

2024 UNDERGROUND FIELD MAINTENANCE ONLY

Historical Record: 3/22/2024
External Version



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ATTENTION:

- The contents held within this book are for field maintenance only. Every effort should be made, when possible, to upgrade to current standards.
- Due to the age of the documentation, this book is not a 100% search-able currently. This may be resolved later.

IF YOU HAVE ANY QUESTIONS REGARDING THE CONTENT OF THESE MANUALS, PLEASE EMAIL
CONSTRUCTIONSTANDARDSADMINISTRATORS@SEMPRAUTILITIES.COM OR CONTACT:

SUMMARY OF CHANGES

| DATE | STANDARD PAGES | FILE NAME |
|-------------|--|--------------------|
| 04/30/19 | New Format Release | UGFMO2019v0430.pdf |
| 05/23/19 | 3000, 3112, 4700, 4800 | UGFMO2019v0523.pdf |
| 06/13/19 | No Updates | UGFMO2019v0613.pdf |
| 07/15/19 | No Updates | UGFMO2019v0715.pdf |
| 07/18/19 | Moved Legacy FMO files into the book | UGFMO2019v0718.pdf |
| 08/19/19 | 4301, 4306, 4308 | UGFMO2019v0819.pdf |
| 09/20/19 | No Updates | UGFMO2019v0920.pdf |
| 10/25/19 | Legacy Standards: 3000, 3100, 3400, 3600, 3700, 4100, 4200 | UGFMO2019v1025.pdf |
| 12/20/19 | 4101, 4181, 4198 | UGFMO2019v1220.pdf |
| 01/24/20 | COVER PAGE | UGFMO2020v0124.pdf |
| 04/24/20 | 4201, 4287 | UGFMO2020v0424.pdf |
| 05/22/20 | INTERNAL SERVER UPGRADE | UGFMO2020v0522.pdf |
| 06/19/20 | 4101, 4110 | UGFMO2020v0619.pdf |
| 07/24/20 | 4401, 4411 | UGFMO2020v0724.pdf |
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| 10/23/20 | 3701, 3720, 4101, 4111 | UGFMO2020v1023.pdf |
| 01/22/21 | COVER PAGE, DISCLAIMER | UGFMO2021v0122.pdf |
| 06/25/21 | 3701, 3703 | UGFMO2021v0625.pdf |
| 08/20/21 | 4201, 4230 | UGFMO2021v0820.pdf |
| 12/17/21 | 3501, 3523, 4101, 4122, 4183 | UGFMO2021v1217.pdf |
| 01/21/22 | Cover Page | UGFMO2022v0121.pdf |
| 02/25/22 | 4101, 4113, 4301, 4305, 4307, 4308, 4401 | UGFMO2022v0225.pdf |
| 10/14/22 | 3501, 3525 | UGFMO2022v1014.pdf |
| 01/20/23 | COVER PAGE, DISCLAIMER, 3301, 3313 | UGFMO2023v0120.pdf |
| 02/24/23 | UGL3599.207 | UGFMO2023v0224.pdf |
| 03/24/23 | 4601, 4641 | UGFMO2023v0324.pdf |
| 04/21/23 | 4701, 4702 | UGFMO2023v0421.pdf |
| 05/19/23 | 3301, 3383 | UGFMO2023v0519.pdf |
| 08/25/23 | 4401, 4410 | UGFMO2023v0825.pdf |
| 09/22/23 | 4800 | UGFMO2023v0922.pdf |
| 10/20/23 | 3301, 3312 | UGFMO2023v1020.pdf |
| 02/23/24 | COVER PAGE, 4305 | UGFMO2024v0223.pdf |
| 03/22/24 | 3401, 3417, 4307 | UGFMO2024v0322.pdf |
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ARCHIVED BOOKS AVAILABLE ON THE INTERNAL VERSION

3000 - GENERAL
INFORMATION

3000 - GENERAL
INFORMATION

PAGE

SUBJECT

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| C | | | | | | F | | | | | |
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| A | ORIGINAL ISSUE | JKI | JES | CZH | 5/23/2019 | D | | | | | |

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| SHEET 1 OF 1 | Indicates Latest Revision | Completely Revised | <input checked="" type="checkbox"/> | New Page | Information Removed | FMO UG3000 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
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3100 - PRACTICES

3100 - PRACTICES

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3103

DISTRIBUTION STATION NUMBERING

3112

GFMS SUMMARY OPERATING MAP SYMBOL TABLE

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| SHEET 1 OF 1 | <input checked="" type="checkbox"/> Indicates Latest Revision | <input type="checkbox"/> Completely Revised | <input type="checkbox"/> New Page | <input type="checkbox"/> Information Removed | FMO OH 3101 |
| | SDG&E UNDERGROUND CONSTRUCTION STANDARD | | | | |
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3200 -
IDENTIFICATION

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| 3212 | TRANSFORMER AND FUSE IDENTIFICATION |
| 3222 | LINE FAULT INDICATOR TAGS LOCATION IDENTIFICATION |
| 3241 | SOIL GAS MITIGATION WARNING DECAL |

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3300 -
SUBSTRUCTURES /
CONDUITS

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| 3312 | HANDHOLE - 3312 |
| 3313 | 3313 NON-TRAFFIC RELATED ELECTRIC DISTRIBUTION HANDHOLE PRECAST CONCRETE |
| 3322 | MANHOLE - 6' X 10' X 7' |
| 3372 | CONDUIT SIZING FOR UNDERGROUND CABLES |
| 3378 | CONDUIT INSTALLATION IN CELL BRIDGES |
| 3383 | CONDUIT SPLICING INSTALLATION FOR CABLE-IN-CONDUIT (PID & SIDA) |
| 3384 | SOIL GASMITIGATION |

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|-----|----------------|-----|-----|-----|-----|------------|-----|---------------------|-----|-----|-----|-----|------|
| C | 3383 UPDATE | ARC | ADW | JES | KRG | 05/08/2023 | F | | | | | | |
| B | 3313 UPDATE | ARC | ADW | JES | KRG | 01/16/2023 | E | | | | | | |
| A | ORIGINAL ISSUE | - | JS | TR | MDJ | 7/25/2016 | D | UG3312 MOVED TO FMO | EDM | EJA | EJA | KRG | |

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| SHEET 1 OF 1 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG3301 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | SUBSTRUCTURES, CONDUIT FMO TABLE OF CONTENTS | | | | |

UG3312 FIELD MAINTENANCE ONLY

ALL VERSIONS LISTED IN FMO ARE SUPERSEDED BY THEIR CURRENT VERSION FOUND INSIDE THE UNDERGROUND CONSTRUCTION STANDARD MANUAL.

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | HANDHOLE-CONCRETE (INSIDE DIMENSIONS - 17" X 30") | | | | |

SCOPE: THIS STANDARD SHOWS THE INSTALLATION AND MATERIAL REQUIREMENTS FOR A 3312 HANDHOLE.

ATTENTION:

* THE 3312 IS FOR LIKE IN-KIND REPLACEMENT **ONLY**. IF SPACE IS AVAILABLE, A 3309.1 OR 2 SHOULD BE USED TO REPLACE THEM. THE 3309.1&2 IS THE PREFERRED BOX FOR PARKWAY SECONDARY INSTALLATIONS.

** THE 3312 WILL STILL BE THE BOX USED FOR UNDER PAD APPLICATION AT THIS TIME.

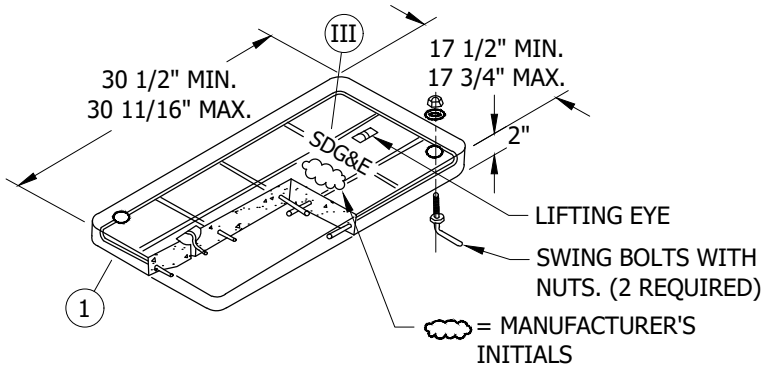


FIGURE 1
CONCRETE PARKWAY COVER (II)
3312 HANDHOLE

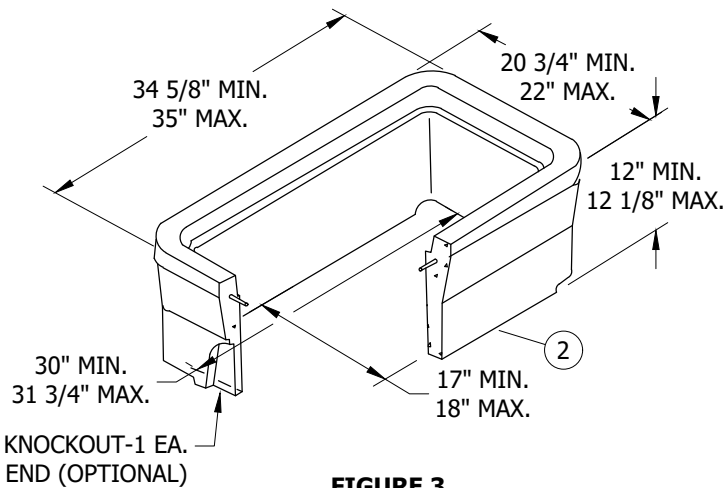


FIGURE 3
BODY
3312 HANDHOLE

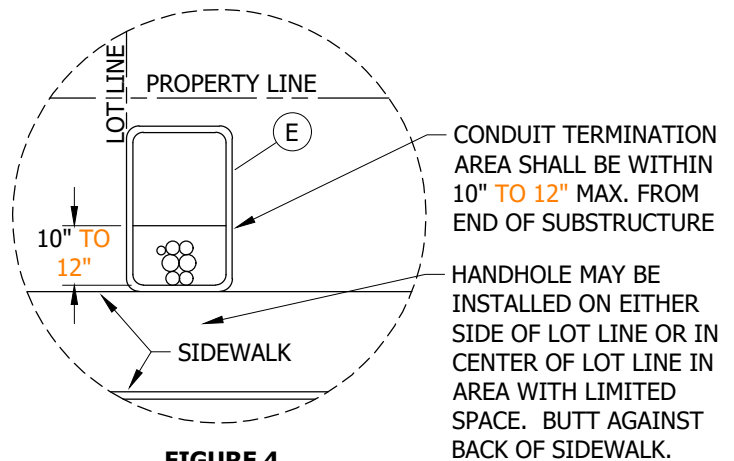


FIGURE 4
TYPICAL PLAN VIEW

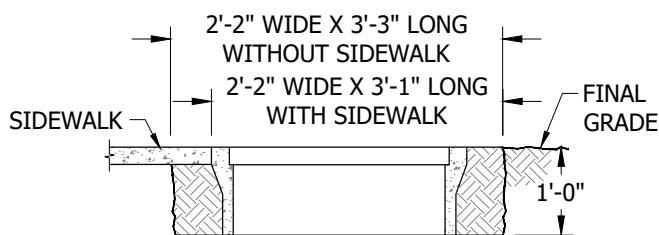


FIGURE 5
EXCAVATION DIMENSIONS
SINGLE HANDHOLE INSTALLATION

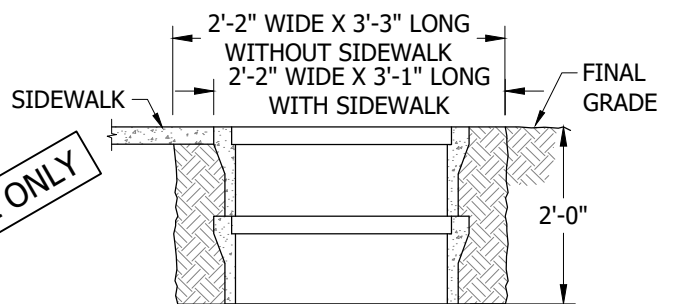


FIGURE 6
EXCAVATION DIMENSIONS
DOUBLE HANDHOLE INSTALLATION

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| C | EDITORIAL CHANGES | - | JC | JS | CZH | 04/22/2019 | F | | | | | | |
| B | BILL OF MATERAILS & NOTES UPDATE | - | JC | JS | CZH | 12/01/2018 | E | | | | | | |
| A | ORIGINAL ISSUE | - | JC | JS | KRG | 07/09/2018 | D | MOVED TO FMO | EDM | EJA | EJA | KRG | 09/21/2023 |

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SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

HANDHOLE-CONCRETE
(INSIDE DIMENSIONS - 17" X 30")

SHEET
2 OF 5

FMO
UG3312.2

INSTALLATION:

- A. ESTABLISH THE HANDHOLE LOCATION PAYING PARTICULAR ATTENTION TO GAS AND FOREIGN UTILITY PLACEMENTS. ANY CHANGE IN LOCATION BY DISTRICT CONSTRUCTION REQUIRES PRIOR APPROVAL FROM SERVICE PLANNING.
- B. AFTER THE LOCATION IS ESTABLISHED, MARK OUT DIMENSIONS FOR THE EXCAVATION WIDTH, LENGTH AND DEPTH PER DRAWING ABOVE. THE WIDTH AND LENGTH DIMENSIONS GIVEN ALLOW EXTRA SPACE FOR SETTING THE SUBSTRUCTURE AND TAMPING THE BACKFILL.
- C. TO DETERMINE FINAL GRADE, MEASURE FROM THE TOP OF CURB OR ESTABLISHED GRADE.
- D. EXCAVATION IS NOW PREPARED FOR INSTALLATION OF SUBSTRUCTURE SECTIONS. AFTER GRADE LEVEL IS ESTABLISHED, SET A STRING LINE FOR CHECKING GRADE. SET HANDHOLE AT FINAL GRADE.
- E. IF RIGHT OF WAY OR OBSTRUCTIONS CAUSE A PROBLEM, THE HANDHOLE MAY BE TURNED TO WHERE THE LONG SIDE OF THE HANDHOLE PARALLELS THE SIDEWALK OR PROPERTY LINE.

BILL OF MATERIALS:

| SINGLE-BODY HANDHOLE | | | | | | | | |
|----------------------|---------------------------|---------------|----------|---------------|--------------|---------------------------------------|--------------|--------------------------|
| ITEM | DESCRIPTION | WEIGHT | QUANTITY | STANDARD PAGE | STOCK NUMBER | STOCK NUMBER | DESIGN UNITS | |
| 1 | COVER, PARKWAY (CONCRETE) | 110 LBS. MAX. | 1 | -- | S286808 | COMPLETE HANDHOLE S162676 | 3312C0 | COMPLETE HANDHOLE 3312-1 |
| 2 | BODY, HANDHOLE | 185 LBS. MAX. | 1 | -- | S162426 | | 3312-0 | |
| DOUBLE-BODY HANDHOLE | | | | | | | | |
| 1 | COVER, PARKWAY (CONCRETE) | 110 LBS. MAX. | 1 | -- | S286808 | COMPLETE DOUBLE-BODY HANDHOLE S162678 | 3312C0 | COMPLETE HANDHOLE 3312-2 |
| 2 | BODY, HANDHOLE | 185 LBS. MAX. | 2 | -- | S162426 | | 3312-0 | |

NOTES:

- II PEDESTRIAN LOADING ONLY. USE THE 3313 HANDHOLE AND STEEL TRAFFIC COVER FOR TRAFFIC INSTALLATIONS.
- III IF THE CUSTOMER IS REQUIRED TO INSTALL A HANDHOLE IN A SERVICE LATERAL, THE LID SHALL BE MARKED "ELECTRIC" NOT "SDG&E".

REFERENCE:

- a. SEE UG3302 FOR SUBSTRUCTURE APPLICATIONS.
- b. SEE UG3483 FOR MINIMUM OPERATING CLEARANCE REQUIREMENTS.
- c. SEE UG3485 WHEN SETTING HANDHOLE ON A SLOPING GRADE.
- d. SEE UG3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- e. SEE UG3605 FOR SUBSTRUCTURE USE AND LIMITATIONS REFERENCE SHEET (MAXIMUM NUMBER OF CABLES, CONNECTORS AND CONDUITS).
- f. SEE UG4173 FOR TRENCH DEPTH, CONDUIT AND CABLE INSTALLATION.
- g. AVAILABLE IN SERVICE UGS AND GUIDE MANUAL.

FIELD MAINTENANCE ONLY

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| C | EDITORIAL CHANGES | - | JC | JS | CZH | 04/22/2019 | F | | | | | | |
| B | BILL OF MATERAILS & NOTES UPDATE | - | JC | JS | CZH | 12/01/2018 | E | | | | | | |
| A | ORIGINAL ISSUE | - | JC | JS | KRG | 07/09/2018 | D | MOVED TO FMO | EDM | EJA | EJA | KRG | 09/21/2023 |

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | HANDHOLE-CONCRETE (INSIDE DIMENSIONS - 17" X 30") | | | | | |

UG3313 FIELD MAINTENANCE ONLY

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REVISION HISTORY:

01/16/2023: 3313 NON-TRAFFIC RATED ELECTRIC DISTRIBUTION HANDHOLE PRECAST CONCRETE (OD - 44" X 32")
- SHEET 1 & 3

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| SHEET 1 OF 1 | Indicates Latest Revision | Completely Revised | <input checked="" type="checkbox"/> New Page | Information Removed | FMO UG3313 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | 3313 NON-TRAFFIC RATED ELECTRIC DISTRIBUTION HANDHOLE PRECAST CONCRETE (OD - 44" X 32") | | | | |

SCOPE: THIS STANDARD SHOWS THE INSTALLATION AND MATERIAL REQUIREMENTS FOR A 3313 NON-TRAFFIC RATED, ELECTRIC DISTRIBUTION AND COMMUNICATION HANDHOLES.

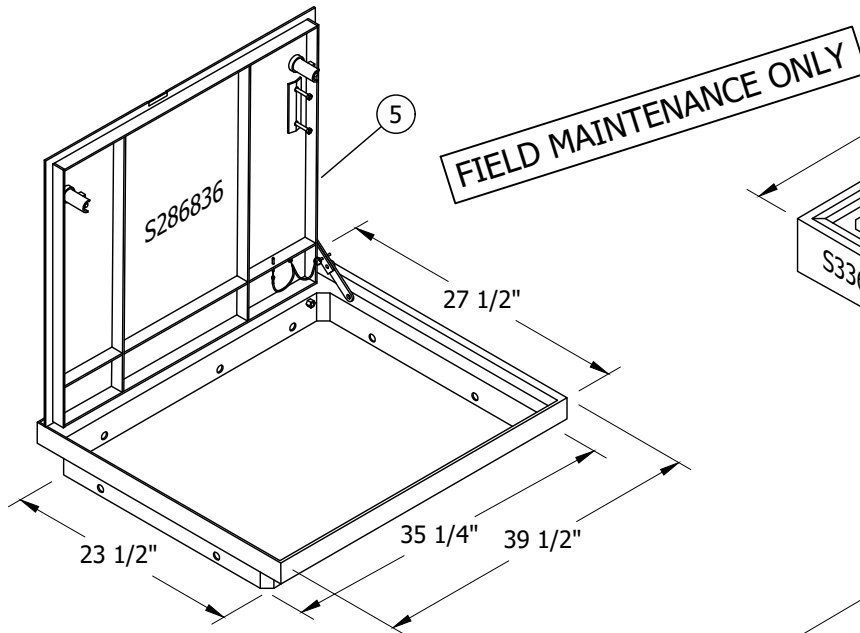


FIGURE 1
PARKWAY EZ-LIFT ALUMINUM COVER (V)
3313 HANDHOLE

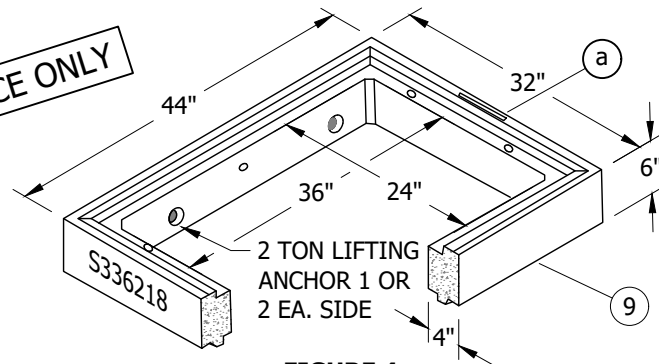


FIGURE 4
6" TOP SECTION
3313 HANDHOLE

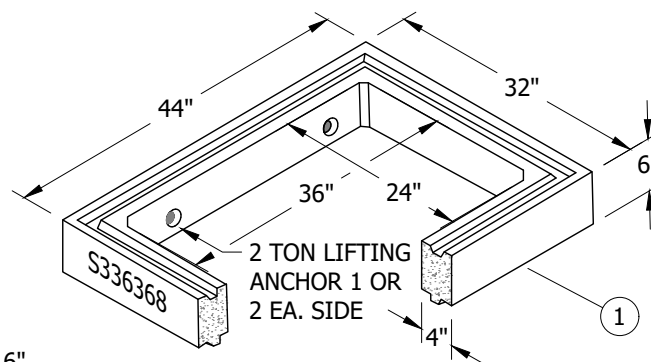


FIGURE 5
6" INTERMEDIATE
EXTENSION SECTION
3313 HANDHOLE

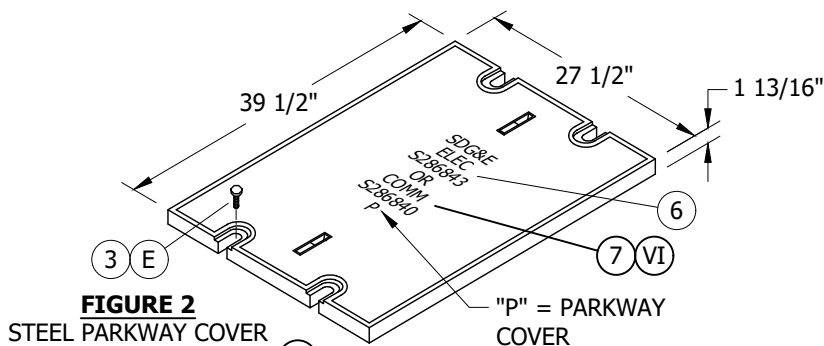


FIGURE 2
STEEL PARKWAY COVER (V)
3313 HANDHOLE
FIELD MAINTENANCE
ONLY

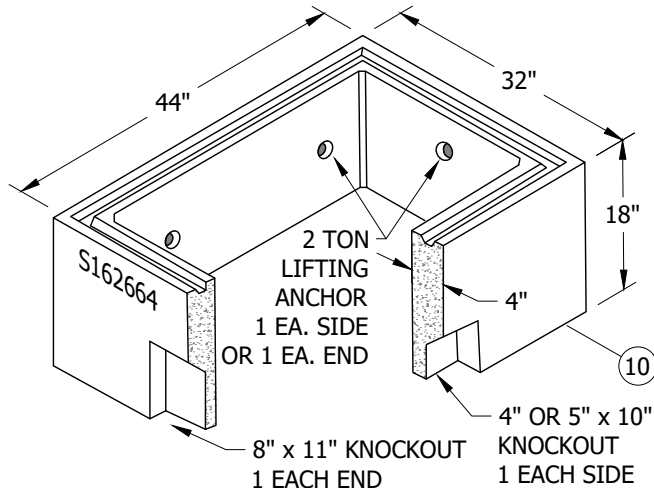


FIGURE 6
18" BASE SECTION
3313 HANDLE

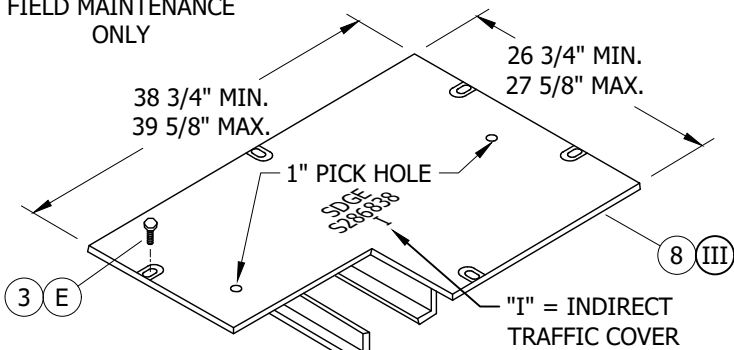


FIGURE 3
STEEL COVER (III)
FIELD MAINTENANCE ONLY

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| C | DRAWING UPDATE | EDM | ADW | JES | CZH | 10/04/2021 | F | | | | | | |
| B | ADD 3313 L & XL | - | - | GW | JS | 06/01/2018 | E | | | | | | |
| A | EDITORIAL CHANGES | - | - | JS | TR | 05/26/2016 | D | MOVED TO FMO | ARC | ADW | JES | KRG | 01/16/2023 |

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1 OF 2

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS
3313 NON-TRAFFIC RATED ELECTRIC DISTRIBUTION HANDHOLE
PRECAST CONCRETE
(OD - 44" X 32")

FMO
UG3313.1

INSTALLATION (CONT'D):

(G) THE 6-INCH INTERMEDIATE SECTION IS NEEDED IN THE 3313 HANDHOLE FOR THE FOLLOWING SCENARIOS:

1. SECONDARY HANDHOLE WITH 2 OR MORE RUNS OF 350 CABLE
2. SECONDARY HANDHOLE WITH 7 OR 8 SECONDARY/SERVICE RUNS
3. PRIMARY ONLY HANDHOLE

FIELD MAINTENANCE ONLY

(H) IF STANDARD DIMENSION CANNOT BE MET, FILL WITH 1-SACK SLURRY.

ATTENTION:

* LOCATE SECONDARY CONDUITS WITHIN 12 INCHES OF THE END OF THE HANDHOLE CLOSEST TO THE SIDEWALK.

BILL OF MATERIALS:

| ITEM | DESCRIPTION | WEIGHT (LBS MAX) | QUANTITY | STANDARD PAGE | STOCK NUMBER | DESIGN UNITS |
|---|---|------------------|----------|---------------|--------------|--------------|
| INTERMEDIATE SECTION AND MISCELLANEOUS ITEMS - ADD AS NEEDED | | | | | | |
| 1 | EXTENSION SECTION, INTERMEDIATE, 6", 2'-0" X 3'-0" (FIG. 5) | 267 | AS REQ'D | -- | S336368 | 3313X1 |
| 2 | LUBRICANT, EZ-1 | -- | AS REQ'D | -- | S469764 | -- |
| 3 | BOLT, PENTAHEAD, 1/2" X 1 1/2" | -- | 6 | -- | S156004 | -- |
| 4 | SEALANT, PLASTIC-MASTIC | -- | AS REQ'D | -- | S631872 | -- |
| PARKWAY 3313 EZ-LIFT ELECTRIC DISTRIBUTION HANDHOLE | | | | | | |
| 5 | COVER, PARKWAY, EZ-LIFT TILT-UP, (FIG. 1) | 96 | 1 | -- | S286836 | 3313PKEZ |
| 9 | TOP SECTION, 6", (FIG. 4) | 285 | 1 | -- | S336218 | 3313X6 |
| 10 | BASE SECTION, 18", (FIG. 6) | 885 | 1 | -- | S162664 | 3313-B |
| NON-TRAFFIC RATED 3313 ELECTRIC DISTRIBUTION HANDHOLE (WITHOUT EXTENSION) | | | | | | |
| 6 | COVER, PARKWAY (STEEL), "ELEC", (FIG. 2) | 96 | 1 | -- | S286843 | 3313E |
| 9 | TOP SECTION, 6" | 285 | 1 | -- | S336218 | 3313X6 |
| 10 | BASE SECTION, 18" | 885 | 1 | -- | S162664 | 3313-B |
| NON-TRAFFIC RATED 3313 COMMUNICATION DISTRIBUTION HANDHOLE (WITHOUT EXTENSION) | | | | | | |
| 7 | COVER, PARKWAY (STEEL), "COMM", (FIG. 2) | 96 | 1 | -- | S286840 | 3313C |
| 9 | TOP SECTION, 6" | 285 | 1 | -- | S336218 | 3313X6 |
| 10 | BASE SECTION, 18" | 885 | 1 | -- | S162664 | 3313-B |
| NON-TRAFFIC RATED 3313 ELECTRIC DISTRIBUTION HANDHOLE (WITHOUT EXTENSION) | | | | | | |
| 8 | COVER, INDIRECT TRAFFIC (STEEL), (FIG. 3) | 150 | 1 | -- | S286838 | 3313TO |
| 9 | TOP SECTION, 6" | 285 | 1 | -- | S336218 | 3313X6 |
| 10 | BASE SECTION, 18" | 885 | 1 | -- | S162664 | 3313-B |

NOTES:

- (I) IF THE CUSTOMER IS REQUIRED TO INSTALL A HANDHOLE IN A SERVICE LATERAL, THE LID SHALL BE MARKED. "ELECTRIC" NOT "SDG&E".
- (II) TO BE ORDERED ONLY FOR ADDITIONAL HEIGHT.
- (III) NOT TO BE INSTALLED IN DIRECT TRAFFIC. APPROVED FOR USE IN AREAS OF INDIRECT TRAFFIC SUCH AS ALLEYS, DRIVEWAYS, PARKING LOTS, ETC.
- (IV) NOT SHOWN ON FIGURES
- (V) ALLOWED ONLY IN AREAS WHERE NO TRAFFIC IS PERMITTED (E.G. SIDEWALKS, GRASS, ETC.)
- (VI) INCLUDES ITEMS 9 AND 10.

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| REV | CHANGE | DR | BY | DSN | APV | DATE | REV | CHANGE | DR | BY | DSN | APV | DATE |
|-----|-------------------|-----|-----|-----|-----|------------|-----|--------------|-----|-----|-----|-----|------------|
| C | DRAWING UPDATE | EDM | ADW | JES | CZH | 10/04/2021 | F | | | | | | |
| B | ADD 3313 L & XL | - | - | GW | JS | 06/01/2018 | E | | | | | | |
| A | EDITORIAL CHANGES | - | - | JS | TR | 05/26/2016 | D | MOVED TO FMO | ARC | ADW | JES | KRG | 01/16/2023 |

| | | | | |
|-------------------------|---|--|-----------------------------------|--|
| SHEET 2 OF 2 | Indicates Latest Revision | Completely Revised <input checked="" type="checkbox"/> | New Page <input type="checkbox"/> | Information Removed <input type="checkbox"/> |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | |
| | 3313 NON-TRAFFIC RATED ELECTRIC DISTRIBUTION HANDHOLE PRECAST CONCRETE (OD - 44" X 32") | | | |
| FMO UG3313.2 | | | | |


FIELD MAINTENANCE ONLY

REVISION HISTORY:

7/13/2016: All versions prior to 2016 are superseded by their current version found inside the Overhead Construction Standard Manual.

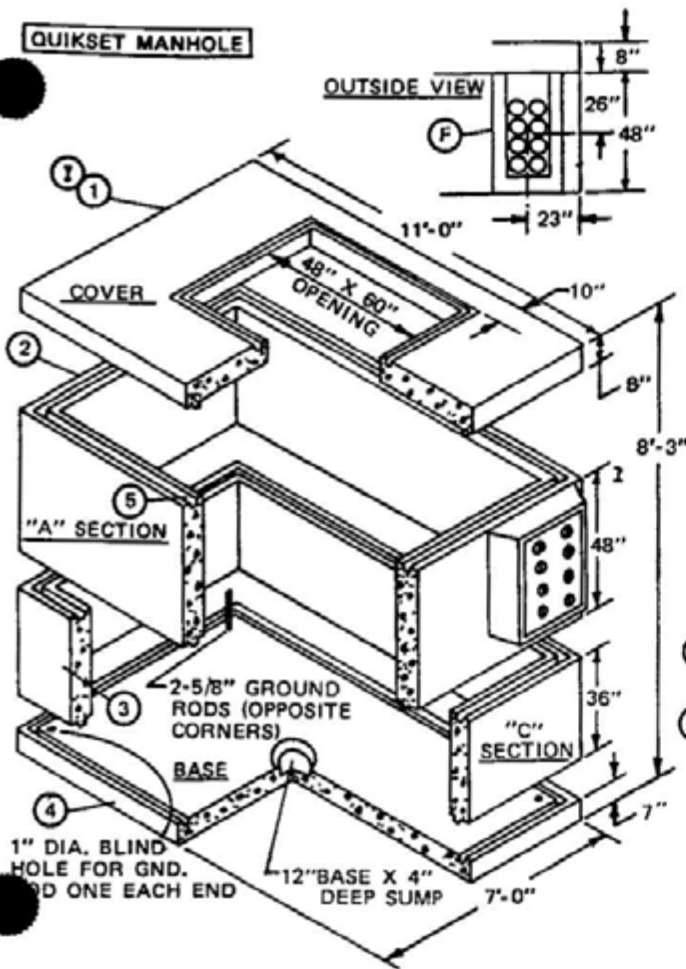
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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
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| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |

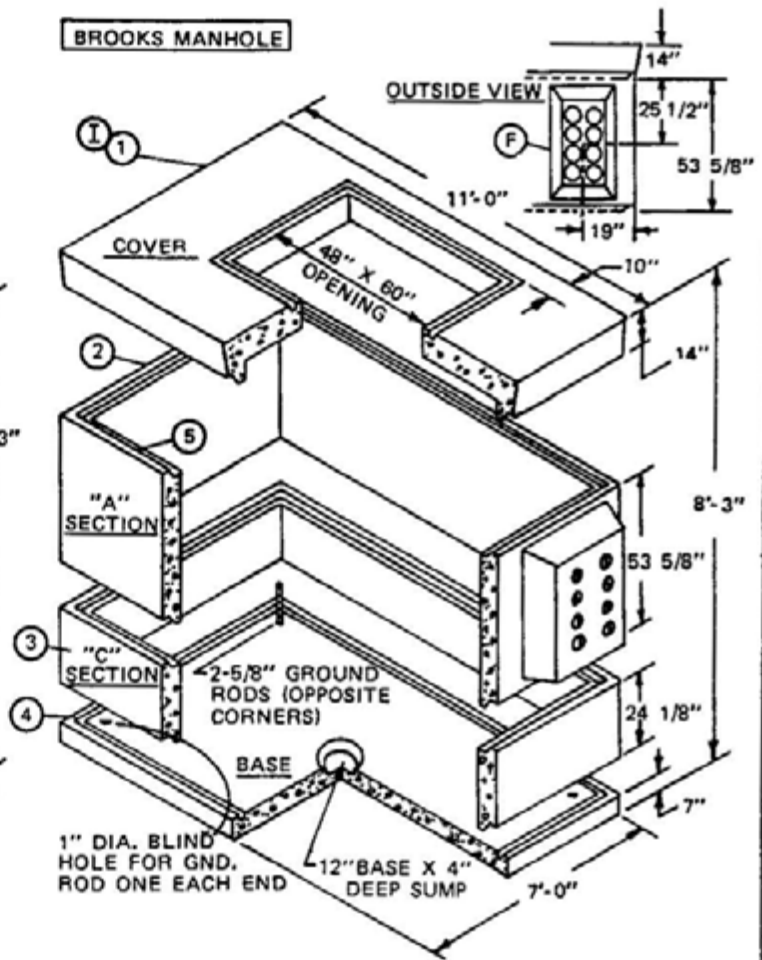
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|--------------------------------|--|---------------------------|-----------------|----------------------------|-------------------------------|
| <p>SHEET 1 OF 1</p> | <p> Indicates Latest Revision</p> | <p>Completely Revised</p> | <p>New Page</p> | <p>Information Removed</p> | <p>FMO UG 3322</p> |
| | <p>SDG&E ELECTRIC UNDERGROUND STANDARD</p> | | | | |
| | <p>MANHOLE - 6' X 10' X 7'</p> | | | | |

SCOPE: THIS STANDARD SHOWS THE MATERIALS AND INSTALLATION INSTRUCTIONS FOR THE 3322 MANHOLE (OLD U28 4)

QUIKSET MANHOLE



BROOKS MANHOLE



NOTES

- MANUFACTURERS IDENTIFICATION PAINTED INSIDE "A" SECTION ON END.

THIS PAGE FOR FIELD MAINTENANCE ONLY

BILL OF MATERIAL

| ITEM | DESCRIPTION | ORDER OF INSTALLATION | 1 INCH INSERT | WEIGHT (LBS.) | | RISS LIFTER | CONSTR. STD. | STOCK NUMBER |
|------|--|-----------------------|-----------------|---------------|--------|-------------|--------------|--------------|
| | | | | QUIK-SET | BROOKS | | | |
| 1 | COVER, CONCRETE MANHOLE | TOP | - | 5800 | 7000 | 4 | - | 287120 |
| 2 | EXTENSION, CONCRETE MANHOLE, "A" SECTION | BELOW TOP | 2 BESIDE TERMS. | 7800 | 9400 | 4 | - | 336268 |
| 3 | EXTENSION, CONCRETE MANHOLE, "C" SECTION | BELOW "A" SECTION | - | 7600 | 4465 | 4 | - | 336276 |
| 4 | BASE, CONCRETE MANHOLE | BASE | 2 | 5000 | 6875 | 4 | - | 125744 |
| 5 | SEALANT, JOINT, PLASTIC- MASTIC | - | - | - | - | - | 3306 | 631872 |
| 6 | CLAMP, GROUND ROD, 5/8" | - | - | - | - | - | - | 230016 |

SDG&E ELECTRIC STANDARDS

DATE 1-1-92
APPD JYB/BJA

MANHOLE - 6' X 10' X 7'

3399.205

SUPERSEDES
3322 1 (3-9-83)

INSTALLATION:

- A. USE MASTIC SEALANT (STOCK NUMBER 631872) BETWEEN ALL SECTIONS, (SEE STANDARD 3306). USE DOUBLE SEAL WHEN FIELD CONDITIONS INDICATE THAT WATER WILL PENETRATE THE MANHOLE THROUGH THE JOINTS.
- B. AN EXCAVATION: 9'-0" X 14'-0" X 10'-7" MINIMUM IS REQUIRED FOR INSTALLATION OF THE MANHOLE AT AN ELEVATION 2 FEET BELOW GRADE, DEPTH TO BE 10'-7" MAXIMUM.
- C. USE #2 AWG BARE COPPER WIRE FOR GROUNDS. CONNECT TO GROUND RODS WITH GROUND ROD CLAMPS (STOCK NUMBER 230016).
- D. WHEN INSTALLING CONDUITS, USE LOWER SET OF CONDUIT KNOCKOUTS FIRST.
- (F) DUCT KNOCKOUT - 18" X 35" X 12" DEEP (QUICKSET), 18" X 36" X 12" DEEP (BROOKS).

REFERENCE:

- (I) FOR 48" X 60" MANHOLE NECK AND COVER, SEE STANDARD 3332.

THIS PAGE FOR FIELD MAINTENANCE ONLY

| | | |
|---|---|-----------------------------|
| 3399.206 SUPERSEDES 3322 2 (3-9-83) | SDG&E ELECTRIC STANDARDS MANHOLE - 6' x 10' x 7' | DATE 3-9-83 APPD JWF/KRH |
|---|---|-----------------------------|


FIELD MAINTENANCE ONLY

REVISION HISTORY:

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| C | | | | | | F | | | | | |
| B | | | | | | E | | | | | |
| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |

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|---|---------------------------|--------------------|----------|---------------------|

**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD
CONDUIT SIZING FOR UNDERGROUND CABLES

**FMO
UG 3372**

SCOPE: THIS STANDARD LISTS THE MINIMUM CONDUIT SIZE REQUIRED FOR THE INSTALLATION OF PRIMARY AND SECONDARY CABLES.

NOTES:

- IF FUTURE LOAD GROWTH REQUIRES LARGER CABLE THAN INITIAL REQUIREMENTS, SIZE CONDUIT FOR FUTURE NEEDS. SERVICE PLANNING SUPERVISOR'S APPROVAL IS REQUIRED.

CONDUIT SIZING CHARTS

FOR FIELD MAINTENANCE ONLY

| PRIMARY | | | | |
|------------------|--------------------------------|-------------------------------|--------|-------------------|
| CABLE TYPE | CONDUCTOR SIZE AWG OR KCMIL | MINIMUM CONDUIT SIZE (INCHES) | | |
| | | 1/C | 2-1/C | 3-1/C OR PARALLEL |
| PECN | 2 CU | 2" | 3" (B) | 3" (D) |
| PECN | 2 SOL AL | 2" | 3" (C) | 3" (D) |
| PECN | 2/0 AL | -- | -- | 3" (A) |
| PECN | 4/0 CU | -- | -- | 5" (A) (F) |
| PECN OR PECN-PEJ | 500 CU | -- | -- | 5" (A) (F) |
| XLPECN | 750 AL | -- | -- | 5" (A) |
| XLPECN | 1000 AL | -- | -- | 5" (A) |

INSTALLATION:

- (A) 2/0 THROUGH 1000 KCMIL PRIMARY CABLES ARE ONLY PURCHASED IN TRIPLEXED CONFIGURATION.
- (B) 2-1/C #2 CU PECN CABLES MAY BE PARALLELED IN A 3 INCH CONDUIT FOR SINGLE-PHASE, 12 KV LOAD.
- (C) 2-1/C #2 SOL PECN CABLES MAY BE PARALLELED IN A 3 INCH CONDUIT FOR SINGLE-PHASE, 12 KV LOAD.
- (D) 3-1/C CABLES MAY BE PARALLELED IN A 3 INCH CONDUIT FOR THREE-PHASE LOAD.
- (F) MAY BE INSTALLED IN EXISTING 4 INCH CONDUITS.

3399.701
SUPERCEDES 3372.1
& .2 (12-21-81)

SDG&E ELECTRIC STANDARDS

CONDUIT SIZING FOR UNDERGROUND CABLES

DATE 1-1-86
APPD JLB/RD


FIELD MAINTENANCE ONLY

REVISION HISTORY:

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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
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|-------------------------|---|--------------------|----------|---------------------|------------------------|
| SHEET 1 OF 1 |  Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG 3378 |
| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | CONDUIT INSTALLATION IN CELL BRIDGES | | | | |

SCOPE: THIS STANDARD (3378.1 TO 3378.6) SHOWS THE INSTALLATION OF CONDUITS IN CLOSED CELL BRIDGE CONSTRUCTION.

INSTALLATION:

- (A) THE CONDUIT SPACERS SHALL BE SECURELY STRAPPED TO THE CONDUIT SPACER SUPPORT (ITEM 1 THRU 7) WITH #14 GALVANIZED WIRE (ITEM 8), FOR EIGHT CONDUITS. WHEN 6 OR LESS CONDUIT RUNS ARE INSTALLED, EXTRA ROD LENGTH MAY BE CUT OR FOLDED OVER TOP OF CONDUITS TOWARD EACH OTHER INSTEAD OF USING THE GALVANIZED WIRE.
- (B) THE FIRST SLIDING SUPPORT INSIDE THE CELL MUST BE PLACED 6" (152) FROM FACE OF EACH END DIAPHRAGM. THE FIRST THREE SLIDING SUPPORTS (ITEM 3) SHALL BE SPACED AT 6 FEET (152) AND FOLLOWED BY TWO FIXED SUPPORTS (ITEM 1) SPACED AT 2 FEET (610). THE REST OF THE SUPPORTS (ITEM 1) SHALL BE PLACED 6 FEET (1828) APART IN THE BRIDGE CELLS.
- (C) TOTAL WEIGHT INCLUDES CONDUIT, CONDUIT SPACERS, CONDUIT SUPPORTS AND CONDUCTORS. CONDUCTORS ARE 1000 KCMIL JACKETED AL. SEE TABLE 1, PG. 3378.2.
- (D) CONDUIT 12 INCHES (305) EXPANSION SLEEVE (ITEM 12 OR 14), SHALL BE INSTALLED BETWEEN THE FIRST AND SECOND SUPPORTS.
- (E) CONDUIT 3 INCHES (76) EXPANSION SLEEVE (ITEM 11 OR 13) SHALL BE INSTALLED A MAXIMUM DISTANCE OF 100 FEET (30480) THROUGHOUT THE RUN.
- (F) BRIDGE OPENINGS REQUIRE AN 18 INCH (457) WIDE STEEL SHEAR PLATE (ITEM 17). THE LENGTH OF THE PLATE SHALL BE 15 FEET (4572). USE STOCK ITEM 543110 THE STEEL SHEAR PLATE IS TO BE PLACED FROM THE BRIDGE ABUTMENT WALL EXTENDING 14'-4" (4369) OUTSIDE THE ABUTMENT TO SUPPORT AND PROTECT THE CONDUITS AGAINST SHEAR FROM EMBANKMENT SETTLEMENT, AND REDUCE THE UPLIFT FORCES ON THE SOIL THAT WOULD BE GENERATED FROM THE BRIDGE BACK WALL IMPACTING THE SOIL DURING A LARGE SEISMIC EVENT.
- (H) THE CONCRETE CONDUIT BASE SUPPORT (ITEM 1 & 4) SHALL BE SECURELY ATTACHED TO THE BRIDGE SLAB WITH EPOXY BINDER (ITEM 9). THE CONCRETE SURFACE SHALL BE LEVELED AND THOROUGHLY CLEANED PRIOR TO APPLICATION OF THE EPOXY.
- (I) THE EPOXY BINDER (CALTRANS APPROVED) IS A 2 COMPONENT ADHESIVE. APPROXIMATELY 1 GAL. OF MIXED EPOXY WILL BE NEEDED FOR EVERY 15 SUPPORTS. "CAREFULLY" FOLLOW MANUFACTURERS INSTRUCTIONS FOR APPLICATION OF EPOXY.
- (J) THE SPACE BETWEEN THE CONDUIT AND THE BRIDGE ABUTMENT OPENING SHALL BE SEALED. TIGHTLY WRAP 1 INCH (25) POLYFORM AROUND CONDUITS, THROUGH THE CELL OPENING AND SEAL WITH MORTAR WITH A MINIMUM THICKNESS OF 4 INCHES (102).
- (K) FOR CELL OPENING SIZE, SEE 3378.5, FOR POSITIONING OF CELL OPENING WITHIN THE BRIDGE, SEE THE CUSTOMER PROJECT PLANNER.
- (L) CONSULT BRIDGE DESIGN ENGINEER FOR LONGITUDINAL & TRANSVERSE DISPLACEMENTS AT SOIL TO ABUTMENT INTERFACE AND ABUTMENT TO BRIDGE INTERFACE.
- (M) CONSULT CIVIL/STRUCTURAL ENGINEERING IF THE BRIDGE DESIGN HAS ANY ONE OF THE FOLLOWING PARAMETERS:
 - a. LONGITUDINAL DISPLACEMENT BETWEEN ABUTMENT AND BRIDGE GREATER THAN 12 INCHES (305).
 - b. TRANSVERSE DISPLACEMENT BETWEEN ABUTMENT AND BRIDGE GREATER THAN 5 INCHES (127).
 - c. TRANSVERSE DISPLACEMENT BETWEEN SOIL AND ABUTMENT GREATER THAN 1 INCH (25.4).
 - d. TRANSVERSE MOVEMENT BETWEEN ABUTMENT BACK-WALL AND SOIL GREATER THAN 1".
 - e. DISPLACEMENT THAT CAUSES CONFLICT WITH INSTALLATION.
 - f. BRIDGE LENGTH GREATER THAN 300 FEET (91440).
 - g. BRIDGE WIDTH SMALLER THAN 50 FEET (15240).
 - h. BRIDGE DEPTH GREATER THAN 8 FEET (2438).
 - i. ARCHED FLOOR SLAB (WHERE CONDUIT SUPPORTS ARE ATTACHED).
 - j. HORIZONTALLY CURVED BRIDGE WITH RADIUS LESS THAN 800 FEET (243840).
 - k. BRIDGE CONTAIN EXPANSION JOINTS OTHER THAN THOSE AT THE END OF THE BRIDGE AT THE ABUTMENT.
 - l. ABUTMENT CONFIGURATIONS DIFFERENT THAN SHOWN IN THE STANDARDS.
 - m. DUCT CONFIGURATIONS NOT SHOWN.

FOR FIELD MAINTENANCE ONLY

| | | |
|--|--|---|
| DATE 1-1-2000 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS CONDUIT INSTALLATION IN CELL BRIDGES | 3399.703 SUPERSEDES 3378.0 (1-1-99) |
|--|--|---|

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNIT |
|------|---|----------|-----------------------|--------------|-------------------|
| 1 | FIXED SUPPORT, TYPE A, CONCRETE CONDUIT SUPPORT, 24" X 6" X 6" (610x152x152)W/ HOT DIPPED GALV. STEEL REINFORCING BAR, 3/8"(0.375) DIA., ASTM A-615 GR 60. | AS REQ'D | -- | 703520 | BR-FIX |
| 2 | FIXED SUPPORT, TYPE B, DIRECT EMBEDDED, H.D. GALV. #4 REBAR ASTM A-615 GR. 60, " L " SHAPE | AS REQ'D | -- | 124020 | U-SUPP |
| 3 | SLIDING SUPPORT, HOT DIP GALVANIZED 3/8"(10) THICK PLATE, 24" x 6"(610 x 152) WITH TWO 3/8" DIA. x 35" (10 x 889) BAR AND TWO 5/8" x 20" (16 x 394) SLOTS | AS REQ'D | 3378 | 703524 | BR-SLI ITEM 3 & 4 |
| 4 | SLIDING SUPPORT TYPE C, CONCRETE CONDUIT SUPPORT, 24" X 6" X 6" (610 x 152 x 152) WITH 1/2" DIA. X 5"(128 x 127) S.S. (304) ANCHOR BOLT WITH 1"(25) LEG. TWO S.S. NUTS AND ONE S.S. FLAT WASHER ON EACH BOLT. | AS REQ'D | 3378 | 703522 | |
| 5 | SLIDING SUPPORT, TYPE D, HOT DIP GALVANIZED 3/8" (10) THICK STEEL PLATE 24" x 6" (610 x 152) WITH FOUR BOLTS AND TWO BENT RODS. | | 3378 | 703560 | BR-SLD 3 & 5 |
| 6 | SPACER, CONDUIT BASE | AS REQ'D | 3375 | 663008 | BSPACE |
| 7 | SPACER, CONDUIT INTERMEDIATE | AS REQ'D | 3375 | 663528 | SPACER |
| 8 | WIRE, IRON, #14 GALVANIZED (A) | AS REQ'D | -- | 815648 | -- |
| 9 | EPOXY BINDER (CAL-TRANS APPROVED) (I) | AS REQ'D | -- | 213242 | -- |
| 10 | CONDUIT, PVC, SCHEDULE 40, 5" | AS REQ'D | 3378 | 251408 | S40-5" |
| 11 | SLEEVE, 3"(76) EXPANSION CAPACITY, CONDUIT PLASTIC, 5"(127) | AS REQ'D | 3378 | 650128 | 5"-EXP |
| 12 | JOINT SEISMIC, 12"(305) EXPANSION CAPACITY, CONDUIT PLASTIC, 5"(127) | AS REQ'D | 3378 | 438700 | SEJ-5" |
| 13 | SLEEVE, 3"(76) EXPANSION CAPACITY, CONDUIT PLASTIC, 4"(102) | AS REQ'D | 3378 | 650126 | 4"-EXP |
| 14 | JOINT SEISMIC, 12"(305) EXPANSION CAPACITY, CONDUIT 4" (102) | AS REQ'D | 3378 | 438698 | SEJ-4" |
| 15 | POLYFOAM WRAP, 1" (25) THICK | AS REQ'D | -- | -- | -- |
| 16 | 3/4"(19), DIAMETER HVA ADHESIVE ANCHOR ROD SYSTEM W/HAS SUPER SS58-758 ANCHOR ROD BY HILTI, INC. (1-800-879-8000) (J) | AS REQ'D | -- | -- | -- |
| 17 | PLATE, SHEAR LARGE (LIGHT GRAY EPOXY COATED, ALL SIDES) SEE 3378.5 FOR DIMENSIONS (F) | AS REQ'D | 3378 | 543110 | SHEAR |
| 18 | PLATE, SHEAR SHORT (LIGHT GRAY EPOXY COATED, ALL SIDES) SEE 3378.5 FOR DIMENSIONS (F) | AS REQ'D | 3378 | 543112 | SSHEAR |
| 19 | FOAM ARCHITECTURAL FOR 4" EXPANSION JOINTS 6' LONG | AS REQ'D | 3378.8 | 359804 | 4"FOAM |
| 20 | FOAM ARCHITECTURAL FOR 5" EXPANSION JOINTS 6' LONG | AS REQ'D | 3378.8 | 359800 | 5"FOAM |
| 21 | CONDUIT, PVC, SCHEDULE 40, 4" | AS REQ'D | 3378 | 251392 | S40-4" |

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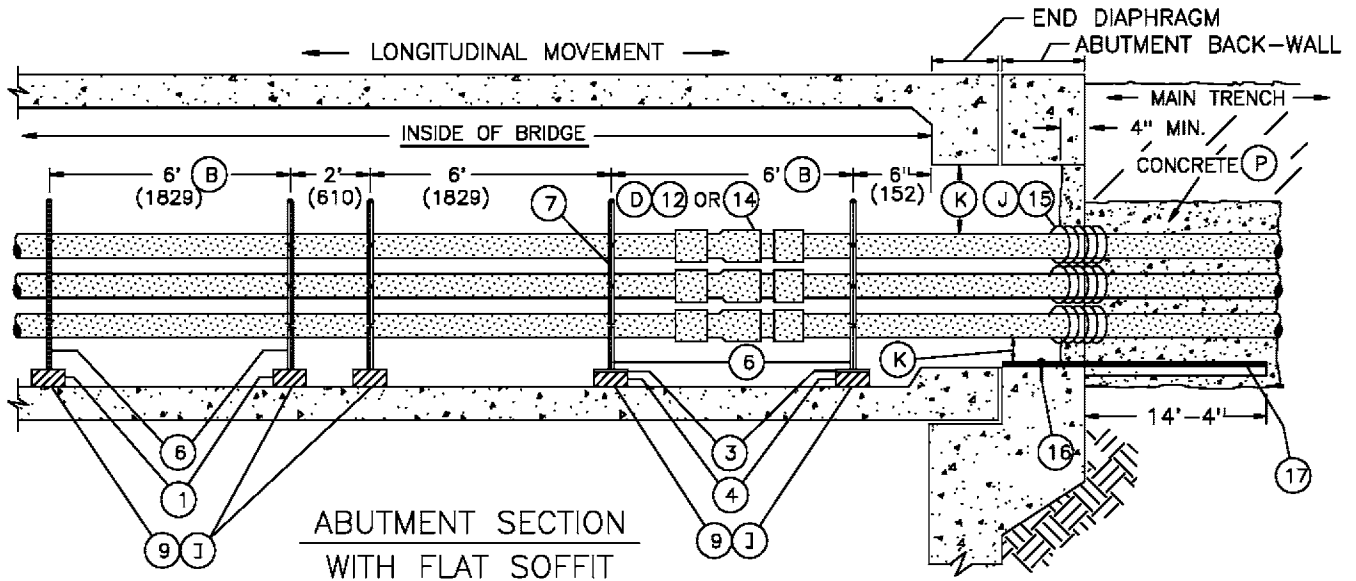
TABLE 1:

| | | |
|---------------------------------------|-----------|-----------|
| ULTIMATE TOTAL WT. PER 100'(2540) (C) | | |
| 4 CONDUIT | 6 CONDUIT | 8 CONDUIT |
| 4542 | 6463 | 8384 |

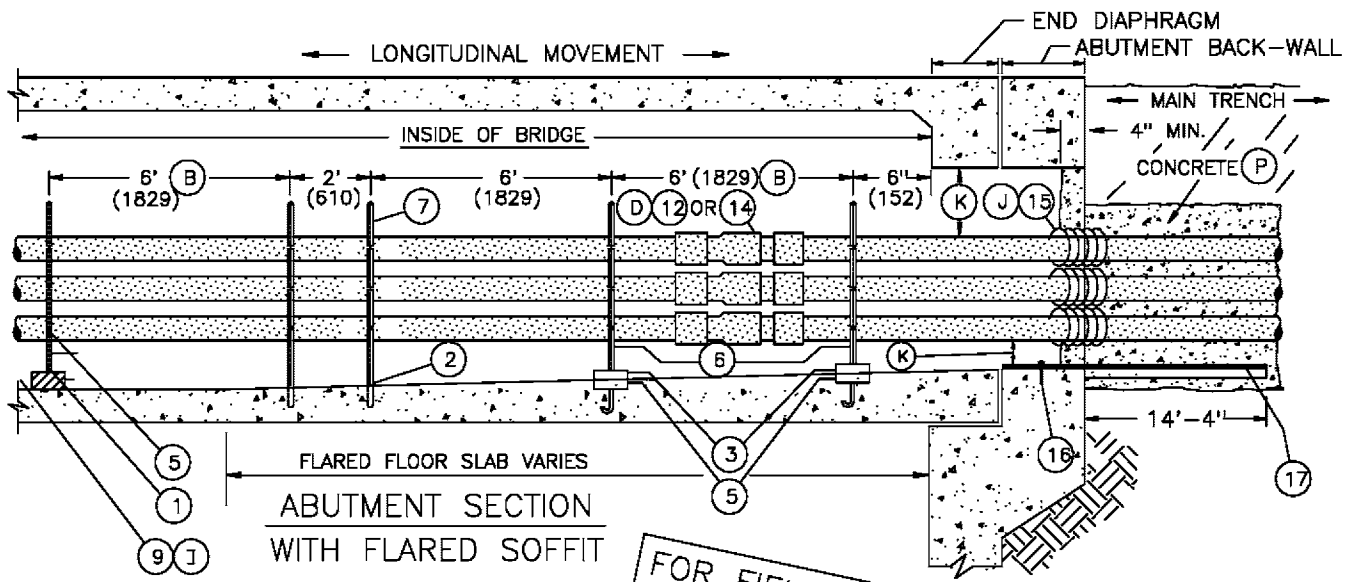
REFERENCE:

- (N) SEE STANDARD PAGES 3370.3/3371.3 FOR TRENCH SHADING REQUIREMENTS.
- (O) SEE STANDARD 3375 FOR CONDUIT SPACER DATA.
- (P) SEE STANDARD 3376 FOR CONCRETE ENCASED MULTI-CONDUIT INSTALLATION.
- Q. CONSULT DESIGN STANDARDS FOR CABLE AMPACITY AND GROUNDING REQUIREMENTS FOR STEEL CONDUITS.

| | | |
|--|---|---|
| <p>3399.704 SUPERSEDES 3378.1 (1-1-97)</p> | <p>SDG&E ELECTRIC STANDARDS</p> <p>CONDUIT INSTALLATION IN CELL BRIDGES</p> | <p>DATE 1-1-2000 APPD <i>[Signature]</i> / <i>[Signature]</i></p> |
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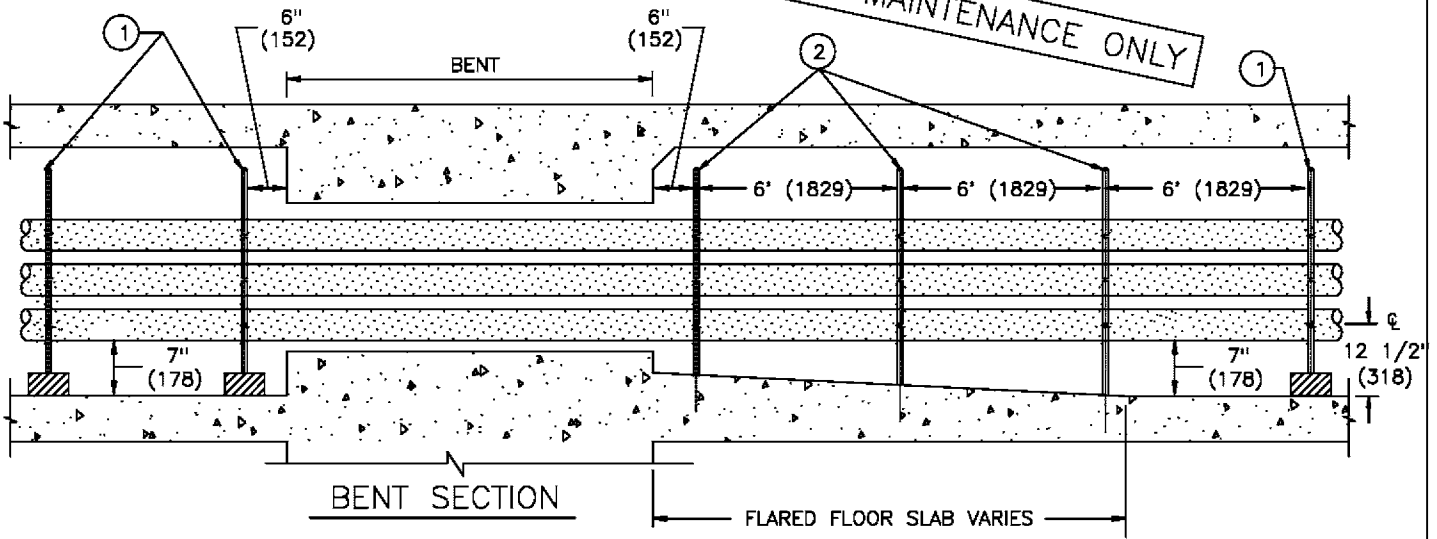


ABUTMENT SECTION WITH FLAT SOFFIT

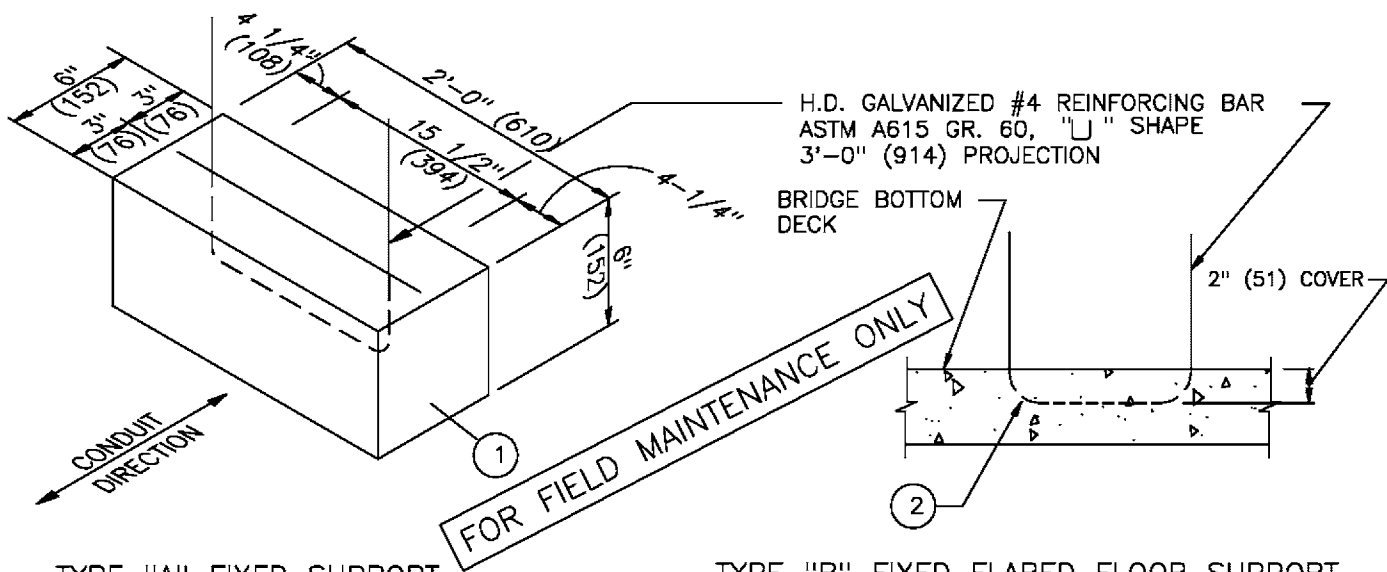


FLARED FLOOR SLAB VARIES
ABUTMENT SECTION WITH FLARED SOFFIT

FOR FIELD MAINTENANCE ONLY



| | | |
|---|--|---|
| DATE 1-1-2000 APPD <i>[Signature]</i> / <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS CONDUIT INSTALLATION IN CELL BRIDGES | 3399.705 SUPERSEDES 3378.2 (1-1-97) |
|---|--|---|



TYPE "A" FIXED SUPPORT

NOT TO SCALE

TYPE "B" FIXED FLARED FLOOR SUPPORT

NOT TO SCALE

FOR FIELD MAINTENANCE ONLY

H.D. GALVANIZED #4 REINFORCING BAR
ASTM A615 GR. 60, "U" SHAPE
3'-0" (914) PROJECTION

BRIDGE BOTTOM
DECK

2" (51) COVER

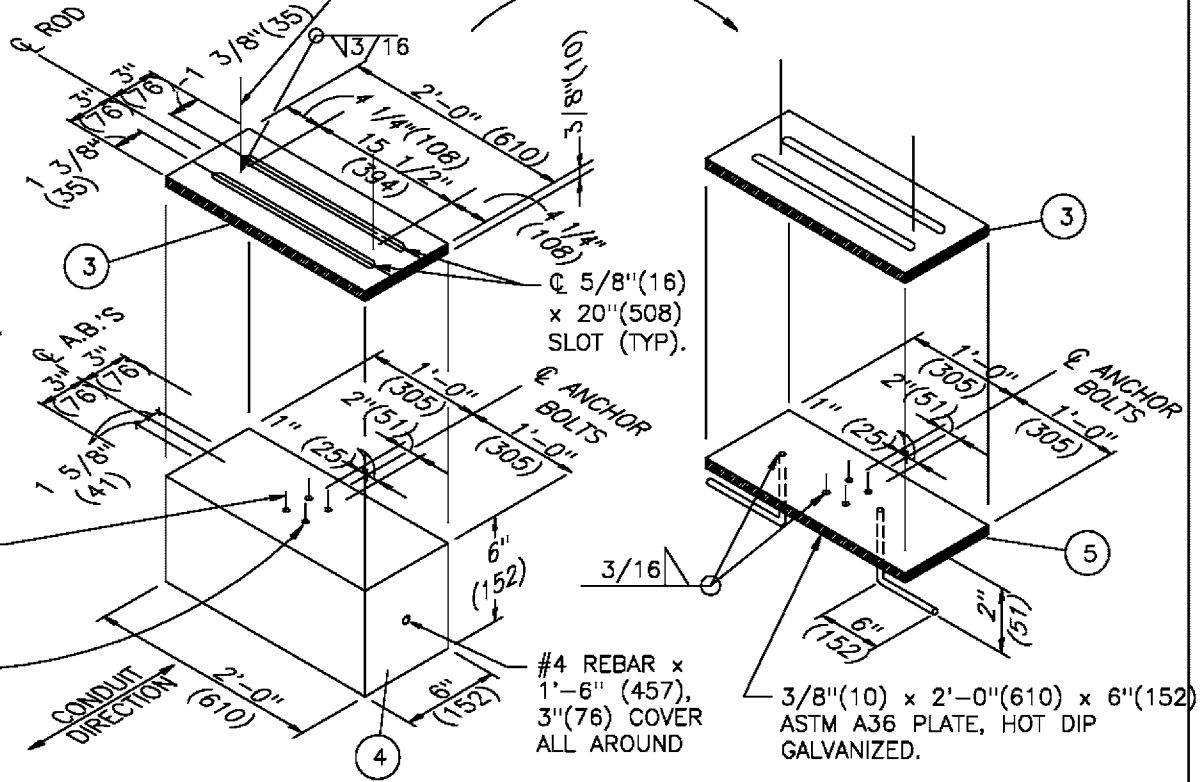
GALVANIZED A36, 1/2" Ø ROD
3'-0" LONG, WELDED TO STEEL PLATE
PRIOR TO GALVANIZING

NOTE: DIMENSIONS TYPICAL

3/8" (10) X 2'-0"
(610) X (152)
ASTM A36 PLATE,
HOT DIP GALVANIZED.

1/2" (13) X 5" (127)
HEAVY HEX ASTM
A307 H.D. GALV.
BOLT WITH 2" (51)
PROJECTION, 2
A563, GR. DH, H.D.
GALV. NUTS AND 1
H.D. GALV. ASTM
F436 WASHER (4
TYP)

WASHER AND
DOUBLE NUT.
ADJUST NUTS TO
CLEAR SO PLATE
CAN SLIDE ON
BASE.

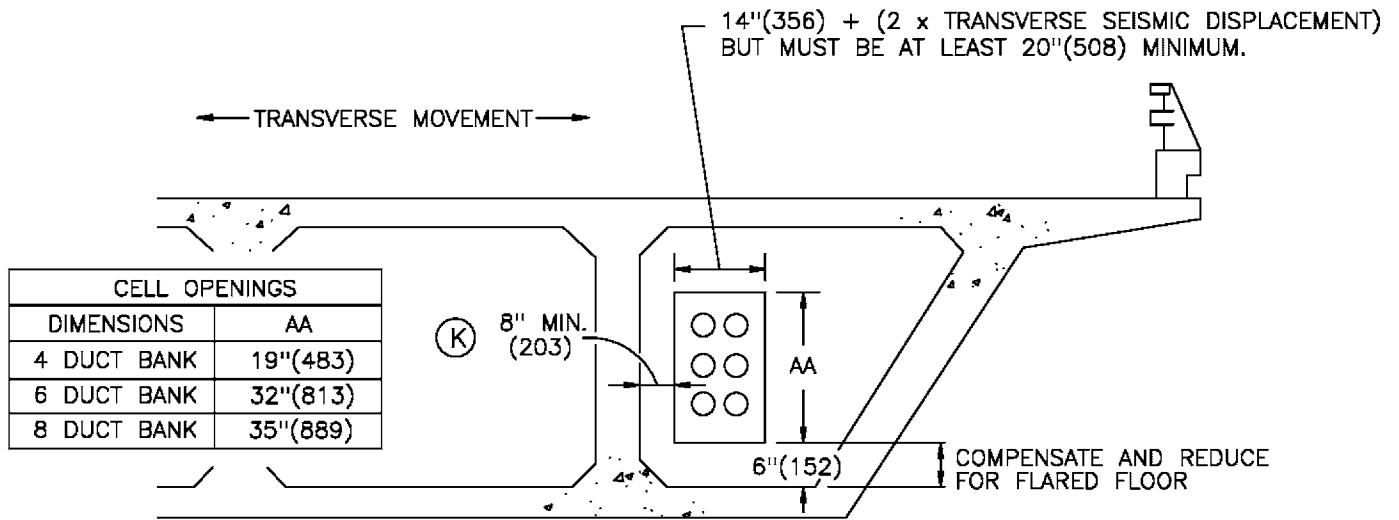


TYPE "C" SLIDING SUPPORT

(NOTE: 5 1/4" LATERAL MOVEMENT)
NOT TO SCALE

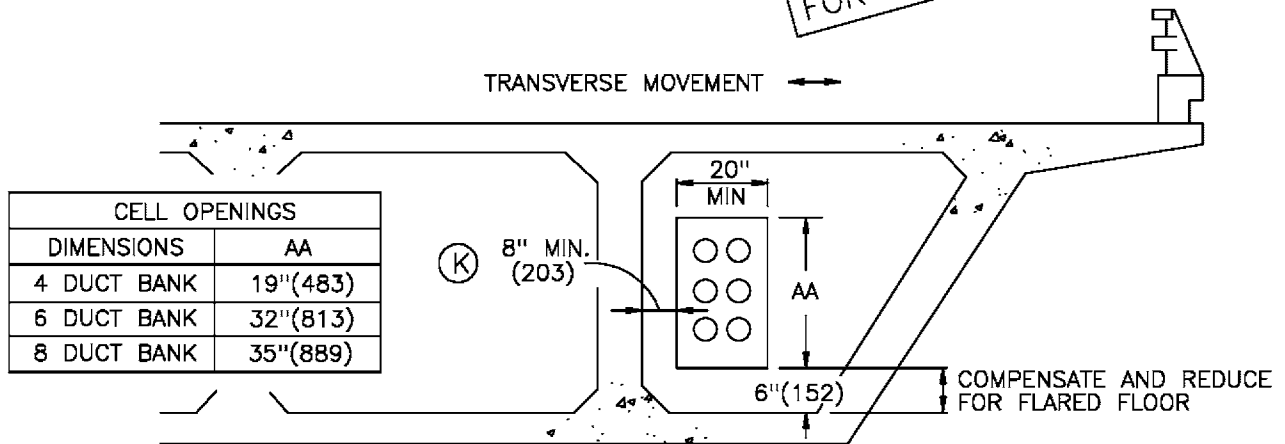
**TYPE "D" SLIDING FLARED
FLOOR SUPPORT**

(NOTE: 5 1/4" LATERAL MOVEMENT)
NOT TO SCALE

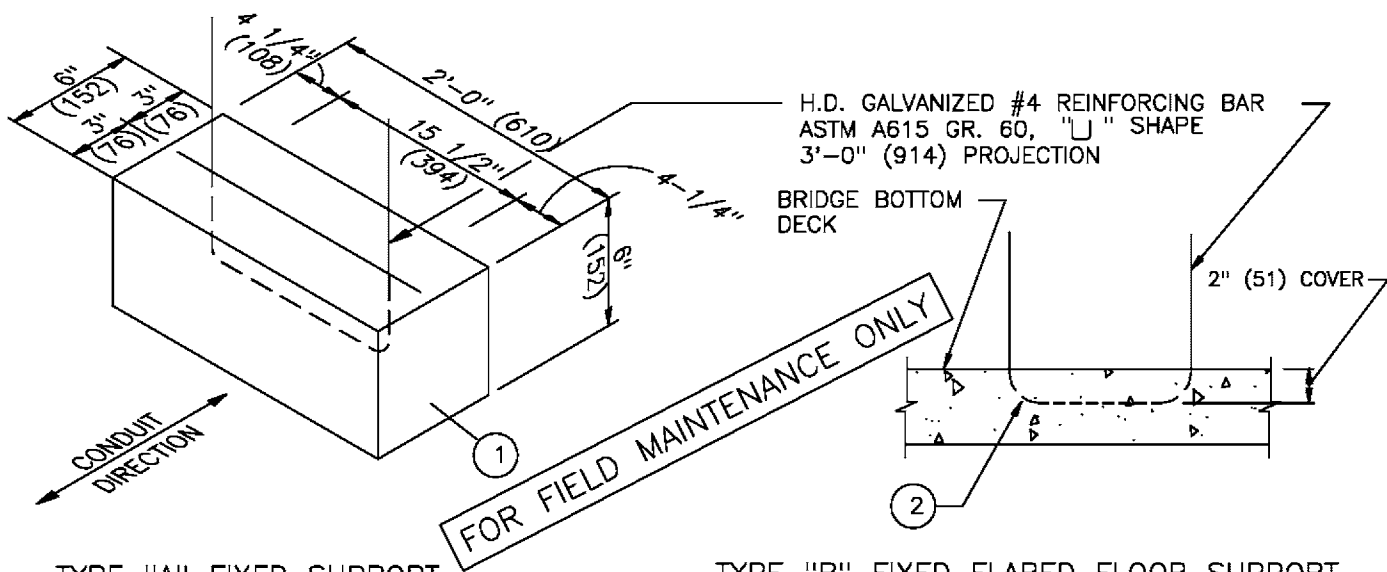


ABUTMENT BACK-WALL AND END DIAPHRAGM OPENING

FOR FIELD MAINTENANCE ONLY



BENT OPENING



TYPE "A" FIXED SUPPORT

NOT TO SCALE

TYPE "B" FIXED FLARED FLOOR SUPPORT

NOT TO SCALE

FOR FIELD MAINTENANCE ONLY

H.D. GALVANIZED #4 REINFORCING BAR
ASTM A615 GR. 60, "U" SHAPE
3'-0" (914) PROJECTION

BRIDGE BOTTOM
DECK

2" (51) COVER

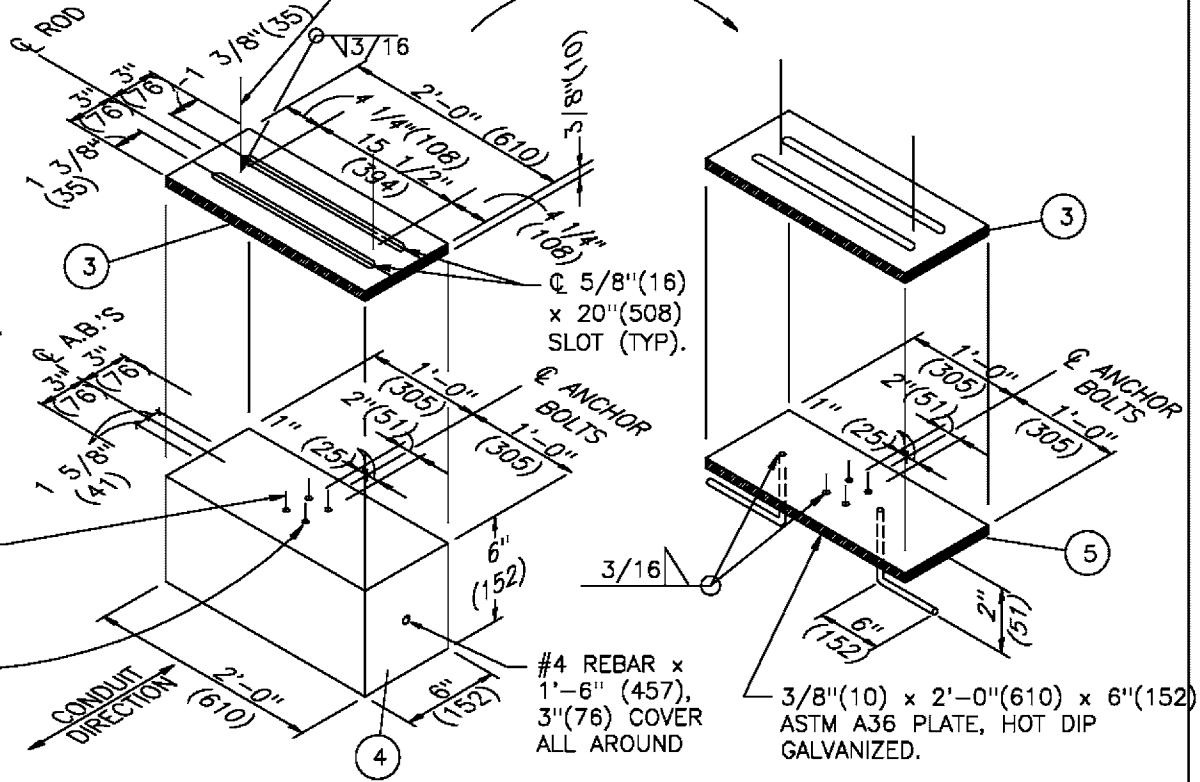
GALVANIZED A36, 1/2" Ø ROD
3'-0" LONG, WELDED TO STEEL PLATE
PRIOR TO GALVANIZING

NOTE: DIMENSIONS TYPICAL

3/8" (10) X 2'-0"
(610) X (152)
ASTM A36 PLATE,
HOT DIP GALVANIZED.

1/2" (13) X 5" (127)
HEAVY HEX ASTM
A307 H.D. GALV.
BOLT WITH 2" (51)
PROJECTION, 2
A563, GR. DH, H.D.
GALV. NUTS AND 1
H.D. GALV. ASTM
F436 WASHER (4
TYP)

WASHER AND
DOUBLE NUT.
ADJUST NUTS TO
CLEAR SO PLATE
CAN SLIDE ON
BASE.



TYPE "C" SLIDING SUPPORT

(NOTE: 5 1/4" LATERAL MOVEMENT)
NOT TO SCALE

**TYPE "D" SLIDING FLARED
FLOOR SUPPORT**

(NOTE: 5 1/4" LATERAL MOVEMENT)
NOT TO SCALE

SDG&E ELECTRIC STANDARDS

3399.706
SUPERSEDES
3378.3 (1-1-97)

CONDUIT INSTALLATION IN CELL BRIDGES

DATE 1-1-2000

APPD *[Signature]* / CMK

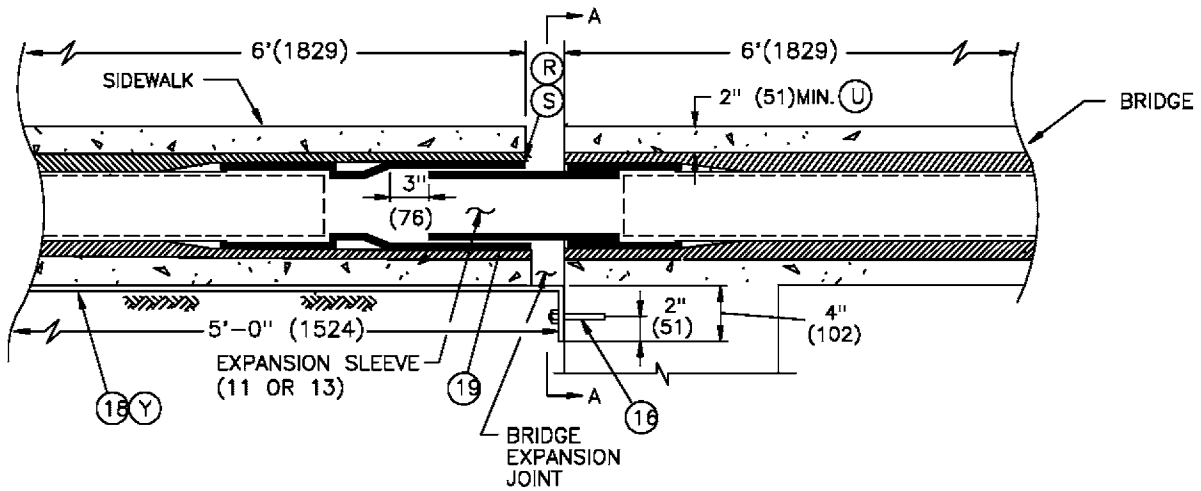
SCOPE: THIS STANDARD (3378.7 & 3378.8) SHOWS THE INSTALLATION OF SCHEDULE 40, 4 INCH (102) OR 5 INCH (127) PVC CONDUIT IN A BRIDGE SIDEWALK OR BRIDGE SLAB FOR SLAB BRIDGE INSTALLATIONS.

INSTALLATION:

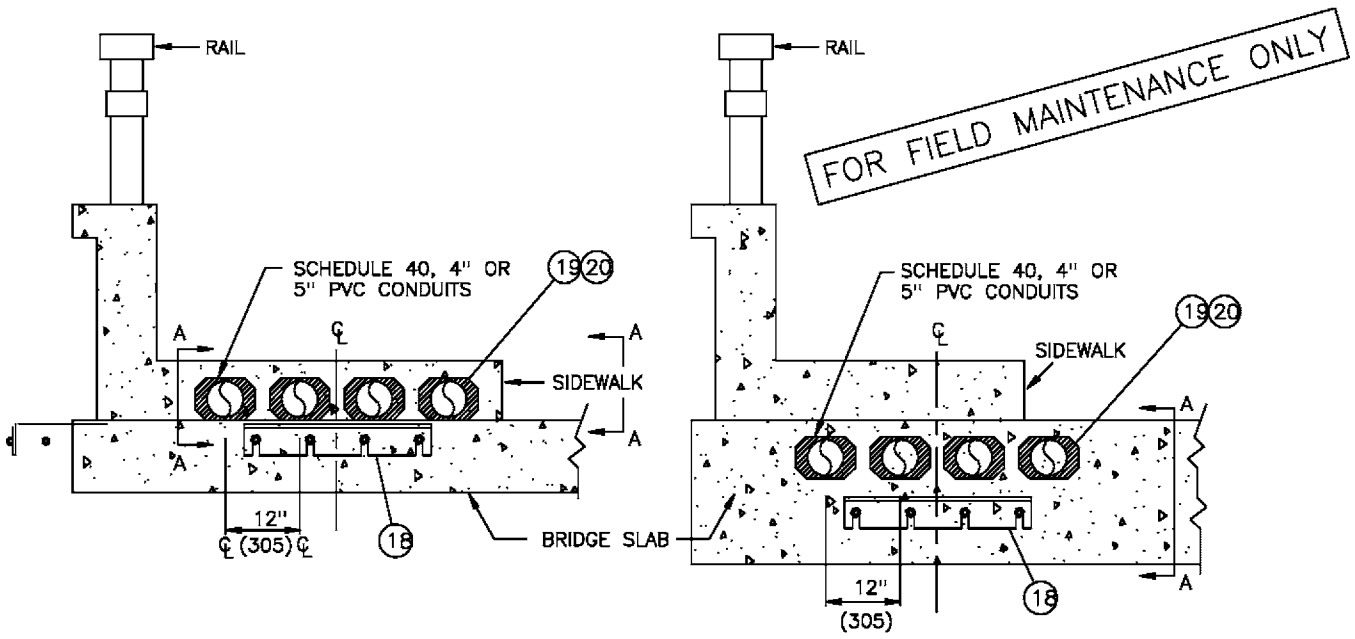
- (R) CONDUIT EXPANSION SLEEVE SHALL BE INSTALLED AT EACH BRIDGE EXPANSION JOINT. IT SHALL BE INSTALLED TO ALLOW SLEEVE MOVEMENT AS BRIDGE EXPANDS AND CONTRACTS.
- (S) THE EDGE OF THE OUTER SLEEVE (FEMALE SECTION) MUST LINE UP WITH THE EDGE OF THE BRIDGE EXPANSION JOINT.
- (T) A 1/2 INCH (13) EPOXY COATED SHEAR PLATE IS BE REQUIRED IF THE APPROACH SLAB IS NOT SUPPORTED . A SHEAR PLATE CAN PROTECT THE CONDUITS AGAINST SHEAR AS A RESULT OF DIFFERENTIAL SETTLEMENT.
- (U) CONDUITS IN THE SIDEWALK MUST BE SCHEDULE 40 PVC AND HAVE A MINIMUM OF 2 INCH CONCRETE COVERAGE.
- (V) CONTACT STANDARDS FOR NON-STANDARD MATERIAL SPECIFICATION.
- (W) CONSULT BRIDGE DESIGN ENGINEER FOR LONGITUDINAL & TRANSVERSE DISPLACEMENT AT SOIL TO ABUTMENT INTERFACE AND ABUTMENT TO BRIDGE INTERFACE.
- (X) CONSULT CIVIL/STRUCTURAL IF THE BRIDGE DESIGN HAS ANY OF THE FOLLOWING PARAMETERS:
 1. LONGITUDINAL DISPLACEMENT GREATER THAN 3 INCHES.
 2. TRANSVERSE DISPLACEMENT GREATER THAN 1 INCH.
 3. DISPLACEMENT THAT CAUSES CONFLICT WITH INSTALLATION.
 4. BRIDGE HAVING EXPANSION JOINTS OTHER THAN THOSE AT THE END OF THE BRIDGE AT THE ABUTMENT.
 5. ABUTMENT CONFIGURATIONS DIFFERENT THAN SHOWN IN THESE STANDARDS.
 6. DUCT CONFIGURATIONS NOT SHOWN.
- (Y) USE SHORT SHEAR PLATE IF THERE IS NO APPROACH SLAB OR APPROACH SLAB IS NOT SUPPORTED BY ABUTMENT.

FOR FIELD MAINTENANCE ONLY

| | | |
|---|--|---|
| DATE 1-1-2000 APPD <i>[Signature]</i> / <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS CONDUIT INSTALLATION IN SLAB BRIDGES | 3399.709 SUPERSEDES 3378.6 (1-1-97) |
|---|--|---|



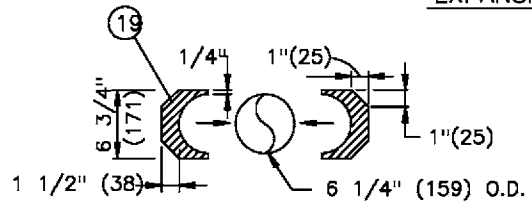
NOTES: IN AN EFFORT TO IMPROVE RESISTANCE TO EARTHQUAKE DAMAGE, 4 INCH CONDUIT IS THE MAXIMUM SIZE PERMITTED BY CALTRANS IN A CALTRANS BRIDGE SIDEWALK.



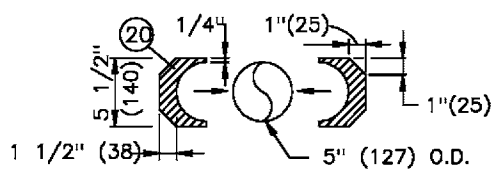
SIDEWALK INSTALLATION, SECTION A-A

SLAB INSTALLATION, SECTION A-A

EXPANSION SECTION A-A



STYROFOAM CASING FOR 5" (127) Ø CONDUIT



STYROFOAM CASING FOR 4" (102) Ø CONDUIT

NOTES:

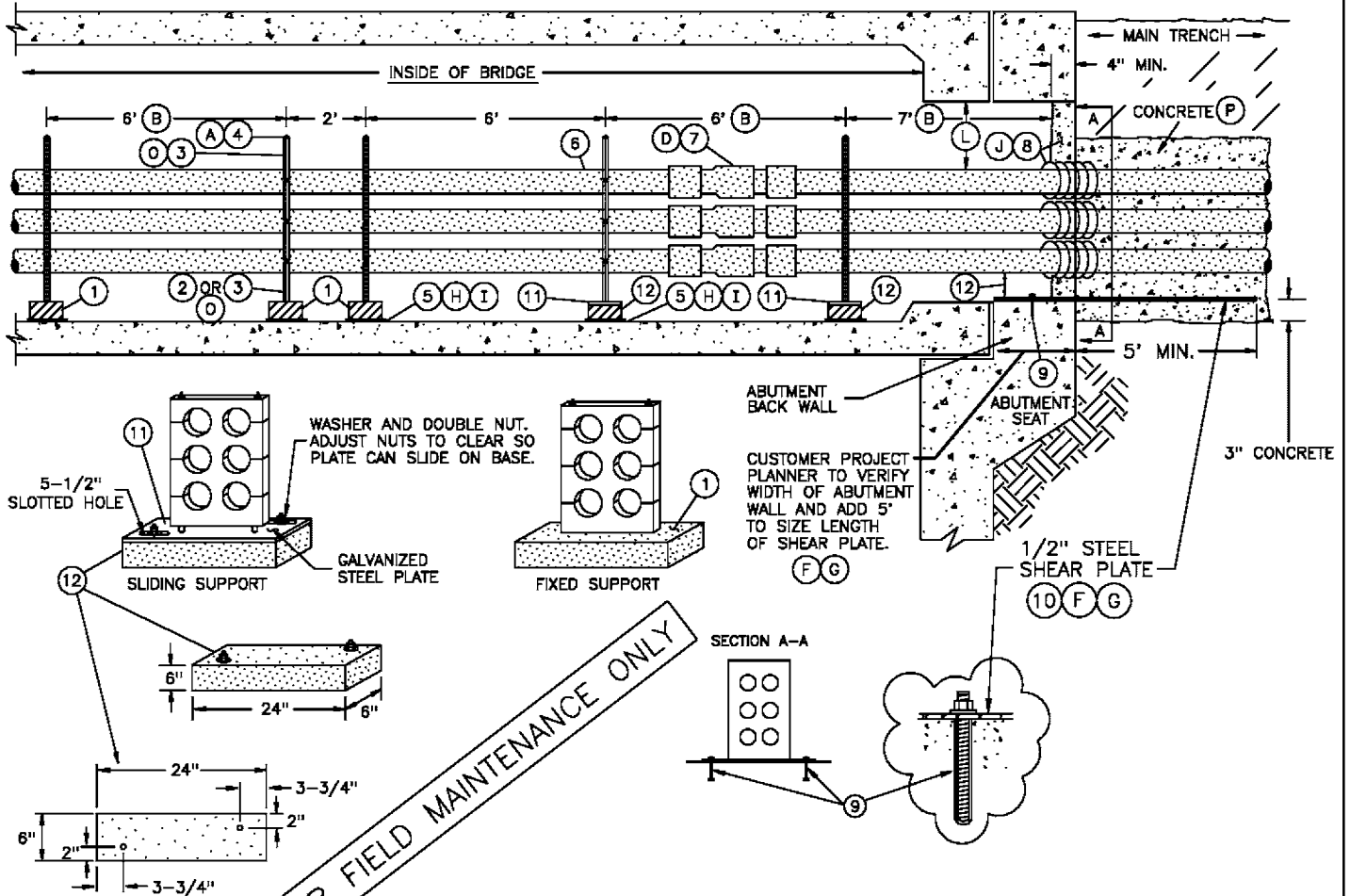
1. MATERIAL SHALL BE NON-DENSE STYROFOAM
2. SEAL ALL JOINTS WITH DUCT TAPE TO PREVENT CONCRETE ENTRY.

| | | |
|--|---|--|
| <p>3399.710 SUPERSEDES 3378.7 (1-1-97)</p> | <p>SDG&E ELECTRIC STANDARDS</p> <p>CONDUIT INSTALLATION IN SLAB BRIDGES</p> | <p>DATE 1-1-2000 APPD <i>[Signature]</i></p> |
|--|---|--|

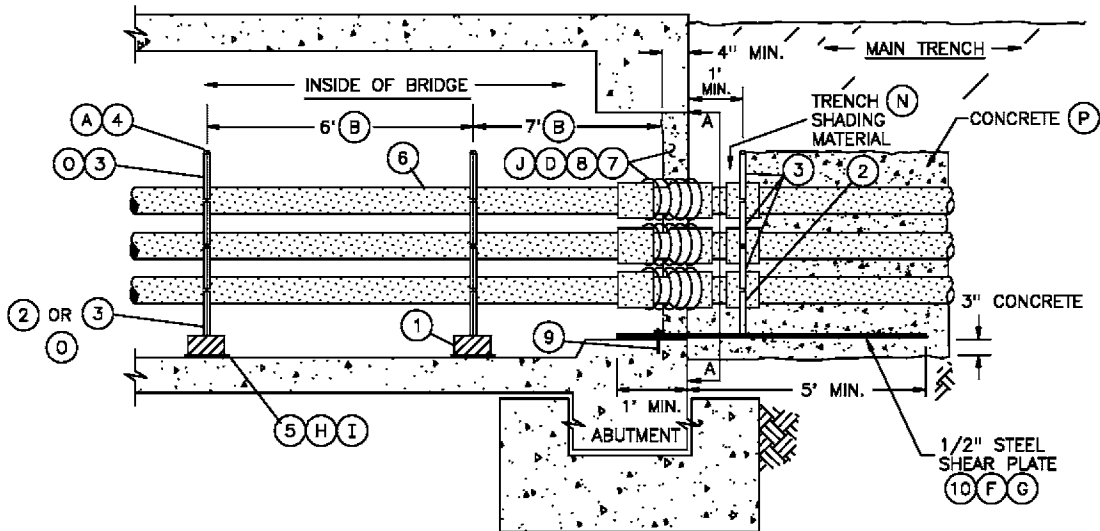
SCOPE: THIS STANDARD SHOWS THE INSTALLATION OF 5 INCH CONDUITS IN CLOSED CELL BRIDGE CONSTRUCTION.

CONDUIT INSTALLATIONS IN CELL BRIDGES

TYPE 1 BRIDGE ABUTMENT



TYPE 2 BRIDGE ABUTMENT



SDG&E ELECTRIC STANDARDS

DATE 1-1-98
 APPD *RWT/CAK*

CONDUIT INSTALLATION IN CELL BRIDGES

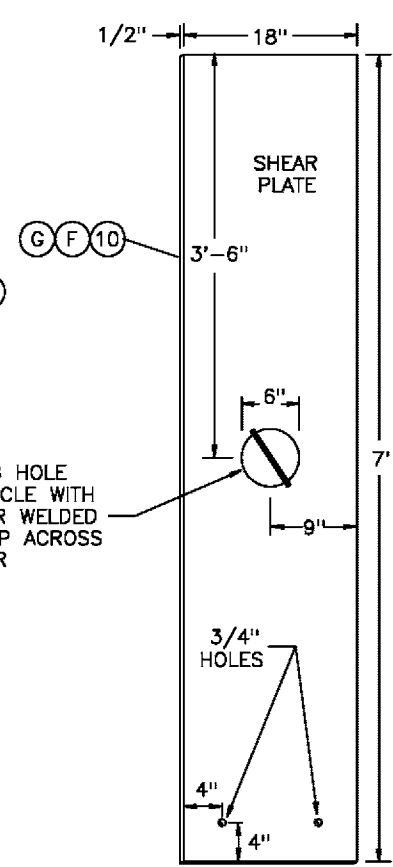
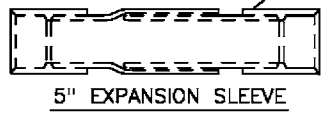
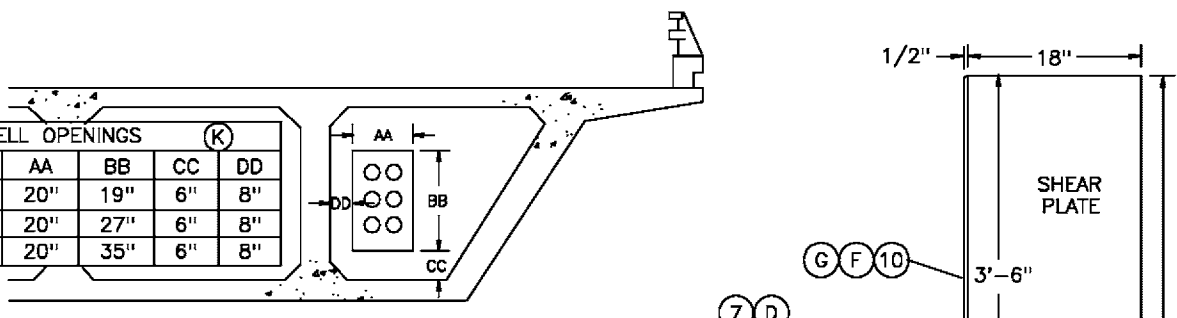
3399.711
 SUPERSEDES
 3378.1 (1-1-98)

TABLE 1

| CELL OPENINGS (K) | | | | |
|-------------------|-----|-----|----|----|
| DIMENSIONS | AA | BB | CC | DD |
| 4 DUCT BANK | 20" | 19" | 6" | 8" |
| 6 DUCT BANK | 20" | 27" | 6" | 8" |
| 8 DUCT BANK | 20" | 35" | 6" | 8" |

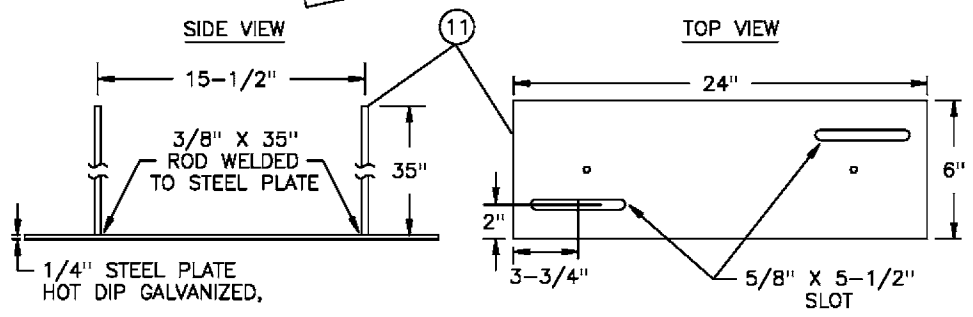
TABLE 2

| ULTIMATE TOTAL WT. PER 100' (C) | | |
|---------------------------------|-----------|-----------|
| 4 CONDUIT | 6 CONDUIT | 8 CONDUIT |
| 4542 | 6463 | 8384 |



FOR FIELD MAINTENANCE ONLY

LIFTING HOLE
6" CIRCLE WITH
1" BAR WELDED
ON TOP ACROSS
CENTER



- NOTES:**
- IN AN EFFORT TO IMPROVE RESISTANCE TO EARTHQUAKE DAMAGE, 4 INCH CONDUIT IS THE MAXIMUM SIZE PERMITTED BY CAL-TRANS IN A BRIDGE SIDEWALK.

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNIT |
|------|---|----------|-----------------------|--------------|---------------|
| 1 | FIXED SUPPORT, CONCRETE CONDUIT SPACER, 24" X 6" X 6" W/GALV. STEEL STEEL REINFORCING ROD, 3/8" | AS REQ'D | --- | 703520 | BR-FIX |
| 2 | SPACER, CONDUIT BASE | AS REQ'D | 3375 | 663008 | --- |
| 3 | SPACER, CONDUIT INTERMEDIATE | AS REQ'D | 3375 | 663528 | |
| 4 | WIRE, IRON, #14 GALVANIZED (A) | AS REQ'D | --- | 815648 | |
| 5 | EPOXY BINDER (CAL-TRANS APPROVED) | AS REQ'D | --- | 213242 | |
| 6 | CONDUIT, PVC, SCHEDULE 40, 5" | AS REQ'D | 3378 | 251408 | S40-5" |
| 7 | SLEEVE, EXPANSION, CONDUIT PLASTIC, 5" | AS REQ'D | 3378 | 650128 | --- |
| 8 | PAPER, BUILDING 15# (ROOFING PAPER) | AS REQ'D | --- | --- | |
| 9 | 5/8" HVA ADHESIVE ANCHOR ROD SYSTEM W/HAS SUPER SS58-758 ANCHOR ROD BY HILTI, INC. (1-800-879-8000) | AS REQ'D | --- | --- | |
| 10 | PLATE, SHEAR (LIGHT GREY EPOXY COATED, ALL SIDES) 18" X 7' X 1/2" (F)(G) | AS REQ'D | 3378 | 543110 | SHEAR |

| | | |
|--|---|--|
| <p>3399.712 SUPERSEDES 3378.2 (1-1-98)</p> | <p>SDG&E ELECTRIC STANDARDS</p> <p>CONDUIT INSTALLATION IN CELL BRIDGES</p> | <p>DATE 1-1-98 APPD <i>[Signature]</i></p> |
|--|---|--|

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNIT |
|------|--|----------|-----------------------|--------------|---------------|
| 11 | SLIDING SUPPORT, HOT DIP GALVANIZED STEEL PLATE, 24" X 6" X 1/4" WITH TWO 3/8" X 35" RODS, TWO 5/8" X 5-1/2" SLOTS. | AS REQ'D | 3378 | 703524 | BR-SLI |
| 12 | SLIDING SUPPORT CONDUIT CONCRETE BASE, 24" X 6" X 6" WITH 1/2" X 5" S.S. (304) ANCHOR BOLT WITH 1" LEG. 2-S.S. NUTS AND 1-S.S. FLAT WASHER ON EACH BOLT. | AS REQ'D | 3378 | 703522 | |

INSTALLATION:

- (A) THE CONDUITS SHALL BE SECURELY STRAPPED TO THE CONDUIT SPACER SUPPORT (ITEM 1 & 11) WITH #14 GALVANIZED WIRE (ITEM 4), FOR EIGHT CONDUITS. WHEN 6 OR LESS CONDUIT RUNS ARE INSTALLED, EXTRA ROD LENGTH MAY BE CUT OR FOLDED OVER TOP OF CONDUITS TOWARD EACH OTHER INSTEAD OF USING THE GALVANIZED WIRE.
- (B) THE FIRST SUPPORT INSIDE THE CELL MUST BE PLACED AT 7 FEET TO ALLOW MAXIMUM DEFLECTION. THE FIRST TWO SLIDING SUPPORTS (ITEM 11) SHALL BE SPACED AT 6 FEET AND FOLLOWED BY TWO FIXED SUPPORTS (ITEM 1) SPACED AT 2 FEET. THE REST OF THE SUPPORTS (ITEM 1) SHALL BE PLACED 6 FEET APART IN THE BRIDGE CELLS.
- (C) TOTAL WEIGHT INCLUDES CONDUIT, CONDUIT SPACERS, CONDUIT SUPPORTS AND CONDUCTORS. CONDUCTORS ARE 1000 KCMIL JACKETED AL. SEE TABLE 2.
- (D) CONDUIT EXPANSION SLEEVE (ITEM 7), SHALL BE INSTALLED AT EACH BRIDGE EXPANSION JOINT AND/OR AT A MAXIMUM DISTANCE BETWEEN EXPANSION JOINTS OF EVERY 100 FEET THROUGHOUT THE RUN.
- (F) A 1/2 INCH STEEL SHEER PLATE IS TO BE PLACED FROM THE BRIDGE ABUTMENT WALL EXTENDING 5 FEET MIN. OUTSIDE THE ABUTMENT TO SUPPORT AND PROTECT THE CONDUITS AGAINST SHEAR FROM EMBANKMENT SETTLEMENT.
- (G) NEW BRIDGES
TYPE 1 BRIDGE OPENINGS REQUIRE AN 18 INCH WIDE STEEL SHEAR PLATE. THE LENGTH OF THE PLATE SHALL BE 5 FEET MIN. OUTSIDE THE ABUTMENT, PLUS THE WIDTH OF THE ABUTMENT WALL, USE STOCK ITEM 543110. IF A SPECIAL SIZE SHEAR PLATE IS REQUIRED, THE CUSTOMER PROJECT PLANNER IS TO FILL OUT A MACHINE SHOP ORDER FORM, AND SEND IT TO THE MACHINE SHOP.

TYPE 2 BRIDGE OPENINGS REQUIRE AN 18 INCH WIDE STEEL SHEAR PLATE. INSTALL WITH 1 FOOT MIN. OF THE PLATE ON THE BRIDGE ABUTMENT AND 5 FEET MIN. OUTSIDE THE ABUTMENT, USE STOCK ITEM 543110. THE CUSTOMER PROJECT PLANNER IS TO FILL OUT A MACHINE SHOP ORDER FORM IF A SPECIAL SIZE SHEAR PLATE IS REQUIRED AND SEND IT TO THE MACHINE SHOP.

 FOR OTHER TYPE BRIDGES, CONSULT DISTRIBUTION STANDARDS ENGINEER FOR INSTALLATION STANDARDS.
- (H) THE CONDUIT SPACER SUPPORT (ITEM 1 & 11) SHALL BE SECURELY ATTACHED TO THE BRIDGE SLAB WITH EPOXY BINDER (ITEM 5). THE CONCRETE SURFACE SHALL BE LEVELED AND THOROUGHLY CLEANED PRIOR TO APPLICATION OF THE EPOXY.
- (I) THE EPOXY BINDER (CAL-TRANS APPROVED) IS A 2 COMPONENT ADHESIVE. APPROXIMATELY 1 GAL. OF MIXED EPOXY WILL BE NEEDED FOR EVERY 15 SUPPORTS. READ "CAREFULLY" MANUFACTURERS INSTRUCTIONS FOR APPLICATION OF EPOXY.
- (J) THE SPACE BETWEEN THE CONDUIT AND THE BRIDGE ABUTMENT OPENING SHALL BE SEALED. TIGHTLY WRAP 2 LAYERS OF #15 BUILDING PAPER AROUND CONDUITS OR EXPANSION SLEEVE, THRU THE CELL OPENING AND SEAL WITH MORTAR AT A MINIMUM THICKNESS OF 4 INCHES.
- (K) FOR POSITIONING OF CELL OPENING WITHIN THE BRIDGE, SEE THE CUSTOMER PROJECT PLANNER.
- (L) CONSULT BRIDGE DESIGN ENGINEER FOR SEISMIC MOVEMENT REQUIREMENTS. THEN CONSULT CIVIL/STRUCTURAL AND ELECTRIC DISTRIBUTION ANALYST FOR APPROPRIATE SEISMIC DESIGN AND CONSTRUCTION MATERIAL.
- M. CONSULT CIVIL/STRUCTURAL ENGINEERING FOR ATTACHMENTS OF CONDUITS TO EXISTING OR SLAB BRIDGES.

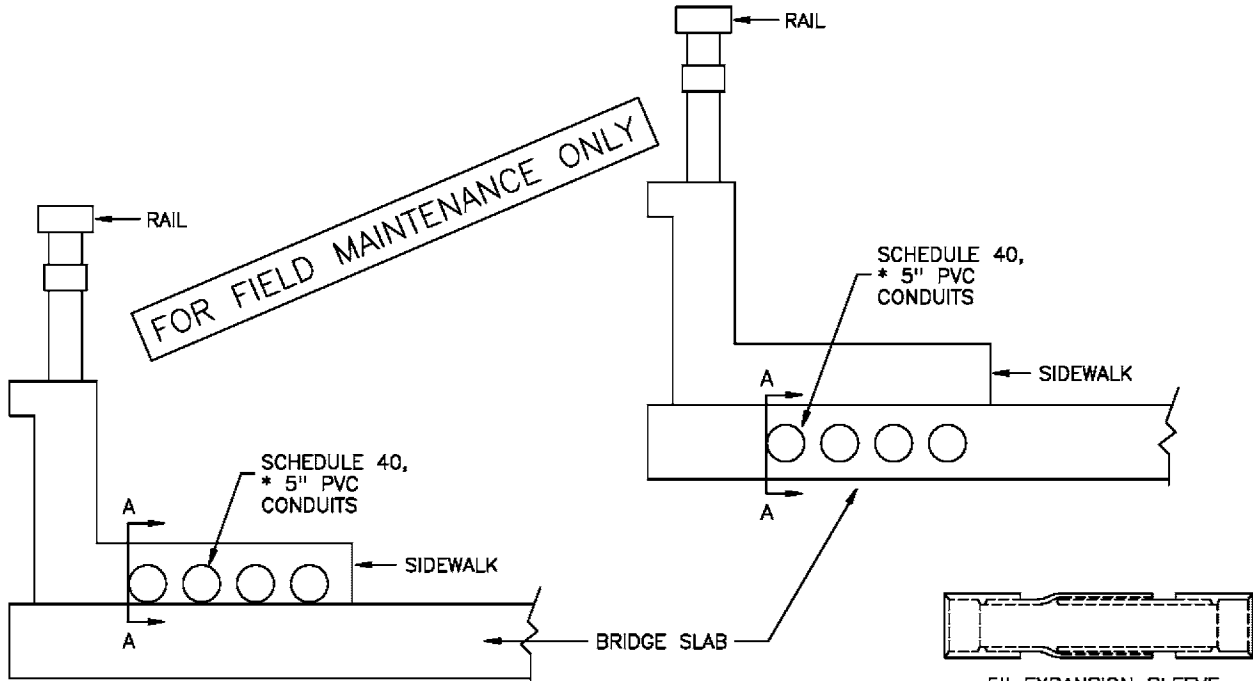
REFERENCE:

- (N) SEE STANDARD PAGES 3370.3/3371.3 FOR TRENCH SHADING REQUIREMENTS.
- (O) SEE STANDARD 3375 FOR CONDUIT SPACER DATA.
- (P) SEE STANDARD 3376 FOR CONCRETE ENCASED MULTI-CONDUIT INSTALLATION.
- Q. CONSULT DESIGN STANDARDS FOR CABLE AMPACITY AND GROUNDING REQUIREMENTS FOR STEEL CONDUITS.

FOR FIELD MAINTENANCE ONLY

| | | |
|-------------------------|--------------------------------------|---|
| DATE 1-1-98 | SDG&E ELECTRIC STANDARDS | |
| APPD <i>[Signature]</i> | CONDUIT INSTALLATION IN CELL BRIDGES | 3399.713 SUPERSEDES 3378.3 (1-1-98) |

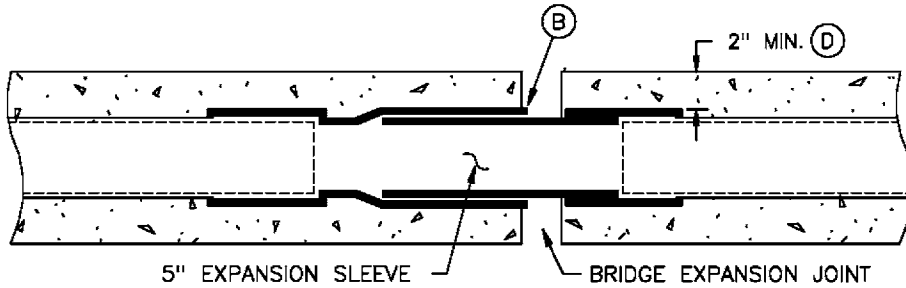
SCOPE: THIS STANDARD SHOWS THE INSTALLATION OF SCHEDULE 40, 5 INCH PVC CONDUITS IN A BRIDGE SIDEWALK OR BRIDGE SLAB FOR SLAB BRIDGE INSTALLATIONS.



5" EXPANSION SLEEVE

STOCK NUMBER

650128



5" EXPANSION SLEEVE

BRIDGE EXPANSION JOINT

SECTION A-A

*** NOTES:**

- IN AN EFFORT TO IMPROVE RESISTANCE TO EARTHQUAKE DAMAGE, 4 INCH CONDUIT IS THE MAXIMUM SIZE PERMITTED BY CAL-TRANS IN A CALTRANS BRIDGE SIDEWALK.

INSTALLATION:

- A. CONDUIT EXPANSION SLEEVE SHALL BE INSTALLED AT EACH BRIDGE EXPANSION JOINT. IT SHALL BE INSTALLED TO ALLOW SLEEVE MOVEMENT AS CONCRETE EXPANDS AND CONTRACTS.
- (B) THE EDGE OF THE OUTER SLEEVE (FEMALE SECTION) MUST LINE UP WITH THE EDGE OF THE EXPANSION JOINT.
- C. A 1/2 INCH COAL-TAR EPOXY COATED SHEAR PLATE MAY BE REQUIRED AT THE JUNCTION OF BRIDGE ABUTMENT AND APPROACHING SLAB. A SHEAR PLATE CAN PROTECT THE CONDUITS AGAINST SHEAR AS A RESULT OF DIFFERENTIAL SETTLEMENT. CONTACT CIVIL ENGINEERING FOR REQUIREMENTS. (SEE PG. 3378.2 FOR SHEAR PLATE)
- (D) CONDUITS IN THE SIDEWALK MUST BE SCHEDULE 40 PVC AND HAVE A MINIMUM OF 2 INCH CONCRETE COVERAGE.
- E. A SET OF PLANS MUST BE SUBMITTED TO CIVIL ENGINEERING FOR REVIEW AND APPROVAL.
- F. CONTACT STANDARDS ENGINEER FOR NON-STANDARD MATERIAL SPECIFICATION.

3399.714
SUPERSEDES
3378.4 (1-1-98)

SDG&E ELECTRIC STANDARDS

CONDUIT INSTALLATION IN SLAB BRIDGES

DATE 1-1-98

APPD *JLB/ROJ*

UG3383 FIELD MAINTENANCE ONLY

ALL VERSIONS LISTED IN FMO ARE SUPERSEDED BY THEIR CURRENT VERSION FOUND INSIDE THE UNDERGROUND CONSTRUCTION STANDARD MANUAL.

REVISION HISTORY:

05/08/2023: MOVED TO FMO

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| REV | CHANGE | DR | BY | DSN | APV | DATE | REV | CHANGE | DR | BY | DSN | APV | DATE |
|-----|----------------|-----|-----|-----|-----|------------|-----|--------|----|----|-----|-----|------|
| C | | | | | | | F | | | | | | |
| B | | | | | | | E | | | | | | |
| A | ORIGINAL ISSUE | ARC | EJA | GLW | KRG | 05/08/2023 | D | | | | | | |

| | | | | | |
|-------------------------|--|--------------------|--|---------------------|-----------------------|
| SHEET 1 OF 1 | Indicates Latest Revision | Completely Revised | <input checked="" type="checkbox"/> New Page | Information Removed | FMO UG3383 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | CONDUIT SPLICING INSTALLATION FOR CABLE-IN-CONDUIT (PID & SIDA) | | | | |

SCOPE: THIS STANDARD SHOWS THE INSTALLATION AND MATERIAL REQUIREMENTS FOR SPLICING OR REPAIRING CABLE-IN-CONDUIT (CIC), CONDUIT OR FLEXIBLE CONDUIT.

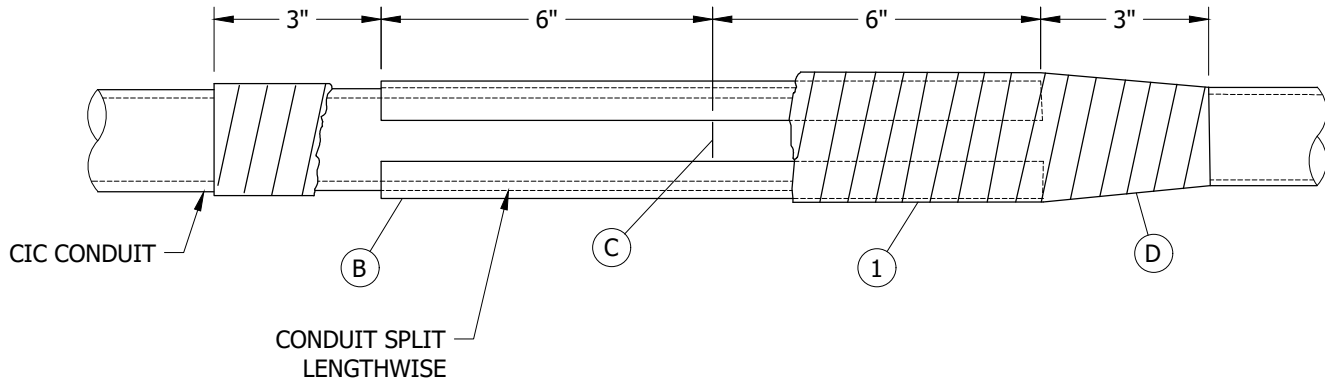


FIGURE 1
SPLICING DETAIL

INSTALLATION:

- A. ASSURE CONDUIT SURFACES ARE CLEAN AND DRY.
- (B) CUT AND SPLIT LENGTHWISE A PIECE OF CONDUIT A MINIMUM OF 12 INCHES LONG THAT IS THE SAME SIZE CONDUIT AS BEING SPLICED.
- (C) CHAMFER THE INSIDE OF THE CONDUIT AND BUTT THE ENDS BEING SPLICED AS CLOSE TOGETHER AS POSSIBLE. PLACE SPLIT SECTION OVER THE CONDUITS BEING JOINED.
- (D) WRAP TWO HALF LAP LAYERS OF GRAY TAPE OVER SPLIT SECTION OF THE CIC CONDUIT. OVERLAP ENDS OF SPLIT SECTION AND ONTO CIC CONDUIT A MINIMUM OF 3 INCHES.

BILL OF MATERIALS:

| ITEM | DESCRIPTION | QUANTITY | STANDARD PAGE | STOCK NUMBER | DESIGN UNITS |
|------|-------------|----------|---------------|--------------|--------------|
| 1 | GRAY TAPE | AS REQ'D | -- | S721120 | INT-PD |

NOTES:

- I. THIS METHOD SHALL BE USED FOR SPLICING FLEXIBLE CONDUIT, PID AND SIDA CONDUIT INCLUDING SIDA IN CORRUGATED CONDUIT WHENEVER REPAIR, REPLACEMENT OR EXTENSION IS NECESSARY.

REFERENCE: NONE

FIELD MAINTENANCE ONLY

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| REV | CHANGE | DR | BY | DSN | APV | DATE | REV | CHANGE | DR | BY | DSN | APV | DATE |
|-----|-------------------|-----|-----|-----|-----|------------|-----|--------|----|----|-----|-----|------|
| C | MOVED TO FMO | ARC | EJA | GLW | KRG | 05/08/2023 | F | | | | | | |
| B | FORMATTING | EDM | JK | - | - | 10/27/2021 | E | | | | | | |
| A | EDITORIAL CHANGES | - | JS | TR | MDJ | 07/25/2016 | D | | | | | | |

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| SHEET 1 OF 1 | <input checked="" type="checkbox"/> Indicates Latest Revision | <input type="checkbox"/> Completely Revised | <input type="checkbox"/> New Page | <input type="checkbox"/> Information Removed | FMO UG3383.1 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | CONDUIT SPLICING INSTALLATION FOR CABLE-IN-CONDUIT (PID & SIDA) | | | | |


FIELD MAINTENANCE ONLY

REVISION HISTORY:

7/13/2016: All versions prior to 2016 are superseded by their current version found inside the Overhead Construction Standard Manual.

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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
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| C | | | | | | F | | | | | |
| B | | | | | | E | | | | | |
| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |

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|--------------------------------|---|--------------------|----------|---------------------|-------------------------------|
| <p>SHEET 1 OF 1</p> |  Indicates Latest Revision | Completely Revised | New Page | Information Removed | <p>FMO UG 3384</p> |
| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | SOIL GAS MITIGATION | | | | |

SCOPE: THIS STANDARD SHALL BE USED WHEN CONSTRUCTING UNDERGROUND ELECTRIC DISTRIBUTION FACILITIES IN AREAS WHERE IT HAS BEEN DETERMINED HIGH CONCENTRATIONS OF SOIL GAS ARE PRESENT.

THESE STANDARDS HAVE BEEN DEVELOPED BY SDG&E AND QUALIFIED EXPERTS IN THE FIELD OF SOIL GAS MITIGATION.

FOR FIELD MAINTENANCE ONLY

DEFINITIONS

TEST LOCATION – A WELL CAPPED AND A VALVE INSTALLED FOR EXTRACTING A SAMPLE OF THE ATMOSPHERE BELOW GRADE.

AREA OF CONCERN – IS THE ENTIRE AREA WITHIN A 300–FT. RADIUS FROM A TEST LOCATION WHERE METHANE GAS CONCENTRATION LEVELS ARE 25% OF THE LOWER EXPLOSIVE LIMIT 12500PPMV, OR HIGHER.

TRENCH DAM – A PORTION OF A MAIN TRENCH OR SERVICE TRENCH WHICH IS BACK FILLED IN A MANNER TO PREVENT THE MIGRATION OF METHANE GAS THROUGH THE TRENCH. THE DAM HAS A MINIMUM LENGTH OF TWICE THE WIDTH OF THE TRENCH OR A MINIMUM OF 36 INCHES IN LENGTH. THE BACK FILL MATERIAL IS A SAND SLURRY MIXTURE WITH A 10% BENTONITE CLAY POWDER ADDED. THE DAM WILL ENCOMPASS ALL UTILITIES WITHIN THE TRENCH AND WILL EXTEND 3 INCHES BELOW, TO THE SIDES AND ABOVE THE UPPER MOST UTILITIES.

VAPOR BARRIER – AN APPLIED GAS TIGHT MEMBRANE OR BARRIER INSTALLED UNDER ALL PAD–MOUNTED EQUIPMENT. THIS MEMBRANE PREVENTS METHANE GAS FROM MIGRATING INTO THE PAD–MOUNTED EQUIPMENT. THE MEMBRANE CONSISTS OF LAYER OF GEOTEXTILE TRADE NAMED TYPAR (WHICH IS THEN SPRAYED WITH A MATERIAL CALLED "LIQUID BOOT). WHEN COMPLETED THE MEMBRANE IS ABOUT AN 1/8 INCH THICK AND EXTENDS BEYOND THE EDGES OF THE PAD–MOUNTED EQUIPMENT.

NOTE: SHOULD THIS BARRIER BE VIOLATED BY ADDING ADDITIONAL CONDUITS ETC. IT MUST BE REPAIRED BY A QUALIFIED LIQUID BOOT INSTALLER. CARE SHOULD BE TAKEN TO INSTALL ALL NECESSARY CONDUITS AT THE TIME OF INITIAL CONSTRUCTION.

REQUIREMENTS:

WITHIN AN "AREA OF CONCERN" THE INSTALLATION OF "PME" SWITCH GEAR IS PROHIBITED. ALL LOADBREAK EQUIPMENT SHALL BE INSTALLED IN PAD–MOUNTED ENCLOSURES. PADMOUNTED EQUIPMENT WILL BE PASSIVELY VENTED TO ALLOW AN EXCHANGE OF AIR FOUR TIMES PER HOUR.

IN AN AREA OF CONCERN, ONLY NON–LOADBREAK EQUIPMENT WILL BE ALLOWED IN SUB–STRUCTURES. HOWEVER, SHOULD A HANDHOLE BE LOCATED IN AN AREA OF CONCERN AND THE TEE'S BE EQUIPPED WITH LBE'S, THE LBE'S SHALL BE TAGGED "DO NOT OPERATE ENERGIZED". THE END COVERS OF THE HANDHOLES WILL BE VENTED.

SDG&E WILL AFFIX A WARNING DECAL TO ALL DISTRIBUTION EQUIPMENT REFERENCING UNDER–GROUND CONSTRUCTION STANDARD 3384 FOR SPECIAL INSTRUCTIONS. SDG&E WILL PROVIDE THE CUSTOMER WITH WARNING DECALS TO BE AFFIXED INSIDE THE SERVICE PANEL BELOW THE TERMINATION LUGS. THIS DECAL REFERENCES UNDERGROUND CONSTRUCTION STANDARD 3384 FOR SPECIAL INSTRUCTIONS.

THE CUSTOMER WILL BE RESPONSIBLE FOR INSTALLING THE FINAL SEAL AFTER SDG&E HAS INSTALLED THE SERVICE CONDUCTORS AND SEALED THE CONDUIT. THE CUSTOMER WILL ALSO BE BE RESPONSIBLE FOR ALL SERVICE TRENCH AND MAIN TRENCH DAMS AND VAPOR BARRIERS.

THE CUSTOMER MUST PROVIDE AN "AS BUILT DRAWING" SHOWING THE LOCATION OF ALL SERVICE AND MAIN TRENCH DAMS UPON COMPLETION OF THEIR WORK, AND PRIOR TO SDG&E ENERGIZING THE FACILITIES. THE DISTANCE FROM SDG&E'S GAS RISER TO THE CLOSEST EDGE OF THE SERVICE TRENCH DAM MUST BE SHOWN ON THE AS–BUILT.

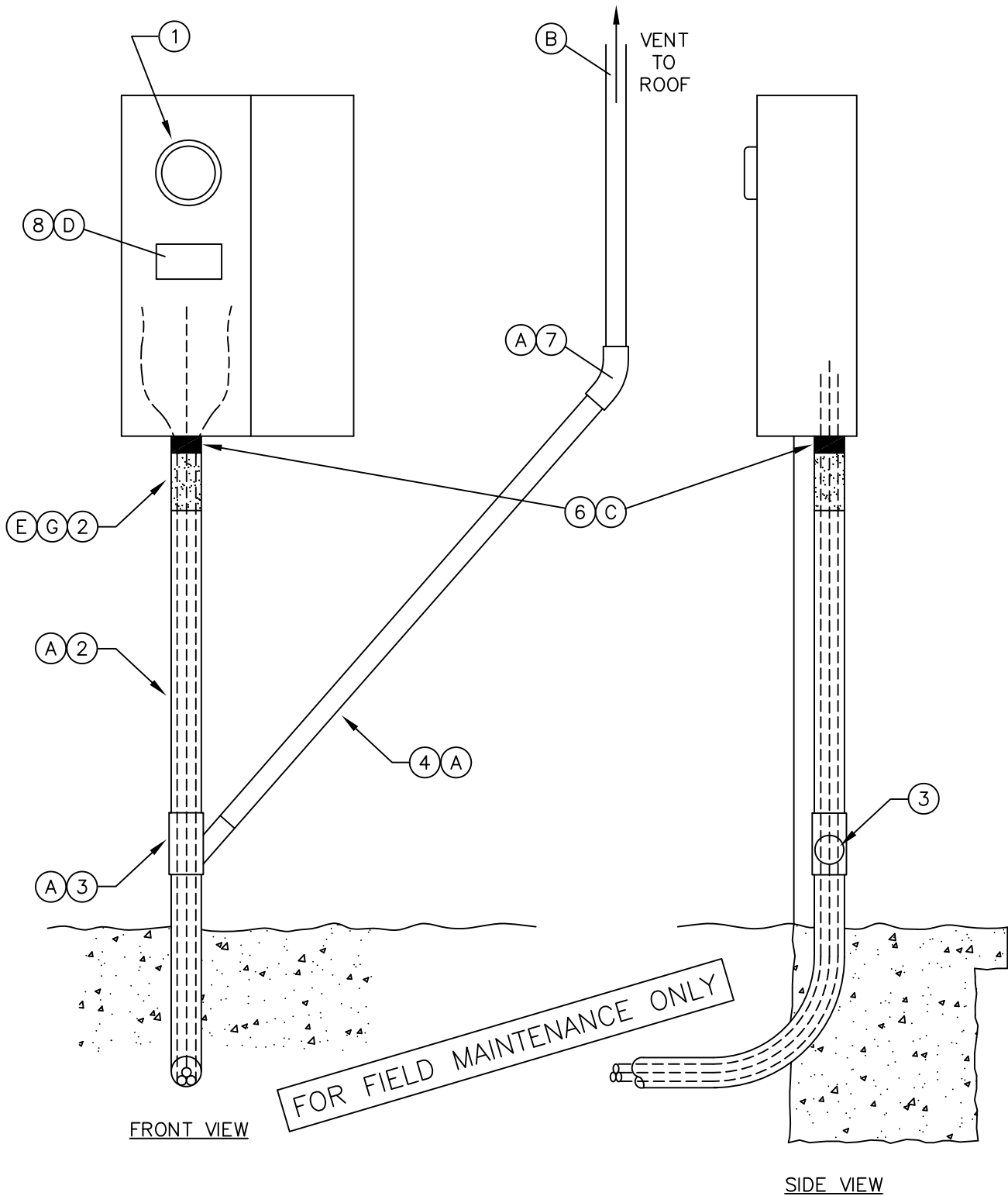
THE CUSTOMER'S SERVICE LATERAL CONDUIT MAY BE REQUIRED TO BE VENTED BELOW THE SERVICE AND METERING PANEL TO MITIGATE THE ENTRY OF METHANE GAS INTO THE PANEL. CUSTOMER WILL BE REQUIRED TO MAINTAIN THE VENT.

ALL TRENCH DAMS WILL CONSIST OF A SAND SLURRY MIXTURE WITH A 10% BY WEIGHT BENTONITE CLAY ADDITIVE.

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| SERVICE GUIDE | Indicates Latest Revision | Completely Revised | New Page | Information Removed |
| REVISION | SDG&E ELECTRIC STANDARDS | | | 3384.0 |
| DATE 8-5-02 | SOIL GAS MITIGATION | | | |
| APPD <i>[Signature]</i> | | | | |

SCOPE: THIS STANDARD SHOWS THE INSTALLATION OF A SERVICE LATERAL CONDUIT VENT.



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| 3384.1 | SDG&E ELECTRIC STANDARDS | | | REVISION |
| | SOIL GAS MITIGATION SERVICE LATERAL CONDUIT VENTING | | | DATE 6-1-02 APPD <i>[Signature]</i> |

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNITS |
|------|-------------------------------|----------|-------------------------|--------------|----------------|
| 1 | METER AND BREAKER PANEL | AS REQ'D | BY CUSTOMER | - | - |
| 2 | SERVICE LATERAL CONDUIT | AS REQ'D | BY CUSTOMER | - | - |
| 3 | "Y" CONNECTOR ABS | 1 | BY CUSTOMER | - | - |
| 4 | 1-1/2 INCH SCH 40 ABS | AS REQ'D | BY CUSTOMER | - | - |
| 5 | SEALANT, CONDUIT SEMCO PR-821 | 2 OZ. | 3948.1 | S631829 | SEAL-2 |
| 6 | SEALANT, SIKAFLEX 1C SL | AS REQ'D | BY CUSTOMER | - | - |
| 7 | 1-1/2 INCH 45 DEGREE BEND ABS | 1 | BY CUSTOMER | - | - |
| 8 | WARNING DECAL | 1 | BY UTILITY | - | - |

INSTALLATION:

- A. ALL CONDUIT, PIPE AND COUPLINGS ETC. TO BE PROVIDED, INSTALLED AND MAINTAINED BY THE CUSTOMER.
- B. VENT RISER SHALL BE CAPPED WITH "TEE" OR APPROPRIATE RAIN HOOD.
- C. SIKAFLEX 1C SL 1/2" THICK POLYURETHANE SEALANT IS TO BE INSTALLED AND REPLACED WHEN NECESSARY BY CUSTOMER.
- D. WARNING DECAL TO BE INSTALLED INSIDE SERVICE PULL SECTION BY THE CUSTOMER.
- E. SEMCO PR-821 BY SDG&E OR IT'S AUTHORIZED AGENT.

REFERENCE:

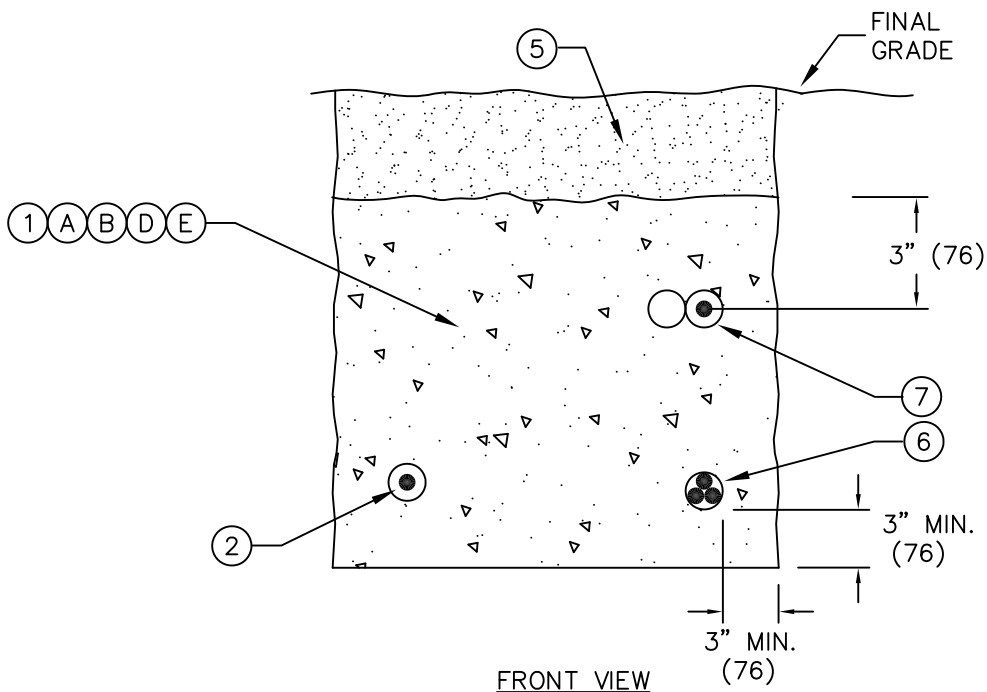
- G. SEE STANDARD 3948.1 FOR INFORMATION ON THE INSTALLATION OF SEMCO PR-821 FOAM SEALANT.

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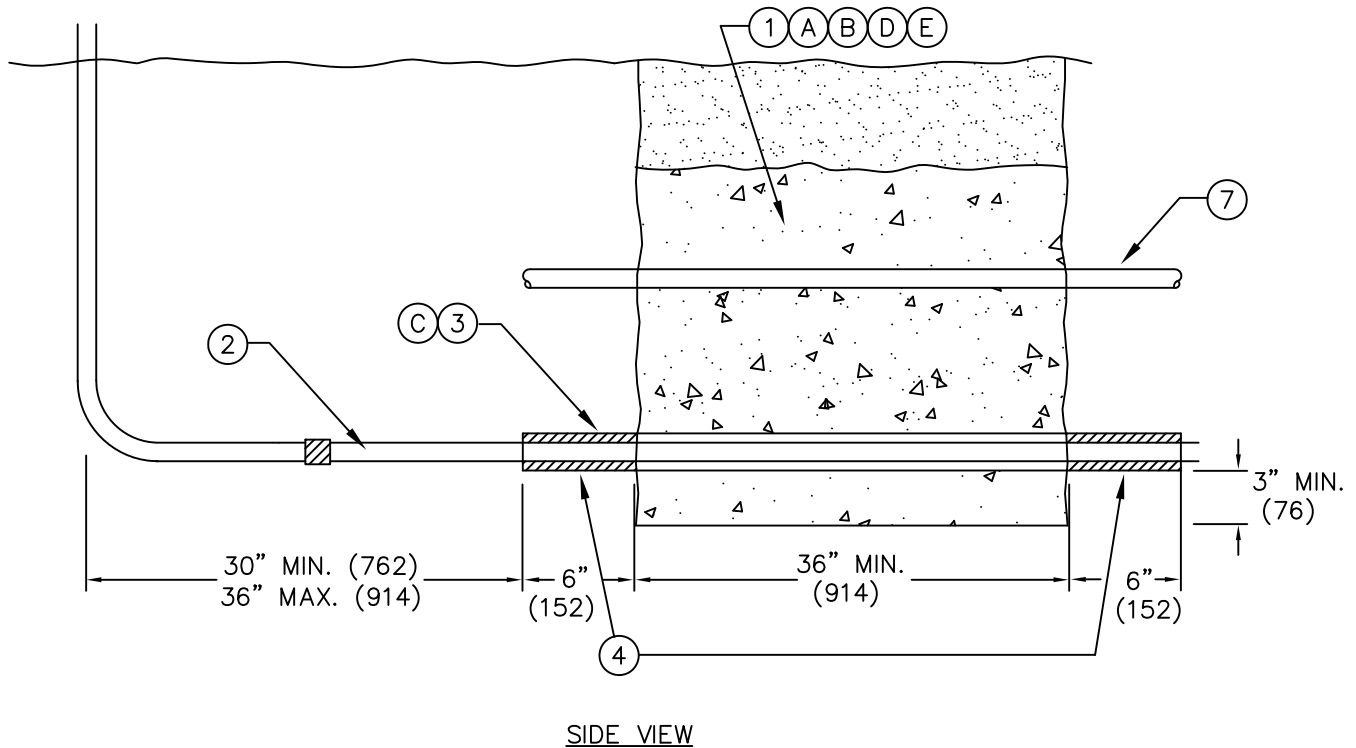
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|-------------------------|---------------------------------|--------------------|----------|---------------------|
| REVISION | SDG&E ELECTRIC STANDARDS | | | 3384.2 |
| DATE 6-1-02 | SOIL GAS MITIGATION | | | |
| APPD <i>[Signature]</i> | SERVICE LATERAL CONDUIT VENTING | | | |

SCOPE: THIS STANDARD SHOWS THE PLACEMENT AND CONSTRUCTION OF A TYPICAL SERVICE TRENCH DAM.



FRONT VIEW

FOR FIELD MAINTENANCE ONLY



SIDE VIEW

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| 3384.3 | SDG&E ELECTRIC STANDARDS | | | REVISION |
| | SOIL GAS MITIGATION SERVICE TRENCH DAM | | | DATE 8-1-02 APPD <i>[Signature]</i> |

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNITS |
|------|--|----------|-------------------------|--------------|----------------|
| 1 | SLURRY/BENTONITE TRENCH DAM | AS REQ'D | BY CUSTOMER | - | - |
| 2 | GAS SERVICE PIPE | AS REQ'D | - | - | - |
| 3 | PVC GAS SERVICE SLEEVE PER TABLE 1 ON 3384.9 | 4' MIN. | BY CUSTOMER | - | - |
| 4 | POLYSEAL EXPANDING FOAM SEALANT | AS REQ'D | BY CUSTOMER | - | - |
| 5 | COMPACTED NATIVE FILL | - | - | - | - |
| 6 | ELECTRIC SERVICE CONDUIT | AS REQ'D | 3942.1 | - | - |
| 7 | COMMUNICATIONS CONDUIT(S) | AS REQ'D | - | - | - |

NOTES:

IT SHALL BE THE RESPONSIBILITY OF THE CUSTOMER TO INSTALL AND MAINTAIN WHEN NECESSARY THE SERVICE TRENCH DAM.

FOR FIELD MAINTENANCE ONLY

INSTALLATION:

- A. TRENCH DAM SHALL BE CONCRETE SLURRY WITH 10% BENTONITE CLAY POWDER. CONCRETE/BENTONITE MIX SHALL BE 300-500 PSI (28 DAYS).
- B. TRENCH DAM SHALL BE INSTALLED IN JOINT UTILITY SERVICE TRENCH AT A POINT JUST BEFORE UTILITIES SPLIT TO THEIR FINAL SERVICE LOCATION.
- C. SPLIT 2 INCH SCH 40 PVC GAS SERVICE SLEEVE IN HALF ALONG ITS LENGTH AND REJOIN BY SPIRAL WRAPPING WITH DUCT TAPE ALONG ENTIRE LENGTH. CENTER GAS SERVICE PIPE IN THE CONDUIT AND SEAL ANNULAR SPACE WITH POLYSEAL POLY FOAM SEALANT A MIN. 6" BEYOND DAM.
- D. TRENCH DAM SHALL EXTEND A MIN. 6 INCHES ABOVE THE UPPERMOST UTILITY.
- E. TRENCH DAM SHALL EXTEND 3 INCHES BELOW AND A MIN. 3 INCHES TO THE SIDE OF UTILITIES.

TABLE 1

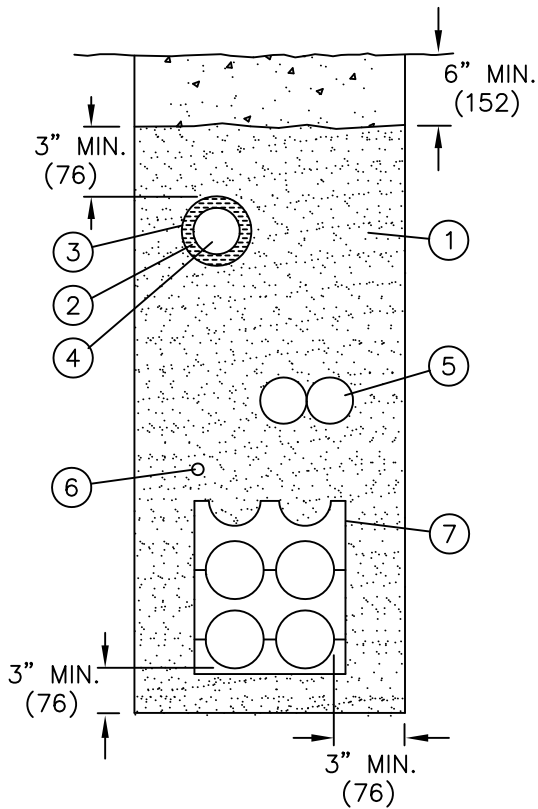
| GAS PIPE SIZE | SCH 40 PVC SLEEVE SIZE |
|----------------------------------|------------------------|
| 1/2" POLY SERVICE | 2" SLEEVE |
| 3/4" STEEL OR 1" POLY SERVICE | 3" SLEEVE |
| 2" STEEL OR POLY SERVICE OR MAIN | 4" SLEEVE |
| 3" POLY MAIN OR SERVICE | 5" OR 6" SLEEVE |
| 4" MAIN | 6" OR 8" SLEEVE |
| 6" MAIN | 8" SLEEVE |

GREATER THAN 6", CONTACT THE GAS DEPARTMENT

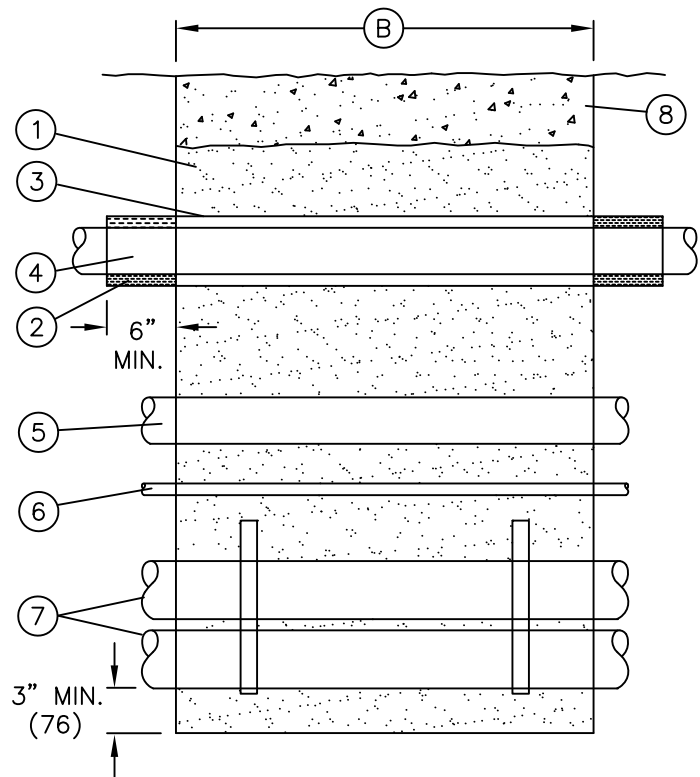
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| REVISION | SDG&E ELECTRIC STANDARDS | | | 3384.4 |
| DATE 6-1-02 | SOIL GAS MITIGATION | | | |
| APPD <i>[Signature]</i> | SERVICE TRENCH DAM | | | |

SCOPE: THIS STANDARD SHOWS THE CONSTRUCTION OF A TYPICAL DISTRIBUTION TRENCH DAM.



FRONT VIEW



SIDE VIEW

FOR FIELD MAINTENANCE ONLY

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNITS |
|------|--|----------|-------------------------|--------------|----------------|
| 1 | CONCRETE MIX (300-500 PSI/28 DAY) WITH 10% BENTONITE CLAY POWDER | AS REQ'D | BY CUSTOMER | - | - |
| 2 | SEALANT FOR POLY GAS MAIN (SEMCO PR-821) | AS REQ'D | BY CUSTOMER | S631890 | - |
| 3 | SLEEVE FOR POLY GAS MAIN (SEE TABLE 1) | AS REQ'D | BY CUSTOMER | - | - |
| 4 | GAS MAIN | AS REQ'D | BY CUSTOMER | - | - |
| 5 | COMMUNICATIONS | AS REQ'D | BY CUSTOMER | - | - |
| 6 | STREET LIGHTNING | AS REQ'D | BY CUSTOMER | - | - |
| 7 | ELECTRIC CONDUIT & SPACERS | AS REQ'D | BY CUSTOMER | - | - |
| 8 | NATIVE BACKFILL | AS REQ'D | BY CUSTOMER | - | - |

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| 3384.5 | SDG&E ELECTRIC STANDARDS | | | REVISION |
| | SOIL GAS MITIGATION DISTRIBUTION TRENCH DAM | | | DATE 7-25-02 APPD [Signature] |

INSTALLATION:

- A. TRENCH DAM SHALL BE CONCRETE SLURRY WITH 10% BENTONITE CLAY POWDER. CONCRETE/BENTONITE MIX SHALL BE 300-500 PSI (28 DAY).
- (B) TRENCH DAM SHALL BE TWICE THE WIDTH OF THE TRENCH IN LENGTH OR A MINIMUM OF 36 INCHES WHICHEVER IS GREATER.
- C. GAS SLEEVE CONDUIT SHALL BE GRAY OR BLACK IN COLOR. NO OTHER COLOR IS ACCEPTABLE.
- D. GAS SLEEVE CONDUIT SHALL BE PVC, SCH 40.
- E. FOR RETROFIT APPLICATIONS SPLIT THE SLEEVE IN HALF ALONG ITS LENGTH AND REJOIN BY SPIRAL WRAPPING W/ DUCT TAPE ALONG ENTIRE LENGTH. CENTER GAS PIPE IN SLEEVE AND SEAL ANNULAR SPACE WITH POLY SEALANT.
- F. TRENCH DAM SHALL EXTEND 3" BELOW AND A MIN. 3" TO THE SIDE OF UTILITIES.

TABLE 1

| GAS PIPE SIZE | SCH 40 PVC SLEEVE SIZE |
|----------------------------------|------------------------|
| 1/2" POLY SERVICE | 2" SLEEVE |
| 3/4" STEEL OR 1" POLY SERVICE | 3" SLEEVE |
| 2" STEEL OR POLY SERVICE OR MAIN | 4" SLEEVE |
| 3" POLY MAIN OR SERVICE | 5" OR 6" SLEEVE |
| 4" MAIN | 6" OR 8" SLEEVE |
| 6" MAIN | 8" SLEEVE |

GREATER THAN 6", CONTACT THE GAS DEPARTMENT

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|-------------------------|---------------------------|--------------------|----------|---------------------|
| REVISION | SDG&E ELECTRIC STANDARDS | | | 3384.6 |
| DATE 6-1-02 | SOIL GAS MITIGATION | | | |
| APPD <i>[Signature]</i> | DISTRIBUTION TRENCH DAM | | | |

SCOPE: THIS STANDARD PROVIDES THE RECOMMENDED PROPORTIONS TO CREATE ONE CUBIC YARD OF SAND SLURRY FOR USE IN TRENCH DAMS.

* THE FOLLOWING PROPORTIONS WILL PROVIDE APPROXIMATELY ONE CUBIC YARD OF CONCRETE SAND/BENTONITE SLURRY. THIS MIX WILL SET UP BETWEEN 8 AND 20 HOURS AND WILL ACHIEVE 471 PSI @28 DAYS AND 266 PSI @4 DAYS.

CONCRETE SAND SLURRY

CONCRETE SAND 3000 LBS. +- 50 LBS.
 WATER 350 LBS. (42 GALLONS)
 CONCRETE 376 LBS. (4 SACKS)

BENTONITE SLURRY

BENTONITE 34 LBS. (200 MESH FORM)
 WATER 564 LBS. (64 GALLONS)

THE MANUFACTURERS OF BENTONITE RECOMMEND ADDING TWO GALLONS OF WATER TO EACH POUND OF BENTONITE TO ACHIEVE A CONSISTENCY OF PANCAKE MIX. THIS MIX SHOULD BE ADDED TO THE ALREADY MIXED CONCRETE SAND SLURRY. A CHEMGROUT PUMP WOULD WORK WELL FOR THIS.

BENTONITE POWDER SHOULD NEVER BE ADDED DIRECTLY TO CONCRETE SAND SLURRY MIXTURE. TO DO SO WILL CAUSE COAGULATION OR LUMPING OF THE BENTONITE POWER IN THE CONCRETE SLURRY MIXTURE.

NOTE:

CONFIRM WITH THE CONCRETE SUPPLIER THAT THEY WILL ALLOW BENTONITE TO BE ADDED TO THE MIXER IF A TRANSIT MIX COMPANY SUPPLIES THE CONCRETE SAND SLURRY.

*THIS MIX WILL YIELD 26 CUBIC FEET (0.96 CUBIC YARD)

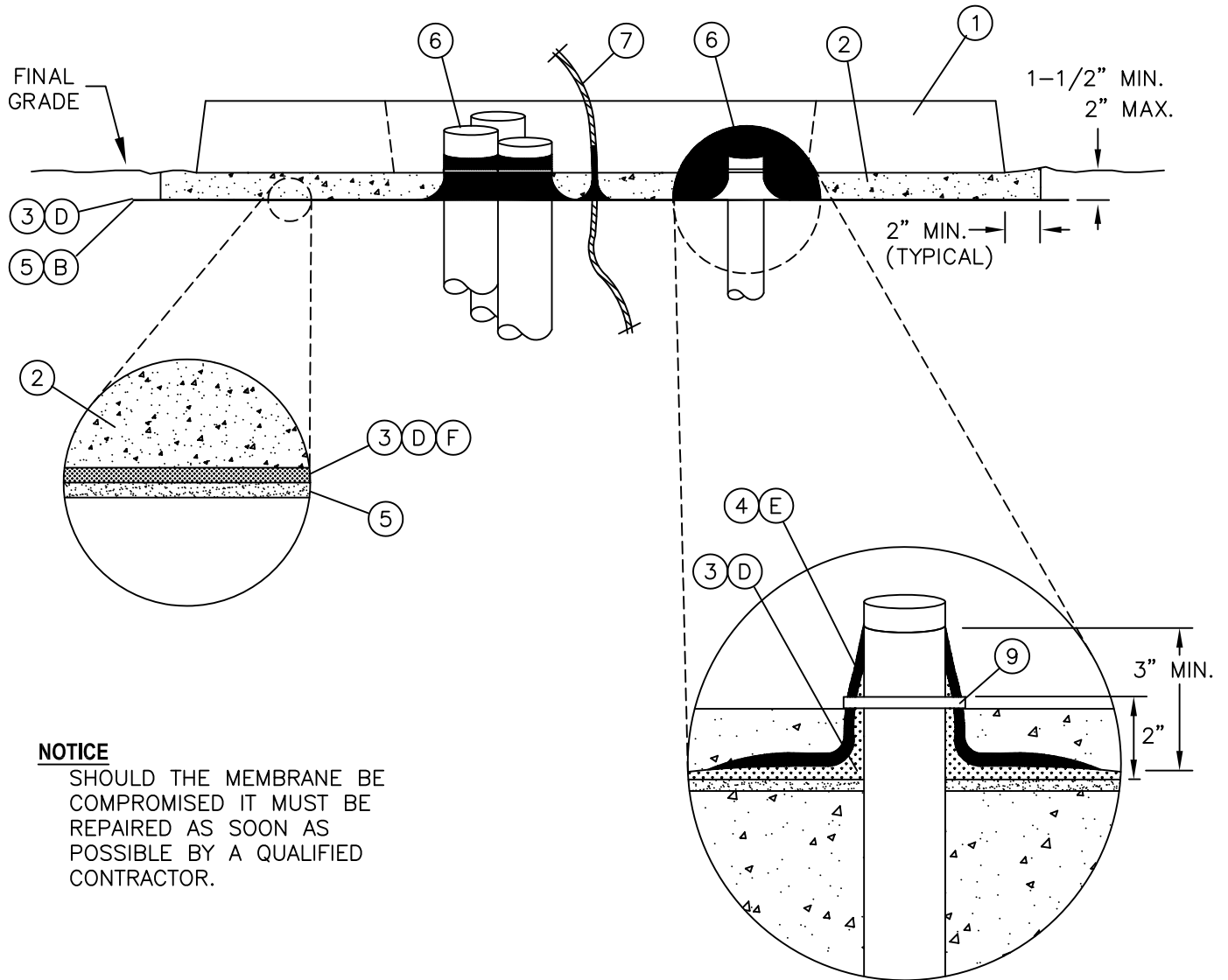
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|---------------|--|--------------------|----------|--|
| 3384.7 | SDG&E ELECTRIC STANDARDS | | | REVISION |
| | SOIL GAS MITIGATION CONCRETE SLURRY/BENTONITE MIX | | | DATE 6-1-02 APPD <i>[Signature]</i> |

SCOPE: THIS STANDARD DESCRIBES THE INSTALLATION OF AN APPLIED MEMBRANE OR METHANE BARRIER UNDER TYPICAL PAD-MOUNTED EQUIPMENT. THIS INCLUDES CONCRETE PADS WITH AND WITHOUT HANDHOLES AND FIBERGLASS STRUCTURES.

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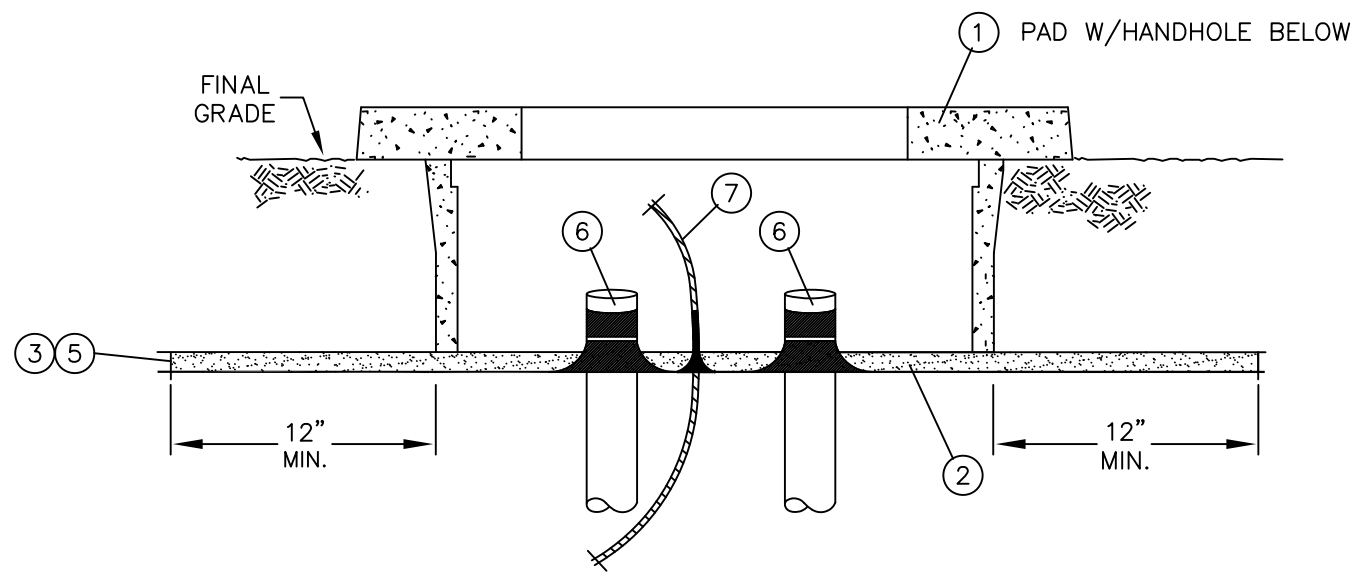
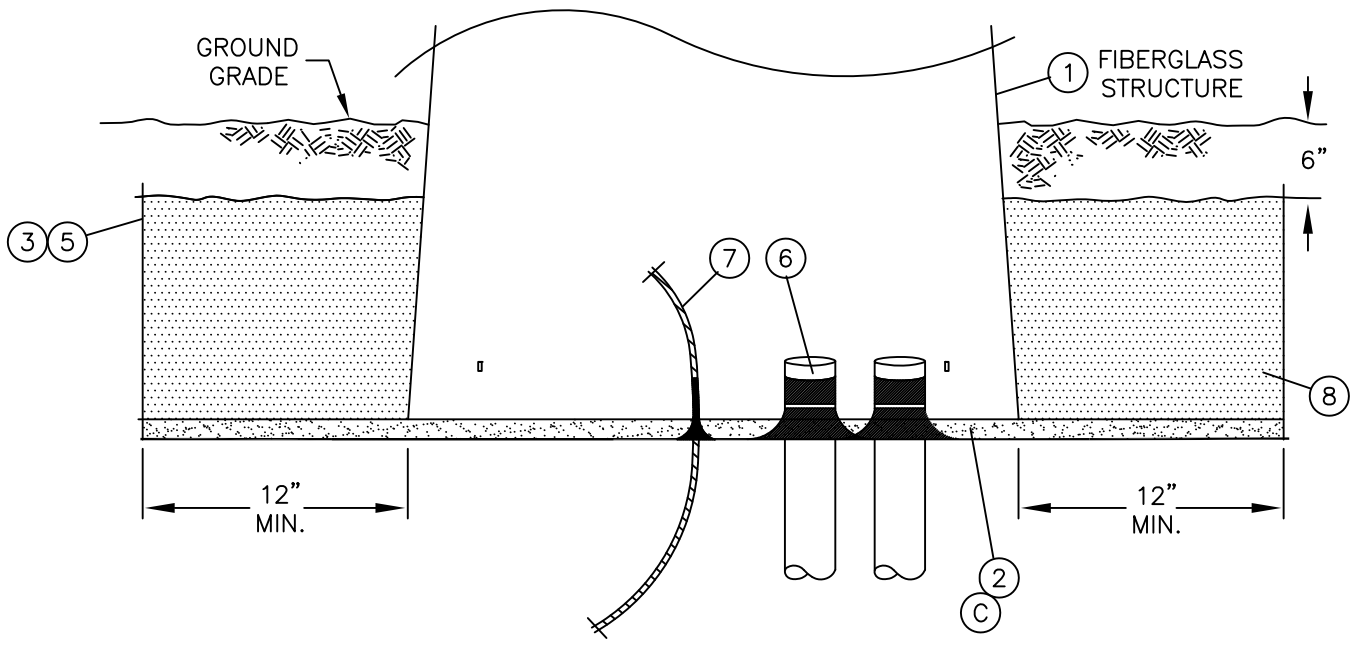
NOTICE

SHOULD THE MEMBRANE BE COMPROMISED IT MUST BE REPAIRED AS SOON AS POSSIBLE BY A QUALIFIED CONTRACTOR.

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| REVISION | SDG&E ELECTRIC STANDARDS | | | 3384.8 |
| DATE 6-1-02 | SOIL GAS MITIGATION | | | |
| APPD <i>[Signature]</i> | PAD-MOUNTED EQUIPMENT VAPOR BARRIER | | | |

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| | SOIL GAS MITIGATION CONCRETE EQUIPMENT PAD VAPOR BARRIER | | | DATE 6-1-02 APPD <i>[Signature]</i> |

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNITS |
|------|--------------------------------|----------|-------------------------|--------------|----------------|
| 1 | PAD OR FIBERGLASS STRUCTURE | 1 | BY CUSTOMER | - | - |
| 2 | SAND | AS REQ'D | BY CUSTOMER | - | - |
| 3 | LIQUID BOOT (COLD SPRAY) | AS REQ'D | BY CUSTOMER | - | - |
| 4 | LIQUID BOOT (TROWEL GRADE) | AS REQ'D | BY CUSTOMER | - | - |
| 5 | TYPAR OR EQUIVALENT, 4oz. MIN. | AS REQ'D | BY CUSTOMER | - | - |
| 6 | CONDUIT | AS REQ'D | BY CUSTOMER | - | - |
| 7 | EQUIPMENT GROUND | AS REQ'D | 4510 | - | - |
| 8 | SAND SLURRY | AS REQ'D | BY CUSTOMER | - | - |
| 9 | CABLE TIE STRAP | AS REQ'D | BY CUSTOMER | - | - |

INSTALLATION:

- A. SOIL UNDER PAD OR FIBERGLASS STRUCTURES SHALL BE COMPACTED TO MIN. OF 90%. STOP THE BACKFILL 1-1/2 TO 2 INCHES BELOW THE RECOMMENDED EXCAVATION DEPTH.
- B. ROLL OUT ONE LAYER OF APPROVED GEOTEXTILE, HEAT ROLLED SIDE UP, AND ALLOW THE GEOTEXTILE TO EXTEND A MINIMUM OF 2 INCHES BEYOND THE EDGES OF THE PAD. OVERLAP ANY SEAMS BY 6 INCHES. KEEP THE GEOTEXTILE FREE FROM DIRT.
- C. FOR FIBERGLASS STRUCTURES THE GEOTEXTILE SHALL EXTEND 12 INCHES BEYOND THE BOTTOM FLANGE OF THE STRUCTURE.
- D. SPRAY APPLY LIQUID BOOT AS PER THE MANUFACTURER INSTRUCTIONS. MAINTAIN A MIN. 80 MIL DRY THICKNESS. PAY PARTICULAR ATTENTION TO THE AREAS BETWEEN BUNCHED CONDUITS. SPRAY LIQUID BOOT ONTO CONDUIT A MINIMUM OF 1-1/2 INCHES ABOVE THE GEOTEXTILE.
- E. APPLY ADDITIONAL LIQUID BOOT (TROWEL GRADE) TO CONDUITS WHERE THEY PENETRATE THE GEOTEXTILE FABRIC. WORK THE TROWEL GRADE LIQUID BOOT A MINIMUM 1-1/2 INCHES HORIZONTALLY FROM THE CONDUIT AND 1-1/2" ABOVE THE SPRAYED LIQUID BOOT. MAINTAIN A MINIMUM DRY THICKNESS OF 80 MILS. WHERE THE CONDUIT PENETRATES THE GEOTEXTILE AND THE LIQUID BOOT, THE CONDUIT SHOULD EXTEND AT LEAST 3 INCHES ABOVE THE GEOTEXTILE. THIS WILL CREATE A COLLAR AROUND THE CONDUIT. TREAT THE EQUIPMENT GROUND AS A CONDUIT.
- F. AFTER THE MEMBRANE HAS CURED, CHECK FOR FLAWS.
- G. WHEN MEMBRANE HAS COMPLETELY CURED WRAP PENETRATING CONDUITS WITH A POLYPROPYLENE CABLE TIE AT A POINT 2 INCHES ABOVE THE PENETRATION. TIGHTEN THE CABLE TIE FIRMLY SO AS TO SQUEEZE THE CURED MEMBRANE COLLAR AROUND THE CONDUIT.
- H. COVER THE NOW COMPLETED MEMBRANE WITH MINIMUM OF 1-1/2 TO 2 INCHES OF SAND. INSTALL PAD OR FIBERGLASS STRUCTURE TO SDG&E STANDARDS. (FOR FIBERGLASS STRUCTURES THE GRAVEL BASE SHALL BE ELIMINATED).

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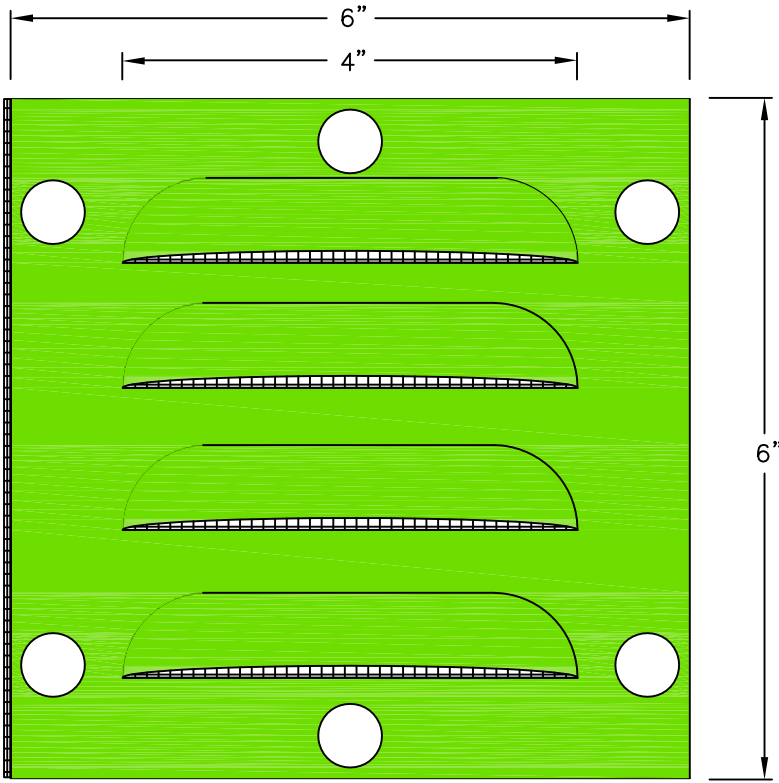
PRODUCT INFORMATION

| PRODUCT NAME | MANUFACTURER | PART OR CATALOG NUMBER |
|-----------------------------|------------------------------|------------------------|
| TYPAR | LINQ INDUSTRIAL FABRICS, INC | 3401 |
| LIQUID BOOT (SPRAY APPLIED) | LBI TECHNOLOGIES, INC | SPRAY APPLIED |
| LIQUID BOOT (TROWEL GRADE) | LBI TECHNOLOGIES, INC | TROWEL GRADE |

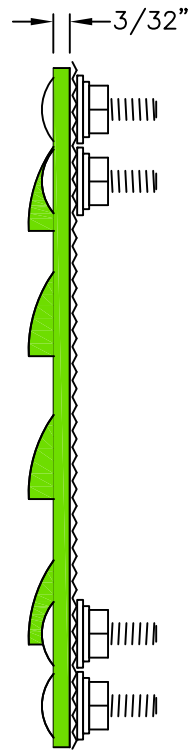
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| DATE 6-1-02 | SOIL GAS MITIGATION | | | |
| APPD <i>[Signature]</i> | CONCRETE EQUIPMENT PAD VAPOR BARRIER | | | |

SCOPE: THIS STANDARD SHOWS THE EQUIPMENT VENT AND INSTALLATION.

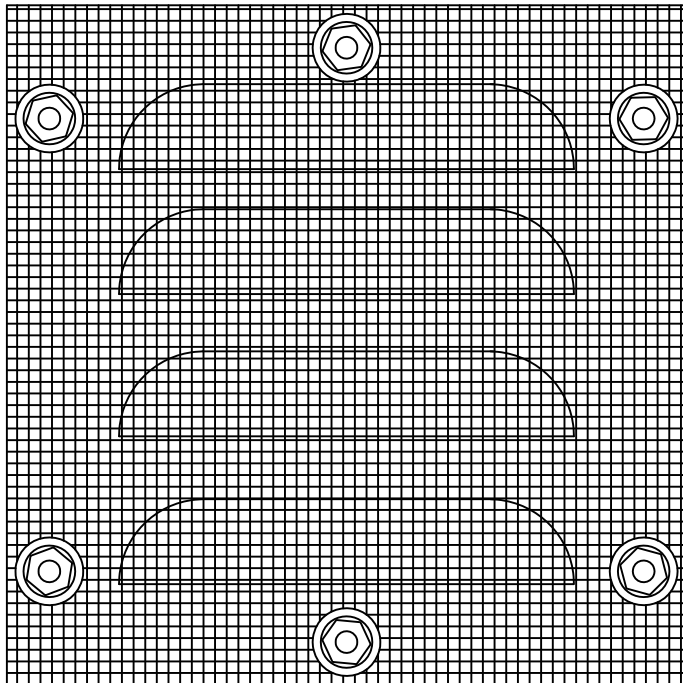


FRONT VIEW



SIDE VIEW

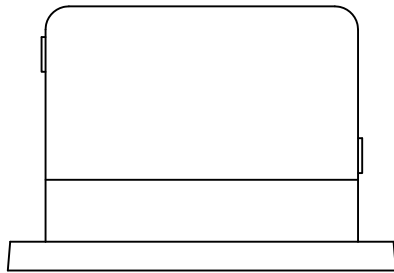
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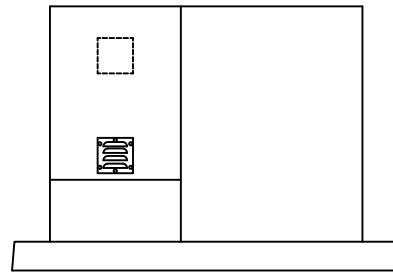
BACK VIEW

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| 3384.11 | SDG&E ELECTRIC STANDARDS | | | REVISION |
| | SOIL GAS MITIGATION EQUIPMENT VENT | | | DATE 6-1-02 APPD <i>[Signature]</i> |

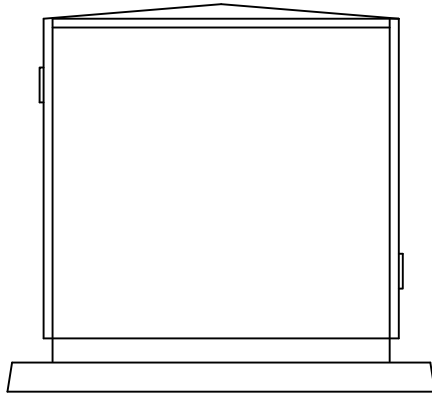


FRONT VIEW

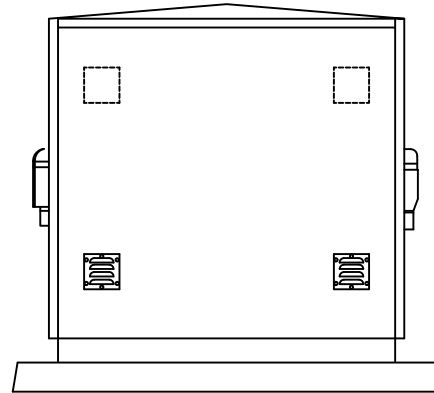


SIDE VIEW

TYPICAL VENT INSTALLATION ON PAD-MOUNTED EQUIPMENT WITH ONE AIR CABINET.



FRONT VIEW



SIDE VIEW

TYPICAL VENT INSTALLATION ON EQUIPMENT WITH TWO AIR CABINETS.

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNITS |
|------|-------------|----------|-------------------------|--------------|----------------|
| 1 | VENT | AS REQ'D | - | S791600 | - |

IMPORTANT

PRIOR TO INSTALLING EQUIPMENT VENTS MAKE SURE THAT THE BOLTS DO NOT CONFLICT WITH ANY EXPOSED ENERGIZED PARTS OR CONDUCTORS. ALSO MAKE SURE THAT PRIOR TO DRILLING ANY POLES THAT THE LOCATION OF THE EQUIPMENT VENT IS IN THE AIR CABINET PORTION OF THE EQUIPMENT.

INSTALLATION:

FOR FIELD MAINTENANCE ONLY

- A. INSTALL A MINIMUM OF TWO VENTS PER AIR COMPARTMENT.
- B. VENTS SHALL BE INSTALLED DIAGONALLY FROM EACH OTHER, ONE ON EACH SIDE OF THE AIR CABINET, WITH ONE AS LOW AS POSSIBLE THE OTHER AS HIGH AS POSSIBLE ON THE AIR CABINET.
- C. AFTER ALL PENETRATIONS IN THE AIR CABINET ARE COMPLETE APPLY A COAT OF AEROSOL PAD-MOUNT GREEN PAINT TO ALL EXPOSED METAL. STOCK NUMBER S518762.
- D. ALLOW THE PAINT TO FULLY DRY BEFORE INSTALLING EQUIPMENT VENT.
- E. INSTALL EQUIPMENT VENT WITH THE LOUVERS DOWN. DO NOT OVER TIGHTEN HARDWARE.

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| DATE 6-1-02 APPD <i>[Signature]</i> | SOIL GAS MITIGATION EQUIPMENT VENT | | | |

3400 - PADS,
RETAINING WALLS,
CLEARANCES

3400 - PADS,
RETAINING WALLS,
CLEARANCES

PAGE

SUBJECT

| | |
|------|---|
| 3409 | MOISTURE BARRIER |
| 3412 | FUSED SWITCHING PAD |
| 3413 | TERMINATOR PAD |
| 3417 | 600A TERMINATING CABINET PAD |
| 3419 | PME 9, 10 AND 11 PAD |
| 3420 | AIR BREAK PMH 3 SECTIONALIZING SWITCH PAD |
| 3422 | AIR BREAK PME 3 SECTIONALIZING SWITCH PAD |
| 3440 | 3440 PAD AND HANDHOLE INSTALLATIONS FOR PAD MOUNTED, 12KV, 600A, 3-PHASE SWITCH |
| 3441 | 3441 PAD AND 3316 HANDHOLE INSTALLATION FOR PAD MOUNTED, 12KV, 600A, 3-PHASE SWITCH |

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| C | | | | | | | F | | | | | | |
| B | UG3417 MOVED TO FMO | EDM | EJA | EJA | KRG | 03/07/2024 | E | | | | | | |
| A | ORIGINAL ISSUE | - | JS | TR | MDJ | 07/25/2016 | D | | | | | | |

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| SHEET 1 OF 1 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG3401.1 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | PADS, RETAINING WALLS, CLEARANCES TABLE OF CONTENTS | | | | |


FIELD MAINTENANCE ONLY

REVISION HISTORY:

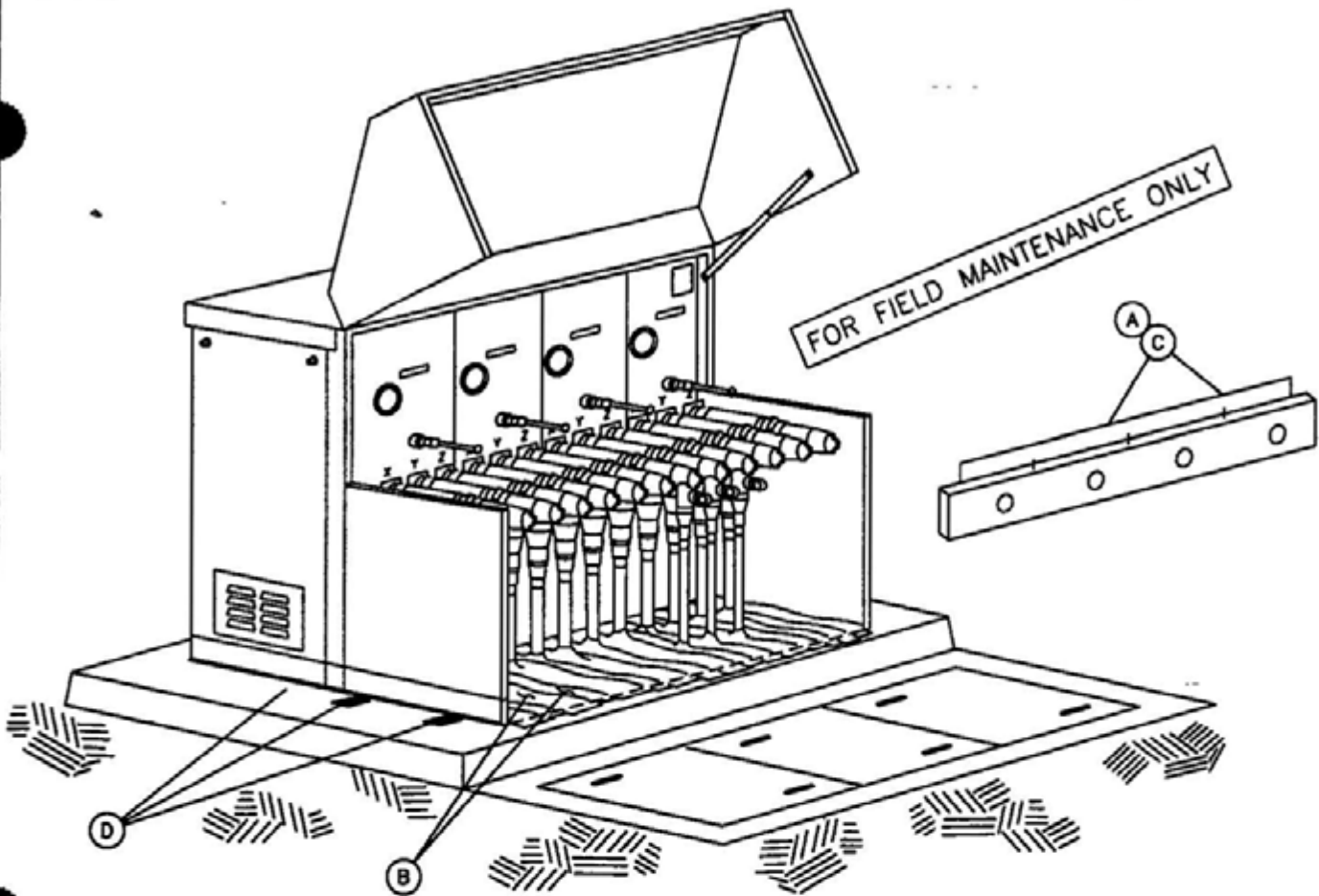
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| <p>SHEET 1 OF 1</p> |  Indicates Latest Revision | Completely Revised | New Page | Information Removed | <p>FMO UG 3409</p> |
| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | MOISTURE BARRIER | | | | |

SCOPE: THIS STANDARD SHOWS HOW TO REDUCE MOISTURE ON EXISTING OIL FILLED PAD-MOUNTED SWITCHES



BILL OF MATERIAL

| ITEM | DESCRIPTION | QUANTITY | CONSTR STD OR PAGE NO | STOCK NUMBER |
|------|-----------------------------------|----------|-----------------------|--------------|
| 1 | TAPE, MOISTURE RESISTANT 2" X 50' | AS REQ'D | - | 720652 |
| 2 | TAPE, MOISTURE RESISTANT 6" X 50' | AS REQ'D | - | 720654 |
| 3 | SEALANT | AS REQ'D | 3408 | 631800 |

INSTALLATION

- (A) REMOVE SWITCH SIL
- (B) CLEAN CONCRETE SURFACE OR ANY PORTION OF THE SWITCH CABINET WITH SOLVENT BEFORE APPLYING MOISTURE RESISTANT TAPE. DRY ANY WET SURFACE THEN APPLY 2 INCH OR 6 INCH TAPE AS REQUIRED. APPLY TAPE ON AS MUCH CONCRETE SURFACE AS POSSIBLE TO ASSURE A GOOD BOND. DO NOT APPLY TAPE ON ANY WET OR DIRTY SURFACES, TAPE WILL NOT STICK.
- (C) REPLACE SWITCH SIL AND TRIM OFF EXCESS TAPE
- (D) BEFORE APPLYING SEALANT, CAREFULLY FOLLOW INSTRUCTIONS ON THE CARTRIDGE. CLEAN CONCRETE SURFACE WITH SOLVENT AND APPLY SEALANT WITH CAULKING GUN COMPLETELY AROUND SWITCH NEXT TO CONCRETE PAD AND IN THE PAD UNISTRUT INSIDE AND OUTSIDE THE SWITCH

SDG&E ELECTRIC STANDARDS

DATE 1-1-91

APPD *JLB/ROJ*

MOISTURE BARRIER

3499.9
SUPERSEDES
3409 (1-1-96)

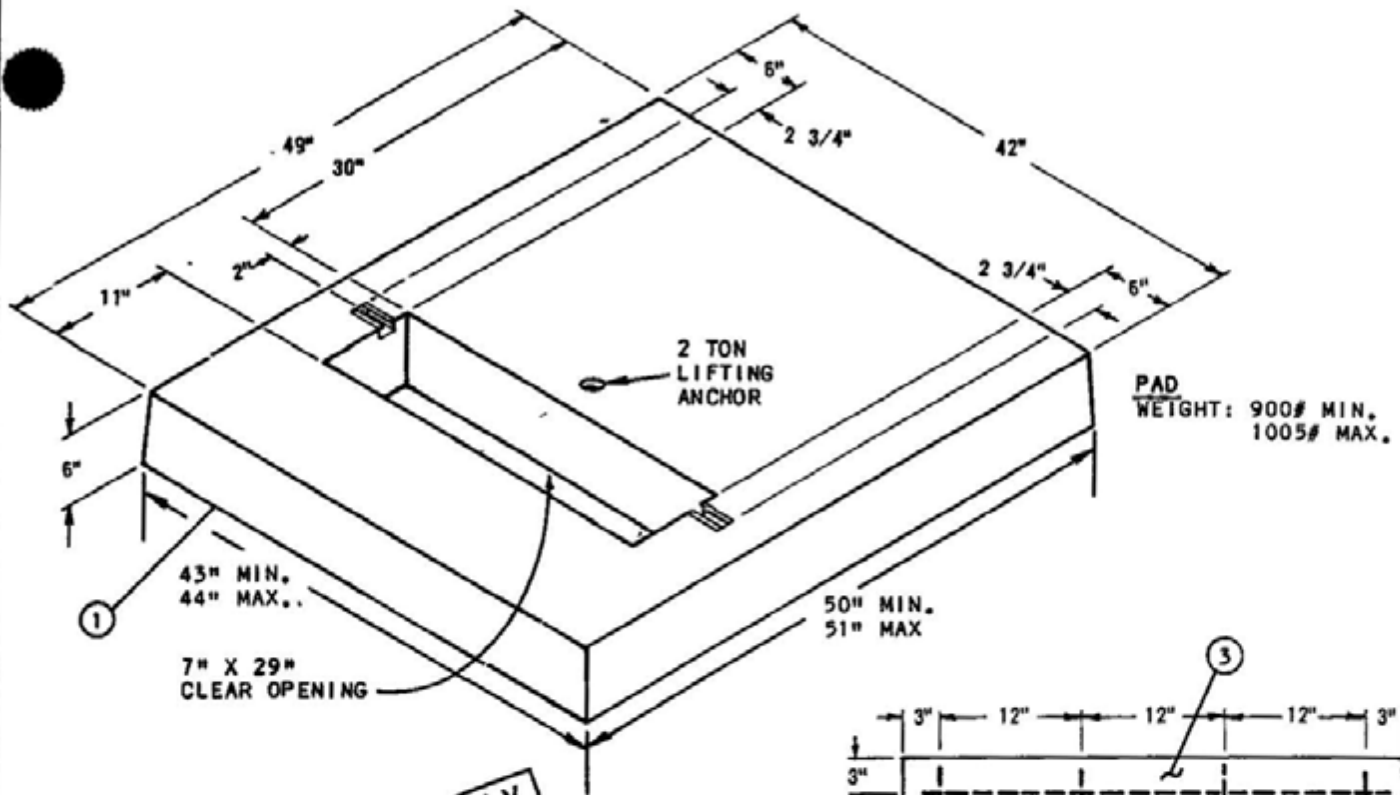
FIELD MAINTENANCE ONLY

REVISION HISTORY:

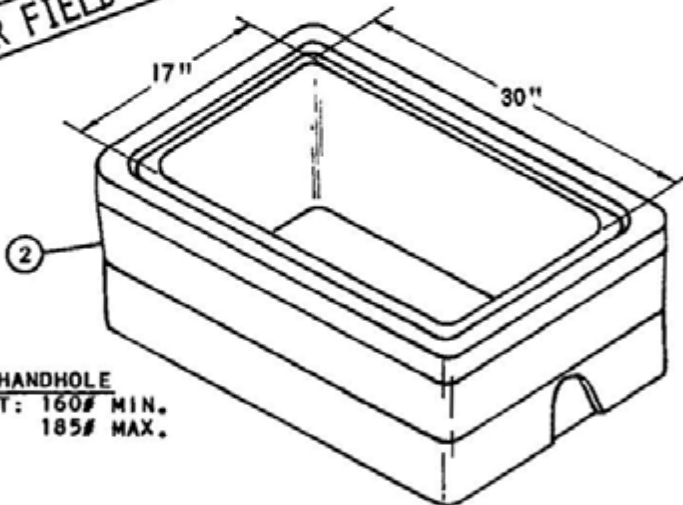
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| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | | | | | | | FMO UG 3412 |
| | FUSED SWITCHING PAD | | | | | | | | | | |

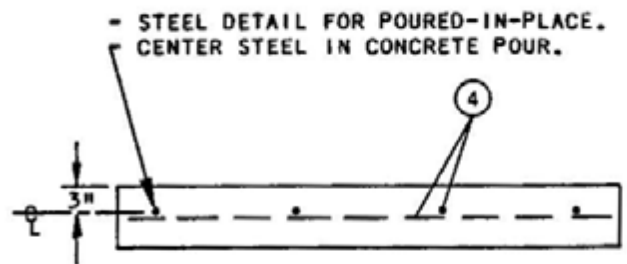
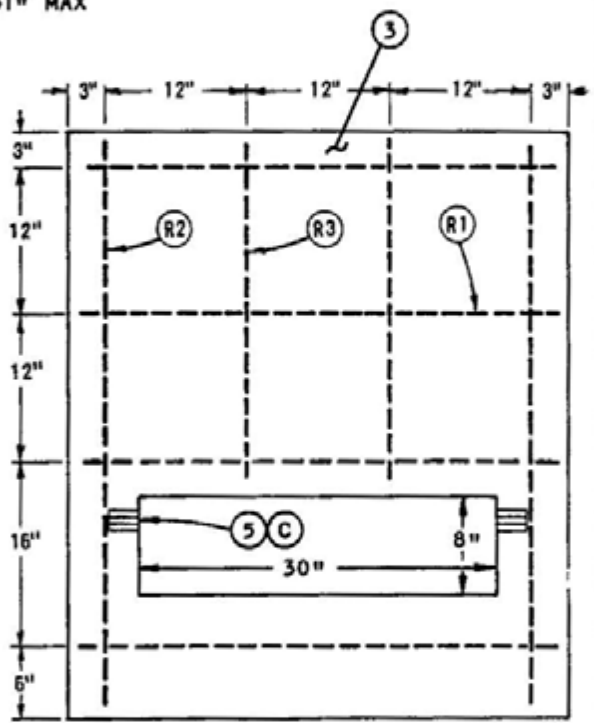
SCOPE: THIS STANDARD SHOWS THE 3Ø FUSED SWITCHING PAD, HANDHOLE AND CONDUIT PLACEMENT USED WITH THE 3Ø FUSED SWITCHING CABINET (STANDARD 3513).



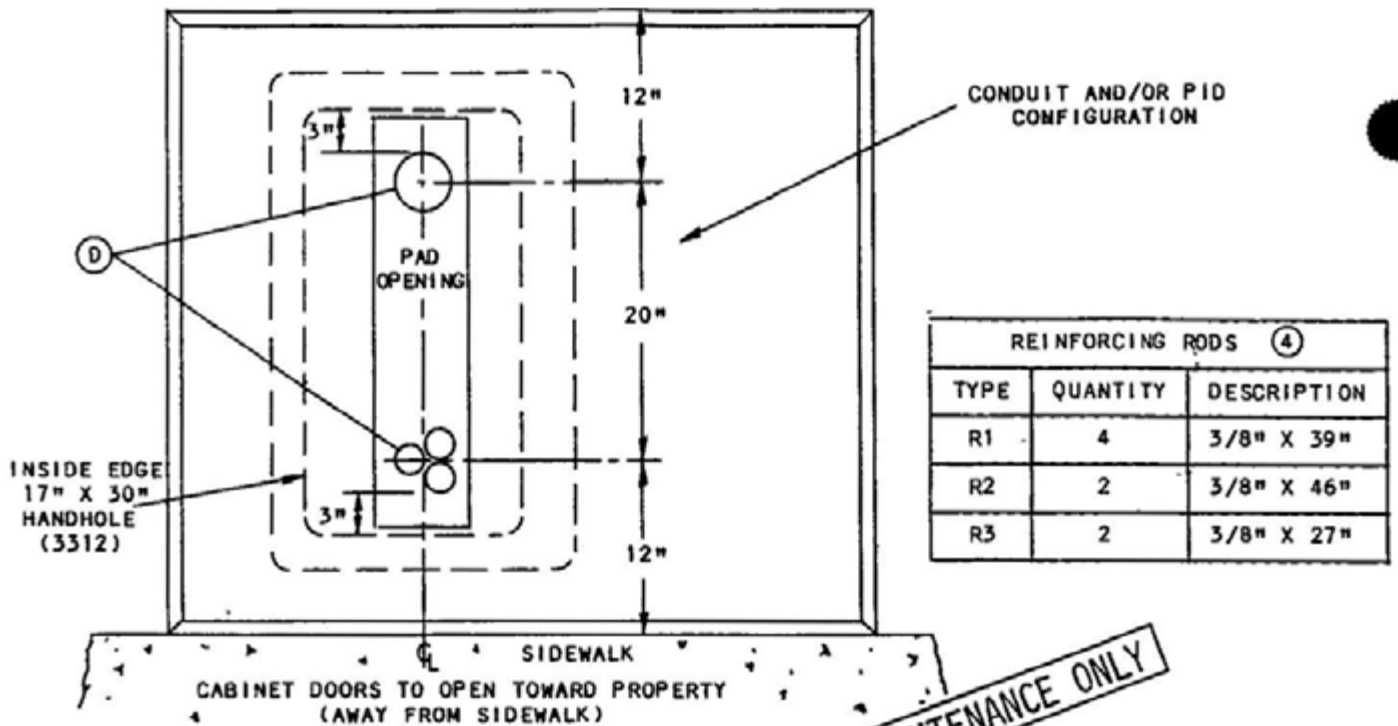
FOR FIELD MAINTENANCE ONLY



3312 HANDHOLE
WEIGHT: 160# MIN.
185# MAX.



**3513 INSTALLATION
(TOP VIEW)
3Ø FUSED SWITCHING CABINET**



| REINFORCING RODS ④ | | |
|--------------------|----------|-------------|
| TYPE | QUANTITY | DESCRIPTION |
| R1 | 4 | 3/8" X 39" |
| R2 | 2 | 3/8" X 46" |
| R3 | 2 | 3/8" X 27" |

FOR FIELD MAINTENANCE ONLY

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD | STOCK NUMBER |
|------|---|-------------|-----------|--------------|
| 1 | FUSED SWITCHING PAD | 1 | -- | 513426 |
| 2 | HANDHOLE, 17" X 30" | 1 | 3312 | 162426 |
| 3 | CONCRETE CLASS 'A', 5 1/2 SACK MIX | 6.32 CU.FT. | -- | -- |
| 4 | #3 REINFORCING RODS, 3/8" (SEE TABLE ABOVE) | 25'-2" | -- | 685280 |
| 5 | CHANNEL, CONCRETE INSERTS, 2 3/4" X 1 5/8" X 7/8" UNISTRUT OR EQUAL ③ | 2 | -- | 426288 |
| 6 | GALVANIZED PAINT ③ | AS REQ'D | -- | 516064 |

INSTALLATION:

- A. THIS PAD MAY BE PRECAST OR POURED IN PLACE. TOP OF PAD MUST BE FINISHED FLAT.
- B. WHEN PAD IS POURED IN PLACE, CONDUIT OPENINGS SHALL BE FORMED SO THAT THE CONDUIT STUBS ARE NOT CONCRETE ENCASED.
- ③ IF POURED IN PLACE, ITEM 5 TO BE CUT IN FIELD. APPLY GALVANIZED PAINT TO EXPOSED ENDS.
- ④ TERMINATE CONDUITS 3" ABOVE THE BOTTOM OF THE HANDHOLE.

REFERENCE:

- H. SEE STANDARD 3211 FOR PAD IDENTIFICATION.
- I. SEE STANDARD 3481 FOR BARRIER PROTECTION AND CLEARANCE.
- J. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- K. SEE STANDARD 3487 FOR RETAINING WALL REQUIREMENTS.
- L. SEE STANDARD 3513 FOR EQUIPMENT OR INSTALLATION DETAILS.
- M. SEE STANDARD 4512 FOR PAD GROUNDING.
- N. SEE STANDARD 4514 FOR GROUNDING TELCO CONDUCTOR IN PAD-MOUNTED EQUIPMENT.


FIELD MAINTENANCE ONLY

REVISION HISTORY:

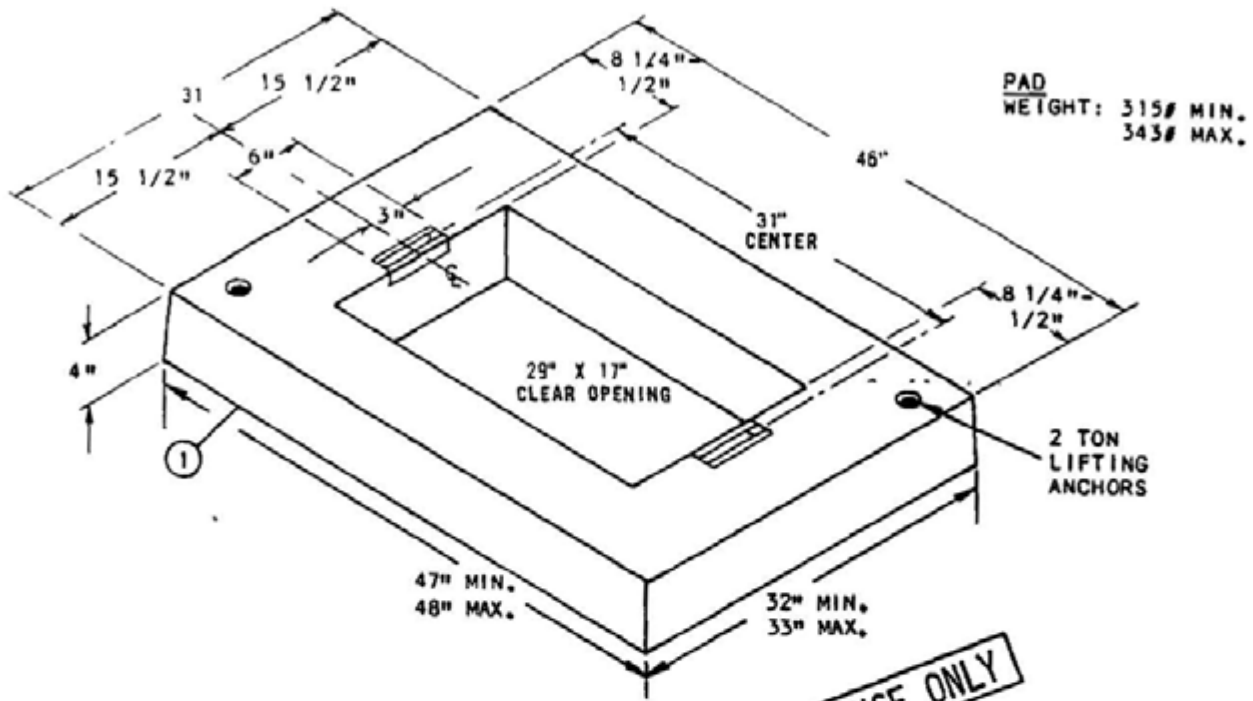
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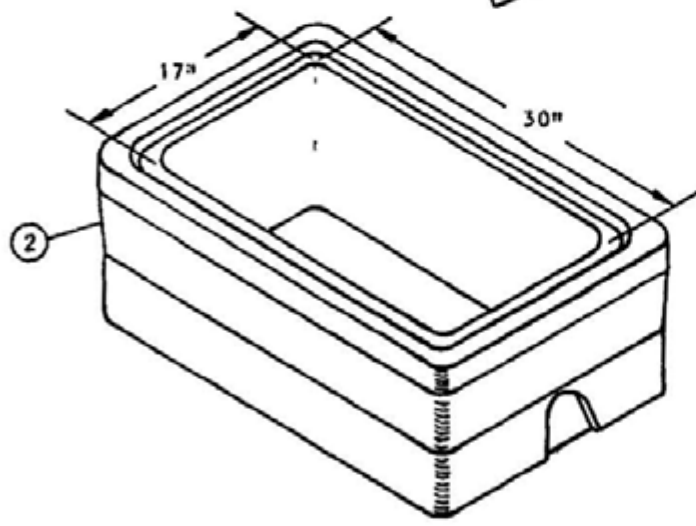
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| <p>SHEET 1 OF 1</p> | <p> Indicates Latest Revision</p> | <p>Completely Revised</p> | <p>New Page</p> | <p>Information Removed</p> | <p>FMO UG 3413</p> |
| | <p>SDG&E ELECTRIC UNDERGROUND STANDARD</p> | | | | |
| | <p>TERMINATOR PAD</p> | | | | |

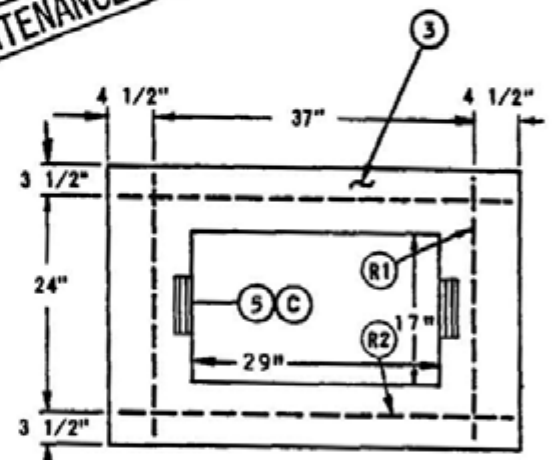
SCOPE: THIS STANDARD SHOWS THE EQUIPMENT PAD, HANDHOLE AND CONDUIT PLACEMENT USED WITH THE 3Ø CABLE TERMINATING ENCLOSURE, 350 KCMIL AND LARGER (STANDARD 3520).



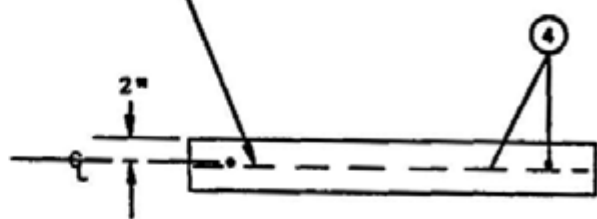
3312 HANDHOLE
WEIGHT: 160# MIN.
185# MAX.



FOR FIELD MAINTENANCE ONLY



- STEEL DETAIL FOR POURED IN PLACE CENTER STEEL IN CONCRETE POUR.



3499.104
SUPERCEDES
3413 (1-1-91)

SDG&E ELECTRIC STANDARDS

TERMINATOR PAD

DATE 1-1-91
APPRO. [Signature]

UG3417 FIELD MAINTENANCE ONLY

ALL VERSIONS LISTED IN FMO ARE SUPERSEDED BY THEIR CURRENT VERSION FOUND INSIDE THE UNDERGROUND CONSTRUCTION STANDARD MANUAL.

REVISION HISTORY:

03/07/2024: MOVED TO FMO

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | 600A TERMINATING CABINET PAD | | | | |

SCOPE: THIS STANDARD SHOWS THE PAD AND HANDHOLE USED WITH THE PAD MOUNTED 600A TERMINATING CABINET. CONDUIT PLACEMENT IS ALSO SHOWN.

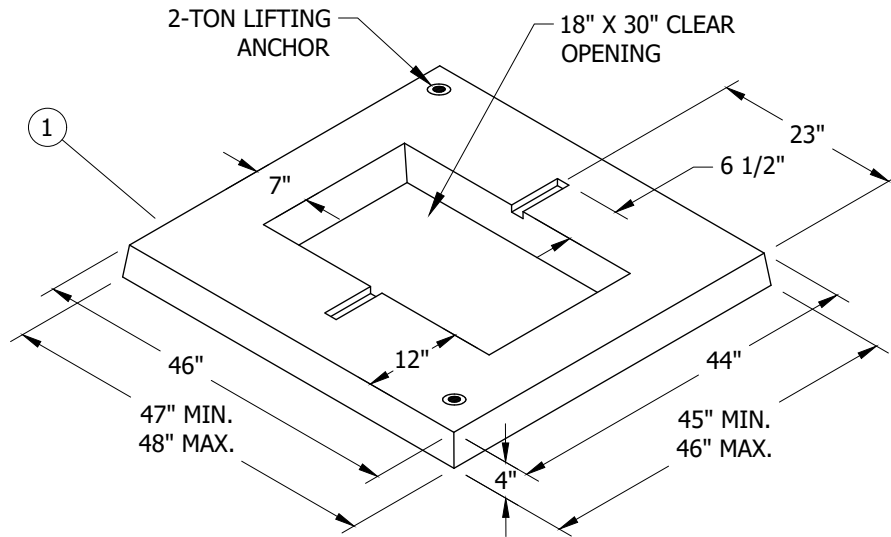


FIGURE 1
ISOMETRIC VIEW

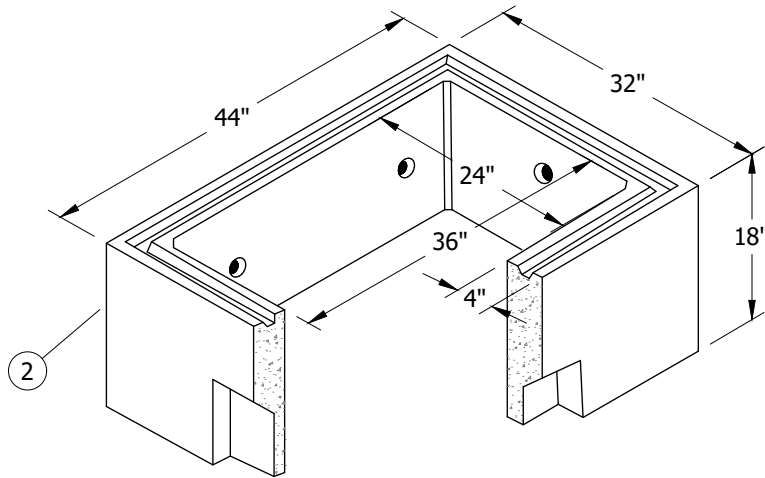


FIGURE 2
3313 HANDHOLE, 18" BASE SECTION

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| B | EDITORIAL CHANGES | - | GW | JS | CZH | 09/04/2018 | E | | | | | | |
| A | ORIGINAL ISSUE | - | KN | KN | CZH | 01/10/2014 | D | UG3417 MOVED TO FMO | EDM | EJA | EJA | KRG | 03/07/2024 |

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| SHEET 1 OF 2 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG3417.1 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | 600A TERMINATING CABINET PAD | | | | |

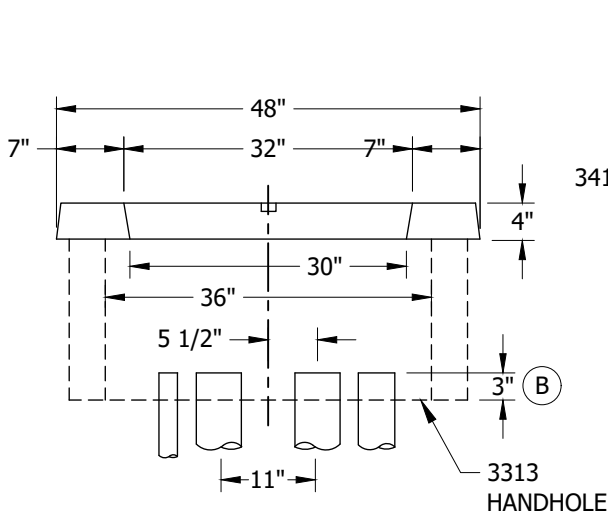


FIGURE 3
SIDE VIEW

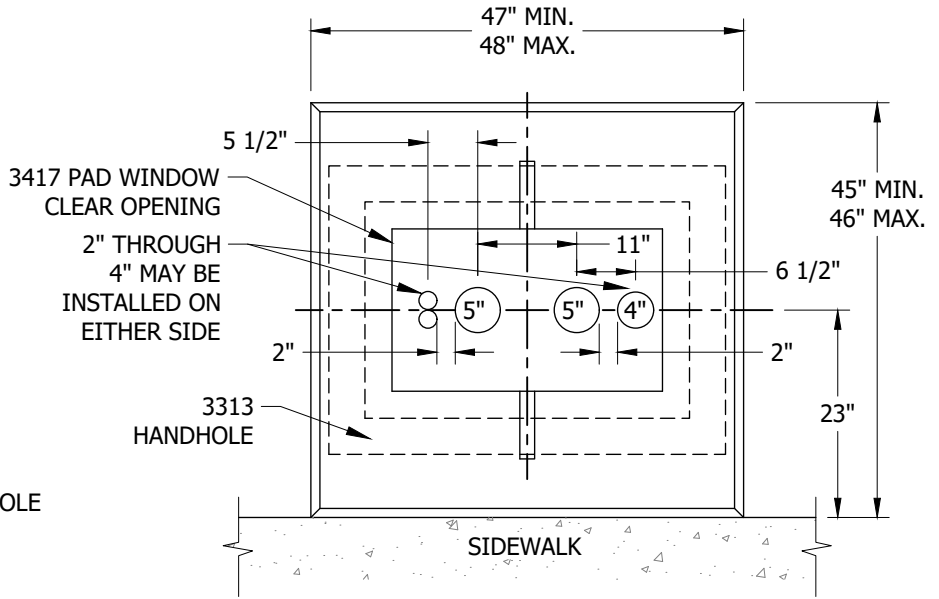


FIGURE 3
PLAN VIEW

INSTALLATION:

- A. SET PAD LEVEL TO FINAL GRADE AND INSTALL EQUIPMENT GROUND.
- (B) TERMINATE CONDUITS 3 INCHES ABOVE THE BOTTOM OF THE 3313 HANDHOLE.

BILL OF MATERIALS:

| ITEM | DESCRIPTION | WEIGHT (LBS) | QUANTITY | STANDARD PAGE | STOCK NUMBER | DESIGN UNITS | SAP CU |
|------|-------------------------------|--------------|----------|---------------|--------------|--------------|---------|
| 1 | PAD, 600A TERMINATING CABINET | 619 MAX. | 1 | -- | S514022 | 3417 | 3417PAD |
| 2 | HANDHOLE, 3313 BASE SECTION | 885 MAX. | 1 | 3313 | S162664 | | |

NOTES:

- I. PAD MAY NOT BE POURED IN PLACE. USE PRECAST PADS ONLY.
- II. MAY INCLUDE TWO ADDITIONAL ONE INCH CONDUITS FOR STREET LIGHTS.

REFERENCE:

- a. SEE UG3479 FOR BARRIER PROTECTION AND CLEARANCE.
- b. SEE UG3480, UG3481, UG3482 & UG3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- c. SEE UG3484 FOR PAD INSTALLATION OF PAD MOUNTED EQUIPMENT.
- d. SEE UG3486 & UG3487 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- e. SEE UG3489 FOR RETAINING WALLS.
- f. SEE UG3582 FOR INSTALLATION REQUIREMENTS FOR PAD MOUNTED 600A TERMINATING CABINET.
- g. SEE UG4512 FOR EQUIPMENT GROUNDING INSTALLATION.

FIELD MAINTENANCE ONLY

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| B | EDITORIAL CHANGES | - | GW | JS | CZH | 09/04/2018 | E | | | | | | |
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Indicates Latest Revision Completely Revised New Page Information Removed

SHEET
2 OF 2

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

600A TERMINATING CABINET PAD

FMO
UG3417.2


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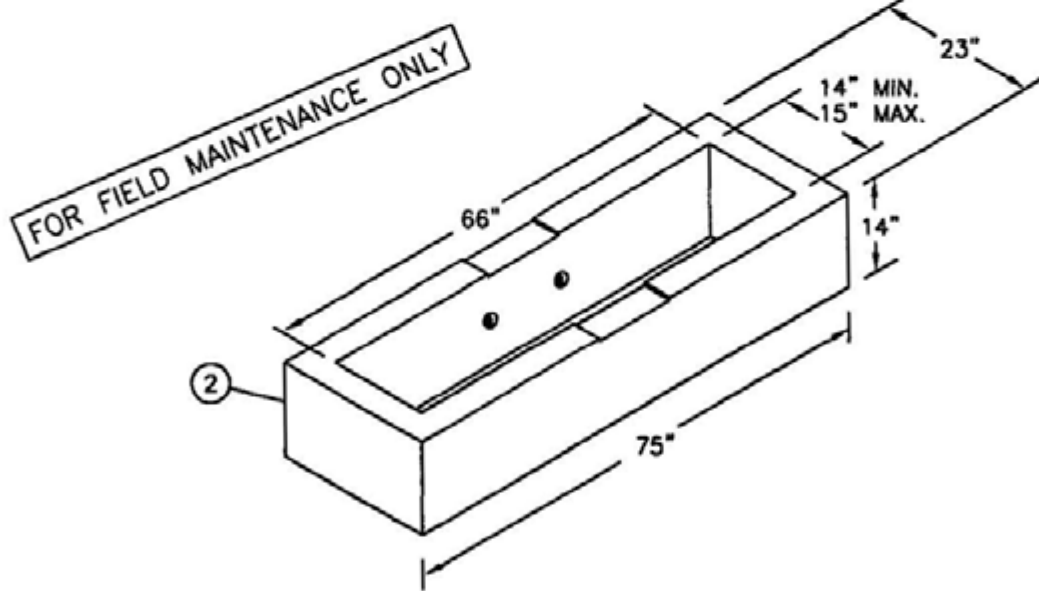
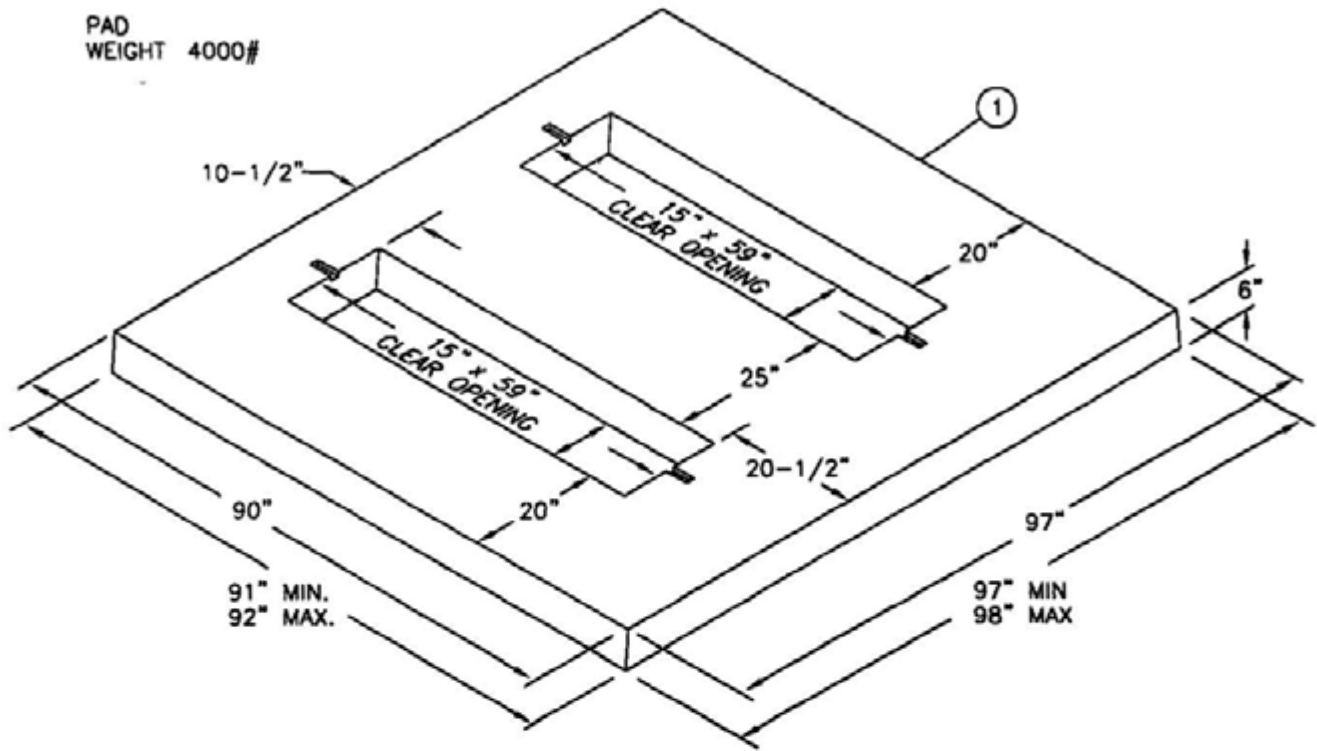
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| | <p>SDG&E ELECTRIC UNDERGROUND STANDARD</p> | | | | |
| | <p>PME 9, 10 & 11 PAD</p> | | | | |

SCOPE: THIS STANDARD SHOWS THE PAD AND HANDHOLE FOR THE PME 9, 10 & 11 PAD-MOUNTED SECTIONALIZING SWITCH CABINET

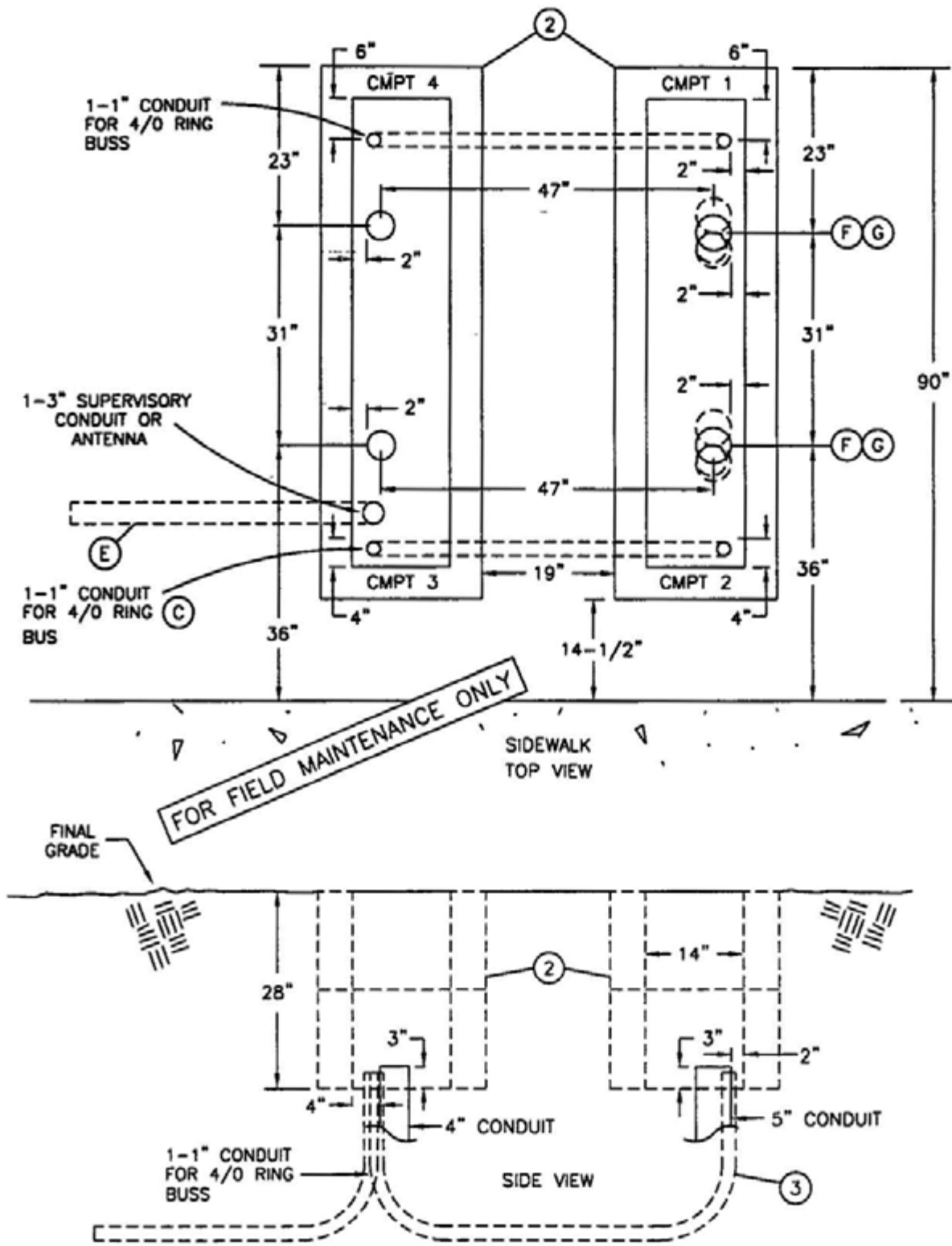
PAD
WEIGHT 4000#



NOTES: - PAD MAY NOT BE POURED IN PLACE. USE PRECAST PADS ONLY.

| | | |
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| <p>3499.110 SUPERSEDES 3419 1 (1-1-96)</p> | <p>SDG&E ELECTRIC STANDARDS PME 9, 10 & 11 PAD</p> | <p>DATE 1-1-96 APPD <i>BD/CAL</i></p> |
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BOX & CONDUIT PLACEMENT

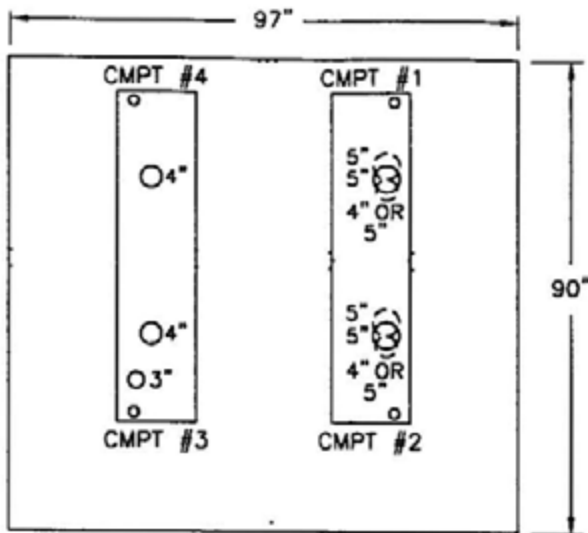


SDG&E ELECTRIC STANDARDS

DATE 1-1-96
APPD *[Signature]*

PME 9, 10 & 11 PAD

3499.111
SUPERSEDES
3419.2 (1-1-96)



CONDUIT SIZE AND PLACEMENT
FOR PME 9, 10 & 11
PAD-MOUNTED SECTIONALIZING
CABINET

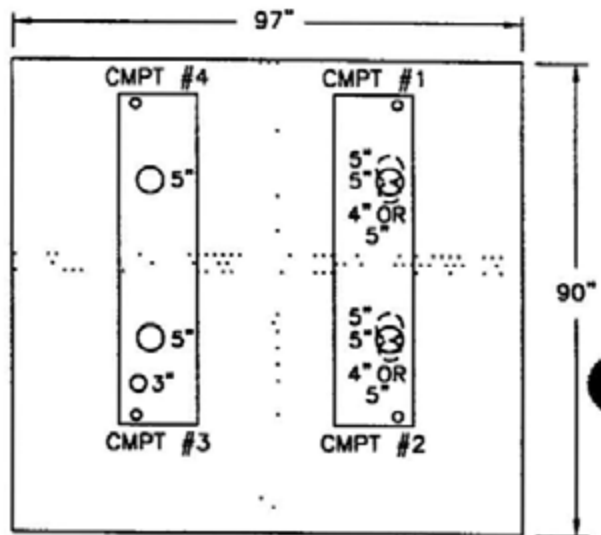
PME 9

FOR FIELD MAINTENANCE ONLY

SIDEWALK

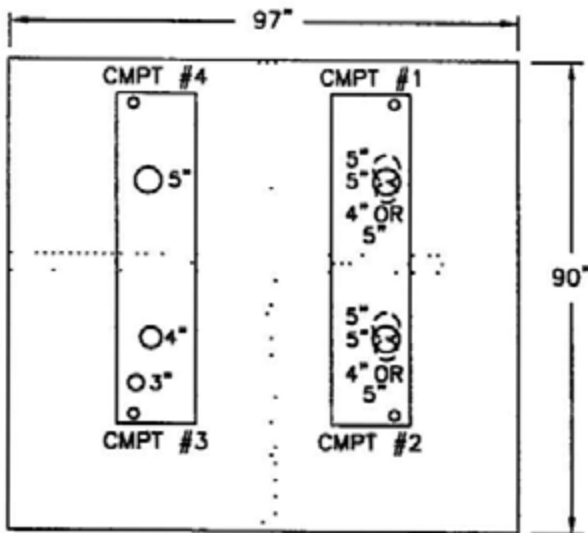
REFER TO INSTALLATION
NOTES (F) & (G) FOR
ALLOWABLE CONDUIT SIZES
AND PLACEMENT

PME 10



SIDEWALK

PME 11



SIDEWALK

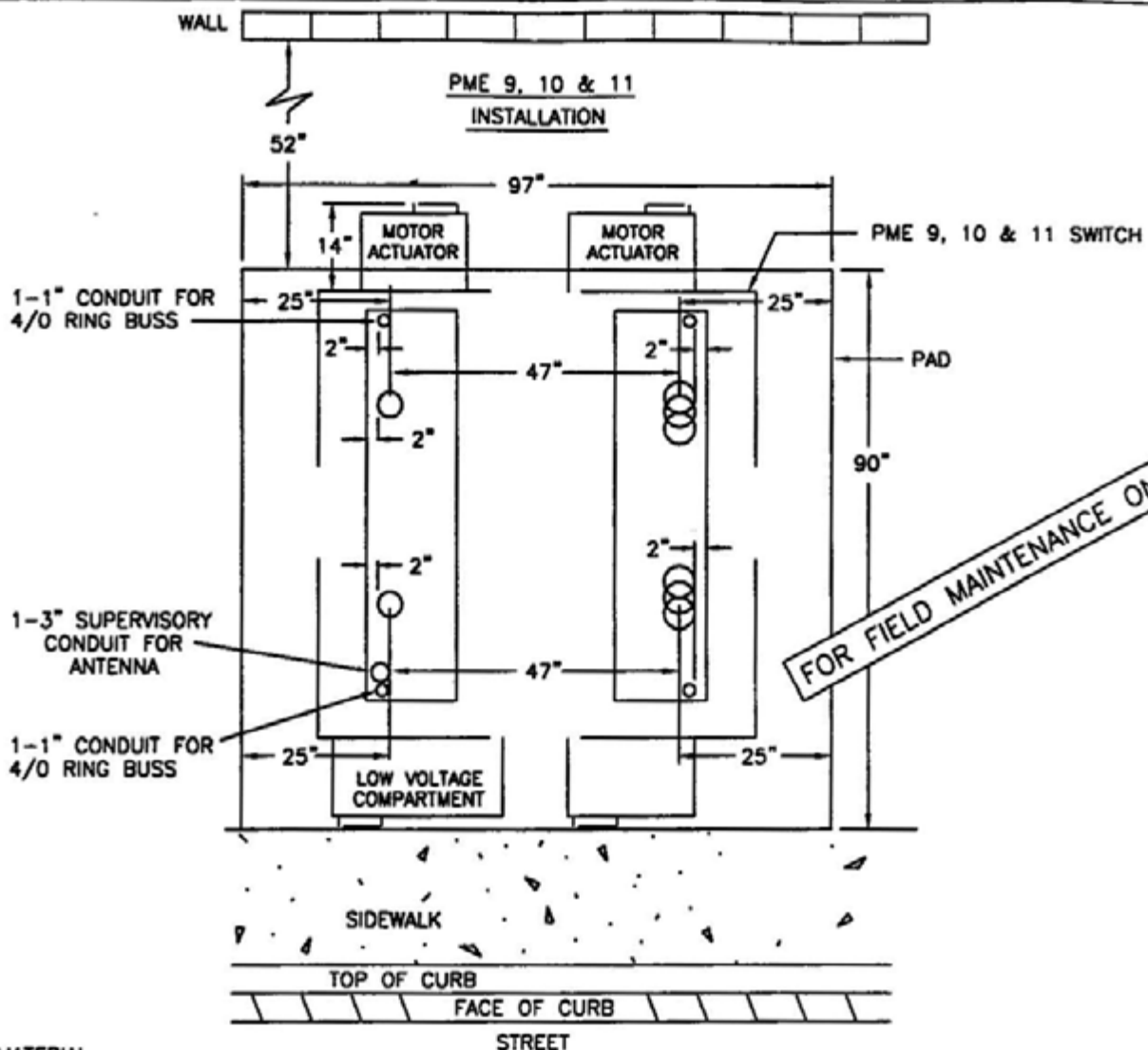
3499.112
SUPERSEDES
3419.3 (1-1-96)

SDG&E ELECTRIC STANDARDS

PME 9, 10 & 11 PAD

DATE 1-1-96

APPD *[Signature]* / CMK



BILL OF MATERIAL.

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD OR PAGE NO | STOCK NUMBER | ASSEMBLY UNIT |
|------|--------------------------------|----------|------------------------|--------------|---------------|
| 1 | PME 9, 10 & 11 PAD | 1 | 3419 | 514024 | 3419 |
| 2 | 3311 HANDHOLE, 14" X 66" X 14" | 4 | 3311 | 162660 | |
| 3 | CONDUIT DB 1" IN POLYETHYLENE | 40FT | 3373 1 | 249630 | |

INSTALLATION.

- A THE PAD AND HANDHOLE LOCATION IS TO BE MARKED OUT PAYING PARTICULAR ATTENTION TO FOREIGN UTILITY PLACEMENTS RELOCATING PAD AND HANDHOLE REQUIRES APPROVAL FROM SERVICE PLANNING
- B. INSTALL CONDUIT AND HANDHOLES.
- (C) INSTALL 2-1" CONDUITS BETWEEN 3311 HANDHOLES FOR 4/0 RING BUSS (RING BUSS IS PROVIDED BY SDG&E)
- D SET PAD LEVEL TO FINAL GRADE AND INSTALL EQUIPMENT GROUND
- (E) STUB 1-3" CONDUIT FROM CMPT #3 4 FEET FROM EDGE OF PAD.
- (F) WHEN TWO CONDUITS ARE INSTALLED IN ONE COMPARTMENT, PLACE CONDUITS SIDE BY SIDE CENTERED ON THE APPROPRIATE DIMENSION. SECOND CONDUIT MAY BE 4" OR 5"
- (G) NO MORE THAN 2 CONDUITS MAY BE INSTALLED IN COMPARTMENTS 1 & 2 FOR CABLE PULLING NO ADDITIONAL CONDUITS MAY BE INSTALLED IN COMPARTMENTS 3 & 4
- H MAINTAIN 2" CLEARANCE BETWEEN CONDUITS AND THE EDGE OF 3311 HANDHOLES

SDG&E ELECTRIC STANDARDS

DATE 1-1-96

APPD *[Signature]*

PME 9, 10 & 11 PAD

3499 113
SUPERSEDES
3419 4 (1-1-96)

REFERENCE:

- I. SEE STANDARD 3211 FOR INSTALLATION OF IDENTIFICATION TAG
- J. SEE STANDARD 3481 FOR EQUIPMENT BARRIER PROTECTION
- K. SEE STANDARD 3483 FOR MINIMUM OPERATING CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- L. SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT
- M. SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- N. SEE STANDARD 3487 FOR RETAINING WALLS.
- O. SEE STANDARD 3565 FOR PAD-MOUNTED PME 9, 10 & 11 FUSE/SECTIONALIZING SWITCH.
- P. SEE STANDARD 3566 FOR CABLE AND SWITCH INSTALLATION
- Q. SEE STANDARD 4512 FOR EQUIPMENT GROUNDING INSTALLATION.
- R. SEE STANDARD 4514 FOR GROUNDING TELCO.

FOR FIELD MAINTENANCE ONLY

| | | |
|---|--|---|
| 3499.114 SUPERSEDES 3419.5 (1-1-96) | SDG&E ELECTRIC STANDARDS PME 9, 10 & 11 PAD | DATE 1-1-96 APPD <i>[Signature]</i> /CRK |
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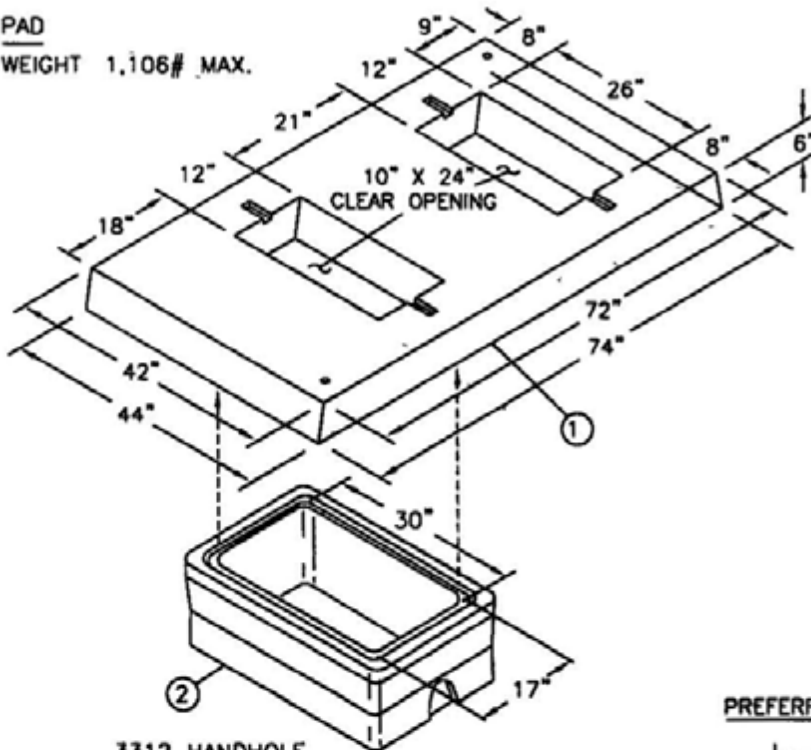
**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD
AIR BREAK PMH 3 SECTIONALIZING SWITCH PAD

**FMO
UG 3420**

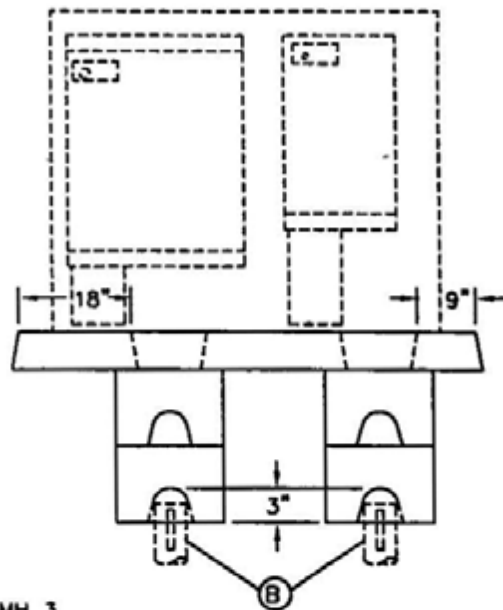
SCOPE: THIS STANDARD SHOWS THE PAD AND HANDHOLE USED WITH THE PAD-MOUNTED 600 AMP AIR BREAK PMH 3 SECTIONALIZING SWITCH CONDUIT PLACEMENT IS ALSO SHOWN.

PAD
WEIGHT 1,106# MAX.

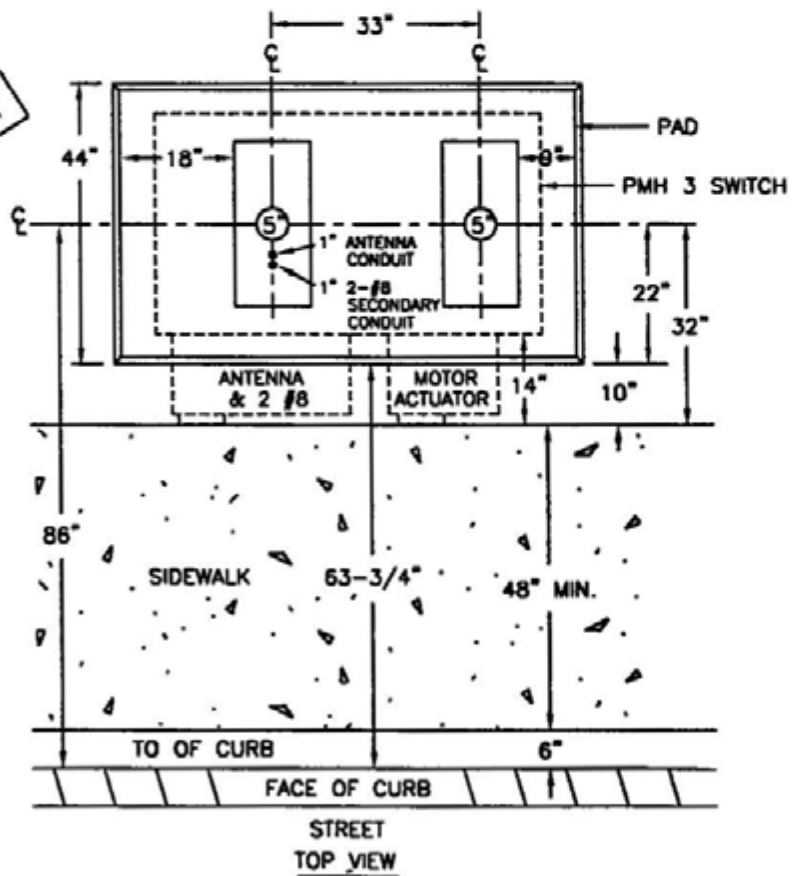


3312 HANDHOLE
WEIGHT: 160# MIN.
185# MAX.

FOR FIELD MAINTENANCE ONLY



PMH 3
PREFERRED INSTALLATION



NOTES:

- PAD MAY NOT BE POURED IN PLACE. USE PRECAST PAD ONLY

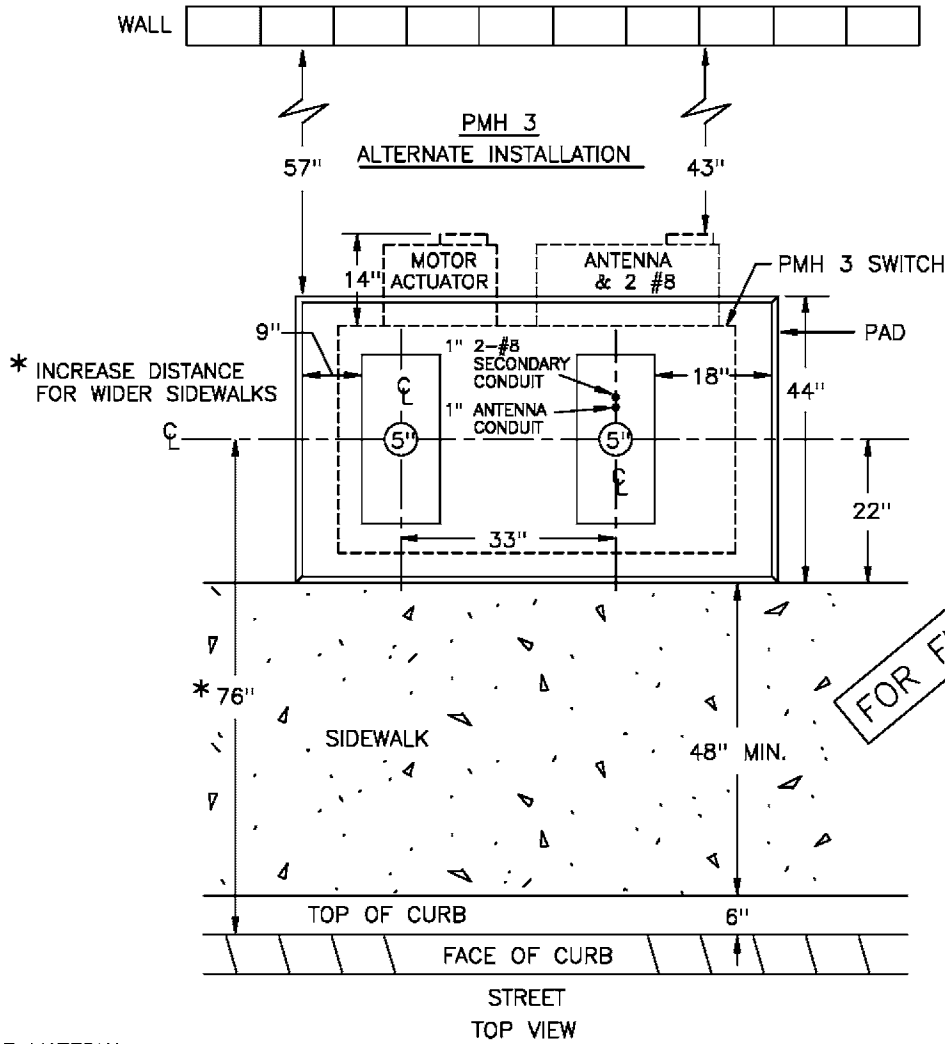
3499.213
SUPERSEDES
3420.1 (1-1-96)

SDG&E ELECTRIC STANDARDS

AIR BREAK PMH 3 SECTIONALIZING SWITCH PAD

DATE 1-1-96

APPD *[Signature]*



BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNIT |
|------|---------------------|----------|-------------------------|--------------|---------------|
| 1 | PAD, PMH 3 SWITCH | 1 | 3420 | 513424 | 3420 |
| 2 | HANDHOLE, 17" X 30" | 4 | 3312 | 162426 | |

INSTALLATION:

- A. SET PAD LEVEL TO FINAL GRADE AND INSTALL EQUIPMENT GROUND.
- ⓑ TERMINATE CONDUITS 3 INCHES ABOVE THE BOTTOM OF THE 3312 HANDHOLES.

REFERENCE:

- E. SEE STANDARD 3481 FOR BARRIER PROTECTION AND CLEARANCE.
- F. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- G. SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT.
- H. SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- I. SEE STANDARD 3487 FOR RETAINING WALLS.
- J. SEE STANDARD 3577 FOR PAD-MOUNTED PMH 3 AIR BREAK SWITCH.
- K. SEE STANDARD 3578 FOR INSTALLATION REQUIREMENTS FOR PAD-MOUNTED PMH 3 AIR BREAK SWITCH.
- L. SEE STANDARD 4512 FOR EQUIPMENT GROUNDING INSTALLATION.

| | | |
|--|---|--|
| DATE 1-1-96 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS | 3499.214 SUPERSEDES 3420.2 (1-1-96) |
| | AIR BREAK PMH 3 SECTIONALIZING SWITCH PAD | |


FIELD MAINTENANCE ONLY

REVISION HISTORY:

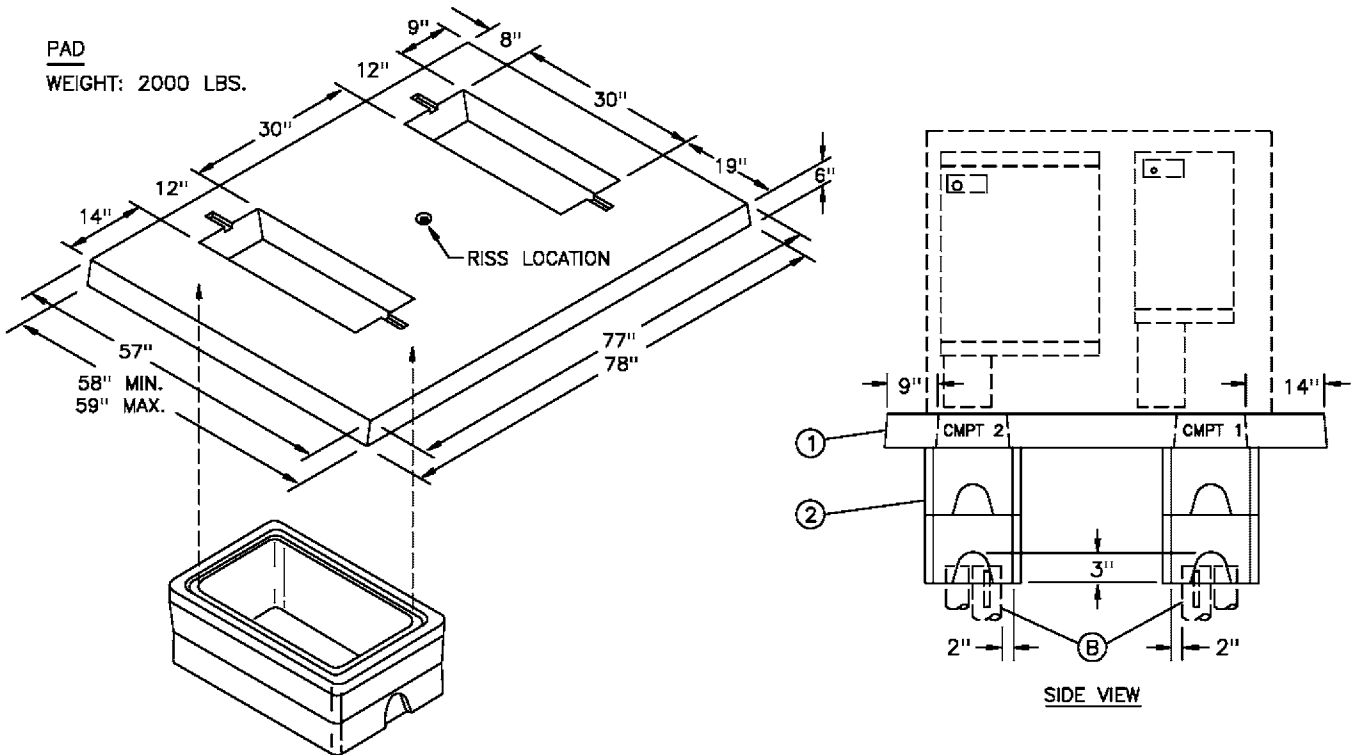
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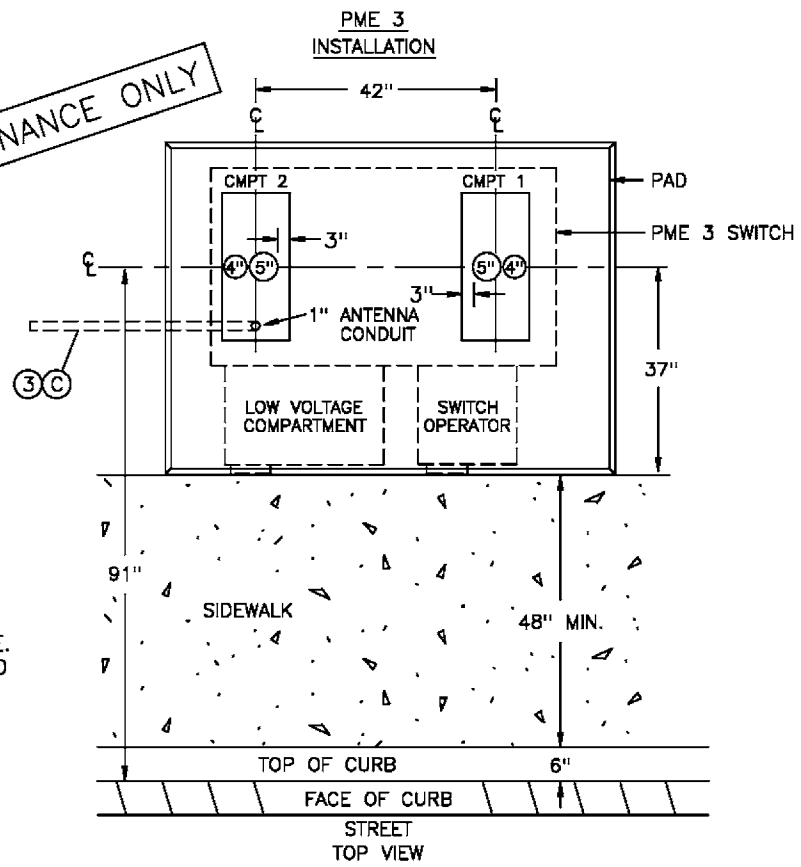
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| <p>SHEET 1 OF 1</p> |  Indicates Latest Revision | Completely Revised | New Page | Information Removed | <p>FMO UG 3422</p> |
| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | AIR BREAK PME 3 SECTIONALIZING SWITCH PAD | | | | |

SCOPE: THIS STANDARD SHOWS THE PAD AND HANDHOLE USED WITH THE PAD-MOUNTED 600 AMP AIR BREAK PME 3 SECTIONALIZING SWITCH. CONDUIT PLACEMENT IS ALSO SHOWN.



FOR FIELD MAINTENANCE ONLY



NOTES:
 - PAD MAY NOT BE
 POURED IN PLACE.
 USE PRECAST PAD
 ONLY.

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNIT |
|------|-------------------------|----------|-------------------------|--------------|---------------|
| 1 | PAD, PME 3 SWITCH | 1 | 3422 | 514030 | 3422 |
| 2 | HANDHOLE, 17" X 30" | 4 | 3312 | 162426 | |
| 3 | 1" POLYETHYLENE CONDUIT | 10 FT | 3373 | 249630 | 1" PE |

INSTALLATION:

- A. SET PAD LEVEL TO FINAL GRADE AND INSTALL EQUIPMENT GROUND.
- ⓑ TERMINATE CONDUITS 3 INCHES ABOVE THE BOTTOM OF THE 3312 HANDHOLES.
- ⓒ STUB OUT 1-1" POLY CONDUIT 4' FROM EDGE OF PAD.

REFERENCE:

- E. SEE STANDARD 3481 FOR BARRIER PROTECTION AND CLEARANCE.
- F. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- G. SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT.
- H. SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- I. SEE STANDARD 3487 FOR RETAINING WALLS.
- J. SEE STANDARD 3583 FOR PAD-MOUNTED PME 3 AIR BREAK SWITCH.
- K. SEE STANDARD 3584 FOR INSTALLATION REQUIREMENTS FOR PAD-MOUNTED PME 3 AIR BREAK SWITCH.
- L. SEE STANDARD 4512 FOR EQUIPMENT GROUNDING INSTALLATION.

FOR FIELD MAINTENANCE ONLY

| | | |
|--|---|---|
| DATE 1-1-98 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS AIR BREAK PME 3 SECTIONALIZING SWITCH PAD | 3499.216 SUPERSEDES 3422.2 (1-1-98) |
|--|---|---|

FIELD MAINTENANCE ONLY

REVISION HISTORY:

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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
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**SHEET
1 OF 1**

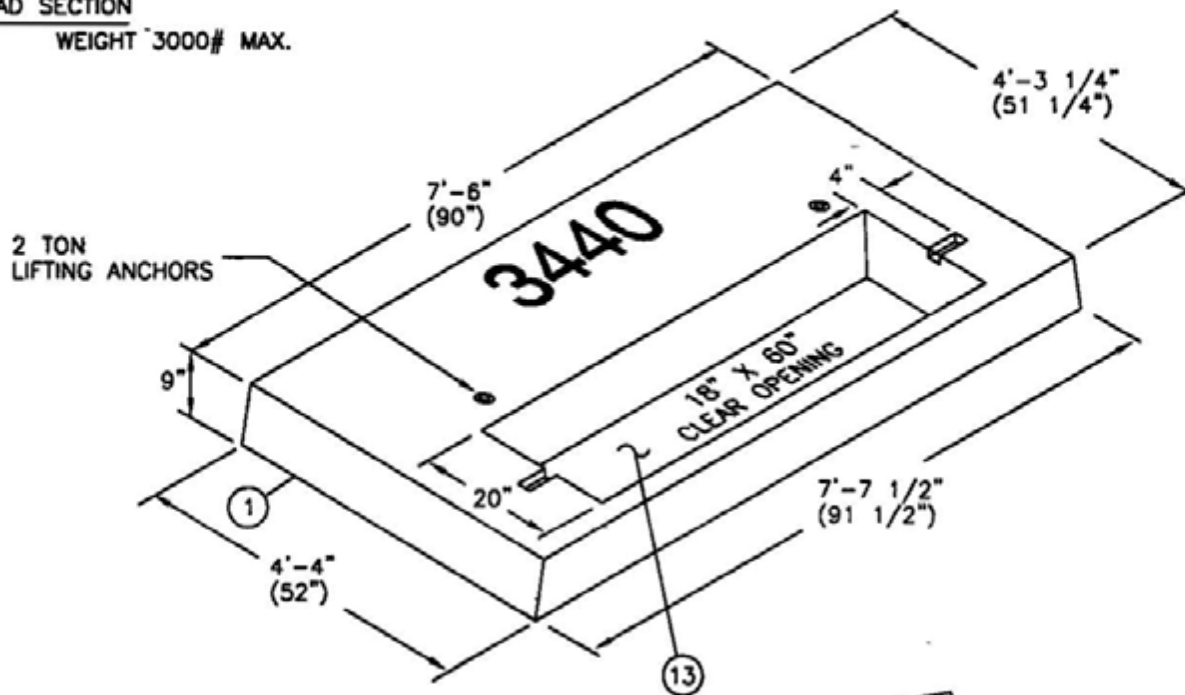
SDG&E ELECTRIC UNDERGROUND STANDARD

3440 PAD & HANDHOLE INSTALLATIONS
FOR PAD-MOUNTED 12KV, 600 AMP, 3 PHASE SWITCH

**FMO
UG 3440**

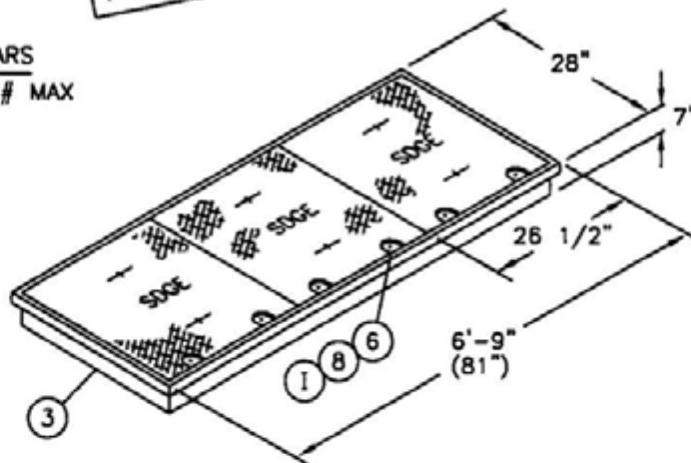
SCOPE: THIS STANDARD SHOWS THE INSTALLATION REQUIREMENTS OF A TYPICAL 3440 PAD AND 3315 HANDHOLE FOR A PAD-MOUNTED 12KV, 600 AMP, 3 PHASE SWITCH

PAD SECTION
WEIGHT 3000# MAX.



FOR FIELD MAINTENANCE ONLY

COVER SECTION
& REMOVABLE SUPPORT BARS
WEIGHT 315# MAX



NOTES:

- PADS MAY NOT BE POURED IN PLACE USE PRECAST PADS ONLY

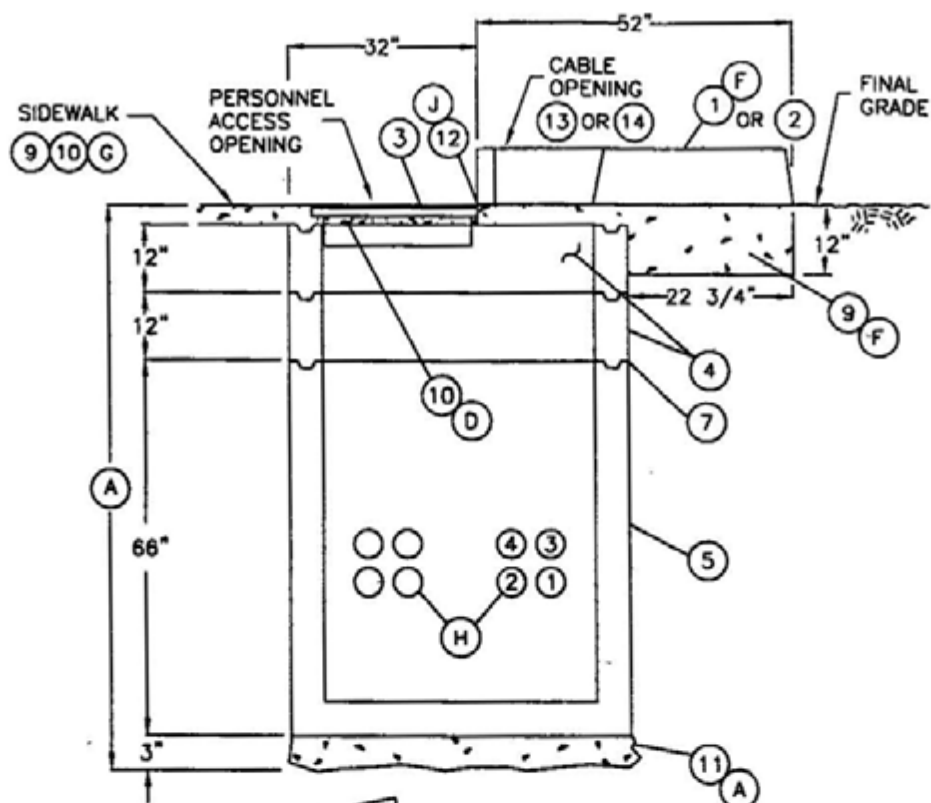
SDG&E ELECTRIC STANDARDS

DATE 1-1-96

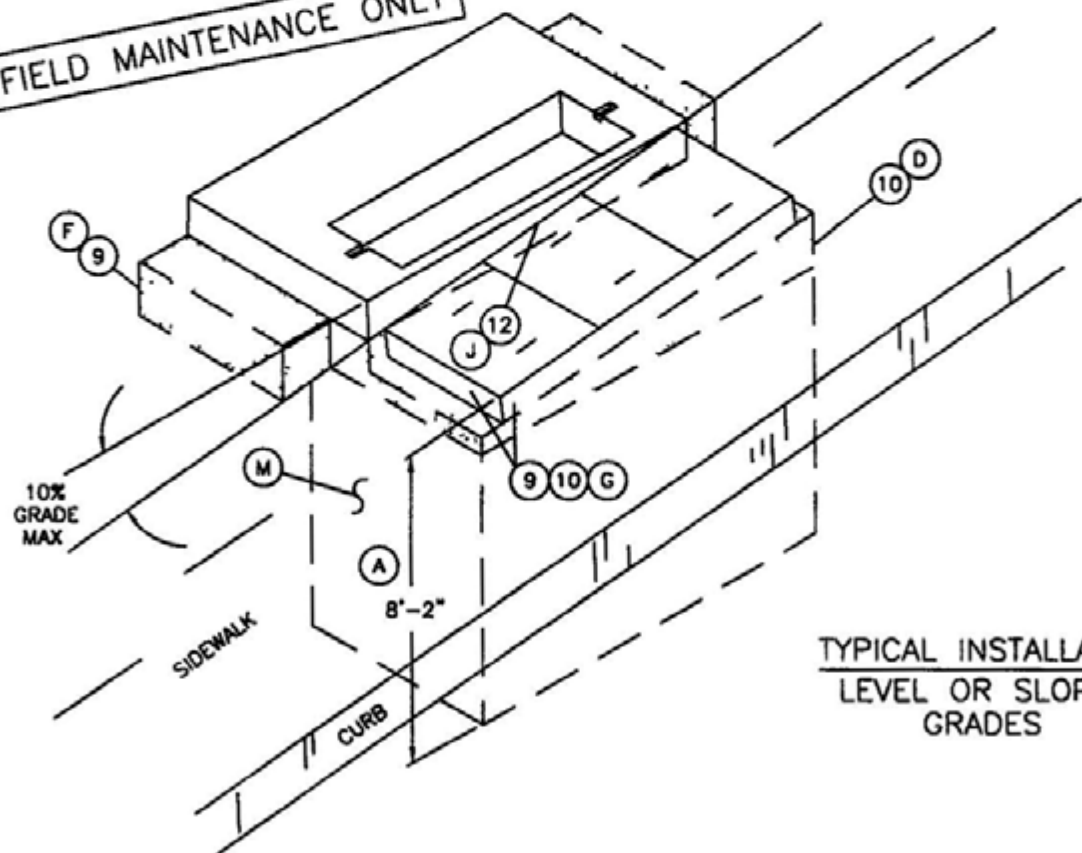
APPD *[Signature]*

3440 PAD & HANDHOLE INSTALLATIONS
FOR PAD-MOUNTED 12KV, 600 AMP, 3 PHASE SWITCH

3499.403
SUPERSEDES
3440 1 (1-1-96)



FOR FIELD MAINTENANCE ONLY



TYPICAL INSTALLATION
LEVEL OR SLOPING
GRADES

| | | |
|--|---|--|
| <p>3499.404 SUPERSEDES 3440 2 (1-1-96)</p> | <p>SDG&E ELECTRIC STANDARDS</p> <p>3440 PAD & HANDHOLE INSTALLATIONS FOR PAD-MOUNTED 12KV, 600 AMPS, 3 PHASE SWITCH</p> | <p>DATE 1-1-96 APPD <i>[Signature]</i></p> |
|--|---|--|

BILL OF MATERIAL FOR 3440 PAD & COVER SECTION OVER 3314 HANDHOLE:

| ITEM | DESCRIPTION | QUANTITY | CONSTR STD OR PAGE NO | STOCK NUMBER | ASSEMBLY UNITS |
|------|---|----------|-----------------------|--------------|----------------|
| 1 | 3440 PAD SECTION (FOR SF-6 SWITCH) | 1 | 3440 | 513912 | SW-PAD |
| 3 | 3440 COVER SECTION & REMOVABLE SUPPORT BARS | 1 | 3440 | 286806 | - |
| 4 | 3315 EXTENSION SECTION, 12" | 2 | 3315 | 336246 | 3315X1 |
| 5 | 3315 BASE ENCLOSURE, 60" | 1 | 3315 | 334356 | - |
| 6 | BOLT, 1/2" X 1-1/4" PENTAHEAD, STAINLESS STEEL | AS REQ'D | - | 156004 | - |
| 7 | SEALANT, PLASTIC-MASTIC | - | 3306 | 631872 | - |
| 8 | SILICONE GREASE (I) | AS REQ'D | - | 391424 | - |
| 9 | CONCRETE, (1 SACK MIX) (F) | AS REQ'D | 3376 | - | - |
| 10 | CONCRETE, (2 OR 4-SACK MIX WITH 3/8" PEA GRAVEL) (D)(G) | AS REQ'D | - | - | - |
| 11 | GRAVEL, (3/8" - 3/4") (A) | AS REQ'D | - | - | - |
| 12 | SEALANT (J) | AS REQ'D | 3408 | 631800 | - |
| 13 | SAFETY PLATE, TEMPORARY (3440) | 1 | - | 541722 | PD/COV |
| 14 | SAFETY PLATE, TEMPORARY (3440A) | 1 | - | 541720 | PADCOV |

FOR FIELD MAINTENANCE ONLY

INSTALLATION FOR 3440 PAD & COVER SECTION OVER 3315 HANDHOLE:

- (A) THE PAD AND HANDHOLE LOCATION IS TO BE MARKED OUT PAYING PARTICULAR ATTENTION TO FOREIGN UTILITY PLACEMENTS. RELOCATING PAD AND HANDHOLE REQUIRES APPROVAL FROM SERVICE PLANNING. ONCE THE LOCATION HAS BEEN ESTABLISHED, MARK OUT DIMENSIONS FOR AN EXCAVATION OF 6'-4" WIDE X 8'-10" LONG X 8'-2" DEEP (ON THE LOW SIDE OF THE SLOPE). EXCAVATION DEPTH ALLOWS 3 INCHES FOR ADJUSTMENT TO FINAL GRADE AND 3 INCHES FOR ADDITIONAL PLACEMENT OF GRAVEL FOR BASE SUPPORT.
- B EXCAVATION IS NOW PREPARED FOR INSTALLATION OF PAD AND SUBSTRUCTURE SECTIONS. ASSURE THE SUBSTRUCTURE WALLS ARE STRAIGHT AND THE FLOOR IS LEVEL. PLACE PLASTIC-MASTIC SEALANT BETWEEN ALL SECTIONS. USE DOUBLE SEAL IF FIELD CONDITIONS INDICATE THAT WATER WILL PENETRATE THE JOINTS. DO NOT APPLY SEALANT UNDER THE PAD SECTION IF CONCRETE IS REQUIRED FOR GRADE ADJUSTMENT.
- C TO DETERMINE FINAL GRADE, ONE OF TWO FOLLOWING METHODS MAY BE USED: 1) WHEN CURB OR GRADE LEVEL IS ALREADY ESTABLISHED, MEASURE FROM THE TOP OF CURB OR GRADE OR 2) HAVE THE FIELD ENGINEER SET THE GRADE STAKES. AFTER GRADE LEVEL IS ESTABLISHED SET A STRING LINE TO CHECK GRADE LEVEL.
- (D) BEFORE POURING CONCRETE (4-SACK MIX WITH 3/8 INCH PEA GRAVEL OR AS REQUIRED BY CITY OR COUNTY CODES) BETWEEN HANDHOLE SECTIONS FOR GRADE ADJUSTMENT, FRAME THE INSIDE OPEN AREA BETWEEN SECTIONS SO CONCRETE CAN BE POURED FROM THE OUTSIDE OF THE TOP SECTION. MAKE SURE THE BRICKS OR WOODEN WEDGES DO NOT SHOW FROM THE INSIDE ONCE THE CONCRETE IS POURED. THE INSIDE FRAME MAY BE OMITTED IF THE CONCRETE IS NOT TOO WET. IF FRAME IS OMITTED TROWEL CONCRETE SMOOTH ON THE INSIDE.
- (F) A CONCRETE BACKFILL (1-SACK MIX) OR 4-SACK MIX WITH 3/8" INCH PEA GRAVEL IS REQUIRED UNDER THE PAD, 12 INCHES BEYOND THE SIDE EDGES OF PAD AND 12 INCHES DEEP UNDER THE OVERHANGING PAD SECTION. LEVEL THE TOP PAD SECTION TO FINAL GRADE. SHIM BETWEEN THE TOP PAD SECTION AND 12 INCH SPECIAL EXTENSION WITH WOODEN WEDGES AND BRICKS. THE COVER SECTION MAY BE INSTALLED IN THE SIDEWALK ON A SLOPING GRADE.
- (G) CONCRETE (2-SACK MIX, OR 4-SACK MIX) IS REQUIRED AROUND THE COVER SECTION WHEN THERE IS NO SIDEWALK PRESENT. FRAME THE CONCRETE POUR TO THE OUTSIDE EDGE OF THE HANDHOLE AND EVEN WITH THE TOP OF THE COVER SECTION. REMOVE FRAME AFTER CONCRETE IS SET.

SDG&E ELECTRIC STANDARDS

DATE 1-1-96
APPD *[Signature]*

3440 PAD & HANDHOLE INSTALLATIONS
FOR PAD-MOUNTED 12KV, 600 AMP, 3 PHASE SWITCH

3499.405
SUPERSEDES
3440.3 (1-1-96)

- (H) INSTALL CONDUITS USING THE BOTTOM OUTSIDE KNOCKOUTS (CLOSEST TO WALL) FIRST ALL CONDUITS MAY COME FROM THE SAME DIRECTION. FEEDER CONDUITS FOR THE SWITCH SHALL ONLY BE INSTALLED IN POSITIONS 1, 2, 3 OR 4 UNDER THE SWITCH
- (I) APPLY SILICONE GREASE TO THE PENTAHEAD BOLTS WHEN SECURING THE COVERS TO REDUCE REMOVAL OR INSTALLATION DIFFICULTIES TIGHTEN DOWN BOLTS WITH TORQUE WRENCH TO 30 FT/LBS. MIN., 40 FT/LBS. MAX
- (J) WHOEVER INSTALLS PAD SHALL INSTALL SEALANT BETWEEN PAD SECTION AND COVER SECTION.

REFERENCE:

- K SEE STANDARD 3211 FOR INSTALLATION OF IDENTIFICATION TAG
- L SEE STANDARD 3306 FOR INSTALLATION OF PLASTIC-MASTIC SEALANT.
- (M) SEE STANDARD 3365 FOR SLURRY BACKFILL.
- N SEE STANDARD 3481 FOR BARRIER PROTECTION
- O SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT
- P SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- Q. SEE STANDARD 3487 FOR RETAINING WALLS.
- R. SEE STANDARD 3549 FOR PAD-MOUNTED SF-6 SWITCH.
- S SEE STANDARD 3550 FOR CABLE AND SWITCH INSTALLATION OF SF-6 SWITCH
- T SEE STANDARD 4512 FOR EQUIPMENT GROUNDING INSTALLATION
- U. SEE STANDARD 4550 FOR GROUNDING TELCO IN HANDHOLES.

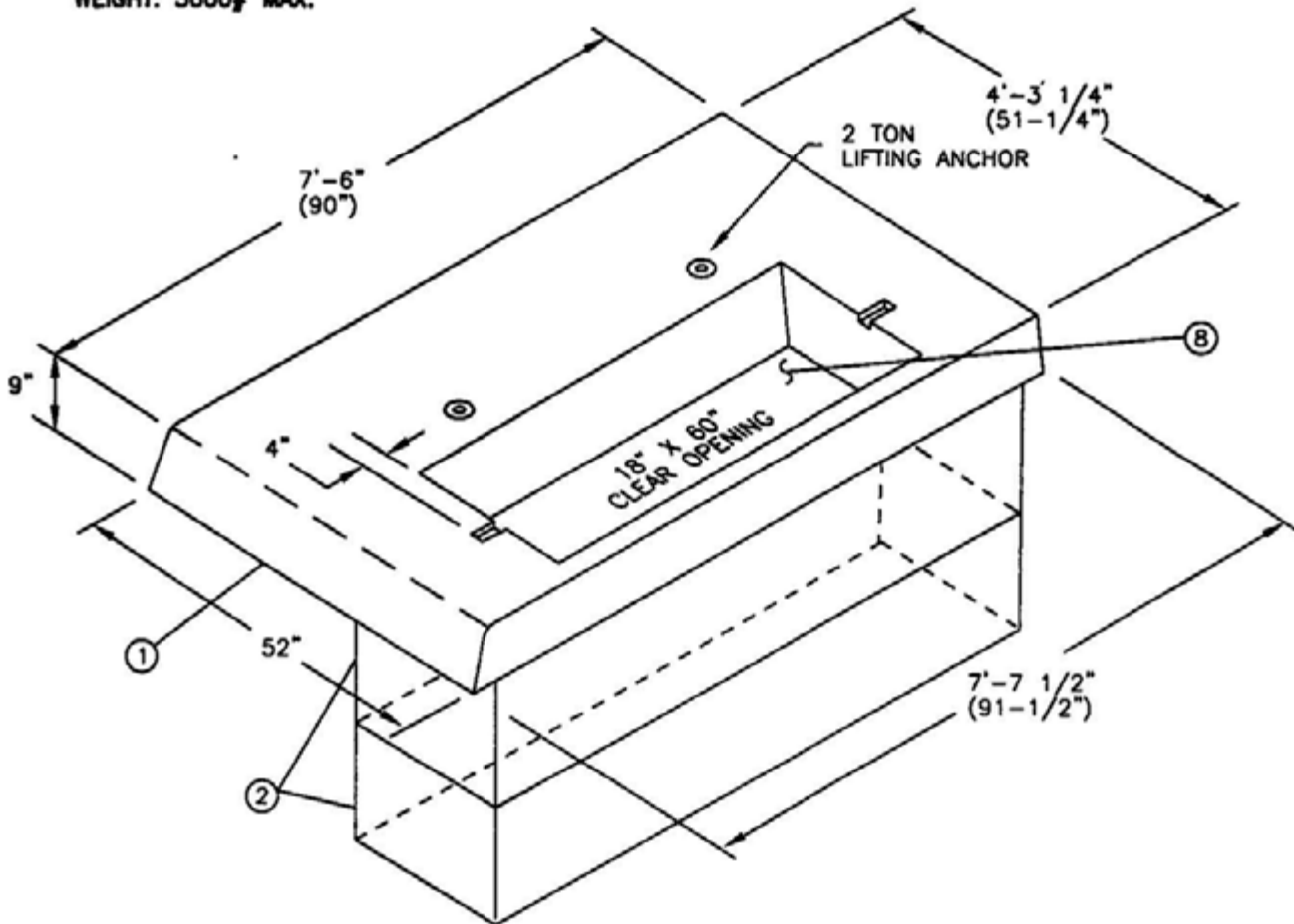
FOR FIELD MAINTENANCE ONLY

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| 3499.406 SUPERSEDES 3440 4 (1-1-96) | SDG&E ELECTRIC STANDARDS 3440 PAD & HANDHOLE INSTALLATIONS FOR PAD-MOUNTED 12KV, 600 AMP, 3 PHASE SWITCH | DATE 1-1-96 APPD <i>[Signature]</i> |
|---|--|--|

SCOPE: THESE PAGES SHOW THE INSTALLATION REQUIREMENTS FOR A TYPICAL 3440 PAD SECTION AND 3311 HANDHOLES BELOW A PAD-MOUNTED 12KV, 600 AMP, THREE-PHASE SWITCH **DO NOT USE IF A FEEDER CABLE IS TO BE INSTALLED FROM A PAD-MOUNTED SWITCH TO A CABLE POLE OR SWITCH TO SWITCH WITH BOTH SWITCHES OVER 3311 HANDHOLES.** (THIS IS ASSUMING THAT THE CABLE DOES NOT PASS THROUGH ANY OTHER STRUCTURE). IT MAY BE REQUIRED TO SWAP PHASES ON THE CABLE, AND DUE TO THE LACK OF SPACE IN THE 3311 HANDHOLE, THIS WOULD BE DIFFICULT IF NOT IMPOSSIBLE IF THIS SITUATION ARISES, USE THE 3440 PAD AND 3315 HANDHOLE WHICH ALLOWS ROOM FOR SWAPPING PHASES.

FOR FIELD MAINTENANCE ONLY

3440 PAD SECTION
WEIGHT: 3000# MAX.



NOTES:

- PAD SECTION MAY **NOT** BE POURED IN PLACE

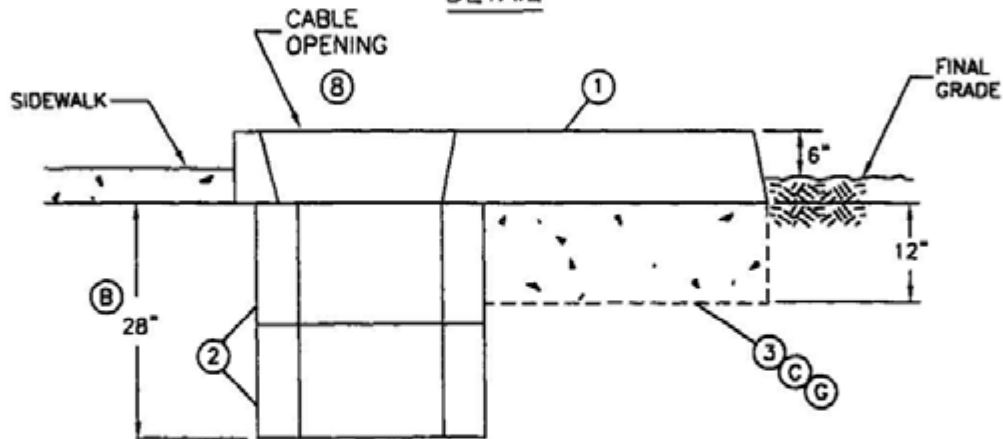
SDG&E ELECTRIC STANDARDS

DATE 1-1-96
 APPD *[Signature]*

3440 PAD & HANDHOLE INSTALLATIONS
 FOR PAD-MOUNTED 12KV, 600 AMP, THREE-PHASE SWITCH

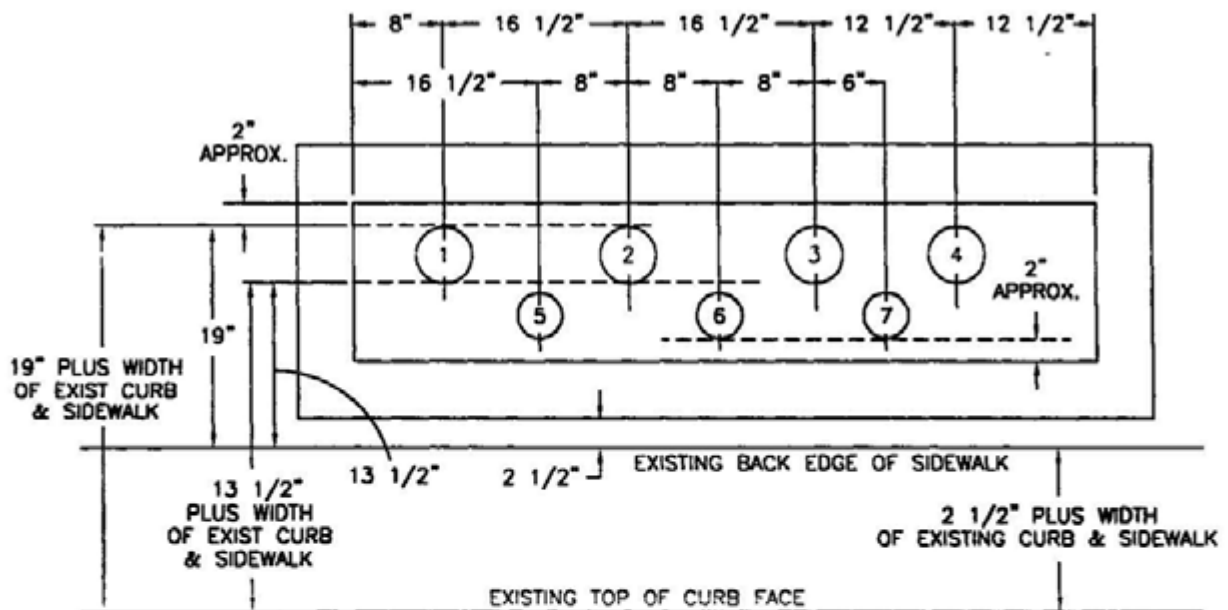
3499.407
 SUPERSEDES
 3440 5 (1-1-96)

INSTALLATION LOCATION
DETAIL



FOR FIELD MAINTENANCE ONLY

CONDUIT ARRANGEMENT
TOP VIEW - 3311 HANDHOLES
CONDUIT SPACING IS CRITICAL TO CABLE TRAINING



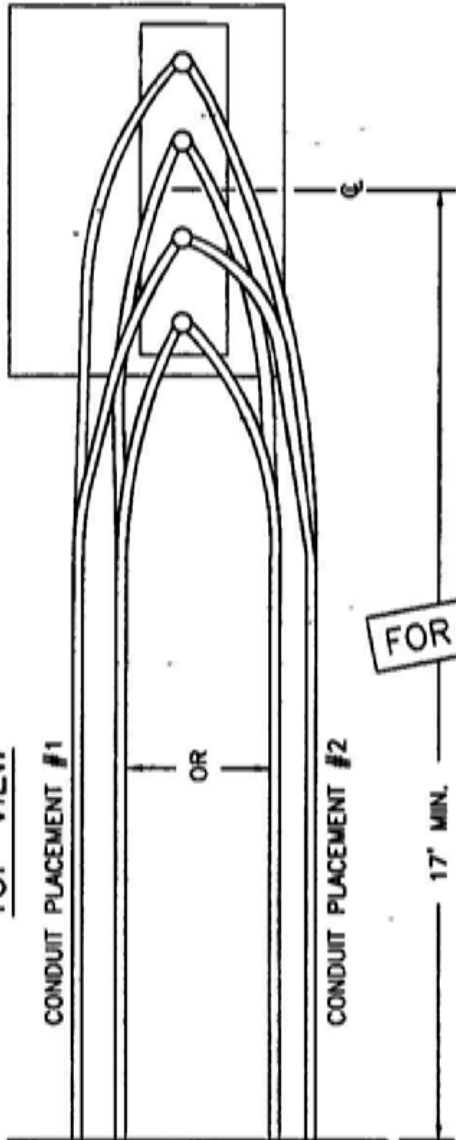
NOTES:

- CONDUITS #1 THROUGH #4 ARE 5 INCH.
- CONDUITS #5 AND #6 ARE 4 INCH (THESE CONDUITS ARE REQUIRED IN EVERY INSTALLATION)
- CONDUIT #7 IS 4 INCH AND REQUIRED FOR SCADA OR FUTURE SCADA INSTALLATIONS.

| | | | |
|---|--|--|-----------------------------------|
| 3499.408 SUPERSEDES 3440 6 (1-1-96) | SDG&E ELECTRIC STANDARDS | | DATE 1-1-96 APPD <i>JLB/BJ</i> |
| | 3440 PAD & HANDHOLE INSTALLATIONS FOR PAD-MOUNTED 12KV, 600 AMP, THREE-PHASE SWITCH | | |

CONDUIT PLACEMENT DETAIL

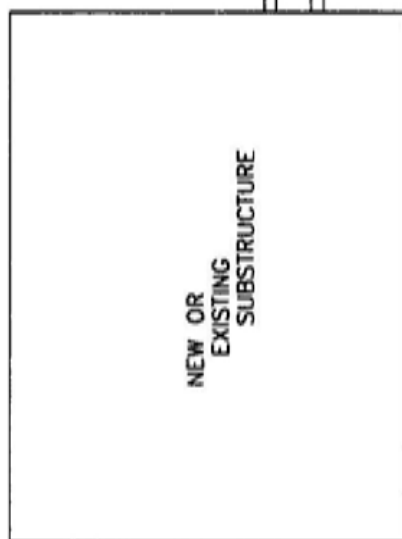
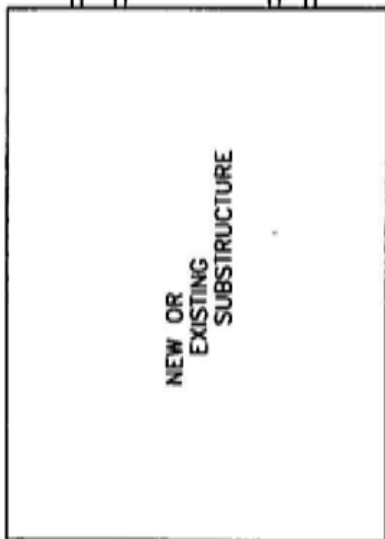
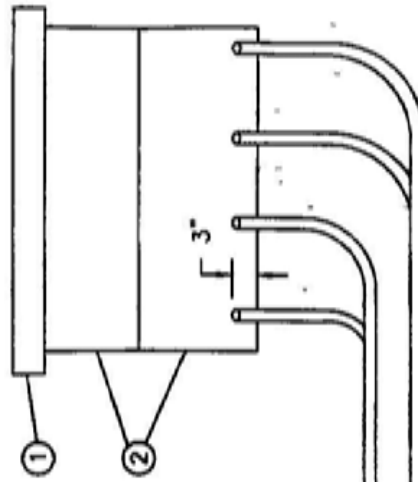
TOP VIEW



FOR FIELD MAINTENANCE ONLY

SIDE VIEW

FOR CONDUIT PLACEMENT #2



NOTES

THE BEST WAY TO SET UP THE CONDUIT INSTALLATIONS IS TO HAVE ALL THE CONDUITS COME FROM ONE SIDE OF THE SUBSTRUCTURE

SDG&E ELECTRIC STANDARDS

DATE 1-1-96

APPD *[Signature]*

3440 PAD & HANDHOLE INSTALLATIONS
FOR PAD-MOUNTED 12KV, 600 AMP, THREE-PHASE SWITCH

3499.409
SUPERSEDES
3440 7 (1-1-96)

BILL OF MATERIAL FOR 3440 PAD OVER 3311 HANDHOLES:

| ITEM | DESCRIPTION | QUANTITY | CONSTR STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNIT | |
|------|--------------------------------|----------|------------------------|--------------|---------------|--------|
| 1 | PAD SECTION | 1 | 3440 | 513912 | SW-PAD | SWI/11 |
| 2 | 3311 HANDHOLE 14" X 66" X 14" | 2 | 3311 | 162660 | 3311-S | |
| 3 | CONCRETE (1-SACK MIX) (C) | AS REQ'D | - | - | - | - |
| 4 | EQUIPMENT GROUNDING EQUIPMENT | 1 | 4512 | - | - | - |
| 5 | SAFETY PLATE, TEMPORARY (3440) | 1 | - | 541722 | PADCOV | - |

INSTALLATION FOR 3440 PAD OVER 3311 HANDHOLE:

- A INSTALL CONDUITS AS SHOWN ON PAGES 3440.6 AND 3440.7
- (B) THE PAD AND HANDHOLE LOCATION IS TO BE MARKED OUT PAYING PARTICULAR ATTENTION TO FOREIGN UTILITY PLACEMENTS. RELOCATING PAD AND HANDHOLES REQUIRES APPROVAL FROM SERVICE PLANNING. ONCE THE LOCATION HAS BEEN ESTABLISHED, MARK OUT DIMENSIONS FOR AN EXCAVATION OF 2'-5" WIDE X 6'-9" LONG. THE DEPTH OF THE EXCAVATION IS 28 INCHES ALLOWING THE BOTTOM OF THE PAD TO SET AT FINAL GRADE.
- (C) A CONCRETE BACKFILL (1-SACK MIX) IS REQUIRED UNDER THE PAD, 12 INCHES BEYOND THE SIDE EDGES OF PAD AND 12 INCHES DEEP UNDER THE PAD SECTION. LEVEL THE TOP PAD SECTION TO FINAL GRADE.

REFERENCE:

- F SEE STANDARD 3211 FOR INSTALLATION OF IDENTIFICATION TAG.
- G. SEE STANDARD 3365 FOR SLURRY BACKFILL
- H SEE STANDARD 3481 FOR EQUIPMENT BARRIER PROTECTION.
- I SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- J. SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT.
- K SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- L SEE STANDARD 3487 FOR RETAINING WALLS.
- M. SEE STANDARD 3549 FOR PAD-MOUNTED SWITCH.
- N. SEE STANDARD 4510 FOR PREFERRED AND ALTERNATE TRENCH GROUND WIRE.
- O. SEE STANDARD 4512 FOR EQUIPMENT GROUNDING INSTALLATION.
- P. SEE STANDARD 4514 FOR GROUNDING TELCO CONDUCTOR IN PAD-MOUNTED EQUIPMENT.

FOR FIELD MAINTENANCE ONLY

| | | |
|---|--|--|
| 3499.410 SUPERSEDES 3440.8 (1-1-96) | SDG&E ELECTRIC STANDARDS | DATE 1-1-96 APPD <i>[Signature]</i> |
| | 3440 PAD & HANDHOLE INSTALLATIONS FOR PAD-MOUNTED 12KV, 600 AMP, 3 PHASE SWITCH | |

FIELD MAINTENANCE ONLY

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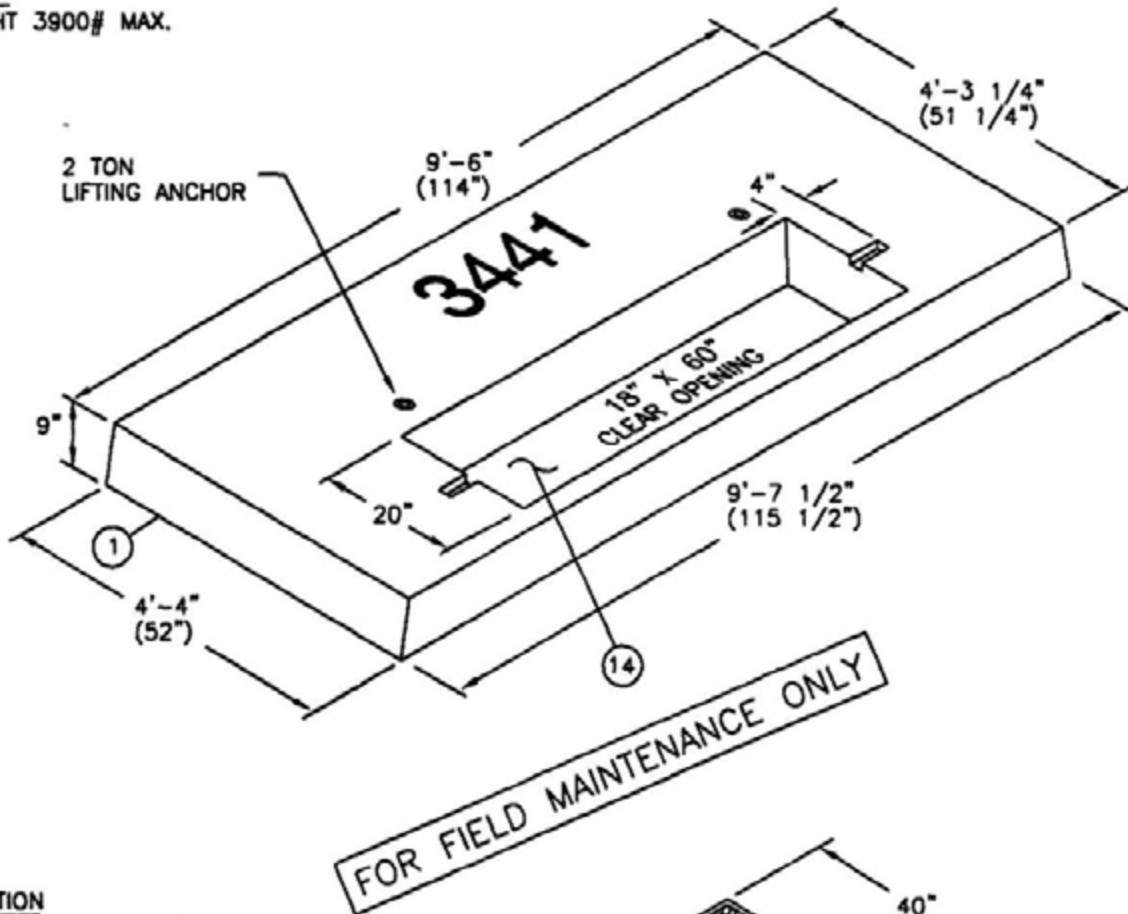
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| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |

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|--------------------------------|---|--|--|---|-------------------------------|
| <p>SHEET 1 OF 1</p> | <p><input checked="" type="checkbox"/> Indicates Latest Revision</p> | <p><input type="checkbox"/> Completely Revised</p> | <p><input type="checkbox"/> New Page</p> | <p><input type="checkbox"/> Information Removed</p> | <p>FMO UG 3441</p> |
| | <p>SDG&E ELECTRIC UNDERGROUND STANDARD</p> | | | | |
| | <p>3441 PAD & 3316 HANDHOLE INSTALLATION FOR PAD-MOUNTED, 12KV, 600 AMP, THREE-PHASE SWITCH</p> | | | | |

SCOPE: THIS STANDARD SHOWS THE INSTALLATION REQUIREMENTS FOR A TYPICAL 3441 PAD AND 3316 HANDHOLE FOR A PAD-MOUNTED, 12KV, 600 AMP, 3 PHASE SWITCH.

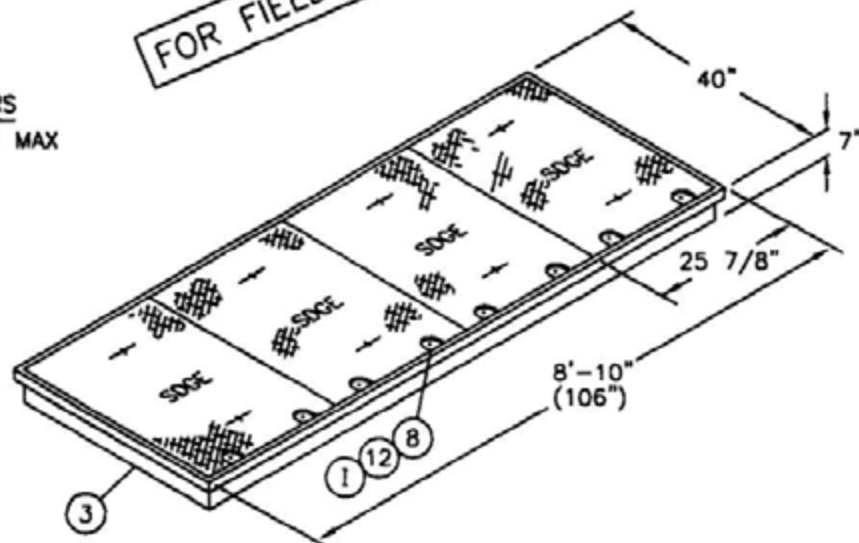
PAD SECTION

WEIGHT 3900# MAX.



**COVER SECTION
& REMOVABLE SUPPORT BARS**

WEIGHT 499# MAX



NOTES:

- PADS MAY NOT BE POURED IN PLACE USE PRECAST PADS ONLY

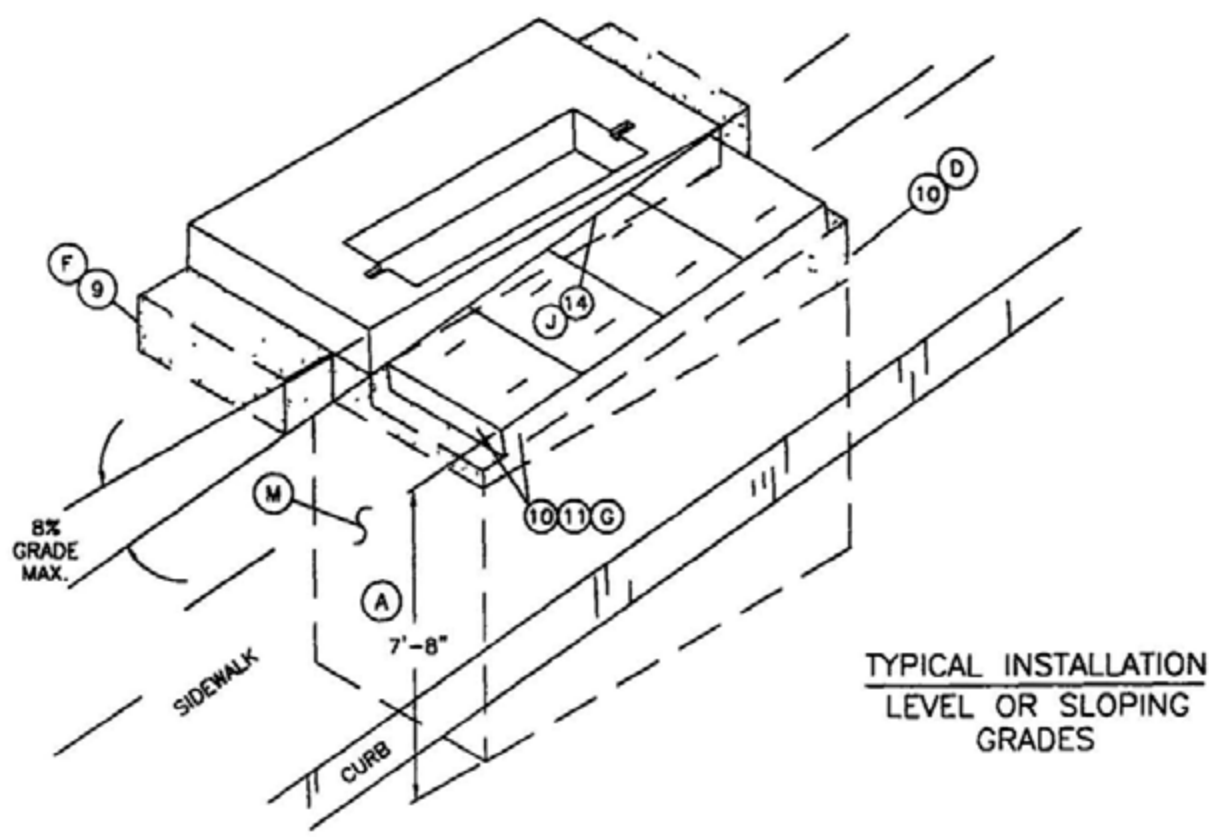
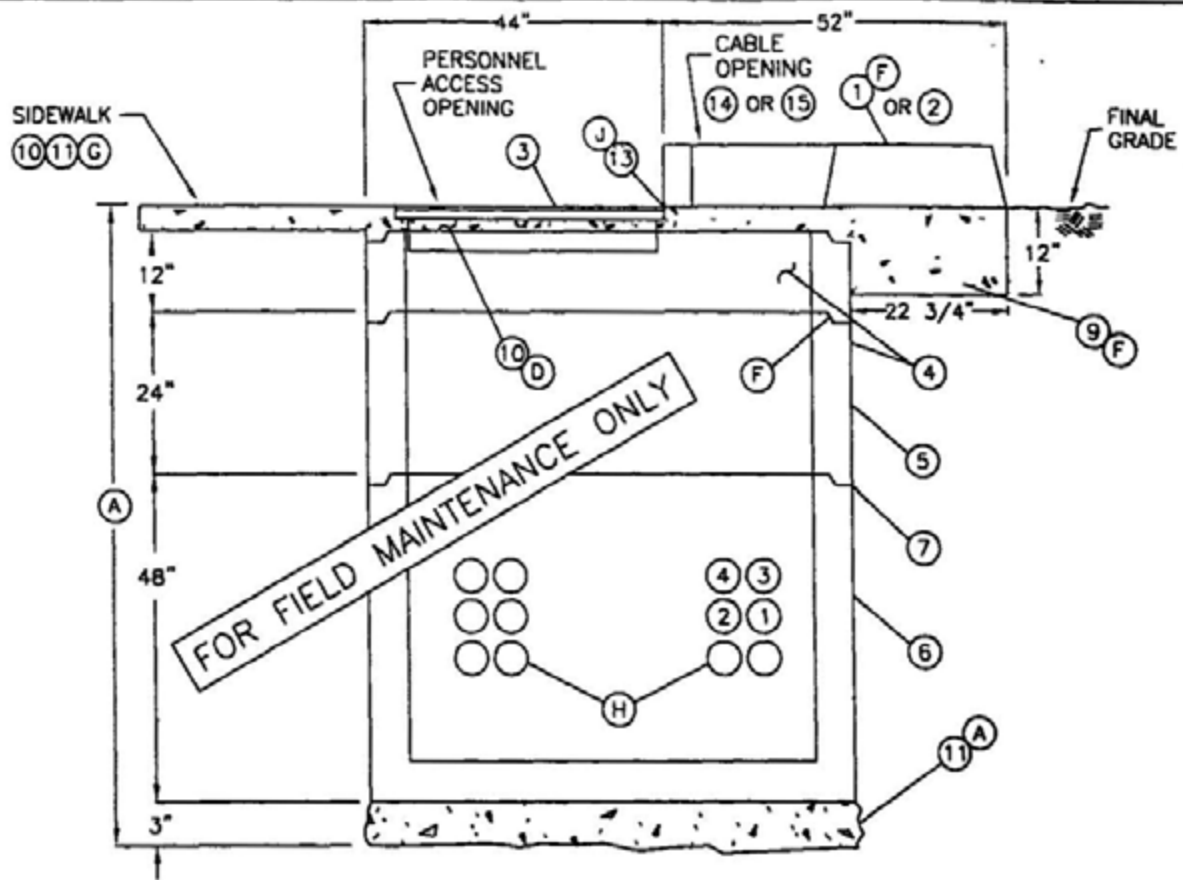
SDG&E ELECTRIC STANDARDS

DATE 1-1-96

APPD *[Signature]*

3441 PAD & 3316 HANDHOLE INSTALLATION
FOR PAD-MOUNTED, 12KV, 600 AMP, THREE-PHASE SWITCH

3499 411
SUPERSEDES
3441 1 (1-1-96)



TYPICAL INSTALLATION
LEVEL OR SLOPING
GRADES

SDG&E ELECTRIC STANDARDS

3499.412
SUPERSEDES
3441 2 (1-1-96)

3441 PAD & 3316 HANDHOLE INSTALLATION FOR
PAD-MOUNTED 12KV 600 AMP 3 PHASE SWITCH

DATE 1-1-96
APPD *[Signature]*

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR STD OR PAGE NO | STOCK NUMBER | ASSEMBLY UNITS |
|------|---|----------|-----------------------|--------------|----------------|
| 1 | 3441 PAD (FOR SF-6 SWITCH) | 1 | 3441 | 513910 | SP3441 |
| 2 | 3441 COVER SECTION & REMOVABLE SUPPORT BARS | 1 | 3441 | 286804 | - |
| 4 | 3316 12" EXTENSION SECTION | 1 | 3316 | 336208 | 3316X1 |
| 5 | 3316 24" EXTENSION SECTION | 1 | 3316 | 248162 | - |
| 6 | 3316 42" BASE ENCLOSURE | 1 | 3316 | 248160 | - |
| 7 | SEALANT, PLASTIC-MASTIC | AS REQ'D | 3306 | 631872 | - |
| 8 | SILICONE GREASE (I) | AS REQ'D | - | 391424 | - |
| 9 | CONCRETE, (1 SACK MIX) (F) | AS REQ'D | 3376 | - | - |
| 10 | CONCRETE, (2 OR 4-SACK MIX WITH 3/8" PEA GRAVEL) (D)(G) | AS REQ'D | - | - | - |
| 11 | GRAVEL, (3/8" - 3/4") (A) | AS REQ'D | - | - | - |
| 12 | BOLT, 1/2" X 1-1/4" PENTAHEAD, STAINLESS STEEL | AS REQ'D | - | - | - |
| 13 | SEALANT (J) | AS REQ'D | - | - | - |
| 14 | SAFETY PLATE, TEMPORARY (3441) | 1 | - | 541722 | PD/COV |

FOR FIELD MAINTENANCE ONLY

UNITS COMPLETE
3441
PAD
SWI/16

INSTALLATION:

- (A) THE PAD AND HANDHOLE LOCATION IS TO BE MARKED OUT PAYING PARTICULAR ATTENTION TO FOREIGN UTILITY PLACEMENTS. RELOCATING PAD AND HANDHOLE REQUIRES APPROVAL FROM SERVICE PLANNING ONCE THE LOCATION HAS BEEN ESTABLISHED, MARK OUT DIMENSIONS FOR AN EXCAVATION OF 7'-4" WIDE X 10'-10" LONG X 7'-8" DEEP (ON THE LOW SIDE OF THE SLOPE) EXCAVATION DEPTH ALLOWS 3 INCHES FOR ADJUSTMENT TO FINAL GRADE AND 3 INCHES FOR ADDITIONAL PLACEMENT OF GRAVEL FOR BASE SUPPORT
- B EXCAVATION IS NOW PREPARED FOR INSTALLATION OF PAD AND SUBSTRUCTURE SECTIONS ASSURE THE SUBSTRUCTURE WALLS ARE STRAIGHT AND THE FLOOR IS LEVEL PLACE PLASTIC-MASTIC SEALANT BETWEEN ALL SECTIONS USE DOUBLE SEAL IF FIELD CONDITIONS INDICATE THAT WATER WILL PENETRATE THE JOINTS DO NOT APPLY SEALANT UNDER THE PAD SECTION IF CONCRETE IS REQUIRED FOR GRADE ADJUSTMENT
- C. TO DETERMINE FINAL GRADE, ONE OF TWO FOLLOWING METHODS MAY BE USED 1) WHEN CURB OR GRADE LEVEL IS ALREADY ESTABLISHED, MEASURE FROM THE TOP OF CURB OR GRADE OR 2) HAVE THE FIELD ENGINEER SET THE GRADE STAKES AFTER GRADE LEVEL IS ESTABLISHED SET A STRING LINE TO CHECK GRADE LEVEL
- (D) BEFORE POURING CONCRETE (4-SACK MIX WITH 3/8 INCH PEA GRAVEL OR AS REQUIRED BY CITY OR COUNTY CODES) BETWEEN HANDHOLE SECTIONS FOR GRADE ADJUSTMENT, FRAME THE INSIDE OPEN AREA BETWEEN SECTIONS SO CONCRETE CAN BE POURED FROM THE OUTSIDE OF THE TOP SECTION MAKE SURE THE BRICKS OR WOODEN WEDGES DO NOT SHOW FROM THE INSIDE ONCE THE CONCRETE IS POURED THE INSIDE FRAME MAY BE OMITTED IF THE CONCRETE IS NOT TOO WET IF FRAME IS OMITTED TROWEL CONCRETE SMOOTH ON THE INSIDE
- (F) A CONCRETE BACKFILL (1-SACK MIX) OR 4-SACK MIX WITH 3/8" INCH PEA GRAVEL) IS REQUIRED UNDER THE PAD, 12 INCHES BEYOND THE SIDE EDGES OF PAD AND 12 INCHES DEEP UNDER THE OVERHANGING PAD SECTION. LEVEL THE TOP PAD SECTION TO FINAL GRADE SHIM BETWEEN THE TOP PAD SECTION AND 12 INCH SPECIAL EXTENSION WITH WOODEN WEDGES AND BRICKS THE COVER SECTION MAY BE INSTALLED IN THE SIDEWALK ON A SLOPING GRADE
- (G) CONCRETE (2-SACK MIX, OR 4-SACK MIX) IS REQUIRED AROUND THE COVER SECTION WHEN THERE IS NO SIDEWALK PRESENT FRAME THE CONCRETE POUR TO THE OUTSIDE EDGE OF THE HANDHOLE AND EVEN WITH THE TOP OF THE COVER SECTION REMOVE FRAME AFTER CONCRETE IS SET

SDG&E ELECTRIC STANDARDS

DATE 1-1-96
APPD *[Signature]*

3441 PAD & 3316 HANDHOLE INSTALLATION
FOR PAD-MOUNTED, 12KV, 600 AMP, THREE-PHASE SWITCH

3499.413
SUPERSEDES
3441 3 (1-1-96)

- (H) INSTALL CONDUITS USING THE BOTTOM OUTSIDE KNOCKOUTS (CLOSEST TO WALL) FIRST. ALL CONDUITS MAY COME FROM THE SAME DIRECTION. FEEDER CONDUITS FOR THE SWITCH SHALL ONLY BE INSTALLED IN POSITIONS 1, 2, 3, OR 4 UNDER THE SWITCH.
- (I) APPLY SILICONE GREASE TO THE PENTAHEAD BOLTS WHEN SECURING THE COVERS TO REDUCE REMOVAL OR INSTALLATION DIFFICULTIES. TIGHTEN DOWN BOLTS WITH TORQUE WRENCH TO 30 FT/LBS. MIN., 40 FT/LBS. MAX.
- (J) WHOEVER INSTALLS PAD SHALL INSTALL SEALANT BETWEEN PAD SECTION AND COVER SECTION.

REFERENCE:

- K SEE STANDARD 3211 FOR INSTALLATION OF IDENTIFICATION TAG
- L SEE STANDARD 3306 FOR INSTALLATION OF PLASTIC-MASTIC SEALANT
- M SEE STANDARD 3365 FOR SLURRY BACKFILL.
- N SEE STANDARD 3481 FOR EQUIPMENT BARRIER PROTECTION
- O IF THE SWITCH IS SUBJECT TO VEHICULAR TRAFFIC, INSTALL BARRIERS PER STANDARD 3481
- P SEE STANDARD 3483 FOR MINIMUM OPERATING CLEARANCE REQUIREMENTS (PAD PLACEMENT)
- Q SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT
- R SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- S SEE STANDARD 3487 FOR RETAINING WALLS.
- T SEE STANDARD 3549 FOR PAD-MOUNTED SF-6 SWITCH
- U SEE STANDARD 3550 FOR CABLE AND SWITCH INSTALLATION OF SF-6 SWITCH
- V SEE STANDARD 4512 FOR EQUIPMENT GROUNDING INSTALLATION.
- W SEE STANDARD 4550 FOR GROUNDING TELCO IN HANDHOLES.

FOR FIELD MAINTENANCE ONLY

| | | |
|--|---|--|
| <p>3499.414 SUPERSEDES 3441.4 (1-1-96)</p> | <p>SDG&E ELECTRIC STANDARDS</p> <p>3441 PAD & 3316 HANDHOLE INSTALLATION FOR PAD-MOUNTED, 12KV, 600 AMP, 3 PHASE SWITCH</p> | <p>DATE 1-1-96 APPD <i>[Signature]</i></p> |
|--|---|--|

**3500 - PAD/WALL
MOUNTED
SECTIONALIZING
EQUIPMENT**

**3500 - PAD/WALL
MOUNTED
SECTIONALIZING
EQUIPMENT**

PAGE

SUBJECT

| | |
|------|--|
| 3515 | THREE-PHASE FUSED SWITCHING CABINET - 12KV |
| 3523 | 12KV, 200A DEADFRONT CABLE JUNCTION PEDESTAL |
| 3525 | THREE-PHASE PAD MOUNTED TERMINATING CABINET - 12KV, 600A AND 3313 HANDHOLE |
| 3549 | PAD MOUNTED SF6 GAS SWITCH 12KV, 600A, THREE-PHASE |
| 3550 | INSTALLATION OF PAD MOUNTED SWITCH & 3315 HANDHOLE 12KV, 600A, THREE-PHASE |
| 3551 | INSTALLATION OF PAD MOUNTED SWITCH & 3316 HANDHOLE & 12KV, 600A, THREE-PHASE |
| 3553 | REPLACEMENT CABINET FOR PAD MOUNTED ESCO OIL SWITCH |
| 3555 | PAD MOUNTED AIR-BREAK PMH 5 SECTIONALIZING SWITCH 12KV, 600A, THREE-PHASE |
| 3560 | EQUIPMENT COMBINATION GUIDELINES - 3316 HANDHOLE AND PAD MOUNTED SWITCH |
| 3565 | PAD MOUNTED AIR-BREAK PMH 9 & 11 FUSE/SECTIONALIZING SWITCH 12KV, 600A, THREE-PHASE |
| 3566 | INSTALLATION OF PAD MOUNTED PMH 9 & 11 FUSE/SECTIONALIZING SWITCH CABINET 12KV, 600A THREE-PHASE |
| 3577 | INSTALLATION OF PAD MOUNTED AIR-BREAK PMH 3 SECTIONALIZING SWITCH 12KV, 600A, THREE-PHASE |
| 3578 | INSTALLATION OF PAD MOUNTED AIRBREAK PMH 3 SECTIONALIZING SWITCH 12KV, 600A, THREE-PHASE |

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| C | MOVED UG3525 TO FMO | EDM | EJA | GLW | KRG | 09/07/2022 | F | | | | | | |
| B | MOVED UG3523 TO FMO | EDM | RSL | JES | CZH | 12/12/2021 | E | | | | | | |
| A | ORIGINAL ISSUE | - | JS | TR | MDJ | 07/25/2016 | D | | | | | | |

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| SHEET 1 OF 1 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG3501.1 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | PAD MOUNTED SECTIONALIZING EQUIPMENT FMO TABLE OF CONTENTS | | | | |

FIELD MAINTENANCE ONLY

REVISION HISTORY:

7/13/2016: All versions prior to 2016 are superseded by their current version found inside the Overhead Construction Standard Manual.

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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
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| B | | | | | | E | | | | | |
| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |

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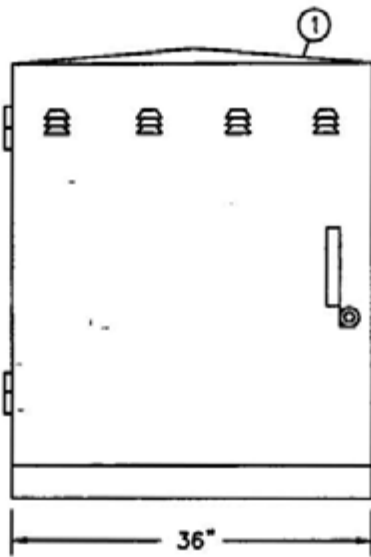
**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD

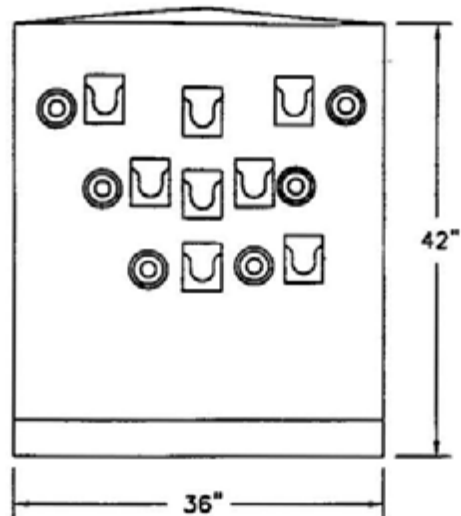
THREE-PHASE FUSED SWITCHING CABINET - 12,000 VOLT

**FMO
UG 3513**

SCOPE: THIS STANDARD SHOWS THE PAD-MOUNTED 3Ø FUSED SWITCHING CABINET AND INSTALLATION REQUIREMENTS USED FOR FUSING 1Ø AND 3Ø LOAD IN THE UNDERGROUND SYSTEM



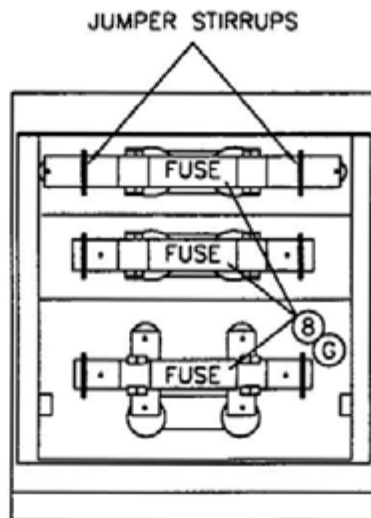
**FRONT & REAR
VIEW**



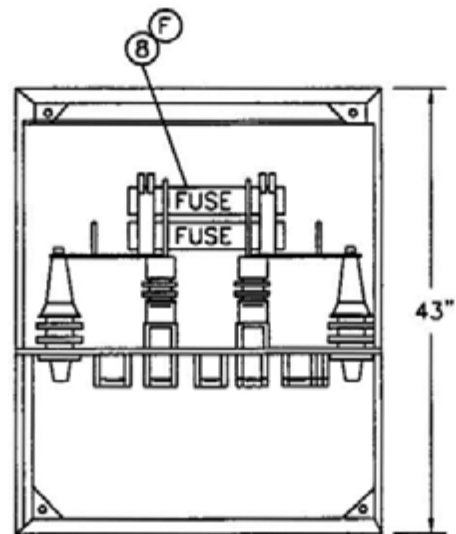
**FRONT VIEW
(EXPOSED)**

FOR FIELD MAINTENANCE ONLY

| RATINGS | |
|-----------|-----|
| FUSE (KV) | 8.3 |
| AMPERES | 200 |
| KV-BIL | 95 |



**REAR VIEW
(EXPOSED)**



**TOP VIEW
(EXPOSED)**

SDG&E ELECTRIC STANDARDS

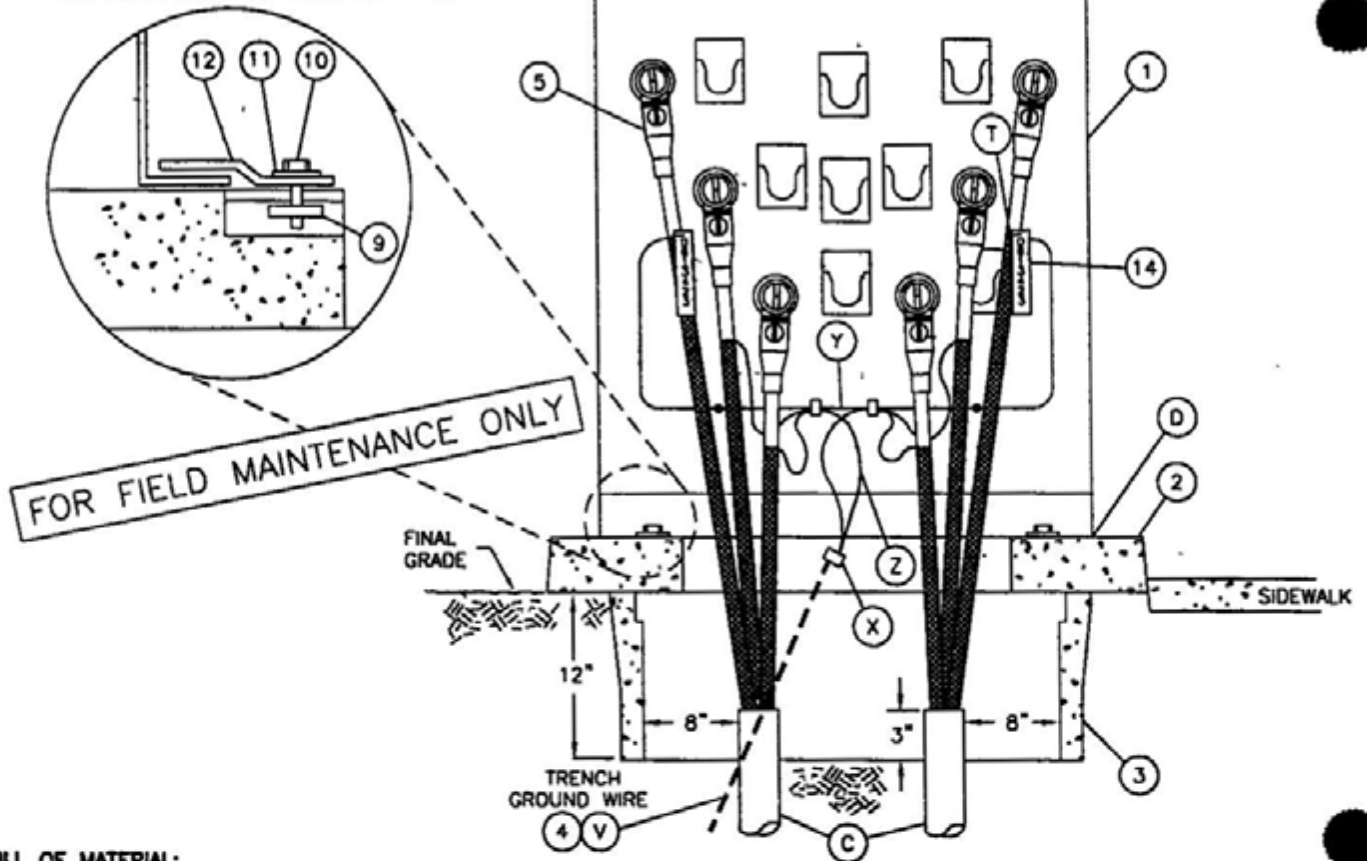
DATE 1-1-93

APPD *J. B. 1/93*

THREE-PHASE FUSED SWITCHING CABINET - 12,000 VOLT

3599 113
SUPERSEDES
3513 1 (1-1-96)

HOLD-DOWN ASSEMBLY DETAIL
TYPICAL BOTH SIDES OF EQUIPMENT PAD



BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD. OR PAGE NO | STOCK NUMBER | ASSEMBLY UNITS |
|------|--|--------------|-------------------------|--------------|----------------|
| 1 | CABINET, FUSED SWITCHING, THREE-PHASE | 1 | -- | 190560 | FC-3PH |
| 2 | SINGLE-PHASE TRANSFORMER\UTILITY EQUIPMENT PAD | 1 | 3421 | 514240 | FC3PAD |
| 3 | HANDHOLE, 17" X 30" | 1 | 3312 | 162426 | 3312-0 |
| 4 | TRENCH GROUND WIRE | (V) AS REQ'D | 4510 | -- | -- |
| 5 | ELBOW, LOADBREAK 14 4KV 200 AMP | AS REQ'D | 4191 | -- | -- |
| 6 | INSULATING RECEPTACLE (NOT SHOWN) | AS REQ'D | 4192 1 | 204304 | -- |
| 7 | KEYLESS LOCKS (NOT SHOWN) | (G) 2 | -- | 468010 | -- |
| 8 | FUSE | (F) 3 | 4311 | -- | -- |
| 9 | NUT, CLAMPING CHANNEL, W/SPRING, 1/2" | 2 | -- | 505520 | -- |
| 10 | SCREW, HEX HEAD CAP, BRONZE 1/2" X 1-1/2" | 2 | -- | 616192 | -- |
| 11 | WASHER, STANDARD FLAT ROUND, BRONZE 1/2" | 2 | -- | 799488 | -- |
| 12 | HOLD DOWN (SUPPLIED WITH CABINET) | 2 | -- | | -- |
| 13 | SEALING COMPOUND (NOT SHOWN) | (C) AS REQ'D | -- | 442976 | -- |
| 14 | CABLE IDENTIFICATION TAGS | AS REQ'D | 3202 | -- | -- |

3599.114
SUPERSEDES
35132 (1-1-96)

SDG&E ELECTRIC STANDARDS

THREE-PHASE FUSED SWITCHING CABINET - 12,000 VOLT

DATE 1-1-96
APPD *[Signature]*

INSTALLATION:

- A. THIS INSTALLATION IS LIMITED TO A MAXIMUM OF 2-3Ø 2/0 AL CABLES AND SMALLER
- B. SET PAD AND HANDHOLE, INSTALL EQUIPMENT GROUND.
- (C) TERMINATE CONDUITS AS SHOWN AND SEAL CONDUITS WITH SEALING COMPOUND (ITEM 13).
- (D) BASE OF CABINET SHALL BE CAULKED WHEN NECESSARY TO PREVENT WIRE ENTRY.
- (F) INSTALL SINGLE BARREL FUSE ALL THE WAY BACK IN DOUBLE BARREL FUSE CLIPS NEAREST THE INSULATOR
- (G) KEYLESS LOCKS (ITEM 7) TO BE ATTACHED TO LATCHING MECHANISM ON FUSE CABINET AND PENTAHEAD BOLT TO BE THREADED IN COMPLETELY

FOR FIELD MAINTENANCE ONLY

REFERENCES:

- J. SEE STANDARD 3202 FOR CABLE IDENTIFICATION
- K. SEE STANDARD 3211 FOR STRUCTURE/EQUIPMENT IDENTIFICATION
- L. SEE STANDARD 3221 FOR HIGH VOLTAGE DECAL
- M. SEE STANDARD 3408 FOR WIRE ENTRY PREVENTION
- N. SEE STANDARD 3421 FOR PAD, HANDHOLE AND CONDUIT PLACEMENT
- O. SEE STANDARD 3481 FOR BARRIER PROTECTION.
- P. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT)
- Q. SEE STANDARD 3484 FOR INSTALLATION OF PAD-MOUNTED EQUIPMENT.
- R. SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- S. SEE STANDARD 3487 FOR RETAINING WALLS
- (T) SEE STANDARD PAGE 4108 FOR SEALING JACKETED CABLE
- U. SEE STANDARD PAGES 4302 AND 4311 1,2,3 FOR FUSING
- V. SEE STANDARD 4510 FOR (PREFERRED I) AND (ALTERNATE) TRENCH GROUND WIRE
- W. SEE STANDARD PAGE 4512 1 FOR (PREFERRED II) EQUIPMENT GROUNDING INSTALLATION
- (X) SEE STANDARD 4512 2 FOR EQUIPMENT GROUNDING
- Y. SEE STANDARD 4514 FOR GROUNDING TELCO CONDUCTOR IN PAD-MOUNTED EQUIPMENT
- (Z) SEE STANDARD 4520 FOR GROUNDING PAD-MOUNTED EQUIPMENT

SDG&E ELECTRIC STANDARDS

DATE 1-1-94

APPD *JLB/1009*

THREE-PHASE FUSED SWITCHING CABINET - 12,000 VOLT

3599.115
SUPERSEDES
3513.3 (1-1-96)

UG3523 FIELD MAINTENANCE ONLY

ALL VERSIONS LISTED IN FMO ARE SUPERSEDED BY THEIR CURRENT VERSION FOUND INSIDE THE UNDERGROUND CONSTRUCTION STANDARD MANUAL.

REVISION HISTORY:

12/12/2021: MOVED TO FMO

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| A | ORIGINAL ISSUE | EDM | RSL | JES | CZH | 12/12/2021 | D | | | | | | |

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | THREE-PHASE LOW PROFILE CABLE TERMINATING CABINET 12KV 600A | | | | | |

SCOPE: THIS STANDARD SHOWS THE DEADFRONT CABLE JUNCTION PEDESTAL, USED FOR TERMINATING 2/0 AND SMALLER CABLE.

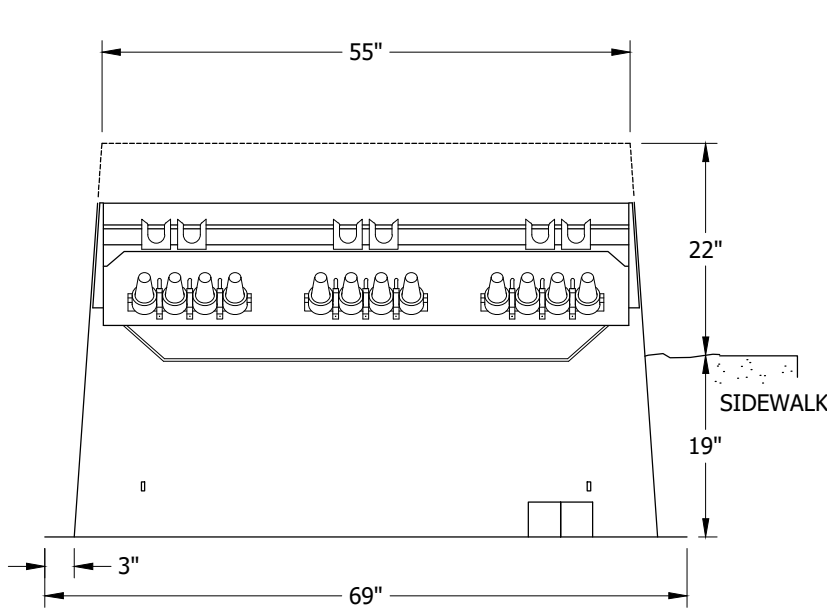


FIGURE 1
FRONT VIEW

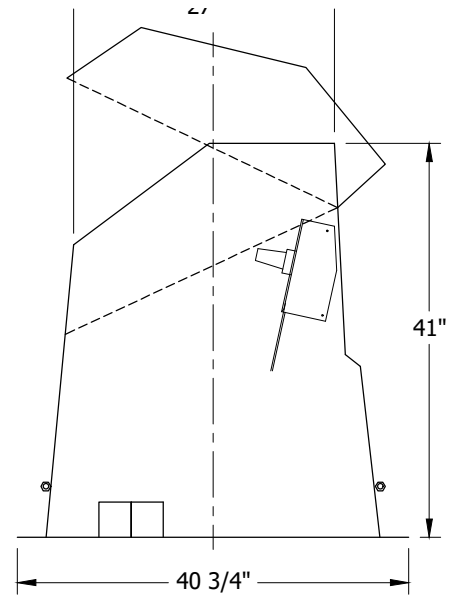


FIGURE 1
SIDE VIEW

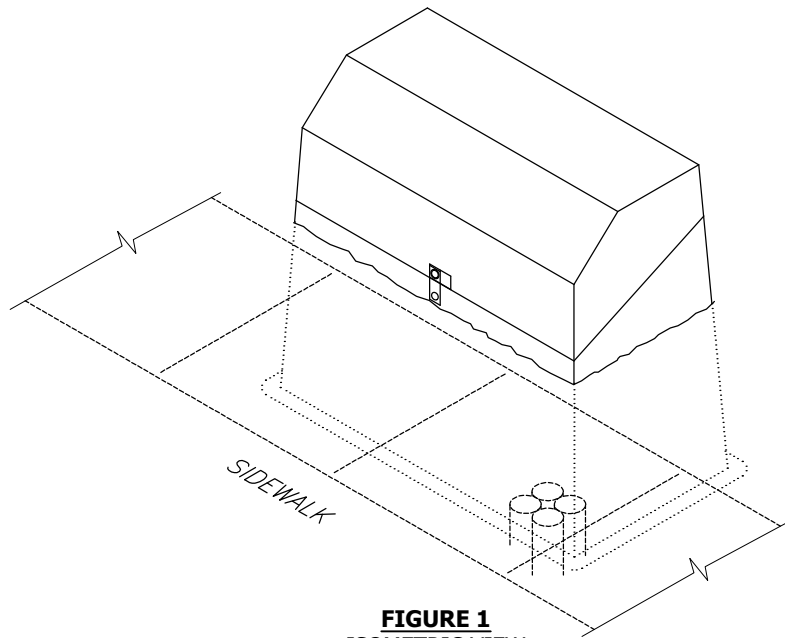


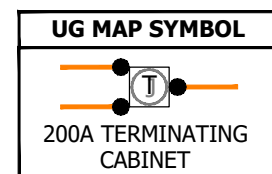
FIGURE 1
ISOMETRIC VIEW

TABLE 1

| RATINGS | |
|--------------|-----|
| KV-BIL | 95 |
| AMPERES | 200 |
| WEIGHT (LBS) | 200 |

TABLE 2

| APPROVED MANUFACTURER & PART NUMBER |
|-------------------------------------|
| PRO GLASS SE 30-41-L22415 |



FIELD MAINTENANCE ONLY

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| C | MOVED TO FMO | EDM | RSL | JES | CZH | 12/12/2021 | F | | | | | | |
| B | FORMATTING | EDM | JK | - | - | 05/17/2021 | E | | | | | | |
| A | EDITORIAL CHANGES | - | JS | TR | MDJ | 08/11/2016 | D | | | | | | |

SHEET
4 OF 8

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SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

THREE-PHASE LOW PROFILE CABLE TERMINATING CABINET
12KV, 200A DEADFRONT CABLE JUNCTION PEDESTAL

FMO
UG3523.4

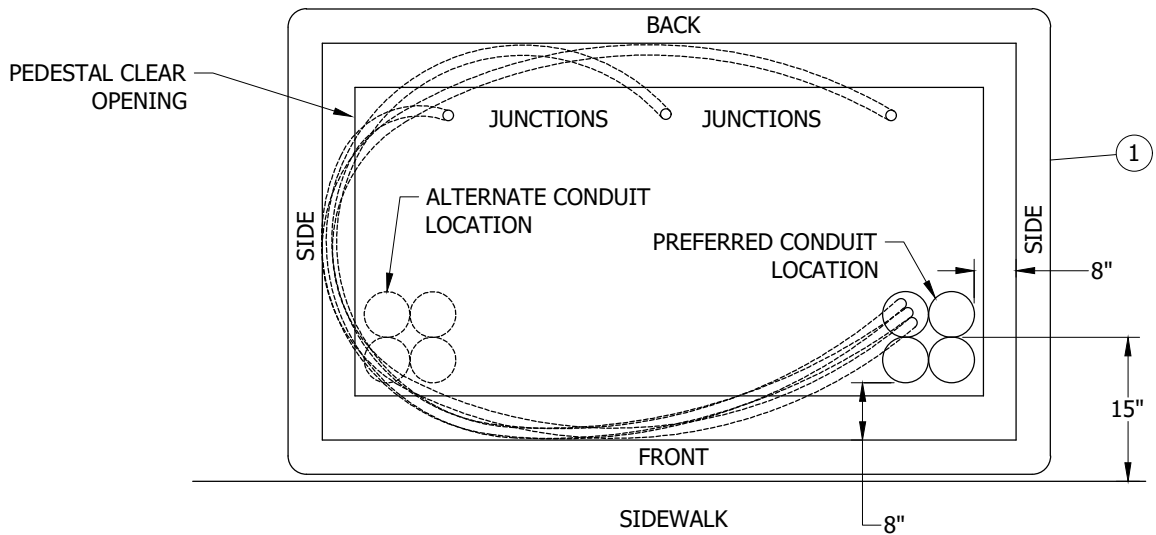


FIGURE 2
CONDUIT AND PEDESTAL INSTALLATION
TOP VIEW

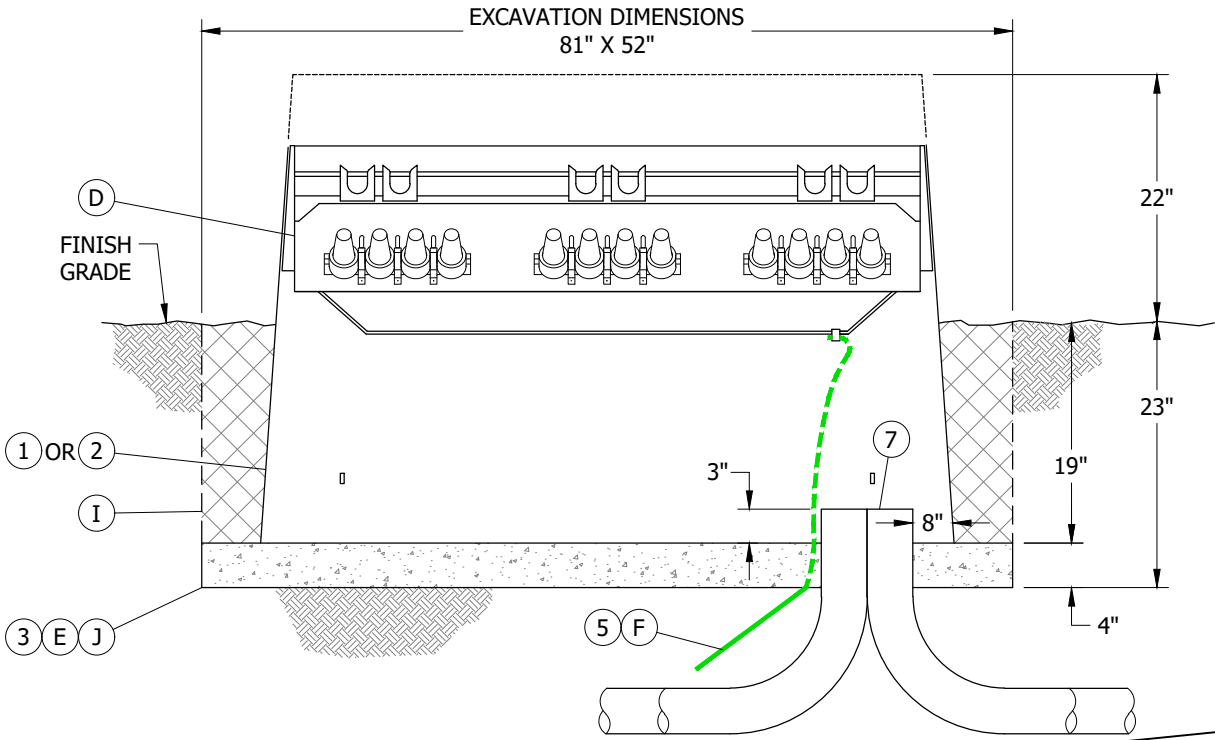


FIGURE 2
SIDE VIEW

FIELD MAINTENANCE ONLY

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|-----|-------------------|-----|-----|-----|-----|------------|-----|--------|----|----|-----|-----|------|
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| B | FORMATTING | EDM | JIK | - | - | 05/17/2021 | E | | | | | | |
| A | EDITORIAL CHANGES | - | JS | TR | MDJ | 08/11/2016 | D | | | | | | |

SHEET
5 OF 8

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New Page
Information Removed
SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS
THREE-PHASE LOW PROFILE CABLE TERMINATING CABINET
12KV, 200A DEADFRONT CABLE JUNCTION PEDESTAL

FMO
UG3523.5

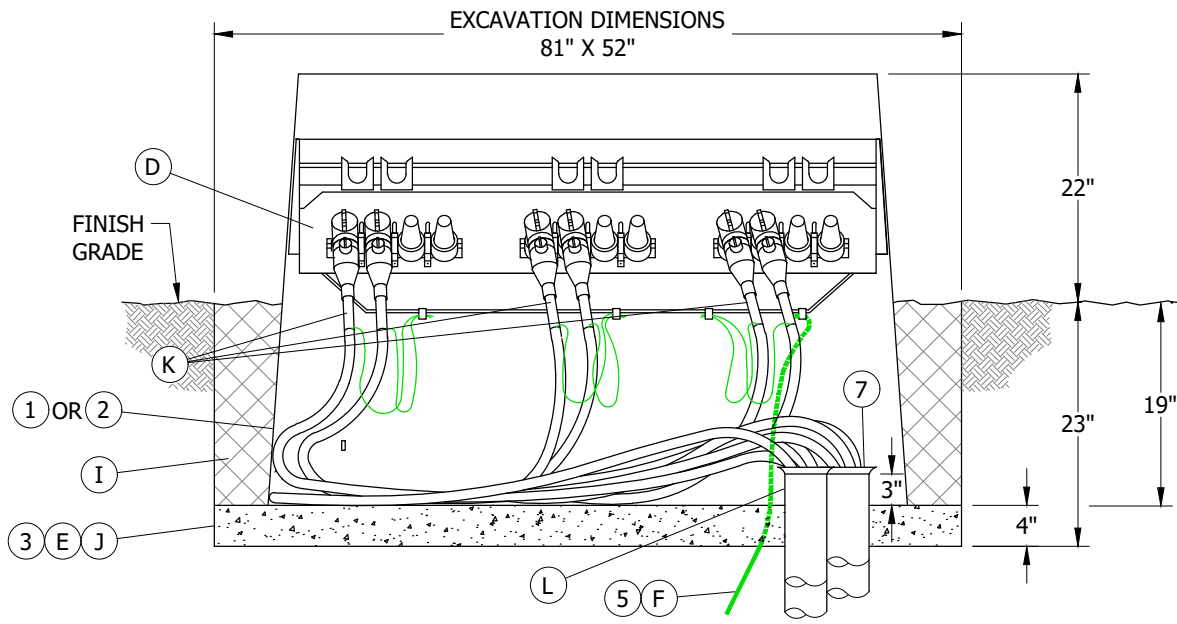


FIGURE 3
FRONT VIEW

ATTENTION:

* RETAINING WALLS ARE NOT REQUIRED WHEN THE SLOPE REMAINS SIX INCHES BELOW AND PARALLEL TO THE JOINT BETWEEN BASE AND COVER OF TERMINATOR.

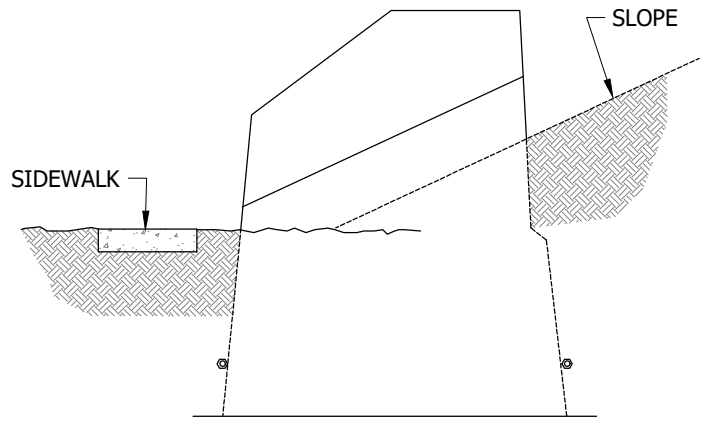


FIGURE 4
SIDE VIEW

TABLE 1

| PRIMARY CONDUIT COMBINATIONS | | | |
|------------------------------|--------|--------|------------------------|
| 2 (IN) | 3 (IN) | 4 (IN) | TOTAL ALLOWED CONDUITS |
| - | - | 4 | 4 |
| 3 | - | 3 | 6 |
| - | 3 | 1 | 4 |

FIELD MAINTENANCE ONLY

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|-----|-------------------|-----|-----|-----|-----|------------|-----|--------|----|----|-----|-----|------|
| C | MOVED TO FMO | EDM | RSL | JES | CZH | 12/12/2021 | F | | | | | | |
| B | FORMATTING | EDM | JKI | - | - | 05/17/2021 | E | | | | | | |
| A | EDITORIAL CHANGES | - | JS | TR | MDJ | 08/11/2016 | D | | | | | | |

SHEET
6 OF 8

Indicates Latest Revision
Completely Revised
New Page
Information Removed
SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS
THREE-PHASE LOW PROFILE CABLE TERMINATING CABINET
12KV, 200A DEADFRONT CABLE JUNCTION PEDESTAL

FMO
UG3523.6

INSTALLATION:

FOR CABLE JUNCTION PEDESTAL:

- A. INSTALL CONDUITS AS SHOWN.
- B. THE CABLE JUNCTION PEDESTAL LOCATION IS TO BE MARKED OUT PAYING PARTICULAR ATTENTION TO FOREIGN UTILITY PLACEMENTS. RELOCATING PEDESTAL REQUIRES APPROVAL FROM SERVICE PLANNING. ONCE THE LOCATION HAS BEEN ESTABLISHED, MARK OUT DIMENSIONS FOR AN EXCAVATION OF FOUR FEET FOUR INCHES WIDE AND SIX FEET SIX INCHES LONG. THE DEPTH OF THE EXCAVATION IS TWENTY THREE INCHES ALLOWING FOUR INCHES OF COMPACTED GRAVEL ON THE BOTTOM OF EXCAVATION.
- C. PLACE PRIMARY CONDUITS WITH PEDESTAL SHOWN IN **FIGURE 3**. TERMINATE PRIMARY CONDUITS THREE INCHES ABOVE GRAVEL BASE. DO NOT CUT INTO THE CURVE PORTION OF ELBOWS.
- (D) 3-4 WAY CABLE TAPS INCLUDED WITH ITEM 1. ADD CABLE TAPS SEPARATELY WHEN INSTALLING ITEM 2.
- (E) WHERE SOIL GASES ARE OF CONCERN, OMIT THE GRAVEL AND INSTALL AN EQUIPMENT PAD VAPOR BARRIER.
- (F) INSTALL TRENCH GROUND PER UG4510.
- G. SECONDARY CONNECTIONS ARE NOT ALLOWED EXCEPT WHEN RETRO FITTING A EXISTING CABINET OR A OPEN OR CLOSED DELTA STATION.
- H. FUSED ELBOWS SHALL NOT BE INSTALLED IN THIS CABINET.
- (J) COMPACTED CLEAN NATIVE SOIL.
- (K) INSTALL TAGS PER UG3202.
- (L) INSTALL TAGS PER 3203.
- (M) THE DEADFRONT CABLE JUNCTION PEDESTALS PREFERRED INSTALLATION IS AS FOLLOWS.
 - 1. GREEN BELT AND LANDSCAPED AREAS.
 - 2. UNEVEN REAR TERRAINS THAT WILL NOT REQUIRE A RETAINING WALL.

BILL OF MATERIALS:

| ITEM | DESCRIPTION | QUANTITY | STANDARD PAGE | STOCK NUMBER | DESIGN UNITS |
|------|--|---------------|---------------|--------------|--------------|
| 1 | CABLE JUNCTION PEDESTAL W/ 3 CABLE TAPS | 1 | - | S525354 | DFCJP3 |
| 2 | CABLE JUNCTION PEDESTAL WITHOUT CABLE TAPS | 1 | - | S525356 | DFCJP0 |
| 3 | GRAVEL, 3/8" X 3/4" | AS REQ'D | - | S601600 | - |
| 4 | CABLE TAPS (NOT NEEDED WITH ITEM 1) | (II) AS REQ'D | 4195 | - | - |
| 5 | WIRE, TRENCH GROUND | 1 | 4510 | - | TG-E-W |
| 6 | GROUND BAR | (II) 1 | - | - | - |
| 7 | PROTECTOR, CABLE | 1 | - | S558720 | - |

NOTES:

- I. THE DEADFRONT JUNCTION PEDESTAL SHOULD NOT BE CONCRETE ENCASED AT THE SURFACE, FOR LEVEL CONCRETED AREAS THE THREE-PHASE LOW PROFILE CABLE TERMINATING CABINET IS RECOMMENDED. (I)

(II) NOT SHOWN ON FIGURES.

REFERENCE:

- a. SEE UG3211 FOR STRUCTURE/EQUIPMENT IDENTIFICATION TAG.
- b. SEE UG3479 FOR BARRIERS IF THE CABINET IS SUBJECT TO VEHICULAR TRAFFIC.
- c. SEE UG3480-3483 FOR MINIMUM OPERATING CLEARANCE REQUIREMENTS.

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| B | FORMATTING | EDM | JKI | - | - | 05/17/2021 | E | | | | | | |
| A | EDITORIAL CHANGES | - | JS | TR | MDJ | 08/11/2016 | D | | | | | | |

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| SHEET 7 OF 8 | X | Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG3523.7 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | THREE-PHASE LOW PROFILE CABLE TERMINATING CABINET 12KV, 200A DEADFRONT CABLE JUNCTION PEDESTAL | | | | | |

REFERENCE (CONT'D):

- d. SEE UG3486-3488 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- e. SEE UG3489 FOR RETAINING WALLS.
- f. SEE UG4510 FOR (PREFERRED I) AND (ALTERNATE TRENCH GROUND WIRE).
- g. SEE UG4512 FOR EQUIPMENT GROUNDING INSTALLATION.
- h. SEE UG4520 (PREVIOUS # UG4520.1-.7) AND UG4521 (PREVIOUS # 4520.8-.9) FOR GROUNDING PAD MOUNTED EQUIPMENT.
- i. SEE 4525 FOR GROUNDING CONCENTRIC NEUTRAL TERMINATIONS AND GROUNDING PREMOLDED CONNECTORS.
- j. SEE UG3221 FOR HIGH VOLTAGE TAGS.
- k. SEE UG3240 FOR WORKING SPACE TAGS.
- l. SEE UG3325 FOR MANHOLE STANDARDS.
- m. SEE UG3202
- n. SEE UG3203

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| A | EDITORIAL CHANGES | - | JS | TR | MDJ | 08/11/2016 | D | | | | | | |

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| SHEET 8 OF 8 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG3523.8 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | THREE-PHASE LOW PROFILE CABLE TERMINATING CABINET 12KV, 200A DEADFRONT CABLE JUNCTION PEDESTAL | | | | |

UG3525 FIELD MAINTENANCE ONLY

ALL VERSIONS LISTED IN FMO ARE SUPERSEDED BY THEIR CURRENT VERSION FOUND INSIDE THE UNDERGROUND CONSTRUCTION STANDARD MANUAL.

REVISION HISTORY:

09/07/2022: MOVED TO FMO

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| C | | | | | | | F | | | | | | |
| B | | | | | | | E | | | | | | |
| A | ORIGINAL ISSUE | EDM | EJA | GLW | KRG | 09/07/2022 | D | | | | | | |

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | THREE-PHASE PAD MOUNTED TERMINATING CABINET 12KV, 600A AND 3313 HANDHOLE | | | | |

SCOPE: THIS STANDARD SHOWS THE PAD MOUNTED THREE-PHASE 600A TERMINATING CABINET AND INSTALLATION REQUIREMENTS USED WHEN FEEDER AND DISTRIBUTION CABLE IS TERMINATED.

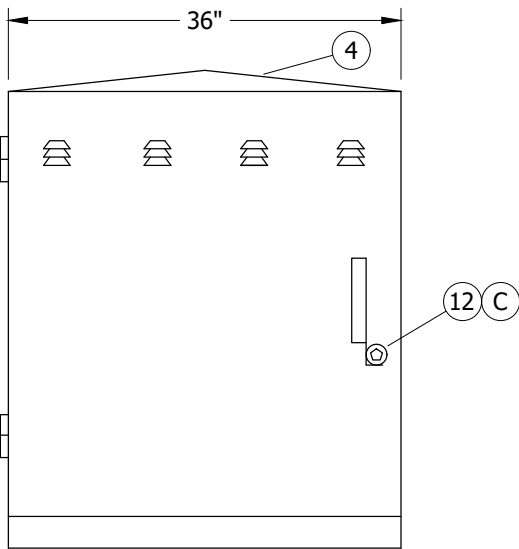


FIGURE 1
FRONT AND REAR VIEW

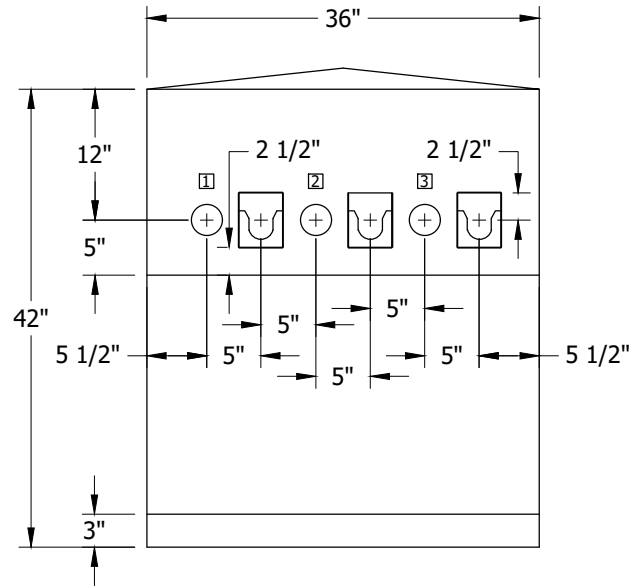


FIGURE 1
FRONT VIEW
EXPOSED

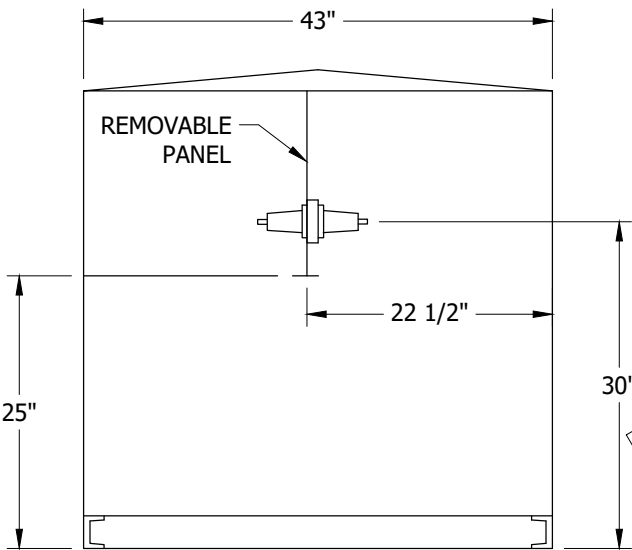


FIGURE 1
SIDE VIEW
EXPOSED

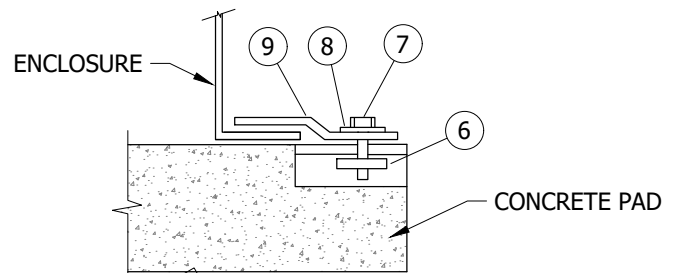
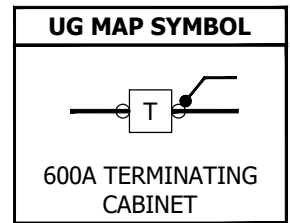


FIGURE 2
HOLD-DOWN ASSEMBLY DETAIL
TYPICAL BOTH SIDES OF EQUIPMENT PAD

FIELD MAINTENANCE ONLY

TABLE 1

| RATINGS | |
|---------|-----|
| AMPERES | 600 |
| KV-BIL | 175 |



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| C | DRAWING UPDATE | - | JK | JS | CZH | 06/01/2018 | F | | | | | | |
| B | EDITORIAL CHANGES | - | BR | BR | MDJ | 03/13/2017 | E | MOVED TO FMO | EDM | EJA | GLW | KRG | 09/07/2022 |
| A | EDITORIAL CHANGES | - | - | - | - | 03/01/2002 | D | MOVED FROM UG3582 | EDM | JIK | - | - | 05/17/2021 |

SHEET
1 OF 3

X Indicates Latest Revision Completely Revised New Page Information Removed

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

THREE-PHASE PAD MOUNTED TERMINATING CABINET
12KV, 600A AND 3313 HANDHOLE

FMO
UG3525.1

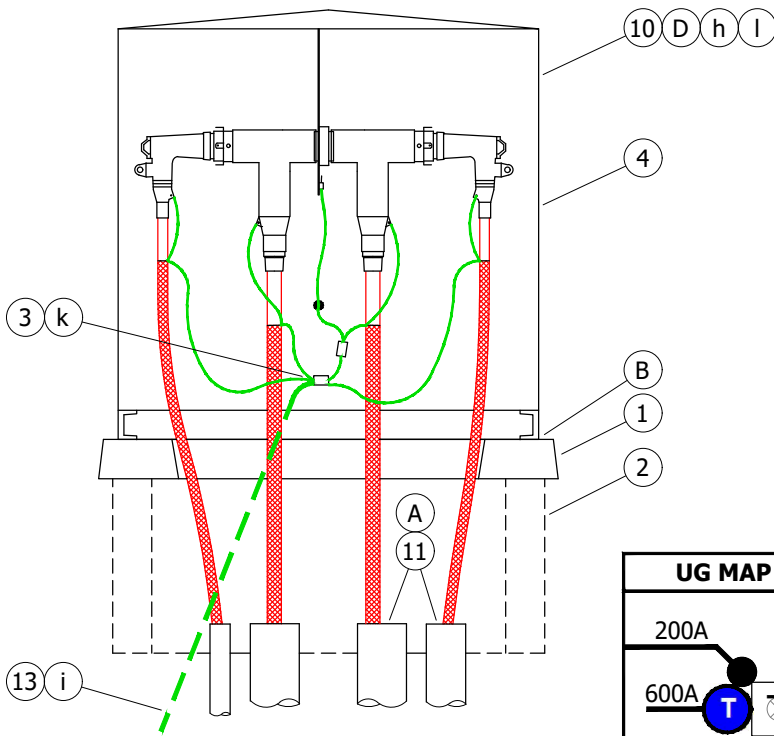


FIGURE 3
SIDE VIEW

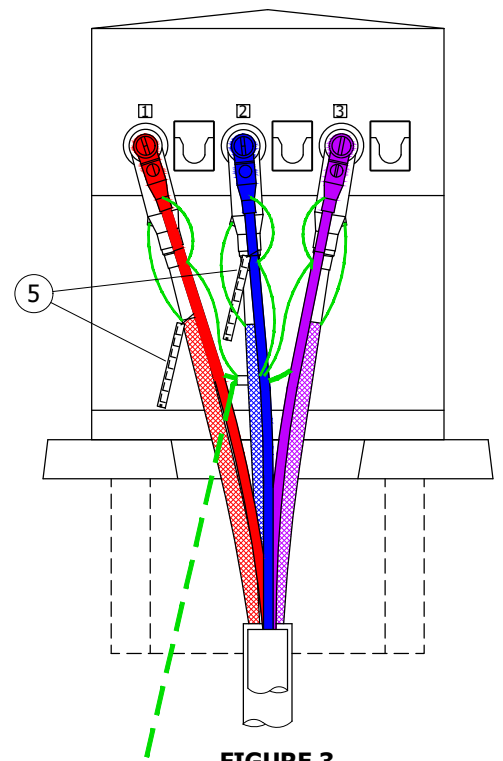
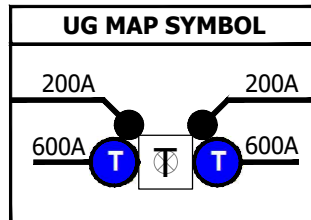


FIGURE 3
SIDE VIEW

INSTALLATION:

- (A) SEAL CONDUITS WITH SEALING COMPOUND.
- (B) BASE OF CABINET SHALL BE CAULKED TO PREVENT MOISTURE ENTRY AND POSSIBLE TAMPERING.
- (C) SECURE BOTH DOORS WITH PENTAHEAD BOLTS KEYLESS LOCKS.
- (D) FUSED ELBOWS ARE ACCEPTABLE.

BILL OF MATERIALS:

| ITEM | DESCRIPTION | QUANTITY | STANDARD PAGE | STOCK NUMBER | DESIGN UNITS |
|------|---|----------|----------------|--------------|--------------|
| 1 | PAD, 600A, TERMINATING CABINET | 1 | 3417 | S514022 | 3417 |
| 2 | HANDHOLE, 3313 BASE SECTION | 1 | 3313 | S162664 | |
| 3 | GROUNDING EQUIPMENT FOR TERMINATING CABINET | 1 | 4520 | - | - |
| 4 | CABINET, TERMINATING | 1 | 3525 | S732938 | 600CAB |
| 5 | TAGS, IDENTIFICATION | AS REQ'D | 3202/3213-3218 | - | - |
| 6 | NUT, CLAMPING CHANNEL | 2 | - | S503520 | - |
| 7 | SCREW, HEX HEAD CAP, BRONZE 1/2" X 1 1/2" | 2 | - | S616192 | - |
| 8 | WASHER, STANDARD FLAT ROUND, BRONZE, 1/2" | 2 | - | S799488 | - |
| 9 | HOLD DOWN (SUPPLIED WITH CABINET) | 2 | - | - | - |
| 10 | 12KV, 200A, LOADBREAK AND 600A CONNECTORS | AS REQ'D | 4181 | - | - |
| 11 | COMPOUND, SEALING | AS REQ'D | - | S442976 | - |
| 12 | LOCK, KEYLESS | 2 | - | S468010 | - |
| 13 | WIRE, TRENCH GROUND | AS REQ'D | 4510 | - | - |

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| C | DRAWING UPDATE | - | JK | JS | CZH | 06/01/2018 | F | | | | | | |
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SHEET
2 OF 3

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

THREE-PHASE PAD MOUNTED TERMINATING CABINET
12KV, 600A AND 3313 HANDHOLE

FMO
UG3525.2

NOTES: NONE

REFERENCE:

- a. SEE UG3211 FOR STRUCTURE/EQUIPMENT IDENTIFICATION TAG.
- b. SEE UG3417 FOR PAD AND HANDHOLE INSTALLATION.
- c. SEE UG3479 FOR BARRIERS IF THE SWITCH IS SUBJECT TO VEHICULAR TRAFFIC.
- d. SEE UG3480, UG3481, UG3482, AND UG3483 FOR MINIMUM OPERATING CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- e. SEE UG3484 FOR PAD INSTALLATION OF PAD MOUNTED EQUIPMENT.
- f. SEE UG3486, UG3487 AND UG3488 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- g. SEE UG3489 FOR RETAINING WALLS.
- h. SEE UG4181 FOR CONNECTOR ASSEMBLIES IDENTIFICATION CHART.
- i. SEE UG4510 FOR (PREFERRED I) AND (ALTERNATE TRENCH GROUND WIRE).
- J. SEE UG4512 FOR EQUIPMENT GROUNDING INSTALLATION.
- k. SEE UG4520 AND UG4521 (PREVIOUS # UG4520) FOR GROUNDING PAD MOUNTED EQUIPMENT.
- l. SEE UG4525 FOR GROUNDING CONCENTRIC NEUTRAL TERMINATIONS AND GROUNDING PREMOLDED CONNECTORS.

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| C | DRAWING UPDATE | - | JK | JS | CZH | 06/01/2018 | F | | | | | | |
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| A | EDITORIAL CHANGES | - | - | - | - | 03/01/2002 | D | MOVED FROM UG3582 | EDM | JK | - | - | 05/17/2021 |

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | THREE-PHASE PAD MOUNTED TERMINATING CABINET 12KV, 600A AND 3313 HANDHOLE | | | | |

FIELD MAINTENANCE ONLY

REVISION HISTORY:

7/13/2016: All versions prior to 2016 are superseded by their current version found inside the Overhead Construction Standard Manual.

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| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |

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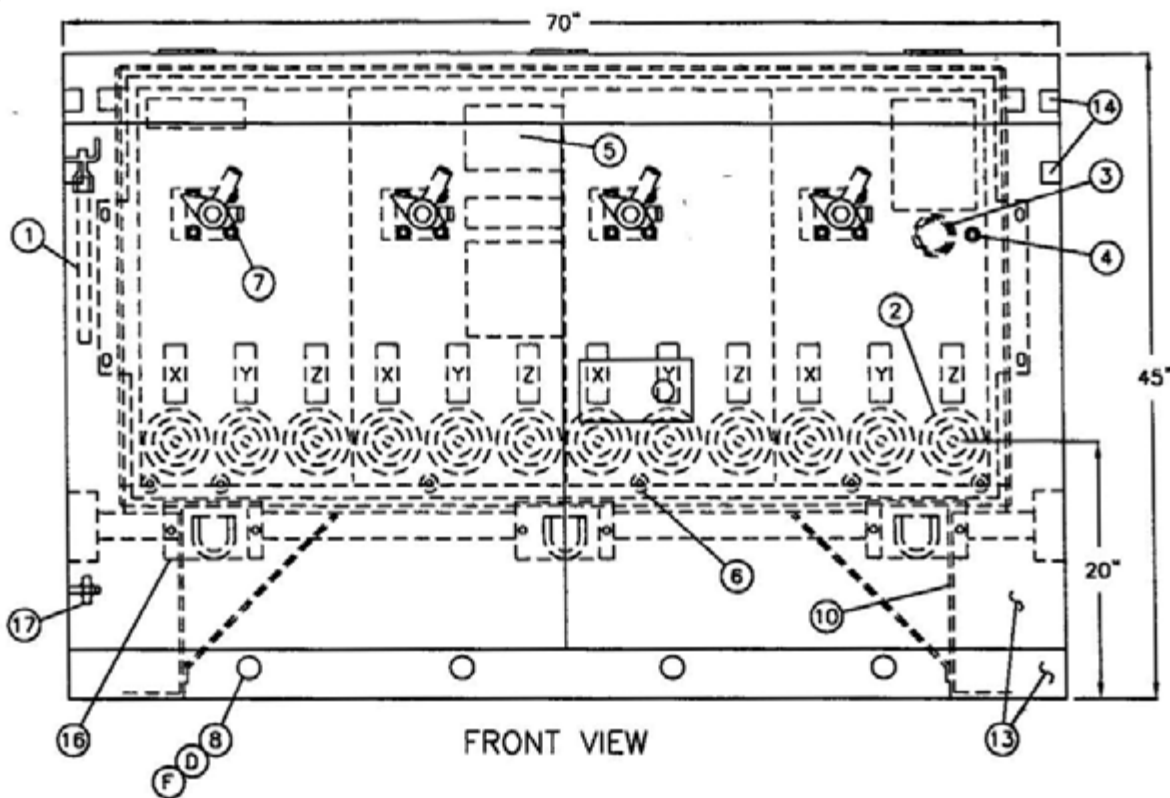
**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD

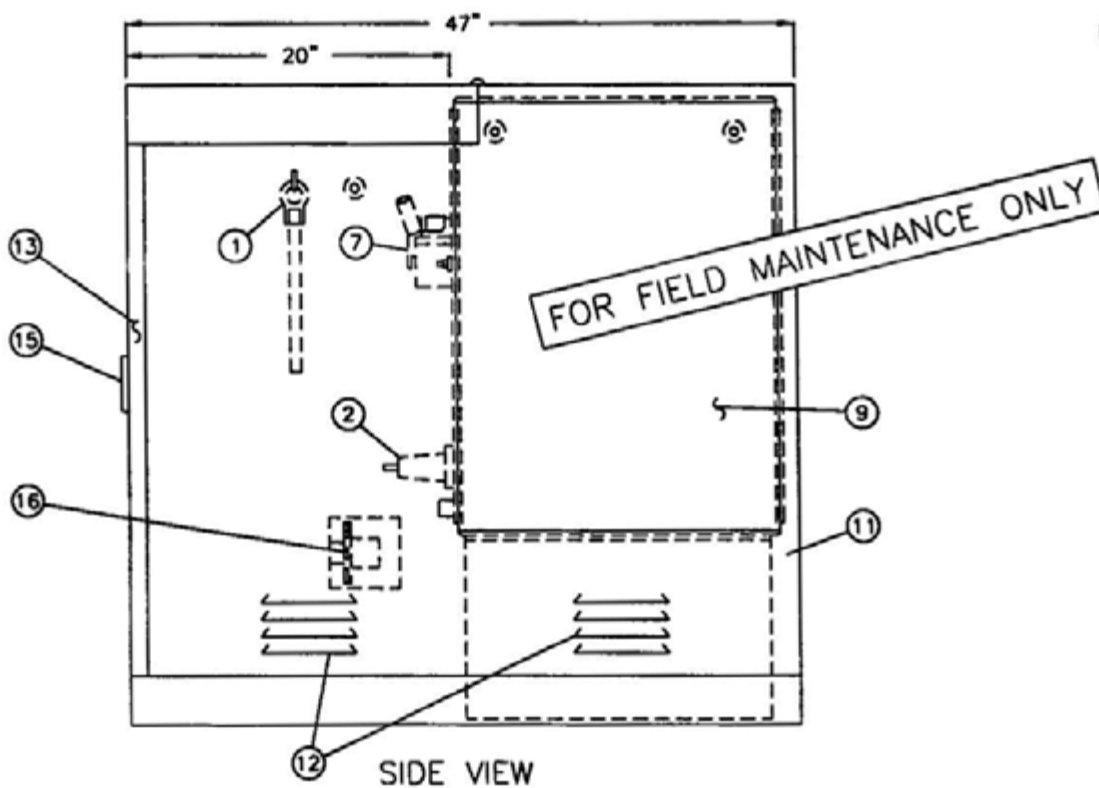
PAD-MOUNTED SF6 GAS SWITCH
12 KV, 600 AMP, THREE-PHASE

**FMO
UG 3549**

SCOPE: THIS STANDARD SHOWS A 600 AMP SF6 GAS SWITCH TO BE USED ONLY FOR REPLACEMENT OF EXISTING SWITCHES WITH THE SAME BUSHING CONFIGURATION DO NOT USE ON NEW CONSTRUCTION



WEIGHT: 1600#



3599.409
SUPERSEDES
3549 1 (1-1-96)

SDG&E ELECTRIC STANDARDS

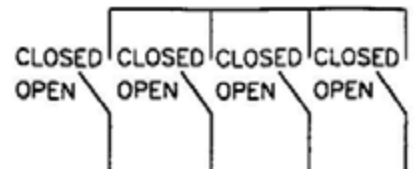
PAD-MOUNTED SF6 GAS SWITCH
12 KV, 600 AMP, THREE-PHASE

DATE 1-1-96

APPD *[Signature]*

ELECTRICAL RATINGS

| | |
|--|------------|
| VOLTAGE | 15KV |
| B.I.L. | 110KV |
| CURRENT, CONTINUOUS | 600 AMP |
| LOADMAKE AND LOADBREAK | 600 AMP |
| MOMENTARY AND FAULT CLOSE (RMS, ASYMETRICAL) | 40,000 AMP |
| (RMS, SYMMETRICAL) | 20,000 AMP |



4-WAY ONE LINE DIAGRAM

SWITCH PARTS LIST

| ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|------|--------------------------------------|------|--|
| 1 | OPERATING HANDLE | 9 | SWITCH TANK |
| 2 | BUSHING | 10 | SWITCH LEGS |
| 3 | COLOR CODED PRESSURE GAUGE | 11 | SWITCH ENCLOSURE |
| 4 | FILL VALVE | 12 | VENTS |
| 5 | NAME PLATE & CONNECTION DIAGRAM | 13 | REMOVABLE FRONT SECTION |
| 6 | GROUND LUGS | 14 | LIFTING POSITIONS FOR ENCLOSURE |
| 7 | SWITCH HANDLE LOCKING PROVISION | 15 | DOOR HANDLE AND PENTAHEAD BOLT LOCKING PROVISION |
| 8 | LEXAN FAULT INDICATOR VIEWING WINDOW | 16 | STANDOFF BRACKET |
| | | 17 | SWITCH ENCLOSURE GROUNDING POSITION |

FOR FIELD MAINTENANCE ONLY

NOTES:

- PAD-MOUNTED SWITCH (STOCK NUMBER 709050) IS DELIVERED FROM THE SUPPLIER WITH ALL THE PARTS LISTED IN THE PARTS LIST
- PAD-MOUNTED SWITCH IS ONLY PURCHASED WITH FOUR SWITCH POSITIONS
- WHEN THE COLOR CODED PRESSURE GAUGE NEEDLE IS IN THE GREEN, SWITCH MAY BE OPERATED DO NOT OPERATE THE SWITCH IF THE NEEDLE IS IN THE RED

REFERENCE:

- A SEE STANDARD 3212 2 FOR SWITCH IDENTIFICATION
- B SEE STANDARD 3440 FOR PAD AND HANDHOLE INSTALLATION FOR PAD-MOUNTED 600 AMP, 12KV SWITCH
- C SEE STANDARD 3550 OR 3551 FOR SWITCH INSTALLATION
- (D) SEE STANDARD 4355 FOR FAULT INDICATOR INSTALLATION
- (F) SEE DESIGN STANDARD 6113 FOR AUTOMATIC FAULT INDICATOR APPLICATION

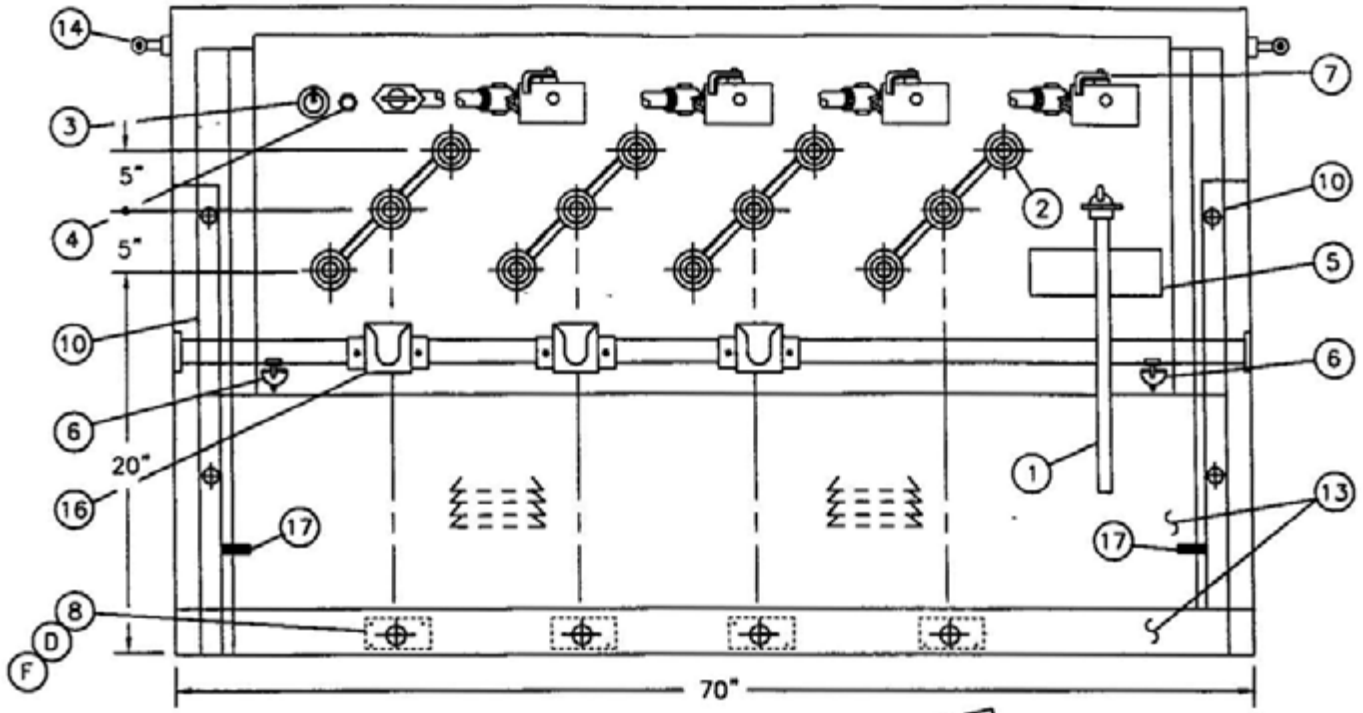
SDG&E ELECTRIC STANDARDS

PAD-MOUNTED SF6 GAS SWITCH
12KV, 600 AMP, THREE-PHASE3599 410
SUPERSEDES
3549 2 (1-1-96)

DATE 1-1-96

APPD JLB/BJG

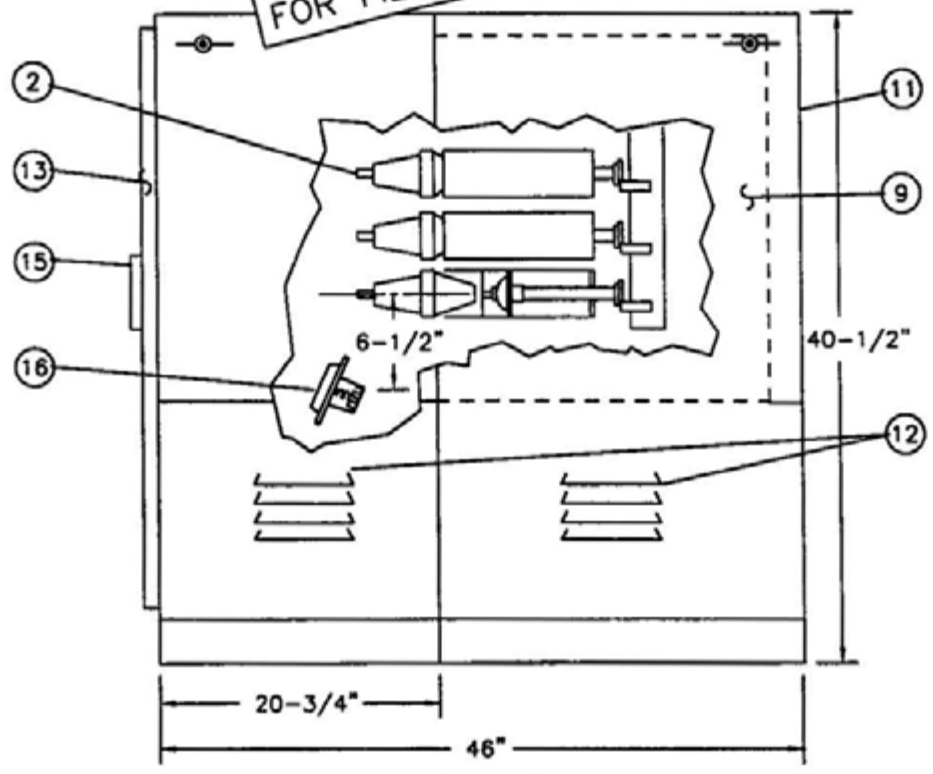
SCOPE: THIS STANDARD SHOWS A 600 AMP SF6 GAS SWITCH TO BE USED FOR PAD-MOUNTED APPLICATIONS



FRONT VIEW

WEIGHT: 980#

FOR FIELD MAINTENANCE ONLY



SIDE VIEW

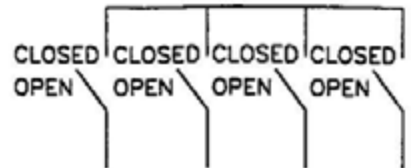
3599.411
SUPERSEDES
3549.3 (1-1-96)

SDG&E ELECTRIC STANDARDS

PAD-MOUNTED SF6 GAS SWITCH
12KV, 600 AMP, THREE-PHASE

DATE 1-1-96
APPD *JLB/ROJ*

| ELECTRICAL RATINGS | |
|--|--------------------------|
| VOLTAGE | 15.5KV |
| B.I.L | 95KV |
| CURRENT, CONTINUOUS | 600 AMP |
| LOADMAKE AND LOADBREAK | 600 AMP |
| MOMENTARY AND FAULT CLOSE (RMS, ASYMETRICAL) (RMS, SYMMETRICAL) | 32,000 AMP 20,000 AMP |



4-WAY ONE LINE DIAGRAM

SWITCH PARTS LIST

| ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|------|--------------------------------------|------|--|
| 1 | OPERATING HANDLE | 9 | SWITCH TANK |
| 2 | BUSHING | 10 | SWITCH LEGS |
| 3 | COLOR CODED PRESSURE GAUGE | 11 | SWITCH ENCLOSURE |
| 4 | FILL VALVE | 12 | VENTS |
| 5 | NAME PLATE & CONNECTION DIAGRAM | 13 | REMOVABLE FRONT SECTION |
| 6 | GROUND LUGS | 14 | BOSS FOR LIFTING EYES |
| 7 | SWITCH HANDLE LOCKING PROVISION | 15 | DOOR HANDLE AND PENTAHEAD BOLT LOCKING PROVISION |
| 8 | LEXAN FAULT INDICATOR VIEWING WINDOW | 16 | STANDOFF BRACKET |
| | | 17 | SWITCH ENCLOSURE GROUNDING PLATE |

FOR FIELD MAINTENANCE ONLY

NOTES:

- DO NOT USE THIS SWITCH IF A FEEDER CABLE IS TO BE INSTALLED FROM A PAD-MOUNTED SWITCH TO A CABLE POLE OR FROM SWITCH TO SWITCH WITH BOTH SWITCHES OVER 3311 HANDHOLES. (THIS IS ASSUMING THAT THE CABLE DOES NOT PASS THROUGH ANY OTHER STRUCTURE) IT MAY BE REQUIRED TO SWAP PHASES ON THE CABLE, AND DUE TO THE LACK OF SPACE IN THE 3311 HANDHOLE, THIS WOULD BE DIFFICULT IF NOT IMPOSSIBLE IF THIS SITUATION ARISES, USE THE 3440 PAD AND 3315 HANDHOLE WHICH ALLOWS ROOM FOR SWAPPING PHASES
- PAD-MOUNTED SWITCH (STOCK NUMBER 708987) IS DELIVERED FROM THE SUPPLIER WITH ALL THE PARTS LISTED IN THE PARTS LIST
- SWITCH NUMBERS ARE TO BE ISSUED BY THE ENGINEERING CLERK IN EACH DISTRICT
- PAD-MOUNTED SWITCH IS ONLY PURCHASED WITH FOUR SWITCH POSITIONS
- WHEN THE COLOR CODED PRESSURE GAUGE NEEDLE IS IN THE GREEN, SWITCH MAY BE OPERATED DO NOT OPERATE THE SWITCH IF THE NEEDLE IS IN THE RED.

REFERENCE:

- A SEE STANDARD 3212 2 FOR SWITCH IDENTIFICATION
- B SEE STANDARD 3440 FOR PAD AND HANDHOLE INSTALLATION FOR PAD-MOUNTED 600 AMP, 12KV SWITCH
- C SEE STANDARD 3550 OR 3551 FOR SWITCH INSTALLATION
- (D) SEE STANDARD 4355 FOR FAULT INDICATOR INSTALLATION
- (F) SEE DESIGN STANDARD 6113 FOR AUTOMATIC FAULT INDICATOR APPLICATION

SDG&E ELECTRIC STANDARDS

PAD-MOUNTED SF6 GAS SWITCH
12KV, 600 AMP, THREE-PHASE

3599.412
SUPERSEDES
3549 4 (1-1-96)

DATE 1-1-96

APPD *JLB/BJ*

FIELD MAINTENANCE ONLY

REVISION HISTORY:

7/13/2016: All versions prior to 2016 are superseded by their current version found inside the Overhead Construction Standard Manual.

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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
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**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD
INSTALLATION OF PAD-MOUNTED SWITCH &
3315 HANDHOLE 12KV, 600 AMP, THREE-PHASE

**FMO
UG 3550**

SCOPE: THIS STANDARD SHOWS THE INSTALLATION REQUIREMENTS FOR A PAD-MOUNTED 12KV, 600A SWITCH OVER A 3315 HANDHOLE

POSITION #2

ALTERNATE FEED FOR 200 AMP CIRCUITS

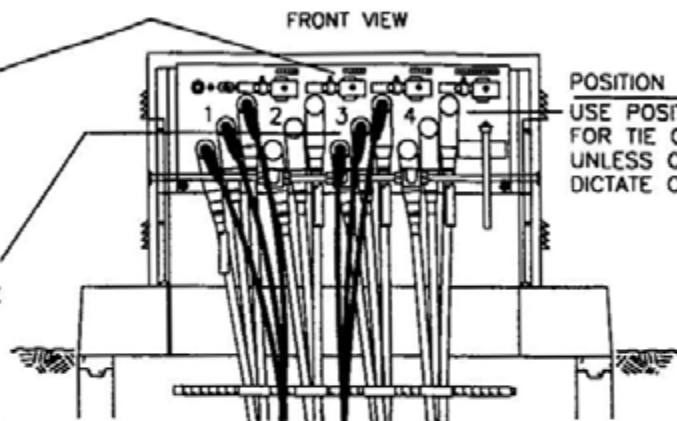
DO NOT INSTALL 200 AMP CABLE PERMANENTLY ON POSITION #2 AND #4 UNLESS CONDITIONS DICTATE OTHERWISE

POSITIONS #1 & #3

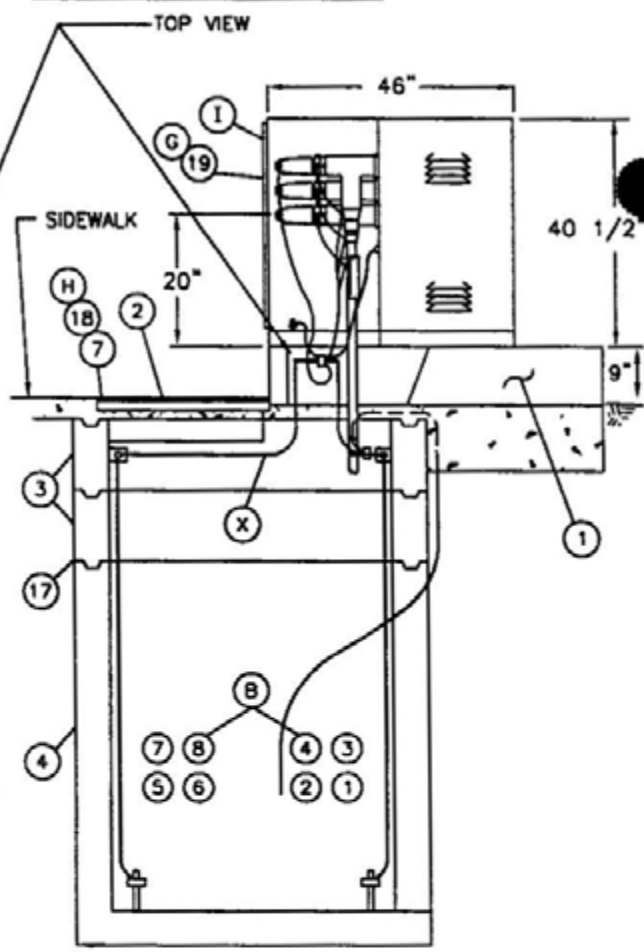
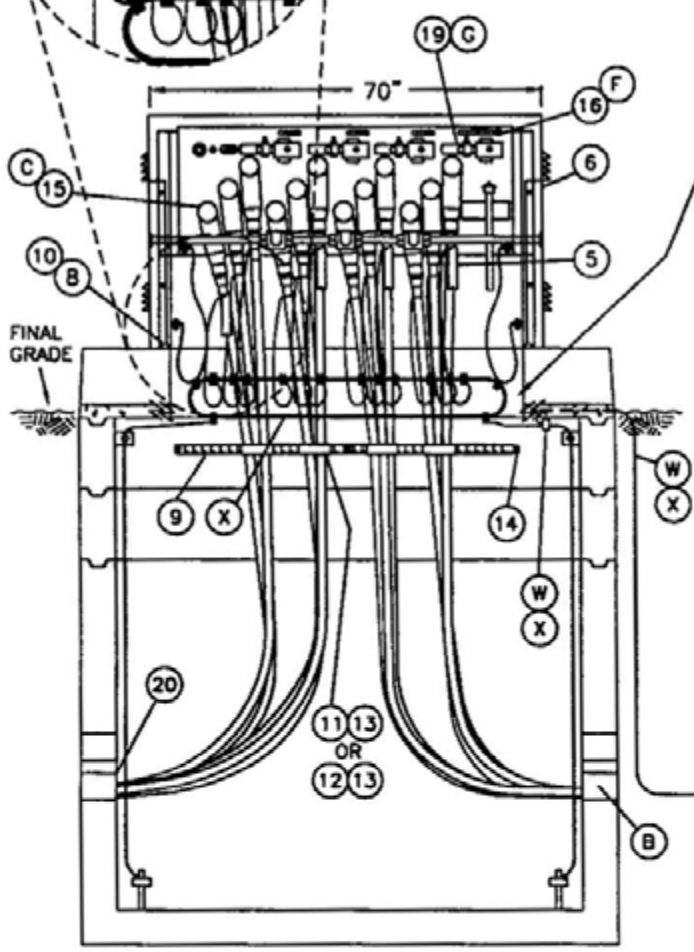
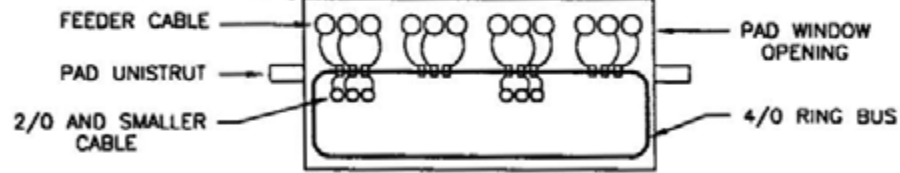
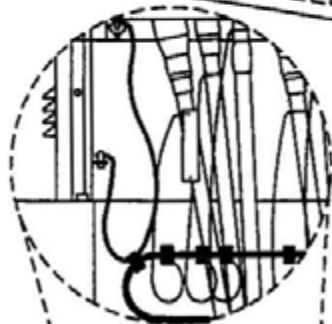
3 PHASE, 200 AMP CIRCUITS MAXIMUM. INSTALL IN POSITIONS #1 & #3 LEAVE ENOUGH SLACK IN CABLE TO REACH POSITION #2 DUE TO POSSIBLE CIRCUIT REARRANGEMENT AT A FUTURE DATE. LEAVE ENOUGH SLACK IN THE 200 AMP CABLE TO REACH ANY 600 AMP TEES

POSITION #4

USE POSITION #4 FOR TIE CIRCUITS UNLESS CONDITIONS DICTATE OTHERWISE.



FOR FIELD MAINTENANCE ONLY



NOTES:

- ALL 200 AMP CONNECTORS ON THE SWITCH MUST BE LOADBREAK

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PAGE NO | STOCK NUMBER | ASSEMBLY UNITS |
|------|---|----------|----------------------|----------------|------------------------|
| 1 | 3440 PAD SECTION | 1 | 3440 | 513912 | COMPLETE UNIT SW/15 |
| 2 | 3440 COVER SECTION & REMOVABLE SUPPORT BARS | 1 | 3440 | 286806 | |
| 3 | 3315 EXTENSION SECTION, 12" | 2 | 3315 | 336246 | |
| 4 | 3315 BASE ENCLOSURE, 60" | 1 | 3315 | 334356 | |
| 5 | CABLE IDENTIFICATION TAGS | AS REQ'D | 3202 | - | - |
| 6 | SWITCH, 4-WAY, 600A, 12KV | 1 | 3549 | 708987 | SW-P/G |
| 7 | BOLT, 1/2"X 1-1/2" PENTAHEAD, STAINLESS STEEL, W/ITEM 2 | AS REQ'D | - | 156004 | - |
| 8 | NUT, 1/2" UNISTRUT SPRING | 4 | - | 503520 | - |
| 9 | HANGERS 30" | 2 | 4178 | 564576 | - |
| 10 | SCREW CAP, BRONZE, 1/2"X 1-1/2", 1 SQ & 1 LOCK WASHER | 4 | - | 616192, 799488 | - |
| 11 | CABLE HOOKS 4" | AS REQ'D | 4178 | 415110 | - |
| 12 | CABLE HOOKS 6" | AS REQ'D | 4178 | 415112 | - |
| 13 | TIE STRAP | AS REQ'D | - | 738440 | - |
| 14 | ANCHOR, CONCRETE STAINLESS STEEL 1/2"X 3-3/4" | 3 | - | 107654 | - |
| 15 | 12KV 200A LOADBREAK AND 600A CONNECTORS | AS REQ'D | 4181 18 - 21 | - | - |
| 16 | DECALS | AS REQ'D | 3212 | - | - |
| 17 | SEALANT, PLASTIC-MASTIC | AS REQ'D | 3306 | 631872 | - |
| 18 | SILICONE GREASE | AS REQ'D | - | 391424 | - |
| 19 | PADLOCK, SCHLAGE ELEC SERIES | AS REQ'D | - | 514848 | - |
| 20 | PROTECTOR, CABLE U G | AS REQ'D | - | 558720 | - |
| 21 | AUTOMATIC FAULT INDICATOR(S) (V) (Z) | AS REQ'D | 4352 | - | - |

FOR FIELD MAINTENANCE ONLY

SDG&E ELECTRIC STANDARDS

DATE 1-1-94

APPD *JLB/BJ*

INSTALLATION OF PAD-MOUNTED SWITCH AND
3315 HANDHOLE 12KV, 600 AMP, THREE-PHASE

3599.504
SUPERSEDES
3550 2 (1-1-96)

INSTALLATION:

- A SET THE SWITCH ON THE PAD AND BOLT IT DOWN TO THE UNISTRUT THE SWITCH HANDLES AND CABLE DOORS ARE NORMALLY INSTALLED FACING THE SIDEWALK OR STREET AN EIGHT FOOT MINIMUM CLEARANCE IS REQUIRED IN FRONT OF THE DOORS (SEE STANDARD 3483)
- B THE ONLY 600 AMP CABLE ALLOWED IN THE SUBSTRUCTURE IS TO BE TERMINATED INTO A SWITCH POSITION THE ONLY 200 AMP CABLE ALLOWED IS TO BE TERMINATED INTO A SWITCH POSITION PLUS TWO CABLES OF 3Ø #2 OR 2/0 PULLED STRAIGHT THRU OR LOOPED AROUND THE HANDHOLE (NO TERMINATIONS) IT IS PREFERRED TO USE CONDUIT POSITIONS 5,6,7 OR 8 FOR THE 3Ø #2 OR 2/0 CABLES PULLED STRAIGHT THROUGH OR LOOPED TO AVOID GROUPING ALL THE CABLES ON ONE SIDE OF THE HOLE CABLE PULLED STRAIGHT THROUGH MUST ENTER AND EXIT THE SAME CONDUIT POSITION ON OPPOSITE ENDS OF THE HANDHOLE. DUE TO POSSIBLE CIRCUIT REARRANGEMENT AT A FUTURE DATE, LEAVE ENOUGH SLACK IN THE 200 AMP CABLE TO REACH ANY 600 AMP TEES THE 600 AMP CABLE MUST ENTER IN CONDUIT POSITIONS 1,2,3 OR 4 ON EITHER END OF THE HANDHOLE ALL FOUR 600 AMP CIRCUITS MAY COME FROM THE SAME DIRECTION THE 200 AMP CABLE MAY BE PULLED IN ANY CONDUIT NOT USED FOR 600 AMP CABLES SECONDARIES (500 KCMIL MAX) ARE ALLOWED IN THIS INSTALLATION INSTALL CABLES IN THE BOTTOM CONDUIT (CLOSEST TO THE WALL) FIRST
- C INSTALL CABLE AND CABLE SUPPORTS, GROUNDS, ETC IN THE HANDHOLE AND ON THE SWITCH AS SHOWN IN DRAWINGS DO NOT "PIGGYBACK" 600 AMP TEES ONE ON TOP OF THE OTHER AT ANY TIME ON THE SWITCH BUSHING
- D AN 18" X 48" UNOBSTRUCTED SPACE MUST BE MAINTAINED IN THE HANDHOLE
- F INSTALL SWITCH IDENTIFICATION NUMBERS PER STANDARD 3212 AND CABLE I D TAGS PER STANDARD 3202
- G LOCK THE SWITCH OPERATING HANDLES AND THE SWITCH DOOR WITH SCHLAGE ELEC SERIES LOCKS
- H SECURE THE HANDHOLE COVERS WITH PENTAHEAD BOLTS AFTER HAVING APPLIED SILICONE GREASE TO REDUCE REMOVAL AND INSTALLATION DIFFICULTIES

REFERENCES:

- I SEE STANDARD 3211 FOR ATTACHING STRUCTURE/EQUIPMENT IDENTIFICATION TAG
- J SEE STANDARD 3440 FOR PAD AND 3311 OR 3315 HANDHOLE INSTALLATION
- K SEE STANDARD 3440 AND PAGE 3374 J FOR CONDUIT PLACEMENT.
- L SEE STANDARD 3481 FOR BARRIERS IF THE SWITCH IS SUBJECT TO VEHICULAR TRAFFIC.
- M SEE STANDARD 3483 FOR MINIMUM OPERATING CLEARANCE REQUIREMENTS (PAD PLACEMENT)
- N SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT
- O SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- P SEE STANDARD 3487 FOR RETAINING WALLS
- Q SEE STANDARD 3645 FOR UNOBSTRUCTED SPACE
- R SEE STANDARD 3646 FOR CABLE AND CONNECTOR PLACEMENT
- S SEE STANDARD 3647 FOR EQUIPMENT DIMENSIONS AND PLACEMENT
- T SEE STANDARD 3648 FOR EQUIPMENT ASSEMBLIES
- U SEE PAGE 3649.10 FOR CORE BORING REQUIREMENTS
- V SEE STANDARD 4355 FOR FAULT INDICATOR INSTALLATION
- W SEE STANDARD 4512 FOR EQUIPMENT GROUNDING INSTALLATION
- X SEE STANDARD 4520 FOR GROUNDING PAD MOUNTED EQUIPMENT
- Y SEE STANDARD 4550 FOR GROUNDING TELCO CONDUCTOR IN HANDHOLES
- Z SEE DESIGN STANDARD 6113 FOR AUTOMATIC FAULT INDICATOR APPLICATION.

FOR FIELD MAINTENANCE ONLY

3599.505
SUPERSEDES
3550 3 (1-1-96)

SDG&E ELECTRIC STANDARDS

INSTALLATION OF PAD-MOUNTED SWITCH & 3315 HANDHOLE
12KV, 600 AMP, THREE-PHASE

DATE 1-1-94

APPD JLB/RD

FIELD MAINTENANCE ONLY

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**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD
INSTALLATION OF PAD-MOUNTED SWITCH &
3316 HANDHOLE 12KV, 600 AMP, THREE-PHASE

**FMO
UG 3551**

SCOPE: THIS STANDARD SHOWS THE INSTALLATION REQUIREMENTS FOR A PAD-MOUNTED 12KV, 600A SWITCH OVER A 3316 HANDHOLE.

POSITION #2

ALTERNATE FEED FOR 200 AMP CIRCUITS

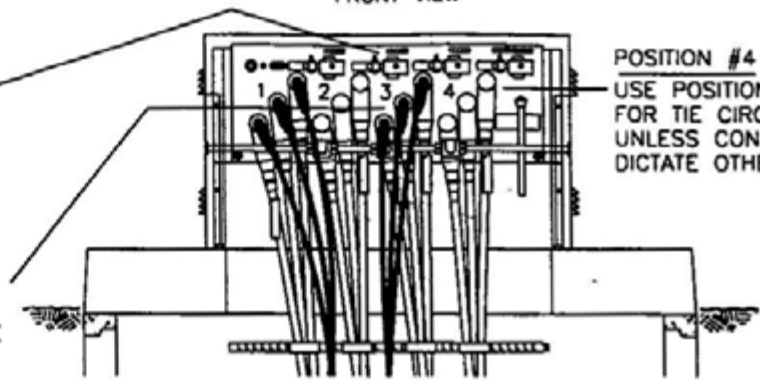
DO NOT INSTALL 200 AMP CABLE PERMANENTLY ON POSITION #2 AND #4 UNLESS CONDITIONS DICTATE OTHERWISE

POSITIONS #1 & #3

3 PHASE, 200 AMP CIRCUITS MAXIMUM, INSTALL IN POSITIONS #1 & #3 LEAVE ENOUGH SLACK IN CABLE TO REACH POSITION #2. DUE TO POSSIBLE CIRCUIT REARRANGEMENT AT A FUTURE DATE, LEAVE ENOUGH SLACK IN THE 200 AMP CABLE TO REACH ANY 600 AMP TEES

(B)

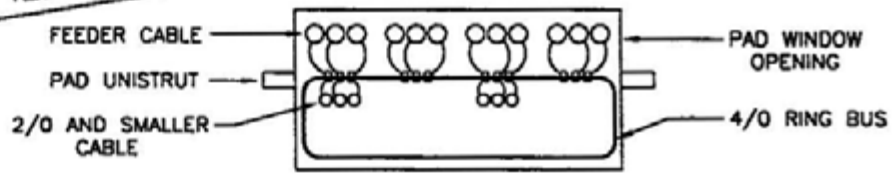
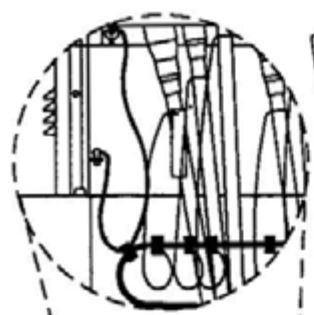
FRONT VIEW



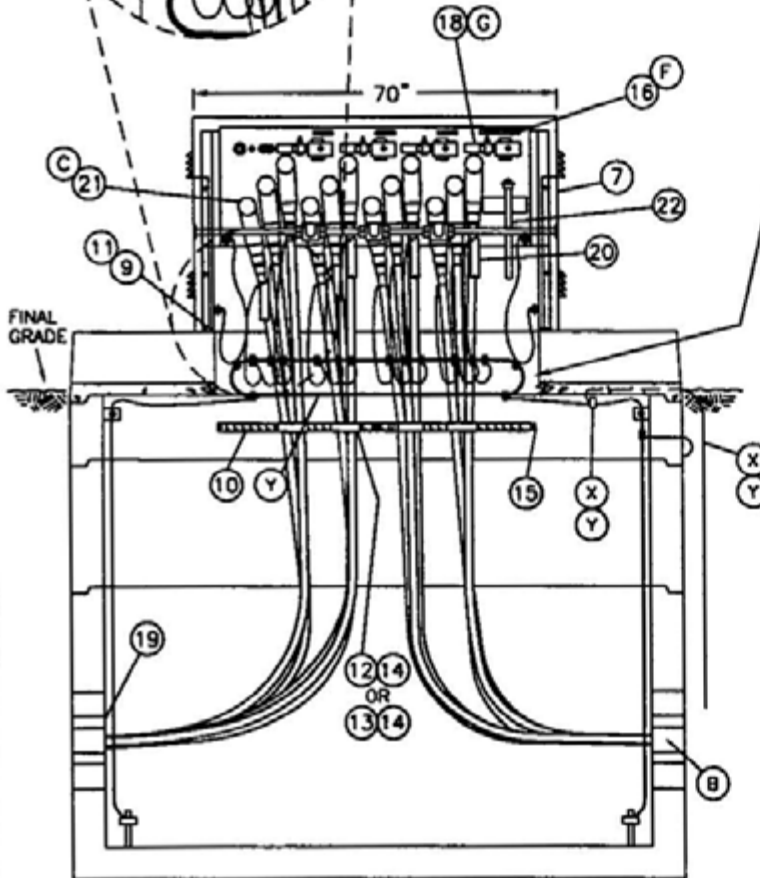
POSITION #4

USE POSITION #4 FOR TIE CIRCUITS UNLESS CONDITIONS DICTATE OTHERWISE

FOR FIELD MAINTENANCE ONLY

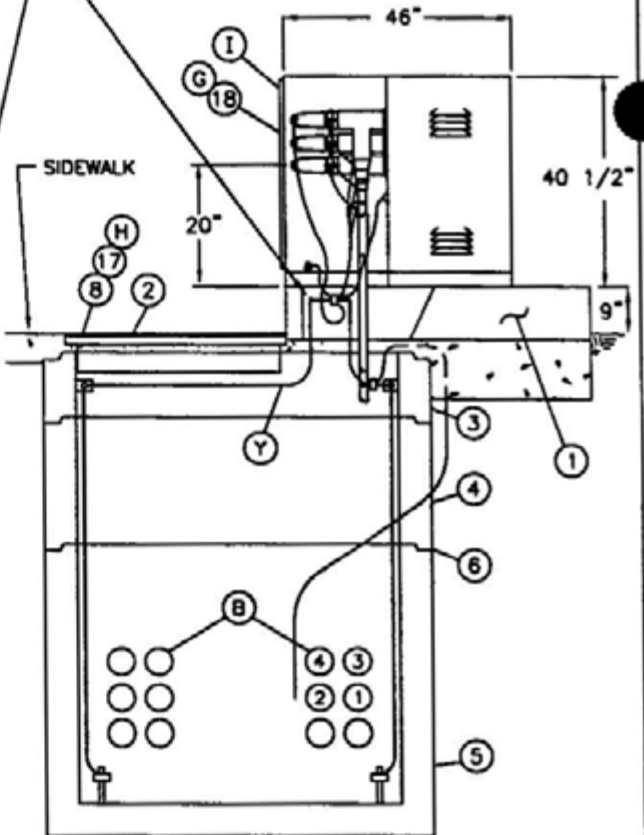


TOP VIEW



3551.1

FRONT VIEW



END VIEW

3599.506
SUPERSEDES
3551.1 (1-1-96)

SDG&E ELECTRIC STANDARDS

INSTALLATION OF PAD-MOUNTED SWITCH &
3316 HANDHOLE 12KV, 600 AMP, THREE-PHASE

DATE 1-1-96
APPD *JLB/ROJ*

NOTES:

- ALL 200 AMP CONNECTORS ON THE SWITCH MUST BE LOADBREAK

FOR FIELD MAINTENANCE ONLY

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PAGE NO | STOCK NUMBER | ASSEMBLY UNITS |
|------|---|----------|----------------------|----------------|------------------------|
| 1 | 3441 PAD SECTION | 1 | 3441 | 513910 | COMPLETE UNIT SW/16 |
| 2 | 3441 COVER SECTION & REMOVABLE SUPPORT BARS | 1 | 3441 | 286804 | |
| 3 | 3316 EXTENSION SECTION, 12" | 1 | 3316 | 336208 | |
| 4 | 3316 EXTENSION SECTION, 24" | 1 | 3316 | 248162 | |
| 5 | 3316 BASE ENCLOSURE 42" | 1 | 3316 | 248160 | |
| 6 | SEALANT, PLASTIC-MASTIC | AS REQ'D | 3306 | 631872 | |
| 7 | SWITCH, 4-WAY, 600A, 12KV | 1 | 3549 | 708987 | SW-P/G |
| 8 | BOLT, 1/2"X 1-1/2" PENTAHEAD, STAINLESS STEEL, W/ITEM 2 | AS REQ'D | - | 156004 | - |
| 9 | NUT, 1/2" UNISTRUT SPRING | 4 | - | 503520 | - |
| 10 | HANGERS 30" | 2 | 4178 | 564576 | - |
| 11 | SCREW CAP, BRONZE, 1/2"X 1-1/2", 1 SQ. & 1 LOCK WASHER | 4 | - | 616192, 799488 | - |
| 12 | CABLE HOOKS 4" | AS REQ'D | 4178 | 415110 | - |
| 13 | CABLE HOOKS 6" | AS REQ'D | 4178 | 415112 | - |
| 14 | TIE STRAP | AS REQ'D | - | 738440 | - |
| 15 | ANCHOR, CONCRETE STAINLESS STEEL 1/2"X 3-3/4" | AS REQ'D | - | 107654 | - |
| 16 | DECALS | AS REQ'D | 3212 | - | - |
| 17 | SILICONE GREASE | AS REQ'D | - | 391424 | - |
| 18 | PADLOCK, SCHLAGE ELEC SERIES | AS REQ'D | - | 514848 | - |
| 19 | PROTECTOR, CABLE U G | AS REQ'D | - | 558720 | - |
| 20 | CABLE IDENTIFICATION TAGS | AS REQ'D | 3202 | - | - |
| 21 | 12KV 200A AND 600A CONNECTORS | AS REQ'D | 4181 18 -21 | - | - |
| 22 | REMOVABLE OPERATING HANDLE | 1 | - | - | - |
| 23 | AUTOMATIC FAULT INDICATOR(S) (W) (AA) | AS REQ'D | 4352 | - | - |

SDG&E ELECTRIC STANDARDS

DATE 1-1-94

APPD *JLB/BJ*

INSTALLATION OF PAD-MOUNTED SWITCH AND
3316 HANDHOLE 12KV, 600 AMP, THREE-PHASE

3599.507
SUPERSEDES
3551 2 (1-1-96)

INSTALLATION

- A SET THE SWITCH ON THE PAD AND BOLT IT DOWN TO THE UNISTRUT THE SWITCH HANDLES AND CABLE DOORS ARE NORMALLY INSTALLED FACING THE SIDEWALK OR STREET AN EIGHT FOOT MINIMUM CLEARANCE IS REQUIRED IN FRONT OF THE DOORS (SEE STANDARD 3483.3)
- B ONLY TWO 200 AMP, 3Ø CIRCUITS ARE ALLOWED TO BE TERMINATED ONTO THE SWITCH DUE TO POSSIBLE CIRCUIT REARRANGEMENT AT A FUTURE DATE, LEAVE ENOUGH SLACK IN THE 200 AMP CABLE TO REACH ANY 600 AMP TEES. THE 600 AMP CABLE TERMINATED ONTO THE SWITCH MUST ENTER IN CONDUIT POSITIONS 1,2,3 OR 4 ON EITHER END OF THE HANDHOLE ALL FOUR 600 AMP CIRCUITS MAY COME FROM THE SAME DIRECTION THE 200 AMP CABLE MAY BE PULLED IN ANY CONDUIT NOT USED FOR 600 AMP CABLES SECONDARIES (500 KCMIL MAX) ARE ALLOWED IN THE HANDHOLE INSTALL CABLE BEING PULLED STRAIGHT THROUGH INTO THE BOTTOM CONDUITS WHEN CONDUITS ARE AVAILABLE INSTALL CABLES IN NUMERICAL SEQUENCE
- C INSTALL CABLE AND CABLE SUPPORTS, GROUNDS, ETC IN THE HANDHOLE AND ON THE SWITCH AS SHOWN IN DRAWINGS DO NOT "PIGGYBACK" 600 AMP TEES ONE ON TOP OF THE OTHER AT ANY TIME ON THE SWITCH BUSHING.
- D A 22" X 72" UNOBSTRUCTED SPACE MUST BE MAINTAINED IN THE HANDHOLE
- F INSTALL SWITCH IDENTIFICATION NUMBERS PER STANDARD 3212 AND CABLE I D TAGS PER STANDARD 3202.
- G LOCK THE SWITCH OPERATING HANDLES AND THE SWITCH DOOR WITH SCHLAGE ELEC SERIES LOCK
- H SECURE THE HANDHOLE COVERS WITH PENTAHEAD BOLTS AFTER HAVING APPLIED SILICONE GREASE TO REDUCE REMOVAL AND INSTALLATION DIFFICULTIES

FOR FIELD MAINTENANCE ONLY

REFERENCES:

- I SEE STANDARD 3211 FOR ATTACHING STRUCTURE/EQUIPMENT TAG
- J. SEE STANDARD 3441 FOR PAD AND HANDHOLE INSTALLATION
- K. SEE STANDARD 3441 AND PAGE 3374.3 FOR CONDUIT PLACEMENT
- L SEE STANDARD 3481 FOR BARRIERS IF THE SWITCH IS SUBJECT TO VEHICULAR TRAFFIC
- M SEE STANDARD 3483 FOR MINIMUM OPERATING CLEARANCE REQUIREMENTS (PAD PLACEMENT)
- N SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT.
- O SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS
- P SEE STANDARD 3487 FOR RETAINING WALLS
- Q SEE STANDARD 3560 FOR EQUIPMENT GUIDELINES
- R SEE STANDARD 3645 FOR UNOBSTRUCTED SPACE
- S. SEE STANDARD 3646 FOR CABLE AND CONNECTOR PLACEMENT
- T SEE STANDARD 3647 FOR EQUIPMENT DIMENSIONS AND PLACEMENT
- U SEE STANDARD 3648 FOR EQUIPMENT ASSEMBLIES
- V SEE PAGE 3649.10 FOR CORE BORING REQUIREMENTS
- W SEE STANDARD 4355 FOR FAULT INDICATOR INSTALLATION
- X SEE STANDARD 4512 FOR EQUIPMENT GROUNDING INSTALLATION
- Y SEE STANDARD 4520 FOR GROUNDING PAD MOUNTED EQUIPMENT
- Z SEE STANDARD 4550 FOR GROUNDING TELCO CONDUCTOR IN HANDHOLES.
- AA SEE DESIGN STANDARD 6113 FOR AUTOMATIC FAULT INDICATOR APPLICATION

3599.508
SUPERSEDES
3551.3 (1-1-96)

SDG&E ELECTRIC STANDARDS

INSTALLATION OF PAD-MOUNTED SWITCH & 3316 HANDHOLE
12KV, 600 AMP, THREE-PHASE

DATE 1-1-94

APPD JLB/BJ

FIELD MAINTENANCE ONLY

REVISION HISTORY:

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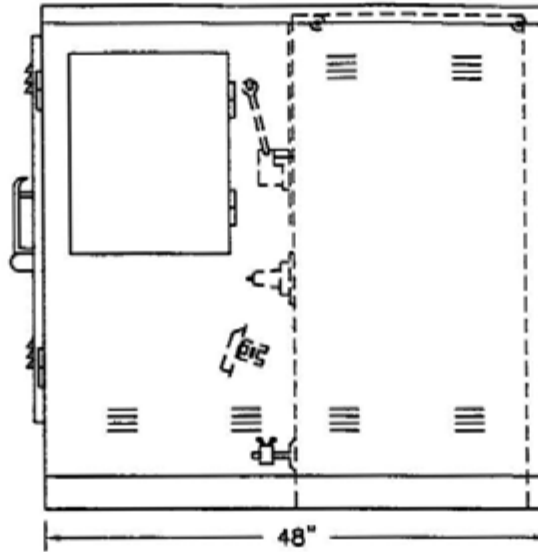
**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD
REPLACEMENT CABINET FOR PAD-MOUNTED
ESCO OIL SWITCH

**FMO
UG 3553**

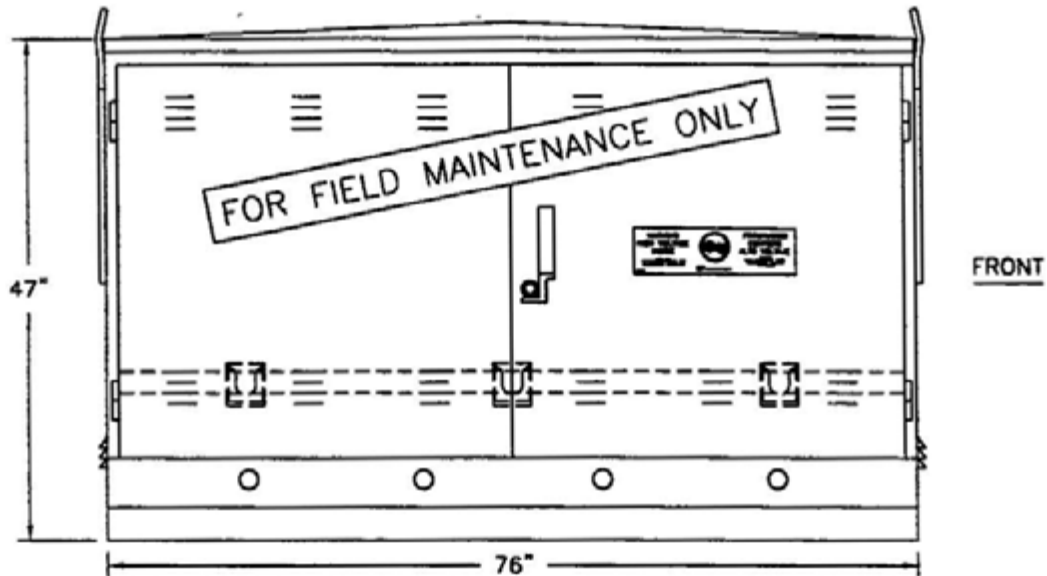
SCOPE: THIS STANDARD SHOWS THE REPLACEMENT CABINET AND INSTALLATION FOR REPLACING CORRODED ESCO PAD-MOUNTED OIL-SWITCH CABINETS.

WEIGHT 675#



| |
|---------------------|
| RETROFIT CABINET |
| STOCK NUMBER 334370 |
| ASSEMBLY UNIT |
| SWICAB |

SIDE

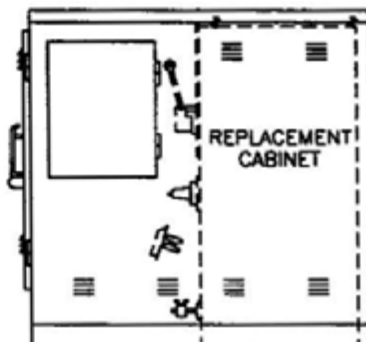
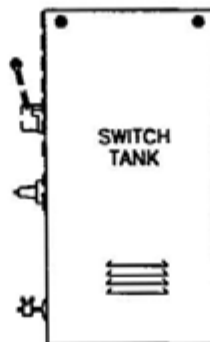
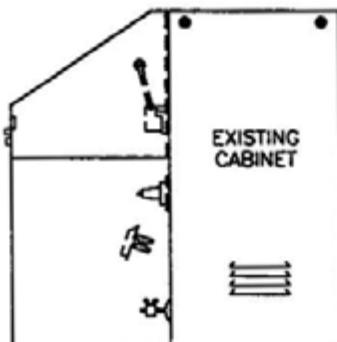


FRONT

CABINET REPLACEMENT PROCEDURE

NOTES:

- TO BE USED WHEN THE ESCO CABINET IS CORRODED BEYOND REPAIR, YET THE SWITCH TANK AND OIL ARE IN GOOD CONDITION.



3599.509
SUPERSEDES
3553 1 (1-1-96)

SDG&E ELECTRIC STANDARDS

REPLACEMENT CABINET FOR PAD-MOUNTED
ESCO OIL SWITCH

DATE 1-1-94

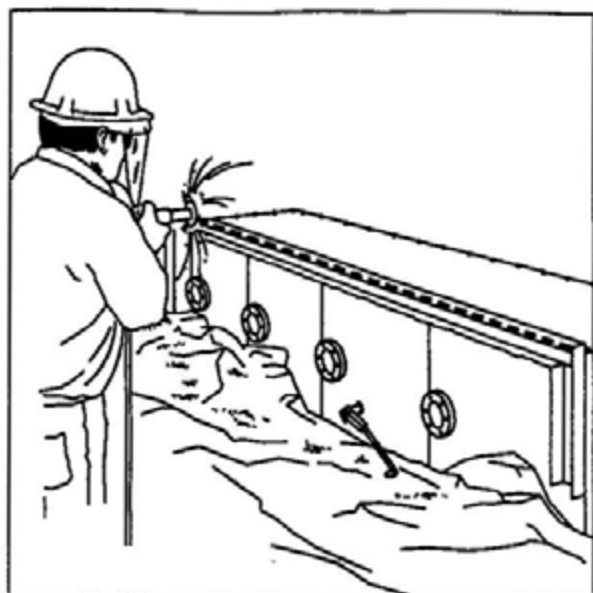
APPD *JYB/RSJ*

CABINET REPLACEMENT PROCEDURE



STEP 1

- 1 WITH DIE GRINDER CUT THROUGH HINGE PIN ACROSS THE TOP OF THE SWITCH & REMOVE THE FRONT PANEL OF THE SWITCH.



STEP 2

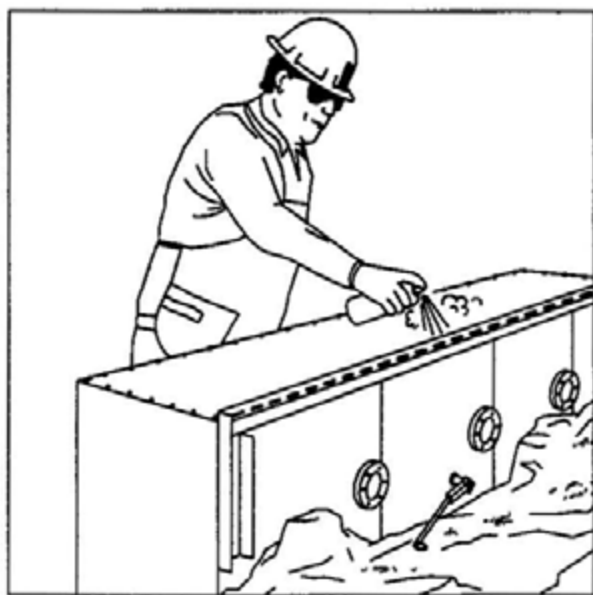
- 1 COVER TEES WITH CANVAS TO CATCH ANY LOOSE DEBRIS
- 2 WITH DIE GRINDER CUT OFF ANY BADLY RUSTED PORTIONS OF THE SWITCH. (WATER GUTTER IS BEING REMOVED IN THIS ILLUSTRATION)

FOR FIELD MAINTENANCE ONLY



STEP 3

- 1 WITH WIRE BRUSH BODY GRINDER OR HAND WIRE BRUSH ETC REMOVE ALL RUST AND DIRT



STEP 4

- 1 SPRAY 2 COATS OF RUST INHIBITOR PAINT ON ALL PREPARED AREAS

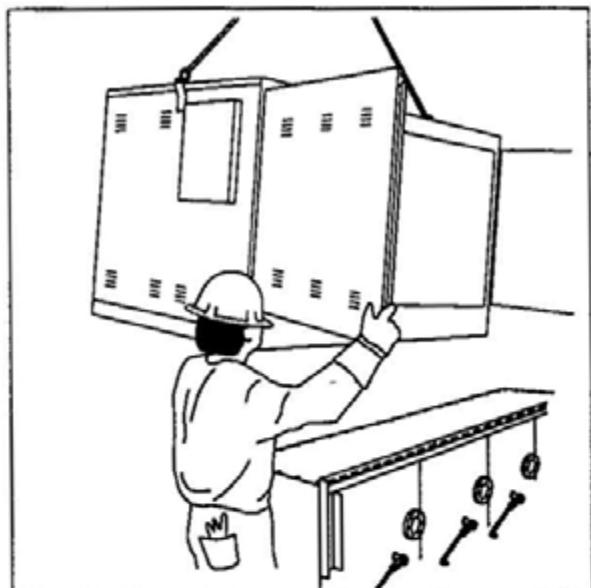
SDG&E ELECTRIC STANDARDS

REPLACEMENT CABINET FOR PAD-MOUNTED
ESCO OIL SWITCH

3599.510
SUPERSEDES
3553 2 (1-1-96)

DATE 1-1-94

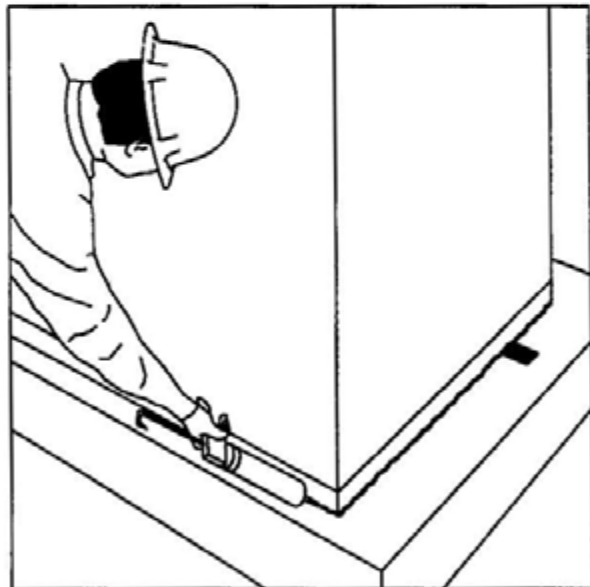
APPD *JLB/RSJ*



STEP 5

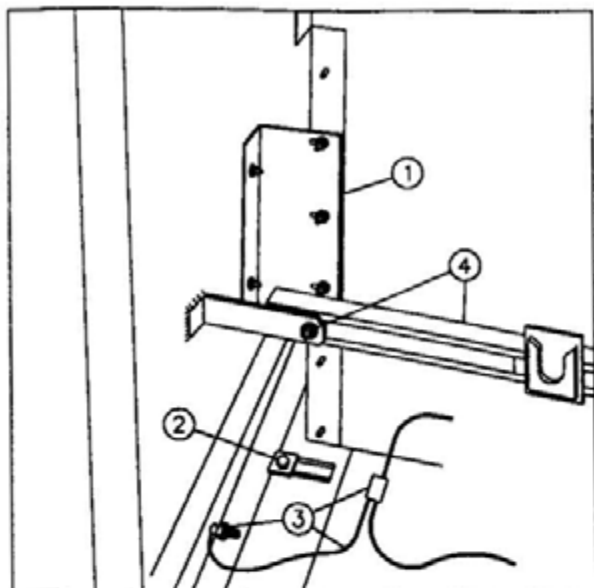
- 1 SET REPLACEMENT CABINET OVER EXISTING SWITCH

NOTE: THE NEW STAND-OFF BRACKET CHANNEL (ITEM 4 IN STEP 6) MUST BE SLID IN BEHIND THE LOADBREAK ELBOWS BEFORE THE CABINET IS LOWERED OVER THE SWITCH. IF OLD BRACKET IS NOT RUSTED, LEAVE IT IN PLACE.



STEP 7

- 1 APPLY SEALANT SN631800 COMPLETELY AROUND CABINET NEXT TO CONCRETE PAD AND IN PAD UNISTRUT INSIDE AND OUTSIDE THE CABINET.



STEP 6

- 1 BOLT THE CABINET TO THE SWITCH WITH THE BRACKET PROVIDED WITH THE CABINET
- 2 SECURE CABINET TO PAD WITH SPRING NUT AND SQUARE WASHER ON BOTH SIDES OF PAD
- 3 WITH SERVICE POST CONNECTOR SN262560, #2 COPPER WIRE SN812816 AND COMPRESSION CONNECTOR SN257856 GROUND BOTH SIDES OF CABINET.
- 4 BOLT THE STAND-OFF BRACKET CHANNEL TO THE CABINET

FOR FIELD MAINTENANCE ONLY

3599.511
SUPERSEDES
3553 3 (1-1-96)

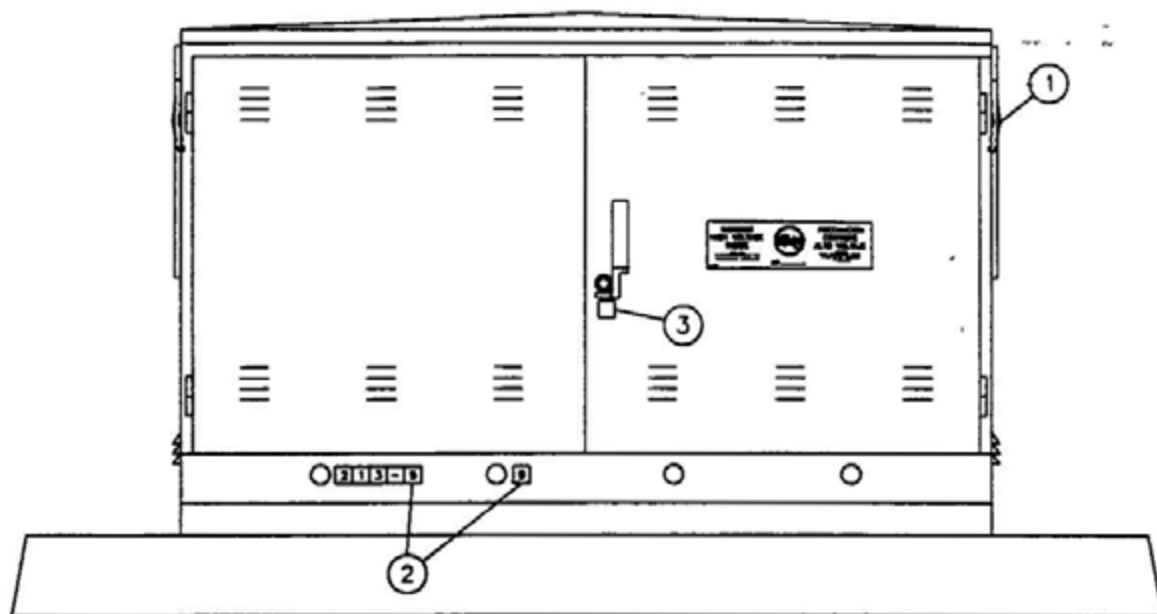
SDG&E ELECTRIC STANDARDS

REPLACEMENT CABINET FOR PAD-MOUNTED
ESCO OIL SWITCH

DATE 1-1-94

APPD *JLB/ROJ*

FOR FIELD MAINTENANCE ONLY



STEP 8

- ① TURN LIFTING EYES DOWNWARD
- ② TAG CABINET TO IDENTIFY FAULT INDICATORS AS SHOWN (SEE STD PG 3212.4)
- ③ LOCK THE CABINET DOOR WITH A SCHLAGE ELEC SERIES LOCK (SN514848)

SDG&E ELECTRIC STANDARDS

REPLACEMENT CABINET FOR PAD-MOUNTED
ESCO OIL SWITCH

3599.512
SUPERSEDES
3553 4 (1-1-96)

DATE 1-1-94

APPD *JLB/RSJ*





FIELD MAINTENANCE ONLY

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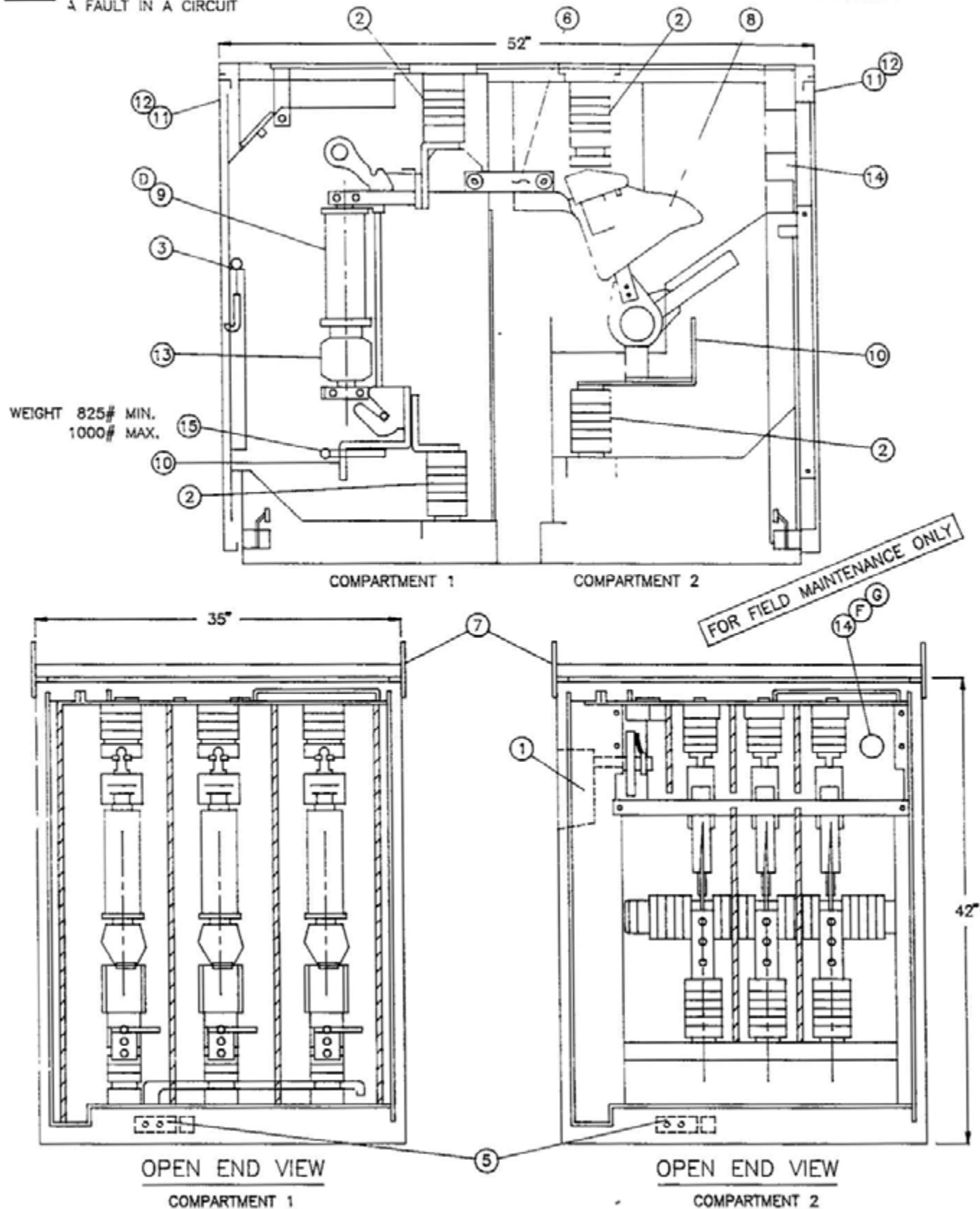
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| <p>SHEET 1 OF 1</p> |  Indicates Latest Revision |  Completely Revised |  New Page |  Information Removed | <p>FMO UG 3555</p> |
| | <p>SDG&E ELECTRIC UNDERGROUND STANDARD</p> | | | | |
| | <p>PAD-MOUNTED AIR BREAK PMH 5 SECTIONALIZING SWITCH 12KV, 600 AMP, 3 PHASE</p> | | | | |

SCOPE: THIS STANDARD SHOWS A 12KV, 600 AMP AIR BREAK PMH 5 SECTIONALIZING SWITCH USED FOR ISOLATING A FAULT IN A CIRCUIT



Indicates Latest Revision

Completely Revised

New Page

Information Removed

SDG&E ELECTRIC STANDARDS

PAD-MOUNTED AIR BREAK PMH 5
SECTIONALIZING SWITCH
12KV, 600 AMP, 3 PHASE

ISSUE 1994

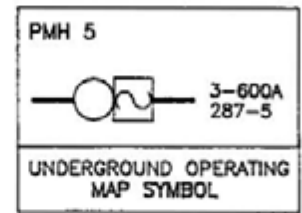
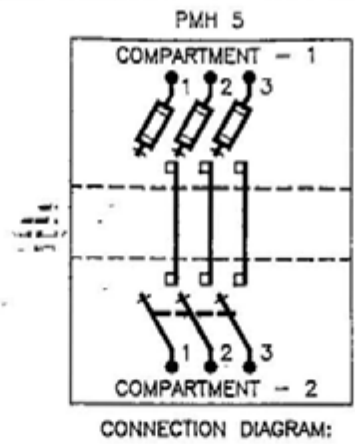
DATE 1-1-94

APPD *JLB/RS*

3599.501
SUPERCEDES
3555 1 (1-1-94)

| ELECTRIC RATINGS | |
|---|------------|
| VOLTAGE | 15.5KV |
| B.I.L. | 95KV |
| CURRENT, CONTINUOUS | 600 AMP |
| LOADMAKE AND LOADBREAK | 600 AMP |
| MOMENTARY AND FAULT CLOSE (RMS, ASYMMETRICAL) | 19,200 AMP |
| (RMS, SYMMETRICAL) | 12,000 AMP |

FOR FIELD MAINTENANCE ONLY



SWITCH PARTS LIST

| ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|------|--|------|---|
| 1 | FOLDING SWITCH OPERATING HANDLE | 9 | •600 AMP FAULT-FITER ELECTRONIC FUSE (STOCK NO. 365800) (D) |
| 2 | BUSHING | 10 | CABLE ATTACHMENT PAD |
| 3 | FUSE HANDELING TOOL | 11 | SWITCH HANDLE LOCKING PROVISION |
| 4 | NAME PLATE (ON OUTSIDE OF DOOR) | 12 | PENTAHEAD BOLT LOCKING PROVISION |
| 5 | GROUNDING PLATE | 13 | ELECTRONIC CONTROL MODULE |
| 6 | 600 AMP BUS | 14 | LEXAN FAULT INDICATOR VIEWING WINDOW |
| 7 | LIFTING TABS (REMOVE AFTER INSTALLATION AND REPLACE BOLTS, STORE INSIDE CABINET) | 15 | GROUNDING STUDS |
| 8 | 600 AMP MINI-RUPTER SWITCH IN COMPARTMENT 2 | | |

NOTES:

- - PAD-MOUNTED SWITCH (STOCK NUMBER 709038) IS DELIVERED FROM THE SUPPLIER WITH ALL THE PARTS LISTED IN THE PARTS LIST INCLUDING FUSES
- SWITCH NUMBERS ARE TO BE ISSUED BY THE ENGINEERING CLERK IN THE DISTRIBUTION FACILITIES INFORMATION SECTION.

REFERENCE:

- A. SEE STANDARD 3212.2 FOR SWITCH IDENTIFICATION
- B. SEE STANDARD 3440 OR 3441 FOR PAD AND HANDHOLE INSTALLATION FOR PAD-MOUNTED 600 AMP, 12 KV SWITCH
- C. SEE STANDARDS 3556 OR 3557 FOR SWITCH INSTALLATION
- (D) SEE STANDARD 4302 FOR FUSE APPLICATION GUIDE
- (F) SEE STANDARD 4355 FOR FAULT INDICATOR INSTALLATION
- (G) SEE DESIGN STANDARD 6113 FOR AUTOMATIC FAULT INDICATOR APPLICATION

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| ISSUE | SDG&E ELECTRIC STANDARDS | | | |
| DATE | PAD-MOUNTED AIR BREAK PMH 5 | | | |
| | SECTIONALIZING SWITCH | | | |
| | 12KV, 600 AMP, 3 PHASE | | | |
| APPD | | | | 3599.502 SUPERCEDES 3555 2 ('-1-94) |

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**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD
EQUIPMENT COMBINATION GUIDELINES -
3316 HANDHOLE AND PAD-MOUNTED SWITCH

**FMO
UG 3560**

SCOPE: THIS STANDARD SHOWS THE MAXIMUM EQUIPMENT COMBINATION THAT CAN BE UTILIZED IN A 3316 SUBSTRUCTURE (HANDHOLE) UNDER A PAD-MOUNTED SWITCH

NOTES:

- FIND THE COMBINATION THAT REPRESENTS THE INSTALLATION, THEN CHECK THE LEGEND BELOW FOR SYMBOLS & REFERENCES COINCIDING TO THE FOLLOWING EQUIPMENT ASSEMBLY OR CABLE HANGER STANDARDS PAGES
- ONLY INSTALL THE THREE TEE COMBINATIONS SHOWN IN THESE STANDARDS TO FEED A SWITCHED TIE POSITION.

| LEGEND | | | | | |
|---------------|----------|------------|-----------|---|-----------------------|
| | TOP VIEW | FRONT VIEW | SIDE VIEW | DESCRIPTION | CONSTRUCTION STANDARD |
| 200 AMP | | | | DEADBREAK STRAIGHT SPLICE | 4196 3 |
| | | | | DEADBREAK ELBOW TEE | 4196 1 & 4196 3 |
| 600 AMP | | | | 600 AMP EXTENSION SPLICE | 4185 |
| | | | | 600 AMP TEES WITH LOADBREAK ELBOWS OR 200 AMP RECEPTACLES, ALSO WITH OR WITHOUT DEADBREAK ELBOWS | 4182 1 |
| | | | | 600 AMP TEES WITH LOADBREAK ELBOWS OR 200 AMP INSULATING RECEPTACLES, ALSO WITHOUT DEADBREAK ELBOWS | 4182 1 |
| 200 & 600 AMP | OR | | | SECONDARY OR PRIMARY CABLE PULLED STRAIGHT THROUGH WITHOUT ANY SPLICES | --- |
| 600 VOLT | | | --- | 600 VOLT SECONDARY CONNECTOR | 4173 1- 3 |
| | --- | --- | | ADAPTER AND 2, 3, OR 4 WAY CABLE ARMS | 4178 |
| | | | | HANGER AND 2, 3 OR 4 WAY CABLE ARMS | 4178 |
| | | | | HANGER AND SMALL CABLE HOOK | 4178 |
| | | | | HANGER AND LARGE CABLE HOOK | 4178 |
| | --- | | | TEE BRACKET | 4178 |
| | --- | | --- | STAND OFF BAR | 4178 |
| | | --- | --- | PAD-MOUNTED SWITCH AREA | 3560 2- 4 |

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SDG&E ELECTRIC STANDARDS

DATE 1-1-96

APPD

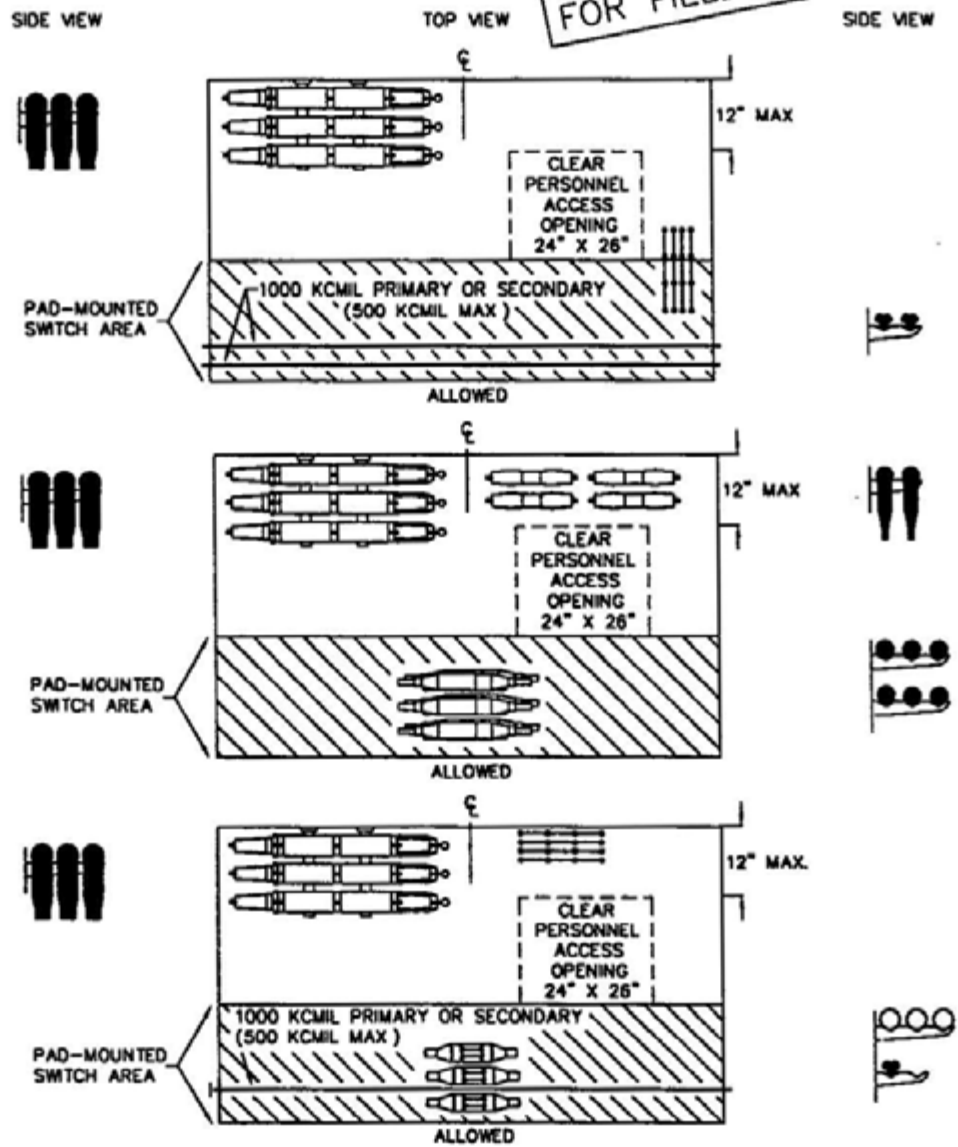
EQUIPMENT COMBINATION GUIDELINES -
3316 HANDHOLE AND PAD-MOUNTED SWITCH

3599.611
SUPERSEDES
3560 1 (1-1-96)

NOTES:

- THE COMBINATIONS SHOWN IN THIS STANDARD ARE ALLOWED IN ADDITION TO THE CABLE TERMINATED ONTO THE SWITCH
- THE ALLOWED INSTALLATIONS SHOWN ARE TYPICAL. OTHER CONFIGURATIONS MAY BE DESIGNED PROVIDED EQUIPMENT LIMITATIONS AND THE UNOBSTRUCTED SPACE REQUIREMENT IS PROVIDED TO ALLOW PERSONNEL TO PERFORM WORK SAFELY AND ALLOW ACCESS INTO THE HANDHOLE AND TO THE CONDUITS
- #2 OR 2/0 PRIMARY CABLES OR SECONDARY (500 KCMIL MAX) MAY BE PULLED IN ANY CONDUIT -- NOT USED FOR LARGER CABLES
- CABLE PULLED STRAIGHT THROUGH SHOULD BE PULLED INTO BOTTOM CONDUITS WHEN CONDUITS ARE AVAILABLE.
- THE NOT ALLOWED EQUIPMENT COMBINATION GUIDELINES SHOWN ARE DUE TO
 - A) NOT ENOUGH ROOM TO ALLOW PROPER CABLE BENDING RADIUS
 - B) NOT ENOUGH "UNOBSTRUCTED SPACE" OR "CLEAR PERSONNEL ACCESS OPENING"
 - C) TOO MANY CABLES TO ALLOW PROPER CABLE TRAINING
 - D) MORE CABLES THAN CABLE KNOCKOUTS PROVIDED
- DRAWINGS ARE NOT TO SCALE

FOR FIELD MAINTENANCE ONLY



3316 HANDHOLE AND PAD-MOUNTED SWITCH

FOR ALL SIZES OF PRIMARY CABLES AND UP TO 500KCMIL SECONDARY CABLES MAXIMUM

3599.612
SUPERSEDES
3560.2 (1-1-96)

SDG&E ELECTRIC STANDARDS

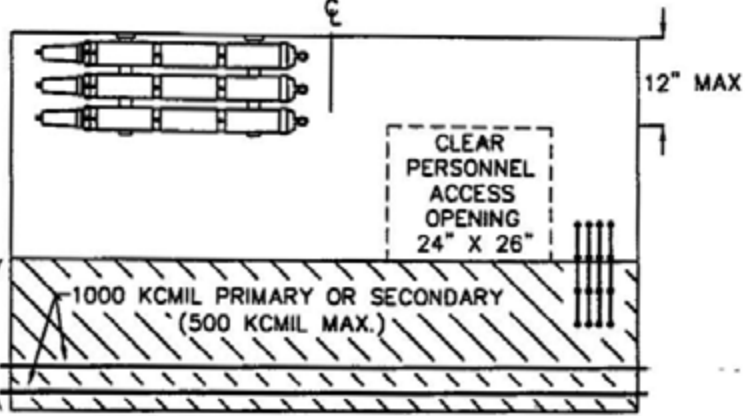
**EQUIPMENT COMBINATION GUIDELINES--
3316 HANDHOLE AND PAD-MOUNTED SWITCH**

DATE 1-1-96
APPD *[Signature]*

SIDE VIEW

TOP VIEW

SIDE VIEW

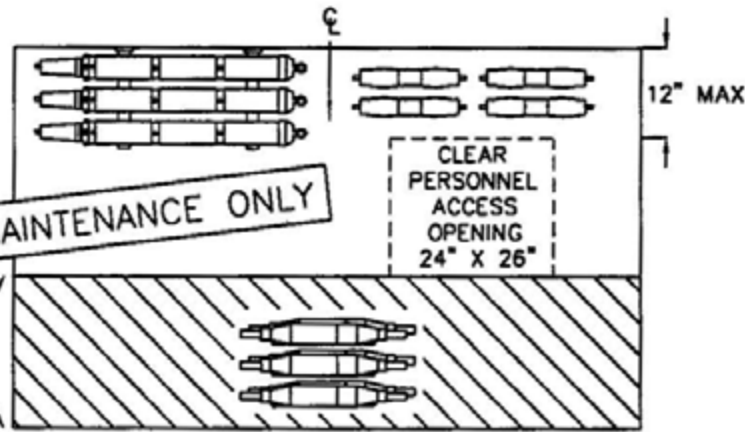


PAD-MOUNTED SWITCH AREA

1000 KCMIL PRIMARY OR SECONDARY (500 KCMIL MAX.)

CLEAR PERSONNEL ACCESS OPENING 24" X 26"

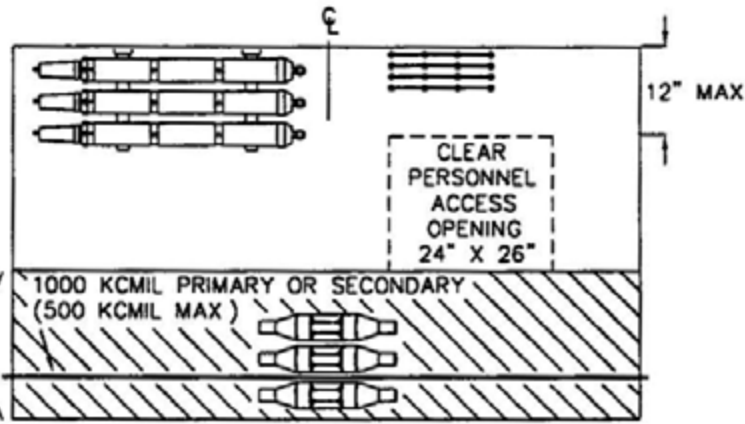
ALLOWED



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PAD-MOUNTED SWITCH AREA

ALLOWED



PAD-MOUNTED SWITCH AREA

1000 KCMIL PRIMARY OR SECONDARY (500 KCMIL MAX.)

CLEAR PERSONNEL ACCESS OPENING 24" X 26"

ALLOWED

3316 HANDHOLE AND PAD-MOUNTED SWITCH

FOR ALL SIZES OF PRIMARY CABLES AND UP TO 500KCMIL SECONDARY CABLES MAXIMUM

SDG&E ELECTRIC STANDARDS

DATE 1-1-96

APPD *[Signature]*

EQUIPMENT COMBINATION GUIDELINES-
3316 HANDHOLE AND PAD-MOUNTED SWITCH

3599.613
SUPERSEDES
3560 3 (1-1-96)

SIDE VIEW

TOP VIEW

SIDE VIEW

MAY USE SIDE RECESSES OR KNOCKOUTS

FOR CONDUITS ENTERING SIDE WALLS,
NO CORE BORING IS REQUIRED

PRIMARY (350 KCMIL MAX)

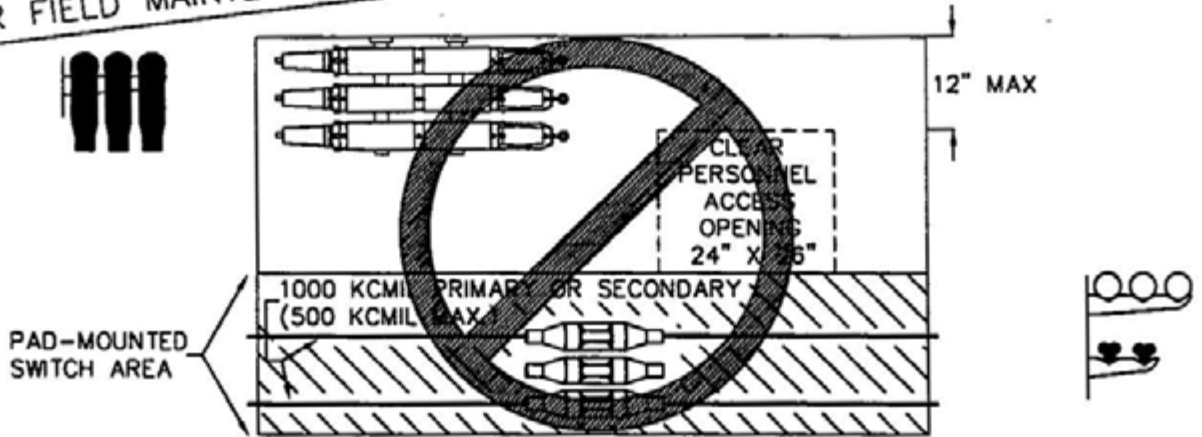
OR

SECONDARY (500 KCMIL MAX)

DO NOT CORE BORE HANDHOLE ENDS.

FOR FIELD MAINTENANCE ONLY

ALLOWED



NOT ALLOWED



NOT ALLOWED

3316 HANDHOLE AND PAD-MOUNTED SWITCH

FOR ALL SIZES OF PRIMARY CABLES AND UP TO 500KCMIL SECONDARY CABLES MAXIMUM

3599.614
SUPERSEDES
3580 4 (1-1-96)

SDG&E ELECTRIC STANDARDS

EQUIPMENT COMBINATION GUIDELINES-
3316 HANDHOLE AND PAD-MOUNTED SWITCH

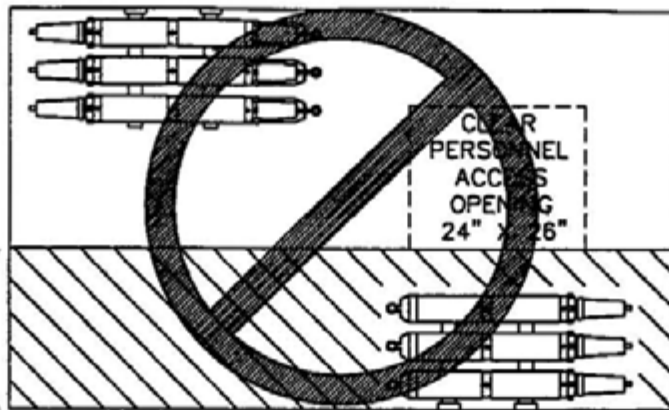
DATE 1-1-96

APPD *[Signature]*

SIDE VIEW

TOP VIEW

SIDE VIEW



12" MAX.

PAD-MOUNTED SWITCH AREA



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NOT ALLOWED

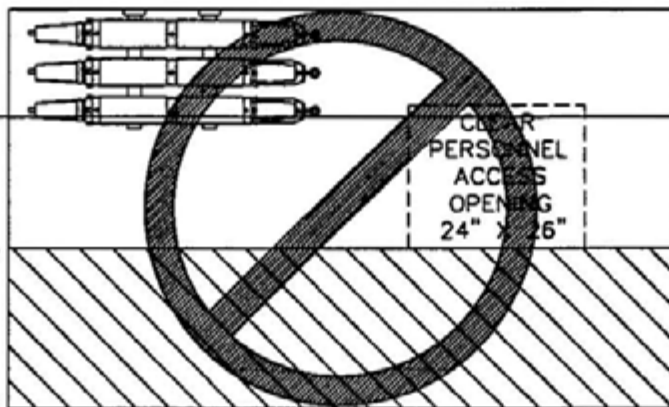
PAD-MOUNTED SWITCH AREA



12" MAX



NOT ALLOWED



12" MAX

CABLE PULLED STRAIGHT THROUGH

PAD-MOUNTED SWITCH AREA

NOT ALLOWED

3316 HANDHOLE AND PAD-MOUNTED SWITCH

FOR ALL SIZES OF PRIMARY CABLES AND UP TO 500KCMIL SECONDARY CABLES MAXIMUM

SDG&E ELECTRIC STANDARDS

EQUIPMENT COMBINATION GUIDELINES-
3316 HANDHOLE AND PAD-MOUNTED SWITCH

3599.615
SUPERSEDES
3580.5 (1-1-96)

DATE 1-1-96

APPD [Signature]

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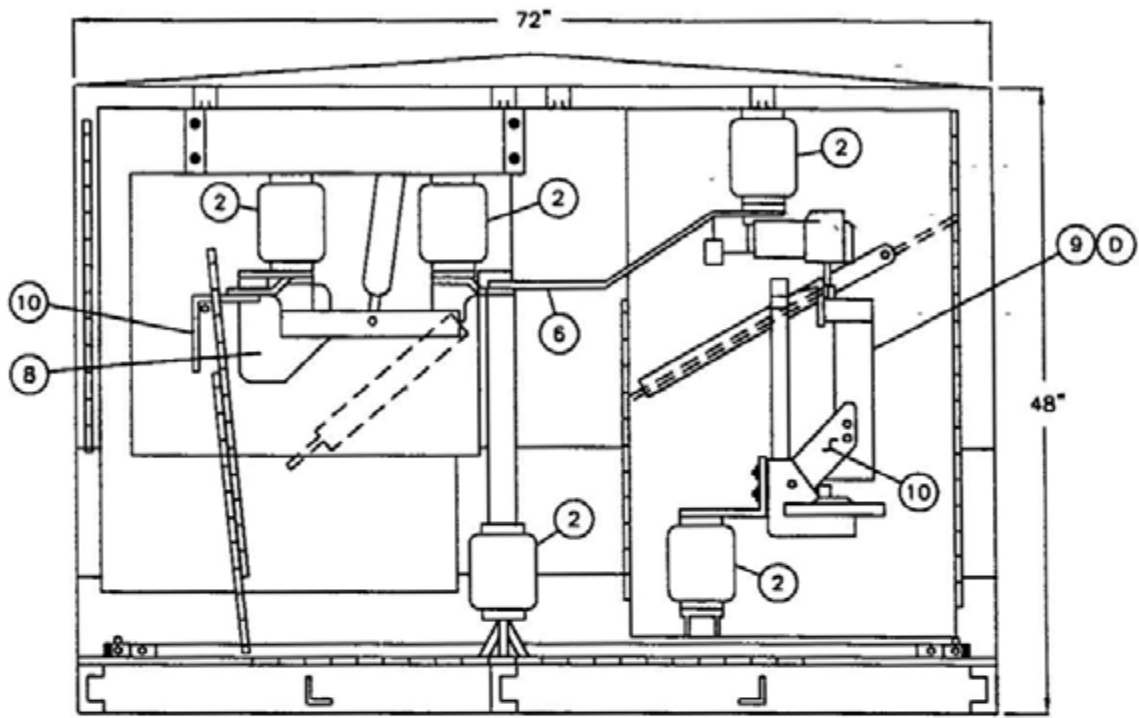
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| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | PAD-MOUNTED AIR BREAK PMH 9 & 11 FUSE/SECTIONALIZING SWITCH 12KV, 600 AMPS, THREE-PHASE | | | | |

SCOPE: THIS STANDARD SHOWS A 12KV, 600 AMP AIR BREAK PMH 9 & 11 FUSE/SECTIONALIZING SWITCH USED FOR PAD-MOUNTED APPLICATIONS.

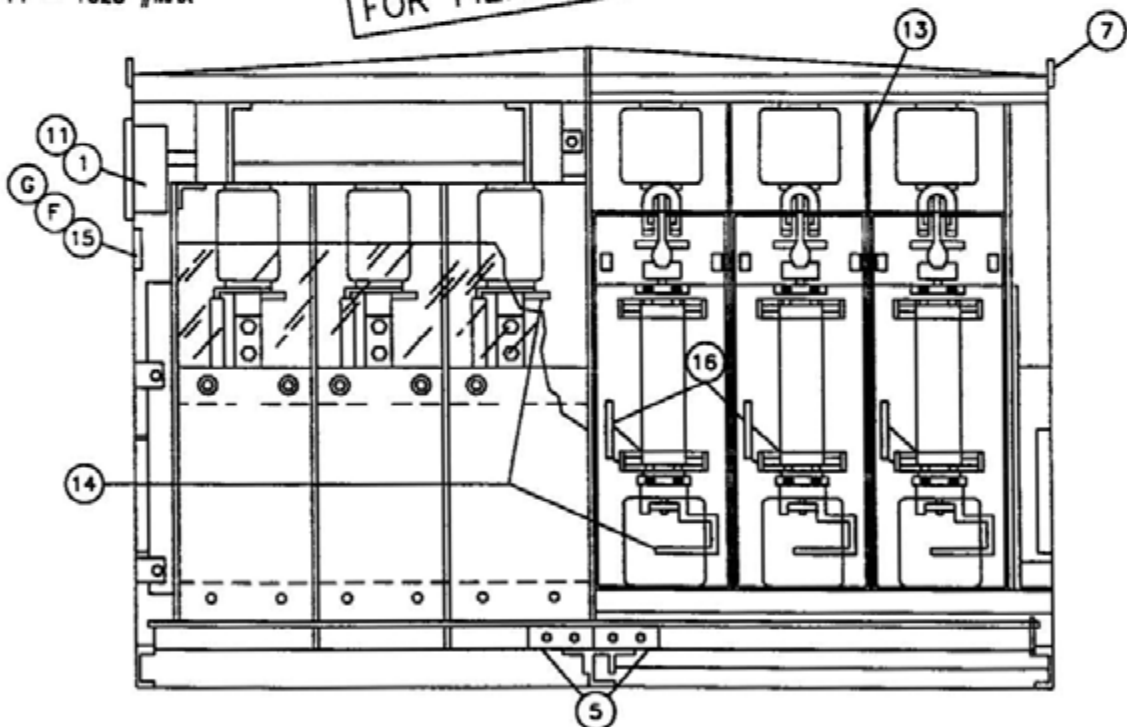


WEIGHT:

- SCOTT PMH 9 - 2245 #MAX
 PMH 11 - 2355 #MAX
 S&C PMH 9 - 1550 #MAX
 PMH 11 - 1625 #MAX

SIDE VIEW

FOR FIELD MAINTENANCE ONLY



OPEN FRONT VIEW

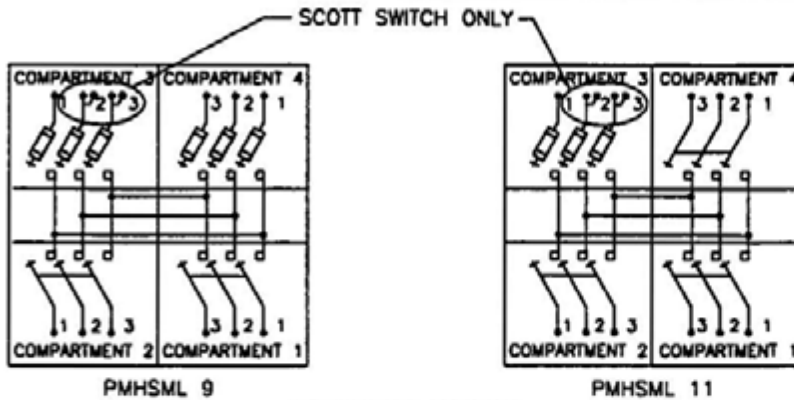
3599.605
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 3565 1 (1-1-96)

SDG&E ELECTRIC STANDARDS
 PAD-MOUNTED AIR BREAK PMH 9 & 11
 FUSE /SECTIONALIZING SWITCH
 12KV, 600 AMPS, THREE-PHASE

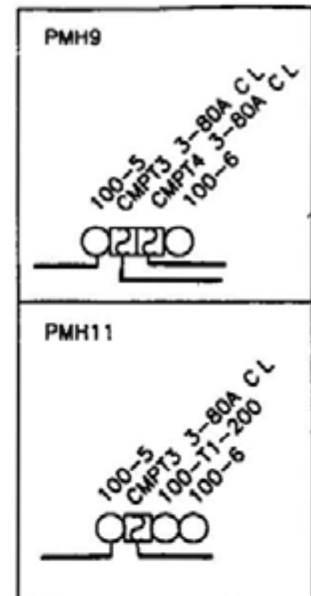
DATE 1-1-96

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| ELECTRIC RATINGS | |
|---|------------|
| VOLTAGE | 15.5 |
| B.I.L. | 95 |
| CURRENT, CONTINUOUS (GANG OPERATED) | 600 AMP |
| LOADMAKE AND LOADBREAK (GANG OPERATED) | 600 AMP |
| MOMENTARY AND FAULT CLOSE (RMS, ASYMMETRICAL) | 19,200 AMP |
| (RMS, SYMMETRICAL) | 12,000 AMP |



CONNECTION DIAGRAM



UNDERGROUND OPERATING MAP SYMBOLS

SWITCH PARTS LIST

| ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|------|--|------|---|
| 1 | FOLDING SWITCH OPERATING HANDLE | 9 | STANDARD 4302 |
| 2 | BUSHING | 10 | CABLE ATTACHMENT PAD |
| 3 | FUSE HANDLING TOOL (NOT SHOWN) | 11 | SWITCH HANDLE LOCKING PROVISION |
| 4 | NAME PLATE (ON INSIDE OF DOOR) | 12 | PENTAHEAD BOLT LOCKING PROVISION (NOT SHOWN) |
| 5 | GROUNDING PLATE | 13 | INSULATING BARRIERS |
| 6 | 600 AMP BUS | 14 | GROUND STUD |
| 7 | LIFTING TABS (REMOVE AFTER INSTALLATION AND REPLACE BOLTS, STORE INSIDE CABINET) | 15 | LEXAN FAULT INDICATOR VIEWING WINDOW |
| 8 | 600 AMP MINI-RUPTER SWITCH | 16 | SINGLE-PHASE LANDING PLATES (SCOTT SWITCH ONLY) |

NOTES:

- PAD-MOUNTED SWITCH (STOCK NUMBERS PMH 9 #709040, PMH 11 #709042) ARE DELIVERED FROM THE SUPPLIER WITH ALL THE PARTS LISTED IN THE PARTS LIST EXCEPT FUSES
- SWITCH NUMBERS ARE TO BE ISSUED BY THE ENGINEERING CLERK IN THE DISTRIBUTION FACILITIES INFORMATION SECTION

REFERENCE:

- A SEE STANDARD 3212.2 FOR SWITCH IDENTIFICATION
- B SEE STANDARD 3419 FOR PAD, HANDHOLE AND CONDUIT PLACEMENT
- C SEE STANDARD 3566 FOR SWITCH INSTALLATION
- (D) SEE STANDARD 4302 FOR FUSE APPLICATION GUIDE
- (F) SEE STANDARD 4355 FOR FAULT INDICATOR INSTALLATION
- (G) SEE DESIGN STANDARD 6113 FOR AUTOMATIC FAULT INDICATOR APPLICATION

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DATE 1-1-96

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SDG&E ELECTRIC STANDARDS

PAD-MOUNTED AIR BREAK PMH 9 & 11
FUSE /SECTIONALIZING SWITCH
12KV, 600 AMPS, THREE-PHASE

3599.606
SUPERSEDES
3565.2 (1-1-96)





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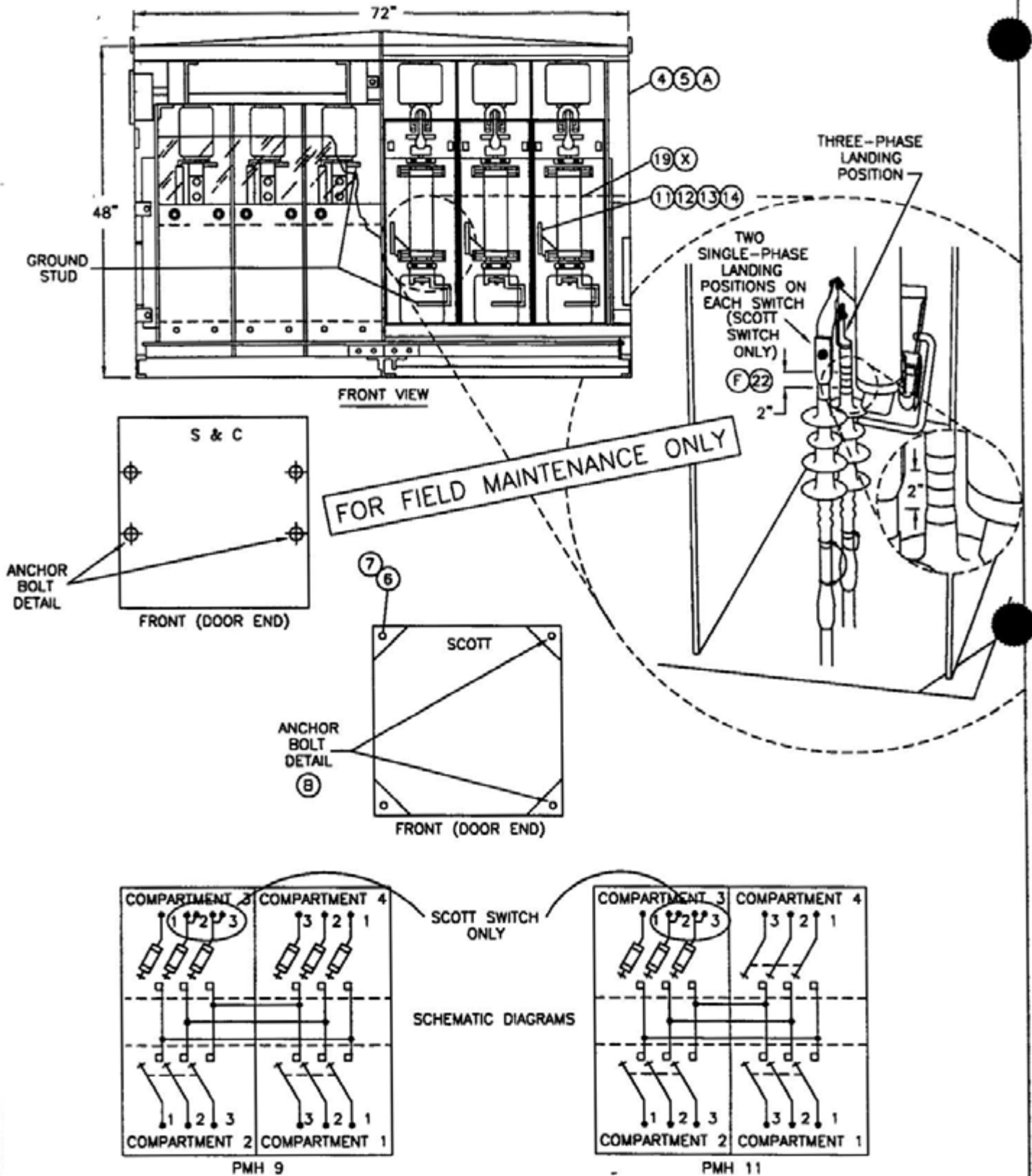
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| | <p>SDG&E ELECTRIC UNDERGROUND STANDARD</p> | | | | |
| | <p>INSTALLATION OF PAD-MOUNTED PMH 9 & 11 FUSE/SECTIONALIZING SWITCH CABINET, 12KV, 600 AMP, THREE-PHASE</p> | | | | |

SCOPE: THIS STANDARD SHOWS THE INSTALLATION FOR PAD-MOUNTED 12KV, 600 AMP AIR BREAK PMH 9 & 11 FUSE/SECTIONALIZING SWITCH



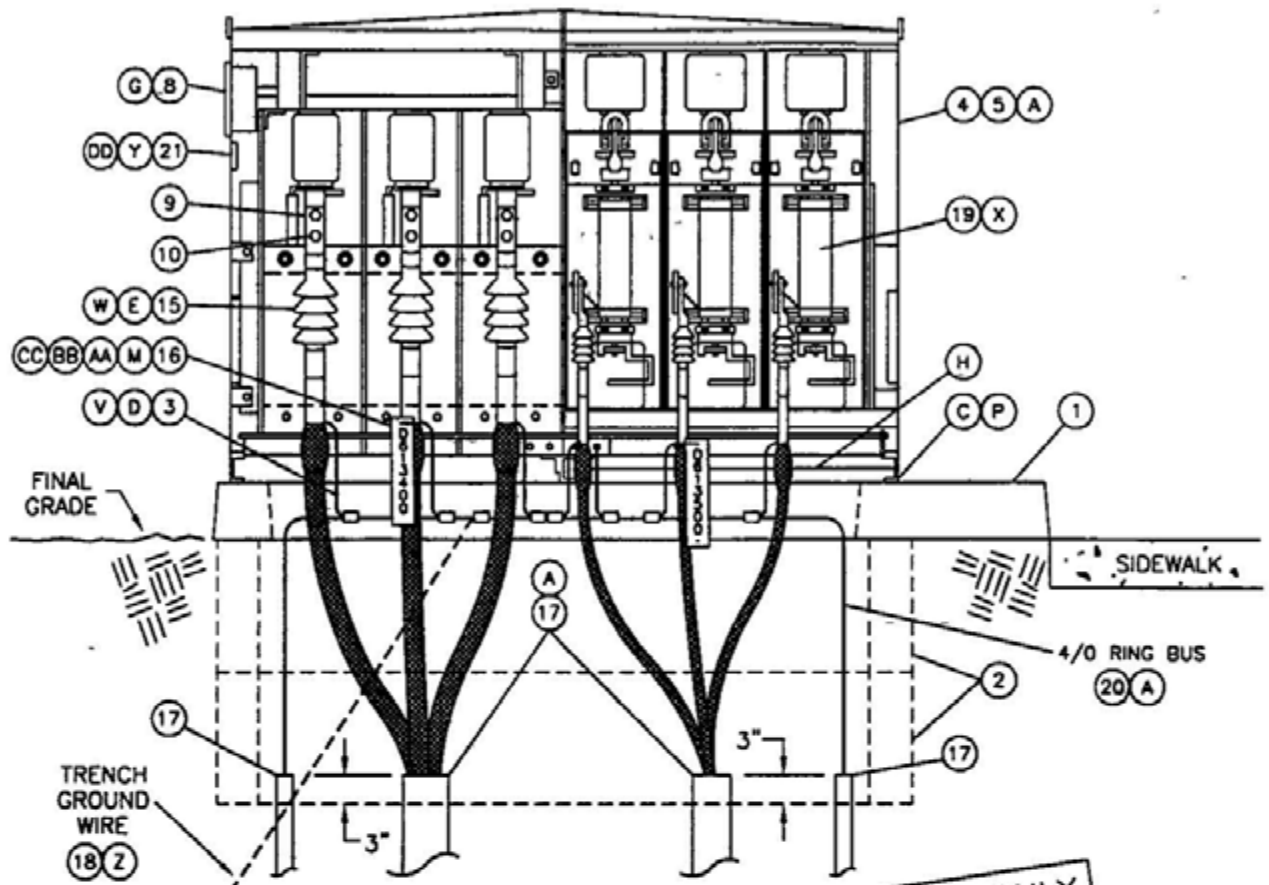
3599.607
SUPERSEDES
3566 1 (1-1-96)

SDG&E ELECTRIC STANDARDS

INSTALLATION OF PAD-MOUNTED PMH 9 & 11
FUSE/SECTIONALIZING SWITCH CABINET, 12KV, 600 AMP,
THREE-PHASE

DATE 1-1-96

APPD *[Signature]*



FOR FIELD MAINTENANCE ONLY

NOTES:

- PMH SWITCH/FUSE CABINETS CONTAIN AT LEAST TWO 600 AMP EXTERNAL HANDLES, GANG-OPERATED, THREE-PHASE INTERRUPTER. IN ADDITION TO THE INTERRUPTER(S), THERE MAY BE ONE OR MORE SETS OF THREE 200 AMP, SINGLE PHASE HOOKSTICK OPERATED FUSES.
- PMH SWITCH MAY BE USED AS A TIE SWITCH

SDG&E ELECTRIC STANDARDS

INSTALLATION OF PAD-MOUNTED PMH 9 & 11
FUSE/SECTIONALIZING SWITCH CABINET, 12KV, 600 AMP,
THREE-PHASE

DATE 1-1-96

APPD *[Signature]*

3599.608
SUPERSEDES
3566 2 (1-1-96)

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PAGE NO | STOCK NUMBER | ASSEMBLY UNITS |
|------|--|----------|----------------------|--------------|----------------|
| 1 | PMH 9 & 11 PAD | 1 | 3419 1 | 514024 | - |
| 2 | 3311 HANDHOLE, 14" X 66" X 14" | 4 | 3311 | 162660 | - |
| 3 | GROUNDING EQUIPMENT (V) (D) | AS REQ'D | 3520 | - | - |
| 4 | SWITCH, AIR BREAK FUSE/SECTIONALIZING, 600A, 12KV (PMH 9) | AS REQ'D | 3655 | 709040 | PMH-09 |
| 5 | SWITCH, AIR BREAK FUSE/SECTIONALIZING, 600A, 12KV (PMH 11) | AS REQ'D | 3655 | 709042 | PMH-11 |
| 6 | ANCHOR, CONCRETE STAINLESS STEEL 1/2" X 3-3/4" (A) | AS REQ'D | - | 107654 | - |
| 7 | HOLD DOWN (SUPPLIED WITH CABINET) | 4 | - | - | - |
| 8 | PADLOCK, SCHLAGE ELEC SERIES (G) | AS REQ'D | - | 514848 | - |
| 9 | COMPRESSION TERMINALS | AS REQ'D | 4121 | - | - |
| 10 | BOLT 1/2" X 2" BOLT ASSEMBLY, STAINLESS STEEL | AS REQ'D | - | 148800 | - |
| 11 | WASHER, 3/8", SPRING LOCK, CADMIUM PLATED | AS REQ'D | - | 798620 | - |
| 12 | WASHER, 3/8", FLAT, CADMIUM PLATED. | AS REQ'D | - | 800160 | - |
| 13 | NUT, 3/8", HEX, MACHINE THREAD, CADMIUM PLATED | AS REQ'D | - | 505020 | - |
| 14 | BOLT, 3/8" X 1 1/2", HEX HEAD MACHINE THREAD, CADMIUM PLATED | AS REQ'D | - | 616106 | - |
| 15 | OUTDOOR CABLE TERMINALS (COLD SHRINK) (E) (W) | AS REQ'D | 4111 | - | - |
| 16 | CABLE IDENTIFICATION TAGS (M) | AS REQ'D | 3202 | - | - |
| 17 | SEALING COMPOUND | AS REQ'D | - | 442976 | - |
| 18 | TRENCH GROUND WIRE | AS REQ'D | 4510 | - | - |
| 19 | FUSES, 200 AMP (X) | AS REQ'D | 4302 | - | - |
| 20 | WIRE, BARE COPPER #4/0 STR SOFT DRAWN | AS REQ'D | - | 812764 | - |
| 21 | AUTOMATIC FAULT INDICATOR(S) (Y) (DD) | AS REQ'D | 4355 | - | - |
| 22 | TAPE, SILICONE (F) | AS REQ'D | - | 720384 | - |
| 23 | SERVICE POST CONNECTOR | AS REQ'D | - | 262560 | - |

FOR FIELD MAINTENANCE ONLY

| | | |
|--|---|--|
| <p>3599.609 SUPERSEDES 3566 3 (1-1-96)</p> | <p>SDG&E ELECTRIC STANDARDS INSTALLATION OF PAD-MOUNTED PMH 9 & 11 FUSE/SECTIONALIZING SWITCH CABINET, 12KV, 600 AMP, THREE-PHASE</p> | <p>DATE 1-1-96 APPD <i>[Signature]</i></p> |
|--|---|--|

INSTALLATION:

- (A) SEAL CONDUITS WITH SEALING COMPOUND
- (B) SET SWITCH ON THE PAD AND BOLT IT DOWN AS SHOWN IN ANCHOR BOLT DETAIL.
- (C) BASE OF CABINET SHALL BE CAULKED TO PREVENT MOISTURE ENTRY AND POSSIBLE TAMPERING
- D REFER TO STANDARDS 4520, 4525 & 4530 FOR GROUNDING.
- (E) INSTALL OUTDOOR CABLE TERMINALS ON ALL 200 AMP AND 600 AMP CABLES TERMINATED ONTO THE SWITCH.
F ON THREE-PHASE 200 AMP CABLE, LEAVE 2 INCHES OF CABLE BETWEEN THE BOTTOM OF THE LUG AND THE COLD SHRINK TERMINAL TAPE THIS AREA WITH SILICONE TAPE FOR SINGLE PHASE CABLE, TERMINATE THE COLD SHRINK TERMINAL ON THE LUG AS SHOWN
- (G) LOCK SECURE THE SWITCH DOORS WITH PENTAHEAD BOLTS AND THE SWITCH DOORS AND THE OPERATING HANDLE COVERS WITH SCHLAGE ELECTRIC SERIES LOCKS.
- (H) REMOVE THE FIBER MOISTURE BARRIER IF INSTALLED, BEFORE SETTING PMH 9 OR 11 SWITCH CABINET ON PAD

REFERENCE:

- (M) SEE STANDARD 3202 FOR CABLE IDENTIFICATION.
- N. SEE STANDARD 3211 FOR ATTACHING STRUCTURE/EQUIPMENT IDENTIFICATION TAG.
- O. SEE STANDARD 3221 FOR HIGH VOLTAGE DECAL.
- (P) SEE STANDARD 3408 FOR WIRE ENTRY PREVENTION AND MOISTURE ENTRY.
- Q. SEE STANDARD 3419 FOR PAD, HANDHOLE AND CONDUIT PLACEMENT.
- R SEE STANDARD 3481 FOR BARRIERS IF THE SWITCH IS SUBJECT TO VEHICULAR TRAFFIC.
- S. SEE STANDARD 3483 FOR MINIMUM OPERATING CLEARANCE REQUIREMENTS.
- T SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS
- U SEE STANDARD 3487 FOR RETAINING WALLS
- (V) SEE STANDARD 4002 FOR WIRE INFORMATION
- (W) SEE STANDARD 4111 FOR OUTDOOR CABLE TERMINALS
- (X) SEE STANDARD 4302 FOR FUSE APPLICATION GUIDE
- (Y) SEE STANDARD 4355 FOR FAULT INDICATOR INSTALLATION
- (Z) SEE STANDARD 4510 FOR (PREFERRED I) AND (ALTERNATE TRENCH GROUND WIRE)
- (AA) SEE STANDARD 4520 FOR EQUIPMENT GROUNDING
- (BB) SEE STANDARD 4525 FOR GROUNDING PREMOLDED CONNECTORS
- (CC) SEE STANDARD 4530 FOR NEUTRAL AND GROUND WIRE SCHEMATIC DIAGRAM
- (DD) SEE DESIGN STANDARD 6113 FOR AUTOMATIC FAULT INDICATOR APPLICATION

FOR FIELD MAINTENANCE ONLY

SDG&E ELECTRIC STANDARDS

INSTALLATION OF PAD-MOUNTED PMH 9 & 11
FUSE/SECTIONALIZING SWITCH CABINET, 12KV, 600 AMP,
THREE-PHASE

3599.610
SUPERSEDES
3566.4 (1-1-96)

DATE 1-1-96

APPD *[Signature]*

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REVISION HISTORY:

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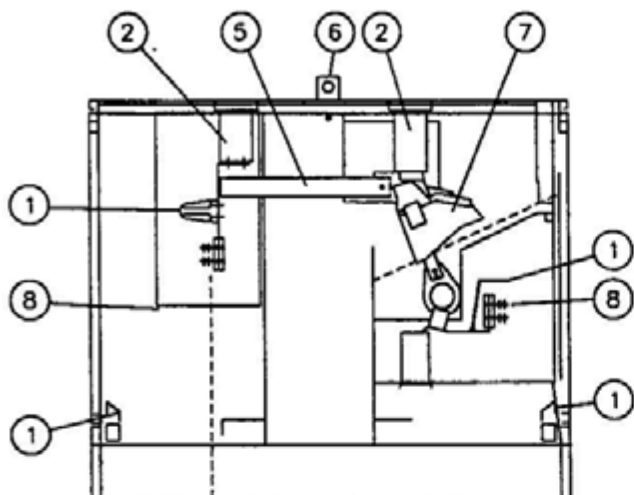
**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD

PAD-MOUNTED AIR BREAK PMH 3 SECTIONALIZING SWITCH
12KV, 600 AMP, THREE-PHASE

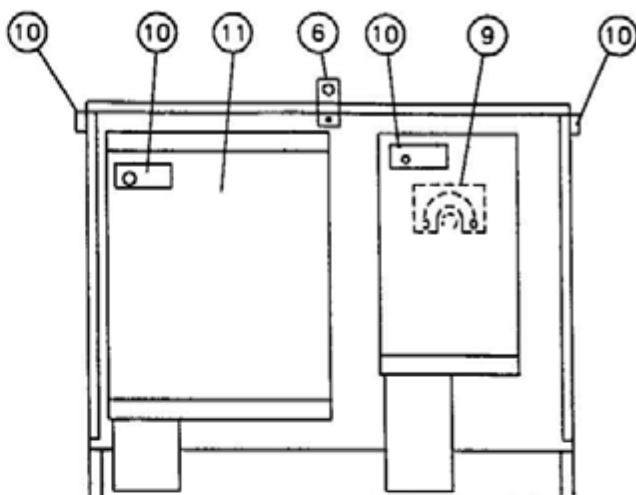
**FMO
UG 3577**

SCOPE: THIS STANDARD SHOWS A 12KV, 600 AMP AIR BREAK PMH 3 SECTIONALIZING SWITCH USED FOR ISOLATING A FAULT IN A CIRCUIT



COMPARTMENT 2 COMPARTMENT 1

SIDE VIEW

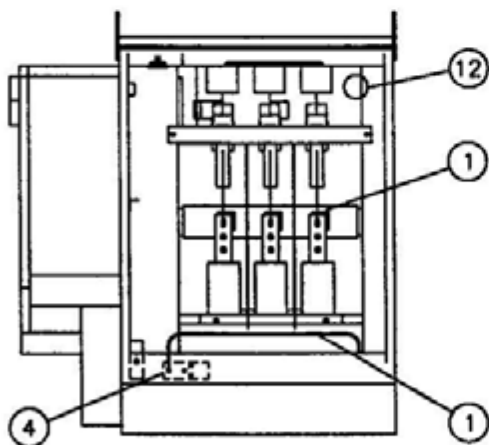


COMPARTMENT 2 COMPARTMENT 1

SIDE VIEW

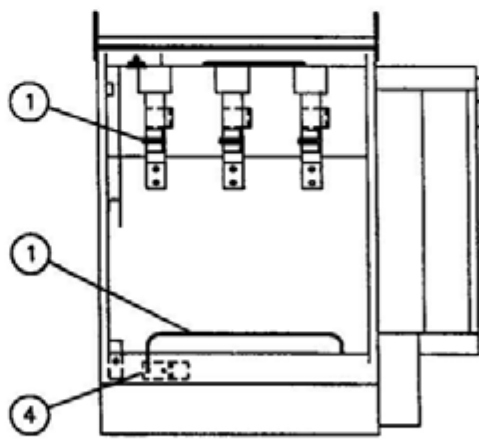
WEIGHT 1040# MAX

FOR FIELD MAINTENANCE ONLY



COMPARTMENT 1

OPEN END VIEW



COMPARTMENT 2

OPEN END VIEW

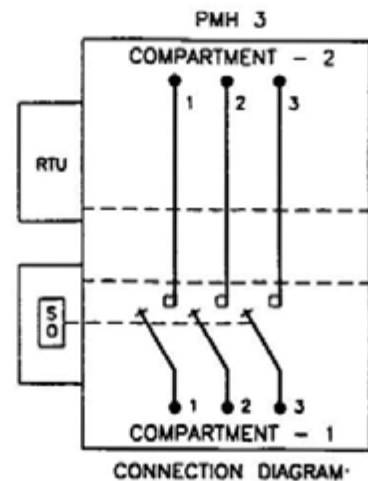
SDG&E ELECTRIC STANDARDS

3599.701
SUPERSEDES
3577.1 (1-1-96)

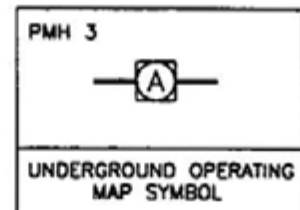
PAD-MOUNTED AIR BREAK PMH 3 SECTIONALIZING SWITCH
12KV, 600 AMP, THREE-PHASE

DATE 1-1-96
APPD *[Signature]*

| ELECTRIC RATINGS | |
|---|------------|
| VOLTAGE | 14.4KV |
| BIL | 95KV |
| CURRENT, CONTINUOUS | 600 AMP |
| LOADMAKE AND LOADBREAK | 600 AMP |
| MOMENTARY AND FAULT CLOSE (RMS, ASYMMETRICAL) | 22,400 AMP |
| (RMS, SYMMETRICAL) | 14,000 AMP |



FOR FIELD MAINTENANCE ONLY



SWITCH PARTS LIST

| ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|------|--|------|--|
| 1 | GROUND RODS | 7 | 600 AMP MINI-RUPTER SWITCH IN COMPARTMENT 1 |
| 2 | BUSHING | 8 | CABLE ATTACHMENT PAD WITH 1/2" BOLT ASSEMBLIES |
| 3 | NAME PLATE (ON OUTSIDE OF DOOR) | 9 | MOTOR ACTUATOR (SWITCH OPERATOR) |
| 4 | GROUNDING PLATE | 10 | PENTAHEAD LATCH LOCKING PROVISION |
| 5 | 600 AMP BUS | 11 | RTU |
| 6 | LIFTING TABS (REMOVE AFTER INSTALLATION AND REPLACE BOLTS, STORE INSIDE CABINET) | 12 | LEXAN FAULT INDICATOR VIEWING WINDOW |

NOTES:

* - PAD-MOUNTED SWITCH IS DELIVERED FROM THE SUPPLIER WITH ALL THE PARTS LISTED IN THE PARTS LIST.

REFERENCE:

- A SEE STANDARD 3212.2 FOR SWITCH IDENTIFICATION.
- B SEE STANDARD 3420 FOR PAD AND HANDHOLE INSTALLATION FOR PAD-MOUNTED 600 AMP, 12 KV SWITCH.
- C. SEE STANDARDS 3578 FOR SWITCH INSTALLATION
- (D) SEE STANDARD 4355 FOR FAULT INDICATOR INSTALLATION.
- (E) SEE DESIGN STANDARD 6113 FOR AUTOMATIC FAULT INDICATOR APPLICATION

SDG&E ELECTRIC STANDARDS

DATE 1-1-96

APPD *PJW/RSJ*

PAD-MOUNTED AIR BREAK PMH 3 SECTIONALIZING SWITCH
12KV, 600 AMP, THREE-PHASE

3599.702
SUPERSEDES
3577.2 (1-1-96)

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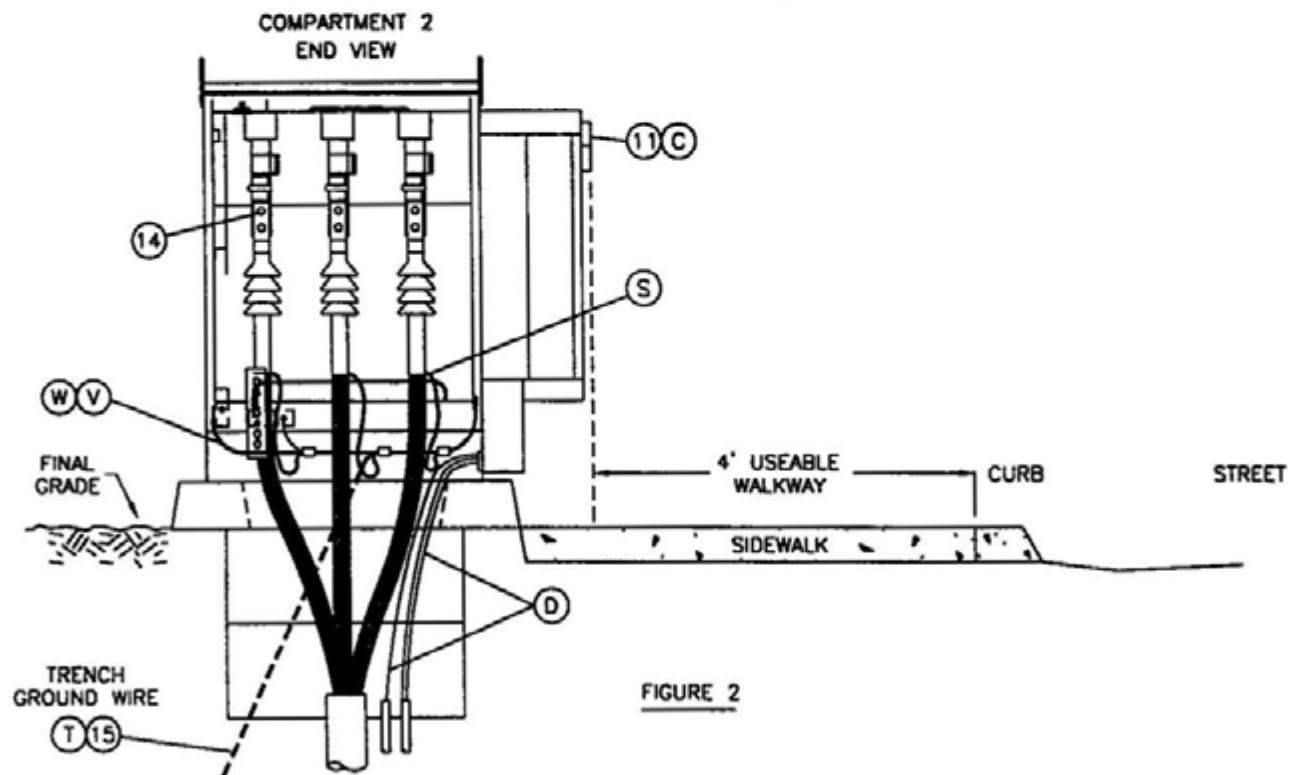
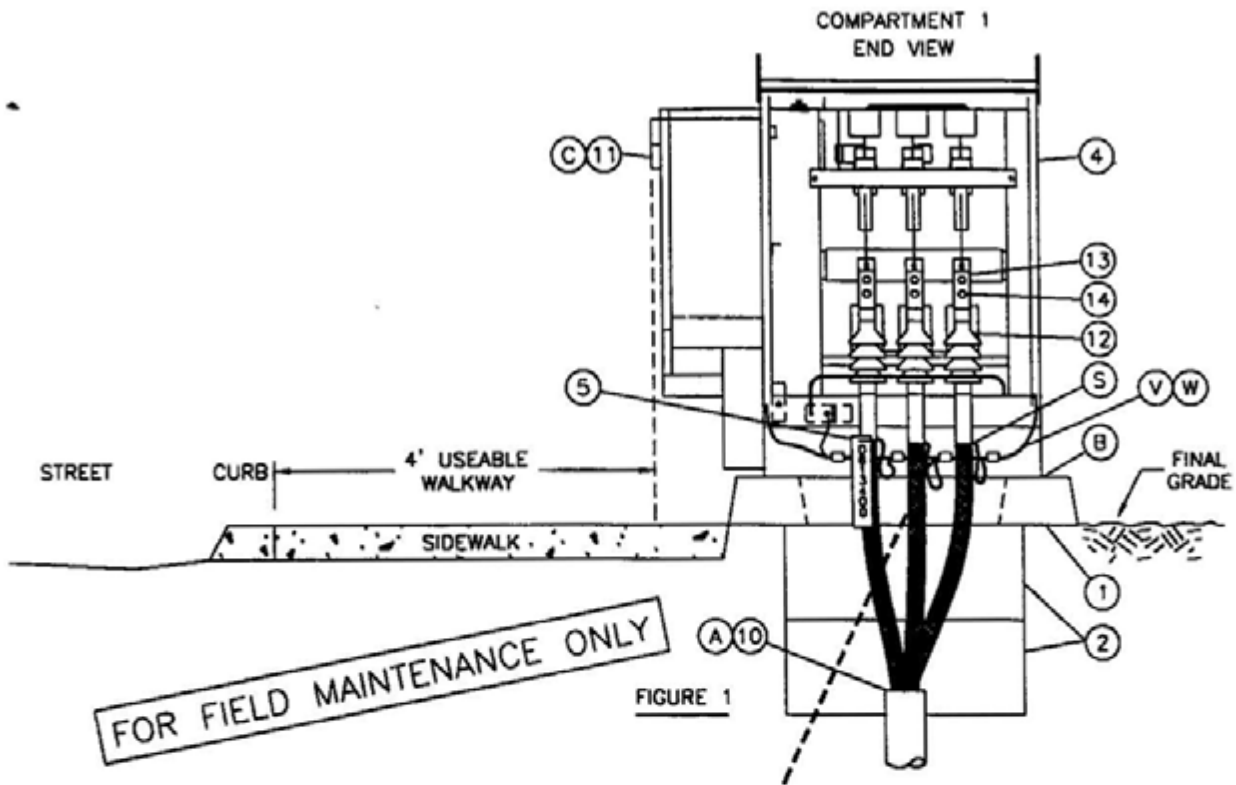
**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD

INSTALLATION OF PAD-MOUNTED AIR BREAK PMH 3
SECTIONALIZING SWITCH 12KV, 600 AMP, THREE-PHASE

**FMO
UG 3578**

SCOPE: THIS STANDARD SHOWS THE INSTALLATION FOR PAD-MOUNTED AIR BREAK 12KV, 600A PMH 3 SECTIONALIZING SWITCH



FOR FIELD MAINTENANCE ONLY

SDG&E ELECTRIC STANDARDS

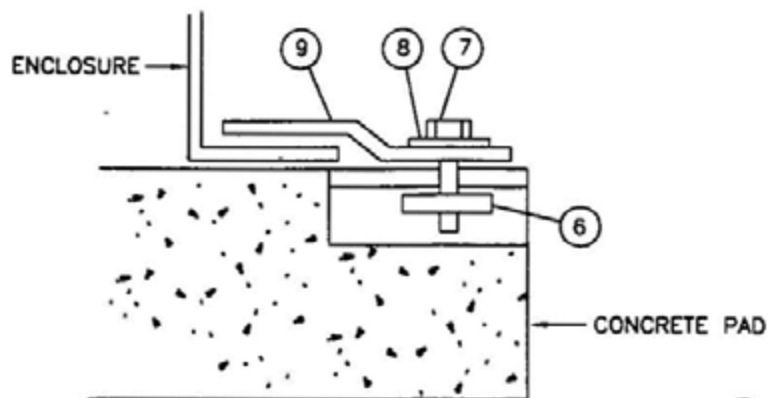
3599.703
SUPERSEDES
3578 1 (1-1-96)

INSTALLATION OF PAD-MOUNTED AIR BREAK PMH 3
SECTIONALIZING SWITCH 12KV, 600 AMP, THREE-PHASE

DATE 1-1-96

APPD *[Signature]*

HOLD-DOWN ASSEMBLY DETAIL
TYPICAL BOTH SIDES OF EQUIPMENT PAD



BILL OF MATERIAL:

FOR FIELD MAINTENANCE ONLY

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PAGE NO | STOCK NUMBER | ASSEMBLY UNITS |
|------|--|----------|----------------------|--------------|----------------|
| 1 | PAD, PMH 3 SWITCH | 1 | 3420 | 513424 | 3420 |
| 2 | HANDHOLE, 3312 | 4 | 3312 | 162426 | - |
| 3 | GROUNDING EQUIPMENT (V) | 1 | 4520 | - | - |
| 4 | PMH 3 SWITCH | 1 | 3577 | * | PMH-03 |
| 5 | IDENTIFICATION TAGS | AS REQ'D | 3202/3212 | - | - |
| 6 | NUT, CLAMPING CHANNEL | 4 | - | 503520 | - |
| 7 | SCREW, HEX HEAD CAP, BRONZE 1/2" X 1-1/2" | 4 | - | 616192 | - |
| 8 | WASHER, STANDARD FLAT ROUND, BRONZE 1/2" | 4 | - | 799488 | - |
| 9 | HOLD DOWN (SUPPLIED WITH CABINET) | 4 | - | - | - |
| 10 | SEALING COMPOUND (A) | AS REQ'D | - | 442976 | - |
| 11 | PADLOCK, SCHLAGE ELEC SERIES (C) | 4 | - | 514848 | - |
| 12 | OUTDOOR CABLE TERMINALS (COLD SHRINK) | 6 | 4111 | - | - |
| 13 | COMPRESSION TERMINALS | 6 | 4121 | - | - |
| 14 | 1/2" BOLT ASSEMBLY (SUPPLIED WITH CABINET) | 12 | - | - | - |
| 15 | TRENCH GROUND WIRE (T) | AS REQ'D | 4510 | - | - |

INSTALLATION:

- (A) SEAL CONDUITS WITH SEALING COMPOUND.
- (B) BASE OF CABINET SHALL BE CAULKED TO PREVENT MOISTURE ENTRY AND POSSIBLE TAMPERING
- (C) SECURE ALL OF THE SWITCH DOORS WITH PENTAHEAD BOLTS AND SCHLAGE ELEC SERIES LOCKS
- (D) SECONDARY REQUIRES 2-#8 CABLES 120V ONLY. SUPERVISORY OR ANTENNA CABLE REQUIRED FOR SCADA
- E. INSTALL CURRENT SENSORS IN COMPARTMENT 1 AND FAULT INDICATORS IN COMPARTMENT 2 IN THE SWITCH

* CONTACT MIKE COLBURN FOR ORDERING INFORMATION EXT. 8248

SDG&E ELECTRIC STANDARDS

DATE 1-1-96

APPD *[Signature]*

INSTALLATION OF PAD-MOUNTED AIR BREAK PMH 3
SECTIONALIZING SWITCH 12KV, 600 AMP, THREE-PHASE

3599.704
SUPERSEDES
3578.2 (1-1-96)

REFERENCES:

- I SEE STANDARD 3211 FOR STRUCTURE/EQUIPMENT IDENTIFICATION TAG
- J SEE STANDARD 3212 FOR SWITCH IDENTIFICATION
- K SEE STANDARD 3408 FOR WIRE ENTRY PREVENTION AND MOISTURE ENTRY
- L SEE STANDARD 3420 FOR PAD AND HANDHOLE INSTALLATION
- M SEE STANDARD 3481 FOR BARRIERS IF THE SWITCH IS SUBJECT TO VEHICULAR TRAFFIC
- N SEE STANDARD 3483 FOR MINIMUM OPERATING CLEARANCE REQUIREMENTS (PAD PLACEMENT)
- O SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT
- P SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS
- Q SEE STANDARD 3487 FOR RETAINING WALLS.
- R SEE STANDARD 3577 FOR PAD-MOUNTED PMH 3 SECTIONALIZING SWITCH
- Ⓢ SEE STANDARD 4108 FOR INSTRUCTIONS TO SEAL JACKETED CABLE.
- Ⓣ SEE STANDARD 4510 FOR (PREFERRED 1) AND (ALTERNATE TRENCH GROUND WIRE)
- Ⓤ SEE STANDARD 4512 FOR EQUIPMENT GROUNDING INSTALLATION
- Ⓥ SEE STANDARD 4520 FOR GROUNDING PAD-MOUNTED EQUIPMENT
- Ⓦ SEE STANDARD 4525 FOR CONCENTRIC NEUTRAL TERMINATIONS AND GROUNDING PREMOLDED CONNECTORS.

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| <p>3599.705 SUPERSEDES 3578 3 (1-1-96)</p> | <p>SDG&E ELECTRIC STANDARDS</p> | | | <p>DATE 1-1-96 APPD <i>[Signature]</i></p> |
| <p>INSTALLATION OF PAD-MOUNTED AIR BREAK PMH 3 SECTIONALIZING SWITCH 12KV, 600 AMP, THREE-PHASE</p> | | | | |

**3600 - SUBSURFACE
SECTIONALIZING
EQUIPMENT**

3600 - SUBSURFACE
SECTIONALIZING
EQUIPMENT

PAGES

SUBJECT

| | |
|------|--|
| 3605 | SUBSTRUCTURE USE AND LIMITATIONS REFERENCE SHEET |
| 3649 | EQUIPMENT COMBINATION GUIDELINES |
| 3670 | SUBSURFACE OIL SWITCH 600 AMP, 12KV, 3Ø |
| 3671 | SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH 12KV, 600 AMP, 3 PHASE |

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| | SDG&E UNDERGROUND CONSTRUCTION STANDARD | | | | |
| | SUBSURFACE SECTIONALIZING EQUIPMENT FMO TABLE OF CONTENTS | | | | |

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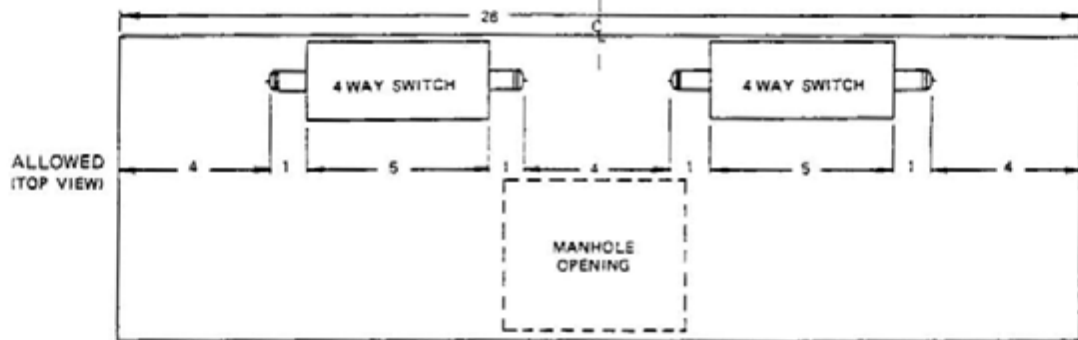
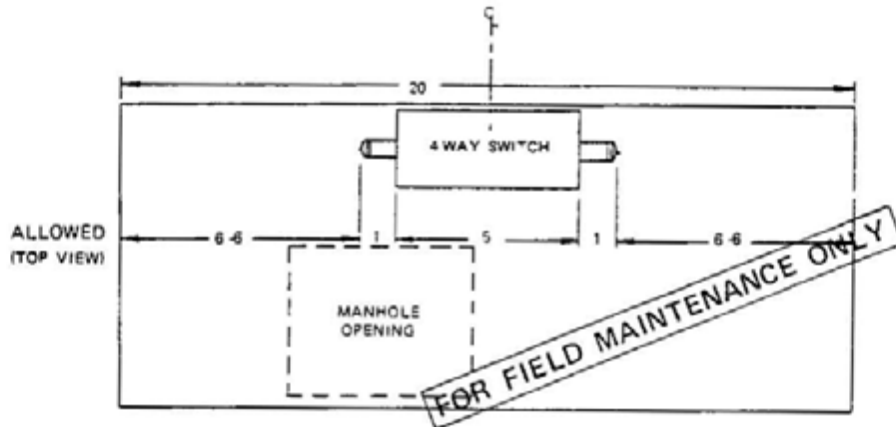
**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD
SUBSTRUCTURE USE AND LIMITATIONS
REFERENCE SHEET

**FMO
UG 3605**

NOTES.

- SWITCHES SHOWN ARE THE MAXIMUM ALLOWED IN THE 3324 MANHOLE.
- PLACE SWITCHES ON WALL OPPOSITE THE MANHOLE OPENING.
- ALL CABLES TERMINATED ON A SWITCH MUST EXIT OR ENTER THE CONDUITS ON THE WALL OPPOSITE THE SWITCH (THE WALL UNDER THE MANHOLE OPENING OR IN CONDUITS INSTALLED IN RECESSES IN THE SIDES OF THE MANHOLE.)
- #2 OR 2/0 PRIMARY CABLES AND SECONDARY CABLES UP TO 500 KCMIL MAXIMUM MAY BE PULLED IN ANY CONDUIT NOT USED OR INTENDED FOR LARGER CABLES EXCEPT AS NOTED OTHERWISE.
- INSTALL PRIMARY CABLES IN THE LOWER CONDUITS AND SECONDARY ABOVE THE PRIMARY. FOR THE PRIMARY, USE THE LOWER CONDUIT CLOSEST TO THE WALL FIRST.
- PRIMARY OR SECONDARY CABLES PULLED STRAIGHT THROUGH MUST ENTER AND EXIT THE SAME CONDUIT POSITION ON OPPOSITE ENDS.
- NEVER INSTALL CABLE OR CONNECTORS LESS THAN 1 FOOT FROM THE FLOOR.
- 4-WAY SWITCHES ARE STAINLESS STEEL AND SHALL BE BOLTED AGAINST THE WALL USING THE 30 INCH SINGLE SUPPORT LEG (STOCK NUMBER 457166). EXCEPTIONS WOULD BE WHENEVER A SWITCH CANNOT BE PLACED AGAINST A WALL BECAUSE OF CABLE TRAINING OR SPACE LIMITATIONS. IN THESE CASES 4-54 INCH LEGS (OLD STYLE), WILL BE REQUIRED.



3324

FOR ALL SIZES OF PRIMARY CABLES AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM

| | | |
|---------------------|----------------------------------|--------------------|
| ISSUE 1990 | SDG&E ELECTRIC STANDARDS | 3699.416 |
| DATE 1-1-90 | EQUIPMENT COMBINATION GUIDELINES | SUPERCEDES 3649.28 |
| APPD <i>JWT/ARW</i> | | (1-1-90) |

| SUBSTRUCTURES | MAJOR USE LIMITATION |
|---|---|
| 3322 6' X 10' X 7' MANHOLE (PRIMARY & SECONDARY) | MAXIMUM INSTALLATION CONSISTS OF 4-350 KCMIL OR LARGER THREE-PHASE PRIMARY CIRCUITS WITH NO MORE THAN TWO OF THESE CIRCUITS WITH STRAIGHT SPLICES OR 600 AMP TEE'S. ONLY ONE 2-WAY 600 AMP SWITCH IS PERMITTED. OTHER SIZES OF PRIMARY AND SECONDARIES UP TO 500 KCMIL MAXIMUM ALSO PERMITTED. NO CABLE TAPS ALLOWED. ALWAYS MAINTAIN AN UNOBSTRUCTED SPACE TO ALLOW ACCESSIBILITY TO CABLE, EQUIPMENT AND CONDUIT. SEE STANDARD 4004 FOR MINIMUM BENDING RADIUS. |

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| DATE 3-9-83 | SDG&E ELECTRIC STANDARDS | 3699 501 |
| APPD <i>JWT/ARW</i> | SUBSTRUCTURE USE AND LIMITATIONS REFERENCE SHEET | SUPERSEDES 3605 2 (3-9-83) |

| SUBSTRUCTURE | MAJOR USE LIMITATION |
|--|--|
| 3312 17"X 30"X 12" HANDHOLE-1 BODY SINGLE-PHASE ONLY (SECONDARY) | ONE BODY ALLOWS A <u>MAXIMUM</u> OF THREE CONNECTORS WITH 7 TERMINAL POSITIONS EACH. THE 7 RUNS SHALL NOT EXCEED TWO RUNS OF 3/0, PLUS WIRE PLUS STREET LIGHT RUNS. FOUR RUNS OF 1/0 THE SEVENTH TERMINAL POSITION SHOULD ONLY BE USED FOR STREET LIGHT RUNS. <u>NO 350 KCMIL OR ABOVE ALLOWED.</u> |
| 3312 17"X 30"X 24" HANDHOLE-2 BODIES SINGLE-PHASE (SECONDARY) | TWO BODIES SINGLE-PHASE ALLOWS A <u>MAXIMUM</u> OF THREE CONNECTORS WITH 7 TERMINAL POSITIONS EACH. THE 7 RUNS SHALL NOT EXCEED TWO RUNS OF 350 KCMIL, PLUS FOUR RUNS OF 3/0 PLUS STREET LIGHT RUNS. THE SEVENTH TERMINAL POSITION SHOULD ONLY BE USED FOR STREET LIGHT RUNS. |
| 3312 17"X 30"X 24" HANDHOLE-2 BODIES THREE-PHASE (SECONDARY) | TWO BODIES THREE-PHASE ALLOWS A <u>MAXIMUM</u> OF FOUR CONNECTORS WITH 7 TERMINAL POSITIONS EACH. THE 7 RUNS SHALL NOT EXCEED FIVE RUNS OF 3/0 WIRE PLUS STREET LIGHT RUNS. THE SIXTH AND SEVENTH TERMINAL POSITION SHOULD ONLY BE USED FOR STREET LIGHT RUNS. <u>NO 350 KCMIL OR ABOVE ALLOWED.</u> |

FOR FIELD MAINTENANCE ONLY

| | | |
|--|---|---|
| REVISION DATE 3-1-02 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS SUBSTRUCTURE USE AND LIMITATIONS REFERENCE SHEET | 3699.502 SUPERSEDES 3605.1 (3-1-02) |
|--|---|---|


FIELD MAINTENANCE ONLY

REVISION HISTORY:

7/13/2016: All versions prior to 2016 are superseded by their current version found inside the Overhead Construction Standard Manual.

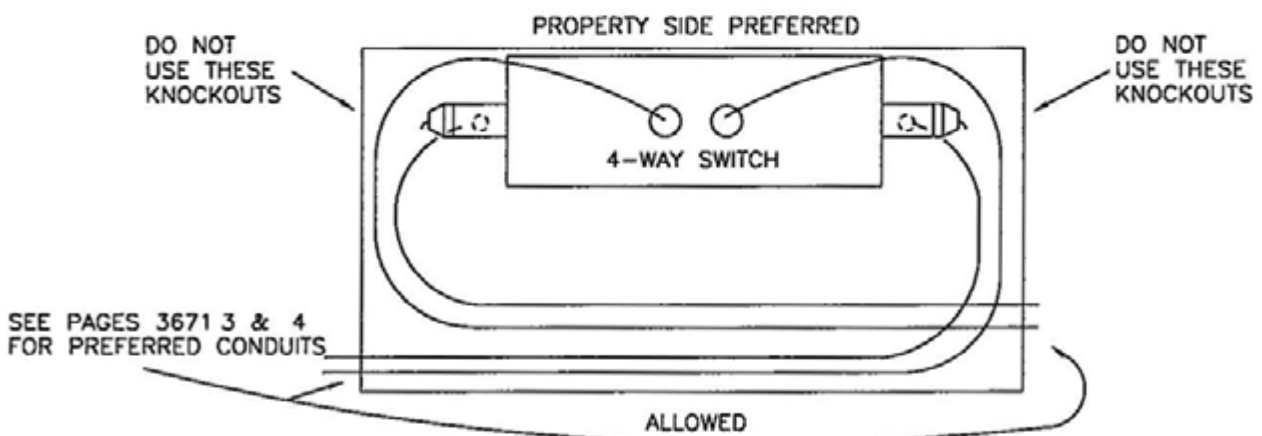
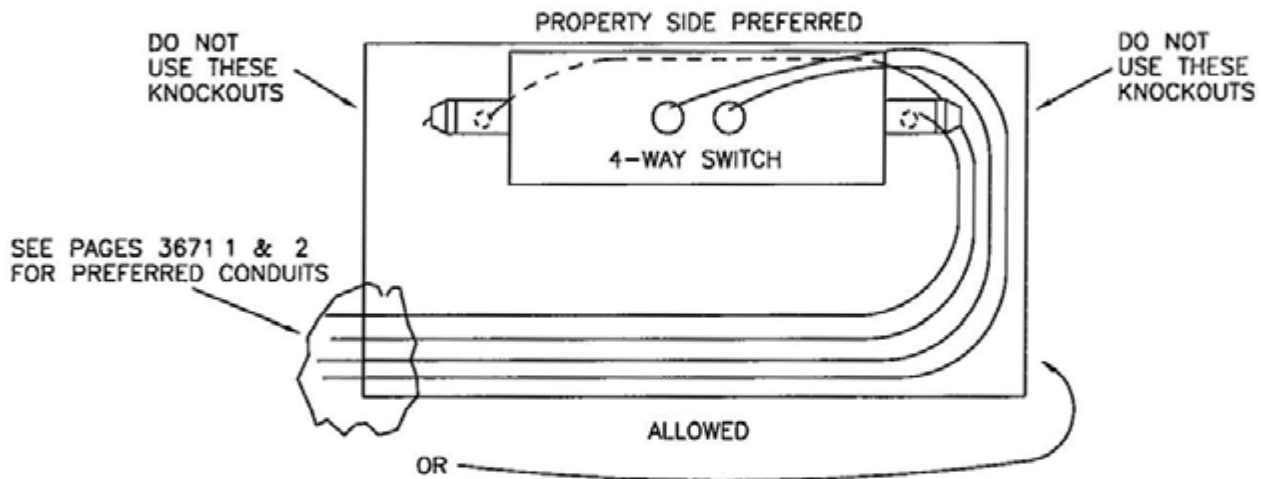
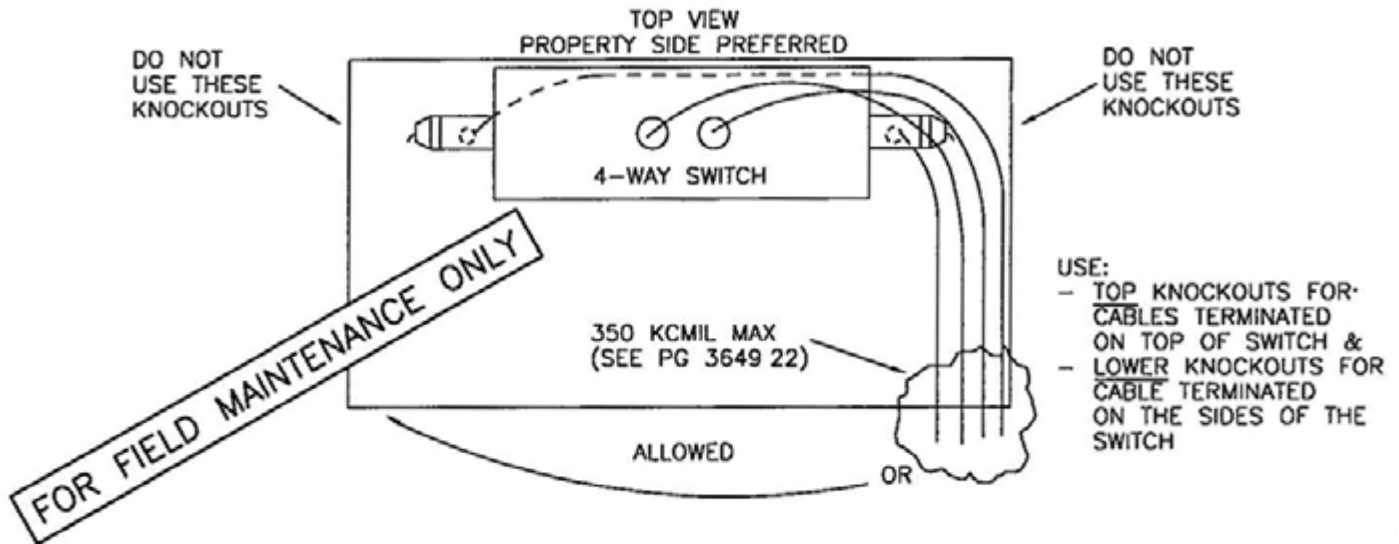
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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
|-----|----------------|----|------|------|-----------|-----|--------|----|------|------|------|
| C | | | | | | F | | | | | |
| B | | | | | | E | | | | | |
| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |

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|--------------------------------|---|--------------------|----------|---------------------|-------------------------------|
| <p>SHEET 1 OF 1</p> |  Indicates Latest Revision | Completely Revised | New Page | Information Removed | <p>FMO UG 3649</p> |
| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | EQUIPMENT COMBINATION GUIDELINES | | | | |

NOTES:

- ALL 350, 750 AND 1000 KCMIL CABLES MUST BE UNTRIPLEXED WHENEVER THEY ARE TRAINED AROUND THE CORNER (90° ANGLE) OF THE HANDHOLE SEE STANDARD 3671 FOR UNTRIPLEXING CRITERIA AND DETAILED SWITCH INSTALLATION DRAWINGS



3316 WITH SUBSURFACE/SURFACE OPERABLE SWITCH

FOR ALL SIZES OF PRIMARY AND NO SECONDARY OTHER THAN FEED TO SUMP PUMP

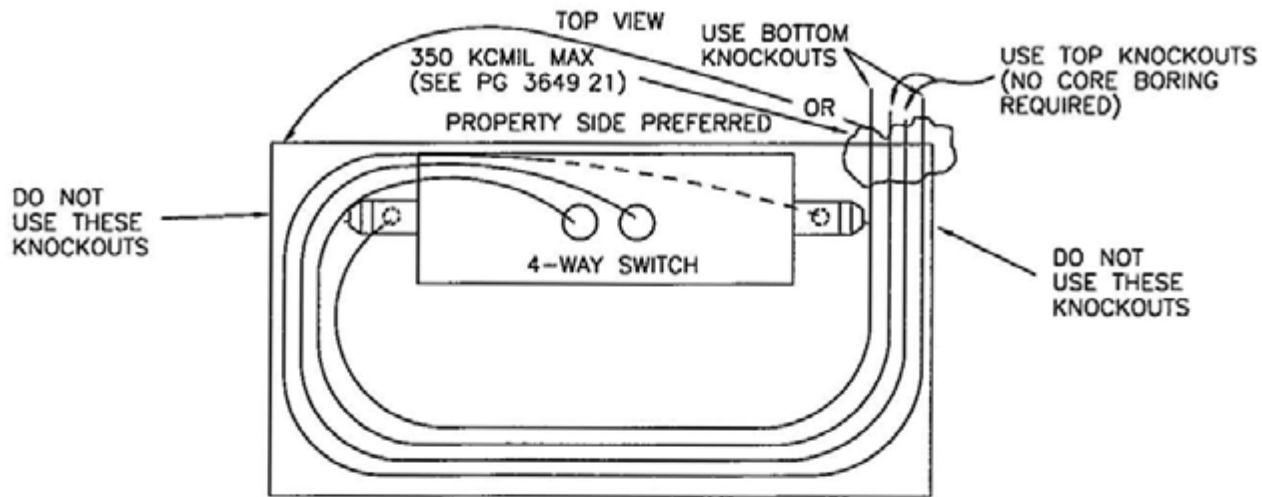
SDG&E ELECTRIC STANDARDS

EQUIPMENT COMBINATION GUIDELINES

DATE 1-1-89

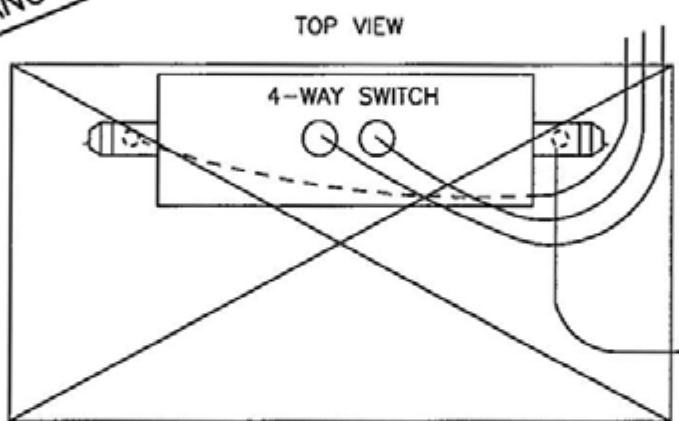
APPD *JLB/RSJ*

3699.416
SUPERSEDES
3649 24 (1-1-98)

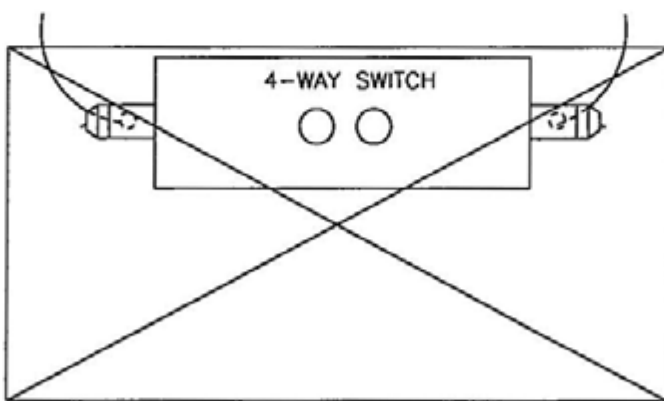


ALLOWED

FOR FIELD MAINTENANCE ONLY



NOT ALLOWED



NOT ALLOWED

3316 WITH SUBSURFACE/SURFACE OPERABLE SWITCH

FOR ALL SIZES OF PRIMARY AND NO SECONDARY OTHER THAN FEED TO SUMP PUMP

3699.417
SUPERSEDES
3649 25 (1-1-98)

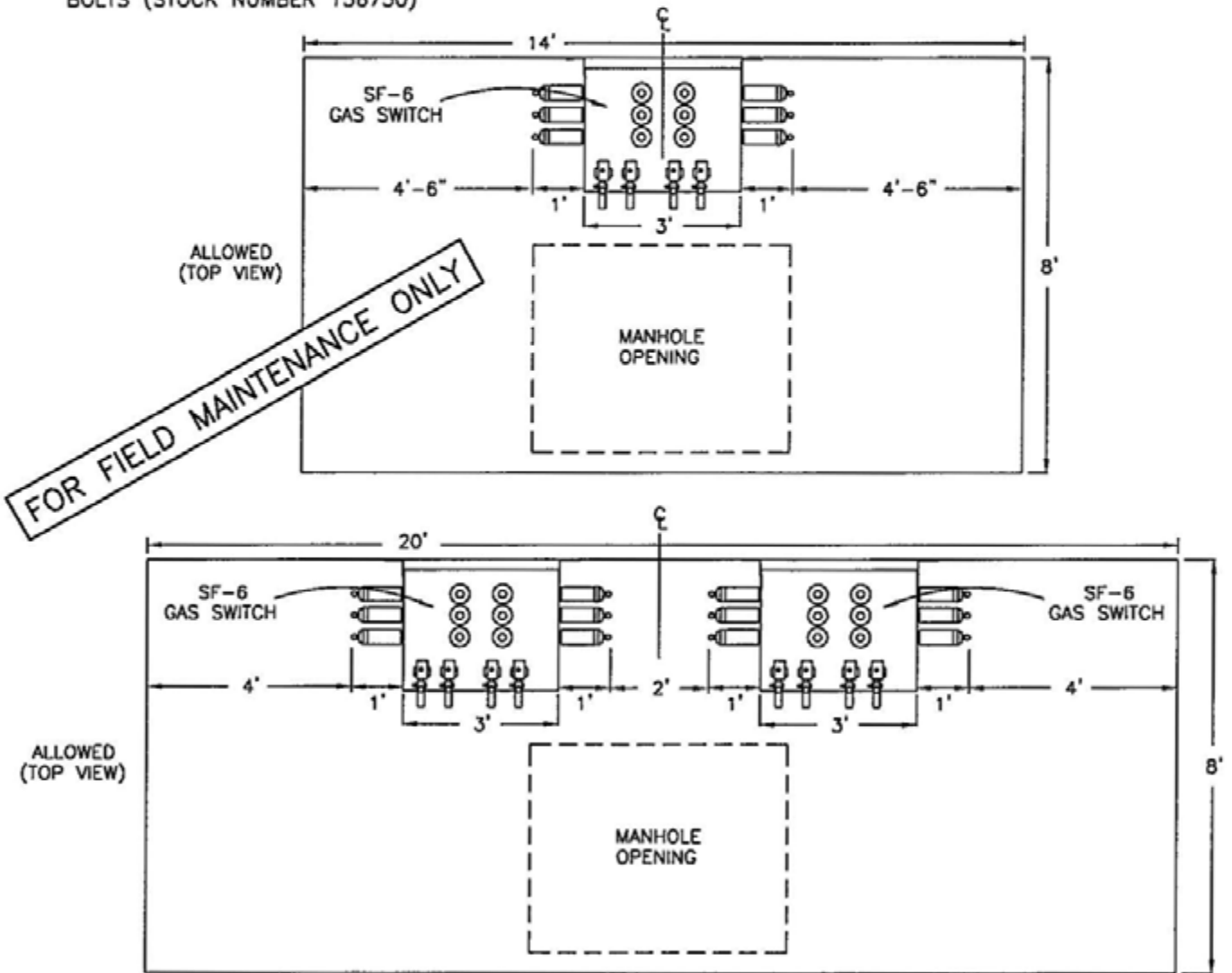
SDG&E ELECTRIC STANDARDS

EQUIPMENT COMBINATION GUIDELINES

DATE 7-31-84
APPD RES / DRH

NOTES:

- SWITCHES SHOWN ARE THE MAXIMUM ALLOWED IN THE 3325 AND 3326 MANHOLES
- PLACE SWITCHES ON WALL OPPOSITE THE MANHOLE OPENING
- ALL CABLES TERMINATED ON A SWITCH MUST EXIT OR ENTER THE CONDUITS ON THE WALL OPPOSITE THE SWITCH (THE WALL UNDER THE MANHOLE OPENING OR IN CONDUITS INSTALLED IN RECESSES IN THE SIDES OF THE MANHOLE)
- #2 OR 2/0 PRIMARY CABLES AND SECONDARY CABLES UP TO 500 KCMIL MAXIMUM MAY BE PULLED IN ANY CONDUIT NOT USED OR INTENDED FOR LARGER CABLES EXCEPT AS NOTED OTHERWISE
- INSTALL PRIMARY CABLES IN THE LOWER CONDUITS AND SECONDARY ABOVE THE PRIMARY FOR THE PRIMARY, USE THE LOWER CONDUIT CLOSEST TO THE WALL FIRST
- PRIMARY OR SECONDARY CABLES PULLED STRAIGHT THROUGH MUST ENTER AND EXIT THE SAME CONDUIT POSITION ON OPPOSITE ENDS
- NEVER INSTALL CABLE OR CONNECTORS LESS THAN 1 FOOT ABOVE THE FLOOR
- 4-WAY SWITCHES ARE STAINLESS STEEL AND SHALL BE BOLTED AGAINST THE WALL AND SUPPORTED USING 4-54 INCH STAINLESS STEEL LEGS (STOCK NUMBER 457168) AND 8 -5/8" X 3-1/2" STAINLESS STEEL BOLTS (STOCK NUMBER 156750)



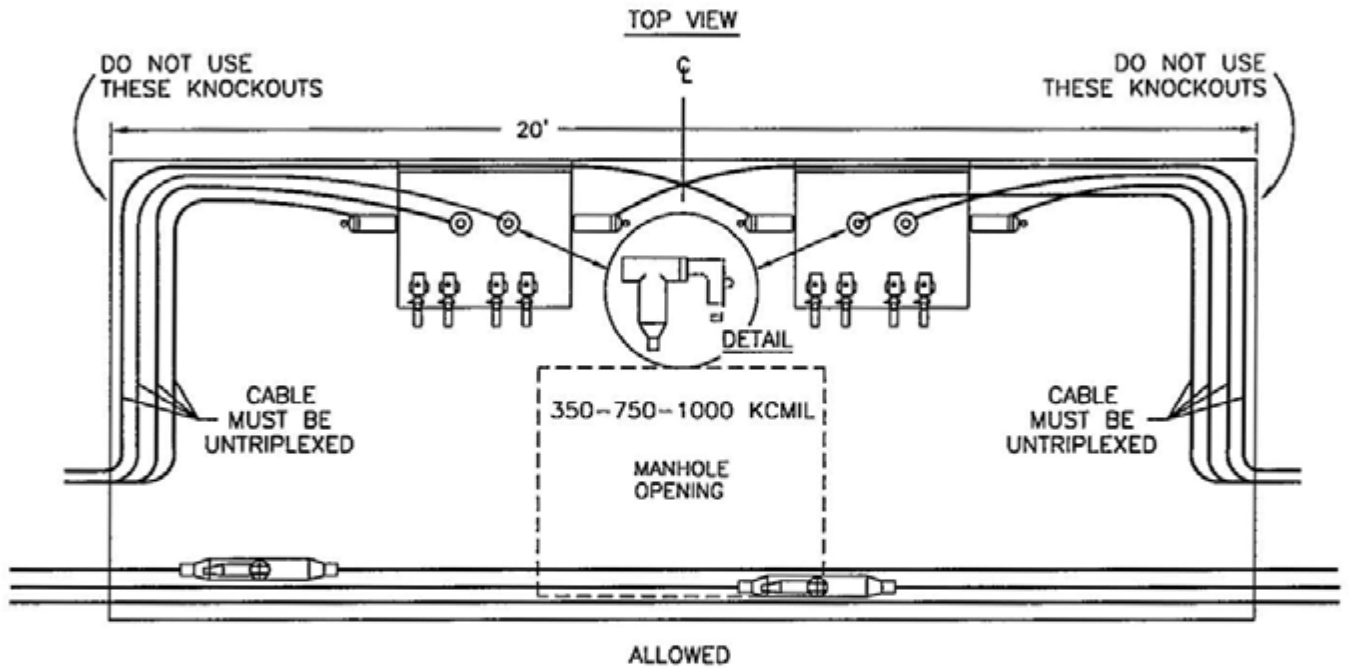
3325/3326

FOR ALL SIZES OF PRIMARY CABLES AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM

NOTES:

- WHEN CABLE ENTERS THE MANHOLE AND MAKES AN IMMEDIATE 90° BEND AS SHOWN IN THE DRAWING, IT MUST BE UNTRIPLEXED AND INSTALLED IN THE THREE OUTSIDE POSITIONS NEAREST THE END OF A OF A 4-WAY STEP (SEE DETAIL BELOW)

FOR FIELD MAINTENANCE ONLY



3699.419
SUPERSEDES
3649 29 (1-1-98)

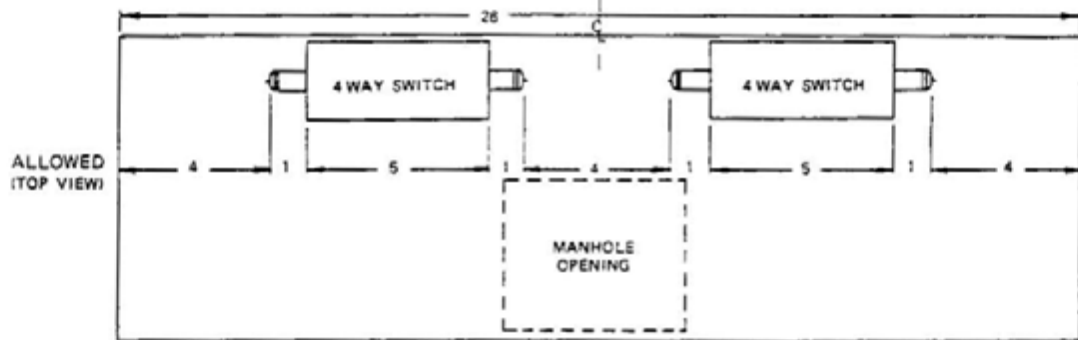
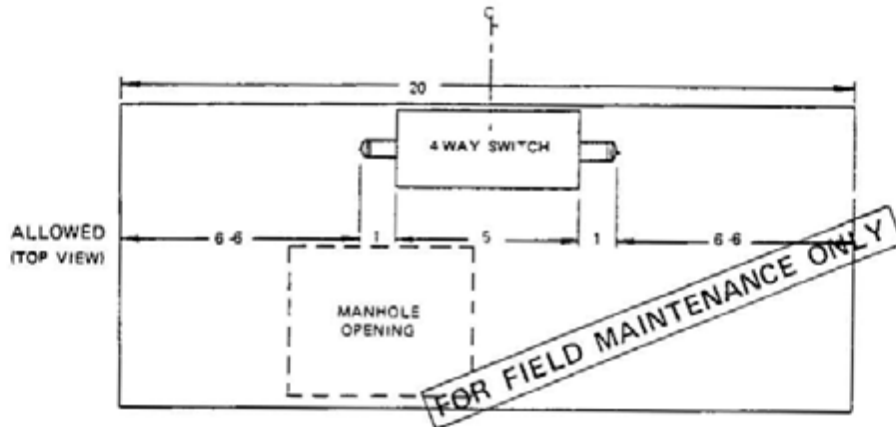
SDG&E ELECTRIC STANDARDS

EQUIPMENT COMBINATION GUIDELINES

DATE 1-1-96
APPD *[Signature]*

NOTES.

- SWITCHES SHOWN ARE THE MAXIMUM ALLOWED IN THE 3324 MANHOLE.
- PLACE SWITCHES ON WALL OPPOSITE THE MANHOLE OPENING.
- ALL CABLES TERMINATED ON A SWITCH MUST EXIT OR ENTER THE CONDUITS ON THE WALL OPPOSITE THE SWITCH (THE WALL UNDER THE MANHOLE OPENING OR IN CONDUITS INSTALLED IN RECESSES IN THE SIDES OF THE MANHOLE.)
- #2 OR 2/0 PRIMARY CABLES AND SECONDARY CABLES UP TO 500 KCMIL MAXIMUM MAY BE PULLED IN ANY CONDUIT NOT USED OR INTENDED FOR LARGER CABLES EXCEPT AS NOTED OTHERWISE.
- INSTALL PRIMARY CABLES IN THE LOWER CONDUITS AND SECONDARY ABOVE THE PRIMARY. FOR THE PRIMARY, USE THE LOWER CONDUIT CLOSEST TO THE WALL FIRST.
- PRIMARY OR SECONDARY CABLES PULLED STRAIGHT THROUGH MUST ENTER AND EXIT THE SAME CONDUIT POSITION ON OPPOSITE ENDS.
- NEVER INSTALL CABLE OR CONNECTORS LESS THAN 1 FOOT FROM THE FLOOR.
- 4-WAY SWITCHES ARE STAINLESS STEEL AND SHALL BE BOLTED AGAINST THE WALL USING THE 30 INCH SINGLE SUPPORT LEG (STOCK NUMBER 457166). EXCEPTIONS WOULD BE WHENEVER A SWITCH CANNOT BE PLACED AGAINST A WALL BECAUSE OF CABLE TRAINING OR SPACE LIMITATIONS. IN THESE CASES 4-54 INCH LEGS (OLD STYLE), WILL BE REQUIRED.



3324

FOR ALL SIZES OF PRIMARY CABLES AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM

| | | |
|---------------------|----------------------------------|--------------------|
| ISSUE 1990 | SDG&E ELECTRIC STANDARDS | 3699.416 |
| DATE 1-1-90 | EQUIPMENT COMBINATION GUIDELINES | SUPERCEDES 3649.28 |
| APPD <i>JWT/ARW</i> | | (1-1-90) |

| SUBSTRUCTURES | MAJOR USE LIMITATION |
|---|---|
| 3322 6' X 10' X 7' MANHOLE (PRIMARY & SECONDARY) | MAXIMUM INSTALLATION CONSISTS OF 4-350 KCMIL OR LARGER THREE-PHASE PRIMARY CIRCUITS WITH NO MORE THAN TWO OF THESE CIRCUITS WITH STRAIGHT SPLICES OR 600 AMP TEE'S. ONLY ONE 2-WAY 600 AMP SWITCH IS PERMITTED. OTHER SIZES OF PRIMARY AND SECONDARIES UP TO 500 KCMIL MAXIMUM ALSO PERMITTED. NO CABLE TAPS ALLOWED. ALWAYS MAINTAIN AN UNOBSTRUCTED SPACE TO ALLOW ACCESSIBILITY TO CABLE, EQUIPMENT AND CONDUIT. SEE STANDARD 4004 FOR MINIMUM BENDING RADIUS. |

FOR FIELD MAINTENANCE ONLY

| | | |
|---------------------|---|-------------------------------|
| DATE 3-9-83 | SDG&E ELECTRIC STANDARDS | 3699 501 |
| APPD <i>JWT/ARW</i> | SUBSTRUCTURE USE AND LIMITATIONS REFERENCE SHEET | SUPERSEDES 3605 2 (3-9-83) |


FIELD MAINTENANCE ONLY

REVISION HISTORY:

7/13/2016: All versions prior to 2016 are superseded by their current version found inside the Overhead Construction Standard Manual.

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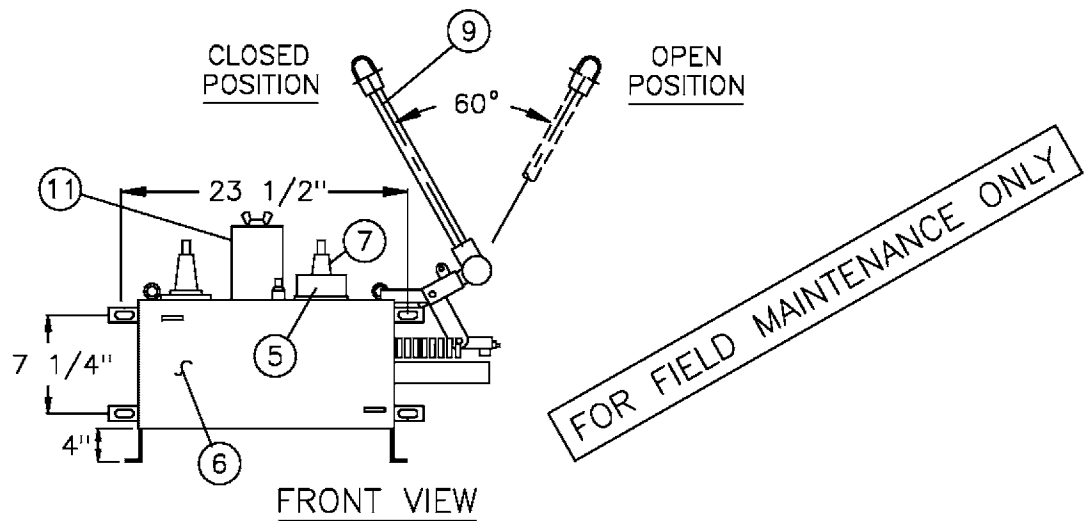
| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
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| B | | | | | | E | | | | | |
| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |

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|--------------------------------|---|--------------------|----------|---------------------|-------------------------------|
| <p>SHEET 1 OF 1</p> |  Indicates Latest Revision | Completely Revised | New Page | Information Removed | <p>FMO UG 3670</p> |
| | <p>SDG&E ELECTRIC UNDERGROUND STANDARD</p> | | | | |
| | <p>SUBSURFACE OIL SWITCH 600 AMP, 12KV, 3Ø</p> | | | | |

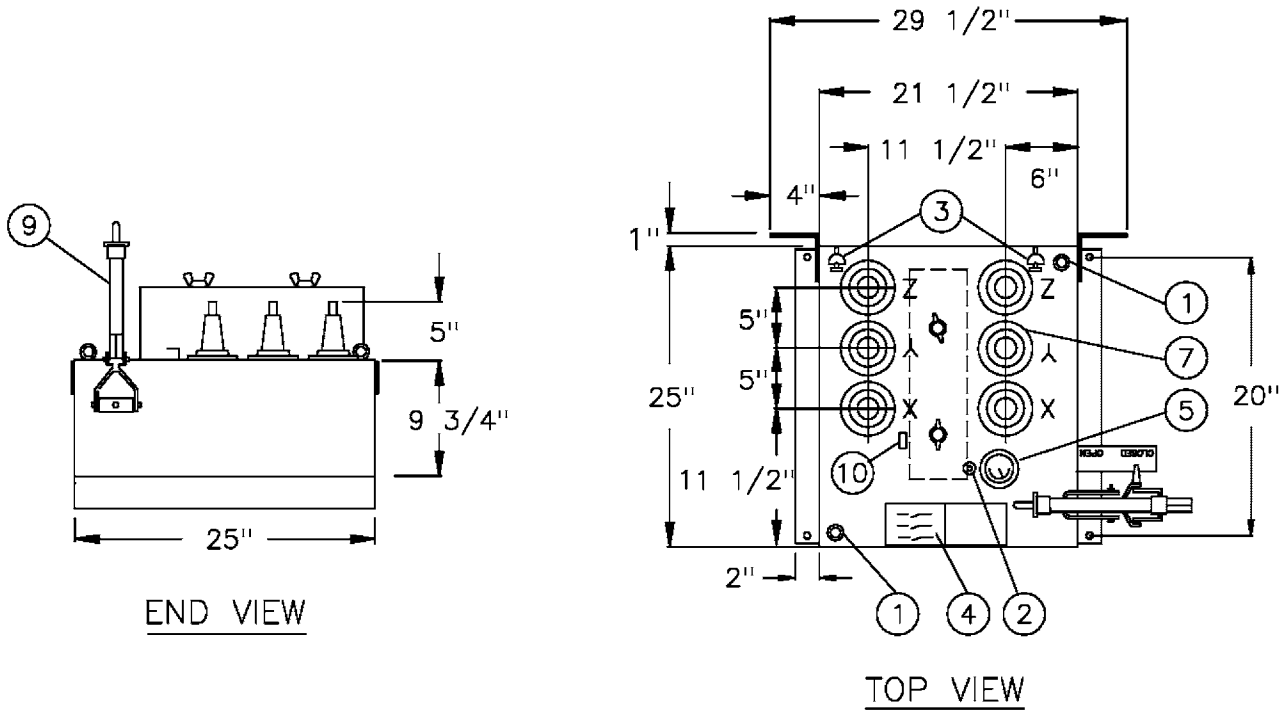
SCOPE: THIS STANDARD SHOWS A SUBSURFACE/SURFACE OPERABLE 600 AMP SF-6 GAS SWITCH.

ON-OFF SWITCH

WEIGHT: 140#



DEVIATION REQUEST IS NOT REQUIRED
FOR NEW INSTALLATION OF ON-OFF SWITCH



3699.709
SUPERSEDES
3670.1 (1-1-98)

SDG&E ELECTRIC STANDARDS

SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH
12KV, 600 AMP, THREE-PHASE

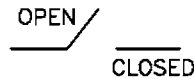
DATE 1-1-91

APPD *JLB/RD*

| ELECTRICAL RATINGS | |
|---|--------------------------|
| VOLTAGE | 15.5 KV |
| BIL | 95 KV |
| CURRENT, CONTINUOUS | 600 AMP |
| LOADMAKE AND LOADBREAK | 600 AMP |
| MOMENTARY AND FAULT CLOSE (RMS, ASYMMETRICAL) (RMS, SYMMETRICAL) | 32,000 AMP 20,000 AMP |

| | | |
|--------------------------|-------------------|---------------|
| 600 AMP | UNIT STOCK NUMBER | ASSEMBLY UNIT |
| ON-OFF (STAINLESS STEEL) | 708982 (A) (B) | SW-0/0 |

TYPICAL ONE LINE DIAGRAM



FOR FIELD MAINTENANCE ONLY

ON-OFF ONE LINE DIAGRAM

SWITCH PARTS LIST

| ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|------|-----------------------------------|------|----------------------------|
| 1 | LIFTING EYES | 6 | SWITCH TANK |
| 2 | SF-6 FILL VALVE | 7 | 600 AMP BUSHING ASSEMBLY |
| 3 | GROUND LUG | 8 | MOUNTING ANGLES |
| 4 | NAME PLATE AND CONNECTION DIAGRAM | 9 | REMOVABLE OPERATING HANDLE |
| 5 | COLOR CODED PRESSURE GAUGE | 10 | HANDLE HANGER |
| | | 11 | STAND OFF BRACKET |

NOTES:

- SWITCH MEASUREMENTS MAY VARY WITH DIFFERENT SUPPLIERS.
- SWITCHES ARE DELIVERED FROM THE SUPPLIERS WITH ALL THE PARTS LISTED IN THE PARTS LISTED.
- SWITCH NUMBERS ARE ISSUED BY THE ENGINEERING CLERK IN EACH DISTRICT.
- THE SWITCHES SHALL BE USED WITH POLYETHYLENE CABLES AND 600 AMP ELBOW TEES.

INSTALLATION:

- (A) DEVIATION REQUEST IS **NOT REQUIRED** FOR INSTALLATION OF ON-OFF SWITCH.
- (B) ON-OFF SWITCHES ARE STAINLESS STEEL AND SHALL BE BOLTED TO THE WALL.

REFERENCE:

- G. SEE STANDARD 3213 FOR SWITCH IDENTIFICATION.
- H. SEE STANDARD 3649 FOR EQUIPMENT COMBINATION GUIDELINES FOR SWITCHES IN MANHOLES.
- I. SEE STANDARD 3671 FOR SWITCH INSTALLATION IN A 3316 HANDHOLE.
- J. SEE STANDARD 4181 FOR SUBSURFACE/SURFACE OPERABLE SWITCH CONNECTIONS.
- K. SEE DESIGN STANDARD 6111 FOR SWITCH APPLICATION.

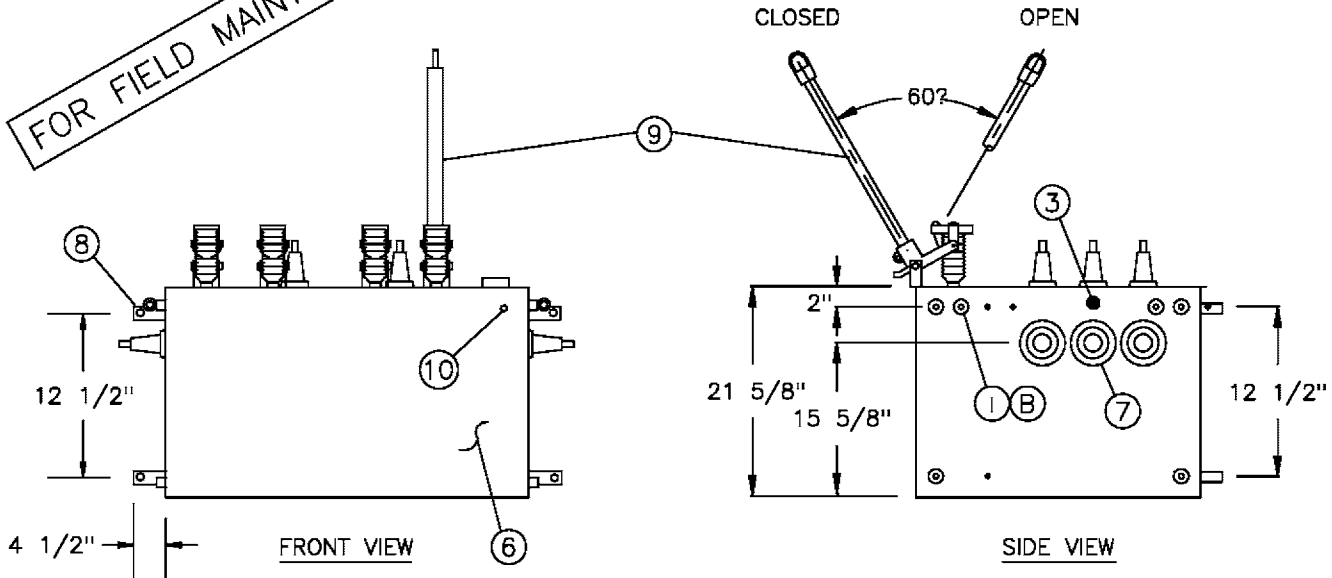
| | | |
|--|---|---|
| DATE 1-1-96 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS | 3699.710 SUPERSEDES 3670.2 (1-1-98) |
| | SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH 12KV, 600 AMP, THREE-PHASE | |

SCOPE: THIS STANDARD SHOWS A SUBSURFACE/SURFACE OPERABLE 600 AMP SF-6 GAS SWITCH.

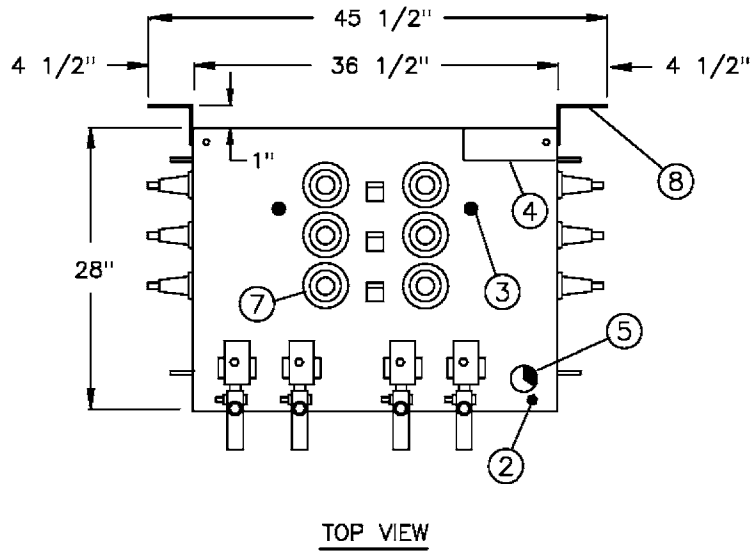
FOR FIELD MAINTENANCE ONLY

4-WAY SWITCH

WEIGHT: 350#



DEVIATION REQUEST IS REQUIRED FOR NEW INSTALLATION OF 4-WAY SWITCH

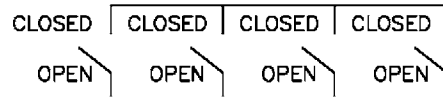


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|--|--|---|
| <p>3699.711 SUPERSEDES 3670.3 (1-1-98)</p> | <p>SDG&E ELECTRIC STANDARDS SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH 12KV, 600 AMP, THREE-PHASE</p> | <p>DATE 1-1-98 APPD <i>RW/CMK</i></p> |
|--|--|---|

| ELECTRICAL RATINGS | |
|---|--------------------------|
| VOLTAGE | 15.5 KV |
| BIL | 95 KV |
| CURRENT, CONTINUOUS | 600 AMP |
| LOADMAKE AND LOADBREAK | 600 AMP |
| MOMENTARY AND FAULT CLOSE (RMS, ASYMMETRICAL) (RMS, SYMMETRICAL) | 32,000 AMP 20,000 AMP |

| 600 AMP | UNIT STOCK NUMBER | ASSEMBLY UNIT |
|-------------------------|-------------------|---------------|
| 4-WAY (STAINLESS STEEL) | 708770 © | SW-4WY |

TYPICAL ONE LINE DIAGRAM



4-WAY ONE LINE DIAGRAM

FOR FIELD MAINTENANCE ONLY

SWITCH PARTS LIST

| ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|------|-----------------------------------|------|----------------------------|
| 1 | LIFTING EYES, REMOVABLE | 6 | SWITCH TANK |
| 2 | SF-6 FILL VALVE | 7 | 600 AMP BUSHING ASSEMBLY |
| 3 | GROUND LUG | 8 | MOUNTING ANGLES |
| 4 | NAME PLATE AND CONNECTION DIAGRAM | 9 | REMOVABLE OPERATING HANDLE |
| 5 | COLOR CODED PRESSURE GAUGE | 10 | HANDLE HANGER |

NOTES:

- SWITCH MEASUREMENTS MAY VARY WITH DIFFERENT SUPPLIERS.
- SWITCHES ARE DELIVERED FROM THE SUPPLIERS WITH ALL THE PARTS LISTED IN THE PARTS LISTED.
- SWITCH NUMBERS ARE ISSUED BY THE ENGINEERING CLERK IN EACH DISTRICT.
- THE SWITCHES SHALL BE USED WITH POLYETHYLENE CABLES AND 600 AMP ELBOW TEES.
- FOR REPLACEMENT OF AN EXISTING 18 INCH SWITCH LEG, USE STOCK NUMBER 457162.

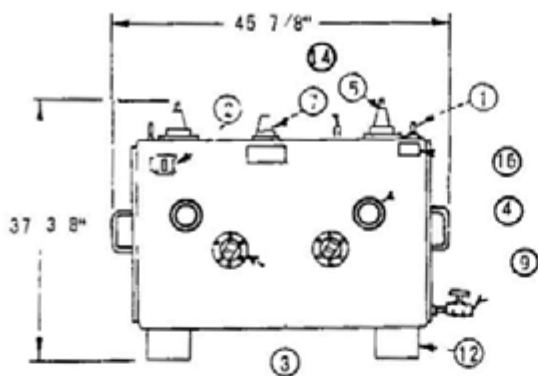
INSTALLATION:

- A. 4-WAY SWITCHES ARE STAINLESS STEEL AND SHALL BE BOLTED AGAINST THE WALL. USE THE 30 INCH STAINLESS STEEL SINGLE SUPPORT LEG (STOCK NUMBER 457166) FOR THE 3316 HANDHOLE INSTALLATION. FOR MANHOLE OR VAULT INSTALLATIONS, USE 4-54 INCH STAINLESS STEEL LEGS (STOCK NUMBER 457168), AND 8-5/8" X 3-1/2" STAINLESS STEEL BOLTS (STOCK NUMBER 156750).
- ⓑ LIFTING EYES ARE NOT STAINLESS STEEL AND SHOULD BE REMOVED AFTER THE SWITCH IS INSTALLED.
- ⓒ A DEVIATION REQUEST IS REQUIRED FOR THE NEW INSTALLATION OF A 4-WAY SWITCH. RETROFITS OF EXISTING SWITCHES DO NOT REQUIRE A DEVIATIONS REQUEST (SEE STANDARD 3005 FOR DEVIATION REQUEST FORM AND PROCEDURE).

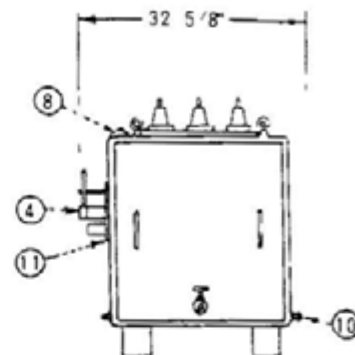
REFERENCE:

- G. SEE STANDARD 3213 FOR SWITCH IDENTIFICATION.
- H. SEE STANDARD 3649 FOR EQUIPMENT COMBINATION GUIDELINES FOR SWITCHES IN MANHOLES.
- I. SEE STANDARD 3671 FOR SWITCH INSTALLATION IN A 3316 HANDHOLE.
- J. SEE STANDARD 4181.3 FOR SUBSURFACE/SURFACE OPERABLE SWITCH CONNECTIONS.
- K. SEE DESIGN STANDARD 6111 FOR SWITCH APPLICATION.

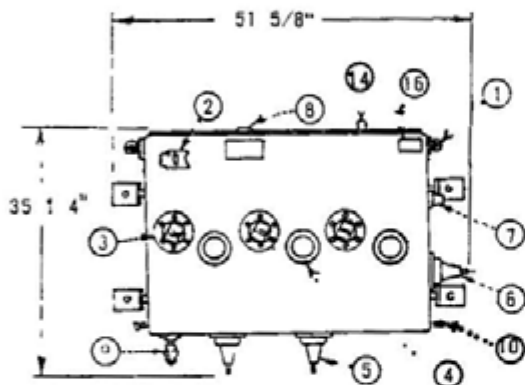
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|--|---|---|
| DATE 1-1-98 APPD <i>[Signature]</i> / CMK | SDG&E ELECTRIC STANDARDS | 3699.712 SUPERSEDES 3670.4 (1-1-98) |
| | SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH 12KV, 600 AMP, THREE-PHASE | |



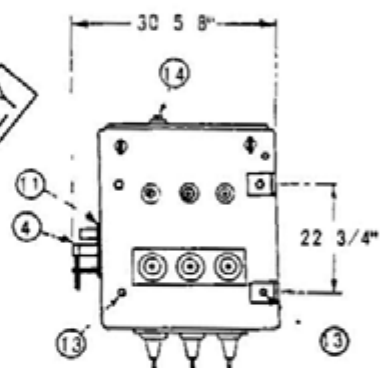
SIDE VIEW - 2 WAY
(ESCO)



END VIEW

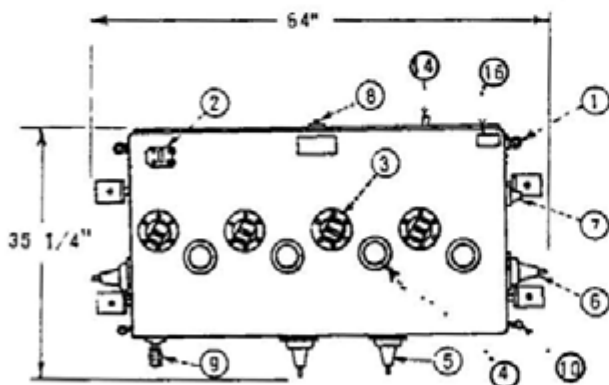


SIDE VIEW - 3 WAY
(ESCO)

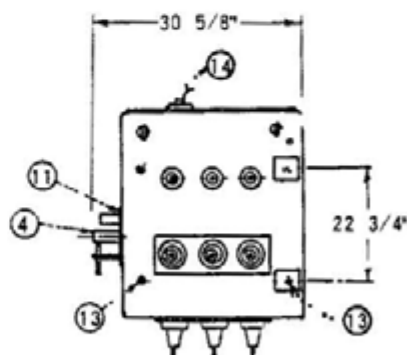


END VIEW

FOR FIELD MAINTENANCE ONLY



SIDE VIEW - 4 WAY
(ESCO)



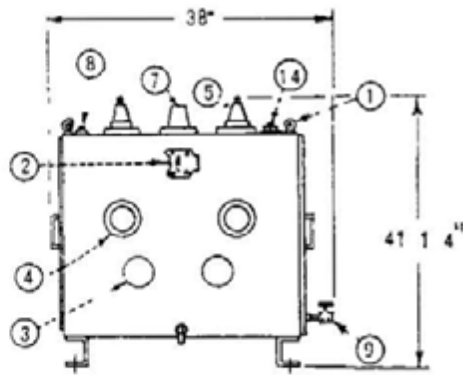
END VIEW

SDG&E ELECTRIC STANDARDS

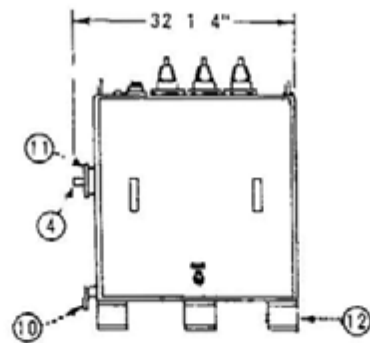
DATE 7/31/84
APPD. *RR/SRH*

SUBSURFACE OIL SWITCH
600 AMP, 12KV, 3Ø

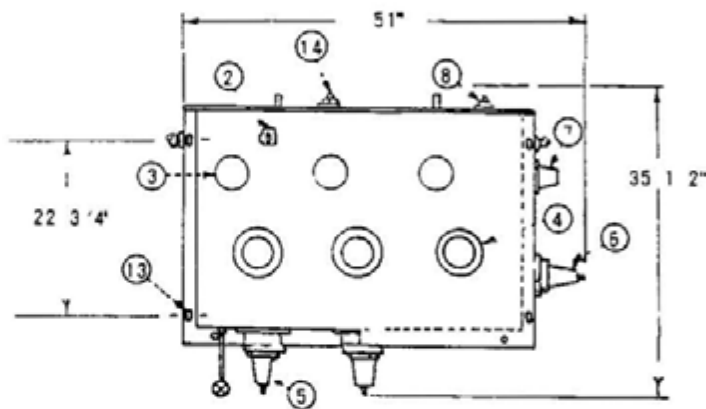
3699.701
SUPERCEDES
3670.1 (3-15-82)



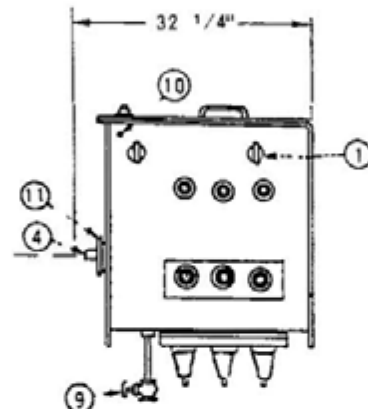
SIDE VIEW - 2 WAY
(G & W)



END VIEW

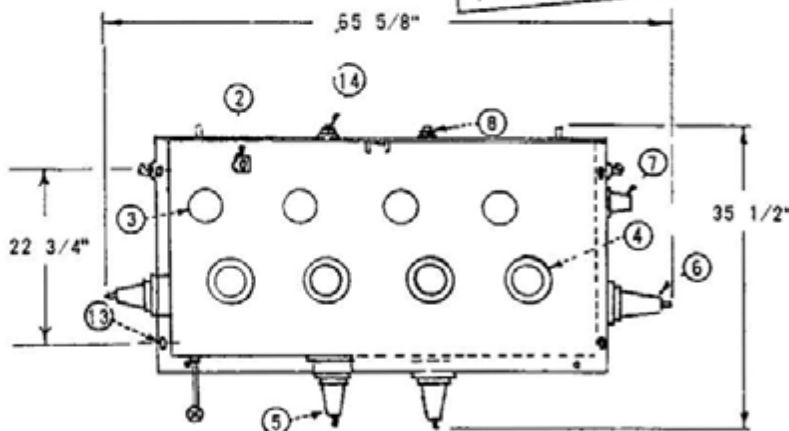


SIDE VIEW - 3 WAY
(G & W)

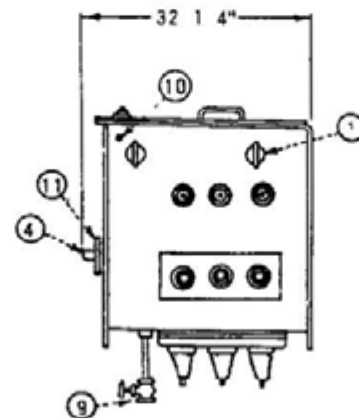


END VIEW

FOR FIELD MAINTENANCE ONLY



SIDE VIEW - 4 WAY
(G & W)



END VIEW

3699.702
SUPERCEDES
3670.2 (3-15-82)

SDG&E ELECTRIC STANDARDS

SUBSURFACE OIL SWITCH
600 AMP, 12KV, 3Ø

DATE 7/31/84
APPD. *REK* / *LSR H*

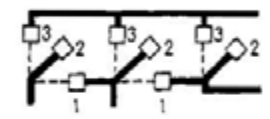
11

SWITCH POSITION

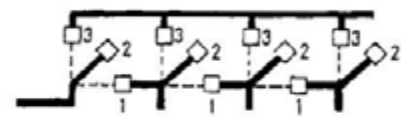
| SWITCH POSITIONS | |
|------------------|----------|
| 1 | CLOSED |
| 2 | OPEN |
| 3 | TEST (C) |

| ELECTRICAL RATINGS: | |
|--|------------|
| VOLTAGE | 15KV |
| BIL | 110KV |
| CURRENT, CONTINUOUS | 600 AMP |
| LOADMAKE AND LOADBREAK | 600 AMP |
| MOMENTARY AND FAULT CLOSE (RMS ASYMMETRICAL) | 40 000 AMP |
| (RMS, SYMMETRICAL) | 25,000 AMP |

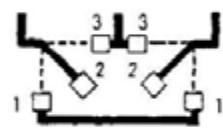
FOR FIELD MAINTENANCE ONLY



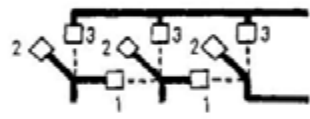
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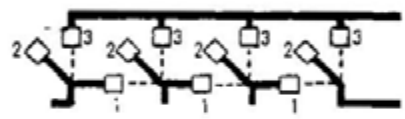
OR



2 WAY ONE LINE DIAGRAM



3 WAY ONE LINE DIAGRAM



4 WAY ONE LINE DIAGRAM

TYPICAL ONE LINE DIAGRAMS

ATTENTION:

WAY WITH OPEN CONTACTS CAN STILL BE ENERGIZED DUE TO CONNECTION TO ADJACENT WAY.

NOTES:

- A MAJOR USE SECTIONALIZING.
- B THIS SWITCH SHALL BE USED WITH POLYETHYLENE CABLES AND 600 AMPERE ELBOW T'S (4182).
- (C) 200 AMPERE TEST BUSHINGS ARE FOR TEMPORARY GROUNDING-TO MEET OSHA REQUIREMENTS-NOT FOR LOAD

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | 600 AMP | UNIT STOCK NUMBER |
|------|---|------|---|---------|-------------------|
| 1 | LIFTING EYES (REMOVABLE) | 12 | MOUNTING BRACKETS | 2 WAY | 708986 |
| 2 | OIL LEVEL GAUGE | 13 | LEG MOUNTING HOLES | 3 WAY | 708979 |
| 3 | LINK VIEWING WINDOWS | 14 | PRESSURE TEST VALVE | 4 WAY | 708977 |
| 4 | OPERATING HANDLE ASSEMBLY | 15 | OPERATING HANDLE, ANTI-REVERSIBLE (NOT SHOWN) | - | - |
| 5 | BUSHINGS (600 AMP) ESNA 600 | 16 | NAMEPLATE | - | - |
| 6 | BUSHINGS (600 AMP) ESNA 600 | | | | |
| 7 | BUSHINGS (200 AMP) GE SUREMAKE (LB) (C) | | | | |
| 8 | FILL PLUG | | | | |
| 9 | DRAIN VALVE | | | | |
| 10 | GROUND LUGS (2) | | | | |
| 11 | POSITION LABELS (SEE SWITCH POSITION TABLE) | | | | |

SDG&E ELECTRIC STANDARDS

DATE 7/31/84
APPD [Signature]

SUBSURFACE OIL SWITCH
600 AMP, 12KV, 3Ø

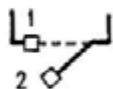
3699.703
SUPERCEDES
3670.3 (3-15-82)

| ELECTRICAL RATINGS* | |
|--|------------|
| VOLTAGE | 15KV |
| BIL | 110KV |
| CURRENT, CONTINUOUS | 600 AMP |
| LOADMAKE AND LOADBREAK | 600 AMP |
| MOMENTARY AND FAULT CLOSE (RMS ASYMMETRICAL) | 40,000 AMP |
| (RMS, SYMMETRICAL) | 25 000 AMP |

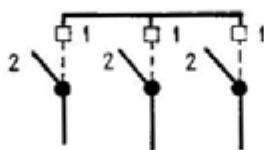
| 600 AMP | UNIT STOCK NUMBER |
|---------|-------------------|
| ON-OFF | 708982 |
| 3 WAY | 708983 |
| 4 WAY | 708984 |

SWITCH POSITION

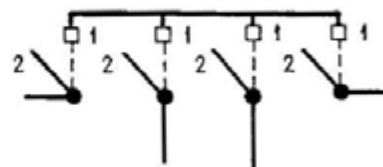
| SWITCH POSITIONS | |
|------------------|--------|
| 1 | CLOSED |
| 2 | OPEN |



ON-OFF ONE LINE DIAGRAM



3 WAY ONE LINE DIAGRAM



4 WAY ONE LINE DIAGRAM

TYPICAL ONE LINE DIAGRAMS

NOTES:

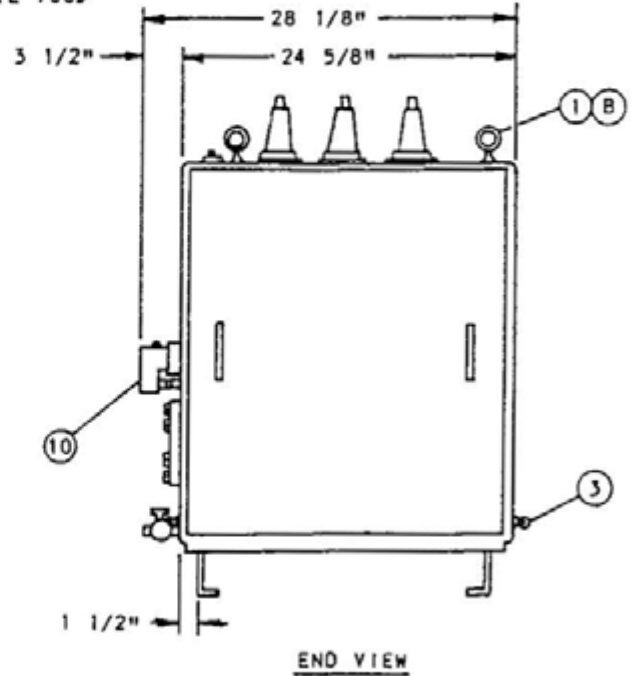
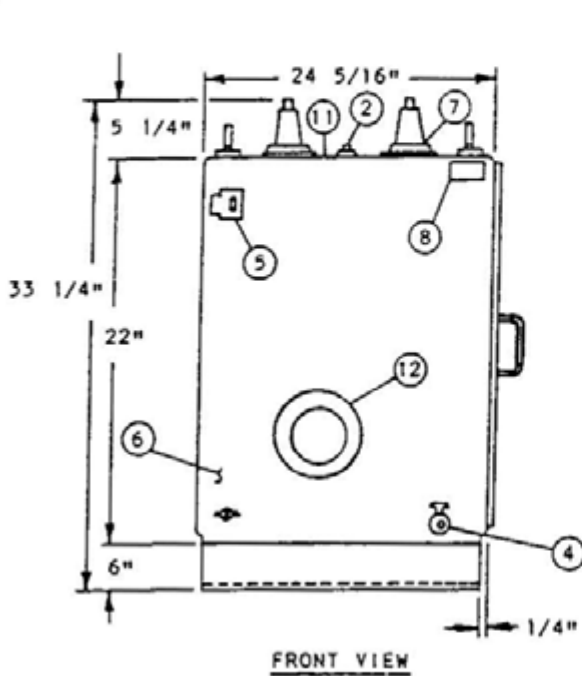
- A. THIS SWITCH SHALL BE USED WITH POLYETHYLENE CABLES AND 600 AMPERE ELBOW T'S (4182).
- B. SWITCH NUMBER TO BE ASSIGNED BY ELECTRIC DISTRIBUTION ENGINEERING.

FOR FIELD MAINTENANCE ONLY

SCOPE: THIS STANDARD SHOWS SUBSURFACE/SURFACE OPERABLE 600 AMP SWITCHES.

ON-OFF OIL SWITCH

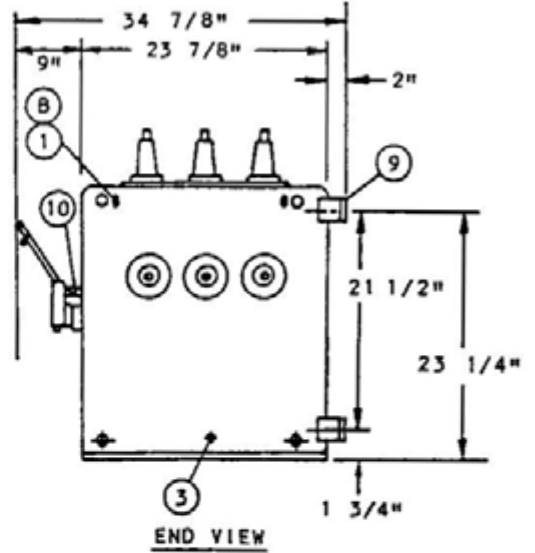
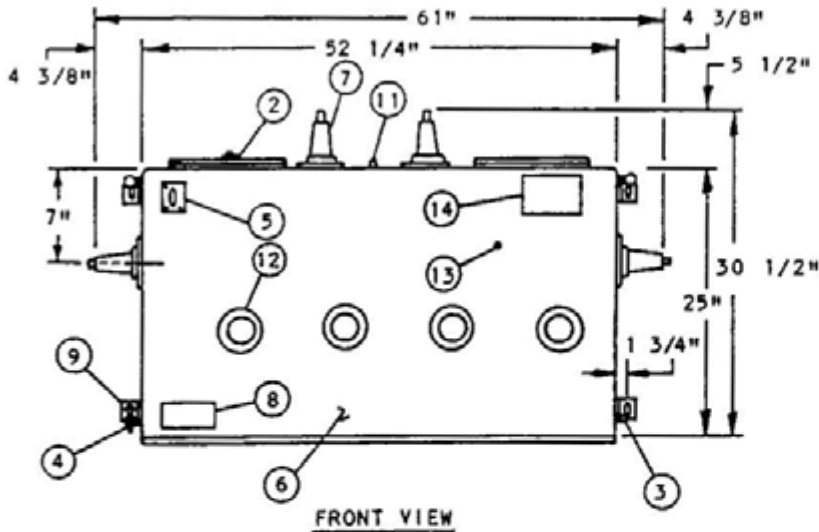
WEIGHT W/O OIL 355#
W/ OIL 700#



FOR FIELD MAINTENANCE ONLY

4-WAY OIL SWITCH

WEIGHT: W/O OIL 575#
W/ OIL 1400#



SDG&E ELECTRIC STANDARDS

DATE 1-1-90
APPD *[Signature]*

SUBSURFACE/SURFACE OPERABLE OIL SWITCH
12KV, 600 AMP, 3Ø

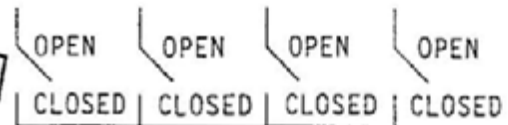
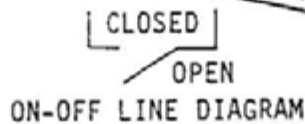
3699.705
SUPERCEDES
3670.1 (1-1-90)

| ELECTRICAL RATINGS | |
|---|------------|
| VOLTAGE | 15.0 KV |
| BIL | 110 KV |
| CURRENT, CONTINUOUS | 600 AMP |
| LOADMAKE AND LOADBREAK | 600 AMP |
| MOMENTARY AND FAULT CLOSE (RMS, ASYMMETRICAL) | 19,200 AMP |
| (RMS, SYMMETRICAL) | 12,000 AMP |

| | |
|-------------------------|-------------------|
| 600 AMP | UNIT STOCK NUMBER |
| ON-OFF | 708982 |
| 4-WAY (STAINLESS STEEL) | 708770 |

TYPICAL ONE LINE DIAGRAMS

FOR FIELD MAINTENANCE ONLY



SWITCH PARTS LIST

| ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|------|--------------------------|------|--|
| 1 | LIFTING EYES, REMOVABLE | 8 | NAME PLATE |
| 2 | FILL PLUG | 9 | MOUNTING ANGLES |
| 3 | GROUND LUG | 10 | OPERATOR HANDLE ASSEMBLY (WITH INTERNAL SPRINGS) |
| 4 | DRAIN VALVE | 11 | AIR CHECK VALVE |
| 5 | OIL LEVEL GAUGE | 12 | VIEWING WINDOW |
| 6 | SWITCH TANK | 13 | HANDLE HANGER (4-WAY SWITCH ONLY) |
| 7 | 600 AMP BUSHING ASSEMBLY | 14 | CONNECTION DIAGRAM (4-WAY SWITCH ONLY) |

NOTES:

- SWITCH MEASUREMENTS MAY VARY WITH DIFFERENT SUPPLIERS.
- SWITCHES ARE DELIVERED FROM THE SUPPLIERS WITH ALL THE PARTS LISTED IN THE PARTS LISTED.
- SWITCH NUMBERS ARE ISSUED BY THE ENGINEERING CLERK IN EACH DISTRICT.
- THE SWITCHES SHALL BE USED WITH POLYETHYLENE CABLES AND 600 AMP ELBOW TEES.
- FOR REPLACEMENT OF AN EXISTING 18 INCH SWITCH LEG, USE STOCK NUMBER 457162.

INSTALLATION:

- A. 4-WAY SWITCHES ARE STAINLESS STEEL AND SHALL BE BOLTED AGAINST THE WALL. USE THE 30 INCH STAINLESS STEEL SINGLE SUPPORT LEG (STOCK NUMBER 457166) FOR THE 3316 HANDHOLE INSTALLATION. FOR MANHOLE OR VAULT INSTALLATIONS, USE 4-54 INCH STAINLESS STEEL LEGS (STOCK NUMBER 457168), 8-5/8" X 3-1/2" STAINLESS STEEL BOLTS (STOCK NUMBER 156750(E)) AND 8 GALVANIZED WASHERS (STOCK NUMBER 800256).
- (B) LIFTING EYES ARE NOT STAINLESS STEEL AND SHOULD BE REMOVED AFTER THE SWITCH IS INSTALLED.
- C. USE THE CORBIN #27 LOCK (STOCK NUMBER 514848(E)) TO LOCK SWITCH POSITIONS.
- D. OIL SWITCHES MUST BE LEVEL. THE LEVELING REQUIREMENT IS A TOLERANCE OF 1/2 INCH FROM THE FRONT TO THE BACK OR 1/2 INCH END TO END.
- (E) EXEMPT MATERIAL.
- (F) DEVIATION REQUEST REQUIRED FOR INSTALLATION OF ON-OFF SWITCH OR 4-WAY SWITCH. (SEE STANDARD 3005 FOR DEVIATION REQUEST FORM AND PROCEDURE).

REFERENCE:

- G. SEE STANDARD 3212 FOR SWITCH IDENTIFICATION.
- H. SEE STANDARD 3649 FOR EQUIPMENT COMBINATION GUIDELINES FOR SWITCHES IN MANHOLES.
- I. SEE STANDARD 3671 FOR SWITCH INSTALLATION IN A 3316 HANDHOLE.
- J. SEE STANDARD 4181.3 FOR SUBSURFACE/SURFACE OPERABLE SWITCH CONNECTIONS.

3699.706
SUPERCEDES
3670.2 (1-1-90)

SDG&E ELECTRIC STANDARDS

SUBSURFACE/SURFACE OPERABLE OIL SWITCH
12KV, 600 AMP, 30

DATE 1-1-90

APPD *[Signature]*

FIELD MAINTENANCE ONLY

REVISION HISTORY:

7/13/2016: All versions prior to 2016 are superseded by their current version found inside the Overhead Construction Standard Manual.

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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
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| C | | | | | | F | | | | | |
| B | | | | | | E | | | | | |
| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |

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**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD

SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH
12KV, 600 AMP, 3 PHASE

**FMO
UG 3671**

SCOPE: THIS STANDARD SHOWS THE MATERIAL AND INSTALLATION REQUIREMENTS FOR INSTALLING A ON-OFF SUBSURFACE/SURFACE OPERABLE SWITCH IN A 3316 HANDHOLE.

ON-OFF SWITCH IN A 3316 HANDHOLE INSTALLATION

FIGURE 3

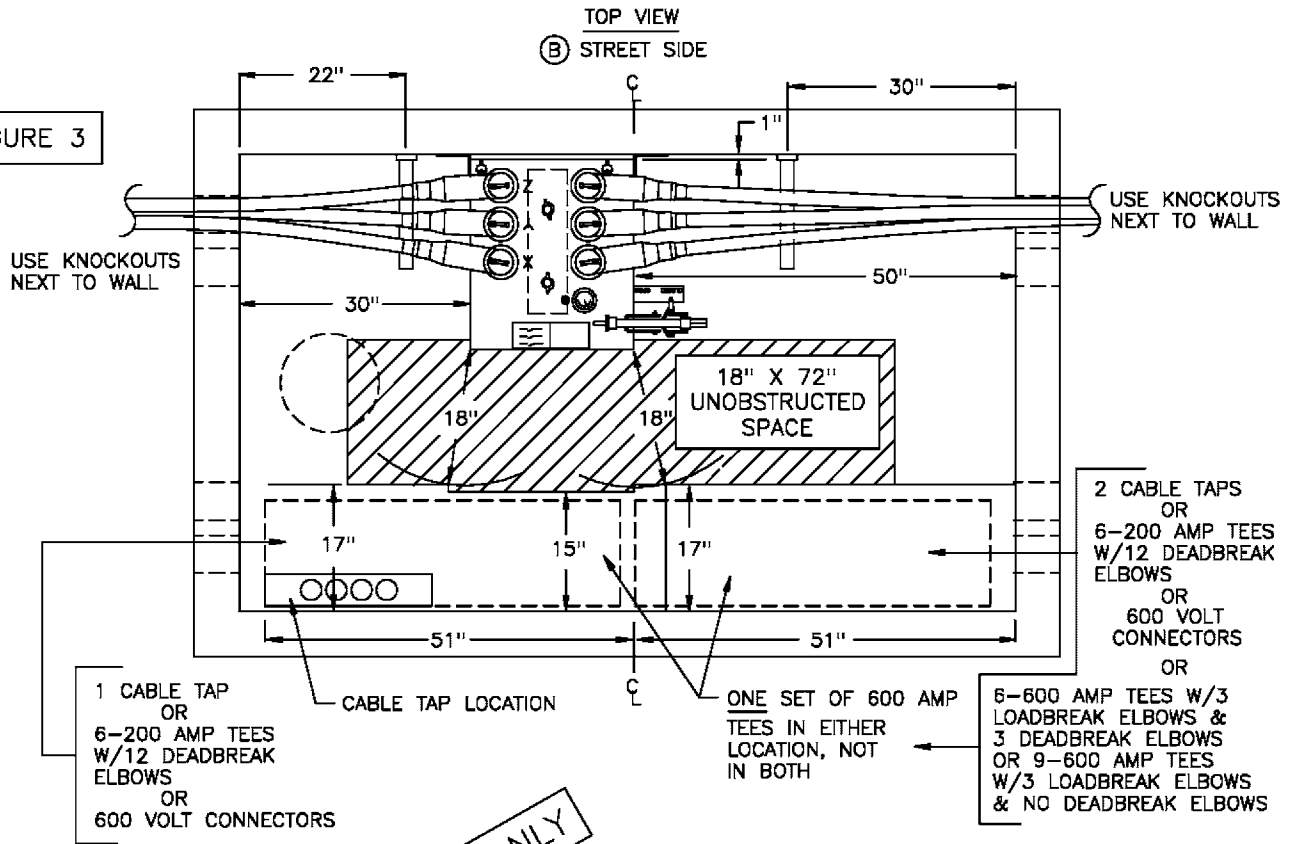
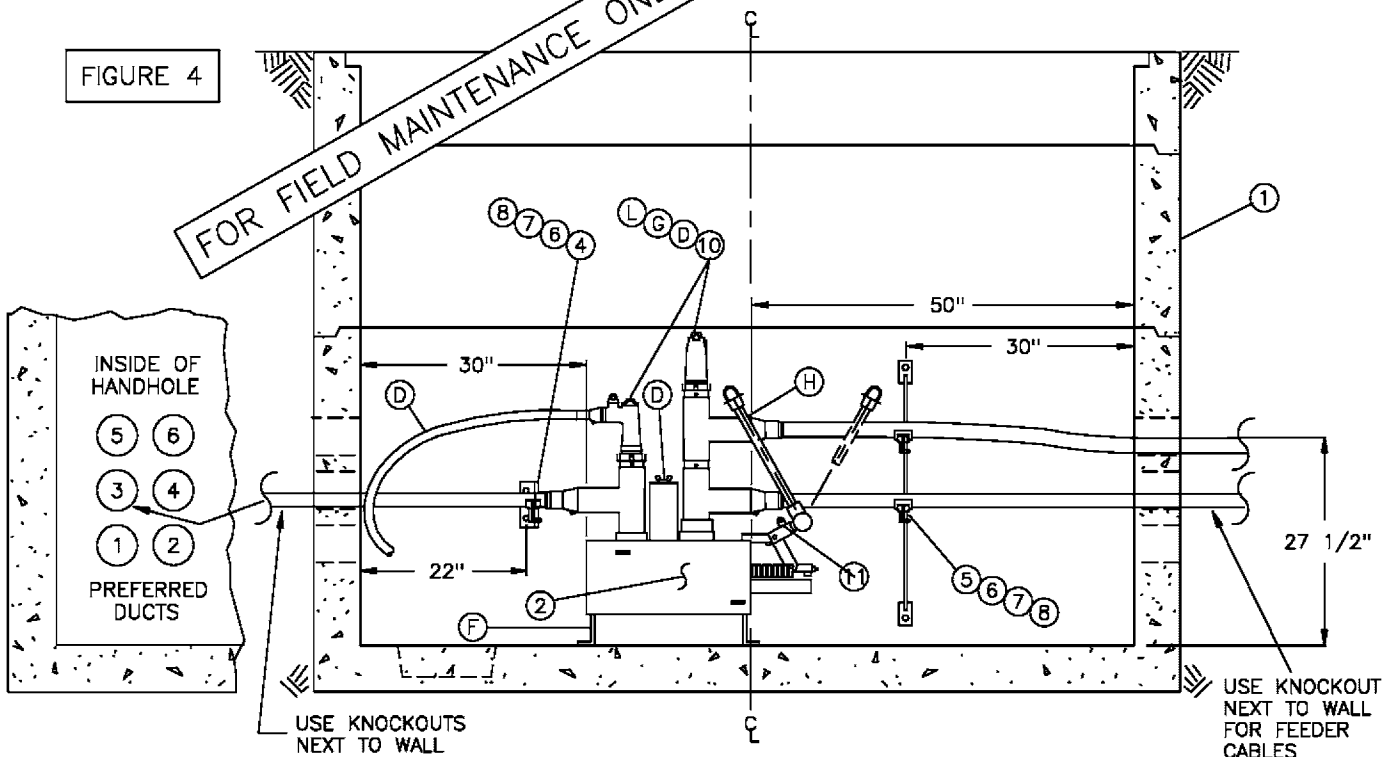


FIGURE 4



3699.713
 SUPERSEDES
 3671.1 (1-1-98)

SDG&E ELECTRIC STANDARDS

SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH
 12KV, 600 AMP, THREE-PHASE

DATE 1-1-94

APPD *JLB/ROJ*

NOTES:

- "PIGGYBACK" TEES SHOWN IN THIS STANDARD SHALL ONLY BE USED TO FEED A SWITCHED TIE POSITION.
- OTHER CONFIGURATIONS MAY BE DESIGNED PROVIDED EQUIPMENT LIMITATIONS AND THE PROPER UNOBSTRUCTED SPACE ARE PROVIDED TO ALLOW PERSONNEL TO PERFORM THEIR WORK SAFELY AND ALLOW ACCESS TO THE CONDUITS.

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD. OR PAGE NO. | STOCK NUMBER |
|------|---|----------|------------------------|--------------|
| 1 | HANDHOLE (PARKWAY OR TRAFFIC) (A) | AS REQ'D | 3316 | - |
| 2 | 12KV SUBSURFACE/SURFACE OPERABLE SWITCH, 600A, ON-OFF | 1 | 3670 | 708982 |
| 3 | PROTECTOR, CABLE U.G. | AS REQ'D | - | 558720 |
| 4 | ADAPTER, CABLE ARM | AS REQ'D | 4178 | 102016 |
| 5 | HANGER, CABLE ARM, 34"/36" | AS REQ'D | 4178 | 564480 |
| 6 | CABLE ARM, 15" (3 WAY) | AS REQ'D | 4178 | 110528 |
| 7 | CABLE INSULATOR | AS REQ'D | 4178 | 430592 |
| 8 | TIE STRAP | AS REQ'D | 4178 | 738440 |
| 9 | ANCHOR, CONCRETE STAINLESS STEEL, 1/2" X 3-3/4" | AS REQ'D | 4178 | 107654 |
| 10 | 12KV, 200A (LOADBREAK) & 600A CONNECTORS (D) | AS REQ'D | 4181 | - |
| 11 | PADLOCK, SCHLAGE ELECT SERIES | 1 | - | 514848 |
| 12 | AUTOMATIC FAULT INDICATOR (O) | AS REQ'D | 4352 | - |

FOR FIELD MAINTENANCE ONLY

INSTALLATION:

- (A) A STANDARD 3316 HANDHOLE IS REQUIRED FOR THE ON-OFF SWITCH. THE NUMBER OF CABLES AND CONNECTORS REQUIRED WILL DETERMINE WHICH HANDHOLE TO USE.
- (B) THE SWITCH BOLTED TO THE STREET SIDE WALL IS PREFERRED. THIS ALLOWS CABLE TAPS TO BE OPERATED FROM THE STREET OR SIDEWALK SIDE.
- C. INSTALL CABLE AND CABLE SUPPORTS, ETC. IN THE HANDHOLE AND ON THE SWITCH AS SHOWN IN THE INSTALLATION DRAWINGS.
- (D) ON THE 200 AMP CABLE, LOOP THE HOLE LEAVING ENOUGH SLACK TO REACH BOTH SETS OF 600 AMP TEES. A STAND OFF BAR, STOCK NUMBER 677240 WILL BE REQUIRED TO ATTACH TO THE STAND OFF BRACKET WHEN TEMPORARLY LANDING LOADBREAK ELBOWS. ALL 200 AMP CONNECTORS ON THE SWITCH SHALL BE LOADBREAK.
- (F) LEVELING OF THE SF-6 GAS SWITCH IS NOT REQUIRED. DO NOT INSTALL SWITCH ANY HIGHER OFF THE FLOOR THAN SHOWN IN THE INSTALLATION DRAWING DUE TO CABLE ARRANGEMENT.
- (G) DO NOT INSTALL LOADBREAK ELBOWS ON PIGGYBACK TEES FOR A PERMANENT INSTALLATION.
- (H) THE REMOVABLE OPERATING HANDLE IS TO REMAIN PERMANENTLY ATTACHED TO THE SWITCH.

REFERENCE:

- I. SEE STANDARD 3200 FOR SWITCH IDENTIFICATION NUMBERS AND CABLE ID TAGS.
- J. SEE STANDARD 3670 FOR SUBSURFACE SWITCH.
- K. SEE PAGE 3374.3 FOR CONDUIT INSTALLATION PRACTICES.
- (L) SEE STANDARD 4181 FOR 12KV 200 AND 600 AMP CONNECTOR ASSEMBLIES.
- M. SEE STANDARD 4530 FOR NEUTRAL AND GROUND WIRE DIAGRAM.
- N. SEE DESIGN STANDARD 6111 FOR SWITCH APPLICATION.
- (O) SEE DESIGN STANDARD 6113 FOR AUTOMATIC FAULT INDICATOR APPLICATION.

| | | |
|------------------------------------|---|---|
| DATE 1-1-94 APPD <i>JLB/ROJ</i> | SDG&E ELECTRIC STANDARDS SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH 12KV, 600 AMP, THREE-PHASE | 3699.714 SUPERSEDES 3671.2 (1-1-98) |
|------------------------------------|---|---|

SCOPE: THIS STANDARD SHOWS THE MATERIAL AND INSTALLATION REQUIREMENTS FOR INSTALLING A 4-WAY SUBSURFACE/SURFACE OPERABLE SWITCH IN A 3316 HANDHOLE.

DEVIATION REQUEST IS REQUIRED FOR NEW INSTALLATION OF 4-WAY SWITCH
TYPICAL INSTALLATION DRAWINGS

IN A 3316 HANDHOLE

ALL FOUR FEEDERS FROM ONE DIRECTION (FIGURES 1, 2 & 3)

FIGURE 1

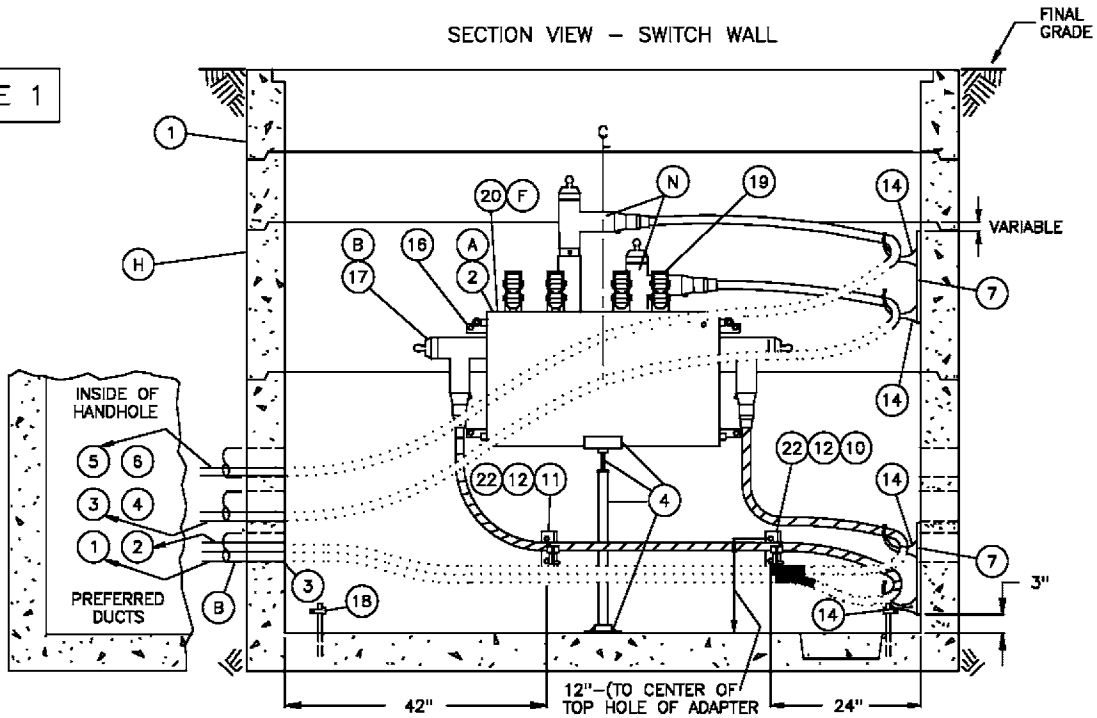
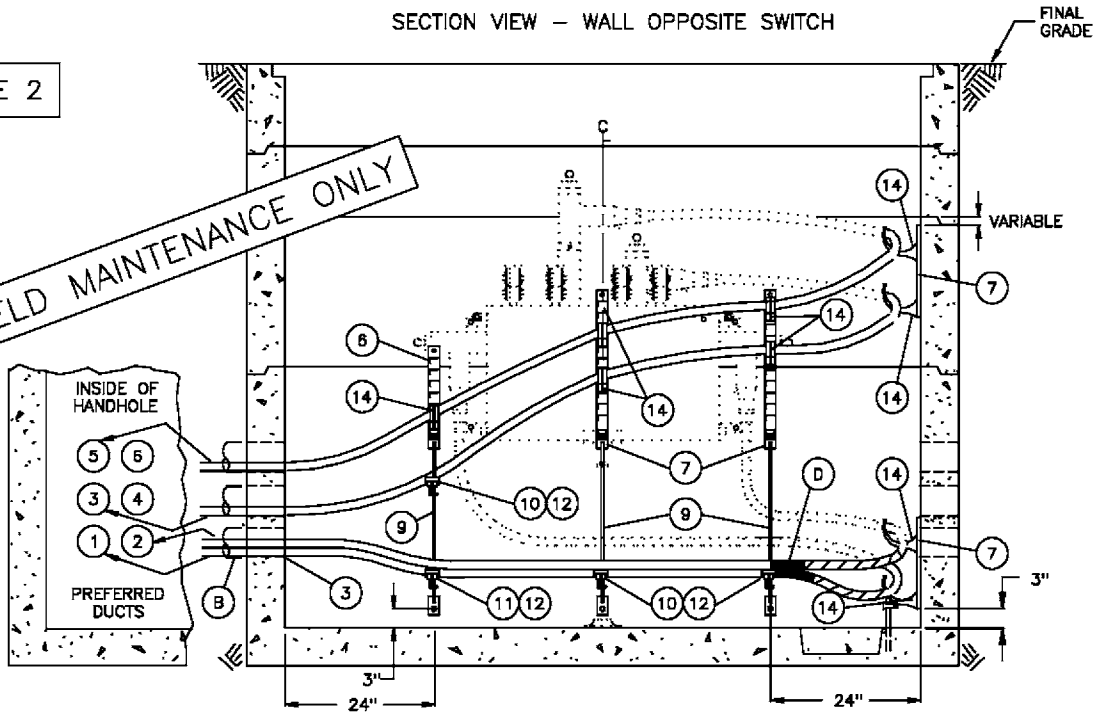


FIGURE 2

FOR FIELD MAINTENANCE ONLY

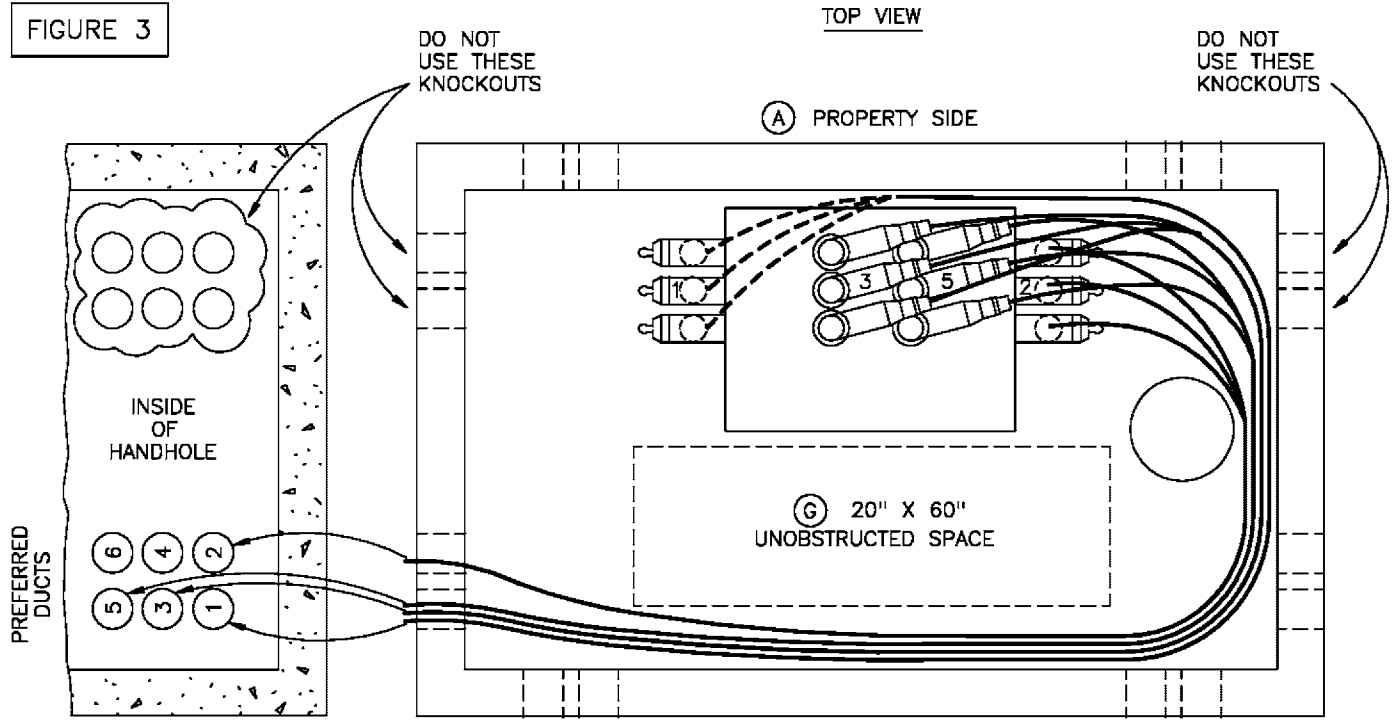


3699.715
 SUPERSEDES
 3671.3 (1-1-98)

SDG&E ELECTRIC STANDARDS
 INSTALLATION OF SUBSURFACE/SURFACE OPERABLE SWITCH
 IN A 3316 HANDHOLE

DATE 1-1-94
 APPD *[Signature]*

FIGURE 3



FOR FIELD MAINTENANCE ONLY

DATE 7-31-84
APPD *JLB/ROJ*

SDG&E ELECTRIC STANDARDS

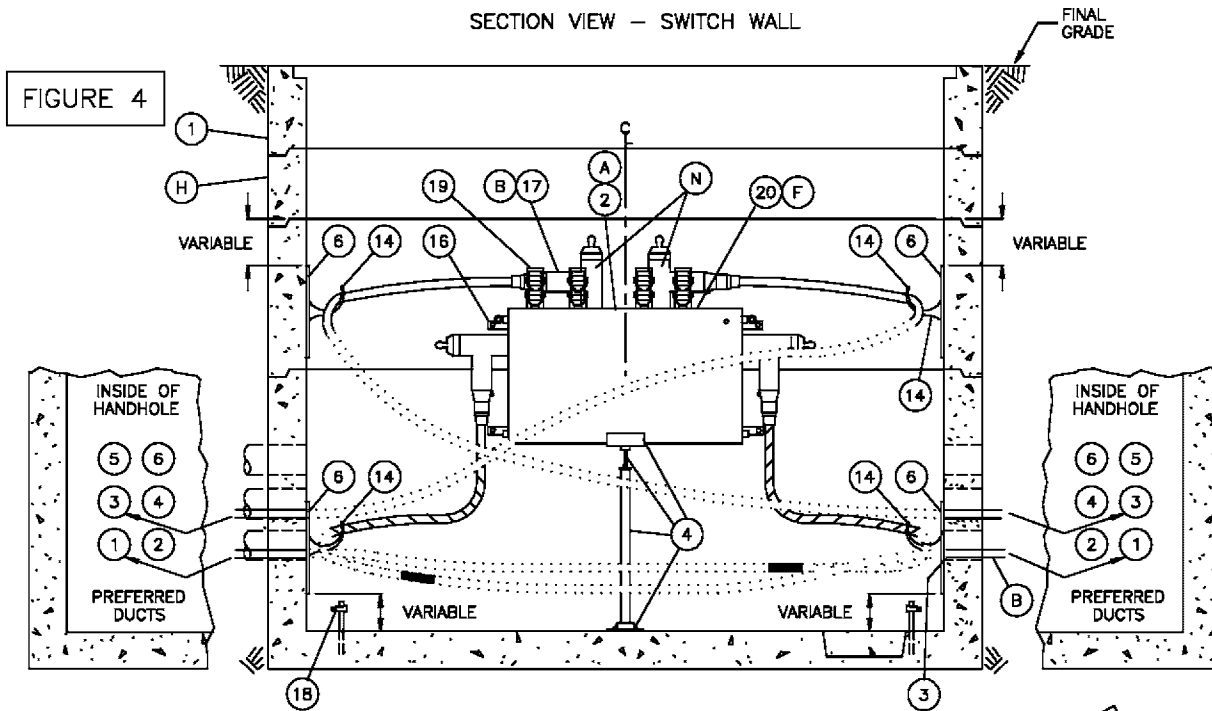
INSTALLATION OF SUBSURFACE/SURFACE OPERABLE
SWITCH IN A 3316 HANDHOLE

3699.716
SUPERSEDES
3671.4 (1-1-98)

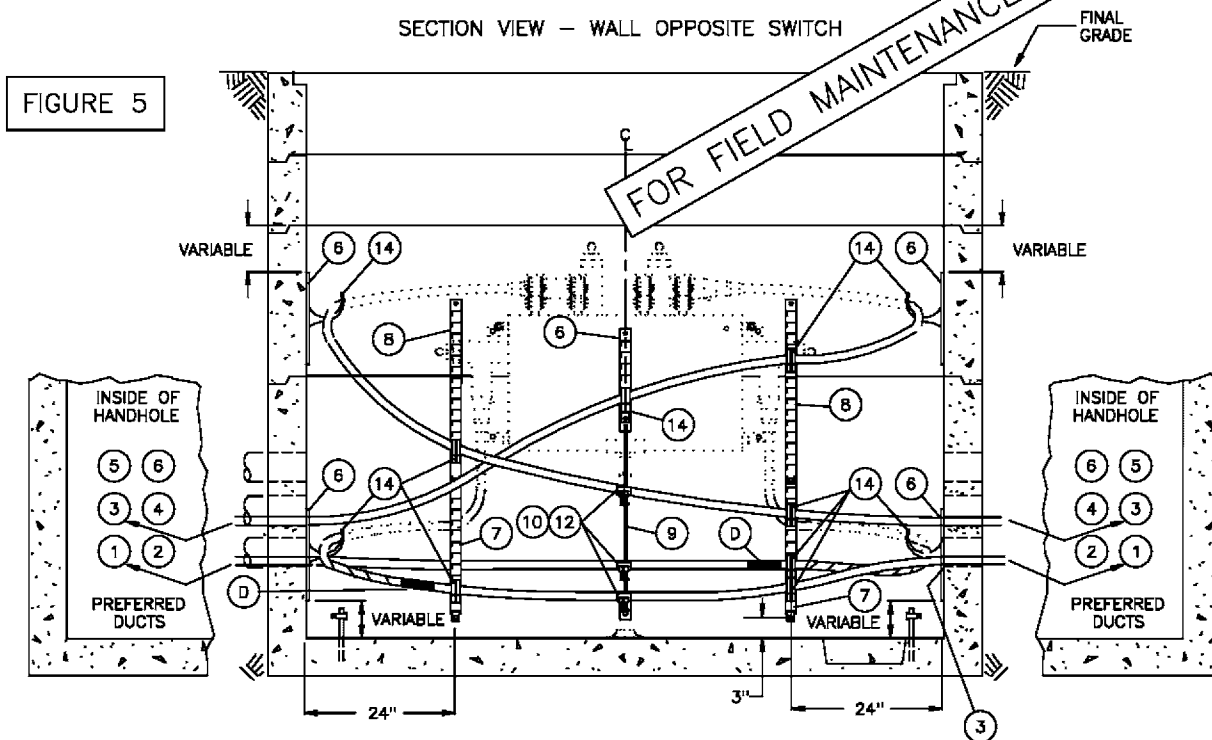
TYPICAL INSTALLATION DRAWINGS

SUBSURFACE/SURFACE OPERABLE SWITCH IN A 3316 HANDHOLE FOUR FEEDERS TWO FROM TWO DIRECTIONS (FIGURES 4, 5, & 6)

SECTION VIEW - SWITCH WALL



SECTION VIEW - WALL OPPOSITE SWITCH



3699.717
SUPERSEDES
3671.5 (1-1-98)

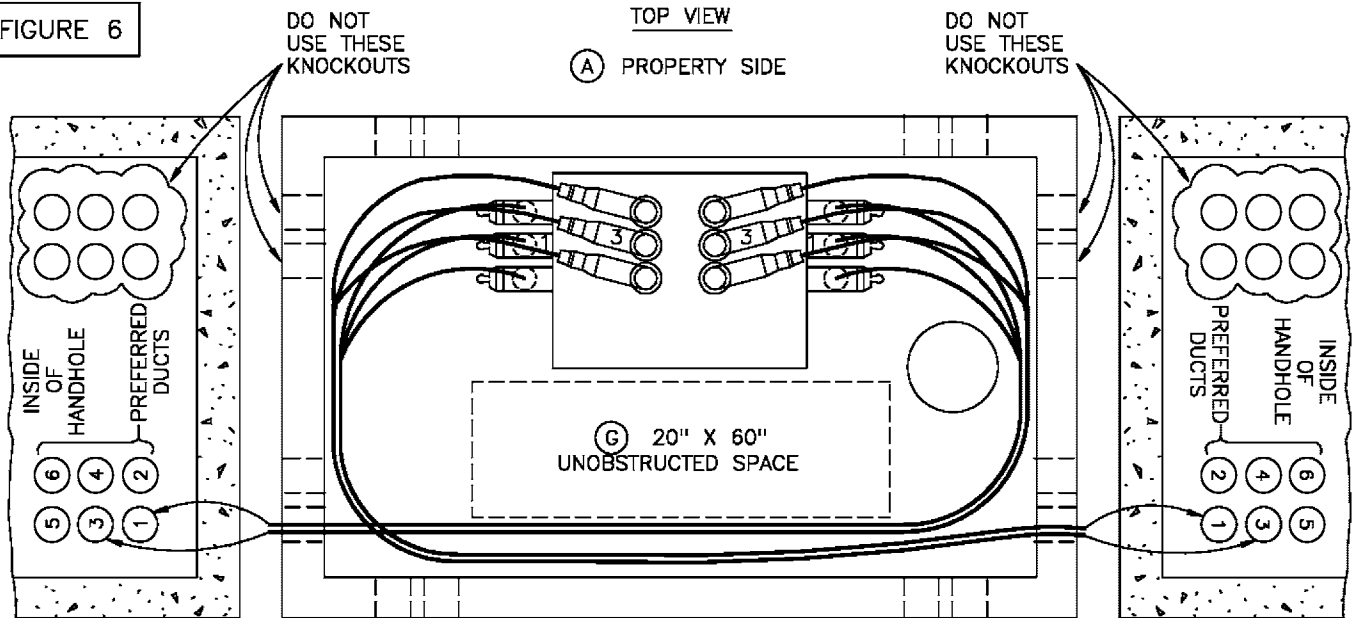
SDG&E ELECTRIC STANDARDS

INSTALLATION OF SUBSURFACE/SURFACE OPERABLE SWITCH
IN A 3316 HANDHOLE

DATE 1-1-90

APPD *J. B. ROY*

FIGURE 6



NOTES:

- OTHER CONFIGURATIONS MAY BE DESIGNED PROVIDED EQUIPMENT LIMITATIONS AND THE PROPER UNOBSTRUCTED SPACE ARE PROVIDED TO ALLOW PERSONNEL TO PERFORM THEIR WORK SAFELY AND ALLOW ACCESS TO THE CONDUITS.
- FOR REPLACEMENT OF AN EXISTING 18 INCH SWITCH LEG, USE (STOCK NUMBER 457162).

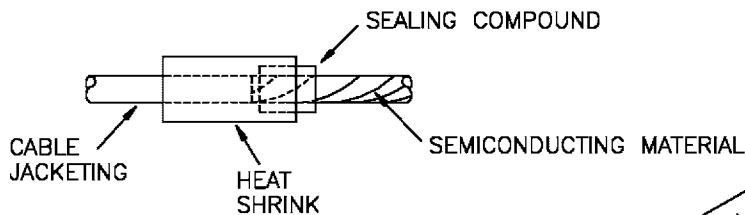
BILL OF MATERIAL: (FOR FIGURES 1 THROUGH 6)

| ITEM | DESCRIPTION | QUANTITY | CONST. STD. OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNIT |
|------|--|----------|-------------------------|--------------|---------------|
| 1 | HANDHOLE, 5' X 8'-6" (PARKWAY OR TRAFFIC COVER) | 1 (H) | 3316 (H) | - | - |
| 2 | 12KV SUBSURFACE/SURFACE OPERABLE SWITCH, 600A, 4-WAY | 1 | 3670 | 708770 | SW-4WY |
| 3 | PROTECTOR, CABLE U.G. | 1 | - | 558720 | - |
| 4 | SWITCH LEG, 1-1/2", 30" | 1 | - | 457166 | - |
| | SWITCH LEG HARDWARE | AS REQ'D | - | | |
| 5 | AUTOMATIC FAULT INDICATOR | AS REQ'D | 4352 | - | - |
| 6 | HANGER, 15" | AS REQ'D | 4178 | 564512 | - |
| 7 | HANGER, 24" | AS REQ'D | 4178 | 564544 | - |
| 8 | HANGER, 30" | AS REQ'D | 4178 | 564576 | - |
| 9 | HANGER, CABLE ARM, 34"/36" | AS REQ'D | 4178 | 564480 | - |
| 10 | CABLE ARM, 10" (2 WAY) | AS REQ'D | 4178 | 110496 | - |
| 11 | CABLE ARM, 15" (3 WAY) | AS REQ'D | 4178 | 110528 | - |
| 12 | CABLE INSULATOR | AS REQ'D | 4178 | 430592 | - |
| 14 | CABLE HOOKS, 6" | AS REQ'D | 4178 | 415112 | - |
| 15 | TIE STRAP | AS REQ'D | 4178 | 738440 | - |
| 16 | ANCHOR, CONCRETE STAINLESS STEEL, 1/2" X 3-3/4" | AS REQ'D | 4178 | 107654 | - |
| 17 | 12KV, 200A AND 600A CONNECTORS | AS REQ'D | 4181 | - | - |
| 18 | CLAMPS, GROUND ROD | AS REQ'D | - | 230016 | - |
| 19 | PADLOCK, SCHLAGE ELECT SERIES | AS REQ'D | - | 514848 | - |
| 20 | DECALS | AS REQ'D | 3212 | - | - |
| 21 | INHIBITOR (NOT SHOWN) | AS REQ'D | - | 247200 | - |
| 22 | ADAPTER FOR CABLE ARMS | AS REQ'D | 4178 | 102016 | - |
| 23 | CONNECTOR, COMPRESSION | AS REQ'D | 4172 | - | - |

FOR FIELD MAINTENANCE ONLY

INSTALLATION:

- (A) BOLT THE SWITCH TO THE WALL (PROPERTY SIDE IS PREFERRED). OIL SWITCH LEVELING REQUIREMENT IS A TOLERANCE OF 1/2 INCH FROM THE FRONT TO THE BACK OR 1/2 INCH END TO END. LEVELING OF THE SF-6 GAS SWITCH IS NOT REQUIRED. INSTALL THE SWITCH LEG USING THE MEASUREMENTS SHOWN IN THE DRAWING.
- (B) NO SECONDARY ALLOWED IN THIS INSTALLATION OTHER THAN THE FEED TO THE SUMP PUMP. THE ONLY 200 AMP AND 600 AMP CABLE ALLOWED IN THIS INSTALLATION IS CABLE TERMINATED ONTO THE SWITCH. THE 200 AMP CABLES MAY BE PULLED IN ANY CONDUIT OTHER THAN THOSE DESIGNATED (DO NOT USE) OR THE ONES USED FOR 600 AMP CABLES. DO NOT TERMINATE #2 OR 2/0 ONTO A BUSHING REQUIRING A BUSHING EXTENSION DUE TO HANDHOLE COVER CLEARANCE.
- C. INSTALL CABLE AND CABLE SUPPORTS, ETC. IN THE HANDHOLE AND ON THE SWITCH AS SHOWN IN THE INSTALLATION DRAWINGS. ALL 350, 750 AND 1000 KCMIL CABLES MUST BE UNTRIPLEXED WHENEVER IT IS TRAINED AROUND THE CORNER (90° ANGLE) ON THE HANDHOLE. DO NOT "PIGGYBACK" 600 AMP TEES (ONE ON TOP OF THE OTHER) AT ANY TIME ON THE SWITCH BUSHING.
- (D) REMOVE THE JACKETING AS SHOWN (APPROXIMATELY 6 FEET) ON THE 750 AND 1000 KCMIL CABLE WHICH TERMINATES ON THE SIDE SWITCH BUSHINGS. INSTALL ONE LAYER OF SEALING COMPOUND UNDER AND OVER THE CONCENTRIC NEUTRAL BUTTING IT AGAINST THE CABLE JACKETING. INSTALL A HEAT SHRINK TUBE OVER THE SEALING COMPOUND AND JACKETING AND APPLY HEAT. MAKE SURE THE HEAT SHRINK TUBE SHRINKS ON THE SEALING COMPOUND AND CABLE JACKETING AND NOT ON THE CABLE SEMICONDUCTING MATERIALS.



FOR FIELD MAINTENANCE ONLY

- (F) INSTALL SWITCH IDENTIFICATION NUMBER AND CABLE I.D. TAGS AS SHOWN IN STANDARD 3200.
- (G) A 20" X 60" UNOBSTRUCTED SPACE MUST BE MAINTAINED IN THE HANDHOLE.
- (H) INSTALL A 12 INCH EXTENSION SECTION (STOCK NUMBER 336208) BETWEEN THE TOP NECK SECTION AND THE 24 INCH EXTENSION SECTION.

REFERENCE:

- J. SEE STANDARD 3670 FOR SUBSURFACE SWITCH.
- K. SEE STANDARD 3213 FOR INSTALLING SWITCH IDENTIFICATION NUMBERS AND STANDARD 3202 FOR INSTALLING CABLE I.D. TAGS.
- L. SEE PAGE 3374.3 FOR CONDUIT INSTALLATION PRACTICES.
- M. SEE STANDARD 3362 FOR SUMP PUMP INSTALLATION.
- (N) SEE STANDARD 4181 FOR 12KV 200 AND 600 AMP CONNECTOR ASSEMBLIES.
- O. SEE STANDARD 4530 FOR NEUTRAL AND GROUND WIRE DIAGRAM.
- P. SEE DESIGN STANDARD 6111 FOR SWITCH APPLICATION.
- R. SEE DESIGN STANDARD 6113 FOR AUTOMATIC FAULT INDICATOR APPLICATION.

3699.719
SUPERSEDES
3671.7 (1-1-98)

SDG&E ELECTRIC STANDARDS

INSTALLATION OF SUBSURFACE/SURFACE OPERABLE
SWITCH IN A 3316 HANDHOLE

DATE 1-1-91

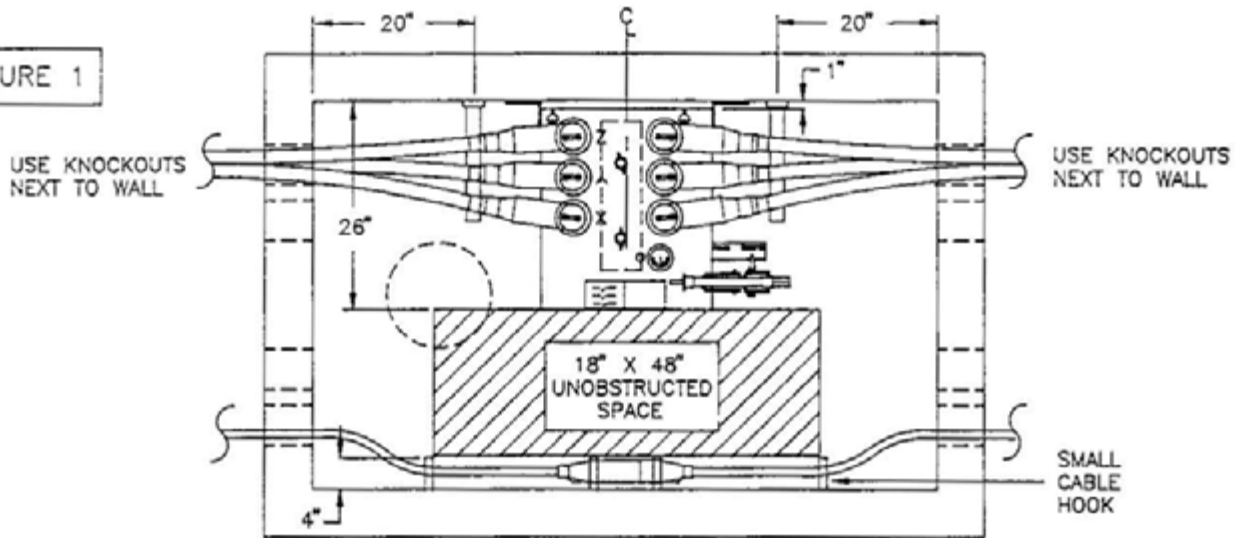
APPD *JLB/ROJ*

SCOPE: THIS STANDARD SHOWS THE MATERIAL AND INSTALLATION REQUIREMENTS FOR INSTALLING A ON-OFF SUBSURFACE/SURFACE OPERABLE SWITCH IN A 33" S HANDHOLE

ON-OFF SWITCH IN A 33" S HANDHOLE INSTALLATION

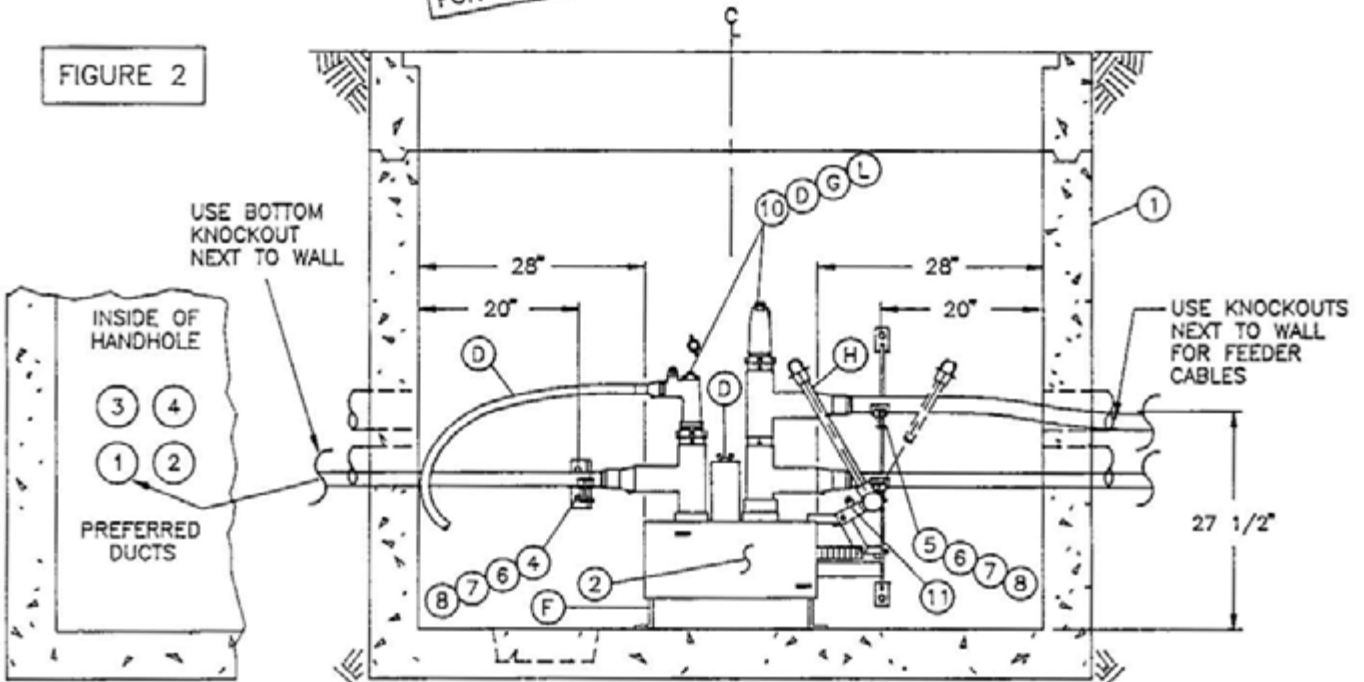
TOP VIEW
(B) STREET SIDE

FIGURE 1



FOR FIELD MAINTENANCE ONLY

FIGURE 2



SDG&E ELECTRIC STANDARDS

DATE 1-1-94
APPD *JLB/RX*

SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH
12KV, 600 AMP, 3 PHASE

3699.707
SUPERCEDES
3671.1 (1-1-94)

NOTES

- "PIGGYBACK" TEES SHOWN IN THIS STANDARD SHALL ONLY BE USED TO FEED A SWITCHED T.E POSITION
- OTHER CONFIGURATIONS MAY BE DESIGNED PROVIDED EQUIPMENT LIMITATIONS AND THE PROPER UNOBSTRUCTED SPACE PROVIDED TO ALLOW PERSONNEL TO PERFORM THEIR WORK SAFELY AND ALLOW ACCESS TO THE CONDUITS

BILL OF MATERIAL

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PAGE NO | STOCK NUMBER |
|------|---|----------|----------------------|--------------|
| 1 | HANDHOLE (PARKWAY OR TRAFFIC) (A) | AS REQ'D | 3315 | - |
| 2 | 12KV SUBSURFACE/SURFACE OPERABLE SWITCH, 600A, ON-OFF | 1 | 3670 | 708982 |
| 3 | PROTECTOR, CABLE U G | AS REQ'D | - | 558720 |
| 4 | ADAPTER, CABLE ARM | AS REQ'D | 4178 | 102016 |
| 5 | HANGER, CABLE ARM, 3/4"/36" | AS REQ'D | 4178 | 564480 |
| 6 | CABLE ARM, 15" (3 WAY) | AS REQ'D | 4178 | 110528 |
| 7 | CABLE INSULATOR | AS REQ'D | 4178 | 430592 |
| 8 | TIE STRAP | AS REQ'D | 4178 | 738440 |
| 9 | ANCHOR, CONCRETE STAINLESS STEEL, 1/2" X 3-3/4" | AS REQ'D | 4178 | 107654 |
| 10 | 12KV, 200A (LOADBREAK) & 600A CONNECTORS (D) | AS REQ'D | 4181 | - |
| 11 | PADLOCK, (SCHLAGE ELECT SERIES) | 1 | - | 514848 |
| 12 | AUTOMATIC FAULT INDICATOR (G) | AS REQ'D | 4352 | - |

FOR FIELD MAINTENANCE ONLY

INSTALLATION:

- (A) A STANDARD 3315 HANDHOLE IS REQUIRED FOR THE ON-OFF SWITCH THE NUMBER OF CABLES AND CONNECTORS REQUIRED WILL DETERMINE WHICH HANDHOLE TO USE
- (B) THE SWITCH BOLTED TO THE STREET SIDE WALL IS PREFERRED THIS ALLOWS CABLE TAPS TO BE OPERATED FROM THE STREET OR SIDEWALK SIDE
- C INSTALL CABLE AND CABLE SUPPORTS, ETC IN THE HANDHOLE AND ON THE SWITCH AS SHOWN IN THE INSTALLATION DRAWINGS
- (D) ON THE 200 AMP CABLE, LOOP THE HOLE LEAVING ENOUGH SLACK TO REACH BOTH SETS OF 600 AMP TEES A STAND OFF BAR, STOCK NUMBER 677240 WILL BE REQUIRED TO ATTACH TO THE STAND OFF BRACKET WHEN TEMPORARILY LANDING LOADBREAK ELBOWS ALL 200 AMP CONNECTORS ON THE SWITCH SHALL BE LOADBREAK.
- (E) LEVELING OF THE SF-6 GAS SWITCH IS NOT REQUIRED DO NOT INSTALL SWITCH ANY HIGHER OFF THE FLOOR THAN SHOWN IN THE INSTALLATION DRAWING DUE TO CABLE ARRANGEMENT.
- (G) DO NOT INSTALL LOADBREAK ELBOWS ON PIGGYBACK TEES FOR A PERMANENT INSTALLATION
- (H) THE REMOVABLE OPERATING HANDLE IS TO REMAIN PERMANENTLY ATTACHED TO THE SWITCH

REFERENCE:

- I SEE STANDARD 3200 FOR SWITCH IDENTIFICATION NUMBERS AND CABLE ID TAGS
- J SEE STANDARD 3670 FOR SUBSURFACE SWITCH
- K SEE PAGE 3374 3 FOR CONDUIT INSTALLATION PRACTICES
- (L) SEE STANDARD 4181 FOR 12KV 200 AND 600 AMP CONNECTOR ASSEMBLIES
- M SEE STANDARD 4530 FOR NEUTRAL AND GROUND WIRE DIAGRAM
- N SEE DESIGN STANDARD 6111 FOR SWITCH APPLICATION
- (O) SEE DESIGN STANDARD 6113 FOR AUTOMATIC FAULT INDICATOR APPLICATION

| | | |
|--|---|---|
| <p>3699.708 SUPERCEDES 3671 3 (1-1-94)</p> | <p>SDG&E ELECTRIC STANDARDS</p> <p>SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH 12KV, 600 AMP, 3 PHASE</p> | <p>DATE 1-1-94 APPD <i>JLB/RT</i></p> |
|--|---|---|

3700 -
TRANSFORMERS

3700 -
TRANSFORMERS

PAGE

SUBJECT

| | |
|------|--|
| 3702 | TRANSFORMER PREFIXES |
| 3703 | DISTRIBUTION TRANSFORMER APPLICATIONS |
| 3720 | 12KV PAD MOUNTED GROUNDING BANK |
| 3752 | THREE-PHASE, 12KV, TYPE "PZR", "HZR" OR "HZR" RADIAL FEED, DEAD FRONT, PAD-MOUNTED TRANSFORMER INSTALLATION. |
| 3756 | THREE-PHASE STEP-DOWN, TYPE "HPP", RADIAL/LOOP, LIVE FRONT, PAD-MOUNTED TRANSFORMER INSTALLATION. |

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| C | EDITORIAL CHANGES | PEI | VMV | FRC | CZH | 08/27/2020 | F | | | | | | |
| B | ADDITION OF 3702.1 | - | KR | JS | MDJ | 03/31/2017 | E | | | | | | |
| A | ORIGINAL ISSUE | - | JS | TR | MDJ | 07/25/2016 | D | EDITORIAL CHANGES | EDM | EJA | GLW | CZH | 06/14/2021 |

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | TRANSFORMERS FMO TABLE OF CONTENTS | | | | |

FIELD MAINTENANCE ONLY

REVISION HISTORY:

3/31/2017: All versions prior to 2017 are superseded by their current version found inside the Overhead Construction Standard Manual.

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| | SDG&E ELECTRIC UNDERGROUND CONSTRUCTION STANDARD | |
| | TRANSFORMER PREFIXES | |

THREE-PHASE PAD-MOUNTED STAINLESS STEEL DEAD FRONT:

| ITEM | VOLTAGE | | DESCRIPTION | KVA | TAPS | STOCK NO. | ASSEMBLY UNITS |
|----------|---------|--|--|-----|------|-----------|----------------|
| | PRIMARY | SECONDARY | | | | | |
| Ⓒ HZS | 12000 | 208Y/120 THREE-PHASE 4 WIRE | MAY STILL BE INSTALLED SEE NOTE ① D.E.W.L. BAY-O-NET FUSES AND PROTECTIVE LINKS, RADIAL/LOOP ② | 75 | -- | S761345 | HZS-75 |
| | | | | 150 | -- | S761298 | HZS150 |
| | | | | 225 | -- | S761311 | HZS225 |
| Ⓒ HMS | 12000 | 480Y/277 THREE-PHASE 3 OR 4 WIRE | MAY STILL BE INSTALLED SEE NOTE ① D.E.W.L. BAY-O-NET FUSES AND PROTECTIVE LINKS, RADIAL/LOOP ② | 75 | -- | S761342 | HMS-75 |
| | | | | 150 | -- | S761296 | HMS150 |
| | | | | 225 | -- | S761308 | HMS225 |
| | | | | 300 | -- | S761322 | HMS300 |
| Ⓒ HKS | 12000 | 240/120 THREE-WIRE 4 WIRE | MAY STILL BE INSTALLED SEE NOTE ① D.E.W.L. BAY-O-NET FUSES AND PROTECTIVE LINKS, RADIAL/LOOP ② | 150 | -- | S761294 | HKS150 |

SINGLE-PHASE PAD-MOUNTED STAINLESS STEEL DEAD FRONT:

| PREFIX | VOLTAGE | | DESCRIPTION | KVA | TAPS | STOCK NO. | ASSEMBLY UNITS |
|----------|-----------------|-----------|--|-----|------|-----------|----------------|
| | PRIMARY | SECONDARY | | | | | |
| Ⓒ NDS | 12000 GRDY/6930 | 240/120 | MAY STILL BE INSTALLED SEE NOTE ② BAY-O-NET FUSE ASSEMBLY WITH ISOLATION LINK STAINLESS STEEL | 25 | -- | S761426 | NDS-25 |
| | | | | 50 | -- | S761428 | NDS-50 |
| | | | | 75 | -- | S761430 | NDS-75 |
| | | | | 100 | -- | S761432 | NDS100 |
| Ⓒ HDS | 12000 | 240/120 | MAY STILL BE INSTALLED SEE NOTE ② BAY-O-NET FUSE ASSEMBLY WITH ISOLATION LINK STAINLESS STEEL | 25 | -- | S751862 | HDS-25 |
| | | | | 50 | -- | S751864 | HDS-50 |
| | | | | 75 | -- | S751866 | HDS-75 |
| | | | | 100 | -- | S751868 | HDS100 |
| | | | | 167 | -- | S751870 | HDS167 |

INSTALLATION:

Ⓒ NDS AND HDS SINGLE-PHASE TRANSFORMERS AND HZS, HMS AND HKS THREE-PHASE TRANSFORMERS ARE FITTED WITH BUSHING WELLS THAT REQUIRE SEPARATELY INSTALLED BUSHINGS PLUGS OR FEED-THRU INSERTS. (SEE STANDARDS 3712, 3713, 3751, 3755, AND 3756). BUSHINGS PLUGS OR FEED-THRU INSERTS ARE NOT SUPPLIED WITH TRANSFORMER.

NOTES:

① ALL HZS, HMS, AND 150KVA HKS TRANSFORMERS ARE BEING REFURBISHED AND MAY STILL BE INSTALLED FOR CHANGE OUT OF LEAKING TRANSFORMER, CMP CHANGE OUTS AND OTHER APPLICATIONS. CHECK STORE ROOMS AND KEARNY FOR AVAILABILITY.

② ALL NDS, AND 50 KVA AND 167 KVA HDS TRANSFORMERS ARE BEING REFURBISHED AND MAY STILL BE INSTALLED FOR CHANGE OUT OF LEAKING TRANSFORMERS, CMP CHANGE OUTS AND OTHER APPLICATIONS. **CHECK STOREROOMS AND KEARNY FOR AVAILABILITY.**

REFERENCE:

b. SEE STANDARD 4311 FOR FUSING.

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| SHEET 1 OF 1 | Indicates Latest Revision | Completely Revised | New Page | Information Removed |
| | SDG&E ELECTRIC UNDERGROUND CONSTRUCTION STANDARD | | | |
| | TRANSFORMER PREFIXES | | | |
| FMO UG 3702.1 | | | | |

UG3703 FIELD MAINTENANCE ONLY

ALL VERSIONS LISTED IN FMO ARE SUPERSEDED BY THEIR CURRENT VERSION FOUND INSIDE THE OVERHEAD CONSTRUCTION STANDARD MANUAL.

REVISION HISTORY:

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | DISTRIBUTION TRANSFORMER APPLICATIONS | | | | |

SCOPE: THIS STANDARD IS A GUIDE FOR SELECTING TRANSFORMER(S), BY PREFIX, FOR REPLACEMENT OF EXISTING UNITS IN FIELD, AND DETERMINING THOSE THAT ARE OBSOLETE.

TABLE 1

| SINGLE-PHASE INSTALLATIONS (PADMOUNT) | | | | |
|---|-----------|------------------------------|-----------------------|-----------------------------|
| VOLTAGE | | EXISTING FIELD UNITS | REPLACEMENT UNITS (C) | NOT TO BE USED OR REORDERED |
| PRIMARY | SECONDARY | | | |
| 2,400 | 240/120 | SDD, SDS, SID, WDD, WEP, WEQ | WEP | - |
| 7,200 | 240/120 | YDP, YDQ, YEP, YTP | NTS, NCS (B) | YDP, YDQ, YEP, YTP, YP, NEP |
| SINGLE-PHASE INSTALLATIONS (SUBSURFACE) | | | | |
| 7,200 | 240/120 | YES, YIS, YSV | NES (B) | YES, YIS, YSV |

INSTALLATION:

- (B) 6930V 'N' TYPE SINGLE-PHASE TRANSFORMERS, WITH SECONDARY TAPS, CAN BE USED TO REPLACE 7200V 'Y' TYPE SINGLE-PHASE TRANSFORMERS ON 7200V SYSTEMS. WE STILL HAVE A FEW 7200V BRANCH LINES IN THE SYSTEM. 7200V SYSTEMS CAN BE IDENTIFIED BY THE UPSTREAM BOOSTER STATION. BOOSTER STATIONS ARE CODED WITH A 'B' SUFFIX, I.E. 275-472B. 'Y' TYPE 7200V TRANSFORMERS (YEP, YDP, ETC.) WERE THE PREFERRED TRANSFORMER FOR 7200V SYSTEMS. HOWEVER, WE NO LONGER STOCK, OR INSTALL, 'Y' TYPE SINGLE-PHASE TRANSFORMERS. WHEN REPLACING SINGLE-PHASE 'Y' TRANSFORMERS FIRST DETERMINE IF YOU'RE ON A 7200V SYSTEM OR A 6930V SYSTEM. IF YOU'RE ON A 7200V SYSTEM, INSTALL AN 'N' TYPE TRANSFORMER WITH SECONDARY TAPS (NTS, NCS). THE FIELD CREW CAN TAP DOWN THE SECONDARY VOLTAGE, AS NEEDED, TO COMPENSATE FOR ANY SECONDARY VOLTAGE BOOST. IF YOU'RE ON A 6930V SYSTEM (NO BOOSTER STATION) REPLACE A 'Y' TRANSFORMER WITH AN 'N' TYPE TRANSFORMER (NTS) - SECONDARY TAPS ARE NOT NEEDED.
- (C) WHEN REPLACING LIVE FRONT TRANSFORMERS EVERY EFFORT SHOULD BE MADE TO UPGRADE TO DEADFRONT. EACH SITUATION SHOULD BE EVALUATED INDEPENDENTLY. WHEN IN DOUBT CONTACT YOUR LOCAL ELECTRIC CONSTRUCTION SUPERVISOR (ECS) IN THE DISTRICT. THE ECS WILL LET YOU KNOW IF CONVERTING IS FEASIBLE AND TELL YOU PRECISELY WHAT ADDITIONAL AND/OR SPECIAL MATERIAL WILL BE NEEDED.

FIELD MAINTENANCE ONLY

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
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UG3720 FIELD MAINTENANCE ONLY

ALL VERSIONS LISTED IN FMO AND UNDERGROUND ARE SUPERSEDED BY THEIR CURRENT VERSION FOUND
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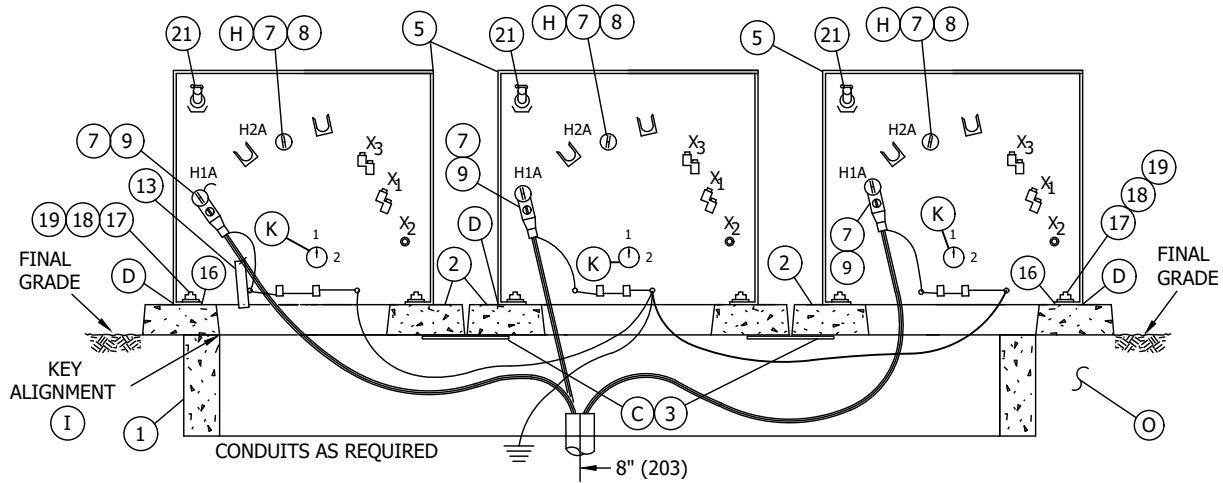
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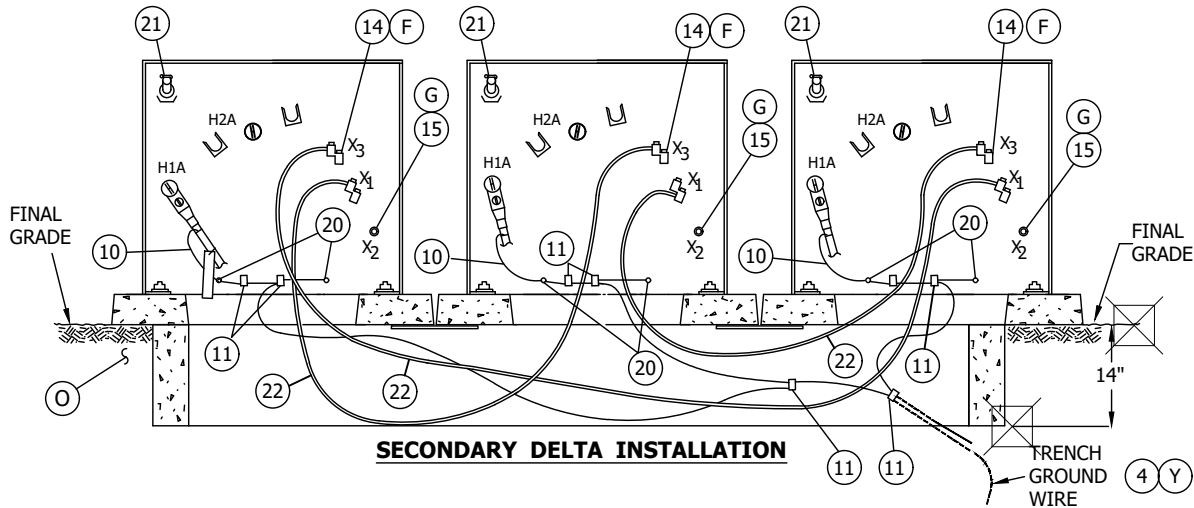
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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | 12KV PAD-MOUNTED GROUNDING BANK | | | | |

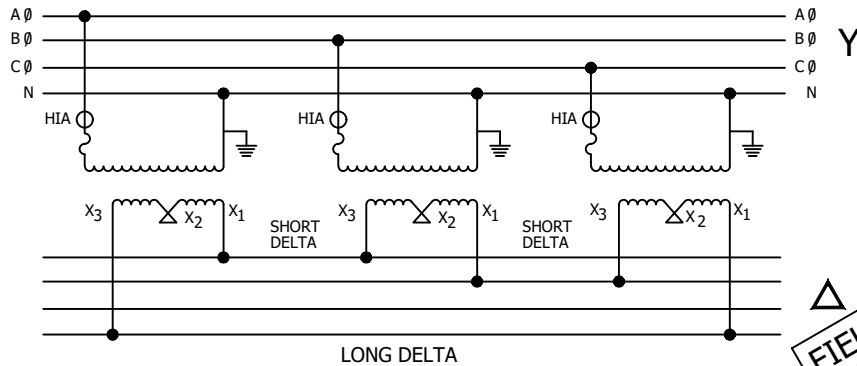
SCOPE: THIS STANDARD SHOWS THE CONSTRUCTION THAT SHALL BE USED FOR INSTALLING THREE SINGLE-PHASE, DEAD FRONT NTS TRANSFORMERS FOR A GROUNDING BANK.



PRIMARY INSTALLATION



SECONDARY DELTA INSTALLATION



LONG DELTA

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1 OF 3

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SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

12KV PAD-MOUNTED GROUNDING BANK

FMO
UG3720.1

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD. OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNITS |
|------|--|----------|------------------------|--------------|----------------|
| 1 | HANDHOLE, 14" X 108" X 14" | 1 | 3311 | S162662 | |
| 2 | PAD, TRANSFORMER | 3 | 3421 | S514240 | 3421-1 |
| 3 | PLATE, FLOOR, 3/8" GALV, 12" X 24" | 2 | - | MACHINE SHOP | |
| 4 | TRENCH GROUND WIRE (Y) | AS REQ'D | 4510 | - | |
| 5 | TRANSFORMERS, NTS (H) | 3 | 3702 | S764236 | NTS100 |
| 6 | SEALING COMPOUND (B)(X) | AS REQ'D | - | S442976 | |
| 7 | BUSHING PLUG | 1 | - | S544676 | |
| 8 | INSULATING CAP | 3 | 4180.0 | S204304 | INSREC |
| 9 | ELBOW, LOADBREAK, 12KV (WITH WHITE-BLACK-WHITE BAND) | 6 | 4191 | - | |
| 10 | CONCENTRIC NEUTRAL TAILS | AS REQ'D | - | - | |
| 11 | CONNECTOR, COMPRESSION | AS REQ'D | 4172 | - | |
| 12 | KEYLESS LOCK (NOT SHOWN ABOVE) (A) | 3 | - | S468101 | |
| 13 | CABLE IDENTIFICATION | AS REQ'D | 3202 | - | |
| 14 | SLIP-FIT CONNECTOR Z BAR (F) | 6 | 4167 | S207294 | 350-8L |
| 15 | NEUTRAL GROUND STRAP (REMOVE) (G) | 3 | - | - | |
| 16 | HOLD DOWN DEVICE (SUPPLIED WITH TRANSFORMER) | 6 | - | - | |
| 17 | NUT, CLAMPING CHANNEL | 6 | - | S503520 | |
| 18 | SCREW, HEX HEAD CAP, BRONZE, 1/2" X 1-1/2" | 6 | - | S616192 | |
| 19 | WASHER, STANDARD FLAT ROUND, BRONZE, 1/2" | 6 | - | S799488 | |
| 20 | SERVICE POST CONNECTOR | 6 | - | S262560 | |
| 21 | BAY-O-NET FUSE | 3 | 4311.5 | S363536 | B69-25 |
| 22 | CABLE SECONDARY DELTA 350 MCM | 40' | 4002.1 | S197594 | U3P350 |

INSTALLATION:

- (A) KEYLESS LOCK, ITEM 12, TO BE ATTACHED TO LATCHING MECHANISM ON TRANSFORMERS AND PENTAHEAD BOLTS THREADED IN COMPLETELY.
- (B) TERMINATE PRIMARY CONDUITS AS SHOWN ON PAGE 3714.1. SEAL PRIMARY CONDUITS WITH SEALING COMPOUND OR EQUIVALENT.
- (C) INSERT ITEM 3 (FLOOR PLATES), PRIOR TO SETTING PADS.
- (D) BASE SHALL BE CAULKED WHEN NECESSARY TO PREVENT WIRE ENTRY (SEE STANDARD 3408).
- (F) SLIP-FIT CONNECTORS ARE NOT PROVIDED WITH TRANSFORMERS, SEE STANDARD 4167 FOR INSTALLATION AND STOCK NUMBERS. ALWAYS MAKE CERTAIN ALL CONNECTIONS ARE TIGHT BEFORE ENERGIZED TRANSFORMER.
- (G) X2 BUSHING REMOVE SECONDARY GROUND STRAPS, NO Z BAR IS REQUIRED ON NEUTRAL.
- (H) THIS INSTALLATION USES THREE-PHASE #2 OR #2/0 PRIMARY CABLES.
- (I) MAKE SURE THE INSIDE WINDOW OPENING ON THE LEFT POWER TRANSFORMER IS STRAIGHT IN LINE WITH THE INSIDE OF THE HANDHOLE OPENING TO ALLOW ROOM FOR CABLE PULLING & TRAINING.
- (J) CHECK TRANSFORMER NAME PLATE FOR POLARITY.
- (K) CHECK TRANSFORMER TAPS ON POSITION (3)

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| B | MOVED TO FMO | PEI | VMV | FRC | CZH | 08/27/2020 | E | | | | | | |
| A | ORIGINAL ISSUE | - | TR | - | DW | 03/14/2014 | D | | | | | | |

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | 12KV PAD-MOUNTED GROUNDING BANK | | | | |

REFERENCE:

- M SEE STANDARD 3202 FOR CABLE IDENTIFICATION.
- N SEE STANDARD 3212 FOR TRANSFORMER IDENTIFICATION.
- Ⓞ SEE STANDARD 3365 FOR SLURRY BACKFILL.
- Ⓟ SEE STANDARD 3421 FOR PAD AND CONDUIT REQUIREMENTS.
- Q SEE STANDARD 3481 FOR TRANSFORMER BARRIER PROTECTION.
- R SEE STANDARD 3483 FOR MINIMUM OPERATING CLEARANCE REQUIREMENTS.
- S SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT.
- T SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- U SEE STANDARD 3487 FOR RETAINING WALLS.
- V SEE STANDARD 3702 FOR TRANSFORMER RATING AND SIZE. SEE THE WORK ORDER FOR TRANSFORMER PREFIXES.
- W SEE STANDARD 3703 FOR TRANSFORMER APPLICATIONS.
- ⓧ SEE STANDARD 3948 FOR SEALING SERVICE LATERAL CONDUITS.
- Ⓨ SEE STANDARD 4510 FOR (PREFERRED I) AND (ALTERNATE) TRENCH GROUND WIRE.
- Z SEE STANDARD PAGE 4512.1 FOR (PREFERRED II) EQUIPMENT GROUNDING INSTALLATION.

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | 12KV PAD-MOUNTED GROUNDING BANK | | | | | |


FIELD MAINTENANCE ONLY

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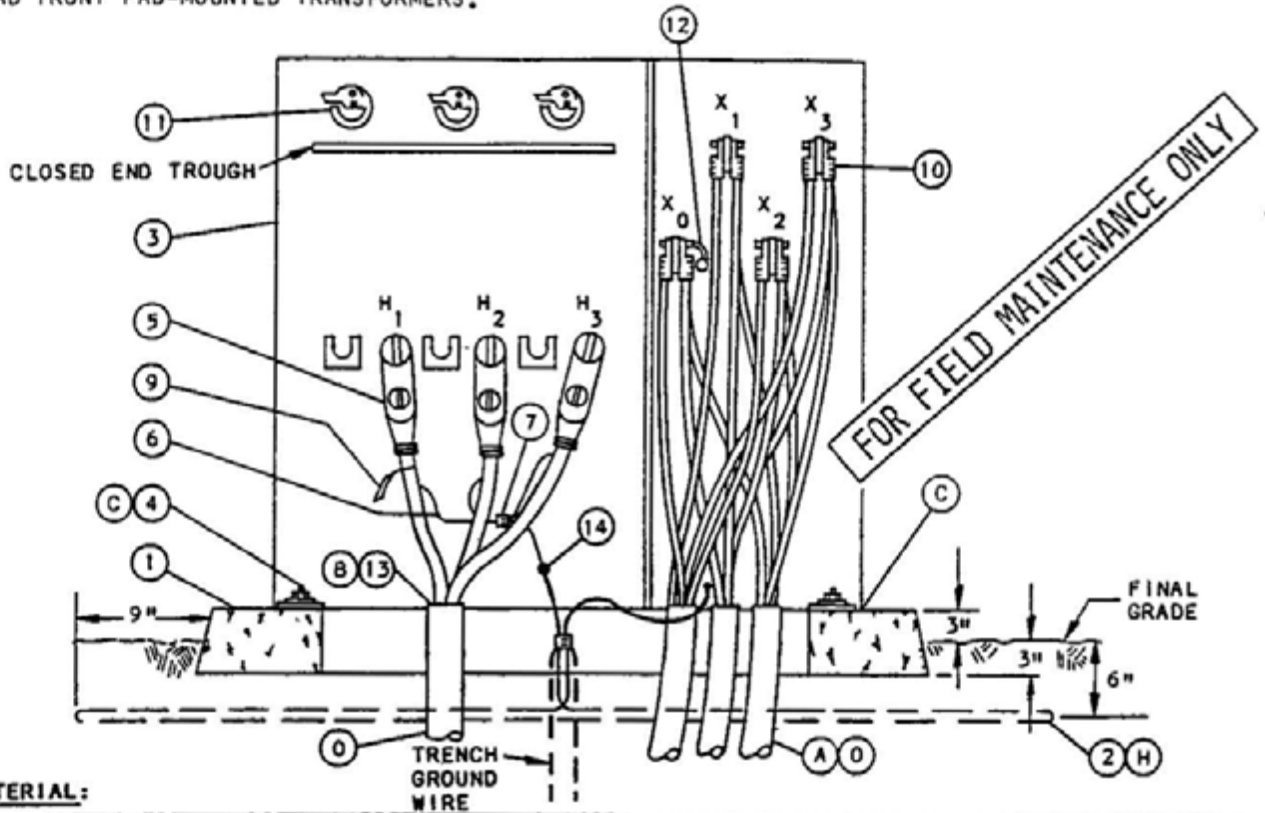
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| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | THREE-PHASE, 12KV, TYPE "PZR", "HZR" OR "HKR" RADIAL FEED, DEAD FRONT, PAD-MOUNTED TRANSFORMER INSTALLATION | | | | |

SCOPE: THIS STANDARD SHOWS THE CONNECTION USED FOR INSTALLING THREE-PHASE, 12KV RADIAL FEED DEAD FRONT PAD-MOUNTED TRANSFORMERS.



BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PG NO | STOCK NUMBER |
|------|--|----------|--------------------|--------------|
| 1 | PAD, TRANSFORMER, 3Ø | 1 | 3425,3426,3427 | - |
| 2 | PAD GROUNDING EQUIPMENT (H) | 1 | 3407 | - |
| 3 | TRANSFORMER, (THRU 1000 KVA) (F) | 1 | 3702 | - |
| 4 | HOLD DOWN DEVICE - (SUPPLIED WITH CABINET) | 2 | - | - |
| 5 | ELBOW, LOADBREAK, 12KV (WITH WHITE-BLACK-WHITE BAND) | 3 | 4191 | - |
| 6 | CONCENTRIC NEUTRAL TAILS | 3 | - | - |
| 7 | CONNECTOR, COMPRESSION | AS REQ'D | 4172 | - |
| 8 | KEYLESS LOCK, (NOT SHOWN ABOVE) (G) | 1 | - | 468010 (E) |
| 9 | CABLE IDENTIFICATION TAGS | AS REQ'D | 3202 | - |
| 10 | SECONDARY CONNECTIONS | AS REQ'D | 4171 | - |
| 11 | FUSE, "BAY-O-NET" (T) | 3 | 4311 | - |
| 12 | NEUTRAL GROUND STRAP (ON TRANSFORMER) | 1 | - | - |
| 13 | AQUA-SEAL OR EQUIVALENT | AS REQ'D | - | 442976 (E) |
| 14 | SERVICE POST CONNECTOR | 2 | - | 262560 (E) |

INSTALLATION:

- (A) THIS INSTALLATION USES 3 SINGLE PHASE #2 OR 2/0 PRIMARY CABLES.
- (B) TERMINATE PRIMARY AND SECONDARY CONDUITS FLUSH WITH TOP OF PAD. SEAL SECONDARY AND PRIMARY CONDUITS WITH AQUA-SEAL OR EQUIVALENT. SEAL SERVICE LATERAL CONDUITS PER STANDARD 3948 (G.O. 128 RULE 31.6).

SDG&E ELECTRIC STANDARDS

THREE-PHASE, 12KV, TYPE "PZR", "HZR" OR "HKR"
RADIAL FEED, DEAD FRONT, PAD-MOUNTED TRANSFORMER INSTALLATION

3799.503
supercedes
3752.1 (1-1-86)

DATE 1-1-87

APPD JYB/RDT

- Ⓒ TRANSFORMER SHALL BE SOLIDLY SECURED TO PAD TO PREVENT UNAUTHORIZED MOVEMENT OR ENTRY. THE BASE SHALL BE CHECKED AND WHEN NECESSARY CAULK TO PREVENT WIRE ENTRY.
- Ⓔ EXEMPT MATERIAL.
- Ⓕ TRANSFORMER RATING AND SIZE PER WORK ORDER.
- Ⓖ KEYLESS LOCK (ITEM 8) TO BE ATTACHED TO LATCHING MECHANISM ON TRANSFORMER AFTER PENTAHEAD BOLT IS THREADED IN COMPLETELY.
- Ⓕ USE PREFERRED GROUNDING SHOWN IN SKETCH WHEN A SYSTEM NEUTRAL FROM A SUBSTATION OR GROUNDING BANK IS PRESENT, OTHERWISE USE PREFERRED Ⓔ GROUNDING METHOD SHOWN ON PAGE 4512.1.

REFERENCE:

- I. SEE STANDARD 3202 FOR CABLE IDENTIFICATION.
- J. SEE STANDARD 3211 FOR PAD IDENTIFICATION.
- K. SEE STANDARD 3212 FOR TRANSFORMER IDENTIFICATION.
- L. SEE STANDARD 3221 FOR HIGH VOLTAGE DECAL.
- M. SEE STANDARD 3407 FOR PAD GROUNDING OR GROUNDING TELCO CONDUCTORS.
- N. SEE STANDARD 3408 FOR WIRE ENTRY PREVENTION.
- Ⓖ SEE STANDARD 3425, 3426 OR 3427 FOR PAD, HANDHOLE AND CONDUIT PLACEMENT.
- P. SEE STANDARD 3481 FOR BARRIER PROTECTION.
- Q. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- R. SEE STANDARD 3487 FOR RETAINING WALL REQUIREMENTS.
- S. SEE STANDARD 3702 FOR TRANSFORMER PREFIXES.
- Ⓕ SEE STANDARD 3704 FOR "BAY-O-NET" FUSE OPERATING INSTRUCTIONS.
- U. SEE STANDARD 3948 FOR SEALING SERVICE LATERAL CONDUITS.

FOR FIELD MAINTENANCE ONLY

| | | |
|---|---|--|
| <p>3799.504 SUPERCEDES 3752.2 (1-1-86)</p> | <p>SDG&E ELECTRIC STANDARDS</p> <p>THREE-PHASE, 12KV, TYPE "PZR", "HZR" OR HKR" RADIAL FEED, DEAD FRONT, PAD-MOUNTED TRANSFORMER INSTALLATION</p> | <p>DATE 1-1-87 APPD <i>[Signature]</i></p> |
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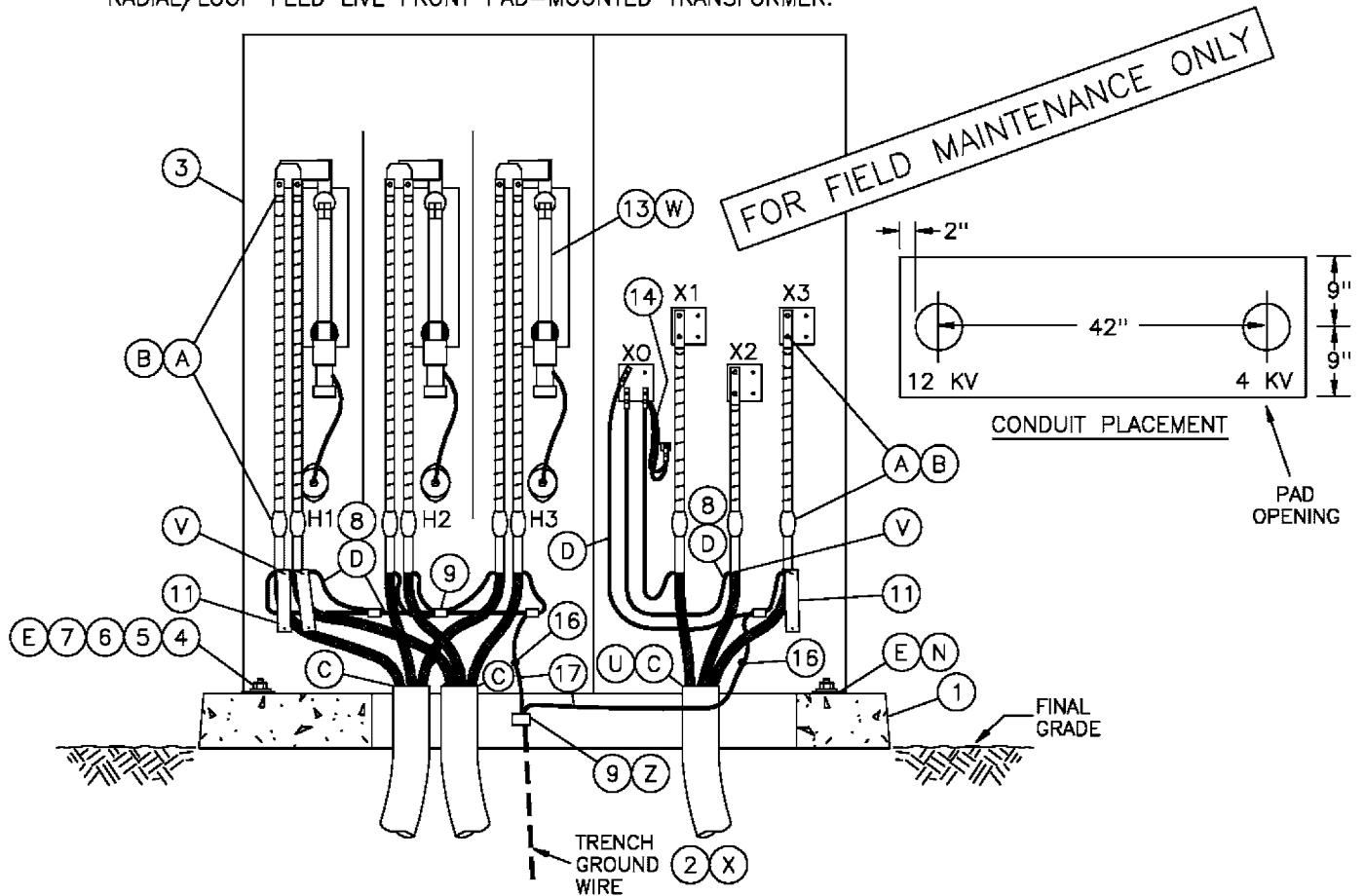
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1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD

THREE-PHASE STEP-DOWN, TYPE "HPP", RADIAL/LOOP,
LIVE FRONT, PAD-MOUNTED TRANSFORMER INSTALLATION

**FMO
UG 3756**

SCOPE: THIS STANDARD SHOWS THE METHOD OF INSTALLING A THREE-PHASE, STEP-DOWN TYPE "HPP" RADIAL/LOOP FEED LIVE FRONT PAD-MOUNTED TRANSFORMER.



BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST. STD. OR PG. NO. | STOCK NUMBER | ASSEMBLY UNITS |
|------|--|----------|------------------------|--------------|----------------|
| 1 | PAD, TRANSFORMER, THREE-PHASE | 1 | 3427 | 514012 | 3427B0 |
| 2 | TRENCH GROUNDING WIRE (X) | AS REQ'D | 4510 | - | GP-T/W |
| 3 | TRANSFORMER, (1500 THRU 2500 KVA) (F)(T) | 1 | 3702 | - | - |
| 4 | HOLD DOWN DEVICE - (SUPPLIED WITH CABINET) | 2 | - | - | - |
| 5 | NUT, CLAMPING CHANNEL | 2 | - | 503520 | - |
| 6 | SCREW, HEX HEAD CAP, BRONZE, 1/2" | 2 | - | 616192 | - |
| 7 | WASHER, FLAT, ROUND, BRONZE, 1/2" | 2 | - | 799488 | - |
| 8 | CONCENTRIC NEUTRAL TAILS (D) | - | 4172.1 | - | - |
| 9 | CONNECTOR, COMPRESSION | AS REQ'D | 4172 | - | - |
| 10 | KEYLESS LOCK (NOT SHOWN) (G) | 1 | - | 468010 | - |
| 11 | CABLE IDENTIFICATION TAGS | AS REQ'D | 3202 | - | - |
| 12 | PRIMARY CONNECTIONS (B) | - | 4121 | - | - |
| 13 | FUSE, SML-4 (SUPPLIED WITH TRANS) (W) | 3 | 4311 | - | - |
| 14 | NEUTRAL GROUND STRAP (ON TRANSFORMER) | 1 | - | - | - |
| 15 | SEALING COMPOUND (C) | AS REQ'D | - | 442976 | - |
| 16 | SERVICE POST CONNECTOR | 2 | - | 262560 | - |
| 17 | WIRE, BARE STRANDED COPPER, #2 | AS REQ'D | - | 812816 | GDWIRE |

SDG&E ELECTRIC STANDARDS

DATE 8-5-99
APPD *[Signature]*

THREE-PHASE STEP-DOWN, TYPE "HPP", RADIAL/LOOP, LIVE FRONT, PAD-MOUNTED TRANSFORMER INSTALLATION

3799.505
SUPERSEDES
3756.1 (1-1-98)

INSTALLATION:

- (A) THIS INSTALLATION USES FROM 3 TO 6 SINGLE-PHASE CONDUCTOR #2 OR 2/0 PRIMARY CABLES FOR THE 12KV SIDE AND 350, 750 OR 1000 KCMIL FOR THE 4KV SIDE.
- (B) TERMINATE PRIMARY CABLE AS SHOWN ON STD. 4121, INCREASE THE 14 INCH MEASUREMENT SHOWN ON STD. 4121 AS REQUIRED. THE PORTION OF CABLE DOWN TO AND INCLUDING THE STRESS RELIEF KIT SHOULD BE AS STRAIGHT AS POSSIBLE TO PREVENT ANY CONTAMINATION THAT MAY BUILD UP ON THE SHOCABLE.
- (C) TERMINATE CONDUITS FLUSH WITH TOP OF PAD. SEAL 12KV AND 4KV CONDUITS WITH SEALING COMPOUND SEAL SERVICE LATERAL CONDUITS PER STANDARD 3948 (G.O. 128 RULE 31.6).
- (D) CONCENTRIC NEUTRAL WIRE OR #2 PER PHASE FOR #2, #2/0 OR 350 KCMIL CABLE. CONCENTRIC NEUTRAL WIRE OR #1/0 PER PHASE FOR 750 OR 1000 KCMIL CABLE.
- (E) TRANSFORMER SHALL BE SOLIDLY SECURED TO PAD TO PREVENT UNAUTHORIZED MOVEMENT OR ENTRY. THE BASE SHALL BE CAULKED TO PREVENT MOISTURE AND WIRE ENTRY.
- (F) TRANSFORMER RATING AND SIZE PER WORK ORDER.
- (G) KEYLESS LOCK TO BE ATTACHED TO LATCHING MECHANISM ON TRANSFORMER AFTER PENTAHEAD BOLT IS THREADED IN COMPLETELY.

REFERENCE:

- K. SEE STANDARD 3202 FOR CABLE IDENTIFICATION.
- L. SEE STANDARD 3212 FOR TRANSFORMER IDENTIFICATION.
- M. SEE STANDARD 3221 FOR HIGH VOLTAGE DECAL.
- (N) SEE STANDARD 3408 FOR MOISTURE AND WIRE ENTRY PREVENTION.
- O. SEE STANDARD 3481 FOR BARRIER PROTECTION.
- P. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- Q. SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT.
- R. SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- S. SEE STANDARD 3487 FOR RETAINING WALLS.
- (T) SEE STANDARD 3702 FOR TRANSFORMER PREFIXES.
- (U) SEE STANDARD 3948 FOR SEALING SERVICE LATERAL CONDUITS.
- (V) SEE STANDARD 4108 FOR CABLE TERMINATION INSTRUCTIONS.
- (W) SEE STANDARD 4311.5 FOR TRANSFORMER FUSING TABLES.
- (X) SEE STANDARD 4510 FOR (PREFERRED I) AND (ALTERNATE) TRENCH GROUND WIRE.
- Y. SEE STANDARD PAGE 4512.1 FOR (PREFERRED II) EQUIPMENT GROUNDING INSTALLATION.
- (Z) SEE STANDARD 4512.2 FOR EQUIPMENT GROUNDING.
- AA. SEE STANDARD 4514 FOR GROUNDING TELCO CONDUCTOR IN PAD-MOUNTED EQUIPMENT.

FOR FIELD MAINTENANCE ONLY

3799.506
SUPERSEDES
3756.2 (1-1-98)

SDG&E ELECTRIC STANDARDS

THREE-PHASE STEP-DOWN, TYPE "HPP", RADIAL/LOOP,
LIVE FRONT, PAD-MOUNTED TRANSFORMER INSTALLATION

DATE 8-5-99

APPD *JLB/ROJ*

3800 - CAPACITORS

3800 - CAPACITORS

PAGES

SUBJECT

3802

CAPACITOR MARKING INSTRUCTIONS DECALS AND TAGS

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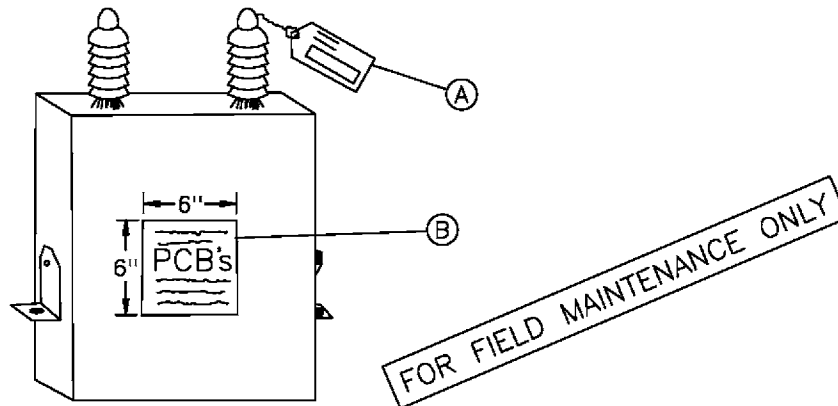
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1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD

CAPACITOR MARKING INSTRUCTIONS
DECALS AND TAGS

**FMO
UG 3802**

SCOPE: THIS STANDARD DESCRIBES CAPACITOR MARKING AND HANDLING PROCEDURES.



(A) CAPACITOR TAGS

THIS IDENTIFICATION TAG (SDG&E FORM 120-7240, STK. NO. 043450) IS USED FOR TRACKING THE CAPACITOR DURING REMOVAL/RETIREMENT AND INSTALLATION. IT SHALL BE USED ON ALL CAPACITORS, PCB UNITS AND NON-PCB UNITS.

EACH CAPACITOR UNIT IN STOCK WILL BE AFFIXED WITH A CAPACITOR IDENTIFICATION TAG BEFORE IT IS REMOVED FROM STOCK. THIS TAG IS TO BE COMPLETED BY THE FIELD PERSONNEL WHO EITHER REMOVES OR INSTALLS A CAPACITOR UNIT. ONE SIDE OF THIS TAG IS USED FOR REMOVAL AND THE OTHER FOR INSTALLATION.

1. INSTALLATION

THE DISTRICT STOCKKEEPER SHALL COMPLETE AS MUCH OF THE CAPACITOR TAG(S) AS POSSIBLE ON THE INSTALLATION SIDE OF THE TAG AND ATTACH TO THE SPECIFIC UNIT. WHEN THE INSTALLATION IS COMPLETED, THE CREW FOREMAN SHALL REMOVE THE TAG AND COMPLETE THE REQUESTED INFORMATION.

2. REPLACEMENT

WHEN A CAPACITOR UNIT IS REPLACING ONE THAT IS BEING REMOVED, THE FOREMAN SHALL FILL OUT BOTH SIDES OF THE TAG.

IF REMOVAL AND REPLACEMENT IS NOT COMPLETED WITHIN TWO CONSECUTIVE WORKDAYS, TWO FORMS ARE TO BE COMPLETED, ONE FOR A REMOVAL, AND ANOTHER FOR INSTALLATION.

IF REPLACEMENT IS DUE TO FAILURE OF ONE OR MORE UNITS, AN EQUIPMENT FAILURE REPORT IS REQUIRED.

3. REMOVAL

WHEN A CAPACITOR UNIT IS REMOVED, THE CREW FOREMAN SHALL COMPLETE THE REMOVAL PORTION ONLY. IF TAGS ARE NOT STORED ON THE TRUCKS, THE DISPATCHER SHALL PROVIDE THE CREW WITH SUFFICIENT TAGS FOR EACH CAPACITOR UNIT TO BE REMOVED.

OH 1399.001
UG 3899.001
SUPERSEDES
3802.1 (1-1-86)

SDG&E ELECTRIC STANDARDS
CAPACITOR MARKING INSTRUCTIONS
DECALS AND TAGS

DATE 1-1-2000

APPD *PA/BJ*

4. RETIREMENT

WHEN A CAPACITOR UNIT IS RETIRED, THE RETIRED PORTION OF THE CAPACITOR TAG MUST BE FILLED OUT BY THE PERSONNEL RETIRING THE UNIT.

5. DISPOSITION

IT SHALL BE THE DISPATCHER'S RESPONSIBILITY TO SEE THAT THE COMPLETED TAGS ARE SENT TO THE DISTRICT'S RECORDS SECTION, ATTENTION OF THE ENGINEERING CLERK, WITHIN ONE WORKING DAY AFTER THE CAPACITOR UNITS HAVE BEEN INSTALLED OR REMOVED.

ⓑ DECAL

THIS DECAL (STOCK NO. 301880) IS TO BE PLACED ON ALL CAPACITOR UNITS WHICH CONTAIN PCB'S.

FIELD PERSONNEL AND STOCKKEEPERS SHOULD MAKE EVERY EFFORT TO INSURE THAT ALL PCB UNITS HAVE A DECAL, AND THAT ALL WORN, WEATHERED DECALS BE REPLACED WITH NEW DECALS. THE DECAL IS BLACK PRINT ON EITHER YELLOW OR WHITE BACKGROUND.

1. MARKING

EVERY CAPACITOR IN SERVICE OR IN STORAGE, WHICH USES AN INSULATING FLUID CONTAINING PCB'S, SHALL BE LABELED WITH THE DECAL (STOCK NO. 301880).

EVERY PCB CAPACITOR WHICH IS REMOVED FROM SERVICE AND DOES NOT HAVE THE DECAL (STOCK NO. 301880) SHALL HAVE THE DECAL PUT ON IT AT THE TIME IT IS REMOVED FROM SERVICE. THIS SHALL BE DONE BY THE WORK CREW THAT REMOVES THE UNIT. IF A PCB UNIT ARRIVES AT A STOREYARD WITH NO PCB DECAL, THE STOCKKEEPER SHALL PUT A DECAL ON.

NOTE: ALL CAPACITOR UNITS PURCHASED BEFORE 1977 USED AN INSULATING FLUID WHICH CONTAINED PCB'S. THE UNITS WITH THE PCB FLUIDS CAN BE IDENTIFIED BY THE WORDS "NON-FLAMMABLE LIQUID" ON NAMEPLATE OR BY THE MANUFACTURER'S TRADE NAMES WHICH ARE:

- G.E. - PYRANOL
- WESTINGHOUSE - INERTEEN
- MCGRAW-EDISON - ELEMEX
- CORNEL DUBILIER OR FEDERAL PACIFIC - DYKANOL
- SANGAMO - DIACHLOR
- ALLIS CHALMERS - CHLOREXTOL

FOR FIELD MAINTENANCE ONLY

ALL OF THE CAPACITOR UNITS RECEIVED THAT DO NOT CONTAIN PCB INSULATING FLUIDS HAVE THE WORDS "CONTAINS A NON-PCB INSULATING FLUID" ON THE NAMEPLATE OR ON A BLUE TANK DECAL.

2. HANDLING CAPACITORS CONTAINING POLYCHLORINATED BIPHENYLS (PCB)

CAPACITORS CONTAINING PCB SHALL BE HANDLED AS SPECIFIED IN THE PCB HANDLING AND PERSONAL SAFETY PROCEDURES. (SEE CONSTRUCTION MANAGEMENT STANDARD PRACTICE 107).

3. RETIRING RUPTURED OR DAMAGED UNITS

WHENEVER TRANSPORTATION OR KEARNY MAINTENANCE RETIRES A CAPACITOR AND DISPOSES OF IT, SPECIFIC DATA (I.E. SERIAL NUMBER, PCB OR NON-PCB, MANUFACTURER, SIZE, ETC.) MUST BE RECORDED ON THE CAPACITOR TAG AND SENT TO THE DISTRICT'S RECORDS SECTION, ATTENTION OF THE ENGINEERING CLERK.

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| DATE 1-1-2000 APPD <i>PA 1/2/00</i> | SDG&E ELECTRIC STANDARDS CAPACITOR MARKING INSTRUCTIONS DECALS AND TAGS | OH 1399.002 UG 3899.002 SUPERSEDES 3802.2 (1-1-86) |
|--|---|---|

C. PRECAUTIONARY MEASURES – DAMAGED CAPACITOR UNITS

DAMAGED CAPACITOR UNITS WITH BULGED CASES MAY HAVE EXCESSIVE PRESSURE INSIDE. THE UNITS MAY RUPTURE WHEN HANDLED OR BUMPED. SINCE THE INSULATING LIQUID IN THE UNITS IS TOXIC, CARE SHALL BE EXERCISED WHEN WORKING WITH BULGED OR OTHERWISE DAMAGED UNITS. UNITS WITH BULGED OR DAMAGED CASES SHALL NOT BE RE-ENERGIZED.

D. CAPACITOR NAMEPLATES

THE CAPACITOR NAMEPLATE AND UNIT SHALL REMAIN INTACT. UNDER NO CIRCUMSTANCES SHALL THE NAMEPLATE BE REMOVED FROM THE CAPACITOR UNIT.

F. SERIES STREET LIGHTING TRANSFORMERS

THE TROUBLEMAN AND/OR CREW SHALL CHECK THE NAMEPLATE OF ANY RUPTURED 2400 VOLT, CONSTANT CURRENT STREET LIGHTING TRANSFORMER TO DETERMINE IF IT CONTAINS AN INTERNAL CAPACITOR. IF NO CAPACITOR IS SHOWN ON THE NAMEPLATE, THE TRANSFORMER IS TO BE TREATED AS ANY OTHER TRANSFORMER ON THE SYSTEM, NO SPECIAL HANDLING OR DISPOSAL IS REQUIRED. IF IT DOES, IT SHALL BE TREATED AS ANY PCB CONTAINING DEVICE UNTIL IT REACHES KEARNY MAINTENANCE. (SEE CONSTRUCTION MANAGEMENT STANDARD PRACTICE 107).

KEARNY SHALL REMOVE THE INTERNAL CAPACITOR IMMEDIATELY AND CHECK TO SEE IF IT HAS LEAKED. IF IT HAS NOT LEAKED, THE CAPACITOR SHALL BE DISPOSED OF IN ACCORDANCE WITH THE EPA REGULATIONS. THE TRANSFORMER MAY THEN RE-ENTER THE SYSTEM AS AN RO UNIT OR BE SCRAPPED.

IF PCB CONTAMINATION OF THE TRANSFORMER OIL IS SUSPECTED, KEARNY MAINTENANCE SHALL HAVE THE BEST LAB VERIFY THE LEVEL OF CONTAMINATION. IF IT IS 500PPM OR GREATER, THE OIL AND THE TRANSFORMER SHALL BE DISPOSED OF ACCORDING TO EPA REGULATIONS.

FOR FIELD MAINTENANCE ONLY

~~OH 1399.003~~
UG 3899.003
SUPERSEDES
3802.3 (1-1-86)

SDG&E ELECTRIC STANDARDS

CAPACITOR MARKING INSTRUCTIONS
DECALS AND TAGS

DATE 1-1-2000
APPD *PLA/ROJ*

3900 - SECONDARIES /
SERVICES

3900 - SECONDARIES /
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SUBJECT

3943

CABLE-IN-CONDUIT (SIDA) SERVICE

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SDG&E UNDERGROUND CONSTRUCTION STANDARD

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OH 3901**


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REVISION HISTORY:

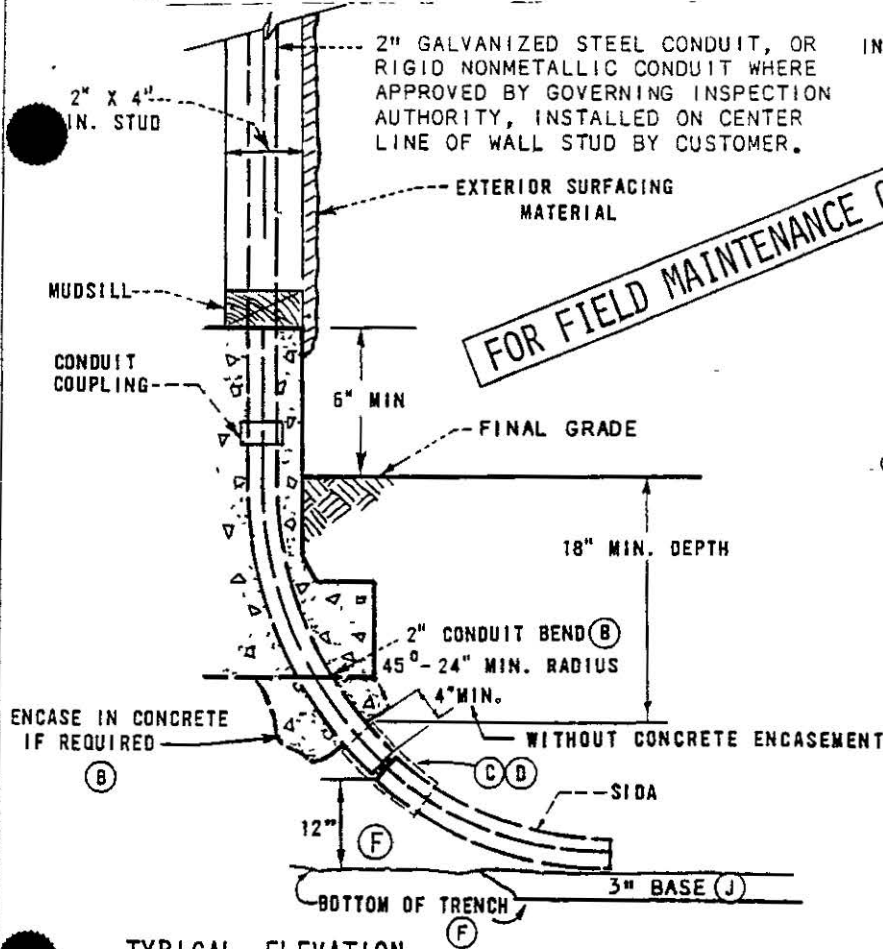
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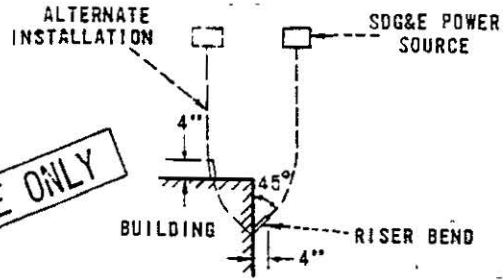
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| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | CABLE-IN-CONDUIT (SIDA) SERVICE | | | | |

SCOPE: THIS STANDARD SHOWS CABLE-IN-CONDUIT (SIDA) TERMINATION AT THE CUSTOMERS CONDUIT RISER.

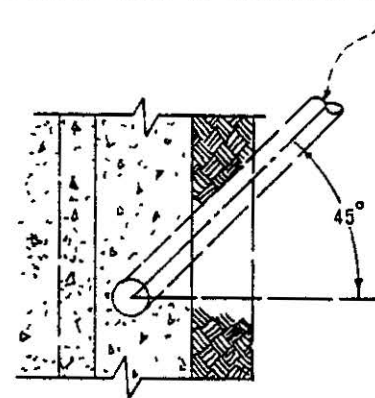


TYPICAL ELEVATION



TYPICAL PLAN

POINT CONDUIT STUB IN DIRECTION OF SUPPLY SOURCE NORMALLY AT 45° ANGLE FROM OUTER FACE OF BUILDING WALL



PLAN

INSTALLATION:

- A. VERIFY METER AND SERVICE LOCATION WITH SDG&E BEFORE INSTALLATION.
- (B) G.O. 128 RULE 33.4D REQUIRES ONE OF THE FOLLOWING DOWN TO AN 18 INCH DEPTH ON PRIVATE PROPERTY: (A) STEEL CONDUIT, OR (B) SCHEDULE 40 PVC OR SCHEDULE 80 PVC CONDUIT WITH A MINIMUM WALL THICKNESS OF 0.15 INCHES, OR (C) AT LEAST A 3 INCH LAYER OF CONCRETE ABOVE AND 2 INCHES ON EACH SIDE OF THE CONDUIT.
- (C) IF A 2-3/0, 1-1/0 SIDA SERVICE (196928) IS REQUIRED THE SIDA CONDUIT WILL BE CUT BACK TO ALLOW THE CABLE TO BE INSERTED INTO THE CONDUIT BEND THE REQUIRED AMOUNT. A 2 INCH COUPLING (279872 (E)) WITH TWO LAYERS OF GRAY TAPE (721120 (E)) OVER THE COUPLING SHALL BE INSTALLED BY SDG&E TO SEAL THE JUNCTION BETWEEN THE BEND AND THE SIDA. FILL WITH SOIL AND COMPACT UNDER THE COUPLING BEFORE BACKFILLING THE TRENCH.
- (D) WHEN A COUPLING IS NOT USED, TERMINATE CONDUIT OF SIDA A MINIMUM OF ONE FOOT INSIDE CONDUIT BEND. WHERE DUCT ENTERS THE CONDUIT BEND, SDG&E CREW WILL SEAL WITH ONE LAYER OF AQUASEAL (442976 (E)) OR EQUIVALENT AND TWO LAYERS OF GRAY INSULATING TAPE (721120 (E)) TO PREVENT DUCT FROM PULLING OUT OF RISER BEND AND ALSO TO PREVENT WATER AND DIRT ENTRY.
- (E) EXEMPT MATERIAL.
- (F) FIRST 3 FEET OF TRENCH AT BUILDING MUST BE A MINIMUM OF 24 INCHES AND 12 INCHES BELOW THE BOTTOM OF CONDUIT BEND. A SLOPE OF 1 FOOT OF THE TRENCH WALL BUTTED AGAINST THE BUILDING AT THE SERVICE ENTRANCE FOR EVERY 1 FOOT DEPTH OF TRENCH SHALL BE MAINTAINED IF UNDERMINING IS POSSIBLE AT THE BUILDING.

REFERENCE:

- J SEE STANDARD 3370 FOR TRENCH DEPTHS, BASE SHADING AND BACKFILL REQUIREMENTS.
- K. SEE STANDARD 3941 FOR CABLE IN CONDUIT SERVICE LATERAL.
- L. SEE STANDARD 3948 FOR SEALING CONDUITS.

4000 - CABLES

4000 - CABLES

PAGES

SUBJECT

No FMO content available at this time.

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**SHEET
1 OF 1**

SDG&E UNDERGROUND CONSTRUCTION STANDARD

**CABLES FMO
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SPlicing,
CONNECTIONS**

**4100 - TERMINATIONS,
SPlicing,
CONNECTIONS**

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| 4147 | 15KV CABLE TRANSITION MODULE |
| 4151 | 200 AMP DEADBREAK CONNECTORS, 12KV |
| 4168 | ALUMINUM TERMINATION SECONDARY (600V) AT TRANSFORMER OR BUS |
| 4171 | TRANSFORMER TERMINAL & BUS COMPRESSION TERMINALS FOR ALUMINUM CONDUCTORS |
| 4173 | 0-600 VOLT CONNECTIONS FOR #8 THROUGH 350 KCMIL ALUMINUM CONDUCTORS |
| 4178 | CABLE HANGERS AND ACCESSORIES |
| 4181 | 12KV, 200 AND 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART |
| 4183 | 600AMP JUNCTION CONNECTOR WITH TEST AND GROUNDING POINT |
| 4191 | LOADBREAK ELBOW CONNECTOR, 6930 VOLTS AND BELOW |
| 4192 | LOADBREAK ACCESSORIES, 12KV AND/OR 6.9KV |
| 4198 | N-JUNCTION CLEAR 600A 25KV |

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| D | EDITORIAL CHANGES | EDM | EJA | GLW | CZH | 06/02/2020 | G | UG4113 MOVED TO FMO | EDM | EJA | GLW | FRC | 02/14/2022 |
| C | EDITORIAL CHANGES | EDM | EJA | GLW | CZH | 12/09/2019 | F | UG4122 & UG4183 MOVED TO FMO | EDM | EJA | GLW | CZH | 12/12/2021 |
| ---- | ADDED 4123 | - | DG | JS | CZH | 12/01/2018 | E | UG4111 MOVED TO FMO | EDM | EJA | GLW | CZH | 10/09/2020 |

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| SHEET 1 OF 1 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4101.1 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | TERMINATIONS, SPLICING CONNECTIONS FMO TABLE OF CONTENTS | | | | |

FIELD MAINTENANCE ONLY

REVISION HISTORY:

7/13/2016: All versions prior to 2016 are superseded by their current version found inside the Overhead Construction Standard Manual.

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



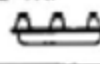
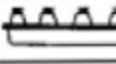


**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD

COMPATIBILITY CHART, FOR 200 AMP CLASS URD SYSTEMS,
LOADBREAK

**FMO
UG 4105**

SCOPE: THIS STANDARD SHOWS COMPATIBILITY, IDENTIFICATION, CONNECTORS, AND ACCESSORIES FOR 200 AMP
LOADBREAK ASSEMBLIES.

| LOADBREAK DEVICE STANDARDS REFERENCE STOCK NUMBER | INSULATING RECEPTACLE | STAND-OFF PLUG | BUSHING PLUG | FEED-THRU INSERT | FEED-THRU BUSHING | 3-WAY CABLE TAP | 4-WAY CABLE TAP | FUSED ELBOW | ELBOW |
|---|--------------------------|-------------------|--------------|---------------------|----------------------|--------------------|--------------------|----------------|-------|
| INSULATING RECEPTACLE 4192 204304  | - | X | X | X | X | X | X | - | - |
| STAND-OFF PLUG 4192 547312  | X | - | - | - | - | - | - | X | X |
| BUSHING PLUG 4192 544676  | X | - | - | - | - | - | - | X | X |
| FEED-THRU INSERT 4192 544678  | X | - | - | - | - | - | - | X | X |
| FEED-THRU BUSHING 4192 182016  | X | - | - | - | - | X | X | X | X |
| 3-WAY CABLE TAP 1192 718312  | X | - | - | - | - | - | - | X | X |
| 4-WAY CABLE TAP 4192 718328  | X | - | - | - | - | - | - | X | X |
| FUSED ELBOW 4191 VARIOUS  | - | X | X | X | X | X | X | - | - |
| ELBOW 4191 VARIOUS  | - | X | X | X | X | X | X | - | - |

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NOTE: X DENOTES UNIT COMPATIBILITY














DATE 1-1-87
APPD *JAB/RDT*

SDG&E ELECTRIC STANDARDS

COMPATIBILITY CHART, FOR 200 AMP CLASS URD SYSTEMS,
LOADBREAK

4199.001
SUPERCEDES
4105.1 (6-3-83)

SCOPE: THIS PAGE PROVIDES THE COMPATIBILITY CHART FOR 200 AMP CLASS DEADBREAK EQUIPMENT.

| DEADBREAK DEVICE STANDARDS REFERENCE STOCK NUMBER | T CONNECTOR | STRAIGHT RECEPTACLE | STRAIGHT PLUG | DEAD END RECEPTACLE | DEAD END PLUG | GROUNDING PLUG | STAND OFF PLUG | BUSHING PLUG | BAILING ASSEMBLY PLUG/RECEPTACLE | BAILING ASSEMBLY DEADBREAK BUSHING | BAILING ASSEMBLY DEAD END PLUG | ELBOW | BAIL CONNECTOR |
|--|-------------|------------------------|------------------|------------------------|------------------|-------------------|-------------------|-----------------|-------------------------------------|--|-----------------------------------|-------|-------------------|
| T CONNECTOR 4196 256112  | - | - | X | X | X | X | X | X | - | X | X | X | X |
| STRAIGHT RECEPTACLE 4196  | X | - | X | - | X | X | X | X | X | - | - | - | - |
| STRAIGHT PLUG 4196  | X | X | - | X | - | - | - | - | X | - | - | X | - |
| DEAD END RECEPTACLE 4197 570304  | X | - | X | - | - | X | X | - | - | - | - | - | - |
| DEAD END PLUG 4197 544864  | X | X | - | - | - | - | - | - | - | - | X | X | - |
| GROUNDING PLUG 4197 544844  | X | X | - | X | - | - | - | - | - | - | - | X | - |
| STAND OFF PLUG 4197 547304  | X | X | - | - | - | - | - | - | - | - | - | X | - |
| BUSHING PLUG 4197 544684  | X | X | - | - | - | - | - | - | - | - | - | X | - |
| BAILING ASSEMBLY 4196 120384 (E)  | X | X | X | - | - | - | - | - | - | - | - | - | - |
| BAILING ASSEMBLY 4196 120416  | X | - | - | - | - | - | - | - | - | - | - | X | - |
| BAILING ASSEMBLY 4196 120352 (E)  | X | - | - | - | X | - | - | - | - | - | - | - | - |
| ELBOW 4196  | X | - | X | - | X | X | X | X | - | - | - | - | X |
| BAIL CONNECTOR 4196 120448 (E)  | X | - | - | - | - | - | - | - | - | - | - | X | - |

FOR FIELD MAINTENANCE ONLY

NOTES:

- "X" DENOTES UNIT CAP COMPATIBILITY.

INSTALLATION:

(E) EXEMPT MATERIAL.

4199.002
SUPERCEDES
4105.2 (1-1-85)

SDG&E ELECTRIC STANDARDS
COMPATIBILITY CHART FOR 200 AMP CLASS URD SYSTEMS,
DEADBREAK

DATE 1-1-87
APPROV. *JLBIRD*

UG4110 FIELD MAINTENANCE ONLY

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06/02/2020: MOVED TO FMO

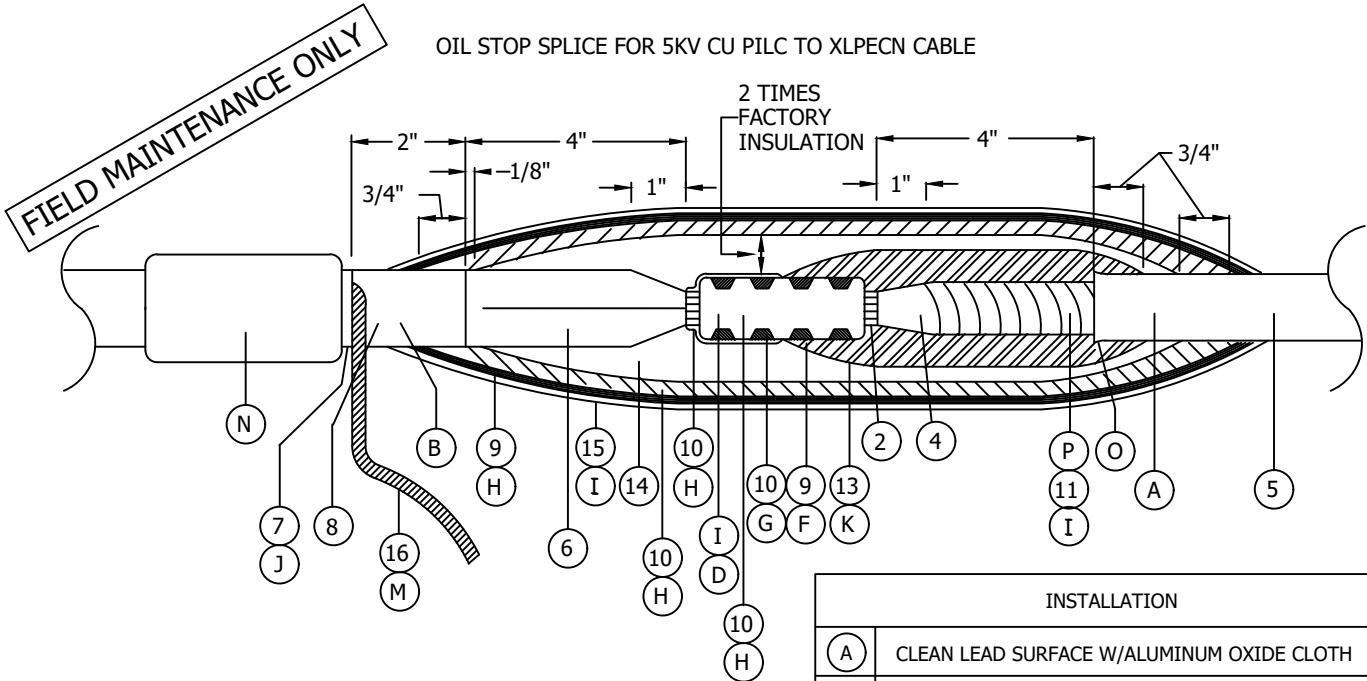
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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | |
| | DEADENDS AND SPLICES FOR 5KV AND 600 VOLT LEAD AND POLYETHYLENE CABLES | | |

SCOPE: THIS STANDARD SHOWS SINGLE-PHASE TERMINATION DEADENDS AND SPLICES FOR 5KV AND 600 VOLT LEAD AND POLYETHYLENE CABLES.

OIL STOP SPLICE FOR 5KV CU PILC TO XLPECN CABLE



| ITEM | DESCRIPTION | CONST STD. | STOCK NUMBER |
|------|------------------------------|------------|--------------|
| 1 | CONNECTOR (INSULINK) | 4172.3 | -- |
| 2 | CU. CONDUCTOR | -- | -- |
| 3 | AL/CU CONDUCTOR | 4002 | -- |
| 4 | FACTORY PAPER INSULATION | -- | -- |
| 5 | LEAD SHEATH | -- | -- |
| 6 | FACTORY XLPE INSULATION | -- | -- |
| 7 | GLASS TAPE, 1/2" | -- | 720256 |
| 8 | SEMI-CON PE JACKET | -- | -- |
| 9 | CU. BRAID | -- | 168864 |
| 10 | SEMI-CON TAPE, 3/4" | -- | 720352 |
| 11 | VARNISHED CAMBRIC TAPE, 1/2" | -- | 720992 |
| 12 | VARNISH CAMBRIC TAPE, 3/4" | -- | 721024 |
| 13 | SILICONE TAPE, 1" | -- | 720384 |
| 14 | H.V. INSULATING TAPE | -- | 720480 |
| 15 | VINYL PLASTIC TAPE, 3/4" | -- | 720580 |
| 16 | CONCENTRIC NEUTRAL | -- | -- |

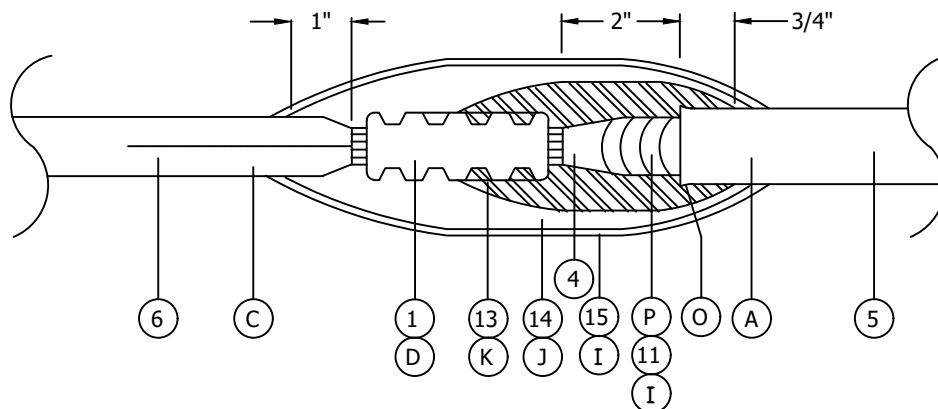
| INSTALLATION | |
|--------------|---|
| (A) | CLEAN LEAD SURFACE W/ALUMINUM OXIDE CLOTH |
| (B) | CLEAN SEMI-CON SURFACE W/SOLVENT |
| (C) | CLEAN SURFACE W/SOLVENT |
| (D) | REMOVE PLASTIC COVER FROM INSULINK AFTER CRIMPING |
| (F) | FILL CRIMPS WITH BRAID |
| (G) | FILL CRIMPS WITH SEMI-CON TAPE |
| (H) | ONE HALF-LAPPED LAYER |
| (I) | TWO HALF-LAPPED LAYERS |
| (J) | THREE HALF-LAPPED LAYERS |
| (K) | SIX HALF-LAPPED LAYERS |
| (L) | SIX LAYERS OVER END AND SIDES OF CABLE/4 LAYERS FOR SECONDARY CABLE |
| (M) | CONNECT TO GROUND |
| (N) | SEE STANDARD 4108 FOR SEALING JACKETED CABLE |
| (O) | FLAIR LEAD TO ALLOW 1/2" CAMBRIC TAPE TO GO UNDER THE FLAIR |
| (P) | REMOVE TWO LAYERS OF FACTORY PAPER INSULATION BEFORE APPLYING 1/2" CAMBRIC TAPE |

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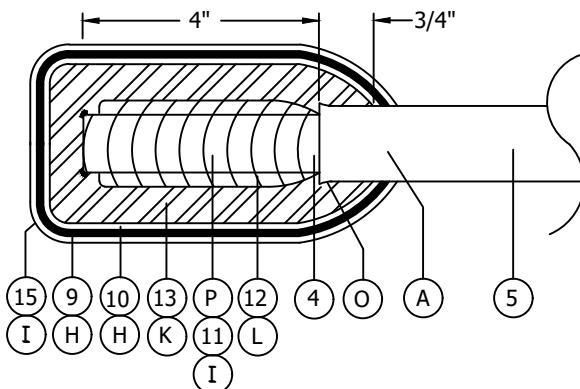
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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | DEADENDS AND SPLICES FOR 5KV AND 600 VOLT LEAD AND POLYETHYLENE CABLES | | | | |

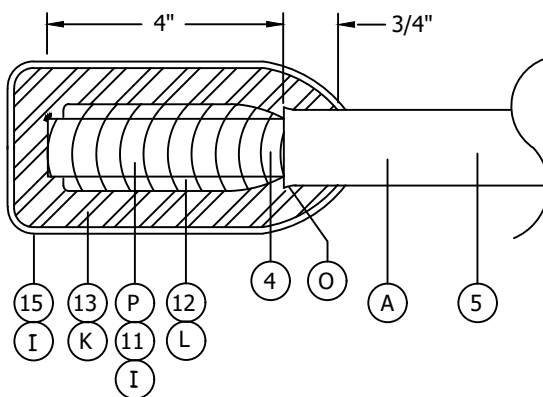
OIL STOP SPLICE FOR SECONDARY CU PILC TO
600 VOLT AL CROSS-LINK POLYETHYLENE



OIL STOP DEADEND FOR 5KV CU PILC CABLE



OIL STOP DEADEND FOR 600 VOLT CU PILC CABLE



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SHEET
2 OF 2

Indicates Latest Revision Completely Revised New Page Information Removed

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

DEADENDS AND SPLICES FOR 5KV AND 600 VOLT
LEAD AND POLYETHYLENE CABLES

FMO
UG4110.2

UG4111 FIELD MAINTENANCE ONLY

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | OUTDOOR CABLE TERMINALS FOR POLYETHYLENE CABLES | | | | | |

SCOPE: THIS STANDARD SHOWS CABLE TERMINALS USED FOR OUTDOOR PRIMARY CABLE TERMINATIONS.

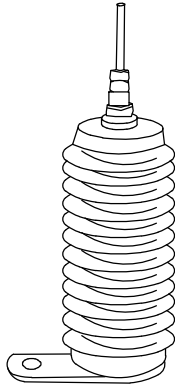


FIGURE 1
G&W

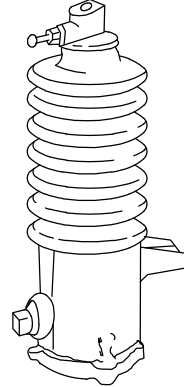


FIGURE 2
G&W

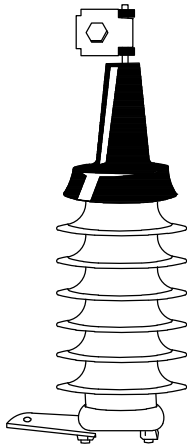


FIGURE 3
JOSLYN

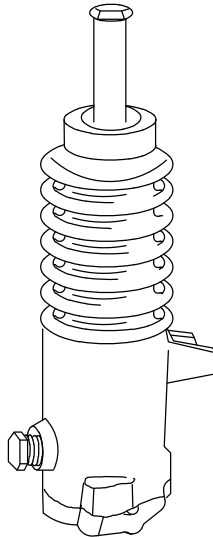


FIGURE 4
G&W

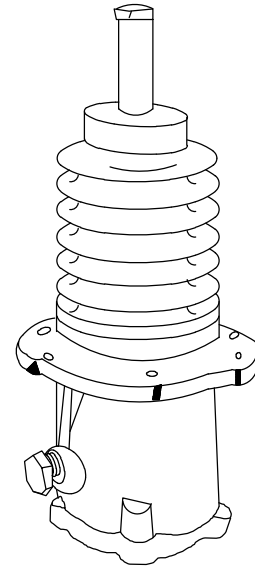


FIGURE 5
G&W

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| B | REVISION | - | - | - | TR/JJ | 06/28/2005 | E | | | | | | |
| A | REVISION | - | - | - | JCE/VCR | 03/01/2002 | D | MOVED TO FMO | EDM | EJA | GLW | CZH | 10/09/2020 |

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | OUTDOOR CABLE TERMINALS FOR POLYETHYLENE | | | | | |

BILL OF MATERIALS:

| CABLE POLYETHYLENE | TERMINAL | | FIGURE NUMBER | AERIAL LUG CATALOG NUMBER/ STOCK NUMBER | COMPRESSION CONNECTOR | | COMPRESSION DIE | ASSEMBLY UNITS |
|-----------------------|-----------------|-----------------|------------------|--|-----------------------|--------------|--------------------|-------------------|
| | CATALOG NUMBER | STOCK NUMBER | | | CATALOG NUMBER | STOCK NUMBER | | |
| 2 SOL AL | PATT 1801 | 727504 | 2 | - (E) | A5088-23-3D10 | - (A) | BG | CP-#2A |
| | E5202-BG | | 3 | PG3 (A) | 002D | - (A) | W-163 | |
| 2/0 AL | PATT 1801 | 727512 | 2 | - (E) | A5088-26-3D10 | - (A) | U-28ART | CP2/0A |
| | E5202-BM | | 3 | PG3 (A) | 2/OS | - (A) | BG | |
| 350 KCMIL AL | PAT 1872 CH | 727634 (C) | 4 | A5076-190 (A) | A5088-4 | - (A) | U31ART | CP350A |
| 2 CU | LCT 126-1701-BA | 727520 (B) | 1 | 261856 | 87XCU | - (A) | W162 | CP-#2C |
| 4 CU | 5641 | 732918 (D) | 6 | - (E) | 8898-6 | 729930 | BG | CP-#2N |
| | JPT15J1 | | | | | | | |
| | TFT-151E | | | | | | | |
| 4/0 CU | PATT 1802 | 727584 (B) | 2 | 3D (A) | A5087-28 | - (A) | U28RT | CP4/0C |
| 500 KCMIL CU | PAT 1872 CH | 727648 (B) (C) | 4 | A5076-190 (A) | A5087-10 | - (A) | U34RT | CP500C |
| 750 KCMIL AL | PATR 1873 CH | 727552 (C) | 5 | A5076-190 (A) | A5088-15 | - (A) | P39ART | CP750A |
| | 5644 | 727138 (D) | 6 | 262432 | PTL-750-2.5 | 729940 | 301 | CP750N |

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| B | REVISION | - | - | - | TR/JJ | 06/28/2005 | E | | | | | | |
| A | REVISION | - | - | - | JCE/VCR | 03/01/2002 | D | MOVED TO FMO | EDM | EJA | GLW | CZH | 10/09/2020 |

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| SHEET 2 OF 3 | X | Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4111.2 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | OUTDOOR CABLE TERMINALS FOR POLYETHYLENE | | | | | |

INSTALLATION:

- (A) SUPPLIED WITH CABLE TERMINAL KIT.
- (B) FOR USE IN ALL CONTAMINATION DISTRICTS.
- (C) DO NOT USE ON UPSWEEP BRACKETS.
- (D) NON-PORCELAIN TERMINALS ARE REQUIRED IN ALL DISTRICTS, FOR SUBSTATION APPLICATION SEE FIGURE 7 PAGE 4111.1.
- (E) AERIAL LUG NOT REQUIRED.
- (F) FOR 350, 750 AND 1000 KCMIL CABLE POLE TERMINALS, INSTALL THE TOP PORTION OF THE COMPRESSION CONNECTOR IN THE BOTTOM POSITION OF THE 2-BOLT CONNECTOR (AERIAL LUG).

REFERENCE:

- L. FOR CONTAMINATION DISTRICTS SEE STANDARD 287/3140.
- M. SEE STANDARD 1407/4207 FOR CABLE TERMINAL MOUNTING INFORMATION.

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| | OUTDOOR CABLE TERMINALS FOR POLYETHYLENE | | | | |


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| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | 3/C POTHEADS (G&W) | | | | |

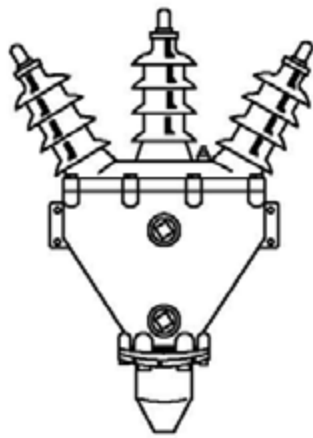


FIGURE 1
SHAPE "B"

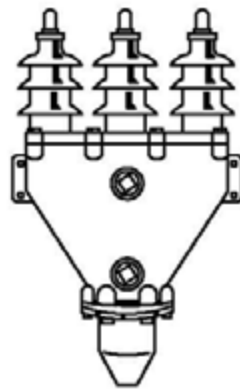


FIGURE 2
SHAPE "C"

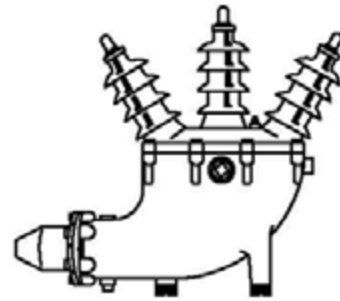


FIGURE 3
SHAPE "BK"

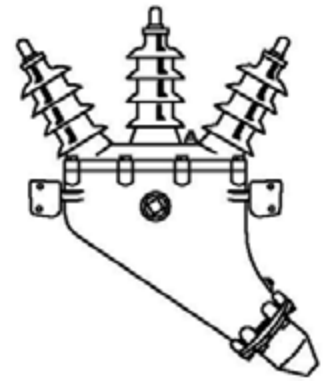


FIGURE 4
SHAPE "BL"

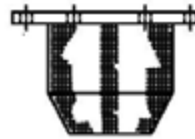


STYLE 8
BUS TYPE
VERTICAL SURFACE



STYLE 3-D
ADJUSTABLE CLAMP TYPE,
HORIZONTAL OR VERTICAL
TAKE-OFF

AERIAL LUGS

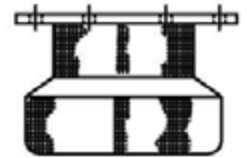


WS
WIPING SLEEVE



WSV
INVERTED WIPING
SLEEVE

(B)



CC
CONDUIT COUPLING

FOR FIELD MAINTENANCE ONLY

NOTES:

- A. SEE LATEST G&W TERMINATIONS BULLETIN FOR POTHEAD DIMENSIONS.
- (B) INVERTED WIPING SLEEVE USED WITH CONDUIT COUPLING.
- (C) CC550 ALSO REQUIRED-PIPE MOUNTED-LARGE BODY-SUBSTATION.
- (D) TO BE USED ONLY IN SUBSTATIONS WITH EXISTING 25KV RATED POTHEADS.

| FIG. NO. | SHAPE | G&W CATALOG NUMBER | MAX COND SIZE (KCM) | APPROX COMP REQ'D (GAL) | PARTS REFERENCE | | | | | | | SDG&E STOCK NUMBER | MAJOR USE | |
|--|-------|--------------------|---------------------|-------------------------|-----------------|---------|------------|--------|------------|------|------------|--------------------|-----------|-------------------------|
| | | | | | CAPNUT | | POR-CELAIN | LID | LID GASKET | BODY | AERIAL LUG | | | WIPING SLEEVE |
| | | | | | CONNECTOR | GASKET | | | | | | | | |
| 4KV SYSTEM VOLTAGE - POTHEAD RATED 8.7KV | | | | | | | | | | | | | | |
| 1 | B | TA3554B | 500 | 1-3/4 | AT25 | A1825-2 | DAC | DH3BAX | A-1777 | H4C | 3D55 | WS41 | 727200 | CABLE POLE |
| 2 | C | UNTA3555C | 500 | 5 | AT25 | A1825-2 | DAD | DJ3CAX | B1825 | J5C | A480-23 | WS51 | | CUBICLE |
| 3 | BK | UTA3555BK | 500 | 5 | AT35 | A1626 | EAB | EJ3BAX | B1825 | J5K | 3D55 | WS51 | | SUB - POLE |
| 4 | BL | UTA3555BL | 500 | 4 | AT35 | A1626 | EAB | EJ3BAX | B1825 | J5L | 3D55 | WS51 | | POLE |
| 12KV SYSTEM VOLTAGE - POTHEAD RATED 15KV | | | | | | | | | | | | | | |
| 1 | B | JTA3755B | 500 | 3-1/2 | AT35 | A1626 | EAG | EJ3BAX | B1825 | J5C | 3D55 | WS51 | 727136 | CABLE POLE - SMALL BODY |
| 1 | B | JTA3755B | 1000 | 3-1/2 | AT38 | A1626 | EAG | EJ3BAX | B1825 | J5C | 3D88 | WS51 | | CABLE POLE - SMALL BODY |
| 1 | B | TA3785B | 1000 | 5-1/2 | AT38 | A1626 | EAG | EK3BAX | B1826 | K5C | 3D88 | WSV51 | | (C) |
| 2 | C | NTA3755C | 500 | 5-1/2 | AT35 | A1626 | EAH | EK3CAX | B1826 | K5C | A480-23 | WS51 | | LARGE BODY - CUBICLE |
| 2 | C | NTA3785C | 1000 | 5-1/2 | AT38 | A1626 | EAH | EK3CAX | B1826 | K5C | A482-23 | WS51 | | LARGE BODY - CUBICLE |
| 3 | BK | TA3755BK | 500 | 6-1/2 | AT35 | A1626 | EAG | EK3BAX | B1826 | K5K | 3D55 | WS51 | | SUB - POLE |
| 3 | BK | TA3785BK | 1000 | 6-1/2 | AT38 | A1626 | EAG | EK3BAX | B1826 | K5K | 3D88 | WS51 | | SUB - POLE |
| 4 | BL | JTA3755BL | 500 | 4 | AT35 | A1626 | EAG | EJ3BAX | B1825 | J5L | 3D55 | WS51 | | POLE |
| 4 | BL | JTA3785BL | 1000 | 4 | AT38 | A1626 | EAG | EJ3BAX | B1825 | J5L | 3D55 | WS51 | | POLE |
| 1 | B | TA3855B | 500 | 5-1/2 | AT25 | A1625-2 | EAK | EK3BAX | B1826 | K5C | 3D55 | WS51 | | POLE - NEAR OCEAN |
| 3 | BK | TA3855BK | 500 | 6-1/2 | AT25 | A1625-2 | EAK | EK3BAX | B1826 | K5K | 3D55 | WS51 | | SUBSTATIONS NEAR OCEAN |

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| DATE 1-1-93 APPD JLB/BSJ | SDG&E ELECTRIC STANDARDS 3/C POTHEADS (G&W) | 4199.910 SUPERSEDES 4112 1-1-93 |
|-----------------------------|--|---------------------------------------|

UG4113 FIELD MAINTENANCE ONLY

ALL VERSIONS LISTED IN FMO ARE SUPERSEDED BY THEIR CURRENT VERSION FOUND INSIDE THE UNDERGROUND CONSTRUCTION STANDARD MANUAL.

REVISION HISTORY:

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | LIVEFRONT TO LOAD BREAK ELBOW CONVERSION RE-SHIELDING OF CABLE | | | | |

SCOPE: THIS STANDARD SHOWS THE APPLICATION OF SEMI CONDUCTIVE SHIELDING ON 15KV XLPE PECN, OR XLPE-PEJ CABLES FOR THE PURPOSE OF CONVERTING LIVEFRONT CONNECTIONS TO LOADBREAK ELBOWS.

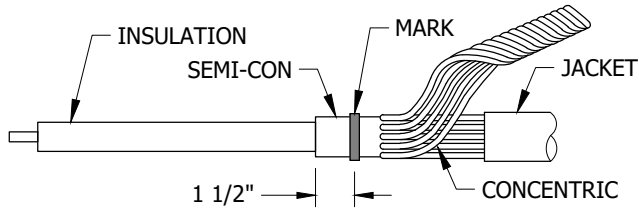


FIGURE 1 (C)

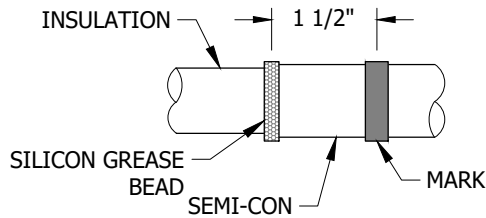


FIGURE 2 (D)

FIELD MAINTENANCE ONLY

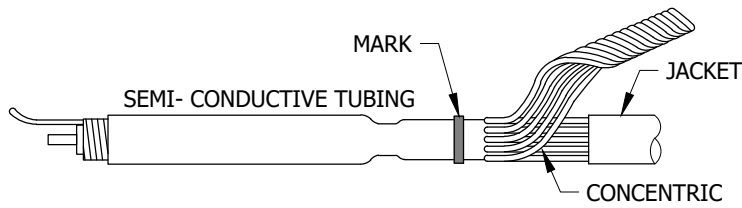


FIGURE 3

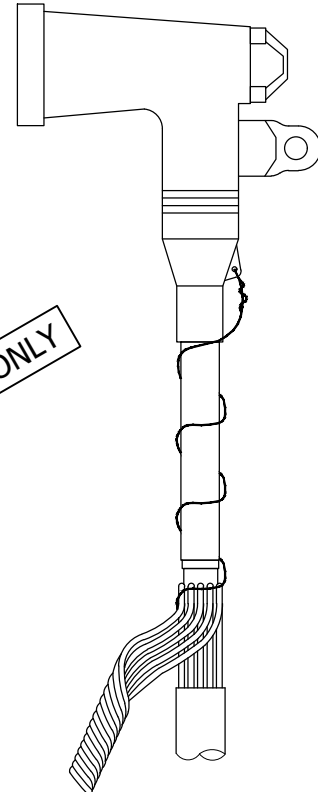


FIGURE 4 (H)

INSTALLATION:

- A. REMOVE LIVE FRONT CONNECTION AND CUT CABLE TO TERMINATION LENGTH. INSTALL ELBOW LUG AND COMPRESS CONNECTION.
- B. INSPECT INSULATION FOR DEGRADATION OR DAMAGE; MINOR IMPERFECTIONS CAN BE REMOVED WITH A FINE GRADE EMERY CLOTH. CLEAN INSULATION AND SEMI-CONDUCTIVE COVER WITH APPROVED CLEANER.
- (C) PLACE A MARK 1 1/2" FROM THE END OF THE SEMI-CONDUCTIVE COVER.
- (D) APPLY A BEAD OF SILICON GREASE AT THE END OF THE SEMI-CONDUCTIVE COVER TO FILL THE VOID WHERE THE INSULATION STARTS.
- E. INSTALL SEMI-CONDUCTIVE TUBE OVER CABLE WITH THE PULL RIBBON TOWARD THE END OF THE CABLE.
- F. PULL THE RIBBON AND ADJUST THE SEMI-CONDUCTIVE TUBING TO THE 1 1/2 INCH MARK ON CABLE SEMI-CONDUCTIVE COVER. UN-WIND RIBBON HOLDING THE END OF THE SEMI-CONDUCTIVE TUBING IN PLACE.
- G. AFTER THE SEMI-CONDUCTIVE TUBING IS APPLIED TO THE CABLE, FOLLOW ELBOW MANUFACTURERS INSTRUCTIONS AND TRIM SEMI-CONDUCTIVE COVERING TO LENGTH AND APPLY ELBOW.
- (H) SPIRAL WRAP A CONCENTRIC NEUTRAL WIRE FROM THE TURN BACK UP TO THE ELBOW AND ATTACH TO THE DRAIN/BLEED CONNECTION POINT ON THE ELBOW.

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | LIVEFRONT TO LOAD BREAK ELBOW CONVERSION RE-SHIELDING OF CABLE | | | | |

BILL OF MATERIALS:

| ITEM | DESCRIPTION | QUANTITY | STANDARD PAGE | STOCK NUMBER | DESIGN UNITS |
|------|---------------------------|----------|---------------|--------------|--------------|
| 1 | 3M SEMI-CONDUCTIVE TUBING | AS REQ'D | - | S776660 | - |

NOTES:

- I. INSPECT QUALITY OF CABLE TO BE RE-SHIELDED. IF CONCENTRIC NEUTRALS SHOW SIGNS OF SEVERE CORROSION OR THE CABLE HAS DEGRADED INSULATION, THE CABLE SHOULD BE REPLACED AND NOT RE-SHIELDED.
- II. SEMI CONDUCTIVE TUBING CAN RE-SHIELD 22 INCHES OF CABLE INSULATION AND CABLE SIZES FROM # 4 COPPER TO 2/0 ALUMINUM.

REFERENCE:

- a. RE-TEST CABLE ACCORDING TO THE ELECTRIC STANDARD PRACTICE 107, 229 OR 200 CABLE TESTING STANDARDS.

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| | LIVEFRONT TO LOAD BREAK ELBOW CONVERSION RE-SHIELDING OF CABLE | | | | |

UG4122 FIELD MAINTENANCE ONLY

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | INDOOR CABLE TERMINATIONS, POLYETHYLENE CABLES (EXISTING CABLES) | | | | | |

SCOPE: THIS STANDARD SHOWS STRESS WRAP USED ON EXISTING INSTALLATIONS FOR THE REPLACEMENT OF DAMAGED STRESS CONES.

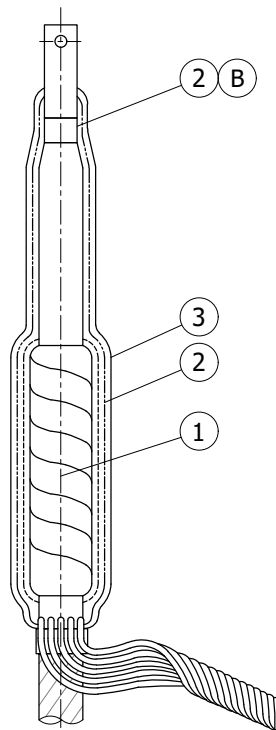


FIGURE 1

FIELD MAINTENANCE ONLY

INSTALLATION:

A. FOLLOW MANUFACTURERS INSTRUCTIONS FOR THE APPLICATION OF STRESS WRAP, HIGH VOLTAGE INSULATING TAPE AND SILICONE TAPE. THE TAPES IN THE BILL OF MATERIAL SHALL BE USED INSTEAD OF TAPES IN MANUFACTURERS INSTRUCTIONS.

(B) ON COPPER CABLE, DO NOT TAPE OVER THE EXPOSED BARE COPPER WIRE BETWEEN THE LUG AND THE CABLE INSULATION.

BILL OF MATERIALS:

| ITEM | DESCRIPTION | QUANTITY | STANDARD PAGE | STOCK NUMBER | DESIGN UNITS |
|------|-------------------------------|----------|---------------|--------------|--------------|
| 1 | STRESS WRAP | 1 | - | S247736 | - |
| 2 | TAPE, HIGH VOLTAGE INSULATING | AS REQ'D | - | S720480 | - |
| 3 | TAPE, SILICONE | AS REQ'D | - | S720384 | - |

NOTES:

I. USE STRESS WRAP WHERE IT IS NOT POSSIBLE TO SLIDE A NEW STRESS CONE OVER THE EXISTING LUG, OR TO HELP MAINTAIN CLEARANCES BETWEEN STRESS CONES AND/OR EQUIPMENT BARRIERS.

REFERENCE:

a. SEE UG4108 OR UG4121 FOR LIVEFRONT CABLE TERMINATIONS USED ON NEW CONSTRUCTION.

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**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

INDOOR CABLE TERMINATIONS, POLYETHYLENE CABLES
(EXISTING CABLES)

**FMO
UG4122.1**

FIELD MAINTENANCE ONLY

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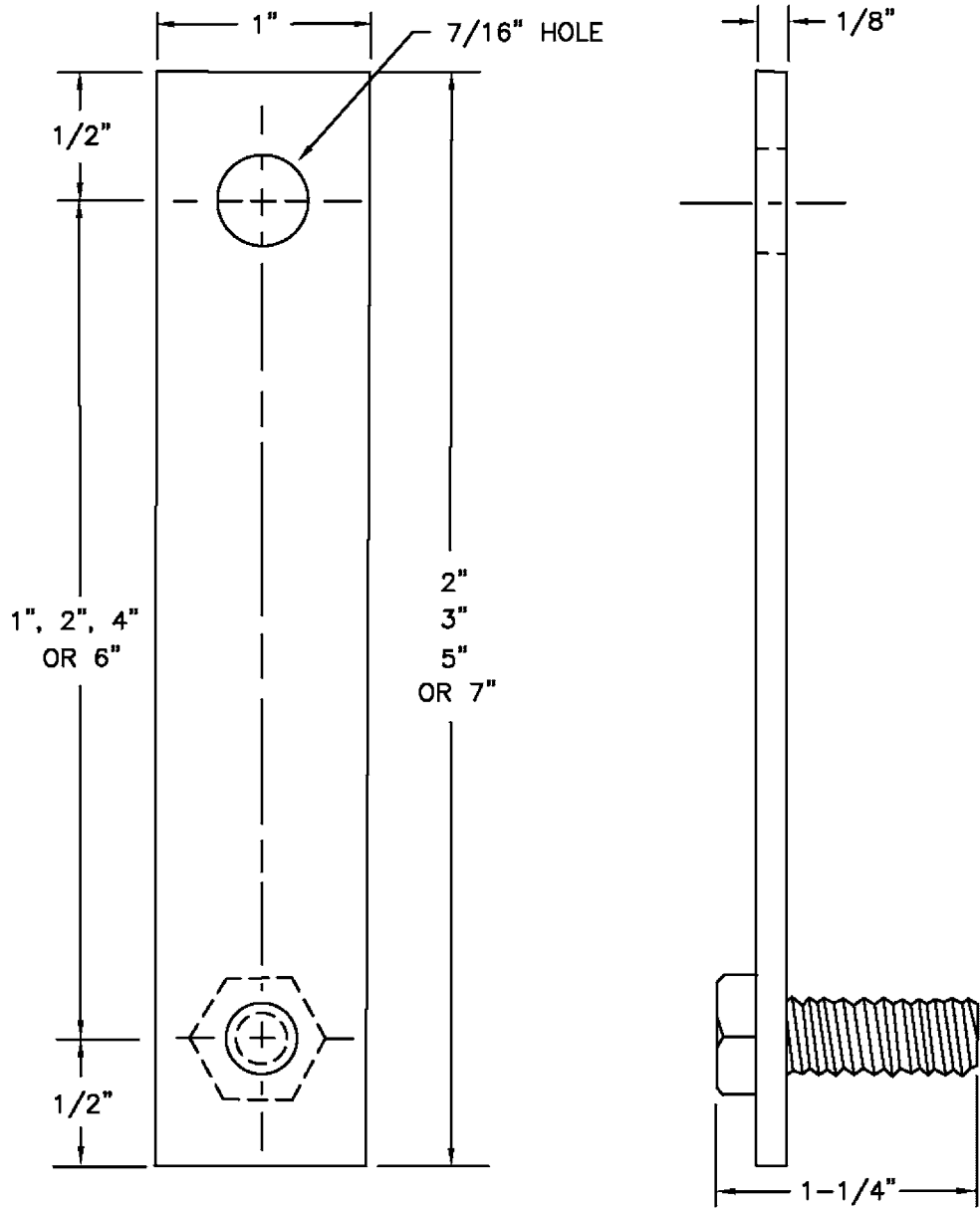
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| | <p>SDG&E ELECTRIC UNDERGROUND CONSTRCUTION STANDARD</p> | | | | |
| | <p>3/C POTHEADS (G&W)</p> | | | | |

SCOPE: THIS STANDARD SHOWS PLATE EXTENSIONS USED TO EXTEND PRIMARY CABLE CONNECTIONS TO HIGHER BUSHING HEIGHTS.



NOTES:

- ADAPTER PLATE TO BE TINNED COPPER.
- BOLT TO BE 3/8", 16 THREADS PER INCH. THREADS SHALL BE CONTINUOUS TO ADAPTER PLATE CONTACT SURFACE.
- BOLT TO BE BRAZED TO BACK OF PLATE.

| STOCK NUMBERS | |
|---------------|--------|
| 1" | 101904 |
| 2" | 101920 |
| 4" | 101952 |
| 6" | 101984 |

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| 4123 SUPERCEDES 3799.902 (4-10-75) | SDG&E ELECTRIC STANDARDS | | | REVISION |
| | TERMINAL ADAPTER PLATE EXTENSION | | | DATE 1-1-86 APPD <i>JLB/ROJ</i> |

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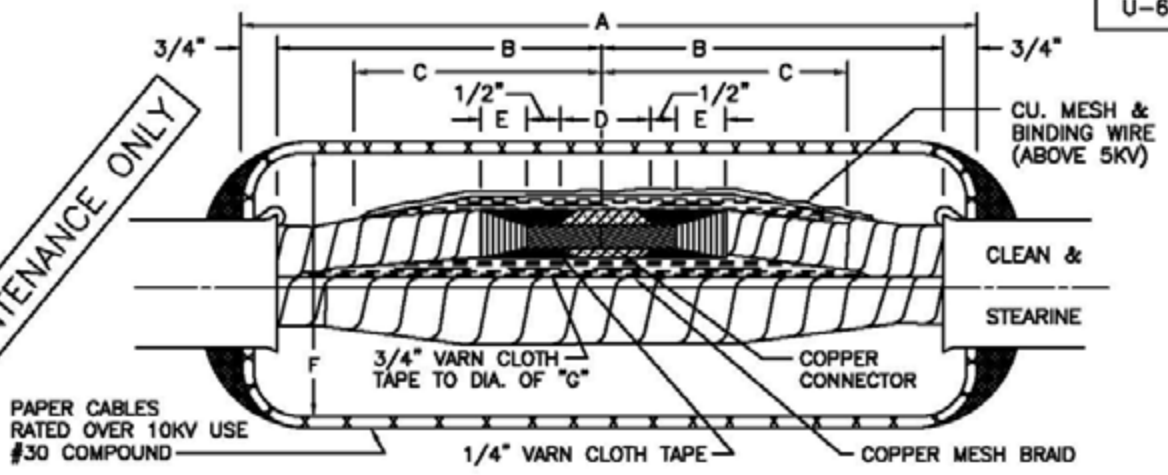
**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD

SPLICE FOR 15KV MULTI-CONDUCTOR CABLES
FOR PAPER OR VANISHED CAMBRIC, LEAD SHEATHED CABLES

**FMO
UG 4145**

FOR FIELD MAINTENANCE ONLY



| SIZE CONDUCTOR | INSULATION THICKNESS | VOLT KV | DIMENSIONS IN INCHES | | | | | | | SPLICE KIT STOCK NO. | ASSEMBLY UNIT |
|----------------|----------------------|---------|----------------------|-------|-------|---|-------|-------|-----|----------------------|---------------|
| | | | A | B | C | D | E | F | G | | |
| 500MCM | .175 | 15 | 22 | 9 1/2 | 7 1/4 | 3 | 1 1/8 | 5 1/2 | .35 | 445472 | KIT500 |
| #2 | .175 | 5 | 15 1/2 | 7 | 5 | 2 | 1 1/8 | 4 1/2 | .35 | F.M.O. | - |

NOTES:

1. TRAIN THE CABLES INTO POSITION AND CUT THE ENDS SO THAT THEY BUTT SQUARELY TOGETHER.
2. CLEAN AND SCRAPE THE ENDS OF THE LEAD SLEEVE FOR FIVE INCHES AND FLUX WITH STEARINE. SLIP THE LEAD SLEEVE OVER ONE CABLE.
3. MAKE A CIRCULAR SCORE HALF-WAY THROUGH THE LEAD SHEATHS AT A POINT (B) INCHES FROM EACH CABLE END. CLEAN AND SCRAPE THE LEAD SHEATHS FIVE INCHES BEYOND THE SCORE AND FLUX WITH STEARINE.
4. REMOVE THE LEAD SHEATHS UP TO THE SCORE PLACES TEARING THEM OFF SO THAT THE LEAD SHEATHS REMAINING ON THE CABLES ARE BELLED. REMOVE ALL BURRS AND SHARP EDGES, UNWRAP AND FOLD BACK THE METAL BINDER TAPE TO WITHIN 3/4" OF THE LEAD SHEATH.
5. REMOVE THE SHIELDING TAPE FOR A DISTANCE OF (C) INCHES FROM EACH CABLE END, AND TAIL DOWN.
6. REMOVE (D/2 + 1/2) INCHES OF INSULATION FROM EACH CONDUCTOR, FLUX CONDUCTORS AND PLACE IN CONNECTOR WITH SLOT UP BEING SURE THEY BUTT SQUARELY TOGETHER IN THE CENTER OF THE CONNECTOR AND CLAMP CONNECTOR. WRAP ROVING BETWEEN INSULATION AND CONNECTOR, A TEMPORARY LAYER OF VARNISHED CAMBRIC TAPE MAY BE WRAPPED OVER THE INSULATION ON THE CONDUCTORS TO PROTECT THEM FROM DIRT.
7. TIN AND SWEAT ON CONNECTOR LADLING SOLDER INTO THE SLOT AND OVER THE CONNECTOR. REMOVE ASBESTOS ROVING AND ALL SHARP SOLDER POINTS. CLEAN AND POLISH THE CONNECTOR.
8. PENCIL THE INSULATION ON EACH CABLE FOR (E) INCHES. USE GILLING THREAD TO TIE DOWN THE LOOSE ENDS OF TAPE. SMOOTH THE PENCILS WITH SHARP KNIFE.
9. APPLY 1/4" VARNISHED CAMBRIC TAPE ON THE CONDUCTORS BETWEEN THE INSULATION AND CONNECTOR BUILDING UP TO THE LEVEL OF THE CONNECTOR AND CARRYING TWO LAYERS ACROSS THE CONNECTOR.
10. CONTINUE THE BUILDUP WITH HALF-LAPPED 3/4" VARNISHED CAMBRIC TAPE REMOVING THE GILLING THREAD AND TEMPORARY LAYER OF VARNISHED CAMBRIC TAPE. CARRY TAPING EVENLY BACK AND FORTH ACROSS THE SPLICE BUILDING UP TO A DIAMETER OF (G) INCHES OVER THE CONNECTOR AND TAPERING TO THE ENDS. BASTE EACH LAYER OF VARNISHED CAMBRIC TAPE WITH OKO-CAL #60 COMPOUND OR EQUAL HEATED TO 250° F FOR CABLES OPERATING ABOVE 6000 VOLTS PHASE TO PHASE. FOR LOWER VOLTAGES, OMIT BASTING. APPLY A HALF-LAPPED LAYER OF COPPER MESH SHIELDING BRAID OVER EACH CONDUCTOR AND OVERLAY BINDING WIRE. SOLDER TO THE ORIGINAL SHIELDING TAPE AT EACH END AND SOLDER BETWEEN THE TURNS.
11. CENTER THE LEAD SLEEVES OVER THE SPLICE. BEAT DOWN THE ENDS OF THE LEAD SLEEVE TO FIT SNUGLY OVER THE CABLE SHEATHS.
12. WIPE THE LEAD SLEEVE TO THE LEAD SHEATHS USING PAPER PASTERS TO LIMIT THE WIPES.
13. CUT ONE VEE-HOLE IN THE TOP OF THE LEAD SLEEVE AT EACH END. FILL THE LEAD SLEEVE WITH OKO-CAL #30 COMPOUND OR EQUAL, TILTING THE SLEEVE SLIGHTLY AND POURING THROUGH THE VEE-HOLE AT THE LOWER END OF THE SLEEVE SO THAT ALL AIR WILL BE FORCED OUT THE HOLE AT THE UPPER END. THE #30 COMPOUND SHOULD BE POURED AT 275° F AND SHOULD NOT BE HEATED TO MORE THAN 375° F.
14. AFTER THE COMPOUND HAS COOLED IN THE SLEEVE, REFILL THE CONTRACTION CONES THROUGH BOTH VEE-HOLES AND SOLDER SEAL THE FILLING HOLES.
15. CONNECT THE LEAD SHEATHS TO GROUND.

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| SDG&E ELECTRIC STANDARDS | | |
| DATE 7-30-02 | SPLICE FOR 15KV MULTI-CONDUCTOR CABLES FOR PAPER OR VARNISHED CAMBRIC, LEAD SHEATHED CABLES | 4199.911 SUPERSEDES 4145 7-30-02 |
| APPD <i>[Signature]</i> | | |

FIELD MAINTENANCE ONLY

REVISION HISTORY:

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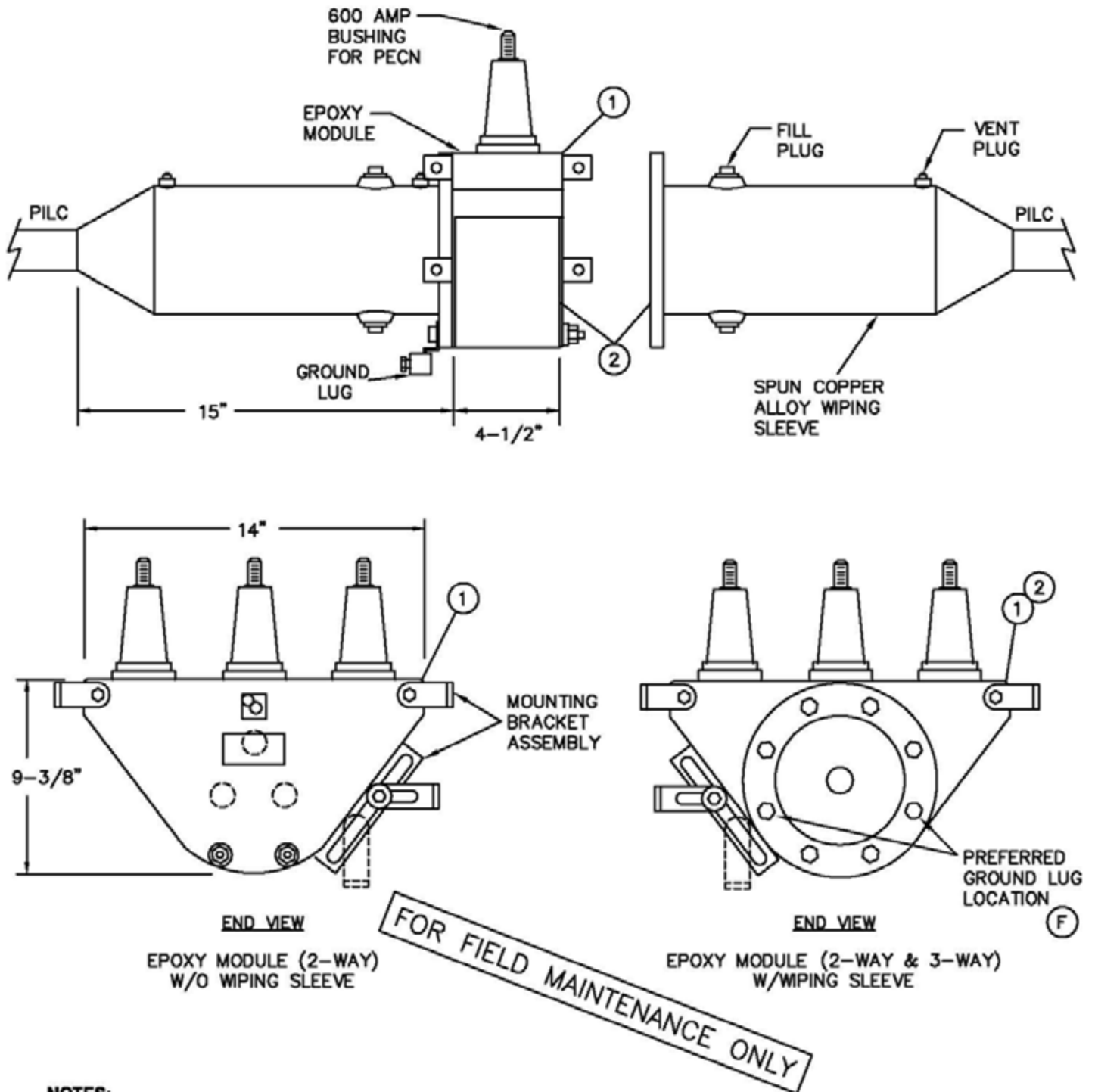
**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD

15KV CABLE TRANSITION MODULE

**FMO
UG 4147**

SCOPE: THIS STANDARD SHOWS THE CABLE TRANSITION MODULE USED FOR SPLICING OR TAPPING 500 KCMIL PILC-PEJ TO 350 - 1000 KCMIL XL-PECN-PEJ. FOR MANHOLE INSTALLATIONS ONLY: (SEE STD. PG. 4147.3 FOR MAP SYMBOLS).



NOTES:

- MAY BE INSTALLED IN 3324 MANHOLES. PROPER UNOBSTRUCTED SPACES MUST BE MAINTAINED.
- FOR INSTALLATIONS REQUIRING 200 AMP CONNECTORS, CONTACT CONSTRUCTION STANDARDS FOR COORDINATION.
- INSTALLATION INSTRUCTIONS FOR 15KV-95KVBIL AND TERMINATION SUPPLIES INCLUDED IN KIT.

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SDG&E ELECTRIC STANDARDS

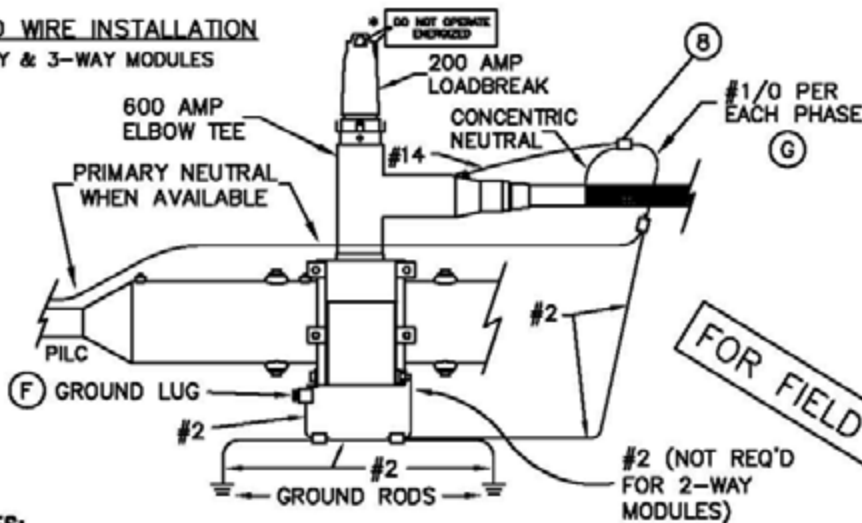
4199.912
SUPERSEDES
4147.1 1-1-94

15KV CABLE TRANSITION MODULE

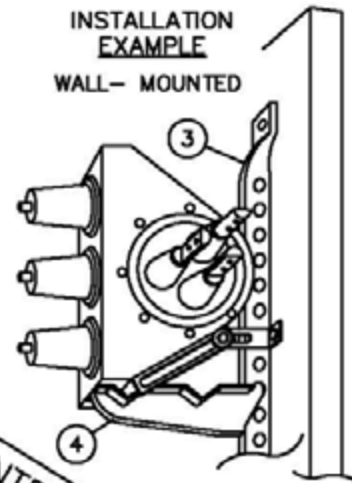
DATE 1-1-94
APPD *JLB/BJG*

GROUND WIRE INSTALLATION

2-WAY & 3-WAY MODULES



INSTALLATION EXAMPLE
WALL-MOUNTED



FOR FIELD MAINTENANCE ONLY

*** NOTES:**

- INSTALL (DO NOT OPERATE ENERGIZED) TAG WHEN INSTALLED IN MANHOLES.

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST. STD. OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNITS |
|------|---|----------|-------------------------|--------------|----------------|
| 1 | KIT, CABLE SPLICING TRANSITION MODULE, 15KV-95KVBIL (2-WAY) | AS REQ'D | - | 443104 | CTM-11 |
| 2 | KIT, CABLE SPLICING TRANSITION MODULE, 15KV-95KVBIL (3-WAY) | AS REQ'D | - | 443106 | CTM-09 |
| 3 | HANGAR FOR CABLE ARMS | AS REQ'D | 4178.2 | 564480 | - |
| 4 | CABLE ARM, 2-WAY | AS REQ'D | 4178.2 | 110496 | - |
| 5 | WIRE, BARE COPPER, #2 STR. SOFT DRAWN | AS REQ'D | - | 812816 | - |
| 7 | WIRE, BARE COPPER, 1/0 STR. SOFT DRAWN | AS REQ'D | - | 812752 | - |
| 8 | WIRE, BARE COPPER, # 4/0 STR. SOFT DRAWN | AS REQ'D | - | 812764 | - |
| 9 | WIRE, BARE COPPER, #14 STR. SOFT DRAWN | AS REQ'D | - | 812934 | - |
| 10 | CONNECTOR, COMPRESSION (SQUEEZON) | AS REQ'D | 4172.2 | - | - |

INSTALLATION:

- FOLLOW INSTALLATION INSTRUCTIONS INCLUDED IN THE TRANSITION MODULE KIT. KIT INCLUDES REQUIRED TAPES, NO VOID COMPOUND, SOLDER, ETC.
 - THE CTM IS NORMALLY POSITIONED ON A BRACKET AND NOT FREE TO MOVE DURING ASSEMBLY. PROPER CABLE TRAINING SPACE FOR ALL CABLES CONNECTED TO THE CTM MUST BE INVESTIGATED PRIOR TO SELECTING THE MOUNTING POSITION.
 - SEE INSTALLATION EXAMPLE ABOVE FOR MOUNTING THE MODULE ON A SUBSTRUCTURE OR VAULT WALL. MODULE MAY BE MOUNTED IN OTHER WAYS (I.E. THE FLOOR OF A VAULT ON BRACKETS MADE FROM CABLE STRUT), IF EXISTING EQUIPMENT AND CABLE LOCATIONS DO NOT PERMIT WALL MOUNTING.
 - WHEN ATTACHING THE WIPING SLEEVE TO THE MODULE, ASSURE THE FILL PLUG AND VENT PLUG ARE ON THE TOP OF THE JOINT. ASSURE "O" RING SEAL IS IN THE PROPER POSITION.
- (F) A GROUND LUG IS SUPPLIED IN THE KIT. THE PILC CABLE AND THE PECN CABLE SHIELDS MUST BE CONNECTED TOGETHER AT THIS GROUND LUG. ON THE 3-WAY MODULE (S/N 443106), BOTH PILC CABLES AND THE PECN CABLE MUST BE TIED TOGETHER. THE GROUND LUG MUST BE ATTACHED TO THE FLANGE OF THE SPUN COPPER ALLOY WIPING SLEEVE, PREFERABLY IN THE FOUR O'CLOCK OR EIGHT POSITION. SEE END VIEW DRAWING ON CONST. STD PAGE NO. 4171.1.
- (G) THE WIRE BETWEEN ALL THREE PHASES OF PECN TO BE: 1) CONCENTRIC WIRE OR #2 FOR 350 KCMIL PER PHASE, OR 2) CONCENTRIC WIRE OR 1/0 FOR 500, 750, OR 1000 KCMIL PER PHASE.

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| | | |
|------------------------------------|------------------------------|---|
| DATE 1-1-94 APPD <i>JLB/BSJ</i> | SDG&E ELECTRIC STANDARDS | 4199.913 SUPERSEDES 4147.2 1-1-94 |
| | 15KV CABLE TRANSITION MODULE | |

FIELD MAINTENANCE ONLY

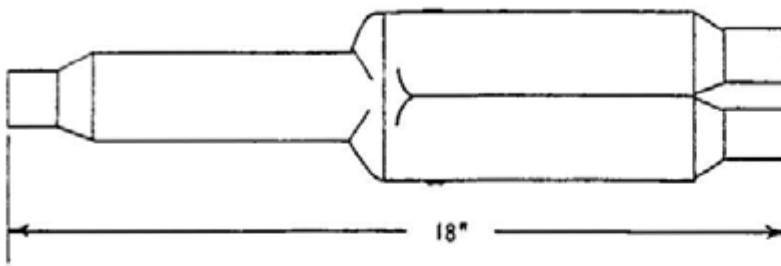
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| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | | | | | | | | |
| | 200 AMP DEADBREAK CONNECTORS, 12KV | | | | | | | | | | | |

200 AMP DEADBREAK CONNECTORS

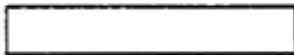
"Y" SPLICE
(DELETED FROM PG. 4196.3)



| STOCK NUMBER | |
|--------------|--------|
| #2 CU | 668416 |
| 2/0 AL | 668408 |
| #2 SOL AL | 668400 |
| #2 CU-#2 CU | 668404 |
| #2 AL | |

MAJOR USE:
USED FOR PERMANENT
SPLICE INSTALLATION

INSULATING PLUG
(DELETED FROM 4196.4)



| STOCK NUMBER | |
|--------------|--------|
| #2 CU | 544862 |

MAJOR USE: (#2 COPPER ONLY)
TO PLUG CABLE ENTRANCES
ON "Y" SPLICE, STRAIGHT
PLUG OR STRAIGHT RECEPTACLES

NOTES:

- FOR INSTALLATION PROCEDURES CONSULT INDIVIDUAL MANUFACTURERS CONTAINERS FOR CURRENT INSTRUCTIONS.

FOR FIELD MAINTENANCE ONLY

SDG&E ELECTRIC STANDARDS

DATE 1-1-85
APPD *RS DRH*

200 AMP DEADBREAK CONNECTORS, 12KV

4199.506
SUPERCEDES 4151.1
(1-22-76)


FIELD MAINTENANCE ONLY

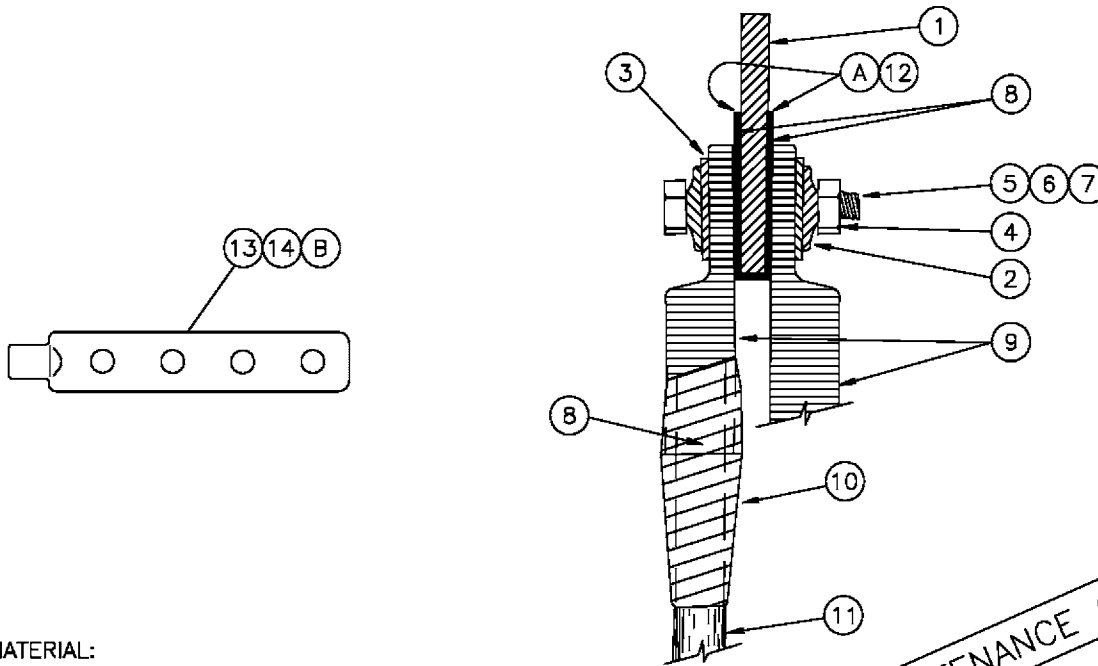
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| | <p>SDG&E ELECTRIC UNDERGROUND STANDARD</p> | | | | |
| | <p>ALUMINUM TERMINATION SECONDARY (600V) AT TRANSFORMER OR BUS</p> | | | | |



FOR FIELD MAINTENANCE ONLY

BILL OF MATERIAL:

| ITEM | DESCRIPTION | CONST STD. | STOCK NUMBER | |
|------|--|--------------------|--------------|--------|
| 1 | TRANSFORMER TERMINAL OR BUS | - | - | |
| 2 | WASHER, 3/8", SPRING LOCK, CADMIUM PLATED | - | 798620 | |
| 3 | WASHER, 3/8", FLAT, CADMIUM PLATED. | - | 800160 | |
| 4 | NUT, 3/8", HEX, MACHINE THREAD, CADMIUM PLATED. | - | 505020 | |
| 5 | BOLT, 3/8" X 1-1/2", HEX HEAD MACHINE THREAD, CADMIUM PLATED. | - | 616106 | |
| 6 | BOLT, 3/8" X 2", HEX HEAD, MACHINE THREAD, CADMIUM PLATED. | - | 616116 | |
| 7 | BOLT, 3/8" X 2-1/2", HEX HEAD, MACHINE THREAD, CADMIUM PLATED. | - | 616120 | |
| 8 | INHIBITOR, (REFER TO 4106 FOR INSTALLATION INSTRUCTIONS) | - | 247200 | |
| 9 | ALUMINUM LUG, (SIZE AS REQ'D) | 4171 | - | |
| 10 | TAPE, PVC | - | 720580 | |
| 11 | ALUMINUM CABLE | 4002 | - | |
| 12 | TRANSITION PLATE, ALUMINUM TO COPPER | 2 HOLE 1-1/2" X 3" | - | 543208 |
| | | (A) 4 HOLE 3" X 3" | - | 543216 |
| | | 4 HOLE 4" X 4" | - | 543224 |
| 13 | ALUMINUM CONNECTOR, 5/8" STUD, FOR 25-75 KVA | (B) | - | 270280 |
| 14 | ALUMINUM CONNECTOR, 1" STUD, FOR 100 & 167 KVA | (B) | - | 270276 |

INSTALLATION:

- (A) TRANSITION PLATE (APPROPRIATE SIZE) TO BE USED WHEN BOLTING ALUMINUM LUG TO UN-TINNED COPPER BUS OR TRANSFORMER TERMINAL.
- (B) COPPER TINNED LUGS MAY ATTACHED TO AN ALUMINUM CONNECTOR STUD, ITEMS 13 & 14.

4199.600
SUPERSEDES
4168 (9-7-99)

SDG&E ELECTRIC STANDARDS
ALUMINUM TERMINATION
SECONDARY (600V) AT TRANSFORMER OR BUS

DATE 1-1-94

APPD *JLB/BJ*

FIELD MAINTENANCE ONLY

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**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD

TRANSFORMER TERMINAL & BUS COMPRESSION TERMINALS
FOR ALUMINUM CONDUCTORS

**FMO
UG 4171**



2 HOLE FOR 1/2" BOLTS (A)

| ITEM | AL WIRE SIZE | BURNDY DIE SIZE | MANUFACTURER/CATALOG NUMBER | | COMPRESSION TERMINAL STOCK NUMBER | ASSEMBLY UNITS |
|------|--------------|-----------------|-----------------------------|------------|-----------------------------------|----------------|
| | | | BURNDY | HOMAC | | |
| 1 | 3/0 | 840 | - | ASL3/0-NTN | 729286 (KIT OF 2) 729287 | 3/0STK |
| 2 | | | - | AL3/0-NTN | | |
| 1 | 350 | 317 | YAK31A-2G1 | ASL350-NTN | 729288 (KIT OF 2) 729289 | 350STK |
| 2 | | | YAK31A-2G2 | AL350-NTN | | |
| 1 | 500 | 608 | YAK34A-2G1 | ASL500-NTN | 729290 (KIT OF 2) 729291 | 500STK |
| 2 | | | YAK34A-2G2 | AL500-NTN | | |

NOTES

THE MAJOR USE FOR STACKABLE LUGS ARE FOR FLAT BUS CONNECTIONS IN PULL CANS WHERE THERE ARE LESS POSITIONS ON THE LANDING TERMINAL THAN THERE ARE CABLES

INSTALLATION

- (A) 2 HOLE PADS ARE DRILLED FOR 1-3/4" SPACING
- B WHEN APPLYING CONNECTORS, USE INHIBITOR (STOCK NUMBER 247200) AT EACH ALUMINUM CONNECTION
- (G) LUGS USED FOR PRIMARY INDOOR TERMINATIONS SHOWN ON STANDARD 4121

REFERENCE

H SEE STANDARD 4106 FOR ALUMINUM CONDUCTOR PREPARATION FOR TERMINATIONS

FOR FIELD MAINTENANCE ONLY

| | | |
|---|---|--|
| 4199.709 SUPERSEDES 4171 2 1-1-96 | SDG&E ELECTRIC STANDARDS | DATE 1-1-96 APPD <i>[Signature]</i> |
| | TRANSFORMER TERMINAL & BUS COMPRESSION TERMINALS FOR ALUMINUM CONDUCTORS | |

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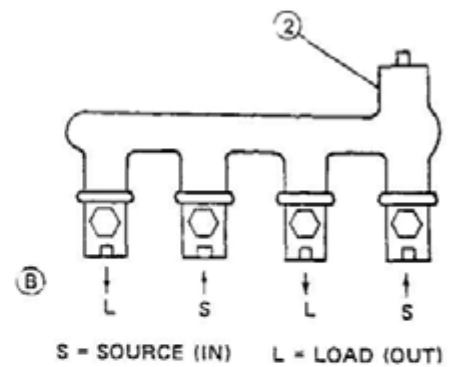
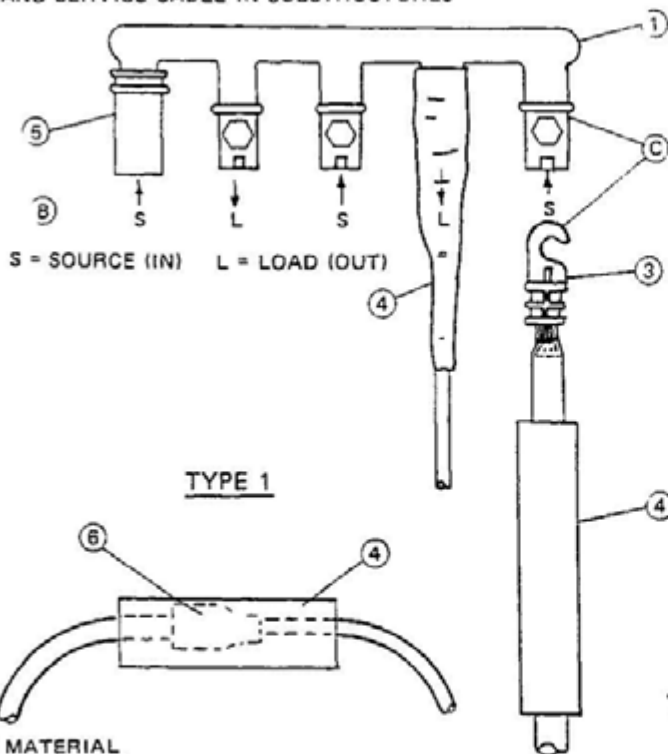
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**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD
0-600 VOLT CONNECTIONS
FOR 8 THROUGH 350 KCMIL ALUMINUM CONDUCTORS

**FMO
UG 4173**

SCOPE THIS STANDARD SHOWS THE EQUIPMENT AND INSTALLATION OF 600 VOLT CONNECTORS TO CONNECT SECONDARY AND SERVICE CABLE IN SUBSTRUCTURES



THIS PAGE FOR FIELD MAINTENANCE ONLY

BILL OF MATERIAL

| ITEM | DESCRIPTION | STOCK NUMBER |
|------|--|--|
| 1 | CONNECTORS | 3 POSITIONS 270048 (E) |
| | | 4 POSITIONS 270064 (E) |
| | | 5 POSITIONS 270176 (E) |
| | | 6 POSITIONS 270264 (E) |
| 2 | CONNECTORS WITH STREET LIGHT TAP FOR WIRE SIZES NO 12 SOLID TO NO 4 STRANDED AWG AL & CU | 3 POSITIONS 269980 (E) |
| | | 4 POSITIONS 270128 (E) |
| | | 6 POSITIONS 270274 (E) |
| 3 | LUGS, ALUMINUM (F) | DIE 840 NO. 4 269952 (E) |
| | | DIE 840 NO 2 269888 (E) |
| | | DIE 840 1/0 269856 (E) |
| | | DIE 840 3/0 269920 (E) |
| | | DIE 655 350 KCMIL 269972 (E) |
| 4 | SLEEVES, HEAT SHRINK | 4-3/0 LUG, SIZE-1 3 EXPANDED X 6" 777984 (E) |
| | | 350 KCMIL LUG, SIZE-1.5 EXPANDED X 9" 778016 (E) |
| 5 | COVER, INSULATING TERMINAL (FOR UNUSED PORTION) | 286956 |
| 6 | REDUCING SLEEVE OR INSULINKS | DIE W-BG 2-4 258528 (E) |
| | | DIE W-BG 1/0-2 258656 (E) |
| | | DIE W-K840 3/0-1/0 651872 |

INSTALLATION

- A USE TORCH TO SHRINK SLEEVES, FLAME SPREADER RECOMMENDED APPLY FLAME OVER SURFACE OF SLEEVE STARTING AT SHOULDER OF CONNECTOR DO NOT CONCENTRATE HEAT.
- B IF THE SOURCE AND LOAD (IN AND OUT) CONDUCTORS ARE ALTERNATED, THE TOTAL AMPACITY WILL BE THE SUM OF THE AMPACITIES OF THE SOURCE CONDUCTORS IF THE SOURCE AND LOAD CONDUCTORS ARE NOT ALTERNATED THE MAXIMUM AMPACITY OF THE CONNECTOR WILL BE 750 AMPS FOR THIS SINGLE BOLT VERSION.
- C APPLY INHIBITOR (STOCK NUMBER 247200) AT EACH ALUMINUM CONNECTION FOR INSTALLATION INSTRUCTIONS OF ALUMINUM CONNECTORS REFER TO STANDARD 4106
- E EXEMPT MATERIAL.
- F FILE SHARP EDGES AFTER CRIMPING

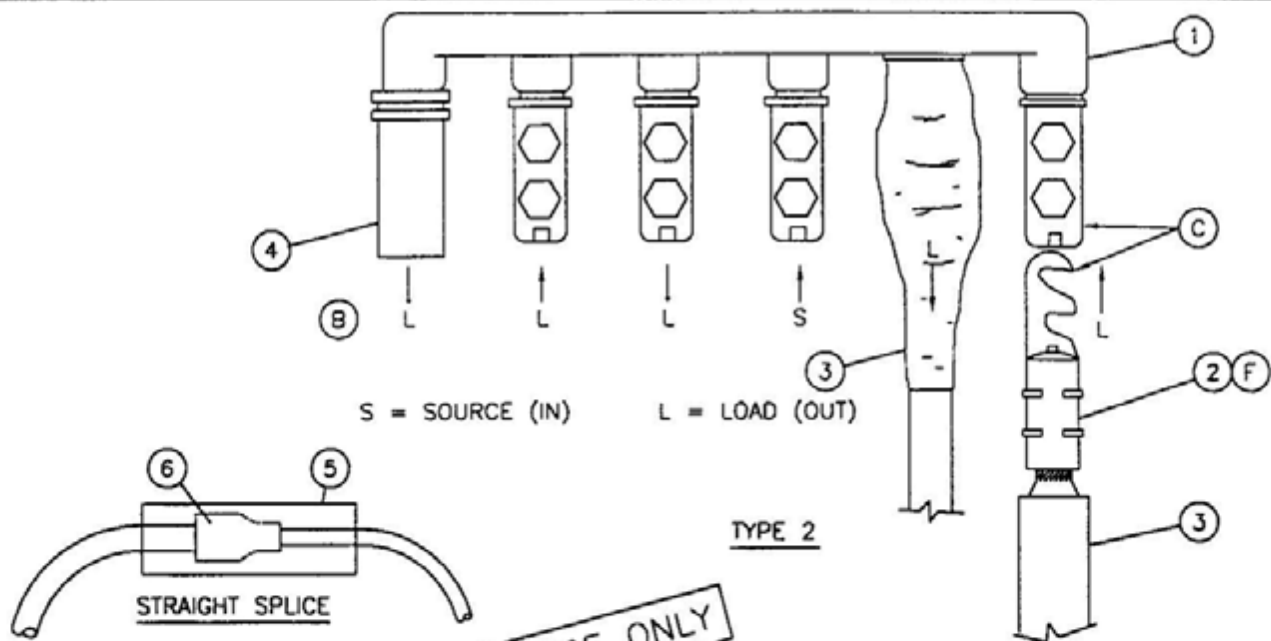
4199.705

SUPERSEDES
4173 1 (3-9-83)

SDB&E ELECTRIC STANDARDS

0-600 VOLT CONNECTIONS
FOR #8 THROUGH 350 KCMIL ALUMINUM CONDUCTORS

DATE 3-9-83
APPD JMT/DR #



BILL OF MATERIAL

FOR FIELD MAINTENANCE ONLY

| ITEM | DESCRIPTION | | STOCK NUMBER | ASSEMBLY UNITS | |
|------|--|---|-------------------------|----------------|--------|
| 1 | CONNECTORS, TYPE 2 | | | | |
| | 2 | TERMINALS | 269978 | 2W>350 | |
| | 3 | TERMINALS | 270040 | 3W>350 | |
| | 6 | TERMINALS | 270224 | 6W>350 | |
| 2 | LUGS, ALUMINUM | DIE U317 | 350 KCMIL (SINGLE HOOK) | 269972 | - |
| | | | 350 KCMIL (DOUBLE HOOK) | 269936 | LUG350 |
| | | | 500 KCMIL | 269968 | LUG500 |
| 3 | SLEEVE, HEAT SHRINK, 2/0 THRU 500 KCMIL LUG, SLEEVE SIZE - 1 5 EXPANDED X 9" | | 778016 | - | |
| 4 | COVER, INSULATING TERMINAL (FOR UNUSED PORTION) | | 286950 | - | |
| 5 | SLEEVES, HEAT SHRINK | 4-3/0 LUG, SIZE - 1 3 EXPANDED X 6" | 777984 | - | |
| | | 350-500 KCMIL LUG, SIZE - 1 5 EXPANDED X 9" | 778016 | - | |
| 6 | REDUCING SLEEVE OR INSULINKS | DIE W-BG | 2-4 | 258528 | - |
| | | | 1/0-2 | 258656 | - |
| | | DIE W-K840 | 3/0-1/0 | 651872 | - |
| 7 | INHIBITOR (USE AS REQUIRED) | | 247200 | - | |

INSTALLATION:

- A USE TORCH TO SHRINK SLEEVES (FLAME SPREADER RECOMMENDED) APPLY FLAME OVER SURFACE OF SLEEVE STARTING AT SHOULDER OF CONNECTOR DO NOT CONCENTRATE HEAT IN ONE AREA.
- (B) INSTALL THE SOURCE CONDUCTOR IN A MIDDLE TERMINAL AND LOAD CABLES ON REMAINING TERMINALS. THE MAXIMUM AMPACITY OF THE CONNECTOR WILL BE 1000 AMPS FOR THIS TWO BOLT VERSION
- (C) APPLY INHIBITOR AT EACH ALUMINUM CONNECTION FOR INSTALLATION INSTRUCTIONS OF ALUMINUM CONNECTORS, REFER TO STANDARD 4106
- (D) FILE SHARP EDGES AFTER CRIMPING
- (G) FOR CABLE SMALLER THAN 350 KCMIL, USE THE ONE HOLE LUGS SHOWN IN STANDARD 4171

DATE 1-1-92

APPD *JLB/BDG*

SDG&E ELECTRIC STANDARDS

0-600 VOLT CONNECTORS
FOR #350 THROUGH 500 KCMIL ALUMINUM CONDUCTORS

4199.710
SUPERSEDES
4173 2 1-1-96

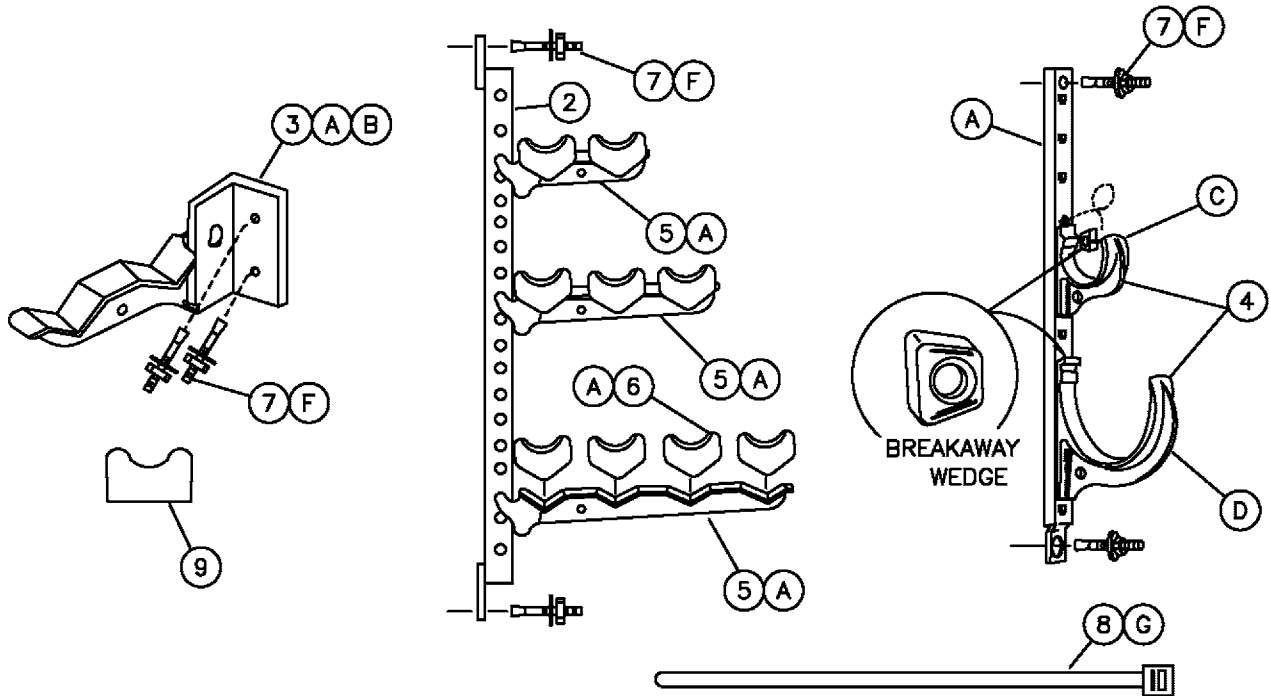
FIELD MAINTENANCE ONLY

REVISION HISTORY:

7/13/2016: All versions prior to 2016 are superseded by their current version found inside the Overhead Construction Standard Manual.

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|--|----------------|---|------|---|-----------|-----------------------------------|--------|--|------|------|------------------------|
| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
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| B | | | | | | E | | | | | |
| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |
| SHEET 1 OF 1 | | <input checked="" type="checkbox"/> Indicates Latest Revision | | <input type="checkbox"/> Completely Revised | | <input type="checkbox"/> New Page | | <input type="checkbox"/> Information Removed | | | |
| | | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | | | | | | |
| | | CABLE HANGERS AND ACCESSORIES | | | | | | | | | |
| | | | | | | | | | | | FMO UG 4178 |

SCOPE: THIS STANDARD SHOWS CABLE HANGERS AND ACCESSORIES USED TO SUPPORT SECONDARY AND PRIMARY CABLES AND CONNECTORS IN SUBSTRUCTURES.



BILL OF MATERIAL:

| ITEM | DESCRIPTION | LENGTH OR SIZE | NUMBER OF HOLES | EXTENSION FROM SUBSTRUCTURE WALL | NUMBER OF INSULATORS | STOCK NUMBER |
|------|---|----------------|-----------------|----------------------------------|----------------------|--------------|
| 1 | HANGERS FOR CABLE HOOKS | 15" | 8 | --- | --- | 564512 |
| | | 24" | 14 | | | 564544 |
| | | 30" | 18 | | | 564576 |
| 2 | HANGER FOR CABLE ARMS | 34" - 36" | 17 OR 20 | --- | --- | 564480 |
| 3 | ADAPTOR FOR CABLE ARMS | 5" | 1 | --- | --- | 102016 |
| 4 | CABLE HOOKS | 2-1/2" | --- | 4" | --- | 415110 |
| | | 5" | | 6" | | 415112 |
| 5 | CABLE ARMS | --- | --- | 10" | 2 | 110496 |
| | | | | 15" | 3 | 110528 |
| | | | | 18-1/2" | 4 | 110560 |
| 6 | CABLE INSULATOR | --- | --- | --- | --- | 430592 |
| 7 | ANCHOR, CONCRETE, 1/2" X 3-3/4" STAINLESS STEEL | --- | --- | --- | --- | 107654 |
| 8 | TIE STRAP | --- | --- | --- | --- | 738440 |
| 9 | CABLE INSULATORS FOR LIGHT DUTY ARMS (FIELD MAINTENANCE ONLY) | --- | --- | --- | --- | 430624 |

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4199.914
SUPERCEDES
4178.2 (1-1-88)

SDG&E ELECTRIC STANDARDS
CABLE HANGERS AND ACCESSORIES

DATE 1-1-88
APPD JLB/BJ

INSTALLATION:

- (A) USE FOR ALL SIZES OF PRIMARY OR SECONDARY CABLE.
- (B) USE FOR SINGLE ARM, 2, 3, OR 4-WAY AND ALL SIZES OF PRIMARY OR SECONDARY CABLES.
- (C) USE FOR 3-1/C, 2/0 PRIMARY CABLES MAXIMUM, OR 3-500 & 1-350 KCMIL SECONDARY MAXIMUM.
- (D) USE FOR 3-1/C, 350, 750, OR 1000 KCMIL PRIMARY CABLES MAXIMUM OR 3-1000 & 1-500 KCMIL SECONDARY MAXIMUM.
- (F) USE ANCHOR BOLT TO SECURE CABLE HANGER TO SUBSTRUCTURE.
- (G) USE A TIE STRAP TO SECURE CABLE ONTO CABLE HOOK OR CABLE ARM. WHEN SECURING TIE STRAP AROUND CABLE, LEAVE APPROXIMATELY 1/4 INCH SLACK FOR CABLE EXPANSION.

REFERENCE:

- H. SEE PAGE 3399.601 FOR LIGHT DUTY CABLE ARMS. (FIELD MAINTENANCE ONLY)
- I. SEE PAGE 3647.2 FOR THE DISTANCE REQUIRED FROM THE WALL AND MAXIMUM CABLE SIZES.

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| | | |
|------------------------------------|---|---|
| DATE 1-1-88 APPD <i>JLB/ROJ</i> | SDG&E ELECTRIC STANDARDS CABLE HANGERS AND ACCESSORIES | 4199.915 SUPERCEDES 4178.3 (1-1-88) |
|------------------------------------|---|---|

UG4181 FIELD MAINTENANCE ONLY

ALL VERSIONS LISTED IN FMO ARE SUPERSEDED BY THEIR CURRENT VERSION FOUND INSIDE THE UNDERGROUND CONSTRUCTION STANDARD MANUAL.

REVISION HISTORY:

12/09/2019: MOVED TO FMO

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| REV | CHANGE | DR | BY | DSN | APV | DATE | REV | CHANGE | DR | BY | DSN | APV | DATE |
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| C | | | | | | | | | | | | | |
| B | | | | | | | E | | | | | | |
| A | ORIGINAL ISSUE | EDM | EJA | GLW | CZH | 12/09/2019 | D | | | | | | |

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| SHEET 1 OF 1 | Indicates Latest Revision | Completely Revised | <input checked="" type="checkbox"/> New Page | Information Removed | FMO UG4181 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | 12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART | | | | |

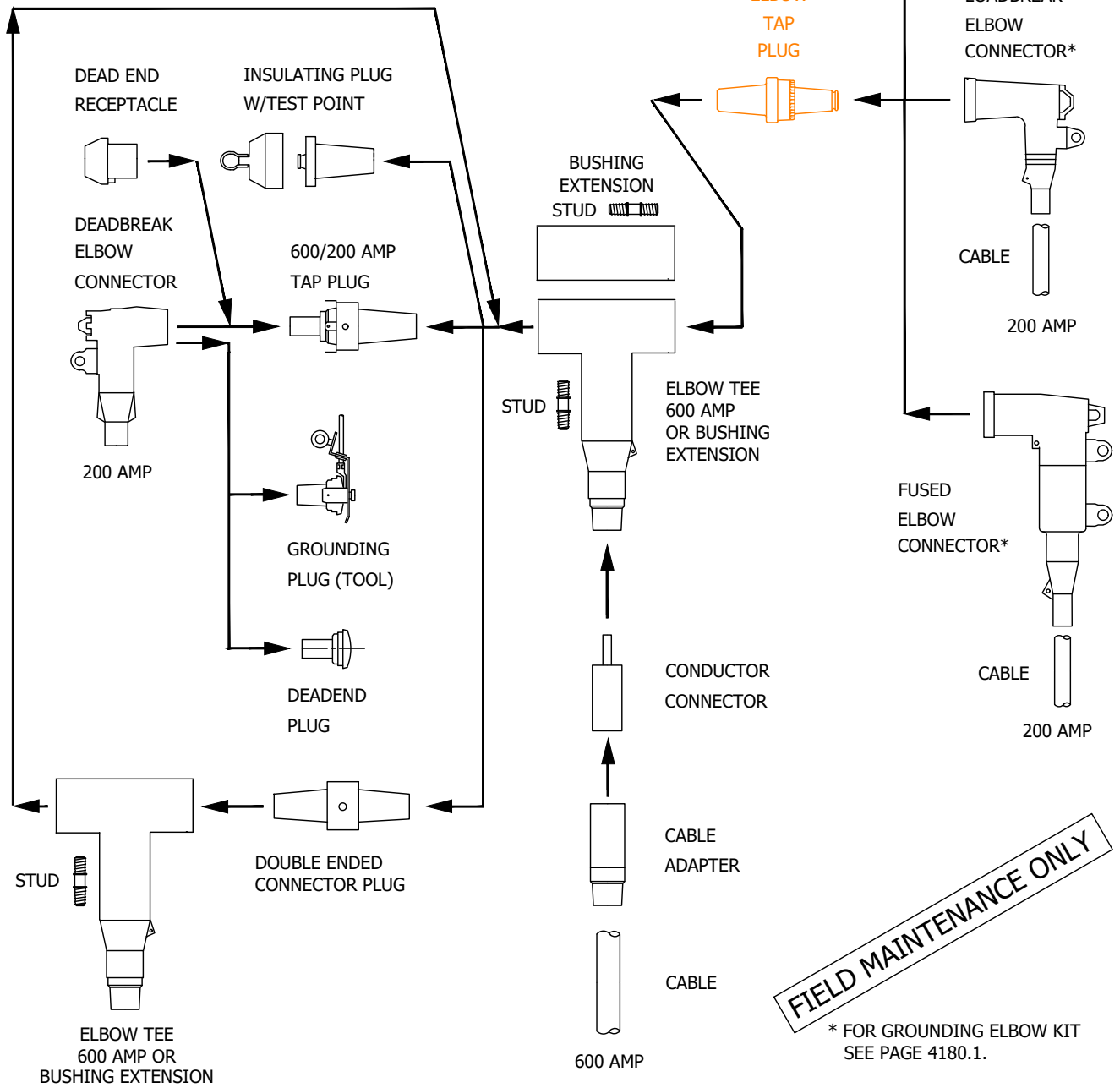
SCOPE: THIS STANDARD SHOWS THE CONNECTIONS AND ASSEMBLY CODES USED FOR CALLING OUT 200 AND 600 AMP CONNECTOR ASSEMBLIES ON ELECTRIC CONSTRUCTION WORK ORDERS.

**SUBSURFACE CONNECTOR APPLICATION CHART
3315 & 3316 HANDHOLE INSTALLATION ONLY**

200 AMP LOADBREAK/DEADBREAK AND 600 AMP DEADBREAK

THIS CHART SHOWS HOW 200 AND 600 AMP CONNECTORS ARE ASSEMBLED.

ALWAYS USE THE MANUFACTURERS RECOMMENDED TORQUE SETTINGS WHEN ASSEMBLING CONNECTORS.



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| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

Indicates Latest Revision Completely Revised New Page Information Removed

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

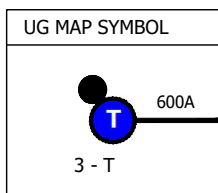
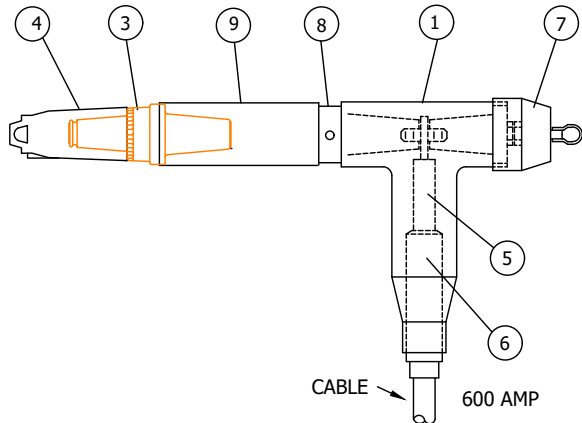
12KV 200 & 600 AMP CONNECTOR ASSEMBLIES
IDENTIFICATION CHART

FMO
UG4181.1

SHEET
1 OF 26

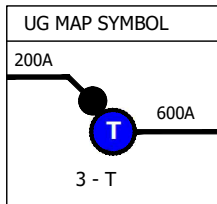
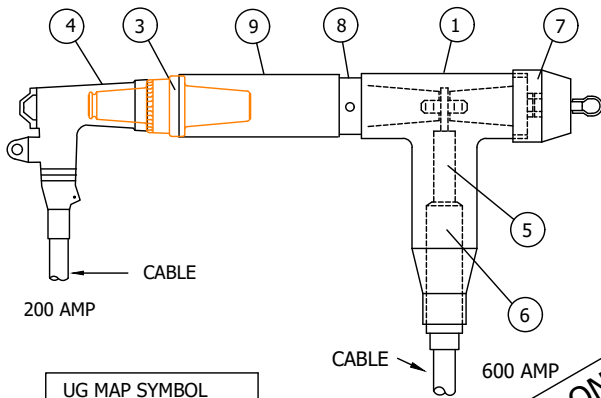
3315 & 3316 HANDHOLE INSTALLATION ONLY

SUBSURFACE CONNECTIONS - 200 AMP LOADBREAK/DEADBREAK AND 600 AMP DEADBREAK



| TYPICAL COMBINATIONS | | | |
|----------------------|-------------------------------|--------------|---|
| CODE CABLE SIZE | 07 350 AL | 08 750 AL | 09 1000 AL |
| MACRO UNITS | CC--07 | CC--08 | CC--09 |
| EQUIPMENT | | QTY. | STOCK NUMBER |
| ① | ELBOW TEE | 1 | S326578 |
| ③ | ELBOW TAP PLUG | 1 | S547328 |
| ④ | 200 AMP INSULATING RECEPTACLE | 1 | S204304 |
| ⑤ | CONDUCTOR CONNECTOR | 1 | S258698 (350 AL) S258704 (750 AL) S258708 (750C AL) S258702 (1000 AL) |
| ⑥ | CABLE ADAPTER | 1 | S102027 (350 AL) S102034 (750 AL) S102051 (750C AL) SS102050 (1000 AL) |
| ⑦ | INSULATED PLUG W/ TEST POINT | 1 | S544848 |
| ⑧ | DOUBLE ENDED CONNECTOR PLUG | 1 | S544832 |
| ⑨ | BUSHING EXTENSION | 1 | S336204 |

| TYPICAL COMBINATIONS | | | | | | |
|----------------------|---------------------|-----------------------|---------------------|----------------------|----------------------|-----------------------|
| CODE CABLE SIZE | L37 #2 AL-350 AL | L57 2/0 AL -350 AL | L38 #2 AL-750 AL | L58 2/0 AL-750 AL | L39 #2 AL-1000 AL | L59 2/0 AL-1000 AL |
| MACRO UNITS | CC-L37 | CC-L57 | CC-L38 | CC-L58 | CC-L39 | CC-L59 |



FIELD MAINTENANCE ONLY

| EQUIPMENT | | | QTY. | STOCK NUMBER |
|-----------|------------------------------|---|--|--------------|
| ① | ELBOW TEE | 1 | S326578 | |
| ③ | ELBOW TAP PLUG | 1 | S547328 | |
| ④ | LOADBREAK ELBOW CONNECTOR | 1 | S443838 (#2 AL) S443840 (2/0 AL) | |
| ⑤ | CONDUCTOR CONNECTOR | 1 | S258698 (350 AL) S258704 (750 AL) S258708 (750C AL) S258702 (1000 AL) | |
| ⑥ | CABLE ADAPTER | 1 | S102027 (350 AL) S102034 (750 AL) S102051 (750C AL) S102050 (1000 AL) | |
| ⑦ | INSULATED PLUG W/ TEST POINT | 1 | S544848 | |
| ⑧ | DOUBLE ENDED CONNECTOR PLUG | 1 | S544832 | |
| ⑨ | BUSHING EXTENSION | 1 | S336204 | |

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| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

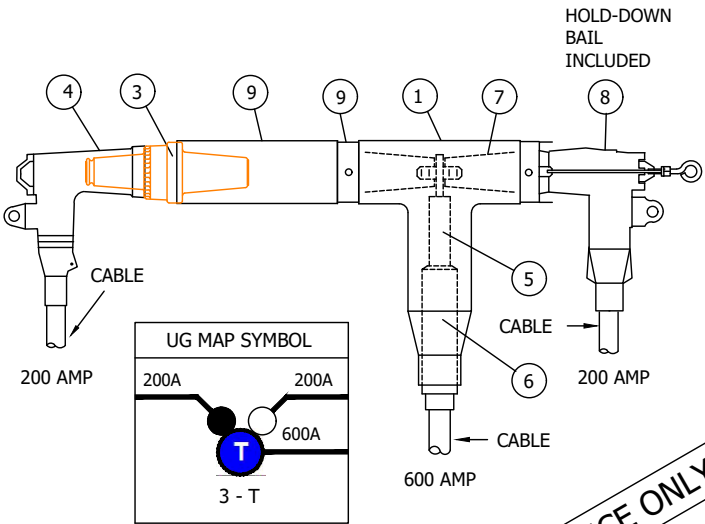
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| SHEET 2 OF 26 | X | Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4181.2 |
| SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | | |
| 12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART | | | | | | |

3315 & 3316 HANDHOLE INSTALLATION ONLY

SUBSURFACE CONNECTIONS - 200 AMP LOADBREAK/DEADBREAK AND 600 AMP DEADBREAK

TYPICAL COMBINATIONS

| CODE CABLE SIZE | L37D5 #2 AL-350 AL- 2/0 AL | L57D5 2/0 AL-350 AL- 2/0 AL | L38D5 #2 AL-750 AL- 2/0 AL | L58D5 2/0 AL-750 AL- 2/0 AL | L39D5 #2 AL-1000 AL- 2/0 AL | L59D5 2/0 AL-1000 AL- 2/0 AL |
|--------------------|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|-----------------------------------|------------------------------------|
| MACRO UNITS | CL37D5 | CL57D5 | CL38D5 | CL58D5 | CL39D5 | CL59D5 |



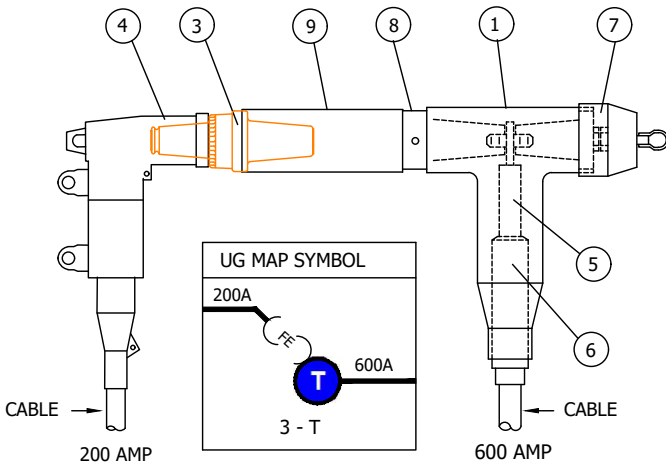
| EQUIPMENT | QTY. | STOCK NUMBER |
|-------------------------------|------|--|
| ① ELBOW TEE | 1 | S326578 |
| ③ ELBOW TAP PLUG | 1 | S547328 |
| ④ LOADBREAK ELBOW CONNECTOR | 1 | S443838 (#2 AL) S443840 (2/0 AL) |
| ⑤ COMPRESSION CONNECTOR | 1 | S258698 (350 AL) S258704 (750 AL) S258708 (750C AL) S258702 (1000 AL) |
| ⑥ CABLE ADAPTER | 1 | S102027 (350 AL) S102034 (750 AL) S102051 (750C AL) S102050 (1000 AL) |
| ⑦ 600/200 AMP TAP PLUG | 1 | S547324 |
| ⑧ DEADBREAK ELBOW CONNECTOR | 1 | S443842 (#2 AL) S443844 (2/0 AL) |
| ⑨ DOUBLE ENDED CONNECTOR PLUG | 1 | S544832 |
| ⑩ BUSHING EXTENSION | 1 | S336204 |

| ADDITIONAL MACRO UNITS | | |
|------------------------|--------|--------|
| C-07D5 | C-08D5 | C-09D5 |

FIELD MAINTENANCE ONLY

TYPICAL COMBINATIONS

| CODE CABLE SIZE | B7 #2 AL-350 AL | C7 2/0 AL-350 AL | B8 #2 AL-750 AL | C8 2/0 AL-750 AL | B9 #2 AL-1000 AL | C9 2/0 AL-1000 AL |
|--------------------|--------------------|---------------------|--------------------|---------------------|---------------------|----------------------|
| MACRO UNITS | CC-B7 | CC-C7 | CC-B8 | CC-C8 | CC-B9 | CC-C9 |



| EQUIPMENT | QTY. | STOCK NUMBER |
|--------------------------------|------|--|
| ① ELBOW TEE | 1 | S326578 |
| ③ ELBOW TAP PLUG | 1 | S547328 |
| ④ FUSED ELBOW CONNECTOR | 1 | S443850 (#2 AL) S443882 (2/0 AL) |
| ⑤ COMPRESSION CONNECTOR | 1 | S258698 (350 AL) S258704 (750 AL) S258708 (750C AL) S258702 (1000 AL) |
| ⑥ CABLE ADAPTER | 1 | S102027 (350 AL) S102034 (750 AL) S102051 (750C AL) S102050 (1000 AL) |
| ⑦ INSULATED PLUG W/ TEST POINT | 1 | S544848 |
| ⑧ DOUBLE ENDED CONNECTOR PLUG | 1 | S544832 |
| ⑨ BUSHING EXTENSION | 1 | S336204 |

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| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

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SHEET
3 OF 26

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

12KV 200 & 600 AMP CONNECTOR ASSEMBLIES
IDENTIFICATION CHART

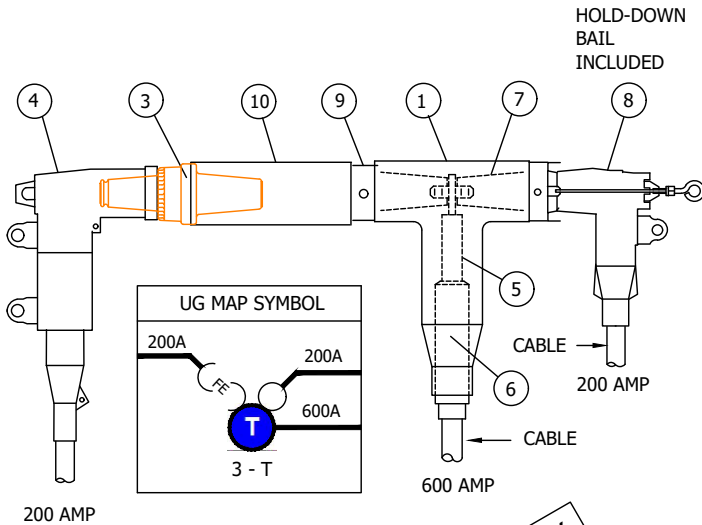
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3315 & 3316 HANDHOLE INSTALLATION ONLY

SUBSURFACE CONNECTIONS - 200 AMP LOADBREAK/DEADBREAK AND 600 AMP DEADBREAK

TYPICAL COMBINATIONS

| CODE CABLE SIZE | B7D5 #2 AL-350 AL- 2/0 AL | C7D5 2/0 AL-350 AL- 2/0 AL | B8D5 #2 AL-750 AL- 2/0 AL | C8D5 2/0 AL-750 AL- 2/0 AL | B9D5 #2 AL-1000 AL- 2/0 AL | C9D5 2/0 AL-1000 AL- 2/0 AL |
|-----------------|---------------------------------|----------------------------------|---------------------------------|----------------------------------|----------------------------------|-----------------------------------|
| MACRO UNITS | C-B7D5 | C-C7D5 | C-B8D5 | C-C8D5 | C-B9D5 | C-C9D5 |

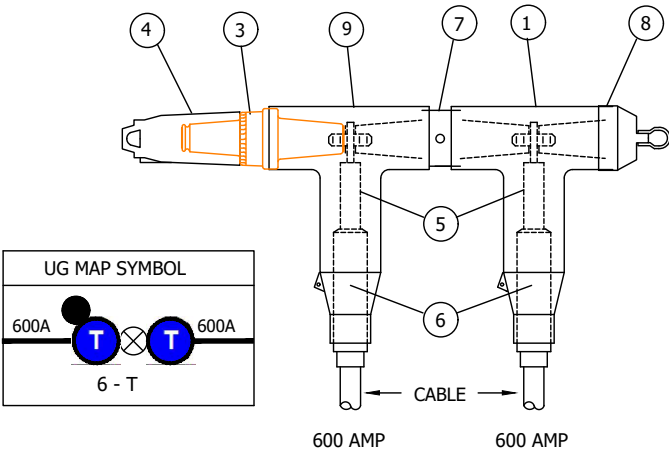


| EQUIPMENT | QTY. | STOCK NUMBER |
|-------------------------------|------|--|
| ① ELBOW TEE | 1 | S326578 |
| ③ ELBOW TAP PLUG | 1 | S547328 |
| ④ FUSED ELBOW CONNECTOR | 1 | S443850 (#2 AL) S443882 (2/0 AL) |
| ⑤ COMPRESSION CONNECTOR | 1 | S258698 (350 AL) S258704 (750 AL) S258708 (750C AL) S258702 (1000 AL) |
| ⑥ CABLE ADAPTER | 1 | S102027 (350 AL) S102034 (750 AL) S102051 (750C AL) S102050 (1000 AL) |
| ⑦ 600/200 AMP TAP PLUG | 1 | S547324 |
| ⑧ DEADBREAK ELBOW CONNECTOR | 1 | S443842 (#2 AL) S443844 (2/0 AL) |
| ⑨ DOUBLE ENDED CONNECTOR PLUG | 1 | S544832 |
| ⑩ BUSHING EXTENSION | 1 | S336204 |

FIELD MAINTENANCE ONLY

TYPICAL COMBINATIONS

| CODE CABLE SIZE | 077 350 AL, 350 AL | 088 750 AL, 750 AL | 099 1000 AL, 1000 AL |
|-----------------|-----------------------|-----------------------|-------------------------|
| MACRO UNITS | CC-077 | CC-088 | CC-099 |



| EQUIPMENT | QTY. | STOCK NUMBER |
|---------------------------------|------|--|
| ① ELBOW TEE | 2 | S326578 |
| ③ ELBOW TAP PLUG | 1 | S547328 |
| ④ 200 AMP INSULATING RECEPTACLE | 1 | S204304 |
| ⑤ COMPRESSION CONNECTOR | 2 | S258698 (350 AL) S258704 (750 AL) S258708 (750C AL) S258702 (1000 AL) |
| ⑥ CABLE ADAPTER | 2 | S102027 (350 AL) S102034 (750 AL) S102051 (750C AL) S102050 (1000 AL) |
| ⑦ DOUBLE ENDED CONNECTOR PLUG | 1 | S544832 |
| ⑧ INSULATED PLUG W/ TEST POINT | 1 | S544848 |

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| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

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SHEET
4 OF 26

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

12KV 200 & 600 AMP CONNECTOR ASSEMBLIES
IDENTIFICATION CHART

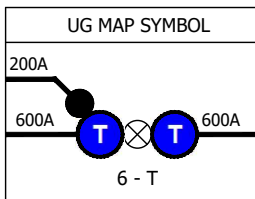
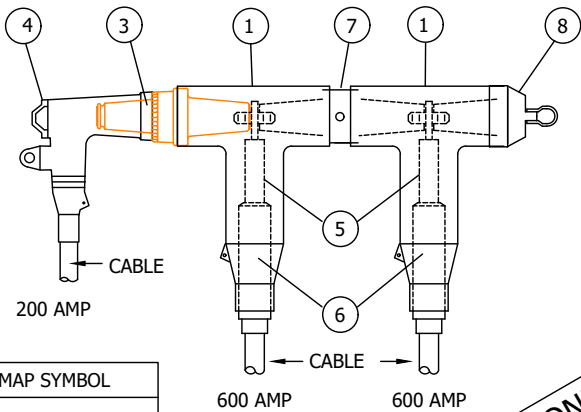
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3315 & 3316 HANDHOLE INSTALLATION ONLY

SUBSURFACE CONNECTIONS - 200 AMP LOADBREAK/DEADBREAK AND 600 AMP DEADBREAK

TYPICAL COMBINATIONS

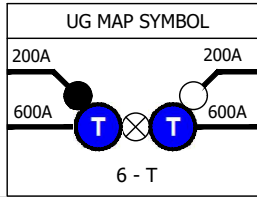
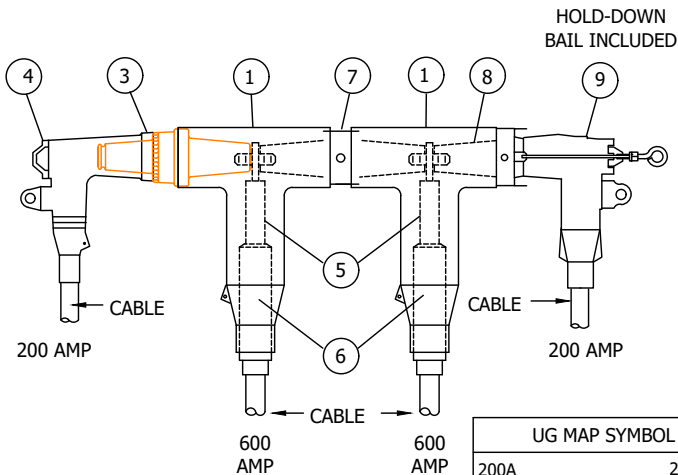
| CODE CABLE SIZE | L377 #2 AL-350 AL- 350 AL | L577 2/0 AL-350 AL 350 AL | L388 #2 AL-750 AL 750 AL | L588 2/0 AL-750 AL- 750 AL | L399 #2 AL-1000 AL- 1000 AL | L599 2/0 AL-1000 AL- 1000 AL |
|--------------------|---------------------------------|---------------------------------|--------------------------------|----------------------------------|-----------------------------------|------------------------------------|
| MACRO UNITS | C-L377 | C-L577 | C-L388 | C-L588 | C-L399 | C-L599 |



| EQUIPMENT | QTY. | STOCK NUMBER |
|--------------------------------|------|--|
| ① ELBOW TEE | 2 | 326578 |
| ③ ELBOW TAP PLUG | 1 | S547328 |
| ④ LOADBREAK ELBOW CONNECTOR | 1 | 443838 (#2 AL) 443840 (2/0 AL) |
| ⑤ COMPRESSION CONNECTOR | 2 | 258698 (350 AL) 258704 (750 AL) 258708 (750C AL) 258702 (1000 AL) |
| ⑥ CABLE ADAPTER | 2 | 102027 (350 AL) 102034 (750 AL) 102051 (750C AL) 102050 (1000 AL) |
| ⑦ DOUBLE ENDED CONNECTOR PLUG | 1 | 544832 |
| ⑧ INSULATED PLUG W/ TEST POINT | 1 | 544848 |

TYPICAL COMBINATIONS

| CODE CABLE SIZE | L377D5 #2 AL-350 AL- 350 AL-2/0 AL | L577D5 2/0 AL-350 AL 350 AL-2/0 AL | L388D5 #2 AL-750 AL 750 AL-2/0 AL | L588D5 2/0 AL-750 AL- 750 AL-2/0 AL | L399D5 #2 AL-1000 AL- 1000 AL-2/0 AL | L599D5 2/0 AL-1000 AL- 1000 AL-2/0 AL |
|--------------------|--|--|---|---|--|---|
| MACRO UNITS | L377D3 L377D5 | L577D3 L577D5 | L388D3 L388D5 | L588D5 | L399D5 | L599D5 |



| EQUIPMENT | QTY. | STOCK NUMBER |
|-------------------------------|------|--|
| ① ELBOW TEE | 2 | 326578 |
| ③ ELBOW TAP PLUG | 1 | S547328 |
| ④ LOADBREAK ELBOW CONNECTOR | 1 | 443838 (#2 AL) 443840 (2/0 AL) |
| ⑤ COMPRESSION CONNECTOR | 2 | 258698 (350 AL) 258704 (750 AL) 258708 (750C AL) 258702 (1000 AL) |
| ⑥ CABLE ADAPTER | 2 | 102027 (350 AL) 102034 (750 AL) 102051 (750C AL) 102050 (1000 AL) |
| ⑦ DOUBLE ENDED CONNECTOR PLUG | 1 | 544832 |
| ⑧ 600/200 AMP TAP PLUG | 1 | 547324 |
| ⑨ DEADBREAK ELBOW CONNECTOR | 1 | 443842 (#2 AL) 443844 (2/0 AL) |

| ADDITIONAL MACRO UNIT COMBINATIONS | | |
|------------------------------------|------------------|------------------|
| CO77D5 CO77D3 | CO88D5 CO88D3 | CO99D5 CO99D3 |

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|-----|----------|----|----|-----|--------|------------|-----|--------------|-----|-----|-----|--------|------------|
| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

SHEET
5 OF 26

X Indicates Latest Revision

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

12KV 200 & 600 AMP CONNECTOR ASSEMBLIES
IDENTIFICATION CHART

FMO
UG4181.5

3315 & 3316 HANDHOLE INSTALLATION ONLY

| SUBSURFACE CONNECTIONS - 200 AMP LOADBREAK/DEADBREAK AND 600 AMP DEADBREAK | | | | | | |
|--|--------------------------------|--------------------------------|-------------------------------|---------------------------------|----------------------------------|-----------------------------------|
| TYPICAL COMBINATIONS | | | | | | |
| CODE CABLE SIZE | B77 #2 AL-350 AL- 350 AL | C77 2/0 AL-350 AL 350 AL | B88 #2 AL-750 AL 750 AL | C88 2/0 AL-750 AL- 750 AL | B99 #2 AL-1000 AL- 1000 AL | C99 2/0 AL-1000 AL- 1000 AL |
| MACRO UNITS | CC-B77 | CC-C77 | CC-B88 | CC-C88 | CC-B99 | CC-C99 |

| EQUIPMENT | QTY. | STOCK NUMBER |
|--------------------------------|------|--|
| ① ELBOW TEE | 2 | 326578 |
| ③ ELBOW TAP PLUG | 1 | 5547328 |
| ④ FUSED ELBOW CONNECTOR | 1 | 443850 (#2 AL) 443882 (2/0 AL) |
| ⑤ COMPRESSION CONNECTOR | 2 | 258698 (350 AL) 258704 (750 AL) 258708 (750C AL) 258702 (1000 AL) |
| ⑥ CABLE ADAPTER | 2 | 102027 (350 AL) 102034 (750 AL) 102051 (750C AL) 102050 (1000 AL) |
| ⑦ DOUBLE ENDED CONNECTOR PLUG | 1 | 544832 |
| ⑧ INSULATED PLUG W/ TEST POINT | 1 | 544848 |

| TYPICAL COMBINATIONS | | | | | | |
|----------------------|---|---|--|--|---|--|
| CODE CABLE SIZE | B77D5 #2 AL-350 AL- 350 AL-2/0 AL | C77D5 2/0 AL-350 AL 350 AL-2/0 AL | B88D5 #2 AL-750 AL 750 AL-2/0 AL | C88D5 2/0 AL-750 AL- 750 AL-2/0 AL | B99D5 #2 AL-1000 AL- 1000 AL-2/0 AL | C99D5 2/0 AL-1000 AL- 1000 AL-2/0 AL |
| MACRO UNITS | CB77D5 | CC77D5 | CB88D5 | CC88D5 | CB99D5 | CC99D5 |

| EQUIPMENT | QTY. | STOCK NUMBER |
|-------------------------------|------|--|
| ① ELBOW TEE | 2 | 326578 |
| ③ ELBOW TAP PLUG | 1 | 5547328 |
| ④ FUSED ELBOW CONNECTOR | 1 | 443850 (#2 AL) 443882 (2/0 AL) |
| ⑤ COMPRESSION CONNECTOR | 2 | 258698 (350 AL) 258704 (750 AL) 258708 (750C AL) 258702 (1000 AL) |
| ⑥ CABLE ADAPTER | 2 | 102027 (350 AL) 102034 (750 AL) 102051 (750C AL) 102050 (1000 AL) |
| ⑦ DOUBLE ENDED CONNECTOR PLUG | 1 | 544832 |
| ⑧ 600/200 AMP TAP PLUG | 1 | 547324 |
| ⑨ DEADBREAK ELBOW CONNECTOR | 1 | 443842 (#2 AL) 443844 (2/0 AL) |

FIELD MAINTENANCE ONLY

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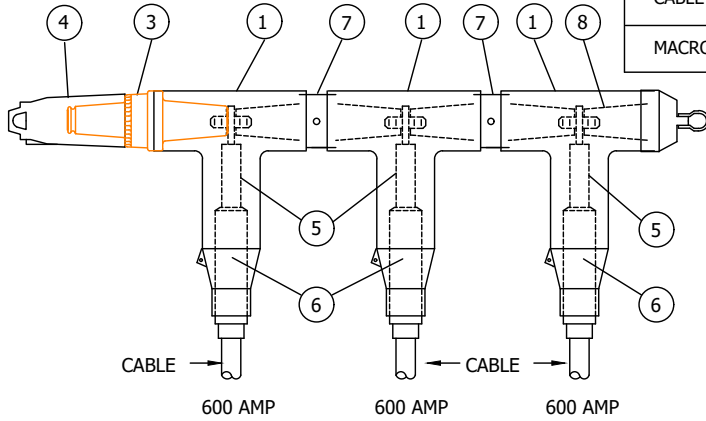
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|-----|----------|----|----|-----|--------|------------|-----|--------------|-----|-----|-----|--------|------------|
| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

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|---|----------|---------------------------|--------------------|----------|---------------------|-------------------------|
| SHEET 6 OF 26 | X | Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4181.6 |
| SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS 12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART | | | | | | |

3315 & 3316 HANDHOLE INSTALLATION ONLY

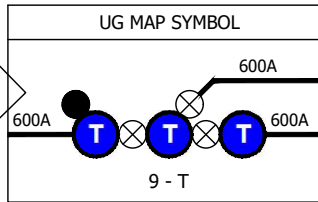
SUBSURFACE CONNECTIONS - 200 AMP LOADBREAK/DEADBREAK AND 600 AMP DEADBREAK

TYPICAL COMBINATIONS



| | | | |
|--------------------|----------------------------------|---------------------------------|-------------------------------------|
| CODE CABLE SIZE | 0777 350 AL- 350 AL-350 AL | 0888 750 AL-750 AL 750 AL | 0999 1000 AL-1000 AL- 1000 AL |
| MACRO UNITS | C-0777 | C-0888 | C-0999 |

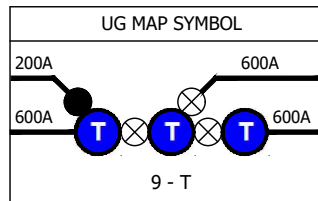
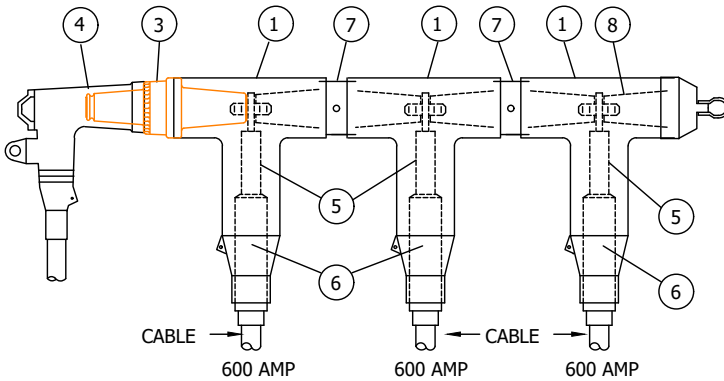
| EQUIPMENT | QTY. | STOCK NUMBER |
|---------------------------------|------|--|
| 1 ELBOW TEE | 3 | S326578 |
| 3 ELBOW TAP PLUG | 1 | S547328 |
| 4 200 AMP INSULATING RECEPTACLE | 1 | S204304 |
| 5 COMPRESSION CONNECTOR | 3 | S258698 (350 AL) S258704 (750 AL) S258708 (750C AL) S258702 (1000 AL) |
| 6 CABLE ADAPTER | 3 | S102027 (350 AL) S102034 (750 AL) S102051 (750C AL) S102050 (1000 AL) |
| 7 DOUBLE ENDED CONNECTOR PLUG | 2 | S544832 |
| 8 INSULATED PLUG W/ TEST POINT | 1 | S544848 |



FIELD MAINTENANCE ONLY

TYPICAL COMBINATIONS

| | | | | | | |
|--------------------|---|--|---|--|--|---|
| CODE CABLE SIZE | L3777 #2 AL-350 AL- 350 AL-350 AL | L5777 2/0 AL-350 AL- 350 AL-350 AL | L3888 #2 AL-750 AL- 750 AL-750 AL | L5888 2/0 AL-750 AL- 750 AL-750 AL | L3999 #2 AL-1000 AL- 1000 AL-1000 AL | L5999 2/0 AL-1000 AL- 1000 AL-1000 AL |
| MACRO UNITS | CL3777 | CL5777 | CL3888 | CL5888 | CL3999 | CL5999 |



| |
|-----------------------|
| ADDITIONAL MACRO UNIT |
| CL5889 |

| EQUIPMENT | QTY. | STOCK NUMBER |
|--------------------------------|------|--|
| 1 ELBOW TEE | 3 | S326578 |
| 3 ELBOW TAP PLUG | 1 | S547328 |
| 4 LOADBREAK ELBOW CONNECTOR | 1 | S443838 (#2 AL) S443840 (2/0 AL) |
| 5 COMPRESSION CONNECTOR | 3 | S258698 (350 AL) S258704 (750 AL) S258708 (750C AL) S258702 (1000 AL) |
| 6 CABLE ADAPTER | 3 | S102027 (350 AL) S102034 (750 AL) S102051 (750C AL) S102050 (1000 AL) |
| 7 DOUBLE ENDED CONNECTOR PLUG | 2 | S544832 |
| 8 INSULATED PLUG W/ TEST POINT | 1 | S544848 |

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| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

**SHEET
7 OF 26**

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SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

12KV 200 & 600 AMP CONNECTOR ASSEMBLIES
IDENTIFICATION CHART

**FMO
UG4181.7**

NOTES:

- THREE TEE COMBINATIONS SHOWN IN THIS STANDARD SHALL ONLY BE USED TO FEED A SWITCHED TIE POSITION.
- FOR SPECIFICATIONS AND INSTALLATION INSTRUCTIONS SEE STANDARDS 4182, 4191 AND 4196.
- BELOW ARE KEYS TO THE CODES USED IN THE TABLES ON PAGES 4181.1 - .7.

CABLES

7 = 350 AL
 8 = 750 AL
 9 = 1000 AL

COMPONENTS

D3 = DEADBREAK ELBOW #2 AL
 D5 = DEADBREAK ELBOW 2/0 AL

 L3 = LOADBREAK ELBOW #2 AL
 L5 = LOADBREAK ELBOW 2/0 AL

 B = #2 AL FUSED ELBOW
 C = 2/0 AL FUSED ELBOW
 O = 200 AMP INSULATING RECEPTACLE

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| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

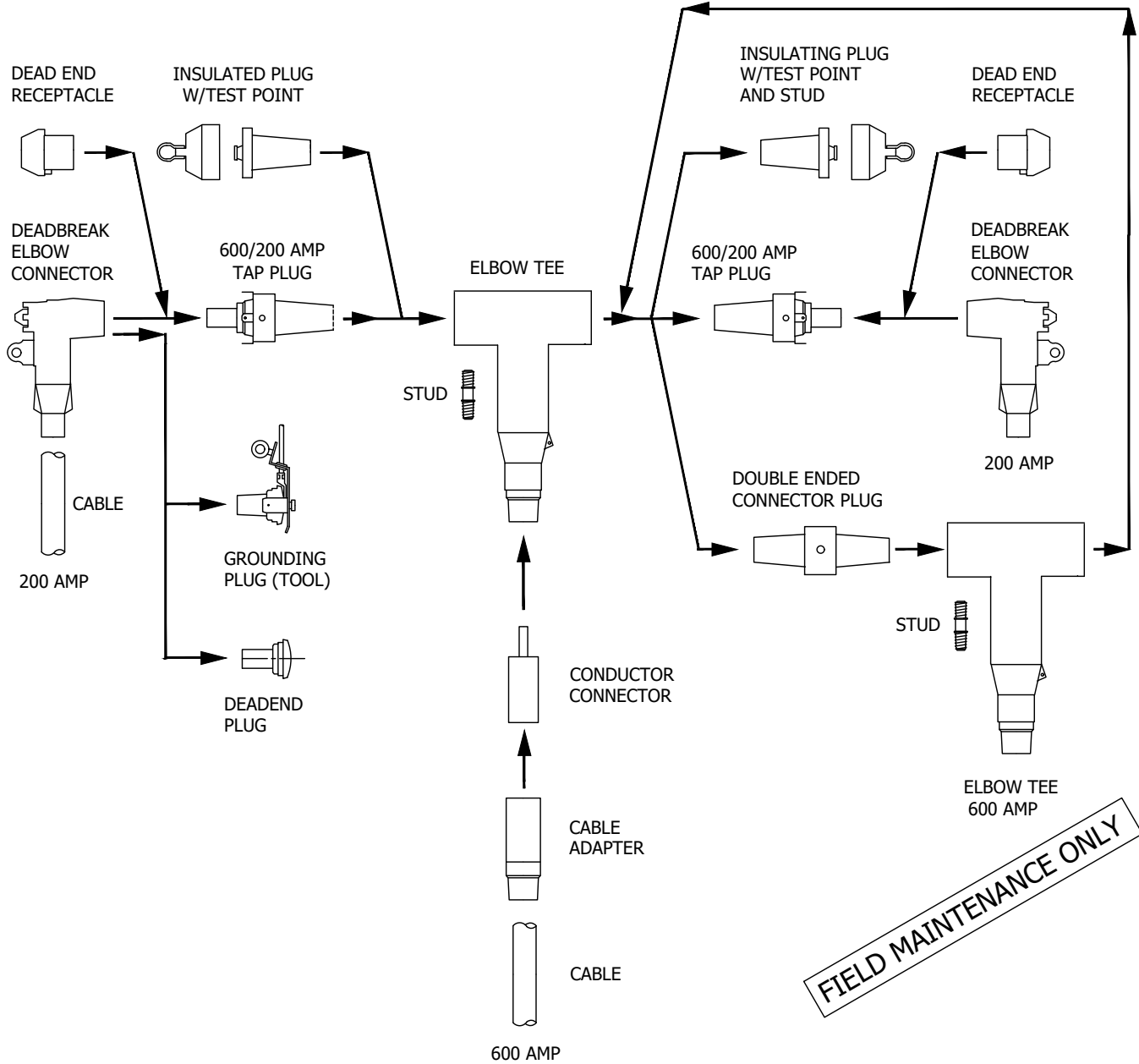
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| SHEET 8 OF 26 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4181.8 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | 12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART | | | | |

SUBSURFACE CONNECTOR APPLICATION CHART

200 AND 600 AMP DEADBREAK

ALWAYS USE THE MANUFACTURERS RECOMMENDED TORQUE SETTINGS WHEN ASSEMBLING CONNECTORS.

THIS CHART SHOWS HOW 200 AND 600 AMP CONNECTORS ARE ASSEMBLED.



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|-----|----------|----|----|-----|--------|------------|-----|--------------|-----|-----|-----|--------|------------|
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| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

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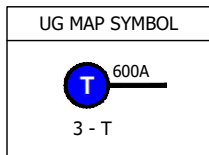
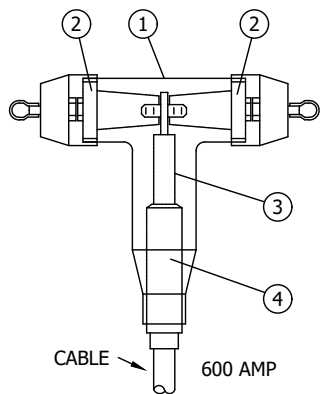
Completely Revised New Page Information Removed

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART

MANHOLE INSTALLATION ONLY

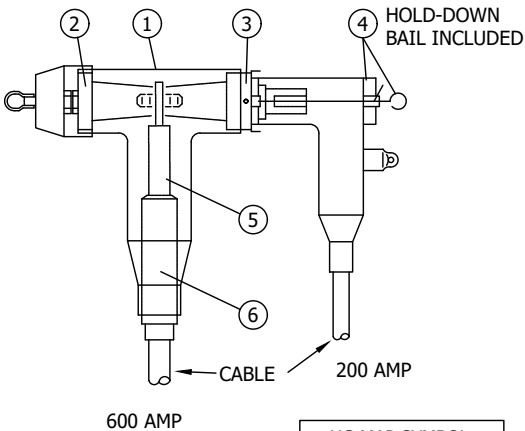
SUBSURFACE CONNECTIONS -- 200 AMP AND 600 AMP DEADBREAK



| TYPICAL COMBINATIONS | | | |
|----------------------|---------------------------------|-------------|--|
| CODE CABLE SIZE | 7 350 AL | 8 750 AL | 9 1000 AL |
| MACRO UNITS | CC---7 | CC---8 | CC---9 |
| EQUIPMENT | | QTY. | STOCK NUMBER |
| ① | ELBOW TEE | 1 | 326578 |
| ② | INSULATED PLUG W/ TEST POINT | 2 | 544848 |
| ③ | CONDUCTOR CONNECTOR | 1 | 258698 (350 AL) 258704 (750 AL) 258708 (750C AL) 258702 (1000 AL) |
| ④ | CABLE ADAPTER | 1 | 102027 (350 AL) 102034 (750 AL) 102051 (750C AL) 102050 (1000 AL) |

TYPICAL COMBINATIONS

| CODE CABLE SIZE | 73 350 AL-#2 AL | 75 350 AL-2/0 AL | 83 750 AL-#2 AL | 85 750 AL-2/0 AL | 93 1000 AL-#2 AL | 95 1000 AL-2/0 AL |
|-----------------|--------------------|---------------------|--------------------|---------------------|---------------------|----------------------|
| MACRO UNITS | CC--73 | CC--75 | CC--83 | CC--85 | CC--93 | CC--95 |



| EQUIPMENT | | QTY. | STOCK NUMBER |
|-----------|---------------------------------|------|--|
| ① | ELBOW TEE | 1 | 326578 |
| ② | INSULATED PLUG W/ TEST POINT | 1 | 544848 |
| ③ | 600/200 AMP TAP PLUG | 1 | 547324 |
| ④ | DEADBREAK ELBOW CONNECTOR | 1 | 443842 (#2 AL) 443844 (2/0 AL) |
| ⑤ | CONDUCTOR CONNECTOR | 1 | 258698 (350 AL) 258704 (750 AL) 258708 (750C AL) 258702 (1000 AL) |
| ⑥ | CABLE ADAPTER | 1 | 102027 (350 AL) 102034 (750 AL) 102051 (750C AL) 102050 (1000 AL) |

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| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

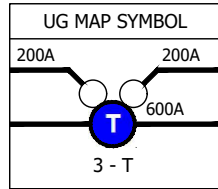
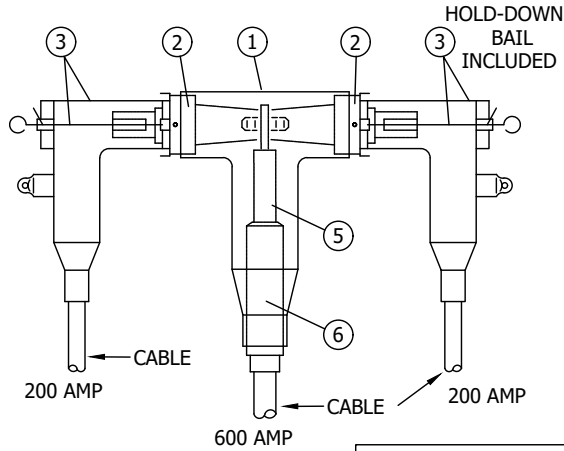
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| SHEET 10 OF 26 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4181.10 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | 12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART | | | | |

MANHOLE INSTALLATION ONLY

SUBSURFACE CONNECTIONS -- 200 AMP AND 600 AMP DEADBREAK

TYPICAL COMBINATIONS

| CODE CABLE SIZE | 375 #2 AL-350AL- 2/0 AL | 575 2/0 AL-350AL- 2/0 AL | 583 2/0 AL-750AL- #2 AL | 585 2/0 AL-750AL- 2/0 AL | 593 2/0 AL-1000AL- #2 AL | 595 2/0 AL-1000AL 2/0 AL |
|-----------------|-------------------------------|--------------------------------|-------------------------------|--------------------------------|--------------------------------|--------------------------------|
| MACRO UNITS | CC-375 | CC-575 | CC-583 | CC-585 | CC-593 | CC-595 |

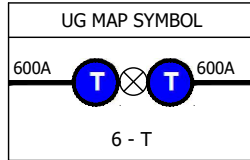
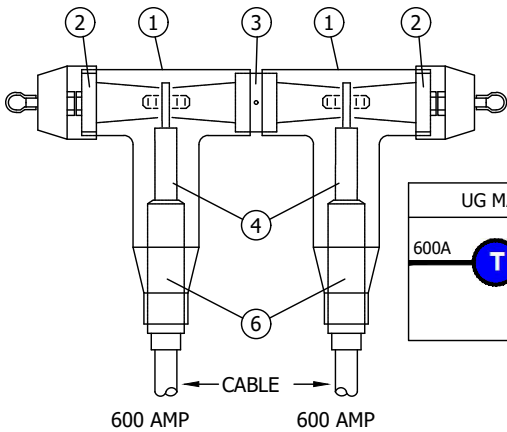


| EQUIPMENT | QTY. | STOCK NUMBER |
|-----------------------------|------|--|
| ① ELBOW TEE | 1 | 326578 |
| ② 600/200 AMP TAP PLUG | 2 | 547324 |
| ③ DEADBREAK ELBOW CONNECTOR | 2 | 443842 (#2 AL) 443844 (2/0 AL) |
| ④ CONDUCTOR CONNECTOR | 1 | 258698 (350 AL) 258704 (750 AL) 258708 (750C AL) 258702 (1000 AL) |
| ⑤ CABLE ADAPTER | 1 | 102027 (350 AL) 102034 (750 AL) 102051 (750C AL) 102050 (1000 AL) |

FIELD MAINTENANCE ONLY

TYPICAL COMBINATIONS

| CODE CABLE SIZE | 77 350AL-350 AL | 87 750AL-350 AL | 88 750AL-750 AL | 97 1000AL-350AL | 98 1000AL-750 AL | 99 1000AL-1000 AL |
|-----------------|--------------------|--------------------|--------------------|--------------------|---------------------|----------------------|
| MACRO UNITS | CC--77 | CC--87 | CC--88 | CC--97 | CC--98 | CC--99 |



| EQUIPMENT | QTY. | STOCK NUMBER |
|--------------------------------|------|--|
| ① ELBOW TEE | 2 | 326578 |
| ② INSULATED PLUG W/ TEST POINT | 2 | 544848 |
| ③ DOUBLE ENDED CONNECTOR PLUG | 1 | 544832 |
| ④ CONDUCTOR CONNECTOR | 2 | 258698 (350 AL) 258704 (750 AL) 258708 (750C AL) 258702 (1000 AL) |
| ⑤ CABLE ADAPTER | 2 | 102027 (350 AL) 102051 (750C AL) 102050 (1000 AL) |

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| REV | CHANGE | DR | BY | DSN | APV | DATE | REV | CHANGE | DR | BY | DSN | APV | DATE |
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| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

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**SHEET
11 OF 26**

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

12KV 200 & 600 AMP CONNECTOR ASSEMBLIES
IDENTIFICATION CHART

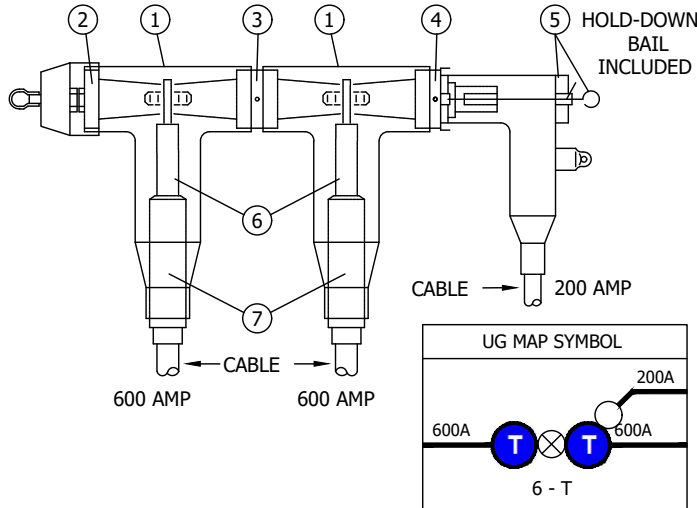
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UG4181.11**

MANHOLE INSTALLATION ONLY

SUBSURFACE CONNECTIONS -- 200 AMP AND 600 AMP DEADBREAK

TYPICAL COMBINATIONS

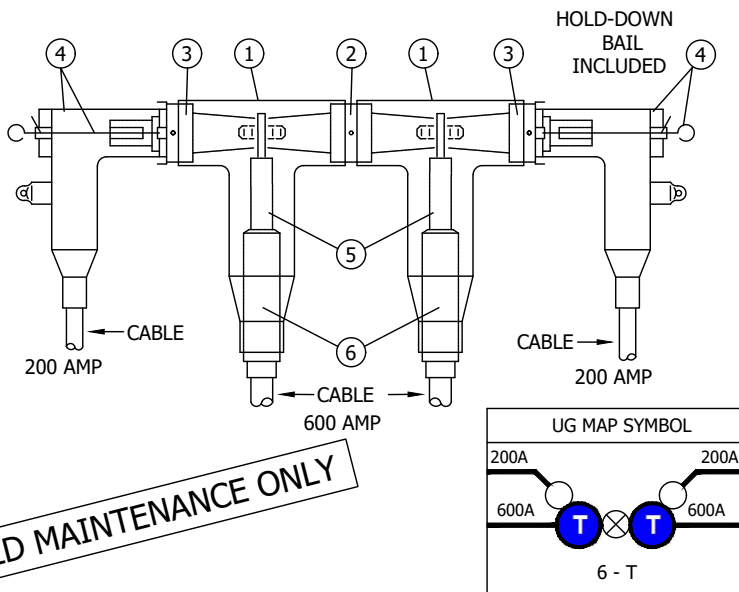
| CODE CABLE SIZE | 773 350AL-350AL- #2 AL | 775 350AL-350AL- 2/0 AL | 883 750AL-750AL- #2 AL | 885 750AL-750AL- 2/0 AL | 993 1000AL-1000AL- #2 AL | 995 1000AL-1000AL- 2/0 AL |
|-----------------|------------------------------|-------------------------------|------------------------------|-------------------------------|--------------------------------|---------------------------------|
| MACRO UNITS | CC-773 | CC-775 | CC-883 | CC-885 | CC-993 | CC-995 |



| EQUIPMENT | QTY. | STOCK NUMBER |
|-----------------------------------|------|--|
| ① ELBOW TEE | 2 | 326578 |
| ② INSULATED PLUG W/ TEST POINT | 1 | 544848 |
| ③ DOUBLE ENDED CONNECTOR PLUG | 1 | 544832 |
| ④ 600/200 AMP TAP PLUG | 1 | 547324 |
| ⑤ DEADBREAK ELBOW CONNECTOR | 1 | 443842 (#2 AL) 443844 (2/0 AL) |
| ⑥ CONDUCTOR CONNECTOR | 2 | 258698 (350 AL) 258704 (750 AL) 258708 (750C AL) 258702 (1000 AL) |
| ⑦ CABLE ADAPTER | 2 | 102027 (350 AL) 102034 (750 AL) 102051 (750C AL) 102050 (1000 AL) |

TYPICAL COMBINATIONS

| CODE CABLE SIZE | 5773 2/0AL-350AL- 350AL-#2 AL | 5775 2/0AL-350AL- 350AL-2/0 AL | 5883 2/0AL-750AL- 750AL-#2 AL | 5885 2/0AL-750AL- 750AL-2/0 AL | 5993 2/0AL-1000AL- 1000AL-#2 AL | 5995 2/0AL-1000AL- 1000AL-2/0 AL |
|-----------------|-------------------------------------|--------------------------------------|-------------------------------------|--------------------------------------|---------------------------------------|--|
| MACRO UNITS | CC5773 | CC5775 | CC5883 | CC5885 | CC5993 | CC5995 |



| EQUIPMENT | QTY. | STOCK NUMBER |
|----------------------------------|------|--|
| ① ELBOW TEE | 2 | 326578 |
| ② DOUBLE ENDED CONNECTOR PLUG | 1 | 544832 |
| ③ 600/200 AMP TAP PLUG | 2 | 547324 |
| ④ DEADBREAK ELBOW CONNECTOR | 2 | 443842 (#2 AL) 443844 (2/0 AL) |
| ⑤ CONDUCTOR CONNECTOR | 2 | 258698 (350 AL) 258704 (750 AL) 258708 (750C AL) 258702 (1000 AL) |
| ⑥ CABLE ADAPTER | 2 | 102027 (350 AL) 102034 (750 AL) 102051 (750C AL) 102050 (1000 AL) |

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|-----|----------|----|----|-----|--------|------------|-----|--------------|-----|-----|-----|--------|------------|
| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

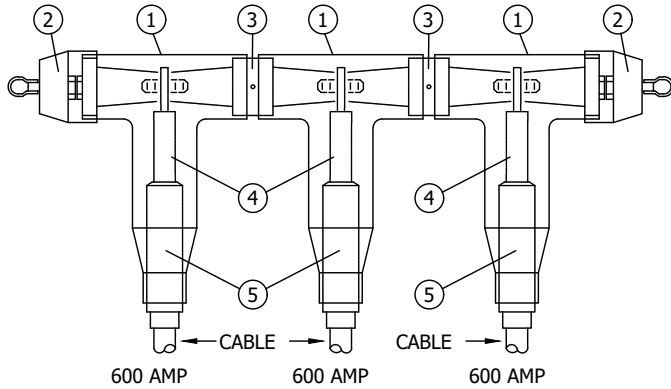
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| SHEET 12 OF 26 | X | Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4181.12 |
| SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | | |
| 12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART | | | | | | |

MANHOLE INSTALLATION ONLY

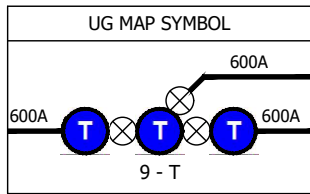
SUBSURFACE CONNECTIONS - 200 AMP LOADBREAK/DEADBREAK AND 600 AMP DEADBREAK

TYPICAL COMBINATIONS

| CODE CABLE SIZE | 777 350AL-350AL-350AL | 888 750AL-750AL-750AL | 889 750AL-750AL-1000AL | 999 1000AL-1000AL-1000AL |
|--------------------|--------------------------|--------------------------|---------------------------|-----------------------------|
| MACRO UNITS | CC-777 | CC-888 | CC-889 | CC-999 |

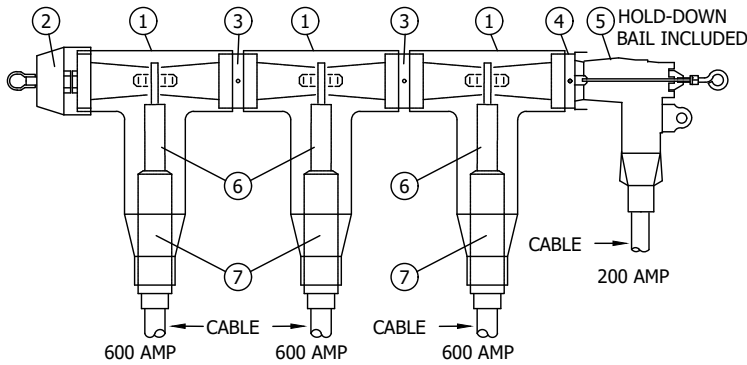


| EQUIPMENT | QTY. | STOCK NUMBER |
|-----------------------------------|------|--|
| ① ELBOW TEE | 3 | 326578 |
| ② INSULATED PLUG W/ TEST POINT | 2 | 544848 |
| ③ DOUBLE ENDED CONNECTOR PLUG | 2 | 544832 |
| ④ COMPRESSION CONNECTOR | 3 | 258698 (350 AL) 258704 (750 AL) 258708 (750C AL) 258702 (1000 AL) |
| ⑤ CABLE ADAPTER | 3 | 102027 (350 AL) 102034 (750 AL) 102051 (750C AL) 102050 (1000 AL) |

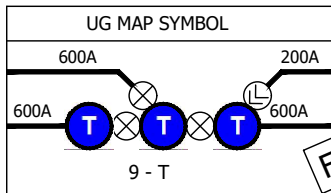


TYPICAL COMBINATIONS

| CODE CABLE SIZE | 7773 350AL-350AL- 350 AL-#2 AL | 7775 350AL-350AL- 350 AL-2/0 AL | 8883 750AL-750AL- 750 AL-#2 AL | 8885 750AL-750AL- 750 AL-2/0 AL | 9993 1000AL-1000AL- 1000 AL-#2 AL | 9995 1000AL-1000AL- 1000 AL-2/0 AL |
|--------------------|--------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|---|--|
| MACRO UNITS | CC7773 | CC7775 | CC8883 | CC8885 | CC9993 | CC9995 |



| EQUIPMENT | QTY. | STOCK NUMBER |
|-----------------------------------|------|--|
| ① ELBOW TEE | 3 | 326578 |
| ② INSULATED PLUG W/ TEST POINT | 1 | 544848 |
| ③ DOUBLE ENDED CONNECTOR PLUG | 2 | 544832 |
| ④ 600/200 AMP TAP PLUG | 1 | 547324 |
| ⑤ DEADBREAK ELBOW CONNECTOR | 1 | 443842 (#2 AL) 443844 (2/0 AL) |
| ⑥ COMPRESSION CONNECTOR | 3 | 258698 (350 AL) 258704 (750 AL) 258708 (750C AL) 258702 (1000 AL) |
| ⑦ CABLE ADAPTER | 3 | 102027 (350 AL) 102034 (750 AL) 102051 (750C AL) 102050 (1000 AL) |



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| REV | CHANGE | DR | BY | DSN | APV | DATE | REV | CHANGE | DR | BY | DSN | APV | DATE |
|-----|----------|----|----|-----|--------|------------|-----|--------------|-----|-----|-----|--------|------------|
| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

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| SHEET 13 OF 26 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4181.13 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | 12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART | | | | |

MANHOLE INSTALLATION ONLY

NOTES:

- THREE TEE COMBINATIONS SHOWN IN THIS STANDARD SHALL ONLY BE USED TO FEED A SWITCHED TIE POSITION.
- FOR SPECIFICATIONS AND INSTALLATION INSTRUCTIONS SEE STANDARDS 4182 AND 4196.
- BELOW ARE THE KEYS TO THE CODES USED IN THE TABLES ON PAGES 4181.9 -.13

CABLES

| | | |
|------------|------------|-------------|
| 3 = #2 AL | 6 = 4/0 CU | 8 = 750 AL |
| 5 = 2/0 AL | 7 = 350 AL | 9 = 1000 AL |

- OTHER COMBINATIONS MAY BE CODED USING THE ABOVE CODES FOR THE SAME TYPE CONNECTIONS SHOWN.

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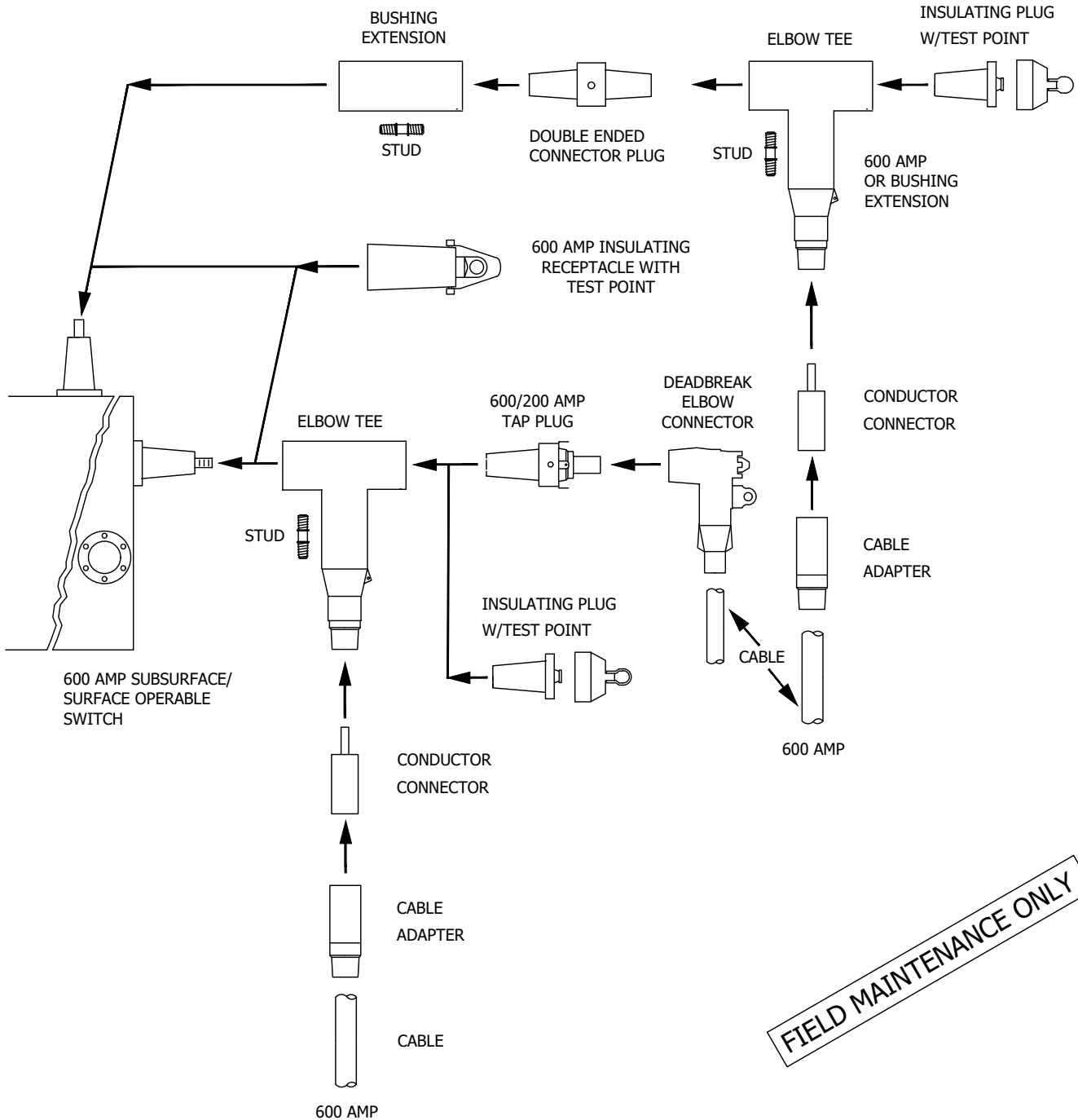
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| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

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|---------------------------|---|---------------------------|--------------------|----------|---------------------|--------------------------|
| SHEET 14 OF 26 | X | Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4181.14 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | 12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART | | | | | |

SUBSURFACE/SURFACE OPERATE SWITCH CONNECTOR APPLICATION CHART 200 AND 600 AMP DEADBREAK

ALWAYS USE THE MANUFACTURERS RECOMMENDED TORQUE SETTINGS WHEN ASSEMBLING CONNECTORS.

THIS CHART SHOWS HOW 200 AND 600 AMP CONNECTORS ARE ASSEMBLED.



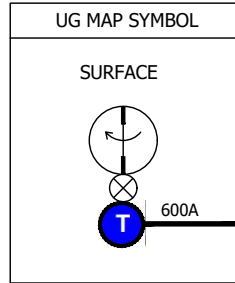
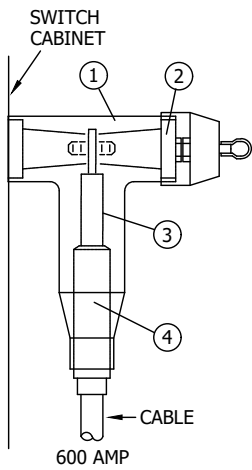
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| REV | CHANGE | DR | BY | DSN | APV | DATE | REV | CHANGE | DR | BY | DSN | APV | DATE |
|-----|----------|----|----|-----|--------|------------|-----|--------------|-----|-----|-----|--------|------------|
| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

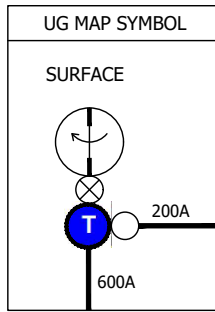
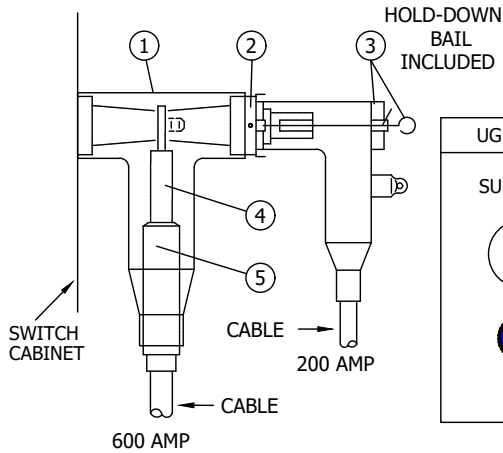
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| SHEET 15 OF 26 | X | Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4181.15 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | 12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART | | | | | |

SUBSURFACE/SURFACE OPERABLE SWITCH CONNECTIONS -- 200 AMP AND 600 AMP DEADBREAK



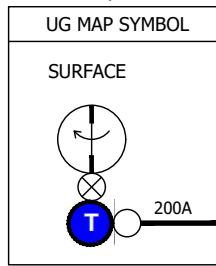
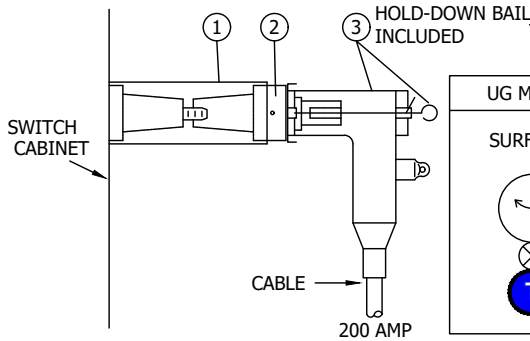
| TYPICAL COMBINATIONS | | | |
|----------------------|---------------------------------|--------------|--|
| CODE CABLE SIZE | T7 350AL | T8 750 AL | T9 1000 AL |
| MACRO UNITS | CC--T7 | CC--T8 | CC--T9 |
| EQUIPMENT | | QTY. | STOCK NUMBER |
| ① | ELBOW TEE | 1 | 326578 |
| ② | INSULATED PLUG W/ TEST POINT | 1 | 544848 |
| ③ | CONDUCTOR CONNECTOR | 1 | 258698 (350 AL) 258704 (750 AL) 258708 (750C AL) 258702 (1000 AL) |
| ④ | CABLE ADAPTER | 1 | 102027 (350 AL) 102034 (750 AL) 102051 (750C AL) 102050 (1000 AL) |

| TYPICAL COMBINATIONS | | | | | | |
|----------------------|---------------------|----------------------|--------------------|----------------------|----------------------|-----------------------|
| CODE CABLE SIZE | T73 350 AL-#2 AL | T75 350 AL-2/0 AL | T83 750 AL-#2AL | T85 750 AL-2/0 AL | T93 1000 AL-#2 AL | T95 1000 AL-2/0 AL |
| MACRO UNITS | CC-T73 | CC-T75 | CC-T83 | CC-T85 | CC-T93 | CC-T95 |



| EQUIPMENT | | QTY. | STOCK NUMBER |
|-----------|------------------------------|------|--|
| ① | ELBOW TEE | 1 | 326578 |
| ② | 600/200 AMP TAP PLUG | 1 | 547324 |
| ③ | DEADBREAK ELBOW CONNECTOR | 1 | 443842 (#2 AL) 443844 (2/0 AL) |
| ④ | CONDUCTOR CONNECTOR | 1 | 258698 (350 AL) 258704 (750 AL) 258708 (750C AL) 258702 (1000 AL) |
| ⑤ | CABLE ADAPTER | 1 | 102027 (350 AL) 102034 (750 AL) 102051 (750C AL) 102050 (1000 AL) |

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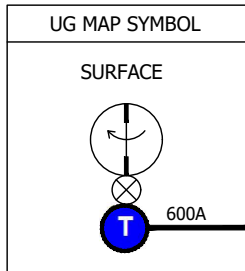
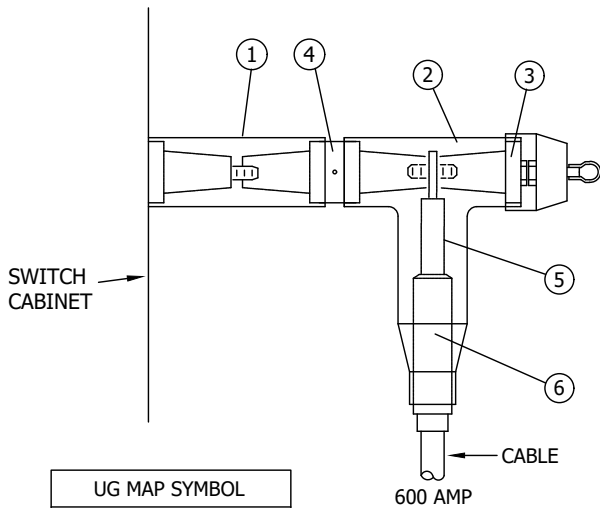
| TYPICAL COMBINATIONS | | | |
|----------------------|------------------------------|--------------|-----------------------------------|
| CODE CABLE SIZE | F3 #2 AL | F5 2/0 AL | |
| MACRO UNITS | CC--F3 | CC--F5 | |
| EQUIPMENT | | QTY. | STOCK NUMBER |
| ① | BUSHING EXTENSION | 1 | 336204 |
| ② | 600/200 AMP TAP PLUG | 1 | 547324 |
| ③ | DEADBREAK ELBOW CONNECTOR | 1 | 443842 (#2 AL) 443844 (2/0 AL) |

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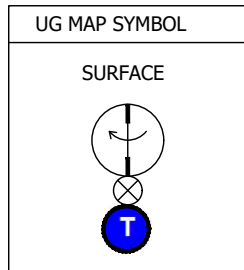
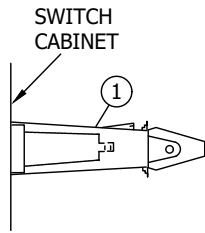
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| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

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| SHEET 16 OF 26 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4181.16 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | 12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART | | | | |

SUBSURFACE/SURFACE OPERABLE SWITCH CONNECTIONS -- 200 AMP AND 600 AMP DEADBREAK



| TYPICAL COMBINATIONS | | | |
|------------------------------------|--------------|--------------|--|
| CODE CABLE SIZE | F7 350 AL | F8 750 AL | F9 1000 AL |
| MACRO UNITS | CC--F7 | CC--F8 | CC--F9 |
| EQUIPMENT | | QTY. | STOCK NUMBER |
| ① BUSHING EXTENSION | | 1 | 336204 |
| ② ELBOW TEE | | 1 | 326578 |
| ③ INSULATING PLUG W/ TEST POINT | | 1 | 544848 |
| ④ DOUBLE ENDED CONNECTOR PLUG | | 1 | 544832 |
| ⑤ CONDUCTOR CONNECTOR | | 1 | 258698 (350 AL) 258704 (750 AL) 258708 (750C AL) 258702 (1000 AL) |
| ⑥ CABLE ADAPTOR | | 1 | 102027 (350 AL) 102034 (750 AL) 102051 (750C AL) 102050 (1000 AL) |



| TYPICAL COMBINATIONS | | | |
|------------------------------------|--------|------|--------------|
| CODE | H | | |
| MACRO UNIT | CC---H | | |
| EQUIPMENT | | QTY. | STOCK NUMBER |
| ① 600 AMP INSULATING RECEPTACLE | | 1 | 570608 |

NOTES:

- DO NOT "PIGGYBACK" 600 AMP TEES ON TOP OF EACH OTHER AT ANY TIME ON THE SWITCH BUSHING.
- FOR SPECIFICATIONS AND INSTALLATION INSTRUCTIONS, REFER TO STANDARDS 4182 AND 4196.
- BELOW ARE THE KEYS TO THE CODES USED IN THE TABLES ON PAGE 4181.15 - .17.

| CABLE | COMPONENTS |
|---|--|
| 3 = #2 AL 7 = 350 AL F = 600 AMP SUBSURFACE/SURFACE OPERABLE SWITCH BUSHING EXTENSION | |
| 5 = 2/0 AL 8 = 750 AL | |
| 9 = 1000 AL H = 600 AMP SUBSURFACE/SURFACE OPERABLE SWITCH INSULATING RECEPTACLE | |
| | T = 600 AMP SUBSURFACE/SURFACE OPERABLE SWITCH TEE |

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- OTHER COMBINATIONS MAY BE CODED USING THE ABOVE CODES FOR THE SAME TYPE CONNECTIONS SHOWN.

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| REV | CHANGE | DR | BY | DSN | APV | DATE | REV | CHANGE | DR | BY | DSN | APV | DATE |
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| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
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| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

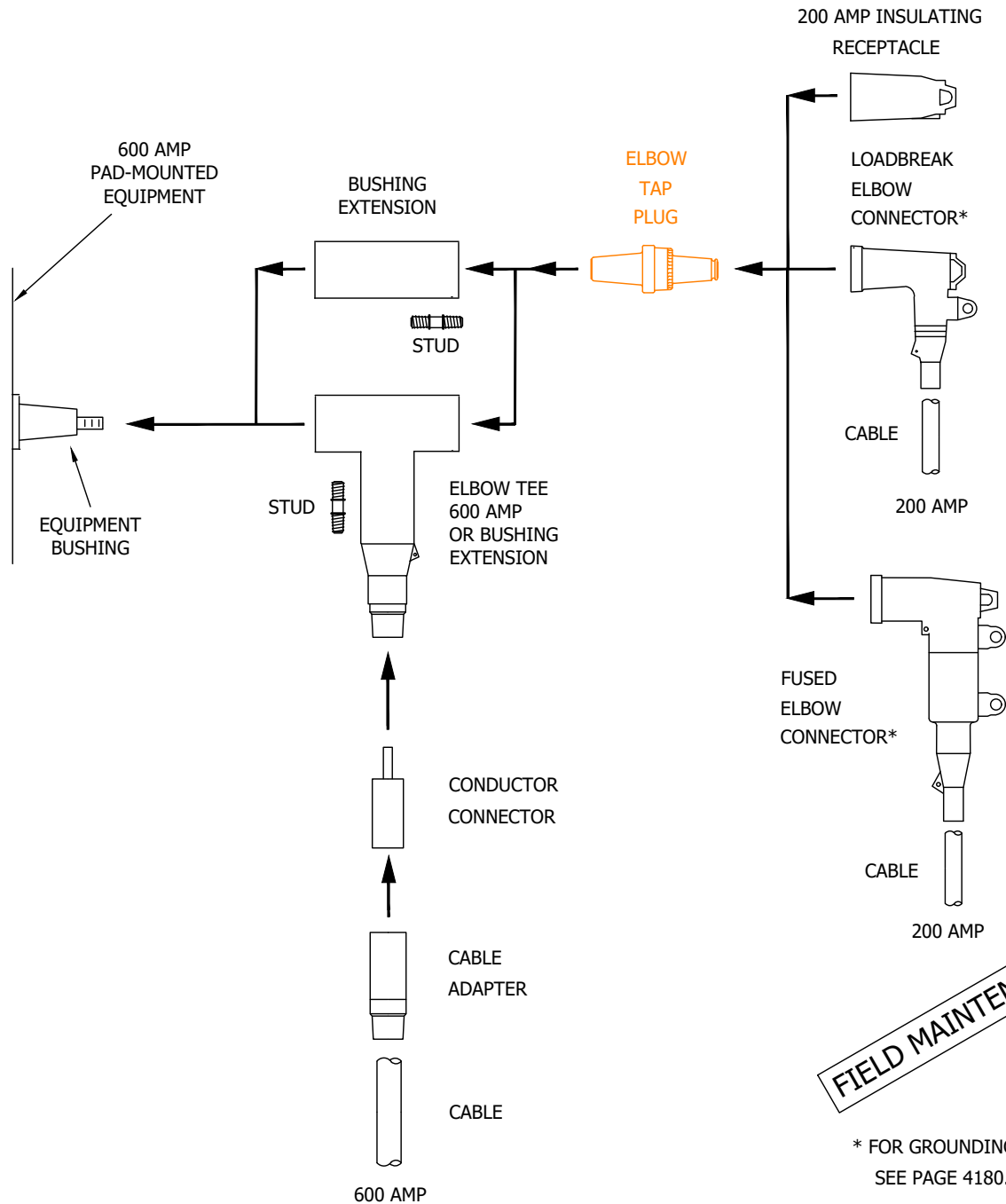
SHEET
17 OF 26

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 SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS
 12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART

FMO
UG4181.17

PAD-MOUNTED 200/600 AMP EQUIPMENT CONNECTOR APPLICATION CHART 200 AND LOADBREAK AND 600 AMP DEADBREAK

THIS CHART SHOWS HOW 200 AND 600 AMP CONNECTORS ARE ASSEMBLED.



* FOR GROUNDING ELBOW KIT
SEE PAGE 4180.1.

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| REV | CHANGE | DR | BY | DSN | APV | DATE | REV | CHANGE | DR | BY | DSN | APV | DATE |
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| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

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| SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| 12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART | | | | |

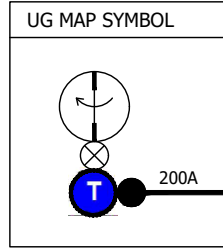
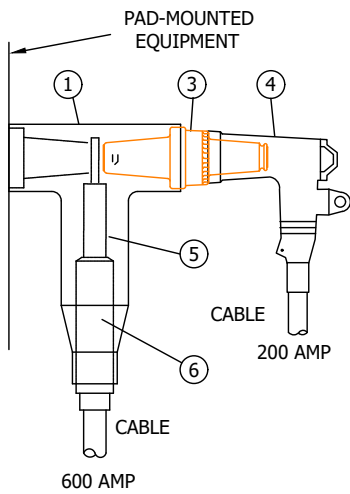
**SHEET
18 OF 26**

**FMO
UG4181.18**

PAD-MOUNTED 200/600 AMP EQUIPMENT CONNECTIONS -- 200 AMP LOADBREAK

TYPICAL COMBINATIONS

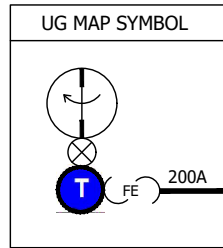
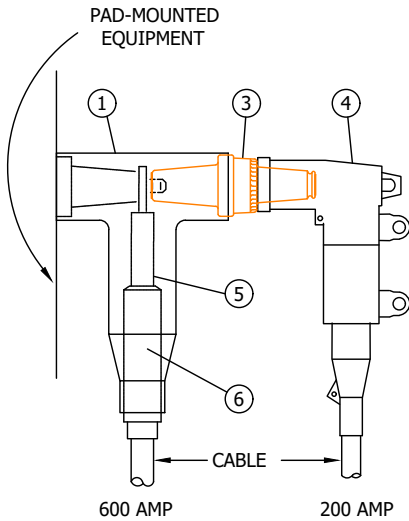
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|--------------------|--------------------|----------------------|---------------------|----------------------|----------------------|-----------------------|
| CODE CABLE SIZE | P73 350AL-#2 AL | P75 350 AL-2/0 AL | P83 750 AL-#2 AL | P85 750 AL-2/0 AL | P93 1000 AL-#2 AL | P95 1000 AL-2/0 AL |
| MACRO UNITS | CC-P73 | CC-P75 | CC-P83 | CC-P85 | CC-P93 | CC-P95 |



| EQUIPMENT | | QTY. | STOCK NUMBER |
|-----------|---------------------------|------|--|
| ① | ELBOW TEE | 1 | S326578 |
| ③ | ELBOW TAP PLUG | 1 | S547328 |
| ④ | LOADBREAK ELBOW CONNECTOR | 1 | S443838 (#2 AL) S443840 (2/0 AL) |
| ⑤ | CONDUCTOR CONNECTOR | 1 | S258698 (350 AL) S258704 (750 AL) S258708 (750C AL) S258702 (1000 AL) |
| ⑥ | CABLE ADAPTER | 1 | S102027 (350 AL) S102034 (750 AL) S102051 (750C AL) S102050 (1000 AL) |

TYPICAL COMBINATIONS

| | | | | | | |
|--------------------|---------------------|----------------------|---------------------|----------------------|----------------------|-----------------------|
| CODE CABLE SIZE | P7B 350 AL-#2 AL | P7C 350 AL-2/0 AL | P8B 750 AL-#2 AL | P8C 750 AL-2/0 AL | P9B 1000 AL-#2 AL | P9C 1000 AL-2/0 AL |
| MACRO UNITS | CC-P7B | CC-P7C | CC-P8B | CC-P8C | CC-P9B | CC-P9C |



| EQUIPMENT | | QTY. | STOCK NUMBER |
|-----------|-----------------------|------|--|
| ① | ELBOW TEE | 1 | 326578 |
| ③ | ELBOW TAP PLUG | 1 | S547328 |
| ④ | FUSED ELBOW CONNECTOR | 1 | S443850 (#2 AL) S443882 (2/0 AL) |
| ⑤ | CONDUCTOR CONNECTOR | 1 | S258698 (350 AL) S258704 (750 AL) S258708 (750C AL) S258702 (1000 AL) |
| ⑥ | CABLE ADAPTER | 1 | S102027 (350 AL) S102034 (750 AL) S102051 (750C AL) S102050 (1000 AL) |

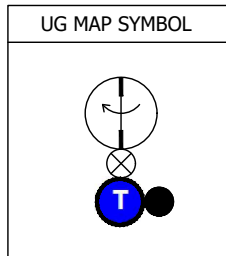
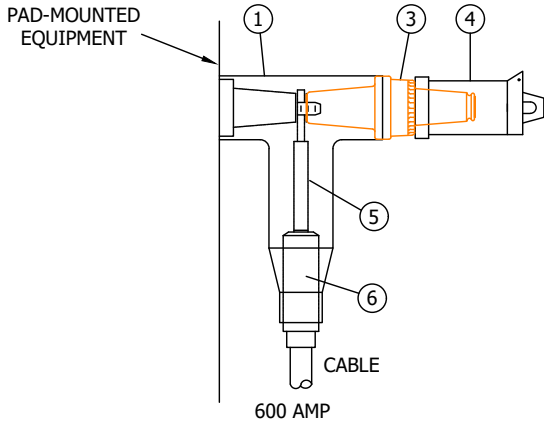
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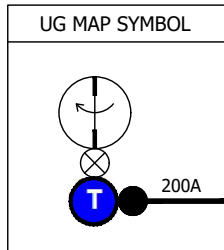
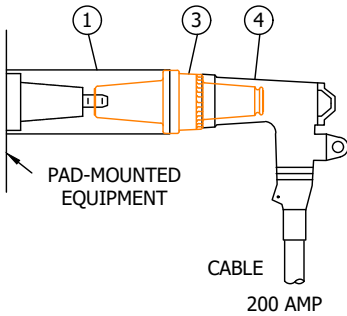
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| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

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| SHEET 19 OF 26 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4181.19 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | 12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART | | | | |

PAD-MOUNTED 200/600 AMP EQUIPMENT CONNECTIONS -- 200 AMP LOADBREAK



| TYPICAL COMBINATIONS | | | |
|----------------------|----------------------------------|---------------|--|
| CODE CABLE SIZE | P70 350AL | P80 750 AL | P90 1000 AL |
| MACRO UNITS | CC-P70 | CC-P80 | CC-P90 |
| EQUIPMENT | | QTY. | STOCK NUMBER |
| ① | ELBOW TEE | 1 | S326578 |
| ③ | ELBOW TAP PLUG | 1 | S547328 |
| ④ | 200 AMP INSULATING RECEPTACLE | 1 | S204304 |
| ⑤ | CONDUCTOR CONNECTOR | 1 | S258698 (350 AL) S258704 (750 AL) S258708 (750C AL) S258702 (1000 AL) |
| ⑥ | CABLE ADAPTER | 1 | S102027 (350 AL) S102034 (750 AL) S102051 (750C AL) S102050 (1000 AL) |



| TYPICAL COMBINATIONS | | | |
|----------------------|------------------------------|--------------|-------------------------------------|
| CODE CABLE SIZE | E3 #2 AL | E5 2/0 AL | |
| MACRO UNITS | CC--E3 | CC--E5 | |
| EQUIPMENT | | QTY. | STOCK NUMBER |
| ① | BUSHING EXTENSION | 1 | 336204 |
| ③ | ELBOW TAP PLUG | 1 | S547328 |
| ④ | LOADBREAK ELBOW CONNECTOR | 1 | S443838 (#2 AL) S443840 (2/0 AL) |

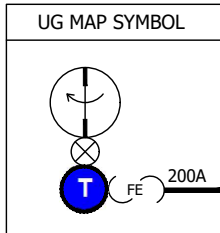
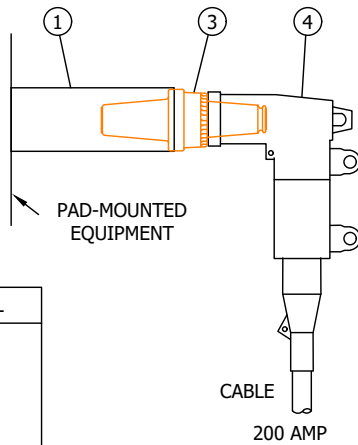
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| REV | CHANGE | DR | BY | DSN | APV | DATE | REV | CHANGE | DR | BY | DSN | APV | DATE |
|-----|----------|----|----|-----|--------|------------|-----|--------------|-----|-----|-----|--------|------------|
| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

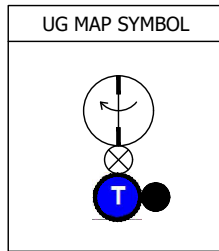
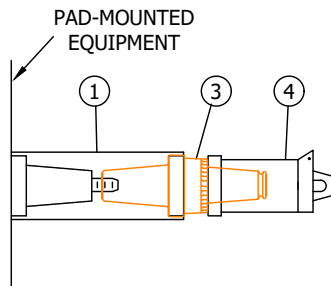
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| SHEET 20 OF 26 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4181.20 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | 12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART | | | | |

PAD-MOUNTED 200/600 AMP EQUIPMENT CONNECTIONS -- 200 AMP LOADBREAK



| TYPICAL COMBINATIONS | | | |
|----------------------|--------------------------|--------------|-------------------------------------|
| CODE CABLE SIZE | EB #2 AL | EC 2/0 AL | |
| MACRO UNITS | CC--EB | | CC--EC |
| EQUIPMENT | | QTY. | STOCK NUMBER |
| ① | BUSHING EXTENSION | 1 | S336204 |
| ③ | ELBOW TAP PLUG | 1 | S547328 |
| ④ | FUSED ELBOW CONNECTOR | 1 | S443850 (#2 AL) S443882 (2/0 AL) |

PAD-MOUNTED 200/600 AMP EQUIPMENT CONNECTIONS -- 200 AMP LOADBREAK



| TYPICAL COMBINATIONS | | | |
|----------------------|----------------------------------|------|--------------|
| CODE | EO | | |
| MACRO UNIT | CC--EO | | |
| EQUIPMENT | | QTY. | STOCK NUMBER |
| ① | BUSHING EXTENSION | 1 | S336204 |
| ③ | ELBOW TAP PLUG | 1 | S547328 |
| ④ | 200 AMP INSULATING RECEPTACLE | 1 | S204304 |

NOTES:

- DO NOT "PIGGYBACK" 600 AMP TEES ON TOP OF EACH OTHER AT ANY TIME ON THE EQUIPMENT BUSHING.
- THE 200 AMP/600 AMP LOADBREAK CONFIGURATIONS ON THESE PAGES ARE ONLY TO BE USED ON PAD-MOUNTED EQUIPMENT INSTALLATIONS.
- FOR SPECIFICATIONS AND INSTALLATION INSTRUCTIONS REFER TO STANDARDS 4182, 4191 AND 4192.
- BELOW ARE THE KEYS TO THE CODES IN THE TABLES ON PAGES 4181.18 - .21.

CODES

3 = #2 AL 7 = 350 AL
5 = 2/0 AL 8 = 750 AL
9 = 1000 AL

COMPONENTS

B = #2 AL FUSED ELBOW
C = 2/0 AL FUSED ELBOW
E = 600 AMP PAD-MOUNTED EQUIPMENT BUSHING EXTENSION
P = 600 AMP PAD-MOUNTED EQUIPMENT TEE
0 = 200 AMP INSULATING RECEPTACLE

- OTHER COMBINATIONS MAY BE CODED USING THE ABOVE CODES FOR THE SAME TYPE CONNECTIONS SHOWN.

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**SHEET
21 OF 26**

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

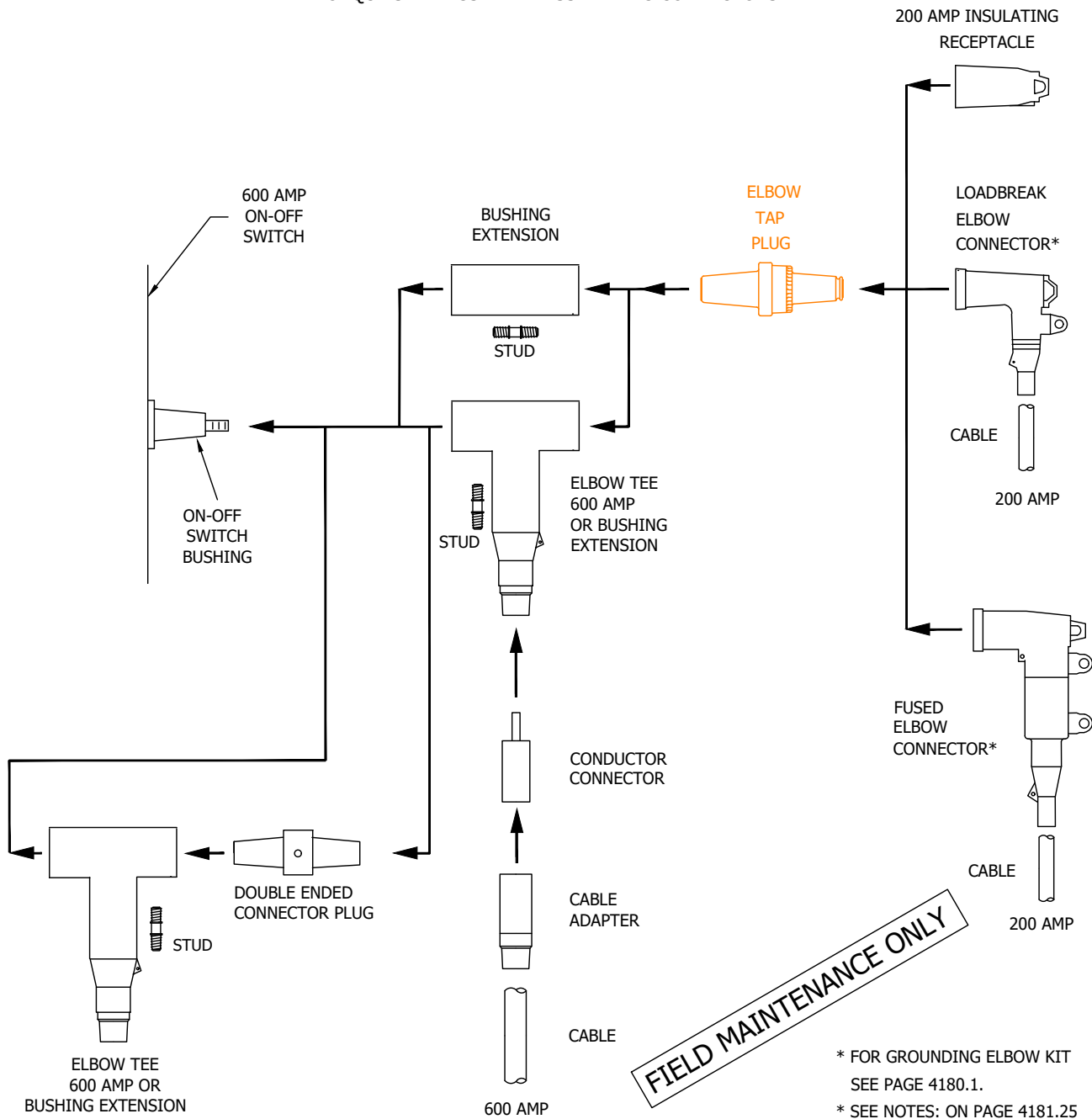
12KV 200 & 600 AMP CONNECTOR ASSEMBLIES
IDENTIFICATION CHART

**FMO
UG4181.21**

SUBSURFACE/SURFACE OPERATE ON-OFF SWITCH CONNECTOR APPLICATION CHART 200 AND LOADBREAK AND 600 AMP DEADBREAK

THIS CHART SHOWS HOW 200 AND 600 AMP CONNECTORS ARE ASSEMBLED.

ALWAYS USE THE MANUFACTURERS RECOMMENDED
TORQUE SETTINGS WHEN ASSEMBLING CONNECTORS.



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| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

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SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

12KV 200 & 600 AMP CONNECTOR ASSEMBLIES
IDENTIFICATION CHART

FMO
UG4181.22

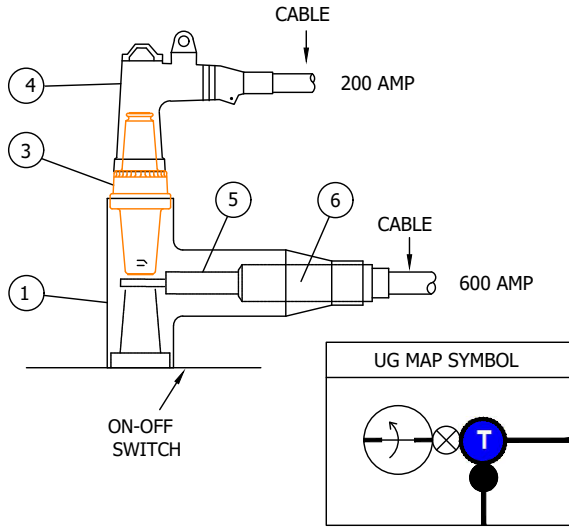
SHEET
22 OF 26

SUBSURFACE/SURFACE OPERABLE ON-OFF

SWITCH CONNECTIONS - 200 AMP LOADBREAK

TYPICAL COMBINATIONS

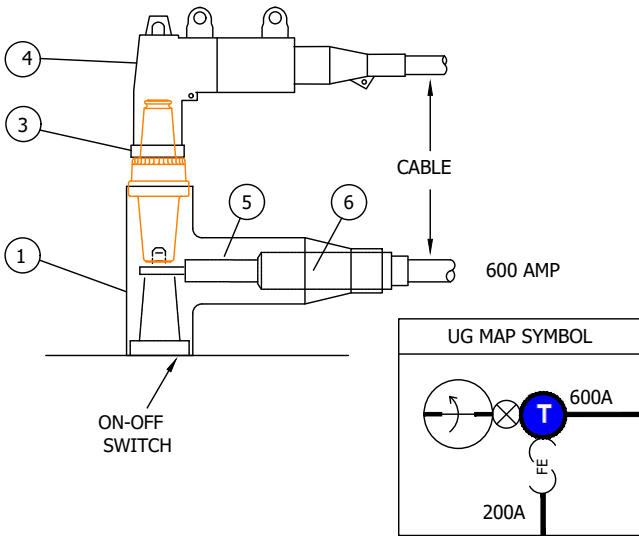
| CODE CABLE SIZE | T73 350 AL-#2 AL | T75 350 AL-2/0 AL | T 83 750 AL-#2 AL | T85 750 AL-2/0 AL | T93 1000 AL-#2 AL | T95 1000 AL-2/0 AL |
|-----------------|---------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|
| MACRO UNITS | C--T73 | C--T75 | C--T83 | C--T85 | C--T93 | C--T95 |



| EQUIPMENT | QTY. | STOCK NUMBER |
|-----------------------------|------|--|
| ① ELBOW TEE | 1 | S326578 |
| ③ ELBOW TAP PLUG | 1 | S547328 |
| ④ LOADBREAK ELBOW CONNECTOR | 1 | S443838 (#2 AL) S443840 (2/0 AL) |
| ⑤ COMPRESSION CONNECTOR | 1 | S258698 (350 AL) S258704 (750 AL) S258708 (750C AL) S258702 (1000 AL) |
| ⑥ CABLE ADAPTER | 1 | S102027 (350 AL) S102034 (750 AL) S102051 (750C AL) S102050 (1000 AL) |

TYPICAL COMBINATIONS

| CODE CABLE SIZE | 7B 350 AL-#2 AL | 7C 350 AL-2/0 AL | 8B 750 AL-#2 AL | 8C 750 AL-2/0 AL | 9B 1000 AL-#2 AL | 9C 1000 AL-2/0 AL |
|-----------------|--------------------|---------------------|--------------------|---------------------|---------------------|----------------------|
| MACRO UNITS | C--T7B | C--T7C | C--T8B | C--T8C | C--T9B | C--T9C |



| EQUIPMENT | QTY. | STOCK NUMBER |
|-------------------------|------|--|
| ① ELBOW TEE | 1 | S326578 |
| ③ ELBOW TAP PLUG | 1 | S547328 |
| ④ FUSED ELBOW CONNECTOR | 1 | S443850 (#2 AL) S443882 (2/0 AL) |
| ⑤ CONDUCTOR CONNECTOR | 1 | S258698 (350 AL) S258704 (750 AL) S258708 (750C AL) S258702 (1000 AL) |
| ⑥ CABLE ADAPTER | 1 | S102027 (350 AL) S102034 (750 AL) S102051 (750C AL) S102050 (1000 AL) |

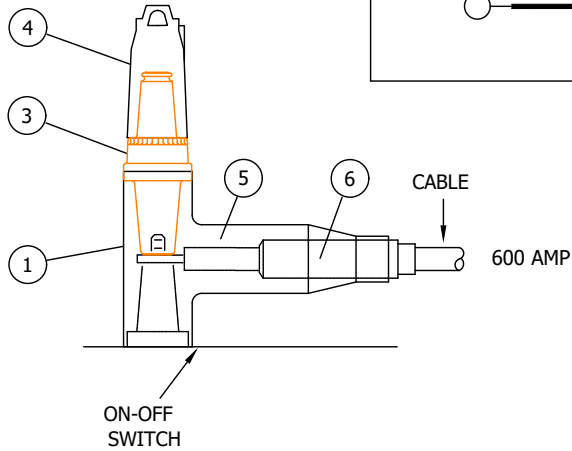
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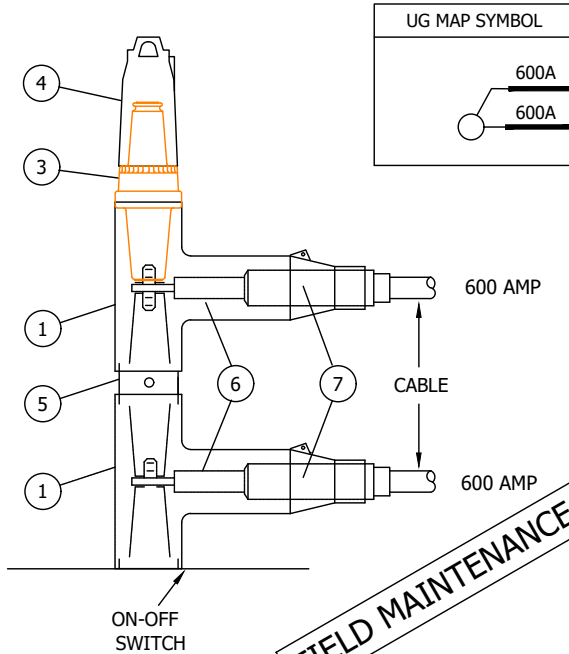
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| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

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| SHEET 23 OF 26 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4181.23 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | 12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART | | | | |

SUBSURFACE/SURFACE OPERABLE ON-OFF SWITCH CONNECTIONS - 200 AMP LOADBREAK



| TYPICAL COMBINATIONS | | | |
|----------------------|-------------------------------|---------------|--|
| CODE CABLE SIZE | T70 350 AL | T80 750 AL | T90 1000 AL |
| MACRO UNITS | CC-T70 | CC-T80 | CC-T90 |
| EQUIPMENT | | QTY. | STOCK NUMBER |
| 1 | ELBOW TEE | 1 | S326578 |
| 3 | ELBOW TAP PLUG | 1 | S547328 |
| 4 | 200 AMP INSULATING RECEPTACLE | 1 | S204304 |
| 5 | CONDUCTOR CONNECTOR | 1 | S258698 (350 AL) S258704 (750 AL) S258708 (750C AL) S258702 (1000 AL) |
| 6 | CABLE ADAPTER | 1 | S102027 (350 AL) S102034 (750 AL) S102051 (750C AL) S102050 (1000 AL) |



| TYPICAL COMBINATIONS | | | |
|----------------------|-------------------------------|----------------|--|
| CODE CABLE SIZE | TT70 350 AL | TT80 750 AL | TT90 1000 AL |
| MACRO UNITS | C-TT70 | C-TT80 | C-TT90 |
| EQUIPMENT | | QTY. | STOCK NUMBER |
| 1 | ELBOW TEE | 2 | S326578 |
| 3 | ELBOW TAP PLUG | 1 | S547328 |
| 4 | 200 AMP INSULATING RECEPTACLE | 1 | S204304 |
| 5 | DOUBLE ENDED CONNECTOR PLUG | 1 | S544832 |
| 6 | CONDUCTOR CONNECTOR | 2 | S258698 (350 AL) S258704 (750 AL) S258708 (750C AL) S258702 (1000 AL) |
| 7 | CABLE ADAPTER | 2 | S102027 (350 AL) S102034 (750 AL) S102051 (750C AL) S102050 (1000 AL) |

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|-----|----------|----|----|-----|--------|------------|-----|--------------|-----|-----|-----|--------|------------|
| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

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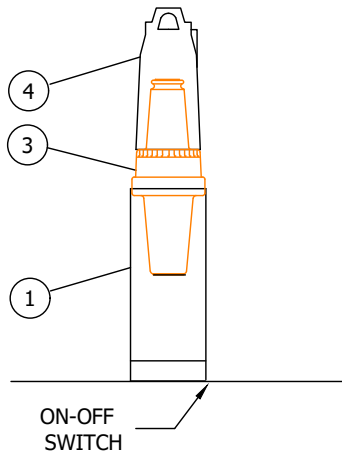
**SHEET
24 OF 26**

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

12KV 200 & 600 AMP CONNECTOR ASSEMBLIES
IDENTIFICATION CHART

**FMO
UG4181.24**

SUBSURFACE/SURFACE OPERABLE ON-OFF SWITCH CONNECTIONS - 200 AMP LOADBREAK



| TYPICAL COMBINATIONS | | | |
|----------------------|-------------------------------|------|--------------|
| CODE | FO | | |
| MACRO UNITS | C---FO | | |
| EQUIPMENT | | QTY. | STOCK NUMBER |
| ① | BUSHING EXTENSION | 1 | S336204 |
| ③ | ELBOW TAP PLUG | 1 | S547328 |
| ④ | 200 AMP INSULATING RECEPTACLE | 1 | S204304 |

NOTES:

- "PIGGYBACK" TEES SHOWN IN THIS STANDARD SHALL ONLY BE USED TO FEED A SWITCH TIE POSITION.
- DO NOT INSTALL LOADBREAK ELBOWS ON SWITCHES INSTALLED IN MANHOLES.
- DO NOT INSTALL LOADBREAK ELBOWS ON "PIGGYBACK" TEES.
- FOR SPECIFICATIONS AND INSTALLATION INSTRUCTIONS REFER TO STANDARDS 4182, 4191 AND 4192.
- BELOW ARE THE KEYS TO THE CODES IN THE TABLES ON PAGES 4181.22 - .25.

CODES

3 = #2 AL 7 = 350 AL
 5 = 2/0 AL 8 = 750 AL
 9 = 1000 AL

COMPONENTS

B = #2 AL FUSED ELBOW
 C = 2/0 AL FUSED ELBOW
 T = 600 AMP SUBSURFACE/SURFACE OPERABLE SWITCH TEE.
 F = 600 AMP SUBSURFACE/SURFACE OPERABLE SWITCH BUSHING EXTENSION.

- OTHER COMBINATIONS MAY BE CODED USING THE ABOVE CODES FOR THE SAME TYPE CONNECTIONS SHOWN.

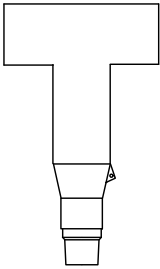
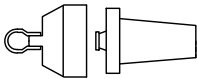

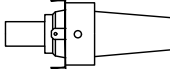
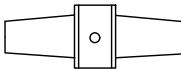
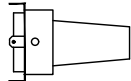


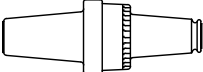
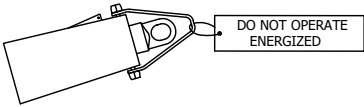
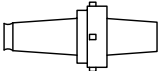


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| C | REVISION | - | - | - | TR/MJC | 11/14/2011 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | REVISION | - | - | - | TR/MJC | 10/30/2012 |
| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

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| SHEET 25 OF 26 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4181.25 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | 12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART | | | | |

SCOPE: THIS STANDARD SHOWS THE CONNECTIONS AND ASSEMBLY CODES USED FOR CALLING OUT 600 AMP SPLICE AND CONNECTOR ASSEMBLIES ON ELECTRIC CONSTRUCTION ORDERS.

| | | | | | | | |
|--|--------------------|--------------|--|--|--|---------------|--------|
|  <p>ELBOW-TEE & STUD</p> | WIRE SIZE | STOCK NUMBER | ASSEMBLY UNIT |  <p>INSULATED PLUG W/TEST POINT</p> | STOCK NUMBER | ASSEMBLY UNIT | |
| | | S326578 | ELBO-T | | S544848 | PLUG-F | |
|  <p>CABLE ADAPTER</p> | 4/0 CU | S102026 | ADP4/0 |  <p>600/200 AMP TAP PLUG</p> | S547324 | TAP-FE | |
| | 350 AL | S102027 | ADP350 | |  <p>DOUBLE-ENDED CONNECTOR PLUG</p> | S544832 | PLUG-C |
| | 500 CU | S102028 | ADP500 |  <p>600/200 AMP REDUCING TAP WELL</p> | | S719600 | REDTAP |
| | 750 COMP AL | S102051 | AD750C | | | | |
| | 750 AL | S102034 | ADP750 | | | | |
| | 1000 AL | S102050 | AD1MIL | | | | |
| 4/0 CU | S258696 | SPD4/0 |  <p>CONNECTOR</p> | | S570608 | | |
| 350 AL | S258698 | SPD350 | | | | | |
| 500 CU | S258700 | SPD500 | | | | | |
| 750 COMP AL | S258708 | SP750C | | | | | |
| 750 AL | S258704 | SPD750 | | | | | |
| 1000 AL | S258702 | SP1000 | | | | | |
|  <p>STUD</p> | S701100 | STUD |  <p>ELBOW TAP PLUG</p> | S547328 | ETP650 | | |
|  <p>INSULATING RECEPTACLE WITH TEST POINT</p> <p>DO NOT OPERATE ENERGIZED</p> <p>NOT TO BE OPERATED ENERGIZED</p> | S570608 | IN-REC | |  <p>200 AMP LOADBREAK BUSHING PLUG</p> | S544676 | BSHPLG | |
|  <p>EXTENSION SPLICE</p> | 350 AL | S668434 | SS-350 | |  <p>BUSHING EXTENSION & STUD</p> | S336204 | BUSH-X |
| | 750 AL | S668436 | SS-750 | | | | |
| | 750 AL COMP | S668442 | SS750C | | | | |
| | 750 AL-750 AL COMP | S668444 | SS750B | | | | |
| | 1000 AL | S668438 | SS1000 | | | | |
| | #4/0 CU | S668430 | SS-4/0 | | | | |
| | 500 CU | S668432 | SS-500 | | | | |
| | 1000 KCMIL CU only | S668460 | SS1KCU | | | | |

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| A | REVISION | - | - | - | TR/MJC | 11/03/2011 | D | REVISION | - | - | - | TR/MJC | 07/24/2012 |

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|---|---|---------------------------|-----------------|----------------------------|--|
| <p>SHEET 26 OF 26</p> | <p>X Indicates Latest Revision</p> | <p>Completely Revised</p> | <p>New Page</p> | <p>Information Removed</p> | <p>FMO UG4181.26</p> |
| | <p>SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS</p> | | | | |
| | <p>12KV 200 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART</p> | | | | |

UG4183 FIELD MAINTENANCE ONLY

ALL VERSIONS LISTED IN FMO ARE SUPERSEDED BY THEIR CURRENT VERSION FOUND INSIDE THE UNDERGROUND CONSTRUCTION STANDARDS MANUAL.

REVISION HISTORY:

12/12/2021: MOVED TO FMO

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| SHEET 1 OF 1 | Indicates Latest Revision | Completely Revised | <input checked="" type="checkbox"/> | New Page | Information Removed | FMO UG4183 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | 600 AMP JUNCTION CONNECTOR WITH TEST AND GROUNDING POINT | | | | | |

SCOPE: THIS STANDARD SHOWS THE IDENTIFICATION CHARTS FOR 600 AMP JUNCTION CONNECTOR ASSEMBLIES WITH TEST AND GROUNDING POINTS.

ATTENTION:

* THIS CHART SHOWS HOW 200 AND 600 AMP CONNECTORS ARE ASSEMBLED.

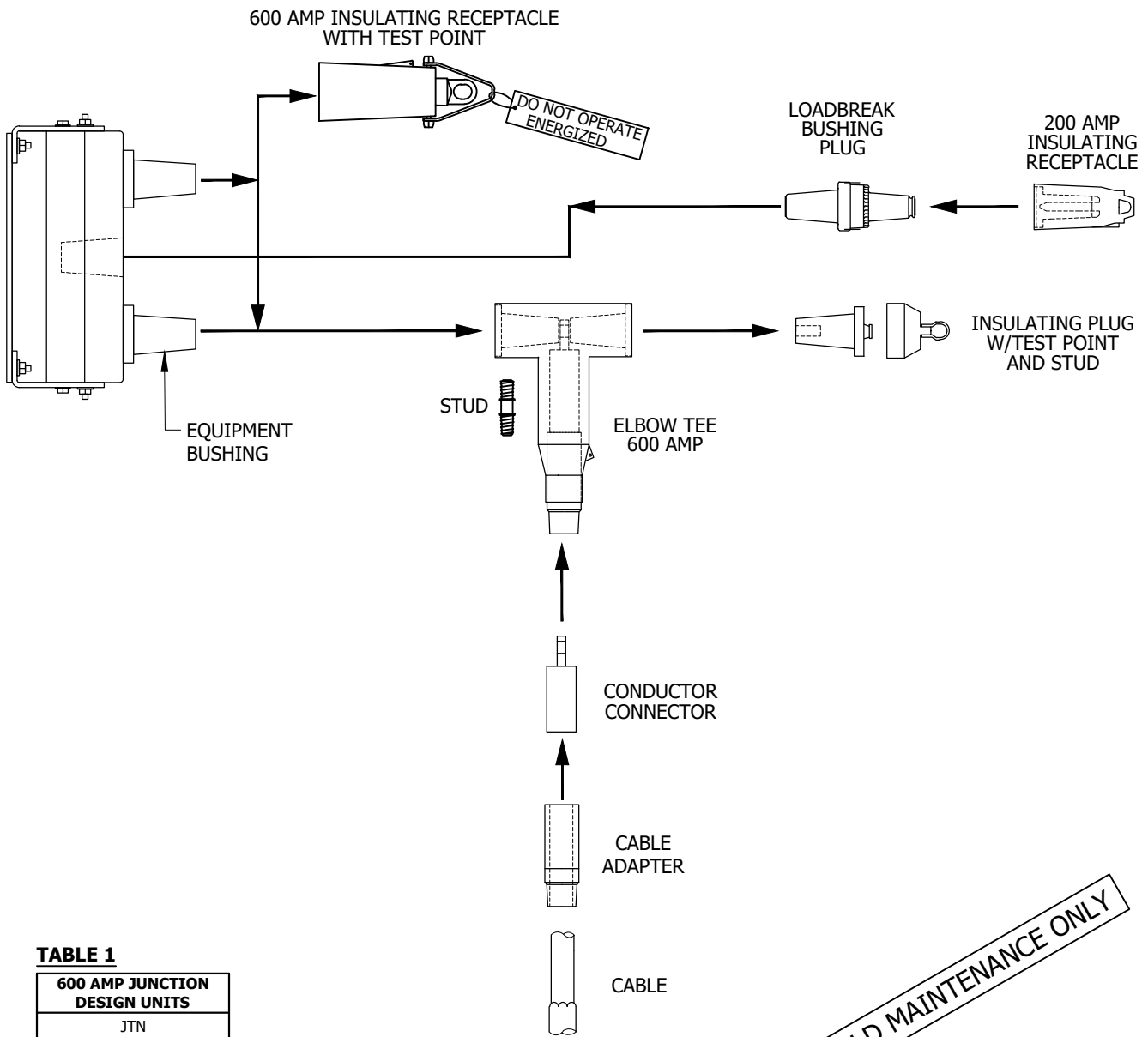


TABLE 1

| |
|--------------------------------------|
| 600 AMP JUNCTION DESIGN UNITS |
| JTN |

FIGURE 1

Vault and Manhole Installation Only
 600 AMP Junction Subsurface Connector Application Chart
 200 and 600 AMP Deadbreak

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| C | FORMATTING | EDM | JIK | - | - | 06/02/2020 | F | | | | | | |
| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | | | | | | |
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| | 600 AMP JUNCTION CONNECTOR WITH TEST AND GROUNDING POINT | | | | |

TABLE 2

| TYPICAL COMBINATIONS | | | |
|----------------------|--------|--------|---------|
| CABLE SIZE | 350 AL | 750 AL | 1000 AL |
| MACRO UNITS | JTN07 | JTN08 | JTN09 |

BILL OF MATERIALS (FIGURE 2):

| ITEM | DESCRIPTION | WIRE SIZE | QUANTITY | STANDARD PAGE | STOCK NUMBER | DESIGN UNITS |
|------|---------------------------------|------------|----------|---------------|--------------|--------------|
| 1 | TEE, ELBOW | - | 1 | - | S326578 | - |
| 2 | PLUG, INSULATED W/ TEST POINT | - | 1 | - | S544848 | - |
| 3 | CONNECTOR, CONDUCTOR | 350 AL | 1 | - | S258698 | - |
| | | 750 AL | | - | S258704 | - |
| | | 750C AL | | - | S258708 | - |
| | | 1000 AL/CU | | - | S258702 | - |
| 4 | ADAPTER, CABLE | 350 AL | 1 | - | S102027 | - |
| | | 750 AL | | - | S102034 | - |
| | | 750C AL | | - | S102051 | - |
| | | 1000 AL/CU | | - | S102050 | - |
| 5 | PLUG, LOADBREAK BUSHING | - | 1 | - | S544676 | - |
| 6 | RECEPTACLE, 200 AMP INSULATING | - | 1 | - | S204304 | - |
| 7 | JUNCTION BAR | - | 1 | - | S484390 | - |
| 8 | RECEPTACLE, 600A INSULATING | - | 1 | - | S570608 | - |
| 9 | TAG, "DO NOT OPERATE ENERGIZED" | - | 1 | - | S647966 | - |

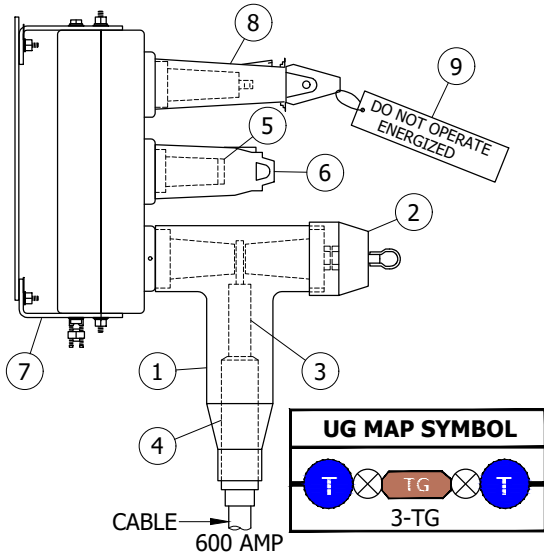


FIGURE 2
VAULT AND MANHOLE INSTALLATION ONLY
VAULT & SUBSURFACE CONNECTIONS
600 AMP DEADBREAK

TABLE 3

| TYPICAL COMBINATIONS | | | |
|----------------------|--------|--------|---------|
| CABLE SIZE | 350 AL | 750 AL | 1000 AL |
| MACRO UNITS | JTN707 | JTN808 | JTN909 |

BILL OF MATERIALS (FIGURE 3):

| ITEM | DESCRIPTION | WIRE SIZE | QUANTITY | STANDARD PAGE | STOCK NUMBER | DESIGN UNITS |
|------|--------------------------------|------------|----------|---------------|--------------|--------------|
| 1 | TEE, ELBOW | - | 2 | - | S326578 | - |
| 2 | PLUG, INSULATED W/ TEST POINT | - | 2 | - | S544848 | - |
| 3 | CONNECTOR, CONDUCTOR | 350 AL | 2 | - | S258698 | - |
| | | 750 AL | | - | S258704 | - |
| | | 750C AL | | - | S258708 | - |
| | | 1000 AL/CU | | - | S258702 | - |
| 4 | ADAPTER, CABLE | 350 AL | 2 | - | S102027 | - |
| | | 750 AL | | - | S102034 | - |
| | | 750C AL | | - | S102051 | - |
| | | 1000 AL/CU | | - | S102050 | - |
| 5 | PLUG, LOADBREAK BUSHING | - | 1 | - | S544676 | - |
| 6 | RECEPTACLE, 200 AMP INSULATING | - | 1 | - | S204304 | - |
| 7 | JUNCTION BAR | - | 1 | - | S484390 | - |

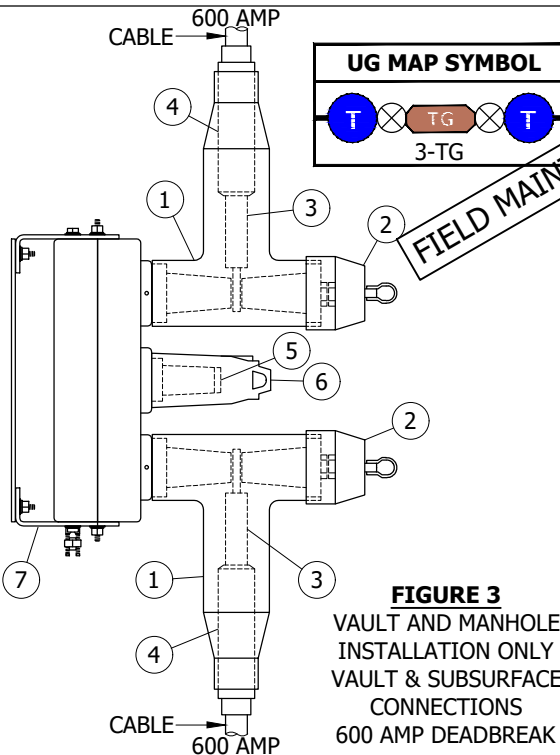


FIGURE 3
VAULT AND MANHOLE INSTALLATION ONLY
VAULT & SUBSURFACE CONNECTIONS
600 AMP DEADBREAK

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| B | REVISION | - | - | - | TR/MJC | 11/08/2011 | E | | | | | | |
| A | REVISION | - | - | - | TR/MF | 06/12/2005 | D | MOVED TO FMO | EDM | ADW | GLW | CZH | 12/12/2021 |

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | |
| | 600 AMP JUNCTION CONNECTOR WITH TEST AND GROUNDING POINT | | | |

**FMO
UG4183.2**

INSTALLATION:

A. ALWAYS USE THE MANUFACTURERS RECOMMENDED TORQUE SETTINGS WHEN ASSEMBLING CONNECTORS.

BILL OF MATERIALS: INDIVIDUALLY INCLUDED WITH FIGURES

NOTES:

I. **TABLE 4**

| CODES USED IN TABLES 2 & 3 | |
|----------------------------|---------|
| CODE | ITEM |
| CABLE | |
| 7 | 350 AL |
| 8 | 750 AL |
| 9 | 1000 AL |

REFERENCE: NONE

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| A | REVISION | - | - | - | TR/MF | 06/12/2005 | D | MOVED TO FMO | EDM | ADW | GLW | CZH | 12/12/2021 |

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | 600 AMP JUNCTION CONNECTOR WITH TEST AND GROUNDING POINT | | | | |


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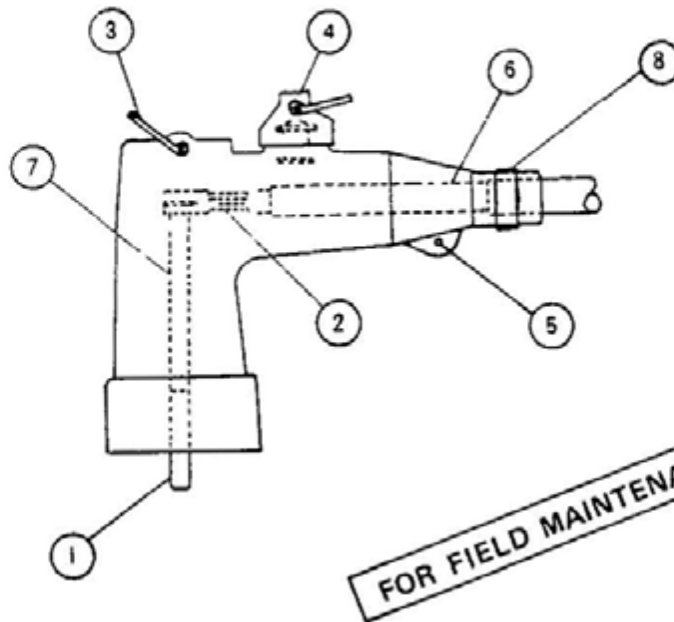
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| | <p>SDG&E ELECTRIC UNDERGROUND STANDARD</p> | | | | |
| | <p>LOADBREAK ELBOW CONNECTOR, 6930 VOLTS AND BELOW</p> | | | | |

MAJOR USE
 USED ON SUBSURFACE, LOW PROFILE PAD-MOUNT
 TRANSFORMERS AND LOADBREAK CABLE TAPS
 (LOADBREAK ON 6.9KV AND 4.16KV SYSTEMS ONLY)



ATTENTION: THIS ELBOW IS DESIGNED FOR OPERATION AS A LOADBREAK DEVICE ON 6.9 & 4.16KV SYSTEMS ONLY. HOWEVER, IF IT IS INSTALLED ON A 12KV SYSTEM, A TAG (3232) "DO NOT OPERATE ENERGIZED" IS THEN ATTACHED.

| RATINGS | |
|---|--|
| KV | 8.3 |
| AMPERES | 200 |
| KV-BIL | 95 |
| LOADBREAK OR LOADMAKE 10 OPERATIONS | 200 AMPS AT 70-80 % POWER FACTOR |
| FAULT CLOSE RMS SYMMETRICAL AMPERES | 10,000 |

| NO. | PARTS | STOCK NO. OR CONSTR. STD |
|-----|-------------------------------|-----------------------------|
| 1 | ARC FOLLOWER | |
| 2 | COMPRESSION SOCKET TERMINAL | 256124 (#4 CU) |
| 3 | ELBOW PULLING EYE | |
| 4 | VOLTAGE TEST POINT & COVER | OR |
| 5 | GROUNDING POINT(S) | |
| 6 | CABLE | 443416 (#2 CU) |
| 7 | ELECTRICAL MALE CONTACT | |
| 8 | WHITE IDENTIFICATION BAND (D) | |

NOTES:

- A. ITEMS ABOVE ACCOMMODATE EITHER #2 OR #4 AWG COPPER CONDUCTORS
- B. UNDER PROPER SUPERVISION THIS ELBOW MAY BE USED AS A LOADBREAK DEVICE AT 6.9KV AND BELOW.
- C. FOR INSTALLATION PROCEDURES CONSULT INDIVIDUAL MANUFACTURERS CONTAINERS FOR CURRENT INSTRUCTIONS.
- (D) WHITE BAND IDENTIFIES ELBOW THAT CAN ONLY BE USED FOR SWITCHING ON A 6939 VOLT (1 PHASE) SYSTEM.

SDG&E ELECTRIC STANDARDS

DATE 6-3-83

APPD *REL MAB*

LOADBREAK ELBOW CONNECTOR, 6930 VOLTS AND BELOW

4199.908

SUPERSEDES
41911 (5-20-83)


FIELD MAINTENANCE ONLY

REVISION HISTORY:

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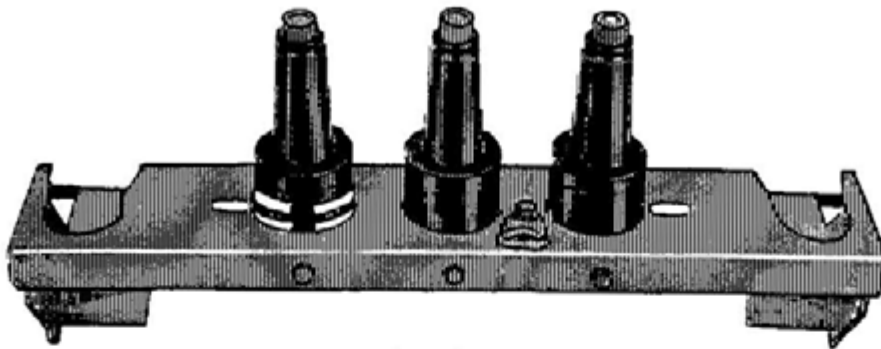
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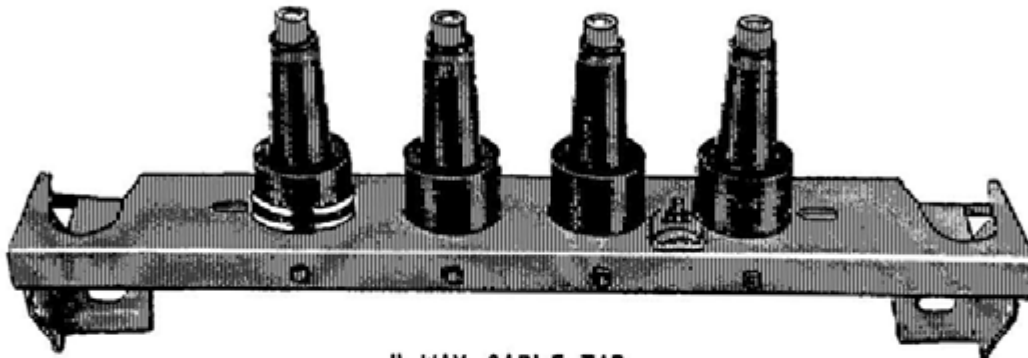
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| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | LOADBREAK ACCESSORIES, 12KV AND/OR 6.9KV | | | | |

MAJOR USE 3-WAY - USED AS A LATERAL TAP FROM A CIRCUIT

4-WAY - USED TO ESTABLISH TWO LATERAL TAPS OR A LOOP FROM A CIRCUIT



3-WAY CABLE TAP



4-WAY CABLE TAP

FOR FIELD MAINTENANCE ONLY

| CABLE TAP WITH BRACKET | STOCK NUMBER |
|------------------------|--------------|
| 3-WAY | 718320 (A) |
| 4-WAY | 718336 (A) |
| 3-WAY | 718312 (B) |
| 4-WAY | 718328 (B) |

| CABLE TAP (D) WITHOUT BRACKET | STOCK NUMBER |
|-------------------------------|--------------|
| 3-WAY | 718314 (B) |
| 4-WAY | 718338 (B) |

NOTES

- (A) NOT LOADBREAK RATED ON 12KV SYSTEM
- (B) INSTALL ONE WHITE-BLACK-WHITE BAND ON THE LEFT BUSHING (WITH A RED MARK), TO IDENTIFY 12KV SWITCHING CAPABILITY (122495).
- C CAP OFF ALL UNUSED TAPS WITH INSULATING RECEPTACLE (204304).
- (D) CABLE TAPS PURCHASED WITHOUT BRACKET TO BE USED FOR REPLACEMENT PURPOSES IN CABLE TAPS WITH BRACKETS. IF NOT AVAILABLE, USE CABLE TAP WITH BRACKET AND SAVE BRACKET

4199.909

SDG&E ELECTRIC STANDARDS

SUPERSEDES
4192 02 (5-20-83)

LOADBREAK ACCESSORIES, 12KV AND/OR 6.9KV

DATE 6-3-83
APPD Red/MB

UG4198 FIELD MAINTENANCE ONLY

ALL VERSIONS LISTED IN FMO ARE SUPERSEDED BY THEIR CURRENT VERSION FOUND INSIDE THE UNDERGROUND CONSTRUCTION STANDARD MANUAL.

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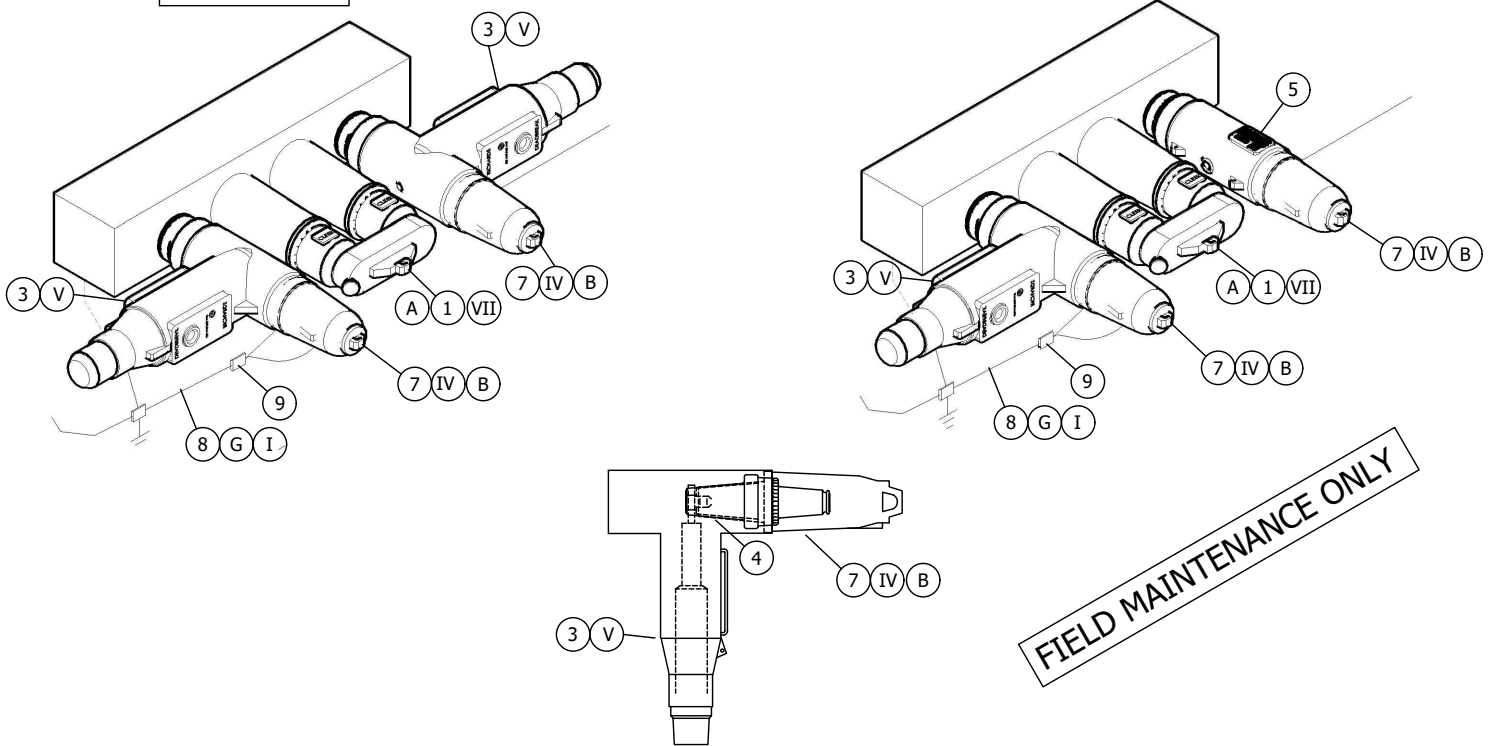
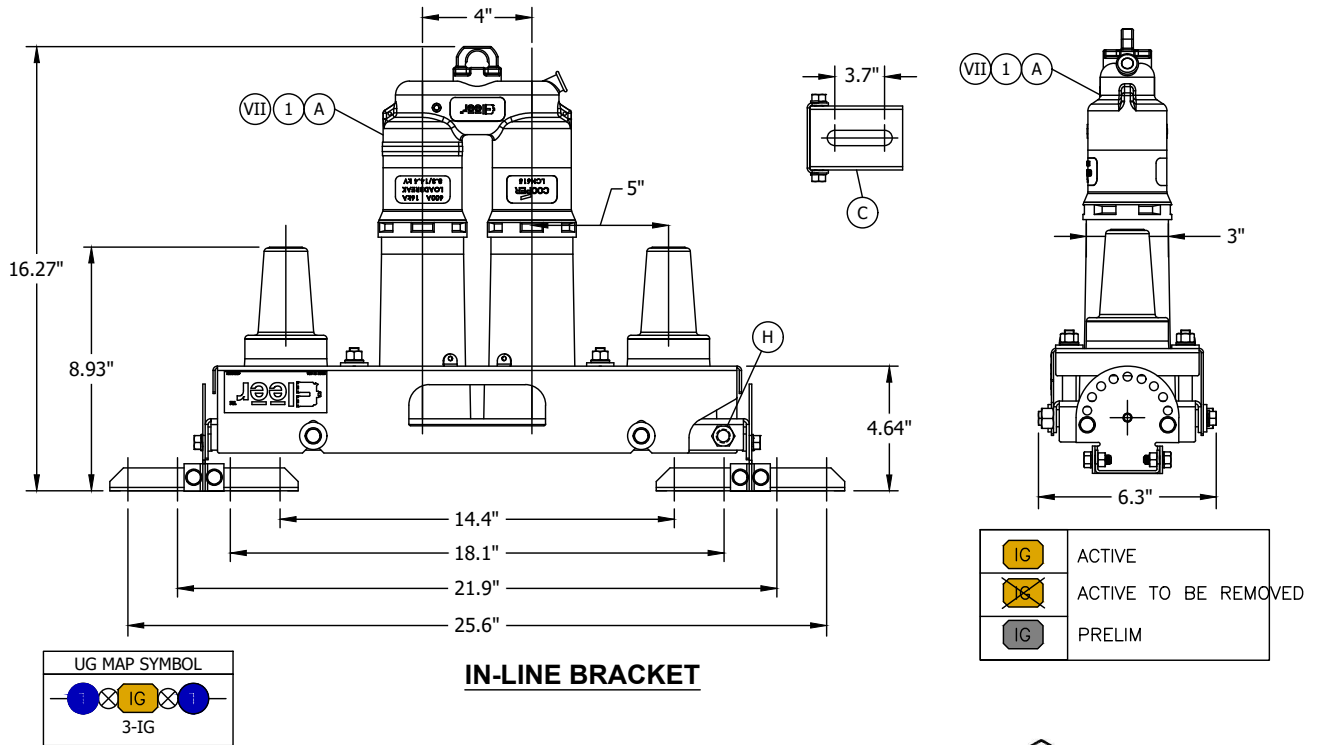
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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | N-JUNCTION CLEER 600A 25KV SQUARE CLEER 600A 25KV | | | | |

SCOPE: THIS STANDARD COVERS THE CLEER, 600 AMP, LIVE LINE TOOL OPERATED, SEPARABLE CONNECTOR.

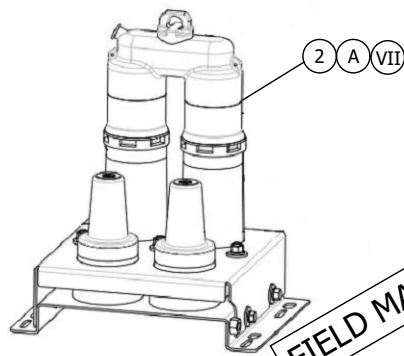
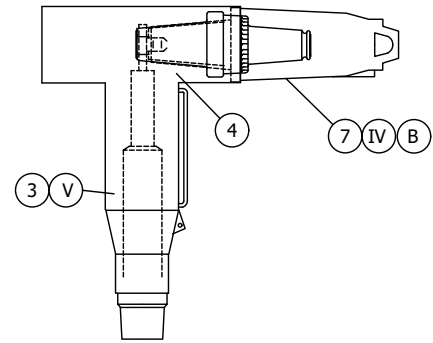
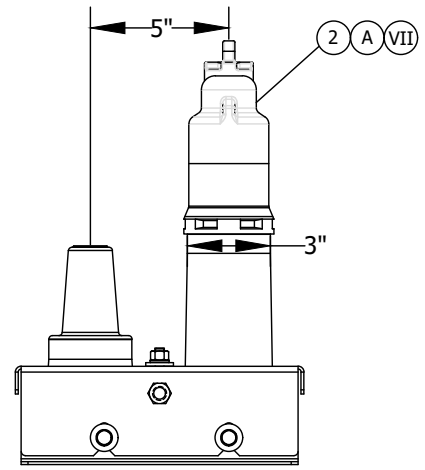
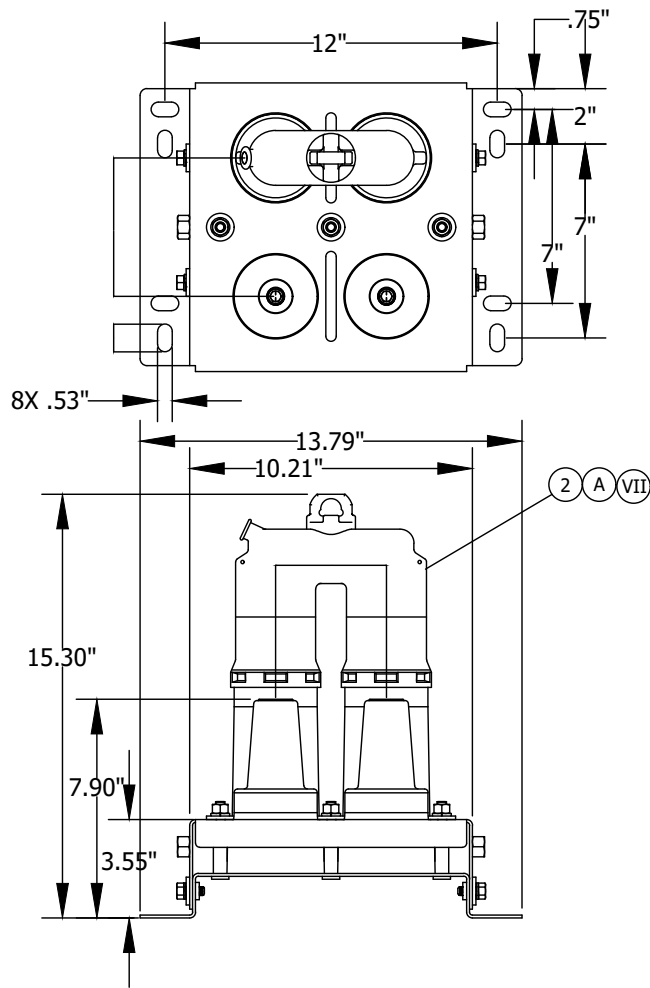
ATTENTION: FEEDER MUST BE DE-ENERGIZED DURING ANY CONSTRUCTION AND INTERCONNECTION WITH THE COOPER CLEER.



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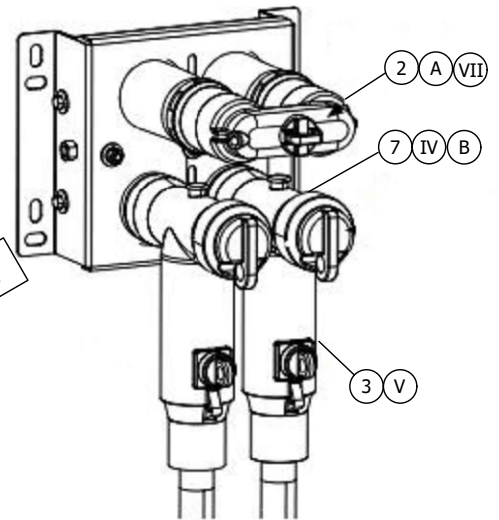
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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | N-JUNCTION CLEER 600A 25KV SQUARE CLEER 600A 25KV | | | | |



FIELD MAINTENANCE ONLY

SQUARE BRACKET



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| | N-JUNCTION CLEAR 600A 25KV SQUARE CLEAR 600A 25KV | | | | |



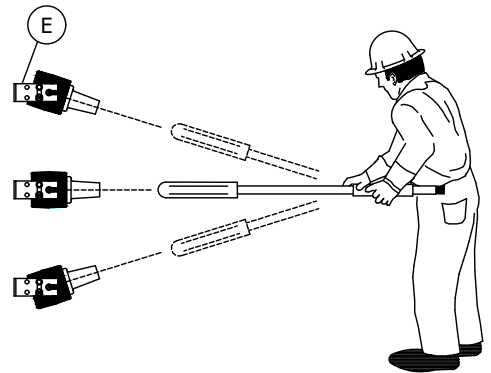
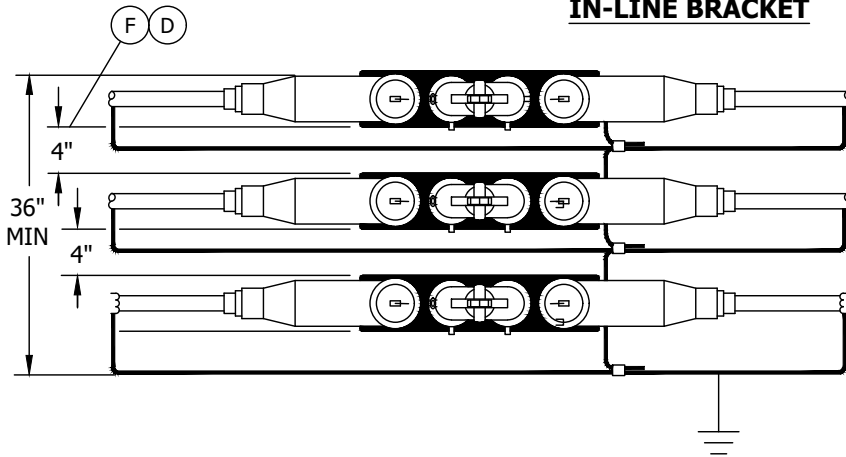
INSULATED PROTECTIVE CAP (5) (III)



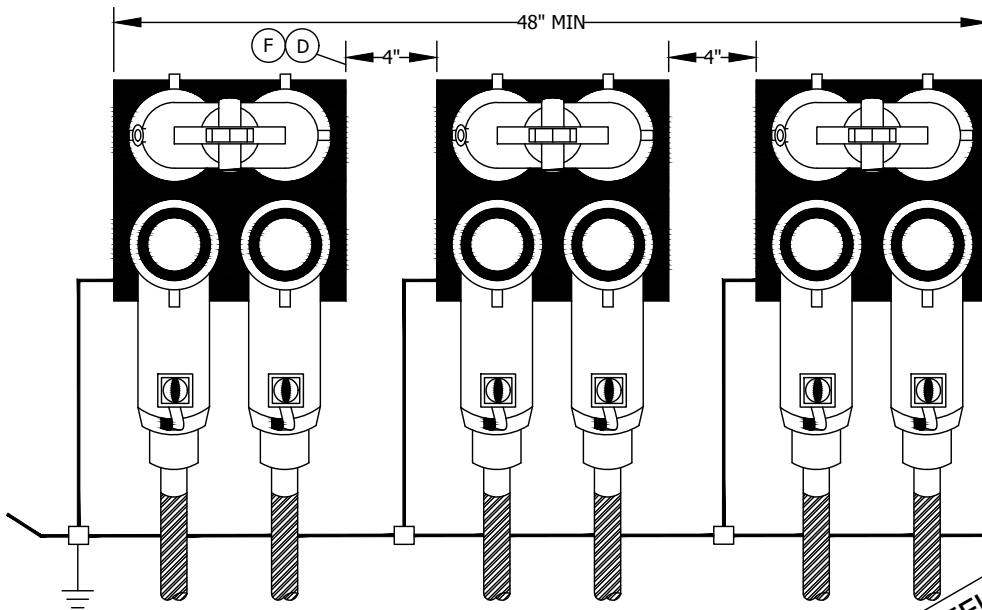
GROUNDING ELBOW

(10) (I)

IN-LINE BRACKET



SQUARE BRACKET



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**SHEET
3 OF 5**

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

N-JUNCTION CLEER 600A 25KV
SQUARE CLEER 600A 25KV

**FMO
UG4198.3**

INSTALLATION:

- (A) N-JUNCTION CLEER PROVIDES A TEST, GROUND, AND ISOLATION POINT FOR 600 AMP TEE CONNECTIONS.
- (B) N-JUNCTION CLEER INSTALLED WITH THE TEE BODY, ELBOW TAP PLUG, 200 AMP INSULATION RECEPTICLE
- (C) N-JUNCTION CLEER CAN BE MOUNTED ON A CONCRETE WALL OR UNISTRUT.
- (D) MOUNT UNITS AWAY FROM THE MANHOLE ENTRY AREA.
- (E) N-JUNCTION CLEER CAN BE SET AT A DESIRED ANGLE FOR LIVE LINE TOOL OPERATION.
- (F) MINIMUM HEIGHT NEEDED FOR STACKED 3 IN-LINE CLEER INSTALLATION IS 36 INCHES. MINIMUM VERTICAL SPACING BETWEEN ADJACENT IN-LINE CLEER BRACKET IS 4 INCHES.
- (G) EACH N-JUNCTION CLEER UNIT IS TO BE CONNECTED TO THE SYSTEM GROUND.
- (H) N-JUNCTION CLEER HAS GROUND ATTACHMENT POINTS AND COMES WITH TWO (2) GROUND LUGS (#8 SOL TO 2/0 STRANDED).
- (I) BOND THE LOAD BREAK "C" CONNECTOR TO GROUND.
- J. TORQUE TEE BODY TO MANUFACTURER'S SPECIFICATION OF 50-60 FOOT POUNDS.
- K. ALL EXISTING CABLE(S) MUST BE RETERMINATED & RECRIMPED TO LAND LUG(S) PROPERLY, TO PREVENT UNNECESSARY STRESS TO CABLE(S), WHICH WILL CAUSE PREMATURE FAILURE.

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | STANDARD PAGE | STOCK NUMBER | ASSEMBLY UNIT |
|------|---|-----------------|---------------|--------------|---------------|
| 1 | JUNCTION BAR, 600A CLEER, 15KV, LOAD BREAK - INLINE | 3 | 4198.2 | S439870 | CCL-JB |
| 2 | JUNCTION BAR, 600A CLEER, 15KV, LOAD BREAK - SQUARE | 3 | 4198.3 | S439872 | CCL-SQ |
| 3 | ELBOW TEE BODY, 15KV, 600A WITH CAPACITIVE TEST POINT | 6 | 4182 | S326578 | ELBO-T |
| 4 | ELBOW TAP PLUG | 6 | 4182 | S547328 | LRTP |
| 5 | CAP, ISOLATION FOR JUNCTION BAR "C" MEMBER | (VIII) AS REQ'D | 4198 | S204300 | CL6CAP |
| 6 | EXTENSION BUSHING, 600 AMP WITH LOAD TAP PLUG | AS REQ'D | 4182 | S336198 | EXLRTP |
| 7 | INSULATION RECEPTACLE, 200 AMP | 6 | 4180 | S204304 | INSREC |
| 8 | WIRE, BARE COPPER, #2, 7 STRANDED, SOFT DRAWN | AS REQ'D | 4002.3 | S812816 | GDWIRE |
| 9 | CONNECTOR, COPPER, COMPRESSION | AS REQ'D | 4172.2 | - | - |
| 10 | JUMPER GROUNDING FOR JUNCTION BAR "C" MEMBER | (VIII) AS REQ'D | 4198 | - | - |

FIELD MAINTENANCE ONLY

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| REV | CHANGE | DR | BY | DSN | APV | DATE | REV | CHANGE | DR | BY | DSN | APV | DATE |
|-----|-------------------|----|-----|-----|--------|------------|-----|--------------------|-----|-----|-----|-----|------------|
| C | EDITORIAL CHANGES | - | DG | JS | MDJ | 10/13/2017 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | EDITORIAL CHANGES | - | DG | JS | MDJ | 06/27/2017 | E | COMPLETELY REVISED | - | DG | JS | CZH | 03/18/2019 |
| A | ORIGINAL ISSUE | - | JBH | TR | JS/MDJ | 07/01/2016 | D | EDITORIAL CHANGES | - | GW | JS | MDJ | 03/22/2018 |

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|-------------------------|---|---------------------------|--------------------|----------|---------------------|-------------------------|
| SHEET 4 OF 5 | X | Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4198.4 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | N-JUNCTION CLEER 600A 25KV SQUARE CLEER 600A 25KV | | | | | |

NOTES:

- I. GROUNDING WITH THE N-JUNCTION CLEER REQUIRES A 600 AMP LOAD BREAK GROUNDING ELBOW (S493780).
- II. N-JUNCTION CLEER IS FULLY SHIELDED AND FULLY SUBMERSIBLE.
- III. THE N-JUNCTION CLEER CAN BE FULLY ISOLATED USING THE 600 AMP LOAD BREAK PROTECTIVE CAP (S204300). ALL BUSHINGS OF THE CONNECTOR SYSTEM ARE THEN INSULATED AND DEADFRONT.
- IV. NO LOAD SHALL BE CONNECTED TO THE 200 AMP TEST POINT.
- V. NO STACKING OF TEES ALLOWED ON THE N-JUNCTION CLEER UNITS.
- VI. BATTERY-OPERATED EQUIPMENT IS NOT TO BE USED WHEN TORQUING REQUIREMENTS EXIST.
- VII. ALTHOUGH THIS DEVICE IS RATED AS A 600amp LOAD BREAK DEVICE, SDG&E WILL ONLY PERFORM OPERATIONS WHEN DE-ENERGIZED.
- VIII. WILL NEED SIX (6) GROUNDING JUMPERS (S439780) AND SIX (6) ISOLATION CAPS (S204300) FOR EACH INSTALLATION. AS THESE ARE REUSABLE (CHECKED IN/OUT) WILL MONITOR FOR MIN/MAX NEEDS AS NEEDED.
- IX. FEEDER MUST BE DE-ENERGIZED DURING ANY CONSTRUCTION AND INTERCONNECTION WITH THE COOPER CLEER. THIS CONNECTION MAY BE PLACED IN WALK-IN VAULTS AND MANHOLES TO CREATE A VISIBLE OPEN IN THE 600 AMP UNDERGROUND SYSTEM. IT CAN BE INSTALLED DURING OUTAGES TO RESTORE PARTIAL SERVICE BY OPENING TEE'S; SEPARATING TEE'S DURING OUTAGES CAN BE FOUND IN ELECTRIC STANDARD PRACTICE 222 SECTION 4.5.3 FOR PARTIAL RESTORATION. IN THE PLANNING AND DESIGN PHASE, THE CONNECTION MAY BE PLACED IN MANHOLES ON LONG, CONTINUOUS RUNS TO SUPPLY A MANUAL, STICK-OPERABLE, DISCONNECT POINT. PLACEMENT WILL ALSO INCLUDE EVERY OTHER MANHOLE AND VAULT BETWEEN SECTIONALIZING DEVICES.
- XI. DESIGN SCOPE SHOULD INCLUDE VAULTS AND MANHOLES THAT HAVE SUFFICIENT SPACE AND LENGTH TO OPERATE WITHIN THE STRUCTURE. 3325, 3326, AND 3327 (TRANSMISSION SUBSTRUCTURE NEAR SUBSTATIONS GENERALLY) MANHOLES SHOULD HAVE SUFFICIENT SPACE (4198.4). 3322, 3324 (BOTH TYPES), AND 3399 MANHOLES WILL REQUIRE APPROVAL FROM EDE DEPENDING ON THE LAYOUT OF THE SUBSTRUCTURE.

REFERENCE:

- a. PARTIAL RESTORATION, SEE ELECTRIC STANDARD PRACTICE 222.

FIELD MAINTENANCE ONLY

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| REV | CHANGE | DR | BY | DSN | APV | DATE | REV | CHANGE | DR | BY | DSN | APV | DATE |
|-----|-------------------|----|-----|-----|--------|------------|-----|--------------------|-----|-----|-----|-----|------------|
| C | EDITORIAL CHANGES | - | DG | JS | MDJ | 10/13/2017 | F | MOVED TO FMO | EDM | EJA | GLW | CZH | 12/09/2019 |
| B | EDITORIAL CHANGES | - | DG | JS | MDJ | 06/27/2017 | E | COMPLETELY REVISED | - | DG | JS | CZH | 03/18/2019 |
| A | ORIGINAL ISSUE | - | JBH | TR | JS/MDJ | 07/01/2016 | D | EDITORIAL CHANGES | - | GW | JS | MDJ | 03/22/2018 |

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|-------------------------|---|--------------------|----------|---------------------|-------------------------|
| SHEET 5 OF 5 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4198.5 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | N-JUNCTION CLEER 600A 25KV SQUARE CLEER 600A 25KV | | | | |

4200 - CABLE POLES

4200 - CABLE POLES

PAGE

SUBJECT

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| 4203 | CABLE POLE RISER INSTALLATION CABLE-IN-CONDUIT |
| 4205 | INSTALLATION OF PERMANENT POLE STEPS |
| 4207 | CABLE POLE TERMINAL MOUNTING INFORMATION (PORCELAIN TERMINATIONS) (FOR CONTAMINATION DISTRICT 1) |
| 4208 | 3Ø CABLE POLE RISER INSTALLATION MODIFICATION FROM SINGLE TO DOUBLE RISER FOR EXISTING CABLE POLES |
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| 4237 | BRACKET MOUNTED TERMINALS, 12KV 3 WIRE, ARMLESS TANGENT CONSTRUCTION |
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| 4239 | CROSSARM CABLE POLE, 3Ø, 1/C PER PHASE DEADEND CONSTRUCTION, 12.47KV AND BELOW |
| 4241 | 12.47KV AND BELOW DEADEND CABLE POLE ARM, 3Ø, 1/C PER Ø, HOOKSTICK SWITCHED |
| 4251 | 12.47KV AND BELOW DEADEND CABLE POLE, 6 OR 7 OH CONDUCTORS, 1 OR 2 TERMINALS PER CONDUCTOR, HOOKSTICK SWITCHED |
| 4287 | REVISED CT & PT POLETOP METERING INSTALLATION, 12 KV, OH & US SERVICES |

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| REV | CHANGE | DR | BY | DSN | APV | DATE | REV | CHANGE | DR | BY | DSN | APV | DATE |
|-----|-------------------|----|-----|-----|-----|-----------|-----|---------------------|-----|-----|-----|-----|------------|
| C | EDITORIAL CHANGES | - | RSL | JES | CZH | 4/13/2020 | F | | | | | | |
| B | ADDED 4232 | - | JK | JS | CZH | 3/18/2019 | E | OH1192 MOVED TO FMO | EDM | MRF | GLW | CZH | 07/27/2021 |
| A | ORIGINAL ISSUE | - | JS | TR | MDJ | 7/25/2016 | D | EDITORIAL CHANGES | EDM | JAC | JES | CZH | 7/1/2020 |

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| SHEET 1 OF 1 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4201.1 |
| | SDG&E ELECTRIC OVERHEAD FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | CABLE POLES FMO TABLE OF CONTENTS | | | | |


FIELD MAINTENANCE ONLY

REVISION HISTORY:

7/13/2016: All versions prior to 2016 are superseded by their current version found inside the Overhead Construction Standard Manual.

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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
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| C | | | | | | F | | | | | |
| B | | | | | | E | | | | | |
| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |

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|--------------------------------|---|--------------------|----------|---------------------|-------------------------------|
| <p>SHEET 1 OF 1</p> |  Indicates Latest Revision | Completely Revised | New Page | Information Removed | <p>FMO UG 4202</p> |
| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | JOINT CABLE POLE RISERS USING WOODEN LADDER ARMS | | | | |

SCOPE: THIS STANDARD 1) SHOWS THE STANDARD CABLE POLE RISER POSITIONS FOR SDG&E TELCO AND CATV COMPANIES IT IS FOR RISER PLACEMENT ONLY (SEE SECTION 1400/4200 FOR SPECIFIC CONSTRUCTION DETAILS)

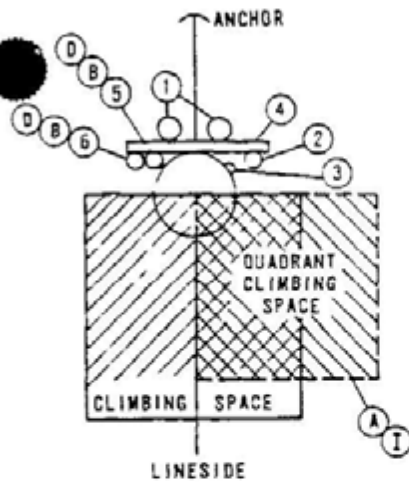


FIGURE 1

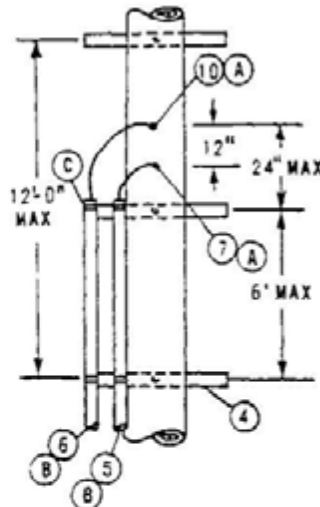


FIGURE 2

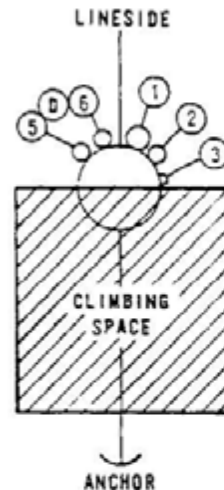


FIGURE 3

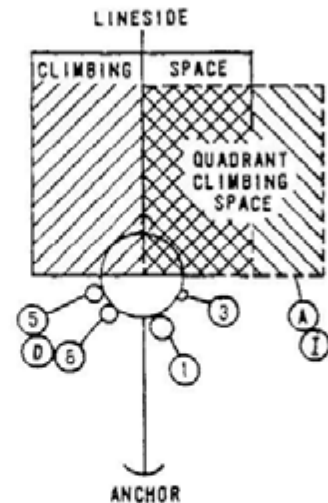


FIGURE 4

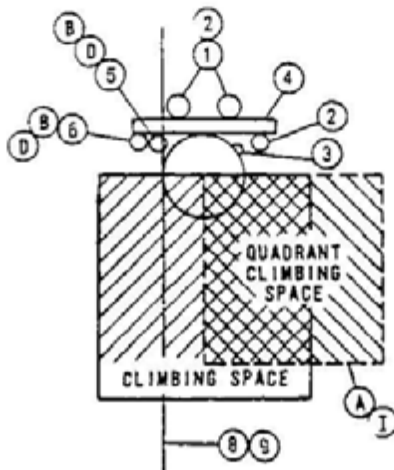


FIGURE 5

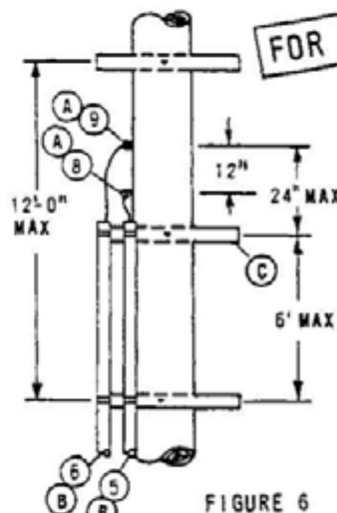


FIGURE 6

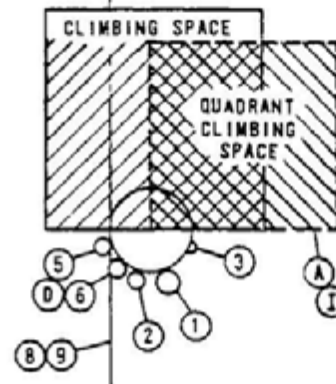


FIGURE 7

INSTALLATION.

- (A) QUADRANT CLIMBING SPACE PROVIDED THROUGH CATV AND TELCO AERIAL ATTACHMENT LEVELS ONLY.
- (B) C.A.T.V. AND TELCO TO ATTACH CONDUIT TO BACK SIDE OF RISER LADDER ARMS
- (C) C.A.T.V. OR TELCO TO PLACE RISER LADDER ARM TO HOLD TOP OF OWN CONDUIT.
- (D) C.A.T.V. AND TELCO TO ALWAYS BE IN SAME QUADRANT.
- F. CONDUIT RISER AT BASE OF POLE NOT TO INFRINGE ON CURB OR SIDEWALK POSITIONS

REFERENCES

- G. PVC RISERS ARE NOT PERMITTED WITHIN THE CLIMBING SPACE PER G.O. 95 RULE 22.2C.
- H. G.O. 95 RULE 91.3-A1C REQUIRES POLE STEPS ON ALL JOINTLY USED CABLE POLES (SEE STANDARD 353)
- I. SEE SECTION 200 FOR ALLOWABLE G.O. 95 CLIMBING SPACE OBSTRUCTIONS.
- J. NO CATV OR TELCO JUMPERS ALLOWED IN QUADRANT CLIMBING SPACE PER G.O. 95 RULE 84.7.

| ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|------|-----------------------|------|----------------------------------|
| 1 | SDG&E PRIMARY RISER | 6 | C.A.T.V. RISER POSITION |
| 2 | SDG&E SECONDARY RISER | 7 | TELCO DEAD END ATTACHMENT |
| 3 | SDG&E ELECTRIC GROUND | 8 | TELCO TANGENT (THRU) POSITION |
| 4 | RISER LADDER ARM | 9 | C.A.T.V. TANGENT (THRU) POSITION |
| 5 | TELCO RISER POSITION | 10 | C.A.T.V. DEAD END ATTACHMENT |

SDG&E ELECTRIC STANDARDS

DATE 11-16-81
APPD JEX

JOINT CABLE POLE RISERS USING WOODEN LADDER ARMS

OH 1499.001
UG 4299.001
SUPERCEDES
4202.1 (3-31-81)


FIELD MAINTENANCE ONLY

REVISION HISTORY:

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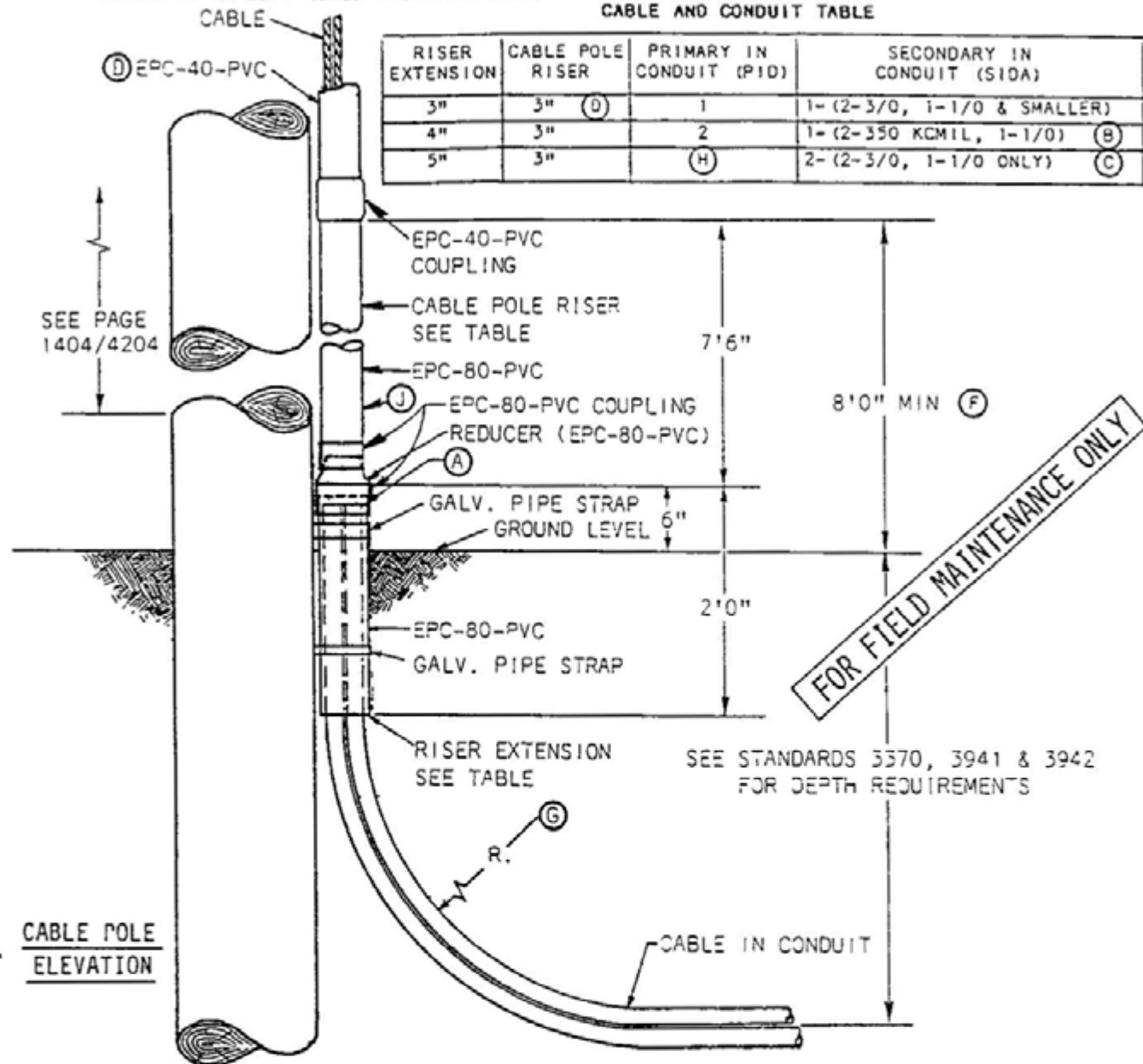
| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
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| B | | | | | | E | | | | | |
| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |

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|-------------------------|---|--------------------|----------|---------------------|------------------------|
| SHEET 1 OF 1 |  Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG 4203 |
| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | CABLE POLE RISER INSTALLATION CABLE-IN-CONDUIT | | | | |

SCOPE: THIS STANDARD SHOWS THE CONSTRUCTION FOR SINGLE-PHASE PRIMARY AND SECONDARY CABLE-IN-CONDUIT (CIC) INSTALLATIONS.

CABLE AND CONDUIT TABLE

| RISER EXTENSION | CABLE POLE RISER | PRIMARY IN CONDUIT (PID) | SECONDARY IN CONDUIT (SIDA) |
|-----------------|------------------|--------------------------|-----------------------------|
| 3" | 3" (D) | 1 | 1- (2-3/0, 1-1/0 & SMALLER) |
| 4" | 3" | 2 | 1- (2-350 KCMIL, 1-1/0) (B) |
| 5" | 3" | (H) | 2- (2-3/0, 1-1/0 ONLY) (C) |



NOTES: NO MORE THAN TWO CIC CONDUITS FOR A RIGID CONDUIT RISER IS ALLOWED.

INSTALLATION:

- (A) CUT CONDUIT FROM CABLE-IN-CONDUIT 4 INCHES ABOVE GROUND LEVEL.
- (B) THE 350 KCMIL CABLE-IN-CONDUIT (SIDA) SHALL NOT BE USED FOR SERVICES, IF A SERVICE REQUIRES 350 CABLE, USA CABLE AND RIGID CONDUIT MUST BE USED.
- (C) FOR 2 RUNS OF SIDA IN ONE RISER, DERATE AMPACITY 20%.
- (D) FOR 3/0 AND SMALLER SIDA, REDUCE THE TOP PORTION OF THE RISER ABOVE THE 8 FOOT LEVEL TO 2 INCH CONDUIT.

REFERENCE:

- (F) RISERS OF PLASTIC PIPE SHALL BE EPC-80-PVC (SCHEDULE 80) WITH A MINIMUM NOMINAL PIPE SIZE OF 3 INCHES FROM THE GROUND LINE TO A LEVEL NOT LESS THAN 8 FEET ABOVE THE GROUND LINE PER G.O. 95, RULE 54.6-E.
- (H) SEE PAGES 1499.003/4299.003 THRU 1403.7/4203.7 FOR THREE-PHASE PRIMARY CABLE IN CONDUIT INSTALLATION WHICH REQUIRES 'U' SHAPED MouldING.
- (I) SEE PAGE 1404.1/4204.2 FOR CABLE POLE RISER BILL OF MATERIAL.
- (J) SEE PAGES 1499.009/4299.009 THRU 1405.3/4205.3 FOR MULTIPLE RISER INSTALLATION.

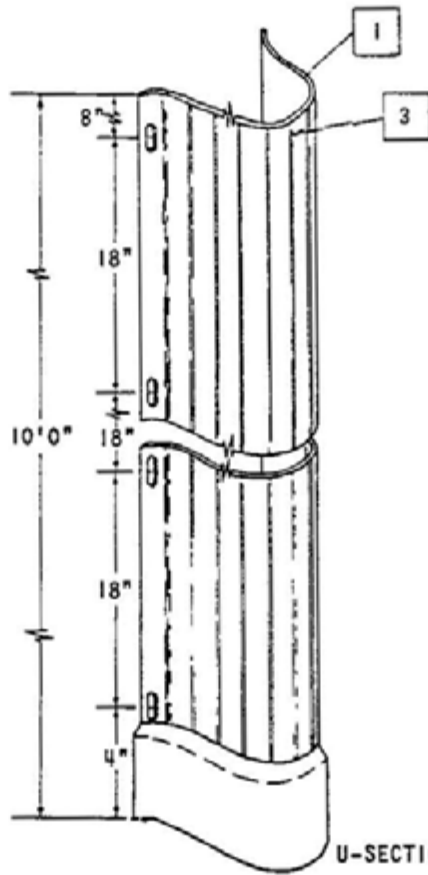
OH 1499.002
UG 4299.002
SUPERCEDES 4203.1
(3-2-84)

SDG&E ELECTRIC STANDARDS

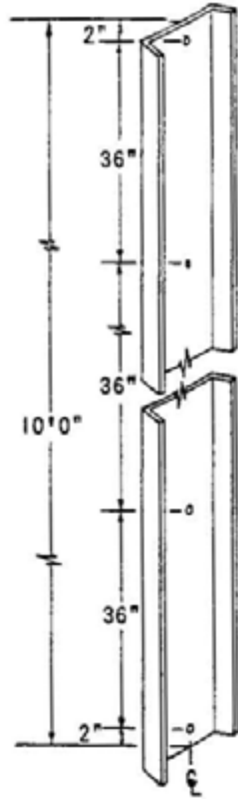
CABLE POLE RISER INSTALLATION
CABLE-IN-CONDUIT

DATE 1-1-87
APPROVED [Signature]

SCOPE: THIS STANDARD SHOWS THE MATERIALS AND PROCEDURES FOR TERMINATING THREE PREASSEMBLED CABLE-IN-CONDUIT ON RISER POLE.

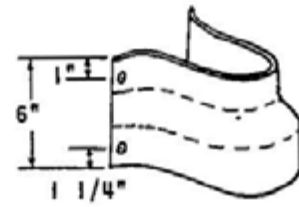


U-SECTION



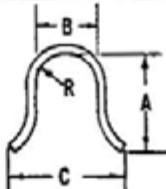

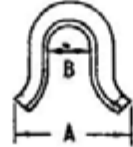
BACKUP PLATE

FOR FIELD MAINTENANCE ONLY



REDUCER BOOT

NOTE: DIMENSIONS A, B, & C HAVE A TOLERANCE OF $\pm 13'$.
BILL OF MATERIAL:

| |  | | |  | |  | |
|----------------|---|------------|------------|--|-------------|---|--|
| | U-SECTION HOLDING | | | BACKUP PLATE | | REDUCER BOOT | |
| SIZE | 3" | 3" | 4" | 3" | 4" | 3" TO 4" | |
| SCHEDULE | 80 | 30 | 40 | N/A | N/A | N/A | |
| LENGTH | 10'0" | 10'0" | 10'0" | 10'0" | 10'0" | 6" | |
| M & S NO. | 600064 | 600032 | 600096 | 542992 | 542994 | 160608 | |
| A | 3 3/8" | 3 3/8" | 4 1/8" | 3 1/4" | 4 1/4" | 8 1/4" | |
| B | 3" | 3" | 4" | 2 5/8" | 3 5/8" | 2 5/8" | |
| C | 6 1/4" | 6 1/4" | 7 1/4" | 7/8" | 1" | -- | |
| R | 1 7/16" | 1 19/32" | 2" | 5" | 5" | -- | |
| WALL THICKNESS | .300" | .150" | .237" | .063" | .063" | .150" | |
| TOLERANCE | -0" +.036" | -0" +.020" | -0" +.020" | $\pm .015"$ | $\pm .015"$ | -0" $\pm .015"$ | |

DATE 1-1-87
APPD *[Signature]*

SDG&E ELECTRIC STANDARDS
3Ø CABLE POLE RISER INSTALLATION
CABLE-IN-CONDUIT

OH 1499.003
UG 4299.003
SUPERCEDES 4203.2
(1-4-80)

SEQUENCE FOR INSPECTION

| SEQ | DESCRIPTION/DIMENSIONS | TOLERANCE |
|-----|------------------------|--------------|
| 1 | WALL THICKNESS | |
| | U-Sections | |
| | 3" Sch. 80 .300 | -.0" + .036" |
| | 3" Sch. 30 .150" | -.0" + .020" |
| | 4" Sch. 40 .237" | -.0" + .020" |

Above wall thicknesses are in accordance with G.O. 95 Rule 54.6D2.

2 GENERAL APPEARANCE ALL SURFACES

U-Sections, Backup Plates and Reducer Boot

Free from warpage, cuts, blemishes and protrusions.

FOR FIELD MAINTENANCE ONLY

3 SCRIBE MARK

Scribe mark indicating minimum overlap distance should be visible 1" from the plain end of the U-Section.

BILL OF MATERIAL:

| ITEM | *QUANTITY REQUIRED | DESCRIPTION | USE BELOW 8 FT. | USE ABOVE 8 FT. | STOCK NO. OR CONST. STDS. |
|------|--------------------|---------------------------------------|-----------------|-----------------|---------------------------|
| 1 | 3' | Riser, U-Section 4"x10' Sch. 40 | yes | no | 600096 |
| 2 | 1 | Riser, U-Section 3"x10' Sch. 80 | yes | no** | 600064 |
| 3 | 2 | Riser, U-Section 3"x10' Sch. 40 | no | yes | 600032 |
| 4 | 1 | Boot, Reducer 4" to 3" | yes | no | 160608 |
| 5 | 3 | Plate, Backup 3"x10' | yes | yes | 542992 |
| 6 | 3' | Plate, Backup 4"x10' | yes | no | 542994 |
| 7 | 1 | Screw, Lag, Sq. Head 1/2"x4" (E) | no | yes | 621568 |
| 8 | 42 | Screw, Lag, Sq. Head 1/4"x 2 1/2" (E) | yes | yes | 621856 |
| 9 | 42 | Washer, Std. Flat Round 1/4" (E) | yes | yes | 799520 |
| 10 | 46 | 6d Galvanized Nails (E) | yes | yes | — |
| 11 | 3 | Grip, Cable 5 1/4"x12" | no | yes | 394336 |

(E) Exempt Material

* This quantity is a typical 40' riser installation, if pole height varies from this distance adjust appropriate material accordingly.

** Only excess portion of 1 - 10 ft. 3" Sch. 80 U-Section is allowed above the 8 ft. level.

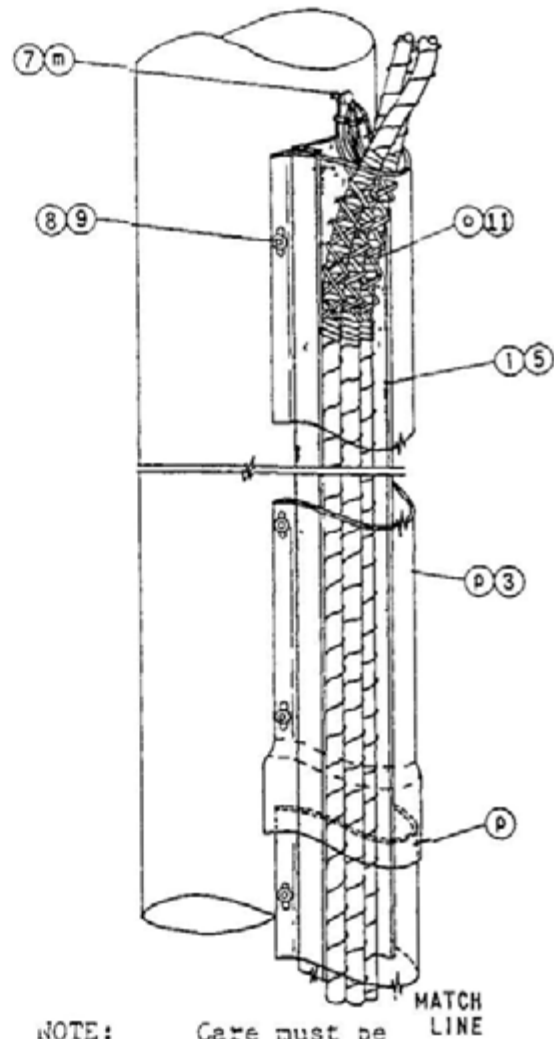
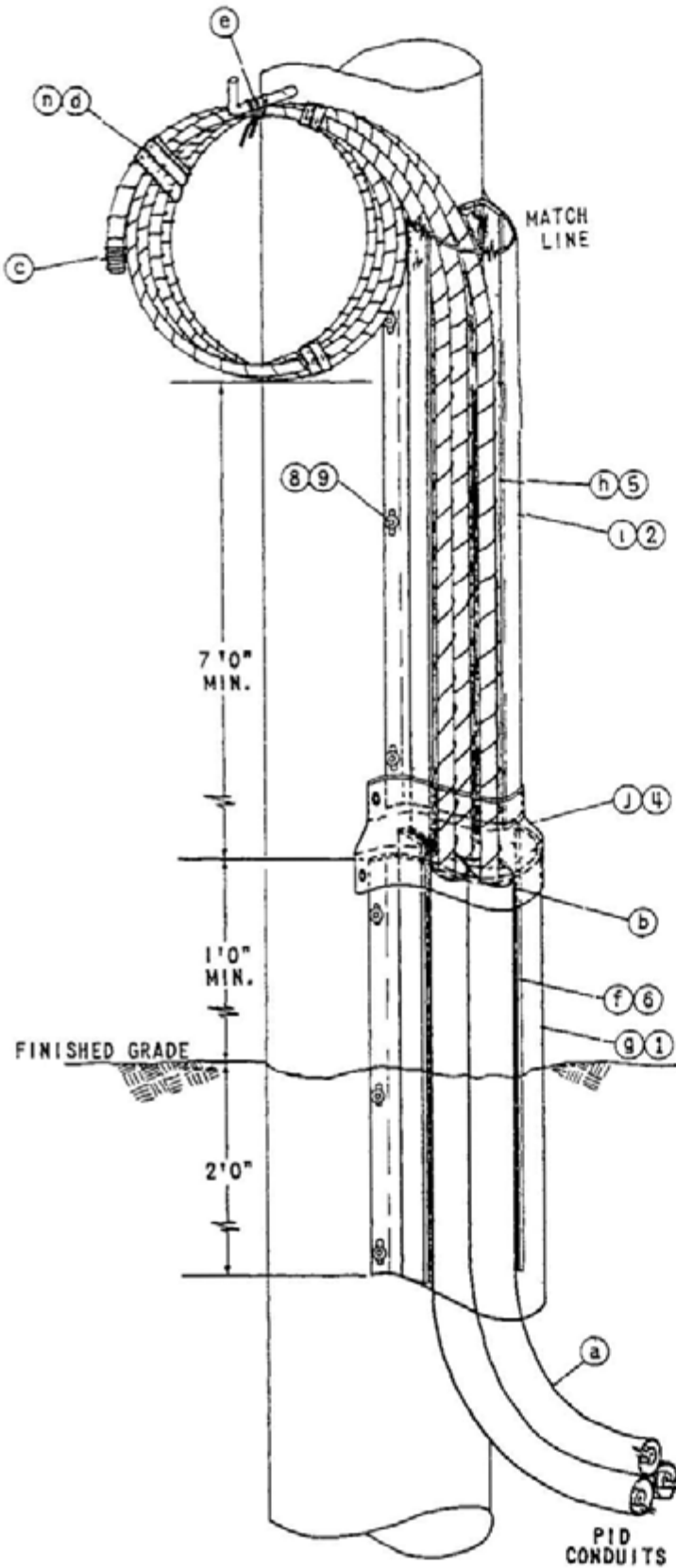
OH 1499.004
UG 4299.004
SUPERCEDES 4203.3
(11-16-81)

SDG&E ELECTRIC STANDARDS

**3Ø CABLE POLE RISER INSTALLATION
CABLE-IN-CONDUIT**

DATE 1-1-87
APPD JLB/RST

INSTALLATIO. INSTRUCTIONS



NOTE:

Care must be taken not to spike conductors with linemans nooks while performing installation, ascending or descending a riser pole.

FOR FIELD MAINTENANCE ONLY

DATE 1-1-87
APPD *[Signature]*

SDG&E ELECTRIC STANDARDS
30 CABLE POLE RISER INSTALLATION
CABLE-IN-CONDUIT

OH 1499.005
UG 4299.005
SUPERCEDES 4203.4
(1-23-80)

U-SECTION MOLDING LOCATION

FOR FIELD MAINTENANCE ONLY

Verify that the quadrant selected by Designer/Planner for the cable pole riser meets the following requirements. If the following requirements cannot be met, contact the Designer or Planner who requested the installation:

Clearances

The U-section molding shall not enter climbing space per G.O. 95 Rule 22.2D. See O.H. Standard page 251 for allowable working and climbing space requirements.

Location of U-section molding in relation to TELCO and CATV (per Overhead Standards page 1402).

U-SECTION MOLDING INSTALLATION

Material Installation Sequence

Note: If installation can be completed sequentially, steps c, d and n, can be eliminated.

- (a) Terminate PID at cable pole by forming a 36" minimum radius bend with the cable-in-conduit at the base of the pole. Provide sufficient cable-in-conduit needed to terminate cable with drip loop at terminal level before cutting cable-in-conduit from cable reel.
- (b) Cut and remove excess pvc conduit from the PID run so the remaining conduit terminates 1' above finished grade. When removing excess pvc conduit, carefully slide excess conduit away from primary conductors.
- (c) To prevent moisture from entering exposed conductors, always seal exposed ends of conductors with "Aquaseal" and pvc tape.
- (d) Individually coil each primary conductor making sure coil is not less than 2' in diameter. Secure each coil in several places with a gray gas wrap tape to prevent conductors from uncoiling.
- (e) Secure coils to the bottom of the pole step with rope to prevent conductors from damage when the pole is climbed. If pole steps are not available, install lag screws (M&S 621856) in place of pole steps. Bottom of each coil must be 8' above existing grade to prevent vandalism.
- (f) Install a 3' section of 4" backup plate with 2' extended below finished grade and 1' extended above finished grade. Temporarily push conductors to one side of the riser quadrant and secure 4" backup plate to pole with 6d galvanized nails at each end and in the middle. Because holes are not provided nails must be driven through backup plate.

~~OH 1499.006~~
UG 4299.006
SUPERCEDES 4203.5
(1-23-80)

SDG&E ELECTRIC STANDARDS

30 CABLE POLE RISER INSTALLATION
CABLE-IN-CONDUIT

DATE 1-1-87
APPROV. JYB IRD

- g) Install a 3' section of 4" U-section molding over the previously installed backup plate (step f) encasing the conduits. Nail 4" U-section molding to pole every 18" using lag screws and washers, (items 8 and 9 from bill of materials).
- h) Install a 10' section of 3" backup plate behind primary conductors and mate to previously installed backup plate. Temporarily push conductors to one side of the riser quadrant to prevent damage to conductors. Use 6d galvanized nails to attach backup plate to pole starting and ending at each end.
- i) Install a 10' section of 3" U-section molding schedule 80, over previously installed backup plate (step h) encasing primary conductors. To permit thermal expansion, do not drive lag screws tight and leave approximately 1/4" gap between the 3" and 4" U-section moldings. Secure U-section molding to pole every 18" with lag screw and washers (item 8 and 9 from bill of materials).
- j) Install reducer boot over 3" and 4" U-section molding using 6d galvanized nails. Make sure reducer boot fits snugly over each section.
- k) When the contractor provides trench, the area around the riser bend at base of pole must be backfilled and compacted to 90% and a distance equal to the depth of the trench by the crew to prevent damage to conductors.
- l) Install remaining backup plate from termination point in (step h) to elevation of pole where U-section molding will terminate. Refer to Overhead Standards page 1406 for elevation of U-section molding termination. Nail backup plate to pole with 6d galvanized nails every 18".
- m) Install lag screw (item 7 from bill of materials) 2" beyond termination of U-section molding for cable grip support.
- n) Remove each conductor coil from pole step, and remove binding tape. Uncoil each conductor carefully to prevent bending conductor.
- o) Install one cable grip approximately 2' from the end of each conductor, (item 11 from bill of materials). Hoist each conductor and hang cable grip on lag screw installed by (step m). Adjust cable grips to determine optimum support positions, tie cables temporarily to pole and slide cable grip below final position. Tape over concentric neutral at final position where grip will seat with half lapped layers of glass tape (720256) and vinyl plastic (720580) over glass tape to assure positive grip. Position cable grip over taped area and attach cable grip to lag screw installed in (step m).
- p) Install required amount of 3" U-section schedule 30 sections needed to cover backup plate and encase conductors to the termination point of the riser installation. Install belled end of U-section molding over a plain end of previously installed U-section molding. Line up edge of belled end with scribe mark 1" from plain end to ensure that sufficient spacing is provided between U-sections for thermal expansion. Nail U-section molding to pole with lag screws and washers (item 8 and 9 from bill of materials) every 36". Lag screws should be snug but not tight, this is also to allow thermal expansion of U-section. Additional lag screws may be needed at 18" intervals if U-section molding separates more than 1/16" away from pole.

FOR FIELD MAINTENANCE ONLY

MAINTENANCE REQUIREMENTS

Inspection

The U-section molding installation shall be inspected periodically for the following:

Warpage of U-Section Exposing Conductors

For Separation of U-Section Molding From Pole More than 1/16"

Cracks or Damage in U-Sections Which Expose Conductors

FOR FIELD MAINTENANCE ONLY

~~OH 1499.008~~
UG 4299.008
SUPERCEDES 4203.7
(12-23-

SDG&E ELECTRIC STANDARDS

3Ø CABLE POLE RISER INSTALLATION
CABLE-IN-CONDUIT

DATE 1-1-87
APPD *JLB RDT*

OH363 UG4205 FIELD MAINTENANCE ONLY

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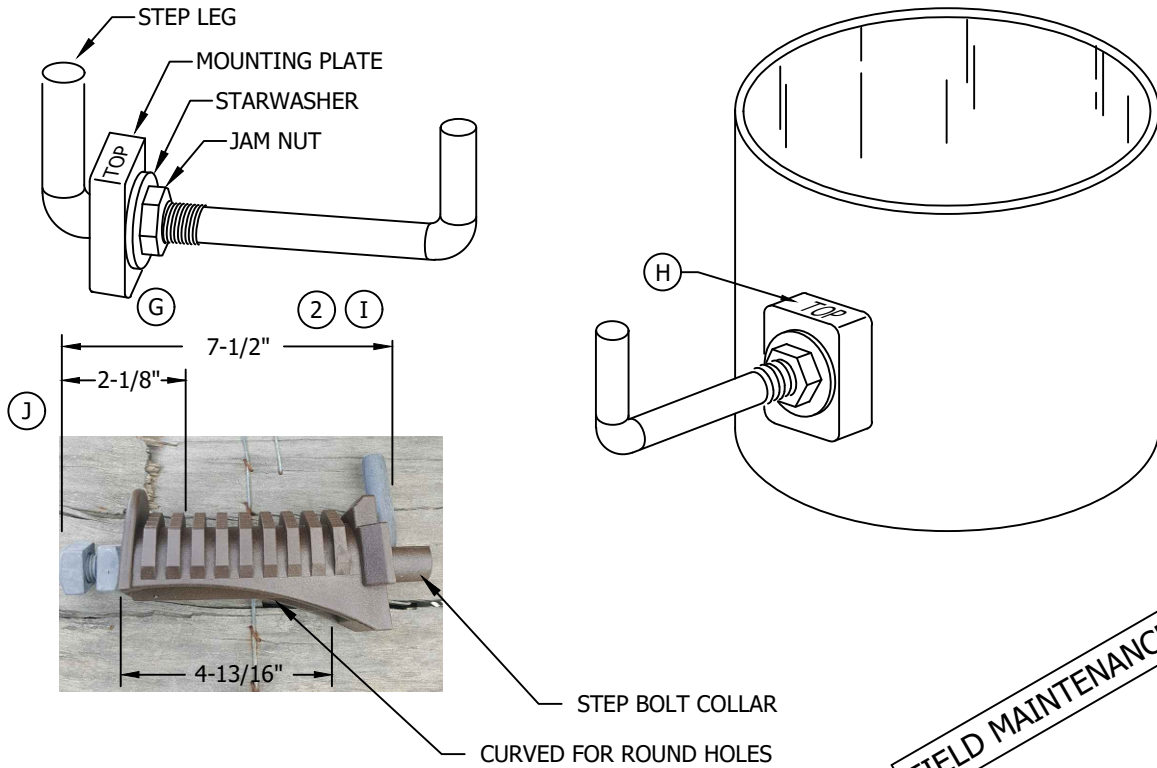
REVISION HISTORY:

07/1/2020: MOVED TO FMO

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| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | INSTALLATION OF PERMANENT POLE STEPS | | | | |



BILL OF MATERIALS:

| ITEM | DESCRIPTION | STOCK NUMBER | A.U |
|------|---|--------------|--------|
| 1 | STEP, POLE, DRIVING TYPE (WOOD) | S692992 | STEP |
| 2 | STEP, POLE, BOLTED (STEEL OR FIBERGLASS) | S692300 | STEP-S |
| 3 | STEP, POLE, COMPOSITE, BROWN, (STEEL OR FIBERGLASS) | S692990 | STEP-C |

INSTALLATION: (Cont'd)

- (H) ENSURE THAT STEP MOUNTING PLATE IS POSITIONED WITH THE SIDE STAMPED "TOP" FACING UP.
- (I) INSTALL STEP BY INSERTING LEG OF STEP INTO POLE STEP HOLE. SLIDE MOUNTING PLATE OVER SQUARE KEY AT BASE OF STEP UNTIL FLUSH AGAINST POLE. SLIDE STAR WASHER OVER STEP THREADS AND FLUSH AGAINST MOUNTING PLATE. RUN JAM NUT DOWN OVER THREADS BY HAND UNTIL FLUSH AGAINST STAR WASHER AND HAND TIGHTEN. USING WRENCH, SNUG JAM NUT AN ADDITIONAL 1/4 TURN ONLY.
- (J) INSTALL COMPOSITE STEP BY REMOVING THE OUTER NUT AND SPIN THE INNER NUT OUT TO THE END OF THE THREADED BOLT. INSERT THE LEG OF STEP INTO THE POLE STEP HOLE. DO NOT BREAK OFF THE STEP BOLT COLLAR. SPIN THE INNER NUT AGAINST THE STEP AND HAND TIGHTEN. USING WRENCH, SNUG JAM NUT AN ADDITIONAL 1/4 TURN ONLY.

NOTE:

II. POLE STEP MOUNTING HOLE DIAMETER 13/16 INCHES TO 1-1/8 INCHES.

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| B | EDITORIAL CHANGES | - | JS | IL | MDJ | 6/23/2016 | E | MOVED TO FMO | EDM | JAC | GLW | CZH | 7/1/2020 |
| A | UPDATED INSTALLATION NOTES | - | JC | - | - | 12/16/2014 | D | NOTES UPDATE | - | JC | JS | MDJ | 1/17/2018 |

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| | <p>SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS</p> | | | | |
| | <p>INSTALLATION OF PERMANENT POLE STEPS</p> | | | | |

FIELD MAINTENANCE ONLY

REVISION HISTORY:

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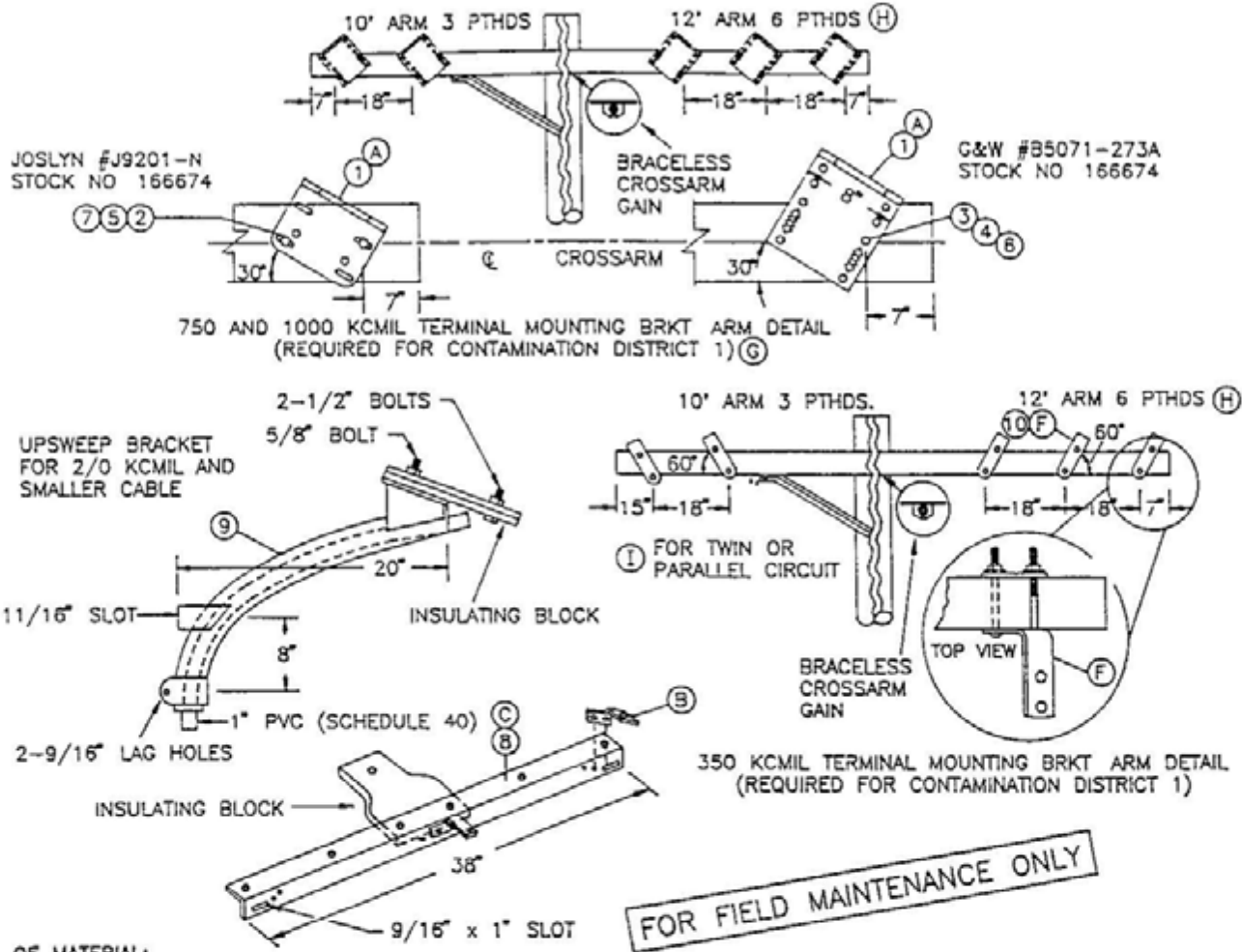
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**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD
CABLE POLE TERMINAL MOUNTING INFORMATION
(PORCELAIN TERMINATIONS)
(FOR CONTAMINATION DISTRICT 1)

**FMO
UG 4207**

SCOPE. THIS STANDARD SHOWS VARIOUS METHODS OF CABLE TERMINATION BRACKETS USED TO CONNECT UNDERGROUND CABLES TO OVERHEAD CONDUCTORS.



BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | STOCK NO OR CONSTR STD | ASSEMBLY UNITS |
|------|--------------------------------|----------|------------------------|----------------|
| 1 | BRACKET, POTHEAD MOUNTING | 3 OR 6 | 166674 | P-X-BK |
| 2 | BOLT, MACHINE, GALV 1/2" x 5" | (E) 2 | 153024 | - |
| 3 | BOLT, MACHINE, GALV. 3/8" x 5" | (E) 2 | 154368 | - |
| 4 | WASHER, 3/8" ROUND | (E) 4 | 800288 | - |
| 5 | WASHER, 1/2" ROUND | (E) 4 | 800192 | - |
| 6 | WASHER, 3/8" DBL COIL | (E) 2 | 798528 | - |
| 7 | WASHER, 1/2" DBL COIL | (E) 2 | 798464 | - |
| 8 | BRACKET TRIPLE TERMINAL (C) | 1 | 166676 | (OVERHEAD) TTB |
| 9 | BRACKET GALV. TERMINAL UPSWEEP | 1 | 166856 | (OVERHEAD) USB |
| 10 | BRACKET, CROSSARM TERMINAL | 3 OR 6 | 166060 | - |

INSTALLATION:

- (A) HOLES IN ARM FOR POTHEAD MOUNTING BRACKETS ARE DRILLED BY OVERHEAD CREWS.
- (B) THREE OF THESE BRACKETS ARE SUPPLIED WITH THE TRIPLE TERMINAL BRACKET (ITEM 8).
- (C) THIS CONSTRUCTION TO BE USED ONLY FOR CABLE SIZES 2/0 AND BELOW.
- (E) EXEMPT MATERIAL.
- (F) TURN TOP OF BRACKET OUTWARD TO OBTAIN APPROX. 60° ANGLE.

REFERENCE:

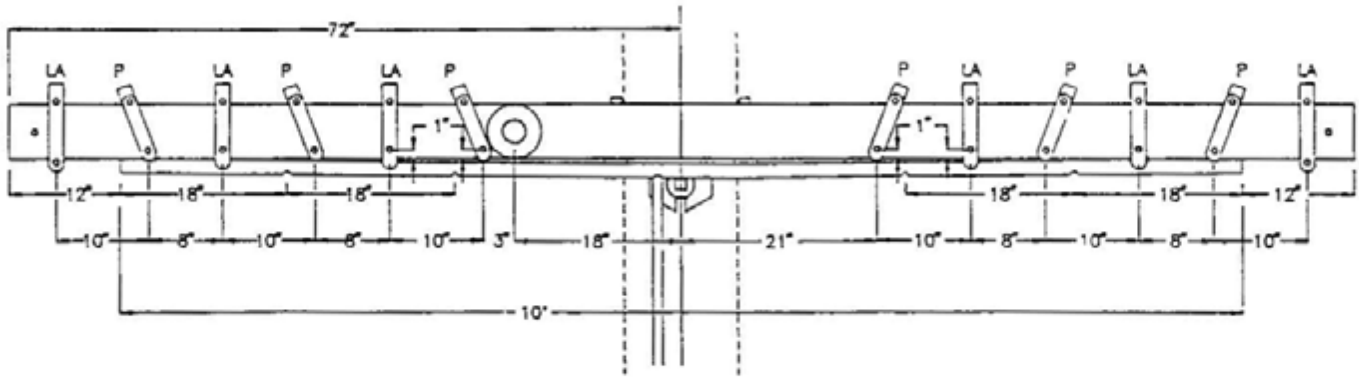
- (G) FOR CONSTRUCTION IN CONTAMINATION DISTRICTS 2 AND 3, SEE STANDARD 1407.2/4207.2.
- (H) SEE STANDARD 1407.2/4207.2 FOR TERMINAL AND LIGHTNING ARRESTER DETAIL.
- (I) SEE STANDARD 1442.1/4242.1 FOR 3-350 KCMIL POTHEADS ON A 10 FOOT CROSSARM

OH 1499.010
UG 4299.010
SUPERCEDES
4207.1 (1-1-93)

SDG&E ELECTRIC STANDARDS
CABLE POLE TERMINAL MOUNTING INFORMATION
(PORCELAIN TERMINATIONS)
(FOR CONTAMINATION DISTRICT 1)

DATE 1-1-93
APPD JLB/AD

12' ARM 6 PTHS AND 6 ARRESTORS



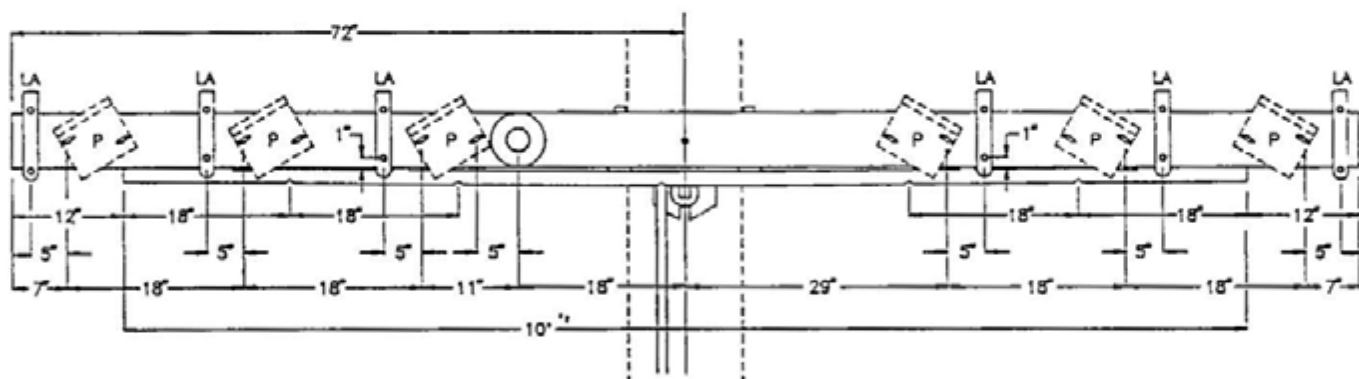
350 KCMIL TERMINAL AND LIGHTNING ARRESTER BRACKETS MOUNTING DETAIL

P=POTHEAD BRACKET

LA=LIGHTNING ARRESTER BRACKET

FOR FIELD MAINTENANCE ONLY

12' ARM 6 PTHS AND 6 ARRESTORS



750 AND 1000 KCMIL TERMINAL AND LIGHTNING ARRESTER BRACKETS MOUNTING DETAIL

SDG&E ELECTRIC STANDARDS

CABLE POLE TERMINAL MOUNTING INFORMATION
(PORCELAIN TERMINATIONS)
(FOR CONTAMINATION DISTRICT 1)

OH 1499.011
UG 4299.011
SUPERCEDES
4207.2 (1-1-93)

DATE 1-1-93

APPD *JLB/RS*

UG4208 **FIELD MAINTENANCE ONLY**

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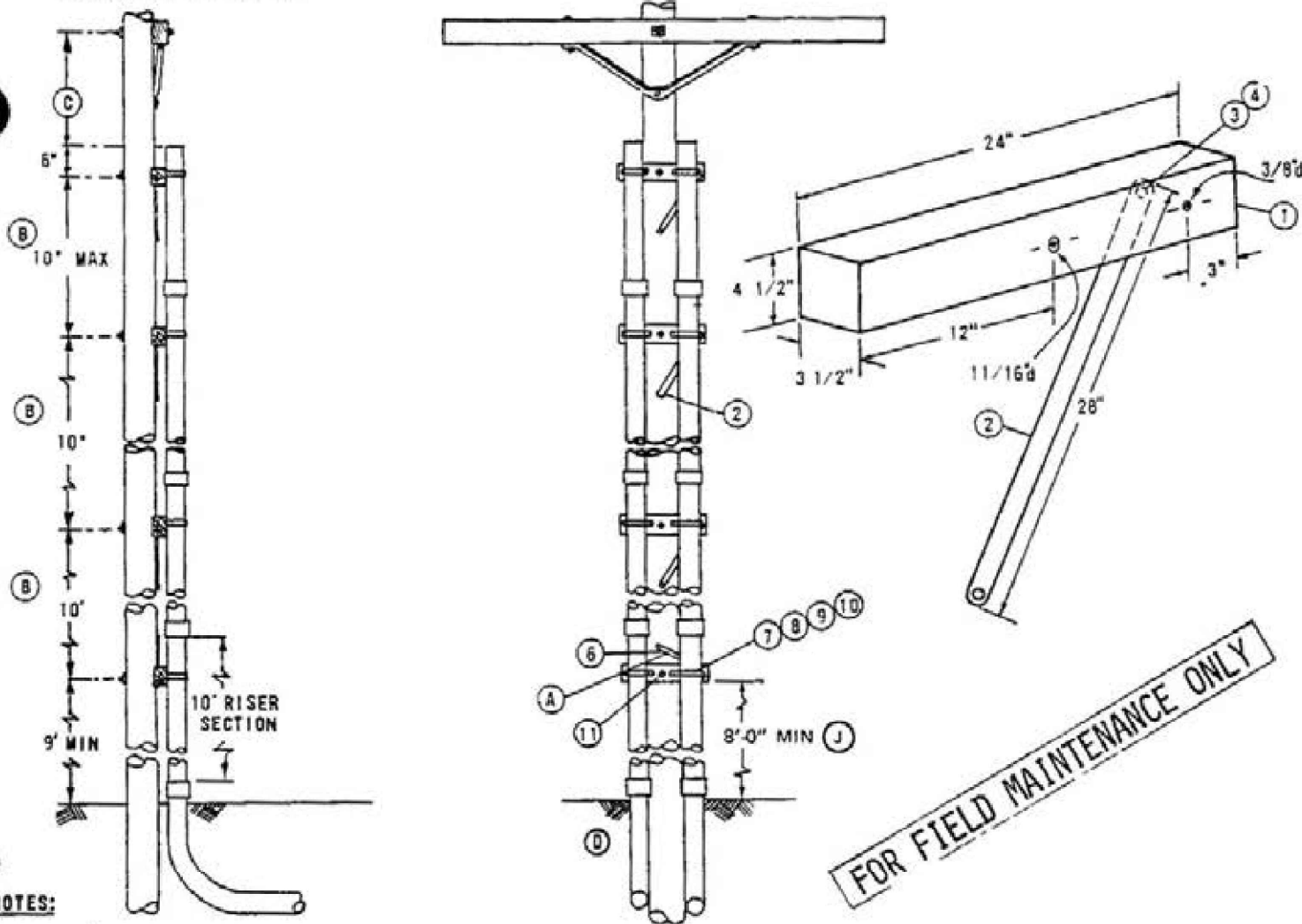
- 07/1/2020:** MOVED FROM FMO UG4205
- 07/13/2016:** MOVED TO FMO

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | INSTALLATION OF PERMANENT POLE STEPS | | | | | |

SCOPE THIS STANDARD SHOWS THE CONSTRUCTION USED WHEN MODIFYING AN EXISTING SINGLE RISER CABLE POLE WHERE A SECOND RISER IS ADDED.



FOR FIELD MAINTENANCE ONLY

NOTES:

- THIS CONSTRUCTION IS RESTRICTED TO A MAXIMUM OF TWO SDG&E RISERS, (PRIMARY OR SECONDARY)
- WHENEVER POSSIBLE RISERS SHOULD BE INSTALLED ON THE SIDE OF THE POLE OPPOSITE TRAFFIC FLOW.
- SPARE DUCT SHALL BE CAPPED JUST ABOVE GROUND LEVEL TO PREVENT MOISTURE ENTRY AND NOT TO BE CONSIDERED AS A RISER

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | STOCK NO OR CONST. STDS. | ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONST. STDS. |
|------|----------------------------------|-----------|--------------------------|------|---|-----------|---------------------------|
| P 1 | CROSSARM 3-1/2" x 4-1/2" x 2'-0" | AS REQ'D. | 380.05 IT.1 | 8 | STRAP PIPE, 2 HOLE, GALV., 4" | AS REQ'D. | 697952 (E) |
| P 2 | BRACE FLAT 28" | AS REQ'D. | 164192 | 9 | STRAP PIPE, 2 HOLE, GALV., 5" | AS REQ'D. | 697984 (E) |
| T 3 | BOLT, WASHER HEAD 3/8" X 4 1/2" | AS REQ'D. | 198528 (E) | 10 | NAILS FLATHEAD STEEL GALV. 16D | AS REQ'D. | 491424 (E) |
| T 4 | WASHER, 3/8" SPRING LOCK | AS REQ'D. | 796832 (E) | T 11 | BOLT, WASH, GALV., 5/8" X (LENGTH AS REQ'D), 2-SQ. WASH 1-08L COIL WASH | AS REQ'D. | PG. 392.1 (E) 392.2 |
| & 5 | | | | & F | | | |
| F 6 | SCREW LAG 1/2" X 4" | AS REQ'D. | 621568 (E) | | | | |
| F 7 | STRAP PIPE, 2 HOLE, GALV., 3" | AS REQ'D. | 697920 (E) | | | | |

INSTALLATION:

- (A) LADDER ARMS TO BE INSTALLED BY U.G. CREWS. MOUNT LOWEST ARM NO LOWER THAN 9 FEET AND INSTALL THE FLAT BRACE ABOVE THE FIRST ARM AS SHOWN.
- (B) INSTALL AT LEAST ONE BRACKET FOR EACH JOINT OF CONDUIT.
- (C) 48 INCHES MINIMUM FOR 350 OR LARGER UG CABLE, 30 INCHES MINIMUM FOR 2/0 AND SMALLER CABLE. THIS DIMENSION APPLIES TO THE TRIPLE TERMINATOR BRACKET AS WELL AS CROSSARMS.
- (D) EXCAVATION MIGHT BE REQUIRED AROUND EXISTING RISER TO FACILITATE THE INSTALLATION OF LADDER ARMS.
- (E) EXEMPT MATERIAL.

REFERENCE:

- F. SEE PAGE 1402.1/4202 FOR POSITION OF RISERS INVOLVING MORE THAN ONE UTILITY.
- G. POLES ARE TO BE STEPPED PER STANDARD 353.
- H. SEE PAGE 1404.1 FOR INSTALLATION OF ONE CABLE RISER.
- I. PVC RISERS ARE NOT PERMITTED WITHIN THE CLIMBING SPACE PER G.O. 95 RULE-22.2C.
- (J) RISERS OF PLASTIC PIPE SHALL BE EPC-80-PVC SCHEDULE 80, WITH A MINIMUM NORMAL PIPE SIZE OF 2-1/2 INCHES, FROM THE GROUND LINE TO A LEVEL NOT LESS THAN 8 FEET ABOVE THE GROUND LINE PER G.O. 95 RULE 54-6-E.

SDG&E ELECTRIC STANDARDS
**30 CABLE POLE RISER INSTALLATION
 MODIFICATION FROM SINGLE TO DOUBLE RISER
 FOR EXISTING CABLE POLES**

DATE 1-1-87
 APPD *[Signature]*

OH 1499.009
 UG 4299.009
 SUPERCEDES 4205.1
 (6-14-83)


FIELD MAINTENANCE ONLY

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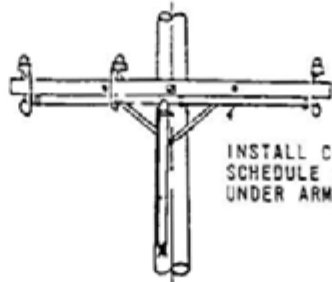
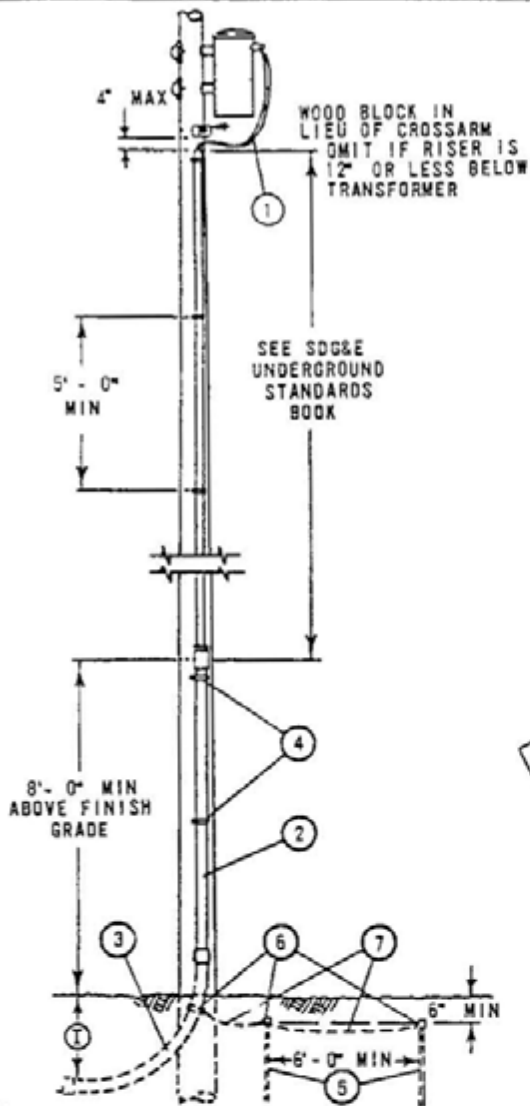
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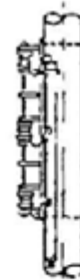
SDG&E ELECTRIC UNDERGROUND STANDARD

0-750V CUSTOMER OWNED UNDERGROUND SERVICE
FROM AN OVERHEAD LINE, ONE DUCT

**FMO
UG 4215**



CROSSARM CONSTRUCTION



RACK CONSTRUCTION

FOR FIELD MAINTENANCE ONLY

NOTES:

- (A) SEE PAGE 1404 /4204 FOR RISER CONSTRUCTION.
- (B) CUSTOMER'S SERVICE ENTRANCE CONDUCTORS SHALL RUN CONTINUOUSLY WITHOUT SPLICES FROM SERVICE EQUIPMENT TO SECONDARY OR TRANSFORMER TERMINALS AND SHALL BE OF A LENGTH SUFFICIENT TO FORM DRIP LOOPS AT THE TOP OF THE RISER CONTRACTOR SHALL IDENTIFY SERVICE ENTRANCE CONDUCTORS WITH CODING OR TAGGING FOR PURPOSE OF PARALLELING PHASES AND NEUTRALS. MAXIMUM SIZE OF EACH CONDUCTOR, SINGLE OR PARALLELED RUNS, SHALL NOT EXCEED 500 KCM.
- (C) WHEN ITEMS 2 AND 3 ARE SCHEDULE 80 PVC OMIT ITEMS 5, 6, AND 7. (SEE SDG&E UNDERGROUND STANDARDS BOOK)
- (D) OMIT ITEMS 5, 6 AND 7 WHERE CUSTOMER'S UNDERGROUND CONDUIT RUN IS AN APPROVED METALLIC CONDUIT.
- (E) OMIT ITEM 5, AND 7 WHERE #6 BARE COPPER BONDING WIRE IS INSTALLED BETWEEN ITEMS 3 AND CUSTOMER'S SERVICE ENTRANCE EQUIPMENT
- (G) USE TWO ROD GROUND SPACED A MINIMUM OF 6 FEET APART.
- H APPROVED METALLIC CONDUIT OR #6 BARE COPPER BONDING WIRE SHALL BE GROUNDED AT THE SERVICE ENTRANCE IN ACCORDANCE WITH REQUIREMENTS OF THE LOCAL INSPECTION AUTHORITY.
- (I) 18" MIN DEPTH ON PRIVATE AND PUBLIC PROPERTY OTHER THAN STREETS AND ALLEYS. 24" MIN DEPTH ACROSS STREETS AND ALLEYS 24" MIN TO BE MAINTAINED CONTINUOUSLY WHERE DUCTS TRAVERSE BOTH STREETS (AND ALLEYS) AND PRIVATE PROPERTY. 24" MIN DEPTH FOR NON-METALLIC CONDUITS.

MATERIAL FURNISHED AND INSTALLED BY CUSTOMER

| ITEM | DESCRIPTION (A) |
|------|---|
| 1 | CUSTOMER'S SERVICE ENTRANCE CONDUCTORS (B) |
| 2 | CONDUIT GALV IRON RIGID RISER (C) |
| 3 | CONDUIT, GALV IRON BEND, 90°, 36" RADIUS (C) |
| 4 | STRAP, PIPE GALV, 2-100 GALV NAILS |
| 5 | RODS, 5/8" X 8'-0" COPPERCLAD STEEL GROUND (D) (E)(G) |
| 6 | CLAMPS, APPROVED TYPE GROUNDING (D) |
| 7 | WIRE, #6 BARE STRANDED COPPER (D) (F) |

OH 1499.101
UG 4299.101
SUPERCEDES
4215 (10-2-78)

SDG&E ELECTRIC STANDARDS
0-750V CUSTOMER OWNED UNDERGROUND SERVICE
FROM AN OVERHEAD LINE, ONE DUCT

DATE 11-16-81
APPD JEXY

FIELD MAINTENANCE ONLY

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SDG&E ELECTRIC UNDERGROUND STANDARD

0-750 VOLT THREE AND FOUR DUCT RISER SUPPORTS

**FMO
UG 4219**

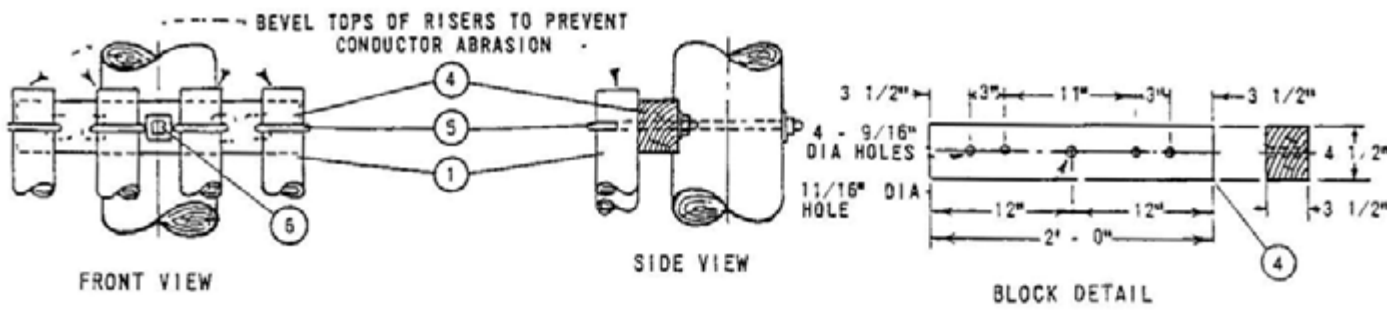


FIGURE 1
PLASTIC PIPE RISER SUPPORT DETAILS

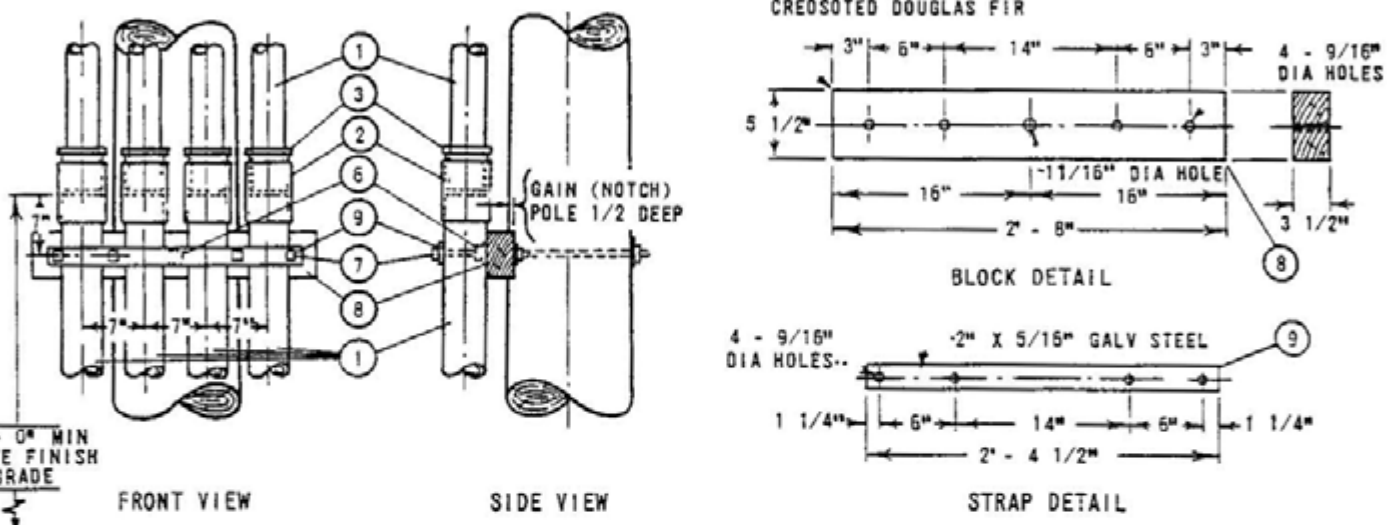


FIGURE 2
GALVANIZED PIPE RISER SUPPORT DETAIL

FOR FIELD MAINTENANCE ONLY

- NOTES:
- A. SEE UNDERGROUND STANDARDS BOOK FOR CABLE, CONDUIT SIZING INFORMATION.
 - (E) EXEMPT MATERIALS.

| ITEM | DESCRIPTION | QUANTITY | | STOCK NO. OR CONSTR STD |
|------|---|------------------|----|------------------------------|
| | | NUMBER OF RISERS | | |
| | | 3" | 4" | |
| 1 | CONDUIT, PVC SIZE AS REQUIRED | AS REQ'D | | 3" - 251552 4" - 251584 |
| 2 | COUPLINGS, PLASTIC SIZE AS REQ'D | AS REQ'D | | 3" - 280448, 4" - 280480 |
| 3 | BUSHINGS, PLASTIC REDUCER 3 1/2" OR 4" X 3" | 3 | 4 | 3 1/2" - 181024, 4" - 573408 |
| 4 | BLOCKS, RISER SUPPORT (SEE FIGURE 1) | 1 | 1 | - |
| 5 | BOLT, 1/2" X 1 SQ WASH | 3 | 4 | PGS 140, 144 |
| 6 | BOLT, MACH 5/8" X 2 - 2" SQ WASH | (E) 1 | 1 | PGS 139, 140 |
| 7 | BOLT MACH 1/2" X 9", 1 RD WASH | (E) 3 | 4 | 153184, 800192 |
| 8 | BLOCK, SPACER (SEE FIGURE 2) | 1 | 1 | - |
| 9 | STRAP, GALV STEEL (SEE FIGURE 2) | 1 | 1 | - |


FIELD MAINTENANCE ONLY

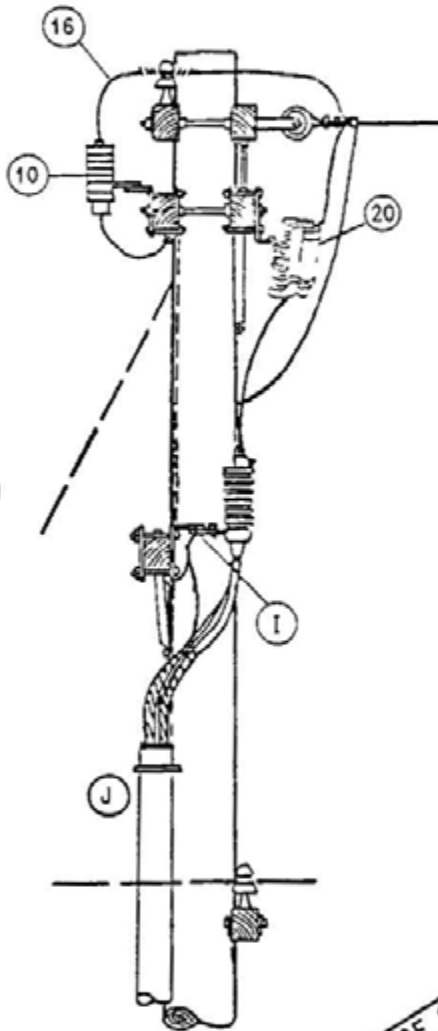
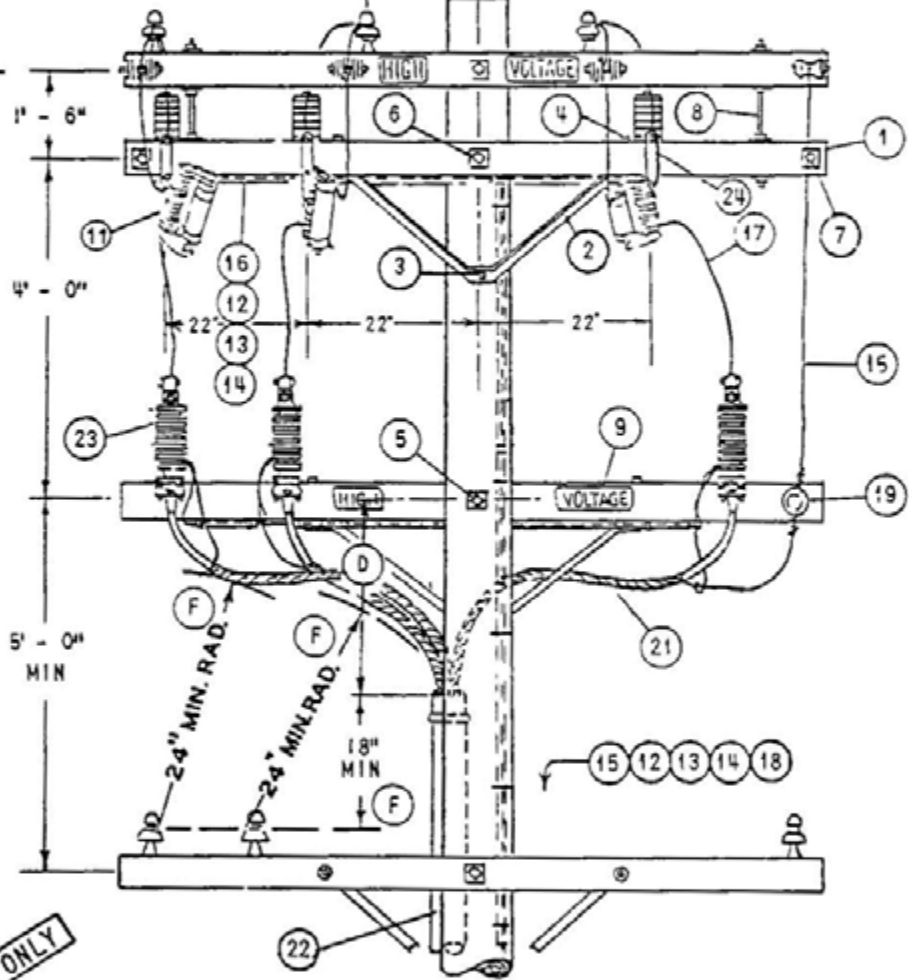
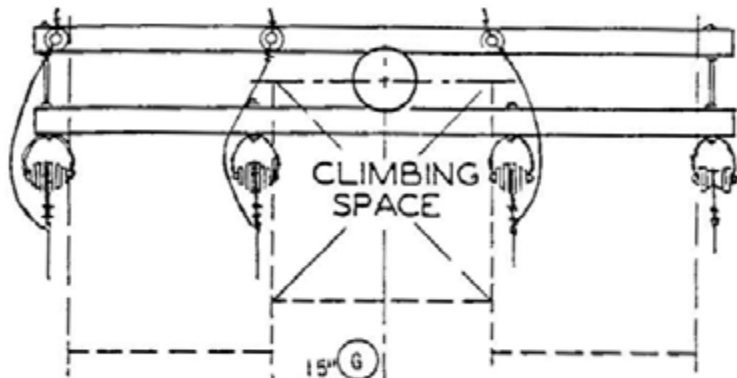
REVISION HISTORY:

7/13/2016: All versions prior to 2016 are superseded by their current version found inside the Overhead Construction Standard Manual.

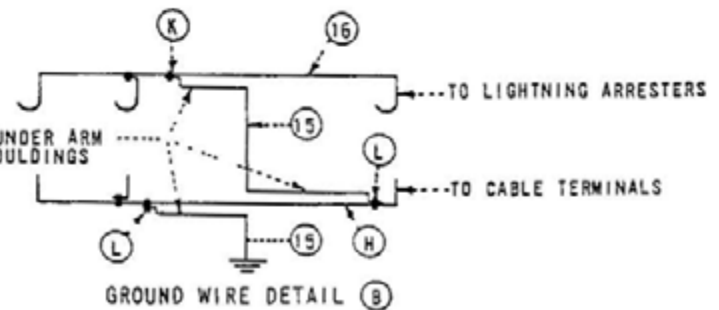
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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
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| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |

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|-------------------------|---|--------------------|----------|---------------------|------------------------|
| SHEET 1 OF 1 |  Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG 4228 |
| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | CROSSARM MOUNTED TERMINALS 4KV 4 WIRE WYE | | | | |



FOR FIELD MAINTENANCE ONLY



SDG&E ELECTRIC STANDARDS

CROSSARM MOUNTED TERMINALS 4KV 4 WIRE WYE

OH 1499.201
 UG 4299.201
 SUPERCEDES
 4228.1 (2-27-80)

DATE 8-27-82
 APPD DRH

NOTES:

- (A) UNIT GROUND COMPLETE ORDER 603120 WITH GRAY MOULDING 603136 WITH PLAIN MOULDING
- (B) INTERCONNECT ARRESTER GROUND LEAD DISCONNECTS WITH #6 BARE COPPER AND GROUND IT WITH #2 BARE COPPER NEAR CENTER ARRESTER.
- (C) USE TWO GROUND RODS SPACED A MINIMUM OF 6' APART
- (D) 3 FOOT MINIMUM DIMENSION 4 FOOT DIMENSION PREFERRED FOR 750 KCM AND LARGER 15KV CABLE
- (E) EXEMPT MATERIAL
- (F) G O 95 MINIMUM DIMENSION
- (G) G O 95 MINIMUM DIMENSION FOR 4KV USE 18" MIN IF BUILT WITH 15KV CABLE
- (H) USE #2 BARE STRANDED COPPER OR LARGER AS REQUIRED
- (I) CONNECT NEUTRAL, TERMINAL AND SHIELDED CABLE GROUNDS TO LIGHTNING ARRESTER GROUND
- (J) INSTALL RISER ON FACE OF POLE OPPOSITE CLIMBING SPACE AND IN A POSITION NEAREST THE END OF ARM ON WHICH THE TWO 4KV PHASES ARE LOCATED.
- (K) CONNECT #2 BARE STRANDED COPPER CONDUCTOR TO #6 BARE STRANDED COPPER CONDUCTOR AT POINT NEAR CENTER LIGHTNING ARRESTER
- (L) CONNECT #2 BARE STRANDED COPPER CONDUCTOR TO REQUIRED CONDUCTOR AT POINT NEAR CENTER TERMINAL AND END TERMINAL

FOR FIELD MAINTENANCE ONLY

| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONSTR STDS |
|---|---|-------------------|--------------------------|
| P T F | 1 CROSSARM 3 3/4" X 5 3/4" X 10' - 0" | 3 | 300 SECTION |
| | 2 BRACE ANGLE CROSSARM 4' - 0" | 2 | 164032 |
| | 3 SCREW LAG GALV. 5/8" X 5" | (E) 2 | 621600 |
| | 4 BOLT WACH GALV 1.2" X 7" 1 RD WASH & 1 DBL COIL WASH | (E) 4 | PGS 139 140 |
| | 5 BOLT WACH GALV 5/8" X 14" 2 - 3" SQ WASH & 1 DBL COIL WASH | (E) 1 | PGS 139 140 |
| | 6 BOLT WACH GALV 5/8" X 20" 2 - 3" SQ WASH. & 1 DBL COIL WASH | (E) 1 | PGS 139 140 |
| | 7 BOLT SPACE GALV. 5/8" X 20" 4 SQ WASH & 4 DBL COIL WASH. | (E) 2 | PGS 139 140 |
| | 8 BOLT SPACE GALV. 5/8" X 28" 4 SQ WASH. & 4 DBL COIL WASH. | (E) 2 | PGS 139 140 |
| | 9 SIGN HIGH VOLTAGE & 8 ROOFING NAILS | (E) 1 | 647648 492224 |
| | 10 ARRESTER LIGHTNING 3KV | 3 | 113216 |
| 11 CUTOUT FOR CURRENT-LIMITING FUSE | 3 | 1200 SECTION | |
| 12 STAPLES, FENCE GALV. 1 1/4" | (A) (E) 25 | 678528 | |
| 13 MOULDING, HARDWOOD 1" | (A) 55' | 487200 | |
| 14 STAPLES, MOULDING GALV. 3" X 1 1/16" X 1/4" | (A) (E) 25 | 678560 | |
| 15 WIRE #2 BARE STRANDED COPPER | (B) 44' | 813664 | |
| 16 WIRE #6 BARE STRANDED COPPER | (B) 18' | 813536 | |
| 17 WIRE COPPER SIZED PER U G CABLE AMPACITY | 8' | 81 | |
| 18 ROD & CLAMP GROUND | (A) (C) 2 | 603072, 230016 | |
| 19 INSULATOR, 4KV WIRE HOLDER | 1 | 413792 | |
| 20 FUSE, CURRENT-LIMITING SIZE AS SPECIFIED ON WORK ORDER | 3 | 1200 SECTION | |
| 21 CABLE, POLYETHYLENE CONCENTRIC NEUTRAL PRIMARY | AS REQ'D | SEE UG STDS | |
| 22 RISER CONSTRUCTION | AS REQ'D | 1400/4200 SECTION | |
| 23 TERMINAL CABLE | 3 | UG BOOK | |
| 24 BRACKET CUTOUT / ARRESTER CROSSARM MOUNTING | (E) 3 | 166070 | |
| 25 | | | |

| | | |
|--|---|---------------------------------|
| OH 1499,202 UG 4299,202 SUPERCEDES 4228,2 (2-27-80) | SDG&E ELECTRIC STANDARDS CROSSARM MOUNTED TERMINALS 4KV 4 WIRE WYE | DATE 8-27-82 APPD <i>DRJ</i> |
|--|---|---------------------------------|


FIELD MAINTENANCE ONLY

REVISION HISTORY:

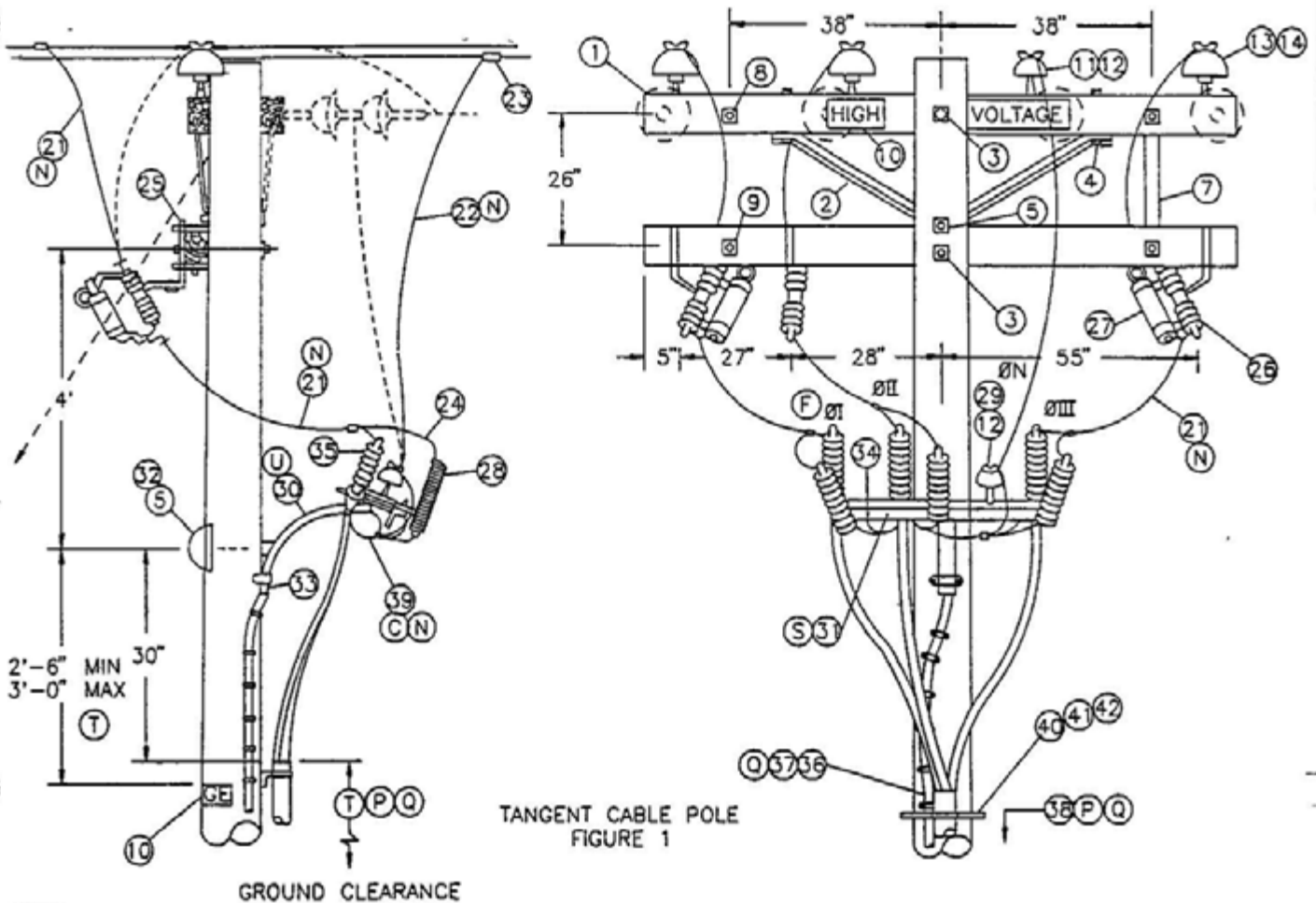
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| C | | | | | | F | | | | | |
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| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |

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|-------------------------|---|--------------------|----------|---------------------|------------------------|
| SHEET 1 OF 1 |  Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG 4229 |
| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | 12.47KV AND BELOW 3Ø CABLE POLE 1/C PER Ø, UPSWEEP BRACKET CONSTRUCTION | | | | |

SCOPE THIS STANDARD SHOWS TANGENT LINE (FIG 1) AND DEAD-END CONSTRUCTION (FIG 2) FOR 12.47 KV AND BELOW. 3Ø CABLE POLE WITH UPSWEEP BRACKET MOUNTED TERMINALS FOR #2/0 AND SMALLER UG CABLE

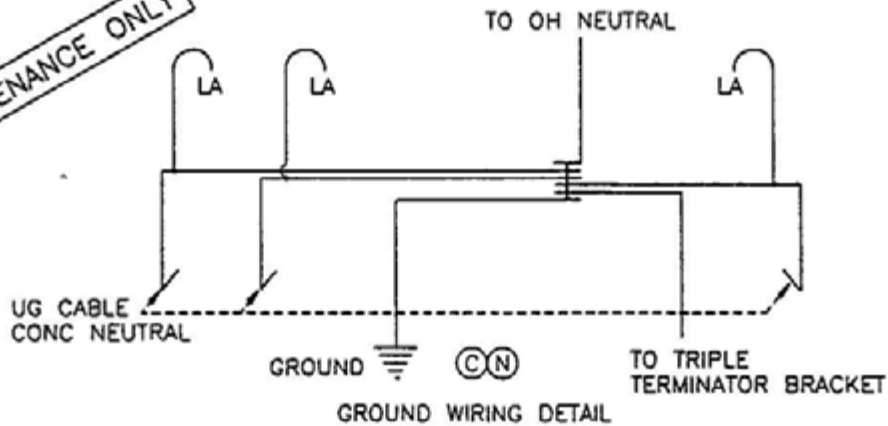


TANGENT CABLE POLE
FIGURE 1

NOTE

- TANGENT CABLE POLE (FIG 1) OR DEAD-END CABLE POLE (DOTTED LINE) IS TO BE USED WHEN FURTHER LINE EXTENSION IS EXPECTED
- DO NOT USE THIS UPSWEEP BRACKET CONSTRUCTION FOR 4KV, 3Ø CABLE POLE. INSTEAD, USE STANDARD 1439/4239

FOR FIELD MAINTENANCE ONLY

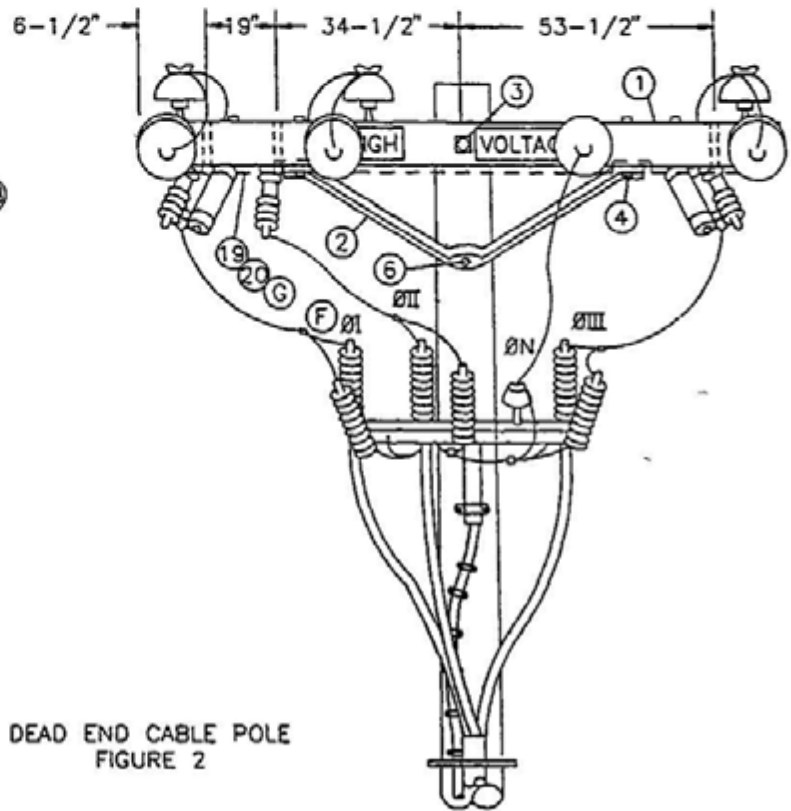
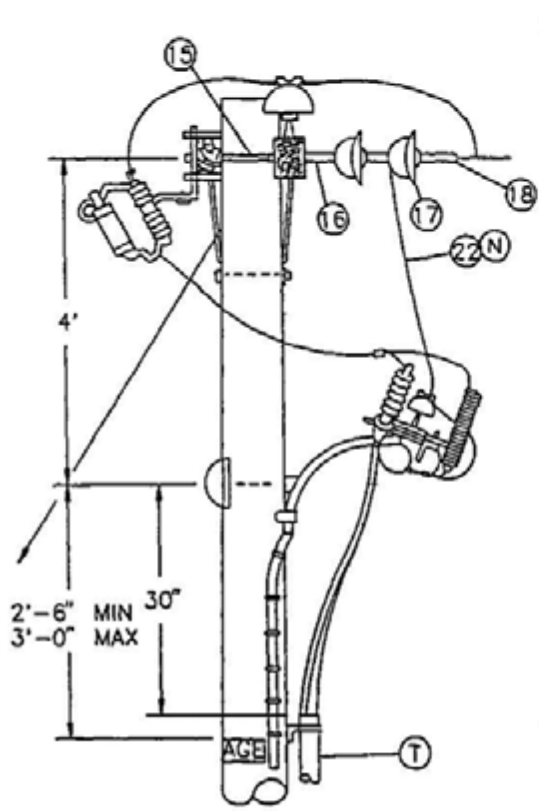


SDG&E ELECTRIC STANDARDS

DATE 1-1-93
APPD *[Signature]*

12.47KV AND BELOW 3Ø CABLE POLE 1/C PER Ø,
UPSWEAP BRACKET CONSTRUCTION

OH 1499.203
UG 4299.203
SUPERCEDES
4229.1 (1-1-93)



DEAD END CABLE POLE
FIGURE 2

NOTE

- DEAD END CABLE POLE (FIG.2) IS TO BE USED ONLY WHEN NO FURTHER LINE EXTENSION OR NO RECONDUCTORING IS EXPECTED.

FOR FIELD MAINTENANCE ONLY

ØH 1499.204
UG 4299.204
SUPERCEDES
4229.2 (1-1-93)

SDG&E ELECTRIC STANDARDS

12.47KV AND BELOW 3Ø CABLE POLE 1/C PER Ø
UPSWEPT BRACKET CONSTRUCTION

DATE 1-1-93
APPD *[Signature]*

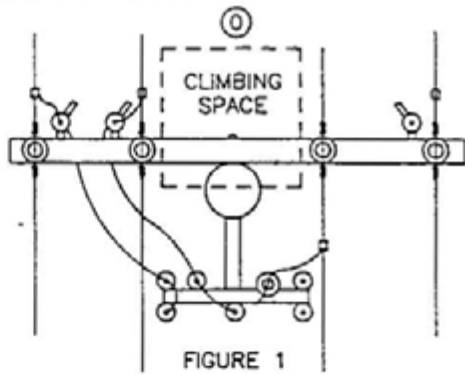


FIGURE 1

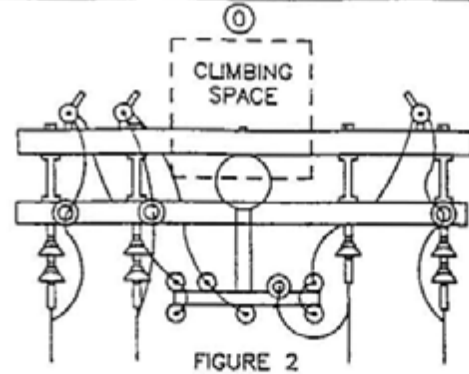


FIGURE 2

CLIMBING SPACE

BILL OF MATERIAL:

FOR FIELD MAINTENANCE ONLY

| ITEM | DESCRIPTION | QUANTITY | | CONST STD OR PAGE NO | STOCK NUMBER |
|------|--|----------|-------|----------------------|--------------|
| | | FIG 1 | FIG.2 | | |
| 1 | CROSSARM, 3-3/4" X 5-3/4" X 10'-0" | 2 | 2 | - | 294128 |
| 2 | BRACE, ANGLE, CROSSARM, 5' | 1 | 2 | - | 164128 |
| 3 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 2 SQUARE & 1 DOUBLE COIL SPRING WASHER (E) | 2 | 1 | 392 | - |
| 4 | BOLT, MACH, GALV, 1/2" X 7", 1 ROUND & 1 DOUBLE COIL SPRING WASHER (E) | 2 | 4 | 392 | - |
| 5 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 SQUARE & 1 DOUBLE COIL SPRING WASHER (E) | 2 | 1 | 392 | - |
| 6 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 DOUBLE COIL SPRING WASHER (E) | - | 1 | 392 | - |
| 7 | BRACE, FLAT, CROSSARM, 25" (E) | 2 | - | - | 164192 |
| 8 | BOLT, MACH, GALV, 3/8" X (LENGTH AS REQ'D), 1 ROUND & 1 SPRING WASHER (E) | 2 | - | 392 | - |
| 9 | BOLT, MACH, GALV, 1/2" X (LENGTH AS REQ'D), 1 ROUND & 1 DOUBLE COIL SPRING WASHER (E) | 2 | - | 392 | - |
| 10 | SIGN, HIGH VOLTAGE AND 9 ROOFING NAILS, GALV (E) | 3 | 3 | - | 647648 |
| | (E) AS REQ'D | | | - | 492224 |
| 11 | PIN, INSULATOR, STRAIGHT, 12KV, 1" LEAD THREAD (D) (E) | 1 | - | - | 532704 |
| 12 | INSULATOR, LINE, 12KV, NEUTRAL (D) (E) | 2 | 1 | - | 429216 |
| 13 | PIN, INSULATOR, STRAIGHT, 12KV, 1" OR 1-3/8" LEAD THREAD (E) | 3 | 3 | - | 532704 |
| | (E) | 3 | 3 | - | 532448 |
| 14 | INSULATOR, LINE, 12KV, 1" OR 1-3/8" PIN (E) | 3 | 3 | 750 | - |
| 15 | BOLT, SPACE, 5/8" X (LENGTH AS REQ'D) 3 SQ, 2 RD, 2 DOUBLE COIL SPRING WASHERS & 1 NUT (D) (E) | - | 4 | 392 | - |
| 16 | CLEVIS, DEAD END, 5/8" BOLT, STEEL (D) (E) | - | 4 | - | 235712 |
| 17 | INSULATOR, SUSPENSION, 12KV, CLEVIS (D) | - | 7 | 750 | - |
| 18 | CLAMP, STRAIGHT LINE, D.E. (D) (E) | - | 4 | 741 | - |
| 19 | WIRE, #8, BARE SOLID ANNEALED COPPER | 10' | 10' | - | 812928 |
| 20 | STAPLES, FENCE, GALV, 1-1/4" (E) | AS REQ'D | | - | 678528 |
| 21 | WIRE, BARE STRANDED COPPER (OH JUMPER) (N) | 21' | 25' | 715-716 | - |
| 22 | WIRE, BARE STRANDED CU OR AL (OH NEUT JUMPER) (N) | 9' | 7' | 711-716 | - |
| 23 | CONNECTOR, WIRE COMPRESSION (SIZE AS REQ'D) (D) (E) | AS REQ'D | | 785-787 | - |

| CABLE SIZE | UG MACRO UNIT PORCELAIN | |
|------------|-------------------------|---------------|
| | W/O LADDER ARMS | W/LADDER ARMS |
| 3C-#2 AL | CP-3#2 | CP3#2L |
| 3C-#2/0 | CP#2/0 | CP2/0L |

SDG&E ELECTRIC STANDARDS

DATE 1-1-93
APPD JLB/RP

12.47KV AND BELOW 3Ø CABLE POLE 1/C PER Ø
UPSWEPT BRACKET CONSTRUCTION

OH 1499.205
UG 4299.205
SUPERCEDES
4229 J (1-1-93)

BILL OF MATERIAL: (CONTINUED)

| ITEM | DESCRIPTION | QUANTITY | | CONSTR. STD OR PAGE NO. | STOCK NUMBER | |
|------|--|----------|--------|-------------------------|--------------|--------|
| | | FIG. 1 | FIG. 2 | | | |
| 24 | WIRE, #6, BARE STRANDED COPPER | 9' | 9' | - | 813536 | |
| 25 | BRACKET, CUTOUT/ARRESTER, FOR CROSSARM MOUNTING (E) | 3 | 3 | - | 166070 | |
| 26 | CUTOUT BODY FOR CURRENT LIMITING FUSE | 3 | 3 | - | 297952 | |
| 27 | FUSE, CURRENT-LIMITING, SIZE AS REQ'D | 3 | 3 | 1206 | - | |
| 28 | ARRESTER, LIGHTNING | 3 | 3 | 1247 | - | |
| 29 | PIN, SHORT SHANK, 1" LEAD THREAD (D) (E) | 1 | 1 | - | 534426 | |
| 30 | BRACKET, GALV, TERMINAL, UPSWEEP | 1 | 1 | - | 166856 | |
| 31 | BRACKET, TRIPLE TERMINATOR (S) | 1 | 1 | - | 166676 | |
| 32 | COVER, BOLT, PLASTIC & 6 - 10D NAILS, GALV | (E) | 1 | 1 | - | 285696 |
| | | (E) | - | - | - | 491392 |
| 33 | SCREW, LAG, GALV, 1/2" X 4" | (E) | 2 | 2 | - | 621568 |
| 34 | BOLT, MACH, GALV, 5/8" X 1 1/2", 1 ROUND AND 1 LOCK WASHER (E) | 1 | 1 | 392 | - | |
| 35 | TERMINALS AND UNDERGROUND CABLE | 3 | 3 | 4111 | - | |
| 36 | WIRE, #4, BARE STRANDED COPPER | 50' | 45' | - | 813760 | |
| 37 | UNIT GROUND, COMPLETE (Q) | 1 | 1 | - | 603136 | |
| 38 | RISER CONSTRUCTION | - | - | 1400/4200 | - | |
| 39 | WIRE, COPPER BARE STRANDED (CABLE POLE NEUTRAL) (N) | 5' | 5' | 715/716 | - | |
| 40 | BRACKET, LADDER ARM (E) | AS REQ'D | | 1404/4204 | 167184 | |
| 41 | NUT, CLAMPING CHANNEL, W/SPRING, 1/2" (E) | AS REQ'D | | 1404/4204 | 503488 | |
| 42 | CHANNEL, DOUBLE GALV, 24" (E) | AS REQ'D | | 1404/4204 | 216700 | |

INSTALLATION:

- A. NEW CABLE POLES SHALL HAVE A STANDARD DEPTH OF 9'. IN MOST CASES THIS WILL REQUIRE A 5' TALLER POLE.
- B. THIS CONSTRUCTION TO BE USED WITH 2/0 AND SMALLER UNDERGROUND CABLE.
- (C) CONNECT OVERHEAD NEUTRAL, TRIPLE TERMINAL BRACKET, AND CONCENTRIC CABLE NEUTRAL CONDUCTOR TO LIGHTNING ARRESTER GROUND.
- (D) REDUCE QUANTITIES AS REQUIRED WHEN NOT USING NEUTRAL.
- (E) EXEMPT MATERIAL.
- (F) OMIT PHASE II AND PHASE N FOR SINGLE PHASE 12KV CABLE POLE; OMIT PHASE I AND PHASE II FOR SINGLE PHASE 6.9 KV CABLE POLE.
- (G) INTERCONNECT CUTOUTS AND DEADEND BONDS PER G.O. 95 RULE 52.7D. BONDING SHOULD BE DONE IN ACCORDANCE WITH RULE 53.4.

| (N) | UG CABLE SIZE AWG OR KCMIL, AL | OH JUMPER COND SIZE, AWG OR KCMIL, CU | OH NEUT JUMPER SIZE | | | CABLE POLE NEUT SIZE (CU) UNDER POTHEAD ARM OR TRIPLE TERM BRKT |
|-----|--------------------------------------|---|---------------------|-------|---|---|
| | | | CU | AL | | |
| | 2 | 4 | 6 | 2 | - | #6 PER PHASE |
| | 2/0 | 4 | 6 | 2 | - | #6 PER PHASE |
| | 350 | 4/0 | 1/0 | 3/0 | - | #2 PER PHASE |
| | 750 | 500 | 4/0 | 336.4 | OR SAME SIZE AS O.H. NEUT CONDUCTOR | 1/0 PER PHASE |
| | 1000 | 500 | 4/0 | 336.4 | | 1/0 PER PHASE |

REFERENCE:

- (O) ALLOWABLE WORKING AND CLIMBING SPACE - SEE STANDARD 251.
- (P) POLE STEPPING - SEE STANDARD 363/4205.
- (Q) GROUNDING METHODS - SEE PAGE 1002.5.
- R. SEE STANDARD SECTION 1200/4300 FOR FUSING.
- S. RISER POSITIONS - SEE STANDARD 1402/4202.
- (T) MINIMUM VERTICAL SEPARATION AS PER G.O. 95 - SEE STANDARD 1406/4206.
- (U) SEE STANDARD 1407/4207 FOR PORCELAIN AND NON-PORCELAIN TERMINAL MOUNTING BRACKET INSTALLATIONS AND MATERIALS.

FOR FIELD MAINTENANCE ONLY

| | | |
|---|---|------------------------------------|
| OH 1499.206 UG 4299.206 SUPERCEDES 4229.4 (1-1-93) | SDG&E ELECTRIC STANDARDS 12.47KV AND BELOW 3 PHASE, CABLE POLE, 1/C PER PHASE, UPSWEEP BRACKET CONSTRUCTION | DATE 1-1-93 APPD <i>JLB/RIS</i> |
|---|---|------------------------------------|

OH1192 UG4230 FIELD MAINTENANCE ONLY

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REVISION HISTORY:

07/27/2021: MOVED TO FMO

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| A | ORIGINAL ISSUE | EDM | JKI | JES | CZH | 07/27/2021 | D | | | | | | |

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| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | VOLTAGE BOOSTING TRANSFORMER STATION CABLE POLE USING NON-PORCELAIN TERMINALS, 12-12.47KV THREE-PHASE INSTALLATION | | | | |

SCOPE: THIS STANDARD SHOWS THE METHOD OF INSTALLING A 12-12.47KV VOLTAGE BOOSTING TRANSFORMER STATION ON A CABLE POLE USING NON-PORCELAIN TERMINALS.

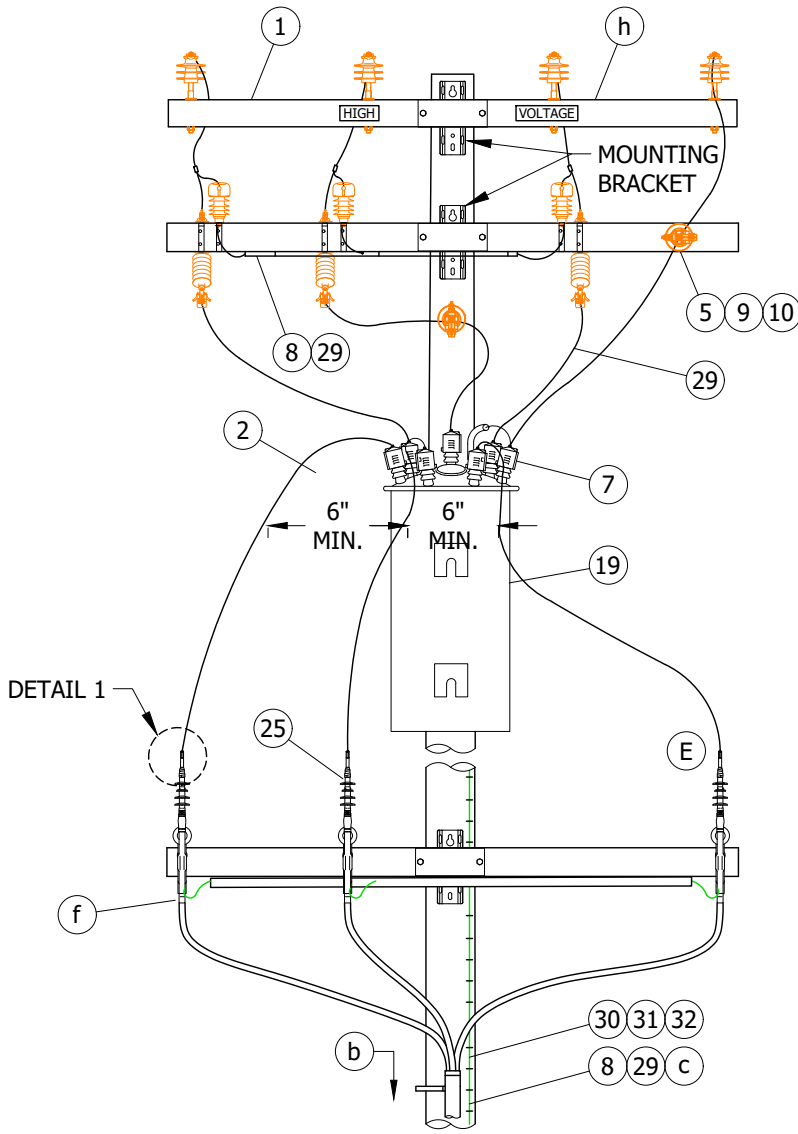


FIGURE 1
FRONT VIEW (C)

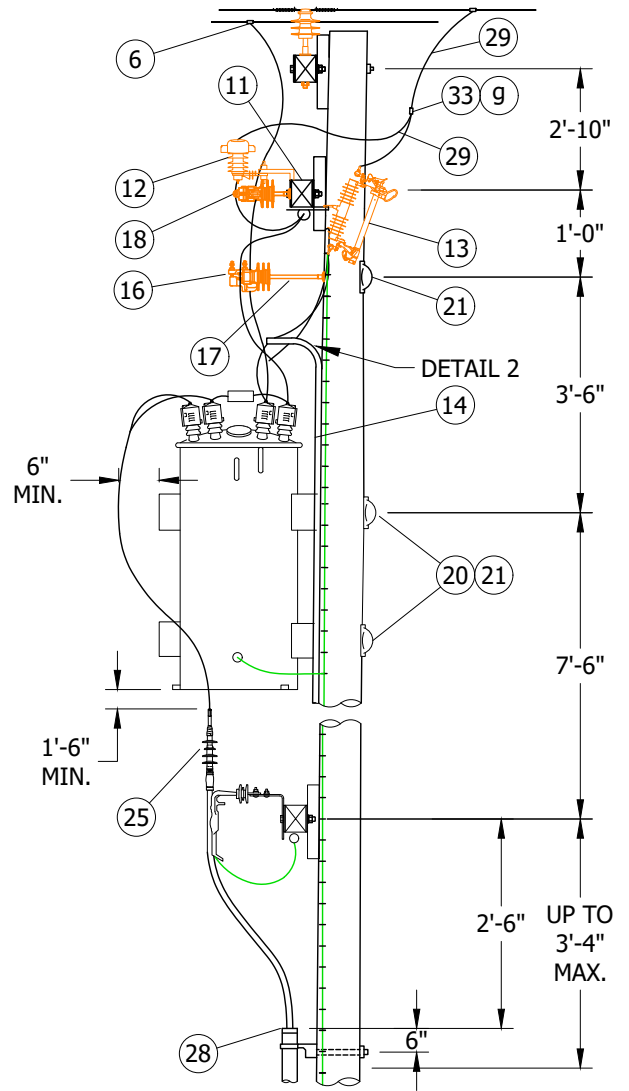


FIGURE 1
SIDE VIEW (C)

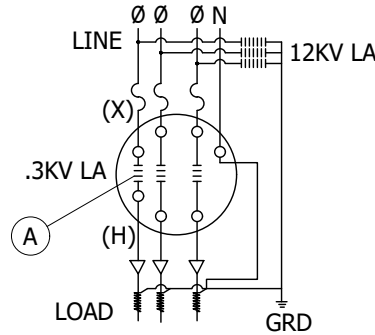


FIGURE 2

FIELD MAINTENANCE ONLY

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| C | MOVED TO FMO | EDM | JIK | JES | CZH | 07/27/2021 | F | | | | | | |
| B | EDITORIAL CHANGES | - | JS | JS | CZH | 10/01/2018 | E | | | | | | |
| A | ORIGINAL ISSUE | - | - | TQ | DW | 07/10/2013 | D | | | | | | |

SHEET
1 OF 4

X Indicates Latest Revision
 Completely Revised New Page Information Removed
 SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS
 VOLTAGE BOOSTING TRANSFORMER STATION CABLE POLE
 USING NON-PORCELAIN TERMINALS,
 12-12.47KV THREE-PHASE INSTALLATION

FMO
OH1192.1
UG4230.1

CAUTION:

* CONTINUITY OF NEUTRAL FROM OVERHEAD THROUGH BOOSTER TO UNDERGROUND SYSTEM MUST BE UNINTERRUPTED WHILE BOOSTER IS IN SERVICE.

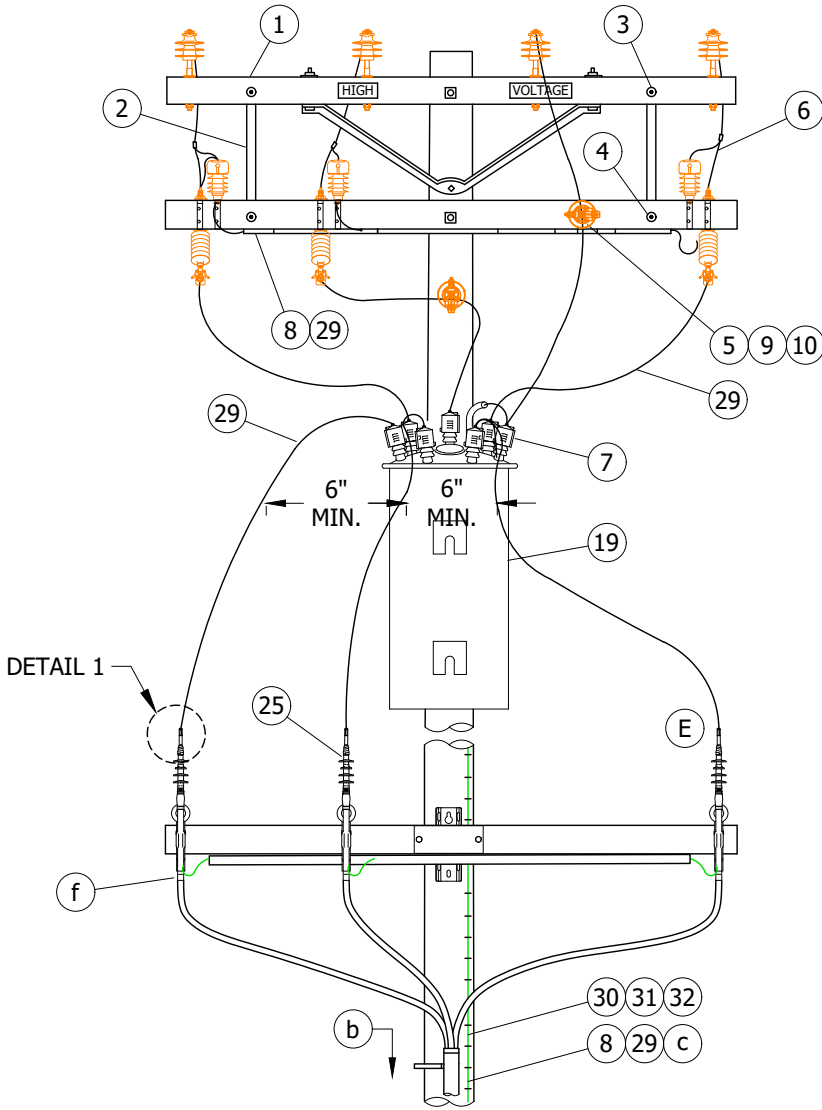


FIGURE 3 (D)
FRONT VIEW

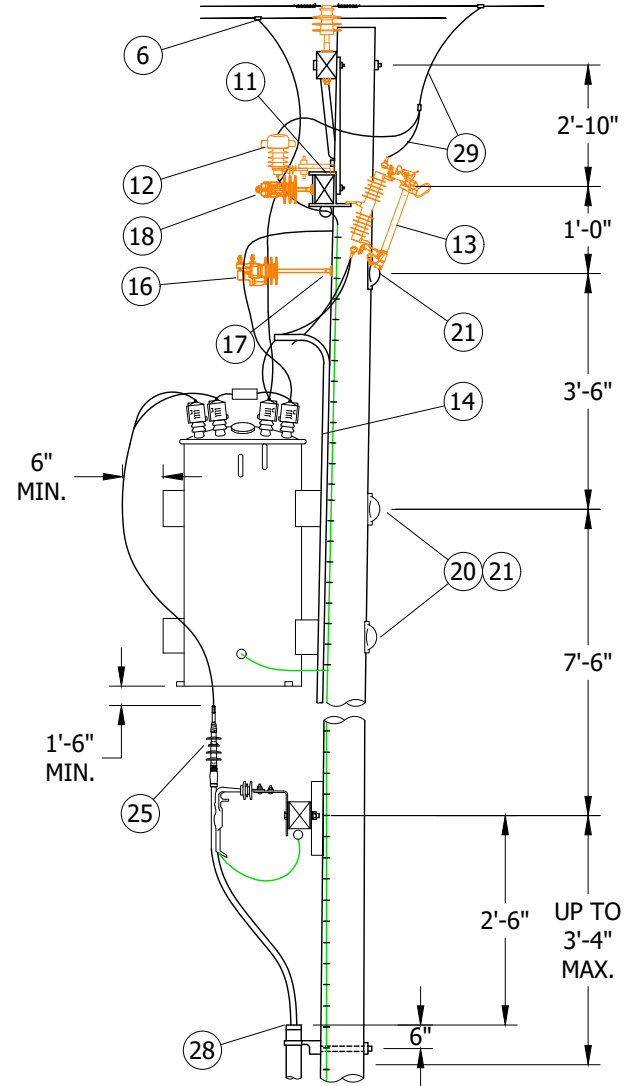
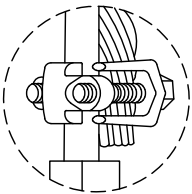


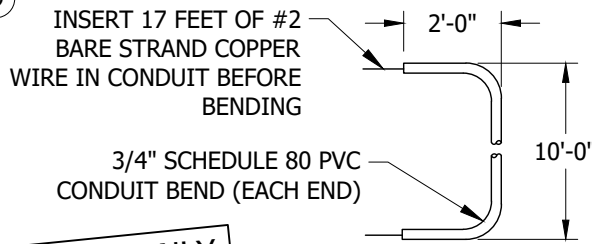
FIGURE 3 (D)
SIDE VIEW

DETAIL 1



DETAIL 1

FIELD MAINTENANCE ONLY



DETAIL 2 (D)
CONDUIT BEND ASSEMBLY

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| B | EDITORIAL CHANGES | - | JS | JS | CZH | 10/01/2018 | E | | | | | | |
| A | ORIGINAL ISSUE | - | - | TQ | DW | 07/10/2013 | D | | | | | | |

SHEET
2 OF 4

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Completely Revised New Page Information Removed

SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

VOLTAGE BOOSTING TRANSFORMER STATION CABLE POLE
USING NON-PORCELAIN TERMINALS,
12-12.47KV THREE-PHASE INSTALLATION

FMO
OH1192.2
UG4230.2

INSTALLATION:

- (A) THE 3KV LIGHTNING ARRESTERS SHOWN ON THE HHT COME AS PART OF THE TRANSFORMER. IF THEY ARE NOT VISIBLE, CHECK THE NAME PLATE TO SEE IF THEY ARE INTERNALLY INSTALLED.
- (B) CONNECT ONE STRAND OF CONCENTRIC NEUTRAL TO TERMINAL MOUNTING BOLT WITH DOUBLE NUT.
- (C) USE FIGURE 1 FOR ALL **NEW** CONSTRUCTION AND WHEN ADDING TO EXISTING CONSTRUCTION WITH NEUTRAL ON OUTSIDE PIN POSITION.
- (D) USE FIGURE 3 ON EXISTING CONSTRUCTION WITH NEUTRAL ON INSIDE PIN POSITION.
- (E) INSTALL TERMINATION PER MANUFACTURERS INSTRUCTIONS.

FIELD MAINTENANCE ONLY

BILL OF MATERIALS:

| ITEM | DESCRIPTION | QUANTITY | STANDARD PAGE | STOCK NUMBER | DESIGN UNITS |
|------|---|----------|---------------|--------------|--------------|
| 1 | CROSSARM, 3 3/4" X 5 3/4" X 10'-0" | 1 | - | S294128 | - |
| 2 | BRACE, FLAT, GALV., 3'-0" | 2 | - | S164224 | - |
| 3 | BOLT, MACH., GALV., 3/8" X 5", 1 ROUND & 1 SPRING WASHER | 2 | 390 | - | - |
| 4 | BOLT, MACH., GALV., 1/2" X 5", 1 RD & 1 DBL COIL SPRING WASHER | 2 | 390 | - | - |
| 5 | BOLT, MACH, GALV., 5/8" X (LENGTH AS REQ'D), 2 SQUARE & 1 DOUBLE COIL SPRING WASHER | 2 | 390 | - | - |
| 6 | CONNECTOR, WIRE, COMPRESSION, CU OR AL, (SIZE AS REQ'D) | AS REQ'D | 784-785 | - | - |
| 7 | BUSHING COVER, TRANSFORMER | 7 | - | S289188 (X) | - |
| 8 | GALVANIZED STAPLES FOR PVC COVERED GROUND WIRE | AS REQ'D | - | S678564 (X) | - |
| 9 | PIN, TRANSFORMER LEAD ADAPTER, 1" | 1 | - | S529248 | - |
| 10 | INSULATOR, 12KV, NEUTRAL | 1 | - | S429216 | - |
| 11 | BRACKET, CUTOUT/ARRESTER, CROSSARM MOUNTING | 6 | - | S166070 | 1 |
| 12 | ARRESTER, LIGHTNING, 12KV W/ 48 #6 COVERED LEAD WIRE | 3 | - | S113256 | LA12 |
| 13 | CUTOUT, 12KV, WITH LOADBUSTER HOOKS, ALUMIFORM | 3 | - | S298020 | - |
| 14 | CONDUIT, PVC, SCHEDULE 80, 3/4" | 24 | - | S251520 | - |
| 15 | STRAPS, PIPE, GALV., 3/4" & 2 - 6D NAILS, GALV. (I) | AS REQ'D | - | S697888 | - |
| | | - | - | S491552 | - |
| 16 | INSULATOR, 12KV (CLASS AS REQ'D) | 1 | 750 | - | - |
| 17 | BRACKET, INSULATOR, 1" OR 1 3/8" LEAD THREAD | 1 | - | S166176 | - |
| | | 1 | - | S166176 | - |
| 18 | FLEXIBLE ARRESTER GROUND STRAP | AS REQ'D | - | S698754 | - |
| 19 | AUTOTRANSFORMER, TYPE 'HHT', 3-PHASE, 12-12.47KV, (COMPLETE WITH 3 - 3KV LIGHTNING ARRESTERS) | 1 | - | - | - |
| | | 1 | 1121 | - | - |
| 20 | BOLT, MACH, GALV., 3/4" X (LENGTH AS REQ'D), 1 SQUARE CURVED RIBBED & 1 DOUBLE COIL SPRING WASHER | - | - | - | - |
| | | 2 | 390 | - | - |
| 21 | COVER, BOLT, PLASTIC & 6-10D NAILS, GALV. | 4 | - | S285696 | - |
| | | - | - | S491456 | - |
| 22 | BOLT, MACH, GALV., 5/8" X (LENGTH AS REQ'D); 1 SQUARE CURVED RIB & 1 DBL COIL SPRING WASHER | - | - | - | - |
| | | 1 | 390 | - | - |
| 23 | BRACKET, POTHEAD UPSWEEP WITH PVC LINER | 1 | - | S166856 | - |
| 24 | XARM, LENGTH AS REQ'D | 1 | - | - | - |
| 25 | TERMINALS, UNDERGROUND CABLE | 1 | 4111 | - | - |

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| REV | CHANGE | DR | BY | DSN | APV | DATE | REV | CHANGE | DR | BY | DSN | APV | DATE |
|-----|-------------------|-----|-----|-----|-----|------------|-----|--------|----|----|-----|-----|------|
| C | MOVED TO FMO | EDM | JIK | JES | CZH | 07/27/2021 | F | | | | | | |
| B | EDITORIAL CHANGES | - | JS | JS | CZH | 10/01/2018 | E | | | | | | |
| A | ORIGINAL ISSUE | - | - | TQ | DW | 07/10/2013 | D | | | | | | |

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|-------------------------|--|---------------------------|--------------------|----------|---------------------|--------------------------------------|
| SHEET 3 OF 4 | X | Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO OH1192.3 UG4230.3 |
| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | VOLTAGE BOOSTING TRANSFORMER STATION CABLE POLE USING NON-PORCELAIN TERMINALS, 12-12.47KV THREE-PHASE INSTALLATION | | | | | |

BILL OF MATERIALS (CONT'D):

| ITEM | DESCRIPTION | QUANTITY | STANDARD PAGE | STOCK NUMBER | DESIGN UNITS |
|------|--|------------|---------------|--------------|--------------|
| 26 | SCREW, LAG, GALV., 5/8" X 5" | 3 | - | S621602 (X) | - |
| 27 | CONDUIT, PLASTIC, PVC, 2" | 2 | - | S251296 | - |
| 28 | CABLE RISER PROTECTION | 1'-0" | 1404/4204 | - | - |
| 29 | GROUNDING, #4 PVC GROUND WIRE, RODS & CONNECTORS | STEEL POLE | 1002 | - | GNDPSP |
| | | WOOD POLE | | - | GNDPVC |
| 30 | BRACKET, LADDER ARM | AS REQ'D | - | S167186 | - |
| 31 | NUT, CLAMPING CHANNEL, W/SPRING, 1/2" | AS REQ'D | - | S503488 (X) | - |
| 32 | CHANNEL, DOUBLE GALV., 2'-0" | AS REQ'D | - | S216702 | - |
| 33 | CLAMP, HOT LINE | 3 | - | S227680 | - |

TABLE 1

| CABLE SIZE | UG MACRO UNITS | | | |
|------------|------------------|---------------|---------------------|---------------|
| | WITH LADDER ARMS | | WITHOUT LADDER ARMS | |
| | PORCELAIN | NON-PORCELAIN | PORCELAIN | NON-PORCELAIN |
| 3C #2/0 AL | CP2/0L | NP2/0L | CP#2/0 | NP-2/0 |
| 3C-3-#2 AL | CP3#2L | NP3#2L | CP-3#2 | NP-3#2 |

NOTES:

- (I) NOT SHOWN ON FIGURES.
- (X) THIS ITEM IS EXEMPT.

REFERENCE:

- a. BOND ALL CUTOUTS IN HEAVY CONTAMINATION DISTRICTS AS IDENTIFIED ON OH287.
- (b) SEE OH363UG4205 FOR POLE STEPPING.
- (c) SEE OH1002 FOR GROUNDING METHODS.
- d. SEE OH1200UG4300 FOR FUSING.
- e. SEE OH1247 FOR LIGHTNING ARRESTER REQUIREMENTS.
- (f) SEE UG4207 FOR NON-PORCELAIN TERMINAL MOUNTING BRACKET INSTRUCTIONS AND MATERIALS.
- (g) SEE OH788 FOR HOT LINE CLAMP CONNECTION.
- (h) SEE OH379 FOR FIBERGLASS CROSSARMS.

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| C | MOVED TO FMO | EDM | JK | JES | CZH | 07/27/2021 | F | | | | | | |
| B | EDITORIAL CHANGES | - | JS | JS | CZH | 10/01/2018 | E | | | | | | |
| A | ORIGINAL ISSUE | - | - | TQ | DW | 07/10/2013 | D | | | | | | |

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| SHEET 4 OF 4 | X | Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO OH1192.4 UG4230.4 |
| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | VOLTAGE BOOSTING TRANSFORMER STATION CABLE POLE USING NON-PORCELAIN TERMINALS, 12-12.47KV THREE-PHASE INSTALLATION | | | | | |

OH 1432 FIELD MAINTENANCE ONLY

All versions listed in FMO are superseded by their current version found inside the Overhead Construction Standard Manual.

REVISION HISTORY:

3/18/2019: Newer Version moved to FMO

2/20/2019: Install S706680 in place of old style Disconnect Switch.

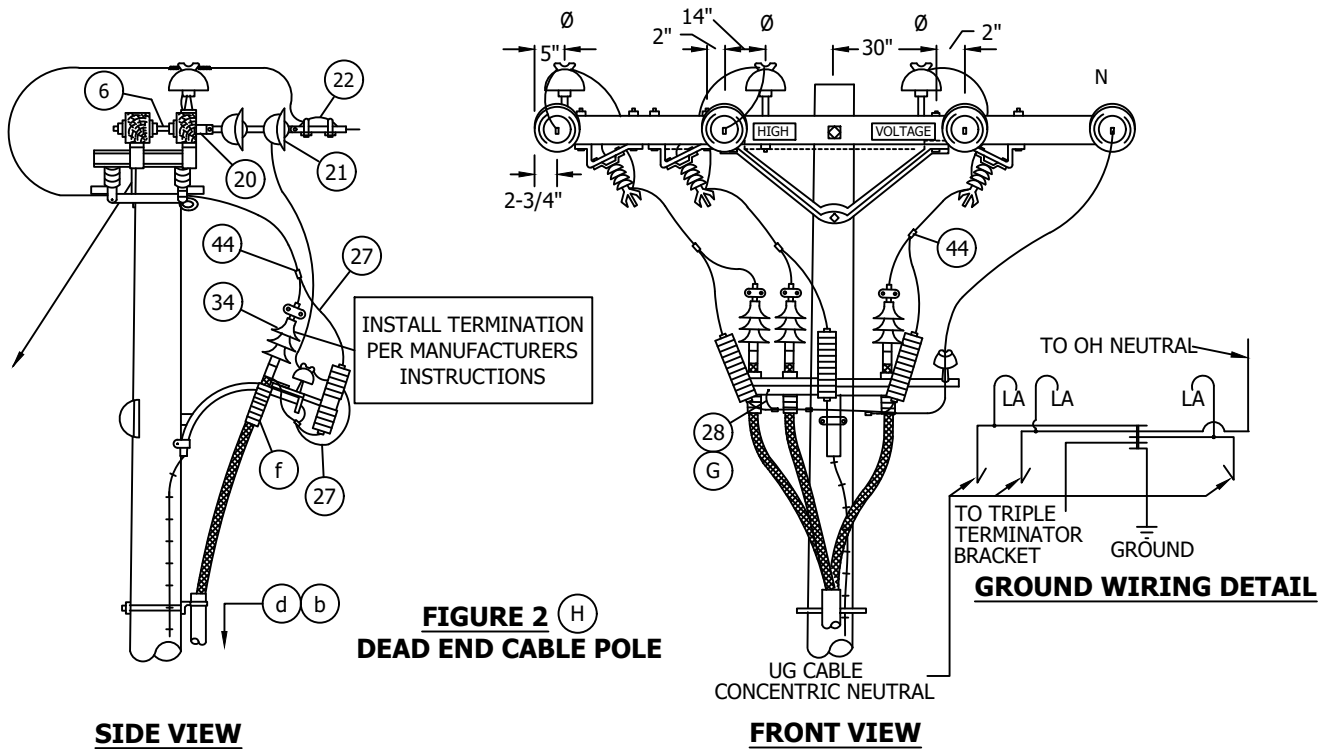
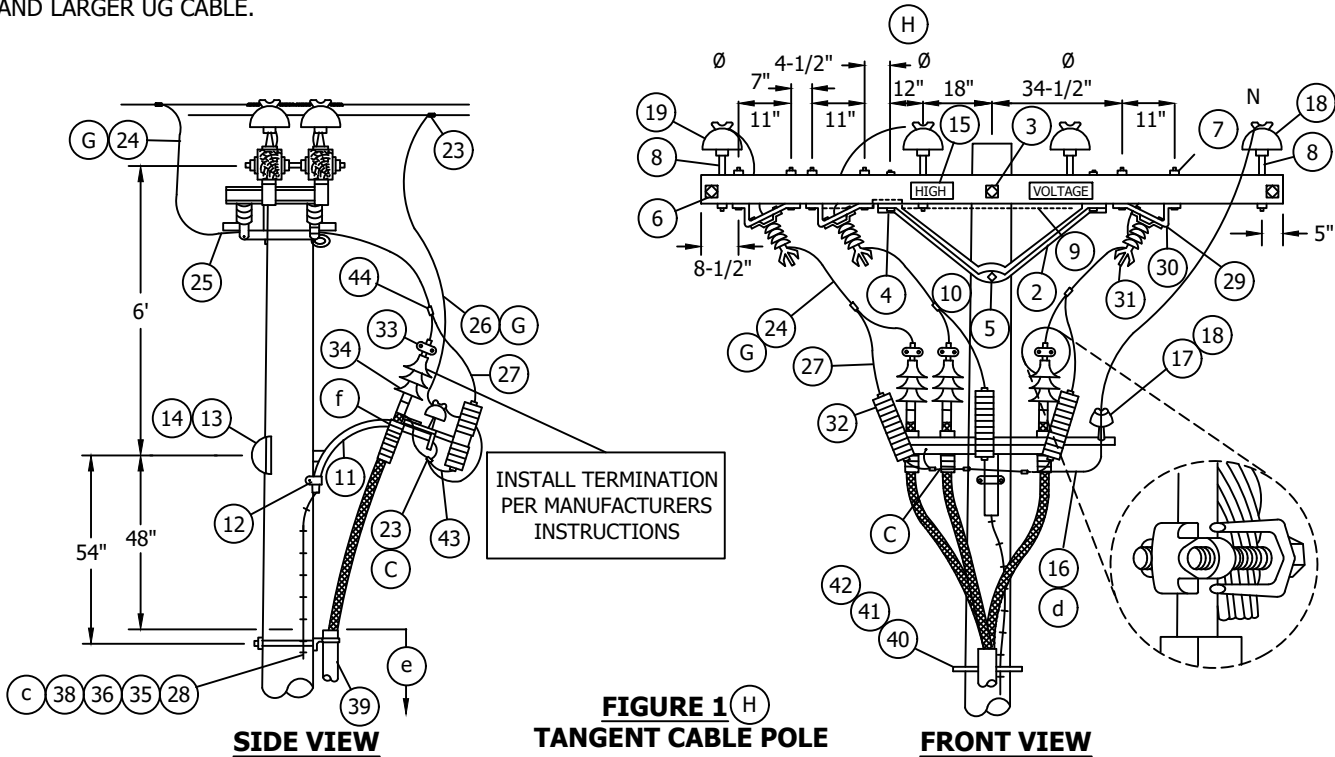
7/13/2016: OH1432 moved to FMO

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| C | EDITORIAL CHANGES | JK | JS | CZH | 3/18/2019 | F | | | | | |
| B | EDITORIAL CHANGES | JK | JS | CZH | 2/20/2019 | E | | | | | |
| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |

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|-------------------------|--|--------------------|----------|---------------------|-----------------------|
| SHEET 1 OF 1 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG4232 |
| | SDG&E ELECTRIC UNDERGROUND STANDARDS | | | | |
| | 12.47KV AND BELOW CABLE POLE, UPSWEEP BRACKET, THREE-PHASE, 1/C PER PHASE, LINE ARM MOUNTED DISCONNECTS, NON-PORCELAIN TERMINALS | | | | |

SCOPE: THIS STANDARD SHOWS THREE-PHASE CABLE POLE CONSTRUCTION USING NON-PORCELAIN TERMINALS FOR 350 KCMIL AND LARGER UG CABLE.



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| B | EDITORIAL CHANGES | GW | JS | MDJ | 04/01/2018 | E | | | | | |
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SHEET
1 OF 5

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SDG&E ELECTRIC OVERHEAD AND UNDERGROUND STANDARDS
 12.47KV AND BELOW CABLE POLE, UPSWEEP BRACKET,
 THREE-PHASE, 1/C PER PHASE, LINE ARM MOUNTED DISCONNECTS,
 NON-PORCELAIN TERMINALS

OH1432.1
 UG4232.1

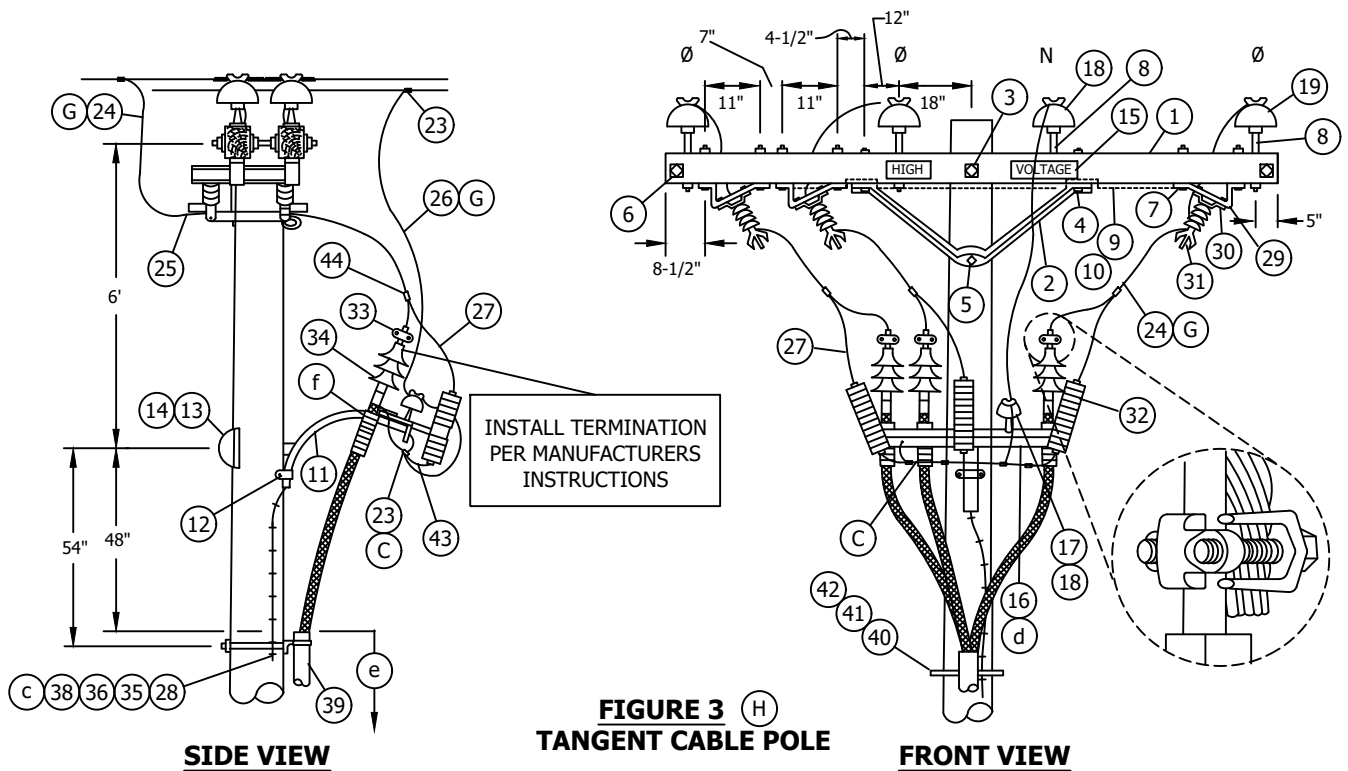


FIGURE 3 (H)
TANGENT CABLE POLE

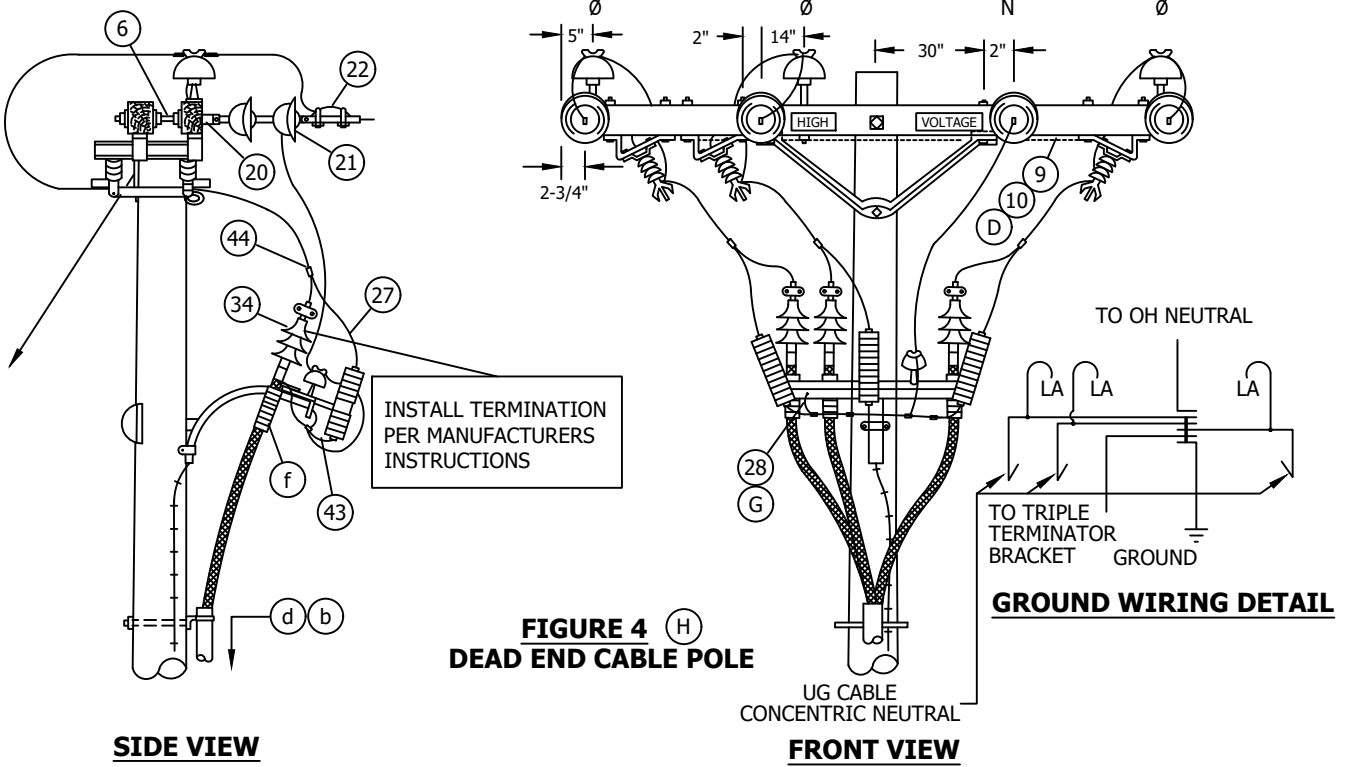
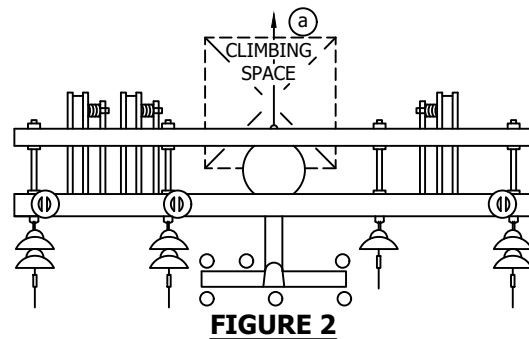
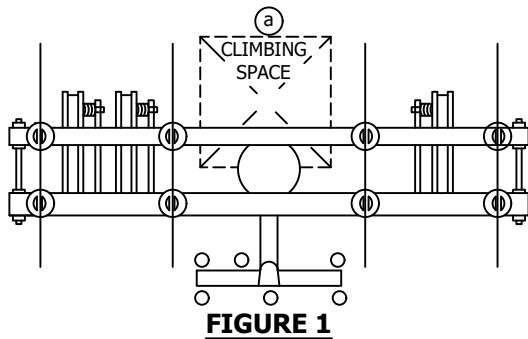


FIGURE 4 (H)
DEAD END CABLE POLE

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| SHEET 2 OF 5 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed |
| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND STANDARDS 12.47KV AND BELOW CABLE POLE, UPSWEEP BRACKET, THREE-PHASE, 1/C PER PHASE, LINE ARM MOUNTED DISCONNECTS, NON-PORCELAIN TERMINALS | | | |
| | OH1432.2 UG4232.2 | | | |



INSTALLATION:

- A. NEW CABLE POLES SHALL HAVE A STANDARD DEPTH OF 9'. IN MOST CASES, THIS WILL REQUIRE A 5' TALLER POLE.
- B. THIS CONSTRUCTION TO BE USED WITH 350 KCMIL AND LARGER UNDERGROUND CABLE.
- (C) INTERCONNECT OVERHEAD NEUTRAL, TRIPLE TERMINAL BRACKET AND CONCENTRIC CABLE NEUTRAL TO LIGHTNING ARRESTER GROUND.
- (D) INTERCONNECT SWITCH AND DEAD END BONDS PER G.O. 95 RULE 52.7 D.
- (E) REDUCE QUANTITIES AS REQUIRED WHEN NOT USING NEUTRAL.
- (F) WHEN ADDING THIS CONSTRUCTION TO AN EXISTING POLE WITH A 10' LINE ARM, AND SUFFICIENT POLE HEIGHT EXISTS, INSTALL 10' SWITCH ARMS AND ASSOCIATED HARDWARE BELOW THE LINE ARM TO AVOID CHANGING LINE ARM FROM 10' TO 12' (SEE O.H. STANDARD 1222. FIG. 1-B).

(G)

| UG CABLE SIZE AWG OR KCMIL, AL | OH JUMPER COND SIZE, AWG OR KCMIL, CU | OH NEUT JUMPER SIZE | | | CABLE POLE NEUT SIZE (CU) UNDER POTHEAD ARM OR TRIPLE TERM BRKT |
|--------------------------------|---------------------------------------|---------------------|-------|-----------------------------------|---|
| | | CU | AL | - | |
| 350 | 4/0 | 1/0 | 3/0 | - | #2 PER PHASE |
| 750 | 500 | 4/0 | 336.4 | OR SAME SIZE AS OH NEUT CONDUCTOR | - |
| 1000 | 500 | 4/0 | 336.4 | OR SAME SIZE AS OH NEUT CONDUCTOR | 1/0 PER PHASE |

BECAUSE THE PROPER SIZE CONNECTOR IS NOT ALWAYS AVAILABLE, THE JUMPER FROM THE OVERHEAD LINE CONDUCTOR TO THE HOOKSTICK SWITCH CAN BE THE SAME SIZE AS, OR LARGER THAN THAT OF THE OVERHEAD CONDUCTOR.

- (H) USE FIGURE ONE AND TWO FOR ALL **NEW** CONSTRUCTION AND WHEN ADDING TO EXISTING CONSTRUCTION WITH NEUTRAL ON OUTSIDE PIN POSITION. SEE DESIGN MANUAL PAGE 5124.2. USE FIGURE THREE AND FOUR ON EXISTING CONSTRUCTION WITH NEUTRAL ON INSIDE PIN POSITION.

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| SHEET 3 OF 5 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed |
| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND STANDARDS | | | |
| | 12.47KV AND BELOW CABLE POLE, UPSWEEP BRACKET, THREE-PHASE, 1/C PER PHASE, LINE ARM MOUNTED DISCONNECTS, NON-PORCELAIN TERMINALS | | | |
| | | | | OH1432.3 UG4232.3 |

BILL OF MATERIALS:

| ITEM | DESCRIPTION | QUANTITY | | CONSTR STANDARD | STOCK NUMBER | ASSEMBLY UNIT |
|------|---|----------|-------|-----------------|--------------------|---------------|
| | | FIG 1 | FIG 2 | | | |
| 1 | CROSSARM, 3-3/4" X 5-3/4" X 12'-0" (F) | 2 | 2 | - | S294160 | - |
| 2 | BRACE, ANGLE, CROSSARM, 5' | 2 | 2 | - | S164128 | - |
| 3 | BOLT, MACH.M GALV, 5/8" X (LENGTH AS REQ'D), 2 SQUARE AND 1 DOUBLE COIL SPRING WASHERS | 1 | 1 | 392 | - | - |
| 4 | BOLT, MACH, GALV, 1/2" X 7", 1 RD, 1 DBL COIL SPR WASH | 4 | 4 | 392 | - | - |
| 5 | BOLT, MACH.M GALV, 5/8" X (LENGTH AS REQ'D), AND 1 DOUBLE COIL SPRING WASHERS | 1 | 1 | 392 | - | - |
| 6 | BOLT, SPACE, GALV, 5/8" X (LENGTH AS REQ'D), 4 SQUARE, 2 ROUND AND 2 DOUBLE COIL SPRING WASHERS (E) | 2 | 4 | 392 | - | - |
| 7 | BOLT, MACH, GALV, 1/2" X 8", 1 ROUND AND 1 DOUBLE COIL SPRING WASHER | 12 | 12 | 392 | - | - |
| 8 | PIN, INSULATOR, STRAIGHT, 12KV, 1" OR (E) | 8 | 3 | - | S532704 | - |
| | 1-3/8" (E) | 8 | 3 | - | S532448 | - |
| 9 | WIRE, #8, BARE SOLID ANNEALED COPPER | 15' | 15' | - | S812928 | - |
| 10 | STAPLES, FENCE, GALV, 1-1/4" | AS REQ'D | | - | S678528 | - |
| 11 | BRACKET, GALV, TERMINAL UPSWEEP (C) | 1 | 1 | - | S166856 | - |
| 12 | SCREW, LAG, GALV, 4" | 2 | 2 | - | S621568 | - |
| 13 | BOLT, SPACE, GALV, 5/8" X (LENGTH AS REQ'D), 1 SQUARE AND 1 DOUBLE COIL SPRING WASHER | 1 | 1 | 392 | - | - |
| 14 | COVER, BOLT, PLASTIC, AND 6 - 100 NAILS, GALV | 1 | 1 | - | S285696 S491392 | - |
| 15 | SIGN, HIGH VOLTAGE, AND 9 ROOFING NAILS, GALV | 2 | 2 | - | S647648 S492224 | - |
| 16 | BRACKET, TRIPLE TERMINATOR | 1 | 1 | - | S166676 | - |
| 17 | PIN, SHORT SHANK, 1" LEAD THREAD (E) | 1 | 1 | - | S532426 | - |
| 18 | INSULATOR, 12KV, NEUTRAL (E) | 3 | 1 | - | S429216 | - |
| 19 | INSULATOR, LINE, 12KV, 1" OR 1-3/8" PIN | 6 | 3 | 750 | - | - |
| 20 | CLEVIS, DEAD END, 5/8" BOLT, STEEL (E) | - | 4 | - | S235715 | - |
| 21 | INSULATOR, SUSPENSION, 12KV, CLEVIS (E) | - | 7 | 750 | - | - |
| 22 | CLAMP, STRAIGHT LINE, D.E. (E) | - | 4 | 741 | - | - |
| 23 | CONNECTOR, WIRE COMPRESSION, (SIZE AS REQ'D) | AS REQ'D | | 783-786 | - | - |
| 24 | WIRE, BARE STRANDED COPPER, (OH JUMPER) (G) | 21' | 30' | 715 | - | - |
| 25 | TERMINAL, COMPRESSION (SIZE AS REQ'D) | 6 | 6 | 794-795 | - | - |
| 26 | WIRE, BARE STRANDED COPPER, (OH NEUT JUMPER) (G) | 9' | 9' | 715 | - | - |
| 27 | WIRE, #6, BARE STRANDED COPPER | 12' | 12' | - | S813536 | - |
| 28 | #4 CU SOLID GROUND WIRE, PVC COVERED | 50' | 50' | - | S812490 | GNDPVC |
| 29 | BRACKET, DISCONNECT, ANGLE MOUNTING | 6 | 6 | - | S166542 | - |
| 30 | BOLT, MACH, GALV, 3/8" X 3", 2 RD WASH & 1 LOCK WASH | 6 | 6 | 392 | - | - |
| 31 | SWITCH, HOOKSTICK DISCONNECT, 14.4KV, 600 A OR 1200 A | 3 | 3 | 1222 | - | - |
| 32 | ARRESTER, LIGHTNING W/48" COVERED LEAD WIRE | 3 | 3 | 1247 | S113256 | 10KVTA |
| 33 | CONNECTOR, TWO BOLT, BRONZE (SIZE AS REQ'D) | 3 | 3 | 4111 | - | - |
| 34 | TERMINALS, UNDERGROUND CABLE (f) | 3 | 3 | 4111 | - | - |
| 35 | GROUND ROD, 5/8" X 8', COPPERWELD | 1 | 1 | - | S603072 | GNDPVC |

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| C | DRAWING UPDATE | PEI | - | - | 02/18/2019 | F | | | | | |
| B | EDITORIAL CHANGES | GW | JS | MDJ | 04/01/2018 | E | | | | | |
| A | REVISION | - | DW | TQ | 03/20/2014 | D | MOVED TO FMO | JK | JS | CZH | 3/18/2019 |

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| SHEET 4 OF 5 | X Indicates Latest Revision | Completely Revised | New Page | Information Removed |
| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND STANDARDS | | | |
| | 12.47KV AND BELOW CABLE POLE, UPSWEEP BRACKET, THREE-PHASE, 1/C PER PHASE, LINE ARM MOUNTED DISCONNECTS, NON-PORCELAIN TERMINALS | | | |

**OH1432.4
UG4232.4**

BILL OF MATERIALS (CONT'D):

| ITEM | DESCRIPTION | QUANTITY | | CONSTR STANDARD | STOCK NUMBER | ASSEMBLY UNIT |
|------|--|----------|-------|-----------------|--------------|---------------|
| | | FIG 1 | FIG 2 | | | |
| 36 | COPPER BONDED GROUND CONNECTOR | 1 | 1 | - | S259010 | - |
| 37 | - | - | - | - | - | - |
| 38 | GALVANIZED STAPLES FOR PVC COVERED GROUND WIRE | AS REQ'D | | - | S678562 | - |
| 39 | RISER CONSTRUCTION | AS REQ'D | | 1400/4200 | - | - |
| 40 | BRACKET, LADDER ARM | AS REQ'D | | 1404/4204 | S167184 | - |
| 41 | NUT, CLAMPING CHANNEL, W/SPRING, 1/2" | AS REQ'D | | 1404/4204 | S503488 | - |
| 42 | CHANNEL, DOUBLE GALV., 24" | AS REQ'D | | 1404/4204 | S216700 | - |
| 43 | FLEXIBLE ARRESTER GROUND STRAP | AS REQ'D | | - | S698754 | - |
| 44 | HOT LINE CLAMP | 3 | 3 | 788 | S227680 | - |

**OVERHEAD MACRO
UNIT 3NS-B**

NOTES: NONE

REFERENCE:

- (a) ALLOWABLE WORKING AND CLIMBING SPACE - SEE STD. 251
- (b) POLE STEPPING - SEE STD. 363.
- (c) GROUNDING METHODS - SEE PAGE 1002.5.
- (d) RISER POSITIONS - SEE STANDARD 1402/4202.
- (e) MINIMUM VERTICAL SEPARATION AS PER G.O. 95 SEE STD. 1406/4206.
- (f) SEE STANDARD 1407/4207 FOR NON PORCELAIN TERMINAL MOUNTING INSTRUCTIONS AND MATERIALS.

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|-------------------------|--|--------------------|----------|---------------------|------------------------------|
| SHEET 5 OF 5 | Indicates Latest Revision | Completely Revised | New Page | Information Removed | OH1432.5 UG4232.5 |
| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND STANDARDS | | | | |
| | 12.47KV AND BELOW CABLE POLE, UPSWEEP BRACKET, THREE-PHASE, 1/C PER PHASE, LINE ARM MOUNTED DISCONNECTS, NON-PORCELAIN TERMINALS | | | | |


FIELD MAINTENANCE ONLY

REVISION HISTORY:

7/13/2016: All versions prior to 2016 are superseded by their current version found inside the Overhead Construction Standard Manual.

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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
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| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |

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| SHEET 1 OF 1 |  Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG 4233 |
| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | 12.47KV AND BELOW CABLE POLE, UPSWEEP BRACKET, 3Ø, 1/C PER PHASE, LINE ARM MOUNTED DISCONNECTS | | | | |

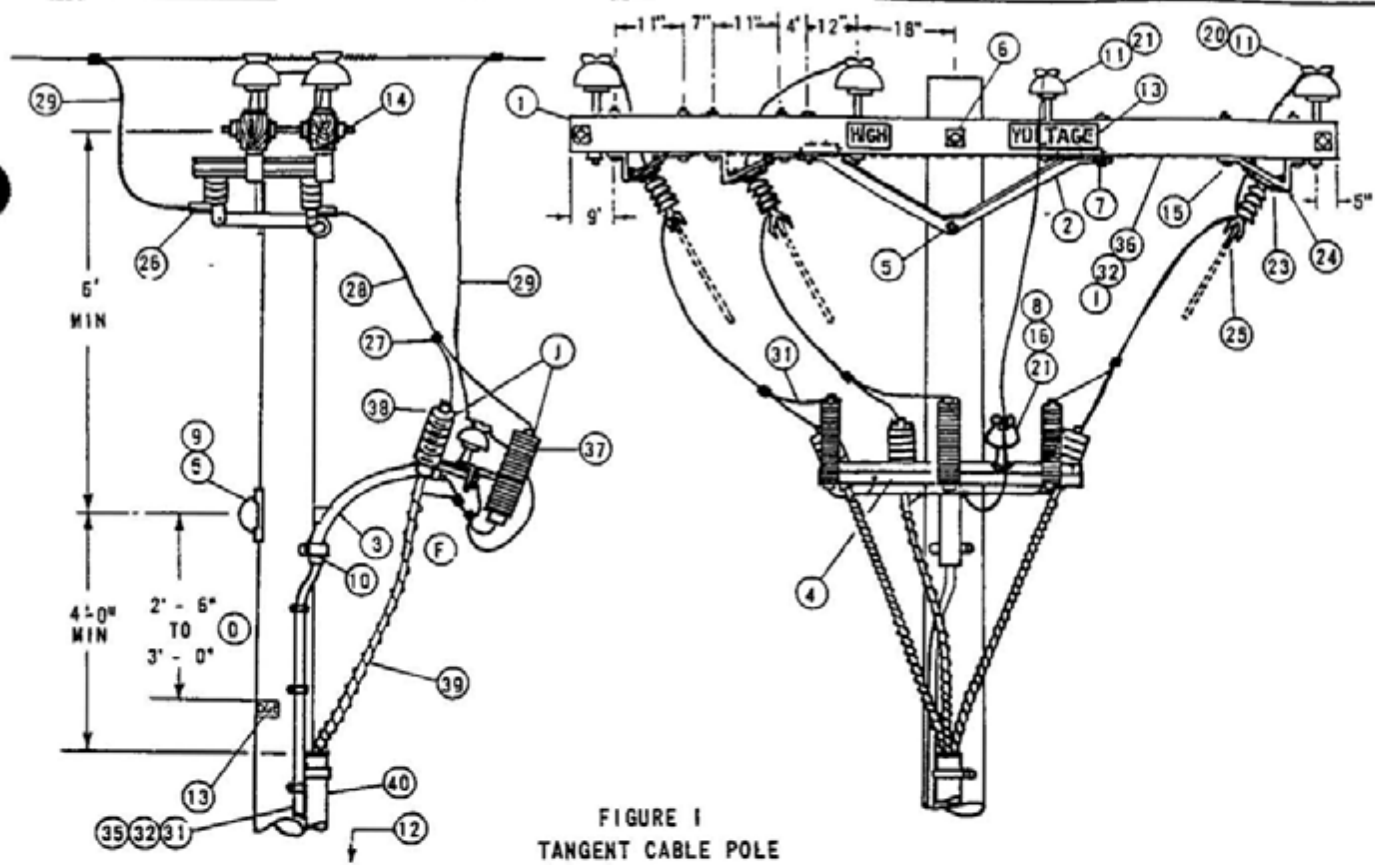


FIGURE 1
TANGENT CABLE POLE

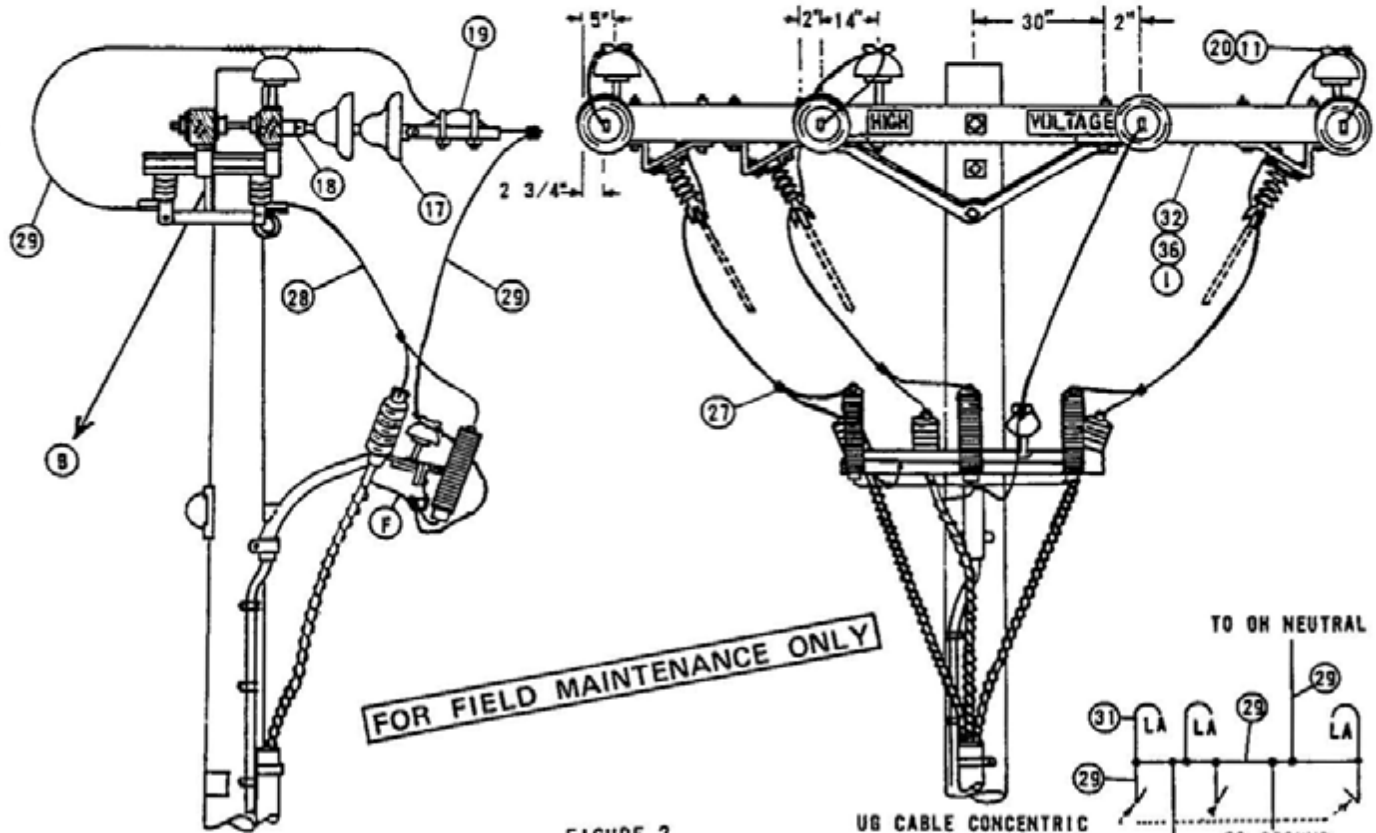
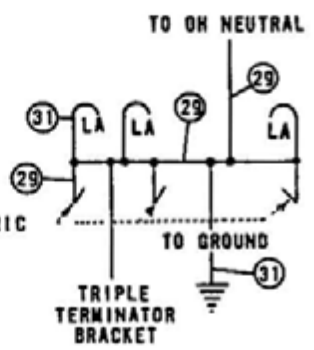


FIGURE 2
DEAD END CABLE POLE



UG CABLE CONCENTRIC NEUTRAL

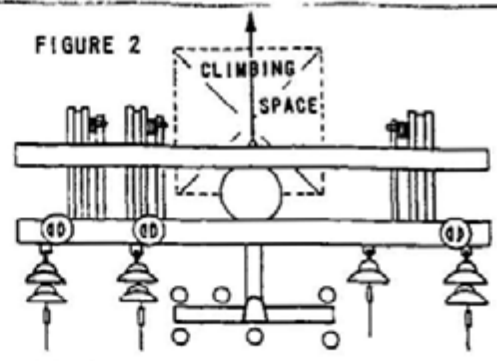
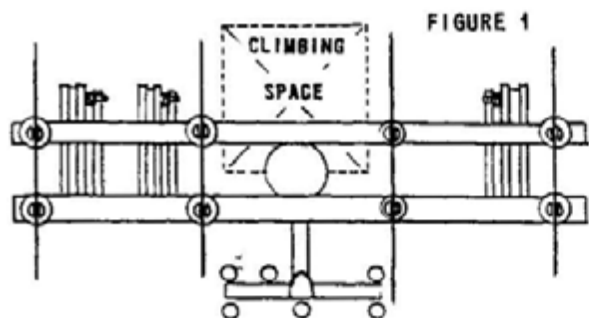
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SDG&E ELECTRIC STANDARDS

ISSUE 1993
DATE 3-9-83
APPD JHT/DR4

12.47KV AND BELOW CABLE POLE, UPSWEEP BRACKET, 3Ø,
1/C PER PHASE, LINE ARM MOUNTED DISCONNECTS

OH 1499.305-
UG 4299.305
SUPERSEDES
4233.1 (3-9-83)



NOTES:

- A. SEE PAGE 1406/4206 FOR G.O. 95 MINIMUM VERTICAL SEPARATION BETWEEN TOP OF RISER PROTECTION AND NEXT LOWER CONDUCTOR LEVEL.
- (B) SEE PAGE 251 FOR ALLOWABLE CLIMBING SPACE OBSTRUCTIONS.
- (C) USE TWO GROUND RODS SPACED A MINIMUM OF 6' APART.
- (D) G.O. 95 DIMENSION.
- (E) EXEMPT MATERIAL.
- (F) INTERCONNECT TRIPLE TERMINAL BRACKET, LIGHTNING ARRESTER GROUND, CONCENTRIC NEUTRAL, AND OVERHEAD NEUTRAL.
- (G) REDUCE QUANTITIES AS REQUIRED WHEN NOT USING NEUTRAL.
- H. THIS CONSTRUCTION TO BE USED WITH 350 KCMIL AND LARGER UNDERGROUND CABLE.
- (I) INTERCONNECT SWITCH AND DEAD END BONDS PER G.O. 95 RULE 52 7 D
- (J) ARRESTER AND CABLE TERMINAL POSITIONS MAY BE INTERCHANGED AT THE DISCRETION OF DISTRICT OPERATIONS PERSONNEL.

FOR FIELD MAINTENANCE ONLY

| ITEM | DESCRIPTION | QUANTITY | | STOCK NO. OR CONSTR STDS |
|------|--|-----------|-------|----------------------------|
| | | FIG 1 | FIG 2 | |
| 1 | CROSSARM, 3 3/4" X 5 3/4" X 12' - 0" | 2 | 2 | 300 SECTION |
| 2 | BRACE, ANGLE, CROSSARM, 5' | 2 | 2 | 164128 |
| 3 | BRACKET, GALV, TERMINAL UPSWEEP, WITH PVC LINER, COMPLETE | 1 | 1 | 166856 |
| 4 | BRACKET, TRIPLE TERMINAL | 1 | 1 | 166676 |
| 5 | BOLT, WACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 SQ WASH., 1 DBL COIL WASH. | (E) 1 | 1 | 100 SECTION |
| 6 | BOLT, WACH, GALV, 5/8" X (LENGTH AS REQ'D), 2-SQ WASH., 1 DBL COIL WASH. | (E) 1 | 1 | 100 SECTION |
| 7 | BOLT, WACH, GALV, 1/2" X 7", 1 RD WASH., 1 DBL COIL WASH | (E) 4 | 4 | 100 SECTION |
| 8 | BOLT, WACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 LOCK WASH | (B) (E) 1 | 1 | 100 SECTION |
| 9 | COVER, BOLT, PLASTIC, & 6-100 NAILS | (E) 1 | 1 | 285696 |
| 10 | SCREW, LAG, GALV, 4" | (E) 2 | 2 | 621568 |
| 11 | PIN INSULATOR STRAIGHT 12KV (AS REQ'D BY ITEM 21) | (B) 8 | 3 | 532704, 532448 |
| 12 | STEPS, POLE | (E) 16 | 16 | 692992 |
| 13 | SIGN, HIGH VOLTAGE, & 8 ROOFING NAILS | 3 | 3 | 647648, 492224 |
| 14 | BOLT, SPACE, GALV, 5/8" X (LENGTH AS REQ'D) 4-SQ WASH., 2 DBL COIL WASH. | (G) (E) 2 | 4 | 100 SECTION |
| 15 | BOLT, WACH, GALV, 1/2" X 8", 1 RD WASH., 1 DBL COIL WASH | (E) 12 | 12 | 100 SECTION |
| 16 | PIN, TRANSFORMER ADAPTER, 1" LEAD THREAD | (B) 1 | 1 | 529248 |
| 17 | INSULATOR, SUSPENSION, 12KV, CLEVIS | (B) - | 7 | 700 SECTION |
| 18 | CLEVIS, DEAD END, 5/8" BOLT STEEL | (G) (E) - | 4 | 235712 |
| 19 | CLAMP, STRAIGHT LINE, D.E. | (G) - | 4 | 700 SECTION |
| 20 | INSULATOR, LINE, 12KV | (G) 6 | 3 | 700 SECTION |
| 21 | INSULATOR, 12KV, NEUTRAL | (G) (E) 3 | 1 | 429216 |
| 22 | | | | |
| 23 | BOLT WACH, GALV, 1/2" X 3" 1-LOCK WASH | (E) 12 | 12 | 100 SECTION |
| 24 | BRACKET, DISCONNECT ANGLE MOUNTING, 1/4" X 3" MILD STEEL | 6 | 6 | 166542 |
| 25 | SWITCH, HOOKSTICK DISCONNECT, 14.4KV, 400 A, 600 A | 3 | 3 | 1200 SECTION |
| 26 | TERMINAL, COMPRESSION | 6 | 6 | 700 SECTION |
| 27 | CONNECTOR WIRE COMPRESSION (SIZE AS REQ'D) | (E) 13 | 9 | 700 SECTION |
| 28 | WIRE, COPPER W.P., SIZE PER UG CABLE AMPACITY | 15' | 15' | 700 SECTION |
| 29 | WIRE, BARE STRANDED COPPER, SIZE PER UG CABLE AMPACITY | 22' | 31' | 700 SECTION |
| 30 | | | | |
| 31 | WIRE, #6, BARE STRANDED COPPER | 40' | 40' | 813536 |
| 32 | STAPLES, FENCE, GALV, 1 1/4" | (E) 40 | 40 | 678528 |
| 33 | | | | |
| 34 | | | | |
| 35 | UNIT GROUND, COMPLETE (WITH GRAY MLDG, WITH PLAIN MLDG) | (C) 1 | 1 | 603120, 603136 |
| 36 | WIRE, #8, BARE SOLID ANNEALED COPPER | 1 LB | 1 LB | 812928 |
| 37 | ARRESTER, LIGHTNING | 3 | 3 | 1200 SECTION |
| 38 | TERMINALS UG CABLE | 3 | 3 | SEE UG STDS |
| 39 | CABLE PRIMARY | | | AS REQ'D SEE UG STDS |
| 40 | RISER CONSTRUCTION | | | AS REQ'D 1400/4200 SECTION |

OH 1499.306
UG 4299.306
SUPERSEDES
4233 2 (3-9-83)

SDG&E ELECTRIC STANDARDS
12.47KV AND BELOW CABLE POLE, UPSWEEP BRACKET, 3Ø,
1/C PER PHASE, LINE ARM MOUNTED DISCONNECTS

DATE 3-9-83
APPD *SAT/WRT*

FIELD MAINTENANCE ONLY

REVISION HISTORY:

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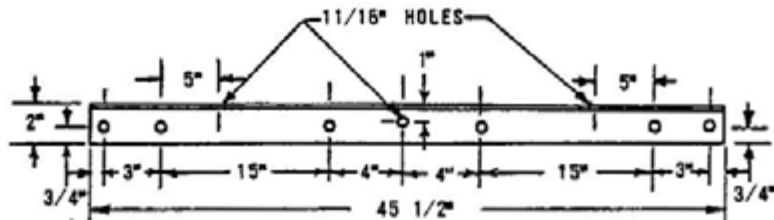
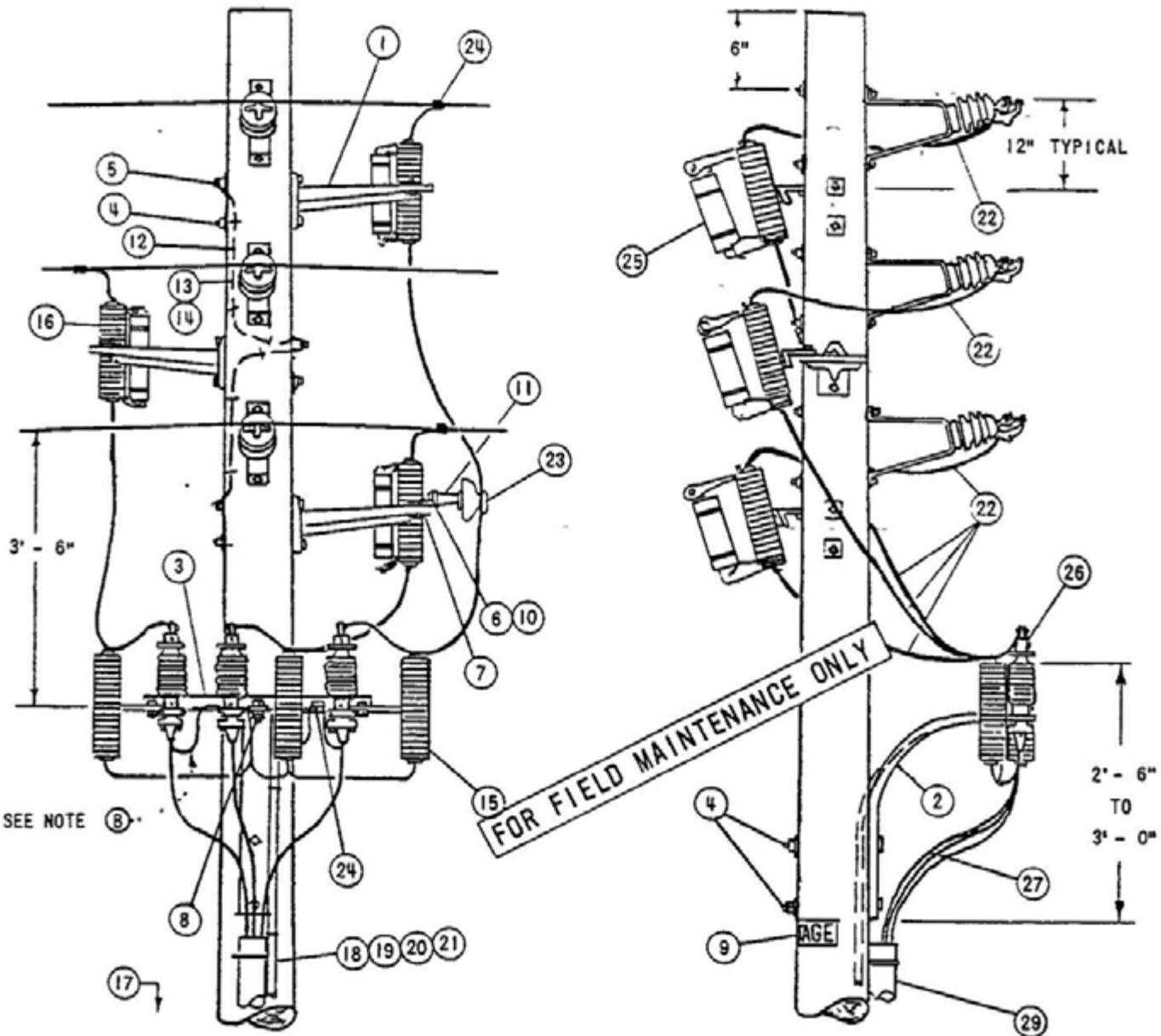
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**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD
BRACKET MOUNTED TERMINALS,
12KV 3 WIRE ARMLESS TANGENT CONSTRUCTION

**FMO
UG 4237**



ALL HOLES 9/16" EXCEPT AS NOTED

FABRICATE FROM 2" X 2" X 3/16" STEEL ANGLE
HOT DIP GALVANIZE AFTER FABRICATION

ARMLESS TERMINAL MOUNTING BRACKET

DATE 8-27-82
APPD DRH

SDG&E ELECTRIC STANDARDS
BRACKET MOUNTED TERMINALS,
12KV 3 WIRE ARMLESS TANGENT CONSTRUCTION

OH 1499.301
UG 4299.301
SUPERCEDES
4237.1 (10-2-78)

NOTES:

- (A) UNIT GROUND, COMPLETE, ORDER 603120 WITH GRAY MOULDING. 603136 WITH PLAIN MOULDING
- (B) THE FIBERGLASS UPSWEEP TERMINAL BRACKET IS TO BE USED FOR UNDERGROUND CONDUCTORS 4/0 OR SMALLER DO NOT USE FOR 500 KCM AND LARGER CONDUCTORS.
- (C) USE TWO-ROD GROUND SPACED A MINIMUM OF 6 FEET APART.
- D. CONNECT ONE STRAND OF CONCENTRIC NEUTRAL TO TERMINAL BOLT WITH DOUBLE NUT
- (E) EXEMPT MATERIAL

FOR FIELD MAINTENANCE ONLY

| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONSTR STD |
|--|---|----------|-------------------------|
| I N S T A L L E D B Y O H C R E W S | 1 BRACKET, GALV., 4-HOLE, MOUNTING | 3 | 166240 |
| | 2 BRACKET, FIBERGLASS, TERMINAL, UPSWEEP SEE NOTE (F) | 1 | 166864 |
| | 3 BRACKET, ARMLESS, TERMINAL MOUNTING, SEE DETAIL PAGE 1437.1 | 1 | 166872 |
| | 4 MACH. BOLT, GALV., 5/8" X LENGTH AS REQ'D., 1-SQ. CURV. WASH., 1-DBL. COIL SPR. WASH. & 1-NUT (E) | 5 | PGS 139, 140 |
| | 5 MACH. BOLT, GALV., 5/8" X LENGTH AS REQ'D., 1-SQ., CURV. WASH., 1-DBL. COIL SPR. WASH., 2-FLAT RD. WASH. & 2-NUTS (E) | 3 | PGS 139, 140 |
| | 6 MACH. BOLT, GALV., 5/8" X 1 1/2", 1-LOCK WASH. (E) | 1 | PGS 139, 140 |
| | 7 MACH BOLT, GALV., 1/2" X 1 1/2", 1-LOCK WASH & 1-NUT (E) | 1 | PGS 139, 140 |
| | 8 MACH. BOLT, GALV., 5/8" X 2 1/2", 1-LOCK, 2-RO. WASH. & 2-NUTS (E) | 1 | PGS 139, 140 |
| | 9 HIGH VOLTAGE SIGN & 8-ROOFING NAILS, GALV. (E) | 2 | 647648, 492224 |
| | 10 BRACKET, INSULATOR, MOUNTING ANGLE | 1 | 166208 |
| | 11 PIN, INSULATOR, 12KV, 1" OR 1 3/8" LEAD THREAD | 1 | 529248-529218 |
| | 12 WIRE, BOND, BARE SOLID ANNEALED, #8 | 6' | 812928 |
| | 13 HARDWOOD MOULDING, 1" (OTHER THAN TOP CIRCUIT ON POLE) | 6' | 487200 |
| | 14 MOULDING STAPLES, GALV., 3" X 1 1/16" X 1/4" (OTHER THAN TOP CIRCUIT ON POLE) | 6 | 678560 |
| U G C R E W S | 15 LIGHTNING ARRESTER, 12KV | 3 | 113248 |
| | 16 CUTOUT, FOR CURRENT-LIMITING FUSE | 3 | 1200 SECTION |
| | 17 GROUND ROD & CLAMP (A) (C) | 2 | 803072-230016 (E) |
| | 18 HARDWOOD MOULDING, 1" (A) | 36' | 487200 |
| | 19 STAPLES, MOULDING, GALV., 3" X 1 1/16" X 1/4" (A) (E) | 24 | 678560 |
| | 20 STAPLES, FENCE, GALV., 1 1/4" (A) (E) | 1/3# | 678528 |
| | 21 WIRE, BARE STRANDED COPPER, #2 (B) | 50' | 813864 |
| | 22 WIRE, BARE STRANDED, COPPER, (SIZE AS REQ'D) | 25' | |
| | 23 INSULATOR, 12KV, PIN TYPE (CLASS AS REQ'D) | 1 | 429056-429152 |
| | 24 CONNECTOR, WIRE, COMPRESSION (SIZE AS REQ'D) | 4 | |
| | 25 FUSE, CURRENT-LIMITING SIZE AS SPECIFIED ON WORK ORDER | 3 | 1200 SECTION |
| | 26 CABLE TERMINAL | 3 | SEE UG STDS |
| | 27 CABLE, PRIMARY | AS REQ'D | SEE UG STDS |
| | 28 | | |
| | 29 RISER CONSTRUCTION | AS REQ'D | 1400/4200 SECTION |

OH 1499,302
UG 4299,302
SUPERCEDES
4237,2 (2-27-80)

SDG&E ELECTRIC STANDARDS
BRACKET MOUNTED TERMINALS,
12KV 3 WIRE ARMLESS TANGENT CONSTRUCTION

DATE 8-27-82
APPD *UR#*


FIELD MAINTENANCE ONLY

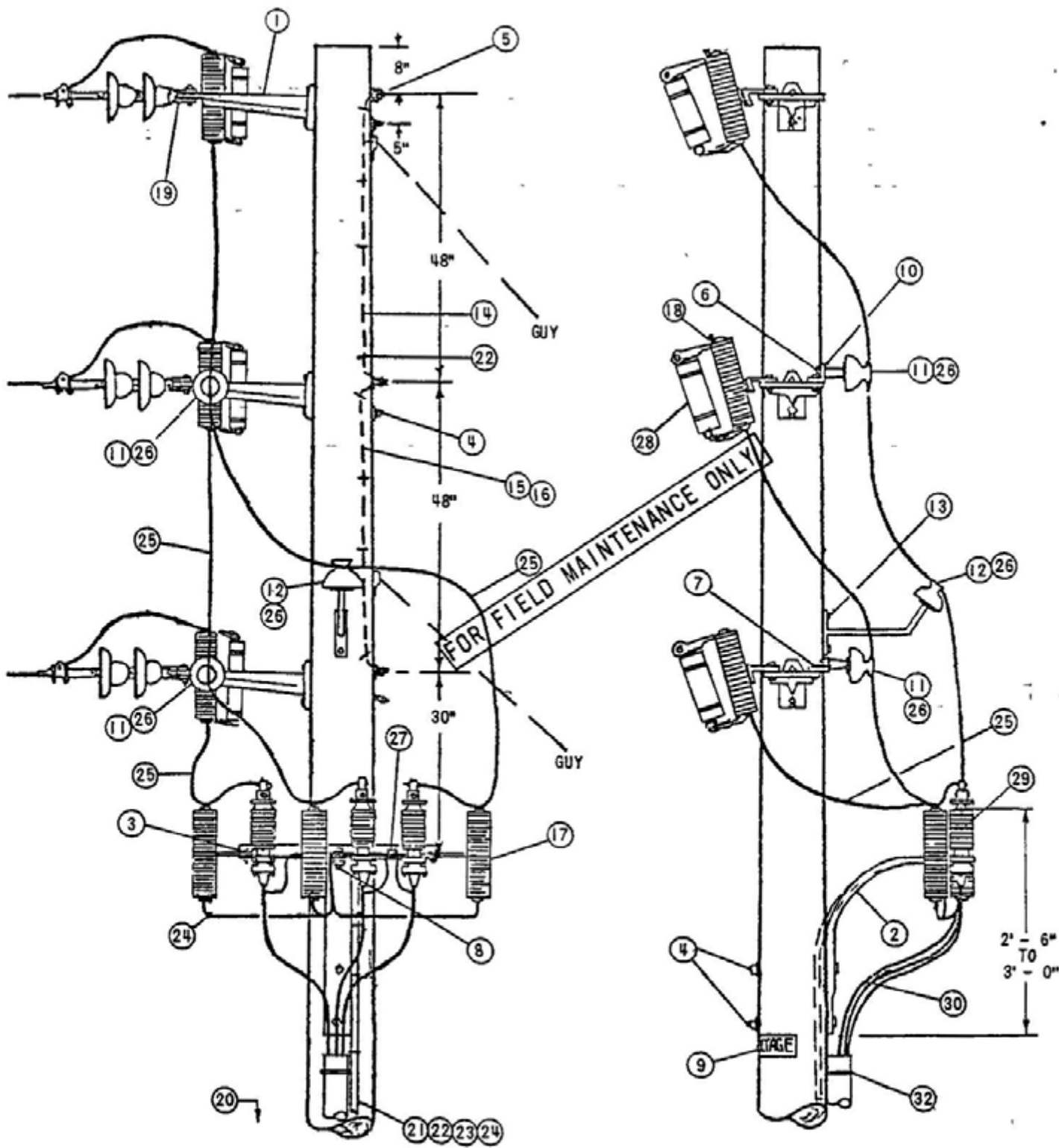
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| SHEET 1 OF 1 |  Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO UG 4238 |
| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | BRACKET MOUNTED TERMINALS, 12KV 3 WIRE, ARMLESS DEAD END CONSTRUCTION | | | | |



DATE 8-27-82
 APPD *ARH*

SDG&E ELECTRIC STANDARDS
 BRACKET MOUNTED TERMINALS, 12KV 3 WIRE,
 ARMLESS DEAD END CONSTRUCTION

OH 1499.303
 UG 4299.303
 SUPERCEDES
 4238.1 (2-27-80)

NOTES:

- (A) UNIT GROUND COMPLETE ORDER 603120 WITH GRAY MOULDING 603136 WITH PLAIN MOULDING
- B UNTWIST SUFFICIENT LENGTH OF #2 STRANDED WIRE TO CONNECT EACH ARRESTER AND POTHEAD (TERMINAL) GROUND WITH A SINGLE STRAND.
- (C) USE TWO-ROD GROUND SPACED A MINIMUM OF 6 FEET APART
- D THIS CONFIGURATION NOT TO BE USED WHERE A FUTURE EXTENSION IS ANTICIPATED
- (E) EXEMPT MATERIALS.
- F THIS INSTALLATION DOES NOT INCLUDE BUYING MATERIAL
- (G) THE FIBERGLASS UPSWEEP TERMINAL BRACKET IS TO BE USED FOR UNDERGROUND CONDUCTORS 4/0 OR SMALLER. DO NOT USE FOR 500 KCM AND LARGER CONDUCTORS

FOR FIELD MAINTENANCE ONLY

| ITEM | DESCRIPTION | QUANT | STOCK NO. OR CONSTR STDS |
|---|-------------|--|----------------------------|
| O H C R E W S U C & D UG C R U I T S | 1 | BRACKET GALV., 4-HOLE, MOUNTING SEE NOTE (G) | |
| | 2 | BRACKET, FIBERGLASS TERMINAL, UPSWEEP | 3 166240 |
| | 3 | BRACKET, ARMLESS, TERMINAL MOUNTING (SEE DETAIL PG. 1437.1) | 1 166864 |
| | 4 | MACH BOLT, GALV., 5/8" X LENGTH AS REQ'D, 1-SQ CURV WASH, 1-DBL COIL SPR. WASH & 1-NUT | 5 (E) PGS 139, 140 |
| | 5 | MACH BOLT, GALV., 5/8" X LENGTH AS REQ'D, 1-SQ CURV WASH, 1-DBL COIL SPR. WASH, 2-FLAT RD WASH. & 2-NUTS | 3 (E) PGS 139, 140 |
| | 6 | MACH BOLT, GALV., 5/8" X 1 1/2" | 2 (E) PGS 139, 140 |
| | 7 | MACH BOLT, GALV., 1/2" X 1 1/2" | 2 (E) PGS 139, 140 |
| | 8 | MACH BOLT, GALV., 5/8" X 2 1/2" 1-LOCK, 2-rd. WASH. & 2-NUTS | 1 (E) PGS 139, 140 |
| | 9 | HIGH VOLTAGE SIGN & 8-ROOFING NAILS, GALV | 2 (E) 647648, 492192 |
| | 10 | BRACKET, INSULATOR MOUNTING ANGLE | 2 PG 151 |
| | 11 | PIN, INSULATOR, 12KV, 1" OR 1 3/8" LEAD THREAD | 2 529248-529216 |
| | 12 | BRACKET, INSULATOR, 1" OR 1 3/8" LEAD THREAD | 1 166144-166176 |
| | 13 | SCREW LAG, GALV., 1/2" X 4" | 2 (E) 621568 |
| | 14 | WIRE BOND, BARE SOLID ANNEALED #8 | 10' 812928 |
| | 15 | HARDWOOD MOULDING, 1", (OTHER THAN TOP CIRCUIT ON POLE) | 10' 487200 |
| | 16 | MOULDING STAPLES, GALV., 3" X 1 1/16" X 1/4" (OTHER THAN TOP CIRCUIT ON POLE) | 8 (E) 678560 |
| | 17 | LIGHTNING ARRESTER, 12KV | 3 113248 |
| | 18 | CUTOUT, FOR CURRENT-LIMITING FUSE | 3 1200 SECTION |
| | 19 | CLEVIS | 3 235776 |
| | 20 | GROUND ROD & CLAMP (G) | 2 603072, 230016 (A)(E) |
| | 21 | HARDWOOD MOULDING, 1" | 36' 487200 (A) |
| | 22 | STAPLES, MOULDING, GALV., 3" X 1 1/16" X 1/4" | 24 (E) 678560 (A) |
| | 23 | STAPLES, FENCE, GALV., 1 1/4" | 32 (E) 678528 (A) |
| | 24 | WIRE, BARE STRANDED, COPPER, #2 | 50' 813664 |
| | 25 | WIRE BARE STRANDED, COPPER, (SIZE AS REQ'D) | 25' PGS 715-717 |
| | 26 | INSULATOR, 12KV, PIN TYPE, (CLASS 55-5 OR 56-1) | 3 429056-429152 |
| | 27 | CONNECTOR, WIRE, COMPRESSION, (SIZE AS REQ'D) | 1 PGS 783-787 |
| | 28 | FUSE, CURRENT-LIMITING AS SPECIFIED ON WORK ORDER | 3 1200 SECTION |
| | 29 | CABLE TERMINAL | 3 SEE UG STDS |
| | 30 | CABLE, PRIMARY | AS REQ'D SEE UG STDS |
| | 31 | | |
| | 32 | RISER CONSTRUCTION | AS REQ'D 1400/4200 SECTION |

OH 1499,304
UG 4299,304
SUPERCEDES
4238.2 (2-27-80)

SDG&E ELECTRIC STANDARDS
BRACKET MOUNTED TERMINALS, 12KV 3 WIRE,
ARMLESS DEAD END CONSTRUCTION

DATE 8-27-82
APPD LPH


FIELD MAINTENANCE ONLY

REVISION HISTORY:

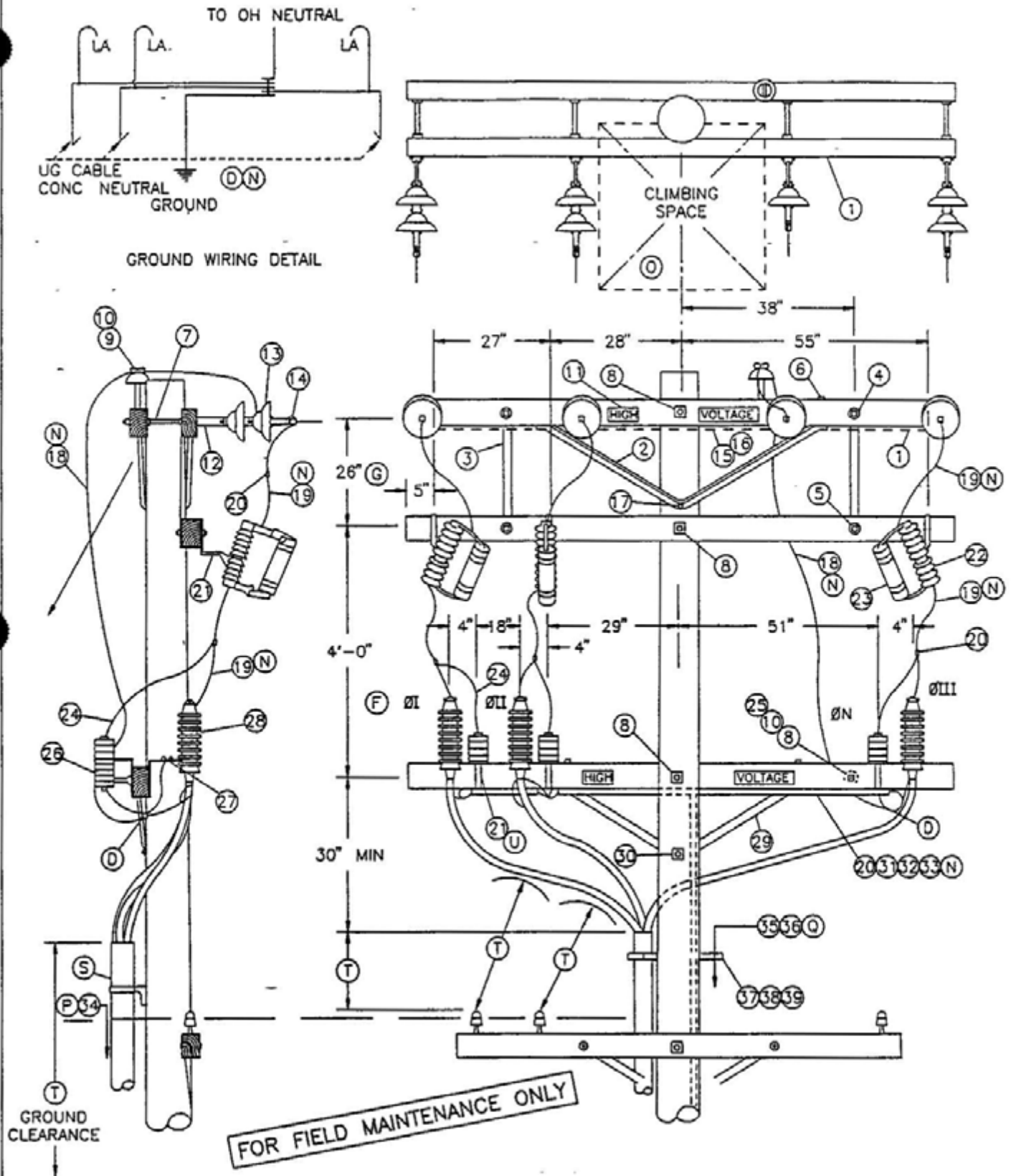
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| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | CROSSARM CABLE POLE, 3Ø, 1/C PER PHASE DEADEND CONSTRUCTION, 12.47KV AND BELOW | | | | |

SCOPE THIS STANDARD SHOWS DEADEND CONSTRUCTION FOR 12.47KV AND BELOW, 3 PHASE CABLE POLE WITH CROSSARM MOUNTED TERMINALS FOR #2/0 AND SMALLER UG CABLE THIS CONSTRUCTION IS TO BE USED IN CONTAMINATION DISTRICT 1 ONLY



ISSUE 1994
 DATE 1-1-93
 APPD *JVB/RS*

SDG&E ELECTRIC STANDARDS
 CROSSARM CABLE POLE, 3Ø, 1/C PER PHASE
 DEADEND CONSTRUCTION, 12.47KV AND BELOW

OH 1499.307
 UG 4299.307
 SUPERCEDES
 4239.1 (1-1-93)

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PAGE NO | STOCK NUMBER |
|------|---|--------------|----------------------|--------------|
| 1 | CROSSARM, 3-3/4" X 5-3/4" X 10' - 0" | 4 | - | 294128 |
| 2 | BRACE, ANGLE, CROSSARM, 5' - 0" | 2 | - | 164128 |
| 3 | BRACE, FLAT, CROSSARM, 28" | (E) 2 | - | 164192 |
| 4 | BOLT, WASHERHEAD, GALV, 3/8" X 4-1/2", 1 ROUND & 1 SPRING WASHER | (E) 2 | 392 | - |
| 5 | BOLT, MACH, GALV, 1/2-1 X 5", 1 ROUND & 1 DOUBLE COIL SPRING WASHER | (E) 2 | 392 | - |
| 6 | BOLT, MACH, GALV, 1/2" X 7", 1 ROUND & 1 DOUBLE COIL SPRING WASHER | (E) 6 | 392 | - |
| 7 | BOLT, SPACE, GALV, 5/8" X (LENGTH AS REQ'D), 2 ROUND, 4 SQUARE & 2 DOUBLE COIL SPRING WASHERS | (B) (E) 4 | 392 | - |
| 8 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 2 SQUARE & 1 DOUBLE COIL SPRING WASHER | (B) (E) 4 | 392 | - |
| 9 | PIN, INSULATOR, STRAIGHT, 12KV, 1" | (B) (E) 1 | - | 532704 |
| 10 | INSULATOR, LINE, 12KV NEUTRAL | (B) (E) 2 | - | 429216 |
| 11 | SIGN, HIGH VOLTAGE & 9 ROOFING NAILS, GALV | (E) 4 | - | 847648 |
| | | (E) - | - | 492224 |
| 12 | CLEVIS, DEAD END, 5/8" BOLT STEEL | (B) (E) 4 | - | 235712 |
| 13 | INSULATOR, SUSPENSION, 12KV, CLEVIS | (B) 7 | 750 | - |
| 14 | CLAMP, STRAIGHT LINE, D.E. | (B) 4 | 741 | - |
| 15 | WIRE, #8, BARE SOLID ANNEALED COPPER | 10' | - | 812928 |
| 16 | STAPLES, FENCE, GALV, 1-1/4" | (E) AS REQ'D | - | 678528 |
| 17 | BOLT, MACH, GALV, 5/3" X (LENGTH AS REQ'D) & 1 DOUBLE COIL SPRING WASHER | (E) 1 | 392 | - |
| 18 | WIRE, COPPER, BARE STRANDED OR ACSR/AW BARE (OH NEUTRAL JUMPER) | (B) (N) 10' | 711-715 | - |
| 19 | WIRE, COPPER, BARE STRANDED (OH JUMPERS) | (N) 18' | 715 | - |
| 20 | CONNECTOR, WIRE, COMPRESSION (SIZE AS REQ'D) | (E) AS REQ'D | 783-787 | - |
| 21 | BRACKET, CUTOFF/ARRESTER, FOR CROSSARM MOUNTING | (E) 6 | - | 166070 |
| 22 | CUTOFF, FOR CURRENT-LIMITING FUSE | 3 | 1212 | - |
| 23 | FUSE, CURRENT-LIMITING (SIZE AS SPECIFIED ON WORK ORDER) | 3 | 1207 | - |
| 24 | WIRE, BARE STRANDED COPPER, #6 | 14' | - | 813536 |
| 25 | PIN, TRANSFORMER ADAPTER, 1" LEAD THREAD | (B) (E) 1 | - | 529248 |
| 26 | ARRESTER, LIGHTNING | 3 | 1247 | - |
| 27 | BRACKET, CROSSARM, TERM (FOR #2 & #2/0 AL CABLE ONLY) | (E) 3 | - | 166060 |
| 28 | TERMINALS, UNDERGROUND CABLE | 3 | 4111 | - |
| 29 | BRACE, ANGLE, CROSSARM, 4' - 0" | 1 | - | 164032 |
| 30 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 SQUARE & 1 DOUBLE COIL SPRING WASHER | (E) 1 | 392 | - |
| 31 | WIRE, BARE STRANDED COPPER (UNDER POTHEAD ARM) (CABLE POLE NEUTRAL) | (N) 10' | 715 | - |
| 32 | CONDUIT, PVC TYPE 2, SCHEDULE 40, 1" | (E) 10' | - | 251200 |
| 33 | STRAPS, PIPE, GALV, 1" & 2 - 6D NAILS, GALV | (E) AS REQ'D | - | 697792 |
| | | (E) - | - | 491552 |
| 34 | RISER CONSTRUCTION | AS REQ'D | 1400/4200 | - |
| 35 | WIRE, #4, BARE STRANDED COPPER | 45' | - | 813760 |
| 36 | UNIT GROUND, COMPLETE | (S) 1 | - | 603136 |
| 37 | BRACKET, LADDER ARM | (E) AS REQ'D | 1404/4204 | 187184 |
| 38 | NUT, CLAMPING CHANNEL, W/SPRING, 1/2" | (E) AS REQ'D | 1404/4204 | 503488 |
| 39 | CHANNEL, DOUBLE GALV, 24" | (E) AS REQ'D | 1404/4204 | 216700 |

FOR FIELD MAINTENANCE ONLY

| CABLE SIZE | UG MACRO UNIT | |
|------------|-------------------------|-----------------|
| | PORCELAIN W/LADDER ARMS | W/O LADDER ARMS |
| 3C #2/0 AL | CP2/0L | CP#2/0 |
| 3C-3#2 AL | CP3#2L | CP-3#2 |

INSTALLATION:

- A NEW CABLE POLES SHALL HAVE A STANDARD DEPTH OF 9' IN MOST CASES THIS WILL REQUIRE A 5' TALLER POLE.
- B REDUCE QUANTITIES AS REQUIRED WHEN NOT USING NEUTRAL.
- C USE THIS CONSTRUCTION FOR 2/0 AND SMALLER UNDERGROUND CABLE.
- D INTERCONNECT OVERHEAD NEUTRAL, TERMINAL BASE, AND CONCENTRIC CABLE NEUTRAL CONDUCTOR TO LIGHTNING ARRESTER GROUND.
- E EXEMPT MATERIAL.
- F OMIT Ø II AND Ø N FOR SINGLE Ø 12KV CABLE POLE, OMIT Ø I AND Ø II FOR SINGLE Ø 6.9KV CABLE POLE.

(N)

| UG CABLE SIZE AWG OR KCMIL, AL | OH JUMPER COND SIZE, AWG OR KCMIL, CU | OH NEUT JUMPER SIZE | | | CABLE POLE NEUT SIZE (CU) UNDER POTHEAD ARM OR TRIPLE TERM BRKT |
|--------------------------------------|---|---------------------|-------|---|---|
| | | CU | AL | | |
| 2 | 4 | 6 | 2 | - | #6 PER PHASE |
| 2/0 | 4 | 6 | 2 | - | #6 PER PHASE |
| 350 | 4/0 | 1/0 | 3/0 | - | #2 PER PHASE |
| 750 | 500 | 4/0 | 336 4 | OR SAME SIZE AS O.H. NEUT CONDUCTOR | 1/0 PER PHASE |
| 1000 | 500 | 4/0 | 336 4 | | 1/0 PER PHASE |

REFERENCE:

- Q ALLOWABLE WORKING AND CLIMBING SPACE - SEE STD. 251.
- P POLE STEPPING - SEE STD. 363/4205.
- R GROUNDING METHODS - SEE PAGE 1002 5
- R SEE STANDARD SECTION 1200/4300 FOR FUSING.
- S RISER POSITIONS - SEE STANDARD 1402/4202.
- T MINIMUM VERTICAL SEPARATION AS PER G.O. 95 - SEE STD. 1406/4206.
- U SEE STANDARD 1407/4207 FOR PORCELAIN TERMINAL MOUNTING BRACKET INSTRUCTIONS AND MATERIALS.

FOR FIELD MAINTENANCE ONLY

DATE 1-1-93
APPD *JLB/RJS*

SDG&E ELECTRIC STANDARDS

CROSSARM CABLE POLE, 3Ø, 1/C PER PHASE
DEADEND CONSTRUCTION, 12.47KV AND BELOW

OH 1499.309
UG 4299.309
SUPERCEDES
4239.3 (1-1-93)


FIELD MAINTENANCE ONLY

REVISION HISTORY:

7/13/2016: All versions prior to 2016 are superseded by their current version found inside the Overhead Construction Standard Manual.

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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
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| A | ORIGINAL ISSUE | JS | IL | MDJ | 7/13/2016 | D | | | | | |

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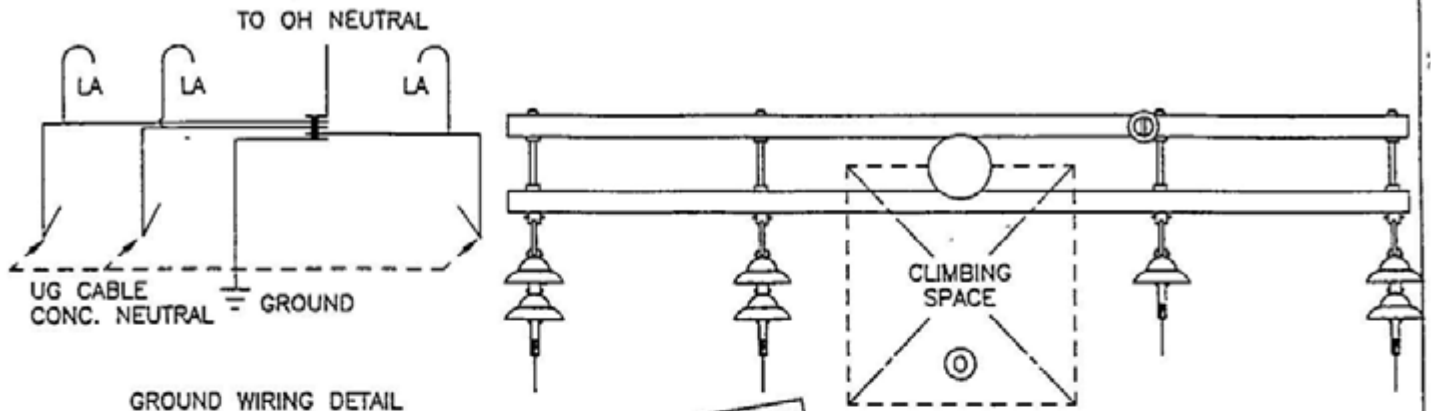
**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD

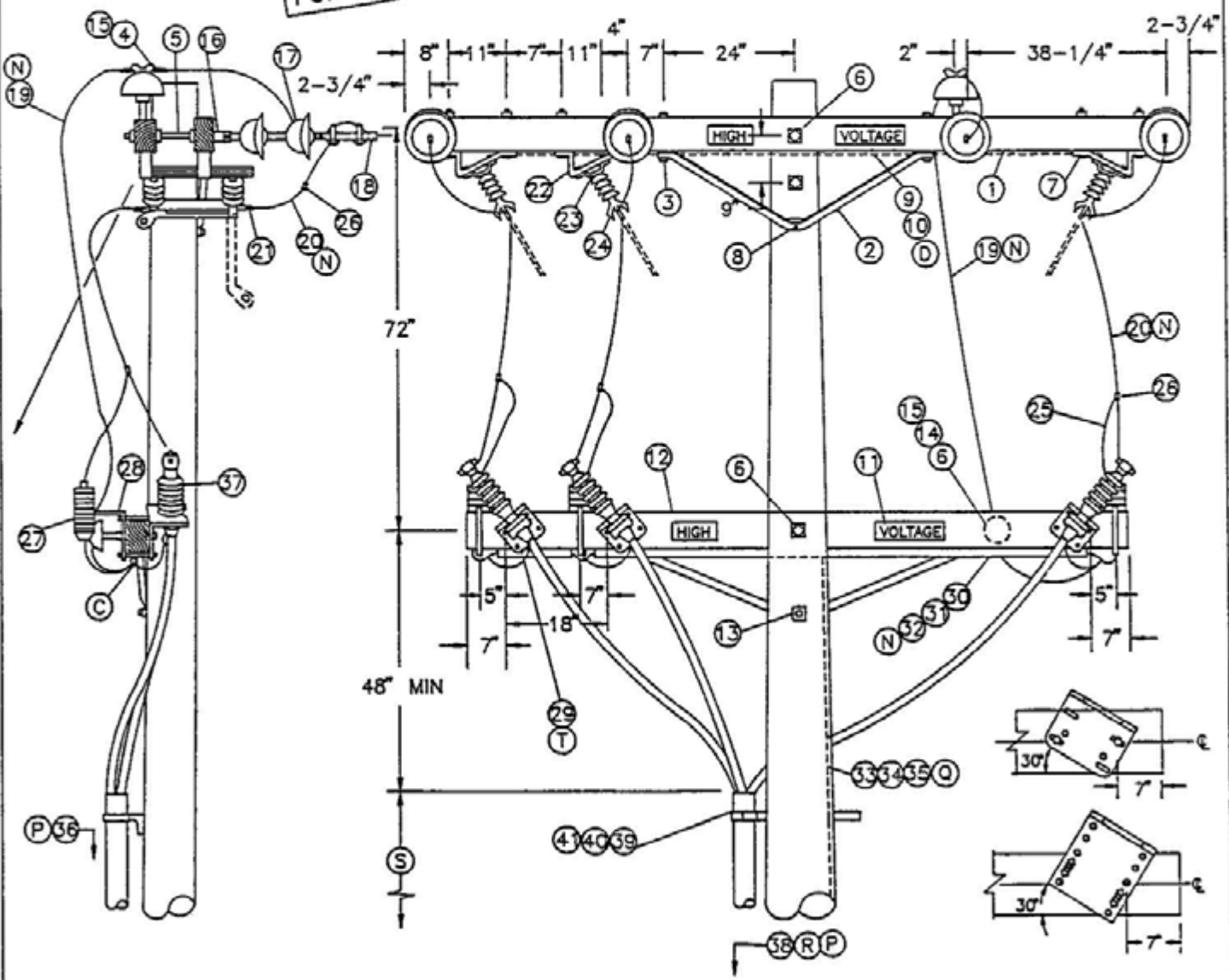
12.47 KV AND BELOW DEAD END CABLE POLE
ARM, 3Ø, 1/C PER Ø, HOOKSTICK SWITCHED

**FMO
UG 4241**

SCOPE: THIS STANDARD SHOWS CABLE POLE CONSTRUCTION USING PORCELAIN TERMINATIONS FOR 750 AND LARGER UNDERGROUND CABLE. (SEE STANDARD 1407/4207 FOR 350 KCMIL TERMINAL MOUNTING INFORMATION).



FOR FIELD MAINTENANCE ONLY



SDG&E ELECTRIC STANDARDS

DATE 1-1-93

APPD *JLB/ROD*

12.47 KV AND BELOW DEAD END CABLE POLE ARM, 3Ø, 1/C PER Ø, HOOKSTICK SWITCHED

OH 1499.401
UG 4299.401
SUPERCEDES
4241.1 (1-1-93)

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR STANDARD | STOCK NUMBER |
|------|--|----------|-----------------|------------------|
| 1 | CROSSARM, 3-3/4" X 5-3/4" X 12'-0" (G) | 2 | - | 294160 |
| 2 | BRACE, ANGLE, CROSSARM, 4'-0" | 3 | - | 164032 |
| 3 | BOLT, MACH, GALV, 1/2" X 7", 1 ROUND AND 1 DOUBLE COIL SPRING WASHER (E) | 6 | 392 | - |
| 4 | PIN, INSULATOR, STRAIGHT, 12KV, 1" LEAD THREAD (F)(E) | 1 | - | 532704 |
| 5 | BOLT, SPACE, GALV, 5/8" X (LENGTH AS REQ'D), 3 SQUARE, 2 ROUND AND 2 DOUBLE COIL SPRING WASHERS (F)(E) | 4 | 392 | - |
| 6 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 2 SQUARE AND 1 DOUBLE COIL SPRING WASHERS (F)(E) | 3 | 392 | - |
| 7 | BOLT, MACH, GALV, 1/2" X 8", 1 ROUND AND 1 DOUBLE COIL SPRING WASHER (E) | 12 | 392 | - |
| 8 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D) AND 1 DOUBLE COIL SPRING WASHER (E) | 1 | 392 | - |
| 9 | WIRE, #8, BARE SOLID ANNEALED COPPER | 15' | - | 812928 |
| 10 | STAPLES, FENCE, GALV, 1-1/4" (E) | AS REQ'D | - | 678528 |
| 11 | SIGN, HIGH VOLTAGE AND 9 ROOFING NAILS, GALV (E) | 4 | - | 647648 492224 |
| 12 | CROSSARM, 3-3/4" X 5-3/4" X 10'-0" | 1 | - | 294128 |
| 13 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 SQUARE AND 1 DOUBLE COIL SPRING WASHER (E) | 1 | 392 | - |
| 14 | PIN, TRANSFORMER LEAD ADAPTER, 1" (F)(E) | 1 | - | 529248 |
| 15 | INSULATOR, 12KV, NEUTRAL (F)(E) | 2 | - | 429216 |
| 16 | CLEVIS, DEAD END, 5/8" BOLT STEEL (F)(E) | 4 | - | 235712 |
| 17 | INSULATOR, SUSPENSION, 12KV, CLEVIS (F) | 7 | 750 | - |
| 18 | CLAMP, STRAIGHT LINE, D.E. (F) | 4 | 741 | - |
| 19 | WIRE, BARE STRANDED CU OR AL (OH NEUT JUMPER) (N)(F) | 12' | 711-715 | - |
| 20 | WIRE, BARE STRANDED COPPER (OH JUMPER) (N) | 25' | 715 | - |
| 21 | TERMINAL, COMPRESSION (E) | 6 | 794-795 | - |
| 22 | BRACKET, DISCONNECT, ANGLE MOUNTING | 6 | - | 166542 |
| 23 | BOLT, MACH, GALV, 3/8" X 3", 2 ROUND & 1 LOCK WASHER (E) | 6 | 392 | - |
| 24 | SWITCH, HOOKSTICK DISCONNECT, 14.4KV, 600 A OR 1200 A | 3 | 1222 | - |
| 25 | WIRE, #6, BARE STRANDED COPPER | 12' | - | 813536 |
| 26 | CONNECTOR, WIRE, COMPRESSION (SIZE AS REQ'D) (E) | AS REQ'D | 783-787 | - |
| 27 | ARRESTER, LIGHTNING (N) | 3 | - | 113248 |
| 28 | BRACKET, CUTOUT/ARRESTER (E) | 3 | - | 166070 |
| 29 | BRACKET, TERMINAL MOUNTING | 3 | - | 166674 |
| 30 | CONDUIT, PVC TYPE 2, SCHEDULE 40, 1" (E) | 10' | - | 251200 |
| 31 | STRAPS, PIPE, GALV, 1" AND 2 - 6D NAILS, GALV (E) | AS REQ'D | - | 697792 491552 |
| 32 | WIRE, BARE STRANDED COPPER (CP NEUT-UNDER POTHEAD ARM) (N) | 15' | 715 | - |
| 33 | WIRE, #4, BARE STRANDED COPPER | 45' | - | 813760 |
| 34 | STAPLES, FENCE, GALV, 1-1/4" (E) | AS REQ'D | - | 678528 |
| 35 | UNIT GROUND, COMPLETE (Q) | 1 | - | 603136 |
| 36 | TAGS, SWITCH NUMBER (E) | 2 | - | 720704 |
| 37 | TERMINALS, UNDERGROUND CABLE | 3 | 4111 | - |
| 38 | RISER CONSTRUCTION | AS REQ'D | 1400/4200 | - |
| 39 | BRACKET, LADDER ARM (E) | AS REQ'D | 1404/4204 | 167184 |
| 40 | NUT, CLAMPING CHANNEL, W/SPRING, 1/2" (E) | AS REQ'D | 1404/4204 | 503488 |
| 41 | CHANNEL, DOUBLE GALV, 24" (E) | AS REQ'D | 1404/4204 | 216700 |

FOR FIELD MAINTENANCE ONLY

| CABLE SIZE | UG MACRO UNIT |
|------------|---------------|
| | W/LADDER ARMS |
| 3C-#350 | CP350L |
| 3C-#750 | CP750L |
| 3C-#1000 | CP-1KL |

| | | |
|---|--|----------------------------|
| OH 1499.402 UG 4299.402 SUPERCEDES 4241.2 (1-1-93) | SDG&E ELECTRIC STANDARDS 12.47KV AND BELOW DEAD END CABLE POLE ARM, 3Φ, 1/C PER Φ, HOTSTICK SWITCHED | DATE 1-1-93 APPD JLB/hv |
|---|--|----------------------------|

INSTALLATION:

- A NEW CABLE POLES SHALL HAVE A STANDARD SETTING DEPTH OF 9' IN MOST CASES THIS WILL REQUIRE A 5' TALLER POLE.
- B THIS CONSTRUCTION TO BE USED WITH 350 KCMIL AND LARGER UNDERGROUND CABLE
- C INTERCONNECT OVERHEAD NEUTRAL, TERMINAL BASE, AND CONCENTRIC CABLE NEUTRAL CONDUCTOR TO LIGHTNING ARRESTER GROUND
- D INTERCONNECT SWITCH AND DEADEND BONDS PER G.O. 95 RULE 52.7D BONDING SHOULD BE DONE IN ACCORDANCE WITH RULE 53.4
- E EXEMPT MATERIAL.
- F REDUCE QUANTITIES AS REQUIRED WHEN NOT USING NEUTRAL.
- G WHEN ADDING THIS CONSTRUCTION TO AN EXISTING POLE WITH A 10' LINE ARM, AND SUFFICIENT POLE HEIGHT EXISTS, INSTALL 10' SWITCH ARMS AND ASSOCIATED HARDWARE BELOW THE LINE ARM TO AVOID CHANGING LINE ARM FROM 10' TO 12' (SEE O H STANDARD 1222, FIG 1-8)

(N)

| UG CABLE SIZE AWG OR KCMIL, AL | OH JUMPER COND SIZE, AWG OR KCMIL, CU | OH NEUT JUMPER SIZE | | | CABLE POLE NEUT SIZE (CU) UNDER POTHEAD ARM OR TRIPLE TERM BRKT |
|--------------------------------------|---|---------------------|-------|--|---|
| | | CU | AL | | |
| 2 | 4 | 6 | 2 | - | #6 PER PHASE |
| 2/0 | 4 | 6 | 2 | - | #6 PER PHASE |
| 350 | 4/0 | 1/0 | 3/0 | - | #2 PER PHASE |
| 750 | 500 | 4/0 | 336 4 | OR SAME SIZE AS O.H NEUT CONDUCTOR | 1/0 PER PHASE |
| 1000 | 500 | 4/0 | 336 4 | | 1/0 PER PHASE |

REFERENCE:

- (O) ALLOWABLE WORKING AND CLIMBING SPACE - SEE STANDARD 251.
- (P) POLE STEPPING - SEE STANDARD 363.
- (Q) GROUNDING METHODS - SEE STANDARD 1002.
- (R) RISER POSITIONS - SEE STANDARD 1402/4202.
- (S) MINIMUM VERTICAL SEPARATION AS PER G.O. 95 - SEE STANDARD 1406/4206
- (T) SEE STANDARD 1407/4207 FOR PORCELAIN AND NON PORCELAIN TERMINAL MOUNTING BRACKET INSTRUCTIONS AND MATERIALS

FOR FIELD MAINTENANCE ONLY

DATE 1-1-93

APPD *JAB/RD*

SDG&E ELECTRIC STANDARDS

12.47KV AND BELOW DEAD END CABLE POLE
ARM, 3Ø. 1/C PER Ø, HOOKSTICK SWITCHED

OH 1499.403
UG 4299.403
SUPERCEDES
4241.3 (1-1-93)

FIELD MAINTENANCE ONLY

REVISION HISTORY:

7/13/2016: All versions prior to 2016 are superseded by their current version found inside the Overhead Construction Standard Manual.

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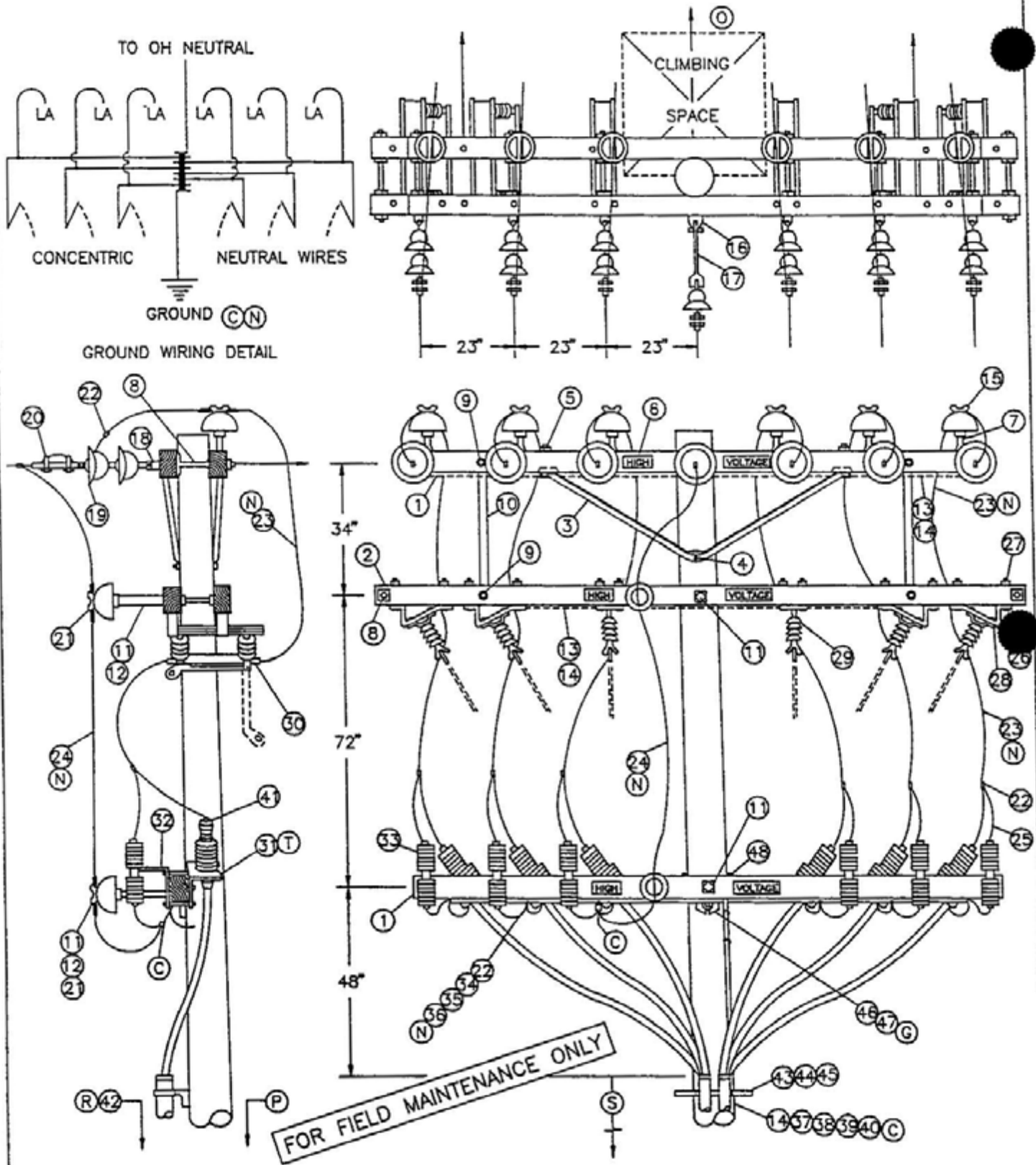
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**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD
12.47KV AND BELOW DEAD END CABLE POLE, 6 OR 7 OH
CONDUCTORS, 1 OR 2 TERMINALS PER CONDUCTOR,
HOOKSTICK SWITCHED

**FMO
UG 4251**

SCOPE: THIS STANDARD SHOWS 6 OR 7 CONDUCTOR DEAD END CABLE POLE WITH HOOKSTICK SWITCHES FOR 750 KCMIL AND LARGER U.G. CABLE. (SEE STANDARD 1407/4207 FOR 350 KCMIL TERMINAL MOUNTING INFORMATION).



BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PG NO | STOCK NUMBER |
|------|---|----------|--------------------|------------------|
| 1 | CROSSARM, 3-3/4" X 5-3/4" X 12'-0" | 3 | - | 294160 |
| 2 | CROSSARM, 3-3/4" X 5-3/4" X 13'-6" | 2 | - | 294368 |
| 3 | BRACE, ANGLE, CROSSARM, 6' | 3 | - | 164160 |
| 4 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 DBL COIL WASH (E) | 1 | 392.1&2 | - |
| 5 | BOLT, MACH, GALV, 1/2" X 7", 1 RD & 1 DBL COIL WASH (E) | 4 | 392.1&2 | - |
| 6 | SIGN, HIGH VOLTAGE & 8 ROOFING NAILS (E) | 6 | - | 847648 492224 |
| 7 | PIN, INSULATOR, STRAIGHT, 12KV, 1" OR 1 3/8" (E) | 6 | - | 532704 532448 |
| 8 | BOLT, SPACE, 5/8" X (LENGTH AS REQ'D), 3 SQ WASH & 2 DBL COIL WASH (E) | 8 | 392.1&2 | - |
| 9 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 RD WASH & 1 DBL COIL WASH (E) | 8 | 392.1&2 | - |
| 10 | BRACE, VERTICAL, 36" (E) | 4 | - | 164224 |
| 11 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 2 SQ FLAT WASH & 1 DBL COIL WASH (E) | 5 | 392.1&2 | - |
| 12 | PIN, TRANSFORMER ADAPTER, 1" LEAD THREAD (D) (E) | 2 | - | 529248 |
| 13 | WIRE, #8, BARE SOLID ANNEALED COPPER | 2 LB | - | 812928 |
| 14 | STAPLES, FENCE, GALV, 1-1/4" | AS REQ'D | - | 678528 |
| 15 | INSULATOR, LINE, 12KV, 1" OR 1-3/8" PIN (D) (E) | 6 | 750 | - |
| 16 | CLEVIS, DEAD END, 3/4" BOLT, STEEL (OPEN TYPE) (D) (E) | 1 | - | 235618 |
| 17 | LINK, EXTENSION, 1/2" X 1-1/2" X 12" (D) | 1 | - | 466240 |
| 18 | CLEVIS, DEAD END, 5/8" BOLT, STEEL (CLOSED TYPE) (E) | 6 | - | 235712 |
| 19 | INSULATOR, SUSPENSION, 12KV (D) | 13 | 750 | - |
| 20 | CLAMP, STRAIGHT LINE, D E (D) | 7 | 742-743 | - |
| 21 | INSULATOR, LINE, 12KV, NEUTRAL (D) (E) | 2 | - | 429216 |
| 22 | CONNECTOR, WIRE, (SIZE & TYPE AS REQ'D) (E) | AS REQ'D | 783-787 | - |
| 23 | WIRE, BARE STRANDED COPPER, (OH JUMPER) (N) | 72' | 715-716 | - |
| 24 | WIRE, BARE STRANDED CU OR AL, (OH NEUT JUMPER) (N) | 12' | 711-716 | - |
| 25 | WIRE, #6, BARE STRANDED COPPER | 25' | - | 813536 |
| 26 | BRACKET, DISCONNECT, ANGLE MOUNTING, 1/4" X 3" | 8 | - | 166542 |
| 27 | BOLT, MACH, GALV, 1/2" X 5", 1 RD & 1 DBL COIL WASH (D) | 24 | 392.1&2 | - |
| 28 | BOLT, MACH, GALV, 3/8" X 3" (E) | 8 | 392.1&2 | - |
| 29 | SWITCH, DISCONNECT, 14.4KV, 600 A OR 1200 A | 6 | 1205 | - |
| 30 | COMPRESSION TERMINALS, CU, 2 HOLE (SIZE AS REQ'D) | 12 | 794-795 | - |
| 31 | BRACKET, POTHEAD MOUNTING | 6 | 1400/4200 | - |
| 32 | BRACKET, CUTOUT/ARRESTER, FOR CROSSARM MOUNTING (E) | 6 | - | 166070 |
| 33 | ARRESTER, LIGHTNING | 6 | 1247 | - |
| 34 | CONDUIT, PVC, SCHEDULE 40, 1-1/2" (E) | 10' | - | 251232 |
| 35 | STRAPS, PIPE, GALV, 1" & 6D NAILS, GALV (E) | AS REQ'D | - | 697792 491552 |
| 36 | WIRE, BARE STRANDED CU, (C.P. NEUTRAL SIZE) (N) | 35' | 715-716 | - |
| 37 | WIRE, #4, BARE STRANDED COPPER | 45' | - | 813760 |
| 38 | STAPLES, MOULDING, GALV, 3" X 1-1/16" X 1/4" (D) (E) | AS REQ'D | - | 678560 |
| 39 | UNIT GROUND, COMPLETE (O) | 1 | - | 603136 |
| 40 | CLAMP, 5/8", GROUND ROD (E) | 2 | - | 230018 |
| 41 | TERMINALS, UNDERGROUND CABLE | 6 | 4111 | - |
| 42 | RISER CONSTRUCTION | AS REQ'D | 1400/4200 | - |
| 43 | BRACKET, LADDER ARM (E) | AS REQ'D | 1404/4204 | 167184 |
| 44 | NUT, CLAMPING CHANNEL, W/SPRING, 1/2" (E) | AS REQ'D | 1404/4204 | 503488 |
| 45 | CHANNEL, DOUBLE GALV, 24" (E) | AS REQ'D | 1404/4204 | 216700 |
| 46 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 SQUARE, 1 ROUND & 1 DOUBLE COIL SPRING WASHER (E) | 1 | 392 | - |
| 47 | GAIN, CROSSARM, BRACELESS (G) | 1 | - | 369598 |
| 48 | BOLT, MACH, GALV, 5/8" X 7", 1 ROUND & 1 DOUBLE COIL SPRING WASHER (E) | 2 | 392 | - |

FOR FIELD MAINTENANCE ONLY

| CABLE SIZE | UG MACRO UNIT PORCELAIN |
|----------------------|-------------------------|
| | W/LADDER ARMS |
| 3C-#750 AL TWO RUNS | 2R750L |
| 3C-#1000 AL TWO RUNS | 2R-1KL |

DATE 1-1-93 APPD *JLB/BJ* SDG&E ELECTRIC STANDARDS 12.47KV AND BELOW DEAD END CABLE POLE, 6 OR 7 OH CONDUCTORS 1 OR 2 TERMINALS PER CONDUCTOR, HOOKSTICK SWITCHED OH 1499.505 UG 4299.505 SUPERCEDES 4251.2 (1-1-93)

INSTALLATION:

- A. NEW CABLE POLES SHALL HAVE A STANDARD DEPTH OF 9' IN MOST CASES THIS WILL REQUIRE A 5' TALLER POLE.
- B. THIS CONSTRUCTION TO BE USED WITH 350 KCMIL AND LARGER UNDERGROUND CABLE.
- Ⓒ INTERCONNECT OVERHEAD NEUTRAL, TERMINAL BASE, AND CONCENTRIC CABLE NEUTRAL CONDUCTOR TO LIGHTNING ARRESTER GROUND.
- Ⓓ REDUCE QUANTITIES AS REQUIRED WHEN NOT USING NEUTRAL .
- Ⓔ EXEMPT MATERIAL.
- Ⓕ INSTRUCTIONS TO INSTALL POTHEAD MOUNTING BRACKETS AND LIGHTNING ARRESTER BRACKETS
- Ⓖ DO NOT CUT GAINS IN THE POLE WHEN INSTALLING THE VERTICALLY MOUNTED SECTIONALIZING SWITCH ARMS. THE GAIN HARDWARE USED HERE MAKE CUT GAINS UNNECESSARY.

Ⓗ

| UG CABLE SIZE AWG OR KCMIL, AL | OH JUMPER COND SIZE, AWG OR KCMIL, CU | OH NEUTRAL JUMPER SIZE CU OR AL | CABLE POLE NEUT SIZE (CU) UNDER POTHEAD ARM OR TRIPLE TERM BRKT |
|--------------------------------------|---|---------------------------------------|---|
| 350 | 4/0 | SAME SIZE | #2 PER PHASE |
| 750 | 500 | AS O.H. NEUT | 1/0 PER PHASE |
| 1000 | 500 | CONDUCTOR | 1/0 PER PHASE |

REFERENCE:

- Ⓒ ALLOWABLE WORKING AND CLIMBING SPACE - SEE STD. 251.
- Ⓓ POLE STEPPING - SEE STD. 363.
- Ⓔ GROUNDING METHODS - SEE PAGE 1002.5.
- Ⓕ RISER POSITIONS - SEE STANDARD 1402/4202.
- Ⓖ MINIMUM VERTICAL SEPARATION AS PER G.O. 95 - SEE STD. 1406/4206.
- Ⓖ SEE STANDARD 1407/4207 FOR PORCELAIN AND NON PORCELAIN TERMINAL MOUNTING BRACKET INSTRUCTIONS AND MATERIALS.

FOR FIELD MAINTENANCE ONLY

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| OH 1499.506 UG 4299.506 SUPERCEDES 4251 3 (1-1-93) | SDG&E ELECTRIC STANDARDS 12.47KV AND BELOW DEAD END CABLE POLE, 6 OR 7 OH CONDUCTORS 1 OR 2 TERMINALS PER CONDUCTOR, HOOKSTICK SWITCHED | DATE 1-1-93 APPD <i>JLB/RSE</i> |
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OH1487/UG4287 FIELD MAINTENANCE ONLY

ALL VERSIONS IN FMO ARE SUPERSEDED BY THEIR CURRENT VERSION FOUND INSIDE THE OVERHEAD CONSTRUCTION STANDARD MANUAL.

REVISION HISTORY:

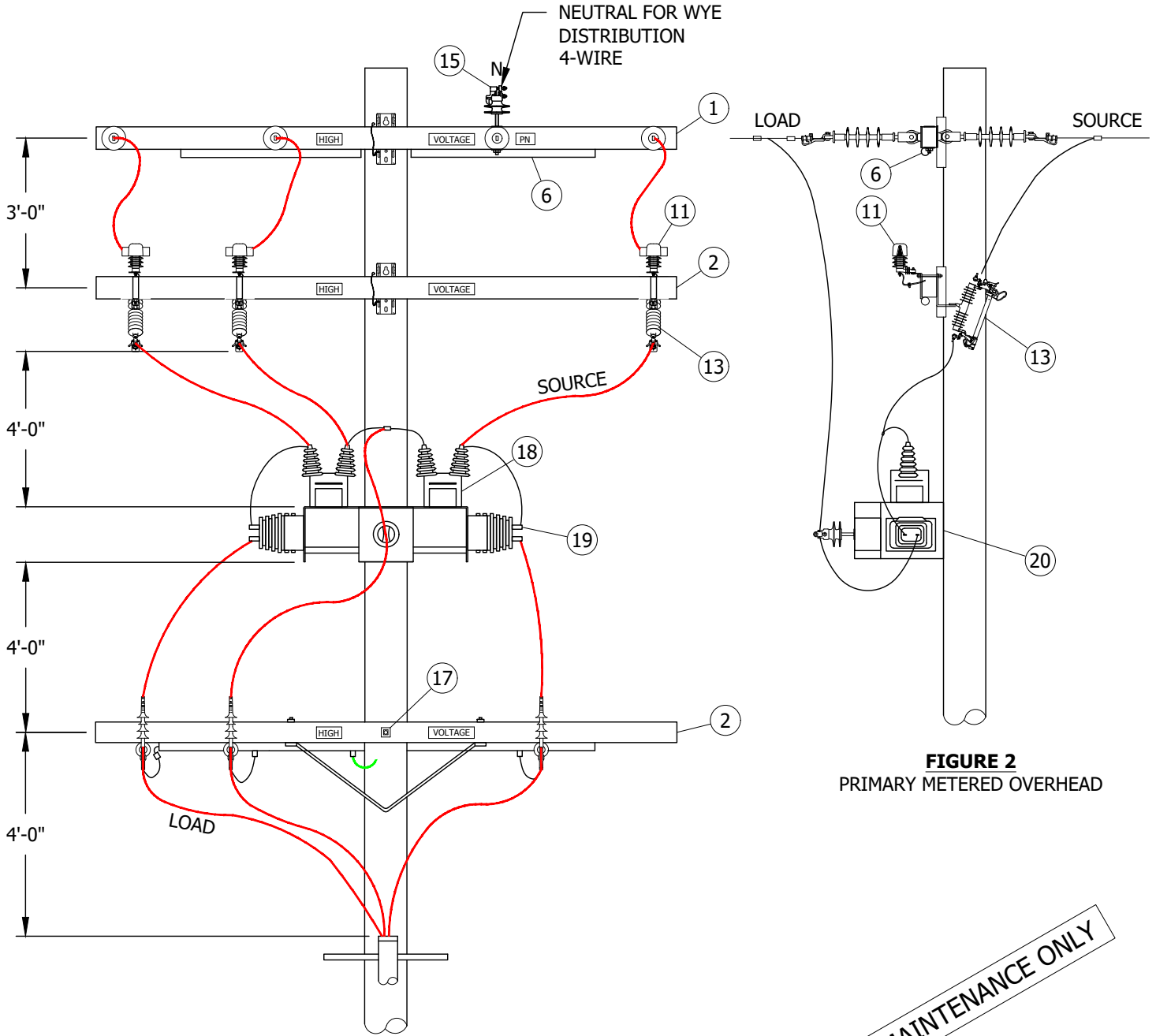
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| SHEET 1 OF 1 | Indicates Latest Revision | Completely Revised | <input checked="" type="checkbox"/> New Page | Information Removed | FMO OH1487 UG4287 |
| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | REVISED CT & PT POLETOP METERING INSTALLATION, 12KV, O.H. & U.G. SERVICES | | | | |

SCOPE: PRIMARY METERED DISTRIBUTION POLE: THIS STANDARD ILLUSTRATES A PRIMARY METERED OVERHEAD AND UNDERGROUND DISTRIBUTION POLE AND HARDWARE.



FIELD MAINTENANCE ONLY

INSTALLATION: NONE

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1 OF 2

X Indicates Latest Revision

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SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

REVISED CT & PT POLETOP METERING INSTALLATION,
12KV, O.H. & U.G. SERVICES

FMO
OH1487.1
UG4287.1

BILL OF MATERIALS:

| ITEM | DESCRIPTION (a) | QUANTITY | STANDARD PAGE | STOCK NUMBER | DESIGN UNITS |
|------|--|----------|---------------|--------------|------------------|
| 1 | CROSSARM, FG, DEADEND | AS REQ'D | - | AS REQ'D | - |
| 2 | CROSSARM, FG, TANGENT, EQUIPMENT | AS REQ'D | - | AS REQ'D | - |
| 3 | DBL ARRESTOR/CUTOUT BRACKET | 3 | - | S165422 | - |
| 4 | 28" STRAP BRACE | 2 | - | S164192 | - |
| 5 | LIGHTNING ARRESTOR GROUND STRAP | 3 | - | S698754 | - |
| 6 | 1" PVC | AS REQ'D | - | S251200 | - |
| 7 | #6 BS | AS REQ'D | - | S813536 | - |
| 8 | #4 BS | AS REQ'D | - | S813764 | - |
| 9 | #4 PVC COVERED GROUND WIRE | AS REQ'D | - | S812480 | - |
| 10 | GROUND WIRE STAPLES | AS REQ'D | - | S678562 | - |
| 11 | 12KV LIGHTNING ARRESTER | 3 | 1247 | S113248 | LA12 |
| 12 | CUTOUT, INTERCHANGEABLE, NON-PORC | 3 | - | AS-REQ'D | - |
| | | | | | ZONE 1 ZONE 2 |
| 13 | FUSE HOLDER, SMU, FOR SMD30 CUTOUT BODY (100A) | 3 | - | S368674 | - |
| 14 | STAND - OFF PIN, 1" | AS REQ'D | - | S529248 | - |
| 15 | INSULATOR, VICE-TOP | 1 | - | S429060 | IPC1 |
| 16 | FUSE (SIZE AS REQ'D) | AS REQ'D | - | AS REQ'D | - |
| 17 | SPACE BOLTS 5/8" X 26", SQUARE WASHERS & NUTS | AS REQ'D | 392 | - | - |
| 18 | 12KV POTENTIAL TRANSFORMER | AS REQ'D | - | - | - |
| 19 | 12KV CURRENT TRANSFORMER | AS REQ'D | - | - | - |
| 20 | P.T./C.T. BRACKET | 1 | - | S165380 | - |
| 21 | C/O / LADDER BRACKET | AS-REQ'D | - | S166070 | - |
| 22 | INDICATOR, CUTOUT, FIREFLY | 3 | - | S423606 | - |
| 23 | COVER, CUTOUT, AVIAN PROTECTION | 3 | - | S298682 | - |

NOTES:

- I. DISTRIBUTION CONSTRUCTION CREW TO INSTALL ALL HIGH SIDE CONNECTORS, JUMPERS AND EQUIPMENT. AMO TO INSTALL LOW SIDE CONNECTORS AND CONDUCTORS.
- II. MAXIMUM WEIGHT FOR PT AND CT TRANSFORMERS IS 85 LBS. EACH.

REFERENCE:

- (a) THE ITEMS CONTAINED IN THE BILL OF MATERIALS REPRESENT WOOD CONSTRUCTION STANDARD, FOR STEEL CONSTRUCTION SEE CURRENT STANDARD.
- b. FOR GROUNDING SEE STANDARD 1002.
- c. CONTACT EMO FOR FUSING CORDINATION AND PT CT SELECTION.

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 SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS
 REVISED CT & PT POLETOP METERING INSTALLATION,
 12KV, O.H. & U.G. SERVICES

**FMO
OH1487.2
UG4287.2**

4300 - FUSES, FAULT
INDICATORS

4300 - FUSES, FAULT
INDICATORS

PAGE

SUBJECT

| | |
|------|---|
| 4303 | SECONDARY CURRENT-LIMITING FUSES |
| 4305 | 4KV, 12KV CUTOFF ASSEMBLY AND FUSE INSTALLATION |
| 4307 | FUSES USED IN OVERHEAD CONSTRUCTION |
| 4308 | ELECTRONIC SECTIONALIZER |

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| C | 4308 MOVED TO FMO | GLC | RSL | JES | CZH | 12/12/2021 | F | | | | | | |
| B | EDITORIAL CHANGES | - | JCE | JES | CZH | 04/21/2019 | E | | | | | | |
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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | FUSES, FAULT INDICATORS FMO TABLE OF CONTENTS | | | | |


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REVISION HISTORY:

7/13/2016: All versions prior to 2016 are superseded by their current version found inside the Overhead Construction Standard Manual.

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| <p>SHEET 1 OF 1</p> |  Indicates Latest Revision | <input type="checkbox"/> Completely Revised | <input type="checkbox"/> New Page | <input type="checkbox"/> Information Removed | <p>FMO UG 4303</p> |
| | <p>SDG&E ELECTRIC UNDERGROUND STANDARD</p> | | | | |
| | <p>SECONDARY CURRENT-LIMITING FUSES</p> | | | | |

SCOPE: THIS STANDARD DESCRIBES THE APPLICATION OF SECONDARY CURRENT-LIMITING FUSE PROTECTION.

SECONDARY CURRENT-LIMITING FUSES, SUCH AS THOSE HOUSED IN THE EKSTROM LIMITER ADAPTOR, ARE TO BE APPLIED TO RESIDENTIAL TYPE SERVICES WHENEVER THE AVAILABLE FAULT CURRENT EXCEEDS THE INTERRUPTING RATING OF THE SERVICE ENTRANCE EQUIPMENT. THE EKSTROM ADAPTOR IN STOCK NUMBER 463402 MAY BE INSTALLED ON 120/240 VOLT, SINGLE-PHASE SERVICES UP THROUGH 125 AMPERES. IT PLUGS IN BETWEEN THE CUSTOMER'S METER SOCKET AND THE COMPANY'S METER. CONTACT THE PROTECTION ENGINEER FOR LARGER SERVICES OR OTHER VOLTAGE REQUIREMENTS. CHECK ALL ELECTRICAL CONNECTIONS ON ADAPTOR FOR TIGHTNESS DURING INSTALLATION.

THESE SECONDARY CURRENT-LIMITING FUSES ARE TO BE INSTALLED BY THE LINE CREWS ON SCHEDULED WORK. IF THE TRANSFORMER IS CHANGED OUT DUE TO TROUBLE, THE SECONDARY CURRENT-LIMITING FUSES SHALL BE ADDED THE FOLLOWING WORKING DAY.

CHANGEOUT OF EXISTING STATIONS

THE FOLLOWING GUIDELINES APPLY TO CHANGEOUTS OF EXISTING TRANSFORMERS, BASED UPON CUSTOMER'S EQUIPMENT WHICH MAY HAVE A MAXIMUM INTERRUPTING CAPABILITY OF 5000 AMPS.

1 SINGLE-FAMILY RESIDENTIAL AND DUPLEX APPLICATIONS.

ALL SERVICES CONNECTED DIRECTLY TO THE SECONDARY TERMINALS OF TRANSFORMERS RATED OTHER THAN 6.9KV SHALL HAVE CURRENT-LIMITING FUSES APPLIED AT EACH METER SOCKET WHENEVER THE TRANSFORMER AT AN EXISTING INSTALLATION IS INCREASED IN SIZE TO 50, 75, OR 100 KVA. SEE NOTE 1

2 INDIVIDUALLY METERED MOBILE HOMES-

ALL SERVICES CONNECTED DIRECTLY TO THE SECONDARY TERMINALS OF TRANSFORMERS RATED OTHER THAN 6.9KV SHALL HAVE CURRENT-LIMITING FUSES APPLIED AT EACH METER SOCKET

NEW INSTALLATIONS

THE FOLLOWING GUIDELINES APPLY TO NEW INSTALLATIONS, BASED UPON CUSTOMER'S EQUIPMENT WHICH SHOULD HAVE A MINIMUM INTERRUPTING CAPABILITY OF 10,000 AMPS. THE TABLE BELOW SPECIFIES THE MINIMUM CONDUCTOR LENGTH REQUIRED TO LIMIT THE SHORT CIRCUIT CURRENTS TO LESS THAN 10,000 AMPS FOR VARIOUS SINGLE-PHASE TRANSFORMERS. THE LIMITER ADAPTOR SHALL BE APPLIED TO THOSE SERVICES WHICH DO NOT MEET THIS REQUIREMENT

| CONDUCTOR SIZE BASED ON | STOCK NUMBER | MINIMUM CONDUCTOR LENGTH TO LIMIT ISC TO 10,000 AMPS | | | |
|----------------------------|-----------------|---|--------|--------|---------|
| | | TRANSFORMER SIZE | | | |
| | | 25 KVA | 50 KVA | 75 KVA | 100 KVA |
| UNDERGROUND CABLE #2 | 197504, 196832 | 0 | 10 | 26 | 32 |
| UNDERGROUND CABLE 1/0 | 197472, 196768 | 0 | 17 | 40 | 50 |
| UNDERGROUND CABLE 3/0 | 197536, 196928 | 0 | 23 | 60 | 74 |
| UNDERGROUND CABLE 350 | 197568 | 0 | 35 | 94 | 119 |
| UNDERGROUND CABLE 500 | - | 0 | 55 | 135 | 173 |

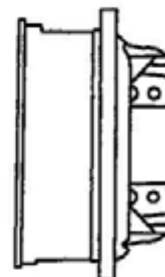
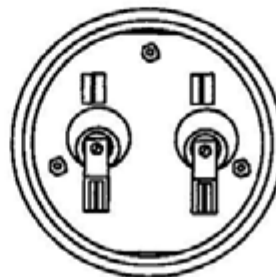
NOTES:

- INSTALLATIONS WHICH ARE DIFFICULT TO PROTECT SHOULD BE REFERRED TO DISTRICT ENGINEERING. CURRENT-LIMITING FUSES MAY NOT BE REQUIRED IF SUFFICIENT SECONDARY CABLE LIMITS THE FAULT DUTY TO SERVICE EQUIPMENT CAPABILITY.
- REPLACEMENT LIMITERS (FUSES) ARE STOCK NUMBER 365643.

CURRENT-LIMITING FUSES

FOR FIELD MAINTENANCE ONLY

EKSTROM ADAPTOR



SDG&E ELECTRIC STANDARDS

SECONDARY CURRENT-LIMITING FUSES

DATE 9-1-83
APPD JEL / DRH

4399.001
SUPERSEDES
4303 (1-1-97)

OH1212 UG4305 FIELD MAINTENANCE ONLY

ALL VERSIONS LISTED IN FMO ARE SUPERSEDED BY THEIR CURRENT VERSION FOUND INSIDE THE OVERHEAD AND UNDERGROUND CONSTRUCTION STANDARD MANUAL.

REVISION HISTORY:

- 06/05/2023: MOVED SHEET 2 "CUTOUT ASSEMBLY SMD20" TO FMO
- 12/12/2021: NUMBER CHANGE FROM UG4306 TO UG4305
- 04/21/2019: MOVED TO FMO

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| C | MOVED TO FMO | ARC | MPC | CWB | KRG | 06/05/2023 | F | | | | | | |
| B | EDITORIAL CHANGES | GLC | RSL | JES | CZH | 12/12/2021 | E | | | | | | |
| A | ORIGINAL ISSUE | - | JCE | JS | CZH | 04/21/2019 | D | | | | | | |

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| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | 4KV, 12KV CUTOUT ASSEMBLY AND FUSE INSTALLATION | | | | | |

SCOPE: THIS STANDARD SHOWS THE SMD20 CUTOUT ASSEMBLY, SECOND CHOICE FOR USE ON THE 4KV AND 12KV ELECTRIC SYSTEM IN TIER 2 & TIER 3 AREAS.

CAUTION:

* NOT FOR USE ON CABLE POLES DUE TO POSSIBILITY OF CONTACT WITH PHASE WIRES WHEN OPENED.

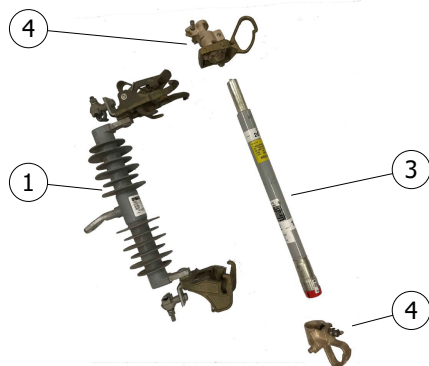


FIGURE 1
CUTOUT BODY WITH FUSE

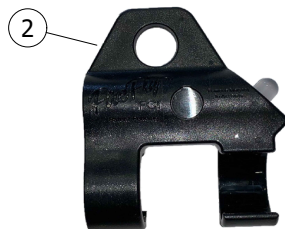


FIGURE 2
FIREFLY



FIGURE 3
ASSEMBLED CUTOUT BODY WITH FUSE AND FIREFLY

INSTALLATION: NONE

BILL OF MATERIALS:

| ITEM | DESCRIPTION | QUANTITY | STANDARD PAGE | STOCK NUMBER | DESIGN UNITS |
|------|---|----------|---------------|--------------|--------------|
| 1 | FUSEHOLDER, POLYMER BODY, WITH END FITTINGS FOR SMU FUSE BARREL SMD20, CURRENT RANGE UP TO 200A (VII) | -- | -- | S298022 | SMD20 |
| 2 | FIREFLY FOR 100A AND SMALLER SMU/CMU FUSES (C) | -- | -- | S423608 | |
| 3 | FUSE, BARREL, REFER TO SIZES | -- | 1207/4307 | -- | -- |
| 4 | FITTINGS, END, UPPER & LOWER, END FOR SMU FUSES (III a) | -- | -- | S368660 | -- |

NOTES:

- I. KEARNY TYPE HX CUTOUTS ARE NO LONGER AVAILABLE. FOR APPLICATIONS IN TIER 2 & TIER 3 AREAS, SMD20 CUTOUT BODY AND SMU FUSES WILL NOW BE USED.
- II. THE PACKAGE CONTAINS THE SMD20 CUTOUT BODY AND UPPER AND LOWER END FITTINGS.
- (III) TROUBLESHOOTER: END FITTINGS CAN BE ORDERED SEPARATELY.
- IV. DO NOT DISCARD END FITTING FROM AN ASSEMBLED USED OR BLOWN FUSE.
- V. WHEN ASSEMBLING END FITTINGS TO THE FUSE BARREL, MAKE SURE NOT TO OVER TIGHTEN BOLTS. FINGER TIGHTEN AND HALF A TURN WITH A WRENCH WILL SUFFICE.
- VI. USE ON 2.4KV - 12KV.
- (VII) CROSSARM MOUNTING BRACKETS ARE INCLUDED WITH THE MATERIALS SUPPLIED BY THE OH DESIGN UNITS (USED ON DESIGN BY LOCATION JOBS). BRACKETS MUST BE ORDERED SEPARATELY ON MANUALLY PREPARED FIELD MEMO JOBS. (b)
 - a. DOUBLE CUTOUT & ARRESTER = S165454 (X)
 - b. CUTOUT OR ARRESTER = S165452 (X)
- (X) THIS ITEM IS EXEMPT.

REFERENCE:

- (a) SEE OH1207UG4307.
- (b) SEE OH397.
- (c) SEE OH1208.

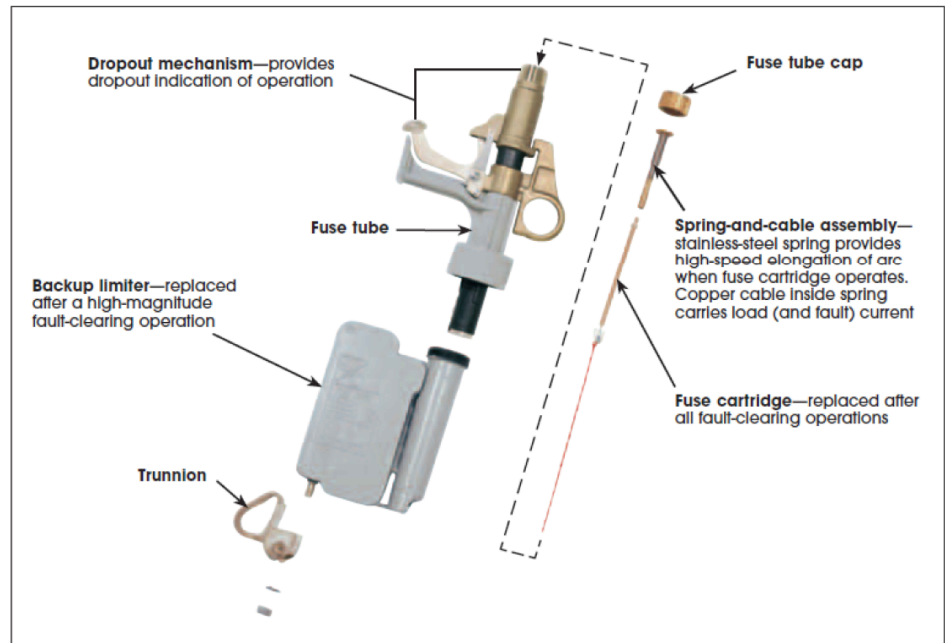
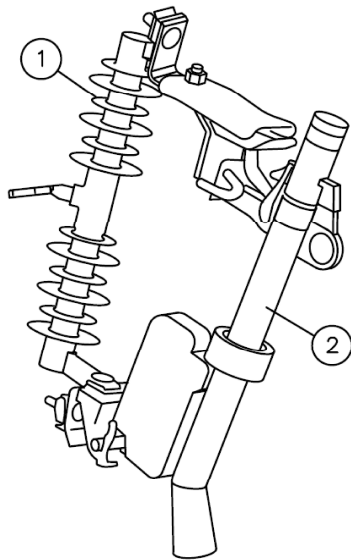
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| D | FORMATTING | EDM | JIK | - | - | 09/28/2020 | G | MOVED TO FMO | ARC | MPC | CWB | KRG | 06/05/2023 |
| C | DRAWING UPDATE | - | RSL | JES | CAH | 03/09/2020 | F | BILL OF MATERIALS UPDATE | EDM | CWB | JES | KRG | - |
| B | DRAWING UPDATE | - | JCE | JS | CAJ | 04/01/2018 | E | EDITORIAL CHANGES | EDM | CWB | JES | CZH | 09/30/2021 |

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| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | CUTOUT ASSEMBLY SMD20 | | | | |

SCOPE: THIS STANDARD SHOWS THE FAULT TAME FUSE TUBE AND BACK-UP LIMITER, AND IT'S APPLICATION .



BILL OF MATERIALS:

| ITEM | CURRENT RANGE | DESCRIPTION | STOCK NUMBER | ASSEMBLY | | ASSEMBLY |
|------|-----------------|---|--------------|----------|----|----------|
| | | | | UNITS | UG | |
| 1 | 0 - 300A | INTERCHANGEABLE CUTOUT BODY, WITHOUT FUSEHOLDER (III) | S298020 | -- | | NPCO |
| 2 | FUSE THRU 20A 5 | FAULT TAME, INCLUDES FUSE TUBE & BACK-UP LIMITER (I) | S365820 | -- | | FTAMER |

NOTES:

- (I) SEE TABLE 1 FOR FUSES.
- II. CUTOUTS SHALL BE BONDED IF INSTALLED IN CONTAMINATION DISTRICT 1 AS SHOWN IN OH STANDARD 287.
- (III) CROSS ARM MOUNTING BRACKET ARE INCLUDED WITH THE MATERIALS SUPPLIED BY THE OH ASSEMBLY UNITS (USED ON "DESIGN BY LOCATION" JOBS). BRACKETS MUST BE ORDERED SEPARATELY ON MANUALLY PREPARED FIELD MEMO JOBS.
 - DOUBLE CUTOUT & ARRESTER MOUNTING BRACKET, USE S165442.
 - CUTOUT OR ARRESTER MOUNTING BRACKET, USE S166070.
- IV. USE ON 6.9KV - 12KV ONLY.

REFERENCE:

- e. SEE ELECTRIC STANDARD PRACTICE 321 S&C FAULT TAME® FUSE LIMITER.
- f. SEE S&C FAULT TAME INSTALLATION INSTRUCTIONS 451-500.

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| B | MOVED TO FMO | - | JCE | JES | CZH | 04/21/2019 | E | | | | | | |
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| | 4KV, 12KV CUTOUT ASSEMBLY AND FUSE INSTALLATION | | | | |
| FMO OH1212.1 UG4305.1 | | | | | |

OH1207 UG4307 FIELD MAINTENANCE ONLY

ALL VERSIONS LISTED IN FMO ARE SUPERSEDED BY THEIR CURRENT VERSION FOUND INSIDE THE OVERHEAD AND UNDERGROUND CONSTRUCTION STANDARD MANUAL.

REVISION HISTORY:

03/04/2024: TABLE 6 AND 7 MOVED TO FMO.

12/12/2021: NUMBER CHANGE FROM UG4308 TO UG4307.

04/21/2020: MOVED TO FMO.

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| | FUSES USED IN OVERHEAD CONSTRUCTION | | | | |

SCOPE: THIS STANDARD SHOWS VARIOUS TYPES OF FUSES USED ON THE OVERHEAD DISTRIBUTION SYSTEM.

TABLE 6:

| SMU FUSES FOR SMD20 CUTOUT BODY (I)(II) | | | | |
|---|---------|--------------|--------------|------------|
| SIZE (AMPS) | TYPE | STOCK NUMBER | DESIGN UNITS | |
| | | | UG | OH |
| 5 | SMU-5 | S368550 | 5SMU | SMU5 (D) |
| 10 | SMU-10 | S368552 | 10SMU | SMU10 (D) |
| 15 | SMU-15 | S368554 | 15SMU | SMU15 (D) |
| 20 | SMU-20 | S368556 | 20SMU | SMU20 (D) |
| 25 | SMU-25 | S368662 | 25SMU | SMU25 (D) |
| 30 | SMU-30 | S368664 | 30SMU | SMU30 (D) |
| 40 | SMU-40 | S368666 | 40SMU | SMU40 (D) |
| 50 | SMU-50 | S368668 | 50SMU | SMU50 (D) |
| 65 | SMU-65 | S368670 | 65SMU | SMU65 (D) |
| 80 | SMU-80 | S368672 | 80SMU | SMU80 (D) |
| 100 | SMU-100 | S368674 | 100SMU | SMU100 (D) |
| 125 | SMU-125 | S368676 | 125SMU | SMU125 |
| 150 | SMU-150 | S368678 | 150SMU | SMU150 |
| 200 | SMU-200 | S368680 | 200SMU | SMU200 |

TABLE 7:

| END FITTINGS FOR SMU FUSES | |
|----------------------------|--------------|
| DESCRIPTION | STOCK NUMBER |
| FUSE END FITTINGS | S368660 |

INSTALLATION:

- (D) CORRESPONDING FIREFLY SHOULD BE INSTALLED WITH APPLICABLE NEW FUSE INSTALLATION OR FUSE REPLACEMENT EXCEPT WHEN FUSING TRANSFORMERS. (e)

BILL OF MATERIALS: NONE

NOTES:

- (I) THESE FUSES ARE CAL-FIRE EXEMPT. THEY WILL BE USED IN TIER 2 & TIER 3 AREAS.
- (III) SMU FUSES ARE NOT TO BE LEFT HANGING IN THE OPEN POSITION. (f)

REFERENCE:

- (e) SEE OH1208 FOR FIREFLY FUSED CUTOUT INDICATOR.
- (f) SEE S&C INSTRUCTION SHEET 252-550.

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| C | | | | | | | F | | | | | | |
| B | | | | | | | E | | | | | | |
| A | MOVED TO FMO | GLC | MPC | JAS | KRG | 03/04/2024 | D | | | | | | |

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| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | FUSES USED IN OVERHEAD CONSTRUCTION | | | | |

TABLE 6

| FAULT TAMER FUSE LIMITERS TCC 123-8 | | | |
|-------------------------------------|-----------------------------|--------------|---------------|
| SIZE (AMPS) | TYPE | STOCK NUMBER | ASSEMBLY UNIT |
| 5 | FAULT TAMER | S365810 | FT5 |
| 10 | FAULT TAMER | S365811 | FT10 |
| 15 | FAULT TAMER | S365812 | FT15 |
| 20 | FAULT TAMER | S365813 | FT20 |
| N/A | FAULT TAMER BACK-UP LIMITER | S365822 | FTBL |

NOTES:

I. THESE FUSES ARE CAL-FIRE EXEMPT. THEY WILL BE USED IN TIER 2 & TIER 3 AREAS.

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| C | MOVED TO FMO | - | JCE | JES | CZH | 04/21/2019 | F | | | | | | |
| B | EDITORIAL CHANGES | - | KN | JS | MDJ | 07/25/2017 | E | | | | | | |
| A | UPDATED MATERIALS | - | DS | JS | MDJ | 01/25/2017 | D | EDITORIAL CHANGES | GLC | RSL | JES | CZH | 12/12/2021 |

| | | | | | | |
|-------------------------|--|---------------------------|--------------------|----------|---------------------|--------------------------------------|
| SHEET 2 OF 2 | X | Indicates Latest Revision | Completely Revised | New Page | Information Removed | FMO OH1207.2 UG4307.2 |
| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | FUSES USED IN OVERHEAD CONSTRUCTION | | | | | |

OH1215 UG4308 FIELD MAINTENANCE ONLY

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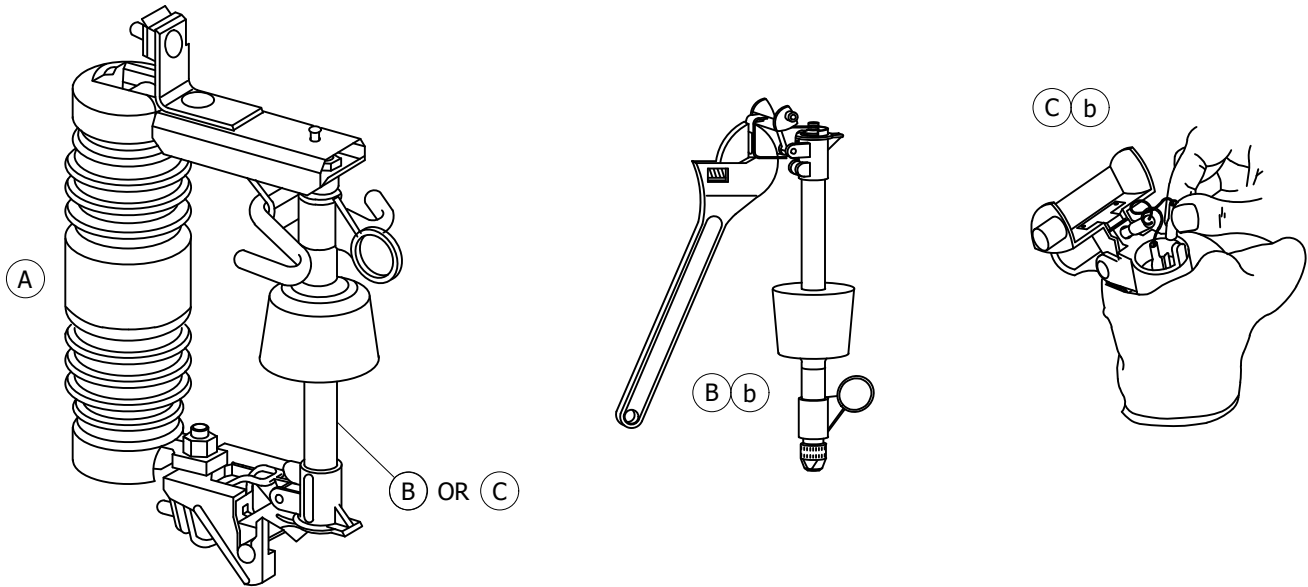
12/12/2021: MOVED TO FMO

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| B | | | | | | | E | | | | | | |
| A | ORIGINAL ISSUE | GLC | RSL | JES | CZH | 12/12/2021 | D | | | | | | |

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| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | ELECTRONIC SECTIONALIZER | | | | |

SCOPE: THIS STANDARD SHOWS VARIOUS ELECTRONIC SECTIONALIZERS AND THEIR GENERAL APPLICATION.



INSTALLATION:

- (A) THE ELECTRONIC SECTIONALIZERS ONLY FIT THE INTERCHANGEABLE CUTOUTS, EITHER STANDARD LEAKAGE OR HIGH LEAKAGE - SEE STANDARD 1212/4306.
- (B) THE RESETTABLE ELECTRONIC SECTIONALIZER IS THE ONLY TYPE CURRENTLY BEING PURCHASED. SEE TABLE 1 FOR DETAILS.
- (C) THE NON-RESETTABLE ELECTRONIC SECTIONALIZER IS NO LONGER PURCHASED. A REPLACEMENT ACTUATOR IS AVAILABLE FOR MAINTENANCE OF THOSE SECTIONALIZERS IN THE FIELD - SEE TABLE 2. IF A NON-RESETTABLE ELECTRONIC SECTIONALIZER BECOMES DAMAGED OR IS NO LONGER USABLE, IT SHOULD BE REPLACED WITH A RESETTABLE TYPE.

TABLE 1 RESETTABLE ELECTRONIC SECTIONALIZER (B) (a)

| SIZE (AMPS) | COUNTS | MANUFACTURER | CATALOG NUMBER | STOCK NUMBER | ASSEMBLY UNITS OVERHEAD | ASSEMBLY UNITS UNDERGROUND |
|-------------|--------|--------------|----------------|--------------|-------------------------|----------------------------|
| 100 | 2 | A.B. CHANCE | C740-272T | S634100 | ES100 | 100ES |
| 140 | 2 | A.B. CHANCE | C740-282T | S634102 | ES140 | 140ES |
| 200 | 2 | A.B. CHANCE | C740-292T | S634104 | ES200 | 200ES |

TABLE 2 NON-RESETTABLE ELECTRONIC SECTIONALIZER (REPLACEMENT ACTUATOR) (C) (a)

| SIZE (AMPS) | MANUFACTURER | CATALOG NUMBER | STOCK NUMBER |
|-------------|--------------|----------------|--------------|
| 100 - 200 | A.B. CHANCE | C700-1729 | S101522 |

NOTES: NONE

REFERENCE:

- (a) FOR APPLICATION OF ELECTRONIC SECTIONALIZERS - SEE DESIGN MANUAL PAGE 6205.3.
- (b) FOR OPERATIONAL INFORMATION - SEE ELECTRIC STANDARD PRACTICE 318.

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| B | DRAWING UPDATE | - | PEI | - | - | 02/18/2019 | E | | | | | | |
| A | ORIGINAL ISSUE | - | - | PTA | MC | 10/08/2010 | D | | | | | | |

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| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | ELECTRONIC SECTIONALIZER | | | | | |

4400 - LIGHTING

4400 - LIGHTING

PAGE

SUBJECT

| | |
|------|--|
| 4410 | HIGH INTENSITY DISCHARGE LAMPS |
| 4411 | REPLACEMENT REFRACTORS |
| 4420 | MERCURY VAPOR CONVENTIONAL LUMINAIRES AND REPLACEMENT REFRACTORS |
| 4421 | HIGH PRESSURE AND LOW PRESSURE SODIUM VAPOR LUMINAIRE, REPLACEMENT BALLAST AND STARTER |

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| C | REFORMAT (ADDED UG4421) | EDM | JIK | - | - | 01/18/2022 | F | | | | | | |
| B | EDITORIAL CHANGES | GLC | JIK | GLW | CZH | 06/08/2020 | E | | | | | | |
| A | ORIGINAL ISSUE | - | JS | TR | MDJ | 07/25/2016 | D | UG4410 MOVED TO FMO | GLC | MRF | MRF | KRG | 07/20/2023 |

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | LIGHTING FMO TABLE OF CONTENTS | | | | |

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| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | | | | | | |
| | HIGH INTENSITY DISCHARGE LAMPS | | | | | | | | | | |

SCOPE: THIS STANDARD DESCRIBES ALL THE NECESSARY INFORMATION WHEN ORDERING LAMPS FOR MERCURY VAPOR, HIGH PRESSURE AND LOW PRESSURE SODIUM LUMINARIES.

INSTALLATION:

- (A) CLEAR MERCURY VAPOR LAMPS.
- (B) DELUXE WHITE OR PHOSPHOR COATED LAMPS, IDENTIFIED BY 'DX'.
- C. RATING BASED ON 16,000 HOURS ON LAMPS.
- (D) LAMPS NOW BEING PURCHASED WILL WORK IN EITHER BASE UP OR BASE DOWN CONFIGURATION.
- (E) LPSV LAMPS MUST BE INSTALLED HORIZONTAL OR BASE UP, AS SHOWN ON THE FOLLOWING FIGURES:

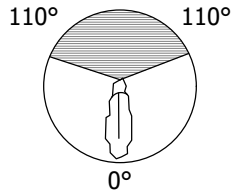


FIGURE 1
FOR 35 AND 55W (E)

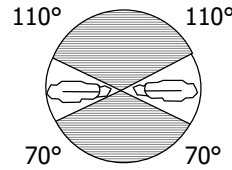


FIGURE 2
FOR 90, 135 AND 180W (E)

F. INSTALLER IS TO SCRIBE A VERTICAL LINE UNDER THE MONTH AND LAST DIGIT OF THE CURRENT YEAR WHEN INSTALLING LAMPS.

BILL OF MATERIALS: NONE

TABLE 1

| HIGH PRESSURE SODIUM VAPOR (HPSV) (D) | | | | | | | | | |
|---------------------------------------|--------------|------------------|------------------------|-----------------------|-------------|--------------------|---------|--------------|--------------|
| LAMP SIZE (WATTS) | MANUFACTURER | | | ANSI LAMP DESIGNATION | LENGTH (IN) | APPROXIMATE LUMENS | | STOCK NUMBER | DESIGN UNITS |
| | GE LUCALUX | SYLVANIA LUMALUX | N.A. PHILIPS CERAMALUX | | | INITIAL | MEAN | | |
| 50 | LU-50 | LU-50 | C-50S68 | S68MS-50 | 7 3/4 | 4,000 | 3,600 | S452578 | LH50 |
| 70 | LU-70 | LU-70 | C-70S62 | S62ME-70 | 7 3/4 | 5,800 | 5,220 | S452580 | LH70 |
| 100 | LU-100 | LU-100 | C-100S54 | S54SB-100 | 7 3/4 | 9,500 | 8,550 | S452582 | LH100 |
| 150 | LU-150/55 | LU-150/55 | C-150S55 | S55SC-150 | 7 3/4 | 16,000 | 14,400 | S452584 | LH150 |
| 200 | LU-200 | LU-200 | C-200S66 | S66MN-200 | 9 3/4 | 22,000 | 19,800 | S452587 | LH200 |
| 250 | LU-250 | LU-250 | C-250S50/S | S50VA-250/S | 9 3/4 | 30,000 | 27,000 | S452588 | LH250 |
| 310 | LU-310 | LU-310 | C-310S67 | S67MR-310 | 9 3/4 | 37,000 | 33,000 | S452591 | LH310 |
| 400 | LU-400 | LU-400 | C-400S51 | S51WA-400 | 9 3/4 | 50,000 | 45,000 | S452592 | LH400 |
| 1000 | LU-1000 | LU-1000 | C-1000S52 | S52XB-1000 | 15 1/16 | 140,000 | 126,000 | S452594 | LH1000 |

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| C | FORMATTING | EDM | JIK | - | - | 01/18/2022 | F | | | | | | |
| B | DRAWING UPDATE | PEI | - | - | - | 02/04/2019 | E | | | | | | |
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SHEET
1 OF 2

X Indicates Latest Revision Completely Revised New Page Information Removed

SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

HIGH INTENSITY DISCHARGE LAMPS

FMO
OH1510.1
UG4410.1

TABLE 2

| MERCURY VAPOR (MV) (D) (NO LONGER USED IN NEW INSTALLATION) | | | | | | | |
|---|-------------------|---|-----------------------|-------------|--------------------|----------|--------------|
| LAMP SIZE (WATTS) | MANUFACTURER | | ANSI LAMP DESIGNATION | LENGTH (IN) | APPROXIMATE LUMENS | | STOCK NUMBER |
| | GE CATALOG NUMBER | SYLVANIA & N.A. PHILIPS CATALOG NUMBERS | | | INITIAL | MEAN (B) | |
| 175 | H175A39-22 | H39KB-175 | H39KB-175 | 8 1/4 | 7,950 | 7,470 | S452352 (A) |
| | H175DX39-22 | H39KC-175/DX | H39KC-175/DX | | 8,600 | 7,650 | S452580 (B) |
| 250 | H250A37-5 | H37KB-250 | H37KB-250 | 8 1/4 | 11,200 | 10,300 | S452384 (A) |
| | H250DX37-5 | H37KC-250/DX | H37KC-250/DX | | 12,100 | 10,400 | S452400 (B) |
| 400 | H400A33-1 | H33CD-400 | H33CD-400 | 11 5/16 | 21,000 | 19,100 | S452416 (A) |
| | H400DX33-1 | H33GL-400/DX | H33GL-400/DX | | 22,500 | 19,100 | S452448 (B) |
| 700 | H700DX35-18 | H35ND-700/DX | H35ND-700/DX | 14 5/16 | 42,000 | 33,600 | S452576 (B) |

TABLE 3

| LOW PRESSURE SODIUM VAPOR (LPSV) (E) | | | | | | |
|--------------------------------------|-----------------------|-------------|--------------------|--------------|--------------|--|
| LAMP SIZE (WATTS) | ANSI LAMP DESIGNATION | LENGTH (IN) | APPROXIMATE LUMENS | STOCK NUMBER | DESIGN UNITS | |
| 35 | L70RB-35 | 12.2 | 4,800 | S452270 | LL35 | |
| 55 | L71RC-55 | 16.7 | 8,000 | S452280 | LL55 | |
| 90 | L72RD-90 | 20.8 | 13,500 | S452282 | L90 | |
| 135 | L73RE-135 | 30.5 | 22,500 | S452284 | LL135 | |
| 180 | L74RF-180 | 44.1 | 33,000 | S452286 | LL180 | |

NOTES:

(I) ALL LAMPS MUST BE DATE CODED WHEN INSTALLED. SCRIBE A VERTICAL LINE BELOW THE MONTH AND YEAR LOCATED ON THE BASE OF LAMPS. SINCE LAMPS ARE GROUP REPLACED, ONLY THE LAST DIGIT OF THE YEAR IS USED. THEY SHOULD NEVER BE OLDER THAN TEN YEARS. THE FOLLOWING EXAMPLE INDICATES A JUNE 1985 INSTALLATION:

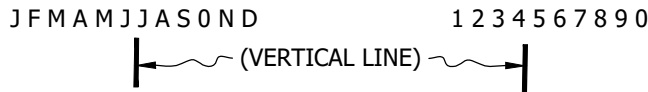


FIGURE 3 (I)

REFERENCE:

a. FOR G.O. 95 MINIMUM CLEARANCE, SEE OH1509.

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| B | DRAWING UPDATE | PEI | - | - | - | 02/04/2019 | E | | | | | | |
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| | HIGH INTENSITY DISCHARGE LAMPS | | | | |

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| | <p>REPLACEMENT REFRACTORS</p> | | | | | | |

SCOPE: NONE

INSTALLATION:

- (A) A GLASS OR LEXAN REFRACTOR MAY BE USED ON THESE LUMINAIRES.
- B. LEXAN REFRACTORS TO BE USED IN HIGH VANDALISM AREAS ONLY.

BILL OF MATERIALS:

| TABLE 1. REPLACEMENT REFRACTORS FOR LUMINAIRES ON PAGES 1521/4421 | | | | | | |
|---|------------|-----------|---------------|-----------------------|----------------|--------------|
| CONVENTIONAL LUMINAIRES | | LAMP TYPE | LAMP WATTAGE | REPLACEMENT REFRACTOR | | |
| MANUFACTURER | TYPE | | | TYPE | CATALOG NUMBER | STOCK NUMBER |
| GENERAL ELECTRIC | M250R2 | HPSV | 70, 100, 150 | GLASS | 35-962560-21 | S579104 |
| GENERAL ELECTRIC | M400R2 | HPSV | 200, 250, 400 | GLASS | 35-962620-05 | S579102 |
| GENERAL ELECTRIC | M1000 | HPSV | 1000 | GLASS | 35-130170R02 | S579100 |
| AMERICAN ELECTRIC | SERIES 113 | HPSV | 70, 100, 150 | GLASS | 13-2-A | S579110 |
| AMERICAN ELECTRIC | SERIES 125 | HPSV | 200, 250, 400 | GLASS | 25-3-A | S579108 |
| AMERICAN ELECTRIC | SERIES 327 | HPSV | 1000 | GLASS | 27-3-A | S79106 |

| TABLE 1. REPLACEMENT REFRACTORS FOR LUMINAIRES ON PAGES 4422 | | | | | | |
|--|-------------------|-----------|--------------|-----------------------|----------------|--------------|
| DECORATIVE LUMINAIRES | | LAMP TYPE | LAMP WATTAGE | REPLACEMENT REFRACTOR | | |
| MANUFACTURER | TYPE | | | TYPE | CATALOG NUMBER | STOCK NUMBER |
| GENERAL ELECTRIC | MISSION BELL (A) | HPSV | 70, 100, 150 | GLASS | 35-130583R01 | S579264 |
| | | | | LEXAN | 35-130707R01 | S579248 |
| | | HPSV | 250, 400 | GLASS | 35-2311374R1 | S579296 |
| | | | | LEXAN | 35-130015R02 | S579312 |
| GENERAL ELECTRIC | DECASHIELD | HPSV | 250, 400 | GLASS | 35-962880-23 | S578702 |
| MCGRAW EDISON | CONCOURSE STYLE A | HPSV | 70, 100, 150 | GLASS | LO-340X1 | S578694 |
| | | | 250, 400 | GLASS | LO-340X2 | S578696 |
| GARDCO | FORM 10P | HPSV | 70, 100, 150 | GLASS | P1413 | S578698 |
| | | | 250, 400 | GLASS | P1913 | S578700 |
| GARDCO | FORM 10P | HPSV | 250, 400 | GLASS | P1913 | S578700 |
| KIM | SQUARE | HPSV | 70, 200 | GLASS | 84044 | S578730 |
| BIEBER | SQUARE | HPSV | 70 | GLASS | BH-HP-GLASS | S578730 |

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| | REPLACEMENT REFRACTORS | | | | | |

BILL OF MATERIALS CONT'D:

TABLE 3. REPLACEMENT REFRACTORS FOR LUMINAIRES ON PAGES 4423 AND 4424

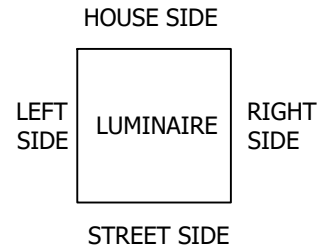
| POST TOP & DW LUMINAIRES | | LAMP TYPE | LAMP WATTAGE | REPLACEMENT REFRACTOR | | |
|--------------------------|-----------------------------|-----------|------------------|-----------------------|----------------|---------------|
| MANUFACTURER | TYPE | | | TYPE | CATALOG NUMBER | STOCK NUMBER |
| MCGRAW EDISON | LAWNAIRE | HPSV | 50, 70, 100, 150 | ACRYLIC | LO-307X1 | S77920 |
| MCGRAW EDISON | TRADITIONAL TYPE III | HPSV | 100, 150 | ACRYLIC | LT-144X11 | S579232 (I) |
| | | | | ACRYLIC | LT-148X11 | S579220 (II) |
| | | | | ACRYLIC | LT-144X12 | S579228 (III) |
| | | | | ACRYLIC | LT-144X13 | S579224 (IV) |
| MCGRAW EDISON | TRADITIONAL TYPE V | HPSV | 50, 70 | ACRYLIC | LT-144X11 | S577920 (V) |
| GENERAL ELECTRIC | TC-100R AND TC-100R MANSARD | HPSV | 70, 150 | ACRYLIC | 35-963160-01 | S579204 (VI) |
| HOLOPHANE | RSL-350 | HPSV | 100, 150 | GLASS | 3313 | S578728 |
| AMERON | VICTORIAN TYPE III | HPSV | 70,200 | GLASS | 80645E | S578720 |

TABLE 4. REPLACEMENT REFRACTORS FOR LUMINAIRES ON PAGES 1533

| FLOOD LIGHT LUMINAIRES | LAMP TYPE | LAMP WATTAGE | REPLACEMENT REFRACTOR | | |
|------------------------|-----------|----------------|-----------------------|----------------|--------------|
| MANUFACTURER | | | TYPE | CATALOG NUMBER | STOCK NUMBER |
| GENERAL ELECTRIC | HPSV | 250, 400, 1000 | GLASS | 35-964960-21 | S78712 |

NOTES:

- (I) REFRACTOR PANEL TO BE INSTALLED ON STREET SIDE.
- (II) REFRACTOR PANEL TO BE INSTALLED ON HOUSE SIDE.
- (III) REFRACTOR PANEL TO BE INSTALLED ON RIGHT SIDE.
- (IV) REFRACTOR PANEL TO BE INSTALLED ON LEFT SIDE.
- (V) REFRACTOR PANEL TO BE INSTALLED ON ALL FOUR SIDES.
- (VI) REFRACTOR PANEL TO BE INSTALLED PER DESIGNATED SIDE.



REFERENCE: NONE

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| C | MOVED TO FMO | GLC | JIK | GLW | CZH | 6/8/2020 | F | | | | | | |
| B | DRAWING UPDATE | PEI | - | - | - | 02/04/2019 | E | | | | | | |
| A | ORIGINAL ISSUE | - | - | RDW | CAK | 01/01/1998 | D | | | | | | |

**SHEET
2 OF 2**

Indicates Latest Revision Completely Revised New Page Information Removed

SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

REPLACEMENT REFRACTORS

**FMO
OH1511.2
UG4411.2**


FIELD MAINTENANCE ONLY

REVISION HISTORY:

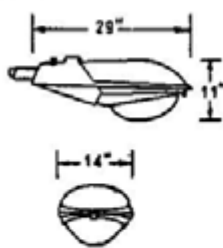
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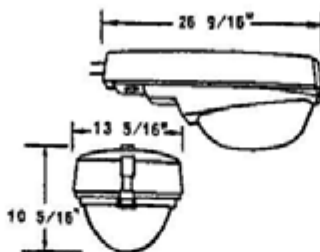
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| | SDG&E ELECTRIC UNDERGROUND STANDARD | | | | |
| | MERCURY VAPOR CONVENTIONAL LUMINAIRES AND REPLACEMENT REFRACTORS | | | | |

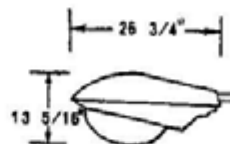
SCOPE: THIS STANDARD SHOWS MERCURY VAPOR LUMINAIRES USED TO PROVIDE ROADWAY AND DUSK TO DAWN LIGHTING, AND REPLACEMENT REFRACTORS.



GENERAL ELECTRIC
M-250A POWR/DOOR

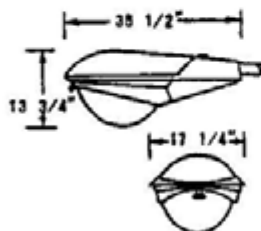


MCGRAW EDISON
UNIDOR 250

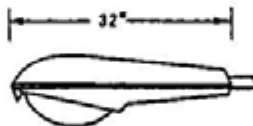


WESTINGHOUSE
0V-15

FIGURE 1



GENERAL ELECTRIC
M-400A POWR/DOOR



WESTINGHOUSE
0V-25

FIGURE 2

BILL OF MATERIAL:

| FIG. NO. | STOCK NUMBER | LAMP SIZE WATTS | BALLAST | | MANUFACTURER AND CATALOG NUMBER | | | | | | | | |
|----------|--------------|-----------------|-------------|----------------|---------------------------------|--------------------|---------------|-------------|--------------|------------|------------------|----------|--|
| | | | TYPE | SOURCE VOLTAGE | GENERAL ELECTRIC | | MCGRAW EDISON | | WESTINGHOUSE | | UNICORN ELECTRIC | | |
| | | | | | TYPE | CAT. NO. | TYPE | CAT. NO. | TYPE | CAT. NO. | TYPE | CAT. NO. | |
| 1 | 473920 | 175 | REGULATOR | 120/240 (A) | M-250A | C7270002 (B) | UNIDOR | UU1104-120R | 0V-15 | 811A208004 | | | |
| | 474048 | | REACTOR NPF | 240 | POWR/DOOR | C7270014 (B) | 250 | UU-1154R | | 811A208020 | | | |
| | 473910 | | SERIES | 6.6 AMPS | M-250-R2 | MZAR17C0XSGMS31036 | | | | | | | |
| 2 | 474208 | 400 | REGULATOR | 120/240 (A) | M-400A POWR/DOOR | C7230001 (B) | | | 0V-25 | 858A303004 | | | |
| | 473912 | | SERIES | 6.6 AMPS | M-250-R2 | M4AR40CXSGMN32043 | | | | | | | |

REPLACEMENT REFRACTORS FOR MERCURY VAPOR LUMINAIRES

| CONVENTIONAL LUMINAIRES | | LAMP TYPE | LAMP WATTAGE | REPLACEMENT REFRACTOR | | |
|-------------------------|---------------|-----------|--------------|-----------------------|----------------|--------------|
| MANUFACTURER | TYPE | | | TYPE | CATALOG NUMBER | STOCK NUMBER |
| GENERAL ELECTRIC | M-250A (C) | MV | 175,250 | GLASS | 35-130583-01 | 579284 |
| GENERAL ELECTRIC | M-400A (C) | MV | 400 | GLASS | 35-231137-01 | 579296 |
| | | | | LEXAN | 35-130015-02 | 579312 |
| AMERICAN ELECTRIC | 23 SERIES (C) | MV | 175,250 | GLASS | 23-002 | 579284 |
| AMERICAN ELECTRIC | 25 SERIES (C) | MV | 400 | GLASS | 25-003 | 578928 (F) |
| | | | | LEXAN | 25-003-8 | - (F) |
| AMERICAN ELECTRIC | 327 SERIES | MV | 1000 | GLASS | 27-003 | 578936 (F) |
| WESTINGHOUSE | 0V-15 | MV | 175,250 | GLASS | 484-D087-H01 | 578978 (F) |
| | | | | GLASS | 484-D336-H02 | 579040 |
| WESTINGHOUSE | 0V-25 (C) | MV | 400 | LEXAN | 6716-D13-H01 | 579058 (F) |

INSTALLATION:

- (A) FACTORY WIRED FOR 120 VOLTS, DO NOT WIRE FOR 240 VOLTS ON NEW INSTALLATIONS.
- (B) ASTRODOME UNITS ARE EQUIPPED WITH BUILT-IN PHOTOELECTRIC CELL, FOR REPLACEMENT SEE PAGE 1512/4412.
- (C) A GLASS OR A LEXAN REFRACTOR MAY BE USED ON THESE LUMINAIRES.
- D. LEXAN REFRACTORS TO BE USED IN HIGH VANDALISM AREAS ONLY.
- (F) ITEM IS NO LONGER PURCHASED.

DATE 1-1-89
APPD PA/DE

SDG&E ELECTRIC STANDARDS

MERCURY VAPOR CONVENTIONAL LUMINAIRES
AND REPLACEMENT REFRACTORS

OH 1599.201
UG 4499.201
SUPERCEDES
442Q.1 (6-1-76)

OH1521 UG4421 FIELD MAINTENANCE ONLY

ALL VERSIONS LISTED IN FMO ARE SUPERSEDED BY THEIR CURRENT VERSION FOUND INSIDE THE OVERHEAD AND UNDERGROUND CONSTRUCTION STANDARD MANUAL.

REVISION HISTORY:

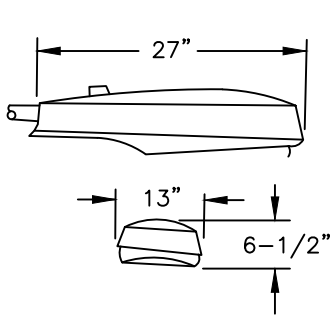
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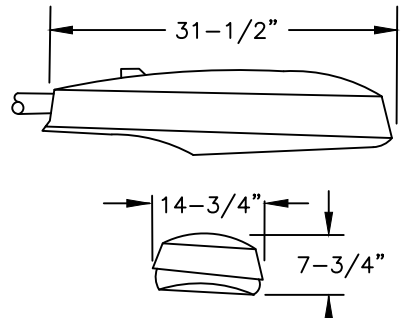
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| | SDG&E ELECTRIC OVERHEAD AND UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | HIGH PRESSURE AND LOW PRESSURE SODIUM VAPOR LUMINAIRE, REPLACEMENT BALLAST AND STARTER | | | | |

SCOPE: THIS STANDARD SHOWS HIGH PRESSURE AND LOW PRESSURE SODIUM VAPOR LUMINAIRES USED TO PROVIDE ROADWAY AND DUSK TO DAWN LIGHTING, AND STARTER.



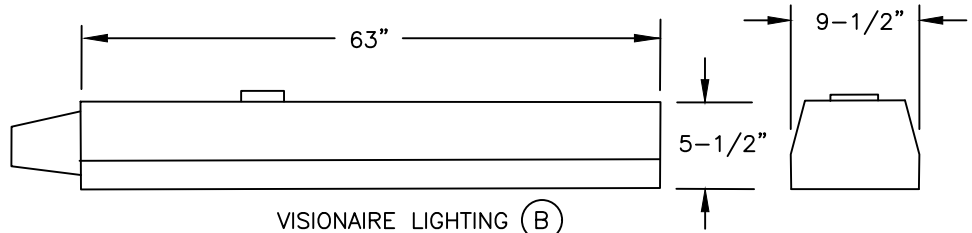
AMERICAN ELECTRIC
SERIES 115 CUTOFF
NON-POWER/PAD

FIGURE □



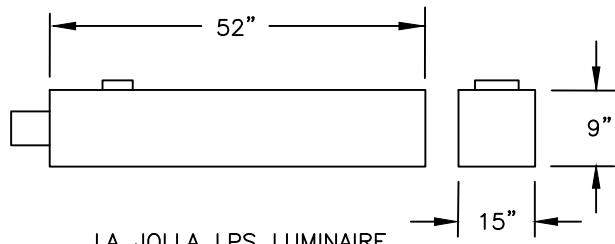
AMERICAN ELECTRIC
SERIES 125

FIGURE □



VISIONAIRE LIGHTING (B)
ROADWAY RDW-3 (135, 180W SHOWN)

FIGURE □



LA JOLLA LPS LUMINAIRE
(180W SHOWN)

FIGURE □

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| OH 1521.1 UG 4421.1 | SDG&E ELECTRIC STANDARDS HIGH PRESSURE AND LOW PRESSURE SODIUM VAPOR LUMINAIRE, REPLACEMENT BALLAST AND STARTER |
| | REVISION DATE 2-3-06 APPD PJA / JJ |

D TABLE **HIGH PRESSURE SODIUM VAPOR LUMINAIRE COMPLETE ASSEMBLY INCLUDING LAMP**

| FIG. NO. | MANUFACTURER | LAMP SIZE WATTS | BALLAST | | STOCK NUMBER |
|----------|--------------|-----------------|--------------------|----------------|--------------|
| | TYPE | | TYPE | SOURCE VOLTAGE | |
| 1 | SERIES 115 | 70 | REACTOR-NPF | 120 | 473400 |
| | SERIES 115 | 100 | | | 473402 |
| | SERIES 115 | 150 | | | 473404 |
| 2 | SERIES 125 | 200 | HIGH REACTANCE-NPF | 120 | 473406 |
| | | 250 | HIGH REACTANCE-NPF | | 473408 |
| | | 400 | CWA | | 473410 |

TABLE **REPLACEMENT STARTER ONLY FOR HIGH PRESSURE SODIUM VAPOR LUMINAIRE**

| FIGURE NUMBER | MANUFACTURER | TYPE | LAMP SIZE WATTS | SOURCE VOLTAGE | STOCK NUMBER |
|---------------|-------------------|------------|-----------------|----------------|--------------|
| 1 | AMERICAN ELECTRIC | SERIES 115 | 50-150 | 120 | 679142 |
| 2 | AMERICAN ELECTRIC | SERIES 125 | 200-400 | 120 | 679144 |

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| DATE 2-3-06 APPD <i>PA</i> / JJ | HIGH PRESSURE AND LOW PRESSURE SODIUM VAPOR LUMINAIRE, REPLACEMENT BALLAST AND STARTER | | | OH 1521.2 UG 4421.2 |

TABLE 1 LO PRESSURE SODIUM VAPOR LUMINAIRE COMPLETE ASSEMBLY INCLUDING LAMP

| FIG. NO. | MAX. LENGTH (IN INCHES) | LAMP SIZE (WATTS) | BALLAST | | STOCK NUMBER |
|----------|-------------------------|-------------------|---------------|----------------|--------------|
| | | | TYPE | SOURCE VOLTAGE | |
| 3 & 4 | 34 | 55 | H P F REACTOR | 120 | 473800 |
| | 39 | 90 | H P F REACTOR | 120 | 473802 |
| | 63 | 135 | H P F REACTOR | 120 | 473804 |
| | 63 | 180 | H P F REACTOR | 120 | 473806 |

INSTALLATION:

- A. ALL LUMINAIRE ARE TO BE WIRED FOR 120 VOLTS ONLY. APPLICATION OF 240 VOLTS TO THESE UNITS WILL CAUSE SEVERE BALLAST DAMAGE.
- (B) THE VISIONAIRE LUMINAIRE WILL ACCEPT BOTH 35 WATT AND 55 WATT LAMPS.
- C. CUTOFF LUMINAIRE SHALL BE INSTALLED WITH THE OPTICAL ASSEMBLY (GLASSWARE) HORIZONTAL.
- (D) STOCK NUMBERS IN TABLES 1 AND 3 ARE FOR COMPLETE LUMINAIRE UNITS.

REFERENCE:

- J. SEE STANDARD 1512/4412 FOR PHOTOELECTRIC CONTROL.
- K. SEE PAGE 1511.1/4411.1 FOR REPLACEMENT REFRACTORS.
- L. SEE STANDARD 1514/4414 FOR IDENTIFICATION DECAL.

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| APPD <i>PA</i> / JJ | | | | UG 4421.3 |

4500 - GROUNDING

4500 - GROUNDING

PAGES

SUBJECT

4512

EQUIPMENT GROUNDING INSTALLATION

4520

GROUNDING PAD-MOUNTED EQUIPMENT

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| | SDG&E UNDERGROUND CONSTRUCTION STANDARD | | | | |
| | GROUNDING FMO TABLE OF CONTENTS | | | | |

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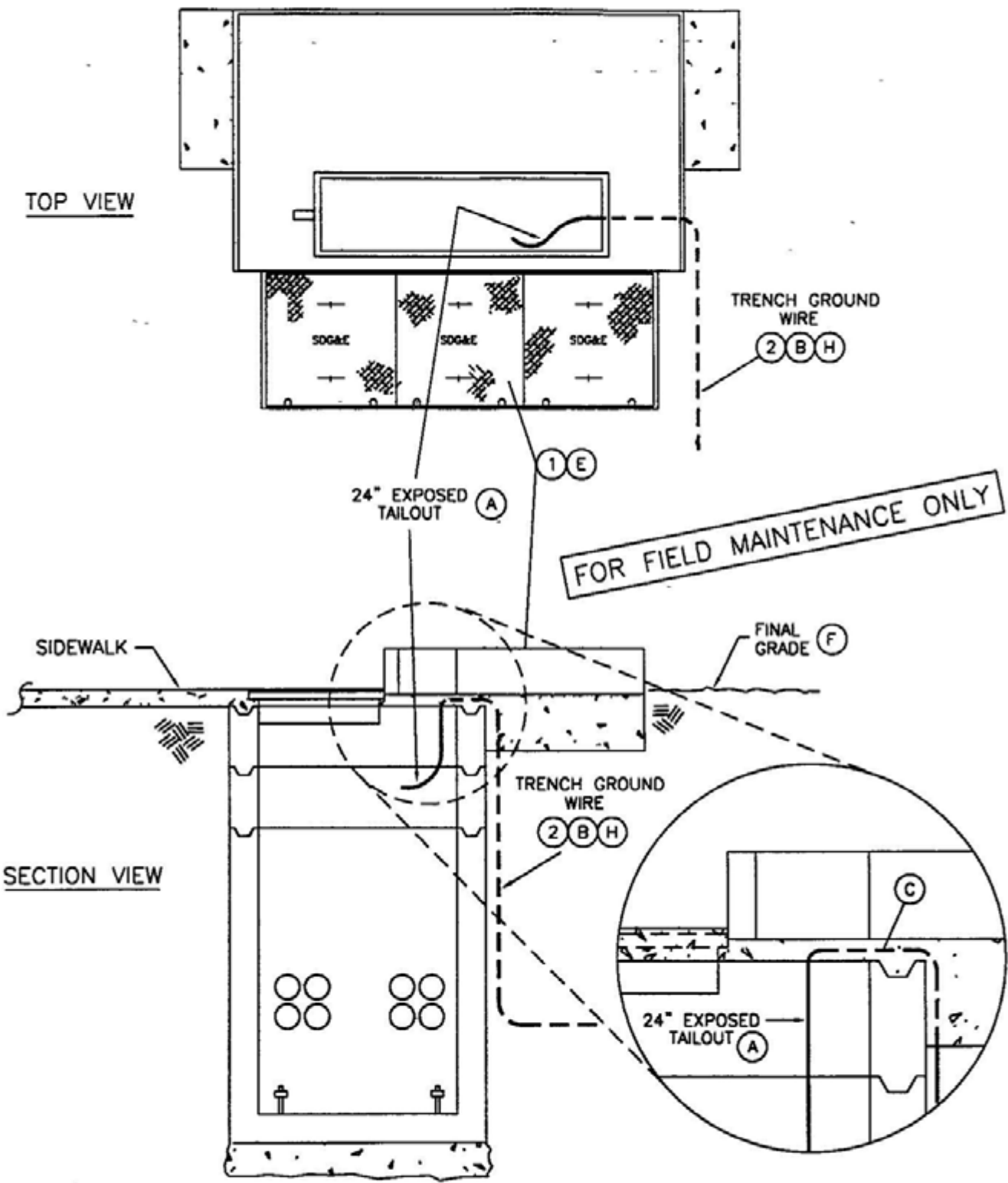
**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD

EQUIPMENT GROUNDING INSTALLATION

**FMO
UG 4512**

SCOPE: THIS STANDARD SHOWS EQUIPMENT GROUNDING INSTALLATION USED WHEN (PREFERRED I) AND (ALTERNATE) TRENCH GROUND WIRE IS INSTALLED, STANDARD 4510 SUBSTITUTE GROUND RODS SHOWN ON STANDARD PAGE 4512.1 FOR TRENCH GROUND WIRE IF (PREFERRED I) OR (ALTERNATE) INSTALLATIONS DO NOT APPLY



SDG&E ELECTRIC STANDARDS

DATE 1-1-96
APPD *[Signature]*

EQUIPMENT GROUNDING INSTALLATION

4599.101
SUPERSEDES
4512.6 (1-1-96)

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | STOCK NUMBER | ASSEMBLY UNITS |
|------|---|----------|---------------------|----------------|
| 1 | PAD & COVER SECTION | 1 EA | REFER TO WORK ORDER | - |
| 2 | WIRE, BARE COPPER, #2, 7 STR SOFT DRAWN | AS REQ'D | 812816 (G) | GDWIRE |

INSTALLATION:

- (A) LEAVE A 24" TAILOUT INSIDE THE HANDHOLE
- (B) (PREFERRED I) OR (ALTERNATE) TRENCH GROUND WIRE IS REQUIRED WHEN PREFERRED II EQUIPMENT GROUNDING INSTALLATION IS NOT INSTALLED
- (C) INSERT GROUND WIRE TAIL(S) BETWEEN PAD AND TOP SECTION OF HANDHOLE THROUGH THE GROUT OR PLASTIC MASTIC SEALANT

REFERENCE:

- (E) SEE STANDARD 3440 & 3441 FOR PAD-MOUNTED SWITCH PAD INSTALLATION
- (F) SEE STANDARD 3484 1 FOR PAD INSTALLATION USED FOR MOUNTING PAD-MOUNTED EQUIPMENT.
- (G) SEE STANDARD 4002.2 FOR WIRE INFORMATION.
- (H) SEE STANDARD 4510 FOR (PREFERRED I) AND (ALTERNATE) TRENCH GROUND WIRE INSTALLATION
- I SEE STANDARD PAGE 4512 1 FOR (PREFERRED II) EQUIPMENT GROUNDING INSTALLATION
- J. SEE STANDARD 4514 FOR GROUNDING TELCO CONDUCTOR IN PAD-MOUNTED EQUIPMENT
- K. SEE STANDARD 4520 FOR GROUNDING PAD-MOUNTED EQUIPMENT

FOR FIELD MAINTENANCE ONLY

| | | |
|---|----------------------------------|--|
| 4599.102 SUPERSEDES 4512.7 (1-1-96) | SDG&E ELECTRIC STANDARDS | DATE 1-1-96 APPD <i>[Signature]</i> |
| | EQUIPMENT GROUNDING INSTALLATION | |

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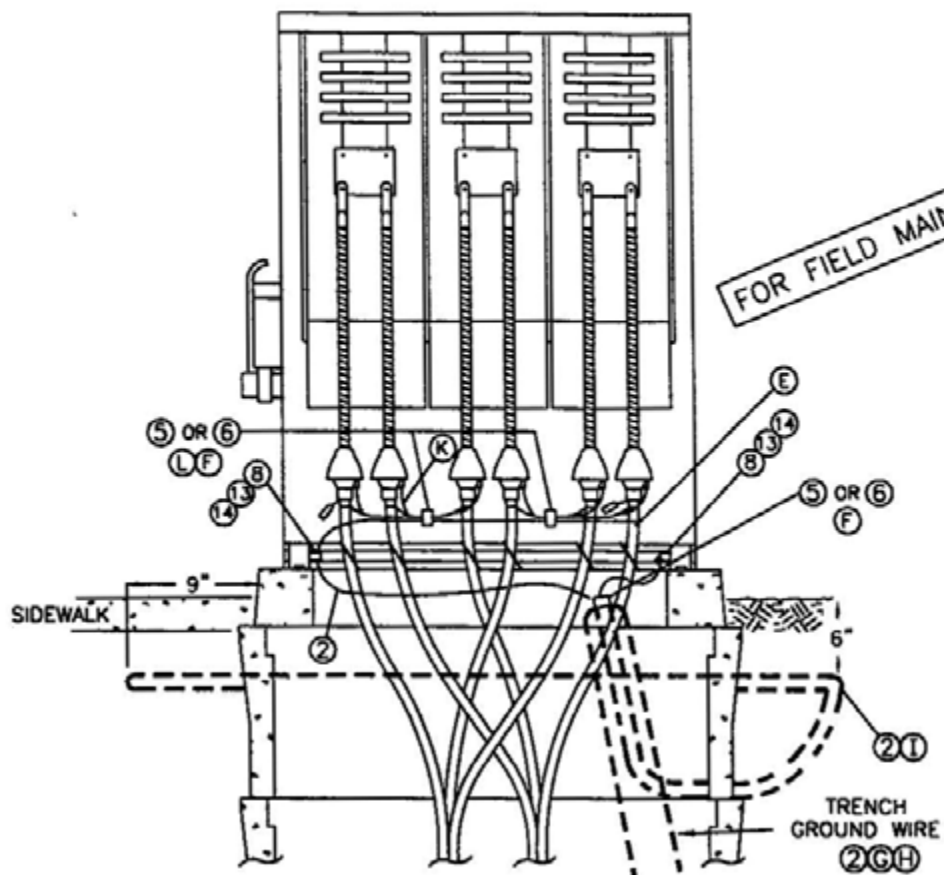
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**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND STANDARD

GROUNDING PAD-MOUNTED EQUIPMENT

**FMO
UG 4520**

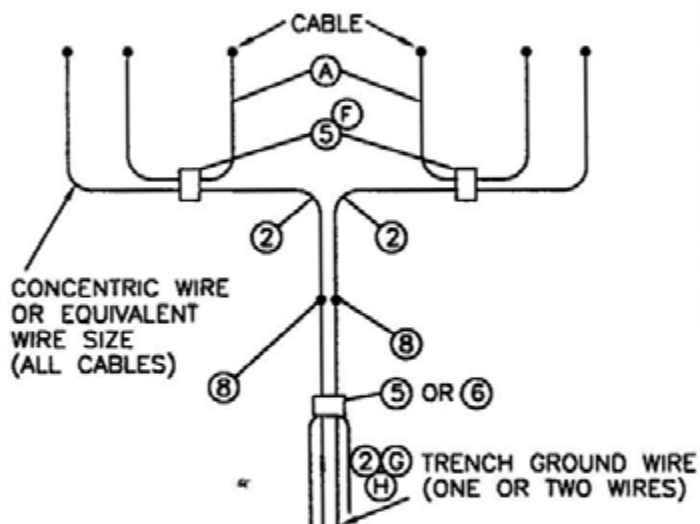


3520/3521 THREE-PHASE TERMINATING ENCLOSURE

GROUNDING DETAILS

FRONT SIDE

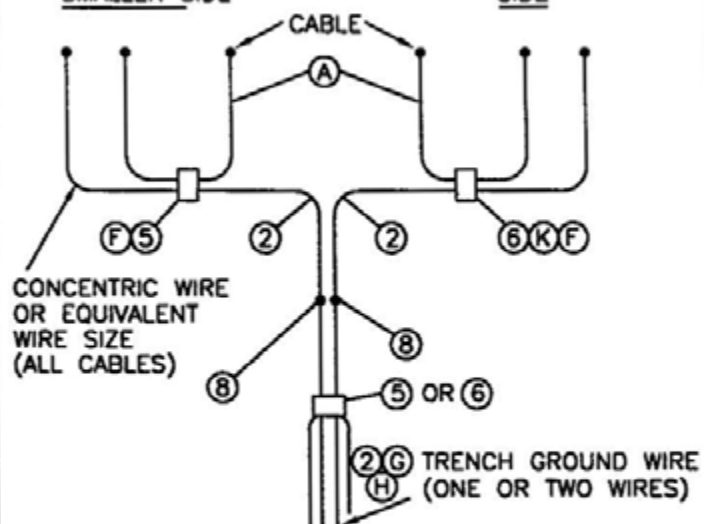
BACK SIDE



3521 - 2/0 CABLE & SMALLER

2/0 CABLE AND SMALLER SIDE

350 KCMIL - 1000 KCMIL SIDE



3520 - 1000 KCMIL & SMALLER

SDG&E ELECTRIC STANDARDS

4599.201
SUPERCEDES
4520.3 1-1-94

GROUNDING PAD-MOUNTED EQUIPMENT

DATE 1-1-94

APPD *JLB/BSJ*

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | STOCK NUMBER | ASSEMBLY UNITS |
|------|--|----------|--------------|----------------|
| 1 | #14 SOLID CU OR A SURPLUS STRAND OF CONCENTRIC NEUTRAL | AS REQ'D | - | - |
| 2 | WIRE, BARE COPPER, #2, 7 STR. SOFT DRAWN | AS REQ'D | 812816 (M) | GDWIRE |
| 3 | WIRE, BARE COPPER 1/0 STR. SOFT DRAWN | AS REQ'D | 812752 (M) | - |
| 4 | WIRE, BARE COPPER 4/0 STR SOFT DRAWN | AS REQ'D | 812764 (M) | 4/0-SD |
| 5 | CONNECTOR, COMPRESSION 1/0 - 1/0 | AS REQ'D | 257760 | - |
| 6 | CONNECTOR, COMPRESSION 4/0 - 1/0 | AS REQ'D | 257856 | - |
| 7 | CONNECTOR, COMPRESSION 4/0 - 4/0 | AS REQ'D | 257824 | - |
| 8 | SERVICE POST CONNECTOR | AS REQ'D | 262560 | - |
| 9 | GROUND CONNECTOR PROVIDED WITH EQUIPMENT | - | - | - |
| 10 | GROUND ROD CLAMP | 2 | 230016 | - |
| 11 | UNISTRUT, CHANNEL FITTING, 1 7/8" X 2" | AS REQ'D | 348960 | - |
| 12 | ANCHOR, CONCRETE STAINLESS STEEL, 1/2" X 3 3/4" | AS REQ'D | 107654 | - |
| 13 | NUT, HEXAGON BRONZE, 1/2" | 2 | 506112 | - |
| 14 | WASHER, STANDARD FLAT ROUND, BRONZE 1/2" | 2 | 799488 | - |

INSTALLATION:

- (A) CONCENTRIC NEUTRAL TAILS OR EQUIVALENT WIRE SIZE PER PHASE (SEE STANDARD 4172 FOR EQUIVALENT WIRE SIZE).

REFERENCE:

- (E) SEE STANDARD 4108 FOR SEALING JACKETED CABLE.
 (F) SEE STANDARD 4172 FOR CONCENTRIC NEUTRAL/COMPRESSION CONNECTOR APPLICATION CHART AND COPPER COMPRESSION CONNECTORS.
 (G) SEE STANDARD 4510 FOR (PREFERRED I) AND (ALTERNATE) TRENCH GROUND WIRE INSTALLATION.
 (H) SEE STANDARD PAGE 4512.1 FOR (PREFERRED II) PAD GROUNDING INSTALLATION.
 (I) SEE STANDARD 4512 FOR PAD GROUNDING INSTALLATION.
 J. SEE STANDARD 4514 FOR GROUNDING TELCO CONDUCTOR IN PAD-MOUNTED EQUIPMENT.
 (K) SEE STANDARD 4525 FOR CONCENTRIC NEUTRAL TERMINATIONS AND GROUNDING PREMOLDED CONNECTORS.
 (L) SEE STANDARD 4530 FOR NEUTRAL AND GROUND WIRE SCHEMATIC DIAGRAM.
 (M) SEE STANDARD 4002.2 FOR WIRE INFORMATION.

FOR FIELD MAINTENANCE ONLY

DATE 1-1-94

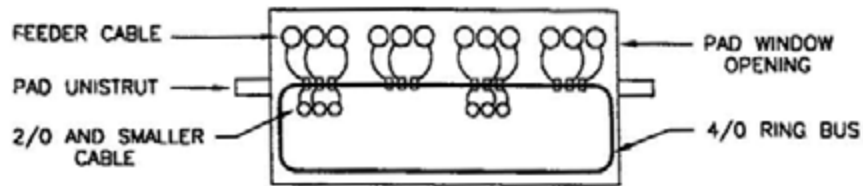
APPD *JLB/RD*

SDG&E ELECTRIC STANDARDS

GROUNDING PAD-MOUNTED EQUIPMENT

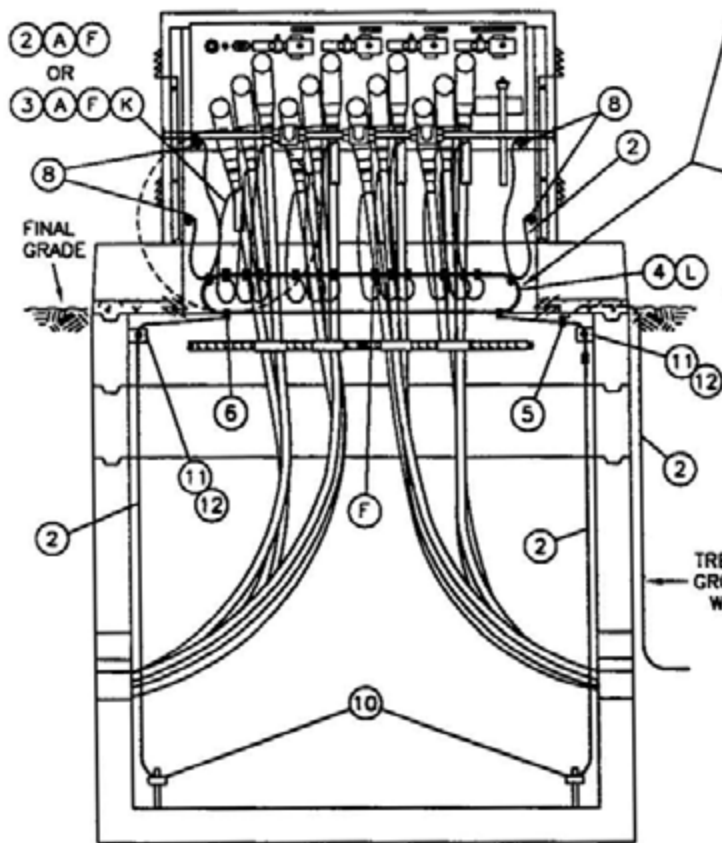
4599.202

SUPERCEDES
4520 5 1-1-94

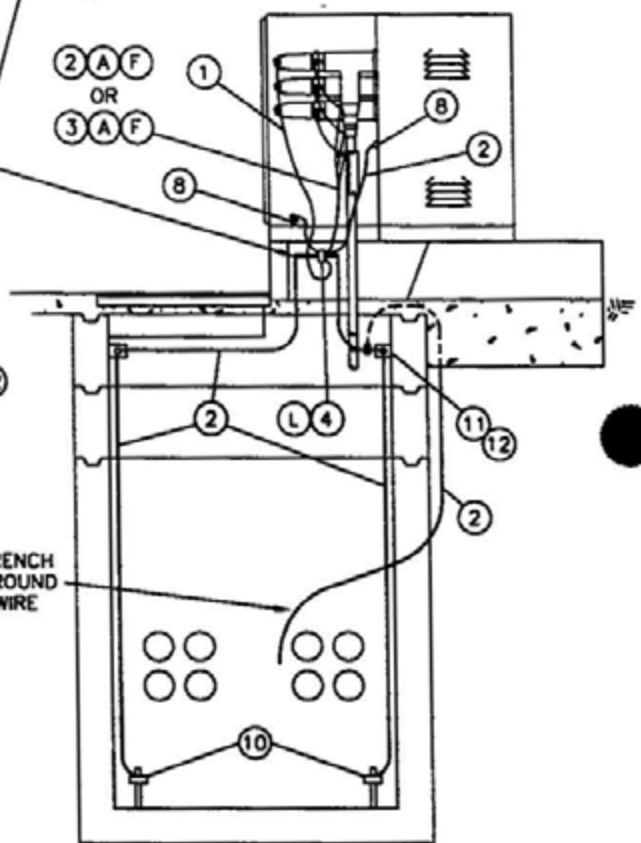


TOP VIEW

FOR FIELD MAINTENANCE ONLY



FRONT VIEW



END VIEW

TRENCH GROUND WIRE

3550/3551 THREE-PHASE PAD MOUNTED SWITCH

(NEW TAGS)

4599.205
SUPERSEDES
4520 4 (1-1-96)

SDG&E ELECTRIC STANDARDS

GROUNDING PAD-MOUNTED EQUIPMENT

DATE 1-1-96

APPD *JLB/ROJ*

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | STOCK NUMBER | ASSEMBLY UNITS |
|------|--|----------|--------------|----------------|
| 1 | #14 SOLID CU OR A SURPLUS STRAND OF CONCENTRIC NEUTRAL | AS REQ'D | - | - |
| 2 | WIRE, BARE COPPER, #2, 7 STR. SOFT DRAWN | AS REQ'D | 812816 (M) | GDWIRE |
| 3 | WIRE, BARE COPPER 1/0 STR. SOFT DRAWN | AS REQ'D | 812752 (M) | - |
| 4 | WIRE, BARE COPPER 4/0 STR. SOFT DRAWN | AS REQ'D | 812764 (M) | 4/0-SD |
| 5 | CONNECTOR, COMPRESSION 1/0 - 1/0 | AS REQ'D | 257760 | - |
| 6 | CONNECTOR, COMPRESSION 4/0 - 1/0 | AS REQ'D | 257856 | - |
| 7 | CONNECTOR, COMPRESSION 4/0 - 4/0 | AS REQ'D | 257824 | - |
| 8 | SERVICE POST CONNECTOR | AS REQ'D | 262560 | - |
| 9 | GROUND CONNECTOR PROVIDED WITH EQUIPMENT | - | - | - |
| 10 | GROUND ROD CLAMP | 2 | 230016 | - |
| 11 | UNISTRUT, CHANNEL FITTING, 1 7/8" X 2" | AS REQ'D | 348960 | - |
| 12 | ANCHOR, CONCRETE STAINLESS STEEL, 1/2" X 3 3/4" | AS REQ'D | 107654 | - |
| 13 | NUT, HEXAGON BRONZE, 1/2" | 2 | 506112 | - |
| 14 | WASHER, STANDARD FLAT ROUND, BRONZE 1/2" | 2 | 799488 | - |

INSTALLATION:

- (A) CONCENTRIC NEUTRAL TAILS OR EQUIVALENT WIRE SIZE PER PHASE (SEE STANDARD 4172 FOR EQUIVALENT WIRE SIZE).

REFERENCE:

- (E) SEE STANDARD 4108 FOR SEALING JACKETED CABLE
- (F) SEE STANDARD 4172 FOR CONCENTRIC NEUTRAL/COMPRESSION CONNECTOR APPLICATION CHART AND COPPER COMPRESSION CONNECTORS
- (G) SEE STANDARD 4510 FOR (PREFERRED I) AND (ALTERNATE) TRENCH GROUND WIRE INSTALLATION.
- H. SEE STANDARD PAGE 4512.1 FOR (PREFERRED II) EQUIPMENT GROUNDING INSTALLATION.
- (I) SEE STANDARD 4512.2 FOR EQUIPMENT GROUNDING INSTALLATION.
- J. SEE STANDARD 4514 FOR GROUNDING TELCO CONDUCTOR IN PAD-MOUNTED EQUIPMENT.
- (K) SEE STANDARD 4525 FOR CONCENTRIC NEUTRAL TERMINATIONS AND GROUNDING PREMOLDED CONNECTORS.
- (L) SEE STANDARD 4530 FOR NEUTRAL AND GROUND WIRE SCHEMATIC DIAGRAM.
- (M) SEE STANDARD 4002.2 FOR WIRE INFORMATION.

FOR FIELD MAINTENANCE ONLY

SDG&E ELECTRIC STANDARDS

DATE 1-1-94

APPD *JLB/BJ*

GROUNDING PAD-MOUNTED EQUIPMENT

4599.206
SUPERSEDES
4520 5 (1-1-96)

4600 - TELECOM,
SCADA

4600 - TELECOM,
SCADA

PAGE

SUBJECT

| | |
|--------|--|
| 4620.1 | TELECOMMUNICATIONS SPLICING PEDESTAL |
| 4620.2 | TELECOMMUNICATIONS SPLICING PEDESTAL INSTALLATION |
| 4620.5 | TELECOMMUNICATIONS PULLING GRIPS |
| 4641.3 | SCADA INSTALLATION FOR PAD MOUNTED SWITCHES |
| 4650 | DRY VAULT SCADA INSTALLATION |
| 4653 | UNMETERED ELECTRIC SERVICE FOR WIRELESS COMMUNICATIONS PROVIDE |
| 4655 | WIRING DIAGRAM FOR SCADA INSTALLATION IN A DRY VAULT |

**THIS SECTION HAS BEEN REMOVED FROM THE EXTERNAL VERSION.
DUE TO CONFIDENTIAL INFORMATION.**

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|-----|------------------------|----|----|-----|-----|------------|-----|--------------|-----|-----|-----|-----|------------|
| C | ADDED 4620.1, .2, & .5 | - | JS | JS | MDJ | 09/13/2017 | F | - | - | - | - | - | - |
| B | ADDED 4645 | - | SL | JS | MDJ | 01/25/2017 | E | - | - | - | - | - | - |
| A | ORIGINAL ISSUE | - | JS | TR | MDJ | 07/25/2016 | D | ADDED 4641.3 | ARC | ADW | GLW | KRG | 02/16/2023 |

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| | TELECOMMUNICATIONS, SCADA FMO TABLE OF CONTENTS | | | | |

4700 - PRIMARY
METER/ REGULATOR/
BOOSTER STATION

**4700 - PRIMARY
METER / REGULATOR /
BOOSTER STATION**

PAGE

4702

SUBJECT

200 & 600 AMP DEAD FRONT PRIMARY METERING STATION SDG&E OWNED ALUMINUM
POWDER COATED GREEN

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| B | UG4702 MOVED TO FMO | GLC | RSL | JAS | KRG | 03/10/2023 | E | | | | | | |
| A | ORIGINAL ISSUE | GLC | JKI | JES | CZH | 05/23/2019 | D | | | | | | |

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UG4702 FIELD MAINTENANCE ONLY

ALL VERSIONS LISTED IN FMO ARE SUPERSEDED BY THEIR CURRENT VERSION FOUND INSIDE THE UNDERGROUND CONSTRUCTION STANDARDS MANUAL.

REVISION HISTORY:

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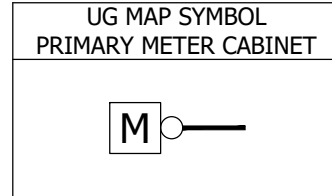
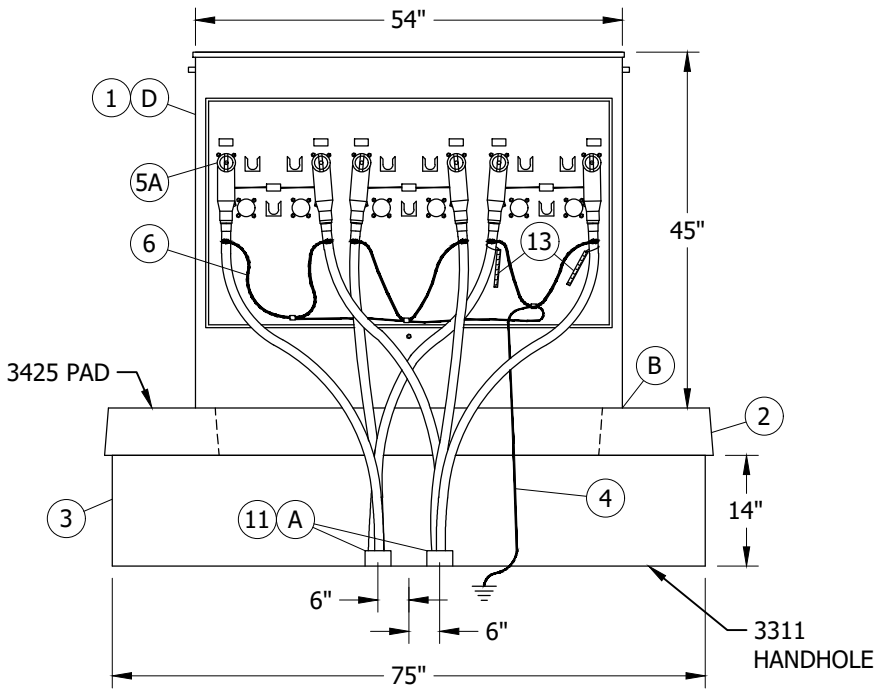
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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | | | | | |
| | 200 & 600 AMP DEAD FRONT PRIMARY METERING STATION SDG&E OWNED ALUMINUM POWDER COATED GREEN | | | | | | | | | |

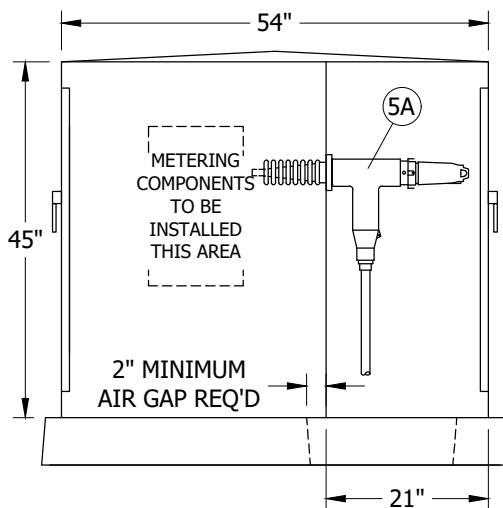
SCOPE: THIS STANDARD SHOWS THE INSTALLATION AND MATERIAL REQUIREMENTS FOR AN SDG&E OWNED PAD-MOUNT PRIMARY METERING CABINET. THIS CABINET CAN BE USED FOR EITHER 4KV OR 12KV AND IS SPECIAL ORDERED FOR EACH JOB. LEAD TIME IS 16 WEEKS.

FRONT VIEW
DOORS REMOVED

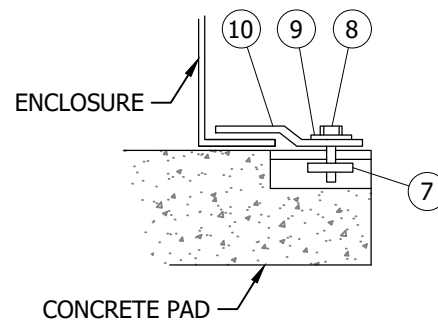


FIELD MAINTENANCE ONLY

SIDE VIEW



HOLD-DOWN ASSEMBLY DETAIL
TYPICAL BOTH SIDES OF EQUIPMENT PAD
(HILTI DRIVE-IN CAN ALSO BE USED)



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SHEET
1 OF 3

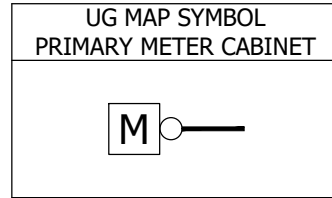
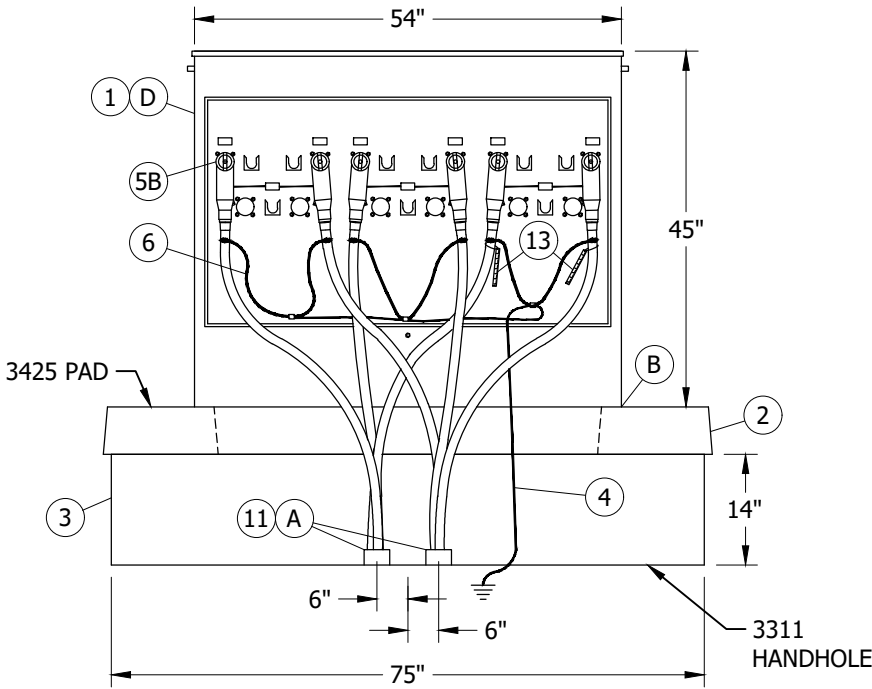
SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

600 AMP DEAD FRONT PRIMARY METERING STATION
SDG&E OWNED ALUMINUM POWDER COATED GREEN

FMO
UG4702.1

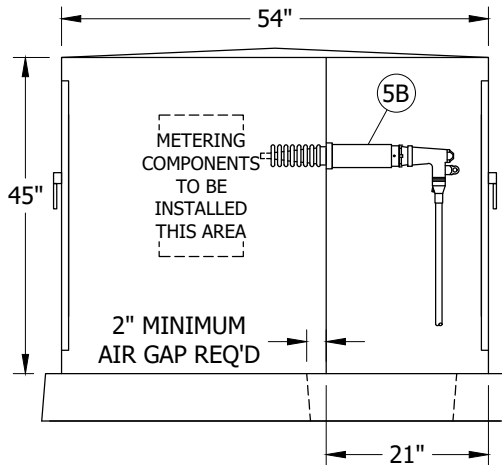
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FRONT VIEW
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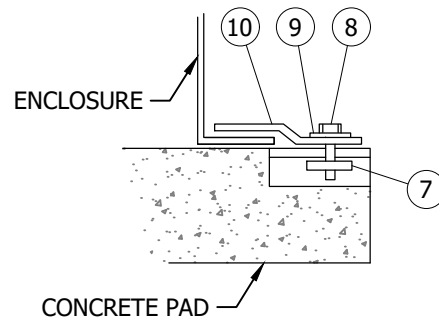


FIELD MAINTENANCE ONLY

SIDE VIEW



HOLD-DOWN ASSEMBLY DETAIL
TYPICAL BOTH SIDES OF EQUIPMENT PAD
(HILTI DRIVE-IN CAN ALSO BE USED)



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SHEET
2 OF 3

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS

200 AMP DEAD FRONT PRIMARY METERING STATION
SDG&E OWNED ALUMINUM POWDER COATED GREEN

FMO
UG4702.2

BILL OF MATERIALS:

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD. OR PAGE NO. | STOCK NUMBER | ASSEMBLY/MACRO UNITS |
|------|---|----------|--------------------------|--------------|------------------------|
| 1 | PRIMARY METER CABINET | 1 | -- | 482100 | 4KCAB, 12KCAB |
| 2 | PAD, 3425 | 1 | -- | -- | 3425.3 |
| 3 | 3311 HANDHOLE, 75" X 23" X 14" | 1 | 3311 | 162660 | 3311-S |
| 4 | TRENCH GROUND WIRE (S) | AS REQ'D | 4510 | -- | CC-970, CC-P80, CC-P90 |
| 5A | 600A CONNECTORS | AS REQ'D | 4181.20 | -- | CC--E3, CC--E5 |
| 5B | 200A CONNECTORS | AS REQ'D | 4181.20 | -- | -- |
| 6 | GROUNDING PAD-MOUNTED EQUIPMENT | -- | 4520.6, 4530.1 - .2 | -- | -- |
| 7 | NUT, CLAMPING CHANNEL, W/SPRING, 1/2" | 2 | -- | 505520 | -- |
| 8 | SCREW, HEX HEAD CAP, BRONZE 1/2" X 1-1/2" | 2 | -- | 616192 | -- |
| 9 | WASHER, STANDARD FLAT ROUND, BRONZE 1/2" | 2 | -- | 799488 | -- |
| 10 | HOLD DOWN (SUPPLIED WITH CABINET) | 2 | -- | -- | -- |
| 11 | SEALING COMPOUND (A) | AS REQ'D | -- | 442976 | -- |
| 12 | KEYLESS LOCK (NOT SHOWN) (D) | 1 | -- | 468010 | -- |
| 13 | CABLE IDENTIFICATION TAGS | AS REQ'D | 3202 | -- | -- |

INSTALLATION:

- A. SEAL CONDUITS WITH SEALING COMPOUND.
- (B) BASE OF CABINET SHALL BE CAULKED ONLY TO PREVENT POSSIBLE WIRE ENTRY.
- (D) KEYLESS LOCK TO BE ATTACHED TO LATCHING MECHANISM ON CABINET AND PENTAHEAD BOLT TO BE THREADED IN COMPLETELY.

REFERENCE:

- J. SEE STANDARD 3211 FOR STRUCTURE/EQUIPMENT IDENTIFICATION TAG.
- K. SEE STANDARD 3408 FOR WIRE ENTRY PREVENTION AND MOISTURE ENTRY.
- L. SEE STANDARD 3425 FOR PAD AND HANDHOLE INSTALLATION.
- M. SEE STANDARD 3481 FOR BARRIERS IF THE PAD IS SUBJECT TO VEHICULAR TRAFFIC.
- N. SEE STANDARD 3483 FOR MINIMUM OPERATING CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- O. SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT.
- P. SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- Q. SEE STANDARD 3487 FOR RETAINING WALLS.
- R. SEE STANDARD 4510 FOR (PREFERRED I) AND (ALTERNATE TRENCH GROUND WIRE).
- (S) SEE STANDARD PAGE 4512 FOR EQUIPMENT GROUNDING INSTALLATION.
- T. SEE STANDARD 4520 FOR GROUNDING PAD-MOUNTED EQUIPMENT.
- U. SEE STANDARD 4525 FOR GROUNDING CONCENTRIC NEUTRAL TERMINATIONS AND GROUNDING PREMOLDED CONNECTORS.

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | 200 & 600 AMP DEAD FRONT PRIMARY METERING STATION SDG&E OWNED ALUMINUM POWDER COATED GREEN | | | | | |

4800 -
VAULT STANDARDS

4800 -
VAULT STANDARDS

PAGE

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| 101 | EQUIPMENT OPENINGS |
| 102 | PICKUP INSERTS AND PULLING EYE REQUIREMENTS |
| 102 | VENTILATION SYSTEM |
| 103 | VAULT LIGHTING SYSTEM |
| 103 | VAULT DRAINAGE |
| 103 | VAULT GROUNDING SYSTEM |
| 104 | CONDUIT INSTALLATION |
| 104 | CUSTOMER SERVICE ENTRANCE |
| 105 | CUSTOMER METERING FACILITIES |
| 105 | TRANSFORMER PAD |
| 105 | TELEPHONE CONDUIT |
| 105 | CABLE TRAY |
| 105 | UNISTRUT HANGERS |
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| 108 | LOW VOLTAGE TERMINALS |
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| 109.01 | LADDER INSTALLATION FOR VAULT |

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| B | 2004 VAULT MOVED TO FMO | EDM | JES | JAS | KRG | 09/07/2023 | E | | | | | | |
| A | ORIGINAL ISSUE | - | JKI | JES | CZH | 05/23/2019 | D | | | | | | |

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| | SDG&E ELECTRIC OUNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
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| 110.06 | BELOW GRADE MULTIPLE TRANSFORMER VAULT REQUIREMENTS FOR 277/480V |
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(SCADA) REQUIREMENT FOR VAULTS

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| 110.15 & .16 | THREE PHASE WALL MOUNTED FUSE CABINET (UG STD 3580.1 &.2) |
| 110.17 | SWITCH CLEARANCES & CABLE WHIPS (UGSTD 3649.34) |

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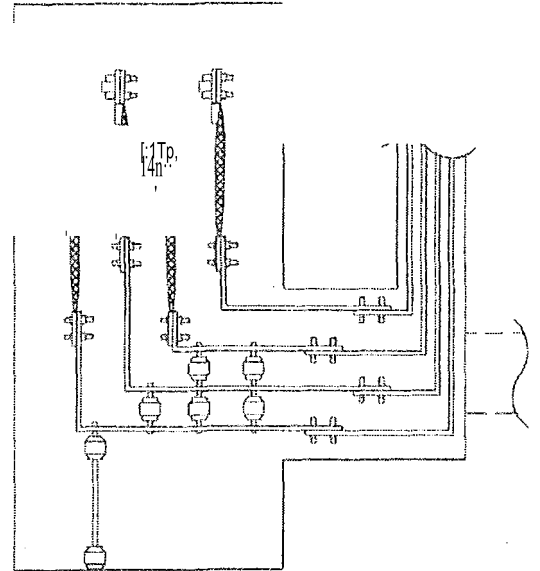
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| | 2004 TRANSFORMER VAULT SPECIFICATIONS | | | | | |



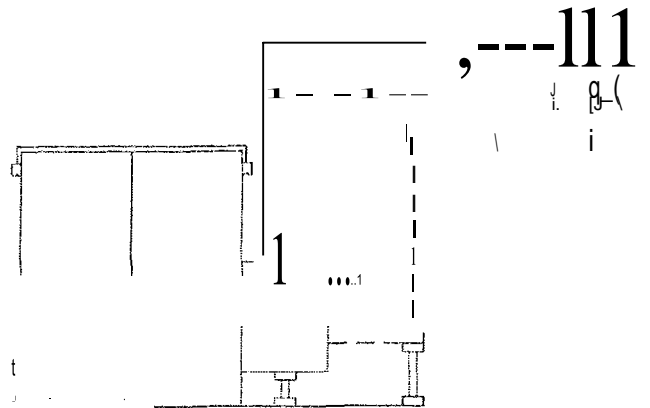
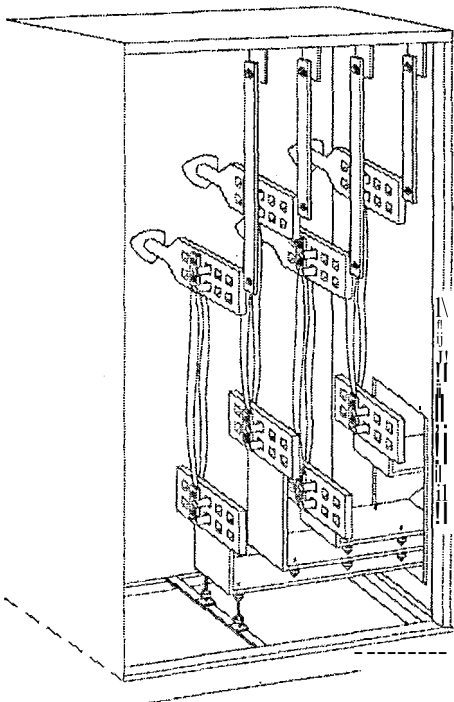
A Sempra Energy utility



2004

TRANSFORMER VAULT SPECIFICATIONS

COMPILED BY ELECTRIC DISTRIBUTION
ENGINEERING UNDERGROUND CONSTRUCTION
STANDARDS GROUP



FIELD MAINTENANCE ONLY

ATTENTION:

THESE STANDARDS WERE DEVELOPED FOR MAINTAINING SAFETY AND RELIABILITY OF THE TRANSFORMER VAULT SPECIFICATIONS AND SERVICE SYSTEMS.

SDG&E WILL NOT ACCEPT ANY SYSTEM DESIGN OR INSTALLATION WHICH DOES NOT CONFORM TO THESE STANDARDS, UNLESS AN APPROVED DEVIATION REQUEST (FORM 107-1201 FOR THE SERVICE STANDARDS & GUIDE) HAS BEEN OBTAINED FROM DISTRIBUTION STANDARDS.

DEVIATIONS CANNOT BE GRANTED WHICH CONFLICT WITH THE GENERAL ORDERS SUCH AS SEPARATIONS AND WORKING CLEARANCES.

A DEVIATION REQUEST WILL NOT BE GRANTED FOR ERRORS IN DESIGN OR CONSTRUCTION AFTER THAT CONSTRUCTION PROJECT IS COMPLETED OR PARTIALLY COMPLETED.

IF YOU HAVE ANY QUESTIONS REGARDING MISSING PAGES, MISPRINTS OR ADDITIONAL MANUALS, ETC., PLEASE CONTACT SUSAN MOHR (858) 654-8241.

IF YOU HAVE ANY QUESTIONS REGARDING THE CONTENTS OF THESE MANUALS,

FOR ELECTRIC DISTRIBUTION ANALYST
CONTACT: MIKE FRUGONE - (858) 654-1641

FOR UNDERGROUND CONSTRUCTION STANDARDS
CONTACT: TOM REGE - (858) 654-8214

FIELD MAINTENANCE ONLY

TRANSFORMER VAULT REQUIREMENTS AND SPECIFICATIONS

THE FOLLOWING SPECIFICATIONS HAVE BEEN COMPILED FOR THE INSTALLATION OF SDG&E DISTRIBUTION FACILITIES IN A CUSTOMER-OWNED VAULT. THE INFORMATION PROVIDED ARE REQUIREMENTS TO BE FOLLOWED FOR THE CONSTRUCTION OF THE VAULT AND INSTALLATION OF ELECTRICAL EQUIPMENT PER SDG&E STANDARDS. CONSULT APPROPRIATE SERVICE CENTER PLANNING DEPARTMENT FOR APPROVAL WHENEVER ANY ALTERATION TO OR DEVIATION FROM THESE PLANS AND SPECIFICATIONS ARE CONTEMPLATED. SEE SERVICE CENTER AND PHONE NUMBER LISTED BELOW.

THIS INSTALLATION MUST COMPLY WITH ALL APPLICABLE RULES OF THE ELECTRICAL SAFETY ORDERS OF THE DIVISION OF INDUSTRIAL SAFETY, DEPARTMENT OF INDUSTRIAL RELATIONS, STATE OF CALIFORNIA; NATIONAL ELECTRIC CODE; AND OTHER GOVERNING CODES AND ORDINANCES.

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PROJECT TITLE: _____

PROJECT LOCATION: _____

PROJECT NUMBER: _____

SERVICE CENTER: _____

PHONE NUMBER: _____

PLANNER: _____ DATE: _____ APPROVAL: _____

| |
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| DATE 11-3-04 |
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TRANSFORMER VAULT REQUIREMENTS AND SPECIFICATIONS

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CUSTOMER SHALL FURNISH, INSTALL, OWN, AND MAINTAIN:

1.0 TRANSFORMER VAULT:

THE WALLS AND ROOF OF THE VAULT SHALL CONSIST OF REINFORCED CONCRETE NOT LESS THAN 6 INCHES IN THICKNESS, BRICK OR REINFORCED CONCRETE BLOCK WITH ALL VOIDS POURED FULL, NOT LESS THAN 8 INCHES IN THICKNESS. ALL CONCRETE BLOCK OR BRICK JOINTS TO BE SOLID MORTARED. A 6-INCH THRESHOLD FOR OIL RETENTION TO BE PROVIDED AT ALL ACCESS OPENINGS INTO VAULT. VAULT SIZE (INSIDE DIMENSIONS). VAULT FLOOR TO BE CAPABLE OF SUPPORTING COMBINED EQUIPMENT WEIGHT OF _____ POUNDS.

WHEREVER VAULT IS CONSTRUCTED OVER SUBLEVELS OF STRUCTURE, THE CUSTOMER IS TO PROVIDE SDG&E WITH A CERTIFICATE FROM A REGISTERED CIVIL ENGINEER VERIFYING THE STRUCTURAL ADEQUACY OF THE BUILDING TO SUPPORT THE TRANSFORMERS UNDER NORMAL AND STRUCTURAL FIRE CONDITIONS AS WELL AS FIRE WITHSTANDING CAPABILITIES OF THE STRUCTURE FLOOR CEILING AND WALL.

ANY VAULT CONSTRUCTION BELOW FINISHED GRADE IS TO BE CONSIDERED A DRY VAULT. THE EXTERIOR SURFACES OF A DRY VAULT WHICH ARE EXPOSED TO SURROUNDING RTH CONDITIONS WILL BE MOISTURE PROOFED AGAINST WATER ENTRY.

NO DUCTS, PIPES OR CONDUITS, EXCEPT THOSE WHICH ARE A PART OF THE ELECTRICAL INSTALLATION, SHALL BE INSTALLED IN OR THROUGH THE VAULT. SPRINKLERS SHALL NOT BE INSTALLED IN THE VAULT ROOM.

CUSTOMER TO INFORM SDG&E WHEN ANY PRESTRESSED CONCRETE PORTIONS OF VAULT ARE PROPOSED FOR CONSTRUCTION.

2.0 PERSONNEL ACCESS DOOR (MANOOOR):

A 3 FOOT X 6 FOOT-8 INCH, 3-HOUR APPROVED SELF-CLOSING FIRE DOOR LOCATED AS SHOWN ON ATTACHED DRAWINGS.

CUSTOMER TO PROVIDE AND INSTALL A SCHLAGE VTOP QUAD SECTION MA SERIES KEY SECTION IN A STOREROOM FUNCTION (SELF LOCKING) RHODES SERIES LEVER ACTION LOCKSET. SDG&E WILL REPLACE THE MA SERIES CYLINDER WITH AN ELECTRIC SERIES CYLINDER PRIOR TO ENERGIZING THE SERVICE. THE CUSTOMER IS REQUIRED TO NOTIFY SDG&E'S INSPECTOR WHEN THE LOCKSET IS INSTALLED.

DOOR THRESHOLD TO BE 6 INCHES ABOVE VAULT FLOOR FOR OIL RETENTION.

CUSTOMER TO PROVIDE SDG&E WITH AN APPROVED ROUTE AND ACCESS EASEMENT TO THE PERSONNEL ACCESS DOOR IN THE VAULT. DOOR TO HAVE 24-HOUR DIRECT ACCESS FOR SDG&E PERSONNEL.

3.0 EQUIPMENT OPENINGS:

A. _____ FT. X _____ FT. EQUIPMENT OPENING THROUGH VAULT CEILING. CUSTOMER

SHALL PROVIDE REMOVABLE 3-HOUR FIRE APPROVED CONCRETE COVER. BOTH OPENING AND COVER TO HAVE MATCHING BEVELED EDGES, WITH **MIN.** ½ INCH TO **MAX.** 1 INCH VERTICAL DEFLECTION. FOUR LIFTING INSERTS TO BE PROVIDED FOR REMOVAL OF COVER. LIFTING INSERTS TO BE 1 INCH MINIMUM COIL, WITH SLOTTED SETTING STUDS, AS SUPPLIED BY SCA CONSTRUCTION SUPPLY OR EQUIVALENT. THE EQUIPMENT OPENING INSIDE AND OUT MUST BE KEPT CLEAR AND UNOBSTRUCTED BY CUSTOMER INSTALLED EQUIPMENT. PROPER CLEARANCE FOR OPERATION OF HEAVY EQUIPMENT, INCLUDING CRANES MUST BE PROVIDED ABOVE THE OPENING FOR INSTALLATION AND REMOVAL OF MATERIAL AND EQUIPMENT IN AND OUT OF VAULT. CONTACT UTILITY FOR REQUIRED CLEARANCE. CUSTOMER SHALL SEAL THE COVER TO PREVENT WATER ENTRY FOLLOWING INSTALLATION OF EQUIPMENT.

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B. FT. X FT. EQUIPMENT OPENING THROUGH EXTERIOR VAULT WALL.

EQUIPMENT DOOR TO BE 3-HOUR FIRE APPROVED. DOOR TO HAVE 24-HOUR DIRECT ACCESS FOR SDG&E PERSONNEL AND TO BE LOCKED WITH A SCHLAGE ELECTRIC SERIES KEYWAY CYLINDER LOCK FOR THE ELECTRIC SERIES KEY. SDG&E WILL RE-KEY THIS LOCK. A PERMANENT SIX-FOOT CLEAR WORKING AREA IS REQUIRED AT THE VAULT FLOOR LEVEL OUTSIDE OF THE ACCESS DOOR.

1. THRESHOLD TO HAVE 6 INCH SILL ABOVE VAULT FLOOR FOR OIL RETENTION.
2. REMOVABLE 6 INCH OIL RETENTION SILL AT EQUIPMENT OPENING FLOOR LEVEL IS REQUIRED WHEN THERE IS NO OTHER ACCESS FOR INSTALLING OR REMOVING TRANSFORMERS OR OTHER VAULT EQUIPMENT. SILL CONSTRUCTION TO BE 6 INCH STEEL BOX BEAM. BOLTS TO PASS THROUGH BEAM AND ALIGN WITH INSERTS EMBEDDED IN BASE OF EQUIPMENT OPENING. THE BEAM MUST ALIGN WITH FLOOR BASE & VERTICAL EDGE TO PROVIDE CLOSE FIT FOR SEALANT COMPRESSION TO RETAIN OIL INSIDE VAULT. SEALANT TO BE OIL AND WATER RESISTANT.

- C. CUSTOMER TO PROVIDE 27 INCH CAST IN FRAME RING AND A 31 INCH CAST IRON COVER PER UNDERGROUND STANDARDS PAGE 3332, LOCATED PER ATTACHED DRAWING.
- D. 48 INCH X 60 INCH MANHOLE NECK AND COVER PER PAGE 100.11, UNDERGROUND STANDARDS PAGE 3332.1.
- E. SIX INCH STEEL (WB X 12) I BEAM (2) FT. SECTIONS USED FOR MOVING TRANSFORMER INTO VAULT PAD POSITION. BEAMS TO REMAIN IN VAULT.

4. PULLING INSERT REQUIREMENTS

- A. TRANSFORMER MOVING INSERTS - (NO.) 1 INCH DIA. COIL PULLING INSERTS WITH SLOTTED STUDS AND SWIVEL LIFTING PLATE. LOCATED 12 INCHES UP FROM VAULT FLOOR, PER ATTACHED SKETCH. THE COIL INSERT STRENGTH SHALL BE BASED ON THE **MAIN** WITH WORKING LOAD SAFETY FACTOR OF 4 (SEE CHART BELOW). THE CONCRETE VAULT TO HAVE A SAFETY FACTOR OF 2 FOR THESE LOADS.

| MAIN SIZE (AMPS) | PULLING TENSION (LBS.) |
|------------------|------------------------|
| 400-800 | 4,700 |
| 900-1200 | 5,100 |
| 1300-5800 | 7,100 |
| 2100-4000 | 12,100 |

- B. CABLE PULLING INSERTS - (NO.) 7/8 INCH DIA. GALVANIZED PULLING IRON(S) LOCATED IN THE OPPOSITE WALL, SAME HEIGHT AS INCOMING CONDUITS. PULLING IRON(S) TO BE DESIGNED TO PROVIDE A MINIMUM PULLING TENSION OF 15,000 LBS. THE CONCRETE VAULT TO HAVE A SAFETY FACTOR OF 2 FOR THESE LOADS.

OPTIONAL CABLE AND/OR TRANSFORMER INSERT - MAY BE LOCATED IN THE VAULT FLOOR, A MINIMUM OF 9 INCHES FROM ANY WALL FACE, AND LOCATED PER ATTACHED SKETCH.

5. VENTILATION SYSTEM:

- A. INTAKE; AIR INTAKE OPENING LOCATED IN WALL OF VAULT CONNECTED WITH STANDARD DUCTING TO 18 INCHES ABOVE VAULT FLOOR. STANDARD DUCTING TO EXTEND FROM VAULT TO A POINT WITH MINIMUM 18 INCHES CLEARANCE ABOVE GROUND AND COVERED WITH A LOUVERED GRATING ON EXTERIOR OF THE BUILDING. COVER INSIDE OF CAP WITH 1/2 INCH MESH HARDWARE CLOTH TO PREVENT ENTRANCE OF FOREIGN OBJECTS. AIR DUCTING IS TO BE CAPABLE OF CFM AIR FLOW. MAXIMUM AIR VELOCITY @ VENTS IS NOT TO EXCEED 500 FPM. IN ADDITION, THE FOREGOING INSTALLATION IS TO COMPLY WITH ALL LOCAL CODES AND ORDINANCES.

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- 8. DISCHARGE; AIR DISCHARGE OPENING TO BE LOCATED IN CEILING OR AS CLOSE TO CEILING AS PRACTICABLE. PROVIDE ADEQUATE CLEARANCE FOR FIRE DAMPER TO CONNECT WITH STANDARD DUCTING WITH VENTILATION FAN MOTOR AS SHOWN ON ATTACHED DRAWING. STANDARD DUCTING IS TO TERMINATE MINIMUM 18 INCHES ABOVE GROUND WITH A LOUVERED GRATING ON EXTERIOR OF BUILDING. COVER INSIDE OF CAP WITH 1/2 INCH MESH HARDWARE CLOTH TO PREVENT ENTRANCE OF FOREIGN OBJECTS. AIR DUCTING TO BE CAPABLE OF _____ CFM AIR FLOW. MAXIMUM VELOCITY @ VENTS IS NOT TO EXCEED 500 FPM. IN ADDITION, THE FOREGOING INSTALLATION IS TO COMPLY WITH ALL LOCAL CODES AND ORDINANCES.
- C. FIRE DAMPERS AS REQUIRED BY LOCAL GOVERNING AGENCIES.
- D. ONE CONTINUOUS _____ CFM (MINIMUM) EXHAUST FAN DIRECT DRIVEN BY A _____ V_ PHASE, SEALED BALLBEARING MOTOR. FAN TO BE MOUNTED AS CLOSE TO THE CEILING AS PRACTICABLE AND CONNECTED TO AIR DISCHARGE DUCTING.
- E. FAN SWITCH WITH PROTECTION AND THERMOSTAT FOR FAN CONTROL. _____ VOLT RANGE 70 TO 140°F, MINNEAPOLIS-HONEYWELL THERMOSTAT MODEL OR EQUAL.

6. VAULT LIGHTING SYSTEM:

- A. 150 WATT LIGHT(S), POSITIONS INDICATED PER ATTACHED DRAWINGS.
- 8. VAULT LIGHT SWITCH AND 120V POWER RECEPTACLE.
- C. EXO SWITCH COMPLETE WITH PROTECTION. VENTILATION BLOWER MOTOR AND VAULT LIGHTING SYSTEM TO BE SEPARATELY PROTECTED.
- D. IN. CONDUIT ENCLOSED CIRCUIT FROM POINT ADJACENT TO SECONDARY SIDE OF TRANSFORMER TO EXO SWITCH AND INTERCONNECT VAULT LIGHTS, SWITCH AND RECEPTACLE, EXHAUST FAN AND THERMOSTAT CONTROL.
- E. IN. EMT CONDUIT (EMBEDDED IN FLOOR OR WALL, USE PLASTIC EB) INTER-CONNECTING CONDUIT FROM SECONDARY SIDE OF ITEM # 16 TRANSFORMER TO 600V FUSED SWITCH AND STEPDOWN TRANSFORMER ITEM 16C AND TO CUSTOMER'S EXO SWITCH AND VAULT ELECTRICAL SYSTEM.
- F. FOUR FOOT DOUBLE FLUORESCENT LAMP FIXTURE WITH 40 WATT BI-FIN LAMPS TO BE MOUNTED ON CEILING OR MAXIMUM HEIGHT OF 9 FEET, LOCATIONS AS SPECIFIED ON DRAWING.

7. VAULT DRAINAGE SYSTEM:

WHEN THE APPROPRIATE INSPECTION AUTHORITY REQUIRES A VAULT DRAINAGE SYSTEM, THE CUSTOMER IS TO INSTALL A STANDARD FLOOR DRAIN TO A DRY SUMP LOCATED OUTSIDE OF THE VAULT. SLOPE THE FLOOR GENTLY TO THIS DRAIN AND COVER WITH STANDARD GRATING.

THE DESIGN AND INSTALLATION, TO BE PROVIDED BY THE CUSTOMER, MUST BE APPROVED BY THE APPROPRIATE INSPECTION AUTHORITY, _____

THE OIL CAPACITY FOR THIS INSTALLATION WILL BE _____ GALLONS.

8. VAULT GROUNDING SYSTEM:

_____-5/8 INCH X 10 FEET LONG COPPERCLAD STEEL GROUND RODS AT MINIMUM 6 FEET INTERVAL, INTERCONNECTED BY #2 BARE STRAND WIRE (REFER TO VAULT PLAN LOCATIONS).

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CUSTOMER TO PROVIDE EXPOSED 24 INCH, #2 BARE STRAND TAIL AT PRIMARY SIDE OF EACH TRANSFORMER LOCATION AND APPROVED GROUNDING CLAMPS AND LUGS FOR CONNECTION TO TRANSFORMER GROUND LUGS. CONTACT SDG&E INSPECTOR TWO (2) DAYS PRIOR TO FINAL INSTALLATION OF CONDUIT GROUND RODS AND GROUND GRID SYSTEM FOR CLEARANCE TO PROCEED.

- A. INSIDE VAULT - GROUND RODS TO HAVE 3 INCHES EXPOSURE ABOVE VAULT FLOOR FOR VISIBLE CONNECTION OF GROUND WIRE. INSTALL TWO 24 INCH LONG #2 BARE STRANDED COPPER WIRE TAILS USING APPROVED TYPE GROUND CLAMP AND LUGS FOR CONNECTION TO TRANSFORMER GROUND LUGS.
- B. OUTSIDE VAULT - #2 BARE STRAND TO EXTEND TO BUILDING ENTRANCEWAY. GROUND WIRE TO BE INSULATED FROM BUILDING ENTRANCEWAY TO TRANSFORMER NEUTRAL GROUND LEAD, TRANSFORMER TANK AND TO CUSTOMER GROUND SYSTEM. ALL BURIED CONNECTIONS ARE TO BE BRAZED. 1-1 INCH IPS CONDUIT FOR GROUND WIRE FROM OUTSIDE BUILDING TO DISTRIBUTION FACILITIES AS SHOWN.

9. CONDUIT INSTALLATION:

CONDUITS SHALL BE EITHER DIRECT BURIED OR CONCRETE ENCASED AS SPECIFIED.
(NO OVERHEAD CONDUITS)

HORIZONTAL BENDS SHALL BE MINIMUM 3 FEET RADIUS. ALL CONDUITS TO BE FREE AND CLEAR OF DIRT, ROCKS OR OTHER OBSTRUCTIONS. IN CONDUIT RUNS OVER 20 FEET, A 3/16 INCH YELLOW POLYPROPYLENE PULL ROPE (MINIMUM OF 720 POUND TENSILE STRENGTH) WILL BE INSTALLED IN EACH CONDUIT WITH AT LEAST A 2 FOOT COIL SECURELY TIED AT EACH TERMINATING END OF CONDUIT RUN. CONTACT SDG&E INSPECTOR TWO (2) DAYS PRIOR TO FINAL INSTALLATION OF CONDUIT SYSTEM FOR CLEARANCE TO PROCEED.

NOTE: SERVICE CONDUITS NOT INCLUDED IN THIS SECTION.

| | | | |
|------------|-----------------|-----------|-------|
| <u>9A.</u> | (NO. CONDUITS), | IN. SIZE, | TYPE. |
| <u>8.</u> | (NO. CONDUITS), | IN. SIZE, | TYPE. |
| <u>C.</u> | (NO. CONDUITS), | IN. SIZE, | TYPE. |
| <u>D.</u> | (NO. CONDUITS), | IN. SIZE, | TYPE. |

10. CUSTOMER SERVICE ENTRANCE:

- A. CONDUITS FROM SECONDARY SIDE OF TRANSFORMER TO CUSTOMERS PULL SECTION AS INDICATED ON ATTACHED SKETCH.
- B. SERVICE BUSWAY FROM CUSTOMER'S EQUIPMENT TO TRANSFORMER AS SHOWN ON ATTACHED SKETCH. THE DESIGN AND LOCATION MUST BE APPROVED BY SDG&E PRIOR TO FABRICATION. INTERCONNECT CORRESPONDING PHASE STAB WITH NEMA DRILLED BUS BAR. SERVICE BUSWAY STABS ARE TO BE A MINIMUM OF 7 FEET-6 INCHES ABOVE FLOOR. BUS AMPACITY TO MATCH OR EXCEED PANEL RATING.
- C. SERVICE BUSWAY FROM CUSTOMER'S SERVICE EQUIPMENT TO TRANSFORMER. THE DESIGN AND LOCATION MUST BE APPROVED BY SDG&E PRIOR TO FABRICATION. REFER TO ATTACHED ENCLOSURE FOR STRAIGHT BUS SECTION AND BUS ENTRANCE BOX FOR ATTACHMENT TO TRANSFORMER HOUSING. BUS BAR CONFIGURATION AND TRANSFORMER HOUSING IS AS SHOWN. BUS AND ENTRANCE BOX TO BE PERMANENTLY SUPPORTED AS REQUIRED. HORIZONTAL BUS CLEARANCE WITHIN VAULT TO MAINTAIN 7 FOOT-6 INCH HEIGHT. WHERE BUS ENTERS VAULT ROOM, OPENING TO BE SEALED FOLLOWING BUS INSTALLATION. BUS AMPACITY TO MATCH OR EXCEED PANEL RATING.
- D. CUSTOMER SERVICE ENTRANCE INSTALLATIONS TO COMPLY WITH ALL LOCAL CODES AND ORDINANCES.

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11. CUSTOMER'S METERING FACILITIES:

CUSTOMER'S METERBOARD TO BE CONSTRUCTED IN ACCORDANCE WITH SOG&E SERVICE GUIDE REQUIREMENTS. MANUFACTURER TO SUBMIT DRAWING TO SOG&E ELECTRIC METER SHOP FOR APPROVAL PRIOR TO FABRICATION.

12. A. STANDARD _____ TRANSFORMER PAO WHEN REQUIRED BY SDG&E.

~~STANDARD~~ _____ TRANSFORMER PAD WHEN REQUIRED BY SOG&E.

C. 3314 HANOHOLE - NUMBER OF SECTIONS _____, INSTALLED PER UNDERGROUND STANDARDS PAGE _____

WHERE SDG&E REQUIRES A PRECAST TRANSFORMER PAO PLACED DIRECTLY ON VAULT FLOOR, PAD MUST BE SECURED TO FLOOR TO PREVENT MOVEMENT BY SEISMIC FORCES.

13. TELEPHONE CONDUIT:

ONE HALF INCH COMMUNICATIONS CONDUIT WITH APPROPRIATE PULL BOXES AND PULL LINES. EXTEND FROM PROJECT TELEPHONE EQUIPMENT AREA TO A POSITION ADJACENT TO VAULT DOOR ACCESS.

14. CABLE TRAY:

--- INCH MINIMUM WIDE CABLE TRAY CAPABLE OF SUPPORTING SERVICE CONDUCTORS WITHIN PERIMETER OF VAULT STRUCTURE. MINIMUM HEIGHT 7 FEET 6 INCHES LOCATED AS SHOWN.

15. _____ (QUANTITY AND WIDTH) UNISTRUT HANGERS SUSPENDED FROM CEILING OF VAULT CAPABLE OF SUPPORTING 500 LBS. PER HANGER, ALIGNED AS INDICATED ON ATTACHED DRAWING.

SDG&E WILL FURNISH AND INSTALL

16. TRANSFORMERS:

A. _____ TRANSFORMER(S) KV, __ / __ VOLT CONNECTED FOR THREE PHASE 4 WIRE SERVICE, (WEIGHT #).

B. _____ TRANSFORMER(S) KV, __ / __ VOLT CONNECTED FOR THREE PHASE 4 WIRE SERVICE, (WEIGHT #).

C. TRANSFORMER 480V TO 120/240 CONNECTED FOR SINGLE PHASE 3 WIRE SERVICE FOR VAULT LIGHTING AND VENTILATION SYSTEM.

17. 12KV DISTRIBUTION CABLE:

18. DISTRIBUTION EQUIPMENT:

SDG&E WILL FURNISH AND INSTALL IN VAULT (A) CABLE TAPS, (B) _____ WAY SWITCH (#), (C) WALL-MOUNTED FUSE CABINET AND FUSE, (D) P.M. CAPACITOR (2,000#). (E) 600A TEE CONNECTORS, (F) SCADA EQUIPMENT.

19. SERVICE CONDUCTORS:

PARALLEL RUNS OF SERVICE ENTRANCE CONDUCTORS FROM TRANSFORMER SECONDARY TERMINALS TO CUSTOMER'S SERVICE PULL SECTION OR CUSTOMER'S BUS STUBS.

FIELD MAINTENANCE ONLY

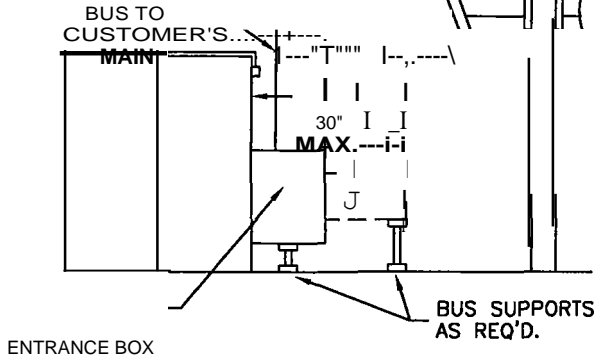
CUSTOMER SERVICE ENTRANCE

DESIGN AND LOCATION TO BE APPROVED BY
SDG&E PRIOR TO FABRICATION

20. BU DUCT INTO
PAD-MOUNTED TRANSFORMER:

TOP ENTRY OF TRANSFORMER
IS NOT PERMITTED

--- OPENING TO BE SEALED WHERE BUS
ENTERS VAULT ROOM.



CUSTOMER SHALL PROVIDE BUS DUCT
ELBOWS, STRAIGHT SECTIONS, "T"
SHAPE SPADE TERMINALS INCLUDING
ENTRANCE BOX AND SUPPORTS FROM
SERVICE MAIN TO TRANSFORMER
SECONDARY CMPT. DRILLED AS PER
PAGE 100.9

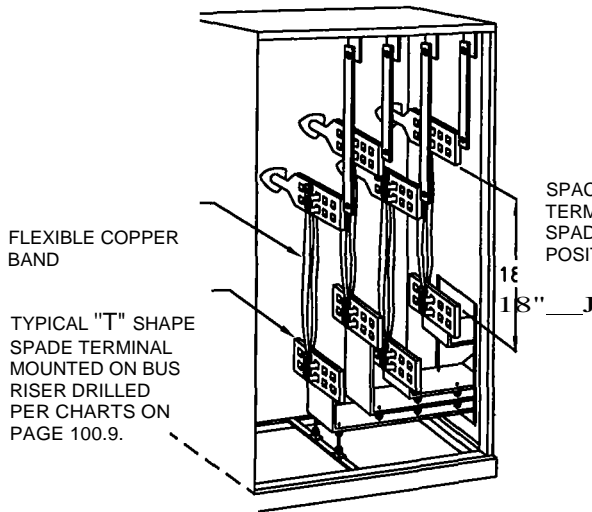
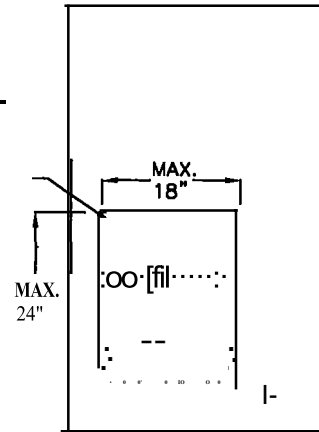
SDG&E WILL DRILL & BOLT ENTRANCE
BOX AT SIDE OF TRANSFORMER AND
PROVIDE AND INSTALL COPPER BRAID
CONNECTION.

BOX SHALL NOT BE USED AS BUS
DUCT SUPPORT. CUSTOMER TO
PROVIDE SUPPORT AS REQUIRED.
ENTRANCE BOX AND CUSTOMER'S
BUS MUST BE 30" OR LESS IN
DEPTH

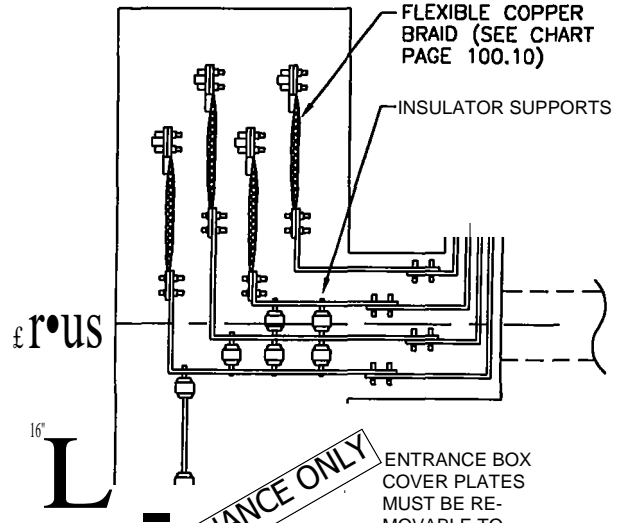
TRANSFORMER SECONDARY COMPARTMENT

WHERE BUS IS REQ'D TO
BE WEATHERPROOF.
HOUSING FLANGE WITH
MATCHING WEATHERPROOF
GASKET TO BE PROVIDED.

SIDE VIEW



FRONT VIEW



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21. COPPER BRAID SIZINGCHART:

**THREE-PHASE PADMOUNT TRANSFORMERS
(NUMBER OF 600 AMP SECONDARY BRAIDED
JUMPERS PER PHASE TO BE USED)**

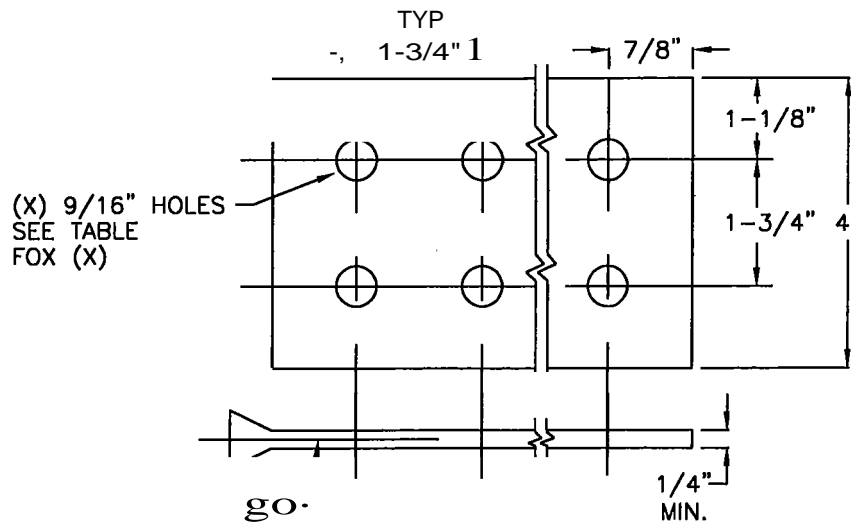
| KVA | SECONDARY VOLTAGE | | |
|------|-------------------|-----------|-----------------|
| | <u>208Y/120</u> | 240 DELTA | <u>480Y/277</u> |
| 75 | | | |
| 150 | | | |
| 225 | 2 | 2 | |
| 300 | 2 | 2 | |
| 500 | 4 | 3 | 2 |
| 750 | 6 | | 3 |
| 1000 | 7 | | 3 |
| 1500 | 11 | | 5 |
| 2000 | | | 6 |
| 2500 | | | 8 |
| 3000 | | | 9 |

FIELD MAINTENANCE ONLY

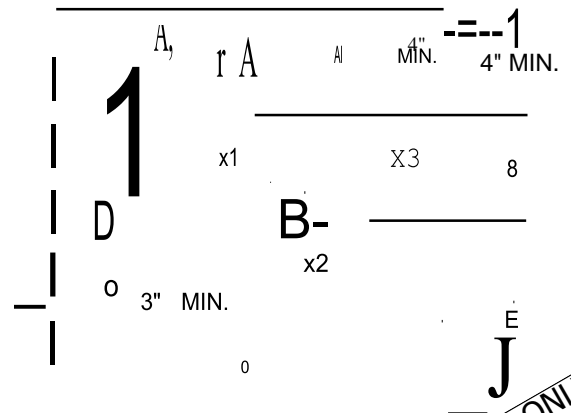
22. LOW VOLTAGE TERMINALS:

LOW VOLTAGE TERMINALS

| KVA X - 6 HOLES | KVA X - 8 HOLES | KVA X - 10 HOLES | KVA X - 12 HOLES | VOLTAGE |
|-----------------------|-----------------------|------------------------|------------------------|----------|
| | 500 | 750 | 1000 | 208Y/120 |
| 750 | 1000 | 1500 | 2000-3000 | 480Y/277 |



| A MIN. | KVA | 8 MIN. | E |
|-----------|-----------|-----------|----------|
| 5± 1/4" | 75 | 6± 1/4" | 27± 1/2" |
| 5± 1/4" | 150 | 6± 1/4" | 27± 1/2" |
| 6± 1/4" | 225 | 8± 1/4" | 31± 1/2" |
| 6± 1/4" | 300 | 8± 1/4" | 31± 1/2" |
| 6± 1/4" | 500 | 8± 1/4" | 31± 1/2" |
| 6± 1/4" | 750 | 8± 1/4" | 46± 1/2" |
| 6± 1/4" | 1000-3000 | 8± 1/4" | 46± 1/2" |



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23. CUSTOMER RESPONSIBILITY FOR VAULT:

THE CUSTOMER/OWNER SHALL FURNISH, INSTALL AND OWN THE TRANSFORMER VAULT FACILITIES AS SPECIFIED. THE CUSTOMER/OWNER WILL ALSO BE RESPONSIBLE FOR THE MAINTENANCE OF THE VAULT FACILITIES INSTALLED, FOR THE DURATION OF THE SERVICE. **THIS INCLUDES ANY PORTION OF THE VAULT STRUCTURE EXTENDING INTO THE PUBLIC RIGHT-OF-WAY, OR OUTSIDE OF THE PROJECT BOUNDARY.**

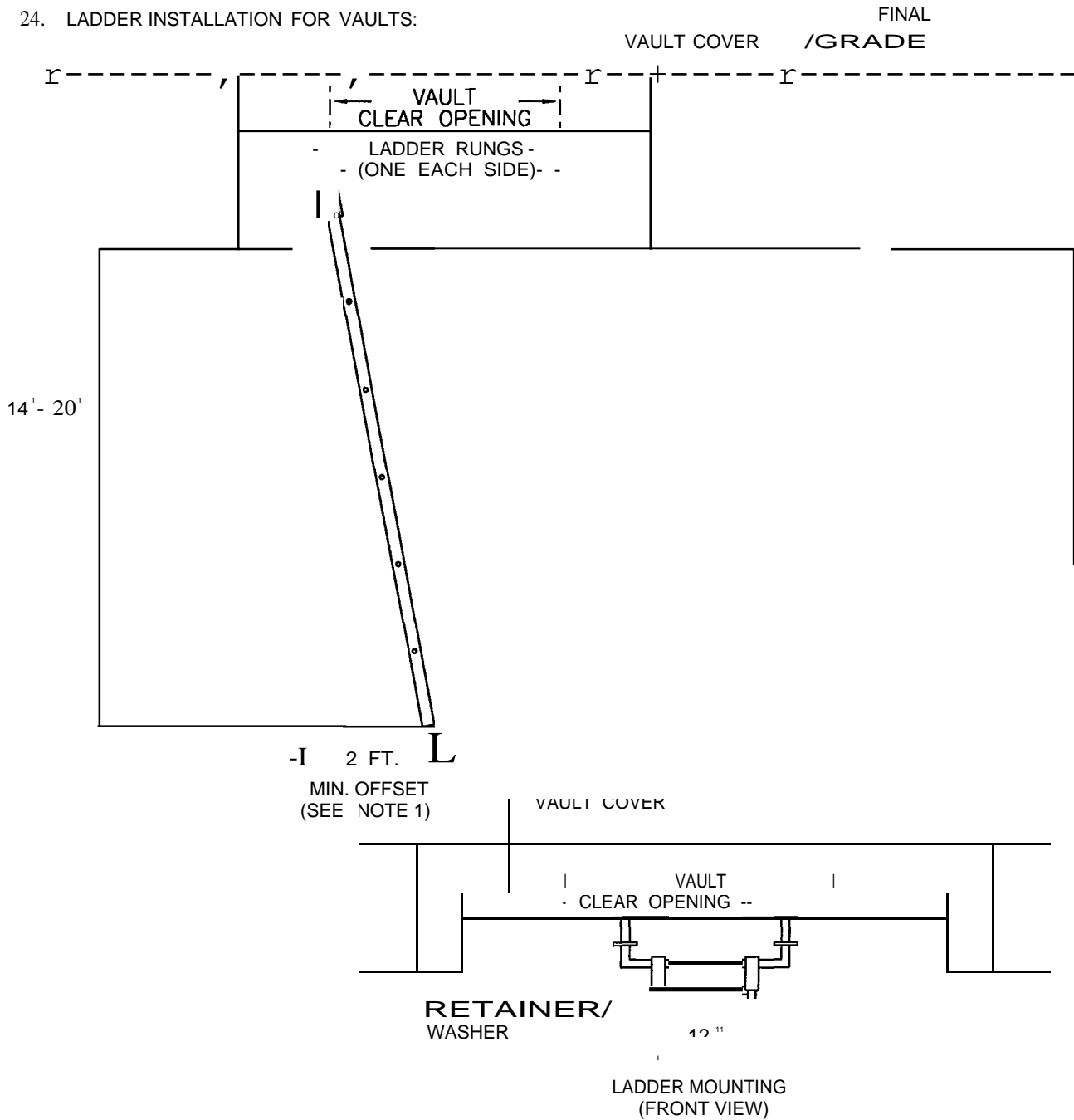
SDG&E WILL BE REPRESENTED IN THE FIELD BY AN INSPECTOR AND ALL WORK AND MATERIAL SHALL BE SUBJECT AT ALL TIMES TO INSPECTION. OUR INSPECTOR MAY BE CONTACTED PRIOR TO THE START OF YOUR CONSTRUCTION TO ANSWER ANY QUESTIONS YOU MAY HAVE CONCERNING YOUR PROJECT. FINAL ACCEPTANCE BY SDG&E WILL BE MADE WHEN YOU HAVE COMPLETED ALL WORK TO THE SATISFACTION OF OUR INSPECTOR. THE METERS CAN ONLY BE SET AFTER FINAL ACCEPTANCE OF YOUR WORK, COMPLETION OF OUR WORK, APPLICATION FOR SERVICE, AND RECEIPT OF FINAL BUILDING INSPECTION CLEARANCE.

ALL MATERIALS, WORK AND WORK AREAS SHALL COMPLY WITH THE WILLIAM-STEIGER OCCUPATIONAL SAFETY AND HEALTH ACT, FEDERAL-OSHA ACT, AND ALL OTHER APPLICABLE FEDERAL, STATE, OR LOCAL SAFETY LAWS OR RULES THAT ARE NECESSARY TO PROTECT APPLICANT'S AND UTILITY'S EMPLOYEES, THE PUBLIC, AND WORKERS DURING THE TIME OF CONSTRUCTION.

BY PROCEEDING WITH THIS INSTALLATION, IT IS UNDERSTOOD THAT YOU AGREE TO ALL THE STIPULATIONS SET FORTH IN THESE SPECIFICATIONS AND DRAWINGS INDICATED HEREIN.

FIELD MAINTENANCE ONLY

24. LADDER INSTALLATION FOR VAULTS:



NOTES:

1. OFFSET BASE OF LADDER TWO FEET (MIN.) FROM VERTICAL.
2. LADDER TO FACE ONCOMING TRAFFIC.
3. GALVANIZED LADDER TO BE PURCHASED THROUGH SUPPLIER OF VAULT COVER. LENGTH TO BE DETERMINED ONCE FINAL GRADE IS ESTABLISHED.
4. LADDERS REQUIRED IN ALL VAULTS FROM 14' TO 20' IN DEPTH UNLESS OTHERWISE SPECIFIED ON WORKING DRAWINGS.
5. CONSULT PLANNER FOR ANY VAULT MORE THAN 20' IN DEPTH.

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THE FOLLOWING TRANSFORMER VAULT PAGES ARE NOT TO BE ISSUED TO THE CUSTOMER. THESE PAGES ARE FOR REFERENCE USE ONLY BY SDG&E CENTER PERSONNEL.

TRANSFORMER VAULT REQUIREMENTS

| INDEX | PAGE# |
|--|--------------|
| BELOW GRADE SINGLE TRANSFORMER VAULT REQUIREMENTS FOR 120/208V | 110.01 & .02 |
| BELOW GRADE MULTIPLE TRANSFORMER VAULT REQUIREMENTS FOR 120/208V | 110.03 |
| BELOW GRADE SINGLE TRANSFORMER VAULT REQUIREMENTS FOR 277 /480V | 110.04 & .05 |
| BELOW GRADE MULTIPLE TRANSFORMER VAULT REQUIREMENTS FOR 277 /480V | 110.06 |
| ON GRADE SINGLE TRANSFORMER VAULT REQUIREMENTS FOR 120/208V | 110.07 & .08 |
| ON GRADE MULTIPLE TRANSFORMER REQUIREMENTS FOR 120/208V | 110.09 |
| ON GRADE SINGLE TRANSFORMER VAULT REQUIREMENTS FOR 277 /480V | 110.10 & .11 |
| ON GRADE MULTIPLE TRANSFORMER REQUIREMENTS FOR 277 / 480V | 110.12 |
| CAPACITOR REQUIREMENT FOR VAULTS | 110.13 |
| (SCADA) REQUIREMENT FOR VAULTS SUPERVISORY CONTROL AND DATA ACQUISITION | 110.14 |
| THREE PHASE WALL MOUNTED FUSE CABINET (UG STD .3580.1 & .2) | 110.15 & .16 |
| SWITCH CLEARANCES & CABLE WHIPS (UG STD .3649..34) | 110.17 |

FIELD MAINTENANCE ONLY

DATE 6-2.3-04
APPD

SDG&E
TRANSFORMER VAULT REQUIREMENTS AND SPECIFICATIONS

VAULT SPEC.

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**BELOW GRADE
 MINIMUM ELECTRIC VAULT REQUIREMENTS FOR 120/208V
 SINGLE TRANSFORMER INSTALLATION -3 PHASE TRANSFORMER**

| CUST. BOARD | 208V TRANSF. SIZE | FRONT TO BACK* | WALL TO WALL | ALONG W/TRANSF. SWITCH INSTALLED ON SIDE WALL. | | ALONG W/TRANSF. SWITCH INSTALLED ON END WALL. | | FLOOR TO CEILING | CEILING EQUIPMENT | TRANSF. | SUMP |
|-------------|-------------------|----------------|--------------|--|---------|---|---------|------------------|-------------------|---------|------|
| | | | | L LENGTH | W WIDTH | L LENGTH | W WIDTH | | | | |
| SIZE | (KVA) | L LENGTH | W WIDTH | L LENGTH | W WIDTH | L LENGTH | W WIDTH | HEIGHT | OPENING | WEIGHT | CAP. |
| 200 | 75 | 13'-6" | 9'-6" | NA | NA | NA | NA | 8'-0" | 4'-6" X 6'-6" | 3,500 | 240 |
| 400 | 150 | 13'-6" | 9'-6" | NA | NA | NA | NA | 8'-0" | 4'-6" X 6'-6" | 3,900 | 240 |
| 600 | 225 | 14'-0" | 9'-6" | NA | NA | NA | NA | 8'-0" | 5'-0" X 6'-6" | 4,200 | 240 |
| 800 | 300 | 15'-0" | 10'-6" | NA | NA | NA | NA | 8'-6" | 6'-0" X 7'-6" | 5,000 | 255 |
| 1000 | 300 | 15'-0" | 10'-6" | NA | NA | NA | NA | 8'-6" | 6'-0" X 7'-6" | 5,000 | 255 |
| 1200 | 500 | 16'-6" | 12'-6" | 21'-6" | 15'-0" | 19'-6" | 20'-9" | 9'-0" | 6'-6" X 7'-6" | 6,600 | 290 |
| 1600 | 500 | 16'-6" | 12'-6" | 21'-6" | 15'-0" | 19'-6" | 20'-0" | 9'-0" | 6'-6" X 7'-6" | 6,600 | 290 |
| 2000 | 750 | 17'-0" | 12'-6" | 22'-6" | 15'-0" | 20'-0" | 20'-0" | 9'-0" | 7'-0" X 7'-6" | 7,550 | 425 |
| 2500 | 1000 | 18'-0" | 13'-6" | 23'-6" | 16'-6" | 21'-6" | 20'-0" | 10'-0" | 8'-0" X 7'-6" | 8,200 | 435 |
| 3000 | 1000 | 18'-0" | 13'-6" | 23'-0" | 16'-6" | 21'-6" | 20'-0" | 10'-0" | 8'-0" X 7'-6" | 8,200 | 4.35 |
| 4000 | 1000 1500** | 20'-0" | 16'-0" | 25'-6" | 19'-0" | 23'-0" | 20'-0" | 11'-0" | 10'-0" X 9'-0" | 10,150 | 515 |

FIELD MAINTENANCE ONLY

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A. THE DIMENSIONS ON PAGE 201.1 COVER NECESSARY WORK AREAS INCLUDING FUSING EQUIPMENT MOUNTED ON WALL WITHIN THE' 8' WORK AREA IN FRONT OF TRANSFORMER.

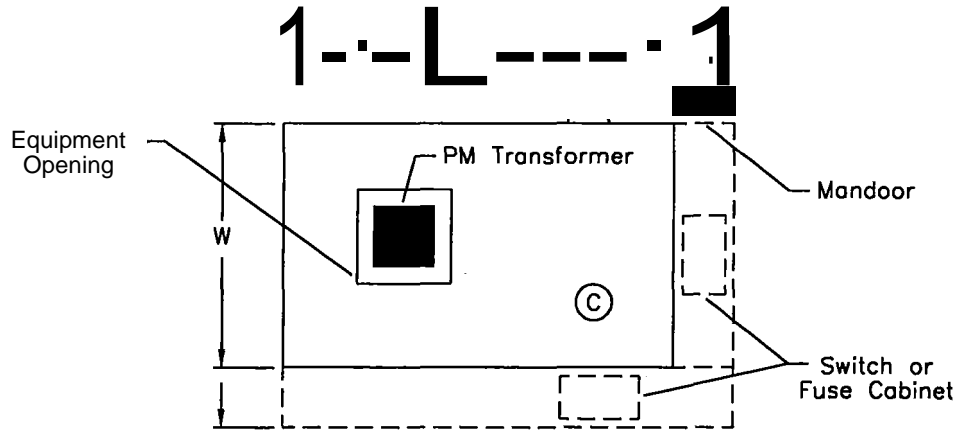
8. VAULTS ALL REQUIRE STANDARD 3'-0" X 6'-8" MANDOOK ADJACENT TO WORK AREA IN FRONT OF TRANSFORMER.

@ THOSE VAULTS WHERE MANDOOK ACCESS IS NOT READILY ACCESSIBLE 24 HRS, REQUIRE A MANHOLE ENTRANCE IN CEILING LOCATION. (MANHOLE WILL ACCESS TO WORK AREA, NOT OVER EQUIPMENT).

• THIS DIMENSION MAY BE REDUCED BY 2'-0" WHERE MANDOOK ENTRANCE IS LOCATED JUST TO THE FRONT AND SIDE OF SWITCH.

** 1500 KVA IS SUBJECT TO DIST. ENGINEERING APPROVAL.

1000 KVA IS **MAX.** INDICATED PER RULE II, 5.a,b,c.



DATE 6-22-04

APPD

SDG&E

**BELOW GRADE SINGLE TRANSFORMER VAULT
REQUIREMENTS FOR 120/208V**

FIELD MAINTENANCE ONLY

VAULT SPEC.

#

PAGE 110.02

**BELOW GRADE
 MULTIPLE TRANSFORMER INSTALLATION
 120/208V SIDE BY SIDE
 MINIMUM VAULT DIMENSIONS FOR MULTI SERVICES**

| | | | | | | | | | | | | |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| "A" | 13'-6" | 13'-6" | 14'-0" | 15'-0" | 15'-0" | 16'-6" | 16'-6" | 17'-0" | 18'-0" | 18'-0" | 20'-0" | LENGTH |
| | 9'-6" | 9'-6" | 9'-6" | 10'-6" | 10'-6" | 12'-6" | 12'-6" | 12'-6" | 13'-6" | 13'-6" | 16'-0" | WIDTH |

200i 400i 600i 800i 1000i 1200i 1600i 2000i 2500i 3000i 4000i

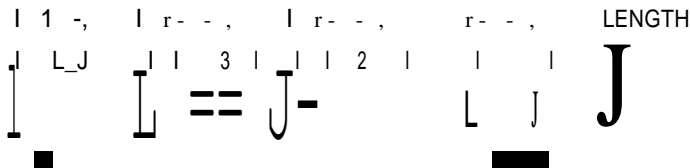
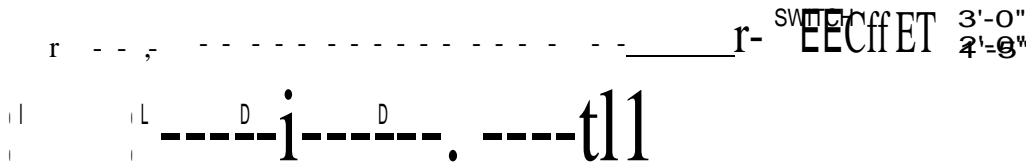
| | | | | | | | | | | | | |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|
| "B" | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | LENGTH |
| | 7'-6" | 7'-6" | 7'-6" | 8'-6" | 8'-6" | 9'-6" | 9'-6" | 9'-6" | 10'-6" | 10'-6" | 12'-0" | WIDTH |

LINE "A" - **MINIMUM** VAULT REQUIREMENTS FOR ONE SERVICE PANEL ACCORDING TO **MAIN** SIZE.

LINE "B" - ADDITIONAL VAULT REQUIREMENTS FOR EACH ADDED SERVICE MAIN.

ADD APPROPRIATE FOOTAGES FOR EACH ADDITIONAL SERVICE MAIN (LINE "B" MINIMUM

REQUIREMENTS (LINE "A") TO CALCULATE MULTIPLE SERVICE VAULT DIMENSIONS.



EXAMPLE: CUSTOMER'S 1-3000i & 1-2000i

A-3000i
 B-2000i

18'-0" X 13'-6"

SWITCH, FUSE CABINET & CABLE TAPS = 3'-0"

FIELD MAINTENANCE ONLY

a,
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N
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O
.i.,

CAPACITOR J
ADDITION

VAULT DIM'S. = 21'-Q" X 32'-Q"

THESE DIMENSIONS ARE TYPICAL ONLY. CUSTOMER'S NEEDS VARY AS TO ALLOCATED SPACE FOR THE ACTUAL VAULT. REARRANGING FACILITIES WITH NECESSARY REQUIREMENTS TO BE WORKED OUT WITH PROJECT ENGINEER.

FIELD MAINTENANCE ONLY

01-11-11

BELOW GRADE
MINIMUM ELECTRIC VAULT REQUIREMENTS FOR 277/480V SINGLE
TRANSFORMER INSTALLATION-3 PHASE TRANSFORMER

| CUST. BOARD | 480V TRANSF. SIZE | FRONT TO BACK* | WALL TO WALL | ALONG W/TRANSF. SWITCH INSTALLED ON SIDE WALL. | | ALONG W/TRANSF. SWITCH INSTALLED ON END WALL. | | FLOOR TO CEILING | CEILING EQUIPMENT | TRANSF. | SUMP |
|-------------|-------------------|----------------|--------------|--|---------|---|---------|------------------|-------------------|---------|------|
| | | | | L LENGTH | W WIDTH | L LENGTH | W WIDTH | | | | |
| SIZE | (KVA) | L LENGTH | W WIDTH | L LENGTH | W WIDTH | L LENGTH | W WIDTH | HEIGHT | OPENING | WEIGHT | CAP. |
| 200 | 150 | 13'-6" | 9'-6" | NA | NA | NA | NA | 8'-0" | 4'-6" X 6'-6" | 3,900 | 240 |
| 400 | 300 | 15'-0" | 10'-6" | NA | NA | NA | NA | 8'-6" | 6'-0" X 7'-6" | 5,000 | 255 |
| 600 | 500 | 16'-6" | 12'-6" | 21'-6" | 15'-0" | 19'-6"* | 20'-0" | 9'-0" | 6'-6" X 7'-6" | 6,600 | 290 |
| 800 | 500 | 16'-6" | 12'-6" | 21'-6" | 15'-0" | 19'-6"* | 20'-0" | 9'-0" | 6'-6" X 7'-6" | 6,600 | 290 |
| 1000 | 750 | 17'-0" | 12'-6" | 22'-6" | 15'-0" | 20'-0"* | 20'-0" | 9'-0" | 7'-0" X 7'-6" | 7,550 | 425 |
| 1200 | 1000 | 1a'-0" | 13'-6" | 23'-6" | 16'-6" | 21'-6"* | 20'-0" | 10'-0" | 8'-0" X 7'-6" | 8,200 - | 435 |
| 1600 | 1000 | 1a'-0" | 13'-6" | 23'-6" | 16'-6" | 21'-6"* | 20'-0" | 10'-0" | 8'-0" X 7'-6" | 8,200 | 435 |
| 2000 | 1500 | 20'-0" | 16'-0" | 25'-6" | 19'-0" | 23'-0"* | 20'-0" | 11'-0" | 10'-0" X 9'-0" | 10,150 | 515 |
| 2500 | 2000 | 20'-0" | 16'-6" | 25'-6" | 19'-6" | 23'-0"* | 20'-0" | 12'-0" | 10'-0" X 10'-0" | 17,300 | 570 |
| 3000 | 2000 | 20'-0" | 16'-6" | 25'-6" | 19'-6" | 23'-0"* | 20'-0" | 12'-0" | 10'-0" X 10'-0" | 17,300 | 570 |
| 4000 | 2500 - 3000** | 20'-0" | 16'-6" | 25'-6" | 19'-6" | 23'-0"* | 20'-0" | 12'-0" | 10'-0" X 10'-0" | 17,300 | 580 |

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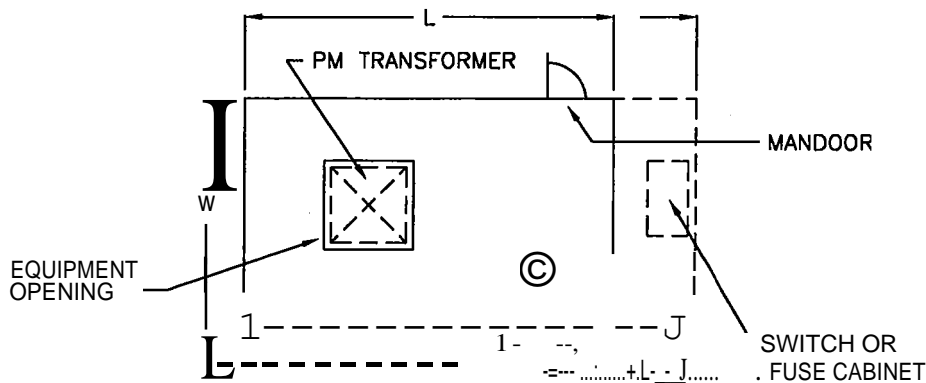
A. THE DIMENSIONS ON PAGE 203.1 COVER NECESSARY WORK AREAS INCLUDING FUSING EQUIPMENT MOUNTED ON WALL WITHIN THE 8' WORK AREA IN FRONT OF TRANSFORMER.

8. VAULTS ALL REQUIRE STANDARD 3'-0" X 6'-8" MANDOOK ADJACENT TO WORK AREA IN FRONT OF TRANSFORMER.

© THOSE VAULTS WHERE MANDOOK ACCESS IS NOT READILY ACCESSIBLE 24 HRS, REQUIRE A MANHOLE ENTRANCE IN CEILING LOCATION. (MANHOLE WILL ACCESS TO WORK AREA, NOT OVER EQUIPMENT).

• THIS DIMENSION MAY BE REDUCED BY 2'-0" WHERE MANDOOK ENTRANCE IS LOCATED JUST TO THE FRONT AND SIDE OF SWITCH.

•• **MAX.** ALLOWED PER RULE II, 5.a,b,c.



FIELD MAINTENANCE ONLY

VAULT SPEC.

PAGE 110.05

SDG&E
BELOW GRADE SINGLE TRANSFORMER VAULT
REQUIREMENTS FOR 277/480V

DATE 6-22-04
APPD

BELOW GRADE
MULTIPLE TRANSFORMER INSTALLATION
277/480V SIDE BY SIDE
MINIMUM VAULT DIMENSIONS FOR MULTI SERVICES

| | | | | | | | | | | | | |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| "A" | 13'-6" | 1s'-0" | 16'-6" | 16'-6" | 11'-0" | 1a'-0" | 18'-0" | 20'-0" | 20'-0" | 20'-0" | 20'-0" | LENGTH |
| | 9'-6" | 10'-6" | 12'-6" | 12'-6" | 12'-6" | 13'-6" | 16'-0" | 16'-6" | 16'-6" | 16'-6" | 16'-6" | WIDTH |
| | 200i | 400i | 600i | 800i | 1000i | 1200i | 1600i | 2000i | 2500i | .3000i | 4000i | |

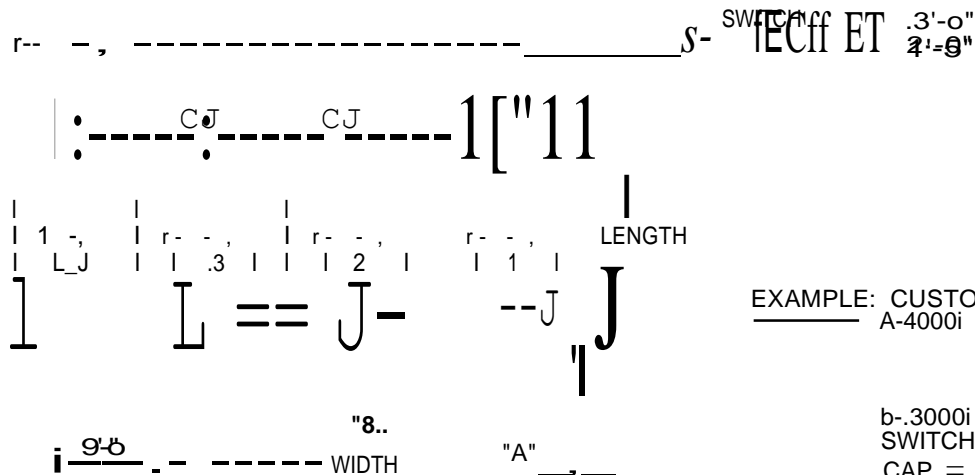
| | | | | | | | | | | | | |
|-----|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|
| "B" | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | LENGTH |
| | 7'-6" | 8'-6" | 9'-6" | 9'-6" | 9'-6" | 10'-6" | 10'-6" | 12'-0" | 12'-6" | 12'-6" | 12'-6" | WIDTH |

LINE "A" - MINIMUM VAULT REQUIREMENTS FOR ONE SERVICE PANEL ACCORDING TO MAIN SIZE.

LINE "B" - ADDITIONAL VAULT REQUIREMENTS FOR EACH ADDED SERVICE MAIN.

ADD APPROPRIATE FOOTAGES FOR EACH ADDITIONAL SERVICE MAIN (LINE "B" MINIMUM

REQUIREMENTS (LINE "A") TO CALCULATE MULTIPLE SERVICE VAULT DIMENSIONS.



EXAMPLE: CUSTOMER'S 1-4000i & 1-.3000i
 A-4000i = 20'-0" X 16'-6"

b-.3000i = 12'-6"
 SWITCH, FUSE CABINET & CABLE TAPS = .3'-0"
 CAP. = 9'-0"

ADDITION

CAPACITOR

FIELD MAINTENANCE ONLY

VAULT

DIM'S. =

2.3'-0" X .38'-0"

THESE DIMENSIONS ARE TYPICAL ONLY. CUSTOMER'S NEEDS VARY AS TO ALLOCATED SPACE FOR THE ACTUAL VAULT.
REARRANGING FACILITIES WITH NECESSARY REQUIREMENTS TO BE WORKED OUT WITH PROJECT ENGINEER.

FIELD MAINTENANCE ONLY

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ON GRADE
MINIMUM ELECTRIC VAULT REQUIREMENTS FOR 120/208V SINGLE
TRANSFORMER INSTALLATION - 3 PHASE TRANSFORMER

| CUST. BOARD | 208V TRANSF. SIZE | FRONT TO BACK* | WALL TO WALL | ALONG W/TRANSF. SWITCH INSTALLED ON SIDE WALL. | | FLOOR TO CEILING | ON GRADE EQUIPMENT OPENING | | TRANSF. | SUMP | CLEAR & LEVEL WORKING SPACE IN FRONT OF EQUIPMENT OPENING | |
|-------------|-------------------|----------------|--------------|--|---------|------------------|----------------------------|---------|---------|------|---|--------|
| | | | | L LENGTH | W WIDTH | | L LENGTH | W WIDTH | | | HEIGHT | WIDE |
| 200 | 75 | 14'-6" | 9'-6" | 14'-6" | 12'-6" | 8'-0" | 7'-6" | 6'-6" | 3,500 | 240 | 6'-0" | 7'-6" |
| 400 | 150 | 14'-6" | 9'-6" | 14'-6" | 12'-6" | 8'-0" | 7'-6" | 7'-6" | 3,900 | 240 | 6'-0" | 7'-6" |
| 600 | 225 | 16'-0" | 9'-6" | 16'-0" | 12'-6" | 8'-0" | 7'-6" | 7'-6" | 4,200 | 240 | 6'-0" | 7'-6" |
| 800 | .300 | 17'-0" | 10'-6" | 17'-0" | 13'-6" | 8'-0" | 8'-6" | 8'-6" | 5,000 | 255 | 7'-0" | 8'-6" |
| 1000 | .300 | 17'-0" | 10'-6" | 17'-0" | 13'-6" | 8'-0" | 8'-6" | 8'-6" | 5,000 | 255 | 7'-0" | 8'-6" |
| 1200 | 500 | 19'-6" | 12'-6" | 19'-6" | 12'-6" | 9'-0" | 8'-6" | 8'-6" | 6,600 | 290 | 7'-0" | 8'-6" |
| 1600 | 500 | 19'-6" | 12'-6" | 19'-6" | 12'-6" | 9'-0" | 8'-6" | 8'-6" | 6,600 | 290 | 7'-0" | 8'-6" |
| 2000 | 750 | 20'-0" | 12'-6" | 20'-0" | 15'-6" | 9'-0" | 8'-6" | 8'-6" | 7,550 | 425 | 8'-0" | 8'-6" |
| 2500 | 1000 | 21'-0" | 13'-6" | 21'-0" | 16'-6" | 10'-0" | 8'-6" | 8'-6" | 8,200 | 435 | 8'-0" | 8'-6" |
| .3000 | 1000 | 21'-0" | 13'-6" | 21'-0" | 16'-6" | 10'-0" | 8'-6" | 8'-6" | 8,200 | 4.35 | 8'-0" | 8'-6" |
| 4000 | 1000, 1500.. | 23'-0" | 16'-0" | 23'-0" | 19'-0" | 11'-0" | 10'-0" | 10'-0" | 10,150 | 515 | 10'-0" | 10'-0" |

FIELD MAINTENANCE ONLY

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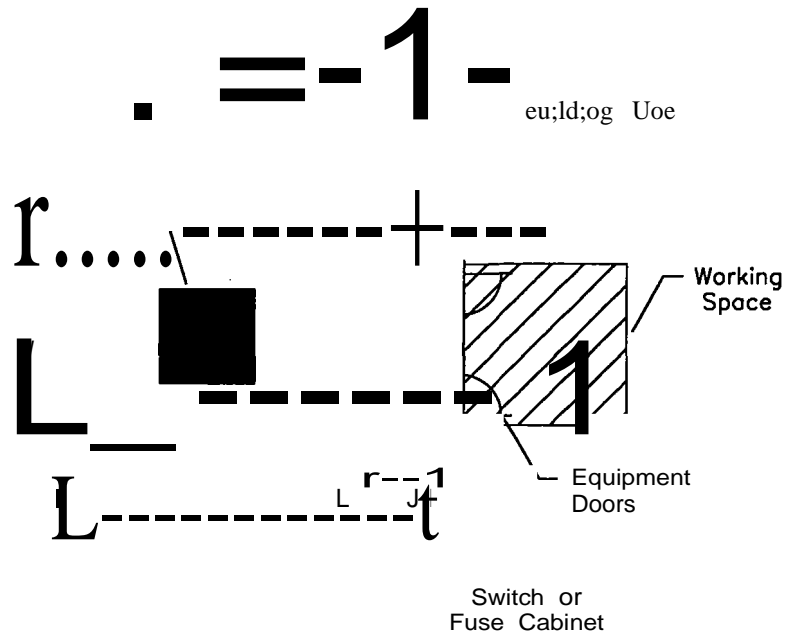
FIELD MAINTENANCE ONLY

A. THESE DIMENSIONS COVER NECESSARY WORK AREA INCLUDING FUSING EQUIPMENT MOUNTED ON WALL WITHIN THE 8' WORK AREA IN FRONT OF TRANSFORMER.

* THIS DIMENSION MAY BE REDUCED BY 6' -0" WHEN THE PAD-MOUNTED TRANSFORMER IS THE ONLY SDG&E EQUIPMENT INSTALLED IN VAULT & TH CLEAR & LEVEL WORKING SPACE REQUIREMENT OUTSIDE VAULT IS MAINTAINED.

** 1500 KVA IS SUBJECT TO DIST. ENGINEERING APPROVAL.

1000 KVA IS MAX. INDICATED PER RULE II, 5.a,b,c.



FIELD MAINTENANCE ONLY

DATE 6-22-04
APPD

SDG&E
ON GRADE SINGLE TRANSFORMER VAULT
REQUIREMENTS FOR 120/208V

VAULT SPEC.

PAGE 110.08

**OF GRADE
 MULTIPLE TRANSFORMER INSTALLATION
 120/208V SIDE BY SIDE
 MINIMUM VAULT DIMENSIONS FOR MULTI SERVICES**

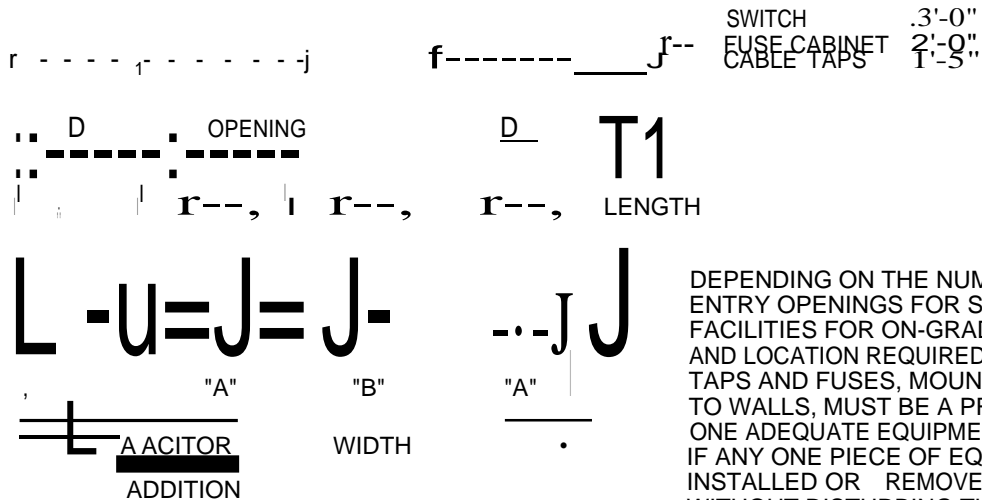
| | | | | | | | | | | | | |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| "A" | 14'-6" | 14'-6" | 16'-0" | 11'-0" | 11'-0" | 19'-6" | 19'-6" | 20'-0" | 21'-0" | 21'-0" | 23'-0" | LENGTH |
| | 9'-6" | 9'-6" | 9'-6" | 10'-6" | 10'-6" | 12'-6" | 12'-6" | 12'-6" | 13'-6" | 13'-6" | 16'-6" | WIDTH |
| | 200i | 400i | 600i | 800i | 1000i | 1200i | 1600i | 2000i | 2500i | 3000i | 4000i | |

| | | | | | | | | | | | | |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|
| "B" | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | LENGTH |
| | 7'-6" | 7'-6" | 7'-6" | 8'-6" | 8'-6" | 9'-6" | 9'-6" | 9'-6" | 10'-6" | 10'-6" | 12'-0" | WIDTH |

LINE "A" - MINIMUM VAULT REQUIREMENTS FOR ONE SERVICE PANEL ACCORDING TO MAIN SIZE.

LINE "B" - ADDITIONAL VAULT REQUIREMENTS FOR EACH ADDED SERVICE MAIN.

ADD APPROPRIATE FOOTAGES FOR EACH ADDITIONAL SERVICE MAIN (LINE "B" MINIMUM REQUIREMENT (LINE "A") TO CALCULATE MULTIPLE SERVICE VAULT DIMENSIONS.



DEPENDING ON THE NUMBER OF EQUIPMENT ENTRY OPENINGS FOR SLIDE-IN OR ROLL-IN FACILITIES FOR ON-GRADE VAULTS, THE SPACE AND LOCATION REQUIRED FOR SWITCH, TAPS AND FUSES, MOUNTED ON OR ADJACENT TO WALLS, MUST BE A PRIME CONSIDERATION. ONE ADEQUATE EQUIPMENT OPENING IS SUFFICIENT, IF ANY ONE PIECE OF EQUIPMENT CAN BE INSTALLED OR REMOVED VIA THAT OPENING WITHOUT DISTURBING THE OTHER EQUIPMENT PLACED IN THE VAULT.

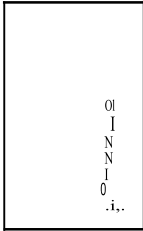
THESE DIMENSIONS ARE TYPICAL ONLY. CUSTOMER'S NEEDS VARY AS TO ALLOCATED SPACE FOR THE ACTUAL VAULT. RE-ARRANGING FACILITIES WITH NECESSARY REQUIREMENTS, TO BE WORKED OUT WITH PROJECT ENGINEER.

FIELD MAINTENANCE ONLY

VAULT SPEC.
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 PAGE 110.09

SDG&E
ON GRADE MULTIPLE TRANSFORMER VAULT
REQUIREMENTS FOR 120/208V

DATE 6-22-04
 APPD



**ON GRADE
MINIMUM ELECTRIC VAULT REQUIREMENTS FOR 277/480V
SINGLE TRANSFORMER INSTALLATION - 3 PHASE TRANSFORMER**

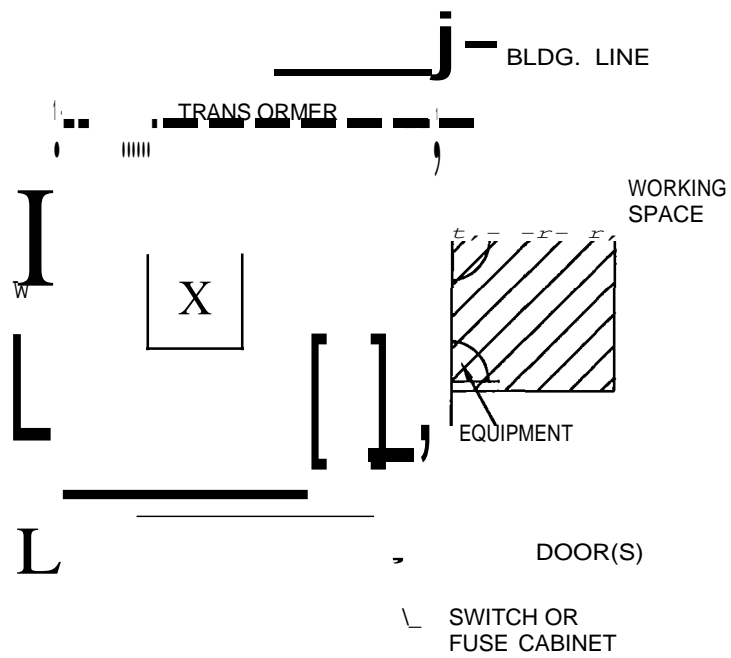
| CUST. BOARD | 480V TRANSF. SIZE | FRONT TO BACK* | WALL TO WALL | ALONG W/TRANSF. SWITCH INSTALLED ON SIDE WALL. | | FLOOR TO CEILING | ON GRADE EQUIPMENT OPENING | | TRANSF. WEIGHT | SUMP CAP. | CLEAR & LEVEL WORKING SPACE IN FRONT OF EQUIPMENT OPENING | |
|-------------|-------------------|----------------|--------------|--|---------|------------------|----------------------------|--------|----------------|-----------|---|---------|
| | | | | L LENGTH | W WIDTH | | WIDE | HIGH | | | L LENGTH | W WIDTH |
| 200 | 150 | 14'-6" | 9'-6" | 14'-6" | 12'-6" | 8'-0" | 7'-6" | 7'-6" | 3,900 | 240 | 6'-0" | 7'-7" |
| 400 | 300 | 11'-0" | 10'-6" | 17'-0" | 13'-6" | 8'-6" | 8'-0" | 8'-6" | 5,000 | 255 | 7'-0" | 8'-6" |
| 600 | 500 | 19'-6" | 12'-6" | 19'-6" | 15'-6" | 9'-0" | 8'-6" | 8'-6" | 6,600 | 290 | 7'-0" | 8'-6" |
| 800 | 500 | 19'-6" | 12'-6" | 19'-6" | 15'-6" | 9'-0" | 8'-6" | 8'-6" | 6,600 | 290 | 7'-0" | 8'-6" |
| 1000 | 750 | 12'-0" | 12'-6" | 20'-0" | 15'-6" | 9'-0" | 8'-6" | 8'-6" | 7,500 | 425 | 8'-0" | 8'-6" |
| 1200 | 1000 | 21'-0" | 13'-6" | 21'-0" | 16'-6" | 10'-0" | 8'-6" | 8'-6" | 8,200 | 435 | 8'-0" | 8'-6" |
| 1600 | 1000 | 21'-0" | 13'-6" | 21'-0" | 16'-6" | 10'-0" | 8'-6" | 8'-6" | 8,200 | 435 | 8'-0" | 8'-6" |
| 2000 | 1500 | 23'-0" | 16'-0" | 23'-0" | 19'-0" | 11'-0" | 10'-0" | 10'-0" | 10,150 | 515 | 10'-0" | 10'-0" |
| 2500 | 2000 | 23'-0" | 16'-6" | 23'-0" | 19'-6" | 12'-0" | 10'-0" | 10'-0" | 17,300 | 570 | 10'-0" | 10'-0" |
| 3000 | 2000 | 23'-0" | 16'-6" | 23'-0" | 19'-6" | 12'-0" | 10'-6" | 10'-0" | 17,300 | 570 | 10'-0" | 10'-0" |
| 4000 | 2500 3000° | 23'-0" | 16'-6" | 23'-0" | 19'-6" | 12'-0" | 10'-6" | 10'-0" | 17,300 | 580 | 10'-0" | 10'-0" |

FIELD MAINTENANCE ONLY

A. THESE DIMENSIONS OF PAGE 303.1 COVER NECESSARY WORK AREAS INCLUDING FUSING EQUIPMENT MOUNTED ON WALL WITHIN THE 8' WORK AREA IN FRONT OF TRANSFORMER.

* THIS DIMENSION MAY BE REDUCED BY 6'-0" WHEN THE PAD-MOUNTED TRANSFORMER IS THE ONLY SDG&E EQUIPMENT INSTALLED IN VAULT & THE CLEAR & LEVEL WORKING SPACE REQUIREMENT OUTSIDE VAULT IS MAINTAINED AND AT THE SAME GRADE AS VAULT FLOOR.

** MAX. ALLOWED PER RULE II, 5.a,b,c.



FIELD MAINTENANCE ONLY

**ON GRADE
MULTIPLE TRANSFORMER INSTALLATION
277/408V SIDE BY SIDE
MINIMUM VAULT DIMENSIONS FOR MULTI SERVICES**

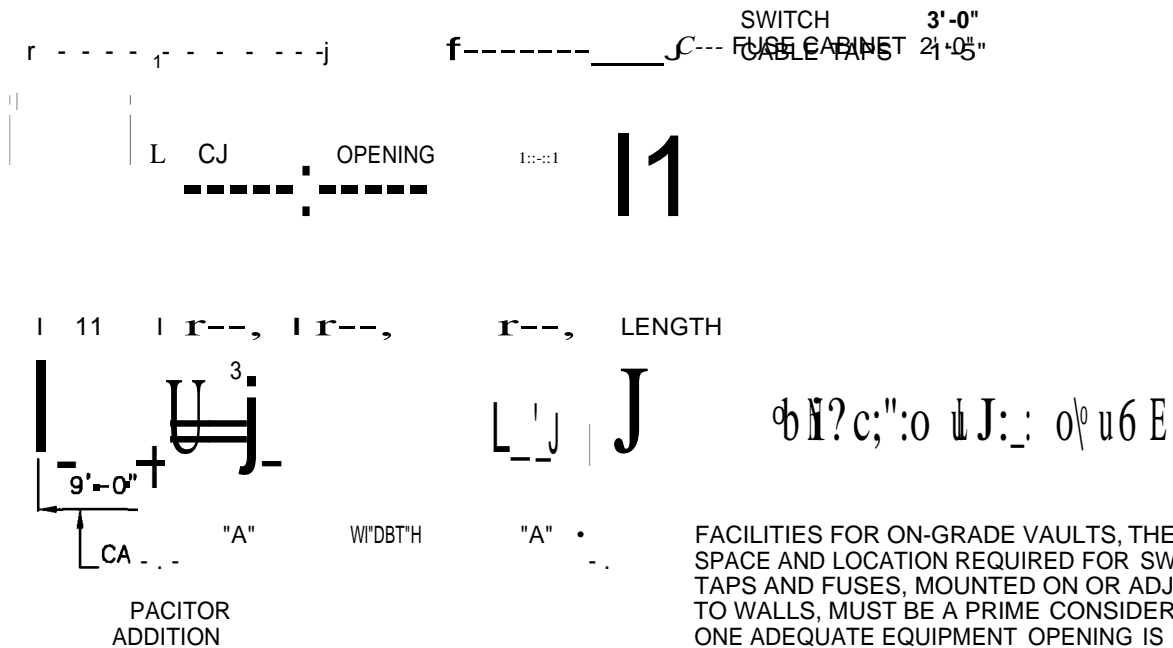
| | | | | | | | | | | | |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 14'-6" | 11'-0" | 19'-6" | 19'-6" | 20'-0" | 21'-0" | 21'-0" | 23'-0" | 23'-0" | 23'-0" | 23'-0" | LENGTH |
| 9'-6" | 10'-6" | 12'-6" | 12'-6" | 12'-6" | 13'-6" | 16'-0" | 16'-6" | 16'-6" | 16'-6" | 16'-6" | WIDTH |
| 200i | 400i | 600i | 800i | 1000i | 1200i | 1600i | 2000i | 2500i | 3000i | 4000i | |

| | | | | | | | | | | | |
|-----|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | LENGTH |
| "B" | 7'-6" | 8'-6" | 9'-6" | 9'-6" | 9'-6" | 10'-6" | 10'-6" | 12'-0" | 12'-6" | 12'-6" | WIDTH |

LINE "A" - MINIMUM VAULT REQUIREMENTS FOR ONE SERVICE PANEL ACCORDING TO MAIN SIZE.

LINE "B" - ADDITIONAL VAULT REQUIREMENTS FOR EACH ADDED SERVICE MAIN.

ADD APPROPRIATE FOOTAGES FOR EACH ADDITIONAL SERVICE MAIN (LINE "B") MINIMUM REQUIREMENT (LINE "A") TO CALCULATE MULTIPLE SERVICE VAULT DIMENSIONS.



FACILITIES FOR ON-GRADE VAULTS, THE SPACE AND LOCATION REQUIRED FOR SWITCH, TAPS AND FUSES, MOUNTED ON OR ADJACENT TO WALLS, MUST BE A PRIME CONSIDERATION. ONE ADEQUATE EQUIPMENT OPENING IS SUFFICIENT, IF ANY ONE PIECE OF EQUIPMENT CAN BE INSTALLED OR REMOVED VIA THAT OPENING WITHOUT DISTURBING THE OTHER EQUIPMENT PLACED IN THE VAULT.

THESE DIMENSIONS ARE TYPICAL ONLY. CUSTOMER'S NEEDS VARY AS TO ALLOCATED SPACE FOR THE ACTUAL VAULT. RE-ARRANGING FACILITIES WITH NECESSARY REQUIREMENTS, TO BE WORKED OUT WITH PROJECT ENGINEER.

FIELD MAINTENANCE ONLY

DATE 6-23-04

APPD

SDG&E
ON GRADE MULTIPLE TRANSFORMER VAULT
REQUIREMENTS FOR 277/408V

VAULT SPEC.

#

PAGE **110.12**

FIELD MAINTENANCE ONLY

CAPACITOR REQUIREMENTS FOR VAULTS

| PANEL | 200 | 400 | 600 | 800 | 1000 | 1200 | 1600 | 2000 | 2500 | 3000 | 4000 |
|------------------|-----|-----|-----|-----|------|------|------|------|------|------|------|
| 120/208 3ϕ 4W | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1r |
| 277/480 3ϕ 4W | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |

1. ADD PANEL SIZES BY VOLTAGE CLASS.TAKE THE TOTAL AND APPLY TO THE TABLE. ROUND UP TO NEXT SIZE.WHEN THE TOTAL EXCEEDS 4000 ALLOW FOR ONE PAD-MOUNTED CAPACITOR AND START OVER, ADDING THE REMAINING PANEL RATINGS
2. A "1" INDICATES VAULT SPACE REQUIRED FOR ONE PAD-MOUNTED CAPACITOR.
3. A "0" INDICATES NO CAPACITOR REQUIRED.

1925 LBS

FIELD MAINTENANCE ONLY

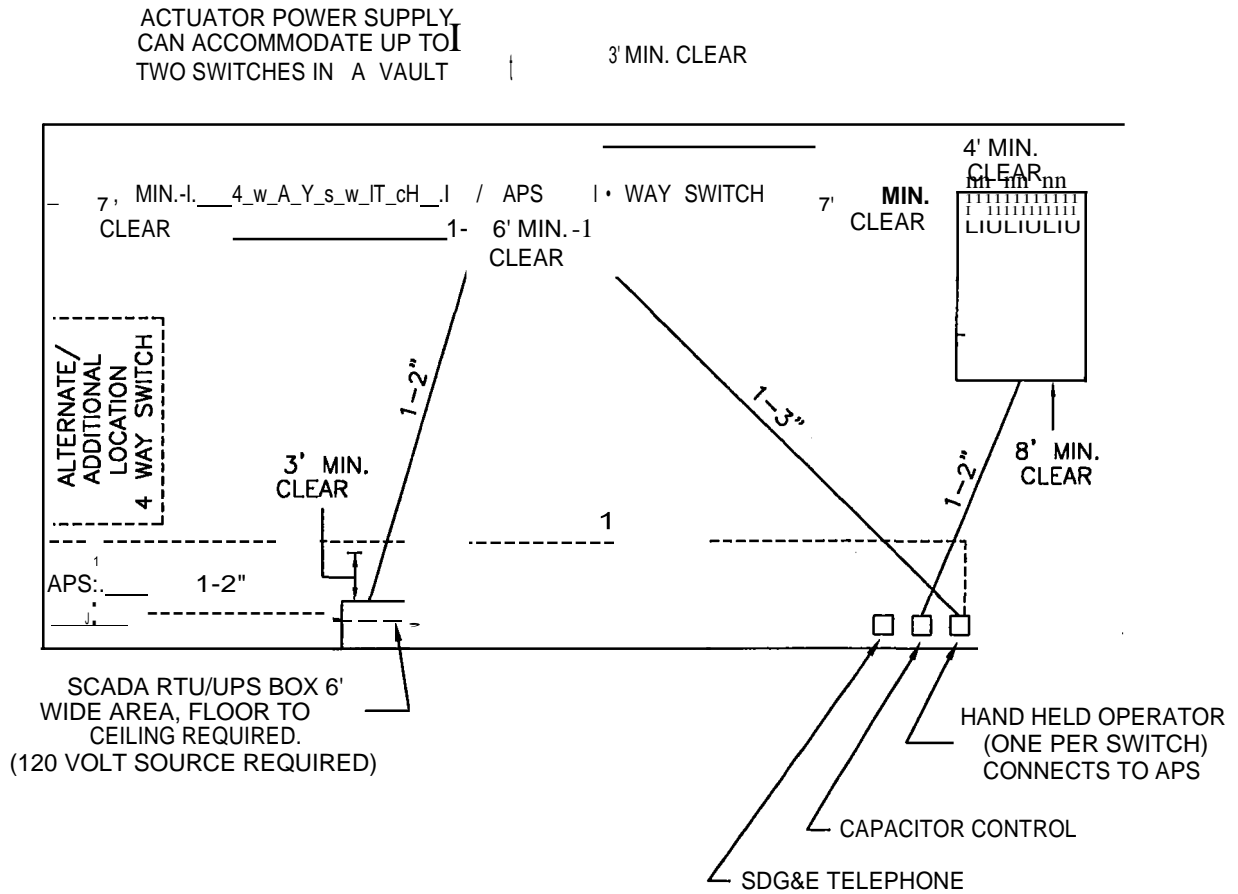
VAULT SPEC.

PAGE 110.13

**SDG&E
CAPACITOR REQUIREMENTS FOR VAULTS**

DATE 6-23-04
APPD

TYPICAL SCADA INSTALLATION



NOTES:

1. INSTALL 50 PAIR CABLE "TO SPLIT- 66 " TERMINAL IN ALL VAULTS FOR SDG&E TELEPHONE AND SCADA, PRESENT OR FUTURE.
2. IN CONDUIT PACKAGE COMING INTO THE VAULT, INSTALL 2-4" CONDUIT ABOVE 5" CONDUITS.
3. INSTALL 120 VOLT SERVICE TO FEED SCADA RTU BOX. THIS MAY OR MAY NOT REQUIRE A 2" CONDUIT, DEPENDING ON THE VAULT ARRANGEMENT.
4. ONE ACTUATOR POWER SUPPLY (APS) CAN CONTROL UP TO TWO 4-WAY SWITCHES. A THIRD SWITCH REQUIRES A SECOND APS.

DATE 6-23-04
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SDG&E
SUPERVISORY CONTROL AND DATA ACQUISITION
(SCADA) REQUIREMENTS

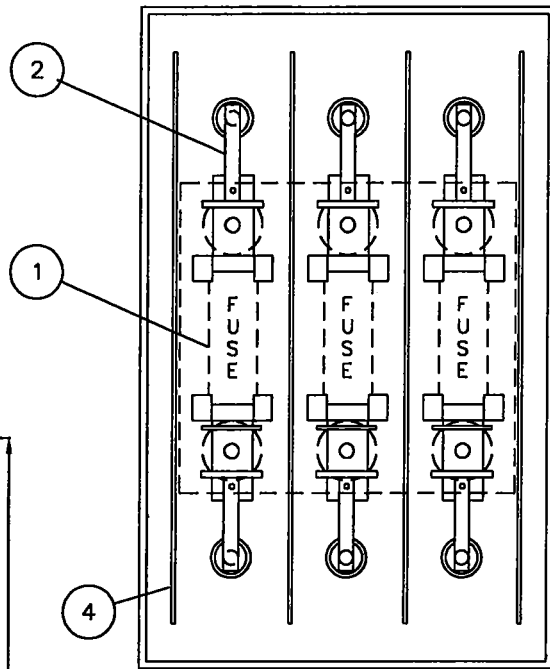
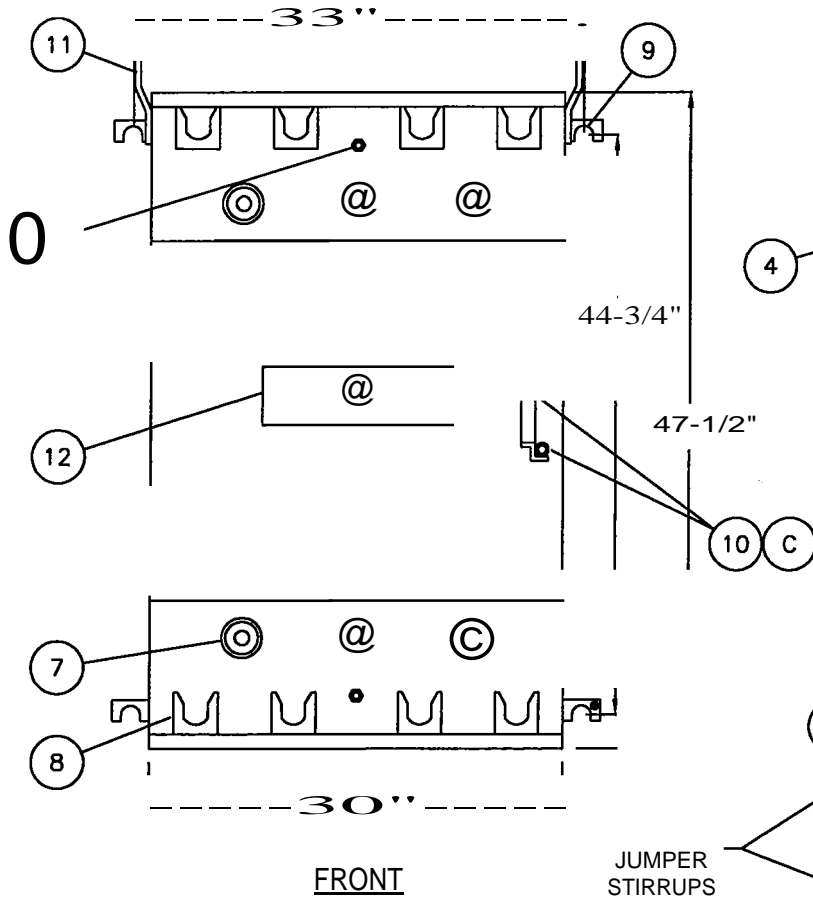
VAULT SPEC.

PAGE 110.14

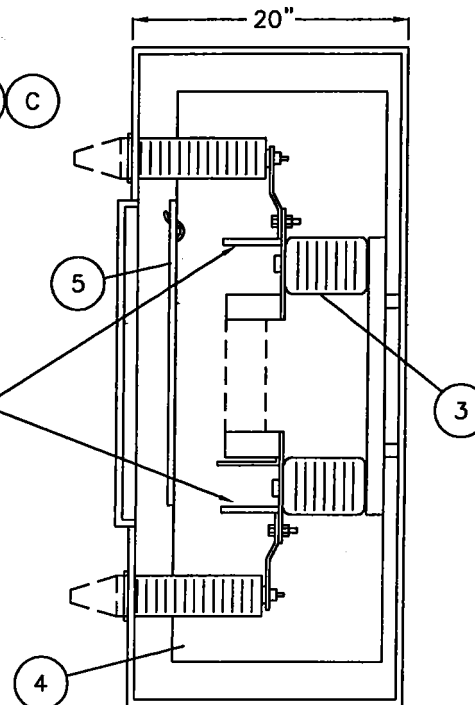
FIELD MAINTENANCE ONLY

SCOPE: THIS STANDARD SHOWS A 12KV, 200 AMP WALL-MOUNTED FUSE CABINET USED FOR FUSING IN TRANSFORMER VAULTS.

WEIGHT: 380 #



FRONT SECTION



SIDE SECTION

JUMPER STIRRUPS

FIELD MAINTENANCE ONLY

VAULT SPEC.

PAGE 110.15

SDG&E
THREE-PHASE WALL-MOUNTED FUSE CABINET
12KV, 200 AMP

DATE 6-23-04
APPD

| ELECTRIC RATINGS: | |
|-------------------|---------|
| VOLTAGE | 15KV |
| B.I.L. | 110KV |
| MAX FUSE SIZE | 200 AMP |

| |
|--|
| WALL-MOUNTED FUSE CABINET ESJ .3-BOA CL |
| UNDERGROUND OPERATING MAP SYMBOL |

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | STOCK NUMBER | ASSEMBLY UNITS |
|------|---------------------------------------|----------|--------------|----------------|
| 1 | THREE-PHASE WALL MOUNTED FUSE CABINET | 1 | 190444 | FC-VLT |

| ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|------|-----------------------------------|------|--|
| 1 | 200 AMP CURRENT LIMITING FUSE (C) | 9 | MOUNTING BRACKET |
| 2 | COPPER BUS | 10 | CABINET DOOR HANDLE AND PENTAHEAD BOLT PROVISION (R) |
| 3 | BUSHING | 11 | LIFTING TABS |
| 4 | BARRIER | 12 | MR OUCH DECAL |
| 5 | REMOVABLE BARRIER | 13 | NAME PLATE (ON INSIDE OF DOOR) |
| 6 | GROUNDING POSITION | | |
| 7 | BUSHING WELL (E) | | |
| 8 | PARKING STAND | | |

NOTES:

- WALL-MOUNTED FUSE CABINET (STOCK NUMBER 190444) IS DELIVERED FROM THE SUPPLIER WITH ALL THE PARTS LISTED IN THE BILL OF MATERIAL EXCEPT FUSES.

INSTALLATION:

- (C) BUSHING WELLS WILL ACCEPT BUSHING PLUGS (STOCK NUMBER 544676) OR FEED- THRU INSERTS, (STOCK NUMBER 544678). FOR LOADBREAK CAPABILITY.
- (R) INSTALL FEED-THRU INSERTS (STOCK NUMBER 544678) ON LOAD SIDE OF ALL CABINETS.
- (R) CABINET DOOR HANDLE DOES NOT REQUIRE A PADLOCK.

REFERENCE:

- (C) SEE STANDARD 4.302 FOR FUSE APPLICATION GUIDE.
- (R) SEE TRANSFORMER VAULTS SPECIFICATIONS BOOK FOR INSTALLATION LOCATION.
- E. SEE STANDARD 3483 FOR CLEARANCE IN FRONT OF CABINET.

DATE 6-23-04
APPD

SDG&E
THREE-PHASE WALL-MOUNTED FUSE CABINET
12KV, 200 AMP

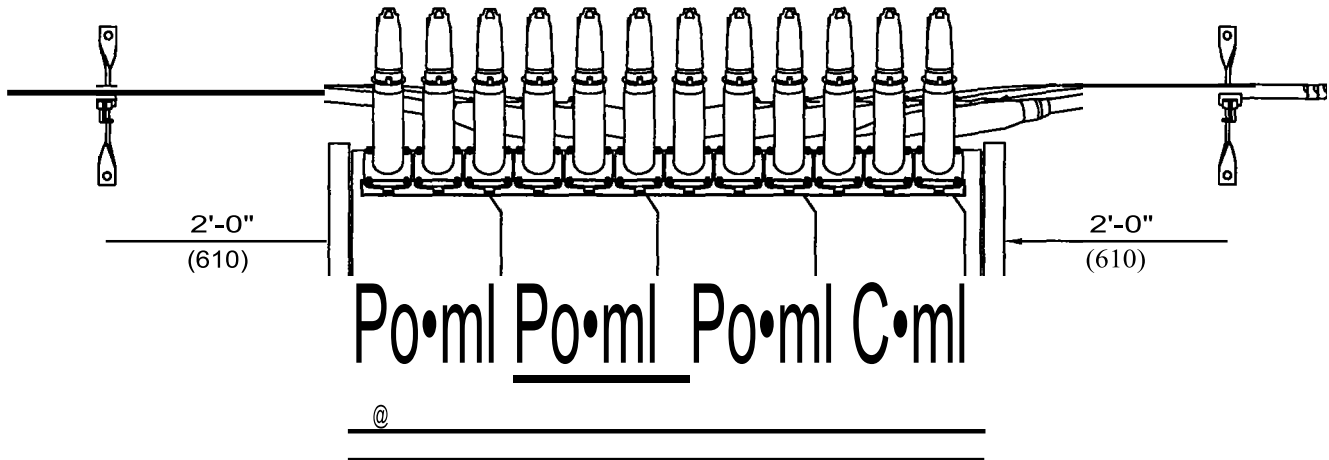
FIELD MAINTENANCE ONLY

VAULT SPEC.

PAGE 110.16

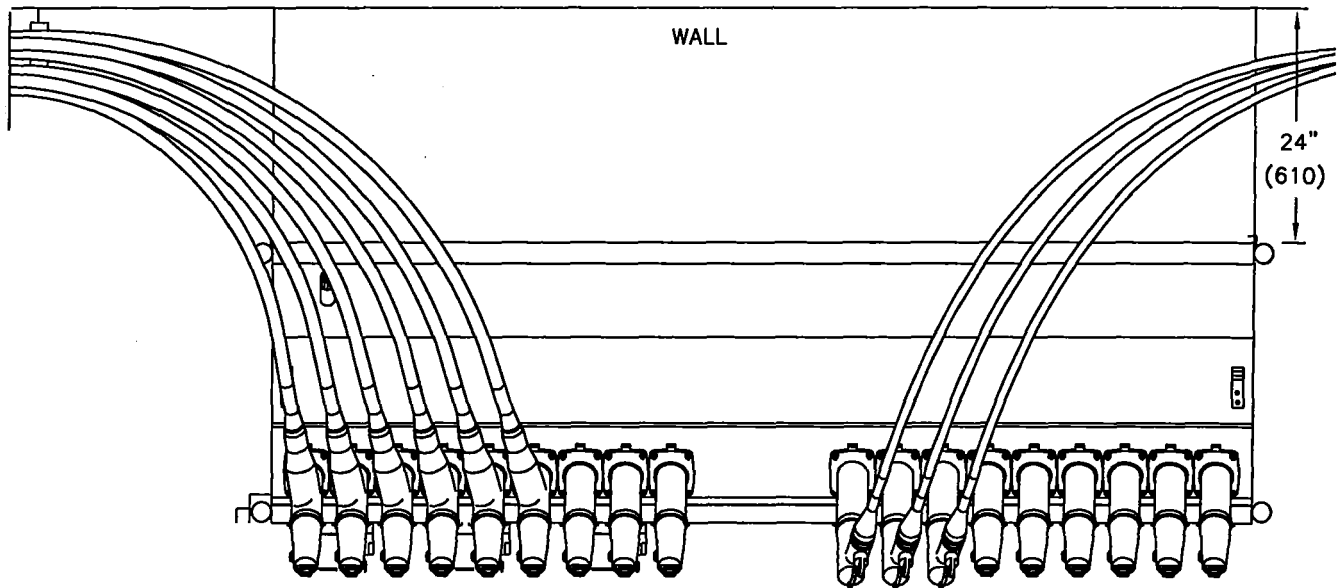
NOTES:

- THE 6 WAY SWITCH SCADA AND FAULT INTERRUPTERS IS THE PREFERRED SWITCH FOR VAULTS
- FOUR AND SIX WAY VISTA SWITCHES MAY BE INSTALLED IN DRY VAULTS WITHOUT A DEVIATION REQUEST.



TYPICAL 4-WAY
MANUAL OR
SCADA SWITCH

FRONT VIEW



TOP VIEW

TYPICAL 6-WAY
SCADA SWITCH

WALK IN VAULTS |

FOR ALL SIZES OF PRIMARY AND SECONDARY CABLES

FIELD MAINTENANCE ONLY

/AULT SPEC.

#

PAGE 110.17

SDG&E

EQUIPMENT COMBINATION GUIDELINES

DATE 6-23-04

APPD

**5000 - TRENCHLESS
CONSTRUCTION**

**5000 - TRENCHLESS
CONSTRUCTION**

PAGE

SUBJECT

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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
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| SHEET 1 OF 1 | <input type="checkbox"/> Indicates Latest Revision | <input type="checkbox"/> Completely Revised | <input checked="" type="checkbox"/> New Page | <input type="checkbox"/> Information Removed | FMO UG5000 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | TRENCHLESS CONSTRUCTION | | | | |

UG LEGACY FMO

UG LEGACY FMO

LEGACY UNDERGROUND FIELD MAINTENANCE ONLY

| <u>PAGES</u> | <u>SUBJECT</u> |
|--------------|---|
| 3100-3300 | IDENTIFICATION, SUBSTRUCTURES, CONDUITS |
| 3400-3500 | PADS, RETAINING WALLS, CLEARANCES, PAD-MOUNTED SECTIONALIZING EQUIPMENT |
| 3600 | SUBSURFACE SECTIONALIZING EQUIPMENT |
| 3700-4000 | TRANSFORMERS, CAPACITORS, CABLES |
| 4100 | TERMINATIONS, SPLICING CONNECTIONS |
| 4200-4500 | CABLE POLES, FUSES, FAULT INDICATORS, LIGHTING, GROUNDING |

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| B | | | | | | E | | | | | |
| A | ORIGINAL ISSUE | JIK | JES | CZH | 10/20/2019 | D | | | | | |

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| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | LEGACY UNDERGROUND FIELD MAINTENANCE MAIN TABLE OF CONTENTS | | | | | |

**3100-3300 IDENTIFICATION,
SUBSTRUCTURES, CONDUITS**

**3100-3300 IDENTIFICATION,
SUBSTRUCTURES, CONDUITS**

| PAGE | SUBJECT |
|---------------|---|
| 3199.001-.002 | DISTRIBUTION STATION NUMBERING |
| 3299.001 | CABLE IDENTIFICATION - CALIFORNIA GRID COORDINATE (CAL-GRID) |
| 3299.002 | CABLE IDENTIFICATION |
| 3299.101 | TRANSFORMER AND FUSE IDENTIFICATION |
| 3299.201 | LINE FAULT INDICATOR TAGS, LOCATION IDENTIFICATION |
| 3299.301 | DEADBREAK ELBOW IDENTIFICATION - TAGS |
| 3399.001 | COUNTERBALANCED FIRE DAMPER ASSEMBLY |
| 3399.002 | SUBSTRUCTURE APPLICATIONS/USE & LIMITATIONS REFERENCE SHEET |
| 3399.101 | HANDHOLE - 30" X 48" X 42" |
| 3399.102 | HANDHOLE AND SUBSURFACE EQUIPMENT ENCLOSURE - 4'-0" X 6'-6" |
| 3399.103 | HANDHOLE AND SUBSURFACE EQUIPMENT ENCLOSURE - 4'-0" X 6'-6" (TOP SECTION) |
| 3399.104 | HANDHOLE TRAFFIC COVER & BASE ENCLOSURE, 3' X 6' |
| 3399.105-.106 | 3314 HANDHOLE REPAIR - "OLD STYLE" PARKWAY COVER |
| 3399.107 | HANDHOLE BASE ENCLOSURE AND BOTTOM SECTION (INSIDE DIMENSIONS 4' X 6'-6") |
| 3399.108 | HANDHOLE TWO-PIECE BASE ENCLOSURE (INSIDE DIMENSIONS 5' X 8'-6") |
| 3399.109-.110 | 3313 & 3314 STEEL PARKWAY COVERS |
| 3399.111 | HANDHOLE EQUIPMENT ENCLOSURE (INSIDE DIMENSIONS - 4' X 6'-6") |
| 3399.112 | MANHOLE EQUIPMENT ENCLOSURE (INSIDE DIMENSIONS - 10'-6" X 5') |
| 3399.113 | MANHOLE EQUIPMENT ENCLOSURE (INSIDE DIMENSIONS - 10'-6" X 5') |
| 3399.201-.202 | MANHOLE - 6' X 10' X 7' |
| 3399.203-.204 | MANHOLE - 8' X 14' X 9'-4" |
| 3399.205-.206 | MANHOLE - 6' X 10' X 7' |
| 3399.207 | MANHOLE - 6' X 10' X 9'-4" |
| 3399.208-.210 | MANHOLE - 8' X 14' X 9'-4" OR 8' X 20' X 9'-4" |
| 3399.301 | 35 INCH MANHOLE FRAME AND COVER - TRAFFIC BEARING |
| 3399.302 | 42 INCH MANHOLE FRAME AND COVER - TRAFFIC BEARING |
| 3399.303-.304 | 42 INCH MANHOLE FRAME AND COVER - NON-TRAFFIC BEARING |
| 3399.305 | 48" X 48" MANHOLE NECK AND COVER - TRAFFIC BEARING |
| 3399.306 | 27 INCH MANHOLE NECK AND COVER - TRAFFIC BEARING FOR 36 INCH OPENING |
| 3399.307 | MANHOLE COVERS, 36 INCH ROUND OPENING |
| 3399.401 | SUBSURFACE TRANSFORMER ENCLOSURE |
| 3399.402-.404 | SUBSURFACE EQUIPMENT ENCLOSURE |
| 3399.501 | MANHOLE BAYS - CONSTRUCTION |
| 3399.502 | MANHOLE ANGLE RECESSES - CONSTRUCTION |
| 3399.503 | ACCESS DOOR FOR TRANSFORMER VAULTS |
| 3399.601 | CABLE RACKS |
| 3399.701 | CONDUIT SIZING FOR UNDERGROUND CABLES |
| 3399.702 | 6" CONDUIT/CONDUIT FITTINGS AND CONDUIT SPACERS |
| 3399.703-.714 | CONDUIT INSTALLATIONS IN SLAB & CELL BRIDGES |

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| A | ORIGINAL ISSUE | JK | JS | CZH | 6/13/2019 | D | | | | | |

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| SHEET 1 OF 1 | Indicates Latest Revision <input checked="" type="checkbox"/> Completely Revised | <input type="checkbox"/> New Page | <input type="checkbox"/> Information Removed | UG LEGACY UGL3101.1 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | |
| | LEGACY UNDERGROUND FIELD MAINTENANCE TABLE OF CONTENTS IDENTIFICATION, SUBSTRUCTURES, CONDUITS | | | |

I. STATION NUMBERS GIVE A UNIQUE NUMBER TO, AND BRIEFLY DESCRIBE, DISTRIBUTION STATIONS. ALL STATION NUMBERS ARE ASSIGNED BY THE TRANSFORMER CLERK (EXT 1217 OR MICROWAVE 02167).

II. THE STATION NUMBER IS BROKEN UP INTO THREE PARTS: CIRCUIT; NUMBER; AND SUFFIX. 40 - 118 - MRO
CIRCUIT NUMBER SUFFIX

CIRCUIT - THE CIRCUIT DESIGNATION DESCRIBES THE VOLTAGE THAT FEEDS THE STATION. IF IT IS ONLY NUMERIC CHARACTERS, THEN THE CIRCUIT ORIGINATING AT THE SUBSTATION IS 12KV. IF IT HAS ALPHABETIC CHARACTERS IN IT, THEN THE CIRCUIT VOLTAGE IS 4 OR 2.4KV. (SEE NOTE F).

EXAMPLES:

40 - CIRCUIT 40 IS 12KV

NO1 - NORTH OTAY ONE IS 4KV

NUMBER - CONTAINS ONLY NUMERIC CHARACTERS. THIS PART IS ARBITRARY.

EXAMPLES:

118 - NUMBER SELECTED BY TRANSFORMER CLERK

908 - NUMBER SELECTED BY TRANSFORMER CLERK

SUFFIX - THE SUFFIX IS DESCRIPTIVE OF THE STATION, (SEE NOTE C) HIERARCHY (ARRANGEMENT IN SERIES) FOR COMBINING SUFFIXES IS:

- I. NUMERIC CHARACTERS (1-99) (SEE NOTE D)
- II. M, V, B, BU, G, R, L, SW, UP, N
- III. RO, RC, SL
- IV. Y, X, C
- V. S

EXAMPLES:

- C - CAPACITOR STATION
- M - 12KV PRIMARY METERED STATION
- MRO - METERED STREET LIGHT STATION
- D - 4 OR 2.4KV STATION THAT IS FED FROM A STEPDOWN STATION SERVING ONLY 1 CUSTOMER OR ONLY PRIMARY METERED CUSTOMER(S)
- 1M - 4 OR 2.4KV PRIMARY METERED STATION FED FROM A STEPDOWN STATION

FOR FIELD MAINTENANCE ONLY

III. THESE PARTS ARE BROUGHT TOGETHER AS FOLLOWS:

A. WHEN WRITING THE STATION NUMBERS ON OTHER THAN FORMS FOR KEYPUNCH USE, EACH PART OF THE STATION NUMBER IS SEPARATED BY A DASH.

EXAMPLES:

- 40-118 12KV TRANSFORMER STATION
- 40-216-C 12KV CAPACITOR STATION
- NO1-118 4 OR 2.4KV TRANSFORMER STATION
- NO1-216-MRO 4 OR 2.4KV METERED STREET LIGHT STATION
- 40-908-D 12 TO 4KV OR 12 TO 2.4KV STEPDOWN STATION (INDICATED BY D) (SEE NOTES A, B & F)
- 40-118-2G 12KV REGULATOR STATION, 2ND POLE OF 3-1Ø REGULATORS ON 3 POLES.

B. THE FOLLOWING FORMS WILL BE USED FOR KEYPUNCHING AND THE STATION NUMBER IS REQUIRED ON THEM:

- | | | | |
|---|-----------|---|--------------------|
| 1. APARTMENT LIST | 101-4145A | 7. NEW SERVICE INPUT DOCUMENT | 124-10152 |
| 2. CIS MASTER STATION UPDATE | 124-13152 | 8. STATION FILE CUTOVERS | 111-391 |
| 3. CUSTOMER NEW SERVICE REQUEST | 124-6201 | 9. TRANSFORMER TAG | 120-5240A |
| 4. ELECTRIC CONSTRUCTION ORDER (NO FILE NUMBER) | | 10. TRANSFORMER STATION FILE PUNCH FORM | 110-591/21A |
| 5. ELECTRIC SERVICE ORDER | 107-212L | 11. TAG NOTICE TO ELECTRIC TROUBLEMAN | (TEMPORARY FORM) |
| 6. GAS/ELECTRIC SET ORDER | 124-610 | 12. CURRENT STATION/CUSTOMER TIE | (COMPUTER LISTING) |

SDG&E ELECTRIC STANDARDS

DATE 1-1-89

APPD *PA/09*

DISTRIBUTION STATION NUMBERING

~~OH 299.001~~
UG 3199.001
SUPERSEDES
3103.1 (1-1-93)

C. THE RULES FOR FILLING IN THE STATION NUMBER ON THESE FORMS ARE AS FOLLOWS:

1. ALL ALPHABETIC CHARACTER 0'S ARE TO BE WRITTEN WITH A SLANT MARK; i.e., Ø. THIS IS TO AVOID CONFUSION WITH THE NUMERIC CHARACTER ZERO.
2. INSTRUCTIONS FOR FILLING IN FORMS.
 - a. THE CIRCUIT FIELD (COLUMN). SEE TABLE 1 BELOW. ALPHABETIC CHARACTERS ARE TO BE LEFT JUSTIFIED AND THE NUMERIC CHARACTERS RIGHT JUSTIFIED (SEE NOTE E). IN MOST CASES, THERE WILL BE BLANK COLUMNS IN THIS FIELD.
 - b. THE NUMBER FIELD (COLUMN). SEE TABLE 1 BELOW. THE NUMERIC CHARACTERS ARE RIGHT JUSTIFIED AND ZEROS ARE ADDED TO COMPLETE FIELD.
 - c. THE SUFFIX FIELD (COLUMN). SEE TABLE 1 BELOW. IF STATION NUMBER HAS NO SUFFIX, LEAVE THIS BLANK. THE ENTIRE PROPERLY FORMED SUFFIX IS LEFT JUSTIFIED AND ZEROS ARE ADDED TO COMPLETE FIELD.

EXAMPLES OF STATION NUMBERS WRITTEN ON FORMS:

TABLE 1

| CIRCUIT | | | | NUMBER | | | | SUFFIX | | | | |
|---------|---|---|---|--------|---|---|---|--------|---|---|---|---|
| 0 | 0 | 4 | 0 | 0 | 1 | 1 | 8 | | | | | |
| 0 | 0 | 4 | 0 | 0 | 2 | 1 | 6 | C | 0 | 0 | 0 | |
| * | N | Ø | 0 | 1 | 0 | 1 | 1 | 8 | | | | |
| * | N | Ø | 0 | 1 | 0 | 2 | 1 | 6 | M | R | Ø | 0 |
| | 0 | 0 | 4 | 0 | 0 | 9 | 0 | 8 | D | 0 | 0 | 0 |
| | 0 | 0 | 4 | 0 | 0 | 9 | 0 | 8 | 3 | 1 | 0 | 0 |

FOR FIELD MAINTENANCE ONLY

NOTES:

- (A) REFER TO THE DISTRIBUTION ENGINEER BEFORE ADDING LOAD TO THESE AREAS TO ENSURE THAT THE STEPDOWN STATION IS NOT OVERLOADED.
- (B) INDICATES A 2.4 OR 4KV STEPDOWN STATION SERVING ONLY ONE CUSTOMER OR ONLY PRIMARY METERED CUSTOMER(S).
- (C) SEE PAGE 299.126 OVERHEAD OR 3199.126 UNDERGROUND - ABBREVIATIONS & CODES, STATION SUFFIX FOR SUFFIX MEANINGS.
- (D) NUMERIC CHARACTERS 1 - 9 ARE RESERVED FOR STATIONS WITH ADDITIONAL SUFFIXES.
- (E) RIGHT AND LEFT JUSTIFICATION MAY BE A NEW TERM FOR MOST PEOPLE. RIGHT JUSTIFIED MEANS TO START WITH THE RIGHT MOST CHARACTER OF THE GROUP AND PUT IT INTO THE RIGHT MOST COLUMN, WORKING LEFT UNTIL ALL CHARACTERS ARE USED UP AND IN ALL REMAINING BLOCKS AND ZEROS. SIMILARLY FOR LEFT JUSTIFIED, ONLY WORK FROM LEFT TO RIGHT AND ADD ZEROS TO FILL UNUSED BLOCKS.

EXAMPLE: RIGHT JUSTIFY: 198 STEP 1

| | | | |
|--|--|--|-------|
| | | | 8 |
| | | | 9 8 |
| | | | 1 9 8 |

 STEP 2

| | | | |
|--|--|--|---------|
| | | | 1 9 8 |
| | | | 0 1 9 8 |

 STEP 3

| | | | |
|--|--|--|---------|
| | | | 1 9 8 |
| | | | 0 1 9 8 |

 FINAL STEP 4

| | | | |
|--|--|--|---------|
| | | | 0 1 9 8 |
|--|--|--|---------|

 ADD ZERO IN REMAINING BLOCK(S)

LEFT JUSTIFY ALPHABETIC CHARACTERS, RIGHT JUSTIFY NUMERIC CHARACTERS: N01

STEP 1

| | | | |
|---|---|--|---|
| N | | | |
| N | Ø | | |
| N | Ø | | 1 |

 STEP 2 *

| | | | |
|---|---|--|-----|
| N | Ø | | |
| N | Ø | | 1 |
| N | Ø | | 0 1 |

 ALPHABETIC CHARACTERS LEFT JUSTIFIED.
 STEP 3 *

| | | | |
|---|---|--|-----|
| N | Ø | | |
| N | Ø | | 1 |
| N | Ø | | 0 1 |

 NUMERIC CHARACTER RIGHT JUSTIFIED
 FINAL STEP 4

| | | | |
|---|---|--|-----|
| N | Ø | | |
| N | Ø | | 1 |
| N | Ø | | 0 1 |

 ADD ZERO IN REMAINING BLOCK(S)

- (F) STEPDOWN STATIONS WILL BE GIVEN NAME EXCEPT FOR THOSE SERVING ONLY ONE CUSTOMER OR ONLY PRIMARY METERED CUSTOMER(S)

* SEE III, C, 1.

~~OH 299.002~~
 UG 3199.002
 SUPERSEDES
 3103.2 (1-1-93)

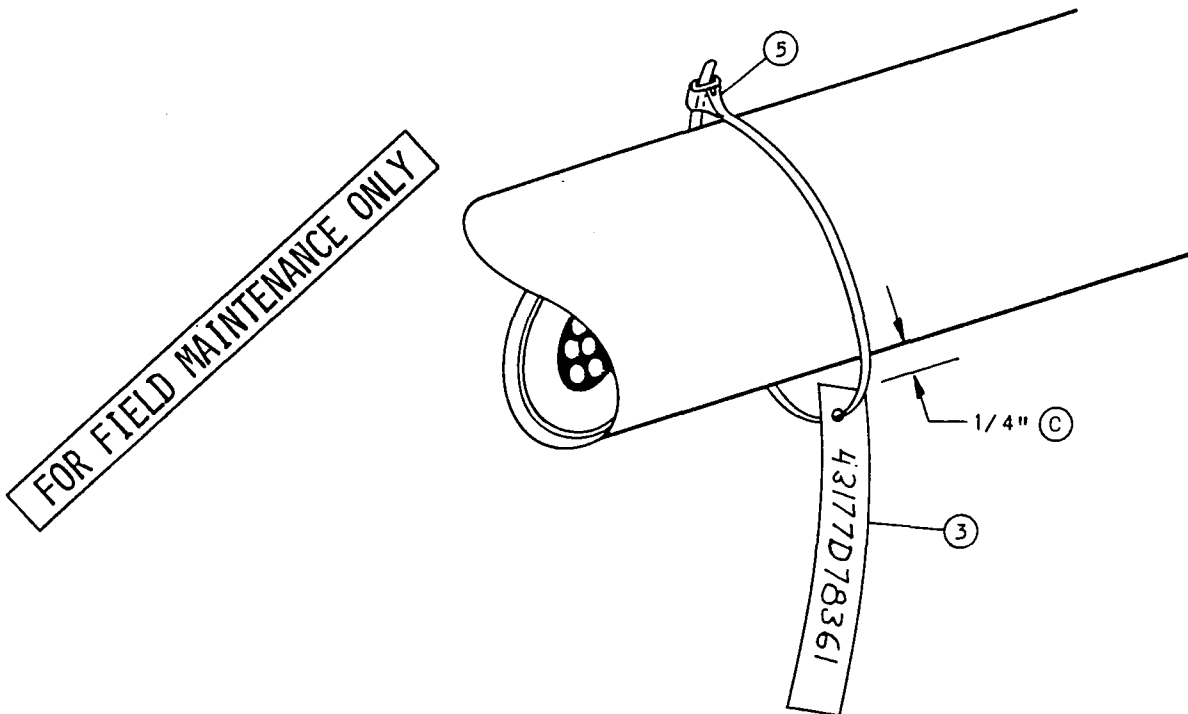
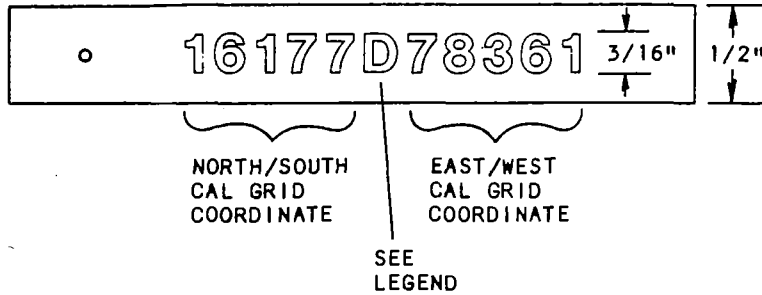
SDG&E ELECTRIC STANDARDS

DISTRIBUTION STATION NUMBERING

DATE 1-1-87
 APPD *PBA/BJ*

LEGEND

| FACILITY CODES FOR CAL GRID | |
|-----------------------------|---|
| B | HANDHOLE WITH PAD (FOR FIELD MAINTENANCE ONLY) |
| D | PADS |
| E | ENCLOSURES (GATES) |
| H | HANDHOLES (PRIMARY ONLY) |
| M | MANHOLES |
| S | SUBSURFACE ENCLOSURE |
| U | VAULTS |



BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | STOCK NO. |
|------|--------------|----------|------------|
| 3 | MONEL TAPE | AS REQ'D | 720160 (E) |
| 5 | TIE STRAP 8" | AS REQ'D | 739400 (E) |

INSTALLATION:

- A. TAGS SHALL BE MADE USING TAPEWRITER TOOL, MONEL METAL TAPE AND TIE STRAP.
- (B) TO MAKE THE MONEL TAG FOLLOW TAPEWRITER OPERATING INSTRUCTIONS.
- (C) WHEN CAL GRID COORDINATE TAG IS COMPLETE, THREAD THE TIE STRAP THROUGH THE PUNCHED HOLE AND WRAP THE TIE STRAP AROUND THE CABLE. SECURE TIE STRAP TAKING UP THE EXCESS UNTIL THERE IS 1/4 INCH BETWEEN THE TAG AND THE EXTERIOR OF THE CABLE.
- (E) EXEMPT MATERIAL.

SDG&E ELECTRIC STANDARDS

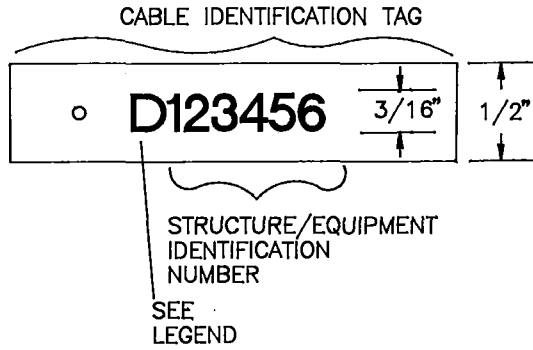
DATE 1-1-87
 APPD *JLB/DB*

CABLE IDENTIFICATION CALIFORNIA GRID COORDINATE
 (CAL GRID)

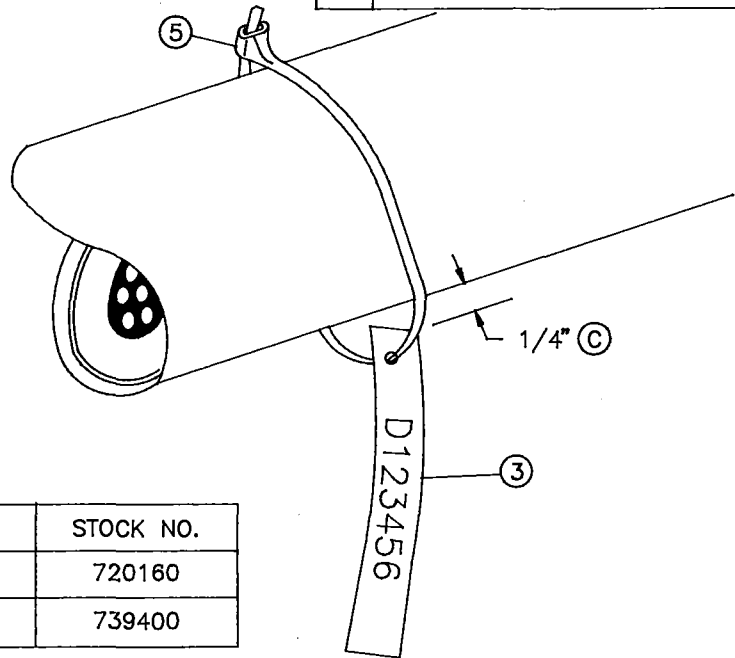
3299.001

LEGEND

| FACILITY CODES FOR TAG | |
|------------------------|---|
| B | HANDHOLE WITH PAD (FOR FIELD MAINTENANCE ONLY) |
| D | PAD-MOUNTED FACILITY |
| E | EQUIPMENT ENCLOSURE (GATES) |
| H | PRIMARY HANDHOLE |
| M | MANHOLE |
| S | SUBSURFACE ENCLOSURE (FOR FIELD MAINTENANCE ONLY) |
| U | VAULT |
| W | PAD W/COMPLETE PRIMARY HANDHOLE (PAD-MOUNTED SWITCH ONLY) |
| Y | PAD W/COMPLETE PRIMARY MANHOLE (PAD-MOUNTED SWITCH ONLY) |



FOR FIELD MAINTENANCE ONLY



BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | STOCK NO. |
|------|--------------|----------|-----------|
| 3 | MONEL TAPE | AS REQ'D | 720160 |
| 5 | TIE STRAP 8" | AS REQ'D | 739400 |

INSTALLATION

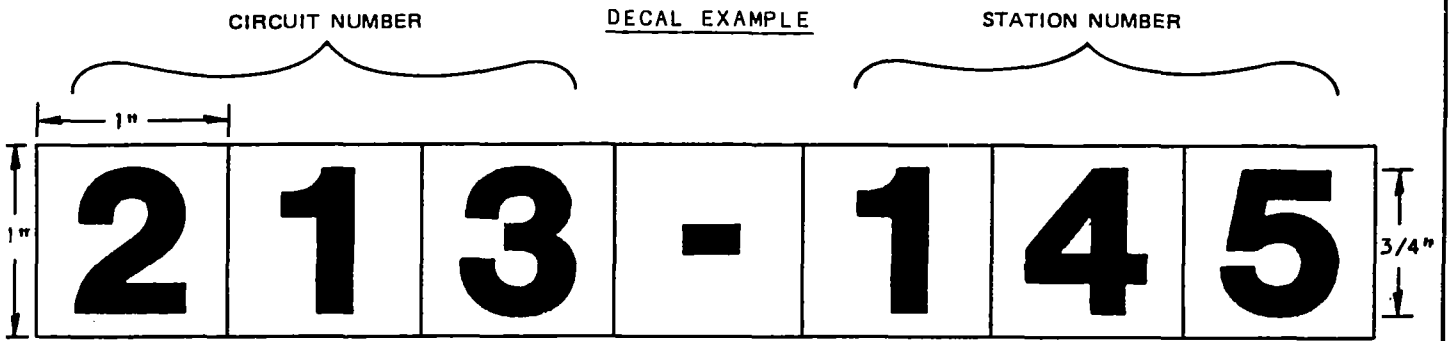
- A. TAGS SHALL BE MADE USING TAPewriter TOLL, MONEL METAL TAPE AND TIE STRAP.
- B TO MAKE THE MONEL TAG FOLLOW TAPewriter OPERATING INSTRUCTIONS.
- C WHEN CABLE IDENTIFICATION TAG IS COMPLETE, THREAD THE TIE STRAP THROUGH THE PUNCHED HOLE AND WRAP THE TIE STRAP AROUND THE CABLE. SECURE TIE STRAP TAKING UP THE EXCESS UNTIL THERE IS 1/4 INCH BETWEEN THE TAG AND THE EXTERIOR OF THE CABLE.

REFERENCE:

- F. SEE "FIELD MAINTENANCE ONLY" STANDARD 4499.101 FOR EXISTING CAL-GRID OR POLE NUMBERING DISTRICT TAG INFORMATION.
- G. SEE STANDARD 3211 FOR STRUCTURE IDENTIFICATION.

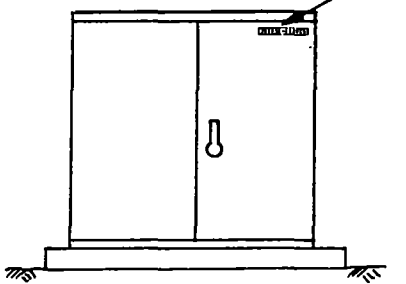
| | | |
|------------------------------------|--------------------------|----------|
| DATE 1-1-94 APPD <i>JLB/RJS</i> | SDG&E ELECTRIC STANDARDS | 3299.002 |
| | CABLE IDENTIFICATION | |

SCOPE: THIS STANDARD SHOWS THE INSTALLATION AND IDENTIFICATION OF STATION NUMBERS, FUSE SIZES, SWITCH NUMBERS AND THE LOCATION OF FAULT INDICATORS.



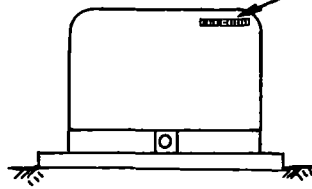
(ACTUAL SIZE)

CIRCUIT AND STA. NUMBER

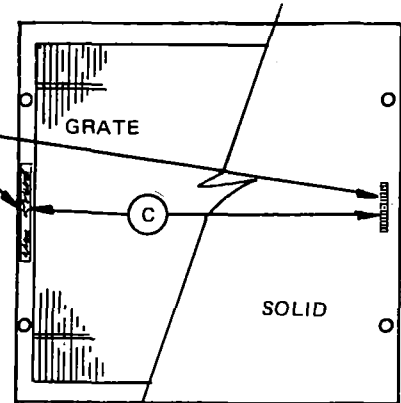


30 PAD-MOUNTED

CIRCUIT AND STA. NUMBER

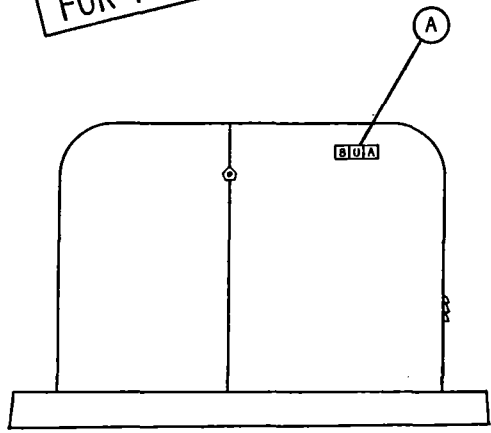


10 PAD-MOUNTED

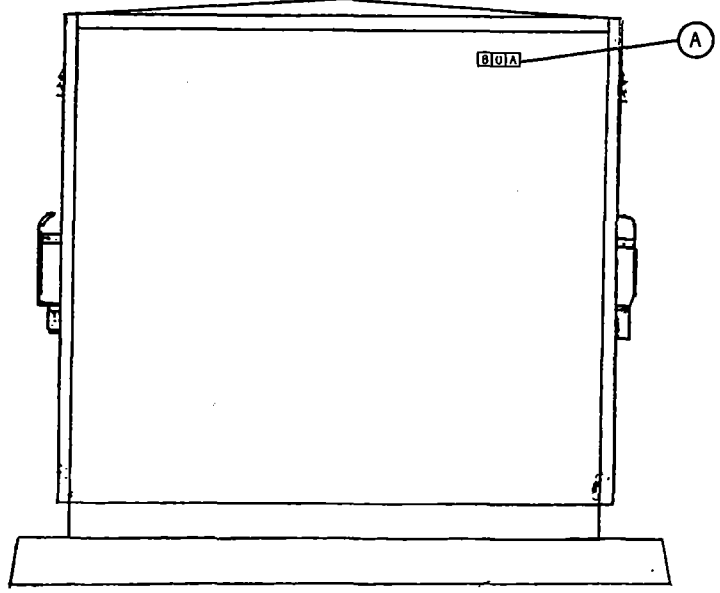


SUBSURFACE
(FIELD MAINTENANCE ONLY)
SOLID COVER OR GRATE COVER

FOR FIELD MAINTENANCE ONLY



10 FUSED SWITCHING CABINET



30 FUSED SWITCHING CABINET

INSTALLATION:

- (A) ON 10 AND 30 FUSED SWITCHING CABINETS, INSTALL DECALS INDICATING FUSE OR SOLID BLADE SIZE ON THE SIDE OF THE CABINET (VISIBLE FROM THE STREET) TOWARD THE FUSED END OF THE CABINET.
- B. SEE WORK ORDER FOR CIRCUIT AND STATION NUMBER.
- (C) MONEL TAPE (STOCK NUMBER (720160 (E))
EPOXY PASTE (STOCK NUMBER (213244 (E))
- (E) EXEMPT MATERIAL.

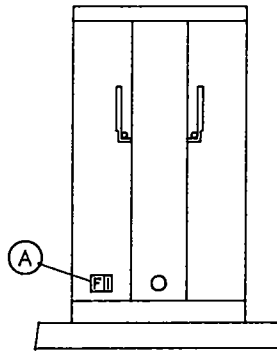
3299.101
SUPERCEDES
3212.1 (1-1-87)

SDG&E ELECTRIC STANDARDS

TRANSFORMER AND FUSE IDENTIFICATION

DATE 1-1-89
APPD JLB DTB

TOP PORTION OF THIS
PAGE TAKEN FROM
PAGE 3212.4 ON 1-1-94

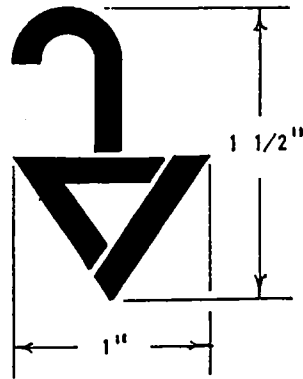


3599.203 3 PHASE TERMINATOR

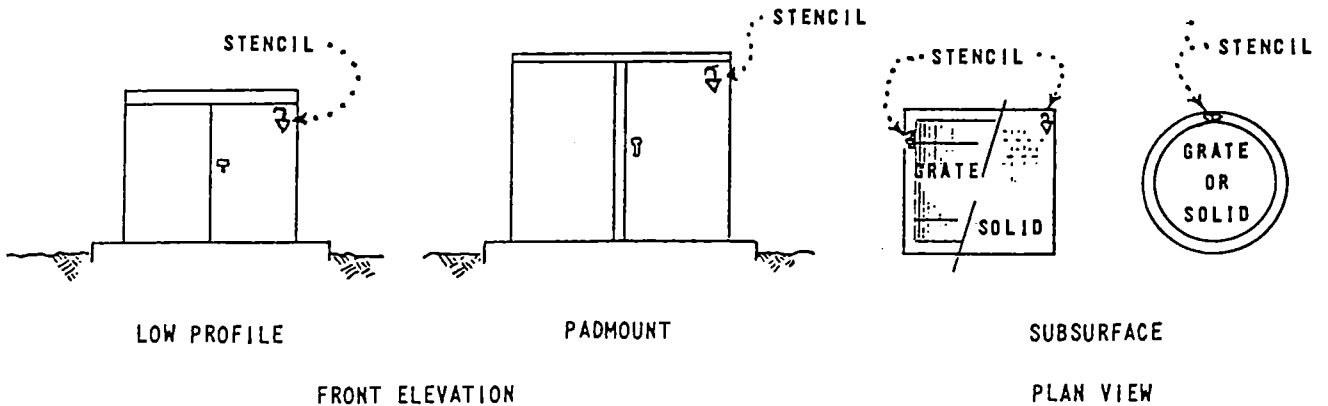
FOR FIELD MAINTENANCE ONLY

INSTALLATION:

- (A) FAULT INDICATORS LOCATED IN 3 PHASE TERMINATORS SHALL BE IDENTIFIED BY INSTALLING DECAL LETTERS "F I" ON THE EQUIPMENT DOOR (TOWARD THE FEEDER CABLES) AS SHOWN IN SKETCH.



STENCIL
STOCK NO. 692800

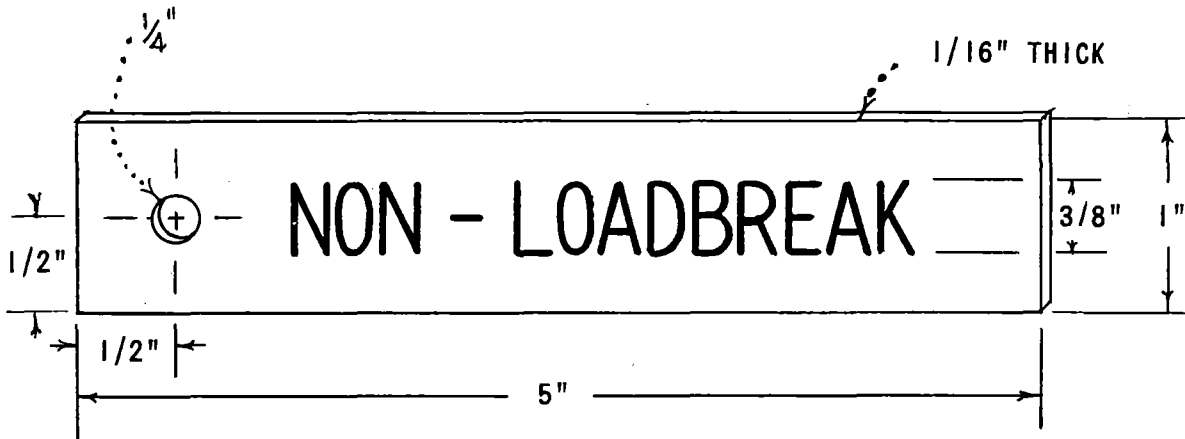


INSTALLATION:

- A. STENCIL (IN FIELD TO BE PAINTED IN YELLOW ENAMEL. STOCK NUMBER 517120
- B. STENCIL TO A CLEAN SURFACE, JUST BELOW TRANSFORMER IDENTIFICATION (3212) STENCIL.
- C. WHEN REMOVING INDICATORS, STENCIL IS TO BE PAINTED OVER SAME COLOR AS TRANSFORMER, GRATE OR SOLID COVER.

| | | |
|-----------------------------------|--|---|
| DATE 1-1-87 APPD <i>JLB/RT</i> | SDG&E ELECTRIC STANDARDS | 3299.201 SUPERCEDES 3222 (1-1-86) |
| | LINE FAULT INDICATOR TAGS LOCATION IDENTIFICATION | |

MAJOR USE: NONE PRESENTLY-PREVIOUSLY WAS INSTALLED ON ALL NON-LOAD BREAK ELBOWS FOR IDENTIFICATION PURPOSES. SEE NOTE AT BOTTOM.

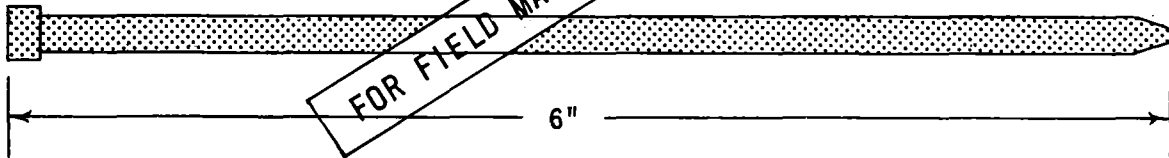


ITEM I

STOCK NUMBER
716736

NOTE:

1. TAGS TO BE ATTACHED TO ALL NON-LOAD BREAK ELBOWS PER SHEET 4196.
2. TAG TO BE LAMINATED PLASTIC, WHITE WITH BLACK LETTERS, SIZE AS PER ABOVE ILLUSTRATION.



ITEM II

STOCK NUMBER
739200 -BLACK

NOTE:

1. NYLON STRAPS, SIZE AS PER ABOVE ILLUSTRATION, TO BE ATTACHED TO ALL TAGS FOR INSTALLATION ON ALL NON-LOADBREAK ELBOWS PER SHEET 4196.

WHEN WORKING ON INSTALLATIONS WITH ELBOWS HAVING THIS TAG - REPLACE TAG WITH 3232. (DO NOT OPERATE ENERGIZED) TAG AND STRAP.

3299.301

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

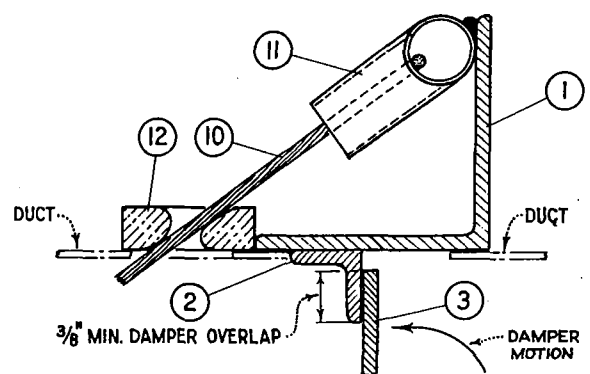
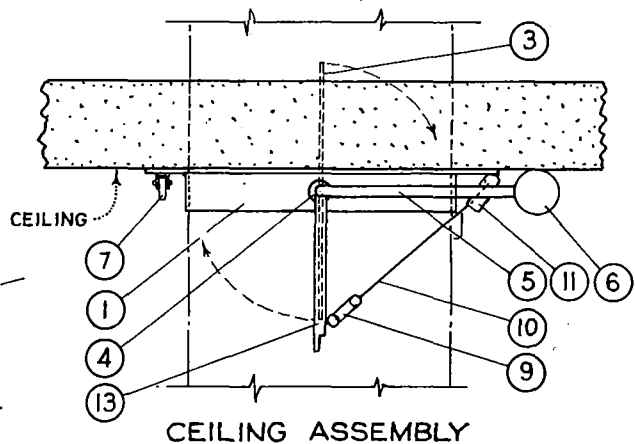
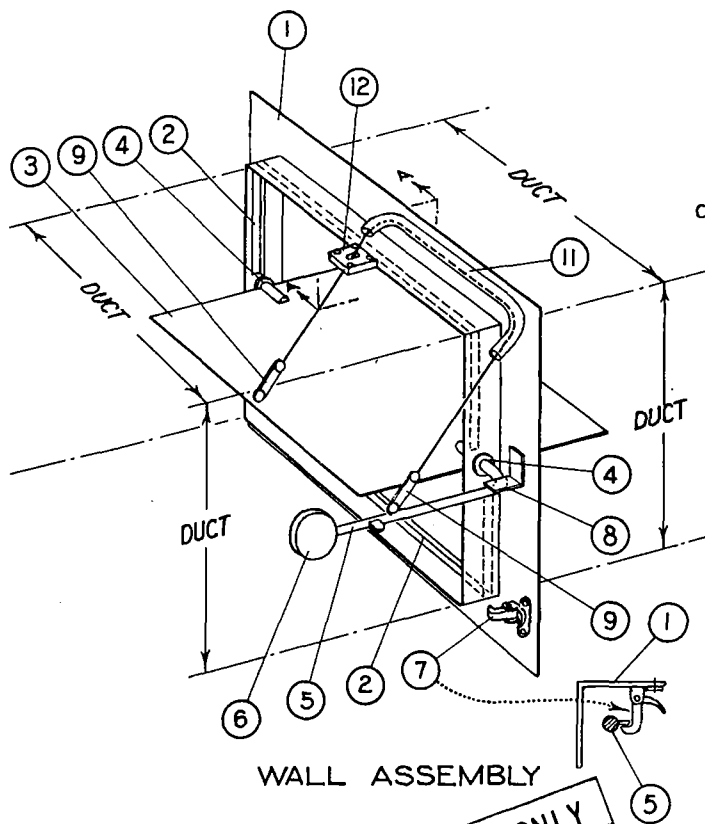
DEAD BREAK ELBOW IDENTIFICATION

TAGS

DATE 2-12-76

APPD

[Signature]



SECTION A-A
SHOWN WITH DAMPER IN CLOSED POSITION

FOR FIELD MAINTENANCE ONLY

NOTES

- A. Assembly to be installed on interior walls or ceiling of transformer vaults.
 - B. Assembly shall meet the requirements of bulletin 90A of the national fire protection association.
 - C. Fusible links shall be mounted so that rupture of either link will provide positive closing action of the damper.
 - D. A 6" x 6" handhole shall be located as required for inspection of the damper and the fusible link in the duct.
 - E. Assembly size as required up to a maximum duct diameter or width of 36 inches.
 - F. For duct diameter or greatest width up to 18" use 5 lb counterweight. For duct diameter or greatest width from 18 inches to 36 inches use 10 lb counterweight.
 - G. All welded construction except as noted.
 - H. Two coats of aluminum paint shall be applied to all steel parts after completion of fabrication.
- 1. Frame, 2"x2"x1/8" angle iron.
 - 2. Damper stops, 5/8"x5/8" angle iron
 - 3. Damper, #10 gage minimum sheet metal
 - 4. Bushing, 1/2" diameter x 1/2", oil impregnated, loose fit between shaft and bushing
 - 5. 1/2" diameter steel bar, corrosion resistant
 - 6. Counterweight (see note F.)
 - 7. Elbow catch
 - 8. Stop
 - 9. Fusible metal links, 212°F. (see notes C & D)
 - 10. 1/8" diameter stranded cable, corrosion resistant.
 - 11. 1/2" diameter steel tube, corrosion resistant, smooth finish inside
 - 12. Aluminum guide, 3/8" thick, attached with sheet metal screws
 - 13. 1/2" diameter steel bar, corrosion resistant, welded perpendicular to item No. 5, for ceiling assembly only.

REFERENCE, CITY OF SAN DIEGO STANDARDS DRAWING M-1-60T.

SDG&E ELECTRIC STANDARDS

DATE 1-23-80
APPD TAF

COUNTERBALANCED FIRE DAMPER ASSEMBLY

3399.001

SUBSTRUCTURE APPLICATIONS

(3399.112, 113)

3320
5' X 10'-7-1/2"
X 8'
MANHOLE

MANHOLE IS TO BE USED ONLY FOR PMH 9 OR PMH 11 SWITCH INSTALLATION. MANHOLE CAN BE USED IN SINGLE-FAMILY RESIDENTIAL, MULTI-FAMILY AND COMMERCIAL DEVELOPMENTS FOR TERMINATION AND CONNECTION OF SINGLE-PHASE AND THREE-PHASE PRIMARY LOCAL DISTRIBUTION, THREE-PHASE PRIMARY FEEDERS, SECONDARIES AND SERVICES. MANHOLES MUST BE INSTALLED IN AREAS THAT REQUIRE TRUCK ACCESS FOR INSTALLATION AND MAINTENANCE.

(3399.208-210)

3324
8' X 14' X 9'-4"
8' X 20' X 9'-4"
8' X 26' X 9'-4"
MANHOLE

MANHOLE CAN BE USED IN SINGLE-FAMILY RESIDENTIAL, MULTI-FAMILY AND COMMERCIAL DEVELOPMENTS FOR TERMINATION AND CONNECTION OF LOCAL PRIMARY DISTRIBUTION THREE-PHASE PRIMARY FEEDERS, SECONDARIES AND SERVICES AND ON-OFF OR 4 WAY SWITCHES. MANHOLE CAN BE INSTALLED IN NON-TRAFFIC OR STREET LOCATIONS. REQUIRES TRUCK ACCESS FOR INSTALLATION AND MAINTENANCE. SEE PAGE 3605.2 FOR 4 WAY SWITCH MANHOLE REQUIREMENTS.

3302

FOR FIELD MAINTENANCE ONLY

SDG&E ELECTRIC STANDARDS

DATE 1-1-96

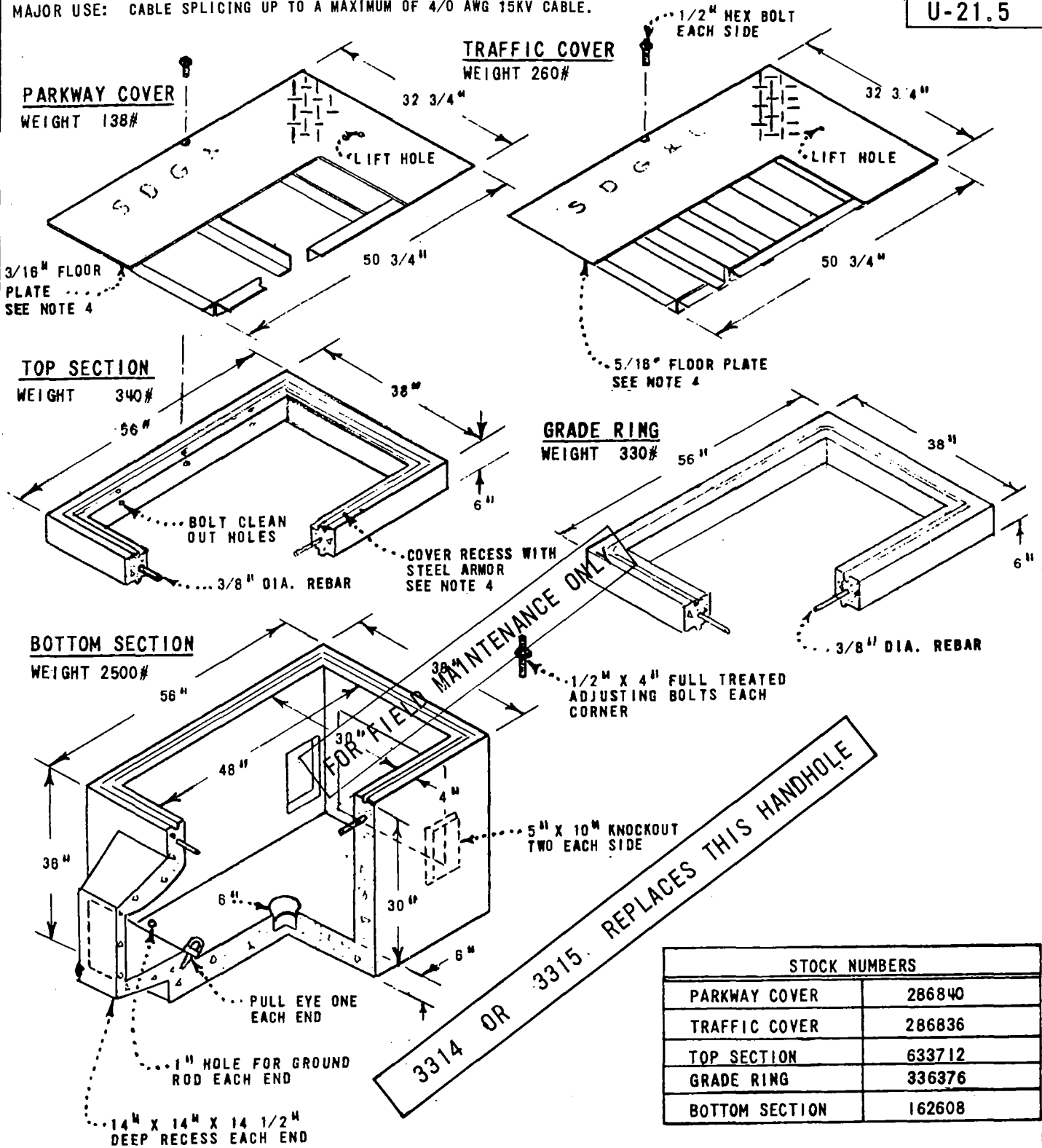
APPD *[Signature]*

SUBSTRUCTURE APPLICATIONS

3399.002

MAJOR USE: CABLE SPLICING UP TO A MAXIMUM OF 4/0 AWG 15KV CABLE.

U-21.5



| STOCK NUMBERS | |
|----------------|--------|
| PARKWAY COVER | 286840 |
| TRAFFIC COVER | 286836 |
| TOP SECTION | 633712 |
| GRADE RING | 336376 |
| BOTTOM SECTION | 162608 |

NOTES:

1. THIS INSTALLATION IS LIMITED TO A MAXIMUM OF 2 - 4" CONDUITS.
2. AN EXCAVATION, 9' - 0" X 4' - 0" X 4' - 6" DEEP IS REQUIRED FOR INSTALLATION OF THIS HANDHOLE.
3. FOR LARGER CABLE THAN 4/0 AWG USE HANDHOLE 3314
4. PARKWAY AND TRAFFIC COVERS TO HAVE ONE COAT DU-PONT PRIMER NUMBER 67-800 AND ONE COAT DU-PONT DULUX NUMBER RP25051 OR EQUAL.

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

3399.101

HANDHOLE - 30" X 48" X 42"

DATE 4-15-71
SDG&E

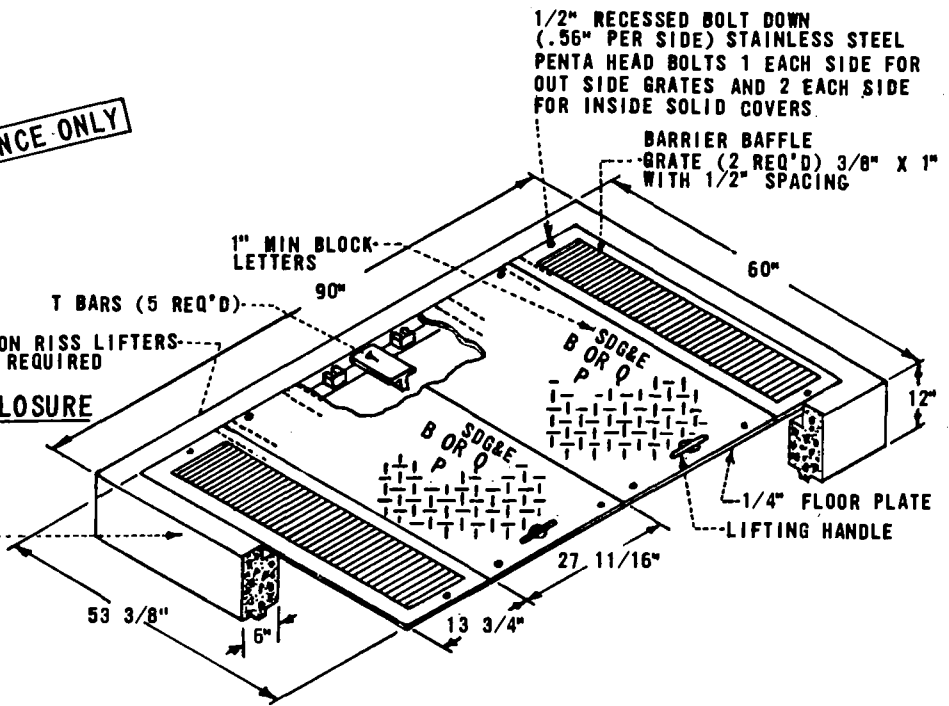
SCOPE: THIS STANDARD SHOWS OBSOLETE PARKWAY AND TRAFFIC COVERS USED FOR THE 3315 TRAFFIC COVER. IF AN EXISTING TRAFFIC COVER CAN NOT BE REPAIRED USING PAGE 3399.103 WHEN DAMAGED, REPLACE IT WITH THE NEW TRAFFIC COVER, STANDARD 3315.

FOR FIELD MAINTENANCE ONLY

PARKWAY COVER FOR EQUIPMENT ENCLOSURE

TOP SECTION W/FRAME
 WEIGHT 2200#
 STOCK NUMBER: PAINTED 286974
 EPOXY 286978

MANUFACTURER'S IDENTIFICATION PAINTED
 'QUIKSET' OR 'BROOKS'
 (INSIDE TOP SECTION ON END)

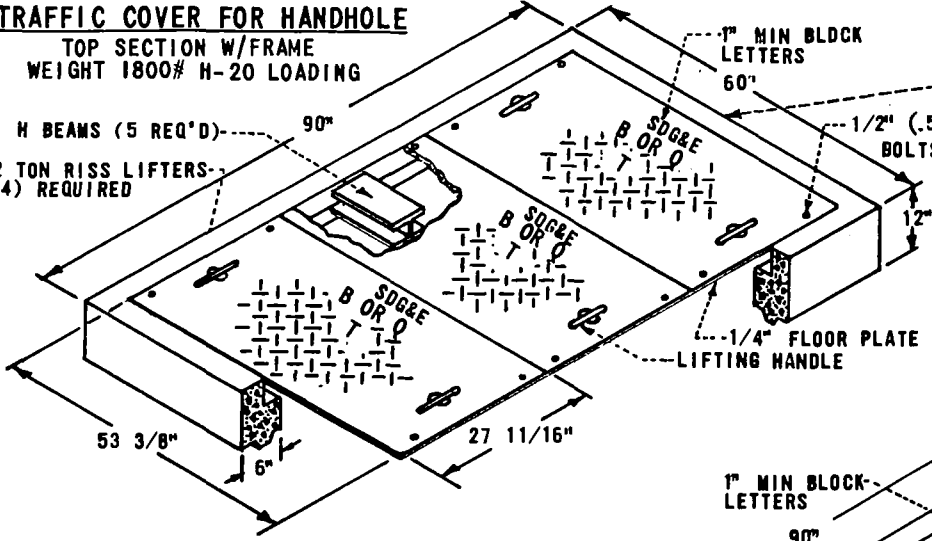


TRAFFIC COVER FOR HANDHOLE

TOP SECTION W/FRAME
 WEIGHT 1800# H-20 LOADING

H BEAMS (5 REQ'D)
 2 TON RISS LIFTERS
 (4) REQUIRED

MANUFACTURER'S IDENTIFICATION PAINTED
 'QUIKSET' OR 'BROOKS'
 (INSIDE TOP SECTION ON END)



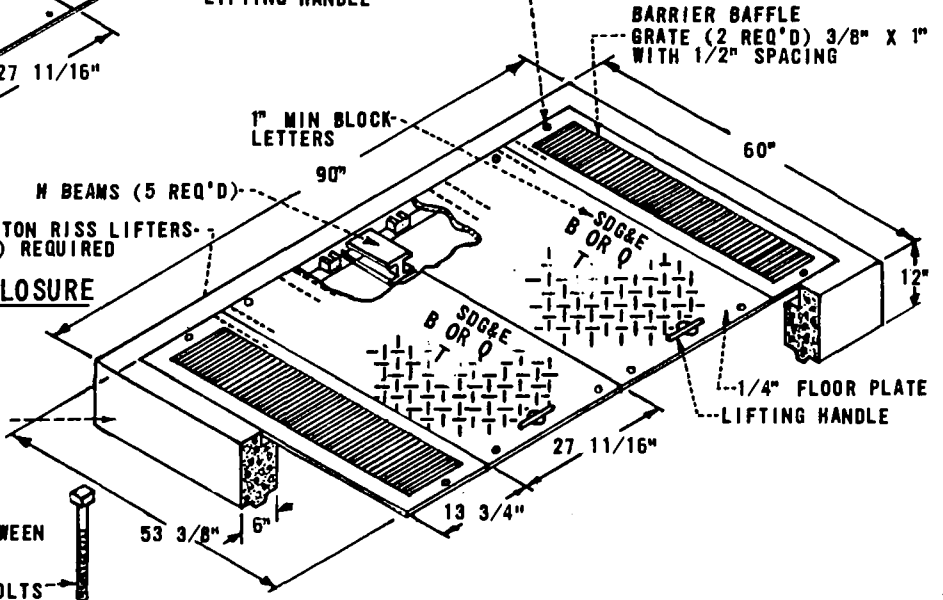
RECESSED BOLT DOWN 1/2" (.56" PER SIDE)
 STAINLESS STEEL PENTA HEAD
 BOLTS 1 EACH SIDE FOR OUTSIDE
 GRATES AND 2 EACH SIDE FOR INSIDE
 SOLID COVERS

TRAFFIC COVER FOR EQUIPMENT ENCLOSURE

TOP SECTION W/FRAME
 WEIGHT 2200# H-20 LOADING

MANUFACTURER'S IDENTIFICATION PAINTED
 'QUIKSET' OR 'BROOKS' (INSIDE TOP SECTION
 ON END)

H BEAMS (5 REQ'D)
 2 TON RISS LIFTERS
 (4) REQUIRED



TYPICAL
 IF GRADE ADJUSTMENT IS REQUIRED GROUT BETWEEN
 TOP SECTION AND EXTENSION

4-5/8" OR 3/4" COIL THREAD 6" ADJUSTING BOLTS

SDG&E ELECTRIC STANDARDS

DATE 2-26-81
 APPD *J.E.M.*

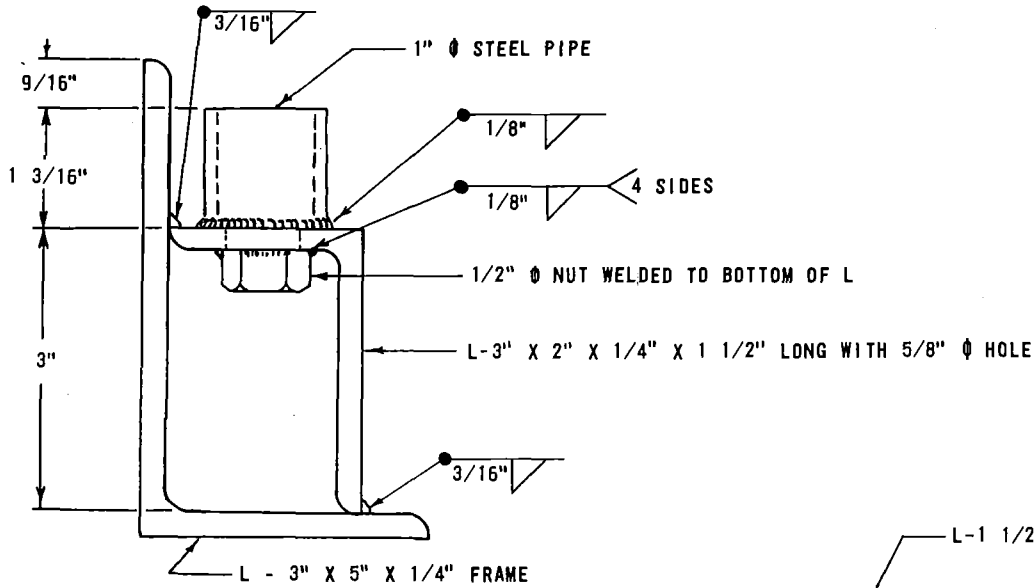
HANDHOLE AND SUBSURFACE EQUIPMENT ENCLOSURE
 4'-0" X 6'-6"

3399.102

MAINTENANCE FOR EXISTING TRAFFIC COVERS THAT CREATE A SAFETY HAZARD

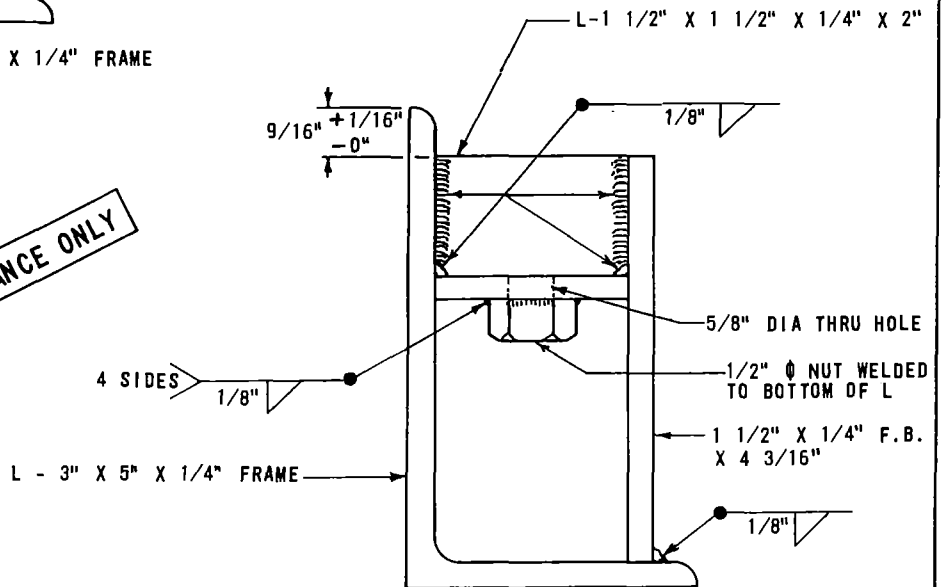
AND/OR ARE A SOURCE OF NOISE COMPLAINTS

THE FOLLOWING SKETCHES ILLUSTRATE A WELD FIX THAT WILL MINIMIZE DAMAGE TO THE UNISTRUTS BY PROVIDING IMPACT SUPPORT AND ALSO PROVIDES FOR CONTINUOUS BOLT TENSION ON PROPERLY TIGHTENED BOLTS SUBJECT TO CYCLIC LOADING AND UNLOADING OF TRAFFIC; THEREBY, REDUCING THE TENDENCY OF THE BOLTS TO VIBRATE LOOSE. IF THIS METHOD DOES NOT WORK, REPLACE TRAFFIC COVER WITH NEW STYLE TRAFFIC COVER, STANDARD 3315.



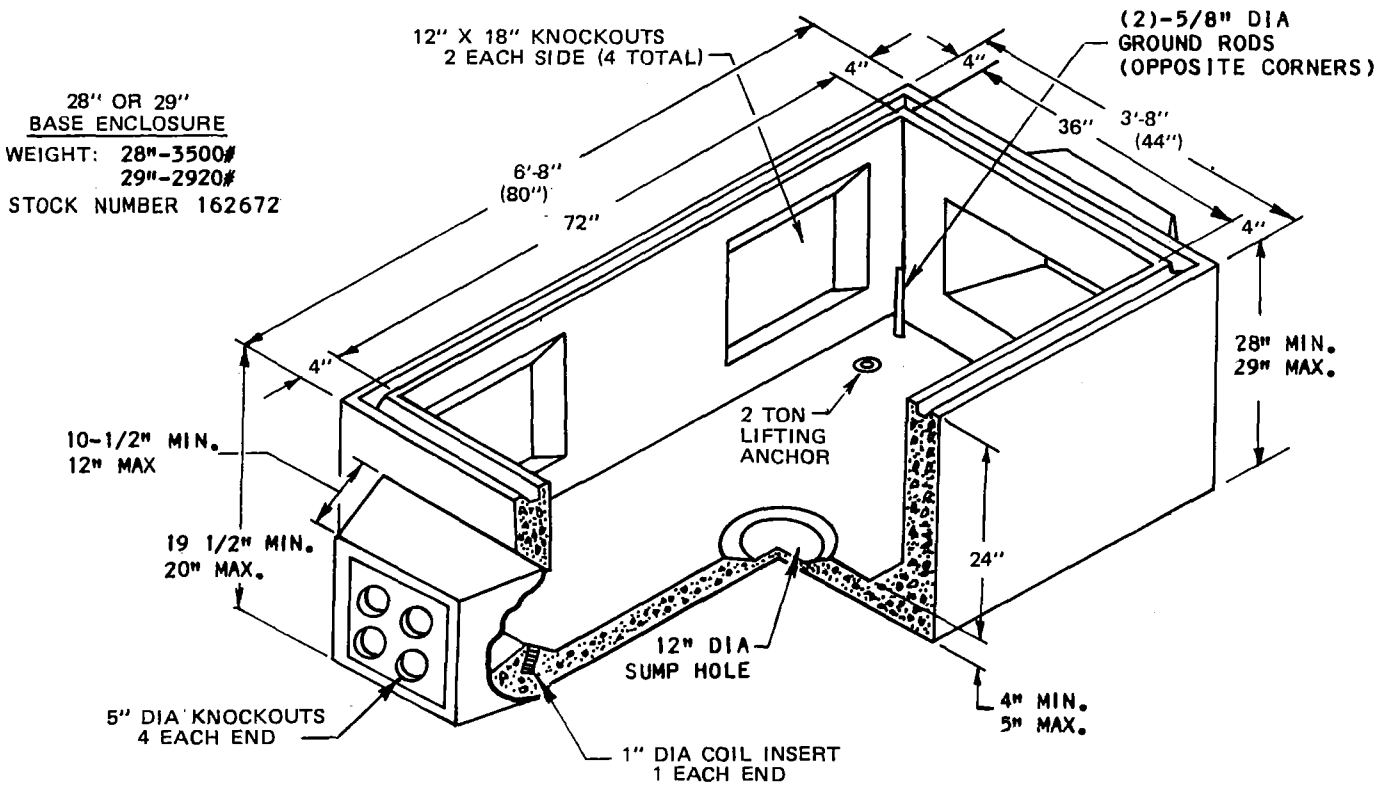
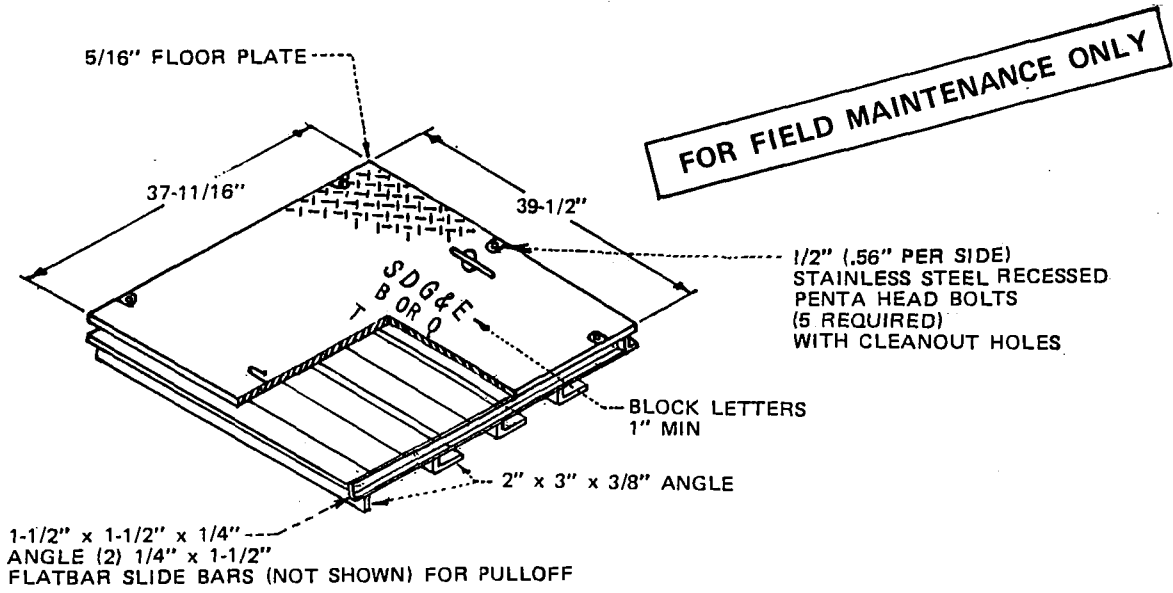
QUIKSET

FOR FIELD MAINTENANCE ONLY



BROOKS

SCOPE: THIS STANDARD SHOWS THE OBSOLETE COVER AND BASE ENCLOSURE FOR A 3314 HANDHOLE. IF AN EXISTING COVER IS DAMAGED, REPLACE IT WITH THE NEW CAST IRON TRAFFIC COVER PER STANDARD 3314.



SDG&E ELECTRIC STANDARDS

DATE 1-1-88
APPD *J. B. [Signature]*

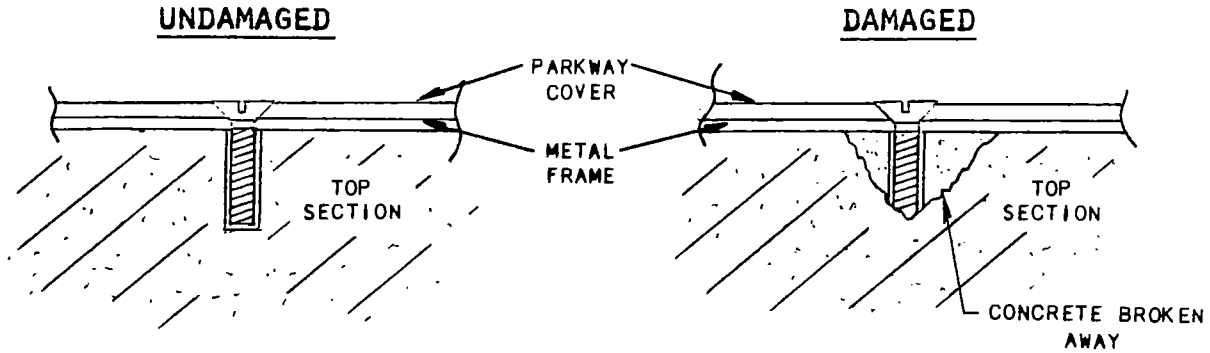
HANDHOLE TRAFFIC COVER AND BASE ENCLOSURE
3' X 6'

3399.104

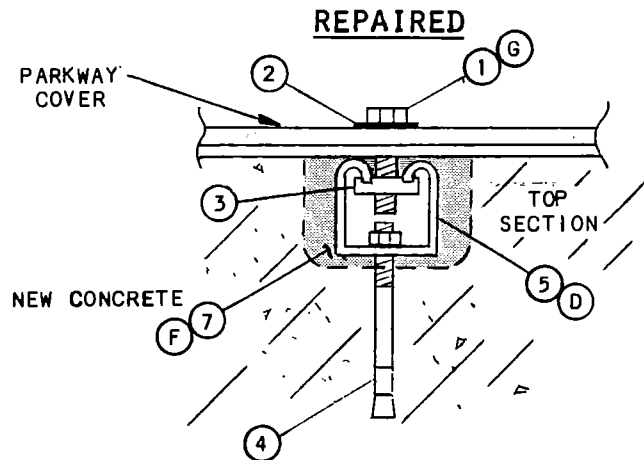
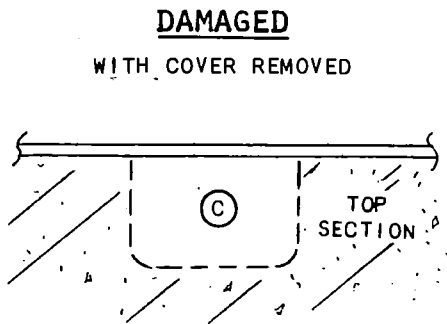
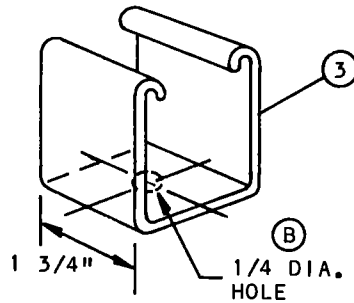
SCOPE: THIS STANDARD SHOWS HOW TO REPAIR DAMAGED "OLD STYLE" 3314 HANDHOLES WITH PARKWAY COVERS.

**"OLD STYLE" 3314 HANDHOLE
REPAIR DRAWINGS**

SIDE VIEWS



FOR FIELD MAINTENANCE ONLY



NOTES:

-USE THE REPAIR METHOD SHOWN IN THIS STANDARD FOR REPAIRING OLD STYLE 3314 HANDHOLES WITH PARKWAY COVERS WHERE THE BOLTS SECURING THE LIDS HAVE PULLED OUT OF THE CONCRETE . THIS METHOD ELIMINATES THE NEED TO REPLACE THE ENTIRE TOP SECTION OF HANDHOLE.

SDG&E ELECTRIC STANDARDS

3399.105

3314 HANDHOLE REPAIR -
"OLD STYLE" PARKWAY COVER

DATE 1-1-87

APPD *JYB IRB*

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | STOCK NUMBER |
|------|---|----------|--------------|
| 1 | SCREW, CAP HEX. HEAD, BRONZE, 3/8" X 1 1/2" | AS REQ'D | 616800 (E) |
| 2 | WASHER, FLAT ROUND, BRONZE, 3/8" | AS REQ'D | 799584 (E) |
| 3 | NUT, CLAMPING UNISTRUT CHANNEL, GALV. W/ SPRING, 3/8" | AS REQ'D | 503616 |
| 4 | ANCHOR, CONCRETE STAINLESS STEEL, 1/4" X 3" | AS REQ'D | 107666 (E) |
| 5 | UNISTRUT, CHANNEL, GALV., 12 GA., 1 5/8" X 1 5/8" | AS REQ'D | 216896 (E) |
| 6 | PAINT, GALVANOX COATING | AS REQ'D | 576064 |
| 7 | MORTOR MIX | AS REQ'D | -- |
| 8 | SILICONE GREASE (NOT SHOWN) | AS REQ'D | 391424 (E) |

INSTALLATION:

- A. REMOVE BOLTS AND PARKWAY COVER.
- (B) CUT A 1 3/4 INCH PIECE OF UNISTRUT AND DRILL A 1/4 INCH DIAMETER HOLE IN THE CENTER. PAINT CUT ENDS AND INSIDE EDGE OF DRILLED HOLE WITH GALVANOX.
- (C) CHIP AWAY CONCRETE IN DAMAGED AREA ENOUGH TO MAKE ROOM FOR THE 1 3/4 INCH PIECE OF UNISTRUT.
- (D) PLACE UNISTRUT IN CHIPPED AWAY AREA AND BOLT IN PLACE WITH ANCHOR BOLT. ASSURE UNISTRUT WILL BE CENTERED BELOW LOCATION OF BOLT HOLE ON COVER WHEN COVER IS ON.
- (E) EXEMPT MATERIAL.
- (F) PLACE MORTOR MIX IN CHIPPED AWAY AREA AROUND UNISTRUT.
- (G) AFTER MORTOR SETS, POSITION CLAMPING CHANNEL NUT AND REPLACE OLD PARKWAY COVER. APPLY SILICONE GREASE TO BOLTS WHEN SECURING THE COVER TO REDUCE REMOVAL OR INSTALLATION DIFFICULTIES.

FOR FIELD MAINTENANCE ONLY

DATE 1-1-87
APPD JYB/RD

SDG&E ELECTRIC STANDARDS

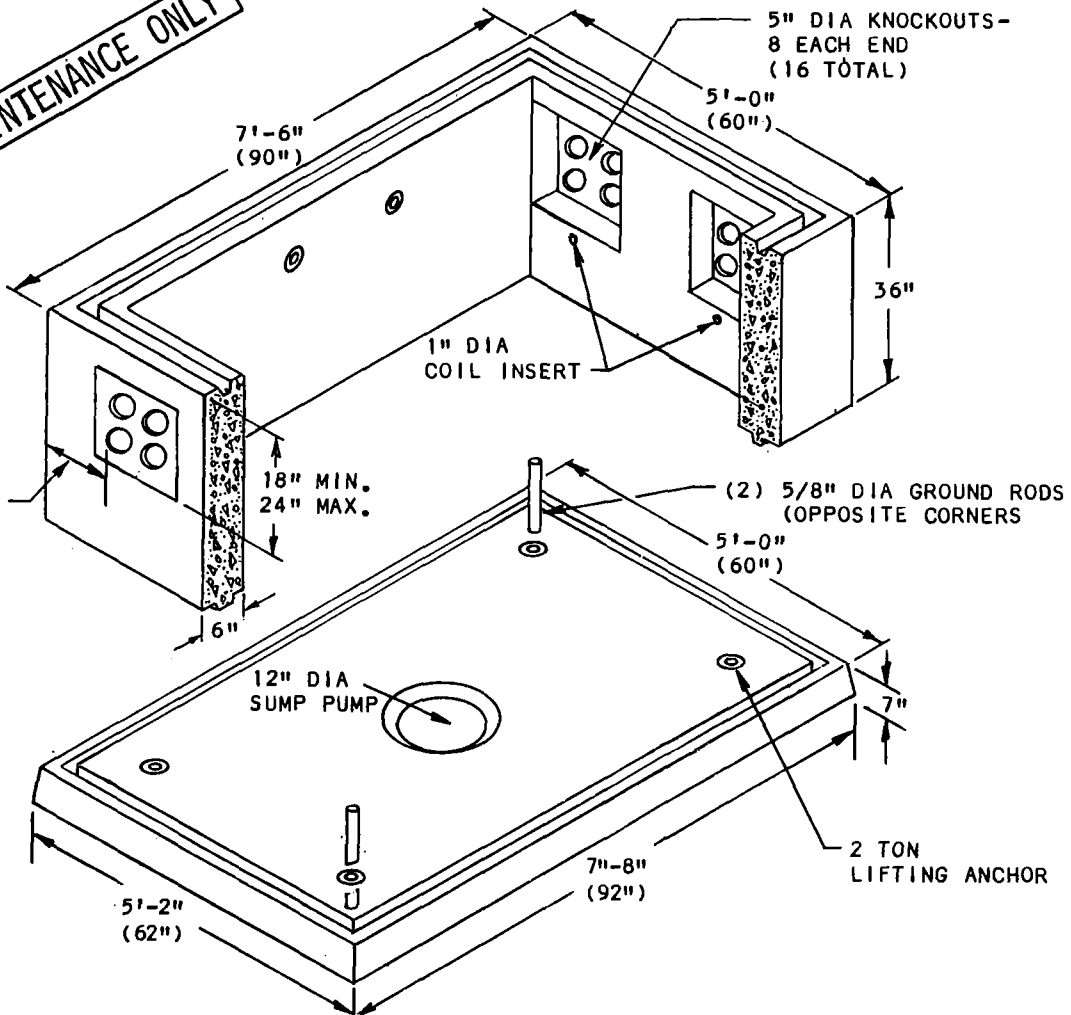
3314 HANDHOLE REPAIR -
"OLD STYLE" PARKWAY COVER

3399.106

SCOPE: THIS STANDARD SHOWS THE OBSOLETE BASE ENCLOSURE AND BOTTOM SECTION FOR THE 3315 HANDHOLE.

3315 HANDHOLE

FOR FIELD MAINTENANCE ONLY



36" BASE ENCLOSURE
 WEIGHT: 4836# MIN.
 5200# MAX.
 STOCK NUMBER 334359

7" BOTTOM SECTION
 WEIGHT: 3200# MIN.
 3300# MAX.
 STOCK NUMBER 125372

SDG&E ELECTRIC STANDARDS

3399.107

HANDHOLE BASE ENCLOSURE AND BOTTOM SECTION
 (INSIDE DIMENSIONS - 4'X6'-6")

DATE 1-1-88
 APPD *[Signature]*

SCOPE: THIS STANDARD SHOWS THE OBSOLETE TWO-PIECE BASE SECTION FOR THE 3316 HANDHOLE.

FOR FIELD MAINTENANCE ONLY

3316 HANDHOLE

5" DIA KNOCKOUTS
12 EACH END -
8 EACH SIDE

2 TON
LIFTING
ANCHOR

1" DIA
COIL
INSERT

35-3/4"

(2) 5/8" DIA
GROUND RODS
(OPPOSITE CORNERS)

6"

TWO PIECE
BASE ENCLOSURE

35 3/4" SECTION
WEIGHT: 6204#

**STOCK NUMBER
248160**

12" BOTTOM SECTION
WEIGHT: 5382#

1" DIA
COIL
INSERT

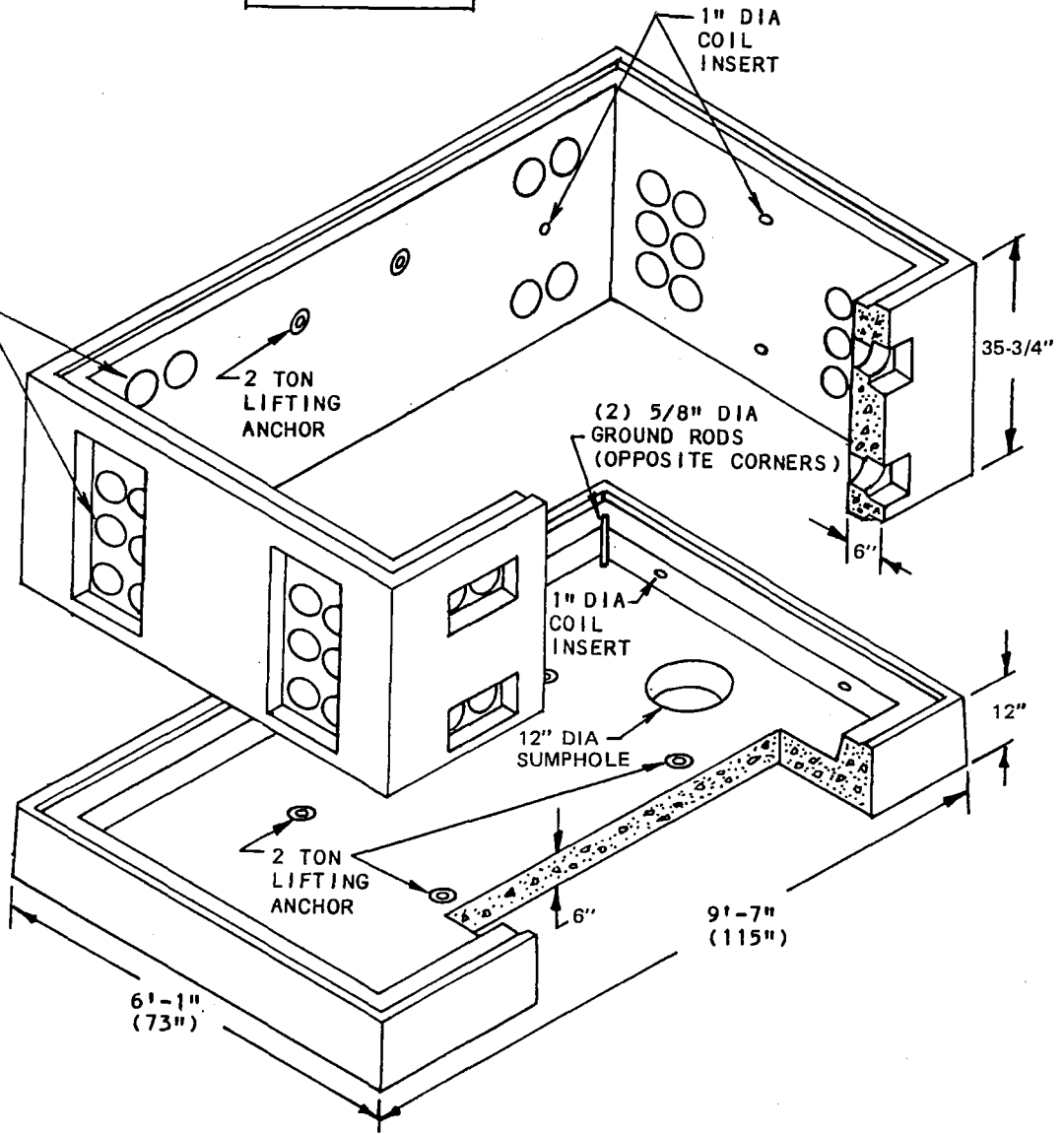
12" DIA
SUMPHOLE

12"

2 TON
LIFTING
ANCHOR

9'-7"
(115")

6'-1"
(73")



SDG&E ELECTRIC STANDARDS

DATE 1-1-88

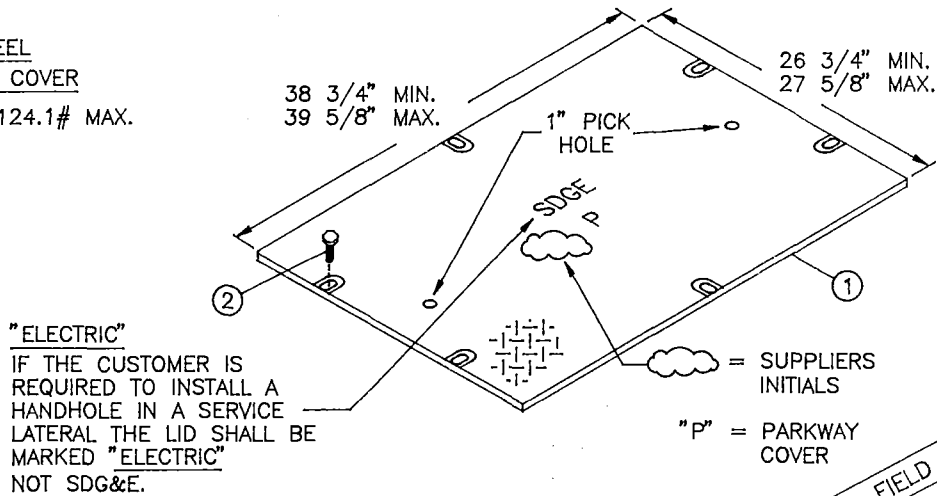
APPD *JLB/RO*

HANDHOLE TWO-PIECE BASE ENCLOSURE
(INSIDE DIMENSIONS - 5' X 8'-6")

3399.108

SCOPE: THIS STANDARD SHOWS 3313 & 3314 HANDHOLE PARKWAY COVERS.

**3313 STEEL
PARKWAY COVER**
WEIGHT: 124.1# MAX.



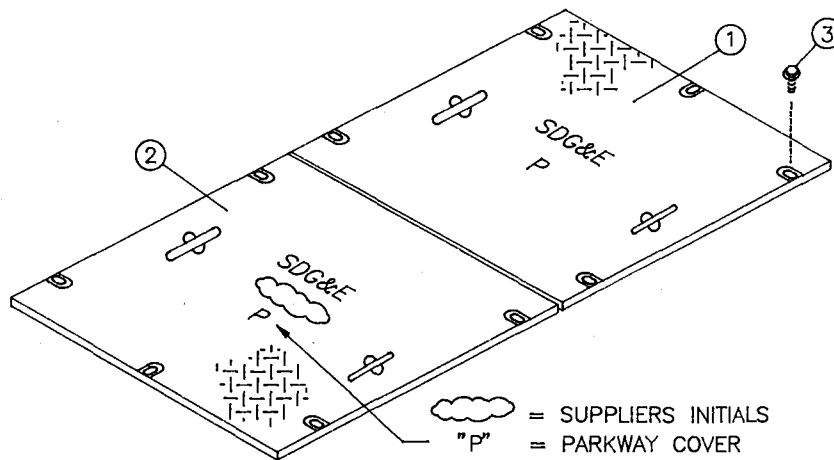
NOTES:

- HANDHOLE SECTIONS AND COVERS FROM DIFFERENT SUPPLIERS ARE NOT INTERCHANGEABLE.

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | STOCK NUMBER |
|------|-------------------------------|----------|--------------|
| 1 | COVER, PARKWAY | 1 | 286834 |
| 2 | BOLT, PENTAHEAD 1/2" X 1-1/2" | 6 | 156004 |

**3314 STEEL
PARKWAY COVERS**
WEIGHT: 378# MAX.



NOTES:

- HANDHOLE SECTIONS AND PARKWAY COVERS FROM DIFFERENT SUPPLIERS ARE NOT INTERCHANGEABLE.

BILL OF MATERIAL:

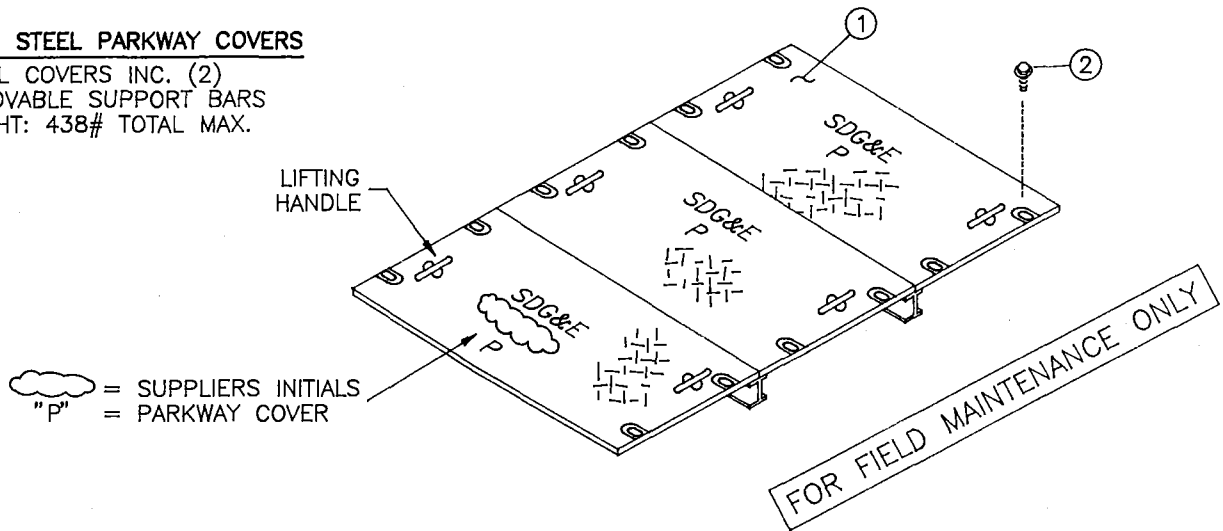
| ITEM | DESCRIPTION | QUANTITY | STOCK NUMBER |
|------|---|----------|--------------|
| 1 | COVER, PARKWAY (2 PC) | 1 | 286842 |
| 2 | COVER, HALF W/LIP, PARKWAY (FOR USE IN TRANSFORMER INSTALLATIONS) | 1 | 286843 |
| 3 | BOLT, PENTAHEAD 1/2" X 2-1/2" | 12" | 156012 |
| | WASHER, 1/2", FLAT ROUND STAINLESS STEEL | 12" | 799680 |

| | | |
|--|----------------------------------|----------|
| DATE 1-1-96 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS | 3399.109 |
| | 3313 & 3314 STEEL PARKWAY COVERS | |

SCOPE: THIS STANDARD SHOWS 3315 & 3316 HANDHOLE PARKWAY COVERS.

3315 STEEL PARKWAY COVERS

STEEL COVERS INC. (2)
REMOVABLE SUPPORT BARS
WEIGHT: 438# TOTAL MAX.



NOTES:

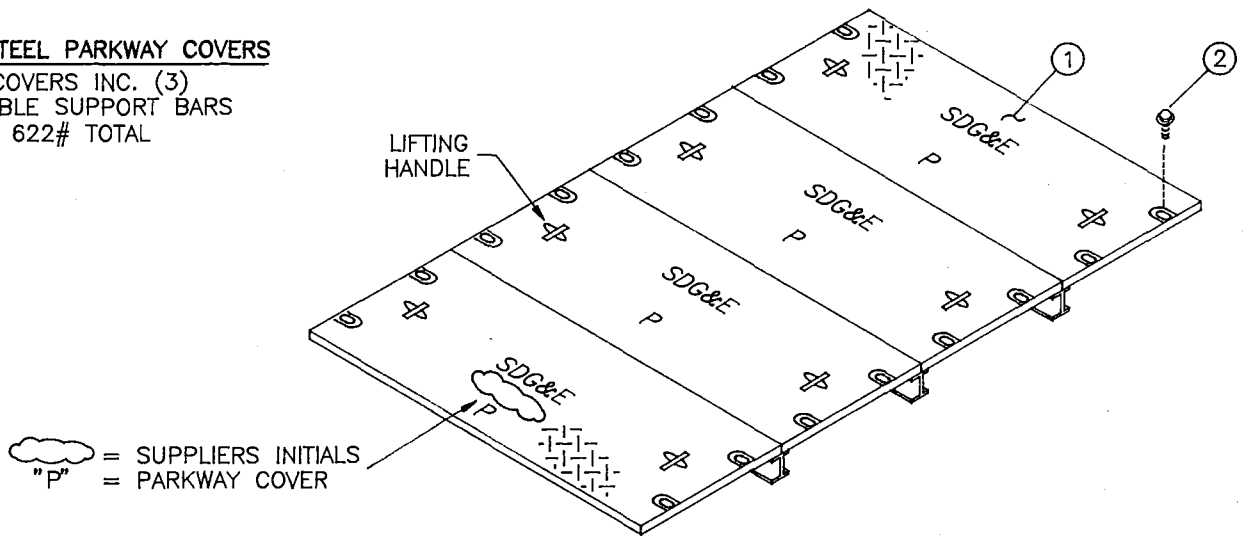
- HANDHOLE SECTIONS AND PARKWAY COVERS FROM DIFFERENT SUPPLIERS ARE NOT INTERCHANGEABLE.

BILL OF MATERIAL FOR PARKWAY 3315 HANDHOLE:

| ITEM | DESCRIPTION | QUANTITY | STOCK NUMBER |
|------|--------------------------------------|----------|--------------|
| 1 | COVER, PARKWAY STEEL PAINTED (3 PC.) | 1 | 286980 |
| 2 | BOLT, PENTAHEAD 1/2" X 2-1/2" | 12 | 156012 |

3316 STEEL PARKWAY COVERS

STEEL COVERS INC. (3)
REMOVABLE SUPPORT BARS
WEIGHT: 622# TOTAL



NOTES:

- HANDHOLE SECTIONS AND COVERS FROM DIFFERENT SUPPLIERS ARE NOT INTERCHANGEABLE.

BILL OF MATERIAL FOR PARKWAY 3316 HANDHOLE:

| ITEM | DESCRIPTION | QUANTITY | STOCK NUMBER |
|------|-------------------------------|----------|--------------|
| 1 | COVER, PARKWAY STEEL (4 PC.) | 1 | 248164 |
| 2 | BOLT, PENTAHEAD 1/2" X 2-1/2" | 16 | 156012 |

SDG&E ELECTRIC STANDARDS

DATE 1-1-96

APPD *[Signature]*

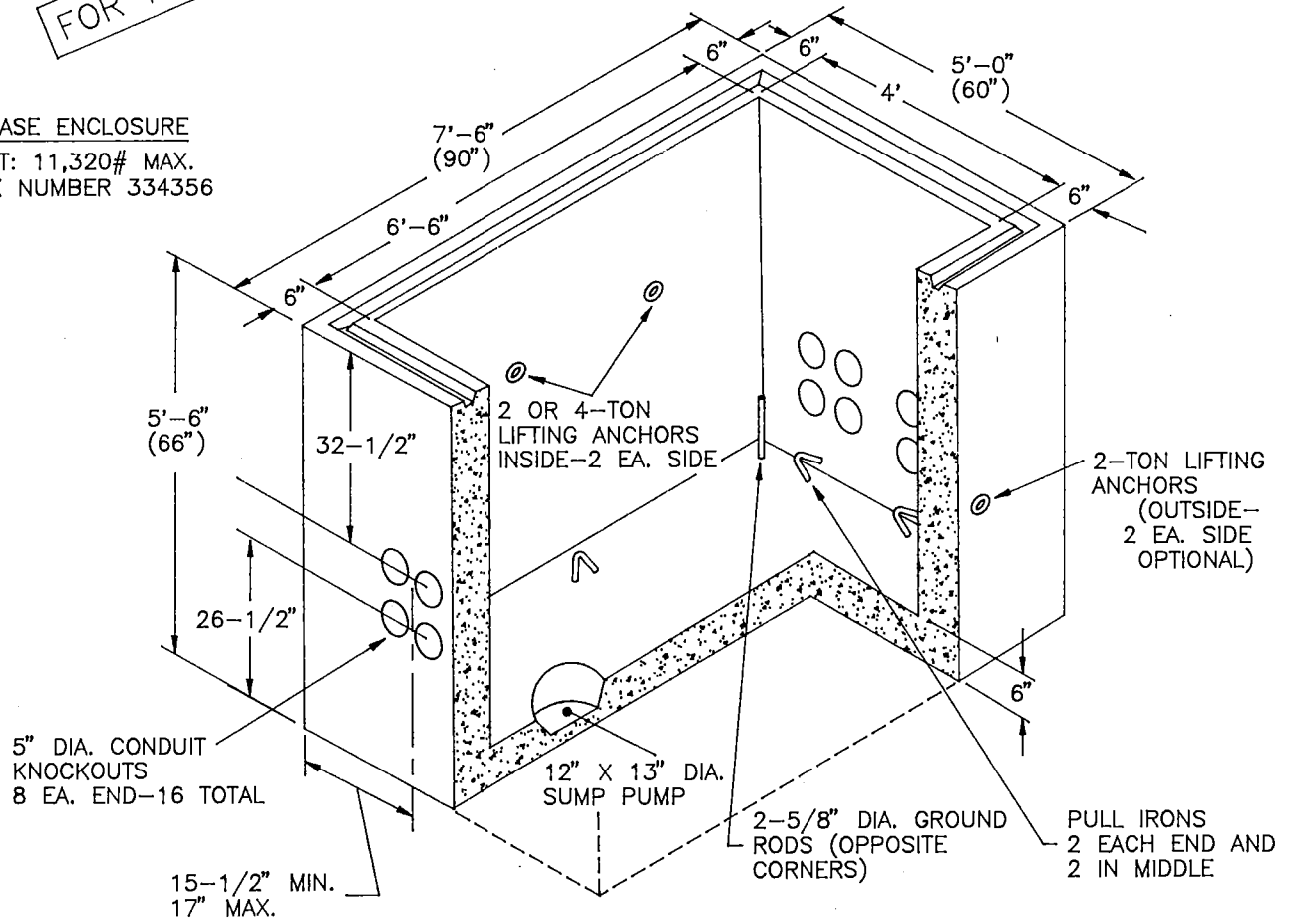
3315 & 3316 STEEL PARKWAY COVERS

3399.110

SCOPE: THIS STANDARD SHOWS THE OBSOLETE BASE ENCLOSURE FOR THE 3315 HANDHOLE.

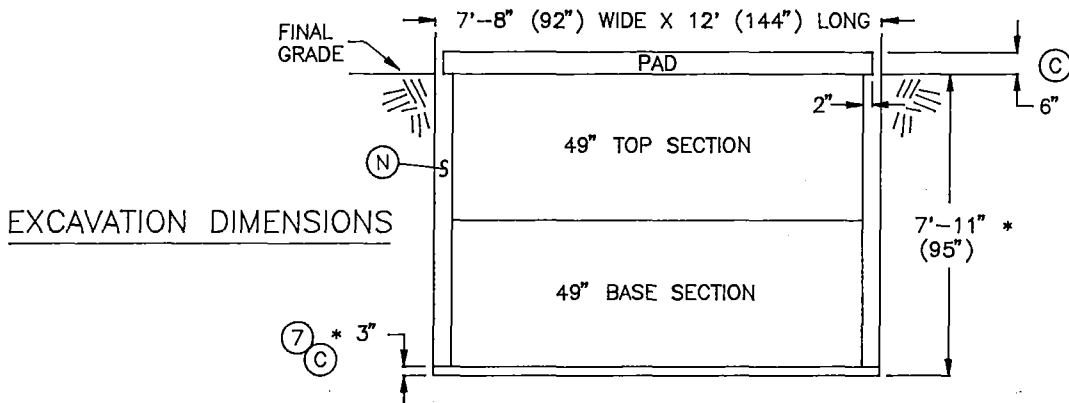
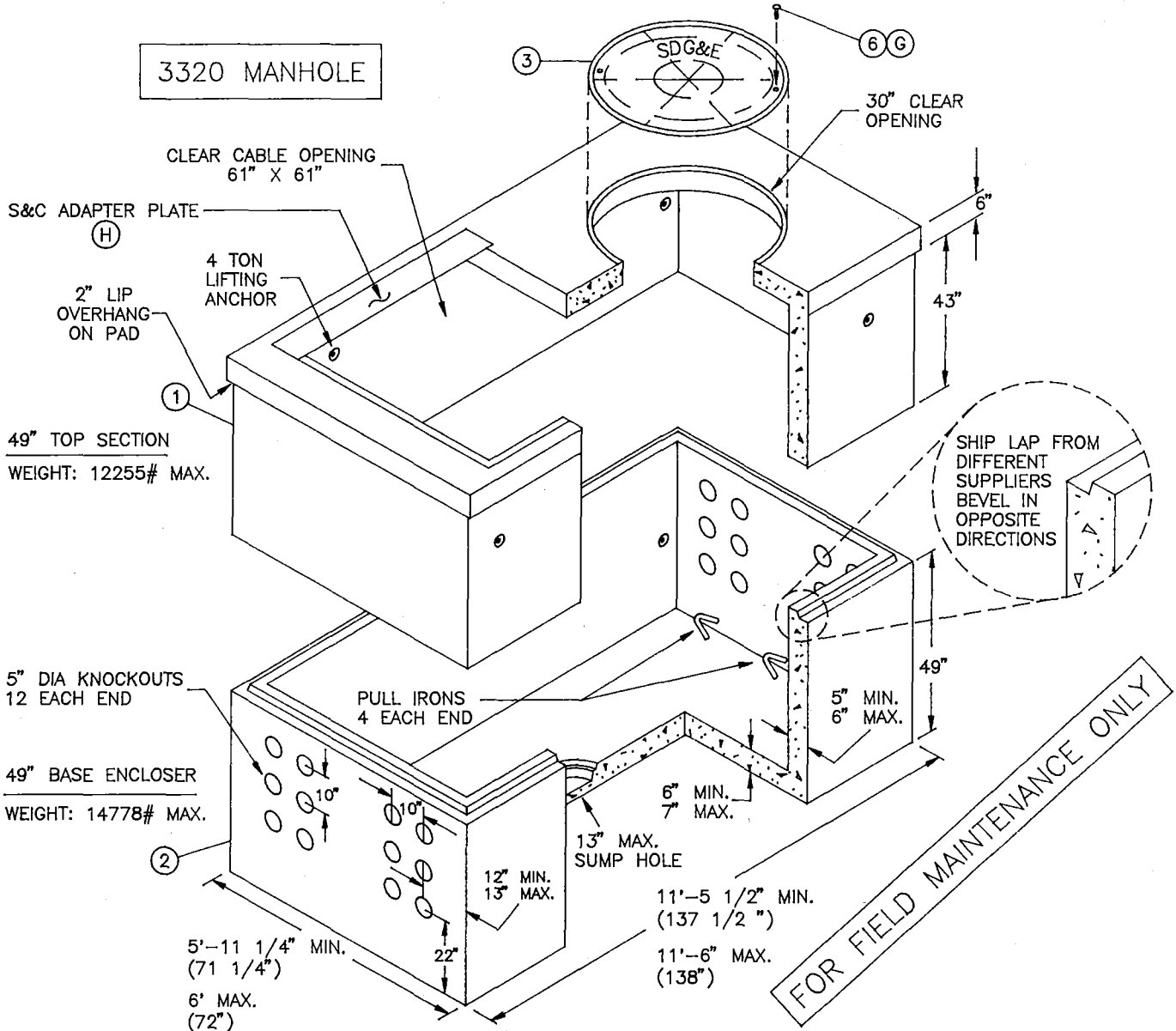
FOR FIELD MAINTENANCE ONLY

60" BASE ENCLOSURE
 WEIGHT: 11,320# MAX.
 STOCK NUMBER 334356



| | | |
|--|--|----------|
| SDG&E ELECTRIC STANDARDS | | |
| DATE 1-1-96 APPD <i>[Signature]</i> | HANDHOLE EQUIPMENT ENCLOSURE (INSIDE DIMENSIONS - 4' x 6'-6") | 3399.111 |

SCOPE: THIS STANDARD SHOWS THE INSTALLATION AND MATERIAL FOR A 3320 MANHOLE. (MANHOLE IS TO BE USED ONLY FOR A PMH 9 OR PMH 11 SWITCH INSTALLATION).



* EXCAVATION DEPTH ALLOWS AN ADDITIONAL 3" FOR PLACEMENT OF GRAVEL AS BASE SUPPORT.

SDG&E ELECTRIC STANDARDS

DATE 1-1-96

APPD *[Signature]*

MANHOLE EQUIPMENT ENCLOSURE
(INSIDE DIMENSIONS - 10'-6" X 5')

3399.112

NOTES:

- MANHOLE SECTIONS AND COVERS FROM DIFFERENT SUPPLIERS ARE NOT INTERCHANGEABLE.
- THE PREFERRED LOCATION FOR A 3320 MANHOLE IS IN NON-VEHICULAR TRAFFIC AREAS (BEHIND SIDEWALK).
- LIFTING ANCHORS ARE NOT TO BE USED FOR CABLE PULLING.
- 3320 MANHOLES ARE DELIVERED BY THE SUPPLIER TO JOB SITE.

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD OR PAGE NO. | STOCK NUMBER | STOCK NUMBER | ASSEMBLY UNITS |
|------|------------------------------|----------|-------------------------|--------------|----------------------------|------------------|
| 1 | TOP SECTION 49" | 1 | 3320 | 633674 | COMPLETE MANHOLE 475900 | 20-TOP |
| 2 | BASE ENCLOSURE 49" | 1 | 3320 | 125758 | | 20BASE |
| 3 | 30" MANHOLE COVER, CAST IRON | 1 | 3320 | 287020 | | IRNCOV |
| 4 | SEALANT, PLASTIC MASTIC | AS REQ'D | 3320 | 631872 | | COMPLETE MANHOLE |
| 5 | SILICONE GREASE | AS REQ'D | - | 319424 | | 3320MH |
| 6 | BOLT 5/8" X 1-1/2" | 4 | 3306 | 156758 | | |
| 7 | GRAVEL 3/8" X 3/4" | AS REQ'D | - | | | |

INSTALLATION:

- A. ESTABLISH THE MANHOLE LOCATION PAYING PARTICULAR ATTENTION TO FOREIGN UTILITY PLACEMENTS. RELOCATING THE MANHOLE TO ANOTHER LOCATION REQUIRES APPROVAL FROM SERVICE PLANNING.
- B. AFTER THE LOCATION IS ESTABLISHED, MARK OUT DIMENSIONS FOR THE EXCAVATION WIDTH, LENGTH AND DEPTH PER DRAWING. THE WIDTH AND LENGTH DIMENSIONS GIVEN, ALLOW AN EXTRA 8 INCHES FOR SETTING THE SUBSTRUCTURE.
- C. EXCAVATION IS NOW PREPARED FOR INSTALLATION OF SUBSTRUCTURE SECTIONS. PLACE BASE ENCLOSURE ON 3 INCHES OF GRAVEL. PLACE PLASTIC-MASTIC SEALANT BETWEEN SECTIONS. USE DOUBLE SEAL IF FIELD CONDITIONS INDICATE THAT WATER WILL PENETRATE THE JOINTS. ASSURE THE SUBSTRUCTURE WALLS ARE STRAIGHT AND THE FLOOR AND PAD (TOP SECTION) IS LEVEL. SET THE PAD PORTION OF THE TOP SECTION 6 INCHES ABOVE FINAL GRADE.
- D. TO DETERMINE FINAL GRADE, ONE OF TWO FOLLOWING METHODS MAY BE USED: 1) WHEN CURB OR GRADE LEVEL IS ESTABLISHED, MEASURE FROM THE TOP OF CURB OR GRADE OR 2) HAVE THE FIELD ENGINEER SET THE GRADE STAKES. AFTER GRADE LEVEL IS ESTABLISHED, SET A STRING LINE FOR CHECKING GRADE LEVEL.
- F. INSTALL CONDUITS USING THE BOTTOM OUTSIDE (CLOSEST TO THE WALL) KNOCKOUTS FIRST.
- G. APPLY SILICONE GREASE TO THE PENTAHEAD BOLTS WHEN SECURING THE COVERS TO REDUCE REMOVAL OR INSTALLATION DIFFICULTIES. TIGHTEN DOWN BOLTS WITH TORQUE WRENCH TO 30 FT/LBS. MIN., 40 FT/LBS. MAX.
- H. THE S&C ADAPTOR PLATE, REQUIRED WITH S&C SWITCH IS INCLUDED WITH EVERY MANHOLE. WHEN INSTALLING A SCOTT SWITCH, REMOVE THE PLATE AND STORE IN THE MANHOLE.

REFERENCE:

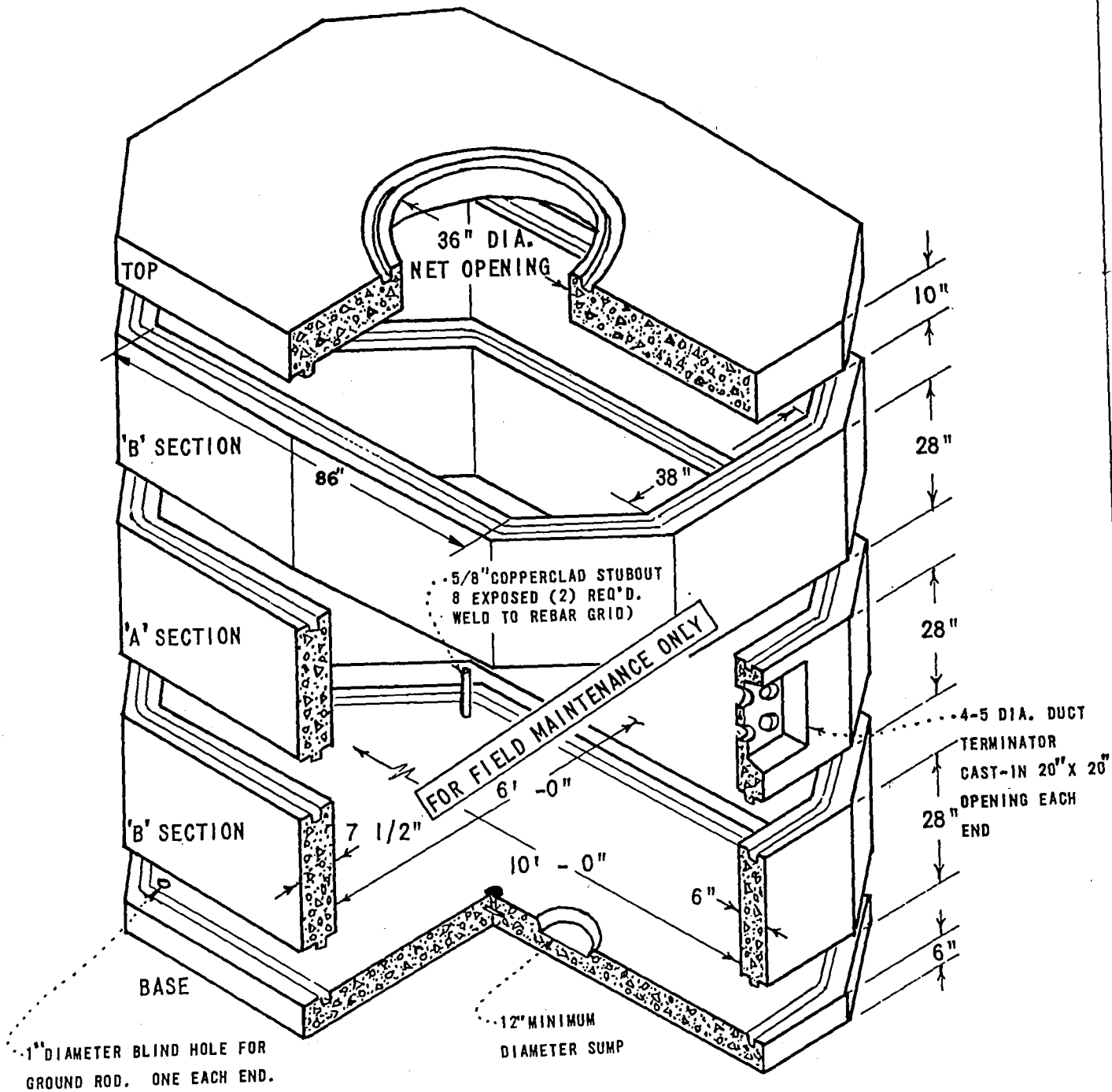
- K. SEE STANDARD 3399.002 FOR SUBSTRUCTURE APPLICATIONS.
- L. SEE STANDARD 3305 WHEN SETTING MANHOLE ON A SLOPING GRADE.
- M. SEE STANDARD 3306 FOR INSTALLATION OF PLASTIC-MASTIC SEALANT.
- N. SEE STANDARD 3365 FOR SLURRY BACKFILL.
- O. SEE STANDARD 3484 FOR PAD INSTALLATION OF PADMOUNTED EQUIPMENT.
- P. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS.
- Q. SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- R. SEE STANDARD 3566 FOR PAD AND MANHOLE GROUNDING.
- S. SEE STANDARD 3699.001 FOR SUBSTRUCTURE USE AND LIMITATIONS REFERENCE SHEET (MAXIMUM NUMBER OF CABLES, CONNECTORS AND CONDUITS).

FOR FIELD MAINTENANCE ONLY

| | | |
|--|--|----------|
| DATE 1-1-96 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS MANHOLE EQUIPMENT ENCLOSURE (INSIDE DIMENSIONS - 10'-6" X 5') | 3399.113 |
|--|--|----------|

MAJOR USE:

USED FOR SPLICING 15KV CABLES.



1" DIAMETER BLIND HOLE FOR GROUND ROD. ONE EACH END.

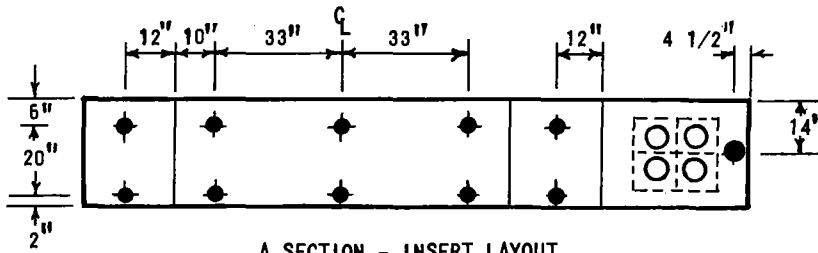
SDG&E ELECTRIC STANDARDS

MANHOLE - 6' X 10' X 7'

3399.201

DATE 1-1-93
APPD *JLB/RD*

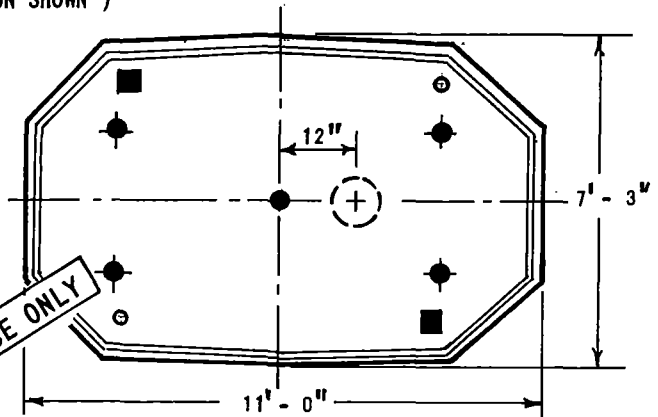
| STOCK NUMBERS | |
|---------------|--------|
| TOP | 287112 |
| A SECTION | 336260 |
| B SECTION | 336264 |
| BASE | 125736 |



A SECTION - INSERT LAYOUT
(1/2 SECTION SHOWN)

LEGEND:

- = GROUNDING REBAR
- = 1" GROUND ROD BLIND HOLE
- = 1/2" INSERT
- = 1" INSERT
- ⊙ = 12" DIAMETER SUMP
- = KNOCKOUT



BASE LAYOUT

SECTION DETAILS

| SECTION | 1/2" INSERT | 1" INSERT | MISC. | POSITION | WEIGHT LBS. |
|---------|-------------|-----------|---|-----------|-------------|
| TOP | - | - | 36" DIA. OPENING | TOP | 6850 |
| A | 20 | 2 | 4-5" DUCT TERMINATORS 1 EACH END | 1 OR 2 | 5675 |
| B | 28 | - | SAME AS 'A' WITH NO DUCT TERMINATORS | 1, 2 OR 3 | 5675 |
| BASE | - | 1 | SEE BASE LAYOUT ABOVE | BASE | 5050 |

NOTES:

- A. LOCATE 12" SUMP UNDER OPENING IN TOP SECTION.
- B. USE MASTIC SEALING COMPOUND (631872) BETWEEN ALL SECTIONS.
- C. AN EXCAVATION, 9' - 6" X 13' - 0" X 10' - 8", IS REQUIRED FOR INSTALLATION OF THE MANHOLE TOP AT AN ELEVATION 2' BELOW GRADE, DEPTH TO BE 10' - 8" MAXIMUM.
- D. FOR 36" MANHOLE NECK AND COVER SEE (3399.306).
- E. THIS INSTALLATION IS LIMITED TO A MAXIMUM OF 6 - 5" CONDUITS.
- F. USE SOFT DRAWN #1/0 BARE COPPER WIRE (812752) FOR MANHOLE GROUNDING, WITH GROUND ROD CLAMP (M&S 230016).

3399.202

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

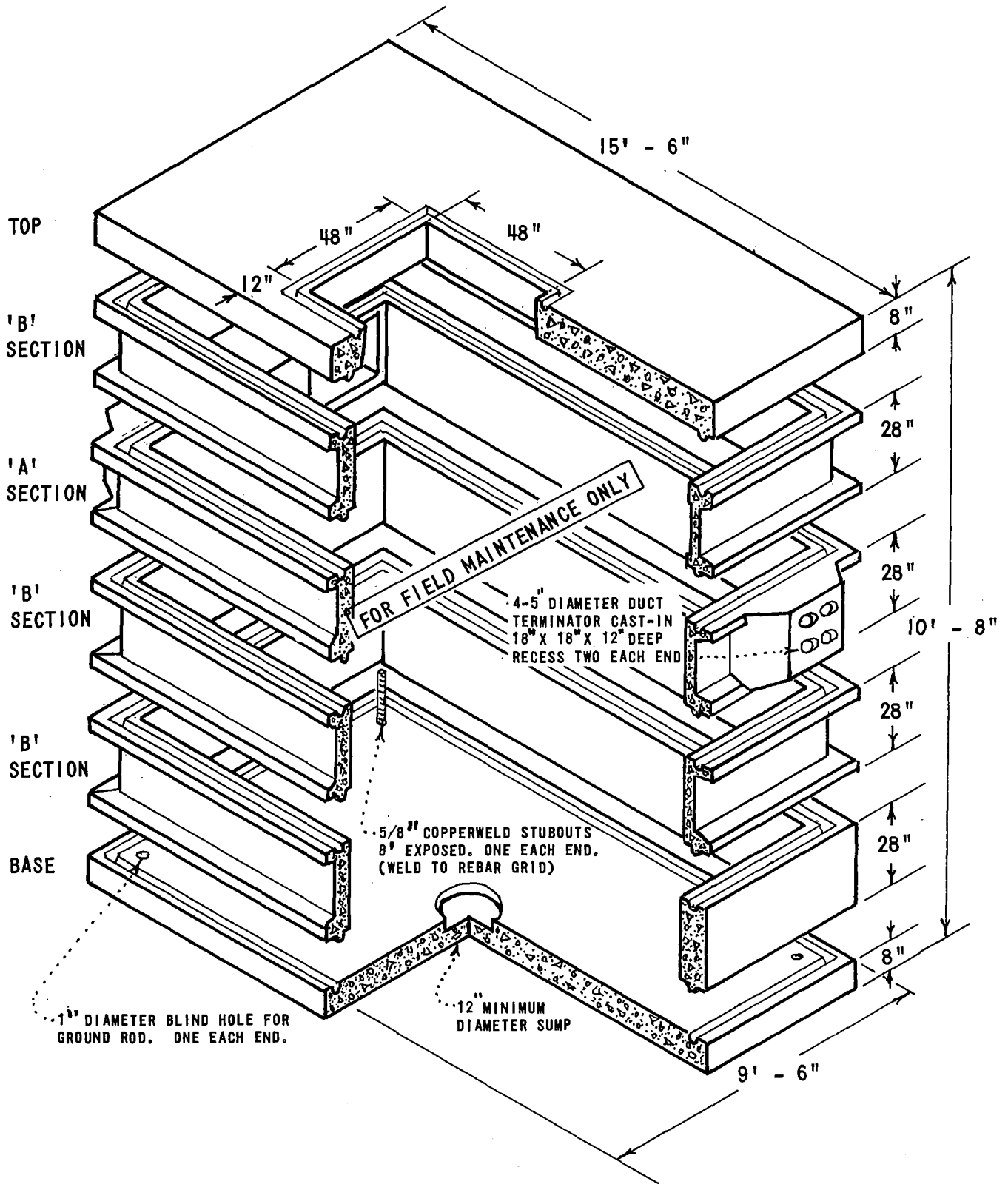
MANHOLE, 6' X 10' X 7'

DATE 6-30-78

APPD TAF

MAJOR USE:

USED AS A MAJOR EQUIPMENT INSTALLATION AND LIMITED CABLE SPLICING.



SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

DATE 4-10-75

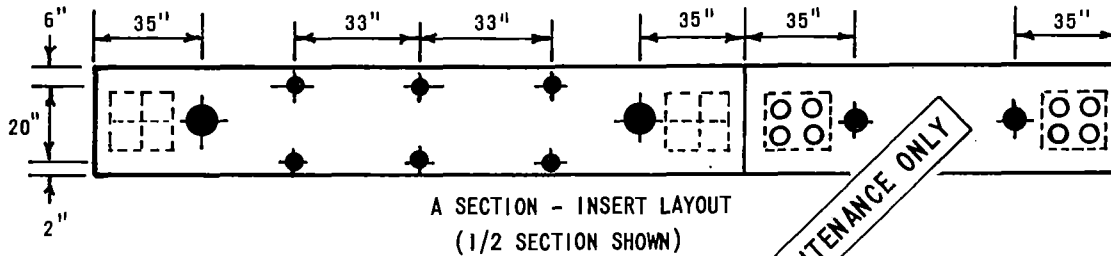
APPD *AWK*

MANHOLE, 8' X 14' X 9' - 4"

3399.203

| STOCK NUMBERS | |
|---------------|--------|
| TOP | 287128 |
| 'A' SECTION | 336280 |
| 'B' SECTION | 336284 |
| BASE | 125752 |

- NOTES:
- AN EXCAVATION, 13'-6" X 18'-8" X 13'-6" IS REQUIRED FOR INSTALLATION OF THE MANHOLE WITH THE TOP AT AN ELEVATION 2'-0" BELOW GRADE. DEPTH IS TO BE 13'-6" MAXIMUM.
 - USE MASTIC SEALING COMPOUND (631872) BETWEEN ALL SECTIONS SEE (3306).
 - FOR 48" X 48" MANHOLE NECK AND COVER SEE (3332).
 - THIS MANHOLE REQUIRES THE USE OF A 30 TON MINIMUM CRANE FOR LIFTING SECTIONS.
 - USE SOFT DRAWN #1/0 BARE COPPER WIRE (812752) FOR MANHOLE GROUNDING.
 - LOCATE 12" SUMP DIRECTLY UNDER CENTER OF OPENING.
 - PROVIDE A 1" INSERT OPPOSITE EACH DUCT RECESS IN AN 'A' SECTION.
 - IN 'A' SECTION, OMIT 2-1/2" INSERTS AT EACH LOCATION A DUCT RECESS IS PROVIDED.
 - WHEN A MAXIMUM OF 8-5" CONDUITS ARE TO BE INSTALLED USE TWO ADJOINING 'A' SECTIONS FOR CONDUIT ENTRANCE.
 - ALL UNCOATED METAL TO BE HOT DIPPED GALVANIZED FOR CORROSION PROTECTION.

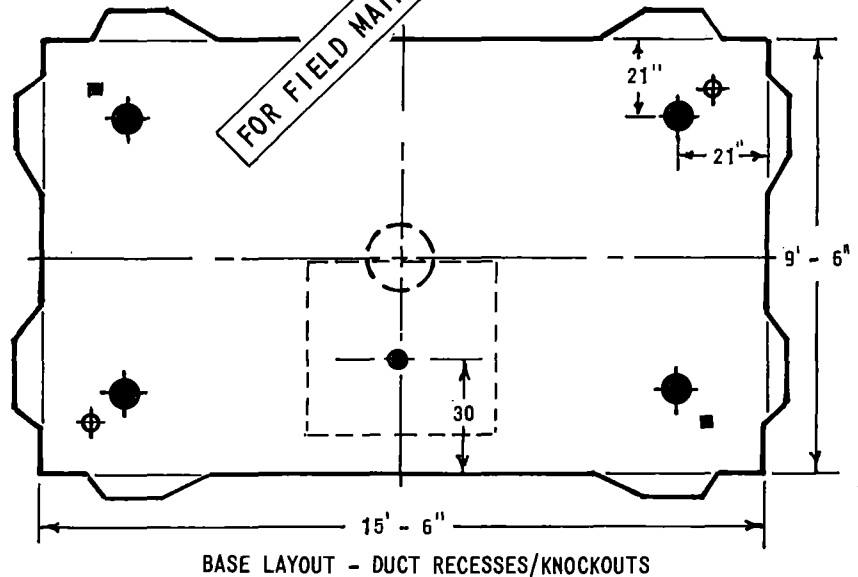


DUCT RECESS:

- ALL THE DUCT RECESSES WILL BE FURNISHED ON THE 'A' SECTION.
- THE END RECESSES WILL BE COMPLETE WITH 4-5" DUCT TERMINATORS.
- ALL SIDE RECESSES WILL BE KNOCKOUTS.

LEGEND:

- GROUNDING REBAR
- 1" GROUND ROD BLIND HOLE
- 1/2" INSERT
- 1" INSERT
- 12" DIAMETER SUMP
- DUCT RECESS
- 8 TON RISS LIFTER



SECTION DETAILS

| SECTION | 1/2" INSERT | 1" INSERT | MISC. | POSITION | WEIGHT | LIFTER |
|---------|-------------|-----------|-----------------------------------|--------------|--------|--------|
| TOP | - | 1 | 48 X 48 OPENING | TOP | 9100 | 4 |
| A | 24 MAX. | 8 MAX. | 4-5 DUCT TERMINATORS, 2 EACH END | 1 OR 2 | 5900 | 4 |
| B | 32 | - | SAME AS 'A', WITHOUT DUCT TERM'S. | 1, 2, 3 OR 4 | 5900 | 4 |
| BASE | - | 1 | SEE BASE LAYOUT ABOVE | BASE | 9550 | 4 |

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

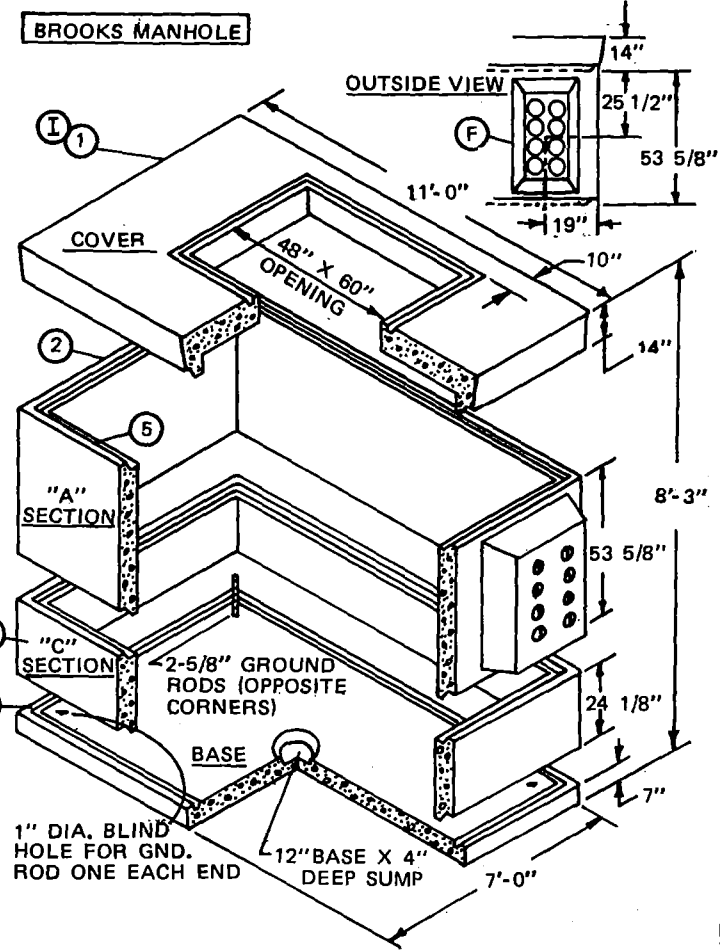
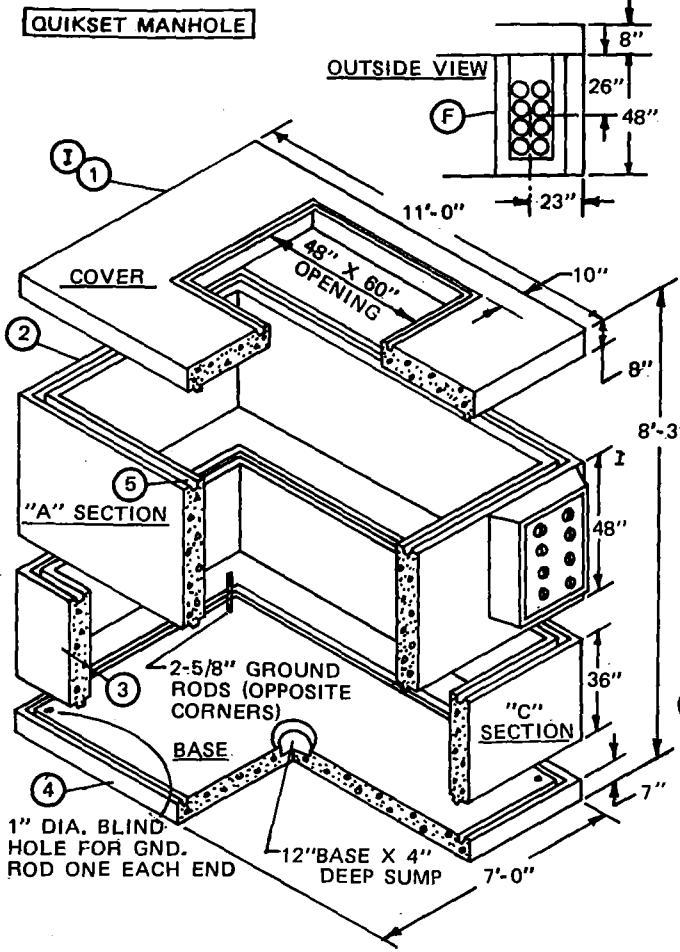
3399.204

MANHOLE, 8' - X 14' - X 9' - 4"

DATE 4-10-75

APPD *[Signature]*

SCOPE: THIS STANDARD SHOWS THE MATERIALS AND INSTALLATION INSTRUCTIONS FOR THE 3322 MANHOLE. (OLD U28.4)



NOTES :

- MANUFACTURERS IDENTIFICATION PAINTED INSIDE "A" SECTION ON END.

THIS PAGE FOR FIELD MAINTENANCE ONLY

BILL OF MATERIAL :

| ITEM | DESCRIPTION | ORDER OF INSTALLATION | 1 INCH INSERT | WEIGHT (LBS.) | | RISS LIFTER | CONSTR. STD. | STOCK NUMBER |
|------|--|-----------------------|-----------------|---------------|--------|-------------|--------------|--------------|
| | | | | QUICK-SET | BROOKS | | | |
| 1 | COVER, CONCRETE MANHOLE | TOP | - | 5800 | 7000 | 4 | - | 287120 |
| 2 | EXTENSION, CONCRETE MANHOLE, "A" SECTION | BELOW TOP | 2 BESIDE TERMS. | 7800 | 9400 | 4 | - | 336268 |
| 3 | EXTENSION, CONCRETE MANHOLE, "C" SECTION | BELOW "A" SECTION | - | 7600 | 4465 | 4 | - | 336276 |
| 4 | BASE, CONCRETE MANHOLE | BASE | 2 | 5000 | 6875 | 4 | - | 125744 |
| 5 | SEALANT, JOINT, PLASTIC- MASTIC | - | - | - | - | - | 3306 | 631872 |
| 6 | CLAMP, GROUND ROD, 5/8" | - | - | - | - | - | - | 230016 |

SDG&E ELECTRIC STANDARDS

DATE 1-1-92
APPD *JLB/BJG*

MANHOLE - 6' X 10' X 7'

3399.205

SUPERSEDES
3322.1 (3-9-83)

INSTALLATION:

- A. USE MASTIC SEALANT (STOCK NUMBER 631872) BETWEEN ALL SECTIONS, (SEE STANDARD 3306). USE DOUBLE SEAL WHEN FIELD CONDITIONS INDICATE THAT WATER WILL PENETRATE THE MANHOLE THROUGH THE JOINTS.
- B. AN EXCAVATION: 9'-0" X 14'-0" X 10'-7" MINIMUM IS REQUIRED FOR INSTALLATION OF THE MANHOLE AT AN ELEVATION 2 FEET BELOW GRADE. DEPTH TO BE 10'-7" MAXIMUM.
- C. USE #2 AWG BARE COPPER WIRE FOR GROUNDS. CONNECT TO GROUND RODS WITH GROUND ROD CLAMPS (STOCK NUMBER 230016).
- D. WHEN INSTALLING CONDUITS, USE LOWER SET OF CONDUIT KNOCKOUTS FIRST.
- (F) DUCT KNOCKOUT - 18" X 35" X 12" DEEP (QUICKSET), 18" X 36" X 12" DEEP (BROOKS).

REFERENCE:

- (I) FOR 48" X 60" MANHOLE NECK AND COVER, SEE STANDARD 3332.

THIS PAGE FOR FIELD MAINTENANCE ONLY

3399.206

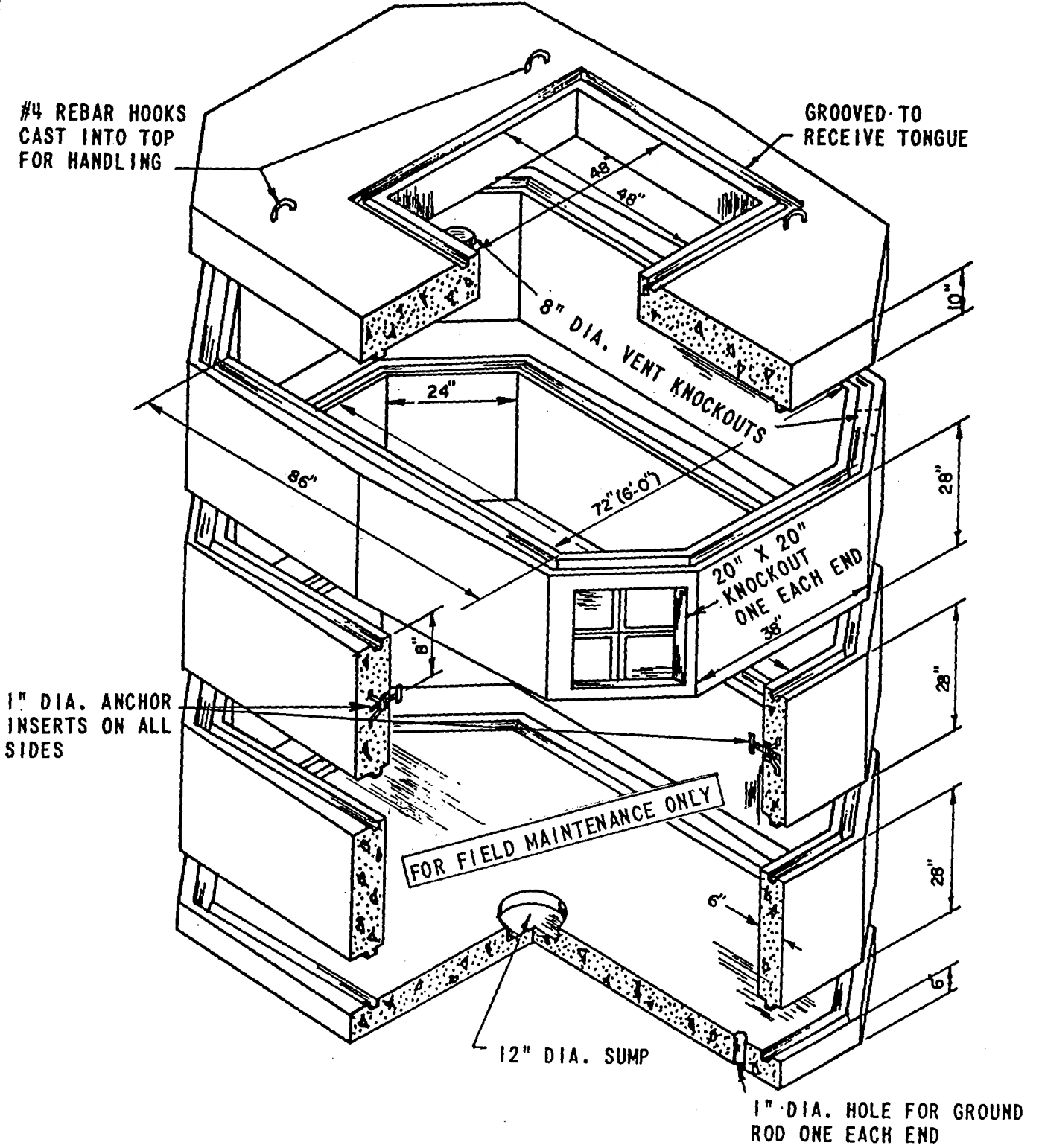
SUPERSEDES
3322.2 (3-9-83)

SDG&E ELECTRIC STANDARDS

MANHOLE - 6' x 10' x 7'

DATE 3-9-83

APPD *JWT/DRH*



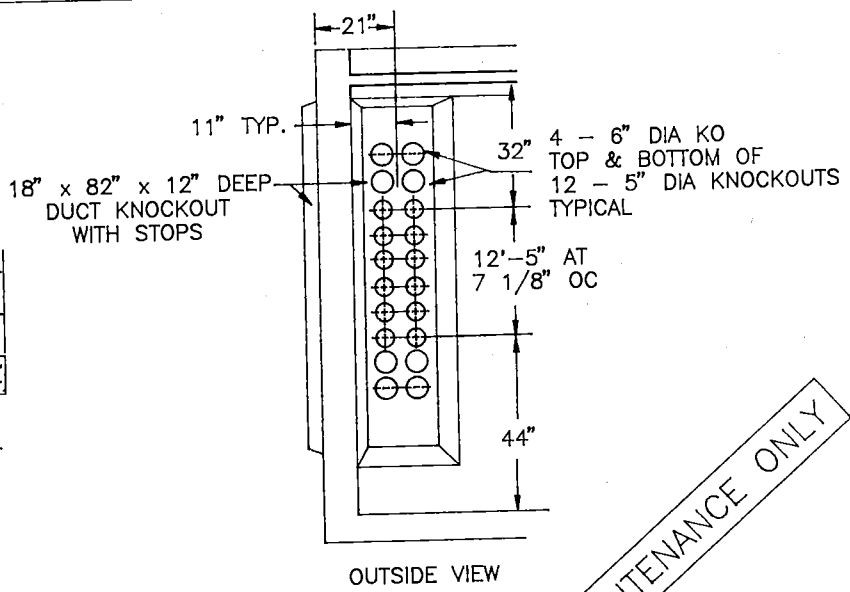
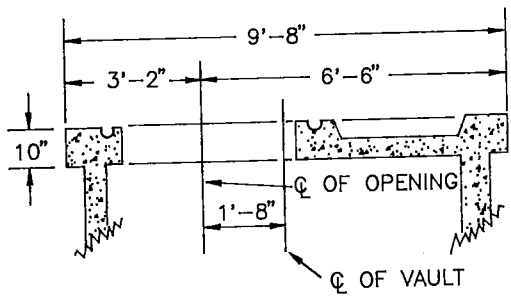
SDG&E ELECTRIC STANDARDS

DATE 1-1-93
APPD *JLB/RG*

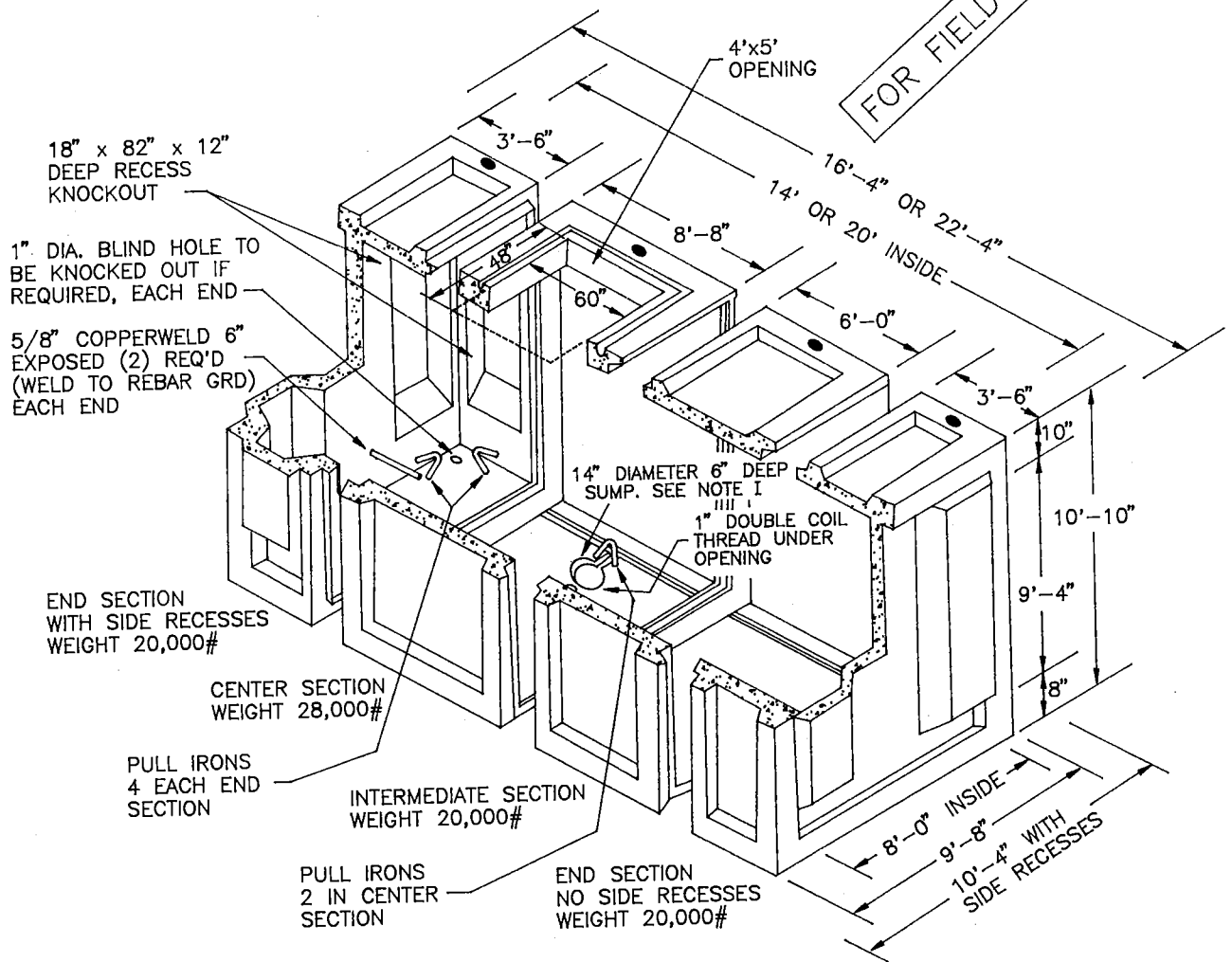
MANHOLE - 6' X 10' X 9'-4"
WITH 48" X 48" OPENING OFFSET IN TOP

3399.207

**3324 MANHOLE
TYPE 1**

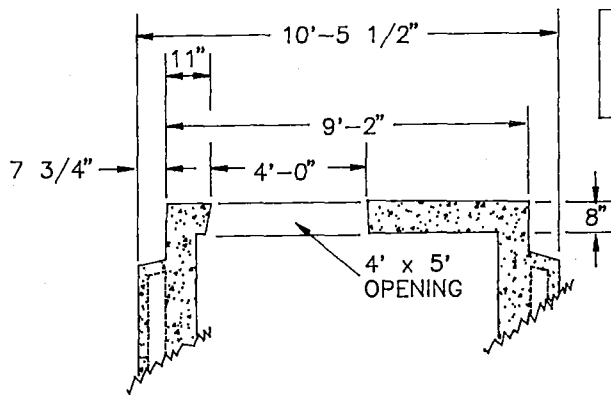


FOR FIELD MAINTENANCE ONLY

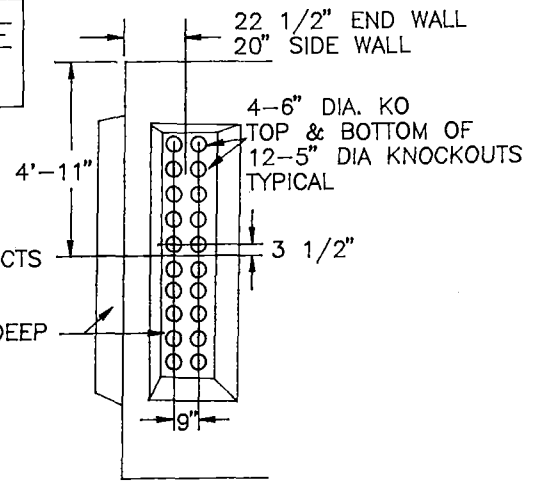


MANUFACTURER'S IDENTIFICATION PAINTED INSIDE CENTER SECTION ON SIDE.

| | | |
|--|--|-----------------|
| SDG&E ELECTRIC STANDARDS | | 3399.208 |
| DATE 1-1-96 APPD <i>[Signature]</i> | MANHOLE, 8' x 14' x 9'-4" OR 8' x 20' x 9'-4" | |

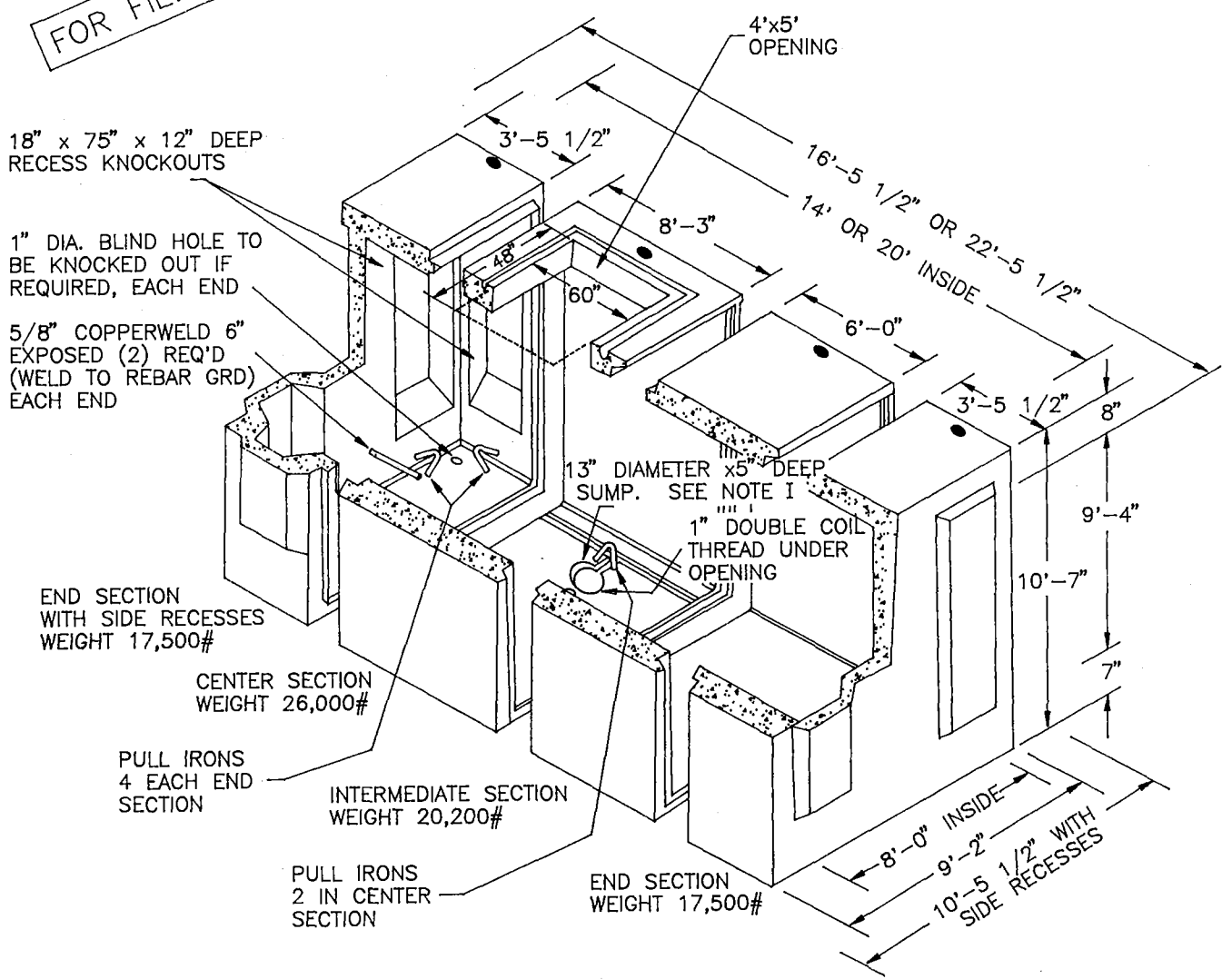


3324 MANHOLE
TYPE 2



OUTSIDE VIEW

FOR FIELD MAINTENANCE ONLY



MANUFACTURER'S IDENTIFICATION PAINTED INSIDE CENTER SECTION ON SIDE.

| | | |
|--|--|----------|
| SDG&E ELECTRIC STANDARDS | | |
| DATE 1-1-96 APPD <i>[Signature]</i> | MANHOLE, 8' x 14' x 9'-4" OR 8' x 14' x 9'-4" | 3399.209 |

| DESCRIPTION | STOCK NUMBER | ASSEMBLY UNITS | | MANHOLE SIZE | MACRO UNITS |
|------------------------------|--------------|----------------|-----------------------------|--------------|---------------------------|
| END SECTION W/SIDE RECESSES | 633672 | - | COMPLETE MANHOLES W/O GRADE | - | COMPLETE MANHOLES W/GRADE |
| 6' INTERMEDIATE SECTION | 336286 | 24MH06 | | | |
| 8' CENTER SECTION | 633668 | - | 24MH14 | 14 FEET | M24-14 |
| END SECTION NO SIDE RECESSES | 633676 | - | 24MH20 | 20 FEET | M24-20 |

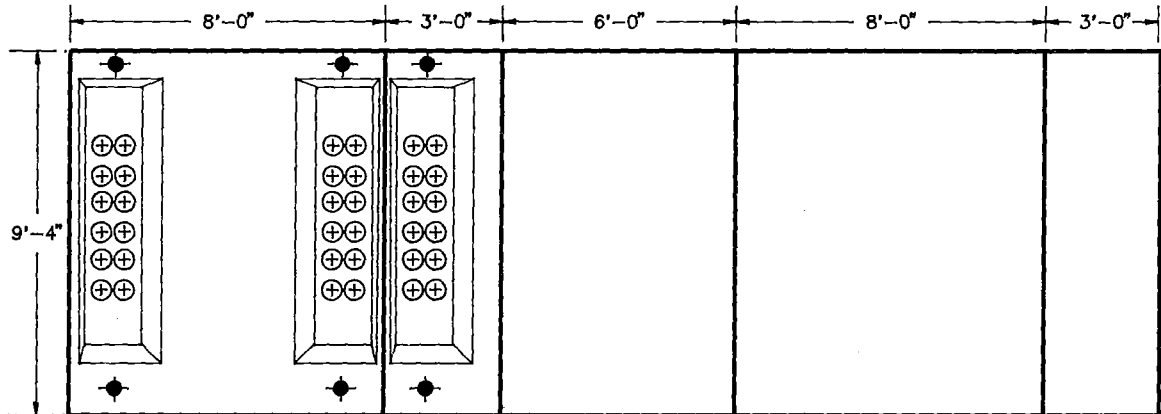
INSTALLATION:

- A. AN EXCAVATION, 11'-8" X 19'-0" X 13'-4" DEEP FOR 14' LONG MANHOLE WITH NO SIDE RECESSES OR 12'-4" X 19'-0" X 13'-4" DEEP FOR 14' LONG MANHOLE WITH SIDE RECESSES IS REQ'D. AN EXCAVATION 11'-8" X 25'-0" X 13'-4" DEEP FOR 20' LONG MANHOLE WITH NO SIDE RECESSES OR 12'-4" X 25'-0" X 13'-4" DEEP EXCAVATION TO BE 13'-4" MAXIMUM BELOW FINAL GRADE. PLACE 6" CRUSHED ROCK ON EXCAVATION BOTTOM WITH 1/2" SLOPE TO FLOW CHANNEL.
- B. USE MASTIC SEALING COMPOUND (STOCK NUMBER 631872) IN ALL SECTIONS (SEE STANDARD 3306). THEN TAKE UP ON TIGHTENING BOLTS. USE DOUBLE SEAL IF WATER IS A PROBLEM.
- C. FOR 48" X 60" MANHOLE NECK AND COVER, SEE STANDARD 3332.
- D. ON INITIAL CABLE INSTALLATION, OCCUPY LOWEST DUCT OPENINGS FIRST.
- F. THIS MANHOLE REQUIRES THE USE OF A 30 TON MINIMUM CRANE FOR LIFTING SECTIONS.
- G. USE #2 AWG BARE COPPER (STOCK NUMBER 812816) FOR GROUNDS WITH CLAMP (STOCK NUMBER 230016).
- H. ALL UNCOATED METAL EXCEPT REBAR TO BE HOT DIPPED GALVANIZED OR CADMIUM PLATED FOR CORROSION PROTECTION.
- I. LOCATE SUMP DIRECTLY UNDER CENTER OF OPENING.
- J. CREWS SHALL INSTALL QUIK BOLTS AS NECESSARY.
- K. WHEN INSTALLING CONDUIT, USE LOWER SET OF KNOCKOUTS FIRST.

FOR FIELD MAINTENANCE ONLY

REFERENCE:

(M) SEE STANDARD 3365 FOR SLURRY BACKFILL.



LEGEND:

- 1" INSERT (DOUBLE COIL)
- ⊕ 1" GROUND ROD KNOCKOUTS (IN BASE)
- ⊕ 5" DUCT TERMINATOR (CAST-IN)
- 8" TON RISS LIFTER (1 EACH SIDE IN EACH SECTION)

| SECTION DETAILS | | | | | |
|----------------------|------------|-------------------------------------|--------------|--------|--------------|
| SECTION | 1" INSERTS | MISC. | WEIGHT (LBS) | | RISS LIFTERS |
| | | | TYPE 1 | TYPE 2 | |
| END W/SIDE RECESS | 8 | (4) 12-5" DIA. DUCT TERM. (CAST-IN) | 20,000 | 17,500 | 2 |
| 6' INTERMEDIATE | - | - | 20,000 | 20,200 | 2 |
| 8' CENTER | 8 | SUMP, 48" X 60" OPENING | 28,000 | 26,000 | 2 |
| END NO SIDE RECESSES | 4 | (2) 12-5" DIA. DUCT TERM. (CAST-IN) | 20,000 | 17,500 | 2 |

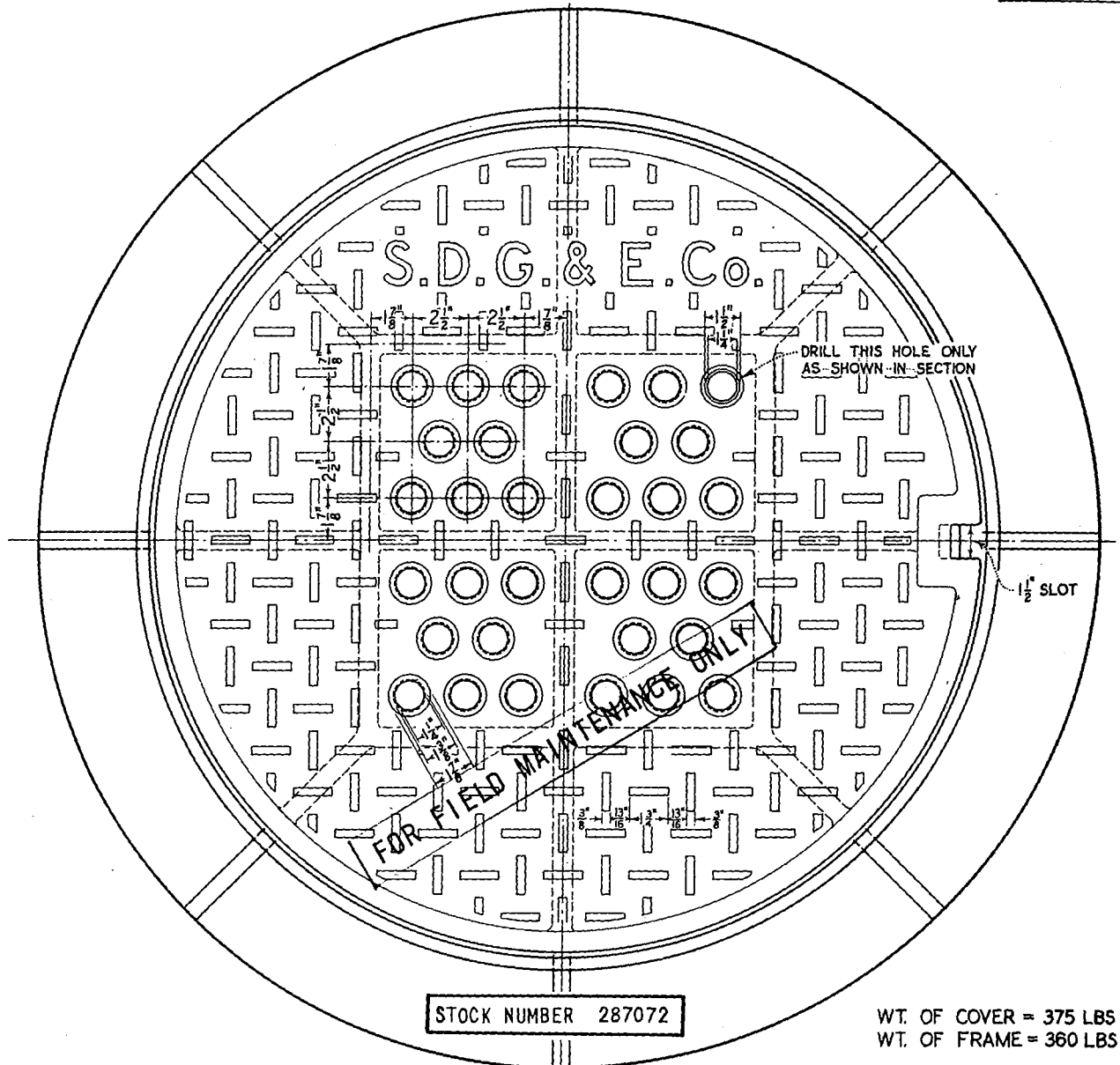
SDG&E ELECTRIC STANDARDS

DATE 1-1-96

APPD *[Signature]*

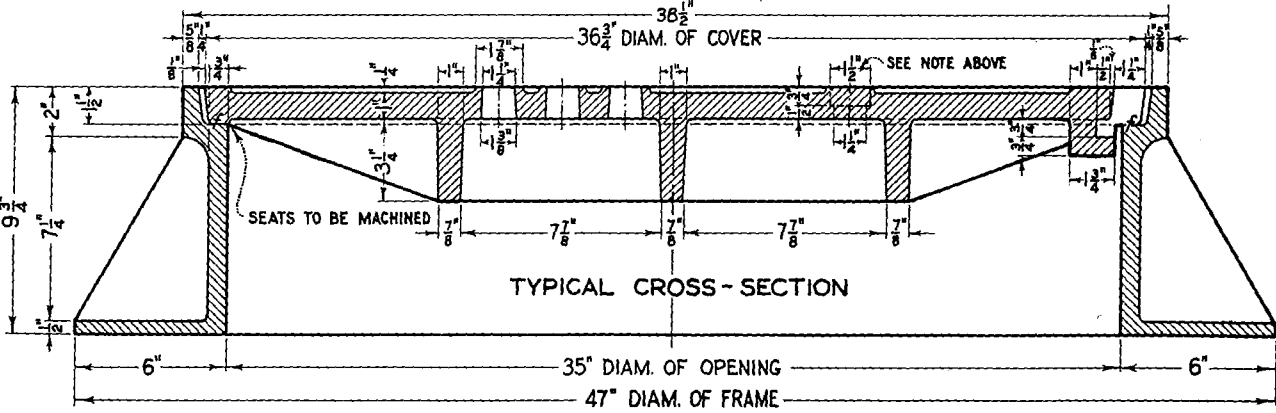
MANHOLE, 8' X 14' X 9'-4" OR
8' X 20' X 9'-4"

3399.210



STOCK NUMBER 287072

WT. OF COVER = 375 LBS
WT. OF FRAME = 360 LBS



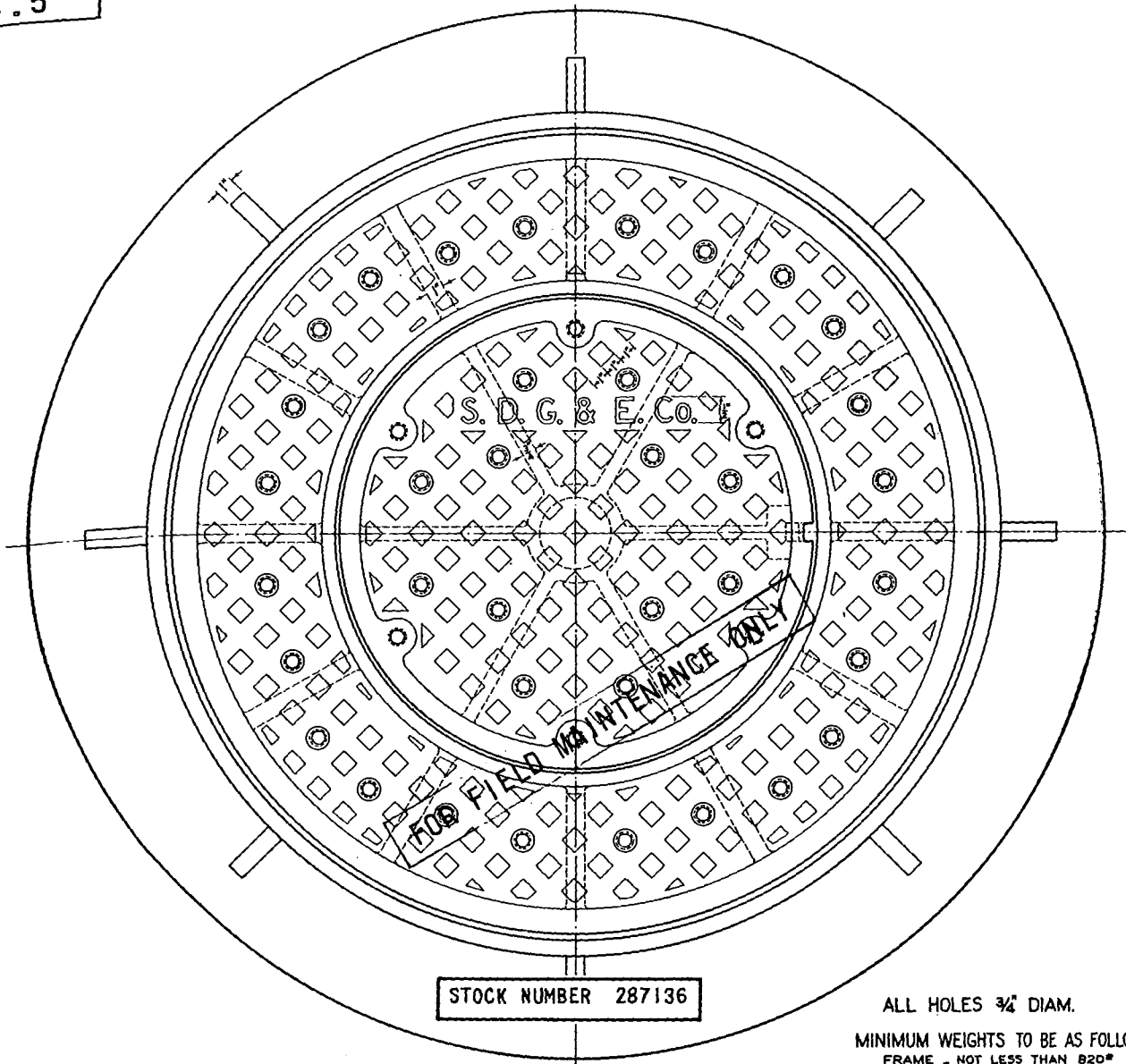
TYPICAL CROSS-SECTION

STOCK NUMBER 361856

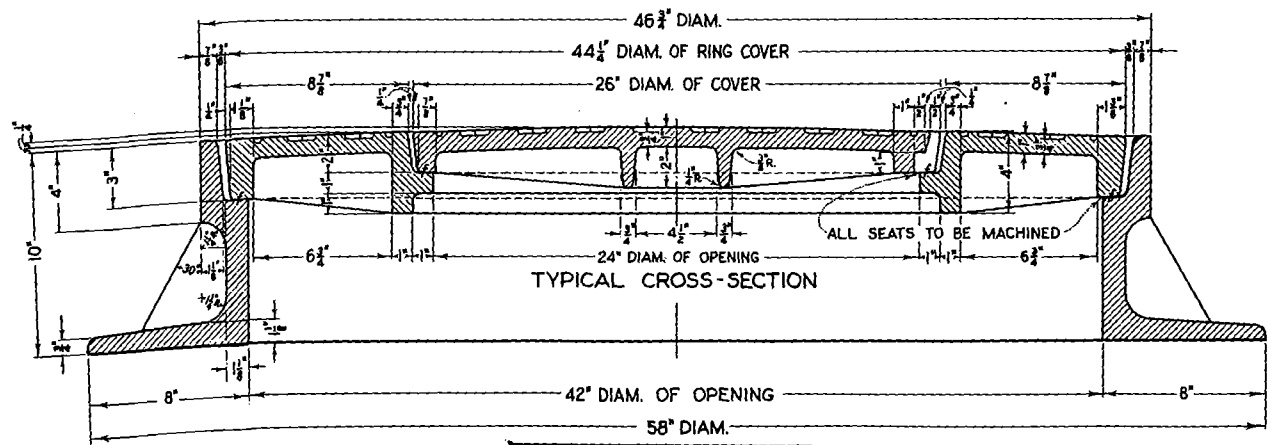
NOTE:

MATERIAL TO BE GRAY CAST IRON PER ASTM A-48, CLASS 40

| | | | |
|----------------------|--|--|---------|
| DATE 6-9-70 SDG&E | SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS | | 3399.30 |
| | 35 INCH MANHOLE FRAME & COVER TRAFFIC BEARING | | |



ALL HOLES $\frac{3}{4}$ " DIAM.
 MINIMUM WEIGHTS TO BE AS FOLLOWS:
 FRAME - NOT LESS THAN 820#
 RING COVER - NOT LESS THAN 485#
 COVER - NOT LESS THAN 160#



STOCK NUMBER 361888

NOTE:

MATERIAL TO BE GRAY CAST IRON PER ASTM A-48, CLASS 40

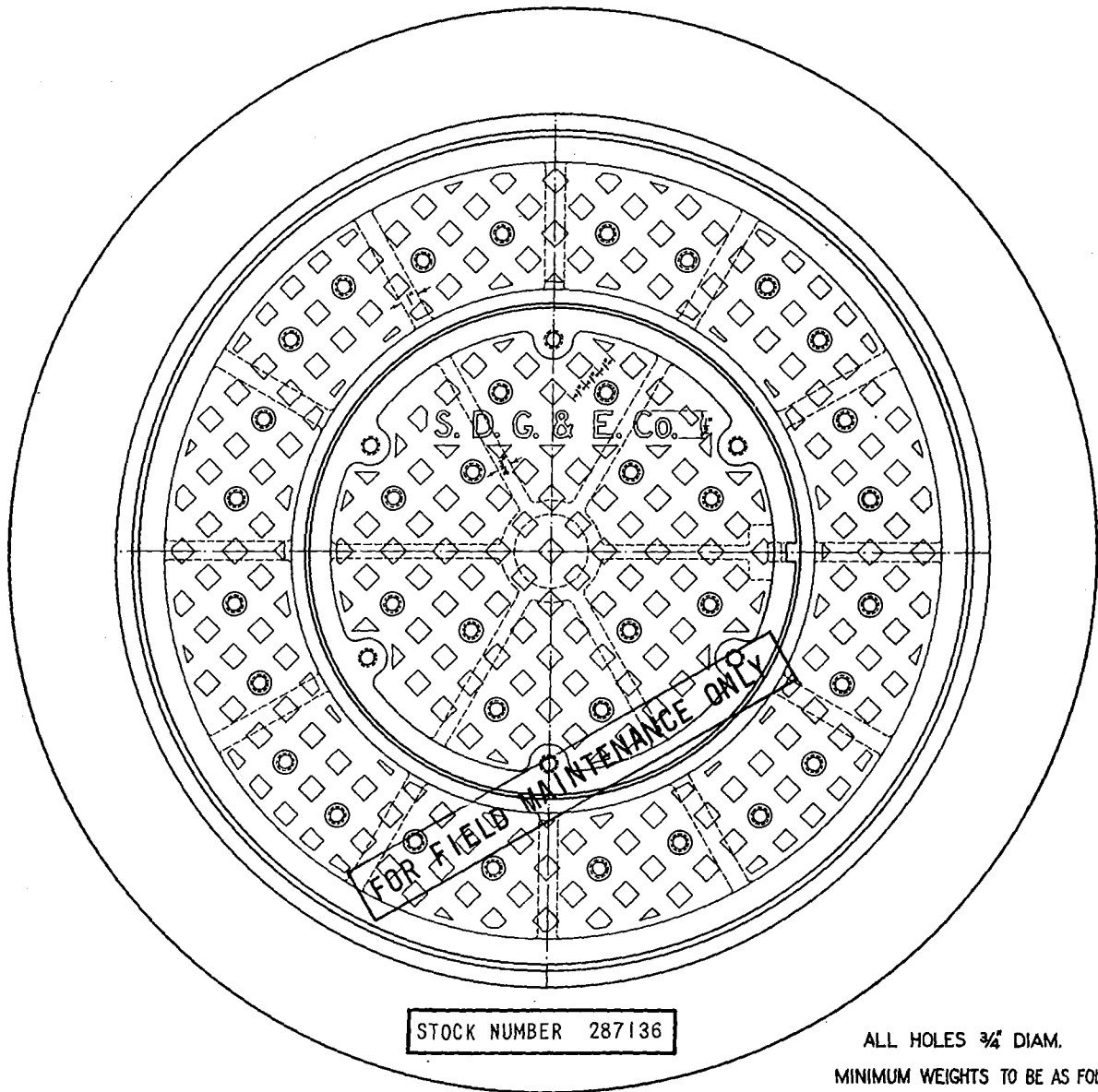
SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

42 INCH MANHOLE FRAME & COVER

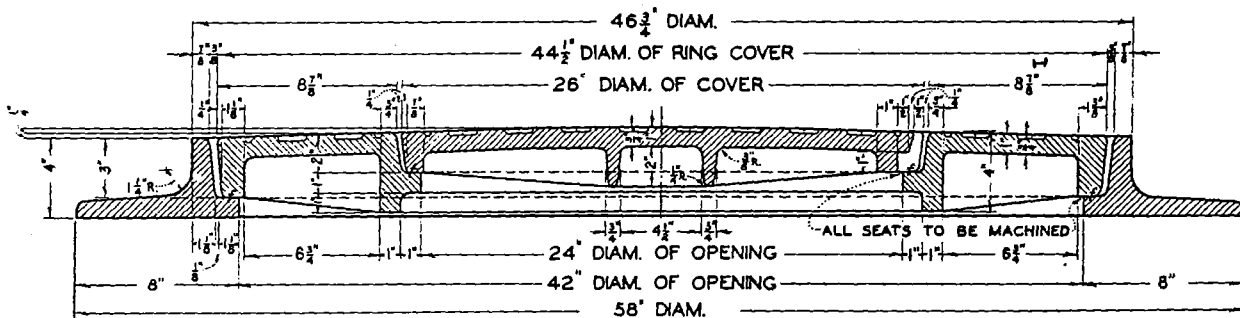
TRAFFIC BEARING

1399.302

DATE 6-9-70
SDG&E



ALL HOLES $\frac{3}{4}$ " DIAM.
 MINIMUM WEIGHTS TO BE AS FOLLOWS:
 RING COVER - NOT LESS THAN 485#
 COVER - NOT LESS THAN 160#



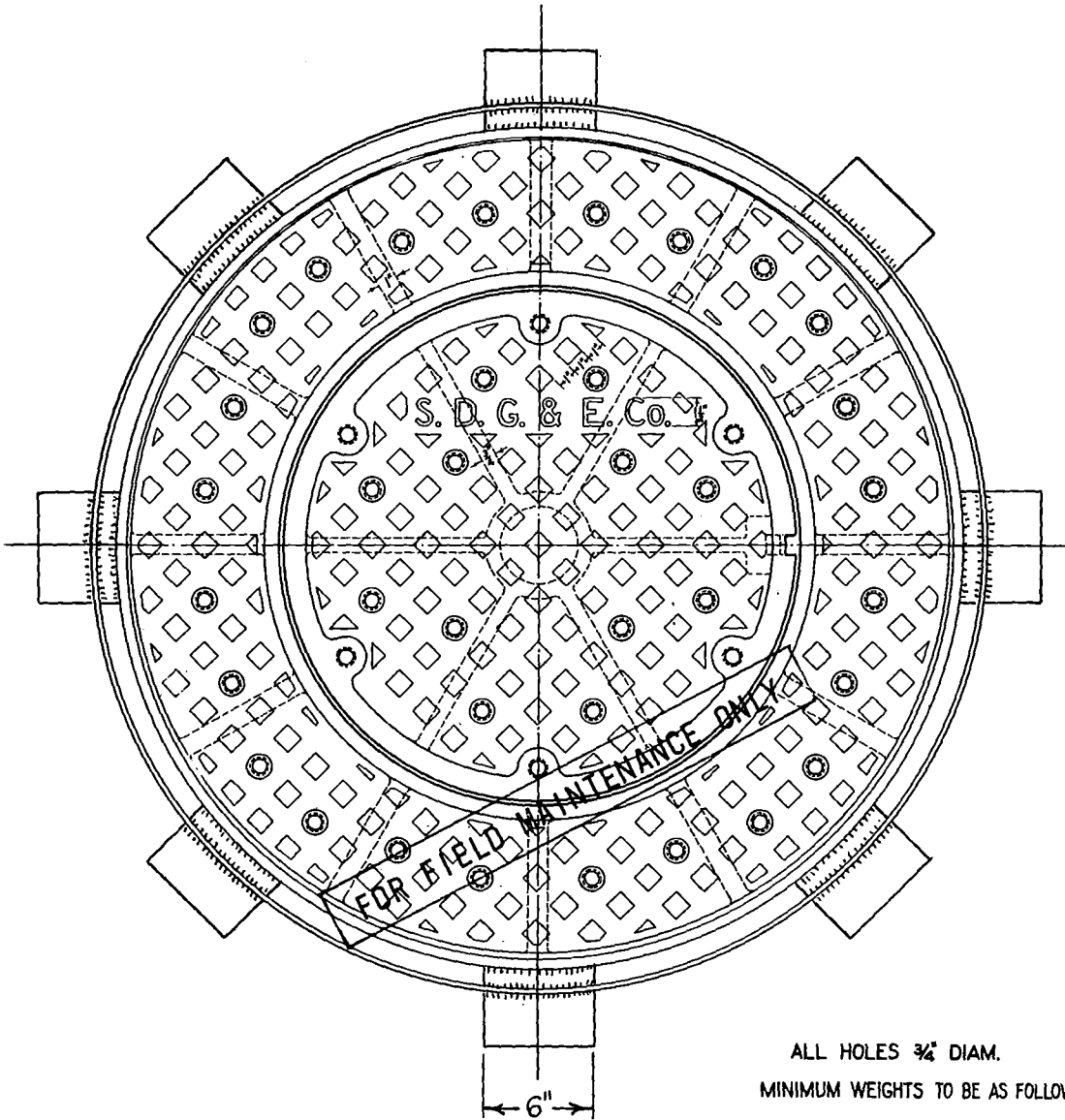
TYPICAL CROSS SECTION

STOCK NUMBER -

NOTE:

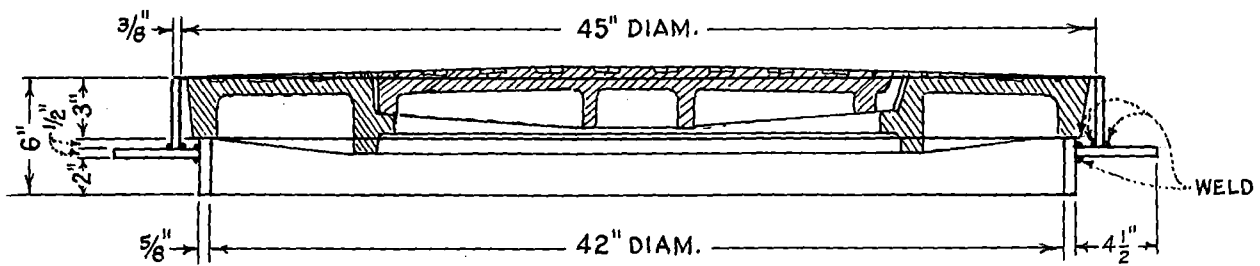
MATERIAL TO BE GRAY CAST IRON PER ASTM A-48, CLASS 40

| | | |
|----------------------|---|----------|
| DATE 6-9-70 SDG&E | SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS 42 INCH MANHOLE FRAME & COVER NON-TRAFFIC BEARING | 3399.303 |
|----------------------|---|----------|



STOCK NUMBER 287136

ALL HOLES $\frac{3}{4}$ " DIAM.
 MINIMUM WEIGHTS TO BE AS FOLLOWS:
 COVER - NOT LESS THAN 160#



TYPICAL CROSS-SECTION

STOCK NUMBER -

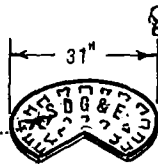
NOTE:

MATERIAL TO BE GRAY CAST IRON PER ASTM A-48, CLASS 40

INTER COVER

WEIGHT 235#
H-20 LOADING

1" MIN. BLOCK LETTERS

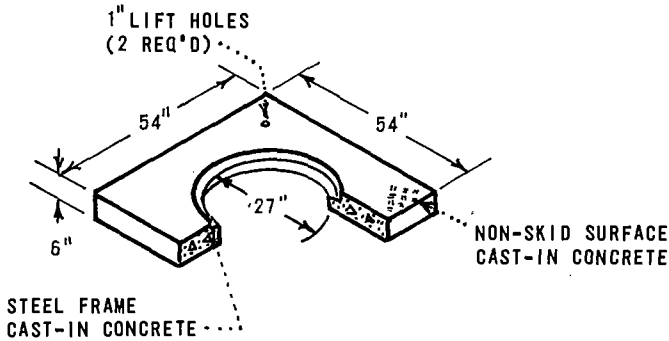


MAJOR USE: FOR ACCESS TO MANHOLES WHERE MAN AND EQUIPMENT ENTRY IS REQUIRED.

STAINLESS STEEL HEX HEAD BOLTS (4 REQ'D)

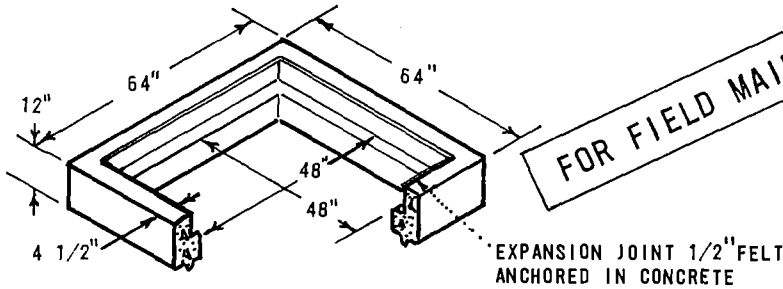
COVER

WEIGHT 1200#
H-20 LOADING



RING SECTION

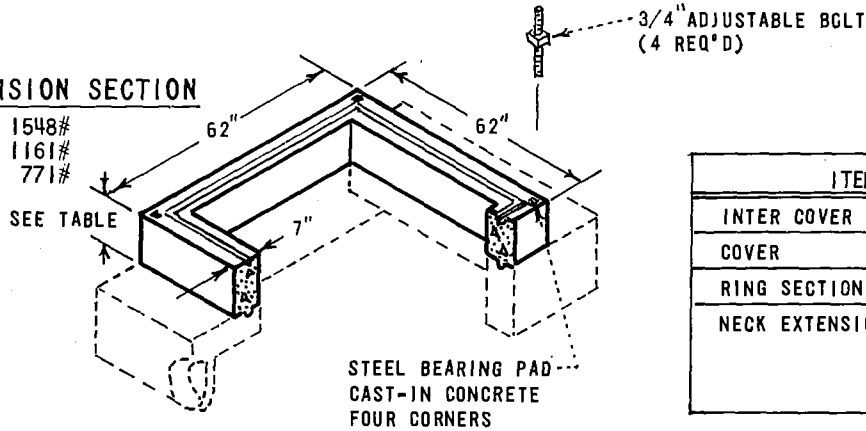
WEIGHT 1344#



FOR FIELD MAINTENANCE ONLY

NECK EXTENSION SECTION

WEIGHT 12" - 1548#
9" - 1161#
6" - 771#



| ITEM | STOCK NUMBER | |
|------------------------|--------------|--------|
| INTER COVER | 287056 | |
| COVER | 287108 | |
| RING SECTION | 597296 | |
| NECK EXTENSION SECTION | 12" | 493488 |
| | 9" | 493560 |
| | 6" | 493544 |

NOTES:

- A. THIS STANDARD REQUIRED WITH USE OF PG 3399.203, 3399.204, AND 3324.
- B. USE MASTIC SEAL (631872) BETWEEN ALL JOINTS, REFER TO PG 3306.
- C. REFER TO PG 3485 WHEN GRADE ADJUSTMENT IS REQUIRED.
- D. DEPTH OF MANHOLE ROOF BELOW GRADE: WITH

| | | |
|----------------------|-----------------------|-----------------------|
| 0" EXTENSION - 1'-2" | 6" EXTENSION - 1'-8" | 12" EXTENSION - 2'-2" |
| 3" EXTENSION - 1'-5" | 9" EXTENSION - 1'-11" | |

DATE 6-30-78
APPD TAF

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

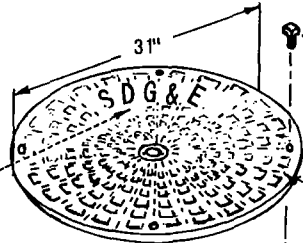
48" X 48" MANHOLE NECK AND COVER, TRAFFIC BEARING

3399.305

TRAFFIC COVER AND FRAME

WEIGHT 235#
H-20 LOADING

1" MIN BLOCK LETTERS



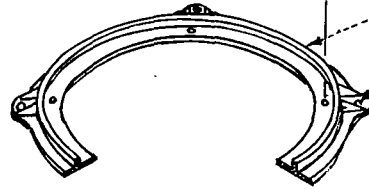
MAJOR USE: FOR ACCESS TO MANHOLES WHERE
MAN ENTRY ONLY IS REQUIRED

RECESSED STAINLESS STEEL HEX
HEAD BOLTS (4 REQ'D)

CAST IRON COVER

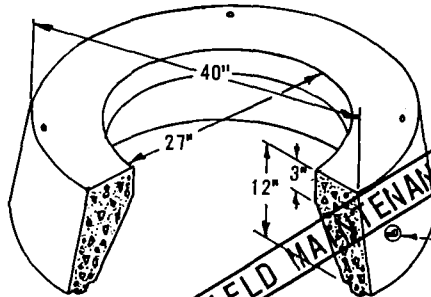
CAST IRON FRAME

1/2" ADJUSTABLE BOLT FOUR PLACES



NECK SECTION

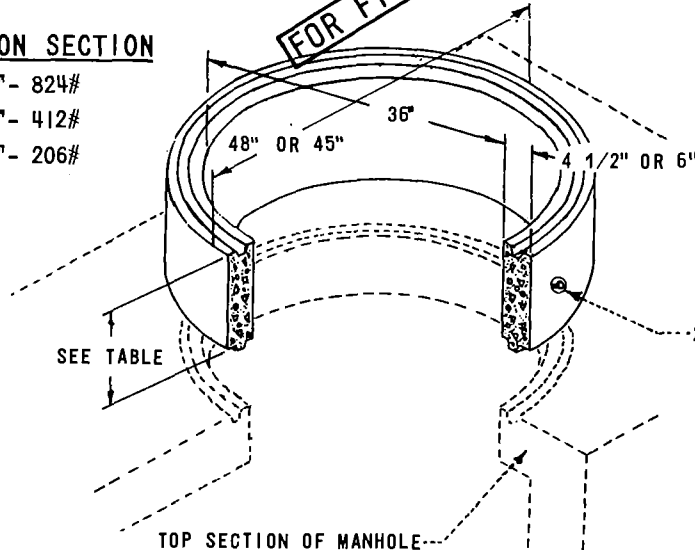
WEIGHT 750#



2 TON RISS LIFTERS (2 REQ'D)

NECK EXTENSION SECTION

MAX WEIGHT 12"- 824#
6"- 412#
3"- 206#



2 TON RISS LIFTERS (2 REQ'D)

TOP SECTION OF MANHOLE

| ITEM | STOCK NUMBER |
|------------------------|--------------|
| TRAFFIC COVER | 287056 |
| FRAME | 361920 |
| NECK SECTION | 493568 |
| NECK EXTENSION SECTION | 3" 493504 |
| | 6" 493536 |
| | 12" 493472 |

QUIKSET AND BROOKS NOT INTERCHANGEABLE

NOTES:

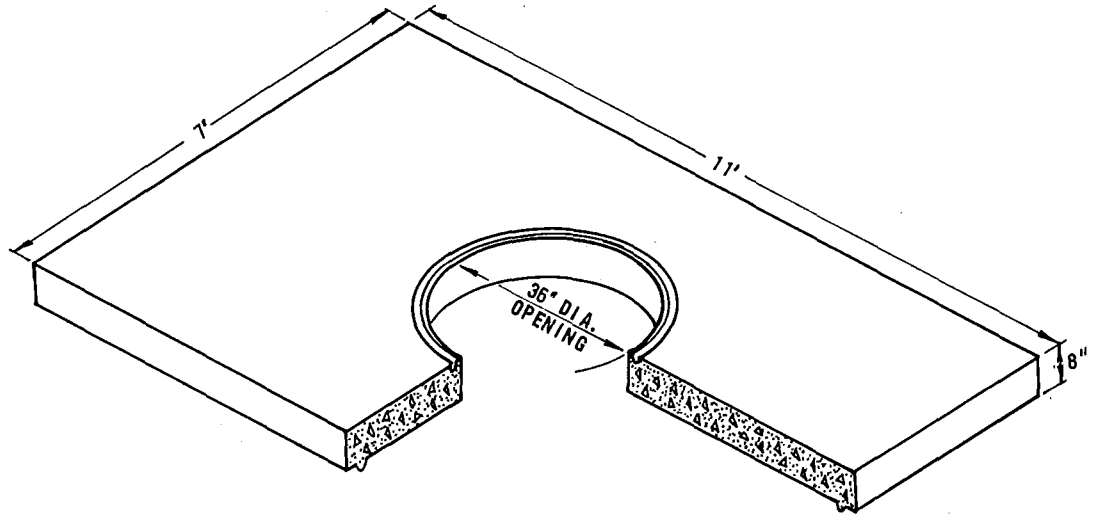
- A. THIS STANDARD MAY BE USED WITH PG 3399.205, 6' X 10' X 7' MANHOLE.
- B. USE MASTIC SEAL (631872) BETWEEN ALL JOINTS, REFER TO (PG 3306).
- C. REFER TO PG 3485 WHEN GRADE ADJUSTMENT IS REQUIRED.
- D. DEPTH OF MANHOLE ROOF BELOW GRADE: WITH
 0" EXTENSION 1' - 2" 6" EXTENSION 1' - 8"
 3" EXTENSION 1' - 5" 12" EXTENSION 2' - 2"
- E. WHEN GROUTING LEAVE CLEANOUT FOR BOLT HOLE.

3399.306

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS
 27" MANHOLE NECK AND COVER, TRAFFIC BEARING FOR 36" OPENING

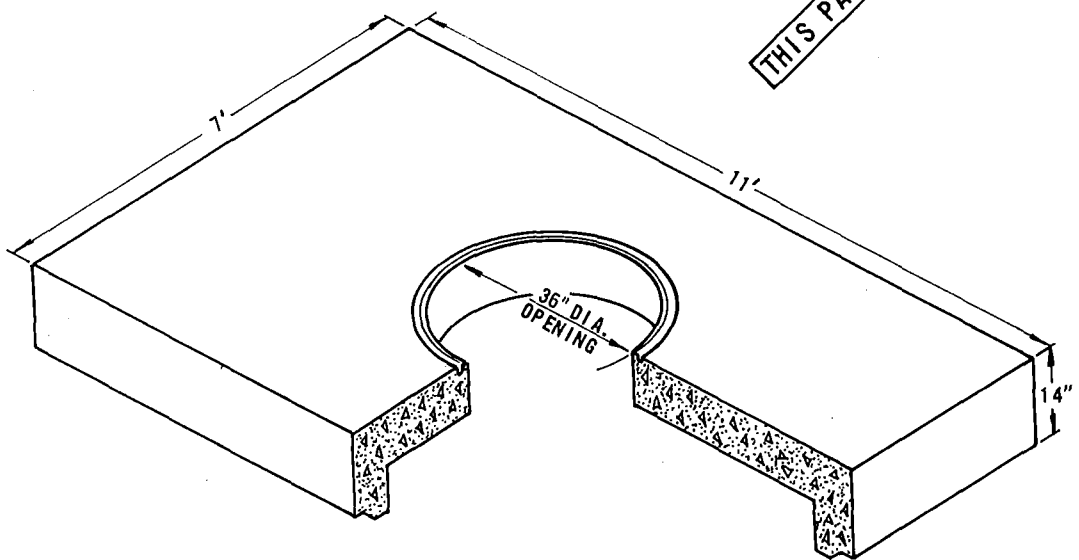
DATE 6-30-78
 APPD TAF

SCOPE : THIS STANDARD SHOWS THE OLD STYLE 36 INCH ROUND OPENING MANHOLE COVER FOR A 3322 MANHOLE.

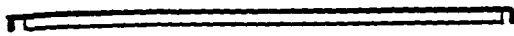


QUIKSET MANHOLE
STOCK NUMBER 633760

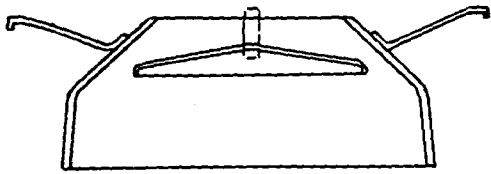
THIS PAGE FOR FIELD MAINTENANCE ONLY



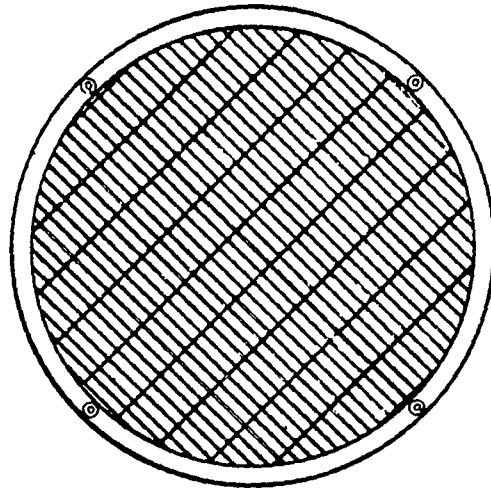
BROOKS MANHOLE
STOCK NUMBER 633760



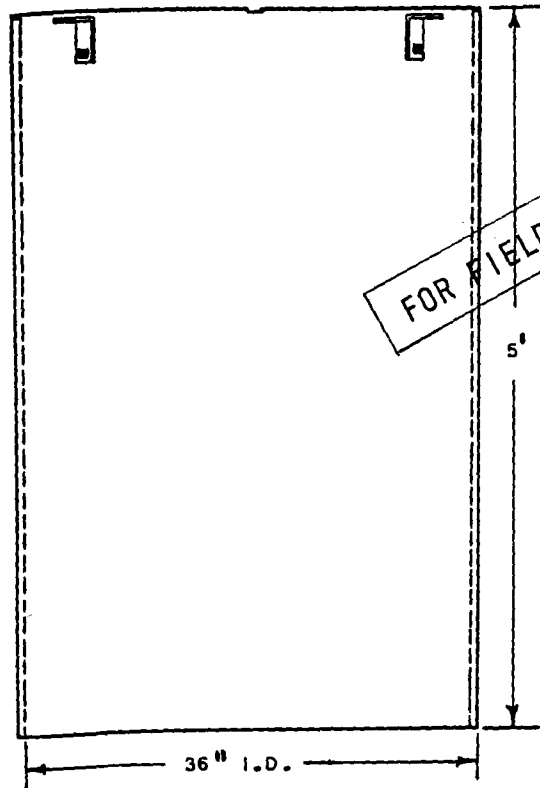
GRATE OR SOLID COVER



TRANSFORMER SHIELD

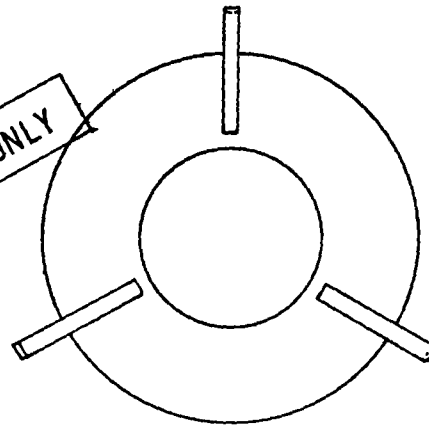


GRATING PLAN



BITUMINOUS FIBRE TUBE

FOR FIELD MAINTENANCE ONLY

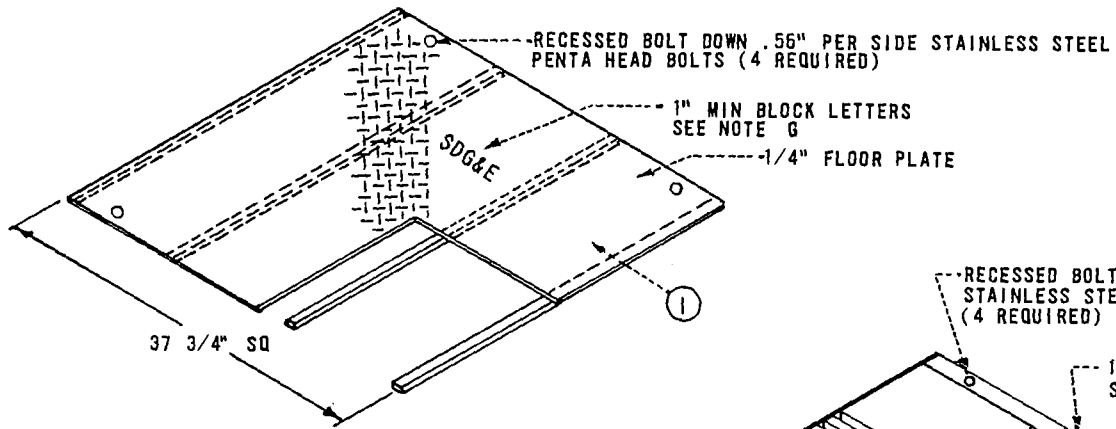


SHIELD PLAN

| STOCK NUMBERS | |
|-----------------------|--------|
| GRATE COVER | 390064 |
| SOLID COVER | 286968 |
| TRANSFORMER SHIELD | 643024 |
| BITUMINOUS FIBRE TUBE | 334384 |

NOTES:

- A. FOR INSTALLATION DETAILS SEE 3799.402, 3799.403, 3799.404, AND 4199.504.
- B. WHEN SOLID COVER IS USED, TRANSFORMER SHIELD IS NOT REQUIRED.
- C. ENCLOSURE NUMBERING SEE 3211.
- D. GRATE AND SOLID COVER TO HAVE ONE COAT DU-PONT NUMBER 67-800 PRIMER AND ONE COAT BLACK DU-PONT DULUX NUMBER RP25051 OR EQUAL.



PARKWAY OR TRAFFIC SWITCH COVER

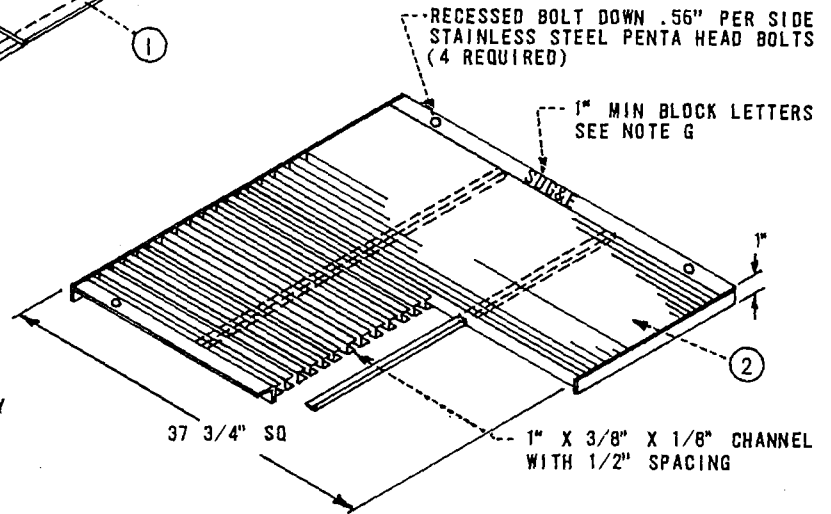
WEIGHT 88#
H-20 LOADING

MAY BE USED AS TRANSFORMER COVER WITH APPROVAL FROM DISTRIBUTION ENGINEER.

USE EPOXY COVER IN CONCRETE AREAS.

USE PAINTED COVERS IN NON-CONCRETE AREAS.

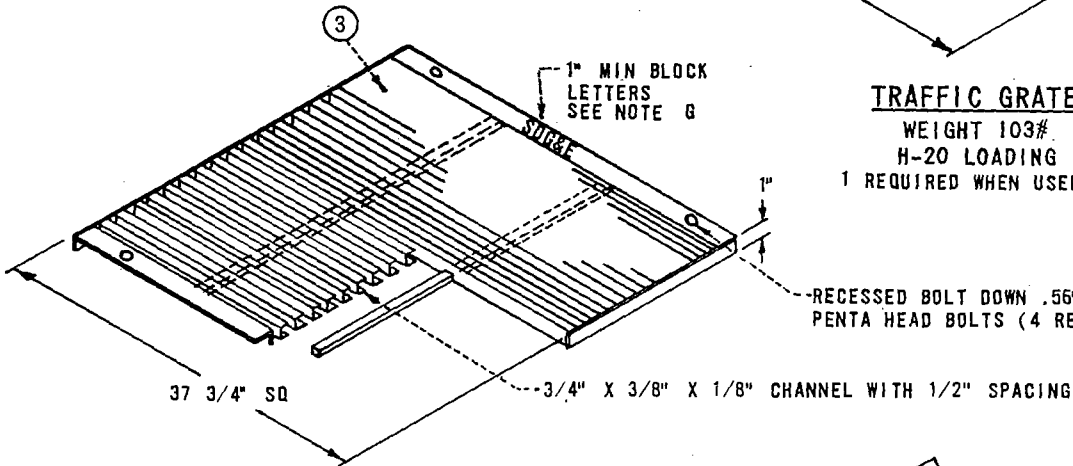
1 REQUIRED WHEN USED EITHER AS TRAFFIC OR PARKWAY SWITCH COVER.



TRAFFIC GRATE

WEIGHT 103#
H-20 LOADING

1 REQUIRED WHEN USED WITH TRAFFIC FRAME.



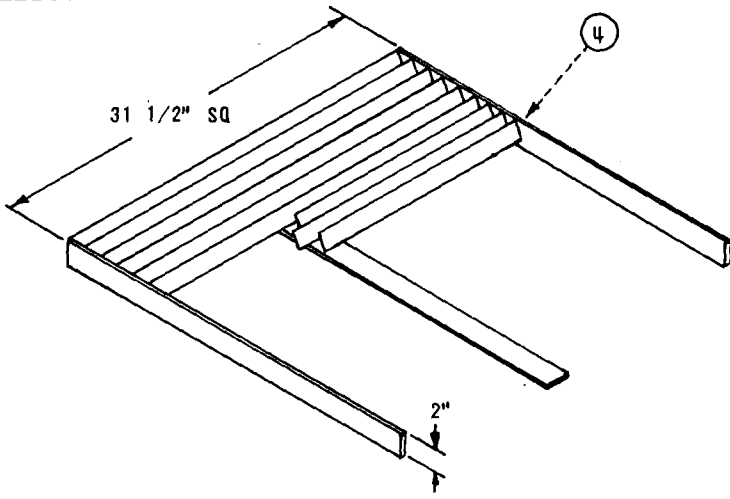
PARKWAY GRATE

WEIGHT 70#
250 PSF LOADING

1 REQUIRED WHEN USED WITH PARKWAY FRAME.

FOR FIELD MAINTENANCE ONLY

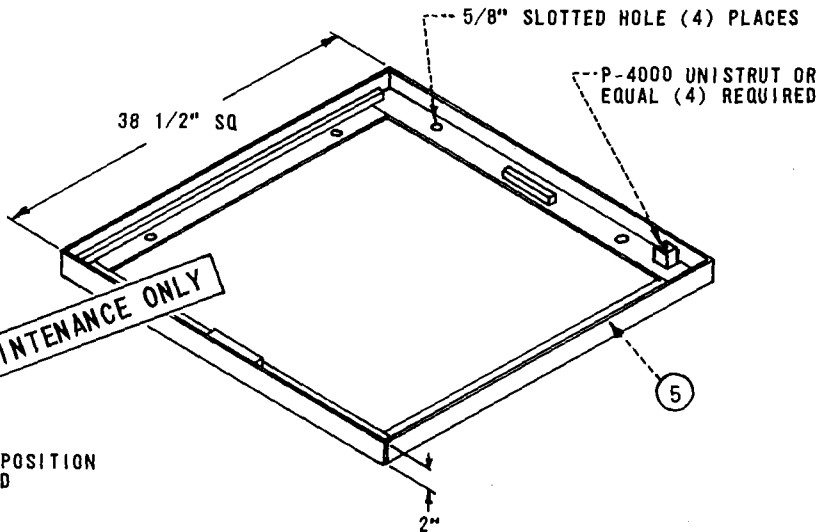
| ITEM | DESCRIPTION | STOCK NUMBER | ITEM | DESCRIPTION | STOCK NUMBER |
|------|---------------------------------|----------------|------|-------------|--------------|
| 1 | PARKWAY OR TRAFFIC SWITCH COVER | EPOXY 287730 | | | |
| | | PAINTED 287732 | | | |
| 2 | TRAFFIC GRATE | 390408 | | | |
| 3 | PARKWAY GRATE | 390344 | | | |



BAFFLE

WEIGHT 70#

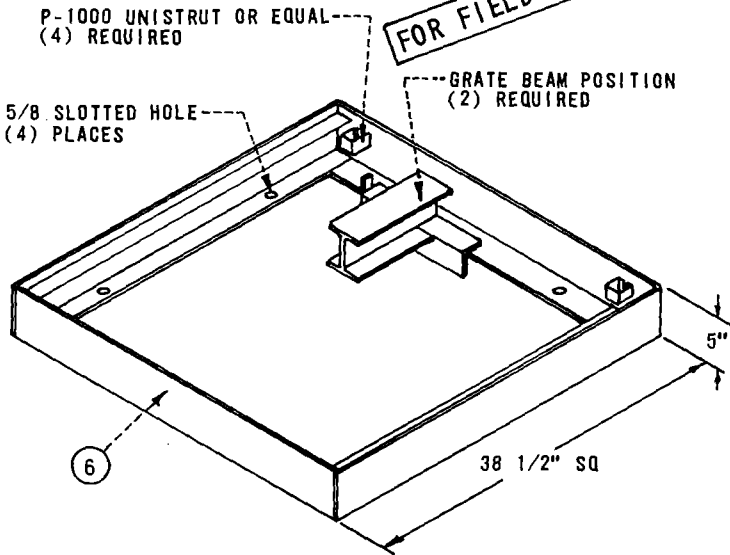
1 REQUIRED WHEN INSTALLATION TO HAVE GRATE TOP
(SEATS IN CONCRETE TOP CAP).



PARKWAY FRAME

WEIGHT 45#

1 REQUIRED WHEN IN PARKWAY AREAS.



TRAFFIC FRAME

WEIGHT 117#

1 REQUIRED WHEN SUBJECT TO VEHICULAR TRAFFIC
AND GRATE OR SOLID COVER IS TO BE USED.

| ITEM | DESCRIPTION | STOCK NUMBER | ITEM | DESCRIPTION | STOCK NUMBER |
|------|---------------|--------------|------|-------------|--------------|
| 4 | BAFFLE | 119264 | | | |
| 5 | PARKWAY FRAME | 362376 | | | |
| 6 | TRAFFIC FRAME | 362408 | | | |

SDG&E ELECTRIC STANDARDS

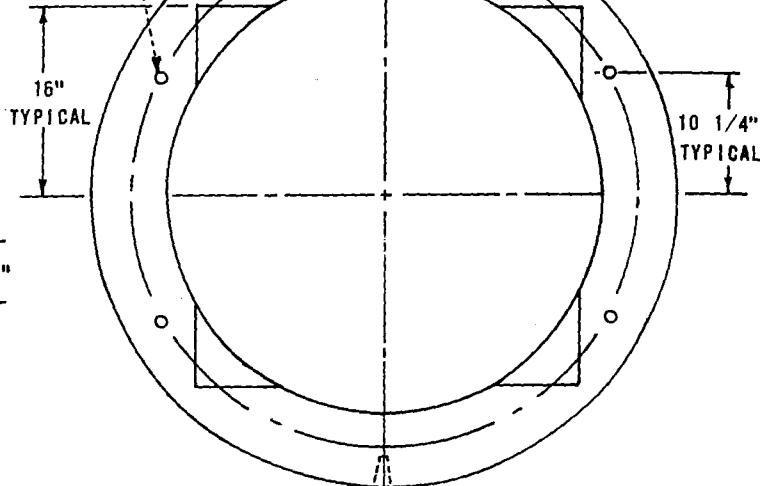
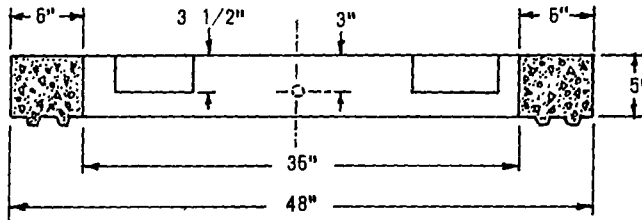
3399.403

SUBSURFACE EQUIPMENT ENCLOSURE

DATE 6-30-78
APPD TAF

2 TON RISS LIFTERS (2) REQUIRED

4- ADJUSTING SCREWS IN TOP CAP SHALL BE USED TO LEVEL UNIT TO GRADE. GROUT OPEN JOINTS

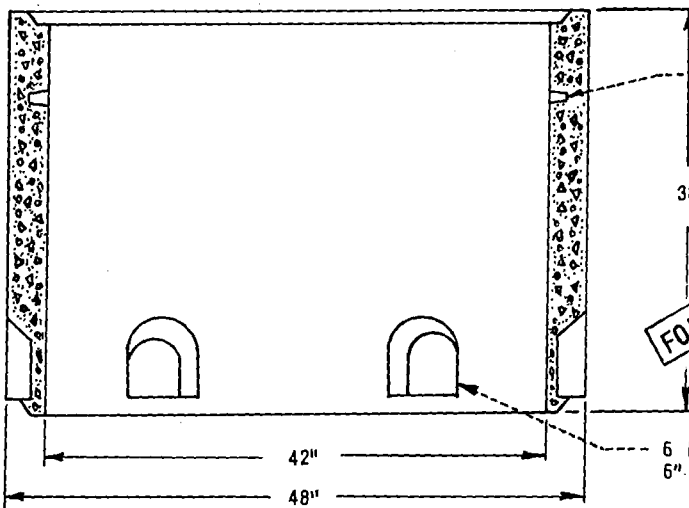


SHAFT

WEIGHT 180#

1 REQUIRED FOR EITHER TRANSFORMER OR SWITCH INSTALLATION

PLAN VIEW



FOR FIELD MAINTENANCE ONLY

6 KNOCKOUTS AT 60°
6" X 5"

TOP CAP

WEIGHT 1320#

2 REQUIRED FOR TRANSFORMER INSTALLATION.
1 REQUIRED FOR SWITCH INSTALLATION.

NOTES:

- A. FOR INSTALLATION DETAILS SEE PAGES 3799.401, 3799.402 AND 3799.403.
- B. CALIFORNIA GRID COORDINATES TO BE STENCILLED TO FLAT SURFACE OF TOP CAP AT TIME OF INSTALLATION PER CONSTRUCTION ORDER.
- C. STATION NUMBER TO BE STENCILLED TO FLAT SURFACE OF THE TOP CAP AT TIME OF INSTALLATION SEE PAGE 3212.
- D. USE MASTIC SEAL (631872) BETWEEN JOINTS SEE PAGE 3306.
- E. PARKWAY FRAME (362376) AND TRAFFIC FRAME (362408) WILL BE DELIVERED ATTACHED TO TOP CAP (206228).
- F. SWITCH COVER, TRAFFIC AND PARKWAY GRATES TO HAVE ONE COAT DU-PONT PRIMER NUMBER 67/800 AND ONE COAT DU-PONT DULUX RP 25051 OR EQUAL.
- G. 'SDG&E' TO BE ARC WELDED OR EQUIVALENT.
- H. ALL METAL TO BE HOT DIPPED GALVANIZED OR CADMIUM PLATED FOR CORROSION PROTECTION.

| ITEM | DESCRIPTION | STOCK NUMBER | ITEM | DESCRIPTION | STOCK NUMBER |
|------|-------------|--------------|------|-------------|--------------|
| 7 | TOP CAP | 206228 | | | |
| 8 | SHAFT | 334358 | | | |

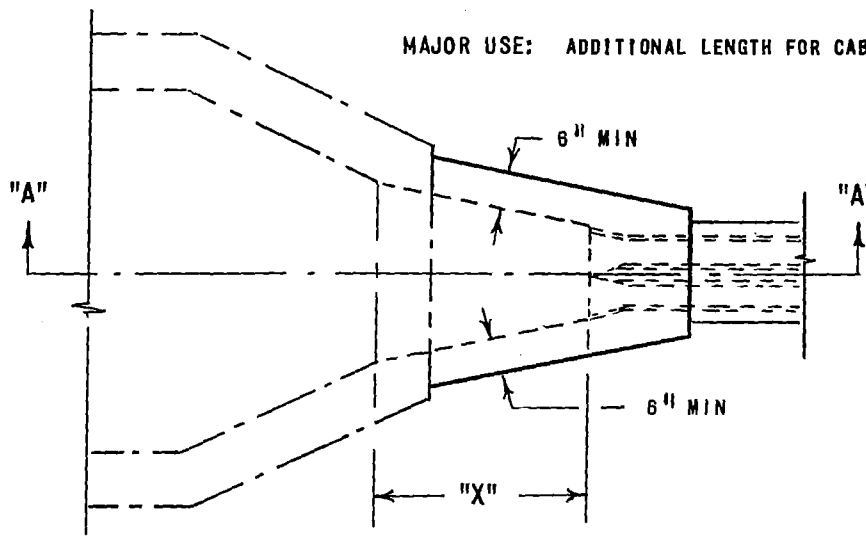
SDG&E ELECTRIC STANDARDS

DATE 6-30-78
APPD TAF

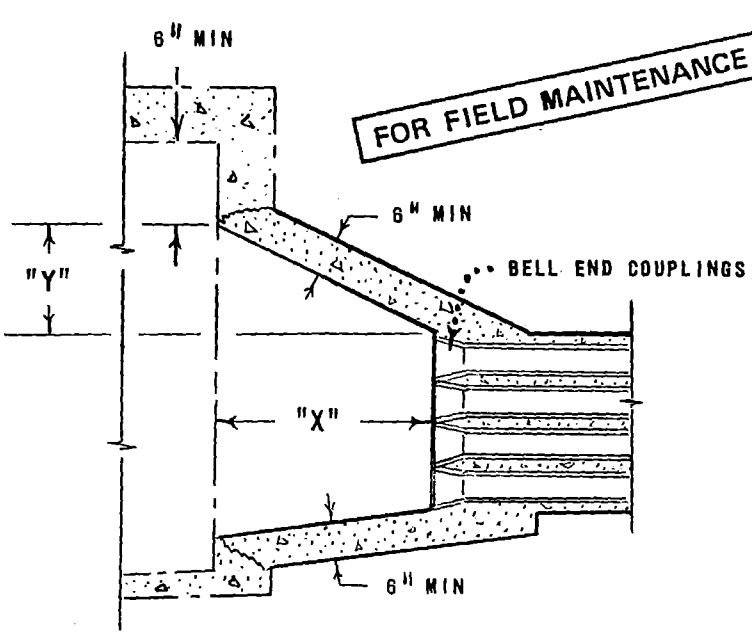
SUBSURFACE EQUIPMENT ENCLOSURE

3399.404

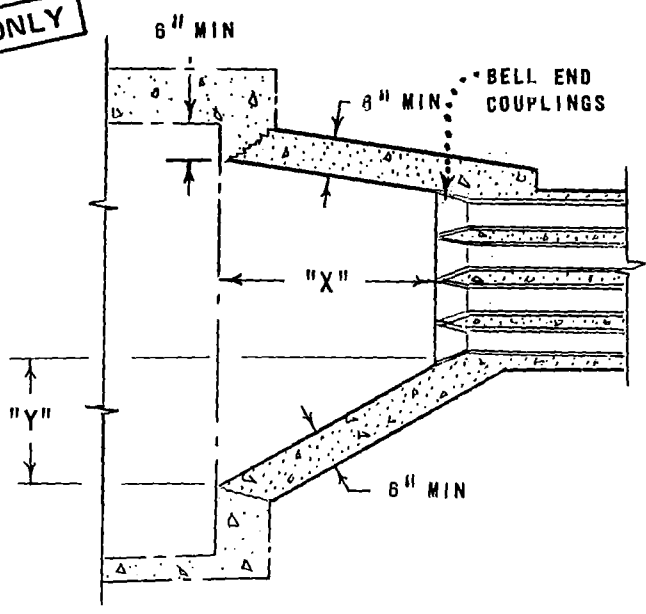
MAJOR USE: ADDITIONAL LENGTH FOR CABLE TRAINING.



PLAN VIEW



SECTION "A" - "A"
LOW DUCT ENTRY



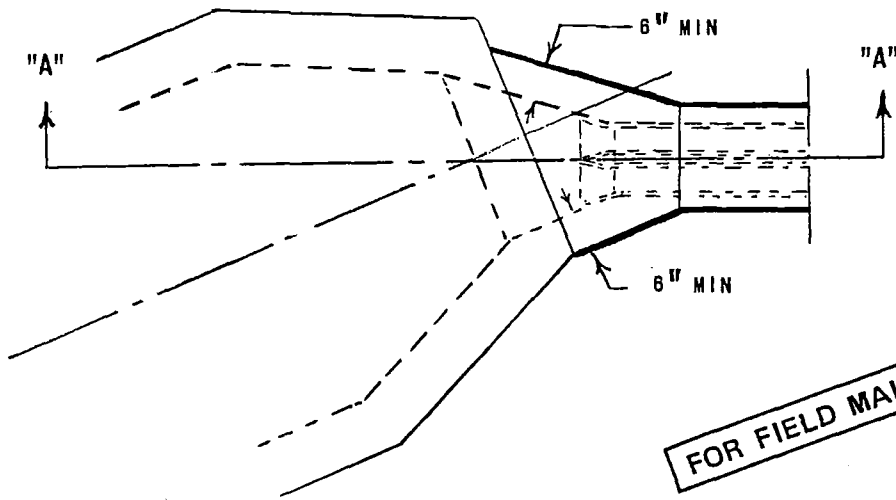
SECTION "A" - "A"
HIGH DUCT ENTRY

| DIFFERENCE IN ELEVATION (FT) | DIMENSION "X" | DIMENSION "Y" | CONCRETE REQUIRED (CUBIC YARDS) |
|------------------------------|---------------|---------------|---------------------------------|
| 2 TO 3 | 30" | 14" | 1 |
| 3 TO 4 | 36" | 18" | 1 1/4 |
| 4 & UP | 42" | 21" | 1 1/2 |

NOTES:

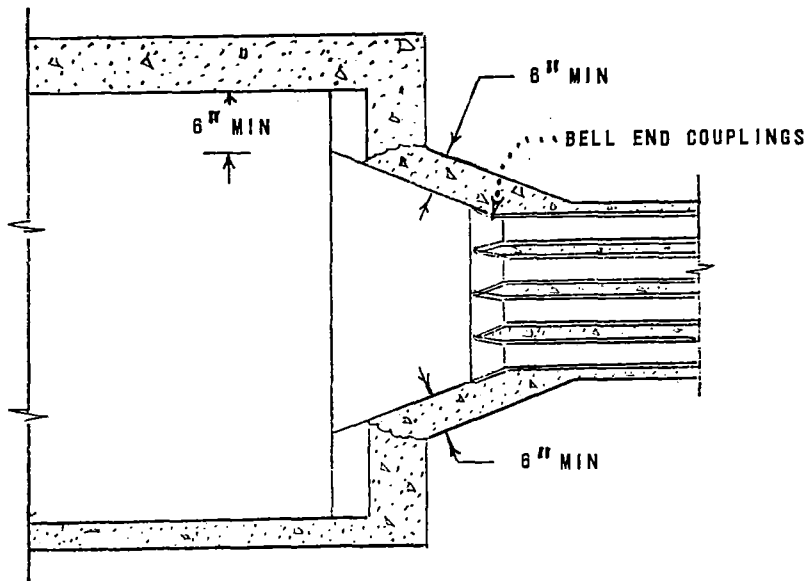
- A. WHERE THE DIFFERENCE IN DUCT ELEVATION ENTERING AND LEAVING THE MANHOLE IS IN EXCESS OF TWO FEET, MEASURED FROM THE CENTER OF EITHER THE TOP OR BOTTOM DUCTS ON BOTH ENDS OF THE MANHOLE, THE MANHOLE SHALL BE ELONGATED AS TABLE ABOVE.
- B. USE RECESSES WITH MANHOLES WHEN REQUIRED.
- C. BAYS (WHEN REQUIRED) TO BE FORMED IN FIELD.
- D. CONCRETE TO BE CLASS 'A', 5 1/2 SACK MIX.

MAJOR USE: ADDITIONAL LENGTH FOR ANGLE CABLE TRAINING



PLAN VIEW

FOR FIELD MAINTENANCE ONLY



SECTION "A" - "A"
LOW OR HIGH DUCT ENTRY

NOTES:

- A. USE ANGLE RECESSES WITH MANHOLES WHEN REQUIRED.
- B. ANGLE RECESSES (WHEN REQUIRED) TO BE FORMED IN FIELD.
- C. CONCRETE TO BE CLASS "A", 5 1/2 SACK MIX.
- D. ELEVATION OF ANGLE RECESS IS VARIABLE.

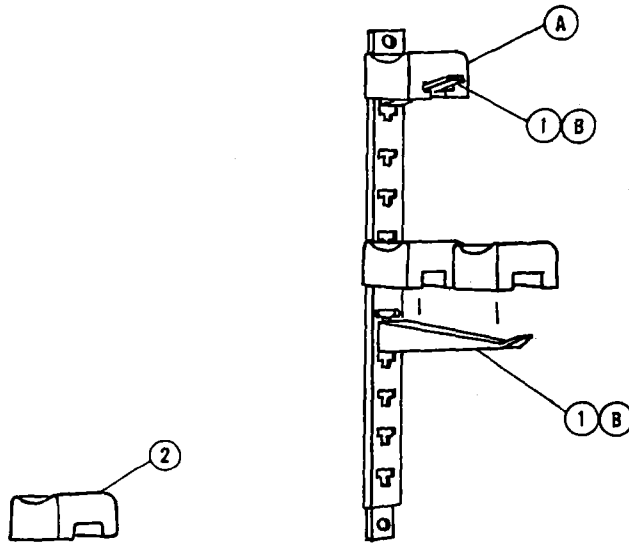
SDG&E ELECTRIC STANDARDS

DATE 7-22-77
APPD TAF

MANHOLE ANGLE RECESSES
CONSTRUCTION

3399.502

SCOPE: CABLE RACKS ARE USED TO SUPPORT SECONDARY AND PRIMARY CABLE IN SUBSTRUCTURES.
THIS PAGE IS FOR FIELD MAINTENANCE ONLY.



FOR FIELD MAINTENANCE ONLY

INSTALLATION:

- (A) REPLACE CABLE INSULATOR AS NEEDED.
- (B) WHEN REPLACEMENT OF LIGHT DUTY ARM IS REQUIRED REFER TO ITEM 4 UG STDS. 4178.

| ITEM | DESCRIPTION | LENGTH | NUMBER OF HOLES | EXTENSION FROM FACE OF RACK | NUMBER OF INSULATORS | LENGTH ALONG ARM | RADIUS | STOCK NUMBER |
|------|------------------|--------|-----------------|-----------------------------|----------------------|------------------|--------|--------------|
| 1 | ARMS, LIGHT DUTY | - | - | 4" | 1 | - | - | 415392 |
| | | - | - | 7 1/2" | 2 | - | - | 415424 |
| | | - | - | 10" | 3 | - | - | 415456 |
| | | - | - | - | - | - | - | - |
| 2 | CABLE INSULATOR | - | - | - | - | - | - | 430624 |

| | | | | |
|--------------|------------|--------------------------|--|-----------------|
| DATE 2-13-81 | | SDG&E ELECTRIC STANDARDS | | 3399.601 |
| APPD | <i>JEM</i> | CABLE RACKS | | |

SCOPE: THIS STANDARD LISTS THE MINIMUM CONDUIT SIZE REQUIRED FOR THE INSTALLATION OF PRIMARY AND SECONDARY CABLES.

NOTES:

- IF FUTURE LOAD GROWTH REQUIRES LARGER CABLE THAN INITIAL REQUIREMENTS, SIZE CONDUIT FOR FUTURE NEEDS. SERVICE PLANNING SUPERVISOR'S APPROVAL IS REQUIRED.

CONDUIT SIZING CHARTS

FOR FIELD MAINTENANCE ONLY

| PRIMARY | | | | |
|------------------|--------------------------------|-------------------------------|--------|-------------------|
| CABLE TYPE | CONDUCTOR SIZE AWG OR KCMIL | MINIMUM CONDUIT SIZE (INCHES) | | |
| | | 1/C | 2-1/C | 3-1/C OR PARALLEL |
| PECN | 2 CU | 2" | 3" (B) | 3" (D) |
| PECN | 2 SOL AL | 2" | 3" (C) | 3" (D) |
| PECN | 2/0 AL | -- | -- | 3" (A) |
| PECN | 4/0 CU | -- | -- | 5" (A) (F) |
| PECN OR PECN-PEJ | 500 CU | -- | -- | 5" (A) (F) |
| XLPECN | 750 AL | -- | -- | 5" (A) |
| XLPECN | 1000 AL | -- | -- | 5" (A) |

INSTALLATION:

- (A) 2/0 THROUGH 1000 KCMIL PRIMARY CABLES ARE ONLY PURCHASED IN TRIPLEXED CONFIGURATION.
- (B) 2-1/C #2 CU PECN CABLES MAY BE PARALLELED IN A 3 INCH CONDUIT FOR SINGLE-PHASE, 12 KV LOAD.
- (C) 2-1/C #2 SOL PECN CABLES MAY BE PARALLELED IN A 3 INCH CONDUIT FOR SINGLE-PHASE, 12 KV LOAD.
- (D) 3-1/C CABLES MAY BE PARALLELED IN A 3 INCH CONDUIT FOR THREE-PHASE LOAD.
- (F) MAY BE INSTALLED IN EXISTING 4 INCH CONDUITS.

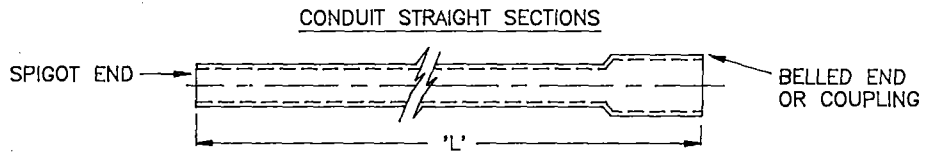
3399.701
SUPERCEDES 3372.1
& .2 (12-21-81)

SDG&E ELECTRIC STANDARDS

CONDUIT SIZING FOR UNDERGROUND CABLES

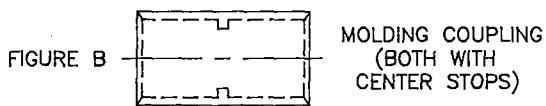
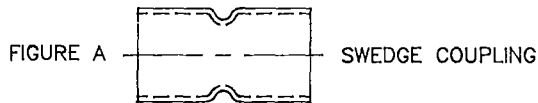
DATE 1-1-86
APPD JJB/RD

SCOPE: THIS STANDARD SHOWS 6" CONDUIT/CONDUIT FITTINGS AND CONDUIT SPACERS.



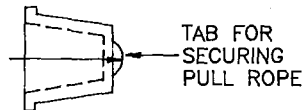
| CONDUIT SIZE | TYPE | LENGTH 'L' | STOCK NUMBER | ASSEMBLY UNITS | | |
|--------------|------|------------|--------------|-----------------|---------|----------|
| | | | | CONCRETE ENCASE | PRIMARY | SEC/SERV |
| * 6" | EB | 20' | 249930 | 2EB6IN | -- | -- |

| * NOMINAL CONDUIT SIZE | DEGREE OF CURVATURE | RADIUS OF CURVATURE | TYPE OF CONDUIT | STOCK NUMBER | ASSEMBLY UNITS | | |
|------------------------|---------------------|---------------------|-----------------|--------------|-----------------|---------|----------|
| | | | | | CONCRETE ENCASE | PRIMARY | SEC/SERV |
| 6" | 22-1/2° | 25'-0" | DB | 321872 | 1EB6-S | -- | -- |
| | 45° | 48" | DB | 322160 | 1EB6-8 | -- | -- |
| | 90° | 48" | DB | 322162 | 1EB6-B | -- | -- |



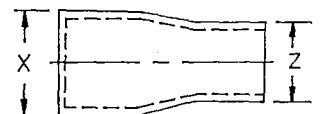
| FIGURES A & B | |
|-----------------------|-----------------------|
| COUPLING CONDUIT SIZE | DB OR EB STOCK NUMBER |
| 6" | 280070 |

CONDUIT PLUG



| CONDUIT SIZE | STOCK NUMBER | ASSEMBLY UNIT |
|--------------|--------------|---------------|
| 6" | 544816 | PLUG-6 |

CONDUIT BELL REDUCER

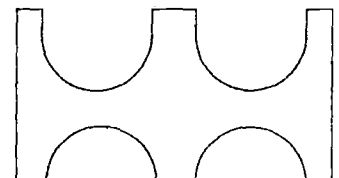


| CONDUIT SIZE X TO Z | STOCK NUMBER | ASSEMBLY UNIT |
|---------------------|--------------|---------------|
| 6"-5" | 573388 | RED6-5 |

FOR FIELD MAINTENANCE ONLY

| CONDUIT SIZE | DESCRIPTION | QUANTITY | STOCK NUMBER |
|--------------|---------------------|----------|--------------|
| 6" | INTERMEDIATE SPACER | AS REQ'D | 663526 |

INTERMEDIATE SPACER



| | | |
|---------------------|---|----------|
| DATE 1-1-96 APPD | SDG&E ELECTRIC STANDARDS | 3399.702 |
| | 6" CONDUIT/CONDUIT FITTINGS AND CONDUIT SPACERS | |

SCOPE: THIS STANDARD (3378.1 TO 3378.6) SHOWS THE INSTALLATION OF CONDUITS IN CLOSED CELL BRIDGE CONSTRUCTION.

INSTALLATION:

- (A) THE CONDUIT SPACERS SHALL BE SECURELY STRAPPED TO THE CONDUIT SPACER SUPPORT (ITEM 1 THRU 7) WITH #14 GALVANIZED WIRE (ITEM 8), FOR EIGHT CONDUITS. WHEN 6 OR LESS CONDUIT RUNS ARE INSTALLED, EXTRA ROD LENGTH MAY BE CUT OR FOLDED OVER TOP OF CONDUITS TOWARD EACH OTHER INSTEAD OF USING THE GALVANIZED WIRE.
- (B) THE FIRST SLIDING SUPPORT INSIDE THE CELL MUST BE PLACED 6" (152) FROM FACE OF EACH END DIAPHRAGM. THE FIRST THREE SLIDING SUPPORTS (ITEM 3) SHALL BE SPACED AT 6 FEET (152) AND FOLLOWED BY TWO FIXED SUPPORTS (ITEM 1) SPACED AT 2 FEET (610). THE REST OF THE SUPPORTS (ITEM 1) SHALL BE PLACED 6 FEET (1828) APART IN THE BRIDGE CELLS.
- (C) TOTAL WEIGHT INCLUDES CONDUIT, CONDUIT SPACERS, CONDUIT SUPPORTS AND CONDUCTORS. CONDUCTORS ARE 1000 KCMIL JACKETED AL. SEE TABLE 1, PG. 3378.2.
- (D) CONDUIT 12 INCHES (305) EXPANSION SLEEVE (ITEM 12 OR 14), SHALL BE INSTALLED BETWEEN THE FIRST AND SECOND SUPPORTS.
- (E) CONDUIT 3 INCHES (76) EXPANSION SLEEVE (ITEM 11 OR 13) SHALL BE INSTALLED A MAXIMUM DISTANCE OF 100 FEET (30480) THROUGHOUT THE RUN.
- (F) BRIDGE OPENINGS REQUIRE AN 18 INCH (457) WIDE STEEL SHEAR PLATE (ITEM 17). THE LENGTH OF THE PLATE SHALL BE 15 FEET (4572). USE STOCK ITEM 543110 THE STEEL SHEAR PLATE IS TO BE PLACED FROM THE BRIDGE ABUTMENT WALL EXTENDING 14'-4" (4369) OUTSIDE THE ABUTMENT TO SUPPORT AND PROTECT THE CONDUITS AGAINST SHEAR FROM EMBANKMENT SETTLEMENT, AND REDUCE THE UPLIFT FORCES ON THE SOIL THAT WOULD BE GENERATED FROM THE BRIDGE BACK WALL IMPACTING THE SOIL DURING A LARGE SEISMIC EVENT.
- (H) THE CONCRETE CONDUIT BASE SUPPORT (ITEM 1 & 4) SHALL BE SECURELY ATTACHED TO THE BRIDGE SLAB WITH EPOXY BINDER (ITEM 9). THE CONCRETE SURFACE SHALL BE LEVELED AND THOROUGHLY CLEANED PRIOR TO APPLICATION OF THE EPOXY.
- (I) THE EPOXY BINDER (CALTRANS APPROVED) IS A 2 COMPONENT ADHESIVE. APPROXIMATELY 1 GAL. OF MIXED EPOXY WILL BE NEEDED FOR EVERY 15 SUPPORTS. "CAREFULLY" FOLLOW MANUFACTURERS INSTRUCTIONS FOR APPLICATION OF EPOXY.
- (J) THE SPACE BETWEEN THE CONDUIT AND THE BRIDGE ABUTMENT OPENING SHALL BE SEALED. TIGHTLY WRAP 1 INCH (25) POLYFORM AROUND CONDUITS, THROUGH THE CELL OPENING AND SEAL WITH MORTAR WITH A MINIMUM THICKNESS OF 4 INCHES (102).
- (K) FOR CELL OPENING SIZE, SEE 3378.5, FOR POSITIONING OF CELL OPENING WITHIN THE BRIDGE, SEE THE CUSTOMER PROJECT PLANNER.
- (L) CONSULT BRIDGE DESIGN ENGINEER FOR LONGITUDINAL & TRANSVERSE DISPLACEMENTS AT SOIL TO ABUTMENT INTERFACE AND ABUTMENT TO BRIDGE INTERFACE.
- (M) CONSULT CIVIL/STRUCTURAL ENGINEERING IF THE BRIDGE DESIGN HAS ANY ONE OF THE FOLLOWING PARAMETERS:
 - a. LONGITUDINAL DISPLACEMENT BETWEEN ABUTMENT AND BRIDGE GREATER THAN 12 INCHES (305).
 - b. TRANSVERSE DISPLACEMENT BETWEEN ABUTMENT AND BRIDGE GREATER THAN 5 INCHES (127).
 - c. TRANSVERSE DISPLACEMENT BETWEEN SOIL AND ABUTMENT GREATER THAN 1 INCH (25.4).
 - d. TRANSVERSE MOVEMENT BETWEEN ABUTMENT BACK-WALL AND SOIL GREATER THAN 1".
 - e. DISPLACEMENT THAT CAUSES CONFLICT WITH INSTALLATION.
 - f. BRIDGE LENGTH GREATER THAN 300 FEET (91440).
 - g. BRIDGE WIDTH SMALLER THAN 50 FEET (15240).
 - h. BRIDGE DEPTH GREATER THAN 8 FEET (2438).
 - i. ARCHED FLOOR SLAB (WHERE CONDUIT SUPPORTS ARE ATTACHED).
 - j. HORIZONTALLY CURVED BRIDGE WITH RADIUS LESS THAN 800 FEET (243840).
 - k. BRIDGE CONTAIN EXPANSION JOINTS OTHER THAN THOSE AT THE END OF THE BRIDGE AT THE ABUTMENT.
 - l. ABUTMENT CONFIGURATIONS DIFFERENT THAN SHOWN IN THE STANDARDS.
 - m. DUCT CONFIGURATIONS NOT SHOWN.

FOR FIELD MAINTENANCE ONLY

| | | |
|--|--|---|
| DATE 1-1-2000 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS CONDUIT INSTALLATION IN CELL BRIDGES | 3399.703 SUPERSEDES 3378.0 (1-1-99) |
|--|--|---|

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNIT |
|------|---|----------|-----------------------|--------------|-------------------|
| 1 | FIXED SUPPORT, TYPE A, CONCRETE CONDUIT SUPPORT, 24" X 6" X 6" (610x152x152)W/ HOT DIPPED GALV. STEEL STEEL REINFORCING BAR, 3/8"(0.375) DIA., ASTM A-615 GR 60. | AS REQ'D | -- | 703520 | BR-FIX |
| 2 | FIXED SUPPORT, TYPE B, DIRECT EMBEDDED, H.D. GALV. #4 REBAR ASTM A-615 GR. 60, " LJ " SHAPE | AS REQ'D | -- | 124020 | U-SUPP |
| 3 | SLIDING SUPPORT, HOT DIP GALVANIZED 3/8"(10) THICK PLATE, 24" x 6"(610 x 152) WITH TWO 3/8" DIA. x 35" (10 x 889) BAR AND TWO 5/8" x 20" (16 x 394) SLOTS | AS REQ'D | 3378 | 703524 | BR-SLI ITEM 3 & 4 |
| 4 | SLIDING SUPPORT TYPE C, CONCRETE CONDUIT SUPPORT, 24" X 6" X 6" (610 x 152 x 152) WITH 1/2" DIA. X 5"(128 x 127) S.S. (304) ANCHOR BOLT WITH 1"(25) LEG. TWO S.S. NUTS AND ONE S.S. FLAT WASHER ON EACH BOLT. | AS REQ'D | 3378 | 703522 | |
| 5 | SLIDING SUPPORT, TYPE D, HOT DIP GALVANIZED 3/8" (10) THICK STEEL PLATE 24" x 6" (610 x 152) WITH FOUR BOLTS AND TWO BENT RODS. | | 3378 | 703560 | BR-SLD 3 & 5 |
| 6 | SPACER, CONDUIT BASE | AS REQ'D | 3375 | 663008 | BSPACE |
| 7 | SPACER, CONDUIT INTERMEDIATE | AS REQ'D | 3375 | 663528 | SPACER |
| 8 | WIRE, IRON, #14 GALVANIZED (A) | AS REQ'D | -- | 815648 | -- |
| 9 | EPOXY BINDER (CAL-TRANS APPROVED) (I) | AS REQ'D | -- | 213242 | -- |
| 10 | CONDUIT, PVC, SCHEDULE 40, 5" | AS REQ'D | 3378 | 251408 | S40-5" |
| 11 | SLEEVE, 3"(76) EXPANSION CAPACITY, CONDUIT PLASTIC, 5"(127) | AS REQ'D | 3378 | 650128 | 5"-EXP |
| 12 | JOINT SEISMIC, 12"(305) EXPANSION CAPACITY, CONDUIT PLASTIC, 5"(127) | AS REQ'D | 3378 | 438700 | SEJ-5" |
| 13 | SLEEVE, 3"(76) EXPANSION CAPACITY, CONDUIT PLASTIC, 4"(102) | AS REQ'D | 3378 | 650126 | 4"-EXP |
| 14 | JOINT SEISMIC, 12"(305) EXPANSION CAPACITY, CONDUIT 4" (102) | AS REQ'D | 3378 | 438698 | SEJ-4" |
| 15 | POLYFOAM WRAP, 1" (25) THICK | AS REQ'D | -- | -- | -- |
| 16 | 3/4"(19), DIAMETER HVA ADHESIVE ANCHOR ROD SYSTEM W/HAS SUPER SS58-758 ANCHOR ROD BY HILTI, INC. (1-800-879-8000) (J) | AS REQ'D | -- | -- | -- |
| 17 | PLATE, SHEAR LARGE (LIGHT GRAY EPOXY COATED, ALL SIDES) SEE 3378.5 FOR DIMENSIONS (F) | AS REQ'D | 3378 | 543110 | SHEAR |
| 18 | PLATE, SHEAR SHORT (LIGHT GRAY EPOXY COATED, ALL SIDES) SEE 3378.5 FOR DIMENSIONS (F) | AS REQ'D | 3378 | 543112 | SSHEAR |
| 19 | FOAM ARCHITECTURAL FOR 4" EXPANSION JOINTS 6' LONG | AS REQ'D | 3378.8 | 359804 | 4"FOAM |
| 20 | FOAM ARCHITECTURAL FOR 5" EXPANSION JOINTS 6' LONG | AS REQ'D | 3378.8 | 359800 | 5"FOAM |
| 21 | CONDUIT, PVC, SCHEDULE 40, 4" | AS REQ'D | 3378 | 251392 | S40-4" |

FOR FIELD MAINTENANCE ONLY

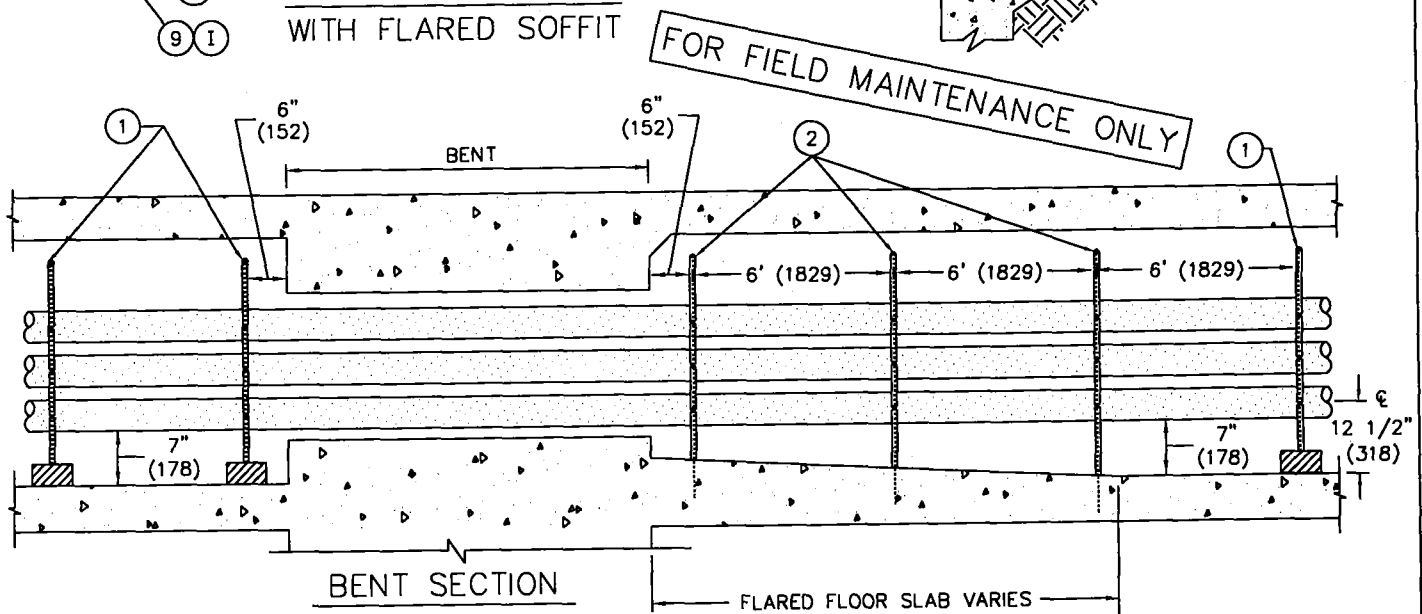
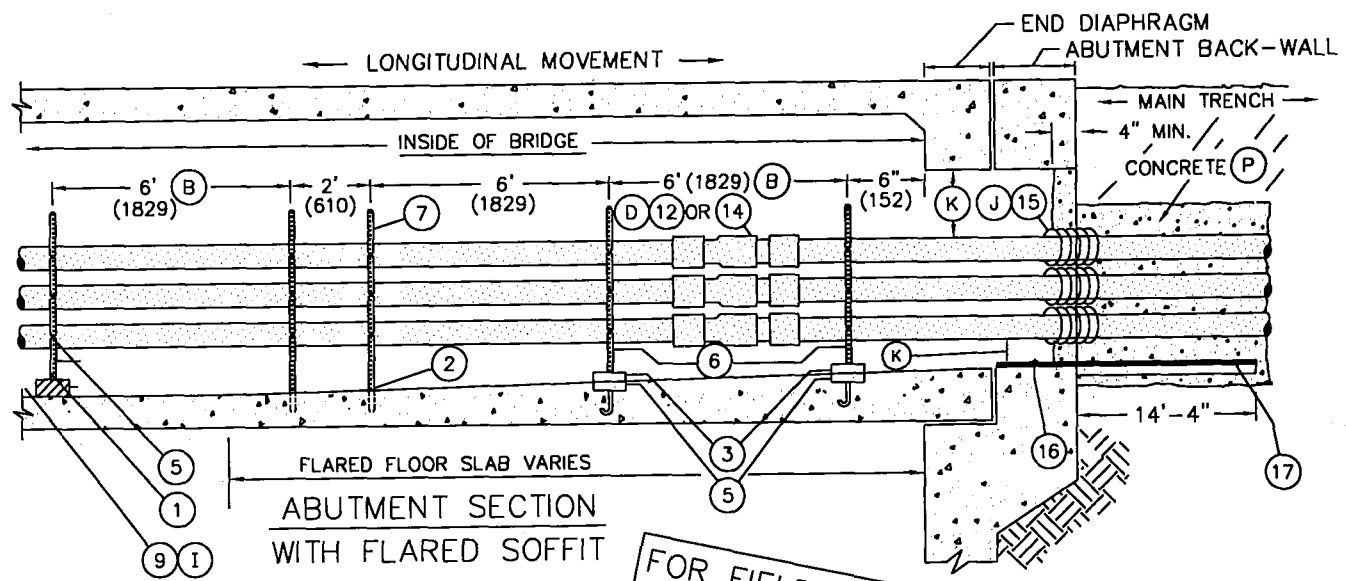
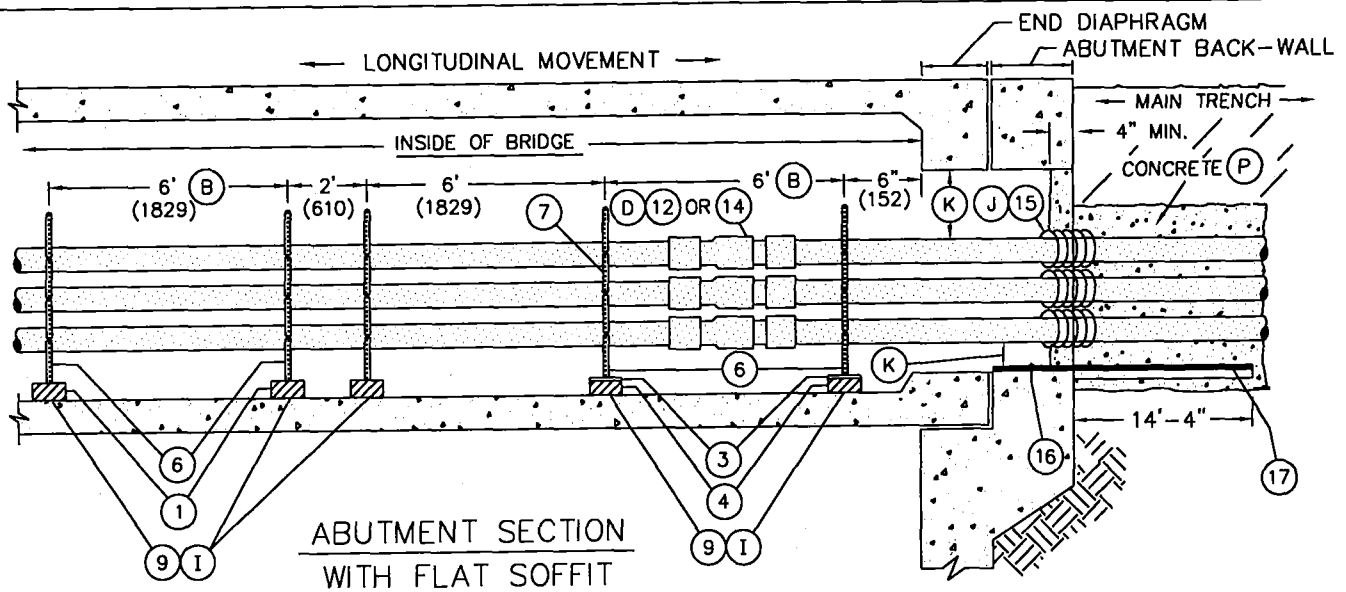
TABLE 1:

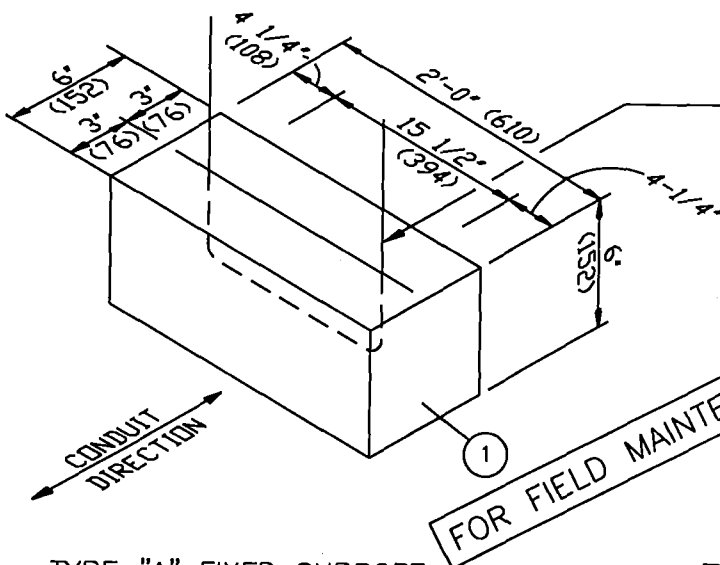
| | | |
|---------------------------------------|-----------|-----------|
| ULTIMATE TOTAL WT. PER 100'(2540) (C) | | |
| 4 CONDUIT | 6 CONDUIT | 8 CONDUIT |
| 4542 | 6463 | 8384 |

REFERENCE:

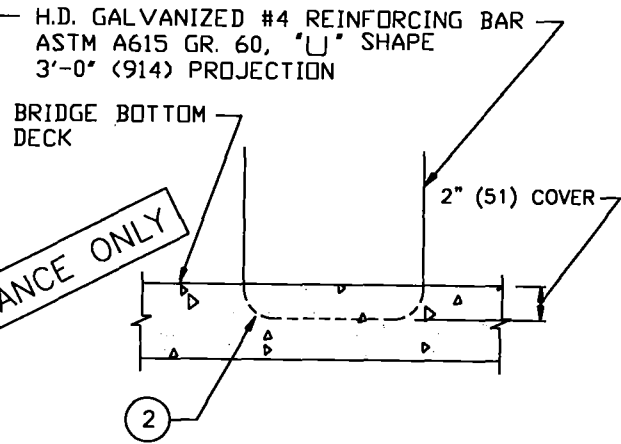
- (N) SEE STANDARD PAGES 3370.3/3371.3 FOR TRENCH SHADING REQUIREMENTS.
- (O) SEE STANDARD 3375 FOR CONDUIT SPACER DATA.
- (P) SEE STANDARD 3376 FOR CONCRETE ENCASED MULTI-CONDUIT INSTALLATION.
- Q. CONSULT DESIGN STANDARDS FOR CABLE AMPACITY AND GROUNDING REQUIREMENTS FOR STEEL CONDUITS.

| | | |
|--|---|--|
| <p>3399.704 SUPERSEDES 3378.1 (1-1-97)</p> | <p>SDG&E ELECTRIC STANDARDS</p> <p>CONDUIT INSTALLATION IN CELL BRIDGES</p> | <p>DATE 1-1-2000 APPD <i>[Signature]</i> / CAK</p> |
|--|---|--|





TYPE "A" FIXED SUPPORT
NOT TO SCALE



TYPE "B" FIXED FLARED FLOOR SUPPORT
NOT TO SCALE

FOR FIELD MAINTENANCE ONLY

H.D. GALVANIZED #4 REINFORCING BAR
ASTM A615 GR. 60, "U" SHAPE
3'-0" (914) PROJECTION

BRIDGE BOTTOM
DECK

2" (51) COVER

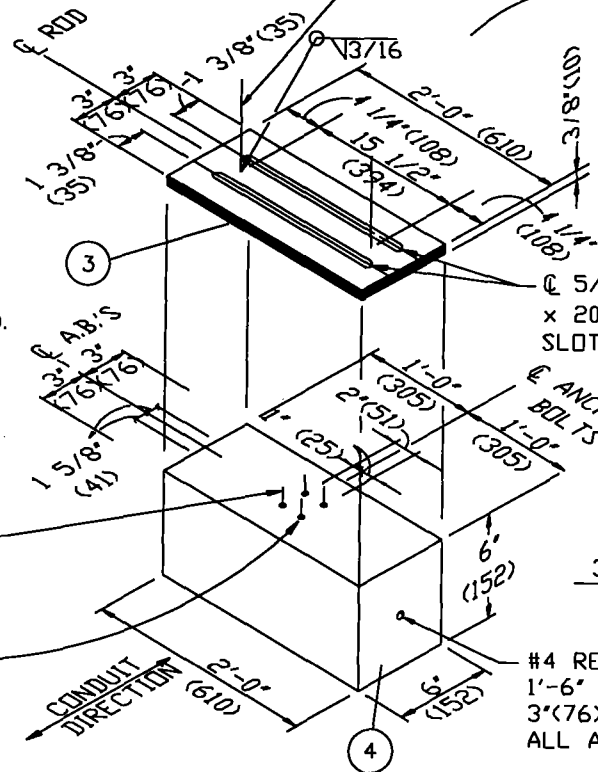
GALVANIZED A36, 1/2" Ø ROD
3'-0" LONG, WELDED TO STEEL PLATE
PRIOR TO GALVANIZING

NOTE: DIMENSIONS TYPICAL

3/8" (10) X 2'-0"
(610) X (152)
ASTM A36 PLATE,
HOT DIP GALVANIZED.

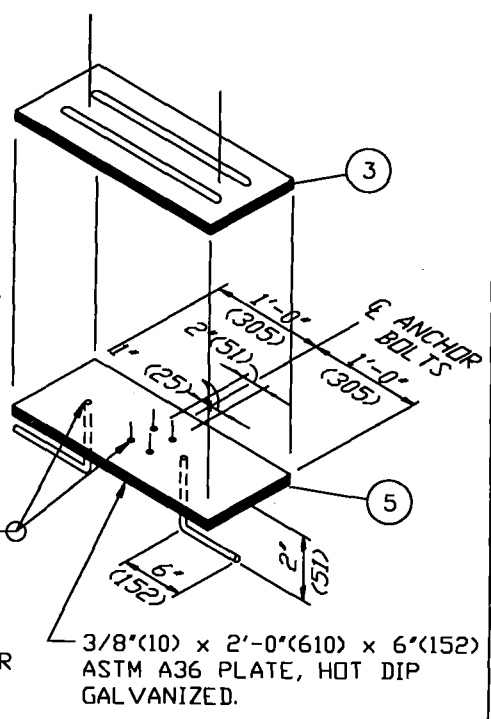
1/2" (13) X 5" (127)
HEAVY HEX ASTM
A307 H.D. GALV.
BOLT WITH 2" (51)
PROJECTION, 2
A563, GR. DH, H.D.
GALV. NUTS AND 1
H.D. GALV. ASTM
F436 WASHER (4
TYP)

WASHER AND
DOUBLE NUT.
ADJUST NUTS TO
CLEAR SO PLATE
CAN SLIDE ON
BASE.



TYPE "C" SLIDING SUPPORT
(NOTE: 5 1/4" LATERAL MOVEMENT)
NOT TO SCALE

#4 REBAR x
1'-6" (457),
3" (76) COVER
ALL AROUND



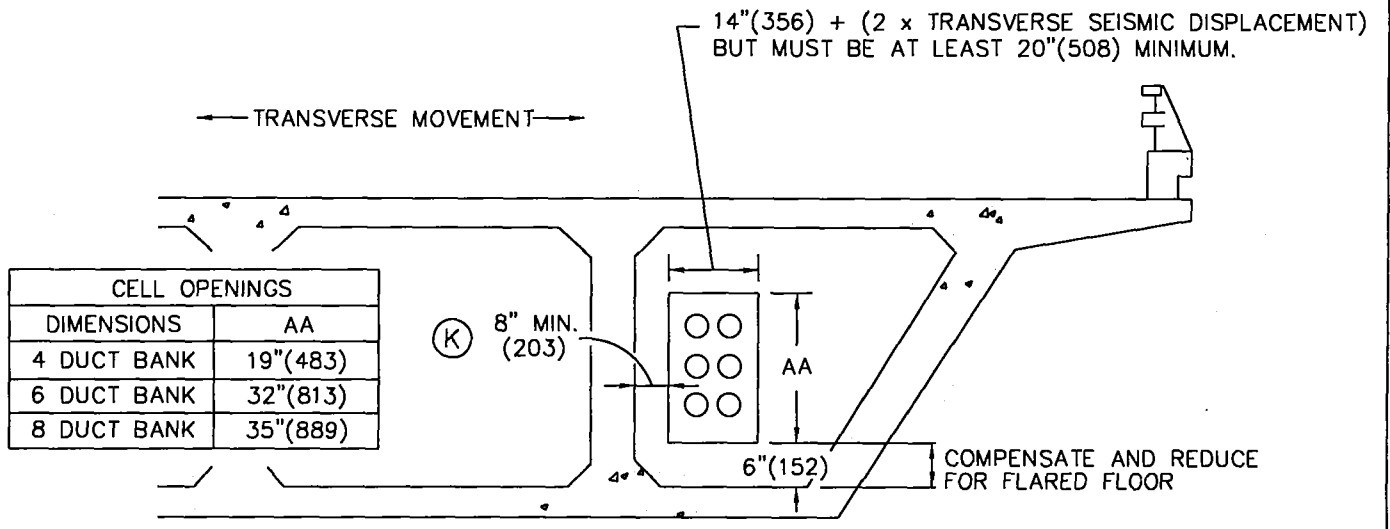
**TYPE "D" SLIDING FLARED
FLOOR SUPPORT**
(NOTE: 5 1/4" LATERAL MOVEMENT)
NOT TO SCALE

3399.706
SUPERSEDES
3378.3 (1-1-97)

SG&E ELECTRIC STANDARDS

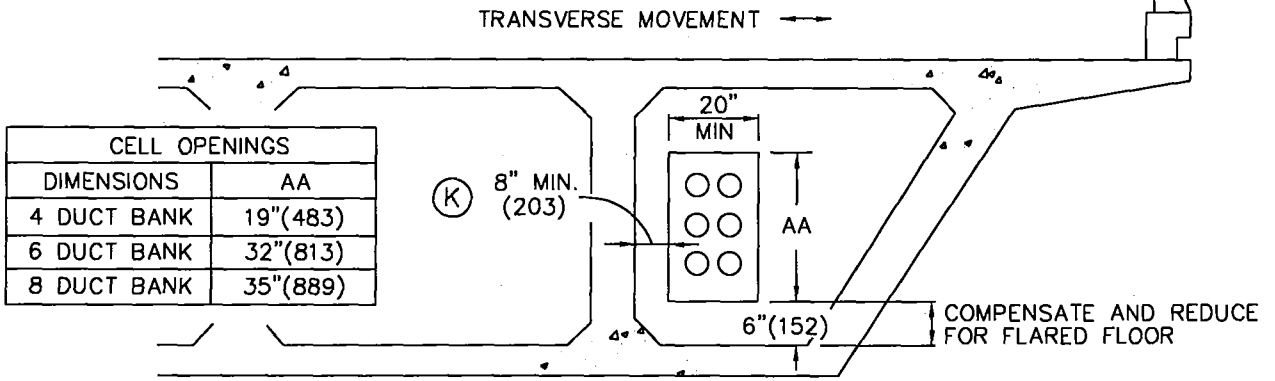
CONDUIT INSTALLATION IN CELL BRIDGES

DATE 1-1-2000
APPD [Signature] / CMK

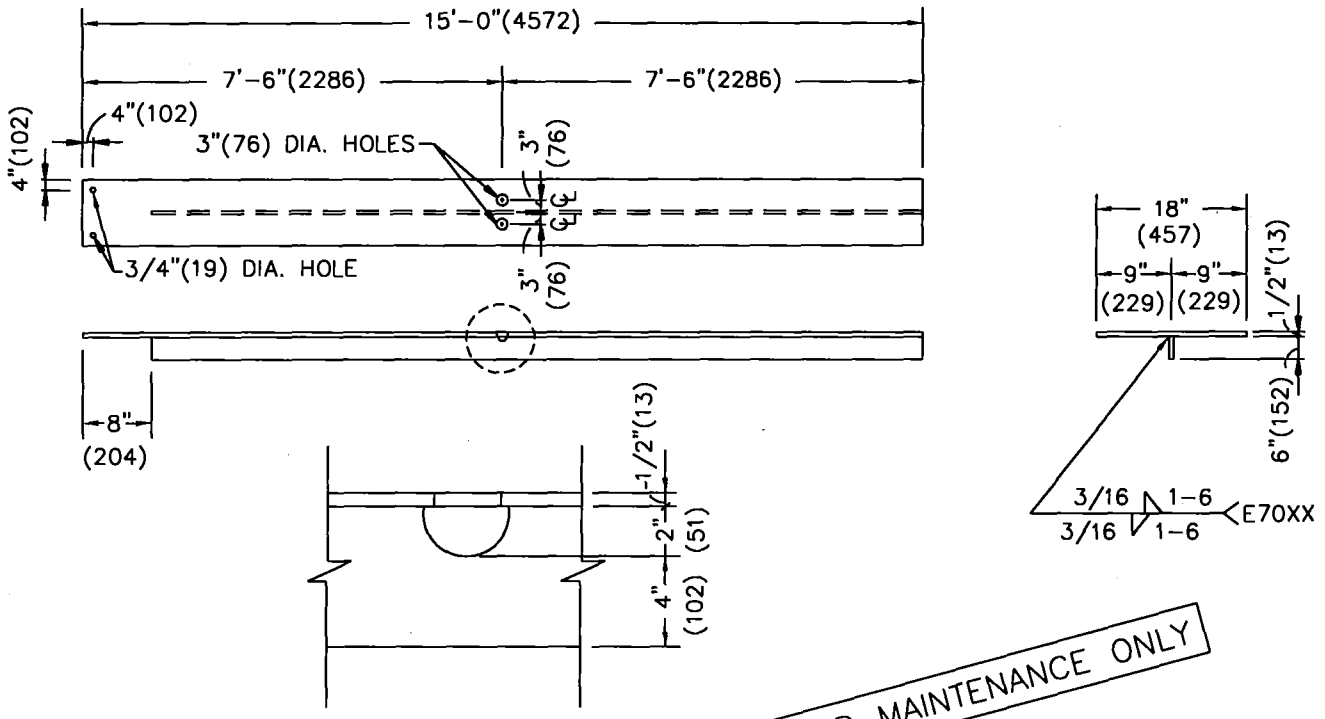


ABUTMENT BACK-WALL AND END DIAPHRAGM OPENING

FOR FIELD MAINTENANCE ONLY

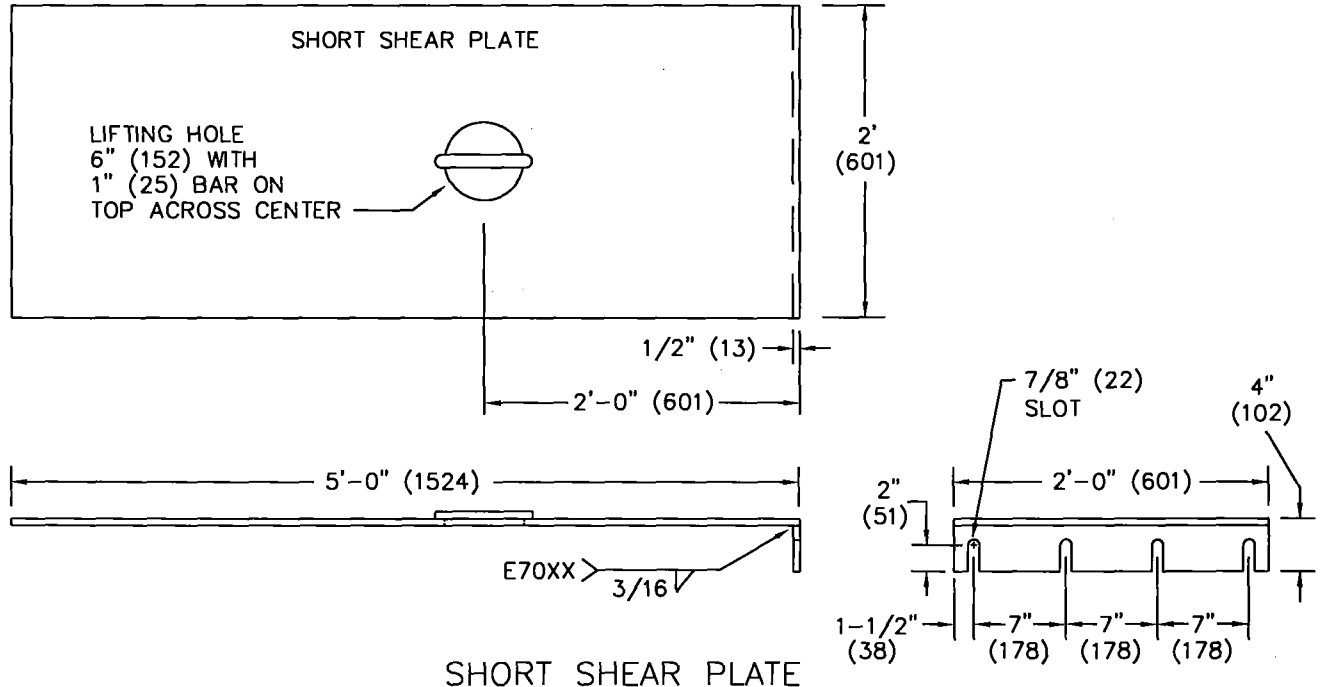


BENT OPENING



FOR FIELD MAINTENANCE ONLY

DETAIL 1
 LARGE SHEAR PLATE



SHORT SHEAR PLATE

| | | |
|---|--|--|
| 3399.708 SUPERSEDES 3378.5 (1-1-97) | SDG&E ELECTRIC STANDARDS SHEAR PLATES | DATE 1-1-2000 APPD <i>[Signature]</i> |
|---|--|--|

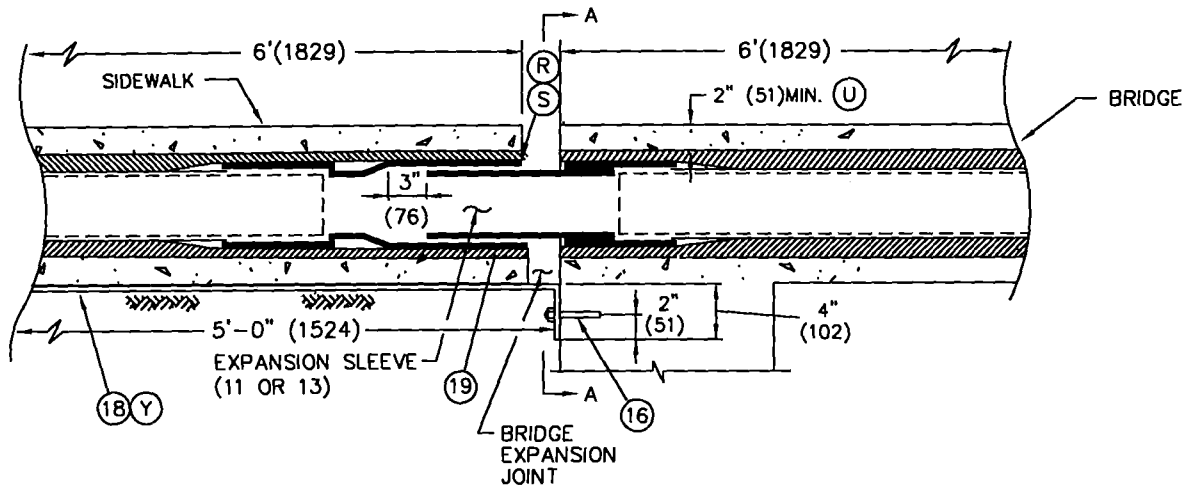
SCOPE: THIS STANDARD (3378.7 & 3378.8) SHOWS THE INSTALLATION OF SCHEDULE 40, 4 INCH (102) OR 5 INCH (127) PVC CONDUIT IN A BRIDGE SIDEWALK OR BRIDGE SLAB FOR SLAB BRIDGE INSTALLATIONS.

INSTALLATION:

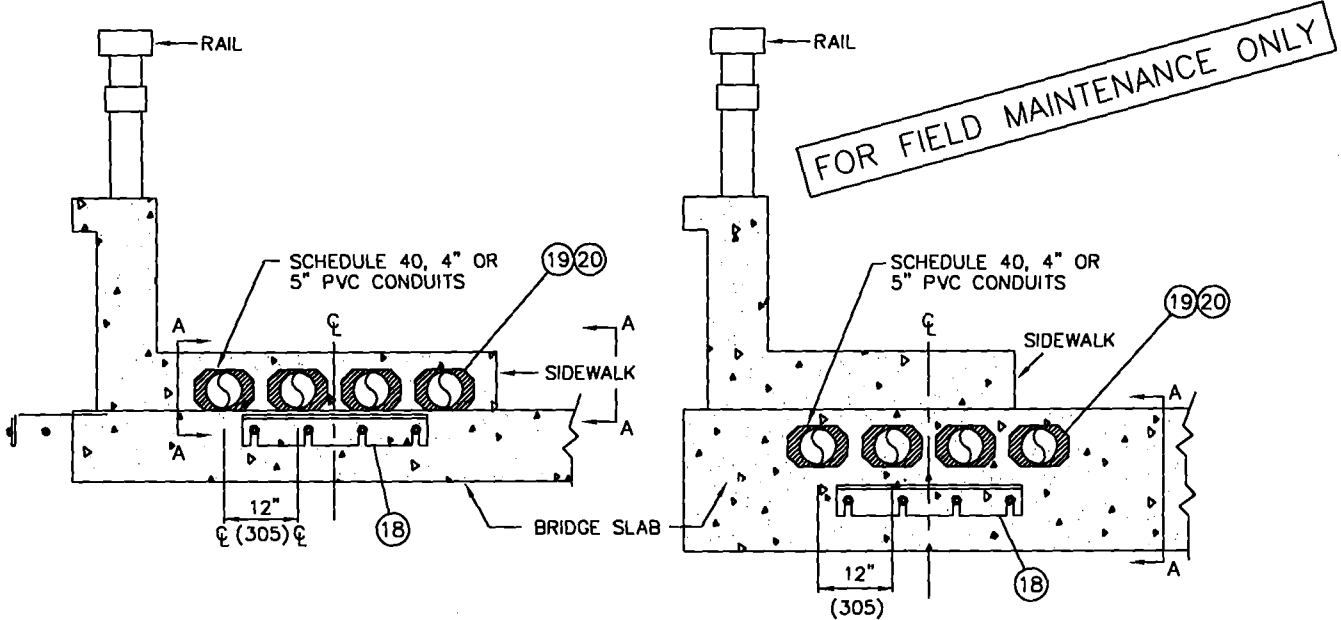
- (R) CONDUIT EXPANSION SLEEVE SHALL BE INSTALLED AT EACH BRIDGE EXPANSION JOINT. IT SHALL BE INSTALLED TO ALLOW SLEEVE MOVEMENT AS BRIDGE EXPANDS AND CONTRACTS.
- (S) THE EDGE OF THE OUTER SLEEVE (FEMALE SECTION) MUST LINE UP WITH THE EDGE OF THE BRIDGE EXPANSION JOINT.
- (T) A 1/2 INCH (13) EPOXY COATED SHEAR PLATE IS BE REQUIRED IF THE APPROACH SLAB IS NOT SUPPORTED . A SHEAR PLATE CAN PROTECT THE CONDUITS AGAINST SHEAR AS A RESULT OF DIFFERENTIAL SETTLEMENT.
- (U) CONDUITS IN THE SIDEWALK MUST BE SCHEDULE 40 PVC AND HAVE A MINIMUM OF 2 INCH CONCRETE COVERAGE.
- (V) CONTACT STANDARDS FOR NON-STANDARD MATERIAL SPECIFICATION.
- (W) CONSULT BRIDGE DESIGN ENGINEER FOR LONGITUDINAL & TRANSVERSE DISPLACEMENT AT SOIL TO ABUTMENT INTERFACE AND ABUTMENT TO BRIDGE INTERFACE.
- (X) CONSULT CIVIL/STRUCTURAL IF THE BRIDGE DESIGN HAS ANY OF THE FOLLOWING PARAMETERS:
 - 1. LONGITUDINAL DISPLACEMENT GREATER THAN 3 INCHES.
 - 2. TRANSVERSE DISPLACEMENT GREATER THAN 1 INCH.
 - 3. DISPLACEMENT THAT CAUSES CONFLICT WITH INSTALLATION.
 - 4. BRIDGE HAVING EXPANSION JOINTS OTHER THAN THOSE AT THE END OF THE BRIDGE AT THE ABUTMENT.
 - 5. ABUTMENT CONFIGURATIONS DIFFERENT THAN SHOWN IN THESE STANDARDS.
 - 6. DUCT CONFIGURATIONS NOT SHOWN.
- (Y) USE SHORT SHEAR PLATE IF THERE IS NO APPROACH SLAB OR APPROACH SLAB IS NOT SUPPORTED BY ABUTMENT.

FOR FIELD MAINTENANCE ONLY

| | | |
|-------------------------------------|--|---|
| DATE 1-1-2000 APPD <i>RW/CAL</i> | SDG&E ELECTRIC STANDARDS CONDUIT INSTALLATION IN SLAB BRIDGES | 3399.709 SUPERSEDES 3378.6 (1-1-97) |
|-------------------------------------|--|---|



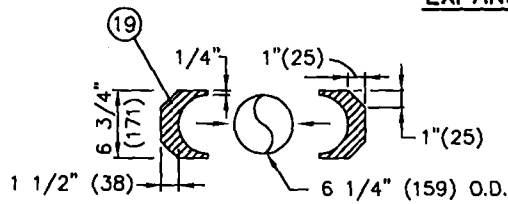
NOTES: IN AN EFFORT TO IMPROVE RESISTANCE TO EARTHQUAKE DAMAGE, 4 INCH CONDUIT IS THE MAXIMUM SIZE PERMITTED BY CALTRANS IN A CALTRANS BRIDGE SIDEWALK.



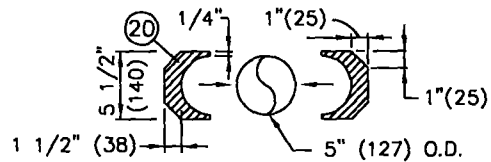
SIDEWALK INSTALLATION, SECTION A-A

SLAB INSTALLATION, SECTION A-A

EXPANSION SECTION A-A



STYROFOAM CASING FOR 5" (127)Ø CONDUIT



STYROFOAM CASING FOR 4" (102)Ø CONDUIT

NOTES:

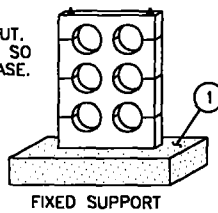
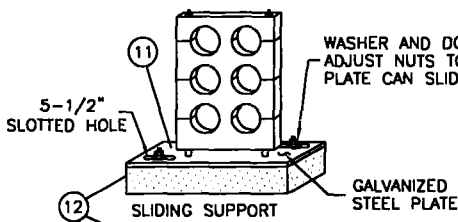
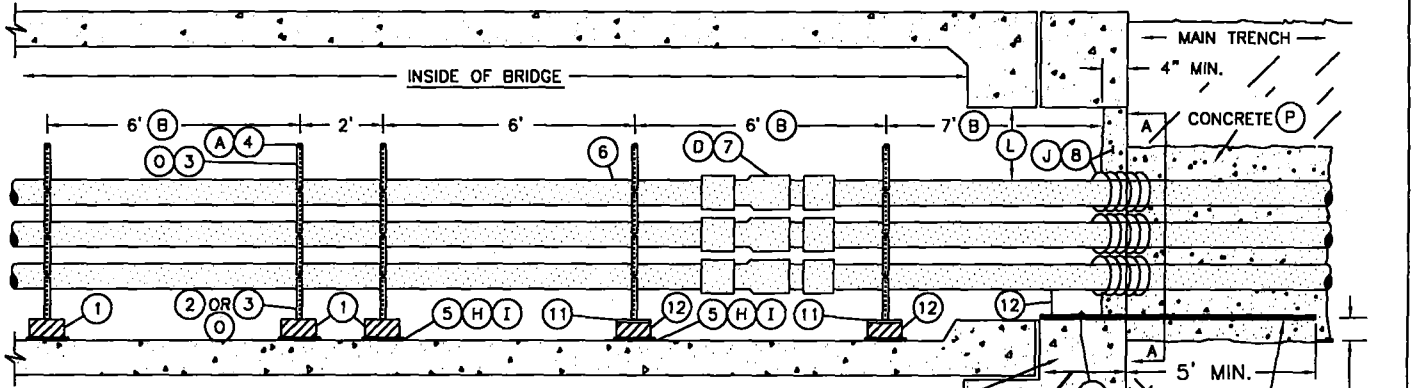
1. MATERIAL SHALL BE NON-DENSE STYROFOAM
2. SEAL ALL JOINTS WITH DUCT TAPE TO PREVENT CONCRETE ENTRY.

| | | |
|---|--|---|
| 3399.710 SUPERSEDES 3378.7 (1-1-97) | SDG&E ELECTRIC STANDARDS CONDUIT INSTALLATION IN SLAB BRIDGES | DATE 1-1-2000 APPD <i>[Signature]</i> / <i>[Signature]</i> |
|---|--|---|

SCOPE: THIS STANDARD SHOWS THE INSTALLATION OF 5 INCH CONDUITS IN CLOSED CELL BRIDGE CONSTRUCTION.

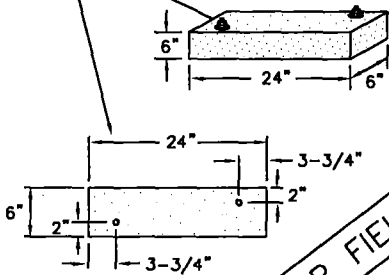
CONDUIT INSTALLATIONS IN CELL BRIDGES

TYPE 1 BRIDGE ABUTMENT



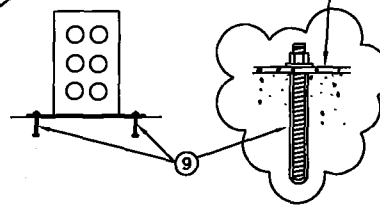
ABUTMENT BACK WALL
CUSTOMER PROJECT PLANNER TO VERIFY WIDTH OF ABUTMENT WALL AND ADD 5' TO SIZE LENGTH OF SHEAR PLATE.

1/2" STEEL SHEAR PLATE
(10 F G)

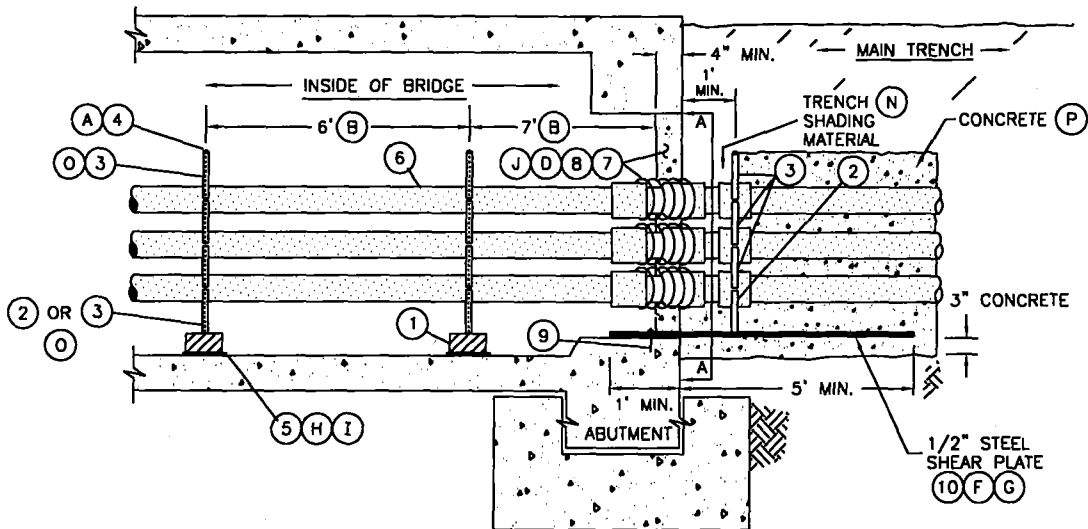


FOR FIELD MAINTENANCE ONLY

SECTION A-A



TYPE 2 BRIDGE ABUTMENT



SDG&E ELECTRIC STANDARDS

DATE 1-1-98
APPD *[Signature]* / CMK

CONDUIT INSTALLATION IN CELL BRIDGES

3399.711
SUPERSEDES
3378.1 (1-1-98)

TABLE 1

| CELL OPENINGS (K) | | | | |
|-------------------|-----|-----|----|----|
| DIMENSIONS | AA | BB | CC | DD |
| 4 DUCT BANK | 20" | 19" | 6" | 8" |
| 6 DUCT BANK | 20" | 27" | 6" | 8" |
| 8 DUCT BANK | 20" | 35" | 6" | 8" |

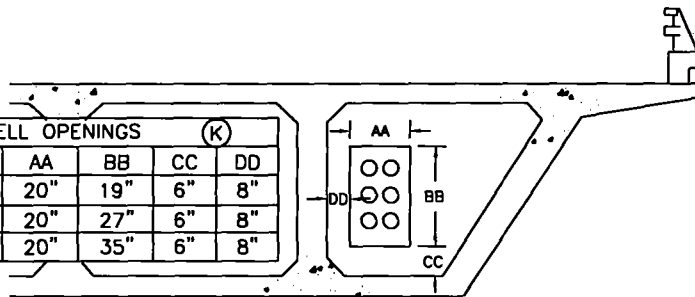
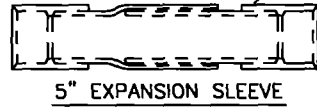


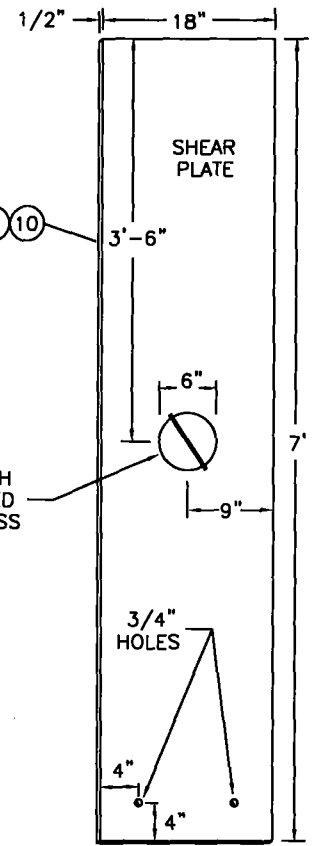
TABLE 2

| ULTIMATE TOTAL WT. PER 100' (C) | | |
|---------------------------------|-----------|-----------|
| 4 CONDUIT | 6 CONDUIT | 8 CONDUIT |
| 4542 | 6463 | 8384 |

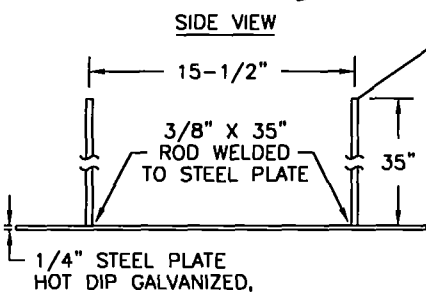


FOR FIELD MAINTENANCE ONLY

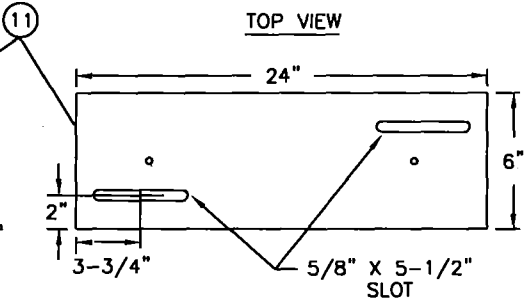
LIFTING HOLE
6" CIRCLE WITH
1" BAR WELDED
ON TOP ACROSS
CENTER



SIDE VIEW



TOP VIEW



NOTES:

- IN AN EFFORT TO IMPROVE RESISTANCE TO EARTHQUAKE DAMAGE, 4 INCH CONDUIT IS THE MAXIMUM SIZE PERMITTED BY CAL-TRANS IN A BRIDGE SIDEWALK.

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNIT |
|------|---|----------|-----------------------|--------------|---------------|
| 1 | FIXED SUPPORT, CONCRETE CONDUIT SPACER, 24" X 6" X 6" W/GALV. STEEL STEEL REINFORCING ROD, 3/8" | AS REQ'D | -- | 703520 | BR-FIX |
| 2 | SPACER, CONDUIT BASE | AS REQ'D | 3375 | 663008 | -- |
| 3 | SPACER, CONDUIT INTERMEDIATE | AS REQ'D | 3375 | 663528 | |
| 4 | WIRE, IRON, #14 GALVANIZED (A) | AS REQ'D | -- | 815648 | -- |
| 5 | EPOXY BINDER (CAL-TRANS APPROVED) | AS REQ'D | -- | 213242 | |
| 6 | CONDUIT, PVC, SCHEDULE 40, 5" | AS REQ'D | 3378 | 251408 | |
| 7 | SLEEVE, EXPANSION, CONDUIT PLASTIC, 5" | AS REQ'D | 3378 | 650128 | -- |
| 8 | PAPER, BUILDING 15# (ROOFING PAPER) | AS REQ'D | -- | -- | |
| 9 | 5/8" HVA ADHESIVE ANCHOR ROD SYSTEM W/HAS SUPER SS58-758 ANCHOR ROD BY HILTI, INC. (1-800-879-8000) | AS REQ'D | -- | -- | |
| 10 | PLATE, SHEAR (LIGHT GREY EPOXY COATED, ALL SIDES) 18" X 7' X 1/2" (F)(G) | AS REQ'D | 3378 | 543110 | SHEAR |

3399.712
SUPERSEDES
3378.2 (1-1-98)

SDG&E ELECTRIC STANDARDS

CONDUIT INSTALLATION IN CELL BRIDGES

DATE 1-1-98

APPD *[Signature]*

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNIT |
|------|--|----------|-----------------------|--------------|---------------|
| 11 | SLIDING SUPPORT, HOT DIP GALVANIZED STEEL PLATE, 24" X 6" X 1/4" WITH TWO 3/8" X 35" RODS, TWO 5/8" X 5-1/2" SLOTS. | AS REQ'D | 3378 | 703524 | BR-SLI |
| 12 | SLIDING SUPPORT CONDUIT CONCRETE BASE, 24" X 6" X 6" WITH 1/2" X 5" S.S. (304) ANCHOR BOLT WITH 1" LEG. 2-S.S. NUTS AND 1-S.S. FLAT WASHER ON EACH BOLT. | AS REQ'D | 3378 | 703522 | |

INSTALLATION:

- (A) THE CONDUITS SHALL BE SECURELY STRAPPED TO THE CONDUIT SPACER SUPPORT (ITEM 1 & 11) WITH #14 GALVANIZED WIRE (ITEM 4), FOR EIGHT CONDUITS. WHEN 6 OR LESS CONDUIT RUNS ARE INSTALLED, EXTRA ROD LENGTH MAY BE CUT OR FOLDED OVER TOP OF CONDUITS TOWARD EACH OTHER INSTEAD OF USING THE GALVANIZED WIRE.
- (B) THE FIRST SUPPORT INSIDE THE CELL MUST BE PLACED AT 7 FEET TO ALLOW MAXIMUM DEFLECTION. THE FIRST TWO SLIDING SUPPORTS (ITEM 11) SHALL BE SPACED AT 6 FEET AND FOLLOWED BY TWO FIXED SUPPORTS (ITEM 1) SPACED AT 2 FEET. THE REST OF THE SUPPORTS (ITEM 1) SHALL BE PLACED 6 FEET APART IN THE BRIDGE CELLS.
- (C) TOTAL WEIGHT INCLUDES CONDUIT, CONDUIT SPACERS, CONDUIT SUPPORTS AND CONDUCTORS. CONDUCTORS ARE 1000 KCMIL JACKETED AL. SEE TABLE 2.
- (D) CONDUIT EXPANSION SLEEVE (ITEM 7), SHALL BE INSTALLED AT EACH BRIDGE EXPANSION JOINT AND/OR AT A MAXIMUM DISTANCE BETWEEN EXPANSION JOINTS OF EVERY 100 FEET THROUGHOUT THE RUN.
- (F) A 1/2 INCH STEEL SHEAR PLATE IS TO BE PLACED FROM THE BRIDGE ABUTMENT WALL EXTENDING 5 FEET MIN. OUTSIDE THE ABUTMENT TO SUPPORT AND PROTECT THE CONDUITS AGAINST SHEAR FROM EMBANKMENT SETTLEMENT.
- (G) **NEW BRIDGES**
TYPE 1 BRIDGE OPENINGS REQUIRE AN 18 INCH WIDE STEEL SHEAR PLATE. THE LENGTH OF THE PLATE SHALL BE 5 FEET MIN. OUTSIDE THE ABUTMENT, PLUS THE WIDTH OF THE ABUTMENT WALL, USE STOCK ITEM 543110. IF A SPECIAL SIZE SHEAR PLATE IS REQUIRED, THE CUSTOMER PROJECT PLANNER IS TO FILL OUT A MACHINE SHOP ORDER FORM, AND SEND IT TO THE MACHINE SHOP.
TYPE 2 BRIDGE OPENINGS REQUIRE AN 18 INCH WIDE STEEL SHEAR PLATE. INSTALL WITH 1 FOOT MIN. OF THE PLATE ON THE BRIDGE ABUTMENT AND 5 FEET MIN. OUTSIDE THE ABUTMENT, USE STOCK ITEM 543110. THE CUSTOMER PROJECT PLANNER IS TO FILL OUT A MACHINE SHOP ORDER FORM IF A SPECIAL SIZE SHEAR PLATE IS REQUIRED AND SEND IT TO THE MACHINE SHOP.
FOR OTHER TYPE BRIDGES, CONSULT DISTRIBUTION STANDARDS ENGINEER FOR INSTALLATION STANDARDS.
- (H) THE CONDUIT SPACER SUPPORT (ITEM 1 & 11) SHALL BE SECURELY ATTACHED TO THE BRIDGE SLAB WITH EPOXY BINDER (ITEM 5). THE CONCRETE SURFACE SHALL BE LEVELED AND THOROUGHLY CLEANED PRIOR TO APPLICATION OF THE EPOXY.
- (I) THE EPOXY BINDER (CAL-TRANS APPROVED) IS A 2 COMPONENT ADHESIVE. APPROXIMATELY 1 GAL. OF MIXED EPOXY WILL BE NEEDED FOR EVERY 15 SUPPORTS. READ "CAREFULLY" MANUFACTURERS INSTRUCTIONS FOR APPLICATION OF EPOXY.
- (J) THE SPACE BETWEEN THE CONDUIT AND THE BRIDGE ABUTMENT OPENING SHALL BE SEALED. TIGHTLY WRAP 2 LAYERS OF #15 BUILDING PAPER AROUND CONDUITS OR EXPANSION SLEEVE, THRU THE CELL OPENING AND SEAL WITH MORTAR AT A MINIMUM THICKNESS OF 4 INCHES.
- (K) FOR POSITIONING OF CELL OPENING WITHIN THE BRIDGE, SEE THE CUSTOMER PROJECT PLANNER.
- (L) CONSULT BRIDGE DESIGN ENGINEER FOR SEISMIC MOVEMENT REQUIREMENTS. THEN CONSULT CIVIL/STRUCTURAL AND ELECTRIC DISTRIBUTION ANALYST FOR APPROPRIATE SEISMIC DESIGN AND CONSTRUCTION MATERIAL.
- M. CONSULT CIVIL/STRUCTURAL ENGINEERING FOR ATTACHMENTS OF CONDUITS TO EXISTING OR SLAB BRIDGES.

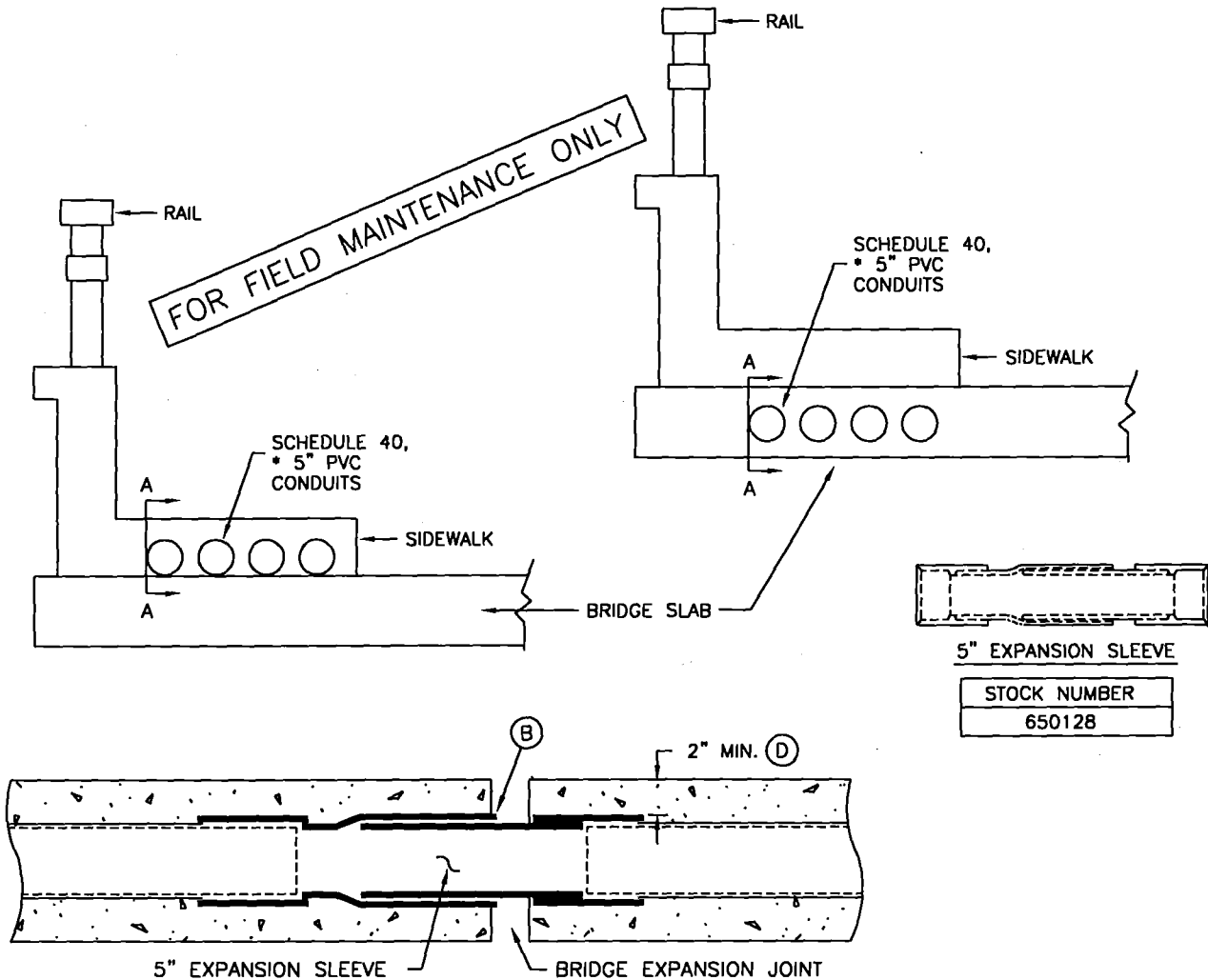
REFERENCE:

- (N) SEE STANDARD PAGES 3370.3/3371.3 FOR TRENCH SHADING REQUIREMENTS.
- (O) SEE STANDARD 3375 FOR CONDUIT SPACER DATA.
- (P) SEE STANDARD 3376 FOR CONCRETE ENCASED MULTI-CONDUIT INSTALLATION.
- Q. CONSULT DESIGN STANDARDS FOR CABLE AMPACITY AND GROUNDING REQUIREMENTS FOR STEEL CONDUITS.

FOR FIELD MAINTENANCE ONLY

| | | |
|--|--------------------------|---|
| DATE 1-1-98 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS | 3399.713 SUPERSEDES 3378.3 (1-1-98) |
| CONDUIT INSTALLATION IN CELL BRIDGES | | |

SCOPE: THIS STANDARD SHOWS THE INSTALLATION OF SCHEDULE 40, 5 INCH PVC CONDUITS IN A BRIDGE SIDEWALK OR BRIDGE SLAB FOR SLAB BRIDGE INSTALLATIONS.



5" EXPANSION SLEEVE
 STOCK NUMBER
 650128

SECTION A-A

*** NOTES:**

- IN AN EFFORT TO IMPROVE RESISTANCE TO EARTHQUAKE DAMAGE, 4 INCH CONDUIT IS THE MAXIMUM SIZE PERMITTED BY CAL-TRANS IN A CALTRANS BRIDGE SIDEWALK.

INSTALLATION:

- A. CONDUIT EXPANSION SLEEVE SHALL BE INSTALLED AT EACH BRIDGE EXPANSION JOINT. IT SHALL BE INSTALLED TO ALLOW SLEEVE MOVEMENT AS CONCRETE EXPANDS AND CONTRACTS.
- (B) THE EDGE OF THE OUTER SLEEVE (FEMALE SECTION) MUST LINE UP WITH THE EDGE OF THE EXPANSION JOINT.
- C. A 1/2 INCH COAL-TAR EPOXY COATED SHEAR PLATE MAY BE REQUIRED AT THE JUNCTION OF BRIDGE ABUTMENT AND APPROACHING SLAB. A SHEAR PLATE CAN PROTECT THE CONDUITS AGAINST SHEAR AS A RESULT OF DIFFERENTIAL SETTLEMENT. CONTACT CIVIL ENGINEERING FOR REQUIREMENTS. (SEE PG. 3378.2 FOR SHEAR PLATE)
- (D) CONDUITS IN THE SIDEWALK MUST BE SCHEDULE 40 PVC AND HAVE A MINIMUM OF 2 INCH CONCRETE COVERAGE.
- E. A SET OF PLANS MUST BE SUBMITTED TO CIVIL ENGINEERING FOR REVIEW AND APPROVAL.
- F. CONTACT STANDARDS ENGINEER FOR NON-STANDARD MATERIAL SPECIFICATION.

| | | |
|--|---|---|
| <p>3399.714 SUPERSEDES 3378.4 (1-1-98)</p> | <p>SDG&E ELECTRIC STANDARDS</p> <p>CONDUIT INSTALLATION IN SLAB BRIDGES</p> | <p>DATE 1-1-98 APPD <i>JLB/ROJ</i></p> |
|--|---|---|

**3400-3500 PADS, RETAINING
WALLS, CLEARANCES,
PAD-MOUNTED
SECTIONALIZING EQUIPMENT**

**3400-3500 PADS, RETAINING
WALLS, CLEARANCES,
PAD-MOUNTED
SECTIONALIZING EQUIPMENT**

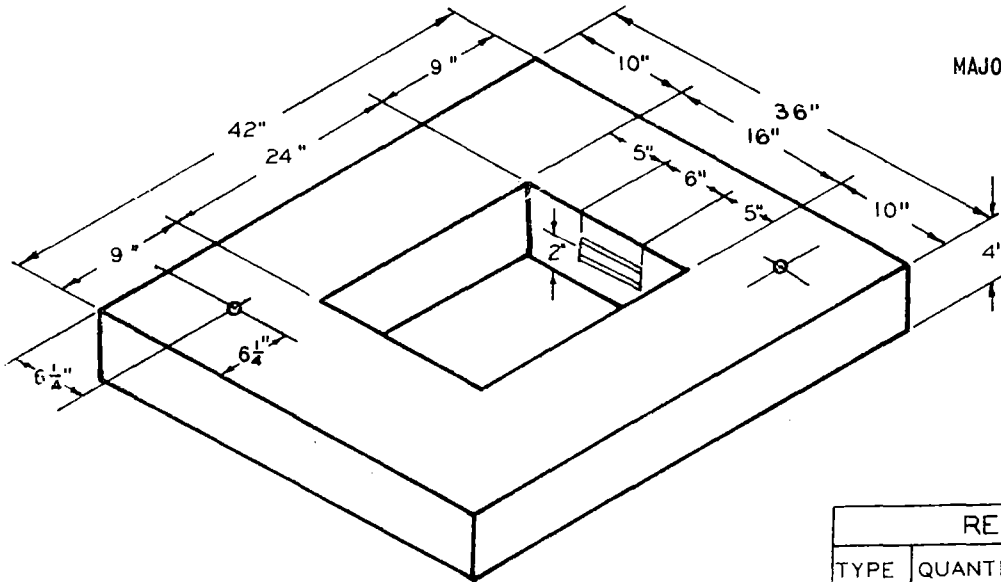
| <u>PAGE</u> | <u>SUBJECT</u> |
|--------------------|---|
| 3499.101 | TERMINATOR PAD INSTALLATION |
| 3499.102 | SWITCHING PAD |
| 3499.103 | FUSE SWITCH PAD INSTALLATION |
| 3499.104-.105 | TERMINATOR PAD |
| 3499.106-.109 | EQUIPMENT PAD |
| 3499.201-.202 | THREE-PHASE TRANSFORMER PAD INSTALLATION |
| 3499.203-.204 | THREE-PHASE TRANSFORMER PAD INSTALLATION - 75 THROUGH 500 KVA |
| 3499.205 | ALTERNATE THREE-PHASE TRANSFORMER PAD INSTALLATION WITH 7 INCH APRON EXTENSION - 750 AND 1000 KVA |
| 3499.206 | THREE-PHASE TRANSFORMER PAD INSTALLATION - 75 THROUGH 500 KVA |
| 3499.207 | THREE-PHASE TRANSFORMER PAD INSTALLATION - 750 AND 1000 KVA |
| 3499.210 | SINGLE-PHASE TRANSFORMER PLASTIC PAD - 5-3", 4-4" OR 3-5" SECONDARY CONDUITS MAXIMUM |
| 3499.211-.212 | FUSED SWITCHING PAD |
| 3499.214-.216 | AIR BREAK PMH-3 SECTIONALIZING SWITCH PAD |
| 3499.401 | 3440 & 3441 PADS FOR PAD-MOUNTED 12KV, 600 AMP, THREE-PHASE SWITCH |
| 3499.402 | 3440A & 3441A PADS FOR PAD PMH-5 12KV, 600 AMP, THREE-PHASE SWITCH |
| 3599.001 | CAPPED SPLICE TERMINATION - 12KV AND BELOW |
| 3599.002 | SWITCH BLADES - ARC STRANGLER |
| 3599.003 | CONTAMINATION PREVENTION INSTALLATION PROCEDURES |
| 3599.101 | PAD-MOUNT SWITCHING CABINET |
| 3599.102 | PAD-MOUNT LOW PROFILE FUSED SWITCHING CABINET |
| 3599.103 | THREE-PHASE PAD-MOUNT FUSE SWITCH |
| 3599.104 | LOW-PROFILE FUSED SECTIONALIZING CABINET - SINGLE-PHASE 7200 VOLTS |
| 3599.105 | IN LINE FUSE SWITCH CABINET - INSTALLATION UNDER 200 AMPS |
| 3599.106 | THREE-PHASE, 200 AMP PAD-MOUNT LOW PROFILE FUSED SWITCHING CABINET - INSTALLATION |
| 3599.107 | LOW PROFILE FUSED SECTIONALIZING CABINET - INSTALLATION |
| 3599.108 | THREE-PHASE 200 AMP, PAD-MOUNT FUSE SWITCH INSTALLATION |
| 3599.109-.110 | FUSE - SECTIONALIZING COMPARTMENT - INSTALLATION UNDER 200 AMPS |
| 3599.111 | THREE-PHASE PAD-MOUNT FUSED SWITCHING CABINET |
| 3599.112 | THREE-PHASE, 200 AMP PAD-MOUNT FUSE SWITCH INSTALLATION |
| 3599.201 | TWO WAY HIGH VOLTAGE TERMINATOR INSTALLATION |
| 3599.202-.204 | THREE-PHASE TERMINATING ENCLOSURE, 12,000 VOLT, 350, 750 OR 1000 KCMIL CABLE |
| 3599.205-.208 | THREE-PHASE TERMINATING ENCLOSURE, 12,000 VOLT, 2/0 CABLE AND ABOVE |
| 3599.209-.212 | SINGLE-PHASE LOW PROFILE CABLE TERMINATOR, 6930 VOLTS |
| 3599.407-.408 | PAD-MOUNTED OIL SWITCH 12KV, 600 AMP, THREE PHASE |

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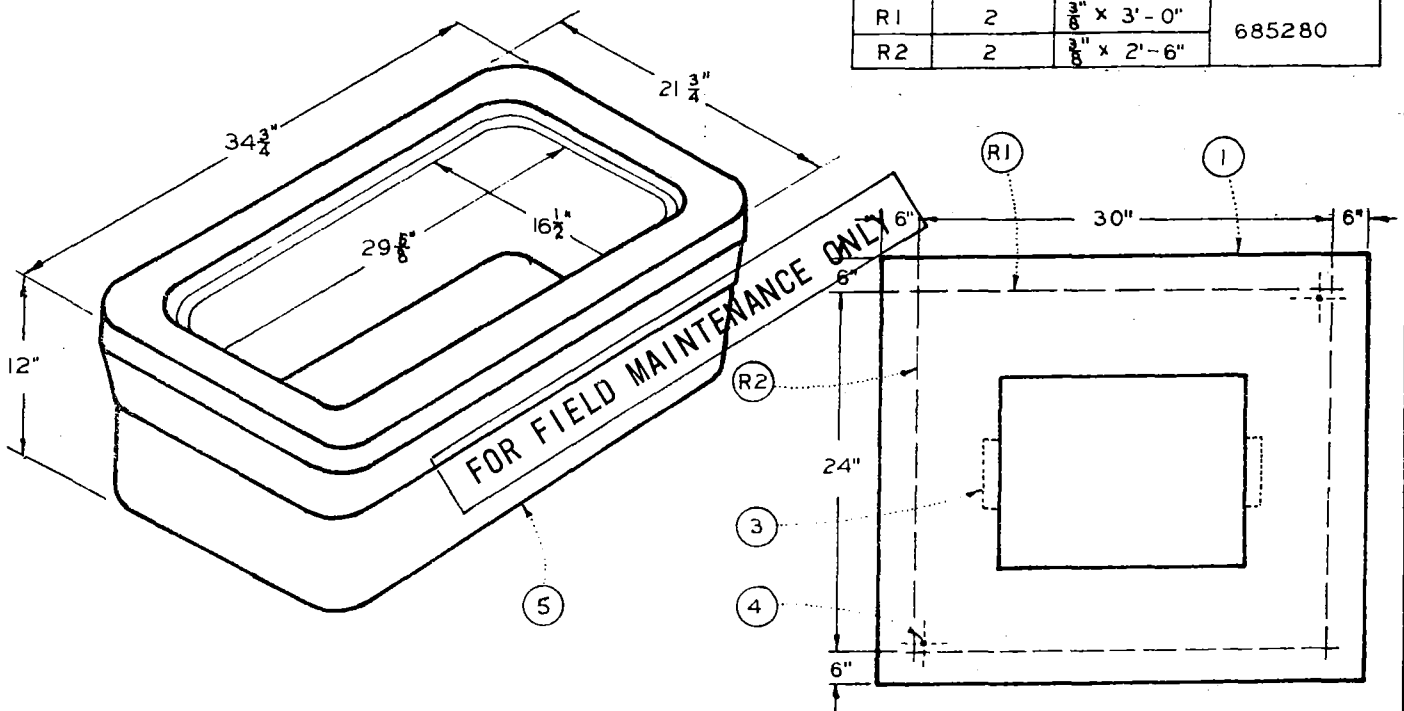
| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
|-----|--------------------|----|------|------|------------|-----|--------|----|------|------|------|
| C | | | | | | F | | | | | |
| B | COMPLETELY REVISED | JK | JS | CZH | 10/16/2019 | E | | | | | |
| A | ORIGINAL ISSUE | JK | JS | CZH | 6/13/2019 | D | | | | | |

| | | | | | |
|-------------------------|---|---|-----------------------------------|--|--------------------------------|
| SHEET 1 OF 1 | Indicates Latest Revision <input checked="" type="checkbox"/> | Completely Revised <input type="checkbox"/> | New Page <input type="checkbox"/> | Information Removed <input type="checkbox"/> | UG LEGACY UGL3401.1 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | |
| | LEGACY UNDERGROUND FIELD MAINTENANCE TABLE OF CONTENTS | | | | |
| | PADS, RETAINING WALLS, CLEARANCES, PAD-MOUNTED SECTIONALIZING EQUIPMENT | | | | |

MAJOR USE: SUPPORT TERMINATOR



| REINFORCING IRON | | | |
|------------------|----------|--------------|------------------------|
| TYPE | QUANTITY | DESCRIPTION | STOCK NO OR CONSTR STD |
| R1 | 2 | 3/8" x 3'-0" | 685280 |
| R2 | 2 | 3/8" x 2'-6" | |



| ITEM | QUANTITY | DESCRIPTION | STOCK NO. OR CONSTR. STD. | PRECAST PAD STOCK NO. |
|------|--------------|--|---------------------------|-----------------------|
| 1 | 2.61 CU. FT. | CONCRETE CLASS "A" 5 1/2 SACK MIX | — | 514272 |
| 2 | 4.1 LBS. | REINFORCING ROD (SEE TABLE ABOVE) | 685280 | |
| 3 | 2 | CHANNEL, CONCRETE INSERT 6"x1 1/8"x 1/8" UNISTRUT, CANESTRUT OR EQUAL | 426280 | |
| 4 | 2 | HANDLING INSERT, 1/2" THREADED GI. | — | |
| 5 | 1 | 17" x 30" HANDHOLE BODY | 3312 | |

NOTES:

- A. THIS PAD MAY BE PRECAST OR Poured IN PLACE, IF Poured IN PLACE OMIT ITEM 4.
- B. ITEM 3, STOCKED IN 12 INCH LENGTHS, TO BE CUT IN FIELD.
- C. FOR EQUIPMENT BARRIER PROTECTION AND CLEARANCE SEE 3481
- D. STACK TWO BOXES WHEN INSTALLING 500 KCMIL OR LARGER CABLES AND WHEN INSTALLING 5" DUCTS.
- E. FOR EQUIPMENT PAD GROUND INSTALLATION SEE 3407.
- F. FOR TERMINATOR PAD NUMBERING SEE 3211

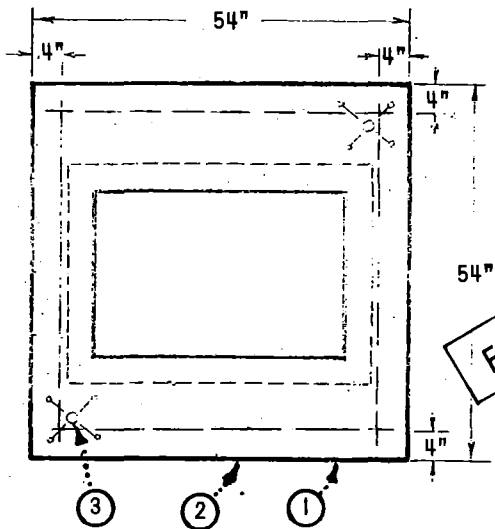
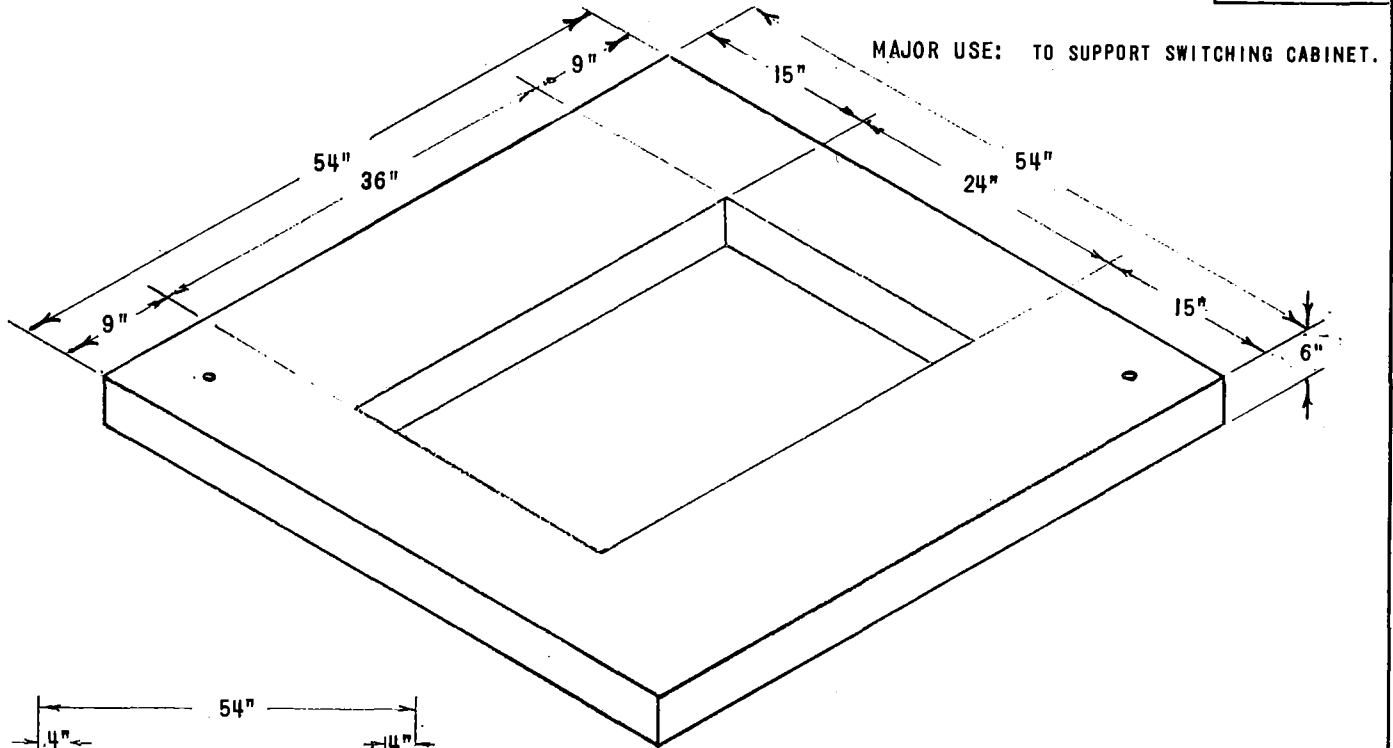
SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

DATE 11-13-73

APPD *[Signature]*

TERMINATOR PAD INSTALLATION

3499.101



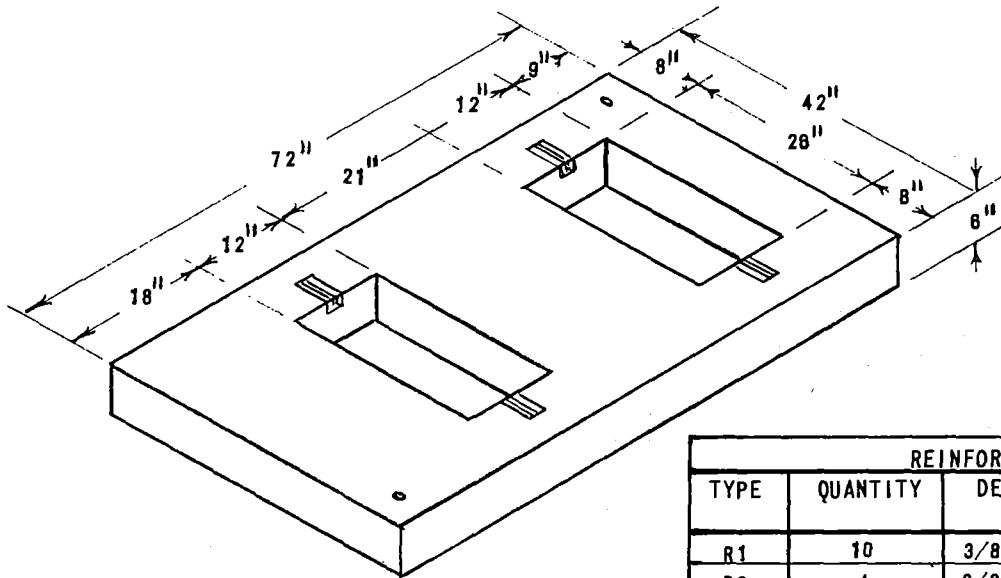
FOR FIELD MAINTENANCE ONLY

| ITEM | QUANTITY | DESCRIPTION | STOCK NO. OR CONSTR. STD. | PRECAST PAD STOCK NO. |
|------|--------------|-------------------------------------|---------------------------|-----------------------|
| 1 | 5.50 CU. FT. | CONCRETE, CLASS "A", 5 1/2 SACK MIX | - | |
| 2 | 8.0 LBS. | REINFORCING ROD, 3/8" X 4'0" (4) | 685280 | 513392 |
| 3 | 2 | HANDLING INSERT, 1" THREADED G.I. | 428288 | |

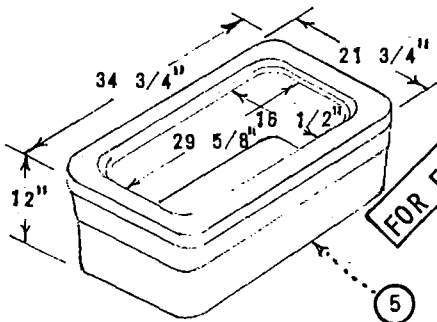
NOTES:

- A. CABINET TO BE ANCHORED AT 4 CORNERS, SEE 3599.101.
- B. THIS PAD MAY BE PRECAST OR POURED IN PLACE, IF POURED IN PLACE OMIT ITEM 3.
- C. FOR SWITCH CABINET PAD INSTALLATION SEE 3599.105.
- D. FOR FUSE SECTIONALIZING COMPARTMENT SEE 3599.109.
- E. FOR FUSE SECTIONALIZING COMPARTMENT SEE 3599.110.
- F. FOR SWITCH CABINET PAD NUMBERING SEE 3211.
- G. FOR SWITCHING CABINET PAD GROUNDING SEE 3407.
- H. FOR SWITCH CABINET BARRIER PROTECTION AND CLEARANCE SEE 3481.

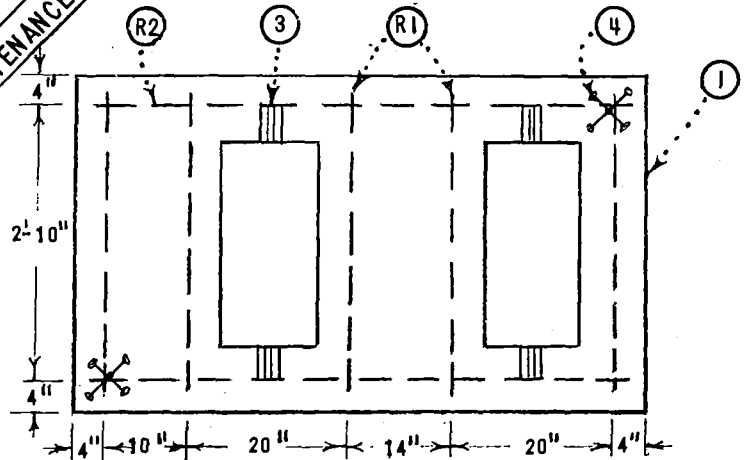
MAJOR USE: TO SUPPORT SWITCHED FUSED CABINETS.



| REINFORCING IRON | | | |
|------------------|----------|--------------|---------------------------|
| TYPE | QUANTITY | DESCRIPTION | STOCK NO. OR CONSTR. STD. |
| R1 | 10 | 3/8" X 3'-2" | 685280 |
| R2 | 4 | 3/8" X 5'-7" | |



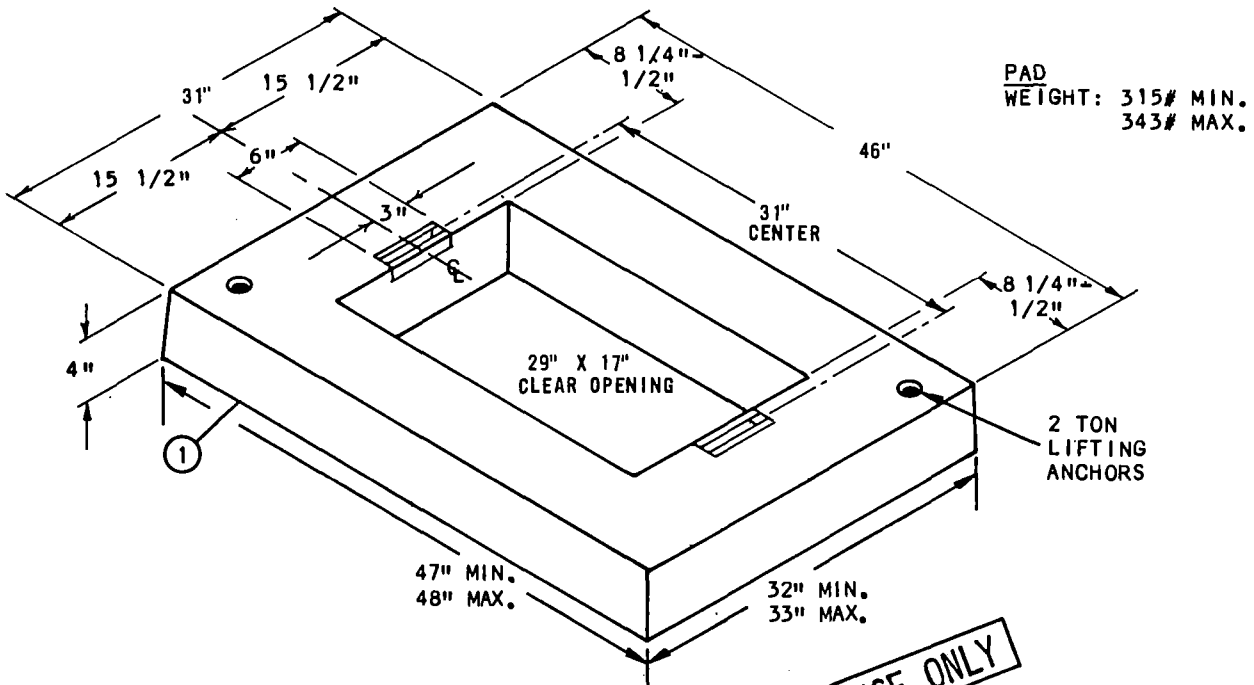
FOR FIELD MAINTENANCE ONLY



| ITEM | QUANTITY | DESCRIPTION | STOCK NO. OR CONSTR. STD. | PRECAST PAD OR STOCK NO. |
|------|--------------|--|---------------------------|--------------------------|
| 1 | 8.5 CU.FT. | CONCRETE, CLASS A, 5 1/2 SACK MIX | - | 513424 |
| 2 | 9.1/18.2 LBS | REINFORCING RODS, SEE TABLE | 685280 | |
| 3 | 4 | CHANNEL, CONCRETE INSERT 4" X 1 5/8" X 7/8" | 426280 | |
| 4 | 2 | HANDLING INSERT, 1/2" THREADED G.I. | - | |
| 5 | 2 | HANDHOLE BODY, 17" X 30" | 3312 | |

- NOTES:
- A. THIS PAD MAY BE PRECAST OR Poured IN PLACE, IF Poured IN PLACE OMIT ITEM 4, AND DECREASE REINFORCING RODS QUANTITY IN HALF.
 - B. ITEM 3, STOCKED IN 12 INCH LENGTHS, TO BE CUT IN FIELD.
 - C. FOR FUSED SWITCH CABINET INSTALLATION SEE FMO 3599.102, 3599.108 & 3599.112.
 - D. FOR FUSED SWITCH CABINET PAD NUMBERING SEE 3211.
 - E. FOR FUSED SWITCH CABINET BARRIER PROTECTION SEE 3481.
 - F. FOR FUSED SWITCH CABINET GROUNDING SEE 3407.

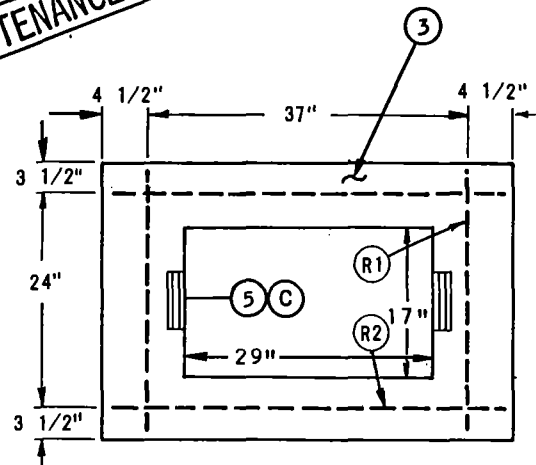
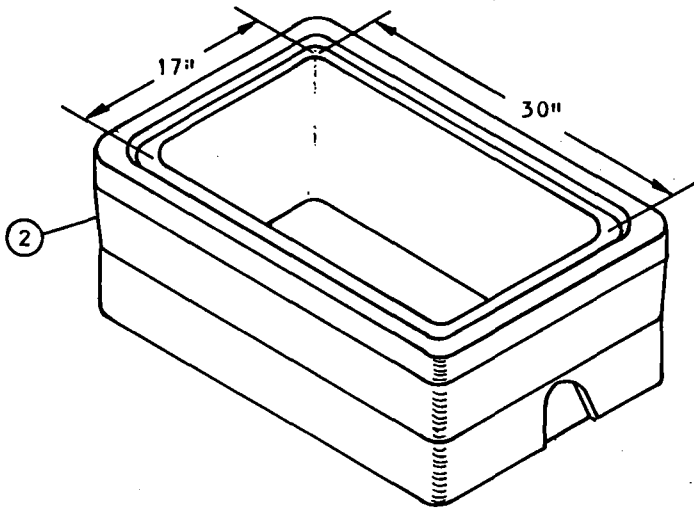
SCOPE: THIS STANDARD SHOWS THE EQUIPMENT PAD, HANDHOLE AND CONDUIT PLACEMENT USED WITH THE 30 CABLE TERMINATING ENCLOSURE, 350 KCMIL AND LARGER (STANDARD 3520).



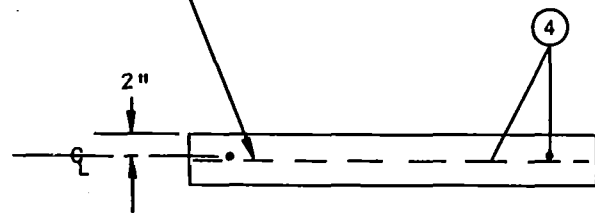
FOR FIELD MAINTENANCE ONLY

3312 HANDHOLE

WEIGHT: 160# MIN. 185# MAX.



- STEEL DETAIL FOR POURED IN PLACE CENTER STEEL IN CONCRETE POUR.



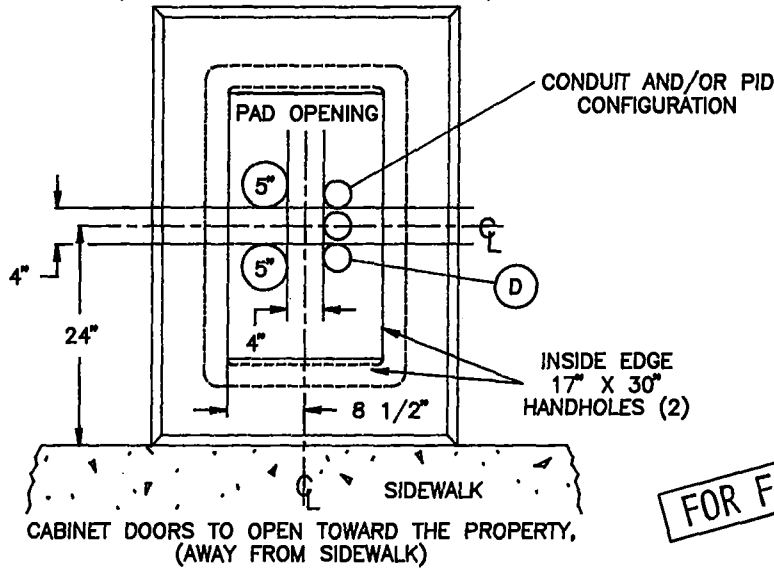
3499.104
SUPERCEDES
3413 (1-1-91)

SDG&E ELECTRIC STANDARDS

TERMINATOR PAD

DATE 1-1-91
APPD *[Signature]*

3520 INSTALLATION
TOP VIEW
3 PHASE CABLE TERMINATING ENCLOSURE
(350, 750 OR 1000 KCMIL CABLE)



| REINFORCING RODS (4) | | |
|----------------------|----------|-------------|
| TYPE | QUANTITY | DESCRIPTION |
| R1 | 2 | 1/2" X 28" |
| R2 | 2 | 1/2" X 43" |

FOR FIELD MAINTENANCE ONLY

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD OR PAGE NO. | STOCK NUMBER |
|------|--|--------------|-------------------------|--------------|
| 1 | EQUIPMENT PAD | 1 | 3413 | 514220 |
| 2 | HANDHOLE, 17" X 30" | 2 | 3312 | 162426 |
| 3 | CONCRETE CLASS 'A' 5 1/2" SACK MIX | 3.24 CU. FT. | - | - |
| 4 | #4 REINFORCING RODS 1/2" (SEE TABLE ABOVE) | 11'-10" | - | 685152 |
| 5 | CHANNEL, CONCRETE INSERTS, 6" X 1 5/8" X 7/8", UNISTRUT OR EQUAL | 2 | - | 426288 |
| 6 | GALVANIZED PAINT | AS REQ'D | - | 516064 |

INSTALLATION:

- A. THIS PAD MAY BE PRECAST OR POURED IN PLACE. TOP OF PAD MUST BE FINISHED FLAT.
- B. WHEN PAD IS POURED IN PLACE, CONDUIT OPENINGS SHALL BE FORMED SO THAT THE CONDUIT STUBS ARE NOT CONCRETE ENCASED.
- (C) IF POURED IN PLACE, ITEM 5 TO BE CUT IN FIELD. APPLY GALVANIZED PAINT TO EXPOSED ENDS.
- (D) TERMINATE CONDUITS 3" ABOVE THE BOTTOM OF THE HANDHOLE.

REFERENCE:

- H. SEE STANDARD 3211 FOR PAD IDENTIFICATION.
- I. SEE STANDARD 3481 FOR BARRIER PROTECTION AND CLEARANCE.
- J. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- K. SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT.
- L. SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- M. SEE STANDARD 3487 FOR RETAINING WALLS.
- N. SEE STANDARD 3520 FOR EQUIPMENT OR INSTALLATION DETAILS.
- O. SEE STANDARD 4512 FOR PAD GROUNDING.
- P. SEE STANDARD 4514 FOR GROUNDING TELCO CONDUCTOR IN PAD-MOUNTED EQUIPMENT.

SDG&E ELECTRIC STANDARDS

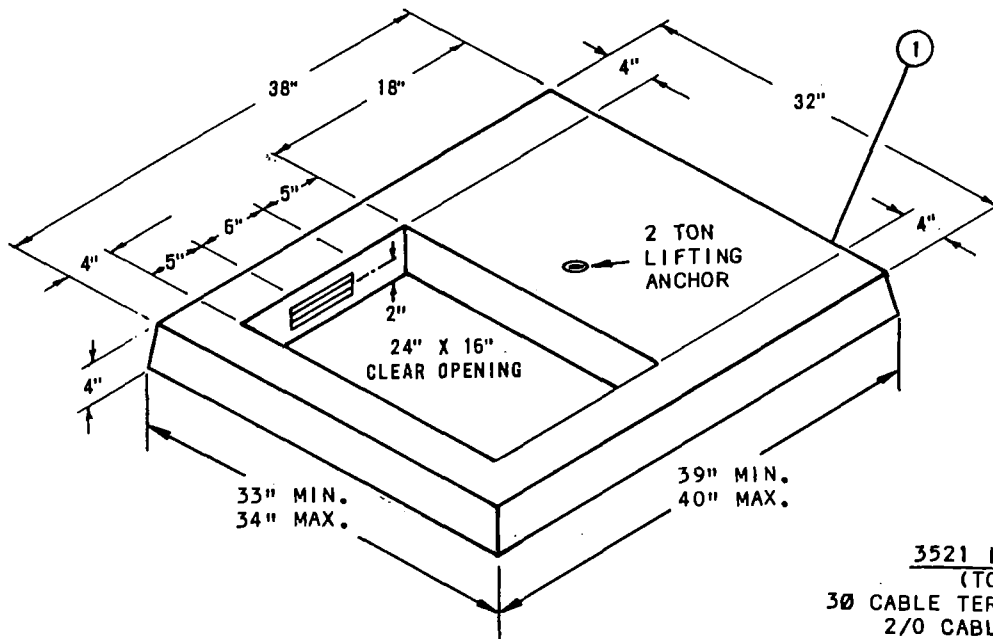
DATE 1-1-91

APPD *JWB/RD*

TERMINATOR PAD

3499.105

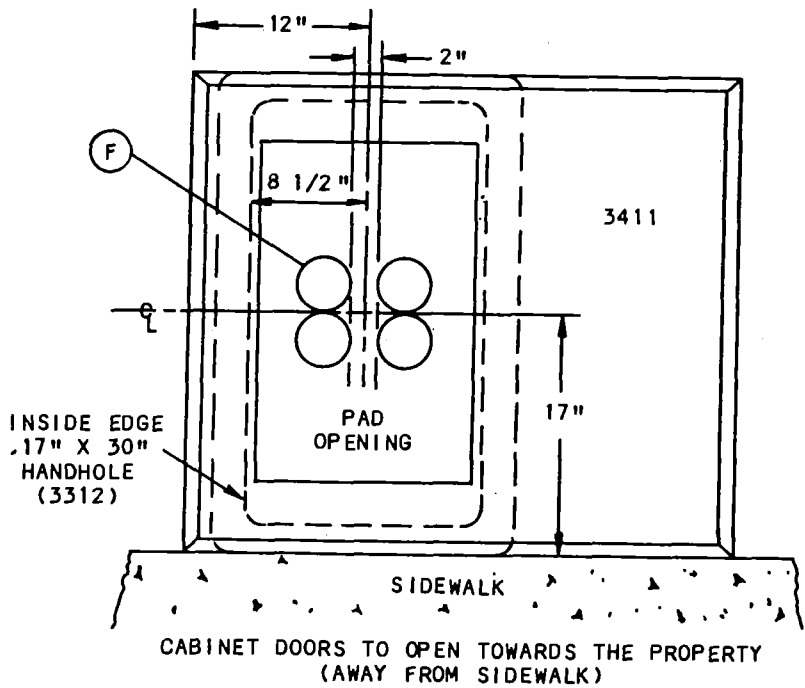
SCOPE: THIS STANDARD SHOWS THE EQUIPMENT PAD, HANDHOLE AND CONDUIT PLACEMENT USED WITH THE 3Ø CABLE TERMINATING ENCLOSURE, (2/0 AND SMALLER).



PAD
WEIGHT: 325# MAX.

FOR FIELD MAINTENANCE ONLY

3521 INSTALLATION
(TOP VIEW)
3Ø CABLE TERMINATING ENCLOSURE
2/0 CABLE AND SMALLER



BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD | STOCK NUMBER |
|------|---------------------|----------|-----------|--------------|
| 1 | EQUIPMENT PAD | 1 | 3411 | 514274 |
| 2 | HANDHOLE, 17" X 30" | 1 | 3312 | 162426 |

SDG&E ELECTRIC STANDARDS

3499.106

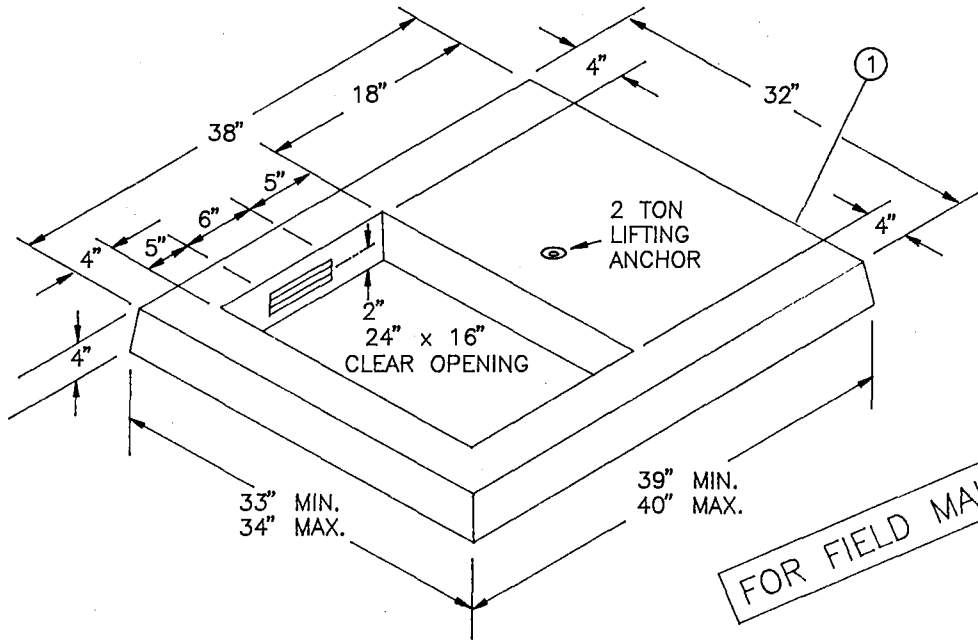
EQUIPMENT PAD

DATE 1-1-91

APPD *[Signature]*

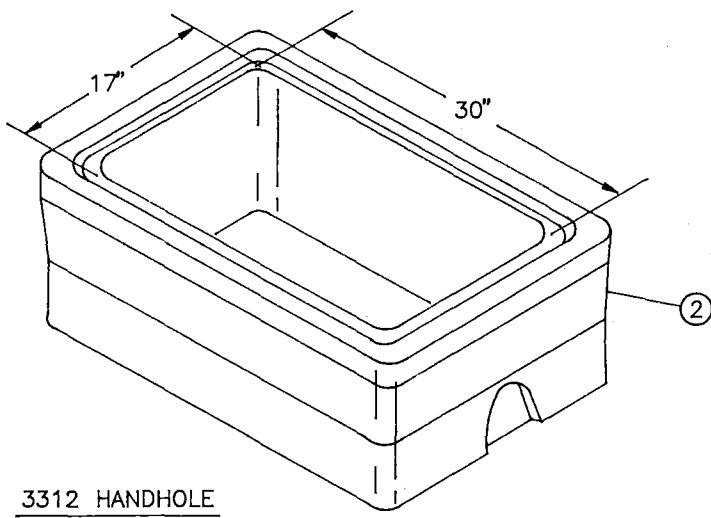
SCOPE: THIS STANDARD SHOWS THE EQUIPMENT PAD, HANDHOLE AND CONDUIT PLACEMENT USED WITH THE SINGLE-PHASE FUSED SWITCHING CABINET AND SINGLE-PHASE CABLE TERMINATOR.

3411.1

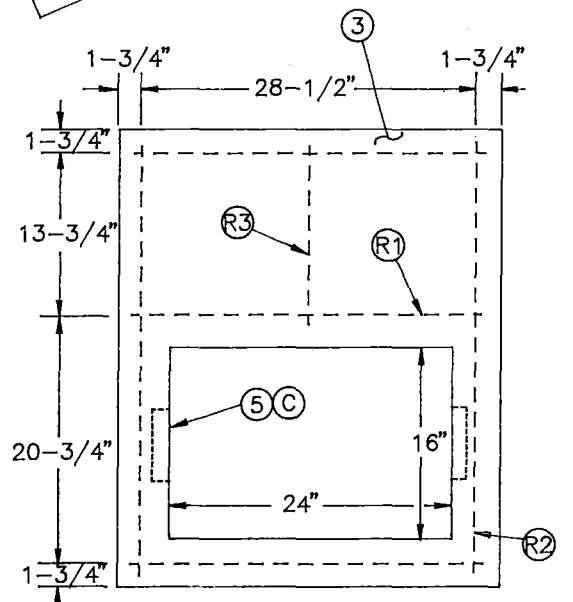


PAD
WEIGHT: 325# MAX.

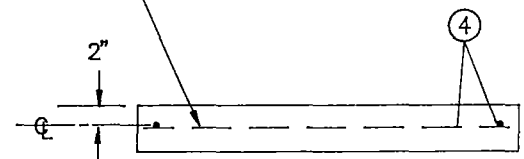
FOR FIELD MAINTENANCE ONLY



3312 HANDHOLE
WEIGHT: 160# MIN.
185# MAX.



- STEEL DETAIL FOR POURED-IN-PLACE. CENTER STEEL IN CONCRETE POUR.



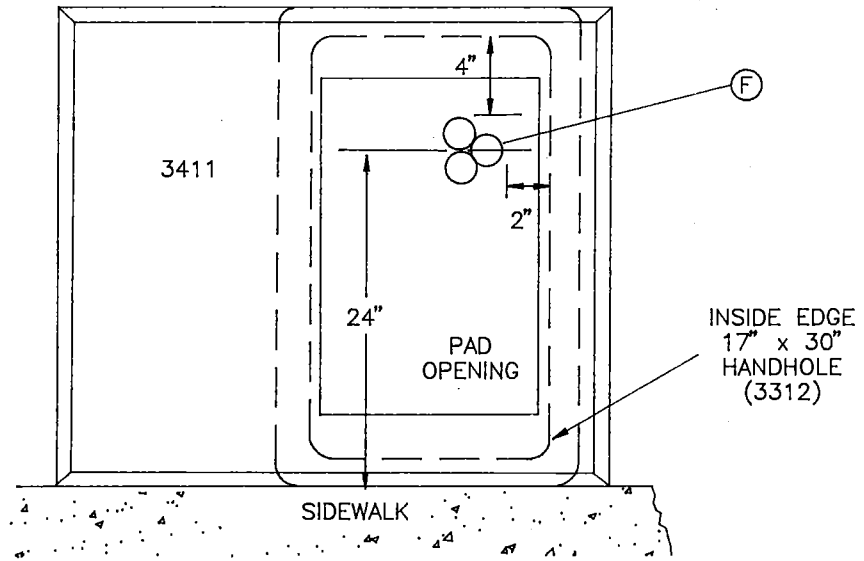
SDG&E ELECTRIC STANDARDS

DATE 1-1-96
APPD *[Signature]*

EQUIPMENT PAD

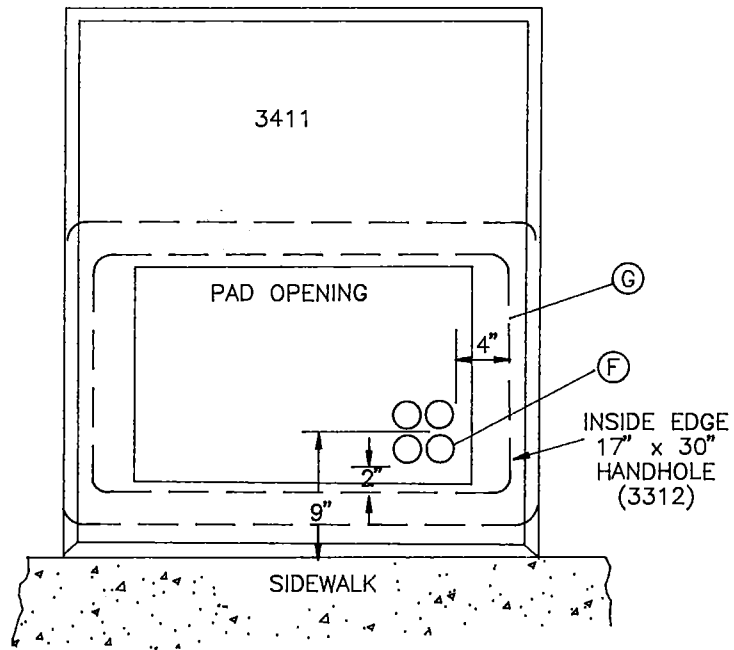
3499.107

3512 INSTALLATION
(TOP VIEW)
1Ø FUSED SWITCHING
CABINET



FOR FIELD MAINTENANCE ONLY

3522 INSTALLATION
(TOP VIEW)
1Ø CABLE TERMINATOR
WITH CABLE TAP



SDG&E ELECTRIC STANDARDS

DATE 1-1-96

APPD *[Signature]*

EQUIPMENT PAD

3499.108

| REINFORCING RODS (C) | | | |
|----------------------|----------|-------------|-----------|
| TYPE | QUANTITY | DESCRIPTION | STOCK NO. |
| R1 | 3 | 3/8" X 30" | 685280 |
| R2 | 2 | 3/8" X 36" | |
| R3 | 1 | 3/8" X 15" | |

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNITS |
|------|---|--------------|-------------------------|--------------|----------------|
| 1 | EQUIPMENT PAD | 1 | 3411 | 514274 | FC1PAD |
| 2 | HANDHOLE, 17" X 30" | 1 | 3312 | 162426 | TERM-T |
| 3 | CONCRETE CLASS 'A' 5 1/2" SACK MIX | 1.93 CU. FT. | - | - | |
| 4 | #3 REINFORCING RODS 3/8" (SEE TABLE ABOVE) | 13.5 FT. | - | 685280 | |
| 5 | CHANNEL, CONCRETE INSERT, 6" X 1 5/8" X 7/8", UNISTRUT OR EQUAL (C) | 2 | - | 426288 | |
| 6 | GALVANIZED PAINT (C) | AS REQ'D | - | 516064 | |

INSTALLATION:

- A. THIS PAD MAY BE PRECAST OR POURED IN PLACE. TOP OF PAD MUST BE FINISHED FLAT.
- B. WHEN PAD IS POURED IN PLACE, CONDUIT OPENINGS SHALL BE FORMED SO THAT THE CONDUIT STUBS ARE NOT CONCRETE ENCASED.
- (C) IF POURED IN PLACE, ITEM 5 TO BE CUT IN FIELD AND APPLY GALVANIZED PAINT TO EXPOSED ENDS.
- (D) TERMINATE CONDUITS FLUSH WITH THE TOP OF PAD (WITHOUT HANDHOLE).
- (F) TERMINATE CONDUITS 3" ABOVE BOTTOM OF HANDHOLE (PAD WITH HANDHOLE).

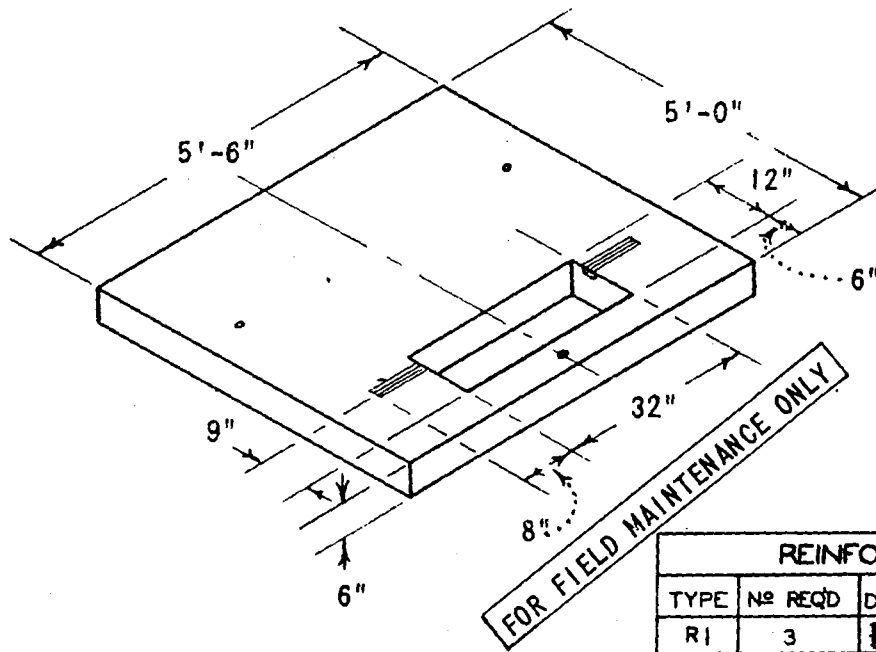
REFERENCE:

- H. SEE STANDARD 3211 FOR PAD IDENTIFICATION.
- I. SEE STANDARD 3481 FOR BARRIER PROTECTION AND CLEARANCE.
- J. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- K. SEE STANDARD 3484 OR 3487 RETAINING WALL REQUIREMENTS.
- L. SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- M. SEE STANDARD 3512, 3521, OR 3522 FOR EQUIPMENT OR INSTALLATION DETAILS.
- N. SEE STANDARD 4510 FOR PREFERRED OR ALTERNATE TRENCH GROUND WIRE.
- O. SEE STANDARD 4512 FOR EQUIPMENT GROUNDING INSTALLATION.
- P. SEE STANDARD 4514 FOR GROUNDING TELCO CONDUCTOR IN PAD-MOUNTED EQUIPMENT.

FOR FIELD MAINTENANCE ONLY

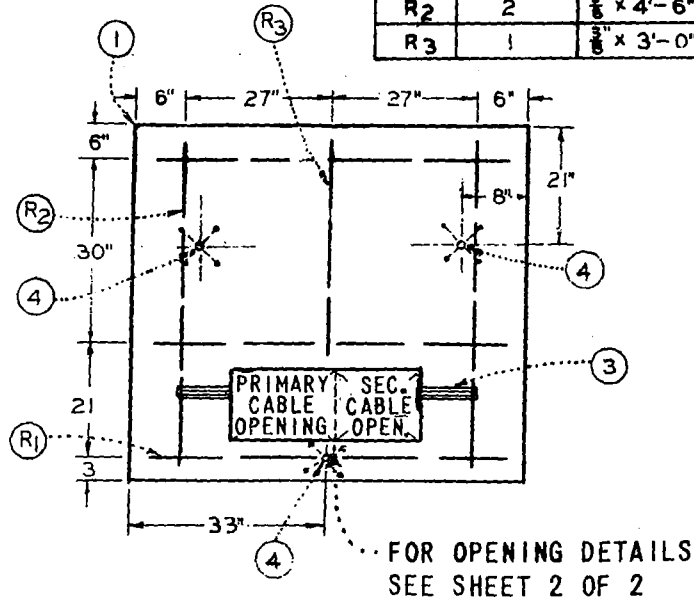
| | | |
|--|--------------------------|----------|
| DATE 1-1-96 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS | 3499.109 |
| | EQUIPMENT PAD | |

MAJOR USE: TO SUPPORT LIVE FRONT 75, 150, 225, 300 & 500KVA THREE PHASE PADMOUNTED TRANSFORMERS ON PAGE 3702.



| REINFORCING IRON | | | |
|------------------|---------|-------------------------|--------------------------|
| TYPE | Nº REQD | DESCRIPTION | STOCK Nº OR CONSTR. STD. |
| R1 | 3 | $\frac{3}{8}$ " x 5'-0" | 685280 |
| R2 | 2 | $\frac{3}{8}$ " x 4'-6" | |
| R3 | 1 | $\frac{3}{8}$ " x 3'-0" | |

WEIGHT



| ITEM | QUANTITY | DESCRIPTION | STOCK Nº OR CONSTR. STD. | STOCK NO. PRE-CAST PAD |
|------|--------------|---|--------------------------|------------------------|
| 1 | 12.5 CU. FT. | CONCRETE, CLASS "A", 5½ SACK MIX | — | 513996 |
| 2 | 10.2 LBS. | REINFORCING RODS SEE TABLE ABOVE | 685280 | |
| 3 | 2 | CHANNEL CONCRETE INSERT UNISTRUT CANESTRUT OR EQUAL 8" x 1½" x ½" | 426288 | |
| 4 | 3 | HANDLING INSERTS, 1" THREADED G.I. | — | |

NOTES:

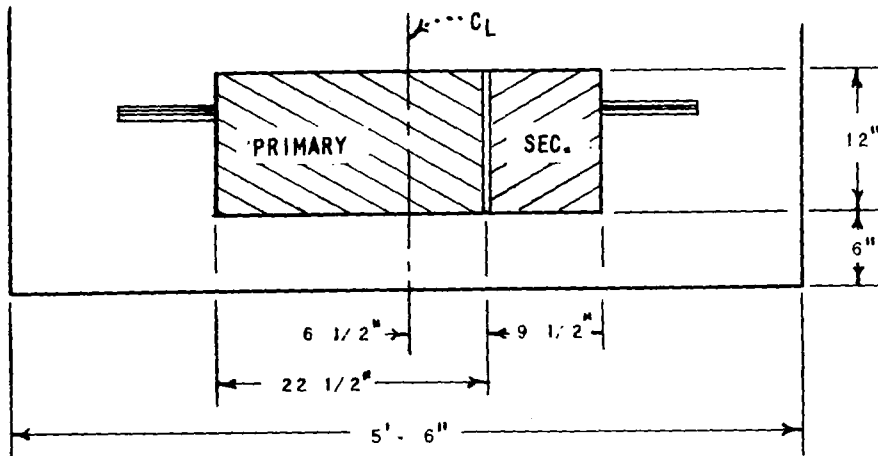
- A. ABOVE PAD MAY BE PRECAST OR POURED IN PLACE. IF POURED IN PLACE OMIT ITEM 4.
- B. CONDUIT OPENINGS TO BE FORMED SO THAT RISER STUBS ARE NOT CONCRETE ENCASED.
- C. FOR TRANSFORMER PAD GROUNDING INSTALLATION SEE 3407.
- D. FOR TRANSFORMER PAD NUMBERING SEE 3211.
- E. FOR TRANSFORMER BARRIER PROTECTION SEE 3481.

SDG&E ELECTRIC STANDARDS

DATE 6-1-75
 APPD *JCH*

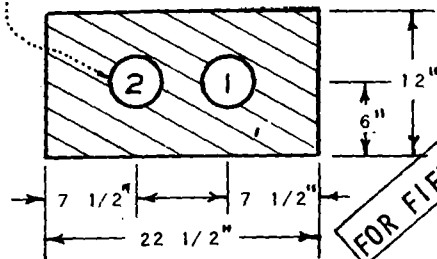
THREE PHASE TRANSFORMER PAD INSTALLATION

3499.201



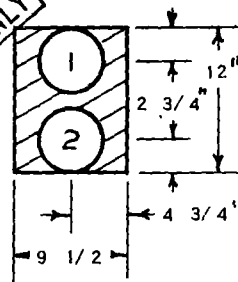
PLAN VIEW OPENINGS

WHEN REQUIRED OR DESIRED



PRIMARY OPENING

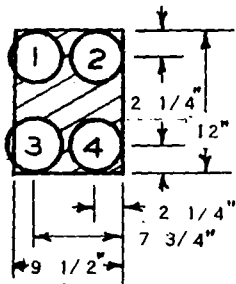
FOR FIELD MAINTENANCE ONLY



SECONDARY OPENING

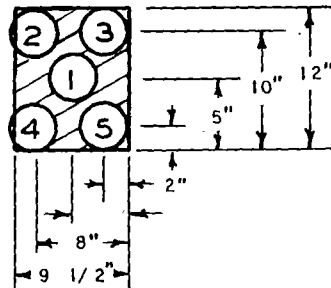
2 - 4" CONDUITS, 4 1/2" O.D. WITH 2" SPACING

2 - 5" CONDUITS, 5 1/2" O.D. WITH 1" SPACING



SECONDARY OPENING

4 - 4" CONDUITS, 4 1/2" O.D. WITH 1" SPACING AND 1/2" OVERHANG INTO PRIMARY SIDE

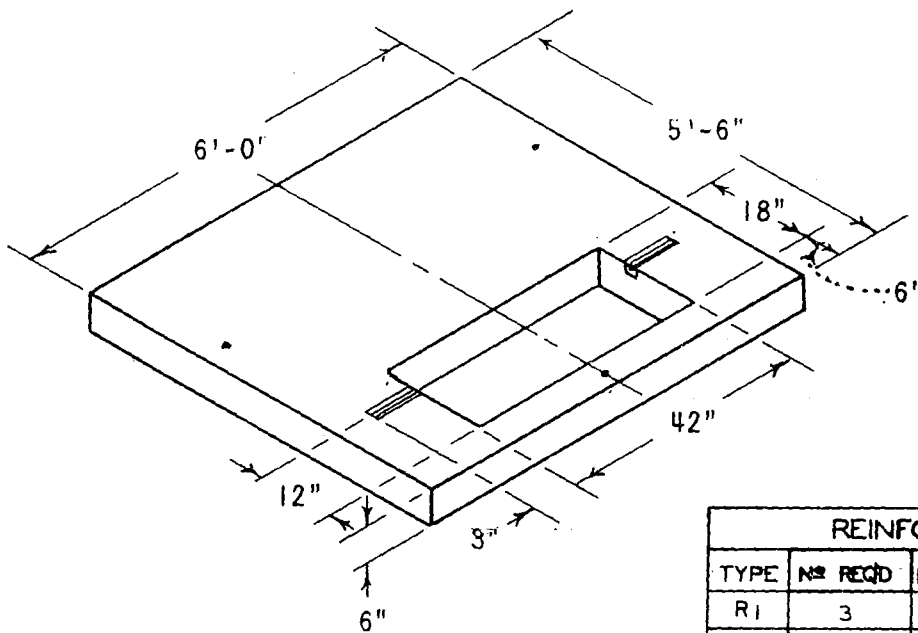


SECONDARY OPENING

5 - 3 1/2" CONDUITS, 4" O.D. WITH 1" SPACING AND 1/2" OVERHANG INTO PRIMARY SIDE

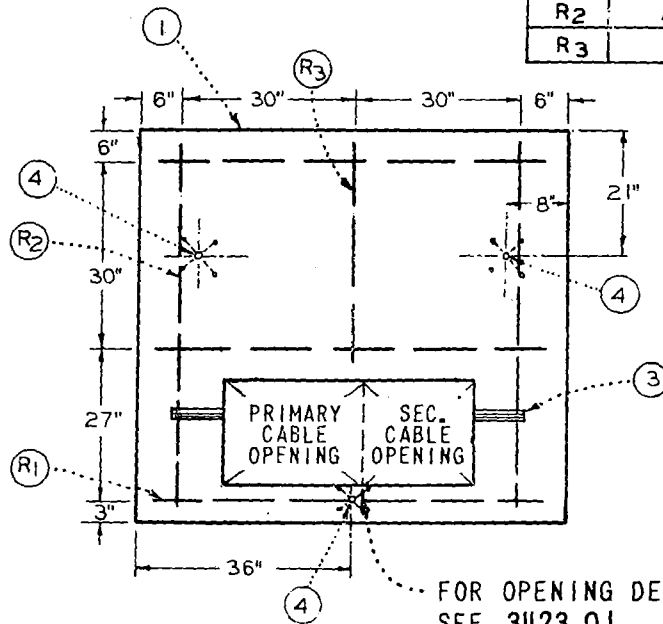
NOTES:

1. PRIMARY AND SECONDARY OPENINGS WITH MAXIMUM SIZE AND NUMBER OF SECONDARY CONDUITS ILLUSTRATED.
2. CONDUIT OPENINGS TO BE FORMED SO THAT RISER STUBS ARE NOT CONCRETE ENCASED.
3. WHEN NUMBER OF REQUIRED CONDUITS IS LESS THAN MAXIMUM SHOWN ON SKETCHES, INSTALL CONDUITS IN NUMBERED SEQUENCE AS SHOWN.



WEIGHT
2100#

| REINFORCING IRON | | | |
|------------------|----------|-------------------------|---------------------------|
| TYPE | NO. REQD | DESCRIPTION | STOCK NO. OR CONSTR. STD. |
| R1 | 3 | $\frac{3}{8}$ " x 5'-6" | 685280 |
| R2 | 2 | $\frac{3}{8}$ " x 5'-0" | |
| R3 | 1 | $\frac{3}{8}$ " x 3'-0" | |



FOR FIELD MAINTENANCE ONLY

| ITEM | QUANTITY | DESCRIPTION | STOCK NO. OR CONSTR. STD. | STOCK NO. PRE-CAST PAD |
|------|------------|--|---------------------------|------------------------|
| 1 | 14 CU. FT. | CONCRETE, CLASS "A", 5½ SACK MIX | — | 514000 |
| 2 | LBS | REINFORCING RODS SEE TABLE ABOVE | 685280 | |
| 3 | 2 | CHANNEL CONCRETE INSERT 8" x 1½" x 8" (UNISTRUT CANESTRUT OR EQUAL) | 426288 | |
| 4 | 3 | HANDLING INSERTS, 1" THREADED G.I. | — | |

NOTES:

- A. ABOVE PAD MAY BE PRECAST OR POURED IN PLACE, IF POURED IN PLACE OMIT ITEM 4.
- B. CONDUIT OPENINGS TO BE FORMED SO THAT RISER STUBS ARE NOT CONCRETE ENCASED.
- C. FOR TRANSFORMER PAD GROUNDING INSTALLATION SEE 3407.
- D. FOR TRANSFORMER PAD NUMBERING SEE 3211.
- E. FOR TRANSFORMER BARRIER PROTECTION SEE 3481.
- F. FOR PAD CLEARANCES SEE PAGE 3483.

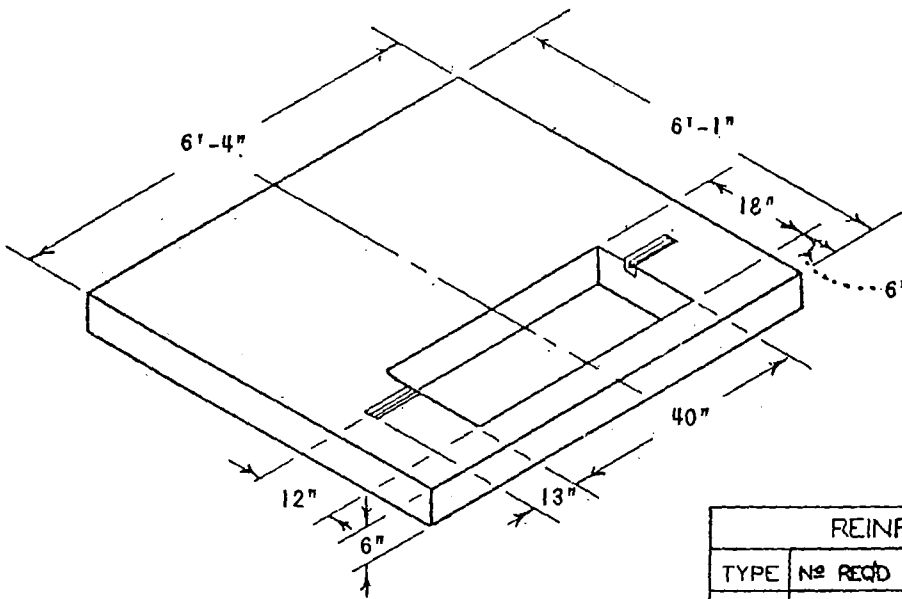
SDG&E ELECTRIC STANDARDS

DATE 10-10-75
APPD *JWK*

THREE PHASE TRANSFORMER PAD INSTALLATION
75 THRU 500 KVA

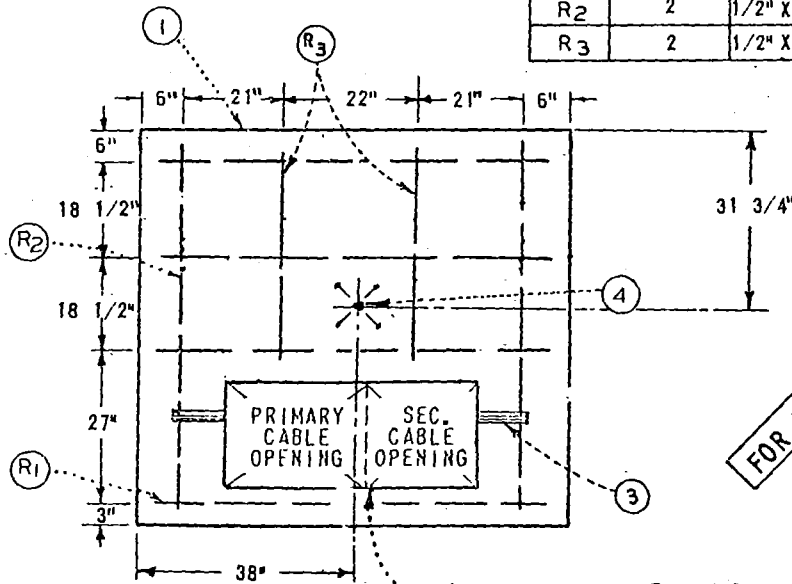
3499.203

PREFERRED



WEIGHT
2430#

| REINFORCING IRON | | | |
|------------------|---------------------|-----------------|--------------------------------------|
| TYPE | N ^o REQD | DESCRIPTION | STOCK N ^o OR CONSTR. STD. |
| R1 | 4 | 1/2" X 5' - 10" | 685152 |
| R2 | 2 | 1/2" X 5' - 5" | |
| R3 | 2 | 1/2" X 3' - 7" | |



FOR FIELD MAINTENANCE ONLY

FOR OPENING DETAILS
SEE 3423.02

| ITEM | QUANTITY | DESCRIPTION | STOCK N ^o OR CONSTR. STD. | STOCK NO. PRE-CAST PAD |
|------|------------|--|--------------------------------------|------------------------|
| 1 | 17 CU. FT. | CONCRETE, CLASS "A", 5 1/2 SACK MIX | — | — |
| 2 | 27.6 LBS | REINFORCING RODS SEE TABLE ABOVE | 685152 | |
| 3 | 2 | CHANNEL CONCRETE INSERT UNISTRUT CANESTRUT OR EQUAL | 426288 | |
| 4 | 1 | 2 TON RISS LIFTER | — | |

NOTES:

- A. ABOVE PAD MAY BE PRECAST OR POURED IN PLACE, IF POURED IN PLACE OMIT ITEM 4.
- B. CONDUIT OPENINGS TO BE FORMED SO THAT RISER STUBS ARE NOT CONCRETE ENCASED.
- C. FOR TRANSFORMER PAD GROUNDING INSTALLATION SEE 3407.
- D. FOR TRANSFORMER PAD NUMBERING SEE 3211.
- E. FOR TRANSFORMER BARRIER PROTECTION SEE 3481.
- F. FOR PAD CLEARANCES SEE PAGE 3483.

3499.204

SDG&E ELECTRIC STANDARDS

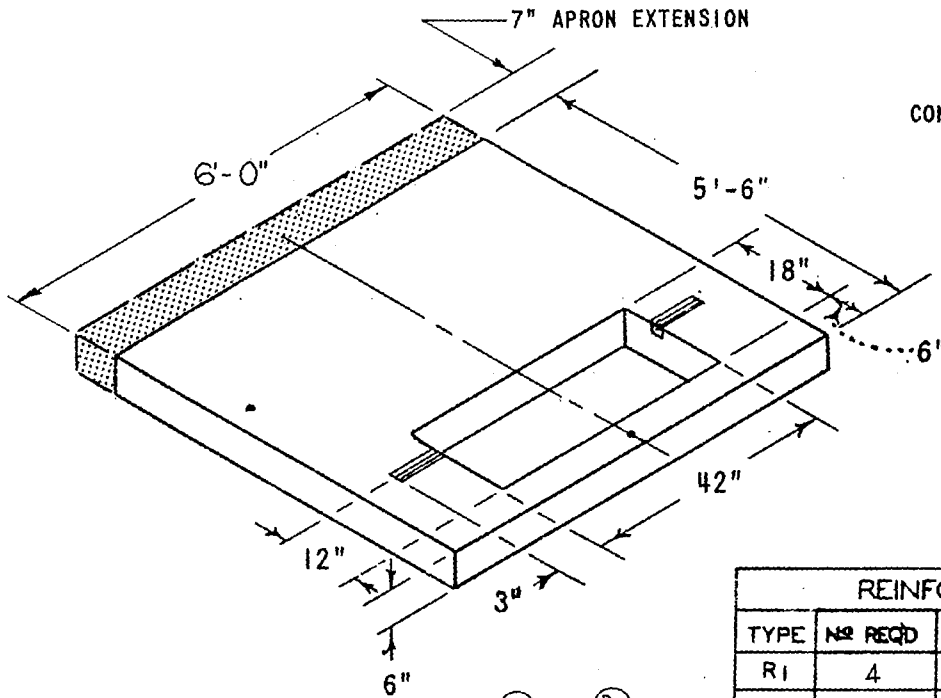
PREFERRED 3Ø TRANSFORMER PAD INSTALLATION
750 AND 1000 KVA

DATE 10-10-75

APPD

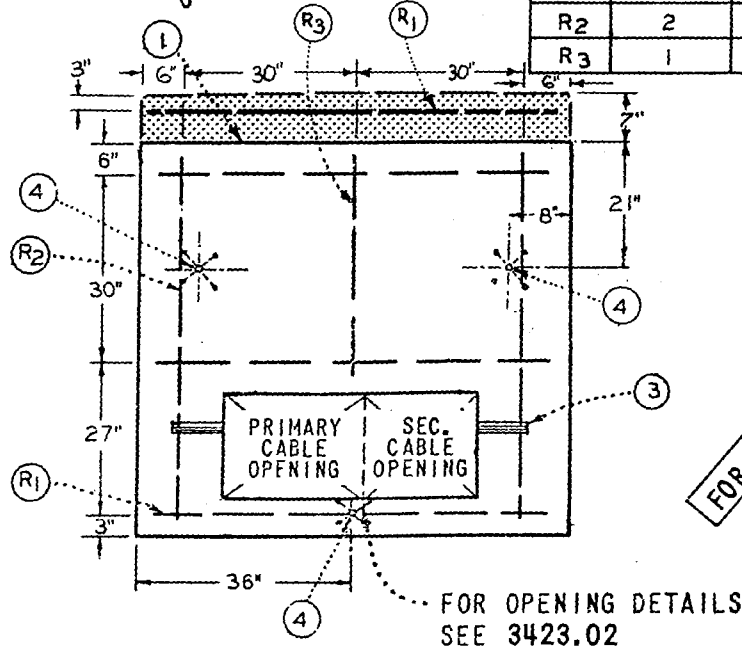
AWK

ALTERNATE
FOR APRON EXTENSION
 CONTACT AREA IS TO BE THOROUGHLY
 CLEANED BEFORE POURING.



WEIGHT
 2100#

| REINFORCING IRON | | | |
|------------------|---------|--------------|--------------------------|
| TYPE | NO REQD | DESCRIPTION | STOCK NO OR CONSTR. STD. |
| R1 | 4 | 1/2" x 5'-6" | 685280 |
| R2 | 2 | 1/2" x 5'-0" | |
| R3 | 1 | 1/2" x 3'-0" | |



FOR FIELD MAINTENANCE ONLY

FOR OPENING DETAILS
 SEE 3423.02

| ITEM | QUANTITY | DESCRIPTION | STOCK NO OR CONSTR. STD. | STOCK NO. PRE-CAST PAD |
|------|------------|--|--------------------------|------------------------|
| 1 | 14 CU. FT. | CONCRETE, CLASS "A", 5 1/2 SACK MIX | — | 514000 |
| 2 | LBS | REINFORCING RODS SEE TABLE ABOVE | 685280 | |
| 3 | 2 | CHANNEL CONCRETE INSERT UNISTRUT CANESTRUT OR EQUAL 8x1 1/2x 1/2 | 426288 | |
| 4 | 3 | HANDLING INSERTS, 1" THREADED G.I. | — | |

NOTES:

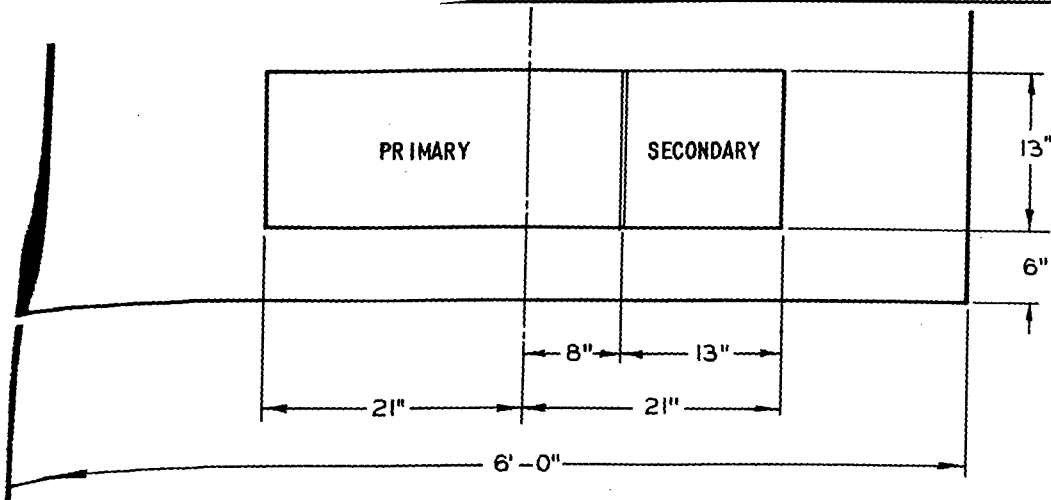
- A. IF PAD IS TO BE POURED INPLACE SEE 'PREFERRED THREE PHASE TRANSFORMER PAD INSTALLATION'
- B. CONDUIT OPENINGS TO BE FORMED SO THAT RISER STUBS ARE NOT CONCRETE ENCASED.
- C. FOR TRANSFORMER PAD GROUNDING INSTALLATION SEE 3407.
- D. FOR TRANSFORMER PAD NUMBERING SEE 3211.
- E. FOR TRANSFORMER BARRIER PROTECTION SEE 3481.
- F. THIS PAGE IS TO BE USED ONLY IF A 6'-0" X 5'-6" (AS SHOWN ABOVE) PRECAST PAD IS USED.
- G. FOR PAD CLEARANCES SEE PAGE 3483.

DATE 10-10-75
 APPD *[Signature]*

SDG&E ELECTRIC STANDARDS

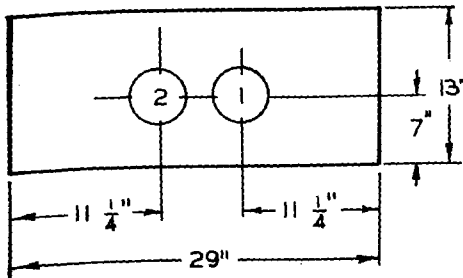
**ALTERNATE 3Ø TRANSFORMER PAD INSTALLATION
 WITH 7" APRON EXTENSION
 750 AND 1000 KVA**

3499.

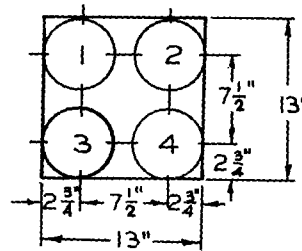


PLAN VIEW TRANSFORMER OPENINGS

WHEN REQUIRED OR DESIRED

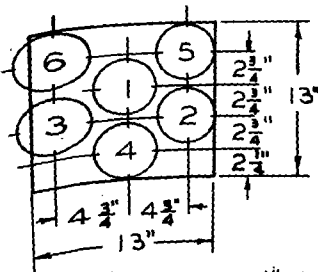


2-4" CONDUITS, 4 1/2" O.D. WITH 2" SPACING
PRIMARY TRANSFORMER OPENING

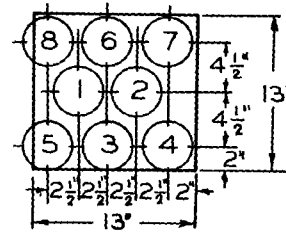


4-5" CONDUITS 5 1/2" O.D.
SECONDARY TRANSFORMER OPENING

FOR FIELD MAINTENANCE ONLY



8-3 1/2" CONDUITS 4" O.D. WITH 1" SPACING
AND 1" OVERHANG INTO PRIMARY SIDE
SECONDARY TRANSFORMER OPENING



8-3 1/2" CONDUITS 4" O.D. WITH 1" SPACINGS
AND 1" OVERHANG INTO PRIMARY SIDE
SECONDARY TRANSFORMER OPENING

NOTES:

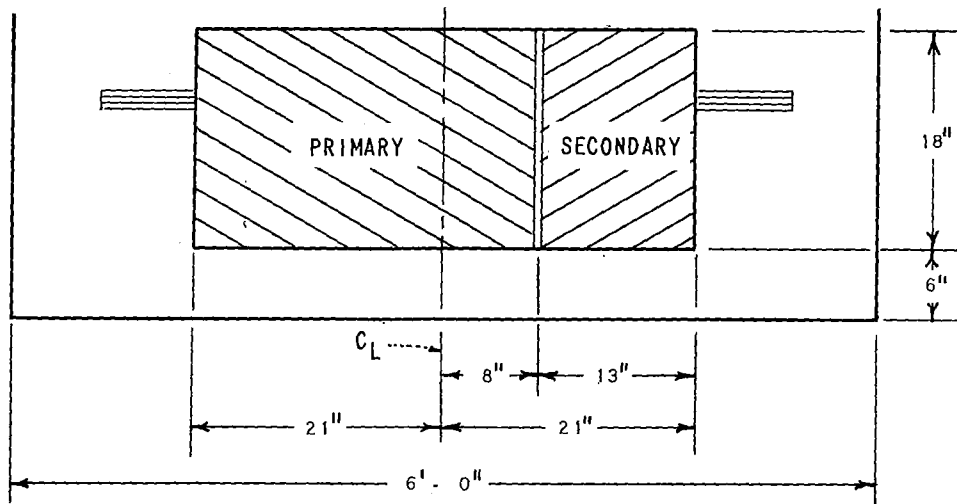
1. PRIMARY AND SECONDARY OPENINGS WITH MAXIMUM SIZE AND NUMBER OF SECONDARY CONDUITS ILLUSTRATED.
2. CONDUIT OPENINGS TO BE FORMED SO THAT RISER STUBS ARE NOT CONCRETE ENCASED.
3. WHEN NUMBER OF REQUIRED CONDUITS IS LESS THAN MAXIMUM SHOWN ON SKETCHES, INSTALL CONDUITS IN NUMBERED SEQUENCE AS SHOWN.

SDG&E ELECTRIC STANDARDS

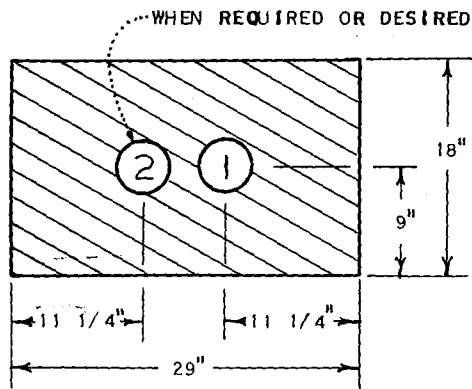
THREE PHASE TRANSFORMER PAD INSTALLATION
75 THRU 500 KVA

9.206

DATE 10-10-75
APPD *J.W.K.*

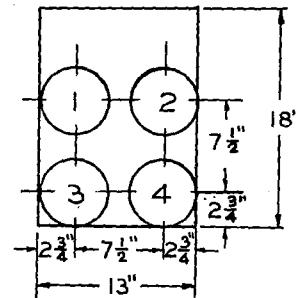


PLAN VIEW OPENINGS



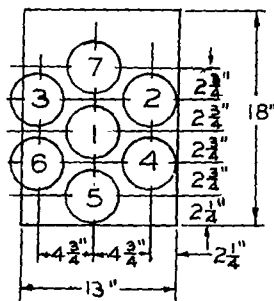
2 - 4" CONDUITS, 4 1/2" O.D. WITH 2" SPACING

PRIMARY OPENING



4-5 CONDUITS 5 1/2" O.D.

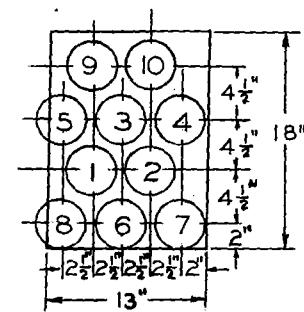
SECONDARY OPENING



7-4" CONDUITS 4 1/2" O.D. WITH 1" SPACING AND 1" OVERHANG INTO PRIMARY SIDE

SECONDARY OPENING

FOR FIELD MAINTENANCE ONLY



10-3 1/2" CONDUITS 4" O.D. WITH 1" SPACINGS AND 1" OVERHANG INTO PRIMARY SIDE

SECONDARY OPENING

NOTES:

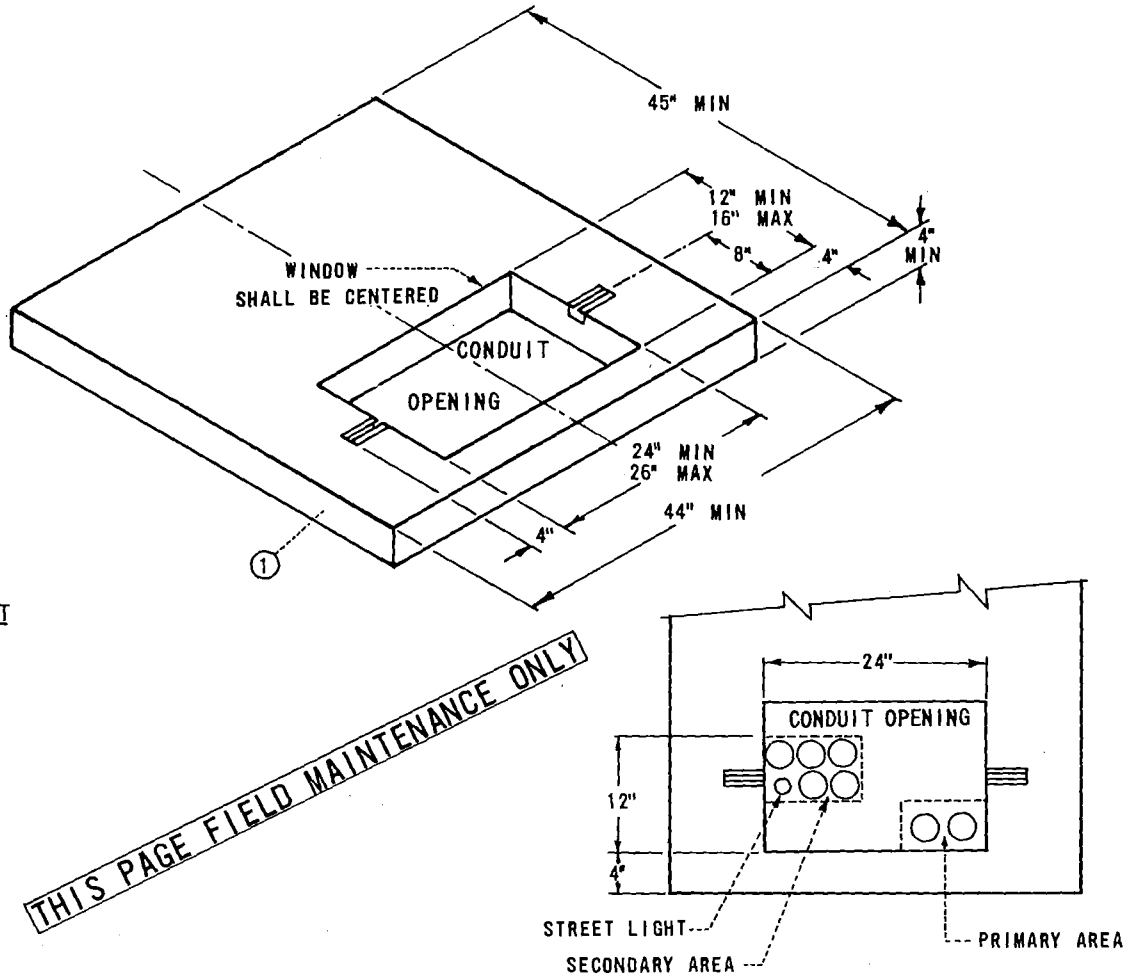
1. PRIMARY AND SECONDARY OPENINGS WITH MAXIMUM SIZE AND NUMBER OF SECONDARY CONDUITS ILLUSTRATED.
2. CONDUIT OPENINGS TO BE FORMED SO THAT RISER STUB ARE NOT CONCRETE ENCASED.
3. WHEN NUMBER OF REQUIRED CONDUITS IS LESS THAN MAXIMUM SHOWN ON SKETCHES, INSTALL CONDUITS IN NUMBERED SEQUENCE AS SHOWN.

SDG&E ELECTRIC STANDARDS

DATE 10-10-75
APPD *[Signature]*

THREE PHASE TRANSFORMER PAD INSTALLATION
750 AND 1000 KVA

3499.207



PAD WEIGHT
40#

THIS PAGE FIELD MAINTENANCE ONLY

NOTES:

- A. FOR TRANSFORMER INSTALLATION SEE 3700 SECTION.
- Ⓑ FOR CONCRETE PAD SEE PAGE 3421.1.
- C. ALL PLASTIC PADS PER SDG&E SPECIFICATION 133 (LATEST REVISION).

| ITEM | QUANTITY | DESCRIPTION | STOCK NO. OR CONSTR STD |
|------|----------|-------------|-------------------------|
| 1 | 1 | PLASTIC PAD | 514240 Ⓑ |
| | | | |
| | | | |
| | | | |

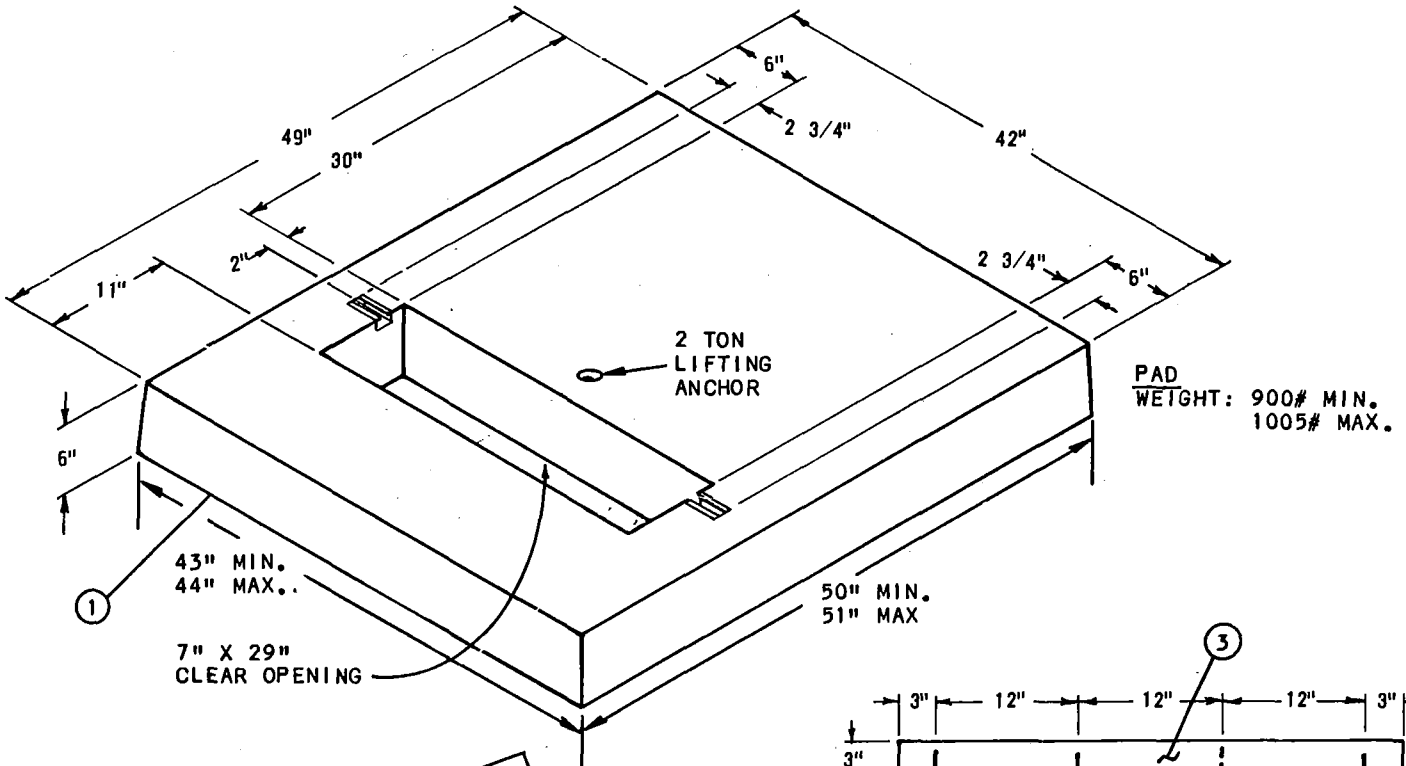
3499.210

SDG&E ELECTRIC STANDARDS

1Ø TRANSFORMER PLASTIC PAD
5 - 3", 4 - 4", OR 3 - 5" SECONDARY CONDUITS MAXIMUM

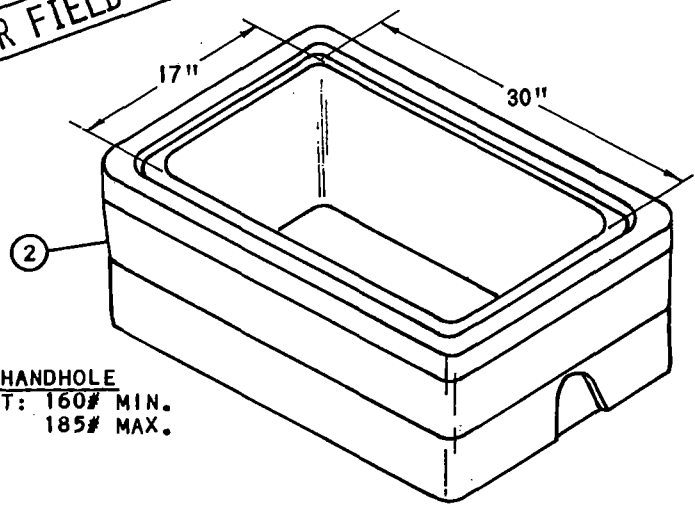
DATE 5-5-78
APPD TAF

SCOPE: THIS STANDARD SHOWS THE 3Ø FUSED SWITCHING PAD, HANDHOLE AND CONDUIT PLACEMENT USED WITH THE 3Ø FUSED SWITCHING CABINET (STANDARD 3513).

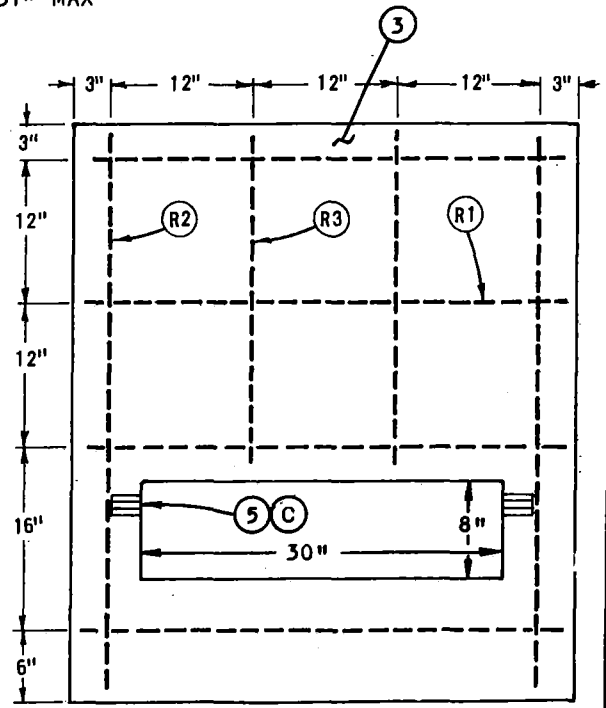


PAD WEIGHT: 900# MIN. 1005# MAX.

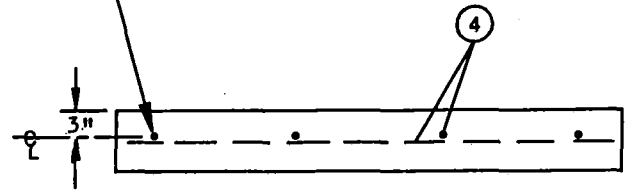
FOR FIELD MAINTENANCE ONLY



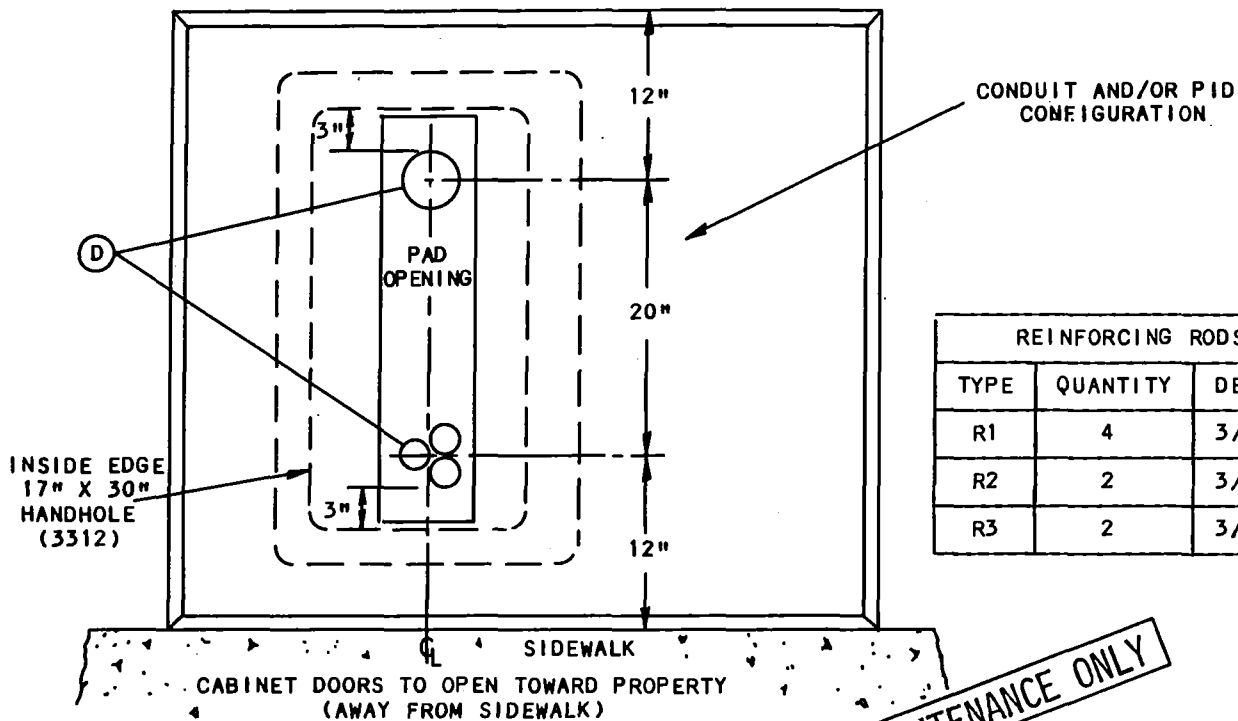
3312 HANDHOLE WEIGHT: 160# MIN. 185# MAX.



- STEEL DETAIL FOR POURED-IN-PLACE. CENTER STEEL IN CONCRETE POUR.



**3513 INSTALLATION
(TOP VIEW)
3Ø FUSED SWITCHING CABINET**



| REINFORCING RODS (4) | | |
|----------------------|----------|-------------|
| TYPE | QUANTITY | DESCRIPTION |
| R1 | 4 | 3/8" X 39" |
| R2 | 2 | 3/8" X 46" |
| R3 | 2 | 3/8" X 27" |

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD | STOCK NUMBER |
|------|---|-------------|-----------|--------------|
| 1 | FUSED SWITCHING PAD | 1 | -- | 513426 |
| 2 | HANDHOLE, 17" X 30" | 1 | 3312 | 162426 |
| 3 | CONCRETE CLASS 'A', 5 1/2 SACK MIX | 6.32 CU.FT. | -- | -- |
| 4 | #3 REINFORCING RODS, 3/8" (SEE TABLE ABOVE) | 25'-2" | -- | 685280 |
| 5 | CHANNEL, CONCRETE INSERTS, 2 3/4" X 1 5/8" X 7/8" UNISTRUT OR EQUAL (C) | 2 | -- | 426288 |
| 6 | GALVANIZED PAINT (C) | AS REQ'D | -- | 516064 |

INSTALLATION:

- A. THIS PAD MAY BE PRECAST OR POURED IN PLACE. TOP OF PAD MUST BE FINISHED FLAT.
- B. WHEN PAD IS POURED IN PLACE, CONDUIT OPENINGS SHALL BE FORMED SO THAT THE CONDUIT STUBS ARE NOT CONCRETE ENCASED.
- (C) IF POURED IN PLACE, ITEM 5 TO BE CUT IN FIELD. APPLY GALVANIZED PAINT TO EXPOSED ENDS.
- (D) TERMINATE CONDUITS 3" ABOVE THE BOTTOM OF THE HANDHOLE.

REFERENCE:

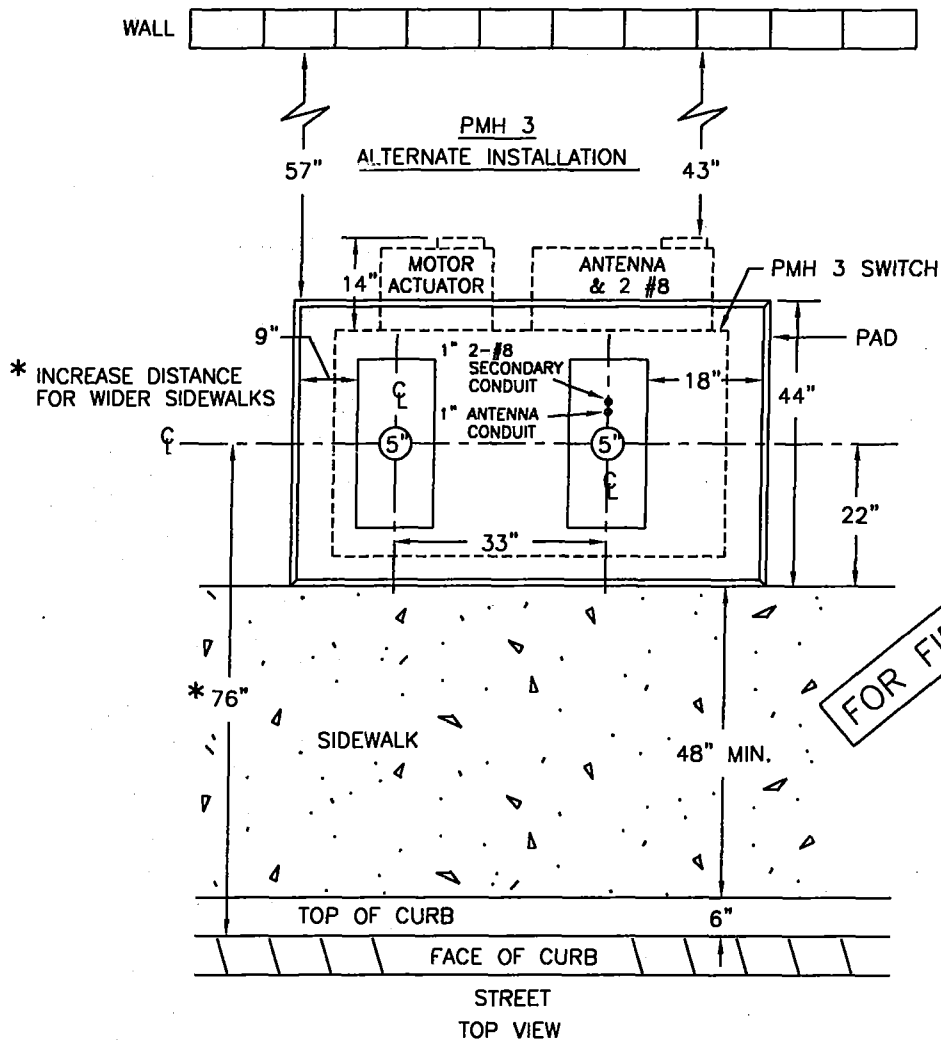
- H. SEE STANDARD 3211 FOR PAD IDENTIFICATION.
- I. SEE STANDARD 3481 FOR BARRIER PROTECTION AND CLEARANCE.
- J. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- K. SEE STANDARD 3487 FOR RETAINING WALL REQUIREMENTS.
- L. SEE STANDARD 3513 FOR EQUIPMENT OR INSTALLATION DETAILS.
- M. SEE STANDARD 4512 FOR PAD GROUNDING.
- N. SEE STANDARD 4514 FOR GROUNDING TELCO CONDUCTOR IN PAD-MOUNTED EQUIPMENT.

3499.212
(supercedes
3412.2 1-1-86)

SDG&E ELECTRIC STANDARDS

FUSED SWITCHING PAD

DATE 1-1-89
APPD SLC/DTB



BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNIT |
|------|---------------------|----------|-------------------------|--------------|---------------|
| 1 | PAD, PMH 3 SWITCH | 1 | 3420 | 513424 | 3420 |
| 2 | HANDHOLE, 17" X 30" | 4 | 3312 | 162426 | |

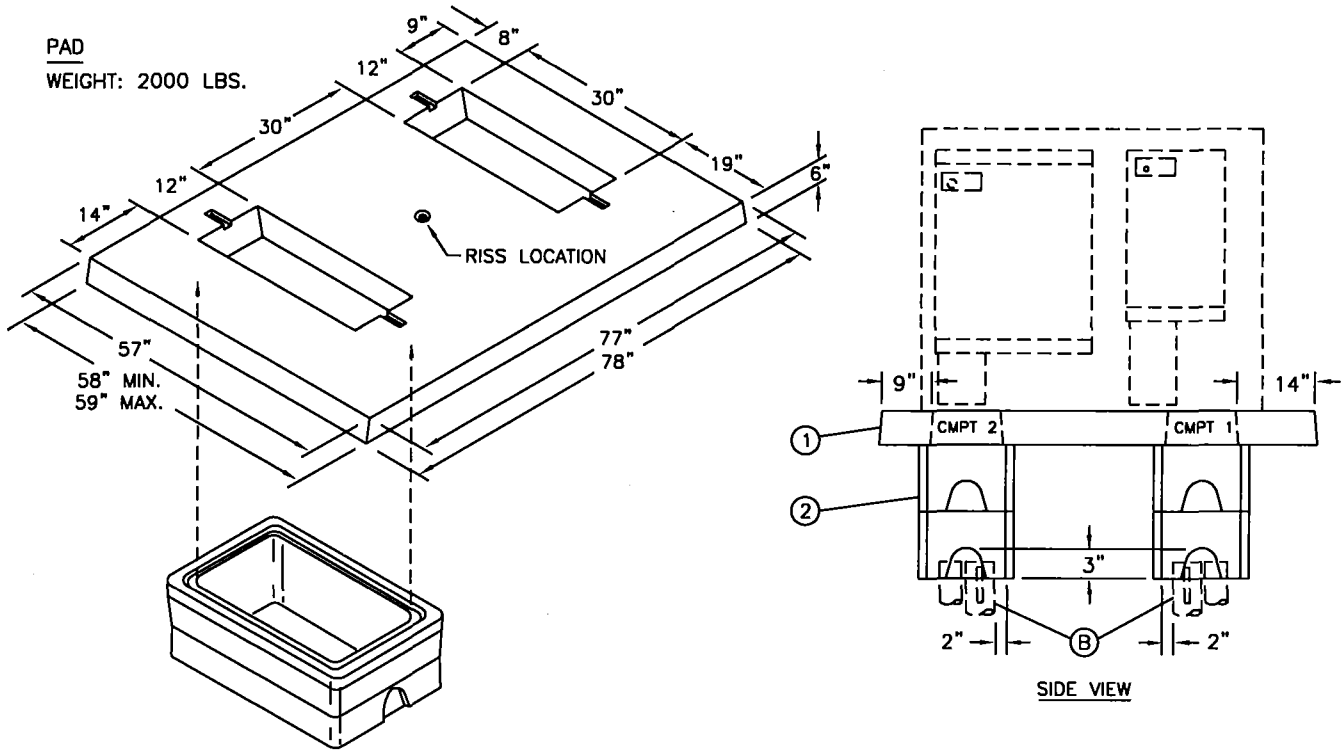
INSTALLATION:

- A. SET PAD LEVEL TO FINAL GRADE AND INSTALL EQUIPMENT GROUND.
- Ⓑ TERMINATE CONDUITS 3 INCHES ABOVE THE BOTTOM OF THE 3312 HANDHOLES.

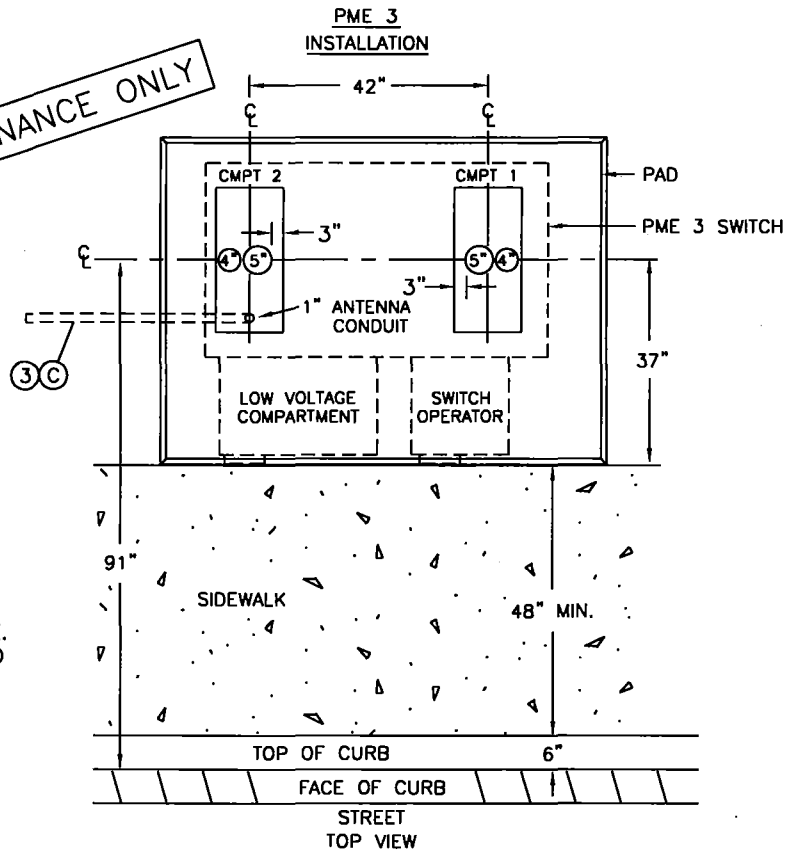
REFERENCE:

- E. SEE STANDARD 3481 FOR BARRIER PROTECTION AND CLEARANCE.
- F. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- G. SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT.
- H. SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- I. SEE STANDARD 3487 FOR RETAINING WALLS.
- J. SEE STANDARD 3577 FOR PAD-MOUNTED PMH 3 AIR BREAK SWITCH.
- K. SEE STANDARD 3578 FOR INSTALLATION REQUIREMENTS FOR PAD-MOUNTED PMH 3 AIR BREAK SWITCH.
- L. SEE STANDARD 4512 FOR EQUIPMENT GROUNDING INSTALLATION.

SCOPE: THIS STANDARD SHOWS THE PAD AND HANDHOLE USED WITH THE PAD-MOUNTED 600 AMP AIR BREAK PME 3 SECTIONALIZING SWITCH. CONDUIT PLACEMENT IS ALSO SHOWN.



FOR FIELD MAINTENANCE ONLY



NOTES:
- PAD MAY NOT BE
POURED IN PLACE.
USE PRECAST PAD
ONLY.

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNIT |
|------|-------------------------|----------|-------------------------|--------------|---------------|
| 1 | PAD, PME 3 SWITCH | 1 | 3422 | 514030 | 3422 |
| 2 | HANDHOLE, 17" X 30" | 4 | 3312 | 162426 | |
| 3 | 1" POLYETHYLENE CONDUIT | 10 FT | 3373 | 249630 | 1" PE |

INSTALLATION:

- A. SET PAD LEVEL TO FINAL GRADE AND INSTALL EQUIPMENT GROUND.
- ⓑ TERMINATE CONDUITS 3 INCHES ABOVE THE BOTTOM OF THE 3312 HANDHOLES.
- ⓒ STUB OUT 1-1" POLY CONDUIT 4' FROM EDGE OF PAD.

REFERENCE:

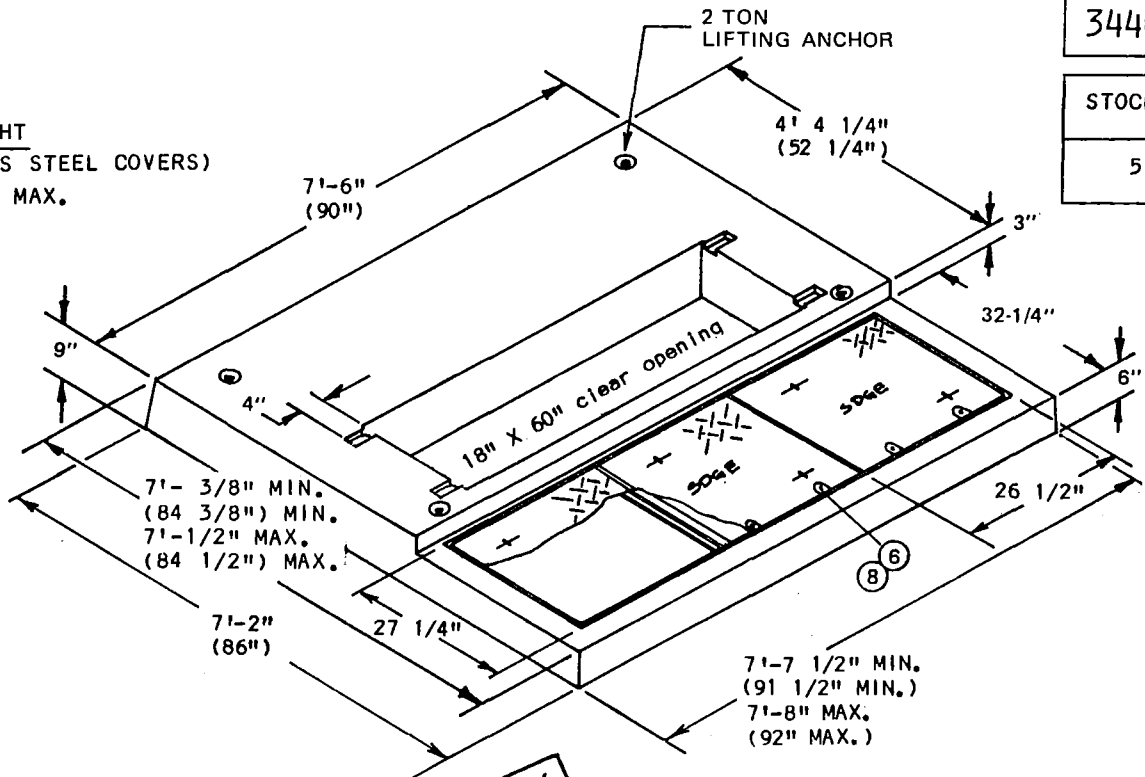
- E. SEE STANDARD 3481 FOR BARRIER PROTECTION AND CLEARANCE.
- F. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- G. SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT.
- H. SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- I. SEE STANDARD 3487 FOR RETAINING WALLS.
- J. SEE STANDARD 3583 FOR PAD-MOUNTED PME 3 AIR BREAK SWITCH.
- K. SEE STANDARD 3584 FOR INSTALLATION REQUIREMENTS FOR PAD-MOUNTED PME 3 AIR BREAK SWITCH.
- L. SEE STANDARD 4512 FOR EQUIPMENT GROUNDING INSTALLATION.

FOR FIELD MAINTENANCE ONLY

| | | |
|---|---|---|
| DATE 1-1-98 APPD <i>[Signature]</i> / <i>CAK</i> | SDG&E ELECTRIC STANDARDS AIR BREAK PME 3 SECTIONALIZING SWITCH PAD | 3499.216 SUPERSEDES 3422.2 (1-1-98) |
|---|---|---|

SCOPE: THIS STANDARD SHOWS 3440 & 3441 PADS FOR A PAD MOUNTED 12KV, 600 AMP, 3Ø SWITCH.

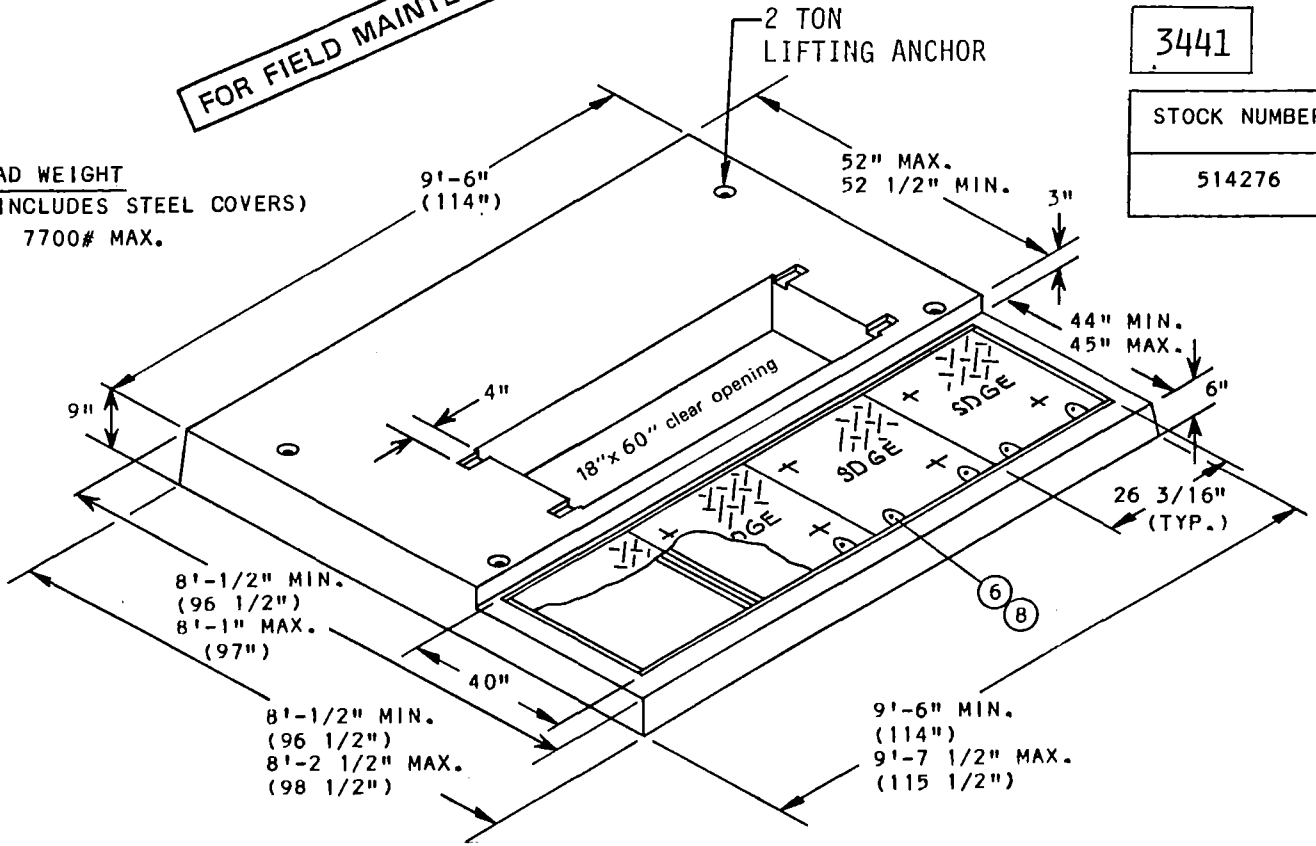
PAD WEIGHT
(INCLUDES STEEL COVERS)
5200# MAX.



| |
|--------------|
| 3440 |
| STOCK NUMBER |
| 513900 |

FOR FIELD MAINTENANCE ONLY

PAD WEIGHT
(INCLUDES STEEL COVERS)
7700# MAX.



| |
|--------------|
| 3441 |
| STOCK NUMBER |
| 514276 |

ISSUE 1994

DATE 1-1-88

APPD *[Signature]*

SDG&E ELECTRIC STANDARDS

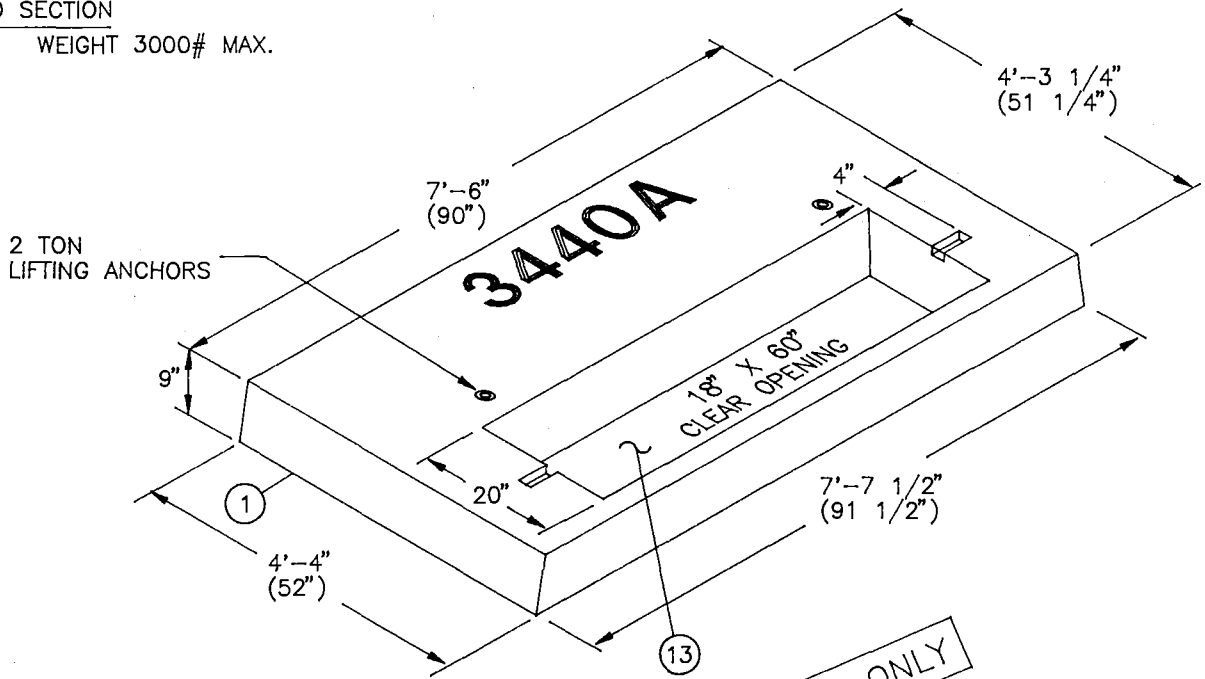
3440 & 3441 PADS
FOR PAD-MOUNTED 12KV, 600 AMP, 3Ø SWITCH

3499.401

SCOPE: THIS STANDARD SHOWS THE INSTALLATION REQUIREMENTS OF A TYPICAL 3440A OR 3441A PAD AND 3315 OR 3316 HANDHOLE FOR A PAD-MOUNTED 12KV, 600 AMP, 3 PHASE SWITCH.

PAD SECTION

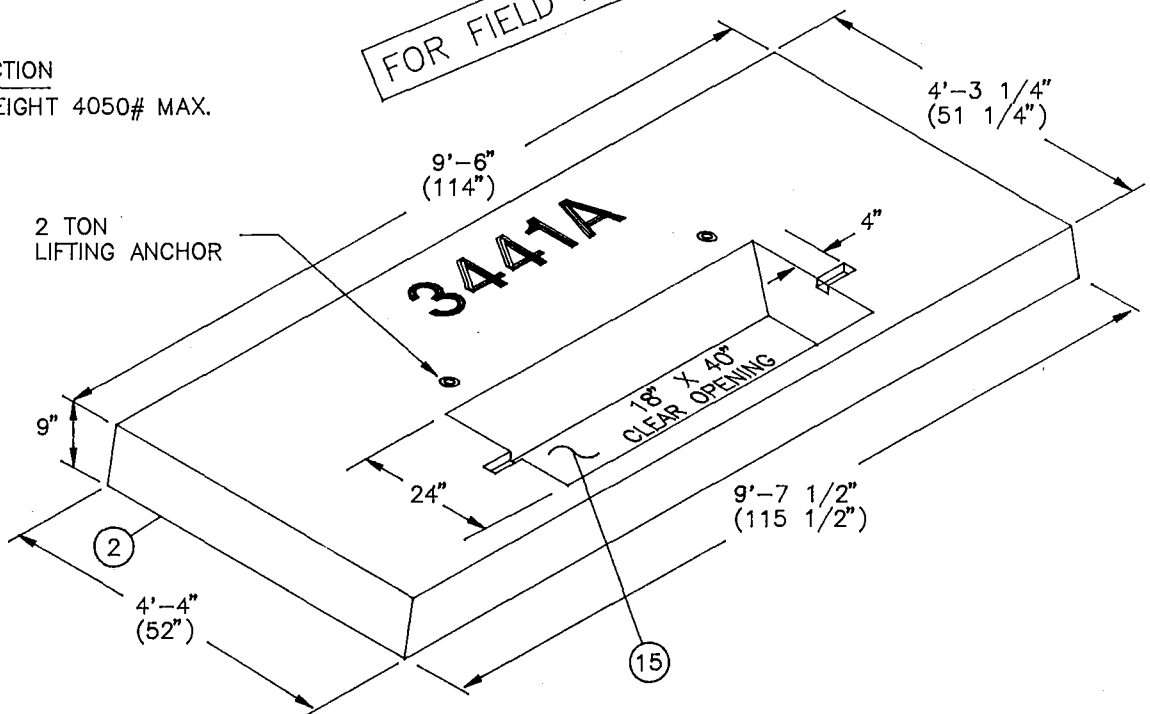
WEIGHT 3000# MAX.



FOR FIELD MAINTENANCE ONLY

PAD SECTION

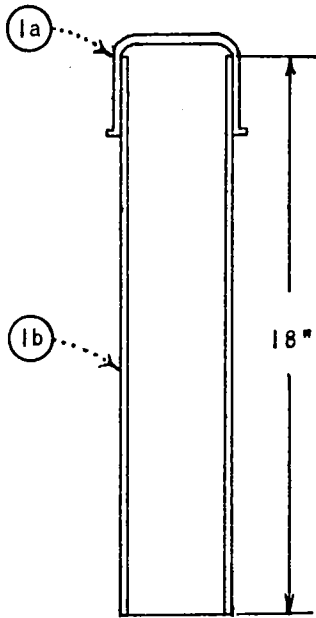
WEIGHT 4050# MAX.



NOTES:

- PADS MAY NOT BE POURED IN PLACE. USE PRECAST PADS ONLY.

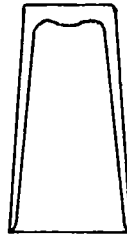
| | | |
|--|--|----------|
| SDG&E ELECTRIC STANDARDS | | |
| DATE 1-1-96 APPD <i>[Signature]</i> | 3440A/3441A PAD & HANDHOLE INSTALLATIONS FOR PAD-MOUNTED 12KV, 600 AMP, PMH 5 | 3499.402 |



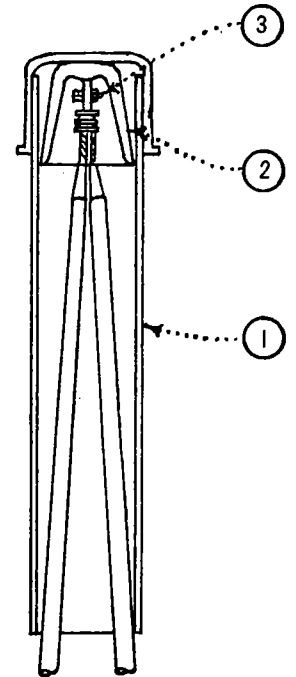
INSULATING TUBE
FIGURE 1



INSULATING GLASS, 2 OUNCE
FIGURE 2



INSULATING GLASS, 11 OUNCE
FIGURE 3



CAPPED SPLICE TERMINATION
FIGURE 4

FOR FIELD MAINTENANCE ONLY

BILL OF MATERIAL see TABLE I for materials selection

| ITEM | DESCRIPTION | QUANTITY | STOCK NO OR CONSTR. STD. |
|------|--|-----------|-------------------------------------|
| 1 | INSULATING TUBE-SHOP MADE | 1 | |
| 1A | ABS CAP - 2", 3", OR 4" (SECURED WITH CEMENT) | AS REQ'D. | 2"-774752 3"-774784 4"-774816 |
| 1B | ABS TYPE II (DB) TUBE - 2", 3", OR 4" | AS REQ'D. | |
| 2 | INSULATING ANTI-TRACK GLASS | 1 | |
| 3 | EVURDUR BOLT, FLAT WASHER, LOCK WASHER, AND NUT - 3/8" | 1 | 140 |

TABLE I

MATERIALS SELECTION

| CABLE AWG | NUMBER OF CABLES | 2" TUBE INSULATING GLASS | 3" TUBE INSULATING GLASS | 4" TUBE INSULATING GLASS |
|----------------|------------------|--------------------------|--------------------------|--------------------------|
| 4 OR 2 | 2 | X | - | - |
| | 3 | - | X | - |
| 4/0 OR 500 MCM | 2 | - | X | - |
| | 3 | - | - | X |

TABLE II

NOTE:

1 CAPPED SPLICE TERMINATION DESIGNED FOR USE IN TRANSFORMER HIGH VOLTAGE COMPARTMENTS AND U-41.2 TERMINATOR.

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

CAPPED SPLICE TERMINATION

12 KV AND BELOW

DATE 9-19-69

SDG&E

3599.001



FIGURE 1



FIGURE 2



FIGURE 3



FIGURE 4

FOR FIELD MAINTENANCE ONLY

| MATERIAL DESCRIPTION | | | | |
|--|--|---------------|----------------|--------------|
| LINE MATERIAL LOAD BREAK SWITCH BLADE-INDOOR | | | | |
| NOMINAL VOLTAGE KV | RATING | FIGURE NUMBER | CATALOG NUMBER | STOCK NUMBER |
| 8.3 | 200 AMPS CONTINUOUS 200 AMPS LOAD BREAK | 1 | FA1BJ | 139552 |
| 15.5 | | 2 | FA3B1 | 139488 |
| WITH FAULT INDICATOR ① | | | | |
| 8.3 | 200 AMPS CONTINUOUS 200 AMPS LOAD BREAK | 3 | FA1B2 | 139584 |
| 15.5 | | 4 | FA3B2 | 139520 |

NOTE:

① TRIP RANGE OF FAULT INDICATOR IS 350-500 AMPS.

3599.002

SDG&E ELECTRIC STANDARDS

SWITCH BLADES - ARC STRANGLER

DATE 4-10-75
APPD *JWK*

TO REDUCE INTERNAL CABINET MOISTURE WHICH INCREASES CABLE INSULATION CONTAMINATION,
INSULATION BARRIER DETERIORATION AND METAL CORROSION -

1. RESTRICT THE AIR FLOW FROM ADJACENT SUBSTRUCTURES AND/OR CONDUITS BY TAPING OR COVERING OVER BASE PAD WINDOW WHEN PAD IS DIRECTLY OVER A SUBSTRUCTURE (WHICH IS A DISCONTINUED PRACTICE FOR LARGER THAN STANDARD 3314 SIZE HANDHOLES) WHICH CAN CONTAIN WATER (WITH CONCRETE OR NON-DRAINING BOTTOM) AND OVER ALL CONDUIT OPENINGS TO SUBSTRUCTURES WITHIN 100 FEET. TAPE SHALL BE APPLIED SO AS NOT TO ALLOW TOUCHING OF CABLE INSULATION SHIELD AND SHALL BE BELOW STRESS CONE LEVEL. "AQUA-SEAL" MAY BE USED TO SEAL CONDUIT OPENINGS INSTEAD OF TAPING.
2. USE SILICONE TAPE ON INDOOR TERMINATIONS PER STANDARD 4121 FOR ALL CABLES.

FOR FIELD MAINTENANCE ONLY

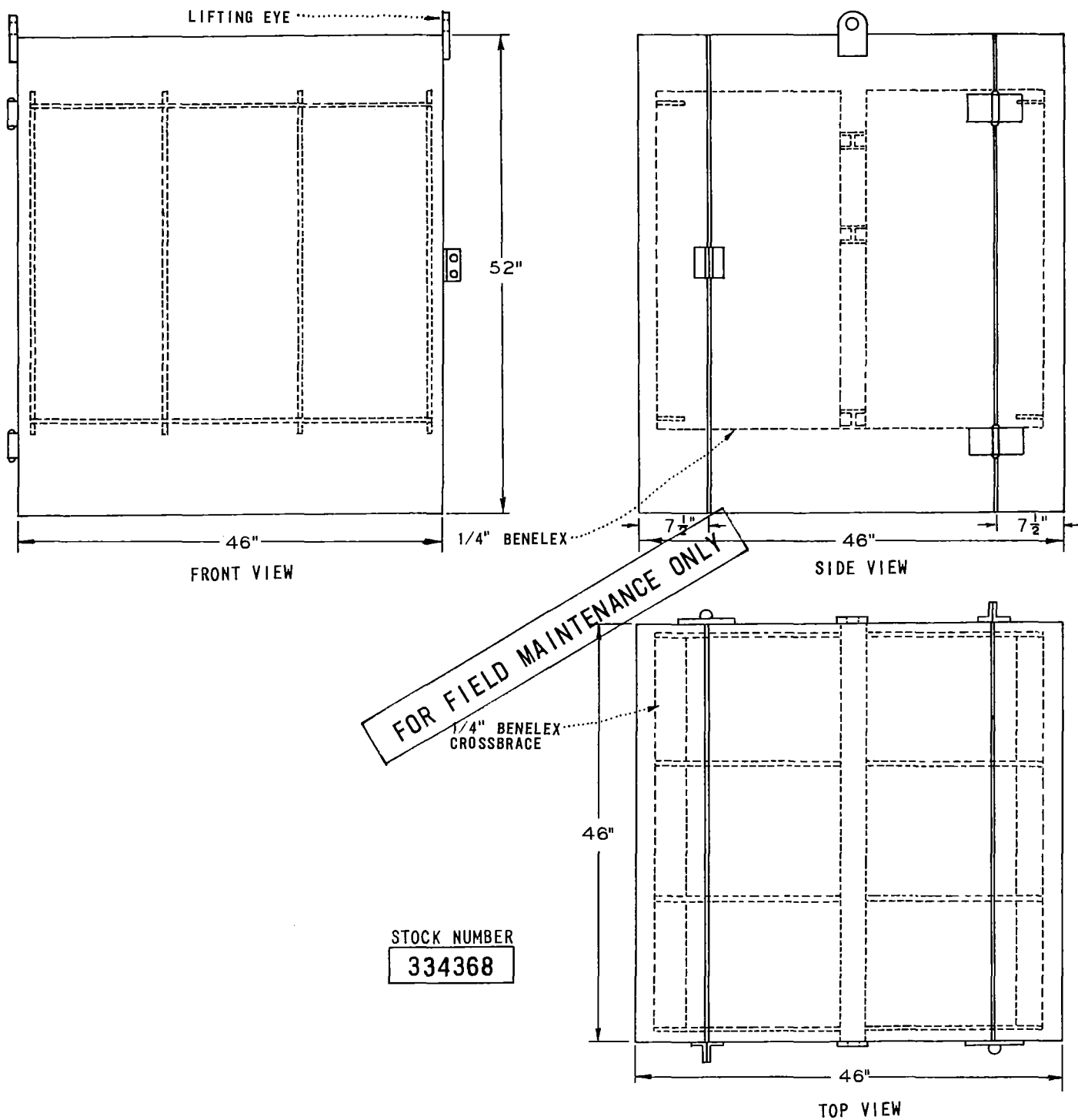
DATE 9-30-82
APPD *JMT*

SDG&E ELECTRIC STANDARDS

CONTAMINATION PREVENTION INSTALLATION PROCEDURES

3599.003

MAJOR USE: ABOVE GROUND SWITCHING POINT WITH PAD MOUNT TRANSFORMER INSTALLATION



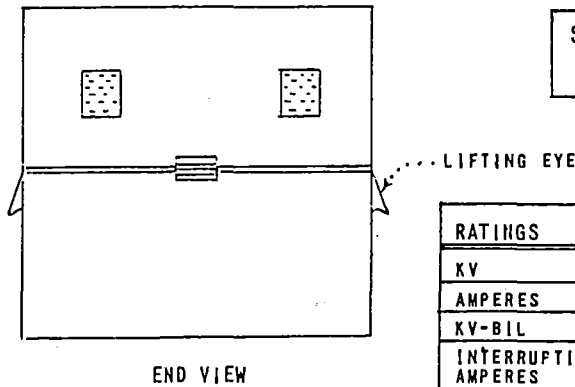
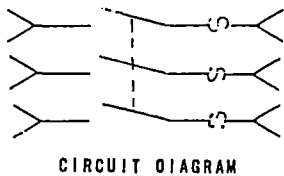
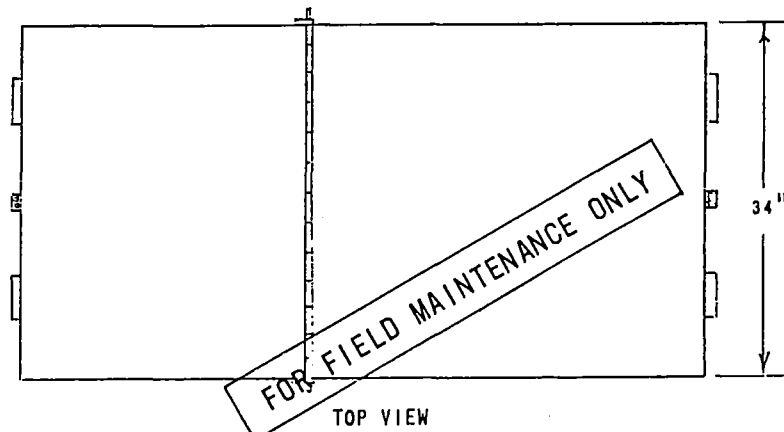
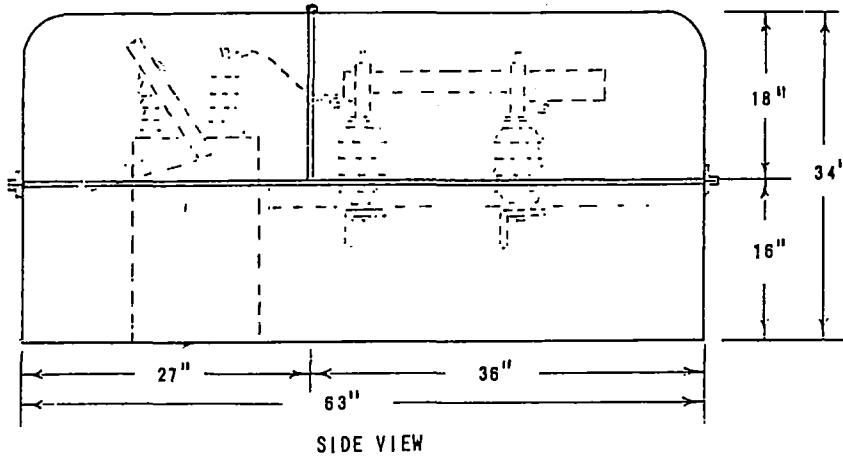
STOCK NUMBER
334368

NOTES:

- A. 12KV SWITCHING CABINET.
- B. SIDE PANELS TO BE MINIMUM 14 GAUGE SHEET METAL.
- C. ALL STEEL PARTS TO BE HOT DIPPED GALVANIZED AFTER FABRICATION.
- D. FINISH: ONE COAT PRIMER AND TWO COATS FINISH LEAF GREEN (SUBOX 524 FD OR EQUAL)
- E. FOR INSTALLATION DETAILS SEE 3599.105, 3599.109, 3599.110.
- F. FOR FUSES SEE 4311.

MAJOR USE: TO FUSE UNDERGROUND TAPS WHICH EMPLOY BOTH 1^Ø & 3^Ø TRANSFORMERS

U-41.51



STOCK NUMBER
334366

| RATINGS | SM-4 FUSE | VAC. SW. |
|--------------------------------------|-----------|----------|
| KV | 14.4 | 13.8 |
| AMPERES | 200 | 200 |
| KV-BIL | 95 | 95 |
| INTERRUPTING AMPERES (SYMMETRICAL) | 12,500 | 2,000 |
| MAKE AND LATCH AMPERES (SYMMETRICAL) | | 10,000 |

CAUTION

MECHANICAL INTERLOCK PROHIBITS FUSE COMPARTMENT DOOR FROM OPENING UNLESS VACUUM SWITCH IS PLACED IN THE OPEN POSITION.

NOTES:

- A. PANELS TO BE 14 GAUGE MINIMUM SHEET METAL.
- B. ALL STEEL PARTS TO BE HOT DIPPED GALVANIZED AFTER FABRICATION.
- C. FINISH; ONE COAT PRIMER AND TWO COATS FINISH LEAF GREEN (SUBOX 524 OR EQUAL).
- D. ALL INTERNAL BARRIERS TO BE 1/4" BENELEX OR EQUAL.
- E. FOR INSTALLATION DETAILS SEE 3599.106.

SDG&E ELECTRIC STANDARDS

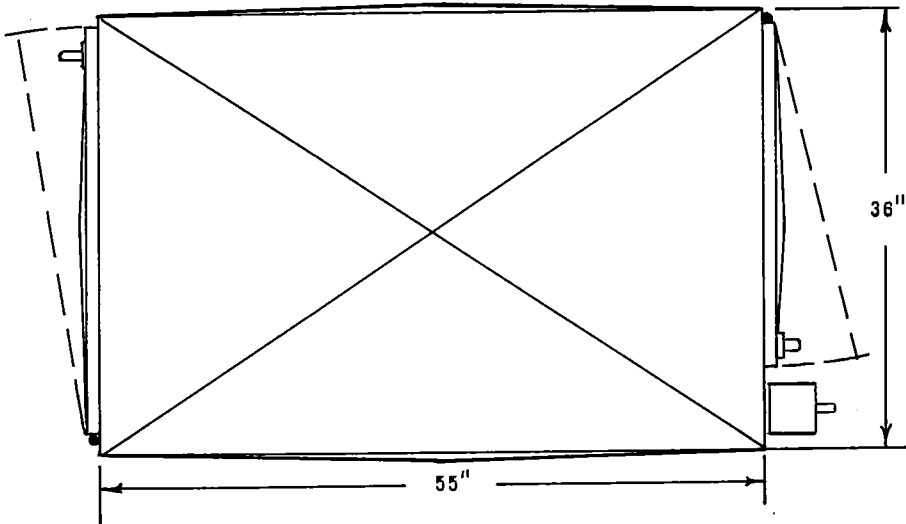
DATE 1-1-93

APPD *[Signature]*

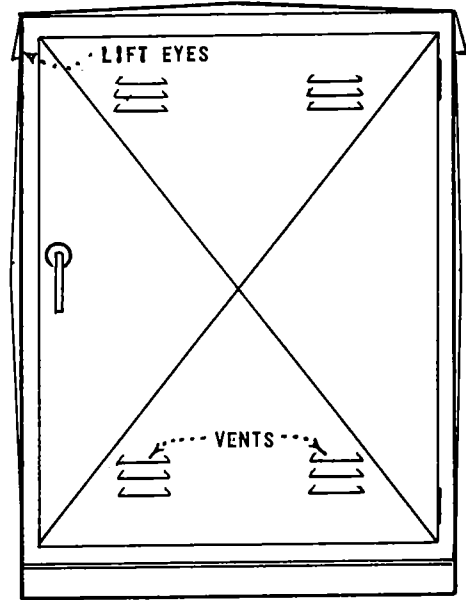
PADMOUNT LOW PROFILE FUSED SWITCHING CABINET

3599.102

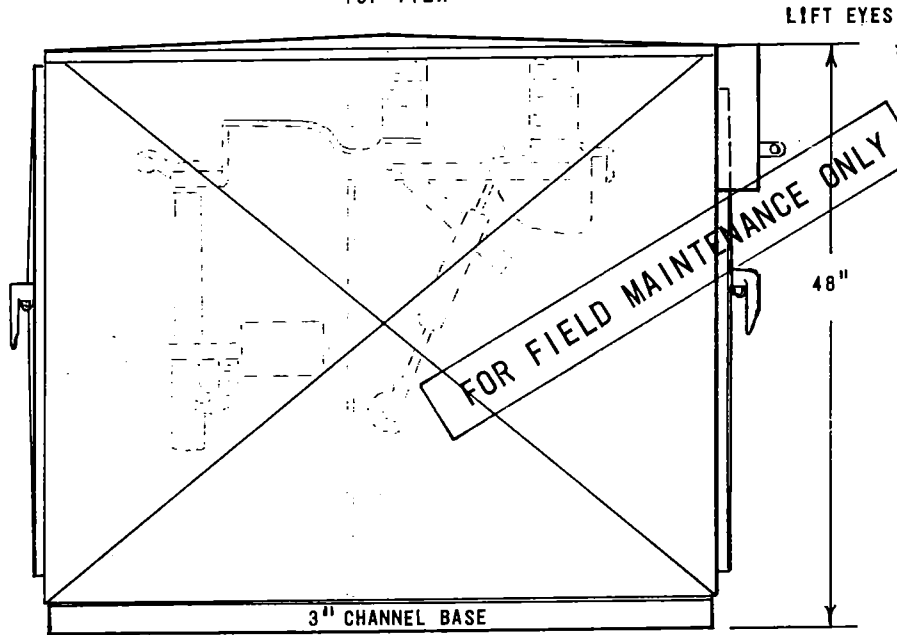
MAJOR USE: TO FUSE UNDERGROUND TAPS WHICH EMPLOY BOTH 1 ϕ & 3 ϕ TRANSFORMERS.



TOP VIEW

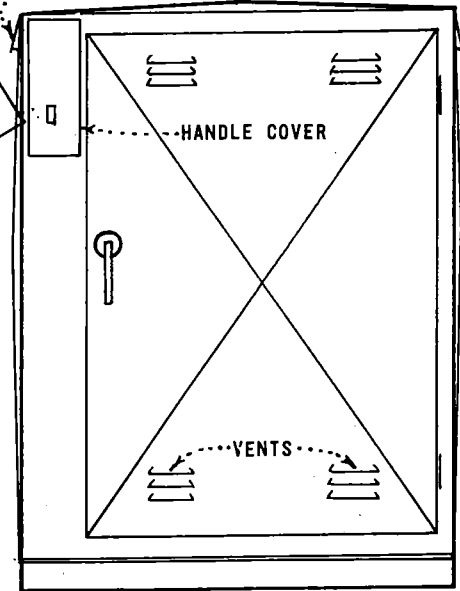


END VIEW - FUSE SIDE



FRONT VIEW

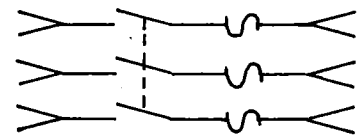
LIFT EYES



END VIEW - SWITCH SIDE

| RATINGS | SM-4 FUSE | 3 ϕ SW. |
|--------------------------------------|-----------|--------------|
| KV | 14.4 | 13.8 |
| AMPERES | 200 | 600 |
| KV-BIL | 95 | 95 |
| INTERRUPTING AMPERES (SYMMETRICAL) | 12,500 | 600 |
| MAKE AND LATCH AMPERES (SYMMETRICAL) | - | 25,000 |

STOCK NUMBER
334366

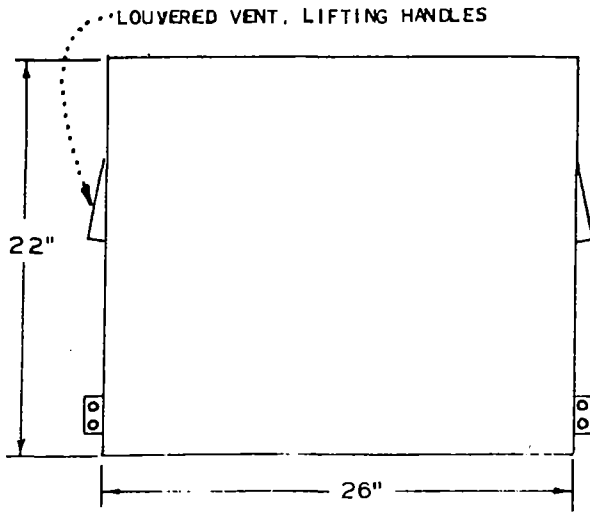


CIRCUIT DIAGRAM

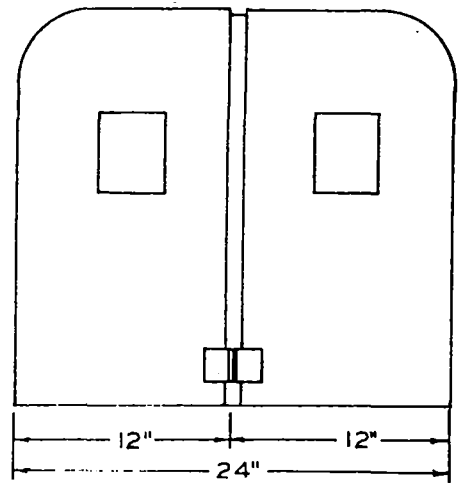
NOTES:

- A. PANELS TO BE 12 GAUGE MINIMUM SHEET METAL REINFORCED.
- B. ALL STEEL PARTS TO BE HOT DIPPED GALV. AFTER FABRICATION.
- C. FINISH: ONE COAT PRIMER AND ONE COAT FINISH FDRST GREEN.
- D. ALL INTERNAL BARRIERS TO BE 3/8" BENELEX OR EQUAL.
- E. FOR INSTALLATION DETAILS SEE 3599.108.

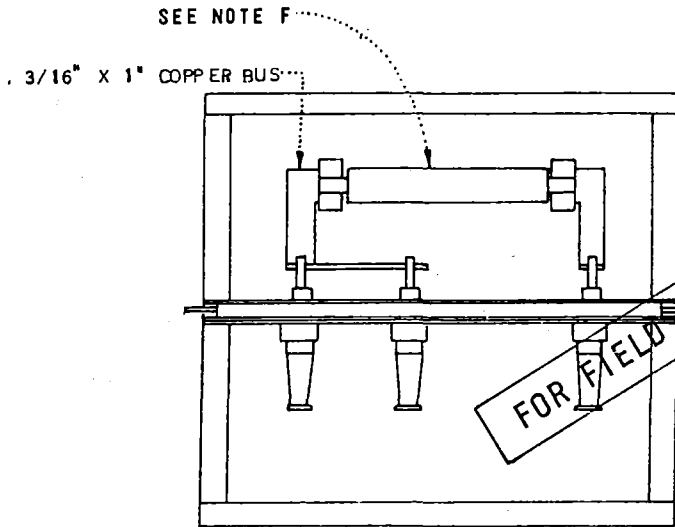
MAJOR USE: ABOVE GROUND SECTIONALIZING POINT WITH LOW PROFILE TRANSFORMER INSTALLATION



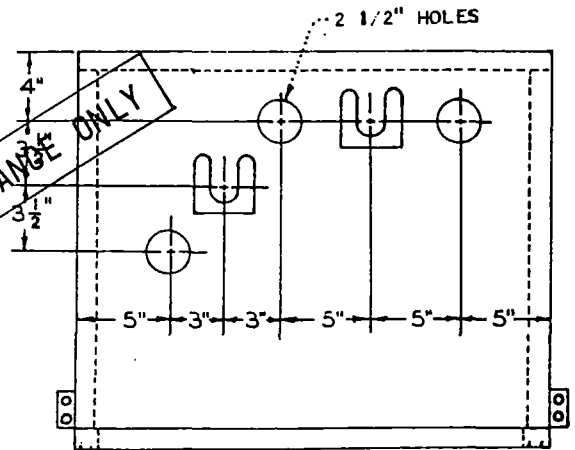
FRONT VIEW



SIDE VIEW



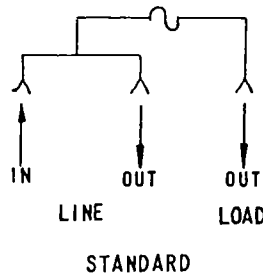
PLAN DETAIL



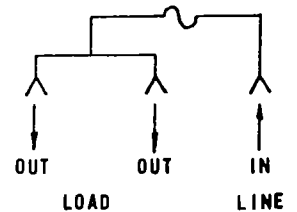
FRONT DETAIL

FOR FIELD MAINTENANCE ONLY

STOCK NUMBER
190432



STANDARD



REVERSED

NOTES:

- A. 1 ϕ 7200 VOLT SECTIONALIZING CABINET
- B. SIDE PANELS TO BE 12 GAUGE MINIMUM SHEET METAL.
- C. ALL STEEL PARTS TO BE HOT DIPPED GALV. AFTER FABRICATION.
- D. FINISH: 1 COAT PRIMER AND 2 COATS FINISH LEAF GREEN (SUBOX #524 F.D.) OR EQUAL.
- E. FOR INSTALLATION DETAILS SEE 3599.107.
- F. FOR FUSES SEE 4302.
- G. THE STANDARD OR REVERSED SCHEMATICS SHALL BE STENCILED INSIDE FUSE CABINET TO MATCH CIRCUITRY AND FEED DIRECTION.

SDG&E ELECTRIC STANDARDS

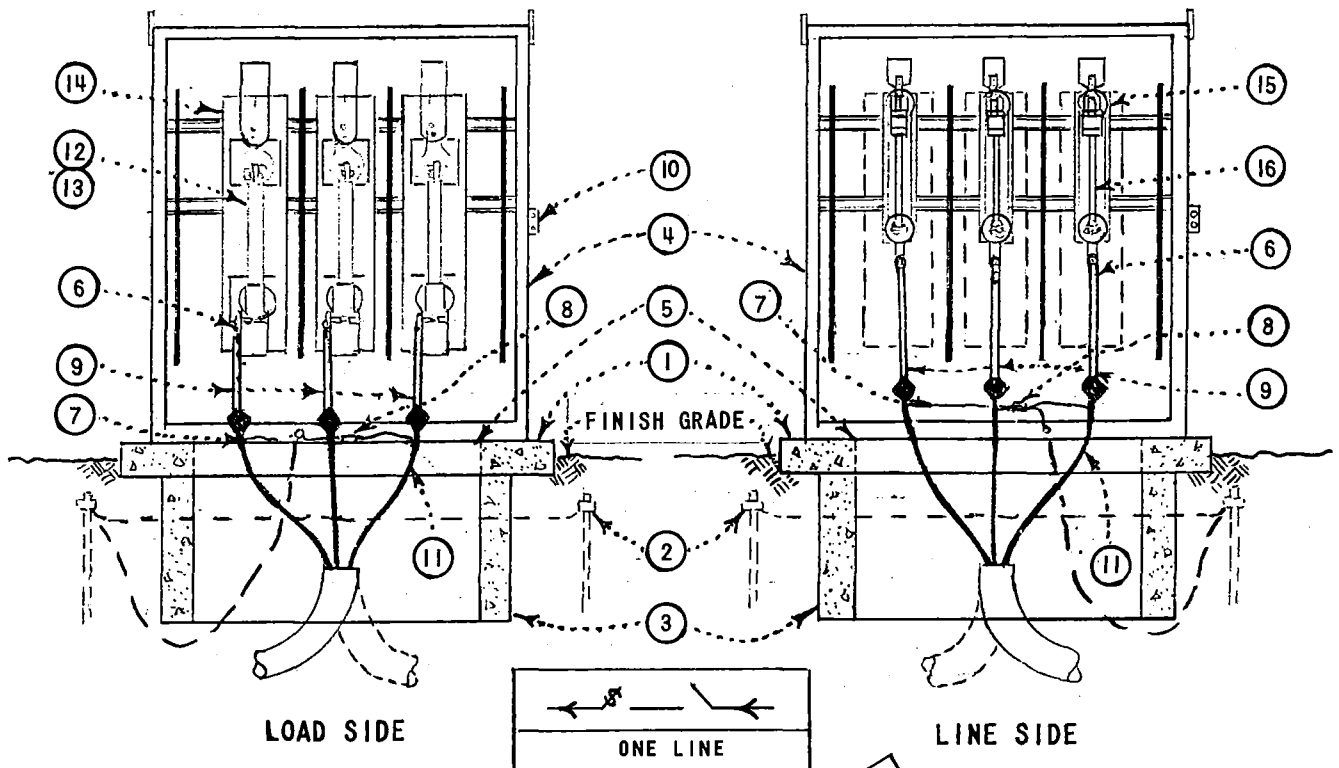
DATE 7-13-73
APPD *[Signature]*

LOW PROFILE FUSED SECTIONALIZING CABINET

1 ϕ 7200 VOLTS

3599.104

MAJOR USE: LINE AND LOAD SIDE LESS THAN 200 AMPS



| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONSTR. STD. |
|------|---|----------|---------------------------|
| 1 | CONCRETE PAD | 1 | 513392, 3499.102 |
| 2 | PAD GROUNDING | 1 | 3407 |
| 3 | HANDHOLE, BOTTOM SECTION (SEE NOTE E) | 1 | 162664, 3313 |
| 4 | CABINET | 1 | 334368, 3599.101 |
| 5 | HOLD DOWN DEVICE, NO STD. | - | - |
| 6 | COMPRESSION CONNECTORS | 6 | 4172 |
| 7 | CONCENTRIC NEUTRAL TAIL | AS REQ'D | - |
| 8 | COMPRESSION CONNECTOR | 2 | 257792 |
| 9 | CABLE TERMINATION | 6 | 4121 |
| 10 | COMPANY LOCK, (CORBIN #27) FF KEY (NOT SHOWN) | 2 | 514848 |
| 11 | PHASE AND ROUTE TAGS | AS REQ'D | 3202, 3231 |
| 12 | FUSE HOLDER | 3 | 413262 |
| 13 | FUSE LINK (CONTACT UG DESIGN DEPT.) | 3 | 4311 |
| 14 | FUSE MOUNTING | 3 | 487984 |
| 15 | DISCONNECT MOUNTING | 3 | 488098 |
| 16 | LOAD BREAK SWITCH BLADE | 3 | 139488, 3599.002 |

NOTES:

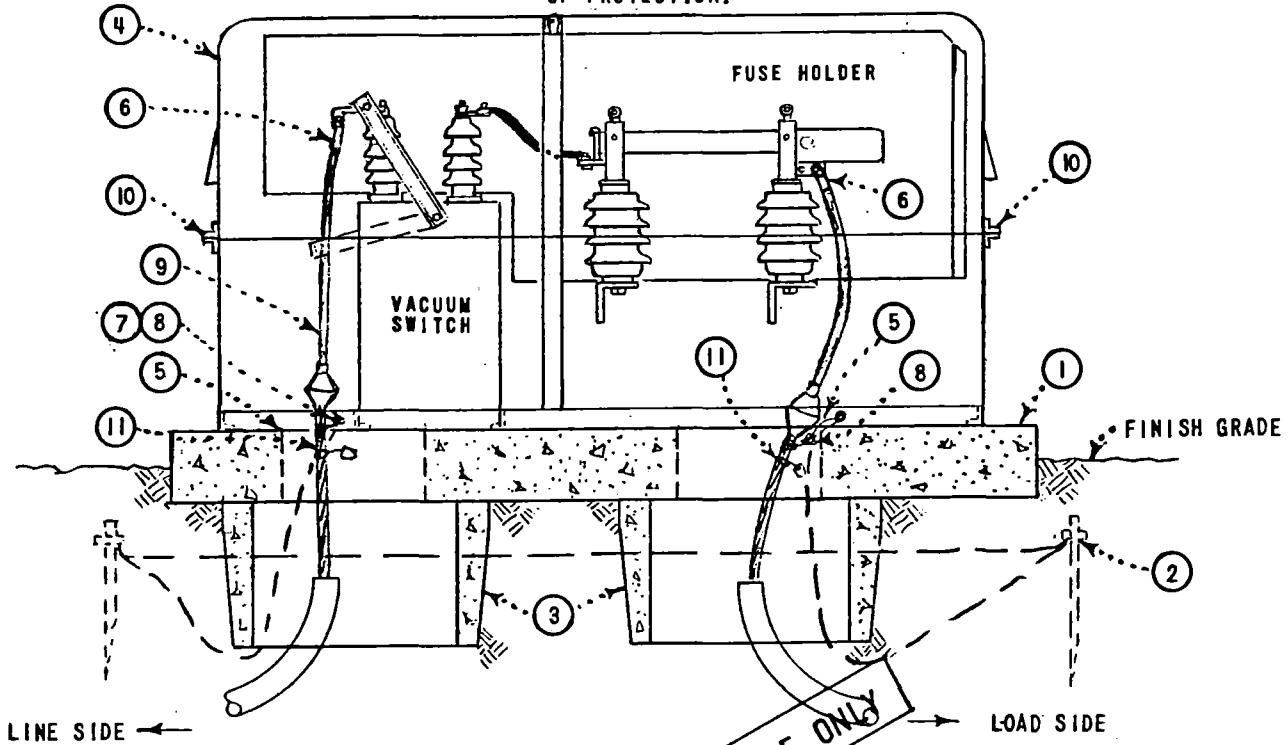
- A. CUT CONDUIT 3" ABOVE BOTTOM OF BOX.
- B. STRUCTURE IDENTIFICATION, 3211
- C. CABLE TERMINATING ENCLOSURE "WARNING SIGN", 3221.
- (D) ITEMS 4, 12, 14, 15 AND 16 ARE CONTAINED IN A UNIT ASSEMBLY UNDER STOCK NUMBER 334364.
- E. INSTALL BOX, STANDARD SHEET 3313 WITH 36" DIMENSION FACING DOOR OPENING.

DATE 6-30-78
 APPD TRF

SDG&E ELECTRIC STANDARDS
 IN LINE FUSE SWITCH CABINET
 INSTALLATION UNDER 200 AMPS

3599.105

MAJOR USE: TO FUSE UNDERGROUND TAPS WHICH EMPLOY BOTH 1 ϕ AND 3 ϕ TRANSFORMERS, ALSO TO FUSE UNDERGROUND EQUIPMENT WHEN CURRENT LIMITING FUSES WILL NOT COORDINATE WITH BACK-UP PROTECTION.



| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONSTR. STD. |
|------|--|-----------|---------------------------|
| 1 | CONCRETE PAD | 1 | 513424, 3499.103 |
| 2 | PAD GROUNDING | 1 | 3407 |
| 3 | HANDHOLE, BOTTOM SECTION, 17" X 30" | 2 | 162426, 3312 |
| 4 | CABINET, (COMPLETE), EXCLUDING FUSE LINKS (SEE NOTE C) | 1 | 334366, 3599.102 |
| 5 | HOLD DOWN DEVICE - NO STANDARD | - | |
| 6 | COMPRESSION CONNECTORS | 6 | 4171 |
| 7 | CONCENTRIC NEUTRAL TAILS | AS REQ'D. | |
| 8 | COMPRESSION CONNECTOR | 2 | 257792 |
| 9 | CABLE TERMINATION | 6 | 4121 |
| 10 | COMPANY LOCK, (CORBIN #27) FF KEY (NOT SHOWN) | 2 | 514848 |
| 11 | PHASE AND ROUTE TAGS | AS REQ'D. | 3202, 3231 |

CAUTION

MECHANICAL INTERLOCK PROHIBITS FUSE COMPARTMENT DOOR FROM OPENING UNLESS VACUUM SWITCH IS PLACED IN THE OPEN POSITION.

NOTES:

- A. 3 ϕ 12000 VOLT GANG OPERATED FUSED SWITCHING CABINET. (SCOTT ENGINEERING CO).
- B. ITEM 4, INCLUDES FUSE LINK CABINET, VACUUM SWITCH, FUSE HOLDERS AND MOUNTING BRACKETS COMPLETE.
- C. SM-4 FUSE LINK (3) SIZE TO BE SPECIFIED ON WORK ORDER. REFER TO 4311.
- D. STRUCTURE IDENTIFICATION SEE 3211.
- E. FUSE SWITCHING CABINET 'WARNING SIGN' SEE 3221.
- F. THIS SWITCH IS MECHANICAL INTERLOCKED AND IS LIMITED TO MAXIMUM ONE CIRCUIT IN AND OUT.

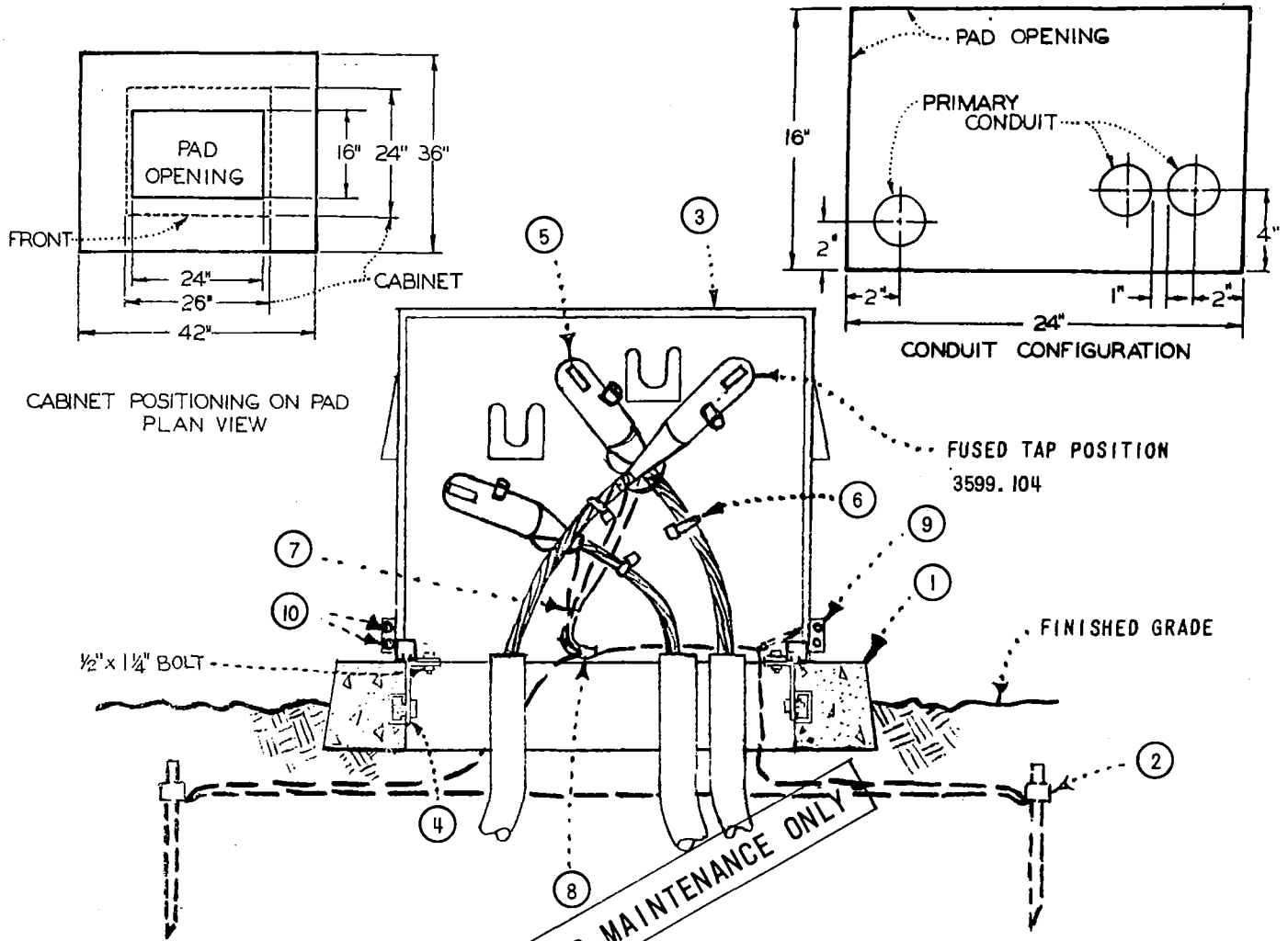
SDG&E ELECTRIC STANDARDS

3599.106

3 ϕ 200 AMP PADMOUNT LOW PROFILE FUSED SWITCHING CABINET INSTALLATION

DATE 1-1-86

APPD *JLB/RJG*



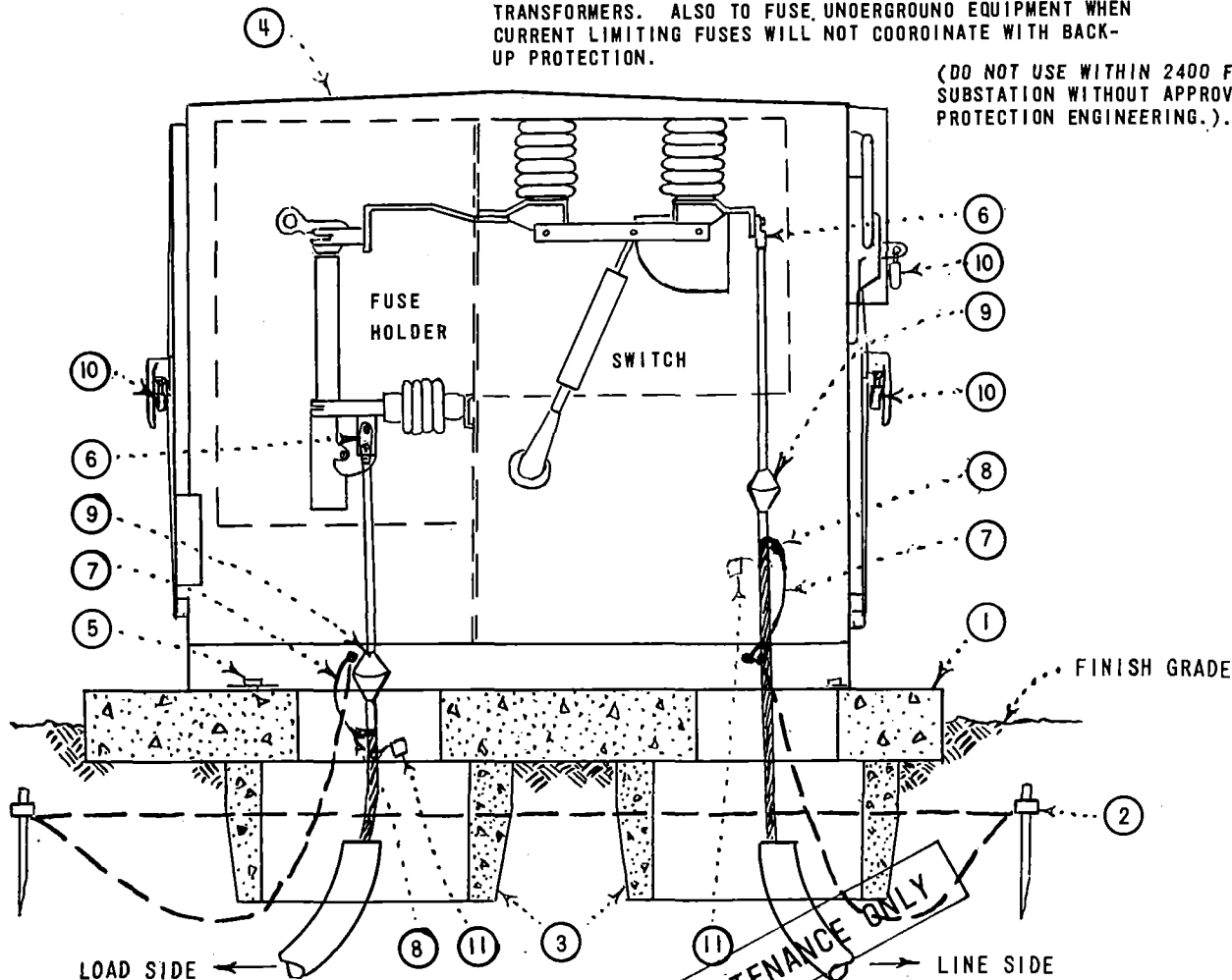
| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONSTR. STD. |
|------|---|----------|---------------------------|
| 1 | CONCRETE PAD | 1 | 514272 3599.101 |
| 2 | PAD GROUNDING | 1 | 3407 |
| 3 | CABINET | 1 | 190432, 3599.104 |
| 4 | HOLD DOWN DEVICE, FURNISHED WITH CABINET | 2 | — |
| 5 | ELBOW - LOAD BREAK, 7.2KV, 200 AMP | 3 | 443416 4191 |
| 6 | PHASE AND ROUTE IDENTIFICATION TAG, | 3 | 3202, 3231 |
| 7 | CONCENTRIC NEUTRAL TAIL | AS REQ'D | — |
| 8 | CONNECTOR, COMPRESSION | 1 | 257792 |
| 9 | COMPANY LOCK, (CORBIN #27), FF KEY, NOT SHOWN ABOVE | 1 | 514848 |
| 10 | BOLT, MACH., GALV., 1/4" X 2", 1-NUT | 2 | 152032 |

NOTES:

- A. THIS INSTALLATION IS LIMITED TO ONE 200 AMP PHASE IN AND OUT WITH ONE SINGLE PHASE FUSED TAP.
- B. COMPANY LOCK, ITEM 10, TO BE ATTACHED TO LATCHING MECHANISM ON CABINET.
- C. PAD NUMBERING, 3211
- D. SECTIONALIZING CABINET 'WARNING SIGN', 3221

MAJOR USE: TO FUSE UNDERGROUND TAPS WHICH EMPLOY BOTH 1 ϕ & 3 ϕ TRANSFORMERS. ALSO TO FUSE UNDERGROUND EQUIPMENT WHEN CURRENT LIMITING FUSES WILL NOT COORDINATE WITH BACK-UP PROTECTION.

(DO NOT USE WITHIN 2400 FEET OF A SUBSTATION WITHOUT APPROVAL FROM PROTECTION ENGINEERING.)



| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONSTR. STD. |
|------|--|-----------|---------------------------|
| 1 | CONCRETE PAD | 1 | 513424, 3499.103 |
| 2 | PAD GROUNDING, UNIT | 1 | 3407 |
| 3 | HANDHOLE, BOTTOM SECTION, 17" X 30" | 2 | 162426, 3312. |
| 4 | CABINET, (COMPLETE), EXCLUDING FUSE LINKS (SEE NOTE C) | 1 | 334366, 3599.103 |
| 5 | HOLD DOWN DEVICE, NO STANDARD | - | - |
| 6 | COMPRESSION CONNECTORS | 6 | 4171. |
| 7 | CONCENTRIC NEUTRAL TAILS | AS REQ'D. | - |
| 8 | COMPRESSION CONNECTOR | 2 | 257792 |
| 9 | CABLE TERMINATION | 6 | 4121 |
| 10 | COMPANY LOCK, (CORBIN #27) FF KEY | 3 | 514848 |
| 11 | PHASE AND ROUTE TAGS | AS REQ'D. | 3202, 3231 |

NOTES:

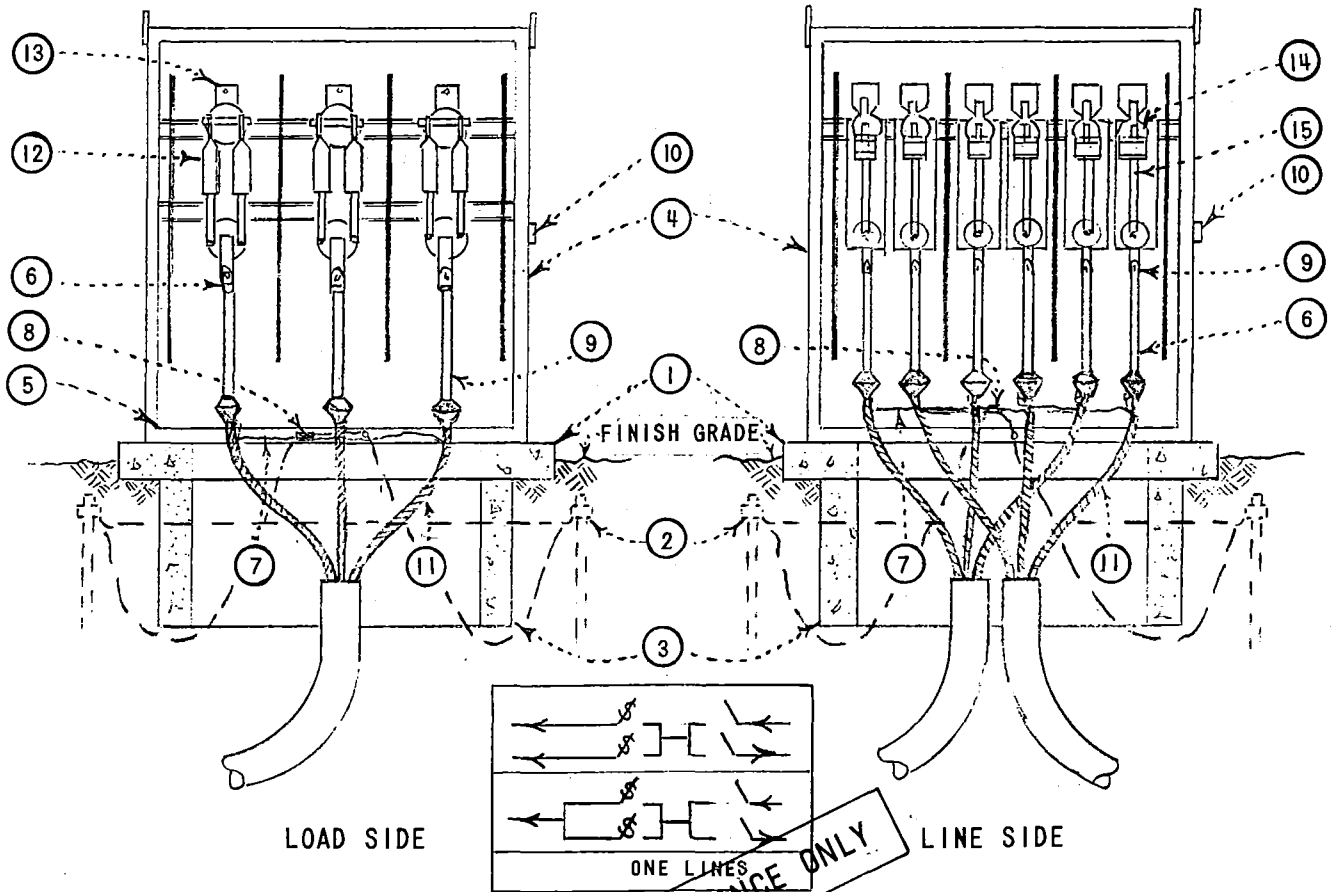
- A. . 3 ϕ 13800 VOLT GANG OPERATED FUSED SWITCHING CABINET. (SCOTT ENGR. CO.).
- B. ITEM 4, INCLUDES CABINET, SWITCH, FUSE HOLDERS AND MOUNTING BRACKETS COMPLETE.
- C. SM-4 FUSE LINKS (3) SIZE TO BE SPECIFIED ON WORK ORDER, REFER TO 4311
- D. STRUCTURE IDENTIFICATION SEE 3211
- E. FUSE SWITCHING CABINET, WARNING SIGN, SEE 3221 (APPLY TO BOTH OPENINGS).
- F. THIS SWITCH IS LIMITED TO MAXIMUM OF ONE CIRCUIT IN AND OUT.
- G. SWITCH NUMBER TO BE ASSIGNED BY ELECTRIC ENGINEERING.
- H. SWITCH IDENTIFICATION SEE 3212 (APPLY TO BOTH OPENINGS).

SDG&E ELECTRIC STANDARDS

3599.108

3 ϕ 200 AMP
PADMOUNT FUSE-SWITCH INSTALLATION

DATE 6-30-78
APPD TRC

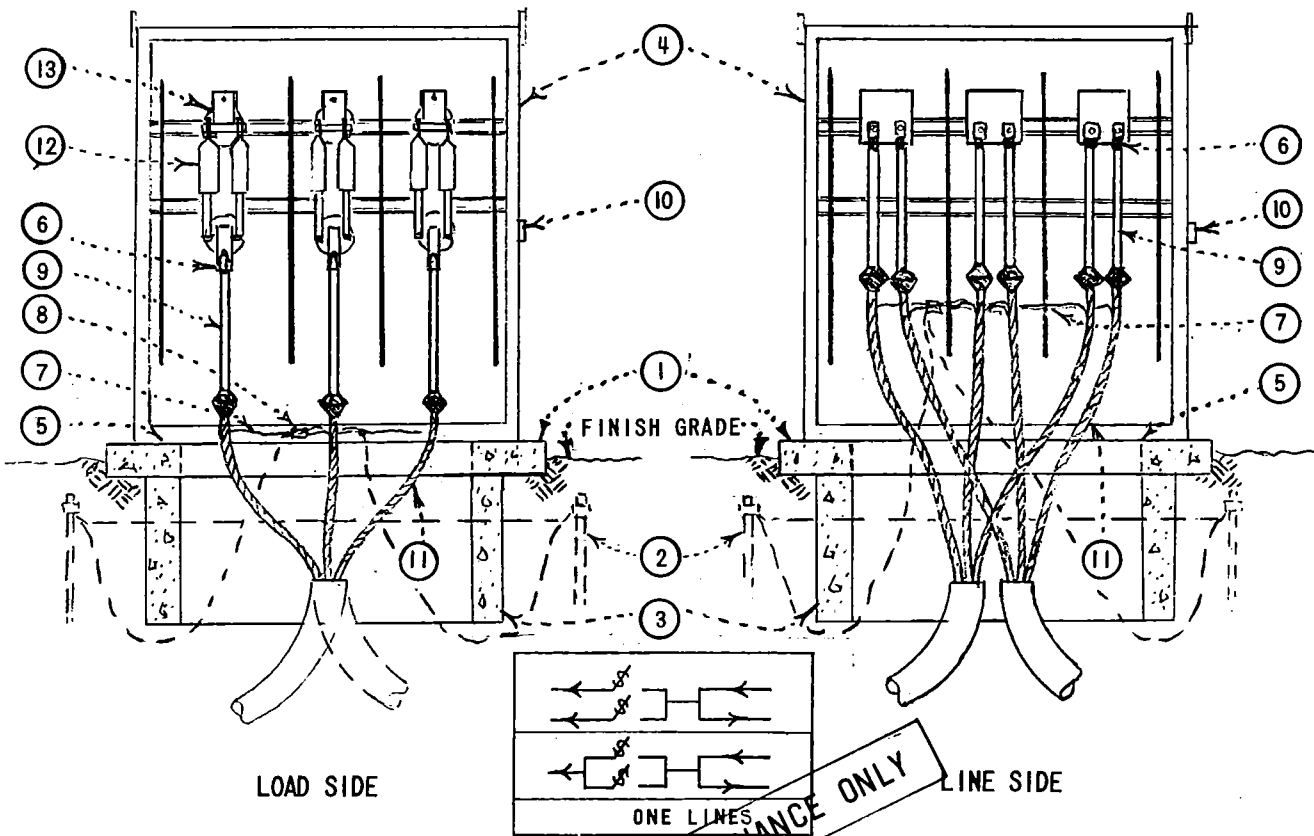


| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONSTR. STD. |
|------|---|----------|---------------------------|
| 1 | CONCRETE PAD | 1 | 513392, 3499.102 |
| 2 | PAD GROUNDING | 1 | 3407 |
| 3 | HANDHOLE, BOTTOM SECTION (SEE NOTE D) | 1 | 162664, 3313 |
| 4 | CABINET | 1 | 334366, 3599.101 |
| 5 | HOLDDOWN DEVICE, NO STD. | - | - |
| 6 | COMPRESSION CONNECTOR | 9 | 4171 |
| 7 | CONCENTRIC NEUTRAL TAIL | AS REQ'D | - |
| 8 | COMPRESSION CONNECTOR | 2 | 257792 |
| 9 | CABLE TERMINATION | 9 OR 12 | 4121 |
| 10 | COMPANY LOCK, (CORBIN #27) FF KEY (NOT SHOWN) | 2 | 514848 |
| 11 | PHASE AND ROUTE IDENTIFICATION | AS REQ'D | 3202, 3231 |
| 12 | FUSE | 6 | 4311 |
| 13 | DISCONNECT MOUNTING (DOUBLE ILLUSTRATED) | 3 OR 6 | 487904, 488096 |
| 14 | DISCONNECT MOUNTING | 6 | 488096 |
| 15 | LOADBREAK SWITCH BLADE | 6 | 139488, 3599.002 |

NOTES:

- A. CUT CONDUIT 3" ABOVE BOTTOM OF BDX.
- B. STRUCTURE IDENTIFICATION, 3211
- C. CABLE TERMINATING ENCLOSURE 'WARNING SIGN', 3221
- D. INSTALL BDX, STANDARD SHEET 3313, WITH 36" DIMENSION FACING DOOR OPENING.

MAJOR USE: LINE SIDE ABOVE 200 AMPS IN AND OUT
LOAD SIDE LESS THAN 200 AMPS

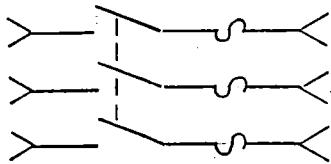


| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONSTR. STD. |
|------|---|----------|---------------------------|
| 1 | CONCRETE PAD | 1 | 513392, 3499.102 |
| 2 | PAD GROUNDING | 1 | 3407 |
| 3 | HANDHOLE, BOTTOM SECTION (SEE NOTE D) | 1 | 162864, 3313 |
| 4 | CABINET | 1 | 334388, 3599.101 |
| 5 | HOLD DOWN DEVICE, NO STD. | - | - |
| 6 | COMPRESSION CONNECTOR | 9 | 4171 |
| 7 | CONCENTRIC NEUTRAL TAIL | AS REQ'D | - |
| 8 | COMPRESSION CONNECTOR | 2 | 257792 |
| 9 | CABLE TERMINATION | 9 OR 12 | 4121 |
| 10 | COMPANY LOCK, (CORBIN #27) FF KEY (NOT SHOWN) | 2 | 514848 |
| 11 | PHASE AND ROUTE TAGS | AS REQ'D | 3202, 3231 |
| 12 | FUSE | 6 | 4311 |
| 13 | DISCONNECT MOUNTING (DOUBLE ILLUSTRATED) | 3 OR 6 | 487804, 488088 |

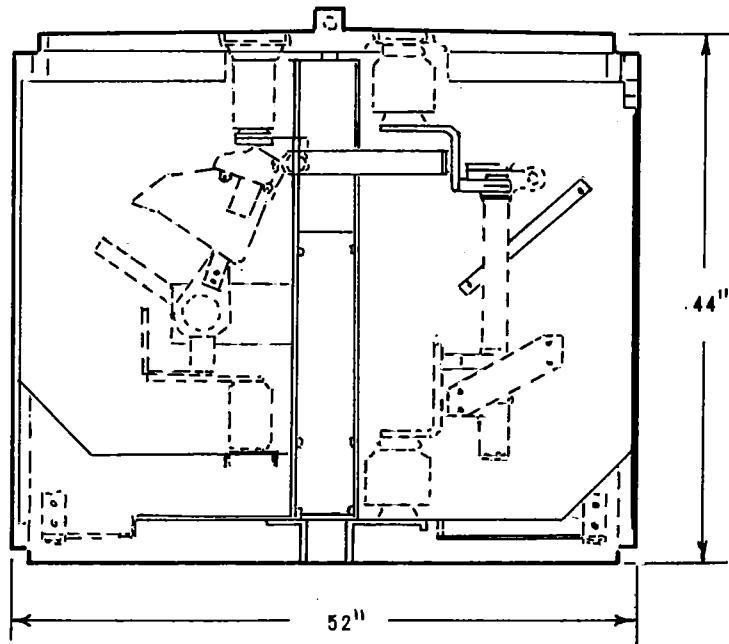
NOTES:

- A. CUT CONDUIT 3" ABOVE BOTTOM OF BOX.
- B. STRUCTURE IDENTIFICATION, 3211
- C. CABLE TERMINATING ENCLOSURE 'WARNING SIGN', 3221
- D. INSTALL BOX, STANDARD SHEET 3313, WITH 36" DIMENSION FACING DOOR OPENING.

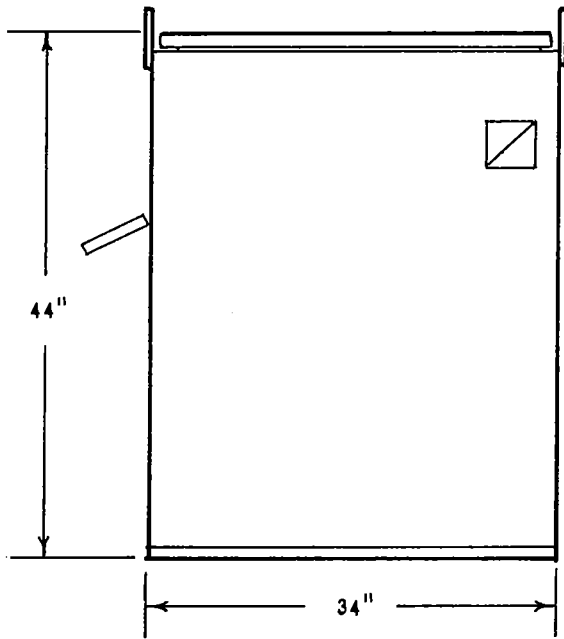
MAJOR USE: TO FUSE UNDERGROUND TAPS WHICH EMPLOY BOTH 1 ϕ & 3 ϕ TRANSFORMERS



CIRCUIT DIAGRAM



SIDE VIEW



FRONT VIEW

FOR FIELD MAINTENANCE ONLY

STOCK NUMBER
334366

| RATINGS | SM-4 FUSE | MINI-RUPTER LINE SWITCH |
|--------------------------------------|-----------|-------------------------|
| KV | 14.4 | 14.4 |
| AMPERES | 200 | 600 |
| KV-BIL | 95 | 95 |
| INTERRUPTING AMPERES (SYMMETRICAL) | 12,500 | 600 |
| MAKE AND LATCH AMPERES (SYMMETRICAL) | - | 12,500 |

NOTES:

- A. PANELS TO BE 11 GAUGE MINIMUM SHEET METAL REINFORCED.
- B. ALL STEEL PARTS TO BE HOT DIPPED GALVANIZED AFTER FABRICATION.
- C. FINISH: ONE COAT PRIMER AND TWO COATS FINISH LEAF GREEN (SUBOX 524 OR EQUAL).
- D. ALL INTERIOR BARRIERS TO BE 1/4" BENELEX OR EQUAL.
- E. FOR INSTALLATION DETAILS SEE 3599.112.

SDG&E ELECTRIC STANDARDS

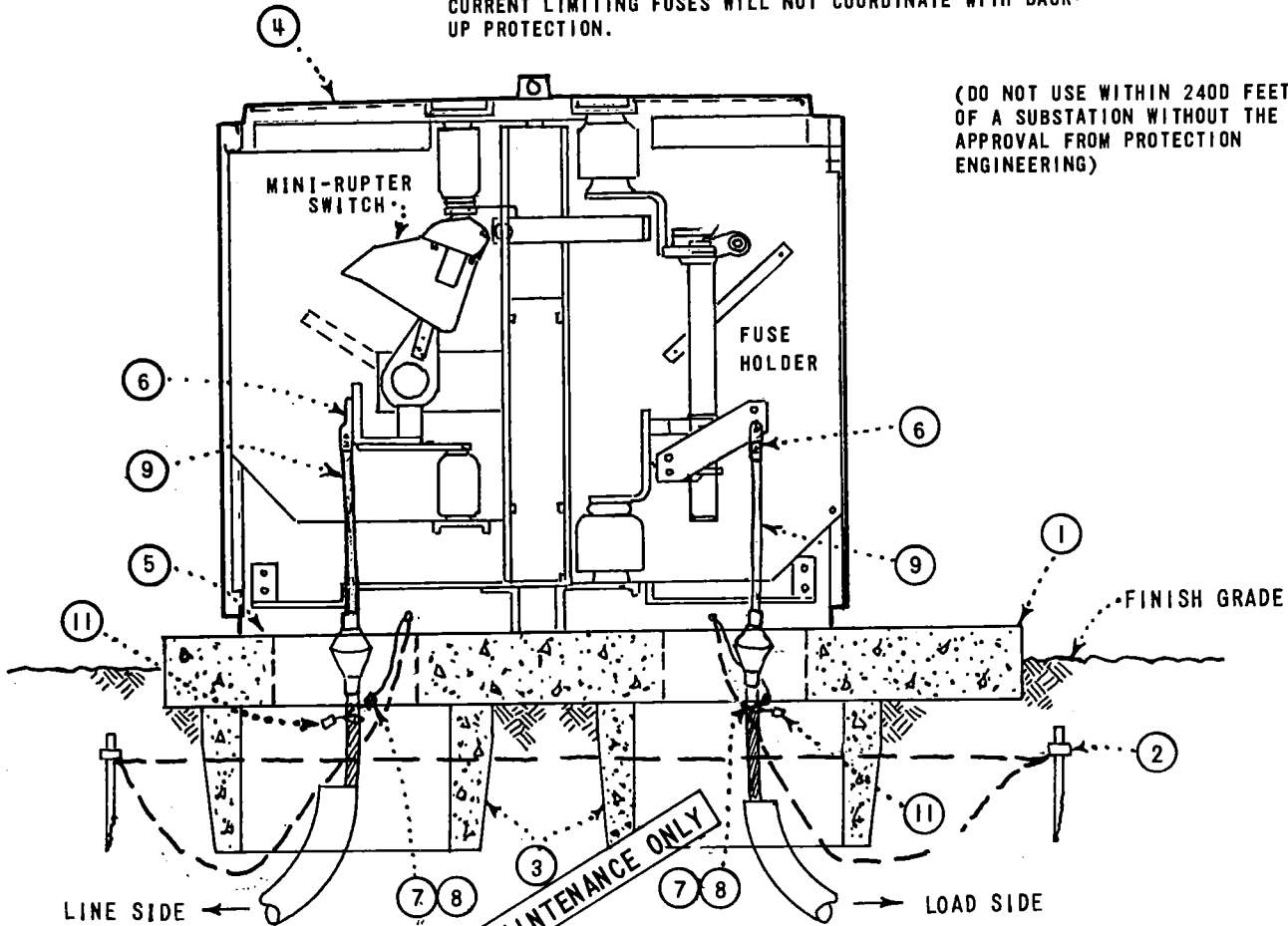
DATE 6-30-78
APPD TRF

3 ϕ PADMOUNT FUSED SWITCHING CABINET

3599.111

MAJOR USE: TO FUSE UNDERGROUND TAPS WHICH EMPLOY BOTH 1 ϕ & 3 ϕ TRANSFORMERS. ALSO TO FUSE UNDERGROUND EQUIPMENT WHEN CURRENT LIMITING FUSES WILL NOT COORDINATE WITH BACK-UP PROTECTION.

(DO NOT USE WITHIN 2400 FEET OF A SUBSTATION WITHOUT THE APPROVAL FROM PROTECTION ENGINEERING)



| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONSTR. STD. |
|------|--|-----------|---------------------------|
| 1 | CONCRETE PAD | 1 | 513424, 3499.102 |
| 2 | PAD GROUNDING, UNIT | 1 | 3407 |
| 3 | HANDHOLE, BOTTOM SECTION, 17" X 30" | 2 | 162426, 3312 |
| 4 | CABINET, (COMPLETE), EXCLUDING FUSE LINKS (SEE NOTE C) | 1 | 334366, 3511.00 |
| 5 | HOLD DOWN DEVICE, NO STANDARD | - | |
| 6 | COMPRESSION CONNECTORS | 6 | 4171 |
| 7 | CONCENTRIC NEUTRAL TAILS | AS REQ'D | |
| 8 | COMPRESSION CONNECTOR | 2 | 257792 |
| 9 | CABLE TERMINATION | 6 | 4121. |
| 10 | COMPANY LOCK, (CORBIN #27) FF KEY (NOT SHOWN) | 2 | 514848 |
| 11 | PHASE AND ROUTE TAGS | AS REQ'D. | 3231. |

NOTES:

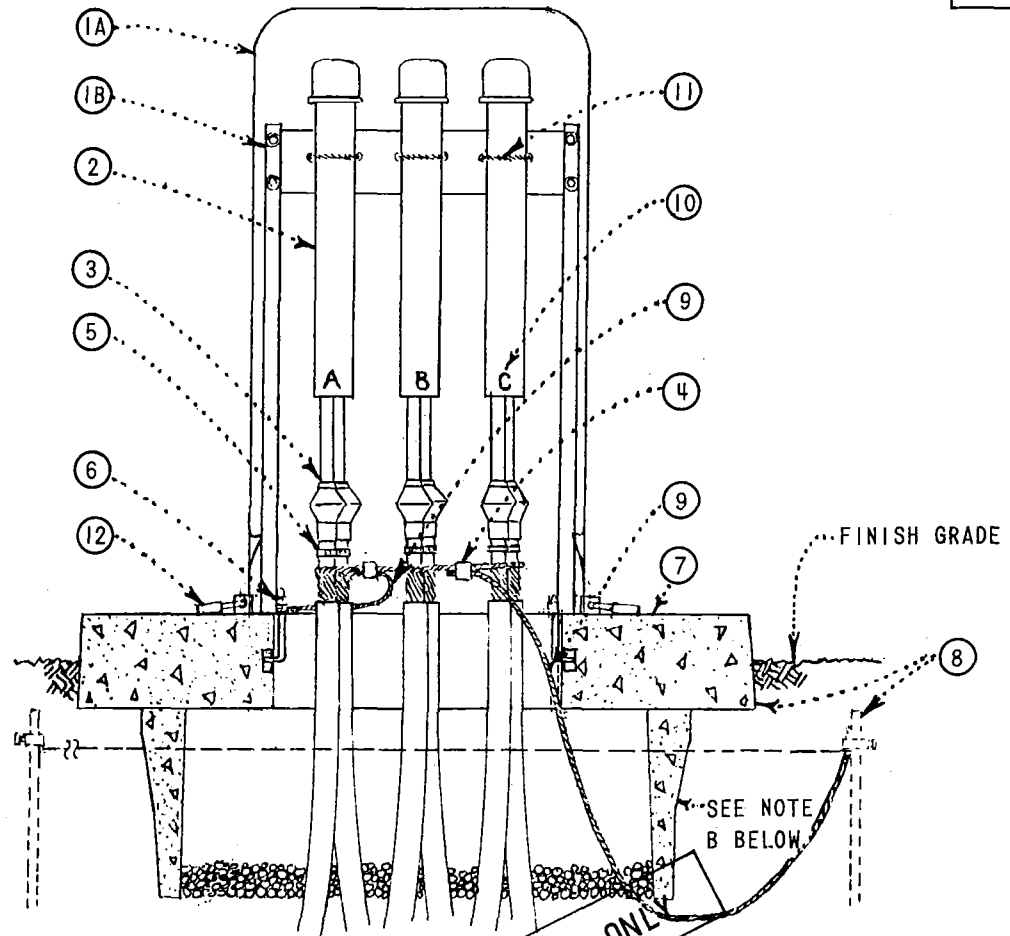
- A. 3 ϕ 14400 VOLT GANG OPERATED FUSED SWITCHING CABINET (S&C ELECTRIC CO.).
- B. ITEM 4, INCLUDES FUSE LINK CABINET, MINI-RUPTER SWITCH, FUSE HOLDERS AND MOUNTING BRACKETS COMPLETE.
- C. SM-4 FUSE LINK (3) SIZE TO BE SPECIFIED ON WORK ORDER, REFER TO 4311.
- D. STRUCTURE IDENTIFICATION SEE 3211.
- E. FUSE SWITCHING CABINET WARNING SIGN SEE 3221. (APPLY TO BOTH OPENINGS).
- F. THIS SWITCH IS MECHANICAL INTERLOCKED AND IS LIMITED TO MAXIMUM OF ONE CIRCUIT IN AND OUT.
- G. SWITCH NUMBER TO BE ASSIGNED BY ELECTRIC ENGINEERING.
- H. SWITCH IDENTIFICATION SEE 3212 (APPLY TO BOTH OPENINGS).

SDG&E ELECTRIC STANDARDS

3599.112

3 ϕ 200 AMP
PADMOUNT FUSE-SWITCH INSTALLATION

DATE 6-30-78
APPD TRF



| ITEM | DESCRIPTION | STOCK NO. OR CONSTR. STD. |
|------|---|---------------------------|
| 1 | A PAD COVER BOX, ARLINGTON SHEET METAL, LOS ANGELES | — |
| | B HOLD DOWN BAND AND CABLE SUPPORT BRACKET, SHOP MADE | — |
| 2 | CAPPED SPLICE TERMINATION | 3599.001 |
| 3 | INDOOR TERMINATION | 4121 |
| 4 | CONNECTOR, SPLIT BOLT | — |
| 5 | PHASE AND ROUTE IDENTIFICATION TAG, "EMBOSSO" OR "DYMO" | 716640 OR 716672 |
| 6 | HOLD DOWN DEVICE — NO STANDARD | — |
| 7 | TERMINATOR PAD, | DWG. REFR. FILE |
| 8 | PAD AND GROUND SYSTEM, | 3407 |
| 9 | BARE COPPER GROUND WIRE, #2 | 813664 |
| 10 | PHASE MARKING, FELT PEN OR GLASS TAPE AND BALL POINT | — |
| 11 | POLYPROPYLENE ROPE, 1/4" | — |
| 12 | COMPANY LOCK, (CORBIN #27) FF KEY | 514848 |

NOTES:

- A. TRANSFORMER, PAD AND CABLE PER WORK ORDER.
- B. ABS CONDUIT INSTALLATION REQUIRING RECESS BOX IS ILLUSTRATED. OMIT BOX ONLY WHEN PREASSEMBLED CABLE-IN-CONDUIT, PID TYPE CABLES ARE TO BE INSTALLED.
- C. TERMINATE DUCTS AND CONDUITS NOT LESS THAN 3" ABOVE FINISHED GRADE.
- D. PAD NUMBERING, 3211
- E. DO NOT INSTALL MORE THAN TWO CABLES PER PHASE. IF MORE THAN TWO CABLES PER PHASE, TERMINATE AND USE FOUR WAY TERMINATOR, 3521

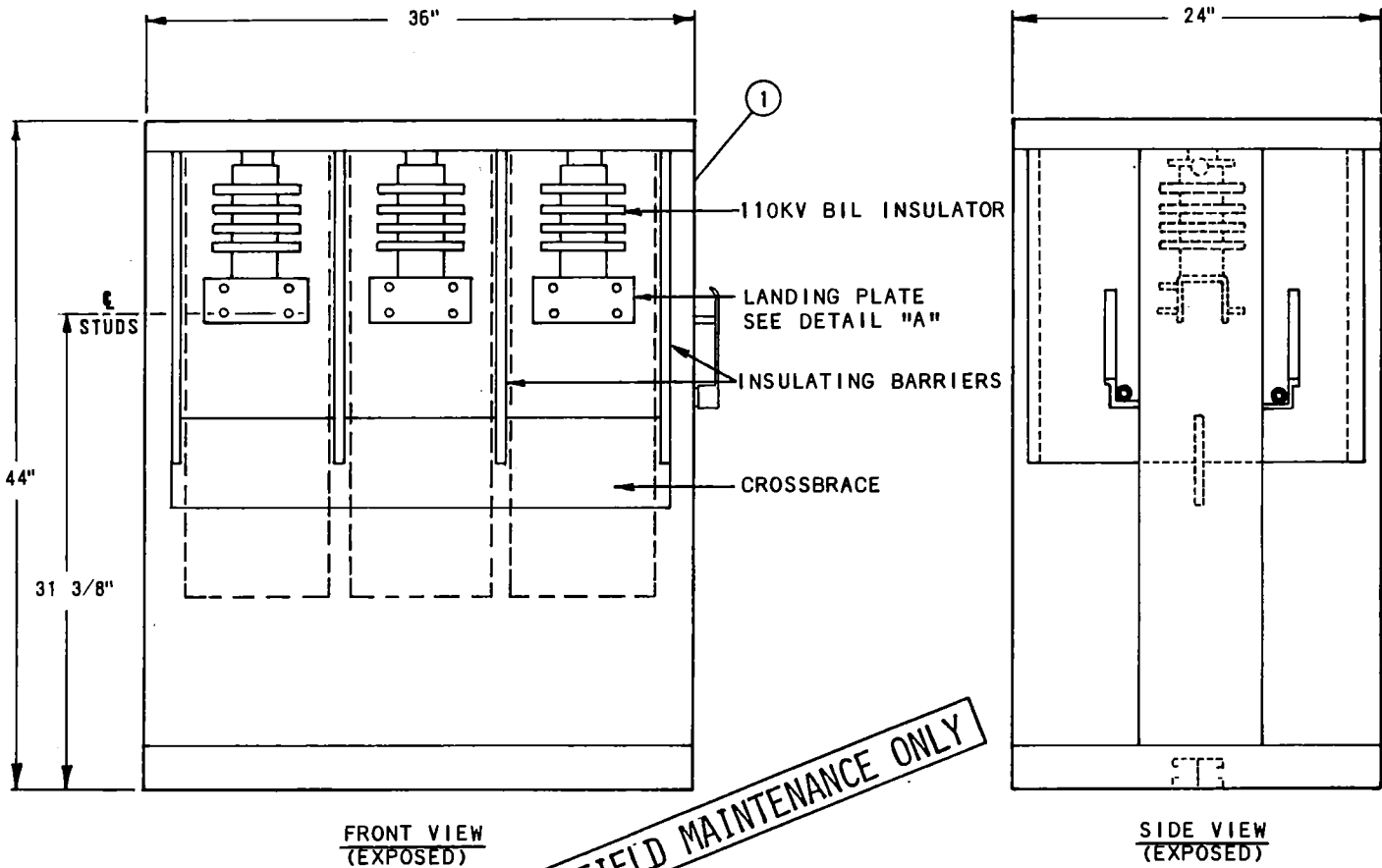
SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

DATE 2-20-69
SDG&E

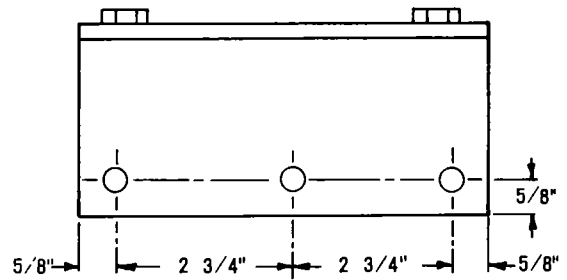
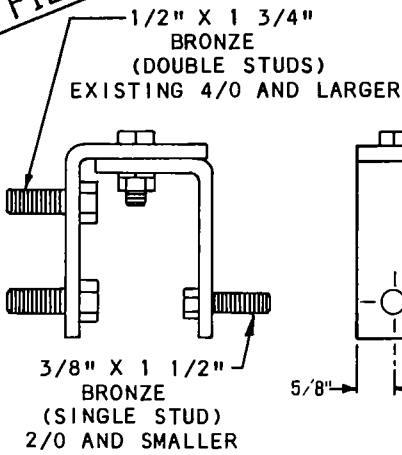
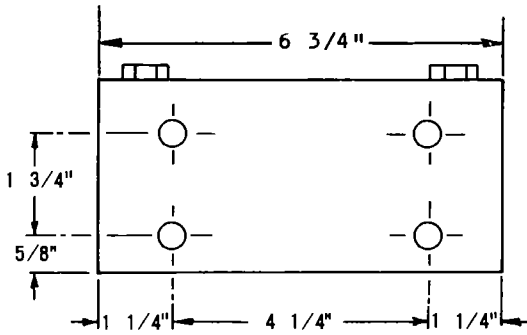
TWO WAY HIGH VOLTAGE TERMINATOR INSTALLATION

3599.201

SCOPE: THIS STANDARD SHOWS THE PAD-MOUNTED 3Ø TERMINATING ENCLOSURE AND INSTALLATION REQUIREMENTS USED WHEN 350, 750 OR 1000 KCMIL CABLE IS TERMINATED OR PLANNED TO BE TERMINATED. (B)(C)(D)



FOR FIELD MAINTENANCE ONLY



(C)(D) 4/0, 350, 750 OR 1000 KCMIL SIDE

2/0 AND SMALLER SIDE

**DETAIL "A"
LANDING PLATE**

SDG&E ELECTRIC STANDARDS

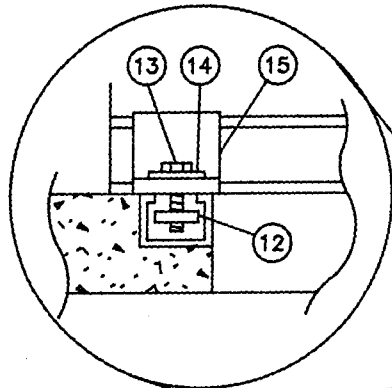
3599.202

THREE-PHASE TERMINATING ENCLOSURE,
12,000 VOLT, 350, 750 OR 1000 KCMIL CABLE

DATE 1-1-91

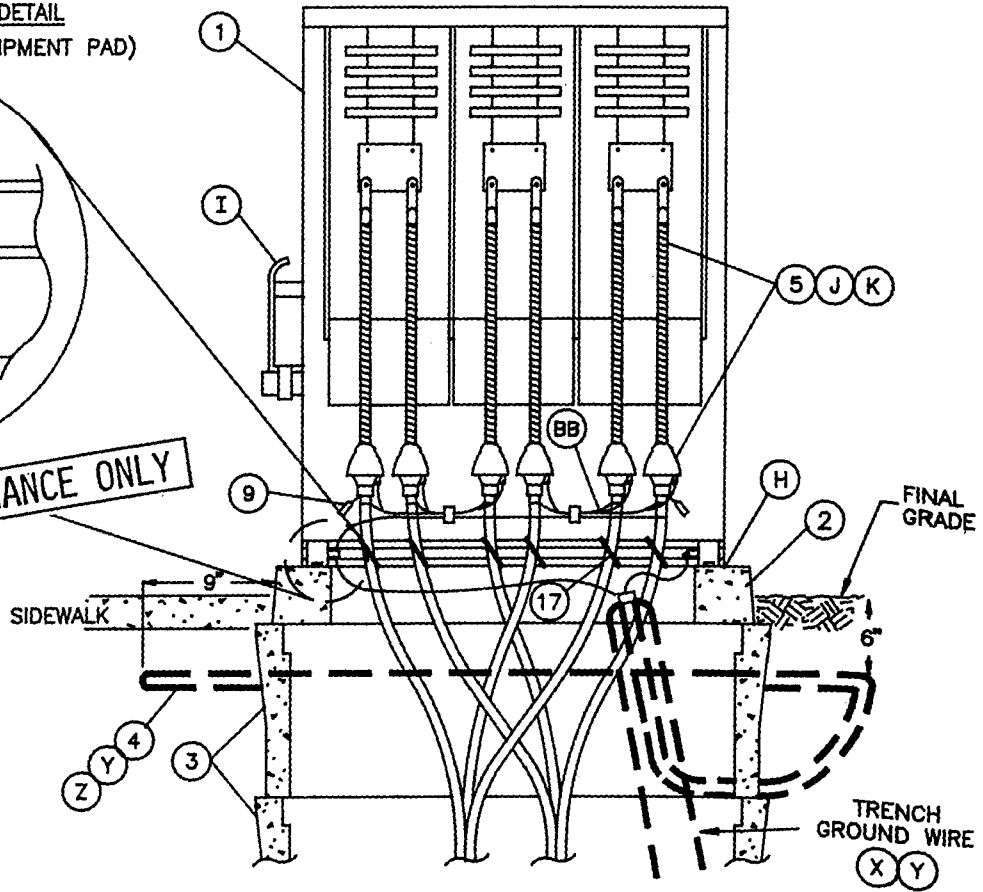
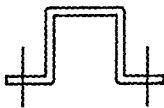
APPD *[Signature]*

HOLD DOWN ASSEMBLY DETAIL
(TYPICAL BOTH SIDES OF EQUIPMENT PAD)



FOR FIELD MAINTENANCE ONLY

ITEM (15) DETAIL
(SUPPLIED WITH CABINET)



| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PG NO. | STOCK NUMBER |
|------|---|----------|---------------------|--------------|
| 1 | CABINET, TERMINATING ENCLOSURE 3 PHASE | 1 | --- | 732964 |
| 2 | TERMINATOR PAD | 1 | 3413 | 514220 |
| 3 | HANDHOLE (G) | 2 | 3312 | 162426 |
| 4 | PAD GROUNDING EQUIPMENT (Z) | 1 | 4512 | --- |
| 5 | INDOOR TERMINATION | AS REQ'D | 4121 | --- |
| 6 | AUTOMATIC FAULT INDICATOR (CC) | 1 | 4352 | --- |
| 7 | | | | |
| 8 | KEYLESS LOCK (NOT SHOWN) (L) | 2 | --- | 468010 (E) |
| 9 | CABLE IDENTIFICATION TAGS | AS REQ'D | 3202 | --- |
| 10 | CONCENTRIC NEUTRAL TAILS | AS REQ'D | --- | --- |
| 11 | | | | |
| 12 | NUT, CLAMPING CHANNEL, W/SPRING, 1/2" | 4 | --- | 503520 (E) |
| 13 | SCREW, HEX HEAD CAP, BRONZE 1/2" X 1-1/2" | 4 | --- | 616192 (E) |
| 14 | WASHER, STANDARD FLAT ROUND, BRONZE 1/2" | 4 | --- | 799488 (E) |
| 15 | HOLD DOWN (SUPPLIED WITH CABINET) | 4 | --- | --- |
| 16 | AQUA - SEAL OR EQUIVALENT (NOT SHOWN) (G) | AS REQ'D | --- | 442976 (E) |
| 17 | TIE STRAP | AS REQ'D | 4178 | 738440 (E) |

SDG&E ELECTRIC STANDARDS

DATE 1-1-91
APPD *JLB*

THREE-PHASE TERMINATING ENCLOSURE,
12,000 VOLT, 350, 750 OR 1000 KCMIL CABLE

3599.

INSTALLATION IS LIMITED TO A MAXIMUM OF 2 3-PHASE FEEDER CABLE RUNS, 4/0, 350, 750 OR
AND 3 3-PHASE DISTRIBUTION CABLE RUNS, 2/0 AND SMALLER.

350, 750 OR 1000 KCMIL IS NOT ANTICIPATED, USE THE SMALLER TERMINATOR IN STANDARD 3521.

4/0 CABLE IN 5 INCH CONDUIT USE THIS TERMINATOR.

4/0 CABLE IN 4 INCH CONDUIT USE THE SMALLER TERMINATOR IN STANDARD 3521.

PT MATERIAL.

PAD AND HANDHOLE, INSTALL GROUND GRID.

NATE CONDUITS AND SEAL CONDUITS WITH AQUA-SEAL OR EQUIVALENT (ITEM 16). CONDUIT ENTER-
HANDHOLE SHALL HAVE AQUA-SEAL OR EQUIVALENT AT OPPOSITE END WHEN CONNECTED TO ADJACENT
HOLE OR MANHOLE TO REDUCE MOISTURE ENTRY INTO TERMINATOR.

OF CABINET SHALL BE CAULKED WHEN NECESSARY TO PREVENT WIRE ENTRY.

NET DOORS TO OPEN TOWARD THE PROPERTY AND AWAY FROM THE SIDEWALK.

AYS MAINTAIN 1 INCH CLEARANCE BETWEEN LIVE PARTS AND INSULATING BARRIER MATERIAL.

SILICONE TAPE (STANDARD 4121) FOR ALL TERMINATIONS TO ELIMINATE EFFECTS OF CONTAMINATION.

LESS LOCKS (ITEM B) TO BE ATTACHED TO LATCHING MECHANISM ON CABINET AND PENTAHEAD BOLT TO
THREADED IN COMPLETELY.

REFERENCES:

- SEE STANDARD 3202 FOR CABLE IDENTIFICATION.
- SEE STANDARD 3211 FOR PAD IDENTIFICATION.
- SEE STANDARD 3221 FOR HIGH VOLTAGE DECAL.
- SEE STANDARD 3408 FOR WIRE ENTRY PREVENTION.
- SEE STANDARD 3413 FOR PAD, HANDHOLE AND CONDUIT PLACEMENT.
- SEE STANDARD 3481 FOR BARRIER PROTECTION.
- SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- SEE STANDARD 3484 FOR INSTALLATION OF PAD-MOUNTED EQUIPMENT.
- SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE
RETAINING WALLS.
- SEE STANDARD 3487 FOR RETAINING WALLS.
- SEE STANDARD 4121 FOR PREPARATION OF INDOOR CABLE TERMINATIONS.
- SEE STANDARD 4510 FOR (PREFERRED I) AND (ALTERNATE) TRENCH GROUND WIRE.
- SEE STANDARD PAGE 4512.1 FOR (PREFERRED II) PAD GROUNDING INSTALLATION.
- SEE STANDARD 4512 FOR PAD GROUNDING.
- SEE STANDARD 4514 FOR GROUNDING TELCO CONDUCTOR IN PAD-MOUNTED EQUIPMENT.
-) SEE STANDARD 4520 FOR GROUNDING PAD-MOUNTED EQUIPMENT.
-) SEE DESIGN STANDARD 6113 FOR AUTOMATIC FAULT INDICATOR APPLICATION.

FOR FIELD MAINTENANCE ONLY

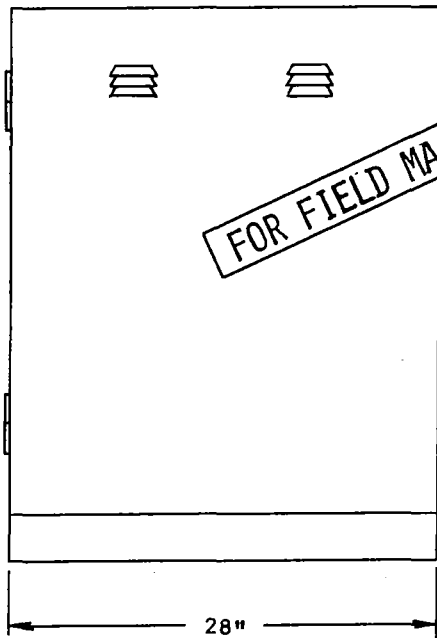
SDG&E ELECTRIC STANDARDS

39.204

THREE-PHASE TERMINATING ENCLOSURE,
12,000 VOLT, 350, 750 OR 1000 KCMIL CABLE

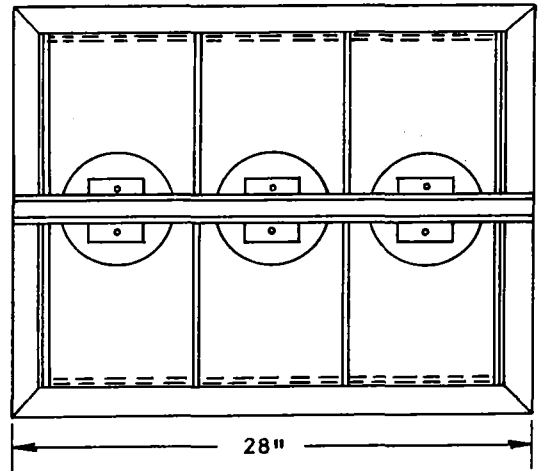
DATE 1-1-91
APPD *[Signature]*

SCOPE: THIS STANDARD SHOWS THE PAD-MOUNTED 3Ø TERMINATING ENCLOSURE AND INSTALLATION REQUIREMENTS USED WHEN 2/0 CABLE AND SMALLER IS TERMINATED OR PLANNED TO BE TERMINATED. (B)(C)(D)

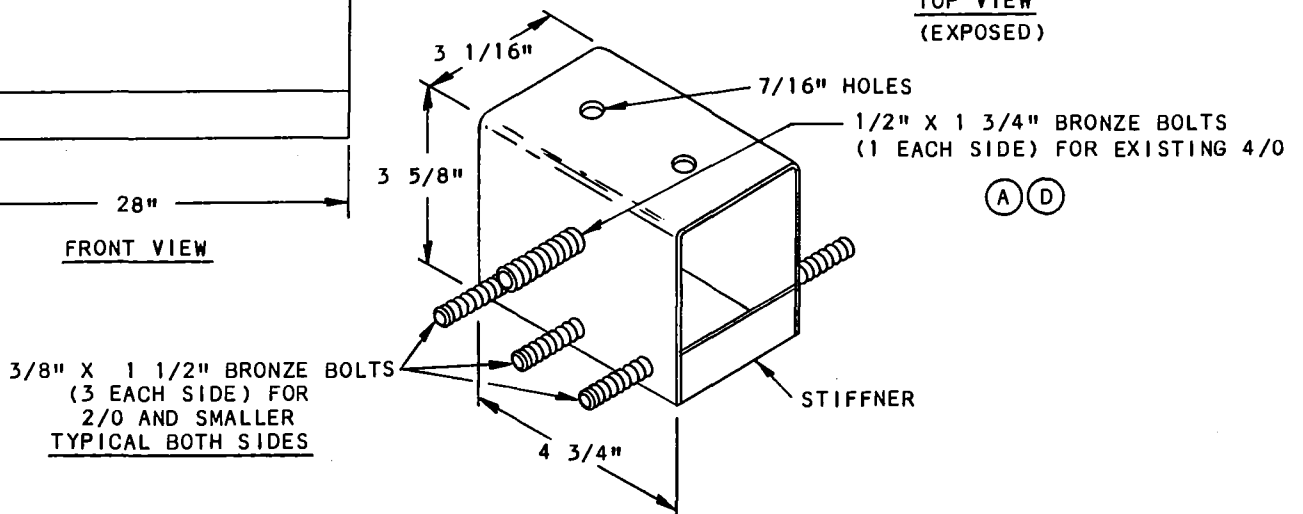


FRONT VIEW

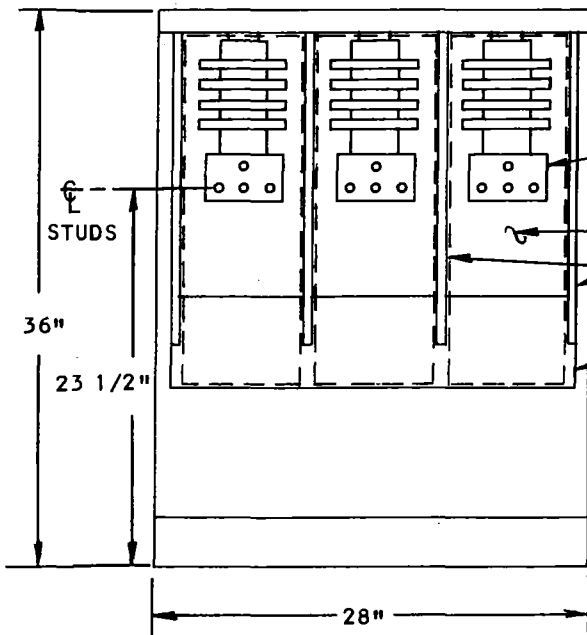
FOR FIELD MAINTENANCE ONLY



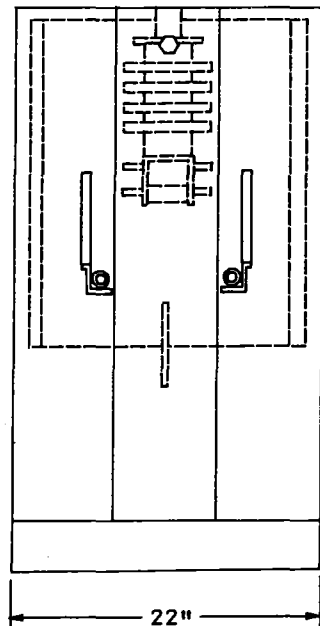
TOP VIEW (EXPOSED)



DETAIL "A" LANDING PLATE



FRONT VIEW (EXPOSED)



SIDE VIEW (EXPOSED)

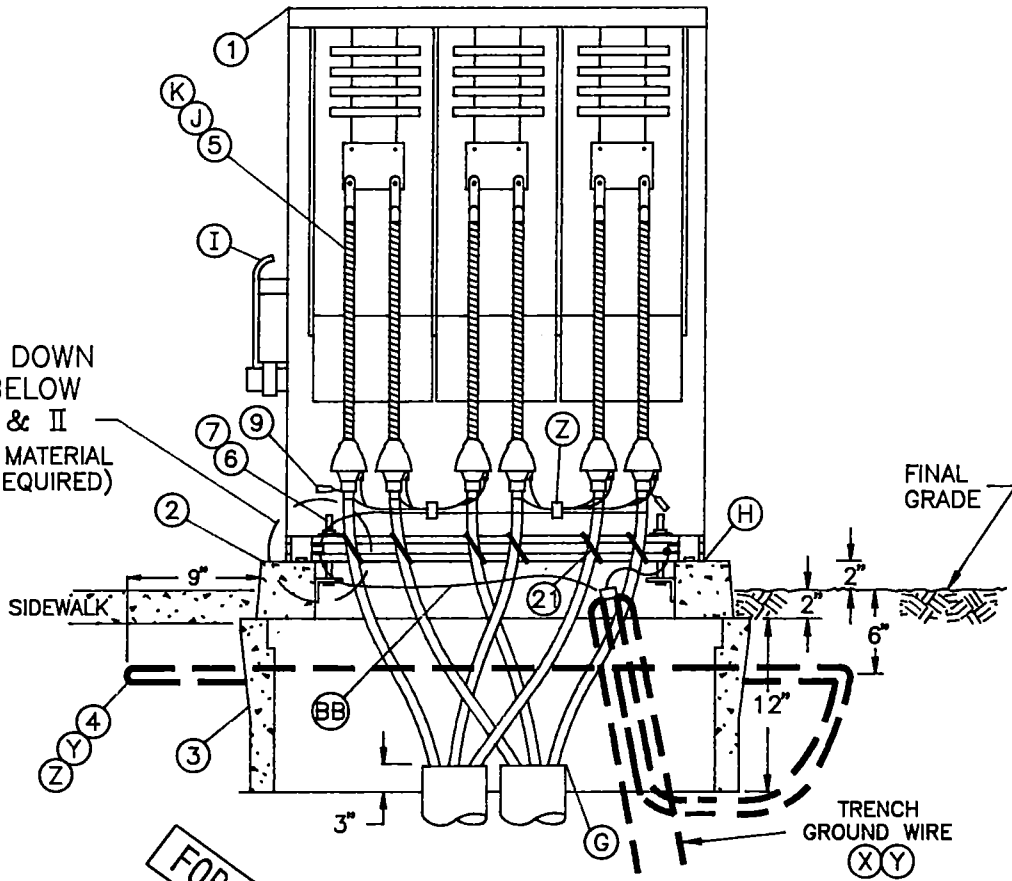
SDG&E ELECTRIC STANDARDS

DATE 1-1-91
APPD *[Signature]*

**THREE-PHASE TERMINATING ENCLOSURE
12,000 VOLT, 2/0 CABLE AND BELOW**

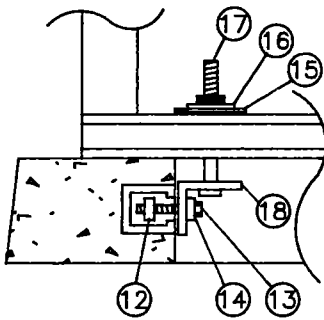
3599.205

SEE HOLD DOWN
DETAILS BELOW
TYPES I & II
(SEE BILL OF MATERIAL
FOR ITEMS REQUIRED)

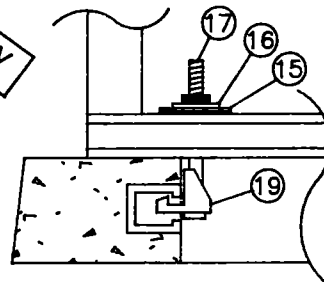


FOR FIELD MAINTENANCE ONLY

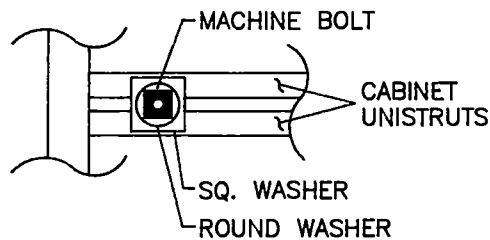
TYPE I
HOLD DOWN ASSEMBLY
(TYPICAL BOTH
SIDES OF EQUIPMENT PAD)



TYPE II - ALTERNATE
HOLD DOWN ASSEMBLY
(TYPICAL BOTH
SIDES OF EQUIPMENT PAD)



TOP VIEW
TYPES I & II



SDG&E ELECTRIC STANDARDS

3599.206

THREE-PHASE TERMINATING ENCLOSURE
12,000 VOLT, 2/0 CABLE AND BELOW

DATE 1-1-91

APPD *J. L. B. R.*

BILL OF MATERIAL

| ITEM | DESCRIPTION | QUANTITY | CONST. STD. | STOCK NUMBER |
|------|--|-------------|-------------|--------------|
| 1 | CABINET, TERMINATING ENCLOSURE 3 PHASE | -- | -- | 5733100 |
| 2 | EQUIPMENT PAD | 1 | 3411 | 514274 (E) |
| 3 | HANDHOLE (G) | 1 | 3312 | 162426 |
| 4 | PAD GROUNDING EQUIPMENT (Z) | 1 | 4512 | -- |
| 5 | INDOOR TERMINATION | AS REQ'D | 4121 | -- |
| 6 | | | | |
| 7 | | | | |
| 8 | KEYLESS LOCK (NOT SHOWN) (L) | 2 | -- | 468010 (E) |
| 9 | CABLE IDENTIFICATION TAGS | AS REQ'D | 3202 | -- |
| 10 | | | | |
| 11 | | | | |
| 12 | NUT, CLAMPING CHANNEL W/SPRING, 1/2" | 2 (TYPE I) | -- | 503520 (E) |
| 13 | SCREW, HEX HEAD CAP, BRONZE 1/2" X 1-1/2" | 2 (TYPE I) | -- | 616192 (E) |
| 14 | WASHER, STANDARD FLAT ROUND, BRONZE 1/2" | 2 (TYPE I) | -- | 799488 (E) |
| 15 | WASHER, SQ., FLAT GALV., 11/16" X 2-1/4" X 2-1/4" | 2 | -- | 799040 |
| 16 | WASHER, STANDARD FLAT ROUND, GALV., 1/2" | 4 | -- | 800192 |
| 17 | BOLT, SQ. HEAD MACHINE, GALV., 1/2" X 5" | 2 | -- | 153024 |
| 18 | HOLD DOWN (SUPPLIED WITH CABINET) OR; UNISTRUT, CHANNEL FITTING, 1-7/8" X 2" | 2 (TYPE I) | -- | -- |
| 19 | SEAT NUT, 5/8" SLOT GALV. | 2 (TYPE II) | -- | 633945 |
| 20 | AQUA-SEAL OR EQUIVALENT (NOT SHOWN) | AS REQ'D | -- | 442976 (E) |
| 21 | TIE STRAP | AS REQ'D | 4178 | 738440 (E) |

INSTALLATION:

- (A) THIS INSTALLATION IS LIMITED TO A MAXIMUM OF 6-3 PHASE DISTRIBUTION CABLE RUNS, 2/0 AND SMALLER OR 2-3 PHASE, 4/0 FEEDER CABLE RUNS AND 4-3 PHASE DISTRIBUTION CABLE RUNS, 2/0 AND SMALLER. NEVER INSTALL MORE THAN THREE CONDUCTORS PER LANDING PLATE.
- (B) WHEN 350, 750 OR 1000 KCMIL IS ANTICIPATED USE THE LARGER TERMINATOR IN STANDARD 3520.
- (C) EXISTING 4/0 CABLE IN 5 INCH CONDUIT USE THE LARGER TERMINATOR IN STANDARD 3520.
- (D) EXISTING 4/0 CABLE IN 4 INCH CONDUIT USE THIS TERMINATOR.
- (E) EXEMPT MATERIAL.
- (F) SET PAD AND HANDHOLE. INSTALL GROUND GRID.
- (G) TERMINATE CONDUITS AS SHOWN AND SEAL CONDUITS WITH AQUA-SEAL OR EQUIVALENT (ITEM 20). CONDUIT ENTERING HANDHOLE SHALL HAVE AQUA-SEAL OR EQUIVALENT AT OPPOSITE END WHEN CONNECTED TO ADJACENT HANDHOLE OR MANHOLE TO REDUCE MOISTURE ENTRY INTO TERMINATOR.
- (H) BASE OF CABINET SHALL BE CAULKED WHEN NECESSARY TO PREVENT WIRE ENTRY.

FIELD MAINTENANCE ONLY

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| REV | CHANGE | DR | BY | DSN | APV | DATE | REV | CHANGE | DR | BY | DSN | APV | DATE |
|-----|-------------------|-----|-----|-----|---------|------------|-----|--------|----|----|-----|-----|------|
| C | | | | | | | F | | | | | | |
| B | EDITORIAL CHANGES | GLC | JES | JAS | KRG | 02/09/2023 | E | | | | | | |
| A | ORIGINAL ISSUE | - | - | - | JYB/RDG | 1-1-91 | D | | | | | | |

| | | | | | | |
|-------------------------|---|---------------------------|--------------------|----------|---------------------|----------------------------------|
| SHEET 1 OF 1 | X | Indicates Latest Revision | Completely Revised | New Page | Information Removed | UG LEGACY UGL3599.207 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | | | |
| | THREE-PHASE TERMINATING ENCLOSURE 12,000 VOLT, 2/0 CABLE AND BELOW | | | | | |

INSTALLATION, CONT'D:

- Ⓘ CABINET DOORS TO OPEN TOWARD THE PROPERTY AND AWAY FROM THE SIDEWALK.
- Ⓝ ALWAYS MAINTAIN 1 INCH CLEARANCE BETWEEN LIVE PARTS AND INSULATING BARRIER MATERIAL.
- Ⓚ USE SILICONE TAPE (STANDARD 4121) FOR ALL TERMINATIONS TO ELIMINATE EFFECTS OF CONTAMINATION.
- Ⓛ KEYLESS LOCKS (ITEM 7) TO BE ATTACHED TO LATCHING MECHANISM ON CABINET AND PENTAHEAD BOLT TO BE THREADED IN COMPLETELY.

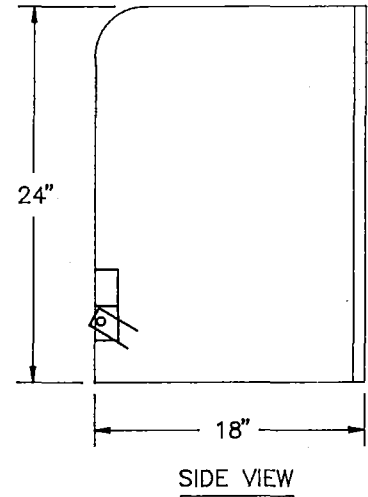
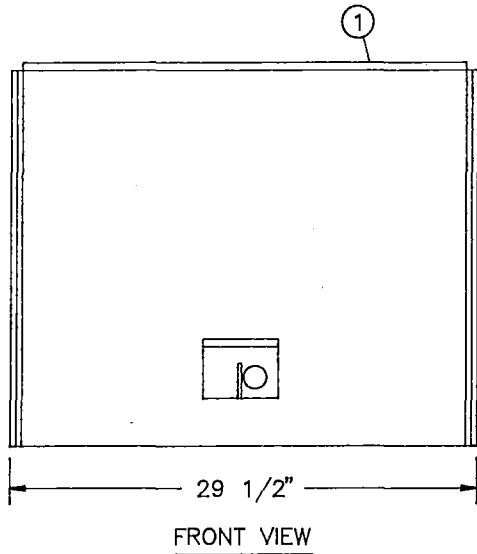
REFERENCES:

- M. SEE STANDARD 3202 FOR CABLE IDENTIFICATION.
- N. SEE STANDARD 3211 FOR PAD IDENTIFICATION.
- O. SEE STANDARD 3221 FOR HIGH VOLTAGE DECAL.
- P. SEE STANDARD 3408 FOR WIRE ENTRY PREVENTION.
- Q. SEE STANDARD 3411 FOR PAD, HANDHOLE AND CONDUIT PLACEMENT.
- R. SEE STANDARD 3481 FOR BARRIER PROTECTION.
- S. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- T. SEE STANDARD 3484 FOR INSTALLATION OF PAD-MOUNTED EQUIPMENT.
- U. SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUB-GRADE RETAINING WALLS.
- V. SEE STANDARD 3487 FOR RETAINING WALLS.
- W. SEE STANDARD 4121 FOR PREPARATION OF INDOOR CABLE TERMINATIONS.
- ⓧ SEE STANDARD 4510 FOR (PREFERRED I) AND (ALTERNATE) TRENCH GROUND WIRE.
- Ⓨ SEE STANDARD PAGE 4512.1 FOR (PREFERRED II) PAD GROUNDING INSTALLATION.
- Ⓩ SEE STANDARD 4512 FOR PAD GROUNDING.
- AA. SEE STANDARD 4514 FOR PAD GROUNDING TELCO CONDUCTOR IN PAD-MOUNTED EQUIPMENT.
- Ⓟ SEE STANDARD 4520 FOR GROUNDING PAD-MOUNTED EQUIPMENT.

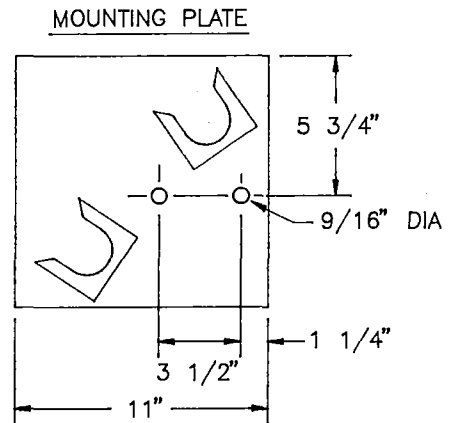
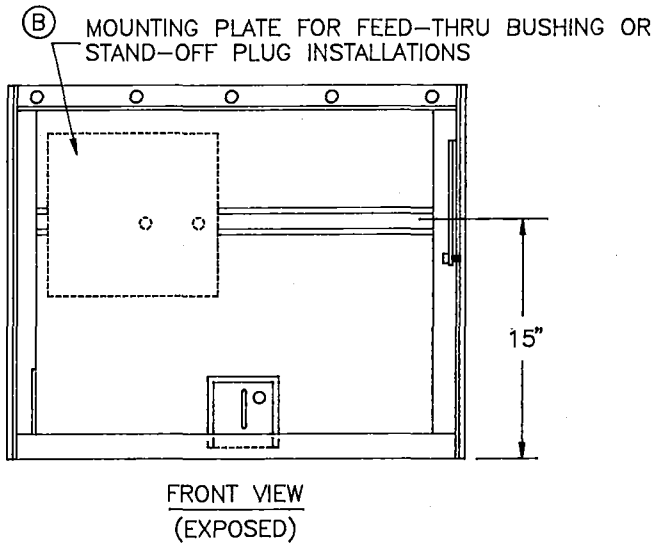
FOR FIELD MAINTENANCE ONLY

| | | |
|----------|---|-------------------------------|
| 3599.208 | SDG&E ELECTRIC STANDARDS | DATE 1-1-91 |
| | THREE-PHASE TERMINATING ENCLOSURE 12,000 VOLT, 2/0 CABLE AND BELOW | APPD <i>J. B. [Signature]</i> |

SCOPE: THIS STANDARD SHOWS THE PAD-MOUNTED, 1 PHASE, LOW PROFILE CABLE TERMINATING ENCLOSURE INSTALLATION REQUIREMENTS USED WHEN #2 CABLE IS TERMINATED OR PLANNED TO BE TERMINATED, AND/OR WHEN A TRANSFORMER WILL REPLACE THE TERMINATOR IN THE FUTURE.



FOR FIELD MAINTENANCE ONLY



USED FOR MOUNTING FEED-THRU BUSHING OR STAND-OFF PLUG. (THIS PLATE IS SUPPLIED WITH CABINET).

NOTES:

- MOUNTING PLATE IS SUPPLIED WITH EACH CABINET WHETHER USED OR NOT. CENTER UNUSED MOUNTING PLATE ON UNISTRUT IN TERMINATOR WHEN INSTALLING 3 WAY OR 4 WAY CABLE TAPS.
- 1 PHASE TERMINATOR SHALL BE INSTALLED ON A 3421 SINGLE-PHASE TRANSFORMER PAD WHEN THE TERMINATOR WILL BE REPLACED BY A TRANSFORMER IN THE FUTURE.

DATE 1-1-96
APPD *[Signature]*

SDG&E ELECTRIC STANDARDS

SINGLE-PHASE LOW PROFILE
CABLE TERMINATOR, 6930 VOLTS

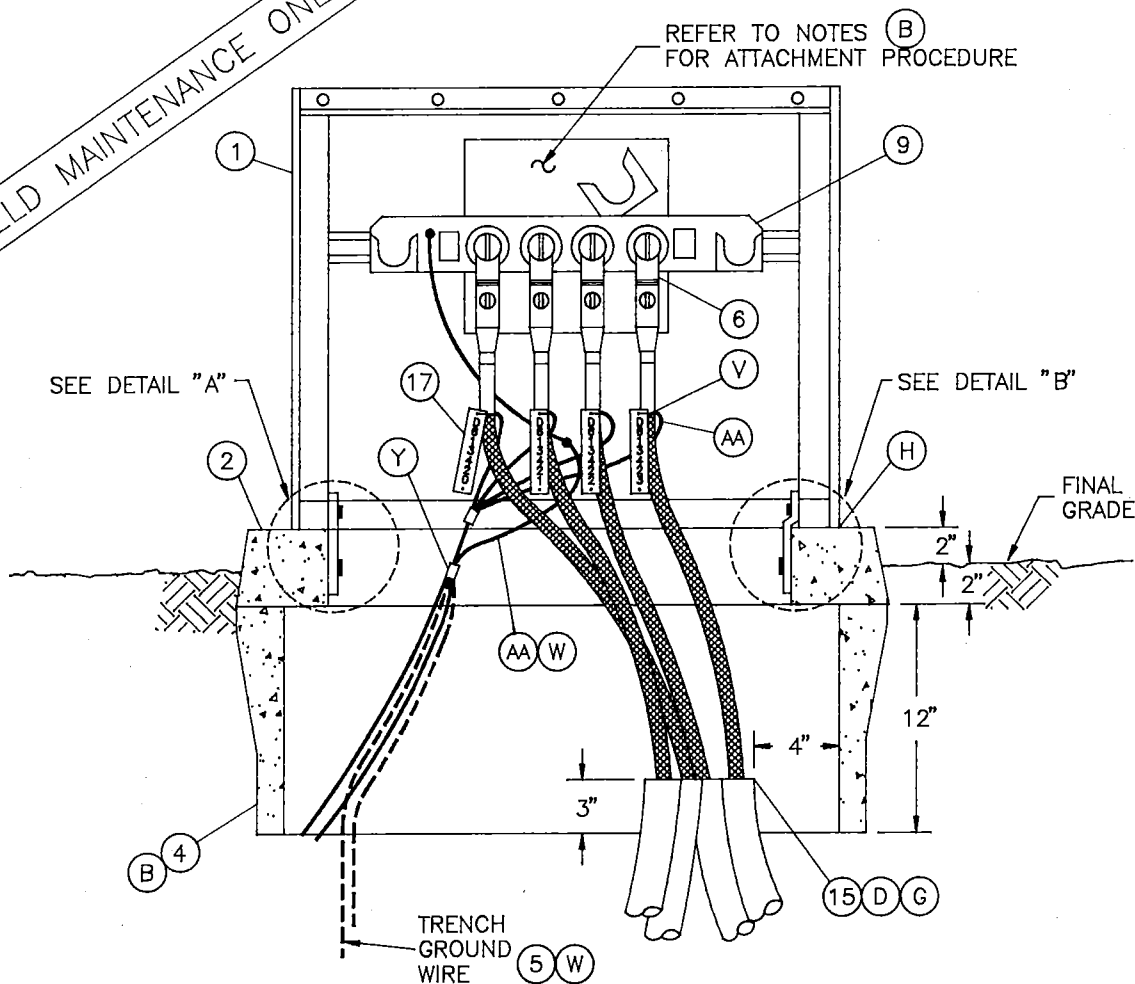
3599.209

CABLE TAP INSTALLATION

(W/3411 PAD)

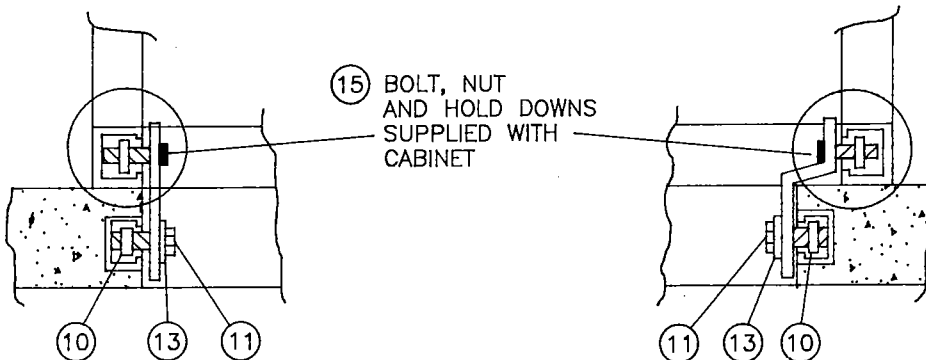
3522.2

FOR FIELD MAINTENANCE ONLY



DETAIL A
HOLD DOWN ASSEMBLY
(LEFT SIDE OF EQUIPMENT PAD)

DETAIL B
HOLD DOWN ASSEMBLY
(RIGHT SIDE OF EQUIPMENT PAD)



SDG&E ELECTRIC STANDARDS

DATE 1-1-96
APPD *[Signature]*

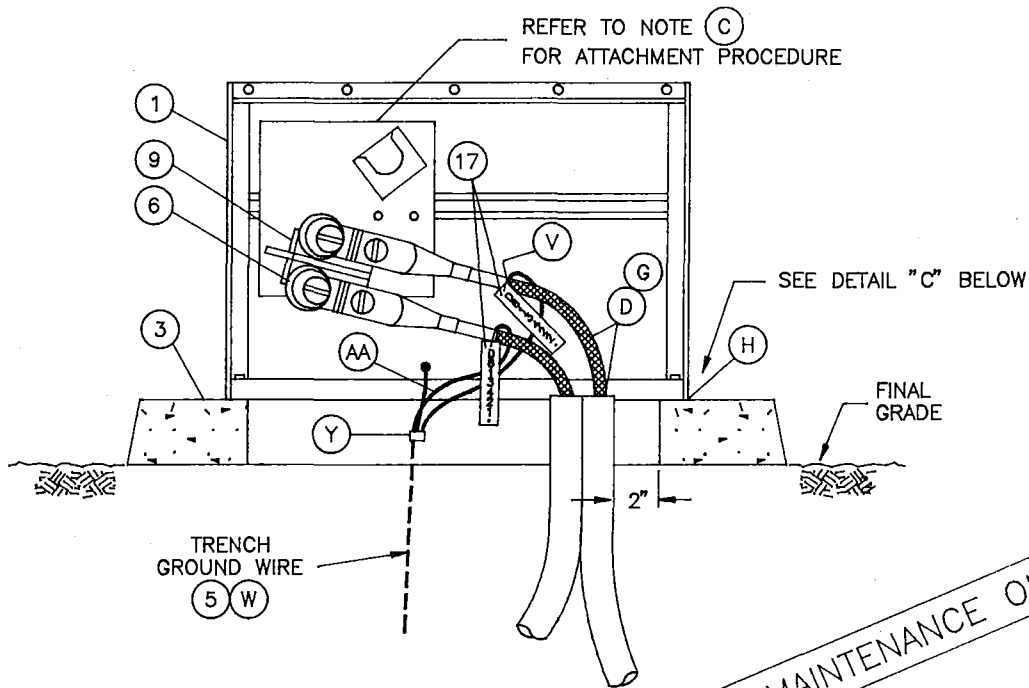
SINGLE-PHASE LOW PROFILE
CABLE TERMINATOR, 6930 VOLTS

3599.210

FEED-THRU BUSHING INSTALLATION

3522.3

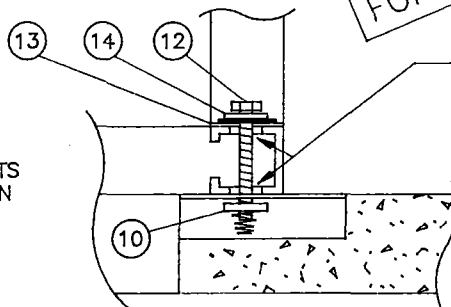
(W/3421 PAD FOR FUTURE TRANSFORMER INSTALLATIONS)



FOR FIELD MAINTENANCE ONLY

DETAIL C

HOLD DOWN ASSEMBLY.
SAVE HOLD-DOWN BRACKETS
INSIDE CABINET FOR USE IN
FUTURE TRANSFORMER
INSTALLATION).



BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNITS |
|------|---|--------------|-------------------------|--------------|----------------|
| 1 | CABINET, LOW PROFILE CABLE TERMINATOR 1 PHASE | 1 | 3522 | 732968 | TERM-1 |
| 2 | EQUIPMENT PAD | (B) 1 | 3411 | 514274 | TERM-T |
| 3 | 1 PHASE TRANSFORMER/FUSE CABINET PAD | 1 | 3421 | 514240 | 3421-1 |
| 4 | HANDHOLE | 1 | 3312 | 162426 | - |
| 5 | TRENCH GROUND WIRE | (W) AS REQ'D | 4510 | - | - |
| 6 | ELBOW, LOADBREAK 14.4KV 200 AMP | AS REQ'D | 4191 | - | - |
| | ELBOW, LOADBREAK FUSED 6930 200 AMP | | | | |
| 7 | INSULATING RECEPTACLE (NOT SHOWN) | AS REQ'D | 4192.1 | 204304 | - |
| 8 | KEYLESS LOCK (NOT SHOWN) | (I) 1 | - | 468010 | - |

CONTINUED NEXT PAGE:

| | | |
|--|--|----------|
| DATE 1-1-96 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS SINGLE-PHASE LOW PROFILE CABLE TERMINATOR, 6930 VOLTS | 3599.211 |
|--|--|----------|

BILL OF MATERIAL, CONT:

| ITEM | DESCRIPTION | QUANTITY | CONSTR. STD OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNITS |
|------|--|----------|-------------------------|--------------|----------------|
| 9 | CABLE TAP - 4 WAY | AS REQ'D | 4192 | - | TAP-4W |
| | CABLE TAP - 3 WAY | | | | TAP-3W |
| | STAND-OFF PLUG | | | | S/OPLG |
| | FEED-THRU BUSHING | | | | FEED-B |
| 10 | NUT, CLAMPING CHANNEL W/SPRING, 1/2" | 2 | - | 503520 | - |
| 11 | SCREW, HEX HEAD CAP, BRONZE 1/2" X 1 1/2" | 2 | - | 616192 | - |
| 12 | SCREW, HEX HEAD CAP, BRONZE, 1/2" X 2 1/2" (J) | 2 | - | 616352 | - |
| 13 | WASHER, STANDARD FLAT ROUND, BRONZE 1/2" (J) | 2 | - | 799488 | - |
| 14 | WASHER, LOCK, BRONZE 1/2" (J) | 2 | - | 796416 | - |
| 15 | HOLD DOWNS (SUPPLIED WITH CABINET) | 2 | - | - | - |
| 16 | SEALING COMPOUND (NOT SHOWN) (G) | AS REQ'D | - | 442976 | - |
| 17 | CABLE IDENTIFICATION TAGS | AS REQ'D | 3202 | - | - |

INSTALLATION:

- A. THIS INSTALLATION IS LIMITED TO A MAXIMUM OF 4-1 PHASE #2 AL PRIMARY CABLES WITH ONE 3 OR 4 WAY CABLE TAP OR FEED THRU BUSHING(S) OR STAND OFF PLUG(S).
- (B) WHEN INSTALLING CABLE TAP: (A) CENTER MOUNTING PLATE AND BOLT TO UNISTRUT (REFERENCE DRAWING ON PAGE 3522.2), (B) USE ONE HANDHOLE (ITEM 4).
- (C) WHEN INSTALLING FEED-THRU BUSHING OR STAND OFF PLUG, USE DETAIL 'A' (PAGE 3522.1).
- (D) CAUTION: CONDUIT AND CABLE SHOULD BE PLANNED FOR FUTURE TRANSFORMER INSTALLATION IF CABINET IS TEMPORARY (SEE STANDARD 3421 FOR CONDUIT PLACEMENT).
- F. SET PAD AND HANDHOLE, INSTALL GROUNDING EQUIPMENT.
- (G) TERMINATE CONDUITS AS SHOWN AND SEAL CONDUITS WITH SEALING COMPOUND (ITEM 16).
- (H) BASE OF CABINET SHALL BE CAULKED TO PREVENT WIRE ENTRY.
- (I) KEYLESS LOCK TO BE ATTACHED TO LATCHING MECHANISM ON CABINET AND PENTAHEAD BOLT TO BE THREADED IN COMPLETELY.
- (J) A 1/2" X 2-1/2" STAINLESS STEEL PENTAHEAD BOLT (S/N 156012), A 1/2" STAINLESS STEEL LOCK WASHER (S/N 796944), AND/OR A 1/2" STAINLESS STEEL FLAT ROUND WASHER (S/N 799680) MAY BE SUBSTITUTED IN BOLT-DOWN ASSEMBLY.

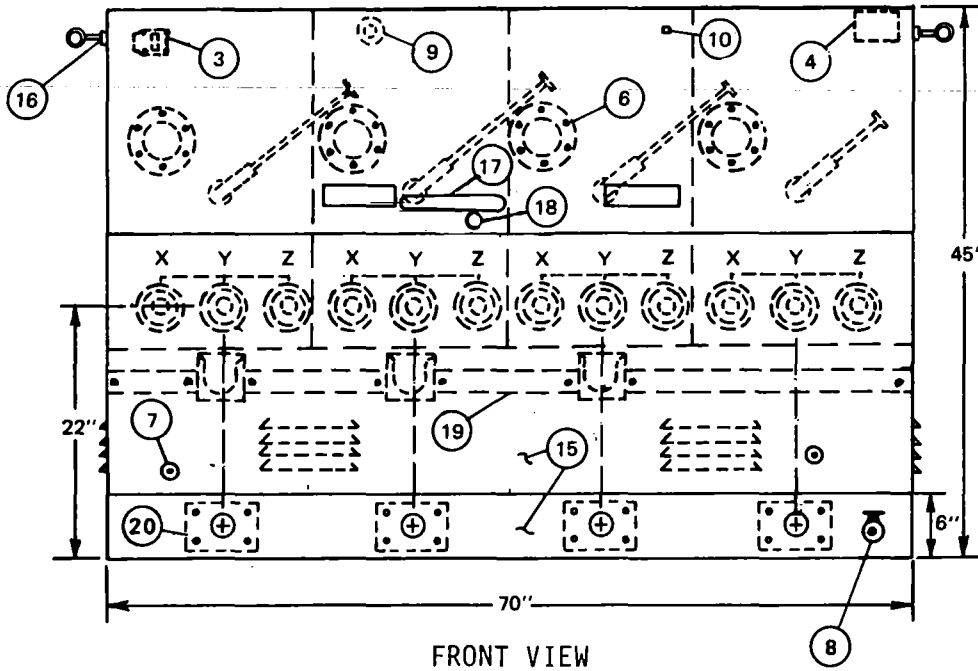
REFERENCE:

- K. SEE STANDARD 3202 FOR CABLE IDENTIFICATION.
- L. SEE STANDARD 3211 FOR STRUCTURE/EQUIPMENT IDENTIFICATION.
- M. SEE STANDARD 3221 FOR HIGH VOLTAGE DECAL.
- N. SEE STANDARD 3408 FOR WIRE ENTRY PREVENTION.
- O. SEE STANDARDS 3411 OR 3421 FOR PAD, HANDHOLE AND CONDUIT PLACEMENT.
- P. SEE STANDARD 3481 FOR BARRIER PROTECTION.
- Q. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- R. SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT.
- S. SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- T. SEE STANDARD 3487 FOR RETAINING WALLS.
- U. SEE STANDARDS 3605 AND 3660 FOR 1 PHASE SUBSURFACE SECTIONALIZING.
- (V) SEE STANDARD 4108 FOR SEALING JACKETED CABLE.
- (W) SEE STANDARD 4510 FOR (PREFERRED I) AND (ALTERNATE) TRENCH GROUND WIRE.
- X. SEE STANDARD PAGE 4512.1 FOR (PREFERRED II) EQUIPMENT GROUNDING INSTALLATION.
- (Y) SEE STANDARD 4512.2 FOR EQUIPMENT GROUNDING.
- Z. SEE STANDARD 4514 FOR GROUNDING TELCO CONDUCTOR IN PAD-MOUNTED EQUIPMENT.
- (AA) SEE STANDARD 4520 FOR GROUNDING PAD-MOUNTED EQUIPMENT.

FOR FIELD MAINTENANCE ONLY

| | | |
|--|--|----------|
| DATE 1-1-96 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS SINGLE-PHASE LOW PROFILE CABLE TERMINATOR, 6930 VOLTS | 3599.212 |
|--|--|----------|

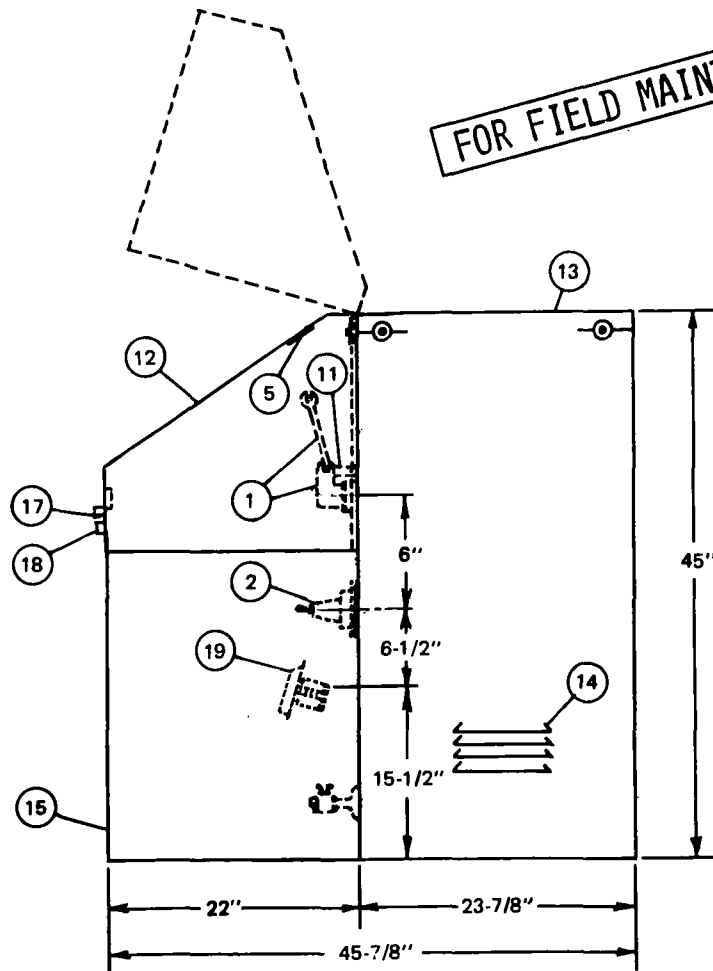
SCOPE: THIS STANDARD SHOWS A 600 AMP OIL SWITCH TO BE USED FOR PAD-MOUNTED APPLICATIONS.



FRONT VIEW

WEIGHT: W/O OIL 1700#
W/ OIL 3125#

FOR FIELD MAINTENANCE ONLY



SIDE VIEW

3599.407

SDG&E ELECTRIC STANDARDS

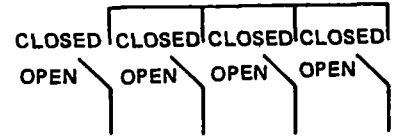
PAD-MOUNTED OIL SWITCH
12KV, 600 AMP, 3Ø

DATE 1-1-91

APPD *[Signature]*

ELECTRICAL RATINGS:

| | |
|---|------------|
| VOLTAGE | 15.5KV |
| B.I.L. | 95KV |
| CURRENT, CONTINUOUS | 600 AMP |
| LOADMAKE AND LOADBREAK | 600 AMP |
| MOMENTARY AND FAULT CLOSE (RMS, ASYMMETRICAL) | 19,200 AMP |
| (RMS, SYMMETRICAL) | 12,000 AMP |



4-WAY ONE LINE DIAGRAM

FOR FIELD MAINTENANCE ONLY

SWITCH PARTS LIST

| ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|------|------------------------|------|--------------------------------------|
| 1 | OPERATING HANDLE | 11 | SWITCH HANDLE LOCKING PROVISION |
| 2 | BUSHING | 12 | LIFT-UP DOOR, CLAM SHELL LID |
| 3 | OIL LEVEL GAUGE | 13 | SWITCH TANK |
| 4 | NAME PLATE | 14 | VENTS |
| 5 | CONNECTION DIAGRAM | 15 | REMOVABLE FRONT SECTION |
| 6 | CONTACT VIEWING WINDOW | 16 | BOSS FOR LIFTING EYES |
| 7 | GROUND LUGS | 17 | DOOR HANDLE |
| 8 | DRAIN VALVE | 18 | PENTAHEAD BOLT LOCKING PROVISION |
| 9 | FILL PLUG | 19 | STANDOFF BRACKET |
| 10 | AIR CHECK VALVE | 20 | LEXAN FAULT INDICATOR VIEWING WINDOW |

NOTES:

- PAD-MOUNTED SWITCH (STOCK NUMBER 708987) IS DELIVERED FROM THE SUPPLIER WITH ALL THE PARTS LISTED IN THE PARTS LIST.
- SWITCH NUMBERS ARE TO BE ISSUED BY THE ENGINEERING CLERK IN THE DISTRIBUTION FACILITIES INFORMATION SECTION.
- PAD-MOUNTED SWITCH IS ONLY PURCHASED WITH FOUR SWITCH POSITIONS.
- THE PANEL INSIDE THE CABINET IS PAINTED GREEN AND GRAY TO HELP QUICKLY IDENTIFY EACH SEPARATE CIRCUIT.

REFERENCE:

- A. SEE STANDARD 3440 FOR PAD AND HANDHOLE INSTALLATION FOR PAD-MOUNTED 600 AMP, 12 KV SWITCH.
- B. SEE STANDARDS 3550 OR 3551 FOR SWITCH INSTALLATION.
- C. SEE STANDARD 3212.2 FOR SWITCH IDENTIFICATION .

SDG&E ELECTRIC STANDARDS

DATE 1-1-91
APPD *JLB/RAJ*

PAD-MOUNTED OIL SWITCH
12KV, 600 AMP, 3Ø

3599.408

3600 SUBSURFACE
SECTIONALIZING EQUIPMENT

3600 SUBSURFACE
SECTIONALIZING EQUIPMENT

| <u>PAGE</u> | <u>SUBJECT</u> |
|---------------|--|
| 3699.001 | SUBSTRUCTURE USE AND LIMITATIONS REFERENCE SHEET |
| 3699.101 | 400 AMP LOADBREAK OIL SWITCH - MULTIPLE POSITION WITH BUS |
| 3699.102 | 400 AMP LOADBREAK OIL SWITCH - MULTIPLE POSITION WITH TIE BUSSES AND EXTERNALLY AVAILABLE MAIN BUS |
| 3699.103 | 400 AMP LOADBREAK OIL SWITCH - LOOP AND TIE |
| 3699.104 | 400 AMP LOADBREAK OIL SWITCH - MULTIPLE POSITION |
| 3699.105 | OIL SWITCH 12KV, THREE-PHASE, 400 & 600 AMPERE |
| 3699.106 | ON-OFF OIL SWITCH, 12KV, THREE-PHASE, 600 AMPERE |
| 3699.107-.108 | ON-OFF OIL SWITCH, 12KV, THREE-PHASE, 600 AMPERE, INSTALLATION |
| 3699.109 | ON-OFF OIL SWITCH, 12KV, THREE-PHASE, 200 AMPERE |
| 3699.110-.111 | ON-OFF OIL SWITCH, 12KV, THREE-PHASE, 200 AMPERE, INSTALLATION |
| 3699.201 | ON-OFF OIL SWITCH, 12KV, THREE-PHASE, 200 AMPERE |
| 3699.202-.203 | ON-OFF OIL SWITCH, 12KV, THREE-PHASE, 200 AMPERE, INSTALLATION |
| 3699.400 | UNOBSTRUCTED SPACE |
| 3699.401-.405 | CABLE AND CONDUIT PLACEMENT |
| 3699.406 | EQUIPMENT ASSEMBLIES |
| 3699.408-.419 | EQUIPMENT COMBINATION GUIDELINES |
| 3699.501 | SUBSTRUCTURE USE AND LIMITATIONS REFERENCE SHEET |
| 3699.701-.704 | SUBSURFACE OIL SWITCH, 600 AMP, 12KV, THREE-PHASE |
| 3699.705-.706 | SUBSURFACE/SURFACE OPERABLE OIL SWITCH 12KV, 600 AMP, THREE-PHASE |
| 3699.707-.708 | SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH 12KV, 600 AMP, THREE-PHASE |
| 3699.709-.714 | SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH 12KV, 600 AMP, THREE-PHASE |
| 3699.715-.719 | INSTALLATION OF SUBSURFACE/SURFACE OPERABLE SWITCH IN 3316 HANDHOLE |

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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
|-----|--------------------|----|------|------|------------|-----|--------|----|------|------|------|
| C | | | | | | F | | | | | |
| B | COMPLETELY REVISED | JK | JS | CZH | 10/16/2019 | E | | | | | |
| A | ORIGINAL ISSUE | JK | JS | CZH | 6/13/2019 | D | | | | | |

Indicates Latest Revision Completely Revised New Page Information Removed

**SHEET
1 OF 1**

SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS
LEGACY UNDERGROUND FIELD MAINTENANCE
TABLE OF CONTENTS
SUBSURFACE SECTIONALIZING EQUIPMENT

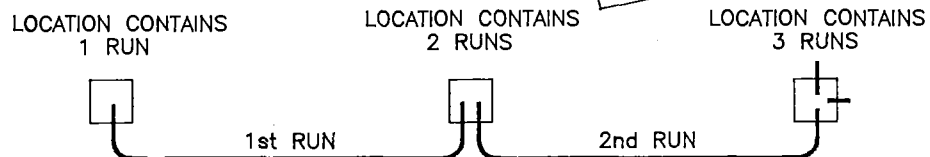
**UG LEGACY
UGL3601.1**

| SUBSTRUCTURES | MAJOR USE LIMITATION |
|---|---|
| 1-1-88 3315 4' X 6'-6" X 6'-7" HANDHOLE (PRIMARY & SECONDARY) | FOR ALL SIZES OF PRIMARY AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM. <u>AN UNOBSTRUCTED SPACE OF 18" X 48" MUST BE MAINTAINED.</u> <u>EXAMPLE:</u> MAXIMUM INSTALLATION CONSISTS OF 3-350 KCMIL OR LARGER ELBOW TEE SPLICED THREE-PHASE PRIMARY CIRCUITS ON OPPOSITE WALLS, EACH ONE TAPPED WITH ONE THREE-PHASE DISTRIBUTION RUN. THE THREE TEE COMBINATION SHALL ONLY BE USED TO FEED A SWITCHED TIE POSITION. (SEE PAGE 3646.2). |
| 1-1-88 3316 5' X 8'-6" X 7' HANDHOLE (PRIMARY & SECONDARY) | FOR ALL SIZES OF PRIMARY AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM. <u>AN UNOBSTRUCTED SPACE OF 22" X 72" MUST BE MAINTAINED.</u> <u>EXAMPLE:</u> MAXIMUM INSTALLATION CONSISTS OF 3-350 KCMIL OR LARGER ELBOW THE SPLICED THREE-PHASE PRIMARY CIRCUITS ON OPPOSITE WALKS, EACH ONE TAPPED WITH ONE THREE-PHASE DISTRIBUTION RUN. IN THE SAME HANDHOLE, 2-350 KCMIL OR LARGER ELBOW TEE SPLICED THREE-PHASE PRIMARY CIRCUITS ON OPPOSITE WALLS EACH ONE TAPPED WITH ONE THREE-PHASE RUN. THE THREE TEE COMBINATION SHALL ONLY BE USED TO FEED A SWITCHED TEE POSITION (SEE PAGE 3649.20). |
| 1-1-96 3320 5' X 10'-7 1/2" X 8' MANHOLE (3399.112, 113) | FOR ALL SIZES OF PRIMARY AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM. <u>AN UNOBSTRUCTED SPACE OF 22" X 72" MUST BE MAINTAINED.</u> MAXIMUM INSTALLATION CONSISTS OF #2 SOLID AND LARGER CABLES AND CONNECTORS. <u>NO CABLE TAPS ALLOWED.</u> |
| 1-1-88 3324 8' X 14' X 9'-4" 8' X 20' X 9'-4" 8' X 26' X 9'-4" MANHOLE (PRIMARY & SECONDARY) | FOR ALL SIZES OF PRIMARY AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM. <u>AN UNOBSTRUCTED SPACE OF 36" X 10' FOR 14 FOOT MANHOLE, OR 36" X 16' FOR 20 FOOT MANHOLE OR 36" X 22' FOR 26 FOOT MANHOLE MUST BE MAINTAINED.</u> <u>EXAMPLE:</u> MAXIMUM INSTALLATION CONSISTS OF ONE 4-WAY SWITCH IN A 20 FOOT LONG MANHOLE AND TWO 4-WAY SWITCHES IN A 26 FOOT LONG MANHOLE. A 26 FOOT LONG MANHOLE IS THE MAXIMUM ALLOWABLE SIZE. <u>NO CABLE TAPS ALLOWED.</u> ALWAYS MAINTAIN AN UNOBSTRUCTED SPACE, AS MENTIONED ABOVE, TO ALLOW ACCESSIBILITY TO CABLE, EQUIPMENT, AND CONDUIT. SEE STANDARD 3649 FOR EQUIPMENT COMBINATION GUIDE-LINES. SEE STANDARD 4004 FOR MINIMUM BENDING RADI. |
| 1-1-96 (3399.208-210) 3324 8' X 14' X 9'-4" 8' X 20' X 9'-4" 8' X 26' X 9'-4" MANHOLE (PRIMARY & SECONDARY) | FOR ALL SIZES OF PRIMARY AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM. <u>AN UNOBSTRUCTED SPACE OF 36" X 10' FOR 14 FOOT MANHOLE, OR 36" X 16' FOR 20 FOOT MANHOLE OR 36" X 22' FOR 26 FOOT MANHOLE MUST BE MAINTAINED.</u> <u>EXAMPLE:</u> MAXIMUM INSTALLATION CONSISTS OF ONE 4-WAY SWITCH IN A 14 FOOT LONG MANHOLE AND TWO 4-WAY SWITCHES IN A 20 FOOT LONG MANHOLE. A 20 FOOT LONG MANHOLE IS THE MAXIMUM ALLOWABLE SIZE. <u>NO CABLE TAPS ALLOWED.</u> ALWAYS MAINTAIN AN UNOBSTRUCTED SPACE, AS MENTIONED ABOVE, TO ALLOW ACCESSIBILITY TO CABLE, EQUIPMENT, AND CONDUIT. SEE STANDARD 3649 FOR EQUIPMENT COMBINATION GUIDE-LINES. SEE STANDARD 4004 FOR MINIMUM BENDING RADI. |

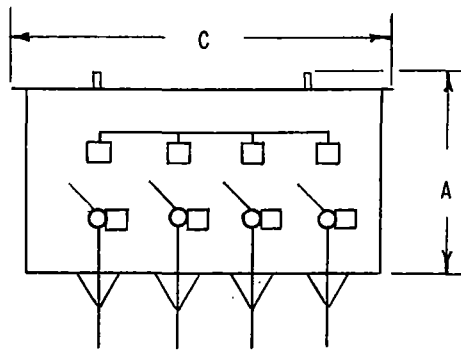
INSTALLATION:

- A. TO AVOID CUTTING THE CONDUIT BENDS, SUBSTRUCTURES AND/OR CABLE POLES WHICH REQUIRE A 90° BEND SHALL BE LOCATED FAR ENOUGH AWAY FROM EACH OTHER TO ALLOW ROOM ENOUGH FOR THE TWO 90° BENDS. THIS WILL VARY DEPENDING ON THE SIZE OF THE 90° BEND. SEE PAGE 3380.2 FOR CIC BENDING RADI.
- B. IN EACH SUBSTRUCTURE, AS MANY CONDUIT KNOCKOUTS MAY BE USED AS NEEDED, PROVIDING PROPER INSTALLATION IS FOLLOWED AND REQUIRED UNOBSTRUCTED SPACE IS MAINTAINED. INSTALL CONDUITS USING THE LOWER SET OF KNOCKOUTS FIRST, UNLESS OTHERWISE SPECIFIED ON JOB PRINT. IF ONLY ONE CONDUIT IS REQUIRED, USE THE BOTTOM OUTSIDE (CLOSEST TO THE WALL) KNOCKOUT.
- C. 'ONE RUN' = CABLE IN CONDUIT FROM ONE LOCATION TO ANOTHER LOCATION.

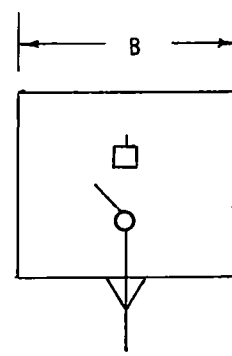
EXAMPLE:



FOR FIELD MAINTENANCE ONLY



FRONT VIEW



SIDE VIEW

| G&W | | | | ESCO | | | APPROXIMATE DIMENSIONS-INCHES | | | STOCK NUMBER |
|-----------|----------------|---------------------|------------|----------------|---------------------|------------|-------------------------------|----|----|--------------|
| KV | CATALOG NUMBER | OIL REQ'D (GALLONS) | DRY WEIGHT | CATALOG NUMBER | OIL REQ'D (GALLONS) | DRY WEIGHT | A | B | C | |
| THREE WAY | | | | | | | | | | |
| 7.5 | RAC3354M | 47 | 700 | RLD3753T | | | | | | 704288 |
| 15 | RAC3374M | 80 | 900 | RLD3853T | 110 | 836 | 30 | 30 | 46 | 704224 |
| FOUR WAY | | | | | | | | | | |
| 7.5 | RAC4354M | 60 | 900 | RLD4753T | 80 | 800 | 26 | 28 | 43 | 704448 |
| 15 | RAC4374M | 100 | 1300 | RLD4853T | 130 | 1039 | 30 | 30 | 58 | 704352 |
| FIVE WAY | | | | | | | | | | |
| 7.5 | RAC5354M | 73 | 1100 | RLD5753T | | | | | | |
| 15 | RAC5374M | 128 | 1700 | RLD5853T | | | | | | |

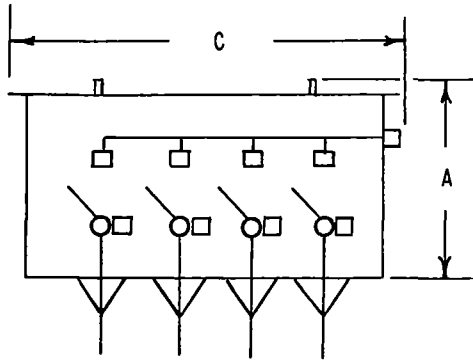
FOR FIELD MAINTENANCE ONLY

NOTES:

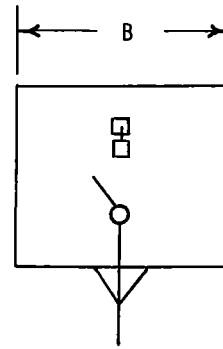
1. CABLE ENTRANCES ARE INCLUDED IN THE CATALOG NUMBER BUT MUST BE SPECIFIED SEPARATELY TO SUIT INDIVIDUAL INSTALLATIONS, I. E., CABLE TYPES AND SIZES.
2. NORMAL SWITCH INSTALLATION REQUIRE 36 INCHES BELOW AND 12 INCHES ABOVE THE SWITCH TANK FOR 7.5 KV. 48 INCHES BELOW AND 18 INCHES ABOVE THE SWITCH TANK FOR 15 KV, TO ALLOW FOR CABLE TRAINING AND TANK ACCESS.

| REFERENCE NUMBER LOAD BREAK OIL SWITCH FOR IDENTIFICATION AND ORDERING | |
|--|-----------|
| 3-WAY | U-46.10-3 |
| 4-WAY | U-46.10-4 |
| 5-WAY | U-46.10-5 |

| | | |
|--------|---|----------|
| APP'D: | SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS 400 AMP LOAD BREAK OIL SWITCH MULTIPLE POSITION WITH BUS | 3699:101 |
|--------|---|----------|



FRONT VIEW



SIDE VIEW

| KV | ESCO | | | APPROXIMATE DIMENSIONS-INCHES | | | STOCK NUMBER |
|-----------|----------------|---------------------|------------|-------------------------------|----|----|--------------|
| | CATALOG NUMBER | OIL REQ'D (GALLONS) | DRY WEIGHT | A | B | C | |
| THREE WAY | | | | | | | |
| 7.5 | RLD3753T-GP | | | | | | 704288 |
| 15 | RLD3853T-GP | 110 | 836 | 33 | 30 | 54 | 704224 |
| FOUR WAY | | | | | | | |
| 7.5 | RLD4753T-GP | 90 | 800 | 32 | 26 | 59 | 704448 |
| 15 | RLD4853T-GP | 130 | 1039 | 33 | 30 | 67 | 704352 |
| FIVE WAY | | | | | | | |
| 7.5 | RLD5753T-GP | | | | | | |
| 15 | RLD5853T-GP | | | | | | |

FOR FIELD MAINTENANCE ONLY

NOTES:

1. CABLE ENTRANCES ARE INCLUDED IN THE CATALOG NUMBER BUT MUST BE SPECIFIED SEPARATELY TO SUIT INDIVIDUAL INSTALLATIONS, I. E., CABLE TYPES AND SIZES.
2. NORMAL SWITCH INSTALLATION REQUIRE 36 INCHES BELOW AND 12 INCHES ABOVE THE SWITCH TANK FOR 7.5 KV. 48 INCHES BELOW AND 18 INCHES ABOVE THE SWITCH TANK FOR 15 KV, TO ALLOW FOR CABLE TRAINING AND TANK ACCESS.
3. SWITCH ALSO AVAILABLE WITH EXTERNAL BUSS CONNECTION ON LEFT END.
4. TIE POSITION MUST BE BLOCKED.

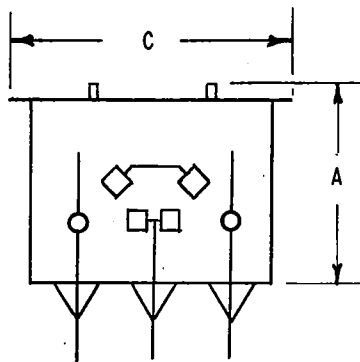
| REFERENCE NUMBER LOAD BREAK OIL SWITCH FOR IDENTIFICATION AND ORDERING | |
|--|-----------|
| 3-WAY | U-46.11-3 |
| 4-WAY | U-46.11-4 |
| 5-WAY | U-46.11-5 |

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

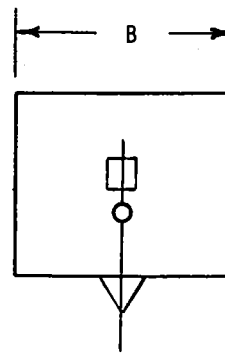
3699.102

400 AMP LOAD BREAK OIL SWITCH
MULTIPLE POSITION WITH TIE BUSSES
AND EXTERNALLY AVAILABLE MAIN BUSS

APP'D: *[Signature]*
DATE 12-27-73



FRONT VIEW



SIDE VIEW

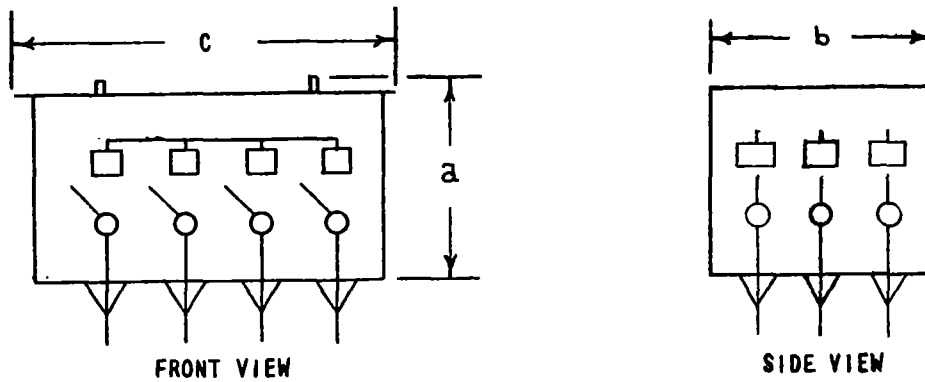
| G&W | | | | ESCO | | | APPROXIMATE DIMENSIONS-INCHES | | | STOCK NUMBER |
|-----|----------------|---------------------|------------------|----------------|---------------------|------------------|-------------------------------|----|----|--------------|
| KV | CATALOG NUMBER | OIL REQ'D (GALLONS) | DRY WEIGHT (LBS) | CATALOG NUMBER | OIL REQ'D (GALLONS) | DRY WEIGHT (LBS) | A | B | C | |
| 7.5 | RAL354M | 28 | 550 | LA753K | 44 69 | 487 | 25 | 28 | 23 | 704192 |
| 15 | RAL374M | 50 | 750 | LA853K | | 594 | 27 | 31 | 28 | |

FOR FIELD MAINTENANCE ONLY

NOTES:

1. CABLE ENTRANCES ARE INCLUDED IN THE CATALOG NUMBER BUT MUST BE SPECIFIED SEPARATELY TO SUIT INDIVIDUAL INSTALLATIONS, I. E., CABLE TYPES AND SIZES.
2. NORMAL SWITCH INSTALLATION REQUIRE 36 INCHES BELOW AND 12 INCHES ABOVE THE SWITCH TANK FOR 7.5 KV. 42 INCHES BELOW AND 12 ABOVE THE SWITCH TANK FOR 15 KV, TO ALLOW FOR CABLE TRAINING AND TANK ACCESS.

| | | |
|-----------------------|--|----------|
| DATE 1-24-68 SDG&E | SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS | 3699-103 |
| | 400 AMP LOAD BREAK OIL SWITCH LOOP AND TIE | |



4 WAY ILLUSTRATED

| G&W | | | | ESCO | | | APPROXIMATE DIMENSIONS-INCHES | | | STOCK NO. OR CONSTR. STD |
|-----------|----------------|---------------------|------------|----------------|---------------------|------------|-------------------------------|----|----|--------------------------|
| KV | CATALOG NUMBER | OIL REQ'D (GALLONS) | DRY WEIGHT | CATALOG NUMBER | OIL REQ'D (GALLONS) | DRY WEIGHT | a | b | c | |
| THREE WAY | | | | | | | | | | |
| 7.5 | RAM 3354 | 47 | 700 | RA 3753 M | 56 | 539 | 26 | 27 | 34 | 704320 |
| 15 | RAM 3374 | 80 | 900 | RA 3853 M | 95 | 702 | 30 | 30 | 40 | 704256 |
| FOUR WAY | | | | | | | | | | |
| 7.5 | RAM 4354 | 60 | 900 | RA 4753 M | 82 | 684 | 26 | 27 | 42 | |
| 15 | RAM 4374 | 100 | 1300 | RA 4853 M | 124 | 890 | 30 | 30 | 50 | 704336 |
| FIVE WAY | | | | | | | | | | |
| 7.5 | RAM 5354 | 73 | 1100 | RA 5753 M | 88 | 829 | 26 | 27 | 50 | |
| 15 | RAM 5374 | 128 | 1700 | RA 5853 M | 151 | 1064 | 30 | 30 | 60 | |

FOR FIELD MAINTENANCE ONLY

NOTES:

- A. TIE POSITIONS MUST BE BLOCKED.
- B. CABLE ENTRANCES ARE INCLUDED IN THE CATALOG NUMBER BUT MUST BE SPECIFIED SEPARATELY TO SUIT INDIVIDUAL INSTALLATIONS, I. E., CABLE TYPES AND SIZES.
- C. NORMAL SWITCH INSTALLATION REQUIRE 36 INCHES BELOW AND 12 INCHES ABOVE THE SWITCH TANK FOR 7.5KV. 48 INCHES BELOW AND 18 INCHES ABOVE THE SWITCH TANK FOR 15KV., TO ALLOW FOR CABLE TRAINING AND TANK ACCESS.

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

3699.104

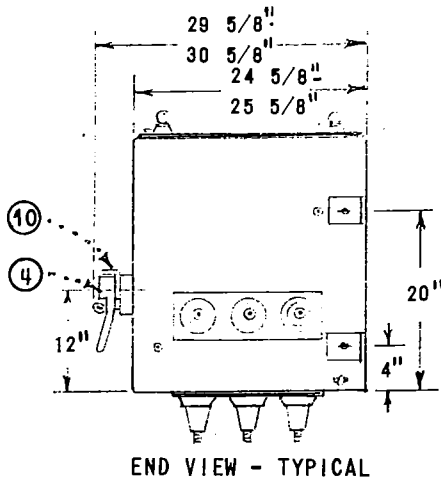
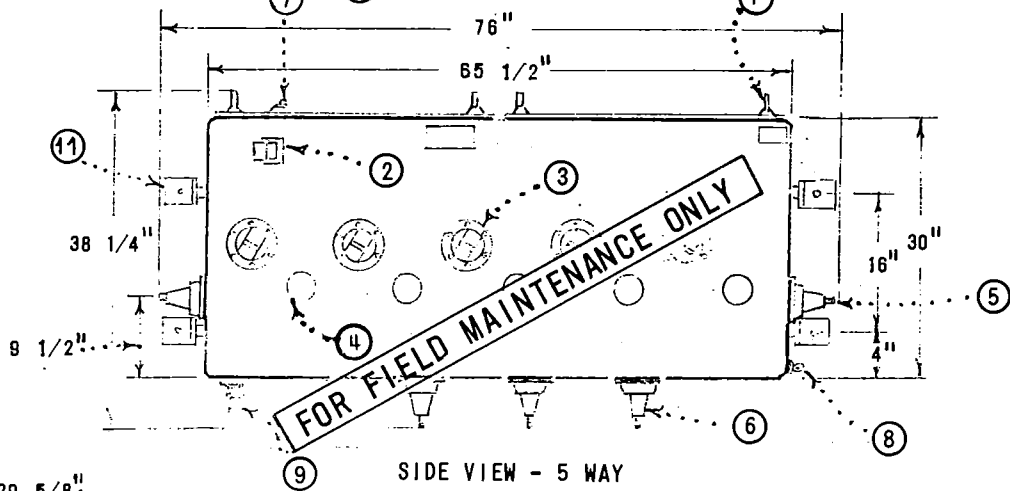
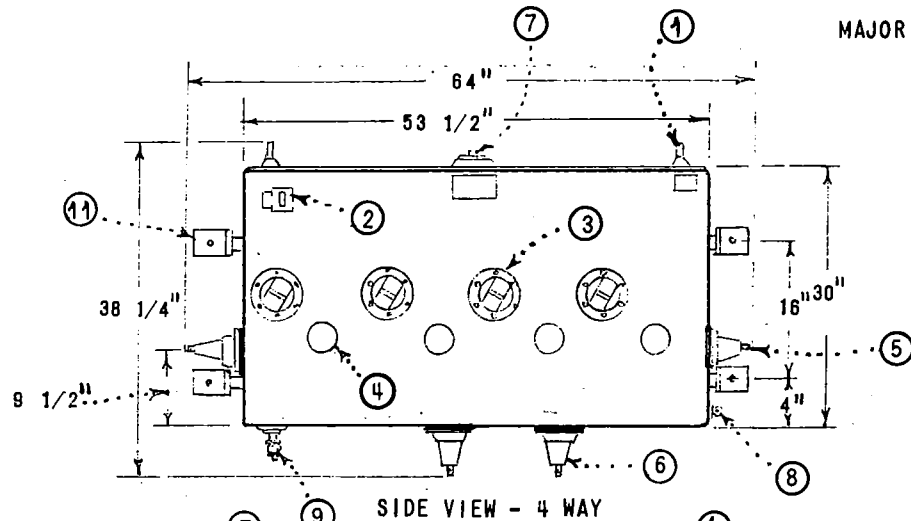
400 AMP LOAD BREAK OIL SWITCH

MULTIPLE POSITION

APP'D: *[Signature]*

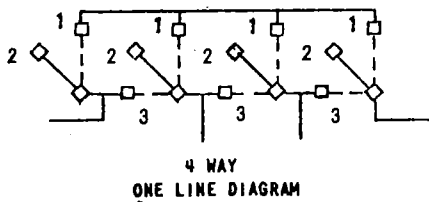
DATE 12-27-73

MAJOR USE: SECTIONALIZING

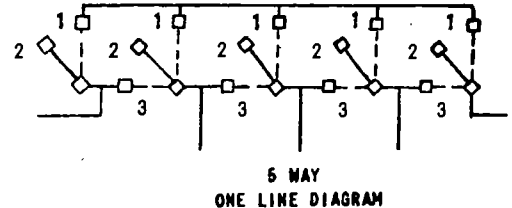


| LEGEND | |
|--------|------------------------------------|
| 1 | LIFTING EYE |
| 2 | OIL LEVEL GAUGE |
| 3 | LINK VIEWING WINDOW |
| 4 | OPERATING HANDLE ASSEMBLY |
| 5 | BUSHING (600 AMP) ESNA 800-T1 |
| 6 | BUSHING (600 AMP) ESNA 600-S1 |
| 7 | PLUG |
| 8 | GROUND LUG |
| 9 | DRAIN VALVE |
| 10 | POSITION LABELS, (SEE TABLE BELOW) |
| 11 | MOUNTING BRACKETS |

| STOCK NUMBERS | | | |
|---------------|--------|---------|--------|
| 400 AMP | | 600 AMP | |
| 4 WAY | 708970 | 4 WAY | 708978 |
| 5 WAY | 708972 | 5 WAY | 708974 |
| | | 6 WAY | (A) |
| | | 7 WAY | (A) |



| SWITCH POSITIONS | |
|------------------|-------------------|
| 1 | CLOSED |
| 2 | OPEN |
| 3 | 'ALT' - ALTERNATE |



NOTE: THIS SWITCH SHALL BE USED WITH POLYETHYLENE CABLES AND 600 AMPERE ELBOW T's (4182).
 (A) SPECIAL ORDER ONLY.

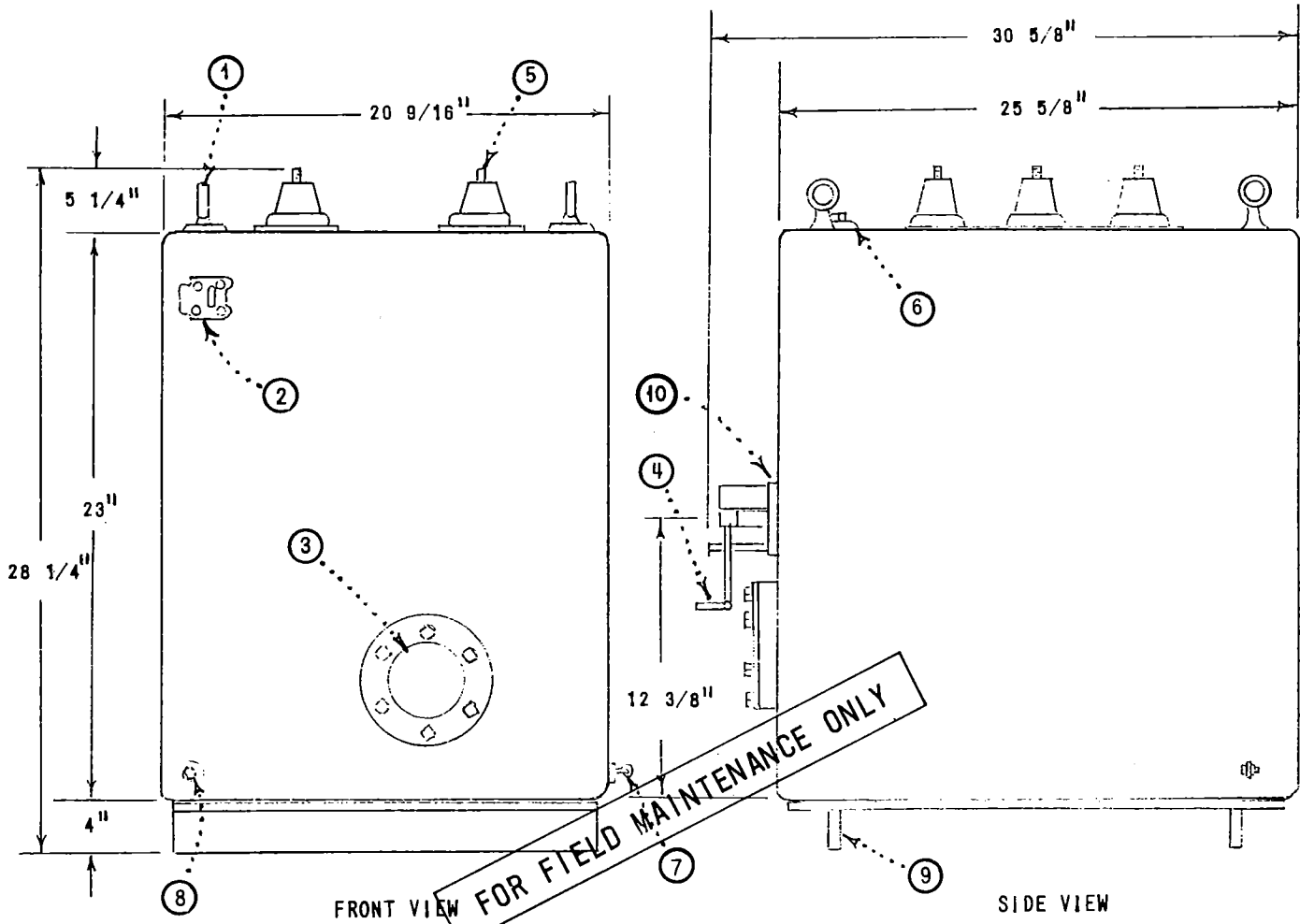
SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

APP'D *J.W.K.*
 DATE 1-7-75

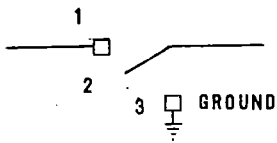
OIL SWITCH, 12KV, 3Ø, 400 & 600 AMPERE

3699:105

MAJOR USE: SECTIONALIZING



FOR FIELD MAINTENANCE ONLY



ONE LINE DIAGRAM

| SWITCH POSITIONS | |
|------------------|--------|
| 1 | CLOSED |
| 2 | OPEN |
| 3 | GROUND |

| LEGEND | |
|--------|--|
| 1 | LIFTING EYE |
| 2 | OIL LEVEL GAUGE |
| 3 | LINK VIEWING WINDOW |
| 4 | OPERATING HANDLE ASSEMBLY |
| 5 | BUSHING (600) ESNA 600-T1 |
| 6 | PLUG |
| 7 | GROUND LUG |
| 8 | DRAIN VALVE |
| 9 | MOUNTING RAILS |
| 10 | POSITION LABELS, (SEE SWITCH POSITION TABLE) |

STOCK NUMBER
708988

NOTES:

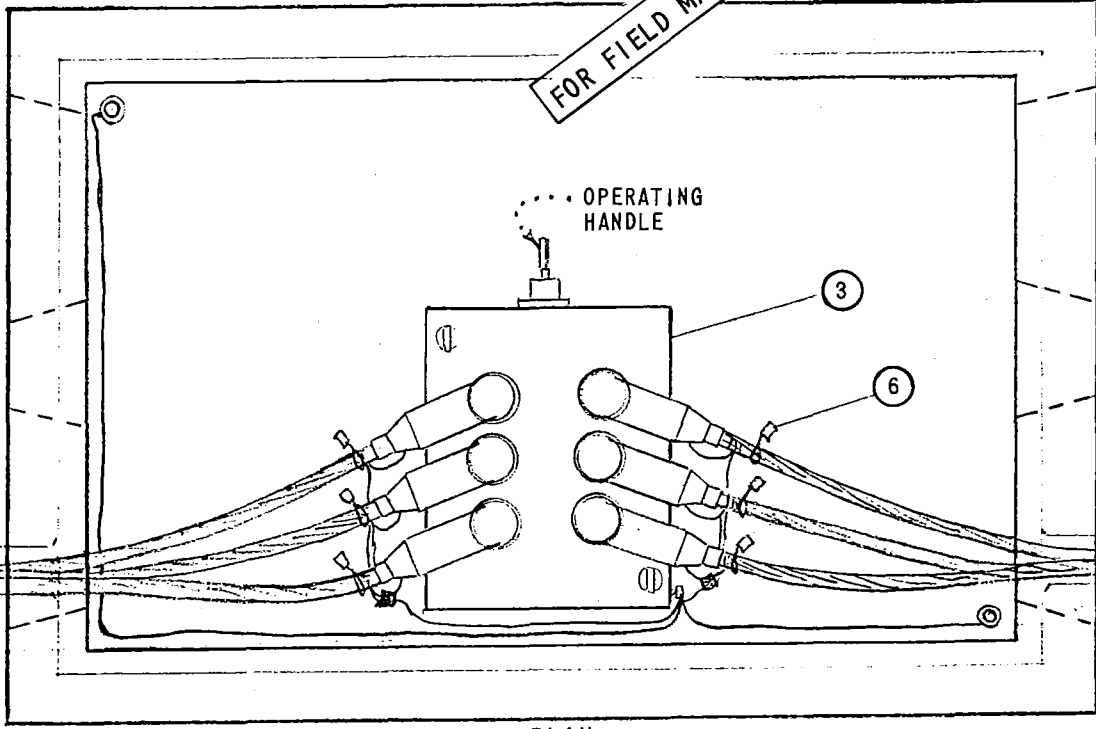
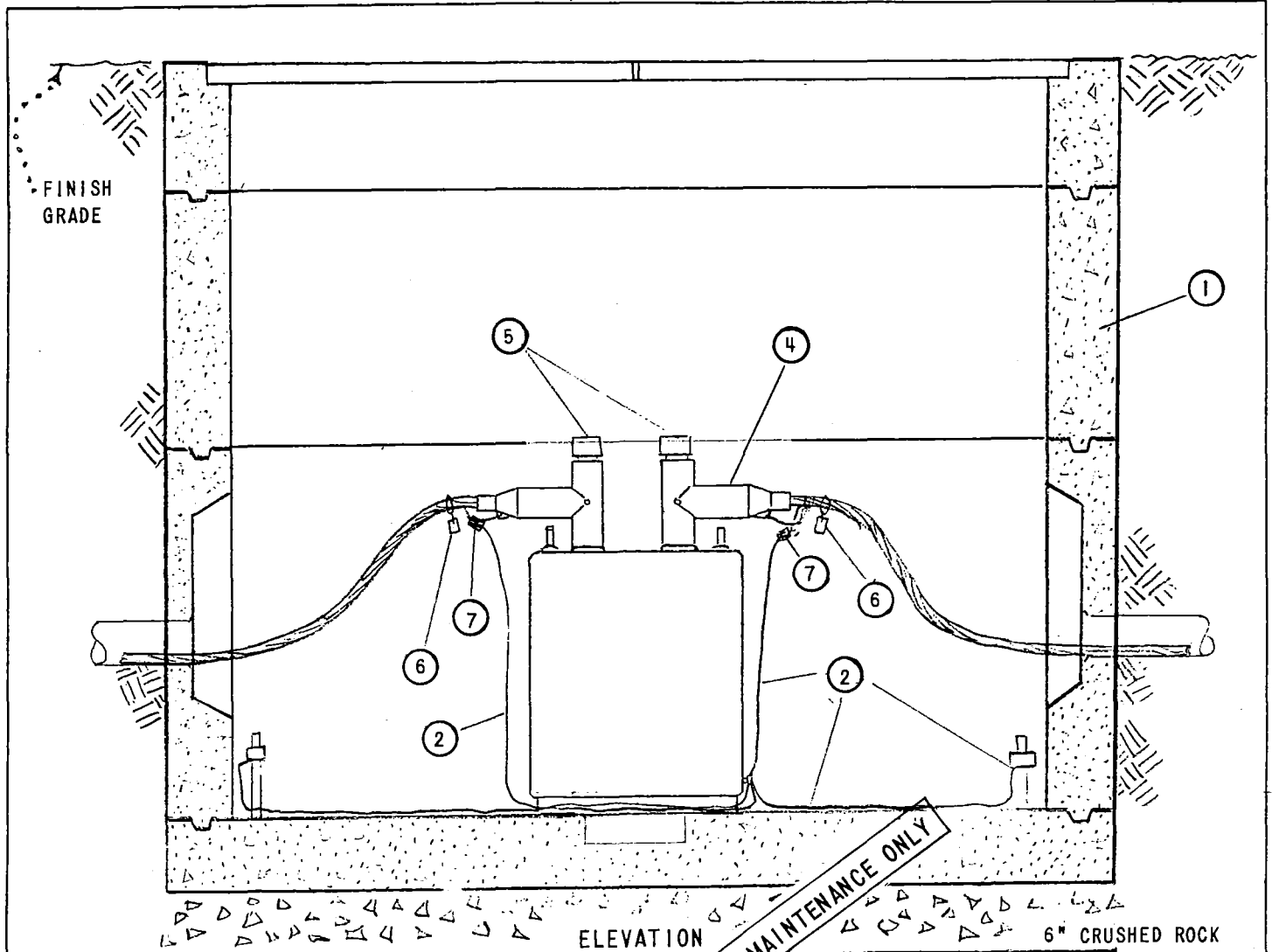
- A. THIS SWITCH SHALL BE USED WITH POLYETHYLENE CABLES, 4/0 AND LARGER USING ELBOW 'T' CONNECTORS, 4182.
- B. FOR INSTALLATION SEE 3699.202.

3699.106

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

ON-OFF OIL SWITCH, 12KV, 3Φ, 600 AMPERE

APP'D *J.W.K.*
DATE 1-7-75



FOR FIELD MAINTENANCE ONLY

PLAN

SDG&E ELECTRIC STANDARDS

APPD *AWK*
DATE 3-24-75

ON-OFF OIL SWITCH, 12KV, 3 ϕ , 600 AMPERE, INSTALLATION

3699.107

| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR STD. PAGE |
|------|---|----------|---------------------------|
| 1 | HANDHOLE, 4' X 6'-6" X 4' | 1 | 3315 |
| 2 | GROUNDING | | |
| | 2-8" STUBOUTS WELDED TO REBAR (FURNISHED WITH BOX) | | |
| | CLAMP | 2 | 230016 |
| | WIRE, BARE COPPER, #1/0 | 20' | 812752 |
| 3 | SWITCH, SUBMERSIBLE, 600 AMP 3 ϕ , ON-OFF (WITH BUSHINGS) | 1 | 708988 , 3699.106 |
| 4 | ELBOW, TEE, 600 AMP (SEE NOTE B) | 6 | 326578, 4182 |
| 5 | INSULATED PLUG, W/TEST POINT | 6 | 544848, 4182 |
| 6 | PHASE AND ROUTE IDENTIFICATION TAG | AS REQ'D | 3231 |
| 7 | CONNECTOR, COMPRESSION, (GROUND CONNECTION) | 2 | 257792 |

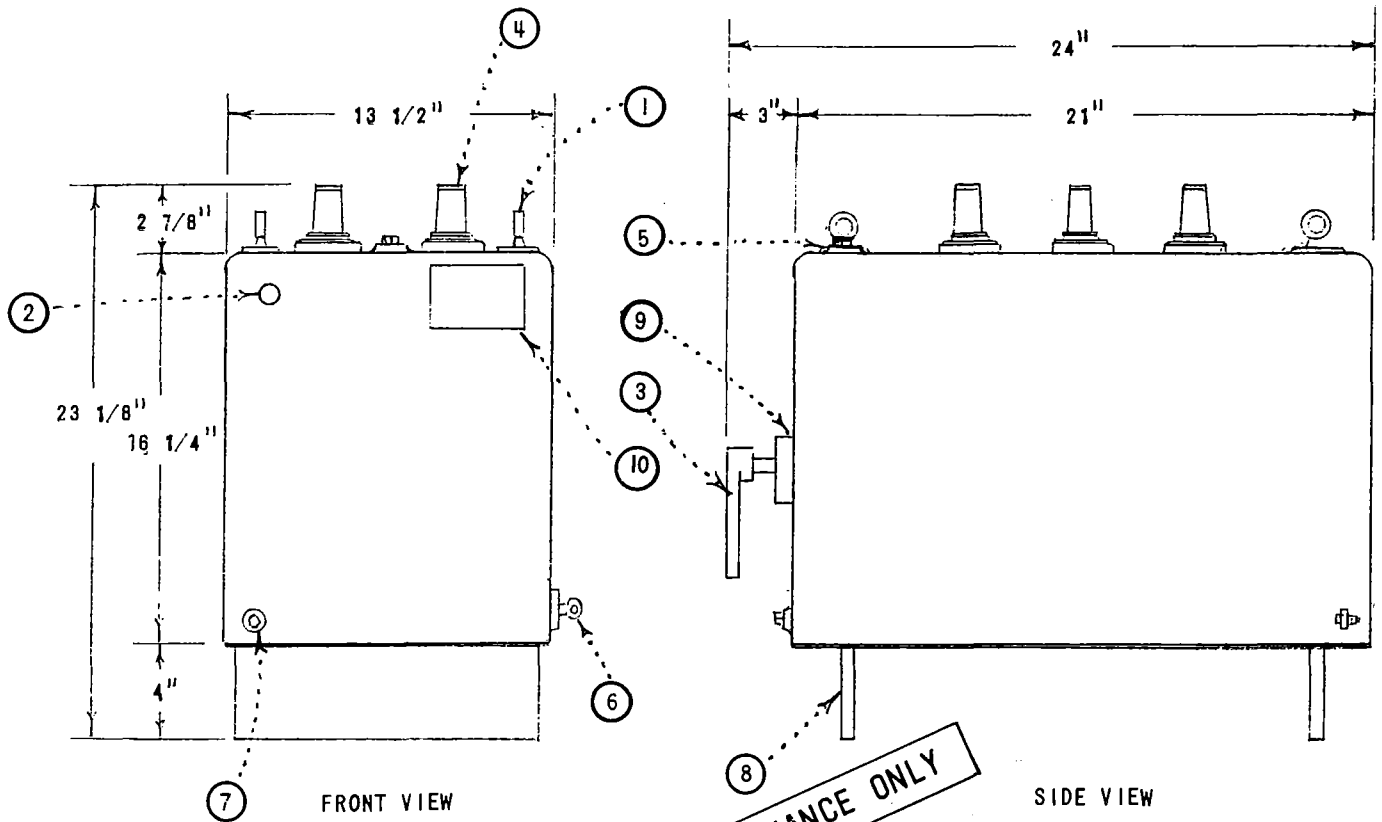
NOTE:

- A. ENCLOSURE NUMBERING, SEE 3211.
- B. WHEN ITEM 4 IS NOT USED, USE 600 AMP INSULATING RECEPTACLE (570608).
- C. SWITCH NUMBER TO BE ASSIGNED BY ELECTRIC ENGINEERING.

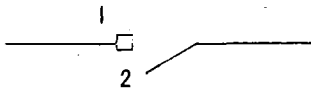
FOR FIELD MAINTENANCE ONLY

| | | | |
|----------|--|--|---------------------------------|
| 3699.108 | SDG&E ELECTRIC STANDARDS | | DATE 3-15-82 APPD <i>PRH</i> |
| | ON-OFF OIL SWITCH, 12KV, 3 ϕ , 600 AMPERE, INSTALLATION | | |

MAJOR USE: SECTIONALIZING



FOR FIELD MAINTENANCE ONLY



ONE LINE DIAGRAM

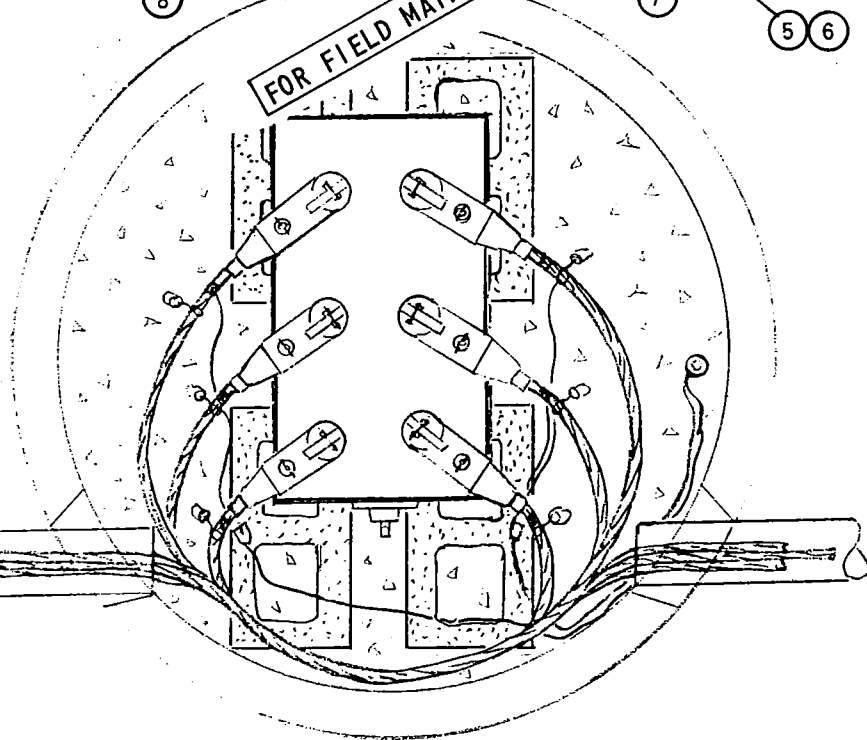
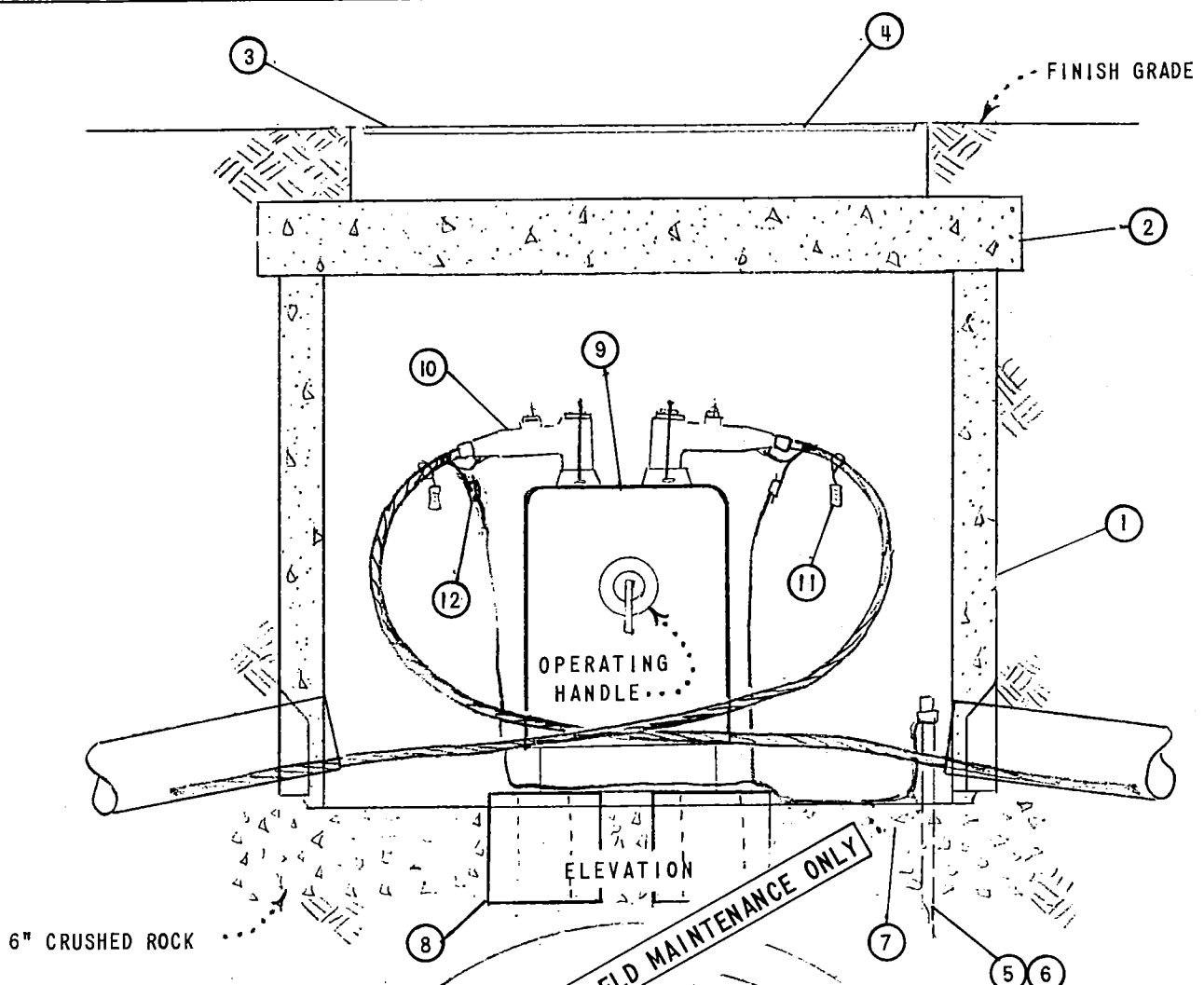
| SWITCH POSITIONS | |
|------------------|--------|
| 1 | CLOSED |
| 2 | OPEN |

| LEGEND | |
|--------|--|
| 1 | LIFTING EYE |
| 2 | OIL LEVEL GAUGE |
| 3 | OPERATING HANDLE ASSEMBLY |
| 4 | BUSHING, 200 AMP, ESNA 180-T2 |
| 5 | FILL PLUG |
| 6 | GROUND LUG |
| 7 | DRAIN VALVE |
| 8 | MOUNTING RAILS |
| 9 | POSITION LABELS, (SEE SWITCH POSITION TABLE) |
| 10 | NAME PLATE |

STOCK NUMBER
708990

NOTES:

- A. THIS SWITCH SHALL BE USED WITH POLYETHYLENE CABLES USING 200 AMP NON-LOAD BREAK ELBOWS, 4196..
- B. FOR INSTALLATION SEE 3699.110 & .111.
- C. ON THE ROUND TANK MODEL, ITEMS 1,2,3,4,5,9 AND 10 ARE LOCATED ON TOP OF THE SWITCH.



PLAN

SDG&E ELECTRIC STANDARDS

APP'D *AWK*
DATE 3-12-75

ON-OFF OIL SWITCH, 12KV, 3 ϕ , 200 AMPERE, INSTALLATION

3699.110

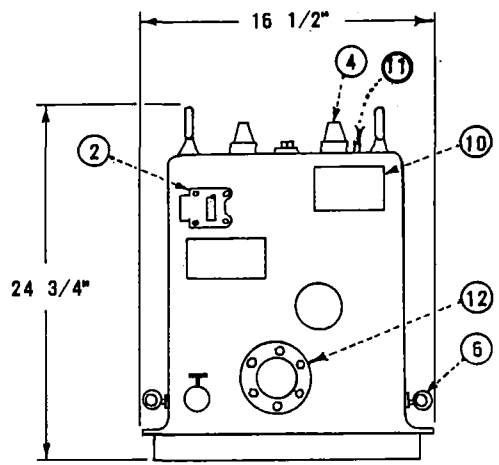
| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR STD. PAGE |
|------|---|----------|------------------------|
| 1 | SHAFT, CONCRETE | 1 | 334358, 3341 |
| 2 | TOP CAP, CONCRETE | 1 | 208228, 3341 |
| 3 | FRAME, PARKWAY OR TRAFFIC | 1 | 382378 OR 362408, 3341 |
| 4 | COVER, EPOXY OR PAINTED | 1 | 287730 OR 287732, 3341 |
| 5 | GROUND ROD, 5/8" X 8'-0", COPPERWELD | 1 | 803072 |
| 6 | GROUND ROD CLAMP | 1 | 230016 |
| 7 | WIRE, BARE COPPER, #1/0 | AS REQ'D | 812752 |
| 8 | CONCRETE BLOCK, 8X8X16 | 4 | 141858 |
| 9 | SWITCH, SUBMERSIBLE, 200 AMP, 3 ϕ , ON-OFF (WITH BUSHINGS) | 1 | 708990 |
| 10 | ELBOW, NON-LOAD BREAK (SEE NOTE B) | 6 | 443458, 4196 |
| 11 | PHASE AND ROUTE IDENTIFICATION TAG | AS REQ'D | 3231 |
| 12 | CONNECTOR, COMPRESSION (GROUND CONNECTION) | 2 | 257792 |

NOTE:

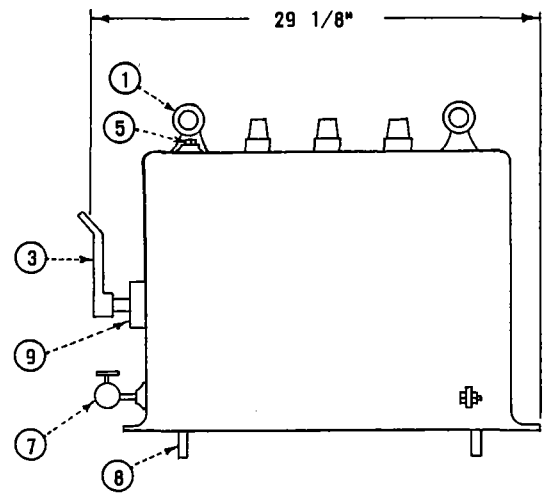
- A. ENCLOSURE NUMBERING SEE 3211.
- B. WHEN ITEM 10 IS NOT USED, USE 200 AMP INSULATING RECEPTACLE (204304).
- C. SWITCH NUMBER TO BE ASSIGNED BY ELECTRIC ENGINEERING.

FOR FIELD MAINTENANCE ONLY

| | | |
|----------|--|---------------------------------|
| 3699.111 | SDG&E ELECTRIC STANDARDS | |
| | ON-OFF OIL SWITCH, 12KV, 3 ϕ , 200 AMPERE, INSTALLATION | DATE 3-15-82 APPD <i>LRH</i> |

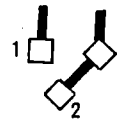


FRONT VIEW



SIDE VIEW

| ELECTRICAL RATINGS: | |
|--|------------|
| VOLTAGE | 15KV |
| BIL | 95KV |
| CURRENT, CONTINUOUS | 200 AMP |
| LOADMAKE AND LOADBREAK | 200 AMP |
| MOMENTARY AND FAULT CLOSE (RMS, SYMMETRICAL) | 12,500 AMP |



ONE LINE DIAGRAM

| SWITCH POSITIONS | |
|------------------|--------|
| 1 | CLOSED |
| 2 | OPEN |

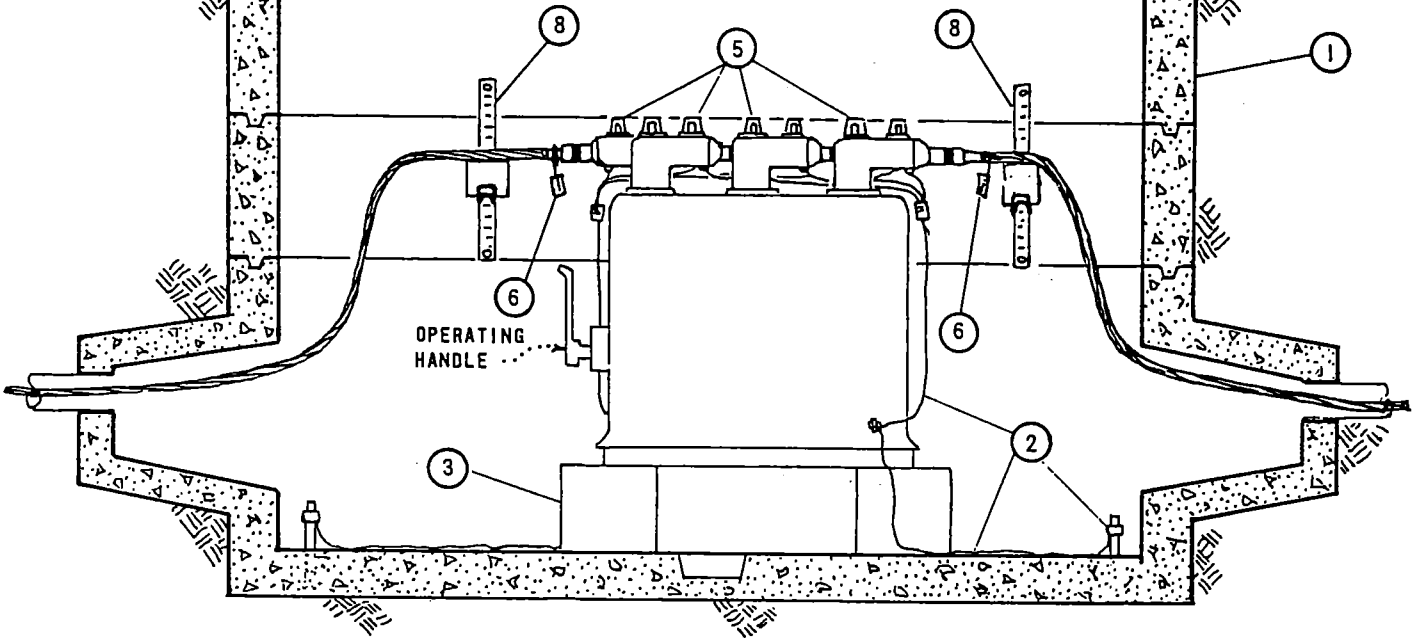
FOR FIELD MAINTENANCE ONLY

- A. THIS SWITCH SHALL BE USED WITH POLYETHYLENE CABLES USING 200 AMP LOAD BREAK ELBOWS, PG 4196. (OLDER MODELS USE DEAD BREAK ELBOWS)
- B. FOR INSTALLATION SEE PG 3621.02.

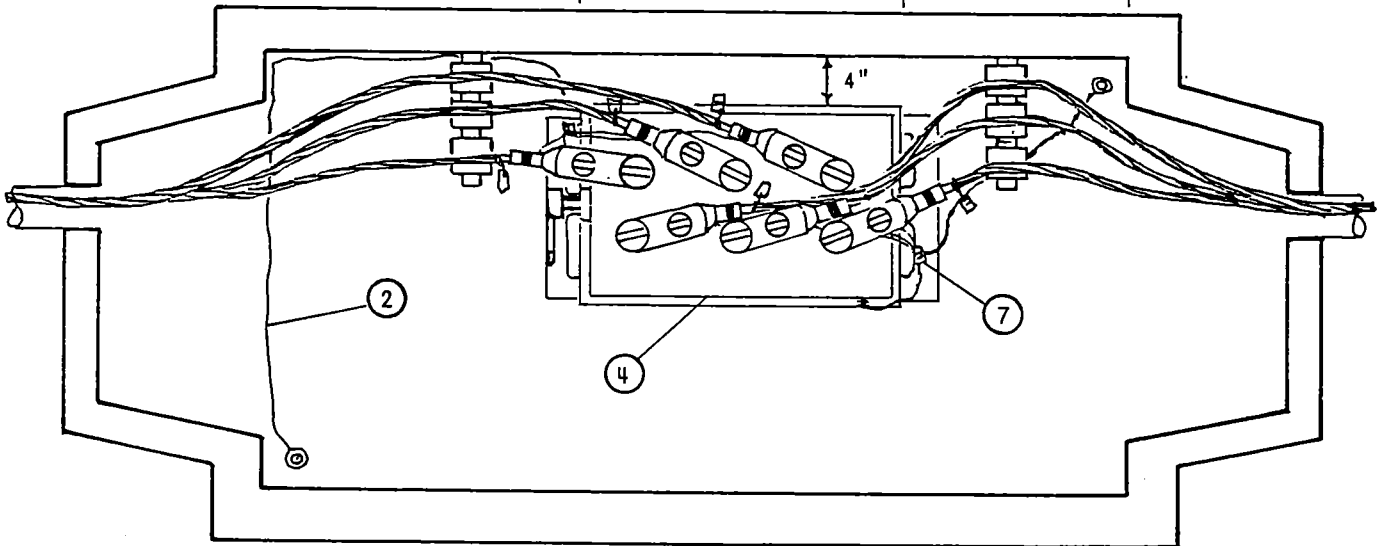
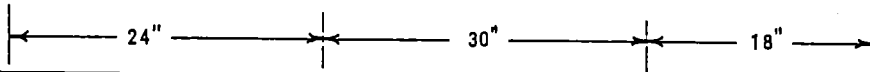
| ITEM | DESCRIPTION | ITEM | DESCRIPTION | UNIT STOCK NUMBER |
|------|------------------------------------|------|--|-------------------|
| 1 | LIFTING EYE | 9 | POSITION LABELS, (SEE SWITCH POSITION TABLE) | 708990 |
| 2 | OIL LEVEL GAUGE | | | |
| 3 | OPERATING HANDLE ASSEMBLY | | | |
| 4 | BUSHING (200 AMP) GE SUREMAKE (LB) | | | |
| 5 | FILL VALVE | | | |
| 6 | GROUND LUGS | | | |
| 7 | DRAIN VALVE | | | |
| 8 | MOUNTING RAILS | | | |
| | | 10 | NAME PLATE | |
| | | 11 | PRESSURE TEST VALVE | |
| | | 12 | LINK VIEWING WINDOW | |

| | | |
|-----------------|---|----------|
| DATE 3-15-82 | SDG&E ELECTRIC STANDARDS | 3699.201 |
| APPD <i>ARH</i> | ON-OFF OIL SWITCH, 12KV, 3Ø, 200 AMPERE | |

FINISH GRADE



ELEVATION



PLAN

FOR FIELD MAINTENANCE ONLY

3699.202

SDG&E ELECTRIC STANDARDS

ON-OFF OIL SWITCH, 12KV, THREE PHASE, 200 AMPERE,
INSTALLATION

DATE 3-15-82
APPD *LRH*

NOTES:

- A. ENCLOSURE NUMBERING, 3211.
- ⓑ WHEN ITEM 5 IS NOT USED, USE 200 AMP INSULATING RECEPTACLE (204304).
- C. SWITCH NUMBER TO BE ASSIGNED BY ELECTRIC ENGINEERING.
- D. NO CABLE TAPS ALLOWED IN THIS INSTALLATION.
- Ⓕ OLDER MODELS HAVE DEADBREAK BUSHINGS AND ELBOWS.

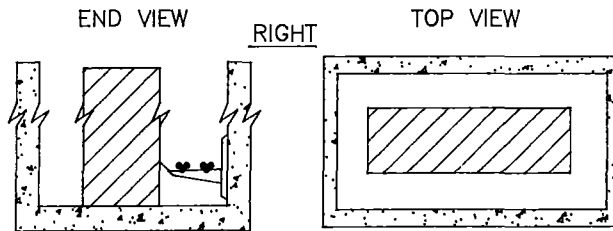
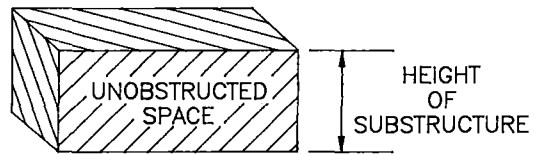
| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONSTR. STD. |
|------|--|---|---------------------------|
| 1 | HANDHOLE, 36" X 72" X 48", (COMPLETE) | 1 | pg 3314 |
| 2 | GROUNDING | 2-8" STUBOUTS WELDED TO REBAR (FURNISHED WITH HANDHOLE) | - |
| | | CLAMP, ROD GROUND, 5/8" | 2 |
| | | WIRE, BARE COPPER, #1/0 | 16' |
| 3 | CONCRETE BLOCK, 8X8X16 | 2 | 141856 |
| 4 | SWITCH, ON-OFF, 3Ø, 200 AMP (SUBMERSIBLE) | 1 | 708990 |
| 5 | ELBOW, LOADBREAK, 12KV, (WITH WHITE-BLACK-WHITE ID BAND) ⓑ Ⓕ | 6 | pg 4191 |
| 6 | PHASE AND ROUTE IDENTIFICATION TAG | AS REQ'D | pg 3231 |
| 7 | CONNECTOR, COMPRESSION (GROUND CONNECTION) | 2 | 257792 |
| 8 | CABLE RACKS | AS REQ'D | pg 478 |

FOR FIELD MAINTENANCE ONLY

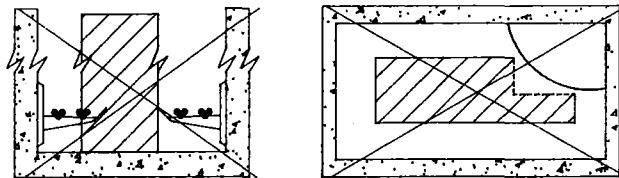
SCOPE: THIS STANDARD SHOWS THE MINIMUM UNOBSTRUCTED SPACE REQUIRED INSIDE A SUBSTRUCTURE TO ALLOW PERSONNEL TO PERFORM WORK SAFELY AND FREE FROM ANY OBSTRUCTIONS.

FOR FIELD MAINTENANCE ONLY

UNOBSTRUCTED SPACE



WRONG



SUBSTRUCTURE

- 3324 - 14' LONG
- 3324 - 20' LONG
- 3324 - 26' LONG

UNOBSTRUCTED SPACE

- 36" X 10'
- 36" X 16'
- 36" X 22'

NOTES:

- AN UNOBSTRUCTED SPACE MUST BE MAINTAINED IN EACH SUBSTRUCTURE TO ALLOW PERSONNEL TO SAFELY ENTER OR EXIT THE SUBSTRUCTURE AND PERFORM WORK.
- AN UNOBSTRUCTED SPACE SHOULD BE IN THE CENTER OF A SUBSTRUCTURE WHENEVER POSSIBLE.
- THE UNOBSTRUCTED SPACE MAY BE REDUCED DURING CONSTRUCTION FOR PULLING, TRAINING AND TERMINATING CABLES, ETC., BUT NO PORTION OF THE FINAL UNOBSTRUCTED SPACE MAY BE REDUCED BY CABLES, CABLE RACKS, ETC.

| | | |
|--|--------------------------|----------|
| DATE 1-1-96 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS | 3699.400 |
| | UNOBSTRUCTED SPACE | |

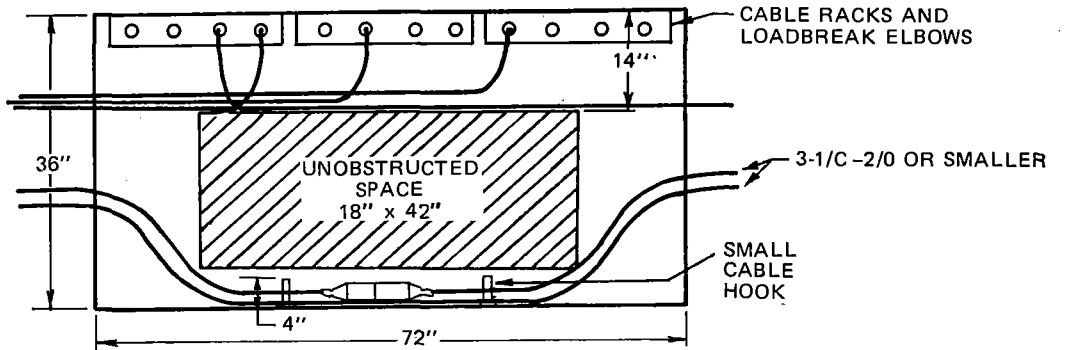
SCOPE: THIS STANDARD SHOWS CABLE AND CONDUIT PLACEMENT IN SUBSTRUCTURES TO ASSURE PROPER CABLE TRAINING.

3314 HANDHOLE

EXAMPLE

FIGURE 1

3314 TOP VIEW

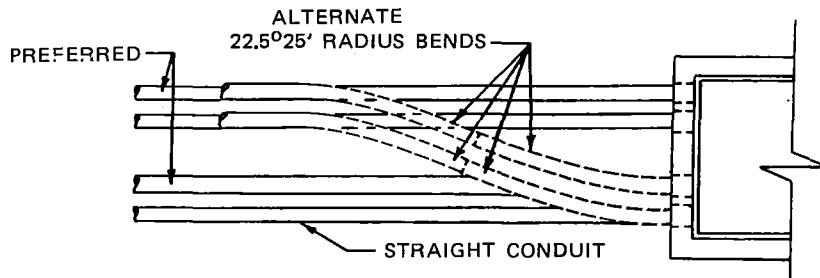


CABLE PULLED STRAIGHT THROUGH MUST ENTER AND EXIT THE SAME CONDUIT POSITION ON OPPOSITE ENDS. CABLE WITH TERMINATIONS SHOULD OCCUPY THE CONDUIT ADJACENT TO THE WALL ON WHICH THE CABLE IS TERMINATED AND RACKED. IF THIS IS NOT POSSIBLE OTHER CONDUIT POSITIONS MAY BE USED. SEE PAGE 3647.1 FOR PLACEMENT OF CABLE TAPS.

3315 HANDHOLE

FIGURE 2

3315 CONDUIT EXIT
RADIUS BENDS OR
STRAIGHT CONDUIT
TOP VIEW



STRAIGHT CONDUIT SECTIONS WILL BEND ENOUGH TO ALLOW THEM TO JOIN IN A SINGLE TRENCH AS DESCRIBED IN STANDARD 3370.

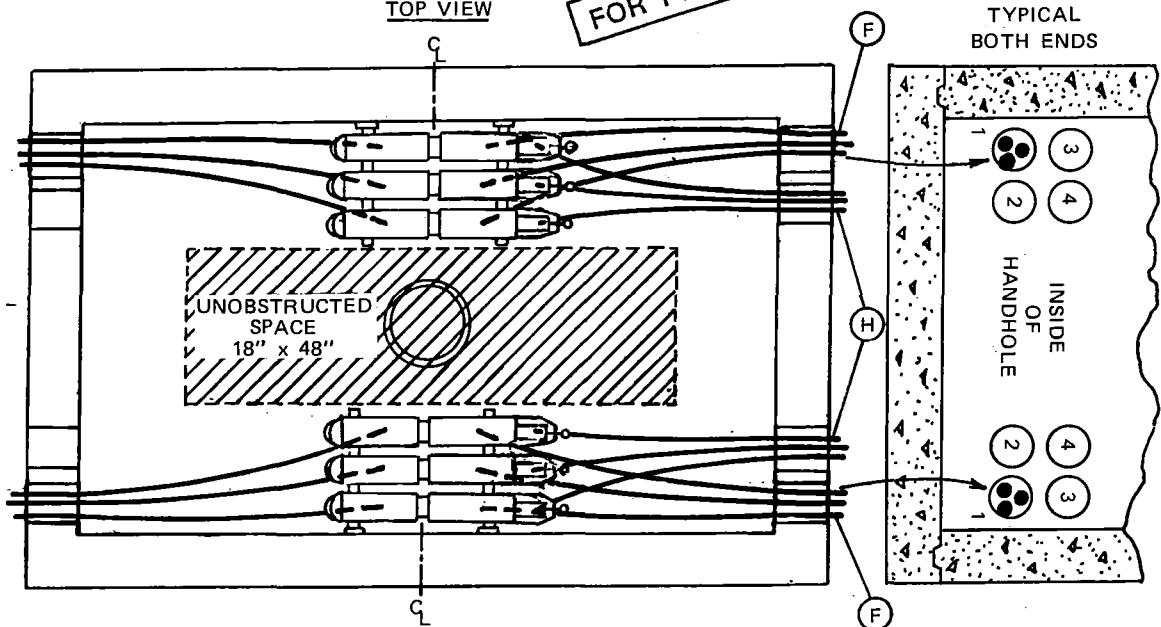
FOR FIELD MAINTENANCE ONLY

3315 HANDHOLE

TOP VIEW

FIGURE 3

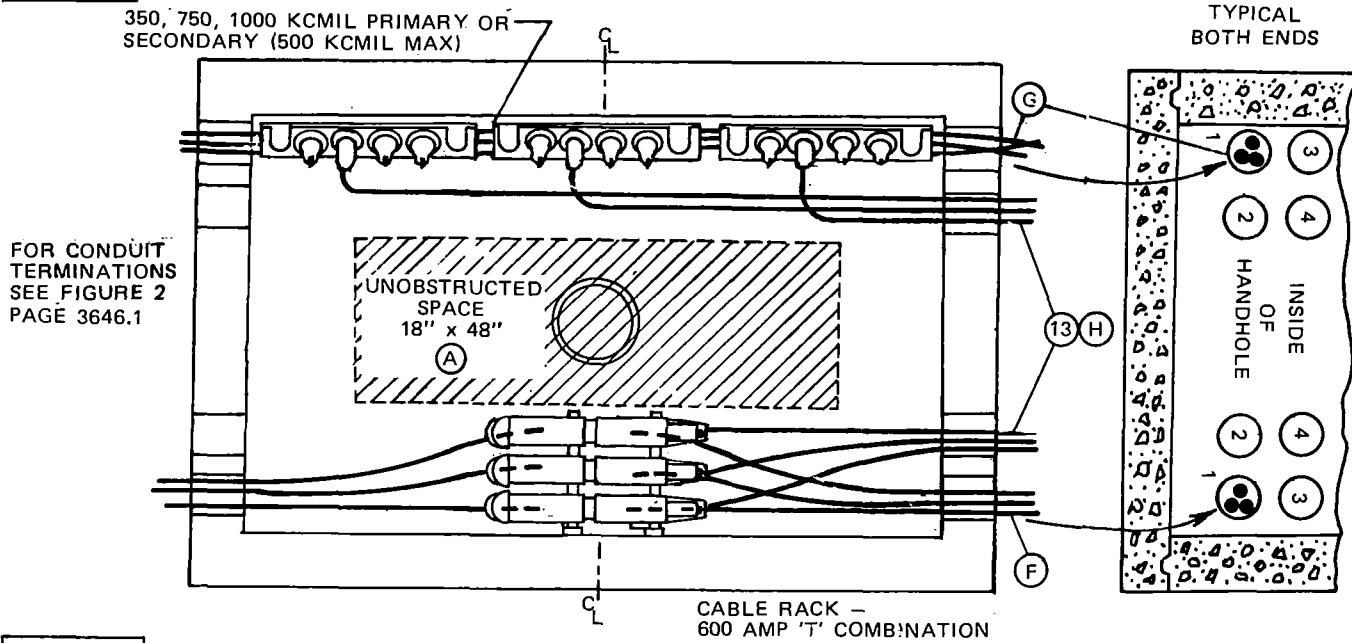
FOR CONDUIT
TERMINATIONS -
SEE FIGURE 2



3315 HANDHOLE
CABLE RACK AND 600 AMP "T" COMBINATION

FIGURE 4

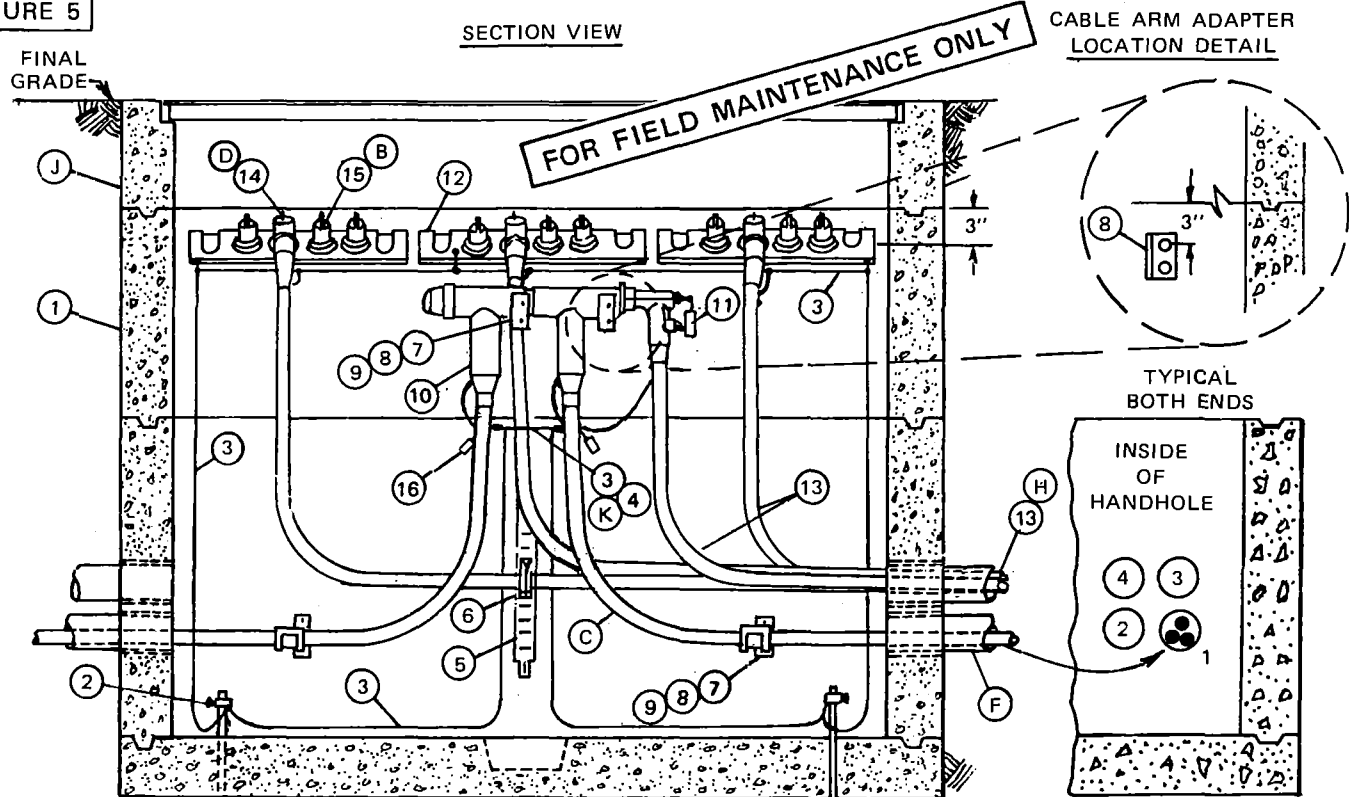
TOP VIEW



FOR CONDUIT TERMINATIONS SEE FIGURE 2 PAGE 3646.1

FIGURE 5

SECTION VIEW



NOTES:

- BEFORE DESIGNING THE INSTALLATION OF HANDHOLES, IT IS IMPORTANT TO FIRST DETERMINE WHICH SIDE THE CABLE TAPS WILL BE PLACED, THEN INSTALL THE OTHER CABLES ACCORDINGLY. DO NOT INSTALL CABLE TAPS ON HANDHOLE ENDS. (SEE PAGE 3647.1 FOR PLACEMENT OF CABLE TAPS.)
- CABLE PULLED STRAIGHT THROUGH MUST ENTER AND EXIT THE SAME DUCT POSITION ON OPPOSITE ENDS. (SEE INSTALLATION NOTES ON PAGE 3646.3 FOR CABLE AND CONNECTOR INSTALLATION IN A 3315.)

BILL OF MATERIAL: (FOR FIGURES 4 AND 5)

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PAGE NO | STOCK NUMBER |
|------|---------------------------------|--------------|----------------------|--------------|
| 1 | HANDHOLE, 4'X 6'-6" | 1 | 3315 | - |
| 2 | CLAMP, GROUND ROD | 2 | - | 230016 (E) |
| 3 | WIRE, BARE COPPER #2 | (K) AS REQ'D | - | 812816 |
| 4 | WIRE, BARE COPPER #1/0 | (K) AS REQ'D | - | 812752 |
| 5 | HANGER, 15" | AS REQ'D | | 564512 (E) |
| 6 | CABLE HOOK, 2-1/2" | AS REQ'D | | 415110 (E) |
| 7 | INSULATOR, CABLE | AS REQ'D | | 430592 (E) |
| 8 | ADAPTOR, CABLE ARM | AS REQ'D | | 102016 (E) |
| 9 | ARM, CABLE, 3-WAY | AS REQ'D | | 110528 (E) |
| 10 | CONNECTOR ASSEMBLY, 200/600 AMP | 3 | 4181.1 | - |
| 11 | TAG, DO NOT OPERATE ENERGIZED | 3 | 3232 | 647966 (E) |
| 12 | CABLE TAP, 12KV, 3-WAY OR 4-WAY | 3 | 4192.4 | - |
| 13 | CABLE, #2 OR #2/0 PECN | AS REQ'D | 4002.2 | - |
| 14 | ELBOW, LOADBREAK, 12KV, 2/0 AL | 3 | 4191.2 | 443840 |
| 15 | CAP, INSULATING RECEPTACLE | 9 (B) | 4192.1 | 204304 |
| 16 | CABLE IDENTIFICATION TAGS | AS REQ'D | 3202 | - |

FOR FIELD MAINTENANCE ONLY

INSTALLATION: (FOR FIGURES 3, 4 AND 5)

- (A) LEAVE AN UNOBSTRUCTED SPACE FREE OF CABLE INTRUSION BY CABLING AROUND WALLS. UNUSED CONDUITS MUST BE ACCESSIBLE FOR FUTURE CABLES. LEAVE ADEQUATE SPACE FOR BLOWING PULL ROPES IN CONDUITS AND/OR CABLE PULLING.
- (B) AS TAP POSITIONS ARE USED, REDUCE QUANTITY OF ITEM 15 ACCORDINGLY.
- (C) NOTE ORIENTATION OF ELBOW TEES AND CABLE LOOPS TO ALLOW FOR CABLE EXPANSION TO PREVENT DAMAGE.
- (D) ELBOWS SHOULD ALWAYS BE POSITIONED VERTICALLY TO ALLOW FOR MAXIMUM ELECTRICAL GROUND CLEARANCE TO ADJACENT ELBOWS WHEN SWITCHING ENERGIZED. CABLES SHOULD BE INSERTED STRAIGHT INTO ELBOWS SO AS NOT TO ALLOW BENDING OF ELBOW ENTRANCE.
- (E) EXEMPT MATERIAL.
- (F) 350, 750 OR 1000 KCMIL CABLES TO BE TERMINATED WITH 600 AMP TEE CONNECTORS SHALL BE ON THE WALL OPPOSITE ANY CABLE TAPS. THIS CABLE SHALL BE IN THE BOTTOM OUTSIDE CONDUIT ENTERING AND LEAVING AND SHALL BE RACKED OR TERMINATED ON THE SAME WALL OF THE CONDUIT BANK THAT THE CABLE ENTERS AND LEAVES (POSITION 1). IF ENOUGH CONDUITS ARE AVAILABLE, LEAVE THE ADJACENT LOWER CONDUIT OPEN FOR REPLACING EXISTING CABLE TERMINATED WITH THE 600 AMP TEES (POSITION 2). USE POSITIONS 3 AND 4 FOR SMALLER CABLES (SEE FIGURES 4 AND 5 PAGE 3646).
- (G) 350, 750 AND 1000 KCMIL PRIMARY OR CABLES PULLED STRAIGHT THROUGH WITHOUT ANY TERMINATIONS SHALL BE PULLED IN THE BOTTOM OUTSIDE DUCTS (POSITION 1), AND SHALL BE RACKED ON THE SAME WALL OF THE DUCT BANK THAT THE CABLE ENTERS AND LEAVES.
- (H) #2 OR 2/0 PRIMARY CABLES OR SECONDARY (500 KCMIL MAX) MAY BE PULLED IN ANY CONDUIT NOT USED FOR LARGER CABLES AS DESCRIBED IN INSTALLATION NOTES 'F' AND 'G'. IF CONDUITS ARE NOT BEING USED AS DESCRIBED IN THESE NOTES, LEAVE THEM EMPTY FOR FUTURE LARGER SIZED CABLES UNLESS THERE IS NO POSSIBLE FUTURE LOAD.
- I. DO NOT USE UNISTRUT FOR MOUNTING CABLE TAPS.
- (J) DO NOT INSTALL EQUIPMENT ON 12 INCH TOP SECTION OF HANDHOLES AS THIS SECTION IS USED FOR FINAL GRADE ADJUSTMENTS.
- (K) FOR THE NEUTRAL CONDUCTOR BETWEEN CABLES (PER PHASE) USE 1-#2 BARE COPPER WIRE WITH 350 KCMIL CABLES. USE 1-#1/0 BARE COPPER WIRE WITH 750 OR 1000 KCMIL CABLES. IF THE CONCENTRIC NEUTRAL TAILS ARE LONG ENOUGH, USE THEM INSTEAD OF THE BARE COPPER WIRE.

REFERENCE:

- L. FOR STRUCTURE IDENTIFICATION, SEE STANDARD 3211.
- M. FOR CONDUIT TERMINATION, SEE STANDARD 3374.

SDG&E ELECTRIC STANDARDS

DATE 1-1-88
APPD *gyb/RDS*

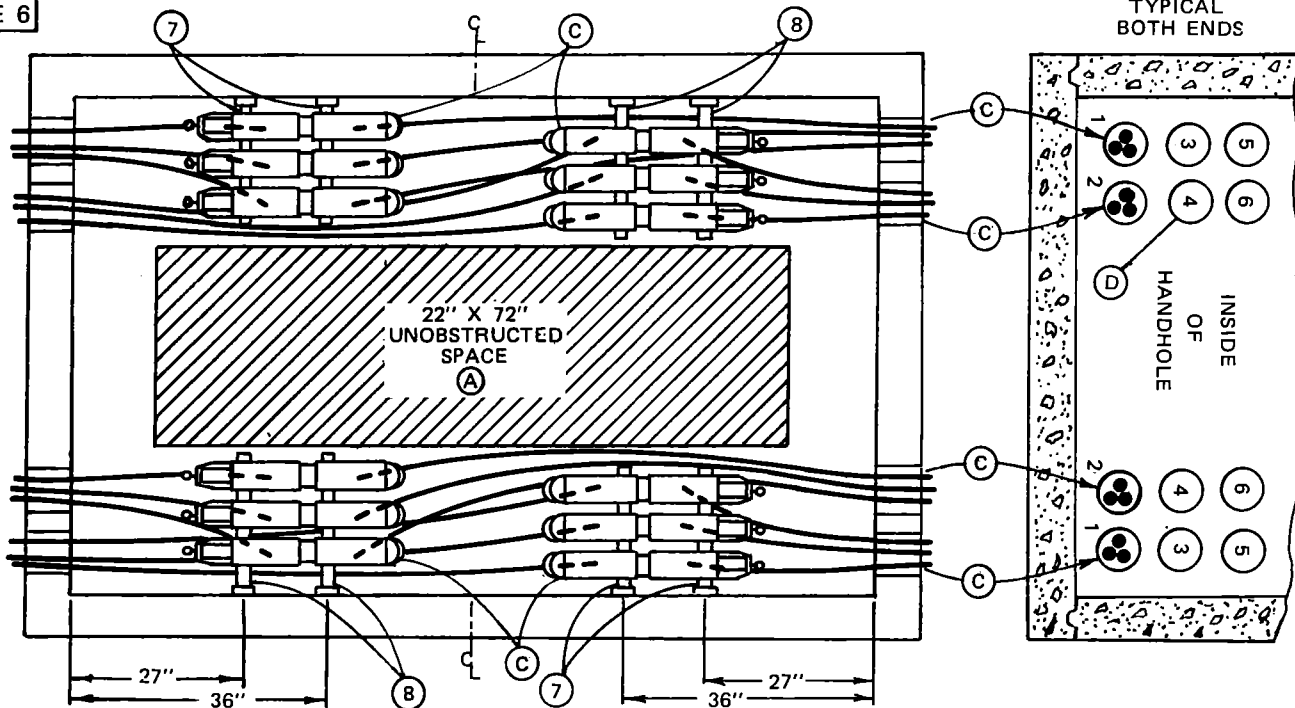
CABLE AND CONDUIT PLACEMENT

3699.403

**3316 HANDHOLE
600 AMP "T" COMBINATION**

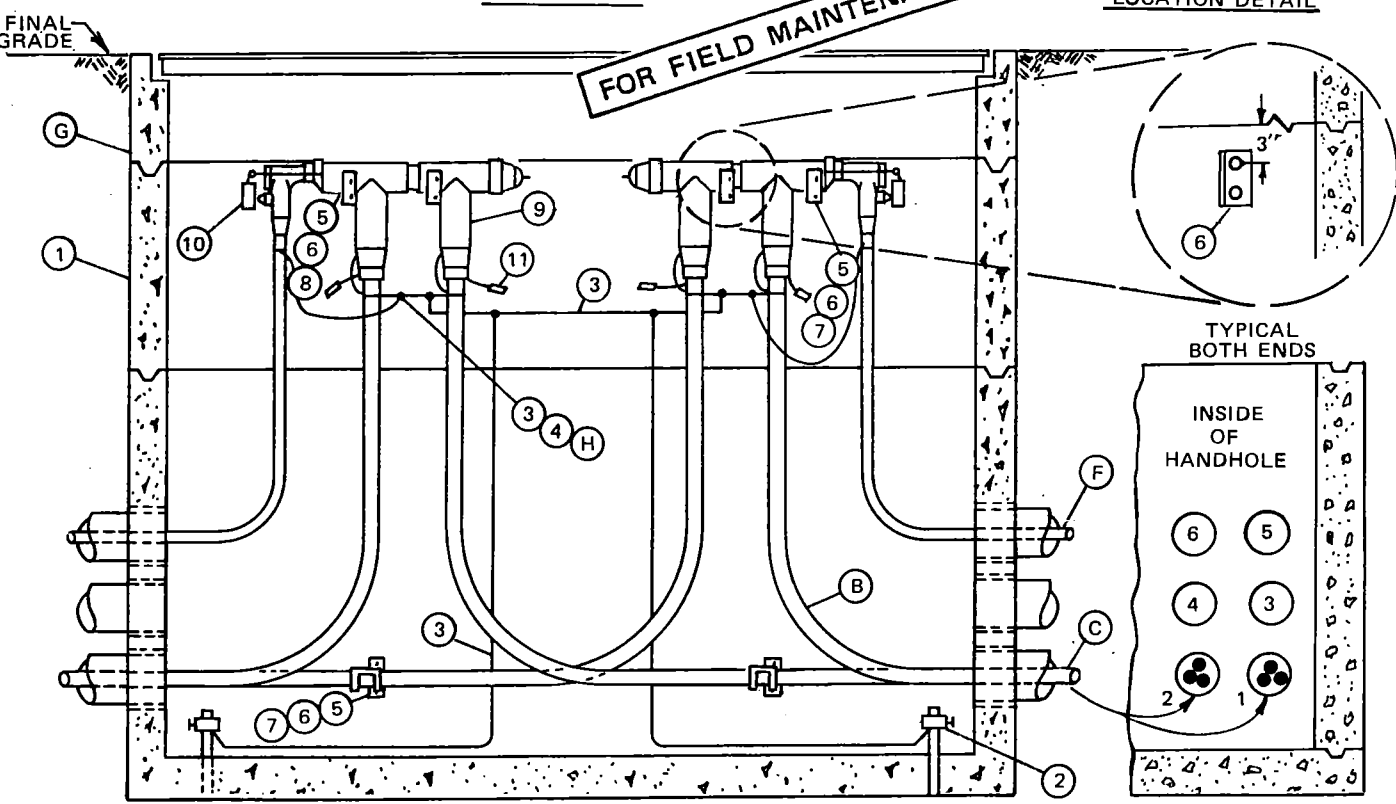
TOP VIEW

FIGURE 6



SECTION VIEW

FIGURE 7



BILL OF MATERIAL: (FOR FIGURES 6 AND 7)

| ITEM | DESCRIPTION | QUANTITY | CONSTR STD OR PAGE NO | STOCK NUMBER |
|------|---------------------------------|--------------|-----------------------|--------------|
| 1 | HANDHOLE, 5' X 8'-6" | 1 | 3316 | - |
| 2 | CLAMP, GROUND ROD | 2 | - | 230016 (E) |
| 3 | WIRE, BARE COPPER #2 | (H) AS REQ'D | - | 812816 |
| 4 | WIRE, BARE COPPER #1/0 | (H) AS REQ'D | - | 812752 |
| 5 | INSULATOR, CABLE | AS REQ'D | 4178 | 430592 (E) |
| 6 | ADAPTOR, CABLE ARM | AS REQ'D | 4178 | 102016 (E) |
| 7 | ARM, CABLE, 3-WAY | AS REQ'D | 4178 | 110528 (E) |
| 8 | ARM, CABLE, 4-WAY | AS REQ'D | 4178 | 110560 (E) |
| 9 | CONNECTOR ASSEMBLY, 200/600 AMP | 12 | 4181.1 | - |
| 10 | TAG, DO NOT OPERATE ENERGIZED | 12 | 3232 | 647966 (E) |
| 11 | CABLE IDENTIFICATION TAGS | AS REQ'D | 3202 | - |

INSTALLATION: (FOR FIGURES 6 AND 7)

- (A) LEAVE AN UNOBSTRUCTED SPACE FREE OF CABLE INTRUSION BY CABLING AROUND WALLS. UNUSED CONDUITS MUST BE ACCESSIBLE FOR FUTURE CABLES. LEAVE ADEQUATE SPACE FOR BLOWING PULL ROPES IN CONDUITS OR CABLE PULLING.
- (B) NOTE ORIENTATION OF ELBOW TEES AND CABLE LOOPS TO ALLOW FOR CABLE EXPANSION AND TO PREVENT DAMAGE.
- (C) WHEN TWO SETS OF 600 AMP TEES ARE INSTALLED ON THE SAME WALL, ONE SET MUST BE ON 3-WAY CABLE ARMS AND THE OTHER SET MUST BE ON 4-WAY CABLE ARMS. THE CABLES TERMINATED ON THE 3-WAY CABLE ARMS SHALL BE INSTALLED IN THE BOTTOM OUTSIDE CONDUIT ENTERING AND LEAVING AND SHALL BE RACKED OR TERMINATED ON THE SAME WALL OF THE CONDUIT BANK THAT THE CABLE ENTERS AND LEAVES (POSITION 1).

THE CABLES TERMINATED ON 4-WAY CABLE ARMS SHALL BE INSTALLED IN THE BOTTOM INSIDE CONDUIT ENTERING AND LEAVING AND SHALL BE RACKED OR TERMINATED ON THE SAME WALL OF THE CONDUIT BANK THAT THE CABLE ENTERS AND LEAVES (POSITION 2).

- (D) USE POSITION #4 FOR SPARE FEEDER CONDUIT.
- (E) EXEMPT MATERIAL.
- (F) #2 OR 2/0 PRIMARY CABLES MAY BE PULLED IN ANY CONDUIT NOT USED FOR LARGER CABLES AS DESCRIBED IN INSTALLATION NOTES "C" AND "D". IF CONDUITS ARE NOT BEING USED AS DESCRIBED IN THESE NOTES, LEAVE THEM EMPTY FOR FUTURE LARGER SIZED CABLES UNLESS THERE IS NO POSSIBLE FUTURE LOAD.
- (G) DO NOT INSTALL EQUIPMENT ON TOP SECTION OF HANDHOLES AS THIS IS USED FOR FINAL GRADE ADJUSTMENTS.
- (H) FOR THE NEUTRAL CONDUCTOR BETWEEN CABLES (PER PHASE) USE 1-#2 BARE COPPER WIRE WITH 350 KCMIL CABLES. USE 1-#1/0 BARE COPPER WIRE WITH 750 OR 1000 KCMIL CABLES. IF THE CONCENTRIC NEUTRAL TAILS ARE LONG ENOUGH, USE THEM INSTEAD OF THE BARE COPPER WIRE.

FOR FIELD MAINTENANCE ONLY

REFERENCE:

- J. FOR STRUCTURE IDENTIFICATION, SEE STANDARD 3211.
- K. FOR CONDUIT TERMINATION, SEE STANDARD 3374.

SDG&E ELECTRIC STANDARDS

CABLE AND CONDUIT PLACEMENT

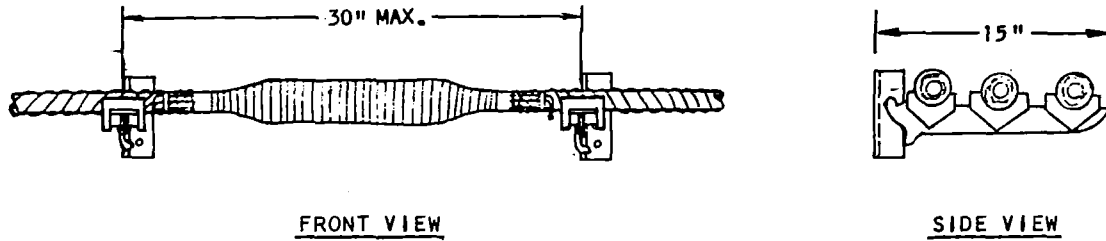
3699.405

DATE 1-1-88

APPD JYB/ROA

3315 & 3316 HANDHOLE OR MANHOLE INSTALLATION

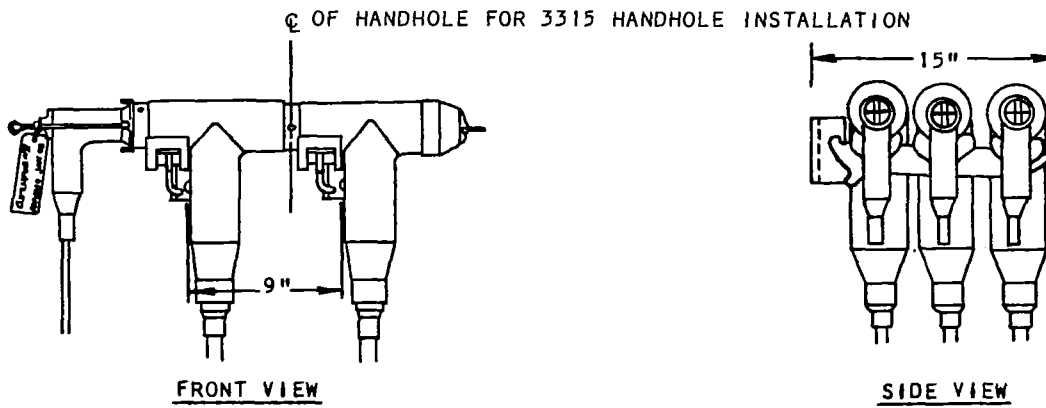
3-1/C CABLE WITH 600 AMP CADWELD TAPED SPLICES INSTALLED ON ADAPTORS AND 3-WAY CABLE ARMS.
HANGERS (STOCK NUMBER 564480) MAY BE USED WHEN MORE THAN ONE LEVEL OF CABLE IS REQUIRED.



FOR FIELD MAINTENANCE ONLY

3315 & 3316 HANDHOLE INSTALLATIONS ONLY

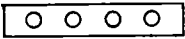
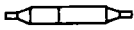
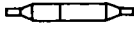
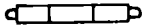
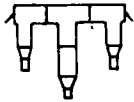

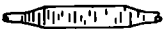

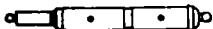
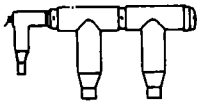


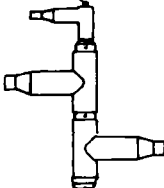


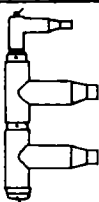

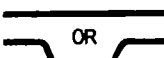



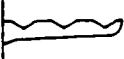
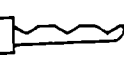


3-1/C 600 AMP TEE SPLICE INSTALLED ON HANGERS AND 3-WAY CABLE ARMS.



SCOPE: THIS STANDARD SHOWS THE MAXIMUM EQUIPMENT COMBINATIONS THAT CAN BE UTILIZED IN A 3314, 3315, 3316 OR 3324 SUBSTRUCTURE.

FIND THE COMBINATION THAT REPRESENTS THE INSTALLATION, THEN CHECK THE LEGEND FOR COINCIDING SYMBOL AND REFERENCE TO THE EQUIPMENT ASSEMBLY OR CABLE HANGER STANDARDS PAGE.

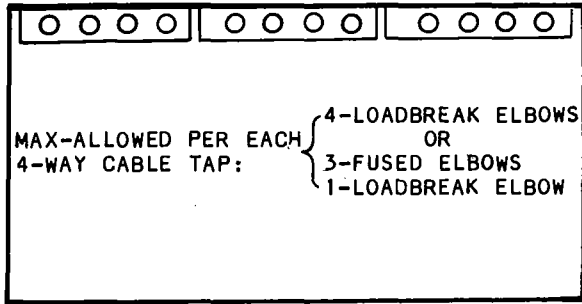
LEGEND

| | TOP VIEW | FRONT VIEW | SIDE VIEW | DESCRIPTION | CONSTRUCTION STANDARD |
|---------------------|---|---|---|--|-----------------------|
| 200 AMP |  | — | — | | 4192.4 |
| |  |  | ● | DEADBREAK STRAIGHT SPLICE | 4196.3 |
| |  |  |  | DEADBREAK ELBOW TEE | 4196.1 & 4196.3 |
| 600 AMP |  |  | ○ | TAPED SPLICE | 4141.1-.3 |
| |  |  |  | 600 AMP TEES WITH OR WITHOUT DEADBREAK ELBOWS IN A HANDHOLE | 4182.1 |
| |  |  |  | 600 AMP TEES WITH OR WITHOUT DEADBREAK ELBOWS IN A MANHOLE | 4182.1 |
| |  |  |  | 600 AMP TEES WITH OR WITHOUT DEADBREAK ELBOWS IN A MANHOLE | 4182.1 |
| 200 & 600 AMP |  | — |  | SECONDARY OR PRIMARY CABLE PULLED STRAIGHT THROUGH WITHOUT ANY SPLICES | — |
| 600 VOLT |  |  | — | 600 VOLT SECONDARY CONNECTOR | 4173.1-.3 |
| | — | — |  | HANGER AND 2, 3 OR 4 WAY CABLE ARMS | 4178 |
| | — | — |  | ADAPTER AND 2, 3 OR 4 WAY CABLE ARMS | 4178 |
| | — | — |  | HANGER AND SMALL CABLE HOOK | 4178 |
| | — | — |  | HANGER AND LARGE CABLE HOOK | 4178 |

FOR FIELD MAINTENANCE ONLY

SIDE VIEW

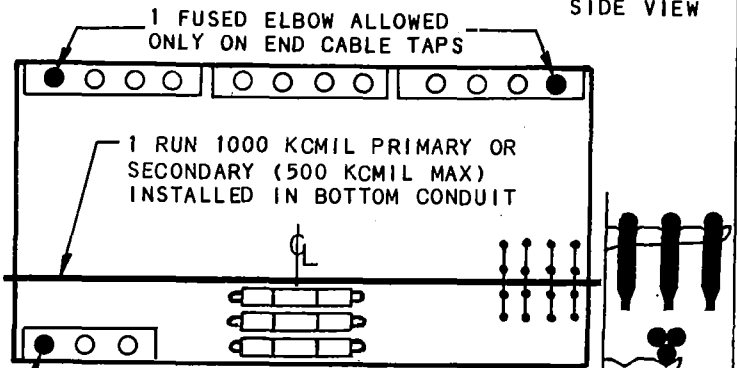
TOP VIEW



ALLOWED

TOP VIEW

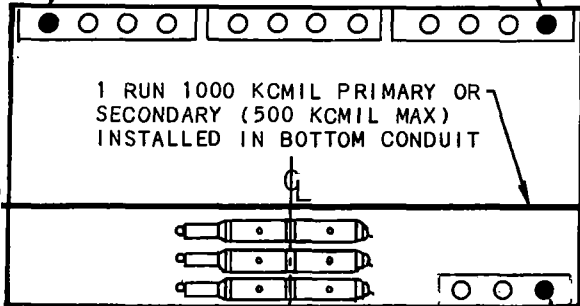
SIDE VIEW



ALLOWED

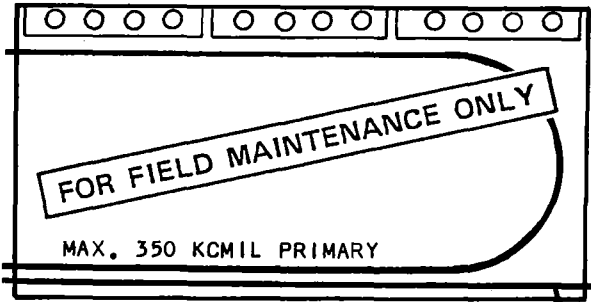
4TH CABLE TAP AND FUSED ELBOW ALLOWED ONLY FOR THIRD FUSED ELBOW. (3 WAY ONLY)

1 FUSED ELBOW ALLOWED ONLY ON END CABLE TAPS.



ALLOWED

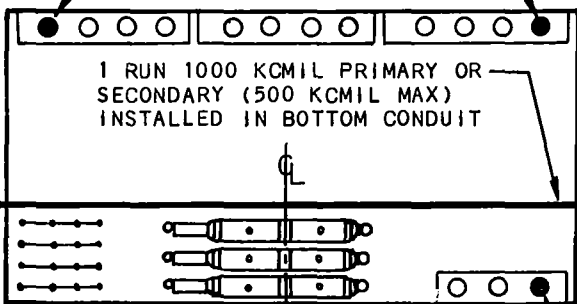
4TH CABLE TAP AND FUSED ELBOW ALLOWED ONLY FOR THIRD FUSED ELBOW. (3 WAY ONLY)



ALLOWED

1 RUN 1000 KCMIL PRIMARY OR SECONDARY (500 KCMIL MAX) INSTALLED IN BOTTOM CONDUIT

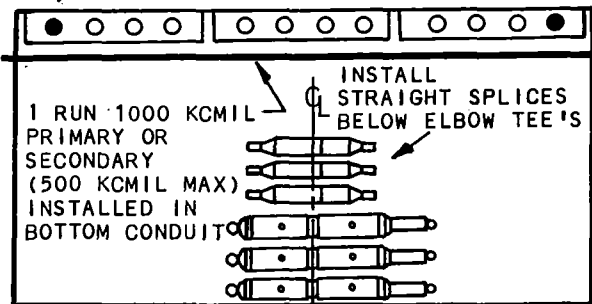
1 FUSED ELBOW ALLOWED ONLY ON END CABLE TAPS



ALLOWED

4TH CABLE TAP AND FUSED ELBOW ALLOWED ONLY FOR THIRD FUSED ELBOW. (3 WAY ONLY)

1 FUSED ELBOW ALLOWED ONLY ON END CABLE TAPS.



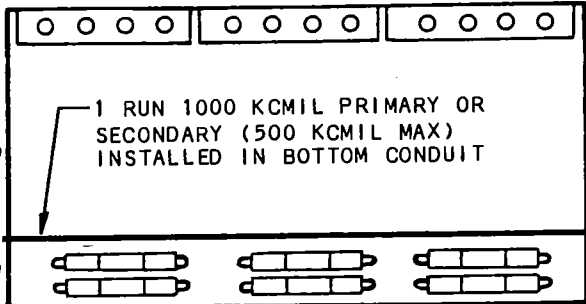
ALLOWED

3315

FOR ALL SIZES OF PRIMARY CABLES AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM.

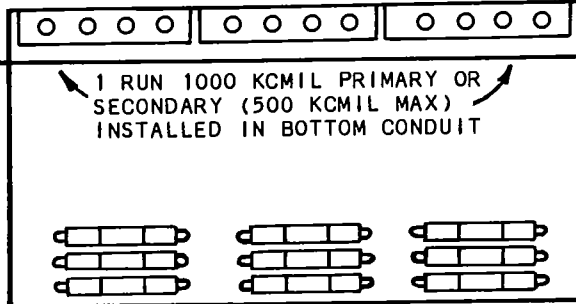
TOP VIEW

NO FUSED ELBOWS



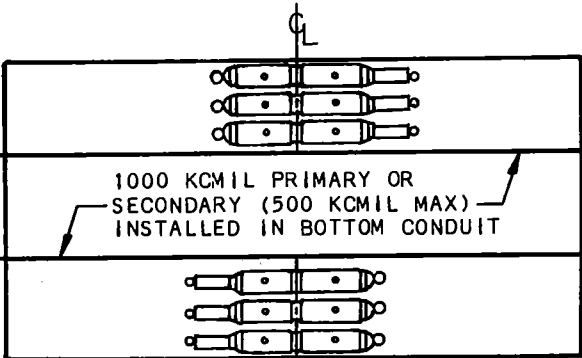
ALLOWED

NO FUSED ELBOWS



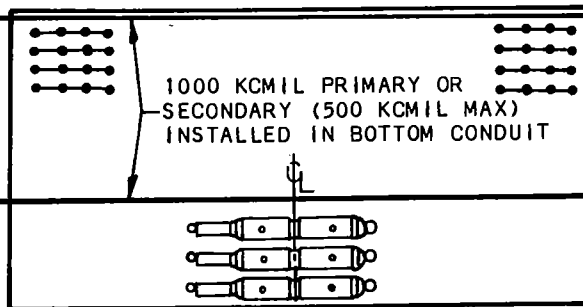
ALLOWED

1000 KCMIL PRIMARY OR SECONDARY (500 KCMIL MAX) INSTALLED IN BOTTOM CONDUIT



ALLOWED

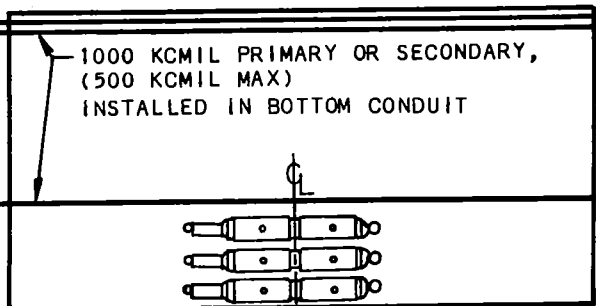
1000 KCMIL PRIMARY OR SECONDARY (500 KCMIL MAX) INSTALLED IN BOTTOM CONDUIT



ALLOWED

FOR FIELD MAINTENANCE ONLY

1000 KCMIL PRIMARY OR SECONDARY, (500 KCMIL MAX) INSTALLED IN BOTTOM CONDUIT

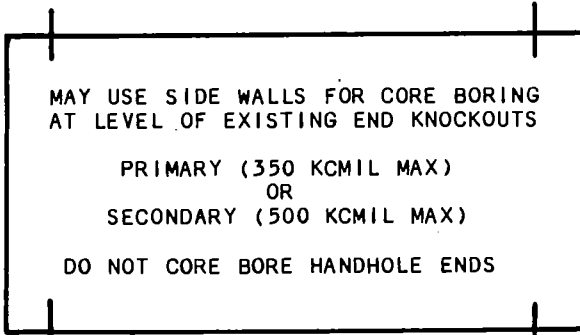


ALLOWED

MAY USE SIDE WALLS FOR CORE BORING AT LEVEL OF EXISTING END KNOCKOUTS

PRIMARY (350 KCMIL MAX) OR SECONDARY (500 KCMIL MAX)

DO NOT CORE BORE HANDHOLE ENDS



ALLOWED

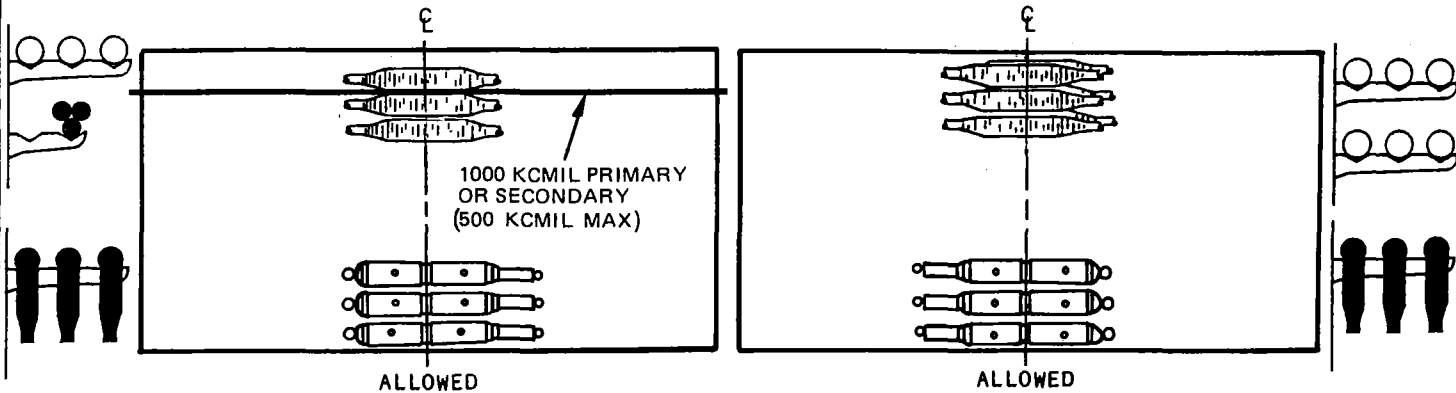
3315

FOR ALL SIZES OF PRIMARY CABLES AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM.

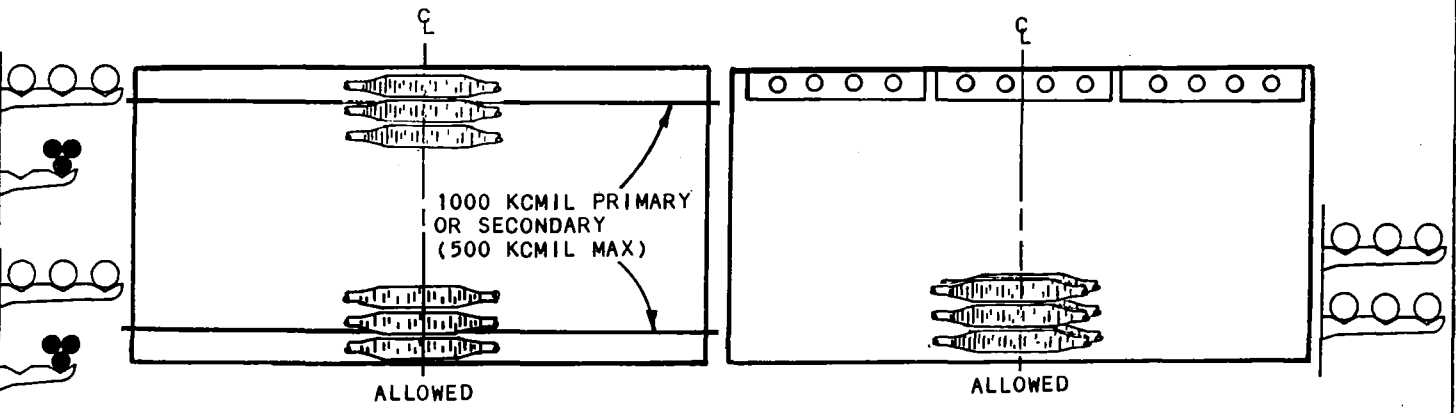
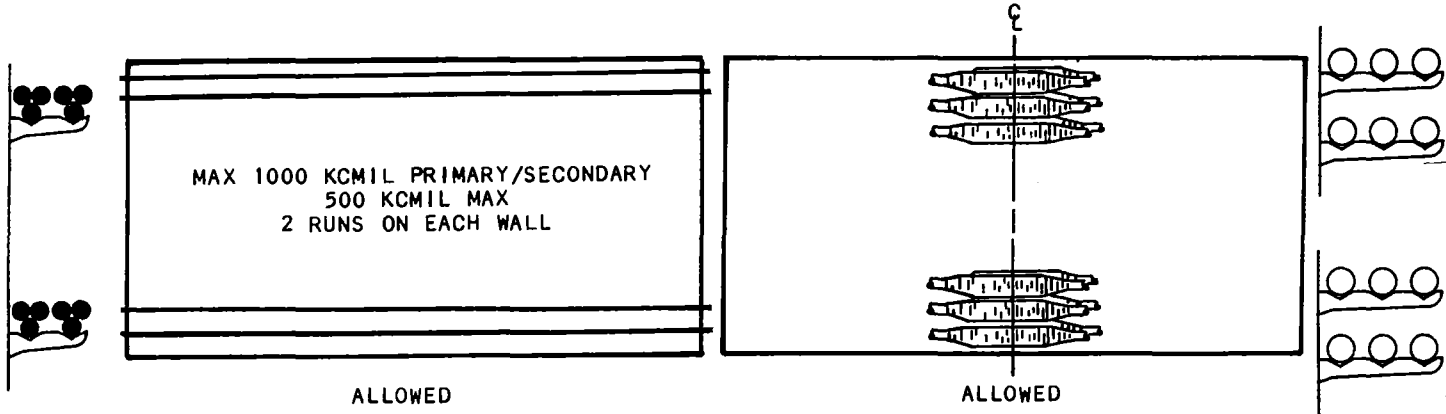
SIDE VIEW

TOP VIEW

SIDE VIEW



FOR FIELD MAINTENANCE ONLY



3315

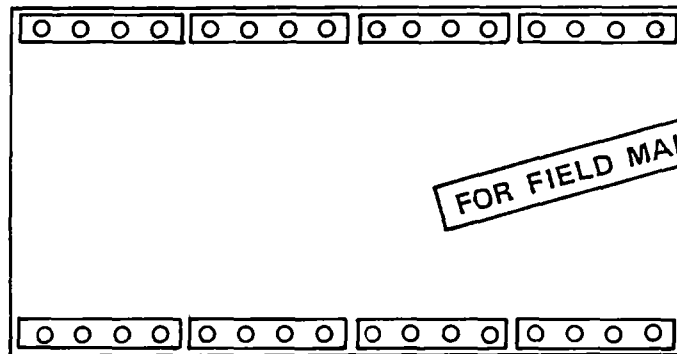
FOR ALL SIZES OF PRIMARY CABLES AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM.

NOTE:

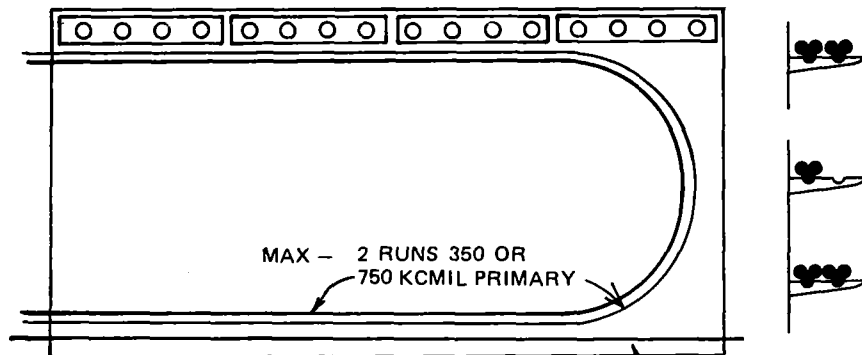
- ONLY 3 CABLE TAPS ALLOWED ON EITHER WALL WHEN HANDHOLE REQUIRES A TRAFFIC COVER. TAPS MUST BE GROUPED TOGETHER AND CENTERED ON THE WALL.
- WHEN ONLY ONE SET OF 600 AMP TEES ARE INSTALLED, USE THE BOTTOM OUTSIDE CONDUIT (CLOSEST TO THE WALL) AND INSTALL THE TEES ON THREE-WAY CABLE ARMS (STEPS).

TOP VIEW

SIDE VIEW



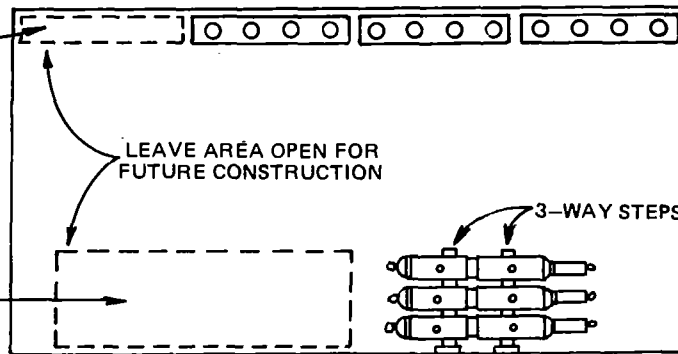
ALLOWED



ALLOWED

1000 KCMIL PRIMARY/OR SECONDARY (500 KCMIL MAX)

1 CABLE TAP
OR
3-200AMP DEADBREAK ELBOW TEES
OR
600 VOLT CONNECTORS



ALLOWED

3316

2 CABLE TAPS
OR
3-600 AMP TEES
OR
6-200 AMP DEADBREAK ELBOWS
OR
600 VOLT CONNECTORS

FOR ALL SIZES OF PRIMARY CABLES AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM

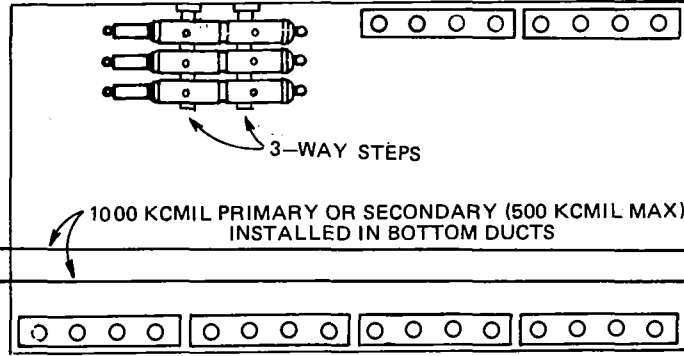
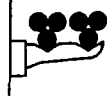
NOTE:

- ONLY 3 CABLE TAPS ALLOWED ON EITHER WALL WHEN HANDHOLE REQUIRES A TRAFFIC COVER. TAPS MUST BE GROUPED TOGETHER AND CENTERED ON THE WALL.
- WHEN ONLY ONE SET OF 600 AMP TEES IS INSTALLED, USE THE BOTTOM OUTSIDE CONDUITS (CLOSEST TO THE WALL) AND INSTALL THE TEES ON THREE-WAY STEPS.
- #2 OR 2/0 PRIMARY CABLES OR SECONDARY (500 KCMIL MAX) MAY BE PULLED IN ANY CONDUIT NOT USED FOR LARGER CABLES.

SIDE VIEW

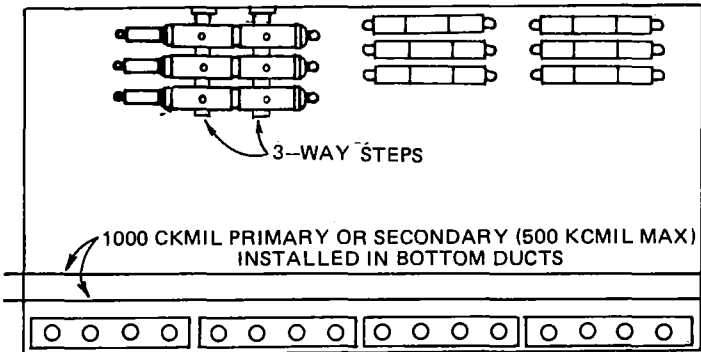
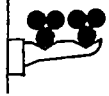
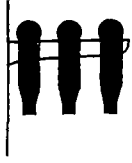
TOP VIEW

SIDE VIEW

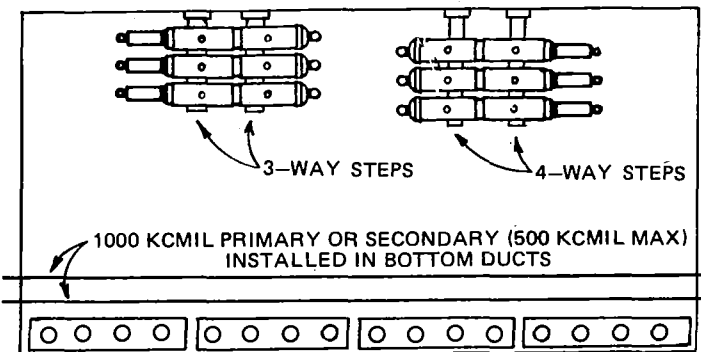
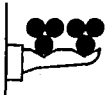
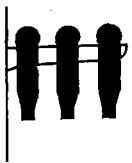


ALLOWED

FOR FIELD MAINTENANCE ONLY



ALLOWED



ALLOWED

3316

FOR ALL SIZES OF PRIMARY CABLES AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM

DATE 1-1-88
APPD JYB/RD

SDG&E ELECTRIC STANDARDS

EQUIPMENT COMBINATION GUIDELINES

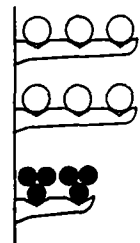
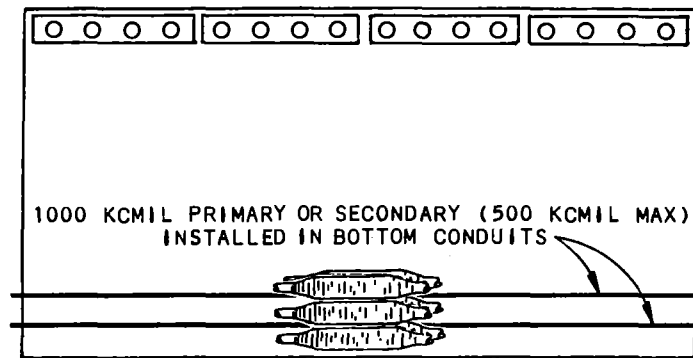
3699.413

NOTE:

- WHEN ONLY TWO SETS OF 600 AMP TEES ARE REQUIRED, INSTALL THEM ON ONE WALL. LEAVE THE OPPOSITE WALL OPEN FOR FUTURE CONSTRUCTION.

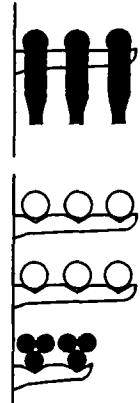
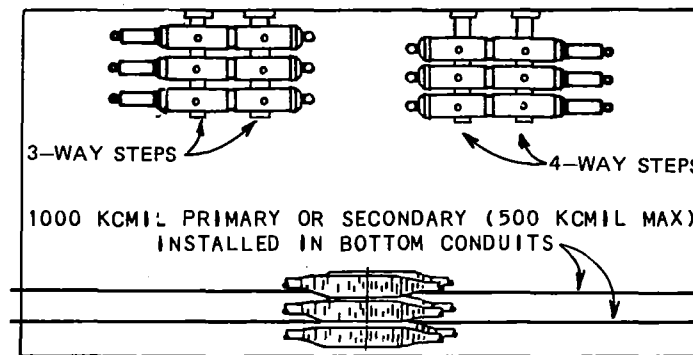
TOP VIEW

SIDE VIEW

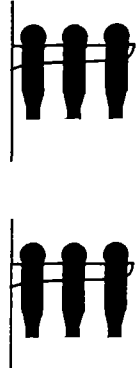
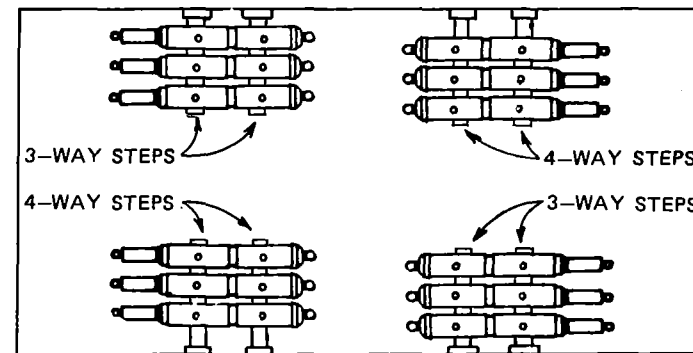


ALLOWED

FOR FIELD MAINTENANCE ONLY



ALLOWED



ALLOWED

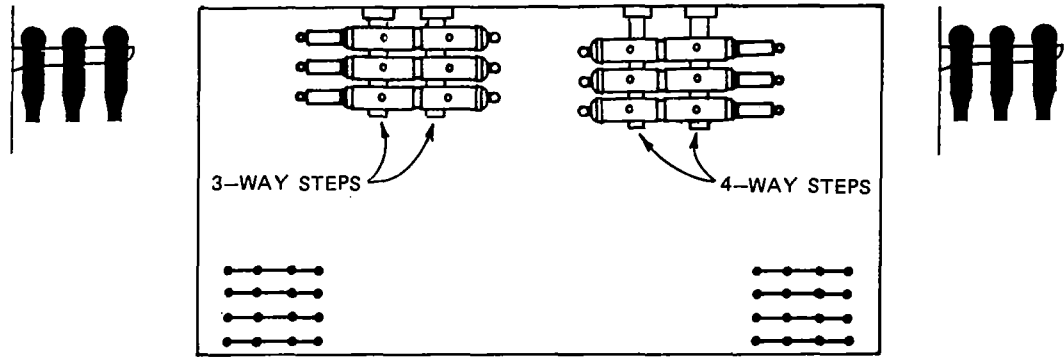
3316

FOR ALL SIZES OF PRIMARY CABLES AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM

SIDE VIEW

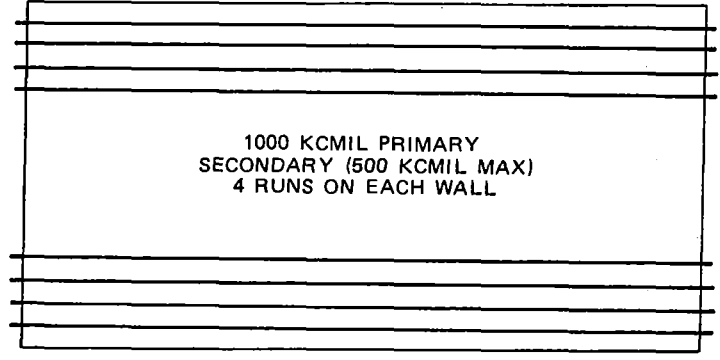
TOP VIEW

SIDE VIEW

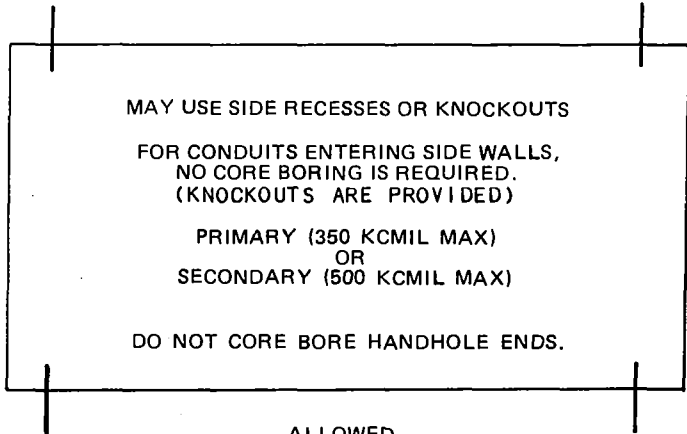


ALLOWED

FOR FIELD MAINTENANCE ONLY



ALLOWED



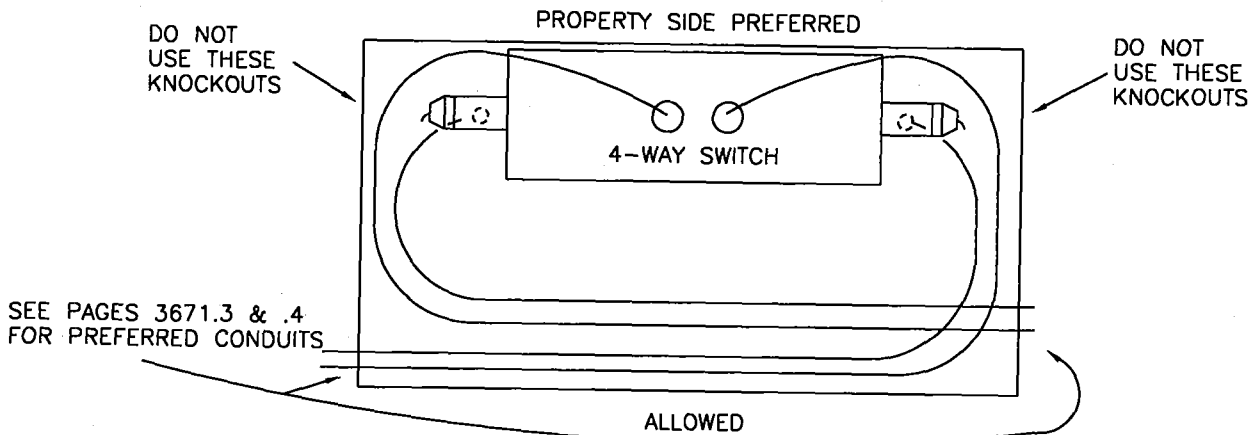
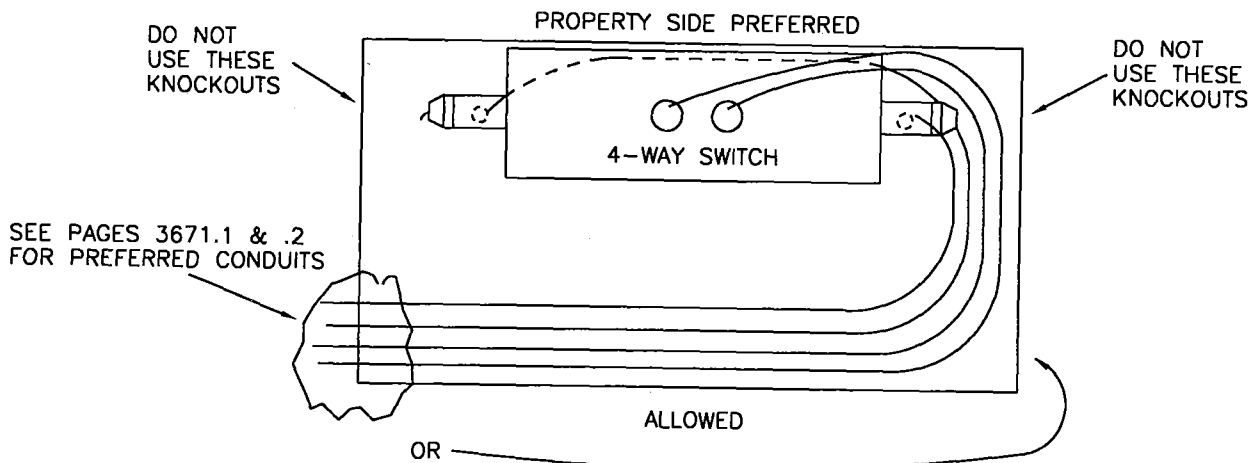
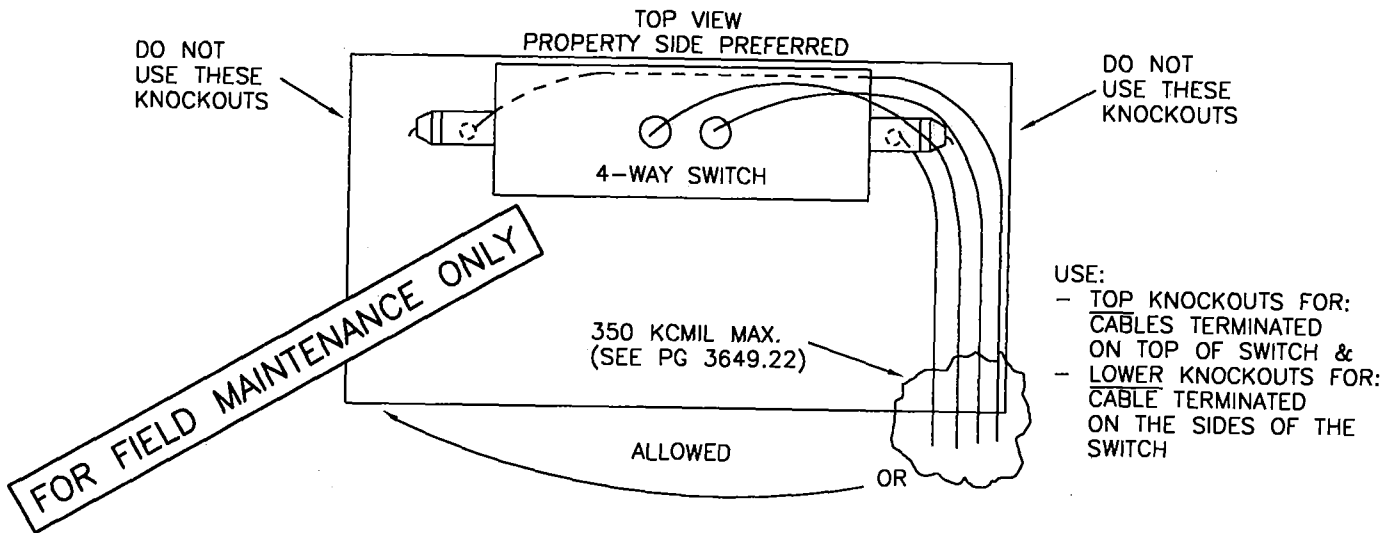
ALLOWED

3316

FOR ALL SIZES OF PRIMARY CABLES AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM

NOTES:

- ALL 350, 750 AND 1000 KCMIL CABLES MUST BE UNTRIPLEXED WHENEVER THEY ARE TRAINED AROUND THE CORNER (90° ANGLE) OF THE HANDHOLE. SEE STANDARD 3671 FOR UNTRIPLEXING CRITERIA AND DETAILED SWITCH INSTALLATION DRAWINGS.



3316 WITH SUBSURFACE/SURFACE OPERABLE SWITCH

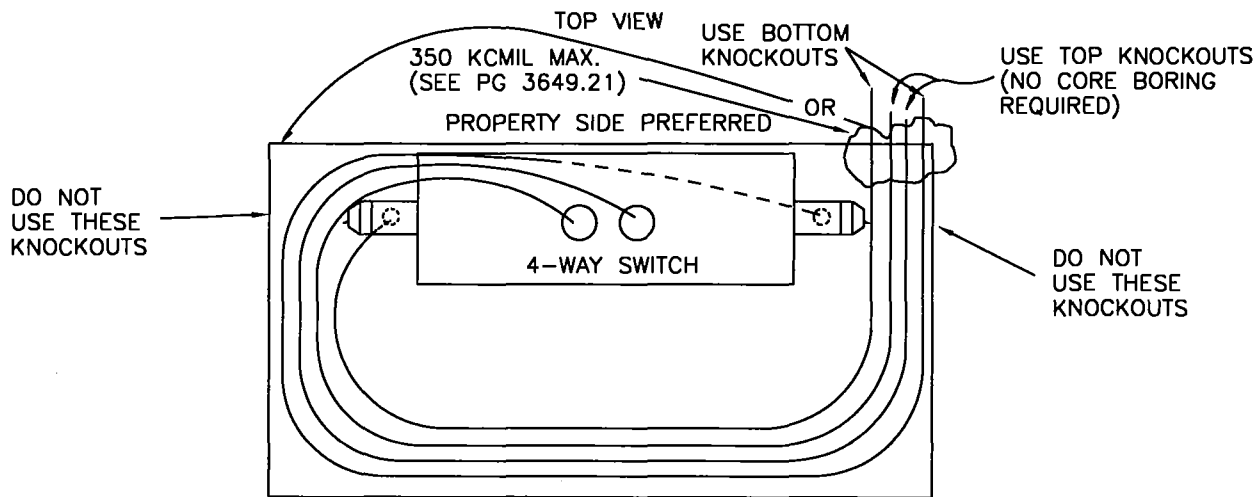
FOR ALL SIZES OF PRIMARY AND NO SECONDARY OTHER THAN FEED TO SUMP PUMP

DATE 1-1-89
APPD *JLB/BJ*

SDG&E ELECTRIC STANDARDS

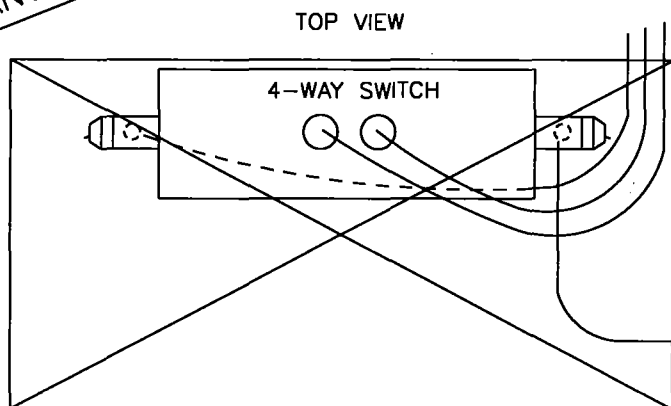
EQUIPMENT COMBINATION GUIDELINES

3699.416
SUPERSEDES
3649.24 (1-1-98)

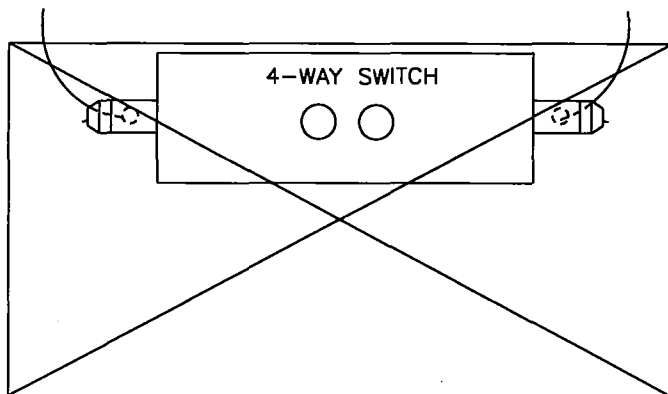


ALLOWED

FOR FIELD MAINTENANCE ONLY



NOT ALLOWED



NOT ALLOWED

3316 WITH SUBSURFACE/SURFACE OPERABLE SWITCH

FOR ALL SIZES OF PRIMARY AND NO SECONDARY OTHER THAN FEED TO SUMP PUMP

3699.417
SUPERSEDES
3649.25 (1-1-98)

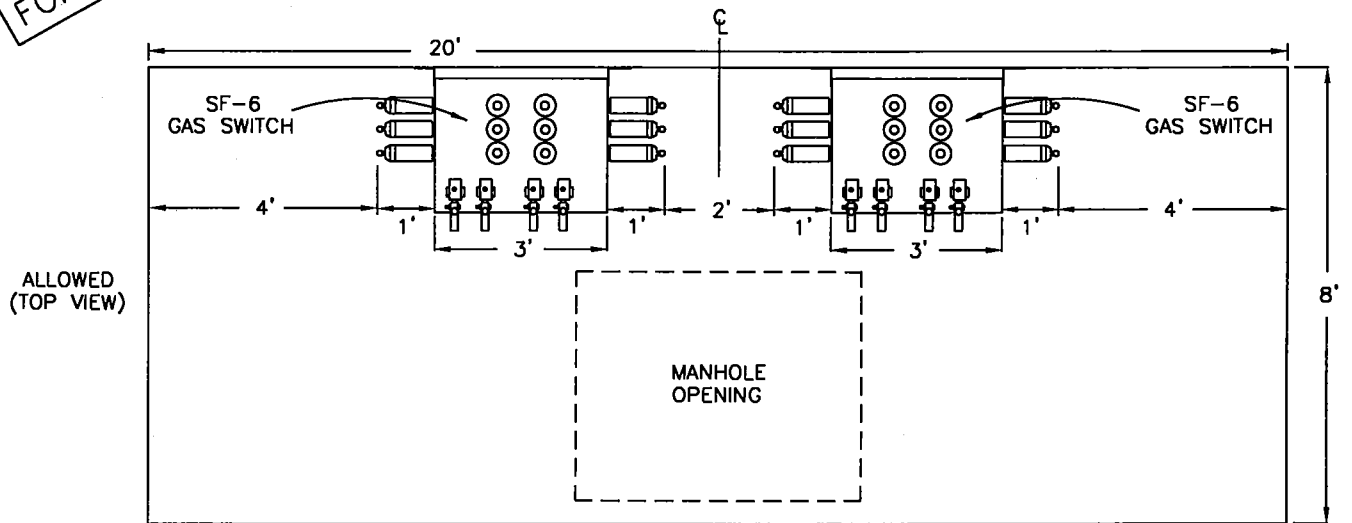
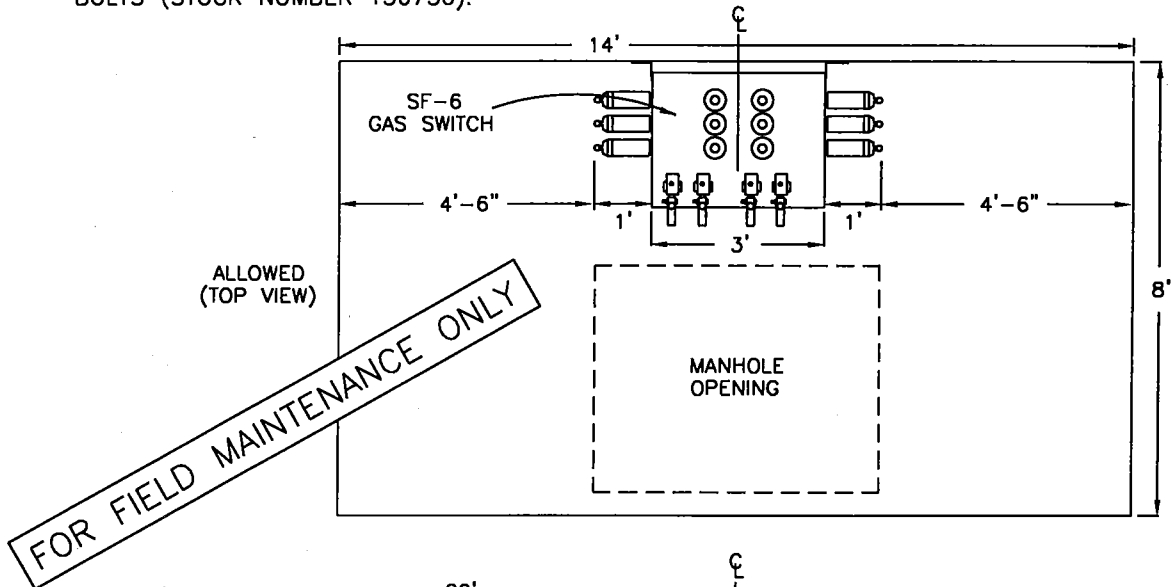
SDG&E ELECTRIC STANDARDS

EQUIPMENT COMBINATION GUIDELINES

DATE 7-31-84
APPD RES/DRH

NOTES:

- SWITCHES SHOWN ARE THE MAXIMUM ALLOWED IN THE 3325 AND 3326 MANHOLES.
- PLACE SWITCHES ON WALL OPPOSITE THE MANHOLE OPENING.
- ALL CABLES TERMINATED ON A SWITCH MUST EXIT OR ENTER THE CONDUITS ON THE WALL OPPOSITE THE SWITCH (THE WALL UNDER THE MANHOLE OPENING OR IN CONDUITS INSTALLED IN RECESSES IN THE SIDES OF THE MANHOLE.)
- #2 OR 2/0 PRIMARY CABLES AND SECONDARY CABLES UP TO 500 KCMIL MAXIMUM MAY BE PULLED IN ANY CONDUIT NOT USED OR INTENDED FOR LARGER CABLES EXCEPT AS NOTED OTHERWISE.
- INSTALL PRIMARY CABLES IN THE LOWER CONDUITS AND SECONDARY ABOVE THE PRIMARY. FOR THE PRIMARY, USE THE LOWER CONDUIT CLOSEST TO THE WALL FIRST.
- PRIMARY OR SECONDARY CABLES PULLED STRAIGHT THROUGH MUST ENTER AND EXIT THE SAME CONDUIT POSITION ON OPPOSITE ENDS.
- NEVER INSTALL CABLE OR CONNECTORS LESS THAN 1 FOOT ABOVE THE FLOOR.
- 4-WAY SWITCHES ARE STAINLESS STEEL AND SHALL BE BOLTED AGAINST THE WALL AND SUPPORTED USING 4-54 INCH STAINLESS STEEL LEGS (STOCK NUMBER 457168) AND 8 -5/8" X 3-1/2" STAINLESS STEEL BOLTS (STOCK NUMBER 156750).



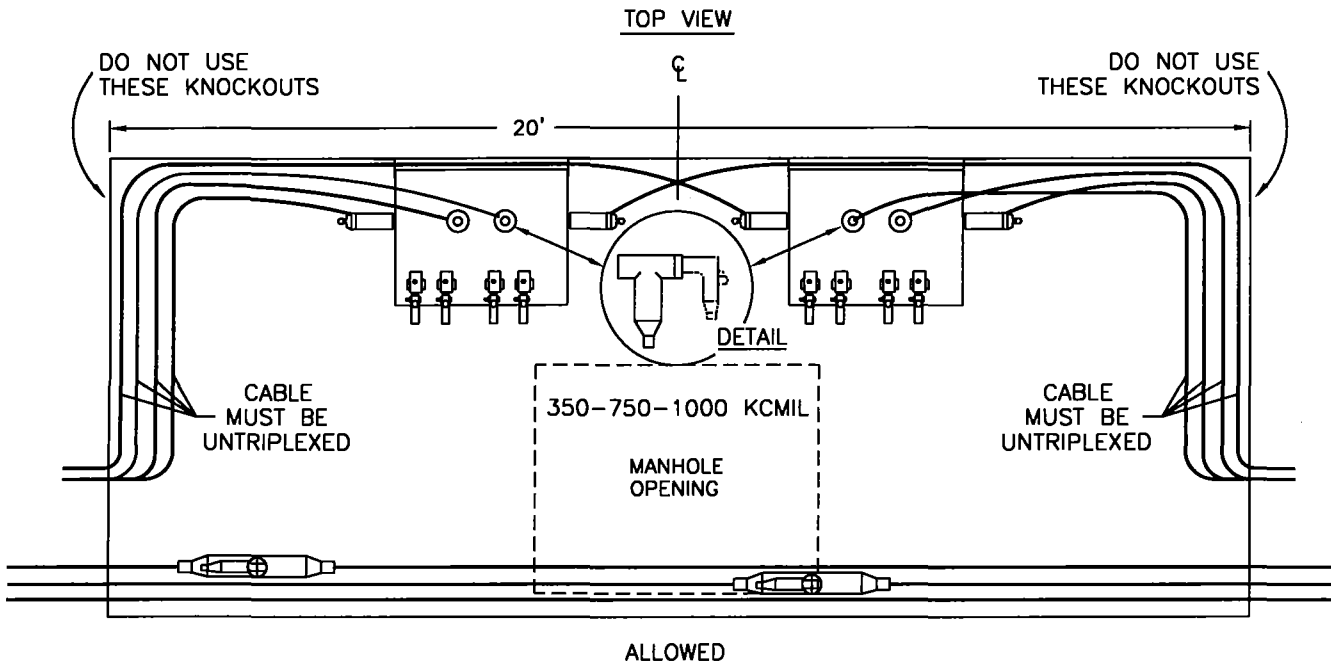
3325/3326

FOR ALL SIZES OF PRIMARY CABLES AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM.

NOTES:

- WHEN CABLE ENTERS THE MANHOLE AND MAKES AN IMMEDIATE 90° BEND AS SHOWN IN THE DRAWING, IT MUST BE UNTRIPLEXED AND INSTALLED IN THE THREE OUTSIDE POSITIONS NEAREST THE END OF A OF A 4-WAY STEP (SEE DETAIL BELOW).

FOR FIELD MAINTENANCE ONLY



SDG&E ELECTRIC STANDARDS

3699.419
SUPERSEDES
3649.29 (1-1-98)

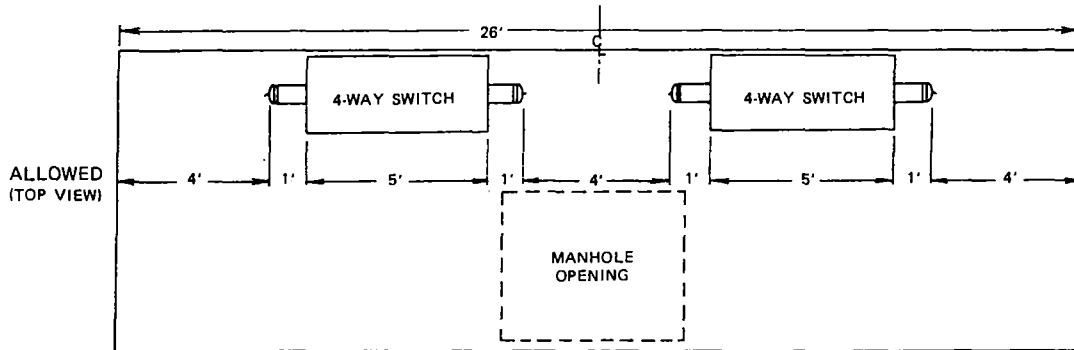
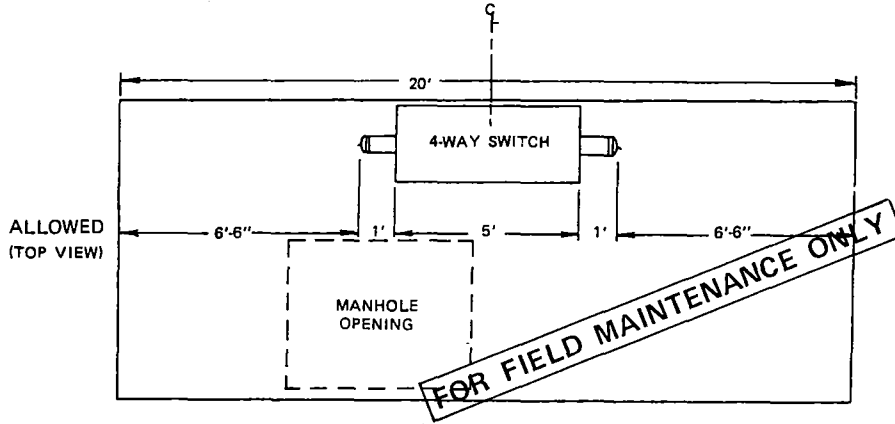
EQUIPMENT COMBINATION GUIDELINES

DATE 1-1-96

APPD *[Signature]*

NOTES:

- SWITCHES SHOWN ARE THE MAXIMUM ALLOWED IN THE 3324 MANHOLE.
- PLACE SWITCHES ON WALL OPPOSITE THE MANHOLE OPENING.
- ALL CABLES TERMINATED ON A SWITCH MUST EXIT OR ENTER THE CONDUITS ON THE WALL OPPOSITE THE SWITCH (THE WALL UNDER THE MANHOLE OPENING OR IN CONDUITS INSTALLED IN RECESSES IN THE SIDES OF THE MANHOLE.)
- #2 OR 2/D PRIMARY CABLES AND SECONDARY CABLES UP TO 500 KCMIL MAXIMUM MAY BE PULLED IN ANY CONDUIT NOT USED OR INTENDED FOR LARGER CABLES EXCEPT AS NOTED OTHERWISE.
- INSTALL PRIMARY CABLES IN THE LOWER CONDUITS AND SECONDARY ABOVE THE PRIMARY. FOR THE PRIMARY, USE THE LOWER CONDUIT CLOSEST TO THE WALL FIRST.
- PRIMARY OR SECONDARY CABLES PULLED STRAIGHT THROUGH MUST ENTER AND EXIT THE SAME CONDUIT POSITION ON OPPOSITE ENDS.
- NEVER INSTALL CABLE OR CONNECTORS LESS THAN 1 FOOT FROM THE FLOOR.
- 4-WAY SWITCHES ARE STAINLESS STEEL AND SHALL BE BOLTED AGAINST THE WALL USING THE 30 INCH SINGLE SUPPORT LEG (STOCK NUMBER 457166). EXCEPTIONS WOULD BE WHENEVER A SWITCH CANNOT BE PLACED AGAINST A WALL BECAUSE OF CABLE TRAINING OR SPACE LIMITATIONS. IN THESE CASES 4-54 INCH LEGS (OLD STYLE), WILL BE REQUIRED.



3324

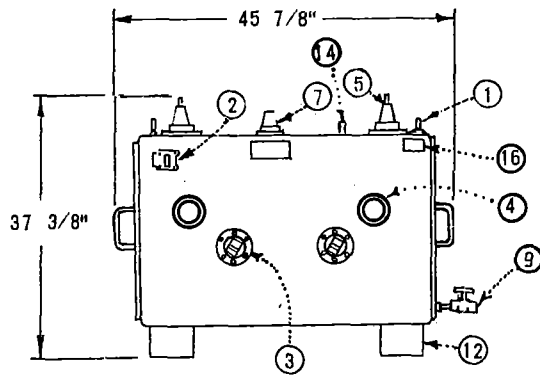
FOR ALL SIZES OF PRIMARY CABLES AND UP TO 500 KCMIL SECONDARY CABLES MAXIMUM

| | | |
|--------------------|----------------------------------|--------------------|
| ISSUE 1990 | SDG & E ELECTRIC STANDARDS | 3699.416 |
| DATE 1-1-90 | EQUIPMENT COMBINATION GUIDELINES | SUPERCEDES 3649.28 |
| APPD <i>JHT/DR</i> | | (1-1-90) |

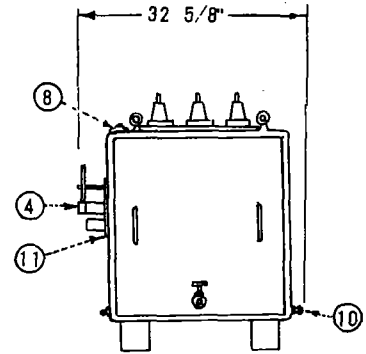
| SUBSTRUCTURES | MAJOR USE LIMITATION |
|---|--|
| 3322 6' X 10' X 7' MANHOLE (PRIMARY & SECONDARY) | MAXIMUM INSTALLATION CONSISTS OF 4-350 KCMIL OR LARGER THREE-PHASE PRIMARY CIRCUITS WITH NO MORE THAN TWO OF THESE CIRCUITS WITH STRAIGHT SPLICES OR 600 AMP TEE'S. ONLY ONE 2-WAY 600 AMP SWITCH IS PERMITTED. OTHER SIZES OF PRIMARY AND SECONOARIES UP TO 500 KCMIL MAXIMUM ALSO PERMITTED. NO CABLE TAPS ALLOWED. ALWAYS MAINTAIN AN UNOBSTRUCTED SPACE TO ALLOW ACCESSIBILITY TO CABLE, EQUIPMENT AND CONDUIT. SEE STANDARD 4004 FOR MINIMUM BENDING RADII. |

FOR FIELD MAINTENANCE ONLY

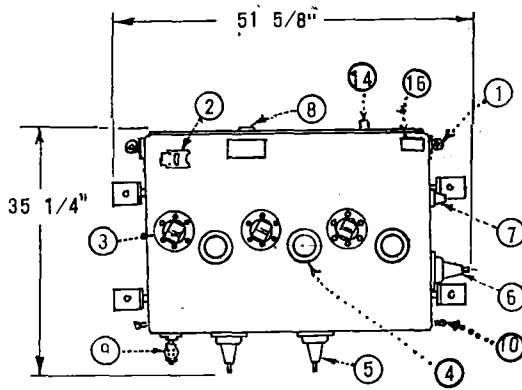
| | | |
|--------------------|---|-------------------------------|
| DATE 3-9-83 | SDG & E ELECTRIC STANDARDS | 3699.501 |
| APPD <i>JHT/DR</i> | SUBSTRUCTURE USE AND LIMITATIONS REFERENCE SHEET | SUPERSEDES 3805.2 (3-9-83) |



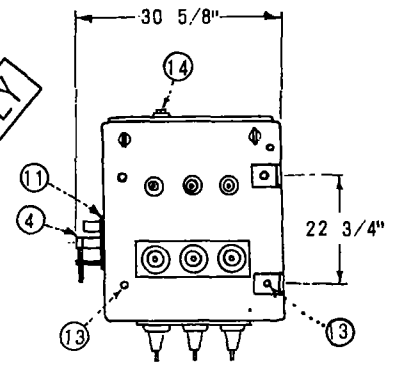
SIDE VIEW - 2 WAY
(ESCO)



END VIEW

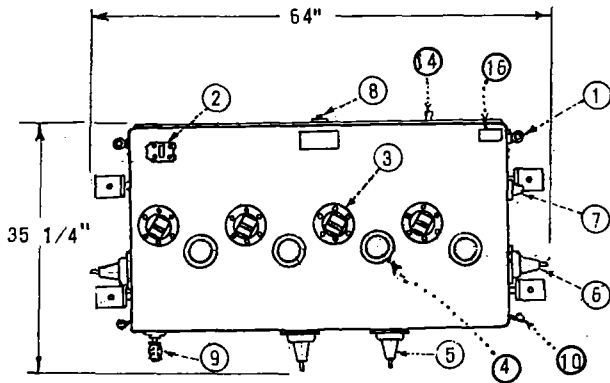


SIDE VIEW - 3 WAY
(ESCO)

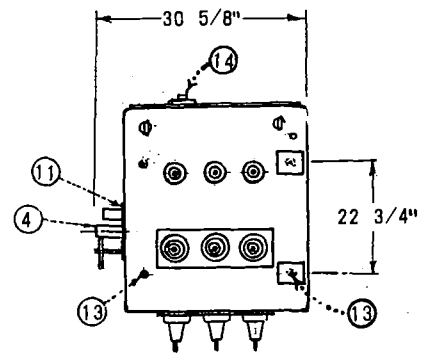


END VIEW

FOR FIELD MAINTENANCE ONLY



SIDE VIEW - 4 WAY
(ESCO)



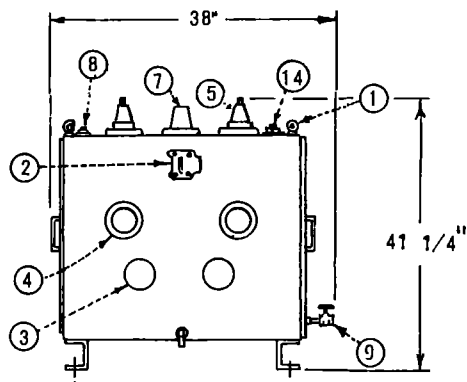
END VIEW

DATE 7/31/84
APPD. *BRH*

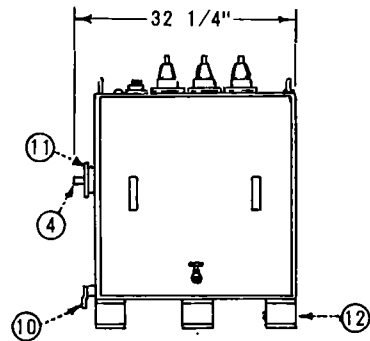
SDG&E ELECTRIC STANDARDS

SUBSURFACE OIL SWITCH
600 AMP, 12KV, 3Ø

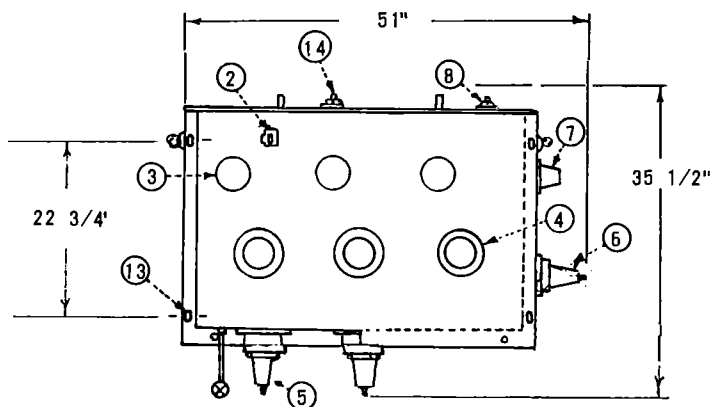
3699.701
SUPERCEDES
3670.1 (3-15-82)



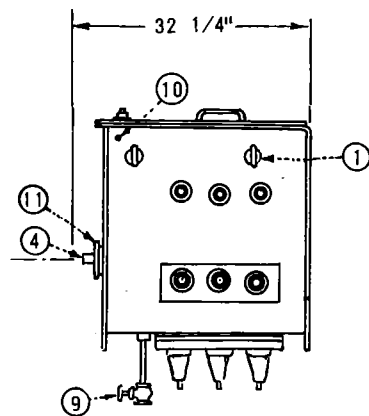
SIDE VIEW - 2 WAY
(G & W)



END VIEW

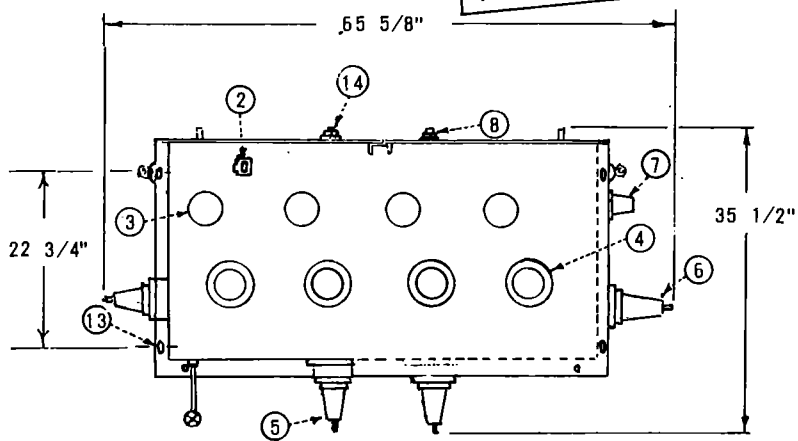


SIDE VIEW - 3 WAY
(G & W)

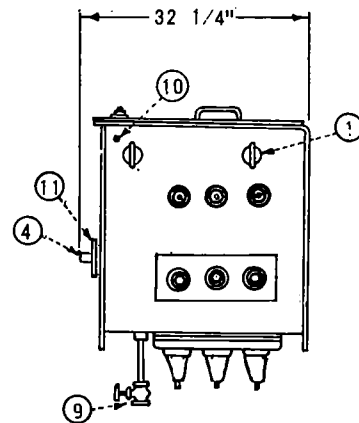


END VIEW

FOR FIELD MAINTENANCE ONLY



SIDE VIEW - 4 WAY
(G & W)



END VIEW

3699.702
SUPERCEDES
3670.2 (3-15-82)

SDG&E ELECTRIC STANDARDS

SUBSURFACE OIL SWITCH
600 AMP, 12KV, 3Ø

DATE 7/31/84
APPD. *RL* / *SRH*

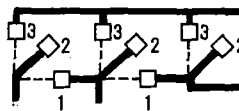
11

SWITCH POSITION

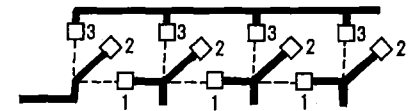
| SWITCH POSITIONS | |
|------------------|----------|
| 1 | CLOSED |
| 2 | OPEN |
| 3 | TEST (C) |

| ELECTRICAL RATINGS: | |
|---|------------|
| VOLTAGE | 15KV |
| BIL | 110KV |
| CURRENT, CONTINUOUS | 600 AMP |
| LOADMAKE AND LOADBREAK | 600 AMP |
| MOMENTARY AND FAULT CLOSE (RMS, ASYMMETRICAL) | 40,000 AMP |
| (RMS, SYMMETRICAL) | 25,000 AMP |

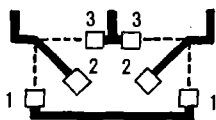
FOR FIELD MAINTENANCE ONLY



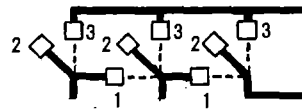
OR



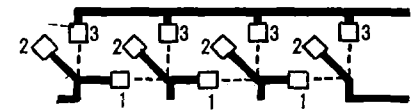
OR



2 WAY ONE LINE DIAGRAM



3 WAY ONE LINE DIAGRAM



4 WAY ONE LINE DIAGRAM

TYPICAL ONE LINE DIAGRAMS

ATTENTION:

WAY WITH OPEN CONTACTS CAN STILL BE ENERGIZED DUE TO CONNECTION TO ADJACENT WAY.

NOTES:

- A. MAJOR USE: SECTIONALIZING.
- B. THIS SWITCH SHALL BE USED WITH POLYETHYLENE CABLES AND 600 AMPERE ELBOW T'S (4182).
- (C) 200 AMPERE TEST BUSHINGS ARE FOR TEMPORARY GROUNDING-TO MEET OSHA REQUIREMENTS-NOT FOR LOAD.

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | 600 AMP | UNIT STOCK NUMBER |
|------|---|------|---|---------|-------------------|
| 1 | LIFTING EYES (REMOVABLE) | 12 | MOUNTING BRACKETS | 2 WAY | 708986 |
| 2 | OIL LEVEL GAUGE | 13 | LEG MOUNTING HOLES | 3 WAY | 708979 |
| 3 | LINK VIEWING WINDOWS | 14 | PRESSURE TEST VALVE | 4 WAY | 708977 |
| 4 | OPERATING HANDLE ASSEMBLY | 15 | OPERATING HANDLE, ANTI-REVERSIBLE (NOT SHOWN) | - | - |
| 5 | BUSHINGS (600 AMP) ESNA 600 | 16 | NAMEPLATE | - | - |
| 6 | BUSHINGS (600 AMP) ESNA 600 | - | - | - | - |
| 7 | BUSHINGS (200 AMP) GE SUREMAKE (LB) (C) | - | - | - | - |
| 8 | FILL PLUG | - | - | - | - |
| 9 | DRAIN VALVE | - | - | - | - |
| 10 | GROUND LUGS (2) | - | - | - | - |
| 11 | POSITION LABELS (SEE SWITCH POSITION TABLE) | - | - | - | - |

SDG&E ELECTRIC STANDARDS

DATE 7/31/84
APPD. [Signature]

SUBSURFACE OIL SWITCH
600 AMP, 12KV, 3Ø

3699.703
SUPERCEDES
3670.3 (3-15-82)

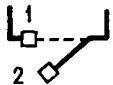
MAJOR USE: SECTIONALIZING

| ELECTRICAL RATINGS: | |
|---|------------|
| VOLTAGE | 15KV |
| BIL | 110KV |
| CURRENT, CONTINUOUS | 600 AMP |
| LOADMAKE AND LOADBREAK | 600 AMP |
| MOMENTARY AND FAULT CLOSE (RMS, ASYMMETRICAL) | 40,000 AMP |
| (RMS, SYMMETRICAL) | 25,000 AMP |

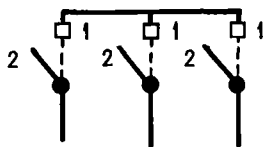
| 600 AMP | UNIT STOCK NUMBER |
|---------|-------------------|
| ON-OFF | 708982 |
| 3 WAY | 708983 |
| 4 WAY | 708984 |
| | |

SWITCH POSITION

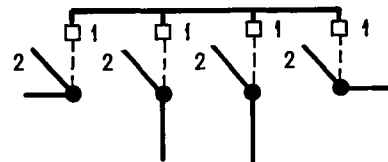
| SWITCH POSITIONS | |
|------------------|--------|
| 1 | CLOSED |
| 2 | OPEN |



ON-OFF ONE LINE DIAGRAM



3 WAY ONE LINE DIAGRAM



4 WAY ONE LINE DIAGRAM

TYPICAL ONE LINE DIAGRAMS

NOTES:

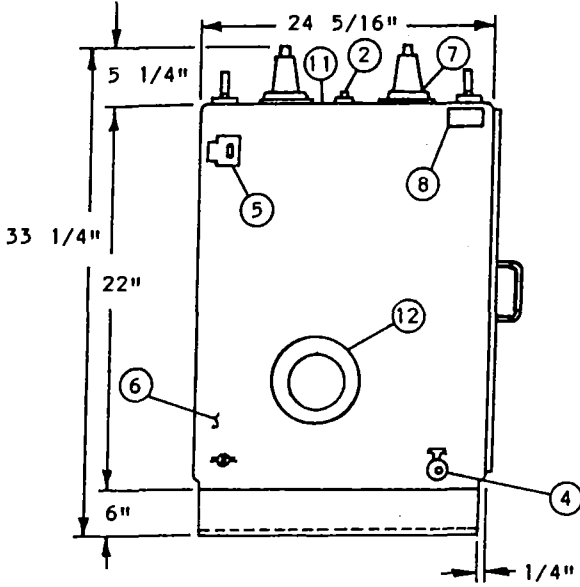
- A. THIS SWITCH SHALL BE USED WITH POLYETHYLENE CABLES AND 600 AMPERE ELBOW T'S (4182).
- B. SWITCH NUMBER TO BE ASSIGNED BY ELECTRIC DISTRIBUTION ENGINEERING.

FOR FIELD MAINTENANCE ONLY

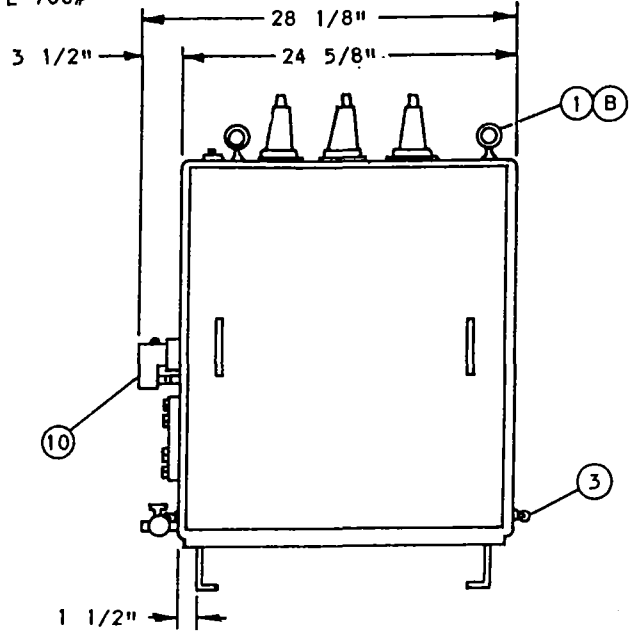
SCOPE: THIS STANDARD SHOWS SUBSURFACE/SURFACE OPERABLE 600 AMP SWITCHES.

ON-OFF OIL SWITCH

WEIGHT: W/O OIL 355#
W/ OIL 700#



FRONT VIEW

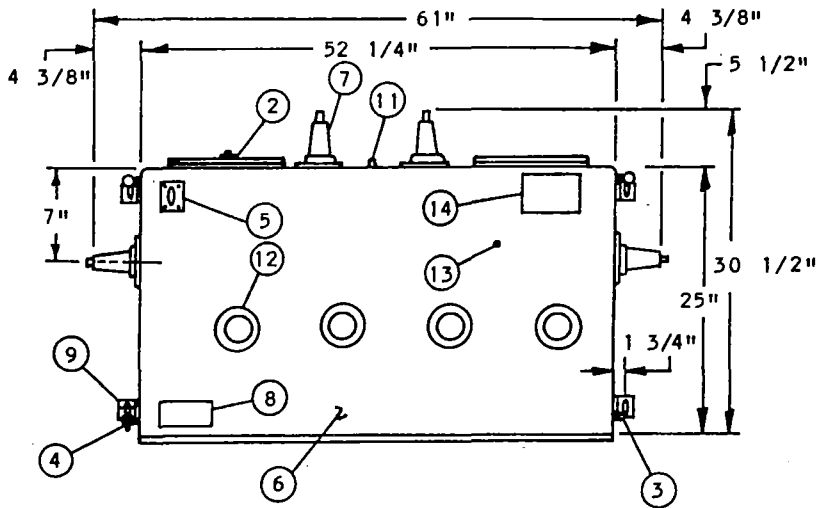


END VIEW

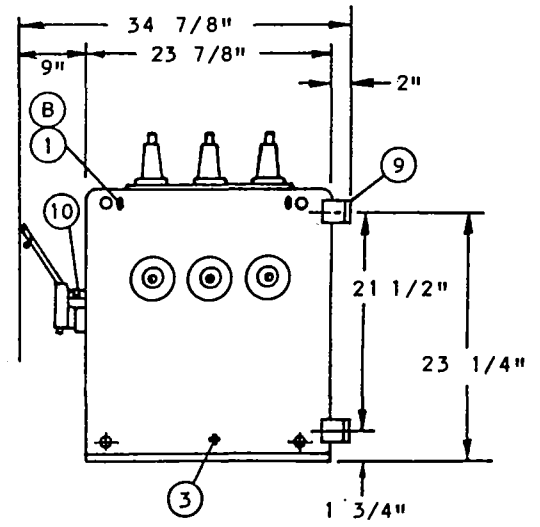
FOR FIELD MAINTENANCE ONLY

4-WAY OIL SWITCH

WEIGHT: W/O OIL 575#
W/ OIL 1400#



FRONT VIEW



END VIEW

SDG&E ELECTRIC STANDARDS

DATE 1-1-90
APPD *[Signature]*

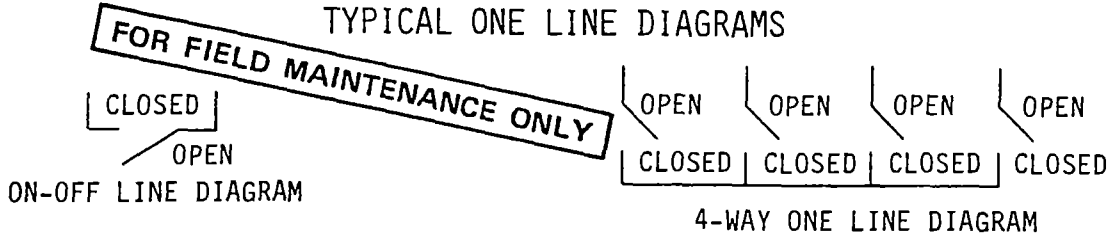
SUBSURFACE/SURFACE OPERABLE OIL SWITCH
12KV, 600 AMP, 3Ø

3699.705
SUPERCEDES
3670.1 (1-1-90)

| ELECTRICAL RATINGS | |
|---|------------|
| VOLTAGE | 15.0 KV |
| BIL | 110 KV |
| CURRENT, CONTINUOUS | 600 AMP |
| LOADMAKE AND LOADBREAK | 600 AMP |
| MOMENTARY AND FAULT CLOSE (RMS, ASYMMETRICAL) | 19,200 AMP |
| (RMS, SYMMETRICAL) | 12,000 AMP |

| | |
|-------------------------|-------------------|
| 600 AMP | UNIT STOCK NUMBER |
| ON-OFF | 708982 |
| 4-WAY (STAINLESS STEEL) | 708770 |

TYPICAL ONE LINE DIAGRAMS



SWITCH PARTS LIST

| ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|------|--------------------------|------|--|
| 1 | LIFTING EYES, REMOVABLE | 8 | NAME PLATE |
| 2 | FILL PLUG | 9 | MOUNTING ANGLES |
| 3 | GROUND LUG | 10 | OPERATOR HANDLE ASSEMBLY (WITH INTERNAL SPRINGS) |
| 4 | DRAIN VALVE | 11 | AIR CHECK VALVE |
| 5 | OIL LEVEL GAUGE | 12 | VIEWING WINDOW |
| 6 | SWITCH TANK | 13 | HANDLE HANGER (4-WAY SWITCH ONLY) |
| 7 | 600 AMP BUSHING ASSEMBLY | 14 | CONNECTION DIAGRAM (4-WAY SWITCH ONLY) |

NOTES:

- SWITCH MEASUREMENTS MAY VARY WITH DIFFERENT SUPPLIERS.
- SWITCHES ARE DELIVERED FROM THE SUPPLIERS WITH ALL THE PARTS LISTED IN THE PARTS LISTED.
- SWITCH NUMBERS ARE ISSUED BY THE ENGINEERING CLERK IN EACH DISTRICT.
- THE SWITCHES SHALL BE USED WITH POLYETHYLENE CABLES AND 600 AMP ELBOW TEES.
- FOR REPLACEMENT OF AN EXISTING 18 INCH SWITCH LEG, USE STOCK NUMBER 457162.

INSTALLATION:

- A. 4-WAY SWITCHES ARE STAINLESS STEEL AND SHALL BE BOLTED AGAINST THE WALL. USE THE 30 INCH STAINLESS STEEL SINGLE SUPPORT LEG (STOCK NUMBER 457166) FOR THE 3316 HANDHOLE INSTALLATION. FOR MANHOLE OR VAULT INSTALLATIONS, USE 4-54 INCH STAINLESS STEEL LEGS (STOCK NUMBER 457168), 8-5/8" X 3-1/2" STAINLESS STEEL BOLTS (STOCK NUMBER 156750 (E)) AND 8 GALVANIZED WASHERS (STOCK NUMBER 800256).
- (B) LIFTING EYES ARE NOT STAINLESS STEEL AND SHOULD BE REMOVED AFTER THE SWITCH IS INSTALLED.
- C. USE THE CORBIN #27 LOCK (STOCK NUMBER 514848 (E)) TO LOCK SWITCH POSITIONS.
- D. OIL SWITCHES MUST BE LEVEL. THE LEVELING REQUIREMENT IS A TOLERANCE OF 1/2 INCH FROM THE FRONT TO THE BACK OR 1/2 INCH END TO END.
- (E) EXEMPT MATERIAL.
- (F) DEVIATION REQUEST REQUIRED FOR INSTALLATION OF ON-OFF SWITCH OR 4-WAY SWITCH. (SEE STANDARD 3005 FOR DEVIATION REQUEST FORM AND PROCEDURE).

REFERENCE:

- G. SEE STANDARD 3212 FOR SWITCH IDENTIFICATION.
- H. SEE STANDARD 3649 FOR EQUIPMENT COMBINATION GUIDELINES FOR SWITCHES IN MANHOLES.
- I. SEE STANDARD 3671 FOR SWITCH INSTALLATION IN A 3316 HANDHOLE.
- J. SEE STANDARD 4181.3 FOR SUBSURFACE/SURFACE OPERABLE SWITCH CONNECTIONS.

SDG&E ELECTRIC STANDARDS

3699.706
SUPERCEDES
3670.2 (1-1-90)

SUBSURFACE/SURFACE OPERABLE OIL SWITCH
12KV, 600 AMP, 3Ø

DATE 1-1-90
APPD *JLB/ROF*

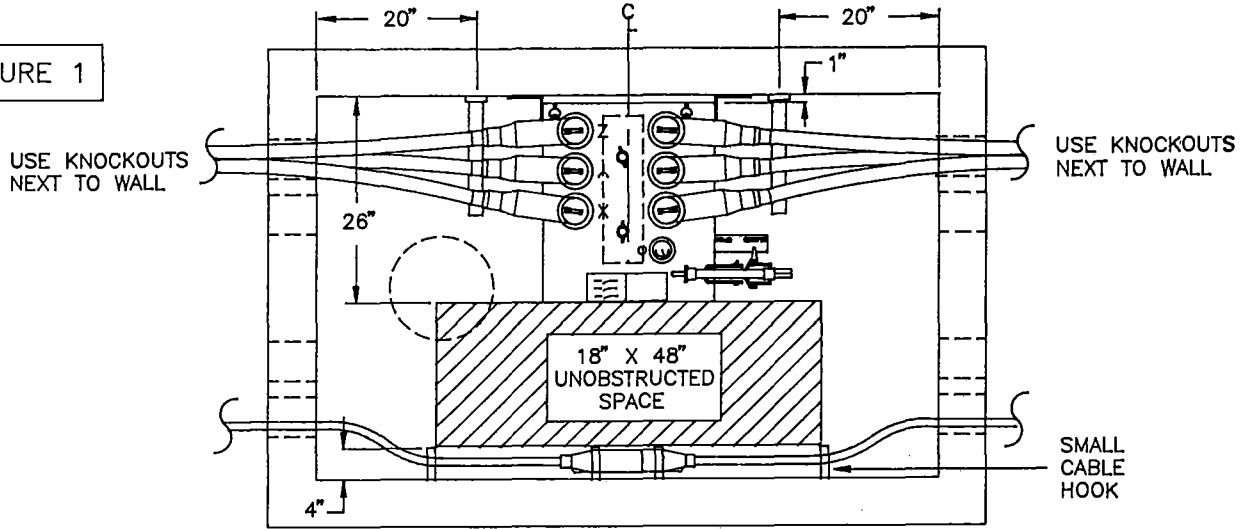
SCOPE: THIS STANDARD SHOWS THE MATERIAL AN INSTALLATION REQUIREMENTS FOR INSTALLING A ON-OFF SUBSURFACE/SURFACE OPERABLE SWITCH IN A 3315 HANDHOLE.

ON-OFF SWITCH IN A 3315 HANDHOLE INSTALLATION

TOP VIEW

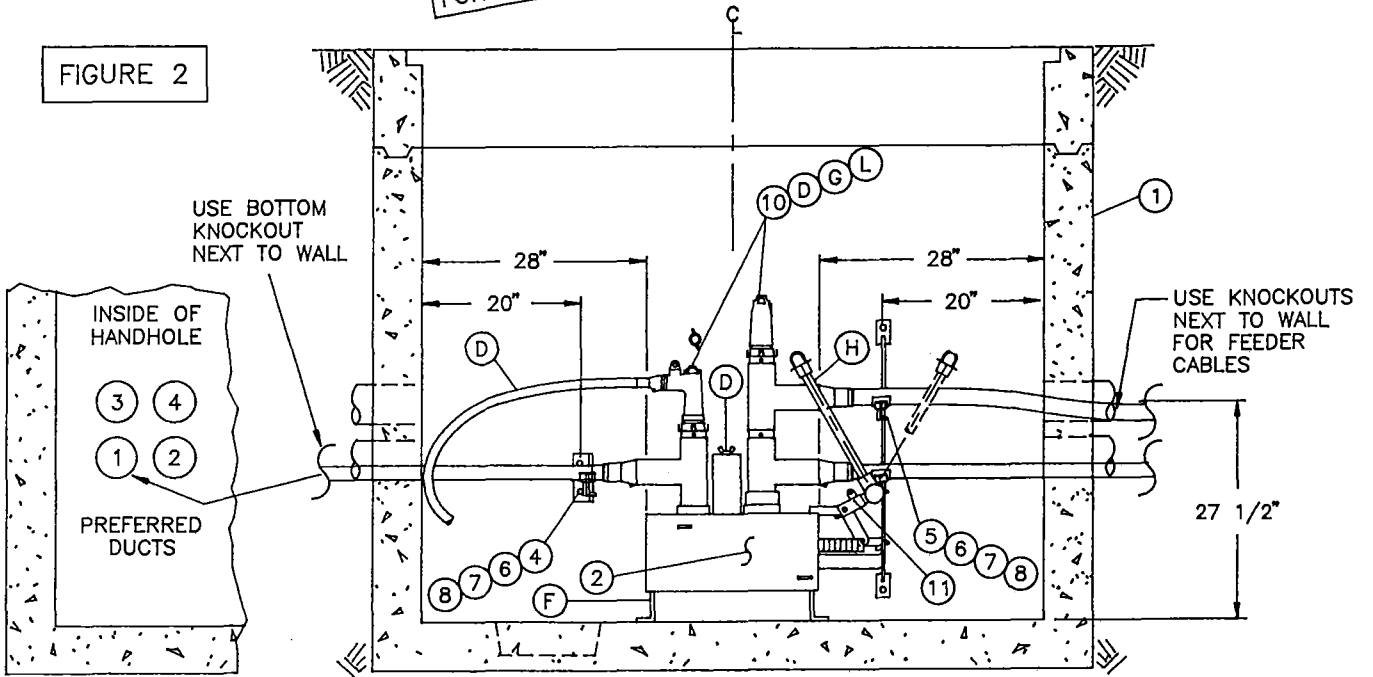
(B) STREET SIDE

FIGURE 1



FOR FIELD MAINTENANCE ONLY

FIGURE 2



SDG&E ELECTRIC STANDARDS

DATE 1-1-94

APPD *JLB/RS*

SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH
12KV, 600 AMP, 3 PHASE

3699.707
SUPERCEDES
3671.1 (1-1-94)

NOTES:

- "PIGGYBACK" TEES SHOWN IN THIS STANDARD SHALL ONLY BE USED TO FEED A SWITCHED TIE POSITION.
- OTHER CONFIGURATIONS MAY BE DESIGNED PROVIDED EQUIPMENT LIMITATIONS AND THE PROPER UNOBSTRUCTED SPACE ARE PROVIDED TO ALLOW PERSONNEL TO PERFORM THEIR WORK SAFELY AND ALLOW ACCESS TO THE CONDUITS.

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD. OR PAGE NO. | STOCK NUMBER |
|------|---|----------|---------------------------|-----------------|
| 1 | HANDHOLE (PARKWAY OR TRAFFIC) (A) | AS REQ'D | 3315 | - |
| 2 | 12KV SUBSURFACE/SURFACE OPERABLE SWITCH, 600A, ON-OFF | 1 | 3670 | 708982 |
| 3 | PROTECTOR, CABLE U.G. | AS REQ'D | - | 558720 |
| 4 | ADAPTER, CABLE ARM | AS REQ'D | 4178 | 102016 |
| 5 | HANGER, CABLE ARM, 34"/36" | AS REQ'D | 4178 | 564480 |
| 6 | CABLE ARM, 15" (3 WAY) | AS REQ'D | 4178 | 110528 |
| 7 | CABLE INSULATOR | AS REQ'D | 4178 | 430592 |
| 8 | TIE STRAP | AS REQ'D | 4178 | 738440 |
| 9 | ANCHOR, CONCRETE STAINLESS STEEL, 1/2" X 3-3/4" | AS REQ'D | 4178 | 107654 |
| 10 | 12KV, 200A (LOADBREAK) & 600A CONNECTORS (D) | AS REQ'D | 4181 | - |
| 11 | PADLOCK, (SCHLAGE ELECT SERIES) | 1 | - | 514848 |
| 12 | AUTOMATIC FAULT INDICATOR (O) | AS REQ'D | 4352 | - |

FOR FIELD MAINTENANCE ONLY

INSTALLATION:

- (A) A STANDARD 3315 HANDHOLE IS REQUIRED FOR THE ON-OFF SWITCH. THE NUMBER OF CABLES AND CONNECTORS REQUIRED WILL DETERMINE WHICH HANDHOLE TO USE.
- (B) THE SWITCH BOLTED TO THE STREET SIDE WALL IS PREFERRED. THIS ALLOWS CABLE TAPS TO BE OPERATED FROM THE STREET OR SIDEWALK SIDE.
- C. INSTALL CABLE AND CABLE SUPPORTS, ETC. IN THE HANDHOLE AND ON THE SWITCH AS SHOWN IN THE INSTALLATION DRAWINGS.
- (D) ON THE 200 AMP CABLE, LOOP THE HOLE LEAVING ENOUGH SLACK TO REACH BOTH SETS OF 600 AMP TEES. A STAND OFF BAR, STOCK NUMBER 677240 WILL BE REQUIRED TO ATTACH TO THE STAND OFF BRACKET WHEN TEMPORARLY LANDING LOADBREAK ELBOWS. ALL 200 AMP CONNECTORS ON THE SWITCH SHALL BE LOADBREAK.
- (E) LEVELING OF THE SF-6 GAS SWITCH IS NOT REQUIRED. DO NOT INSTALL SWITCH ANY HIGHER OFF THE FLOOR THAN SHOWN IN THE INSTALLATION DRAWING DUE TO CABLE ARRANGEMENT.
- (G) DO NOT INSTALL LOADBREAK ELBOWS ON PIGGYBACK TEES FOR A PERMANENT INSTALLATION.
- (H) THE REMOVABLE OPERATING HANDLE IS TO REMAIN PERMANENTLY ATTACHED TO THE SWITCH..

REFERENCE:

- I. SEE STANDARD 3200 FOR SWITCH IDENTIFICATION NUMBERS AND CABLE ID TAGS.
- J. SEE STANDARD 3670 FOR SUBSURFACE SWITCH.
- K. SEE PAGE 3374.3 FOR CONDUIT INSTALLATION PRACTICES.
- (L) SEE STANDARD 4181 FOR 12KV 200 AND 600 AMP CONNECTOR ASSEMBLIES.
- M. SEE STANDARD 4530 FOR NEUTRAL AND GROUND WIRE DIAGRAM.
- N. SEE DESIGN STANDARD 6111 FOR SWITCH APPLICATION.
- (O) SEE DESIGN STANDARD 6113 FOR AUTOMATIC FAULT INDICATOR APPLICATION.

SDG&E ELECTRIC STANDARDS

3699.708
SUPERCEDES
3671.3 (1-1-94)

SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH
12KV, 600 AMP, 3 PHASE

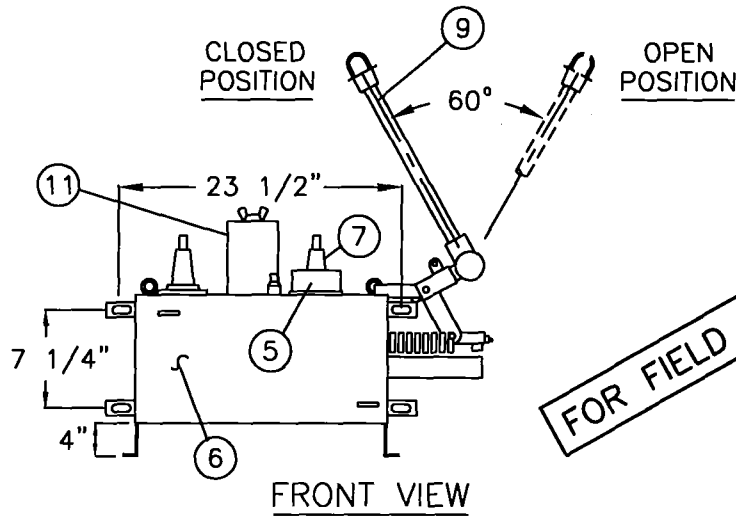
DATE 1-1-94

APPD JLB/RFJ

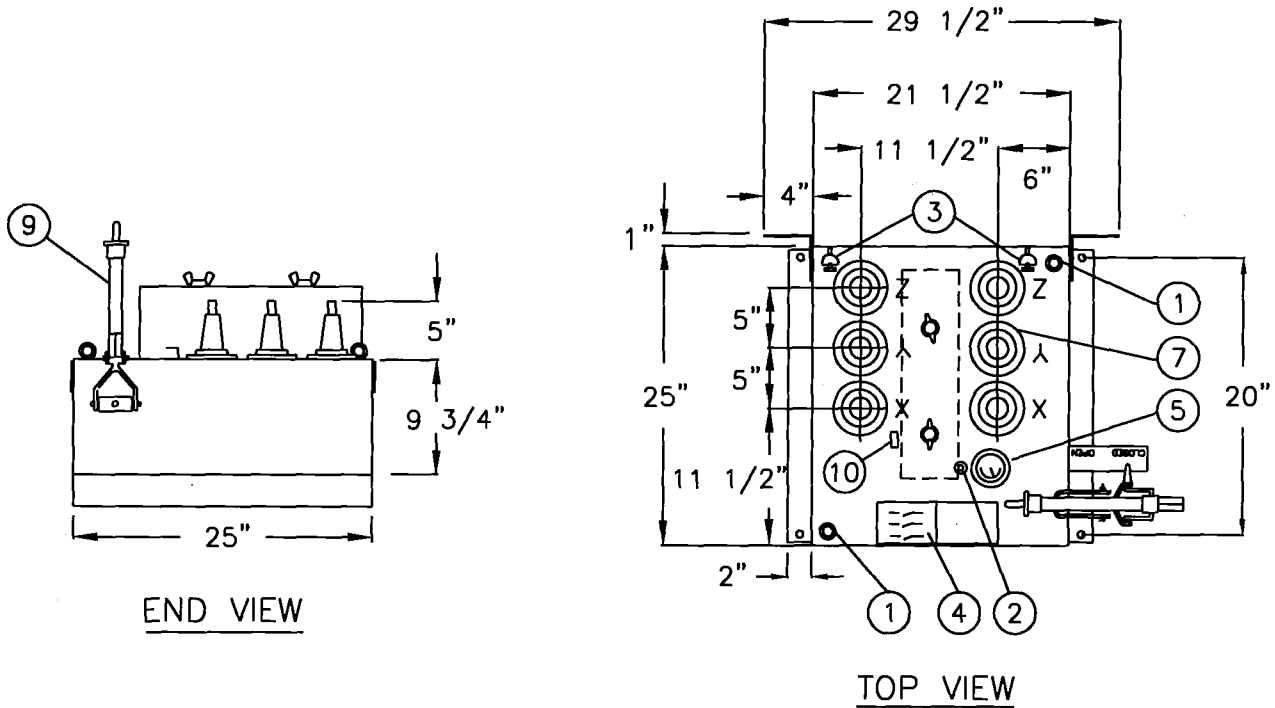
SCOPE: THIS STANDARD SHOWS A SUBSURFACE/SURFACE OPERABLE 600 AMP SF-6 GAS SWITCH.

ON-OFF SWITCH

WEIGHT: 140#



DEVIATION REQUEST IS NOT REQUIRED
FOR NEW INSTALLATION OF ON-OFF SWITCH



3699.709
SUPERSEDES
3670.1 (1-1-98)

SDG&E ELECTRIC STANDARDS

SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH
12KV, 600 AMP, THREE-PHASE

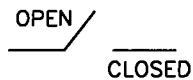
DATE 1-1-91

APPD *JLB/ROJ*

| ELECTRICAL RATINGS | |
|---|--------------------------|
| VOLTAGE | 15.5 KV |
| BIL | 95 KV |
| CURRENT, CONTINUOUS | 600 AMP |
| LOADMAKE AND LOADBREAK | 600 AMP |
| MOMENTARY AND FAULT CLOSE (RMS, ASYMMETRICAL) (RMS, SYMMETRICAL) | 32,000 AMP 20,000 AMP |

| | | |
|--------------------------|-------------------|---------------|
| 600 AMP | UNIT STOCK NUMBER | ASSEMBLY UNIT |
| ON-OFF (STAINLESS STEEL) | 708982 (A)(B) | SW-0/0 |

TYPICAL ONE LINE DIAGRAM



ON-OFF ONE LINE DIAGRAM

SWITCH PARTS LIST

| ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|------|-----------------------------------|------|----------------------------|
| 1 | LIFTING EYES | 6 | SWITCH TANK |
| 2 | SF-6 FILL VALVE | 7 | 600 AMP BUSHING ASSEMBLY |
| 3 | GROUND LUG | 8 | MOUNTING ANGLES |
| 4 | NAME PLATE AND CONNECTION DIAGRAM | 9 | REMOVABLE OPERATING HANDLE |
| 5 | COLOR CODED PRESSURE GAUGE | 10 | HANDLE HANGER |
| | | 11 | STAND OFF BRACKET |

NOTES:

- SWITCH MEASUREMENTS MAY VARY WITH DIFFERENT SUPPLIERS.
- SWITCHES ARE DELIVERED FROM THE SUPPLIERS WITH ALL THE PARTS LISTED IN THE PARTS LISTED.
- SWITCH NUMBERS ARE ISSUED BY THE ENGINEERING CLERK IN EACH DISTRICT.
- THE SWITCHES SHALL BE USED WITH POLYETHYLENE CABLES AND 600 AMP ELBOW TEES.

INSTALLATION:

- (A) DEVIATION REQUEST IS **NOT REQUIRED** FOR INSTALLATION OF ON-OFF SWITCH.
- (B) ON-OFF SWITCHES ARE STAINLESS STEEL AND SHALL BE BOLTED TO THE WALL.

REFERENCE:

- G. SEE STANDARD 3213 FOR SWITCH IDENTIFICATION.
- H. SEE STANDARD 3649 FOR EQUIPMENT COMBINATION GUIDELINES FOR SWITCHES IN MANHOLES.
- I. SEE STANDARD 3671 FOR SWITCH INSTALLATION IN A 3316 HANDHOLE.
- J. SEE STANDARD 4181 FOR SUBSURFACE/SURFACE OPERABLE SWITCH CONNECTIONS.
- K. SEE DESIGN STANDARD 6111 FOR SWITCH APPLICATION.

| | | |
|--|---|---|
| DATE 1-1-96 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS | 3699.710 SUPERSEDES 3670.2 (1-1-98) |
| | SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH 12KV, 600 AMP, THREE-PHASE | |

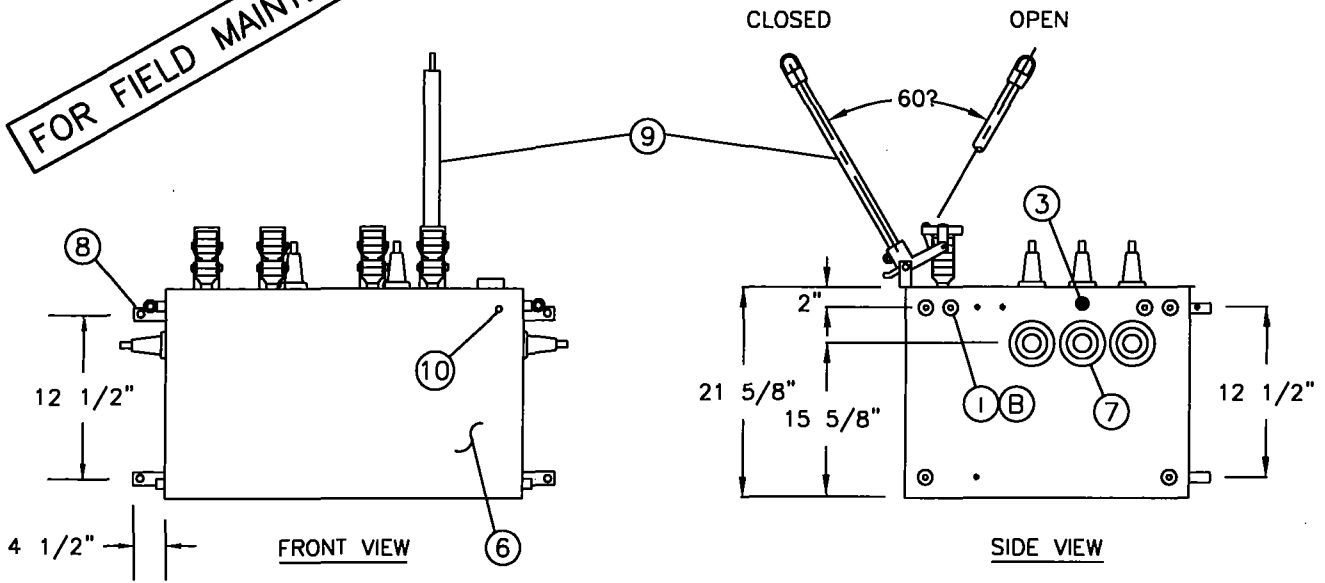
FOR FIELD MAINTENANCE ONLY

SCOPE: THIS STANDARD SHOWS A SUBSURFACE/SURFACE OPERABLE 600 AMP SF-6 GAS SWITCH.

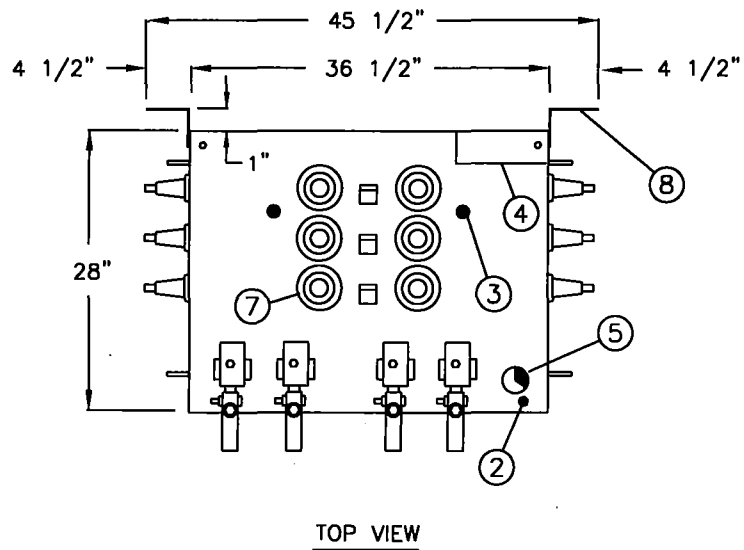
FOR FIELD MAINTENANCE ONLY

4-WAY SWITCH

WEIGHT: 350#



DEVIATION REQUEST IS REQUIRED FOR NEW INSTALLATION OF 4-WAY SWITCH

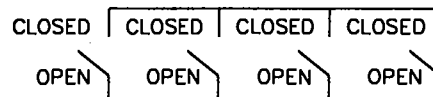


| | | |
|---|---|--|
| 3699.711 SUPERSEDES 3670.3 (1-1-98) | SDG&E ELECTRIC STANDARDS SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH 12KV, 600 AMP, THREE-PHASE | DATE 1-1-98 APPD <i>[Signature]</i> / CMK |
|---|---|--|

| ELECTRICAL RATINGS | |
|---|--------------------------|
| VOLTAGE | 15.5 KV |
| BIL | 95 KV |
| CURRENT, CONTINUOUS | 600 AMP |
| LOADMAKE AND LOADBREAK | 600 AMP |
| MOMENTARY AND FAULT CLOSE (RMS, ASYMMETRICAL) (RMS, SYMMETRICAL) | 32,000 AMP 20,000 AMP |

| | | |
|----------------------------|-------------------|---------------|
| 600 AMP | UNIT STOCK NUMBER | ASSEMBLY UNIT |
| 4-WAY (STAINLESS STEEL) | 708770 © | SW-4WY |

TYPICAL ONE LINE DIAGRAM



4-WAY ONE LINE DIAGRAM

SWITCH PARTS LIST

| ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|------|-----------------------------------|------|----------------------------|
| 1 | LIFTING EYES, REMOVABLE | 6 | SWITCH TANK |
| 2 | SF-6 FILL VALVE | 7 | 600 AMP BUSHING ASSEMBLY |
| 3 | GROUND LUG | 8 | MOUNTING ANGLES |
| 4 | NAME PLATE AND CONNECTION DIAGRAM | 9 | REMOVABLE OPERATING HANDLE |
| 5 | COLOR CODED PRESSURE GAUGE | 10 | HANDLE HANGER |

FOR FIELD MAINTENANCE ONLY

NOTES:

- SWITCH MEASUREMENTS MAY VARY WITH DIFFERENT SUPPLIERS.
- SWITCHES ARE DELIVERED FROM THE SUPPLIERS WITH ALL THE PARTS LISTED IN THE PARTS LISTED.
- SWITCH NUMBERS ARE ISSUED BY THE ENGINEERING CLERK IN EACH DISTRICT.
- THE SWITCHES SHALL BE USED WITH POLYETHYLENE CABLES AND 600 AMP ELBOW TEES.
- FOR REPLACEMENT OF AN EXISTING 18 INCH SWITCH LEG, USE STOCK NUMBER 457162.

INSTALLATION:

- A. 4-WAY SWITCHES ARE STAINLESS STEEL AND SHALL BE BOLTED AGAINST THE WALL. USE THE 30 INCH STAINLESS STEEL SINGLE SUPPORT LEG (STOCK NUMBER 457166) FOR THE 3316 HANDHOLE INSTALLATION. FOR MANHOLE OR VAULT INSTALLATIONS, USE 4-54 INCH STAINLESS STEEL LEGS (STOCK NUMBER 457168), AND 8-5/8" X 3-1/2" STAINLESS STEEL BOLTS (STOCK NUMBER 156750).
- ⓑ LIFTING EYES ARE NOT STAINLESS STEEL AND SHOULD BE REMOVED AFTER THE SWITCH IS INSTALLED.
- ⓒ A DEVIATION REQUEST IS REQUIRED FOR THE NEW INSTALLATION OF A 4-WAY SWITCH. RETROFITS OF EXISTING SWITCHES DO NOT REQUIRE A DEVIATIONS REQUEST (SEE STANDARD 3005 FOR DEVIATION REQUEST FORM AND PROCEDURE).

REFERENCE:

- G. SEE STANDARD 3213 FOR SWITCH IDENTIFICATION.
- H. SEE STANDARD 3649 FOR EQUIPMENT COMBINATION GUIDELINES FOR SWITCHES IN MANHOLES.
- I. SEE STANDARD 3671 FOR SWITCH INSTALLATION IN A 3316 HANDHOLE.
- J. SEE STANDARD 4181.3 FOR SUBSURFACE/SURFACE OPERABLE SWITCH CONNECTIONS.
- K. SEE DESIGN STANDARD 6111 FOR SWITCH APPLICATION.

| | | |
|---|---|---|
| DATE 1-1-98 APPD <i>[Signature]</i> / <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS | 3699.712 SUPERSEDES 3670.4 (1-1-98) |
| | SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH 12KV, 600 AMP, THREE-PHASE | |

SCOPE: THIS STANDARD SHOWS THE MATERIAL AND INSTALLATION REQUIREMENTS FOR INSTALLING A ON-OFF SUBSURFACE/SURFACE OPERABLE SWITCH IN A 3316 HANDHOLE.

ON-OFF SWITCH IN A 3316 HANDHOLE INSTALLATION

TOP VIEW
(B) STREET SIDE

FIGURE 3

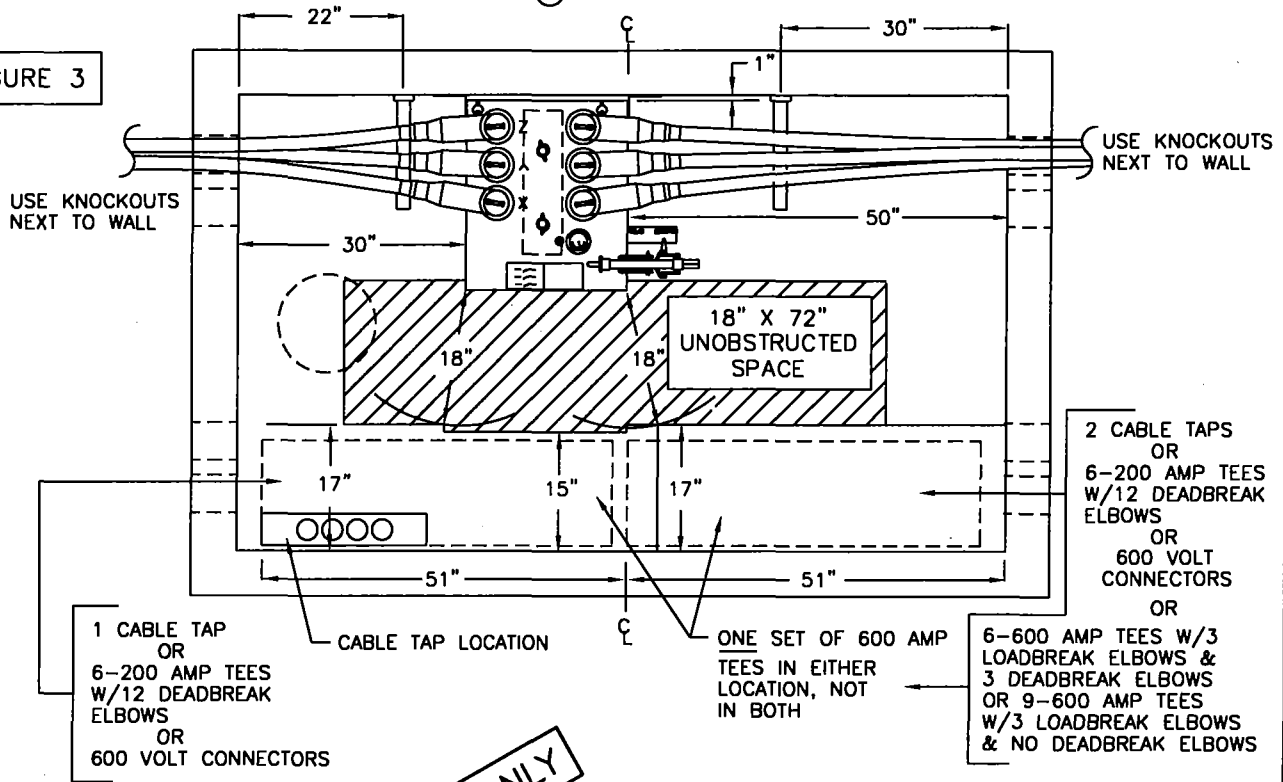
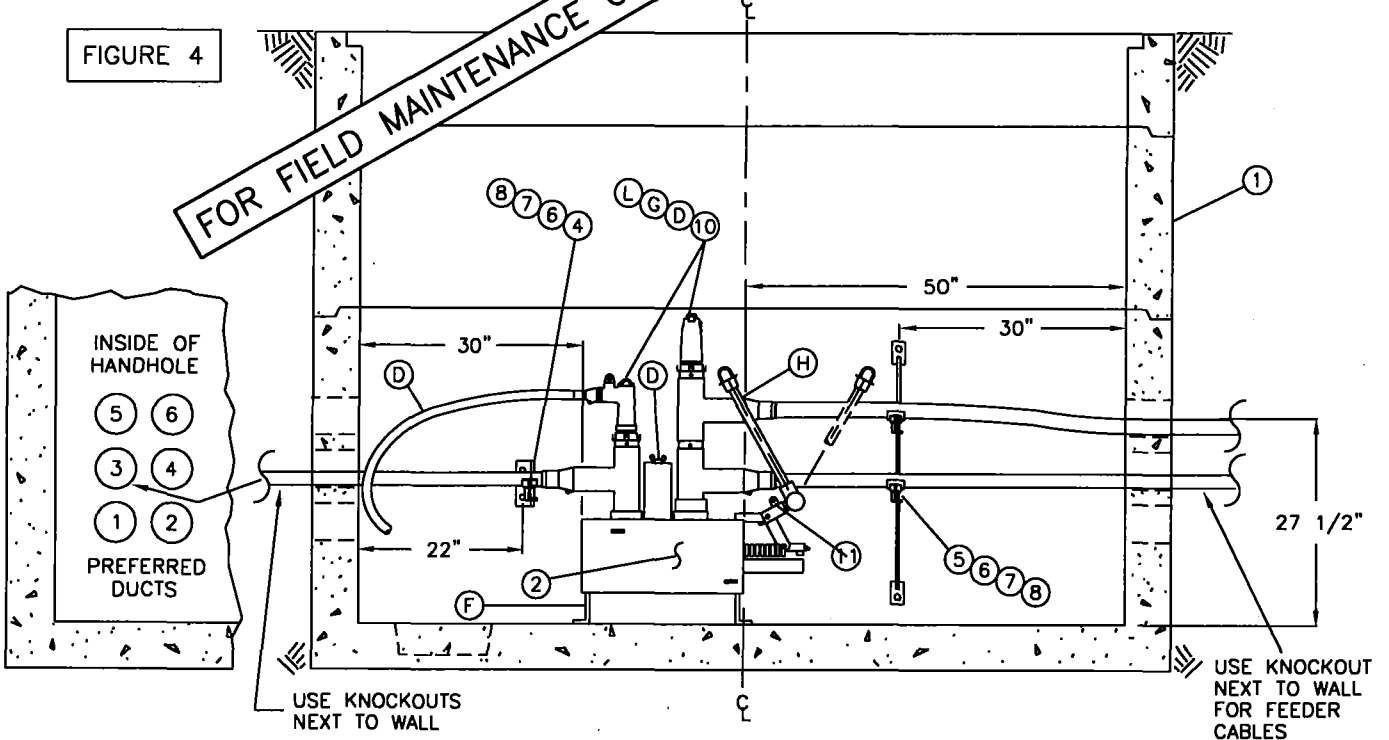


FIGURE 4

FOR FIELD MAINTENANCE ONLY



3699.713
SUPERSEDES
3671.1 (1-1-98)

SDG&E ELECTRIC STANDARDS
SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH
12KV, 600 AMP, THREE-PHASE

DATE 1-1-94
APPD *JLB/ROJ*

NOTES:

- "PIGGYBACK" TEES SHOWN IN THIS STANDARD SHALL ONLY BE USED TO FEED A SWITCHED TIE POSITION.
- OTHER CONFIGURATIONS MAY BE DESIGNED PROVIDED EQUIPMENT LIMITATIONS AND THE PROPER UNOBSTRUCTED SPACE ARE PROVIDED TO ALLOW PERSONNEL TO PERFORM THEIR WORK SAFELY AND ALLOW ACCESS TO THE CONDUITS.

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD. OR PAGE NO. | STOCK NUMBER |
|------|---|----------|------------------------|--------------|
| 1 | HANDHOLE (PARKWAY OR TRAFFIC) (A) | AS REQ'D | 3316 | - |
| 2 | 12KV SUBSURFACE/SURFACE OPERABLE SWITCH, 600A, ON-OFF | 1 | 3670 | 708982 |
| 3 | PROTECTOR, CABLE U.G. | AS REQ'D | - | 558720 |
| 4 | ADAPTER, CABLE ARM | AS REQ'D | 4178 | 102016 |
| 5 | HANGER, CABLE ARM, 34"/36" | AS REQ'D | 4178 | 564480 |
| 6 | CABLE ARM, 15" (3 WAY) | AS REQ'D | 4178 | 110528 |
| 7 | CABLE INSULATOR | AS REQ'D | 4178 | 430592 |
| 8 | TIE STRAP | AS REQ'D | 4178 | 738440 |
| 9 | ANCHOR, CONCRETE STAINLESS STEEL, 1/2" X 3-3/4" | AS REQ'D | 4178 | 107654 |
| 10 | 12KV, 200A (LOADBREAK) & 600A CONNECTORS (D) | AS REQ'D | 4181 | - |
| 11 | PADLOCK, SCHLAGE ELECT SERIES | 1 | - | 514848 |
| 12 | AUTOMATIC FAULT INDICATOR (O) | AS REQ'D | 4352 | - |

FOR FIELD MAINTENANCE ONLY

INSTALLATION:

- (A) A STANDARD 3316 HANDHOLE IS REQUIRED FOR THE ON-OFF SWITCH. THE NUMBER OF CABLES AND CONNECTORS REQUIRED WILL DETERMINE WHICH HANDHOLE TO USE.
- (B) THE SWITCH BOLTED TO THE STREET SIDE WALL IS PREFERRED. THIS ALLOWS CABLE TAPS TO BE OPERATED FROM THE STREET OR SIDEWALK SIDE.
- C. INSTALL CABLE AND CABLE SUPPORTS, ETC. IN THE HANDHOLE AND ON THE SWITCH AS SHOWN IN THE INSTALLATION DRAWINGS.
- (D) ON THE 200 AMP CABLE, LOOP THE HOLE LEAVING ENOUGH SLACK TO REACH BOTH SETS OF 600 AMP TEES. A STAND OFF BAR, STOCK NUMBER 677240 WILL BE REQUIRED TO ATTACH TO THE STAND OFF BRACKET WHEN TEMPORARLY LANDING LOADBREAK ELBOWS. ALL 200 AMP CONNECTORS ON THE SWITCH SHALL BE LOADBREAK.
- (F) LEVELING OF THE SF-6 GAS SWITCH IS NOT REQUIRED. DO NOT INSTALL SWITCH ANY HIGHER OFF THE FLOOR THAN SHOWN IN THE INSTALLATION DRAWING DUE TO CABLE ARRANGEMENT.
- (G) DO NOT INSTALL LOADBREAK ELBOWS ON PIGGYBACK TEES FOR A PERMANENT INSTALLATION.
- (H) THE REMOVABLE OPERATING HANDLE IS TO REMAIN PERMANENTLY ATTACHED TO THE SWITCH.

REFERENCE:

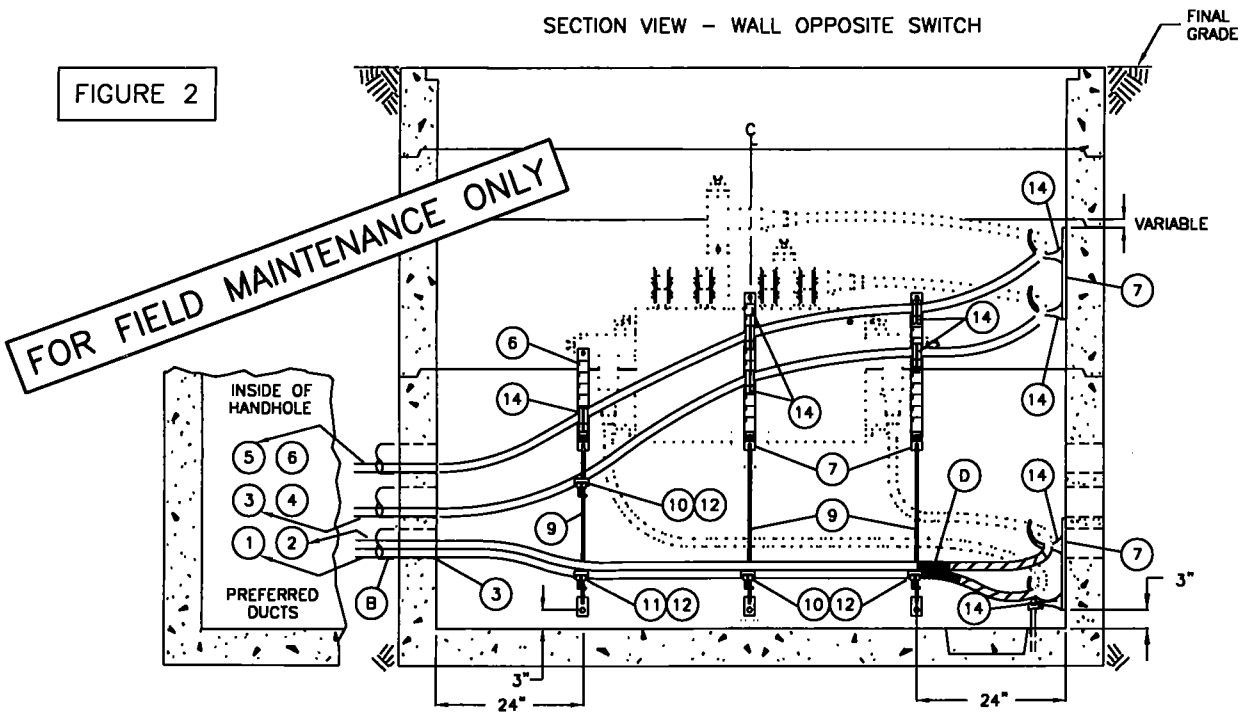
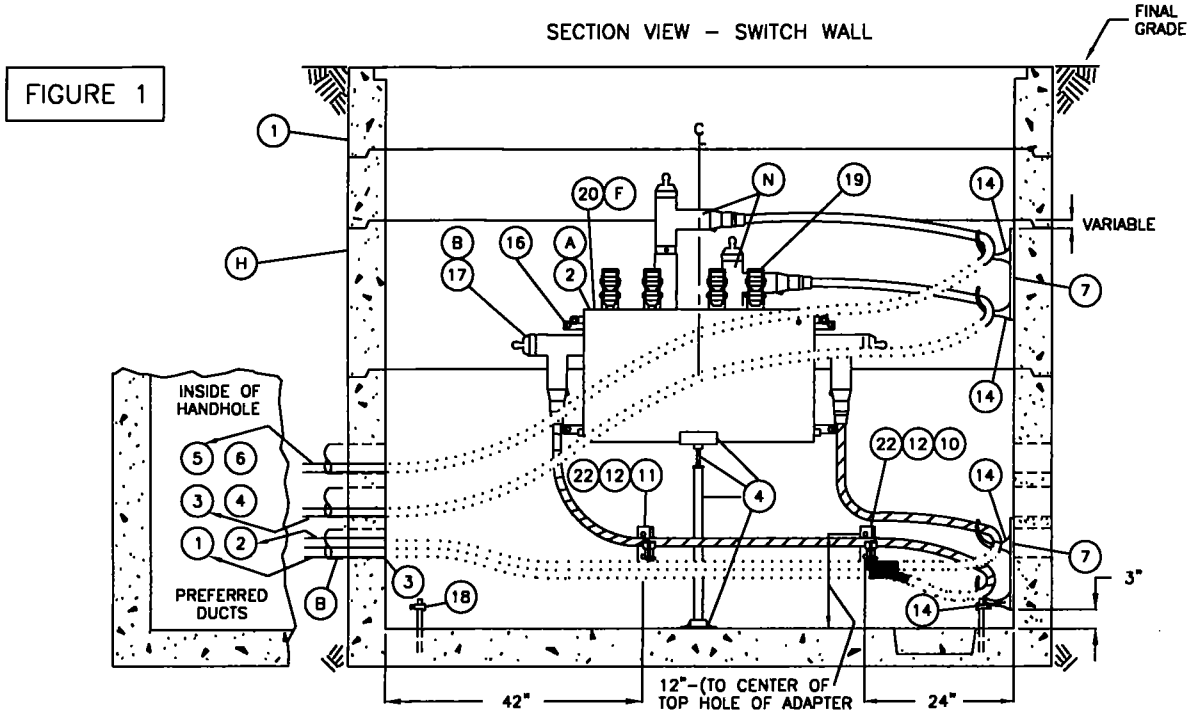
- I. SEE STANDARD 3200 FOR SWITCH IDENTIFICATION NUMBERS AND CABLE ID TAGS.
- J. SEE STANDARD 3670 FOR SUBSURFACE SWITCH.
- K. SEE PAGE 3374.3 FOR CONDUIT INSTALLATION PRACTICES.
- (L) SEE STANDARD 4181 FOR 12KV 200 AND 600 AMP CONNECTOR ASSEMBLIES.
- M. SEE STANDARD 4530 FOR NEUTRAL AND GROUND WIRE DIAGRAM.
- N. SEE DESIGN STANDARD 6111 FOR SWITCH APPLICATION.
- (O) SEE DESIGN STANDARD 6113 FOR AUTOMATIC FAULT INDICATOR APPLICATION.

| | | |
|------------------------------------|---|---|
| DATE 1-1-94 APPD <i>JLB/ROJ</i> | SDG&E ELECTRIC STANDARDS | 3699.714 SUPERSEDES 3671.2 (1-1-98) |
| | SUBSURFACE/SURFACE OPERABLE SF-6 GAS SWITCH 12KV, 600 AMP, THREE-PHASE | |

SCOPE: THIS STANDARD SHOWS THE MATERIAL AND INSTALLATION REQUIREMENTS FOR INSTALLING A 4-WAY SUBSURFACE/SURFACE OPERABLE SWITCH IN A 3316 HANDHOLE.

DEVIATION REQUEST IS REQUIRED FOR NEW INSTALLATION OF 4-WAY SWITCH
TYPICAL INSTALLATION DRAWINGS

IN A 3316 HANDHOLE
 ALL FOUR FEEDERS FROM ONE DIRECTION (FIGURES 1, 2 & 3)



3699.715
 SUPERSEDES
 3671.3 (1-1-98)

SDG&E ELECTRIC STANDARDS

INSTALLATION OF SUBSURFACE/SURFACE OPERABLE SWITCH
 IN A 3316 HANDHOLE

DATE 1-1-94

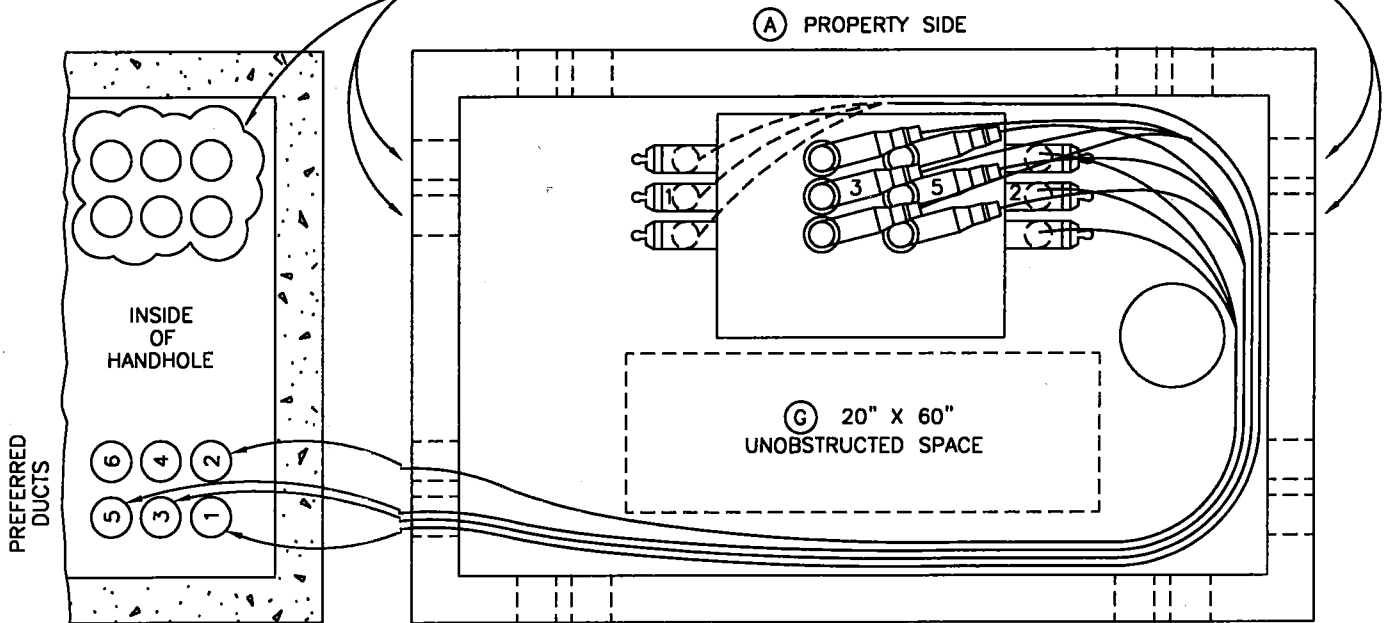
APPD *JLB/ROJ*

FIGURE 3

TOP VIEW

DO NOT USE THESE KNOCKOUTS

DO NOT USE THESE KNOCKOUTS

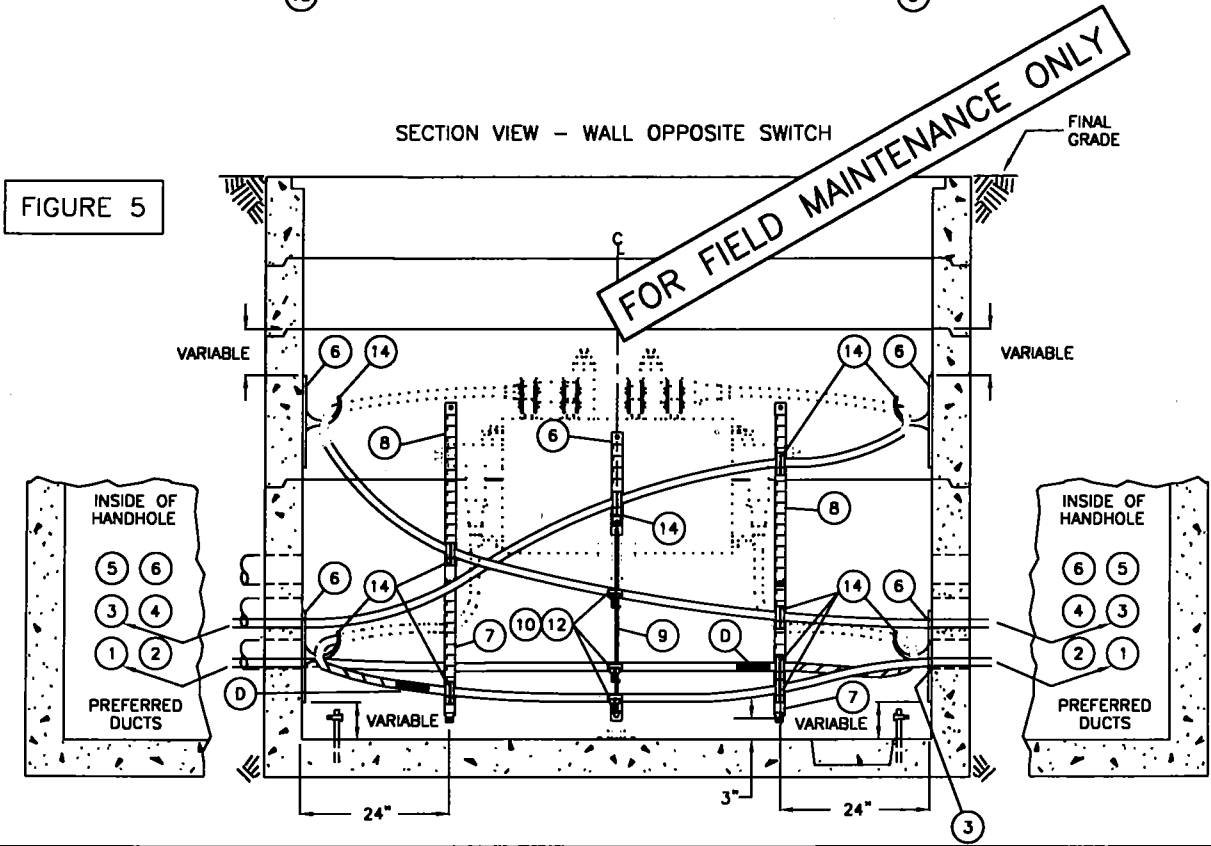
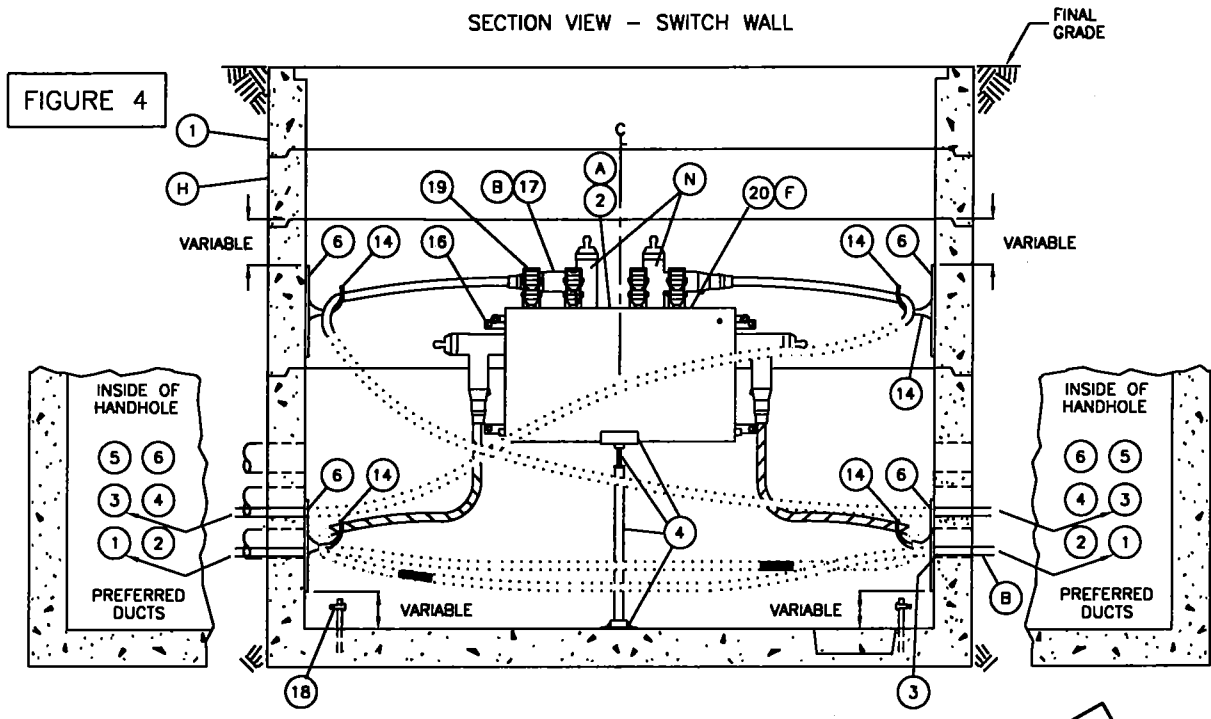


FOR FIELD MAINTENANCE ONLY

| | | |
|-------------------------------------|--|---|
| DATE 7-31-84 APPD <i>JLB/ROJ</i> | SDG&E ELECTRIC STANDARDS INSTALLATION OF SUBSURFACE/SURFACE OPERABLE SWITCH IN A 3316 HANDHOLE | 3699.716 SUPERSEDES 3671.4 (1-1-98) |
|-------------------------------------|--|---|

TYPICAL INSTALLATION DRAWINGS

SUBSURFACE/SURFACE OPERABLE SWITCH IN A 3316 HANDHOLE FOUR FEEDERS TWO FROM TWO DIRECTIONS (FIGURES 4, 5, & 6)

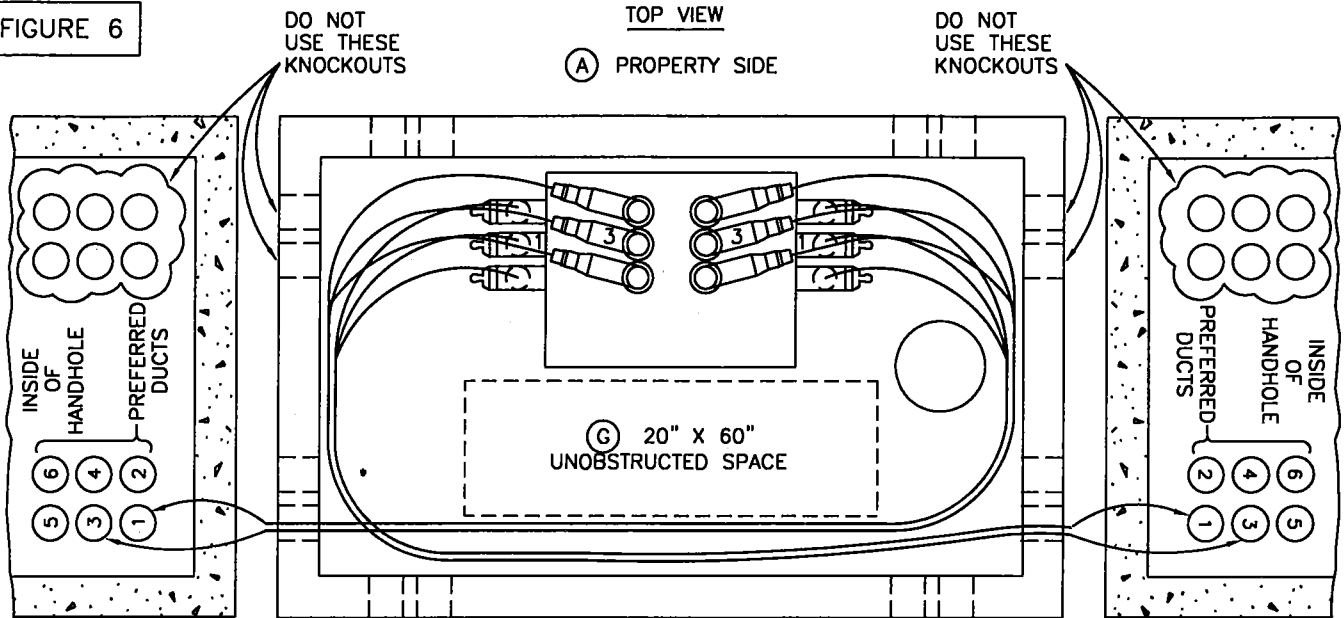


3699.717
 SUPERSEDES
 3671.5 (1-1-98)

SDG&E ELECTRIC STANDARDS
 INSTALLATION OF SUBSURFACE/SURFACE OPERABLE SWITCH
 IN A 3316 HANDHOLE

DATE 1-1-90
 APPD *JLB/BJ*

FIGURE 6



NOTES:

- OTHER CONFIGURATIONS MAY BE DESIGNED PROVIDED EQUIPMENT LIMITATIONS AND THE PROPER UNOBSTRUCTED SPACE ARE PROVIDED TO ALLOW PERSONNEL TO PERFORM THEIR WORK SAFELY AND ALLOW ACCESS TO THE CONDUITS.
- FOR REPLACEMENT OF AN EXISTING 18 INCH SWITCH LEG, USE (STOCK NUMBER 457162).

BILL OF MATERIAL: (FOR FIGURES 1 THROUGH 6)

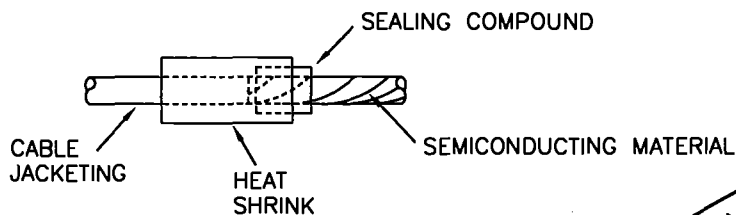
| ITEM | DESCRIPTION | QUANTITY | CONST STD. OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNIT |
|------|--|----------|------------------------|--------------|---------------|
| 1 | HANDHOLE, 5' X 8'-6" (PARKWAY OR TRAFFIC COVER) | 1 (H) | 3316 (H) | - | - |
| 2 | 12KV SUBSURFACE/SURFACE OPERABLE SWITCH, 600A, 4-WAY | 1 | 3670 | 708770 | SW-4WY |
| 3 | PROTECTOR, CABLE U.G. | 1 | - | 558720 | - |
| 4 | SWITCH LEG, 1-1/2", 30" | 1 | - | 457166 | - |
| | SWITCH LEG HARDWARE | AS REQ'D | - | | |
| 5 | AUTOMATIC FAULT INDICATOR | AS REQ'D | 4352 | - | - |
| 6 | HANGER, 15" | AS REQ'D | 4178 | 564512 | - |
| 7 | HANGER, 24" | AS REQ'D | 4178 | 564544 | - |
| 8 | HANGER, 30" | AS REQ'D | 4178 | 564576 | - |
| 9 | HANGER, CABLE ARM, 34"/36" | AS REQ'D | 4178 | 564480 | - |
| 10 | CABLE ARM, 10" (2 WAY) | AS REQ'D | 4178 | 110496 | - |
| 11 | CABLE ARM, 15" (3 WAY) | AS REQ'D | 4178 | 110528 | - |
| 12 | CABLE INSULATOR | AS REQ'D | 4178 | 430592 | - |
| 14 | CABLE HOOKS, 6" | AS REQ'D | 4178 | 415112 | - |
| 15 | TIE STRAP | AS REQ'D | 4178 | 738440 | - |
| 16 | ANCHOR, CONCRETE STAINLESS STEEL, 1/2" X 3-3/4" | AS REQ'D | 4178 | 107654 | - |
| 17 | 12KV, 200A AND 600A CONNECTORS | AS REQ'D | 4181 | - | - |
| 18 | CLAMPS, GROUND ROD | AS REQ'D | - | 230016 | - |
| 19 | PADLOCK, SCHLAGE ELECT SERIES | AS REQ'D | - | 514848 | - |
| 20 | DECALS | AS REQ'D | 3212 | - | - |
| 21 | INHIBITOR (NOT SHOWN) | AS REQ'D | - | 247200 | - |
| 22 | ADAPTER FOR CABLE ARMS | AS REQ'D | 4178 | 102016 | - |
| 23 | CONNECTOR, COMPRESSION | AS REQ'D | 4172 | - | - |

FOR FIELD MAINTENANCE ONLY

| | | |
|--------------------|---|----------------------------|
| DATE 1-1-94 | SDG&E ELECTRIC STANDARDS | 3699.718 |
| APPD <i>JLB/BJ</i> | INSTALLATION OF SUBSURFACE/SURFACE OPERABLE SWITCH IN A 3316 HANDHOLE | SUPERSEDES 3671.6 (1-1-98) |

INSTALLATION:

- (A) BOLT THE SWITCH TO THE WALL (PROPERTY SIDE IS PREFERRED). OIL SWITCH LEVELING REQUIREMENT IS A TOLERANCE OF 1/2 INCH FROM THE FRONT TO THE BACK OR 1/2 INCH END TO END. LEVELING OF THE SF-6 GAS SWITCH IS NOT REQUIRED. INSTALL THE SWITCH LEG USING THE MEASUREMENTS SHOWN IN THE DRAWING.
- (B) NO SECONDARY ALLOWED IN THIS INSTALLATION OTHER THAN THE FEED TO THE SUMP PUMP. THE ONLY 200 AMP AND 600 AMP CABLE ALLOWED IN THIS INSTALLATION IS CABLE TERMINATED ONTO THE SWITCH. THE 200 AMP CABLES MAY BE PULLED IN ANY CONDUIT OTHER THAN THOSE DESIGNATED (DO NOT USE) OR THE ONES USED FOR 600 AMP CABLES. DO NOT TERMINATE #2 OR 2/0 ONTO A BUSHING REQUIRING A BUSHING EXTENSION DUE TO HANDHOLE COVER CLEARANCE.
- C. INSTALL CABLE AND CABLE SUPPORTS, ETC. IN THE HANDHOLE AND ON THE SWITCH AS SHOWN IN THE INSTALLATION DRAWINGS. ALL 350, 750 AND 1000 KCMIL CABLES MUST BE UNTRIPLEXED WHENEVER IT IS TRAINED AROUND THE CORNER (90° ANGLE) ON THE HANDHOLE. DO NOT "PIGGYBACK" 600 AMP TEES (ONE ON TOP OF THE OTHER) AT ANY TIME ON THE SWITCH BUSHING.
- (D) REMOVE THE JACKETING AS SHOWN (APPROXIMATELY 6 FEET) ON THE 750 AND 1000 KCMIL CABLE WHICH TERMINATES ON THE SIDE SWITCH BUSHINGS. INSTALL ONE LAYER OF SEALING COMPOUND UNDER AND OVER THE CONCENTRIC NEUTRAL BUTTING IT AGAINST THE CABLE JACKETING. INSTALL A HEAT SHRINK TUBE OVER THE SEALING COMPOUND AND JACKETING AND APPLY HEAT. MAKE SURE THE HEAT SHRINK TUBE SHRINKS ON THE SEALING COMPOUND AND CABLE JACKETING AND NOT ON THE CABLE SEMICONDUCTING MATERIALS.



FOR FIELD MAINTENANCE ONLY

- (F) INSTALL SWITCH IDENTIFICATION NUMBER AND CABLE I.D. TAGS AS SHOWN IN STANDARD 3200.
- (G) A 20" X 60" UNOBSTRUCTED SPACE MUST BE MAINTAINED IN THE HANDHOLE.
- (H) INSTALL A 12 INCH EXTENSION SECTION (STOCK NUMBER 336208) BETWEEN THE TOP NECK SECTION AND THE 24 INCH EXTENSION SECTION.

REFERENCE:

- J. SEE STANDARD 3670 FOR SUBSURFACE SWITCH.
- K. SEE STANDARD 3213 FOR INSTALLING SWITCH IDENTIFICATION NUMBERS AND STANDARD 3202 FOR INSTALLING CABLE I.D. TAGS.
- L. SEE PAGE 3374.3 FOR CONDUIT INSTALLATION PRACTICES.
- M. SEE STANDARD 3362 FOR SUMP PUMP INSTALLATION.
- (N) SEE STANDARD 4181 FOR 12KV 200 AND 600 AMP CONNECTOR ASSEMBLIES.
- O. SEE STANDARD 4530 FOR NEUTRAL AND GROUND WIRE DIAGRAM.
- P. SEE DESIGN STANDARD 6111 FOR SWITCH APPLICATION.
- R. SEE DESIGN STANDARD 6113 FOR AUTOMATIC FAULT INDICATOR APPLICATION.

3699.719
SUPERSEDES
3671.7 (1-1-98)

SDG&E ELECTRIC STANDARDS

INSTALLATION OF SUBSURFACE/SURFACE OPERABLE
SWITCH IN A 3316 HANDHOLE

DATE 1-1-91

APPD *JLB/ROJ*

3700-4000 TRANSFORMERS,
CAPACITORS, CABLES

3700-4000 TRANSFORMERS,
CAPACITORS, CABLES

PAGE**SUBJECT**

| | |
|---------------|---|
| 3799.101-.102 | REPLACEMENT OF "YP" PAD-MOUNTED TRANSFORMER TO "YDP" LOW PROFILE PAD-MOUNTED TRANSFORMER WITH FUSED SECTIONALIZING CABINET |
| 3799.103-.104 | REPLACEMENT OF "YP" OR "YEP" PAD-MOUNTED TRANSFORMER TO "YDP" LOW PROFILE PAD-MOUNTED TRANSFORMER WHEN ONE-PHASE WITHIN TRANSFORMER COMPARTMENT |
| 3799.105-.106 | REPLACEMENT OF "YEP" PAD-MOUNTED TRANSFORMER TO "YDP" LOW PROFILE PAD-MOUNTED TRANSFORMER WHEN MULTI-PHASES WITHIN TRANSFORMER COMPARTMENT |
| 3799.201 | 12KV, ONE-PHASE, PAD-MOUNTED TRANSFORMER INSTALLATION |
| 3799.202 | 2.4 OR 7.2 ONE-PHASE PAD-MOUNTED TRANSFORMER INSTALLATION |
| 3799.203 | TRANSFORMER PREFIXES, PAD-MOUNTED, DEAD FRONT/SINGLE-PHASE |
| 3799.204 | TRANSFORMER PREFIXES, PAD-MOUNTED, LIVE FRONT/SINGLE-PHASE |
| 3799.205 | TRANSFORMER PREFIXES, PAD-MOUNTED, LIVE FRONT OR SUBSURFACE/SINGLE PHASE |
| 3799.206 | TRANSFORMER PREFIXES, SUBSURFACE/SINGLE-PHASE |
| 3799.207 | TRANSFORMER PREFIXES, PAD-MOUNTED DEAD FRONT/THREE-PHASE |
| 3799.208-.209 | TRANSFORMER PREFIXES, PAD-MOUNTED LIVE FRONT/THREE-PHASE |
| 3799.210 | TRANSFORMER PREFIXES, SUBSURFACE/THREE-PHASE |
| 3799.301 | TWO 12KV PAD-MOUNTED TRANSFORMERS FOR OPEN DELTA BANKS |
| 3799.302 | THREE 12KV PAD-MOUNTED TRANSFORMERS FOR CLOSED DELTA BANKS |
| 3799.401-.402 | SUBSURFACE TRANSFORMER AND ENCLOSURE INSTALLATION, SINGLE-PHASE, TYPE "WS", "WSV", "WUS", "YSV", "YIS", "YES", OR "HSS" |
| 3799.403-.404 | SUBSURFACE TRANSFORMER AND ENCLOSURE INSTALLATION, MULTIPLE PHASES, TYPE "YIS" OR "YES" |
| 3799.501-.502 | THREE-PHASE, 12KV, TYPE "HZL", "HAL", "HML" OR "HNL" LOOP FEED, DEAD FRONT, PAD-MOUNTED TRANSFORMER INSTALLATION |
| 3799.503-.504 | THREE-PHASE, 12KV, TYPE "PZR", "HZR", OR "HKR" RADIAL FEED, DEAD FRONT, PAD-MOUNTED TRANSFORMER INSTALLATION |
| 3799.505-.506 | THREE-PHASE, STEP DOWN, TYPE "HPP" RADIAL/LOOP LIVE FRONT PAD-MOUNTED TRANSFORMER INSTALLATION |
| 3799.901 | TERMINAL ADAPTOR PLATE |
| 3899.001-.003 | CAPACITOR MARKING INSTRUCTIONS, DECALS AND TAGS |
| 3899.201-.203 | 1200 KVAR PAD-MOUNTED CAPACITOR |
| 3999.001-.003 | 600 VOLT CABLE REFERENCE CHART |
| 3999.301 | TEMPORARY SERVICE - FROM PAD-MOUNT TRANSFORMER TO CUSTOMER-OWNED METER INSTALLATION |
| 3999.401 | CABLE-IN-CONDUIT (SIDA) SERVICE |
| 4099.001 | 12KV CABLE SIZES |
| 4099.012 | 0-600 VOLT CABLE SIZES AND AMPACITIES, COPPER AND ALUMINUM CABLES |

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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
|-----|--------------------|----|------|------|------------|-----|--------|----|------|------|------|
| C | | | | | | F | | | | | |
| B | COMPLETELY REVISED | JK | JS | CZH | 10/16/2019 | E | | | | | |
| A | ORIGINAL ISSUE | JK | JS | CZH | 6/13/2019 | D | | | | | |

| | | | | |
|-------------------------|---|-----------------------------------|--|--------------------------------|
| SHEET 1 OF 1 | Indicates Latest Revision <input checked="" type="checkbox"/> Completely Revised | <input type="checkbox"/> New Page | <input type="checkbox"/> Information Removed | UG LEGACY UGL3701.1 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | |
| | LEGACY UNDERGROUND FIELD MAINTENANCE TABLE OF CONTENTS TRANSFORMERS, CAPACITORS, CABLES | | | |

- (A) REFER TO 3799.101 THROUGH 3799.104 FOR TRANSFORMER INSTALLATION, TEMPORARY AND PERMANENT REPLACEMENT PROCEDURE OF "YP" PADMOUNT TRANSFORMERS.
- (B) REFER TO 3512 FOR LOW PROFILE FUSED SECTIONALIZING CABINET INSTALLATIONS.
- (C) INSTALLATION PROCEDURES FOR LOW PROFILE FUSED SECTIONALIZING CABINETS.

FOR FIELD MAINTENANCE ONLY

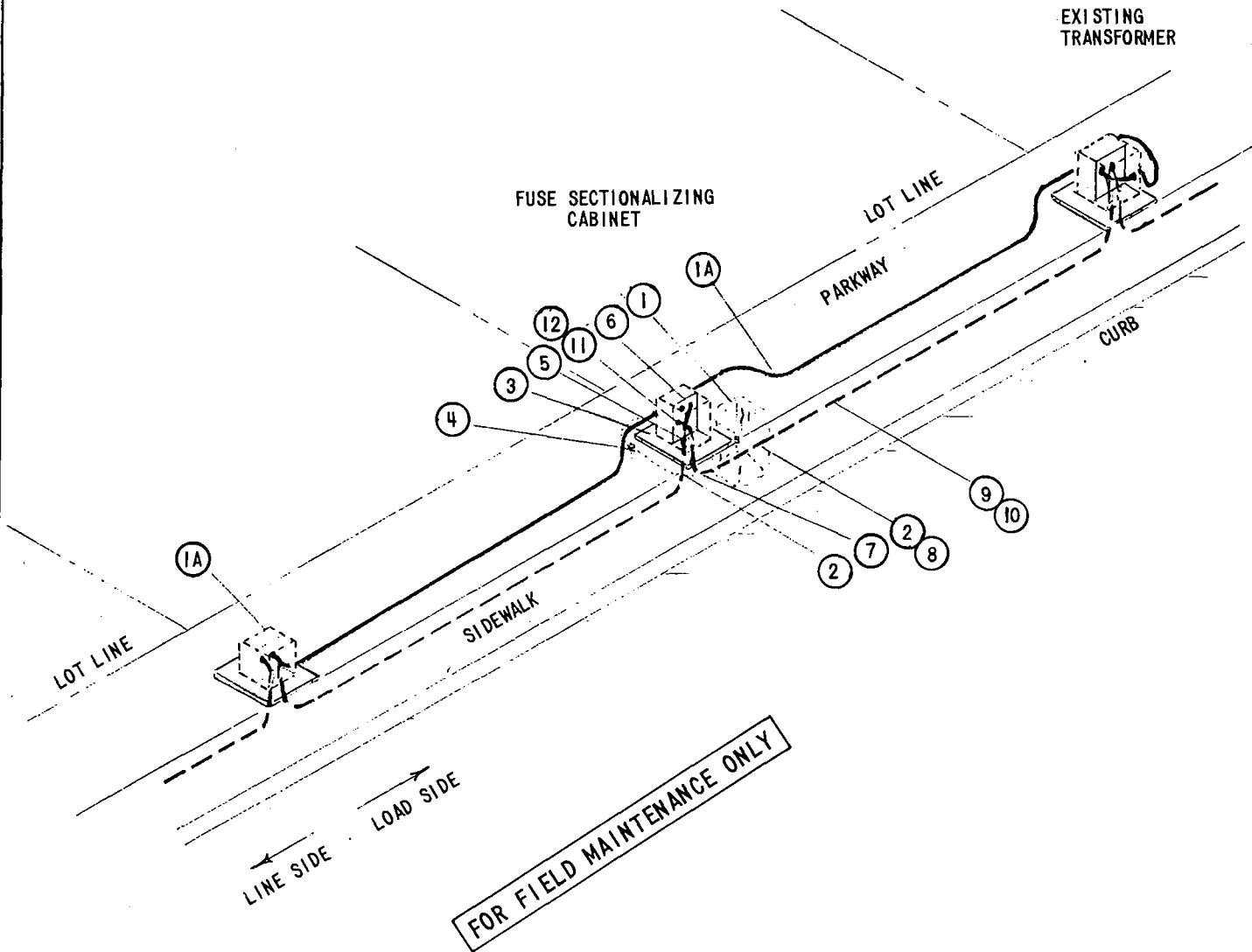
TEMPORARY INSTALLATION PROCEDURE

- (1A) ON LOAD SIDE OF REPLACED TRANSFORMER USE (PID) CABLES FOR TEMPORARY PRIMARY CIRCUIT TO NEXT TRANSFORMER. LAY CABLE ON GROUND SURFACE BETWEEN ADJACENT UNITS, PROTECTED AT POINTS WHERE VEHICULAR TRAFFIC WOULD REQUIRED CROSSING BY USE OF WOOD PLANKING AND BRIDGING. REMOVE LOAD BREAK ELBOW ON LOAD SIDE DE-ENERGIZING. BRING CABLE OUT LOW VOLTAGE SIDE OF TRANSFORMER CABLE COMPARTMENT SKIRT, IF CONVENIENT.

PERMANENT INSTALLATION PROCEDURE

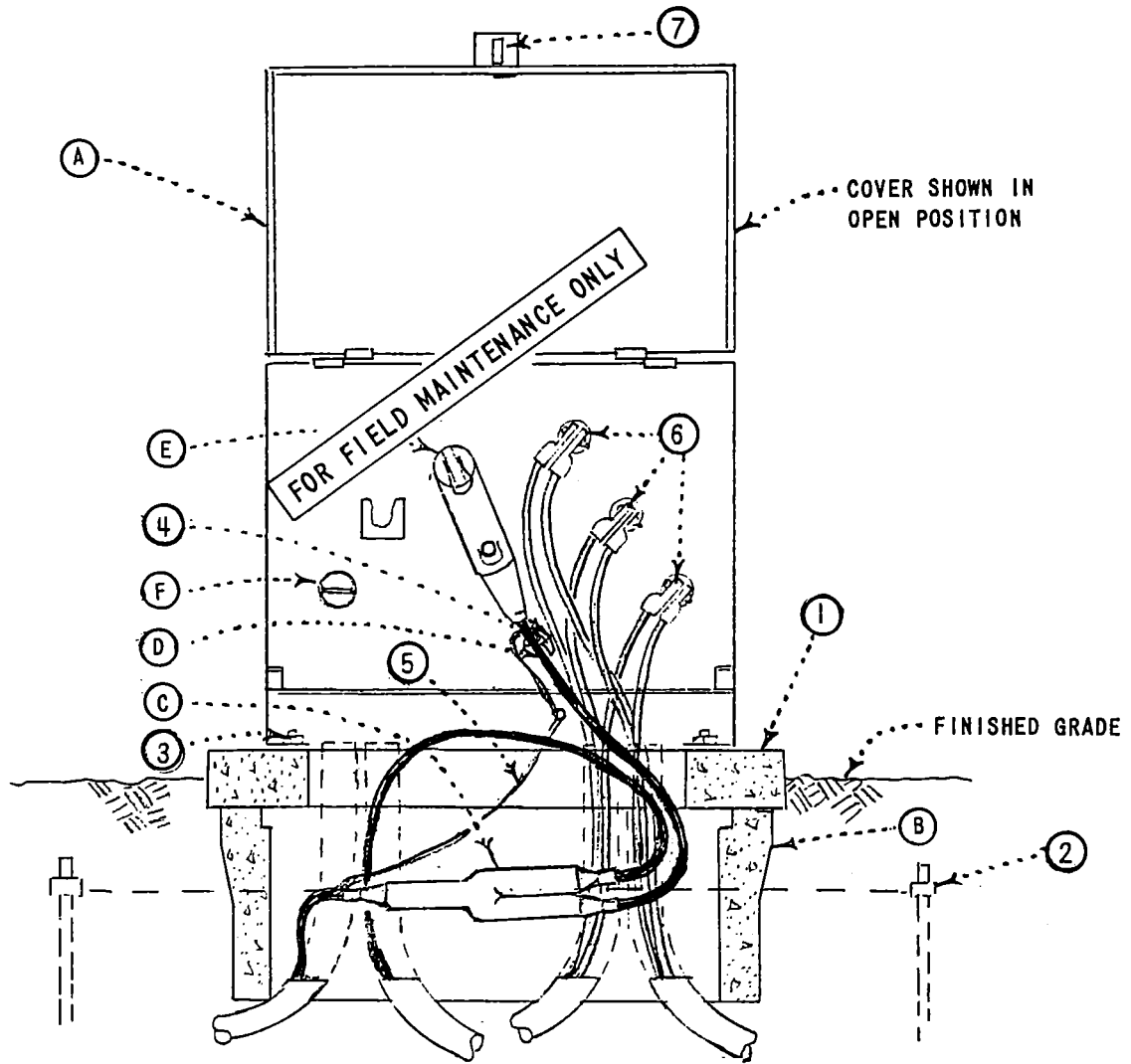
- (1) DIG AND BISECT THE PRIMARY CABLE (PID) ON LOAD SIDE FROM THE REPLACED TRANSFORMER, ON FIRST LOT LINE NOT OCCUPIED OR MOST CONVENIENT LOCATION.
- (2) CUT CABLE SO THAT SUFFICIENT CABLE CAN BE BROUGHT UP INTO NEW PAD OPENING.
- (3) INSTALL PAD (3421) ADJACENT TO EXCAVATION.
- (4) INSTALL PAD GROUNDING (3407).
- (5) CUT EXCESS DUCT AND CABLE (PID) IF REQUIRED.
- (6) WITH THE END OF CABLE MAKE LOAD BREAK ELBOW (4191) CONNECTION. ATTACH LOAD SIDE PRIMARY TO THE RIGHT TOP BUSHING IN FUSED SECTIONALIZING CABINET (3512.00).
- (7) IN EXCAVATION, LAY NEW SECTION OF EQUIVALENT SIZE (ABS) DUCT WITH SUFFICIENT LENGTH TO REACH CABINET BASE JUST ABOVE SLAB.
- (8) ON NEW DUCT SLIDE COUPLING OVER END AND APPLY AQUA-SEAL AROUND DUCT OUTER EDGE. SLIDE COUPLING OVER END, ON EXISTING (PID) DUCT APPLY AQUA-SEAL AROUND AND THEN SLIDE DUCT ON. TAPE AT SEAMS.
- (9) PULL EXISTING (PID) CABLE FROM DUCT.
- (10) INSTALL NEW PRIMARY CABLE FROM FUSED SECTIONALIZING CABINET TO LINE SIDE OF EXISTING TRANSFORMER.
- (11) ON OPPOSITE END OF CABLE ATTACH LOAD BREAK ELBOW (4191). ATTACH TO LEFT BUSHING IN FUSED SECTIONALIZING CABINET.
- (12) ATTACH GROUND TO CABINET.
- (13) INSTALL PHASE AND ROUTE IDENTIFICATION TAGS (3231).
- (14) LOCK FUSE SECTIONALIZING CABINET.
- (15) REPLACE PROPERTY IN ORIGINAL ORDER.

| | | |
|-------------------------|--|----------|
| DATE 8-6-79 APPD TAF | SDGE ELECTRIC STANDARDS REPLACEMENT OF 'YP' PADMOUNT TRANSFORMER TO 'YDP' LOW PROFILE PADMOUNT TRANSFORMER WITH FUSED SECTIONALIZING CABINET | 3799.101 |
|-------------------------|--|----------|



NOTE:

DURING ENTIRE TIME (PID) CABLE IS LAID ATOP GROUND A QUALIFIED ELECTRIC WORKER MUST BE IN ATTENDANCE.



| ITEM | DESCRIPTION (REUSABLE MATERIALS) | QUANTITY | STOCK NUMBER OR CONSTR. STD. |
|------|-------------------------------------|----------|---------------------------------|
| 1 | CONCRETE PAD | 1 | 514240, 3421 |
| 2 | PAD GROUNDING | 1 | 3407. |
| 3 | HOLD DOWN DEVICE-NO STANDARD | - | - |
| 4 | PHASE AND ROUTE TAGS | AS REQ'D | 3231 |
| 5 | CONCENTRIC NEUTRAL TAIL | AS REQ'D | - |
| 6 | SECONDARY TERMINATIONS | AS REQ'D | 4171, 4168 |
| 7 | COMPANY LOCK, (CORBIN #27 FF KEY | 1 | 514848 |
| 8 | | | |

| ITEM | DESCRIPTION (NEW MATERIALS) | QUANTITY | STOCK NUMBER OR CONSTR. STD. |
|------|---------------------------------------|----------|---------------------------------|
| A | TRANSFORMER, LOW PROFILE | 1 | 3702 |
| B | HANDHOLE, BOTTOM SECTION (SEE NOTE 1) | 1 | 162664, 3313 |
| C | 'Y' SPLICE, #2 CU, (SEE NOTE 1) | 1 | 668416 |
| D | CONDUCTOR, #2 CU, 15KV (SEE NOTE 1) | AS REQ'D | 194498, U-12.4-FM0 |
| E | ELBOW, LOAD BREAK, 7.2KV | 1 | 443416, 4191 |
| F | INSULATING RECEPTACLE, LOAD BREAK | 1 | 204304, 4192 |

SDG&E ELECTRIC STANDARDS

REPLACEMENT OF 'YP' OR 'YEP' PADMOUNT TRANSFORMER
TO 'YDP' LOW PROFILE PADMOUNT TRANSFORMER
(WHEN ONE PHASE WITHIN TRANSFORMER COMPARTMENT)

3799.103

DATE 8-6-79
APPD TAF

NOTE:

1. IF SUFFICIENT SLACK CABLE FROM DUCT CAN BE OBTAINED OR IF LAST TRANSFORMER ON RADIAL FEED OMIT ITEM B, C, AND D.
2. STRUCTURE IDENTIFICATION, 3211.
3. TRANSFORMER IDENTIFICATION, 3212.
4. TRANSFORMER 'WARNING SIGN', 3221.

FOR FIELD MAINTENANCE ONLY

TEMPORARY REPLACEMENT PROCEDURE

TO AVOID EXTENDED OUTAGES ON RADIAL SYSTEMS IT IS RECOMMENDED THAT THE USE OF A PORTABLE "YDP" LOW PROFILE TRANSFORMER BE USED, MOUNTED ADJACENT TO THE TRANSFORMER BEING REPLACED. USE PID CABLE FOR TEMPORARY PRIMARY CIRCUIT BETWEEN ADJACENT UNITS OR ON LAST TRANSFORMER ON RADIAL FEED. TOTAL LENGTH OF PID CABLES TO BE MADE UP PRIOR TO USE. TWO LENGTHS OF CABLE, ONE END TO HAVE LOAD BREAK ELBOW (4191), OTHER END TO HAVE STRESS CONE (4121) AND CABLE LUG. LENGTHS OF CABLES TO BE 300' TO COVER ALL NORMAL INSTALLATIONS. THE "YDP" TRANSFORMER TO BE MOUNTED ON WOODEN FLOAT PROVIDING EASY INSTALLATION AND PORTABILITY. LAY PID CABLES ON GROUND SURFACE BETWEEN ADJACENT UNITS OR FROM LAST TRANSFORMER, PROTECTED AND MARKED AT POINTS WHERE VEHICULAR TRAFFIC WOULD REQUIRE CROSSING BY USE OF WOOD PLANKING AND BRIDGING. SECONDARY CONNECTIONS COULD BE PROVIDED BY JUMPING FROM PORTABLE "YDP" TO PERMANENT SECONDARY CONNECTION. WHEN TEMPORARY SERVICE IS RESTORED PROCEED WITH PERMANENT REPLACEMENT PROCEDURE.

PERMANENT REPLACEMENT PROCEDURE

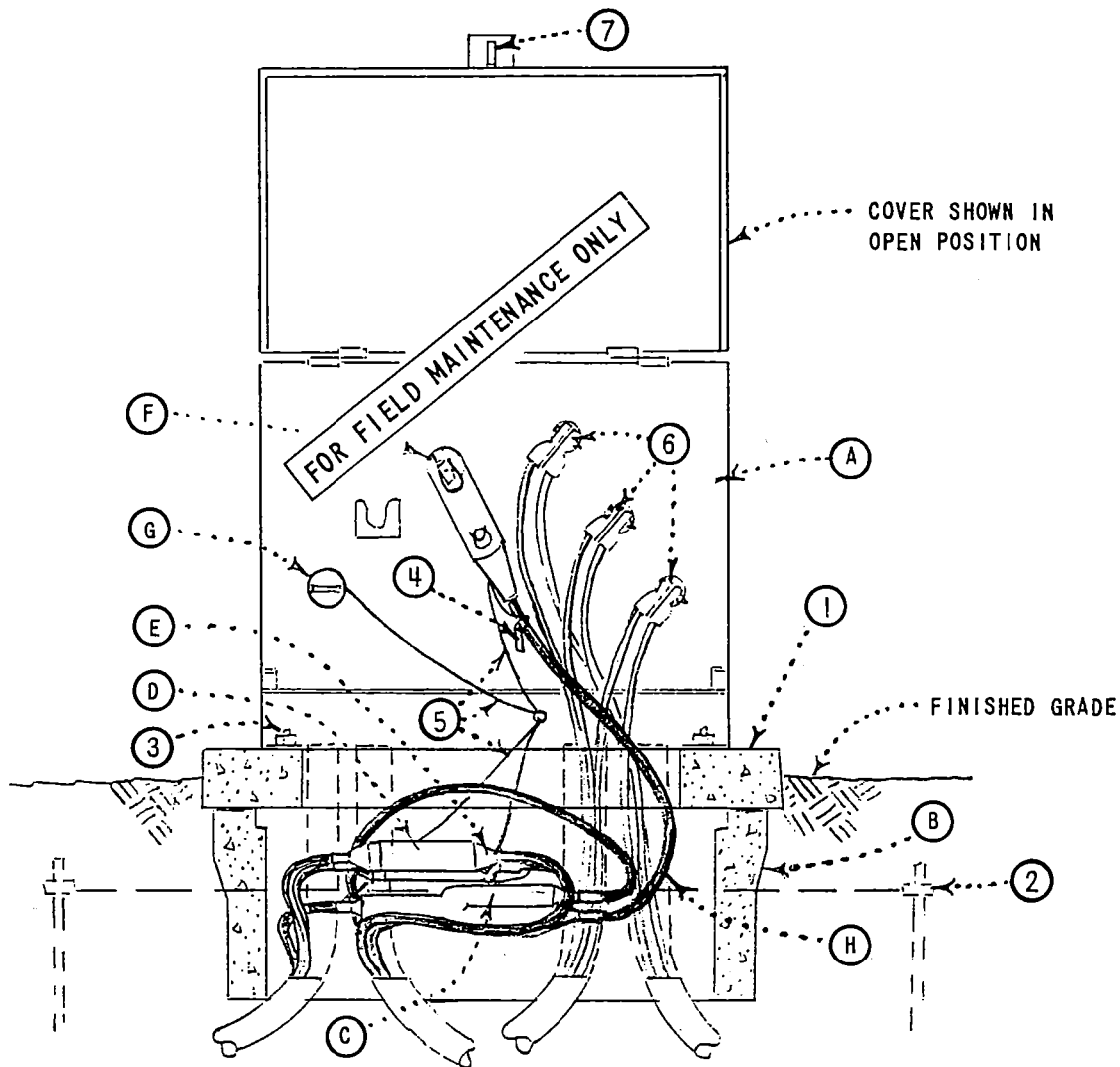
1. REMOVE INCOMING AND OUTGOING (IF ANY) PRIMARY CONNECTIONS AND DETACH SECONDARY CONNECTIONS. REMOVE STRESS CONES, HARDWARE AND GROUNDS.
2. REMOVE EXISTING "YP" OR "YEP" TRANSFORMER FROM PAD.
3. IF REQUIRED (SEE NOTE 1) REMOVE PAD AND GROUNDING (LEAVE GROUND RODS IN PLACE).
4. IF REQUIRED (SEE NOTE 1) EXCAVATE HOLE, (38" W X 24" L X 14" DEEP, BACKFILL TO 12" LEVEL BELOW PAD), UNDER CONDUIT OPENING TO ACCOMMODATE (ITEM B) HANDHOLE - BOTTOM SECTION.
5. CUT DUCTS OFF 3" ABOVE THE BASE OF EXCAVATION (IF BOX REQUIRED).
6. INSTALL HANDHOLE OVER DUCTS.
7. PREPARE CABLE (S) DIRECTLY FOR LOAD BREAK ELBOW (4191) (IF SUFFICIENT CABLE AVAILABLE) OR FOR "Y" SPLICE (4151) WHEN NOT LAST TRANSFORMER ON RADIAL FEED.
8. ON ONE (DOUBLE END) OF "Y" SPLICE INSTALL JUMPER AND ATTACH TO LOAD BREAK ELBOW.
9. ON SECOND (DOUBLE END) OF "Y" INSTALL NEEDED #2 COPPER, 15KV CABLE TO MAKE CONNECTION TO TOP BUSHING. ADD ELBOW (4191) AND ATTACH GROUND WIRE TO TRANSFORMER GROUND POINT.
10. ATTACH SINGLE END OF "Y" SPLICE TO INCOMING CIRCUIT.
11. REPLACE PAD (IF REMOVED) OVER HANDHOLE (IF INSTALLED) SO THAT CABLES ARE IN LINE WITH CONNECTIONS.
12. REPLACE PAD GROUNDING.
13. INSTALL "YDP" TRANSFORMER, SECURE TO PAD AND ATTACH TO PAD GROUNDING.
14. ATTACH SECONDARIES TO TERMINALS, ADJUST IF NECESSARY.
15. INSTALL INSULATING RECEPTACLE (4192) ITEM F OVER LOWER UNUSED PRIMARY BUSHING TERMINAL, GROUND TO TRANSFORMER GROUND POINT.
16. INSTALL PHASE AND ROUTE IDENTIFICATION TAGS (3202).
17. LOCK TRANSFORMER CABINET.
18. REPLACE PROPERTY IN ORIGINAL ORDER.

SDG&E ELECTRIC STANDARDS

3799.104

REPLACEMENT OF 'YP' OR 'YEP' PADMOUNT TRANSFORMER
TO 'YDP' LOW PROFILE PADMOUNT TRANSFORMER
(WHEN ONE PHASE WITHIN TRANSFORMER COMPARTMENT)

DATE 8-6-79
APPD TAF



| ITEM | DESCRIPTION (REUSABLE MATERIALS) | QUANTITY | STOCK NUMBER OR CONSTR. STD. |
|------|-------------------------------------|----------|---------------------------------|
| 1 | CONCRETE PAD | 1 | 514240, 3421 |
| 2 | PAD GROUNDING | 1 | 3407 |
| 3 | HOLD DOWN DEVICE-NO STANDARD | | |
| 4 | PHASE AND ROUTE TAGS | AS REQ'D | 3231 |
| 5 | CONCENTRIC NEUTRAL TAILS | AS REQ'D | |
| 6 | SECONDARY TERMINATIONS | AS REQ'D | 4171, 4168 |
| 7 | COMPANY LOCK, (CORBIN #27) FF KEY | 1 | 514848 |
| 8 | | | |

| ITEM | DESCRIPTION (NEW MATERIALS) | QUANTITY | STOCK NUMBER OR CONSTR. STD. |
|------|-----------------------------------|----------|---------------------------------|
| A | TRANSFORMER, LOW PROFILE | 1 | 3702 |
| B | HANDHOLE, BOTTOM SECTION | 1 | 162664, 3313 |
| C | SPLICE, 'Y', #2, | 1 | 668416, 4199.506 |
| D | STRAIGHT RECEPTACLE, #2 COPPER | 2 | 570256, 4196 |
| E | STRAIGHT PLUG, #2 COPPER | 2 | 544688, 4196 |
| F | ELBOW, LOAD BREAK, 7.2KV | 1 | 443418, 4191 |
| G | INSULATING RECEPTACLE, LOAD BREAK | 1 | 204304, 4192 |
| H | CONDUCTOR, #2 COPPER, 15KV | AS REQ'D | 194496,U-12.4 FMO |

SDG&E ELECTRIC STANDARDS

REPLACEMENT OF 'YEP' PADMOUNT TRANSFORMER TO 'YDP'
 LOW PROFILE PADMOUNT TRANSFORMER
 (WHEN MULTI-PHASES WITHIN TRANSFORMER COMPARTMENT)

3799.105

DATE 8-6-79
 APPD TAF

NOTES:

1. STRUCTURE IDENTIFICATION, 3211.
2. TRANSFORMER IDENTIFICATION, 3212.
3. TRANSFORMER 'WARNING SIGN', 3221.

FOR FIELD MAINTENANCE ONLY

TEMPORARY REPLACEMENT PROCEDURE

DROP ANY 3 ϕ LOAD IN LOAD SIDE OF TRANSFORMER BEING REPLACED TO PROTECT AGAINST ANY POSSIBLE BACK FEED. TO AVOID OUTAGES ON RADIAL SYSTEMS IT IS SUGGESTED THAT THE USE OF A PORTABLE "YDP" LOW PROFILE TRANSFORMER BE USED, MOUNTED ADJACENT TO THE TRANSFORMER BEING REPLACED. USE PID CABLE FOR TEMPORARY PRIMARY CIRCUIT BETWEEN ADJACENT UNITS TO THE TRANSFORMER BEING REPLACED. TOTAL LENGTH OF PID CABLES TO BE MADE UP PRIOR TO USE. TWO LENGTHS OF CABLE, ONE END TO HAVE LOAD BREAK ELBOW (4191), OTHER END TO HAVE STRESS CONE (4121) AND CABLE LUG. LENGTHS OF CABLES TO BE 300' TO COVER ALL NORMAL INSTALLATIONS. THE "YDP" TRANSFORMER TO BE MOUNTED ON WOODEN FLOAT PROVIDING EASY INSTALLATION AND PORTABILITY. LAY PID CABLES ON GROUND SURFACE BETWEEN ADJACENT UNITS OR FROM LAST TRANSFORMER, PROTECTED AND MARKED AT POINTS WHERE VEHICULAR TRAFFIC WOULD REQUIRE CROSSING BY USE OF WOOD PLANKING AND BRIDGING. SECONDARY CONNECTIONS COULD BE PROVIDED BY JUMPING FROM PORTABLE "YDP" TO PERMANENT SECONDARY CONNECTION. WHEN TEMPORARY SERVICE IS RESTORED PROCEED WITH PERMANENT REPLACEMENT PROCEDURE.

PERMANENT REPLACEMENT PROCEDURE

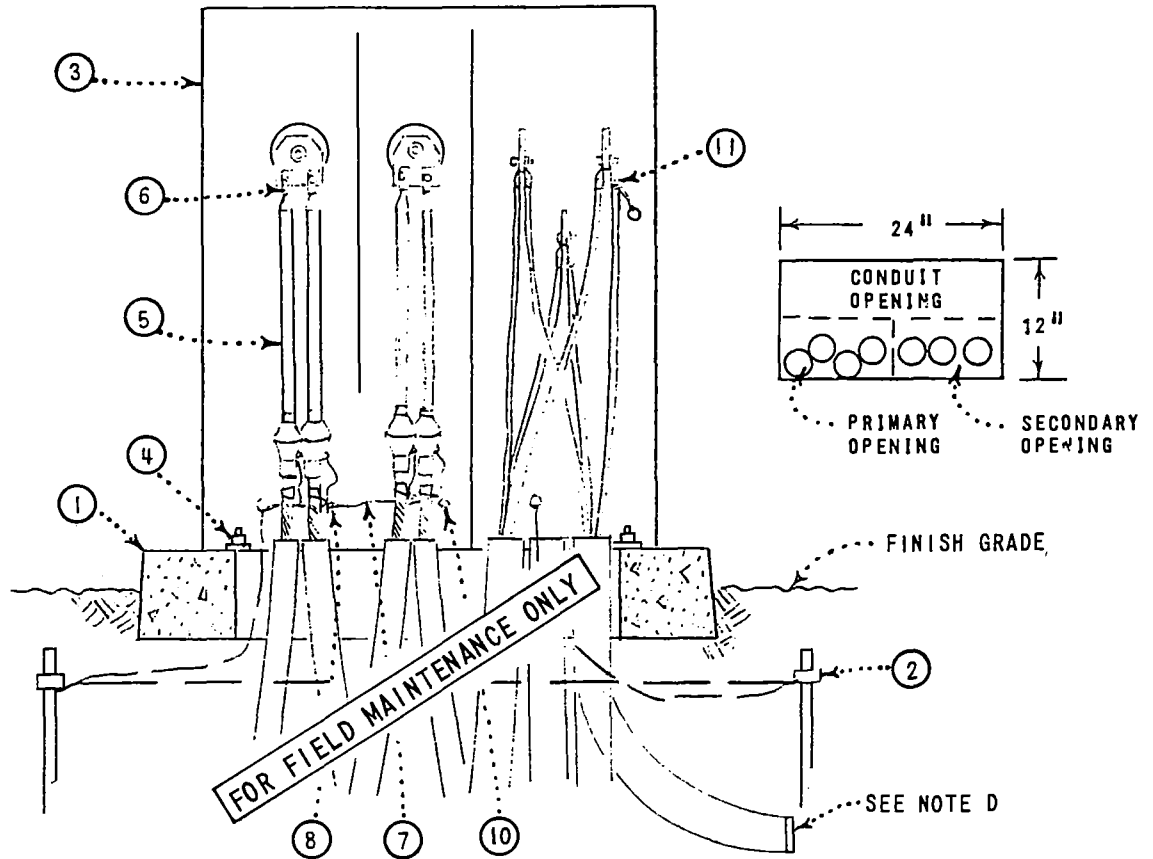
1. REMOVE INCOMING AND OUTGOING PRIMARY CONNECTIONS AND DETACH SECONDARY CONNECTIONS. REMOVE STRESS CONES, HARDWARE AND GROUNDS.
2. REMOVE EXISTING "YEP" TRANSFORMER FROM PAD.
3. REMOVE PAD AND GROUNDING (LEAVE GROUND RODS IN PLACE).
4. EXCAVATE HOLE, (48" W X 36" L X 20" DEEP, BACKFILL TO 18" LEVEL BELOW PAD), UNDER CONDUIT OPENING TO ACCOMMODATE (ITEM B) HANDHOLE-BOTTOM SECTION.
5. CUT DUCTS OFF 3" ABOVE THE BASE OF EXCAVATION.
6. INSTALL HANDHOLE OVER DUCTS.
7. THE TWO PHASE CONDUCTORS WHICH ARE NOT BEING EXTENDED TO THE TRANSFORMER REQUIRE INSTALLATION FOR STRAIGHT RECEPTACLE (4198) AND STRAIGHT PLUG (4198).
8. ON REMAINING PHASE PREPARE CABLE TO RECEIVE "Y" SPLICE (4199.506). INSTALL INCOMING LINE ON SINGLE END OF "Y", OUTGOING LINE ON ONE SIDE OF DOUBLE END.
9. REPLACE PAD OVER HANDHOLE SO THAT CABLES ARE IN LINE WITH CONNECTIONS.
10. REPLACE PAD GROUNDING.
11. INSTALL "YDP" TRANSFORMER, SECURE TO PAD AND ATTACH TO PAD GROUNDING.
12. ATTACH SECONDARIES TO TERMINALS, ADJUST IF NECESSARY.
13. INSTALL INSULATING RECEPTACLE (4192) OVER LOWER UNUSED PRIMARY BUSHING TERMINAL, GROUND TO TRANSFORMER GROUND POINT.
14. ON REMAINING OPEN END OF "Y" INSTALL NEEDED #2 COPPER, 15KV CABLE TO MAKE CONNECTION TO TOP PRIMARY BUSHING, ADD ELBOW (4191) AND ATTACH GROUND WIRE TO TRANSFORMER GROUND POINT.
15. INSTALL PHASE AND ROUTE IDENTIFICATION TAGS (3202).
16. LOCK TRANSFORMER CABINET.
17. REPLACE PROPERTY IN ORIGINAL ORDER.

SDG&E ELECTRIC STANDARDS

3799.106

REPLACEMENT OF 'YEP' PADMOUNT TRANSFORMER TO 'YDP'
 LOW PROFILE PADMOUNT TRANSFORMER
 (WHEN MULTI PHASES WITHIN TRANSFORMER COMPARTMENT)

DATE 8-6-79
 APPD TAF



| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONST. STD. |
|------|---|----------|--------------------------|
| 1 | CONCRETE PAD | 1 | 514240, 3421 |
| 2 | PAD GROUNDING UNIT | 1 | 3407 |
| 3 | TRANSFORMER | 1 | 3702 |
| 4 | HOLD DOWN DEVICE, NO STANDARD | - | - |
| 5 | INDOOR TERMINATION | 4 | 4121 |
| 6 | COMPRESSION CONNECTOR | 4 | 4171 |
| 7 | CONCENTRIC NEUTRAL TAIL | - | - |
| 8 | CONNECTOR, COMPRESSION | AS REQ'D | 257792 |
| 9 | COMPANY LOCK, (CORBIN #27) FF KEY (NOT SHOWN ABOVE) | 1 | 514848 |
| 10 | PHASE AND ROUTE TAGS | AS REQ'D | 3231 |
| 11 | SECONDARY CONNECTION | AS REQ'D | 4171, 4168 |

NOTES:

- A. TRANSFORMER RATING AND SIZE PER WORK ORDER (3702)
- B. TERMINATE OUCTS NOT LESS THAN 3" ABOVE FINISH GRADE.
- C. COMPANY LOCK, ITEM 9, TO BE ATTACHED TO LATCHING MECHANISM ON TRANSFORMER.
- D. AT THE TIME THE TRANSFORMER PAD IS SET A 2" IPS ABS (DB) 90° - 24" RADIUS BEND WITH PLUG SHOULD BE INSTALLED FOR EACH FUTURE SERVICE.
- E. THE SURFACE OF THE PAD SHALL BE GROOVED TO INDICATE LOCATION OF BURIED FUTURE SERVICE STUB-OUTS (ITEM D).
- F. TRANSFORMER IDENTIFICATION, 3211.
- G. TRANSFORMER STATION CIRCUIT NUMBER, 3212.
- H. TRANSFORMER WARNING SIGN, 3221.
- I. TRANSFORMER BARRIER PROTECTION AND CLEARANCE, 3481.

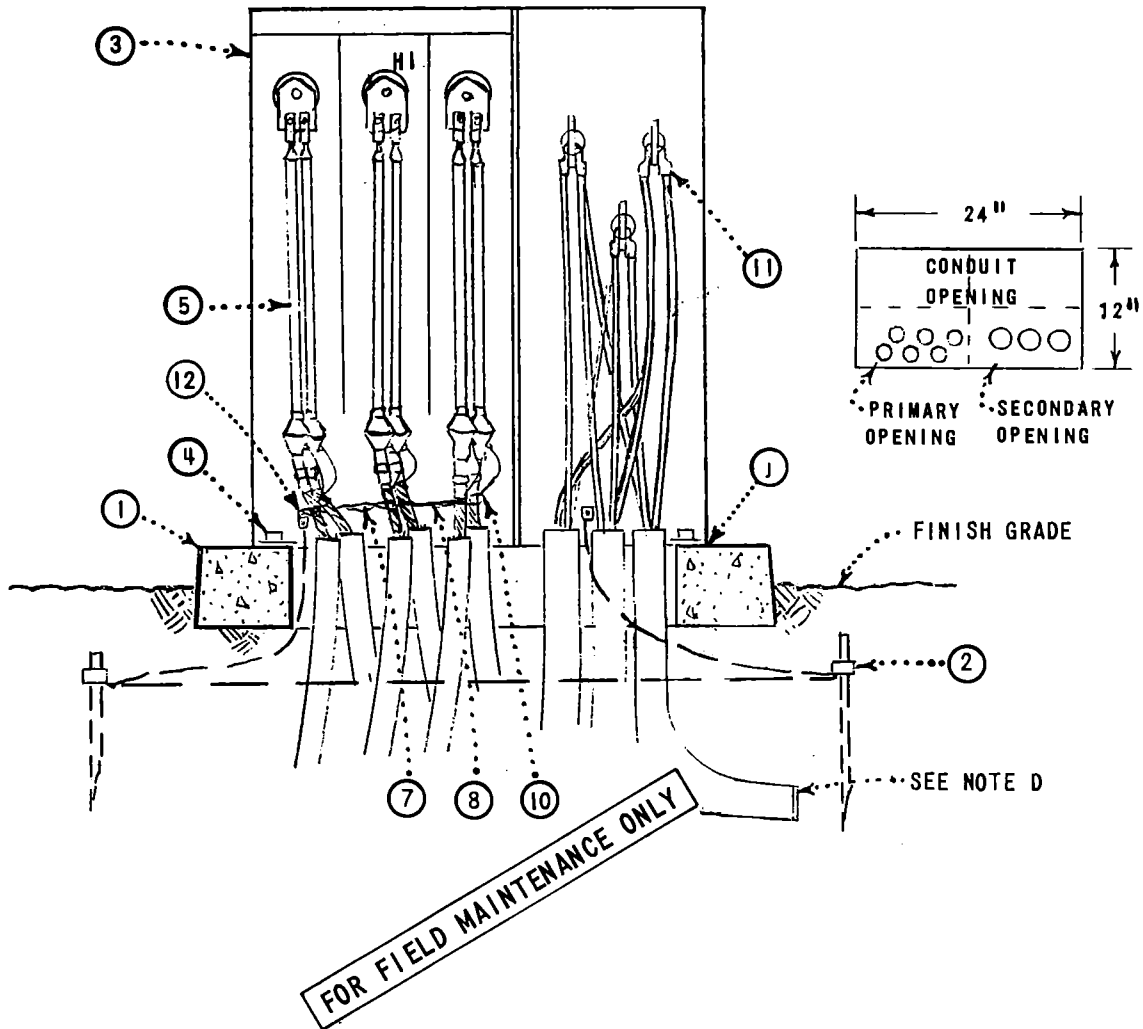
DATE 4-10-75

APPD *fwk*

SDG&E ELECTRIC STANDARDS

12KV 1Ø PADMOUNT TRANSFORMER
INSTALLATION

3799.201



NOTES:

- A. TRANSFORMER RATING AND SIZE PER WORK ORDER (PAGE 3702 AND T&D SPEC NO. 108).
- B. TERMINATE DUCTS NOT LESS THAN 3" ABOVE FINISHED GRADE.
- C. COMPANY LOCK, ITEM 9, TO BE ATTACHED TO LATCHING MECHANISM ON TRANSFORMER AND PENTAHEAD BOLT THREADED IN COMPLETELY.
- D. TRANSFORMER IDENTIFICATION, PAGE 3211.
- F. TRANSFORMER STATION CIRCUIT NUMBER, PAGE 3212.
- G. TRANSFORMER WARNING SIGN, PAGE 3221.
- H. TRANSFORMER BARRIER PROTECTION AND CLEARANCE PAGE 3481.
- (J) BASE SHALL BE CHECKED AND CAULKED WHEN NECESSARY TO PREVENT WIRE ENTRY.

| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONSTR STD |
|------|---|----------|-------------------------|
| 1 | CONCRETE PAD | 1 | 514240, PG 3421 |
| 2 | PAD GROUNDING, UNIT | 1 | PG 3407 |
| 3 | TRANSFORMER (INCLUDING NEP) | 1 | PG 3702 |
| 4 | HOLD DOWN DEVICE, NO STANDARD | 2 | - |
| 5 | INDOOR TERMINATION (NO MORE THAN 2 PER LANDING PLATE) | AS REQ'D | PG 4121 |
| 6 | | | |
| 7 | CONCENTRIC NEUTRAL TAILS | 2 | - |
| 8 | CONNECTOR, COMPRESSION | AS REQ'D | 25 7792 |
| 9 | COMPANY LOCK, (CORBIN #27) FF KEY (NOT SHOWN ABOVE) | 1 | 514848 |
| 10 | PHASE AND ROUTE TAGS | AS REQ'D | PG 3231 |
| 11 | SECONDARY CONNECTIONS | AS REQ'D | PGS 4171, 4168 |
| 12 | NEUTRAL GROUNDING STRAP (ON TRANSFORMER) | 1 | - |

| | | |
|----------|--|-------------------------|
| 3799.202 | SDG&E ELECTRIC STANDARDS | DATE 8-6-79 APPD TAF |
| | 2.4 OR 7.2 1Ø PADMOUNT TRANSFORMER (INCLUDING NEP) INSTALLATION | |

PAD-MOUNTED DEAD FRONT/SINGLE PHASE:

| PREFIX | VOLTAGE | | DESCRIPTION | KVA | TAPS | STOCK NO. | ASSEMBLY UNITS |
|--------------------------------|------------------------------------|-----------|---|-----|------|------------|----------------|
| | PRIMARY | SECONDARY | | | | | |
| SDD | 4160 GRDY/2400X 12000 GRDY/6930 | 240/120 | WEAK LINK | 25 | - | 761402 (A) | - |
| | | | | 50 | - | 761404 (A) | - |
| | | | | 75 | - | 761406 (A) | - |
| NDP | 12000 GRDY/6930 | 240/120 | WEAK LINK AND SECONDARY BREAKER | 25 | - | 761380 (A) | - |
| | | | | 50 | - | 761382 (A) | - |
| | | | | 75 | - | 761384 (A) | - |
| | | | | 100 | - | 761386 (A) | - |
| NTP | 12000 GRDY/6930 | 240/120 | WEAK LINK AND SECONDARY BREAKER | 25 | (B) | 761388 (A) | - |
| | | | | 50 | (B) | 761390 (A) | - |
| | | | | 75 | (B) | 761392 (A) | - |
| | | | | 100 | (B) | 761394 (A) | - |
| NTQ | 12000 GRDY/6930 | 240/120 | WEAK LINK & SECONDARY BREAKER LOW NOISE | 25 | (B) | 761396 (A) | - |
| | | | | 75 | (B) | 761400 (A) | - |
| YDP | 12470 GRDY/7200 | 240/120 | WEAK LINK AND SECONDARY BREAKER | 25 | - | 762260 (A) | - |
| | | | | 50 | - | 762264 (A) | - |
| | | | | 75 | - | 762268 (A) | - |
| | | | | 100 | - | 762258 (A) | - |
| YDQ | 12470 GRDY/7200 | 240/120 | WEAK LINK AND SECONDARY BREAKER LOW NOISE | 25 | - | 762262 (A) | - |
| | | | | 50 | - | 762266 (A) | - |
| | | | | 75 | - | 762270 (A) | - |
| YTP | 12470 GRDY/7200 | 240/120 | WEAK LINK AND SECONDARY BREAKER | 25 | (H) | 762532 (A) | - |
| | | | | 50 | (H) | 762534 (A) | - |
| | | | | 75 | (H) | 762536 (A) | - |
| | | | | 100 | (H) | 762538 (A) | - |
| HDD | 12000 | 240/120 | WEAK LINK | 25 | - | 759826 (A) | - |
| | | | | 50 | - | 759828 (A) | - |
| | | | | 75 | - | 759830 (A) | - |
| | | | | 100 | - | 759832 (A) | - |
| | | | | 167 | - | 759834 (A) | - |
| HTD | 12000 | 240/120 | WEAK LINKS | 50 | (B) | 761094 (A) | - |
| | | | | 167 | (B) | 761102 (A) | - |
| ↙ SUPERCEDES 3702.1 (1-1-96) ↘ | | | | | | | |
| NSD | 12000 GRDY/6930 | 240/120 | STAINLESS STEEL WEAK LINK | 25 | - | 761415 | NSD-25 |
| | | | | 50 | - | 761416 | NSD-50 |
| | | | | 75 | - | 761417 | NSD-75 |
| | | | | 100 | - | 761418 | NSD100 |

| | | |
|--|---|----------|
| DATE 1-1-96 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS | 3799.203 |
| | TRANSFORMER PREFIXES PAD-MOUNTED DEAD FRONT/SINGLE-PHASE | |

PAD-MOUNTED DEAD FRONT/SINGLE PHASE:

| PREFIX | VOLTAGE | | DESCRIPTION | KVA | TAPS | STOCK NUMBER |
|--------|--|-----------|--|-----|------|--------------|
| | PRIMARY | SECONDARY | | | | |
| SDD | 4160 GRDY/ 2400X 12000 GRDY/ 6930 | 240/120 | WEAK LINK | 25 | - | 761402 (A) |
| | | | | 50 | - | 761404 (A) |
| | | | | 75 | - | 761406 (A) |
| NDP | 12000 GRDY/ 6930 | 240/120 | WEAK LINK AND SECONDARY BREAKER | 25 | - | 761380 (A) |
| | | | | 50 | - | 761382 (A) |
| | | | | 75 | - | 761384 (A) |
| | | | | 100 | - | 761386 (A) |
| NTP | 12000 GRDY/ 6930 | 240/120 | WEAK LINK AND SECONDARY BREAKER | 25 | (B) | 761388 (A) |
| | | | | 50 | (B) | 761390 (A) |
| | | | | 75 | (B) | 761392 (A) |
| | | | | 100 | (B) | 761394 (A) |
| NTQ | 12000 GRDY/ 6930 | 240/120 | WEAK LINK AND SECONDARY BREAKER LOW NOISE | 25 | (B) | 761396 (A) |
| | | | | 75 | (B) | 761400 (A) |
| YDP | 12470 GRDY/ 7200 | 240/120 | WEAK LINK AND SECONDARY BREAKER | 25 | - | 762260 (A) |
| | | | | 50 | - | 762264 (A) |
| | | | | 75 | - | 762268 (A) |
| | | | | 100 | - | 762258 (A) |
| YDQ | 12470 GRDY/ 7200 | 240/120 | WEAK LINK AND SECONDARY BREAKER LOW NOISE | 25 | - | 762262 (A) |
| | | | | 50 | - | 762266 (A) |
| | | | | 75 | - | 762270 (A) |
| YTP | 12470 GRDY/ 7200 | 240/120 | WEAK LINK AND SECONDARY BREAKER | 25 | (H) | 762532 (A) |
| | | | | 50 | (H) | 762534 (A) |
| | | | | 75 | (H) | 762536 (A) |
| | | | | 100 | (H) | 762538 (A) |
| HDD | 12000 | 240/120 | WEAK LINKS | 25 | - | 759826 (A) |
| | | | | 50 | - | 759828 (A) |
| | | | | 75 | - | 759830 (A) |
| | | | | 100 | - | 759832 (A) |
| | | | | 167 | - | 759834 (A) |
| HTD | 12000 | 240/120 | WEAK LINKS | 50 | (B) | 761094 (A) |
| | | | | 167 | (B) | 761102 (A) |

FOR FIELD MAINTENANCE ONLY

DATE 1-1-88

APPD *[Signature]*

SDG&E ELECTRIC STANDARDS

TRANSFORMER PREFIXES
PAD-MOUNTED DEAD FRONT/SINGLE-PHASE

3799.203

PAD-MOUNTED LIVE FRONT/SINGLE PHASE:

| PREFIX | VOLTAGE | | DESCRIPTION | KVA | TAPS | STOCK NUMBER |
|--------|-----------------|------------|--|-----|------|--------------|
| | PRIMARY | SECONDARY | | | | |
| WEP | 4160 GRDY/2400 | 240/120 | WEAK LINK AND SECONDARY BREAKER | 15 | - | 761408 (A) |
| | | | | 25 | - | 761440 (A) |
| | | | | 50 | - | 761472 (A) |
| | | | | 75 | - | 761504 (G) |
| WEQ | 4160 GRDY/2400 | 240/120 | WEAK LINK AND SECONDARY BREAKER LOW NOISE | 25 | - | 761442 (A) |
| | | | | 50 | - | 761474 (A) |
| YP | 12470 GRDY/7200 | 240/120 | EXTERNALLY FUSED | 15 | - | 762304 (A) |
| | | | | 25 | - | 762368 (A) |
| | | | | 50 | - | 762400 (A) |
| | | | | 50 | (H) | 762416 (A) |
| | | | | 75 | - | 762432 (A) |
| | | | | 100 | - | 762272 (A) |
| | | | | 167 | - | 762336 (A) |
| YEP | 12470 GRDY/7200 | 240/120 | WEAK LINK AND SECONDARY BREAKER | 15 | - | 762048 (A) |
| | | | | 15 | (H) | 762080 (A) |
| | | | | 25 | - | 762112 (A) |
| | | | | 25 | (B) | 762144 (A) |
| | | | | 50 | - | 762176 (A) |
| | | | | 50 | (B) | 762208 (A) |
| | | | | 75 | - | 762240 (A) |
| | | | | 75 | (B) | 762256 (A) |
| | | | | 100 | - | 761984 (A) |
| | | | | 100 | (B) | 762016 (A) |
| NEP | 12000 GRDY/6930 | 240/120 | WEAK LINK | 50 | (B) | 761410 (G) |
| | | | | 100 | (B) | 761414 (G) |
| HP | 12000 | 240/120 | EXTERNALLY FUSED | 25 | - | 760672 (A) |
| | | | | 25 | (B) | 760674 (G) |
| | | | | 50 | - | 760704 (A) |
| | | | | 50 | (B) | 760706 (G) |
| | | | | 75 | - | 760736 (A) |
| | | | | 100 | - | 760608 (A) |
| | | | | 100 | (B) | 760740 (A) |
| | | | | 167 | - | 760640 (A) |
| 167 | (B) | 760744 (G) | | | | |
| HQ | 12000 | 240/120 | EXTERNALLY FUSED, LOW NOISE | 167 | - | 760642 (A) |

FOR FIELD MAINTENANCE ONLY

SDG&E ELECTRIC STANDARDS

3799.204

TRANSFORMER PREFIXES
PAD-MOUNTED LIVE FRONT/SINGLE-PHASE

DATE 1-1-88

APPD *JYS/108*

PAD-MOUNTED LIVE FRONT/SINGLE PHASE: (CONT'D)

| PREFIX | VOLTAGE | | DESCRIPTION | KVA | TAPS | STOCK NUMBER |
|--------|---------|------------|---------------------------------|------|-------|--------------|
| | PRIMARY | SECONDARY | | | | |
| HEP | 12000 | 240/120 | WEAK LINK AND SECONDARY BREAKER | 15 | - | 759904 (A) |
| | | | | 15 | (B) | 759936 (A) |
| | | | | 25 | - | 759968 (A) |
| | | | | 25 | (B) | 760000 (G) |
| | | | | 37.5 | - | 760032 (A) |
| | | | | 50 | - | 760064 (A) |
| | | | | 50 | (B) | 760096 (G) |
| | | | | 75 | - | 760128 (A) |
| | | | | 75 | (B) | 760160 (A) |
| | | | | 100 | - | 759840 (A) |
| | | | | 100 | (B) | 759872 (G) |
| | | | | HEQ | 12000 | 240/120 |
| 50 | (B) | 760066 (A) | | | | |
| 75 | (B) | 760130 (A) | | | | |
| HJP | 12000 | 240/480 | WEAK LINK AND SECONDARY BREAKER | 15 | - | 760224 (A) |
| | | | | 25 | - | 760256 (A) |
| | | | | 25 | (B) | 760258 (A) |
| | | | | 50 | - | 760260 (A) |
| | | | | 50 | (B) | 760264 (G) |
| | | | | 100 | (B) | 760268 (A) |

FOR FIELD MAINTENANCE ONLY

SUBSURFACE/SINGLE PHASE:

| PREFIX | VOLTAGE | | DESCRIPTION | KVA | TAPS | STOCK NUMBER |
|--------|------------|-----------|-----------------------|------|------|--------------|
| | PRIMARY | SECONDARY | | | | |
| WS | 2400/4160Y | 240/120 | LEAD PRIMARY BUSHINGS | 5 | - | 757376 (A) |
| | | | | 5 | (H) | 757408 (A) |
| | | | | 7.5 | - | 757472 (A) |
| | | | | 10 | - | 757120 (A) |
| | | | | 15 | - | 757216 (A) |
| | | | | 15 | (H) | 757232 (A) |
| | | | | 20 | - | - (A) |
| | | | | 25 | - | 757312 (A) |
| | | | | 30 | - | 757344 (A) |
| | | | | 37.5 | - | 757360 (A) |
| | | | | 40 | - | - (A) |

SUBSURFACE/SINGLE PHASE: (CONT'D)

| PREFIX | VOLTAGE | | DESCRIPTION | KVA | TAPS | STOCK NUMBER | ASSEMBLY UNITS |
|--------|-----------------|-----------|---------------------------------|------|------|--------------|----------------|
| | PRIMARY | SECONDARY | | | | | |
| WS | 2400/4160Y | 240/120 | LEAD PRIMARY BUSHINGS | 50 | - | 757440 (A) | - |
| | | | | 75 | - | 757504 (A) | - |
| | | | | 75 | (H) | 757536 (A) | - |
| | | | | 100 | - | 757152 (A) | - |
| | | | | 100 | (H) | 757184 (A) | - |
| | | | | 167 | - | 757248 (A) | - |
| | | | | 167 | (H) | 757280 (G) | - |
| WSV | 2400/4160Y | 240/120 | - | 10 | - | 761632 (A) | - |
| | | | | 15 | - | 761664 (A) | - |
| | | | | 25 | - | 761696 (A) | - |
| | | | | 50 | - | 761728 (A) | - |
| | | | | 75 | - | 761760 (A) | - |
| WUS | 2400/4160Y | 240/120 | WEAK LINK | 25 | - | 761544 (G) | - |
| | | | | 50 | - | 761552 (G) | - |
| | | | | 37.5 | - | 761548 (A) | - |
| | | | | 75 | - | 761560 (G) | - |
| YSV | 7200/12470Y | 240/120 | WEAK LINK AND SECONDARY BREAKER | 25 | - | 762464 (A) | - |
| | | | | 50 | - | 762496 (A) | - |
| | | | | 75 | - | 762528 (A) | - |
| YIS | 12470 GRDY/7200 | 240/120 | RTE BAY-O-NET FUSE | 50 | - | 764203 (A) | - |
| | | | | 100 | - | 764207 (A) | - |
| YES | 12470 GRDY/7200 | 240/120 | WEAK LINK AND SECONDARY BREAKER | 25 | - | 764202 (A) | - |
| | | | | 50 | - | 764204 (A) | - |
| | | | | 75 | - | 764210 (A) | - |
| | | | | 100 | - | 764208 (A) | - |
| NES | 12000 GRDY/6930 | 240/120 | WEAK LINK | 50 | (B) | 764221 (G) | - |
| | | | | 100 | (B) | 764223 (G) | - |

FOR FIELD MAINTENANCE ONLY

STREET LIGHT

| PREFIX | VOLTAGE | | DESCRIPTION | KVA | TAPS | STOCK NUMBER | ASSEMBLY UNITS |
|--------|---------|-----------|---|-----|------|--------------|----------------|
| | PRIMARY | SECONDARY | | | | | |
| RS | 2400 | 6.6A | (STREET LIGHT) SUBWAY TYPE, CONSTANT CURRENT | 5 | - | - (A) | - |
| | | | | 10 | - | 763616 (G) | - |
| | | | | 15 | (C) | 763648 (G) | - |
| | | | | 25 | (H) | 763712 (A) | - |
| | | | | 25 | (C) | 763680 (G) | U-RS25 |
| | | | | 30 | (C) | 763744 (G) | - |
| RRS | 2400 | 20A | (STREET LIGHT) SUBWAY TYPE, CONSTANT CURRENT | 30 | (C) | 763746 (G) | U---R25 |

PAD-MOUNTED DEAD FRONT/THREE-PHASE:

| PREFIX | VOLTAGE | | DESCRIPTION | | | KVA | TAPS | STOCK NUMBER |
|--------|-------------|--------------|---|----------------------------|------------------------------------|------|------------|--------------|
| | PRIMARY | SECONDARY | | | | | | |
| PZR | 4160X12000 | 208Y/120 | RADIAL BAY-O-NET PROTECTIVE LINKS | D.E.W.L. (I) (D) | D.E.W.L. | 75 | - | 761958 (A) |
| | | 3 PHASE | | | FAULT SENSING | 150 | - | 761962 (A) |
| | | 4 WIRE | | | | 500 | - | 761976 (A) |
| HZL | 12000 | 208Y/120 | D.E.W.L. BAY-O-NET FUSES AND PROTECTIVE LINKS, LOOP (I) | | | 75 | - | 761135 (A) |
| | | 3 PHASE | | | | 150 | - | 761137 (A) |
| | | 4 WIRE | | | | 225 | - | 761139 (A) |
| HZR | 12000 | 208Y/120 | D.E.W.L. BAY-O-NET FUSES AND PROTECTIVE LINKS, RADIAL (I) | | | 75 | - | 761144 (A) |
| | | 3 PHASE | | | | 150 | - | 761145 (A) |
| | | 4 WIRE | | | | 225 | - | 761148 (A) |
| | | | | | 300 | - | 761149 (A) | |
| HAL | 12000 | 208Y/120 | D.E.W.L. BAY-O-NET FUSES AND PROTECTIVE LINKS, LOOP (I) | | | 300 | (B) | 759596 (A) |
| | | 3 PHASE | | | | 500 | (B) | 759598 (A) |
| | | 4 WIRE | | | | 750 | (B) | 759600 (A) |
| | | | | | 1000 | (B) | 759602 (A) | |
| HKR | 12000 | 240/120 | D.E.W.L. BAY-O-NET FUSES AND PROTECTIVE LINKS, RADIAL (I) | | | 75 | - | 760269 (A) |
| | | 3 PHASE | | | | 150 | - | 760270 (A) |
| | | 4 WIRE | | | | 225 | - | 760271 (A) |
| HML | 12000 | 480Y/277 | D.E.W.L. BAY-O-NET FUSES AND PROTECTIVE LINKS, LOOP (I) | | | 75 | - | 760386 (A) |
| | | 3 PHASE | | | | 150 | - | 760388 (A) |
| | | 3 OR 4 WIRE | | | | 225 | - | 760392 (A) |
| | | | | | 300 | - | 760394 (A) | |
| HNL | 12000 | 480Y/277 | LOOP (I) PROTECTIVE LINKS BAY-O-NET FUSES | D.E.W.L. | 500 | (B) | 760408 (A) | |
| | | 3 PHASE | | FAULT SENSING | 750 | (B) | 760410 (A) | |
| | | 3 OR 4 WIRE | | | 1000 | (B) | 760412 (A) | |
| HPR | 12000 | 2400/4160Y/ | RADIAL PROTECTIVE LINKS BAY-O-NET FUSES (I) | D.E.W.L. (I) FAULT SENSING | 200AMP LOADBREAK SECONDARY BUSHING | 225 | (B) | 760934 (A) |
| | | 2400 OR | | | 600AMP DEADBREAK SECONDARY BUSHING | 500 | (B) | 760936 (A) |
| | | 2400/4160GRD | | | | 750 | (B) | 760938 (A) |
| | | Y/2400, 3Ø | | | | 1000 | (B) | 760940 (A) |
| | 3 OR 4 WIRE | | | | | | | |

FOR FIELD MAINTENANCE ONLY

NOTES:

- D.E.W.L. IS DEFINED AS "DUAL ELEMENT WEAK LINK".

DATE 1-1-93

APPD *[Signature]*

SDG&E ELECTRIC STANDARDS

**TRANSFORMER PREFIXES
PAD-MOUNTED DEAD FRONT/THREE-PHASE**

3799.207

PAD-MOUNTED LIVE FRONT/THREE PHASE:

| PREFIX | VOLTAGE | | DESCRIPTION | KVA | TAPS | STOCK NUMBER |
|--------|------------|-------------------------------|--|-------|------|--------------|
| | PRIMARY | SECONDARY | | | | |
| WGP | 2400/4160Y | 208Y/120 | - | 75 | - | 761600 (A) |
| | | | | 150 | - | 761568 (A) |
| WZP | 4160 | 208Y/120 3 PHASE 4 WIRE | INTERNALLY FUSED, SECONDARY BREAKER | 75 | - | 761920 (A) |
| | | | | 75 | (B) | 761952 (G) |
| | | | | 112.5 | - | 761856 (A) |
| | | | | 150 | (B) | 761888 (G) |
| | | | | 150 | (B) | 761824 (G) |
| WXP | 4160 | 240X480 3 PHASE 3 WIRE | INTERNALLY FUSED, SECONDARY BREAKER | 75 | (B) | 761824 (G) |
| | | | | 150 | - | 761792 (G) |
| HGP | 12000 | 208Y/120 | - | 75 | - | - (A) |
| | | | | 112.5 | - | 760176 (A) |
| | | | | 150 | - | - (A) |
| | | | | 225 | - | 760184 (A) |
| | | | | 300 | - | 760188 (A) |
| | | | | 500 | - | 760192 (A) |
| HHP | 12000 | 208Y/120 | - | 1875 | - | 760208 (A) |
| HAP | 12000 | 208Y/120 3 PHASE 4 WIRE | EXTERNALLY FUSED | 75 | (B) | 759776 (G) |
| | | | | 225 | (B) | 759680 |
| | | | | 300 | (B) | 759712 (G) |
| | | | | 500 | (B) | 759744 |
| | | | | 750 | (B) | 759808 (G) |
| | | | | 1000 | (B) | 759632 |
| HAQ | 12000 | 208Y/120 3Ø - 4 WIRE | EXTERNALLY FUSED, LOW NOISE | 300 | (B) | 759714 (A) |
| HBP | 12000 | 208Y/120 | INTERNALLY FUSED | 150 | (B) | - (A) |
| | | | | 225 | (B) | 759816 (A) |
| | | | | 300 | (B) | 759834 (A) |
| HZP | 12000 | 208Y/120 3 PHASE 4 WIRE | INTERNALLY FUSED, SECONDARY BREAKER | 75 | (B) | 761376 (A) |
| | | | | 112.5 | (B) | 761312 (A) |
| | | | | 150 | (B) | 761344 (A) |
| HZQ | 12000 | 208Y/120 3 PHASE 4 WIRE | INTERNALLY FUSED, SECONDARY BREAKER LOW NOISE | 75 | (B) | 761378 (A) |
| | | | | 150 | (B) | 761346 (A) |
| HDP | 12000 | 240/480 | - | 45 | - | - (A) |
| | | | | 75 | - | - (A) |
| | | | | 150 | - | - (A) |
| | | | | 300 | - | - (A) |

FOR FIELD MAINTENANCE ONLY

PAD-MOUNTED LIVE FRONT/THREE-PHASE: (CONT'D)

| PREFIX | VOLTAGE | | DESCRIPTION | KVA | TAPS | STOCK NUMBER | ASSEMBLY UNITS |
|--------|---------|---|--|-------|------|--------------|----------------|
| | PRIMARY | SECONDARY | | | | | |
| HFP | 12000 | 240/480 | INTERNALLY FUSED | 30 | - | - (A) | - |
| HLP | 12000 | 240X480 THREE-PHASE 3 WIRE | EXTERNALLY FUSED | 75 | (B) | 760384 (A) | - |
| | | | | 150 | - | 760272 (A) | - |
| | | | | 225 | (B) | 760288 (A) | - |
| | | | | 300 | (B) | 760320 (A) | - |
| | | | | 500 | (B) | 760352 (A) | - |
| HXP | 12000 | 240X480 THREE-PHASE 3 WIRE | INTERNALLY FUSED, SECONDARY BREAKER | 45 | (B) | 761248 (A) | - |
| | | | | 75 | (B) | 761280 (A) | - |
| | | | | 112.5 | (B) | 761152 (A) | - |
| | | | | 150 | (B) | 761184 (A) | - |
| | | | | 225 | (B) | 761216 (A) | - |
| HUP | 12000 | 480Y/277 | - | 225 | (B) | - (A) | - |
| | | | | 300 | (B) | - (A) | - |
| | | | | 500 | - | - | - |
| HMP | 12000 | 480Y/277 THREE-PHASE 3 OR 4 WIRE | EXTERNALLY FUSED | 75 | (B) | 761136 (A) | - |
| | | | | 225 | (B) | 760560 (G) | - |
| | | | | 300 | (B) | 760480 | - |
| | | | | 500 | (B) | 760512 | - |
| | | | | 750 | (B) | 760544 | - |
| | | | | 1000 | (B) | 760576 | - |
| | | | | 1500 | (B) | 760416 | - |
| | | | | 2500 | (B) | 760448 | HMP1.5 |
| HOP | 12000 | 4160Y/2400 | - | 1500 | (B) | 760464 | HMP2.0 |
| | | | | 2500 | (B) | 760468 | HMP2.5 |
| HPP | 12000 | 2400/4160Y/ 2400 THREE-PHASE 3 OR 4 WIRE | EXTERNALLY FUSED | 500 | (B) | - (A) | - |
| | | | | 150 | (B) | 760800 (G) | - |
| | | | | 225 | (B) | 760832 (G) | - |
| | | | | 300 | (B) | 760864 (G) | - |
| | | | | 500 | (B) | 760896 | - |
| | | | | 750 | (B) | 760928 (G) | - |
| | | | | 1000 | (B) | 760768 (G) | - |
| | | | | 1500 | (B) | 760816 | HPP1.5 |
| | | | | 2000 | (B) | 760824 | HPP2.0 |
| 2500 | (B) | 760828 | HPP2.5 | | | | |
| HSV | 12000 | 7200/2400 | - | 10 | - | 760960 (A) | - |
| | | | | 15 | - | 760992 (A) | - |
| | | | | 25 | - | 761024 (A) | - |
| | | | | 50 | - | 761056 (A) | - |
| | | | | 75 | - | 761088 (A) | - |

FOR FIELD MAINTENANCE ONLY

| | | |
|---|--|----------|
| DATE 7-21-99 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS | 3799.209 |
| | TRANSFORMER PREFIXES PAD-MOUNTED LIVE FRONT/THREE-PHASE | |

SINGLE PHASE STREET LIGHT:

| PREFIX | VOLTAGE | | DESCRIPTION | KVA | TAPS | STOCK NUMBER |
|--------|---------|-------------------------------|-------------|-----|------|--------------|
| | PRIMARY | SECONDARY | | | | |
| HAS | 12000 | 208Y/120 3 ϕ - 4 WIRE | - | 750 | (B) | 764200 (G) |

INSTALLATION:

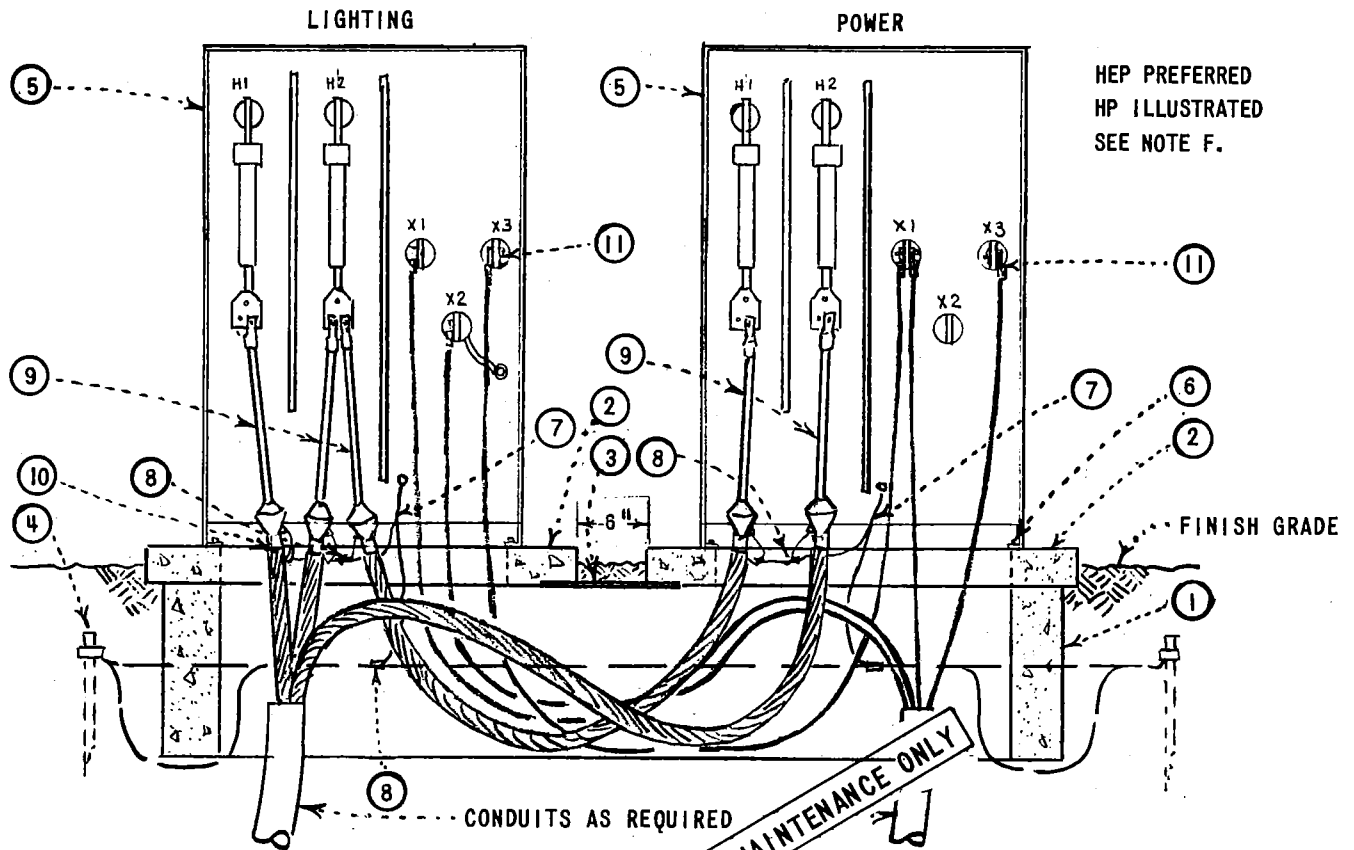
- (A) NO LONGER PURCHASED.
- (B) TWO 2 1/2% TAPS ABOVE AND BELOW
- (C) TAPS 1-10%.
- (D) BAY-O-NET FUSES MUST BE RESIZED WHEN TRANSFORMER IS CUT FROM 4 TO 12KV.
- (G) SPECIAL ORDER (MAY REQUIRE 20 WEEKS LEAD TIME TO RECEIVE ITEMS).
- (H) FOUR 2 1/2% TAPS BELOW.

REFERENCE:

- (I) SEE STANDARD 4311 FOR FUSING.
- J. FOR SINGLE AND THREE-PHASE POLE-MOUNTED, STREET LIGHT AND SUBSTATION TRANSFORMER, SEE OVERHEAD STANDARDS BOOK.

FOR FIELD MAINTENANCE ONLY

| | | |
|----------|---|--------------------------------|
| 3799.210 | SDG&E ELECTRIC STANDARDS | DATE 1-1-93 APPD <i>JLB</i> |
| | TRANSFORMER PREFIXES SUBSURFACE/SINGLE PHASE AND THREE PHASE | |



HEP PREFERRED
HP ILLUSTRATED
SEE NOTE F.

| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR STD. PAGE |
|------|--|----------|------------------------|
| 1 | HANDHOLE, 14" X 14" X 66" | 1 | 162660, 3311 |
| 2 | CONCRETE PAD, 1φ | 2 | 514240, 3421 |
| 3 | FLOOR PLATE, 3/8" GALV., 12" X 24" | 1 | - |
| 4 | PAD GROUNDING | 1 | 3407 |
| 5 | TRANSFORMER HEP, HP, HEQ OR HQ (SEE NOTE F) | 2 | 3702 |
| 9 | TRANSFORMER HOLD DOWN | 4 | - |
| 7 | CONCENTRIC NEUTRAL TAIL | AS REQ'D | - |
| 8 | CONNECTOR, COMPRESSION (GROUND CONNECTION) | 4 | 257792 |
| 9 | INDOOR TERMINATIONS | 5 | 4171, 4121 |
| 10 | PHASE AND ROUTE IDENTIFICATION TAGS | AS REQ'D | 3231 |
| 11 | SECONDARY CONNECTIONS | 8 | 4171, 4168 |
| 12 | COMPANY LOCK, (CORBIN #27) FF KEY, (NOT SHOWN ABOVE) | 2 | 514848 |

NOTES:

- A. ON POWER TRANSFORMER REMOVE SECONDARY GROUND STRAP. ATTACH GROUND TO LIGHTING TRANSFORMER.
- B. LEAVE 6" BETWEEN TRANSFORMER PAD, INSERT ITEM 3 PRIOR TO SETTING PADS.
- C. PAD NUMBERING, 3211.
- D. TRANSFORMER IDENTIFICATION, 3212.
- E. TRANSFORMER ENCLOSURE 'WARNING SIGN', 3221.
- F. HEP TRANSFORMERS ARE PREFERRED FOR THIS APPLICATION. HP TO BE USED ONLY WHEN HEP TRANSFORMERS ARE UNAVAILABLE.
- G. HEQ OR HQ TRANSFORMERS TO BE USED ONLY WITH APPROVAL OF THE DISTRIBUTION ENGINEER.

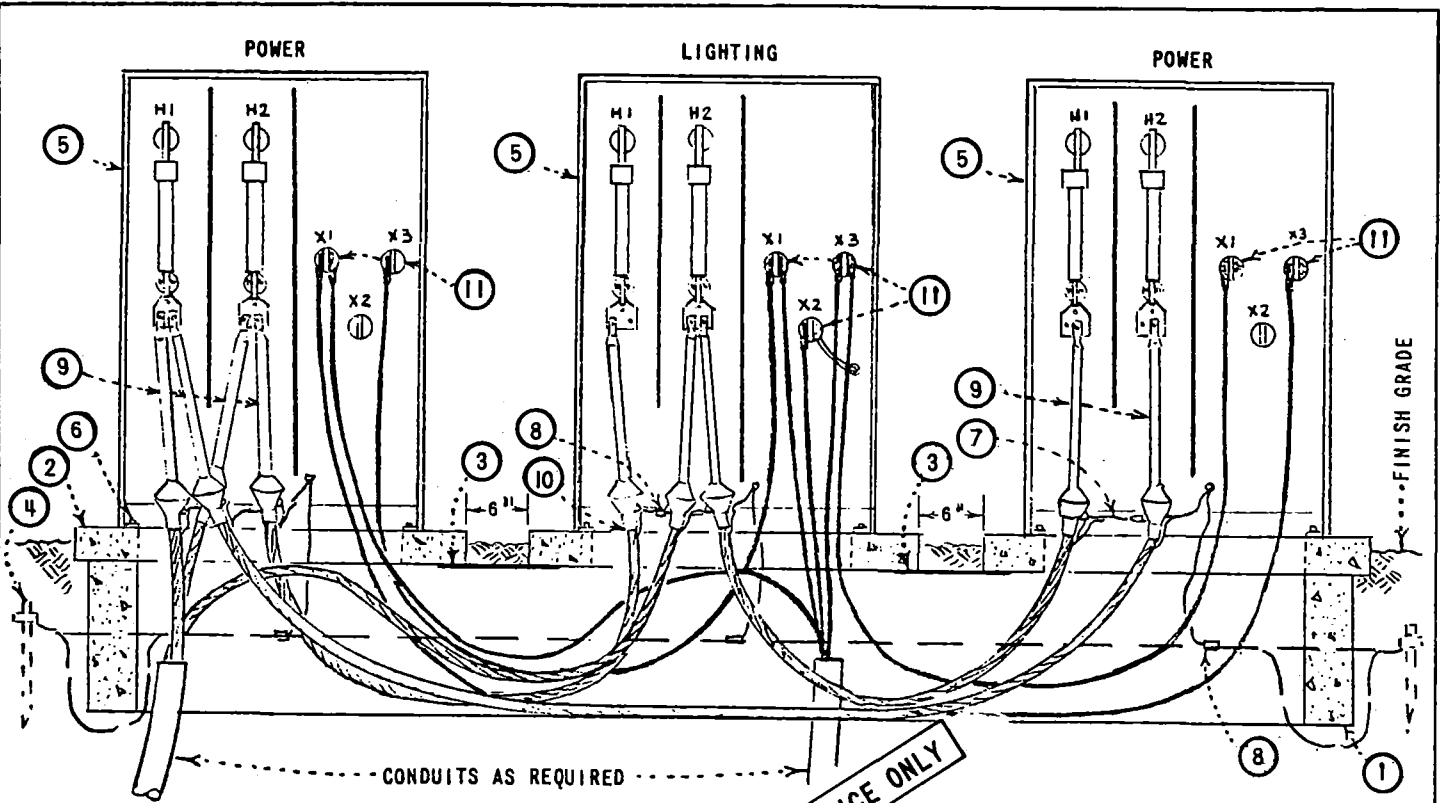
SDG&E ELECTRIC STANDARDS

2-12KV PADMOUNTED TRANSFORMERS
FOR OPEN DELTA BANKS

3799.301

DATE 3-15-82

APPD *ARH*



| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR STD. PAGE |
|------|--|----------|------------------------|
| 1 | HANDHOLE, 14" X 14" X 108" | 1 | 162862, 3311 |
| 2 | CONCRETE PAD, 1 ⁰ | 3 | 514240, 3421 |
| 3 | FLOOR PLATE, 3/8" GALV., 12" X 24" | 2 | - |
| 4 | PAD GROUNDING | 1 | 3407 |
| 5 | TRANSFORMER (HP OR HQ) | 3 | 3702 |
| 6 | TRANSFORMER HOLD DOWN | 6 | - |
| 7 | CONCENTRIC NEUTRAL TAILS | AS REQ'D | - |
| 8 | CONNECTOR, COMPRESSION (GROUND CONNECTION) | 4 | 257792 |
| 9 | INDOOR TERMINATIONS | 9 | 4171, 4121 |
| 10 | PHASE AND ROUTE IDENTIFICATION TAGS | AS REQ'D | 3231 |
| 11 | SECONDARY CONNECTIONS | 10 | 4171, 4168 |
| 12 | COMPANY LOCK, (CORBIN #27) FF KEY, (NOT SHOWN ABOVE) | 3 | 514848 |

NOTES:

- A. ON POWER TRANSFORMERS REMOVE SECONDARY GROUND STRAPS. ATTACH GROUND TO LIGHTING TRANSFORMER.
- B. LEAVE 6" BETWEEN EACH TRANSFORMER PAD, INSERT ITEM 3 AT BOTH LOCATIONS JUST PRIOR TO SETTING PADS.
- C. PAD NUMBERING, 3211.
- D. TRANSFORMER IDENTIFICATION, 3212.
- E. TRANSFORMER ENCLOSURE 'WARNING SIGN', 3221.

3799.302

SDG&E ELECTRIC STANDARDS

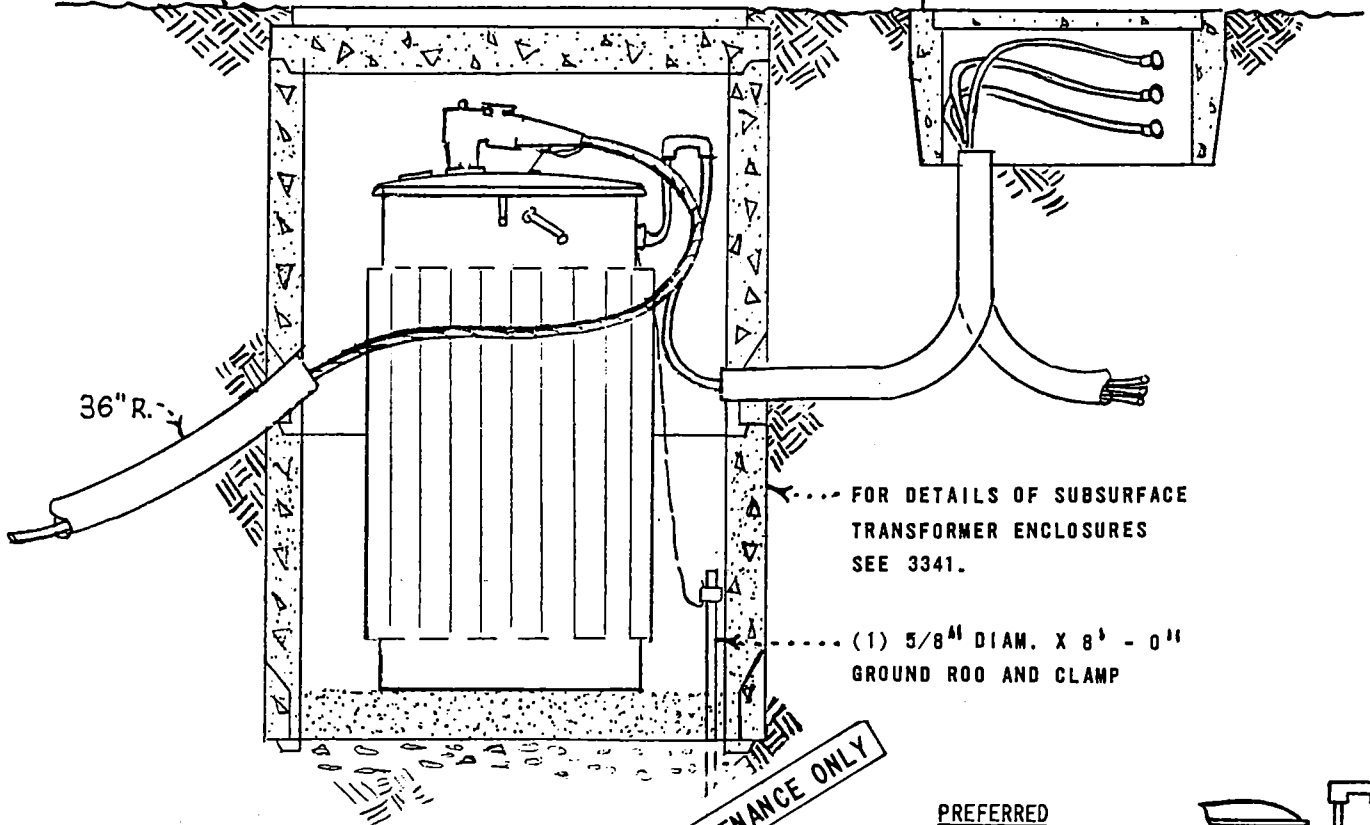
3-12KV PADMOUNTED TRANSFORMERS
FOR CLOSED DELTA BANKS

DATE 3-15-82

APPD *ARH*

FINISH GRADE

SEE 4174 FOR DETAILS OF SECONDARY JUNCTION BOX



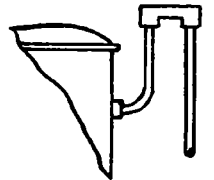
FOR DETAILS OF SUBSURFACE TRANSFORMER ENCLOSURES SEE 3341.

(1) 5/8" DIAM. X 8'-0" GROUND ROD AND CLAMP

FOR FIELD MAINTENANCE ONLY

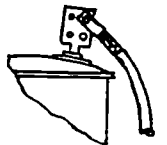
PREFERRED

SECONDARY CONNECTION WHEN 1 FOOT CABLE LEADS OR STUD IS FURNISHED

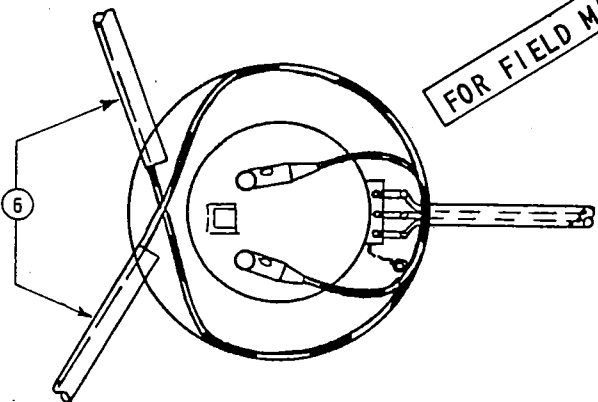


ALTERNATE

USE A HEAT SHRINK SLEEVE ON COMPRESSION CONNECTOR AND TAPE SPADE FOR COMPLETE INSULATION OF SECONDARY CONNECTION



ALTERNATE SECONDARY CONNECTION WHEN NEMA SPADE IS USED ON TRANSFORMER



NOTES:

- 1 SECONDARY CONNECTION USING 2 POSITION URD MOLE, COMPRESSION CONNECTOR AND HEAT SHRINKABLE TUBING. SEE 4173.
- 2 REFER TO 3799.403 WHERE MULTIPLE PHASES ARE INSTALLED.
- 3 REFER TO 4196 FOR SPLICES.
- 4 ENCLOSURE NUMBERING, SEE
- 5 THIS INSTALLATION IS LIMITED TO #2 AWG PRIMARY CONDUCTORS.
- ⑥ SKETCH ILLUSTRATES CABLING ORIENTATION FOR 'YIS' AND 'YES'.

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

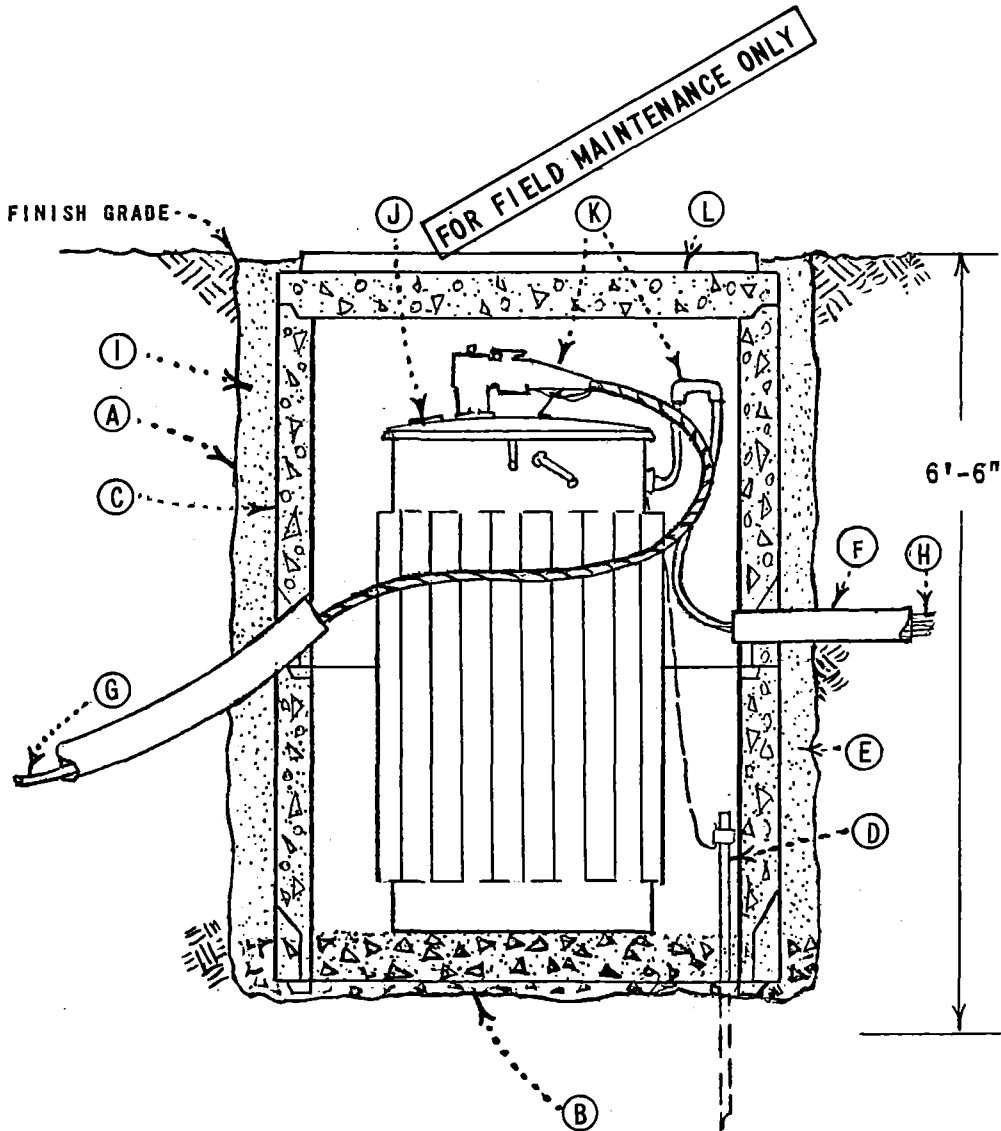
SUBSURFACE TRANSFORMER AND ENCLOSURE INSTALLATION, SINGLE PHASE, TYPE "WS", "WSV", "WUS", "YSV", "YIS", "YES" OR "HSS"

3799.401

APPD *J.W.K.*
DATE 4-16-76

INSTALLATION OF SUBSURFACE TRANSFORMER ENCLOSURE PROCEDURE

- (A) EXCAVATE HOLE 60" IN DIAMETER BY 6' - 6" DEEP.
- (B) PLACE 6" OF TAMPED GRAVEL IN BOTTOM OF HOLE FOR DRAINAGE.
- (C) PLACE SHAFTS IN CENTER OF EXCAVATION.
- (D) INSTALL 1 - 5/8" DIAMETER BY 8' - 0" GROUND ROD AND CLAMP WITH SUFFICIENT #2 COPPER WIRE TO CLEAR OPENING.
- (E) BACKFILL WITH USABLE SPOIL OR SAND OUTSIDE SHAFT TO A POINT JUST BELOW CONDUIT OPENING ENTRY INTO ENCLOSURE.
- (F) INSTALL DUCTS AS REQUIRED.
- (G) PULL PRIMARY CABLE, BEND BACK FOR TRANSFORMER ENTRY. ALLOW 10' INSIDE SHAFT FOR TRAINING AND TERMINATING.
- (H) PULL SECONDARY CABLES, ALLOW SUFFICIENT CABLE FOR TRAINING AND TERMINATING.
- (I) COMPLETE BACK FILL WITH USABLE SPOIL OR SAND OUTSIDE ENCLOSURE TO JUST BELOW FINISHED GRADE.
- (J) INSERT TRANSFORMER.
- (K) MAKE PRIMARY AND SECONDARY CONNECTIONS.
- (L) REFER TO 3341 FOR SUBSURFACE EQUIPMENT ENCLOSURE FOR PROPER COMPONENT PARTS.



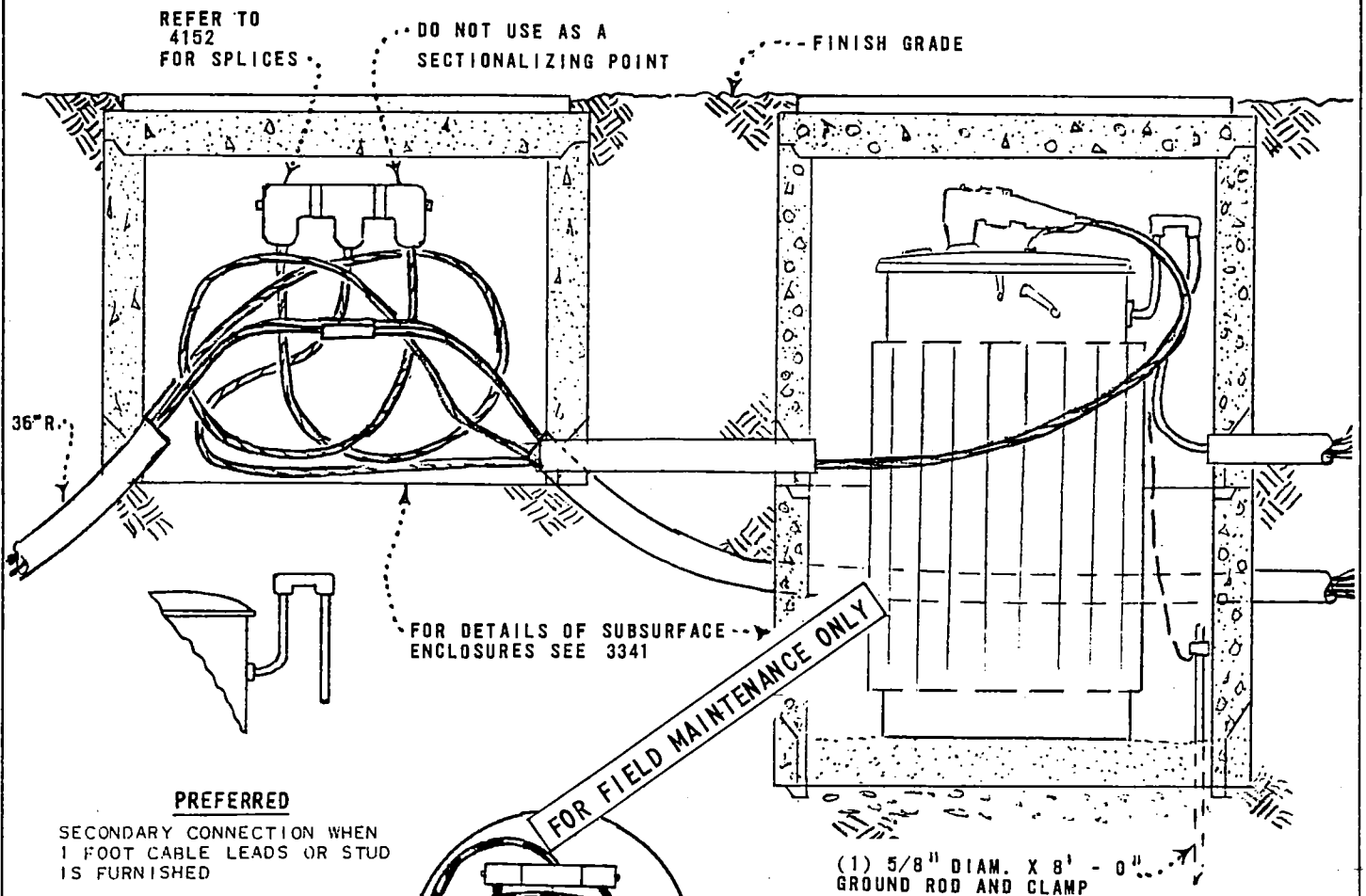
SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

3799.402

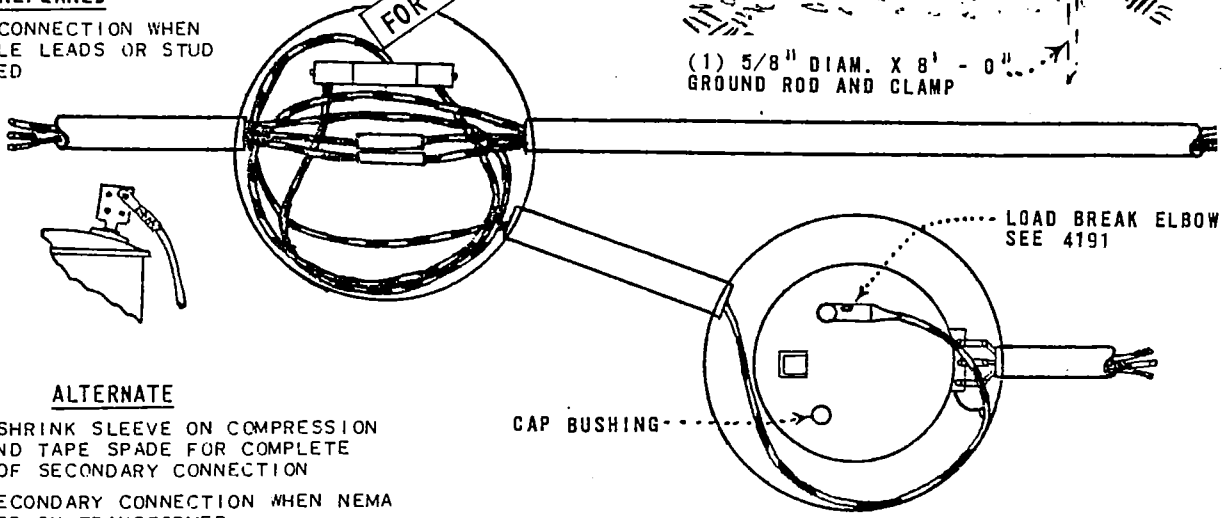
SUBSURFACE TRANSFORMER AND ENCLOSURE INSTALLATION,
SINGLE PHASE, TYPE "WS", "WSV", "WUS", "YSV", "YIS", "YES"
OR "HSS"

DATE 4-16-76

APPD *JWK*



PREFERRED
 SECONDARY CONNECTION WHEN
 1 FOOT CABLE LEADS OR STUD
 IS FURNISHED



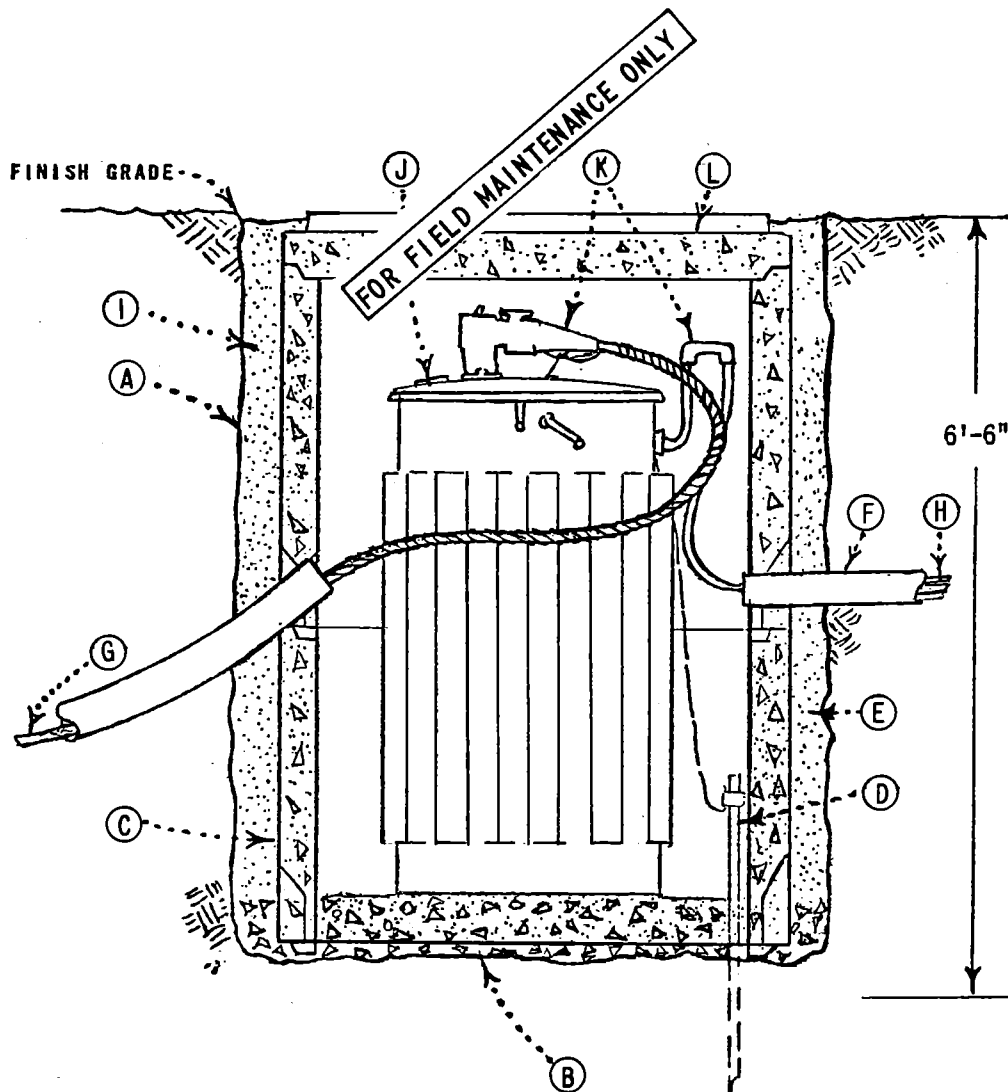
ALTERNATE
 USE A HEAT SHRINK SLEEVE ON COMPRESSION
 CONNECTOR AND TAPE SPADE FOR COMPLETE
 INSULATION OF SECONDARY CONNECTION
 ALTERNATE SECONDARY CONNECTION WHEN NEMA
 SPADE IS USED ON TRANSFORMER

NOTES:

- 1 SECONDARY CONNECTION USING 2 POSITION URD MOLE, COMPRESSION CONNECTOR AND HEAT SHRINKABLE TUBING. SEE 4173.
- 2 REFER TO 3799.401 WHERE SINGLE PHASE IS INSTALLED.
- 3 REFER TO 4196 FOR SPLICES.
- 4 ENCLOSURE NUMBERING, SEE 3211.
- 5 THIS INSTALLATION IS LIMITED TO #2 AWG PRIMARY CONDUCTORS.

INSTALLATION OF SUBSURFACE TRANSFORMER ENCLOSURE PROCEDURE

- (A) EXCAVATE HOLE 60" IN DIAMETER BY 6' - 6" DEEP.
- (B) PLACE 6" OF TAMPED GRAVEL IN BOTTOM OF HOLE FOR DRAINAGE.
- (C) PLACE SHAFTS IN CENTER OF EXCAVATION.
- (D) INSTALL 1 - 5/8" DIAMETER X 8' - 0" GROUND ROD AND CLAMP WITH SUFFICIENT #2 COPPER TO CLEAR OPENING.
- (E) BACKFILL WITH USABLE SPOIL OR SAND OUTSIDE SHAFT TO A POINT JUST BELOW CONDUIT ENTRY INTO ENCLOSURE.
- (F) INSTALL DUCTS AS REQUIRED.
- (G) PULL PRIMARY CABLE, BEND BACK FOR TRANSFORMER ENTRY. ALLOW 10' INSIDE SHAFT FOR TRAINING AND TERMINATING.
- (H) PULL SECONDARY CABLES, ALLOW SUFFICIENT CABLE FOR TRAINING AND TERMINATING.
- (I) COMPLETE BACKFILL WITH USABLE SPOIL OR SAND OUTSIDE SHAFT TO JUST BELOW FINISHED GRADE.
- (J) INSERT TRANSFORMER.
- (K) MAKE PRIMARY AND SECONDARY CONNECTIONS.
- (L) REFER TO 3344 FOR SUBSURFACE EQUIPMENT ENCLOSURE FOR PROPER COMPONENT PARTS.



SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

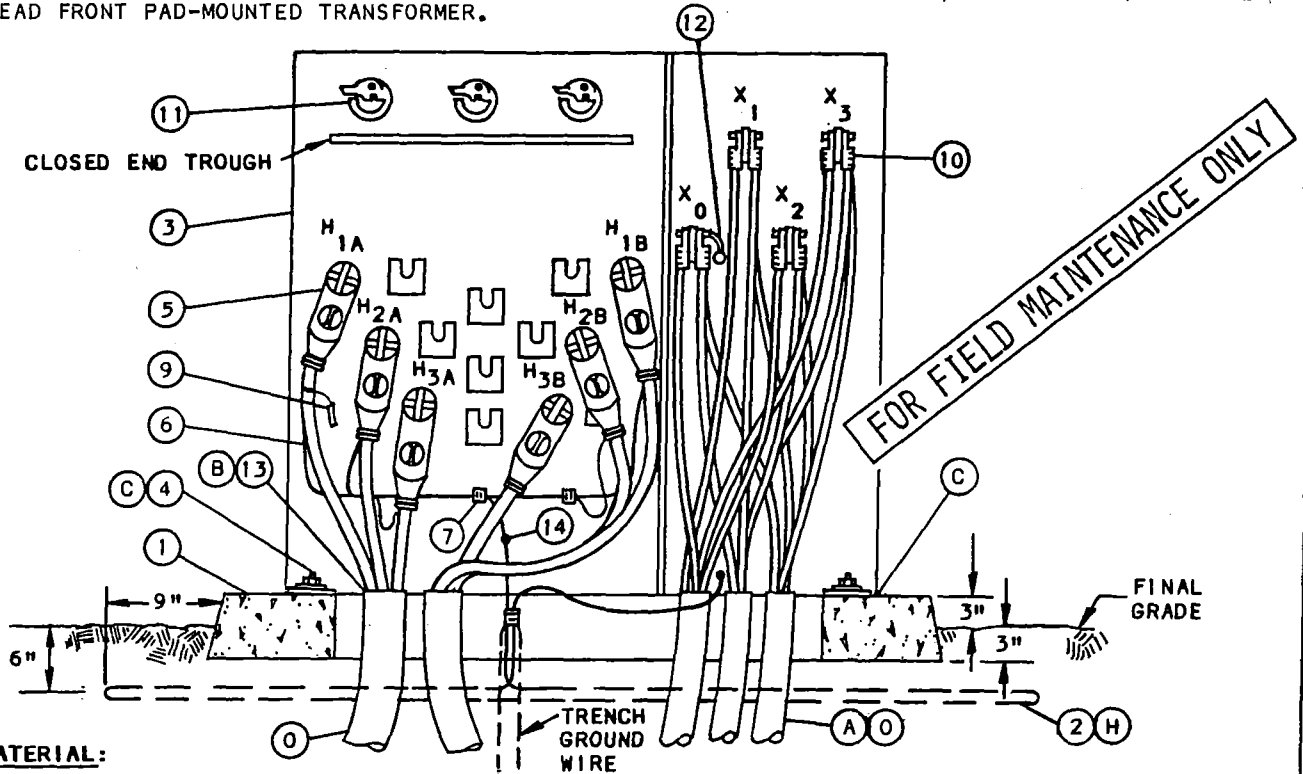
3799.404

SUBSURFACE TRANSFORMER AND ENCLOSURE INSTALLATION,
MULTIPLE PHASES, TYPE "YIS" OR "YES"

DATE 4-16-76

APPD *J.W.K.*

SCOPE: THIS STANDARD SHOWS THE CONNECTION USED FOR INSTALLING THREE-PHASE, 12KV RADIAL/LOOP FEED DEAD FRONT PAD-MOUNTED TRANSFORMER.



BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PG NO | STOCK NUMBER |
|------|--|----------|--------------------|--------------|
| 1 | PAD, TRANSFORMER, 3Ø | 1 | 3425, 3426, 3427 | - |
| 2 | PAD GROUNDING EQUIPMENT (H) | 1 | 3407 | - |
| 3 | TRANSFORMER, (THRU 1000 KVA) (F) | 1 | 3702 | - |
| 4 | HOLD DOWN DEVICE - (SUPPLIED WITH CABINET) | 2 | - | - |
| 5 | ELBOW, LOADBREAK, 12KV (WITH WHITE-BLACK-WHITE BAND) | 6 | 4191 | - |
| 6 | CONCENTRIC NEUTRAL TAILS | - | - | - |
| 7 | CONNECTOR, COMPRESSION | AS REQ'D | 4172 | - |
| 8 | KEYLESS LOCK, (NOT SHOWN ABOVE) (G) | 1 | - | 468010 (E) |
| 9 | CABLE IDENTIFICATION TAGS | AS REQ'D | 3202 | - |
| 10 | SECONDARY CONNECTIONS | AS REQ'D | 4168, 4171 | - |
| 11 | FUSE, "BAY-O-NET" (T) | 3 | 4311 | - |
| 12 | NEUTRAL GROUND STRAP (ON TRANSFORMER) | 1 | - | - |
| 13 | AQUA-SEAL OR EQUIVALENT | AS REQ'D | - | 442976 (E) |
| 14 | SERVICE POST CONNECTOR | 2 | - | 262560 (E) |

INSTALLATION:

- (A) THIS INSTALLATION USES 6 SINGLE CONDUCTOR #2 OR 2/0 PRIMARY CABLES.
- (B) TERMINATE PRIMARY AND SECONDARY CONDUITS FLUSH WITH TOP OF PAD. SEAL SECONDARY AND PRIMARY CONDUITS WITH AQUA-SEAL OR EQUIVALENT. SEAL SERVICE LATERAL CONDUITS PER STANDARD 3948 (G.O. 128 RULE 31.6).

SDG&E ELECTRIC STANDARDS

DATE 1-1-87
APPD JLB/IRJ

THREE-PHASE, 12KV, TYPE "HZL", "HAL", "HML" OR "HNL"
LOOP FEED, DEAD FRONT, PAD-MOUNTED TRANSFORMER INSTALLATION

3799.501

- Ⓒ TRANSFORMER SHALL BE SOLIDLY SECURED TO PAD TO PREVENT UNAUTHORIZED MOVEMENT OR ENTRY THE BASE SHALL BE CAULKED WHEN NECESSARY TO PREVENT WIRE ENTRY.
- Ⓔ EXEMPT MATERIAL.
- Ⓕ TRANSFORMER RATING AND SIZE PER WORK ORDER.
- Ⓖ KEYLESS LOCK (ITEM 8) TO BE ATTACHED TO LATCHING MECHANISM ON TRANSFORMER AFTER PENTAHEAD BOLT IS THREADED IN COMPLETELY.
- Ⓕ USE PREFERRED GROUNDING SHOWN IN SKETCH WHEN A SYSTEM NEUTRAL FROM A SUBSTATION OR GROUNDING BANK IS PRESENT, OTHERWISE USE PREFERRED II GROUNDING METHOD SHOWN ON PAGE 4512.1.

REFERENCE:

- I. SEE STANDARD 3202 FOR CABLE IDENTIFICATION.
- J. SEE STANDARD 3211 FOR PAD IDENTIFICATION.
- K. SEE STANDARD 3212 FOR TRANSFORMER IDENTIFICATION.
- L. SEE STANDARD 3221 FOR HIGH VOLTAGE DECAL.
- M. SEE STANDARD 3407 FOR PAD GROUNDING OR GROUNDING TELCO CONDUCTORS.
- N. SEE STANDARD 3408 FOR WIRE ENTRY PREVENTION.
- ⓪ SEE STANDARD 3425, 3426 OR 3427 FOR PAD, HANDHOLE AND CONDUIT PLACEMENT.
- P. SEE STANDARD 3481 FOR BARRIER PROTECTION.
- Q. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- R. SEE STANDARD 3487 FOR RETAINING WALL REQUIREMENTS.
- S. SEE STANDARD 3702 FOR TRANSFORMER PREFIXES.
- Ⓣ SEE STANDARD 3704 FOR "BAY-O-NET" FUSE OPERATING INSTRUCTIONS.
- U. SEE STANDARD 3948 FOR SEALING SERVICE LATERAL CONDUITS.

FOR FIELD MAINTENANCE ONLY

3799.502

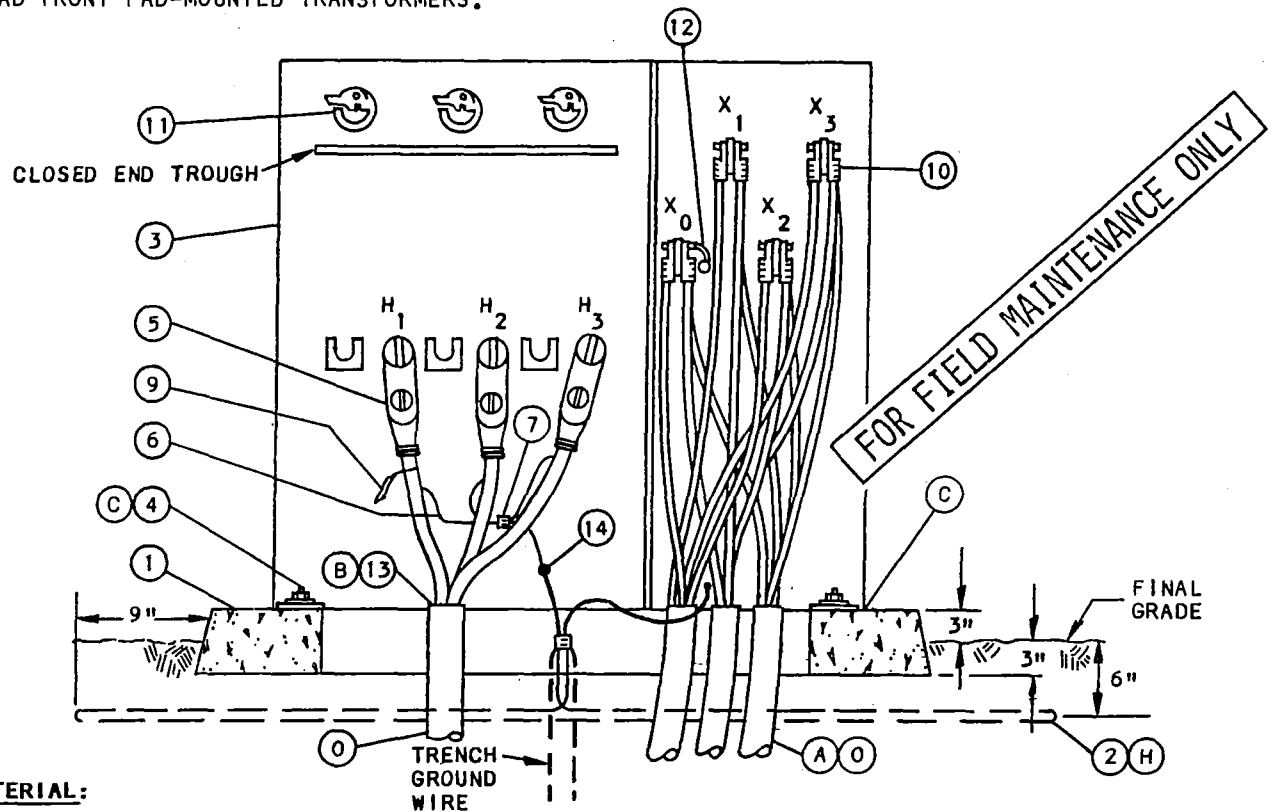
SDG&E ELECTRIC STANDARDS

THREE-PHASE, 12KV, TYPE "HZL", "HAL", "HML" OR "HNL"
LOOP FEED, DEAD FRONT, PAD-MOUNTED TRANSFORMER INSTALLATION

DATE 1-1-87

APPD *JLB/RD*

SCOPE: THIS STANDARD SHOWS THE CONNECTION USED FOR INSTALLING THREE-PHASE, 12KV RADIAL FEED DEAD FRONT PAD-MOUNTED TRANSFORMERS.



BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PG NO | STOCK NUMBER |
|------|--|----------|--------------------|--------------|
| 1 | PAD, TRANSFORMER, 3Ø | 1 | 3425, 3426, 3427 | - |
| 2 | PAD GROUNDING EQUIPMENT (H) | 1 | 3407 | - |
| 3 | TRANSFORMER, (THRU 1000 KVA) (F) | 1 | 3702 | - |
| 4 | HOLD DOWN DEVICE - (SUPPLIED WITH CABINET) | 2 | - | - |
| 5 | ELBOW, LOADBREAK, 12KV (WITH WHITE-BLACK-WHITE BAND) | 3 | 4191 | - |
| 6 | CONCENTRIC NEUTRAL TAILS | 3 | - | - |
| 7 | CONNECTOR, COMPRESSION | AS REQ'D | 4172 | - |
| 8 | KEYLESS LOCK, (NOT SHOWN ABOVE) (G) | 1 | - | 468010 (E) |
| 9 | CABLE IDENTIFICATION TAGS | AS REQ'D | 3202 | - |
| 10 | SECONDARY CONNECTIONS | AS REQ'D | 4171 | - |
| 11 | FUSE, "BAY-O-NET" (T) | 3 | 4311 | - |
| 12 | NEUTRAL GROUND STRAP (ON TRANSFORMER) | 1 | - | - |
| 13 | AQUA-SEAL OR EQUIVALENT | AS REQ'D | - | 442976 (E) |
| 14 | SERVICE POST CONNECTOR | 2 | - | 262560 (E) |

INSTALLATION:

- (A) THIS INSTALLATION USES 3 SINGLE PHASE #2 OR 2/0 PRIMARY CABLES.
- (B) TERMINATE PRIMARY AND SECONDARY CONDUITS FLUSH WITH TOP OF PAD. SEAL SECONDARY AND PRIMARY CONDUITS WITH AQUA-SEAL OR EQUIVALENT. SEAL SERVICE LATERAL CONDUITS PER STANDARD 3948 (G.O. 128 RULE 31.6).

- Ⓒ TRANSFORMER SHALL BE SOLIDLY SECURED TO PAD TO PREVENT UNAUTHORIZED MOVEMENT OR ENTRY. THE BASE SHALL BE CHECKED AND WHEN NECESSARY CAULK TO PREVENT WIRE ENTRY.
- Ⓔ EXEMPT MATERIAL.
- Ⓕ TRANSFORMER RATING AND SIZE PER WORK ORDER.
- Ⓖ KEYLESS LOCK (ITEM 8) TO BE ATTACHED TO LATCHING MECHANISM ON TRANSFORMER AFTER PENTAHEAD BOLT IS THREADED IN COMPLETELY.
- Ⓗ USE PREFERRED GROUNDING SHOWN IN SKETCH WHEN A SYSTEM NEUTRAL FROM A SUBSTATION OR GROUNDING BANK IS PRESENT, OTHERWISE USE PREFERRED II GROUNDING METHOD SHOWN ON PAGE 4512.1.

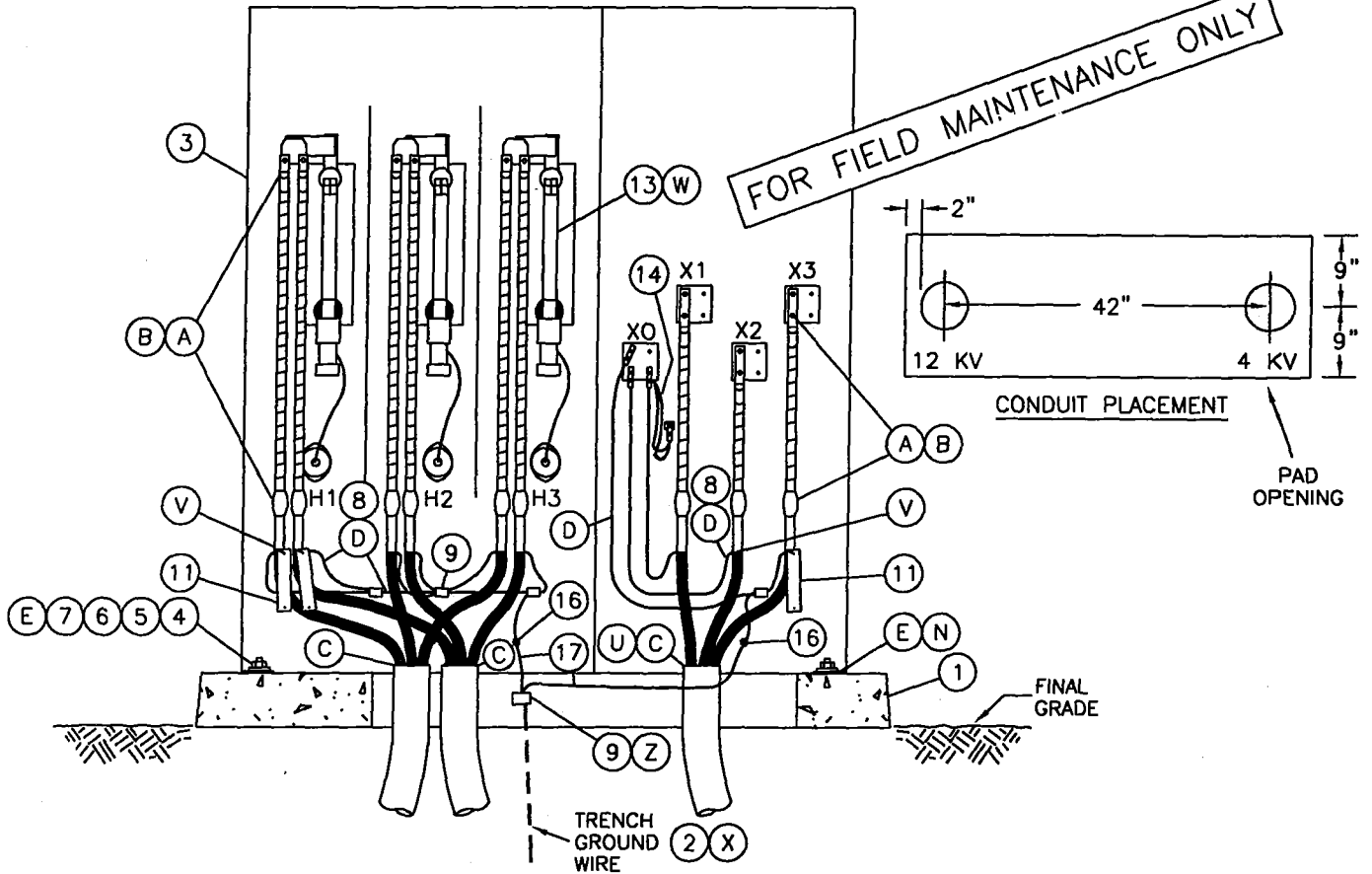
REFERENCE:

- I. SEE STANDARD 3202 FOR CABLE IDENTIFICATION.
- J. SEE STANDARD 3211 FOR PAD IDENTIFICATION.
- K. SEE STANDARD 3212 FOR TRANSFORMER IDENTIFICATION.
- L. SEE STANDARD 3221 FOR HIGH VOLTAGE DECAL.
- M. SEE STANDARD 3407 FOR PAD GROUNDING OR GROUNDING TELCO CONDUCTORS.
- N. SEE STANDARD 3408 FOR WIRE ENTRY PREVENTION.
- ⓪ SEE STANDARD 3425, 3426 OR 3427 FOR PAD, HANDHOLE AND CONDUIT PLACEMENT.
- P. SEE STANDARD 3481 FOR BARRIER PROTECTION.
- Q. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- R. SEE STANDARD 3487 FOR RETAINING WALL REQUIREMENTS.
- S. SEE STANDARD 3702 FOR TRANSFORMER PREFIXES.
- Ⓣ SEE STANDARD 3704 FOR "BAY-O-NET" FUSE OPERATING INSTRUCTIONS.
- U. SEE STANDARD 3948 FOR SEALING SERVICE LATERAL CONDUITS.

FOR FIELD MAINTENANCE ONLY

| | | |
|--|---|---|
| 3799.504 SUPERCEDES 3752.2 (1-1-86) | SDG&E ELECTRIC STANDARDS THREE-PHASE, 12KV, TYPE "PZR", "HZR" OR HKR" RADIAL FEED, DEAD FRONT, PAD-MOUNTED TRANSFORMER INSTALLATION | DATE 1-1-87 APPD <i>JLB/RDT</i> |
|--|---|---|

SCOPE: THIS STANDARD SHOWS THE METHOD OF INSTALLING A THREE-PHASE, STEP-DOWN TYPE "HPP" RADIAL/LOOP FEED LIVE FRONT PAD-MOUNTED TRANSFORMER.



BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST. STD. OR PG. NO. | STOCK NUMBER | ASSEMBLY UNITS |
|------|--|----------|------------------------|--------------|----------------|
| 1 | PAD, TRANSFORMER, THREE-PHASE | 1 | 3427 | 514012 | 3427B0 |
| 2 | TRENCH GROUNDING WIRE (X) | AS REQ'D | 4510 | - | GP-T/W |
| 3 | TRANSFORMER, (1500 THRU 2500 KVA) (E)(T) | 1 | 3702 | - | - |
| 4 | HOLD DOWN DEVICE - (SUPPLIED WITH CABINET) | 2 | - | - | - |
| 5 | NUT, CLAMPING CHANNEL | 2 | - | 503520 | - |
| 6 | SCREW, HEX HEAD CAP, BRONZE, 1/2" | 2 | - | 616192 | - |
| 7 | WASHER, FLAT, ROUND, BRONZE, 1/2" | 2 | - | 799488 | - |
| 8 | CONCENTRIC NEUTRAL TAILS (D) | - | 4172.1 | - | - |
| 9 | CONNECTOR, COMPRESSION | AS REQ'D | 4172 | - | - |
| 10 | KEYLESS LOCK (NOT SHOWN) (G) | 1 | - | 468010 | - |
| 11 | CABLE IDENTIFICATION TAGS | AS REQ'D | 3202 | - | - |
| 12 | PRIMARY CONNECTIONS (B) | - | 4121 | - | - |
| 13 | FUSE, SML-4 (SUPPLIED WITH TRANS) (W) | 3 | 4311 | - | - |
| 14 | NEUTRAL GROUND STRAP (ON TRANSFORMER) | 1 | - | - | - |
| 15 | SEALING COMPOUND (C) | AS REQ'D | - | 442976 | - |
| 16 | SERVICE POST CONNECTOR | 2 | - | 262560 | - |
| 17 | WIRE, BARE STRANDED COPPER, #2 | AS REQ'D | - | 812816 | GDWIRE |

SDG&E ELECTRIC STANDARDS

DATE 8-5-99
 APPD *[Signature]*

THREE-PHASE STEP-DOWN, TYPE "HPP", RADIAL/LOOP;
 LIVE FRONT, PAD-MOUNTED TRANSFORMER INSTALLATION

3799.505
 SUPERSEDES
 3756.1 (1-1-98)

INSTALLATION:

- (A) THIS INSTALLATION USES FROM 3 TO 6 SINGLE-PHASE CONDUCTOR #2 OR 2/0 PRIMARY CABLES FOR THE 12KV SIDE AND 350, 750 OR 1000 KCMIL FOR THE 4KV SIDE.
- (B) TERMINATE PRIMARY CABLE AS SHOWN ON STD. 4121, INCREASE THE 14 INCH MEASUREMENT SHOWN ON STD. 4121 AS REQUIRED. THE PORTION OF CABLE DOWN TO AND INCLUDING THE STRESS RELIEF KIT SHOULD BE AS STRAIGHT AS POSSIBLE TO PREVENT ANY CONTAMINATION THAT MAY BUILD UP ON THE SHOCABLE.
- (C) TERMINATE CONDUITS FLUSH WITH TOP OF PAD. SEAL 12KV AND 4KV CONDUITS WITH SEALING COMPOUND SEAL SERVICE LATERAL CONDUITS PER STANDARD 3948 (G.O. 128 RULE 31.6).
- (D) CONCENTRIC NEUTRAL WIRE OR #2 PER PHASE FOR #2, #2/0 OR 350 KCMIL CABLE. CONCENTRIC NEUTRAL WIRE OR #1/0 PER PHASE FOR 750 OR 1000 KCMIL CABLE.
- (E) TRANSFORMER SHALL BE SOLIDLY SECURED TO PAD TO PREVENT UNAUTHORIZED MOVEMENT OR ENTRY. THE BASE SHALL BE CAULKED TO PREVENT MOISTURE AND WIRE ENTRY.
- (F) TRANSFORMER RATING AND SIZE PER WORK ORDER.
- (G) KEYLESS LOCK TO BE ATTACHED TO LATCHING MECHANISM ON TRANSFORMER AFTER PENTAHEAD BOLT IS THREADED IN COMPLETELY.

REFERENCE:

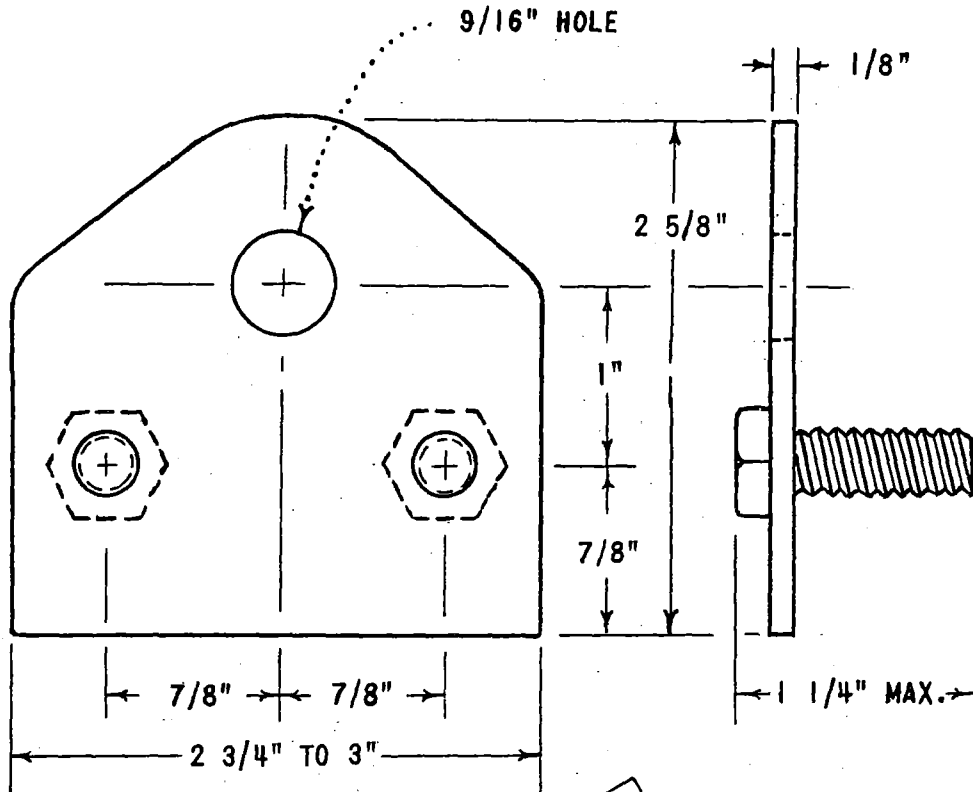
- K. SEE STANDARD 3202 FOR CABLE IDENTIFICATION.
- L. SEE STANDARD 3212 FOR TRANSFORMER IDENTIFICATION.
- M. SEE STANDARD 3221 FOR HIGH VOLTAGE DECAL.
- (N) SEE STANDARD 3408 FOR MOISTURE AND WIRE ENTRY PREVENTION.
- O. SEE STANDARD 3481 FOR BARRIER PROTECTION.
- P. SEE STANDARD 3483 FOR MINIMUM OPERATING AND CLEARANCE REQUIREMENTS (PAD PLACEMENT).
- Q. SEE STANDARD 3484 FOR PAD INSTALLATION OF PAD-MOUNTED EQUIPMENT.
- R. SEE STANDARD 3486 FOR RETAINING WALL REQUIREMENTS AND CLEARANCES FROM REVERSE SUBGRADE RETAINING WALLS.
- S. SEE STANDARD 3487 FOR RETAINING WALLS.
- (T) SEE STANDARD 3702 FOR TRANSFORMER PREFIXES.
- (U) SEE STANDARD 3948 FOR SEALING SERVICE LATERAL CONDUITS.
- (V) SEE STANDARD 4108 FOR CABLE TERMINATION INSTRUCTIONS.
- (W) SEE STANDARD 4311.5 FOR TRANSFORMER FUSING TABLES.
- (X) SEE STANDARD 4510 FOR (PREFERRED I) AND (ALTERNATE) TRENCH GROUND WIRE.
- Y. SEE STANDARD PAGE 4512.1 FOR (PREFERRED II) EQUIPMENT GROUNDING INSTALLATION.
- (Z) SEE STANDARD 4512.2 FOR EQUIPMENT GROUNDING.
- AA. SEE STANDARD 4514 FOR GROUNDING TELCO CONDUCTOR IN PAD-MOUNTED EQUIPMENT.

FOR FIELD MAINTENANCE ONLY

| | | |
|---|---|-----------------------------|
| 3799.506 SUPERSEDES 3756.2 (1-1-98) | SDG&E ELECTRIC STANDARDS THREE-PHASE STEP-DOWN, TYPE "HPP", RADIAL/LOOP, LIVE FRONT, PAD-MOUNTED TRANSFORMER INSTALLATION | DATE 8-5-99 APPD JLB/ROJ |
|---|---|-----------------------------|

MAJOR USE:

TO CONNECT TWO PRIMARY CABLES TO A SINGLE TRANSFORMER BUSHING.



FOR FIELD MAINTENANCE ONLY

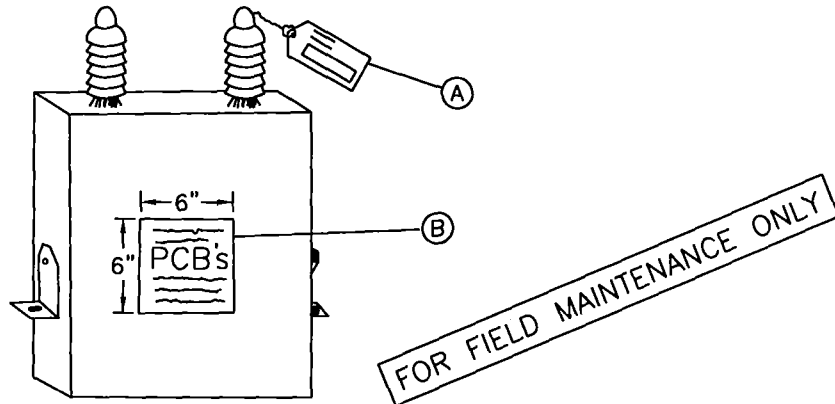
| |
|-----------|
| STOCK NO. |
| 541072 |

NOTES:

- A. ADAPTER PLATE TO BE TINNED COPPER.
- B. BOLTS TO BE 3/8" 16 THREADS PER INCH, THREADS SHALL BE CONTINUOUS TO ADAPTER PLATE CONTACT SURFACE.
- C. BOLTS TO BE BRAZED TO BACK OF PLATE.
- D. ADAPTER PLATE TO BE MOUNTED WITH 2-3/8" BOLTS IN LOWEST POSITION (DOWNWARD).

| | | |
|------------------------------------|--------------------------|----------|
| DATE 4-10-75 APPD <i>A.W.K.</i> | SDG&E ELECTRIC STANDARDS | 3799.901 |
| | TERMINAL ADAPTER PLATE | |

SCOPE: THIS STANDARD DESCRIBES CAPACITOR MARKING AND HANDLING PROCEDURES.



(A) CAPACITOR TAGS

THIS IDENTIFICATION TAG (SDG&E FORM 120-7240, STK. NO. 043450) IS USED FOR TRACKING THE CAPACITOR DURING REMOVAL/RETIREMENT AND INSTALLATION. IT SHALL BE USED ON ALL CAPACITORS, PCB UNITS AND NON-PCB UNITS.

EACH CAPACITOR UNIT IN STOCK WILL BE AFFIXED WITH A CAPACITOR IDENTIFICATION TAG BEFORE IT IS REMOVED FROM STOCK. THIS TAG IS TO BE COMPLETED BY THE FIELD PERSONNEL WHO EITHER REMOVES OR INSTALLS A CAPACITOR UNIT. ONE SIDE OF THIS TAG IS USED FOR REMOVAL AND THE OTHER FOR INSTALLATION.

1. INSTALLATION

THE DISTRICT STOCKKEEPER SHALL COMPLETE AS MUCH OF THE CAPACITOR TAG(S) AS POSSIBLE ON THE INSTALLATION SIDE OF THE TAG AND ATTACH TO THE SPECIFIC UNIT. WHEN THE INSTALLATION IS COMPLETED, THE CREW FOREMAN SHALL REMOVE THE TAG AND COMPLETE THE REQUESTED INFORMATION.

2. REPLACEMENT

WHEN A CAPACITOR UNIT IS REPLACING ONE THAT IS BEING REMOVED, THE FOREMAN SHALL FILL OUT BOTH SIDES OF THE TAG.

IF REMOVAL AND REPLACEMENT IS NOT COMPLETED WITHIN TWO CONSECUTIVE WORKDAYS, TWO FORMS ARE TO BE COMPLETED, ONE FOR A REMOVAL, AND ANOTHER FOR INSTALLATION.

IF REPLACEMENT IS DUE TO FAILURE OF ONE OR MORE UNITS, AN EQUIPMENT FAILURE REPORT IS REQUIRED.

3. REMOVAL

WHEN A CAPACITOR UNIT IS REMOVED, THE CREW FOREMAN SHALL COMPLETE THE REMOVAL PORTION ONLY. IF TAGS ARE NOT STORED ON THE TRUCKS, THE DISPATCHER SHALL PROVIDE THE CREW WITH SUFFICIENT TAGS FOR EACH CAPACITOR UNIT TO BE REMOVED.

~~OH 1399.001~~
UG 3899.001
SUPERSEDES
3802.1 (1-1-86)

SDG&E ELECTRIC STANDARDS

CAPACITOR MARKING INSTRUCTIONS
DECALS AND TAGS

DATE 1-1-2000
APPD PA/BDJ

4. RETIREMENT

WHEN A CAPACITOR UNIT IS RETIRED, THE RETIRED PORTION OF THE CAPACITOR TAG MUST BE FILLED OUT BY THE PERSONNEL RETIRING THE UNIT.

5. DISPOSITION

IT SHALL BE THE DISPATCHER'S RESPONSIBILITY TO SEE THAT THE COMPLETED TAGS ARE SENT TO THE DISTRICT'S RECORDS SECTION, ATTENTION OF THE ENGINEERING CLERK, WITHIN ONE WORKING DAY AFTER THE CAPACITOR UNITS HAVE BEEN INSTALLED OR REMOVED.

ⓑ DECAL

THIS DECAL (STOCK NO. 301880) IS TO BE PLACED ON ALL CAPACITOR UNITS WHICH CONTAIN PCB'S.

FIELD PERSONNEL AND STOCKKEEPERS SHOULD MAKE EVERY EFFORT TO INSURE THAT ALL PCB UNITS HAVE A DECAL, AND THAT ALL WORN, WEATHERED DECALS BE REPLACED WITH NEW DECALS. THE DECAL IS BLACK PRINT ON EITHER YELLOW OR WHITE BACKGROUND.

1. MARKING

EVERY CAPACITOR IN SERVICE OR IN STORAGE, WHICH USES AN INSULATING FLUID CONTAINING PCB'S, SHALL BE LABELED WITH THE DECAL (STOCK NO. 301880).

EVERY PCB CAPACITOR WHICH IS REMOVED FROM SERVICE AND DOES NOT HAVE THE DECAL (STOCK NO. 301880) SHALL HAVE THE DECAL PUT ON IT AT THE TIME IT IS REMOVED FROM SERVICE. THIS SHALL BE DONE BY THE WORK CREW THAT REMOVES THE UNIT. IF A PCB UNIT ARRIVES AT A STOREYARD WITH NO PCB DECAL, THE STOCKKEEPER SHALL PUT A DECAL ON.

NOTE: ALL CAPACITOR UNITS PURCHASED BEFORE 1977 USED AN INSULATING FLUID WHICH CONTAINED PCB'S. THE UNITS WITH THE PCB FLUIDS CAN BE IDENTIFIED BY THE WORDS "NON-FLAMMABLE LIQUID" ON NAMEPLATE OR BY THE MANUFACTURER'S TRADE NAMES WHICH ARE:

- G.E. - PYRANOL
- WESTINGHOUSE - INERTEEN
- MCGRAW-EDISON - ELEMEX
- CORNEL DUBILIER OR FEDERAL PACIFIC - DYKANOL
- SANGAMO - DIACHLOR
- ALLIS CHALMERS - CHLOREXTOL

FOR FIELD MAINTENANCE ONLY

ALL OF THE CAPACITOR UNITS RECEIVED THAT DO NOT CONTAIN PCB INSULATING FLUIDS HAVE THE WORDS "CONTAINS A NON-PCB INSULATING FLUID" ON THE NAMEPLATE OR ON A BLUE TANK DECAL.

2. HANDLING CAPACITORS CONTAINING POLYCHLORINATED BIPHENYLS (PCB)

CAPACITORS CONTAINING PCB SHALL BE HANDLED AS SPECIFIED IN THE PCB HANDLING AND PERSONAL SAFETY PROCEDURES. (SEE CONSTRUCTION MANAGEMENT STANDARD PRACTICE 107).

3. RETIRING RUPTURED OR DAMAGED UNITS

WHENEVER TRANSPORTATION OR KEARNY MAINTENANCE RETIRES A CAPACITOR AND DISPOSES OF IT, SPECIFIC DATA (I.E. SERIAL NUMBER, PCB OR NON-PCB, MANUFACTURER, SIZE, ETC.) MUST BE RECORDED ON THE CAPACITOR TAG AND SENT TO THE DISTRICT'S RECORDS SECTION, ATTENTION OF THE ENGINEERING CLERK.

| | | |
|--------------------------------------|---|--|
| DATE 1-1-2000 APPD <i>PA 1/07</i> | SDG&E ELECTRIC STANDARDS | OH 1399.002 |
| | CAPACITOR MARKING INSTRUCTIONS DECALS AND TAGS | UG 3899.002 SUPERSEDES 3802.2 (1-1-86) |

C. PRECAUTIONARY MEASURES - DAMAGED CAPACITOR UNITS

DAMAGED CAPACITOR UNITS WITH BULGED CASES MAY HAVE EXCESSIVE PRESSURE INSIDE. THE UNITS MAY RUPTURE WHEN HANDLED OR BUMPED. SINCE THE INSULATING LIQUID IN THE UNITS IS TOXIC, CARE SHALL BE EXERCISED WHEN WORKING WITH BULGED OR OTHERWISE DAMAGED UNITS. UNITS WITH BULGED OR DAMAGED CASES SHALL NOT BE RE-ENERGIZED.

D. CAPACITOR NAMEPLATES

THE CAPACITOR NAMEPLATE AND UNIT SHALL REMAIN INTACT. UNDER NO CIRCUMSTANCES SHALL THE NAMEPLATE BE REMOVED FROM THE CAPACITOR UNIT.

F. SERIES STREET LIGHTING TRANSFORMERS

THE TROUBLEMAN AND/OR CREW SHALL CHECK THE NAMEPLATE OF ANY RUPTURED 2400 VOLT, CONSTANT CURRENT STREET LIGHTING TRANSFORMER TO DETERMINE IF IT CONTAINS AN INTERNAL CAPACITOR. IF NO CAPACITOR IS SHOWN ON THE NAMEPLATE, THE TRANSFORMER IS TO BE TREATED AS ANY OTHER TRANSFORMER ON THE SYSTEM, NO SPECIAL HANDLING OR DISPOSAL IS REQUIRED. IF IT DOES, IT SHALL BE TREATED AS ANY PCB CONTAINING DEVICE UNTIL IT REACHES KEARNY MAINTENANCE. (SEE CONSTRUCTION MANAGEMENT STANDARD PRACTICE 107).

KEARNY SHALL REMOVE THE INTERNAL CAPACITOR IMMEDIATELY AND CHECK TO SEE IF IT HAS LEAKED. IF IT HAS NOT LEAKED, THE CAPACITOR SHALL BE DISPOSED OF IN ACCORDANCE WITH THE EPA REGULATIONS. THE TRANSFORMER MAY THEN RE-ENTER THE SYSTEM AS AN RO UNIT OR BE SCRAPPED.

IF PCB CONTAMINATION OF THE TRANSFORMER OIL IS SUSPECTED, KEARNY MAINTENANCE SHALL HAVE THE BEST LAB VERIFY THE LEVEL OF CONTAMINATION. IF IT IS 500PPM OR GREATER, THE OIL AND THE TRANSFORMER SHALL BE DISPOSED OF ACCORDING TO EPA REGULATIONS.

FOR FIELD MAINTENANCE ONLY

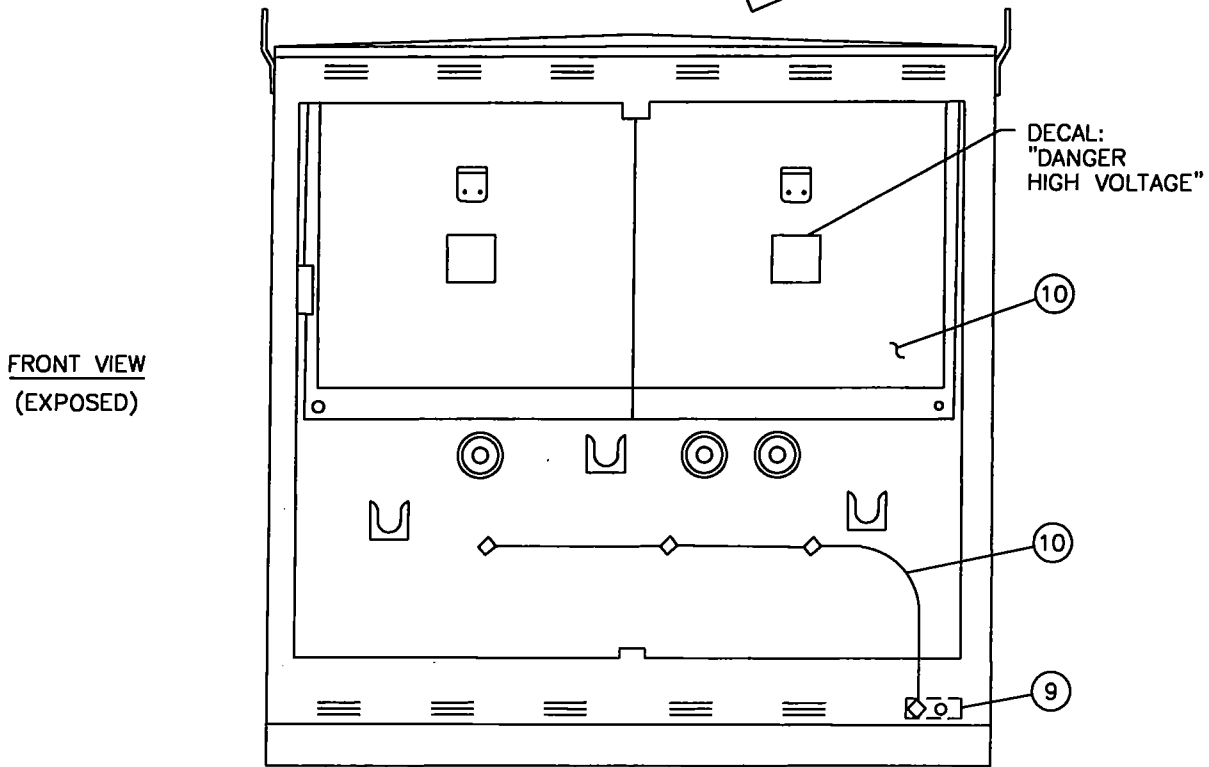
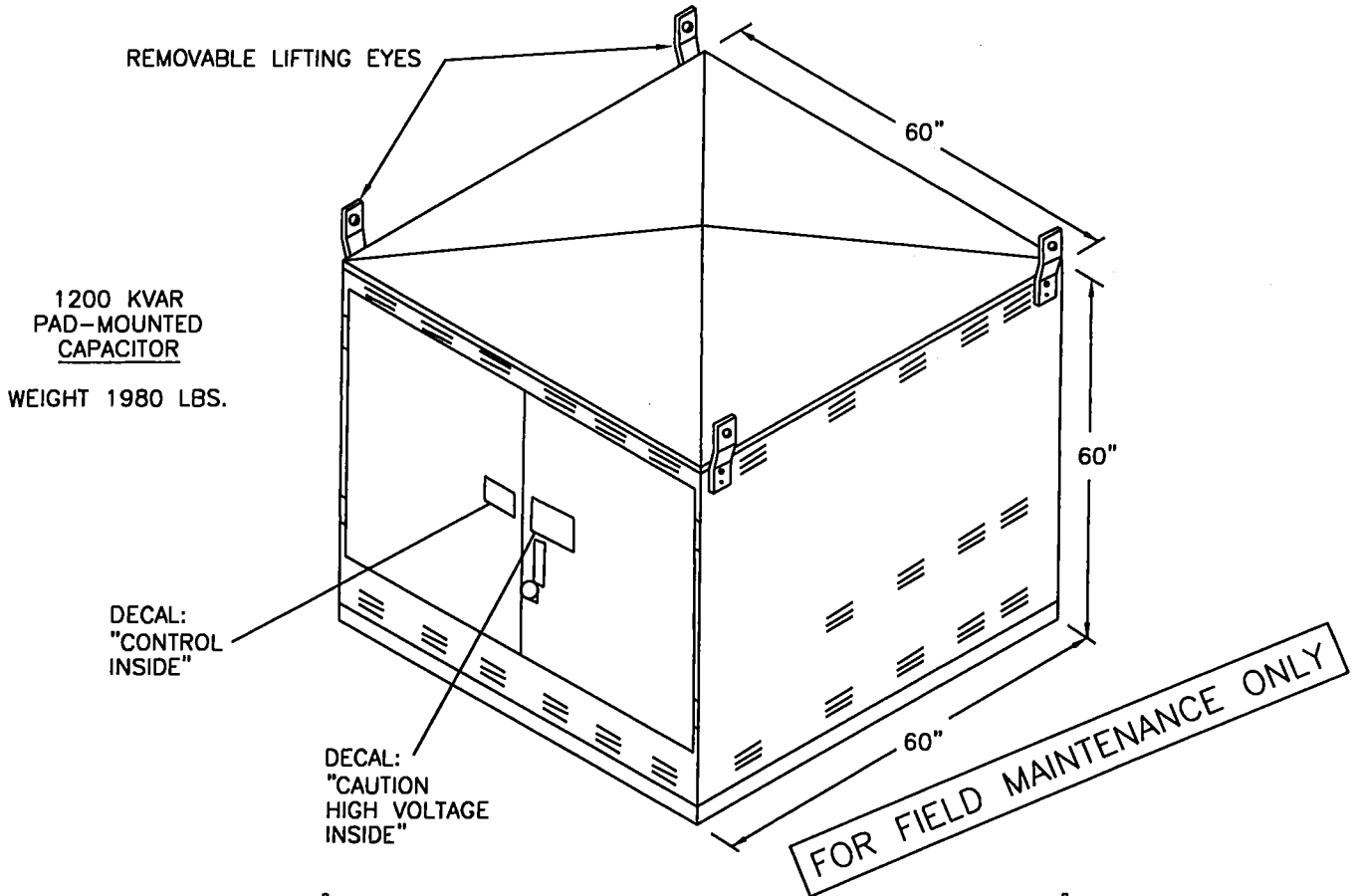
~~OH 1399.003~~
UG 3899.003
SUPERSEDES
3802.3 (1-1-86)

SDG&E ELECTRIC STANDARDS

CAPACITOR MARKING INSTRUCTIONS
DECALS AND TAGS

DATE 1-1-2000
APPD *PA 1/09*

SCOPE: THIS STANDARD SHOWS THE 1200 KVAR PAD-MOUNTED CAPACITOR.



3899.201

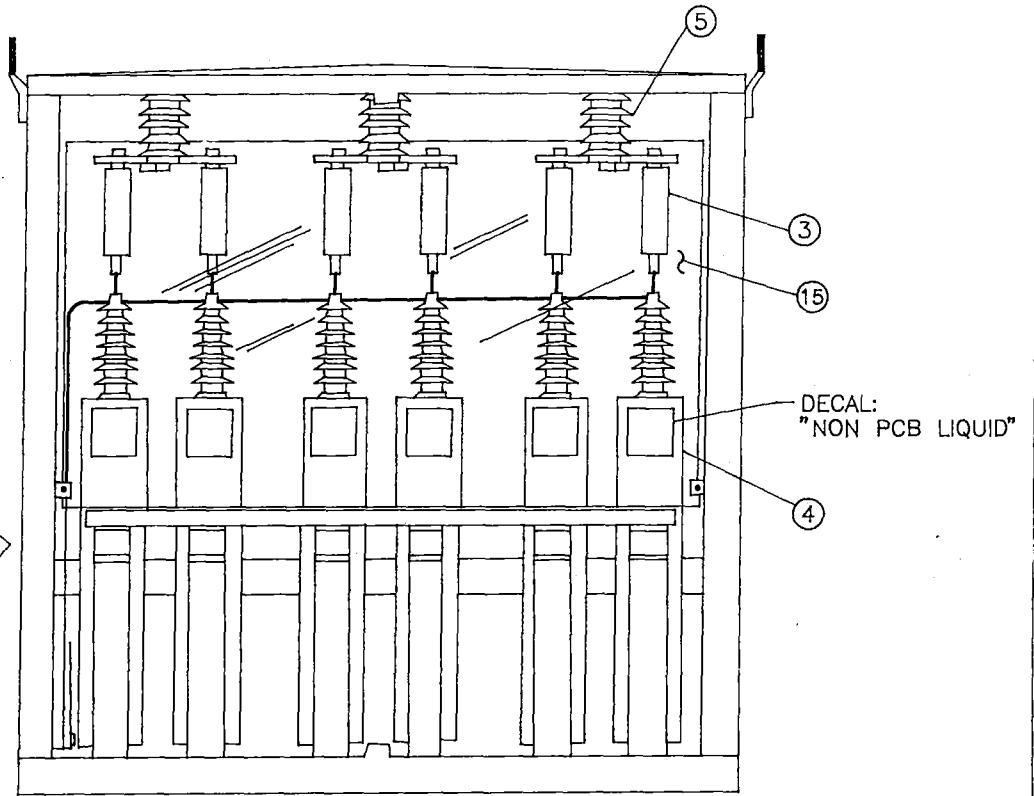
SDG&E ELECTRIC STANDARDS

1200 KVAR PAD-MOUNTED CAPACITOR

DATE 1-1-96

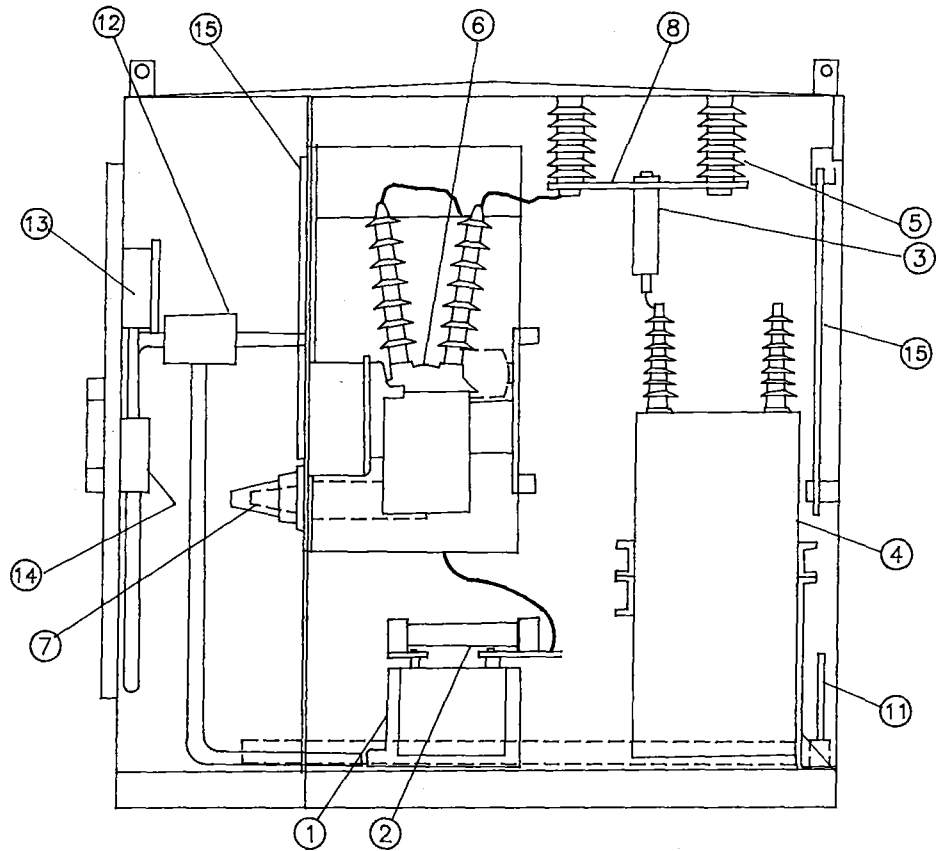
APPD *[Signature]*

BACK VIEW
EXPOSED



FOR FIELD MAINTENANCE ONLY

SIDE VIEW
EXPOSED



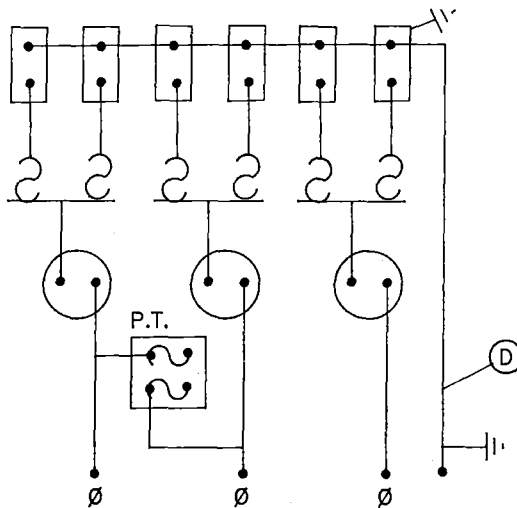
SDG&E ELECTRIC STANDARDS

DATE 1-1-96

APPD *[Signature]*

1200 KVAR PAD-MOUNTED CAPACITOR

3899.202



SCHEMATIC DIAGRAM

NOTES:

- PAD-MOUNTED CAPACITOR (STOCK NUMBER 207426) IS DELIVERED FROM THE SUPPLIER WITH ALL THE PARTS LISTED IN THE PARTS LIST.

CAPACITOR PARTS LIST

| ITEM | DESCRIPTION | QUANTITY | CONSTR STD OR PAGE NO | STOCK NUMBER |
|------|--|----------|-----------------------|--------------|
| 1 | TRANSFORMER (P.T.), 12KV | 1 | --- | 762714 |
| 2 | FUSE, CURRENT-LIMITING 0.5 AMP, 14.4KV - GE TYPE J-1 | 2 | --- | 366456 |
| 3 | FUSE, MCGRAW EDISON TYPE NXC, 45 AMP, 8.3KV | 6 | --- | 365718 |
| 4 | CAPACITOR, 200 KVAR, 7200V, 1Ø | 6 | --- | 207350 |
| 5 | POST INSULATOR, 110 KV BIL | 9 | --- | --- |
| 6 | SWITCH, OIL 15KV, 200 AMP | 3 | --- | 705568 |
| 7 | PLUG, BUSHING, 14.4KV, 200 AMP | 3 | 4192.01 | 544676 |
| 8 | COPPER BUS | 6 | --- | --- |
| 9 | GROUND BUS | 1 | --- | --- |
| 10 | #2 COPPER GROUND WIRE | AS REQ'D | --- | --- |
| 11 | 3/8" COPPER ROD 9" LONG | 1 | --- | --- |
| 12 | JUNCTION BOX | 1 | --- | --- |
| 13 | METER SOCKET - 6 CLIP (FOR CAPACITOR CONTROL SWITCH) | 1 | --- | --- |
| 14 | TERMINAL BOARD | 1 | --- | --- |
| 15 | 1/4" CLEAR ACRYLIC BARRIER (REMOVABLE) | 4 | --- | --- |

FOR FIELD MAINTENANCE ONLY

REFERENCE:

- A. SEE STANDARD 3821 FOR THE INSTALLATION INSTRUCTIONS.
- B. SEE STANDARDS 4302 AND 4309 FOR FUSING.
- C. SEE DESIGN MANUAL 5811.5 FOR CONNECTING CAPACITOR TO SYSTEM.

| | | |
|--|---|----------|
| DATE 1-1-96 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS 1200 KVAR PAD-MOUNTED CAPACITOR | 3899.203 |
|--|---|----------|

**UNDERGROUND CABLE REFERENCE CHART
INDIVIDUAL 120/240V 1 ϕ SERVICE
DIRECTLY FROM TRANSFORMER (ALUMINUM CONDUCTOR)**

| TRANSFORMER KVA | DESIGN DEMAND 85% P.F. | | COND./DUCT AWG & KCMIL (AL) | DUCT SIZE MINIMUM (INCHES) | NO. DUCT RUNS USED | THERMAL LIMIT 85% P.F. | | |
|--------------------|---------------------------|-----|--------------------------------|----------------------------------|-----------------------|------------------------|-----|-------|
| | KW | AMP | | | | AMP | KW | (KVA) |
| 15 | 12.5 | 62 | 2-#2 & 1-#4 | 2 | 1 | 120 | 24 | 28 |
| 25 | 21 | 104 | 2-1/0 & 1-#2 | 2 | 1 | 159 | 32 | 37 |
| 37.5 | 32 | 158 | 2-3/0 & 1-1/0 | 2 | 1 | 209 | 42 | 50 |
| | | | 2-#2 & 1-#4 (1) | | 2 | 225 | 45 | 53 |
| 50 | 42 | 208 | 2-350 & 1-3/0 | 2.5 | 1 | 326 | 66 | 77 |
| | | | 2-1/0 & 1-#2 | 2 | 2 | 299 | 61 | 72 |
| | | | 2-#2 & 1-#4 (1) | | 3 | 328 | 67 | 78 |
| 75 | 83 | 312 | 2-3/0 & 1-1/0 | 2 | 2 | 570 | 118 | 137 |
| | | | 2-1/0 & 1-#2 | 2 | 4 | 553 | 112 | 133 |
| | | | 2-#2 & 1-#4 (1) | | 5 | 503 | 102 | 121 |
| 100 | 85 | 417 | 2-350 & 1-3/0 | 2.5 | 2 | 812 | 125 | 147 |
| | | | 2-3/0 & 1-1/0 | 2 | 4 | 727 | 148 | 174 |
| | | | 2-1/0 & 1-#2 (1) | | 5 | 867 | 136 | 160 |
| | | | 2-#2 & 1-#4 (1) | | 7 | 862 | 135 | 159 |
| 167 | 142 | 696 | 2-350 & 1-3/0 | 2.5 | 4 | 1133 | 231 | 272 |
| | | | 2-3/0 & 1-1/0 (1) | 2 | 7 | 1157 | 238 | 277 |
| | | | 2-1/0 & 1-1/0 (1) | | 9 | 1116 | 228 | 268 |
| | | | 2-#2 & 1-#4 (1) | | 11 | 1000 | 204 | 240 |

FOR FIELD MAINTENANCE ONLY

NOTES:

- (1) NOT TO BE USED WITHOUT CLEARANCE BY UNDERGROUND DESIGN SUPERVISOR.
- 2 RUNS EXCEEDING 100' SHOULD BE GIVEN INDIVIDUAL CONSIDERATION.

U-8.2

UNDERGROUND CABLE REFERENCE CHART
 INDIVIDUAL 277/480Y 3^{PH} SERVICE
 DIRECTLY FROM TRANSFORMER (ALUMINUM CONDUCTOR)

| TRANSFORMER KVA | DESIGN DEMAND 85% P.F. | | COND./DUCT AWG & KCMIL (AL) | DUCT SIZE MINIMUM | | NO. DUCT RUNS USED | THERMAL LIMIT 85% P.F. | | |
|--------------------|-----------------------------------|------|--------------------------------|----------------------|----|-----------------------|------------------------|------|-------|
| | KW | AMP | | 3W | 4W | | AMP | KW | (KVA) |
| 75 | 83 | 90 | 3-1/0 & 1-#2 | 2 | 2 | 1 | 158 | 112 | 132 |
| | | | 3-#2 & 1-#4 (1) | | | 2 | 226 | 160 | 188 |
| 150 | 127 | 181 | 3-350 & 1-3/0 | 3 | 3 | 1 | 328 | 230 | 271 |
| | | | 3-1/0 & 1-#2 | 2 | 2 | 2 | 299 | 211 | 248 |
| | | | 3-#2 & 1-#4 (1) | | | 3 | 327 | 231 | 272 |
| 225 | 191 | 271 | 3-500 & 1-350 | 3½ | 3½ | 1 | 402 | 283 | 334 |
| | | | 3-3/0 & 1-1/0 | | 2½ | 2 | 383 | 277 | 328 |
| | | | 3-1/0 & 1-#2 | 2 | 2 | 3 | 434 | 308 | 360 |
| | | | 3-#2 & 1-#4 (1) | | | 4 | 418 | 295 | 347 |
| 300 | 255 | 362 | 7-350 OR 6-350 & 2-3/0 | 4 | 4½ | 1 | 522 | 368 | 433 |
| | | | 3-350 & 1-3/0 | 3 | 3 | 2 | 612 | 431 | 507 |
| | | | 3-3/0 & 1-1/0 | | 2½ | 3 | 570 | 402 | 473 |
| | | | 3-1/0 & 1-#2 | 2 | 2 | 4 | 553 | 380 | 459 |
| | | | 3-#2 & 1-#4 (1) | | | 6 | 584 | 412 | 485 |
| 500 | 425 | 602 | 7-350 OR 8-350 & 2-3/0 | 4 | 4½ | 2 | 882 | 603 | 818 |
| | | | 3-350 & 1-3/0 | 3 | 3 | 3 | 890 | 628 | 740 |
| | | | 3-3/0 & 1-1/0 | | 2½ | 4 | 878 | 618 | 728 |
| | | | 3-1/0 & 1-#2 (1) | 2 | 2 | 7 | | | |
| | | | 3-#2 & 1-#4 (1) | | | 9 | 843 | 594 | 700 |
| 750 | 638 | 904 | 7-350 OR 8-350 & 2-3/0 | 4 | 4½ | 3 | 1425 | 1010 | 1185 |
| | | | 3-500 & 1-350 | 3½ | 3½ | 4 | 1400 | 987 | 1160 |
| | | | 3-350 & 1-3/0 | 3 | 3 | 5 | 1370 | 988 | 1140 |
| | | | 3-3/0 & 1-1/0 | | 2½ | 8 | 1305 | 922 | 1085 |
| | | | 3-1/0 & 1-#2 (1) | 2 | 2 | 11 | 1295 | 913 | 1075 |
| | | | 3-#2 & 1-#4 (1) | | | 15 | | | |
| 1000 | 850 | 1205 | 7-500 OR 8-500 & 2-350 | 4½ | 5 | 3 | 1755 | 1240 | 1460 |
| | | | 7-350 OR 8-350 & 2-3/0 | 4 | 4½ | 4 | 1815 | 1280 | 1510 |
| | | | 3-500 & 1-350 | 3½ | 3½ | 6 | 1950 | 1375 | 1620 |
| | | | 3-350 & 1-3/0 | 3 | 3 | 7 | 1825 | 1290 | 1515 |
| | | | 3-3/0 & 1-1/0 (1) | 2 | 2½ | 12 | 1855 | 1310 | 1540 |
| | | | 3-1/0 & 1-#2 (1) | | 2 | 16 | 1860 | 1312 | 1545 |
| 1500 | 1275 | 1810 | 7-500 OR 8-500 & 2-350 | 4½ | 5 | 5 | 2700 | 1905 | 2240 |
| | | | 7-350 OR 8-350 & 2-3/0 | 4 | 4½ | 7 | 2885 | 2040 | 2400 |
| | | | 3-500 & 1-350 | 3½ | 3½ | 9 | 2820 | 1990 | 2345 |
| | | | 3-350 & 1-3/0 | 3 | 3 | 11 | 2850 | 1970 | 2200 |
| | | | 3-3/0 & 1-1/0 (1) | 2 | 2½ | 18 | 2870 | 1990 | 2220 |
| 2000 | REQUIRES INDIVIDUAL CONSIDERATION | | | | | | | | |

FIELD MAINTENANCE ONLY

- NOTES: (1) NOT TO BE USED WITHOUT CLEARANCE BY UNDERGROUND DESIGN SUPERVISOR.
 2 RUNS EXCEEDING 50' SHOULD BE GIVEN INDIVIDUAL CONSIDERATION.
 3 THIS CHART IS NOT TO BE USED FOR SIZING CABLE.

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

3999.002

600 VOLT CABLE REFERENCE CHART

DATE 12-27-73
 APPD

**UNDERGROUND CABLE REFERENCE CHART
INDIVIDUAL 120/208Y 3^Ø SERVICE
DIRECTLY FROM TRANSFORMER (ALUMINUM CONDUCTORS)**

U-8.2

| TRANSFORMER KVA | DESIGN DEMAND 85% P.F. | | CONDUCTOR AWG & KCMIL (AL) | DUCT | | NO. DUCT RUNS USED | THERMAL LIMIT 85% P.F. | | |
|--------------------|-----------------------------------|------|-------------------------------|------|----|-----------------------|------------------------|------|-------|
| | KW | AMP | | 3W | 4W | | AMP | KW | (KVA) |
| 75 | 63 | 208 | 4-350 | 3 | 3 | 1 | 328 | 88 | 117 |
| | | | 4-1/0 | 2 | 2 | 2 | 289 | 81 | 107 |
| | | | 4-#2 | | | 3 | 327 | 88 | 117 |
| 150 | 127 | 417 | 7-500 OR 6-500 & 2-350 | 4½ | 5 | 1 | 643 | 196 | 231 |
| | | | 3-350 & 1-3/0 | 3 | 3 | 2 | 612 | 187 | 220 |
| | | | 3-3/0 & 1-1/0 | | | 2½ | 4 | 726 | 222 |
| | | | 3-1/0 & 1-#2 | 2 | 2 | 5 | 867 | 204 | 240 |
| | | | 3-#2 & 1-#4 (1) | | | 7 | 863 | 203 | 239 |
| 225 | 181 | 627 | 7-350 OR 6-350 & 2-3/0 | 4 | 4½ | 2 | 982 | 300 | 353 |
| | | | 3-500 & 1-350 | 3½ | 3½ | 3 | 1010 | 335 | 395 |
| | | | 3-350 & 1-3/0 | 3 | 3 | 4 | 1135 | 348 | 407 |
| | | | 3-3/0 & 1-1/0 | 2 | 2 | 8 | 1015 | 310 | 365 |
| | | | 3-1/0 & 1-#2 | | | 8 | 893 | 304 | 357 |
| 300 | 255 | 834 | 7-350 OR 6-350 & 2-3/0 | 4 | 4½ | 3 | 1425 | 435 | 512 |
| | | | 3-500 & 1-350 | 3½ | 3½ | 4 | 1400 | 427 | 503 |
| | | | 3-350 & 1-3/0 | 3 | 3 | 5 | 1370 | 418 | 492 |
| | | | 3-3/0 & 1-1/0 | 2 | 2 | 8 | 1305 | 398 | 468 |
| 500 | 425 | 1390 | 7-500 OR 6-500 & 2-350 | 4½ | 5 | 4 | 2240 | 685 | 805 |
| | | | 7-350 OR 6-350 & 2-3/0 | 4 | 4½ | 5 | 2180 | 672 | 780 |
| | | | 3-500 & 1-350 | 3½ | 3½ | 7 | 2220 | 680 | 800 |
| | | | 3-350 & 1-3/0 | 3 | 3 | 8 | 2035 | 622 | 732 |
| | | | 3-3/0 & 1-1/0 (1) | 2 | 2½ | 14 | 2135 | 653 | 788 |
| | | | 7-500 OR 6-500 & 2-350 | 4½ | 5 | 8 | 3120 | 958 | 1120 |
| 750 | 638 | 2085 | 7-350 OR 6-350 & 2-3/0 | 4 | 4½ | 8 | 3255 | 980 | 1170 |
| | | | 3-500 & 1-350 | 3½ | 3½ | 10 | 3095 | 950 | 1115 |
| | | | 3-350 & 1-3/0 | 3 | 3 | 12 | 2970 | 908 | 1070 |
| | | | 3-3/0 & 1-1/0 (1) | 2 | 2½ | 20 | 2965 | 906 | 1065 |
| | | | 7-500 OR 6-500 & 2-350 | 4½ | 5 | 8 | 4000 | 1225 | 1442 |
| 1000 | 850 | 2780 | 7-350 OR 6-350 & 2-3/0 | 4 | 4½ | 10 | 4020 | 1230 | 1445 |
| | | | 3-500 & 1-350 | 3½ | 3½ | 14 | 4050 | 1240 | 1458 |
| | | | 3-350 & 1-3/0 | 3 | 3 | 17 | 4050 | 1240 | 1458 |
| | | | 3-3/0 & 1-1/0 (1) | 2 | 2½ | 28 | 4030 | 1232 | 1450 |
| 1500 | REQUIRES INDIVIDUAL CONSIDERATION | | | | | | | | |

FOR FIELD MAINTENANCE ONLY

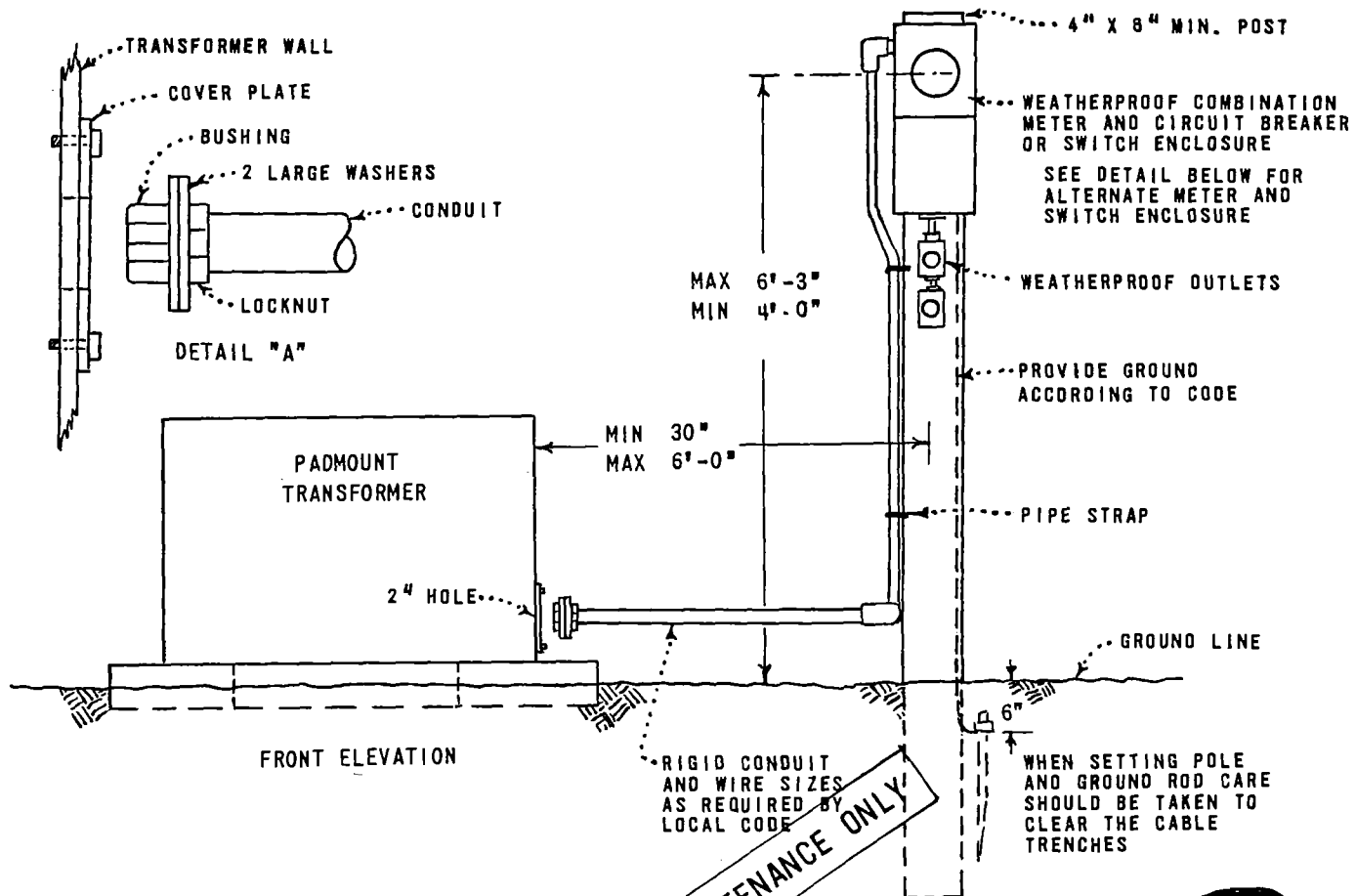
- NOTES: ① NDT TO BE USED WITHOUT CLEARANCE BY UNDERGROUND DESIGN SUPERVISOR.
 2 RUNS EXCEEDING 50' SHOULD BE GIVEN INDIVIDUAL CONSIDERATION.
 3 THIS CHART IS NOT TO BE USED FOR SIZING CABLE.

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

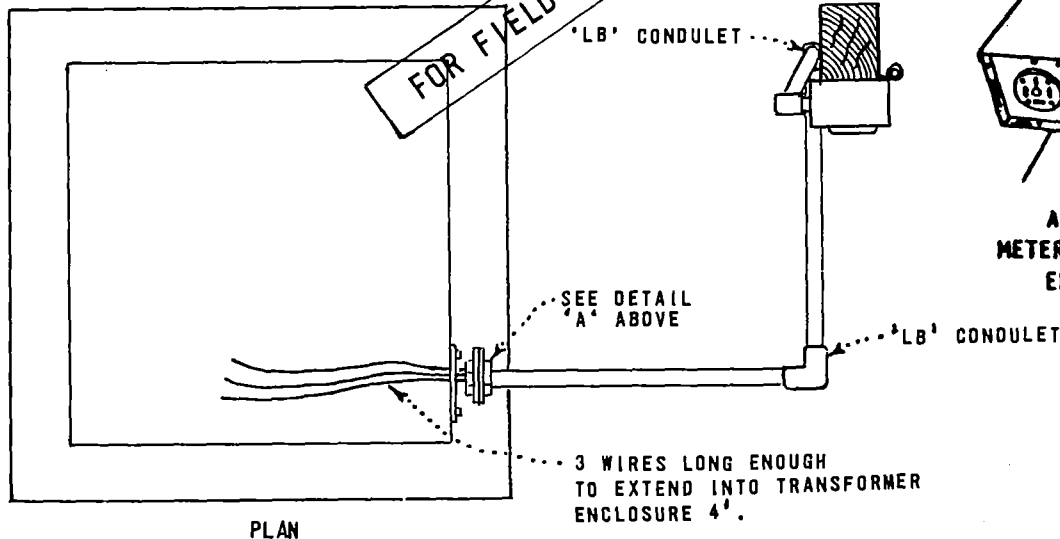
DATE 12-27-73
APPD *SM*

600 VOLT CABLE REFERENCE CHART

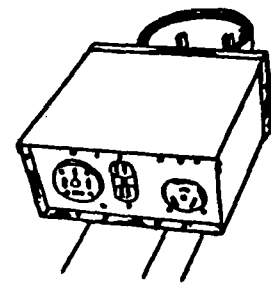
3999.003



FRONT ELEVATION



PLAN



ALTERNATE
METER AND SWITCH
ENCLOSURE

CUSTOMER SHALL FURNISH, INSTALL, OWN & MAINTAIN AT HIS EXPENSE:

- ① POST, METER INSTALLATION, CONDUIT RISER, WEATHERPROOF PULL BOX, CONDULETS AND FITTINGS.

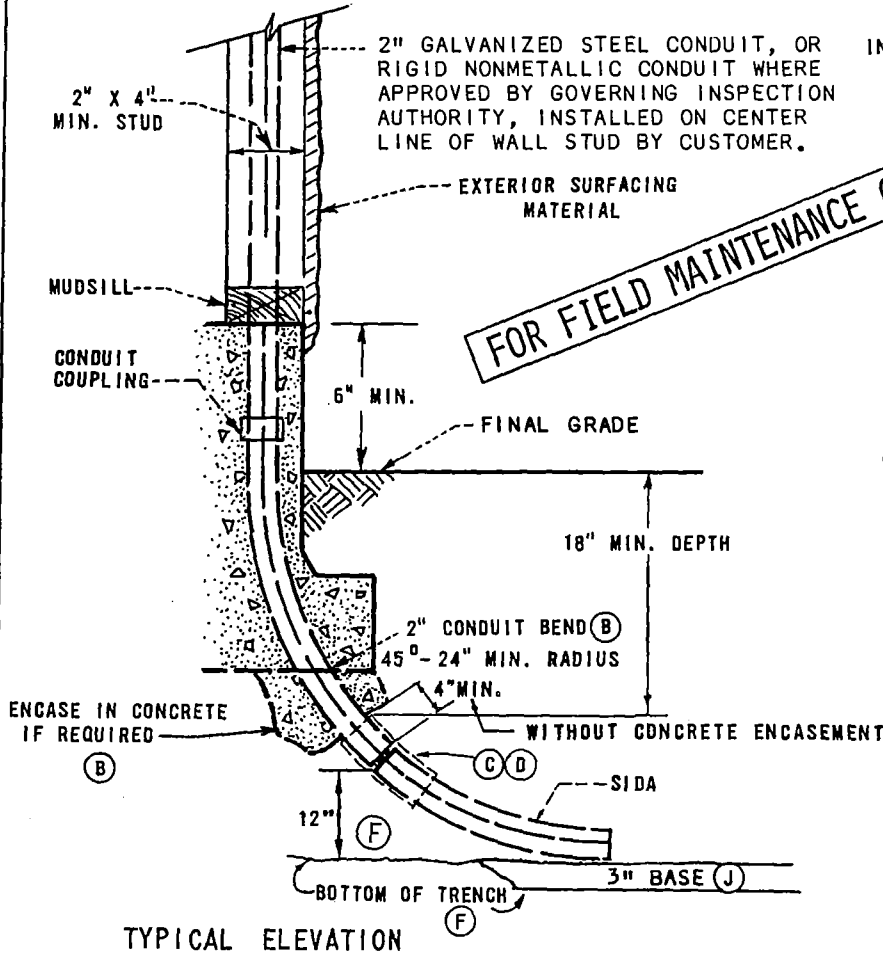
SDG&E WILL:

- ② CONNECT RIGID CONDUIT TO PADMOUNT TRANSFORMER AND CONNECT SECONDARY CONDUCTORS.

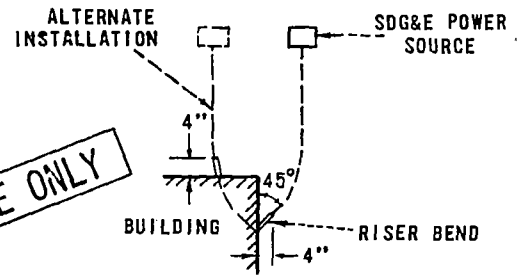
NOTE:

A. OVERHEAD CONDUCTORS SHALL NOT BE ATTACHED TO THIS METER POLE,

SCOPE: THIS STANDARD SHOWS CABLE-IN-CONDUIT (SIDA) TERMINATION AT THE CUSTOMERS CONDUIT RISER.

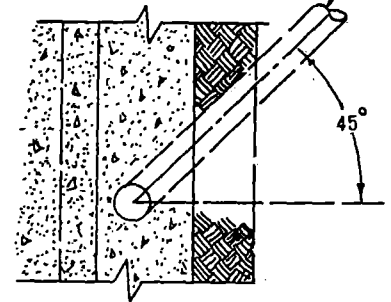


FOR FIELD MAINTENANCE ONLY



TYPICAL PLAN

POINT CONDUIT STUB IN DIRECTION OF SUPPLY SOURCE NORMALLY AT 45° ANGLE FROM OUTER FACE OF BUILDING WALL



PLAN

INSTALLATION:

- A. VERIFY METER AND SERVICE LOCATION WITH SDG&E BEFORE INSTALLATION.
- (B) G.O. 128 RULE 33.4D REQUIRES ONE OF THE FOLLOWING DOWN TO AN 18 INCH DEPTH ON PRIVATE PROPERTY: (A) STEEL CONDUIT, OR (B) SCHEDULE 40 PVC OR SCHEDULE 80 PVC CONDUIT WITH A MINIMUM WALL THICKNESS OF 0.15 INCHES, OR (C) AT LEAST A 3 INCH LAYER OF CONCRETE ABOVE AND 2 INCHES ON EACH SIDE OF THE CONDUIT.
- (C) IF A 2-3/0, 1-1/0 SIDA SERVICE (196928) IS REQUIRED THE SIDA CONDUIT WILL BE CUT BACK TO ALLOW THE CABLE TO BE INSERTED INTO THE CONDUIT BEND THE REQUIRED AMOUNT. A 2 INCH COUPLING (279872 (E)) WITH TWO LAYERS OF GRAY TAPE (721120 (E)) OVER THE COUPLING SHALL BE INSTALLED BY SDG&E TO SEAL THE JUNCTION BETWEEN THE BEND AND THE SIDA. FILL WITH SOIL AND COMPACT UNDER THE COUPLING BEFORE BACKFILLING THE TRENCH.
- (D) WHEN A COUPLING IS NOT USED, TERMINATE CONDUIT OF SIDA A MINIMUM OF ONE FOOT INSIDE CONDUIT BEND. WHERE DUCT ENTERS THE CONDUIT BEND, SDG&E CREW WILL SEAL WITH ONE LAYER OF AQUASEAL (442976 (E)) OR EQUIVALENT AND TWO LAYERS OF GRAY INSULATING TAPE (721120 (E)) TO PREVENT DUCT FROM PULLING OUT OF RISER BEND AND ALSO TO PREVENT WATER AND DIRT ENTRY.
- (E) EXEMPT MATERIAL.
- (F) FIRST 3 FEET OF TRENCH AT BUILDING MUST BE A MINIMUM OF 24 INCHES AND 12 INCHES BELOW THE BOTTOM OF CONDUIT BEND. A SLOPE OF 1 FOOT OF THE TRENCH WALL BUTTED AGAINST THE BUILDING AT THE SERVICE ENTRANCE FOR EVERY 1 FOOT DEPTH OF TRENCH SHALL BE MAINTAINED IF UNDERMINING IS POSSIBLE AT THE BUILDING.

REFERENCE:

- J SEE STANDARD 3370 FOR TRENCH DEPTHS, BASE SHADING AND BACKFILL REQUIREMENTS.
- K. SEE STANDARD 3941 FOR CABLE IN CONDUIT SERVICE LATERAL.
- L. SEE STANDARD 3948 FOR SEALING CONDUITS.

ALUMINUM

| WIRE SIZE | DUCT OR CONDUIT MIN. SIZE | REEL FOOTAGE | MAXIMUM REEL DIAMETER | STOCK NUMBER | U-NUMBER REFERENCE |
|---------------------------------|---------------------------|---------------|---|--------------|--------------------|
| 1/C #2 SOL PECN (A) | 2" | 5000' | 52" WIDE X 96" DIA. | 194482 | U-12.04 |
| 1/C #2 SOL PECN-PEJ (A)(C) | 1-1/4" PID | 5000' | 52" WIDE X 96" DIA. | 194492 | U-12.051 |
| 1/C #2 SOL PECN (A) | 1-1/4" PID | 5000' | 52" WIDE X 96" DIA. | 194490 | U-12.05 |
| 3-1/C #2/0 STR PECN (A) | 3" | 2000' | 52" WIDE X 96" DIA. | 194486 | U-12.06 |
| 3-1/C 750 KCMIL STR XLPECN (A) | 5" | 600' 1200' | 52" WIDE X 96" DIA. 64" WIDE X 108" DIA. | 197776 | U-12.09 |
| 3-1/C 1000 KCMIL STR XLPECN (A) | 5" | 600' 1200' | 52" WIDE X 96" DIA. 64" WIDE X 108" DIA. | 197785 | U-12.095 |
| 1/C 1000 KCMIL STR XLPECN-PEJ | 5" | 3600' | 45" WIDE X 90" DIA. | 197628 | U-12.097 |

COPPER

| WIRE SIZE | DUCT OR CONDUIT MIN. SIZE | REEL FOOTAGE | MAXIMUM REEL DIAMETER | STOCK NUMBER | U-NUMBER REFERENCE |
|----------------------------|---------------------------|---------------|--|--------------|--------------------|
| 1/C #4 STR PECN (A) | 1-1/4" PID | 2000' | 52" WIDE X 96" DIA. | 194880 | U-12.3 |
| 1/C #4 STR PECN (A) | 3" | 5000' | 52" WIDE X 96" DIA. | 194656 | U-12.2 |
| 1/C #2 STR PECN (A) | 1-1/2" PID | 2000' | 52" WIDE X 96" DIA. | 194784 | U-12.5 |
| 1/C #2 STR PECN (A) | 3" | 5000' | 52" WIDE X 96" DIA. | 194496 | U-12.4 |
| 3-1/C #2 STR PECN (A) | 3" | 1500' | 52" WIDE X 96" DIA. | 194544 | U-12.41 |
| 3-1/C #4/0 STR PECN (A)(B) | 5" | 600' 1200' | 52" WIDE X 96" DIA. 62" WIDE X 96" DIA. | 194592 | U-12.7 |
| 3/C 500 KCMIL PECN (A)(B) | 5" | 1200' | 62" WIDE X 96" DIA. | 194720 | U-12.9 |
| 3-1/C 500 KCMIL PECN-PEJ | 5" | 1200' | 62" WIDE X 96" DIA. | 194736 | U-12.91 |

ABBREVIATION DEFINITIONS

1/C = ONE CONDUCTOR
 3/C = THREE CONDUCTORS
 PECN-PEJ = POLYETHYLENE INSULATION, CONCENTRIC NEUTRAL, POLYETHYLENE JACKET
 XLPECN-PEJ = CROSSLINKED POLYETHYLENE INSULATION, CONCENTRIC NEUTRAL, POLYETHYLENE JACKET
 EPR-PEJ = ETHYLENE PROPYLENE RUBBER INSULATION, FLAT STRAP NEUTRAL, POLYETHYLENE JACKET
 SOL = SOLID
 STR = STRANDED
 PID = PRIMARY-IN-DUCT
 KCMIL = THOUSAND CIRCULAR MILS

INSTALLATION:

- (A) NO LONGER PURCHASED.
- (B) MAY BE INSTALLED EXISTING 4 INCH CONDUITS (SEE STANDARD 3372).
- (C) INFORMATION REMOVED FROM PAGE 4002.2 AND ADDED TO FMO SECTION IN 1987.

| | | | |
|------------------------------------|--------------------------|--|----------|
| DATE 1-1-87 APPD <i>JLB/ROJ</i> | SDG&E ELECTRIC STANDARDS | | 4099.001 |
| | 12KV CABLE SIZES | | |

600 VOLT CABLE AMPACITIES
COPPER AND ALUMINUM TRIPLEXED CONCENTRIC STRANDED CABLES IN DUCT,
600 VOLT, 1 CIRCUIT, 75°C INSULATED CABLE IN 25°C AMBIENT EARTH
WITH 75% LOAD FACTOR AND RHO-120

| NUMBER CONDUCTORS/WIRE SIZE-AWG | COPPER | ALUMINUM |
|---------------------------------|--------|----------|
| 2 - #8 | 58 | 44 |
| 2 - #4, 1 - #6 | 100 | 77 |
| 2 - #2, 1 - #4 | 131 | 102 |
| 2 - #1/0, 1 - #2 | 174 | 136 |
| 2 OR 3 - #3/0, 1 - #1/0 | 228 | 178 |
| 2 - #4/0, 1 - #1/0 | 262 | 206 |
| 2 OR 3 - 350KCMIL & 1 - #3/0 | 352 | 277 |
| 2 OR 3 - 500KCMIL & 1 - #4/0 | 430 | 340 |

FOR FIELD MAINTENANCE ONLY

600 VOLT SIDA CABLE SIZES
600 VOLT ALUMINUM CROSS-LINKED POLYETHYLENE (A)

| WIRE SIZE | CABLE-IN-CONDUIT SIZE | REEL FOOTAGE | MAXIMUM REEL DIMIAMETER | STOCK NUMBER | U-NUMBER REFERENCE |
|-------------------|-----------------------|--------------|-------------------------|--------------|--------------------|
| 2-#8 | 3/4" SIDA | 2000 | 32" WIDE X 50" DIA. | 196960 | U-10.01 |
| 2-#2, 1-#4 | 1 1/4" SIDA | 4000 | 52" WIDE X 96" DIA. | 196832 | U-10.03 |
| 2-1/0, 1-#2 | 1 1/2" SIDA | 3000 | 52" WIDE X 96" DIA. | 196768 | U-10.05 |
| 2-3/0, 1-1/0 | 2" SIDA | 2000 | 52" WIDE X 96" DIA. | 196928 | U-10.07 |
| 2-350KCMIL, 1-3/0 | 2 1/2" SIDA | 1500 | 52" WIDE X 96" DIA. | 197570 | U-10.081 |

ABBREVIATION DEFINITIONS

SIDA = SECONDARY-IN-DUCT, ALUMINUM
 KCMIL = THOUSAND CIRCULAR MILLS

INSTALLATION:

(A) INFORMATION REMOVED FROM PAGE 4002.1 AND ADDED TO THE "FIELD MAINTENANCE ONLY" SECTION IN 1987.

**4100 TERMINATIONS,
SPLICING CONNECTIONS**

**4100 TERMINATIONS,
SPLICING CONNECTIONS**

PAGE

SUBJECT







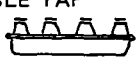
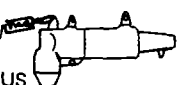

| | |
|---------------|---|
| 4199.001 | COMPATIBILITY CHART FOR 200 AMP CLASS URD SYSTEMS, LOADBREAK |
| 4199.002 | COMPATIBILITY CHART FOR 200 AMP CLASS URD SYSTEMS, DEADBREAK |
| 4199.101-.102 | CABLE TERMINALS |
| 4199.103-.106 | CABLE TERMINATION INSTRUCTIONS "RA" OIL SWITCHES |
| 4199.107-.108 | OIL FILLED FUSE CUTOUTS (SUBMERSIBLE), 4KV, 100 AMP AND 200 AMP, SINGLE-PHASE |
| 4199.109 | OIL FILLED FUSE CUTOUTS (SUBMERSIBLE), 4KV, 60 AMP OR LESS |
| 4199.201 | OUTDOOR COPPER CABLE TERMINALS |
| 4199.202 | INDOOR CABLE TERMINATIONS, POLYETHYLENE CABLES |
| 4199.203-.204 | LIVE FRONT CABLE TERMINATIONS, POLYETHYLENE CABLES |
| 4199.401 | PRECAST SPLICE BOX INSTALLATION |
| 4199.402-.405 | SPLICES FOR 5KV AND 15KV 1/C POLYETHYLENE INSULATED CONCENTRIC TYPE CABLE |
| 4199.406 | SPLICE FOR 15KV 500 KCMIL CU PILC-NJ TO 15KV 750 KCMIL XLPE |
| 4199.407-.409 | SPLICE (CADWELD) |
| 4199.501-.503 | 15KV SPLICE CONNECTIONS FOR NON-LOADBREAK |
| 4199.504 | NON-LOADBREAK BURIED EQUIPMENT ENCLOSURE INSTALLATION - SPLICES |
| 4199.505 | 1 PHASE LOADBREAK & 3 PHASE NON-LOADBREAK BURIED EQUIPMENT ENCLOSURE INSTALLATION - SPLICES |
| 4199.506 | 200 AMP DEADBREAK CONNECTORS - 12KV |
| 4199.600 | ALUMINUM TERMINATION SECONDARY (600V) AT TRANSFORMER OR BUS |
| 4199.702 | 0-750 VOLT PULL BOX INSTALLATION |
| 4199.703 | 0-600 VOLT CONNECTIONS |
| 4199.704 | 0-750 VOLT PRECAST HANDHOLE INSTALLATION |
| 4199.705 | 0-600 VOLT CONNECTIONS FOR #8 THROUGH 350 KCMIL ALUMINUM CONDUCTORS |
| 4199.706-.708 | 0-600 VOLT CONNECTORS FOR #8 THROUGH 350 KCMIL AL OR CU CONNECTORS |
| 4199.801-.802 | 15KV 200 AND 600 AMP SPLICES AND CONNECTORS - IDENTIFICATION CHART |
| 4199.803 | 12KV 600 AMP SPLICES AND CONNECTIONS - IDENTIFICATION CHART |
| 4199.804 | 12KV, 200 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART |
| 4199.805 | 12KV, 200 AMP PREMOLDED SPLICE AND CONNECTOR ASSEMBLIES IDENTIFICATION CHART |
| 4199.806 | 12KV 200 & 600 AMP PREMOLDED SPLICE & CONNECTOR ASSEMBLIES IDENTIFICATION CHART |
| 4199.807-.808 | 12KV 20 & 600 AMP CONNECTOR ASSEMBLIES IDENTIFICATION CHART |
| 4199.901 | NON-LOADBREAK CABLE TAP |
| 4199.902-.903 | LOADBREAK CABLE TAPS - INSTALLATION |
| 4199.904-.905 | LOADBREAK ACCESSORIES, 12KV AND/OR 6.9KV |
| 4199.906 | LOADBREAK ELBOW TEE CONNECTOR "PIGGYBACK", 12000 VOLTS AND BELOW |
| 4199.907 | LOADBREAK ELBOW TEE "PIGGYBACK", INSTRUCTIONS |
| 4199.908 | LOADBREAK ELBOW CONNECTOR, 6930 VOLTS AND BELOW |
| 4199.909 | LOADBREAK ACCESSORIES, 12KV AND/OR 6.9KV |

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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
|-----|--------------------|----|------|------|------------|-----|--------|----|------|------|------|
| C | | | | | | F | | | | | |
| B | COMPLETELY REVISED | JK | JS | CZH | 10/16/2019 | E | | | | | |
| A | ORIGINAL ISSUE | JK | JS | CZH | 6/13/2019 | D | | | | | |

| | | | | |
|-------------------------|--|-----------------------------------|--|--------------------------------|
| SHEET 1 OF 1 | Indicates Latest Revision <input checked="" type="checkbox"/> Completely Revised | <input type="checkbox"/> New Page | <input type="checkbox"/> Information Removed | UG LEGACY UGL4101.1 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | |
| | LEGACY UNDERGROUND FIELD MAINTENANCE TABLE OF CONTENTS TERMINATIONS, SPLICING, CONNECTIONS | | | |









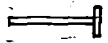




SCOPE: THIS STANDARD SHOWS COMPATIBILITY, IDENTIFICATION, CONNECTORS, AND ACCESSORIES FOR 200 AMP LOADBREAK ASSEMBLIES.

| <ul style="list-style-type: none"> LOADBREAK DEVICE STANDARDS REFERENCE STOCK NUMBER | | | INSULATING RECEPTACLE | STAND-OFF PLUG | BUSHING PLUG | FEED-THRU INSERT | FEED-THRU BUSHING | 3-WAY CABLE TAP | 4-WAY CABLE TAP | | FUSED ELBOW | ELBOW | | |
|--|--|--|-----------------------|----------------|--------------|------------------|-------------------|-----------------|-----------------|--|-------------|-------|--|--|
| INSULATING RECEPT. 4192 204304  | | | - | X | X | X | X | X | X | | - | - | | |
| STAND-OFF PLUG 4192 547312  | | | X | - | - | - | - | - | - | | X | X | | |
| BUSHING PLUG 4192 544676  | | | X | - | - | - | - | - | - | | X | X | | |
| FEED-THRU INSERT 4192 544678  | | | X | - | - | - | - | - | - | | X | X | | |
| FEED-THRU BUSHING 4192 182016  | | | X | - | - | - | - | X | X | | X | X | | |
| 3-WAY CABLE TAP 4192 718312  | | | X | - | - | - | - | - | - | | X | X | | |
| 4-WAY CABLE TAP 4192 718328  | | | X | - | - | - | - | - | - | | X | X | | |
| FUSED ELBOW 4191 VARIOUS  | | | - | X | X | X | X | X | X | | - | - | | |
| ELBOW 4191 VARIOUS  | | | - | X | X | X | X | X | X | | - | - | | |

FOR FIELD MAINTENANCE ONLY

NOTE: X DENOTES UNIT COMPATIBILITY

SCOPE: THIS PAGE PROVIDES THE COMPATIBILITY CHART FOR 200 AMP CLASS DEADBREAK EQUIPMENT.

| DEADBREAK DEVICE STANDARDS REFERENCE STOCK NUMBER | T CONNECTOR | STRAIGHT RECEPTACLE | STRAIGHT PLUG | DEAD END RECEPTACLE | DEAD END PLUG | GROUNDING PLUG | STAND OFF PLUG | BUSHING PLUG | BAILING ASSEMBLY PLUG/RECEPTACLE | BAILING ASSEMBLY DEADBREAK BUSHING | BAILING ASSEMBLY DEAD END PLUG | ELBOW | BAIL CONNECTOR |
|--|-------------|------------------------|------------------|------------------------|------------------|-------------------|-------------------|-----------------|-------------------------------------|--|-----------------------------------|-------|-------------------|
| T CONNECTOR 4196 256112  | - | - | X | X | X | X | X | X | - | X | X | X | X |
| STRAIGHT RECEPTACLE 4196  | X | - | X | - | X | X | X | X | X | - | - | - | - |
| STRAIGHT PLUG 4196  | X | X | - | X | - | - | - | - | X | - | - | X | - |
| DEAD END RECEPTACLE 4197 570304  | X | - | X | - | - | X | X | - | - | - | - | - | - |
| DEAD END PLUG 4197 544864  | X | X | - | - | - | - | - | - | - | - | X | X | - |
| GROUNDING PLUG 4197 544844  | X | X | - | X | - | - | - | - | - | - | - | X | - |
| STAND OFF PLUG 4197 547304  | X | X | - | - | - | - | - | - | - | - | - | X | - |
| BUSHING PLUG 4197 544684  | X | X | - | - | - | - | - | - | - | - | - | X | - |
| BAILING ASSEMBLY 4196 120384 (E)  | X | X | X | - | - | - | - | - | - | - | - | - | - |
| BAILING ASSEMBLY 4196 120416  | X | - | - | - | - | - | - | - | - | - | - | X | - |
| BAILING ASSEMBLY 4196 120352 (E)  | X | - | - | - | X | - | - | - | - | - | - | - | - |
| ELBOW 4196  | X | - | X | - | X | X | X | X | - | - | - | - | X |
| BAIL CONNECTOR 4196 120448 (E)  | X | - | - | - | - | - | - | - | - | - | - | X | - |

FOR FIELD MAINTENANCE ONLY

NOTES:
- "X" DENOTES UNIT CAP COMPATIBILITY.

INSTALLATION:
(E) EXEMPT MATERIAL.

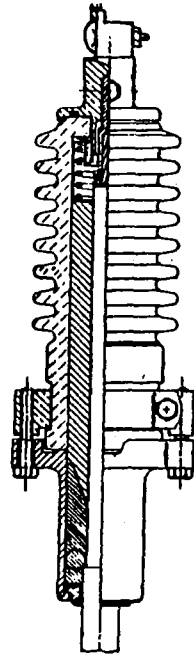


FIGURE 1

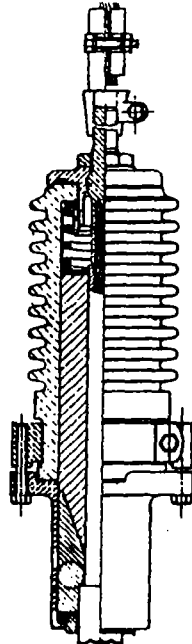


FIGURE 2

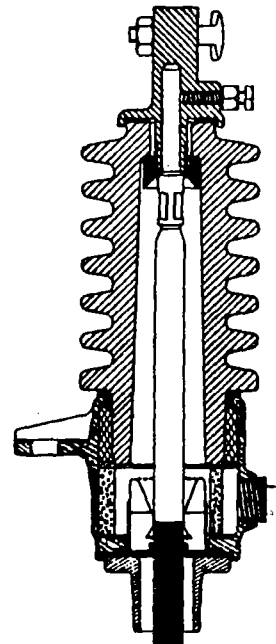


FIGURE 3

FOR MAINTENANCE ONLY

JOSLYN PSC TERMINALS - 15KV

| CABLE | CONDUCTOR | MODEL "C" BODY | STOCK NO. FOR FIG. NO. | FILLER KIT ① | STOCK NO. | AERIAL LUG | COMPRESSION CONNECTOR. | STOCK NO. | MOUNTING BRACKET |
|----------|------------|----------------|------------------------|-----------------------------------|-----------|------------|------------------------|-----------|------------------|
| 4099.004 | 4 CU | J9280 | 727616 | 80-4C71J80 OR 80-4B71J80 | 445742 | - | 80-20A-4Z | 258584 | J9201-E8A |
| 4099.005 | 2 CU | J9280 | 727520 | 80-2C79J85 OR 80-2B79J85 | 445728 | - | 80-20A-2Z | 258168 | J9201-E8A |
| 4099.008 | 4/0 CU | J9280-2 | 727584 | 80-04G104L110 OR 80-04B104L110 | 445760 | 80-108 | 80-39A-04Z | 259552 | J9201-E8A |
| 4099.010 | 500 MCM CU | J9280-2 | 727648 | 80-50C135L145 OR 80-50B135L145 | 445824 | 80-108 | 80-39B-50Z | 259648 | J9201-E8A |
| 4099.002 | 750 MCM AL | J9280-3 | 727552 | 80-75C141V150 | 445840 | 80-111 | 80-128-75Z | 259680 | J9201-N |

① USE FILLER KIT 'C' WITH MODEL "C" BODY ONLY. USE FILLER KIT 'B' WITH ANY SALVABLE 'B' BODY. ('B' BODY NO LONGER MANUFACTURED)

G&W TERMINALS - 15KV "SLIP-ON" TERMINAL - FIGURE 3

| CABLE | CONDUCTOR | CATALOG NUMBER. | STOCK NO. | AERIAL LUG | BRACKET |
|----------------------|-----------|---|------------------|------------|---------|
| 4099.004 4099.007 | 4 & 2 CU. | PAT 1701 - FURNISH WIRE SIZE, O. D. OVER SEMI-CONDUCTING JACKET, ALUMINUM OR COPPER CONDUCTORS. | 727616 727520 | - | - |
| 4099.008 | 4/0 CU. | PAT 1802 - FURNISH WIRE SIZE, O. D. OVER SEMI-CONDUCTING JACKET, ALUMINUM OR COPPER CONDUCTORS. | 727584 | - | - |

NOTE:

FOR INDOOR TERMINATIONS SEE 4121.

SDG&E ELECTRIC STANDARDS

DATE 1-28-74

APPD *[Signature]*

CABLE TERMINALS

4199.101

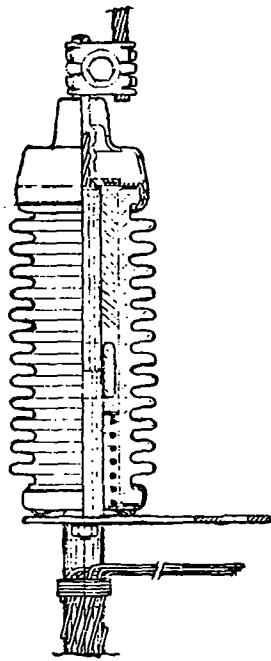


FIGURE 1

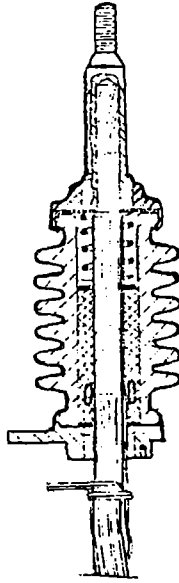


FIGURE 2

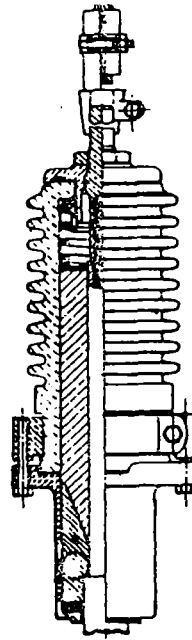


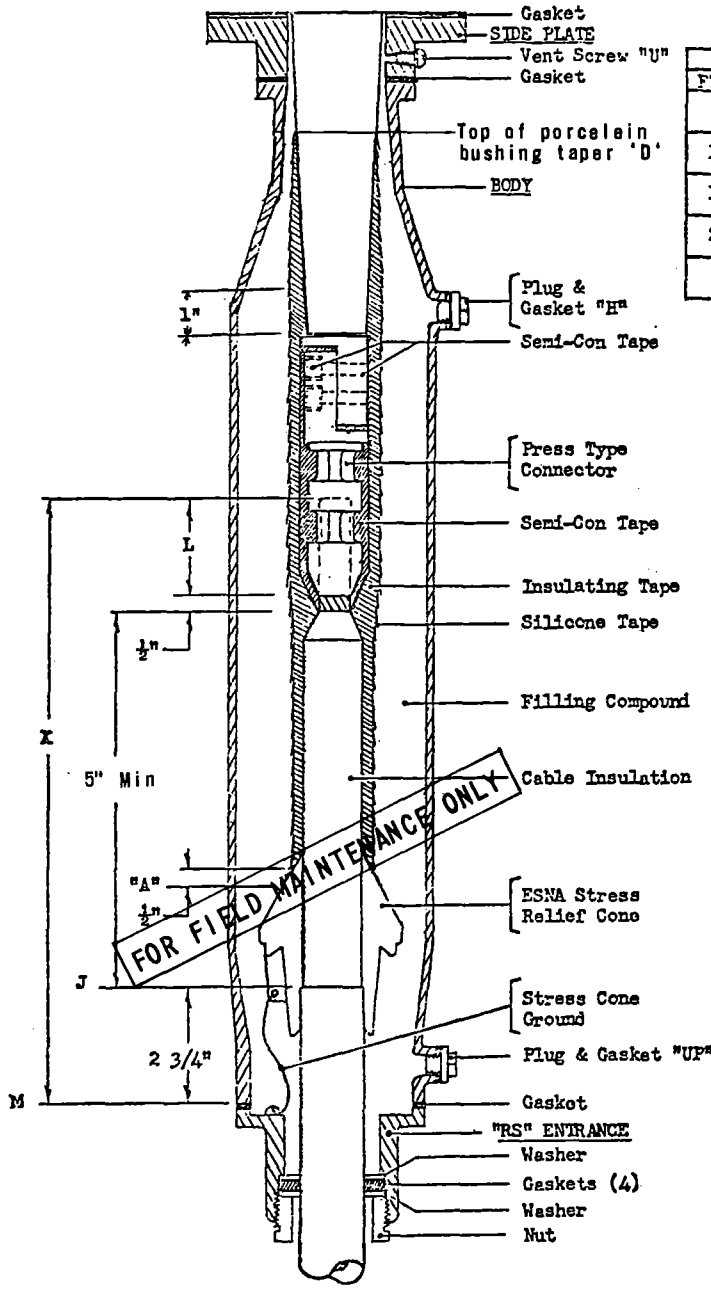
FIGURE 3

FOR FIELD MAINTENANCE ONLY

JOSLYN PSC & "EASY-ON" TERMINALS - 15KV

| CABLE | CONDUCTOR | TERMINAL | STOCK NO. | FIG. NO. | AERIAL LUG | COMPRESSION CONNECTOR | STOCK NO. | MOUNTING BRACKET |
|----------|------------|------------|-----------|----------|------------|-----------------------|-----------|------------------|
| 4099.004 | 4 CU | J9279 | 727616 | 1 | - | 103-01-091 | 259540 | J9201-E6A |
| 4099.005 | 2 CU | J9279 | 727520 | 1 | - | 103-01-125 | 259536 | J9201-E6A |
| 4099.008 | 4/0 CU | E5260 | 727584 | 2 | 80-108 | 1047013 | 259538 | J9201-E6A |
| 4099.010 | 500 KCM CU | E5260 | 727648 | 2 | .80-108 | 10474146 | 259542 | J9201-E6A |
| 4099.002 | 750 KCM AL | J9280-3/78 | 727552 | 3 | 80-111 | 80-128-75Z | 259680 | J9201-N |

NOTE: ① FOR 4099.001 750 KCM AL USE FILLER KIT 80-75C141V155 STOCK NUMBER 445840.



| TORQUE GUIDE | |
|--------------|--------------------------|
| FT.-LBS | DESCRIPTION |
| 5 | 5/16 -18 ENTRANCE BOLTS |
| 10 | 2 3/8 -16 BODY BOLTS |
| 15 | 3/8 -16 CONNECTOR BOLTS |
| 25 | 1 1/2 -13 SIDEPLATE NUTS |
| 5 | 1 1/2 STRAIGHT PIPE PLUG |

FOR FIELD MAINTENANCE ONLY

CABLE TERMINATION INSTRUCTION
"RA" OIL SWITCHES
3-1/C STUD BUSHING COMPARTMENTS FOR 15KV 750MCM (MAX)

The following instructions apply to concentric neutral cable, copper or aluminum, press connectors, Novoid 254 compound filled compartments, "RS" entrance. Make measurements on each conductor after the switch is mounted in position. Do not remove the porcelain bushings from the switch.

1. Remove the entrance and gaskets.
2. Measure the "X" dimension with a stiff wire.
3.
 - a. Position cable and mark jacket at point (M).
 - b. Cut cable "X" inches above mark (M) on jacket.
 - c. Bend neutral wires back out of the way.
4. Remove the body and connector. Torque sideplate nuts to 25 ft - lbs.
5. Place the entrance parts and body back over the cable in proper sequence for reassembly.
6. Measure the depth "L" of the connector socket and add $\frac{1}{2}$ " to this dimension. Remove the cable jacket, insulation and any semi-conducting strand shielding for this distance from the end of the cable.
7. Measure and remove the cable semi-con jacket to cable mark (J).
8.
 - a. Remove all trace of semi-conducting material from the surface of the cable insulation.
 - b. Taper the cable insulation.
 - c. Install ESNA stress relief cone. (Complete with ground wire.)
9. Install appropriate connector per the following instructions:

a. COPPER PRESS TYPE:

Orient the connector on the conductor for a bolted connection without twisting the cable. Press the connector onto the conductor according to the press manufacturer's instructions.

b. ALUMINUM PRESS TYPE:

Using a wire brush, clean the bare conductor strands to remove all traces of aluminum oxide. Remove the seal over the connector socket and immediately fit the connector over the cable conductor. Orient the connector on the conductor for a bolted connection without twisting the cable. Press the connector onto the conductor according to the press manufacturer's instructions.

FOR FIELD MAINTENANCE ONLY

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

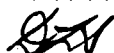
4199.104

CABLE TERMINATION INSTRUCTIONS
'RA' OIL SWITCHES

3-1/C STUD BUSHING COMPONENTS FOR 15KV 750KCMIL (MAX)

DATE 6-14-74

APPD



10. a. Bolt connector to pad. Torque screws to values shown in table.
- b. Pack semi-con tape into all connector bolt holes to form a smooth taping surface.
- c. File off flashing from press operation to blend with circular connector. Fill circumferential grooves with semi-con to form a smooth cylindrical surface. Cut tape to fit grooves.
- d. Clean the porcelain, connector and cable end.
- e. Apply one half-lapped layer of semi-conducting tape over the entire connector surface, starting at the cable stranding and wrapping to the porcelain edge at the top of the connector.
11. Apply half-lapped layers of insulating tape (3M23 or Bishop 3) to a thickness of 200 mils. Start taping at the connector-conductor junction and "fill-in" until the applied tape is even with the cable insulation, then complete the overall taping maintaining 200 mils one (1) inch onto porcelain bushing before tapering, as per sketch, up to top of porcelain bushing taper at point (D).
12. Apply (1) half-lapped layer of Bishop Tri-Sil silicone tape. Start wrapping at point (A) on the cone and continue up the slope and overlap 1" of the insulating tape onto the porcelain bushing up to top of taper at point (D).
13. Clean the termination and compartment parts.
14. a. Assemble the gasket and body to the sideplate. Cross torque bolts to values in table.
- b. Fasten the stress cone ground wire to ground screw.
15. Install the entrance:

"RS" Entrance - Bolt the "RS" body to the entrance gasket and compartment base. Cross torque bolts to value shown in table. Raise the "RS" washers and gaskets and nut into the body. Tighten the nut to seal the entrance to the cable jacket.
16. After the compartments are completely assembled they must be prepared for compounding.
17. Screw a riser pipe into the pipe plug boss listed below. Extend the riser pipe about 12" above the highest point to be filled with compound.

Vent the compartment in the following manner:

FOR UPRIGHT COMPOUNDING - remove the vent screw "U", fill through boss "UP".

FOR INVERTED COMPOUNDING - vent through the top of the entrance; fill through boss "H". Loosen or remove the entrance to provide a vent.

FOR HORIZONTAL COMPOUNDING - remove plug "H" for venting, fill through boss "UP".

FOR FIELD MAINTENANCE ONLY

18. The compartment is prepared for compounding after the filling system is assembled and vented.
19. Heat the compound to the temperature indicated on the container label and observe precautions thereon. Use a thermometer to prevent over-heating.
20. The compartment must be warm to prevent the compound from "freezing" on the cold surface. If necessary, warm with hot air or infra-red lights before filling. CAUTION: Do not heat by applying a torch flame. The riser pipe must be kept hot during the entire pouring operation until the compound in the compartment has completely cooled.
21. Pour the compound through the riser pipe until the compound reaches a vent level. Clean all compound from the sealing surfaces and seal the vent. To prevent void formation continue to add compound until cool.
22. Remove the riser pipe and seal the compartment. Torque pipe plug to value in table.
23. Clean the outside of the compartment. Tighten all bolts, nuts and fittings.
24. Restore neutral wires to their original position on cable. Twist wires together underneath the entrance for attachment to ground.
25. Make the neutral wire ground connection.

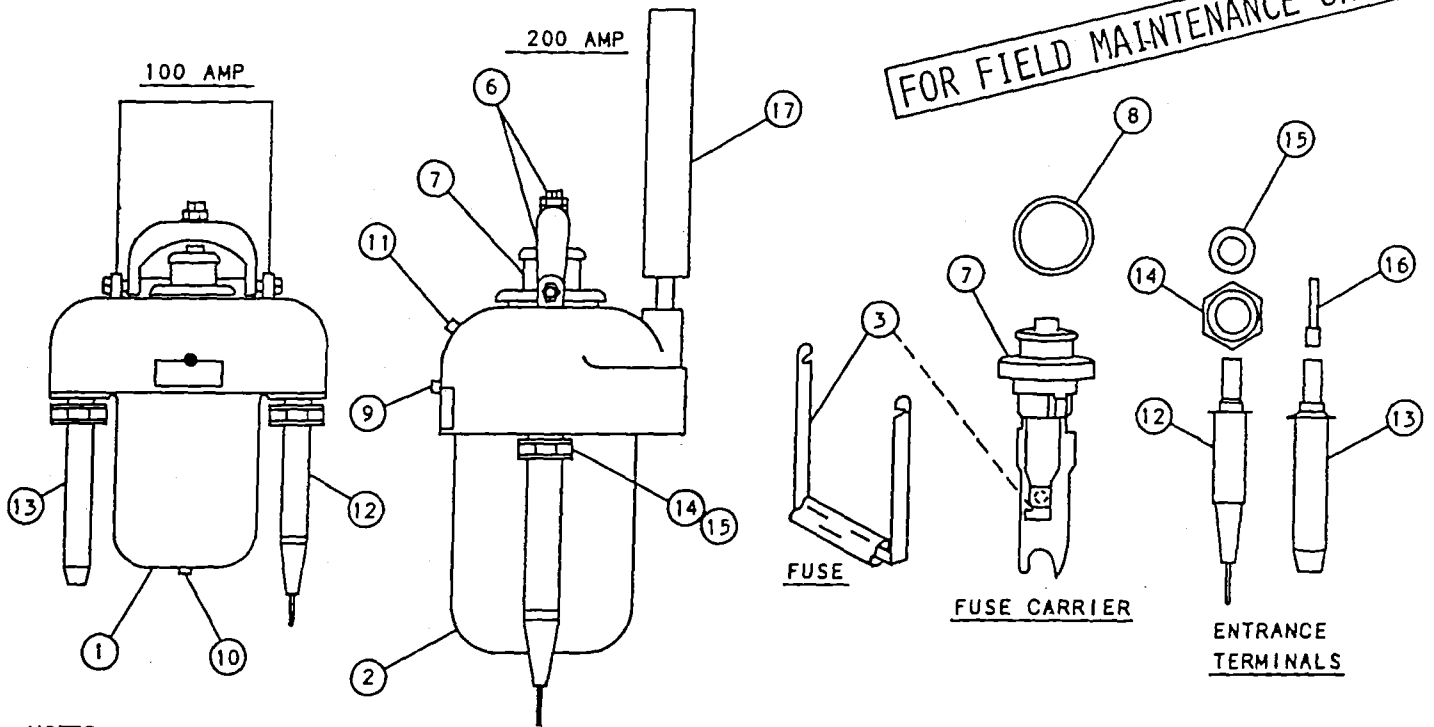
PRECAUTIONS:

1. Do not bend cable to a radius less than that recommended by the cable manufacturer.
2. Make all required reference marks using string or tape.
3. Remove all shielding from cable ends for proper creepage distance and terminate cable shielding with stress relief cones.
4. All trace of semi-conducting material must be removed from the surface of the exposed insulation.
5. Avoid damaging the cable insulation.
6. Keep cable insulation clean and dry.
7. Gasket and gasket surfaces must be free of oil or dirt. Do not use adhesive or cement on gaskets.
8. Fill compartment with hot compound. Do not "top off".
9. Check all joints for positive tightness.

FOR FIELD MAINTENANCE ONLY

| | | |
|----------|---|---|
| 4199.106 | SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS CABLE TERMINATION INSTRUCTIONS 'RA' OIL SWITCHES 3-1/C STUD BUSHING COMPONENTS FOR 15KV 750CMIL (MAX) | DATE 6-14-74 APPD <i>[Signature]</i> |
|----------|---|---|

SCOPE: THIS STANDARD SHOWS THE 100 AMP AND 200 AMP SUBMERSIBLE OIL FILLED FUSE CUTOUTS.



NOTES:

- CAUTION DO NOT INSERT THE FUSE CARRIER INTO THE CUTOUT IF THE FUSE IS BLOWN OR DAMAGED.
- ALWAYS OPEN OR CLOSE THE ENERGIZED CUTOUT WITH ONE COMPLETE RAPID MOTION.
- CUTOUTS COME AS A UNIT INCLUDING TWO ENTRANCE TERMINALS FOR POLYETHYLENE TYPE CABLES.

BILL OF MATERIAL/PARTS LIST:

| ITEM | DESCRIPTION | QUANTITY | CONST. STD. OR PAGE NO. | STOCK NUMBER | ASSEMBLY UNITS |
|------|---|----------|-------------------------|--------------|----------------|
| 1 | 100 AMP LOAD MAKE/LOAD BREAK CUTOUT (RATED 5.2KV) | AS REQ'D | --- | 297824 | DW100 |
| 2 | 200 AMP LOAD MAKE/LOAD BREAK CUTOUT (RATED 5.2KV) | AS REQ'D | --- | 297856 | DW200 |
| 3 | FUSE | 1 | 4311.4 | --- | --- |
| 4 | OIL (NOT SUPPLIED WITH CUTOUT) | AS REQ'D | --- | --- | --- |
| 5 | PETROLATUM (NOT SHOWN) | AS REQ'D | --- | --- | --- |
| 6 | YOKE, CLAMPING SCREW & LOCKNUT ASSEMBLY | 1 | --- | --- | --- |
| 7 | FUSE CARRIER | 1 | --- | --- | --- |
| 8 | FUSE CARRIER GASKET | 1 | --- | --- | --- |
| 9 | OIL LEVEL PLUG | 1 | --- | --- | --- |
| 10 | OIL DRAIN PLUG | 1 | --- | --- | --- |
| 11 | OIL FILL PLUG | 1 | --- | --- | --- |
| 12 | ENTRANCE TERMINAL FOR POLYETHYLENE TYPE CABLE | 100 AMP | AS REQ'D | 730272 | PE-100 |
| | | 200 AMP | | 730304 | PE-200 |
| 13 | WIPING SLEEVE FOR LEAD COVERED CABLE (FERRULE) | AS REQ'D | --- | --- | --- |

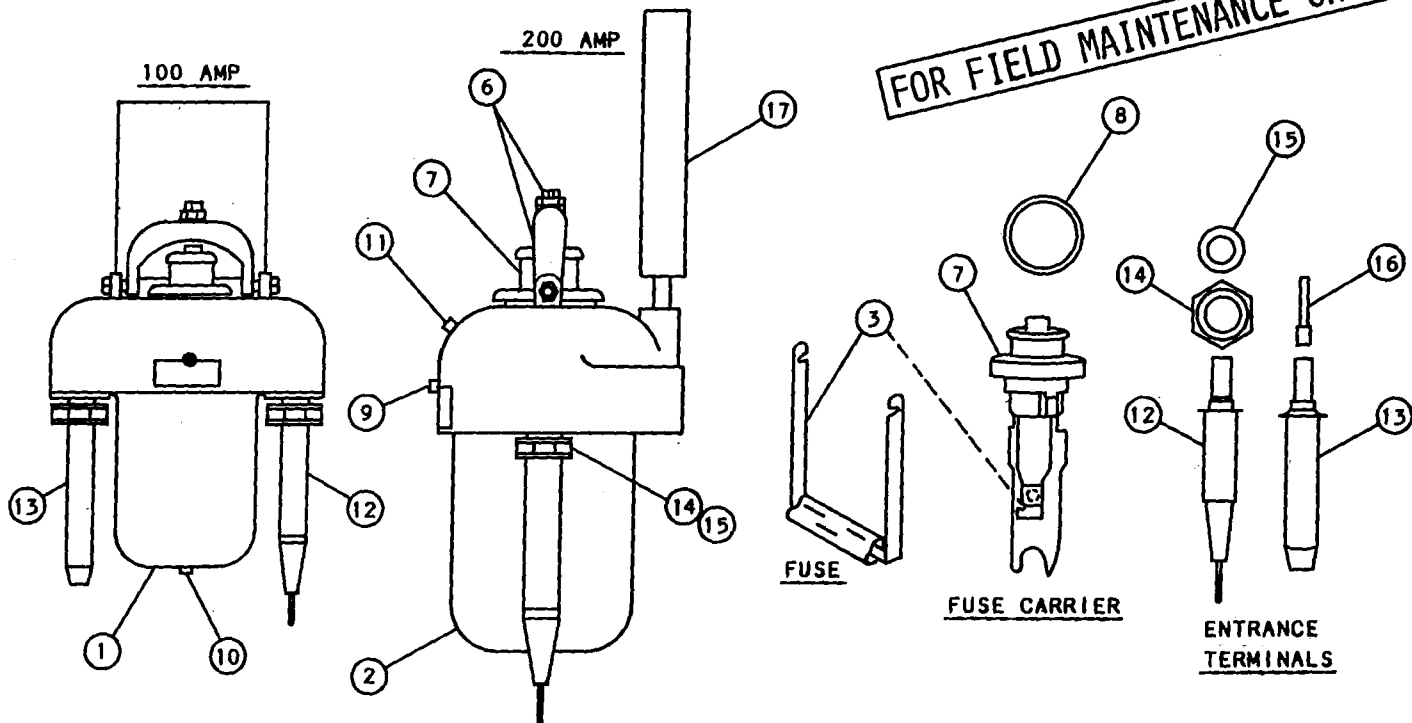
SDG&E ELECTRIC STANDARDS

DATE 1-1-96
 APPD *[Signature]*

4KV OIL FILLED FUSE CUTOUTS
 (SUBMERSIBLE)

4199.107

SCOPE: THIS STANDARD SHOWS THE 100 AMP AND 200 AMP SUBMERSIBLE OIL FILLED FUSE CUTOUTS.



NOTES:

- CAUTION DO NOT INSERT THE FUSE CARRIER INTO THE CUTOUT IF THE FUSE IS BLOWN OR DAMAGED.
- ALWAYS OPEN OR CLOSE THE ENERGIZED CUTOUT WITH ONE COMPLETE RAPID MOTION.
- CUTOUTS COME AS A UNIT INCLUDING TWO ENTRANCE TERMINALS FOR POLYETHYLENE TYPE CABLES.

BILL OF MATERIAL/PARTS LIST:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PAGE NO | STOCK NUMBER |
|------|---|----------|----------------------|--------------|
| 1 | 100 AMP LOAD MAKE/LOAD BREAK CUTOUT (RATED 5.2KV) | AS REQ'D | -- | 297824 |
| 2 | 200 AMP LOAD MAKE/LOAD BREAK CUTOUT (RATED 5.2KV) | AS REQ'D | -- | 297856 |
| 3 | FUSE | 1 | 4311.4 | -- |
| 4 | OIL (NOT SUPPLIED WITH CUTOUT) | AS REQ'D | -- | -- |
| 5 | PETROLATUM (NOT SHOWN) | AS REQ'D | -- | -- |
| 6 | YOKE, CLAMPING SCREW & LOCKNUT ASSEMBLY | 1 | -- | -- |
| 7 | FUSE CARRIER | 1 | -- | -- |
| 8 | FUSE CARRIER GASKET | 1 | -- | -- |
| 9 | OIL LEVEL PLUG | 1 | -- | -- |
| 10 | OIL DRAIN PLUG | 1 | -- | -- |
| 11 | OIL FILL PLUG | 1 | -- | -- |
| 12 | ENTRANCE TERMINAL FOR POLYETHYLENE TYPE CABLE | 100 AMP | AS REQ'D | 730272 |
| | | 200 AMP | | 730304 |
| 13 | WIPING SLEEVE FOR LEAD COVERED CABLE (FERRULE) | AS REQ'D | -- | -- |

DATE 1-1-86
APPD *[Signature]*

SDG&E ELECTRIC STANDARDS

4KV OIL FILLED FUSE CUTOUTS
(SUBMERSIBLE)

4199.107

BILL OF MATERIAL/PARTS LIST CON'T:

| ITEM | DESCRIPTION | QUANTITY |
|------|---|----------|
| 14 | UNION NUT FOR ENTRANCE TERMINALS | 2 |
| 15 | UNION GASKET FOR ENTRANCE TERMINAL | 2 |
| 16 | PLUG CONTACT FOR WIPING SLEEVE TYPE TERMINALS | 2 |
| 17 | EXPANSION CHAMBER | 1 |

INSTALLATION:

A. FOLLOW MANUFACTURERS INSTRUCTIONS WHEN ASSEMBLING CUTOUT.

FOR FIELD MAINTENANCE ONLY

4199.108

SDG&E ELECTRIC STANDARDS

4KV OIL FILLED FUSE CUTOUTS
(SUBMERSIBLE)

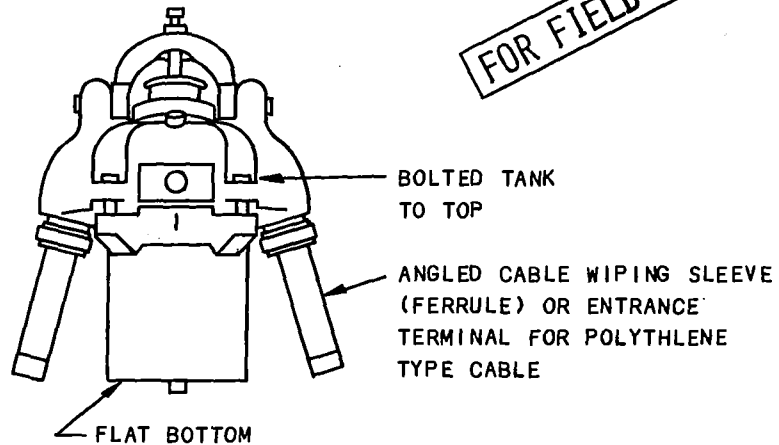
DATE 1-1-86
APPD *[Signature]*

SCOPE: THIS STANDARD SHOWS 60 AMP SUBMERSIBLE OIL FILLED CUTOUTS. **CAUTION:** AT NO TIME SHOULD THIS CUTOUT BE OPERATED ENERGIZED OR ANY SERVICE WORK BE PERFORMED WHILE IT IS ENERGIZED.

CAUTION

60 AMP OR LESS

FOR FIELD MAINTENANCE ONLY



NOTES:

THESE CUTOUTS HAVE BEEN REMOVED FROM OUR SYSTEM BUT IF ONE IS LOCATED IT SHOULD BE CHANGED OUT. THEY MAY STILL BE INSTALLED ON THE CUSTOMERS SYSTEM AND SHOULD BE DEALT WITH IN THE FOLLOWING MANNER:

1. DO NOT OPERATE ENERGIZED.
2. DO NOT DO ANY SERVICE WORK TO THE CUTOUT (CHANGE THE FUSE OR REMOVE CABLES, ETC).

SEVERAL PROBLEMS THAT EXIST WITH THIS STYLE CUTOUT ARE AS FOLLOWS:

1. OIL CAN BE DISCHARGED FROM THE CUTOUT WHEN OPENING THE CUTOUT FUSE HOLDER.
2. THE INTERNAL SPRING CONTACTS MAY BE DETERIORATED AND CAN BREAK APART WHEN THE CUTOUT IS OPERATED RESULTING IN FAILURE. THE CONTACT CANNOT HANDLE OVERLOADS OR FAULT CURRENTS.
3. SOME CABLE FERRULES CAN BE PULLED APART WHEN REMOVING CABLE.

SDG&E ELECTRIC STANDARDS

DATE 1-1-86

APPD

4KV OIL FILLED FUSE CUTOUT
(SUBMERSIBLE)

4199.109

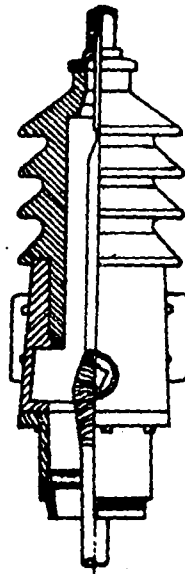


FIGURE 1

| G&W TERMINALS - 8.7KV - FIGURE 1 | | | | | |
|----------------------------------|-------------|----------------|----------|-------------|---------------------------|
| CABLE | CONDUCTOR | CATALOG NUMBER | COMPOUND | BRACKET | STOCK NO. OR CONSTR. STD. |
| U-11.3 & U-11.5 FMO | 4 & 2 CU | UT-15031-R | G&W 254 | NONE-BOLT | 728096 |
| U-11.7 FMO | 4/0 CU | UT-15231-R | | TO CROSSARM | 728192 |
| 4099.001 | 500KCMIL CU | UT-15531-R | | | 728352 |

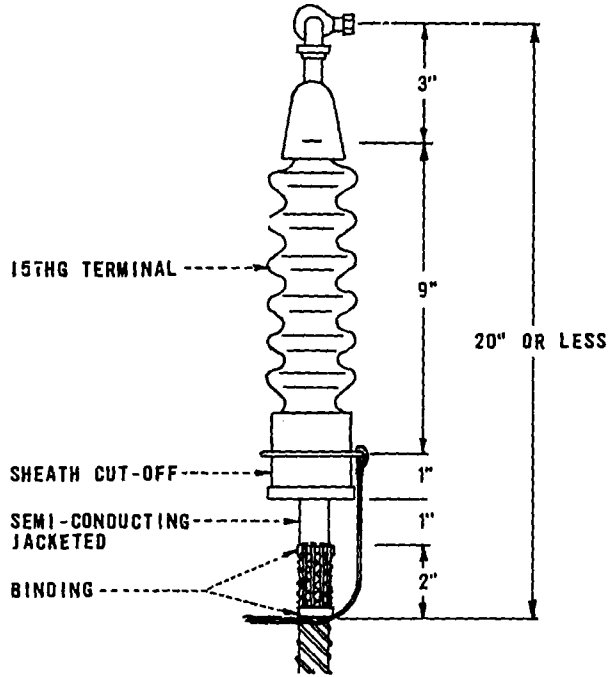
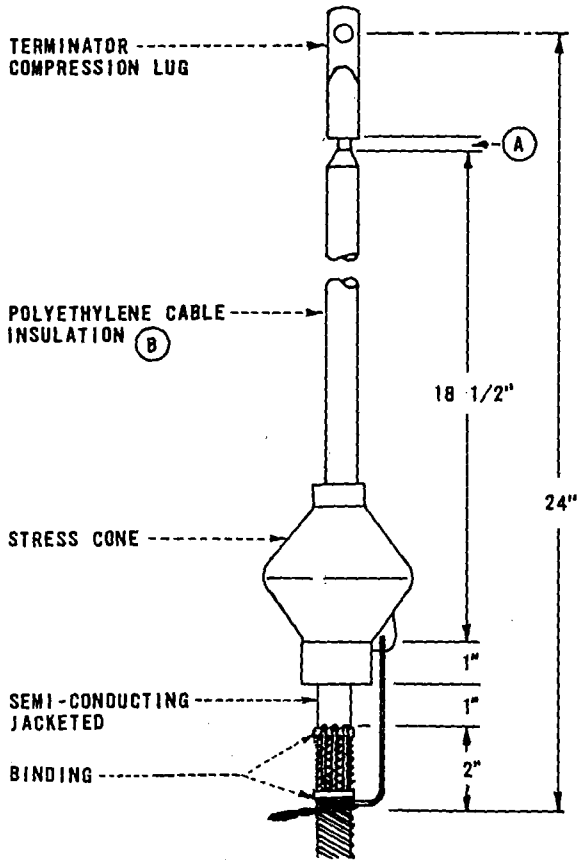
FOR FIELD MAINTENANCE ONLY

NOTE:

- A. FOR INDOOR TERMINATIONS SEE 4121.

| | | |
|--------------------------------------|--|----------|
| APP'D <i>J.W.K.</i> DATE 10-30-74 | SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS | 4199.201 |
| | OUTDOOR COPPER CABLE TERMINALS | |

MAJOR USE: USED FOR INDOOR PRIMARY CABLE TERMINATIONS.

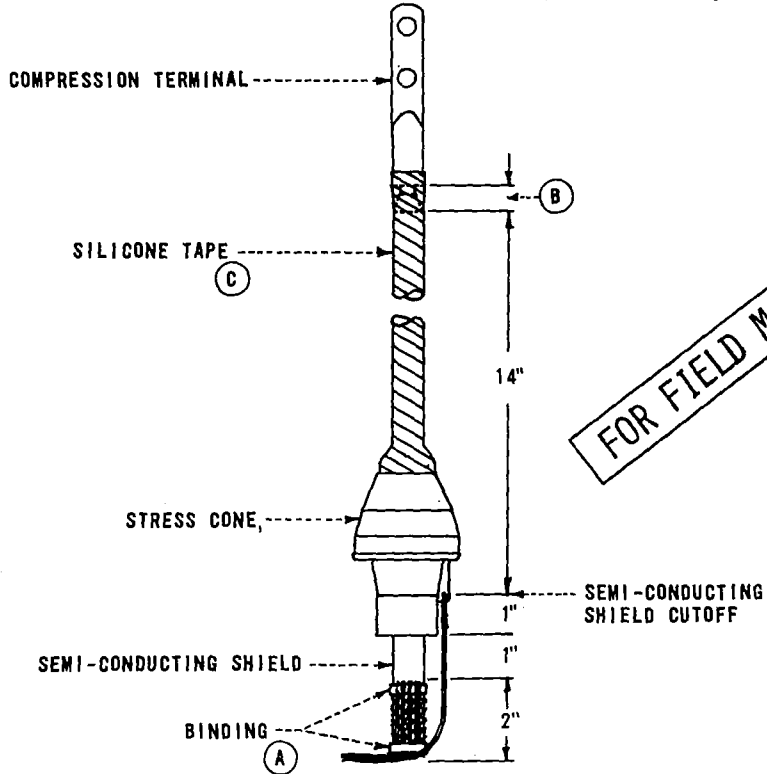


FIELD MAINTANANCE ONLY

NOTES:

- (A) BEVEL TOP EDGE OF CABLE INSULATION NOT MORE THAN 1/4" BACK. FOR ALUMINUM CABLES, SEAL INSULATION TO CABLE TERMINALS WITH THREE 1/2" LAP LAYERS OF ELECTRICAL TAPE (720480). FOR COPPER CABLES LEAVE 1/2" GAP.
- (B) THIS INSTALLATION WITHOUT SILICONE TAPE (720384) SHOULD NO LONGER BE INSTALLED. REFER TO PAGE 4121 FOR PROPER INSTALLATION.

SCOPE: THIS STANDARD SHOWS LIVE FRONT INDOOR PRIMARY CABLE TERMINATIONS.



BILL OF MATERIAL:

| 15KV CABLE SIZE POLYETHYLENE | STRESS CONE | | COMPRESSION TERMINAL |
|---------------------------------|-----------------------|--------------|----------------------|
| | CATALOG NUMBER | STOCK NUMBER | STOCK NUMBER |
| 2 CU | 35-MSC-FG SKC-FG | 252928 (E) | 259008 (E) |
| 4 CU | 35-MSC-FAG SKC-FAB | 252880 (E) | 259040 (E) |
| 4/0 CU | 35-MSC-HA SKC-HA | 252960 (E) | 729792 (E) |
| 500 KCMIL CU | 35-MSC-JAB | 252896 (E) | 729856 (E) |

INSTALLATION:

- (A) USE THREE LAYERS OF 1/2" GLASS TAPE (STOCK NUMBER 720256 (E)) WITH THREE LAYERS OF 3/4" VINYL PLASTIC TAPE (STOCK NUMBER 720580 (E)) OVER GLASS TAPE.
- (B) BEVEL TOP EDGE OF CABLE INSULATION 1/4" BACK. FOR ALUMINUM CABLES, LEAVE 1/4" BARE CONDUCTOR BELOW COMPRESSION TERMINAL AND SEAL INSULATION TO CABLE TERMINALS WITH A MINIMUM OF THREE 1/2" LAP LAYERS OF HIGH VOLTAGE INSULATING TAPE (STOCK NUMBER 720480 (E)). FOR COPPER CABLES LEAVE 1/2" GAP.
- (C) USE MODERATE OR SLIGHT TENSION TO APPLY SILICONE TAPE (STOCK NUMBER 720384 (E)). HALF LAP TAPE STARTING ABOUT 1/2" BELOW TOP OF STRESS CONE AND ENDING 1/4" WAY UP LUG FOR ALUMINUM CABLES OR BELOW GAP FOR COPPER CABLES. (DO NOT END TAPE INSIDE THE CRIMP OF THE COMPRESSION TERMINAL, BECAUSE IT MAY COLLECT MOISTURE).
- D. FOR OUTDOOR TERMINATIONS REFER TO PAGE 4111.
- (E) EXEMPT MATERIAL.

REFERENCE:

- G. SEE STANDARD 4122 FOR INDOOR CABLE TERMINATIONS FOR EXISTING CABLES.

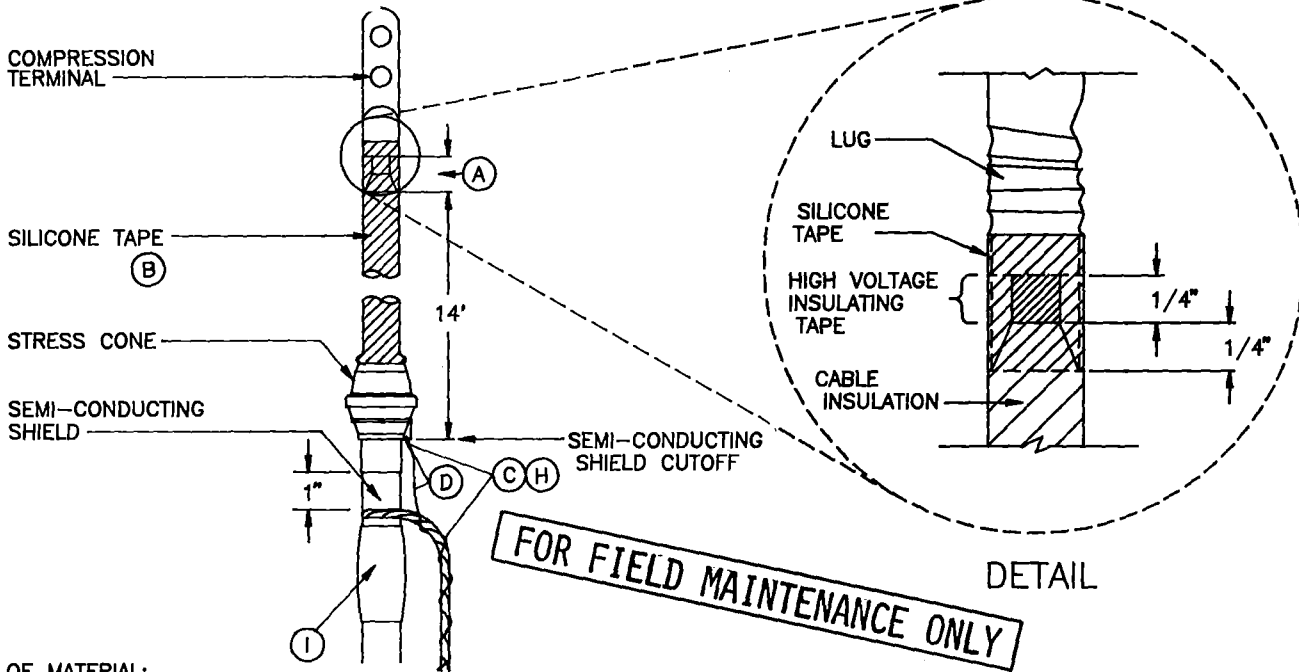
DATE 1-1-87
APPD *[Signature]*

SDG&E ELECTRIC STANDARDS

LIVE FRONT CABLE TERMINATIONS,
POLYETHYLENE CABLES

4199.203

SCOPE: THIS STANDARD SHOWS LIVE FRONT TERMINATION FOR HIGH VOLTAGE CABLE.



BILL OF MATERIAL:

| 15KV CABLE SIZE POLYETHYLENE | STRESS CONE | | COMPRESSION TERMINAL |
|---------------------------------|--|--------------|----------------------|
| | CATALOG NUMBER | STOCK NUMBER | STOCK NUMBER |
| 2 SOL AL | 35-MSC-FAG SKC-FAB | 252880 (E) | 728688 (E) |
| 2/0 AL | 35-MSC-GA | 252882 (E) | 728696 (E) |
| 350 KCMIL AL | 35-MSC-HAB SKC-HAB | 252886 (E) | 728864 (E) |
| 750 KCMIL AL | 35-MSC-JB | 253008 (E) | 729280 (E) |
| 1000 KCMIL AL | SEE STANDARD PAGE 4121 FOR STRESS RELIEF KIT | | |

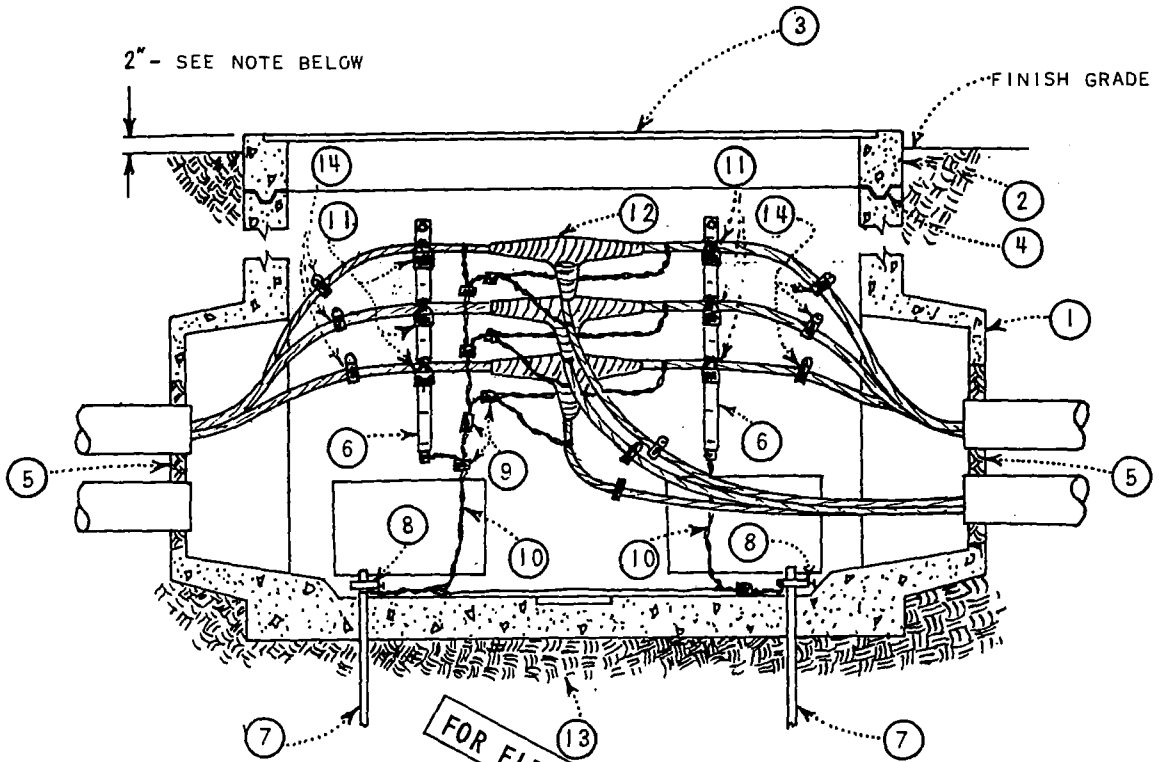
INSTALLATION:

- (A) BEVEL TOP EDGE OF CABLE INSULATION BACK 1/4". LEAVE 1/4" BARE CONDUCTOR BELOW COMPRESSION TERMINAL AND SEAL THE CABLE INSULATION TO THE CABLE TERMINAL WITH A MINIMUM OF THREE HALF-LAP LAYERS OF HIGH VOLTAGE INSULATING TAPE (STOCK NUMBER 720480 (E)).
- (B) USE MODERATE OR SLIGHT TENSION TO APPLY SILICONE TAPE (STOCK NUMBER 720384 (E)). HALF-LAP TAPE STARTING ABOUT 1/2" BELOW TOP OF STRESS CONE AND ENDING 1/4 WAY UP THE LUG. DO NOT END TAPE INSIDE THE CRIMP OF THE COMPRESSION TERMINAL, BECAUSE IT MAY COLLECT MOISTURE.
- (C) GROUND EACH GROUNDING EYE OF THE PREMOLDED CONNECTORS. USE A PIECE OF NO. 14 SOLID COPPER WIRE OR A SURPLUS PIECE OF CONCENTRIC NEUTRAL TAIL THAT IS LONG ENOUGH TO REACH THE NEAREST COMPRESSION CONNECTOR OR TO THE BUSHING WELL TAB USED TO SECURE BAILING ASSEMBLIES. DO NOT USE ANY CONCENTRIC NEUTRAL ATTACHED TO THE CABLE STRANDS UNLESS THE CABLE IS 2/0 OR 2 SOLID TRIPLEXED.
- (D) MAKE A SMALL LOOP THRU THE GROUNDING EYE AND TWIST THE WIRE TIGHTLY AROUND ITSELF TAKING CARE NOT TO DAMAGE THE EYE. WRAP THE WIRE AROUND THE CONCENTRIC NEUTRAL TAIL.
- (E) EXEMPT MATERIAL.

REFERENCE:

- F SEE STANDARD 4111 FOR OUTDOOR TERMINATIONS.
- G SEE STANDARD 4122 FOR INDOOR CABLE TERMINATIONS FOR EXISTING CABLES.
- (H) SEE STANDARD 4525 FOR CONCENTRIC NEUTRAL TERMINATIONS AND GROUNDING PREMODELED CONNECTORS.
- (I) SEE STANDARD 4108 FOR INSTRUCTIONS ON SEALING JACKETED CABLE.
- J. SEE STANDARD 4199.203 FOR INDOOR CABLE TERMINATIONS ON "FIELD MAINTENANCE ONLY" CABLES.

| | | |
|----------|---|----------------------------|
| 4199.204 | SDG&E ELECTRIC STANDARDS | DATE 1-1-91 APPD JLB/KJ |
| | LIVE FRONT CABLE TERMINATIONS, POLYETHYLENE CABLES | |



| ITEM | BILL OF MATERIAL | QUANTITY |
|------|--|-----------|
| 1 | SPLICE BOX, AS SPECIFIED | 1 |
| 2 | EXTENSION (AS REQUIRED PER WORK ORDER) | AS REQ'D. |
| 3 | COVER (PARKWAY OR TRAFFIC PER WORK ORDER) | 1 |
| 4 | GROUT OR SEALANT PER MANUFACTURES INSTRUCTIONS | AS REQ'D. |
| 5 | GROUT | AS REQ'D. |
| 6 | CABLE RACK, 3361 | AS REQ'D. |
| 7 | GROUND ROD, 5/8" X 8", COPPERWELD | 2 |
| 8 | GROUND ROD CLAMP | 2 |
| 9 | COPPER SPLIT COMPRESSION CONNECTORS | AS REQ'D. |
| 10 | #2 COPPER GROUND WIRE | AS REQ'D. |
| 11 | CABLE BINDER - GLASS TAPE | AS REQ'D. |
| 12 | SPLICE, 4142, 4143 | AS REQ'D. |
| 13 | BEDDING SAND, 3" TO 6" | AS REQ'D. |
| 14 | CABLE CLAMPS | AS REQ'D. |

NOTE:

1. INSTALL SPLICE BOX FLUSH WHEN IN OR ADJACENT TO SIDEWALK OR PAVED AREA.

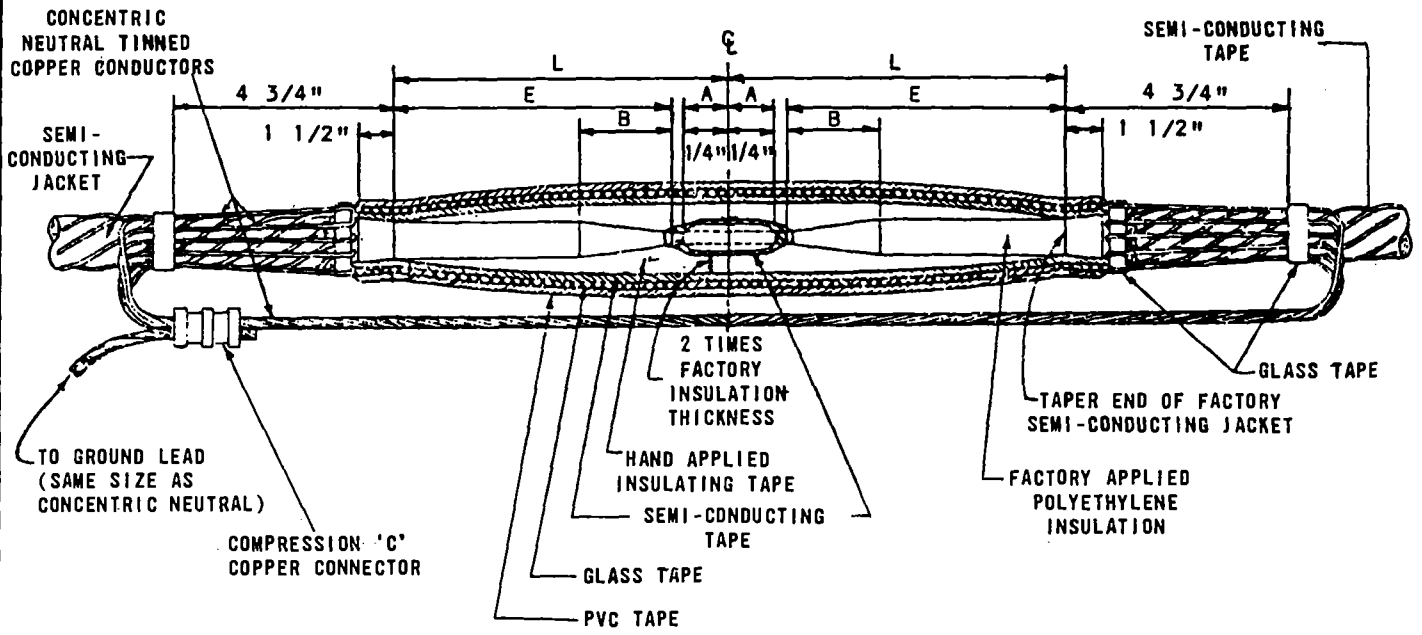


TABLE 1

| CABLE RATING KV | DIMENSIONS INCHES | | |
|--------------------|-------------------|---|---|
| | L | B | E |
| 5 | 4 1/2+A | 1 | 4 |
| 15 | 6 1/2+A | 2 | 6 |

FOR FIELD MAINTENANCE ONLY

NOTES:

1. TRAIN THE CABLES INTO POSITION. MARK THE POINT AT WHICH EACH CABLE IS TO BE CUT.
2. APPLY SEVERAL LAYERS OF FRICTION TAPE AT A DISTANCE $L + 4 \frac{3}{4}$ INCHES FROM THE PREVIOUS MARK. UNWIND THE CONCENTRIC CONDUCTORS. FOLD AND LAY THESE CONDUCTORS BACK OUT OF THE WAY. CUT THE CABLES AT THE MARK (THE CONCENTRIC CONDUCTORS SHOULD BE LONGER THAN THE INSULATED CONDUCTOR TO ALLOW FOR FOLDING BACK OF CONCENTRIC CONDUCTORS AT EACH END OF SPLICE. SEE TABLE 1. IF THIS IS NOT POSSIBLE, THE TWISTED NEUTRAL CONDUCTOR MAY BE 'SPLICED OUT').
3. USING THE SEMI-CONDUCTOR SCORING TOOL MAKE A CIRCUMFERENTIAL SCORE AROUND THE SEMI-CONDUCTING JACKET AT A DISTANCE 'L' FROM THE END OF THE CABLE. USING THE SCORING TOOL MAKE SEVERAL LONGITUDINAL SCORES FROM THE CIRCUMFERENTIAL SCORE TO THE END OF THE CABLE. USE CARE TO ENSURE THAT THE PROPER BLADE IS IN THE SCORING TOOL. THE SCORES MUST NOT COMPLETELY PENETRATE THE SEMI-CONDUCTING JACKET. REMOVE THE SEMI-CONDUCTING JACKET BY TEARING THE STRIPS ALONG THE LONGITUDINAL SCORES.
4. REMOVE THE INSULATION AND CONDUCTOR STRAND SHIELDING FOR A DISTANCE OF $A + 1 \frac{1}{4}$ ".
5. TAPER THE INSULATION WITH A TAPERING TOOL TO DIMENSION 'B'. BUFF THE TAPER.
6. JOIN THE CONDUCTOR WITH A COMPRESSION TYPE CONNECTOR. USE CIRCULAR CRIMP DIES AS SHOWN IN TABLE 2. ALL IRREGULARITIES AND ROUGHNESS MUST BE REMOVED FROM THE CONNECTOR BY USE OF A FILE.
7. CLEAN THE EXPOSED SURFACE OF THE INSULATION USING A CLEAN RAG MOISTENED WITH SOLVENT. USE CARE NOT TO WIPE FROM THE SEMI-CONDUCTING JACKET BACKOVER THE INSULATION AS THIS WILL CARRY CONTAMINANTS ONTO THE SURFACE OF THE INSULATION.
8. WRAP A 1/2 LAP LAYER OF SEMI-CONDUCTING TAPE OVER THE CONNECTOR AND EXPOSED CONDUCTOR, OVERLAPPING THE FACTORY STRAND SHIELDING BUT NOT THE FACTORY INSULATION. THE SEMI-CONDUCTING TAPE SHOULD BE APPLIED SMOOTHLY BY STRETCHING TO BE IN INTIMATE CONTACT WITH THE FACTORY STRAND SHIELDING, THE CONDUCTOR, AND THE COMPRESSION CONNECTOR.

9. TAPE OVER THE JOINT AND ALL THE EXPOSED INSULATION WITH HIGH VOLTAGE INSULATING TAPE, BEING CAREFUL NOT TO COVER THE FACTORY SEMI-CONDUCTING LAYER AT EACH END. WRAP THE INSULATING TAPE 1/2 LAP IN SUCCESSIVE LAYERS UNTIL THE THICKNESS OVER THE CONNECTOR IS EQUAL TO 2 TIMES THE THICKNESS OF THE FACTORY INSULATION. IN WRAPPING THE TAPE, STRETCH IT UNTIL ITS WIDTH IS APPROXIMATELY 3/4 OF ITS ORIGINAL WIDTH. EVEN TENSION SHOULD BE USED SO THAT EACH LAYER IS OF UNIFORM THICKNESS AND DENSITY. KEEP THE TAPE FREE OF DIRT AND MOISTURE.
10. WRAP A 1/2 LAP LAYER OF SEMI-CONDUCTING TAPE OVER THE INSULATED JOINT OVERLAPPING THE FACTORY SEMI-CONDUCTING LAYER 1 1/2 INCHES AT EACH END OF THE SPLICE. THE SEMI-CONDUCTING TAPE SHOULD BE APPLIED SMOOTHLY BY STRETCHING TO BE IN INTIMATE CONTACT WITH THE INSULATION.
11. APPLY A HALF-LAPPED LAYER OF GLASS TAPE OVER THE SEMI-CONDUCTING TAPE AS SHOWN.
12. STARTING NEXT TO THE TURNED BACK CONCENTRIC CONDUCTORS, OVERWRAP THE ENTIRE SPLICE WITH TWO HALF LAPPED LAYERS OF PVC TAPE.
13. REPLACE THE CONCENTRIC CONDUCTORS AND USING GLASS TAPE AS SHOWN, FOLD BACK THE CONCENTRIC CONDUCTORS OVER BINDING AND LAY THEM AGAINST THE CABLE. APPLY A SECOND BINDING OF GLASS TAPE OVER THE LAYED BACK CONCENTRIC CONDUCTORS APPROXIMATELY 4 INCHES FROM THE PREVIOUSLY APPLIED BINDING, TWIST THE REMAINING LENGTH OF CONCENTRIC CONDUCTORS TOGETHER TO FORM A STRANDED CONDUCTOR.
14. CONNECT TWISTED CONDUCTORS TOGETHER USING A COMPRESSION CONNECTOR.

TABLE 2

| CONDUCTOR SIZE | DIE | NUMBER OF COMPRESSIONS | STOCK NO. OR CONSTR. STD. |
|----------------|------|------------------------|---------------------------|
| 4 | U181 | 1 | — |
| | U242 | 2 | |
| 2 | U182 | 1 | 849800 |
| 4/0 | U243 | 2 | 849840 |
| 500KCMIL | U251 | 3 | 848848 |

FOR FIELD MAINTENANCE ONLY

| DESCRIPTION | UNIT | STOCK NO. OR CONSTR. STD. |
|-------------------------|-------------|---------------------------|
| HIGH VOLTAGE INSULATING | 30 FT. ROLL | 720480 (E) |
| SEMI-CONDUCTING TAPE | 15 FT. ROLL | 720352 (E) |
| PVC TAPE | 66 FT. ROLL | 720580 |
| SOLVENT | 1 GAL. CAN | 662484 |
| GLASS TAPE | 80 FT. ROLL | 720224 (E) |

NOTE:

(E) EXEMPT MATERIAL

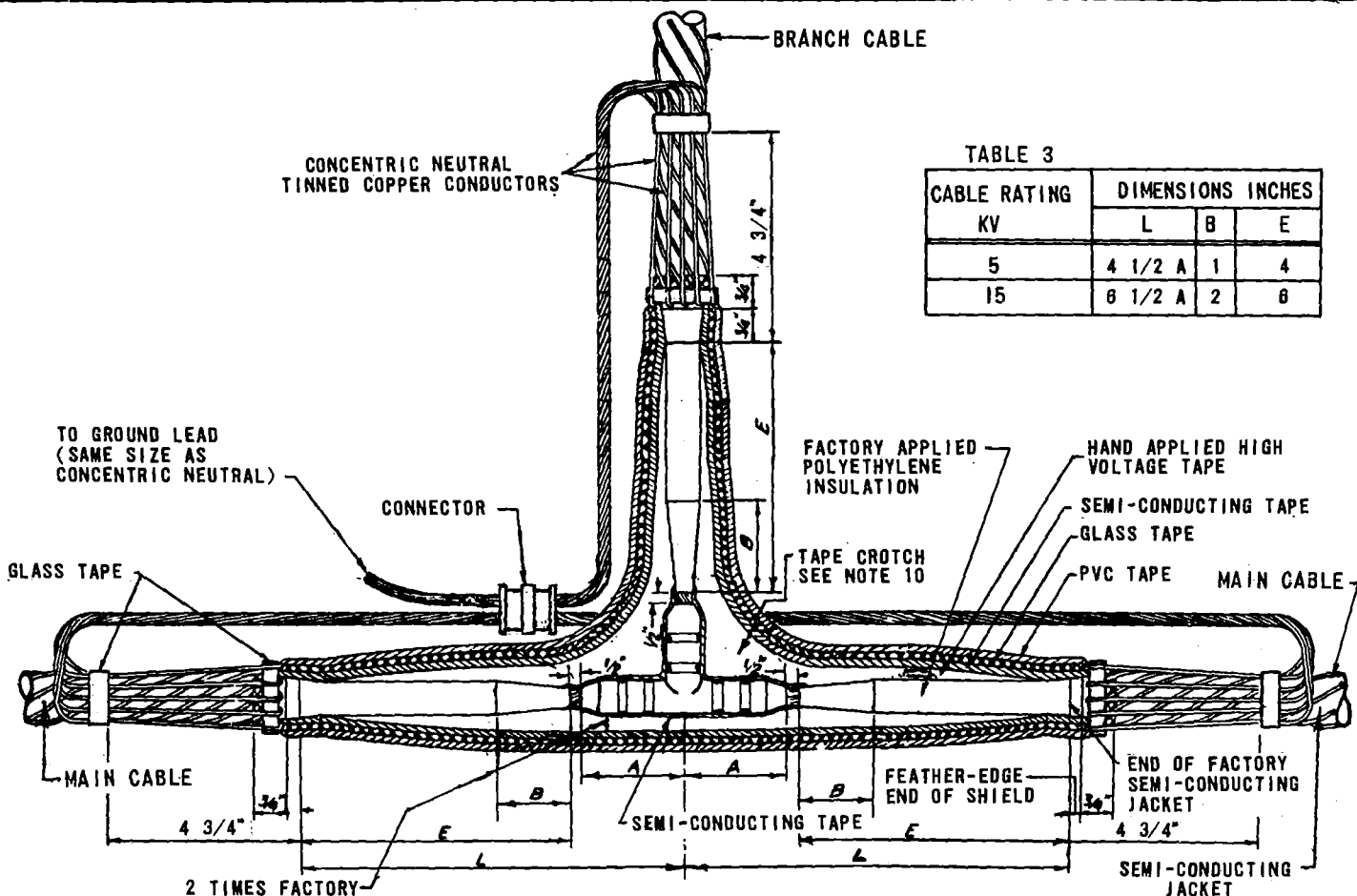


TABLE 3

| CABLE RATING KV | DIMENSIONS INCHES | | |
|--------------------|-------------------|---|---|
| | L | B | E |
| 5 | 4 1/2 A | 1 | 4 |
| 15 | 6 1/2 A | 2 | 6 |

FIG. 2

NOTE: THIS SPLICE SHALL NOT BE USED FOR NEW INSTALLATIONS. THE MOLDED 'T' SPLICE SHALL BE USED WHERE THIS TYPE OF INSTALLATION IS REQUIRED AS FOLLOWS:

1. FOR #2 OR #4 CABLE USE UG STANDARD PAGE 4151, INSTALL 1 - 'T' CONNECTOR, 1- STRAIGHT PLUG AND 2- STRAIGHT RECEPTACLES.
2. FOR CABLES 4/0 AND LARGER USE UG STANDARD PAGE 4182, INSTALL 3 - ELBOW- T'S 1- INSULATED PLUG W/TEST POINT AND 1- INSULATED PLUG W/TEST POINT AND STUD.

- NOTES:
1. TRAIN THE MAIN CABLES AND THE BRANCH CABLE INTO POSITION. MARK THE POINT AT WHICH EACH CABLE IS TO BE CUT.
 2. MARK THE MAIN CABLES 'L' 4 3/4 INCHES AND FOR THE BRANCH CABLE AT A DISTANCE 'L' 4 3/4 INCHES FROM THE PREVIOUS. UNWIND THE CONCENTRIC CONDUCTORS OF EACH CABLE. FOLD AND LAY THESE CONDUCTORS BACK OUT OF THE WAY. CUT EACH CABLE AT ITS MARK. (THE CONCENTRIC CONDUCTORS SHOULD BE LONGER THAN THE INSULATED CONDUCTOR TO ALLOW FOR FOLDING BACK OF CONCENTRIC CONDUCTORS AS SHOWN IN FIG.2. IF THIS IS NOT POSSIBLE, THE TWISTED NEUTRAL CONDUCTOR MAY BE 'SPLICED OUT')
 3. USING THE SEMI-CONDUCTOR SCORING TOOL MAKE A CIRCUMFERENTIAL SCORE AROUND THE SEMI-CONDUCTING JACKET AT A DISTANCE 'L' FROM THE END OF EACH MAIN CABLE AND THE BRANCH CABLE. USING THE SCORING TOOL MAKE SEVERAL LONGITUDINAL SCORES FROM THE CIRCUMFERENTIAL SCORE TO THE END OF EACH CABLE. USE CARE TO ENSURE THAT THE PROPER BLADE IS IN THE SCORING TOOL. THE SCORES MUST NOT COMPLETELY PENETRATE THE SEMI-CONDUCTING JACKET. REMOVE THE SEMI-CONDUCTING JACKET BY TEARING THE STRIPS ALONG THE LONGITUDINAL SCORES.
 4. REMOVE THE INSULATION AND CONDUCTOR STRAND SHIELDING OF THE MAIN CABLES FOR A DISTANCE OF A + 1/2 AND OF THE BRANCH CABLE FOR A DISTANCE OF A + 1/2 AS SHOWN.
 5. TAPER THE INSULATION OF EACH CABLE WITH A TAPERING TOOL TO DIMENSION 'B'. BUFF THE TAPER.
 6. JOIN THE CONDUCTORS WITH A 'HYTEE' COUPLER. USE REDUCING TEE WHEN REQUIRED. USE CIRCULAR SRIMP DIES AS SHOWN IN TABLE 2. ALL IRREGULARITIES AND ROUGHNESS MUST BE REMOVED FROM THE CONNECTOR BY USE OF A FILE.
 7. CLEAN THE SURFACE OF THE EXPOSED SURFACE OF THE INSULATION USING A CLEAN RAG MOISTENED WITH SOLVENT. USE CARE NOT TO WIPE FROM THE SEMI-CONDUCTING JACKET BACKOVER THE INSULATION AS THIS WILL CARRY CONTAMINANTS ONTO THE SURFACE OF THE INSULATION.
 8. APPLY ONE LAYER HALF LAPPED SEMI-CONDUCTING TAPE OVER THE CONNECTOR AND EXPOSED CONDUCTOR OVERLAPPING FACTORY APPLIED SEMI-CONDUCTING STRAND SHIELDING BUT NOT OVER THE FACTORY INSULATION. THE SEMI-CONDUCTING TAPE SHOULD BE APPLIED SMOOTHLY BY STRETCHING TO BE IN INTIMATE CONTACT WITH THE FACTORY STRAND SHIELDING, THE CONDUCTOR AND THE COMPRESSION CONNECTOR.

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9. BUILD UP INSULATION WITH HIGH VOLTAGE INSULATING TAPE TO 2 TIMES THE THICKNESS OF THE FACTORY INSULATION OVER THE CONNECTOR. TAPERING OFF AS SHOWN. USE A MIRROR TO VIEW UNDERSIDE OF SPLICE TO INSURE VOID FREE TAPING. IN WRAPPING THE TAPE, STRECH IT IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS EVEN TENSION SHOULD BE USED SO THAT EACH LAYER IS OF UNIFORM THICKNESS AND DENSITY. KEEP THE TAPE FREE OF DIRT AND MOISTURE. USE EXTRA CARE IN TAPING CROTCHES.
10. APPLY 1/2 LAPPED LAYER OF SEMI-CONDUCTING TAPE OVER THE INSULATED JOINT, OVERLAPPING THE SEMI-CONDUCTING FACTORY LAYER 1 1/2 INCHES AT EACH END OF THE SPLICE AS SHOWN. THE SEMI-CONDUCTING TAPE SHOULD BE APPLIED SMOOTHLY BY STRETCHING TO BE IN INTIMATE CONTACT WITH THE INSULATION. USE MIRROR TO VIEW UNDERSIDE OF SPLICE.
11. APPLY A HALF-LAPPED LAYER OF GLASS TAPE OVER THE SEMI-CONDUCTING TAPE AS SHOWN.
12. STARTING NEXT TO THE TURNED BACK CONCENTRIC CONDUCTORS, OVERWRAP THE ENTIRE SPLICE WITH TWO HALF LAPPED LAYER OF PVC TAPE AS SHOWN.
13. REPLACE THE CONCENTRIC CONDUCTORS OF EACH CABLE AND USING GLASS TAPE, BIND DOWN AS SHOWN. FOLD BACK THE CONCENTRIC CONDUCTORS OF EACH CABLE OVER GLASS TAPE BINDING AND LAY THEM AGAINST THE CABLE. APPLY A SECOND BINDING OF GLASS TAPE OVER THE LAYER BACK CONCENTRIC CONDUCTORS APPROXIMATELY 4 INCHES FROM THE PREVIOUSLY APPLIED BINDING. TWIST THE REMAINING LENGTH OF CONCENTRIC CONDUCTORS TOGETHER OF EACH CABLE SEPARATELY TO FORM THREE SEPARATE STRANDED NEUTRAL CONDUCTORS.
14. INSERT THE TWISTED CONCENTRIC CONDUCTORS INTO A COPPER CONNECTOR AND SQUEEZE TOGETHER TO MAKE A TIGHT FIT.

TABLE 2

| COPPER CONDUCTOR SIZE | DIE | NUMBER OF COMPRESSIONS | STOCK NO. OR CONSTR. STD. |
|-----------------------|------|------------------------|---------------------------|
| 4 | U161 | 1 | - |
| | U242 | 2 | |
| 2 | U162 | 1 | 649800 |
| 4/0 | U243 | 2 | 649840 |
| 500 KCMIL | U251 | 3 | 649848 |

FOR FIELD MAINTENANCE ONLY

| DESCRIPTION | UNIT | STOCK NO. OR CONSTR. STD. |
|-------------------------|-------------|---------------------------|
| HIGH VOLTAGE INSULATING | 30 FT. ROLL | 720480 (E) |
| SEMI-CONDUCTING TAPE | 15 FT. ROLL | 720352 (E) |
| PVC TAPE | 66 FT. ROLL | 720580 |
| SOLVENT | 1 GAL. CAN | 662464 |
| GLASS TAPE | 60 FT. ROLL | 720224 (E) |

NOTE:

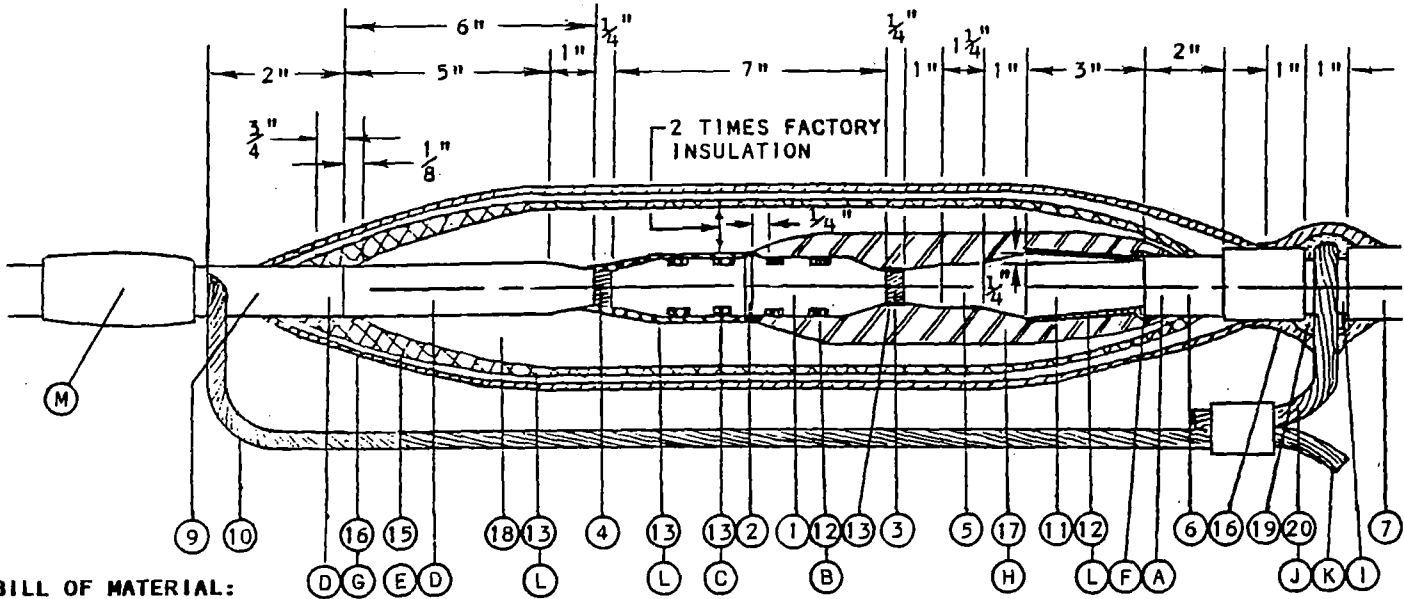
(E) EXEMPT MATERIAL

DATE 5-5-78
APPD TAF

SDG&E ELECTRIC STANDARDS
SPLICES FOR 5KV AND 15KV I/C
POLYETHYLENE INSULATED CONCENTRIC TYPE CABLE
1" SPLICE, (TYPE Pe-CN)

4199.405

SCOPE: THIS STANDARD SHOWS A 10 TRANSITION SPLICE FROM 15KV, 500 KCMIL CU LEAD CABLE TO 15KV, 750 KCMIL POLYETHYLENE CABLE.



BILL OF MATERIAL:

| ITEM | DESCRIPTION | CONST STD | STOCK NO. |
|------|------------------------------|-----------|------------|
| 1 | CONNECTOR, 500 CU TO 750 AL | | 652320 |
| 2 | OIL DAM (PART OF CONNECTOR) | -- | -- |
| 3 | 500 KCMIL CU. CONDUCTOR | -- | 195120 |
| 4 | 750 KCMIL AL CONDUCTOR | 4002 | 197776 |
| 5 | FACTORY PAPER INSULATION | -- | -- |
| 6 | LEAD SHEATH | -- | -- |
| 7 | NEOPRENE JACKET | -- | -- |
| 8 | FACTORY XLPE INSULATION | -- | -- |
| 9 | SEMI-CON PE JACKET | -- | -- |
| 10 | CONCENTRIC NEUTRAL | -- | -- |
| 11 | VARNISHED CAMBRIC TAPE, 3/4" | -- | 721024 (E) |
| 12 | CU. BRAID | -- | 168864 (E) |
| 13 | SEMI-CON TAPE, 3/4" | -- | 720352 (E) |
| 15 | GLASS TAPE, 1/2" | -- | 720256 (E) |
| 16 | VINYL PLASTIC TAPE, 3/4" | -- | 720580 (E) |
| 17 | TAPE, SILICONE | -- | 720384 (E) |
| 18 | H.V. INSULATING TAPE | -- | 720480 (E) |
| 19 | AQUA SEAL OR EQUIVALENT | -- | 631872 |
| 20 | #4 STR. CU. GROUND WIRE | -- | 808256 |

FOR FIELD MAINTENANCE ONLY

| INSTALLATION | |
|--------------|--|
| (A) | ROUGH UP LEAD FOR OIL STOP |
| (B) | FILL CRIMPS WITH BRAID |
| (C) | FILL CRIMPS WITH SEMI-CON TAPE |
| (D) | ROUGH SURFACE W/ALUMINUM OXIDE CLOTH |
| (E) | EXEMPT MATERIAL |
| (F) | BEFORE SOLDERING BRAID PEEN DOWN LEAD TO EXCLUDE AIR |
| (G) | TWO HALF-LAPPED LAYERS |
| (H) | SIX HALF-LAPPED LAYERS OF SILICONE TAPE |
| (I) | RING NEOPRENE JACKET TO EXPOSE LEAD SHEATH |
| (J) | SPOT SOLDER #4 STR. CU. GRD. WIRE TO LEAD SHEATH |
| (K) | CONNECT TO GROUND |
| (L) | ONE HALF-LAPPED LAYER |
| (M) | SEE STANDARD 4108 FOR SEALING JACKETED CABLE |

INSTALLATION:

(E) EXEMPT MATERIAL.

REFERENCE:

(A) SEE STANDARD 4525 FOR CONCENTRIC NEUTRAL TERMINATIONS AND GROUNDING PREMOLDED CONNECTORS.

MAJOR USE: TO CONNECT CONDUCTORS FOR NON-DISCONNECTABLE SPLICES ON 5, 15, AND 69KV CABLES.

EXOTHERMIC CONNECTION - INSTRUCTIONS

PREPARATION OF CONDUCTORS

ALUMINUM TO ALUMINUM

FOR FIELD MAINTENANCE ONLY

1. PREPARE END OF CONDUCTOR IN NORMAL FASHION. SEE TABLE BELOW FOR STRIPPING INSTRUCTIONS.

| CONDUCTOR | 4/0 TO 350 KCMIL | 500 TO 1000 KCMIL |
|------------------|------------------|-------------------|
| MIN STRIP LENGTH | 2-1/2" | 3" |

2. END OF CABLE TO BE WELDED MUST BE WASHED WITH SOLVENT TO REMOVE ALL OIL, GREASE AND DRAWING COMPOUNDS. ALLOW TO DRAIN AND DRY WITH CABLE TIPPED DOWNWARD.
3. ALLOW 1/8" TAPPER (TOP TO BOTTOM) ON CONDUCTOR ENDS. BRUSH END AND OUTER STRANDS OF CABLE WITH CABLE CLEANING WIRE BRUSH TO REMOVE ALL OXIDES.
4. PEEL BACK REQUIRED DISTANCE ON INSTALLATION. TAP CONDUCTOR ENDS TO REMOVE ALL FILINGS.
5. APPLY NON-ADHESIVE OR COTTON BINDING TAPE (STOCK NUMBER 721504) OVER CONDUCTOR LEAVING "X" EXPOSED BEFORE FLUXING CONDUCTOR.

| SIZE | "X" |
|------|--------|
| 4/0 | 1-1/8" |
| 500 | 1-1/8" |
| 750 | 1-1/4" |
| 1000 | 1-3/8" |

6. APPLY AIR DRY FLUX, FROM AEROSOL CAN, TO CABLE END AND 1/2" TO 3/4" BACK ALONG SIDES OF CABLE. APPLY EVENLY AS A MIST AND ALLOW TO DRY TO AN EVEN WHITE COATING.

NOTES:

- ALUMINUM AIR DRY FLUX IS A MECHANICAL SUSPENSION OF FLUX IN A QUICK EVAPORATING LIQUID VEHICLE. IT MUST BE SPRAYED ON AS A MIST, NOT A SOLID STREAM. A SOLID STREAM WILL GIVE TOO HEAVY A COATING AND LUMPS. BRUSH OR WASH OFF EXCESS IF NECESSARY.
- SHAKE FLUX BOTTOM VIGOROUSLY TO PLACE FLUX IN MECHANICAL SUSPENSION, TURN BOTTOM OVER TO BE SURE ALL FLUX IS OFF THE BOTTOM. IT IS ALSO NECESSARY TO FREQUENTLY SHAKE FLUX BOTTLE WHILE SPRAYING TO MAINTAIN CORRECT MECHANICAL MIXTURE OF FLUX AND LIQUID VEHICLE.

COPPER TO ALUMINUM TRANSITION

1. COPPER MUST BE TINNED BACK ABOUT 4" FROM END TO BE WELDED. ALLOW 1/8" TAPER ON CONDUCTOR ENDS.
2. TINNING MUST BE DONE WITH 100% PURE TIN. DO NOT USE SOLDER (TIN AND LEAD) AS LEAD WILL CONTAMINATE WELDS. USE A NON-CORROSIVE COPPER SOLDERING FLUX. ANY GREASY FILM REMAINING MUST BE REMOVED WITH SOLVENT.
3. DO NOT FLUX TINNED COPPER CONDUCTOR PRIOR TO WELDING.
4. FOLLOW INSTRUCTIONS FOR ALUMINUM CABLE (ABOVE) AND WELDING PROCEDURE (BELOW).

COPPER TO COPPER

1. CUT INSULATION BACK 1/2 MOLD WIDTH ± 1/2" FROM EACH END. COPPER MUST BE CLEAN AND DRY TO INSURE A COMPLETE WELD. ALLOW 1/8" TAPER ON CONDUCTOR ENDS.
2. CABLE ENDS SHOULD BE STRAIGHTENED PRIOR TO INSERTION INTO MOLD. THIS RELIEVES ANY TENSION IN MOLD.
3. USING FILE CARD, CLEAN, BRIGHTEN AND ROUGH UP CONDUCTORS.

WELDING PROCEDURE

1. CLEAN MOLD (SEE STEP 9 BELOW).
2. WET OR DAMP MOLDS WILL PRODUCE POROUS WELDS. CAUTION: MOLD MUST BE HEATED AND DRIED OUT WITH TORCH BEFORE MAKING THE FIRST WELD WITH IT AFTER MOLD HAS BEEN SITTING AROUND AT AMBIENT TEMPERATURE.
3. INSERT THE PREPARED CABLE (FLUXED OR TINNED) CONDUCTORS INTO MOLD.
4. LOCK MOLD WITH E-Z CHANGE HANDLE CLAMP.
5. INSERT CERAMIC INSERTS AND METAL DISK, MAKING SURE IT IS PROPERLY SEATED AND COMPLETELY COVERS TAP HOLE.

NOTE:

- WHEN CABLE ENTRANCE HOLE IN MOLD BECOMES WORN, DISCARD MOLD TO PREVENT LEAKAGE OF WELD MATERIAL.

| | | |
|-----------------------------------|---|----------|
| SDG&E ELECTRIC STANDARDS | | |
| DATE 1-1-86 APPD <i>JLB/RD</i> | CONDUCTOR CONNECTIONS, EXOTHERMIC TYPE (CADWELD) | 4199.407 |

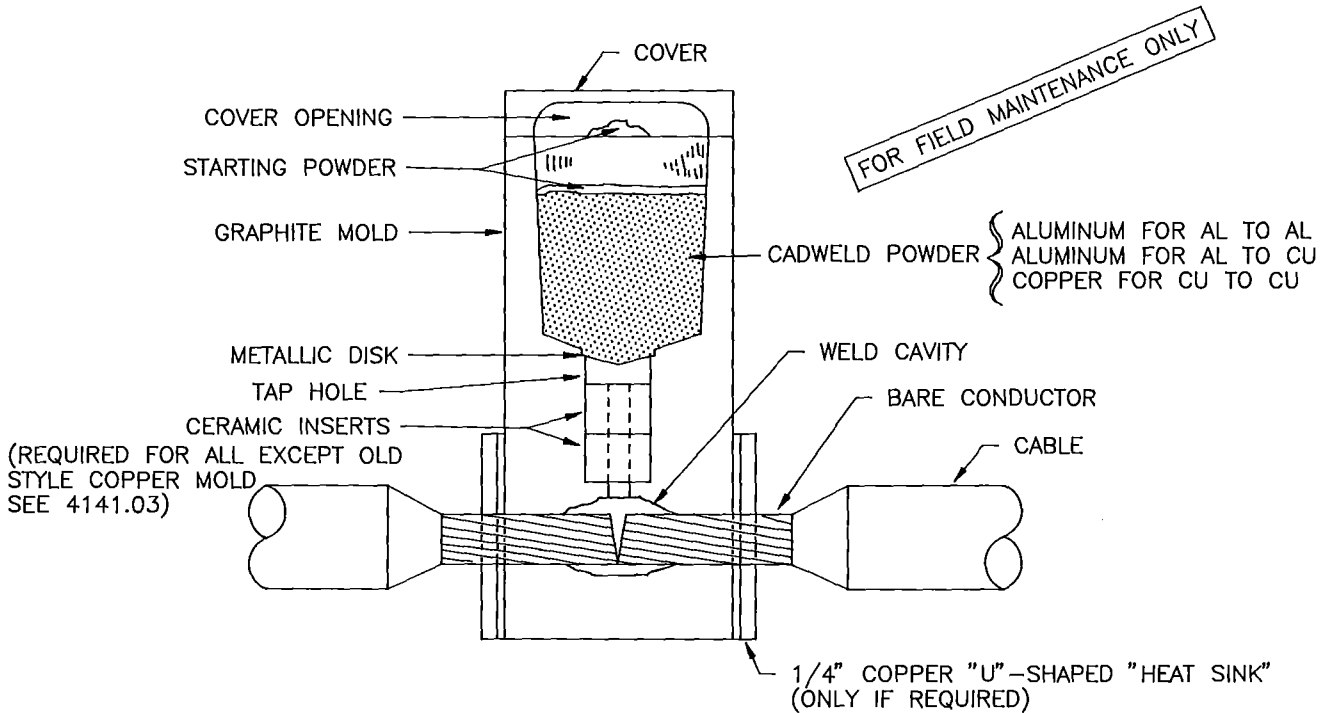
6. OPEN FOIL CARTRIDGE BAG AND REMOVE INNER POLYETHYLENE BAG CONTAINING WELDING POWDER. KNEAD BAG TO BREAK UP ANY LUMPS. FLUFF POWDER BY HOLDING AT TOP AND SHAKING UP AND DOWN. (NOTE: SMALL SIZE CARTRIDGES ARE PACKED TWO OR MORE IN FOIL BAG AS NOTED ON OUTER LABEL).
7. DUMP WELDING POWDER INTO CRUCIBLE, BEING CAREFUL NOT TO UPSET THE METAL DISK. DO NOT TAMP OR COMPRESS WELDING POWDER IN CRUCIBLE. OPEN STARTING POWDER CARTRIDGE AND SPREAD EVENLY OVER WELDING POWDER. PLACE A SMALL AMOUNT OF STARTING POWDER ON TOP OF THE CRUCIBLE SECTION OF MOLD, UNDER THE COVERED OPENING FOR EASY IGNITION.
8. CLOSE COVER AND IGNITE WITH FLINT GUN. JERK GUN AWAY QUICKLY TO PREVENT FOULING. IF GUN BECOMES FOWLED, SOAK IN HOUSEHOLD AMMONIA.
9. ALLOW MINIMUM OF TWO MINUTES FOR WELD METAL TO SOLIDIFY BEFORE OPENING MOLD.
10. REMOVE ALL SLAG FROM MOLD AFTER MAKING EACH WELD. CLEAN MOLD AND COVER BEFORE EACH WELD. CLEAN WITH CLOTH. DO NOT USE WIRE BRUSH.

NOTES:

- A. PROPER CARTRIDGE SIZE IS MARKED ON MOLD TAG AND SHOWN IN CATALOG PROVIDED.
- B. PROPER CARTRIDGE MUST BE USED. DO NOT SUBSTITUTE.

WELD CLEAN-UP

1. CUT OFF WELD RISER WITH HACK SAW CLOSE TO WELD BODY OF CONNECTION.
2. USING A FILE, SMOOTH AND REMOVE ALL FLASHING FROM TOP TO BOTTOM OF CONNECTION.
3. REMOVE ANY OTHER SHARP CORNERS, EDGES, ETC.
4. CONNECTION MUST BE SMOOTHED, IF REQUIRED, USING ALUMINUM OXIDE METAL CLOTH STRIPS.
5. MINOR VOIDS SHALL BE FILLED FLUSH WITH WELD SURFACE WITH SEMI-CONDUCTING TAPE.
CAUTION: DO NOT FILE CABLE STRANDS.
6. WIPE CONNECTION CLEAN. INSURE THAT ALL FILINGS AND FLUX ARE REMOVED FROM CONDUCTOR STRANDS.



FOR FIELD MAINTENANCE ONLY

ALUMINUM FOR AL TO AL
ALUMINUM FOR AL TO CU
COPPER FOR CU TO CU

| | | |
|----------|---|-----------------------------------|
| 4199.408 | SDG&E ELECTRIC STANDARDS | DATE 1-1-94 APPD <i>JLB/RS</i> |
| | CONDUCTOR CONNECTIONS, EXOTHERMIC TYPE (CADWELD) | |

COMPONENT PARTS FOR EXOTHERMIC SPLICING (CADWELD)

| MOLDS | | | |
|------------|----------------|---------|--------------|
| CABLE SIZE | CATALOG NUMBER | | STOCK NUMBER |
| | OLD | NEW | |
| 4/0 CU | WC-3093-2Q | S3R-2QC | 484560 |
| 500 CU | WC-3093-3Q | S3R-3QC | 484568 |
| 750 AL | WD-1556-4L | S1F-4LC | 484512 |
| 1000 AL | WD-1556-4Y | S1F-4YC | 484482 |

| MOLD HANDLE CLAMP | | |
|-------------------|----------------|--------------|
| CABLE SIZE | CATALOG NUMBER | STOCK NUMBER |
| 4/0 CU | L-160 | 227888 |
| 500 CU | L-160 | 227888 |
| 750 AL | L-159 | 227880 |
| 1000 AL | L-159 | 227880 |

| CARTRIDGES | | | |
|------------|-----------------|---------|-------------------------------|
| CABLE SIZE | CATALOG NUMBER | | STOCK NUMBER |
| | OLD | NEW | |
| 4/0 CU | CADWELD 90 CU | #96-2C | 209228 |
| 500 CU | CADWELD 200 CU | #206-2C | 209224 |
| 750 AL | CADWELD 300 XAL | #201-2D | 209220 INCLUDES NO. 426208 |
| 1000 AL | CADWELD 480 XAL | #301-2D | 209226 INCLUDES NO. 426208 |

FOR FIELD MAINTENANCE ONLY

| CERAMIC INSERTS | | |
|-----------------|-------------|--------------|
| CABLE SIZE | CATALOG NO. | STOCK NUMBER |
| 750 AL | 20-S-3671 | 426208 |
| 1000 AL | 20-S-3671 | 426208 |

| ALUMINUM CABLE PREPARATION MATERIAL | |
|---|--------------|
| CATALOG NUMBER | STOCK NUMBER |
| FLUX CADWELD T327B | 359264 |
| SOLVENT CADWELD ERICO 27 S-3506-Q | 662368 |

| | | |
|--|---|----------|
| DATE 1-1-96 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS | 4199.409 |
| | CONDUCTOR CONNECTIONS, EXOTHERMIC TYPE (CADWELD) | |

COMPONENT PARTS FOR EXOTHERMIC SPLICING (CADWELD)

| MOLDS | | | |
|------------|----------------|---------|--------------|
| CABLE SIZE | CATALOG NUMBER | | STOCK NUMBER |
| | OLD | NEW | |
| 4/0 CU | WC-3093-2Q | S3R-2QC | 484560 |
| 500 CU | WC-3093-3Q | S3R-3QC | 484568 |
| 750 AL | WD-1556-4L | S1F-4LC | 484512 |
| 1000 AL | WD-1556-4Y | S1F-4YC | 484482 |

| MOLD HANDLE CLAMP | | |
|-------------------|----------------|--------------|
| CABLE SIZE | CATALOG NUMBER | STOCK NUMBER |
| 4/0 CU | L-160 | 227888 |
| 500 CU | L-160 | 227888 |
| 750 AL | L-159 | 227880 |
| 1000 AL | L-159 | 227880 |

| CARTRIDGES | | | |
|------------|-----------------|---------|----------------------------------|
| CABLE SIZE | CATALOG NUMBER | | STOCK NUMBER |
| | OLD | NEW | |
| 4/0 CU | CADWELD 90 CU | #96-2C | 209228 |
| 500 CU | CADWELD 200 CU | #206-2C | 209224 |
| 750 AL | CADWELD 300 XAL | #201-2D | 209220 INCLUDES NO. 426208 |
| 1000 AL | CADWELD 480 XAL | #301-2D | 209226 INCLUDES NO. 426208 |

FOR FIELD MAINTENANCE ONLY

| CERAMIC INSERTS | | |
|-----------------|-------------|--------------|
| CABLE SIZE | CATALOG NO. | STOCK NUMBER |
| 750 AL | 20-S-3671 | 426208 |
| 1000 AL | 20-S-3671 | 426208 |

| ALUMINUM CABLE PREPARATION MATERIAL | |
|---|--------------|
| CATALOG NUMBER | STOCK NUMBER |
| APPLICATOR, FLUX CADWELD KIT S-4047 | 109728 |
| APPLICATOR, POWER CADWELD KIT S-4048 | 109760 |
| FLUX CADWELD KIT S-4049 | 359264 |
| SOLVENT CADWELD ERICO 27 S-3506-Q | 662368 |

| | | |
|-----------------------------------|---|----------|
| DATE 1-1-94 APPD <i>JLB/RB</i> | SDG&E ELECTRIC STANDARDS | 4199.409 |
| | CONDUCTOR CONNECTIONS, EXOTHERMIC TYPE (CADWELD) | |

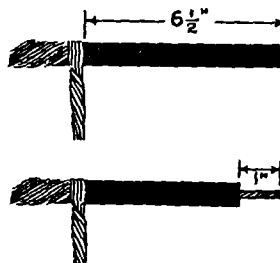
INSTALLATION OF "T" CONNECTOR PROCEDURE

U-41.8

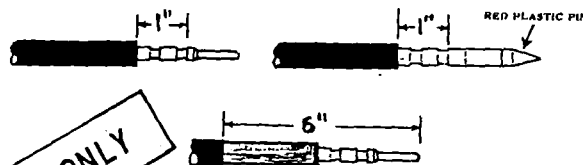
- (A) LUBRICATE MATING SURFACES WITH SILICONE GREASE.
- (B) PLACE NYLON STRING OR ROD IN SOCKET OF MATING DEVICE WITH ENOUGH STRING OR ROD EXPOSED TO PROVIDE FIRM GRIP. STRING OR ROD WILL PERMIT ENTRAPPED AIR TO ESCAPE AFTER DEVICES ARE MATED.
- (C) FIRMLY PLACE "T" CONNECTOR AGAINST RECEPTACLE OR PLUG AND HOLD IN POSITION UNTIL AIR HAS BEEN EXHAUSTED.
- (D) REMOVE NYLON STRING OR ROD.

INSTALLATION OF STRAIGHT RECEPTACLE AND STRAIGHT PLUG PROCEDURE

- (A) CUT CABLE, BIND BACK CONCENTRIC NEUTRAL WIRES WITH TAPE 6 1/2" FROM END. ALLOW EXTRA LENGTH ON NEUTRAL WIRES FOR GROUND CONNECTION. IF CONNECTING TO A MATING STRAIGHT PLUG, THE CABLE ENDS WILL BE 3 1/2" APART WHEN THE CONNECTION IS COMPLETE.

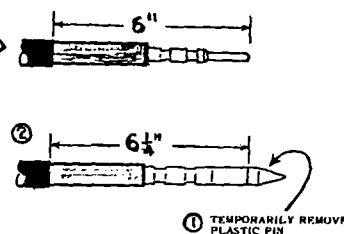


- (B) REMOVE 1" INSULATION OF CABLE INSULATION. LEAVE A SQUARE SHOULDER. (DO NOT PENCIL).
- (C) CRIMP SMOOTH END OF THREADED COMPRESSION CONNECTOR ON BARED CONDUCTOR.
- (D) ON RECEPTACLE REMOVE THE SEMI-CONDUCTIVE SHIELD TO A POINT 6" BACK FROM THE END OF THE PIN, CUT SQUARELY.

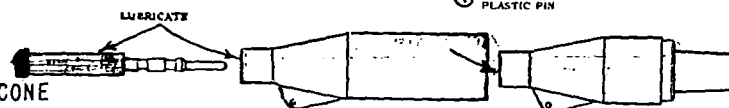


ON STRAIGHT PLUG

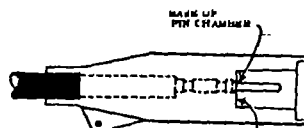
1. TEMPORARILY REMOVE PLASTIC PIN.
2. REMOVE SEMI-CONDUCTIVE SHIELD 6 1/4" FROM THE END OF THE SOCKET; CUT SQUARELY.
3. REPLACE PLASTIC PIN.



- (E) REMOVE PROTECTIVE CAPS. LUBRICATE THE CABLE INSULATION AND INSIDE CABLE ENTRANCE WITH SILICONE GREASE.

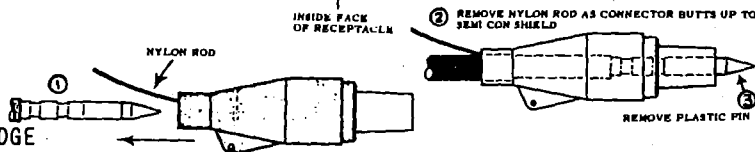


- (F) ON STRAIGHT RECEPTACLE PUSH CABLE INTO HOUSING UNTIL THE BASE OF THE PIN COMES FLUSH WITH THE INSIDE FACE OF THE RECEPTACLE.

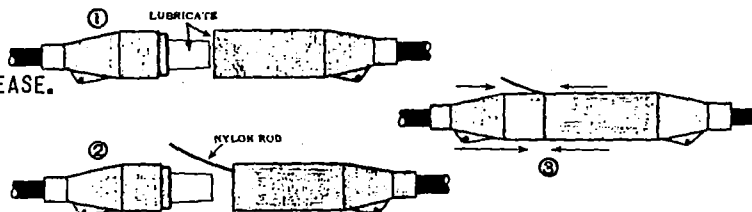


ON STRAIGHT PLUG:

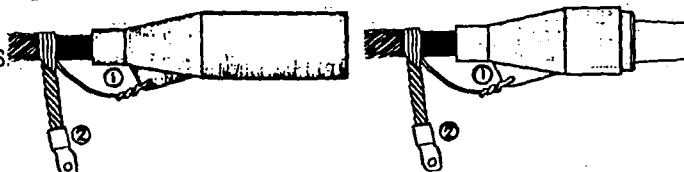
1. INSERT NYLON STRING OR ROD INTO CABLE ENTRANCE OF PLUG.
2. INSERT CABLE UNTIL FRONT EDGE OF THE SOCKET CONTACT COMES FLUSH WITH FRONT EDGE OF PLUG. THEN REMOVE NYLON STRING OR ROD.
3. REMOVE PIN AND DISCARD.



- (G) TO CONNECT TO A MATING PLUG OR RECEPTACLE:
 1. LUBRICATE NOSE OF PLUG WITH SILICONE GREASE.
 2. PLACE NYLON STRING OR ROD INTO RECEPTACLE BASE TO BOTTOM.
 3. INSERT PLUG ASSEMBLY.
 4. REMOVE NYLON STRING OR ROD.



- (H) CABLE GROUNDING:
 1. CONNECT ONE OR MORE CONCENTRIC NEUTRAL WIRES TO GROUNDING EYE AND TWIST TIGHTLY.
 2. TWIST REMAINING WIRES TOGETHER WITH CRIMP CONNECTOR FOR GROUND CONNECTION.



SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

4199.501

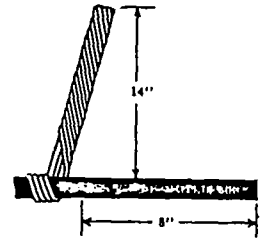
15KV SPLICE CONNECTION

FOR NON-LOAD BREAK

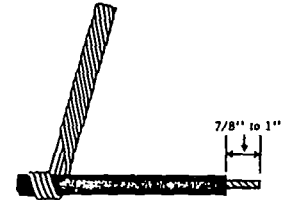
JLB/RB
DATE 1-1-94

INSTALLATION OF "Y" SPLICE
PROCEDURE

- (A) CUT CABLE WHERE SPLICE IS REQUIRED. ALLOW ABOUT 6" CONCENTRIC NEUTRAL BEYOND CUT. MEASURE 8" BACK FROM CUT AND PULL BACK CONCENTRIC NEUTRAL AND BIND.



- (B) REMOVE 7/8" TO 1" OF CABLE INSULATION FROM EACH END OF CABLE. CUT SQUARELY, DO NOT PENCIL. WIRE BRUSH BARE ALUMINUM CONDUCTORS AND INSERT IN CRIMP BARRELS.

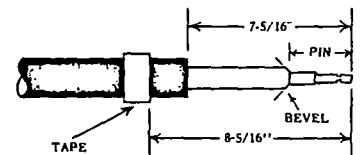


- (C) CRIMP PIN CONTACT OR BARREL CONDUCTOR HOLDING CONTACT BARREL AGAINST THE CABLE INSULATION. ROTATE INSULATION OR CRIMPS 90°.



FOR FIELD MAINTENANCE ONLY

- (D) REMOVE SEMI-CON SHIELD TO A POINT 7 5/16" BACK FROM THE FAR END OF THE PIN CONTACT WITH A STRAIGHT SMOOTH SQUARE CUT. MARK THE SEMI-CON SHIELD WITH A WRAP OF TAPE EXACTLY 8 5/16" BACK FROM THE FAR END OF THE PIN CONTACT. CLEAN THE SHIELD AND WIPE INSULATION CLEAN. BEVEL THE INSULATION NO MORE THAN 1/8" BACK AT 45°.



- (E) REMOVE PROTECTIVE CAP FROM THE CABLE ENTRANCE ON THE "Y" SPLICE. LUBRICATE THE INSIDE OF THE CABLE ENTRANCE, PIN CONTACT AND CABLE INSULATION WITH LUBRICATING SILICONE GREASE SUPPLIED.

APP'D: *[Signature]*
DATE 12-27-73

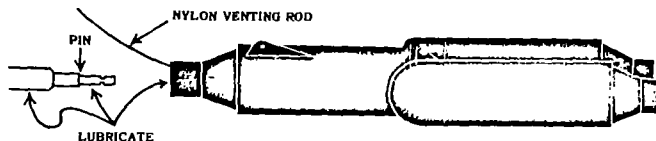
SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

15KV SPLICE CONNECTIONS

FOR NON-LOAD BREAK

4199.502

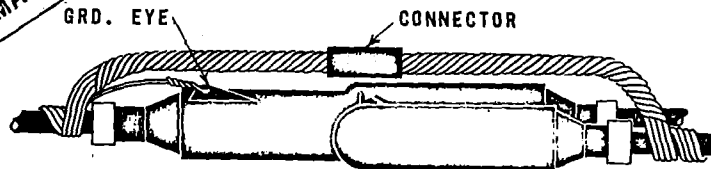
- F INSERT NYLON ROD ABOUT 6" INTO CABLE ENTRANCE. PUSH CABLE INTO ENTRANCE WITH A TWISTING MOTION UNTIL THE TAPE INDICATOR ON THE SEMI-CON SHIELD IS ABOUT 1" AWAY FROM THE END OF THE CABLE ENTRANCE. REMOVE THE ROD. CONTINUE TO PUSH THE CABLE INTO THE "Y" SPLICE UNTIL THE TAPE INDICATOR LINES UP WITH THE END OF THE "Y" SPLICE. CABLE IS THEN LOCKED INTO "Y" SPLICE.



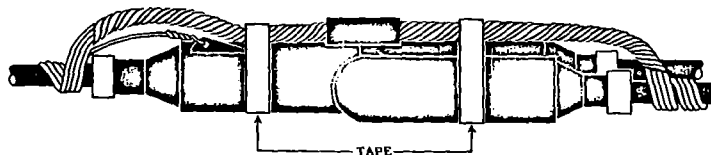
- G REPEAT STEPS A THRU F FOR THE OTHER TWO CABLES.

- H CONNECT ONE OR MORE CONCENTRIC NEUTRAL WIRES TO GROUNDING EYE AND TWIST TIGHTLY. TRAIN AND TWIST REMAINING WIRES TO OPPOSITE ENDS OF "Y" SPLICE HOUSING AND CRIMP TOGETHER WITH CONNECTOR.

FOR FIELD MAINTENANCE ONLY



- I TAPE CONCENTRIC NEUTRAL WIRE TO HOUSING.

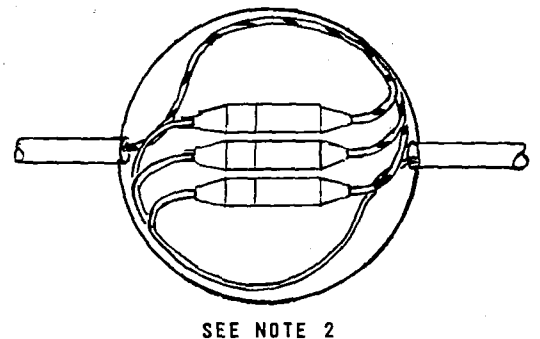
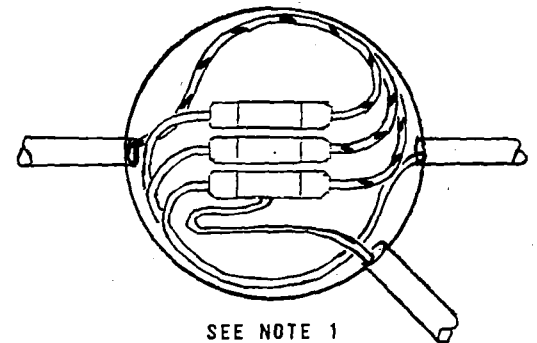
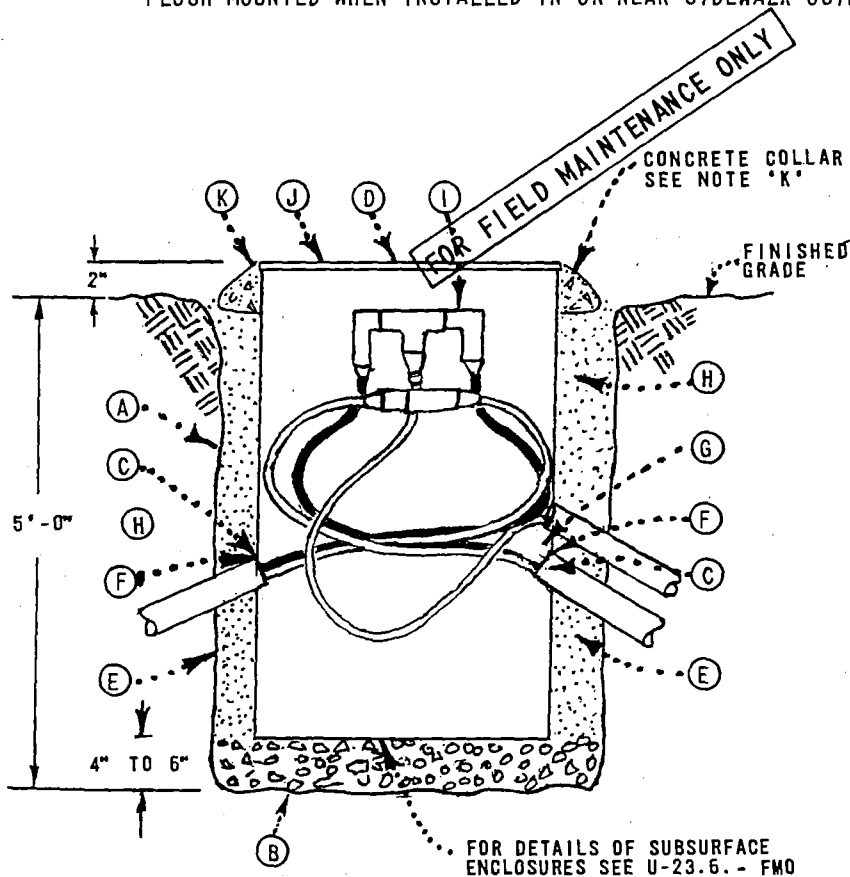


- J "Y" SPLICE IS THEN COMPLETE.

MAJOR USE: USE NEXT OR ADJACENT TO A TRANSFORMER FOR A 1Ø TAP FROM A 1Ø OR 3Ø CIRCUIT.

INSTALLATION OF BURIED EQUIPMENT ENCLOSURE PROCEDURE

- (A) EXCAVATE HOLE 40" TO 48" IN DIAMETER BY 5' - 0" DEEP.
- (B) PLACE 4" TO 6" OF TAMPED 3/4" TO 1 1/2" CRUSHED ROCK IN BOTTOM OF HOLE FOR DRAINAGE, CUT 5' - 0" TUBE TO FIT FINISHED GRADE OR 2" ABOVE. SEE NOTE K BELOW.
- (C) CUT CONDUIT HOLES IN WALL WITH SABRE SAW, KEYHOLE SAW OR HOLE BIT AT DESIRED DEPTHS.
- (D) PLACE ENCLOSURE IN CENTER OF EXCAVATION. SEE NOTE K BELOW.
- (E) BACKFILL WITH USABLE SPOIL OR SAND OUTSIDE ENCLOSURE TO A POINT JUST BELOW CONDUIT ENTRY INTO ENCLOSURE.
- (F) INSTALL CONDUITS AS REQUIRED.
- (G) PULL CABLE, ALLOW 10' INSIDE LINER FOR CONNECTIONS AND BEND UP FOR ACCESSIBILITY.
- (H) COMPLETE BACKFILL WITH USABLE SPOIL OR SAND OUTSIDE ENCLOSURE TO JUST BELOW FINISHED GRADE.
- (I) MAKE CONNECTIONS.
- (J) SECURE GRATING OR SOLID COVER, IF GRATING IS USED PLACE IN A POSITION SO THAT WHEN INSTALLED GRATING BARS ARE PERPENDICULAR TO THE LINE OF THE SIDEWALK.
- (K) WHERE A DRAINAGE PROBLEM MAY OCCUR IT IS SUGGESTED THAT A 3" SLOPED CONCRETE COLLAR AT GRATING AND CONTINUING TO JUST BELOW FINISHED GRADE BE INSTALLED. FIBRE TUBE TO BE FLUSH MOUNTED WHEN INSTALLED IN OR NEAR SIDEWALK USING SOLID COVER.



NOTES:

1. USE *T* TAP (4196) AND NON-LOAD BREAK ELBOWS (4196) FOR 1-1Ø TAP FROM 1Ø OR 3Ø CIRCUIT, USE STRAIGHT RECEPTACLE AND PLUG (4196) FOR PHASES NOT TAPPED.
2. USE STRAIGHT RECEPTACLE (4196) WITH STRAIGHT PLUG (4196) FOR SECTIONALIZING.

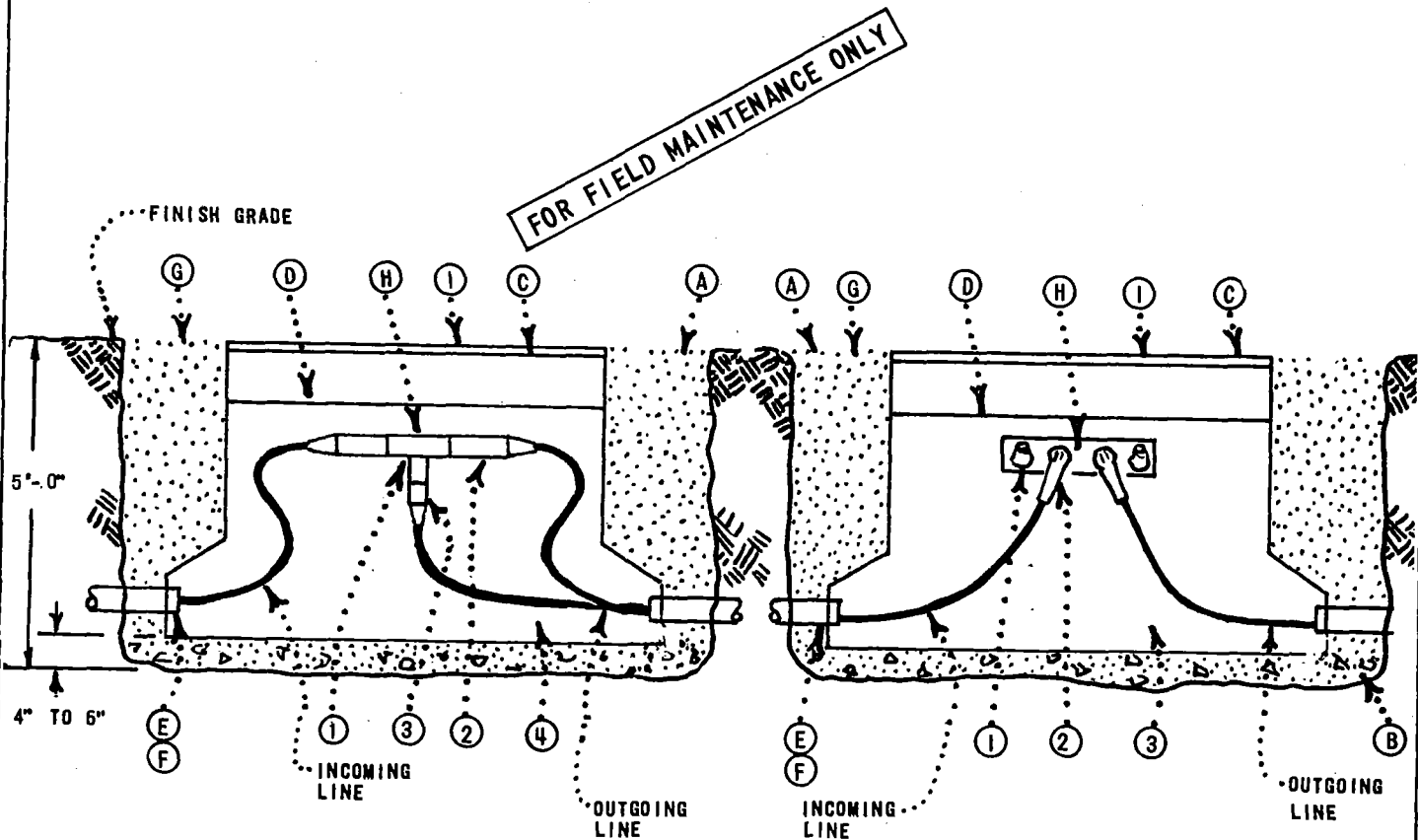
DATE 6-30-78
APPD TAP

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS
NON-LOAD BREAK BURIED EQUIPMENT ENCLOSURE
INSTALLATION
SPLICES

4199.504

INSTALLATION OF BURIED EQUIPMENT ENCLOSURE PROCEDURE

- (A) EXCAVATE HOLE 5' X 9' X 5' DEEP.
- (B) PLACE 4" TO 6" OF TAMPED 3/4" TO 1 1/2" CRUSHED ROCK IN BOTTOM OF HOLE.
- (C) PLACE HANDHOLE IN CENTER OF EXCAVATION.
- (D) INSTALL TOP SECTION USING MASTIC SEALING COMPOUND IN SECTION JOINTS.
- (E) INSTALL CONDUITS AS REQUIRED.
- (F) PULL CABLE, ALLOW 10' INSIDE HANDHOLE FOR CONNECTIONS.
- (G) BACKFILL WITH USABLE SPOIL OR SAND OUTSIDE ENCLOSURE.
- (H) MAKE CONNECTIONS.
- (I) SECURE COVER.



NOTES:

- ① USE 'T' TAP NON-LOAD BREAK (4196).
- ② USE STRAIGHT RECEPTACLE (4196).
- ③ USE STRAIGHT PLUG (4196)
- ④ USE HANDHOLE, 30" X 48" X 42", (3399.101)

NOTES:

- ① USE CABLE TAPS, 3 & 4 WAY ONLY, (4192)
- ② USE LOAD BREAK ELBOWS, (4191).
- ③ USE HANDHOLE, 30" X 48" X 42", (3399.101)

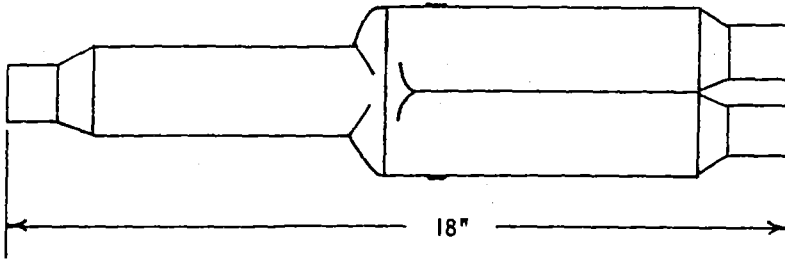
4199.505

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS
1φ LOAD BREAK & 3φ NON-LOAD BREAK BURIED
EQUIPMENT ENCLOSURE INSTALLATION
SPLICES

DATE 6-30-78
APPD TAF

200 AMP DEADBREAK CONNECTORS

"Y" SPLICE
(DELETED FROM PG. 4196.3)



| STOCK NUMBER | |
|--------------|--------|
| #2 CU | 668416 |
| 2/0 AL | 668408 |
| #2 SOL AL | 668400 |
| #2 CU-#2 CU | 668404 |
| #2 AL | |

MAJOR USE:
USED FOR PERMANENT
SPLICE INSTALLATION

INSULATING PLUG
(DELETED FROM 4196.4)



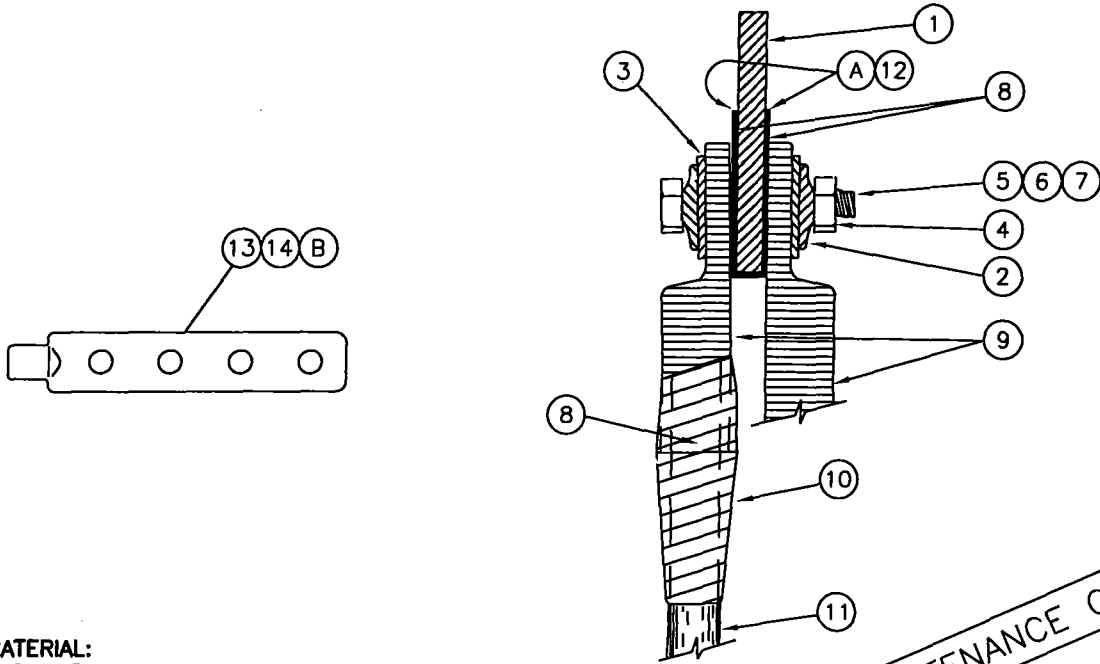
| STOCK NUMBER | |
|--------------|--------|
| #2 CU | 544862 |

MAJOR USE: (#2 COPPER ONLY)
TO PLUG CABLE ENTRANCES
ON "Y" SPLICE. STRAIGHT
PLUG OR STRAIGHT RECEPTACLES

NOTES:

- FOR INSTALLATION PROCEDURES CONSULT INDIVIDUAL MANUFACTURERS CONTAINERS FOR CURRENT INSTRUCTIONS.

FOR FIELD MAINTENANCE ONLY

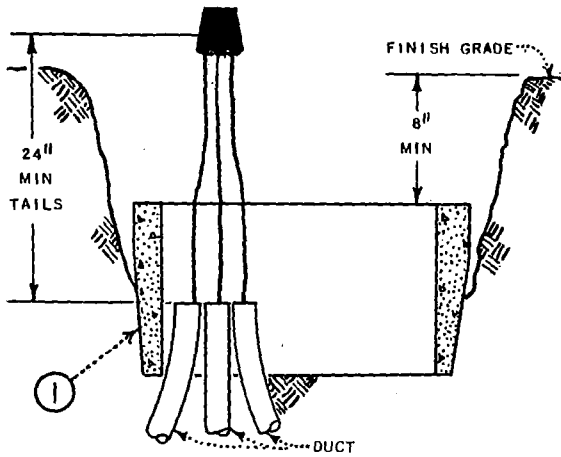


BILL OF MATERIAL:

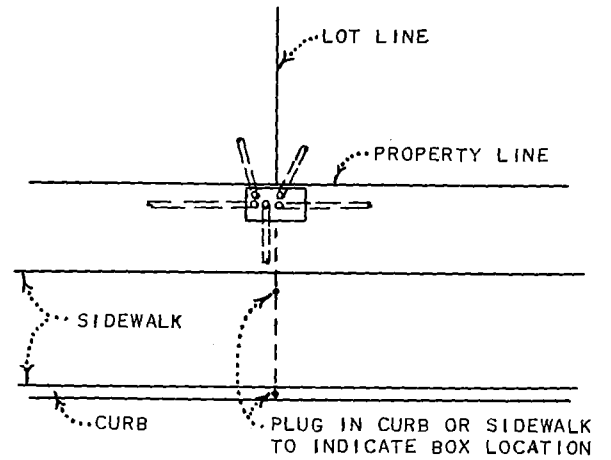
| ITEM | DESCRIPTION | CONST STD. | STOCK NUMBER |
|------|--|--------------------|--------------|
| 1 | TRANSFORMER TERMINAL OR BUS | - | - |
| 2 | WASHER, 3/8", SPRING LOCK, CADMIUM PLATED | - | 798620 |
| 3 | WASHER, 3/8", FLAT, CADMIUM PLATED. | - | 800160 |
| 4 | NUT, 3/8", HEX, MACHINE THREAD, CADMIUM PLATED. | - | 505020 |
| 5 | BOLT, 3/8" X 1-1/2", HEX HEAD MACHINE THREAD, CADMIUM PLATED. | - | 616106 |
| 6 | BOLT, 3/8" X 2", HEX HEAD, MACHINE THREAD, CADMIUM PLATED. | - | 616116 |
| 7 | BOLT, 3/8" X 2-1/2", HEX HEAD, MACHINE THREAD, CADMIUM PLATED. | - | 616120 |
| 8 | INHIBITOR, (REFER TO 4106 FOR INSTALLATION INSTRUCTIONS) | - | 247200 |
| 9 | ALUMINUM LUG, (SIZE AS REQ'D) | 4171 | - |
| 10 | TAPE, PVC | - | 720580 |
| 11 | ALUMINUM CABLE | 4002 | - |
| 12 | TRANSITION PLATE, ALUMINUM TO COPPER | 2 HOLE 1-1/2" X 3" | 543208 |
| | | (A) 4 HOLE 3" X 3" | 543216 |
| | | 4 HOLE 4" X 4" | 543224 |
| 13 | ALUMINUM CONNECTOR, 5/8" STUD, FOR 25-75 KVA (B) | - | 270280 |
| 14 | ALUMINUM CONNECTOR, 1" STUD, FOR 100 & 167 KVA (B) | - | 270276 |

INSTALLATION:

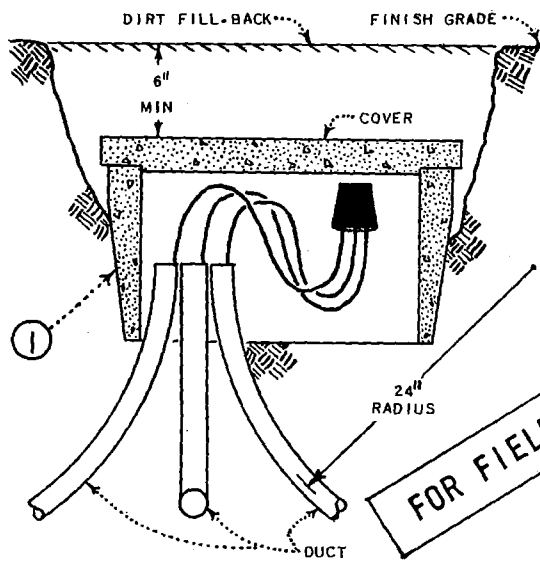
- (A) TRANSITION PLATE (APPROPRIATE SIZE) TO BE USED WHEN BOLTING ALUMINUM LUG TO UN-TINNED COPPER BUS OR TRANSFORMER TERMINAL.
- (B) COPPER TINNED LUGS MAY ATTACHED TO AN ALUMINUM CONNECTOR STUD, ITEMS 13 & 14.



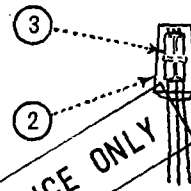
DUCTS AND CONDUCTORS



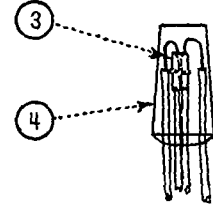
LOCATION PLAN



FINISHED CONDUCTOR CONFIGURATION



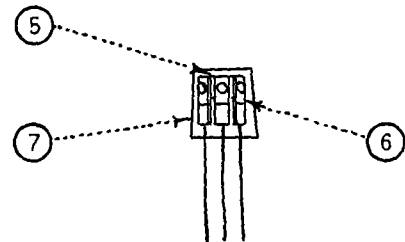
METHOD FOR CONNECTING ONE SECONDARY AND A MAXIMUM OF THREE SERVICE CONDUCTORS.



SQUEEZON

METHOD FOR CONNECTING TWO SECONDARY CONDUCTORS, PLUS TWO SERVICE CONDUCTORS.

FOR FIELD MAINTENANCE ONLY



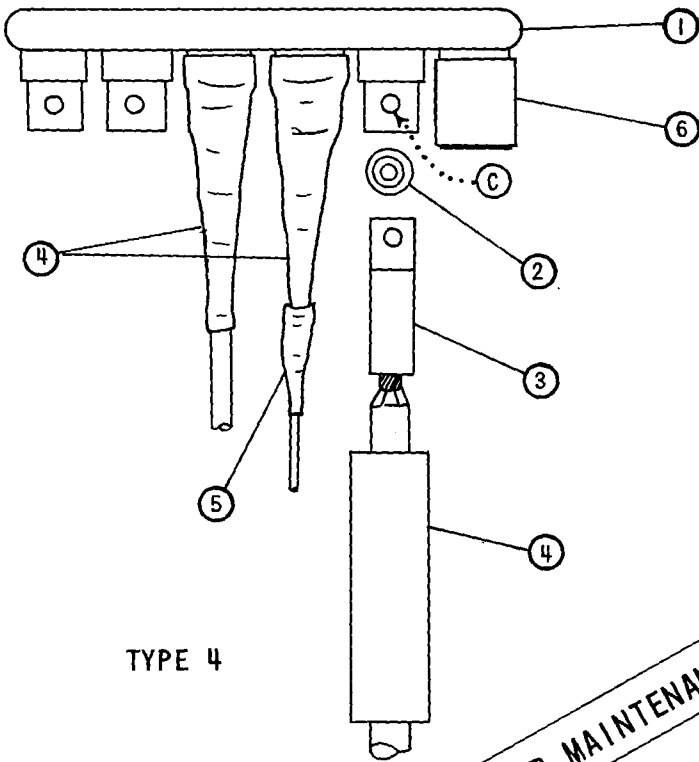
HEXAGONAL HUB

METHOD FOR CONNECTING 350 MCM OR THREE OR MORE SECONDARY CONDUCTORS, PLUS SERVICE CONDUCTORS.

CONNECTIONS

| ITEM | BILL OF MATERIAL | QUANTITY |
|------|--|----------|
| 1 | SECONDARY PULL BOX, REFR. FILE U-21.2 | 1 |
| 2 | BOOT WITH COMPOUND, 6 OUNCE | 3 |
| 3 | SQUEEZON, 4199.701 | 3 |
| 4 | BOOT WITH COMPOUND, 9 OUNCE | 3 |
| 5 | HEXAGONAL HUB | 3 |
| 6 | COMPRESSION LUG CONNECTORS FOR HEXAGONAL HUB, 4171 | AS REQ'D |
| 7 | BOOT WITH COMPOUND, 36 OUNCE | 3 |

MAJOR USE: FOR SECONDARY TERMINATIONS



TYPE 4

FOR FIELD MAINTENANCE ONLY

| URD CONNECTOR ① | |
|-----------------|--------------------------|
| POSITIONS | STOCK NO. OR CONSTR. STD |
| 4 | 270080 |
| 6 | 270208 |

| HEAT SHRINK SLEEVE ④ ⑤ | | |
|------------------------|----------------------|--------------------------|
| LUG | SLEEVE SIZE | STOCK NO. OR CONSTR. STD |
| 4-3/0 | 1.25 EXPANDED X 6" | 777984 |
| 350 KCMIL | 1.5 EXPANDED X 9" | 778016 |
| 8 | 1.25 EXPANDED X 6" | 777984 |
| | ⑤ 0.75 EXPANDED X 3" | 777952 |

INSULATING CAP FOR UNUSED POSITIONS SHIPPED WITH URD CONNECTOR ⑥

| URD INSULATED TERMINAL ASSEMBLY (INCLUDES ② BOLT & WASHER ③ LUG) | | |
|--|-----------------|--------------------------|
| WIRE SIZE AWG | DIE | STOCK NO. OR CONSTR. STD |
| 4 | BG | 730688 |
| 2 | | 730592 |
| 1/0 | 840 | 730560 |
| 3/0 | | 730624 |
| 350 KCMIL | 1 1/8, 705, 299 | 730656 |

NOTES:

- A. USE TORCH TO SHRINK SLEEVES. FLAME SPREADER RECOMMENDED- DO NOT CONCENTRATE HEAT; PLAY FLAME OVER SURFACE OF SLEEVE STARTING AT SHOULDER OF CONNECTOR.
- B. INSTALL SECONDARIES ON CENTER POSITIONS, SERVICES ON OUTER POSITIONS.
- ③ APPLY INHIBITOR (247200) AT EACH ALUMINUM CONNECTION. FOR INSTALLATION INSTRUCTIONS OF ALUMINUM CONNECTORS REFER TO 4106.

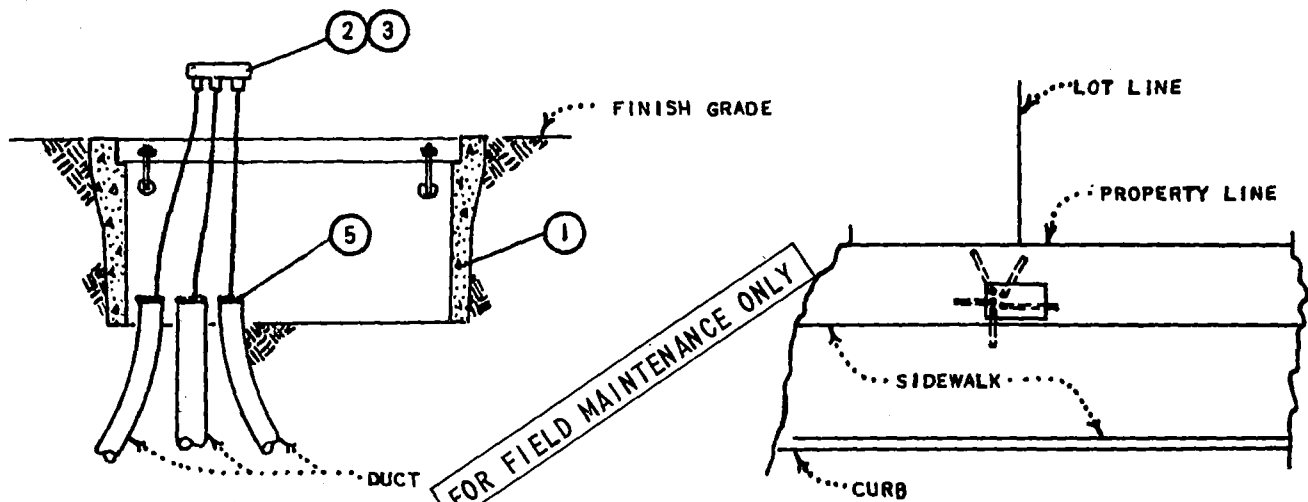
4199.703

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

0-600 VOLT CONNECTIONS
FOR 8 THROUGH 350KCMIL ALUMINUM CONDUCTORS

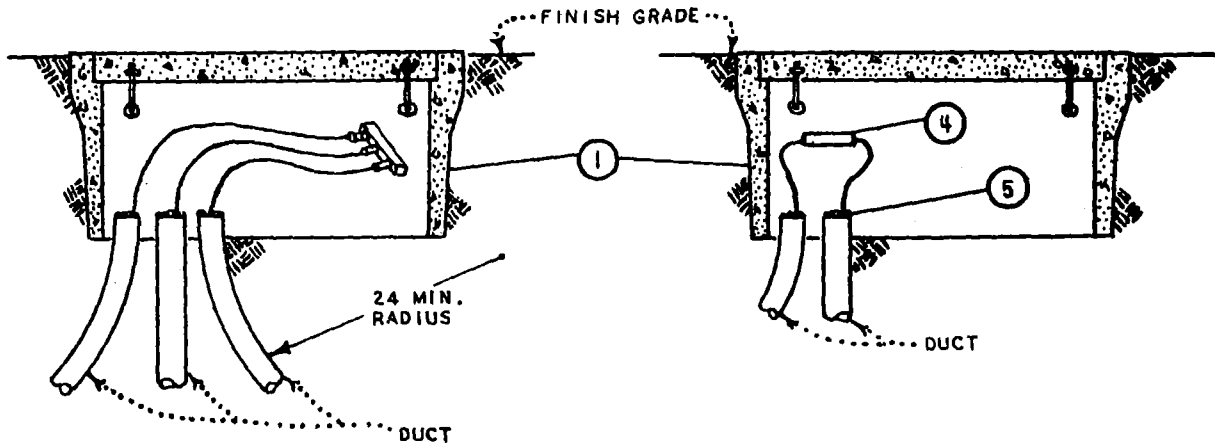
DATE: 1-22-76

APPD *SWK*



DUCTS AND CONDUCTORS

TYPICAL PLAN



FINISHED INSTALLATION
SECONDARIES OR SERVICES

FINISHED INSTALLATION
SECONDARY IN - SERVICE OUT

| ITEM | BILL OF MATERIAL | QUANTITY | STOCK NO. OR CONSTR. STD. |
|------|--|-----------|---------------------------|
| 1 | SECONDARY PRE-CAST HANDHOLE | 1 | 3312 |
| 2 | CONNECTOR | 3 | 4199.705 |
| 3 | LUGS & HEAT SHRINK SLEEVES | AS REQ'D. | 4173 |
| 4 | REDUCING SLEEVES & HEAT SHRINK SLEEVES | 3 | 4173.4 |
| 5 | AQUA SEAL | AS REQ'D. | 631872 |

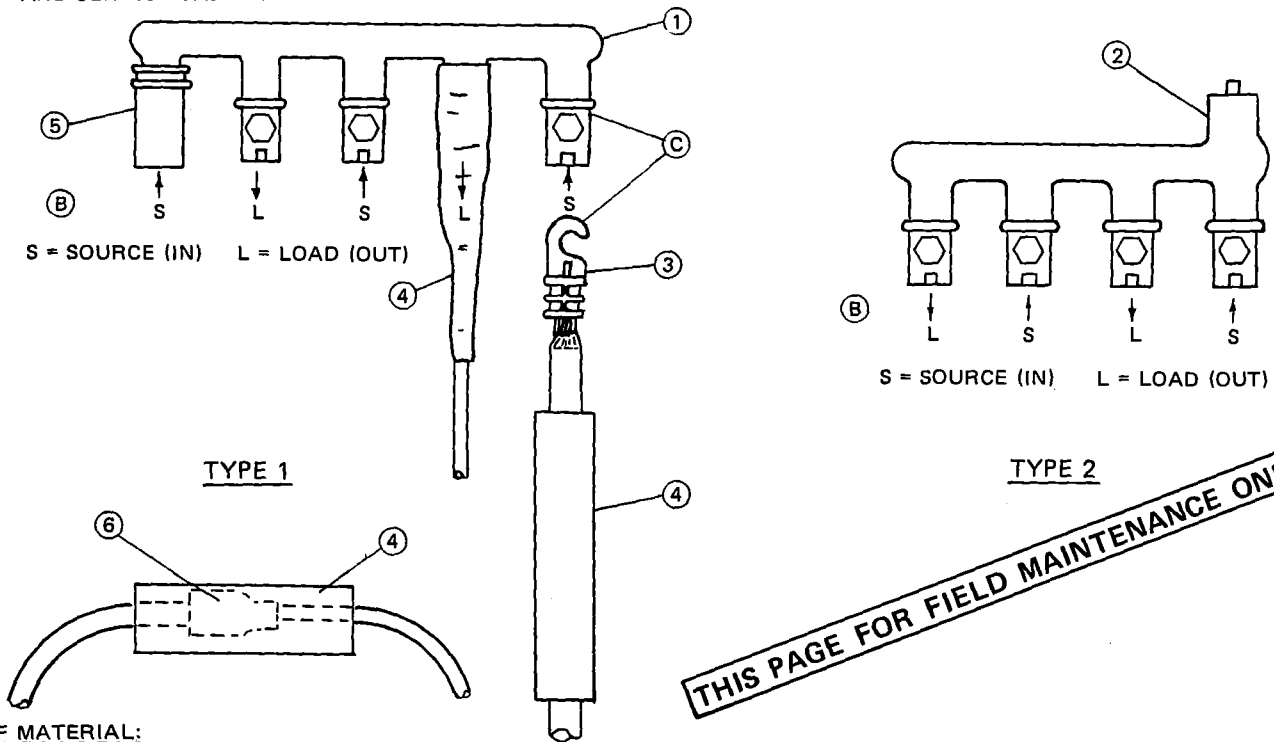
SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

APPD. *J.W.K.*
DATE 8-3-76

0-750 VOLT PRE-CAST HANDHOLE INSTALLATION

4199.704

SCOPE: THIS STANDARD SHOWS THE EQUIPMENT AND INSTALLATION OF 600 VOLT CONNECTORS TO CONNECT SECONDARY AND SERVICE CABLE IN SUBSTRUCTURES.



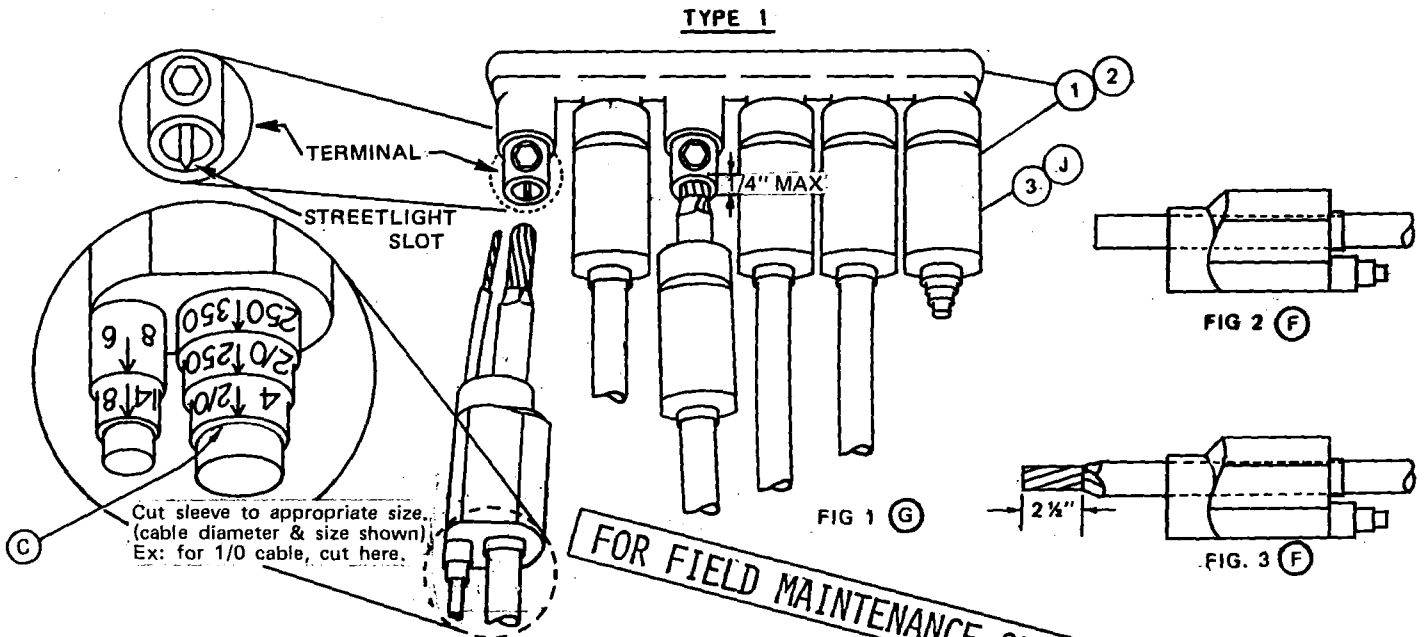
BILL OF MATERIAL:

| ITEM | DESCRIPTION | STOCK NUMBER |
|------|---|--|
| 1 | CONNECTORS | 3 POSITIONS 270048 (E) |
| | | 4 POSITIONS 270064 (E) |
| | | 5 POSITIONS 270176 (E) |
| | | 6 POSITIONS 270264 (E) |
| 2 | CONNECTORS WITH STREET LIGHT TAP FOR WIRE SIZES NO. 12 SOLID TO NO. 4 STRANDED AWG AL & CU. | 3 POSITIONS 269980 (E) |
| | | 4 POSITIONS 270128 (E) |
| | | 6 POSITIONS 270274 (E) |
| 3 | LUGS, ALUMINUM (F) | DIE 840 NO. 4 269952 (E) |
| | | DIE 840 NO. 2 269888 (E) |
| | | DIE 840 1/0 269856 (E) |
| | | DIE 840 3/0 269920 (E) |
| | | DIE 655 350 KCMIL 269972 (E) |
| 4 | SLEEVES, HEAT SHRINK | 4-3/0 LUG, SIZE-1.3 EXPANDED X 6" 777984 (E) |
| | | 350 KCMIL LUG, SIZE-1.5 EXPANDED X 9" 778016 (E) |
| 5 | COVER, INSULATING TERMINAL (FOR UNUSED PORTION) | 286956 |
| 6 | REDUCING SLEEVE OR INSULINKS | DIE W-BG 2-4 258528 (E) |
| | | DIE W-BG 1/0-2 258656 (E) |
| | | DIE W-K840 3/0-1/0 651872 |

INSTALLATION:

- A. USE TORCH TO SHRINK SLEEVES, FLAME SPREADER RECOMMENDED. APPLY FLAME OVER SURFACE OF SLEEVE STARTING AT SHOULDER OF CONNECTOR. DO NOT CONCENTRATE HEAT.
- (B) IF THE SOURCE AND LOAD (IN AND OUT) CONDUCTORS ARE ALTERNATED, THE TOTAL AMPACITY WILL BE THE SUM OF THE AMPACITIES OF THE SOURCE CONDUCTORS. IF THE SOURCE AND LOAD CONDUCTORS ARE NOT ALTERNATED THE MAXIMUM AMPACITY OF THE CONNECTOR WILL BE 750 AMPS FOR THIS SINGLE BOLT VERSION.
- (C) APPLY INHIBITOR (STOCK NUMBER 247200) AT EACH ALUMINUM CONNECTION. FOR INSTALLATION INSTRUCTIONS OF ALUMINUM CONNECTORS REFER TO STANDARD 4106.
- (E) EXEMPT MATERIAL.
- (F) FILE SHARP EDGES AFTER CRIMPING.

SCOPE: THIS STANDARD SHOWS THE EQUIPMENT AND INSTALLATION OF 600 VOLT CONNECTORS TO CONNECT SECONDARY AND SERVICE CABLE IN SUBSTRUCTURES.



FOR FIELD MAINTENANCE ONLY

NOTES:

- IF MORE THAN ONE STREET LIGHT POSITION IS REQUIRED, REPLACE THE SINGLE POSITION SLEEVE SUPPLIED ON THE CONNECTOR WITH A DOUBLE POSITION SLEEVE, ITEM 3.
- IN THE BILL OF MATERIAL THE SIX POSITION CONNECTOR TERMINALS LISTED IN ITEM NUMBERS 1 AND 2 ARE THE SAME CONNECTOR KIT WITH DIFFERENT STOCK NUMBERS. THIS IS TO ASSURE THE AVAILABILITY OF A SIX POSITION STREET LIGHT CONNECTOR.

BILL OF MATERIAL (TYPE 1):

| ITEM | DESCRIPTION | STOCK NUMBER | |
|------|---|-----------------|-------------------------|
| 1 | (KIT) CONNECTOR WITH SLEEVES #8 THRU #350 | 3 TERMINALS, AL | NO LONGER STOCKED |
| | | 4 TERMINALS, AL | |
| | | 5 TERMINALS, AL | |
| | | 6 TERMINALS, AL | |
| 2 | STREET LIGHT KIT CONNECTORS WITH SLEEVES #8 THRU #350 | 6 TERMINALS | |
| 3 | SLEEVE, INSULATING (DOUBLE POSITION) | #8 - #350 | 650154 (E) |
| 4 | INHIBITOR (USE AS REQUIRED) | | 247200 (E) |

INSTALLATION:

- A. INSTALL THE SOURCE IN A MIDDLE TERMINAL AND LOAD CABLES IN THE REMAINING TERMINALS. THE MAXIMUM AMPACITY OF THE CONNECTOR WILL BE 1000 AMPS FOR THIS SINGLE SETSCREW TYPE.
- B. THE MINIMUM CABLE SIZE FOR A STREET LIGHT TERMINAL POSITION SHALL BE #8 AL. NEVER INSTALL A #8 CABLE INTO A TERMINAL POSITION UNLESS IT IS COMBINED WITH EITHER #1/0, #3/0 OR #350 CABLES. IF A STREET LIGHT CABLE IS CU, SPLICE A #8 AL TO THE CU CABLE AND INSTALL THE AL CABLE INTO THE TERMINAL. THIS CONNECTOR MAY BE USED FOR CU BUT NEVER COMBINE CU AND AL IN THE SAME TERMINAL POSITION. DO NOT TAP OFF ANOTHER CONDUCTOR.
- C. REFERRING TO THE EMBOSSED MARKINGS ON THE INSULATOR SLEEVE, SELECT THE PROPER RING AND CUT (SEE FIGURE 1). CUT RING ONLY FOR THE SIZE OF CABLE TO BE INITIALLY INSTALLED.

INSTALLATION CON'T:

D. PREPARE CABLE BY REMOVING ALL DIRT AND/OR MOISTURE FROM THE CABLE ENDS FOR A DISTANCE OF 12 TO 18 INCHES. LIBERALLY APPLY LUBRICANT (SILICONE GREASE) ON CABLE INSULATION AND ALL INTERNAL SEALING SURFACES OF INSULATING SLEEVE AND EXTERIOR OF TERMINAL WITH SUPPLIED LUBRICANT IN PREPARATION OF SLEEVE INSTALLATION.

Ⓔ EXEMPT MATERIAL.

Ⓕ CUT THE CABLE FLUSH, THEN SLIDE THE INSULATING SLEEVE OVER THE CABLE INSULATION (SEE FIGURE 2). REMOVE INSULATION 2-1/2 INCHES AS SHOWN IN FIGURE 3.

Ⓖ WIRE BRUSH CONDUCTOR WITH INHIBITOR (SEE STANDARD 4106) AND INSERT CONDUCTOR INTO TERMINAL UNTIL THERE IS 1/4 INCH MAXIMUM GAP BETWEEN THE INSULATION AND THE TERMINAL (SEE FIGURE 1).

H. AFTER THE INITIAL CONNECTIONS HAVE BEEN MADE, VERIFY THAT THE PROPER TORQUE VALUES HAVE BEEN APPLIED. IT IS EXTREMELY IMPORTANT THE SETSCREWS BE TORQUED TO 25 FOOT POUNDS AS NOTED IN THE MANUFACTURER'S INSTRUCTIONS.

I. SLIDE INSULATING SLEEVES UP OVER CABLES SO THAT SLEEVES BUTT AGAINST CONNECTOR BAR.

Ⓙ USE UNCUT SLEEVES ON SPARE TERMINALS.

FOR FIELD MAINTENANCE ONLY

SDG&E ELECTRIC STANDARDS

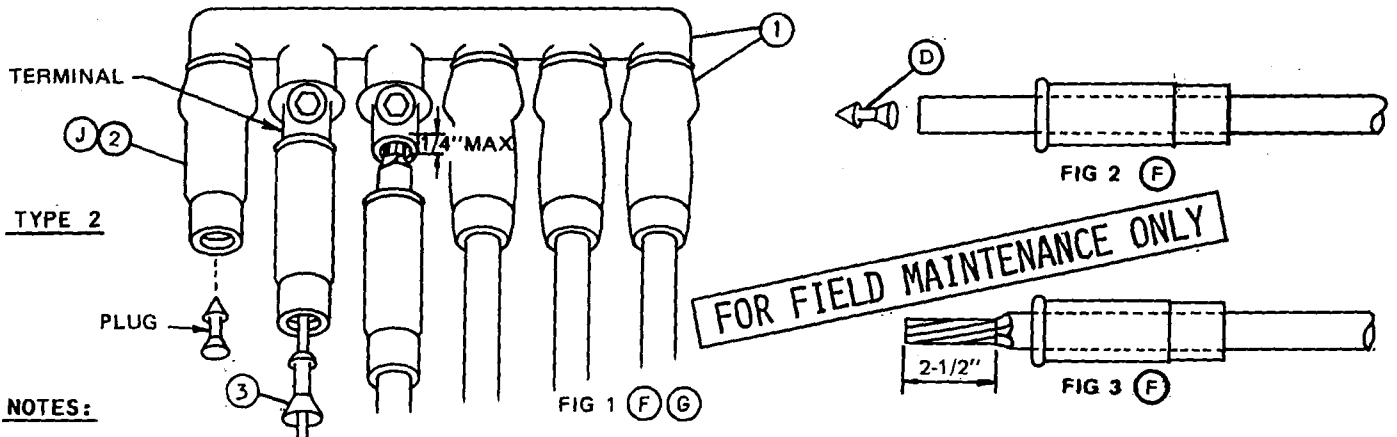
4199.707

0 - 600 VOLT CONNECTORS
FOR # 8 THRU 350 KCMIL AL OR CU CONDUCTORS

DATE 1-1-91

APPD

[Signature]



NOTES:

- IF MORE STREET LIGHT POSITIONS ARE REQUIRED THAN THERE ARE POSITIONS AVAILABLE, USE TYPE 1 CONNECTOR AND EXTRA DOUBLE POSITION SLEEVES, ITEMS 1 & 3, PAGE 4173.1
- IF A SIX POSITION CONNECTOR TERMINAL HAS SIX CABLES AND A STREET LIGHT CABLE IS REQUIRED IN ADDITION, THE TYPE 1 SIX POSITION CONNECTOR TERMINAL - ITEM 1, PAGE 4173.1 - MUST BE USED (STOCK NUMBER 256138 (E)). DO NOT TAP OFF ANOTHER CONDUCTOR.

BILL OF MATERIAL (TYPE 2):

| ITEM | DESCRIPTION | STOCK NUMBER | |
|------|-------------------------------|--------------------|------------|
| 1 | (KIT) | 3 TERMINALS, AL-CU | |
| | CONNECTOR WITH SLEEVES | 4 TERMINALS, AL-CU | |
| | #2 THRU #350 | 5 TERMINALS, AL-CU | |
| | AND ONE SLEEVE INSERT ADAPTOR | 6 TERMINALS, AL-CU | |
| 2 | SLEEVE, INSULATING | #2 - #350 | 650150 (E) |
| 3 | SLEEVE, ADAPTOR | #8 - #4 | 650152 (E) |
| 4 | INHIBITOR (USE AS REQUIRED) | | 247200 (E) |

INSTALLATION:

- A. INSTALL THE SOURCE IN A MIDDLE TERMINAL AND LOAD CABLES IN THE REMAINING TERMINALS. THE MAXIMUM AMPACITY OF THE CONNECTOR WILL BE 1000 AMPS FOR THIS SINGLE SETSCREW TYPE.
- (B) THIS CONNECTOR UNIT ONLY ALLOWS ONE CONDUCTOR PER TERMINAL. THE MINIMUM CABLE SIZE FOR A STREET LIGHT TERMINAL POSITION SHALL BE #8 AL OR CU AND SHALL OCCUPY ONE TERMINAL BY ITSELF.
- C. PREPARE CABLE BY REMOVING ALL DIRT AND/OR MOISTURE FROM THE CABLE ENDS FOR A DISTANCE OF 12 TO 18 INCHES. LIBERALLY APPLY LUBRICANT (SILICONE GREASE) ON CABLE INSULATION AND ALL INTERNAL SEALING SURFACES OF INSULATING SLEEVE AND EXTERIOR OF TERMINAL WITH SUPPLIED LUBRICANT IN PREPARATION OF SLEEVE INSTALLATION.
- (D) REMOVE SUPPLIED PLUG FROM SLEEVE BY PUSHING IT THROUGH THE INSULATED SLEEVE WITH BLUNT INSTRUMENT OR CABLE END (SEE FIGURE 2).
- (E) EXEMPT MATERIAL.
- (F) FOR #8 THRU #4 CABLES, CUT THE CABLE FLUSH THEN SLIDE LUBRICATED "SLEEVE INSERT ADAPTOR" OVER CABLE INSULATION. ALSO SLIDE THE INSULATING SLEEVE OVER THE CABLE INSULATION (SEE FIGURE 1). THEN, REMOVE INSULATION 2-1/2 INCHES AS SHOWN IN FIGURE 3. ONE ADAPTOR FOR #8 THRU #4 CONDUCTOR IS SUPPLIED IN EACH KIT. PLUGS ARE SUPPLIED IN EACH OF THE SLEEVES. FOR #2 THRU #350, CUT THE CABLE FLUSH THEN SLIDE THE INSULATING SLEEVE OVER THE CABLE INSULATION. REMOVE THE INSULATION AS SHOWN IN FIGURE 3.
- (G) WIRE BRUSH CONDUCTOR WITH INHIBITOR (SEE STANDARD 4106) AND INSERT CONDUCTOR INTO TERMINAL UNTIL THERE IS A 1/4 INCH MAXIMUM GAP BETWEEN THE INSULATION AND THE TERMINAL (SEE FIGURE 1).
- H. AFTER THE INITIAL CONNECTIONS HAVE BEEN MADE, VERIFY THAT THE PROPER TORQUE VALUES HAVE BEEN APPLIED. IT IS EXTREMELY IMPORTANT THAT SETSCREWS MEET THE FOLLOWING TORQUE VALUES: (#8 THRU #4) - 20 FT. LBS. TORQUE, (#2 THRU #350) - 25 FT. LBS. TORQUE.
- I. SLIDE INSULATING SLEEVES UP OVER CABLE SO THAT SLEEVES BUTT AGAINST CONNECTOR BAR.
- (J) USE REMAINING SLEEVES WITH PLUGS ON SPARE TERMINALS.


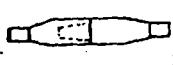
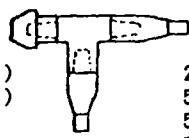
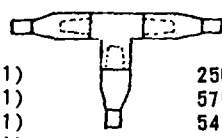
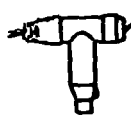
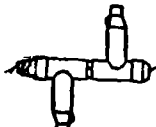
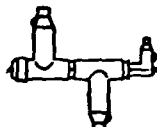
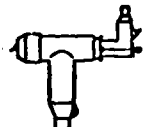
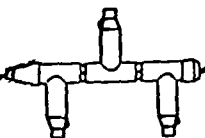
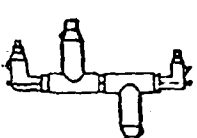

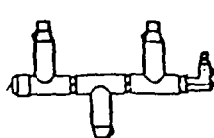
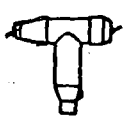
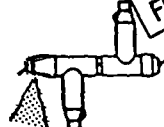
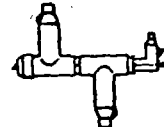
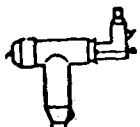
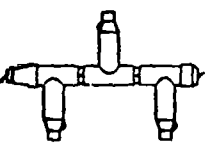
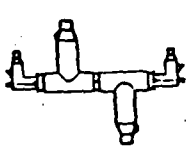
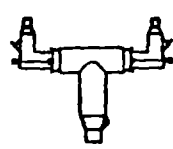
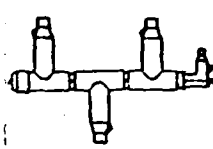
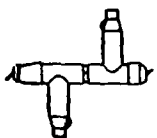
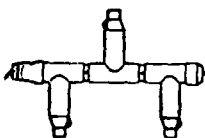
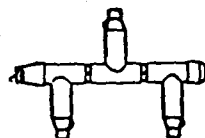
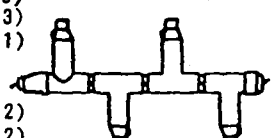
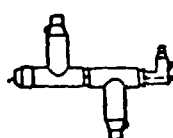
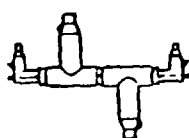
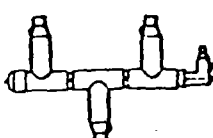
SDG&E ELECTRIC STANDARDS

DATE 1-1-91

APPD. *[Signature]*

0 - 600 VOLT CONNECTORS
FOR # 8 THRU 350 KCMIL AL OR CU CONDUCTORS

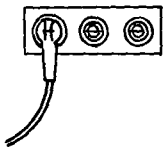
4199.708

| | | | |
|---|--|--|--|
| <p>12-A</p>  <p>544888 (1) 570304 (1)</p> <p>#2</p> | <p>12-B</p>  <p>570256 (1) 544888 (1)</p> <p>#2-#2</p> | <p>12-C</p>  <p>258112 (1) 570256 (1) 544888 (1) 570304 (1)</p> <p>#2-#2</p> | <p>12-D</p>  <p>258112 (1) 570256 (2) 544888 (1)</p> <p>#2-#2-#2</p> |
| <p>13-AG</p>  <p>328578 (1) 544856 (1) 544832 (1) 258698 (1) 102026 (1) 570608 (1)</p> <p>4/0</p> | <p>13-BG</p>  <p>328578 (2) 544856 (1) 570608 (1) 544832 (2) 102026 (2) 258698 (2)</p> <p>4/0-4/0</p> | <p>13-C</p>  <p>328578 (2) 544856 (1) 547324 (1) 544832 (1) 443456 (1) 102026 (2) 258698 (2)</p> <p>4/0-4/0-#2</p> | <p>13-D</p>  <p>328578 (1) 544856 (1) 547324 (1) 443456 (1) 102026 (1) 258698 (1)</p> <p>4/0-#2</p> |
| <p>13-EG</p>  <p>328578 (3) 544856 (1) 570608 (1) 544832 (3) 102026 (3) 258698 (3)</p> <p>4/0-4/0-4/0</p> | <p>13-F</p>  <p>328578 (2) 547324 (1) 547318 (1) 544832 (1) 443456 (2) 102026 (2) 258698 (2)</p> <p>#2-4/0-4/0-#2</p> | <p>13-G</p>  <p>328578 (1) 547324 (1) 547318 (1) 443456 (2) 102026 (1) 258698 (1)</p> <p>#2-4/0-#2</p> | <p>13-H</p>  <p>328578 (3) 547324 (1) 544856 (1) 544832 (2) 443456 (1) 102026 (3) 258698 (3)</p> <p>4/0-4/0-4/0-#2</p> |
| <p>14-AG</p>  <p>328578 (1) 544856 (1) 544832 (1) 102034 (1) 258704 (1) 570608 (1)</p> <p>750</p> | <p>14-BG</p>  <p>328578 (2) 544856 (1) 570608 (1) 544832 (2) 102034 (2) 258704 (2)</p> <p>750-750</p> | <p>14-C</p>  <p>328578 (2) 544856 (1) 547324 (1) 544832 (1) 443456 (1) 102034 (2) 258704 (2)</p> <p>750-750-#2</p> | <p>14-D</p>  <p>328578 (1) 544856 (1) 547324 (1) 443456 (1) 102034 (1) 258704 (1)</p> <p>750-#2</p> |
| <p>14-EG</p>  <p>328578 (3) 544856 (1) 570608 (1) 544832 (3) 102034 (3) 258704 (3)</p> <p>750-750-750</p> | <p>14-F</p>  <p>328578 (2) 547324 (1) 547318 (1) 544832 (1) 443456 (2) 102034 (2) 258704 (2)</p> <p>#2-750-750-#2</p> | <p>14-G</p>  <p>328578 (1) 547324 (1) 547318 (1) 443456 (2) 102034 (1) 258704 (1)</p> <p>#2-750-#2</p> | <p>14-H</p>  <p>328578 (3) 547324 (1) 544856 (1) 544832 (2) 443456 (1) 102034 (3) 258704 (3)</p> <p>750-750-750-#2</p> |
| <p>15-AG</p>  <p>328578 (2) 544856 (1) 570608 (1) 544832 (2) 102034 (1) 258704 (1) 102026 (1) 258698 (1)</p> <p>750-4/0</p> | <p>15-BG</p>  <p>328578 (3) 544856 (1) 570608 (1) 544832 (3) 102034 (1) 258704 (1) 102026 (2) 258698 (2)</p> <p>4/0-750-4/0</p> | <p>15-CG</p>  <p>570608 (1) 544832 (3) 328578 (3) 544856 (1)</p> <p>102034 (2) 258704 (2) 102026 (1) 258698 (1)</p> <p>750-4/0-750</p> | <p>15-DG</p>  <p>328578 (4) 544856 (1) 570608 (1) 544832 (4) 102034 (2) 258704 (2) 102026 (2) 258698 (2)</p> <p>750-750-4/0-4/0</p> |
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FOR FIELD MAINTENANCE ONLY

NOTES: 1. USED FOR ORDERING COMPONENT PARTS FROM ELECTRIC CONSTRUCTION ORDERS.

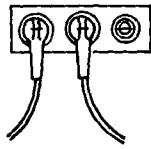
16-A



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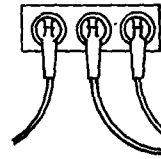
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#2-#2

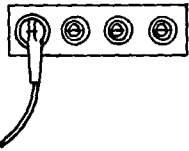
16-C



718320 (1)
443416 (3)

#2-#2-#2

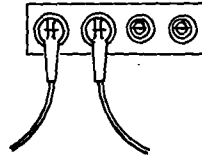
16-D



718336 (1)
443416 (1)
204304 (3)

#2

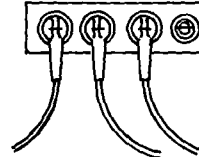
16-E



718336 (1)
443416 (2)
204304 (2)

#2-#2

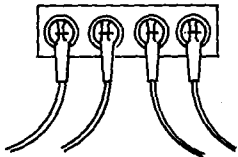
16-F



718336 (1)
443416 (3)
204304 (1)

#2-#2-#2

16-G



718336 (1)
443416 (4)

#2-#2-#2-#2

FOR FIELD MAINTENANCE ONLY

17-A



326578 (1)
544848 (1)
258696 (1)
102026 (1)

4/0

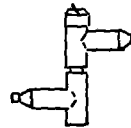
17-B



326578 (1)
547324 (1)
443456 (1)
258696 (1)
102026 (1)

4/0-#2

17-C



326578 (2)
544832 (1)
544848 (1)
258696 (2)
102026 (2)

4/0-4/0

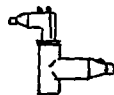
18-A



326578 (1)
544848 (1)
258704 (1)
102034 (1)

750

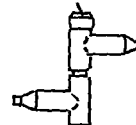
18-B



326578 (1)
547324 (1)
443456 (1)
258704 (1)
102034 (1)

750-#2

18-C



326578 (2)
544832 (1)
544848 (1)
258704 (2)
102034 (2)

750-750

NOTES:

- A. USED FOR ORDERING COMPONENT PARTS FROM ELECTRIC CONSTRUCTION ORDERS.
- B. IF NON-LOAD BREAK ELBOWS (443456) ARE USED SUBSTITUTE A 3 WAY CABLE TAP (718320) WITH A NON-LOAD BREAK CABLE TAP (718342)
- C. WHEN USING #4 CABLE SUBSTITUTE LOAD BREAK ELBOW (#2 443416) WITH (#4 256124) ELBOW IN QUANTITIES REQUIRED ABOVE.

4199.802

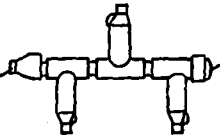
SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

15KV 200 & 600 AMP SPLICES AND CONNECTORS
IDENTIFICATION CHART

DATE 6-22-75

APPD *AWK*

12KV AND BELOW, 600 AMP - DEADBREAK SPLICE CONNECTIONS:

| | 666G | 888G | 898G | 989G | 999G | |
|---|--------------------------|-------------------------|---------------------------|----------------------------|------------|---------------------------------|
|  | 326578 (3) | 326578 (3) | 326578 (3) | 326578 (3) | 326578 (3) | |
| | 544856 (1) | 544856 (1) | 544856 (1) | 544856 (1) | 544856 (1) | |
| | 570608 (1) | 570608 (1) | 570608 (1) | 570608 (1) | 570608 (1) | |
| | 544832 (3) | 544832 (3) | 544832 (3) | 544832 (3) | 544832 (3) | |
| | 102026 (3) | 102034 (3) | 102034 (2) | 102034 (1) | 102050 (3) | |
| | 258696 (3) | 258704 (3) | 258704 (2) | 258704 (1) | 258702 (3) | |
| | | | 102050 (1) | 102050 (2) | | |
| | | | 258702 (1) | 258702 (2) | | |
| | 4/0 CU-4/0 CU- 4/0 CU | 750 AL-750 AL 750 AL | 750 AL-1000 AL- 750 AL | 1000 AL-750 AL- 1000 AL | | 1000 AL- 1000 AL- 1000 AL |

FOR FIELD MAINTENANCE ONLY

NOTES:

- I. FOR FIELD MAINTAINCE ONLY. THIS INSTALLATION SHOULD NO LONGER BE USED WHEN A FEEDER CABLE IS BRANCHED TWO OR MORE WAYS. IF FEEDER CABLE IS BRANCHED TWO OR MORE WAYS A SWITCH SHALL BE USED.
- II. FOR SPECIFICATIONS AND INSTALLATIONS REFER TO PAGES 4182 AND 4196.
- III. CABLE CODE: 6 - 4/0 CU, 8 - 750 AL, 9 - 1000 AL.
- IV. COMPONENT CODE, SUFFIX: G - 600 AMP GROUNDABLE TEE SPLICE.
- V. OTHER COMBINATIONS MAY BE CODED USING THE ABOVE CODES FOR THE SAME TYPE CONNECTIONS SHOWN ON THIS PAGE.

SDG&E ELECTRIC STANDARDS

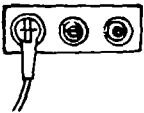
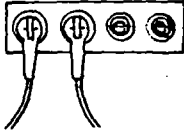
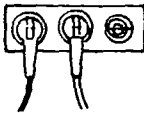
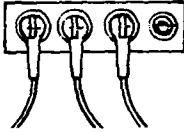
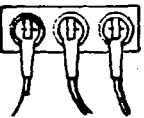
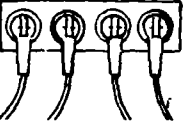
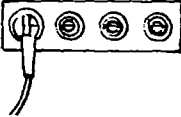
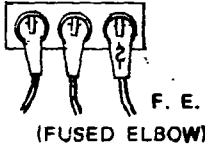
DATE 1-23-80
APPD TRF

12KV 600 AMP SPLICES AND CONNECTIONS
IDENTIFICATION CHART

4199.803

SCOPE: THIS STANDARD SHOWS THE CONNECTIONS AND ASSEMBLY CODES USED FOR CALLING OUT 200 AMP SPLICE AND CONNECTOR ASSEMBLIES ON ELECTRIC CONSTRUCTION ORDERS.

PAD-MOUNTED AND SUBSURFACE CONNECTIONS -- 200 AMP LOADBREAK

| | | | |
|--|---|--|--|
|  | <p>100 718312 (1) 443837 (1) 204304 (2) #2 CU</p> |  | <p>1100 718328 (1) 443837 (2) 204304 (2) #2 CU-#2 CU</p> |
|  | <p>110 718312 (1) 443837 (2) 204304 (1) #2 CU-#2 CU</p> |  | <p>1110 718328 (1) 443837 (3) 204304 (1) #2 CU-#2 CU- #2 CU</p> |
|  | <p>111 718312 (1) 443837 (3) #2 CU-#2 CU- #2 CU</p> |  | <p>1111 718328 (1) 443837 (4) #2 CU-#2 CU- #2 CU-#2 CU</p> |
|  | <p>1000 718328 (1) 443837 (1) 204304 (3) #2 CU</p> |  | <p>11A 718312 (1) 443837 (2) 443864 (1) #2 CU-#2 CU #2 CU F.E.</p> |

FOR FIELD MAINTENANCE ONLY

NOTES:

- FOR SPECIFICATIONS AND INSTALLATION INSTRUCTIONS REFER TO STANDARDS 4191, & 4192.
- BELOW ARE THE KEYS TO THE CODES USED IN THE TABLES ON THIS PAGE.

CABLES

1 = #2 CU

COMPONENTS

A = #2 CU FUSED ELBOW

O = 200 AMP INSULATING RECEPTACLE


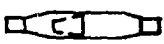
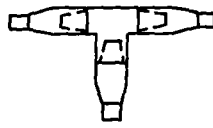

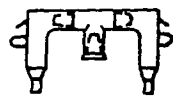
-OTHER COMBINATIONS MAY BE CODED USING THE ABOVE CODES FOR THE SAME TYPE CONNECTIONS SHOWN.

4199.804

SDG&E ELECTRIC STANDARDS
12KV 200 AMP CONNECTOR
ASSEMBLIES IDENTIFICATION CHART

DATE 1-1-87
APPD JYB/KD

SCOPE: THIS STANDARD SHOWS THE CONNECTIONS AND ASSEMBLY CODES USED FOR CALLING OUT 200 AMP SPLICE AND CONNECTOR ASSEMBLIES ON ELECTRIC CONSTRUCTION ORDERS.

| SUBSURFACE SPLICE CONNECTIONS -- 200 AMP DEADBREAK | | | | | |
|---|---|--|---|---|--|
|  | <p>S1</p> <p>544688 (1) 570304 (1) 120384 (1)</p> <p>#2 CU</p> |  | <p>S11</p> <p>570256 (1) 544688 (1) 120384 (1)</p> <p>#2 CU-#2 CU</p> | <p>S13</p> <p>570256 (1) 547314 (1) 120384 (1)</p> <p>#2 CU-#2 AL</p> | <p>S15</p> <p>570256 (1) 547316 (1) 120384 (1)</p> <p>#2 CU-2/0 AL</p> |
|  | <p>S111</p> <p>570256 (2) 256112 (1) 544688 (1) 120384 (1)</p> <p>#2 CU-#2 CU- #2 CU</p> | <p>S333</p> <p>570816 (2) 256112 (1) 547314 (1) 120384 (1)</p> <p>#2 AL-#2 AL- #2 AL</p> | <p>S555</p> <p>570848 (2) 256112 (1) 547316 (1) 120384 (1)</p> <p>2/0 AL-2/0 AL- 2/0 AL</p> | | |
|  | <p>D111</p> <p>256112 (1) 544688 (1) 443456 (2) 120384 (1) 120448 (2)</p> <p>#2 CU-#2 CU- #2 CU</p> | | | | |
|  | <p>D11</p> <p>256112 (1) 544864 (1) 443456 (2) 120352 (1) 120448 (2)</p> <p>#2 CU-#2 CU</p> | | | | |

FOR FIELD MAINTENANCE ONLY

NOTES:

- FOR SPECIFICATIONS AND INSTALLATION INSTRUCTIONS REFER TO STANDARDS 4191, & 4192.
- BELOW ARE THE KEYS TO THE CODES USED IN THE TABLES ON THIS PAGE.

CABLES
 1 = #2 CU
 3 = #2 AL
 5 = 2/0 AL

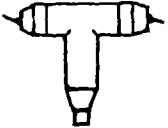
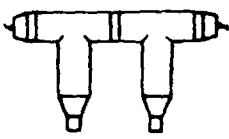
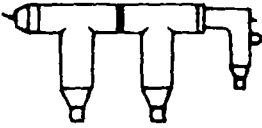
COMPONENTS
 D = 200 AMP TEE SPLICE
 S = 200 AMP SPLICE

-OTHER COMBINATIONS MAY BE CODED USING THE ABOVE CODES FOR THE SAME TYPE CONNECTIONS SHOWN.

DATE 1-1-87
 APPD *J. B. [Signature]*

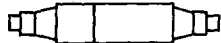

SCOPE: THIS STANDARD SHOWS THE CONNECTIONS AND ASSEMBLY CODES USED FOR CALLING OUT 200 AMP AND 600 AMP SPLICE AND CONNECTOR ASSEMBLIES ON ELECTRIC CONSTRUCTION ORDERS.

SUBSURFACE CONNECTIONS -- 200 AMP AND 600 AMP DEADBREAK

| | | | | |
|---|--|--|--|--|
|  | 6 | | | |
| | 326578 (1) 544856 (1) 258696 (1) 102026 (1) 544848 (1) | | | |
| | 4/0 CU | | | |
|  | 66 | 76 | 86 | |
| | 326578 (2) 544856 (1) 544832 (1) 102026 (2) 258696 (2) 544848 (1) | 326578 (2) 544856 (1) 544832 (1) 102026 (1) 258698 (1) 102027 (1) 258696 (1) 544848 (1) | 326578 (2) 544856 (1) 544832 (1) 102034 (1) 258704 (1) 102026 (1) 258696 (1) 544848 (1) | |
| | 4/0 CU-4/0 CU | 350 AL-4/0 CU | 750 AL-4/0 CU | |
|  | 661 | 771 | 881 | 991 |
| | 326578 (2) 544856 (1) 547324 (1) 544832 (1) 443456 (1) 102026 (2) 258696 (2) | 326578 (2) 544856 (1) 547324 (1) 544832 (1) 443456 (1) 102027 (2) 258698 (2) | 326578 (2) 544856 (1) 547324 (1) 544832 (1) 443456 (1) 102034 (2) 258704 (2) | 326578 (2) 544856 (1) 547324 (1) 544832 (1) 443456 (1) 102050 (2) 258702 (2) |
| | 4/0 CU-4/0 CU- #2 CU | 350 AL-350 AL- #2 CU | 750 AL-750 AL- #2 CU | 1000 AL- 1000 AL-#2 CU |

FOR FIELD MAINTENANCE ONLY

SUBSURFACE CONNECTIONS -- 600 AMP DEADBREAK

| | | |
|--|---------------------------------|--|
|  | SS77 | <u>STRAIGHT SPLICE</u> |
| | 667264 (E) (1) 350 AL-350 AL | MAJOR USE: STRAIGHT SPLICE FOR SPLICING. |
|  | STOCK NUMBER | <u>SPLICE ASSEMBLY TOOL</u> |
| | 746650 (E) | MAJOR USE: TOOL USED FOR JOINING THE STRAIGHT SPLICE |

NOTES:

- FOR SPECIFICATIONS AND INSTALLATION INSTRUCTIONS SEE STANDARDS 4182 AND 4196.
- BELOW ARE THE KEYS TO THE CODES USED IN THE TABLES ABOVE.

CABLES

COMPONENTS

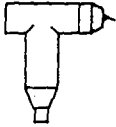
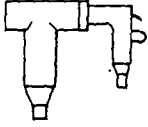
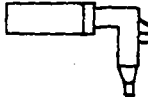
- | | | |
|------------|-------------|------------------------------|
| 1 = #2 CU | 7 = 350 AL | SS = 600 AMP STRAIGHT SPLICE |
| 6 = 4/0 CU | 8 = 750 AL | |
| | 9 = 1000 AL | |

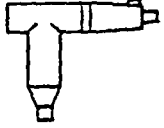
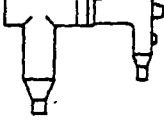
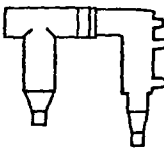
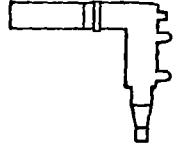

- OTHER COMBINATIONS MAY BE CODED USING THE ABOVE CODES FOR THE SAME TYPE CONNECTIONS SHOWN.

INSTALLATION:

(E) EXEMPT MATERIAL.

SCOPE: THIS STANDARD SHOWS THE CONNECTIONS AND ASSEMBLY CODES USED FOR CALLING OUT 200 AMP AND 600 AMP SPLICE AND CONNECTOR ASSEMBLIES ON ELECTRIC CONSTRUCTION ORDERS.

| SUBSURFACE/SURFACE OPERABLE SWITCH CONNECTIONS -- 200 AMP AND 600 AMP DEADBREAK | | | | | |
|---|---|---|--|---|--|
|  | T6 326578 (1) 544848 (1) 258696 (1) 102026 (1) 4/0 CU |  | T61 326578 (1) 547324 (1) 443456 (1) 258696 (1) 102026 (1) 4/0 CU-#2 CU |  | F1 336204 (1) 547324 (1) 443456 (1) #2 CU |

| PAD-MOUNTED SWITCH CONNECTIONS -- 200 AMP AND 600 AMP LOADBREAK | | | | | |
|--|--|--|--|---|---|
|  | P60 326578 (1) 719600 (1) 544676 (1) 204304 (1) 258696 (1) 102026 (1) 4/0 CU |  | P61 326578 (1) 719600 (1) 544676 (1) 443837 (1) 258696 (1) 102026 (1) 4/0 CU-#2 CU |  | PA61 326578 (1) 719600 (1) 544676 (1) 443864 (1) 258696 (1) 102026 (1) 4/0 CU-#2 CU |
|  | EA1 336204 (1) 719600 (1) 544676 (1) 443864 (1) #2 CU |  | E1 336204 (1) 719600 (1) 544676 (1) 443837 (1) #2 CU | | |

NOTES:

- DO NOT "PIGGYBACK" 600 AMP TEES ON TOP OF EACH OTHER AT ANY TIME ON THE SWITCH BUSHING.
- THE 200 AMP/600 AMP LOADBREAK CONFIGURATIONS ON THESE PAGES ARE ONLY TO BE USED ON PAD-MOUNTED SWITCH INSTALLATIONS.
- FOR SPECIFICATIONS AND INSTALLATION INSTRUCTIONS REFER TO STANDARDS 4182, 4191, 4192, AND 4196.
- BELOW ARE THE KEYS TO THE CODES USED IN THE TABLES ON THIS PAGE:

CABLES

1 = #2 CU
6 = 4/0 CU

COMPONENTS

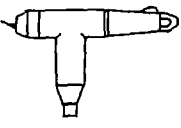
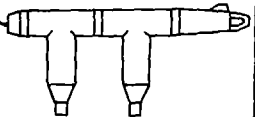
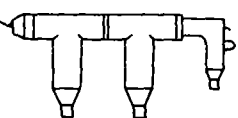
A = #2 CU FUSED ELBOW
E = 600 AMP PAD-MOUNTED SWITCH BUSHING EXTENSION
F = 600 AMP SUBSURFACE/SURFACE OPERABLE SWITCH BUSHING EXTENSION
P = 600 AMP PAD-MOUNTED SWITCH TEE
O = 200 AMP INSULATING RECEPTACLE
T = 600 AMP SUBSURFACE/SURFACE OPERABLE SWITCH TEE

FOR FIELD MAINTENANCE ONLY

- OTHER COMBINATIONS MAY BE CODED USING THE ABOVE CODES FOR THE SAME TYPE CONNECTIONS SHOWN.

SCOPE: THIS STANDARD SHOWS THE CONNECTIONS AND ASSEMBLY CODES USED FOR CALLING OUT 200 AMP AND 600 AMP SPLICE AND CONNECTOR ASSEMBLIES ON ELECTRIC CONSTRUCTION ORDERS.

SUBSURFACE CONNECTIONS -- 200 AMP AND 600 AMP DEADBREAK

| | | | | | |
|--|---|--|--|---|---|
|  | 6G | 7G | 8G | 9G | |
| | 326578 (1) 544856 (1) 544832 (1) 258696 (1) 102026 (1) 570608 (1) 4/0 CU | 326578 (1) 544856 (1) 544832 (1) 258698 (1) 102027 (1) 570608 (1) 350 AL | 326578 (1) 544856 (1) 544832 (1) 258704 (1) 102034 (1) 570608 (1) 750 AL | 326578 (1) 544856 (1) 544832 (1) 258702 (1) 102050 (1) 570608 (1) 1000 AL | |
|  | 66G | 76G | 77G | 86G | 87G |
| | 326578 (2) 544856 (1) 570608 (1) 544832 (2) 102026 (1) 258696 (2) 4/0 CU-4/0 CU | 326578 (2) 544856 (1) 570608 (1) 544832 (2) 102026 (1) 258698 (1) 102027 (1) 258696 (1) 350 AL-4/0 CU | 326578 (2) 544856 (1) 570608 (1) 570608 (1) 544832 (2) 102027 (2) 258698 (2) 350 AL-350 AL | 326578 (2) 544856 (1) 570608 (1) 570608 (1) 544832 (2) 102034 (1) 258704 (1) 102026 (1) 258696 (1) 750 AL-4/0 CU | 326578 (2) 544856 (1) 570608 (1) 544832 (2) 102034 (1) 258704 (1) 102027 (1) 258698 (1) 750 AL-350 AL |
| | 88G | 97G | 98G | 99G | |
| | 326578 (2) 544856 (1) 570608 (1) 544832 (2) 102034 (2) 258704 (2) 750 AL-750 AL | 326578 (2) 544856 (1) 570608 (1) 544832 (2) 102050 (1) 258702 (1) 102027 (1) 258698 (1) 1000 AL-350 AL | 326578 (2) 544856 (1) 570608 (1) 544832 (2) 102034 (1) 258704 (1) 102050 (1) 258702 (1) 1000 AL-750 AL | 326578 (2) 544856 (1) 570608 (1) 544832 (2) 102050 (2) 258702 (2) 1000 AL-1000 AL | |
|  | 661 | 771 | 773 | 775 | 881 |
| | 326578 (2) 544856 (1) 547324 (1) 544832 (1) 443456 (1) 102026 (2) 258696 (2) 4/0 CU-4/0 CU- #2 CU | 326578 (2) 544856 (1) 547324 (1) 544832 (1) 443456 (1) 102027 (2) 258698 (2) 350 AL-350 AL- #2 CU | 326578 (2) 544856 (1) 547324 (1) 544832 (1) 443842 (1) 102027 (2) 258698 (2) 350 AL-350 AL- #2 AL | 326578 (2) 544856 (1) 547324 (1) 544832 (1) 443844 (1) 102027 (2) 258698 (2) 350 AL-350 AL- 2/0 AL | 326578 (2) 544856 (1) 547324 (1) 544832 (1) 443456 (1) 102034 (2) 258704 (2) 750 AL-750 AL- #2 CU |
| | 883 | 885 | 991 | 993 | 995 |
| | 326578 (2) 544856 (1) 547324 (1) 544832 (1) 443842 (1) 102034 (2) 258704 (2) 750 AL-750 AL- #2 AL | 326578 (2) 544856 (1) 547324 (1) 544832 (1) 443844 (1) 102034 (2) 258704 (2) 750 AL-750 AL- 2/0 AL | 326578 (2) 544856 (1) 547324 (1) 544832 (1) 443456 (1) 102050 (2) 258702 (2) 1000 AL- 1000 AL-#2 CU | 326578 (2) 544856 (1) 547324 (1) 544832 (1) 443842 (1) 102050 (2) 258702 (2) 1000 AL- 1000 AL-#2 AL | 326578 (2) 544856 (1) 547324 (1) 544832 (1) 443844 (1) 102050 (2) 258702 (2) 1000 AL- 1000 AL-2/0 AL |

FOR FIELD MAINTENANCE ONLY

NOTES:

- FOR SPECIFICATIONS AND INSTALLATION INSTRUCTIONS SEE STANDARDS 4182 AND 4196.
- BELOW ARE THE KEYS TO THE CODES USED IN THE TABLES ON PAGE 4181.1.

CABLES

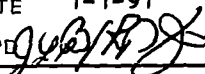
COMPONENTS

- 1 = #2 CU 7 = 350 AL G = 600 AMP GROUNDABLE TEE SPLICE
- 3 = #2 AL 8 = 750 AL SS = 600 AMP STRAIGHT SPLICE
- 5 = 2/0 AL 9 = 1000 AL
- 6 = 4/0 CU

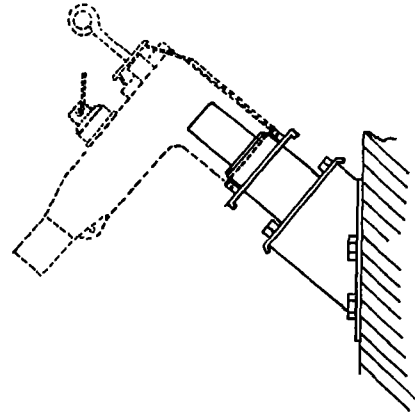
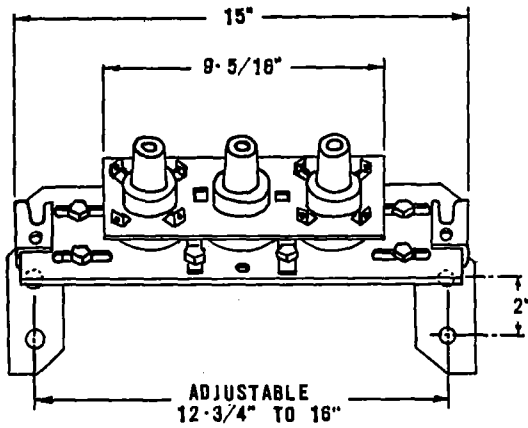
- OTHER COMBINATIONS MAY BE CODED USING THE ABOVE CODES FOR THE SAME TYPE CONNECTIONS SHOWN.

4199.808

SDG & E ELECTRIC STANDARDS
12 KV 200 & 600 AMP PREMOLDED SPLICE &
CONNECTOR ASSEMBLIES - IDENTIFICATION CHART

DATE 1-1-91
APPROVED 

MAJOR USE: USED AS A LATERAL TAP FROM A CIRCUIT



3 WAY CABLE TAP ILLUSTRATED

FOR FIELD MAINTENANCE ONLY

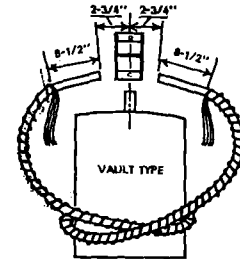
| CABLE TAP | STOCK NO OR CONSTR. STD. |
|-----------|--------------------------|
| 3 WAY | 718342 |
| 4 WAY | 718348 |

NOTES:

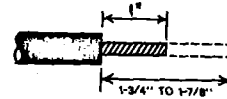
- USE ONLY FOR REPLACEMENT OF EXISTING CABLE TAP.
- CAP OFF ALL UNUSED TAPS WITH DEAD END RECEPTACLE 4197.

INSTALLATION OF CABLE TAP
PROCEDURE

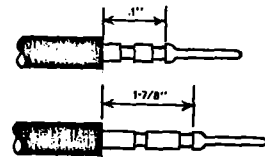
(A) TRAIN CABLE AND MARK AT DESIRED LENGTH. ALLOW ENOUGH CABLE AROUND UNIT FOR FUTURE REPLACEMENT FROM ENCLOSURE. INSTALL MOUNTING BRACKET ON SIDE OF ENCLOSURE A SUFFICIENT HEIGHT FOR LOAD BREAK ELBOW OPERATION. CUT CABLE 2 3/4" FROM CENTER OF BRACKET. MEASURE 8 1/2" FROM END OF CABLE AND BIND CONCENTRIC NEUTRAL WIRES AND TAPE, ALLOW EXTRA LENGTH ON NEUTRAL FOR GROUND CONNECTION.



(B) REMOVE 1" OF CABLE INSULATION AND CONDUCTIVE SHIELD. LEAVE A SQUARE SHOULDER. (DO NOT PENCIL)

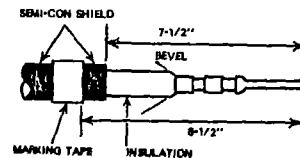


(C) CRIMP SMOOTH END OF THREADED COMPRESSION CONNECTOR ON BARED CONDUCTOR HOLDING CONNECTOR AGAINST INSULATION.



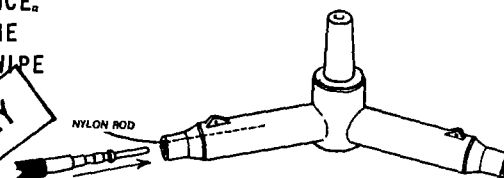
FOR FIELD MAINTENANCE ONLY

(D) REMOVE THE SEMI-CON SHIELD TO A POINT 7 1/2" BACK FROM THE END CONNECTOR LEAVING A SMOOTH SQUARE SHOULDER. MARK THE SEMI-CON SHIELD WITH A WRAP OF TAPE EXACTLY 8 1/2" BACK FROM THE FAR END OF THE SOCKET. BEVEL THE INSULATION SLIGHTLY.



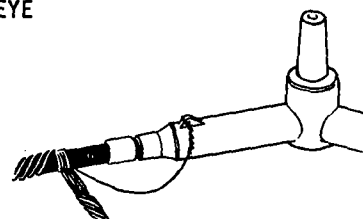
(E) REMOVE THE SMALLER PROTECTIVE CAP FROM THE CABLE ENTRANCE ON ONE OF THE CABLE TAPS. LUBRICATE THE INSIDE OF THE CABLE INSULATION WITH SILICONE GREASE.

(F) INSERT NYLON ROD APPROXIMATELY 6" INTO CABLE ENTRANCE. PUSH CABLE INTO ENTRANCE IN TWISTING MOTION UNTIL TAPE INDICATOR IS APPROXIMATELY 1" AWAY FROM THE END OF THE CABLE ENTRANCE. REMOVE THE ROD. CONTINUE TO PUSH CABLE INTO TAP UNTIL THE TAPE INDICATOR LINES UP WITH THE END OF THE CABLE TAP. WIPE EXCESS GREASE.



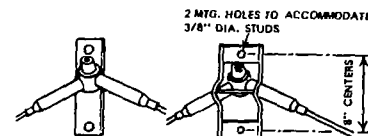
(G) CONNECT ONE OR MORE CONCENTRIC NEUTRAL WIRES TO GROUNDING EYE AND TWIST TIGHTLY. TWIST REMAINING WIRES TOGETHER AND CONNECT TO GROUND.

FOR FIELD MAINTENANCE ONLY

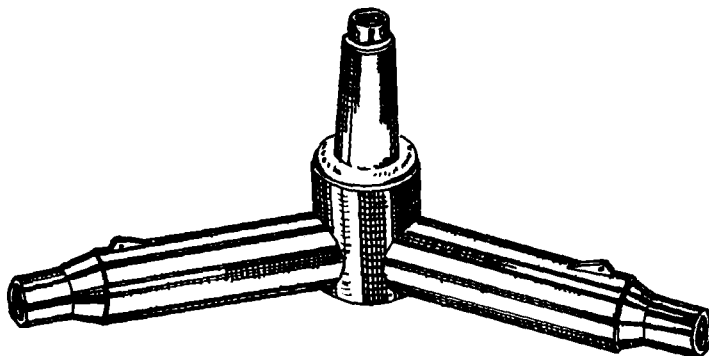
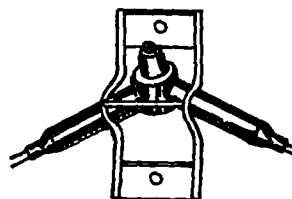


(H) REPEAT PROCEDURE B THRU G FOR OTHER SIDE.

(I) PLACE CABLE TAP IN POSITION ON BRACKET BACK PLATE. PLACE HOLDING BRACKET OVER CABLE TAP SO THAT PLUG IS ABOVE BRACKET CENTER AND SECURE TO WALL.



MAJOR USE: USED AS LINE TAP ON SUBSURFACE TRANSFORMERS.



CABLE TAP

CABLE TAP FOR FIELD MAINTENANCE ONLY

| STOCK NUMBER | |
|--------------|------------|
| 2 CU | 718360 (A) |
| 2 SOL AL | 718266 (A) |
| 2/O AL | 718298 (A) |
| 2 SOL AL | 718234 (B) |
| 2/O AL | 718282 (B) |

NOTES:

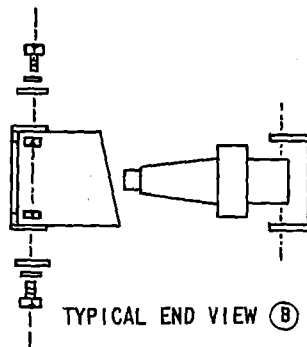
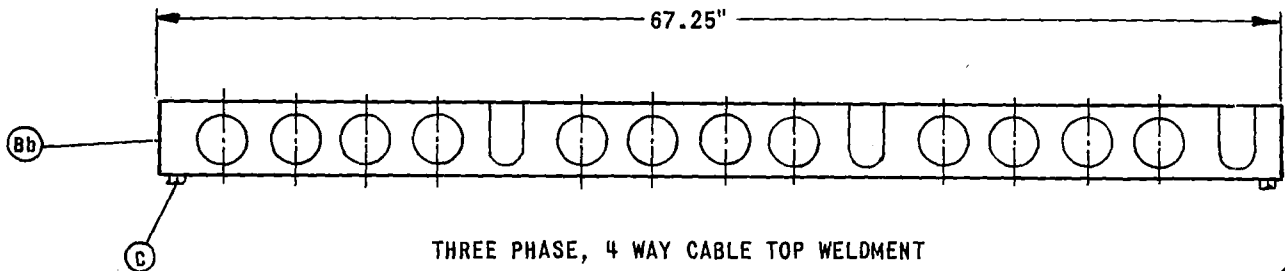
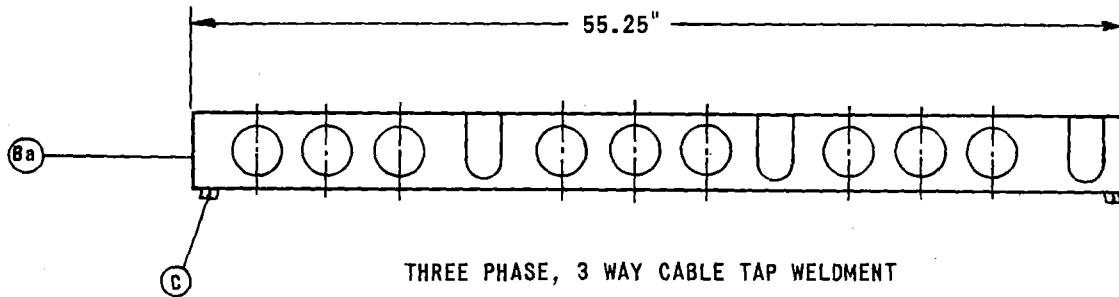
- (A) NOT LOADBREAK RATED ON 12KV SYSTEM.
- (B) INSTALL WHITE-BLACK-WHITE BAND ON BUSHING, TO IDENTIFY 12KV SWITCHING CAPABILITY (122495).
- C. CABLE TAP IS COMPLETE WITH MOUNTING BRACKET.

4199.904

SDG&E ELECTRIC STANDARDS

LOADBREAK ACCESSORIES, 12KV AND/OR 6.9KV

DATE 8-21-81
APPD *[Signature]*



THIS PAGE FOR FIELD MAINTENANCE ONLY

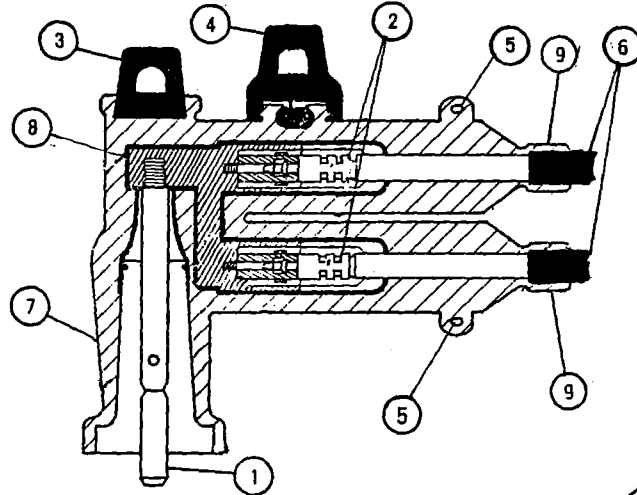
| WELDMENT (A) | STOCK NUMBER |
|--------------|--------------|
| 3 WAY | 803250 |
| 4 WAY | 803258 |

NOTES:

- (A) WELDMENT TO BE USED IN SECTIONALIZING HANDHOLE PAGE 3315 WITH THREE APPROPRIATE GE CABLE TAPS (718314 OR 718338) TO ALLOW ROOM FOR MOUNTING ON ONE WALL.
- (B) ASSEMBLY CONSISTS OF:
 - (a) 3 PHASE, 3 WAY WELDMENT (803250), 9 "U" BRACKETS, 18 BOLTS, LOCKWASHERS, WASHERS
 - (b) 3 PHASE, 4 WAY WELDMENT (803258), 12 "U" BRACKETS, 24 BOLTS, LOCKWASHERS, WASHERS
- (C) GROUND WELDMENT USING 2 SERVICE POST CONNECTORS (262656).
- D. USE EXTREME CAUTION WHEN ASSEMBLING CABLE TAPS IN WELDMENTS. CHECK LARGE DIAMETER HOLES FOR BUSHINGS WHEN INSERTING THEM IN WELDMENTS.

MAJOR USE:

TO ALLOW LOOP FEED THROUGH SINGLE PHASE AND OPEN DELTA 12KV DEAD FRONT TRANSFORMERS AND TO CONVERT THREE PHASE 12KV DEAD FRONT RADIAL FEED TO LOOP FEED TRANSFORMER (LOAD BREAK AT 12KV, 6.9KV AND 4.16KV, 2.4KV)



THIS PAGE FOR FIELD MAINTENANCE ONLY

ATTENTION:

THIS DEVICE IS DESIGNED FOR OPERATION AS A LOADBREAK DEVICE ON 12.0, 6.9 & 4.16KV SYSTEMS. HOWEVER, IF IT IS INSTALLED ON A 12KV SYSTEM WITHOUT A 12KV RATED BUSHING, A TAG (3232) "DO NOT OPERATE ENERGIZED" IS THEN ATTACHED.

| RATINGS | |
|---|--|
| KV | 14.4 |
| AMPERES | 200 |
| LOAD BREAK OR LOAD MAKE 20 OPERATIONS | 200 AMPS AT 70-80 % POWER FACTOR |
| FAULT CLOSE RMS SYMMETRICAL AMPERES | 15,000 |

| NO. | PARTS | STOCK NO. OR CONSTR. STD. |
|-----|--------------------------------|------------------------------|
| 1 | MALE CONTACT PROBE | |
| 2 | PROBE CONNECTORS | 2 SOL AL (443846) |
| 3 | ELBOW PULLING EYE | |
| 4 | VOLTAGE TEST POINT AND COVER | OR |
| 5 | GROUNDING EYES | 2/0 AL |
| 6 | CABLES (D) | (443848) |
| 7 | ELBOW | |
| 8 | ELECTRICAL BUS | |
| 9 | WHITE-BLACK-WHITE ID BANDS (E) | |

| SPARE PARTS | STOCK NO. |
|-----------------------------|-----------|
| GE 2 SOL AL PROBE CONNECTOR | 260850 |
| GE 2/0 AL PROBE CONNECTOR | 260854 |
| SILICON GREASE | 391424 |
| MALE CONTACT PROBE | 444425 |

NOTES:

- A. UNDER PROPER SUPERVISION THIS ELBOW MAY BE USED AS A LOAD BREAK DEVICE AT 12KV AND BELOW. REFER TO 4107 FOR OPERATING INSTRUCTIONS ON 12KV SYSTEMS TO AVOID FERRORESONANCE.
- B. FOR INSTALLATION PROCEDURES CONSULT INDIVIDUAL MANUFACTURERS CONTAINERS FOR CURRENT INSTRUCTIONS.
- C. REFER TO FOLLOWING PAGES FOR INSTRUCTIONS.
- (D) FOR INSULATING PLUG, INSTEAD OF CABLE, USE 544860 FOR 2 SOL AL OR 544852 FOR 2/0 AL.
- (E) WHITE-BLACK-WHITE BAND IDENTIFIES ELBOW THAT CAN BE USED FOR 12KV (2 OR 3 PHASE) SWITCHING WITH 12KV RATED BUSHING AND 6930 VOLT (1 PHASE) SWITCHING.

SDG&E ELECTRIC STANDARDS

DATE 7-30-82

APPD *DRH*

**LOADBREAK ELBOW TEE CONNECTOR "PIGGYBACK",
12000 VOLTS AND BELOW**

4199.906

I. APPLICATIONS:

- A. 12KV - SINGLE PHASE DEADFRONT TRANSFORMER, FOR CONVERSION TO LOOP FEED, WITH NOT MORE THAN THREE TRANSFORMERS BEYOND FIRST 'PIGGYBACK'. (PAGE 3712)
- B. 12KV - THREE PHASE RADIAL FEED TRANSFORMER, FOR CONVERSION TO LOOP FEED TRANSFORMER, WITH NOT MORE THAN THREE TRANSFORMERS BEYOND FIRST 'PIGGYBACK'.
- C. 12KV - OPEN DELTA TRANSFORMER INSTALLATION. (PAGE 3713)

II INSTALLATIONS:

- A. 12KV - SINGLE PHASE DEADFRONT TRANSFORMERS. USE STANDARD PAGE 3712 WITH SUBSTITUTION OF TWO 'PIGGYBACK' ELBOWS AND ADDITION OF TWO MORE CABLES WITH CONDUIT(S).
- B. 12KV - THREE PHASE RADIAL FEED DEADFRONT TRANSFORMERS. USE STANDARD PAGE 3751.1 WITH SUBSTITUTION OF THREE 'PIGGYBACK' ELBOWS AND ADDITION OF THREE MORE CABLES WITH CONDUIT(S), IF LATERAL IS TO BE EXTENDED AT LATER DATE, CABLE CAN BE CONNECTED FROM TRANSFORMER TO TERMINATOR INITIALLY. THIS ALLOWS LATER EXTENSION FROM TERMINATOR. CONSIDERATION FOR LOOP FEED TRANSFORMER SHOULD BE GIVEN ALSO IN THIS CASE, INSTEAD OF 'PIGGYBACK' AND TERMINATOR.
- C. 12KV - OPEN DELTA TRANSFORMERS. USE STANDARD PAGE 3713. IF NECESSARY TO LOOP THROUGH OPEN DELTA BANK, USE THREE ADDITIONAL 'PIGGYBACK' ELBOWS.

III OPERATING PROCEDURES:

A. TRANSFORMER ISOLATION-

- 1. PLACE STANDOFF BUSHINGS IN PARKING STANDS.
- 2. PLACE 'PIGGYBACK' ELBOWS ON STANDOFF BUSHINGS, TRANSFORMER ISOLATED.

B. CABLE ISOLATION - (START AT SOURCE TRANSFORMER)

- 1. PLACE FEED THRU IN PARKING STANDS.
- 2. PLACE GROUND ROD IN EACH FEED THRU.
- 3. OPEN CIRCUIT ON SOURCE SIDE OF TRANSFORMER.
- 4. TEST 'PIGGYBACK' ELBOWS, IF DEAD.
- 5. PLACE 'PIGGYBACK' ELBOW ON ITS RESPECTIVE FEED THRU, GROUNDING CABLE VISIBLY.
- 6. GROUND ALL POSSIBLE SOURCES TO EACH 'PIGGYBACK'.
- 7. REMOVE CABLE TO BE ISOLATED FROM EACH 'PIGGYBACK' BY HAND.

THIS PAGE FOR FIELD MAINTENANCE ONLY

DUE TO THE DIFFICULTY IN THE DISSASSEMBLY PROCESS, IT IS NECESSARY TO MAKE THIS A TWO MAN OPERATION.

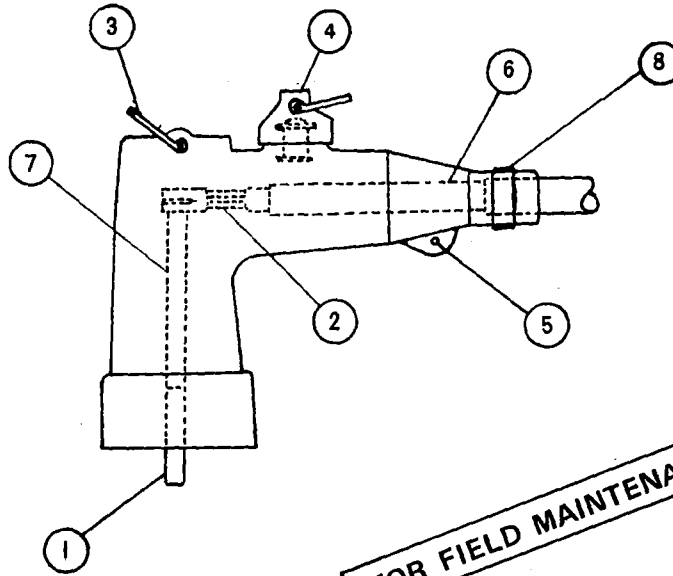
THE PIGGY BACK ELBOW THAT IS TO BE DISSASSEMBLED MUST BE REMOVED FROM TRANSFORMER OR STAND OFF BUSHING AND HELD TO THE LEFT HAND SIDE OF TRANSFORMER AS LOW AS POSSIBLE. THEN THE OTHER PERSON CAN WITH A PULLING TWISTING MOTION REMOVE THE CABLE FROM THE ELBOW. THIS POSITIONING OF ELBOW WILL GIVE THE MAXIMUM PULLING POWER FOR REMOVAL OF CABLE.

- 8. INSERT NYLON ROD INTO EACH PIGGYBACK ELBOW (STOCK NUMBER 544852 OR 544860) SEALING CABLE ENTRANCE.
- 9. REMOVE GROUNDS FROM SOURCE TO EACH PIGGYBACK AND PLACE PIGGYBACKS ON BUSHINGS.
- 10. CLOSE CIRCUIT ON SOURCE SIDE OF TRANSFORMER.
- 11. ISOLATE CABLES AT OTHER ENDS IN SIMILAR MANNER.
- 12. REMOVE GROUND RODS AND FEED THRU.

NOTE:

- A. TEMPORARY BY-PASS CABLE MAY BE INSERTED INTO PIGGYBACK ELBOW INSTEAD OF NYLON ROD IN ORDER TO JUMPER FAILED CABLE.

MAJOR USE :
 USED ON SUBSURFACE, LOW PROFILE PAD-MOUNT
 TRANSFORMERS AND LOADBREAK CABLE TAPS.
 (LOADBREAK ON 6.9KV AND 4.16KV SYSTEMS ONLY)



FOR FIELD MAINTENANCE ONLY

ATTENTION: THIS ELBOW IS DESIGNED FOR OPERATION AS A LOADBREAK DEVICE ON 6.9 & 4.16KV SYSTEMS ONLY. HOWEVER, IF IT IS INSTALLED ON A 12KV SYSTEM, A TAG (3232) " DO NOT OPERATE ENERGIZED" IS THEN ATTACHED.

| RATINGS | |
|---|--|
| KV | 8.3 |
| AMPERES | 200 |
| KV-BIL | 95 |
| LOADBREAK OR LOADMAKE 10 OPERATIONS | 200 AMPS AT 70-80 % POWER FACTOR |
| FAULT CLOSE RMS SYMMETRICAL AMPERES | 10,000 |

| NO. | PARTS | STOCK NO. OR CONSTR. STD. |
|-----|-------------------------------|------------------------------|
| 1 | ARC FOLLOWER | |
| 2 | COMPRESSION SOCKET TERMINAL | 255124 |
| 3 | ELBOW PULLING EYE | (#4 CU) |
| 4 | VOLTAGE TEST POINT & COVER | OR |
| 5 | GROUNDING POINT(S) | |
| 6 | CABLE | 443416 |
| 7 | ELECTRICAL MALE CONTACT | (#2 CU) |
| 8 | WHITE IDENTIFICATION BAND (D) | |

NOTES:

- A. ITEMS ABOVE ACCOMMODATE EITHER #2 OR #4 AWG COPPER CONDUCTORS
- B. UNDER PROPER SUPERVISION THIS ELBOW MAY BE USED AS A LOADBREAK DEVICE AT 6.9KV AND BELOW.
- C. FOR INSTALLATION PROCEDURES CONSULT INDIVIDUAL MANUFACTURERS CONTAINERS FOR CURRENT INSTRUCTIONS.
- (D) WHITE BAND IDENTIFIES ELBOW THAT CAN ONLY BE USED FOR SWITCHING ON A 6939 VOLT (1 PHASE) SYSTEM.

SDG&E ELECTRIC STANDARDS

DATE 6-3-83
 APPD *REL VAS*

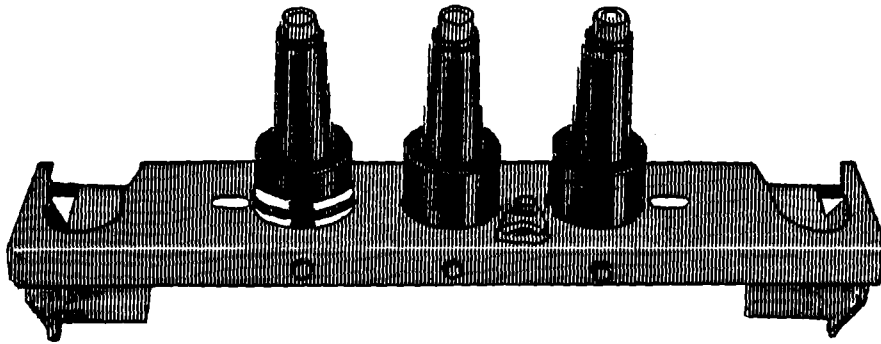
LOADBREAK ELBOW CONNECTOR, 6930 VOLTS AND BELOW

4199.908

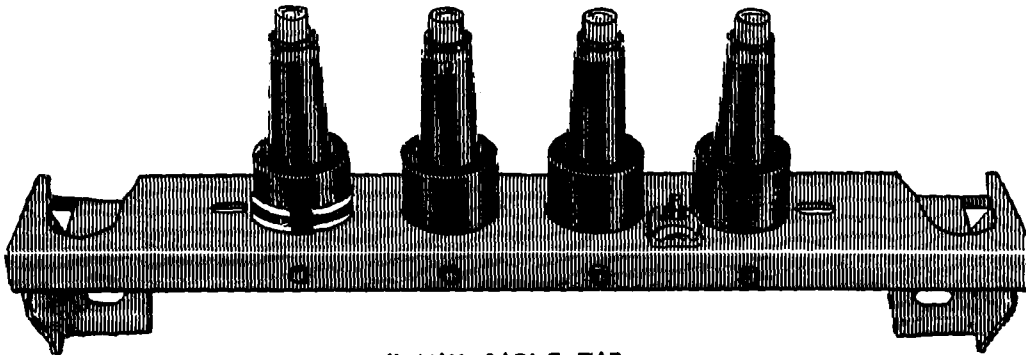
SUPERSEDES
 4191.1 (5-20-83)

MAJOR USE: 3-WAY - USED AS A LATERAL TAP FROM A CIRCUIT.

4-WAY - USED TO ESTABLISH TWO LATERAL TAPS OR A LOOP FROM A CIRCUIT.



3-WAY CABLE TAP



4-WAY CABLE TAP

FOR FIELD MAINTENANCE ONLY

| CABLE TAP WITH BRACKET | STOCK NUMBER |
|------------------------|--------------|
| 3-WAY | 718320 (A) |
| 4-WAY | 718336 (A) |
| 3-WAY | 718312 (B) |
| 4-WAY | 718328 (B) |

| CABLE TAP (D) WITHOUT BRACKET | STOCK NUMBER |
|-------------------------------|--------------|
| 3-WAY | 718314 (B) |
| 4-WAY | 718338 (B) |

NOTES:

- (A) NOT LOADBREAK RATED ON 12KV SYSTEM.
- (B) INSTALL ONE WHITE-BLACK-WHITE BAND ON THE LEFT BUSHING (WITH A RED MARK), TO IDENTIFY 12KV SWITCHING CAPABILITY (122495).
- C. CAP OFF ALL UNUSED TAPS WITH INSULATING RECEPTACLE (204304).
- (D) CABLE TAPS PURCHASED WITHOUT BRACKET TO BE USED FOR REPLACEMENT PURPOSES IN CABLE TAPS WITH BRACKETS. IF NOT AVAILABLE, USE CABLE TAP WITH BRACKET AND SAVE BRACKET.

4199.909

SUPERSEDES
192.02 (5-20-83)

SDG&E ELECTRIC STANDARDS

LOADBREAK ACCESSORIES, 12KV AND/OR 6.9KV

DATE 6-3-83
APPD *Red/MLB*

4200-4500 CABLE POLES,
FUSES, FAULT INDICATORS,
LIGHTING, GROUNDING

4200-4500 CABLE POLES,
FUSES, FAULT INDICATORS,
LIGHTING, GROUNDING

PAGE**SUBJECT**

| | |
|---------------|---|
| 4299.001 | JOINT CABLE POLE RISERS USING WOODEN LADDER ARMS |
| 4299.002 | CABLE POLE RISER INSTALLATION, CABLE-IN-CONDUIT |
| 4299.003-.008 | 3 PHASE CABLE POLE RISER INSTALLATION, CABLE-IN-CONDUIT |
| 4299.009 | 3 PHASE CABLE POLE RISER INSTALLATION, MODIFICATION FROM SINGLE TO DOUBLE RISER |
| 4299.010-.011 | CABLE POLE TERMINAL MOUNTING INFORMATION (PORCELAIN TERMINATIONS) (FOR CONTAMINATION DISTRICT 1) |
| 4299.101 | 0-750V CUSTOMER OWNED UNDERGROUND SERVICE FROM AND OVERHEAD LINE, ONE DUCT |
| 4299.104 | 0-750V VOLT THREE AND FOUR DUCT RISER SUPPORTS |
| 4299.201-.202 | CROSSARM MOUNTED TERMINALS, 4KV, 4-WIRE SYE |
| 4299.203-.206 | 12.47KV AND BELOW 3 PHASE CABLE POLE 1/C PER PHASE, LINE ARM MOUNTED DISCONNECTS |
| 4299.301-.302 | BRACKET MOUNTED TERMINALS, 12KV, 3-WIRE ARMLESS TANGENT CONSTRUCTION |
| 4299.303-.304 | BRACKET MOUNTED TERMINALS, 12KV, 3-WIRE ARMLESS DEADEND CONSTRUCTION |
| 4299.305-.306 | 12.47KV AND BELOW CABLE POLE, UPSWEEP BRACKET, 3 PHASE 1/C PER PHASE, LINE ARM MOUNTED DISCONNECTS |
| 4299.307-.309 | CROSSARM CABLE POLE 3 PHASE 1/C PER PHASE DEADEND CONSTRUCTION, 12.47KV AND BELOW |
| 4299.401-.403 | 12.47KV AND BELOW DEAD END CABLE POLE ARM, 3 PHASE, 1/C PER PHASE, HOOKSTICK SWITCHED |
| 4299.501-.503 | CABLE POLE, STEEL, LIGHT DUTY |
| 4299.504-.506 | 12.47KV AND BELOW DEAD END CABLE POLE, 6 OR 7 OH CONDUCTORS, 1 OR 2 TERMINALS PER CONDUCTOR, HOOKSTICK SWITCHED |
| 4399.501-.502 | FAULT INDICATOR INSTALLATION |
| 4499.101 | NUMBERING ORNAMENTAL STREET LIGHT POLES |
| 4499.201 | MERCURY VAPOR CONVENTIONAL LUMINAIRES |
| 4499.203-.204 | HIGH PRESSURE SODIUM VAPOR LUMINAIRE AND REPLACEMENT BALLAST |
| 4499.701 | STREET LIGHTING - MULTIPLE MERCURY VAPOR BALLAST |
| 4499.702 | FOUNDATION DETAIL PRESTRESSED CONCRETE LIGHT STANDARD |
| 4599.001 | 3312 HANDHOLE STEEL COVER GROUNDING |
| 4599.201-.202 | EQUIPMENT GROUNDING INSTALLATION |
| 4599.203 | PAD GROUNDING INSTALLATION (PREFERRED II) |
| 4599.204 | PAD GROUNDING INSTALLATION |

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| REV | CHANGE | BY | DSGN | APPV | DATE | REV | CHANGE | BY | DSGN | APPV | DATE |
|-----|--------------------|----|------|------|------------|-----|--------|----|------|------|------|
| C | | | | | | F | | | | | |
| B | COMPLETELY REVISED | JK | JS | CZH | 10/16/2019 | E | | | | | |
| A | ORIGINAL ISSUE | JK | JS | CZH | 6/13/2019 | D | | | | | |

| | | | | |
|-------------------------|--|-----------------------------------|--|--------------------------------|
| SHEET 1 OF 1 | Indicates Latest Revision <input checked="" type="checkbox"/> Completely Revised | <input type="checkbox"/> New Page | <input type="checkbox"/> Information Removed | UG LEGACY UGL4201.1 |
| | SDG&E ELECTRIC UNDERGROUND FIELD MAINTENANCE ONLY STANDARDS | | | |
| | LEGACY UNDERGROUND FIELD MAINTENANCE TABLE OF CONTENTS CABLE POLES, FUSES, FAULT INDICATORS, LIGHTING, GROUNDING | | | |

SCOPE: THIS STANDARD: 1) SHOWS THE STANDARD CABLE POLE RISER POSITIONS FOR SDG&E, TELCO, AND CATV COMPANIES. IT IS FOR RISER PLACEMENT ONLY (SEE SECTION 1400/4200 FOR SPECIFIC CONSTRUCTION DETAILS).

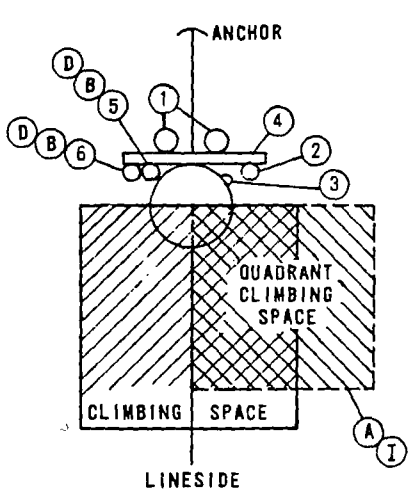


FIGURE 1

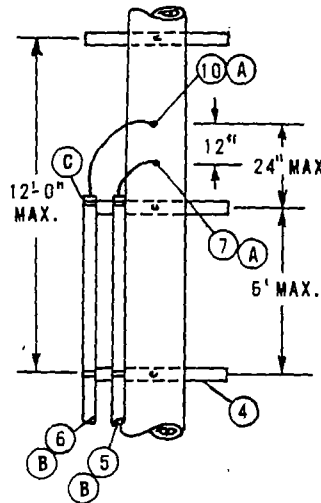


FIGURE 2

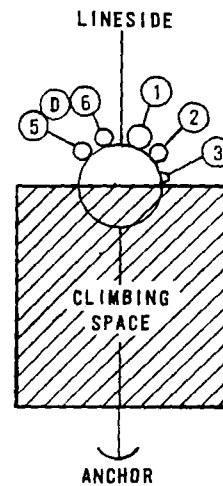


FIGURE 3

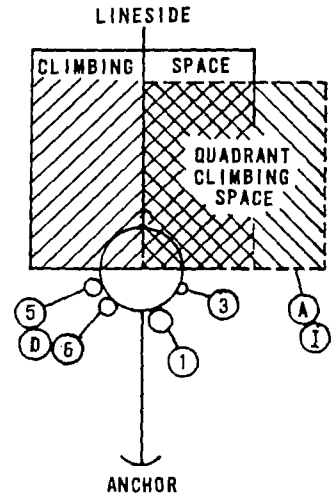


FIGURE 4

DEAD END CONSTRUCTION

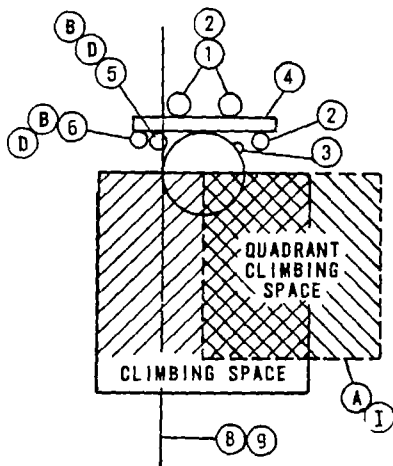


FIGURE 5

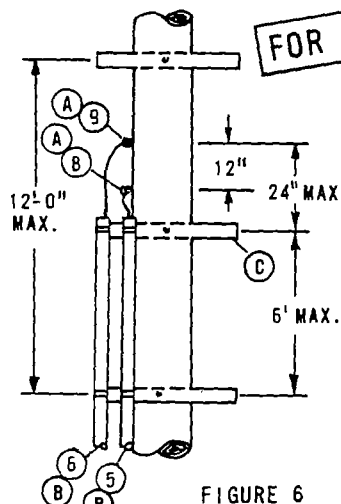


FIGURE 6

FOR FIELD MAINTENANCE ONLY

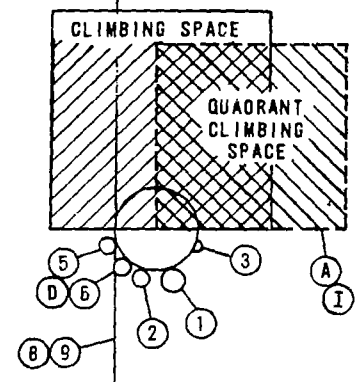


FIGURE 7

TANGENT CONSTRUCTION

INSTALLATION:

- (A) QUADRANT CLIMBING SPACE PROVIDED THROUGH CATV AND TELCO AERIAL ATTACHMENT LEVELS ONLY.
- (B) C.A.T.V. AND TELCO TO ATTACH CONDUIT TO BACK SIDE OF RISER LADDER ARMS.
- (C) C.A.T.V. OR TELCO TO PLACE RISER LADDER ARM TO HOLD TOP OF OWN CONDUIT.
- (D) C.A.T.V. AND TELCO TO ALWAYS BE IN SAME QUADRANT.
- F. CONDUIT RISER AT BASE OF POLE NOT TO INFRINGE ON CURB OR SIDEWALK POSITIONS.

REFERENCES:

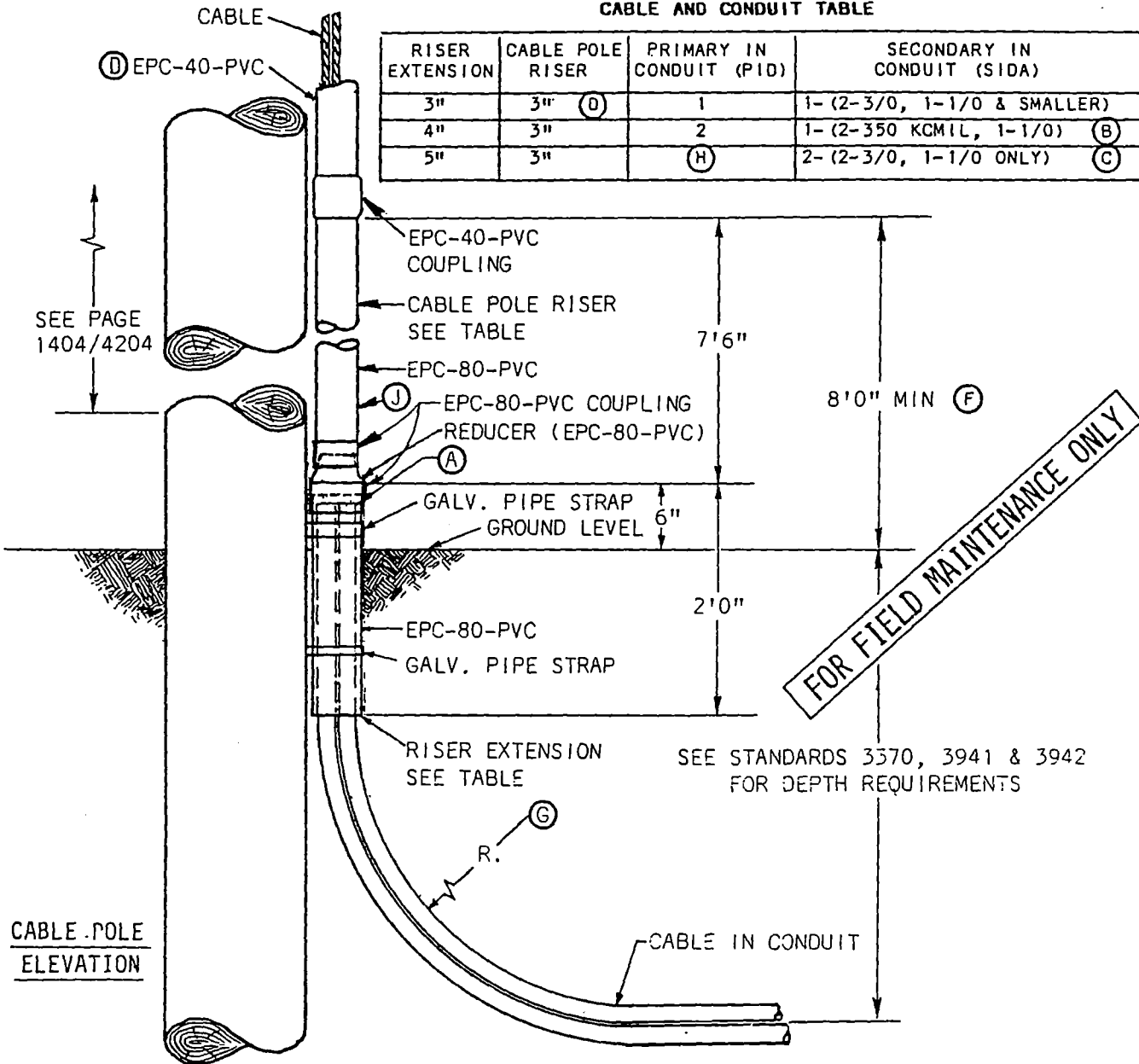
- G. PVC RISERS ARE NOT PERMITTED WITHIN THE CLIMBING SPACE PER G.O. 95 RULE 22.20.
- H. G.O. 95 RULE 91.3-A1C REQUIRES POLE STEPS ON ALL JOINTLY USED CABLE POLES (SEE STANDARD 363).
- I. SEE SECTION 200 FOR ALLOWABLE G.O. 95 CLIMBING SPACE OBSTRUCTIONS.
- J. NO CATV OR TELCO JUMPERS ALLOWED IN QUADRANT CLIMBING SPACE PER G.O. 95 RULE B4.7.

| ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|------|-----------------------|------|----------------------------------|
| 1 | SDG&E PRIMARY RISER | 6 | C.A.T.V. RISER POSITION |
| 2 | SDG&E SECONDARY RISER | 7 | TELCO DEAD END ATTACHMENT |
| 3 | SDG&E ELECTRIC GROUND | 8 | TELCO TANGENT (THRU) POSITION |
| 4 | RISER LADDER ARM | 9 | C.A.T.V. TANGENT (THRU) POSITION |
| 5 | TELCO RISER POSITION | 10 | C.A.T.V. DEAD END ATTACHMENT |

SCOPE: THIS STANDARD SHOWS THE CONSTRUCTION FOR SINGLE-PHASE PRIMARY AND SECONDARY CABLE-IN-CONDUIT (CIC) INSTALLATIONS.

CABLE AND CONDUIT TABLE

| RISER EXTENSION | CABLE POLE RISER | PRIMARY IN CONDUIT (P10) | SECONDARY IN CONDUIT (SIDA) |
|-----------------|------------------|--------------------------|-----------------------------|
| 3" | 3" (D) | 1 | 1- (2-3/0, 1-1/0 & SMALLER) |
| 4" | 3" | 2 | 1- (2-350 KCMIL, 1-1/0) (B) |
| 5" | 3" | (H) | 2- (2-3/0, 1-1/0 ONLY) (C) |



NOTES: NO MORE THAN TWO CIC CONDUITS FOR A RIGID CONDUIT RISER IS ALLOWED.

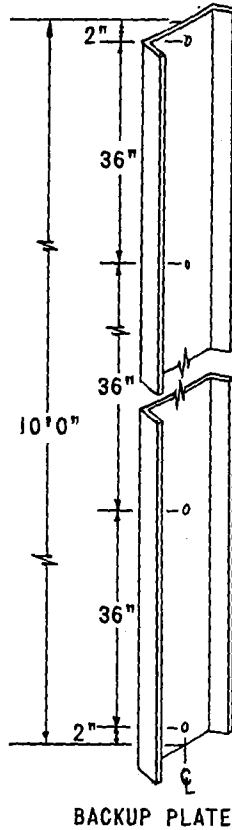
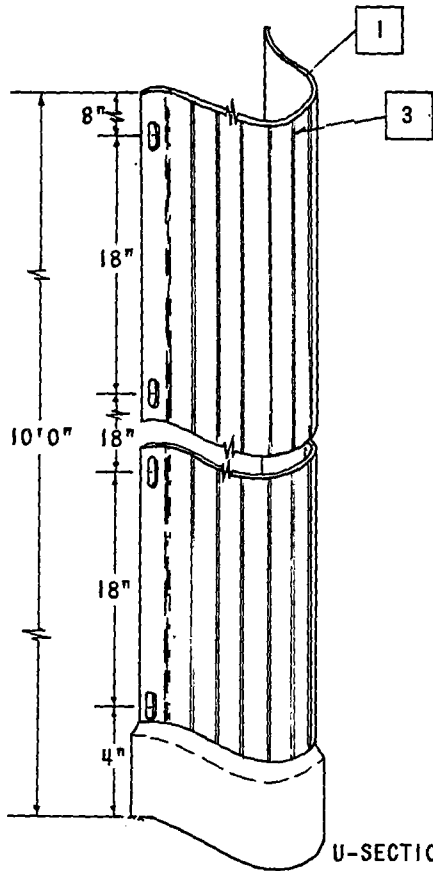
INSTALLATION:

- (A) CUT CONDUIT FROM CABLE-IN-CONDUIT 4 INCHES ABOVE GROUND LEVEL.
- (B) THE 350 KCMIL CABLE-IN-CONDUIT (SIDA) SHALL NOT BE USED FOR SERVICES. IF A SERVICE REQUIRES 350 CABLE, USA CABLE AND RIGID CONDUIT MUST BE USED.
- (C) FOR 2 RUNS OF SIDA IN ONE RISER, DERATE AMPACITY 20%.
- (D) FOR 3/0 AND SMALLER SIDA, REDUCE THE TOP PORTION OF THE RISER ABOVE THE 8 FOOT LEVEL TO 2 INCH CONDUIT.

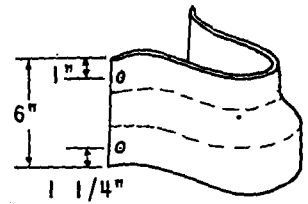
REFERENCE:

- (F) RISERS OF PLASTIC PIPE SHALL BE EPC-80-PVC (SCHEDULE 80) WITH A MINIMUM NOMINAL PIPE SIZE OF 3 INCHES FROM THE GROUND LINE TO A LEVEL NOT LESS THAN 8 FEET ABOVE THE GROUND LINE PER G.O. 95, RULE 54.6-E.
- (H) SEE PAGES 1499.003/4299.003 THRU 1403.7/4203.7 FOR THREE-PHASE PRIMARY CABLE IN CONDUIT INSTALLATION WHICH REQUIRES "U" SHAPED MOULDING.
- (I) SEE PAGE 1404.1/4204.2 FOR CABLE POLE RISER BILL OF MATERIAL.
- (J) SEE PAGES 1499.009/4299.009 THRU 1405.3/4205.3 FOR MULTIPLE RISER INSTALLATION.

SCOPE: THIS STANDARD SHOWS THE MATERIALS AND PROCEDURES FOR TERMINATING THREE PREASSEMBLED CABLE-IN-CONDUIT ON RISER POLE.



FOR FIELD MAINTENANCE ONLY



NOTE: DIMENSIONS A, B, & C HAVE A TOLERANCE OF $\pm .13$ ".
BILL OF MATERIAL:

| | U-SECTION MOLDING | | | BACKUP PLATE | | REDUCER BOOT | |
|----------------|-------------------|-------------|-------------|--------------|--------------|--------------|--|
| SIZE | 3" | 3" | 4" | 3" | 4" | 3" TO 4" | |
| SCHEDULE | 80 | 30 | 40 | N/A | N/A | N/A | |
| LENGTH | 10'0" | 10'0" | 10'0" | 10'0" | 10'0" | 6" | |
| M & S NO. | 600064 | 600032 | 600096 | 542992 | 542994 | 160608 | |
| A | 3 3/8" | 3 3/8" | 4 1/8" | 3 1/4" | 4 1/4" | 8 1/4" | |
| B | 3" | 3" | 4" | 2 5/8" | 3 5/8" | 2 5/8" | |
| C | 6 1/4" | 6 1/4" | 7 1/4" | 7/8" | 1" | -- | |
| R | 1 7/16" | 1 19/32" | 2" | 5" | 5" | -- | |
| WALL THICKNESS | .300" | .150" | .237" | .063" | .063" | .150" | |
| TOLERANCE | -.0" +.036" | -.0" +.020" | -.0" +.020" | $\pm .015$ " | $\pm .015$ " | -.0" +.015" | |

SDG&E ELECTRIC STANDARDS

DATE 1-1-87
 APPD JLB/RD

3Ø CABLE POLE RISER INSTALLATION
 CABLE-IN-CONDUIT

OH 1499.003
 UG 4299.003
 SUPERCEDES 4203.
 (1-4-80)

SEQUENCE FOR INSPECTION

| SEQ | DESCRIPTION/DIMENSIONS | TOLERANCE |
|-----|------------------------|--------------|
| 1 | WALL THICKNESS | |
| | U-Sections | |
| | 3" Sch. 80 | .300 |
| | 3" Sch. 30 | .150" |
| | 4" Sch. 40 | .237" |
| | | -.0" + .036" |
| | | -.0" + .020" |
| | | -.0" + .020" |

Above wall thicknesses are in accordance with G.O. 95 Rule 54.6D2.

2 GENERAL APPEARANCE ALL SURFACES

U-Sections, Backup Plates and Reducer Boot

Free from warpage, cuts, blemishes and protrusions.

FOR FIELD MAINTENANCE ONLY

3 SCRIBE MARK

Scribe mark indicating minimum overlap distance should be visible 1" from the plain end of the U-Section.

BILL OF MATERIAL:

| ITEM | *QUANTITY REQUIRED | DESCRIPTION | USE BELOW 8 FT. | USE ABOVE 8 FT. | STOCK NO. OR CONST. STDS. |
|------|--------------------|---------------------------------------|-----------------|-----------------|---------------------------|
| 1 | 3' | Riser, U-Section 4"x10' Sch. 40 | yes | no | 600096 |
| 2 | 1 | Riser, U-Section 3"x10' Sch. 80 | yes | no** | 600064 |
| 3 | 2 | Riser, U-Section 3"x10' Sch. 40 | no | yes | 600032 |
| 4 | 1 | Boot, Reducer 4" to 3" | yes | no | 160608 |
| 5 | 3 | Plate, Backup 3"x10' | yes | yes | 542992 |
| 6 | 3' | Plate, Backup 4"x10' | yes | no | 542994 |
| 7 | 1 | Screw, Lag, Sq. Head 1/2"x4" (E) | no | yes | 621568 |
| 8 | 42 | Screw, Lag, Sq. Head 1/4"x 2 1/2" (E) | yes | yes | 621856 |
| 9 | 42 | Washer, Std. Flat Round 1/4" (E) | yes | yes | 799520 |
| 10 | 46 | 6d Galvanized Nails (E) | yes | yes | -- |
| 11 | 3 | Grip, Cable 5 1/4"x12" | no | yes | 394336 |

(E) Exempt Material

* This quantity is a typical 40' riser installation, if pole height varies from this distance adjust appropriate material accordingly.

** Only excess portion of 1 - 10 ft. 3" Sch. 80 U-Section is allowed above the 8 ft. level.

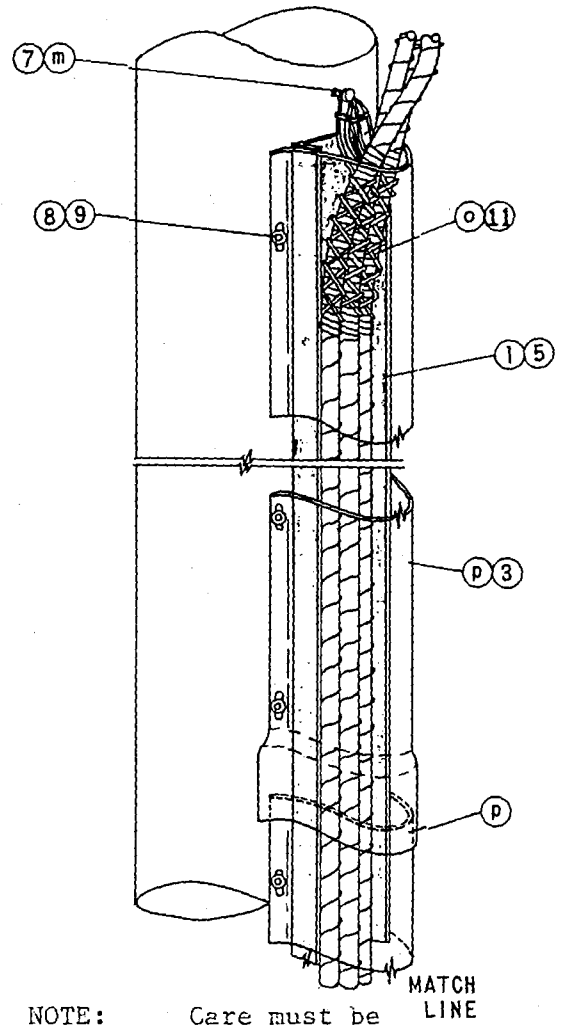
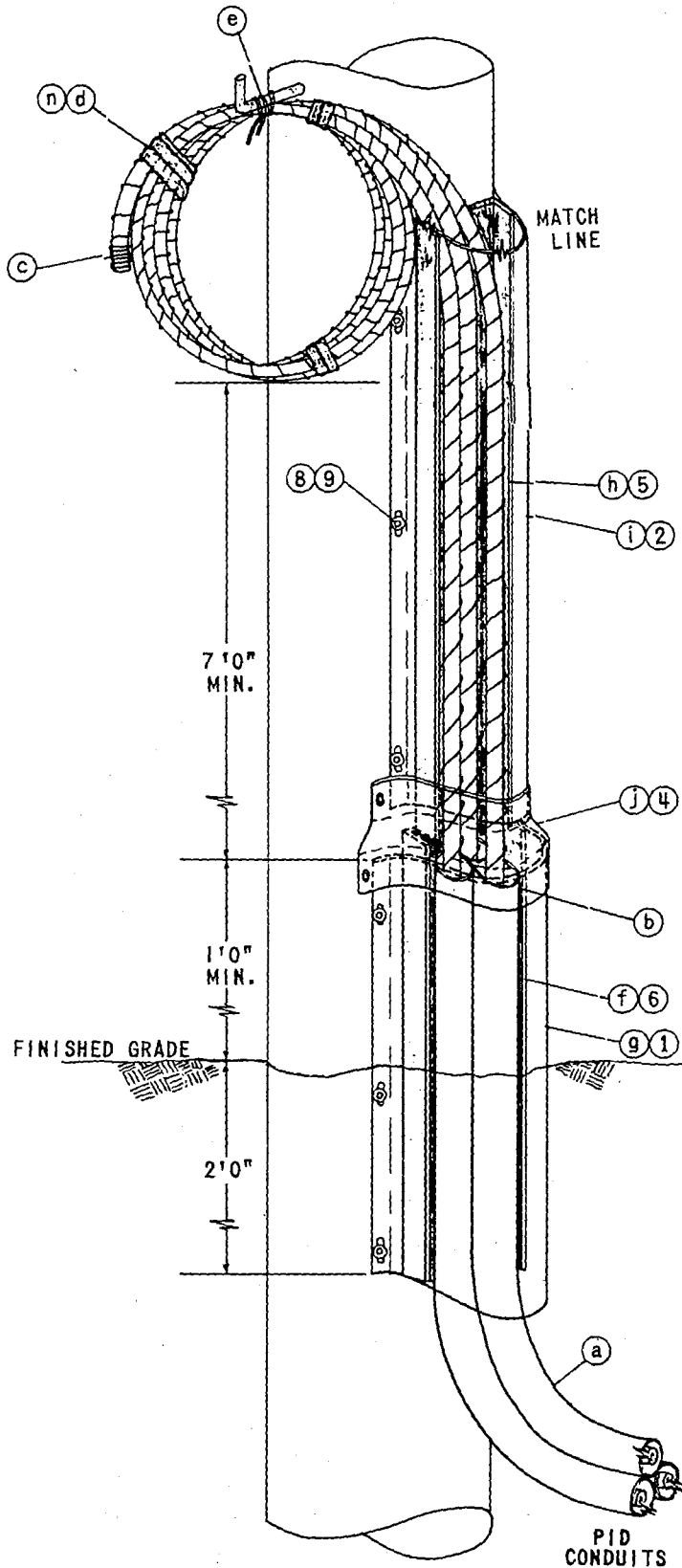
~~OH 1499.004~~
UG 4299.004
PERCEDES 4203.3
(11-16-81)

SDG&E ELECTRIC STANDARDS

**3Ø CABLE POLE RISER INSTALLATION
CABLE-IN-CONDUIT**

DATE 1-1-87
APPD *JLB/RJS*

INSTALLATION INSTRUCTIONS



NOTE: Care must be taken not to spike conductors with linemans hooks while performing installation, ascending or descending a riser pole.

FOR FIELD MAINTENANCE ONLY

DATE 1-1-87
APPD *[Signature]*

SDG&E ELECTRIC STANDARDS

3Ø CABLE POLE RISER INSTALLATION
CABLE-IN-CONDUIT

OH 1499.00
UG 4299.00
SUPERCEDES 42
(1-23-80)

FOR FIELD MAINTENANCE ONLY

U-SECTION MOLDING LOCATION

Verify that the quadrant selected by Designer/Planner for the cable pole riser meets the following requirements. If the following requirements cannot be met, contact the Designer or Planner who requested the installation:

Clearances

The U-section molding shall not enter climbing space per G.O. 95 Rule 22.2D. See O.H. Standard page 251 for allowable working and climbing space requirements.

Location of U-section molding in relation to TELCO and CATV (per Overhead Standards page 1402).

U-SECTION MOLDING INSTALLATION

Material Installation Sequence

Note: If installation can be completed sequentially, steps c, d and n, can be eliminated.

- (a) Terminate PID at cable pole by forming a 36" minimum radius bend with the cable-in-conduit at the base of the pole. Provide sufficient cable-in-conduit needed to terminate cable with drip loop at terminal level before cutting cable-in-conduit from cable reel.
- (b) Cut and remove excess pvc conduit from the PID run so the remaining conduit terminates 1' above finished grade. When removing excess pvc conduit, carefully slide excess conduit away from primary conductors.
- (c) To prevent moisture from entering exposed conductors, always seal exposed ends of conductors with "Aquaseal" and pvc tape.
- (d) Individually coil each primary conductor making sure coil is not less than 2' in diameter. Secure each coil in several places with a gray gas wrap tape to prevent conductors from uncoiling.
- (e) Secure coils to the bottom of the pole step with rope to prevent conductors from damage when the pole is climbed. If pole steps are not available, install lag screws (M&S 621856) in place of pole steps. Bottom of each coil must be 8' above existing grade to prevent vandalism.
- (f) Install a 3' section of 4" backup plate with 2' extended below finished grade and 1' extended above finished grade. Temporarily push conductors to one side of the riser quadrant and secure 4" backup plate to pole with 6d galvanized nails at each end and in the middle. Because holes are not provided nails must be driven through backup plate.

| | | |
|---|--|------------------------------------|
| 1499,006 1299,006 EDES 4203.5 -23-80) | SDG&E ELECTRIC STANDARDS 3Ø CABLE POLE RISER INSTALLATION CABLE-IN-CONDUIT | DATE 1-1-87 APPD <i>JYB IRD</i> |
|---|--|------------------------------------|

- (g) Install a 3' section of 4" U-section molding over the previously installed backup plate (step f) encasing the conduits. Nail 4" U-section molding to pole every 18" using lag screws and washers, (items 8 and 9 from bill of materials).
- (h) Install a 10' section of 3" backup plate behind primary conductors and mate to previously installed backup plate. Temporarily push conductors to one side of the riser quadrant to prevent damage to conductors. Use 6d galvanized nails to attach backup plate to pole starting and ending at each end.
- (i) Install a 10' section of 3" U-section molding schedule 80, over previously installed backup plate (step h) encasing primary conductors. To permit thermal expansion, do not drive lag screws tight and leave approximately 1/4" gap between the 3" and 4" U-section moldings. Secure U-section molding to pole every 18" with lag screw and washers (item 8 and 9 from bill of materials).
- (j) Install reducer boot over 3" and 4" U-section molding using 6d galvanized nails. Make sure reducer boot fits snugly over each section.
- (k) When the contractor provides trench, the area around the riser bend at base of pole must be backfilled and compacted to 90% and a distance equal to the depth of the trench by the crew to prevent damage to conductors.
- (l) Install remaining backup plate from termination point in (step h) to elevation of pole where U-section molding will terminate. Refer to Overhead Standards page 1406 for elevation of U-section molding termination. Nail backup plate to pole with 6d galvanized nails every 18".
- (m) Install lag screw (item 7 from bill of materials) 2" beyond termination of U-section molding for cable grip support.
- (n) Remove each conductor coil from pole step, and remove binding tape. Uncoil each conductor carefully to prevent bending conductor.
- (o) Install one cable grip approximately 2' from the end of each conductor, (item 11 from bill of materials). Hoist each conductor and hang cable grip on lag screw installed by (step m). Adjust cable grips to determine optimum support positions, tie cables temporarily to pole and slide cable grip below final position. Tape over concentric neutral at final position where grip will seat with half lapped layers of glass tape (720256) and vinyl plastic (720580) over glass tape to assure positive grip. Position cable grip over taped area and attach cable grip to lag screw installed in (step m).
- (p) Install required amount of 3" U-section schedule 30 sections needed to cover backup plate and encase conductors to the termination point of the riser installation. Install belled end of U-section molding over a plain end of previously installed U-section molding. Line up edge of belled end with scribe mark 1" from plain end to ensure that sufficient spacing is provided between U-sections for thermal expansion. Nail U-section molding to pole with lag screws and washers (item 8 and 9 from bill of materials) every 36". Lag screws should be snug but not tight, this is also to allow thermal expansion of U-section. Additional lag screws may be needed at 18" intervals if U-section molding separates more than 1/16" away from pole.

FOR FIELD MAINTENANCE ONLY

DATE 1-1-87
APPD JLB/RDT

SDG&E ELECTRIC STANDARDS

30 CABLE POLE RISER INSTALLATION
CABLE-IN-CONDUIT

~~OH 1499.007~~
UG 4299.007
SUPERCEDES 4203.6
(6-14-83)

MAINTENANCE REQUIREMENTS

Inspection

The U-section molding installation shall be inspected periodically for the following:

Warpage of U-Section Exposing Conductors

For Separation of U-Section Molding From Pole More than 1/16"

Cracks or Damage in U-Sections Which Expose Conductors

FOR FIELD MAINTENANCE ONLY

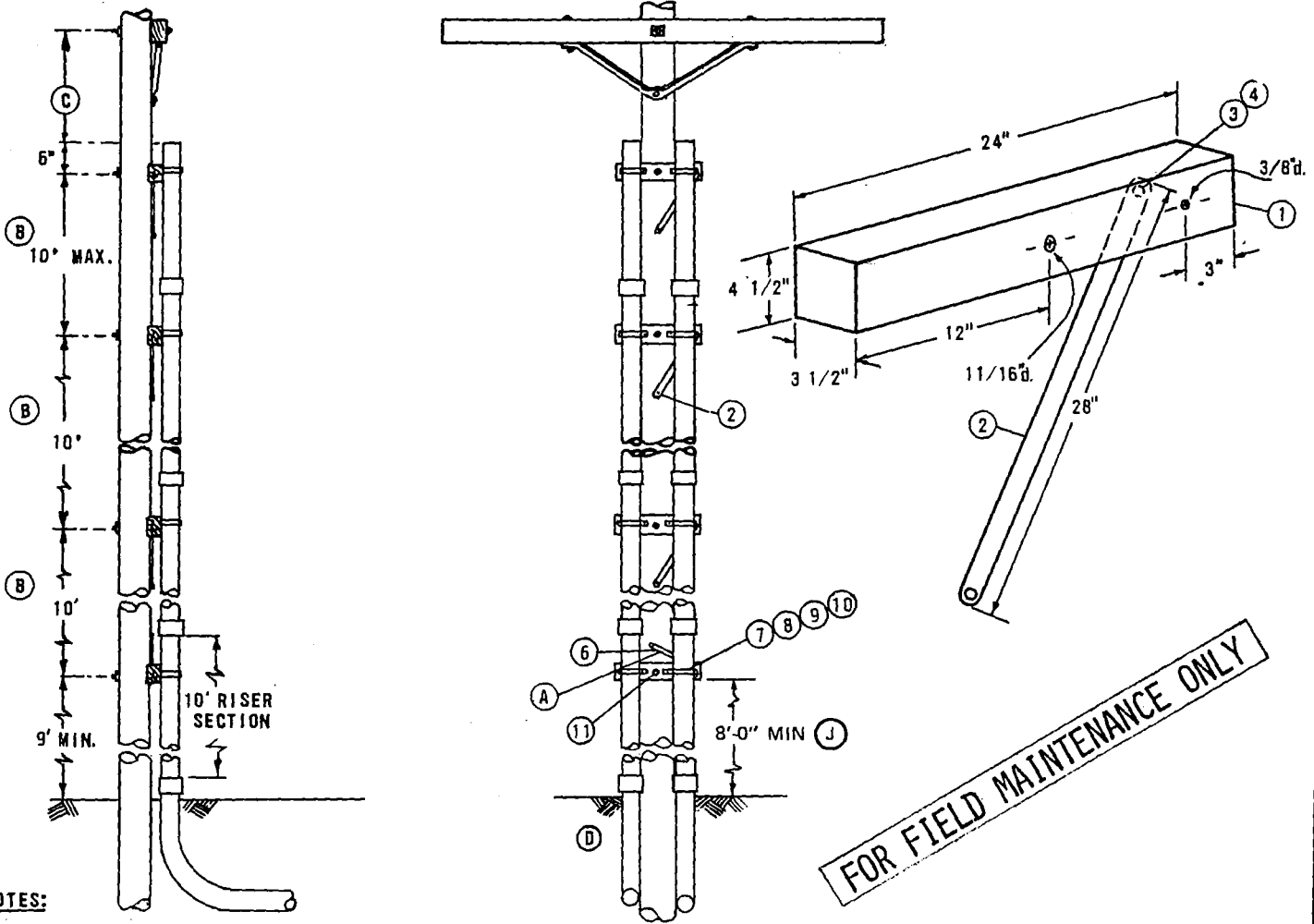
~~OH 1499.008~~
UG 4299.008
SUPERCEDES 4203.7
(12-23-

SDG&E ELECTRIC STANDARDS

30 CABLE POLE RISER INSTALLATION
CABLE-IN-CONDUIT

DATE 1-1-87
APPD JLB/RD

SCOPE: THIS STANDARD SHOWS THE CONSTRUCTION USED WHEN MODIFYING AN EXISTING SINGLE RISER CABLE POLE WHERE A SECOND RISER IS ADDED.



NOTES:

- THIS CONSTRUCTION IS RESTRICTED TO A MAXIMUM OF TWO SDG&E RISERS, (PRIMARY OR SECONDARY).
- WHENEVER POSSIBLE RISERS SHOULD BE INSTALLED ON THE SIDE OF THE POLE OPPOSITE TRAFFIC FLOW.
- SPARE DUCT SHALL BE CAPPED JUST ABOVE GROUND LEVEL TO PREVENT MOISTURE ENTRY AND NOT TO BE CONSIDERED AS A RISER.

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONST. STDS. | ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONST. STDS. |
|------|----------------------------------|-----------|---------------------------|------|--|-----------|---------------------------|
| 1 | CROSSARM, 3-1/2" x 4-1/2" x 2-0" | AS REQ'D. | 380.05 IT.1 | 8 | STRAP, PIPE, 2 HOLE, GALV., 4" | AS REQ'D. | 697952 (E) |
| P 2 | BRACE, FLAT 28" | AS REQ'D. | 164192 | 9 | STRAP, PIPE, 2 HOLE, GALV., 5" | AS REQ'D. | 697984 (E) |
| T 3 | BOLT, WASHER HEAD 3/8" x 4 1/2" | AS REQ'D. | 158528 (E) | 10 | NAILS, FLATHEAD, STEEL GALV. 16D | AS REQ'D. | 491424 (E) |
| T 4 | WASHER, 3/8" SPRING LOCK | AS REQ'D. | 795832 (E) | T 11 | BOLT, MACH. GALV., 5/8" X (LENGTH AS REQ'D), 2-SQ. WASH. 1-DBL COIL WASH | AS REQ'D. | PG. 392.1 (E) 392.2 |
| & 5 | | | | & F | | | |
| F 6 | SCREW, LAG 1/2" X 4" | AS REQ'D. | 621568 (E) | | | | |
| 7 | STRAP, PIPE, 2 HOLE, GALV., 3" | AS REQ'D. | 697920 (E) | | | | |

INSTALLATION:

- (A) LADDER ARMS TO BE INSTALLED BY U.G. CREWS. MOUNT LOWEST ARM NO LOWER THAN 9 FEET AND INSTALL THE FLAT BRACE ABOVE THE FIRST ARM AS SHOWN.
- (B) INSTALL AT LEAST ONE BRACKET FOR EACH JOINT OF CONDUIT.
- (C) 48 INCHES MINIMUM FOR 350 OR LARGER UG CABLE, 30 INCHES MINIMUM FOR 2/0 AND SMALLER CABLE. THIS DIMENSION APPLIES TO THE TRIPLE TERMINATOR BRACKET AS WELL AS CROSSARMS.
- (D) EXCAVATION MIGHT BE REQUIRED AROUND EXISTING RISER TO FACILITATE THE INSTALLATION OF LADDER ARMS.
- (E) EXEMPT MATERIAL.

REFERENCE:

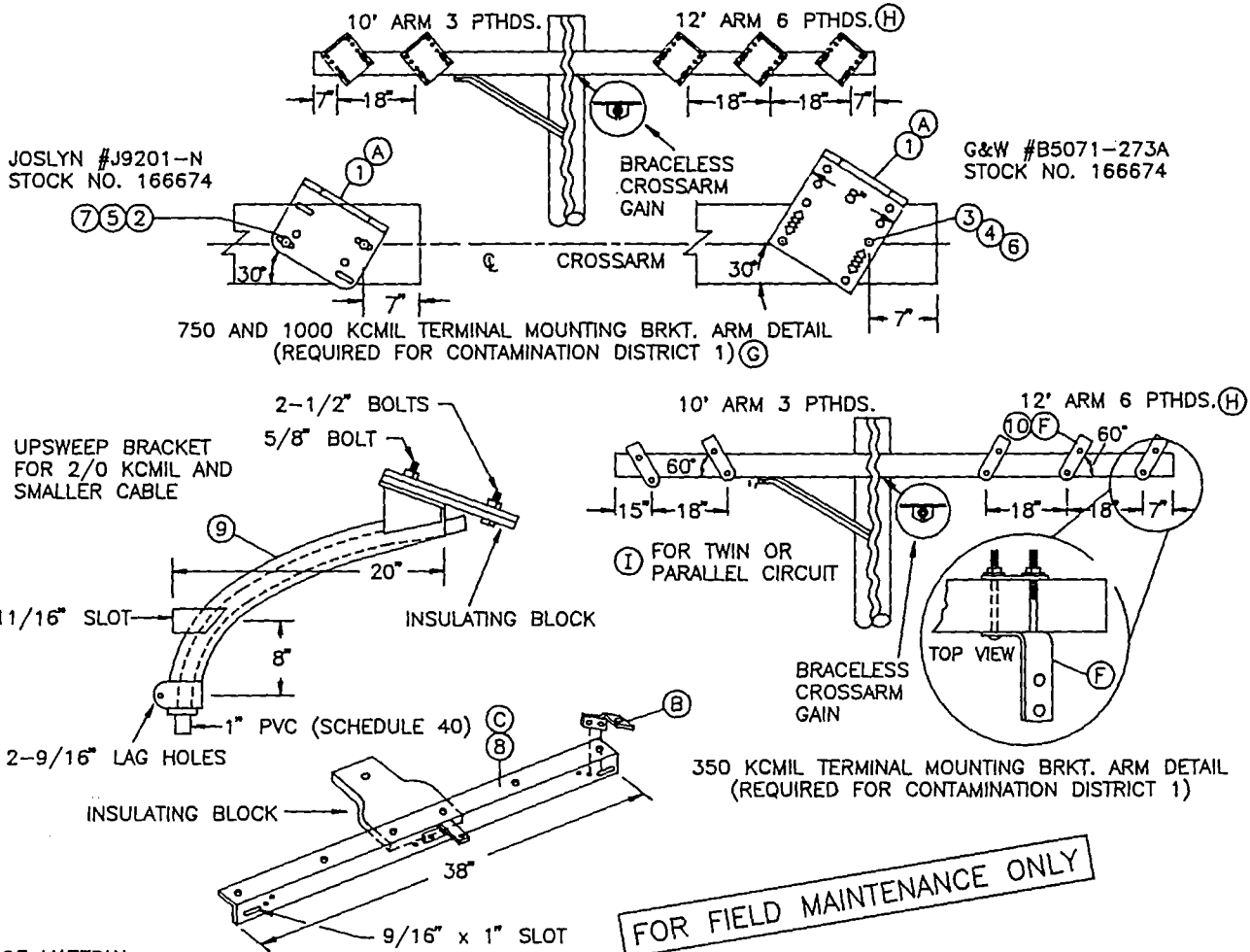
- F. SEE PAGE 1402.1/4202 FOR POSITION OF RISERS INVOLVING MORE THAN ONE UTILITY.
- G. POLES ARE TO BE STEPPED PER STANDARD 363.
- H. SEE PAGE 1404.1 FOR INSTALLATION OF ONE CABLE RISER.
- I. PVC RISERS ARE NOT PERMITTED WITHIN THE CLIMBING SPACE PER G.O. 95 RULE-22.2C.
- (J) RISERS OF PLASTIC PIPE SHALL BE EPC-80-PVC SCHEDULE 80, WITH A MINIMUM NORMAL PIPE SIZE OF 2-1/2 INCHES, FROM THE GROUND LINE TO A LEVEL NOT LESS THAN 8 FEET ABOVE THE GROUND LINE PER G.O. 95 RULE 54-6-E.

DATE 1-1-87
APPD. JYB/ROA

SDG&E ELECTRIC STANDARDS
**30 CABLE POLE RISER INSTALLATION
MODIFICATION FROM SINGLE TO DOUBLE RISER
FOR EXISTING CABLE POLES**

OH 1499.009
UG 4299.009
SUPERCEDES 4205.1
(6-14-83)

SCOPE: THIS STANDARD SHOWS VARIOUS METHODS OF CABLE TERMINATION BRACKETS USED TO CONNECT UNDERGROUND CABLES TO OVERHEAD CONDUCTORS.



BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONSTR STD | ASSEMBLY UNITS |
|------|--------------------------------|----------|-------------------------|----------------|
| 1 | BRACKET, POTHEAD MOUNTING | 3 OR 6 | 166674 | P-X-BK |
| 2 | BOLT, MACHINE, GALV. 1/2" x 5" | (E) 2 | 153024 | - |
| 3 | BOLT, MACHINE, GALV. 3/8" x 5" | (E) 2 | 154368 | - |
| 4 | WASHER, 3/8" ROUND | (E) 4 | 800288 | - |
| 5 | WASHER, 1/2" ROUND | (E) 4 | 800192 | - |
| 6 | WASHER, 3/8" DBL COIL | (E) 2 | 798528 | - |
| 7 | WASHER, 1/2" DBL COIL | (E) 2 | 798464 | - |
| 8 | BRACKET TRIPLE TERMINAL | (C) 1 | 166676 | (OVERHEAD) TTB |
| 9 | BRACKET GALV. TERMINAL UPSWEAP | 1 | 166856 | (OVERHEAD) USB |
| 10 | BRACKET, CROSSARM TERMINAL | 3 OR 6 | 166060 | - |

INSTALLATION:

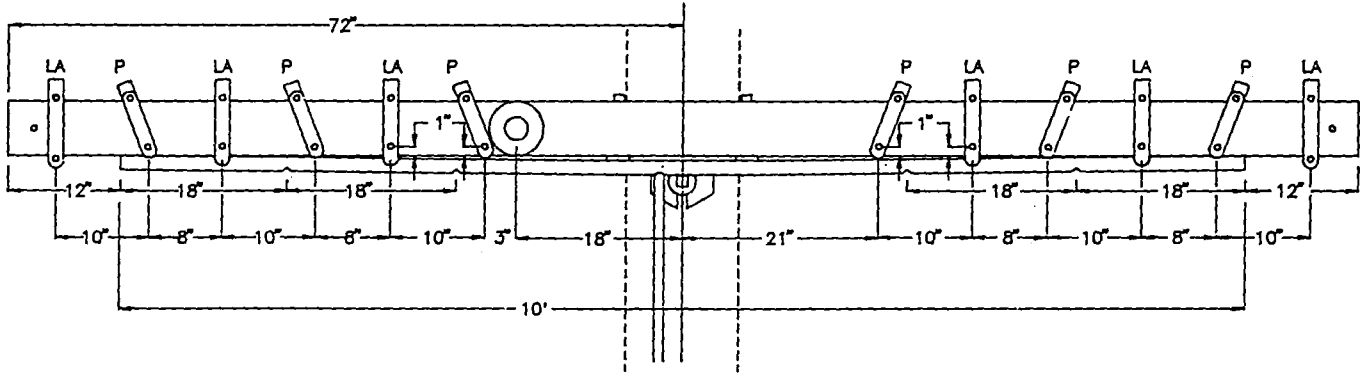
- (A) HOLES IN ARM FOR POTHEAD MOUNTING BRACKETS ARE DRILLED BY OVERHEAD CREWS.
- (B) THREE OF THESE BRACKETS ARE SUPPLIED WITH THE TRIPLE TERMINAL BRACKET (ITEM 8).
- (C) THIS CONSTRUCTION TO BE USED ONLY FOR CABLE SIZES 2/0 AND BELOW.
- (E) EXEMPT MATERIAL.
- (F) TURN TOP OF BRACKET OUTWARD TO OBTAIN APPROX. 60° ANGLE.

REFERENCE:

- (G) FOR CONSTRUCTION IN CONTAMINATION DISTRICTS 2 AND 3, SEE STANDARD 1407.2/4207.2.
- (H) SEE STANDARD 1407.2/4207.2 FOR TERMINAL AND LIGHTNING ARRESTER DETAIL.
- (I) SEE STANDARD 1442.1/4242.1 FOR 3-350 KCMIL POTHEADS ON A 10 FOOT CROSSARM.

| | | |
|---|--|-----------------------------------|
| HI 1499.010 JG 4299.010 SUPERCEDES 4207.1 (1-1-93) | SDG&E ELECTRIC STANDARDS CABLE POLE TERMINAL MOUNTING INFORMATION (PORCELAIN TERMINATIONS) (FOR CONTAMINATION DISTRICT 1) | DATE 1-1-93 APPD <i>JLB/RD</i> |
| | | |

12' ARM 6 PTHS AND 6 ARRESTORS

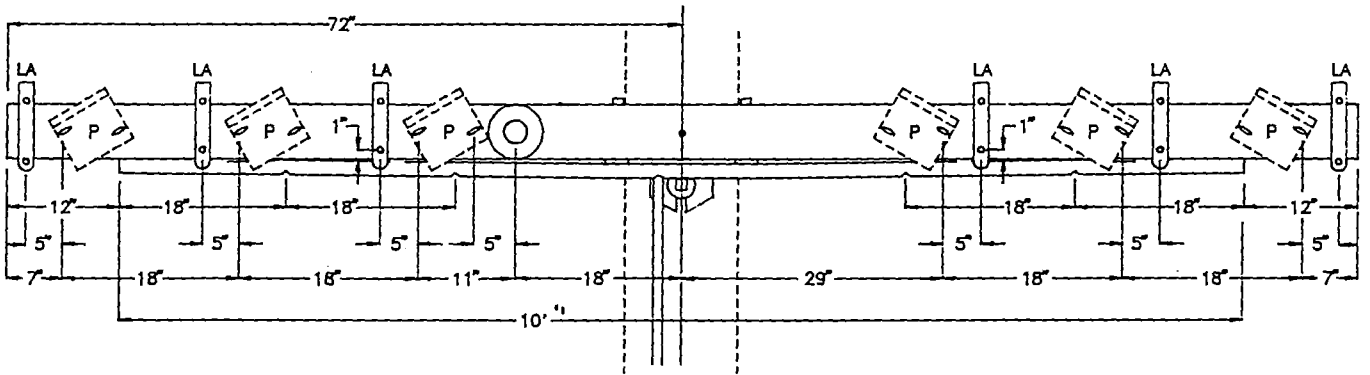


350 KCMIL TERMINAL AND LIGHTNING ARRESTER BRACKETS MOUNTING DETAIL

P=POTHEAD BRACKET
 LA=LIGHTNING ARRESTER BRACKET

FOR FIELD MAINTENANCE ONLY

12' ARM 6 PTHS AND 6 ARRESTORS



750 AND 1000 KCMIL TERMINAL AND LIGHTNING ARRESTER BRACKETS MOUNTING DETAIL

DATE 1-1-93

APPD *JLB/RP*

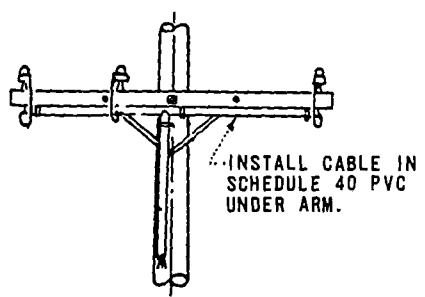
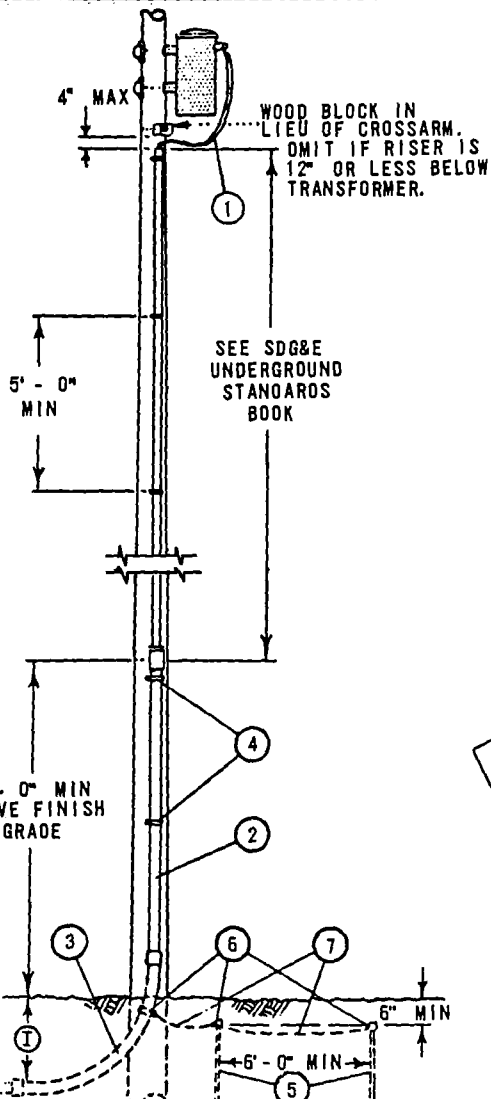
SDG&E ELECTRIC STANDARDS

CABLE POLE TERMINAL MOUNTING INFORMATION
 (PORCELAIN TERMINATIONS)
 (FOR CONTAMINATION DISTRICT 1)

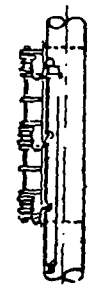
OH 1499.011

UG 4299.011

SUPERCEDES
 4207.2 (1-1-93)



CROSSARM CONSTRUCTION



RACK CONSTRUCTION

FOR FIELD MAINTENANCE ONLY

SEE SDG&E UNDERGROUND STANDARDS BOOK

8'- 0" MIN ABOVE FINISH GRADE

NOTES:

- (A) SEE PAGE 1404 /4204 FOR RISER CONSTRUCTION.
- (B) CUSTOMER'S SERVICE ENTRANCE CONDUCTORS SHALL RUN CONTINUOUSLY WITHOUT SPLICES FROM SERVICE EQUIPMENT TO SECONDARY OR TRANSFORMER TERMINALS AND SHALL BE OF A LENGTH SUFFICIENT TO FORM DRIP LOOPS AT THE TOP OF THE RISER. CONTRACTOR SHALL IDENTIFY SERVICE ENTRANCE CONDUCTORS WITH CODING OR TAGGING FOR PURPOSE OF PARALLELING PHASES AND NEUTRALS. MAXIMUM SIZE OF EACH CONDUCTOR, SINGLE OR PARALLELED RUNS, SHALL NOT EXCEED 500 KCM.
- (C) WHEN ITEMS 2 AND 3 ARE SCHEDULE 80 PVC OMIT ITEMS 5, 6, AND 7. (SEE SDG&E UNDERGROUND STANDARDS BOOK)
- (D) OMIT ITEMS 5, 6, AND 7 WHERE CUSTOMER'S UNDERGROUND CONDUIT RUN IS AN APPROVED METALLIC CONDUIT.
- (E) OMIT ITEM 5, AND 7 WHERE #6 BARE COPPER BONDING WIRE IS INSTALLED BETWEEN ITEMS 3 AND CUSTOMER'S SERVICE ENTRANCE EQUIPMENT.
- (G) USE TWO ROD GROUND SPACED A MINIMUM OF 6 FEET APART.
- H. APPROVED METALLIC CONDUIT OR #6 BARE COPPER BONDING WIRE SHALL BE GROUNDED AT THE SERVICE ENTRANCE IN ACCORDANCE WITH REQUIREMENTS OF THE LOCAL INSPECTION AUTHORITY.
- (I) 18" MIN DEPTH ON PRIVATE AND PUBLIC PROPERTY OTHER THAN STREETS AND ALLEYS. 24" MIN DEPTH ACROSS STREETS AND ALLEYS. 24" MIN TO BE MAINTAINED CONTINUOUSLY WHERE DUCTS TRAVERSE BOTH STREETS (AND ALLEYS) AND PRIVATE PROPERTY. 24" MIN DEPTH FOR NON-METALLIC CONDUITS.

MATERIAL FURNISHED AND INSTALLED BY CUSTOMER

| EM | DESCRIPTION (A) |
|----|--|
| | CUSTOMER'S SERVICE ENTRANCE CONDUCTORS (B) |
| | CONDUIT, GALV. IRON RIGID RISER (C) |
| | CONDUIT, GALV IRON BEND, 90°, 36" RADIUS (C) |
| | STRAP, PIPE GALV, 2-10D GALV NAILS |
| | RODS, 5/8" X 8'- 0" COPPERCLAD STEEL GROUND (D) (F)(G) |
| | CLAMPS, APPROVED TYPE GROUNDING (D) |
| | WIRE, #6 BARE STRANDED COPPER (D) (F) |

H 1499,101
6 4299,101
SUPERCEDES
215 (10-2-78)

SDG&E ELECTRIC STANDARDS
0-750V CUSTOMER OWNED UNDERGROUND SERVICE
FROM AN OVERHEAD LINE, ONE DUCT

DATE 11-16-81
APPD JEXY

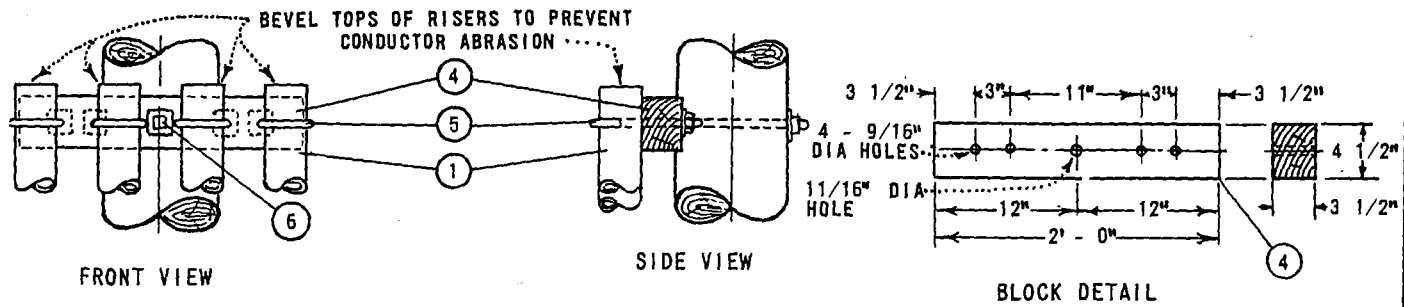


FIGURE 1
PLASTIC PIPE RISER SUPPORT DETAILS

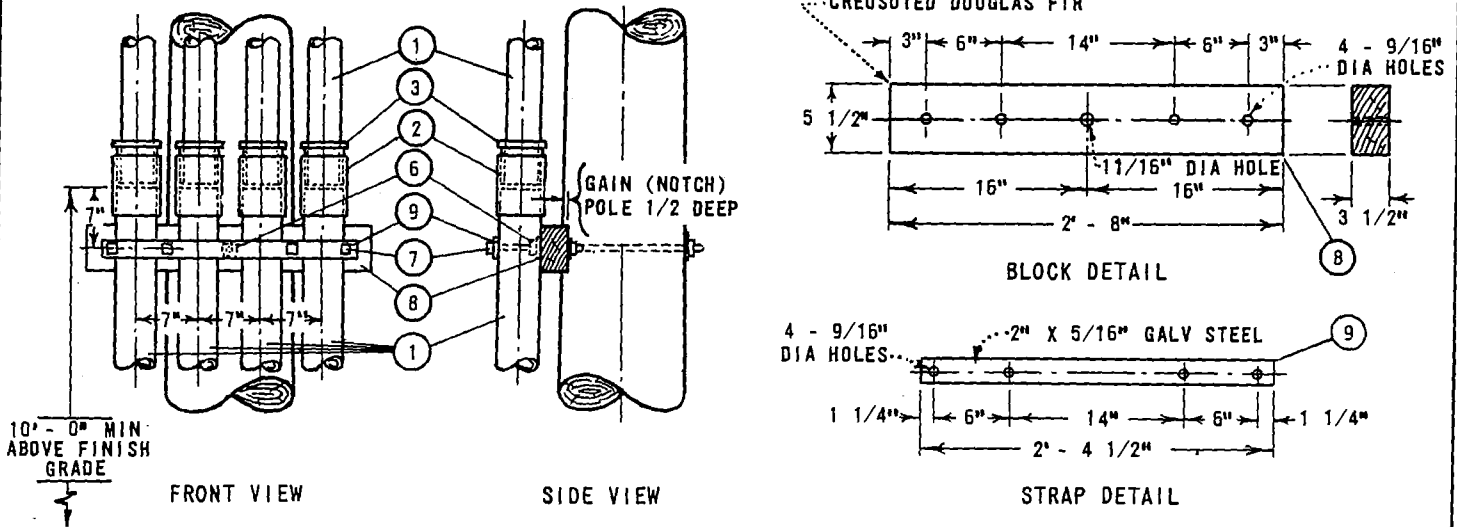


FIGURE 2
GALVANIZED PIPE RISER SUPPORT DETAIL

FOR FIELD MAINTENANCE ONLY

NOTES:

- A. SEE UNDERGROUND STANDARDS BOOK FOR CABLE, CONDUIT SIZING INFORMATION.
- (E) EXEMPT MATERIALS.

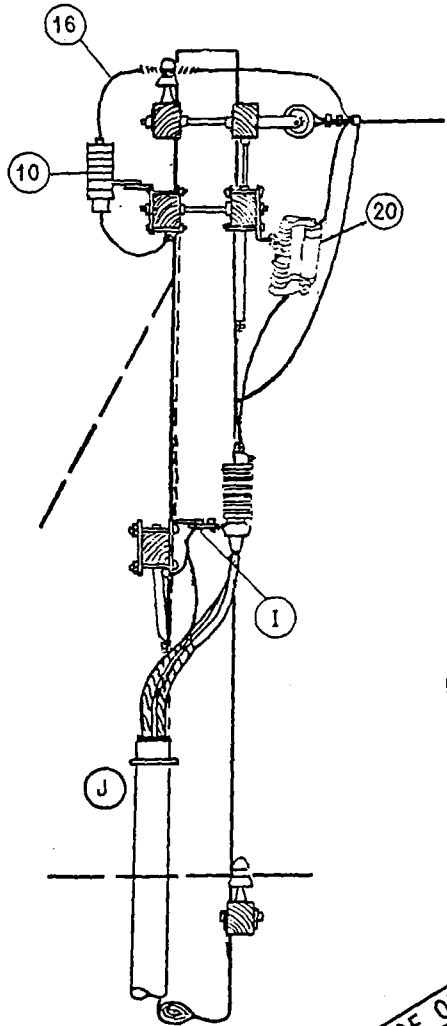
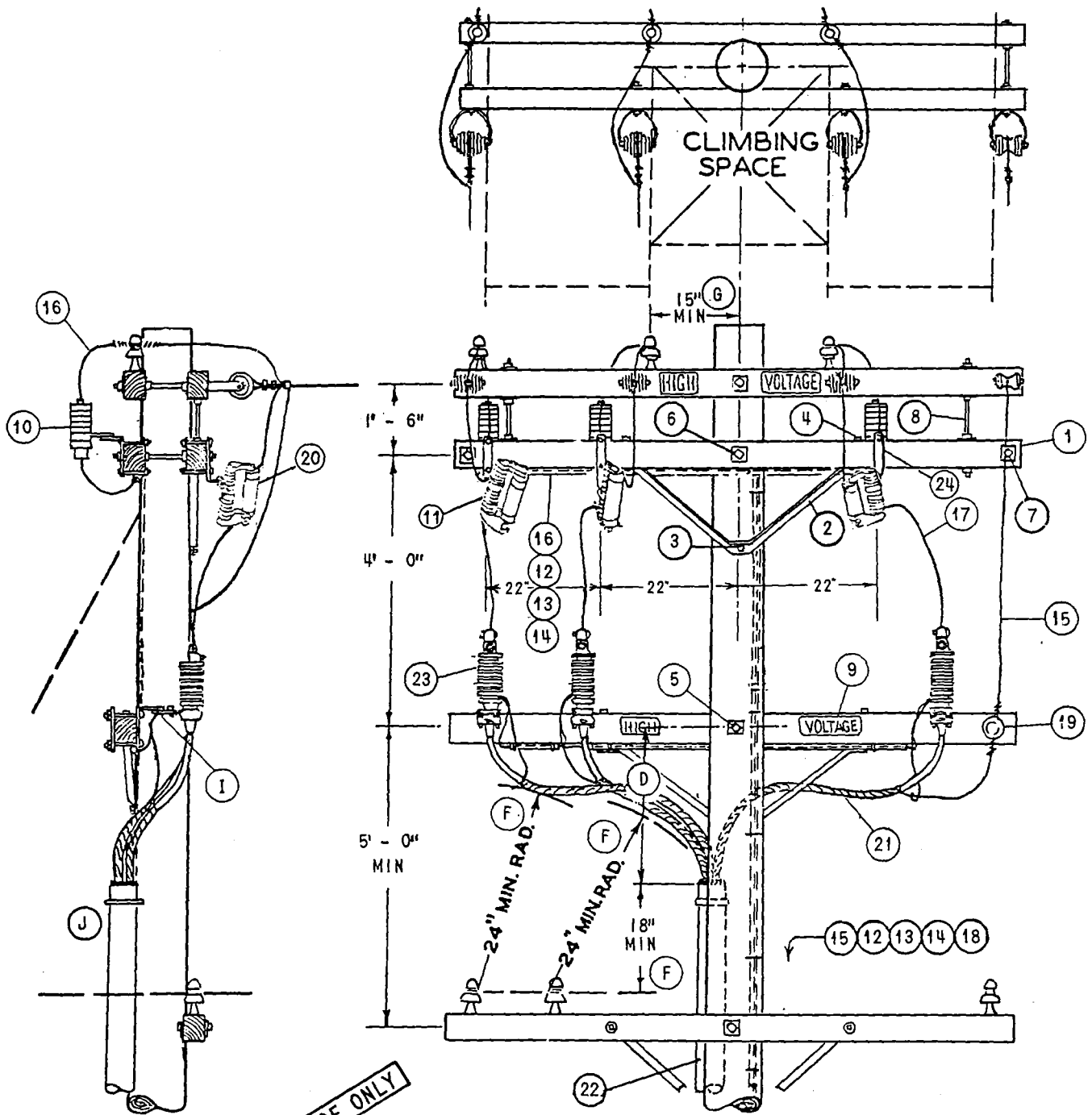
| ITEM | DESCRIPTION | QUANTITY | | STOCK NO. OR CONSTR STD |
|------|---|------------------|----------|------------------------------|
| | | NUMBER OF RISERS | | |
| | | 3" | 4" | |
| 1 | CONDUIT, PVC SIZE AS REQUIRED | | AS REQ'D | 3" - 251552, 4" - 251584 |
| 2 | COUPLINGS, PLASTIC SIZE AS REQ'D | | AS REQ'D | 3" - 280448, 4" - 280480 |
| 3 | BUSHINGS, PLASTIC REDUCER 3 1/2" OR 4" X 3" | 3 | 4 | 3 1/2" - 181024, 4" - 573408 |
| 4 | BLOCKS, RISER SUPPORT (SEE FIGURE 1) | 1 | 1 | - |
| 5 | BOLT, 1/2" X 1 SQ WASH. | 3 | 4 | PGS 140, 144 |
| 6 | BOLT, MACH 5/8" X 1/2", 2 - 2" SQ WASH. | (E) 1 | 1 | PGS 139, 140 |
| 7 | BOLT MACH 1/2" X 9", 1 RD WASH. | (E) 3 | 4 | 153184, 800192 |
| 8 | BLOCK, SPACER (SEE FIGURE 2) | 1 | 1 | - |
| 9 | STRAP, GALV STEEL (SEE FIGURE 2) | 1 | 1 | - |

DATE 1-1-87
APPD *[Signature]*

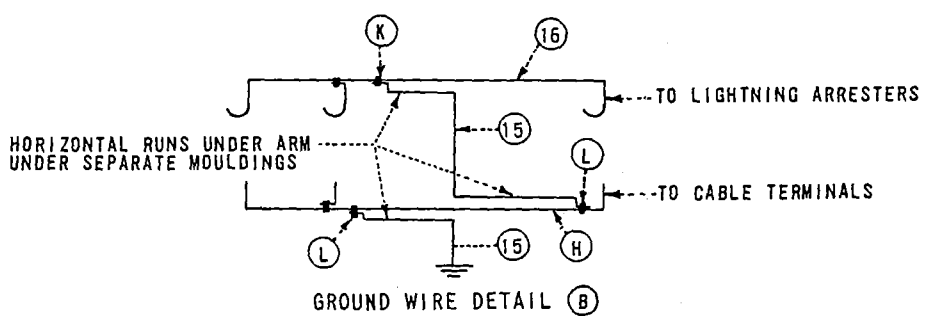
SDG&E ELECTRIC STANDARDS

0-750 VOLT THREE AND FOUR DUCT RISER SUPPORTS

~~OH 1499.104~~
~~UG 4299.104~~
SUPERCEDES 4219
(5-22-75)



FOR FIELD MAINTENANCE ONLY



NOTES:

- (A) UNIT GROUND COMPLETE ORDER 603120 WITH GRAY MOULDING, 603136 WITH PLAIN MOULDOING
- (B) INTERCONNECT ARRESTER GROUND LEAD DISCONNECTS WITH #6 BARE COPPER AND GROUND IT WITH #2 BARE COPPER NEAR CENTER ARRESTER.
- (C) USE TWO GROUND RODS SPACED A MINIMUM OF 6' APART.
- (D) 3 FOOT MINIMUM DIMENSION, 4 FOOT DIMENSION PREFERRED FOR 750 KCM AND LARGER 15KV CABLE.
- (E) EXEMPT MATERIAL.
- (F) G.O. 95 MINIMUM DIMENSION.
- (G) G.O. 95 MINIMUM DIMENSION FOR 4KV. USE 18" MIN IF BUILT WITH 15KV CABLE.
- (H) USE #2 BARE STRANDED COPPER OR LARGER AS REQUIRED.
- (I) CONNECT NEUTRAL, TERMINAL AND SHIELDED CABLE GROUNDS TO LIGHTNING ARRESTER GROUND.
- (J) INSTALL RISER ON FACE OF POLE OPPOSITE CLIMBING SPACE AND IN A POSITION NEAREST THE END OF ARM ON WHICH THE TWO 4KV PHASES ARE LOCATED.
- (K) CONNECT #2 BARE STRANDED COPPER CONDUCTOR TO #6 BARE STRANDED COPPER CONDUCTOR AT POINT NEAR CENTER LIGHTNING ARRESTER.
- (L) CONNECT #2 BARE STRANDED COPPER CONDUCTOR TO REQUIRED CONDUCTOR AT POINT NEAR CENTER TERMINAL AND END TERMINAL.

FOR FIELD MAINTENANCE ONLY

| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONSTR STDS |
|-------------|---|----------|--------------------------|
| | 1 CROSSARM, 3 3/4" X 5 3/4" X 10' - 0" | 3 | 300 SECTION |
| | 2 BRACE, ANGLE CROSSARM 4' - 0" | 2 | 164032 |
| | 3 SCREW, LAG GALV, 5/8" X 5" | (E) 2 | 621600 |
| P T F | 4 BOLT, MACH GALV, 1/2" X 7", 1 RD WASH. & 1 DBL COIL WASH. | (E) 4 | PGS 139, 140 |
| | 5 BOLT, MACH GALV, 5/8" X 14", 2 - 3" SQ WASH. & 1 DBL COIL WASH. | (E) 1 | PGS 139, 140 |
| | 6 BOLT, MACH GALV, 5/8" X 20", 2 - 3" SQ WASH. & 1 DBL COIL WASH. | (E) 1 | PGS 139, 140 |
| | 7 BOLT, SPACE GALV, 5/8" X 20", 4 SQ WASH. & 4 DBL COIL WASH. | (E) 2 | PGS 139, 140 |
| | 8 BOLT, SPACE GALV, 5/8" X 28", 4 SQ WASH. & 4 DBL COIL WASH. | (E) 2 | PGS 139, 140 |
| | 9 SIGN, HIGH VOLTAGE & 8 ROOFING NAILS | (E) 1 | 647648, 492224 |
| | 10 ARRESTER, LIGHTNING 3KV | 3 | 113216 |
| | 11 CUTOUT FOR CURRENT-LIMITING FUSE | 3 | 1200 SECTION |
| | 12 STAPLES, FENCE GALV, 1 1/4" (A) | (E) 25 | 678528 |
| | 13 MOULDING, HARDWOOD 1" (A) | 55' | 487200 |
| | 14 STAPLES, MOULDING GALV, 3" X 1 1/16" X 1/4" (A) | (E) 25 | 678560 |
| | 15 WIRE, #2 BARE STRANDED COPPER (B) | 44' | 813664 |
| | 16 WIRE, #6 BARE STRANDED COPPER (B) | 18' | 813536 |
| | 17 WIRE, COPPER, SIZED PER U.G. CABLE AMPACITY. | 8' | 81 |
| U C D | 18 ROD & CLAMP, GROUND (A) (C) | 2 | 603072, 230016 |
| | 19 INSULATOR, 4KV WIRE HOLDER | 1 | 413792 |
| | 20 FUSE, CURRENT-LIMITING SIZE AS SPECIFIED ON WORK ORDER | 3 | 1200 SECTION |
| | 21 CABLE, POLYETHYLENE, CONCENTRIC NEUTRAL PRIMARY | AS REQ'D | SEE UG. STDS |
| | 22 RISER CONSTRUCTION | AS REQ'D | 1400/4200 SECTION |
| | 23 TERMINAL CABLE | 3 | UG BOOK |
| | 24 BRACKET, CUTOUT/ARRESTER CROSSARM MOUNTING (E) | 3 | 166070 |
| | 25 | | |

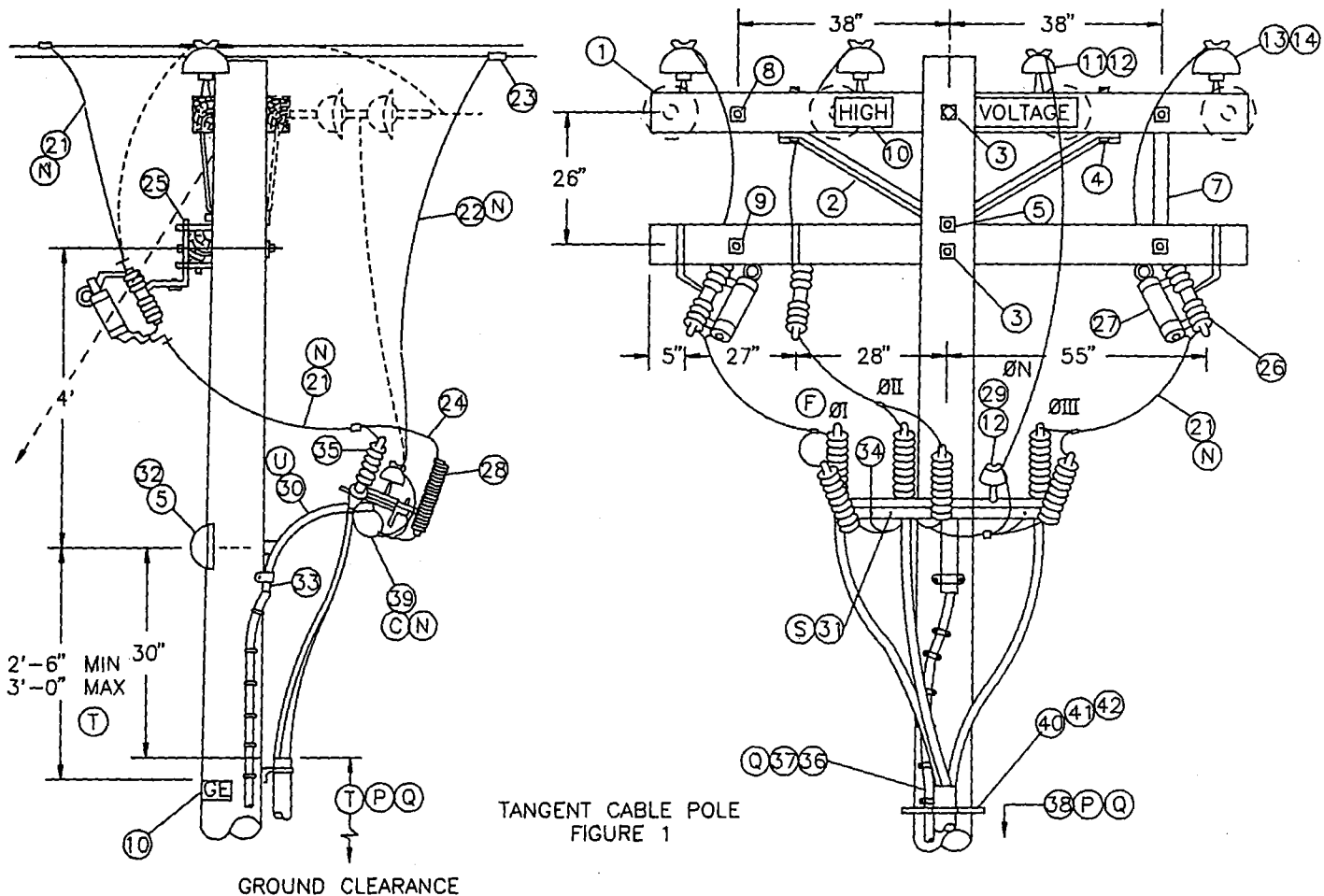
1499.202
16 4299.202
SUPERCEDES
228.2 (2-27-80)

SDG&E ELECTRIC STANDARDS

CROSSARM MOUNTED TERMINALS 4KV 4 WIRE WYE

DATE 8-27-82
APPD *DRJ*

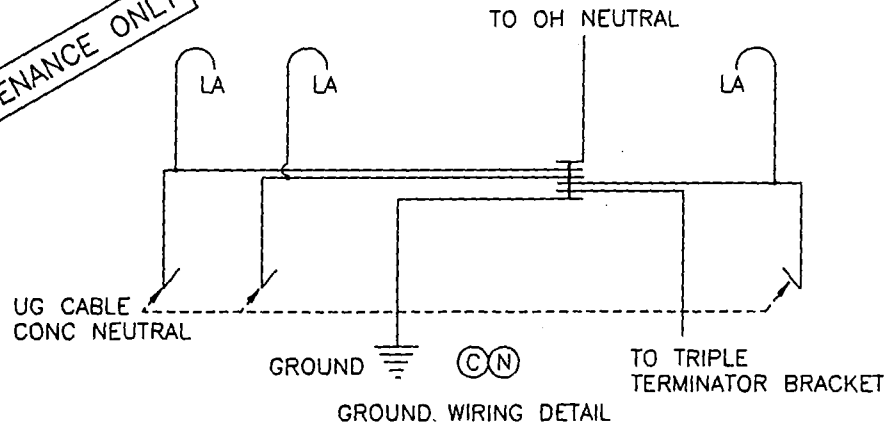
SCOPE: THIS STANDARD SHOWS TANGENT LINE (FIG.1) AND DEAD-END CONSTRUCTION (FIG.2) FOR 12.47 KV AND BELOW, 3Ø CABLE POLE WITH UPSWEEP BRACKET MOUNTED TERMINALS FOR #2/0 AND SMALLER UG CABLE.



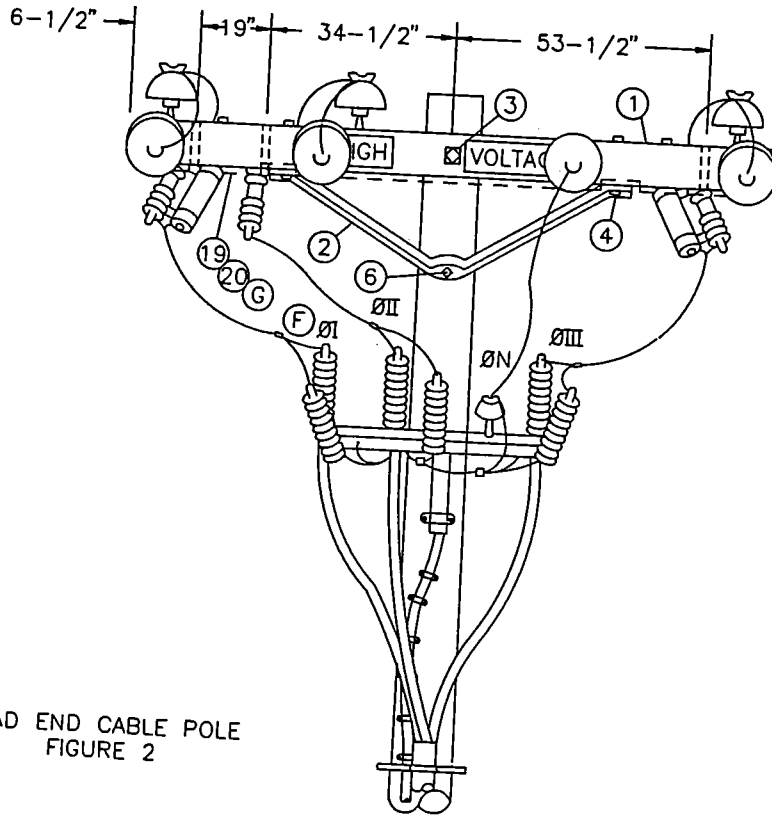
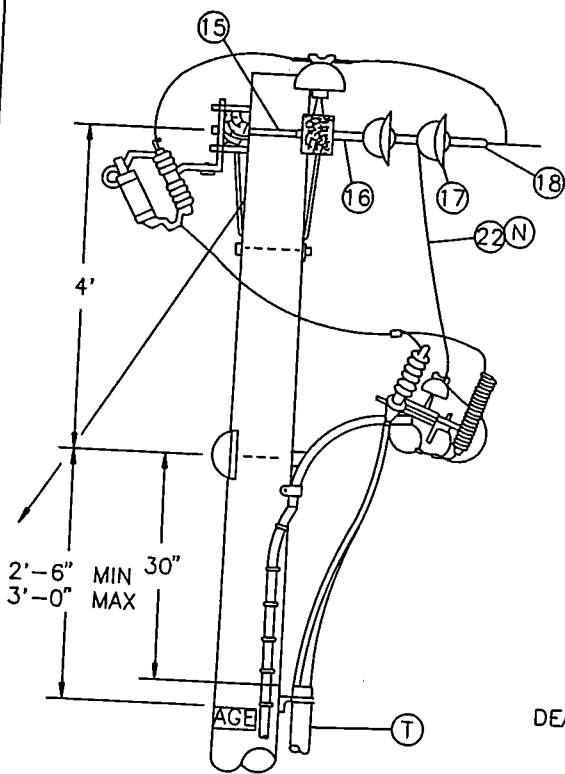
NOTE:

- TANGENT CABLE POLE (FIG.1) OR DEAD-END CABLE POLE (DOTTED LINE) IS TO BE USED WHEN FURTHER LINE EXTENSION IS EXPECTED.
- DO NOT USE THIS UPSWEEP BRACKET CONSTRUCTION FOR 4KV, 3Ø CABLE POLE. INSTEAD, USE STANDARD 1439/4239.

FOR FIELD MAINTENANCE ONLY



| | | |
|--|--|---|
| DATE 1-1-93 APPD <i>[Signature]</i> | SDG&E ELECTRIC STANDARDS 12.47KV AND BELOW 3Ø CABLE POLE 1/C PER Ø, UPSWEEP BRACKET CONSTRUCTION | OH 1499.203 UG 4299.203 SUPERCEDES 4229.1 (1-1-93) |
|--|--|---|



DEAD END CABLE POLE
FIGURE 2

NOTE:

- DEAD END CABLE POLE (FIG.2) IS TO BE USED ONLY WHEN NO FURTHER LINE EXTENSION OR NO RECONDUCTORING IS EXPECTED.

FOR FIELD MAINTENANCE ONLY

| | | |
|---|---|--|
| 1499.204 4299.204 SUPERCEDES 4229.2 (1-1-93) | SDG&E ELECTRIC STANDARDS 12.47KV AND BELOW 3Ø CABLE POLE 1/C PER Ø UPSWEEP BRACKET CONSTRUCTION | DATE 1-1-93 APPD <i>[Signature]</i> |
|---|---|--|

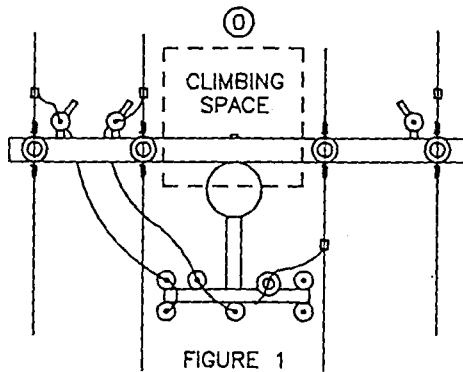


FIGURE 1

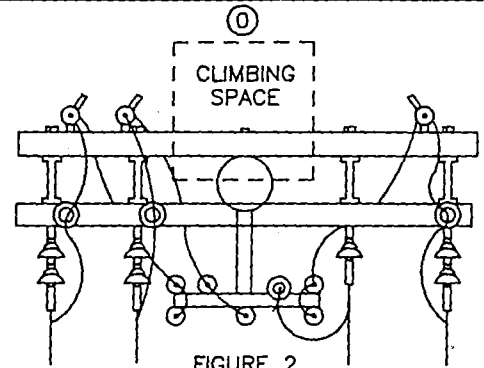


FIGURE 2

CLIMBING SPACE

BILL OF MATERIAL:

FOR FIELD MAINTENANCE ONLY

| ITEM | DESCRIPTION | QUANTITY | | CONST STD OR PAGE NO | STOCK NUMBER |
|------|--|----------|-------|----------------------|--------------|
| | | FIG.1 | FIG.2 | | |
| 1 | CROSSARM, 3-3/4" X 5-3/4" X 10'-0" | 2 | 2 | - | 294128 |
| 2 | BRACE, ANGLE, CROSSARM, 5' | 1 | 2 | - | 164128 |
| 3 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 2 SQUARE & 1 DOUBLE COIL SPRING WASHER (E) | 2 | 1 | 392 | - |
| 4 | BOLT, MACH, GALV, 1/2" X 7", 1 ROUND & 1 DOUBLE COIL SPRING WASHER (E) | 2 | 4 | 392 | - |
| 5 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 SQUARE & 1 DOUBLE COIL SPRING WASHER (E) | 2 | 1 | 392 | - |
| 6 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 DOUBLE COIL SPRING WASHER (E) | - | 1 | 392 | - |
| 7 | BRACE, FLAT, CROSSARM, 28" (E) | 2 | - | - | 164192 |
| 8 | BOLT, MACH, GALV, 3/8" X (LENGTH AS REQ'D), 1 ROUND & 1 SPRING WASHER (E) | 2 | - | 392 | - |
| 9 | BOLT, MACH, GALV, 1/2" X (LENGTH AS REQ'D), 1 ROUND & 1 DOUBLE COIL SPRING WASHER (E) | 2 | - | 392 | - |
| 10 | SIGN, HIGH VOLTAGE AND 9 ROOFING NAILS, GALV (E) | 3 | 3 | - | 647648 |
| | (E) AS REQ'D | | | - | 492224 |
| 11 | PIN, INSULATOR, STRAIGHT, 12KV, 1" LEAD THREAD (D) (E) | 1 | - | - | 532704 |
| 12 | INSULATOR, LINE, 12KV, NEUTRAL (D) (E) | 2 | 1 | - | 429216 |
| 13 | PIN, INSULATOR, STRAIGHT, 12KV, 1" OR 1-3/8" LEAD THREAD (E) | 3 | 3 | - | 532704 |
| | (E) | 3 | 3 | - | 532448 |
| 14 | INSULATOR, LINE, 12KV, 1" OR 1-3/8" PIN (E) | 3 | 3 | 750 | - |
| 15 | BOLT, SPACE, 5/8" X (LENGTH AS REQ'D) 3 SQ, 2 RD, 2 DOUBLE COIL SPRING WASHERS & 1 NUT (D) (E) | - | 4 | 392 | - |
| 16 | CLEVIS, DEAD END, 5/8" BOLT, STEEL (D) (E) | - | 4 | - | 235712 |
| 17 | INSULATOR, SUSPENSION, 12KV, CLEVIS (D) | - | 7 | 750 | - |
| 18 | CLAMP, STRAIGHT LINE, D.E. (D) (E) | - | 4 | 741 | - |
| 19 | WIRE, #8, BARE SOLID ANNEALED COPPER | 10' | 10' | - | 812928 |
| 20 | STAPLES, FENCE, GALV, 1-1/4" (E) | AS REQ'D | | - | 678528 |
| 21 | WIRE, BARE STRANDED COPPER (OH JUMPER) (N) | 21' | 25' | 715-716 | - |
| 22 | WIRE, BARE STRANDED CU OR AL (OH NEUT JUMPER) (N) | 9' | 7' | 711-716 | - |
| 23 | CONNECTOR, WIRE COMPRESSION (SIZE AS REQ'D) (D) (E) | AS REQ'D | | 785-787 | - |

| CABLE SIZE | UG MACRO UNIT PORCELAIN | |
|------------|-------------------------|---------------|
| | W/O LADDER ARMS | W/LADDER ARMS |
| 3C-#2 AL | CP-3#2 | CP3#2L |
| 3C-#2/0 | CP#2/0 | CP2/0L |

BILL OF MATERIAL: (CONTINUED)

| ITEM | DESCRIPTION | QUANTITY | | CONSTR. STD OR PAGE NO. | STOCK NUMBER | |
|------|--|----------|--------|-------------------------|--------------|--------|
| | | FIG. 1 | FIG. 2 | | | |
| 24 | WIRE, #6, BARE STRANDED COPPER | 9' | 9' | - | 813536 | |
| 25 | BRACKET, CUTOUT/ARRESTER, FOR CROSSARM MOUNTING (E) | 3 | 3 | - | 166070 | |
| 26 | CUTOUT BODY FOR CURRENT LIMITING FUSE | 3 | 3 | - | 297952 | |
| 27 | FUSE, CURRENT-LIMITING, SIZE AS REQ'D | 3 | 3 | 1206 | - | |
| 28 | ARRESTER, LIGHTNING | 3 | 3 | 1247 | - | |
| 29 | PIN, SHORT SHANK, 1" LEAD THREAD (D) (E) | 1 | 1 | - | 534426 | |
| 30 | BRACKET, GALV, TERMINAL, UPSWEEP | 1 | 1 | - | 166856 | |
| 31 | BRACKET, TRIPLE TERMINATOR (S) | 1 | 1 | - | 166676 | |
| 32 | COVER, BOLT, PLASTIC & 6 - 10D NAILS, GALV | (E) | 1 | 1 | - | 285696 |
| | | (E) | - | - | - | 491392 |
| 33 | SCREW, LAG, GALV, 1/2" X 4" | (E) | 2 | 2 | - | 621568 |
| 34 | BOLT, MACH, GALV, 5/8" X 1 1/2", 1 ROUND AND 1 LOCK WASHER (E) | 1 | 1 | 392 | - | |
| 35 | TERMINALS AND UNDERGROUND CABLE | 3 | 3 | 4111 | - | |
| 36 | WIRE, #4, BARE STRANDED COPPER | 50' | 45' | - | 813760 | |
| 37 | UNIT GROUND, COMPLETE (Q) | 1 | 1 | - | 603136 | |
| 38 | RISER CONSTRUCTION | - | - | 1400/4200 | - | |
| 39 | WIRE, COPPER BARE STRANDED (CABLE POLE NEUTRAL) (N) | 5' | 5' | 715/716 | - | |
| 40 | BRACKET, LADDER ARM (E) | AS REQ'D | | 1404/4204 | 167184 | |
| 41 | NUT, CLAMPING CHANNEL, W/SPRING, 1/2" (E) | AS REQ'D | | 1404/4204 | 503488 | |
| 42 | CHANNEL, DOUBLE GALV, 24" (E) | AS REQ'D | | 1404/4204 | 216700 | |

INSTALLATION:

- A. NEW CABLE POLES SHALL HAVE A STANDARD DEPTH OF 9'. IN MOST CASES THIS WILL REQUIRE A 5' TALLER POLE.
- B. THIS CONSTRUCTION TO BE USED WITH 2/0 AND SMALLER UNDERGROUND CABLE.
- (C) CONNECT OVERHEAD NEUTRAL, TRIPLE TERMINAL BRACKET, AND CONCENTRIC CABLE NEUTRAL CONDUCTOR TO LIGHTNING ARRESTER GROUND.
- (D) REDUCE QUANTITIES AS REQUIRED WHEN NOT USING NEUTRAL.
- (E) EXEMPT MATERIAL.
- (F) OMIT PHASE II AND PHASE N FOR SINGLE PHASE 12KV CABLE POLE; OMIT PHASE I AND PHASE II FOR SINGLE PHASE 6.9 KV CABLE POLE.
- (G) INTERCONNECT CUTOUTS AND DEADEND BONDS PER G.O. 95 RULE 52.7D. BONDING SHOULD BE DONE IN ACCORDANCE WITH RULE 53.4.

(N)

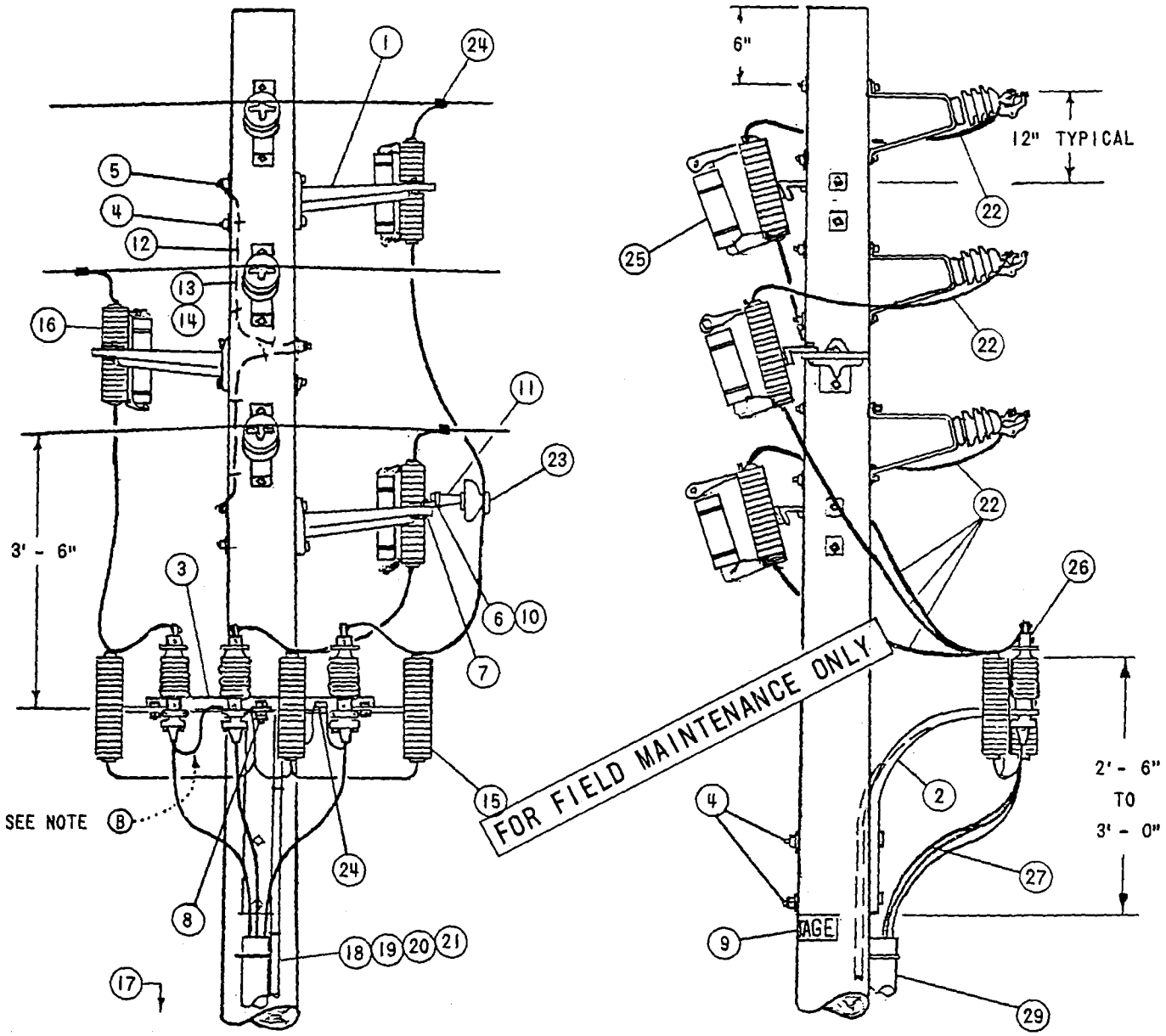
| UG CABLE SIZE AWG OR KCMIL, AL | OH JUMPER COND SIZE, AWG OR KCMIL, CU | OH NEUT JUMPER SIZE | | | CABLE POLE NEUT SIZE (CU) UNDER POTHEAD ARM OR TRIPLE TERM BRKT |
|--------------------------------------|---|---------------------|-------|---|---|
| | | CU | AL | | |
| 2 | 4 | 6 | 2 | - | #6 PER PHASE |
| 2/0 | 4 | 6 | 2 | - | #6 PER PHASE |
| 350 | 4/0 | 1/0 | 3/0 | - | #2 PER PHASE |
| 750 | 500 | 4/0 | 336.4 | OR SAME SIZE AS O.H. NEUT CONDUCTOR | 1/0 PER PHASE |
| 1000 | 500 | 4/0 | 336.4 | | 1/0 PER PHASE |

REFERENCE:

- (O) ALLOWABLE WORKING AND CLIMBING SPACE - SEE STANDARD 251.
- (P) POLE STEPPING - SEE STANDARD 363/4205.
- (Q) GROUNDING METHODS - SEE PAGE 1002.5.
- R. SEE STANDARD SECTION 1200/4300 FOR FUSING.
- S. RISER POSITIONS - SEE STANDARD 1402/4202.
- (T) MINIMUM VERTICAL SEPARATION AS PER G.O. 95 - SEE STANDARD 1406/4206.
- (U) SEE STANDARD 1407/4207 FOR PORCELAIN AND NON-PORCELAIN TERMINAL MOUNTING BRACKET INSTALLATIONS AND MATERIALS.

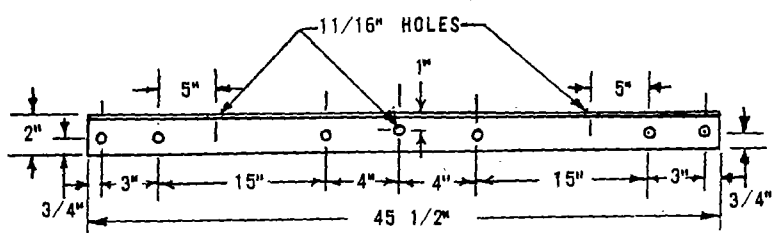
FOR FIELD MAINTENANCE ONLY

| | | |
|---|---|------------------------------------|
| † 1499.206 † 4299.206 SUPERCEDES 29.4 (1-1-93) | SDG&E ELECTRIC STANDARDS 12.47KV AND BELOW 3 PHASE, CABLE POLE, 1/C PER PHASE, UPSWEEP BRACKET CONSTRUCTION | DATE 1-1-93 APPD <i>JLB/RAS</i> |
|---|---|------------------------------------|



SEE NOTE (B)

FOR FIELD MAINTENANCE ONLY



ALL HOLES 9/16" EXCEPT AS NOTED

FABRICATE FROM 2" X 2" X 3/16" STEEL ANGLE
 HOT DIP GALVANIZE AFTER FABRICATION
 ARMLESS TERMINAL MOUNTING BRACKET

| | | |
|--------------------------|--|---|
| DATE 8-27-82 APPD DRH | SDG&E ELECTRIC STANDARDS BRACKET MOUNTED TERMINALS, 12KV 3 WIRE ARMLESS TANGENT CONSTRUCTION | OH 1499.30 UG 4299.30 SUPERCEDES 4237.1 (10-2- |
|--------------------------|--|---|

NOTES:

- (A) UNIT GROUND, COMPLETE, ORDER 603120 WITH GRAY MOULDING, 603136 WITH PLAIN MOULDING.
- (B) THE FIBERGLASS UPSWEEP TERMINAL BRACKET IS TO BE USED FOR UNDERGROUND CONDUCTORS 4/0 OR SMALLER. DO NOT USE FOR 500 KCM AND LARGER CONDUCTORS.
- (C) USE TWO-ROD GROUND SPACED A MINIMUM OF 6 FEET APART.
- D. CONNECT ONE STRAND OF CONCENTRIC NEUTRAL TO TERMINAL BOLT WITH DOUBLE NUT.
- (E) EXEMPT MATERIAL

FOR FIELD MAINTENANCE ONLY

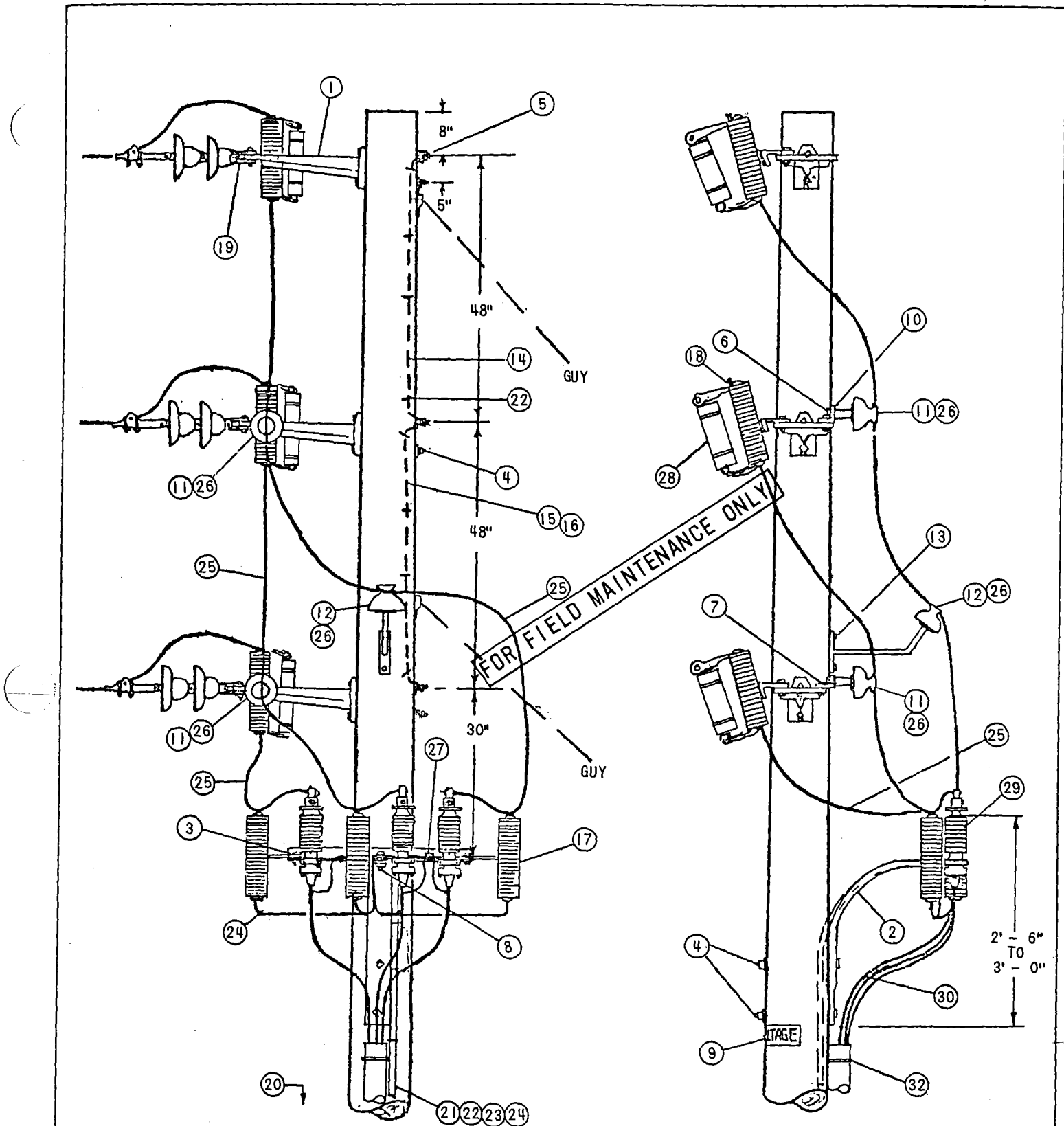
INSTALLED

P
T
F

U
C
D

| ITEM | DESCRIPTION | QUANTITY | STOCK NO. OR CONSTR STD |
|------|---|----------|-------------------------|
| 1 | BRACKET, GALV., 4-HOLE, MOUNTING | 3 | 166240 |
| 2 | BRACKET, FIBERGLASS, TERMINAL, UPSWEEP SEE NOTE (F) | 1 | 166864 |
| 3 | BRACKET, ARMLESS, TERMINAL MOUNTING, SEE DETAIL PAGE 1437.1 | 1 | 166672 |
| 4 | MACH. BOLT, GALV., 5/8" X LENGTH AS REQ'D., 1-SQ. CURV. WASH., 1-DBL. COIL SPR. WASH. & 1-NUT (E) | 5 | PGS 139, 140 |
| 5 | MACH. BOLT, GALV., 5/8" X LENGTH AS REQ'D., 1-SQ., CURV. WASH., 1-DBL. COIL SPR. WASH., 2-FLAT RD. WASH. & 2-NUTS (E) | 3 | PGS 139, 140 |
| 6 | MACH. BOLT, GALV., 5/8" X 1 1/2", 1-LOCK WASH. (E) | 1 | PGS 139, 140 |
| 7 | MACH. BOLT, GALV., 1/2" X 1 1/2", 1-LOCK WASH. & 1-NUT (E) | 1 | PGS 139, 140 |
| 8 | MACH. BOLT, GALV., 5/8" X 2 1/2", 1-LOCK, 2-RO. WASH. & 2-NUTS (E) | 1 | PGS 139, 140 |
| 9 | HIGH VOLTAGE SIGN & 8-ROOFING NAILS, GALV. (E) | 2 | 647648, 492224 |
| 10 | BRACKET, INSULATOR, MOUNTING ANGLE | 1 | 166208 |
| 11 | PIN, INSULATOR, 12KV, 1" OR 1 3/8" LEAD THREAD | 1 | 529248-529218 |
| 12 | WIRE, BOND, BARE SOLID ANNEALED, #8 | 6' | 812928 |
| 13 | HARDWOOD MOULDING, 1" (OTHER THAN TOP CIRCUIT ON POLE) | 6' | 487200 |
| 14 | MOULDING STAPLES, GALV., 3" X 1 1/16" X 1/4" (OTHER THAN TOP CIRCUIT ON POLE) | 6 | 678560 |
| 15 | LIGHTNING ARRESTER, 12KV | 3 | 113248 |
| 16 | CUTOFF, FOR CURRENT-LIMITING FUSE | 3 | 1200 SECTION |
| 17 | GROUND ROD & CLAMP (A) (C) | 2 | 603072-230016 (E) |
| 18 | HARDWOOD MOULDING, 1" (A) | 36' | 487200 |
| 19 | STAPLES, MOULDING, GALV., 3" X 1 1/16" X 1/4" (A) (E) | 24 | 678560 |
| 20 | STAPLES, FENCE, GALV., 1 1/4" (A) (E) | 1/3# | 678528 |
| 21 | WIRE, BARE STRANDED COPPER, #2 (B) | 50' | 813664 |
| 22 | WIRE, BARE STRANDED, COPPER, (SIZE AS REQ'D) | 25' | |
| 23 | INSULATOR, 12KV, PIN TYPE (CLASS AS REQ'D) | 1 | 429056-429152 |
| 24 | CONNECTOR, WIRE, COMPRESSION (SIZE AS REQ'D) | 4 | |
| 25 | FUSE, CURRENT-LIMITING SIZE AS SPECIFIED ON WORK ORDER | 3 | 1200 SECTION |
| 26 | CABLE TERMINAL | 3 | SEE UG STOS |
| 27 | CABLE, PRIMARY | AS REQ'D | SEE UG STDS |
| 28 | | | |
| 29 | RISER CONSTRUCTION | AS REQ'D | 1400/4200 SECTION |

| | | |
|---|--|---------------------------------|
| 1499,302 4299,302 SUPERCEDES 7.2 (2-27-80) | SDG&E ELECTRIC STANDARDS BRACKET MOUNTED TERMINALS, 12KV 3 WIRE ARMLESS TANGENT CONSTRUCTION | DATE 8-27-82 APPD <i>LRH</i> |
|---|--|---------------------------------|



(DEAD ENDS OMITTED FOR CLARITY)

DATE 8-27-82
 APPD *RRH*

SDG&E ELECTRIC STANDARDS
 BRACKET MOUNTED TERMINALS, 12KV 3 WIRE,
 ARMLESS DEAD END CONSTRUCTION

OH 1499.303
 UG 4299.303
 SUPERCEDES
 4238.1 (2-27-80)

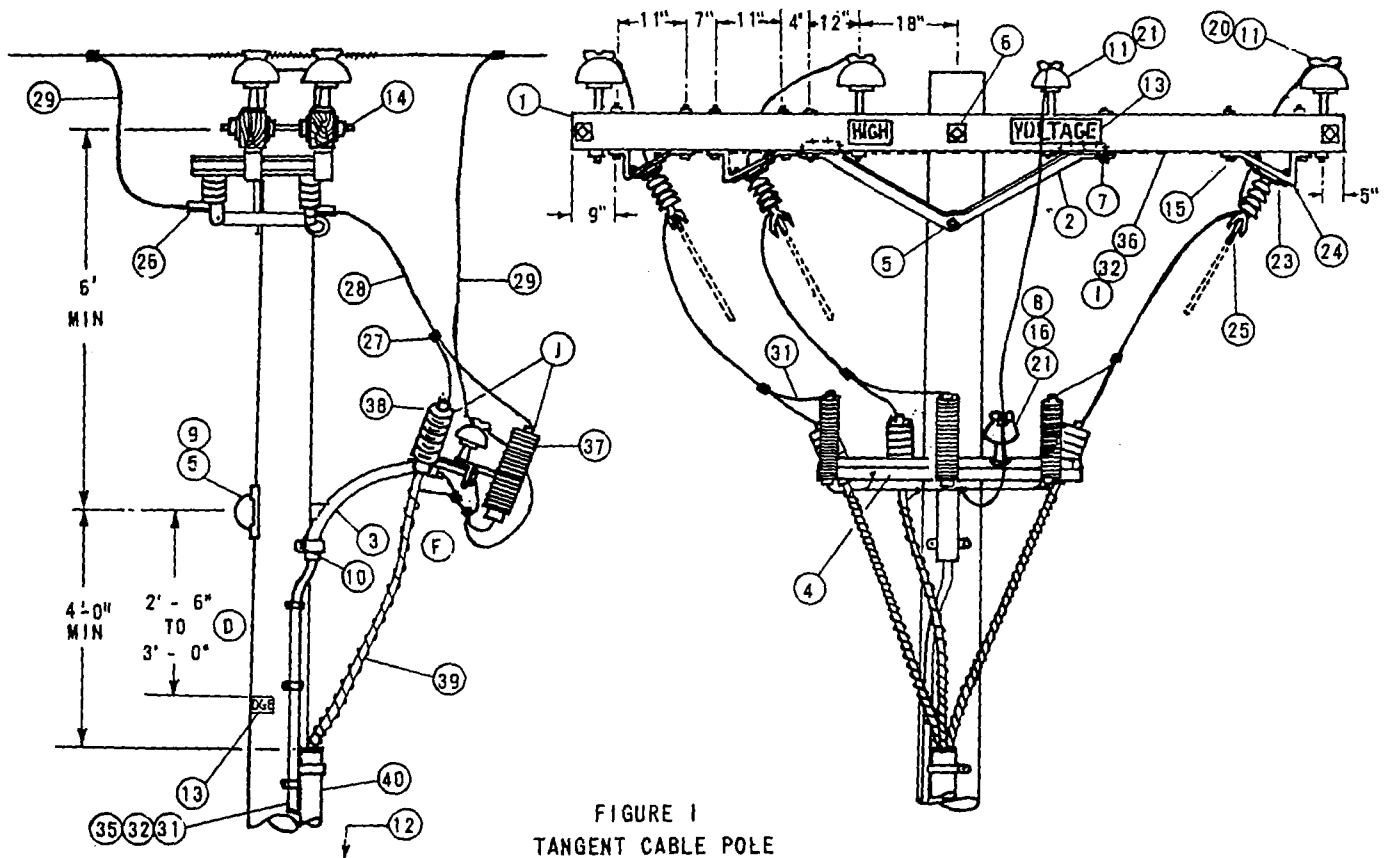


FIGURE 1
TANGENT CABLE POLE

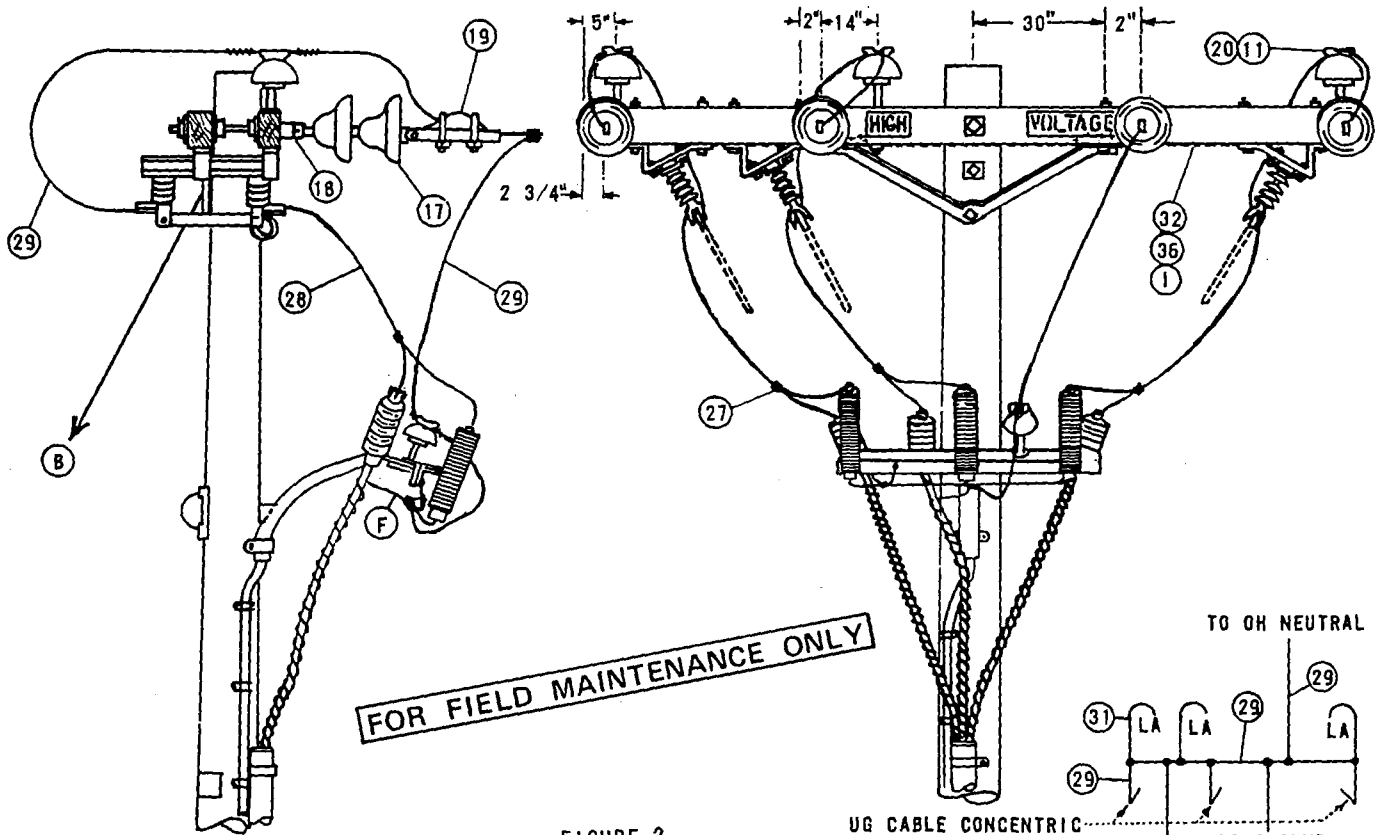
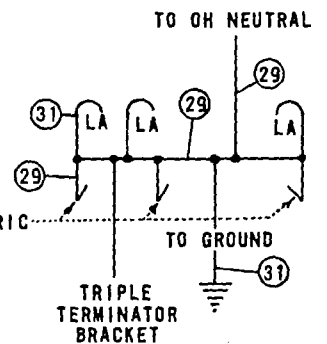


FIGURE 2
DEAD END CABLE POLE

UG CABLE CONCENTRIC
NEUTRAL



Indicates Latest Revision



Completely Revised



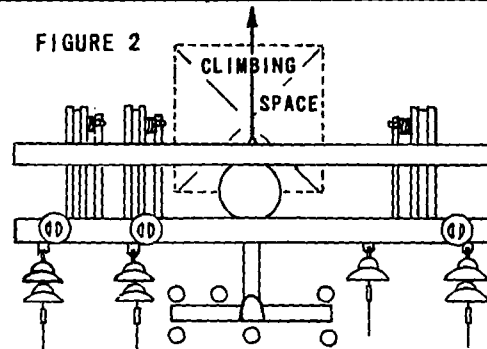
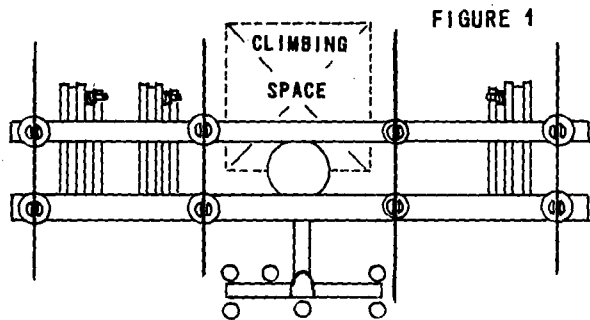
New Page

ISSUE 1993
DATE 3-9-83
APPD JHT/DR4

SDG & E ELECTRIC STANDARDS

12.47KV AND BELOW CABLE POLE, UPSWEEP BRACKET, 3Ø,
1/C PER PHASE, LINE ARM MOUNTED DISCONNECTS

OH 1499.305
UG 4299.305
SUPERSEDES
4233.1 (3-9-83)



NOTES:

- A. SEE PAGE 1406/4206 FOR G.O. 95 MINIMUM VERTICAL SEPARATION BETWEEN TOP OF RISER PROTECTION AND NEXT LOWER CONDUCTOR LEVEL.
- (B) SEE PAGE 251 FOR ALLOWABLE CLIMBING SPACE OBSTRUCTIONS.
- (C) USE TWO GROUND RODS SPACED A MINIMUM OF 6' APART.
- (D) G.O. 95 DIMENSION.
- (E) EXEMPT MATERIAL.
- (F) INTERCONNECT TRIPLE TERMINAL BRACKET, LIGHTNING ARRESTER GROUND, CONCENTRIC NEUTRAL, AND OVERHEAD NEUTRAL.
- (G) REDUCE QUANTITIES AS REQUIRED WHEN NOT USING NEUTRAL.
- H. THIS CONSTRUCTION TO BE USED WITH 350 KCMIL AND LARGER UNDERGROUND CABLE.
- (I) INTERCONNECT SWITCH AND DEAD END BONDS PER G.O. 95 RULE 52.7 D
- (J) ARRESTER AND CABLE TERMINAL POSITIONS MAY BE INTERCHANGED AT THE DISCRETION OF DISTRICT OPERATIONS PERSONNEL.

FOR FIELD MAINTENANCE ONLY

| ITEM | DESCRIPTION | QUANTITY | | STOCK NO. OR CONSTR STDS |
|------|---|----------|-------------------|--------------------------|
| | | FIG 1 | FIG 2 | |
| 1 | CROSSARM, 3 3/4" X 5 3/4" X 12" - 0" | 2 | 2 | 300 SECTION |
| 2 | BRACE, ANGLE, CROSSARM, 5' | 2 | 2 | 164128 |
| 3 | BRACKET, GALV, TERMINAL UPSWEEP, WITH PVC LINER, COMPLETE | 1 | 1 | 166856 |
| 4 | BRACKET, TRIPLE TERMINAL | 1 | 1 | 166676 |
| 5 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 SQ WASH., 1 DBL COIL WASH. (E) | 1 | 1 | 100 SECTION |
| 6 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 2-SQ WASH., 1 DBL COIL WASH. (E) | 1 | 1 | 100 SECTION |
| 7 | BOLT, MACH, GALV, 1/2" X 7", 1 RD WASH., 1 DBL COIL WASH. (E) | 4 | 4 | 100 SECTION |
| 8 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 LOCK WASH (G) | 1 | 1 | 100 SECTION |
| 9 | COVER, BOLT, PLASTIC, & 6-100 NAILS (E) | 1 | 1 | 285696 |
| 10 | SCREW, LAG, GALV, 4" (E) | 2 | 2 | 621568 |
| 11 | PIN INSULATOR STRAIGHT 12KV (AS REQ'D BY ITEM 21) (G) | 8 | 3 | 532704, 532448 |
| 12 | STEPS, POLE (E) | 16 | 16 | 692992 |
| 13 | SIGN, HIGH VOLTAGE, & 8 ROOFING NAILS | 3 | 3 | 647648, 492224 |
| 14 | BOLT, SPACE, GALV, 5/8" X (LENGTH AS REQ'D) 4- SQ WASH., 2 DBL COIL WASH, (G) (E) | 2 | 4 | 100 SECTION |
| 15 | BOLT, MACH, GALV, 1/2" X 8", 1 RD WASH., 1 DBL COIL WASH (E) | 12 | 12 | 100 SECTION |
| 16 | PIN, TRANSFORMER ADAPTER, 1" LEAD THREAD (G) | 1 | 1 | 529248 |
| 17 | INSULATOR, SUSPENSION, 12KV, CLEVIS (G) | - | 7 | 700 SECTION |
| 18 | CLEVIS, DEAD END, 5/8" BOLT STEEL (G) (E) | - | 4 | 235712 |
| 19 | CLAMP, STRAIGHT LINE, D.E. (G) | - | 4 | 700 SECTION |
| 20 | INSULATOR, LINE, 12KV (G) | 6 | 3 | 700 SECTION |
| 21 | INSULATOR, 12KV, NEUTRAL (G) (E) | 3 | 1 | 429216 |
| 22 | | | | |
| 23 | BOLT MACH, GALV, 1/2" X 3" 1-LOCK WASH (E) | 12 | 12 | 100 SECTION |
| 24 | BRACKET, DISCONNECT ANGLE MOUNTING, 1/4" X 3" MILD STEEL | 6 | 6 | 166542 |
| 25 | SWITCH, HOOKSTICK DISCONNECT, 14.4KV, 400 A, 600 A. | 3 | 3 | 1200 SECTION |
| 26 | TERMINAL, COMPRESSION | 6 | 6 | 700 SECTION |
| 27 | CONNECTOR WIRE COMPRESSION (SIZE AS REQ'D) (E) | 13 | 9 | 700 SECTION |
| 28 | WIRE, COPPER W.P., SIZE PER UG CABLE AMPACITY | 15' | 15' | 700 SECTION |
| 29 | WIRE, BARE STRANDED COPPER, SIZE PER UG CABLE AMPACITY | 22' | 31' | 700 SECTION |
| 30 | | | | |
| 31 | WIRE, #6, BARE STRANDED COPPER | 40' | 40' | 813536 |
| 32 | STAPLES, FENCE, GALV, 1 1/4" (E) | 40 | 40 | 678528 |
| 33 | | | | |
| 34 | | | | |
| 35 | UNIT GROUND, COMPLETE (WITH GRAY MLDG, WITH PLAIN MLDG) (C) | 1 | 1 | 603120, 603136 |
| 36 | WIRE, #8, BARE SOLID ANNEALED COPPER | 1 LB | 1 LB | 812928 |
| 37 | ARRESTER, LIGHTNING | 3 | 3 | 1200 SECTION |
| 38 | TERMINALS UG CABLE | 3 | 3 | SEE UG STDS |
| 39 | CABLE PRIMARY | AS REQ'D | SEE UG STDS | |
| 40 | RISER CONSTRUCTION | AS REQ'D | 1400/4200 SECTION | |

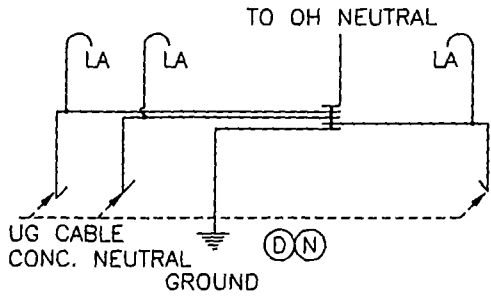
HI-1499.306-
IG 4299.306
SUPERSEDES
1233.2 (3-9-83)

SDG&E ELECTRIC STANDARDS

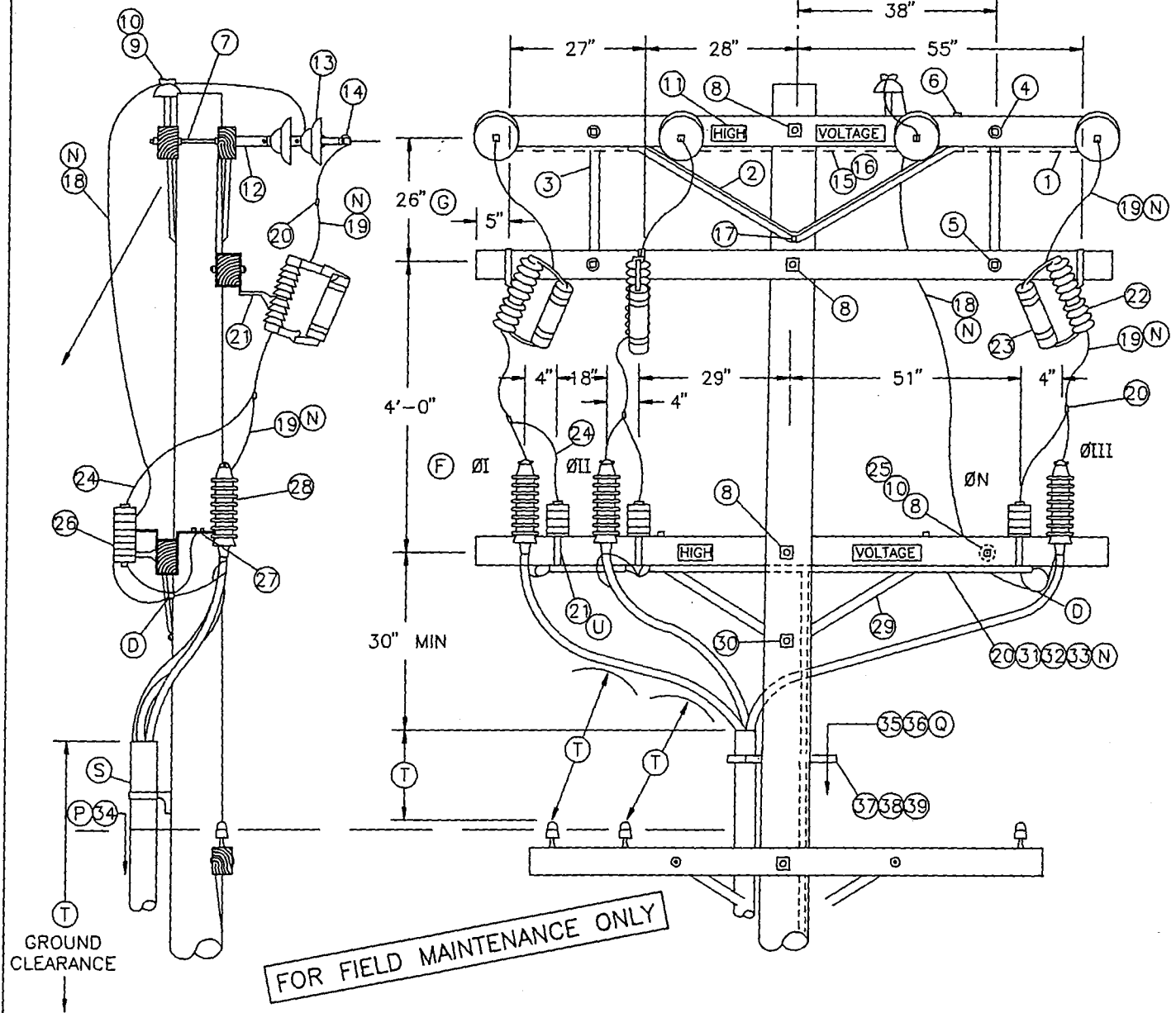
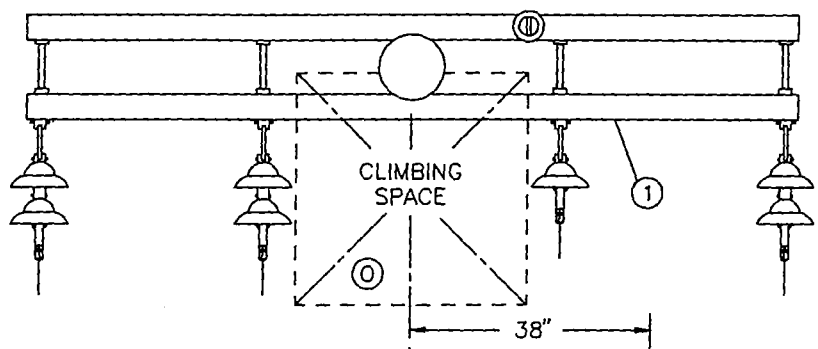
12.47KV AND BELOW CABLE POLE, UPSWEEP BRACKET, 3Ø,
1/C PER PHASE, LINE ARM MOUNTED DISCONNECTS

DATE 3-9-83
APPD *SHT/WRT*

SCOPE: THIS STANDARD SHOWS DEADEND CONSTRUCTION FOR 12.47KV AND BELOW, 3 PHASE CABLE POLE WITH CROSSARM MOUNTED TERMINALS FOR #2/0 AND SMALLER U.G. CABLE. THIS CONSTRUCTION IS TO BE USED IN CONTAMINATION DISTRICT 1 ONLY.



GROUND WIRING DETAIL



ISSUE 1994
 DATE 1-1-93
 APPD *JLB/RSS*

SDG&E ELECTRIC STANDARDS
 CROSSARM CABLE POLE, 3Ø, 1/C PER PHASE
 DEADEND CONSTRUCTION, 12.47KV AND BELOW

OH 1499.307
 UG 4299.307
 SUPERCEDES
 4239.1 (1-1-93)

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PAGE NO | STOCK NUMBER |
|------|---|----------|----------------------|--------------|
| 1 | CROSSARM, 3-3/4" X 5-3/4" X 10' - 0" | 4 | - | 294128 |
| 2 | BRACE, ANGLE, CROSSARM, 5' - 0" | 2 | - | 164128 |
| 3 | BRACE, FLAT, CROSSARM, 28" (E) | 2 | - | 164192 |
| 4 | BOLT, WASHERHEAD, GALV, 3/8" X 4-1/2", 1 ROUND & 1 SPRING WASHER (E) | 2 | 392 | - |
| 5 | BOLT, MACH, GALV, 1/2-1 X 5", 1 ROUND & 1 DOUBLE COIL, SPRING WASHER (E) | 2 | 392 | - |
| 6 | BOLT, MACH, GALV, 1/2" X 7", 1 ROUND & 1 DOUBLE COIL SPRING WASHER (E) | 6 | 392 | - |
| 7 | BOLT, SPACE, GALV, 5/8" X (LENGTH AS REQ'D), 2 ROUND, 4 SQUARE & 2 DOUBLE COIL SPRING WASHERS (B) (E) | 4 | 392 | - |
| 8 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 2 SQUARE & 1 DOUBLE COIL SPRING WASHER (B) (E) | 4 | 392 | - |
| 9 | PIN, INSULATOR, STRAIGHT, 12KV, 1" (B) (E) | 1 | - | 532704 |
| 10 | INSULATOR, LINE, 12KV NEUTRAL (B) (E) | 2 | - | 429216 |
| 11 | SIGN, HIGH VOLTAGE & 9 ROOFING NAILS, GALV (E) | 4 | - | 647648 |
| | | - | - | 492224 |
| 12 | CLEVIS, DEAD END, 5/8" BOLT STEEL (B) (E) | 4 | - | 235712 |
| 13 | INSULATOR, SUSPENSION, 12KV, CLEVIS (B) | 7 | 750 | - |
| 14 | CLAMP, STRAIGHT LINE, D.E. (B) | 4 | 741 | - |
| 15 | WIRE, #8, BARE SOLID ANNEALED COPPER | 10' | - | 812928 |
| 16 | STAPLES, FENCE, GALV, 1-1/4" (E) | AS REQ'D | - | 678528 |
| 17 | BOLT, MACH, GALV, 5/3" X (LENGTH AS REQ'D) & 1 DOUBLE COIL SPRING WASHER (E) | 1 | 392 | - |
| 18 | WIRE, COPPER, BARE STRANDED OR ACSR/AW BARE (OH NEUTRAL JUMPER) (B) (N) | 10' | 711-715 | - |
| 19 | WIRE, COPPER, BARE STRANDED (OH JUMPERS) (N) | 18' | 715 | - |
| 20 | CONNECTOR, WIRE, COMPRESSION (SIZE AS REQ'D) (E) | AS REQ'D | 783-787 | - |
| 21 | BRACKET, CUTOUT/ARRESTER, FOR CROSSARM MOUNTING (E) | 6 | - | 166070 |
| 22 | CUTOUT, FOR CURRENT-LIMITING FUSE | 3 | 1212 | - |
| 23 | FUSE, CURRENT-LIMITING (SIZE AS SPECIFIED ON WORK ORDER) | 3 | 1207 | - |
| 24 | WIRE, BARE STRANDED COPPER, #6 | 14' | - | 813536 |
| 25 | PIN, TRANSFORMER ADAPTER, 1" LEAD THREAD (B) (E) | 1 | - | 529248 |
| 26 | ARRESTER, LIGHTNING | 3 | 1247 | - |
| 27 | BRACKET, CROSSARM, TERM (FOR #2 & #2/0 AL CABLE ONLY) (E) | 3 | - | 166060 |
| 28 | TERMINALS, UNDERGROUND CABLE | 3 | 4111 | - |
| 29 | BRACE, ANGLE, CROSSARM, 4' - 0" | 1 | - | 164032 |
| 30 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 SQUARE & 1 DOUBLE COIL SPRING WASHER (E) | 1 | 392 | - |
| 31 | WIRE, BARE STRANDED COPPER (UNDER POTHEAD ARM) (CABLE POLE NEUTRAL) (N) | 10' | 715 | - |
| 32 | CONDUIT, PVC TYPE 2, SCHEDULE 40, 1" (E) | 10' | - | 251200 |
| 33 | STRAPS, PIPE, GALV, 1" & 2 - 6D NAILS, GALV (E) | AS REQ'D | - | 697792 |
| | | - | - | 491552 |
| 34 | RISER CONSTRUCTION | AS REQ'D | 1400/4200 | - |
| 35 | WIRE, #4, BARE STRANDED COPPER | 45' | - | 813760 |
| 36 | UNIT GROUND, COMPLETE (S) | 1 | - | 603136 |
| 37 | BRACKET, LADDER ARM (E) | AS REQ'D | 1404/4204 | 167184 |
| 38 | NUT, CLAMPING CHANNEL, W/SPRING, 1/2" (E) | AS REQ'D | 1404/4204 | 503488 |
| 39 | CHANNEL, DOUBLE GALV, 24" (E) | AS REQ'D | 1404/4204 | 216700 |

FOR FIELD MAINTENANCE ONLY

| CABLE SIZE | UG MACRO UNIT | |
|------------|-------------------------|-----------------|
| | PORCELAIN W/LADDER ARMS | W/O LADDER ARMS |
| 3C #2/0 AL | CP2/OL | CP#2/0 |
| 3C-3#2 AL | CP3#2L | CP-3#2 |

H 1499.308
G 4299.308
SUPERCEDES
239.2 (1-1-93)

SDG&E ELECTRIC STANDARDS

CROSSARM CABLE POLE, 3Ø, 1/c PER PHASE
DEADEND CONSTRUCTION, 12.47KV AND BELOW

DATE 1-1-93
APPD JLB/RAS

INSTALLATION:

- A. NEW CABLE POLES SHALL HAVE A STANDARD DEPTH OF 9'. IN MOST CASES THIS WILL REQUIRE A 5' TALLER POLE.
- B. REDUCE QUANTITIES AS REQUIRED WHEN NOT USING NEUTRAL.
- C. USE THIS CONSTRUCTION FOR 2/0 AND SMALLER UNDERGROUND CABLE.
- D. INTERCONNECT OVERHEAD NEUTRAL, TERMINAL BASE, AND CONCENTRIC CABLE NEUTRAL CONDUCTOR TO LIGHTNING ARRESTER GROUND.
- E. EXEMPT MATERIAL.
- F. OMIT Ø II AND Ø N FOR SINGLE Ø 12KV CABLE POLE, OMIT Ø I AND Ø II FOR SINGLE Ø 6.9KV CABLE POLE.

(N)

| UG CABLE SIZE AWG OR KCMIL, AL | OH JUMPER COND SIZE, AWG OR KCMIL, CU | OH NEUT JUMPER SIZE | | | CABLE POLE NEUT SIZE (CU) UNDER POTHEAD ARM OR TRIPLE TERM BRKT |
|--------------------------------------|---|---------------------|-------|---|---|
| | | CU | AL | | |
| 2 | 4 | 6 | 2 | - | #6 PER PHASE |
| 2/0 | 4 | 6 | 2 | - | #6 PER PHASE |
| 350 | 4/0 | 1/0 | 3/0 | - | #2 PER PHASE |
| 750 | 500 | 4/0 | 336.4 | OR SAME SIZE AS O.H. NEUT CONDUCTOR | 1/0 PER PHASE |
| 1000 | 500 | 4/0 | 336.4 | | 1/0 PER PHASE |

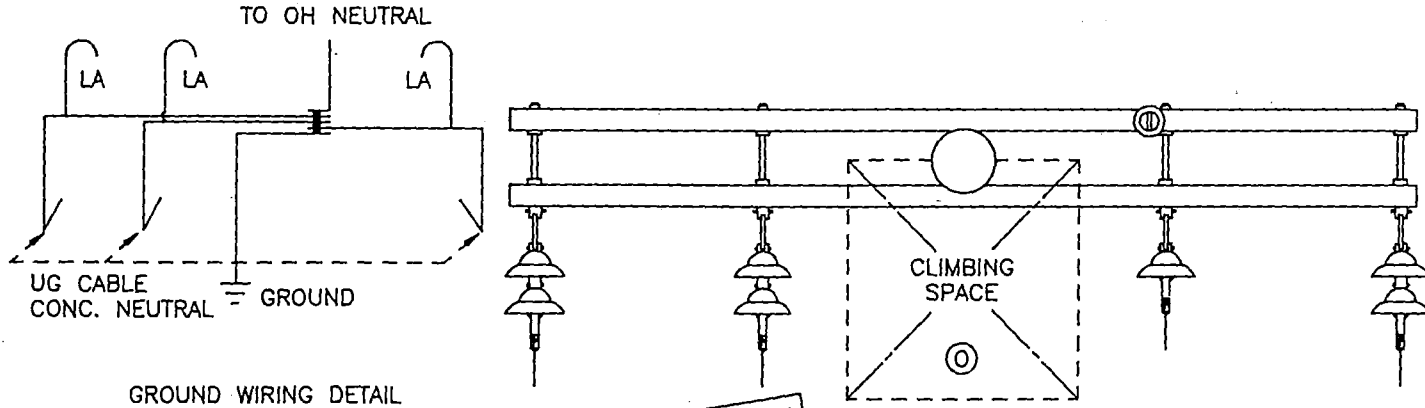
REFERENCE:

- O. ALLOWABLE WORKING AND CLIMBING SPACE - SEE STD. 251.
- P. POLE STEPPING - SEE STD. 363/4205.
- Q. GROUNDING METHODS - SEE PAGE 1002.5.
- R. SEE STANDARD SECTION 1200/4300 FOR FUSING.
- S. RISER POSITIONS - SEE STANDARD 1402/4202.
- T. MINIMUM VERTICAL SEPARATION AS PER G.O. 95 - SEE STD. 1406/4206.
- U. SEE STANDARD 1407/4207 FOR PORCELAIN TERMINAL MOUNTING BRACKET INSTRUCTIONS AND MATERIALS.

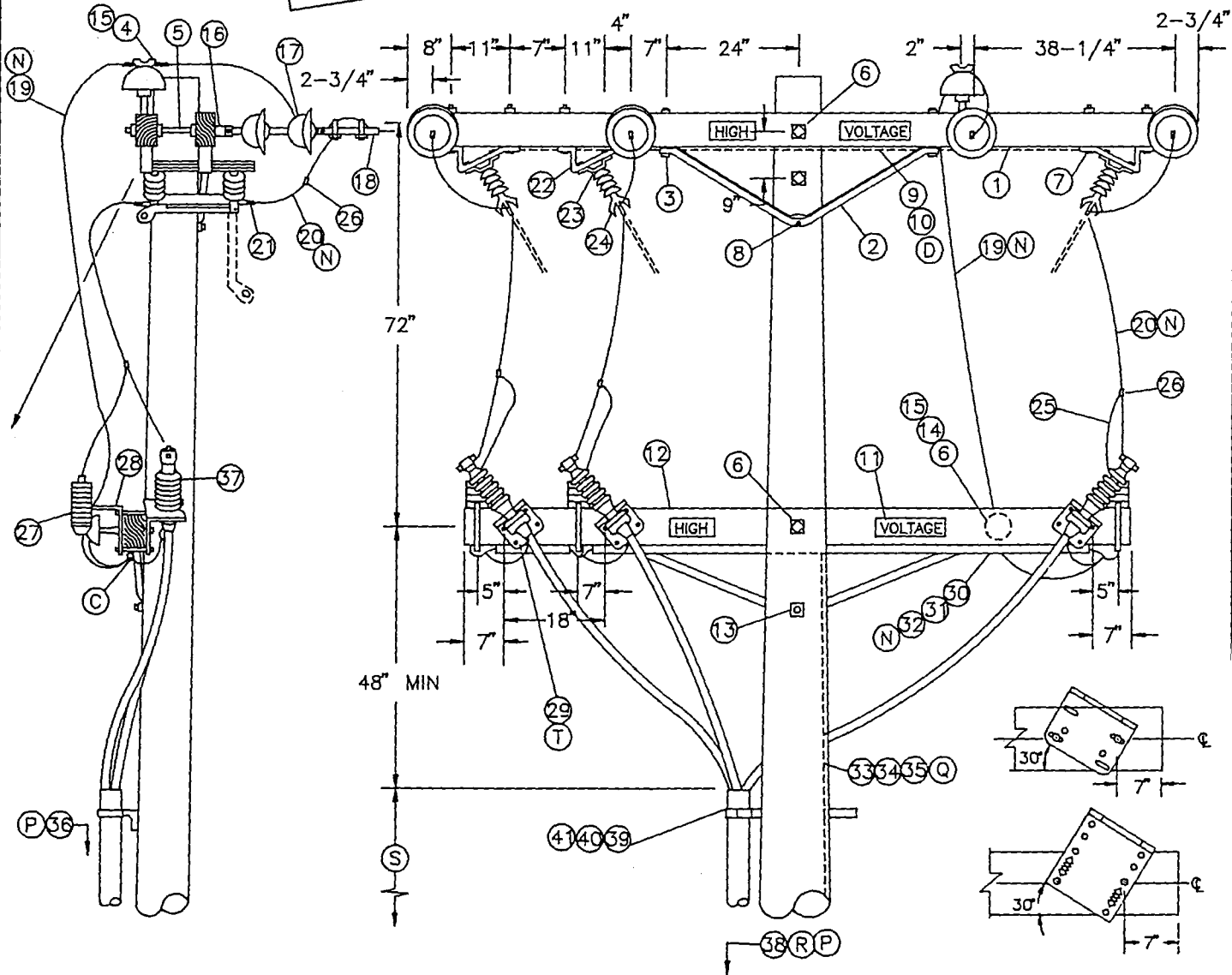
FOR FIELD MAINTENANCE ONLY

| | | |
|-----------------------------------|---|---|
| DATE 1-1-93 APPD <i>JLB/RD</i> | SDG&E ELECTRIC STANDARDS CROSSARM CABLE POLE, 3Ø, 1/C PER PHASE DEADEND CONSTRUCTION, 12.47KV AND BELOW | OH 1499.3C UG 4299.3C SUPERCEDES 4239.3 (1-1-93) |
|-----------------------------------|---|---|

SCOPE: THIS STANDARD SHOWS CABLE POLE CONSTRUCTION USING PORCELAIN TERMINATIONS FOR 750 AND LARGER UNDERGROUND CABLE. (SEE STANDARD 1407/4207 FOR 350 KCMIL TERMINAL MOUNTING INFORMATION).



FOR FIELD MAINTENANCE ONLY



SDG&E ELECTRIC STANDARDS

DATE 1-1-93

APPD *[Signature]*

12.47 KV AND BELOW DEAD END CABLE POLE
ARM, 3Ø, 1/C PER Ø, HOOKSTICK SWITCHED

OH 1499.40'
UG 4299.40'
SUPERCEDES
4241.1 (1-1-93)

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONSTR STANDARD | STOCK NUMBER |
|------|--|----------|-----------------|------------------|
| 1 | CROSSARM, 3-3/4" X 5-3/4" X 12'-0" (G) | 2 | - | 294160 |
| 2 | BRACE, ANGLE, CROSSARM, 4'-0" | 3 | - | 164032 |
| 3 | BOLT, MACH, GALV, 1/2" X 7", 1 ROUND AND 1 DOUBLE COIL SPRING WASHER (E) | 6 | 392 | - |
| 4 | PIN, INSULATOR, STRAIGHT, 12KV, 1" LEAD THREAD (F)(E) | 1 | - | 532704 |
| 5 | BOLT, SPACE, GALV, 5/8" X (LENGTH AS REQ'D), 3 SQUARE, 2 ROUND AND 2 DOUBLE COIL SPRING WASHERS (F)(E) | 4 | 392 | - |
| 6 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 2 SQUARE AND 1 DOUBLE COIL SPRING WASHERS (F)(E) | 3 | 392 | - |
| 7 | BOLT, MACH, GALV, 1/2" X 8", 1 ROUND AND 1 DOUBLE COIL SPRING WASHER (E) | 12 | 392 | - |
| 8 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D) AND 1 DOUBLE COIL SPRING WASHER (E) | 1 | 392 | - |
| 9 | WIRE, #8, BARE SOLID ANNEALED COPPER | 15' | - | 812928 |
| 10 | STAPLES, FENCE, GALV, 1-1/4" (E) | AS REQ'D | - | 678528 |
| 11 | SIGN, HIGH VOLTAGE AND 9 ROOFING NAILS, GALV (E) | 4 | - | 647648 492224 |
| 12 | CROSSARM, 3-3/4" X 5-3/4" X 10'-0" | 1 | - | 294128 |
| 13 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 SQUARE AND 1 DOUBLE COIL SPRING WASHER (E) | 1 | 392 | - |
| 14 | PIN, TRANSFORMER LEAD ADAPTER, 1" (F)(E) | 1 | - | 529248 |
| 15 | INSULATOR, 12KV, NEUTRAL (F)(E) | 2 | - | 429216 |
| 16 | CLEVIS, DEAD END, 5/8" BOLT STEEL (F)(E) | 4 | - | 235712 |
| 17 | INSULATOR, SUSPENSION, 12KV, CLEVIS (F) | 7 | 750 | - |
| 18 | CLAMP, STRAIGHT LINE, D.E. (F) | 4 | 741 | - |
| 19 | WIRE, BARE STRANDED CU OR AL (OH NEUT JUMPER) (N)(F) | 12' | 711-715 | - |
| 20 | WIRE, BARE STRANDED COPPER (OH JUMPER) (N) | 25' | 715 | - |
| 21 | TERMINAL, COMPRESSION (E) | 6 | 794-795 | - |
| 22 | BRACKET, DISCONNECT, ANGLE MOUNTING | 6 | - | 166542 |
| 23 | BOLT, MACH, GALV, 3/8" X 3", 2 ROUND & 1 LOCK WASHER (E) | 6 | 392 | - |
| 24 | SWITCH, HOOKSTICK DISCONNECT, 14.4KV, 600 A OR 1200 A | 3 | 1222 | - |
| 25 | WIRE, #6, BARE STRANDED COPPER | 12' | - | 813536 |
| 26 | CONNECTOR, WIRE, COMPRESSION (SIZE AS REQ'D) (E) | AS REQ'D | 783-787 | - |
| 27 | ARRESTER, LIGHTNING (N) | 3 | - | 113248 |
| 28 | BRACKET, CUTOUT/ARRESTER (E) | 3 | - | 166070 |
| 29 | BRACKET, TERMINAL MOUNTING | 3 | - | 166674 |
| 30 | CONDUIT, PVC TYPE 2, SCHEDULE 40, 1" (E) | 10' | - | 251200 |
| 31 | STRAPS, PIPE, GALV, 1" AND 2 - 6D NAILS, GALV (E) | AS REQ'D | - | 697792 491552 |
| 32 | WIRE, BARE STRANDED COPPER (CP NEUT-UNDER POTHEAD ARM) (N) | 15' | 715 | - |
| 33 | WIRE, #4, BARE STRANDED COPPER | 45' | - | 813760 |
| 34 | STAPLES, FENCE, GALV, 1-1/4" (E) | AS REQ'D | - | 678528 |
| 35 | UNIT GROUND, COMPLETE (Q) | 1 | - | 603136 |
| 36 | TAGS, SWITCH NUMBER (E) | 2 | - | 720704 |
| 37 | TERMINALS, UNDERGROUND CABLE | 3 | 4111 | - |
| 38 | RISER CONSTRUCTION | AS REQ'D | 1400/4200 | - |
| 39 | BRACKET, LADDER ARM (E) | AS REQ'D | 1404/4204 | 167184 |
| 40 | NUT, CLAMPING CHANNEL, W/SPRING, 1/2" (E) | AS REQ'D | 1404/4204 | 503488 |
| 41 | CHANNEL, DOUBLE GALV, 24" (E) | AS REQ'D | 1404/4204 | 216700 |

FOR FIELD MAINTENANCE ONLY

| CABLE SIZE | UG MACRO UNIT |
|------------|---------------|
| | W/LADDER ARMS |
| 3C-#350 | CP350L |
| 3C-#750 | CP750L |
| 3C-#1000 | CP-1KL |

| | | |
|--|--|-------------------------------------|
| H 1499.402 3 4299.402 SUPERCEDES 241.2 (1-1-93) | SDG&E ELECTRIC STANDARDS 12.47KV AND BELOW DEAD END CABLE POLE ARM, 3Φ, 1/C PER Φ, HOTSTICK SWITCHED | DATE 1-1-93 APPD <i>JLB/1/93</i> |
|--|--|-------------------------------------|

INSTALLATION:

- A. NEW CABLE POLES SHALL HAVE A STANDARD SETTING DEPTH OF 9'. IN MOST CASES THIS WILL REQUIRE A 5' TALLER POLE.
- B. THIS CONSTRUCTION TO BE USED WITH 350 KCMIL AND LARGER UNDERGROUND CABLE.
- C. INTERCONNECT OVERHEAD NEUTRAL, TERMINAL BASE, AND CONCENTRIC CABLE NEUTRAL CONDUCTOR TO LIGHTNING ARRESTER GROUND.
- D. INTERCONNECT SWITCH AND DEADEND BONDS PER G.O. 95 RULE 52.7D. BONDING SHOULD BE DONE IN ACCORDANCE WITH RULE 53.4.
- E. EXEMPT MATERIAL.
- F. REDUCE QUANTITIES AS REQUIRED WHEN NOT USING NEUTRAL.
- G. WHEN ADDING THIS CONSTRUCTION TO AN EXISTING POLE WITH A 10' LINE ARM. AND SUFFICIENT POLE HEIGHT EXISTS, INSTALL 10' SWITCH ARMS AND ASSOCIATED HARDWARE BELOW THE LINE ARM TO AVOID CHANGING LINE ARM FROM 10' TO 12' (SEE O.H. STANDARD 1222, FIG. 1-B).

(N)

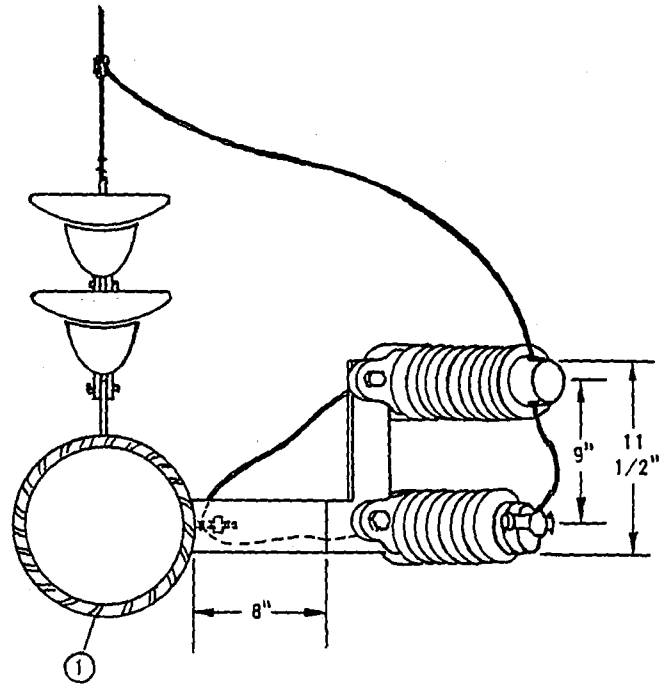
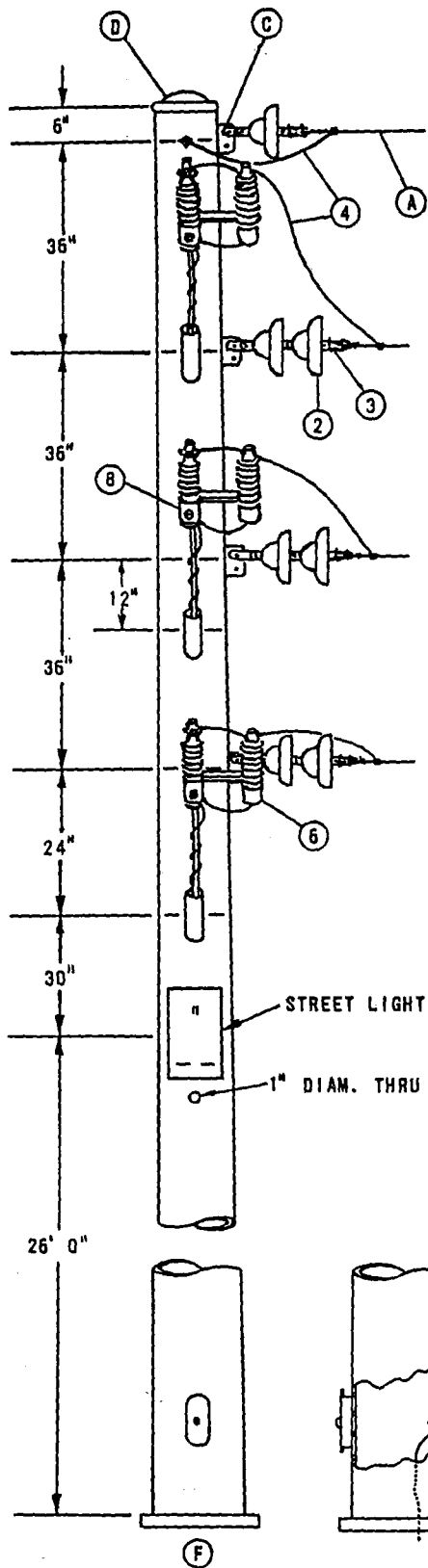
| UG CABLE SIZE AWG OR KCMIL, AL | OH JUMPER COND SIZE, AWG OR KCMIL, CU | OH NEUT JUMPER SIZE | | | CABLE POLE NEUT SIZE (CU) UNDER POTHEAD ARM OR TRIPLE TERM BRKT |
|--------------------------------------|---|---------------------|-------|---|---|
| | | CU | AL | | |
| 2 | 4 | 6 | 2 | - | #6 PER PHASE |
| 2/0 | 4 | 6 | 2 | - | #6 PER PHASE |
| 350 | 4/0 | 1/0 | 3/0 | - | #2 PER PHASE |
| 750 | 500 | 4/0 | 336.4 | OR SAME SIZE AS O.H. NEUT CONDUCTOR | 1/0 PER PHASE |
| 1000 | 500 | 4/0 | 336.4 | | 1/0 PER PHASE |

REFERENCE:

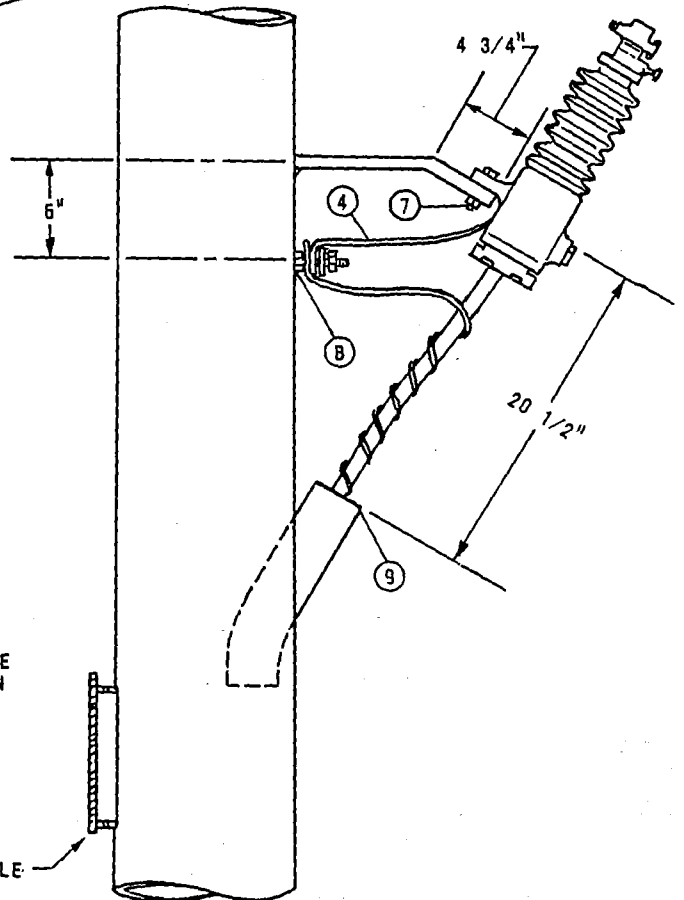
- (O) ALLOWABLE WORKING AND CLIMBING SPACE - SEE STANDARD 251.
- (P) POLE STEPPING - SEE STANDARD 363.
- (Q) GROUNDING METHODS - SEE STANDARD 1002.
- (R) RISER POSITIONS - SEE STANDARD 1402/4202.
- (S) MINIMUM VERTICAL SEPARATION AS PER G.O. 95 - SEE STANDARD 1406/4206.
- (T) SEE STANDARD 1407/4207 FOR PORCELAIN AND NON PORCELAIN TERMINAL MOUNTING BRACKET INSTRUCTIONS AND MATERIALS.

FOR FIELD MAINTENANCE ONLY

| | | |
|-----------------------------------|---|---|
| DATE 1-1-93 APPD <i>JLB/RD</i> | SDG&E ELECTRIC STANDARDS 12.47KV AND BELOW DEAD END CABLE POLE ARM, 3Ø, 1/C PER Ø, HOOKSTICK SWITCHED | OH 1499.40 UG 4299.40 SUPERCEDES 4241.3 (1-1-93) |
|-----------------------------------|---|---|



FOR FIELD MAINTENANCE ONLY



SDG&E ELECTRIC STANDARDS

DATE 1-92
APPD. [Signature]

CABLE POLE, STEEL, LIGHT DUTY

OH 1499.50
UG 4299.50

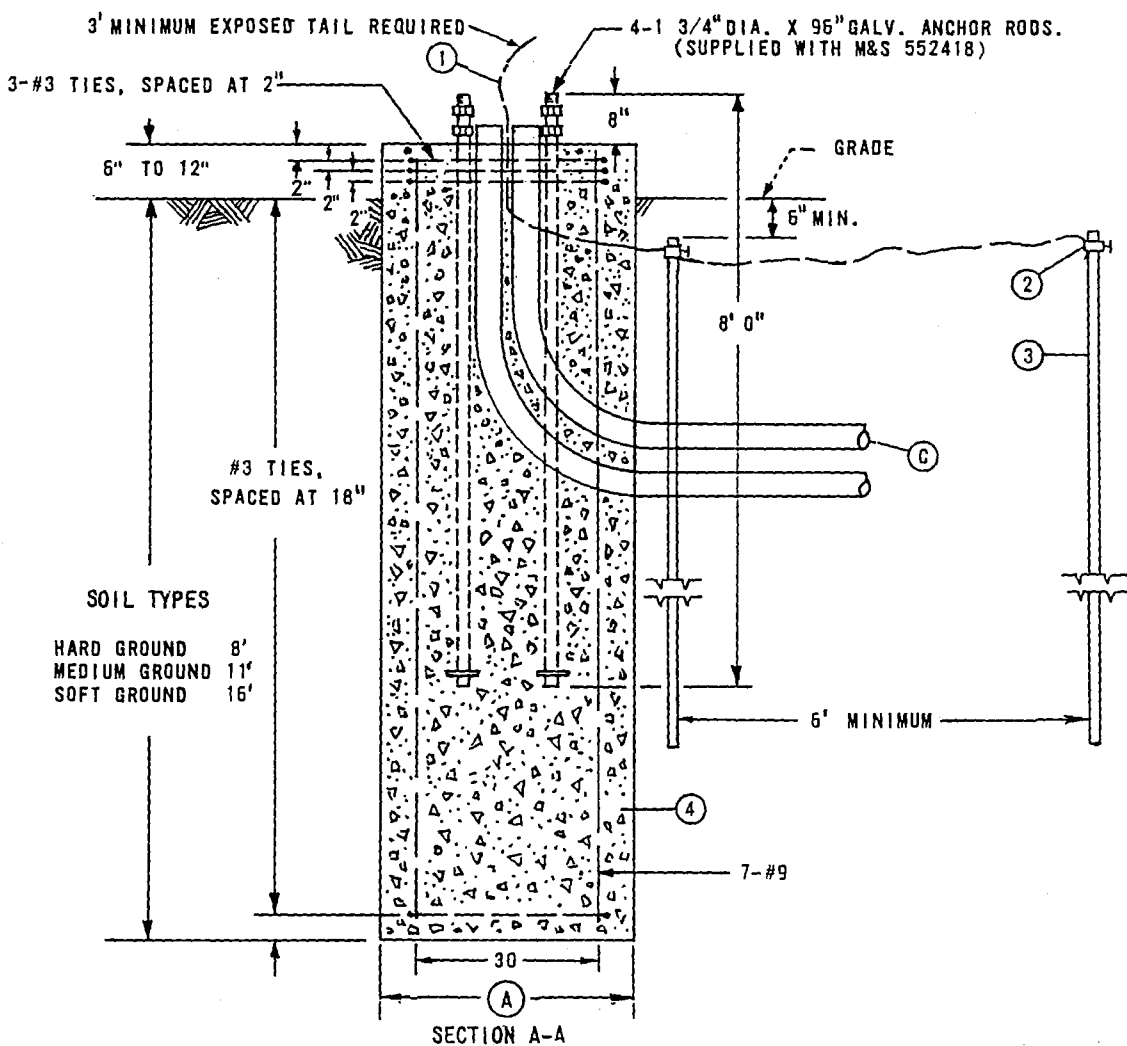
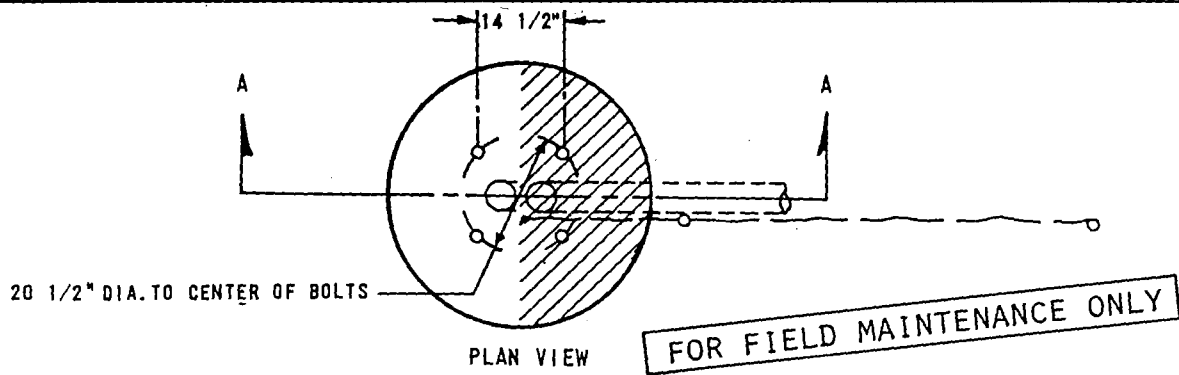
FOR FIELD MAINTENANCE ONLY

NOTES:

- (A) THIS POLE IS DESIGNED FOR A MAXIMUM LOADED TENSION OF 850# PER CONDUCTOR, AND A MAXIMUM SPAN LENGTH OF 250'.
- (B) LIGHTNING ARRESTER GROUND, AND CONCENTRIC CABLE NEUTRAL ARE CONNECTED TO STUD AS SHOWN. BASE OF TERMINAL GROUNDED THROUGH MOUNTING BRACKET.
- (C) DEAD END TO BE ATTACHED TO TOP HOLE OF DEAD END ATTACHMENT PLATE.
- (D) TOP IS REMOVABLE.
- (E) EXEMPT MATERIAL.
- (F) SEE STANDARDS PAGES 1454/4241 FOR FOUNDATION CONSTRUCTION.
- G. SECTIONALIZING TO BE DONE ON ADJACENT POLE.
- H. THIS POLE IS NONCLIMBABLE.
- (I) TO BE USED FOR STREET LIGHT SECONDARY FROM UG SYSTEM.
- J. NO OVERHEAD ATTACHMENT THAN THOSE SHOWN MAY BE MADE TO THIS POLE.

| ITEM FUCD | MATERIAL | QUANTITY | STOCK NO. OR CONSTR. STD. |
|--------------|---|----------|------------------------------|
| | POLE, LIGHT DUTY, STEEL CABLE, NONCLIMBABLE | 1 | 552418 |
| | INSULATOR, SUSPENSION | 7 | 700 SECTION |
| | CLAMP, DEAD END | 4 | 700 SECTION |
| 4 | WIRE, #2 WP COPPER | 10' | 812608 |
| 5 | WIRE, #6 BS COPPER | 8' | 813536 |
| 6 | ARRESTER, LIGHTNING | 3 | 1200 SECTION |
| 7 | BOLT, MACH., GALV., 5/8" X 2", 1 LOCK WASHER. (E) | 6 | 100 SECTION |
| 8 | TERMINAL, UNDERGROUND CABLE | 3 | SEE U.G. STDS. |
| 9 | GRIP, CABLE | 3 | 394048 |
| | | | |

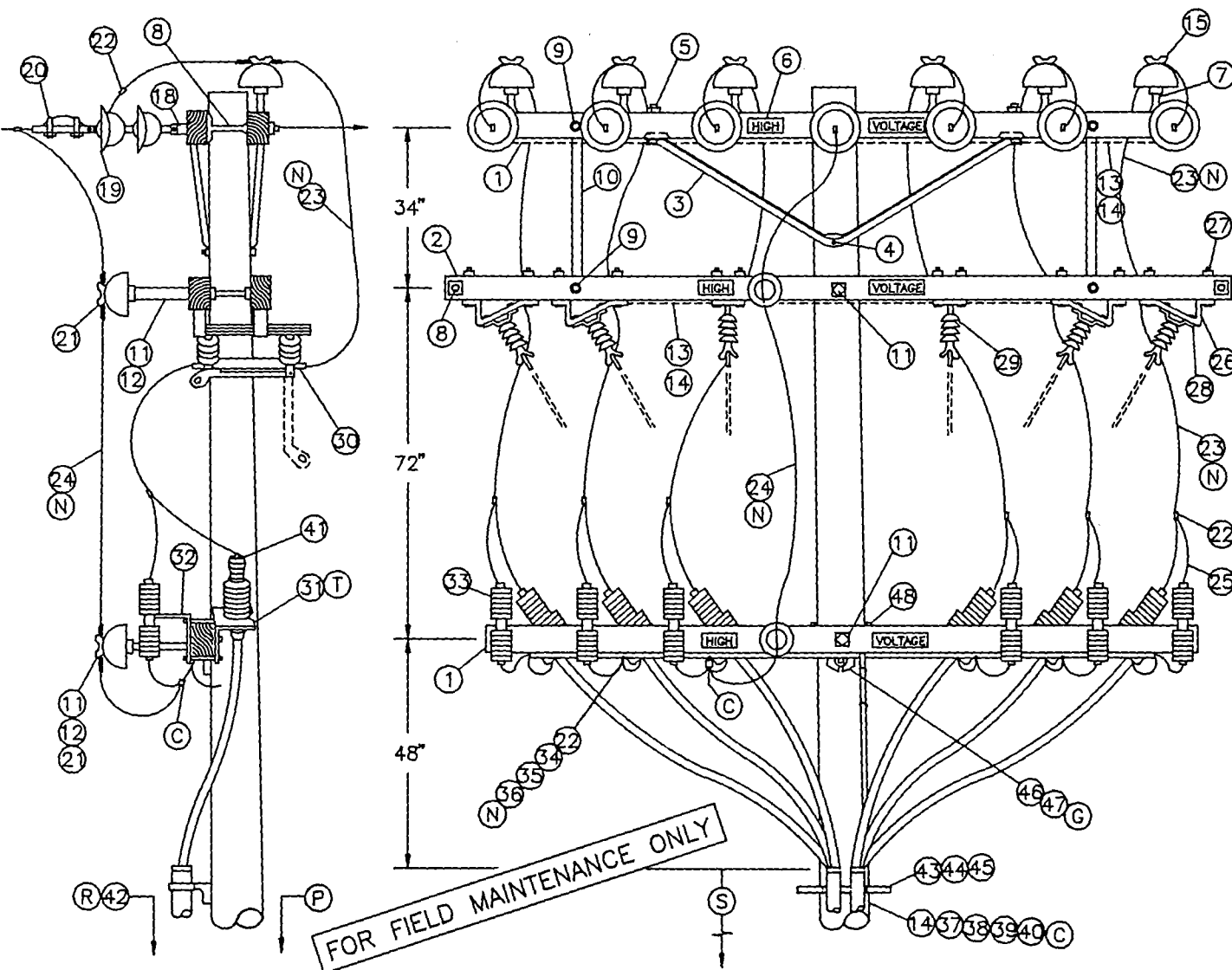
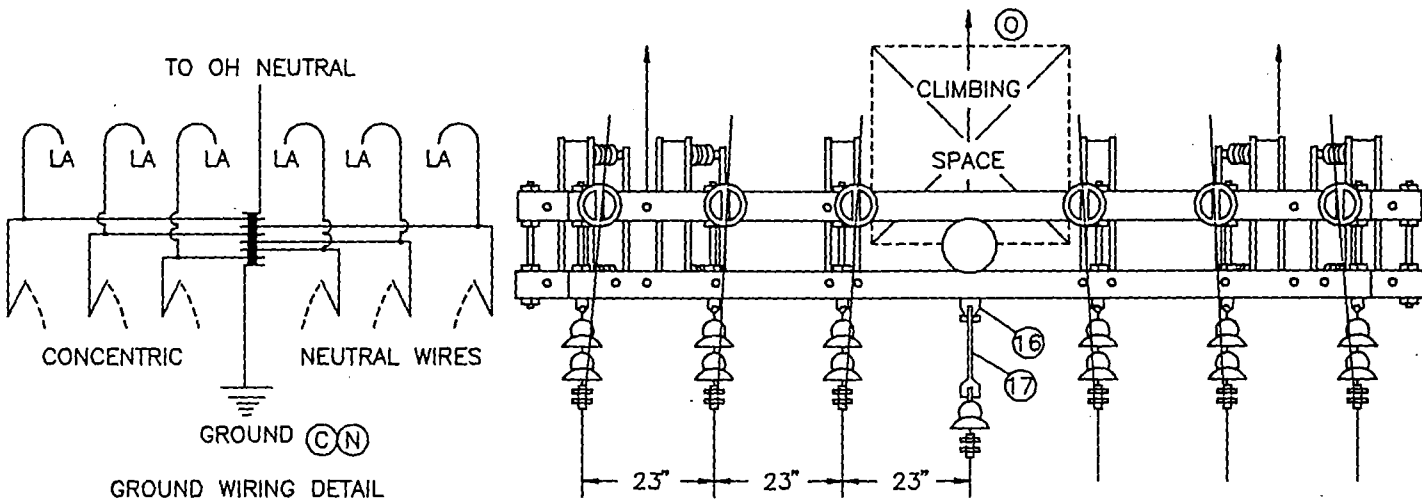
| | | |
|---------------------------------|--|------------------------------------|
| 1499.502 4299.502 | SDG&E ELECTRIC STANDARDS CABLE POLE, STEEL, LIGHT DUTY | DATE 1-1-92 APPD. <i>JLB/BA</i> |
|---------------------------------|--|------------------------------------|



- NOTES:
- (A) WHEN DIRECTION OF PULL OF THE OVERHEAD CONDUCTORS IS IN SHADED AREA IN THE PLAN VIEW, FOUNDATION DIAMETER SHALL BE 48". WHEN IN THE UNSHADED AREA THE FOUNDATION DIAMETER MAY BE REDUCED TO 42". DIAMETER REQUIRED ON WORK ORDER.
 - B CONTACT CIVIL ENGINEERING FOR CONFIRMATION OF SOIL TYPES BEFORE DECIDING FOUNDATION DIMENSIONS.
 - (C) TWO DUCTS TO BE INSTALLED IN FOUNDATION. THREE DUCTS ARE REQUIRED IF STREET LIGHT IS TO BE INSTALLED ON POLE
 - (E) EXEMPT MATERIAL.

| ITEM | DESCRIPTION | QUANTITY | STOCK NO. | VOLUME OF CONCRETE (IN CUBIC YARDS) | |
|------|-------------------------------|-------------|-----------|---------------------------------------|------------------------|
| | | | | DEPTH (IN FEET) | DIAMETER (IN INCHES) |
| 1 | WIRE, #2 BARE STRANDED COPPER | 15' | 813664 | | |
| 2 | CLAMPS, GROUND | (E) 2 | 230016 | 42 | 48 |
| 3 | RODS, GROUND | 2 | 603072 | 8 | 2.85 3.72 |
| 4 | CONCRETE | (SEE TABLE) | - | 11 | 3.92 5.12 |
| | | | | 16 | 5.70 7.45 |

SCOPE: THIS STANDARD SHOWS 6 OR 7 CONDUCTOR DEAD END CABLE POLE WITH HOOKSTICK SWITCHES FOR 750 KCMIL AND LARGER U.G. CABLE. (SEE STANDARD 1407/4207 FOR 350 KCMIL TERMINAL MOUNTING INFORMATION).



1499.504
4299.504
SUPERCEDES
1.1 (1-1-93)

SDG&E ELECTRIC STANDARDS
12.47KV AND BELOW DEAD END CABLE POLE, 6 OR 7 OH
CONDUCTORS, 1 OR 2 TERMINALS PER CONDUCTOR,
HOOKSTICK SWITCHED

DATE 1-1-93

APPD *JLB/RDS*

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | CONST STD OR PG NO | STOCK NUMBER |
|------|---|----------|--------------------|------------------|
| 1 | CROSSARM, 3-3/4" X 5-3/4" X 12'-0" | 3 | - | 294160 |
| 2 | CROSSARM, 3-3/4" X 5-3/4" X 13'-6" | 2 | - | 294368 |
| 3 | BRACE, ANGLE, CROSSARM, 6' | 3 | - | 164160 |
| 4 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 DBL COIL WASH | 1 | 392.1&.2 | - |
| 5 | BOLT, MACH, GALV, 1/2" X 7", 1 RD & 1 DBL COIL WASH | 4 | 392.1&.2 | - |
| 6 | SIGN, HIGH VOLTAGE & 8 ROOFING NAILS | 6 | - | 647648 492224 |
| 7 | PIN, INSULATOR, STRAIGHT, 12KV, 1" OR 1 3/8" | 6 | - | 532704 532448 |
| 8 | BOLT, SPACE, 5/8" X (LENGTH AS REQ'D), 3 SQ WASH & 2 DBL COIL WASH | 8 | 392.1&.2 | - |
| 9 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 RD WASH & 1 DBL COIL WASH | 8 | 392.1&.2 | - |
| 10 | BRACE, VERTICAL, 36" | 4 | - | 164224 |
| 11 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 2 SQ FLAT WASH & 1 DBL COIL WASH | 5 | 392.1&.2 | - |
| 12 | PIN, TRANSFORMER ADAPTER, 1" LEAD THREAD | 2 | - | 529248 |
| 13 | WIRE, #8, BARE SOLID ANNEALED COPPER | 2 LB | - | 812928 |
| 14 | STAPLES, FENCE, GALV, 1-1/4" | AS REQ'D | - | 678528 |
| 15 | INSULATOR, LINE, 12KV, 1" OR 1-3/8" PIN | 6 | 750 | - |
| 16 | CLEVIS, DEAD END, 3/4" BOLT, STEEL (OPEN TYPE) | 1 | - | 235618 |
| 17 | LINK, EXTENSION, 1/2" X 1-1/2" X 12" | 1 | - | 466240 |
| 18 | CLEVIS, DEAD END, 5/8" BOLT, STEEL (CLOSED TYPE) | 6 | - | 235712 |
| 19 | INSULATOR, SUSPENSION, 12KV | 13 | 750 | - |
| 20 | CLAMP, STRAIGHT LINE, D.E. | 7 | 742-743 | - |
| 21 | INSULATOR, LINE, 12KV, NEUTRAL | 2 | - | 429216 |
| 22 | CONNECTOR, WIRE, (SIZE & TYPE AS REQ'D) | AS REQ'D | 783-787 | - |
| 23 | WIRE, BARE STRANDED COPPER, (OH JUMPER) | 72' | 715-716 | - |
| 24 | WIRE, BARE STRANDED CU OR AL, (OH NEUT JUMPER) | 12' | 711-716 | - |
| 25 | WIRE, #8, BARE STRANDED COPPER | 25' | - | 813536 |
| 26 | BRACKET, DISCONNECT, ANGLE MOUNTING, 1/4" X 3" | 8 | - | 166542 |
| 27 | BOLT, MACH, GALV, 1/2" X 8", 1 RD & 1 DBL COIL WASH | 24 | 392.1&.2 | - |
| 28 | BOLT, MACH, GALV, 3/8" X 3" | 8 | 392.1&.2 | - |
| 29 | SWITCH, DISCONNECT, 14.4KV, 600 A OR 1200 A | 6 | 1205 | - |
| 30 | COMPRESSION TERMINALS, CU, 2 HOLE (SIZE AS REQ'D) | 12 | 794-795 | - |
| 31 | BRACKET, POTHEAD MOUNTING | 6 | 1400/4200 | - |
| 32 | BRACKET, CUTOUT/ARRESTER, FOR CROSSARM MOUNTING | 6 | - | 166070 |
| 33 | ARRESTER, LIGHTNING | 6 | 1247 | - |
| 34 | CONDUIT, PVC, SCHEDULE 40, 1-1/2" | 10' | - | 25123 |
| 35 | STRAPS, PIPE, GALV, 1" & 6D NAILS, GALV | AS REQ'D | - | 69779 49155 |
| 36 | WIRE, BARE STRANDED CU, (C.P. NEUTRAL SIZE) | 35' | 715-716 | - |
| 37 | WIRE, #4, BARE STRANDED COPPER | 45' | - | 8137 |
| 38 | STAPLES, MOULDING, GALV, 3" X 1-1/16" X 1/4" | AS REQ'D | - | 6785 |
| 39 | UNIT GROUND, COMPLETE | 1 | - | 6031 |
| 40 | CLAMP, 5/8", GROUND ROD | 2 | - | 2301 |
| 41 | TERMINALS, UNDERGROUND CABLE | 6 | 4111 | - |
| 42 | RISER CONSTRUCTION | AS REQ'D | 1400/4200 | - |
| 43 | BRACKET, LADDER ARM | AS REQ'D | 1404/4204 | 16' |
| 44 | NUT, CLAMPING CHANNEL, W/SPRING, 1/2" | AS REQ'D | 1404/4204 | 50 |
| 45 | CHANNEL, DOUBLE GALV, 24" | AS REQ'D | 1404/4204 | 21 |
| 46 | BOLT, MACH, GALV, 5/8" X (LENGTH AS REQ'D), 1 SQUARE, 1 ROUND & 1 DOUBLE COIL SPRING WASHER | 1 | 392 | - |
| 47 | GAIN, CROSSARM, BRACELESS | 1 | - | 3 |
| 48 | BOLT, MACH, GALV, 5/8" X 7", 1 ROUND & 1 DOUBLE COIL SPRING WASHER | 2 | 392 | - |

FOR FIELD MAINTENANCE ONLY

| | |
|----------------------|-------------------------|
| CABLE SIZE | UG MACRO UNIT PORCELAIN |
| | W/LADDER ARMS |
| 3C-#750 AL TWO RUNS | 2R750L |
| 3C-#1000 AL TWO RUNS | 2R-1KL |

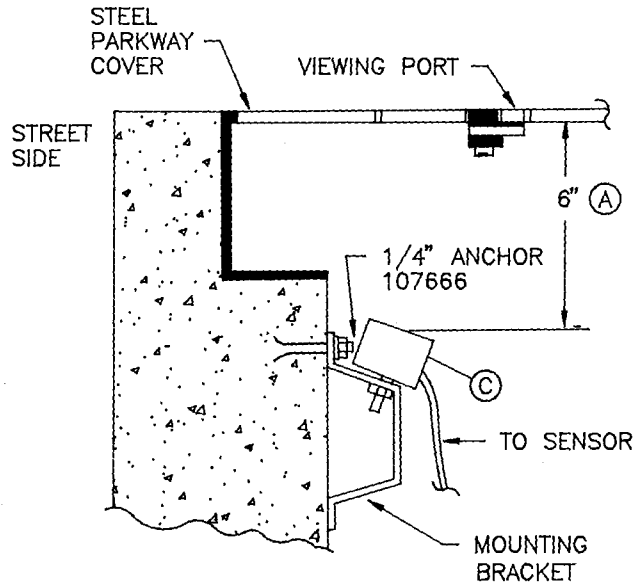
DATE 1-1-93
 APPD *JLB/BG*

SDG&E ELECTRIC STANDARDS

12.47KV AND BELOW DEAD END CABLE POLE, 6 OR 7 OH CONDUCTORS
 1 OR 2 TERMINALS PER CONDUCTOR, HOOKSTICK SWITCHED

OH
 UG
 SU
 4251

HANDHOLE INSTALLATIONS



FOR FIELD MAINTENANCE ONLY

INSTALLATION:

- (A) ALL MEASUREMENTS SHOWN ARE APPROXIMATE — EXACT PLACEMENT OF THE FAULT INDICATOR TARGET WILL HAVE TO BE DETERMINED INDIVIDUALLY, USING THE FRAME AND COVER INTENDED FOR THAT INSTALLATION.
- B. ATTACH LEADS TO HANDHOLE WALL.
- (C) THREE FAULT INDICATORS MAY BE INSTALLED UNDER ONE VIEWING PORT.

REFERENCE:

- F. SEE STANDARD 3212 FOR FAULT INDICATOR IDENTIFICATION.
- G. SEE STANDARD 4352 FOR AUTOMATIC FAULT INDICATORS APPLICATION AND SELECTION.

DATE 1-1-96

APPD

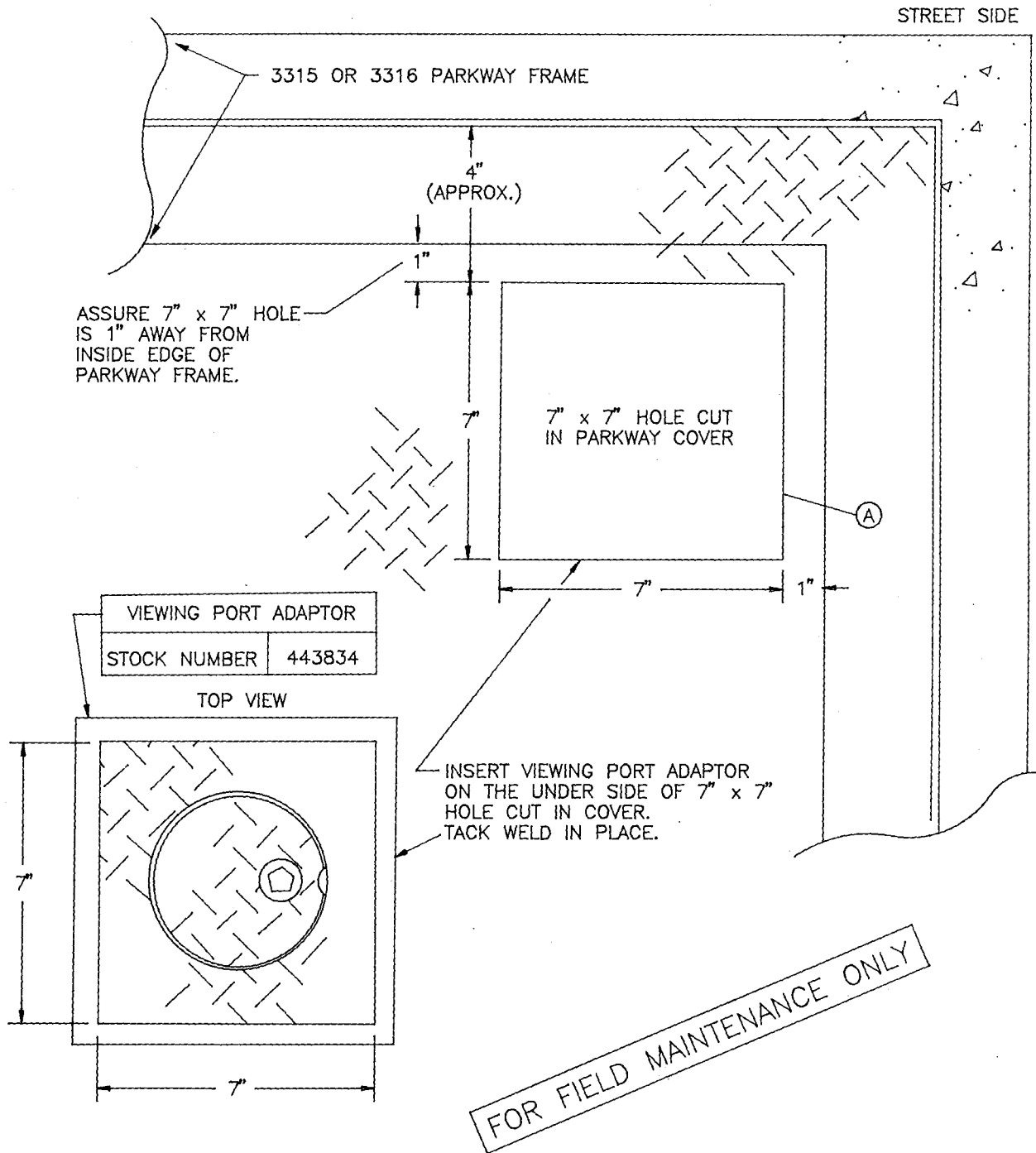
[Signature]

SDG&E ELECTRIC STANDARDS

FAULT INDICATOR INSTALLATION

4399.5

VIEWING PORT ADAPTER AND INSTALLATION ON HANDHOLE PARKWAY COVERS



INSTALLATION:

- Ⓐ APPLY RUST INHIBITOR AND SAME COLOR PAINT ON TACK WELD AND EDGES OF HOLE CUT IN COVER.

DATE 1-1-96

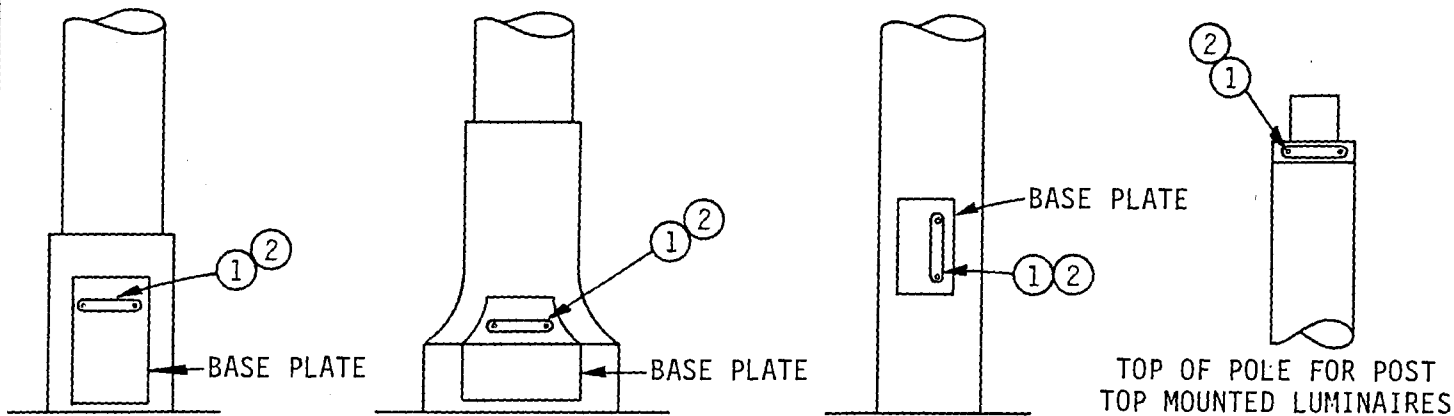
APPD *[Signature]*

SDG&E ELECTRIC STANDARDS

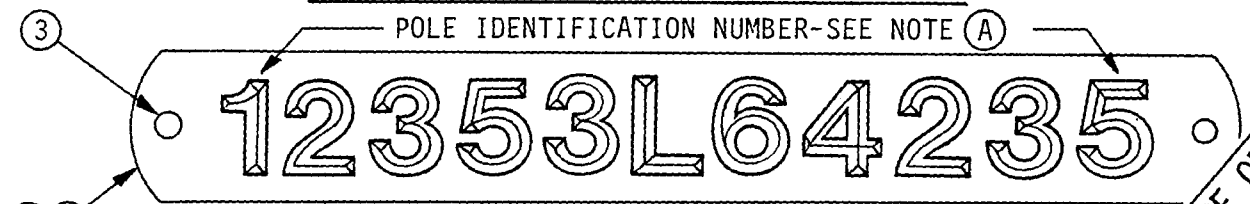
FAULT INDICATOR INSTALLATION

4399.50

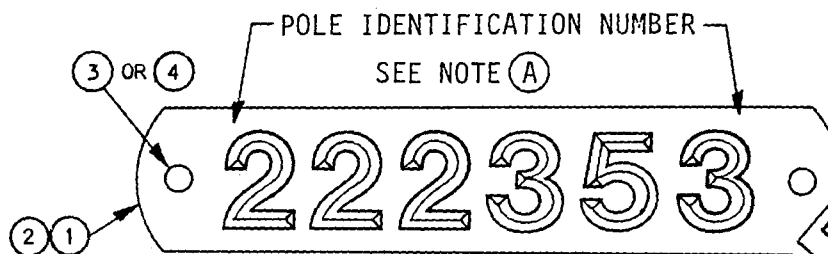
SCOPE: THIS STANDARD SHOWS THE INSTALLATION AND REQUIREMENTS FOR TAGGING SDG&E OWNED ORNAMENTAL STREET LIGHT POLES.



TAG PER CALIFORNIA GRID COORDINATE SYSTEM



TAG PER POLE NUMBERING DISTRICTS



FOR FIELD MAINTENANCE ONLY

NOTES:

- TAG SDG&E OWNED POLES ONLY-DO NOT TAG POLES OWNED BY OTHERS.
- DO NOT RETAG (WITH NEW IDENTIFICATION NUMBERS), EXISTING POLES THAT HAVE OLD CAL-GRID OR POLE DISTRICT NUMBERS. THE OLD NUMBER STILL APPLIES FOR IDENTIFICATION PURPOSES.

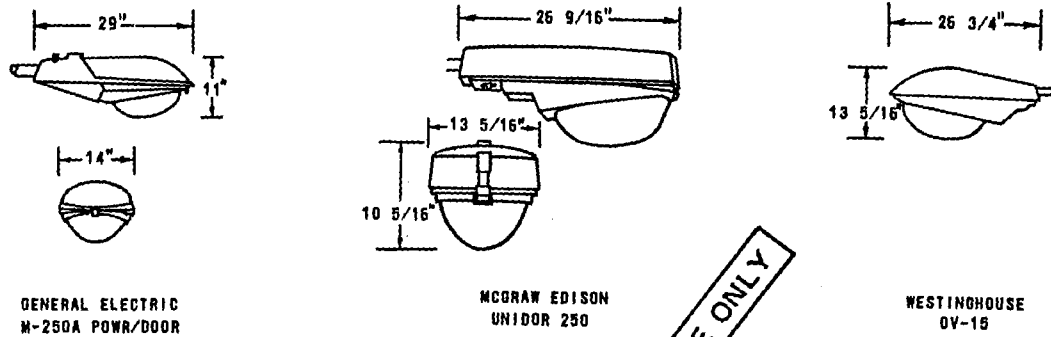
BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | STOCK NO. |
|------|--|----------|----------------|
| 1 | ALUMINUM EMBOSING TAPE 7/8" ROLL | AS REQ'D | 720704 (E) |
| 2 | BRASS EMBOSING TAPE 7/8" ROLL | AS REQ'D | 720736 (D) (E) |
| 3 | STAINLESS STEEL SELF TAPPING DRIVE SCREW #4 - 1/4" | 2 | 621344 (E) |
| 4 | EPOXY PASTE | AS REQ'D | 213244 (E) |

INSTALLATION:

- (A) NUMBER IS ACCORDING TO OLD SDG&E POLE NUMBERING DISTRICTS OR OLD CAL-GRID COORIDINATE SYSTEM.
- B. ALL TAGS TO BE ATTACHED BY DRILLING TWO HOLES AS SHOWN ABOVE USING SELF TAPPING SCREWS OR EPOXY PASTE.
- C. WORK ORDER SKETCHES, TEXT AND MATERIAL LISTS WILL SPECIFY NUMBERS TO BE ATTACHED TO POLES.
- (D) FOR USE IN CORROSIVE AREAS.
- (E) EXEMPT MATERIAL.

SCOPE: THIS STANDARD SHOWS MERCURY VAPOR LUMINAIRES USED TO PROVIDE ROADWAY AND DUSK TO DAWN LIGHTING, AND REPLACEMENT REFRACTORS.

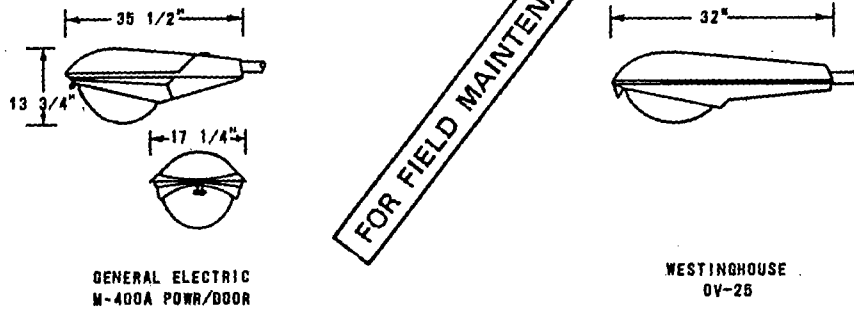


GENERAL ELECTRIC
M-250A POWR/DOOR

MCGRAW EDISON
UNIDOR 250

WESTINGHOUSE
OV-15

FIGURE 1



GENERAL ELECTRIC
M-400A POWR/DOOR

WESTINGHOUSE
OV-25

FIGURE 2

BILL OF MATERIAL:

| FIG. NO. | STOCK NUMBER | LAMP SIZE WATTS | BALLAST | | MANUFACTURER AND CATALOG NUMBER | | | | | | | |
|----------|--------------|-----------------|-------------|----------------|---------------------------------|--------------------|---------------|-------------|--------------|------------|------------------|----------|
| | | | TYPE | SOURCE VOLTAGE | GENERAL ELECTRIC | | MCGRAW EDISON | | WESTINGHOUSE | | UNICORN ELECTRIC | |
| | | | | | TYPE | CAT. NO. | TYPE | CAT. NO. | TYPE | CAT. NO. | TYPE | CAT. NO. |
| 1 | 473920 | 175 | REGULATOR | 120/240 (A) | M-250A | C727G002 (B) | UNIDOR | UU1104-120R | OV-15 | B11A208G04 | | |
| | 474048 | | REACTOR NPF | 240 | POWR/DOOR | C727G014 (B) | 250 | UU-1154R | | B11A208G20 | | |
| | 473910 | | SERIES | 6.6 AMPS | M-250-R2 | M2AR17CXSIGMS31036 | | | | | | |
| 2 | 474208 | 400 | REGULATOR | 120/240 (A) | M-400A | C723G001 (B) | | | OV-25 | B56A303G04 | | |
| | 473912 | | SERIES | 6.6 AMPS | M-250-R2 | M4AR40CXSIGMN32043 | | | | | | |

REPLACEMENT REFRACTORS FOR MERCURY VAPOR LUMINAIRES

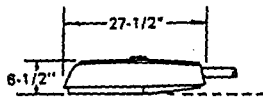
| CONVENTIONAL LUMINAIRES | | LAMP TYPE | LAMP WATTAGE | REPLACEMENT REFRACTOR | | |
|-------------------------|---------------|-----------|--------------|-----------------------|----------------|--------------|
| MANUFACTURER | TYPE | | | TYPE | CATALOG NUMBER | STOCK NUMBER |
| GENERAL ELECTRIC | M-250A (C) | MV | 175,250 | GLASS | 35-130583-01 | 579284 |
| GENERAL ELECTRIC | M-400A (C) | MV | 400 | GLASS | 35-231137-01 | 579298 |
| | | | | LEXAN | 35-130015-02 | 579312 |
| AMERICAN ELECTRIC | 23 SERIES (C) | MV | 175,250 | GLASS | 23-002 | 579284 |
| AMERICAN ELECTRIC | 25 SERIES (C) | MV | 400 | GLASS | 25-003 | 578928 (F) |
| | | | | LEXAN | 25-003-8 | - (F) |
| AMERICAN ELECTRIC | 327 SERIES | MV | 1000 | GLASS | 27-003 | 578936 (F) |
| WESTINGHOUSE | OV-15 | MV | 175,250 | GLASS | 464-D067-H01 | 578976 (F) |
| WESTINGHOUSE | OV-25 (C) | MV | 400 | GLASS | 464-D336-H02 | 579040 |
| | | | | LEXAN | 6716-D13-H01 | 579058 (F) |

INSTALLATION:

- (A) FACTORY WIRED FOR 120 VOLTS, DO NOT WIRE FOR 240 VOLTS ON NEW INSTALLATIONS.
- (B) ASTRODOME UNITS ARE EQUIPPED WITH BUILT-IN PHOTOELECTRIC CELL, FOR REPLACEMENT SEE PAGE 1512/4412.
- (C) A GLASS OR A LEXAN REFRACTOR MAY BE USED ON THESE LUMINAIRES.
- D. LEXAN REFRACTORS TO BE USED IN HIGH VANDALISM AREAS ONLY.
- (F) ITEM IS NO LONGER PURCHASED.

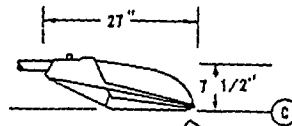
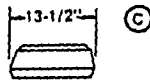
| | | |
|------------------------------------|---|---------------------------------|
| DATE 1-1-89 APPD <i>PEA/DTE</i> | SDG&E ELECTRIC STANDARDS | OH 1599 |
| | MERCURY VAPOR CONVENTIONAL LUMINAIRES AND REPLACEMENT REFRACTORS | UG 4499 SUPERC 4420.1 (1) |

SCOPE: THIS STANDARD SHOWS HIGH PRESSURE SODIUM VAPOR LUMINAIRES USED TO PROVIDE ROADWAY AND DUSK TO DAWN LIGHTING, REPLACEMENT BALLAST AND REFRACTORS.



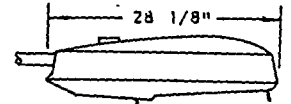
GENERAL ELECTRIC
M150 CUTOFF POWER/DOOR

FIGURE 1



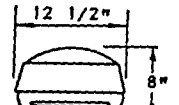
GENERAL ELECTRIC
M-250A CUTOFF POWER/DOOR

FIGURE 2

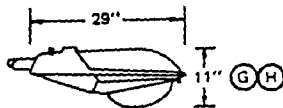


AMERICAN ELECTRIC
SERIES 213 CUTOFF
POWER/PAD

FIGURE 3

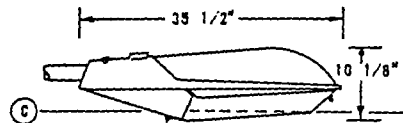


FOR FIELD MAINTENANCE ONLY



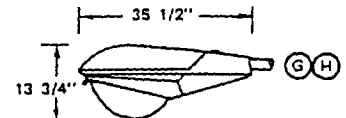
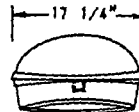
GENERAL ELECTRIC
M-250A POWER/DOOR

FIGURE 4



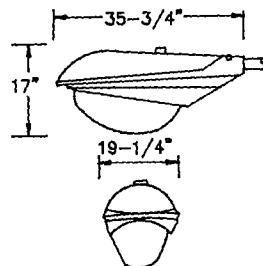
GENERAL ELECTRIC
M-400A CUTOFF
POWER/DOOR

FIGURE 5



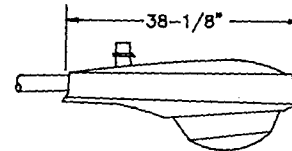
GENERAL ELECTRIC
M-400A POWER/DOOR

FIGURE 6



GENERAL ELECTRIC
M-1000

FIGURE 7



AMERICAN ELECTRIC
SERIES 327

FIGURE 8

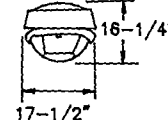


TABLE 1 (D)
HIGH PRESSURE SODIUM VAPOR (HPSV) LUMINAIRES - COMPLETE ASSEMBLY (EXCLUDING LAMP)

| FIG. NO. | MANUFACTURER | | LAMP SIZE WATTS | BALLAST | | STOCK NUMBER |
|-------------|------------------|--------------|--------------------|----------------|----------------|--------------|
| | GENERAL ELECTRIC | AMER. ELECT. | | TYPE | SOURCE VOLTAGE | |
| 1, 2 & 3 | M 150 CUTOFF | SERIES 213 | 70 | REACTOR | 120 | 473382 |
| | M 250A CUTOFF | | 100 | | 120 | |
| | M 150 CUTOFF | | 150 | | 120 | |
| 4 | M 250A | - | 100 | REACTOR | 120 | 473924 |
| | M 400A | - | 200 | REGULATOR | 120 | 473360 |
| 5 & 6 | M 400A CUTOFF | - | 250 | AUTO REGULATOR | 120 | 473312 |
| | | | 400 | REGULATOR | 120 | 473280 |
| 6 | M 400A | - | 250 | AUTO REGULATOR | 120 | 473928 |
| 7 & 8 | M 1000 | SERIES 327 | 1000 | AUTO REGULATOR | 120 | 473248 |

SDG&E ELECTRIC STANDARDS

DATE 1-1-94

HIGH PRESSURE SODIUM VAPOR LUMINAIRE,
REPLACEMENT BALLAST AND REFRACTORS

OH 1599.20
UG 4499.20

TABLE 2 (F)
REPLACEMENT BALLAST ONLY FOR HIGH PRESSURE SODIUM VAPOR (HPSV) LUMINAIRES

| FIG. NO. | BALLAST | | LAMP SIZE WATTS | MANUFACTURER | | STOCK NUMBER |
|-------------|----------------|----------------|-----------------|--------------|-----------------|--------------|
| | TYPE | SOURCE VOLTAGE | | MANUFACTURER | TYPE POWER/DOOR | |
| 1, 2, 3 & 4 | REACTOR | 120 | 70 | GE | M 150 | 121044 |
| | | | | GE | M 250A | 121140 |
| | | | | AMER. ELECT. | SERIES 213 | 121172 |
| | | 120 | 100 | GE | M 150 | 121076 |
| | | | | GE | M 250A | 121142 |
| | | | | AMER. ELECT. | SERIES 213 | 121174 |
| | | 120 | 150 | GE | M 150 | 121108 |
| | | | | GE | M 250A | 121144 |
| | | | | AMER. ELECT. | SERIES 213 | 121176 |
| 5 & 6 | REACTOR | 120 | 150 | GE | M 400A | 121146 |
| | REGULATOR | 120 | 200 | GE | M 400A | 121204 |
| | | | | AMER. ELECT. | SERIES 25 | 121178 |
| | AUTO REGULATOR | 120 | 250 | GE | M 400A | 121148 |
| | | | | AMER. ELECT. | SERIES 25 | 121180 |
| REGULATOR | 120 | 400 | GE | M 400A | 121150 | |
| | | | AMER. ELECT. | SERIES 25 | 121182 | |

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TABLE 3

| REPLACEMENT REFRACTORS FOR HPSV LUMINAIRES | | | | | | |
|--|------------------|-----------|--------------|-----------------------|----------------|--------------|
| CONVENTIONAL LUMINAIRES | | LAMP TYPE | LAMP WATTAGE | REPLACEMENT REFRACTOR | | |
| MANUFACTURER | TYPE | | | TYPE | CATALOG NUMBER | STOCK NUMBER |
| GENERAL ELECTRIC | M-250A (I) | HPSV | 100,150 | LEXAN | 35-130707-01 | 579248 |
| GENERAL ELECTRIC | M-250A-CUTOFF | HPSV | 100,150 | GLASS | 35-962560-21 | 579282 |
| GENERAL ELECTRIC | M-400A-CUTOFF | HPSV | 250,400 | GLASS | 35-962490-V4 | 578706 |
| GENERAL ELECTRIC | M-1000 | HPSV | 1000 | GLASS | 35-130170-02 | 578704 |
| AMERICAN ELECTRIC | 23 SERIES (I) | HPSV | 100,150 | LEXAN | 23-002-6 | 579248 |
| AMERICAN ELECTRIC | 25 SERIES CUTOFF | HPSV | 250,400 | GLASS | - | - (B) |
| AMERICAN ELECTRIC | 327 SERIES | HPSV | 1000 | GLASS | 27-003 | 579936 (B) |

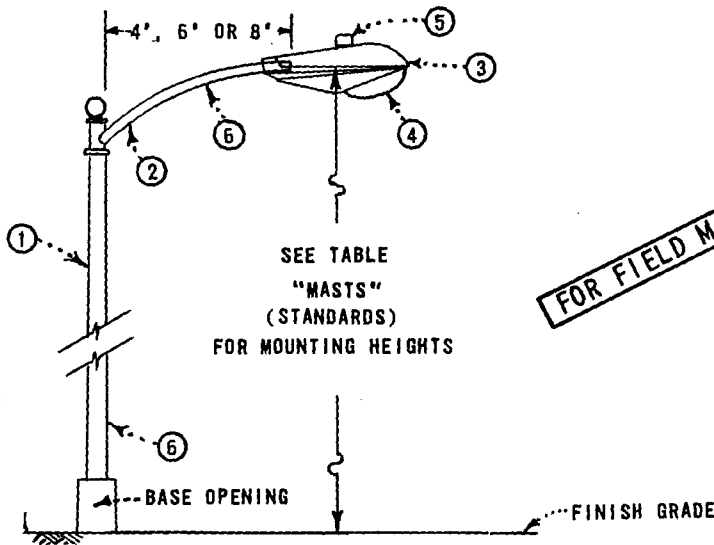
INSTALLATION:

- A. ALL LUMINAIRES ARE TO BE WIRED FOR 120 VOLTS ONLY. APPLICATION OF 240 VOLTS TO THESE UNITS WILL CAUSE SEVERE BALLAST DAMAGE.
- (B) ITEM IS NO LONGER PURCHASED.
- (C) CUTOFF LUMINAIRES SHALL BE INSTALLED WITH THE OPTICAL ASSEMBLY (GLASSWARE) HORIZONTAL.
- (D) ITEMS IN TABLE 1 ARE FOR COMPLETE LUMINAIRE UNITS AND ARE NO LONGER PURCHASED.
- (F) STOCK NUMBERS IN TABLE 2 ARE FOR BALLAST ONLY AND MAY BE PURCHASED FOR PURPOSE OF REPLACEMENT.
- (G) ASTRODOME UNITS ARE EQUIPPED WITH BUILT-IN PHOTOELECTRIC CELL.
- (H) USE LEVELING PAD FOR PROPER ADJUSTMENT OF LUMINAIRE.
- (I) A GLASS OR A LEXAN REFRACTOR MAY BE USED ON THESE LUMINAIRES (LEXAN REFRACTORS TO BE USED IN HIGH VANDALISM AREAS ONLY).

REFERENCE:

- J. SEE STANDARD 1512/4412 FOR PHOTOELECTRIC CONTROL.
- K. SEE STANDARD 1514/4414 FOR IDENTIFICATION DECAL.

| | | |
|-------------------------------------|---|----------------------------|
| SDG&E ELECTRIC STANDARDS | | |
| 1599.204 4499.204 | HIGH PRESSURE SODIUM VAPOR LUMINAIRE, REPLACEMENT BALLAST AND REFRACTORS | DATE 1-1-89 APPD P/A/BJ |



FOR FIELD MAINTENANCE ONLY

| FUSES | | | | MERCURY VAPOR STREET LIGHT CODE | | | | | | | |
|--------------------------------------|--------------|----------------|-----------|---------------------------------|-------|-------------------|-----|-----|-----------------|-----|-----|
| DESCRIPTION | MANUFACTURER | CATALOG NUMBER | STOCK NO. | WATT | LUMEN | REGULATOR BALLAST | | | REACTOR BALLAST | | |
| | | | | | | 4' | 6' | 8' | 4' | 6' | 8' |
| FUSE HOLDER | ESNA | 64-B4A-B4A | 443392 | 175 | 7000 | 4AG | 6AG | 8AG | 4AR | 6AR | 8AR |
| FUSE CARTRIDGE DUAL ELEMENT 10A 250V | BUSSMANN | FNM 10 | 363936 | 250 | 10000 | 4BG | 6BG | 8BG | 4BR | 6BR | 8BR |
| LIMITRON 20A, 600V | BUSSMANN | KTK 20 | 366128 | 400 | 20000 | 4CG | 6CG | 8CG | - | - | - |

| ITEM | MATERIAL | QUANTITY BALLAST | | | | | | STOCK NUMBER OR CONSTR. STD. | |
|------|--|-------------------|-------------------|-------------------|------------|------------|------------|------------------------------|----------|
| | | REGULATOR | | | REACTOR | | | | |
| | | 4AG 4BG 4CG | 6AG 6BG 6CG | 8AG 8BG 8CG | 4AR 4BR | 6AR 6BR | 8AR 8BR | | |
| 1 | PACIFIC UNION METAL MFG. CO. SEE TABLE BELOW (STANDARDS) | AS REQ'D | AS REQ'D | AS REQ'D | AS REQ'D | AS REQ'D | AS REQ'D | SEE TABLE BELOW | |
| 2 | UPSWEPT BRACKET, 2" I.P.S. | 1 | 1 | 1 | 1 | 1 | 1 | 167296-6' | |
| 3 | MERCURY VAPOR LAMP | 1 | 1 | 1 | 1 | 1 | 1 | PG. 4410 | |
| 4 | MERCURY VAPOR LUMINAIRE, | REGULATOR BALLAST | 1 | 1 | 1 | - | - | - | PG. 4420 |
| | | REACTOR BALLAST | - | - | - | 1 | 1 | 1 | |
| 5 | PHOTOELECTRIC CONTROL, TWISTLOCK BASE. | 105-285 VOLT | 1 | 1 | 1 | - | - | - | 273888 |
| 6 | WIRE, #8 THW, 600V, ALUMINUM INSULATED CABLE | 1023K | 62' | 67' | 73' | 62' | 67' | 73' | 196176 |
| | | 938K | 70' | 75' | 81' | 70' | 75' | 81' | |

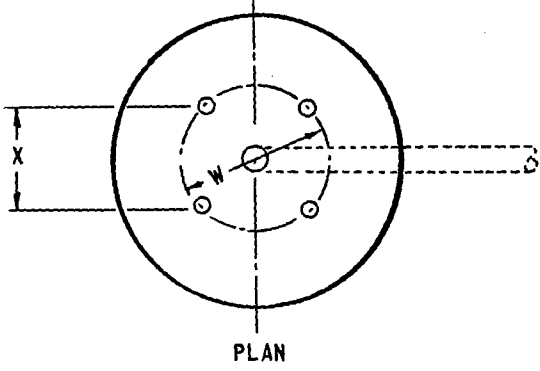
| STANDARDS | | | | | | | |
|-----------|---|--------|-----------|--------|-----------|--------|-----------|
| LUMEN | PACIFIC UNION METAL COMPANY OR EQUIVALENT | 4' | STOCK NO. | 6' | STOCK NO. | 8' | STOCK NO. |
| 7000 | 1023K | 26'-0" | - | 26'-9" | 677792 | 27'-5" | - |
| 10000 | 938K | 30'-0" | - | 30'-9" | 677856 | 31'-5" | - |
| 20000 | 938K | 30'-0" | - | 30'-9" | 677856 | 31'-5" | - |

NOTES:

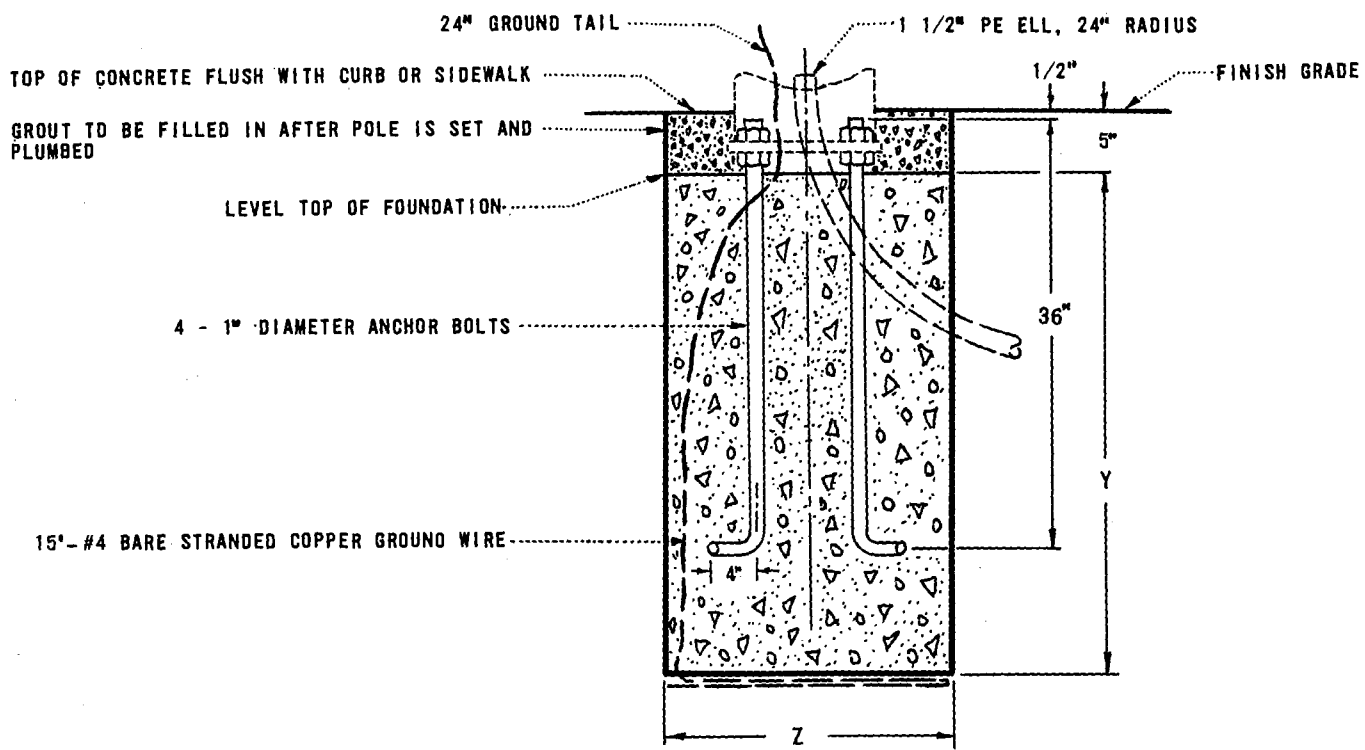
- A. FOR STREET LIGHT FOUNDATIONS SEE PAGE 4472
- B. INSTALL FUSE HOLDER AT BASE OPENING.
- C. DOUBLE MOUNTING BRACKETS TO BE ORDERED SEPARATELY AND SPECIAL.

| | | | |
|---------------------------------|--|--|-------|
| APP'D <i>AWK</i> DATE 6-2-76 | SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS | | 4499. |
| | STREET LIGHTING MULTIPLE MERCURY VAPOR LUMINAIRE | | |

FOR FIELD MAINTENANCE ONLY



PLAN



ELEVATION

- NOTES:**
- A. CONCRETE USED FOR FOUNDATIONS TO BE CLASS 'A' 5 1/2 SACK, MINIMUM.
 - B. FOR PRESTRESSED CONCRETE POLES SEE SPECIFICATION 132.
 1. FOUNDATION DEPTH IS BASED ON AVERAGE SOIL CONDITIONS. IF SOIL IS LOOSE, USE THE FOLLOWING PROCEDURE:
 1. EXCAVATE TO THE FOUNDATION DEPTH (Y) SPECIFIED WITH A MINIMUM BOTTOM DIAMETER FOR A 3' - 6" ROUND FORM.
 2. FORM AND PLACE 3' - 6" DIAMETER FOUNDATION, INCLUDING THE ANCHOR BOLTS PLACED IN THE PROPER BOLT CIRCLE (W) AND BOLT SQUARE (X).
 3. BACKFILL TO BE WELL TAMPED.

| FOUNDATION REFERENCE NUMBER | LIGHTING STANDARD STOCK NO. | BOLT CIRCLE (W) | BOLT SQ. (X) | FOUNDATION | | CONCRETE (CU. YDS.) | FOUNDATION REFERENCE NUMBER | LIGHTING STANDARD STOCK NO. | BOLT CIRCLE (W) | BOLT SQ. (X) | FOUNDATION | | CONCRETE (CU. YDS.) |
|-----------------------------|-----------------------------|-----------------|--------------|------------|----------|---------------------|-----------------------------|-----------------------------|-----------------|--------------|------------|----------|---------------------|
| | | | | DEPTH (Y) | DIA. (Z) | | | | | | DEPTH (Y) | DIA. (Z) | |
| 3 | 677856 | .21" | 14 7/8" | 43" | 30" | .65 | 3 | 677904 | 12 1/2" | 8 7/8" | 42" | 24" | .41 |
| | 677872 | | | 43" | 30" | | | 677748 | | | | | |
| | 677792 | 677808 | 43" | 24" | 874908 | | | | | | | | |
| 4 | 677888 | 14" | 9 7/8" | 42" | 24" | .42 | 4 | 677742 | 15 1/4" | 10 3/4" | 42" | 24" | .41 |
| | 677912 | | | 42" | 24" | | | 677736 | | | | | |
| | 677754 | 12 1/2" | 8 7/8" | 42" | 24" | | | .41 | | | | | |

SAN DIEGO GAS & ELECTRIC COMPANY UNDERGROUND STANDARDS

19.702

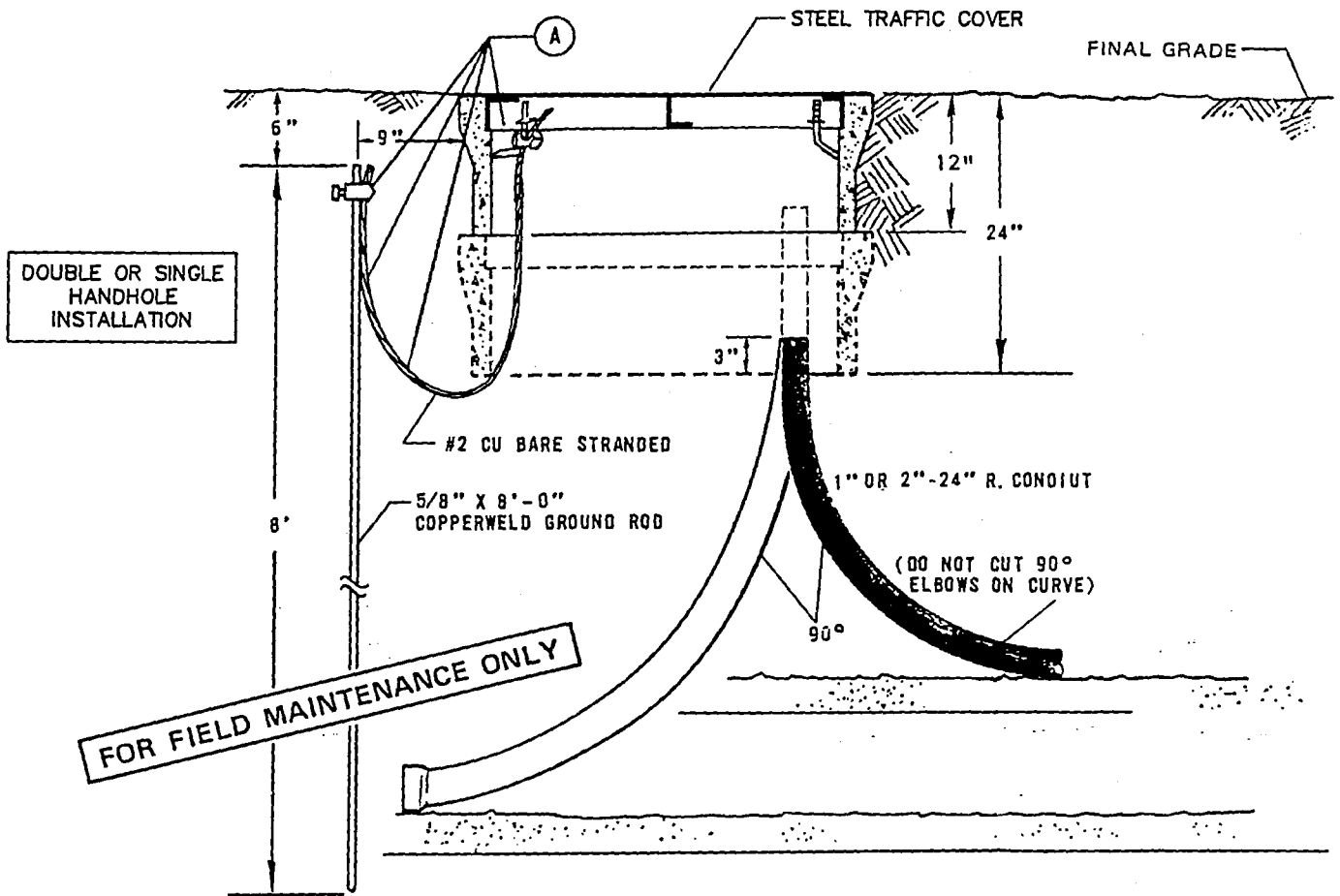
**FOUNDATION DETAIL
PRESTRESSED CONCRETE LIGHT STANDARDS**

DATE 6-2-76

APPD *J.W.K.*

SCOPE: THIS STANDARD SHOWS THE GROUND ROD INSTALLATION FOR 3312 HANDHOLES WITH STEEL COVERS.

GROUND ROD INSTALLATION 3312 HANDHOLE WITH STEEL COVER



INSTALLATION:

- (A) ALL EXISTING 3312 HANDHOLES WITH STEEL COVERS SHALL BE SAFETY GROUNDED BY DRIVING A 5/8" X 8'-0" COPPERWELD GROUND ROD (STOCK NUMBER 603072) AND ATTACHING A #2 CU WIRE (STOCK NUMBER 812816) WITH A GROUND ROD CLAMP (STOCK NUMBER 230016 (E)). THE OTHER END OF THE WIRE SHALL BE ATTACHED TO THE HANDHOLE "L" BOLT OR SWING BOLT WITH A 2-STRAND CONNECTOR (STOCK NUMBER 269536 (E)). USE ONLY ONE GROUND PER INSTALLATION, ONE OR TWO HANDHOLES.

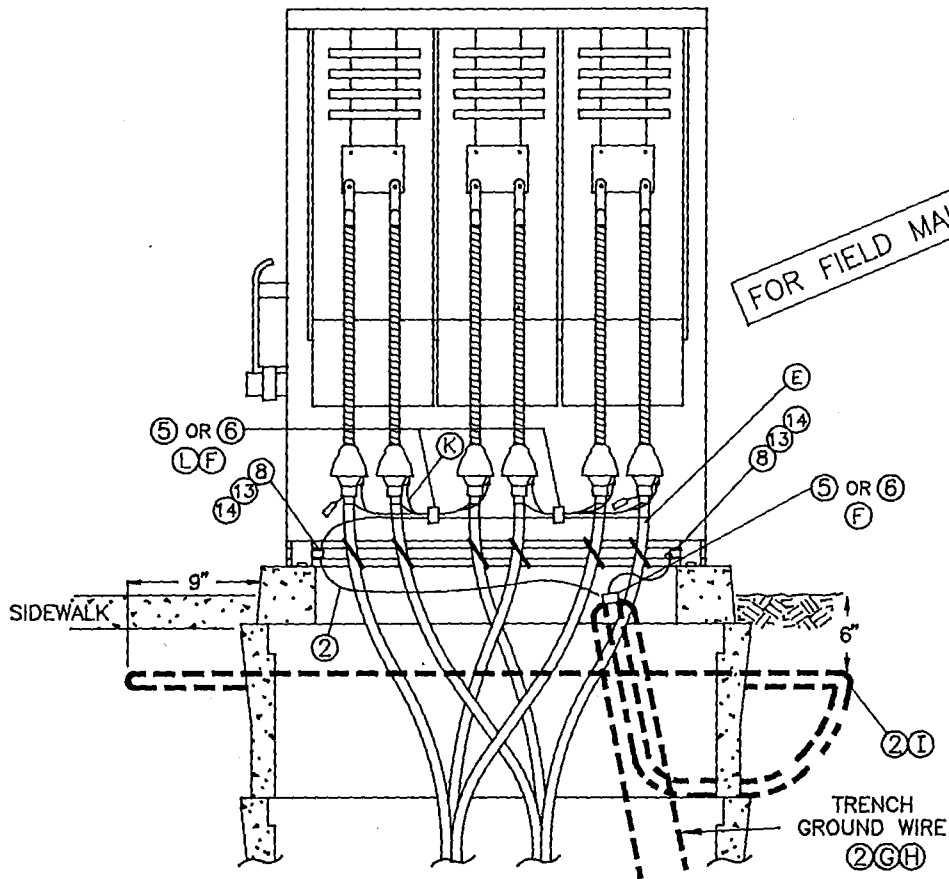
SDG&E ELECTRIC STANDARDS

DATE .1-1-90

APPD *SLC/B*

3312 HANDHOLE
STEEL COVER GROUNDING

4599.001

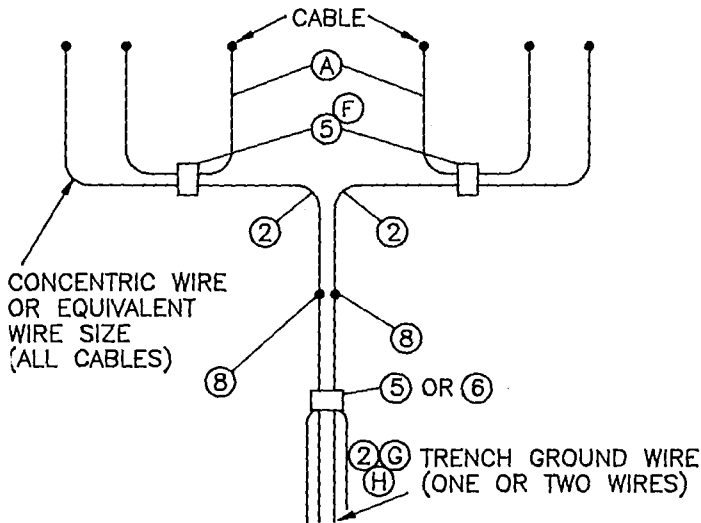


3520/3521 THREE-PHASE TERMINATING ENCLOSURE

GROUNDING DETAILS

FRONT SIDE

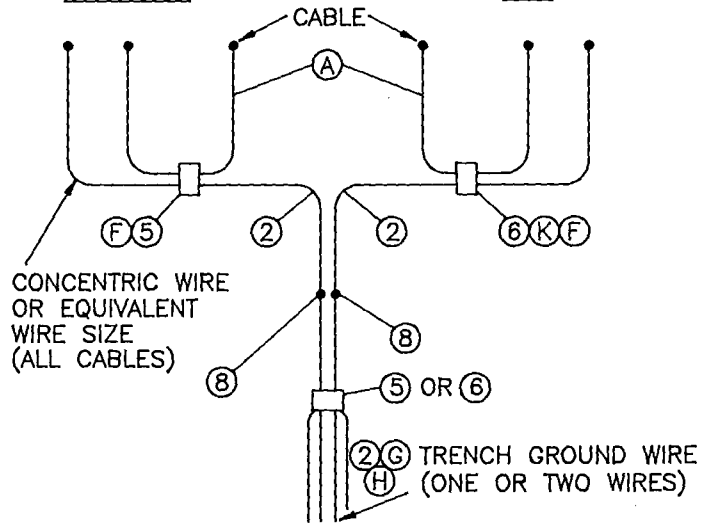
BACK SIDE



3521 - 2/0 CABLE & SMALLER

2/0 CABLE AND
SMALLER SIDE

350 KCMIL - 1000 KCMIL
SIDE



3520 - 1000 KCMIL & SMALLER

4599.201
SUPERCEDES
520.3 1-1-94

SDG&E ELECTRIC STANDARDS

GROUNDING PAD-MOUNTED EQUIPMENT

DATE 1-1-94
APPD *JLB/RS*

BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | STOCK NUMBER | ASSEMBLY UNITS |
|------|--|----------|--------------|----------------|
| 1 | #14 SOLID CU OR A SURPLUS STRAND OF CONCENTRIC NEUTRAL | AS REQ'D | - | - |
| 2 | WIRE, BARE COPPER, #2, 7 STR. SOFT DRAWN | AS REQ'D | 812816 (M) | GDWIRE |
| 3 | WIRE, BARE COPPER 1/0 STR. SOFT DRAWN | AS REQ'D | 812752 (M) | - |
| 4 | WIRE, BARE COPPER 4/0 STR. SOFT DRAWN | AS REQ'D | 812764 (M) | 4/0-SD |
| 5 | CONNECTOR, COMPRESSION 1/0 - 1/0 | AS REQ'D | 257760 | - |
| 6 | CONNECTOR, COMPRESSION 4/0 - 1/0 | AS REQ'D | 257856 | - |
| 7 | CONNECTOR, COMPRESSION 4/0 - 4/0 | AS REQ'D | 257824 | - |
| 8 | SERVICE POST CONNECTOR | AS REQ'D | 262560 | - |
| 9 | GROUND CONNECTOR PROVIDED WITH EQUIPMENT | - | - | - |
| 10 | GROUND ROD CLAMP | 2 | 230016 | - |
| 11 | UNISTRUT, CHANNEL FITTING, 1 7/8" X 2" | AS REQ'D | 348960 | - |
| 12 | ANCHOR, CONCRETE STAINLESS STEEL, 1/2" X 3 3/4" | AS REQ'D | 107654 | - |
| 13 | NUT, HEXAGON BRONZE, 1/2" | 2 | 506112 | - |
| 14 | WASHER, STANDARD FLAT ROUND, BRONZE 1/2" | 2 | 799488 | - |

INSTALLATION:

- (A) CONCENTRIC NEUTRAL TAILS OR EQUIVALENT WIRE SIZE PER PHASE (SEE STANDARD 4172 FOR EQUIVALENT WIRE SIZE).

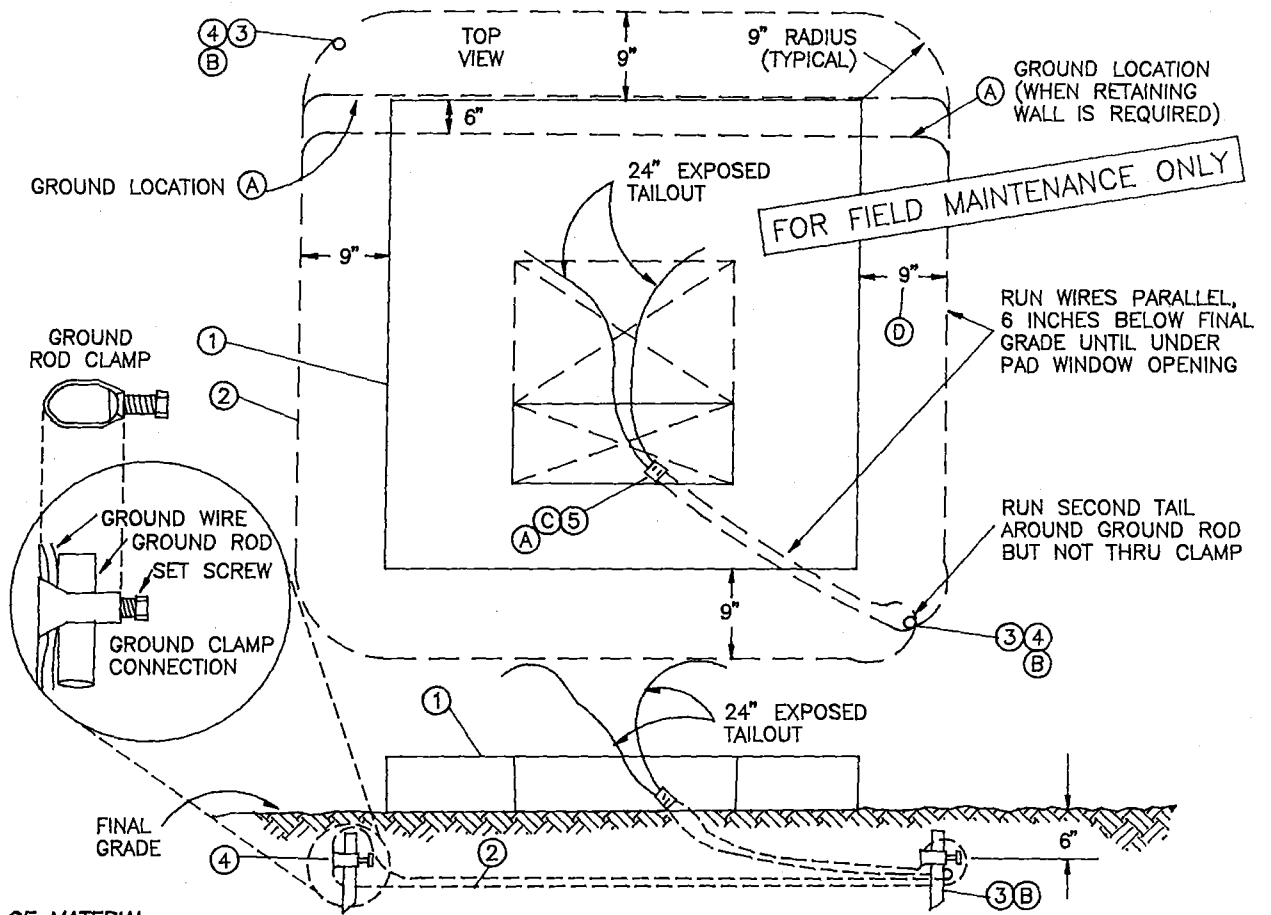
REFERENCE:

- (E) SEE STANDARD 4108 FOR SEALING JACKETED CABLE.
- (F) SEE STANDARD 4172 FOR CONCENTRIC NEUTRAL/COMPRESSION CONNECTOR APPLICATION CHART AND COPPER COMPRESSION CONNECTORS.
- (G) SEE STANDARD 4510 FOR (PREFERRED I) AND (ALTERNATE) TRENCH GROUND WIRE INSTALLATION.
- (H) SEE STANDARD PAGE 4512.1 FOR (PREFERRED II) PAD GROUNDING INSTALLATION.
- (I) SEE STANDARD 4512 FOR PAD GROUNDING INSTALLATION.
- J. SEE STANDARD 4514 FOR GROUNDING TELCO CONDUCTOR IN PAD-MOUNTED EQUIPMENT.
- (K) SEE STANDARD 4525 FOR CONCENTRIC NEUTRAL TERMINATIONS AND GROUNDING PREMOLDED CONNECTORS.
- (L) SEE STANDARD 4530 FOR NEUTRAL AND GROUND WIRE SCHEMATIC DIAGRAM.
- (M) SEE STANDARD 4002.2 FOR WIRE INFORMATION.

FOR FIELD MAINTENANCE ONLY

| | | |
|-----------------------------------|---|---|
| DATE 1-1-94 APPD <i>JLB/RD</i> | SDG&E ELECTRIC STANDARDS GROUNDING PAD-MOUNTED EQUIPMENT | 4599.202 SUPERCEDES 4520.5 1-1-94 |
|-----------------------------------|---|---|

SCOPE: THIS STANDARD SHOWS THE PAD GROUNDING INSTALLATION USED TO PROVIDE EQUIPMENT GROUNDING. THIS METHOD SHALL BE USED WHEN DIFFERENT PARTIES ARE RESPONSIBLE FOR THE CONDUIT AND PAD INSTALLATION. USE PREFERRED OR ALTERNATE TRENCH GROUND WIRE IN STANDARD 4510 WHEN THE SAME PARTY IS RESPONSIBLE FOR CONDUIT AND PAD INSTALLATION.



BILL OF MATERIAL:

| ITEM | DESCRIPTION | QUANTITY | STOCK NUMBER | ASSEMBLY UNITS |
|------|--|-----------|---------------------|----------------|
| 1 | PAD (TYPICAL) | 1 | REFER TO WORK ORDER | -- |
| 2 | WIRE, BARE COPPER, #2, 7 STR. SOFT DRAWN | AS REQ'D. | 812816 (K) | GDWIRE |
| 3 | GROUND ROD, 5/8" X 8'-0", COPPERWELD | 2 | 603072 | -- |
| 4 | GROUND ROD, CLAMP | 2 | 230016 | -- |
| 5 | CONNECTOR, COMPRESSION | 1 | 257760 (C) | -- |

INSTALLATION:

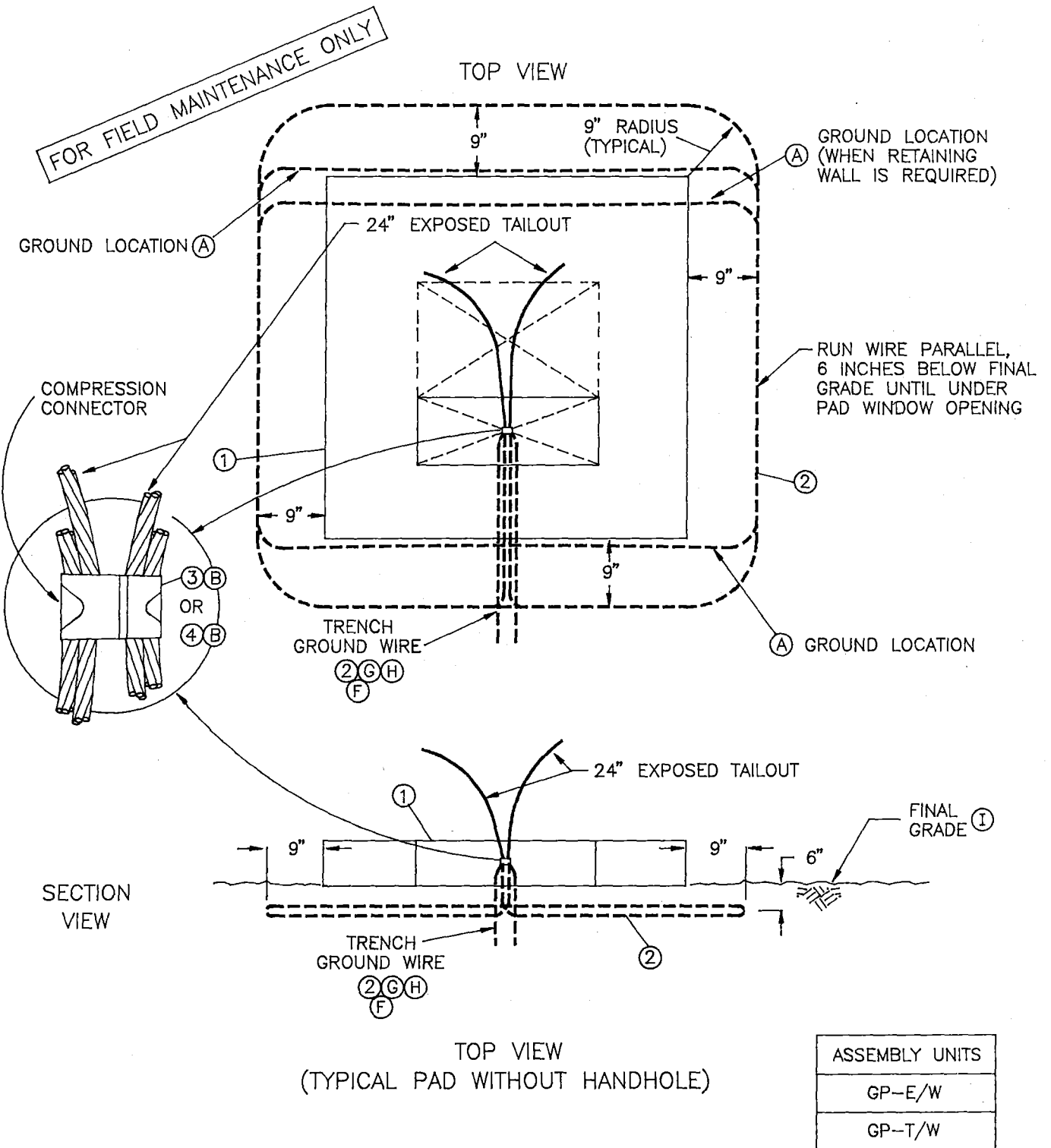
- (A) INSTALL GROUND GRID AT THE EDGE OF PAD (ON ANY SIDE) WHERE THE 9 INCH DISTANCE REQUIRED AROUND PAD CANNOT BE MET. IN GROUND GRID INSTALLATIONS WHERE A RETAINING WALL IS REQUIRED, GROUND GRID MAY BE INSTALLED 6 INCHES UNDER PAD (ON ANY SIDE), AS SHOWN. SQUEEZE THE GROUND WIRES TOGETHER WITH A COMPRESSION CONNECTOR (ITEM 5).
- (B) GROUND RODS TO HAVE 6 FOOT MINIMUM SEPARATION.
- (C) SDG&E SHALL FURNISH AND INSTALL THE COMPRESSION CONNECTOR (ITEM 5).
- (D) FOR PAD-MOUNTED CAPACITOR INSTALLATION, THE PAD GROUND SHALL BE INSTALLED UNDER THE OUTER EDGE OF THE PAD SO IT WILL NOT ENCROACH PRIVATE PROPERTY (OUTSIDE OF RIGHT-OF-WAY).

REFERENCE:

- G. SEE STANDARD 3211 FOR EQUIPMENT PAD IDENTIFICATION.
- H. SEE STANDARDS 3426 AND 3427 FOR PAD INSTALLATIONS OVER HANDHOLES.
- I. SEE STANDARD 4510 FOR (PREFERRED I) AND (ALTERNATE) TRENCH GROUND WIRE INSTALLATIONS.
- J. SEE STANDARD 4514 FOR GROUNDING TELCO CONDUCTOR IN PAD-MOUNTED EQUIPMENT.
- (K) SEE STANDARD 4002.2 FOR WIRE INFORMATION.

| | | |
|-----------------------------|--|----------|
| SDG&E ELECTRIC STANDARDS | | |
| DATE 1-1-96 APPD JLB/ROJ | PAD GROUNDING INSTALLATION (PREFERRED II) | 4599.203 |

SCOPE: THIS STANDARD SHOWS PAD GROUNDING INSTALLATION USED WHEN (PREFERRED I) OR (ALTERNATE) TRENCH GROUND WIRE IS INSTALLED, STANDARD 4510. SUBSTITUTE GROUND RODS SHOWN ON STANDARD PAGE 4512.1 FOR TRENCH GROUND WIRE IF (PREFERRED I) OR (ALTERNATE) INSTALLATIONS DO NOT APPLY.



SDG&E ELECTRIC STANDARDS

DATE 1-1-96

APPD *JLB/RD*

PAD GROUNDING INSTALLATION

4599.204