COATING REPAIR SPECIFICATION. DUE ACCOUNT SHALL BE TAKEN OF THE MODIFICATION IN PIPE SURFACE PROFILE DUE TO THE PRESENCE OF THE STUD PLATE IN APPLYING THE PROJECT FIELD COATING REPAIR SPECIFICATION.  
THE STUD PLATE IN APPLYING THE PROJECT FIELD COATING REPAIR SPECIFICATION.

I) AFTER SUCCESSFULLY INSTALLING THE CABLE TO THE CONNECTION PLATE VIA THE EXOTHERMIC WELD AS DESCRIBED ABOVE, THE CONNECTION PLATE SHALL BE WELDED TO THE PIPE.

12-ANOTHER PROCEDURE IS AS SHOWN IN DETAIL B AND C IN THIS DRAWING .

13-ALL CONNECTION IN CLUDING WELDING , NUT AND BOIT AND CABLE LUG SHALL BE FULLY WRAPPED AND SEALED AT SITE .

14--ALL DIMENSION IS mm.

15-THICKNESS IS SIMILAR TO PIPE THICKNESS.

16-ALL CONNECTION AREA SHALL BE FULLY WRAPPED AND SEALED.

## REFERENCE DRAWINGS

| DWG. NO. | TITLE |
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| 06 | 12.Feb.2025 | FINAL ISSUE        | Y.J | S.S | A.H | A.A.H |
| 05 | 01Dec.2024  | FINAL ISSUE        | Y.J | S.S | A.H | A.A.H |
| 04 | 20.Nov.2021 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 03 | 31.Aug.2021 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 02 | 08.Fab.2020 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 01 | 25.Dec.2019 | ISSUE FOR APPROVAL | E.N | F.S | A.H | A.A.H |
| 00 | 03.Dec.2019 | ISSUE FOR APPROVAL | E.N | F.S | A.H | A.A.H |

| REV. | DATE | DESCRIPTION | PREP.<br>BY | CHKD.<br>BY | APPD.<br>BY | AUTH.<br>BY |
|------|------|-------------|-------------|-------------|-------------|-------------|
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|                                                                                                                   |                                                       |                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>Babcock &amp; Wilcox</p> | <p>Southern Adish Gas Condensate Refinery Project</p> |  <p>ADISH<br/>Southern Adish Gas Condensate Refinery company</p> |
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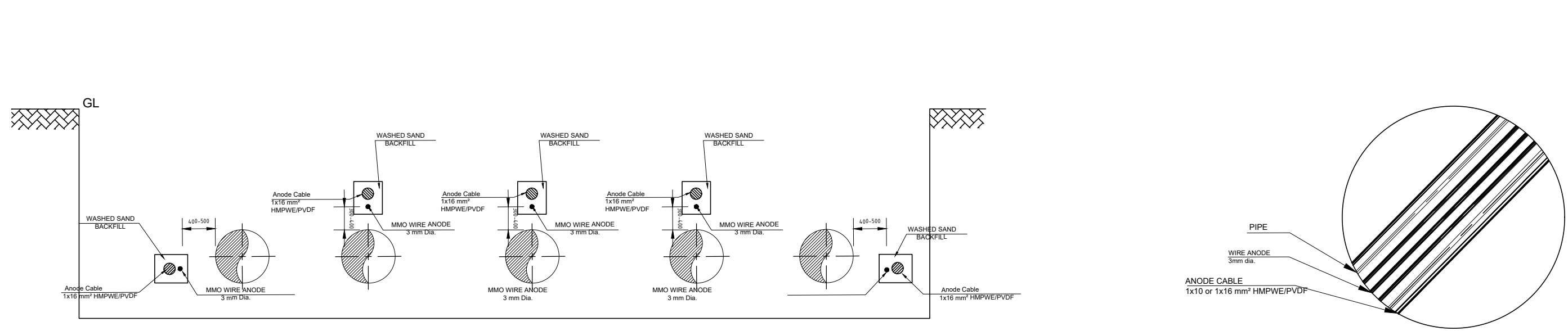
|               |            |
|---------------|------------|
| CONTRACT NO.: | SCALE: N/S |
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DRAWING TITLE:

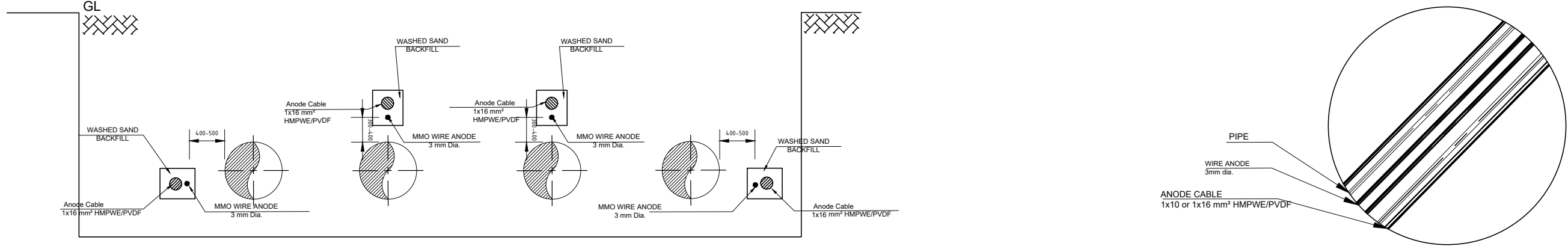
# Permanent Cathodic Protection Standard Installation Detail for UG Piping (Cable Connection to Stainless Steel Pipe)

|          |      |       |      |      |      |      |         |       |      |
|----------|------|-------|------|------|------|------|---------|-------|------|
| DWG NO.: | PROJ | PHASE | AREA | DESC | TYPE | SEQ. | SHT No. | CLASS | SIZE |
|          | SACR | DE    | GEN  | EL   | DWG  | 0151 | 8/27    | 1     | A3   |

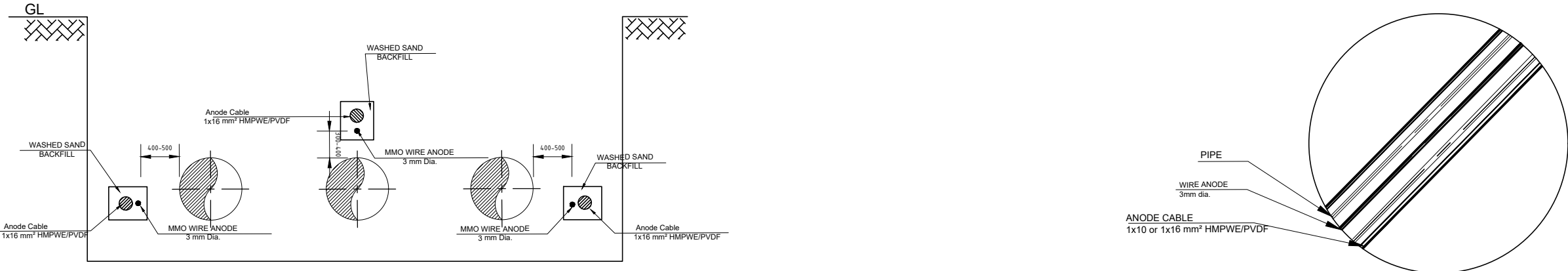




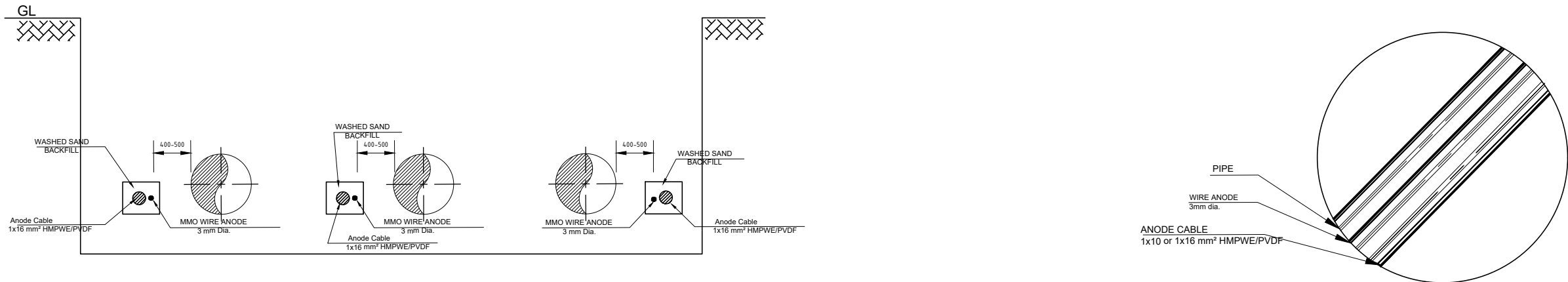
MMO WIRE INSTALLATION DETAIL - TYPE 6



MMO WIRE INSTALLATION DETAIL - TYPE 5



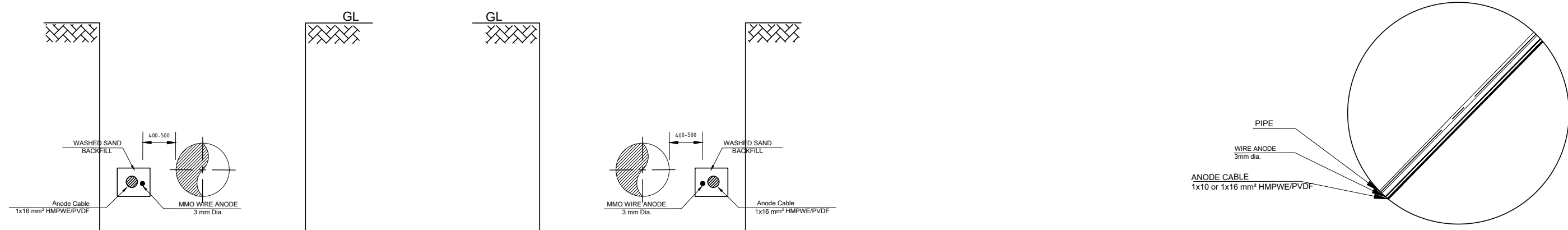
MMO WIRE INSTALLATION DETAIL - TYPE 4



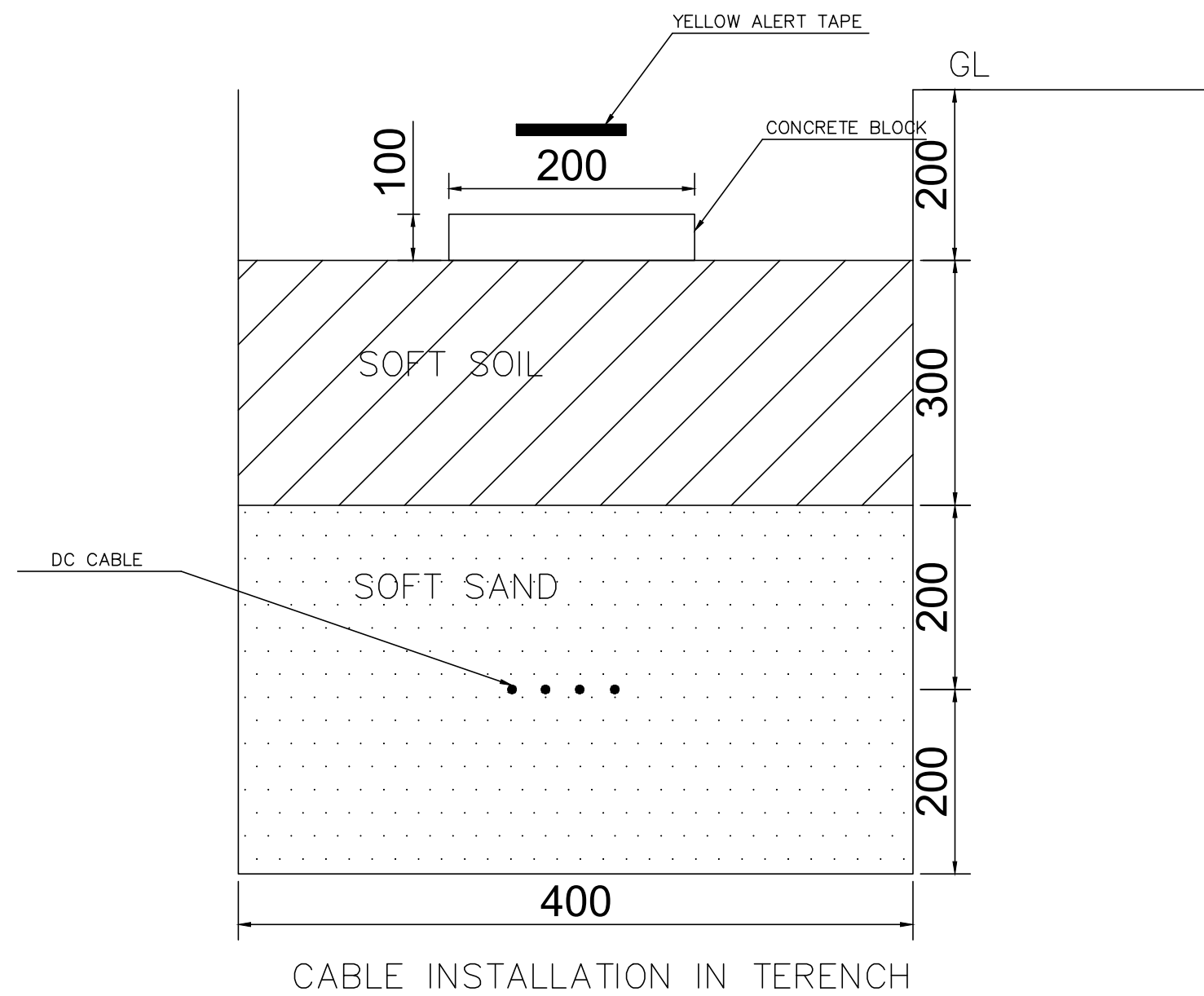
MMO WIRE INSTALLATION DETAIL - TYPE 3



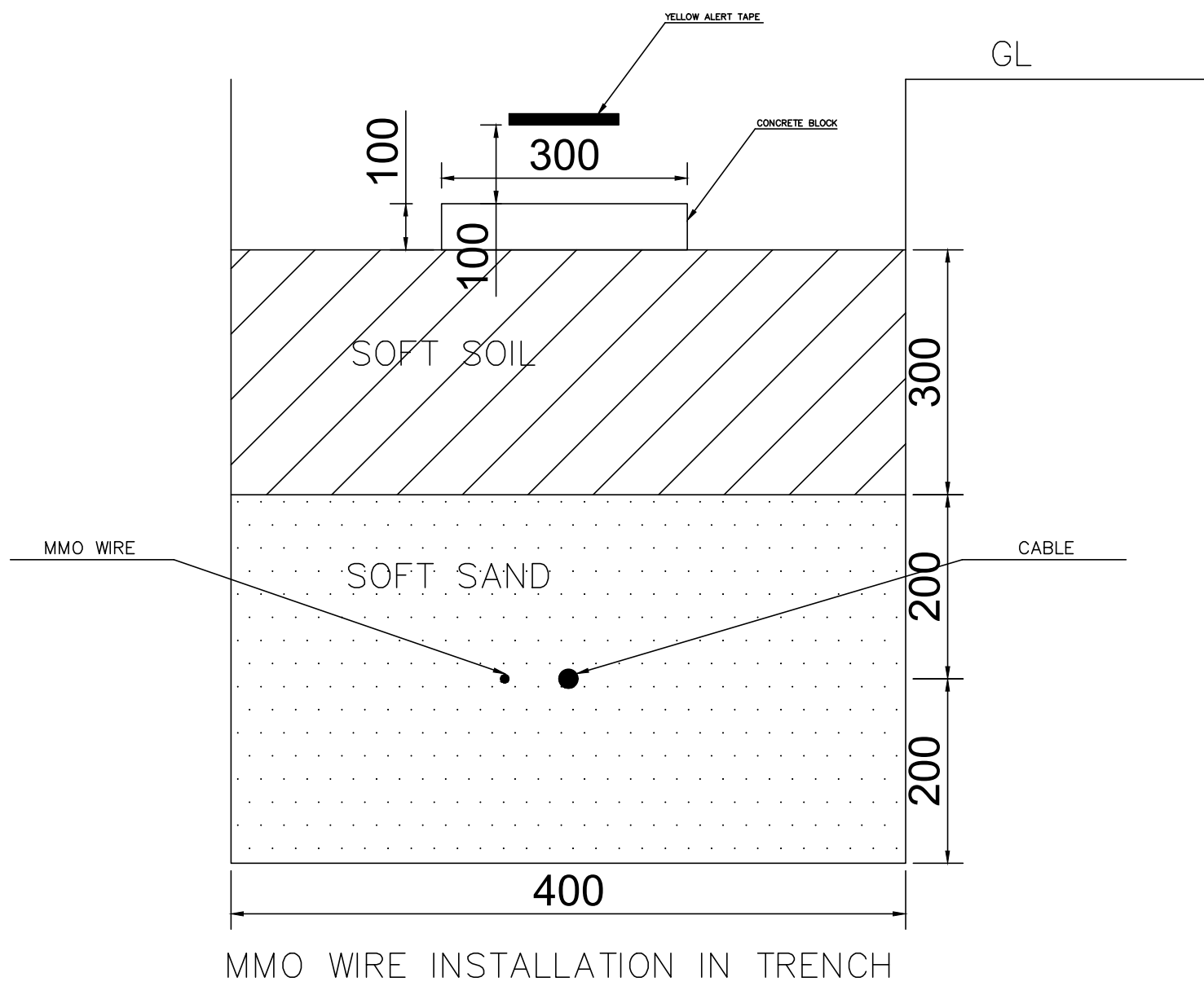
MMO WIRE INSTALLATION DETAIL - TYPE 2



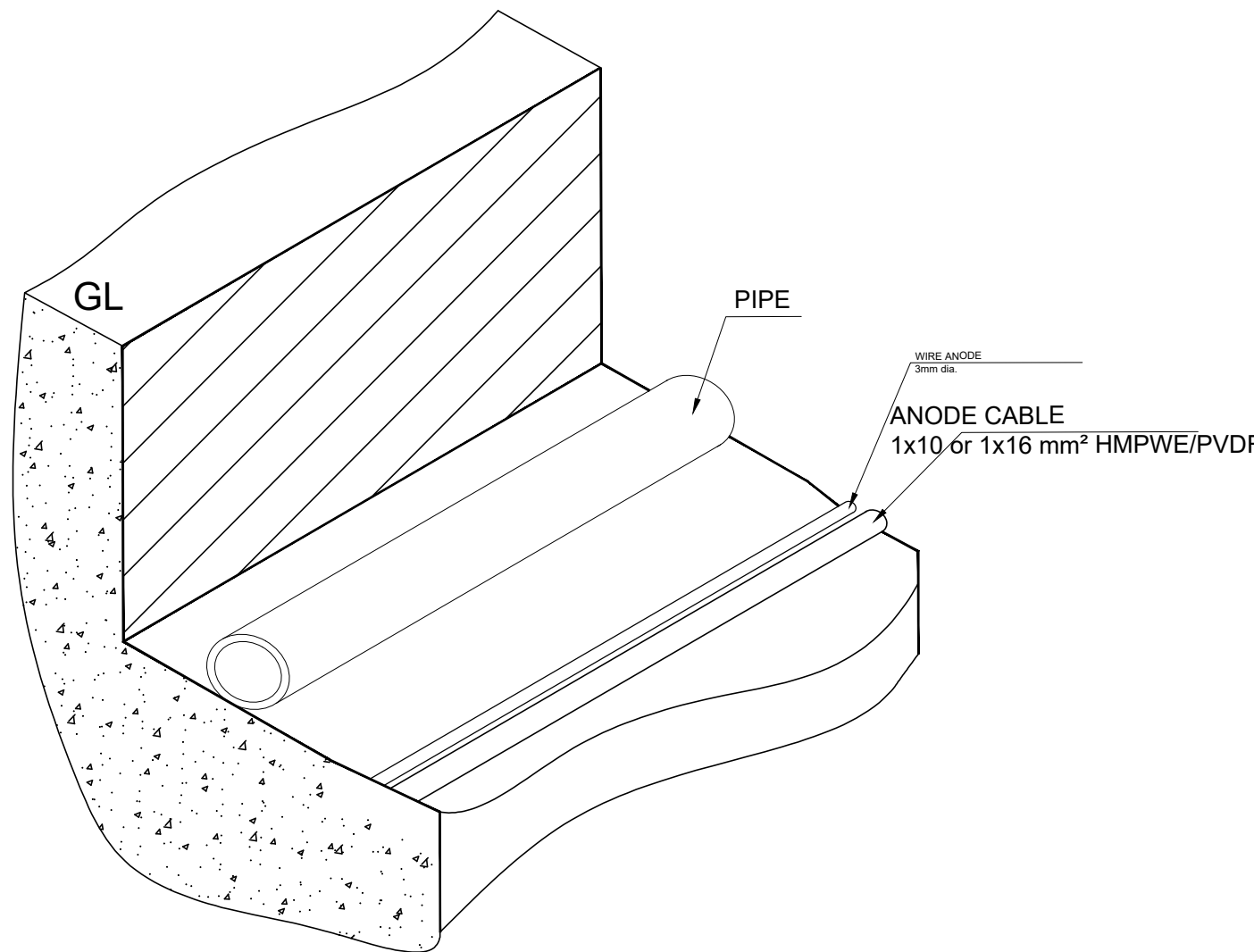
MMO WIRE INSTALLATION DETAIL - TYPE 1



CABLE INSTALLATION IN TERENCE



MMO WIRE INSTALLATION IN TRENCH



MMO WIRE INSTALLATION DETAIL - TYPE 1

## NOTE

- 1- ALL DIMENSION IS IN MM.
- 2- WHEN MORE THAN TWO PIPES EXIST IN ONE TRENCH WITH DISTANCE MORE THAN 1M, DETAIL NO.3 SHALL BE FOLLOWED.
- 3- WHEN MORE THAN TWO PIPES EXIST IN ONE TRENCH WITH DISTANCE LESS THAN 1M, DETAIL NO.4,5,6 SHALL BE FOLLOWED.
- 4- WHEN TWO PIPES EXIST IN ONE TRENCH DETAIL NO. 2 SHALL BE FOLLOWED.
- 5- MMO WIRE ANODE SHALL BE INSTALLED IN THE MIDDLE OF SAND TRENCH WITH 40CM HEIGHT AND 40CM WIDTH.
- 6- SAND PROPERTIES SHALL BE CONFIRMED BY MMO WIRE ANODE MANUFACTURER.
- 7- SAND BACKFILL SHALL BE SOFT AND WASHED AS MINIMUM.
- 8- FOR MORE INFORMATION PLEASE SEE PROJECT INSTALLATION PROCEDURE AND MANUFACTURER DATA SHEET AND INSTRUCTION.
- 9- THE CABLE ROUTE MARKER SHALL BE PROVIDED FOR ALL TRENCHES AT INTERVALS NOT EXCEEDING 20 METERS FOR STRAIGHT RUNS, AT EVERY CHANGE OF DIRECTION, AT ROAD ROAD OR PIPE CROSSINGS AND SPLICING POINTS.

## REFERENCE DRAWINGS

| DWG. NO. | TITLE |
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|          |       |
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| 06   | 12.Feb.2025 | FINAL ISSUE        | Y.J      | S.S      | A.H      | A.A.H    |
| 05   | 01Dec.2024  | FINAL ISSUE        | Y.J      | S.S      | A.H      | A.A.H    |
| 04   | 20.Nov.2021 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 03   | 31.Aug.2021 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 02   | 08.Fab.2020 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 01   | 25.Dec.2019 | ISSUE FOR APPROVAL | E.N      | F.S      | A.H      | A.A.H    |
| 00   | 03.Dec.2019 | ISSUE FOR APPROVAL | E.N      | F.S      | A.H      | A.A.H    |
| REV. | DATE        | DESCRIPTION        | PREP. BY | CHKD. BY | APPD. BY | AUTH. BY |

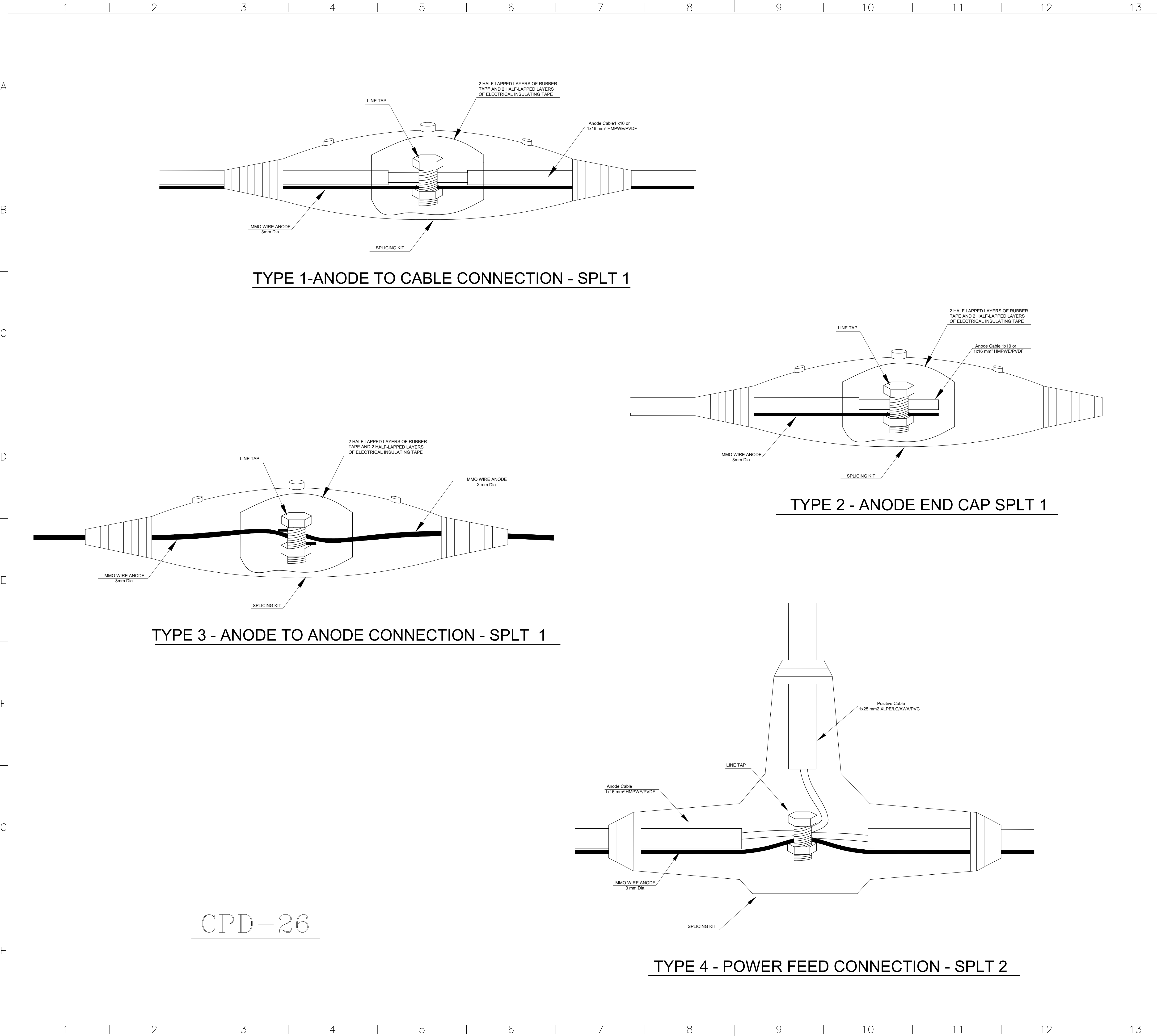
|                                                                                       |                                                |                                                                                       |
|---------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------|
|  | Southern Adish Gas Condensate Refinery Project |  |
| CONTRACT NO.:                                                                         |                                                | SCALE: N/S                                                                            |

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|---------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|
| DRAWING TITLE:                                                                                          |  |  |  |  |  |  |  |  |
| Permanent Cathodic Protection Standard Installation Detail for UG Piping (MMO Wire Installation Detail) |  |  |  |  |  |  |  |  |

|          |      |       |      |      |      |      |         |       |      |
|----------|------|-------|------|------|------|------|---------|-------|------|
| DWG NO.: | PROJ | PHASE | AREA | DESC | TYPE | SEQ. | SHT No. | CLASS | SIZE |
|          | SACR | DE    | GEN  | EL   | DWG  | 0151 | 9/27    | 1     | A3   |

CPD-25





CPD-26

NOTE

1- USED RESIN FOR SPLICING KITS SHALL MEET REQUIREMENT STIPULATED IN STANDARD IPS-M-TP-750.

REFERENCE DRAWINGS

| DWG. NO. | TITLE |
|----------|-------|
|          |       |
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| 06 | 12.Feb.2025 | FINAL ISSUE        | Y.J | S.S | A.H | A.A.H |
| 05 | 01Dec.2024  | FINAL ISSUE        | Y.J | S.S | A.H | A.A.H |
| 04 | 20.Nov.2021 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 03 | 31.Aug.2021 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 02 | 08.Fab.2020 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 01 | 25.Dec.2019 | ISSUE FOR APPROVAL | E.N | F.S | A.H | A.A.H |
| 00 | 03.Dec.2019 | ISSUE FOR APPROVAL | E.N | F.S | A.H | A.A.H |

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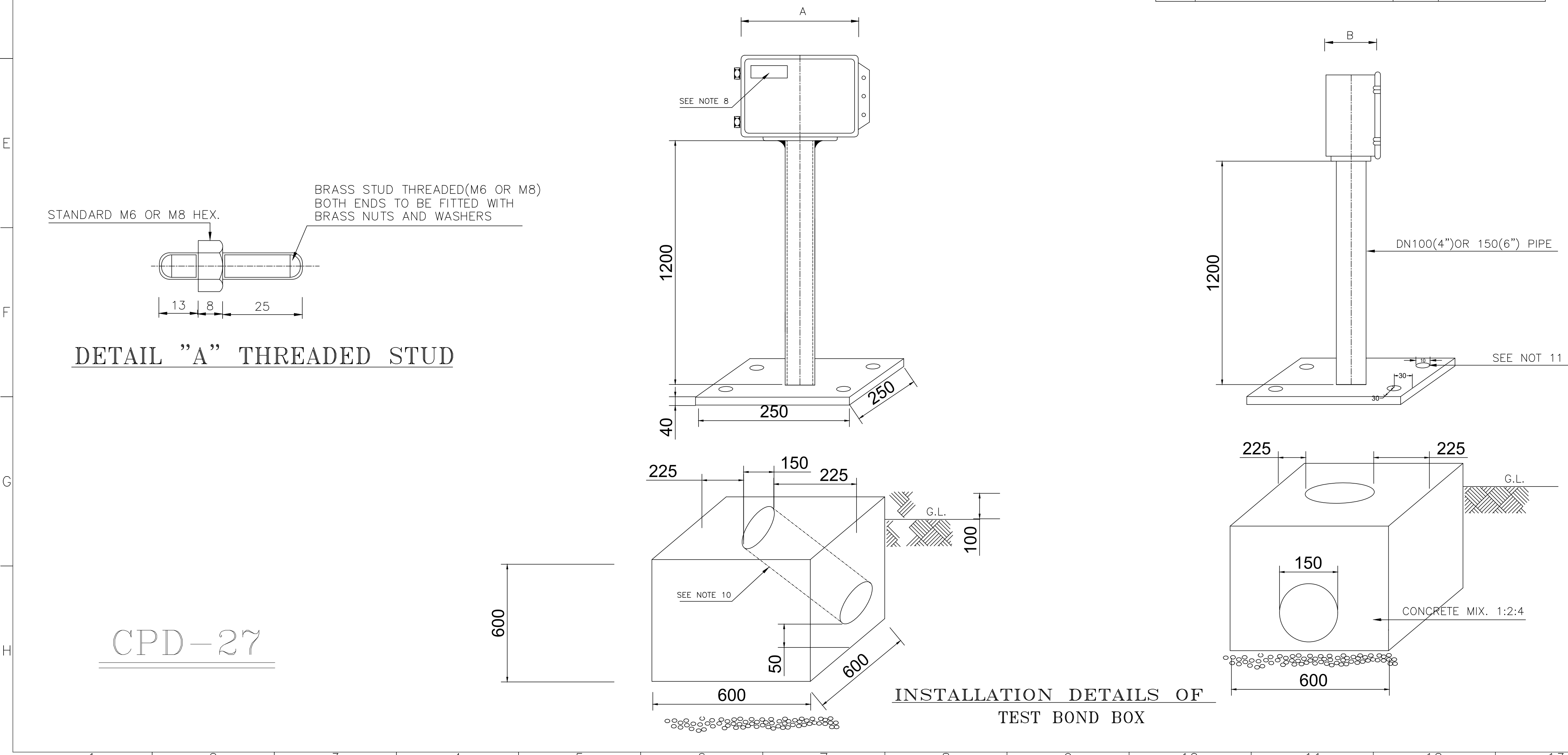
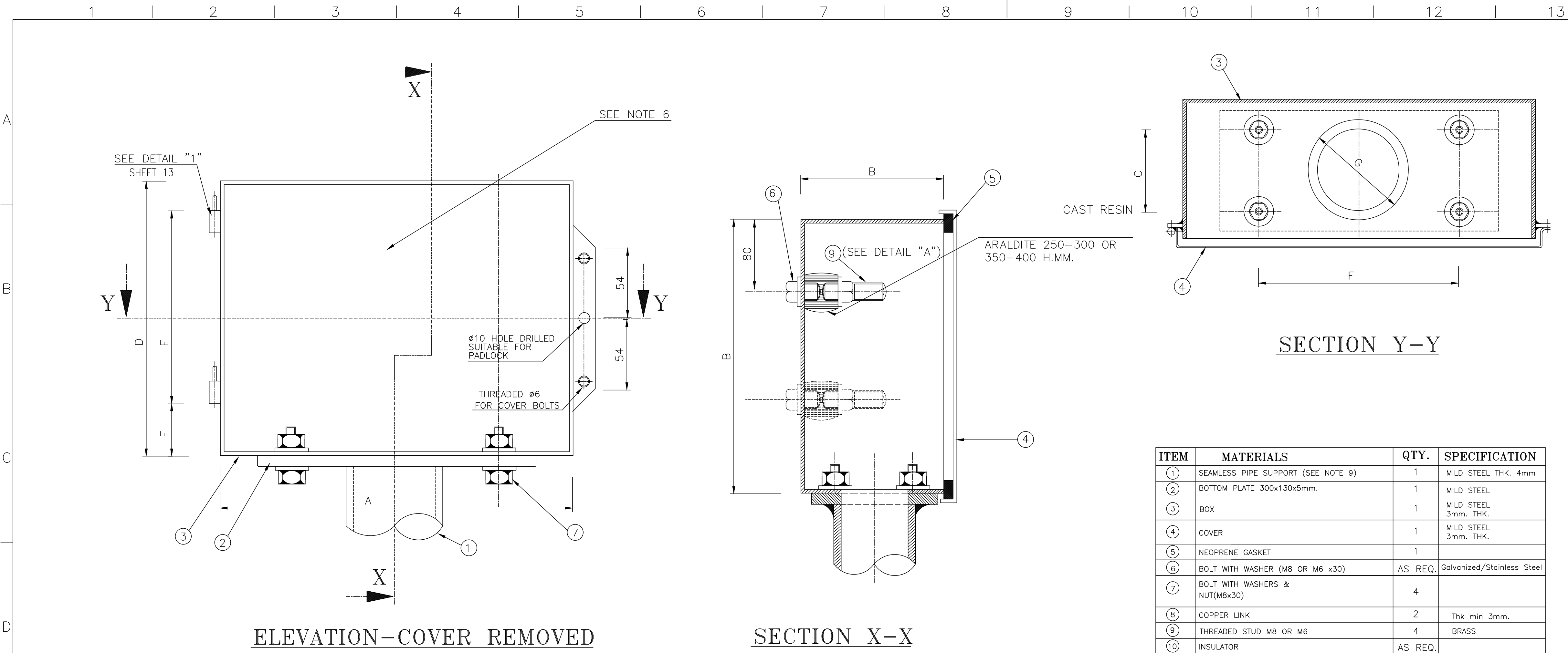
Southern Adish Gas Condensate Refinery Project



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|---------------------------------------------------------------------------------------------------------------|--|------------|--|--|--|--|
| CONTRACT NO.:                                                                                                 |  | SCALE: N/S |  |  |  |  |
| DRAWING TITLE:                                                                                                |  |            |  |  |  |  |
| Permanent Cathodic Protection Standard<br>Installation Detail for UG Piping<br>(MMO Wire Installation Detail) |  |            |  |  |  |  |

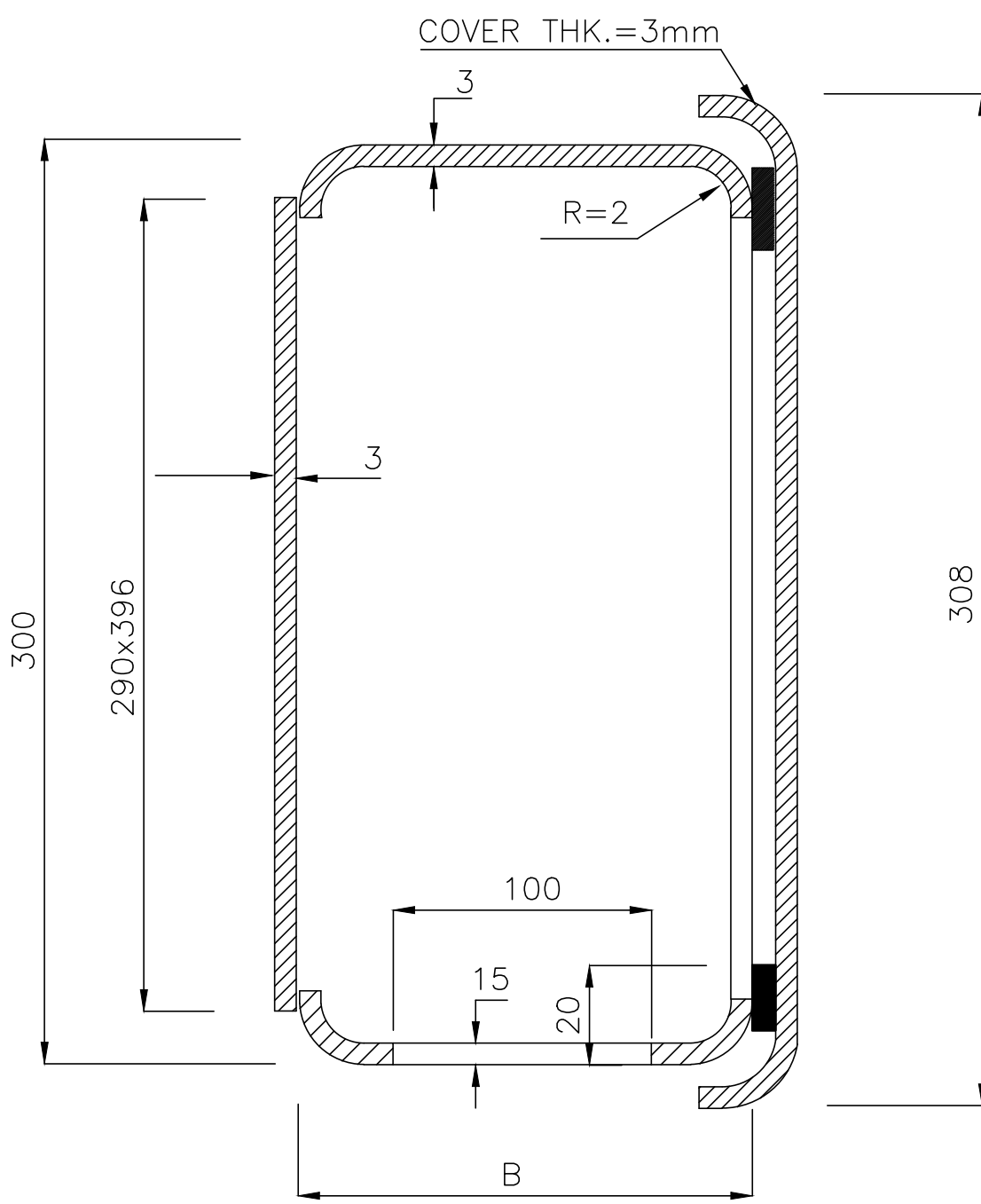
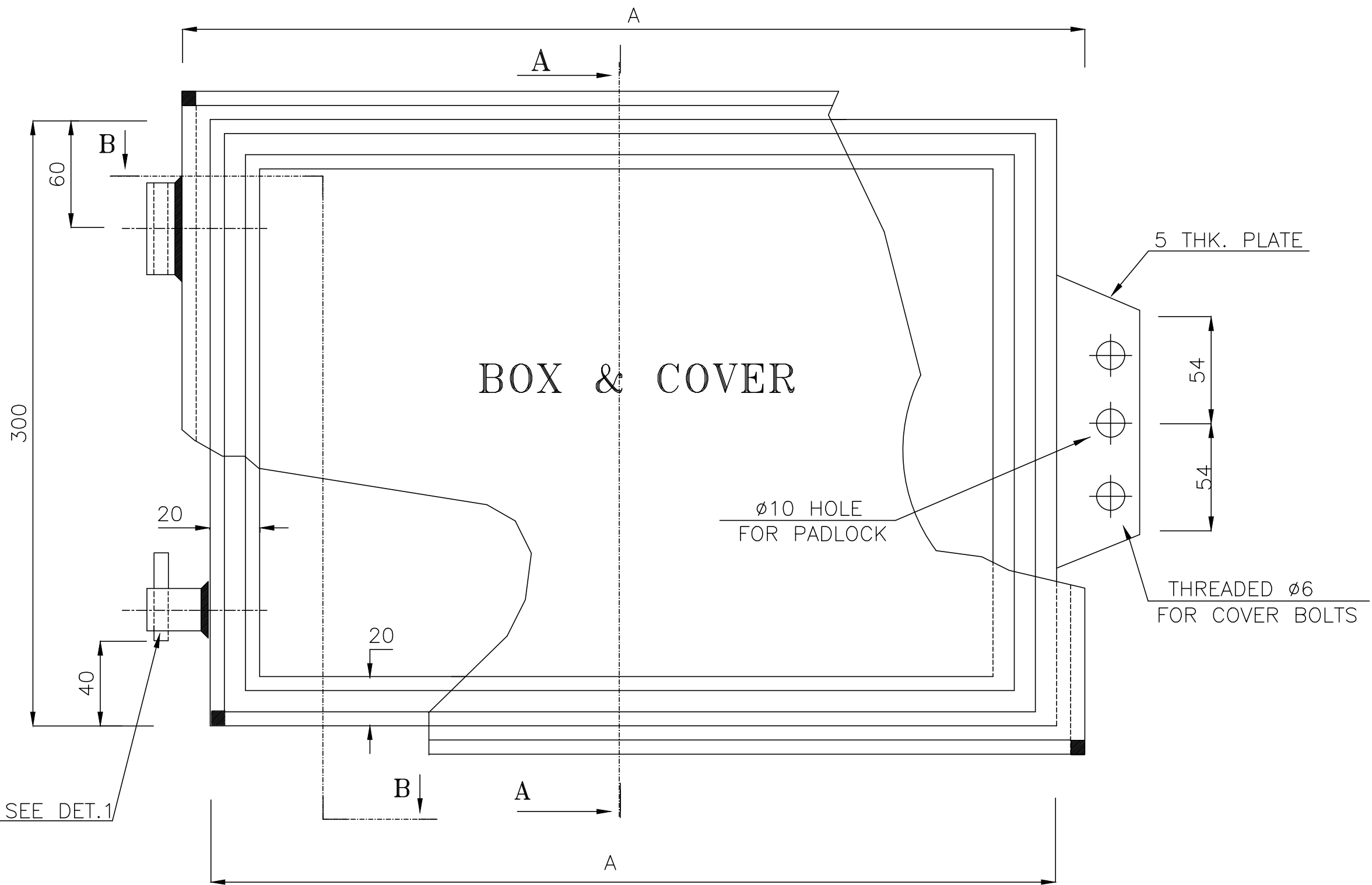
| DWG NO.: | PROJ | PHASE | AREA | DESC | TYPE | SEQ. | SHT No. | CLASS | SIZE |
|----------|------|-------|------|------|------|------|---------|-------|------|
|          | SACR | DE    | GEN  | EL   | DWG  | 0151 | 10/27   | 1     | A3   |



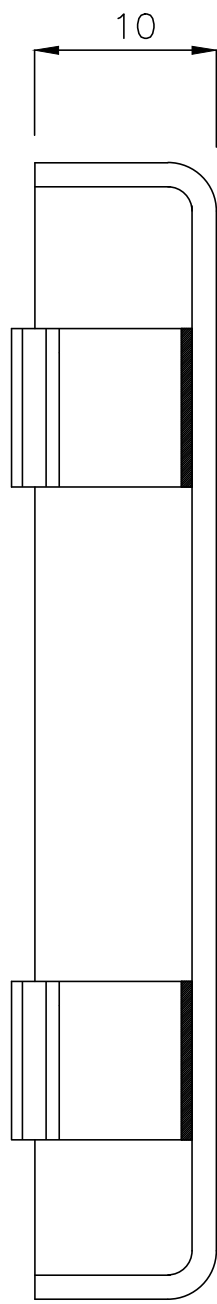
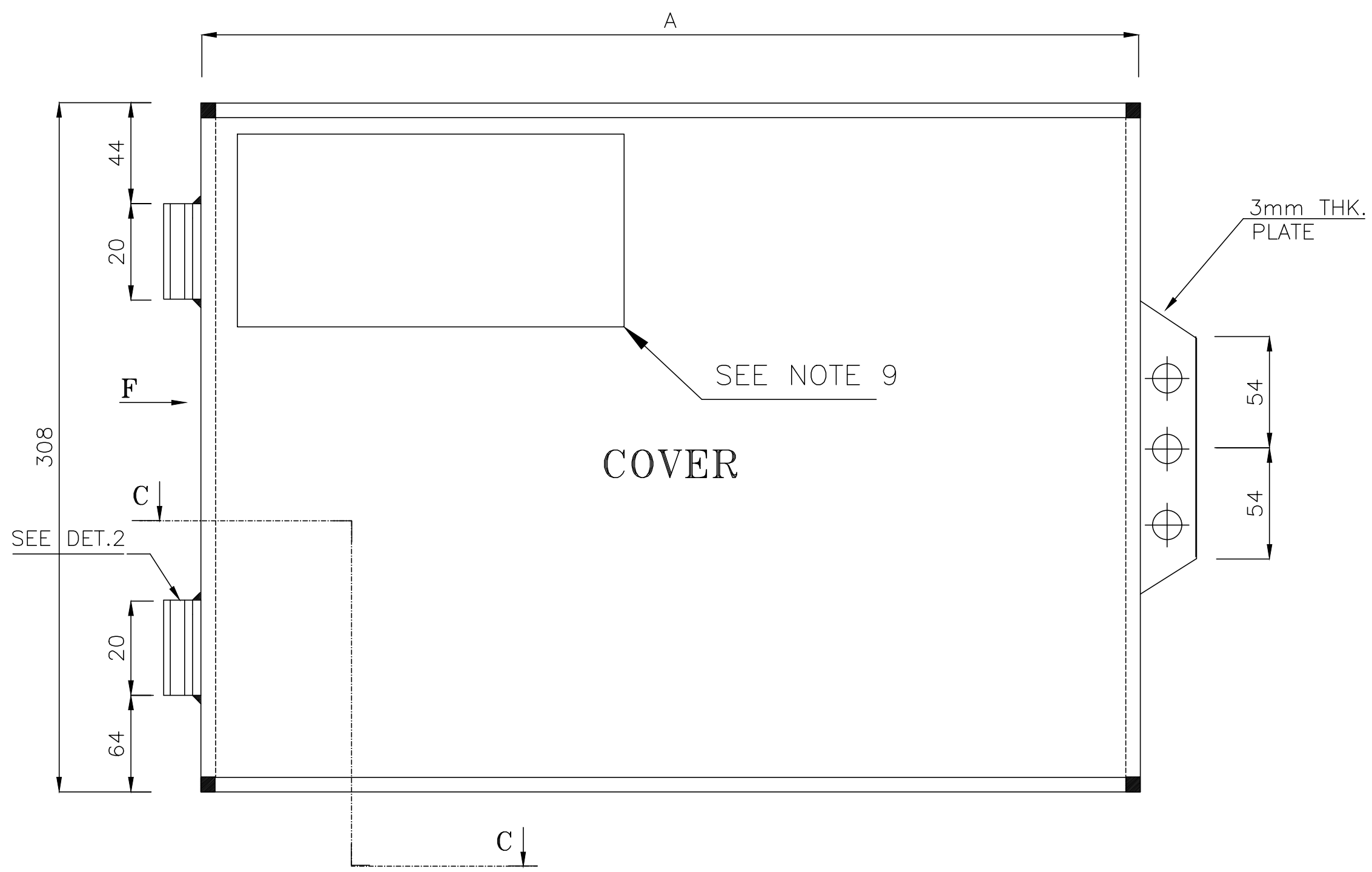


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|                                                                                                                                                |  | 14 |  |       |  | 15 |  |  |  | 16 |  |
| NOTE                                                                                                                                           |  |    |  |       |  |    |  |  |  |    |  |
| 1- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.                                                                               |  |    |  |       |  |    |  |  |  |    |  |
| 2- ALL BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.                                                                                            |  |    |  |       |  |    |  |  |  |    |  |
| 3- AFTER ASSEMBLY OF TEST BOX TO MOUNTING PIPE & PRIOR TO INSTALLATION, ALL STEEL PARTS SHALL BE PAINTED WITH FOLLOWING PROCEDURE:             |  |    |  |       |  |    |  |  |  |    |  |
| A) SURFACE PREPARATION TO Sa2 1/2.                                                                                                             |  |    |  |       |  |    |  |  |  |    |  |
| B) ONE RED LEAD PRIMER (70MICRONS).                                                                                                            |  |    |  |       |  |    |  |  |  |    |  |
| C) ONE INTERMEDIATE COAT OF ALKYD PAINT (100 MICRONS AT LEAST).                                                                                |  |    |  |       |  |    |  |  |  |    |  |
| D) ONE FINISHING COAT OF ALKYD GLOSSY YELLOW COLOR PAINT (100 MICRONS) TO BS 381C, NO.309. (TOTAL THICKNESS OF PAINTING 270 MICRONS AT LEAST). |  |    |  |       |  |    |  |  |  |    |  |
| 4- ALTERNATIVE INTERNAL FITTINGS MAY BE SUPPLIED SUBJECT TO APPROVAL.                                                                          |  |    |  |       |  |    |  |  |  |    |  |
| 5- ALTERNATIVE COATING SUITABLE FOR MAINE ENVIRONMENT IS ACCEPTABLE AFTER PURCHASER APPROVAL.                                                  |  |    |  |       |  |    |  |  |  |    |  |
| 6- FOR TERMINAL CONFIGURATION PLEASE SEE SHEETS 13.                                                                                            |  |    |  |       |  |    |  |  |  |    |  |
| 7- DIMENSIONS A TO G SHALL BE SPECIFIED BY MANUFACTURER APPROVED BY PURCHASER.                                                                 |  |    |  |       |  |    |  |  |  |    |  |
| 8- BOX TAGE SHALL BE MADE OF CORROSIN RESISTANCE MATERIAL AND HAS 150mmX100mm DIMENSION AS MINIMUM.                                            |  |    |  |       |  |    |  |  |  |    |  |
| 9- SUPPORT PIPE DIA. IS 4" FOR BOX WITH MAX 9 TERMINALS. AND IS 6" FOR BOX MORE THAN 9 TERMINALS.                                              |  |    |  |       |  |    |  |  |  |    |  |
| 10- 6" PE PIPE SHALL BE INSTALLED INSTALLED IN THE CONCRETE WITH SUITABLE BEND IN THE MIDDLE FOR CABLE PASSING.                                |  |    |  |       |  |    |  |  |  |    |  |
| 11- BASE PLATE SHALL BE INSTALLED ON FOUNDATION BY FOUR M8 EXPANSION BOLT.                                                                     |  |    |  |       |  |    |  |  |  |    |  |
| 12- MANUFACTURER SHALL PROVIDE ALL PROVISION TO MEET IP55.                                                                                     |  |    |  |       |  |    |  |  |  |    |  |
| REFERENCE DRAWINGS                                                                                                                             |  |    |  |       |  |    |  |  |  |    |  |
| DWG. NO.                                                                                                                                       |  |    |  | TITLE |  |    |  |  |  |    |  |
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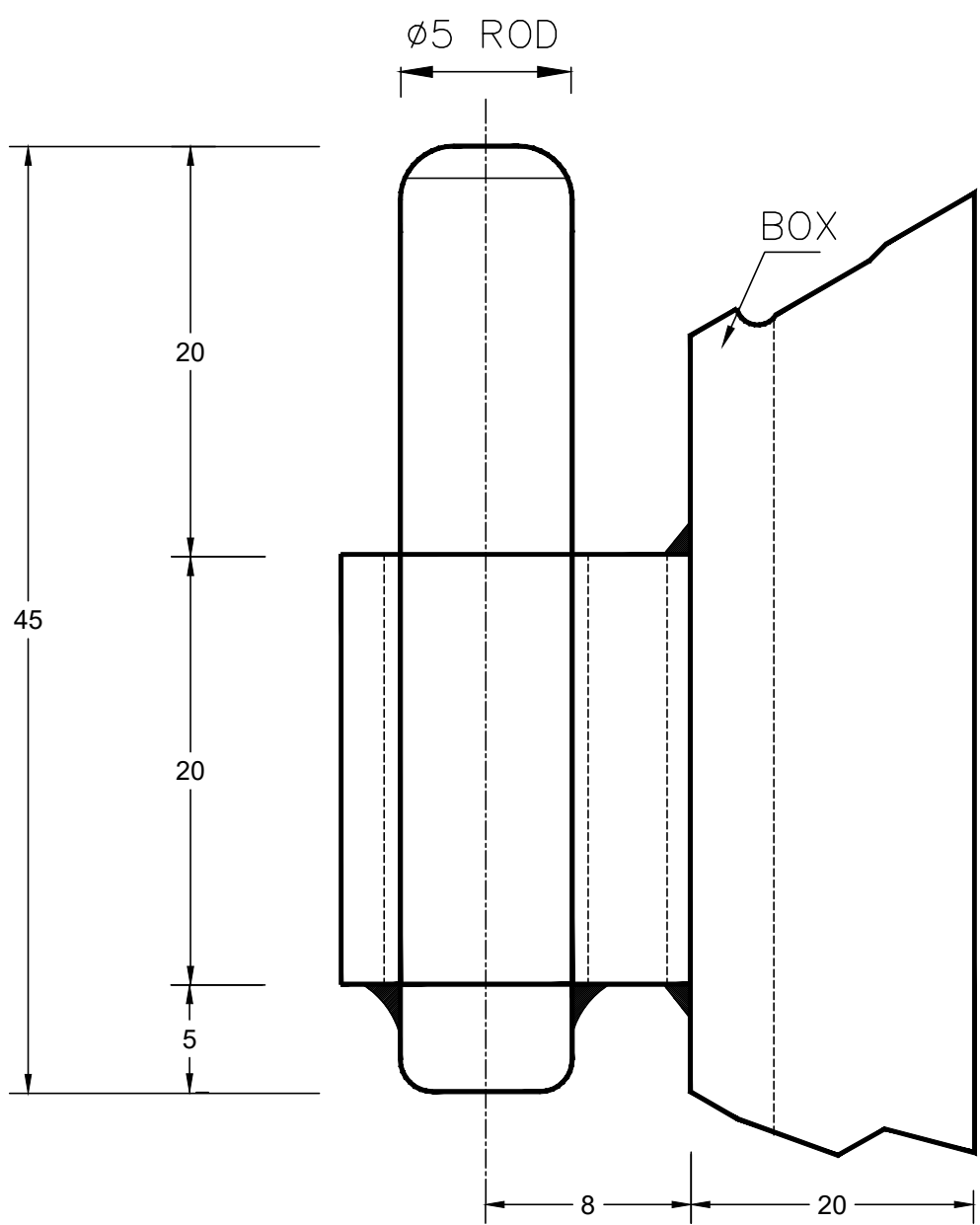




SECTION "A-A"



VIEW F



DETAL "1"

FRONT VIEW

CPD-27

NOTE

- 1- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
- 2- ALL BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.
- 3- AFTER ASSEMBLY OF TEST BOX TO MOUNTING PIPE & PRIOR TO INSTALLATION, ALL STEEL PARTS SHALL BE PAINTED WITH FOLLOWING PROCEDURE:
  - A) SURFACE PREPARATION TO Sa2 1/2.
  - B) ONE RED LEAD PRIMER (70MICRONS).
  - C) ONE INTERMEDIATE COAT OF ALKYD PAINT (100 MICRONS AT LEAST).
  - D) ONE FINISHING COAT OF ALKYD GLOSSY YELLOW COLOR PAINT (100 MICRONS) TO BS 381C, NO.309. (TOTAL THICKNESS OF PAINTING 270 MICRONS AT LEAST).
- 4- ALTERNATIVE INTERNAL FITTINGS MAY BE SUPPLIED SUBJECT TO APPROVAL.
- 5- ALTERNATIVE COATING SUITABLE FOR MAINE ENVIRONMENT IS ACCEPTABLE AFTER PURCHASER APPROVAL.
- 6- FOR TERMINAL CONFIGURATION PLEASE SEE SHEETS 131
- 7- DIMENSIONS A AND B SHALL BE SPECIFIED BY MANUFACTURER APPROVED BY PURCHASER.
- 8- MANUFACTURE SHALL PROVIDE ALL PROVISION TO MEET IP55.
- 9- BOX TAGE SHALL BE MADE OF CORROSIN RESISTANCE MATERIAL AND HAS 150mmX100mm DIMENSION AS MINIMUM.

REFERENCE DRAWINGS

| DWG. NO. | TITLE |
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| 06 | 12.Feb.2025 | FINAL ISSUE        | Y.J | S.S | A.H | A.A.H |
| 05 | 01Dec.2024  | FINAL ISSUE        | Y.J | S.S | A.H | A.A.H |
| 04 | 20.Nov.2021 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 03 | 31.Aug.2021 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 02 | 08.Fab.2020 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 01 | 25.Dec.2019 | ISSUE FOR APPROVAL | E.N | F.S | A.H | A.A.H |
| 00 | 03.Dec.2019 | ISSUE FOR APPROVAL | A.R | F.S | A.H | A.A.H |

| REV. | DATE | DESCRIPTION | PREP. BY | CHKD. BY | APPD. BY | AUTH. BY |
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Baitool Saraf Pars Co.

Southern Adish Gas Condensate Refinery Project



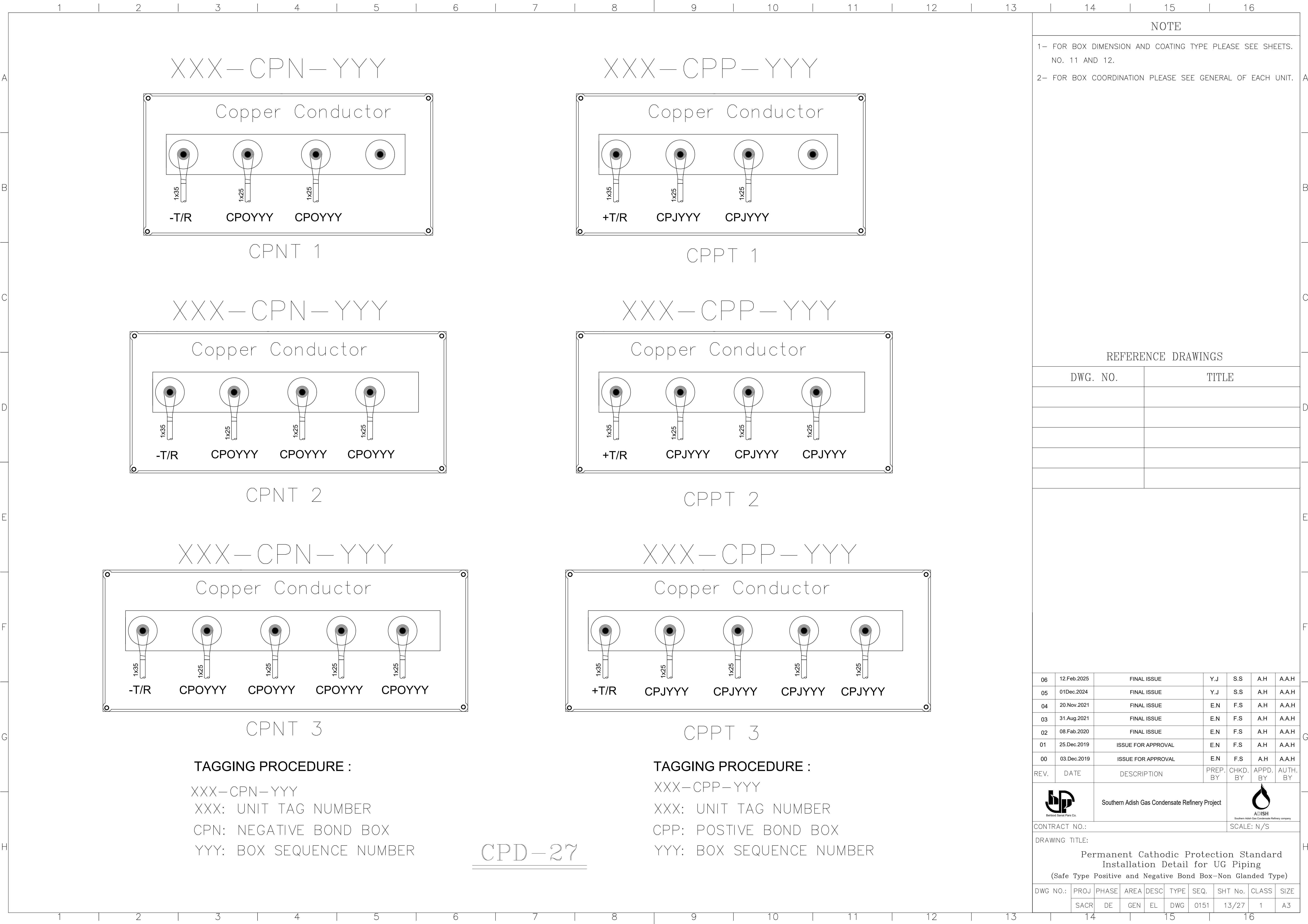
ADISH  
Southern Adish Gas Condensate Refinery company

CONTRACT NO.: SCALE: N/S

DRAWING TITLE:  
Permanent Cathodic Protection Standard  
Installation Detail for UG Piping  
(Safe Type Junction Box Detail-Non Glanded Type)

| DWG NO.: | PROJ | PHASE | AREA | DESC | TYPE | SEQ. | SHT No. | CLASS | SIZE |
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|          | SACR | DE    | GEN  | EL   | DWG  | 0151 | 12/27   | 1     | A3   |





NOTE

1- FOR BOX DIMENSION AND COATING TYPE PLEASE SEE SHEETS. NO. 11 AND 12.

2- FOR BOX COORDINATION PLEASE SEE GENERAL OF EACH UNIT.

REFERENCE DRAWINGS

| DWG. NO. | TITLE |
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| 06   | 12.Feb.2025 | FINAL ISSUE        | Y.J      | S.S      | A.H      | A.A.H    |
| 05   | 01Dec.2024  | FINAL ISSUE        | Y.J      | S.S      | A.H      | A.A.H    |
| 04   | 20.Nov.2021 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 03   | 31.Aug.2021 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 02   | 08.Fab.2020 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 01   | 25.Dec.2019 | ISSUE FOR APPROVAL | E.N      | F.S      | A.H      | A.A.H    |
| 00   | 03.Dec.2019 | ISSUE FOR APPROVAL | E.N      | F.S      | A.H      | A.A.H    |
| REV. | DATE        | DESCRIPTION        | PREP. BY | CHKD. BY | APPD. BY | AUTH. BY |



Bechtel Saudi Piping Co.

Southern Adish Gas Condensate Refinery Project



ADISH  
Southern Adish Gas Condensate Refinery company

CONTRACT NO.:

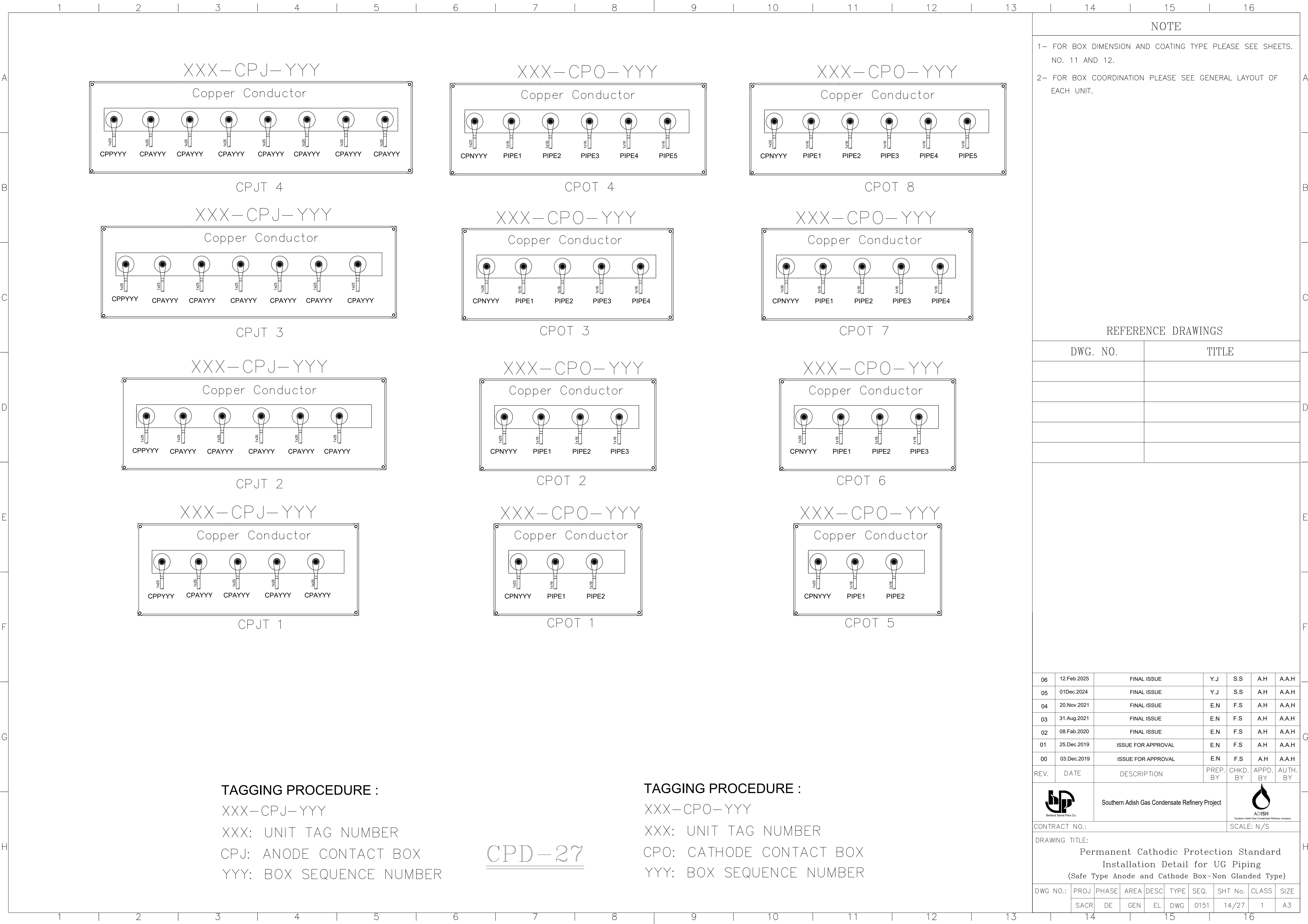
SCALE: N/S

DRAWING TITLE:

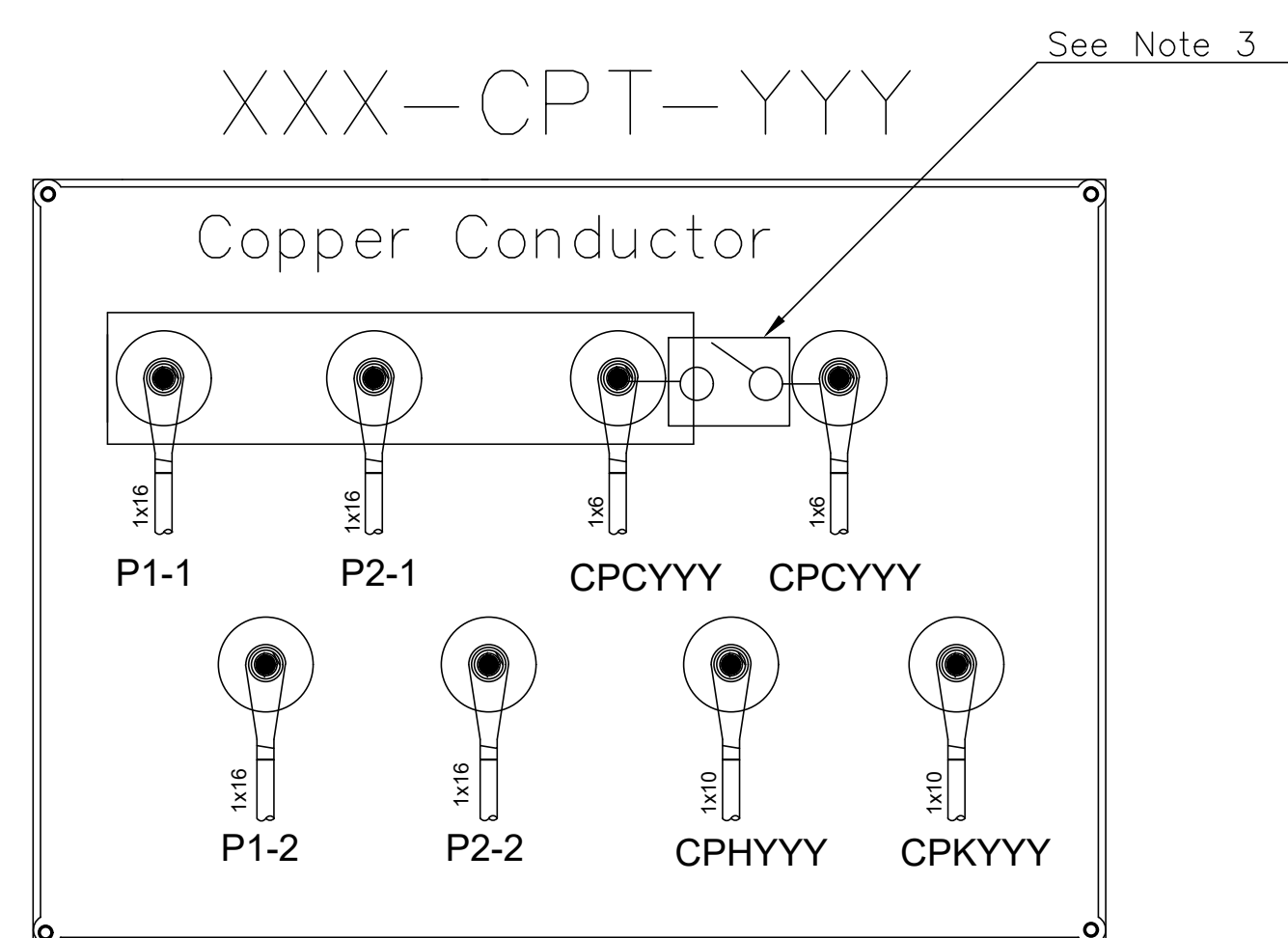
Permanent Cathodic Protection Standard  
Installation Detail for UG Piping  
(Safe Type Positive and Negative Bond Box-Non Glanded Type)

|          |      |       |      |      |      |      |         |       |      |
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| DWG NO.: | PROJ | PHASE | AREA | DESC | TYPE | SEQ. | SHT No. | CLASS | SIZE |
|          | SACR | DE    | GEN  | EL   | DWG  | 0151 | 13/27   | 1     | A3   |

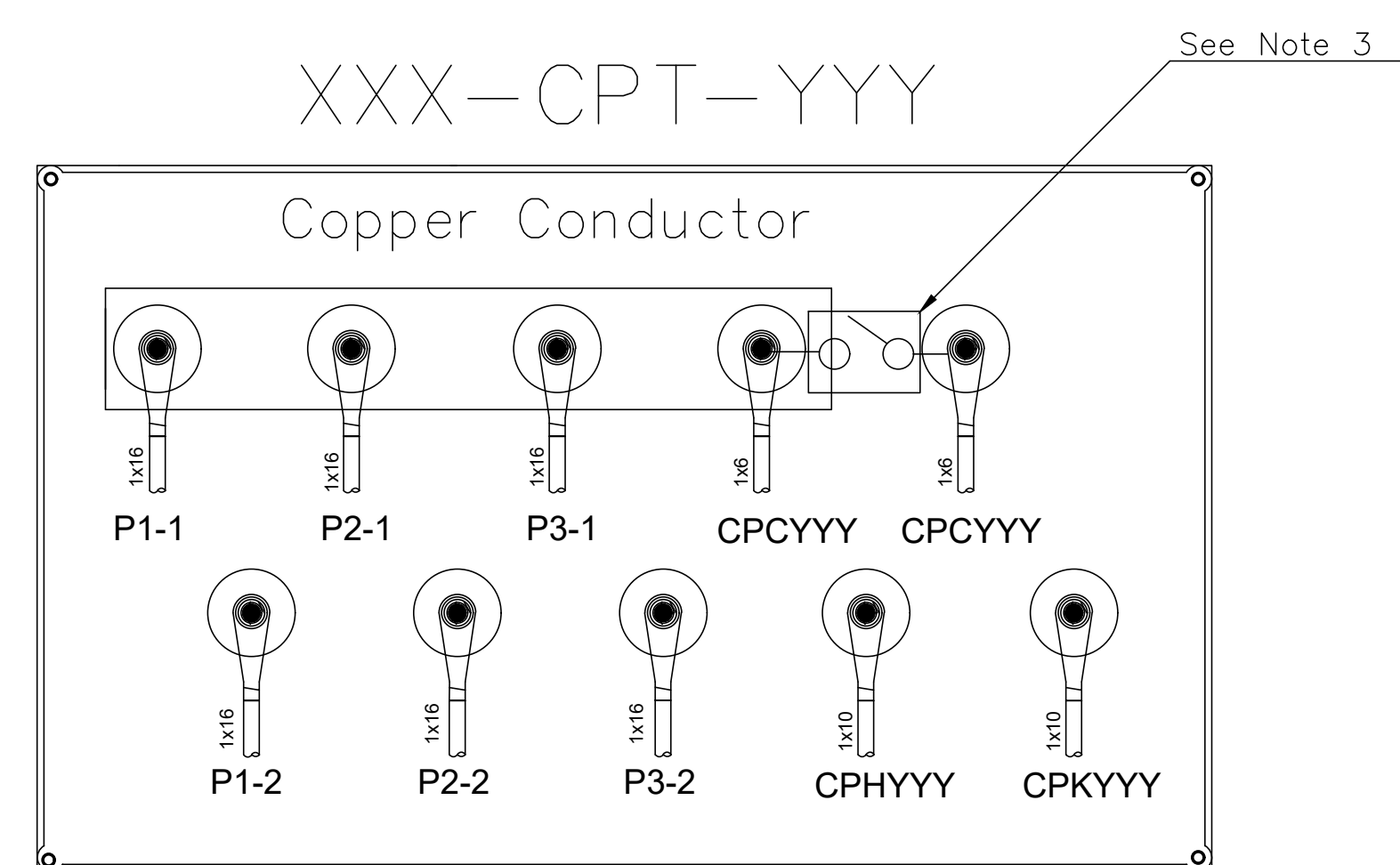




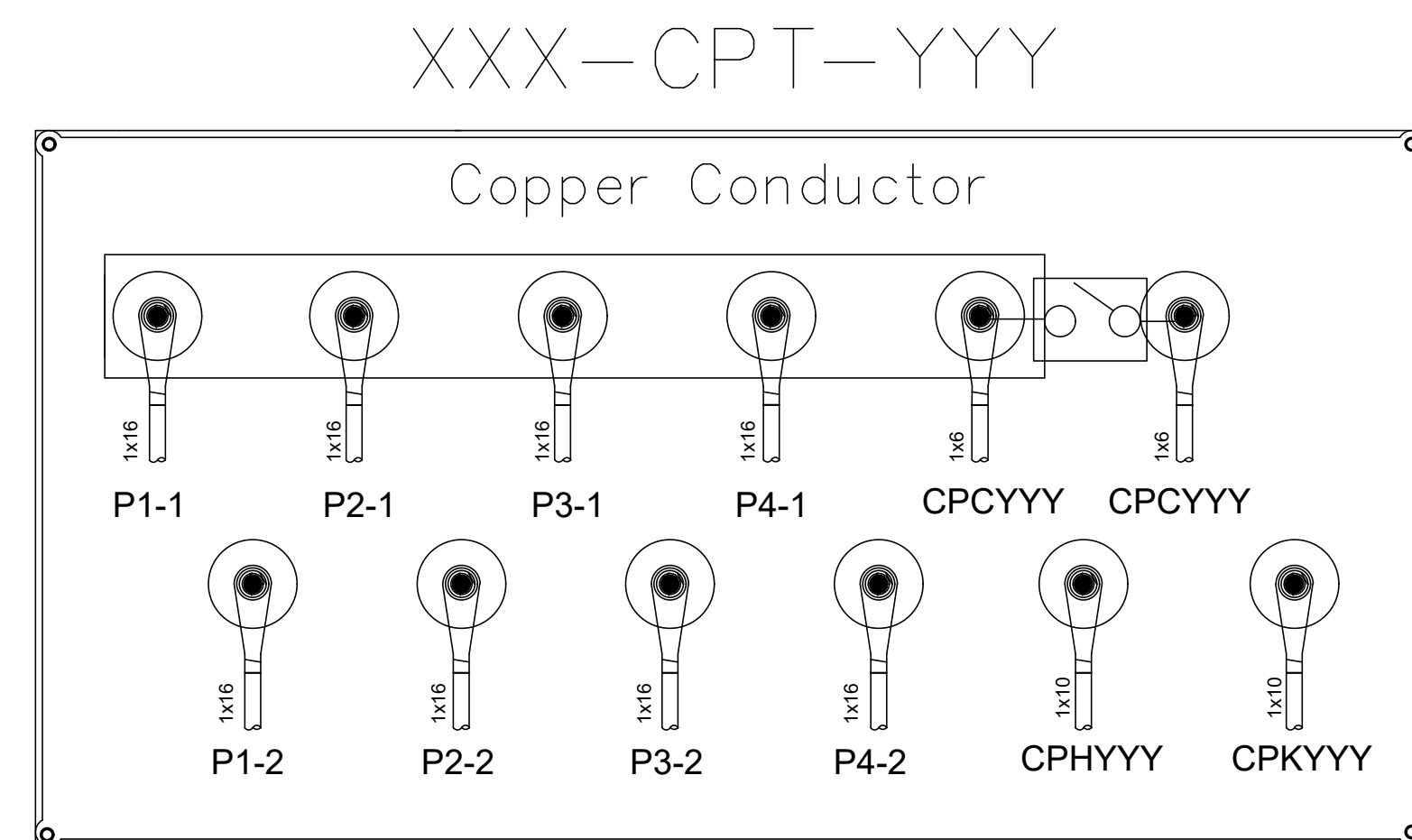




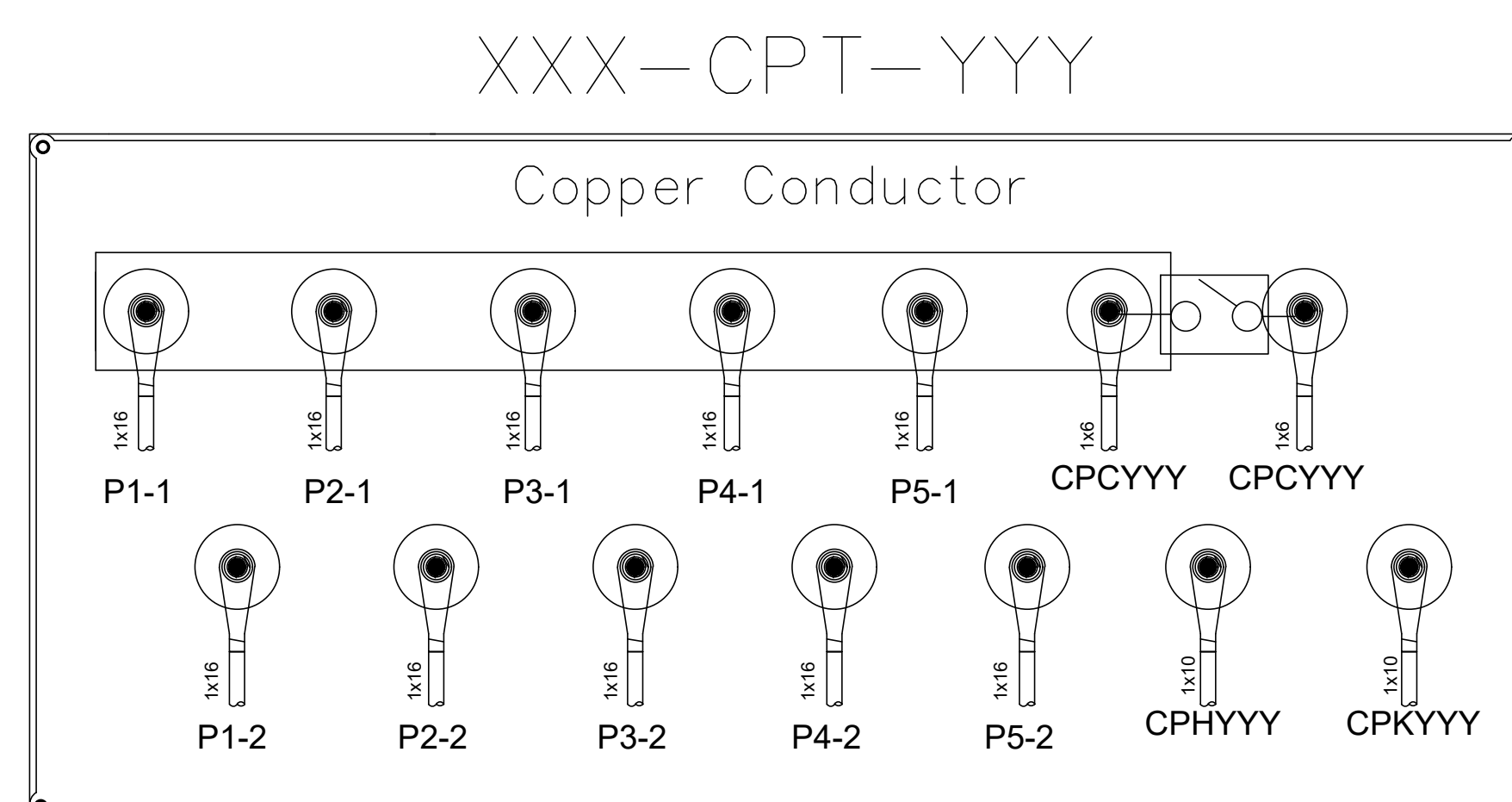
CP TT 1



CP TT 2



CPTT 3



CPTT 4

### TAGGING PROCEDURE :

XXX-CPT-YYY

XXX: UNIT TAG NUMBER

CPT: TEST BOND BOX

YYY: BOX SEQUENCE NUMBER

CPD-27

## NOTE

1-FOR BOX DIMENSION AND COATING TYPE PLEASE SEE SHEETS.  
NO. 11 AND 12.

|                                                                         |   |
|-------------------------------------------------------------------------|---|
| 2-FOR BOX COORDINATION PLEASE SEE GENERAL LAYOUT DRAWING.<br>EACH UNIT. | A |
|-------------------------------------------------------------------------|---|

3-TWO CABLES OF POLARIZATION COUPONS SHALL BE CONNECTED TOGETHER VIA AN ELECTRICAL SWITCH WHEN REQUIRED.

### REFERENCE DRAWINGS

| DWG. NO. | TITLE |
|----------|-------|
|          |       |
|          |       |
|          |       |
|          |       |
|          |       |

|      |             |                    |              |              |              |              |
|------|-------------|--------------------|--------------|--------------|--------------|--------------|
| 06   | 12.Feb.2025 | FINAL ISSUE        | Y.J          | S.S          | A.H          | A.A.H        |
| 05   | 01Dec.2024  | FINAL ISSUE        | Y.J          | S.S          | A.H          | A.A.H        |
| 04   | 20.Nov.2021 | FINAL ISSUE        | E.N          | F.S          | A.H          | A.A.H        |
| 03   | 31.Aug.2021 | FINAL ISSUE        | E.N          | F.S          | A.H          | A.A.H        |
| 02   | 08.Fab.2020 | FINAL ISSUE        | E.N          | F.S          | A.H          | A.A.H        |
| 01   | 25.Dec.2019 | ISSUE FOR APPROVAL | E.N          | F.S          | A.H          | A.A.H        |
| 00   | 03.Dec.2019 | ISSUE FOR APPROVAL | E.N          | F.S          | A.H          | A.A.H        |
| REV. | DATE        | DESCRIPTION        | PREP.<br>RY. | CHKD.<br>RY. | APPD.<br>RY. | AUTH.<br>RY. |

|                                                                                       |                                                       |                                                                                       |  |  |  |
|---------------------------------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------------------|--|--|--|
|  | <p>Southern Adish Gas Condensate Refinery Project</p> |  |  |  |  |
|---------------------------------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------------------|--|--|--|

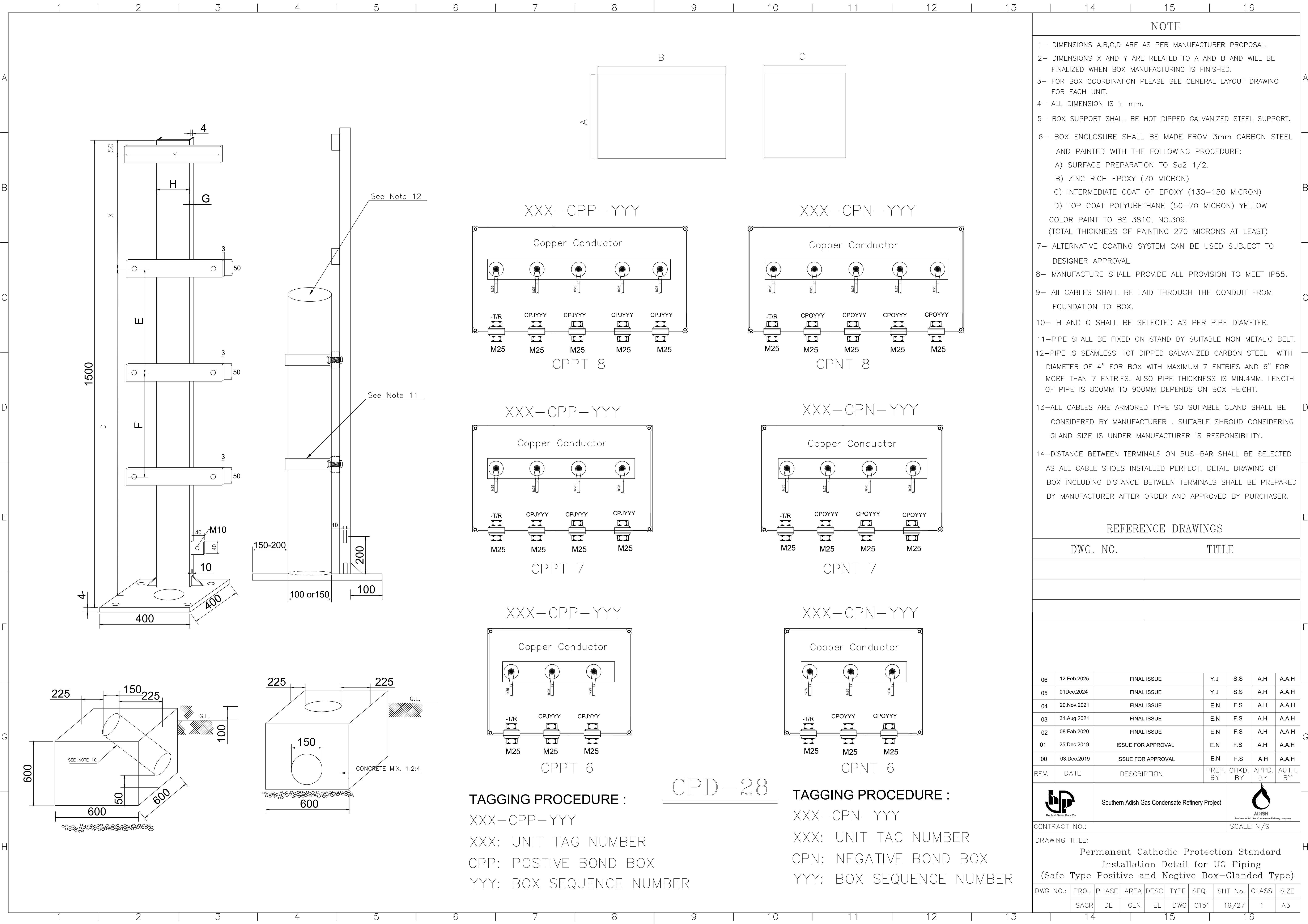
|               |            |
|---------------|------------|
| CONTRACT NO.: | SCALE: N/S |
|---------------|------------|

DRAWING TITLE:

Permanent Cathodic Protection Standard  
Installation Detail for UG Piping  
(Safe Type Test Bond Box–Non Glanded Type)

|          |      |       |      |      |      |      |         |       |      |
|----------|------|-------|------|------|------|------|---------|-------|------|
| DWG NO.: | PROJ | PHASE | AREA | DESC | TYPE | SEQ. | SHT No. | CLASS | SIZE |
|          | SACR | DE    | GEN  | EL   | DWG  | 0151 | 15/27   | 1     | A3   |





NOTE

- 1- DIMENSIONS A,B,C,D ARE AS PER MANUFACTURER PROPOSAL.
- 2- DIMENSIONS X AND Y ARE RELATED TO A AND B AND WILL BE FINALIZED WHEN BOX MANUFACTURING IS FINISHED.
- 3- FOR BOX COORDINATION PLEASE SEE GENERAL LAYOUT DRAWING FOR EACH UNIT.
- 4- ALL DIMENSION IS in mm.
- 5- BOX SUPPORT SHALL BE HOT DIPPED GALVANIZED STEEL SUPPORT.
- 6- BOX ENCLOSURE SHALL BE MADE FROM 3mm CARBON STEEL AND PAINTED WITH THE FOLLOWING PROCEDURE:  
A) SURFACE PREPARATION TO Sa2 1/2.  
B) ZINC RICH EPOXY (70 MICRON)  
C) INTERMEDIATE COAT OF EPOXY (130-150 MICRON)  
D) TOP COAT POLYURETHANE (50-70 MICRON) YELLOW COLOR PAINT TO BS 381C, NO.309.  
(TOTAL THICKNESS OF PAINTING 270 MICRONS AT LEAST)
- 7- ALTERNATIVE COATING SYSTEM CAN BE USED SUBJECT TO DESIGNER APPROVAL.
- 8- MANUFACTURE SHALL PROVIDE ALL PROVISION TO MEET IP55.
- 9- All CABLES SHALL BE LAID THROUGH THE CONDUIT FROM FOUNDATION TO BOX.
- 10- H AND G SHALL BE SELECTED AS PER PIPE DIAMETER.
- 11-PIPE SHALL BE FIXED ON STAND BY SUITABLE NON METALIC BELT.
- 12-PIPE IS SEAMLESS HOT DIPPED GALVANIZED CARBON STEEL WITH DIAMETER OF 4" FOR BOX WITH MAXIMUM 7 ENTRIES AND 6" FOR MORE THAN 7 ENTRIES. ALSO PIPE THICKNESS IS MIN.4MM. LENGTH OF PIPE IS 800MM TO 900MM DEPENDS ON BOX HEIGHT.
- 13-ALL CABLES ARE ARMORED TYPE SO SUITABLE GLAND SHALL BE CONSIDERED BY MANUFACTURER . SUITABLE SHROUD CONSIDERING GLAND SIZE IS UNDER MANUFACTURER 'S RESPONSIBILITY.
- 14-DISTANCE BETWEEN TERMINALS ON BUS-BAR SHALL BE SELECTED AS ALL CABLE SHOES INSTALLED PERFECT. DETAIL DRAWING OF BOX INCLUDING DISTANCE BETWEEN TERMINALS SHALL BE PREPARED BY MANUFACTURER AFTER ORDER AND APPROVED BY PURCHASER.

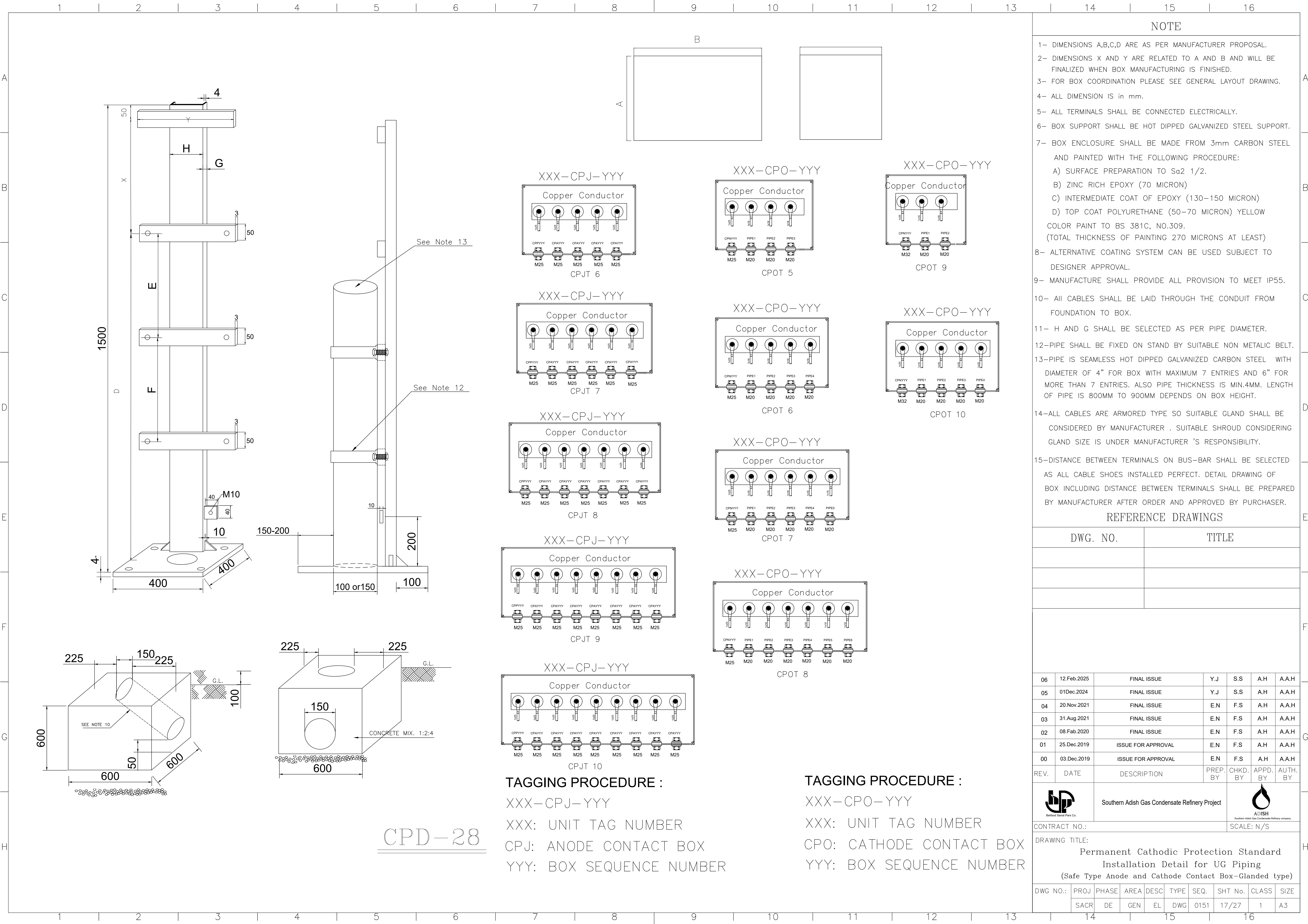
REFERENCE DRAWINGS

| DWG. NO. |  | TITLE |  |  |  |
|----------|--|-------|--|--|--|
|          |  |       |  |  |  |
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|------|-------------|--------------------|----------|----------|----------|----------|
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| 00   | 03.Dec.2019 | ISSUE FOR APPROVAL | E.N      | F.S      | A.H      | A.A.H    |
| REV. | DATE        | DESCRIPTION        | PREP. BY | CHKD. BY | APPD. BY | AUTH. BY |

|                                                                                                                                   |      |                                                |      |      |      |                                                                                                                                         |         |       |      |
|-----------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------|------|------|------|-----------------------------------------------------------------------------------------------------------------------------------------|---------|-------|------|
| <br>Beehool Sarani Pans Co.                  |      | Southern Adish Gas Condensate Refinery Project |      |      |      | <br>Southern Adish Gas Condensate Refinery company |         |       |      |
| CONTRACT NO.:                                                                                                                     |      |                                                |      |      |      | SCALE: N/S                                                                                                                              |         |       |      |
| DRAWING TITLE:                                                                                                                    |      |                                                |      |      |      |                                                                                                                                         |         |       |      |
| Permanent Cathodic Protection Standard<br>Installation Detail for UG Piping<br>(Safe Type Positive and Negative Box–Glanded Type) |      |                                                |      |      |      |                                                                                                                                         |         |       |      |
| DWG NO.:                                                                                                                          | PROJ | PHASE                                          | AREA | DESC | TYPE | SEQ.                                                                                                                                    | SHT No. | CLASS | SIZE |
|                                                                                                                                   | SACR | DE                                             | GEN  | EL   | DWG  | 0151                                                                                                                                    | 16/27   | 1     | A3   |





NOTE

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- 3- FOR BOX COORDINATION PLEASE SEE GENERAL LAYOUT DRAWING.
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- 6- BOX SUPPORT SHALL BE HOT DIPPED GALVANIZED STEEL SUPPORT.
- 7- BOX ENCLOSURE SHALL BE MADE FROM 3mm CARBON STEEL AND PAINTED WITH THE FOLLOWING PROCEDURE:
- A) SURFACE PREPARATION TO Sa2 1/2.
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  - C) INTERMEDIATE COAT OF EPOXY (130-150 MICRON)
  - D) TOP COAT POLYURETHANE (50-70 MICRON) YELLOW COLOR PAINT TO BS 381C, NO.309.
- (TOTAL THICKNESS OF PAINTING 270 MICRONS AT LEAST)
- 8- ALTERNATIVE COATING SYSTEM CAN BE USED SUBJECT TO DESIGNER APPROVAL.
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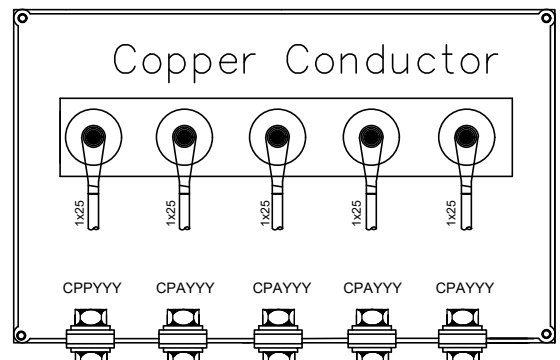
REFERENCE DRAWINGS

| DWG. NO. | TITLE |
|----------|-------|
|          |       |
|          |       |
|          |       |

|      |             |                    |          |          |          |          |
|------|-------------|--------------------|----------|----------|----------|----------|
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| REV. | DATE        | DESCRIPTION        | PREP. BY | CHKD. BY | APPD. BY | AUTH. BY |

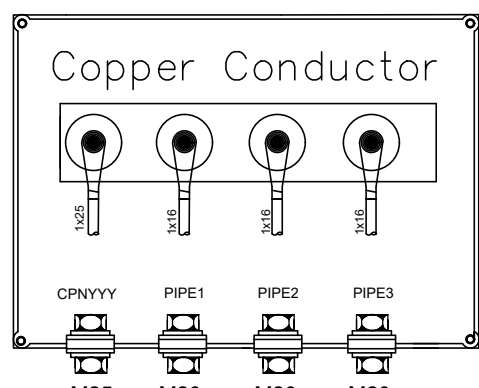
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|---------------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------|------|------|------|------|-----------------------------------------------------------------------------------------------------------------------------------------|-------|------|
| <br>Bechtel Saudi Plant Co.                      |      | Southern Adish Gas Condensate Refinery Project |      |      |      |      | <br>Southern Adish Gas Condensate Refinery company |       |      |
| CONTRACT NO.:                                                                                                                         |      |                                                |      |      |      |      | SCALE: N/S                                                                                                                              |       |      |
| DRAWING TITLE:                                                                                                                        |      |                                                |      |      |      |      |                                                                                                                                         |       |      |
| Permanent Cathodic Protection Standard<br>Installation Detail for UG Piping<br>(Safe Type Anode and Cathode Contact Box-Glanded type) |      |                                                |      |      |      |      |                                                                                                                                         |       |      |
| DWG NO.:                                                                                                                              | PROJ | PHASE                                          | AREA | DESC | TYPE | SEQ. | SHT No.                                                                                                                                 | CLASS | SIZE |
|                                                                                                                                       | SACR | DE                                             | GEN  | EL   | DWG  | 0151 | 17/27                                                                                                                                   | 1     | A3   |

XXX-CPJ-YYY



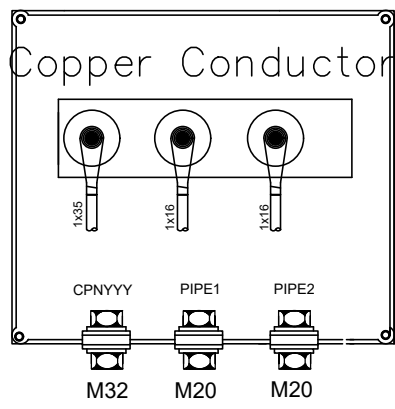
CPJT 6

XXX-CPO-YYY



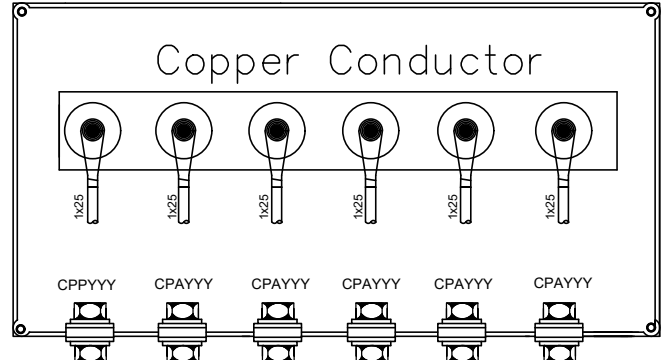
CPOT 5

XXX-CPO-YYY



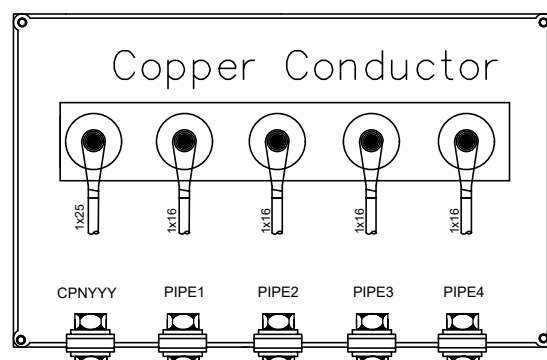
CPOT 9

XXX-CPJ-YYY



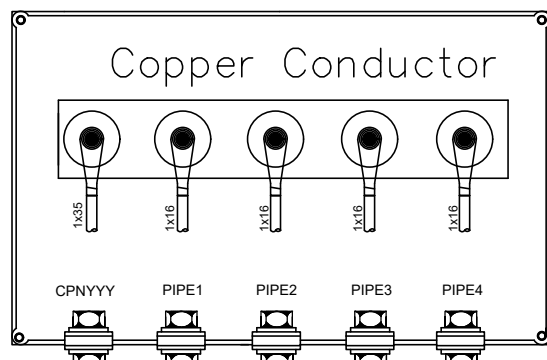
CPJT 7

XXX-CPO-YYY



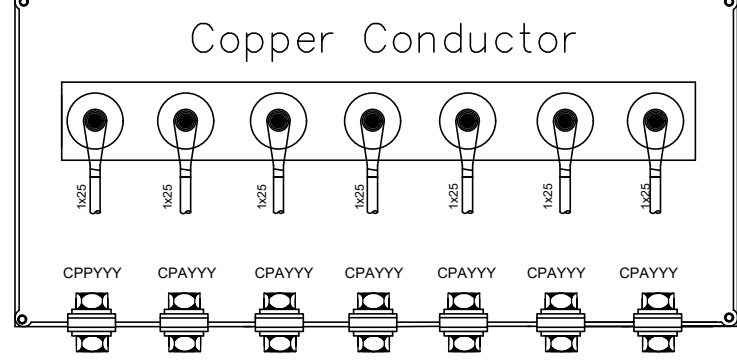
CPOT 6

XXX-CPO-YYY



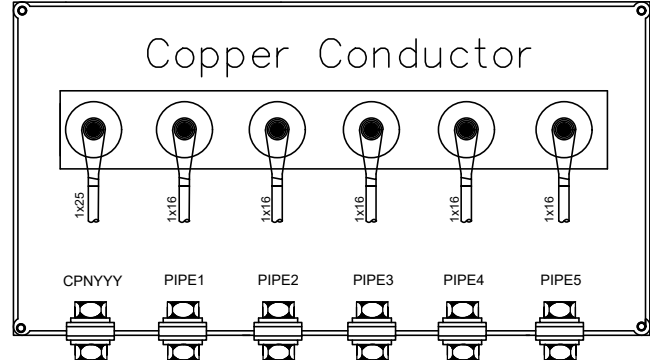
CPOT 10

XXX-CPJ-YYY



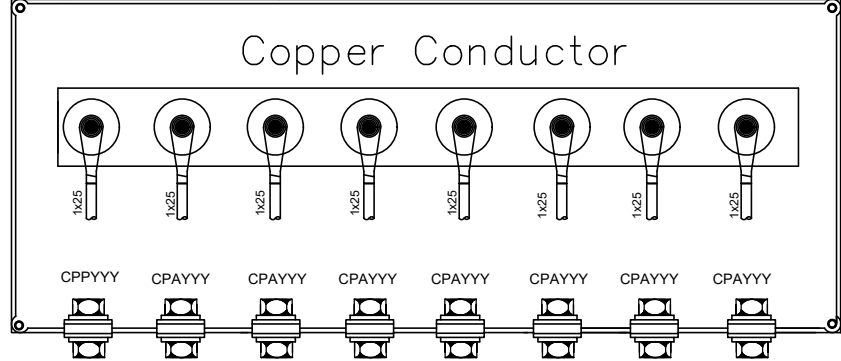
CPJT 8

XXX-CPO-YYY



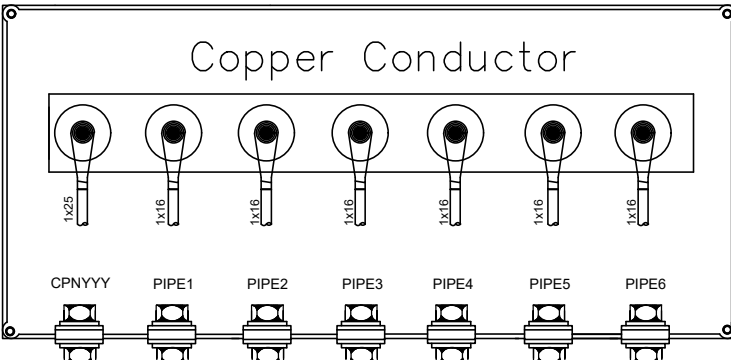
CPOT 7

XXX-CPJ-YYY



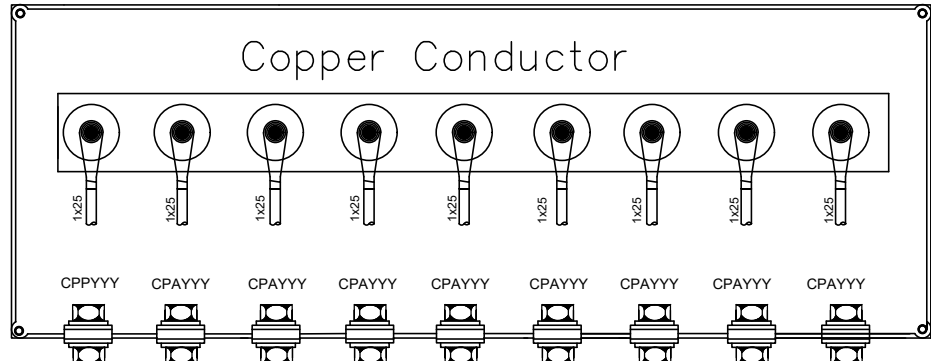
CPJT 9

XXX-CPO-YYY



CPOT 8

XXX-CPJ-YYY



CPJT 10

TAGGING PROCEDURE :

XXX-CPJ-YYY

XXX: UNIT TAG NUMBER

CPJ: ANODE CONTACT BOX

YYY: BOX SEQUENCE NUMBER

TAGGING PROCEDURE :

XXX-CPO-YYY

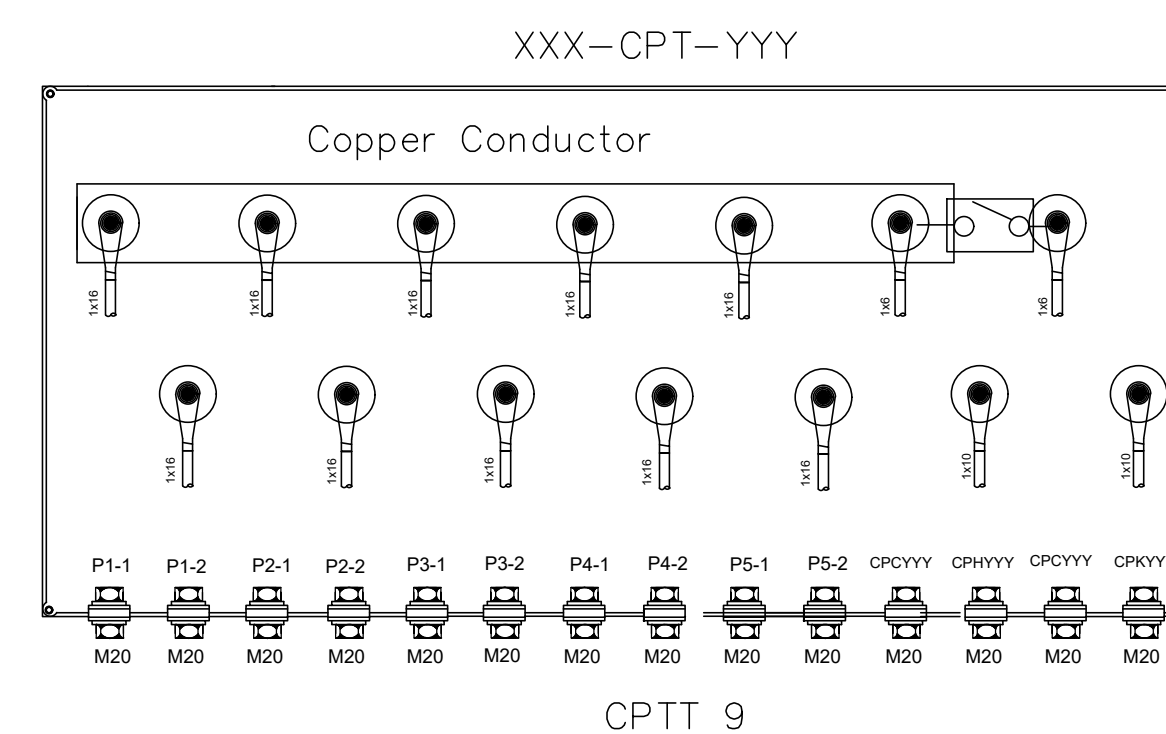
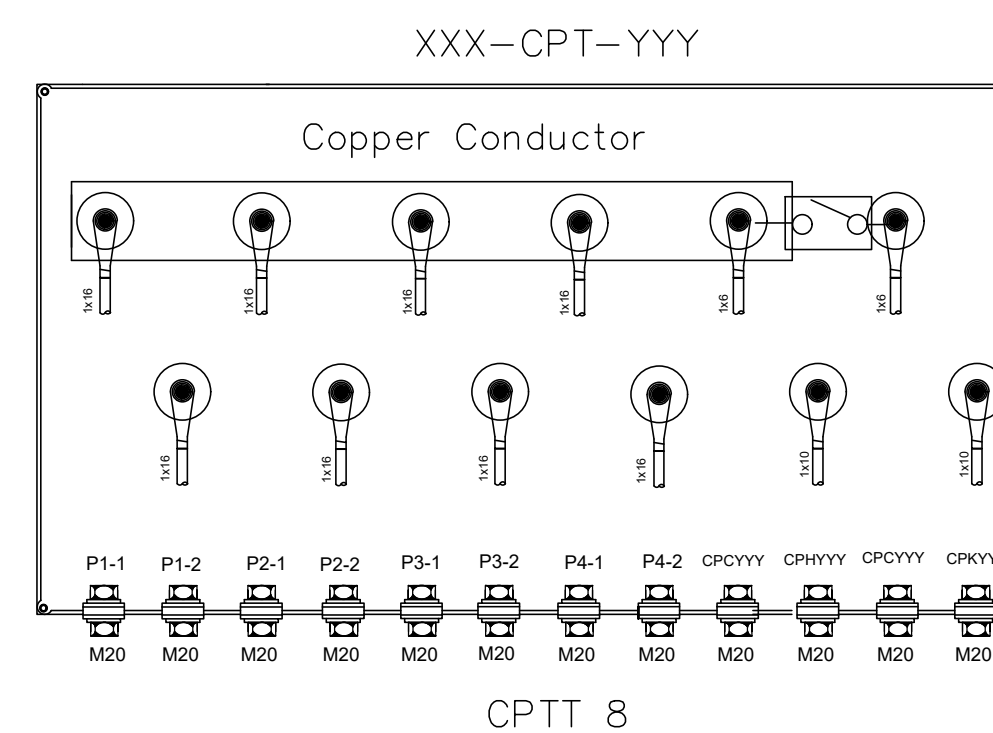
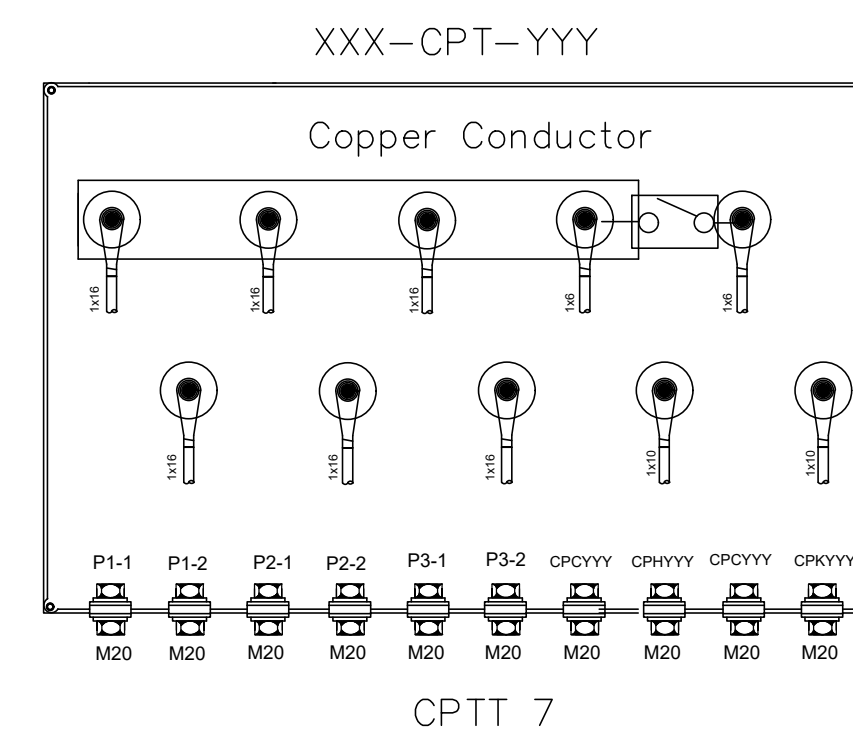
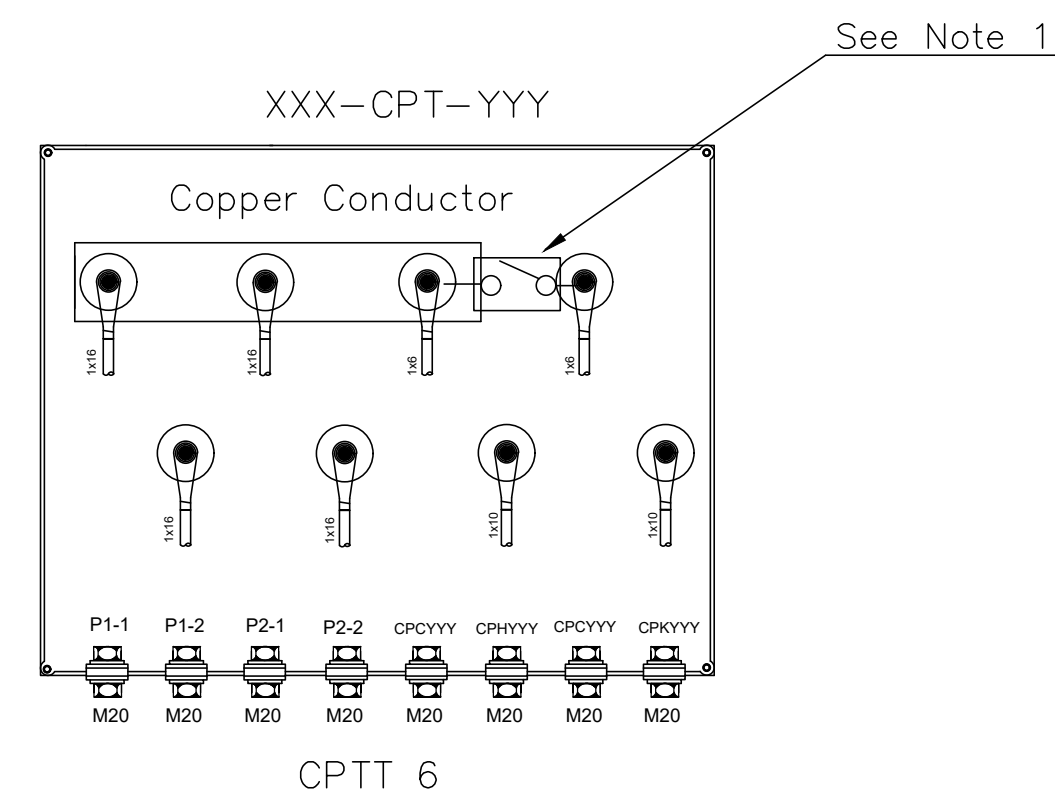
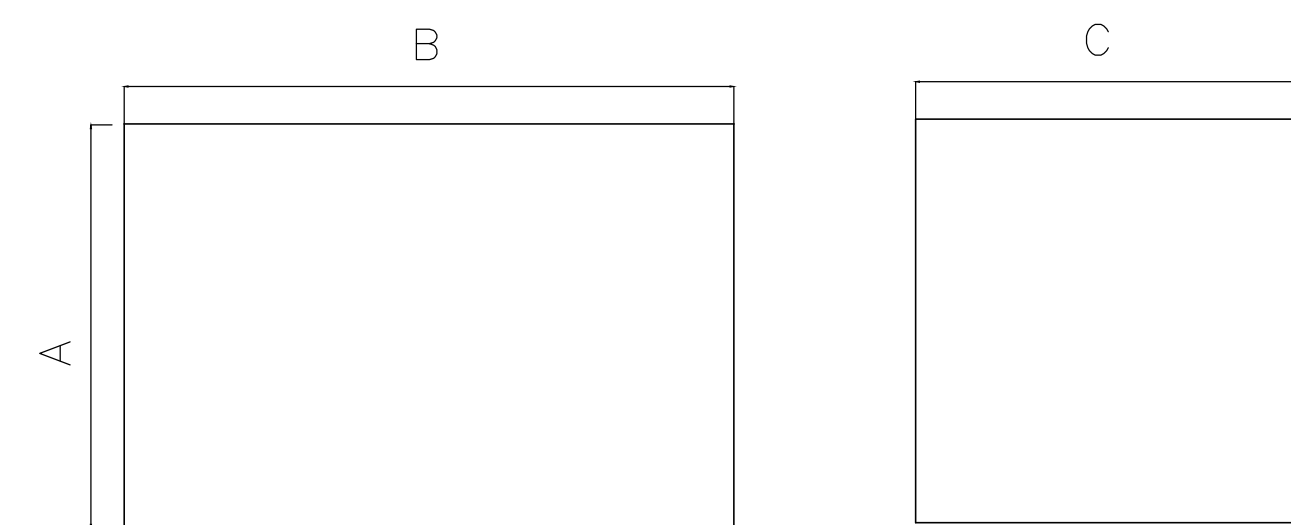
XXX: UNIT TAG NUMBER

CPO: CATHODE CONTACT BOX

YYY: BOX SEQUENCE NUMBER

CPD-28





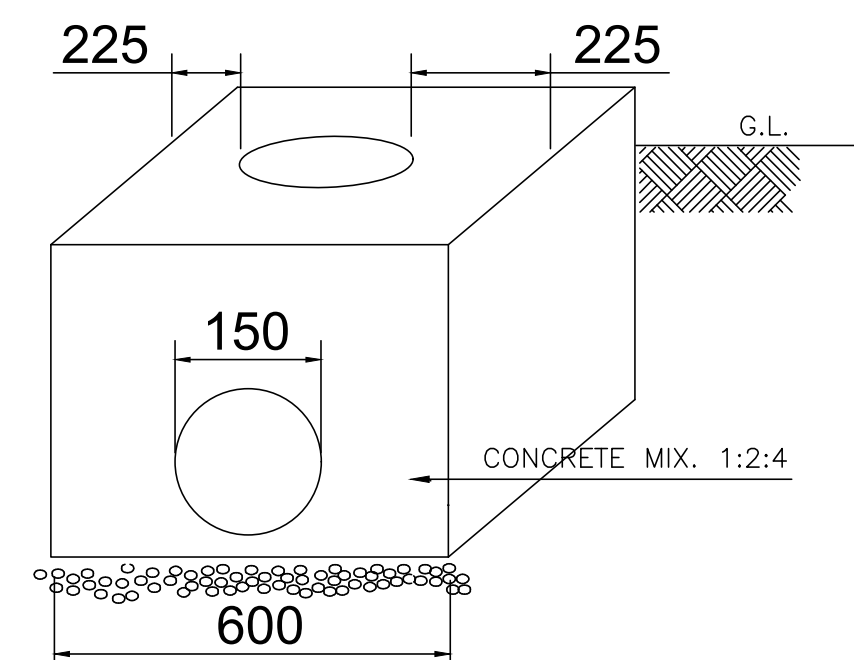
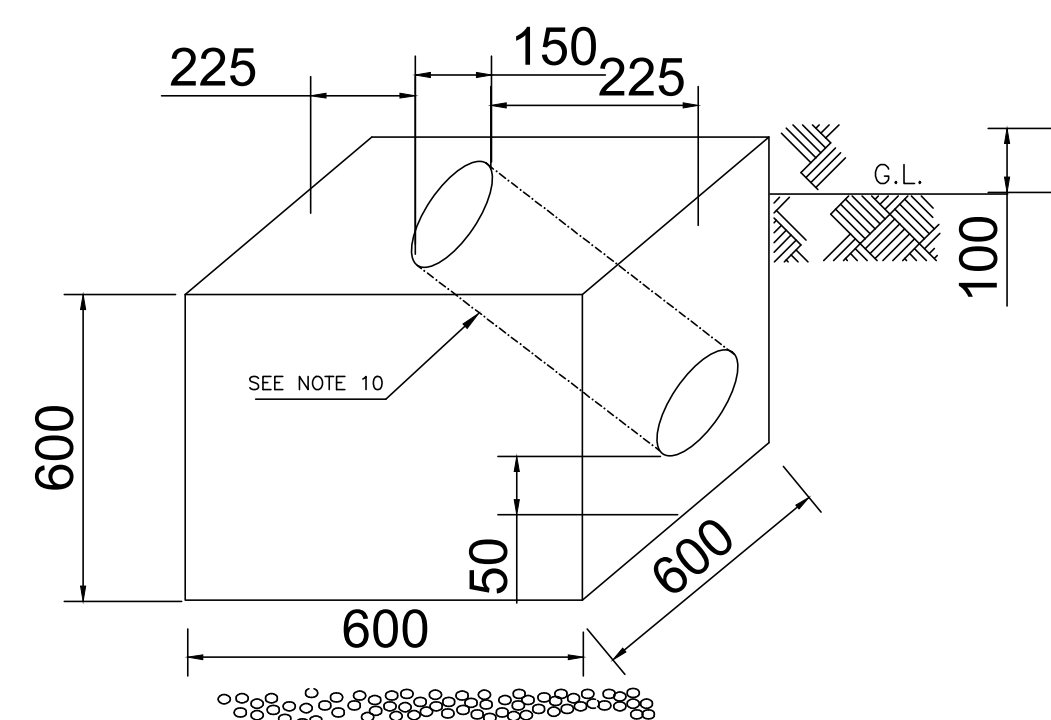
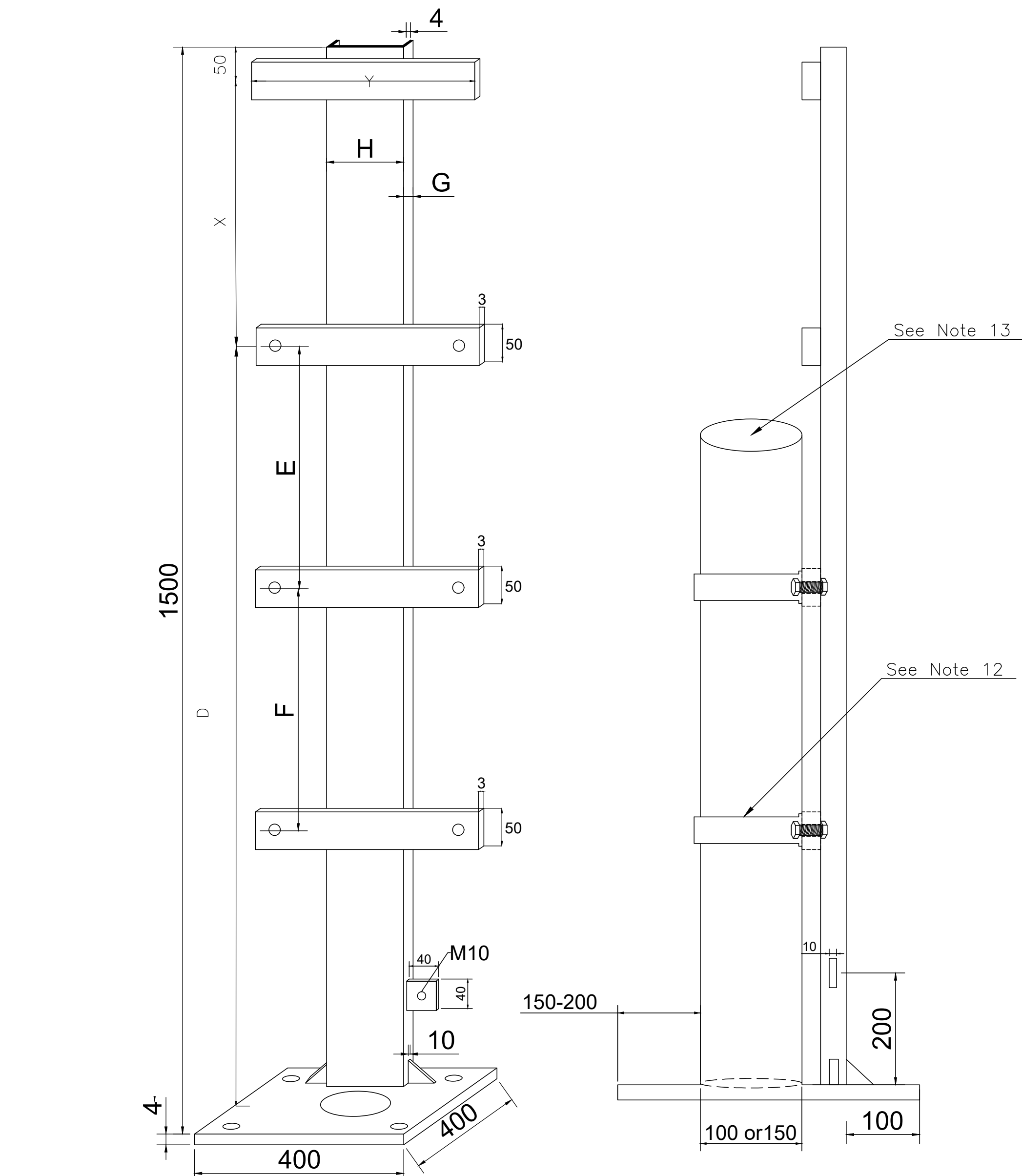
### TAGGING PROCEDURE :

XXX-CPT-YYY

XXX: UNIT TAG NUMBER

CPT: TEST BOND BOX

YYY: BOX SEQUENCE NUMBER



CPD-28

## NOTE

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## REFERENCE DRAWINGS

| DWG. NO. | TITLE |
|----------|-------|
|          |       |
|          |       |
|          |       |
|          |       |
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|      |             |                    |             |             |             |             |
|------|-------------|--------------------|-------------|-------------|-------------|-------------|
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| 03   | 31.Aug.2021 | FINAL ISSUE        | E.N         | F.S         | A.H         | A.A.H       |
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| 01   | 25.Dec.2019 | ISSUE FOR APPROVAL | E.N         | F.S         | A.H         | A.A.H       |
| 00   | 03.Dec.2019 | ISSUE FOR APPROVAL | E.N         | F.S         | A.H         | A.A.H       |
| REV. | DATE        | DESCRIPTION        | PREP.<br>BY | CHKD.<br>BY | APPD.<br>BY | AUTH.<br>BY |



Southern Adish Gas Condensate Refinery Project



Southern Adish Gas Condensate Refinery company

|               |  |            |
|---------------|--|------------|
| CONTRACT NO.: |  | SCALE: N/S |
|---------------|--|------------|

DRAWING TITLE:

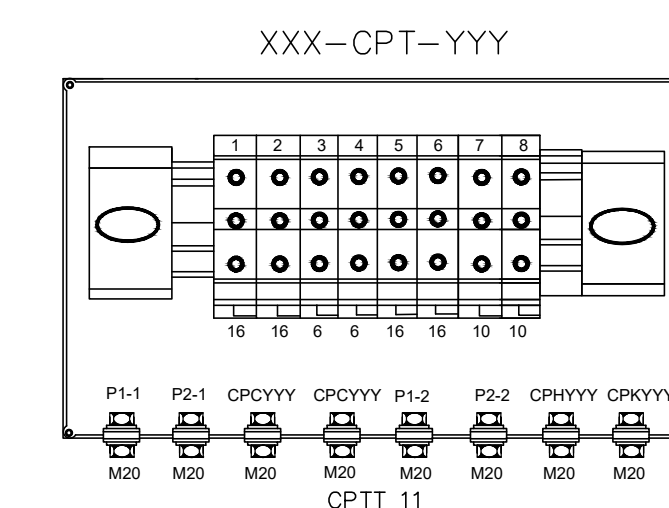
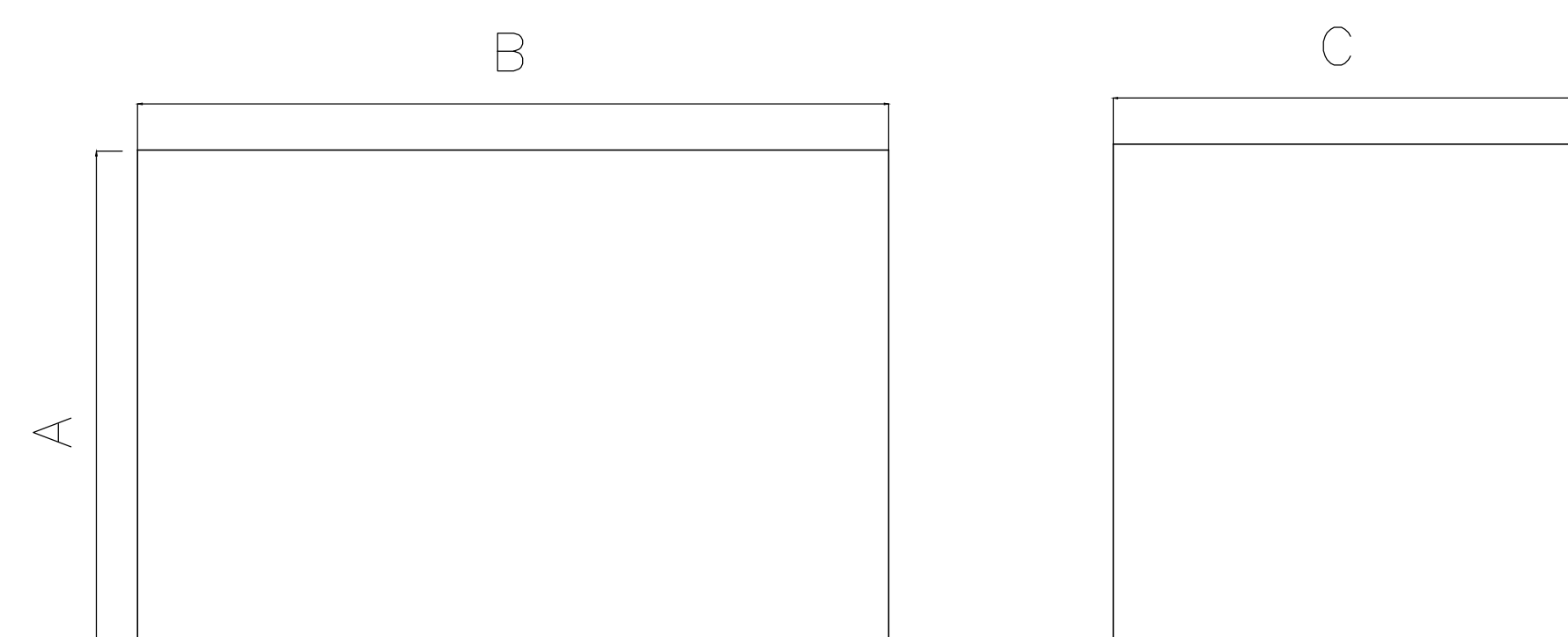
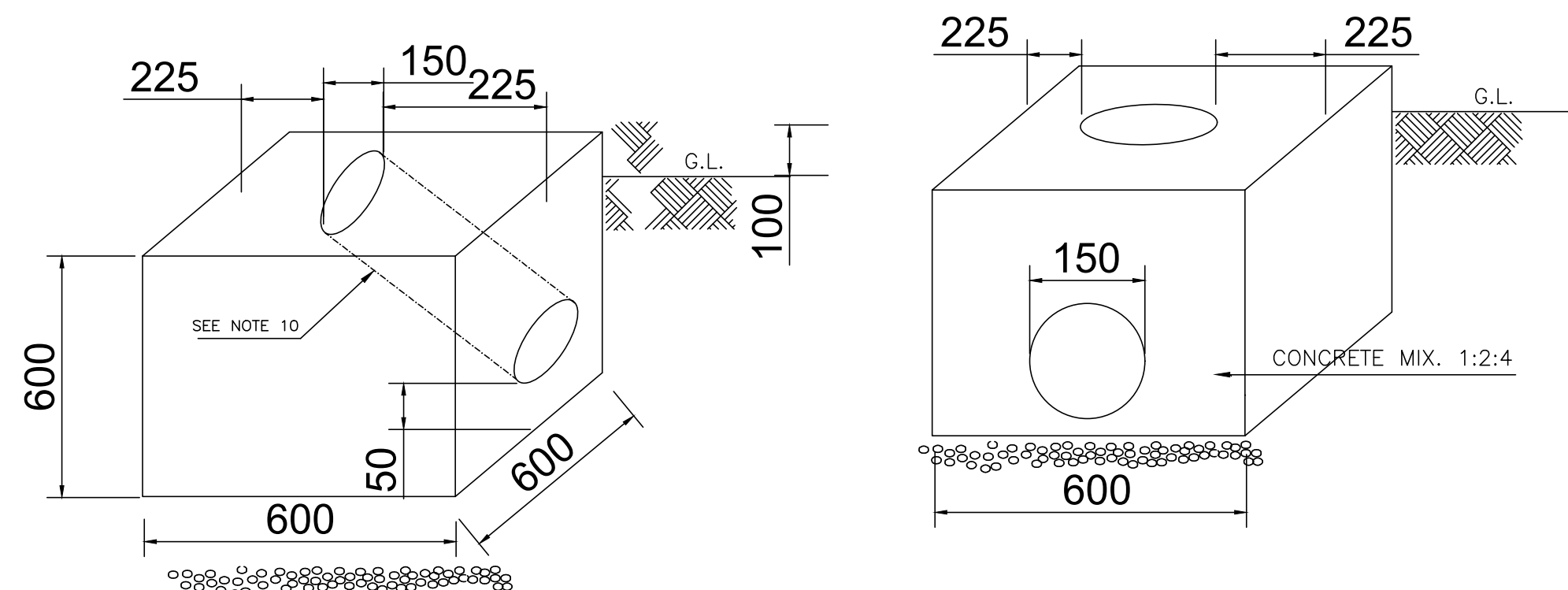
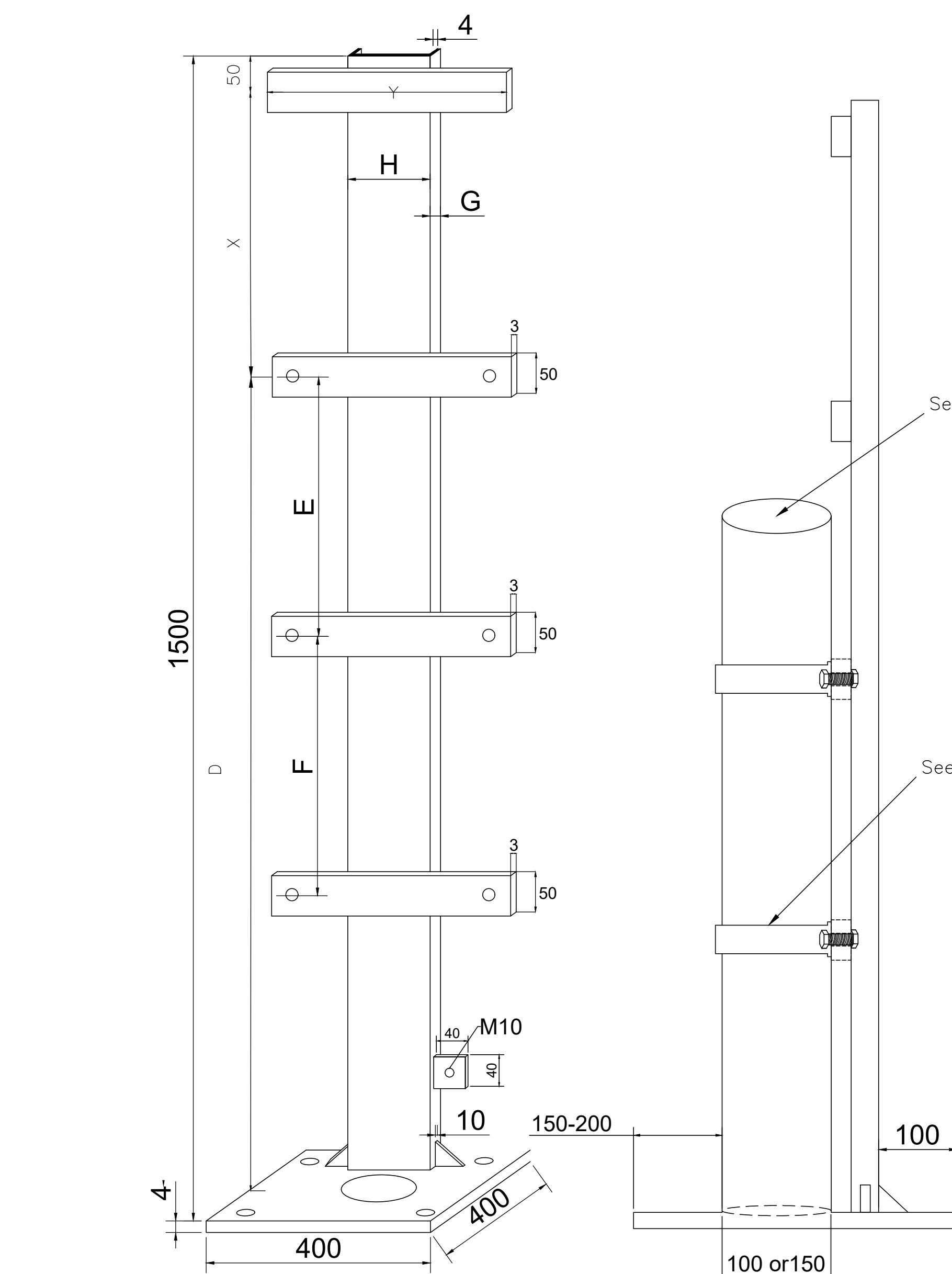
Permanent Cathodic Protection Standard  
Installation Detail for UG Piping  
(Safe Type Test Bond Box-Glanded Type)

|          |      |       |      |      |      |      |         |       |      |
|----------|------|-------|------|------|------|------|---------|-------|------|
| DWG NO.: | PROJ | PHASE | AREA | DESC | TYPE | SEQ. | SHT No. | CLASS | SIZE |
|          | SACR | DE    | GEN  | EL   | DWG  | 0151 | 18/27   | 1     | A3   |



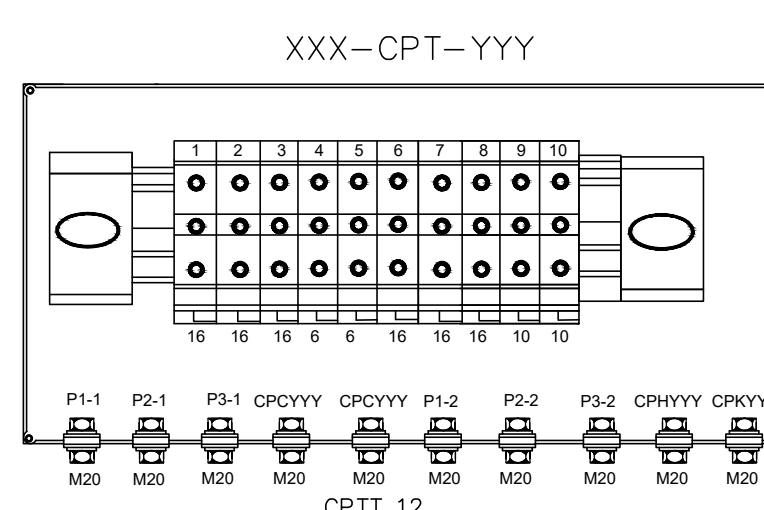






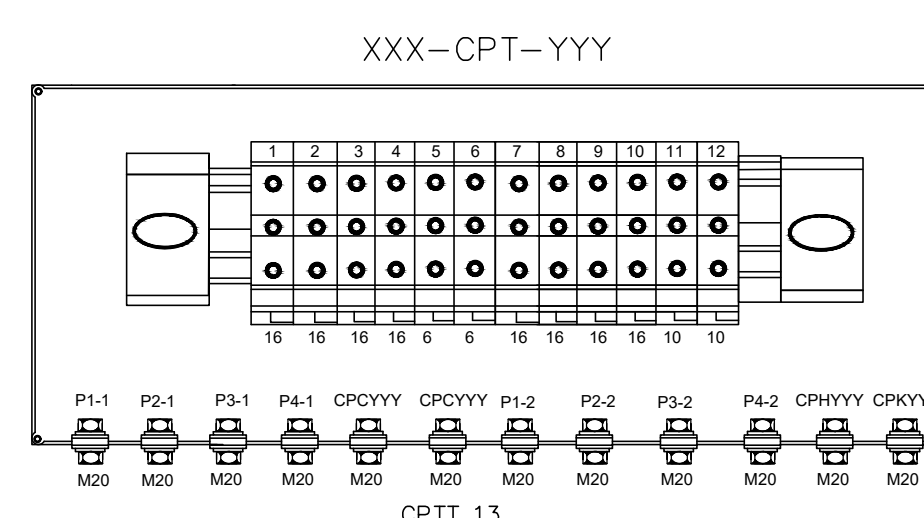
IMPORTANT NOTE

TERMINALS NO. 1 TO 2 SHALL BE ELECTRICALLY CONNECTED.  
FOR CONNECTION OF TERMINAL 2 TO 3 AN ELECTRICAL SWITCH SHALL  
BE CONSIDERED BY BOX MANUFACTURER.  
TERMINALS NO. 4-8 SHALL BE CONSIDERED SEPARATELY.



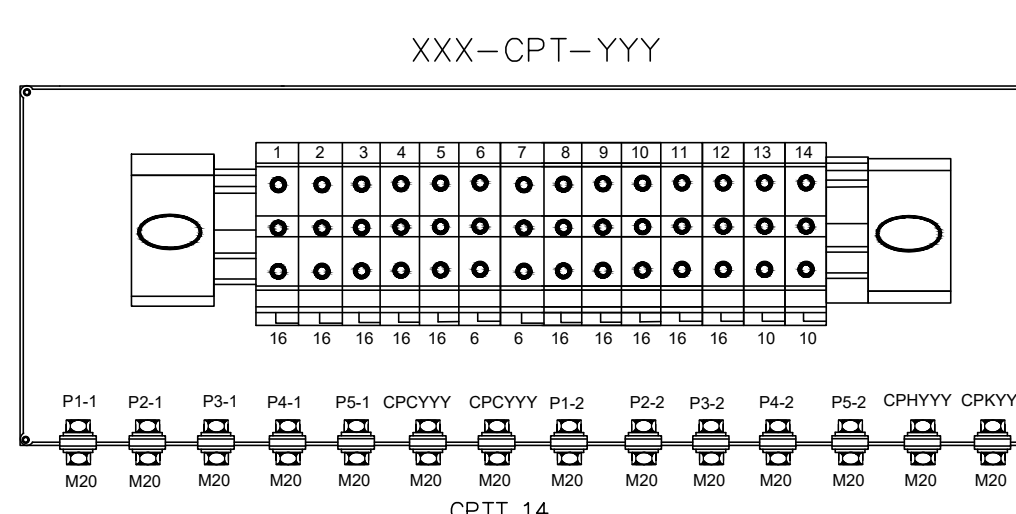
### IMPORTANT NOTE

TERMINALS NO. 1 TO 3 SHALL BE ELECTRICALLY CONNECTED.  
FOR CONNECTION OF TERMINAL 3 TO 4 AN ELECTRICAL SWITCH SHALL  
BE CONSIDERED BY BOX MANUFACTURER AND CAN SWITCH ON/OFF ON OTUT OF THE DOOR WITHOUT OPENING.  
TERMINALS NO. 5-10 SHALL BE CONSIDERED SEPARATE.



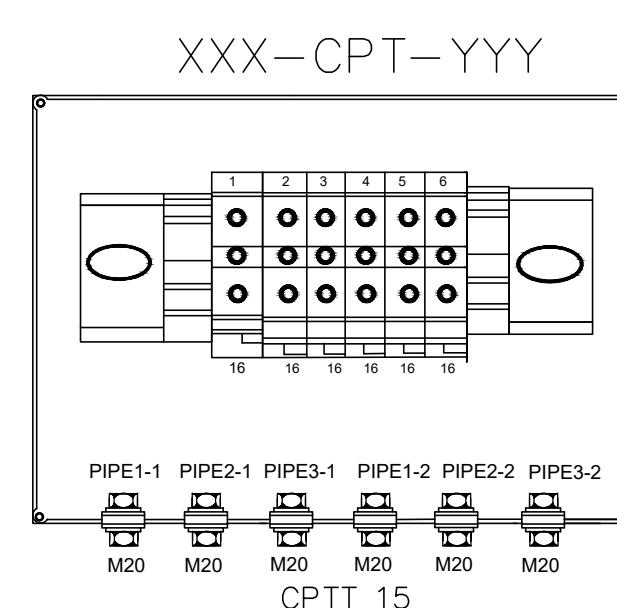
### IMPORTANT NOTE

TERMINALS NO. 1 TO 4 SHALL BE ELECTRICALLY CONNECTED.  
FOR CONNECTION OF TERMINAL 4 TO 5 AN ELECTRICAL SWITCH SHALL  
BE CONSIDERED BY BOX MANUFACTURER AND CAN SWITCH ON/OFF ON OTUT OF THE DOOR WITHOUT OPENING  
TERMINALS NO. 6-12 SHALL BE CONSIDERED SEPARATE.



IMPORTANT NOTE

TERMINALS NO. 1 TO 5 SHALL BE ELECTRICALLY CONNECTED.  
FOR CONNECTION OF TERMINAL 5 TO 6 AN ELECTRICAL SWITCH SHALL  
BE CONSIDERED BY BOX MANUFACTURER AND CAN SWITCH ON/OFF ON OTUT OF THE DOOR WITHOUT OPENING  
TERMINALS NO. 7-14 SHALL BE CONSIDERED SEPARATE.



IMPORTANT NOTE

TERMINALS NO. 1 TO 3 SHALL BE ELECTRICALLY CONNECTED.  
TERMINALS NO. 4-6 SHALL BE CONSIDERED SEPARATE.

### TAGGING PROCEDURE :

XXX-CPT-YYY

XXX: UNIT TAG NUMBER

CPT: TEST BOND BOX

YYY: BOX SEQUENCE NUMBER

## NOTE

- 1- DIMENSIONS A,B,C,D ARE AS PER MANUFACTURER PROPOSAL.
- 2- DIMENSIONS X AND Y ARE RELATED TO A AND B AND WILL BE FINALIZED WHEN BOX MANUFACTURING IS FINISHED.
- 3- FOR BOX COORDINATION PLEASE SEE GENERAL LAYOUT DRAWING.
- 4- ALL DIMENSION IS in mm.
- 5- BOX SUPPORT SHALL BE HOT DIPPED GALVANIZED STEEL SUPPORT.
- 6- All CABLES SHALL BE LAID THROUGH THE CONDUIT FROM FOUNDATION TO BOX.
- 8- H AND G SHALL BE SELECTED AS PER PIPE DIAMETER.
- 9-PIPE SHALL BE FIXED ON STAND BY SUITABLE NON METALIC BELT.
- 10-PIPE IS SEAMLESS HOT DIPPED GALVANIZED CARBON STEEL WITH DIAMETER OF 4" FOR BOX WITH MAXIMUM 7 ENTRIES AND 6" FOR MORE THAN 7 ENTRIES. ALSO PIPE THICKNESS IS MIN.4MM. LENGTH OF PIPE IS 800MM TO 900MM DEPENDS ON BOX HEIGHT.
- 11-ALL CABLES ARE ARMORED TYPE SO SUITABLE GLAND SHALL BE CONSIDERED BY MANUFACTURER . SUITABLE SHROUD CONSIDERING GLAND SIZE IS UNDER MANUFACTURER 'S RESPONSIBILITY.
- 12-ALL CABLES ARE ARMORED TYPE SO SUITABLE GLAND SHALL BE CONSIDERED BY MANUFACTURER . SUITABLE SHROUD CONSIDERING GLAND SIZE IS UNDER MANUFACTURER 'S RESPONSIBILITY. ANYHOW BOX MANUFACTURE SHALL REVIEW AND CONSIDER BOX LIST AND THEIR CABLE SPECIFICATION FOR GLAND TYPE AND SIZE SELECTION.

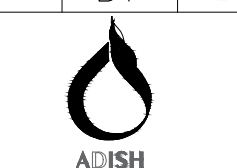
## REFERENCE DRAWINGS

| DWG. NO. | TITLE |
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|      |             |                    |             |             |             |             |
|------|-------------|--------------------|-------------|-------------|-------------|-------------|
| 06   | 12.Feb.2025 | FINAL ISSUE        | Y.J         | S.S         | A.H         | A.A.H       |
| 05   | 01Dec.2024  | FINAL ISSUE        | Y.J         | S.S         | A.H         | A.A.H       |
| 04   | 20.Nov.2021 | FINAL ISSUE        | E.N         | F.S         | A.H         | A.A.H       |
| 03   | 31.Aug.2021 | FINAL ISSUE        | E.N         | F.S         | A.H         | A.A.H       |
| 02   | 08.Fab.2020 | FINAL ISSUE        | E.N         | F.S         | A.H         | A.A.H       |
| 01   | 25.Dec.2019 | ISSUE FOR APPROVAL | E.N         | F.S         | A.H         | A.A.H       |
| 00   | 03.Dec.2019 | ISSUE FOR APPROVAL | E.N         | F.S         | A.H         | A.A.H       |
| REV. | DATE        | DESCRIPTION        | PREP.<br>BY | CHKD.<br>BY | APPD.<br>BY | AUTH.<br>BY |



Southern Adish Gas Condensate Refinery Project



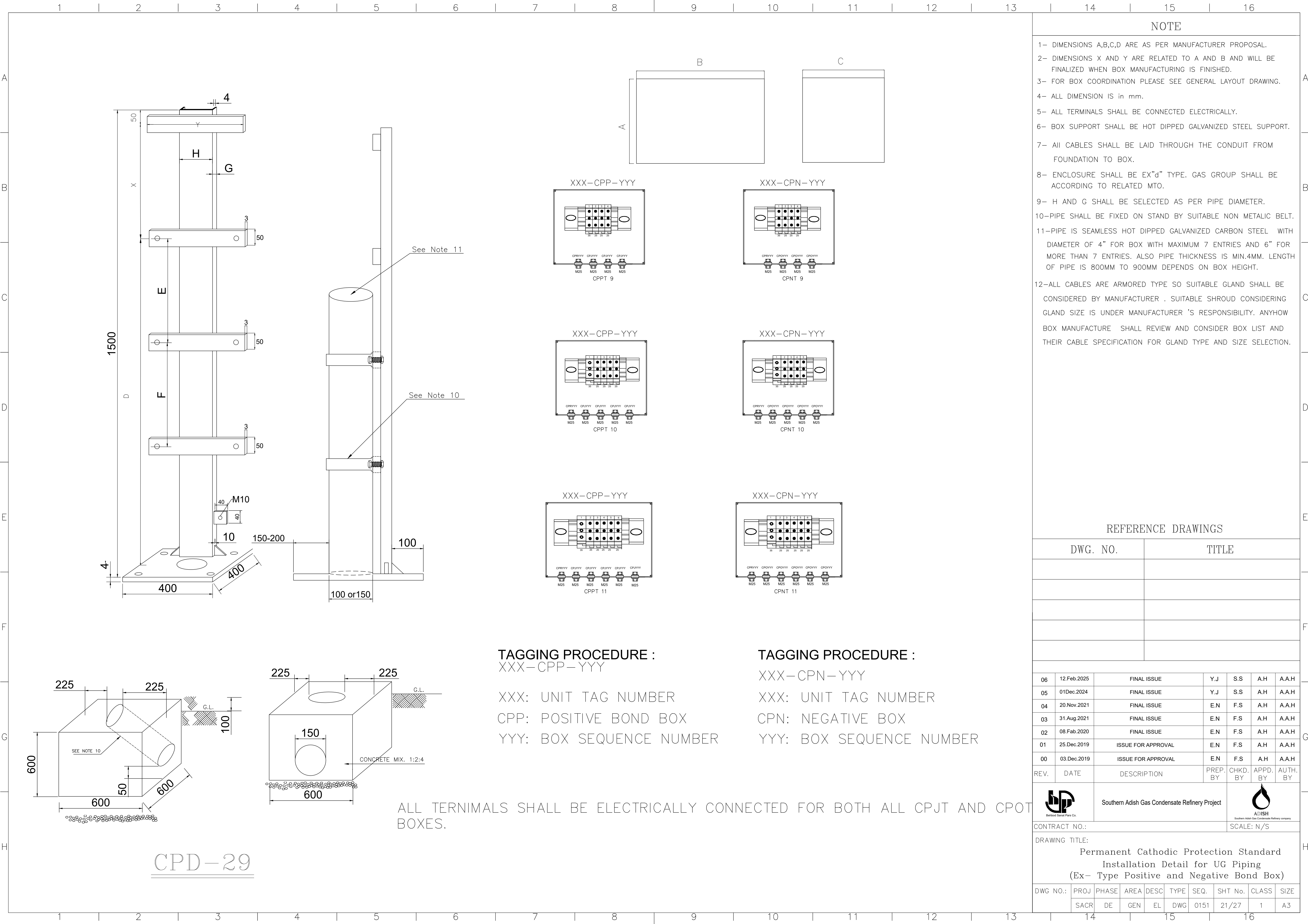
|               |  |                                                |
|---------------|--|------------------------------------------------|
|               |  | Southern Adish Gas Condensate Refinery company |
| CONTRACT NO.: |  | SCALE: N/S                                     |

DRAWING TITLE:

Permanent Cathodic Protection Standard  
Installation Detail for UG Piping  
(Ex- Type Test Bond Box)

|          |      |       |      |      |      |      |         |       |      |
|----------|------|-------|------|------|------|------|---------|-------|------|
| DWG NO.: | PROJ | PHASE | AREA | DESC | TYPE | SEQ. | SHT No. | CLASS | SIZE |
|          | SACR | DE    | GEN  | EL   | DWG  | 0151 | 20/27   | 1     | A3   |





NOTE

- 1- DIMENSIONS A,B,C,D ARE AS PER MANUFACTURER PROPOSAL.
- 2- DIMENSIONS X AND Y ARE RELATED TO A AND B AND WILL BE FINALIZED WHEN BOX MANUFACTURING IS FINISHED.
- 3- FOR BOX COORDINATION PLEASE SEE GENERAL LAYOUT DRAWING.
- 4- ALL DIMENSION IS in mm.
- 5- ALL TERMINALS SHALL BE CONNECTED ELECTRICALLY.
- 6- BOX SUPPORT SHALL BE HOT DIPPED GALVANIZED STEEL SUPPORT.
- 7- All CABLES SHALL BE LAID THROUGH THE CONDUIT FROM FOUNDATION TO BOX.
- 8- ENCLOSURE SHALL BE EX"d" TYPE. GAS GROUP SHALL BE ACCORDING TO RELATED MTO.
- 9- H AND G SHALL BE SELECTED AS PER PIPE DIAMETER.
- 10-PIPE SHALL BE FIXED ON STAND BY SUITABLE NON METALIC BELT.
- 11-PIPE IS SEAMLESS HOT DIPPED GALVANIZED CARBON STEEL WITH DIAMETER OF 4" FOR BOX WITH MAXIMUM 7 ENTRIES AND 6" FOR MORE THAN 7 ENTRIES. ALSO PIPE THICKNESS IS MIN.4MM. LENGTH OF PIPE IS 800MM TO 900MM DEPENDS ON BOX HEIGHT.
- 12-ALL CABLES ARE ARMORED TYPE SO SUITABLE GLAND SHALL BE CONSIDERED BY MANUFACTURER . SUITABLE SHROUD CONSIDERING GLAND SIZE IS UNDER MANUFACTURER 'S RESPONSIBILITY. ANYHOW BOX MANUFACTURE SHALL REVIEW AND CONSIDER BOX LIST AND THEIR CABLE SPECIFICATION FOR GLAND TYPE AND SIZE SELECTION.

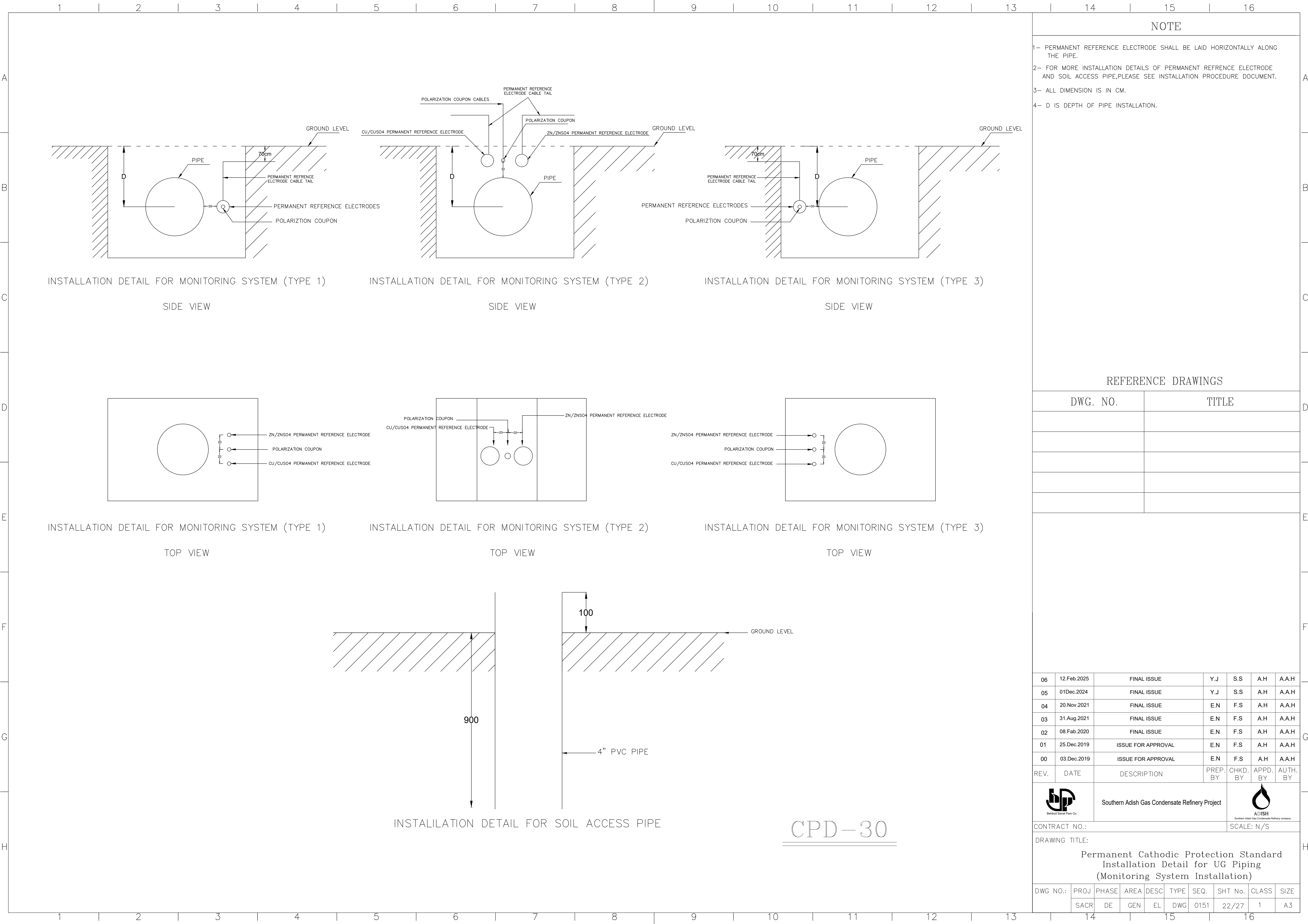
REFERENCE DRAWINGS

| DWG. NO. | TITLE |
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|------|-------------|--------------------|----------|----------|----------|----------|
| 06   | 12.Feb.2025 | FINAL ISSUE        | Y.J      | S.S      | A.H      | A.A.H    |
| 05   | 01Dec.2024  | FINAL ISSUE        | Y.J      | S.S      | A.H      | A.A.H    |
| 04   | 20.Nov.2021 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 03   | 31.Aug.2021 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 02   | 08.Fab.2020 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 01   | 25.Dec.2019 | ISSUE FOR APPROVAL | E.N      | F.S      | A.H      | A.A.H    |
| 00   | 03.Dec.2019 | ISSUE FOR APPROVAL | E.N      | F.S      | A.H      | A.A.H    |
| REV. | DATE        | DESCRIPTION        | PREP. BY | CHKD. BY | APPD. BY | AUTH. BY |

|                                                                                                                          |      |                                                |      |      |            |                                                                                                                                         |         |       |      |
|--------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------|------|------|------------|-----------------------------------------------------------------------------------------------------------------------------------------|---------|-------|------|
| <br>Behrood Serial Parts Co.        |      | Southern Adish Gas Condensate Refinery Project |      |      |            | <br>Southern Adish Gas Condensate Refinery company |         |       |      |
| CONTRACT NO.:                                                                                                            |      |                                                |      |      | SCALE: N/S |                                                                                                                                         |         |       |      |
| DRAWING TITLE:                                                                                                           |      |                                                |      |      |            |                                                                                                                                         |         |       |      |
| Permanent Cathodic Protection Standard<br>Installation Detail for UG Piping<br>(Ex- Type Positive and Negative Bond Box) |      |                                                |      |      |            |                                                                                                                                         |         |       |      |
| DWG NO.:                                                                                                                 | PROJ | PHASE                                          | AREA | DESC | TYPE       | SEQ.                                                                                                                                    | SHT No. | CLASS | SIZE |
|                                                                                                                          | SACR | DE                                             | GEN  | EL   | DWG        | 0151                                                                                                                                    | 21/27   | 1     | A3   |





NOTE

1- PERMANENT REFERENCE ELECTRODE SHALL BE LAID HORIZONTALLY ALONG THE PIPE.

2- FOR MORE INSTALLATION DETAILS OF PERMANENT REFERENCE ELECTRODE AND SOIL ACCESS PIPE,PLEASE SEE INSTALLATION PROCEDURE DOCUMENT.

3- ALL DIMENSION IS IN CM.

4- D IS DEPTH OF PIPE INSTALLATION.

REFERENCE DRAWINGS

| DWG. NO. | TITLE |
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|------|-------------|--------------------|----------|----------|----------|----------|
| 06   | 12.Feb.2025 | FINAL ISSUE        | Y.J      | S.S      | A.H      | A.A.H    |
| 05   | 01Dec.2024  | FINAL ISSUE        | Y.J      | S.S      | A.H      | A.A.H    |
| 04   | 20.Nov.2021 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 03   | 31.Aug.2021 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 02   | 08.Fab.2020 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 01   | 25.Dec.2019 | ISSUE FOR APPROVAL | E.N      | F.S      | A.H      | A.A.H    |
| 00   | 03.Dec.2019 | ISSUE FOR APPROVAL | E.N      | F.S      | A.H      | A.A.H    |
| REV. | DATE        | DESCRIPTION        | PREP. BY | CHKD. BY | APPD. BY | AUTH. BY |



Southern Adish Gas Condensate Refinery Project



ADISH  
Southern Adish Gas Condensate Refinery company

CONTRACT NO.:

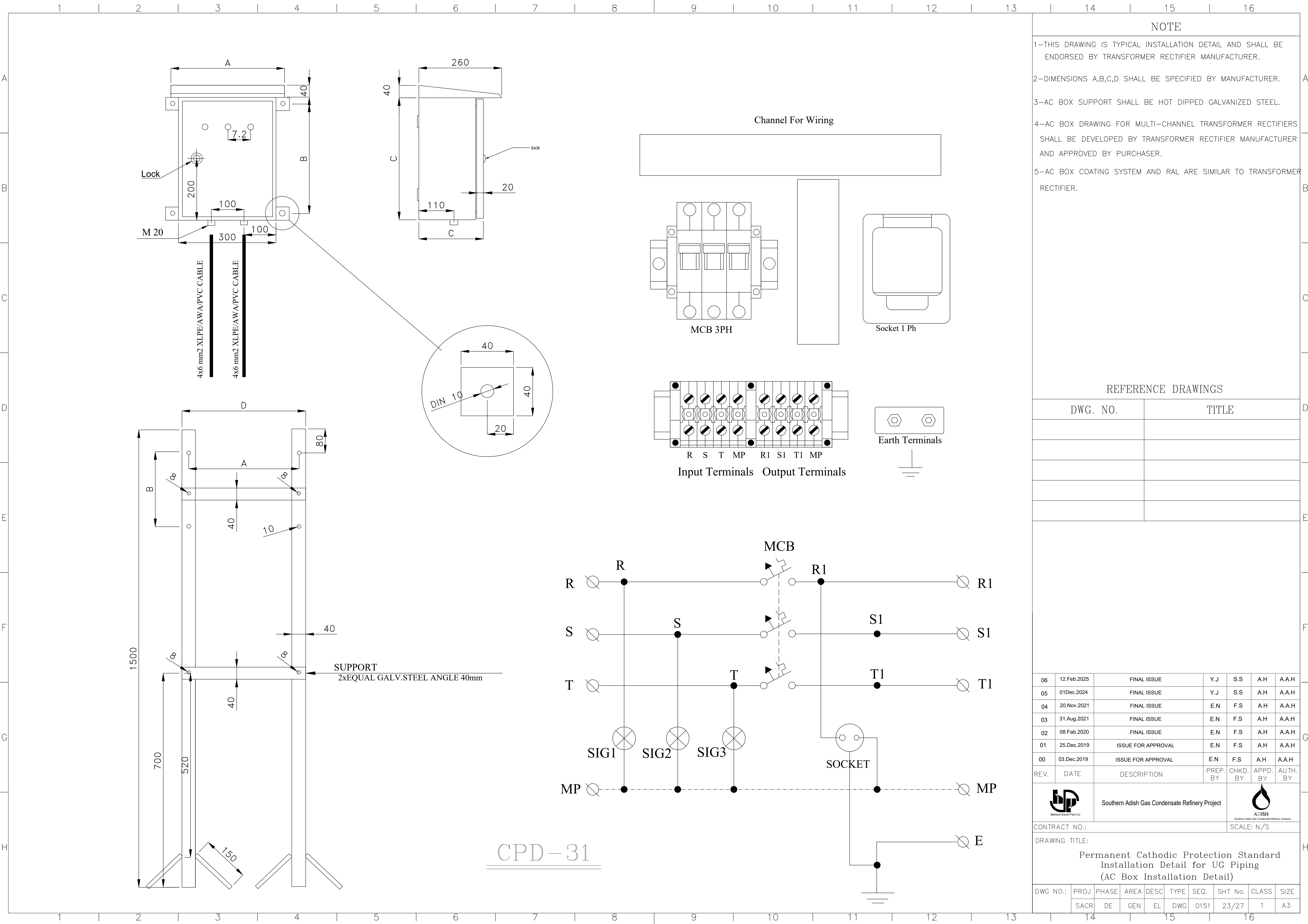
SCALE: N/S

DRAWING TITLE:

Permanent Cathodic Protection Standard  
Installation Detail for UG Piping  
(Monitoring System Installation)

|          |      |       |      |      |      |      |         |       |      |
|----------|------|-------|------|------|------|------|---------|-------|------|
| DWG NO.: | PROJ | PHASE | AREA | DESC | TYPE | SEQ. | SHT No. | CLASS | SIZE |
|          | SACR | DE    | GEN  | EL   | DWG  | 0151 | 22/27   | 1     | A3   |





NOTE

- 1-TTHIS DRAWING IS TYPICAL INSTALLATION DETAIL AND SHALL BE ENDORSED BY TRANSFORMER RECTIFIER MANUFACTURER.
- 2-DIMENSIONS A,B,C,D SHALL BE SPECIFIED BY MANUFACTURER.
- 3-AC BOX SUPPORT SHALL BE HOT DIPPED GALVANIZED STEEL.
- 4-AC BOX DRAWING FOR MULTI-CHANNEL TRANSFORMER RECTIFIERS SHALL BE DEVELOPED BY TRANSFORMER RECTIFIER MANUFACTURER AND APPROVED BY PURCHASER.
- 5-AC BOX COATING SYSTEM AND RAL ARE SIMILAR TO TRANSFORMER RECTIFIER.

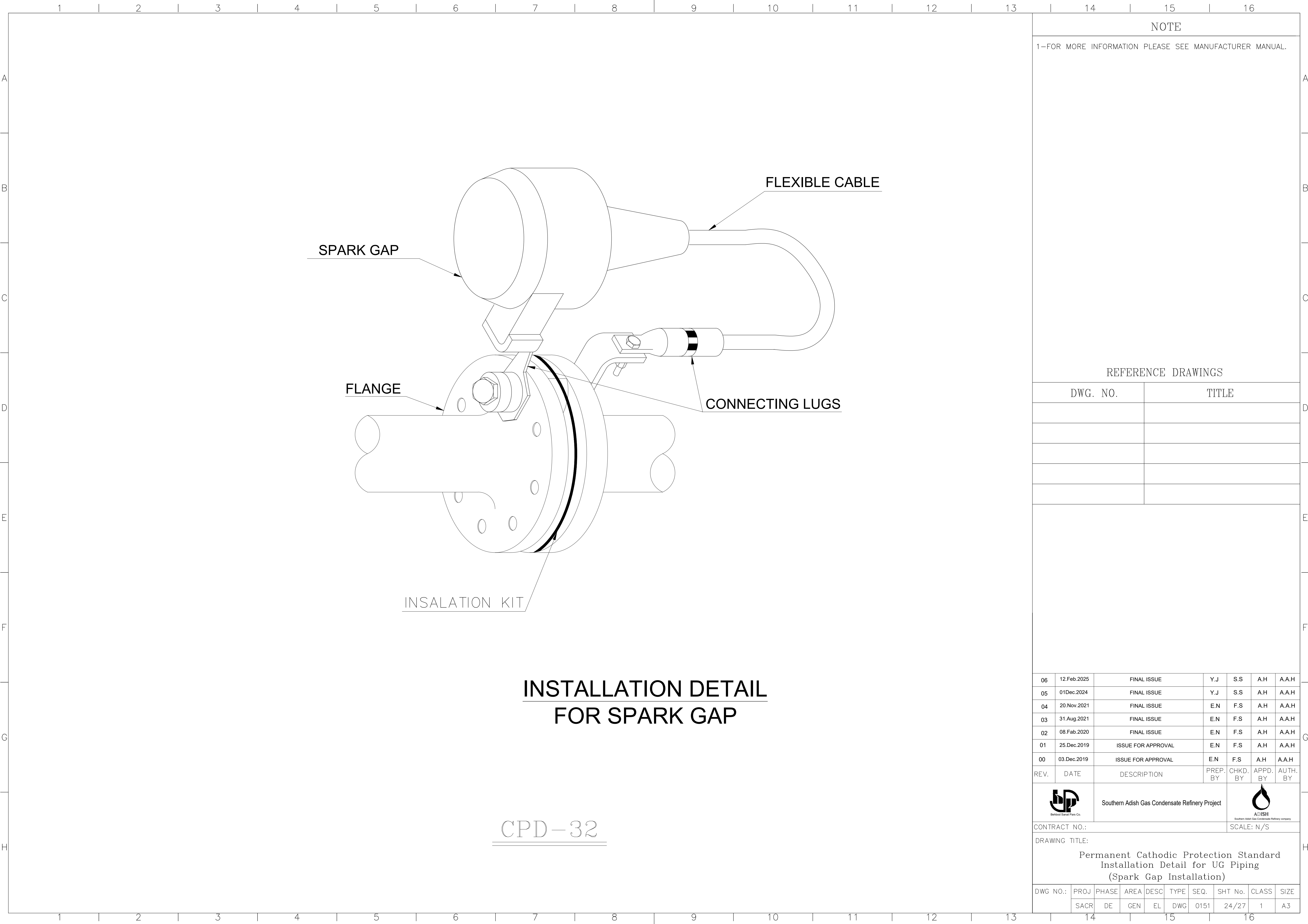
REFERENCE DRAWINGS

| DWG. NO. | TITLE |
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|------|-------------|--------------------|----------|----------|----------|----------|
| 06   | 12.Feb.2025 | FINAL ISSUE        | Y.J      | S.S      | A.H      | A.A.H    |
| 05   | 01Dec.2024  | FINAL ISSUE        | Y.J      | S.S      | A.H      | A.A.H    |
| 04   | 20.Nov.2021 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 03   | 31.Aug.2021 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 02   | 08.Fab.2020 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 01   | 25.Dec.2019 | ISSUE FOR APPROVAL | E.N      | F.S      | A.H      | A.A.H    |
| 00   | 03.Dec.2019 | ISSUE FOR APPROVAL | E.N      | F.S      | A.H      | A.A.H    |
| REV. | DATE        | DESCRIPTION        | PREP. BY | CHKD. BY | APPD. BY | AUTH. BY |

|                                                                                                                             |      |                                                |      |      |      |      |            |                                                                                                                                         |      |
|-----------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------|------|------|------|------|------------|-----------------------------------------------------------------------------------------------------------------------------------------|------|
| <br>Bechtel International Partners Co. |      | Southern Adish Gas Condensate Refinery Project |      |      |      |      |            | <br>Southern Adish Gas Condensate Refinery company |      |
| CONTRACT NO.:                                                                                                               |      |                                                |      |      |      |      | SCALE: N/S |                                                                                                                                         |      |
| DRAWING TITLE:                                                                                                              |      |                                                |      |      |      |      |            |                                                                                                                                         |      |
| Permanent Cathodic Protection Standard<br>Installation Detail for UG Piping<br>(AC Box Installation Detail)                 |      |                                                |      |      |      |      |            |                                                                                                                                         |      |
| DWG NO.:                                                                                                                    | PROJ | PHASE                                          | AREA | DESC | TYPE | SEQ. | SHT No.    | CLASS                                                                                                                                   | SIZE |
|                                                                                                                             | SACR | DE                                             | GEN  | EL   | DWG  | 0151 | 23/27      | 1                                                                                                                                       | A3   |





NOTE

1-FOR MORE INFORMATION PLEASE SEE MANUFACTURER MANUAL.

REFERENCE DRAWINGS

| DWG. NO. | TITLE |
|----------|-------|
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|------|-------------|--------------------|----------|----------|----------|----------|
| 06   | 12.Feb.2025 | FINAL ISSUE        | Y.J      | S.S      | A.H      | A.A.H    |
| 05   | 01Dec.2024  | FINAL ISSUE        | Y.J      | S.S      | A.H      | A.A.H    |
| 04   | 20.Nov.2021 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 03   | 31.Aug.2021 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 02   | 08.Fab.2020 | FINAL ISSUE        | E.N      | F.S      | A.H      | A.A.H    |
| 01   | 25.Dec.2019 | ISSUE FOR APPROVAL | E.N      | F.S      | A.H      | A.A.H    |
| 00   | 03.Dec.2019 | ISSUE FOR APPROVAL | E.N      | F.S      | A.H      | A.A.H    |
| REV. | DATE        | DESCRIPTION        | PREP. BY | CHKD. BY | APPD. BY | AUTH. BY |

Behrood Saraf Pars Co.

Southern Adish Gas Condensate Refinery Project

ADISH  
Southern Adish Gas Condensate Refinery company

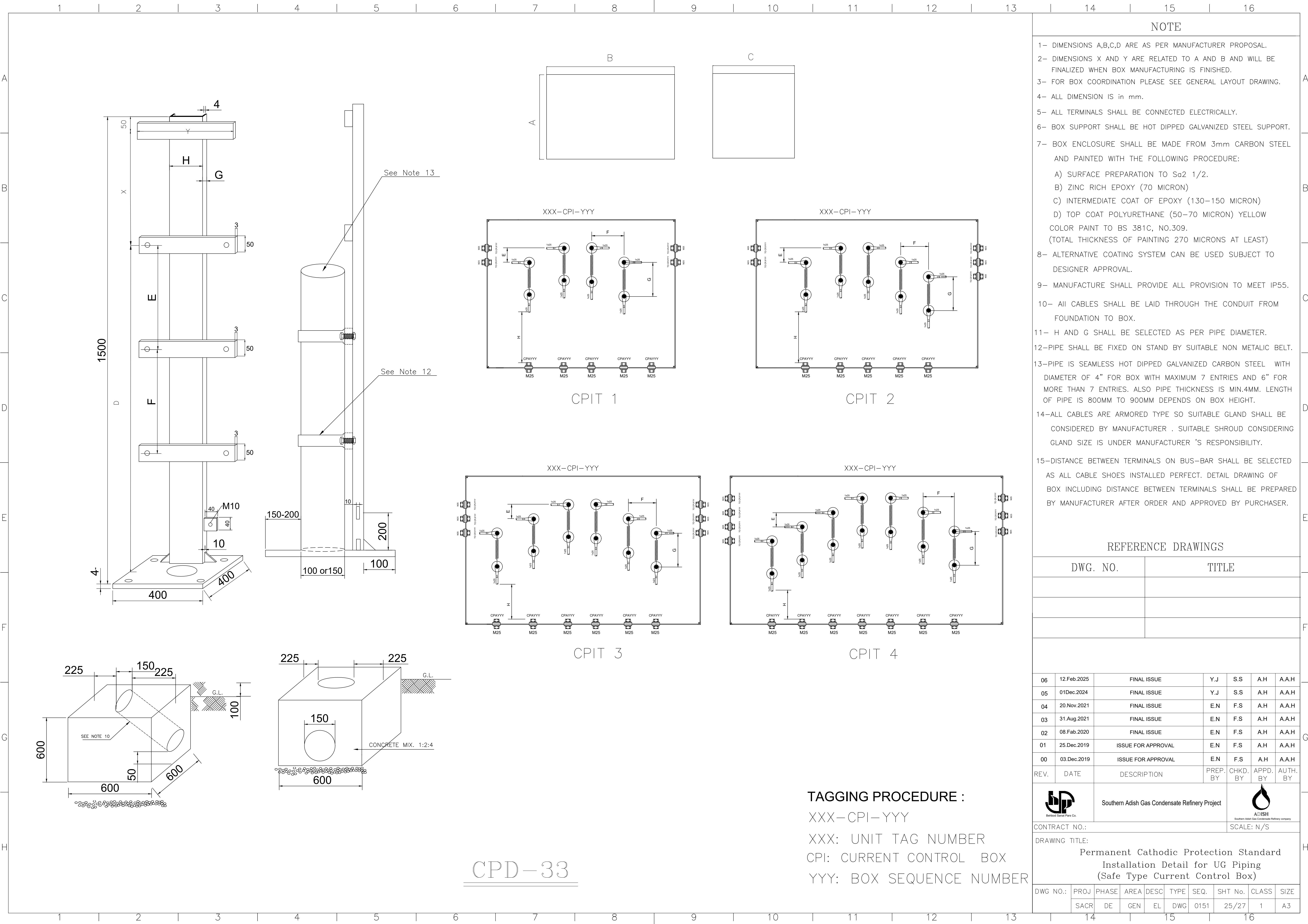
CONTRACT NO.:SCALE: N/S

DRAWING TITLE:

Permanent Cathodic Protection Standard  
Installation Detail for UG Piping  
(Spark Gap Installation)

| DWG NO.: | PROJ | PHASE | AREA | DESC | TYPE | SEQ. | SHT No. | CLASS | SIZE |
|----------|------|-------|------|------|------|------|---------|-------|------|
|          | SACR | DE    | GEN  | EL   | DWG  | 0151 | 24/27   | 1     | A3   |





NOTE

- 1- DIMENSIONS A,B,C,D ARE AS PER MANUFACTURER PROPOSAL.
- 2- DIMENSIONS X AND Y ARE RELATED TO A AND B AND WILL BE FINALIZED WHEN BOX MANUFACTURING IS FINISHED.
- 3- FOR BOX COORDINATION PLEASE SEE GENERAL LAYOUT DRAWING.
- 4- ALL DIMENSION IS in mm.
- 5- ALL TERMINALS SHALL BE CONNECTED ELECTRICALLY.
- 6- BOX SUPPORT SHALL BE HOT DIPPED GALVANIZED STEEL SUPPORT.
- 7- BOX ENCLOSURE SHALL BE MADE FROM 3mm CARBON STEEL AND PAINTED WITH THE FOLLOWING PROCEDURE:
- A) SURFACE PREPARATION TO Sa2 1/2.
- B) ZINC RICH EPOXY (70 MICRON)
- C) INTERMEDIATE COAT OF EPOXY (130-150 MICRON)
- D) TOP COAT POLYURETHANE (50-70 MICRON) YELLOW COLOR PAINT TO BS 381C, NO.309.
- (TOTAL THICKNESS OF PAINTING 270 MICRONS AT LEAST)
- 8- ALTERNATIVE COATING SYSTEM CAN BE USED SUBJECT TO DESIGNER APPROVAL.
- 9- MANUFACTURE SHALL PROVIDE ALL PROVISION TO MEET IP55.
- 10- All CABLES SHALL BE LAID THROUGH THE CONDUIT FROM FOUNDATION TO BOX.
- 11- H AND G SHALL BE SELECTED AS PER PIPE DIAMETER.
- 12-PIPE SHALL BE FIXED ON STAND BY SUITABLE NON METALIC BELT.
- 13-PIPE IS SEAMLESS HOT DIPPED GALVANIZED CARBON STEEL WITH DIAMETER OF 4" FOR BOX WITH MAXIMUM 7 ENTRIES AND 6" FOR MORE THAN 7 ENTRIES. ALSO PIPE THICKNESS IS MIN.4MM. LENGTH OF PIPE IS 800MM TO 900MM DEPENDS ON BOX HEIGHT.
- 14-ALL CABLES ARE ARMORED TYPE SO SUITABLE GLAND SHALL BE CONSIDERED BY MANUFACTURER . SUITABLE SHROUD CONSIDERING GLAND SIZE IS UNDER MANUFACTURER 'S RESPONSIBILITY.
- 15-DISTANCE BETWEEN TERMINALS ON BUS-BAR SHALL BE SELECTED AS ALL CABLE SHOES INSTALLED PERFECT. DETAIL DRAWING OF BOX INCLUDING DISTANCE BETWEEN TERMINALS SHALL BE PREPARED BY MANUFACTURER AFTER ORDER AND APPROVED BY PURCHASER.

REFERENCE DRAWINGS

| DWG. NO. | TITLE |
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|----|-------------|--------------------|-----|-----|-----|-------|
| 06 | 12.Feb.2025 | FINAL ISSUE        | Y.J | S.S | A.H | A.A.H |
| 05 | 01Dec.2024  | FINAL ISSUE        | Y.J | S.S | A.H | A.A.H |
| 04 | 20.Nov.2021 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 03 | 31.Aug.2021 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 02 | 08.Fab.2020 | FINAL ISSUE        | E.N | F.S | A.H | A.A.H |
| 01 | 25.Dec.2019 | ISSUE FOR APPROVAL | E.N | F.S | A.H | A.A.H |
| 00 | 03.Dec.2019 | ISSUE FOR APPROVAL | E.N | F.S | A.H | A.A.H |

| REV. | DATE | DESCRIPTION | PREP. BY | CHKD. BY | APPD. BY | AUTH. BY |
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|                                                                                       |                                                |                                                                                       |
|---------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------|
|  | Southern Adish Gas Condensate Refinery Project |  |
|---------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------|

CONTRACT NO.: SCALE: N/S

DRAWING TITLE:  
Permanent Cathodic Protection Standard  
Installation Detail for UG Piping  
(Safe Type Current Control Box)

| DWG NO.: | PROJ | PHASE | AREA | DESC | TYPE | SEQ. | SHT No. | CLASS | SIZE |
|----------|------|-------|------|------|------|------|---------|-------|------|
|          | SACR | DE    | GEN  | EL   | DWG  | 0151 | 25/27   | 1     | A3   |

TAGGING PROCEDURE :

XXX-CPI-YYY

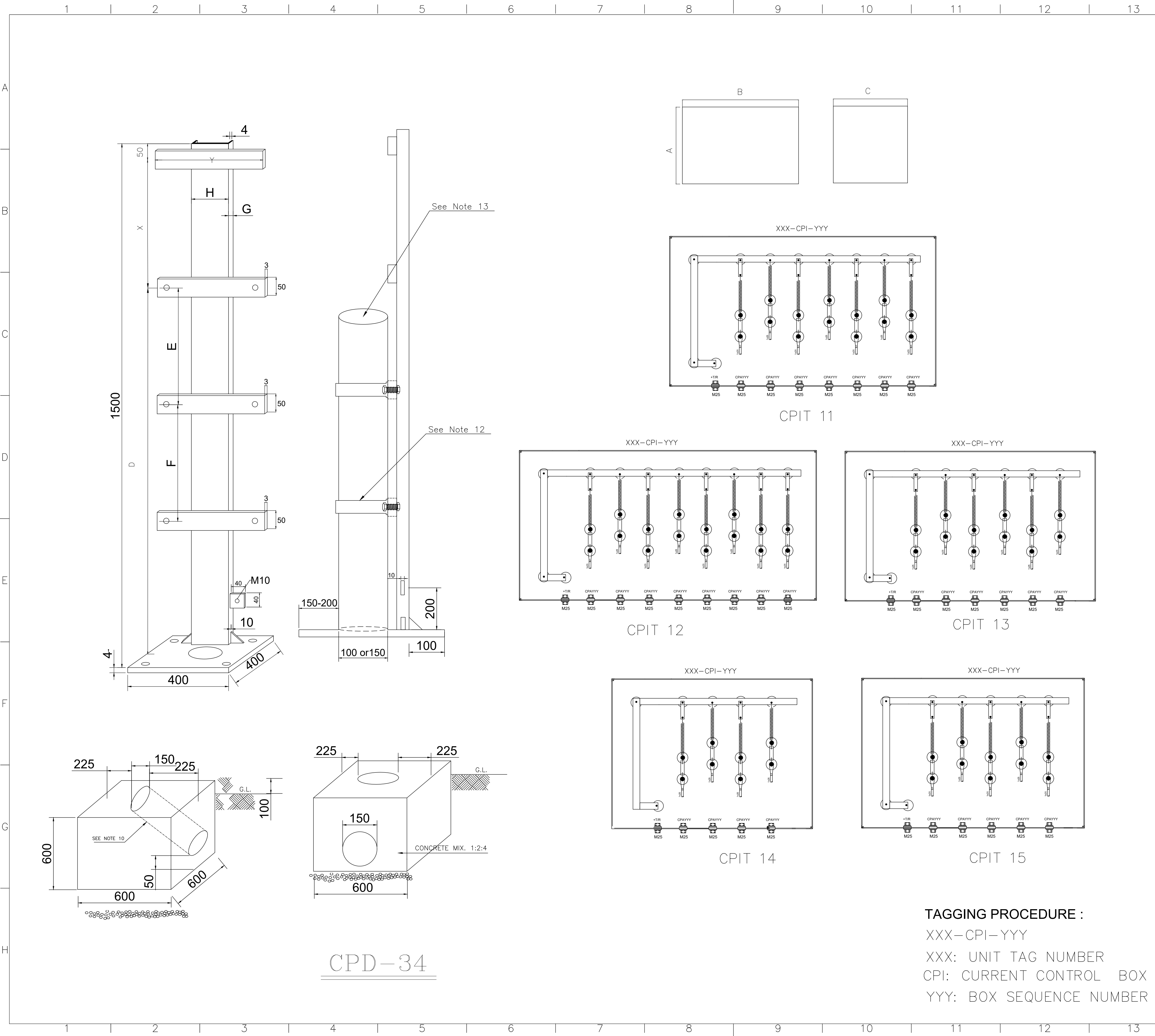
XXX: UNIT TAG NUMBER

CPI: CURRENT CONTROL BOX

YYY: BOX SEQUENCE NUMBER

CPD-33





|                                                                                                                                                                                                                                      |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------|------|----------|-----------------------------------------------------------------------------------------------------------------------------------------|----------|----------|-------|------|
|                                                                                                                                                                                                                                      | 14          |                                                | 15   |          | 16                                                                                                                                      |          |          |       |      |
| NOTE                                                                                                                                                                                                                                 |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| 1- DIMENSIONS A,B,C,D ARE AS PER MANUFACTURER PROPOSAL.                                                                                                                                                                              |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| 2- DIMENSIONS X AND Y ARE RELATED TO A AND B AND WILL BE FINALIZED WHEN BOX MANUFACTURING IS FINISHED.                                                                                                                               |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| 3- FOR BOX COORDINATION PLEASE SEE GENERAL LAYOUT DRAWING.                                                                                                                                                                           |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| 4- ALL DIMENSION IS in mm.                                                                                                                                                                                                           |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| 5- ALL TERMINALS SHALL BE CONNECTED ELECTRICALLY.                                                                                                                                                                                    |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| 6- BOX SUPPORT SHALL BE HOT DIPPED GALVANIZED STEEL SUPPORT.                                                                                                                                                                         |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| 7- BOX ENCLOSURE SHALL BE MADE FROM 3mm CARBON STEEL AND PAINTED WITH THE FOLLOWING PROCEDURE:                                                                                                                                       |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| A) SURFACE PREPARATION TO Sa2 1/2.                                                                                                                                                                                                   |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| B) ZINC RICH EPOXY (70 MICRON)                                                                                                                                                                                                       |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| C) INTERMEDIATE COAT OF EPOXY (130-150 MICRON)                                                                                                                                                                                       |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| D) TOP COAT POLYURETHANE (50-70 MICRON) YELLOW COLOR PAINT TO BS 381C, NO.309.                                                                                                                                                       |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| (TOTAL THICKNESS OF PAINTING 270 MICRONS AT LEAST)                                                                                                                                                                                   |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| 8- ALTERNATIVE COATING SYSTEM CAN BE USED SUBJECT TO DESIGNER APPROVAL.                                                                                                                                                              |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| 9- MANUFACTURE SHALL PROVIDE ALL PROVISION TO MEET IP55.                                                                                                                                                                             |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| 10- All CABLES SHALL BE LAID THROUGH THE CONDUIT FROM FOUNDATION TO BOX.                                                                                                                                                             |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| 11- H AND G SHALL BE SELECTED AS PER PIPE DIAMETER.                                                                                                                                                                                  |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| 12-PIPE SHALL BE FIXED ON STAND BY SUITABLE NON METALIC BELT.                                                                                                                                                                        |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| 13-PIPE IS SEAMLESS HOT DIPPED GALVANIZED CARBON STEEL WITH DIAMETER OF 4" FOR BOX WITH MAXIMUM 7 ENTRIES AND 6" FOR MORE THAN 7 ENTRIES. ALSO PIPE THICKNESS IS MIN.4MM. LENGTH OF PIPE IS 800MM TO 900MM DEPENDS ON BOX HEIGHT.    |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| 14-ALL CABLES ARE ARMORED TYPE SO SUITABLE GLAND SHALL BE CONSIDERED BY MANUFACTURER . SUITABLE SHROUD CONSIDERING GLAND SIZE IS UNDER MANUFACTURER 'S RESPONSIBILITY.                                                               |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| 15-DISTANCE BETWEEN TERMINALS ON BUS-BAR SHALL BE SELECTED AS ALL CABLE SHOES INSTALLED PERFECT. DETAIL DRAWING OF BOX INCLUDING DISTANCE BETWEEN TERMINALS SHALL BE PREPARED BY MANUFACTURER AFTER ORDER AND APPROVED BY PURCHASER. |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| REFERENCE DRAWINGS                                                                                                                                                                                                                   |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| DWG. NO.                                                                                                                                                                                                                             |             | TITLE                                          |      |          |                                                                                                                                         |          |          |       |      |
|                                                                                                                                                                                                                                      |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
|                                                                                                                                                                                                                                      |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
|                                                                                                                                                                                                                                      |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
|                                                                                                                                                                                                                                      |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| 06                                                                                                                                                                                                                                   | 12.Feb.2025 | FINAL ISSUE                                    |      | Y.J      | S.S                                                                                                                                     | A.H      | A.A.H    |       |      |
| 05                                                                                                                                                                                                                                   | 01Dec.2024  | FINAL ISSUE                                    |      | Y.J      | S.S                                                                                                                                     | A.H      | A.A.H    |       |      |
| 04                                                                                                                                                                                                                                   | 20.Nov.2021 | FINAL ISSUE                                    |      | E.N      | F.S                                                                                                                                     | A.H      | A.A.H    |       |      |
| 03                                                                                                                                                                                                                                   | 31.Aug.2021 | FINAL ISSUE                                    |      | E.N      | F.S                                                                                                                                     | A.H      | A.A.H    |       |      |
| 02                                                                                                                                                                                                                                   | 08.Fab.2020 | FINAL ISSUE                                    |      | E.N      | F.S                                                                                                                                     | A.H      | A.A.H    |       |      |
| 01                                                                                                                                                                                                                                   | 25.Dec.2019 | ISSUE FOR APPROVAL                             |      | E.N      | F.S                                                                                                                                     | A.H      | A.A.H    |       |      |
| 00                                                                                                                                                                                                                                   | 03.Dec.2019 | ISSUE FOR APPROVAL                             |      | E.N      | F.S                                                                                                                                     | A.H      | A.A.H    |       |      |
| REV.                                                                                                                                                                                                                                 | DATE        | DESCRIPTION                                    |      | PREP. BY | CHKD. BY                                                                                                                                | APPD. BY | AUTH. BY |       |      |
|                                                                                                                                                 |             | Southern Adish Gas Condensate Refinery Project |      |          | <br>Southern Adish Gas Condensate Refinery company |          |          |       |      |
| CONTRACT NO.:                                                                                                                                                                                                                        |             |                                                |      |          | SCALE: N/S                                                                                                                              |          |          |       |      |
| DRAWING TITLE:                                                                                                                                                                                                                       |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| Permanent Cathodic Protection Standard<br>Installation Detail for UG Piping<br>(Safe Type Current Control Box)                                                                                                                       |             |                                                |      |          |                                                                                                                                         |          |          |       |      |
| DWG NO.:                                                                                                                                                                                                                             | PROJ        | PHASE                                          | AREA | DESC     | TYPE                                                                                                                                    | SEQ.     | SHT No.  | CLASS | SIZE |
|                                                                                                                                                                                                                                      | SACR        | DE                                             | GEN  | EL       | DWG                                                                                                                                     | 0151     | 26/27    | 1     | A3   |
|                                                                                                                                                                                                                                      | 14          |                                                | 15   |          | 16                                                                                                                                      |          |          |       |      |



