



Overhead Distribution Construction Standards

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Engineering_Standards@srpnet.com

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REVISION LOG

| Revisions Previous to 04/25/2024 | | | |
|---|--|------------|--|
| Standard Title | Standard Change | Date | |
| All | Republication | 04/25/2024 | |
| Basic Assembly Units – Primary, Angle & Deadend Clamps | Deadend Clamps, Missing | 06/04/2024 | |
| Basic Assembly Units – Cutout-Arrester Combinations for Transformers | 3-Bolt Clamp Removal, T-Bracket Update | 09/12/2024 | |
| 12 kV Line Devices – 600 A Pole Mounted Disconnects, Crossarm Construction | 'Y-Shackle', Repl. Ext. Strap & Anchor Shackle | 12/26/2024 | |
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| Overhead Distribution | | | |
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| Construction Standards | | ISSUE DATE: | 04/30/24 |
| S | REVISION LOG | REV. DATE: | |
| | | APPROVAL: | J. Robbins |
| PROPRIETARY MATERIAL | i | OHRevisio | nLog.doc |

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1. PURPOSE AND SCOPE

- A. THE FOLLOWING OVERHEAD DISTRIBUTION LINE CONSTRUCTION STANDARDS ADDRESS THE MAJORITY OF CONSTRUCTION ISSUES.
- B. IT IS IMPERATIVE TO MAINTAIN STANDARDIZATION, AND THAT COMPLETED JOB ORDERS REFLECT ANY CHANGES ON THE INSTALLATION RECORDS TO ASSURE THAT ALL RECORD SYSTEMS REFLECT THE ACTUAL LOCATION AND FACILITIES AS THEY HAVE BEEN CONSTRUCTED. THE ACCURACY OF CONSTRUCTION TO STANDARDS WILL ALLOW SRP TO EXPEDITE FUTURE LOCATING, REBUILDING OR REPAIRING OF THESE FACILITIES TO IMPROVE CUSTOMER SERVICE.

2. HOW TO USE THIS BOOK

- A. REVISIONS ARE INDICATED BY RED FONT COLOR.
- B. TITLE BLOCKS ARE USED TO HOLD INFORMATION ABOUT THE BOOK, SECTION, AND STANDARD AND ARE LOCATED AT THE BOTTOM OF THE PAGE.
 - 1. "APPROVAL" REFERS TO THE ENGINEER RESPONSIBLE FOR THAT STANDARD.
 - 2. "ISSUE DATE" IS WHEN THE STANDARD WAS ORIGINALLY CREATED.
 - 3. REVISION DATE ("REV DATE") IS THE DATE THE STANDARD WAS LAST UPDATED. NOTE THAT STANDARDS ARE REVIEWED PERIODICALLY BY THE RESPONSIBLE ENGINEER, AND IF NO UPDATES ARE NECESSARY IN THAT REVIEW, THE REV DATE WILL REMAIN UNCHANGED.
 - 4. REVISION STATEMENTS ARE A SUMMARY OF THE CHANGES MADE ON THE PAGE AND ARE LOCATED AT THE TOP OF THE TITLE BLOCK.
 - 5. IF A REVISION RESULTS IN THE COMPLETE REMOVAL OF A DIAGRAM OR AN ENTIRE SECTION OF A DIAGRAM OR A COMPLETE SECTION OF TEXT, A BRIEF EXPLANATION OF THE REMOVAL WILL BE ENTERED IN THE REVISION STATEMENT LOCATION OF THE TITLE BLOCK.
 - 6. REVISIONS TO FORMATTING AND CORRECTIONS TO TYPOGRAPHICAL ERRORS AND/OR PAGE NUMBERS WILL NOT BE NOTED AS A REVISION DATE CHANGE, HOWEVER, IT WILL BE INDICATED IN RED AND ENTERED AS A CHANGE IN THE STANDARDS REVISION LOG.
- C. UTILIZING SRP STANDARDS
 - 1. WHEN UTILIZING SRP'S STANDARDS IN DESIGN PROJECTS, MODIFICATION OF SAID STANDARDS IS NOT PERMITTED.
 - 2. DETAILS OR IMAGES MAY BE EXTRACTED AND USED IN DESIGN PROJECTS WHEN THEY DO NOT INCLUDE THE TITLE BLOCK OF THE STANDARD AND ARE NOT PRESENTED AS A STANDARD.

3. CHANGES TO STANDARDS

THESE OVERHEAD DISTRIBUTION CONSTRUCTION STANDARDS ARE SUBJECT TO UPDATE AND MODIFICATION AT ANY TIME. PRINTED COPIES OF THIS BOOK MAY NOT INCLUDE THE MOST UP-TO-DATE STANDARDS, REFERENCES, OR REQUIREMENTS.

TO ACCESS CURRENT STANDARDS, VISIT OUR WEBSITE: <u>HTTPS://WWW.SRPNET.COM/DOING-BUSINESS/BUILDERS-DEVELOPERS-</u> <u>CONTRACTORS/COMMERCIAL-SPECIFICATIONS-GUIDELINES-HANDBOOKS</u>



4. CONTACT INFORMATION

A. BUSINESS AND RESIDENTIAL

| ELECTRICAL EMERGENCIES | NOTE: CALL 9-1-1 FIRST FOR MEDICAL EMERGENCIES | (602) 236-8811 |
|---------------------------------------|---|--|
| | FALLEN POWER LINES, ARCING, ELECTRIC SHOCK, DAMAGE TO SRP FACILITIES | |
| RESIDENTIAL | GENERAL INFORMATION, BILLING INQUIRIES, POWER OUTAGES, MAINTENANCE OF SRP FACILITIES, TEMPORARY DISCONNECT FROM SRP FACILITIES, INSPECTIONS | (602) 236-8888 |
| BUSINESS CENTER | GENERAL INFORMATION, BILLING INQUIRIES, MUNICIPAL CUSTOMERS, PUBLIC AGENCY CUSTOMERS, INSPECTIONS, TEMPORARY DISCONNECT FROM SRP FACILITIES | (602) 236-8833 |
| SPANISH | LA LINEA – Servicio en Español | (602) 236-1111 |
| SRP WATER (IRRIGATION) | EMERGENCIES, WATER (IRRIGATION), FLOODING, GENERAL INFORMATION, BILLING INQUIRIES, IRRIGATION ORDERS, SCHEDULE TIME INQUIRIES | (602) 236-3333 |
| LOCATION OF UNDERGROUND FACILITIES | NATIONAL "CALL BEFORE YOU DIG" NUMBER ("ONE CALL" OFFICE) | 811 |
| BLUE STAKE | WITHIN MARICOPA COUNTY OUTSIDE OF MARICOPA COUNTY | (602) 263-1100 (800) 782-5348 |
| SRP EARTHWISE SOLAR ENERGY | MAIN LINE RESIDENTIAL PHOTOVOLTAIC RESIDENTIAL SOLAR WATER HEATERS COMMERCIAL PHOTOVOLTAIC (SOLAR | (602) 236-4448 (602) 236-4661 (602) 236-4662 |
| | | (002) 230-4663 |

B. ADDITIONAL RESOURCES

| GRAPHIC RECORDS: | CONTRACT CONSTRUCTION COMPANIES CAN REQUEST PRINTING SERVICES ONLINE AT <u>SRPNET.COM/ELECTRIC/BUSINESS/GRAPHICREQUEST.ASPX</u> |
|---------------------------------|---|
| STANDARDS-RELATED QUESTIONS: | EMAIL ENGINEERING_STANDARDS@SRPNET.COM |
| SRP'S WEBSITE: | SRPNET.COM RESIDENTIAL / BUSINESS ELECTRIC / WATER ASSISTANCE INFORMATION. |

| Construction Standards | SUE DATE: (| 03/22/18 |
|-------------------------|-------------|----------|
| | EV. DATE: | |
| | PPROVAL: S | 3. Duran |
| PROPRIETARY MATERIAL IV | OHIntro.doc | > |

5. AREA BUSINESS OFFICE LOCATIONS

6. REFERENCES

THERE ARE NUMEROUS DOCUMENTS AND STANDARDS THAT WERE USED IN DEVELOPING THESE GUIDELINES. MANY OF THESE DOCUMENTS ARE MODIFIED AND UPDATED OVER TIME. A PARTIAL LIST OF DOCUMENTS USED IS INCLUDED BELOW:

- NATIONAL ELECTRIC CODE (NEC)
- NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
- NATIONAL ELECTRIC SAFETY CODE (NESC)
- UNDERWRITER LABORATORIES (UL)
- VARIOUS STATE AND MUNICIPAL REQUIREMENTS



SECTION 1: MISCELLANEOUS & CONNECTORS

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| SECONDARY OR COLD PRIMARY WORK, CONDUCTORS, #6 SOLID THRU 500 MCM | 1-13-3 |
| CONNECTORS, FOR HOT PRIMARY WORK, CONDUCTORS, #6 SOLID THRU 397.5 MCM STRANDED AND DIES | 1-13-4 |
| CONNECTORS, LARGE CONDUCTORS, CONDUCTORS, #1/0 THRU 795 MCM AND DIES | 1-13-5 |
| CONNECTORS, COPPER COMPRESSION, NON-TENSION SLEEVES & SERVICE ENTRANCE SLEEVES | 1-13-6 |
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JUA

THE COMPATIBLE UNIT JUA HAS BEEN ESTABLISHED TO SATISFY PLANT ACCOUNTING REQUIREMENTS. A BILL OF MATERIAL IS NOT GENERATED BY THIS UNIT.

USE THIS COMPATIBLE UNIT WHENEVER DISTRIBUTION PRIMARY, SECONDARY OR NEUTRAL CONDUCTORS ARE ATTACHED TO A POLE NOT OWNED BY SRP OR WHEN SUCH CONDUCTORS ARE ATTACHED TO AN SRP-OWNED TRANSMISSION POLE.

WHEN COMPATIBLE UNIT JUA IS INVOLVED, IT MUST BE SHOWN ON THE GRID PORTION OF THE GRID SKETCH. ANY OR ALL ATTACHING HARDWARE CONSTITUTES ONE SUCH ATTACHMENT.

THE COMPATIBLE UNIT JUA IS NOT APPLICABLE TO STREET LIGHTING, DUSK TO DAWN CONDUCTORS, PILOT WIRE OR ACCESSORIES.

RJUA

THIS CODE IS USED SIMILARLY TO THE RW SERIES FOR POLES. THAT IS, WHENEVER FRAMING THAT REPRESENTS A JUA IS TO BE REMOVED, THE CODE RJUA MAY BE USED. QUANTITY SHOWN MUST BE PRECEDED BY THE ACTIVITY CODE "R". THIS WILL PROVIDE A MANHOUR ESTIMATE AS A PERFORMANCE MEASUREMENT FOR REMOVAL OF HARDWARE AND A CPR UNIT FOR ACCOUNTING. AS WITH THE RW POLE SERIES, RJUA POLE HARDWARE SHOULD NOT BE LISTED UNLESS IT REPRESENTS ADDITIONAL CPR UNITS, OR IF IT IS NOT A PART OF THE GENERAL POLE HARDWARE, SUCH AS TRANSFORMERS, GUYS, ETC.

THE COMPATIBLE UNIT RJUA IS NOT APPLICABLE TO STREET LIGHTING, DUSK TO DAWN CONDUCTORS, PILOT WIRE OR ACCESSORIES.

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| Construction Standards | MISCELLANEOUS | ISSUE DATE: | 08/29/73 |
| | CODES FOR | REV. DATE: | 06/22/11 |
| | JOINT USE ATTACHMENT | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 1-1-1 | 8512E355 | .DGN |
| | | | |

RPT

REMOVE POLE TOP

USE THE COMPATIBLE UNIT RPT WHEN TOPPING ANY POLES, INCLUDING SRP OR FOREIGN OWNED.

TELCO POLES WILL BE TOPPED APPROXIMATELY ONE FOOT ABOVE THE TELEPHONE ATTACHMENT, UNDER THE FOLLOWING CIRCUMSTANCES:

- 1. ON REQUEST OF US WEST WHEN THE POLE THEY WISH TO REMOVE IS IN AN SRP POWER LINE (ANY VOLTAGE)
- 2. WHEN SRP REPLACES AN EXISTING TELCO POLE IN AN EXISTING OR NEW SRP POWER LINE (ANY VOLTAGE)

THE DECISION TO TOP A TELCO POLE SHOULD BE BASED ON THE KNOWLEDGE THAT US WEST WILL REMOVE THE POLE.

TELCO POLES ARE TOPPED TO REDUCE THE HAZARD OF CONTACTING OVERHEAD POWER LINES WHEN THE POLES ARE REMOVED.

COMPATIBLE UNIT RPT MUST BE ENTERED BY THE DESIGNER ON LINES 13 THROUGH 18 OF THE GRID SKETCH.



REMOVE FOREIGN CONDUCTOR



REMOVE FOREIGN POLE



REMOVE FOREIGN DISCONNECT SWITCH

USE COMPATIBLE UNITS RFC, RFD AND RFP WHEN REMOVING CONDUCTORS, DISCONNECT SWITCHES OR POLES OWNED BY CUSTOMERS FOR WHICH SRP HAS RESPONSIBILITY BY CONTRACT (INDIAN SERVICE - IS OR ROOSEVELT WATER CONSERVATION DISTRICT - RWCD). ENTER THE CODES AS FOLLOWS:

RFC ON LINE 4, 7, OR 9 OF THE GRID SKETCH, AS APPLICABLE

RFD ON ANY LINE, 13 THROUGH 18. THE QUANTITY SHOWN REFLECTS THE NUMBER OF SWITCHES REMOVED.

RFP ON LINE 19



CUT AND REPAIR ASPHALT

| CRC CUT AND REPAIR CONCRETE |
|-----------------------------|
|-----------------------------|

USE THE COMPATIBLE UNITS CRA AND CRC TO PROVIDE MANHOURS NECESSARY TO CUT AND REPAIR ASPHALT AND CONCRETE FOR INSTALLATION OR REMOVAL OF POLES AND ANCHORS.



PHASE BALANCE - PROVIDES 2 1/2 HOURS FOR A 4 MAN CREW.

ENTER THESE UNITS IN THE MISCELLANEOUS SECTION OF THE GRID SKETCH (LINES 13-18).

| Overhead Distribution | | | |
|------------------------|---------------------------|-------------|-----------|
| Construction Standards | MISCELLANEOUS | ISSUE DATE: | 07/13/05 |
| | REMOVAL, REPAIR AND PHASE | REV. DATE: | 05/05/11 |
| | BALANCE CODES | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 1-2-1 | 8512E485 | 5.DGN |



| Overhead Distribution | | | |
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| Construction Standards | | ISSUE DATE: | 10/19/83 |
| | MISCELLANEOUS | REV. DATE: | 05/15/13 |
| | | APPROVAL: | B. PRIEST |
| | 1-3-1 | 8512E23 | .DGN |

DISTRIBUTION LINE DEVICE NUMBER (RISER, RECLOSER, SECTIONALIZER, CAPACITOR BANK, SINGLE BLADE DISCONNECTS, FRINGE AREA INTERCONNECTION FUSE OR GANG OPERATED SWITCH) 1X1.5" ADHESIVE BACKED ALPHA CHARACTERS AND 1-3/4" X 2-7/8"ADHESIVE BACKED NUMERIC CHARACTERS PLACED ON ALUMINUM SHEET (5035692)

NOTE: FOR POLE RISERS SEE UG12-7-7. NOT ALL RISERS ARE MARKED ON THE POLE.

STREET LIGHT NUMBER-1X1.5" CHARACTERS PLACED ON AN ADHESIVE BACKED 1-1/2" X 12" PLATE (5035695) (DISTRIBUTION USE ONLY)

MILE POST COORDINATES 1"x1-1/2" ALPHA, 1-3/4"X2-7/8" NUMERIC PSL ON ALUMINUM PLATE (5035692)

TRANSMISSION STRUCTURE NUMBER 1-3/4"X2-7/8" NUMERIC PSL ON ALUMINUM PLATE (5035692).

TRANSMISSION SWITCH NUMBER, 1"x 1-1/2" ALPHA, 1-3/4"x2-7-8" NUMERIC PSL ON ALUMINUM PLATE (5035692)

POLE INSPECTION TAGS - ALL POLES (POLE INSPECTION CREW USE)

POLE TAG SHOWING SRP OWNERSHIP (5029151). (TRANSMISSION USE ONLY)

IF DISTRIBUTION TRANSFORMER ON POLE HAS CO-GENERATION, PLACE "CO-GEN", 1-3/4" X 2-7/8" NUMERIC PSL ON ALUMINUM PLATE (5035692).

NOTES



1. ANY POLE LOCATED AT A MILE COORDINATE POINT IN AN AREA LACKING AN INTERSECTION OF BOTH MILE ROADS IS TO BE LABELED WITH THAT COORDINATE POINT. THE COORDINATE LABELING IS TO READ IN A HORIZONTAL DIRECTION ON THE POLE, WITH ONE DIRECTION COORDINATE IMMEDIATELY BELOW THE OTHER.

- 2. ANY POLE HAVING A STREETLIGHT, RECLOSER, CAPACITOR BANK, SET OF SINGLE BLADE DISCONNECTS, GANGED LOAD BREAK SWITCH, OR POLE RISER IS TO BE LABELED WITH THE PROPER LINE DEVICE NUMBER. THIS NUMBER IS TO BE ATTACHED IN A VERTICAL DIRECTION READING TOP TO BOTTOM ON THE POLE.
- 3. POLES ARE TO HAVE MARKINGS INSTALLED ON THE MOST VISIBLE SIDE OF THE POLE; e.g; A POLE ON A NORTHEAST CORNER OF AN INTERSECTION SHOULD HAVE MARKINGS FACING WEST, OR SOUTH. THE MARKINGS SHALL NOT COVER THE POLE BRAND.
- 4. THE ALUMINUM SHEETS ARE ATTACHED TO THE WOOD POLES WITH SPECIAL SCREW NAILS STOCK # 5006221. THE 1 INCH ADHESIVE LABELS FOR STREETLIGHTS ARE APPLIED TO A 10 INCH PLASTIC PLATE WHICH IS THEN ATTACHED TO THE POLE WITH THE SPECIAL SCREW NAILS. ON STEEL POLES, IF PLATE THICKNESS IS 1/2" OR LESS THE SELF DRILL/SELF TAPPING SCREWS (5028982) MAY BE USED. IF PLATE THICKNESS IS GREATER THAN 1/2" DRILL 3/16" DIAMETER HOLE FOR SELF DRILL/SELF TAP SCREWS (5028982).
- 5. THE OWNER OF THE LIGHT SHALL PLACE STREET LIGHT NUMBERS AT 12' ON SHARED POLES (AS SHOWN ABOVE) AND 8' ON DEDICATED "STREET LIGHT" POLES.
- 6. PLACEMENT OF POLE MARKINGS SHALL BE IN ACCORDANCE WITH FIGURE 1. IF THRU-BOLTS OR OTHER SRP HARDWARE IMPEDE THE SPECIFIED LOCATION OF THE POLE MARKINGS, PLACEMENT OF POLE MARKINGS MAY BE ADJUSTED. EVERY EFFORT MUST BE MADE TO LOCATE THE MARKINGS AS CLOSE AS POSSIBLE TO THE INDICTED POSITIONS.

| Overhead Distribution | | | |
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| Construction Standards | | ISSUE DATE: | 08/25/87 |
| ® | MISCELLANEOUS POLE MARKING AND IDENTIFICATION | REV. DATE: | 12/23/20 |
| | | APPROVAL: | J. LUERA |
| PROPRIETARY MATERIAL | 1-4-1 | 8512E250 | DGN |
| | | | |

WOOD POLES ARE INSPECTED AND CLASSIFIED AS: SERVICEABLE - POLE STRENGTH MEETS CODE REQUIREMENTS. REINFORCEABLE - POLE MUST BE REINFORCED DUE TO WEAKENED GROUND LINE.

MOST INSPECTED POLES HAVE ALUMINUM INSPECTION TAGS WITH THE YEAR OF INSPECTION AND THE NAME OF THE INSPECTION CONTRACTOR. POLES TREATED WITH OSMOPLASTIC HAVE NO TAG. THE VARIOUS TYPES OF INSPECTION TAGS ARE SHOWN BELOW. FOR QUESTIONS REGARDING OBSOLETE OR INDISCERNIBLE POLE TAGS, CONTACT LINE MAINTENANCE ENGINEERING.

INSPECTED VISUALLY NO TREATMENT: POLE VISUALLY INSPECTED ON DATE BY CONTRACTOR SHOWN. NO TREATMENTS.





INSPECTED VISUALLY AND TREATED: SERVICEABLE POLE INSPECTED ON DATE BY CONTRACTOR SHOWN AND TREATED WITH PRODUCT SHOWN. TREATMENT TAGS

FUMIGANT, INTERNAL VOID





REFERENCE ONLY

REINFORCE POLE, INSPECTED AND TREATED: CAPACITY LESS THAN 70%. SCHEDULED FOR REINFORCEMENT SINGLE TAG WHITE



PRIORITY REINFORCE POLE, INSPECTED AND TREATED: CAPACITY LESS THAN 40%. SCHEDULED FOR IMMEDIATE REINFORCEMENT DOUBLE TAG WHITE



(TAG COLOR: WHITE) (TAG COLOR: W

REJECT AND REPLACE POLE, NOT SERVICEABLE OR REINFORCEABLE.CAPACITY LESS THAN 70%. NO TREATMENT APPLIED. SCHEDULED FOR REPLACEMENT SINGLE TAG RED

(TAG COLOR: RED)

PRIORITY REJECT AND REPLACE POLE, NOT SERVICEABLE OR REINFORCEABLE. CAPACITY LESS THAN 40%. NO TREATMENT APPLIED. SCHEDULED FOR IMMEDIATE REPLACEMENT DOUBLE TAG RED



(TAG COLOR: RED) (TAG COLOR: RED)

NOTE: FOR REPLACEMENT POLES, ARROW DENOTES DIRECTION OF REJECTION.

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| Construction Standards | MISCELLANEOUS | ISSUE DATE: | 05/24/04 |
| | POLE MARKING AND IDENTIFICATION | REV. DATE: | 08/19/13 |
| | WOOD POLE INSPECTION TAGGING SYSTEM | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 1-4-2 | 8512E486 | .DGN |

THE THREE TYPES OF PRESERVATIVE TREATMENTS ON SRP POLES ARE:

1) EXTERIOR

BRAND NAMES INCLUDE "OSMOPLASTIC", "CURAP 20" AND "BIO GUARD PASTE". THESE TREATMENTS ARE APPLIED TO THE POLE BELOW GROUND LEVEL AND COVERED WITH PAPER THAT HAS A PROTECTIVE MEMBRANE FACING THE POLE TO CONFINE THE CHEMICALS. OSMOPLASTIC IS A BLACK CREOSOTE PASTE APPLIED TO THE POLE AND COVERED WITH A BLACK KRAFT PAPER (NOT TAGGED - LOOK FOR KRAFT PAPER TO DETERMINE IF TREATED). BOTH THE CURAP 20 AND BIO GUARD PASTE ARE COVERED WITH A TAN PAPER SIMILAR TO BUTCHER PAPER WITH A WAXY INSIDE MEMBRANE TO CONFINE THE CHEMICALS. POLES TREATED WITH CURAP 20 AND BIO GUARD PASTE ARE TAGGED.

2) INTERNAL VOID

EITHER COPPER-NAPTHENATE OR PERME8. BOTH ARE A GREEN LIQUID CONSISTING OF COPPER AND DIESEL OIL, APPLIED TO VOIDS IN POLE (TAG "INT TR" OR "IT").

3) FUMIGANT

EITHER "MITC-FUME" OR "ULTRA-FUME". "MITC-FUME" CONSISTS OF METHYLISOTHICOCYANATE IN ALUMINUM CARTRIDGES, INSERTED INTO HOLES DRILLED IN POLE (TAG "MITC-FUME"). "ULTRA-FUME CONSIST OF DAZOMET IN GRANULAR FORM AND IS "ACTIVATED" USING PERM E8 AND SHOULD BE ABSORBED INTO THE POLE AND LEAVES NO RESIDUAL EVIDENCE IN THE HOLES DRILLED IN POLE (TAG "ULTRA-FUME" AND "PERM E8").

POLES TREATED WITH MITC-FUME WILL ALSO HAVE A MONTH TAG INDICATING THE MONTH THE POLE WAS TREATED.

MSDS SHEETS FOR THESE CHEMICALS ARE ON FILE AND AVAILABLE ON-LINE FOR MSDS SEARCH.

PRECAUTIONS FOR HANDLING:

- FOR SKIN CONTACT WITH ANY OF THESE CHEMICALS, WASH IMMEDIATELY WITH SOAP AND WATER.
- TO DISPOSE OF LOOSE MITC-FUME CARTRIDGES, PICK UP ALUMINUM CARTRIDGES WITH A SHOVEL DO NOT PICK UP WITH HANDS PUT IN PLASTIC BUCKET AND COVER WITH DIRT. TRANSPORT ON OUTSIDE OF VEHICLE AND RETURN BUCKET TO TEMPE SERVICE CENTER.

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| | WOOD POLE INSPECTION TAGGING SYSTEM | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 1-4-3 | 8512E487 | .DGN |
| | | | |



| POLE LENGTH | DEPTH OF SET | | |
|-------------|--------------|---------------|---------|
| (IN FEET) | IN EARTH | IN SOLID ROCK | UF "X"* |
| 25 | 4'-6" | 3'-0" | 1'-6" |
| 30 | 5'-0" | 3'-6" | 1'-6" |
| 35 | 5'-6" | 4'-0'' | 1'-6" |
| 40 | 6'-0" | 4'-6" | 1'-6" |
| 45 | 6'-6" | 5'-0'' | 1'-6" |
| 50 | 7'-0" | 5'-6" | 1'-6" |
| 55 | 7'-6" | 5'-6" | 1'-6" |
| 60 | 8'-0" | 6'-0'' | 1'-6" |
| 65 | 8'-6" | 6'-6" | 1'-6" |
| 70 | 9'-0'' | 6'-6" | 2'-0" |
| 75 | 9'-6" | 7'-0" | 2'-0" |
| 80 | 10'-0'' | 7'-6" | 2'-0" |
| 85 | 10'-6'' | 7'-6" | 2'-6" |
| 90 | 11'-0" | 7'-6" | 2'-6" |

* IF VALUES OF "X" EXCEED MAXIMUM DEPTH INDICATED, THEN THE SETTING DEPTH IN EARTH SHOULD BE USED.

NOTES

- 1. MAINTAIN POLE DEPTHS AS ACCURATE AS PRACTICAL DUE TO JOINT USE SPACE AND CLEARANCE REQUIREMENTS. DO NOT SET POLES AT EXTRA DEPTHS EXCEPT WHERE SPECIFIED ON THE CONSTRUCTION SKETCH.
- 2. ALL POLE-HOLES ARE TO BE OF SUFFICIENT DIAMETER TO ALLOW COMPLETE TAMPING ON ALL SIDES OF THE POLE AND TO FULL DEPTH.
- 3. THOROUGHLY TAMP THE BACKFILL AROUND A SET POLE FOR THE FULL DEPTH.
- 4. USE THE SETTING DEPTH IN EARTH IF THE HOLE, AFTER BLASTING, IS CONE SHAPED OR MORE THAN TWICE THE NORMAL DIAMETER AT THE TOP.
- 5. DISTRIBUTION OR TRANSMISSION POLE EXCAVATIONS SHALL BE COVERED WITH A WOOD CABLE SPOOL END OR EQUIVALENT AND BARRICADED, WITH LIGHTED BARRICADES IF LEFT OVERNIGHT, UNTIL THE POLE IS INSTALLED.

| Overhead Distribution | | | |
|---------------------------------------|-------------------------------------|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 06/29/66 |
| C C C C C C C C C C C C C C C C C C C | MISCELLANEOUS POLE SETTING DEPTH | REV. DATE: | 01/19/11 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 1-5-1 | 8512E293 | B.DGN |

| | POLE DESCRIPTION | | | COMPATIBLE UNIT CODING FOR POLE INSTALLATION | | | C | OMPATIBLE U | NIT CODING AL (ANY CLA | FOR ASS) | |
|--------|------------------|---------|---------|---|------------------|--------------------|---------------|---------------|---------------------------|------------------|--------------------|
| HEIGHT | CLASS | WT(LBS) | STOCK | DIST. PRIM./SEC. | STREET LIGHTS | SECURITY LIGHTS | COM. CABLE | COM. CABLE | DIST. PRIM./SEC. | STREET LIGHTS | SECURITY LIGHTS |
| | | **** | NO. | CONS | TRUCTION O | OF WOOD POL | ES | I | RETIREMENT | OF WOOD PC | DLES |
| 30' | - | | - | - | - | - | - | RW30K | RW30* | RW30L* | RW30D* |
| 35' | 5 | 700 | 5029021 | W35 | W35L | W35D | W35K | RW35K | RW35 | RW35L | RW35D |
| 40' | 4 | 1000 | 5029023 | W40 | W40L | W40D | - | - | RW40 | RW40L | RW40D |
| 40' | 1 | 1500 | 5029022 | W401 | - | - | - | - | RW40 | - | - |
| 45' | 3 | 1300 | 5029026 | W45 | - | - | - | - | RW45 | RW45L | - |
| 45' | 1 | 1700 | 5029025 | W451 | - | - | - | - | RW45 | - | - |
| 50' | 1 | 2000 | 5029027 | W501 | - | - | - | - | RW50 | RW50L | - |
| 55' | 1 | 2300 | 5029028 | W551 | - | - | - | - | RW55 | - | - |
| 60' | 1 | 2600 | 5029029 | W601 | - | - | - | - | RW60 | - | RW60D |
| 65' | 1 | 3100 | 5029030 | W651 | - | - | - | - | RW65 | - | - |
| 65' | H4 | 5000 | 5029032 | W65H4 | - | - | - | - | RW65 | - | - |
| 70' | 1 | 3500 | 5029033 | W70 | - | - | - | - | RW70 | - | - |
| 70' | H4 | 5600 | 5029035 | W70H4 | - | - | - | - | RW70 | - | - |
| 75' | 1 | 3900 | 5029036 | W75 | - | - | - | - | RW75 | - | - |
| 75' | H4 | 6100 | 5029038 | W75H4 | - | - | - | - | RW75 | - | - |
| 80' | H4 | 6800 | 5029040 | W80H4 | - | - | - | - | RW80 | - | - |
| 85' | | | | | | | | | RW85 | | |
| 90' | | | | | | | | | RW90 | | |

* ALSO USE FOR POLES SHORTER THAN 30'.

** COMPATIBLE UNIT CODE FOR POLE REMOVAL ALSO INCLUDES TANGENT FRAMING FOR PRIMARY AND SECONDARY ATTACHMENTS. LIST REMOVAL OF ALL OTHER ATTACHMENTS SEPARATELY; I.E. DOWN GUYS, BUCK ARMS, STREETLIGHTS, TRANSFORMER FRAMING AND CPR UNIT.

*** REFURBISHED POLES USED AS DISTRIBUTION POLES. DESIGNER MUST USE BOTH THE COMPATIBLE UNIT LISTED AND A STOCK CODE. CONTACT POLICIES PROCEDURES & STANDARDS FOR STEEL POLE AVAILABILITY DESIGN AND STOCK CODE.

**** WEIGHTS FOR DOUGLAS FIR (WESTERN RED CEDAR IS LIGHTER) ARE AVERAGES. WEIGH POLE FOR SAFETY RELATED WORK.

NOTES

1. ALWAYS ENTER POLES IN CUS WITH A COMPATIBLE UNIT CODE. DO NOT USE STOCK CODE NUMBERS (EXCEPT FOR REFURBISHED POLES).

| COMPATIBLE UNIT CODING FOR DISTRIBUTION METAL POLES | | | | | |
|--|---------------|--|--|--|--|
| MC49: | 49' MULTI-USE | | | | |
| MC50: | 50' MULTI-USE | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| M37DE: | SEE PG. 2 & 3 | | | | |
| M45DE: | SEE PG. 2 & 3 | | | | |
| M37DE90: | SEE PG. 2 & 3 | | | | |
| M45DE90: | SEE PG. 2 & 3 | | | | |
| | | | | | |

| RETIREMENT CODES FOR SPECIAL PURPOSE STEEL POLES | | | | | |
|---|--------|--|--|--|--|
| 49' MULTI-USE | RMC49 | | | | |
| 50' MULTI-USE | RMC50 | | | | |
| 30' DIRECT BURIAL, TANGENT | RMB30 | | | | |
| 41' DIRECT BURIAL, ANGLE | RMB41A | | | | |
| 41' DIRECT BURIAL, DEADEND | RMB41D | | | | |
| 35' TRIPARTITE | RMT35 | | | | |
| 40' TRIPARTITE | RMT40 | | | | |
| 45' TRIPARTITE | RMT45 | | | | |
| 30' WELTRUS | RMW30 | | | | |
| 35' WELTRUS | RMW35 | | | | |
| 40' WELTRUS | RMW40 | | | | |
| 45' WELTRUS | RMW45 | | | | |
| 50' WELTRUS | RMW50 | | | | |

| COMPATIBLE UNIT CODING FOR FOREIGN-OWNED WOOD STREET LIGHT POLES | | | | | | |
|---|--------------------|-------|-----------------|--|--|--|
| HEIGHT | CLASS | CODE | RETIREMENT CODE | | | |
| 35' | 35' 5 W35LF RW35LF | | | | | |
| 40' | 4 | W40LF | RW40LF | | | |

| REFURBISHED STEEL *** | | | | | | | |
|-----------------------|------|--------|------|--|--|--|--|
| HEIGHT | C.U. | HEIGHT | C.U. | | | | |
| 40' | MG40 | 60' | MG60 | | | | |
| 45' | MG45 | 65' | MG65 | | | | |
| 50' | MG50 | 70' | MG70 | | | | |
| 55' | MG55 | 75' | MG75 | | | | |
| 57' | MG57 | 80' | MG80 | | | | |

| COMPATIBLE UNIT CODES FOR RETIREMENT OF SPECIAL PURPOSE STRUCTURES | | | | | | | |
|---|--|--------|---------|---------|-------|--|--|
| HEIGHT | MULTIPLE WOOD POLE STEEL TOWERS HEIGHT STRUCTURES | | | | | | |
| | 2-POLE | 3-POLE | TANGENT | DEADEND | - | | |
| 30' | - | - | - | RLT30DP | - | | |
| 35' | RW35P2 | - | RLT35TP | - | RM35A | | |
| 40' | RW40P2 | - | - | - | RM40B | | |
| 45' | RW45P2 | RW45P3 | RLT45TP | - | RM45C | | |
| 50' | RW50P2 | - | - | - | - | | |
| 55' | - | RW55P3 | - | - | - | | |
| 60' | RW60P2 | - | - | - | - | | |



MISCELLANEOUS WOOD AND STEEL POLE CODING CONSTRUCTION AND RETIREMENT

ISSUE DATE: 04/14/72 REV. DATE: 05/10/13 APPROVAL: B. PRIEST OH1-6-1.doc



NOTES

1. BOTH THE BOTTOM POLE SECTION (FOR A 37.5' OUT OF GROUND) AND THE TOP POLE SECTION (FOR 45' OUT OF GROUND) ARE INCLUDED. SCRAP THE TOP SECTION.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | MISCELLANEOUS | ISSUE DATE: | 07/17/01 |
| | WOOD AND STEEL POLE CODING CONSTRUCTION AND RETIREMENT | REV. DATE: | 05/15/13 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 1-6-2 | 8512E340 | .DGN |



INSTALLATION INSTRUCTIONS

- 1. POLE MUST BE PLACED AND BACKFILL COMPLETED WITHIN 72 HOURS OF STARTING HOLE EXCAVATION.
- 2. PLUMB AND BRACE POLE
- 3. DEPB MATERIAL SHALL BE "DIRECT EMBED POLE BACKFILL", STOCK CODE 5075312.
- 4. POLE SHALL NOT BE LOADED FOR 72 HOURS AFTER PLACEMENT OF DEPB.
- 5. ALTERNATE BACKFILL: AGGREGATE AND LEAN FLYASH GROUT. SEE 69KV CONSTRUCTION BOOK, PAGE 1-9-1. FOR INSTALLATION INSTRUCTIONS.
- 6. SETTING DEPTHS VARY; SEE DIMENSIONS AND NOTES ABOVE FOR PROPER SETTING DEPTH.

| ITEM | MATERIAL DESCRIPTION | QUANTITY | STOCK NO. |
|------|---|----------|--------------------|
| 1 | POLE, STEEL, SELF SUPPORTING DEAD END | 1 | 5028752 OR 5028757 |
| 2 | DIRECT EMBED POLE BACKFILL (DEPB) 1000PSI | 5 YARDS | 5075312 |

| Overhead Distribution | | | |
|------------------------|-----------------------------|-------------|-----------|
| Construction Standards | MISCELLANEOUS | ISSUE DATE: | 07/17/01 |
| | WOOD AND STEEL POLE CODING | REV. DATE: | 05/15/13 |
| | CONSTRUCTION AND RETIREMENT | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 1-6-3 | 8512E488 | .DGN |

ACB CONDUCTORS A2, A266, A397, AC312 & AW78



ELEVATION

NOTES

- 1. SPHERE IS TO BE ATTACHED TO THE CENTER PHASE CONDUCTOR (OR TOP PHASE ON VERTICAL) AT THE POINT WHERE IT CROSSES THE OUTSIDE EDGE OF THE MAINTENANCE ROAD.
- 2. INSTALL SPHERE WITH WHITE SIDE UP, FLANGE PARALLEL TO THE GROUND.
- 3. EACH SPHERE REQUIRES ONE SET OF LINEGUARDS TO FIT THE CONDUCTOR TO WHICH THE SPHERE IS TO BE ATTACHED.
- 4. FOR ANY AQUEDUCT CROSSING, NEVER INSTALL SECONDARY **ONLY**, AS WARNING SPHERES CANNOT BE INSTALLED ON CABLED WIRE.

| Overhead Distribution | | | |
|------------------------|--|-------------|-----------|
| Construction Standards | MISCELLANEOUS | ISSUE DATE: | 07/16/81 |
| | AIRCRAFT WARNING SPHERES C.A.P. AQUEDUCT CROSSING | REV. DATE: | 06/15/11 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 1-7-1 | 8512E260 | DGN |

ACF__ CONDUCTOR AW78



ELEVATION

NOTES

- 1. SPHERE IS TO BE ATTACHED TO THE TOP PHASE CONDUCTOR (OR CENTER PHASE ON FLAT CONSTRUCTION).
- 2. EACH SPHERE REQUIRES ONE SET OF LINEGUARDS TO FIT THE CONDUCTOR TO WHICH THE SPHERE IS TO BE ATTACHED.
- 3. NOT TO BE INSTALLED ON SECONDARY, AS WARNING SHPERES CANNOT BE INSTALLED ON CABLED WIRE.

4. WARNING SPHERES TO BE LOCATED WHERE REQUESTED BY THE F.A.A.

| Overhead Distribution | | | |
|------------------------|--------------------------|-------------|-----------|
| Construction Standards | MISCELLANEOUS | ISSUE DATE: | 07/17/01 |
| | AIRCRAFT WARNING SPHERES | REV. DATE: | 06/15/11 |
| | FAA REQUIREMENT | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 1-7-2 | 8512E261 | .DGN |



NOTES

- 1. OSHA 1910.333 REQUIRES AN "UNQUALIFIED PERSON" OR EQUIPMENT OPERATED BY SUCH "UNQUALIFIED PERSON" TO MAINTAIN CERTAIN CLEARANCES FROM OVERHEAD LINES. THIS INCLUDES, NEUTRALS, SUPPORTING MESSENGERS, OVERHEAD GUY WIRES (DOWN GUYS EXCLUDED) AND SECONDARY CABLES (10 FEET) IN ADDITION TO PHASE CONDUCTORS (SEE TABLE).
- 2. THE LINE CLEARANCE MARKER (5034341), IS PURCHASED WITH A 13 FOOT CLEARANCE LENGTH (CHAINS) WHICH CAN BE REDUCED BY RELOCATING THE ROD END BOLTS THROUGH THE CHAIN OR CABLE TIE (5031993) TO CREATE THE LENGTHS GIVEN FOR THE VOLTAGE INVOLVED PER THE TABLE.

| LINE TO LINE VOLTAGE | MARKER LENGTH FEET |
|-------------------------|-----------------------|
| 0 TO 69KV | 10 |
| 115KV | 11 |
| 230KV | 13 |

3. RETURN TO INVESTMENT RECOVERY.

| Overhead Distribution | | | |
|------------------------|--|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 07/27/93 |
| S | MISCELLANEOUS LINE CLEARANCE MARKER | REV. DATE: | 05/08/13 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 1-8-1 | 8512E211 | I.DGN |

| ALUMINUM CONDUCTOR | | | | |
|------------------------------|--|--|--|--|
| PHASE/WIRE | CONDUCTOR DESCRIPTION | CU CODING FOR INSTALLATION OF SERVICES | | |
| | #6 DUPLEX | SDX6 | | |
| | #2 TRIPLEX | STX2* | | |
| SINGLE PHASE – THREE WIRE | 1/0 TRIPLEX | STX10* | | |
| | 4/0 TRIPLEX | STX40 | | |
| | 1/0 TRIPLEX – DOUBLED | S2TX10 | | |
| | 4/0 TRIPLEX – DOUBLED | S2TX40 | | |
| | 1/0 QUADRUPLEX | SQX10* | | |
| | | SQX40 | | |
| FOUR WIRE | | S2QX10 | | |
| | | S2QX40 | | |
| | COPPER CONDUCTOR | - | | |
| SINGLE PHASE – | 2-350 MCM (4/0 N) | SC3501P | | |
| THREE WIRE | 2-500 MCM (350 MCM N) | SC5001P | | |
| THREE PHASE - | 3-4/0 | SC40N | | |
| THREE WIRE (NO NEUTRAL) | 3-350 MCM | SC350N | | |
| | 3-500 MCM | SC500N | | |
| | 3-4/0 – DOUBLED | S2C40N | | |
| | 2-350 MCM – DOUBLED | S2C350N | | |
| | 3-500 MCM – DOUBLED | S2C500N | | |
| | 3-350 MCM – TRIPLED | S3C350N | | |
| | 3-500 MCM – TRIPLED | S3C500N | | |
| | 3-4/0 (2/0 N) | SC40 | | |
| FOUR WIRE | 3-350 MCM (350 MCM N) | SC350 | | |
| | 3-500 MCM (350 MCM N) | SC500 | | |
| | 3-4/0 - DOUBLED (500 MCM N) | S2C40 | | |
| | | S2C350A | | |
| | 3-550 MCM – DOUBLED (350 MCM – DOUBLED N) | S2C350 | | |
| | | S2C300 | | |
| | 3-500 MCM - TRIPLED (500 MCM - DOUBLED N) | S3C500 | | |
| THREE PHASE – | 2-350 MCM (4/0 N) #2 P I | SC350C2 | | |
| FOUR WIRE WITH | 2-350 MCM (4/0 N) 2/0 P I | SC350C20 | | |
| POWER LEG | 2 350 MCM (4/0 N) 2/0 T .L. | SC350C40 | | |
| | 2-550 MCM (240 N) 4/0 F.L. | 80500040 | | |
| | 2-500 MCM (350 MCM N) 2/0 P.L. | SU300020 | | |
| | 2-500 MCM (350 MCM N) 4/0 P.L. | SC500C40 | | |
| | 2-4/0 DOUBLED (350 MCM N) 4/0 P.L. | S2C40C40 | | |
| | 2-4/0 DOUBLED (350 MCM N) 4/0 DOUBLED P.L. | S2C402C40 | | |
| | 2-350 MCM DOUBLED (500 MCM N) 4/0 P.L. | S2C350C40 | | |



| COPPER CONDUCTOR (CONT'D.) | | | | | |
|--|---|-------------|--|--|--|
| PHASE/WIRE | CU CODING FOR INSTALLATION OF SERVICES | | | | |
| THREE PHASE – FOUR WIRE WITH POWER LEG | 2-350 MCM DOUBLED (500 MCM N) 350 MCM P.L. | S2C350C350 | | | |
| | 2-350 MCM DOUBLED (500 MCM N) 4/0 DOUBLED PL | S2C3502C40 | | | |
| | 2-500 MCM DOUBLED (500 MCM N) 4/0 DOUBLED PL | S2C5002C40 | | | |
| | 2-500 MCM DOUBLED (500 MCM N) 350 MCM-DOUBLED PL | S2C5002C350 | | | |

* ADD "W" TO THE COMPATIBLE UNIT NUMBER IF A BOLT-TYPE WIREHOLDER HAS TO BE INSTALLED WHEN CHANGING AN OPEN WIRE SERVICE TO A CABLED SERVICE.

NOTE: SERVICES ARE ORDERED WITH THE UNIT OF ISSUE "EACH", NOT "FOOT".

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 05/05/72 |
| ® | MISCELLANEOUS SERVICE CONDUCTOR CODING | | 03/21/18 |
| | SERVICE CONDUCTOR CODING | APPROVAL: | N. Sabbah |
| PROPRIETARY MATERIAL | 1-9-2 | OH1-9- | 1.doc |
| | | | |

| | STOCK | COMPATIBLE UNIT CODING PER CONDUCTOR APPLICATION | | | | |
|-------------|-------|---|---------|-----------|------------------|--------------------|
| DESCRIPTION | CODE | DISTRIBUTION (PRI. & SEC.) | NEUTRAL | SECONDARY | STREET LIGHTS | SECURITY LIGHTS |

ALUMINUM - BARE (AA)

| | | | 1 / | | | |
|---------------------|---------|------|------|------|------|------|
| +#2-7 STRAND | 5035625 | A2 | A2N | A2S | A2L | A2D |
| 1/0-7 STRAND | 5035627 | A10 | A10N | A10S | A10L | A10D |
| 3/0-7 STRAND | 5035629 | A30 | A30N | | | |
| 266.8 MCM-7 STRAND | 5035631 | A266 | | | | |
| 397.5 MCM-19 STRAND | 5035633 | A397 | | | | |

ALUMINUM - STEEL REINFORCED - BARE (ACSR)

| #2-6/1 STRAND | 5035740 | R2 | R2N | R2S | |
|--------------------------|---------|-------|-------|-----|--|
| 3/0-6/1 STRAND | 5035742 | R30 | R30N | | |
| 266.8 MCM-26/7 STRAND | 5035744 | R266 | R266N | | |
| 477 MCM-26/7 STRAND | 5035745 | R477P | | | |

COPPER - BARE

| #6 SOLID OR STRAND | 5033844 | C6 | C6N | C6S | |
|-------------------------|---------|-----|------|-----|--|
| #4-3 STRAND OR SOLID | 5033847 | C4 | C4N | C4S | |
| #2-7 STRAND OR SOLID | 5033850 | C2 | C2N | | |
| 2/0-7 STRAND | 5033855 | C20 | C20N | | |

COPPER - XLPE INSULATED

| #4 SOLID | 5033864 | WC4 | | |
|-------------------|---------|-------|-------|--|
| #2/7 STRAND | 5033865 | WC2 | | |
| 2/0-7 STRAND | 5033963 | WC20 | | |
| 4/0-7 STRAND | 5033964 | WC40 | WC40S | |
| 350 MCM-19 STRAND | 5033965 | WC350 | | |
| 500 MCM-37 STRAND | 5033966 | WC500 | | |

ALUMOWELD

| 7-#8 | 5035756 | AW78 | AW78N | | |
|------|---------|------|-------|--|--|
| | | | | | |

ALUMINUM ALLOY - BARE (AAAC)

| 312.8 MCM-19 STRAND | 5035732 | AC312 | AC312N | | |
|---------------------|---------|-------|--------|--|--|

CABLES - 600 VOLT INSULATED

| #6 DUPLEX | 5028149 | DX6 | | | DX6L | DX6D |
|----------------|---------|------|--|--|-------|-------|
| #2 TRIPLEX | 5028373 | TX2 | | | TX2L | TX2D |
| 1/0 TRIPLEX | 5028375 | TX10 | | | TX10L | TX10D |
| 4/0 TRIPLEX | 5028381 | TX40 | | | | |
| 1/0 QUADRUPLEX | 5028377 | QX10 | | | | |
| 4/0 QUADRUPLEX | 5028382 | QX40 | | | | |

| Overhead Distribution | | | |
|------------------------|--------|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 12/17/71 |
| ® | | REV. DATE: | 06/12/13 |
| | | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 1-10-1 | OH1-10-1. | .doc |



PROPER REEL HANDLING





IMPROPER REEL HANDLING

NOTES

- 1. UNLOADING EQUIPMENT SHALL NOT COME IN CONTACT WITH THE CABLE OR ITS PROTECTIVE COVERING.
- 2. IF A CRANE IS USED TO UNLOAD CABLE, A SHAFT THROUGH THE ARBOR HOLE OR A CRADLE SUPPORTING BOTH REEL FLANGES SHALL BE USED.
- 3. FORKLIFTS MUST LIFT THE REEL BY CONTACTING BOTH FLANGES.
- 4. STORE REELS ON HARD SURFACE SO THAT THE FLANGES WILL NOT SINK AND ALLOW REEL WEIGHT TO REST ON CABLE.
- 5. PLACE A BOARD UNDER BOTH FLANGES TO PREVENT ROLLING WHEN IN STORAGE, IN ADDITION TO OTHER SECURING METHODS IN SHIPPING.

| Overhead Distribution | | | |
|------------------------|--------------------|-------------|-----------|
| Construction Standards | MISCELLANEOUS | ISSUE DATE: | 04/07/03 |
| | REEL HANDLING AND | REV. DATE: | 05/04/11 |
| | STORAGE GUIDELINES | APPROVAL: | B. PRIEST |
| | 1-11-1 | 8512E342 | .DGN |

ALUMINUM CONNECTORS



COPPER CONNECTORS



NOTES

1. CONDUCTORS MUST BE BRUSHED AND GREASED BEFORE INSTALLING CONNECTORS.

- 2. WHEN USING COMPRESSION CONNECTOR ON ALUMINUM TO COPPER, THE ALUMINUM CONDUCTOR MUST BE ABOVE THE COPPER CONDUCTOR.
- 3. USE ALUMINUM COMPRESSION CONNECTORS ON ALUMINUM OR COPPER RUNS TO ALUMINUM TAPS.
- 4. USE COPPER COMPRESSION CONNECTORS ON COPPER RUNS TO COPPER TAPS.
- 5. TWO OR THREE PHASE TAPS MUST BE INSTALLED SO THAT ALL OF THE TAPS ARE FED FROM THE SAME SIDE OF ANY JUMPERS OR SWITCHES IN THE PRIMARY LINE.
- 6. WHEN USING POWER GRIP CONNECTOR, WITH HOT STICK, TIGHTEN 2 TO 2-1/2 TURNS AFTER FINGER TIGHT.
- 7. TAP ALUMINUM CONDUCTOR TO LATERALS AND UNDERGROUND RISERS.
- 8. TAP COPPER CONDUCTOR TO TRANSFORMERS AND CAPACITORS.

| Overhead Distribution | | |
|------------------------|----------------------------|----------------------|
| Construction Standards | MISCELLANEOUS - CONNECTORS | ISSUE DATE: 06/24/83 |
| | VARIOUS TYPES OF TAPS | REV. DATE: 01/03/23 |
| | OFF OF PRIMARY CONDUCTORS | APPROVAL: J. ROBBINS |
| PROPRIETARY MATERIAL | 1-12-1 | 8512E245.DGN |

POWER GRIP CONNECTOR FOR ALUMINUM OR COPPER CONDUCTORS



| STOCK # | TAP SIZE | RUN SIZE | COMPATIBLE UNIT |
|---------|----------------|-----------------|-----------------|
| 5035724 | #8 - #2 | #4 - 1/0 | BPG01 |
| 5035725 | #8 - #2 | 1/0 - 397 | BPG02 |
| 5033937 | 1/0 - 397 | 1/0 - 397 | BPG03 |

NOTES

1. THE END OF TAP CONDUCTOR SHALL EXTEND APPROXIMATELY 3" BEYOND CONNECTOR EDGE.

2. THE END OF TAP CONDUCTOR SHALL EXTEND APPROXIMATELY 1" BEYOND SET SCREW BOSS.

3. BRUSH AND GREASE CONDUCTOR PRIOR TO INSTALLATION ONTO RUNNING LINE.

POWER GRIP CONNECTOR WITH FLEXIBLE BRAID

FLEXIBLE BRAID FOR #6 COPPER EQUIPMENT TAPS FOR USE ON SPANS SUBJECT TO VIBRATION (200 FEET AND GREATER) AND AS REPLACEMENT ON BROKEN TAP CONDUCTOR.



NOTES

- 1. REMOVE SUFFICIENT INSULATION FROM TAP CONDUCTOR FOR DEPTH OF COMPRESSION CONNECTOR.
- 2. COMPRESS CONNECTION BETWEEN CABLE AND FLEXIBLE BRAID.
- 3. INSTALL FLEXIBLE BRAID APPROXIMATELY 1" BEYOND SET SCREW BOSS.
- 4. BRUSH AND GREASE CONDUCTOR PRIOR TO INSTALLATION ONTO RUNNING LINE.

| Overhead Distribution | | |
|------------------------|----------------------------|----------------------|
| Construction Standards | MISCELLANEOUS - CONNECTORS | ISSUE DATE: 06/24/83 |
| | VARIOUS TYPES OF TAPS | REV. DATE: 01/03/23 |
| | OFF OF PRIMARY CONDUCTORS | APPROVAL: J. ROBBINS |
| PROPRIETARY MATERIAL | 1-12-2 | 8512E489.DGN |



| RANGE | ТАР | SHELL | AMP NO. |
|-------|------------|---------|------------|
| 1 | 5033834 | 5033935 | 600448 |
| 2 | 59-1663 ** | 5033935 | 600459 |
| 3 | 5033835 | 5033936 | 602000 |
| 4 | 59-1665 ** | 5033936 | 602003 |
| 5 | 5033836 | 5033936 | 602007 |
| 6* | 5033837 | 5033936 | 1-602031-5 |

* CONNECTOR #6 HAS A LARGE AND SMALL GROOVE. THE SMALLER CONDUCTOR MUST BE IN THE SMALLER GROOVE. ** INDICATES NO SAP MATERIAL STOCKCODE NUMBER EXISTS.



ISSUE DATE: 04/02/84 REV. DATE: 06/11/13 APPROVAL: B. PRIEST 8512E438.DGN

| CONDUCTOR SIZE AND CONFIGURATION | VENDOR NO. / C | RIMPS () | MATERIAL ITEM NUMBER | DIE | SIZING CHART # | SECONDARY COVERS MATERIAL ITEM | |
|--|----------------|----------|----------------------------|-----|-------------------|---|--|
| | BURNDY | HOMAC | | | | NUMBER | |
| #6 SOL #3 STR. | YHO-100 | OB44 | 5000040 | | | 500 4000 | |
| #6 SOL - #3 STR | (4) | (4) | 5033812 | 0 | 1 | 5034083 | |
| #2 STR 1/0 ACSR | YHO-150 | OB101 | 5022912 | 0 | · · · | 5024092 | |
| #6 SOL #1 STR. | (5) | (4) | 5055615 | 0 | 2 | 5034083 | |
| 2/0 ACSR - 3/0 STR. | YHD-200 | DB202 | E022914 | 50 | 2 | 5024090 | |
| #6 SOL #1 STR. | (5) | (4) | 5055614 | 03 | 5 | 5034080 | |
| 4/0 STR 4/0 ACSR | YHD-250 | DB404 | 5033815 | 50 | Λ | 5034080 | |
| STR. | (5) | (4) | 5055015 | 03 | - | 000-000 | |
| 1/0 STR 3/0 STR. | YHD-300 | DB2020 | 5022916 | 50 | F | 5024090 | |
| 1/0 STR 2/0 ACSR | (5) | (5) | 5055610 | 03 | 5 | 5054080 | |
| 4/0 STR 4/0 ACSR | YHD-350 | DB4020 | 5033817 | 50 | 6 | 5034080 | |
| 1/0 STR 2/0 ACSR | (7) | (6) | 5055017 | 55 | | 5054000 | |
| 3/0 ACSR - 4/0 ACSR | YHD-400 | DB4040 | 5033818 | 50 | 7 | 5034080 | |
| 3/0 ACSR - 4/0 ACSR | (7) | (6) | 3033010 | | , r | 3034000 | |
| 250 STR 500 STR. | YHN-500 | | 5033819 | N | 8 | 5034081 | |
| #6 SOL3/0 STR. | (2) | | 0000010 | | J J | 0001001 | |
| 250 STR 500 STR. TO | YHN-550 | NB50040 | | | | | |
| 2/0 ACSR - 4/0 ACSR | (2) | (2) | 5033820 | N | 9 | 5034081 | |
| 250 STR - 500 STR. | YHN-525 | NB500 | 5000004 | | 10 | 500 400 4 | |
| 250 STR 500 STR. | (3) | (3) | 5033821 | N | 10 | 5034081 | |
| UP TO 4-7/16" LONG CONNECTORS | | | | | | 5034082 | |



NOTES

1. THESE CONNECTORS MAY BE USED ON ALUMINUM OR COPPER CONDUCTORS.

2. NUMBER OF CRIMPS SHOWN IN PARENTHESIS ().

| Overhead Distribution | | | |
|------------------------|---------------------------------------|-------------|----------|
| Construction Standards | MISCELLANEOUS - CONNECTORS | ISSUE DATE: | 01/15/87 |
| | CONNECTOR AND DIE CHART (NON-TENSION) | REV. DATE: | 10/13/20 |
| | CONDUCTORS #6 SOLID THRU 500 STRANDED | APPROVAL: | J. LUERA |
| PROPRIETARY MATERIAL | 1-13-2 | 8512E224 | DGN |
| | | | |



1. ALUMINUM CONNECTORS MAY BE USED ON ALUMINUM OR COPPER CONDUCTORS.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | MISCELLANEOUS - CONNECTORS | ISSUE DATE: | 08/06/93 |
| | FOR USE WITH SECONDARY OR COLD PRIMARY WORK | REV. DATE: | 05/07/11 |
| | CONDUCTORS #6 SOL THRU 500 MCM | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 1-13-3 | 8512E220 | DGN |

| A GR | DOVE | | | | 4 | | | / | 7 | | | | | | | | | | | | | | | | | | | | | | | \sim | \ \ | | | | | | | | |
|------|----------------------------|-------------------|----------|------|-------|-----|-----|-----|----------------|------|-----|-----|-----|-------------|-----|------------------|-----|----------|-----|-----|--------|-------|------|-----|-------------|----------|-------------|------------------|---------------|-------|-----|-------------|------------------|--------------|--------------|--------------|---------------|-------|-----|-----|------|
| | ALA CINC | RSILE | , | 2414 | J. | / | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 10PUI | or ^o a | FICO | | / | | | | | | | | | | | | | | | | | | | | | | (| 6 |) | | / | | / | | | | | | | | |
| | OUC: CONDE | JP CO | | / | | | | | | | | | | | | | | | | | | | | | | | l | | J | / | | V | 9 | | | | | | | | |
| COL | ./ 0 | PL | | | | | | | | | | | | | | | | | | | | | | | | | Ę | \checkmark | | | / | | | | | | | | | | |
| .268 | 2 STR. COMP. | | ĹΤ | | | | | | | | | | | | | | | | | | | | | | | | ľ | Ć, | Ń | / | | | | | | | | | | | |
| .289 | 1 SOL | | | | | | | | | | | | | | | | | | | | | | | | | | | \mathbb{Z} | \mathcal{V} | | | | | | | | | | | | |
| .290 | 2 ACSR. 6/1 COMP. | | | | | + | | | | | | _ | | | _ | | _ | | | | | | | | | | | | `` | YΡ | | | | | | / | | | | | |
| .292 | 2 STR. | | | | | | _ | | | | _ | _ | | _ | - | | _ | | _ | | | | | | | | | | | ••• | | | | | / | / |) | 1 | | | |
| .298 | 1 STR COMP | | \vdash | | | + | | | | + | | - | | | + | | - | + | + | | | - | | | | | | | | | | | | | | | / | J | | | |
| .316 | 2 ACSR 6/1 | | | | | | | | | | | + | | | - | | | | - | | | | | | | | | | | | | 1 | \leq | | | \checkmark | / | | | | |
| .325 | 2 ACSR. 7/1 | | | | | | | | | | + | 1 | 1 | | | | | | | | | | | | | | | | | | | ((| $\left(\right)$ | | / | 1 | | 1 | | | |
| .325 | 1/0 SOL. | | | | | | | | | | - | 1 | ı 1 | | | | | | | | | | | | | | | | | | | | l | | | > | \geq_{l} | / | | | |
| .326 | 1 ACSR. 6/1 COMP. | | | | | | | | | | | | | | | | | | | | | | | | | | | | _ | | | | | | / | / | | | | | |
| .328 | 1 STR. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | () | | \checkmark | · | | Ζ | | | | |
| .340 | 1/0 STR. COMP. | | \vdash | | | + | | | | + | | _ | | | _ | | _ | | | | | | - | | _ | | + | | - | | | | _ | (| | / | | | | | |
| .355 | 1 ACSR. | | | | | + | | | | + | | _ | | - | - | | _ | + | | | | | + | | | \vdash | _ | | - | | | ų | 2 | 1/ | | | | | | | |
| 365 | 2/0 SOL | | | | | | | | | + | | | | | - | | | + | | | | | + | | + | ้ล่ | + | | - | | | | | ν | | _ | | | | | |
| .368 | 1/0 STR. | | | | | | | | | + | | | | | - | | | + | - | | | | + | | + | 0 | + | | | | | | | Y | PC |) | | | | | |
| .382 | 2/0 STR. COMP. | | | | | | | | | | | | | | | | | | | | | | + | | | | + | | | | | | | | | | | | | | |
| .385 | 7 NO. 8 ALUMOWEL | D | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .398 | 1/0 ACSR. 6/1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .410 | 2/0 ACSR. COMP. | | | | | | _ | | | | | _ | | _ | - | | | | | | | | - | | _ | | + | | _ | _ | | _ | - | | | | | | | | |
| .410 | 3/0 SOL. | | \vdash | | | + | | | | + | | - | | - | + | | - | + | | | | | + | | - | | + | $\left \right $ | + | - | + | - | - | | | | | | | | |
| 414 | 3/0 STR COMP | | | | | | - | 2 | + | + | | - | | - | - | | + | 1 | + | | | | + | | - | | _ | · + | + | - | + | - | | | | | | | | | |
| .447 | 2/0 ACSR. 6/1 & 4/3 | | | | | | + | | + | | | | | | + | | + | <u> </u> | + | | | | + | | - | | 1 | , † | | - | | | 1 | | | | | | | | |
| .460 | 4/0 SOL. | | | | | | | | | | | | | | | | | | | | | | | | | | + | | | | | | | | | | | ٦ | | | |
| .461 | 3/0 ACSR. COMP. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .464 | 3/0 STR. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | \downarrow | \rightarrow | | | | |
| .481 | 4/0 STR. COMP. | | \vdash | | | + | | | | + | | _ | | _ | - | | _ | | | | | | - | | _ | | + | | - | _ | | _ | | | | ++ | + | - | | | |
| 502 | 3/0 ACSR. | | | | | + | | | | + | | _ | | _ | - | | _ | + | | | _ | | + | | | \vdash | + | | + | _ | ╉┼┤ | _ | | | - | + | + | - | | | |
| .517 | 4/0 ACSR. COMP. 4/0 STR | | | | | | - | ່ຈ່ | ' | | | - | | | - | | + | 5 | + | | | - | + | | + | ່ວ່ | + | | + | - | | - | | - 'c | י 'ב | +++ | + | - | | | |
| 551 | 266.8 STR COMP | | | | | | - | | + | + | | | | | + | | + | 5 | + | | | | + | | + | 0 | + | | + | - | | + | | | י ר י | ++ | + | | | | |
| .559 | 266.8 ACSR. COMP. | | | | | | | | | | | | | | | | | | | | | | + | | | | + | | | | | | | | | | | | | | |
| .563 | 4/0 ACSR. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .586 | 266.8 STR. | | | | | | | | | | | | | | | | | | | | | | | | _ | | | | | | | | | | | | | | | | |
| .642 | 266.8 ACSR. STR. | | | | | | | | | | | | | _ | - + | ÌÒ | + | | | | | | - | | _ | | _ | | _ | _ | | _ | ÷ | 11 | + | ++ | \rightarrow | + | 1 | 2ŀ | _ |
| .642 | 312 AAAC | | \vdash | | | + | | | | + | | - | | | + | \vdash | - | ++ | + | | - | _ | + | | - | | + | \vdash | + | - | ++ | - | + | | - | ++ | + | + | - | 4 | _ |
| ./24 | 397.5 STR. | | | | | + + | | | | | | | | | + | | - | + | | | | | + | | - | | +- | | + | - | + | | | _ | - | ┿┿ | + | + | | + | - |
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| | Щ Z | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | κ ŵ | | | | | | ₽ | e | | | | đ | | | đ | ₽ | | | | ₽ | | | | | Щ | | | | 2 | | | | | | ₫ | ₽ | | | | |
| | A A | οщ | | l≞l | | | | 10 | Ę | 5 | | | õ | | | 5 | lõ | | | | ŝ | | Ę | | ₽ | l≥ | 1 | | - 9 | 8 년 | | 影 | Ч | | | S. | 8 | | | | |
| | 2 10 | 단단 | Ž | | | | Š. | 15 | 2 | | 5 5 | - | 10 | Į | | 5 | 5 | No. | 5 5 | | 5 | | 8 | | lõ | N S S | 50 | | ġ | 55 | | 8 | 10 | | | 1 | К | | - K | | ~ |
| | | BE | 5 | 2 | | | ŏ | L R | | | 80 | 2 | R | C | | R. | | ŏ | | | R 8 | SR | S S | | r r | 8 AI | 5 I K | 님 | μġ | r R | | К) e | é e | LS 6 | ŝΕ | ST | P S | IS E | PQ | ¥. | ŝ |
| | | ZA | | | H C | Įğ | E S | | LI ST | źI≹I | SIC | | SO | E | Įğ | 1 2 1 2 | | E | | S | S | AC AC | M | S | s S S | 9 | Įĕ | S | S | NAC N | No. | <u>کا ک</u> | s S S | AC | N S | 200 | 8.9 | AC AC | 0.8 | A L | 7.5 |
| 1 | C C O | ы | ώu | စ်စြ | 60 6 | 94 | 4 0 | 4 | 4 | 14 | 4 | 2 | 34 | ε n n | | 0 | 5 | 1-1 | 2 2 | 12 | = | ~ \$ | £ ¥ | 121 | 티었 | 2 | 티었 | Ж | 2 | 20 | ¥ | <u>چ</u> چ | 94 | 3 | 4 | 26 | 8 | 4 | 28 | 9 | 39 |
| | O ∞ | | | | | | | | | | | | | | 1_ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 162 | ĕ 8 | 18/10 | 50 | 21: | 226 | 232 | 52 | 25(| 258 | 256 | 26(| 382 | 590 | 295 | 30 | 325 | 325 | 326 | 355 | 365 | 36 | š Ř | 38 | <u>4</u> 10 | 14 | 412 | 42 | 460 | 461 | 8 | 502 | 522 | 551 | 555 | 56 | 642 | 642 | .724 |
| L | | | | | | 1 | | | | | | | | | - | | | 1 1 | | | | | | | _ | | | | - | | 1 | | | | _ | <u></u> | | - | | | _ |
| | | ВG | RO | ov | Е | | | | | | | | | | | | | - | | | _ | | M | AT | ER | AL | IT | EN | 1 | _ | | | | | | | | _ | _ | | |

| RANGE | MATERIAL ITEM NUMBER † | BURNDY** | DIE |
|-------|---------------------------|--------------|-------------|
| 1 | 5033822 | YP26 AU2 (4) | 0 |
| 2 | 5033823 | YP27 AU4 (4) | D |
| 3 | 5033824 | YPC 28U4 (4) | D |
| 4 | 5033825 | YP27 AU2 (4) | D |
| 5 | 5033826 | YP 28U2 (4) | D |
| 6 | 5033827 | YP25 U25 (4) | D |
| 7 | 5033828 | YP27 AU26(4) | D |
| 8 | 5033829 | YP28 U26 (9) | D* |
| 9 | 5033830 | YPC28U28 (2) | D |
| 10 | 5033831 | YPC33R26U(2) | Ν |
| 11 | 5033832 | YPC33R28R(3) | Ν |
| 12 | 5033833 | YPC33R33R(3) | N |
| | () IND * HYD | ICATES NUMBE | R OF CRIMPS |

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NOTES

1. ALUMINUM CONNECTORS MAY BE USED ON ALUMINUM OR COPPER CONDUCTORS.

2. **THESE CONNECTORS ARE ALSO ACCEPTABLE FOR COPPER-TO-COPPER CONNECTIONS



MISCELLANEOUS - CONNECTORS FOR HOT PRIMARY WORK CONDUCTORS #6 SOL THRU 397.5 MCM STR, AND DIES

ISSUE DATE: 10/25/73 05/08/13 REV. DATE: APPROVAL: B. PRIEST 8512E262.DGN

NOT IN IMPREST BIN STOCK

1-13-4

| · · | TAP CONDUCTOR "B" GROOVE | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------|-----------------------------|-----------------------------|------------------|--------------------|------------------|--------------------|------------------|-------------------|------------------|------------------|-------------------|------------------|-------------------|------------------|---------------------|-------------------|--------------------|--------------------|---------------|---|----|----|----|----|----|------------|-----------|
| .398 | 1/0 6/1 ACSR | • | | | | | | | | | | | ٦ | | | | | | | | | | | | | | |
| .414 | 2/0 STR | | - | | | | | | | | | | | | | | | | | | | | | | | | |
| .426 | 3/0 COMP. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| .447 | 2/0 4/3 AUSR | | | | | | | | | | | | | | | | | | | | | | | | _ | | |
| .404 | 3/0 SIR | | | | | | | | | | | | | | | | | | | | | _ | | | 7 | | |
| .400 502 | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| 522 | 1/0 STR | | | | | | | | | | \frown | | | | | | | | (E | | | | | / | 1. | _ | |
| 523 | 250 MCM COMP | | | (| 1 | |) | | | (| 2 | | | | | | | | E | _ | _ | | | / | | |) |
| 574 | 250 MCM STR | | | | \subseteq | | | | | \langle | <u> </u> | | | | | | | | Π | | Г | | | | | | |
| 586 | 266.8 MCM STR | | | BLA | ACKE | BURI | N- | | BLA | ٩CK | BUR | RN- | | | | | | | | | | | | | | | |
| 613 | 350 MCM COMP | | | 4 (| CRIN | IPS | | | 4 | CR | MPS | 5 | | | | | | | | | 1 | | | | | | |
| 628 | 300 MCM STR | | | OTI | HER | S- | | | OT | HER | RS- | _ | | | | | | | 6 | 2 | 2 | | | | | | J |
| 642 | 266.8 MCM ACSR | | | 3 | CRI | VIP5 | | | 3 | CR | MPS | 5 | | | | | | | l | | | | | _ | ~ | | - |
| 642 | | | | | | | | | | | | | | | | | | | \mathcal{X} | | | _ | | | Ł | | |
| 679 | 350 MCM STR | | | | | | | | | | | | | | | | | | (- | | | | | _ | ~ | | |
| 724 | 397 5 MCM STR | | ⊢ | | | | | | | | | | - | | | | | | F | | _ | _ | | | | | |
| 728 | 400 MCM STR | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 735 | 500 MCM COMP | | | / | | | | | | (| \frown | | | | | | | | | | | | | | | | |
| 811 | 500 MCM STR | | | (| 3 | ;) |) | | | (| 4 |) | | | | | | | | | | | | | | | |
| .814 | 477 MCM ACSR | | | | \sim | / | _ | | | | | / | | | | | | | | | | | | | | | |
| 893 | 600 MCM STR | | | 4 | 4 CR | IMP | S | | | 4 | CRIN | MPS | | | | | | | | | | | | | | | |
| 897 | 750 MCM STR | | ! | : | : | | : : | | | | _ | | - | | | | | | | | | | | | | | |
| 1.026 | 795 MCM STR | | | | <u> </u> | | | | | (| <u> </u> | \mathcal{A} | ł | | | | | | | | | | | | | | |
| 1.031 | 800 MCM STR | | + | 1 | 1 | | | - | | | 5 | | | | | | | | | | | | | | | | |
| 1.063 | 795 45/7 MCM ACSR | 2 | | | 1 | | | I | | 4 | | MPS | | | | | | | | | | | | | | | |
| 1.124 | 954 MCM STR | | 1 | 1 | 1 | | | _ | | | | | _ | | | | | | | | | | | | | | |
| 1.140 | 795 30/19 ACSR | | 1 | 1 | 1 | | | | | L | | | (| 6 | Š |) | | | | | | | | | | | |
| 1.151 | 1000 MCM STR | | 1 | ! | ! | | | | | <u> </u> | | | `` | | | / | | | | | | | | | | | |
| 1.165 | 954 45/7 ACSR | | - | | | | | | | | | | | 4 CF | RIMF | rs | | | | | | | | | | | |
| 1.170 | 1033.5 STR | | 1 | ! | 1 | | | | | <u> </u> | | | | | | | | | | | | | | | | | |
| | | RUN CONDUCTOR "A" GROOVE | .679 350 MCM STR | .724 397.5 MCM STR | .728 400 MCM STR | .735 500 MCM COMP. | .811 500 MCM STR | .814 477 MCM ACSR | .893 600 MCM STR | .897 750 MCM STR | . 026 795 MCM STR | .031 800 MCM STR | .063 795 MCM ACSR | .124 954 MCM STR | .140 795 30/19 ACSR | .151 1000 MCM STR | .165 954 45/7 ACSR | 170 1033.5 MCM STR | | | | | | | | | |
| | | L | | | | _ | | | - | | - | <u> </u> | ~ | - | - | ~ | | - | I | | RA | NG | ΕN | 0. | MA | ATEF NU | RIA Me |
| | т | | | | | Τ | | п | IES | ; | | ٦ | | | | | | | | | | 1 | | | | 503 | 357 |
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| | ľ ľ | 40 | | | | - | 0.1 | ۲. ۲. | | \ \ \ \ | - | - | | | | | | | | | | 3 | 5 | | | 503 | 357 |
| | Y | 40 | | <u> </u> | | | 5-r | | | (S | -2 | - | | | | | | | | | | 4 | Ļ | | | 50 | 357 |
| | VITH S | -Z DIE C | VE | KL | AΡ | CF | KIM | PS |) | | | | | | | | | | | | | 5 | 5 | | | 503 | 338 |
| | | | | | | | | | | | | | | | | | | | | | | | | | - | | |

NOTES

1. ALUMINUM CONNECTORS MAY BE USED ON ALUMINUM OR COPPER CONDUCTORS.



MISCELLANEOUS - CONNECTORS LARGE CONDUCTORS CONDUCTORS #1/0 THRU 795 MCM, AND DIES ISSUE DATE: 10/25/73 05/06/13 REV. DATE: APPROVAL: B. PRIEST 8512E263.DGN

BER 728 729 730 731 806 6 5033807

1-13-5

| STOCK CODE | CONNECT | OR RANGE | | TOOLS | |
|------------|----------------------|----------------------|-------|-------|--------|
| STOCK CODE | RUN | ΤΑΡ | MD6-8 | Y-35 | CRIMPS |
| 5033933 | 2 SOL. 2 STR. | 8 SOL. 4 STR. | W-C | — | 2 |
| 5035164 | 6 SOL. 2 STR. | 6 SOL. 2 STR. | | U-O | 1 |
| 5035164 | 2 STR. 1/0 STR. | 4 STR. | _ | U-O | 1 |
| 5035166 | 2 STR. 1/0 STR. | 2 STR. 1/0 STR. | _ | U-O | 1 |
| 5035167 | 2/0 STR. 4/0 STR. | 2 STR. 1/0 STR. | _ | U-O | 1 |
| 5035168 | 2/0 STR. 4/0 STR. | 2/0 STR. 4/0 STR. | | U-D3 | 1 |
| 5035169 | 1 STR. 2/0 STR. | 1 STR. 2/0 STR. | | U-O | 1 |

COPPER COMPRESSION CONNECTORS

SERVICE ENTRANCE SLEEVES – INSULATED

| STOCK CODE | SID | DE A | SID | EB | DIE |
|------------|----------|--------|----------|--------|-----|
| STOCK CODE | SIZE | COLOR | SIZE | COLOR | DIE |
| 5035111 | 10 STR. | BROWN | 10 STR. | BROWN | BG |
| 5035112 | 6 STR. | BLUE | 8 STR. | GREEN | BG |
| 5035113 | 6 STR. | BLUE | 6 STR. | BLUE | BG |
| 5035114 | 4 STR. | ORANGE | 4 STR. | ORANGE | BG |
| 5035115 | 6 STR. | BLUE | 2 STR. | RED | BG |
| 5035116 | 4 STR. | ORANGE | 2 STR. | RED | BG |
| 5035117 | 2 STR. | RED | 2 STR. | RED | BG |
| 5035214 | 6 STR. | BLUE | 1/0 STR. | YELLOW | BG |
| 5035215 | 2 STR. | RED | 1/0 STR. | YELLOW | BG |
| 5035216 | 1/0 STR. | YELLOW | 1/0 STR. | RED | BG |
| 5035217 | 1/0 STR. | YELLOW | 1/0 STR. | YELLOW | BG |
| 5035218 | 2/0STR. | GRAY | #2 STR. | RED | 840 |
| 5035219 | 2/0 STR. | GRAY | 1/0 STR. | YELLOW | 840 |
| 5035220 | 2/0 STR. | GRAY | 2/0 STR. | GRAY | 840 |
| 5035221 | 3/0 STR. | BLACK | #2 STR. | RED | 840 |
| 5035222 | 3/0 STR. | BLACK | 1/0 STR. | YELLOW | 840 |
| 5035223 | #2 STR. | RED | 4/0 STR. | PINK | 840 |
| 5035224 | 4/0 STR. | PINK | 1/0 STR. | YELLOW | 840 |
| 5035225 | 4/0 STR. | PINK | 2/0 STR. | GRAY | 840 |
| 5035226 | 4/0 STR. | PINK | 4/0 STR. | PINK | 840 |

SERVICE NEUTRAL SLEEVE *

| STOCK CODE | RANGE | DIE |
|------------|----------|-----|
| 5035237 | 1/0 ACSR | BG |

PRIMARY JUMPER SLEEVES - NO TENSION

| STOCK CODE | RANGE | DIE |
|------------|------------|------|
| 5035241 | 266.8 STR. | U251 |
| 5035244 | 397.5 STR. | U468 |

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* THIS CONNECTOR MAY BE USED FOR SERVICES AND SLACK SPANS. IT WILL HOLD UP TO 40% OF MAXIMUM CONDUCTOR STRENGTH.

NOTES

1. ALL CONNECTORS ON THIS PAGE ARE IMPREST BIN STOCK.

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|-----------|
| Construction Standards | MISCELLANEOUS - CONNECTORS | ISSUE DATE: | |
| | NON-TENSION SLEEVES AND | REV. DATE: | 05/15/13 |
| | SERVICE ENTRANCE SLEEVES | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 1-13-6 | OH1-13-6 | 3.doc |

| CONDUCTOR | TE | ENSION SLEI | EVE | | | | TOOLS | | |
|-----------|---------|-------------|----------|-----|--------|-----|--------|------|----------|
| SIZE | STOCK # | | VENDOR # | М | D 6-8 | | Y-35 | 60 T | ON PRESS |
| | 01001 | VENDOR | VENDON # | DIE | CRIMPS | DIE | CRIMPS | DIE | CRIMPS |

(# OF STRANDS)

ALL ALUMINUM (AAC)

| | | BLACKBURN | AC4-BB | | | | | | |
|------------|---------|-----------|------------|-------|------|-------|----|---------|--------|
| #4 (7) | 5035232 | BURNDY | YDS4CA | W162 | 4 | U162 | 1 | | |
| | | NICOPRESS | AL-4 STR-P | | | | | | |
| | | BLACKBURN | AC2-TB | | 6 | | | | |
| #2 (7) | 5035233 | BURNDY | YDS2CA | W163 | 0 | U163 | 2 | | |
| | | NICOPRESS | AL-2 STR-X | | 5 | | | | |
| | | BLACKBURN | AC10-TB | | ▶ 12 | | | | |
| 1/0 (7) | 5025225 | BURNDY | YDS25AT | BG — | 12 | 11242 | 2 | | |
| 1/0 (7) | 5035235 | COOPER | OH1-0-7AL | OR | | 0243 | 3 | | |
| | | BLACKBURN | U 2 A 9 | W243— | • • | | | | |
| 3/0 (7) | 5035338 | BURNDY | YDS27AT | W247 | Q | 11247 | Λ | | |
| 3/0 (7) | 3033230 | BLACKBURN | 2169 | VVZ47 | 0 | 0247 | 4 | | |
| 269.9 (7) | 5025240 | BURNDY | YDS291AT | | | 11051 | 7 | | 4 |
| 200.0 (7) | 5055240 | BLACKBURN | AC266 | | | 0251 | 1 | 0075 AH | 3 |
| 312.8 (19) | 5035242 | AFL | 7514.719 | | | | | 6014 AH | |
| 207 5 (40) | 5005040 | HUBBELL | FTA397 | | | 11400 | 9 | | |
| 397.5 (19) | 5035243 | BURNDY | YDS311AT | | | 0468 | 10 | | |
| 477 (19) | 5035346 | AFL | 7020.812 | | | | | 6020 AH | OV/LAP |

(AL-STEEL)

ACSR

| #6 (6-1) | 5035231 | NICOPRESS | 1706-P | W162 | 4 | U162 | 1 | | |
|--------------|---------------------------|-----------|-------------|------|----|------|---|---------|--------|
| | | BURNDY | YDS2RLY | | 10 | | | | |
| #2 (6-1) | 5035234 | COOPER | OH2-61-71AS | WBG | 12 | U243 | 6 | | |
| | | BLACKBURN | DS 267 | | 10 | | | | |
| | | BLACKBURN | RC10 | | 16 | | | | |
| 1/0 (6-1) | 5035236 | BURNDY | YDS25RL | W702 | 12 | U247 | 8 | | |
| | | BLACKBURN | RS 10 | | | | | | |
| 3/0 (6-1) | 5035239 (AL SLEEVE) | | 8075.547 | | | | | 6075 AH | |
| (NOTE 2) | 5035368 (STEEL SLEEVE) | AFL | 4075.179 | | | | | 6075 SH | OV/LAP |
| 266.8 (26-7) | 5035245 (AL SLEEVE) | | 8076.688 | | | | | 6076 AH | |
| (NOTE 2) | 5035369 (STEEL SLEEVE) | AFL | 4076.246 | | | | | 6076 SH | UV/LAF |

NOTES

- 1. UNLESS CRIMPS CALL FOR OVERLAP (OV/LAP), LEAVE DISTANCE OF ONE CRIMP EACH SIDE OF CENTER STOP.
- 2. REQUIRES BOTH STOCK #'S, FOR ONE APPLICATION.

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|-----------|
| Construction Standards | MISCELLANEOUS – CONNECTORS | ISSUE DATE: | 01/14/83 |
| | TOOL AND DIE CHART | REV. DATE: | 06/11/13 |
| | FOR TENSION SLEEVES | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 1-14-1 | OH1-14-1 | .doc |

| ALUMINUM REPAIR SLEEVES | | | | | | |
|-------------------------|------------------|------------|--------|--------|------|--------|
| | | | TOOLS | | | |
| CONDUCTOR SIZE | SLEEVE STOCK NO. | BURNDY NO. | MD 6-8 | | Y-35 | |
| | | | DIE | CRIMPS | DIE | CRIMPS |
| #2, 7 STR. | 5035227 | YCU2CA | W163 | 27 | U163 | 9 |
| 1/0 STR. | 5035228 | YCU25A | W243 | 20 | U243 | 10 |
| 3/0 STR. | 5035229 | YCU27A | W247 | 24 | U247 | 12 |
| 266 STR. | 5035230 | YCU291A | | | U251 | 20 |

| COPPER TENSION SLEEVES | | | | | | | |
|---|--|---|-------|---------------------|------|---------------------|--|
| | TENSION SLEEVE | TENSION SLEEVE TOOI | | | OLS | LS | |
| CONDUCTOR SIZE & | | | I | MD 6-8 | | Y-35 | |
| SLEEVE STOCK NO. | VENDOR | VENDOR NO. | DIE | CRIMPS EACH SIDE | DIE | CRIMPS EACH SIDE | |
| #6 SOL. 5035364 | NICOPRESS THOMAS & BETTS-BLACKBURN BURNDY THOMAS & BETTS-HOMAC MFG CO | 1-162-J CTS6 YDS6W J2C3 | W161 | 2 | U161 | 1 | |
| #4 SOL. 5035365 | NICOPRESS THOMAS & BETTS-BLACKBURN BURNDY THOMAS & BETTS-HOMAC MFG CO | 1-204-X 2-1/2" CTS4 YDS4W L2C4 | W162 | 4 | U162 | 1 | |
| #4, 3 STR. 5035366 | NICOPRESS BURNDY THOMAS & BETTS-HOMAC MFG CO | 1-258-X YDS2W Q2C6 | W163 | 6 | U163 | 2 | |
| #4, 7 STR. 5093328 | NICOPRESS THOMAS & BETTS-BLACKBURN BURNDY | 1-204/7-X L2C5 YDS4C | W-162 | 4 | U162 | 1 | |
| #4, 3 TO 7 STR. TENSION LIMIT 1691 LBS. 5093329 | NICOPRESS | 1-258 X 204/7-X | W-163 | 6 | U163 | 2 | |
| #2, 7 STR. 5035367 | NICOPRESS THOMAS & BETTS-BLACKBURN BURNDY THOMAS & BETTS-HOMAC MFG CO | 1-258-7X CTS27 YDS2C Q2C7 | W163 | 6 | U163 | 2 | |

| PREFORMED SPLICES | | | | | |
|--------------------------|-----------|------------|--|--|--|
| 7 NO. 8 ALUMOWELD | CHANCE | 16M AWFS | | | |
| 5035371 | HELICAL | HS 525-16M | | | |
| 2/0, 4/3 ACSR 5035372 | PREFORMED | LS-MS-1674 | | | |



| AUTOMATIC SPLICING SLEEVES | | | | |
|----------------------------|---------------------|--------------------------|-------------------------------------|--|
| C | OPPER | ALUMINUM | | |
| STOCK NO. | CONDUCTOR SIZE | MATERIAL ITEM NO. | CONDUCTOR SIZE | |
| 5035090 * | #6 SOL. | | | |
| 5035091 * | #4 SOL. | 5035101 | #2 AA & #2, 6/1 ACSR | |
| | | 5035095 | 1/0, 7 STR. | |
| 5035092 * | #4, 3 STR. OR 7 STR | 5035096 * | 3/0, 7 STR. & NEUTRAL FOR 4/0 AA TX | |
| 5035093 * | #2, 7 STR. | 5035100 | 3/0, 6/1 ACSR | |
| | — | 5035097 | 266.8 MCM, 7 STR. | |
| 5035094 * | #1, 7 STR. | 5035099 | 266.8 MCM ACSR & 312.8 AAAC | |
| 5035102 * | 1/0, 7 STR. | 5035098 | 397.5 MCM 19 STR. | |
| 5035103 * | 2/0, 7 STR. | STEEL GUY OR STATIC WIRE | | |
| 5035104 * | 4/0, 7 STR. | 5035106 | 5/16" | |
| | | 5035107 | 3/8" | |
| | | 5035108 | 7/16" | |
| | | 5035105 | 1/4" | |

| AUTOMATIC GUY CLAMPS | | | | | |
|----------------------|----------------|-------------------|----------------|--|--|
| SHORT BAIL | | | LONG BAIL | | |
| STOCK NO. | CONDUCTOR SIZE | MATERIAL ITEM NO. | CONDUCTOR SIZE | | |
| 5028518 | 1/4" | 5028520 | 5/16" | | |
| 5028519 * | 5/16" | 5028522 * | 3/8" | | |
| 5028521 * | 3/8" | | _ | | |
| 5028523 * | 7/16" | | | | |

* IMPREST BIN STOCK

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|----------|
| Construction Standards | MISCELLANEOUS – CONNECTORS | ISSUE DATE: | 01/28/93 |
| | TOOL AND DIE CHART | REV. DATE: | 05/31/22 |
| | FOR TENSION SLEEVES | APPROVAL: | J. Luera |
| PROPRIETARY MATERIAL | 1-14-3 | OH1-14-2 | doc |
| | | | |


| | | | BURNDY COMPRESSION TOOLS & DIE INDEX NUMBERS | | |
|-----------------------|-------|----------------------------|---|------------------------------|--|
| WIRE SIZE CU OR AL | LUG | MATERIAL ITEM NUMBER | MD6-HAND TOOL | Y35 OR Y39 HYDRAULIC TOOL | |
| #2 | | 5035281 | BG | BG OR 243 | |
| 1/0 | | 5035282 | BG | BG OR 243 | |
| 2/0 | | 5035284 | 249 OR 840 | 249 OR 840 | |
| 3/0 | | 5035285 | 249 OR 840 | 249 OR 840 | |
| 4/0 | LOWER | 5035286 | 249 OR 840 | 249 OR 840 | |
| 4/0 | UPPER | 5035287 | 249 OR 840 | 249 OR 840 | |
| 266.8 MCM | | 5035288 | NONE | 251 | |
| 350 MCM | LOWER | 5035289 | NONE | 299 OR 31ART | |
| 350 MCM | UPPER | 5035290 | NONE | 299 OR 31ART | |
| 397 MCM | | 5035291 | NONE | 316 | |
| 500 MCM | LOWER | 5035292 | NONE | 317 | |
| 500 MCM | UPPER | 5035293 | NONE | 317 | |
| 750 MCM | UPPER | 5035294 | NONE | 608 | |
| 750 MCM | LOWER | 5035295 | NONE | 608 | |

- 1. THE LETTER "W" USUALLY PRECEDES MD6 DIE NUMBERS
- 2. THE LETTER "U" USUALLY PRECEDES Y35 DIE NUMBERS
- 3. "U" DIES MAY BE USED IN Y45 TOOLS WITH BURNDY ADAPTER PT-6515.
- 4. "U" DIES MAY BE USED IN Y46 TOOLS WITH BURNDY ADAPTER P-UADP

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|-----------|
| Construction Standards | CONNECTORS | ISSUE DATE: | 09/27/04 |
| PROPRIETARY MATERIAL | TOOL AND DIE CHART | REV. DATE: | 05/04/13 |
| | 2-HOLE TERMINAL CONNECTORS | APPROVAL: | B. PRIEST |
| | 1-15-1 | 8512E350 | DGN |

RETIREMENT CODES TO BE USED FOR REMOVAL OF NON-STANDARD CONDUCTORS

| | COMPATIBLI | E UNIT RETIREMEN | T CODING |
|---|--------------|------------------|--------------------|
| CONDUCTOR DESCRIPTION | DISTRIBUTION | STREETLIGHTS | SECURITY LIGHTS |
| ALUMINUM – WEATHERPROOF | | | |
| #4 STRANDED | | | |
| #2 STRANDED | | | |
| ALUMINUM CONDUCTOR – STEEL REINFORCED – WEATHERPROOF | | | |
| #4 STRANDED | | | |
| #2 STRANDED | | | |
| ALUMINUM CONDUCTOR – STEEL REINFORCED – BARE | | | |
| 2/0 STRANDED | | | |
| ALUMOWELD – BARE | | | |
| 7 #10 STRANDED | | | |
| COPPER – BARE | | | |
| #8 SOLID | | | |
| #6 SOLID OR STRANDED | | | |
| #5 SOLID OR STRANDED | | | |
| #4 SOLID OR STRANDED | | | |
| | | | DOOCENO |
| 3/0 STRANDED | RCODINS | RCUSLINS | RCUSENS |
| 4/0 STRANDED | | | |
| COPPER – WEATHERPROOF | | | |
| #8 SOLID | | | |
| #6 SOLID | | | |
| 1/0 STRANDED | | | |
| COPPERWELD – BARE | | | |
| #6 SOLID OR STRANDED | | | |
| #5 STRANDED | | | |
| STEEL – BARE | | | |
| 5/16" STRANDED | | | |
| 3/8" STRANDED | | | |
| MULTIPLEX CABLE | | | |
| | 4 | | |
| #2 DUPLEX (INCLUDES CONCENTRIC) | 4 | | |
| | 4 | | |
| #2 QUADRUPLEX | 1 | | |

NOTES

1. USE THE RETIREMENT CODE BASED ON THE CONDUCTOR'S APPLICATION, FOR THESE NON-STANDARD CONDUCTORS, NO LONGER INSTALLED ON THE SYSTEM.

| Construction Standards | DATE: 04/13/72 | |
|-----------------------------|-----------------|--|
| | DATE: 07/15/22 | |
| | OVAL: J. Robbin | |
| PROPRIETARY MATERIAL 1-16-1 | OH1-16-1.doc | |

| CONDUCTOR DESCRIPTION | COMPATIBLE UNIT CODING FOR REMOVAL |
|------------------------|---------------------------------------|
| ANY TWO-WIRE SERVICE | R2W |
| ANY THREE-WIRE SERVICE | R3W |
| ANY FOUR-WIRE SERVICE | R4W |

| Overhead Distribution | | | |
|---------------------------------------|--------------------------|--------------|-----------|
| Construction Standards | MISCELLANEOUS | ISSUE DATE: | 10/12/99 |
| R R R R R R R R R R R R R R R R R R R | SERVICE CONDUCTOR CODING | REV. DATE: | 06/09/11 |
| | REMOVAL ONLY | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 1-16-2 | OH1-16-2.doc | |



| RECOMMENDED TORQUE FOR SET SCREWS | | | |
|--------------------------------------|--------------------|--|--|
| CONDUCTOR SIZE | RECOMMENDED TORQUE | | |
| #12 - 6 STR | 10 - 13 FT - LBS | | |
| #4 - 3/0 STR | 15 - 20 FT - LBS | | |
| 4/0 - 350 STR | 23 - 35 FT - LBS | | |

| CONDUCTOR (AL OR C | RANGE ;U) |
|-----------------------|--------------|
| MAIN | #2 - 250MCM |
| TAP | #14 - 4/0 |

- 1. FOR USE ON OPEN WIRE, MULTIPLEX, OR POT LEADS WITH UP TO 4 SERVICE CONNECTIONS
- 2. STOCK CODE 5077169 INCLUDES ONE CONNECTOR AND ONE COVER.
- 3. BRUSH CONDUCTORS PRIOR TO INSTALLATION.

| Construction Standards PROPRIETARY MATERIAL Construction Standards MISCELLANEOUS & CONNECTORS SECONDARY ATTACHMENTS OVERHEAD SECONDARY BOX CONNECTOR WITH COVER 1-17-1 SECONDARY ATTACHMENTS OVERHEAD SECONDARY BOX CONNECTOR WITH COVER 1-17-1 SECONDARY ATTACHMENTS SECONDARY BOX CONNECTOR WITH COVER SECONDARY BOX CONNECTOR WITH COVER SECONDARY BOX CONNECTOR WITH COVER SECONDARY ATTACHMENTS SECONDARY BOX CONNECTOR WITH COVER SECONDARY BOX CONNECTOR WITH COVER | Overhead Distribution | | | |
|--|------------------------|---|-------------|----------|
| SECONDARY ATTACHMENTS REV. DATE: 10/13/2 PROPRIETARY MATERIAL 1-17-1 REV. DATE: 10/13/2 | Construction Standards | MISCELLANEOUS & CONNECTORS | ISSUE DATE: | 06/24/15 |
| OVERHEAD SECONDARY BOX CONNECTOR WITH COVER APPROVAL: J. LUER PROPRIETARY MATERIAL 1-17-1 8512E463 DGN | | SECONDARY ATTACHMENTS | | 10/13/20 |
| PROPRIETARY MATERIAL 1_17_1 8512E463 DGN | | OVERHEAD SECONDARY BOX CONNECTOR WITH COVER | APPROVAL: | J. LUERA |
| | PROPRIETARY MATERIAL | 1-17-1 | 8512E463 | .DGN |

SECTION 2: BASIC ASSEMBLY UNITS

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| PRIMARY AND NEUTRAL MID-SPAN TAPS, TAP LOCATION | 2-10-3 |
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| DISTRIBUTION UNDERBUILD, 69 KV STEEL POLE | 2-15-1 |
| LINK TYPE POLE BAND ASSEMBLY, STREET LIGHT AND 12 KV BRACKETS | 2-16-1 |
| LINK TYPE POLE BAND ASSEMBLY, SINGLE CIRCUIT, TANGENT | 2-17-1 |
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| PRIMARY INSULATOR ASSEMBLIES, POLE-TOP PINS AND DEADEND BELLS | 2-19-1 |
| PRIMARY INSULATOR ASSEMBLIES, PIN-TYPE INSULATORS | 2-20-1 |
| PRIMARY INSULATOR ASSEMBLIES, SIDE MOUNTED INSULATORS | |
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| EXTENDED BRACKET, STEEL POLE MOUNTING | 2-26-1 |
| EXTENDED BRACKETS, CUTOUT-ARRESTER COMBINATIONS | 2-27-1 |
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| 69 KV STEEL POLE, EXTENDED UNIVERSAL 12 KV HORIZONTAL TANGENT ARM | 2-29-1 |

| Overhead Distribution | | | |
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| Construction Standards | | ISSUE DATE: | 05/14/13 |
| R | BASIC ASSEMBLY UNITS | REV. DATE: | 08/23/23 |
| | | | J. Robbins |
| PROPRIETARY MATERIAL | 2-1-1 | OH2-1- | 1.doc |

SECTION 2: BASIC ASSEMBLY UNITS

| TITLE / DESCRIPTION | PAGE |
|---|--------|
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| Overhead Distribution Construction Standards | INDEX BASIC ASSEMBLY UNITS | ISSUE DATE: REV. DATE: APPROVAL: | 05/14/13 08/23/23 J. Robbins |
|---|-------------------------------|--|------------------------------------|
| PROPRIETARY MATERIAL | 2-1-2 | OH2-1- | 1.doc |
| | | | |

THIS GUIDE RELATES TO THE INSTALLATION, REMOVAL OR REPLACEMENT OF BASIC CONSTRUCTION ASSEMBLIES USED IN DISTRIBUTION LINE CONSTRUCTION. ALTHOUGH MANY OF THESE UNITS ARE INCLUDED AS PARTS OF CONSTRUCTION UNITS, AS IN THE "P" AND "X" SECTIONS, THEY MAY BE CALLED FOR INDIVIDUALLY BY USING THE CODE NUMBER OUTLINED IN THIS SECTION.

COMPATIBLE UNIT CODING FOR SECTION "B"

GENERAL CRITERIA

THIS SECTION IS COMPOSED OF THE FUNDAMENTAL CONSTRUCTION ASSEMBLIES UTILIZED IN THE DESIGN OF OVERHEAD DISTRIBUTION FACILITIES. DASHES IN THE COMPATIBLE UNIT NUMBERS INDICATE A WIRE CODE MUST BE ADDED TO COMPLETE THE NUMBER. REFER TO THE MISCELLANEOUS SECTION FOR CONDUCTOR CODING CHARTS.

SPECIAL NOTE: THE FOLLOWING FREQUENTLY USED BASIC ASSEMBLY UNITS ARE NOT INCLUDED IN OTHER CONSTRUCTION UNITS:

B1-B5BR...... NEUTRAL AND SECONDARY ASSEMBLIES B2-B7...... SECONDARY ATTACHMENTS (SERVICES) BTC1-BTT26...... MID-SPAN TAPS (PRIMARY & NEUTRAL) B29-B29D TEN FOOT CROSSARMS

THESE UNITS MUST BE SPECIFIED ON THE GRID SKETCH WHENEVER THEY ARE REQUIRED.

NEUTRAL AND SECONDARY ASSEMBLIES - STREET LIGHT AND SECURITY LIGHTING CONDUCTOR ASSEMBLIES

THE NEUTRAL, SECONDARY AND SERVICE SUPPORT ATTACHMENTS FOR WOOD POLE APPLICATION ARE AVAILABLE IN TWO TYPES:

- 1. STEEL BRACKETS FOR GROUNDED NEUTRALS ONLY (OPEN WIRE OR CABLE)
- 2. INSULATED BRACKETS FOR NEUTRALS OR OPEN WIRE SECONDARIES

INSULATED BRACKETS ARE LIMITED TO 900 LBS. TENSION ON DEADENDS AND 900 LBS. RESULTANT FORCE ON ANGLES.

MID-SPAN UNITS FOR OPEN WIRE AND CABLED SECONDARIES ARE ALSO INCLUDED TO PROVIDE MID-SPAN SECONDARY AND SERVICE TAPS.

PRIMARY ASSEMBLIES

THE PRIMARY SUPPORT ATTACHMENTS, INCLUDING INSULATORS, ARE ASSIGNED INDIVIDUAL COMPATIBLE UNIT NUMBERS. EACH NUMBER PROVIDES THE PROPER CLAMP, LINEGUARD, ARMOR ROD, ETC. TO FIT THE CONDUCTOR WHICH IS SPECIFIED ON THE GRID SKETCH.

CUTOUTS, ARRESTERS & COMBINATIONS

THE INDIVIDUAL AND MULTIPLE UNIT ASSEMBLIES FOR FUSE AND LIGHTNING PROTECTION ARE SHOWN WITH THEIR COMPATIBLE UNIT CODE NUMBERS. THE CODING SEQUENCE CAN BE NOTED BY THE FOLLOWING EXAMPLES:

BC1..... COMBO, ONE

BG1..... GRASSHOPPER COMBO, ONE

BCF1..... CUTOUT, ONE

BCA1 CUTOUT AND ARRESTER, ONE

BUC1 UNDERGROUND CUTOUT AND ARRESTER APPLICATION, ONE

BCC1 CUTOUT CAPACITOR APPLICATION, ONE

| Overhead Distribution | | | |
|------------------------|----------------------|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 12/03/71 |
| ® | BASIC ASSEMBLY UNITS | REV. DATE: | 06/06/11 |
| DR | INSTRUCTIONAL GUIDE | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 2-2-1 | OH2-2-1. | doc |

BLADE DISCONNECTS

INDIVIDUAL BLADE DISCONNECTS ARE AVAILABLE IN ONE TYPE:

BD6 = BLADE DISCONNECT, 600 AMP

MID-SPAN TAPS

VARIATIONS OF MID-SPAN TAPS ARE AVAILABLE USING THE LISTED CODES. THESE CODES APPLY TO PRIMARY AND NEUTRAL BARE CONDUCTORS.

CROSSARMS

FOUR, EIGHT AND TEN FOOT CROSSARMS ARE CODED BY LENGTH AND TYPE. THESE MAY BE CALLED FOR INDIVIDUALLY AND THEN FRAMED BY THE ADDITION OF THE OTHER BASIC UNITS FOR SPECIAL CROSSARM APPLICATIONS WHICH ARE NOT COVERED IN CONSTRUCTION STANDARDS.

GRID SKETCH APPLICATION

MOST OF THE CONDUCTOR SUPPORT UNITS ARE CODED TO FIT A GIVEN WIRE SIZE. THESE UNITS SHOULD BE RECORDED ON LINE 5 OR LINE 6 FOR PRIMARIES, LINE 8 FOR NEUTRALS, LINES 10, 11 OR 12 FOR SECONDARIES, STREET LIGHT CIRCUITS AND DUSK TO DAWN CIRCUITS.

EXAMPLE: TYPICAL GRID SKETCH NOTATION UTILIZING BASIC ASSEMBLY UNITS.

| | | | A | В | C | D \ |
|------------------------------------|-----------------------|----|--------------|--------------|-------|-----|
| | | 1 | TAX CODE | 17-18 | 8-04 | |
| | | 2 | POINT NO. | | ACT | ľ |
| | Span Length 📂 | 3 | | 200 | DUANT | |
| | Primary Conductor 📂 | 4 | | Л266 | З | |
| IS NE P | Basic Assembly Unit 📂 | 5 | STD. NO. | 3 8/0 | / | / |
| PRI- 2000 | Basic Assembly Unit ► | 6 | | B 30 | 2 | |
| | Neutral Conductor 📂 | 7 | | ЛЗО | 1 | |
| | Basic Assembly Unit 🗩 | 8 | STD. NO. | B/B | / | |
| | Secondary Conductor 📂 | 9 | | Л/О | 2 | |
| | Basic Assembly Unit 🗩 | 10 | STD. NO. | B/BR | 2 | |
| | | 11 | | | | |
| | | 12 | | | | Ţ |
| N= N | | 13 | | | | |
| Sel | | 14 | | | | |
| | | 15 | | | | |
| | | 16 | | | | |
| | | 17 | | | | Y |
| | | 18 | | | | |
| 0 | Pole Specification ► | 19 | POLE | 140 Z | 1 | |
| units specified on grid sketch $*$ | • | | | | | |



* BASIC ASSEMBLY UNITS DO NOT SPECIFY FRAMING DETAILS, THEREFORE THE ESTIMATOR MUST PROVIDE THAT INFORMATION FOR THE FIELD PERSONNEL. THIS SHOULD BE DONE IN THE FORM OF A REFERENCE NOTE OR STICK SKETCH ON THE CONSTRUCTION DRAWING PORTION OF THE GRID SKETCH FORM.

BASIC ASSEMBLY UNITS WHICH DO NOT VARY WITH CONDUCTOR SIZES ARE TO BE RECORDED ON THE MISCELLANEOUS PORTION OF THE GRID SKETCH – LINES 13 THRU 18. UNITS OF THIS TYPE ARE:

| B2, B2M3, B2M4 | .MID-SPAN SECONDARY AND SERVICE ATTACHMENTS |
|----------------|---|
| B9, B92 | .POLE GROUNDS |
| B13M | STRAIN INSULATOR REPLACEMENT UNITS |
| BC1 THRU BCC4 | ALL CUTOUT-ARRESTER UNITS |
| BD6 | .BLADE DISCONNECT – SIDE MOUNTED |
| B24 THRU B29D | ALL CROSSARM UNITS |
| BKM | .KPF OPERATING ROD REPLACEMENT UNIT |

| Overhead Distribution | | | |
|------------------------|----------------------|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 12/03/71 |
| R R | BASIC ASSEMBLY UNITS | REV. DATE: | 06/06/11 |
| DR | INSTRUCTIONAL GUIDE | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 2-2-3 | OH2-2-1. | doc |
| | | | - |

MACHINE BOLTS WITH NUT

DOUBLE ARMING BOLTS WITH 4 NUTS

| LENGTH | 1/2" DIA. | 5/8" DIA. | 3/ | 4" DIA. | 7/8" DIA. |]] | 5/8" DIA. | 3/4" DIA. |
|--------|------------|------------------|----------------|---------|---------------------------|-------------------|---------------|-----------------------|
| 1 1/2 | 5027611 | | | | | 1 | | |
| 2 | 5027612 | 5027730 | | | | | | |
| 2 1/2 | 5027613 | | 5 | 027749 | | | | |
| 3 | | 5027731 | | | | | | |
| 3 1/2 | | | 5 | 027750 | 5027863 | | | |
| 4 | | 5027732 | 2 | | 5027864 | | | |
| 4 1/2 | 5027614 | | | | | | | |
| 5 | 5027615 | | | | | | | |
| 6 | 5027616 | 5027733 | | | | | | |
| 7 | 5027617 | | | | | | | |
| 8 | | 5027734 | 50 | 027751 | | | | |
| 9 | 5027618 | 5027735 | | | | | | |
| 10 | 5027722 | 5027736 | 5 | 027752 | | | | |
| 11 | | 5027737 | | | | | | |
| 12 | 5027723 | 5027738 | 5 | 027753 | | | | |
| 14 | 5027724 | 5027739 | 50 | 027754 | 5027865 | | 5027484 | 5027593 |
| 16 | 5027725 | 5027740 | 5 | 027755 | 5027866 | | 5027485 | 5027594 |
| 18 | 5027726 | 5027741 | 50 | 027857 | 5027867 | | 5027486 | 5027595 |
| 20 | 5027727 | 5027742 | 5 | 027858 | 5027868 | | 5027585 | 5027596 |
| 22 | 5027728 | 5027743 | 5 | 027859 | 5027869 | | 5027586 | 5027597 |
| 24 | 5027729 | 5027744 | 5 | 027860 | 5027870 | | 5027587 | 5027598 |
| 26 | | 5027745 | 5 | 027861 | 5027871 | | 5027588 | 5027599 |
| 28 | | 5027746 | 5 | 027862 | 5027872 | | 5027589 | 5027600 |
| 30 | | | | | | | 5027590 | 5027601 |
| 32 | | 5027747 | | | | | 5027591 | 5027602 |
| 34 | | | | | | | | 5027603 |
| 36 | | 5027748 | | | | | | 5027604 |
| 38 | | | | | | | | 5027605 |
| 40 | | | | | | | | 5027606 |
| 42 | | | | | | | | 5027607 |
| | | | | | | | | HOT DIP GALVANIZED |
| | I.D. SQUAR | E DOUBLE COIL | SPRING LOCK | ROUND | 3-1/4" X 3-1/4" CURVED | 4" X 4" CURVED | MF LOCKNUT | |
| | 1/2" | 5029167 | 5029177 | 5029172 | | | 5028256 | |

| Construction | Stand | dards | | BA | ASIC ASS | EMBLY UNITS | | | ISSUE D |
|--------------|---------|---------|---------|---------|----------|-------------|---------|---------|---------|
| Overhead Di | istribu | ution | | | | | | | |
| | 7/8" | | 5028170 | | | | 5029164 | 5028259 | |
| | 3/4" | 5029181 | 5029169 | 5029179 | 5029175 | 5029162 | 5029163 | 5028258 | |
| | 5/8" | 5029180 | 5029168 | 5029178 | 5029173 | | | 5028257 | |
| | | | | | | | | | |

Construction Standards

PROPRIETARY MATERIAL

HOT GALVANIZED BOLTS, NUTS & WASHERS
 ISSUE DATE:
 07/20/93

 REV. DATE:
 12/20/16

 APPROVAL:
 S. DURAN

 8512E205.DGN

2-3-1



DEADEND GRIP

| B7 CU WIRE SIZE | CLAMP (1) | GRIP (1) | CONNECTORS & COVERS | |
|--------------------------|--------------|-------------|---------------------------------------|--|
| | 1 | NEUTRA | L OR SECONDARY | |
| A2 | | 5034320 | 5033813 (1) | |
| A10 | 5035602 | | 5033816 (1) | |
| A30 | | 5034321 | 5033817 (1) | |
| DX6 | 5035601 | | 5033813 (2), 5034083 (1) | |
| DX4 | 5035601 | | 5033813 (2), 5034083 (1) | |
| TX2 | | 5034320 | 5033813 (3), 5034083 (2) | |
| TX10 | | 5034324 | 5033817 (3), 5034080 (2) | |
| TX40 | | 5034325 | 5033816 (1), 5033818 (2), 5034080 (2) | |
| QX2 | | 5034320 | 5033813 (4), 5034083 (3) | |
| QX10 | | 5034324 | 5033817 (4), 5034080 (3) | |
| QX40 | | 5034325 | 5033816 (1), 5033818 (3), 5034080 (3) | |
| SECURITY LIGHTS | | | | |
| DX6D | 5035601 | | 5033813 (2), 5034083 (1) | |
| DX4D | 5035601 | | 5033813 (2), 5034083 (1) | |
| TX2D | 5035601 | | 5033813 (3), 5034083 (2) | |
| TX10D | 5035602 | | 5033817 (3), 5034080 (2) | |
| | | ST | REET LIGHTS | |
| DX6L | 5035601 | | 5033813 (2), 5034083 (1) | |
| DX4L | 5035601 | | 5033813 (2), 5034083 (1) | |
| TX2L | 5035601 | | 5033813 (3), 5034083 (2) | |
| TX10L | 5035602 | | 5033817 (3), 5034080 (2) | |
| | | | SERVICES | |
| SDX6 | 5035601 | | 5033813 (2), 5034083 (1) | |
| SDX4 | 5035601 | | 5033813 (2), 5034083 (1) | |
| STX2 | 5035601 | | 5033813 (3), 5034083 (2) | |
| STX10 | 5035602 | | 5033817 (3), 5034080 (2) | |
| STX40 | 5035603 | | 5033816 (1), 5033818 (2), 5034080 (2) | |
| SQX2 | 5035601 | | 5033813 (4), 5034083 (3) | |
| SQX10 | 5035602 | | 5033817 (4), 5034080 (3) | |
| SQX40 | 5035603 | | 5033816 (1), 5033818 (3), 5034080 (3) | |

NOTES

1. NUMBER IN PARENTHESIS () IS QUANTITY

| BASIC ASSEMBLY UNITS | ISSUE DATE: | 11/30/77 |
|--|---|---|
| SERVICE, STREETLIGHTS & SECONDARY DEADEND ATTACHMENTS | REV. DATE: | 05/20/13 |
| | APPROVAL: | B. PRIEST |
| 2-4-1 | 8512E71 | .DGN |
| | BASIC ASSEMBLY UNITS SERVICE, STREETLIGHTS & SECONDARY DEADEND ATTACHMENTS 2-4-1 | BASIC ASSEMBLY UNITS SERVICE, STREETLIGHTS & SECONDARY DEADEND ATTACHMENTS 2-4-1 8512E71 |











| BPT2_ | SIDE TIE | | | | |
|-----------------|-------------------------|----------------------------|--|--|--|
| CU WIRE SIZE | MATERIAL ITEM NUMBER | CODES | | | |
| A2 | 5035605 | F NECK-YELLOW, SIZE-PURPLE | | | |
| A266 | 5035607 | F NECK-YELLOW, SIZE-PURPLE | | | |
| AC312 | 5035607 | F NECK-YELLOW, SIZE-PURPLE | | | |
| A397 | 5035506 | F NECK-YELLOW, SIZE-BROWN | | | |
| R2 | 5035606 | F NECK-YELLOW, SIZE-RED | | | |
| | | | | | |

| Overhead Distribution | | | |
|------------------------|----------------------|-------------|-----------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 04/01/92 |
| | PRIMARY | REV. DATE: | 05/17/13 |
| | TOP AND SIDE TIES | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 2-5-1 | 8512E150 |).DGN |

TIE PAD





CENTER MARK & COLOR CODE

| BR_ | ARMOR ROD | | | |
|-----------------|-------------------------|-------------------|--|--|
| CU WIRE SIZE | MATERIAL ITEM NUMBER | PIECES, CODE | | |
| A2 | 5034851 | 8 - PURPLE | | |
| A30 | 5034852 | 10 - GREEN | | |
| A266 | 5034854 | 12 - BLACK | | |
| A397 | 5034856 | 12 - GREEN | | |
| R2 | 5034848 | 9 - RED | | |
| R30 | 5034853 | 11 - ORANGE | | |
| R266 | 5034855 | 12 - YELLOW | | |
| AC312 | 5034855 | 12 - YELLOW | | |
| AW78 | 5034968 | 10 - ORANGE 50" | | |

NOTES

- 1. ARMOR RODS MAY BE USED AS PATCH RODS WHEN DAMAGE IS LIMITED TO 50% OF OUTER STRANDS. RODS ARE TO BE CENTERED OVER DAMAGED AREA. THE ENDS OF THE ARMOR RODS MUST BE LOCATED AT LEAST 6" FROM SUPPORT POINT (TIES, RODS).
- 2. THOROUGHLY WIRE BRUSH THE DAMAGED CONDUCTOR THE FULL LENGTH OF THE ARMOR RODS TO BE APPLIED.
- 3. APPLY INHIBITOR (5012206) ON THE BRUSHED AREA THEN APPLY ARMOR RODS.

| BL_ | LINE GUARD | | |
|-----------------|-------------------------|-------------------|--|
| CU WIRE SIZE | MATERIAL ITEM NUMBER | PIECES, CODE | |
| A2 | 5034978 | 9 - PURPLE | |
| A30 | 5034982 | 13 - GREEN | |
| A266 | 5034984 | 14 - BLACK | |
| A397 | 5034985 | 16 - GREEN | |
| R2 | 5034986 | 9 - RED | |
| R30 | 5034983 | 14 - ORANGE | |
| R266 | 5034987 | 14 - YELLOW | |
| AC312 | 5034987 | 14 - YELLOW | |

- 1. LINE GUARD MAY BE USED AS PATCH RODS WHEN DAMAGE IS LIMITED TO 25% OF OUTER STRANDS. RODS ARE TO BE CENTERED OVER DAMAGED AREA. THE ENDS OF THE LINE GUARD MUST BE LOCATED AT LEAST 6" FROM SUPPORT POINT (TIES, RODS).
- 2. THOROUGHLY WIRE BRUSH THE DAMAGED CONDUCTOR THE FULL LENGTH OF THE ARMOR RODS TO BE APPLIED.
- 3. APPLY INHIBITOR (5012206) ON THE BRUSHED AREA THEN APPLY ARMOR RODS.

| Overhead Distribution | | | |
|---------------------------------------|--|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 04/01/92 |
| C C C C C C C C C C C C C C C C C C C | BASIC ASSEMBLY UNITS ARMOR ROD & LINE GUARD | REV. DATE: | 05/20/13 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 2-6-1 | 8512E148 | B.DGN |



QUADRANT FIG. 1







 \bigcirc

WEDGE FIG. 3

STRAIGHT LINE FIG. 4

ANGLE FIG. 5

| | BA1 | BA2 | BD | BD2 |
|-------------------|--------------------|-----------------------|--------------------------------|--|
| | ANGLE CLA (FIC | MP 30° - 60° 6. 5) | DEAD-END CLAMP (FIG. 1 - 4) | |
| C.U. WIRE SIZE | SPANS 300' OR LESS | SPANS OVER 300' | FULL TENSION ONLY | SLACK SPAN / MID-SPAN TAP / FULL TENSION |
| C6 | | | 5035577 | (FIG. 2) |
| C4 | | | | |
| C2 | 5028391 | | | 5025579 (EIC 1) |
| C1 | | | | 5055576 (FIG. 1) |
| C20 | | | 5035581 (FIG. 3) | |
| A2 | E029 | 2207 | | |
| R2 | 5020 | 0007 | | 5035579 (FIG. 1) OR |
| A30 | | | | 5035583 (FIG. 4) |
| R30 | | | | |
| A226 | 5028 | 3389 | | 5035587 (FIG. 1) OR |
| R226 | | | 5035586 (FIG. 3) | 5035583 (FIG. 4) |
| AC312 | | | | 5035587 (FIG. 1) OR |
| A397 | | 5028388 | | 5035584 (FIG. 4) |

| | | AIR GAP DEAD END CLAMPS (FIG. 3) | | |
|------------------------|------------------------|--|-------------|--------|
| | #4 - #2/0 | TWO CLAMPS ARE USED FOR AIR GAPS WITH INSULATOR 5039548 | 5035581 | |
| | 266-397 AA | TWO CLAMPS ARE USED FOR AIR GAPS WITH INSULATOR 5039548 | 5035586 | |
| | | | | |
| Overhead Distribution | | REV: ADDED ILLUSTRATIONS, FIGURE CALLOUTS, NEW CU, AND UPDATED TABLE | | |
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE | E: 04/01/92 | |
| | PRIMARY | | 06/04/24 | |
| | ANGLE & DEADEND CLAMPS | APPROVAL: | J. ROBBINS | |
| | ETARY MATERIAL | 2-7-1 | 8512E1 | 46.DGN |
| | | | | |



6 DEG. - 15 DEG.





DEADEND

| | BCT1 | BCT2 | BCT3 | BCT4 | BCT5 |
|--------------|--------------------------------------|----------------|-----------------------------------|----------------|---------------|
| | SPANS 300' OR LESS WITH LINEGUARD | | SPANS OVER 300' WITH ARMOR ROD | | DEADEND CLAMP |
| CU WIRE SIZE | 6 DEG 15 DEG. | 15 DEG 30 DEG. | 6 DEG 15 DEG. | 15 DEG 30 DEG. | |
| A2 | 5028393 | 5028397 | 5028394 | 5028398 | 5028401 |
| A30 | 5028394 | 5028398 | 5028394 | 5028398 | 5035574 |
| A266 | 5028394 | 5028398 | 5028394 | 5028398 | 5035574 |
| A397 | 5028394 | 5028398 | 5028395 | 5028399 | 5035575 |
| R2 | 5028393 | 5028397 | 5028394 | 5028398 | 5028401 |
| R30 | 5028394 | 5028398 | 5028394 | 5028398 | 5035574 |
| R266 | 5028394 | 5028398 | 5028394 | 5028398 | 5035574 |
| AC312 | 5028394 | 5028398 | 5028394 | 5028398 | 5035575 |
| C2-C20 | 5028392 | | | | |

| Overhead Distribution | | | |
|------------------------|---------------------------------|-------------|-----------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 04/01/92 |
| | PRIMARY | REV. DATE: | 05/10/13 |
| | CLAMPS FOR CLAMP-TOP INSULATORS | APPROVAL: | B. PRIEST |
| | 2-7-2 | 8512E147 | .DGN |

| KPF REPLACEME | ENT PARTS |
|---------------|-----------|
|---------------|-----------|

| Overhead Distribution | | | |
|------------------------|----------------------|-------------|-----------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 05/10/01 |
| | MAINTENANCE | REV. DATE: | 06/06/11 |
| | COMPATIBLE UNITS | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 2-8-1 | 8512E339 | .DGN |
| | | | |

15KV VERTICLE STAGGERED MOUNTED KPF 4 1/2 HOURS, 3 WHIPS, 3 WHIP RETAINERS, 3 HOODED ARC CHUTES

BLBF 4 1/2 HOURS, 3 WHIPS, 3 WHIP RETAINERS, 3 HOODED ARC CHUTES

BLBV

BLBV1

15KV VERTICLE STACKED MOUNTED KPF 4 1/2 HOURS, 3 WHIPS, 3 WHIP RETAINERS, 3 HOODED ARC CHUTES

15K CROSSARM MOUNTED KPF



1. THE PREFERRED METHOD TO MOUNT STREET LIGHT ARMS ON STEEL POLES IS WITH THE STAINLESS STEEL BANDS. SEE OUTDOOR LIGHTING STANDARDS.







THESE TAPS MAY BE APPLIED ANY OF THREE WAYS.





| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|----------------------|----------|-------------------------|
| 1 | THIMBLE - CLEVIS | 1 | 5029157 |
| 2 | INSULATOR | 1 | 5039548 |
| 3 | LINK | 1 | VARIOUS |
| 4 | DEAD - END CLAMP | 1 | VARIOUS |
| 5 | HOT - LINE CONNECTOR | 1 | VARIOUS |
| 6 | SIDE TIE | 1 | VARIOUS |

| 12KV PRIMARY INSULATED MID - SPAN TAP COMPATIBLE UNITS | | | | | |
|---|------------------------|---------|------------|------------|--|
| | RUNNING LINE CONDUCTOR | | | | |
| | | A2 | A266 | A397 | |
| OR | A2 | BTTD2A2 | BTTD26A2 | BTTD39A2 | |
| L L | A266 | | BTTD26A266 | BTTD39A266 | |
| CONDU | A397 | | | BTTD39A397 | |

1. FOR NEUTRAL CONDUCTOR MID - SPAN TAP, SEE 2-10-1.

2. T-TAPS ARE TO BE CONSTRUCTED ONLY ON FULL TENSION RUNNING LINE.

| PROPRIETARY MATERIAL | PRIMARY INSULATED MID - SPAN TAP PHASE CONDUCTORS ONLY | REV. DATE: | 02/02/16 S. DURAN |
|------------------------|---|---------------------------|----------------------|
| Construction Standards | 12KV BASIC ASSEMBLY UNITS PRIMARY INSULATED MID - SPAN TAP | ISSUE DATE: REV. DATE: | 06/07/11 02/02/16 |
| Overhead Distribution | | | |



| Overhead Distribution | | | |
|------------------------|-----------------------------------|-------------|-----------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 06/08/11 |
| | PRIMARY AND NEUTRAL MID SPAN TAPS | REV. DATE: | 0 |
| | TAP LOCATION | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 2-10-3 | 8512E490 |).DGN |



ATTACHMENT DIRECTLY TO WOOD POLE

SPANS 0' TO 300'

| $ANGLE \rightarrow$ | TANGENT - 10° | 10° - 45° | 45° - 60° | | |
|--|---------------|-----------|-----------|--|--|
| WIRE SIZE ↓ | | | | | |
| DX6, DX6L, DX6D | B1 | B1 | B1 | | |
| A2, R2, TX2, TX2L, TX2D, QX2, TX10, TX10L, TX10D, QX10 | B3* | B3* | B3C* | | |
| A30, R20, R30, TX40, QX40 | B3* | B3* | B3C | | |
| AW78 | B3** | B3** | B3C** | | |

| TANGENT - 10° | 10° - 45° | 45° - 60° |
|---------------|-----------|-----------|
|---------------|-----------|-----------|

| B3* | B3R** | B3CR** |
|------|--------|--------|
| B3* | B3CR** | B3CR** |
| B3** | B3C** | B3C** |

ATTACHMENT DIRECTLY TO STEEL POLE

(IF ATTACHMENT IS TO 69KV STEEL TRANSMISSION POLE, ALSO USE BK2AL, BK2AM, OR BK2AS.

| DX6, DX6L, DX6D | B1M | B1M | B1M |
|--|-------|-------|-------|
| A2, R2, TX2, TX2L, TX2D, QX2 | B1M* | B1A* | B3C* |
| A10, A30, R20, R30, TX10, TX10L, TX10D, QX10, TX40, QX40 | B1M* | B3C* | B3C* |
| AW78 | B1M** | B3C** | B3C** |

| B1M* | B3CR** | B3CR** |
|-------|--------|--------|
| B1M* | B3CR** | B3CR** |
| B1M** | B3C** | B3C** |

ATTACHMENT TO EXTENSION OFFSET BRACKET - WOOD POLE

(THIS IS LIMITED TO A MAXIMUM ANGLE OF 30°)

| DX6, DX6L, DX6D | B1X | B1X | |
|--|-----|--------|--|
| A2, R2, TX2, TX2L, TX2D, QX2 | B1X | B2X* | |
| A10, A30, R20, R30, TX10, TX10L, TX10D, QX10, TX40, QX40 | B1X | B3X* | |
| AW78 | B1X | B3XR** | |

| B2X* | B3XR** | |
|------|--------|--|
| B1X | B3XR** | |
| B1X | B3XR** | |

* WITH LINEGUARD

** WITH ARMOR ROD

| Overhead Distribution | | | |
|------------------------|--------------------------------|-------------|-----------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 03/24/94 |
| | NEUTRAL & SECONDARY ASSEMBLIES | REV. DATE: | 06/02/11 |
| | 0 TO 60 DEG. | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 2-12-1 | OH2-12- | -1.doc |









SECONDARY-NEUTRAL UNDERBUILD

NOTES

1. FOR CONDUCTOR ATTACHMENT USE B1A__,B1M__,B3C__,B3CR__ B5__,B5B__,B5BR__,B15__,BK2,BK4T,BK4X,BK5,ETC.



| CORRECT BAND COMPATIBLE UNIT TO USE BASED ON POLE DIAMETER | | | | |
|--|----------|-------|--------------|--|
| MAXIMUM ALLOWABLE POLE DIAMETER AT CONTACT LOCATION | | | | |
| | 4" - 25" | | 40" - 55" | |
| TANGENT | BK2AS | BK2AM | BK2AL | |
| DEADEND | BK2BS | BK2BM | BK2BL | |
| INSULATOR MOUNT | BK2CS | BK2CM | BK2CL | |

| Overhead Distribution | | | |
|------------------------|-------------------------|-------------|----------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 12/03/90 |
| ® | DISTRIBUTION UNDERBUILD | REV. DATE: | 05/09/13 |
| | 69kV STEEL POLE | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 2-15-1 | 8512E34. | DGN |
| | | | |



| ITEM | DESCRIPTION | MATERIAL ITEM NUMBER | QUANTITY |
|------|--|-------------------------|----------|
| 1 | BAND, POLE, LINK ASSEMBLY | 5028719 | 3 |
| 2 | BRACKET, 12KV UNIVERSAL (BTA851T) | 5028857 | 1 |
| 3 | BRACKET, STREET LIGHT ARM (BTA851S) | 5028858 | 1 |

- 1. APPROXIMATE LOCATION OF TAKE-UPS FOR BAND.
- 2. ALWAYS INSTALL CLEVIS PINS WITH THE COTTER KEYS IN THE DOWN POSITION.
- 3. FOR EASE OF INSTALLATION ON LINK TAKEUP ASSEMBLY, INSTALL CARRIAGE BOLTS IN OPPOSITE DIRECTIONS. TIGHTEN NUTS ONE FULL TURN AFTER ALL SLACK AND "PLAY" IS TAKEN UP.
- 4. THE ULTIMATE STRENGTH OF ASSEMBLY IS 18,000 LBS. MAXIMUM WORKING LOAD IS 50% OF THE ULTIMATE STRENGTH. THIS RATING IS FOR A DEAD-END TYPE OF LOAD ONLY. DO NOT USE ASSEMBLIES FOR DOWN GUYS.
- 5. THE PREFERRED METHOD TO MOUNT STREET LIGHT ARMS ON STEEL POLES IS WITH THE STAINLESS STEEL BANDS. SEE OUTDOOR LIGHTING STANDARDS.

| Overhead Distribution Construction Standards | | | |
|---|--|-------------|-----------|
| | BASIC ASSEMBLY UNITS | ISSUE DATE: | 11/30/92 |
| | LINK TYPE POLE BAND ASSEMBLY STREET LIGHT AND 12kV BRACKETS | REV. DATE: | 05/02/13 |
| | | APPROVAL: | B. PRIEST |
| | 2-16-1 | 8512E256 | DGN |

BTA851BC SINGLE CIRCUIT TANGENT



| ITEM | DESCRIPTION | MATERIAL ITEM NUMBER | QUANTITY |
|------|---------------------------|-------------------------|----------|
| 1 | BAND, POLE, LINK ASSEMBLY | 5028719 | 2 |
| 2 | BRACKET, POLE BAND (BOX) | 5028961 | 1 |

- 1. APPROXIMATE LOCATION OF TAKEUPS FOR BAND.
- 2. SEE 69KV OVERHEAD CONSTRUCTION STANDARDS, CHAPTER 3 FOR NOTES AND KEY.

| Overhead Distribution Construction Standards | | | |
|---|---|-------------|-----------|
| | BASIC ASSEMBLY UNITS | ISSUE DATE: | 05/05/95 |
| | LINK TYPE POLE BAND ASSEMBLY SINGLE CIRCUIT, TANGENT | REV. DATE: | 05/01/13 |
| | | APPROVAL: | B. PRIEST |
| | 2-17-1 | 8512E321 | I.DGN |















| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | BASIC ASSEMBLY UNITS BLADE DISCONNECT SWITCHES | ISSUE DATE: | 11/15/71 |
| | | REV. DATE: | 05/02/13 |
| | | APPROVAL: | B. PRIEST |
| | 2-22-1 | 8512E197 | '.DGN |
| | | | |


BCF1 BCF1M WITHOUT MOUNTING HARDWARE



| Overhead Distribution | | | |
|------------------------|------------------------------|-------------|-----------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 11/15/71 |
| PROPRIETARY MATERIAL | CUTOUT-ARRESTER COMBINATIONS | REV. DATE. | 06/05/13 |
| | FOR TRANSFORMERS | APPROVAL: | B. PRIEST |
| | 2-23-1 | 8512E198 | 3.DGN |
| | | | |

BCA5 40"TRI-MOUNT BRACKET



BCA3



| Overhead Distribution | REV: ILLUSTRATION TO REFLECT THE WELDED STEEL STOCK THAT REPL 3-BOLT CLAMP. | |
|------------------------|---|----------------------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: 11/15/71 |
| | CUTOUT-ARRESTER COMBINATIONS | REV. DATE: 09/12/24 |
| | FOR TRANSFORMERS | APPROVAL: J. ROBBINS |
| PROPRIETARY MATERIAL | 2-23-2 | 8512E492.DGN |



BCC3



FOR FIXED CAPACITOR BANKS

| Overhead Distribution | REV: ILLUSTRATION TO REFLECT THE WELDED STEEL STOCK THAT REPL 3-BOLT CLAMP. | | |
|------------------------|---|----------------------|--|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: 08/18/81 | |
| | CUTOUT-ARRESTER COMBINATIONS | REV. DATE: 09/12/24 | |
| | FOR CAPACITOR BANKS | APPROVAL: J. ROBBINS | |
| PROPRIETARY MATERIAL | 2-24-1 | 8512E199.DGN | |

BCC4



FOR SWITCHED CAPACITOR BANKS

| Overhead Distribution | REV: ILLUSTRATION TO REFLECT THE WELDED STEEL STOCK THAT REPL 3-BOLT CLAMP. | | |
|------------------------|---|------------|------------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE | : 08/18/81 |
| | CUTOUT-ARRESTER COMBINATIONS | REV. DATE: | 09/12/24 |
| | FOR CAPACITOR BANKS | APPROVAL: | J. ROBBINS |
| PROPRIETARY MATERIAL | 2-24-2 | 8512E49 | 3.DGN |







BCA3EST









| Overhead Distribution | REV: ILLUSTRATION TO REFLECT THE WELDED STEEL STOCK THAT REPL 3-BOLT CLAMP. | |
|------------------------|---|----------------------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: 06/06/88 |
| | EXTENDED BRACKETS | REV. DATE: 09/12/24 |
| | CUTOUT-ARRESTER COMBINATIONS | APPROVAL: J. ROBBINS |
| PROPRIETARY MATERIAL | 2-27-1 | 8512E200.DGN |



6'- 2"



NOTES

1. WEIGHT = 226 LBS.

REFERENCE DRAWINGS

UNIVERSAL 12kV DEADEND ARM A-967-69.6

| Overhead Distribution | | | |
|------------------------|---------------------------------------|-------------|-----------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 11/30/92 |
| | 69kV STEEL POLE | REV. DATE: | 05/13/13 |
| | UNIVERSAL 12kV HORIZONTAL DEADEND ARM | APPROVAL: | B. PRIEST |
| | 2-28-1 | 8512E238 | DGN |
| | | | |



4'- 6"



NOTES

- 1. WEIGHT = 171 LBS. 5028708
- 2. FABRICATE FROM 57-1223 OR NEW FABRICATION.
- 3. MAX. SPAN = 500 FT.

REFERENCE DRAWINGS:

EXTENDED UNIVERSAL 12KV TANGENT ARM A-967-69.10

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 01/25/99 |
| PROPRIETARY MATERIAL | 69kV STEEL POLE EXTENDED UNIVERSAL 12kV HORIZONTAL TANGENT ARM | REV. DATE: | 05/13/13 |
| | | APPROVAL: | B. PRIEST |
| | 2-29-1 | 8512E346 | .DGN |
| | | | |





1. WEIGHT = 129 LBS.

REFERENCE DRAWINGS:

UNIVERSAL 12kV VERTICAL DEADEND ARM A-967-69.7

| Overhead Distribution | | |
|---|-------|-----------|
| Construction Standards BASIC ASSEMBLY UNITS | DATE: | 11/30/92 |
| 69kV STEEL POLE | ATE: | 05/13/13 |
| UNIVERSAL 12kV VERTICAL DEADEND ARM | VAL: | B. PRIEST |
| PROPRIETARY MATERIAL 2-30-1 85 | 2E239 | .DGN |

BTA892WC 0 DEG.TO 90 DEG. DEADEND



| ITEM | DESCRIPTION | MATERIAL ITEM NUMBER | QUANTITY FOR BAND RANGE DIAMETER C (24"-31") |
|------|------------------------------------|----------------------------|---|
| 1 | POLE BAND LINK ASSEMBLY | 5028719 | 9 |
| 2 | LINK SEGMENT | 5027576 | - |
| 3 | 1/2 LINK SEGMENT | 5027577 | - |
| 4 | TAKEUP ASSEMBLY | 5028488 | - |
| 5 | UNIVERSAL DEADEND ARM | 5028595 | 2 |
| 6 | BOLT, HEX, STEEL, 1/2" X 1-1/2" | 5029529 | 6 |

- 1. DRILL & TAP 6 HOLES FOR 1/2" DIA,. SAE GRADE 5, 1 1/2" LONG BOLTS AS SHOWN.
- 2. ARM DESIGNED FOR THE FOLLOWING:
- SINGLE 397.5 KCM AAC AT 3,000 LBS. PER CONDUCTOR WITH 9 LB.WIND, 300 FT. RULING SPAN. VERTICAL LOAD = 2,040 LBS. WORKING LOAD.
- 3. SEE DWG. A-967-69.6 FOR DESIGN LOAD CASES.
- 4. THIS BAND NOT REQUIRED FOR NON-DEADEND APPLICATION.
- 5. REVERSE FIRST LINK AT ARM VANGS TO IMPROVE FIT-UP.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 05/05/95 |
| PROPRIETARY MATERIAL | 69kV STEEL POLE UNIVERSAL 12kV HORIZONTAL DEADEND ARM ASSEMBLY | REV. DATE: | 04/03/13 |
| | | APPROVAL: | B. PRIEST |
| | 2-31-1 | 8512E240 | .DGN |
| | | | |

BTA891XD

SINGLE CIRCUIT 0 DEG.-90 DEG.DEADEND





| ITEM | DESCRIPTION | MATERIAL ITEM NUMBER | QUANTITY |
|------|-------------------------|-------------------------|----------|
| 1 | POLE BAND LINK ASSEMBLY | 5028719 | 6 |
| 2 | UNIVERSAL DEADEND ARM | 5028695 | 1 |

- 1. DRILL & TAP 4 HOLES FOR 1/2" DIA., SAE GRADE 5, 1 1/2" LONG BOLTS AS SHOWN.
- 2. ARM DESIGNED FOR THE FOLLOWING: SINGLE 397.5 KCM AAC AT 3,000 LBS. PER CONDUCTOR WITH 9 LB.WIND, 300 FT. RULING SPAN.
 VERTICAL LOAD = 2,040 LBS. WORKING LOAD.
- 3. SEE DWG. A-967-69.7 FOR DESIGN LOAD CASES.
- 4. REVERSE FIRST LINK AT ARM VANGS TO IMPROVE FIT-UP.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 05/05/95 |
| S XA® | 69 kV STEEL POLE UNIVERSAL 12 kV VERTICAL DEADEND ARM ASSEMBLY | REV. DATE: | 05/03/13 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 2-32-1 | 8512E241 | .DGN |
| | | | |

BTA892XD 0 DEG.-90 DEG. DEADEND





| ITEM | DESCRIPTION | MATERIAL ITEM NUMBER | QUANTITY |
|------|-------------------------|-------------------------|----------|
| 1 | POLE BAND LINK ASSEMBLY | 5028719 | 6 |
| 2 | UNIVERSAL DEADEND ARM | 5028695 | 2 |

- 1. DRILL & TAP 4 HOLES FOR 1/2" DIA., SAE GRADE 5, 1 1/2" LONG BOLTS AS SHOWN.
- 2. ARM DESIGNED FOR THE FOLLOWING: SINGLE 397.5 KCM AAC AT 3 000 LBS_PER CONDUCTO
- SINGLE 397.5 KCM AAC AT 3,000 LBS. PER CONDUCTOR WITH 9 LB.WIND, 300 FT. RULING SPAN. VERTICAL LOAD = 2,040 LBS. WORKING LOAD.
- 3. SEE DWG. A-967-69.7 FOR DESIGN LOAD CASES.
- 4. REVERSE FIRST LINK AT ARM VANGS TO IMPROVE FIT-UP.

| Overhead Distribution | | | |
|------------------------|--|-------------|-----------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 05/05/95 |
| | 69kV STEEL POLE | REV. DATE: | 05/10/13 |
| | UNIVERSAL 12kV VERTICAL DEADEND ARM ASSEMBLY | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 2-32-2 | 8512E242 | .DGN |
| | | | |

BTA892XYD TANGENT TO 2 DEG.





| ITEM | DESCRIPTION | MATERIAL ITEM NUMBER | QUANTITY |
|------|----------------------------|-------------------------|----------|
| 1 | POLE BAND LINK ASSEMBLY | 5028719 | 6 |
| 2 | LINK SEGMENT | 5027576 | 3 |
| 3 | UNIVERSAL 12KV TANGENT ARM | 5028697 | 2 |

NOTES

1. NO BOLTS OR DRILLING REQUIRED.

2. FOR NON-DEADEND APPLICATIONS ONLY.

3. SEE DWG.A-967-69.10 FOR DESIGN LOAD CASES.

4. GAP MAY BE PRESENT BETWEEN BAND AND POLE ON SMALL DIAMETER POLES.

5. REVERSE FIRST LINK AT ARM VANGS TO IMPROVE FIT-UP.

| Overhead Distribution | | | |
|------------------------|-------------------------------------|-------------|-----------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 04/16/04 |
| ® | 69 kV STEEL POLE | REV. DATE: | 06/03/11 |
| | EXTENDED 12 kV TANGENT ARM ASSEMBLY | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 2-33-1 | 8512E347 | DGN |



| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 03/03/05 |
| PROPRIETARY MATERIAL | STEEL POLE NEUTRAL GROUND CONNECTION | REV. DATE: | 05/07/13 |
| | | APPROVAL: | B. PRIEST |
| | 2-34-1 | 8512E352 | DGN |
| | | | |







- 1. PLACE ONLY AFTER CUSTOMER REQUEST.
- 2. MOVE UP OR DOWN POLES SLIGHTLY TO AVOID COVERING POLE MARKINGS, CAPACITOR CONTROL BOX, ETC.
- 3. COMPLETELY ENCIRCLE POLE BUT DO NOT COVER OR PLACE UNDER A RISER IF ONE EXISTS. OVERLAP PLATES IF NECESSARY.

| Overhead Distribution | | | |
|------------------------|-----------------------------------|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 12/14/95 |
| | BASIC ASSEMBLY UNITS CAT GUARD | REV. DATE: | 05/07/13 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 2-37-1 | 8512E254 | DGN |



- 1. THIS IS TO BE USED IN CASES WHERE A FLASH OVER HAS OCCURED OR AS SPECIFIED ON A JOB. ATTACH TO TOP PHASE.
- 2. GENERAL APPLICATION: P15, P17, P18, P25A, P28, P35A, P36B, P65.
- 3 SPECIAL APPLICATION:
 - + P28 & P28C-PUT ON THE OPPOSITE SIDE OF POLE FROM THE TOP POST INSULATED.

 - + P25N,P35N & P35BJ-PUT ON THE SAME SIDE OF POLE AS LOWEST PHA. + PB15,PB25A,PB35A-PUT ON THE OPPOSITE SIDE OF POLE FROM THE STAND OFF PIN INSULATORS.
 - + P38 & P38C-PUT ON THE OPPOSITE SIDE OF POLE FROM THE CENTER PHASE.



BA91



NOTES

- 1. THIS IS TO BE USED IN CASES WHERE A FLASH OVER HAS OCCURED OR AS SPECIFIED ON A JOB. ATTACH TO TOP PHASE.
- 2. GENERAL APPLICATION: P15N,P35AN, & P36

BA91



2. GENERAL APPLICATION: P35

| Overhead Distribution | | | |
|------------------------|----------------------|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 09/09/85 |
| | BASIC ASSEMBLY UNITS | REV. DATE: | 05/1/13 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 2-38-2 | 8512E36. | DGN |



- 1. THIS IS TO BE USED IN CASES WHERE A FLASH OVER HAS OCCURED OR AS SPECIFIED ON A JOB.
- 2. GENERAL APPLICATION: P25, & P26



- 1. THIS IS TO BE USED IN CASES WHERE A FLASH OVER HAS OCCURED OR AS SPECIFIED ON A JOB.
- 2. GENERAL APPLICATION:P66,PHB25N,PHB35N,PHB25,PHB35, & PHN36.

| Overhead Distribution | | | |
|-------------------------------|---|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 09/11/85 |
| ® | BASIC ASSEMBLY UNITS ARRESTER ASSEMBLIES | REV. DATE: | 05/03/13 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 2-38-3 | 8512E37 | .DGN |

BA93



NOTES

1. THIS IS TO BE USED IN CASES WHERE A FLASH OVER HAS OCCURED, OR AS SPECIFIED ON A JOB.

2. GENERAL APPLICATION: PH25 THRU PH36, PH29 THRU PH29J.

| Overhead Distribution | | | |
|------------------------|----------------------|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 09/13/85 |
| | BASIC ASSEMBLY UNITS | REV. DATE: | 05/02/13 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 2-38-4 | 8512E38 | DGN |



B9 COVERED POLE GROUND #2 COPPERWELD 5033969



- 1. INSTALL STAPLES (5035477) 2-3" APART AT THE END OF THE GROUND WIRE, BEND THE GROUND WIRE OVER THE 2 STAPLES BEFORE PULLING TIGHT, THEN INSTALL 2 STAPLES AT THE BOTTOM POLE TO HOLD IN PLACE. INSTALL REMAINDER OF STAPLES APPROXIMATELY 3' APART.
- 2. 2" MIN. CLEARANCE BETWEEN GROUND WIRE AND ANY WASHER, BRACKET, OR OTHER HARDWARE ITEM.
- 3. STRIP 12-18 INCHES WITHIN THE 8FT-10FT ABOVE GROUND OF PVC SHIELDING FROM THE #2 COPPERWELD TO MITIGATE FOR FIRE MIGRATION POTENTIAL UP THE WOODEN POLES IN FIRE PRONE AREAS.

| Overhead Distribution | | |
|------------------------|-------------------------------------|----------------------|
| Construction Standards | | ISSUE DATE: 04/02/91 |
| | BASIC ASSEMBLY UNITS POLE GROUND | REV. DATE: 10/07/21 |
| | | APPROVAL: E. LUBANDI |
| PROPRIETARY MATERIAL | 2-39-1 | 8512E39.DGN |





1. POLE GROUND REPAIR: EXPOSE THE BURIED END AND INSTALL A SEGMENT OF #2 COVERED COPPERWELD 5033969, USING 2 COMPRESSION CONNECTORS 5035164 AT EACH JOINT. IF THE END CANNOT BE LOCATED, INSTALL A GROUND ROD.

| Overhead Distribution | | | |
|------------------------|----------------------|-------------|----------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 04/02/91 |
| PROPRIETARY MATERIAL | POLE GROUND | REV. DATE: | 11/23/21 |
| | REPAIR | APPROVAL: | J. LUERA |
| | 2-39-3 | 8512E495 | .DGN |

INSTALLATION PROCEDURES

- 1. SUPPORT EXISTING WOOD POLE.
- 2. CUT WOOD POLE ABOVE DAMAGED AREA.
- 3. MOVE WOOD POLE ASIDE AND SUPPORT.
- 4. REMOVE WOOD POLE BUTT.
- 5. CLEAN EXISTING HOLE OF LOOSE MATERIAL.
- 6. INSTALL BUTT PLATE, GROUND WIRE AND MODULAR POLE BUTT.
- 7. STRIP 12-18 INCHES WITHIN THE 8FT-10FT ABOVE GROUND OF PVC SHIELDING OFF THE #2 COPPERWELD TO MITIGATE THE POTENTIAL OF FIRE MIGRATION UP THE WOODEN POLES IN FIRE PRONE AREAS.
- 8. CUT WOOD POLE TO DESIRED LENGTH.
- 9. SLIDE STEEL CONNECTOR UP WOOD POLE AND SECURE WITH LAG BOLT.
- 10. POSITION WOOD POLE ON MODULAR POLE BUTT AND LOWER STEEL CONNECTOR. SECURE AT NAIL HOLES PROVIDED AT TOP OF CONNECTOR. GROUND WIRE SHOULD PROTRUDE FROM TOP OF STEEL CONNECTOR TO A POINT CONVENIENT TO MAKE CONNECTION WITH EXISTING GROUND WIRE.
- 11. DRIVE WOOD WEDGES INTO TOP OF CONNECTOR TO CENTER ON POLE.
- 12. WRAP TWO-INCH TAPE AROUND THE BOTTOM EDGE OF THE CONNECTOR AND THE CONCRETE POLE BUTT TO PREVENT GROUT LEAKAGE. NEOPRENE PLUGS ARE TEMPORARILY PLACED IN CONNECTOR WEEP HOLES.
- 13. MIX QUICK SETTING GROUT WITH WATER PER INSTRUCTIONS ON CONTAINER.
- 14. POUR GROUT INTO CONNECTOR TOP USING CARDBOARD FUNNEL. TAP CONNECTOR SEVERAL TIMES TO ENSURE GROUT HAS FILLED THE BOTTOM. IF SPACE BETWEEN THE POLE AND THE CONNECTOR IS MORE THAN ONE INCH, PEA GRAVEL MAY BE USED AS FILLER. ALTERNATE GROUT AND PEA GRAVEL UNTIL COMPLETELY FULL.
- 15. AFTER THE GROUT IS SET, REMOVE THE NEOPRENE PLUGS AND TAPE.

| Overhead Distribution | | 0 | |
|------------------------|-------------------------|-------------|------------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 06/03/99 |
| R | MODULAR POLE BUTT | REV. DATE: | 10/07/21 |
| | INSTALLATION PROCEDURES | APPROVAL: | E. Lubandi |
| PROPRIETARY MATERIAL | 2-40-1 | OH2-40 | -1.doc |
| | | | |

BPB14 | 14' CONCRETE POLE BUTT REPLACEMENT 5028659

BPB18 18' CONCRETE POLE BUTT REPLACEMENT 5029020



WOOD POLE REINFORCING BANDED STEEL STUBS, SINGLE UNIT

DETERMINING STUB SIZE

THE SIZE OF STEEL STUB CHANNELS ARE DETERMINED BY POLE SIZE AND CLASS. BANDED STEEL STUBS PROVIDE APPROXIMATELY 70% OF THE ORIGINAL ULTIMATE STRENGTH GROUND LINE CAPACITY OF THE WOOD POLE. NEVER INSTALL A SMALLER SIZE STUB CHANNEL THAN REQUIRED BY THESE STANDARDS. IF THE REQUIRED STUB SIZE IS OUT OF STOCK, USE A STUB WITH THE NEXT LOWER MATERIAL ITEM NUMBER.

COMPATIBLE UNIT CODES

SEE COMPATIBLE UNIT TABLE ON PAGE 2-41-3.

EXAMPLE: **BWPR 25**; BWPR = BASIC ASSEMBLY, WOOD POLE REINFORCEMENT; 25 = STRENGTH OF STEEL STUB IN KIP FEET (1,000 LBS. = 1 KIP)

INSTALLATION NOTES

- 1. BLUE STAKE POLE PRIOR TO REINFORCING.
- TIGHTEN SWITCH HANDLE BOLTS UNTIL WELL SEATED INTO WOOD. DO NOT DRILL THROUGH OR WELD ON BANDING.
- 3. INSTALLATION SEQUENCE:
 - A. MARK FINISHED HEIGHT OF STEEL STUB ON WOOD POLE (TYPICAL 5'-0").
 - B. SET STEEL STUB POLE AGAINST WOOD POLE. ALIGN STUB ON POLE (SEE PG. 2-41-2). SECURE STUB TO WOOD POLE WITH CLOTH STRAP. SET WINCH POLE. LIFT AIR HAMMER INTO PLACE. SECURE HOLD-DOWN CHAIN AROUND POLE. ATTACH HAMMER CHAIN BRACKET TO PULL DOWN WINCH ASSEMBLY. SECURE TENSION ROLLER AROUND BASE OF POLE AND STEEL STUB.
 - C. DRIVE STEEL STUB. KEEP PULL DOWN TENSION ON HAMMER TO AVOID HAMMER "DANCING".
 - **NOTE:** DURING DIFFICULT DRIVING, IT IS POSSIBLE TO LIFT THE WOOD POLE. MONITOR POLE SETTING DEPTH BY MARKING GRADE LINE AND INSPECTING PERIODICALLY DURING THE DRIVING. STOP DRIVING IF POLE IS LIFTING. STOP HAMMER WHEN STUB IS SET TO APPROPRIATE DEPTH.
 - E. WRAP BANDS TWICE AROUND POLE. VERTICAL SPACING OF BANDS ON POLE IS CRITICAL. USE 2 CLIP SEALS PER BAND. AS BANDS ARE BEING TENSIONED, TAP BAND WITH RUBBER MALLET TO PROVIDE EVEN TENSION AROUND POLE. TENSION BANDS STARTING AT THE TOP OF THE POLE AND TENSION BOTH BANDS AT SAME TIME TO AVOID LOOSE BANDS. CRIMP EACH SEAL TWICE. TRIM BANDS BY SCORING AND BENDING.
 - F. ATTACH GUARD CAP WITH GALVANIZED NAILS. TOUCH UP NICKS AND SCRATCHES WITH "GALVANOX". COAT TOP AND BOTTOM OF CRIMPED SEALS THOROUGHLY.
 - G. CONTACT SRP-MCM FOR FINAL PAINTING.

ORIENTATION OF STEEL STUBS ON POLES







| | | | BANDED STEEL STUB MATERIAL QUANTITIES | | | | | | | | |
|-------------|--------|---------|---------------------------------------|---------|---------|----------------|---------|---------|---------|---------|--|
| | | | | | BANDING | DOUBLE SEAL | | | | | |
| SF STOCK | | 5028782 | 5028781 | 5028780 | 5028779 | 5028778 | 5028777 | 5028775 | 5027476 | 5028903 | |
| VENDOR | LWS | 5-10-4 | 7-10-4 | 7-11-4 | 8-11-4 | 9-11-4 | 10-12-6 | 11-12-6 | | | |
| MARKING | OSMOSE | 7-10 | 8-10 | 9-11 | 980-11 | 1280-11 | 1380-12 | 1480-12 | | | |
| | | | | | | | | | | | |
| BWP | R25 | 1 | | | | | | | 0.2 | 8 | |
| BWP | 'R36 | | 1 | | | | | | 0.2 | 8 | |
| BWP | R55 | | | 1 | | | | | 0.2 | 8 | |
| BWP | R73 | | | | 1 | | | | 0.2 | 8 | |
| BWPR129 | | | | | | 1 | | | 0.2 | 8 | |
| BWPR148 | | | | | | | 1 | | 0.2 | 8 | |
| BWPI | R169 | | | | | | | 1 | 0.3 | 12 | |

THE COMPATIBLE UNIT IS CODED: BASIC UNIT, WOOD POLE REINFORCING. THE NUMBER IS THE STRENGTH OF THE STEEL STUB IN KIP FEET.

SEE PAGE 2-42-3 TO SELECT CORRECT POLE REINFORCING COMPATIBLE UNIT.

| Overhead Distribution | |
|------------------------|--|
| Construction Standards | |
| | |
| | |
| PROPRIETARY MATERIAL | |

BASIC ASSEMBLY UNITS WOOD POLE REINFORCING BANDED STEEL STUBS - SINGLE UNIT
 ISSUE DATE:
 03/24/97

 REV. DATE:
 05/13/13

 APPROVAL:
 B. PRIEST

 8515E92.DGN

COMPATIBLE UNITS FOR REINFORCING DISTRIBUTION WOOD POLES

| | CLASS | | | | | | | | | | |
|----------------|---------|---------|---------|--------|--------|--------|--------|--------|--------|--|--|
| POLE LENGTH | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 10 | | |
| 20 | BWPR55 | BWPR36 | BWPR36 | BWPR25 | BWPR25 | BWPR25 | BWPR25 | BWPR25 | BWPR25 | | |
| 25 | BWPR55 | BWPR55 | BWPR36 | BWPR36 | BWPR25 | BWPR25 | BWPR25 | BWPR25 | BWPR25 | | |
| 30 | BWPR73 | BWPR55 | BWPR55 | BWPR36 | BWPR36 | BWPR25 | BWPR25 | BWPR25 | | | |
| 35 | BWPR129 | BWPR73 | BWPR55 | BWPR55 | BWPR36 | BWPR36 | BWPR25 | | | | |
| 40 | BWPR129 | BWPR129 | BWPR73 | BWPR55 | BWPR55 | BWPR36 | | | | | |
| 45 | BWPR129 | BWPR129 | BWPR73 | BWPR73 | BWPR55 | BWPR36 | | | | | |
| 50 | BWPR129 | BWPR129 | BWPR129 | BWPR73 | BWPR55 | | | | | | |
| 55 | BWPR129 | BWPR129 | BWPR129 | BWPR73 | | | | | | | |
| 60 | BWPR148 | BWPR129 | | | | | | | | | |
| 65 | BWPR169 | BWPR148 | | | | | | | | | |

FOR POLES LARGER THAN APPEARING ON THIS TABLE SEE TRANSMISSION WOOD POLE REINFORCING STANDARDS FOR INSTALLATION REQUIREMENTS IN THE 69KV OVERHEAD TRANSMISSION CONSTRUCTION STANDARDS BOOK.

USE RBWPR WHEN REMOVING ANY WOOD DISTRIBUTION POLE REINFORCEMENT.

THE FOLLOWINGTABLE IS A REFERENCE TO DETERMINE POLE SIZE AND CLASS WHEN THE BRAND CANNOT BE FOUND. ESTIMATE OR MEASURE THE HEIGHT OF POLE ABOVE GROUND, MEASURE THE CIRCUMFERENCE AT GROUND LINE, THEN MATCH THE MEASUREMENTS TO A POLE SIZE.

DIMENSIONS OF DOUGLAS FIR AND SOUTHERN PINE POLES

| | CLAS | SS | H4 | H3 | H2 | H1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 10 |
|--|--------------------------|----------------|------|------|------|------|--------|--------|-------|-------|--------|------|------|------|------|
| MIN. CIRCUMFERENCE AT TOP OF POLE (INCHES) | | 35 | 33 | 31 | 29 | 27 | 25 | 23 | 21 | 19 | 17 | 15 | 15 | 12 | |
| POLE HT. OUT OF GROUND | ACTUAL POLE LENGTH | EMBED DEPTH | | | | | | | | | | | | | |
| | (FEET) | | | | | GRO | UND LI | NE CIF | RCUMF | ERENC | E (INC | HES) | | | |
| 16.0 | 20 | 4.0 | | | | | 31.6 | 29.6 | 27.6 | 25.6 | 23.6 | 21.6 | 20.1 | 17.9 | |
| 20.5 | 25 | 4.5 | | | | | 34 | 32 | 30 | 28 | 26 | 23.5 | 22 | 19.9 | 14.3 |
| 25.0 | 30 | 5.0 | | | | | 36.9 | 34.4 | 32.4 | 29.9 | 27.9 | 25.3 | 23.9 | 20.7 | 15.2 |
| 29.5 | 35 | 5.5 | | | 43.7 | 41.7 | 39.2 | 36.7 | 34.2 | 31.7 | 29.2 | 27.2 | 21.5 | | |
| 34.0 | 40 | 6.0 | 51.0 | 48.5 | 46 | 43.5 | 41 | 38 | 36 | 33.5 | 31 | 28.5 | | | |
| 38.5 | 45 | 6.5 | 53.3 | 50.8 | 48.3 | 45.3 | 42.8 | 40.3 | 37.3 | 34.8 | 32.3 | | | | |
| 43.0 | 50 | 7.0 | 55.0 | 52.5 | 50.1 | 47.1 | 44.6 | 41.6 | 38.6 | 36.1 | 33.7 | | | | |
| 47.5 | 55 | 7.5 | 57.3 | 54.3 | 51.4 | 48.9 | 45.9 | 42.9 | 40 | 37.5 | | | | | |
| 52.0 | 60 | 8.0 | 58.6 | 56.1 | 53.1 | 50.2 | 47.2 | 44.3 | 41.3 | 38.3 | | | | | |
| 56.5 | 65 | 8.5 | 60.4 | 57.4 | 54.5 | 51.5 | 48.5 | 45.6 | 42.6 | 39.7 | | | | | |

| Overhead Distribution Construction Standards | BASIC ASSEMBLY UNITS WOOD POLE REINFORCING BANDED STEEL STUBS - SINGLE UNIT | ISSUE DATE: REV. DATE: APPROVAL: | 03/24/97 12/17/14 B. PRIEST |
|---|---|--|-----------------------------------|
| PROPRIETARY MATERIAL | 2-41-3 | OH2-41- | -3.doc |



DETAIL (NOTE 1)

| | BILL OF MATERIALS | | | | | | | |
|------|--|----------|------------------|--|--|--|--|--|
| ITEM | DESCRIPTION | QUANTITY | MATERIAL ITEM | | | | | |
| 1 | FIRE MESH, 4' X 12' ROLL | 1 | 5093895 | | | | | |
| 2 | NAIL, ROOFING #11 X 1-1/4 IN. GALVANIZED | 0.25 | 5094838 | | | | | |

| Overhead Distribution Construction Standards | BASIC ASSEMBLY UNITS FIRE MESH WOOD POLE | ISSUE DATE: 08/23/23 REV. DATE: APPROVAL: J. ROBBINS |
|---|--|--|
| PROPRIETARY MATERIAL | 2-42-1 | 8512E470.DGN |

- 1. VEGETATION SHALL HAVE A CLEARING OF 10' HORIZONTAL RADIUS EXTENDING TO THE HEIGHT OF POLE.
- 2. COMPLETELY EXPOSE THE AREA AROUND THE BASE OF POLE TO A DEPTH OF 6 IN. BELOW EXISTING GRADE.
- 3. ROLL OUT A SECTION OF MESH AND POSITION THE 4' EDGE OF ROLL VERTICALLY AGAINST THE POLE TO THE BOTTOM OF EXCAVATION.
- 4. INITIALLY SECURE THE MESH WITH A NAIL TO THE BOTTOM CORNER APPROXIMATELY 1 IN. FROM THE VERTICAL EDGE OF MESH.
- 5. PULL MESH FIRMLY AROUND THE POLE UNTIL A MINIMUM 3" OVERLAP OF VERTICAL SEAM IS ACHIEVED, CUT SECTION FROM ROLL USING A UTILITY KNIFE. SECURE MESH WITH NAILS APPROXIMATELY 1 IN. FROM THE EDGE OF MESH WITH VERTICAL AND HORIZONTAL SPACING NO MORE THAN 6 IN. APART. A MINIMUM OF 50 NAILS SHALL BE USED PER POLE APPLICATION.
- 6. POSITION A SECOND WRAP OF MESH ABOVE THE LOWER SECTION TO ACHIEVE A MINIMUM 3" OVERLAP ALONG THE HORIZONTAL EDGE. ENSURE THE VERTICAL SEAMS ARE OFFSET BY AT LEAST 30°. WHEN DONE CORRECTLY, THE COVERAGE OF MESH SHALL EXTEND UP THE POLE A MINIMUM HEIGHT OF 7' ABOVE GRADE AND THE TWO VERTICAL SEAMS ARE NOT ALIGNED.
- 7. PULL, CUT, AND SECURE THE MESH THE SAME FASHION AS THE LOWER SECTION WITH A MINIMUM 3" OF VERTICAL SEAM OVERLAP AND NAILS ALONG THE UPPER AND BOTTOM EDGES AND VERTICAL SEAM WITH SPACING NO MORE THAN 6 IN. APART.
- 8. UNIFORMLY APPLY NAILS ALONG THE BODY OF THE MESH (SECTION BETWEEN THE EDGE AND SEAM) AROUND THE POLE WITH A MINIMUM OF 12 IN. SPACING.
- 9. BACKFILL THE EXCAVATION.
- 10. ANY DEVIATION LESS THAN THE RECOMMENDED 7' HEIGHT SHALL CONTACT SRP FIRE MANAGEMENT OFFICER (SEE FIRE MANAGEMENT INTERNAL PAGE).
- 11. MESH IS ALLOWED TO COVER U-GUARDS AND GROUND WIRE. A SEPARATE CUT PIECE MAY BE REQUIRED TO COVER U-GUARD BOOT. FOR EQUIPMENT OR HANDLES ATTACHED TO POLE, MESH MAY BE CUT TO FIT BUT SHALL NOT COVER.
- 12. DO NOT COVER SRP TAGS OR MARKINGS, RELOCATE AS NEEDED ABOVE THE MESH.

PROBLEM

WOOD STRUCTURES PRONE TO WILDFIRES.

SOLUTION

REDUCE DAMAGE TO POLE FROM DIRECT CONTACT WITH FLAMES.

| PROPRIETARY MATERIAL | 2-42-2 | OH2-42-2 | 2.doc |
|------------------------|----------------------|-------------|------------|
| | WOOD POLE | APPROVAL: | J. Robbins |
| | FIRE MESH | REV. DATE: | |
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 08/23/23 |
| Overhead Distribution | | | |

BTA892Y__ TANGENT TO 30 DEG.



BILL OF MATERIAL

| ITEM | DESCRIPTION | MATERIAL | QUANTITY FOR BAND RANGE DIAMETER | | | |
|------|-------------------------|----------|-------------------------------------|----------------|----------------|--|
| | | | B (17"-24") | C (24"-31") | D (31"-38") | |
| 1 | POLE BAND LINK ASSEMBLY | 5028719 | 3 | 4 | 4 | |
| 2 | LINK SEGMENT | 5027576 | 8 | 10 | 23 | |
| 3 | | 5028488 | 1 | _ | _ | |
| 4 | UNIVERSAL TANGENT ARM | 5028596 | 2 | 2 | 2 | |

- 1. NO BOLTS OR DRILLING REQUIRED.
- 2. FOR NON-DEADEND APPLICATIONS ONLY.
- 3. ARM DESIGNED FOR THE FOLLOWING: SINGLE 397.5 KCM AAC AT 3000 LBS. PER CONDUCTOR WITH 9 LB.WIND, 300 FT. RULING SPAN VERTICAL LOAD = 2040 LBS. WORKING LOAD.
- 4. SEE DWG. A-967-69.4 FOR DESIGN LOAD CASES.
- 5. GAP MAY BE PRESENT BETWEEN BAND AND POLE ON SMALL DIAMETER POLES.
- 6. PHASE SPACING LIMITS SPAN TO 300 FEET MAXIMUM.

| Overhead Distribution Construction Standards | | | |
|---|---|-------------|-----------|
| | BASIC ASSEMBLY UNITS | ISSUE DATE: | 05/05/95 |
| | 69 kV STEEL POLE | REV. DATE: | 05/02/13 |
| | UNIVERSAL 12 KV HORIZONTAL TANGENT ARM ASSEMBLY | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 2-43-1 | 8512E243 | DGN |
| | | | |



1. WEIGHT = 138 LBS.

2. PHASE SPACING LIMITS SPAN TO 300 FEET MAXIMUM.

REFERENCE DRAWINGS

UNIVERSAL 12kV TANGENT ARM A-967-69.5

| Overhead Distribution | | - | |
|------------------------|--|----------------|---------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: 11 | 1/30/92 |
| | 69 kV STEEL POLE | REV. DATE: 05 | 5/03/13 |
| | UNIVERSAL 12 kV HORIZONTAL TANGENT ARM | APPROVAL: B. | PRIEST |
| PROPRIETARY MATERIAL | 2-43-2 | 8512E237.D | GN |



| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 10/01/82 |
| PROPRIETARY MATERIAL | BASIC ASSEMBLY UNITS | REV. DATE: | 05/02/13 |
| | SWITCH OF ERATING ROD & ADAFTER BRACKET | APPROVAL: | B. PRIEST |
| | 2-44-1 | 8512E21. | DGN |


| | (C) (C) (C) (C) (C) (C) (C) (C) (C) (C) | | MOUNTING BRACKET | |
|---|---|---|--|--|
| | | | | |
| | | | | |
| | ТИ | O PIECE 12KY GALVANI | ZED | |
| TRANSMISSION POLE | TOP POSITION CROSSARM | TOP POSITION CROSSARM | BOTTOM POSITION CROSSARM | BOTTOM POSITION CROSSARM |
| (POLE DESCRIPTION ON SHEET 1) | BASIC COMPATIBLE UNIT | STOCK CODE | UNIT | STOCK CODE |
| (POLE DESCRIPTION ON SHEET 1) | BASIC COMPATIBLE UNIT BM1 | 5028701 | BASIC COMPATIBLE UNIT BM2 | STOCK CODE 57-1201 * |
| (POLE DESCRIPTION ON SHEET 1) 5027958 5027961 | BASIC COMPATIBLE UNIT BM1 BM3 | 5028701 57-1209 * | BASIC COMPATIBLE UNIT BM2 BM4 | 57-1201 * |
| (POLE DESCRIPTION ON SHEET 1) 5027958 5027961 5027959 | BASIC COMPATIBLE UNIT BM1 BM3 BM5 | 5028701 57-1209* 57-1203 * | BASIC COMPATIBLE UNIT BM2 BM4 BM6 | 57-1201 * 57-1210 * 57-1204 * |
| (POLE DESCRIPTION ON SHEET 1) 5027958 5027961 5027959 5027963 | BASIC COMPATIBLE UNIT BM1 BM3 BM5 BM7 | STOCK CODE 5028701 57-1209* 57-1203 * 57-1212 * | BASIC COMPATIBLE UNIT BM2 BM4 BM6 BM8 | STOCK CODE 57-1201 * 57-1210 * 57-1204 * 57-1213 * |
| (POLE DESCRIPTION ON SHEET 1) 5027958 5027961 5027959 5027963 5027964 | BASIC COMPATIBLE UNIT BM1 BM3 BM5 BM7 BM9 | STOCK CODE 5028701 57-1209* 57-1203* 57-1212* 57-1218* | BASIC COMPATIBLE UNIT BM2 BM4 BM6 BM8 BM8 BM10 | STOCK CODE 57-1201 * 57-1210 * 57-1204 * 57-1213 * 5028705 |
| (POLE DESCRIPTION ON SHEET 1) 5027958 5027961 5027959 5027963 5027964 5027960 | BASIC COMPATIBLE UNIT BM1 BM3 BM5 BM7 BM9 BM11 | STOCK CODE 5028701 57-1209* 57-1203* 57-1212* 57-1218* 5028702 | BASIC COMPATIBLE UNIT BM2 BM4 BM6 BM8 BM10 BM12 | STOCK CODE 57-1201 * 57-1210 * 57-1204 * 57-1213 * 5028705 5028703 |

* INDICATES NO SAP MATERIAL NUMBER EXISTS.

NOTES

1. THESE BASIC COMPATIBLE UNITS ISSUE ONLY THE STEEL CROSSARM. ALL OTHER MATERIAL MUST BE ISSUED SEPARATELY WITH OTHER BASIC COMPATIBLE UNITS.

| Overhead Distribution | | | |
|------------------------|-------------------------|-------------|-----------|
| Construction Standards | BASIC ASSEMBLY UNITS | ISSUE DATE: | 03/27/91 |
| | DISTRIBUTION UNDERBUILD | REV. DATE: | 05/20/13 |
| | STEEL CROSSARMS | APPROVAL: | B. PRIEST |
| | 2-46-1 | 8512E75 | DGN |

POLE BANDS REQUIRED FOR SPECIFIC CONTACT POINTS

| TRANSMISSION POLE STOCK CODE | | TRANSMISSION POLE COMPATIBLE UNIT | TRANSMISSION12KV PRIMARYPOLEALL POSITIONSCOMPATIBLEREQUIRED POLEUNITBAND COMPATIBLEUNITSUNITS | | RY AND POLE IT REQUIRED COMPATIBLE NCLUDES T LIGHTS) |
|------------------------------------|--|--|---|-----------------|--|
| 5027958 | | TM72S60 | * | BK2A | L, BK2CL |
| 5027961 | | TM72S90 | * | BK2A | L, BK2CL |
| 5027959 | | TM74D60 | * | BK2A | L, BK2CL |
| 5027963 | | TM74D90 | * | ВК24 | L, BK2CL |
| 5027964 | | TM74D180 | * | ВК2А | L, BK2CL |
| 5027960 | | TM82D60 | | BK2A | L, BK2CL |
| 5027965 | | TM82D90 | | BK2A | L, BK2CL |
| 5027848 | | TM58S5 | BK2CS, BK2BS | BK2A | S, BK2CS |
| **57-7020 | (58' TALL, | SINGLE CIRCUIT 69KV TRAN TM64D5 | ISMISSION, 0-5 DEGREE ANGLE BK2CS, BK2BS | E) BK2A | M, BK2CM |
| 5027852 | (64' TALL, | TM64D15 | NSMISSION, 0-5 DEGREE ANGL BK2CM, BK2BM | .E) BK2A | M, BK2CM |
| 5027855 | (64' TALL, | DOUBLE CIRCUIT 69KV TRA TM64D30 | NSMISSION, 6-15 DEGREE AND BK2CM, BK2BM | BLE) BK2A | M, BK2CM |
| **57-7030 | (64' TALL, | DOUBLE CIRCUIT 69KV TRA TM64S15 | NSMISSION, 16-30 DEGREE AN BK2CS, BK2BS | GLE) BK2A | M, BK2CM |
| 5027854 | (64' TALL, | DOUBLE CIRCUIT 69KV TRA TM64\$30 | NSMISSION, 6-15 DEGREE ANG BK2CM, BK2BM | LE) BK2A | M, BK2CM |
| | (64 TALL, | DOUBLE CIRCUIT OPRV TRA | NSIMISSION, 10-30 DEGREE AND | JLE) | |
| | * MEANS N | O POLE BANDS NEEDED; SE | PECIAL CROSSARM USED. SEE | SHEET 2. | |
| | ** MEANS I | NO STOCK CODE NUMBER E | ISSION POLE COMPATIBLE UNI | T 65-1829-12 | |
| | 2" + [<u><u><u>v</u></u> = 65-</u> | .1 <u>829-1</u> 2 | POLE HEIGHT IN FEET | | IUMBER OF NCHOR BOLTS |
| | | | MA MC | MENT IN FTKIPS | |
| Overhead Dis | tribution | | | | |
| Construction S | tandards | BAS DISTF POLE II | SIC ASSEMBLY UNITS RIBUTION UNDERBUILD DENTIFICATION & BANDS | | REV. DATE: 03/27/9 |
| PROPRIETARY | MATERIAL | | 2-47-1 | | 8512E76.DGN |

RETIREMENT OF NON-STANDARD UNITS REMOVAL ONLY CODES

| ASSEMBLY DESCRIPTION | COMPATIBLE UNIT CODING FOR REMOVAL ONLY |
|---|--|
| NON-STANDARD NEUTRAL OR SECONDARY BRACKET | RBK |
| TWO-SPOOL RACK | RRK2 |
| THREE-SPOOL RACK | RRK3 |
| FOUR-SPOOL RACK | RRK4 |
| FIVE-SPOOL RACK | RRK5 |
| BLADE DISCONNECT, 200 A | RBD2M |

| Overhead Distribution Construction Standards | BASIC ASSEMBLY UNITS RETIREMENT OF NON-STANDARD UNITS REMOVAL ONLY CODES | ISSUE DATE: REV. DATE: APPROVAL: | 06/23/72 06/06/11 B. Priest |
|---|--|--|-----------------------------------|
| PROPRIETARY MATERIAL | 2-48-1 | OH2-48-1 | .doc |
| | | | |

SECTION 3: 22 kV BASIC ASSEMBLY UNITS

| TITLE / DESCRIPTION | PAGE |
|--|-------|
| PRIMARY INSULATOR ASSEMBLIES | 3-2-1 |
| PRIMARY PIN INSULATOR ASSEMBLIES | 3-2-2 |
| BLADE DISCONNECT SWITCHES | 3-3-1 |
| PRIMARY POST INSULATOR ASSEMBLIES | 3-4-1 |
| PRIMARY & NEUTRAL MID-SPAN TAPS | 3-5-1 |
| PRIMARY INSULATED MID-SPAN TAPS, PHASE CONDUCTORS ONLY | 3-5-2 |
| CUTOUT-ARRESTER ASSEMBLIES | 3-6-1 |
| ARRESTER ASSEMBLIES | 3-7-1 |

| Overhead Distribution | | | |
|-------------------------|-------------------------------------|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 05/14/13 |
| SNP [®] | INDEX 22 kV BASIC ASSEMBLY UNITS | REV. DATE: | 06/20/18 |
| | | APPROVAL: | N. Sabbah |
| PROPRIETARY MATERIAL | 3-1-1 | OH3-1-1.doc | |
| | 3-1-1 | OH3-1-1 | 1.doc |



| B32 FOR 4' & 8' CROSSARMS | B32L FOR 10' CROSSARMS |
|--|---|
| CONDUCTORS: | CONDUCTORS: |
| AC312, A2, A30, A266, | AC312, A2, A30, A266, |
| A397, C1, C2, C4, C6, | A397, C1, C2, C4, C6, |
| C20, R2, R30, R266 | C20, R2, R30, R266 |
| B32W FOR 4' & 8' | B32LW FOR 10' |
| CROSSARMS | CROSSARMS |
| CONDUCTORS: | CONDUCTORS: |
| AC312, A2, A10, A30, | AC312, A2, A10, A30, |
| C1, C2, C4, C6, C20, | C1, C2, C4, C6, C20, |
| R2, R30, R266 | R2, R30, R266 |
| B32 - NORMAL PIN, GRAY INSULATOR 5034594 | B32L - LONG PIN, GRAY INSULATOR 5034594 |
| B32W - NORMAL PIN, WHITE INSULATOR 5034593 | B32LW - LONG PIN, WHITE INSULATOR 5034593 |
| B33 CONDUCTORS: AC312, A2, A30, A266, A397, C1, C2, C4, C6, C20, R2, R30, R266 | |
| B33W CONDUCTORS: AC312, A2, A30, C1, C2, C4, C6, C20, R2 | |
| B33 - ANGLE PIN, GRAY INSULATOR 5034594 B33W - ANGLE PIN, WHITE INSULATOR 5034593 | |

| Overhead Distribution Construction Standards | | | |
|---|---|-------------|-----------|
| | 22KV BASIC ASSEMBLY UNITS | ISSUE DATE: | 12/02/74 |
| | PRIMARY INSULATOR ASSEMBLIES PIN-TYPE INSULATORS | REV. DATE: | 04/30/13 |
| | | APPROVAL: | B. PRIEST |
| | 3-2-2 | 8512E232 | 2.DGN |



B212_

CONDUCTORS-A2, AC312, R2, R30, R266

PROPRIETARY MATERIAL



B222C

CONDUCTORS-AC312, R2, R30, R266

PRIMARY POST INSULATOR ASSEMBLIES

APPROVAL: B. PRIEST



RUNNING LINE

| | | BTT22 | BTT262 | BTT302 | BTT312 | BTT782 |
|----|------|---------|---------|---------|---------|---------|
| | | (R2) | (R266) | (R30) | (AC312) | (AW78) |
| 0 | A2 | 5035724 | 5035725 | 5035725 | 5035725 | 5035724 |
| IA | A30 | | 5033937 | 5035725 | 5033937 | |
| | A397 | | 5033937 | | 5033937 | |

- 1. WHEN CONSTRUCTING AN **INTERSECTION** BETWEEN NONSTANDARD CONDUCTORS USE T-TAP WHICH IS CLOSEST IN SIZE TO THE ACTUAL CONDUCTORS.
- 2. FOR PRIMARY MID SPAN TAPS, SEE 3-5-2 FOR PHASE CONDUCTOR ASSEMBLY.

| PROPRIETARY MATERIAL | 3-5-1 | 8512E42 | .DGN |
|------------------------|--|-------------|-----------|
| | | APPROVAL: | B. PRIEST |
| | 22kV BASIC ASSEMBLY UNITS PRIMARY AND NEUTRAL MID SPAN TAPS | REV. DATE: | 04/29/13 |
| Construction Standards | | ISSUE DATE: | 02/05/91 |
| Overhead Distribution | | | |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|----------------------|----------|-------------------------|
| 1 | THIMBLE - CLEVIS | 1 | 5029157 |
| 2 | INSULATOR | 1 | 5039548 |
| 3 | LINK | 1 | 5034732 |
| 4 | DEAD - END CLAMP | 1 | VARIOUS |
| 5 | HOT - LINE CONNECTOR | 1 | VARIOUS |
| 6 | SIDE TIE | 1 | VARIOUS |

| 22KV PRIMARY INSULATED MID - SPAN TAP COMPATIBLE UNITS | | | | |
|---|------------------------|----------|-------------|------------|
| | RUNNING LINE CONDUCTOR | | | |
| | | R2 | R266 | AC312 |
| P CTOR | A2 | BTTD22A2 | BTTD262A2 | BTTD39A2 |
| CONDUC | A397 | | BTTD262A397 | BTTD39A397 |

1. FOR NEUTRAL CONDUCTOR MID - SPAN TAP, SEE 3-5-1.

| Overhead Distribution | | |
|--|------------|-----------|
| Construction Standards 22KV BASIC ASSEMBLY UNITS | SUE DATE: | 06/07/11 |
| PRIMARY INSULATED MID - SPAN TAP | EV. DATE: | 05/15/13 |
| PHASE CONDUCTORS ONLY APP | PPROVAL: I | B. PRIEST |
| PROPRIETARY MATERIAL 3-5-2 | 8512E491. | DGN |



BCA52 40" TRI-MOUNT BKT.



| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 11/19/74 |
| S | 22KV BASIC ASSEMBLY UNITS CUTOUT-ARRESTER ASSEMBLIES | REV. DATE: | 05/22/13 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 3-6-1 | 8512E265 | DGN |
| | | | |

| Overhead Distribution | | | |
|------------------------|---------------------------|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 11/19/74 |
| | 22KV BASIC ASSEMBLY UNITS | REV. DATE: | 05/22/13 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 3-6-2 | 8512E496 | .DGN |

ALL LIGHTNING ARRESTERS SHALL BE MOUNTED ON TRANSFORMER TANK.

ARRESTER ONLY 5034088

CUTOUT ONLY 5034371





- 1. TO BE USED IN CASES WHERE FLASHOVER HAS OCCURED, OR STATIC WIRE CONSTRUCTION WAS NOT USED.
- 2. ARRESTER SHALL BE MOUNTED ON SIDE OF POLE OPPOSITE LINe ATTACHING HARDWARE. TYPICAL EXAMPLES SHOWN ABOVE.





1. TO BE USED IN CASES WHERE FLASH OVER HAS OCCURED, OR STATIC WIRE CONSTRUCTION WAS NOT USED.

| Overhead Distribution | | | |
|------------------------|--|-------------|----------|
| Construction Standards | | ISSUE DATE: | 02/04/91 |
| | 22kV BASIC ASSEMBLY UNITS ARRESTER ASSEMBLIES | REV. DATE: | 04/20/13 |
| | | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 3-7-2 | 8512E41 | .DGN |

SECTION 4: POLE GUYING AND BRACING

| TITLE / DESCRIPTION | PAGE |
|--|--------|
| INSTRUCTIONAL GUIDE | |
| SIDEWALK GUYING | 4-3-1 |
| DOWN GUYING | |
| DOUBLE DOWN GUYING | |
| OVERHEAD GUYING | |
| OVERHEAD GUY TO SELF-SUPPORTING STUB POLE | 4-7-1 |
| TEMPORARY TANGENT 12 KV POLE BRACE NEAR TRENCH | |
| BUTT PLATE BRACING | |
| STABILIZING BACKFILL | 4-10-1 |
| HAND DIGGING LABOR CODE | 4-11-1 |
| POLE KEY BRACING | 4-12-1 |
| PUSH POLE BRACING | 4-13-1 |
| TEMPORARY WOOD POLE BRACING | 4-14-1 |
| GUY GUARD STUB | 4-15-1 |
| DOWN GUYS WITH POLE BANDS | 4-16-1 |
| PRIMARY, SECONDARY, AND PEDESTRIAN GUY GUARDS | 4-17-1 |
| CORROSION RESISTANT ANCHOR AND ROD | 4-18-1 |
| HAND DIG ANCHOR AND ROD | 4-19-1 |
| LOG ANCHORS | 4-20-1 |
| GROUTED ROCK ANCHORS | 4-21-1 |
| SURFACE ROCK ANCHORS | 4-22-1 |
| UNGROUNDED INSULATED GUYS | 4-23-1 |
| MISCELLANEOUS GUYING STANDARDS | 4-24-1 |
| TRANSMISSION WITH DISTRIBUTION UNDERBUILD WITH SPAN GUYS | 4-25-1 |
| TRANSMISSION WITH DISTRIBUTION UNDERBUILD WITH SPAN GUYS (FAILED) | 4-25-2 |
| TRANSMISSION DEADEND WITH DISTRIBUTION UNDERBUILD AT 90° | 4-26-1 |
| TRANSMISSION DEADEND WITH DISTRIBUTION UNDERBUILD AT 90° (FAILED) | 4-26-2 |
| TRANSMISSION DEADEND WITH DISTRIBUTION UNDERBUILD CONTINUING ON | 4-27-1 |
| TRANSMISSION DEADEND WITH DISTRIBUTION UNDERBUILD CONTINUING ON (FAILED) | |
| DISTRIBUTION, VERTICAL CONSTRUCTION | 4-28-1 |
| DISTRIBUTION, VERTICAL CONSTRUCTION (FAILED) | 4-28-2 |
| DISTRIBUTION DOUBLE DEADEND WITH RISER | 4-29-1 |
| DISTRIBUTION DOUBLE DEADEND WITH RISER (FAILED) | 4-29-2 |

| Overhead Distribution | | | |
|-------------------------|-------------------------|-------------|----------|
| Construction Standards | INDEX | ISSUE DATE: | 04/14/13 |
| POLE GUYING AND BRACING | POLE GUYING AND BRACING | REV. DATE: | |
| | APPROVAL: | D. Poore | |
| PROPRIETARY MATERIAL | 4-1-1 | OH4-1-1 | .doc |

SECTION 4: POLE GUYING AND BRACING

| TITLE / DESCRIPTION | PAGE |
|--------------------------------------|------|
| WITH DISTRIBUTION SECONDARY | |
| WITH DISTRIBUTION SECONDARY (FAILED) | |

| Overhead Distribution Construction Standards | INDEX POLE GUYING AND BRACING | ISSUE DATE: REV. DATE: APPROVAL: | 04/14/13 D. Poore |
|---|----------------------------------|--|----------------------|
| PROPRIETARY MATERIAL | 4-1-2 | OH4-1-1 | .doc |

FOR INSTALLATION OR REMOVAL OF GUYS, ANCHORS AND BRACING DEVICES FOR OVERHEAD DISTRIBUTION POLES.

COMPATIBLE UNIT CODING FOR "G" AND "A" SECTION

GUYS

GUYS HAVE BEEN CODED ACCORDING TO SIZE AND TYPE USING A "G" PREFIX. SPECIAL PURPOSE GUYS AND ATTACHMENTS HAVE ALSO BEEN APPROPRIATELY CODED. SINGLE, DOUBLE, OVERHEAD AND SIDEWALK GUYS ARE AVAILABLE WITH INDIVIDUAL COMPATIBLE UNIT CODE NUMBERS. PRIMARY, SECONDARY AND PEDESTRIAN GUY GUARDS ARE ALSO AVAILABLE.

ANCHORS

STANDARD ANCHORS AND ANCHOR/ROD COMBINATIONS ARE CODED WITH AN "A" PREFIX. THE NUMBERS AND LETTERS IN THE CODE DESIGNATE THE SIZES AND DESCRIPTIONS OF THE ANCHORING DEVICES.

GUY/ANCHOR COMBINATIONS

GUY AND ANCHOR COMBINATIONS ARE AVAILABLE BY COMBINING THE INDIVIDUAL NUMBERS TO FORM ONE COMPATIBLE UNIT NUMBER. THIS APPLIES TO ALL THE RECOMMENDED SINGLE AND DOUBLE DOWN GUY COMBINATIONS WITH THE VARIOUS TYPES OF ANCHORS.

EXAMPLE: COMPATIBLE UNIT NO. G5 A108

G5 = ONE 5/16" DOWN GUY WITH GUY GUARD; A108 = ONE 10" ANCHOR WITH 8 FT. ROD

EXAMPLE: COMPATIBLE UNIT NO. G3 5 A108

G3 = TOP GUY WITH GUY GUARD, ONE 3/8" AND ONE 5/16" DOWN GUY WITH GUY GUARD; 5 = BOTTOM GUY; A108 = ONE 10" ANCHOR WITH 8 FT. ROD

| COMPATIBLE UNIT | AVAILA | AVAILABLE GUY & ANCHOR COMBINATIONS | | | |
|-----------------|--------|-------------------------------------|----|----|--|
| LG3 | A108 | | | | |
| GW | A108 | | | | |
| GW2 | A108 | | | | |
| G5 | A108 | | AG | AR | |
| G3 | A108 | | AG | AR | |
| G7 | A108 | A120 | AG | AR | |
| G55 | A108 | | AG | AR | |
| G53 | A108 | A120 | AG | AR | |
| G57 | A108 | A120 | AG | AR | |
| G35 | A108 | A120 | AG | AR | |
| G33 | A108 | A120 | AG | AR | |
| G37 | A108 | A120 | | AR | |
| G75 | A108 | A120 | AG | AR | |
| G73 | A108 | A120 | | AR | |
| G3H | | A120 | | AR | |
| G7H | | A120 | | AR | |

| Overhead Distribution Construction Standards | POLE GUYING AND BRACING INSTRUCTIONAL GUIDE | ISSUE DATE: REV. DATE: APPROVAL: | 12/09/71 06/02/11 B. Priest |
|---|--|--|-----------------------------------|
| PROPRIETARY MATERIAL | 4-2-1 | OH4-2-1. | doc |
| | τ- 2- 1 | 0114-2-1. | 400 |

SPECIAL POLE BRACING

SPECIAL TYPES OF POLE BRACING ARE PROVIDED IN THIS SECTION AND HAVE A "G" PREFIX. TILE POLE FOUNDATIONS, BUTT PLATE BRACING, POLE KEY BRACING, PUSH POLE BRACING, TEMPORARY POLE BRACING AND STUB POLE BRACING HAVE BEEN ASSIGNED COMPATIBLE UNIT NUMBERS TO ALLOW A VARIETY OF POLE BRACING APPLICATIONS. THE NUMBERS ARE EXPLAINED IN DETAIL ON THE STANDARD DRAWINGS.

GRID SKETCH APPLICATION

GUY, ANCHOR AND POLE BRACING CODES ARE TO BE ENTERED IN THE MISCELLANEOUS SECTION OF THE GRID SKETCH (LINES 13 THRU 18) UNDER THE POINT NUMBER WHICH REPRESENTS THE POLE THEY ARE TO BE INSTALLED ON.

| Overhead Distribution Construction Standards | POLE GUYING AND BRACING INSTRUCTIONAL GUIDE | ISSUE DATE: REV. DATE: APPROVAL: | 12/09/71 06/02/11 B. Priest |
|---|--|--|-----------------------------------|
| PROPRIETARY MATERIAL | 4-2-2 | OH4-2-1. | doc |



AS SPECIFIED ----

| ITEM | | STOCK | QUANTITY | |
|------|---|----------|----------|------|
| | MATERIAL DESCRIPTION | CODE | GW | GW2 |
| 1 | CONNECTOR, VISE, 2-#6 SOL TO 2-#4 STR | 5034068 | 1 | 2 |
| 2 | BOLT, MACHINE, 3/4" X 14" | 5027754* | 1 | 2 |
| 3 | CLAMP, GUY, AUTOMATIC, LONG BAIL | 5028520 | 0 | 1 |
| 4 | CLAMP, GUY, AUTOMATIC, 5/16", SHORT BAIL | 5028519* | 1 | 1 |
| 5 | CLAMP, GUY, SIDEWALK, QUEEN POST FITTING | 5028525 | 1 | 1 |
| 6 | FLANGE, POLE, SIDEWALK GUY | 5028916 | 1 | 1 |
| 7 | GUARD, GUY, 8' | 5028920 | 1 | 1 |
| 8 | HOOK, GUY, 3/4" BOLT | 5028923 | 1 | 2 |
| 9 | PIPE, GALVANIZED, 2" X 5' | 5028648 | 1 | 1 |
| 10 | CLIP, WIRE ROPE, 5/16" WIRE | 5028900 | 2 | 2 |
| 11 | SCREW, LAG, 1/2" X 4" | 5028003 | 3 | 3 |
| 12 | WASHER, DOUBLE COIL LOCK, 3/4" | 5029169* | 1 | 2 |
| 13 | WASHER, SQUARE, 3/4" | 5029163* | 1 | 2 |
| 14 | WIRE, STEEL, COIL, 5/16" S.M. | 5033973 | 50' | 100' |
| 15 | WIRE, COPPER, BARE, #6 | 5033845 | 1 | 2 |
| 16 | CONNECTOR, COMP, COPPER, 2 SOL-2 STR. TO 8-SOL-4STR. | 5033933 | 1 | 2 |
| 17 | GRIP, GUY, 5/16" | 5028917 | 1 | 2 |

* IMPREST BIN ITEM

NOTES

1. THIS TYPE OF GUY SHOULD NOT BE USED IF CONVENTIONAL DOWN GUY CAN BE INSTALLED.

| Overhead Distribution | | | |
|------------------------|--|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 09/30/71 |
| PROPRIETARY MATERIAL | POLE GUYING AND BRACING SIDFWALK GUYING | REV. DATE: | 05/02/13 |
| | | APPROVAL: | B. PRIEST |
| | 4-3-1 | 8512E267 | .DGN |

G5 5/16" DOWN GUY

G3

G7

3/8" DOWN GUY

7/16" DOWN GUY



| Overhead Distribution | | | |
|------------------------|-------------------------|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 09/30/71 |
| PROPRIETARY MATERIAL | POLE GUYING AND BRACING | REV. DATE: | 05/17/12 |
| | | APPROVAL: | B. PRIEST |
| | 4-4-1 | 8512E268 | DGN |

| [| G55 | (TWO) 5/16" DOWN | I GUYS WITH GUY GUARD | |
|---|---------|--|--|----------------------|
| [| G53 | (ONE) 5/16'' AND (0 | ONE) 3/8" DOWN GUY WITH GUY GUARD | |
| [| G57 | (ONE) 5/16'' AND (0 | ONE) 7/16" DOWN GUY WITH GUY GUARD | |
| [| G35 | (ONE) 3/8" AND (O | NE) 5/16" DOWN GUY WITH GUY GUARD | |
| [| G33 | (TWO) 3/8" DOWN | GUYS WITH GUY GUARD | |
| [| G37 | (ONE) 3/8" AND (O | NE) 7/16" DOWN GUY WITH GUY GUARD | |
| [| G73 | (ONE) 7/16" AND (C | ONE) 3/8" DOWN GUY WITH GUY GUARD | |
| [| G75 | (ONE) 7/16" AND (C - DESIGNATES BOT - DESIGNATES TOP | DNE) 5/16'' DOWN GUY WITH GUY GUARD TOM GUY GUY | |
| | | | GRIP, WRAP GRIP, WRAP Fr- 0" MIN. SPACING REQ'D IF 2 GUY F ARE INSTALLED CLAMP, AUTOMATIC | RODS |
| ſ | | | | |
| | Overhe | ad Distribution | | |
| | Constru | ction Standards | POLE GUYING AND BRACING | ISSUE DATE: 09/30/71 |
| | | | DOUBLE DOWN GUYING | REV. DATE: 05/17/12 |
| | | | | APPROVAL: B. PRIEST |
| | PROPRI | ETARY MATERIAL | 4-5-1 | 8512E269.DGN |



GH7

5/16" OVERHEAD GUY

GH3 3/8" OVERHEAD GUY

7/16" OVERHEAD GUY

GUYED POLE

STUB POLE



| Overhead Distribution Construction Standards | POLE GUYING AND BRACING OVERHEAD GUYING | ISSUE DATE: REV. DATE: APPROVAL: | 09/30/71 05/20/11 B. PRIEST |
|---|--|--|-----------------------------------|
| PROPRIETARY MATERIAL | 4-6-1 | 8512E270 | .DGN |
| PROPRIETARY MATERIAL | 4-6-1 | APPROVAL: 8512E270 | B. PRIES |



| Overhead Distribution | | | |
|------------------------|---------------------------|-------------|-----------|
| Construction Standards | POLE GUYING AND BRACING | ISSUE DATE: | 08/04/93 |
| PROPRIETARY MATERIAL | OVERHEAD GUY TO | REV. DATE: | 05/20/11 |
| | SELF-SUPPORTING STUB POLE | APPROVAL: | B. PRIEST |
| | 4-7-1 | 8512E217 | .DGN |

GPH



- 1. DO NOT USE WHERE PEAK WIND GUSTS EXCEED 30 MPH.
- 2. BRACE IS TO BE USED ONLY FOR CONDITIONS DEFINED ON PAGE 4-20 OF THE EXCAVATION SAFETY RESOURCE MANUAL, 1993 REVISION (LIMITED TIME FRAME AND SPECIFIC TANGENT CONFIGURATION).
- 3. UP TO A 50' CLASS ONE WOOD POLE ONLY PLACED AT NORMAL EMBEDMENT.
- 4. THIS BRACE IS NOT INTENDED TO SUPPORT POLES CARRYING TRANSFORMERS, SWITCHES, CAPACITORS, ETC.
- 5. THE BRACE WILL NOT SUPPORT POLES EMBEDDED IN TYPE C (SOFT, SATURATED OR SUBMERGED) SOILS.
- 6. IF THERE ARE QUESTIONS CONCERNING THE USE OF THIS BRACE CONTACT ELECTRIC SYSTEM ENGINEERING, POLICIES, PROCEDURES AND STANDARDS.
- 7. THE PARTS ARE STOCKED AT DIVISION TOOL ROOMS.
- 8. 3 MANHOURS OF TIME ARE ASSIGNED.

| Overhead Distribution | | | |
|------------------------|-----------------------------------|-------------|-----------|
| Construction Standards | POLE GUYING AND BRACING | ISSUE DATE: | 09/06/00 |
| | TEMPORARY TANGENT 12KV POLE BRACE | REV. DATE: | 03/27/13 |
| | NEAR TRENCH | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 4-8-1 | 8512E337 | .DGN |
| | | | |

| ITEM | DESCRIPTION | LENGTH | QTY |
|------|------------------------------------|--------|-----|
| 1 | POLE LINK BAND ASSEMBLY | | 2 |
| 2 | VANG, VERTICAL, 3/8" | | 2 |
| 3 | STEEL CLEVIS CONNECTION, 3" X 3/8" | 3" | 2 |
| 4 | STEEL CLEVIS CONNECTION, 3" X 3/8" | 12" | 1 |
| 5 | STEEL CLEVIS CONNECTION, 2" X 3/8" | 8" | 1 |
| 6A | | 4'-0" | 1 |
| 6B | STEEL FIFE, 2.5 DIA. SCH. 40 | 5'-0" | 1 |
| 7A | | 4'-0" | 1 |
| 7B | STEEL PIPE, 2 DIA. SCH. 40 | 5'-0" | 1 |
| 8 | A325 BOLT, 3/4" DIA. | 4" | 7 |
| 9 | STRUCTURAL TEE STEEL, WT 6 X 26.5 | 2'-6" | 1 |
| 10 | STRUCTURAL TEE STEEL, WT 6 X 26.5 | 3'-6" | 1 |
| 11 | STEEL PLATE, 5-1/2" X 1" | 4.75" | 1 |
| 12 | 1" DIA. GADS | 4'-6" | 4 |
| 13 | STEEL PIPE, 2" DIA. SCH. 80 | 6" | 4 |



1. THIS BUTT PLATE INSTALLATION FOR USE ON DISTRIBUTION POLES ONLY.

2. DRILL HOLE FOR THIS INSTALLATION WITH A 30" AUGER.

3. SECURE BUTT PLATE TO BUTT OF POLE WITH (3) 1/2" LAG SCREWS.

4. REMOVE COVERING FROM POLE GROUND.

| PROPRIETARY MATERIAL | 4-9-1 | 8512E271 | .DGN |
|------------------------|---|-------------|----------|
| S | POLE GUYING AND BRACING BUTT PLATE BRACING | REV. DATE: | 03/25/14 |
| Construction Standards | | ISSUE DATE: | 09/30/71 |
| Overhead Distribution | | | |

GGB THIS COMPATIBLE UNIT INCLUDES 2 CUBIC YARDS OF AGGREGATE SLURRY BACKFILL (ASB) 5075311



- 1. FOR POLES WITH UNGUYED ANGLED SLACK SPANS OR ANY UNBALANCED LOAD OR POLES SET IN LOOSE OR SWAMPY, MUDDY SOIL.
- 2. POLE SHOULD HAVE A 6 INCH RAKE OPPOSITE THE STRAIN OF CONDUCTOR.

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | | ISSUE DATE: | 01/06/81 |
| ® | POLE GUYING AND BRACING STABILIZING BACKEILI | REV. DATE: | 01/04/16 |
| | | APPROVAL: | S. DURAN |
| PROPRIETARY MATERIAL | 4-10-1 | 8512E120 | .DGN |

GPAH

THIS COMPATIBLE UNIT INCLUDES LABOR ONLY TO HAND DIG A HOLE FOR A POLE OR ANCHOR. THIS UNIT INCLUDES 4 MANHOURS.



| Overhead Distribution | | | |
|------------------------|--|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 02/15/94 |
| PROPRIETARY MATERIAL | POLE GUYING AND BRACING HAND DIGGING LABOR CODE | REV. DATE: | 08/02/11 |
| | | APPROVAL: | B. PRIEST |
| | 4-11-1 | 8512E227 | DGN |



1. GK1: TOP POLE KEY MAY BE USED ON EXISTING POLES FOR:

- STRAIGHTENING LEANING POLES
- NON-GUYED POLES WITH SLACK SPAN TAKE-OFFS
- MINOR LINE ANGLE POLES
- ALLEY ARM CONSTRUCTION
- UNBALANCED SERVICE TAKE-OFFS
- 2. GK2: TOP AND BOTTOM POLE KEYS MAY BE USED FOR KEYING NEW POLE INSTALLATIONS WHERE GUYS ARE IMPRACTICAL.
- 3. GK3: BOTTOM POLE KEY MAY ONLY BE USED ON A NEW POLE IF INSTALLED IN CONCRETE SIDEWALK.
- 4. GK4: DRILL OVERSIZE HOLE (30" DIAMETER), CENTER POLE IN HOLE, BACKFILL WITH ONE SACK LMB (5075314). DO NOT APPLY LINE LOAD UNTIL 24 HOURS AFTER POURING LMB.
- 5. RAKE POLES AGAINST LINE TENSION (TYPICALLY 6").
- 6. TAMP BACKFILL FIRMLY.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 09/30/71 |
| | POLE GUYING AND BRACING POLE KEY BRACING | REV. DATE: | 05/22/13 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 4-12-1 | 8512E55 | .DGN |



| Overhead Distribution | | | |
|------------------------|--|-------------|----------|
| Construction Standards | | ISSUE DATE: | 12/09/71 |
| | POLE GUYING AND BRACING PUSH POLE BRACING | REV. DATE: | 01/27/11 |
| | | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 4-13-1 | 8512E44. | DGN |
| | | | |



- 1. TEMPORARY SUPPORT FOR EXCAVATION IN LOOSE SOIL ADJACENT TO POLE.
- 2. AS AN ALTERNATIVE TO USING GUY WIRE, ANCHOR MAY BE INSTALLED VERTICALLY AND BOLTED TO HORIZONTAL BRACE.
- 3. PLUG HOLES IN LINE POLE AFTER REMOVAL OF BRACING WITH PLUGS 5028906.
- 4. SINCE THESE ARE TEMPORARY INSTALLATIONS, ENTER BOTH THE CONSTRUCTION AND REMOVAL OF THE COMPATIBLE UNIT ON THE JOB ESTIMATE.
- 5. NORMAL LENGTH OF EXPOSED ROD IS 6". FOR TEMPORARY GUYING AND BRACING, MAXIMUM EXPOSED ANCHOR ROD OF 24" MAY BE USED.

| Overhead Distribution | | | |
|------------------------|-------------------------|-------------|----------|
| Construction Standards | | ISSUE DATE: | 09/30/71 |
| PROPRIETARY MATERIAL | POLE GUYING AND BRACING | REV. DATE: | 02/02/16 |
| | | APPROVAL: | S.DURAN |
| | 4-14-1 | 8512E7. | DGN |





- 1. SET STUB 4' TO 6' DEEP DEPENDING UPON SOIL CONDITIONS.
- 2. THIS STANDARD IS FLEXIBLE. ESTIMATORS MAY ADAPT DETAILS TO FIT THE SITUATION, AND CREWS ARE TO CUT THE STUB AS NECESSARY.
- 3. RESTRICT USEAGE TO INSTALLATIONS WHERE PROTECTION IS NECESSARY.

| Overhead Distribution | | | |
|------------------------|-------------------------|-------------|-----------------|
| Construction Standards | | ISSUE DATE: | 08/28/72 |
| PROPRIETARY MATERIAL | POLE GUYING AND BRACING | REV. DATE: | 05/17/12 |
| | | APPROVAL: | B.PRIEST |
| | 4-15-1 | 8512E272 | DGN |



- 1. LINK TYPE POLE BANDS ARE INCLUDED WITH THESE UNITS AND ARE SIZED FOR APPROXIMATELY 10 INCH DIAMETER. LINKS MAY BE REMOVED OR ADDITIONAL LINKS, STOCK NUMBER 5027576, MAY BE ADDED IF NEEDED.
- DOWN GUYS WITH EPOXIGLASS STRAIN INSULATORS ARE TO BE USED WHEN THE GUY WIRE NEEDS PROTECTION FROM ACCIDENTAL CONTACT WITH ENERGIZED CONDUCTORS.
 *AUTOMATIC GUY CLAMPS MAY BE SUBSTITUTED WHEN SPACE IS LIMITED.

| Overhead Distribution | | | |
|------------------------|-------------------------|-------------|----------|
| Construction Standards | | ISSUE DATE: | 08/09/93 |
| PROPRIETARY MATERIAL | POLE GUYING AND BRACING | REV. DATE: | 04/30/13 |
| | | APPROVAL: | B.PRIEST |
| | 4-16-1 | 8512E221 | DGN |

FOR USE ON DEADENDS WITH GUY TENSION EXCEEDING 11,000 LBS.











| Overhead Distribution | | | |
|-------------------------|-------------------------|-------------|----------|
| Construction Standards | | ISSUE DATE: | 09/30/71 |
| SRP [®] | POLE GUYING AND BRACING | REV. DATE: | 03/24/16 |
| | | APPROVAL: | S. DURAN |
| PROPRIETARY MATERIAL | 4-19-1 | 8512E47. | DGN |



SECTION "A-A"




NOTES

1. THIS ANCHOR NORMALLY INSTALLED BY C&M DEPT.

| Overhead Distribution Construction Standards | POLE GUYING AND BRACING GROUTED ROCK ANCHORS | ISSUE DATE: REV. DATE: APPROVAL: | 09/30/71 05/17/12 B. PRIEST |
|---|---|--|-----------------------------------|
| PROPRIETARY MATERIAL | 4-21-1 | 8512E274 | DGN |



NOTES

- 1. DO NOT INSTALL ON ANY BOULDERS MEASURING LESS THAN FIVE FEET IN TWO DIRECTIONS AT RIGHT ANGLES TO EACH OTHER.
- 2. THIS ANCHOR NORMALLY INSTALLED BY C&M DEPT.

| Overhead Distribution Construction Standards | POLE GUYING AND BRACING SURFACE ROCK ANCHORS | ISSUE DATE: REV. DATE: | 09/30/71 06/02/11 |
|---|---|---------------------------|----------------------|
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 4-22-1 | 8512E275 | 5.DGN |

UNGROUNDED (INSULATED) GUYS

1. OBJECTIVES

THIS PROCEDURE AND EXAMPLES ON THE FOLLOWING PAGES WILL:

DEFINE GUYING

PROVIDE GUIDELINES FOR THE INSTALLATION OF UNGROUNDED (INSULATED) GUYS

2. RESPONSIBILITIES

ESE WILL MAINTAIN PROGRAM PROCEDURES (REVIEW NESC FOR CHANGES), ADVISE AND TRAIN PERSONNEL WHO DESIGN AND BUILD FACILITIES WITH GUYS AND PROVIDE INSPECTION SERVICES IF REQUESTED BY RESPONSIBLE DIVISIONS. THE RESPONSIBLE DIVISIONS WILL ASSURE THAT DESIGNS PROPERLY SHOW HOW GUYS AND GUY INSULATORS ARE USED AND WHERE TO INSTALL THEM. THE LINE CREWS THAT CONSTRUCT THE GUYING MUST BE SURE THAT THE GUYS ARE PROPERLY GROUNDED OR IF UNGROUNDED THE INSULATED SECTIONS ARE PROPERLY INSTALLED.

- 3. DEFINITIONS:
 - A. GUY A SUPPORTING MEMBER FASTENED BETWEEN A FIXED SUPPORT AND A POLE TO PROVIDE AN OPPOSING FORCE TO BALANCE CONDUCTOR TENSION(S) ACTING ON THE POLE.
 - B. DOWN GUY A DOWN GUY CONSISTS OF A WIRE RUNNING FROM AN ATTACHMENT ON A POLE TO A ROD AND ANCHOR INSTALLED IN THE GROUND.
 - C. SPAN OR HEAD GUY A SPAN GUY CONSISTS OF A WIRE RUNNING FROM AN ATTACHMENT ON A POLE TO AN ADJACENT POLE OPPOSING THE STRAIN FROM THE LINE CONDUCTORS. INSULATED GUY ROD - A DEVICE INSTALLED IN A GUY TO MAINTAIN ADEQUATE ELECTRICAL CLEARANCES, PROVIDE SAFE WORKING SPACE FOR LINEMEN, REDUCE NUISANCE LINE TRIPPING FROM GUY CONTACTS WITH LINE CONDUCTORS AND PROTECT THE PUBLIC AGAINST POSSIBLE EXPOSURE TO AN ENERGIZED GUY.
- 4. GROUNDING GUY REQUIREMENTS

ALL GUYS SHALL BE EFFECTIVELY GROUNDED UNLESS INSULATED PER ITEM NO. 5.

TO BE EFFECTIVELY GROUNDED, GUYS SHALL BE ELECTRICALLY CONNECTED TO ONE OR MORE OF THE FOLLOWING:

- A. GROUNDED METALLIC SUPPORTING STRUCTURE (GROUNDED STEEL POLE)
- B. AN EFFECTIVE GROUND ON A NONMETALLIC SUPPORTING STRUCTURE (POLE GROUND)
- C. A LINE CONDUCTOR THAT HAS AT LEAST FOUR (4) GROUNDS IN EACH MILE OF LINE (SYSTEM NEUTRAL)

| Overhead Distribution | | | |
|------------------------|---------------------------|-------------|-----------|
| Construction Standards | POLE GUYING AND BRACING | ISSUE DATE: | 10/13/97 |
| | | REV. DATE: | 05/10/11 |
| | UNGROUNDED INSULATED GUTS | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 4-23-1 | OH4-23-1 | .doc |
| | | | |

5. INSULATED GUY RODS

ALL EFFORTS TO GROUND THE GUY WIRE MUST BE EXHAUSTED PRIOR TO INSTALLATION OF THE INSULATED GUY SECTION. WHEN THE GUY TO ENERGIZED PART CLEARANCE CANNOT BE OBTAINED, THE INSULATED GUY MUST COMPLY WITH THE FOLLOWING:

- A. INSULATORS SHALL BE SO PLACED THAT IF THE GUY IS BROKEN BELOW THE INSULATOR OR ANY GUY IS CONTACTED BY AN ENERGIZED CONDUCTOR OR PART, THE VOLTAGE WILL NOT BE TRANSFERRED TO OTHER FACILITIES ON THE STRUCTURE(S) OR BELOW 8' ABOVE GROUND.
- B. INSULATORS SHALL BE SO PLACED THAT IN CASE ANY GUY SAGS DOWN UPON ANOTHER, THE INSULATORS WILL NOT BECOME INEFFECTIVE.

THE PLACEMENT OF INSULATOR(S) IN AN UNGROUNDED GUY IS INTENDED TO PROTECT THE PUBLIC AGAINST A POSSIBLE EXPOSURE TO AN ENERGIZED GUY. THE PROPER LOCATION OF AN INSULATOR IN AN UNGROUNDED GUY MAY BE DETERMINED AS FOLLOWS:

DOWN GUY - THE HORIZONTAL PLANE DEFINED BY THE LOWEST ENERGIZED FACILITY SHALL PASS THROUGH THE CENTER OR UPPER HALF OF THE LOWEST GUY INSULATOR. A FACILITY IS CONSIDERED ENERGIZED IF IT IS AT A SERVICE VOLTAGE (120 VOLTS) OR HIGHER. A CHECK SHALL BE MADE TO DETERMINE, UNDER A BROKEN GUY CONDITION (AT ANCHOR EYE), GUY HANGING VERTICALLY, THAT REQUIREMENTS 5A AND 5B ARE MET.

HEAD GUY - TERMINATED TO STUB POLE, NO OTHER ELECTRICAL FACILITIES ADJACENT/ON THE STUB POLE OR BETWEEN THE GUYED AND STUB POLE: THE HORIZONTAL PLANE DEFINED BY THE LOWEST ENERGIZED FACILITY SHALL PASS THROUGH THE CENTER OR UPPER HALF OF THE LOWEST GUY INSULATOR. A CHECK SHALL BE MADE TO DETERMINE, UNDER A BROKEN GUY CONDITION (AT STUB POLE), GUY HANGING VERTICALLY, THAT REQUIREMENTS 5A AND 5B ARE MET.

HEAD GUY - TERMINATED TO STUB POLE, WITH OTHER ELECTRICAL FACILITIES ADJACENT/ON THE STUB POLE OR BETWEEN THE GUYED AND STUB POLE: IN ADDITION TO THE ABOVE CHECK, A CHECK SHALL BE MADE, UNDER A BROKEN GUY CONDITION (AT THE GUYED POLE), GUY HANGING VERTICALLY, THAT REQUIREMENTS 5.A. AND 5.B. ARE MET.





NOTES

1. PRIMARY & SECONDARY GUY STRAIN INSULATOR SHOULD BE PLACED SO THAT CONDUCTORS WILL PASS AS CLOSE TO MID-WAY AS POSSIBLE.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 10/13/97 |
| ® | POLE GUYING & BRACING MISCELLANEOUS GUYING STANDARDS | REV. DATE: | 05/04/11 |
| | MISCELLANEOUS GUTING STANDARDS | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 4-24-1 | 8512E426 | .DGN |



| Overhead Distribution | | | |
|------------------------|--------------------------------|-------------|-----------|
| Construction Standards | POLE GUYING & BRACING | ISSUE DATE: | 10/13/97 |
| | TRANSMISSION WITH DISTRIBUTION | REV. DATE: | 01/27/11 |
| | UNDERBUILD WITH SPAN GUYS | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 4-25-1 | 8512E449 | DGN |
| | | | |



























| Overhead Distribution | | | |
|------------------------|-------------------------------------|-------------|-----------|
| Construction Standards | POLE GUYING & BRACING | ISSUE DATE: | 10/13/97 |
| | DISTRIBUTION, VERTICAL CONSTRUCTION | REV. DATE: | 10/27/13 |
| | (FAILED) | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 4-28-2 | 8512E456 | 6.DGN |



| Overhead Distribution | | | |
|------------------------|------------------------------|-------------|-----------|
| Construction Standards | POLE GUYING & BRACING | ISSUE DATE: | 10/13/97 |
| PROPRIETARY MATERIAL | DISTRIBUTION DOUBLE DEAD END | REV. DATE: | 10/27/13 |
| | WITH RISER | APPROVAL: | B. PRIEST |
| | 4-29-1 | 8512E457 | .DGN |



| Overhead Distribution Construction Standards | | | |
|---|------------------------------|-------------|-----------|
| | POLE GUYING & BRACING | ISSUE DATE: | 10/13/97 |
| | DISTRIBUTION DOUBLE DEAD END | REV. DATE: | 10/29/13 |
| | WITH RISER (FAILED) | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 4-29-2 | 8512E458 | 3.DGN |



| Overhead Distribution | | | |
|---------------------------------------|--|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 02/09/07 |
| C C C C C C C C C C C C C C C C C C C | POLE GUYING & BRACING WITH DISTRIBUTION SECONDARY | REV. DATE: | 11/25/13 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 4-30-1 | 8512E459 | .DGN |



| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 02/09/07 |
| | POLE GUYING & BRACING WITH DISTRIBUTION SECONDARY (FAILED) | REV. DATE: | 10/24/13 |
| | ······ · · · · · · · · · · · · · · · · | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 4-30-2 | 8512E460 | .DGN |
| | | | |

SECTION 5: PRIMARY CONSTRUCTION UNITS

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| HOT STICK OPERATED SWITCHES | 5-3-1 |
| PHASING ORDER | 5-4-1 |
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| THREE PHASE SMALL ANGLE, 6° - 15° | 5-24-1 |
| THREE PHASE SMALL & INTERMEDIATE ANGLE, 6° - 15°, 15° - 30° | 5-25-1 |
| THREE PHASE INTERMEDIATE ANGLE, 15° - 30° | 5-26-1 |
| THREE PHASE MEDIUM ANGLE, 30° - 60° | 5-27-1 |
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| THREE PHASE LARGE ANGLE, 60° - 90°, ON STEEL POLE | 5-28-2 |
| THREE PHASE DEADEND CROSSARM | 5-29-1 |
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| Overhead Distribution | | | |
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| Construction Standards | | ISSUE DATE: | 05/14/13 |
| | INDEX PRIMARY CONSTRUCTION LINITS | REV. DATE: | 04/11/22 |
| | | APPROVAL: E. Luband | E. Lubandi |
| PROPRIETARY MATERIAL | 5-1-1 | OH5-1- | 1.doc |

SECTION 5: PRIMARY CONSTRUCTION UNITS

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| PROPRIETARY MATERIAL | 5-1-2 | OH5-1- | 1.doc |

SECTION 5: PRIMARY CONSTRUCTION UNITS

| TITLE / DESCRIPTION | PAGE |
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|---|-------------------------------------|--|------------------------------------|
| PROPRIETARY MATERIAL | 5-1-3 | OH5-1- | 1.doc |
| | | - | |

THIS GUIDE RELATES TO THE INSTALLATION, REMOVAL OR REPLACEMENT OF OVERHEAD DISTRIBUTION PRIMARY CONSTRUCTION UNITS. IN GENERAL, THE ITEMS DIAGRAMED WITH BROKEN OR DASHED LINES IN THE FOLLOWING STANDARDS ARE *NOT* INCLUDED IN THE COMPATIBLE UNIT.

COMPATIBLE UNIT CODING FOR "P" SECTION

GENERAL CRITERIA

THIS SECTION IS COMPOSED OF THE SINGLE, DUAL AND THREE PHASE UNITS USED IN THE CONSTRUCTION OF 7200/12470 VOLT OVERHEAD DISTRIBUTION LINES. DASHES IN THE COMPATIBLE UNIT NUMBERS INDICATE A WIRE CODE MUST BE ADDED TO COMPLETE THE NUMBER. REFER TO THE MISCELLANEOUS SECTION FOR CONDUCTOR CODING CHARTS.

PRIMARY CODING, STANDARD VERTICAL CONSTRUCTION

THE STANDARDS ARE GENERALLY IN ORDER ACCORDING TO THE NUMBER OF PHASES AND DEGREE OF LINE ANGLE INVOLVED. THE FIRST DIGIT REPRESENTS THE NUMBER OF PHASES. THE SECOND DIGIT REPRESENTS THE DEGREE OF LINE ANGLE AND IS CODED AS FOLLOWS:

- 0.....TANGENT, 0° 6°
- 1.....SMALL ANGLE, 6° 15°
- 2.....INTERMEDIATE ANGLE, 15° 30°
- 3.....MEDIUM ANGLE, 30° 60°
- 4LARGE ANGLE, 60° 90°
- 5.....DEAD END, SINGLE
- 6.....CROSSARM DEADEND & 180° SLACK SPAN
- 7.....TANGENT & 90° BUCK (SINGLE PHASE ONLY)
- 8.....VERTICAL DEADEND & 180° SLACK SPAN
- 9.....CROSSARM TENSION DOUBLE DEADEND

THE THIRD INDICATOR OF THE CODE MAY BE AN "A" WHICH INDICATES THAT ARMOR RODS WILL BE USED. OR IT MAY BE AN "A, B, C, D, E, F, G, H, J OR K", WHICH SPECIFIES THE VARIATION IN FRAMING OR MATERIAL REQUIRED. THE FOURTH INDICATOR, WHEN REQUIRED, WILL ALWAYS BE AN "A" AND DESIGNATES THE USE OF ARMOR RODS FOR THE INSTALLATION. **NOTE**: THE NEUTRAL OR SECONDARY ATTACHMENTS MUST BE REQUESTED SEPARATELY – THEY ARE NOT INCLUDED IN THE "P" SECTION MATERIALS FOR WOOD POLE CONSTRUCTION.

BUCK

BUCK STRUCTURES HAVE BEEN ASSIGNED A "PB" PREFIX. THESE UNITS ARE DESIGNED FOR A SINGLE, DUAL OR THREE PHASE BUCK OFF AN EXISTING LINE POLE.

PRIMARY CODING, HORIZONTAL CONSTRUCTION

A "PH" PREFIX DESIGNATES HORIZONTAL CONSTRUCTION AND THE CODE NUMBERS ARE SIMILAR TO THOSE USED IN OTHER STANDARDS.

STEEL POLE CONSTRUCTION

STEEL POLE CONSTRUCTION UNITS HAVE A "PMH" PREFIX.

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 03/11/91 |
| | PRIMARY CONSTRUCTION UNITS | REV. DATE: | 08/31/15 |
| | INCINCICIONAL CODE | APPROVAL: | N. Sabbah |
| PROPRIETARY MATERIAL | 5-2-1 | OH5-2- | 1.doc |
| | | | |

GRID SKETCH APPLICATION

PRIMARY CONSTRUCTION UNITS SHOULD BE WRITTEN ON LINES 5 OR 6 OF THE GRID SKETCH. ENTER THE CONDUCTOR CODE NUMBER ON LINE 4 IN ORDER TO INSURE COMPATIBILITY BETWEEN CONDUCTOR AND CONDUCTOR SUPPORT UNITS.

ALTERNATE

WHEN MORE THAN TWO CODE NUMBERS MUST BE RECORDED FOR PRIMARY CONDUCTOR ATTACHMENTS, WRITE THE PRIMARY CONSTRUCTION UNIT CODE NUMBER AND **ADD** THE CONDUCTOR CODE NUMBER IN THE MISCELLANEOUS PORTION OF THE GRID SKETCH (LINES 13 – 18). FOR EXAMPLE, THE NORMAL AND ALTERNATE METHODS FOR SPECIFYING A PULL-OFF (P33) FOR 266.8 MCM AA CONDUCTOR ARE SHOWN BELOW.

| | | Q | R | S | Т | |
|---------------------------------|----|---------------|---------|--------------|---------------|-----------|
| | 1 | TAX CODE | | | | |
| | 2 | POINT NO. | | ACT QUANT | LABOR DIFF | |
| PRIMARY CONDUCTOR CODE | 3 | RUN SPAN | | | | |
| L | 4 | PRI | A266 | | | |
| → | 5 | STD NO. | P33 | 1 | | METHOD |
| I PRIMARY SUPPORTS AND | 6 | | | | |] |
| FRAMINGFOR CONDUCTOR | 7 | NEUT | | | | |
| SHOWN ABOVE WITH LINE GUARD. | 8 | STD NO. | | | | |
| | 9 | SL-DD SEC. | | | | |
| | 10 | STD NO. | | | | |
| FRAMING. CLAMPS TO FIT | 11 | | | | | - |
| 266.8 MCM AA CONDUCTOR | 12 | | | | | |
| WITH LINE GUARD. | 13 | | | | | |
| ▶ | 14 | | P33A266 | 1 | | ALTERNATE |
| | 15 | | | | | |
| | 16 | | | | | - |
| | 1/ | | | | | 4 |
| | 10 | | | | | - |
| | 13 | | | 1 | 1 | |

MULTIPLE NEUTRALS

WHENEVER MORE THAN ONE NEUTRAL EXISTS ON A POLE, E.G. A BUCK OR CROSSING STRUCTURE, CONNECT THE NEUTRALS TOGETHER WITH A CONDUCTOR THE SAME SIZE AS THE SMALLER OF THE NEUTRALS AND TIE THEM TO THE POLE GROUND. IF THE NEUTRALS ARE SEPARATED BY MORE THAN SEVEN FEET, THE NEUTRAL CONNECTION CONDUCTOR SHALL BE SECURELY FASTENED TO THE POLE SO AS TO PREVENT MOVEMENT. IN THE CASE OF A NEUTRAL BEING CARRIED ON A CROSSARM, TAKE CARE TO ROUTE AND FASTEN IN A MANNER THAT WILL NOT INTERFERE WITH THE PHASE CONDUCTORS OR INSULATORS.

| Overhead Distribution | | | |
|---------------------------------------|---------------------|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 03/11/91 |
| R R R R R R R R R R R R R R R R R R R | INSTRUCTIONAL GUIDE | REV. DATE: | 08/31/15 |
| | | APPROVAL: | N. Sabbah |
| PROPRIETARY MATERIAL | 5-2-2 | OH5-2-2 | 1.doc |



2. THE MOUNTING HEIGHT OF ALL BLADE DISCONNECT SWITCHES AND CUTOUTS FOR UNDERGROUND RISERS IS LIMITED TO 35 FT ABOVE GROUND.

NOTES

- 3. 18" SPACING MAY BE USED WHEN BOTTOM PHASE IS LOCATED AT OR BELOW 36'-6" ABOVE FINAL GRADE. 42" SPACING MUST BE USED WHEN BOTTOM PHASE IS LOCATED AT 38'-6" ABOVE FINAL GRADE.
- 4. THERE SHALL NOT BE MORE THAN 42" BETWEEN THE TOP MOUNTING BOLT OF THE SWITCHES AND THE BOTTOM PHASE CONDUCTOR. FOR PRIMARY CONDUCTOR CONSTRUCTION AT LEVELS HIGHER THAN THOSE INDICATED IN NOTES 2 & 3, CONSULT POWER SYSTEM ENGINEERING.

Overhead Distribution Construction Standards

PROPRIETARY MATERIAL

| PRIMARY CONSTRUCTION UNITS | |
|-----------------------------|--|
| HOT STICK OPERATED SWITCHES | |
| | |

ISSUE DATE: 10/03/89 REV DATE 04/15/13 APPROVAL: B. PRIEST 8512E22.DGN

42"MAXIMUM (SEE NOTES 3 & 4)

> 35'MAXIMUM (SEE NOTE 2)

db



PHASING OF VERTICAL CONSTRUCTION SHALL BE "BAC" FROM TOP TO BOTTOM AS IN FIGURES 1 TO 4. PHASE "A" IS TO BE LOCATED ON THE WESTERN OR NORTHERN SIDE OF POLE ON NEW LINE CONSTRUCTION. FIG.4 MAY HAVE ALL PHASES LOCATED ON OTHER SIDE OF POLE.ONE CIRCUIT OF VERTICAL CONSTRUCTION (AS IN FIG.1 TO 4) MAY BE TRANSITIONED DIRECTLY TO HORIZONTAL CONSTRUCTION OF FIG.5 & 6. DOUBLE CIRCUITS MAY_NOT BE TRANSITIONED IN THE SAME SPAN.



PHASING OF HORIZONTAL (FLAT) CONSTRUCTION SHALL BE "ABC" WEST TO EAST OR NORTH TO SOUTH. "B" PHASE CONDUCTOR MAY BE LOCATED ON EITHER SIDE OF THE POLE OR ON THE POLE TOP. EXISTING VERTICAL CONSTRUCTION WHICH IS DIFFERENT THAN FIG.1 TO 4 SHOULD BE TRANSITIONED TO ONE OF THE ABOVE STANDARD VERTICAL CONSTRUCTIONS BEFORE TRANSITION TO STANDARD HORIZONTAL CONSTRUCTION.

| Overhead Distribution | | |
|------------------------|----------------------------|----------------------|
| Construction Standards | | ISSUE DATE: 08/15/92 |
| | PRIMARY CONSTRUCTION UNITS | REV. DATE: 05/23/11 |
| | | APPROVAL: B. PRIEST |
| PROPRIETARY MATERIAL | 5-4-1 | 8512E497.DGN |
| | | |





| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 1 OR 2 | 5034594 |
| 2 | PIN, INSULATOR, 18 IN. LENGTH, HOT GALV. | 1 OR 2 | 5028637 |
| 3 | TOP TIE, VARIOUS | 1 | BPT1_ |
| 4 | ARMOR ROD, VARIOUS | 0 OR 1 | BR_ |

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|-----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | SINGLE PHASE | REV. DATE: | 05/05/13 |
| | TANGENT AND SMALL ANGLE | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 5-5-1 | 8512E77 | .DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 2 | 5034719 |
| 2 | ANGLE CLAMP, 30 DEG 60 DEG., VARIOUS | 1 | BA1_OR BA2_ |
| 3 | LINE GUARD, VARIOUS | 0 OR 1 | BL_ |
| 4 | ARMOR ROD, VARIOUS | 0 OR 1 | BR_ |

| Overhead Distribution | | | |
|------------------------|------------------------------|-------------|-----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| PROPRIETARY MATERIAL | SINGLE PHASE | REV. DATE: | 05/05/13 |
| | MEDIUM ANGLE, 24 DEG 60 DEG. | APPROVAL: | B. PRIEST |
| | 5-6-1 | 8512E78. | .DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4 IN. CLEVIS | 4 | 5034719 |
| 2 | DEADEND CLAMP, VARIOUS | 2 | BD_ |

| Overhead Distribution | | | |
|------------------------|-----------------------------|-------------|-----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| PROPRIETARY MATERIAL | SINGLE PHASE | REV. DATE: | 05/06/13 |
| | LARGE ANGLE, 60 DEG 90 DEG. | APPROVAL: | B. PRIEST |
| | 5-7-1 | 8512E79 | .DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS, EA | 2 | 5034719 |
| 2 | DEADEND CLAMP, VARIOUS | 1 | BD_ |

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|-----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | SINGLE PHASE | REV DATE | 05/06/13 |
| PROPRIETARY MATERIAL | DEADEND | APPROVAL: | B. PRIEST |
| | 5-8-1 | 8512E80 | DGN |

P15_

P15N CONDUCTOR A2



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | INSULATOR, PIN, 12KV, PORCELAIN GRAY EA | 1 | 5034594 |
| 2 | PIN, INSULATOR, 18 IN. LENGTH, HOT GALV. EA | 1 | 5038637 |
| 3 | DEADEND GRIP, VARIOUS | 1 | BDG |

| Overhead Distribution Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 12/26/74 |
|---|----------------------------|-------------|-----------|
| | SINGLE PHASE DEADEND | REV. DATE: | 05/06/13 |
| D K r | SLACK SPAN | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 5-9-1 | 8512E81. | DGN |
| | | , | |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | PIN, INSULATOR, 18 IN. LENGTH, HOT GALV. | 1 | 5028637 |
| 2 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 1 | 5034594 |
| 3 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 2 | 5034719 |
| 4 | DEADEND CLAMP, VARIOUS | 1 | BD_ |
| 5 | TOP TIE, VARIOUS | 1 | BPT1_ |

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|-----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| PROPRIETARY MATERIAL | SINGLE PHASE | REV. DATE: | 05/01/13 |
| | TANGENT WITH 90 DEG. BUCK | APPROVAL: | B. PRIEST |
| | 5-10-1 | 8512E82 | .DGN |
| | | | |

P17

CONDUCTORS A2,C4,C6,R2

P18_



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | PIN, INSULATOR, 18 IN. LENGTH, HOT GALV. | 1 | 5028637 |
| 2 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 1 | 5034594 |
| 3 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 2 | 5034719 |
| 4 | DEADEND GRIP, VARIOUS | 1 | BDG_ |
| 5 | DEADEND CLAMP, VARIOUS | 1 | BD_ |

NOTES

1. MAXIMUM SPAN LENGTH - SEE SLACK SPAN SAG CHARTS

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|-----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| PROPRIETARY MATERIAL | SINGLE PHASE DEADEND | REV. DATE: | 05/06/13 |
| | 180 DEG. SLACK SPAN | APPROVAL: | B. PRIEST |
| | 5-11-1 | 8512E83 | .DGN |







| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | BRACKET, SIDE MOUNT, HOT GALV. LARGE | 1 | 5028505 |
| 2 | PIN, INSULATOR, 5/8 X 1.5 IN. SHORT | 1 | 5028641 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 2 | 5034594 |
| 4 | PIN, INSULATOR, 18 IN. LENGTH, HOT GALV. | 1 | 5028637 |
| 5 | TOP TIE, VARIOUS | 1 | BPT1_ |
| 6 | SIDE TIE, VARIOUS | 1 | BPT2_ |

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|-----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| PROPRIETARY MATERIAL | TWO PHASE | REV. DATE. | 05/05/13 |
| | TANGENT, 0 DEG 6 DEG. | APPROVAL: | B. PRIEST |
| | 5-12-1 | 8512E92 | DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | BRACKET, SIDE MOUNT, HOT GALV. LARGE | 1 | 5028505 |
| 2 | INSULATOR, VERTICAL LINE POST, 22KV | 1 | 5034466 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 2 | 5034594 |
| 4 | PIN, INSULATOR, 18 IN. LENGTH, HOT GALV. | 2 | 5028637 |
| 5 | INSULATOR, HORIZONTAL LINE POST, 15KV | 1 | 5034465 |
| 6 | BRACKET, SIDE MOUNT, HOT GALV. SMALL | 1 | 5028504 |
| 7 | LINE GUARD, VARIOUS | 1 | BL_ |
| 8 | CLAMPTOP CLAMP, 6 DEG 15 DEG., VARIOUS | 0 OR 2 | BCT1_OR BCT3_ |
| 9 | ARMOR ROD, VARIOUS | 0 OR 2 | BR_ |

| Overhead Distribution | | |
|------------------------|----------------------------|----------------------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: 09/30/71 |
| | TWO PHASE | REV. DATE: 02/27/19 |
| | SMALL ANGLE, 6 DEG 15 DEG. | APPROVAL: N. SABBAH |
| PROPRIETARY MATERIAL | 5-13-1 | 8512E93.DGN |
| | | |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | BRACKET, SIDE MOUNT, HOT GALV. LARGE | 1 | 5028505 |
| 2 | INSULATOR, HORIZONTAL LINE POST, 15 KV | 1 | 5034465 |
| 3 | INSULATOR, VERTICAL LINE POST, 22 KV | 1 | 5034466 |
| 4 | BRACKET, SIDE MOUNT, HOT GALV. SMALL | 2 | 5028504 |
| 5 | CLAMPTOP CLAMP, 6° - 15° | 1 | BCT1_OR BCT3_ |
| 6 | LINE GUARD, VARIOUS | 0 OR 2 | BL_ |
| 7 | ARMOR ROD, VARIOUS | 0 OR 2 | BR_ |
| 8 | CLAMPTOP CLAMP, 15° - 30° | 1 | BCT2_OR BCT4_ |

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | TWO PHASE SMALL AND INTERMEDIATE ANGLE | REV. DATE: | 02/27/20 |
| | 6 DEG 15 DEG., 15 DEG30 DEG., WOOD POLE | APPROVAL: | J. LUERA |
| PROPRIETARY MATERIAL | 5-14-1 | 8512E94. | .DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---------------------------------------|----------|-------------------------|
| 1 | BRACKET, INSULATOR, 5/8 IN. STUD | 2 | 5028499 |
| 2 | INSULATOR, HORIZONTAL LINE POST, 15KV | 2 | 5034465 |
| 3 | CLAMPTOP CLAMP, 15 DEG30 DEG. | 2 | BCT2_OR BCT4_ |
| 4 | LINE GUARD, VARIOUS | 0 OR 2 | BL_ |
| 5 | ARMOR ROD, VARIOUS | 0 OR 2 | BR_ |

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| Overhead Distribution | | |
|------------------------|---|----------------------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: 09/30/71 |
| PROPRIETARY MATERIAL | TWO PHASE INTERMEDIATE ANGLE, 15 DEG 30 DEG. | REV. DATE: 02/27/19 |
| | | APPROVAL: N. SABBAH |
| | 5-15-1 | 8512E95.DGN |





| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 4 | 5034719 |
| 2 | LINE GUARD, VARIOUS | 0 OR 2 | BL_ |
| 3 | ANGLE CLAMP 30 DEG 60 DEG., VARIOUS | 2 | BA1_ OR BA2_ |
| 4 | ARMOR ROD, VARIOUS | 0 OR 2 | BR_ |

| Overhead Distribution | | |
|------------------------|------------------------------|----------------------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: 09/30/71 |
| PROPRIETARY MATERIAL | TWO PHASE | REV. DATE: 02/27/19 |
| | MEDIUM ANGLE, 30 DEG 60 DEG. | APPROVAL: N. SABBAH |
| | 5-16-1 | 8512E96.DGN |

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P23A


| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 8 | 5034719 |
| 2 | DEADEND CLAMP, VARIOUS | 4 | BD_ |

| Overhead Distribution | | | |
|------------------------|-----------------------------|-------------|-----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | TWO PHASE | REV. DATE: | 05/06/13 |
| | LARGE ANGLE, 60 DEG 90 DEG. | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 5-17-1 | 8512E97 | .DGN |



| IIEM | MATERIAL DESCRIPTION | QUANTITY | NUMBER |
|------|--|----------|---------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 4 F | 1 | 5029407 |
| 2 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 4 | 5034719 |
| 3 | BRACE, CROSSARM, 1.25 X 0.25 X 20 I | 2 | 5027884 |
| 4 | DEADEND CLAMP, VARIOUS | 2 | BD_ |
| 5 | PLATE, GAIN, 5-5/16" X 4" | 1 | 5028652 |

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|-----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | TWO PHASE DEADEND | REV. DATE: | 05/06/13 |
| | CROSSARM | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 5-18-1 | 8512E49 | .DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 4 | 5034719 |
| 2 | DEADEND CLAMP, VARIOUS | 2 | BD_ |

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|-----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | TWO PHASE DEADEND | REV. DATE: | 05/06/13 |
| | VERTICAL | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 5-19-1 | 8512E50 | DGN |

P25A_

5N_ CONDUCTOR A2



MAX. SPAN LENGTH- SEE SLACK SPAN SAG CHARTS

| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | BRACKET, SIDE MOUNT, HOT GALV. LARGE | 1 | 5028505 |
| 2 | PIN, INSULATOR, 5/8 X 1.5 IN. SHORT | 1 | 5028641 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 2 | 5034594 |
| 4 | PIN, INSULATOR, 18 IN. LENGTH, HOT GALV. | 1 | 5028639 |
| 5 | DEADEND GRIP, VARIOUS | 2 | BDG_ |

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 12/30/74 |
| | TWO PHASE DEADEND | REV. DATE: | 05/06/13 |
| | SLACK SPAN | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-20-1 | 8512E117 | .DGN |
| | | | |

P25N_



MAX. SPAN LENGTH- SEE SLACK SPAN SAG CHARTS

| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---------------------------------------|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 4 FT. | 1 | 5029407 |
| 2 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 2 | 5034594 |
| 3 | PIN, INSULATOR, 5/8" X 5-3/4" LONG | 2 | 5028642 |
| 4 | INSULATOR, SUSPENSION, 6-1/4", CLEVIS | 4 | 5034719 |
| 5 | BRACE, CROSSARM, 1.25" X 0.25" X 20" | 2 | 5027884 |
| 6 | DEADEND GRIP, VARIOUS | 2 | BDG_ |
| 7 | DEADEND CLAMP, VARIOUS | 2 | BD_ |
| 8 | PLATE, GAIN, 5-5/16" X 4" | 1 | 5028652 |

| Overhead Distribution | | | |
|------------------------|-------------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | TWO PHASE DEADEND | REV. DATE: | 05/07/13 |
| | 180 DEG. SLACK SPAN, CROSSARM | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-21-1 | 8512E118 | DGN |





| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 2 | 5034594 |
| 2 | BRACKET, SIDE MOUNT, HOT GALV. SMALL | 2 | 5028504 |
| 3 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 4 | 5034719 |
| 4 | PIN, INSULATOR, 5/8 X 1.5 IN., SHORT | 2 | 5028641 |
| 5 | DEADEND GRIP, VARIOUS | 2 | BDG_ |
| 6 | DEADEND CLAMP, VARIOUS | 2 | BD_ |

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | TWO PHASE DEADEND | REV. DATE: | 05/07/13 |
| | 180 DEG. SLACK SPAN | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-22-1 | 8512E119 | DGN |

P28





| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--------------------------------------|----------|-------------------------|
| 1 | BRACKET, SIDE MOUNT, HOT GALV. LARGE | 3 | 5028505 |
| 2 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 3 | 5034594 |
| 3 | PIN, INSULATOR, 5/8" X 1.5" SHORT | 3 | 5028641 |
| 4 | LINE GUARD, VARIOUS | 0 OR 3 | BL_ |
| 5 | SIDE TIE, VARIOUS | 3 | BPT2_ |

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| PROPRIETARY MATERIAL | THREE PHASE TANGENT, 0 DEG 6 DEG., WOOD POLE | REV. DATE: | 02/27/20 |
| | | APPROVAL: | J. LUERA |
| | 5-23-1 | 8512E151 | .DGN |

P30A



P30C_



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | BRACKET, SIDE MOUNT, HOT GALV. LARGE | 2 | 5028505 |
| 2 | PIN, INSULATOR, 5/8 X 1.5 IN. SHORT | 2 | 5028641 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 3 | 5034594 |
| 4 | PIN, INSULATOR, 18 IN. LENGTH, HOT GALV. | 1 | 5028637 |
| 5 | LINE GUARD, VARIOUS | 0 OR 3 | BL_ |
| 6 | SIDE TIE, VARIOUS | 2 | BPT2_ |
| 7 | TOP TIE, VARIOUS | 1 | BPT1_ |

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| PROPRIETARY MATERIAL | THREE PHASE | REV. DATE | 05/05/13 |
| | TANGENT, 0 DEG 6 DEG. | APPROVAL: | B.PRIEST |
| | 5-23-2 | 8512E152 | DGN |
| | | | |



P31B

6 DEG. - 15 DEG. (SPANS LESS THAN 300')

P31BA

6 DEG. - 15 DEG. (SPANS MORE THAN 300')

CONDUCTORS AC312,A2,A266,A30,A397, C2,C20,R2,R266,R30

| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | BRACKET, SIDE MOUNT, HOT GALV. SMALL | 1 | 5028504 |
| 2 | PIN, INSULATOR, 18 IN. LENGTH, HOT GALV. | 2 | 5028637 |
| 3 | INSULATOR, HORIZONTAL, LINE POST, 15KV | 1 | 5034465 |
| 4 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 2 | 5034594 |
| 5 | BRACKET, SIDE MOUNT, HOT GALV. LARGE | 1 | 5028505 |
| 6 | INSULATOR, VERTICAL, LINE POST, 22KV | 1 | 5034466 |
| 7 | CLAMPTOP CLAMP, 6 DEG 15 DEG., VARIOUS | 1 | BCT1_OR BCT3_ |
| 8 | LINE GUARD, VARIOUS | 0 OR 3 | BL_ |
| 9 | ARMOR ROD, VARIOUS | 0 OR 3 | BR_ |

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|-----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| PROPRIETARY MATERIAL | THREE PHASE | REV. DATE: | 02/27/19 |
| | SMALL ANGLE, 6 DEG 15 DEG. | APPROVAL: | N. Sabbah |
| | 5-24-1 | 8512E121 | .DGN |
| | | | |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | BRACKET, SIDE MOUNT, HOT GALV. LARGE | 1 OR 2 | 5028505 |
| 2 | INSULATOR, HORIZONTAL LINE POST, 15KV | 1 OR 2 | 5034465 |
| 3 | BRACKET, SIDE MOUNT, HOT GALV. SMALL | 1 OR 2 | 5028504 |
| 4 | INSULATOR, VERTICAL, LINE POST, 22KV | 1 OR 2 | 5034466 |
| 5 | CLAMPTOP CLAMP, 6° - 15°, VARIOUS | 1 OR 2 | BCT1_OR BCT3_ |
| 6 | CLAMPTOP CLAMP, 15° - 30°, VARIOUS | 1 OR 2 | BCT2_OR BCT4_ |
| 7 | ARMOR ROD, VARIOUS | 0 OR 3 | BR_ |
| 8 | LINE GUARD, VARIOUS | 0 OR 3 | BL |

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | THREE PHASE SMALL AND INTERMEDIATE ANGLE | REV. DATE: | 02/27/20 |
| | 6 DEG 15 DEG.,- 30 DEG., WOOD POLE | APPROVAL: | J. LUERA |
| PROPRIETARY MATERIAL | 5-25-1 | 8512E122 | DGN |

15° - 30° SPANS LESS THAN 300'

P32__ P32A__

15° - 30° SPANS MORE THAN 300'

CONDUCTOR A2

| PW32 |
|-------|
| PW32A |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | BRACKET, INSULATOR, 5/8" STUD | 3 | 5028499 |
| 2 | INSULATOR, HORIZONTAL, LINE POST, 15KV | 3 | 5034465 |
| 3 | CLAMPTOP CLAMP, 15° - 30°, VARIOUS | 3 | BCT2_OR BCT4_ |
| 4 | ARMOR ROD, VARIOUS | 0 OR 3 | BR_ |
| 5 | LINE GUARD, VARIOUS | 0 OR 3 | BL_ |

| Overhead Distribution | | | |
|------------------------|--|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| PROPRIETARY MATERIAL | THREE PHASE INTERMEDIATE ANGLE, 15 DEG 30 DEG., WOOD POLE | REV. DATE: | 02/27/20 |
| | | APPROVAL: | J. LUERA |
| | 5-26-1 | 8512E123 | .DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---------------------------------------|----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4", CLEVIS | 6 | 5034719 |
| 2 | LINE GUARD, VARIOUS | 0 OR 3 | BL_ |
| 3 | ANGLE CLAMP, 30° - 60°, VARIOUS | 3 | BA1_OR BA2_ |
| 4 | ARMOR ROD, VARIOUS | 0 OR 3 | BR_ |

| Overhead Distribution | | | |
|------------------------|--|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | THREE PHASE | REV. DATE: | 02/27/20 |
| | MEDIUM ANGLE, 30 DEG 60 DEG. , WOOD POLE | APPROVAL: | J. LUERA |
| PROPRIETARY MATERIAL | 5-27-1 | 8512E124 | .DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4 IN, CLEVIS | 12 | 5034719 |
| 2 | DEADEND CLAMP, VARIOUS | 6 | BD_ |

| Overhead Distribution | | | |
|-------------------------|-----------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| SXP [®] | THREE PHASE | REV DATE: | 05/06/13 |
| | LARGE ANGLE, 60 DEG 90 DEG. | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-28-1 | 8512E125 | .DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 12 | 5034719 |
| 2 | DEADEND CLAMP, VARIOUS | 6 | BD_ |

| Overhead Distribution | | | |
|-------------------------|---|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 06/05/02 |
| SKP [®] | THREE PHASE LARGE ANGLE, 60 DEG 90 DEG. | REV. DATE: | 05/02/13 |
| | ON STEEL POLE | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-28-2 | 8512E442 | DGN |
| | | | |

P35__ CONDUCTORS A2, A30, A266, A397, C2, C4, C6, C20, R2, R30





| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---------------------------------------|----------|-------------------------|
| 1 | CROSSARM, DEADEND, 8' | 1 | 5029412 |
| 2 | INSULATOR, SUSPENSION, 6-1/4", CLEVIS | 6 | 5034719 |
| 3 | DEADEND CLAMP, VARIOUS | 3 | BL_ |
| 4 | BOLT, EYE, 1-3/4" X 3" I.D. | 1 | 5028908 |

NOTES

1. SEE POLE GUYING AND BRACING.

| Construction Standards PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
|---|-------------|----------|
| THREE PHASE DEADEND | REV. DATE: | 02/27/20 |
| CROSSARM, WOOD POLE | APPROVAL: | J. LUERA |
| PROPRIETARY MATERIAL 5-29-1 | 8512E126 | .DGN |

CONDUCTORS A2,A266,A30,A397, C2,C20,C4,C6,R2,R30

PREFERRED FOR RISER ON STEEL DEADEND POLES (M45DE AND M45DE90 ONLY)



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CROSSARM, DEADEND, 10FT. | 1 | 5027457 |
| 2 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 6 | 5034719 |
| 3 | DEADEND CLAMP, VARIOUS | 3 | BD_ |
| 4 | BOLT, EYE, 1.75 X 3 IN. I.D. | 1 | 5028908 |

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 06/05/02 |
| | THREE PHASE DEADEND ON STEEL POLE CROSSARM | REV. DATE: | 05/02/13 |
| | | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-29-2 | 8512E443 | DGN |

P35S







| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---------------------------------------|----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4", CLEVIS | 6 | 5034719 |
| 2 | DEADEND CLAMP, VARIOUS | 3 | BD_ |

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | THREE PHASE DEADEND | REV. DATE: | 02/27/20 |
| | VERTICAL, WOOD POLE | APPROVAL: | J. LUERA |
| PROPRIETARY MATERIAL | 5-30-1 | 8512E127 | .DGN |



ONLY FOR USE ON STEEL DEADEND POLES: M45DE AND M45DE90

| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 6 | 5034719 |
| 2 | DEADEND CLAMP, VARIOUS | 3 | BD_ |

| Overhead Distribution | | | |
|------------------------|-----------------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 06/05/02 |
| PROPRIETARY MATERIAL | THREE PHASE DEADEND ON STEEL POLE | REV. DATE: | 05/06/13 |
| | VERTICAL | APPROVAL: | B.PRIEST |
| | 5-30-2 | 8512E444 | DGN |

P35AS





| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CROSSARM, 8', 3000 LB. CONDUCTOR TENSION | 1 | 5029412 |
| 2 | PIN, INSULATOR, 18 IN. LENGTH, HOT GALV. | 1 | 5028637 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 3 | 5034594 |
| 4 | PIN, INSULATOR, 5/8 X 5.75 IN. LONG | 2 | 5028642 |
| 5 | DEADEND GRIP, VARIOUS | 3 | BDG_ |

NOTES

1. FOR MAXIMUM SPAN LENGTH SEE SLACK SPAN SAG CHARTS.

| Overhead Distribution Construction Standards | | | |
|---|----------------------------|-------------|----------|
| | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 01/30/84 |
| | THREE PHASE DEADEND | REV. DATE: | 05/06/13 |
| | SLACK SPAN | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-31-1 | 8512E128 | DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN | 1 | 5029409 |
| 2 | BRACE, CROSSARM, 1.25 X 0.25 X 20 IN. | 1 | 5027884 |
| 3 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 6 | 5034719 |
| 4 | DEADEND CLAMP, VARIOUS | 3 | BD_ |
| 5 | PLATE, GAIN, 9" X 4-1/2" | 1 | 5028653 |

| Overhead Distribution | | | |
|------------------------|-----------------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 06/07/74 |
| | THREE PHASE DEADEND | REV. DATE: | 04/29/13 |
| PROPRIETARY MATERIAL | STAGGERED CONFIGURATION, CROSSARM | APPROVAL: | B.PRIEST |
| | 5-32-1 | 8512E129 | .DGN |

P35B

ALTERNATE



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 12 | 5034719 |
| 2 | DEADEND CLAMP, VARIOUS | 6 | BD_ |

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 07/29/93 |
| | THREE PHASE DOUBLE DEADEND | REV. DATE: | 04/12/13 |
| | VERTICAL | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-33-1 | 8512E208 | DGN |

P35D

CONDUCTORS AC312,A2,A266,A30,A397, C2,C20,C4,C6,R2,R266,R30

ONLY FOR USE ON STEEL DEADEND POLES: M45DE AND M45DE90



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 12 | 5034719 |
| 2 | DEADEND CLAMP, VARIOUS | 6 | BD_ |
| 3 | INSULATOR, CLAMPTOP | 3 | 5034465 |

| Overhead Distribution | | | |
|------------------------|--|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 06/05/02 |
| | THREE PHASE DOUBLE DEADEND ON STEEL POLE | REV. DATE: | 05/06/13 |
| | VERTICAL | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-33-2 | 8512E446 | .DGN |

P35DS



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN | 1 | 5029409 |
| 2 | PIN, INSULATOR, 1 IN. LEAD THREAD | 1 | 5028639 |
| 3 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 12 | 5034719 |
| 4 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 3 | 5034594 |
| 5 | BRACE, CROSSARM, 1.25 X 0.25 X 20 IN. | 1 | 5027884 |
| 6 | PIN, INSULATOR, 18 IN. LENGTH, HOT GALV. | 1 | 5028637 |
| 7 | PIN, INSULATOR, 5/8 X 5.75 IN. LONG | 1 | 5028642 |
| 8 | DEADEND CLAMP, VARIOUS | 6 | BD_ |
| 9 | PLATE, GAIN, 9" X 4-1/2" | 1 | 5028653 |

| Overhead Distribution | | | |
|------------------------|-----------------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 06/10/74 |
| | THREE PHASE DEADEND, JUMPERED | REV. DATE: | 04/29/13 |
| | STAGGERED CONFIGURATION, CROSSARM | APPROVAL: | B.PRIEST |
| | 5-34-1 | 8512E130 | .DGN |



P36_



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CROSSARM, 8', 3000 LB. CONDUCTOR TENSION | 1 | 5029412 |
| 2 | PIN, INSULATOR, 5/8 X 5.75 IN. LONG | 2 | 5028642 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 3 | 5034594 |
| 4 | PIN, INSULATOR, 18 IN. LENGTH, HOT GALV. | 1 | 5028637 |
| 5 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 6 | 5034719 |
| 6 | DEADEND GRIP, VARIOUS | 3 | BDG_ |
| 7 | DEADEND CLAMP, VARIOUS | 3 | BD_ |

NOTES

1. FOR MAXIMUM SPAN LENGTH SEE SLACK SPAN SAG CHARTS.

| Overhead Distribution | | | |
|------------------------|-------------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | THREE PHASE DEADEND | REV. DATE: | 05/11/13 |
| | 180 DEG. SLACK SPAN, CROSSARM | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-35-1 | 8512E131 | .DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN | 1 | 5029409 |
| 2 | PIN, INSULATOR, 5/8 X 5.75 IN. LONG | 1 | 5028642 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 3 | 5034594 |
| 4 | BRACE, CROSSARM, 1.25 X 0.25 X 20 IN. | 1 | 5027884 |
| 5 | PIN, INSULATOR, 18 IN. LENGTH, HOT GALV. | 2 | 5028637 |
| 6 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 6 | 5034719 |
| 7 | DEADEND GRIP, VARIOUS | 3 | BDG_ |
| 8 | DEADEND CLAMP, VARIOUS | 3 | BD_ |
| 9 | PLATE, GAIN, 9" X 4-1/2" | 1 | 5028653 |

NOTES

1. FOR MAXIMUM SPAN LENGTH SEE SLACK SPAN SAG CHARTS.

| Construction Standards THREE PHASE DEADEND 180 DEG. SLACK SPAN STACCEPED CONFIGURATION CROSSARM | Overhead Distribution | | | |
|--|---------------------------------------|--|-------------|-----------------|
| THREE PHASE DEADEND 180 DEG. SLACK SPAN STACCEPED CONFIGURATION CROSSARM | Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 05/22/75 |
| | C C C C C C C C C C C C C C C C C C C | THREE PHASE DEADEND 180 DEG. SLACK SPAN | REV. DATE: | 04/29/13 |
| | | STAGGERED CONFIGURATION, CROSSARM | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL 5-36-1 8512E132.DGN | PROPRIETARY MATERIAL | 5-36-1 | 8512E132 | DGN |





| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 3 | 5034594 |
| 2 | DEADEND GRIP, VARIOUS | 3 | BDG_ |
| 3 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 6 | 5034719 |
| 4 | BRACKET, SIDE MOUNT, HOT GALV. SMALL | 3 | 5038504 |
| 5 | PIN, INSULATOR, 5/8 X 1.5 IN. SHORT | 3 | 5038641 |
| 6 | DEADEND CLAMP, VARIOUS | 3 | BD_ |

NOTES

1. MAX. SPAN LENGTH- SEE SLACK SPAN SAG CHARTS

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|-----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | THREE PHASE DEADEND | REV. DATE: | 04/25/13 |
| | 180 DEG. SLACK SPAN | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 5-37-1 | 8512E89 | .DGN |

P38



PB10__ 1¢ TANGENT, INTERSECTION OF SAME CIRCUIT CONDUCTORS A2,C4,C6,R2

PB20___ 2¢ TANGENT, INTERSECTION OF SAME CIRCUIT CONDUCTORS A2, C4, C6, R2

PB30____ 3Ф TANGENT, INTERSECTION OF SAME CIRCUIT CONDUCTORS AC312, A2, A266, A30, A397, C2, C20, C4, C6, R2, R266, R30

| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--------------------------------------|-----------|-------------------------|
| 1 | PIN, INSULATOR, 5/8 X 1.5 IN. SHORT | 1, 2 OR 3 | 5028641 |
| 2 | INSULATOR, PIN 12KV PORCELAIN GRAY | 1, 2 OR 3 | 5034594 |
| 3 | SIDE TIE, VARIOUS | 1, 2 OR 3 | BPT2_ |
| 4 | BRACKET, SIDE MOUNT, HOT GALV. LARGE | 1, 2 OR 3 | 5028505 |
| 5 | LINE GUARD, VARIOUS | 0 OR 3 | BL_ |

| Overhead Distribution | | | |
|------------------------|---------------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | ONE, TWO OR THREE PHASE TANGENT | REV DATE | 05/06/13 |
| | INTERSECTION, SAME CIRCUIT | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-38-1 | 8512E133 | .DGN |
| | | | |



PB15_

1¢ BUCK

2¢BUCK

3¢BUCK

CONDUCTORS A2,C4,C6,R2

PB25A__

CONDUCTORS A2,C4,C6,R2

PB35A

CONDUCTORS AC312,A2,A266,A397,C2,C20,C4,C6,R2,R266,R30

| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|-----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 2, 4 OR 6 | 5034719 |
| 2 | PIN, INSULATOR, 1 IN. LEAD THREAD, 1 | 0 OR 1 | 5028639 |
| 3 | INSULATOR, PIN 12KV PORCELAIN GRAY | 0 OR 1 | 5034594 |
| 4 | DEADEND CLAMP, VARIOUS | 1, 2 OR 3 | BD_ |

| 30/71 |
|-------------|
| 30/13 |
| RIEST |
| N |
| 3 3 F |



PB15_____1 De BUCK FROM UNDERBUILD CONDUCTORS A2,C4,C6,R2 PB25A____2 DBUCK FROM UNDERBUILD CONDUCTORS A2,C4,C6,R2 PB35A____ 3 DBUCK FROM UNDERBUILD CONDUCTORS AC312,A2,A266,A397,C2,C20,C4,C6,R2,R266,R30

| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|-----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4 IN. CLEVIS | 2, 4 OR 6 | 5034719 |
| 2 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 0, 1 OR 2 | 5034594 |
| 3 | PIN, INSULATOR, 1 IN. LEAD THREAD, 1 | 0, 1 OR 2 | 5028639 |
| 4 | DEADEND CLIP, VARIOUS | 1, 2 OR 3 | BD_ |

| Overhead Distribution | | | |
|------------------------|------------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | ONE, TWO OR THREE PHASE BUCK | REV DATE | 05/06/13 |
| | FROM UNDERBUILD | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-39-2 | 8512E135 | .DGN |
| | | | |

CONDUCTORS A266, A397, AC312,



CONDUCTORS A397

PW60_



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--------------------------------------|----------|-------------------------|
| 1 | PIN, INSULATOR, 5/8" X 1.5" SHORT | 6 | 5028641 |
| 2 | INSULATOR, PIN 12KV PORCELAIN GRAY | 6 | 5034594 |
| 3 | BRACKET, SIDE MOUNT, HOT GALV. LARGE | 6 | 5028505 |
| 4 | LINE GUARD, VARIOUS | 0 OR 6 | BL_ |
| 5 | SIDE TIE, VARIOUS | 6 | BPT2_ |

NOTES

1. WHEN INSTALLING PARALLELING DISCONNECT SWITCHES ON THIS TYPE OF CONSTRUCTION, REFER TO DB4PV.

| Overhead Distribution | | | |
|-------------------------------|---|-------------|----------|
| Construction Standards | | ISSUE DATE: | 01/13/75 |
| ® | PRIMARY CONSTRUCTION UNITS | REV. DATE: | 02/27/20 |
| | DOUBLE ONCON TANGENT, O'DEG O'DEG., WOOD FOLE | APPROVAL: | J. LUERA |
| PROPRIETARY MATERIAL | 5-40-1 | 8512E136 | DGN |
| | | | |



CONDUCTOR A397

P60A

PW60A



PRIMARY CONSTRUCTION UNITS DOUBLE CIRCUIT VERTICAL, WOOD POLE ISSUE DATE: 09/30/71 REV. DATE: 02/27/20 APPROVAL: J. LUERA 8512E153.DGN



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--------------------------------------|----------|-------------------------|
| 1 | PIN, INSULATOR, 5/8" X 1.5" SHORT | 6 | 5028641 |
| 2 | INSULATOR, PIN 12KV PORCELAIN GRAY | 6 | 5034594 |
| 3 | BRACKET, SIDE MOUNT, HOT GALV. LARGE | 6 | 5028505 |
| 4 | SIDE TIE, VARIOUS | 6 | BPT2_ |

Overhead Distribution



6 DEG -15 DEG (SPANS MORE THAN 300')

6 DEG -15 DEG (SPANS MORE THAN 300')

_ 15 DEG -30 DEG (SPANS LESS THAN 300')

: __ 15 DEG -30 DEG (SPANS MORE THAN 300')

CONDUCTORS A2, A397, AC312, R2



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER | |
|------|--|----------|-------------------------|--|
| 1 | BRACKET, SIDE MOUNT, HOT GALV. LARGE | 3 | 5028505 | |
| 2 | INSULATOR, HORIZONTAL LINE POST, 15KV | 3 | 5034465 | |
| 3 | INSULATOR, VERTICAL LINE POST, 22KV | 3 | 5034466 | |
| 4 | BRACKET, SIDE MOUNT, HOT GALV. SMALL | 3 | 5028504 | |
| 5 | CLAMPTOP CLAMP, 6 DEG-15 DEG, VARIOUS | 0 OR 3 | BCT1_OR BCT3 | |
| 6 | CLAMPTOP CLAMP, 15 DEG-30 DEG, VARIOUS | 0 OR 3 | BCT2_OR BCT4 | |
| 7 | ARMOR ROD, VARIOUS | 0 OR 6 | BR_ | |
| 8 | LINE GUARD, VARIOUS | 0 OR 6 | BL_ | |

NOTES

1. ARROW INDICATES POSITION OF CONDUCTOR ON INSULATOR.

| Overhead Distribution | | |
|------------------------|----------------------------|----------------------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: 01/13/75 |
| | DOUBLE CIRCUIT | REV. DATE: 02/27/19 |
| | ANGLE, 6 DEG 30 DEG. | APPROVAL: N. SABBAH |
| PROPRIETARY MATERIAL | 5-42-1 | 8512E154.DGN |
| | | |



IF UNDERBUILD, DESIGNATE CIRCUIT SEPARATION



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | BRACKET, SIDE MOUNT, HOT GALV. LARGE | 3 | 5028506 |
| 2 | PIN, INSULATOR, 5/8 X 1.5 IN. SHORT | 3 | 5028641 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 3 | 5034594 |
| 4 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 6 | 5034719 |
| 5 | DEADEND CLAMP, VARIOUS | 3 | BD_ |
| 6 | LINE GUARD, VARIOUS | 3 | BL_ |
| 7 | SIDE TIE, VARIOUS | 3 | BPT2_ |

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 01/31/75 |
| | DOUBLE CIRCUIT | REV DATE: | 04/25/13 |
| | ONE CIRCUIT DEADEND | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-43-1 | 8512E137 | DGN |
| | | | |

P65



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 4 FT, PLANK | 3 | 5029408 |
| 2 | BRACE, CROSSARM, 1.25 X 0.25 X 20 IN. | 6 | 5027884 |
| 3 | PIN, INSULATOR, 5/8 X 5.75 IN. LONG | 6 | 5028642 |
| 4 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 12 | 5034719 |
| 5 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 6 | 5034594 |
| 6 | DEADEND CLAMP, VARIOUS | 6 | BD_ |
| 7 | DEADEND GRIP, VARIOUS | 6 | BDG_ |
| 8 | PLATE, GAIN, 5-5/16" X 4" | 3 | 5028652 |

NOTES

P66

1. FOR MAXIMUM SPAN LENGTH SEE SLACK SPAN SAG CHARTS.

| Overhead Distribution | | | |
|------------------------|--|-------------|----------------------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 06/23/83 |
| | DOUBLE CIRCUIT THREE PHASE DEADEND 180 DEC. SLACK SPAN, CROSSARM | REV. DATE: | 05/16/13 B PRIEST |
| | TOO DEG. SEACK SPAN, CROSSANM | | |
| PROPRIETARY MATERIAL | 5-44-1 | 8512E138 | DGN |

CONDUCTOR: A266, A397



| ITEM | DESCRIPTION | MATERIAL ITEM NUMBER | QTY |
|------|--|-------------------------|-----|
| 1 | CROSSARM, 8', 3000 LB. CONDUCTOR TENSION | 5029412 | 3 |
| 2 | PIN, INSULATOR, 5/8 X 5.75 IN. LONG | 5026642 | 6 |
| 3 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 5034719 | 12 |
| 4 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 5034594 | 6 |
| 5 | DEADEND CLAMP, VARIOUS | BD_ | 6 |
| 6 | DEADEND GRIP, VARIOUS | BDG_ | 6 |
| 7 | PLATE, GAIN 5-5/16" X 4" | 5028652 | 3 |

* FOR MAXIMUM SPAN LENGTH SEE SLACK SPAN SAG CHARTS.

NOTES

1. EVALUATE POLE STRENGTH TO DETERMINE WHETHER DOWN GUYS SHALL BE REQUIRED.

| Construction Standarda | | |
|--------------------------------------|--------|-----------|
| CONSTRUCTION UNITS DOUBLE CIRCUIT | ATE: | 06/23/83 |
| THREE PHASE DEADEND 180 DEGREE SLACK | ATE: | 04/11/22 |
| SPAN, CROSSARM APPRO | /AL: I | E.LUBANDI |
| PROPRIETARY MATERIAL 5-44-2 851 | 2E502 | DGN |

PWM66



5-45-1

8512E276.DGN


| ľ | ТЕМ | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|---|-----|--|----------|-------------------------|
| | 1 | PIN, INSULATOR, 1 IN. LEAD THREAD, 1 | 0 OR 3 | 5028639 |
| | 2 | INSULATOR, PIN 12KV PORCELAIN GRAY | 0 OR 3 | 5034594 |
| | 3 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 6 | 5034719 |
| | 4 | DEADEND CLAMP, VARIOUS | 3 | BD_ |

1. THIS FRAMING CANNOT BE USED ON UNDERBUILD OR WITH OTHER EQUIPMENT ON THE POLE.

| Construction Standards PRIMARY CONSTRUCTION UNITS | TE. 01/12/75 |
|--|---------------|
| | ATE. 01/13/75 |
| DOUBLE CIRCUIT REV. DATE: 0 | TE: 05/06/13 |
| VERTICAL, 3 ¢ BUCK | AL: B.PRIEST |
| PROPRIETARY MATERIAL 5-46-1 8512E155.D | E155.DGN |

(2 Ø TANGENT, 8' CROSSARM, STEEL BRACES) CONDUCTORS A2,C4,C6,R2



PH2

(3 Ø TANGENT, 8' CROSSARM, STEEL BRACES, POLE TOP PIN) CONDUCTORS AC312,A2,A266,A30,A397,C2,C20,C4,C6 R2,R266,R30



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 8 FOOT | 1 | 5029410 |
| 2 | BRACE, CROSSARM, 1.25 X 0.25 X 28 IN. | 2 | 5027885 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 2 OR 3 | 5034594 |
| 4 | PIN, INSULATOR, 5/8 X 5.75 IN. LONG | 1 OR 2 | 5028642 |
| 5 | PIN, INSULATOR, 18 IN. LENGTH, HOT G | 0 OR 1 | 5028637 |
| 6 | TOP TIE, VARIOUS | 2 OR 3 | BPT1_ |
| 7 | LINE GUARD, VARIOUS | 0 OR 3 | BL_ |
| 8 | PLATE, GAIN, 5-5/16" X 4" | 1 | 5028652 |

 Overhead Distribution Construction Standards
 PRIMARY CONSTRUCTION UNITS TWO OR THREE PHASE TANGENT CROSSARM CONSTRUCTION
 ISSUE DATE: 09/30/71

 REV. DATE:
 05/16/13

 APPROVAL:
 B.PRIEST

 5-47-1
 8512E139.DGN

CONDUCTORS A2, C4, C6, R2



CONDUCTORS A2, A266, A397, AC312, R2

| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--------------------------------------|-----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE, 8' | 0, 1 OR 2 | 5029410 |
| 2 | BRACE, CROSSARM, 60" SPAN 18" PR | 1 OR 2 | 5027886 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 2 OR 3 | 5034594 |
| 4 | PIN, INSULATOR, 5/8" X 5-3/4" LONG | 2, 4 OR 6 | 5028642 |
| 5 | PIN, INSULATOR, 5/8" X 6-1/2" LONG | 3 OR 6 | 5028643 |
| 6 | PIN, INSULATOR, 1" LEAD THREAD, H | 4 OR 6 | 5028636 |
| 7 | CROSSARM, DENSE OR CLOSE GRAIN, 10' | 0, 1 OR 2 | 5029414 |
| 8 | ARMOR ROD, VARIOUS | 0, 2 OR 3 | BR_ |
| 9 | LINE GUARD, VARIOUS | 0, 2 OR 3 | BL_ |
| 10 | TOP TIE, VARIOUS | 0, 2 OR 3 | BPT1_ |
| 11 | PLATE, GRAIN, 5-5/16" X 4" | 1 OR 2 | 5028652 |

- 1. USE 10' CROSSARMS FOR UNDERBUILD CONSTRUCTION ON CLASS H4 TRANSMISSION POLES.
- 2. PARROW INDICATES POSITION OF CONDUCTOR ON INSULATOR.

| Overhead Distribution | | | |
|------------------------|----------------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | TWO PHASE OR THREE PHASE | REV. DATE: | 02/27/20 |
| | CROSSARM CONSTRUCTION, WOOD POLE | APPROVAL: | J. LUERA |
| PROPRIETARY MATERIAL | 5-48-1 | 8512E60 | DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---------------------------------------|-----------|-------------------------|
| 1 | CROSSARM, DEADEND, 8' | 0 OR 1 | 5029412 |
| 2 | CROSSARM, DEADEND, 10' | 0 OR 1 | 5027457 |
| 3 | PIN, INSULATOR, 5/8" X 5.75" LONG | 0, 2 OR 3 | 5028642 |
| 4 | INSULATOR, SUSPENSION, 6-1/4", CLEVIS | 4 OR 6 | 5034719 |
| 5 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 0, 2 OR 3 | 5034594 |
| 6 | PIN, INSULATOR, 5/8" X 6.5" LONG | 0, 2 OR 3 | 5028643 |
| 7 | DEADEND GRIP, VARIOUS | 0, 2 OR 3 | BDG_ |
| 8 | DEADEND CLAMP, VARIOUS | 2 OR 3 | BD_ |

- 1. USE 10' CROSSARMS FOR UNDERBUILD CONSTRUCTION ON CLASS H4 TRANSMISSION POLES.
- 2. FOR MAXIMUM SPAN LENGTH SEE RULE 235E; ELECTRICAL CLEARANCE STANDARDS.
- 3. THIS DIMENSION IS 21" FOR 8' ARMS AND 20" FOR 10' ARMS.
- 4. PREFERRED FOR EXISTING LINES WHEN A DEADEND/SLACK SPAN MUST BE CUT IN TO UNDERGROUND A PORTION OF LINE.

| Overhead Distribution | | | |
|---------------------------------------|--|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| C C C C C C C C C C C C C C C C C C C | TWO PHASE OR THREE PHASE DEADEND 180° SLACK SPAN CROSSARM CONSTRUCTION | REV. DATE: | 02/27/20 |
| | WOOD POLE | APPROVAL: | J. LUERA |
| PROPRIETARY MATERIAL | 5-49-1 | 8512E141 | .DGN |



PH29___ (2Ø DOUBLE DEADEND,8'ARM) PH29J___ (2Ø DOUBLE DEADEND,8'ARM,JUMPERED)

CONDUCTORS A2,C4,C6,R2

PH39 (3 Ø DOUBLE DEADEND,8'ARM)

PH39J (3 Ø DOUBLE DEADEND,8'ARM,JUMPERED)

CONDUCTORS A2,A266,A30,A397,AC312,C2,C20,C4,C6,R2,R30

| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|-----------|-------------------------|
| 1 | CROSSARM, DEADEND, 8 FOOT | 0 OR 1 | 5029412 |
| 2 | CROSSARM, DEADEND, 10 FOOT | 0 OR 1 | 5027457 |
| 3 | PIN, INSULATOR, 5/8 X 5.75 IN. LONG | 0, 2 OR 3 | 5028642 |
| 4 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 8 OR 12 | 5034719 |
| 5 | INSULATOR, PIN 12KV, PORCELAIN, GRAY | 0, 2 OR 3 | 5034594 |
| 6 | PIN, INSULATOR, 5/8 X 6.5 IN. LONG | 0, 2 OR 3 | 5028643 |
| 7 | DEADEND CLAMP, VARIOUS | 4 OR 6 | BD_ |

PH39A

PH39JA

(3 Ø DOUBLE DEADEND, 10'ARM,)

(3 Ø DOUBLE DEADEND, 10'ARM, JUMPERED)

CONDUCTORS A2,A266,A397,AC312,R2

CONDUCTORS A2,A266,A30,A397,AC312,C20,R2

- 1. USE 10' CROSSARMS FOR UNDERBUILD CONSTRUCTION ON CLASS H4 TRANSMISSION POLES.
- 2. THIS DIMENSION IS 21 INCHES FOR 8 FOOT ARMS AND 20 INCHES FOR 10 FOOT ARMS.
- 3. PREFERRED FOR EXISTING LINES WHEN A DOUBLE DEADEND MUST BE USED DURING AN OH TO UG CONVERSION.

| Overhead Distribution | | | |
|------------------------|-----------------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | TWO OR THREE PHASE DOUBLE DEADEND | REV. DATE: | 05/15/13 |
| | CROSSARM CONSTRUCTION | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-50-1 | 8512E142 | .DGN |

PH39JAS___ (3Ø DOUBLE DEADEND,10'ARM,JUMPERED) CONDUCTORS A2,A266,A30,A397,AC312,C20,R2



ONLY FOR USE ON STEEL DEADEND POLES: M45DE AND M45DE90

| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|-----------|-------------------------|
| 1 | CROSSARM, DEADEND, 10 FOOT | 0 OR 1 | 5027457 |
| 2 | PIN, INSULATOR, 5/8 X 5.75 IN. LONG | 0, 2 OR 3 | 5028642 |
| 3 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 8 OR 12 | 5034719 |
| 4 | INSULATOR, PIN 12KV, PORCELAIN, GRAY | 0, 2 OR 3 | 5034594 |
| 5 | PIN, INSULATOR, 5/8 X 6.5 IN. LONG | 0, 2 OR 3 | 5028643 |
| 6 | DEADEND CLAMP, VARIOUS | 4 OR 6 | BD_ |

NOTES

1. USE M45DE FOR CHANGE OF GRADE OF CONSTRUCTION.

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 06/05/02 |
| | THREE PHASE DOUBLE DEADEND ON STEEL POLES | REV. DATE: | 05/11/13 |
| | CROSSARM CONSTRUCTION | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-50-2 | 8512E445 | .DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 10 FOOT | 1 | 5029414 |
| 2 | PIN, INSULATOR, 5/8 X 6-1/2 IN. LONG | 4 | 5028643 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 3 | 5034594 |
| 4 | BRACE, CROSSARM, 60 IN. SPAN 18 IN. PR | 1 | 5027886 |
| 5 | INSULATOR, PIN, 4KV, PORCELAIN WHITE | 1 | 5034593 |
| 6 | LINE GUARD, VARIOUS | 1 | BL_ |
| 7 | TOP TIE, VARIOUS | 3 | BPT1_ |
| 8 | PLATE, GAIN, 5-5/16" X 4" | 1 | 5028652 |

- 1. THIS UNIT USES A 10-FOOT CROSSARM.
- 2. MAXIMUM SPAN LENGTH IS LIMITED TO: A MAXIMUM FINAL SAG OF 16FT. AT 60 DEG. F. FOR PHASE SEPARATION REQUIREMENTS.
- 3. THIS CONSTRUCTION IS FOR 12.47 KV ONLY.

| Overhead Distribution Construction Standards | | | |
|---|----------------------------|-------------|----------|
| | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 02/16/81 |
| | THREE PHASE TANGENT | REV. DATE: | 05/02/13 |
| | NEUTRAL ON CROSSARM | APPROVAL: | B.PRIEST |
| | 5-51-1 | 8512E61 | .DGN |

PHN3

PHN36

CONDUCTORS A2,A266,A397,AC312



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CROSSARM, DEADEND, 10 FOOT | 1 | 5027457 |
| 2 | PIN, INSULATOR, 5/8 X 6.5 IN. LONG | 4 | 5028643 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 3 | 5034594 |
| 4 | INSULATOR, PIN, 4KV, PORCELAIN WHITE | 1 | 5034593 |
| 5 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 6 | 5034719 |
| 6 | DEADEND CLAMP, VARIOUS | 3 | BD_ |
| 7 | DEADEND GRIP, VARIOUS | 4 | BDG_ |

NOTES

1. MAXIMUM SPAN LENGTH IS LIMITED TO A MAXIMUM FINAL SAG OF 16 FEET @ 60 DEG. F. FOR PHASE SEPARATION REQUIREMENTS.

- 2. FOR MAXIMUM SLACK SPAN LENGTH, SEE RULE 235E; ELECTRICAL CLEARANCE STANDARDS.
- 3. THIS CONSTRUCTION IS FOR 12.47kV ONLY.
- 4. IF UNDERBUILD, DESIGNATE CIRCUIT SEPARATION.

| Overhead Distribution | | | |
|------------------------|--|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 02/27/81 |
| | THREE PHASE DEADEND, 180 DEG. SLACK SPAN | REV. DATE: | 05/15/13 |
| | NEUTRAL ON CROSSARM | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-52-1 | 8512E62. | DGN |
| | | | |

PHN39J__ CONDUCTORS A2,A266,A397



SIDE VIEW

| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CROSSARM, DEADEND, 10 FOOT | 1 | 5027457 |
| 2 | PIN, INSULATOR, 5/8 X 6.5 IN. LONG | 4 | 5028643 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 3 | 5034594 |
| 4 | INSULATOR, PIN, 4KV, PORCELAIN WHITE | 1 | 5034593 |
| 5 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 12 | 5034719 |
| 6 | DEADEND CLAMP, VARIOUS | 6 | BD_ |

- 1. MAXIMUM SPAN LENGTH IS LIMITED TO A MAXIMUM FINAL SAG OF 16 FEET @ 60 DEG. F. FOR PHASE SEPARATION REQUIREMENTS.
- 2. THIS CONSTRUCTION IS FOR 12.47kV ONLY.
- 3. IF UNDERBUILD, DESIGNATE CIRCUIT SEPARATION.

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 03/02/81 |
| PROPRIETARY MATERIAL | THREE PHASE DOUBLE DEADEND | REV. DATE: | 05/11/13 |
| | NEUTRAL ON CROSSARM | APPROVAL: | B.PRIEST |
| | 5-53-1 | 8512E63. | DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|-----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 8 FOOT | 0 OR 1 | 5029410 |
| 2 | BRACE, CROSSARM, 60 IN. SPAN 18 IN. PR | 1 | 5027886 |
| 3 | PIN, INSULATOR, 5/8 X 5-3/4 IN. LONG | 2, 3 OR 4 | 5028642 |
| 4 | INSULATOR, PIN, 4KV, PORCELAIN WHITE | 0 OR 1 | 5034593 |
| 5 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 2 OR 3 | 5034594 |
| 6 | DEADEND GRIP, VARIOUS | 2, 3 OR 4 | BDG_ |
| 7 | CROSSARM, DENSE OR CLOSE GRAIN, 10 FOOT | 0 OR 1 | 5029414 |
| 8 | PLATE, GAIN, 5-5/16 X 4 IN. | 1 | 5028652 |

| Overhead Distribution | | | |
|------------------------|--------------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 11/26/85 |
| PROPRIETARY MATERIAL | TWO OR THREE PHASE BUCK, SLACK | REV. DATE: | 04/29/13 |
| | CROSSARM CONSTRUCTION | APPROVAL: | B.PRIEST |
| | 5-54-1 | 8512E64. | DGN |



SECONDARY OR NEUTRAL GUY IF REQUIRED

| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|-----------|-------------------------|
| 1 | CROSSARM, DEADEND, 8 FOOT | 0 OR 1 | 5029412 |
| 2 | CROSSARM, DEADEND, 10 FOOT | 0 OR 1 | 5027457 |
| 3 | PIN, INSULATOR, 5/8 X 5-3/4 IN. LONG | 1 OR 2 | 5028642 |
| 4 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 1 OR 2 | 5034594 |
| 5 | INSULATOR, SUSPENSION, 6-1/4 IN. CLEVIS | 4 OR 6 | 5034719 |
| 6 | PIN, INSULATOR, 5/8 X 6-1/2 IN. LONG | 1 OR 2 | 5028643 |
| 7 | DEADEND CLAMP, VARIOUS | 2, 3 OR 4 | BD_ |
| 8 | PLATE, GAIN, 5-5/16 X 4 IN. | 1 | 5028652 |

NOTES

1. WHEN THE NEUTRAL IS INSTALLED ON THE BUCK ARM, A #2/0 CU. NEUTRAL MUST BE INSTALLED ON THE POLE FROM THE BUCK ARM TO THE EXISTING SYSTEM NEUTRAL.

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 04/29/88 |
| ® | TWO OR THREE PHASE BUCK | REV. DATE: | 04/29/13 |
| | CROSSARM CONSTRUCTION | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-55-1 | 8512E156 | .DGN |



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THE OFFSET OF THE CROSSARM AND THE LOCATION OF THE LOCATOR ASSEMBLIES IS TO BE DETERMINED BY THE DESIGNER.

| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|-----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 8 FOOT | 0 OR 1 | 5029410 |
| 2 | PIN, INSULATOR, 5/8 X 5-3/4 IN. LONG | 0, 2 OR 3 | 5028642 |
| 3 | BRACE, ALLEY ARM, 7 FT LONG X 1.75 | 0 OR 1 | 5027880 |
| 4 | BRACE, ALLEY ARM, 10 FR LONG X 2 X | 0 OR 1 | 5027881 |
| 5 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 2 OR 3 | 5034594 |
| 6 | CROSSARM, DENSE OR CLOSE GRAIN, 13 FOOT | 0 OR 1 | 5027458 |
| 7 | CROSSARM, DENSE OR CLOSE GRAIN, 10 FOOT | 0 OR 1 | 5029414 |
| 8 | PIN, INSULATOR, 5/8 X 6-1/2 IN. LONG | 0, 2 OR 3 | 5028643 |
| 9 | PIN, INSULATOR, 18 IN. LENGTH, HOT GALV. | 0 OR 1 | 5028637 |
| 10 | LINE GUARD, VARIOUS | 2 OR 3 | BL_ |
| 11 | TOP TIE, VARIOUS | 2 OR 3 | BPT1_ |
| 12 | PLATE, GAIN, 5-5/16 X 4 IN. | 1 | 5028652 |

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 11/26/85 |
| | 8' AND 10', ALLEY ARMS | REV. DATE: | 05/02/13 |
| | STEEL BRACES | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-56-1 | 8512E157 | DGN |
| | | | |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|-----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 8 FOOT | 0 OR 1 | 5029410 |
| 2 | BRACE, CROSSARM, 60 IN. SPAN 18 IN. PR. | 1 | 5027886 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 2 OR 3 | 5034594 |
| 4 | PIN, INSULATOR, 5/8 X 5-3/4 IN. LONG | 2 OR 3 | 5028642 |
| 5 | TOP TIE, VARIOUS | 2 OR 3 | BPT1_ |
| 6 | LINE GUARD, VARIOUS | 2 OR 3 | BL_ |
| 7 | PIN INSULATOR, 18 IN. LENGTH, HOT GALV. | 0 OR 1 | 5028637 |
| 8 | PIN, INSULATOR, 5/8 X 6-1/2 IN. LONG | 0, 2 OR 3 | 5028643 |
| 9 | CROSSARM, DENSE OR CLOSE GRAIN, 10 FOOT | 0 OR 1 | 5029414 |
| 10 | PLATE, GAIN, 5-5/16 X 4 IN. | 1 | 5028652 |

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 04/29/88 |
| | 8' AND 10' ALLEY ARMS | REV. DATE: | 05/15/13 |
| | WOOD BRACES | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-57-1 | 8512E158 | DGN |

PH60__

(8 FT ARMS) CONDUCTORS AC312,A266,A397



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 8 FOOT | 2 | 5029410 |
| 2 | BRACE, CROSSARM, 60 IN. SPAN 18 IN. PR. | 1 | 5027886 |
| 3 | PIN, INSULATOR, 5/8 X 5-3/4 IN. LONG | 5 | 5028642 |
| 4 | PIN, INSULATOR, 18 IN. LENGTH HOT, GALV. | 1 | 5028637 |
| 5 | LINE GUARD, VARIOUS | 6 | BL_ |
| 6 | TOP TIE, VARIOUS | 6 | BPT1_ |
| 7 | BRACE, CROSSARM, 1.25 X 0.25 X 28 IN. | 2 | 5027885 |
| 8 | PLATE, GAIN, 5-5/16 X 4 IN. | 2 | 5028652 |

 Overhead Distribution Construction Standards
 PRIMARY CONSTRUCTION UNITS DOUBLE CIRCUIT, TANGENT CROSSARM CONSTRUCTION
 ISSUE DATE: 11/04/75

 PROPRIETARY MATERIAL
 REV. DATE: 04/17/13

 APPROVAL:
 B.PRIEST

 8512E91.DGN

 PH61__ PH62 (3Ø SMALL ANGLE, 8' DOUBLE ARM, WOOD BRACES) UP TO 15 DEG

(3Ø INTERMEDIATE ANGLE, 8' DOUBLE ARM, ANGLE PINS, WOOD BRACES) 15 DEG -30 DEG



(3Ø SMALL ANGLE, 10' DOUBLE ARM, WOOD BRACES) UP TO 15 DEG (3Ø INTERMEDIATE ANGLE, 10' DOUBLE ARM, ANGLE PINS, WOOD BRACES) 15 DEG -30 DEG CONDUCTORS = A266, A397. AC312



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 10 FOOT | 0 OR 4 | 5029414 |
| 2 | BRACE, CROSSARM, 60 IN. SPAN 18 IN. PR. | 4 | 5027886 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 12 | 5034594 |
| 4 | PIN, INSULATOR, 5/8 X 5-3/4 IN. LONG | 12 | 5028642 |
| 5 | CROSSARM, DENSE OR CLOSE GRAIN, 8 FOOT | 0 OR 4 | 5029410 |
| 6 | PIN, INSULATOR, 1 IN. LEAD THREAD | 12 | 5028636 |
| 7 | ARMOR ROD, VARIOUS | 0 OR 6 | BR_ |
| 8 | PLATE, GAIN, 5-5/16 X 4 IN. | 4 | 5028652 |

NOTES

1. DO NOT USE 8' CROSSARMS FOR UNDERBUILD CONSTRUCTION ON CLASS H4 TRANSMISSION POLES.

Overhead Distribution Construction Standards

PRIMARY CONSTRUCTION UNITS DOUBLE CIRCUIT, CROSSARM ANGLE ISSUE DATE: 04/29/88 REV. DATE: 05/17/13 APPROVAL: B.PRIEST 8512E65.DGN





| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE, 10 FT. | 0 OR 2 | 5029414 |
| 2 | BRACE, CROSSARM, 60 IN. SPAN, 18 IN. PR. | 2 | 5027886 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GREY | 6 | 5034594 |
| 4 | PIN, INSULATOR, 5/8 X 5-3/4 IN. LONG | 0 OR 6 | 5028642 |
| 5 | PIN, INSULATOR, 5/8 X 6-1/2 IN. LONG | 0 OR 6 | 5028643 |
| 6 | CROSSARM, DENSE OR CLOSE GRAIN, 8 FT. | 0 OR 2 | 5029410 |
| 7 | LINE GUARD, VARIOUS | 0 OR 6 | BL_ |
| 8 | TOP TIE, VARIOUS | 6 | BPT1_ |
| 9 | PLATE, GAIN, 5-5/16 IN. X 4 IN. LONG | 2 | 5028652 |

- 1. USE 10 FOOT CROSSARM ON ALL H4 POLES.
- 2. THIS DIMENSION IS 1'- 8 7/8" FOR 10 FOOT CROSSARM.

| Overhead Distribution | | |
|---|------------|----------|
| Construction Standards PRIMARY CONSTRUCTION UNITS | SSUE DATE: | 08/20/87 |
| | REV. DATE: | 05/13/13 |
| CROSSARM CONSTRUCTION | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL 5-60-1 | 8512E234. | DGN |

PHN32__ CONDUCTORS: A2,A266,A397



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 10 FT. | 2 | 5029414 |
| 2 | PIN, INSULATOR, 5/8 X 6-1/2 IN. LONG | 7 | 5028643 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GREY | 6 | 5034594 |
| 4 | INSULATOR, PIN, 4KV, PORCELAIN WHITE | 1 | 5034593 |
| 5 | BRACE, CROSSARM, 60 IN. SPAN, 18 IN. PR. | 2 | 5027886 |
| 6 | TOP TIE, VARIOUS | 6 | BPT1_ |
| 7 | LINE GUARD, VARIOUS | 1 | BL_ |
| 8 | PLATE, GAIN, 5-5/16 IN. X 4 IN. LONG | 2 | 5028652 |

- 1. THIS UNIT USES TWO (2) 10 FOOT CROSSARMS.
- 2. MAXIMUM SPAN LENGTH IS LIMITED TO A MAXIMUM FINAL SAG OF 16 FT. @ 60 DEG F FOR PHASE SEPARATION REQUIREMENTS.
- 3. THIS CONSTRUCTION IS FOR 12.47kV ONLY AND FOR THE SAME WIRE SIZE. DIFFERENT WIRE SIZE MAY REQUIRE MORE CIRCUIT SEPARATION FOR CLEARANCE.

| Overhead Distribution | | | |
|------------------------|----------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/18/87 |
| | DOUBLE CIRCUIT TANGENT | REV DATE | 05/13/13 |
| | NEUTRAL ON CROSSARM | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-61-1 | 8512E235 | .DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 10 FT. | 0 OR 2 | 5029414 |
| 2 | BRACE, DOUBLE CIRCUIT, 57 IN. LONG | 1 | 5027879 |
| 3 | PIN, INSULATOR, 5/8 X 6-1/2 IN. LONG | 6 | 5028643 |
| 4 | BRACE, ALLEY ARM, 10 FT LONG X 2 X 2 X 1/4" | 1 | 5027881 |
| 5 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 6 | 5034594 |
| 6 | CROSSARM, DENSE OR CLOSE GRAIN, 13 FT. | 0 OR 2 | 5027458 |
| 7 | TOP TIE, VARIOUS | 6 | BPT1_ |
| 8 | PLATE, GAIN, 5-5/16 X 4 IN. | 2 | 5028652 |

- 1. THE OFFSET OF THE CROSSARM AND THE LOCATION OF THE INSULATOR ASSEMBLIES IS TO BE DETERMINED BY THE ESTIMATOR.
- 2. IF A 397MCM AA FEEDER IS USED IN CONJUCTION WITH ANOTHER SIZE FEEDER, THE 397MCM AA MUST BE THE TOP CIRCUIT.

| Overhead Distribution | | | |
|------------------------|--|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 11/05/81 |
| | 10' AND 13' ALLEY ARMS, DOUBLE CIRCUIT | REV. DATE: | 05/13/13 |
| | STEEL BRACES | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-62-1 | 8512E159 | .DGN |



| I | TEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|---|-----|-------------------------------------|----------|-------------------------|
| | 1 | POLE, EXTENSION, 60 IN. X 7-1/4 IN. | 1 | 58-8010 * |

* INDICATES NO SAP MATERIAL NUMBER EXISTS.

- 1. THIS EXTENSION IS FOR USE IN TANGENT LINES ONLY.
- 2. USE CURVED WASHER 5029162 ON BOLT END OPPOSITE THE HARDWARE BEING ATTACHED TO THE FIBERGLASS EXTENSION.

| Overhead Distribution | | | |
|------------------------|--------------------|-------------|----------|
| Construction Standards | | ISSUE DATE: | 03/12/91 |
| | POLE TOP EXTENSION | REV. DATE: | 05/18/13 |
| | | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-63-1 | 8512E66. | DGN |

CONDUCTORS-A2,A266,A397, C1,C2,C20,C4

NOTES

PM30A

- 1. POLE IS TO BE SET IN A 3 FT. MINIMUM DIAMETER HOLE AND ORIENTED FOR PROPER TRAFFIC LIGHT INSTALLATION.
- 2. POLE IS TO BE BACKFILLED WITH MAG C. MAG C IS 2000 PSI CONCRETE, SRP STOCK CODE 5075320.
- 3. MAKE SURE THE WIRE ENTRY NIPPLE IS EXTENDED OUTSIDE OF THE BACKFILL AND CAPPED.
- 4. A GROUND ROD MUST BE DRIVEN OUTSIDE OF THE BACKFILL. A #6 OR LARGER GROUND WIRE CLAMPED TO THE ROD IS TO BE ATTACHED TO THE POLE WITH CONNECTOR 5034347.

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- 5. STREET LIGHT MAST ARM SHALL BE PROVIDED BY THE MUNICIPALITY AT THE TIME THE POLE IS INSTALLED.
- 6. SRP WILL INSTALL THE STREET LIGHT MAST ARM TO THIS POLE.
- 7. IF SRP INSTALLS THE LUMINAIRE, SRP WILL INSTALL THE WIRING IN THE MAST ARM. IF SERVICE IS TO BE FROM OVERHEAD SECONDARY, SRP WILL CONNECT THE STREET LIGHT WIRE TO THE SECONDARY.
- 8. ALL WIRING INSIDE THE POLE INCLUDING UNDERGROUND SERVICE TO THE STREET LIGHT, SHALL BE PROVIDED AND INSTALLED BY THE MUNICIPALITY.

| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | INSULATOR, VERTICAL, LINE POST, 12KV | 1 | 5034587 |
| 2 | INSULATOR, HORIZONTAL, LINE POST, 15KV | 2 | 5034465 |
| 3 | BRACKET, SIDE MOUNT, HOT GALVANIZED, SMALL | 2 | 5028504 |
| 4 | CLAMPTOP CLAMP, 6 DEG-15 DEG, VARIOUS | 3 | BCT1_ |
| 5 | LINE GUARD, VARIOUS | 3 | BL_ |

| Overhead Distribution | | | |
|------------------------|--|-------------|-----------------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 11/05/81 |
| ® | VERTICAL CONSTRUCTION 50'-6" MULTI-USE STEEL POLE | REV. DATE: | 05/07/13 |
| | STREET LIGHT AND TRAFFIC SIGNAL | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-64-1 | 8512E68. | DGN |



1'-9"

2'46'

3'-9'

 $(3)^{(2)}$

8 1/2

m

(5)(4)

SEE / NOTE 6

40' MAX.

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B21C

PM30_

CONDUCTORS-A2,A266,A397 C1,C2,C20,C4

- 1. POLE IS TO BE SET IN A 3 FT. MINIMUM DIAMETER HOLE AND ORIENTED FOR PROPER TRAFFIC LIGHT INSTALLATION.
- 2. POLE IS TO BE BACKFILLED WITH MAG C. MAG C IS 2000 PSI CONCRETE, SRP STOCK CODE 5075320.
- 3. MAKE SURE THE WIRE ENTRY NIPPLE IS EXTENDED OUTSIDE OF THE BACKFILL AND CAPPED.
- 4. A GROUND ROD MUST BE DRIVEN OUTSIDE OF THE BACKFILL. A #6 OR LARGER GROUND WIRE CLAMPED TO THE ROD IS TO BE ATTACHED TO THE POLE WITH CONNECTOR 5034347.
- 5. STREETLIGHT MAST ARM SHALL BE PROVIDED BY THE MUNICIPALITY AT THE TIME THE POLE IS INSTALLED.
- 6. SRP WILL INSTALL THE STREETLIGHT MAST ARM TO THIS POLE.
- 7. IF SRP INSTALLS THE LUMINAIRE, SRP WILL INSTALL THE WIRING IN THE MAST ARM. IF SERVICE IS TO BE FROM THE OVERHEAD SECONDARY, SRP WILL CONNECT THE STREETLIGHT WIRE TO THE SECONDARY.
- 8. ALL WIRING INSIDE THE POLE INCLUDING UNDERGROUND SERVICE TO THE STREETLIGHT, SHALL BE PROVIDED AND INSTALLED BY THE MUNICIPALITY.

| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | INSULATOR, VERTICAL LINE POST, 15KV | 1 | 5034587 |
| 2 | INSULATOR, HORIZONTAL, LINE POST, 15KV | 2 | 5034465 |
| 3 | BRACKET, SIDE MOUNT, HOT GALVANIZED, SMALL | 2 | 5028504 |
| 4 | LINE GUARD, VARIOUS | 3 | BL_ |
| 5 | CLAMPTOP CLAMP, 6 DEG-15 DEG, VARIOUS | 3 | BCT1_ |

| Overhead Distribution | | | |
|------------------------|---------------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 08/29/73 |
| | | REV. DATE: | 05/07/13 |
| | STREET LIGHT AND TRAFFIC SIGNAL | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-65-1 | 8512E67. | DGN |





PMH5___ CONDUCTORS - A2, A266, A397



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CLEVIS, FORGED STEEL, 7/8 X 2.75 IN. | 0 OR 4 | 5028895 |
| 2 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 0 OR 6 | 5034719 |
| 3 | INSULATOR, VERTICAL, LINE POST, 12KV | 0 OR 3 | 5034587 |
| 4 | PIN, INSULATOR, 5/8 X 1.5 IN. SHORT | 0 OR 1 | 5028641 |
| 5 | INSULATOR, PIN, 4KV, PORCELAIN WHITE | 0 OR 1 | 5034593 |
| 6 | CLAMPTOP CLAMP | 0 OR 3 | BCT1_ |
| 7 | DEADEND CLAMP, VARIOUS | 0 OR 4 | BL_ |

NOTES

1. SEE 69KV TRANSMISSION CONSTRUCTION STANDARDS TA88 & TA89 FOR THE ARMS.

| Overhead Distribution | | | |
|------------------------|-----------------------------|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/71 |
| | 69kV STEEL POLE, UNDERBUILD | REV. DATE: | 05/15/13 |
| | TANGENT AND DEADEND | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-66-1 | 8512E69 | DGN |

CONDUCTORS, A2, A266, A397, AC312 PWM30D__



PWM60A IF UNDERBUILD, DESIGNATE CIRCUIT SEPARATION 37 B23C 12" 2'-6" ¥ 12" ¥ 2'-6" 1 , 12'' ↓ ¥ 2**X** 3 2'-6" 4 12'' _♥ 2'-6" **▲** 12" 2'-6" (This 12" ¥ 4'-0" ¥

CONDUCTORS, A2, A266, A397, AC312

| ITEM | | QUAI | NTITY | MATERIAL |
|------|--|--------|--------|-----------------|
| | MATERIAL DESCRIPTION | PWM3S1 | PWM3S2 | ITEM NUMBER |
| 1 | INSULATOR, HORIZONTAL, LINE POST, 12KV | 3 | 6 | 5034465 |
| 2 | LINE GUARD, 300' OR LESS, ARMOR ROD OVER 300' | 3 | 6 | BL BR |
| 3 | CLAMPTOP, 6° - 15°, VARIOUS | 3 | 6 | BCT1 OR BCT3 |
| 4 | BRACKET, SIDE MOUNT | 3 | 6 | 5028505 |

NOTES

1. ALL COMPATIBLE UNITS ARE SUPPLIED WITH 12" BOLTS.

2. FOR SPANS LESS THAN 300' "BLANK" OVER 300' "L"

| Overhead Distribution | | | |
|------------------------|--|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 10/01/07 |
| | LIGHT DUTY STEEL POLE DOUBLE CIRCUIT VERTICAL | REV. DATE: | 02/27/20 |
| | THREE PHASE, TANGENT | APPROVAL: | J. LUERA |
| PROPRIETARY MATERIAL | 5-67-1 | 8512E429 | .DGN |

CONDUCTORS, A2, A266, A397, AC312

CONDUCTORS, A2, A266, A397, AC312



| ITEM | | QUAI | NTITY | MATERIAL |
|------|--|-------|-------|----------------|
| | WATERIAL DESCRIPTION | PWM31 | PWM32 | ITEM NUMBER |
| 1 | INSULATOR, HORIZONTAL, LINE POST, 12KV | 3 | 6 | 5034465 |
| 2 | LINE GUARD, 300' OR LESS, ARMOR ROD OVER 300' | 3 | 6 | BL BR |
| 3 | CLAMPTOP, 6° - 15°, VARIOUS | 3 | 6 | BCT1OR BCT3 |
| 4 | BRACKET, SIDE MOUNT | 3 | 6 | 5028505 |

NOTES

1. ALL COMPATIBLE UNITS ARE SUPPLIED WITH 12" BOLTS.

2. FOR SPANS LESS THAN 300' "BLANK" OVER 300' "L".

| Overhead Distribution | | | |
|------------------------|--|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 10/01/07 |
| | LIGHT DUTY STEEL POLE DOUBLE CIRCUIT VERTICAL | REV. DATE: | 02/27/20 |
| | THREE PHASE, TANGENT | APPROVAL: | J. LUERA |
| PROPRIETARY MATERIAL | 5-68-1 | 8512E430 | .DGN |

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/14/89 |
| | HEAVY DUTY STEEL POLE | REV. DATE: | 02/27/20 |
| DRF | THREE PHASE, SMALL ANGLE, 0 DEG 10 DEG. | APPROVAL: | J. LUERA |
| PROPRIETARY MATERIAL | 5-69-1 | 8512E18. | DGN |

| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | BAND, POLE, 1.25" WIDE 180" | 0 OR 6 | 5027473 |
| 2 | BAND, POLE, 1.25" WIDE 132" | 0 OR 6 | 5027472 |
| 3 | BAND, POLE, 1.25" WIDE 84" | 0 OR 6 | 5027470 |
| 4 | MOUNT, BRACKET, 10" X 5" FORMED | 3 | 5028261 |
| 5 | INSULATOR, HORIZONTAL, LINE POST, 12KV | 3 | 5034465 |
| 6 | LINE GUARD, VARIOUS | 3 | BL_ |
| 7 | CLAMPTOP CLAMP, 15° - 30°, VARIOUS | 3 | BCT2_OR BCT4_ |



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| PM30BL | 0° - 10° SPAN LESS THAN 300' |
|--------------------------------|--|
| PM30BLA | 0° - 10° SPAN MORE THAN 300' |
| CONDUCTOR | A397, 25" - 40" DIA. |
| РМ30ВМ | 0° - 10° SPAN LESS THAN 300' |
| | |
| PM30BMA | 0° - 10° SPAN MORE THAN 300' |
| PM30BMA | 0° - 10° SPAN MORE THAN 300' A2, A397, AC312, UP TO 25'' DIA. |
| PM30BMA CONDUCTOR PM30BS | 0° - 10° SPAN MORE THAN 300' A2, A397, AC312, UP TO 25'' DIA. 0° - 10° SPAN LESS THAN 300' |

t

| CONDUCTOR A397, 40"-55" DIA. |
|---|
| PM30DL 0° - 10° SPANS LESS THAN 300' |
| PM30DLA0° - 10° SPANS MORE THAN 300' |
| CONDUCTOR A397, 25" - 40" DIA. |
| PM30DM 0° - 10° SPANS LESS THAN 300' |
| PM30DMA 0° - 10° SPANS MORE THAN 300 |
| CONDUCTOR A2, A397, AC312, UP TO 25" DIA. |
| PM30DS 0° - 10° SPANS LESS THAN 300' |
| PM30DSA 0° - 10° SPAN MORE THAN 300' |

CONDUCTOR A397. 40"-55" DIA





| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | BAND, POLE, 1.25 IN. WIDE 180 IN. | 0 OR 6 | 5027473 |
| 2 | BAND, POLE, 1.25 IN. WIDE 132 IN. | 0 OR 6 | 5027472 |
| 3 | BAND, POLE, 1.25 IN. WIDE 84 IN. | 0 OR 6 | 5027470 |
| 4 | NUT, HEXAGON, 5/8 IN. HOT GALVANIZED | 3 | 5028628 |
| 5 | MOUNT, STUD, 3 X 5/8 IN. BOLT HEAVY | 3 | 5028260 |
| 6 | INSULATOR, SUSPENSION, 6-1/4 IN. CLEVIS | 6 | 5034719 |
| 7 | LINE GUARD, VARIOUS | 0 OR 3 | BL_ |
| 8 | ANGLE CLAMP, 30 DEG-60 DEG, VARIOUS | 3 | BA1_OR BA2_ |
| 9 | ARMOR ROD, VARIOUS | 0 OR 3 | BR_ |

| Overhead Distribution | | |
|------------------------|---|----------------------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: 09/16/88 |
| | STEEL POLE | REV. DATE: 02/27/19 |
| | THREE PHASE, MEDIUM ANGLE, 10 DEG 60 DEG. | APPROVAL: N. SABBAH |
| PROPRIETARY MATERIAL | 5-70-1 | 8512E19.DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 12 | 5034719 |
| 2 | DEADEND CLAMP, VARIOUS | 6 | BD_ |
| 3 | LINK, SEGMENT | 18 | 5027576 |
| 4 | LINK, TAKEUP ASSEMBLY | 3 | 5028488 |
| 5 | LINK, VERTICAL VANG | 6 | 5029395 |

1. ANGLES OF 60 TO 90 DEGREES MAY BE JUMPERED ACROSS. ANGLES LESS THAN 60 DEGREES MAY NOT BE JUMPERED WITHOUT ADDITIONAL SUPPORTS.

| Construction Standards PRIMARY CONSTRUCTION UNITS | : 01/30/94 |
|---|-----------------|
| | |
| THREE PHASE DOUBLE DEADEND REV. DATE: | 05/13/13 |
| VERTICAL, ON STEEL POLE, 0 - 90 DEG. APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL 5-71-1 8512E2 | 6.DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 10 FOOT | 1 OR 2 | 5029414 |
| 2 | PIN, INSULATOR, 5/8 X 6.5 IN. LONG | 4 | 5028643 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 3 | 5034594 |
| 4 | INSULATOR, PIN, 4KV, PORCELAIN WHITE | 1 | 5034593 |
| 5 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 6 | 5034719 |
| 6 | BRACE, CROSSARM, 60 IN. SPAN 18 IN. PR. | 2 | 5027886 |
| 7 | CROSSARM, DENSE OR CLOSE GRAIN, 10 FOOT, PLANK | 0 OR 1 | 5027456 |
| 8 | DEADEND CLAMP, VARIOUS | 3 | BD |
| 9 | TOP TIE, VARIOUS | 4 | BPT1 |

1. MAXIMUM SPAN LENGTH IS LIMITED TO:

A. A MAXIMUM FINAL SAG OF 16 FEET @ 60 DEG. F. FOR PHASE SEPARATION REQUIREMENTS. OR:

- B. CROSSARM DEADEND TENSION LIMITATIONS.
- 2. FOR MAXIMUM SLACK SPAN LENGTH, SEE SLACK SPAN SAG CHARTS.
- 3. THIS CONSTRUCTION IS FOR 12.47 kV ONLY.
- 4. IF UNDERBUILD, DESIGNATE CIRCUIT SEPARATION.

| Overhead Distribution | | | |
|------------------------|--|-------------|----------|
| Construction Standards | PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 02/27/81 |
| | THREE PHASE DEADEND, 180 DEG. SLACK SPAN | REV DATE | 05/15/13 |
| | NEUTRAL ON CROSSARM | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 5-72-1 | 8512E499 | .DGN |
| | | | |

SECTION 6: 22 kV PRIMARY CONSTRUCTION UNITS

| TITLE / DESCRIPTION | PAGE |
|---|--------|
| SHIELD WIRE CONFIGURATION, SINGLE PHASE, TANGENT AND SMALL ANGLE | 6-2-1 |
| SHIELD WIRE CONFIGURATION, SINGLE PHASE, MEDIUM ANGLE, 24° - 60° | 6-3-1 |
| SHIELD WIRE CONFIGURATION, SINGLE PHASE, LARGE ANGLE 60° - 90° | 6-4-1 |
| SHIELD WIRE CONFIGURATION, SINGLE PHASE, DEADEND | 6-5-1 |
| SHIELD WIRE CONFIGURATION, SINGLE PHASE, DEADEND, SLACK SPAN | 6-6-1 |
| SHIELD WIRE CONFIGURATION, SINGLE PHASE, TANGENT WITH 90° BUCK | 6-7-1 |
| SHIELD WIRE CONFIGURATION, DEADEND WITH 180° SLACK SPAN | 6-8-1 |
| SHIELD WIRE CONFIGURATION, TWO PHASE, TANGENT, 0° - 6° | 6-9-1 |
| SHIELD WIRE CONFIGURATION, TWO PHASE, SMALL ANGLE, 6° - 24° | 6-10-1 |
| SHIELD WIRE CONFIGURATION, TWO PHASE, MEDIUM ANGLE, 24° - 60° | 6-11-1 |
| SHIELD WIRE CONFIGURATION, TWO PHASE, LARGE ANGLE, 60° - 90° | 6-12-1 |
| SHIELD WIRE CONFIGURATION, TWO PHASE, DEADEND, VERTICAL | 6-13-1 |
| SHIELD WIRE CONFIGURATION, TWO PHASE, DEADEND, SLACK SPAN | 6-14-1 |
| SHIELD WIRE CONFIGURATION, TWO PHASE, DEADEND, 180° SLACK SPAN | 6-15-1 |
| SHIELD WIRE CONFIGURATION, THREE PHASE, TANGENT, 0° - 6° | 6-16-1 |
| SHIELD WIRE CONFIGURATION, THREE PHASE, SMALL ANGLE, 6° - 24° | 6-17-1 |
| SHIELD WIRE CONFIGURATION, THREE PHASE, MEDIUM ANGLE, 24° - 60° | 6-18-1 |
| SHIELD WIRE CONFIGURATION, THREE PHASE, LARGE ANGLE, 60° - 90° | 6-19-1 |
| SHIELD WIRE CONFIGURATION, THREE PHASE, DEADEND, VERTICAL | 6-20-1 |
| SHIELD WIRE CONFIGURATION, THREE PHASE, DEADEND, CROSSARM | 6-21-1 |
| SHIELD WIRE CONFIGURATION, THREE PHASE, DEADEND, SLACK SPAN | 6-22-1 |
| SHIELD WIRE CONFIGURATION, THREE PHASE, DEADEND, 180° SLACK SPAN | 6-23-1 |
| SHIELD WIRE CONFIGURATION, ONE, TWO, OR THREE PHASE BUCK | 6-24-1 |
| THREE PHASE TANGENT, MAINTENANCE, CROSSARM CONSTRUCTION | 6-25-1 |
| THREE PHASE DEADEND, MAINTENANCE, CROSSARM CONSTRUCTION | 6-26-1 |
| THREE PHASE TANGENT, NEUTRAL ON ARM, MAINTENANCE, CROSSARM CONSTRUCTION | 6-27-1 |
| THREE PHASE DEADEND, NEUTRAL ON ARM, MAINTENANCE, CROSSARM CONSTRUCTION | 6-28-1 |

| Overhead Distribution | | | |
|------------------------|--|-------------|----------|
| Construction Standards | NDEX | ISSUE DATE: | 05/14/13 |
| | INDEX 22kV PRIMARY CONSTRUCTION UNITS | REV. DATE: | |
| | | APPROVAL: | D. Poore |
| PROPRIETARY MATERIAL | 6-1-1 | OH6-1-1. | doc |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | INSULATOR, VERTICAL, LINE POST, 22KV PO | 1 | 5034466 |
| 2 | BRACKET, SIDE MOUNT, HOT GALV. SMALL | 1 | 5028504 |
| 3 | SIDE, TIE, VARIOUS | 1 | BPT2_ |
| 4 | CLAMPTOP CLAMP, 15 DEG - 30 DEG, VARIOUS | 1 | BCT2_OR BCT4_ |
| 5 | ARMOR, ROD, VARIOUS | 1 | BR_ |
| 6 | BRACKET, INSULATOR, 5/8 IN. STUD BA | 1 | 5028637 |
| 7 | INSULATOR, HORIZONTAL, LINE POST, 22KV, P | 1 | 5034467 |
| 8 | LINE GUARD, VARIOUS | 1 | BL_ |

- 1. WHEN GUY TENSION EXCEEDS 11.000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS OR LONG SPANS.
- 3. IF THE INSULATOR CANNOT BE INSTALLED TO BISECT THE ANGLE AND MAINTAIN THE 12 DEG. MAX. AS SHOWN, USE P132 OR P132A.

| Overhead Distribution | | | |
|------------------------|---------------------------------------|-------------|----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 12/05/74 |
| | SHIELD WIRE CONFIGURATION | REV. DATE: | 05/08/13 |
| | SINGLE PHASE, TANGENT AND SMALL ANGLE | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 6-2-1 | 8512E160 | .DGN |

P132

24 DEG.- 60 DEG. (SPANS LESS THAN 300')

CONDUCTOR R2

P132A 24 DEG - 60 DEG. (SPANS LESS THAN 300')

CONDUCTOR R2



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | ANGLE CLAMP, 30 DEG - 60 DEG., VARIOUS | 1 | BA1_OR BA2_ |
| 2 | ARMOR ROD, VARIOUS | 0 OR 1 | BR_ |
| 3 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 2 | 5034719 |
| 4 | LINE GUARD, VARIOUS | 0 OR 1 | BL_ |

- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS
- OR LONG SPANS.

| Construction Standards Construction Standards PROPRIETARY MATERIAL Construction Standards 22kV PRIMARY CONSTRUCTION UNITS SHIELD WIRE CONFIGURATION SINGLE PHASE, MEDIUM ANGLE, 24 DEG 60 DEG. 6-3-1 8512E161 DGN | Overhead Distribution | | | |
|---|------------------------|--|-------------|----------|
| SHIELD WIRE CONFIGURATION Rev. Date: 05/06/13 SINGLE PHASE, MEDIUM ANGLE, 24 DEG 60 DEG. APPROVAL: B.PRIEST PROPRIETARY MATERIAL 6-3-1 | Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/92 |
| SINGLE PHASE, MEDIUM ANGLE, 24 DEG 60 DEG. APPROVAL: B.PRIEST PROPRIETARY MATERIAL 6-3-1 8512E161 DGN | | SHIELD WIRE CONFIGURATION | REV DATE: | 05/06/13 |
| PROPRIETARY MATERIAL 6-3-1 8512E161 DGN | | SINGLE PHASE, MEDIUM ANGLE, 24 DEG 60 DEG. | APPROVAL: | B.PRIEST |
| 0-3-1 0312E101.BOK | PROPRIETARY MATERIAL | 6-3-1 | 8512E161 | .DGN |





| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | DEADEND CLAMP, VARIOUS | 2 | BD_ |
| 2 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 3 | 5034719 |

- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS
 - OR LONG SPANS.

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | 22KV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 12/11/74 |
| | SHIELD WIRE CONFIGURATION | REV. DATE: | 05/06/13 |
| | SINGLE PHASE, LARGE ANGLE, 60 DEG 90 DEG. | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 6-4-1 | 8512E162 | DGN |

P142

CONDUCTOR R2



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | DEADEND CLAMP, VARIOUS | 1 | BD_ |
| 2 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS, EA | 2 | 5034719 |

NOTES

- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS
 - OR LONG SPANS.

| Overhead Distribution | | | |
|------------------------|---------------------------------|-------------|----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 12/13/74 |
| | SHIELD WIRE CONFIGURATION | REV. DATE: | 05/06/13 |
| | SINGLE PHASE DEADEND | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 6-5-1 | 8512E163 | DGN |

P152

CONDUCTOR R2



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | DEADEND GRIP, VARIOUS | 1 | BDG_ |
| 2 | BRACKET, SIDE MOUNT, HOT GALVANIZED SMALL | 1 | 5028504 |
| 3 | INSULATOR, VERT. LINE POST, 22KV | 1 | 5034466 |



P152_

P172_ CONDUCTOR R2



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | BRACKET, SIDE MOUNT, HOT GALVANIZED SMALL | 1 | 5028504 |
| 2 | DEADEND CLAMP, VARIOUS | 1 | BD_ |
| 3 | INSULATOR, VERTICAL LINE POST, 22KV | 1 | 5034466 |
| 4 | SIDE TIE, VARIOUS | 1 | BPT2_ |
| 5 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 2 | 5034719 |

- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS OR LONG SPANS.

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 12/31/74 |
| | SHIELD WIRE CONFIGURATION | REV. DATE: | 03/19/13 |
| | SINGLE PHASE, TANGENT WITH 90 DEG. BUCK | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 6-7-1 | 8512E164 | DGN |
| | | | |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | DEADEND CLAMP, VARIOUS | 1 | BD_ |
| 2 | DEADEND GRIP, VARIOUS | 1 | BDG_ |
| 3 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 2 | 5034719 |
| 4 | INSULATOR, VERTICAL LINE POST, 22KV, PO | 1 | 5034466 |

- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS OR LONG SPANS.
- 3. FOR MAXIMUM SLACK SPAN LENGTH SEE SLACK SPAN SAG CHARTS.

| Overhead Distribution | | | |
|------------------------|---------------------------------|-------------|----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 12/13/74 |
| | SHIELD WIRE CONFIGURATION | REV. DATE: | 05/06/13 |
| | DEADEND WITH 180 SLACK SPAN | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 6-8-1 | 8512E165 | .DGN |


| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | BRACKET, SIDE MOUNT, HOT GALVANIZED LARGE | 1 | 5028505 |
| 2 | SIDE TIE, VARIOUS | 2 | BPT2_ |
| 3 | INSULATOR, VERTICAL LINE POST, 22KV | 2 | 5034466 |
| 4 | BRACKET, SIDE MOUNT, HOT GALVANIZED SMALL | 1 | 5028504 |

1. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS OR LONG SPANS.

| Overhead Distribution | | | |
|------------------------|----------------------------------|-------------|----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 12/17/74 |
| | SHIELD WIRE CONFIGURATION | REV. DATE: | 05/13/13 |
| | TWO PHASE, TANGENT, 0 DEG 6 DEG. | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 6-9-1 | 8512E166 | DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CLAMPTOP CLAMP, 15 DEG - 30 DEG, VARIOUS | 1 | BCT2_OR BCT4_ |
| 2 | ARMOR ROD, VARIOUS | 0 OR 2 | BR_ |
| 3 | BRACKET, INSULATOR, 5/8 IN. STUD | 2 | 5028499 |
| 4 | INSULATOR, HORIZONTAL, LINE POST, 22KV P | 2 | 5034467 |
| 5 | LINE GUARD, VARIOUS | 0 OR 2 | BL_ |

- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS OR LONG SPANS.

| Overhead Distribution | | | |
|------------------------|---------------------------------------|-------------|----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 12/18/74 |
| | SHIELD WIRE CONFIGURATION | REV. DATE: | 05/12/13 |
| | TWO PHASE, SMALL ANGLE, 6 DEG 24 DEG. | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 6-10-1 | 8512E167 | .DGN |



- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS
 - OR LONG SPANS.

| Overhead Distribution Construction Standards | | | |
|---|---|-------------|-----------------|
| | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 12/17/74 |
| | SHIELD WIRE CONFIGURATION | REV. DATE: | 05/10/13 |
| | TWO PHASE, MEDIUM ANGLE, 24 DEG 60 DEG. | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 6-11-1 | 8512E168 | DGN |
| | | | |



| | ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|---|------|--|----------|-------------------------|
| [| 1 | DEADEND CLAMP, VARIOUS | 4 | BD_ |
| | 2 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 8 | 5034719 |

- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS OR LONG SPANS.

| Overhead Distribution | | | |
|------------------------|--------------------------------------|-------------|----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 12/27/74 |
| | SHIELD WIRE CONFIGURATION | REV. DATE: | 05/13/13 |
| | TWO PHASE, LARGE ANGLE, 60 - 90 DEG. | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 6-12-1 | 8512E169 | DGN |

2 __ CONDUCTOR R2



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | DEADEND CLAMP, VARIOUS | 2 | BD_ |
| 2 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 4 | 5034719 |

NOTES

- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS
 - OR LONG SPANS.

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 12/17/74 |
| | SHIELD WIRE CONFIGURATION TWO PHASE, DEADEND, VERTICAL | REV. DATE: | 05/12/13 |
| | | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 6-13-1 | 8512E170 | .DGN |

P242 _



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | DEADEND GRIP, VARIOUS | 2 | BDG_ |
| 2 | BRACKET, SIDE MOUNT, HOT GALVANIZED SMALL | 2 | 5028504 |
| 3 | INSULATOR, VERT. LINE POST, 22KV | 2 | 5034466 |

| Overhead Distribution | | | |
|------------------------|---------------------------------|-------------|----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/26/89 |
| | SHIELD WIRE CONFIGURATION | REV. DATE: | 05/12/13 |
| | TWO PHASE, DEADEND, SLACK SPAN | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 6-14-1 | 8512E11. | .DGN |





| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | INSULATOR, VERTICAL LINE POST, 22KV | 2 | 5034466 |
| 2 | BRACKET, SIDE MOUNT, HOT GALVANIZED SMALL | 2 | 5028504 |
| 3 | DEADEND CLAMP, VARIOUS | 2 | BD_ |
| 4 | DEADEND GRIP, VARIOUS | 2 | BDG_ |
| 5 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 4 | 5034719 |

- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS
 - OR LONG SPANS.

| Construction Standards | Overhead Distribution | | | |
|--|------------------------|---|-------------|----------|
| BAREARY MATERIAL SHIELD WIRE CONFIGURATION TWO PHASE, DEADEND, 180 DEG. SLACK SPAN REV. DATE: 05/13/13 APPROVAL: B.PRIEST | Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 09/30/92 |
| TWO PHASE, DEADEND, 180 DEG. SLACK SPAN APPROVAL: B.PRIEST | | SHIELD WIRE CONFIGURATION | REV. DATE: | 05/13/13 |
| PROPRIETARY MATERIAL | | TWO PHASE, DEADEND, 180 DEG. SLACK SPAN | APPROVAL: | B.PRIEST |
| 6-15-1 8512E171.DGN | | 6-15-1 | 8512E171 | DGN |





| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | BRACKET, SIDE MOUNT, HOT GALVANIZED LARGE | 2 OR 3 | 5028505 |
| 2 | LINE GUARD, VARIOUS | 0 OR 3 | BL_ |
| 3 | INSULATOR, VERTICAL LINE POST, 22KV | 3 | 5034466 |
| 4 | SIDE TIE, VARIOUS | 3 | BPT2_ |
| 5 | BRACKET, SIDE MOUNT, HOT GALVANIZED SMALL | 0 OR 1 | 5028504 |

1. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS OR LONG SPANS.

| Overhead Distribution | | | |
|------------------------|------------------------------------|-------------|----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 11/09/74 |
| | SHIELD WIRE CONFIGURATION | REV. DATE: | 05/13/13 |
| | THREE PHASE, TANGENT, 0 DEG 6 DEG. | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 6-16-1 | 8512E172 | DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CLAMPTOP CLAMP, 15 DEG - 30 DEG, VARIOUS | 3 | BCT2_OR BCT4_ |
| 2 | ARMOR ROD, VARIOUS | 0 OR 3 | BR |
| 3 | BRACKET, INSULATOR, 5/8 IN. STUD BA | 3 | 5028499 |
| 4 | INSULATOR, HORIZONTAL, LINE POST, 22KV | 3 | 5034467 |
| 5 | LINE GUARD, VARIOUS | 0 OR 3 | BL |

- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS
- OR LONG SPANS.

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 11/14/74 |
| | SHIELD WIRE CONFIGURATION | REV. DATE: | 05/12/13 |
| | THREE PHASE, SMALL ANGLE, 6 DEG 24 DEG. | APPROVAL: | B.PRIEST |
| | 6-17-1 | 8512E173 | DGN |
| | | | |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | ANGLE CLAMP, 30-60, VARIOUS | 3 | BA1_OR BA2_ |
| 2 | ARMOR ROD, VARIOUS | 0 OR 3 | BR_ |
| 3 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 6 | 5034719 |
| 4 | LINE GUARD, VARIOUS | 0 OR 3 | BL_ |

- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS
- OR LONG SPANS.

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 11/15/74 |
| | SHIELD WIRE CONFIGURATION | REV. DATE: | 05/12/13 |
| | THREE PHASE, MEDIUM ANGLE, 24 DEG 60 DEG. | APPROVAL: | B.PRIEST |
| | 6-18-1 | 8512E174 | DGN |
| | | | |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | DEADEND CLAMP, VARIOUS | 6 | BD_ |
| 2 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 12 | 5034719 |

- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS
- OR LONG SPANS.

| Overhead Distribution | | | |
|------------------------|--|-------------|----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 11/15/74 |
| | SHIELD WIRE CONFIGURATION | REV. DATE: | 05/12/13 |
| | THREE PHASE, LARGE ANGLE, 60 DEG 90 DEG. | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 6-19-1 | 8512E175 | .DGN |
| | | | |



- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS OR LONG SPANS.

| Overhead Distribution | | | |
|------------------------|---------------------------------|-------------|----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 11/16/74 |
| | SHIELD WIRE CONFIGURATION | REV. DATE: | 05/13/13 |
| | THREE PHASE, DEADEND, VERTICAL | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 6-20-1 | 8512E176 | DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 4F PLANK | 0 OR 1 | 5029408 |
| 2 | BRACE, CROSSARM, 1.25 X 0.25 X 20 IN. | 2 | 5027884 |
| 3 | DEADEND CLAMP, VARIOUS | 3 | BD_ |
| 4 | INSULATOR, SUSPENSION, 6-1/4, CLEVIS | 6 | 5034719 |
| 5 | CROSSARM, DENSE OR CLOSE GRAIN, 4F | 0 OR 1 | 5029407 |

- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS OR LONG SPANS.

| Overhead Distribution | | | |
|------------------------|---------------------------------|-------------|----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 11/19/74 |
| PROPRIETARY MATERIAL | SHIELD WIRE CONFIGURATION | REV. DATE: | 05/11/13 |
| | THREE PHASE, DEADEND, CROSSARM | APPROVAL: | B.PRIEST |
| | 6-21-1 | 8512E177 | DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 4F | 1 | 5029407 |
| 2 | BRACKET, INSULATOR, 5/8 IN. STUD BA | 1 | 5028499 |
| 3 | CLAMPTOP CLAMP, DEADEND, VARIOUS | 1 | BCT5_ |
| 4 | INSULATOR, VERTICAL LINE POST, 15KV, PO | 1 | 5034587 |
| 5 | BRACE, CROSSARM, 1.25 X 0.25 X 20 IN. | 2 | 5027884 |
| 6 | PIN, INSULATOR, 5/8 X 5.75 IN. LONG | 2 | 5028642 |
| 7 | DEADEND GRIP, VARIOUS | 2 | BDG_ |
| 8 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 2 | 5034594 |

| Overhead Distribution Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS SHIELD WIRE CONFIGURATION THREE PHASE, DEADEND, SLACK SPAN | ISSUE DATE: REV. DATE: APPROVAL: | 09/26/89 05/15/13 B.PRIEST |
|---|--|--|----------------------------------|
| PROPRIETARY MATERIAL | 6-22-1 | 8512E12. | DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | DEADEND GRIP, VARIOUS | 3 | BDG_ |
| 2 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 6 | 5034719 |
| 3 | BRACKET, SIDE MOUNT, HOT GALVANIZED, SMALL | 3 | 5028504 |
| 4 | DEADEND CLAMP, VARIOUS | 3 | BD_ |
| 5 | INSULATOR, VERTICAL LINE POST, 22KV, PO | 3 | 5034466 |

- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS OR LONG SPANS.
- 3. FOR MAXIMUM SLACK SPAN LENGTH SEE SLACK SPAN SAG CHARTS.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 11/17/74 |
| PROPRIETARY MATERIAL | SHIELD WIRE CONFIGURATION THREE PHASE, DEADEND, 180 SLACK SPAN | REV. DATE: | 05/09/13 |
| | | APPROVAL: | B. PRIEST |
| | 6-23-1 | 8512E17 | B.DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|-----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 2, 4 OR 6 | 5034719 |
| 2 | BRACKET, INSULATOR, 5/8 IN. STUD BA | 0 OR 1 | 5028499 |
| 3 | DEADEND CLAMP, VARIOUS | 1, 2 OR 3 | BD_ |
| 4 | INSULATOR, VERTICAL LINE POST, 22KV, PO | 0 OR 1 | 5034466 |

- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS OR LONG SPANS.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 12/04/74 |
| PROPRIETARY MATERIAL | SHIELD WIRE CONFIGURATION ONE, TWO OR THREE PHASE BUCK | REV DATE: | 05/09/13 |
| | | APPROVAL: | B. PRIEST |
| | 6-24-1 | 8512E179 | .DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|-----------|-------------------------|
| 1 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 2, 4 OR 6 | 5034719 |
| 2 | BRACKET, INSULATOR, 5/8 IN. STUD BA | 0, 1 OR 2 | 5028499 |
| 3 | DEADEND CLAMP, VARIOUS | 1, 2 OR 3 | BD_ |
| 4 | INSULATOR, VERTICAL LINE POST, 22KV, PO | 0, 1 OR 2 | 5034466 |

- 1. WHEN GUY TENSION EXCEEDS 11,000 LBS. POLE BANDS ARE REQUIRED (REFER TO GPLH3-G7H).
- 2. THE DESIGNER MAY SPECIFY A GREATER SEPARATION FOR CERTAIN WIRE SIZE COMBINATIONS OR LONG SPANS.

| Overhead Distribution | | |
|------------------------|---------------------------------|----------------------|
| Construction Standards | 22kV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: 12/15/74 |
| | SHIELD WIRE CONFIGURATION | REV. DATE: 05/06/11 |
| | | APPROVAL: B. PRIEST |
| PROPRIETARY MATERIAL | 6-24-2 | 8512E51.DGN |
| | | |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 8 FOOT | 0 OR 1 | 5029410 |
| 2 | BRACE, CROSSARM, 60 IN. SPAN, 18 IN. PR. | 2 | 5027886 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 3 | 5034594 |
| 4 | PIN, INSULATOR, 5/8 X 5.75 IN. LONG | 0 OR 3 | 5028642 |
| 5 | CROSSARM, DENSE OR CLOSE GRAIN, 10 FOOT | 0 OR 1 | 5029414 |
| 6 | TOP TIE, VARIOUS | 3 | BP1_ |
| 7 | LINE GUARD, VARIOUS | 0 OR 3 | BL_ |
| 8 | PIN, INSULATOR, 5/8 X 6.5 IN. LONG | 0 OR 3 | 5028643 |
| 9 | PLATE, GAIN, 5-5/16" X 4" | 1 | 5028652 |

1. THIS CONSTRUCTION IS FOR MAINTENANCE IN EXISTING LINES AND DOES NOT CONTAIN CONDUCTOR HOLDING COMPONENTS. FOR SPECIFIC SIZE WIRE ATTACHMENTS, SOME BASIC UNIT (OR UNITS) WILL ALSO BE REQUIRED AS NEEDED.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | 22KV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 08/11/93 |
| S | THREE PHASE TANGENTFMAINTENANCE, CROSSARM CONSTRUCTIONA | REV. DATE: | 05/06/13 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 6-25-1 | 8512E192 | DGN |





| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | BRACE, CROSSARM, 1.25 X 0.25 X 20 IN. | 2 | 5027884 |
| 2 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 6 | 5034719 |
| 3 | CROSSARM, DENSE OR CLOSE GRAIN, PLANK | 1 | 5029408 |
| 4 | DEADEND CLAMP, VARIOUS | 3 | BD_ |
| 5 | PLATE, GAIN, 5-5/16" X 4" | 1 | 5028652 |

1. THIS CONSTRUCTION IS FOR MAINTENANCE IN EXISTING LINES AND DOES NOT CONTAIN CONDUCTOR HOLDING COMPONENTS. FOR SPECIFIC SIZE WIRE ATTACHMENTS, SOME BASIC UNIT (OR UNITS) WILL ALSO BE REQUIRED AS NEEDED.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | 22KV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 08/11/93 |
| | THREE PHASE DEADEND MAINTENANCE, CROSSARM CONSTRUCTION | REV. DATE: | 05/16/13 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 6-26-1 | 8512E193 | DGN |
| | | | |

P352_

PHN10



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 10 FOOT | 1 | 5029414 |
| 2 | PIN, INSULATOR, 5/8 X 6.5" LONG | 4 | 5028643 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 3 | 5034594 |
| 4 | BRACE, CROSS ARM, 60" SPAN 18" PR | 2 | 5027886 |
| 5 | INSULATOR, PIN, 4KV, PORCELAIN WHITE | 1 | 5034593 |
| 6 | LINE GUARD, VARIOUS | 4 | BL_ |
| 7 | TOP TIE, VARIOUS | 4 | BPT1_ |

- 1. THIS CONSTRUCTION IS FOR MAINTENANCE IN EXISTING LINES AND DOES NOT CONTAIN CONDUCTOR HOLDING COMPONENTS. FOR SPECIFIC SIZE WIRE ATTACHMENTS, SOME BASIC UNIT (OR UNITS) WILL ALSO BE REQUIRED AS NEEDED.
- 2. WHEN USING LINE GUARD, TOP TIES MAY NOT BE COMPATIBLE DUE TO INCREASED DIAMETER. UTILIZE A COMPATIBLE HAND TIE AS AN ALTERNATIVE.

| Overhead Distribution | | | |
|------------------------|-------------------------------------|--------------|----------|
| Construction Standards | 22KV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 06/25/93 |
| | THREE PHASE TANGENT, NEUTRAL ON ARM | REV. DATE: | 08/30/17 |
| | MAINTENANCE, CROSSARM CONSTRUCTION | APPROVAL: | S. DURAN |
| PROPRIETARY MATERIAL | 6-27-1 | 8512E194.DGN | |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | CROSSARM, DENSE OR CLOSE GRAIN, 10 FOOT | 1 OR 2 | 5029414 |
| 2 | PIN, INSULATOR, 5/8 X 6.5 IN. LONG | 4 | 5028643 |
| 3 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 3 | 5034594 |
| 4 | INSULATOR, PIN, 4KV, PORCELAIN WHITE | 1 | 5034593 |
| 5 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 6 OR 12 | 5034719 |
| 6 | BRACE, CROSSARM, 60 IN. SPAN 18 IN. PR. | 2 | 5027886 |
| 7 | CROSSARM, DENSE OR CLOSE GRAIN, 10 FOOT, PLANK | 0 OR 1 | 5027456 |
| 8 | DEADEND CLAMP, VARIOUS | 3 OR 6 | BD_ |
| 9 | DEADEND GRIP, VARIOUS | 0 OR 4 | BDG_ |

1. THIS CONSTRUCTION IS FOR MAINTENANCE IN EXISTING LINES AND DOES NOT CONTAIN CONDUCTOR HOLDING COMPONENTS. FOR SPECIFIC SIZE WIRE ATTACHMENTS, SOME BASIC UNIT (OR UNITS) WILL ALSO BE REQUIRED AS NEEDED.

| Overhead Distribution | | - | |
|------------------------|-------------------------------------|-------------|-----------|
| Construction Standards | 22KV PRIMARY CONSTRUCTION UNITS | ISSUE DATE: | 06/25/93 |
| | THREE PHASE DEADEND, NEUTRAL ON ARM | REV. DATE: | 05/16/13 |
| | MAINTENANCE, CROSSARM CONSTRUCTION | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 6-28-1 | 8512E195 | 5.DGN |

SECTION 7: 12 kV TRANSFORMERS

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| Overhead Distribution | | | |
|------------------------|-----------------------------|-------------|----------|
| Construction Standards | INDEX | ISSUE DATE: | 05/14/13 |
| | INDEX 12 kV_TRANSFORMERS | REV. DATE: | 12/11/18 |
| | | APPROVAL: | S. Duran |
| PROPRIETARY MATERIAL | 7-1-1 | OH7-1-1.0 | doc |

SECTION 7: 12 kV TRANSFORMERS

| TITLE / DESCRIPTION | PAGE |
|--|--------|
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| Overhead Distribution | | | |
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| R R R R R R R R R R R R R R R R R R R | | REV. DATE: | 12/11/18 |
| | | APPROVAL: | S. Duran |
| PROPRIETARY MATERIAL | 7-1-2 | OH7-1-1. | doc |

TRANSFORMER CONNECTIONS INSTRUCTIONAL GUIDE

THIS GUIDE RELATES TO THE INSTALLATION, REMOVAL, OR REPLACEMENT OF 7.2/12.47 KV POLE-MOUNTED DISTRIBUTION TRANSFORMERS.

COMPATIBLE UNIT CODING FOR "X" SECTION

SIZE AND CONNECTION CODING

EACH TRANSFORMER, OR BANK OF TRANSFORMERS, HAS BEEN ASSIGNED AN INDIVIDUAL CODE NUMBER. "X" IS THE PREFIX FOR ALL CODE NUMBERS. THE FIRST DIGIT IS NUMERICAL AND REPRESENTS THE SECONDARY VOLTAGE AND CONNECTION ARRANGEMENT. THE SECOND (AND THIRD, WHEN REQUIRED) DIGIT ESTABLISHES THE TRANSFORMER SIZE BY KVA RATING.

EXAMPLE:

COMPATIBLE UNIT X 3 1

277/480 VOLT 3Ø, 4 WIRE ______

FOR TWO-POT OR THREE-POT BANKS INVOLVING TRANSFORMERS OF DIFFERENT SIZES IN THE BANK, THE SECOND AND THIRD DIGITS REPRESENT THE TEASER TRANSFORMER AND LIGHTING TRANSFORMER SIZES RESPECTIVELY.

COMPATIBLE UNIT X 7 2 3

EXAMPLES:

120/240 VOLT 1Ø-3Ø, 4 WIRE ______ ONE 10 KVA TEASER TRANSFORMER ONE 15 KVA LIGHTING TRANSFORMER (TWO-POT BANK)

> COMPATIBLE UNIT X 5 2 3

120/240 VOLT 1Ø-3Ø, 4 WIRE ______ TWO 10 KVA TEASER TRANSFORMER _____ ONE 15 KVA LIGHTING TRANSFORMER _____ (THREE-POT BANK)

TAPS AND IMPEDANCE

IF EITHER TAPS AND/OR A SPECIFIC IMPEDANCE ARE REQUIRED, THE DESIRED IMPEDANCE AND/OR THE DESIRED TAP SETTING MUST BE SHOWN ON THE DISTRIBUTION LINE TRANSFORMER ORDER.

TRANSFORMER REPLACEMENT

TO REPLACE ONE, TWO, OR THREE TRANSFORMERS IN AN EXISTING TRANSFORMER BANK, THE CODES ARE GIVEN ON STANDARD X815-X11167. THESE CODES INDICATE THE SIZE AND VOLTAGE OF THE TRANSFORMER(S) TO BE INSTALLED. REPLACEMENT TRANSFORMER(S) SHOULD BE THE SAME SIZE AS THE TRANSFORMER(S) THEY REPLACE, UNLESS INFORMATION FROM ELECTRIC SYSTEM PLANNING AND ENGINEERING SHOWS THEM TO BE OVERLOADED, OR A FIELD MEASUREMENT OF LOAD CURRENT INDICATES AN OVERLOAD. PEELING PAINT MAY OR MAY NOT INDICATE AN OVERLOAD.

| Overhead Distribution | | | |
|------------------------|-------------------------|---------------|---------------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: F | Prior to 1987 |
| | TRANSFORMER CONNECTIONS | REV. DATE: | 06/10/11 |
| | INSTRUCTIONAL GUIDE | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-2-1 | OH7-2-1 | .doc |

TRANSFORMER CONNECTIONS INSTRUCTIONAL GUIDE

EXAMPLE: TO REPLACE A 25 KVA TRANSFORMER IN A 75 KVA BANK, SERVING 480 VOLTS, 3Ø, 3-WIRE:



NOTE: INDICATE THE NUMBER OF TRANSFORMERS TO BE REPLACED IN THE ACTIVITY/QUANTITY COLUMN OF THE GRID SKETCH. TRANSFORMERS THAT ARE BEING REMOVED DUE TO REPLACEMENT WILL NOT BE SHOWN ON THE GRID PORTION OF THE GRID SKETCH.

THE CODE NUMBERS IN THE REPLACEMENT TABLES SPECIFY INDIVIDUAL SIZES AND VOLTAGES OF TRANSFORMERS. WHEN REPLACING TRANSFORMERS IN A BANK REQUIRING THE INSTALLATION OF TWO DIFFERENT SIZES, USE THE APPROPRIATE COMPATIBLE UNIT FOR EACH SIZE.

EXAMPLE: TO REPLACE THE LIGHTING TRANSFORMER AND ONE TEASER TRANSFORMER IN AN X554 BANK, THE FOLLOWING COMPATIBLE UNITS MUST BE USED:



"X" CODED MATERIALS, NEW BANKS

THE FOLLOWING MATERIALS ARE PROVIDED WITH A TRANSFORMER OR A BANK OF TRANSFORMERS WHEN REQUESTED AS PART OF COMPATIBLE UNITS X11 THRU X767.

- TRANSFORMER(S) REQUIRED
- MOUNTING BRACKET(S) FOR TRANSFORMER(S)
- COMBINATION CUT-OUT/ARRESTER
- SECONDARY RISER WIRES
- SECONDARY CONNECTORS
- INSULATED CONNECTOR COVERS
- CABLE LASHING
- INSULATED TUBING
- GROUNDING WIRE
- TRANSFORMER TANK GROUNDING CONNECTORS (AS NEEDED)
- FUSE LINK(S)

| Overhead Distribution | | | |
|------------------------|-------------------------|---------------|---------------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: F | Prior to 1987 |
| R R | TRANSFORMER CONNECTIONS | REV. DATE: | 06/10/11 |
| | INSTRUCTIONAL GUIDE | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-2-2 | OH7-2-1.doc | |
| | | | |

TRANSFORMER CONNECTIONS INSTRUCTIONAL GUIDE

"X" CODED MATERIALS, REPLACEMENTS

THE FOLLOWING MATERIALS ARE PROVIDED WHEN TRANSFORMER REPLACEMENT IS REQUESTED, USING COMPATIBLE UNITS X815 THRU X11167.

- TRANSFORMER(S) REQUIRED
- TRANSFORMER TANK GROUNDING CONNECTORS (AS NEEDED)
- FUSE LINK(S)

COMPATIBLE UNIT CODING FOR "XP" SECTION

TRANSFORMER FRAMING

THE CODING OF TRANSFORMER FRAMING IN THE "XP" SECTION IS BASED ON THE NUMBER OF TRANSFORMERS BEING INSTALLED (ONE, TWO, OR THREE), AND HOW THE POLE IS FRAMED (HORIZONTAL OR VERTICAL). THE TABLE BELOW SHOWS THE TRANSFORMER FRAMING COMPATIBLE UNITS THAT ARE AVAILABLE.

| FRAMING | 1 TRANSFORMER | 2 TRANSFORMERS | 3 TRANSFORMERS |
|--------------------|---------------|----------------|----------------|
| VERTICAL FRAMING | XP1 | XP2 | XP3 |
| HORIZONTAL FRAMING | XPH1 | XPH2 | XPH3 |

"XP" CODED MATERIALS

THE MATERIALS INCLUDED IN EACH OF THE TRANSFORMER FRAMING COMPATIBLE UNITS ARE SHOWN ON PAGES 7-3-1 AND 7-3-2.

| Overhead Distribution | | | |
|------------------------|-------------------------|---------------|---------------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: F | Prior to 1987 |
| R R | TRANSFORMER CONNECTIONS | REV. DATE: | 06/10/11 |
| | INSTRUCTIONAL GUIDE | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-2-3 | OH7-2-1 | 1.doc |
| | | | |

XP1

TRANSFORMER FRAMING

VERTICALLY FRAMED POLES WITH ONE TRANSFORMER

XP2 TRANSFORMER FRAMING

VERTICALLY FRAMED POLES WITH TWO TRANSFORMERS

XP3

TRANSFORMER FRAMING

VERTICALLY FRAMED POLES WITH THREE TRANSFORMERS



| | QUANTITY BY CU | | UOI | DESCRIPTION | |
|---------|-------------------|-----|-----|-------------|---|
| | XP1 | XP2 | XP3 | | |
| 5034220 | | 1 | 1 | EA | BRACKET TRI-MOUNT, 40" |
| 5034613 | 1 | | | EA | HANGER POLE MTG 2 |
| 5027738 | 1 | 1 | 1 | EA | BOLT MACHINE HOT GALV., ROLLED THREAD 5/8 X 12" |
| 5028639 | 1 | 2 | 2 | EA | PIN INSULATOR 5" HEIGHT ABOVE BASE HOT GALV. |
| 5028003 | 1 | 1 | 1 | EA | SCREW LAG HOT DIP GALV. 1/2 X 4" |
| 5029168 | 1 | 1 | 1 | EA | WASHER DOUBLE COIL LOCK GALVANIZED .219 X .188" |
| 5029180 | 1 | 1 | 1 | EA | WASHER SQUARE 5/8" BOLT 2-1/4 X 2-1/4 X 3/16" |
| 5035724 | 1 | 2 | 3 | EA | CONNECTOR EQUIPMENT OR LINE TAP NON-TENSION |
| 5033933 | 2 | 4 | 6 | EA | CONNECTOR COMPR. COPPER PARALLEL GROOVE |
| 5034594 | 1 | 2 | 2 | EA | INSULATOR PIN PORCELAIN GRAY 12KV, 18 PER PACK |
| 5033845 | 6 | 12 | 12 | EA | WIRE COPPER, BARE SOFT DRAWN #6 AWG SOLID |
| 5033863 | 15 | 30 | 42 | EA | SOLID COPPER CABLE #6 600V INSULATED |

| Overhead Distribution Construction Standards | | | |
|---|-------------------------|-------------|-----------|
| | 12kV TRANSFORMERS | ISSUE DATE: | 06/13/11 |
| | TRANSFORMER FRAMING | | 06/11/13 |
| | VERTICALLY FRAMED POLES | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 7-3-1 | 8512E44C |).DGN |

XPH1

TRANSFORMER FRAMING

HORIZONTALLY FRAMED POLES WITH ONE TRANSFORMER

XPH2 TRANSFORMER FRAMING

HORIZONTALLY FRAMED POLES WITH TWO TRANSFORMERS

XPH3

TRANSFORMER FRAMING

HORIZONTALLY FRAMED POLES WITH THREE TRANSFORMERS



| MATERIAL | QUANTITY BY CU | | | | DESCRIPTION | |
|-------------|----------------|------|------|-----|---|--|
| ITEM NUMBER | XPH1 | XPH2 | XPH3 | 001 | DESCRIPTION | |
| 5034614 | 2 | 4 | 6 | EA | HANGER CO-ARR | |
| 5028898 | 7 | 11 | 11 | EA | CLIP GROUND WIRE 1000 PER CARTON PLATED STEEL | |
| 5028263 | 0.1 | 0.1 | 0.1 | EA | NAIL HOT DIP GALV. 10D BOX; 50 LBS/BOX | |
| 5035724 | 1 | 2 | 3 | EA | CONNECTOR EQUIPMENT OR LINE TAP NON-TENSION | |
| 5033933 | 2 | 4 | 6 | EA | CONNECTOR COMPR. COPPER PARALLEL GROOVE | |
| 5034832 | 1 | 1 | 1 | EA | MOULDING GROUND WIRE DOUGLAS FIR 8' LENGTH | |
| 5035478 | 6 | 6 | 6 | EA | STAPLE MOULDING HOT DIP GALV. CEMENT RESIN | |
| 5033845 | 10 | 18 | 18 | EA | WIRE COPPER, BARE SOFT DRAWN #6 AWG SOLID | |
| 5033863 | 12 | 24 | 36 | EA | SOLID COPPER CABLE #6 600V INSULATED | |

Overhead Distribution Construction Standards

12kV TRANSFORMERS TRANSFORMER FRAMING HORIZONTALLY FRAMED POLES

ISSUE DATE: 06/13/11 REV. DATE: 06/11/13 APPROVAL: B. PRIEST 8512E498.DGN

- 1. TRANSFORMER SECONDARY VOLTAGE RATINGS.
 - A. A NAMEPLATE VOLTAGE WRITTEN 120/240 OR 240/480 INDICATES THE TRANSFORMER SECONDARY MAY BE CONNECTED EITHER SERIES FOR 2 OR 3-WIRE OPERATION, OR PARALLEL FOR 2-WIRE OPERATION.
 - B. A NAMEPLATE VOLTAGE WRITTEN 240/120 INDICATES THE TRANSFORMER SECONDARY MAY BE CONNECT-ED SERIES FOR 2 OR 3-WIRE OPERATION BUT CAN NOT BE CONNECTED PARALLEL FOR 2 WIRE OPERATION.
 - C. A NAMEPLATE VOLTAGE WRITTEN 240X480 INDICATES THE TRANSFORMER SECONDARY MAY BE CONNECTED EITHER PARALLEL OR SERIES FOR 2-WIRE OPERATION BUT CAN NOT BE USED FOR SERIES 3 WIRE OPERATION.
 - D. A NAMEPLATE VOLTAGE WRITTEN 277/480 INDICATES THE TRANSFORMER SECONDARY IS CONNECTED FOR 2 WIRE OPERATION AND IS TO BE ONLY CONNECTED WYE ON THE SECONDARY.
- 2. TRANSFORMER SECONDARY WINDING CONNECTIONS.

```
TRANSFORMERS HAVING THREE
SECONDARY LEADS OR BUSHINGS
```

TRANSFORMERS HAVING TWO SECONDARY LEADS OR BUSHINGS TRANSFORMERS HAVING FOUR SECONDARY LEADS OR BUSHINGS



OPERATION



PARALLEL 2-WIRE OPERATION



2-WIRE OPERATION ONLY

SERIES 2 OR 3-WIRE OPERATION SUPPLIED AS EITHER 120/240 OR 240/480V. TIE JUMPER MUST BE SAME SIZE AS SERVICE

CONDUCTORS.

FIG.4



PARALLEL 2-WIRE OPERATION SUPPLIED AS EITHER 120 OR 240V. TIE JUMPERS MAY BE HALF THE SIZE OF SERVICE CONDUCTORS.

- 3. TRANSFORMERS CONNECTED IN PARALLEL.
 - A. NAMEPLATE VOLTAGE RATING AND PRIMARY WINDING TAPS OF PARALLELED TRANSFORMERS MUST BE IDENTICAL.
 - B. EXCEPT IN SPECIALLY APPROVED CASES, THE NAMEPLATE IMPEDANCE AND KVA RATING MUST BE IDENTICAL.
 - C. ALL PARALLEL CONNECTIONS MUST BE BETWEEN TERMINALS HAVING THE SAME POLARITY DESIGNATION.
- 4. STANDARD POLARITY OF DISTRIBUTION TRANSFORMERS.
 - A. 2300V OR 7200V TRANSFORMERS 200 KVA AND SMALLER HAVE "ADDITIVE POLARITY."
 - B. 2300V OR 7200V TRANSFORMERS LARGER THAN 200 KVA HAVE "SUBTRACTIVE POLARITY."
 - C. ALL 12,000V TRANSFORMERS REGARDLESS OF SIZE HAVE "SUBTRACTIVE POLARITY."

SOME OF THE OLDER TRANSFORMERS DO NOT CONFORM TO THIS STANDARD AND IT IS THEREFORE IM-PORTANT THAT THE POLARITY OF ALL BANKED TRANSFORMERS BE CHECKED BEFORE CONNECTIONS ARE MADE.

PARTICULAR ATTENTION IS CALLED TO THE FACT THAT OPPOSITE POLARITY RESULTS WHEN 7200V TRANSFORMERS LARGER THAN 200 KVA ARE BANKED WITH TRANSFORMERS 200 KVA AND SMALLER.

| Overhead Distribution | | | |
|------------------------|-------------------------|-------------|-----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 02/08/68 |
| B | TRANSFORMER CONNECTIONS | REV. DATE: | 06/11/11 |
| | GENERAL INFORMATION | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 7-4-1 | 8512E294 | DGN |

| KVA SIZE | SECONDARY VOLTAGE | PRIMARY VOLTAGE | MATERIAL ITEM NO. | FIGURE NO. FROM TRANSFORMER CONNECTIONS GENERAL INFORMATION |
|----------|----------------------|--------------------|----------------------|---|
| | | SINGLE PHASE – WI | THOUT TAPS | |
| 5 | 120/240 | 7200/12470Y | 5071739 | 1 |
| 10 | 120/240 | 7200/12470Y | 5039051 | 1 |
| 15 | 120/240 | 7200/12470Y | 5039052 | 1 |
| 25 | 120/240 | 7200/12470Y | 5039053 | 1 |
| 37.5 | 120/240 | 7200/12470Y | 5039054 | 1 |
| 50 | 120/240 | 7200/12470Y | 5039055 | 1 |
| 75 | 120/240 | 7200/12470Y | 5039056 | 1 |
| 100 | 120/240 | 7200/12470Y | 5039057 | 1 |
| | 0, | SINGLE PHASE – V | VITH TAPS | · · |
| 15 | 120 | 7200/12470Y | 5039058 | 2 |
| 25 | 120 | 7200/12470Y | 5039059 | 2 |
| 37.5 | 120 | 7200/12470Y | 5039060 | 2 |
| 50 | 120 | 7200/12470Y | 5039061 | 2 |
| 75 | 120 | 7200/12470Y | 5039062 | 2 |
| 100 | 120 | 7200/12470Y | 5039063 | 2 |
| 167 | 120/240 OR 120/208 | 7200/12470Y | 5039064 | 4 OR 5 |
| 10 | 120/240 | 12000/20780 | 5039073 | 1 |
| 15 | 120/240 | 12000/20780 | 5039074 | 1 |
| 25 | 120/240 | 12000/20780 | 5039174 | 1 |
| 37.5 | 120/240 | 12000/20780 | 5071803 | 1 |
| 50 | 120/240 | 12000/20780 | 5039175 | 1 |
| 75 | 120/240 | 12000/20780 | 5039176 | 1 |
| 100 | 120/240 | 12000/20780 | 5039177 | 1 |
| 167 | 120/240 | 12000/20780 | 5039178 | Δ |
| 250 | 120/240 | 12000/20780Y | 5039179 | 4 |
| 333 | 120/240 | 12000/20780Y | 5039180 | 4 |
| 500 | 120/240 | 12000/20780Y | 5039181 | 4 |
| 250 | 120/240 OP 120/208 | | 5030183 | |
| 230 | 120/240 OR 120/208 | 12000 DELTA | 5039183 | 4 OR 5 |
| 500 | 120/240 OR 120/208 | 12000 DELTA | 5039104 | 4 OR 5 |
| 300 | 277/4000 | 12000 DELTA | 5039105 | 401(3 |
| 25 | 277/480Y | 12470 | 5039180 | 3 |
| 37.5 | 277/480Y | 12470 | 5039187 | 3 |
| 50 | 277/480Y | 12470 | 5039188 | 3 |
| /5 | 277/480Y | 12470 | 5039189 | 3 |
| 100 | 277/480Y | 12470 | 5039190 | 3 |
| 167 | 277/480Y | 12470 | 5039191 | 3 |
| 250 | 277/480Y | 12470 | 5039192 | 3 |
| 333 | 277/480Y | 12470 | 5039193 | 3 |
| 500 | 211/48UY | 12470 | 5039194 | 3 |
| 25 | 277/480Y | 12470/21600Y | 5039200 | 3 |
| 37.5 | 277/480Y | 12470/21600Y | 0861637 * | 3 |
| 50 | 277/480Y | 12470/21600Y | 5039201 | 3 |
| 75 | 277/480Y | 12470/21600Y | 5039202 | 3 |
| 100 | 277/480Y | 12470/21600Y | 5039203 | 3 |
| 167 | 277/480Y | 12470/21600Y | 0861687 * | 3 |
| 250 | 277/480Y | 12470/21600Y | 5039204 | 3 |
| 333 | 277/480Y | 12470/21600Y | 5039205 | 3 |
| 500 | 277/480Y | 12470/21600Y | 5039206 | 3 |

* INDICATES NO MATERIAL STOCK CODE EXISTS IN SAP.

| Overhead Distribution | | | |
|------------------------|-------------------------|-------------|-----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 07/16/86 |
| | TRANSFORMER CONNECTIONS | REV. DATE: | 06/12/13 |
| | GENERAL INFORMATION | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-4-2 | OH7-4-2.doc | |



| 120/208V 3Ø - 4 WIRE 120/208Y V. OR 120 V. | | | | | |
|--|----------------|-----------------|-----------------|----------|------------------------------------|
| CODE NO. | KVA OF BANK | T RISER SIZE | N RISER SIZE | | 120/208 V. OR 277/480V 3Ø - 4 WIRE |
| X41 | 45 | #2 | #2 | h | |
| X42 | 75 | # 2/0 | # 2/0 | | |
| X43 | 112 | 350MCM | # 4/0 | | A_ _ ҿ _ ° î î î ° î |
| X44 | 150 | 500MCM | 350MCM | NOTE 4 | |
| X45 | 225 | 2-350MCM | 350MCM | | ╱ <u>┨─┠╴┤─┠╴┐</u> ╋╴╴╰─╢╯⋈─┠╯──┤ |
| X46 | 300 | 2-350MCM | 500MCM | J | |
| X47 | 500 | 3-500MCM | 2-350MCM | Б | |
| X48 | 750 | 4-500MCM | 2-500MCM | | |
| X49 | 1000 | 5-500MCM | 3-500MCM | U NOTE 5 | |
| 277/4 | 80V 3Ø - 4 WIR | Æ | | | PLATFORM BANK POLE MOUNTED BANK |
| | 277/480Y | V. | | | |
| | OR 277 | V. | | | |
| CODE NO. | KVA OF BANK | T RISER SIZE | N RISER SIZE | | |
| X31 | 75 | #2 | #2 | | |
| X33 | 150 | # 2/0 | #2/0 | | |
| X34 | 225 | # 4/0 | # 2/0 | | |
| X35 | 300 | 350MCM | # 4/0 | | |
| X36 | 500 | 2-#4/0 | 350MCM | | |
| X37 | 750 | 2-500MCM | 2-350MCN | | |
| X38 | 1000 | 3-350MCM | 2-350MCM | | |
| X39 | 1500 | 4-350MCM | 2-350MCM | | |
| | | | | | |

- 1. ALL TRANSFORMER BANKS CONSIST OF THREE (3) EQUALLY SIZED TRANSFORMERS.
- 2. RISER SIZES SHOWN ARE FOR CROSSLINKED POLYETHYLENE INSULATED COPPER CONDUCTORS.
- 3. WHEN SPECIFIC IMPEDANCE AND/OR TAPS ARE REQUIRED, REFER TO THE INSTRUCTIONAL GUIDE OF THIS SECTION.
- 4. CONNECTED FOR 120V. OPERATION (SEE FIG.2, TRANSFORMER CONNECTIONS GENERAL INFORMATION). 5. CONNECTED FOR 120V. OPERATION USING 4 SECONDARY BUSHINGS (SEE FIG. 5, TRANSFORMER
- CONNECTIONS GENERAL INFORMATION).

| Overhead Distribution | | | |
|------------------------|-----------------------|-------------|-----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 11/22/82 |
| | COMPATIBLE UNIT CODES | REV. DATE: | 06/10/13 |
| | BALANCED LOADS | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 7-5-1 | 8512E231 | .DGN |



SECONDARY CONNECTION DIAGRAMS 120/240 VOLT 10 3 WIRE TRANSFORMER INSTALLATIONS

| 120/240 VOLT, 1 PHASE, 3-WIRE | | | | | | | | |
|-------------------------------|---------------------|-------------------|-------------------|--|--|--|--|--|
| CODE NO. | TRANSFORMER SIZE | RISER SIZE "L" | RISER SIZE "N" | | | | | |
| X62 | 10KVA | #2 | #2 | | | | | |
| X63 | 15KVA | #2 | #2 | | | | | |
| X64 | 25KVA | #2 | #2 | | | | | |
| X65 | 37KVA | 2/0 | #2 | | | | | |
| X66 | 50KVA | 4/0 | 2/0 | | | | | |
| X67 | 75KVA | 350MCM | 4/0 | | | | | |
| X68 | 100KVA | 350MCM | 4/0 | | | | | |
| X69 | 167KVA | 2 - 350MCM | 500MCM | | | | | |





POLE MOUNTED BANK

SECONDARY CONNECTION DIAGRAM 120/240 VOLT 1Ø - 3Ø 4-WIRE TRANSFORMER INSTALLATIONS

| | | 120/240 VOLT 1Ø - 3Ø 4-WIRE | | | | | | | | | |
|----------|-----------|-----------------------------|--|-------------------------|-------------------------|-----------------------------|-------------------------------|---------------------------------|--|--|--|
| | | C | CODE NUMBER "L" AND TRANSFORMER SIZE "L" | | | | | | | | |
| CODE NO. | TRANSF. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | |
| "Т" | SIZES "T" | 5 KVA | 10 KVA | 15 KVA | 25 KVA | 37 KVA | 50 KVA | 75 KVA | | | |
| X72 | 10 KVA | | T # 2 L # 2 N # 2 | T # 2 L # 2 N # 2 | T # 2 L # 2 N # 2 | T # 2 L # 2/0 N # 2 | T # 2 L # 4/0 N # 2/0 | T # 2 L 350 MCM N # 4/0 | | | |
| X73 | 15 KVA | | | T # 2 L # 2 N # 2 | T # 2 L # 2 N # 2 | T # 2 L # 2/0 N # 2 | T # 2 L # 4/0 N # 2/0 | T # 2 L 350 MCM N # 4/0 | | | |
| X74 | 25 KVA | | | | T # 2 L # 2 N # 2 | T # 2 L # 2/0 N # 2 | T # 2 L # 4/0 N # 2/0 | T # 2 L 350 MCM N # 4/0 | | | |
| X75 | 37 KVA | | | | T # 2 L # 2 N # 2 | T # 2/0 L # 2/0 N # 2 | T # 2 L # 4/0 N # 2/0 | T # 2/0 L 350 MCM N # 4/0 | | | |
| X76 | 50 KVA | | | | | | T # 4/0 L # 4/0 N # 2/0 | T # 4/0 L 350 MCM N # 4/0 | | | |

NOTES

1. TO DESIGNATE THE DESIRED TRANSFORMER BANK, REQUEST THE "T" CODE NUMBER FIRST THEN ADD THE APPROPRIATE "L" CODE NUMBER.

EXAMPLE: TO REQUEST A TRANSFORMER BANK CONSISTING OF A 25 KVA TRANSFORMER AND ONE 37 KVA TRANSFORMER, THE CODE NUMBER IS X 745.

- X74..... INDICATES THE 25 KVA TRANSFORMER.
- 5..... INDICATES THE 37 KVA TRANSFORMER.

2. RISER SIZES FOR THE "T", "L" AND "N" RISERS ARE DISPLAYED IN THE TABLE WHERE "X74" AND "5" INTERSECT.

| Overhead Distribution Construction Standards | | | |
|---|---|-------------|-----------|
| | 12kV TRANSFORMERS | ISSUE DATE: | 09/30/71 |
| | TRANSFORMER BANK AND RISER CODING | REV. DATE: | 06/11/11 |
| | TWO TRANSFORMERS, 120/240 VOLT, 1Ø - 3Ø, 4 WIRE | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 7-7-1 | 8512E278 | DGN |
| | | 00122210 | |





SECONDARY CONNECTION DIAGRAMS 120/240 VOLT, 1Ø - 3Ø, 4 WIRE TRANSFORMER INSTALLATIONS

120/240 VOLT, 1Ø - 3Ø, 4 WIRE

| | | CODE NO. "L" AND TRANSFORMER SIZE "L" | | | | | | |
|------------|--------------|---------------------------------------|-----------------------|-------------------------|----------------------------|-----------------------------------|--------------------------------------|--|
| CODE | TRANSF. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| NO. "T" | SIZES "T" | 15KVA | 25KVA | 37KVA | 50KVA | 75KVA | 100KVA | 167KVA |
| X52 | 10KVA | | | T #2 L 2/0 N #2 | T #2 L 4/0 N 2/0 | T #2 L 350MCM N 4/0 | T #2 L 500MCM N 350MCM | T #2 L 2 - 350MCM N 500MCM |
| X53 | 15KVA | T #2 L #2 N #2 | T #2 L #2 N #2 | T #2 L 2/0 N #2 | T #2 L 4/0 N 2/0 | T #2 L 350MCM N 4/0 | T #2 L 500MCM N 350MCM | T #2 L 2 - 350MCM N 500MCM |
| X54 | 25KVA | | T #2 L 2/0 N #2 | T #2 L 2/0 N #2 | T #2 L 4/0 N 2/0 | T #2 L 350MCM N 4/0 | T #2 L 500MCM N 350MCM | T #2 L 2 - 350MCM N 500MCM |
| X55 | 37KVA | | | T 2/0 L 4/0 N 2/0 | T 2/0 L 350MCM N 4/0 | T 2/0 L 500MCM N 350MCM | T 2/0 L 500MCM N 350MCM | T #2 L 2 - 350MCM N 500MCM |
| X56 | 50KVA | | | | T 4/0 L 350MCM N 4/0 | T 4/0 L 500MCM N 350MCM | T 4/0 L 2 - 4/0 N 350MCM | T 4/0 L 2 - 350MCM N 500MCM |
| X57 | 75KVA | | | | | T 350MCM L 2 - 4/0 N 350MCM | T 350MCM L 2 - 4/0 N 350MCM | T 350MCM L 2 - 500MCM N 500MCM |
| X58 | 100KVA | | | | | | T 350MCM L 2 - 350MCM N 500MCM | T 350MCM L 2 - 500MCM N 500MCM |
| X59 | 167KVA | | | | | | | T 2 - 350MCM L 2 - 500MCM N 500MCM |

- 1. TO DESIGNATE THE DESIRED TRANSFORMER BANK, REQUEST THE "T" CODE NUMBER FIRST, THEN ADD THE APPROPRIATE "L" CODE NUMBER.
 - EXAMPLE: TO REQUEST A TRANSFORMER BANK CONSISTING OF TWO 25KVA TRANSFORMERS AND ONE 37KVA TRANSFORMER, THE CODE NUMBER IS X543.
 - X54INDICATES THE TWO 25KVA TRANSFORMERS 3INDICATES THE 37KVA TRANSFORMER
- 2. RISER SIZES FOR THE "T", "L" AND "N" RISERS ARE DISPLAYED IN THE TABLE WHERE "X54" AND "3" INTERSECT.

| Overhead Distribution | | | |
|------------------------|--|-------------|-----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 09/30/71 |
| | THREE TRANSFORMERS 120/240 VOLT | REV. DATE: | 06/10/11 |
| | $1 \varnothing - 3 \varnothing$, 4 WIRE | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-8-1 | OH7-8-1.0 | doc |

120/208V

(120/280Y VOLT TRANSFORMERS OR 120 VOLT TRANSFORMERS)

| CODE NUMBER | TRANSFORMER SIZE (kVA) |
|-------------|------------------------|
| X815 | 15 |
| X825 | 25 |
| X837 | 37 |
| X850 | 50 |
| X875 | 75 |
| X8100 | 100 |
| X8167 | 167 |
| X8250 | 250 |
| X8333 | 333 |

120/240V

| CODE NUMBER | TRANSFORMER SIZE (kVA) |
|-------------|------------------------|
| X910 | 10 |
| X915 | 15 |
| X925 | 25 |
| X937 | 37 |
| X950 | 50 |
| X975 | 75 |
| X9100 | 100 |
| X9167 | 167 |

277/480V

(277/480Y VOLT TRANSFORMERS OR 277 VOLT TRANSFORMERS)

| CODE NUMBER | TRANSFORMER SIZE (kVA) |
|-------------|------------------------|
| X1025 | 25 |
| X1050 | 50 |
| X1075 | 75 |
| X10100 | 100 |
| X10167 | 167 |
| X10250 | 250 |
| X10333 | 333 |
| X10500 | 500 |

240/480V

FOR EMERGENCY REPLACEMENT ONLY. PREFER TO REBUILD BANK WITH 277/480V. USE ONLY SALVAGED UNITS, NO NEW UNITS ARE PURCHASED.

| CODE NUMBER | TRANSFORMER SIZE (kVA) |
|-------------|------------------------|
| XW25 | 25 |
| XW50 | 50 |
| XW75 | 75 |
| XW100 | 100 |



| CODE NUMBER | NUMBER OF CANS |
|-------------|----------------|
| RX1 | 1 |
| RX2 | 2 |
| RX3 | 3 |

| Overhead Distribution | | | |
|------------------------|--------------------------|-------------|-------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 0 |
| R R | TRANSFORMER REMOVAL CODE | REV. DATE: | 0 |
| | ANY VOLTAGE | APPROVAL: | B |
| PROPRIETARY MATERIAL | 7-10-1 | OH7-10- | 1.doo |
XP1 SEE NOTE 2





- 1. THIS DIMENSION 3'-6" MAXIMUM WITH NUETRAL LOCATED 7'-2" FROM TOP OF POLE.
- 2. USE XP1 FOR P10, P11A, OR P15N FRAMING.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 09/30/71 |
| | SINGLE TRANSFORMER INSTALLATION SINGLE PHASE, TANGENT, SMALL ANGLE | REV. DATE: | 06/11/10 |
| | AND SLACK DEADEND, POLE TOP | ATTROVAL. | D. FRIEST |
| PROPRIETARY MATERIAL | 7-11-1 | 8512E98 | .DGN |

SEE NOTE 2

XP1



- 1. THIS DIMENSION 3'-6" MAXIMUM WITH NEUTRAL
- LOCATED 7'-2" FROM TOP OF POLE.
- 2. USE XP1 FOR P13, P13A, P15, OR P18 FRAMING.

| Overhead Distribution | | | |
|------------------------|--------------------------------------|-------------|-----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 11/15/71 |
| | SINGLE TRANSFORMER INSTALLATION | REV. DATE: | 06/11/11 |
| | SINGLE PHASE, MEDIUM ANGLE & DEADEND | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 7-12-1 | 8512E99 | .DGN |

XP1 SEE NOTE 2



- 1. LOCATE TRANSFORMER ON OPPOSITE SIDE OF POLE FROM PHASE CONDUCTOR FOR P30C FRAMING.
- 2. USE XP1 FOR P20A, P30A, P30B, P30C, P25N OR P35N FRAMING.

| Overhead Distribution | | |
|------------------------|---|----------------------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: 04/30/91 |
| | SINGLE TRANSFORMER INSTALLATION TWO AND THREE PHASE, TANGENT | REV. DATE: 06/11/11 |
| | AND SLACK DEADEND, POLE TOP | APPROVAL: B. PRIEST |
| PROPRIETARY MATERIAL | 7-13-1 | 8512E100.DGN |

XP1 SEE NOTE 1



NOTES

1. USE XP1 FOR P20D OR P30D FRAMING.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 09/30/71 |
| PROPRIETARY MATERIAL | SINGLE TRANSFORMER INSTALLATION | REV. DATE: | 06/10/11 |
| | TWO AND THREE PHASE, TANGENT UNDERBUILD | APPROVAL: | B. PRIEST |
| | 7-14-1 | 8512E101 | .DGN |

SEE NOTE 1



NOTES

1. USE XP1 FOR P21B, P31B, P21BA, P31BA, P21D, P31D, P21DA, OR P31DA FRAMING.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 01/15/87 |
| | SINGLE TRANSFORMER INSTALLATION TWO AND THREE PHASE. SMALL ANGLE | REV. DATE: | 06/11/11 |
| | POLE TOP | APPROVAL: E | B. PRIEST |
| PROPRIETARY MATERIAL | 7-15-1 | 8512E102. | DGN |

XP1

SEE NOTE 1

XP1





NOTES

1. USE XP1 FOR P21F, P31F, P21FA, P31FA, P21G, P31G, P21GA, P31GA, P31K, P31KA, P31L, OR P31LA FRAMING.

| Overhead Distribution | | |
|------------------------|---|----------------------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: 09/30/71 |
| E | SINGLE TRANSFORMER INSTALLATION TWO AND THREE PHASE, SMALL ANGLE | REV. DATE: 06/11/11 |
| | AND INTERMEDIATE ANGLES, UNDERBUILD | APPROVAL: B. PRIEST |
| PROPRIETARY MATERIAL | 7-16-1 | 8512E103.DGN |

XP1 SEE NOTE 1



NOTES

1. USE XP1 FOR P22, P32, P22A, P32A, P23, P33, P23A, P33A, P25A OR P35A FRAMING.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 09/30/71 |
| | SINGLE TRANSFORMER INSTALLATION TWO AND THREE PHASE, INTERMEDIATE OR | REV. DATE: | 06/11/11 |
| | MEDIUM ANGLE AND VERTICAL DEADEND | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 7-17-1 | 8512E104 | 4.DGN |

XP1 SEE NOTE 2



NOTES

1. OFFSET TRANSFORMER 45 DEG.

2. USE XP1 FOR P25 OR P35 FRAMING.

| Overhead Distribution | | |
|------------------------|---|----------------------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: 09/30/71 |
| E | SINGLE TRANSFORMER INSTALLATION TWO AND THREE PHASE, DEADEND | REV. DATE: 06/11/11 |
| | CROSSARM | APPROVAL: B. PRIEST |
| PROPRIETARY MATERIAL | 7-18-1 | 8512E105.DGN |

SEE NOTE 1



NOTES

1. USE XP1 FOR P35B, P35BJ OR P36B FRAMING.

| Overhead Distribution | | | |
|------------------------|--|-------------|-----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 05/02/11 |
| | SINGLE TRANSFORMER INSTALLATION THREE PHASE DEADEND | REV. DATE: | 06/11/11 |
| | STAGGERED CONFIGURATION, CROSSARM | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 7-19-1 | 8512E106 | 6.DGN |

XP1

XP2 SEE NOTE 1



NOTES

1. USE XP2 FOR P20A, P30A, P30C, P25N OR P35N FRAMING.

| Overhead Distribution | | | |
|---------------------------------------|------------------------------|-------------|-----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 09/30/71 |
| C C C C C C C C C C C C C C C C C C C | TWO TRANSFORMER INSTALLATION | REV. DATE: | 06/11/11 |
| | POLE TOP | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 7-20-1 | 8512E279 | .DGN |



- 1. USE XP2 FOR P20D, P21F, P21FA, P30D, P31F OR P31FA FRAMING.
- 2. USE XP2 FOR P21D, P21GA, P31G, P31GA, P31K, P31KA, P31L OR P31LA FRAMING, AND LOWER DOWN GUY 12".

| Overhead Distribution | | | |
|------------------------|--|-------------|-----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 09/30/71 |
| ® | TWO TRANSFORMER INSTALLATION | | 06/11/11 |
| | TWO AND THREE PHASE, TANGENT | REV. DATE. | 00/11/11 |
| | SMALL AND INTERMEDIATE ANGLE, UNDERBUILD | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 7-21-1 | 8512E280 |).DGN |
| | | | |

XP2 SEE NOTE 1



NOTES

1. USE XP2 FOR P21B, P31B, P21BA, P31BA, P31D OR P31DA FRAMING.

| Overhead Distribution | | | |
|------------------------|------------------------------|-------------|-----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 09/30/71 |
| | TWO TRANSFORMER INSTALLATION | REV. DATE: | 06/11/11 |
| | POLE TOP | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 7-22-1 | 8512E281 | I.DGN |

XP2



NOTES

1. USE XP2 FOR P21D, P31B, P21DA OR P31BA FRAMING.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 09/30/71 |
| ® | TWO TRANSFORMERS INSTALLATION TWO AND THREE PHASE, SMALL ANGLE | REV. DATE: | 06/11/11 |
| | POLE TOP | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 7-22-2 | 8512E283 | B.DGN |



1. USE XP2 FOR P22, P22A, P23, P23A, P25A, P32, P32A, P33, P33A, OR P35A FRAMING.

| Overhead Distribution | | | |
|------------------------|---|-------------------------|----------------------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 09/30/71 |
| PROPRIETARY MATERIAL | TWO TRANSFORMER INSTALLATION TWO AND THREE PHASE, INTERMEDIATE OR MEDIUM ANGLE AND VERTICAL DEADEND | REV. DATE: APPROVAL: | 06/11/11 B.PRIEST |
| | 7-23-1 | 8512E284 | DGN |

XP2



NEUTRAL AND/OR BOTTOM DOWN GUY MAY BE LOWERED FOR LARGER TRANSFORMERS.

NOTES

1. USE XP2 P252 OR P352 FRAMING.

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 09/30/71 |
| | TWO TRANSFORMER INSTALLATION TWO AND THREE PHASE DEADEND | REV. DATE: | 06/12/11 |
| | CROSSARM | APPROVAL. | B.PRIEST |
| PROPRIETARY MATERIAL | 7-24-1 | 8512E286 | DGN |



1. USE XP2 FOR P35A FRAMING.

| Overhead Distribution | | | |
|------------------------|---|-------------------------|----------------------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 04/26/76 |
| PROPRIETARY MATERIAL | TWO TRANSFORMER INSTALLATION THREE PHASE DEADEND VERTICAL | REV. DATE: APPROVAL: | 06/12/11 B.PRIEST |
| | 7-25-1 | 8512E56. | DGN |

XP2



- 1. THIS DIMENSION IS 2'-0" MAX. WITH NEUTRAL LOCATED 10'-4" FROM TOP OF POLE.
- 2. USE XP3 FOR P35AN FRAMING.

| Overhead Distribution | | | |
|---------------------------------------|---|-------------|-----------------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 09/30/71 |
| C C C C C C C C C C C C C C C C C C C | THREE TRANSFORMER INSTALLATION THREE PHASE TANGENT AND SLACK DEADEND | REV. DATE: | 06/12/11 |
| | POLE TOP | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 7-26-1 | 8512E287 | DGN |



1. USE XP3 FOR P30A, P30C, OR P30D FRAMING.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 06/26/81 |
| | THREE TRANSFORMER INSTALLATION THREE PHASE TANGENT | REV. DATE: | 06/11/11 |
| | UNDERBUILD | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 7-27-1 | 8512E288 | DGN |

SEE NOTE 1



NOTES

1. USE XP3 FOR P35 FRAMING.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 09/30/71 |
| | THREE TRANSFORMER INSTALLATION THREE PHASE DEADEND | REV. DATE: | 06/12/11 |
| | CROSSARM | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 7-28-1 | 8512E289 | DGN |

XP3



1. USE XPH1 FOR PH20 OR PH30 FRAMING.

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 09/30/71 |
| | SINGLE TRANSFORMER INSTALLATION TWO OR THREE PHASE TANGENT | REV. DATE: | 06/12/11 |
| | CROSSARM CONSTRUCTION | AFFROVAL. | D.FRIEST |
| PROPRIETARY MATERIAL | 7-29-1 | 8512E290 | DGN |



- 1. THIS STANDARD SHOULD ONLY BE USED WHEN INSTALLING A SINGLE TRANSFORMER ON AN **EXISTING 35' POLE** WITH CROSSARM.
- 2. POLE MUST BE IN SOUND CONDITION.
- 3. USE XPH1 FOR PH20 OR PH30 FRAMING.

| Overhead Distribution | | |
|------------------------|---|----------------------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: 05/21/76 |
| | SINGLE TRANSFORMER INSTALLATION TWO OR THREE PHASE TANGENT | REV. DATE: 06/12/11 |
| | CROSSARM CONSTRUCTION, 35' POLE | APPROVAL: B. PRIEST |
| PROPRIETARY MATERIAL | 7-30-1 | 8512E291.DGN |

SEE NOTE 1



NOTES

1. USE XPH2 FOR PH20 OR PH30 FRAMING.

| Overhead Distribution | | | |
|------------------------|---|-------------------------|----------------------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 09/30/71 |
| PROPRIETARY MATERIAL | TWO TRANSFORMER INSTALLATION TWO OR THREE PHASE TANGENT CROSSARM CONSTRUCTION | REV. DATE: APPROVAL: | 06/12/11 B.PRIEST |
| | 7-31-1 | 8512E253 | .DGN |

XPH2



1. USE XPH3 FOR PH30 FRAMING.

| Overhead Distribution | | | |
|------------------------|--|-------------------------|----------------------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 09/30/71 |
| PROPRIETARY MATERIAL | THREE TRANSFORMER INSTALLATION THREE PHASE TANGENT CROSSARM CONSTRUCTION | REV. DATE: APPROVAL: | 06/12/11 B.PRIEST |
| | 7-32-1 | 8512E292 | DGN |

SINGLE PHASE PRIMARY ONE PHASE TO COMMON NEUTRAL



1. USE

SINGLE PHASE ONLY: THIS CONNECTION WILL BE USED FOR ALL SINGLE-PHASE LOADS ON THE 7.2/12.4 AND 12.6/21.8KV SYSTEMS, EXCEPT FOR SPECIAL APPLICATIONS. TRANSFORMERS ARE RATED 7.200/12.470 Y FOR THE 7.2/12.4 KV SYSTEM AND 12000/20780 GRDY OR 12470/21600 FOR THE 12.4/21.6 KV SYSTEM.

2. LOAD CAPACITY

THE CAPACITY IS EQUAL TO THE PERMISSIBLE KVA LOADING OF THE TRANSFORMER.

3. CONNECTIONS

- A. THE TRANSFORMER MUST BE RATED FOR PRIMARY LINE TO NEUTRAL VOLTAGE AND MAY BE CONNECTED TO ANY PRIMARY PHASE AVAILABLE, BUT AS REQUIRED TO MAINTAIN SYSTEM PHASE BALANCING.
- B. SINGLE PRIMARY BUSHING TRANSFORMERS MAY BE USED.

- 1. ARRESTER AND CUTOUT AS REQUIRED. SEE CUTOUT & ARRESTER REQUIREMENTS, PAGE 7-43-1.
- 2. SEE STANDARD PRIMARY FUSE SIZES ON PAGE 7-42-1 FOR STANDARD FUSING.

| Overhead Distribution | | | |
|---------------------------------------|-----------------------------|-------------|-----------|
| Construction Standards | 12 kV TRANSFORMERS | ISSUE DATE: | 02/08/68 |
| R R R R R R R R R R R R R R R R R R R | SINGLE PHASE PRIMARY | REV. DATE: | 06/10/11 |
| JK | ONE PHASE TO COMMON NEUTRAL | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-33-1 | OH7-33-1 | .doc |
| | | | |

2Ø PRIMARY, 1Ø SECONDARY PHASE-TO-PHASE CONNECTION



1. USE

SINGLE PHASE ONLY: THIS CONNECTION MAY BE USED ON THE 7.2/12.4 KV SYSTEM FOR SPECIAL SINGLE PHASE APPLICATIONS. TRANSFORMERS ARE RATED 12000/20780 GRDY, 12470/21600 GRDY, 12000 OR 12470.

2. LOAD CAPACITY

THE CAPACITY IS EQUAL TO THE PERMISSIBLE KVA LOADING OF THE TRANSFORMER.

3. CONNECTIONS

- A. THE TRANSFORMER MUST BE RATED FOR PRIMARY LINE TO LINE VOLTAGE AND MAY BE CONNECTED TO ANY TWO PRIMARY PHASES AVAILABLE, BUT AS REQUIRED TO MAINTAIN SYSTEM PHASE BALANCING.
- B. TWO PRIMARY BUSHING TRANSFORMERS MUST BE USED.

- 1. ARRESTER AND CUTOUT AS REQUIRED. SEE CUTOUT & ARRESTER REQUIREMENTS, PAGE 7-43-1.
- 2. SEE STANDARD PRIMARY FUSE SIZES ON PAGE 7-42-1 FOR STANDARD FUSING.

| Overhead Distribution | | | |
|------------------------|--|-------------|-----------|
| Construction Standards | 12 kV TRANSFORMERS | ISSUE DATE: | 02/08/68 |
| R R | $2\varnothing$ PRIMARY, $1\varnothing$ SECONDARY | REV. DATE: | 06/10/11 |
| | PHASE-TO-PHASE CONNECTION | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-34-1 | OH7-34-1 | .doc |
| | | | |

TRANSFORMER CONNECTIONS OPEN WYE PRIMARY, OPEN DELTA SECONDARY



1. USE

- A. USE THIS CONNECTION FOR ALL THREE-PHASE 240 V LOADS LESS THAN 43 KVA. IF THREE-PHASE PRIMARY IS NOT READILY AVAILABLE, THE THREE-PHASE LOAD SERVED MAY BE INCREASED TO 87 KVA. TRANSFORMERS ARE RATED 7200/12470 Y FOR THE 7.2/12.4 KV SYSTEM, AND 12000/20780 GRD Y OR 12470/21600 GRD Y FOR THE 12.4/21.6 KV SYSTEM.
- B. COMBINATION LOADS: USE THIS CONNECTION FOR ALL LOADS WHICH TOTAL LESS THAN 45 KVA (1Ø & 3Ø) AND FOR LARGER LOADS AS DETERMINED BY THE DESIGNER.
- C. THREE-WIRE SERVICES ARE NOT PERMITTED FOR NEW CONSTRUCTION.

2. LOAD CAPACITY

- A. THREE PHASE ONLY: TWO TRANSFORMERS OF EQUAL SIZE ARE USED AND THE CAPACITY OF THE BANK IS 1.73 TIMES THE PERMISSIBLE KVA LOADING OF EITHER TRANSFORMER
- B. COMBINATION LOADS: THE THREE-PHASE CAPACITY IS 1.73 TIMES THE PERMISSIBLE KVA LOADING OF TRANSFORMER (T). THE SINGLE PHASE CAPACITY IS THE PERMISSIBLE KVA LOADING OF THE TRANSFORMER (L) MINUS 50% OF THE ACTUAL THREE PHASE KVA LOAD.

3. CONNECTIONS

- A. THE DIAGRAM ABOVE IS FOR TRANSFORMERS HAVING LIKE POLARITY. IF THEY HAVE OPPOSITE POLARITY, REVERSE THE SECONDARY CONNECTION OF EITHER TRANSFORMER.
- B. REVERSE PHASE ROTATION BY INTERCHANGING THE TWO SECONDARY PHASE CONDUCTORS (A AND B) WHICH SUPPLY SINGLE-PHASE LOAD. FOR A GROUP OF CUSTOMERS, THIS CHANGE SHOULD BE MADE AT THE TRANSFORMER SECONDARY BUS WHEREAS, FOR A SINGLE CUSTOMER, IT SHOULD BE MADE AT THE SERVICE ENTRANCE.
- C. TRANSFORMERS MUST BE RATED FOR PRIMARY LINE TO NEUTRAL VOLTAGE AND HAVE IDENTICAL NAMEPLATE VOLTAGE RATINGS. THE TRANSFORMER TAPS MUST BE SET TO POSITIONS GIVING THE SAME PERCENTAGES OF PRIMARY WINDINGS
- D. ON 120/240 VOLT INSTALLATIONS, THE VOLTAGE BETWEEN THE POWER LEG (PHASE C) AND NEUTRAL (N) IS APPROXIMATELY 200 VOLTS. 120 VOLT SERVICES ARE NOT TO BE CONNECTED TO THIS PHASE.

| Overhead Distribution | | | |
|------------------------|----------------------|-------------|-----------|
| Construction Standards | 12 kV TRANSFORMERS | ISSUE DATE: | 02/08/68 |
| | OPEN WYE PRIMARY | REV. DATE: | 06/12/11 |
| | OPEN DELTA SECONDARY | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-35-1 | OH7-35-1 | .doc |

TRANSFORMER CONNECTIONS OPEN WYE PRIMARY, OPEN DELTA SECONDARY

E. THREE-WIRE SERVICES ARE NO LONGER PERMITTED FOR NEW CONSTRUCTION. ON EXISTING 240 OR 480 VOLT THREE-PHASE, THREE-WIRE UNGROUNDED SECONDARIES, THE VOLTAGE MEASURED BETWEEN ANY PHASE AND GROUND MAY VARY GREATLY, HOWEVER, THIS IS NOT SIGNIFICANT.

4. IMPEDANCE

A. TRANSFORMER IMPEDANCES DO NOT NEED TO MATCH.

| Overhead Distribution | | | |
|------------------------|----------------------|-------------|-----------|
| Construction Standards | 12 kV TRANSFORMERS | ISSUE DATE: | 02/08/68 |
| | OPEN WYE PRIMARY | REV. DATE: | 06/12/11 |
| | OPEN DELTA SECONDARY | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-35-2 | OH7-35-1 | .doc |
| | | | |

TRANSFORMER CONNECTIONS WYE PRIMARY, DELTA SECONDARY, FLOATING PRIMARY NEUTRAL



1. USE

- A. THREE PHASE ONLY: USE THIS CONNECTION FOR ALL 240 VOLT LOADS GREATER THAN 43 KVA. IN ADDITION, 480 VOLT LOADS GREATER THAN 43 KVA MAY BE SERVED USING THIS CONNECTION IF 7.2/12.4 KV - 240/480 V TRANSFORMERS OF THE CORRECT KVA RATING ARE AVAILABLE. TRANSFORMERS ARE RATED 7200/12470 Y FOR THE 7.2/12.4 KV SYSTEM AND 12000/20780 GRD Y OR 12470/21600 GRD Y FOR THE 12.4/21.6 KV SYSTEM.
- B. COMBINATION LOADS: USE THIS CONNECTION WHEN THE SINGLE-PHASE LOAD DOES NOT EXCEED 2/3 OF THE THREE-PHASE LOAD AND THE COMBINED LOAD IS TOO LARGE TO BE SERVED BY THE OPEN – WYE DELTA CONNECTION.

2. LOAD CAPACITY

- A. THREE PHASE ONLY: THE CAPACITY OF THE BANK IS THREE TIMES THE PERMISSIBLE KVA LOADING OF ONE TRANSFORMER, USING THREE EQUAL SIZE TRANSFORMERS.
- B. COMBINATION LOADS: TRANSFORMERS "T1" AND "T2" EACH SUPPLY 1/3 THE THREE-PHASE LOAD AND 1/3 THE SINGLE-PHASE LOAD. TRANSFORMER "L" SUPPLIES 1/3 THE THREE-PHASE AND 2/3 THE SINGLE-PHASE LOAD.

3. CONNECTIONS

- A. DO NOT CONNECT THE PRIMARY WYE NEUTRAL POINT TO GROUND OR LINE NEUTRAL.
- B. THE DIAGRAM ABOVE IS FOR TRANSFORMERS HAVING LIKE POLARITY. IF ONE TRANSFORMER IS OF OPPOSITE POLARITY, REVERSE ITS PRIMARY CONNECTION. IF IT IS DESIRED TO REVERSE ONE PRIMARY CONNECTION FOR OTHER REASONS, THEN PRIMARY CONNECTIONS OF ALL THREE TRANSFORMERS MUST BE REVERSED.
- C. REVERSE PHASE ROTATION BY INTERCHANGING THE TWO SECONDARY PHASE CONDUCTORS (A AND B) WHICH SUPPLY SINGLE-PHASE LOAD. FOR A GROUP OF CUSTOMERS, THIS CHANGE SHOULD BE MADE AT THE TRANSFORMER SECONDARY BUS, WHEREAS, FOR A SINGLE CUSTOMER, IT SHOULD BE MADE AT THE SERVICE ENTRANCE.
- D. TRANSFORMERS MUST BE RATED FOR PRIMARY LINE TO NEUTRAL VOLTAGE AND HAVE TWO PRIMARY BUSHINGS. NAMEPLATE VOLTAGE RATINGS MUST BE IDENTICAL AND THE TAPS SET TO GIVE THE SAME PERCENTAGE OF THE PRIMARY WINDINGS.

| Overhead Distribution | | | |
|------------------------|------------------------------|-------------|-----------|
| Construction Standards | 12 kV TRANSFORMERS | ISSUE DATE: | 05/24/95 |
| | WYE PRIMARY, DELTA SECONDARY | REV. DATE: | 04/17/13 |
| | FLOATING PRIMARY NEUTRAL | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-36-1 | OH7-36-1. | doc |

TRANSFORMER CONNECTIONS WYE PRIMARY, DELTA SECONDARY, FLOATING PRIMARY NEUTRAL

- E. ON 120/240 VOLT INSTALLATIONS, THE VOLTAGE BETWEEN THE POWER LEG (PHASE C) AND NEUTRAL (N) IS APPROXIMATELY 200 VOLTS. 120 VOLT SERVICES ARE NOT TO BE CONNECTED TO THIS PHASE.
- F. ON 240 OR 480 VOLT THREE-PHASE, THREE-WIRE SECONDARIES, THE VOLTAGE MEASURED BETWEEN ANY PHASE AND GROUND MAY VARY GREATLY, HOWEVER, THIS IS NOT SIGNIFICANT.

4. IMPEDANCE

A. TRANSFORMER IMPEDANCES DO NOT NEED TO MATCH. *THREE-WIRE SECONDARY IS NO LONGER AVAILABLE FOR NEW INSTALLATIONS OR FOR REVAMP OF EXISTING INSTALLATIONS. NO NEUTRAL REQUIRED FOR EXISTING THREE-WIRE SERVICES

- 1. ARRESTER AND CUTOUT AS REQUIRED. SEE CUTOUT & ARRESTER REQUIREMENTS, PAGE 7-43-1.
- 2. SEE STANDARD PRIMARY FUSE SIZES ON PAGE 7-42-1 FOR STANDARD FUSING.

| Overhead Distribution | | | |
|------------------------|------------------------------|-------------|-----------|
| Construction Standards | 12 kV TRANSFORMERS | ISSUE DATE: | 05/24/95 |
| | WYE PRIMARY, DELTA SECONDARY | REV. DATE: | 04/17/13 |
| | FLOATING PRIMARY NEUTRAL | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-36-2 | OH7-36-1 | .doc |
| | | | |

TRANSFORMER CONNECTIONS WYE PRIMARY, DELTA SECONDARY, GROUNDED PRIMARY NEUTRAL



1. USE

- A. DO NOT USE THIS CONNECTION, IT ACTS AS A GROUND SOURCE FOR THE PRIMARY SYSTEM. USE "WYE PRIMARY - DELTA SECONDARY, FLOATING PRIMARY NEUTRAL CONNECTION".
- B. COMBINATION LOADS: USE THIS CONNECTION WHEN THE SINGLE-PHASE LOAD EXCEEDS 2/3 OF THE THREE- PHASE LOAD AND THE COMBINED LOAD IS TOO LARGE TO BE SERVED BY THE OPEN WYE – OPEN DELTA CONNECTION. TRANSFORMERS ARE RATED 7200/12470 Y FOR THE 7.2/12.4 KV SYSTEM AND 12000/20780 GRD Y OR 12470/21600 GRD Y FOR THE 12.4/21.6 KV SYSTEM.

2. LOAD CAPACITY

A. EACH TRANSFORMER SUPPLIES 1/3 THE THREE-PHASE LOAD PLUS SOME PERCENTAGE OF THE SINGLE-PHASE LOAD, WHICH IS DETERMINED PRIMARILY BY THE RELATIVE KVA RATING OF THE TRANSFORMERS USED.

3. CONNECTIONS

- A. THE COMMON WYE POINT OF THE PRIMARY MUST BE CONNECTED TO LINE NEUTRAL
- B. THE DIAGRAM ABOVE IS FOR TRANSFORMERS HAVING LIKE POLARITY. IF ONE TRANSFORMER IS OF OPPOSITE POLARITY, REVERSE ITS PRIMARY CONNECTION. IF IT IS DESIRED TO REVERSE ONE PRIMARY CONNECTION FOR OTHER REASONS, THEN PRIMARY CONNECTIONS OF ALL THREE TRANSFORMERS MUST BE REVERSED
- C. REVERSE PHASE ROTATION BY INTERCHANGING THE TWO SECONDARY PHASE CONDUCTORS (A AND B) WHICH SUPPLY SINGLE-PHASE LOAD. FOR A GROUP OF CUSTOMERS, THIS CHANGE SHOULD BE MADE AT THE TRANSFORMER SECONDARY BUS, WHEREAS, FOR A SINGLE CUSTOMER, IT SHOULD BE MADE AT THE SERVICE ENTRANCE
- D. TRANSFORMERS MUST BE RATED FOR PRIMARY LINE TO NEUTRAL VOLTAGE AND HAVE IDENTICAL VOLTAGE RATINGS. THE TRANSFORMER TAPS MUST BE SET TO POSITIONS GIVING THE SAME PERCENTAGE OF THE PRIMARY WINDINGS. SINGLE PRIMARY BUSHING TRANSFORMERS MAY BE USED IF THEY HAVE LIKE POLARITY.
- E. ON 120/240 VOLT INSTALLATIONS, THE VOLTAGE BETWEEN THE POWER LEG (PHASE C) AND NEUTRAL (N) IS APPROXIMATELY 200 VOLTS. 120 VOLT SERVICES ARE NOT TO BE CONNECTED TO THIS PHASE.

| Overhead Distribution | | | |
|------------------------|------------------------------|-------------|-----------|
| Construction Standards | 12 kV TRANSFORMERS | ISSUE DATE: | 05/24/95 |
| | WYE PRIMARY, DELTA SECONDARY | REV. DATE: | 06/12/11 |
| | GROUNDED PRIMARY NEUTRAL | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-37-1 | OH7-37-1 | .doc |

TRANSFORMER CONNECTIONS WYE PRIMARY, DELTA SECONDARY, GROUNDED PRIMARY NEUTRAL

4. IMPEDANCE

A. IMPEDANCE OF TRANSFORMER "L" SHALL NOT EXCEED 4.1%. THE LARGEST NAMEPLATE IMPEDANCE SHALL NOT BE MORE THAN 1.14 TIMES THE SMALLEST IMPEDANCE.

| Overhead Distribution | | | |
|------------------------|------------------------------|-------------|-----------|
| Construction Standards | 12 kV TRANSFORMERS | ISSUE DATE: | 05/24/95 |
| | WYE PRIMARY, DELTA SECONDARY | REV. DATE: | 06/12/11 |
| | GROUNDED PRIMARY NEUTRAL | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-37-2 | OH7-37-1. | .doc |
| | | | |



1. USE

- A. 120/208 V SECONDARIES ON 7.2/12.4 KV SYSTEMS: USE TO SUPPLY LOADS 500 KVA OR LESS. TRANSFORMERS ARE RATED 7200/12470 Y.
- B. 277/480 V SECONDARIES ON 7.2/12.4 KV SYSTEMS. USE TO SUPPLY LOADS 500 KVA OR LESS (VERIFY TRANSFORMER AVAILABILITY).
- C. 120/208 AND 277/480 V SECONDARIES ON 12.4/21.6 KV SYSTEMS: USE TO SUPPLY ALL LOADS. TRANSFORMERS ARE RATED 12000/20780 GRD Y OR 12470/21600 GRD Y FOR THE 120/208 V SECONDARIES AND 12470/21600 GRD Y FOR THE 277/480 V SECONDARIES.

2. LOAD CAPACITY

A. THE TOTAL BANK CAPACITY IS THREE TIMES THE PERMISSIBLE KVA LOADING OF ONE TRANSFORMER, USING THREE EQUAL SIZE TRANSFORMERS.

3. CONNECTIONS

- A. THE COMMON WYE POINTS OF BOTH PRIMARY AND SECONDARY MUST BE CONNECTED TO LINE NEUTRAL.
- B. FOR 120/208 V BANKS, THE TWO SECONDARY WINDINGS OF EACH TRANSFORMER MUST BE CONNECTED IN PARALLEL FOR 120 V OPERATION. SEE FIG. 2 FOR BANKS 3-15 THRU 3-100 KVA, FIG. 5 FOR BANKS 3-167 KVA, TRANSFORMER CONNECTIONS, GENERAL INFORMATION.
- C. THE DIAGRAM ABOVE IS FOR TRANSFORMERS HAVING LIKE POLARITY. IF ONE TRANSFORMER IS OF OPPOSITE POLARITY, REVERSE ITS PRIMARY CONNECTION. IF IT IS DESIRED TO REVERSE ONE PRIMARY CONNECTION FOR OTHER REASONS, THEN PRIMARY CONNECTIONS OF ALL THREE TRANSFORMERS MUST BE REVERSED.
- D. REVERSE PHASE ROTATION BY INTERCHANGING ANY TWO SECONDARY PHASE CONDUCTORS. FOR A GROUP OF CUSTOMERS, THIS CHANGE SHOULD BE MADE AT THE TRANSFORMER SECONDARY BUS, WHEREAS, FOR A SINGLE CUSTOMER, IT SHOULD BE MADE AT THE SERVICE ENTRANCE.
- E. TRANSFORMERS MUST BE RATED FOR PRIMARY LINE TO NEUTRAL VOLTAGE AND HAVE IDENTICAL NAMEPLATE VOLTAGE RATINGS. THE TRANSFORMER TAPS MUST BE SET TO POSITIONS GIVING THE SAME PERCENTAGE OF PRIMARY WINDINGS. SINGLE BUSHING TRANSFORMERS MAY BE USED IF THEY HAVE LIKE POLARITY.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 06/10/11 |
| ® | 12 KV TRANSFORMERS WYF PRIMARY - WYF SECONDARY | REV. DATE: | |
| | | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-38-1 | OH7-38-1 | .doc |

F. IT IS THE CUSTOMER'S RESPONSIBILITY TO MAINTAIN BALANCED LOADING BETWEEN THE THREE PHASES.

4. IMPEDANCE

A. THE LARGEST IMPEDANCE SHALL NOT BE MORE THAN 1 ½ TIMES THE SMALLEST IMPEDANCE.

- 1. ARRESTER AND CUTOUT AS REQUIRED. SEE CUTOUT & ARRESTER REQUIREMENTS, PAGE 7-43-1.
- 2. SEE STANDARD PRIMARY FUSE SIZES ON PAGE 7-42-1 FOR STANDARD FUSING.



TRANSFORMER CONNECTIONS DELTA PRIMARY, WYE SECONDARY (WYE SYSTEMS)



1. USE

- A. 120/208 V SECONDARIES ON 7.2/12.4 KV SYSTEMS: USE TO SUPPLY LOADS LARGER THAN 500 KVA. TRANSFORMERS OF THE FOLLOWING VOLTAGES MAY BE USED: 12000/20780 GRD Y, 12470/21600 GRD Y, 12000 OR 12470 V.
- B. 277/480 V FOUR-WIRE OR 480 V THREE-WIRE SECONDARIES ON 7.2/12.4 KV SYSTEMS: USE TO SUPPLY ALL LOADS. TRANSFORMERS RATED 12470/12600 GRD Y OR 12470 V MAY BE USED.

2. LOAD CAPACITY

A. THE TOTAL BANK CAPACITY IS THREE TIMES THE PERMISSIBLE KVA LOADING OF ONE TRANSFORMER, USING THREE EQUAL SIZE TRANSFORMERS.

3. CONNECTIONS

- A. FOR 120/208 V BANKS, THE TWO SECONDARY WINDINGS OF EACH TRANSFORMER MUST BE CONNECTED IN PARALLEL FOR 120 V OPERATION. SEE FIG. 2 FOR BANKS 3-15 THRU 3-100 KVA, FIG. 5 FOR BANKS 3-167 KVA THRU 3-500 KVA, TRANSFORMER CONNECTIONS, GENERAL INFORMATION.
- B. THE DIAGRAM ABOVE IS FOR TRANSFORMERS HAVING LIKE POLARITY. IF ONE TRANSFORMER IS OF OPPOSITE POLARITY, REVERSE ITS PRIMARY CONNECTION. IF IT IS DESIRED TO REVERSE ONE PRIMARY CONNECTION FOR OTHER REASONS, THEN PRIMARY CONNECTIONS OF ALL THREE TRANSFORMERS MUST BE REVERSED.
- C. REVERSE PHASE ROTATION BY INTERCHANGING ANY TWO SECONDARY PHASE CONDUCTORS. FOR A GROUP OF CUSTOMERS, THIS CHANGE SHOULD BE MADE AT THE TRANSFORMER SECONDARY BUS, WHEREAS, FOR A SINGLE CUSTOMER, IT SHOULD BE MADE AT THE SERVICE ENTRANCE.
- D. TRANSFORMERS MUST BE RATED FOR PRIMARY LINE TO LINE VOLTAGE AND HAVE TWO PRIMARY BUSHINGS. NAMEPLATE VOLTAGE RATINGS MUST BE IDENTICAL AND THE TAPS SET TO GIVE THE SAME PERCENTAGE OF THE PRIMARY WINDINGS.

| Overhead Distribution | | | |
|------------------------|------------------------------|-------------|-----------|
| Construction Standards | 12 kV TRANSFORMERS | ISSUE DATE: | 10/26/99 |
| | DELTA PRIMARY. WYE SECONDARY | REV. DATE: | 06/12/11 |
| | (WYE SYSTEMS) | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-39-1 | OH7-39-1 | .doc |

TRANSFORMER CONNECTIONS DELTA PRIMARY, WYE SECONDARY (WYE SYSTEMS)

- E. IT IS THE CUSTOMER'S RESPONSIBILITY TO MAINTAIN BALANCED LOADING BETWEEN THE THREE PHASES.
- F. THE 480 V, THREE-WIRE, UNGROUNDED SECONDARY VOLTAGE MEASURED BETWEEN ANY PHASE AND GROUND MAY VARY GREATLY, HOWEVER, THIS IS NOT SIGNIFICANT.

- 1. ARRESTER AND CUTOUT AS REQUIRED. SEE CUTOUT & ARRESTER REQUIREMENTS, PAGE 7-43-1.
- 2. SEE STANDARD PRIMARY FUSE SIZES ON PAGE 7-42-1 FOR STANDARD FUSING.

| Overhead Distribution | | | |
|------------------------|------------------------------|-------------|-----------|
| Construction Standards | 12 kV TRANSFORMERS | ISSUE DATE: | 10/26/99 |
| | DELTA PRIMARY, WYE SECONDARY | REV. DATE: | 06/12/11 |
| | (WYE SYSTEMS) | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-39-2 | OH7-39-1 | .doc |
| | | | |

TEMPORARILY PARALLELING TRANSFORMERS SINGLE AND THREE PHASE



1. USE

A. TEMPORARILY PARALLELING DISTRIBUTION TRANSFORMERS TO PERMIT REMOVAL OF EXISTING TRANSFORMER OR TRANSFORMER BANK WITHOUT INTERRUPTING CONTINUITY OF ELECTRICAL SERVICE.

2. REQUIRED TRANSFORMER CHARACTERISTICS

- A. LIKE POLARITY
- B. IDENTICAL NAMEPLATE VOLTAGE RATING
- C. SAME TAP PERCENTAGES
- D. THE TOTAL IMPEDANCE OF EACH BANK NEED NOT MATCH ONE ANOTHER. IMPEDANCE IS AN IMPORTANT FACTOR IN PERMANENTLY PARALLELED TRANSFORMERS BUT NEED NOT BE CONSIDERED IN TEMPORARY PARALLELING WHEN EITHER BANK OF TRANSFORMERS HAS SUFFICIENT CAPACITY TO CARRY THE TOTAL LOAD ALONE.

3. CONNECTION PROCEDURE

- A. SET TAPS ON NEW TRANSFORMERS IDENTICAL TO THOSE OF EXISTING BANK. TRANSFORMERS WITH DIFFERENT TAP SETTINGS SHOULD NOT BE PARALLELED, EVEN FOR SHORT PERIODS OF TIME, BECAUSE OF RESULTING HIGH CIRCULATING CURRENTS. CONTACT DISTRIBUTION OPERATIONS CENTER WHEN A TAP CHANGE IS NEEDED FOR VOLTAGE CORRECTION.
- B. CONSTRUCT NEW BANK EXACTLY LIKE EXISTING BANK, BOTH PHYSICALLY AND ELECTRICALLY.
- C. MAKE SECONDARY GROUND CONNECTION ON NEW BANK SIMILAR TO THAT ON PRESENT BANK.
- D. ENERGIZE THE PRIMARY OF NEW TRANSFORMER INSTALLATION.
 - 1) OBSERVE PRIMARY CIRCUITRY CAREFULLY WHEN NEW INSTALLATION IS ON A DIFFERENT POLE TO BE SURE THERE IS NO TRANSPOSED PHASING OR OPEN PRIMARY SWITCHES BETWEEN THE TWO INSTALLATIONS. TRANSFORMERS WITH SECONDARIES TO BE PARALLELED SHOULD NEVER BE CONNECTED TO DIFFERENT PRIMARY CIRCUITS.
 - 2) IT IS IMPORTANT TO NOTE THAT THE PRIMARY SIDE OF BOTH THE OLD AND NEW TRANSFORMER INSTALLATIONS MUST BE CONNECTED TO THE PRIMARY LINES AND ENERGIZED AT ALL TIMES DURING THE PERIOD OF TESTING, PARALLELING AND BREAKING PARALLEL BETWEEN THE TWO TRANSFORMER SECONDARIES. THIS IS NECESSARY TO AVOID THE EXTREMELY HIGH MAGNETIZING CURRENTS THAT FLOW IN THE SECONDARY FOR A FEW CYCLES WHEN A TRANSFORMER IS ENERGIZED FROM THE SECONDARY SIDE.

| Overhead Distribution | | 4 | |
|-------------------------------|--------------------------------------|-------------|-----------|
| Construction Standards | 12 kV TRANSFORMERS | ISSUE DATE: | 06/10/11 |
| | TEMPORARILY PARALLELING TRANSFORMERS | REV. DATE: | |
| DR | SINGLE AND THREE PHASE | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-40-1 | OH7-40-1 | .doc |
| | | | |
TEMPORARILY PARALLELING TRANSFORMERS SINGLE AND THREE PHASE

- E. USE A VOLTMETER TO ACCURATELY MEASURE THE VOLTAGE ACROSS THE SECONDARY OF EACH NEW TRANSFORMER BEFORE PARALLELING AND COMPARE WITH THE VOLTAGES OF THE EXISTING BANK TO DETERMINE IF THE CORRECT TAP SETTING HAS BEEN SELECTED. IF EXISTING TRANSFORMERS ARE LOADED TO NAMEPLATE CAPACITY, THEIR SECONDARY VOLTAGE WILL BE APPROXIMATELY 2% LESS THAN THOSE OF THE NEW TRANSFORMERS HAVING THE SAME TAP SETTING WITH NO LOAD. CONSIDER THIS DIFFERENCE WHEN SELECTING IDENTICAL TAP SETTINGS.
- F. MEASURE THE VOLTAGE BETWEEN ANY TWO SECONDARY PHASE WIRES TO BE PARALLELED. IF THE VOLTAGE IS ZERO, OR NEAR ZERO, THE TWO WIRES MAY BE SOLIDLY CONNECTED TOGETHER. PROCEED IN SIMILAR MANNER WITH THE OTHER SECONDARY PHASE WIRES TO BE PARALLELED.
 - 1) WHEN TWO BANKS BEING PARALLELED HAVE THREE-PHASE, THREE-WIRE UNGROUNDED SECONDARY, THE FIRST TWO PHASE WIRES SHOULD BE TEMPORARILY CONNECTED UNTIL IT IS DEFINITELY DETERMINED THAT THE REMAINING WIRES WILL ALSO PARALLEL.
 - 2) THE ONLY VOLTAGE THAT SHOULD BE MEASURED BETWEEN TWO PHASE WIRES BEFORE PARALLELING IS THE SMALL DIFFERENCE BETWEEN LOAD AND NO-LOAD VOLTAGE OF THE TWO BANKS (2% OR LESS), PROVIDING OTHER CONNECTIONS ARE MADE CORRECTLY.

4. DISCONNECT PROCEDURE

- A. AFTER THE PARALLELING HAS BEEN COMPLETED, REMOVE THE EXISTING TRANSFORMER BANK.
- B. WITH THE PRIMARY STILL ENERGIZED, DISCONNECT THE SECONDARY PHASE WIRES FROM THE EXISTING TRANSFORMER INSTALLATION.
- C THE PRIMARY OF THE DISCONNECTED TRANSFORMER INSTALLATION MAY BE DE-ENERGIZED IMMEDIATELY AFTER ALL SECONDARY PHASE WIRES TO BE REMOVED HAVE BEEN DISCONNECTED.
- NOTE: OPEN WYE PRIMARY OPEN DELTA SECONDARY SHOWN, APPLICABLE TO ALL CONNECTIONS.

| Overhead Distribution | | | |
|---------------------------------------|--------------------------------------|-------------|-----------|
| Construction Standards | 12 kV TRANSFORMERS | ISSUE DATE: | 06/10/11 |
| R R R R R R R R R R R R R R R R R R R | TEMPORARILY PARALLELING TRANSFORMERS | REV. DATE: | |
| | SINGLE AND THREE PHASE | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-40-2 | OH7-40-1 | .doc |
| | | | - |



1. **USE** 120/208V. OR 277/480V. SECONDARIES TO SUPPLY 2000 KVA AND LARGER LOADS.

2. LOAD CAPACITY

THE TOTAL BANK CAPACITY IS SIX (6) TIMES THE PERMISSIBLE KVA LOADING OF ONE (1) TRANSFORMER.

- 3. CONNECTIONS
 - A. TRANSFORMERS MUST BE RATED FOR PRIMARY LINE TO LINE VOLTAGE AND HAVE TWO (2) PRIMARY BUSHINGS. NAMEPLATE VOLTAGE RATINGS MUST BE IDENTICAL AND THE TAPS SET TO GIVE THE E PERCENTAGE OF THE PRIMARY WINDING.
 - B. THE DIAGRAMS ABOVE ARE FOR TRANSFORMERS HAVING LIKE POLARITY. IF ONE TRANSFORMER IS OF OPPOSITE POLARITY, REVERSE THE PRIMARY CONNECTION. IF IT'S DESIRED TO REVERSE ONE PRIMARY CONNECTION FOR OTHER REASONS, PRIMARY CONNECTIONS FOR ALL SIX TRANSFORMERS MUST BE REVERSED.
 - C. FOR 120/208V. BANKS, THE TWO SECONDARY WINDINGS OF EACH TRANSFORMER MUST BE CONNECTED IN PARALLEL FOR 120V. OPERATION.
 - D. PHASE ROTATION MAY BE REVERSED BY INTERCHANGING ANY TWO SECONDARY PHASE CONDUCTORS. FOR A GROUP OF CUSTOMERS, THIS CHANGE SHOULD BE MADE AT THE TRANSFORMER SECONDARY BUS. FOR A SINGLE CUSTOMER, IT SHOULD BE MADE AT THE SERVICE ENTRANCE.
 - E. IT IS THE CUSTOMER'S RESPONSIBILITY TO MAINTAIN BALANCED LOADING BETWEEN THE THREE PHASES.
 - F1. METHOD 1: THE NEUTRAL TIE FROM THE CENTER OF THE WYE TO THE CUSTOMER'S BUS SHOULD BE MADE AT THE CENTER PAIR OF TRANSFORMERS.
 - F2. METHOD 2: THE NEUTRAL TIE FROM THE CENTER OF THE WYE TO THE CUSTOMER'S BUS SHOULD BE MADE AT ONE LOCATION FOR EACH THREE POT BANK.
 - G1. METHOD 1: THE TIE FROM THE CENTER OF THE WYE TO THE GROUND GRID OF THE VAULT SHOULD BE MADE AT ONE LOCATION FOR THE ENTIRE BANK.
 - G2. METHOD 2: THE TIE FROM THE CENTER OF THE WYE TO THE GROUND GRID OF THE VAULT SHOULD BE MADE AT ONE LOCATION FOR EACH THREE POT BANK.

4. IMPEDANCE

THE LARGEST NAMEPLATE IMPEDANCE SHALL NOT BE MORE THAN 1.075 TIMES THE SMALLEST IMPEDANCE.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 07/01/76 |
| | TRANSFORMER CONNECTIONS DELTA PRIMARY, WYE SECONDARY | REV. DATE: | 06/12/11 |
| | PARALLEL, 3-POT BANKS | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 7-41-1 | 8512E297 | .DGN |

| TRANSFORMER SIZE KVA | 2400V TRANSFORMERS ON 2.4/4.16KV CKTS. | 7200/12470Y V TRANSFORMERS ON 7.2/12.47KV CKTS. | 12000 OR12000/20780Y OR 12470V TRANSFORMERS ON 7.2/12.47KV CKTS | | 12000 OR 12470/21600Y V TRANSFORMERS ON 12.47/21.6 CKTS. |
|----------------------------|--|---|--|----------|---|
| | "T" FUSE | "T" FUSE | "T" FUSE | "L" FUSE | "T" FUSE |
| 3 | 1-1/2 | 3/4 | 3/4 | 3/4 | 3/4 |
| 5 | 2-1/2 | 1 | 3/4 | 1 | 3/4 |
| 7-1/2 | 4 | 1-1/2 | 1 | 1-1/2 | 1 |
| 10 | 5-1/2 | 2 | 1-1/2 | 2 | 1 |
| 15 | 10 | 2-1/2 | 2 | 2-1/2 | 2 |
| 25 | 15 | 4 | 2-1/2 | 4 | 2-1/2 |
| 37-1/2 | 20 | 5-1/2 | 4 | 5-1/2 | 4 |
| 50 | 30 | 10 | 5-1/2 | 10 | 5-1/2 |
| 75 | 40 | 15 | 10 | 15 | 10 |
| 100 | 50 | 20 | 10 | 20 | 10 |
| 150 | | 30 | 15 | 30 | 15 |
| 167 | | 30 | 20 | 30 | 20 |
| 250 | | 50 | 25 | 50 | 30 |
| 333 | | 65 | 40 | 65 | 40 |
| 500 | | 85N | 50 | 85N | 50 |

| STOCK CODE NUMBERS FOR FUSES | | | | |
|---------------------------------|---------|---------|--|--|
| FUSE SIZE | OPEN | | | |
| 3/4 | 5034484 | 5034373 | | |
| 1 | 5034485 | 5034374 | | |
| 1-1/2 | - | 5034375 | | |
| 2 | 5034486 | 5034376 | | |
| 2-1/2 | 5034487 | 5034377 | | |
| 4 | 5034488 | 5034378 | | |
| 5-1/2 | 5034489 | 5034476 | | |
| 10 | 5034491 | 5034478 | | |
| 15 | 5034492 | 5034479 | | |
| 20 | 5034493 | 5034480 | | |
| 25 | 5034494 | 5034481 | | |
| 30 | 5034495 | 5034482 | | |
| 40 | 5034496 | 5034483 | | |
| 50 | 5034497 | - | | |
| 65 | 5034500 | - | | |
| 85N | 5034502 | - | | |

| Overhead Distribution | | |
|------------------------|---------------------------------|--------------------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: 08/05/ |
| | TRANSFORMER CONNECTIONS | REV. DATE: 05/20/* |
| | STANDARD TRANSFORMER FUSE SIZES | APPROVAL: B. PRIES |
| PROPRIETARY MATERIAL | 7-42-1 | OH7-42-1.doc |



- 1. ALL SINGLE PHASE, OPEN WYE AND CLOSED WYE CONNECTED TRANSFORMERS ARE TO BE FUSED WITH "T" FUSES. OPEN DELTA CONNECTED TRANSFORMERS ARE TO BE FUSED WITH TWO "T" FUSES AND ONE "L" FUSE. CLOSED DELTA CONNECTED TRANSFORMERS ARE TO BE FUSED WITH "L" FUSES. WHEN USING AN "OPEN DELTA" TRANSFORMER ARRANGEMENT, THE "L" FUSE MUST BE SIZED TO MEET THE REQUIREMENTS OF THE LARGER TRANSFORMER.
- 2. TRANSFORMER BANK FUSES MUST BE OF THE SAME STYLE AND MANUFACTURE TO INSURE PROPER COORDINATION. THE PRESENT POLICY IS TO USE:
 - A. KEARNEY TRIPOLINK "TYPE X" (SIZES 3/4A TO 5-1/2A) AND "TYPE KS" (SIZES 7A TO 30A) FOR OPEN CUTOUTS.
 - B. KEARNEY FITALL CABLE "TYPE X" (SIZES 3/4A TO 5-1/2A) AND "TYPE KS" (SIZES 7A TO 100A) FOR HEAVY DUTY ENCLOSED CUTOUTS.

| Overhead Distribution | | | |
|------------------------|--|-------------|----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 08/05/70 |
| | TRANSFORMER CONNECTIONS STANDARD TRANSFORMER FUSE SIZES | REV. DATE. | 06/12/11 |
| | | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 7-42-2 | 8512E230 | .DGN |
| | | | |

TRANSFORMER AND CAPACITOR CUTOUT & ARRESTER REQUIREMENTS NEW CONSTRUCTION

| | | FUSED C | REQUIRED | |
|------------------------------------|--|--|--|--------------------------------|
| SYSTEM VOLTAGE | TRANSFORMER PRIMARY RATING | 3 TO 25 KVA TRANSFORMERS | 37.5 KVA & LARGER TRANSFORMERS | ARRESTER RATING |
| 2.3 KV 25 CYCLE 3-WIRE DELTA | 2.3 KV | OPEN-LINK COMBINATION * 15 KV, 50 AMP MI# 5034369 | DROPOUT TYPE 15 KV, 200 AMP MI# 5034372 | 9 KV MI# 5033988 (GRAY) |
| 7 0/10 / 10/ | 7200/ 12470 Y | DROPOUT TYPE 7.2 KV, 100 AMP MI# 5034369 | DROPOUT TYPE 7.2 KV, 100 AMP MI# 5034369 | 9 KV MI# 5033988 (GRAY) |
| 7.2/12.4 KV WYE SYSTEM | 12000 V 12470 V 12470/21600 GRD Y 12000/20780 GRD Y | DROPOUT TYPE 7.2 KV, 100 AMP MI# 5034369 | DROPOUT TYPE 7.2 KV, 100 AMP MI# 5034369 | 9 KV MI# 5033988 (GRAY) |
| 12.4/21.6 KV WYE SYSTEM | 12470/21600 GRD Y 12000/20780 GRD Y PROPER TAP | DROPOUT TYPE 25 KV, 100 AMP MI# 5034371 (GRAY) | DROPOUT TYPE 25 KV, 100 AMP MI# 5034371 (GRAY) | 18 KV MI# 5034088 (GRAY) |

* USE DROPOUT TYPE CUTOUT (5034369) AND 9 KV ARRESTER ON CLUSTER-MOUNTED (2 & 3) TRANSFORMER BANKS TO MINIMIZE ARCING AND PICK-UP TIME.

FIXED CAPACITOR INSTALLATIONS

| SYSTEM VOLTAGE | CUTOUTS | REQUIRED ARRESTER RATING |
|----------------------------|---|-----------------------------|
| 7.2/12.4 KV WYE SYSTEM | DROPOUT TYPE CUTOUT WITH LINK BREAK, 15 KV, 100 AMP, MI# 5034370 | 9 KV, MI# 5033988 (GRAY) |
| 12.4/21.6 KV WYE SYSTEM | DROPOUT TYPE CUTOUT, 27 KV, 100 AMP, MI# 5034371 | 18 KV, MI# 5034088 (GRAY) |

- 1. CUTOUTS ARE AVAILABLE IN FOUR BASIC TYPES:
 - A. DROPOUT: FUSE LINK ENCLOSED IN A FIBER TUBE; ARC IS EXTINGUISHED IN TUBE, WHICH HANGS DOWN WHEN FUSE IS BLOWN.
 - B. CUTOUT/ARRESTER COMBINATION WITH OPEN LINK-TYPE FUSE; ARC EXTINGUISHED IN AIR.
 - C. DROPOUT TYPE WITH LINK BREAK.
 - D. DROPOUT TYPE WITH LOAD BREAK ARC CHUTE.
- 2. THE ABOVE IS TO BE USED AS A GUIDE FOR NEW CONSTRUCTION.

| Overhead Distribution | | | |
|------------------------|--------------------------------|-------------|-----------|
| Construction Standards | 12 kV TRANSFORMERS | ISSUE DATE: | 05/15/13 |
| R | CUTOUT & ARRESTER REQUIREMENTS | REV. DATE: | |
| | NEW CONSTRUCTION | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-43-1 | OH7-43-1 | .doc |

TRANSFORMER CONNECTIONS TAP SETTING CHART

| TRANSFORMER NAME PLATE VOLTAGE RATING | | | | TAP SETTING | | |
|--|------------|-----------|-------------------|----------------------|--------------------|--|
| PRIMARY | SECONDARY | VOLTAGE | (2-1/2 % EACH) | 7.2/12.47 KV AREA | 12/21.6 KV AREA | |
| | 120/240 | 120/240 | 4 BELOW | 1 OR A | | |
| | 120/240 | 120/240 | 2 ABOVE & 2 BELOW | 3 OR C | | |
| 7200/12470 V | 120/240 OR | 120/208 V | 4 BELOW | 2 OR B | | |
| 1200/12470 T | 120/208 | 120/200 1 | 2 ABOVE & 2 BELOW | 4 OR D | | |
| 12470 | 240/480 | 190 | 4 BELOW | 1 OR A * | | |
| 12470 | 240/400 | 400 | 2 ABOVE & 2 BELOW | 2 OR B | | |
| | 277/480 V | 277/480 V | 4 BELOW | 1 OR A * | | |
| | 211/400 f | 211/40U Y | 2 ABOVE & 2 BELOW | 2 OR B | | |
| | 120/240 | 120/240 | 4 BELOW | 1 OR A * | 1 OR A | |
| | 120/240 | 120/240 | 2 ABOVE & 2 BELOW | 2 OR B | 3 OR C | |
| | 120/240 OR | 100/000 V | 4 BELOW | 1 OR A * | 2 OR B | |
| 12000 | 120/208 | 120/200 1 | 2 ABOVE & 2 BELOW | 3 OR C *** | 4 OR D | |
| 12000/20780 Y | 240/490 | 190 | 4 BELOW | | 1 OR A * | |
| | 240/400 | 400 | 2 ABOVE & 2 BELOW | 1 OR A | 2 OR B | |
| | 277/480 V | 277/480 V | 4 BELOW | | 1 OR A * | |
| | 277/400 1 | 211/400 1 | 2 ABOVE & 2 BELOW | 1 OR A | 2 OR B | |
| | 120/240 | 120/240 | 4 BELOW | | 3 OR C | |
| | 120/240 | 120/240 | 2 ABOVE & 2 BELOW | | 5 OR E | |
| 12470/21600 Y | 120/240 OR | 120/208 V | 4 BELOW | | 4 OR D | |
| | 120/208 | 120/200 1 | 2 ABOVE & 2 BELOW | | 5 OR E ** | |
| | 277/480 Y | 277/480 Y | 2 ABOVE & 2 BELOW | | 4 OR D | |

* TAP RESULTS IN HIGHER THAN DESIRED NOMINAL VOLTAGE. REMAINING TAPS WILL INCREASE SECONDARY VOLTAGE FURTHER.

** TAP RESULTS IN LOWER THAN DESIRED NOMINAL VOLTAGE. REMAINING TAPS WILL DECREASE SECONDARY VOLTAGE FURTHER.

*** TAP SETTING IS FOR ALL NEW INSTALLATIONS. FOR CHANGE OUT OF EXISTING TRANSFORMERS, THE EXISTING TAP SETTING AND VOLTAGE SHOULD BE CHECKED AS SOME OLDER EQUIPMENT WAS DESIGNED FOR 440 VOLTS. FOR THOSE CASES, THE TAP SETTING SHOULD BE 2 OR B.

TO INCREASE THE SECONDARY VOLTAGE, THE PRIMARY TAP SETTING MUST BE LOWERED. TO DECREASE THE SECONDARY VOLTAGE, THE PRIMARY TAP SETTING MUST BE RAISED.

TAP SETTINGS OTHER THAN SHOWN ABOVE SHOULD BE USED TO MAINTAIN THE VOLTAGE AT THE CUSTOMER'S METER WITHIN THE FOLLOWING LIMITS:

| | SERVICE | VOLTAGE |
|------------------------|---------|---------|
| NOMINAL STSTEM VOLTAGE | MINIMUM | MAXIMUM |
| 120/240 | 114/228 | 126/252 |
| 120/208 Y | 114/197 | 126/218 |
| 277/480 Y | 263/456 | 291/504 |
| 480 | 456 | 504 |

NOTES

1. MINIMUM SERVICE VOLTAGE IS GIVEN AT FULL LOAD; MAXIMUM SERVICE VOLTAGE IS GIVEN AT NO LOAD.

| Overhead Distribution | | | |
|------------------------|-------------------------|-------------|-----------|
| Construction Standards | 12 kV TRANSFORMERS | ISSUE DATE: | 06/06/73 |
| | TRANSFORMER CONNECTIONS | REV. DATE: | 06/10/11 |
| | TAP SETTING CHART | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-44-1 | OH7-44-1 | .doc |

| 12024027748024004160720012000325.012.510.86.31.25.72.42.25541.720.818.110.42.081.20.69.421083.341.736.120.84.172.401.39.8315125.062.554.231.36.253.612.081.2525208.0104.090.352.110.406.013.472.0837.5313.0156.0135.078.115.609.015.213.13 | KVA | | | | | VOLTS | | | | |
|--|--|--|--|--|---|--|---|---|--|--|
| 325.012.510.86.31.25.72.42.25541.720.818.110.42.081.20.69.421083.341.736.120.84.172.401.39.8315125.062.554.231.36.253.612.081.2525208.0104.090.352.110.406.013.472.0837.5313.0156.0135.078.115.609.015.213.13 | | 120 | 240 | 277 | 480 | 2400 | 4160 | 7200 | 12000 | 12470 |
| 50417.0208.0180.0104.020.8012.006.944.1775625.0313.0271.0156.031.3018.0010.406.25100833.0417.0361.0208.041.7024.0013.908.331671392.0696.0603.0348.069.6040.1023.2013.902502083.01042.0903.0521.0104.0060.1034.7020.803332775.01388.01191.0694.0139.0080.0046.3027.70 | 3 5 10 15 25 37.5 50 75 100 167 250 333 | 25.0 41.7 83.3 125.0 208.0 313.0 417.0 625.0 833.0 1392.0 2083.0 2775.0 | 12.5 20.8 41.7 62.5 104.0 156.0 208.0 313.0 417.0 696.0 1042.0 1388.0 | 10.8 18.1 36.1 54.2 90.3 135.0 180.0 271.0 361.0 603.0 903.0 1191.0 | 6.3 10.4 20.8 31.3 52.1 78.1 104.0 156.0 208.0 348.0 521.0 694.0 | 1.25 2.08 4.17 6.25 10.40 15.60 20.80 31.30 41.70 69.60 104.00 139.00 | .72 1.20 2.40 3.61 6.01 9.01 12.00 18.00 24.00 40.10 60.10 80.00 | .42 .69 1.39 2.08 3.47 5.21 6.94 10.40 13.90 23.20 34.70 46.30 | .25 .42 .83 1.25 2.08 3.13 4.17 6.25 8.33 13.90 20.80 27.70 | .24 .40 .80 1.20 2.00 3.01 4.01 6.01 8.02 13.40 20.00 26.70 |

SINGLE PHASE

FULL LOAD CURRENT =

KVA X 1000

LINE TO GROUND VOLTAGE

THREE PHASE *

| KVA | | | | | VOLTS | | | | |
|--|--|--|--|---|--|--|--|--|---|
| | 208 | 240 | 480 | 2400 | 4160 | 7200 | 12000 | 12470 | 21600 |
| 15 30 45 75 112.5 150 225 300 500 750 1000 1500 2000 | 41.6 83.3 125.0 208.0 312.0 416.0 625.0 833.0 1388.0 2082.0 2776.0 4164.0 5552.0 | 36.1 72.2 108.0 180.0 271.0 361.0 541.0 722.0 1203.0 1804.0 2406.0 3608.0 4811.0 | 18.0 36.1 54.1 90.2 135.0 180.0 271.0 361.0 601.0 902.0 1203.0 1804.0 2406.0 | 3.61 7.22 10.80 18.00 27.10 36.10 54.10 72.20 120.0 180.0 241.0 361.0 481.0 | 2.08 4.17 6.25 10.4 15.6 20.8 31.3 41.7 69.4 104.0 139.0 208.0 278.0 | 1.20 2.41 3.61 6.01 9.02 12.00 18.00 24.10 40.10 60.10 80.20 120.00 160.00 | .72 1.44 2.17 3.61 5.41 7.22 10.80 14.40 24.10 36.10 48.10 72.20 96.20 | .69 1.39 2.08 3.48 5.21 6.95 10.40 13.90 23.20 34.70 46.30 69.40 92.60 | .40 .80 1.20 2.00 3.01 4.01 6.01 8.02 13.40 20.00 26.70 40.10 53.50 |
| 2500 | 6940.0 | 6014.0 | 3007.0 | 601.0 | 347.0 | 200.00 | 120.00 | 116.00 | 66.80 |

* APPLIES TO THREE-POT BANKS HAVING EQUAL SIZE TRANSFORMERS, OR THREE-PHASE PAD MOUNT.

FULL LOAD CURRENT =

KVA X 1000 (1.732 X LINE TO LINE VOLTAGE)

| Overhead Distribution | | | |
|------------------------|---------------------------|-------------|-----------|
| Construction Standards | 12KV TRANSFORMERS | ISSUE DATE: | 07/11/05 |
| R R | TRANSFORMERS | REV. DATE: | 06/12/11 |
| | FULL LOAD CURRENT IN AMPS | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 7-45-1 | OH7-45-1 | .doc |



- 1. WRAP NEUTRAL CONDUCTOR WITH WHITE PLASTIC TAPE ONLY.
- 2. INSTALL CONNECTORS AND WRAP WITH BLACK PLASTIC TAPE. THEN INSTALL CONNECTOR COVERS AND SECURE WITH TWO WRAPS OF BLACK PLASTIC TAPE AROUND CENTER OF COVER. SEE 1-13-2 AND 1-17-1 FOR CONNECTORS. NO TAPE REQUIRED FOR 1-17-1.
- 3. BUNDLE ALL TRANSFORMER LEAD CONDUCTORS AND SECURE WITH BLACK PLASTIC TAPE.
- 4. SEE TRANSFORMER FRAMING DETAILS IN THIS CHAPTER FOR INDIVIDUAL TRANSFORMER FRAMING.
- 5. TRANSFORMERS 100 KVA AND SMALLER HAVE EYE-BOLT TYPE BUSHING TERMINALS. TRANSFORMER POT LEADS SHALL BE INSERTED DIRECTLY INTO EYE-BOLTS. MULTIPLE POT LEADS SHALL BE CONNECTED USING TRANSFORMER TERMINAL ADAPTERS (2-WIRE 5033983 OR 3-WIRE 5033984).
- 6. TRANSFORMERS 167 KVA AND LARGER HAVE NEMA PAD TYPE BUSHING TERMINALS. TLS TYPE CONNECTORS OR PADDLES ARE USED TO CONNECT POT LEADS TO NEMA PADS. MULTIPLE POT LEADS SHALL BE CONNECTED USING MULTIPLE TLS CONNECTORS.
- 7. BRING ALL CONDUCTORS DOWN 8" FROM SECONDARY TERMINALS AND THEN BEND 90° AND TRAIN INTO BUNDLE. THIS IS TO ALLOW SPACE FOR A RECORDING VOLT-METER AND CLAMP STYLE AMP-METER.
- 8. REFER TO SECONDARY CONNECTION DIAGRAMS IN THIS CHAPTER FOR SPECIFIC POT LEAD CONNECTIONS.
- 9. INDIVIDUAL SERVICES REQUIRE A SINGLE CONNECTOR ONLY.
- 10. ATTACH TRANSFORMER LINE TRAINER (5028503) TO THE BOTTOM EDGE OF A LARGE TRANSFORMER TO PROVIDE AN INSULATED SUPPORT FOR HEAVY SECONDARY LEADS.

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 02/12/76 |
| | TRANSFORMER CONNECTIONS SECONDARY WIRING DIAGRAM | REV. DATE: | 10/21/20 |
| | SINGLE TRANSFORMER | APPROVAL: | J. Luera |
| PROPRIETARY MATERIAL | 7-46-2 | 8512E299 | .DGN |
| | | | |



- 1. WRAP NEUTRAL CONDUCTOR WITH WHITE PLASTIC TAPE ONLY.
- 2. INSTALL CONNECTORS AND WRAP WITH BLACK PLASTIC TAPE. THEN INSTALL CONNECTOR COVERS AND SECURE WITH TWO WRAPS OF BLACK PLASTIC TAPE AROUND CENTER OF COVER. SEE 1-13-2 AND 1-17-1 FOR CONNECTORS. NO TAPE REQUIRED FOR 1-17-1.
- 3. BUNDLE ALL TRANSFORMER LEAD CONDUCTORS AND SECURE WITH BLACK PLASTIC TAPE.
- 4. SEE TRANSFORMER FRAMING DETAILS IN THIS CHAPTER FOR INDIVIDUAL TRANSFORMER FRAMING.
- 5. TRANSFORMERS 100 KVA AND SMALLER HAVE EYE-BOLT TYPE BUSHING TERMINALS. TRANSFORMER POT LEADS SHALL BE INSERTED DIRECTLY INTO EYE-BOLTS. MULTIPLE POT LEADS SHALL BE CONNECTED USING TRANSFORMER TERMINAL ADAPTERS (2-WIRE 5033983 OR 3-WIRE 5033984).
- 6. TRANSFORMERS 167 KVA AND LARGER HAVE NEMA PAD TYPE BUSHING TERMINALS. TLS TYPE CONNECTORS OR PADDLES ARE USED TO CONNECT POT LEADS TO NEMA PADS. MULTIPLE POT LEADS SHALL BE CONNECTED USING MULTIPLE TLS CONNECTORS.
- 7. BRING ALL CONDUCTORS DOWN 8" FROM SECONDARY TERMINALS AND THEN BEND 90° AND TRAIN INTO BUNDLE. THIS IS TO ALLOW SPACE FOR A RECORDING VOLT-METER AND CLAMP STYLE AMP-METER.
- 8. REFER TO SECONDARY CONNECTION DIAGRAMS IN THIS CHAPTER FOR SPECIFIC POT LEAD CONNECTIONS.
- 9. INDIVIDUAL SERVICES REQUIRE A SINGLE CONNECTOR ONLY.
- 10. ATTACH TRANSFORMER LINE TRAINER (5028503) TO THE BOTTOM EDGE OF A LARGE TRANSFORMER TO PROVIDE AN INSULATED SUPPORT FOR HEAVY SECONDARY LEADS.

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 1973 |
| | TRANSFORMER CONNECTIONS TWO TRANSFORMER BANK | REV. DATE: | 10/21/20 |
| | | APPROVAL: | J. Luera |
| | 7-47-2 | 8512E300 | .DGN |
| | | | |



- 1. THERE SHALL BE NO MORE THAN ONE SECONDARY SOURCE AT A POLE.
- 2. THE SECONDARY BUS MUST BE SPLIT A MINIMUM OF TWO FEET FROM THE POLE

| Overhead Distribution | | | |
|------------------------|--|-------------|----------------------|
| Construction Standards | 12kV TRANSFORMERS | ISSUE DATE: | 08/29/79 |
| S | TRANSFORMER CONNECTIONS SECONDARY CONNECTIONS | REV. DATE: | 06/12/11 B.PRIEST |
| | SECONDART SECTIONALIZING | | |
| PROPRIETARY MATERIAL | 7-48-1 | 8512E301 | .DGN |



5028507



0-100 kVA 5028508 II

| THREE TRANSFORMER BANKS | | | | | |
|-------------------------|----------------------------------|---|-----------------------------|--|--|
| BRACKET NUMBER | LUG TYPES AND COMBINATIONS | BOLT SPACING FOR MOUNTING TO POLE | NO. OF ADAPTER PLATES | | |
| I | A | 12" | NONE | | |
| I | A & B | 25-3/4" | NONE | | |





0-50 kVA 1000 #/ POSITION 5028510 III











| THREE TRANSFORMER BANKS | | | | | | |
|-------------------------|----------------------------------|---|-----------------------------|--|--|--|
| BRACKET NUMBER | LUG TYPES AND COMBINATIONS | BOLT SPACING FOR MOUNTING TO POLE | NO. OF ADAPTER PLATES | | | |
| III | A | 12" | NONE | | | |
| IV | A & B | 17-1/2" | NONE | | | |
| V | A & B | 14" | NONE | | | |

MAXIMUM CAPACITY = 2,000 LBS PER TRANSFORMER 5028512 V



| 12 kV TRANSFORMERS | |
|-------------------------------|--|
| TRANSFORMER MOUNTING BRACKETS | |
| THREE TRANSFORMERS, 0-100 kVA | |

ISSUE DATE: 01/04/74 REV. DATE: 12/11/18 APPROVAL: S. DURAN 8512E144.DGN

7-50-1



MAXIMUM CAPACITY = 2,500 LBS PER TRANSFORMER 5028511 9-1/2'' - 19'' POLE DIAMETER VI

| THREE TRANSFORMER BANKS | | | | | |
|-------------------------|----------------------------------|--|-----------------------------|--|--|
| BRACKET NUMBER | LUG TYPES AND COMBINATIONS | BOLT SPACING FOR MOUNTING TO POLE | NO. OF ADAPTER PLATES | | |
| VI | С | NONE | 6 | | |

| Overhead Distribution | | | |
|------------------------|---------------------------------|-------------|----------|
| Construction Standards | 12 kV TRANSFORMERS | ISSUE DATE: | 01/04/74 |
| | TRANSFORMER MOUNTING BRACKETS | REV. DATE: | 12/10/18 |
| PROPRIETARY MATERIAL | THREE TRANSFORMERS, 167-333 kVA | APPROVAL: | S. DURAN |
| | 7-51-1 | 8512E143 | DGN |



1. USE

- A. USE THIS CONNECTION FOR ALL 3 240V LOADS LESS THAN 43KVA. IF THREE PHASE PRIMARY IS NOT READILY AVAILABLE, THE 3 LOAD SERVED MAY BE INCREASED TO 87KVA. TRANSFORMERS ARE RATED 7200/12470 Y FOR THE 7.2/12.4KV SYSTEM.
- B. COMBINATION LOADS: USE THIS CONNECTION FOR ALL LOADS WHICH TOTAL LESS THAN 45KVA (140-8, 34) AND FOR LARGER LOADS AS DETERMINED BY THE DESIGNER.

2. LOAD CAPACITY

- A. THREE PHASE ONLY: TWO TRANSFORMERS OF EQUAL SIZE ARE USED AND THE CAPACITY OF THE BANK IS 1.73 TIMES THE PERMISSIBLE KVA LOADING OF EITHER TRANSFORMER.
- B. COMBINATION LOADS; THE THREE-PHASE CAPACITY IS 1.73 TIMES THE PERMISSIBLE KVA LOADING OF TRANSFORMER (T). THE SINGLE PHASE CAPACITY IS THE PERMISSIBLE KVA LOADING OF THE TRANSFORMER (L) MINUS 58% OF THE ACTUAL THREE PHASE KVA LOAD.

3. CONNECTIONS

A. THE DIAGRAM ABOVE IS FOR TRANSFORMERS HAVING LIKE POLARITY. IF THEY HAVE OPPOSITE POLARITY, REVERSE THE SECONDARY CONNECTION OF EITHER TRANSFORMER.

- B. REVERSE PHASE ROTATION BY INTERCHANGING THE TWO SECONDARY PHASE CONDUCTORS ("A" & "B") WHICH SUPPLY SINGLE PHASE LOAD. FOR A GROUP OF CUSTOMERS THIS CHANGE SHOULD BE MADE AT THE TRANSFORMER SECONDARY BUS WHEREAS, FOR A SINGLE CUSTOMER IT SHOULD BE MADE AT THE SERVICE ENTRANCE.
- C. TRANSFORMERS MUST BE RATED FOR PRIMARY LINE TO NEUTRAL VOLTAGE AND HAVE IDENTICAL NAMEPLATE VOLTAGE. RATINGS. THE TRANSFORMER TAPS MUST BE SET TO POSITIONS GIVING THE SAME PERCENTAGES OF PRIMARY WINDINGS.
 - D. ON 120/240 VOLT INSTALLATIONS, THE VOLTAGE BETWEEN THE POWER LEG (PHASE "C") AND NEUTRAL ("N") IS APPROXIMATELY 200 VOLTS. 120 VOLT SERVICES ARE NOT TO BE CONNECTED TO THIS PHASE.
- E. ON EXISTING 240 OR 480 VOLT 34, THREE-WIRE UNGROUNDED SECONDARIES, THE VOLTAGE MEASURED BETWEEN ANY ANY PHASE AND GROUND MAY VARY GREATLY, HOWEVER, THIS IS NOT SIGNIFICANT.

4. IMPEDANCE

TRANSFORMER IMPEDANCES DO NOT NEED TO MATCH.

| Overhead Distribution Construction Standards | | | |
|---|---|-------------|----------|
| | 12kV TRANSFORMERS | ISSUE DATE: | 06/15/78 |
| | TRANSFORMER CONNECTIONS, SINGLE BUSHING OPEN WYE PRIMARY, OPEN DELTA SECONDARY | REV. DATE: | 04/30/13 |
| | | APPROVAL: | B.PRIEST |
| | 7-52-1 | 8512E298 | DGN |
| | | | |

SECTION 8: 22 kV TRANSFORMERS

| TITLE / DESCRIPTION | PAGE |
|--|--------|
| TRANSFORMER BANK & RISER CODING, BALANCED 3Ø LOADS | 8-2-1 |
| TRANSFORMER BANK & RISER CODING, UNBALANCED 3Ø AND 1Ø LOADS | 8-3-1 |
| TRANSFORMER BANK & RISER CODING, 3Ø LOADS, TWO TRANSFORMER BANKS | 8-4-1 |
| REPLACEMENT OF INSTALLED TRANSFORMERS | 8-5-1 |
| SINGLE TRANSFORMER INSTALLATION, 1 \varnothing TANGENT | 8-6-1 |
| SINGLE TRANSFORMER INSTALLATION, 1 \varnothing SMALL, MEDIUM ANGLE AND DEADEND | 8-7-1 |
| SINGLE TRANSFORMER INSTALLATION, 2 AND 3 \varnothing TANGENT | 8-8-1 |
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| SINGLE TRANSFORMER INSTALLATION, 3Ø DEADEND, CROSSARM | 8-10-1 |
| TWO TRANSFORMER INSTALLATION, 2 AND 3 $arnothing$ TANGENT | 8-11-1 |
| TWO TRANSFORMER INSTALLATION, 2 AND 3 $arnothing$ SMALL, MEDIUM ANGLE AND DEADEND | 8-12-1 |
| TWO TRANSFORMER INSTALLATION, 3Ø DEADEND, CROSSARM | 8-13-1 |
| THREE TRANSFORMER INSTALLATION, 3Ø TANGENT | 8-14-1 |
| THREE TRANSFORMER INSTALLATION, 3Ø DEADEND, CROSSARM | 8-15-1 |
| SINGLE TRANSFORMER INSTALLATION, 2 OR $3 \varnothing$ TANGENT, CROSSARM CONSTRUCTION | 8-16-1 |
| TWO TRANSFORMER INSTALLATION, 2 OR 3 \varnothing TANGENT, CROSSARM CONSTRUCTION | 8-16-2 |
| THREE TRANSFORMER INSTALLATION, 3Ø TANGENT, CROSSARM CONSTRUCTION | 8-17-1 |

| Overhead Distribution | | | |
|------------------------|--------------------|-------------|----------|
| Construction Standards | NDEX | ISSUE DATE: | 05/14/13 |
| | 22 kV TRANSFORMERS | REV. DATE: | |
| | | APPROVAL: | D. Poore |
| PROPRIETARY MATERIAL | 8-1-1 | OH8-1-1. | doc |
| | | | |



Т

PLATFORM BANK

POLE MOUNTED BANK

SECONDARY CONNECTION DIAGRAMS

12.4/21.8 PRIMARY TRANSFORMER INSTALLATIONS

| 277/480 VOLT 3Ø 4-WIRE | | | | | | |
|------------------------|------------------------|-------------------|--------------------|--------------------|--|--|
| CODE NO. | kVA PER TRANSFORMER | kVA OF BANK | T RISER SIZE | N RISER SIZE | | |
| X 312 | 25 | 75 | 2 | 2 | | |
| X 332 | 50 | 150 | 2/0 | 2/0 | | |
| X 342 | 75 | 225 | 4/0 | 2/0 | | |
| X 352 | 100 | 300 | 350 MCM | 4/0 | | |
| X 362 | 167 | 500 | 2-4/0 | 350 MCM | | |

| 120/208 VOLT 3Ø 4-WIRE (SEE NOTE 2) | | | | | | |
|-------------------------------------|------------------------|-------------|--------------------|-----------------|--|--|
| CODE NO. | kVA PER TRANSFORMER | kVA OF BANK | T RISER SIZE | N RISER SIZE | | |
| X 422 | 25 | 75 | 2/0 | 2/0 | | |
| X 442 | 50 | 150 | 500 MCM | 350 MCM | | |
| X 452 | 75 | 225 | 2-350 MCM | 350 MCM | | |
| X 462 | 100 | 300 | 2-350 MCM | 500 MCM | | |

- 1. RISER SIZES GIVEN IN ABOVE TABLES ARE FOR CROSS-LINK POLYETHYLENE INSULATED COPPER CONDUCTORS.
- 2. TRANSFORMERS ARE STOCKED WITH 120/240V SECONDARY AND MUST BE SENT TO THE SHOP FOR RECONNECTION TO 120V SECONDARY BEFORE INSTALLING.

| Overhead Distribution Construction Standards | | | |
|---|---|-------------|-----------|
| | 22kV TRANSFORMERS | ISSUE DATE: | 06/17/93 |
| | TRANSFORMER BANK AND RISER CODING BALANCED 3-PHASE LOADS | REV. DATE: | 06/08/11 |
| | | APPROVAL: | B. PRIEST |
| | 8-2-1 | 8512E191 | .DGN |

| | | 120/240 VOLT 1Ø - 3Ø 4-WIRE | | | |
|----------|-------------|-----------------------------|-------------------------|---------------------------------|-------------------------------------|
| | | CODE N | UMBER | Dand trans | FORMER SIZE |
| CODE NO. | TRANSFORMER | 12 | 22 | 42 | 52 |
| T T | SIZES | 15 KVA | 25 KVA | 50 KVA | 75 KVA |
| X 52 | 10 KVA | | | T # 2 L # 4/0 N # 2/0 | L 350 MCM N # 4/0 |
| X 53 | 15 KVA | T # 2 L # 2 N # 2 | T # 2 L # 2 N # 2 | T # 2 L # 4/0 N # 2/0 | T # 2 L 350 MCM N # 4/0 |
| X 54 | 25 KVA | | T # 2 L # 2 N # 2 | T # 2 L # 4/0 N # 2/0 | T # 2 L 350 MCM N # 4/0 |
| X 56 | 50 KVA | | | T # 4/0 L 350 MCM N # 4/0 | T # 4/0 L 500 MCM N 350 MCM |
| X 57 | 75 KVA | | | | T 350 MCM L 2 # 4/0 N 350 MCM |



PLATFORM BANK



SECONDARY CONNECTION DIAGRAMS 120/240 VOLT 1Ø - 3Ø 4 WIRE 12.4/21.8 KV PRIMARY TRANSFORMER INSTALLATIONS

NOTES

1. TO DESIGNATE THE DESIRED TRANSFORMER BANK - CALL FOR THE ① CODE NUMBER FIRST, THEN ADD THE APPROPRIATE ① CODE NUMBER.

EXAMPLE

TO CALL FOR A TRANSFORMER BANK CONSISTING OF TWO 25 KVA TRANSFORMERS AND ONE 50 KVA TRANSFORMER, THE CODE NUMBER IS X5442 .

X54 INDICATES THE TWO 25 KVA TRANSFORMERS

42 INDICATES THE ONE 50 KVA TRANSFORMER

2. RISER SIZES FOR THE T, L, AND N RISERS ARE GIVEN IN THE BLOCK WHERE X54 AND 42 INTERSECT.

| | 120/240 VOLT 1Ø 3-WIRE | | | | | |
|-------------|------------------------|--------------|--------------|--|--|--|
| CODE NO. | TRANSFORMER SIZE | L RISER SIZE | N RISER SIZE | | | |
| X 622 | 10 KVA | #2 | #2 | | | |
| X 632 | 15 KVA | #2 | #2 | | | |
| X 642 | 25 KVA | #2 | #2 | | | |
| X 662 | 50 KVA | #4/0 | #2/0 | | | |
| X 672 | 75 KVA | 350 MCM | #4/0 | | | |
| X 682 | 100 KVA | 350 MCM | #4/0 | | | |



POLE MOUNTED BANK

SECONDARY CONNECTION DIAGRAM

120/240 VOLT 1Ø 3 WIRE 12.4/21.8 KV PRIMARY TRANSFORMER INSTALLATIONS

| Overhead Distribution Construction Standards | | | |
|---|---|-------------|-----------|
| | 22kV TRANSFORMERS | ISSUE DATE: | 06/17/93 |
| | TRANSFORMER BANK AND RISER CODING UNBALANCED 3Ø AND 1Ø | REV. DATE: | 06/09/10 |
| | | APPROVAL: | B. PRIEST |
| | 8-3-1 | 8512E188 | DGN |

| | | CODE NUMBER LAND TRANSFORMER SIZE L | | | | |
|----------|-------------|-------------------------------------|-------------------|-------------------------|-------------------------------|-------------------------------|
| CODE NO. | TRANSFORMER | 22 | 32 | 42 | 62 | 72 |
| (7) | SIZES | 10 KVA | 15 KVA | 25 KVA | 50 KVA | 75 KVA |
| X 72 | 10 KVA | T # 2 L # 2 N # 2 | T#2 L#2 N#2 | T # 2 L # 2 N # 2 | T # 2 L # 4/0 N # 2/0 | |
| X 73 | 15 KVA | | T#2 L#2 N#2 | T # 2 L # 2 N # 2 | T # 2 L # 4/0 N # 2/0 | T # 2 L 350 MCM N # 4/0 |
| X 74 | 25 KVA | | | T # 2 L # 2 N # 2 | T # 2 L # 4/0 N # 2/0 | T # 2 L 350 MCM N # 4/0 |
| X 76 | 50 KVA | | | | T # 4/0 L # 4/0 N # 4/0 | T # 2 L 350 MCM N # 4/0 |

120/240 VOLT 1Ø - 3Ø 4 WIRE

1. TO DESIGNATE THE DESIRED TRANSFORMER BANK - CALL FOR THE CODE NUMBER FIRST, THEN ADD THE APPROPRIATE CODE NUMBER.

EXAMPLE

TO CALL FOR A TRANSFORMER BANK CONSISTING OF A 25 KVA TRANSFORMERS AND A 50 KVA TRANSFORMER, THE CODE NUMBER IS X7462.

X74 INDICATES THE 25 KVA TRANSFORMER.

62 INDICATES THE 50 KVA TRANSFORMER.

2. RISER SIZES FOR THE T, L, AND N RISERS ARE GIVEN IN THE BLOCK WHERE **X74** AND **62** INTERSECT.



POLE MOUNTED BANK

SECONDARY CONNECTION DIAGRAM 120/240 VOLT 1Ø - 3Ø 4 WIRE 12.4/21.8 KV PRIMARY TRANSFORMER INSTALLATIONS



REPLACEMENT OF TRANSFORMER(S) IN X5242 – X5752, X622 – X672 AND X7222 – X7672 TYPE BANKS

| CODE NO. | TRANSFORMER KVA |
|----------|-----------------|
| X9102 | 10 |
| X9152 | 15 |
| X9252 | 25 |
| X9502 | 50 |
| X9752 | 75 |

USE THESE CODE NUMBERS FOR REPLACEMENT OF ONE, TWO OR THREE TRANSFORMERS IN A 120/240 VOLT BANK OR A 240 VOLT 30 BANK.

| CODE NO. | TRANSFORMER KVA |
|----------|-----------------|
| X10252 | 25 |
| X10502 | 50 |
| X10752 | 75 |
| X101002 | 100 |
| X101672 | 167 |

USE THESE CODE NUMBERS FOR REPLACEMENT OF ONE, TWO OR THREE TRANSFORMERS IN A 277/480 VOLT BANK.

| Overhead Distribution | | | |
|------------------------|------------------------|-------------|-----------|
| Construction Standards | 22kV TRANSFORMERS | ISSUE DATE: | 06/17/93 |
| R R | REPLACEMENT OF | REV. DATE: | 05/24/11 |
| | INSTALLED TRANSFORMERS | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 8-5-1 | OH8-5-1. | doc |
| | | | |

XP1 SEE NOTE 1



| POLE | SRP | TELCO |
|--------|-------|------------|
| HEIGHT | GRADE | ATTACHMENT |
| 40' | Z | В |

NOTES

1. USE XP1 FOR P102 FRAMING.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | 22kV TRANSFORMERS | ISSUE DATE: | 11/24/74 |
| | SINGLE TRANSFORMER INSTALLATION SINGLE PHASE TANGENT | REV. DATE: | 06/08/11 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 8-6-1 | 8512E302 | DGN |

SEE NOTE 1



| POLE | SRP | TELCO |
|--------|-------|------------|
| HEIGHT | GRADE | ATTACHMENT |
| 40' | Z | |

NOTES

1. USE XP1 FOR P112, P112A, P132, P132A OR P152 FRAMING.

| Overhead Distribution Construction Standards | 22KV TRANSFORMERS | ISSUE DATE: | 12/13/74 |
|---|--|-------------|-----------|
| | SINGLE TRANSFORMER INSTALLATION | REV. DATE: | 06/08/10 |
| | SINGLE PHASE SMALL, MEDIUM ANGLE AND DEADEND | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 8-7-1 | 8512E303 | B.DGN |

XP1



| POLE | SRP | TELCO |
|--------|-------|------------|
| HEIGHT | GRADE | ATTACHMENT |
| 45' | Z | В |

XP1

1. USE XP1 FOR P202A, P202D, P302A OR P302D FRAMING.

| Overhead Distribution Construction Standards | 22KV TRANSFORMERS SINGLE TRANSFORMER INSTALLATION TWO AND THREE PHASE TANGENT | ISSUE DATE: REV. DATE: APPROVAL: | 10/16/74 06/08/10 B. PRIEST |
|---|---|--|-----------------------------------|
| PROPRIETARY MATERIAL | 8-8-1 | 8512E304 | .DGN |





| POLE | SRP | TELCO |
|--------|-------|------------|
| HEIGHT | GRADE | ATTACHMENT |
| 45' | Z | В |

1. USE XP1 FOR P222, P222A, P232, P232A, P252A, P322, P322A, P332A OR P352A FRAMING.

| Overhead Distribution | | | |
|------------------------|--|-------------|-----------|
| Construction Standards | 22KV TRANSFORMERS | ISSUE DATE: | 10/16/74 |
| | SINGLE TRANSFORMER INSTALLATION TWO AND THREE PHASE | REV. DATE: | 06/08/10 |
| | SMALL, MEDIUM ANGLE AND DEADEND | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 8-9-1 | 8512E305 | 5.DGN |

XP1 SEE NOTE 1



| POLE | SRP | TELCO |
|--------|-----------|------------|
| HEIGHT | GRADE | ATTACHMENT |
| 45' | Z + 4'-6" | В |

NOTES

1. USE FOR XP1 FOR P352 FRAMING.

| Overhead Distribution | | | |
|------------------------|---------------------------------|-------------|-----------|
| Construction Standards | 22KV TRANSFORMERS | ISSUE DATE: | 12/23/74 |
| | SINGLE TRANSFORMER INSTALLATION | REV. DATE: | 06/08/11 |
| | THREE PHASE DEADEND, CROSSARM | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 8-10-1 | 8512E306 | .DGN |

XP2 SEE NOTE 1



NOTES

POLE HEIGHT

45'

SRP GRADE

Z + 4'-6"

1. USE XF2 FOR P202A, P202D, P302A OR P302D FRAMING.

| Overhead Distribution Construction Standards | 22KV TRANSFORMERS TWO TRANSFORMER INSTALLATION TWO AND THREE PHASE TANGENT | ISSUE DATE: 11/20/74 REV. DATE: 06/08/10 APPROVAL: B. PRIEST |
|---|--|--|
| PROPRIETARY MATERIAL | 8-11-1 | 8512E307.DGN |
| | | |

XP2 SEE NOTE 1



NOTES

1. USE XP2 FOR P222, P222A, P232, P232A, P252A, P322, P322A, P332A, OR P352A FRAMING.



XP2 SEE NOTE 1



| POLE | SRP | TELCO |
|--------|-----------|------------|
| HEIGHT | GRADE | ATTACHMENT |
| 45' | Z + 4'-6" | В |

NOTES

1. USE XP2 FOR P352 FRAMING.

| Overhead Distribution | | • | |
|------------------------|-------------------------------|-------------|-----------|
| Construction Standards | 22KV TRANSFORMERS | ISSUE DATE: | 08/22/74 |
| | TWO TRANSFORMER INSTALLATION | REV. DATE: | 06/08/10 |
| | THREE PHASE DEADEND, CROSSARM | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 8-13-1 | 8512E309 | .DGN |





1. USE XP3 FOR P302A OR P302D FRAMING.

| Overhead Distribution Construction Standards | | | |
|---|--------------------------------|-------------|-----------|
| | 22KV TRANSFORMERS | ISSUE DATE: | 11/05/74 |
| | THREE TRANSFORMER INSTALLATION | REV. DATE: | 06/08/10 |
| | THREE PHASE TANGENT | APPROVAL: | B. PRIEST |
| | 8-14-1 | 8512E310 |).DGN |



1. XP3 FOR P352 FRAMING.

| Overhead Distribution | | | |
|------------------------|--------------------------------|-------------|-----------|
| Construction Standards | 22KV TRANSFORMERS | ISSUE DATE: | 11/16/74 |
| | THREE TRANSFORMER INSTALLATION | REV. DATE: | 06/08/10 |
| | THREE PHASE DEADEND, CROSSARM | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 8-15-1 | 8512E31 | 1 DGN |

XPH1 SEE NOTE 1



| POLE HEIGHT | SRP GRADE | TELCO ATTACHMENT |
|----------------|--------------|---------------------|
| 40' | Z | В |
| 45' | Z + 4'-6" | В |

NOTES

1. USE XPH1 FOR PH102 OR PH82 FRAMING.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | 22KV TRANSFORMERS | ISSUE DATE: | 12/04/74 |
| | SINGLE TRANSFORMER INSTALLATION TWO OR THREE PHASE TANGENT | REV. DATE: | 06/08/11 |
| | CROSSARM CONSTRUCTION | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 8-16-1 | 8512E312 | DGN |

SEE NOTE 1



| POLE HEIGHT | SRP GRADE | TELCO ATTACHMENT | |
|----------------|--------------|---------------------|--|
| 40' | Z | В | |
| 45' | Z + 4'-6" | В | |

NOTES

1. USE XPH2 FOR PH102 OR PH82 FRAMING.

| Overhead Distribution | | |
|------------------------|--|----------------------|
| Construction Standards | 22KV TRANSFORMERS | ISSUE DATE: 11/06/74 |
| | TWO TRANSFORMER INSTALLATION TWO OR THREE PHASE TANGENT | REV. DATE: 06/09/10 |
| | CRUSSARM CONSTRUCTION | ATTROVAL BITRIEST |
| PROPRIETARY MATERIAL | 8-16-2 | 8512E316.DGN |

XPH2

SEE NOTE 1



| POLE HEIGHT | SRP GRADE | TELCO ATTACHMENT |
|----------------|--------------|---------------------|
| 40' | Z | В |
| 45' | Z + 4'-6" | |

NOTES

1. USE XPH3 FOR PH102 OR PH82 FRAMING.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | 22KV TRANSFORMERS | ISSUE DATE: | 11/11/74 |
| ® | THREE TRANSFORMER INSTALLATION THREE PHASE TANGENT | REV. DATE: | 06/08/11 |
| | CROSSARM CONSTRUCTION | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 8-17-1 | 8512E317 | .DGN |

XPH3

SECTION 9: 12 kV LINE DEVICES

| TITLE / DESCRIPTION | PAGE |
|--|----------|
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| Overhead Distribution | | | |
|------------------------|-------|-------------|------------|
| Construction Standards | | ISSUE DATE: | 06/04/13 |
| S | | REV. DATE: | 10/17/24 |
| | | APPROVAL: | J. Robbins |
| PROPRIETARY MATERIAL | 9-1-1 | OH9-1-1 | l.doc |

THIS GUIDE CONCERNS THE INSTALLATION OR REMOVAL OF THREE PHASE SETS OF LINE DISCONNECT SWITCHES.

COMPATIBLE UNIT CODING FOR "LINE DEVICES"

OVERHEAD LINE SWITCHES HAVE BEEN ASSIGNED COMPATIBLE UNIT CODES WITH VARIOUS PREFIX DESIGNATIONS AS FOLLOWS:

- DB = BLADE DISCONNECT SWITCHES, OPERATED SINGLE PHASE
- DC = CUTOUT TYPE DISCONNECT SWITCHES, OPERATED SINGLE PHASE
- DG = GANG OPERATED, THREE PHASE UNITIZED (PRE-ASSEMBLED) SWITCH TO BE USED FOR NEW CONSTRUCTION
- KPF = GANG OPERATED, THREE PHASE SWITCH TO BE ASSEMBLED WHEN INSTALLED ON A WOOD POLE; NO LONGER STANDARD FOR NEW CONSTRUCTION
- DR = RECLOSURE, THREE PHASE, TO BE SPECIAL ORDERED FOR SPECIFIC APPLICATIONS
- DS = SECTIONALIZER, THREE PHASE, TO BE SPECIAL ORDERED FOR SPECIFIC APPLICATIONS

| Overhead Distribution Construction Standards | | | |
|---|---|-------------|-----------|
| | 12 kV LINE DEVICES INSTRUCTIONAL GUIDE | ISSUE DATE: | 03/23/94 |
| | | REV. DATE: | 05/27/11 |
| | | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 9-2-1 | OH9-2-1.doc | |
| | | | |


600 AMP BLADE DISCONNECT

SWITCH BLADE MAY BE ENERGIZED IN OPEN POSITION. CLEARANCE MUST BE MAINTAINED BETWEEN SWITCH BLADE AND ANY OTHER EQUIPMENT OR GROUNDS.

| Overhead Distribution | | | |
|------------------------|-------------------------------------|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 04/30/94 |
| | 12kV LINE DEVICES SWITCH OPENING | REV. DATE: | 06/01/11 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 9-3-1 | 8512E52 | .DGN |



| Overhead Distribution | | | |
|------------------------|-------------------------------------|-------------|-----------|
| Construction Standards | 12kV LINE DEVICES | ISSUE DATE: | 1989 |
| | 600 AMPERE LINE DISCONNECTS | REV. DATE: | 06/09/11 |
| | VERTICAL CONSTRUCTION, TANGENT ONLY | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 9-4-1 | 8512E318 | .DGN |



| Overhead Distribution | | | |
|------------------------|---------------------------------------|-------------|-----------|
| Construction Standards | 12kV LINE DEVICES | ISSUE DATE: | 06/04/96 |
| | 600 AMPERE LINE DISCONNECTS, VERTICAL | REV. DATE: | 06/06/11 |
| | DOUBLE DEADEND, INTERMEDIATE ANGLE | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 9-5-1 | 8512E233 | .DGN |

CONDUCTORS-A2, A266, A30, A397

FOR ALUMINUM CONDUCTOR ONLY



NOTES

1. MAXIMUM POLE HEIGHT OF 45'

| Overhead Distribution | | | |
|------------------------|---------------------------------------|-------------|----------|
| Construction Standards | 12kV LINE DEVICES | ISSUE DATE: | 1985 |
| | 600 AMPERE LINE DISCONNECTS, VERTICAL | REV. DATE: | 06/06/11 |
| | DEADEND WITH 180 DEG.SLACK SPAN | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 9-6-1 | 8512E319 | .DGN |

DB38_



DB6

DB6VE SWITCH ASSEMBLY WITH EXTENSION STRAPS

> IF UNDERBUILD, DESIGNATE CIRCUIT SEPERATION





| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | 12kV LINE DEVICES | ISSUE DATE: | 04/30/91 |
| SN | CUTOUT TYPE SWITCHES, 300 AMP SWITCHED SLACK SPAN TO CUSTOMER WELL, VERTICAL | REV. DATE: | 06/10/13 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 9-9-1 | 8512E327 | .DGN |
| | | | |





| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | 12kV LINE DEVICES | ISSUE DATE: | 04/30/91 |
| | CUTOUT TYPE SWITCHES, 300 AMP SWITCHED SLACK SPAN TO CUSTOMER WELL | REV. DATE: | 06/08/11 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 9-9-2 | 8512E323 | B.DGN |



9-9-3

DC1

FUSE SIZE 100 A. OR LESS

DC1A FUSE SIZE GREATER THAN 100 A.



- 1. CUTOUT LEADS ARE #2 CU, INSULATED WHICH ARE SUITABLE FOR USE WITH 200 AMP FUSES.
- 2. SECTIONALIZER MAY BE MOUNTED IN DC1 CUTOUTS. SECTIONALIZER MUST BE ORDERED SPECIFICALLY FOR JOB.
- 3. FUSE SIZE SHALL BE IDENTIFIED ON POLE USING 2 INCH ALUMINUM NUMBERS AND CHARACTER.
- 4. SEE HIGH FIRE RISK AREA IN DDS FOR USE OF DOCL. 5091194







| DCH2 | 2 PHASE | |
|-------|---------|--------------------------|
| DCH3 | 3 PHASE | FUSE SIZE 100 A. OR LESS |
| DCH2A | 2 PHASE | FUSE SIZE GREATER |
| DCH3A | 3 PHASE | THAN 100 A. |



| Overhead Distribution | | | |
|------------------------|--------------------------------------|-------------|----------|
| Construction Standards | 12kV LINE DEVICES | ISSUE DATE: | 08/01/93 |
| | TWO OR THREE PHASE DEADEND, CROSSARM | REV. DATE: | 09/16/21 |
| | FUSED LATERAL | APPROVAL: | J. LUERA |
| PROPRIETARY MATERIAL | 9-12-1 | 8512E214 | .DGN |
| | | | |



| Overhead Distribution | | | |
|------------------------|------------------------------------|-------------|----------|
| Construction Standards | 12kV LINE DEVICES | ISSUE DATE: | 08/02/93 |
| | TWO OR THREE PHASE BUCK SLACK SPAN | REV DATE | 09/16/21 |
| | FUSED LATERAL | APPROVAL: | J. LUERA |
| PROPRIETARY MATERIAL | 9-13-1 | 8512E215 | .DGN |

DGH6

NOTES

2. OPERATING ROD GUIDES

8FT FROM GRADE.

GREATER THAN 5FT.

5FT FROM SWITCH CRANK.

CONDUCTORS A266, A397

USE WHEN FUTURE EQUIPMENT WILL BE **INSTALLED ON POLE**



| 101 | | | GRADE |
|------|--|----------|-------------------------|
| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
| Α | DEADEND CLAMP, VARIOUS | 6 | BD_ |
| В | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 12 | 5034719 |
| С | STRAP, EXTENSION, 14" CLEVIS-TONGUE | 6 | 5034722 |
| D | ROD, INTERPHASE, 1 IN. DIA., FIBERGLASS | 30 | 5034616 |
| Е | SPLICE, FOR INTERPHASE ROD | 1 | 5034631 |
| F | SWITCH, UNITIZED POLE MOUNT, 600A | 1 | 5034638 |

| Overhead Distribution | REV: REPL CLEVIS & STRAIGHT EXT. W/ THE ONE 14" CLEVIS-TONGUE EXT. | | |
|------------------------|--|----------------------|--|
| Construction Standards | 12 kV LINE DEVICES | ISSUE DATE: 07/22/93 | |
| | GANG OPERATED SWITCH, 600 A UNITIZED | REV. DATE: 12/26/24 | |
| | SPACE RESERVED FOR FUTURE EQUIPMENT ON POLE | APPROVAL: J. ROBBINS | |
| PROPRIETARY MATERIAL | 9-14-1 | 8512E206.DGN | |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | DEADEND CLAMP, VARIOUS | 0 OR 6 | BD_ |
| 2 | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 0 OR 6 | 5034719 |
| 3 | ROD, INTERPHASE, 1 IN. DIA., FIBERGLASS | 30 | 5034616 |
| 4 | SPLICE, FOR INTERPHASE ROD | 1 | 5034631 |
| 5 | SWITCH, UNITIZED POLE MOUNTED, 600A | 1 | 5034638 |
| 6 | LINK | 3 | 5034732 |

| Overhead Distribution Construction Standards | | - | |
|---|------------------------------------|-------------|-----------|
| | 12kV LINE DEVICES | ISSUE DATE: | 05/20/91 |
| | GANG OPERATED SWITCHES | REV. DATE: | 04/25/13 |
| PROPRIETARY MATERIAL | 600A UNITIZED, EXISTING HORIZONTAL | APPROVAL: | B. PRIEST |
| | 9-15-1 | 8512E115 | 5.DGN |



FRONT VIEW

NOTES

1. FOR DOUBLE CIRCUIT THE TANGENT CIRCUIT MUST BE REBUILT PER P65. THE BOLT HEADS FOR THE EXTENDED BRACKETS SHALL BE ON THE POLE SIDE.

| Overhead Distribution | REV: REPL CLEVIS & STRAIGHT EXT. W/ THE ONE 14" CLEVIS-TONGUE EXT. | | | |
|------------------------|--|----------------------|--|--|
| Construction Standards | 12 kV LINE DEVICES | ISSUE DATE: 05/20/91 | | |
| | GANG OPERATED SWITCHES | REV. DATE: 12/26/24 | | |
| | 600 A UNITIZED, VERTICAL | APPROVAL: J. ROBBINS | | |
| PROPRIETARY MATERIAL | 9-16-1 | 8512E116.DGN | | |









| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| Α | ROD, INTERPHASE, 1 IN. DIA., FIBERGLASS | 30 | 5034616 |
| В | SPLICE, FOR INTERPHASE ROD | 1 | 5034631 |
| С | SWITCH, UNITIZED POLE MOUNTED, 600A | 1 | 5034639 |
| D | INSULATOR, SUSPENSION, 6-1/4 IN., CLEVIS | 12 | 5034719 |
| Е | DEADEND CLAMP, VARIOUS | 6 | BD_ |
| F | STRAP, EXTENSION, 14" CLEVIS-TONGUE | 6 | 5034722 |

- 1. THE BOLT EYE OF OPERATING ROD GUIDE SHALL NOT BE GREATER THAN 5 FEET FROM SWITCH CRANK.
- 2. BOTTOM BOLT EYE OF OPERATING ROD GUIDE SHALL NOT BE LOWER THAN 8 FEET FROM GRADE.
- 3. INTERMEDIATE BOLT EYES SHALL NOT BE SPACED GREATER THAN 5 FEET.

| Overhead Distribution | REV: REPL CLEVIS & STRAIGHT EXT. W/ THE ONE 14" CLEVIS-TONGUE EXT. | | | |
|------------------------|--|----------------------|--|--|
| Construction Standards | 12 kV LINE DEVICES | ISSUE DATE: 05/20/91 | | |
| | GANG OPERATED SWITCHES | REV. DATE: 12/26/24 | | |
| | 600 A UNITIZED, VERTICAL | APPROVAL: J. ROBBINS | | |
| PROPRIETARY MATERIAL | 9-16-2 | 8512E441.DGN | | |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| 1 | ROD, INTERPHASE, 1 IN. DIA., FIBERGLASS | 30 | 5034616 |
| 2 | SPLICE, FOR INTERPHASE ROD | 1 | 5034631 |
| 3 | SWITCH, UNITIZED POLE MOUNTED, 600A | 1 | 5034639 |
| 4 | BRACKET, SIDE MOUNT, HOT GALV. EXTENDED | 6 | 5028506 |
| 5 | PIN, INSULATOR, 5/8" X 1.5 IN. SHORT | 6 | 5028641 |
| 6 | INSULATOR, PIN, 12KV, PORCELAIN GRAY | 6 | 5034594 |
| 7 | SIDE TIE, VARIOUS | 6 | BPT2_ |

| Overhead Distribution Construction Standards | | | |
|---|-------------------------------------|-------------|----------|
| | 12kV LINE DEVICES | ISSUE DATE: | 05/23/95 |
| | GANG OPERATED SWITCHES, PARALLELING | REV DATE | 05/01/13 |
| | 600A UNITIZED, VERTICAL | APPROVAL: | B.PRIEST |
| | 9-17-1 | 8512E246 | DGN |
| | | | |

DGH6PB_

CONDUCTORS A266, A397



- 1. DIMENSION MAY BE 1'-5 3/4" (W/STEEL BRACES), 1'-8 1/4" (WOOD BRACES) OR 1'-8 7/8" (10' ARMS). SEE NOTE 2.
- 2. 2" MINIMUM.
- 3. SEE PRIMARY CONSTRUCTION UNITS SECTION FOR CONSTRUCTION DETAIL.
- 4. SEE DGR6 IN LINE DEVICES SECTION FOR CONSTRUCTION DETAIL.
- 5. JUMPERS TO BE A397 OR SAME AS LARGEST PHASE CONDUCTOR.

| Overhead Distribution | | | |
|------------------------|-------------------------------|-------------|-----------|
| Construction Standards | 12kV LINE DEVICES | ISSUE DATE: | 11/14/02 |
| | GANG OPERATED PARALLEL SWITCH | REV. DATE | 06/06/11 |
| | BRACED ARMS | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 9-18-1 | 8512E333 | DGN |



- 1. SEE PH39__ FOR ARM CONSTRUCTION DETAILS AND OPTIONS.
- 2. SEE DGR6, IN LINE DEVICES SECTION, FOR CONSTRUCTION DETAIL.
- 3. JUMPERS TO BE A397 OR SAME AS LARGEST PHASE CONDUCTOR.

| Overhead Distribution | | | |
|------------------------|-------------------------------|-------------|-----------|
| Construction Standards | 12kV LINE DEVICES | ISSUE DATE: | 11/05/02 |
| | GANG OPERATED PARALLEL SWITCH | REV. DATE: | 06/06/11 |
| PROPRIETARY MATERIAL | DEADEND ARMS | APPROVAL: | B. PRIEST |
| | 9-19-1 | 8512E332 | DGN |



| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|--|----------|-------------------------|
| 1 | SWITCH, UNITIZED POLE MOUNTED, 600A | 1 | 5034638 |
| 2 | BRACKET, POST INSULATOR | 3 | 5034741 |
| 3 | INSULATOR, VERTICAL LINE POST | 3 | 5034587 |
| 4 | CLAMP, PINTLE BOLT | 3 | 5028394 |
| 5 | CONNECTOR, ALUM, NON-TENSION, HOT LINE | 6 | 5033937 |
| 6 | SPLICE, FOR INTERPHASE ROD | 1 | 5034631 |
| 7 | ROD, INTERPHASE, 1 IN. DIA. FIBERGLASS | 30 | 5034616 |

- 1. DIMENSION MAY BE 1'- 5 3/4" (W/STEEL BRACES), 1'- 8 1/4" (WOOD BRACES) OR 1'-8 7/8" (10' ARMS). SEE NOTE 2.
- 2. SEE DGR6 IN LINE DEVICES SECTION FOR CONSTRUCTION DETAIL.
- 3. JUMPERS TO BE A397 OR SAME AS LARGEST PHASE CONDUCTOR.
- 4. LOOSEN THE U-BOLT HOLDING EACH SINGLE PHASE SWITCH TO THE SWITCH ARM. AFTER BOLTING THE LINE POST INSULATOR (5034587) TO BRACKET (5034741) ATTACH THE BRACKET TO THE SWITCH ARM VIA THE U-BOLT.

| Overhead Distribution | | | |
|------------------------|--|-------------|-----------|
| Construction Standards | 12kV LINE DEVICES | ISSUE DATE: | 04/20/06 |
| | GANG OPERATED SWITCHES 600 A UNITIZED PARALLELING | REV. DATE: | 05/01/13 |
| | CROSSING CIRCUITS | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 9-20-1 | 8512E353 | DGN |



| ITEM | | | QUANTITY | | MATERIAL | |
|------|----------|---|----------|-------|-------------|--|
| | | | | DGR6B | ITEM NUMBER | |
| | 1 | ROD, INTERPHASE, 1 IN. DIA., FIBERGLASS | 30 | 0 | 5034616 | |
| | 2 | SPLICE, FOR INTERPHASE ROD | 1 | 0 | 5034631 | |
| | 3 | SWITCH, UNITIZED POLE MOUNTED, 600A | 1 | 0 | 5034637 | |
| 4 | (NOTE 2) | TUBING, SPLIT, 3/8" | 0 | 14' | 5035615 | |
| 5 | (NOTE 2) | GUARD, BUSHING (BIRD GUARD) | 0 | 3 | 5034511 | |
| 6 | (NOTE 2) | ARRESTER, LIGHTING, HD (YELLOW GROUND LEAD) | 0 | 3 | 5033991 | |
| 7 | (NOTE 2) | BRACKET, TRI-MOUNT | 0 | 1 | 5034220 | |

| Overhead Distribution Construction Standards | | | |
|---|---------------------------|-------------|----------|
| | 12kV LINE DEVICES | ISSUE DATE: | 05/20/91 |
| | GANG OPERATED SWITCHES | REV. DATE: | 04/30/13 |
| | 600A UNITIZED, FOR RISERS | APPROVAL: | B.PRIEST |
| | 9-21-1 | 8512E114 | DGN |

DGVM6__ CONDUCTORS A266, A397





| Overhead Distribution | REV: REPL CLEVIS & STRAIGHT EXT. W/ THE ONE 14" CLEVIS-TONGUE EXT. & MOVE DETAILS, BOM & NOTES | | |
|------------------------|--|----------------------|--|
| Construction Standards | 12 kV LINE DEVICES | ISSUE DATE: 11/30/94 | |
| | GANG OPERATED SWITCHES | REV. DATE: 12/26/24 | |
| | 600 A UNITIZED, VERTICAL, ON STEEL POLE | APPROVAL: J. ROBBINS | |
| PROPRIETARY MATERIAL | 9-22-1 | 8512E70.DGN | |









| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| Α | ROD, INTERPHASE, 1 IN. DIA., FIBERGLASS | 30 | 5034616 |
| В | SPLICE, FOR INTERPHASE ROD | 1 | 5034631 |
| С | SWITCH, UNITIZED POLE MOUNTED, 600A | 1 | 5034639 |
| D | BRACKET, BOX | 3 | 5028961 |
| E | LINK, SEGMENT | 36 | 5027576 |
| F | LINK, TAKEUP ASSEMBLY | 6 | 5028488 |
| G | LINK, VANG | 6 | 5029395 |
| Н | INSULATOR, SUSPENSION, 6-1/4" CLEVIS | 12 | 5034719 |
| | DEADEND CLAMP, VARIOUS | 6 | BD_ |
| J | STRAP, EXTENSION, 14" CLEVIS-TONGUE | 6 | 5034722 |

1. OPERATING ROD GUIDES

- TOP BOLT EYE SHALL NOT BE GREATER THAN 5FT FROM SWITCH CRANK

- BOTTOM BOLT EYE SHALL NOT BE LOWER THAN 8FT FROM GRADE
- INTERMEDIATE BOLT EYES SHALL NOT BE SPACED GREATER THAN 5FT.

| Overhead Distribution | REV: REPL CLEVIS & STRAIGHT EXT. W/ THE ONE 14" CLEVIS-TONGUE EXT. | | |
|------------------------|--|----------------------|--|
| Construction Standards | 12 kV LINE DEVICES | ISSUE DATE: 11/30/94 | |
| | GANG OPERATED SWITCHES | REV. DATE: 12/26/24 | |
| | 600 A UNITIZED, VERTICAL, ON STEEL POLE | APPROVAL: J. ROBBINS | |
| PROPRIETARY MATERIAL | 9-22-2 | 8512E552.DGN | |



G.O.S. 600 A UNITIZED DGH6____ A266, A397 INTELLIRUPTER DRPW___ A266, A397



| Overhead Distribution | REV: REPL CLEVIS & STRAIGHT EXT. W/ THE ONE 14" CLEVIS-TONGUE EXT. | | |
|------------------------|--|----------------------|--|
| Construction Standards | 12 kV LINE DEVICES | ISSUE DATE: 03/21/19 | |
| PROPRIETARY MATERIAL | S&C INTELLIRUPTER, RC PULSE RECLOSER FAN | REV. DATE: 12/26/24 | |
| | WOOD POLE, FLAT CONSTRUCTION | APPROVAL: J. ROBBINS | |
| | 9-24-1 | 8513E506.DGN | |



- 1. CONNECT GROUND LUGS TO POLE NEUTRAL WITH #2 COPPER 5033850.
- 2. ATTACH LIFTING SLING ONLY TO LIFTING BRACKETS. LIFT INTELLIRUPTER UNTIL SLING IS TAUT. UNBOLT INTELLIRUPTER FROM STEEL BRACKETS ATTACHED TO SHIPPING SKIDS. BOLT INTELLIRUPTER TO POLE.
- 3. MUST HAVE BUCKET TRUCK ACCESS.
- 4. 5034742 WEIGHS 1,100 LBS. EPA= 4,266 INCHES SQUARE.
- 5. CONTROL ENGINEERING TO PROVIDE ANTENNA DETAIL.
- 6. CONNECT ARRESTER HOT LEAD (#6 CU SOL 600 V, 5033863) TO PHASE TERMINAL WITH TAP LUG 5016725. TRAIN HOT LEAD TO SIDE.
- 7. HOLD TAG OPERATOR.
- 8. G.O.S. OPERATION ROD.
- 9. ARRESTER GROUND LEAD 5033990.
- 10. A397 OR SAME AS PHASE CONDUCTOR. COVER WITH INSULATED TUBING 5035617.
- 11. STICK OPERATED INTEGRAL DISCONNECT.
- 12. COORDINATE WITH CONTROL ENGINEERING FOR INSTALLATION OF RADIO CONTROLLER (RTU).

| Overhead Distribution | | | |
|------------------------|--|-------------|----------|
| Construction Standards | 12 kV LINE DEVICES | ISSUE DATE: | 02/24/09 |
| PROPRIETARY MATERIAL | S & C INTELLIRUPTER, RC PULSE RECLOSER | REV. DATE: | 06/10/19 |
| | WOOD POLE, FLAT CONSTRUCTION | APPROVAL: | M. DYER |
| | 9-24-2 | 8513E572 | DGN |





PM1



PRIMARY METERING DETAIL

NOTES

1. CONTACT POLICY, PROCEDURES & STANDARDS TO USE THIS ON 22KV.

| Overhead Distribution | REV: REPL CLEVIS & STRAIGHT EXT. W/ THE ONE 14" CLEVIS-TONGUE EXT. | | |
|------------------------|--|----------------------|--|
| Construction Standards | | ISSUE DATE: 10/13/71 | |
| | 12 KV LINE DEVICES 12 KV PRIMARY METERING INSTALLATION | REV. DATE: 12/26/24 | |
| | | APPROVAL: J. ROBBINS | |
| PROPRIETARY MATERIAL | 9-27-1 | 8512E259.DGN | |

STOCK CODE DEFINITION TABLE

- A. 5022489 8" X 8" X 6" JUNCTION BOX
- B. 5022778 1" LIQUID TIGHT CONNECTOR 14 EA.
- C. 5022634 LIQUID TIGHT FLEX CONDUIT 65' 5021220 1" CONDUIT STRAPS – 15 EA.
- D. 5031100 ALUMAFORM CLUSTER MOUNT
- E. 5008706 1/0 COPPER WIRE, 600V
- F. 5033845 #6 COPPER WIRE, 600V BARE GROUNDING 5035188 FRAMING CHANNEL – 10' (BRACKETS FOR J-BOX & METER BOX)
- G. 5008700 #6 COPPER WIRE, 600V INSULATED
- H. METER SOCKET M/S

CT'S AND PT'S ORDERED BY METER SHOP ON A JOB-BY-JOB BASIS:

| 5008690 | #10 COPPER WIRE, 600V BLACK | | |
|---------|-----------------------------|-----------|----------|
| 5008691 | #10 COPPER WIRE, 600V RED | | |
| 5008693 | #10 COPPER WIRE, 600V WHITE | | |
| 5008694 | #10 COPPER WIRE, 600V BLUE | l | METERING |
| 5008583 | #14 COPPER WIRE, 600V BLACK | (| M/S WIRE |
| 5008584 | #14 COPPER WIRE, 600V RED | | |
| 5008585 | #14 COPPER WIRE, 600V WHITE | | |
| 5008582 | #14 COPPER WIRE, 600V BLUE | \square | |
| | | | |

| Overhead Distribution | | | |
|-------------------------|--------------------------------|-------------|-----------|
| Construction Standards | 12 kV LINE DEVICES | ISSUE DATE: | 10/13/71 |
| SNP [®] | PRIMARY METERING INISTALLATION | REV. DATE: | 05/22/13 |
| | FRIMARY METERING INSTALLATION | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 9-27-2 | OH9-27-2 | .doc |
| | | | |



| Overhead Distribution | | | |
|------------------------|--|-------------|-----------------|
| Construction Standards | 12kV LINE DEVICES | ISSUE DATE: | 01/01/72 |
| | DISCONNECT SWITCHES 400 AMPERE LINE TENSION DISCONNECTS | REV. DATE: | 06/11/11 |
| | CROSSARM CONSTRUCTION | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 9-28-1 | 8512E252 | 2.DGN |

DBL4__





- 1. THIS STANDARD IS DESIGNED FOR INSTALLATION ON A 40' POLE. FOR USE WITH TALLER POLES, ORDER ONE BKM FOR EACH 5' OF LENGTH IN EXCESS OF 40'.
- 2. FOR IN-LINE CONSTRUCTION ONLY. SINGLE DEAD END CANNOT BE MADE TO HORIZONTAL KPF.
- 3. SPACE INTERMEDIATE GUIDES 5' APART.

| Overhead Distribution | | | |
|------------------------|---|-------------|-----------|
| Construction Standards | | ISSUE DATE: | 09/01/88 |
| S | 12kV LINE DEVICES IN-LINE GANG OPERATED HORIZONTAL KPF | REV. DATE: | 06/01/11 |
| | | APPROVAL: | B. PRIEST |
| PROPRIETARY MATERIAL | 9-29-1 | 8512E3. | DGN |
| | | | |

DB6PV





| Overhead Distribution | | | |
|------------------------|------------------------------|-------------|-----------------|
| Construction Standards | 12kV LINE DEVICES | ISSUE DATE: | 02/13/75 |
| PROPRIETARY MATERIAL | 600A PARALLELING DISCONNECTS | REV. DATE: | 06/11/11 |
| | VERTICAL CONSTRUCTION | APPROVAL: | B.PRIEST |
| | 9-30-1 | 8512E326 | .DGN |

DB6P



| Overhead Distribution | | | |
|------------------------|------------------------------|-------------|----------|
| Construction Standards | 12kV LINE DEVICES | ISSUE DATE: | 01/01/72 |
| PROPRIETARY MATERIAL | 600A PARALLELING DISCONNECTS | REV DATE: | 06/06/11 |
| | CROSSARM CONSTRUCTION | APPROVAL: | B.PRIEST |
| | 9-31-1 | 8512E257 | .DGN |

| UNIT DESCRIPTION | COMPATIBLE UNIT CODE |
|---|-------------------------|
| SWITCH, DIRECTIONAL, 15KV, 200 AMP, 3-PHASE | RAT152 |
| DISCONNECTS, SINGLE-POLE, 15KV, 100 AMP | RD151 |
| DISCONNECTS, SINGLE-POLE, 15KV, 200 AMP | RD152 |
| DISCONNECTS, SINGLE-POLE, 15KV, 300 AMP | RD153 |
| DISCONNECTS, THREE-POLE, 15KV, 250 AMP, GANG-OPERATED | RK1525 |
| SWITCH, OIL, 15KV, 200 AMP, STREETLIGHT | RLD2 |
| SWITCH, RECLOSER, 15KV, UNDER 600 AMP, 3-PHASE | RCL15 |
| SWITCH, SECTIONALIZER, 15KV, UNDER 600 AMP, 3-PHASE | RAD15 |
| REGULATOR, VOLTAGE, 14KV, UNDER 600 AMP, 3-PHASE | RR34 |
| DISCONNECTS, SINGLE-POLE, 15KV, 400 AMP | RD154 |

| Overhead Distribution | | | |
|------------------------|----------------------|--------------|-----------|
| Construction Standards | 12 kV LINE DEVICES | ISSUE DATE: | 10/13/71 |
| SKP ® | FOR RETIREMENT OF | REV. DATE: | 06/09/11 |
| | NON-STANDARD DEVICES | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 9-32-1 | OH9-32-1.doc | |
| | | | |
5095101



| CONDUCTOR DIA. RANGE | DESCRIPTION |
|----------------------|---|
| 0.3" - 1.25" | FAULT INDICATOR, 1Ø OH 3/0 - 1,000 KCMIL AAC & ACSR |

- 1. WILL FLASH 6 RED LEDS 30 TIMES PER MINUTE (6 PER MINUTE ON LOW BATTERY) WHEN THE FAULT CURRENT EXCEEDS THE TRIP RATING. RESETS AFTER 8HRS.
- 2. FLASHES OF A SINGLE AMBER LED ON ONE SIDE INDICATES LOW BATTERY WHICH SHOULD BE REPLACED WITHIN 6 MONTHS.
- 3. REFER TO DOC'S FAULT INDICATOR OPERATING PROCEDURE FOR INSTALLATION, REMOVAL AND MAINTENANCE.

| Overhead Distribution Construction Standards | | |
|---|----------------------------|----------------------|
| | 12 kV & 22 kV LINE DEVICES | ISSUE DATE: 10/17/23 |
| | OVERHEAD FAULT INDICATOR | REV. DATE: |
| | (DOC USE ONLY) | APPROVAL: J. ROBBINS |
| | 9-33-1 | 8512E551.DGN |

SECTION 10: 22 kV LINE DEVICES

| TITLE / DESCRIPTION | PAGE |
|--|--------|
| DISCONNECT SWITCH, 600 AMP, SHIELD WIRE CONFIGURATION | 10-2-1 |
| DISCONNECT SWITCH, 600 AMP, CROSSARM CONSTRUCTION | 10-3-1 |
| GANG OPERATED SWITCH, 600 AMP UNITIZED, VERTICAL | 10-4-1 |
| S & C INTELLIRUPTER, RC PULSE RECLOSER, WOOD POLE, FLAT CONSTRUCTION | 10-5-1 |
| COMPATIBLE UNIT CODING FOR RETIREMENT OF NON-STANDARD DEVICES | 10-6-1 |

| Overhead Distribution | | | |
|------------------------|--------------------|-------------|----------|
| Construction Standards | | ISSUE DATE: | 05/14/13 |
| SN | 22 kV LINE DEVICES | REV. DATE: | 06/17/19 |
| | | APPROVAL: | J. Luera |
| PROPRIETARY MATERIAL | 10-1-1 | OH10-1-1 | doc |





PROPRIETARY MATERIAL

DISCONNECT SWITCHES, 600 AMP CROSSARM CONSTRUCTION ISSUE DATE: 03/08/75 REV. DATE: 06/04/13 APPROVAL: B.PRIEST 8512E328.DGN R2, R30, AC312



| Overhead Distribution | REV: REPL CLEVIS & STRAIGHT EXT. W/ THE ONE 14" CLEVIS-TONGUE EXT. & MOVE DETAILS, BOM & NOTES | | |
|------------------------|--|----------------------|--|
| Construction Standards | 22 kV LINE DEVICES | ISSUE DATE: 08/08/05 | |
| PROPRIETARY MATERIAL | GANG OPERATED SWITCHES | REV. DATE: 12/26/24 | |
| | 600 A UNITIZED, VERTICAL | APPROVAL: J. ROBBINS | |
| | 10-4-1 | 8512E351.DGN | |

DGV62







| ITEM | MATERIAL DESCRIPTION | QUANTITY | MATERIAL ITEM NUMBER |
|------|---|----------|-------------------------|
| Α | ROD, INTERPHASE, 1 IN. DIA., FIBERGLASS | 30 | 5034616 |
| В | SPLICE, FOR INTERPHASE ROD | 1 | 5034631 |
| С | SWITCH, UNITIZED POLE MOUNTED, 600A | 1 | 5034639 |
| D | INSULATOR, SUSPENSION, 6-1/4 IN. CLEVIS | 12 | 5034719 |
| Е | DEADEND CLAMP, VARIOUS | 6 | BD_ |
| F | STRAP, EXTENSION, 14" CLEVIS-TONGUE | 6 | 5034722 |

NOTES

1. FOR DOUBLE CIRCUIT THE TANGENT CIRCUIT MUST BE REBUILT PER P65. THE BOLT HEADS FOR THE EXTENDED BRACKETS SHALL BE ON THE POLE SIDE.

- 2. OPERATING ROD GUIDES
 - TOP BOLT EYE SHALL NOT BE GREATER THAN 5FT FROM SWITCH CRANK
 - BOTTOM BOLT EYE SHALL NOT BE LOWER THAN 8FT FROM GRADE
 - INTERMEDIATE BOLT EYES SHALL NOT BE SPACED GREATER THAN 5FT.

| Overhead Distribution | REV: REPL CLEVIS & STRAIGHT EXT. W/ THE ONE 14" CLEVIS-TONGUE EXT. | | |
|------------------------|--|----------------------|--|
| Construction Standards | 22 kV LINE DEVICES | ISSUE DATE: 08/08/05 | |
| | GANG OPERATED SWITCHES | REV. DATE: 12/26/24 | |
| | 600 A UNITIZED, VERTICAL | APPROVAL: J. ROBBINS | |
| PROPRIETARY MATERIAL | 10-4-2 | 8512E553.DGN | |

DETAIL B



| Overhead Distribution | REV: REPL CLEVIS & STRAIGHT EXT. W/ THE ONE 14" CLEVIS-TONGUE EXT. | | |
|------------------------|--|----------------------|--|
| Construction Standards | 22 kV LINE DEVICES | ISSUE DATE: 06/17/19 | |
| | S&C INTELLIRUPTER, RC PULSE RECLOSER | REV. DATE: 12/26/24 | |
| | WOOD POLE, FLAT CONSTRUCTION | APPROVAL: J. ROBBINS | |
| PROPRIETARY MATERIAL | 10-5-1 | 8513E591.DGN | |



DETAIL B



- 1. CONNECT GROUND LUGS TO POLE NEUTRAL WITH #2 COPPER 5033850.
- 2. ATTACH LIFTING SLING ONLY TO LIFTING BRACKETS. LIFT INTELLIRUPTER UNTIL SLING IS TAUT. UNBOLT INTELLIRUPTER FROM STEEL BRACKETS ATTACHED TO SHIPPING SKIDS. BOLT INTELLIRUPTER TO POLE.
- 3. MUST HAVE BUCKET TRUCK ACCESS.
- 4. 5076103 WEIGHS 1,100 LBS. EPA= 4,266 INCHES SQUARE.
- 5. CONTROL ENGINEERING TO PROVIDE ANTENNA DETAIL.
- 6. CONNECT ARRESTER HOT LEAD (#6 CU SOL 600 V, 5033863) TO PHASE TERMINAL WITH TAP LUG 5016725. TRAIN HOT LEAD TO SIDE.
- 7. HOLD TAG OPERATOR.
- 8. G.O.S. OPERATION ROD.
- 9. ARRESTER GROUND LEAD 5033990.
- 10. RC312 OR SAME AS PHASE CONDUCTOR. COVER WITH INSULATED TUBING 5035617.
- 11. CONTROL MODULE 5081582 INCLUDED IN CU.
- 12. TANGENT CONSTRUCTION ONLY. MAXIMUM LINE TENSION DIFFERENCE 1,500 POUNDS PER POSITION.
- 13. THE REQUIRED COMMUNICATION MODULE MUST BE REQUESTED SEPARATELY: MIMO MX TORANADO RADIO 5081717 OR MDS INET 900-DG RADIO RTU-DFAINETRADIO (5081618).
- 14. COORDINATE WITH CONTROL ENGINEERING FOR INSTALLATION OF RADIO CONTROLLER (RTU).

| Overhead Distribution | | | |
|------------------------|--|-------------|----------|
| Construction Standards | 22 kV LINE DEVICES | ISSUE DATE: | 06/17/19 |
| | S & C INTELLIRUPTER, RC PULSE RECLOSER | REV. DATE: | |
| | WOOD POLE, FLAT CONSTRUCTION | APPROVAL: | M. DYER |
| PROPRIETARY MATERIAL | 10-5-2 | 8513E592 | DGN |

| UNIT DESCRIPTION | COMPATIBLE UNIT |
|---|-----------------|
| SWITCH, RECLOSER, 22 KV, UNDER 600 AMP, 3 PHASE | RCL22 |
| DISCONNECTS, SINGLE POLE, 22 KV, 400 AMP | RD224 |

| Overhead Distribution | | | |
|------------------------|------------------------------------|-------------|-----------|
| Construction Standards | 22 kV LINE DEVICES | ISSUE DATE: | 01/30/94 |
| ® | COMPATIBLE UNIT CODING FOR | REV. DATE: | 06/01/11 |
| | RETIREMENT OF NON-STANDARD DEVICES | APPROVAL: | B. Priest |
| PROPRIETARY MATERIAL | 10-6-1 | OH10-6-1 | .doc |
| | | | |

SECTION 11: 12 kV CAPACITORS

| TITLE / DESCRIPTION | PAGE |
|--|-----------|
| INSTRUCTIONAL GUIDE | 11-2-1 |
| PRIMARY AND GROUND CONNECTIONS | 11-3-1 |
| APPROXIMATE WEIGHTS FOR VARIOUS 12 KV CAPACITORS | 11-4-1 |
| SWITCHED BANK, VERTICAL OR HORIZONTAL CONSTRUCTION | 11-5-1 |
| 450-1200 KVAR SWITCHED BANK, VERTICAL DOUBLE CIRCUIT TANGENT CONSTRUCTION | 11-6-1 |
| SWITCHED BANK, CROSSARM CONSTRUCTION | 11-7-1 |
| CAPACITOR CONTROL GROUNDING INSTRUCTIONS | 11-8-1 |
| CONTROL WIRING DIAGRAM | 11-9-1 |
| PROTECTIVE EQUIPMENT AND FUSING, 12.47 KV CAPACITOR FUSES | . 11-10-1 |
| PROCEDURE FOR TESTING DISTRIBUTION CAPACITOR BANKS, RATED 7.2 KV FOR 12.4 KV SYSTEM | . 11-11-1 |
| COMPATIBLE UNIT CODING FOR MAINTENANCE OF CAPACITOR BANKS | . 11-12-1 |
| COMPATIBLE UNIT CODING FOR RETIREMENT OF NON-STANDARD CAPACITOR BANKS | . 11-13-1 |
| CURRENT CONTROL CAPACITOR WIRING DIAGRAM | . 11-14-1 |

| Overhead Distribution Construction Standards | INDEX 12 kV CAPACITORS | ISSUE DATE: REV. DATE: APPROVAL: | 05/14/13 12/03/21 J. Robbins |
|---|---------------------------|--|------------------------------------|
| PROPRIETARY MATERIAL | 11-1-1 | OH11-1- | -1.doc |
| | | | |

THIS GUIDE PERTAINS TO THE INSTALLATION OF CAPACITOR BANKS ON THE 7.2/12.4 KV DISTRIBUTION SYSTEM.

COMPATIBLE UNIT CODING FOR "C" SECTION

GENERAL CRITERIA

THE CAPACITOR BANKS IN THIS SECTION CONSIST OF PRE-ASSEMBLED UNITS. THE THREE TYPES TO BE INSTALLED ARE:

- 450 KVAR SWITCHED BANK
- 600 KVAR SWITCHED BANK
- 900 KVAR SWITCHED BANK
- 1,200 KVAR SWITCHED BANK

THE PREFIX LETTERS OF THE COMPATIBLE UNIT CODE DESIGNATE THE POLE FRAMING ON WHICH THE CAPACITOR BANK IS INSTALLED. THE FOLLOWING CODES INDICATE:

- CA = VERTICAL CONSTRUCTION
- CAH = CROSSARM CONSTRUCTION (FOR REFERENCE ONLY SEE PAGE 11-5-1)

THE NEXT CHARACTER IN THE CODE DESIGNATES THE TOTAL KVAR:

- 45 = 450 KVAR
- 6 = 600 KVAR
- 9 = 900 KVAR
- 12 = 1,200 KVAR

THE CAPACITOR BANK CONSISTS OF SINGLE-PHASE CAPACITORS.

SWITCHED CAPACITOR BANKS

ALL SWITCHED CAPACITOR BANKS REQUIRE AN EXTERNAL 120 V SOURCE FOR OPERATION. IF 120 V IS AVAILABLE ON THE CAPACITOR BANK POLE, OR NEAR ENOUGH TO THE BANK POLE TO RUN A 120 V SECONDARY, THEN THE CONTROLS SHOULD BE SERVED FROM THE AVAILABLE SOURCE.

IF 120 V IS NOT AVAILABLE, THEN A 1/2 KVA SINGLE-PHASE TRANSFORMER WILL HAVE TO BE INSTALLED TO PROVIDE THE CONTROL VOLTAGE FOR THE BANK SWITCHING. THIS IS ACCOMPLISHED BY ADDING AN "X" TO THE CAPACITOR BANK CODE.

EXAMPLE: <u>COMPATIBLE UNIT</u>

CA6X

CAH9X

POLYCHLORINATED BIPHENYL (PCB) CONTENT

DUE TO GOVERNMENTAL REGULATIONS, IT IS NECESSARY TO ACCOUNT FOR CAPACITORS FILLED WITH POLYCHLORINATED BIPHENYL (PCB) DIELECTRIC FLUID. THERE MUST NOT BE ANY PCB CAPACITORS LEFT WITHIN THE DISTRIBUTION SYSTEM. IF ANY IS FOUND, CONTACT POWER DELIVERY ENGINEERING.

| PROPRIETARY MATERIAL | 11-2-1 | OH11-2-1 | .doc |
|------------------------|----------------------------|-------------|----------|
| | INSTRUCTIONAL GUIDE | APPROVAL: | M. Dyer |
| ® | OVERHEAD CAPACITOR SECTION | REV. DATE: | 05/15/19 |
| Construction Standards | 12 kV CAPACITORS | ISSUE DATE: | 04/08/91 |
| Overhead Distribution | | | |



NOTES

1. THREE STINGERS TO LINE, MAXIMUM.



NOTES

1. THREE STINGERS TO LINE, MAXIMUM.

| Overhead Distribution | | | |
|---------------------------------------|--|-------------|----------|
| Construction Standards | | ISSUE DATE: | 07/09/02 |
| C C C C C C C C C C C C C C C C C C C | 12 kV CAPACITORS PRIMARY AND GROUND CONNECTIONS | REV. DATE: | 05/27/11 |
| | | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 11-3-1 | 8512E341 | .DGN |

APPROXIMATE WEIGHTS FOR VARIOUS 12 KV CAPACITORS

SWITCHED BANKS

| SIZE | WEIGHT (LBS.) |
|------------|---------------|
| 450 KVAR | 498 |
| 600 KVAR | 519 |
| 900 KVAR | 711 |
| 1,200 KVAR | 831 |

IF UNSWITCHED, SUBTRACT 135 LBS.

| SIZE | WEIGHT (LBS.) |
|----------|---------------|
| 150 KVAR | 45 |
| 200 KVAR | 52 |
| 300 KVAR | 68 |
| 400 KVAR | 82 |

| Overhead Distribution | | | |
|------------------------|------------------------------|-------------|----------|
| Construction Standards | 12 kV CAPACITORS | ISSUE DATE: | 06/01/11 |
| ® | APPROXIMATE WEIGHTS | REV. DATE: | 05/15/19 |
| | FOR VARIOUS 12 kV CAPACITORS | APPROVAL: | M. Dyer |
| PROPRIETARY MATERIAL | 11-4-1 | OH11-4-1 | .doc |
| | | | |

| COMPATIBLE UNIT | BANK SIZE | CAP. UNITS | TRANSFORMER INCLUDED* |
|--------------------|--------------|---------------|--------------------------|
| CA45 | 450 kVAR | 1 <i>Φ</i> | NO |
| CA45X | 450 kVAR | 1 <i>Φ</i> | YES |
| CA6 | 600 kVAR | 1 <i>Φ</i> | NO |
| CA6X | 600 kVAR | 1 <i>Φ</i> | YES |
| CA9 | 900 kVAR | 1 <i>Φ</i> | NO |
| CA9X | 900 kVAR | 1 <i>Φ</i> | YES |
| CA12 | 1200 kVAR | 1 <i>Φ</i> | NO |
| CA12X | 1200 kVAR | 1 <i>Φ</i> | YES |

*CONTROL VOLTAGE TRANSFORMER FOR **INSTALLATION WHERE 120 V IS NOT AVAILABLE**

NOTES

- 1. EACH BANK IS TO HAVE ALL NEUTRALS, **ARRESTORS & CAPACITOR RACK CONNECTED TO** THE POLE GROUND.
- 2. CAPACITOR NEUTRAL CONNECTION MUST BE GROUNDED.
- 3. GROUND CONTROL BOX (CB) TO POLE GROUND (SEE ODCS 11-8-1 FOR GROUNDING INSTRUCTIONS).
- 4. SECONDARY POWER FOR THE CONTROL MUST ORIGINATE FROM THE SAME CIRCUIT TO WHICH THE CAPACITOR IS CONNECTED (I.E. NO SWITCHES BETWEEN TRANSFORMER AND CAPACITOR BANK).
- 5. 28'-6" CONTROL CABLE AND FLEX CONDUIT ARE INCLUDED IN COMPATIBLE UNIT.
- 6. LOCATE CONTROLS ON OPPOSITE SIDE OF POLE FROM BANK.
- 7. CUSTOMER OWNED/SRP MAINTAINED CAPACITOR SHALL BE MARKED WITH THE CB NUMBER FOLLOWED BY AN "F" (I.E. CB 123F).
- 8. CLAMP NEUTRAL CURRENT SENSOR ON THE GROUND WIRE BETWEEN CAPACITOR RACK AND POLE GROUND. RUN THE SENSOR CABLE THROUGH THE JUNCTION BOX AND DOWN INSIDE THE CONTROL CABLE CONDUIT TO THE CONTROLLER.
- 9. THE HEIGHT OF THE BANKS ARE LOWER RELATIVE TO THE NEUTRAL ATTACHMENT, ALLOWING FLEXIBILITY FOR EITHER VERTICAL (USING MOUNTING BRACKETS) OR HORIZONTAL (USING CROSSARM) CONSTRUCTION.



| Overhead Distribution | | |
|------------------------|--------------------------------------|----------------------|
| Construction Standards | 12 kV CAPACITORS | ISSUE DATE: 12/16/71 |
| | SWITCHED BANK | REV. DATE: 01/25/24 |
| | VERTICAL AND HORIZONTAL CONSTRUCTION | APPROVAL: J. ROBBINS |
| PROPRIETARY MATERIAL | 11-5-1 | 8512E187.DGN |

| COMPATIBLE UNIT | BANK SIZE | CAP. UNITS | TRANSFORMER INCLUDED* |
|--------------------|--------------|---------------|--------------------------|
| CAE452 | 450 kVAR | 1 <i>Φ</i> | NO |
| CAE45X2 | 450 kVAR | 1 <i>Φ</i> | YES |
| CAE62 | 600 kVAR | 1 <i>Φ</i> | NO |
| CAE6X2 | 600 kVAR | 1 <i>Φ</i> | YES |
| CAE92 | 900 kVAR | 1Φ | NO |
| CAE9X2 | 900 kVAR | 1 <i>Φ</i> | YES |
| CAE122 | 1200 kVAR | 1Φ | NO |
| CAE12X2 | 1200 kVAR | 1 <i>Φ</i> | YES |

*CONTROL VOLTAGE TRANSFORMER FOR INSTALLATION WHERE 120 V IS NOT AVAILABLE

NOTES

- 1. EACH BANK IS TO HAVE ALL NEUTRALS, ARRESTORS & CAPACITOR RACK CONNECTED TO THE POLE GROUND.
- 2. CAPACITOR NEUTRAL CONNECTION MUST BE GROUNDED.
- 3. GROUND CONTROL BOX TO POLE GROUND (SEE ODCS 11-8-1 FOR GROUNDING INSTRUCTIONS).
- 4. SECONDARY POWER FOR THE CONTROL MUST ORIGINATE FROM THE SAME CIRCUIT TO WHICH THE CAPACITOR IS CONNECTED (I.E. NO SWITCHES BETWEEN TRANSFORMER AND CAPACITOR BANK).
- 5. 28'-6" CONTROL CABLE AND FLEX CONDUIT ARE INCLUDED IN COMPATIBLE UNIT.
- 6. LOCATE CONTROLS ON OPPOSITE SIDE OF POLE FROM BANK.
- 7. CUSTOMER OWNED/SRP MAINTAINED CAPACITOR SHALL BE MARKED WITH THE CB NUMBER FOLLOWED BY AN "F" (I.E. CB 123F).
- 8. CLAMP NEUTRAL CURRENT SENSOR ON THE GROUND WIRE BETWEEN CAPACITOR RACK AND POLE GROUND. RUN THE SENSOR CABLE THROUGH THE JUNCTION BOX AND DOWN INSIDE THE CONTROL CABLE CONDUIT TO THE CONTROLLER.

Overhead Distribution Construction Standards

12 kV CAPACITORSISSUE DATE: 11/20/85450 - 1200 KVAR, SWITCHED BANKREV. DATE: 01/25/24VERTICAL DOUBLE CIRCUIT TANGENT CONSTRUCTIONAPPROVAL: J. ROBBINS

11-6-1



8512E244.DGN

| MPATIBLE UNIT | BANK SIZE | CAP. UNITS | TRANSFORMER INCLUDED* | | |
|---|--|---|---|--|--|
| CAH6 | 600 KVAR | 1φ | NO | | |
| CAH6X | 600 KVAR | 1φ | YES | | |
| CAH9 | 900 KVAR | 1φ | NO | | |
| САН9Х | 900 KVAR | 1φ | YES | | |
| CAH12 | 1200 KVAR | 1φ | NO | 5'-0" | |
| CAH12X | 1200 KVAR | 1φ | YES | | |
| NOTES 1. EACH BA & CAPACIT BE GROU 2. CAPACIT BE GROU 3. GROUND POLE GR FOR GRO 4. SECOND, CONTRO THE SAM CAPACIT NO SWITT AND CAP 5. DIMENSIO FACTURE BORING 6. 28'-6" CO IN COMP | NK IS TO HAVE S NOT AVAILAE ITOR RACK CC OR NEUTRAL (JNDED CONTROL BO) OUND (SEE OE DUNDING INSTI ARY POWER F(L MUST ORIGIN E CIRCUIT TO ' OR IS CONNEC CHES BETWEE ACITOR BANK) ON VARIES WIT ER. MEASURE F BOTTOM HOLE NTROL CABLE ATIBLE UNITS. | E ALL NEU DNNECTE CONNECT CONN | JTRALS, ARRESTOR D TO THE POLE GR TION MUST 1 SFORMER FORE | P T'-2" VARIES SEE NOTE 5 SOUND 9' MAX. 7'-8" MIN. ODCS 11-8-1 FINAL GRADE | OCATE CONTROLS O PPOSITE SIDE OF OLE FROM BANK |
| | | <u> </u> | | | |
| Overhea Construc | ad Distributior ction Standarc | n Is | | | ISSUE DATE: 06/23/93 |
| | |) | | SWITCHED BANK | REV. DATE: 11/05/21 |
| | | | CR | OSSARM CONSTRUCTION | APPROVAL: J. ROBBINS |
| PROPRIE | TARY MATERIA | L | | 11-7-1 | 8512E185.DGN |





- 1. ALL CAPACITOR CONTROL BOXES (CB) MUST BE GROUNDED.
- 2. GROUNDING OF THE METER SOCKET DOES NOT HAVE SUFFICIENT CONTINUITY THROUGH THE METER RING.
- 3. USE THE GROUNDING TERMINAL (AS NOTED IN ABOVE DIAGRAM) TO GROUND CB.
- 4. USE A MINIMUM OF #6 SOFT DRAWN COPPER FROM CB TO POLE GROUND OR TO THE SYSTEM GROUND IN PAD-MOUNTED APPLICATION.
- 5. ALL CAPACITOR CONTROLS MUST BE INSTALLED BETWEEN 9' MAXIMUM AND 7'-8" MINIMUM CENTERLINE FROM FINAL GRADE. (NESC 232 & ADA RULE 307.3)

| Overhead Distribution | | |
|------------------------|--------------------------|----------------------|
| Construction Standards | 12 kV CAPACITORS | ISSUE DATE: 07/19/85 |
| PROPRIETARY MATERIAL | CAPACITOR CONTROLLER AND | REV. DATE: 01/10/24 |
| | GROUNDING INSTRUCTIONS | APPROVAL: J. ROBBINS |
| | 11-8-1 | 8512E330.DGN |



| Overhead Distribution | | | |
|------------------------|--------|-------------|----------|
| Construction Standards | | ISSUE DATE: | 08/03/93 |
| ® | | REV. DATE: | 05/12/13 |
| | | APPROVAL: | B.PRIEST |
| PROPRIETARY MATERIAL | 11-9-1 | 8512E216 | .DGN |

PROTECTIVE EQUIPMENT AND FUSING 12.47 kV CAPACITOR FUSES

| PRIMARY FUSES FOR DISTRIBUTION CAPACITOR BANKS | | | | | |
|--|--|--|--|--|--|
| 3 PHASE CAPACITOR BANK SIZE | 7.2/12.47 KV WYE AREA HAVING PRIMARY NEUTRAL | | | | |
| (KVAR) | LOAD BREAK CUTOUT | | | | |
| 300 | KS 15 FITALL (5034492) | | | | |
| 450 | KS 20 FITALL (5034493) | | | | |
| 600 | KS 30 FITALL (5034495) | | | | |
| 900 | KS 50 FITALL (5034497) | | | | |
| 1200 | KS 65 FITALL (5034500) | | | | |

| PRIMARY FUSE FOR | 1/2 KVA CONTROL VOLTAGE TRANSFORMER |
|------------------|-------------------------------------|
| ALL KVAR SIZES | KS ¾ FITALL (5034484) |

| Overhead Distribution | | | |
|------------------------|---------------------------------|-------------|-----------|
| Construction Standards | 12 kV CAPACITORS | ISSUE DATE: | 07/09/08 |
| ® | PROTECTIVE EQUIPMENT AND FUSING | REV. DATE: | 06/04/18 |
| | 12.47 kV CAPACITOR FUSES | APPROVAL: | N. Sabbah |
| PROPRIETARY MATERIAL | 11-10-1 | OH11-10 |)-1.doc |
| | | | |

PROCEDURE FOR TESTING 12.47 KV OVERHEAD DISTRIBUTION CAPACITOR BANKS RATED 7.2 KV, 60 HZ

- 1. DE-ENERGIZE CAPACITOR BANK WITH AUTOMATIC CONTROL, OR LINK-BREAK CUTOUT.
- 2. USE HIGH VOLTAGE AMP METER TO VERIFY OIL SWITCHES ARE OPEN.
- 3. OPEN CUTOUTS AND REMOVE STINGERS, WAIT FIVE MINUTES FOR CAPACITOR TO DISCHARGE.
- 4. USING A HOT STICK AND TEMPORARY JUMPERS, SHUNT ACROSS EACH OF THE THREE GROUPS OF CAPACITOR TANKS.
- 5. VISUALLY INSPECT ALL OIL SWITCHES, CAPACITOR TANKS, AND POTENTIAL TRANSFORMER; CHECKING FOR BROKEN BUSHINGS, BULGING TANKS AND OBVIOUS OIL LEAKS.
- 6. USING A MULTI-METER ON THE MICROFARAD SETTING, MEASURE THE MICROFARAD RANGE BETWEEN THE BUSHINGS OF EACH CAPACITOR TANK. IF THE MEASURED VALUE OF THE CAPACITOR TANK IS NOT IN THE ACCEPTABLE RANGE SHOWN IN THE CHART BELOW, THEN THE CAPACITOR NEEDS TO BE REPLACED.

| | | ACCEPTABLE MICROFARAD VALUES | | | ACCEPTA | BLE PHASE | CURRENT |
|-------------------------|------------------------|---------------------------------|-----------------|-----------------|----------------|----------------|----------------|
| PHASE VOLTAGE (V) | TANK SIZE (kVAR) | MINIMUM (μF) | NOMINAL (μF) | MAXIMUM (μF) | MINIMUM (A) | NOMINAL (A) | MAXIMUM (A) |
| | 100 | 4.61 | 5.12 | 6.14 | 12.51 | 13.90 | 16.67 |
| | 150 | 6.91 | 7.68 | 9.21 | 18.76 | 20.85 | 25.00 |
| 7,200 | 200 | 9.21 | 10.23 | 12.28 | 25.00 | 27.77 | 33.33 |
| | 300 | 13.82 | 15.35 | 18.42 | 37.51 | 41.67 | 50.00 |
| | 400 | 18.42 | 20.46 | 24.56 | 50.00 | 55.54 | 66.66 |

- 7. WHEN REMOVING CAPACITORS BANKS OR CAPACITOR TANKS FROM SERVICE, A PIECE OF CONDUCTOR SHALL BE INSTALLED BETWEEN THE BUSHINGS OF EACH TANK.
- 8. LOW VOLTAGE FUSES IN THE CONTROLLERS ARE:
 - HD ELECTRIC (VARCOM)
 15 AMP SLOW-BLOW (5034355) REFERENCE ONLY
 - EATON COOPER 10 AMP SLOW-BLOW (5089126)

- 1. PRIOR TO PLACING IN SERVICE, ON-LINE TEST EACH PHASE OF THE CAPACITOR BANK USING THE ABOVE CHART FOR ACCEPTABLE PHASE CURRENT BASED ON CAPACITOR SIZE.
- 2. THE FIRST FOUR STEPS OF THE ABOVE PROCEDURE MAY BE OMITTED FOR NEW INSTALLATIONS THAT HAVE NEVER BEEN ENERGIZED.
- 3. MULTI-METER WITH MICROFARAD SETTING REPLACES THE CAPACITANCE AND SIMPSON METER FOR CHECKING CAPACITORS.

| Overhead Distribution | | | |
|------------------------|---------------------------------|-------------|------------|
| Construction Standards | 12 kV CAPACITORS | ISSUE DATE: | 07/23/01 |
| | PROCEDURE FOR TESTING | REV. DATE: | 01/10/24 |
| | RATED 7.2 kV FOR 12.4 kV SYSTEM | APPROVAL: | J. Robbins |
| PROPRIETARY MATERIAL | 11-11-1 | OH11-11 | -1.doc |

| DESCRIPTION | MATERIAL ITEM | NOTE | COMPATIBLE UNIT |
|-------------------------|---------------|------|-----------------|
| 150 KVAR 1Ø | 5034234 | | BCM15 |
| 200 KVAR 1Ø, 1 BUSHING | 5034237 | | BCM21 |
| 200 KVAR 1Ø, 2 BUSHINGS | 5034238* | 1 | BCM2 |
| 300 KVAR 1Ø | 5034235* | 2 | BCM3 |
| 400 KVAR 1Ø | 5034239 | 4 | BCM4 |
| 300 KVAR 3Ø | | 3 | |

• NOT PURCHASED BUT SALVAGE USEABLE.

AUXILIARY EQUIPMENT USED WITH CAPACITOR BANKS

| DESCRIPTION | MATERIAL ITEM | COMPATIBLE UNIT |
|---|---------------|-----------------|
| 12 KV 200 AMP, OIL SWITCH (SPECIFY MFG. TO MATCH EXISTING) | 5034754 | BCD |
| 0.5 KVA TRANSFORMER | 5034764 | BCT |
| CONTROLLER CBC8000 W/O RADIO | 5087345 | TC-CAPCTRL |
| CONTROLLER CBC8000 WITH RADIO | 5086438 | TC-CAPCTRLEP |
| OH CAP CONTROL ANTENNA | 5087111 | |
| NEUTRAL CURRENT SENSOR | 5090920 | |

- 1. WHEN OUT, USE 5034237.
- 2. WHEN OUT, REPLACE BANK OR REPLACE EACH TANK WITH TWO 5034234.
- 3. REPLACE BANK.
- 4. REPLACE DAMAGED 400 KVAR 1Ø CAPACITORS WITH:
 - ONE 400 KVAR 1Ø CAPACITOR (5034239) OR
 - TWO 200 KVAR 1Ø CAPACITORS (5034237). USE #2 COPPER, 600 V, 7-STRAND (5033865) FOR NEW CONNECTS.

| Overhead Distribution | | | |
|---------------------------------------|--------------------------------|-------------|------------|
| Construction Standards | 12 kV CAPACITORS | ISSUE DATE: | 07/23/01 |
| R R R R R R R R R R R R R R R R R R R | COMPATIBLE UNIT CODING FOR | REV. DATE: | 01/10/24 |
| | MAINTENANCE OF CAPACITOR BANKS | APPROVAL: | J. Robbins |
| PROPRIETARY MATERIAL | 11-12-1 | OH11-12 | -1.doc |

COMPATIBLE UNIT CODING FOR RETIREMENT OF NON-STANDARD CAPACITOR BANKS

CONTROLLED CAPACITOR BANKS

| BANK SIZE | UNIT SIZE | UN | IITS | COMPATIBLE UNIT CODE |
|-----------|-----------|----|------------|----------------------|
| KVAR | KVAR | 1Ø | 3 Ø | NO PCBS |
| 300 | 100 | х | | RCC1003 |
| 600 | 300 | | х | RCC30036 |
| 900 | 300 | | х | RCC30039 |
| 1,200 | 300 | | X | RCC300312 |

FIXED CAPACITOR BANKS

| BANK SIZE | UNIT SIZE | UN | IITS | COMPATIBLE UNIT CODE |
|-----------|-----------|----|------------|----------------------|
| KVAR | KVAR | 1Ø | 3 Ø | NO PCBS |
| 300 | 100 | х | | RCF1003 |
| 450 | 150 | Х | | RCF1504 |
| 600 | 300 | | x | RCF30036 |
| 600 | 200 | Х | | RCA6F |
| 900 | 150 | Х | | RCF1509 |





NOTES

1. CURRENT SENSOR IS NOT A TRANSFORMER. IT MAY BE LEFT OPEN CIRCUITED OR SHORT CIRCUITED WITH NO ADVERSE AFFECT. IT MAY BE USED ON A OR C PHASE.

| Construction Standards | |
|-----------------------------------|---------------|
| 12kV CAPACITORS | ATE: 01/21/87 |
| CURRENT CONTROL CAPACITOR | TE: 08/14/13 |
| WIRING DIAGRAM APPROV | AL: H.CRUZ |
| PROPRIETARY MATERIAL 11-14-1 8512 | E285.DGN |

SECTION 12: 22 kV CAPACITORS

| TITLE / DESCRIPTION | PAGE |
|---|--------|
| 1350 KVAR, SWITCHED BANK | 12-2-1 |
| PROTECTIVE EQUIPMENT AND FUSING, 21.6 KV CAPACITOR FUSES | 12-3-1 |
| PROCEDURE FOR TESTING DISTRIBUTION CAPACITOR BANKS RATED 12.47 KV FOR 22 KV SYSTEM | 12-4-1 |

| Overhead Distribution | | | |
|-------------------------|------------------|--------------|------------|
| Construction Standards | INDEX | ISSUE DATE: | 05/14/13 |
| SNP [®] | 22 kV CAPACITORS | REV. DATE: | 11/05/21 |
| | | APPROVAL: | J. Robbins |
| PROPRIETARY MATERIAL | 12-1-1 | OH12-1-1.doc | |
| | | | |

| C.U. | BANK SIZE | CAP. UNITS | TRANSFORMER INCLUDED |
|-------|-----------|---------------|-------------------------|
| CA132 | 1350 KVAR | 1Ø | NO |

PROPRIETARY MATERIAL



12-2-1

8512E48.DGN

PROTECTIVE EQUIPMENT AND FUSING 21.6 KV CAPACITOR FUSES

| 3 PHASE CAPACITOR | 12.47 / 21.6 KV WYE | | |
|-------------------|---------------------------|--|--|
| BANK SIZE | WITH PRIMARY NEUTRAL | | |
| 1350 KVAR | KS 40 FITALL (5034496) | | |

COMPATIBLE UNIT FOR MAINTENANCE OF CAPACITOR BANKS

| DESCRIPTION | MATERIAL ITEM | COMPATIBLE UNIT | |
|--------------------|---------------|-----------------|--|
| 150 KVAR 1Ø, 22 KV | 5034240 | BCM152 | |

| Overhead Distribution | | | |
|------------------------|---|-------------|----------|
| Construction Standards | 22 kV CAPACITORS | ISSUE DATE: | 03/23/94 |
| R | CAPACITOR FUSES AND COMPATIBLE UNIT FOR | REV. DATE: | 05/16/19 |
| | MAINT. OF CAPACITOR BANKS | APPROVAL: | M. Dyer |
| PROPRIETARY MATERIAL | 12-3-1 | OH12-3-1 | .doc |

PROCEDURE FOR TESTING 22 KV OVERHEAD DISTRIBUTION CAPACITOR BANKS RATED 12.47 KV, 60 HZ

- 1. DE-ENERGIZE CAPACITOR BANK WITH AUTOMATIC CONTROL, OR LINK-BREAK CUTOUT.
- 2. USE HIGH VOLTAGE AMP METER TO VERIFY OIL SWITCHES ARE OPEN.
- 3. OPEN CUTOUTS AND REMOVE STINGERS, WAIT 5 MINUTES FOR CAPACITOR TO DISCHARGE.
- 4. USING A HOT STICK AND TEMPORARY JUMPERS, SHUNT ACROSS EACH OF THE THREE GROUPS OF CAPACITOR TANKS.
- 5. VISUALLY INSPECT ALL OIL SWITCHES, CAPACITOR TANKS, AND POTENTIAL TRANSFORMER; CHECKING FOR BROKEN BUSHINGS, BULGING TANKS AND OBVIOUS OIL LEAKS.
- 6. USING A MULTI-METER ON THE MICROFARAD SETTING, MEASURE THE MICROFARAD RANGE BETWEEN THE BUSHINGS OF EACH CAPACITOR TANK. IF THE MEASURED VALUE OF THE CAPACITOR TANK IS NOT IN THE ACCEPTABLE RANGE SHOWN IN THE CHART BELOW, THEN THE CAPACITOR NEEDS TO BE REPLACED.

| ACCEPTABLE MICROFARAD VALU | | | AD VALUES | ACCEPTA | BLE PHASE | CURRENT | |
|----------------------------|--------------|------------------|------------------|------------------|-----------------------------|-----------------------------|-----------------------------|
| PHASE VOLTAGE | TANK SIZE | MINIMUM VALUE | NOMINAL VALUE | MAXIMUM VALUE | MINIMUM PHASE CURRENT | NOMINAL PHASE CURRENT | MAXIMUM PHASE CURRENT |
| (V) | (kVAR) | (μF) | (μF) | (µF) | (A) | (A) | (A) |
| 12,470 | 150 | 2.30 | 2.56 | 3.07 | 6.24 | 6.95 | 8.33 |

- 7. WHEN REMOVING CAPACITORS BANKS OR CAPACITOR TANKS FROM SERVICE, A PIECE OF CONDUCTOR SHALL BE INSTALLED BETWEEN THE BUSHINGS OF EACH TANK.
- 8. LOW VOLTAGE FUSES IN THE CONTROLLERS ARE:
 - EATON COOPER 10 AMP SLOW-BLOW (5089126)

- 1. PRIOR TO PLACING IN SERVICE, ON-LINE TEST EACH PHASE OF THE CAPACITOR BANK USING THE ABOVE CHART FOR ACCEPTABLE PHASE CURRENT BASED ON CAPACITOR SIZE.
- 2. THE FIRST FOUR STEPS OF THE ABOVE PROCEDURE MAY BE OMITTED FOR NEW INSTALLATIONS THAT HAVE NEVER BEEN ENERGIZED.
- 3. MULTI-METER WITH MICROFARAD SETTING REPLACES THE CAPACITANCE AND SIMPSON METER FOR CHECKING CAPACITORS

| Overhead Distribution | | | |
|------------------------|---------------------------------|-------------|------------|
| Construction Standards | 22 kV CAPACITORS | ISSUE DATE: | 08/02/93 |
| ® | PROCEDURE FOR TESTING | REV. DATE: | 01/10/24 |
| DR | RATED 12.47 kV FOR 22 kV SYSTEM | APPROVAL: | J. Robbins |
| PROPRIETARY MATERIAL | 12-4-1 | OH12-4- | 1.doc |