OVERHEAD ELECTRIC DISTRIBUTION CONSTRUCTION STANDARDS

MAY 2021 EDITION

SUMMARY OF CHANGES

January 1, 2021

OH-II-1 Miscellaneous Adders and Removal Plates

1. On page 5, added notes under Animal Guard Plates

OH-II-2 Poles

1. No change

OH-II-3 Conductor

1. No change.

OH-II-4 Bolts

1. No change.

OH-III-1 Sub-Structures

1. No change

OH-III-2 Vertical Primary

1. No change

OH-III-3 Horizontal Primary

1. No change

OH-III-4 Aerial Cable

1. No change

OH-III-5 Contaminated Environment

1. No change

OH-III-6 Single Phase Standard

1. No change.

OH-IV-1 Regulators & Capacitors

1. On pages 18 -22, added notes and instruction on installing the neutral conductor
2. On pages 1 -5, added notes and updated CAPBANK PLATES

OH-IV-2-Transformers

1. No change

OH-IV-3-Switching

1. On page 6, added notes for installing guy plates
2. The ANTENNA plate has been added to the following plates: AS-TSE, AS-TSH

OH-IV-4-Riser Poles
1. No change

OH-IV-5-UG Feeding OH
1. No change

OH-IV-6-Primary Metering
1. No change

OH-IV-7-System Proctection Fusing
1. Updated Tables 11
2. On page 1, updated Note 3 under INTRODUCTION

OH-IV-8-System-Protection-Plating
1. On page 39, added notes for installing DG-TSE

OH-V-1-Grounding
1. No change

OH-V-2-Guying
1. No change

OH-V-3-Lighting
1. No change

OH-V-4-Secondary
1. No change

OH-V-5-Identification
1. No change

OH-V-6-Fiber Optics
2. On page 33, added notes on installing vibration dampers

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DETAILED LISTING

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MISCELLANEOUS ADDERS AND REMOVAL PLATES

INTRODUCTION

1. This section has been expanded to clarify the use of various “adder” plates and those used for removal.

2. The removal plates were designed several years ago to improve the cost estimates for unit-price construction. Until the removal plates were created, material was removed by placing a construction standard in the removal column of the plating sheets used for project design. The person responsible for plating the removal of material tried to select the construction standard or plate that “best fit” the material being removed. In many cases, a construction standard did not exist for many of the structures found in the field and therefore could not be accurately plated for removal. Since the unit-price contractor was paid for items removed, many of the cost estimates for unit-price construction were not very accurate due to this inconsistency with plate removal.

3. In addition to plate removal, plates can also be relocated. However, conductor and streetlights are the only plates that should be placed in the relocate column. When relocating conductor, the “RC.” prefix should be used for the various conductors. These plates are to be placed in the relocate column and are to be called for on a “per station” basis for each conductor. For example: relocating three 1/0 triplex service drops from one structure to another would be plated as RC.1/0T in the relocate column -- quantity 3. Special circumstances may require the relocation of some equipment other than conductor or a streetlight. Other plates or items may be placed in the relocate column, but must be approved by the affected service center “Checker” before construction begins.

4. Adders and severe condition plates should not be used for additional time for temporary work. For example: the plates RUBUP and RUBDOWN should only be used for projects calling for the specific installation of line rubber. They should not be used to give additional time to a crew for “temporary” work. The installation of line rubber and other temporary work has been incorporated into the manhour standards for each plate. If a particular plate or group of plates is consistently not allowing enough time to construct a particular standard, the responsible standards engineer should be informed of the problem so that he or she can make the necessary changes.

5. All adder plates are for time only, no material is issued with any of these plates.

MISCELLANEOUS ADDERS

SEVERE CONDITIONS

A severe condition will apply each time an independent operation such as setting a pole, framing a pole, or hanging equipment (transformers, switches, etc.), requires a trip to the structure. However, a particular Group severe adder can only be used once per station.

DEFINITION:

1) Terrain, marsh, or swamp not accessible to all-wheel drive vehicle or an area which would require that equipment be "matted" into the jobsite, and that such equipment is necessary to perform the construction of the unit or plate.

2) Easements not accessible to trucks, where pole lines are along rear lot lines and are inaccessible because of buildings, lawns, shrubs, fences, etc., existing between the street and the pole line, and such equipment would have been used to perform the construction unit or plate and therefore other construction methods are employed.

3) An area where it is nearly impossible due to caving water and large obstacles to perform required "item or plate" without extensive de-watering equipment, sheet piling, road building, and progress is anticipated to be slow due to no fault of the crew.

SEVC - Severe condition for conductor installation crew

SEVF - Severe condition for framing crew

SEVG - Severe condition for grounding crew

SEVGA - Severe condition for guying and anchoring crew

SEVP - Severe condition for crew setting pole

DEEPER

This adder is appropriate when poles are being installed at more than the normal setting depth by any means necessary. It should be plated on a "per foot" basis.

JET

This adder is appropriate for increasing the setting depth of existing poles. It should be plated on a "per foot" basis.

LEAN

This adder is appropriate where an existing pole is dislodged or displaced from its existing position. It is also appropriate where an existing pole is leaned away from the line for removal by others or for any other reason. It should be plated on a "per station" basis.

DRILL-X

This adder is appropriate where an additional hole must be drilled by the crew in a wood crossarm. It should be plated on a "per hole" basis.

DRILL-W

This adder is appropriate where an additional hole must be drilled by the crew in a wood pole. It should be plated on a "per hole" basis.

DRILL-C

This adder is appropriate where an additional hole must be drilled by the crew in a concrete pole. It should be plated on a "per hole" basis.

CUT

This adder is appropriate where a pole or crossarm may need to be cut or "shortened" as per the request of the engineer. It is not to be used for convenience topping occasionally done to facilitate other job operations. It should be plated on a "per each cut" basis.

ASPH

This adder is appropriate when a pole, anchor, or splice box is installed and cutting through paving is required. Cutting pavement or concrete, and removal of debris from the job site are included as part of the work required for this item. It should be plated on a "per square foot" basis.

PATCH

This adder is appropriate where concrete, pavement, or asphalt must be repaired to original condition due to previous construction of another plate. It should be plated on a "per square foot" basis.

OHSEED1

This adder is appropriate where due to construction, property damage has occurred whether private, commercial, City, State, or Federal. Damaged landscape, up to 100 square feet, is to be restored to its original condition. It should be plated on a "per square foot" basis.

OHSEED2

This adder is appropriate where due to construction, property damage has occurred whether private, commercial, City, State, or Federal. Damaged landscape, 101 to 500 square feet, is to be restored to its original condition. It should be plated on a "per square foot" basis.

OHSEED3

This adder is appropriate where due to construction, property damage has occurred whether private, commercial, City, State, or Federal. Damaged landscape, over 500 square feet, is to be restored to its original condition. It should be plated on a "per square foot" basis.

ARM

This adder is appropriate where a crossarm must be bolted to an existing facility to provide additional working clearance. It should be plated on a "per each arm" basis.

RUBUP

This adder is appropriate where line rubber is installed specifically for the protection of a contractor working near JEA distribution lines that are energized. It should be plated on a "per section" basis.

RUBDOWN

This adder is appropriate where line rubber is removed which was specifically installed for the protection of a contractor working near JEA distribution lines that are energized. It should be plated on a "per section" basis.

TRANS

This adder is appropriate where only a transformer is changed out or replaced and the existing brackets, cutouts, arresters, etc. are still used. The transformer itself must be itemized. It should be plated on a "per transformer" basis.

LAMP

This adder is appropriate where only a lamp is to be replaced in a streetlight fixture. The actual lamp must be itemized to receive the material. It should be plated on a "per lamp" basis.

REFR

This adder is appropriate where only a refractor is to be replaced on a streetlight fixture. The actual refractor must be itemized to receive the material. It should be plated on a "per refractor" basis.

PHOTO

This adder is appropriate where only a photocontrol is to be replaced on a streetlight fixture. The actual photocontrol must be itemized to receive the material. It should be plated on a "per control" basis.

SPLICE

This adder is appropriate where a conductor must be spliced to extend or continue the conductor and the splice itself is not part of another construction standard plated at the same station. It should be plated on a "per splice" basis. This is a labor plate only.

CUTBOLT

This adder is appropriate where it is anticipated that certain bolts will need to be cut by the const. crew and then cold galvanized. It should be plated on a "per bolt" basis.

ANIMAL GUARDS

AG-ARR

This adder is appropriate where an animal guard is needed for a distribution class arrester. It should be plated on a "per arrester" basis.

AG-TX1

This adder is appropriate where an animal guard is needed for a single-phase transformer.

AG-TX2

This adder is appropriate where an animal guard is needed for a two-phase transformer bank.

AG-TX3

This adder is appropriate where an animal guard is needed for a three-phase transformer bank.

AG-FUSE

This adder is appropriate where an animal guard is needed for a fuse cutout. It should be plated on a "per fuse" basis.

AG-RSR1

This adder is appropriate where an animal guard is needed for a single-phase riser cable.

AG-RSR2

This adder is appropriate where an animal guard is needed for a two-phase riser cable.

AG-RSR3

This adder is appropriate where an animal guard is needed for a three-phase riser cable.

Note: Each plate includes #4 insulated tap wire, a fiberglass bracket, and animal guards for transformer(s), cutout(s) and/or arrester(s).

REMOVAL PLATES

BRACKETS

PIN

This plate is used for removing the pins used to mount primary or secondary insulators on crossarms. It should be plated on a "per pin" basis.

POLETOP

This plate is used for removing the bracket that allowed the installation of a pin or post type insulator on the top of a distribution pole. It should be plated on a "per bracket" basis.

STANDOFF

This plate is used for removing the standoff bracket used to mount post insulators for vertical construction. It should be plated on a "per bracket" basis.

AERIAL

This plate is used for removing the various brackets used with aerial cable. It also includes the removal of all spacers for one span. It should be plated on a "per bracket" basis.

EQUIP

This plate is used for removing brackets used for supporting cable terminations or "Potheads". It should be plated on a "per bracket" basis.

CLUSTER

This plate is used for removing the cluster bracket used to install the current and potential transformers on primary meter structures. It should be plated on a "per bracket" basis.

DOWNLEAD

This plate is used for removing the fiberglass downlead standoff bracket that was used years ago to standoff the ground wire away from the pole in the area of the primary. It should be plated on a "per bracket" basis.

OFFSET

This plate is used for removing a bracket that was used for offset deadending on a pole. It is to be plated on a "per bracket" basis.

SWITCH

This plate is used for removing the various brackets used for mounting cutouts (single, tri-mount, and crossarm), hook disconnect switches (vertical const.), bypass switches (vertical const.), and even those used for arresters since most are used to install fuse cutouts also. It should be plated on a "per bracket" basis.

SEC

This plate is used for removing the clevis type bracket used to mount secondary spool insulators to the pole. It is also used to remove a "rack" for mounting secondary spool insulators. In both cases, each assembly is to be considered one assembly or bracket. However, the insulators are separate units and will be discussed later in this section. It should be plated on a "per bracket" basis.

SINGLE

This plate is used to remove the brackets used to move the transformers further from the pole when banking two or three units. Each bracket is considered a single bracket. For example: A two transformer bank requires two brackets and a three transformer bank requires three brackets. It should be plated on a "per bracket" basis.

MULTI

This plate is used to remove the unitized mounting bracket that was used in the past to mount multiple transformers in a bank configuration. One bracket was used to mount two and three transformer banks. It should be plated on a "per bracket" basis.

A15-FOOT

This plate is used to remove 15 foot truss-type streetlight brackets. It should be plated on a "per bracket" basis.

A12-FOOT

This plate is used to remove 12 foot truss-type streetlight brackets. It should be plated on a "per bracket" basis.

A8-FOOT

This plate is used to remove 8 foot eliptical type streetlight brackets. It should be plated on a "per bracket" basis.

INSULATORS

PRIINS

This plate is used to remove primary insulators from 4kV to 69kV. It should be plated on a "per insulator assembly" basis. This covers three bell-type insulators.

SECINS

This plate is used to remove secondary insulators of all types. A rack of three secondary insulators would require the removal of three insulators and not just one. It should be called for on a "per insulator" basis.

CROSSARMS

SARMDIST

This plate is used for removal of a single distribution crossarm up to ten feet in length including braces. It should be plated on a "per crossarm" basis.

DARMDIST

This plate is used for removal of a double set of distribution crossarms up to ten feet in length including braces. It should be plated on a "per set" basis.

SARMTRAN

This plate is used for removal of a single transmission crossarm up to fifteen feet in length including braces. It should be plated on a "per crossarm" basis.

DARMTRAN

This plate is used for removal of a double set of transmission crossarms up to fifteen feet in length including braces. It should be plated on a "per set" basis.

SHIELD

BAYONET

This plate is for the removal of all sizes of bayonets used to support the shield wire. It should be plated on a "per bayonet" basis.

SWITCHES, CUTOUTS, AND ARRESTERS

GROUP

This plate is used to remove a group-operated switch, vertical or horizontal mount. It includes the switch, switch handle, operating pipe, idler brackets, and any other material supplied with the switch itself. It should be plated on a "per switch" basis. Older units that were not totally unitized are still considered one switch.

HOOK

This plate is used to remove a hook disconnect switch of any voltage class. Three switches on a three-phase structure are considered as three separate units. It should be plated on a "per switch" basis.

INLINE

This plate is used to remove a hook disconnect switch that is "in-line" with the primary conductor of any voltage class. It should be plated on a "per switch" basis.

BYPASS

This plate is used to remove a bypass switch of any voltage class. Three switches on a three-phase structure are considered as three separate units. It should be plated on a "per switch" basis.

CUTOUT

This plate is used to remove a fuse cutout or "Jack box" of any voltage class or BIL. It should be plated on a "per cutout" basis.

ARRESTER

This plate is used to remove a distribution class arrester or the new riser pole type arrester used on underground risers. It should be plated on a "per arrester" basis.

IA

This plate is used to remove a intermediate class arrester that in the past was used on underground feeder risers. It should be plated on a "per arrester" basis.

TRANSFORMERS

BANKCOMP10

This plate is used to remove cutout, arrester, and a single-phase transformer up to and including 75kVA. It should be plated on a "per transformer" basis.

BANKCOMP11

This plate is used to remove cutout, arrester, and a single-phase transformer over 75kVA and up to and including 250kVA. It should be plated on a "per transformer" basis.

BANKCOMP20

This plate is used to remove cutouts, arresters, and a two-phase transformer bank with the largest transformer up to and including 75kVA. It should be plated on a "per bank" basis.

BANKCOMP21

This plate is used to remove cutouts, arresters, and a two-phase transformer bank with the largest transformer over 75kVA and up to and including 250kVA. It should be plated on a "per bank" basis.

BANKCOMP30

This plate is used to remove cutouts, arresters, and a three-phase transformer bank with the largest transformer up to and including 75kVA. It should be plated on a "per bank" basis.

BANKCOMP31

This plate is used to remove cutouts, arresters, and a three-phase transformer bank with the largest transformer over 75kVA and up to and including 250kVA. It should be plated on a "per bank" basis.

STREETLIGHT FIXTURES

Removal of street lights/area lights should be plated according to the wattage and voltage of the fixture. The following removal plates for street light fixtures should be plated on a "per-fixture" basis.

LUM7 – 70W HPS

LUM20 – 200W HPS

LUM25 – 250W HPS

LUM40 – 400W HPS

LUM40M – 400W MH

LUM17M – 175W MH

LUM17V – 175W MV

OBSLUM

This plate is used for removing obstruction lights near areas with nearby air traffic. It should be plated on a "per assembly" basis. Two obstruction lights make-up one assembly.

MISCELLANEOUS HARDWARE

DESHOE

This plate is used to remove a primary, neutral, or secondary deadend, not including the insulator which would be a separate removal item. It should be plated on a "per deadend" basis.

DEYE

This plate is used to remove a double eyebolt (S6). It should be plated on a "per eyebolt" basis.

POLECON

This plate is used to remove a connection at the pole or (S20). It should be plated on a "per connection" basis.

HOUSECON

This plate is used to remove the connection at the house or a (S21). It should be plated on a "per connection" basis.

TANGENT

This plate is used to remove a neutral or secondary tangent assembly or (S7). It should be plated on a "per tangent" basis.

MIDSPAN

This plate is used to remove secondary mid-span taps or (J16). It should be plated on a "per tap" basis.

NUMBER

This plate is used for removing equipment identification tags. It should be plated on a "per tag" basis.

EYENUT

This plate is used for removing eyenuts not part of any other removal plate. It should be plated on a "per eyenut" basis.

SMWEDGE

This plate is used to remove the smaller wedge clamp with a range from #6 to #2 messengers that are not part of any other removal plate. It should be plated on a "per clamp" basis.

LGWEDGE

This plate is used to remove the larger wedge clamp with a range from 1/0 to 4/0 messengers that are not part of any other removal plate. It should be plated on a "per clamp" basis.

CLAMP

This plate is used to remove hot-line clamps or (DHLC). It should be plated on a "per clamp" basis.

POLE ANCHORS

ANCHOR

This plate is used to remove all single-helix anchors. It should be plated on a "per anchor" basis.

MANCHOR

This plate is used to remove all multi-helix anchors in addition to the Manta-Ray anchor. It should be plated on a "per anchor" basis.

A5FTEXT

This plate is used for removing anchor extensions up to and including 5 feet. It should be plated on a "per extension" basis.

A7FTEXT

This plate is used for removing anchor extensions 7 feet and longer. It should be plated on a "per extension" basis.

ANCHEYE

This plate is used for removing the anchor eye section used with multi-helix anchoring systems. It should be plated on a "per eye" basis.

KEY

This plate is used for removing pole keys used for anchoring. It should be plated on a "per key" basis.

CUTANC

This plate is used to cut and remove guy anchor a minimum of 12 inches below existing grade and backfill the hole.

POLE GUYS

SPAN

This plate is used for removing span guys of all sizes. It should be plated on a "per guy" basis.

DOWN3/8

This plate is used for removing 3/8" guy strand. It should be plated on a "per guy" basis.

DOWN7/16

This plate is used for removing 7/16" guy strand. It should be plated on a "per guy" basis.

SIDEWALK

This plate is used for removing the guy strand and standoff pipe used on a sidewalk guy. It should be plated on a "per guy" basis.

STRAIN

This plate is used for removing fiberglass strain insulators used with the various guy plates. It should be plated on a "per insulator" basis.

GUARD

This plate is used to remove the PVC or metal guy guard used to make downguys more visible. It should be plated on a "per guard" basis.

poles and pole supports

POLES AND SUPPORTS

PULLPOLES

This plate is used to remove clear wood poles (no attachments) from soft surfaces (sod, etc.). These poles shall not be returned to stock.

PULLOPLEH

This plate is used to remove clear poles (no attachments) from hard surfaces (asphalt, concrete, etc.). These poles shall not be returned to stock.

OTRUSS

This plate is used for the removal of Osmose pole supports. The supports shall be returned to JEA.

GROUNDING

RODREM

This plate is used to remove a single 8 foot ground rod or the number of rods in addition to the 3 rods used on a "full" ground. It should be plated on a "per rod" basis.

FULLGRD

This plate is used to remove a "full" ground which constitutes three rods. It should be plated on a "per ground" basis.

CONCGRD

This plate is used to remove a non-equipment ground for a concrete pole. It should be plated on a "per ground" basis.

WOODGRD

This plate is used to remove a non-equipment ground for a wood pole. It should be plated on a "per ground" basis.

CAPBANK

This plate is used to remove an entire capacitor bank, including all brackets, oil switches, of any size. It should be plated on a "per bank" basis.

CAPCAN

This plate is used to remove an individual capacitor can of any size. It should be plated on a "per can" basis.

CAPSW

This plate is used to remove an individual oil switch used on a capacitor bank. Switches are normally included with the removal plate "CAPBANK". It should be plated on a "per switch" basis.

REG

This plate is used to remove a voltage regulator. It should be plated on a "per regulator" basis.

RECL

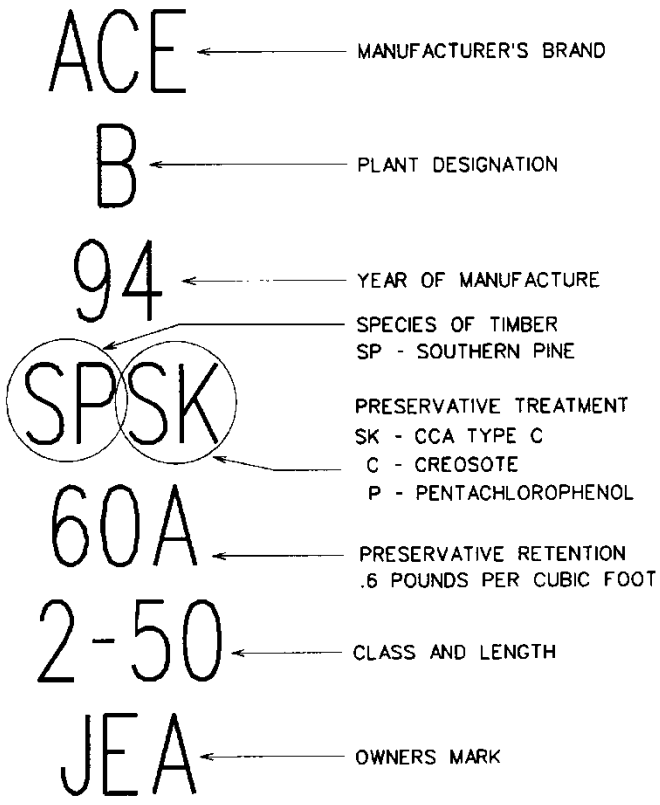
This plate is used to remove a three-phase recloser or sectionalizer. It includes the mounting bracket, control panel, and the control cable. It should be plated on a "per unit" basis.

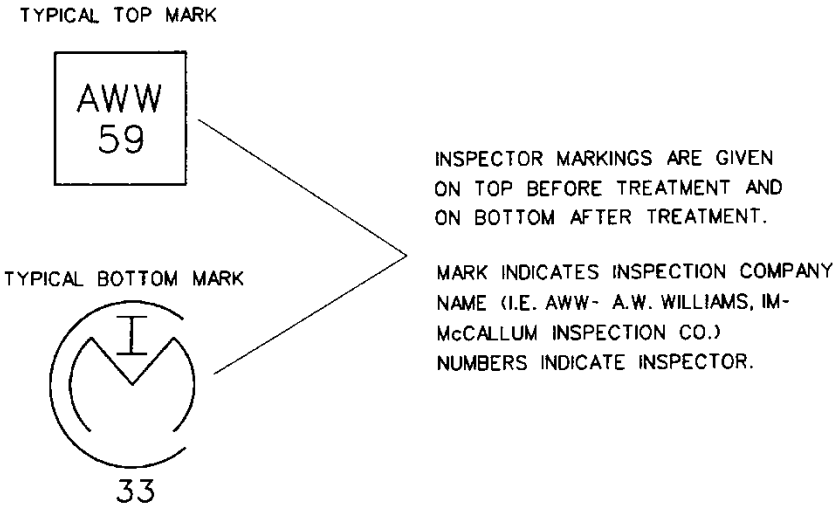
POLES

INTRODUCTION

1. The JEA integrated standards outlined on the following pages depend on strict adherence to these guidelines. Construction varying from these standards must be covered in NOTED FORM on the drawing by the design engineer.
2. Concrete and wood poles are predrilled in accordance with the pole drilling details of this Section. However, some holes will have to be drilled in the field and will require the engineer to call for either the plate DRILL-W or DRILL-C if he or she is aware of the extra holes to be drilled.
3. Equipment attachment locations called for on a construction standard or the following drilling details are denoted by the hole number at which the bolt will be placed.
4. Birthmark location on the pole varies with length and type. Larger poles may have two birthmarks -- if the pole is set extra deep, at least one birthmark will still be visible for identification. Unless special circumstances prevail, always set every pole with the birthmark facing the street (roadside). Split the angle on curves.
5. If concrete poles are set deeper than their normal setting depth, the crew installing the pole shall attach piece of #4 CU to the pole grounding loop to make it accessible from the groundline.
6. Poles shall be raked such that the side opposite to the face on which the load is applied shall be 90 degrees or perpendicular to the ground as shown.
7. Poles shall be oriented so that the unbalanced force bisects the conductor angle perpendicular to the load bearing face of the pole.
8. The split bolt assembly (SH30) is included in the 45 to 65 foot wood pole plates and should be installed in hole 7.
9. Additional washers, connectors, and #4 bare copper are issued with the concrete pole plates to be used for grounding purposes (See hardware grounding detail in the GROUNDING Section).
10. Unless otherwise stated, holes shown on the pole drilling details are in inches from the tip or the bottom of the pole roof. Holes are 1 inch in diameter on concrete poles and 7/8 of an inch in diameter on wood poles. Pole drilling details are not to scale.
11. A tag holder is issued with each pole plate for the purpose of identifying the pole address when the pole is installed. Adhesive for these tag holders is also issued with concrete poles.

POLE INSPECTION AND MANUFACTURER'S MARKINGS





POLE INFORMATION

POLE SETTING DEPTHS		
LENGTH (FT)	WOOD POLE	CONCRETE POLE
30	5'-6"	6'-0"
35	6'-0"	6'-6"
40	6'-0"	7'-0"
45	6'-6"	7'-6"
50	7'-0"	8'-0"
55	7'-6"	8'-6"
60	8'-0"	9'-0"
65	8'-6"	10'-0"
70	9'-0"	11'-0"
75	9'-6"	12'-0"

WEIGHTS OF CCA TREATED WOOD POLES (IN POUNDS)				
LENGTH	CLASS 1	CLASS 2	CLASS 3	CLASS 4
30	1,224	1,068	924	798
35	1,572	1,368	1,182	1,026
40	1,956	1,692	1,470	1,272
45	2,358	2,046	1,770	1,536
50	3,029	2,626	2,275	1,976
55	3,530	3,062	2,652	2,301
60	4,069	3,523	3,055	2,646
65	4,622	4,004	3,471	3,016
70	5,207	4,518	3,913	--
75	5,816	5,051	4,375	--
80	6,455	5,597	4,849	--
85	7,124	6,169	5,350	--
90	7,807	6,760	5,863	--

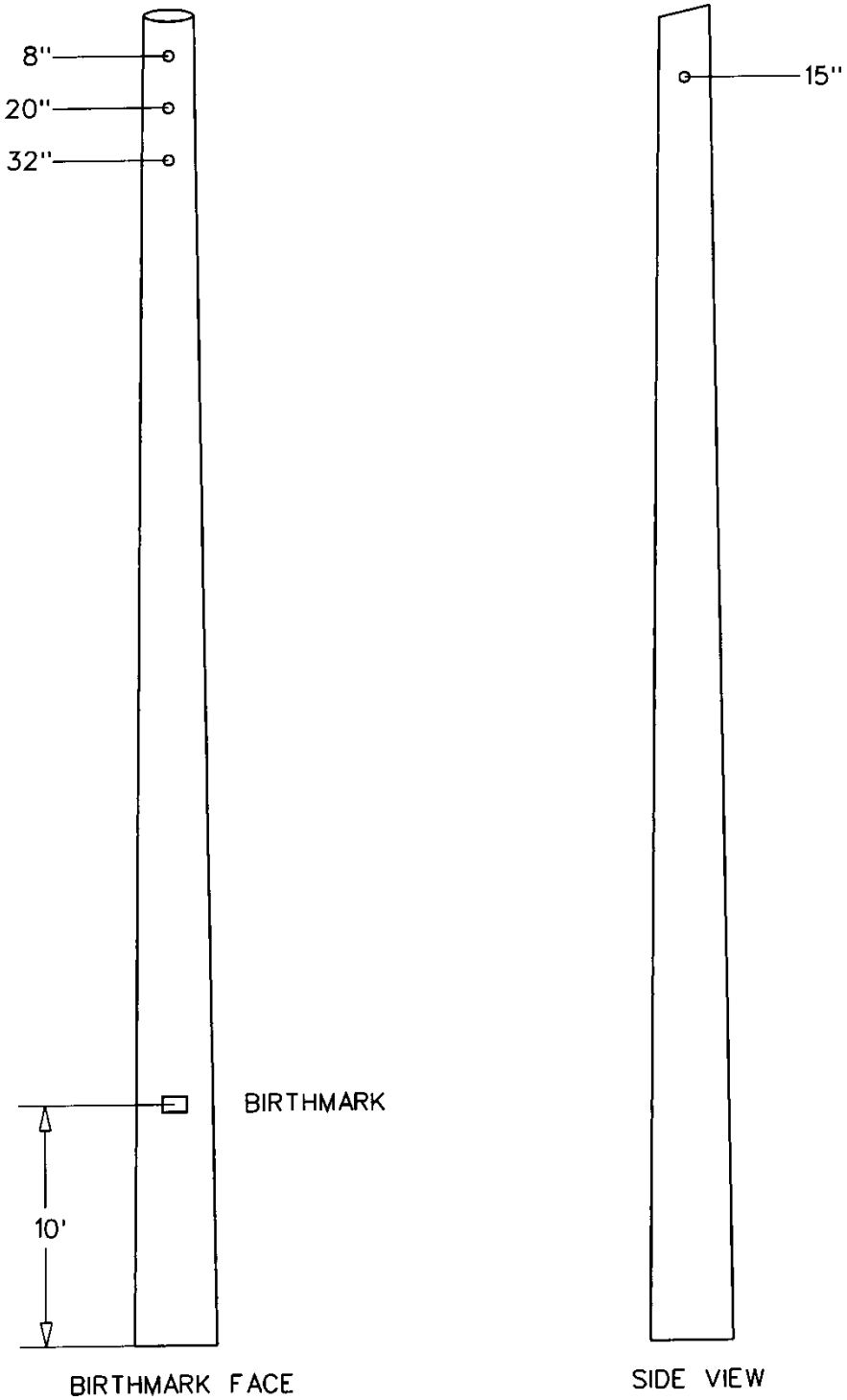
TIP DIMENSIONS OF WOOD POLES (IN INCHES)				
DIMENSION	CLASS 1	CLASS 2	CLASS 3	CLASS 4
MIN. TIP DIA.	8.6	8.0	7.3	6.7
MIN. CIRCUMFERENCE	27	25	23	21

POLE INFORMATION – CONTINUED

DIMENSIONS OF WOOD POLES SIX FEET FROM BUTT (DIAMETER IN INCHES)				
POLE LENGTH	**CLASS 1**	**CLASS 2**	**CLASS 3**	**CLASS 4**
30	11.6	10.8	10.2	9.4
35	12.4	11.6	10.8	10.0
40	13.1	12.3	11.5	10.7
45	13.7	12.9	11.9	10.3
50	14.3	13.4	12.4	11.6
55	14.8	13.8	12.9	12.1
60	15.3	14.3	13.4	12.4
65	15.8	14.8	13.8	12.9
70	16.2	15.3	14.3	13.2
75	16.7	15.6	14.6	--
80	17.2	16.1	15.0	--
85	17.5	16.4	15.3	--
90	17.8	16.9	15.6	--

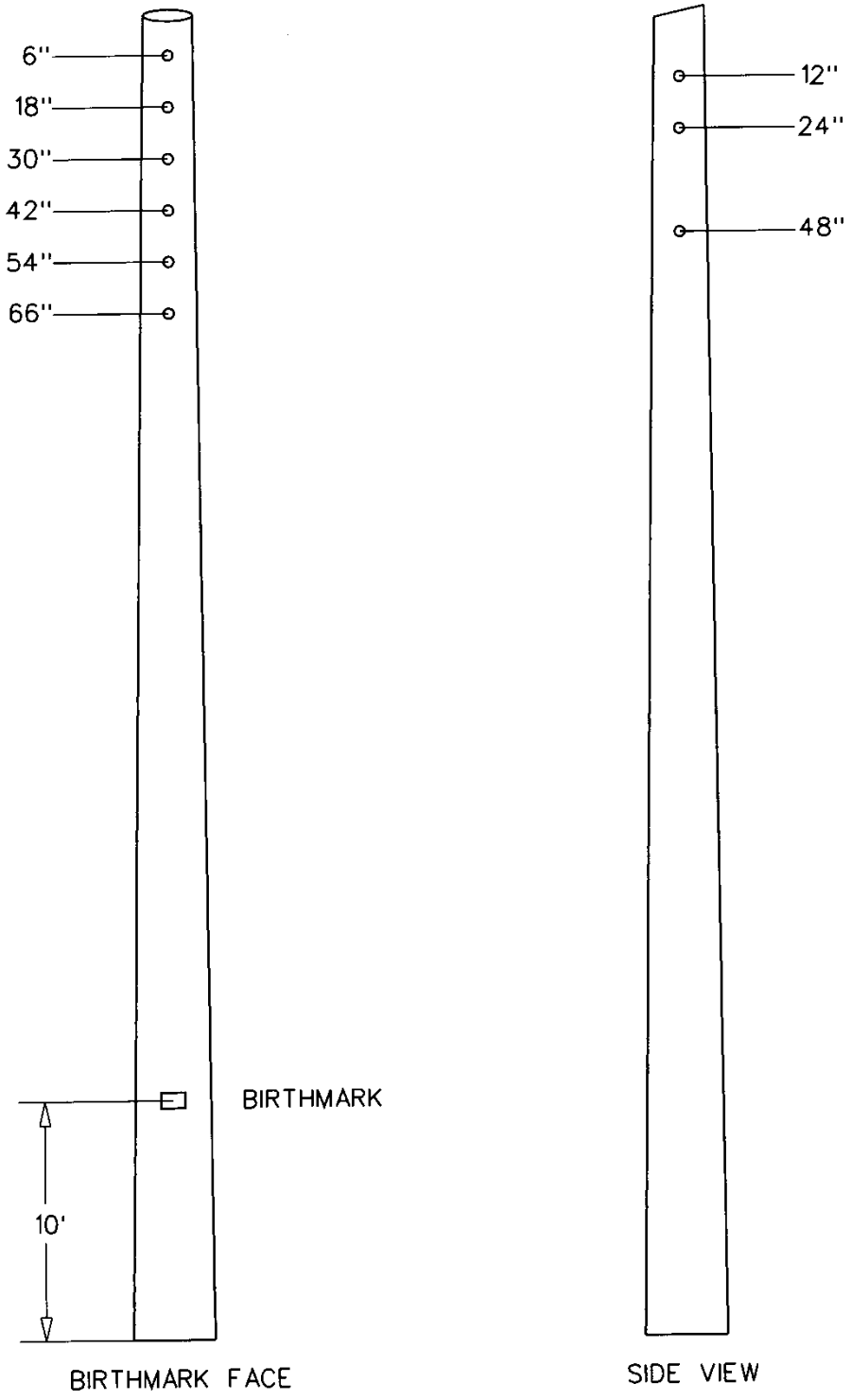
APPROXIMATE WEIGHTS OF CONCRETE POLES (IN POUNDS) AND DIMENSIONS (INCHES SQUARE)				
POLE LENGTH	**CLASS OR TYPE**	**WEIGHT (LBS.)**	**TIP DIMENSION**	**BUTT DIMENSION**
30	1	1,340	4	8.86
35	1	1,820	4	9.67
35	2	2,360	6	11.67
40	3	2,900	6	12.48
45	3	3,510	6	13.29
50	3	4,050	6.5	14.60
50	H	8,100	9	17.10
55	H	9,500	9	17.91
55	LT	18,100	13.25	22.16
55	HT	18,100	13.25	22.16
60	H	11,060	9	18.72
60	LT	20,400	13.25	22.97
60	HT	20,400	13.25	22.97
65	LT	22,900	13.25	23.78
65	HT	22,900	13.25	23.78
70	HT	25,100	13.25	24.59
75	HT	27,500	13.25	25.40
80	HT	30,000	13.25	26.21
80	XHT	37,375	16.55	29.51
85	HT	32,600	13.25	27.02
85	XHT	40,775	16.55	30.32
90	HT	35,600	13.25	27.83
90	XHT	44,275	16.55	31.13
95	HT	38,900	13.25	28.64
95	XHT	47,875	16.55	31.94
100	HT	42,100	13.25	29.45
100	XHT	51,475	16.55	32.75
105	HT	45,500	13.25	30.26
110	HT	49,000	13.25	31.07

POLE DRILLING DETAIL



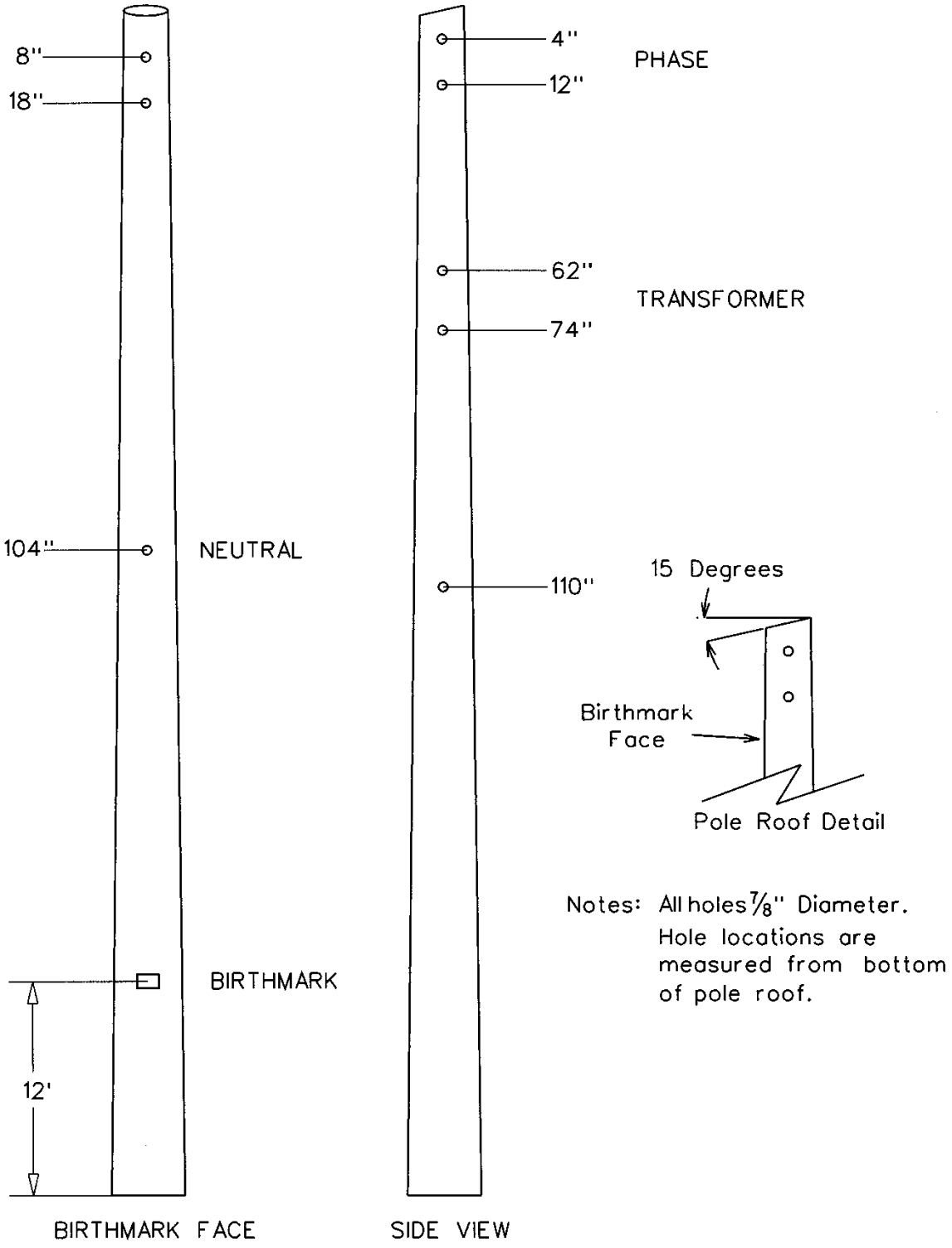
30 FOOT WOOD POLE - CLASS 4

POLE DRILLING DETAIL



35 FOOT WOOD POLE - CLASS 4

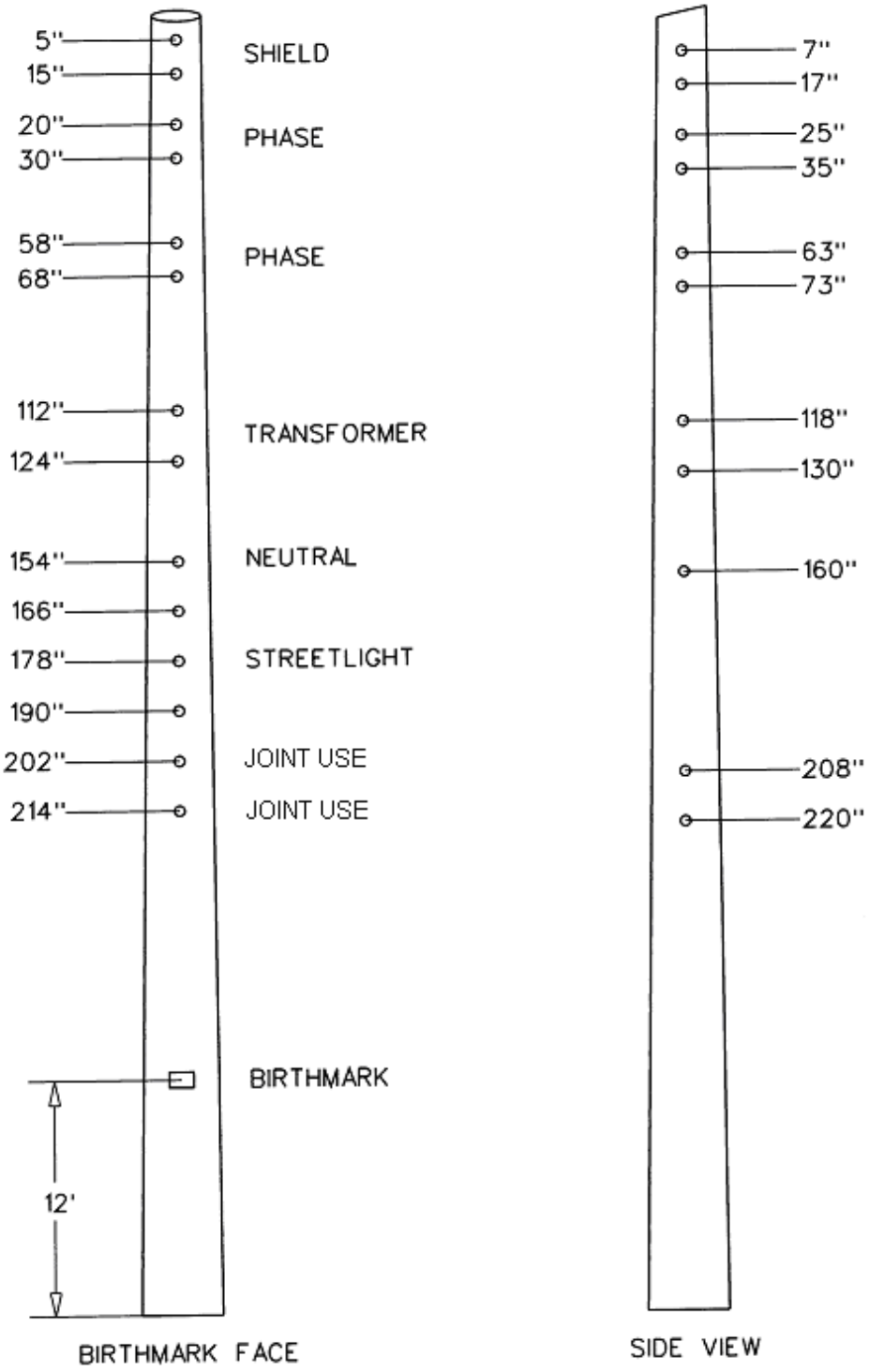
POLE DRILLING DETAIL



Notes: All holes 7/8" Diameter.
Hole locations are measured from bottom of pole roof.

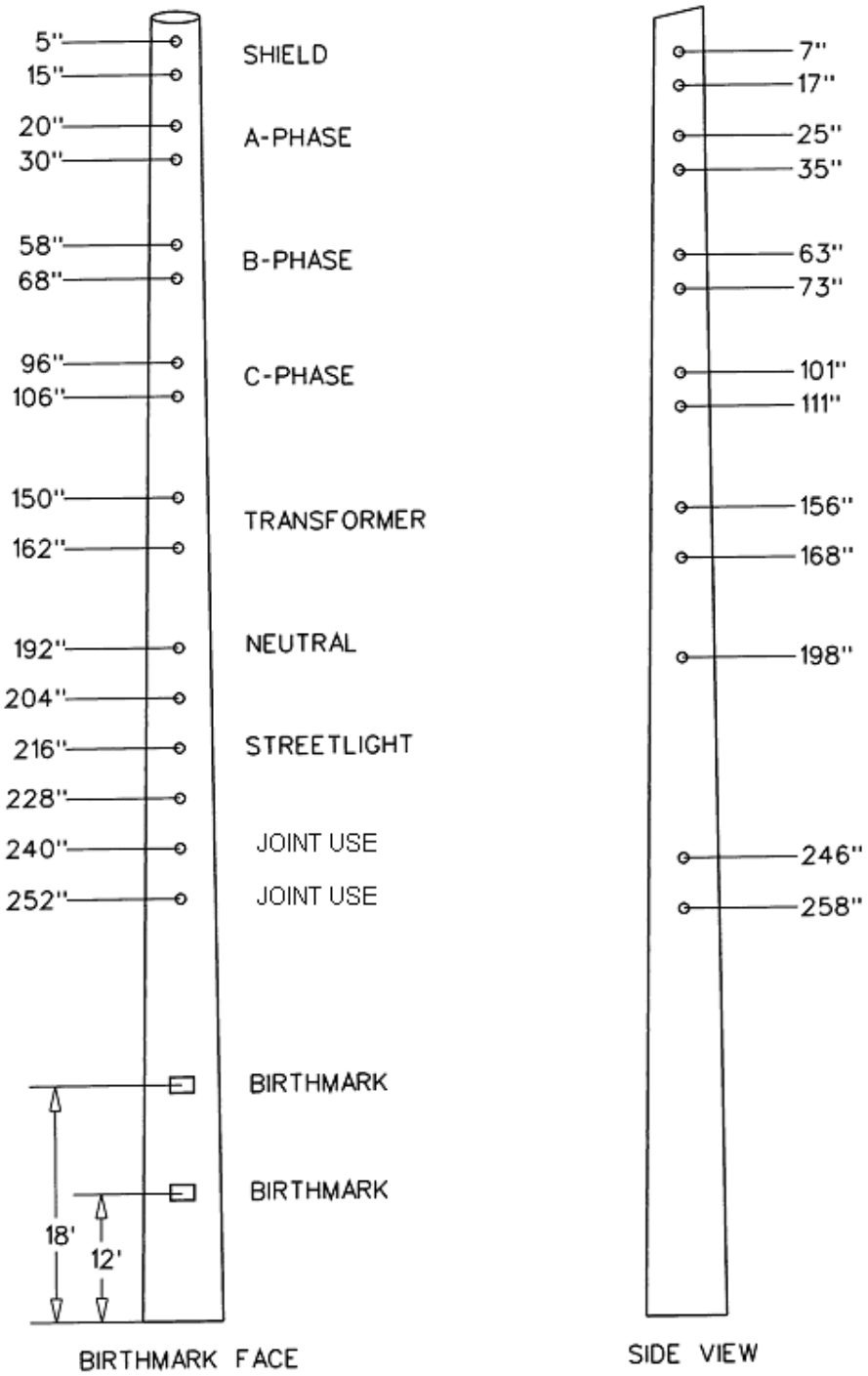
40 FOOT WOOD POLE - CLASS 4

POLE DRILLING DETAIL



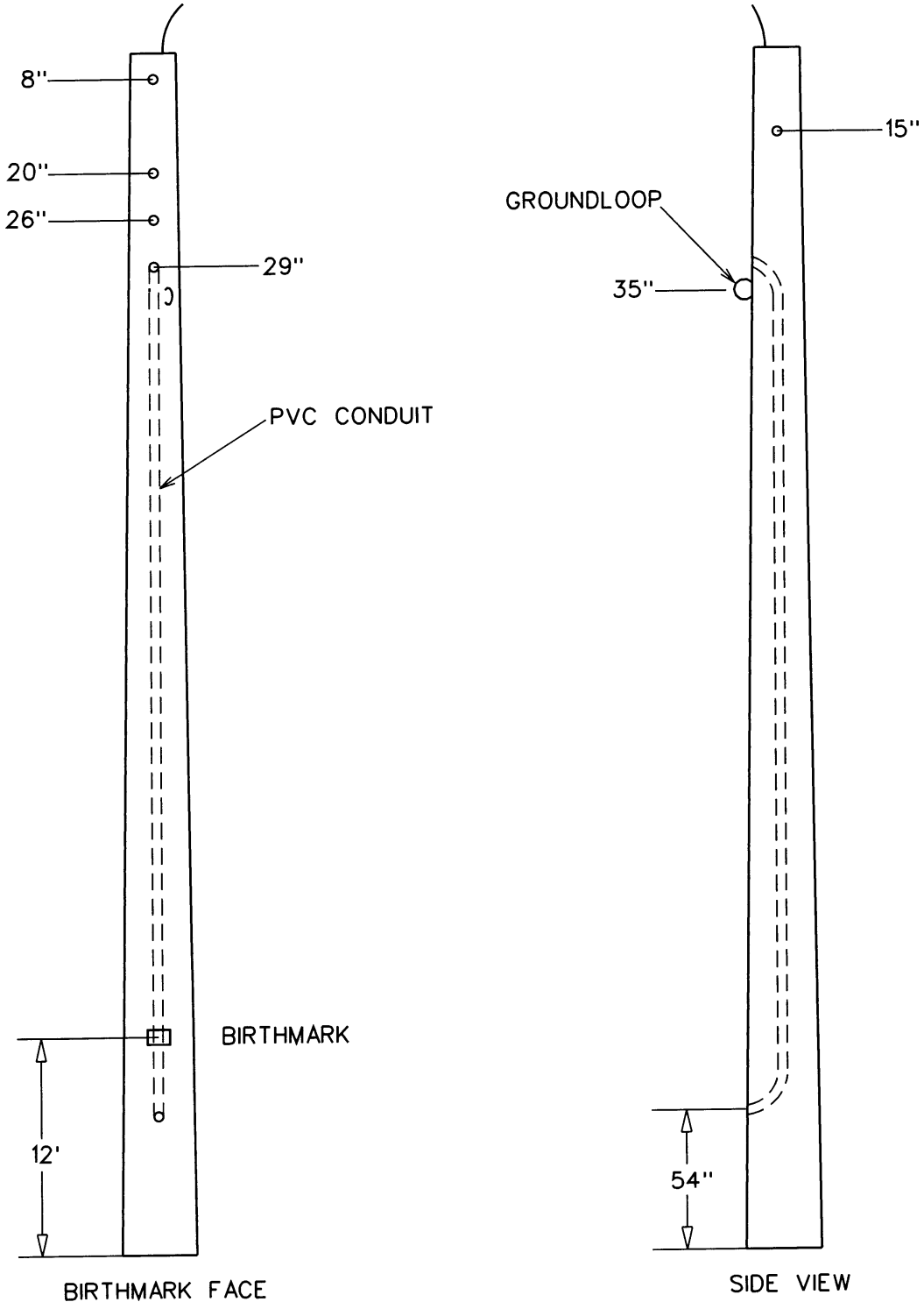
45 & 50 FOOT WOOD POLE - CLASS 3

POLE DRILLING DETAIL



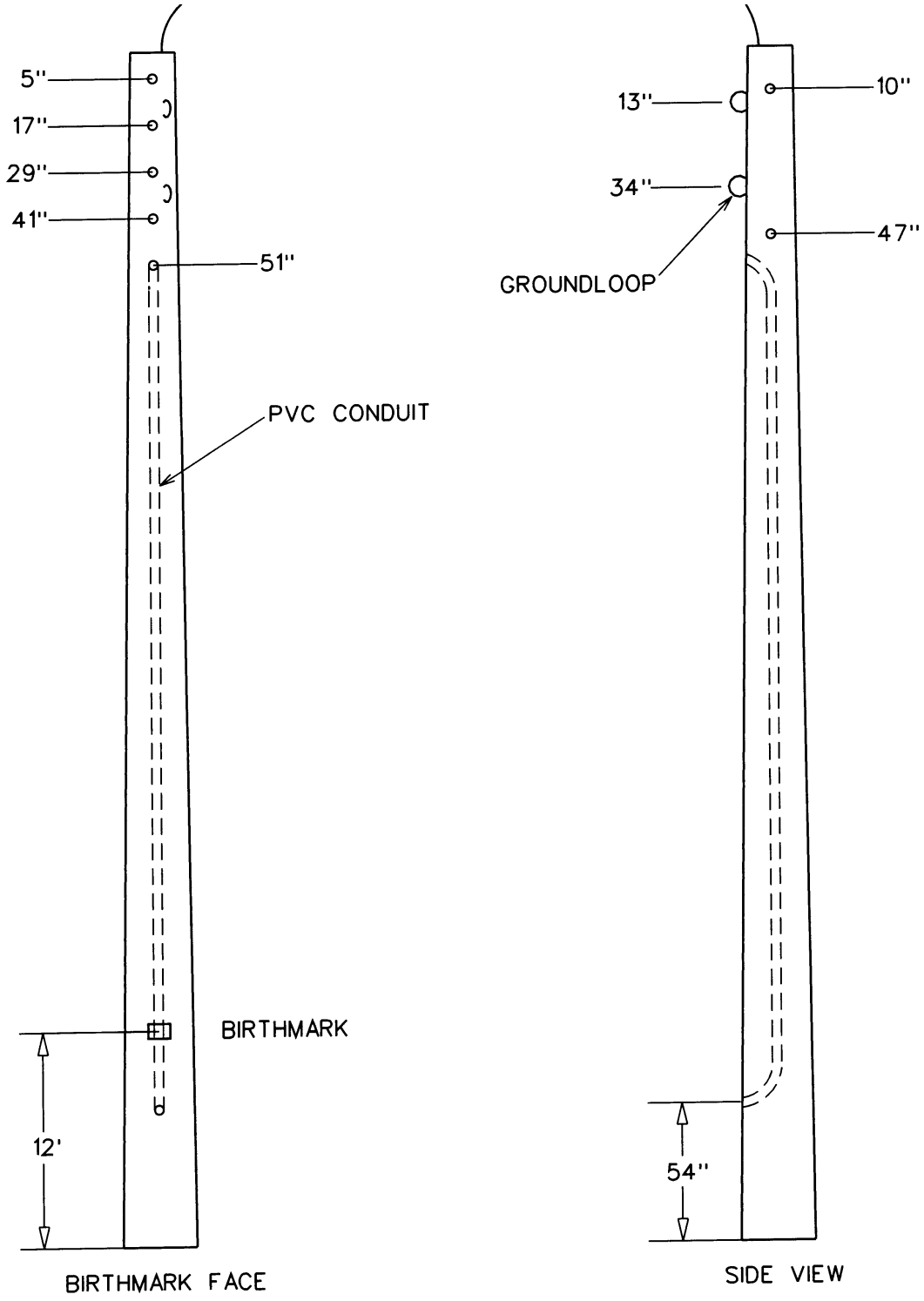
50 THRU 65 FOOT WOOD POLE - CLASS 1 OR 2

POLE DRILLING DETAIL



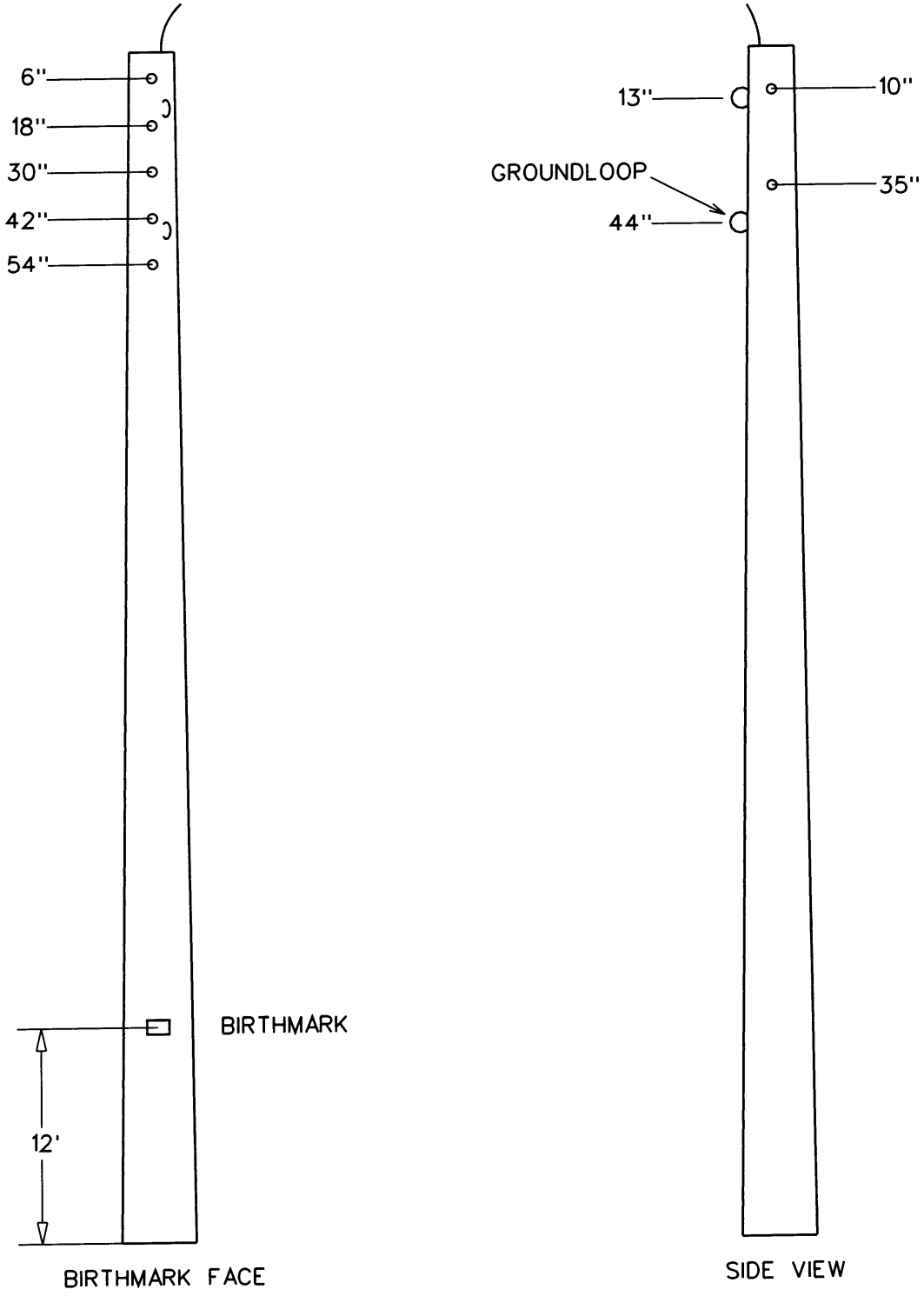
30 FOOT CONCRETE POLE - TYPE 1

POLE DRILLING DETAIL



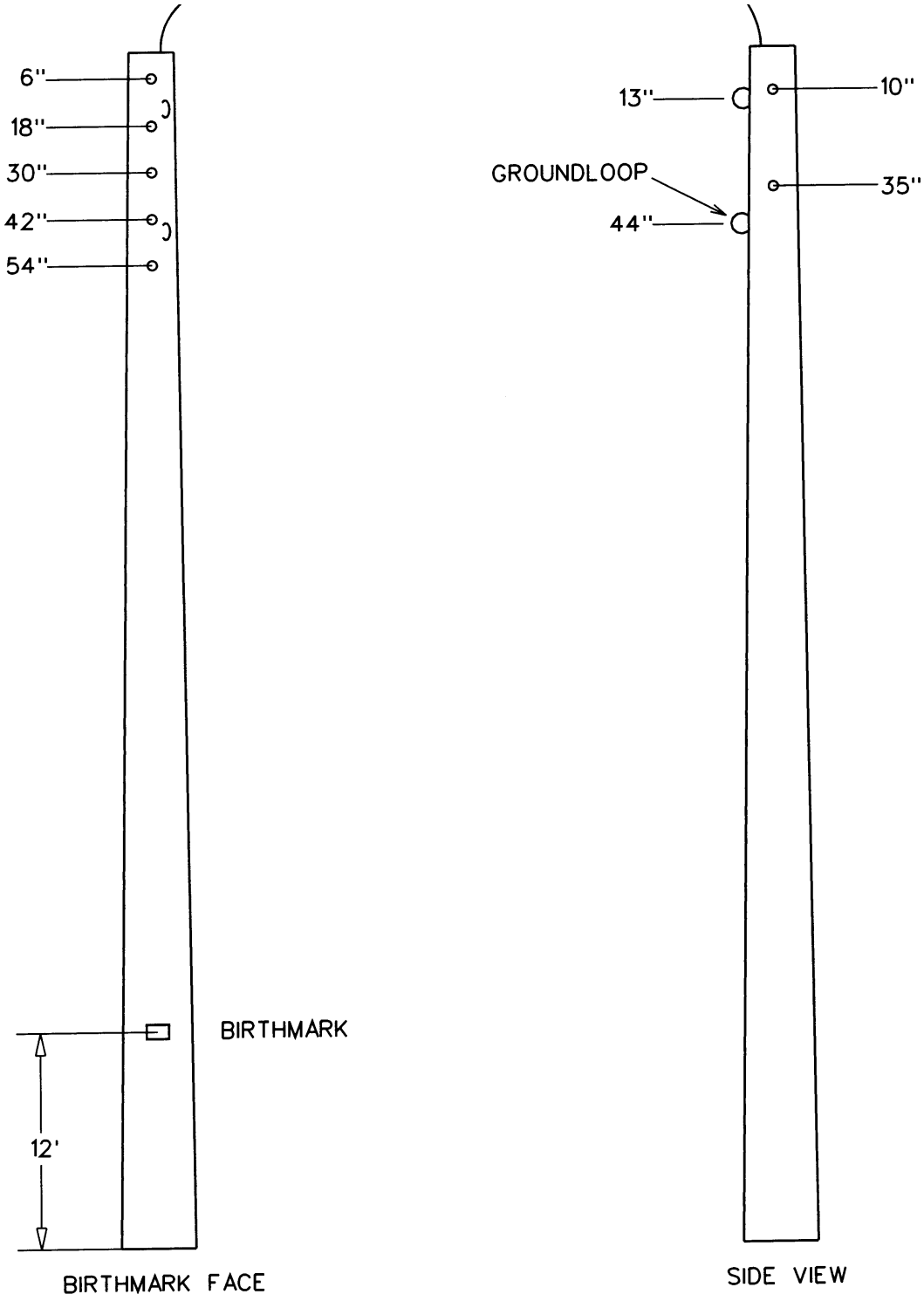
35 FOOT CONCRETE POLE - TYPE 1

POLE DRILLING DETAIL



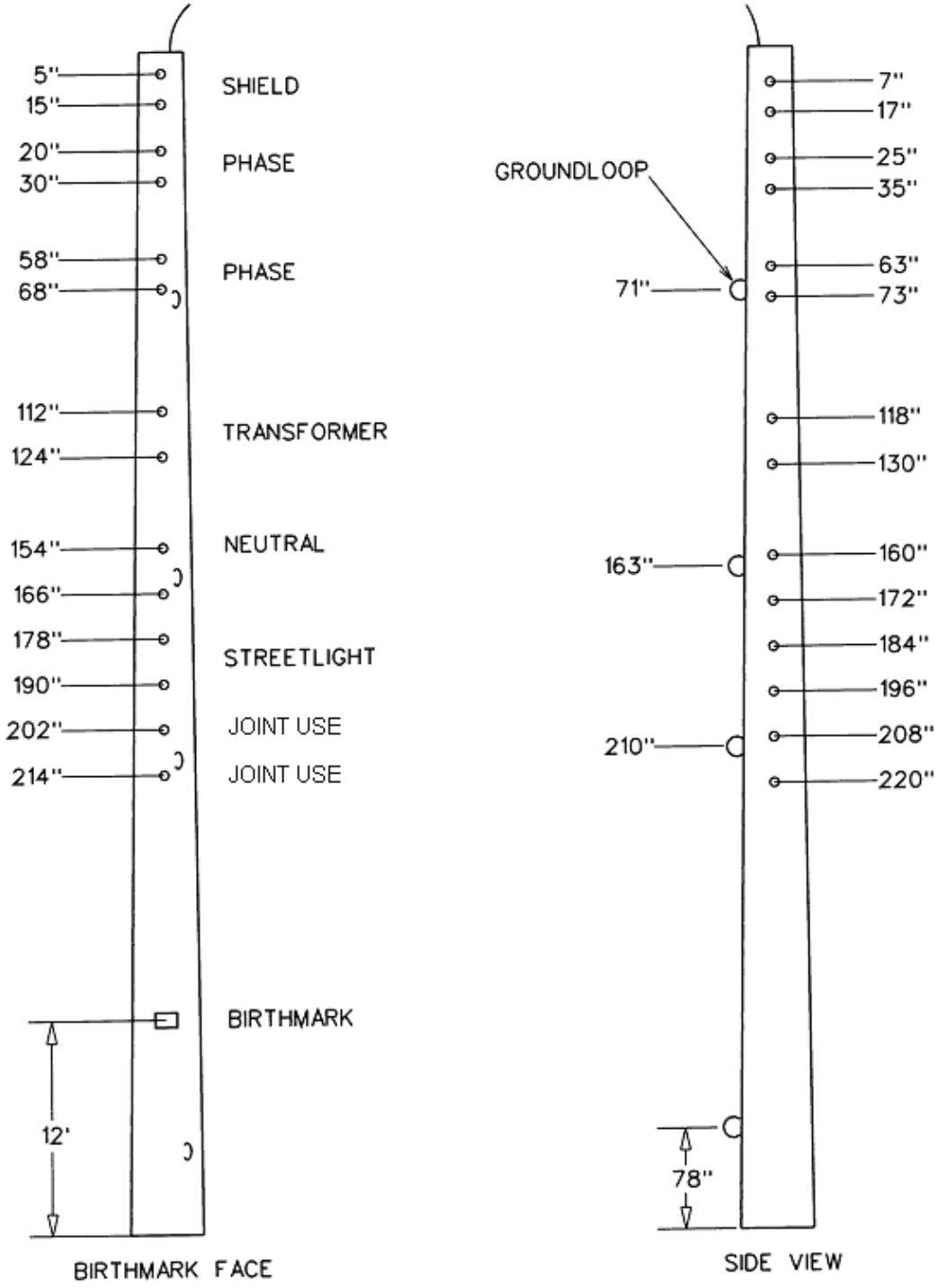
35 FOOT CONCRETE POLE - TYPE 2

POLE DRILLING DETAIL



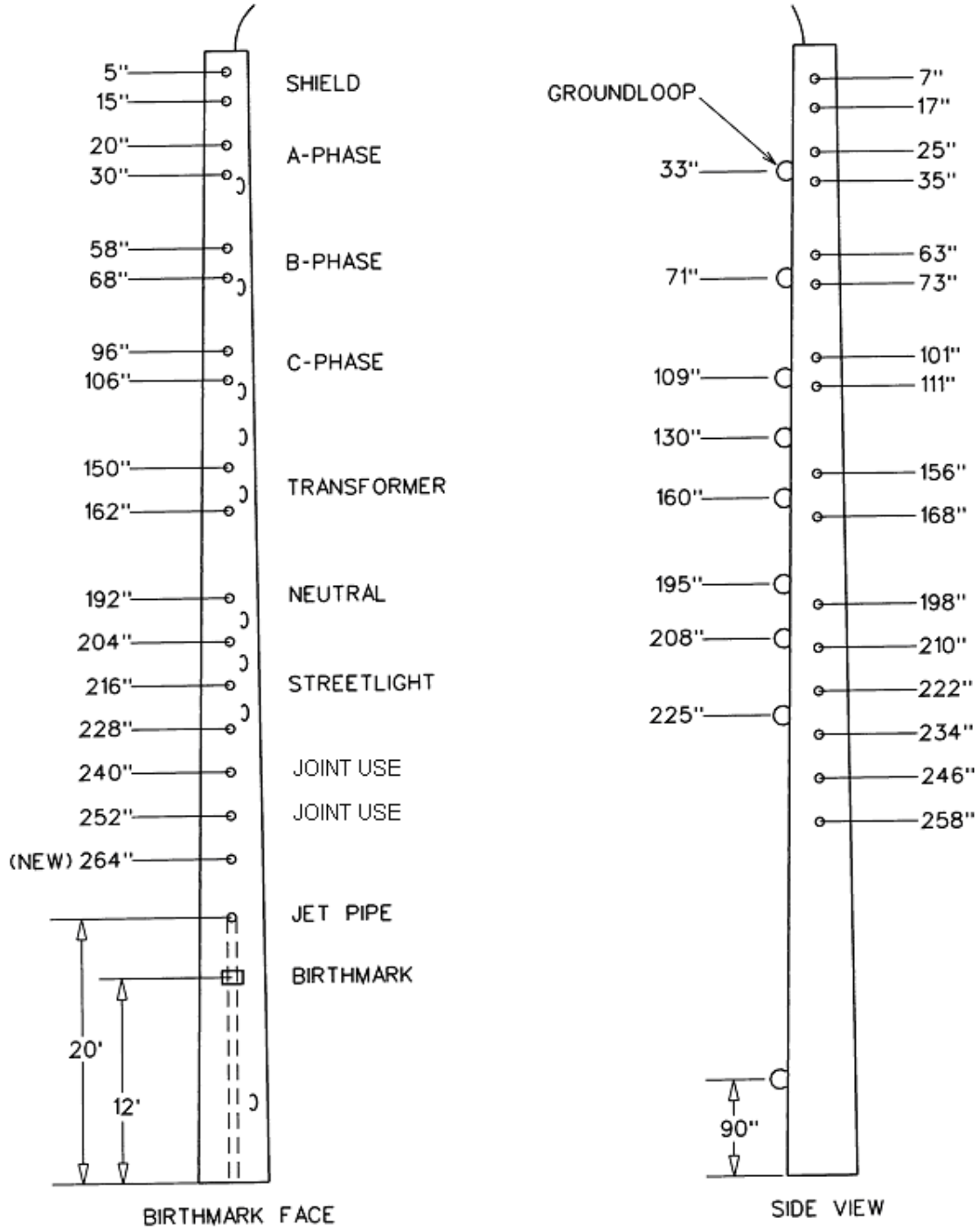
40 FOOT CONCRETE POLE - TYPE 3 (FOR LIGHTING ONLY)

POLE DRILLING DETAIL



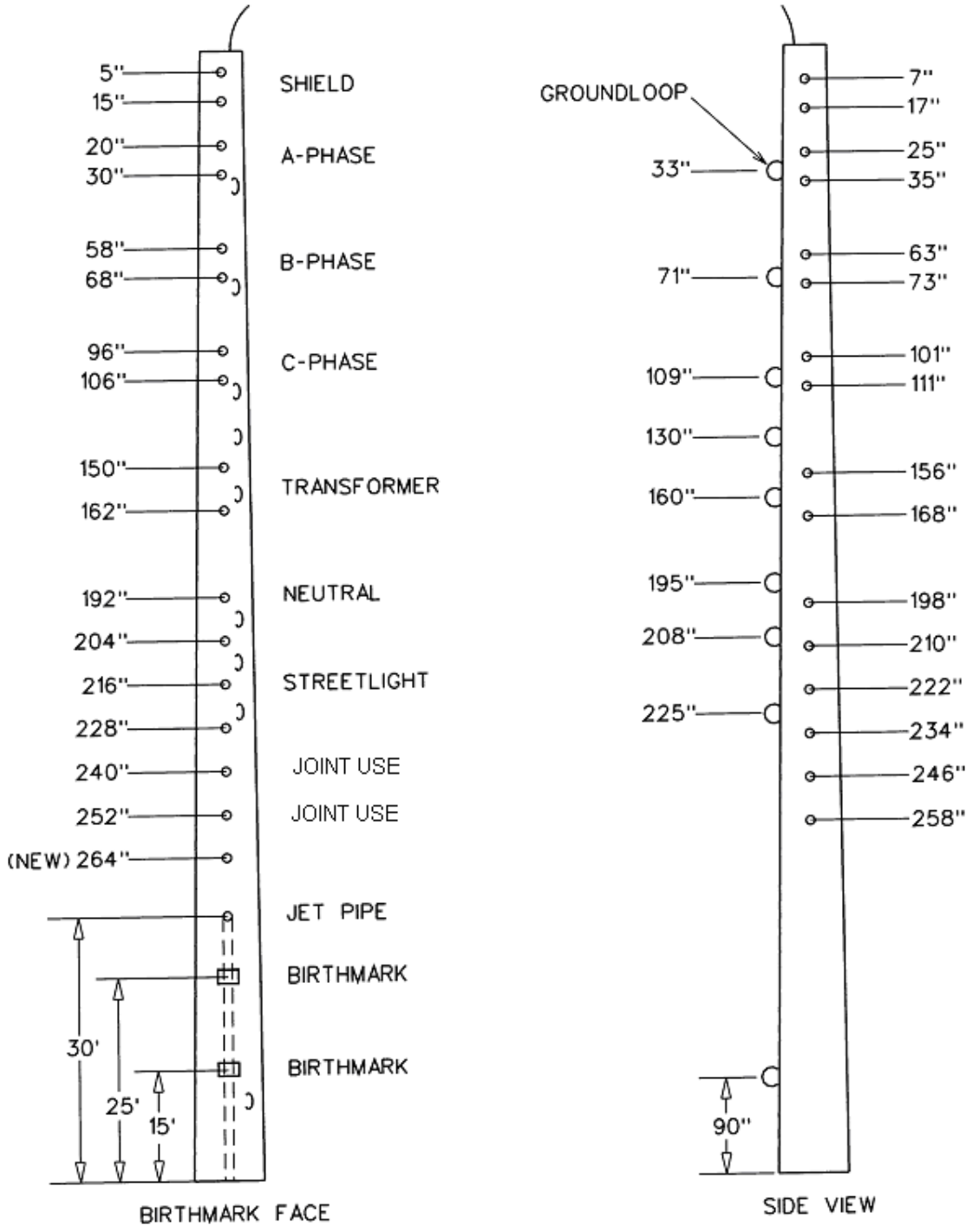
45 FOOT CONCRETE POLE - TYPE 3

POLE DRILLING DETAIL



50 FOOT CONCRETE POLE - TYPE 3 OR H

POLE DRILLING DETAIL



55 FT AND TALLER CONCRETE POLE - TYPE H, LT, HT & 80-100 FT XHT

CONDUCTOR

INTRODUCTION

1. In order to ensure safety, certain minimum clearances shall be maintained between various circuits of an overhead distribution system. Proper clearances from joint-use utilities, railroads, buildings, and other objects shall always be maintained. The standard adopted by JEA is the National Electric Safety Code.

2. Table 232-1 and Footnotes contained in this section reprinted with permission from Table 232-1, "Vertical Clearance of Wires, Conductors, and Cables Above Ground, Roadway, Rail, or Water Surfaces" Copyright © 2006 IEEE All Rights Reserved, published in the latest National Electric Safety Code (NESC); this table references Rules 232B1, 232C1a, and 232D4; Copyright © 2006 IEEE All Rights Reserved, by IEEE. The IEEE disclaims any responsibility or liability resulting from the placement and use in the described manner.

3. The information given by the following table and its footnotes are intended to cover the most common situations. If site conditions arise which are not covered in this section, refer to Section 23 of the latest NESC for more specific information.

4. For more detailed information concerning the types of conductors used by JEA, the associated connectors and splices, and various other conductor related material, refer to the Master Material Catalog.

5. Transition spans from vertical construction to horizontal construction or the reverse shall be limited to 200 feet.

6. Sag & Tension data is provided for the various size conductors used by JEA. The most common temperatures and ruling spans were used for the tables, but other criteria may be provided if requested. The data in the tables were calculated by Alcoa's SAG 10 software, with certain assumed values for variables based upon the geographical location, temperature, and wind speed.

2007 NESC TABLE 232-1

ft

Table 232-1
Vertical Clearance of Wires, Conductors, and Cables Above Ground, Roadway, Rail, or Water Surfaces[25]

(Voltages are phase to ground for effectively grounded circuits and those other circuits where all ground faults are cleared by promptly de-energizing the faulted section, both initially and following subsequent breaker operations. See the definitions section for voltages of other systems.
See Rules 232B1, 232C1a, and 232D4.)

Nature of surface underneath wires, conductors, or cables	Insulated communication conductors and cable; messengers; overhead shield/surge-protection wires; grounded guys; ungrounded guys exposed to 0 to 300 V[11, 15]; neutral conductors meeting Rule 230E1; supply cables meeting Rule 230C1 (ft)	Noninsulated communication conductors; supply cables of 0 to 750 V meeting Rules 230C2 or 230C3 (ft)	Supply cables over 750 V meeting Rules 230C2 or 230C3; open supply conductors, 0 to 750 V[3]; ungrounded guys exposed to over 300 V to 750 V[14](ft)	Open supply conductors, over 750 V to 22 kV; ungrounded guys exposed to 750 V to 22 kV[14] (ft)	Trolley and electrified railroad contact conductors and associated span or messenger wires	
					0 to 750 V to ground (ft)	Over 750 V to 22 kV to ground (ft)
Where wires, conductors, or cables cross over or overhang						
1. Track rails of railroads (except electrified railroads using overhead trolley conductors)[2, 16]	23.5	24.0	24.5	26.5	22.0[4]	22.0[4]
2. Roads, streets, and other areas subject to truck traffic [23]	15.5	16.0	16.5	18.5	18.0[5]	20.0[5]
3. Driveways, parking lots, and alleys[23]	15.5[7,13]	16.0[7,13]	16.5[7]	18.5	18.0[5]	20.0[5]
4. Other land traversed by vehicles, such as cultivated, grazing, forest, orchards, etc. [26]	15.5	16.0	16.5	18.5	–	–
5. Spaces and ways subject to pedestrians or restricted traffic only [9]	9.5	12.0[8]	12.5[8]	14.5	16.0	18.0
6. Water areas not suitable for sailboating or where sailboating is prohibited[21]	14.0	14.5	15.0	17.0	–	–

2007 NESC TABLE 232-1 – CONTINUED

ft

Table 232-1 (Continued)
Vertical Clearance of Wires, Conductors, and Cables Above Ground, Roadway, Rail, or Water Surfaces25

(Voltages are phase to ground for effectively grounded circuits and those other circuits where all ground faults are cleared by promptly de-energizing the faulted section, both initially and following subsequent breaker operations. See the definitions section for voltages of other systems.
See Rules 232B1, 232C1a, and 232D4.)

Nature of surface underneath wires, conductors, or cables	Insulated communication conductors and cable; messengers; surge-protection wires; grounded guys; ungrounded guys exposed to 0 to 300V 11,15; neutral conductors meeting Rule 230E1; supply cables meeting Rule 230C1 (ft)	Noninsulated communication conductors; supply cables of 0 to 750 V meeting Rules 230C2 or 230C3 (ft)	Supply cables over 750 V meeting Rules 230C2 or 230C3; open supply conductors, 0 to 750 V; ungrounded guys exposed to over 300 V to 750 V 14 (ft)	Open supply conductors, over 750 V to 22 kV; ungrounded guys exposed to 750 V to 22kV 14 (ft)	Trolley and electrified railroad contact conductors and associated span or messenger wires	
					0 to 750 V to ground (ft)	Over 750 V to 22 kV to ground (ft)
7. Water areas suitable for sailboating including lakes, ponds, reservoirs, tidal waters, rivers, streams, and canals with an unobstructed surface area of [7, 18, 19, 20, 21]						
Less than 20 acres	17.5	18.0	18.5	20.5	–	–
Over 20 to 200 acres	25.5	26.0	26.5	28.5	–	–
Over 200 to 2000 acres	31.5	32.0	32.5	34.5	–	–
Over 2000 acres	37.5	38.0	38.5	40.5	–	–
8. Established boat ramps and associated rigging areas; areas posted with sign(s) for rigging or launching sail boats	Clearance above ground shall be 5 ft greater than in 7 above, for the type of water areas served by the launching site					
Where wires, conductors, or cables run along and within the limits of highways or other road rights-of-way but do not overhang the roadway						
9. Roads, streets, or alleys	15.5[24]	16.0	16.5	18.5	18.0[5]	20.0[5]
10. Roads where it is unlikely that vehicles will be crossing under the line	13.5[10,12]	14.0[10]	14.5[10]	16.5	18.0[5]	20.0[5]

From Table 232-1. Vertical Clearance of Wires, Conductors, and Cables Above Ground, Roadway, Rail, or Water Surfaces, published in the 2007 National Electrical Safety Code (NESC); Copyright © 2006, IEEE. All rights reserved.

2007 NESC TABLE 232-1 (FOOTNOTES)

[1]Where subways, tunnels, or bridges require it, less clearance above ground or rails than required by Table 232-1 may be used locally. The trolley and electrified railroad contact conductor should be graded very gradually from the regular construction down to the reduced elevation.

[2]For wires, conductors, or cables crossing over mine, logging, and similar railways that handle only cars lower than standard freight cars, the clearance may be reduced by an amount equal to the difference in height between the highest loaded car handled and 20 ft, but the clearance shall not be reduced below that required for street crossings.

[3]Does not include neutral conductors meeting Rule 230E1

[4]In communities where 21 ft has been established, this clearance may be continued if carefully maintained. The elevation of the contact conductor should be the same in the crossing and next adjacent spans. (See Rule 225D2 for conditions that must be met where uniform height above rail is impractical.)

[5]In communities where 16 ft has been established for trolley and electrified railroad contact conductors 0 to 750 V to ground, or 18 ft for trolley and electrified railroad contact conductors exceeding 750 V, or where local conditions make it impractical to obtain the clearance given in the table, these reduced clearances may be used if carefully maintained.

[6]This footnote not used in this edition.

[7]Where the height of a residential building does not permit its service drop(s) to meet these values, the clearances over residential driveways only may be reduced to the following:

		(feet)
a)	Insulated supply service drops limited to 300 V to ground	12.5
b)	Insulated drip loops of supply service drops limited to 300 V to ground	10.5
c)	Supply service drops limited to 150 V to ground and meeting Rules 230C1 or 230C3	12.0
d)	Drip loops only of service drops limited to 150 V to ground and meeting Rules 230C1 or 230C3	10.0
e)	Insulated communication service drops	11.5

[7]Where the height of a residential building does not permit its service drop(s) to meet these values, the clearances may be reduced to the following:

		(feet)
a)	Insulated supply service drops limited to 300 V to ground	10.5
b)	Insulated drip loops of supply service drops limited to 300 V to ground	10.5
c)	Supply service drops limited to 150 V to ground and meeting Rules 230C1 or 230C3	10.0
d)	Drip loops only of supply service drops limited to 150 V to ground and meeting Rules 230C1 or 230C3	10.0

[9]Spaces and ways subject to pedestrians or restricted traffic only are those areas where riders on horses or other large animals, vehicles, or other mobile units exceeding a total height of 8 ft are prohibited by regulation or permanent terrain configurations, or are otherwise not normally encountered nor reasonably anticipated.

[10]Where a supply or communication line along a road is located relative to fences, ditches, embankments, etc., so that the ground under the line would not be expected to be traveled except by pedestrians, the clearances may be reduced to the following values:

		(feet)
1)	Insulated communication conductor and communication cables.	9.5
2)	Conductors of other communication circuits	9.5
3)	Supply cables of any voltage meeting Rule 230C1, supply cables limited to 150 V to ground meeting Rules 230C2 or 230C3, and neutral conductors meeting Rule 230E1	9.5
4)	Insulated supply conductors limited to 300 V to ground	12.5
5)	Guys	9.5

2007 NESC TABLE 232-1 (FOOTNOTES) – CONTINUED

[11]No clearance from ground is required for anchor guys not crossing tracks, rails, streets, driveways, roads or pathways.

[12]This clearance may be reduced to 13 ft for communication conductors and guys.

[13]Where this construction crosses over or runs along alleys, driveways, or parking lots not subject to truck traffic this clearance may be reduced to 15 ft.

[14]Ungrounded guys and ungrounded portions of span guys between guy insulators shall have clearances based on the highest voltage to which they may be exposed due to a slack conductor or guy.

[15]Anchor guys insulated in accordance with Rule 279 may have the same clearance as grounded guys.

[16]Adjacent to tunnels and overhead bridges that restrict the height of loaded rail cars to less than 20 ft, these clearances may be reduced by the difference between the highest loaded rail car handled and 20 ft, if mutually agreed to by the parties at interest.

[17]For controlled impoundments, the surface area and corresponding clearances shall be based upon the design high-water level.

[18]For uncontrolled water flow areas, the surface area shall be that enclosed by its annual high-water mark. Clearances shall be based on the normal flood level; if available, the 10-year flood level may be assumed as the normal flood level.

[19]The clearance over rivers, streams, and canals shall be based upon the largest surface area of any 1-mi-long segment that includes the crossing. The clearance over a canal, river, or stream normally used to provide access for sailboats to a larger body of water shall be the same as that required for the larger body of water.

[20]Where an overwater obstruction restricts vessel height to less than the applicable reference height given in Table 232-3, the required clearance may be reduced by the difference between the reference height and the overwater obstruction height, except that the reduced clearance shall be not less than that required for the surface area on the line-crossing side of the obstruction.

[21]Where the US Army Corps of Engineers, or the state, or surrogate thereof has issued a crossing permit, clearances of that permit shall govern.

[22]See Rule 234I for the required horizontal and diagonal clearances to rail cars.

[23]For the purpose of this Rule, trucks are defined as any vehicle exceeding 8 ft in height. Areas not subject to truck traffic are areas where truck traffic is not normally encountered nor reasonably anticipated.

[24]Communication cables and conductors may have a clearance of 15 ft where poles are back of curbs or other deterrents to vehicular traffic.

[25]The clearance values shown in this table are computed by adding the applicable Mechanical and Electrical (M&E) value of Table A-1 to the applicable Reference Component of Table A-2a of Appendix A.

[26]When designing a line to accommodate oversized vehicles, these clearance values shall be increased by the difference between the known height of the oversized vehicle and 14 ft.

SAG & TENSION NOTES

1) The first row in each sag chart is a Light Loading condition based on 9 lb/ft².

2) * This is the tension limit that became the limiting factor in this design.

3) For clearance calculations, the final sag at 200°F should be used.

4) The limits on conductor tensions per the 2007 NESC are as follows:

1. In the light loading district, the conductor's initial tensions shall not exceed 60 percent of its rated breaking strength at 30°F without ice and with a horizontal wind pressure of 9 lb/ft² (59 mph wind).

2. In all districts, the conductor's initial tension at 60°F without ice and wind shall not exceed 35 percent of the rated breaking strength.

3. In all districts, the conductor's final tension at 60°F without ice and wind shall not exceed 25 percent of the rated breaking strength.

However, the following tables are bound by the Alcoa design limits which are more stringent than the standard NESC limits:

1. In the light loading district, the conductor's initial tensions shall not exceed **50** percent of its rated breaking strength at 30°F without ice and and with a horizontal wind pressure of 9 lb/ft² (59 mph wind).

2. In all districts, the conductor's initial tension at **30**°F without ice and wind shall not exceed **33** percent of the rated breaking strength.

3. In all districts, the conductor's final tension at **30**°F without ice and wind shall not exceed 25 percent of the rated breaking strength.

SAG & TENSION DATA

Bare Aluminum Conductor, Steel Reinforced - 556 Parakeet 24/7 strand
Rated Breaking Strength: 19,800 lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	6639	0.44	4927	0.59
30	6593*	0.31	4817	0.42
35	6402	0.31	4548	0.44
40	6209	0.32	4282	0.47
45	6012	0.34	4018	0.50
50	5814	0.35	3759	0.54
55	5613	0.36	3504	0.58
60	5410	0.37	3254	0.62
65	5204	0.39	3012	0.67
70	4997	0.40	2779	0.73
75	4788	0.42	2556	0.79
80	4577	0.44	2347	0.86
85	4365	0.46	2151	0.94
90	4151	0.49	1973	1.02
95	3936	0.51	1811	1.11
200	1122	1.80	1106	1.52

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	6673	0.78	4977	1.05
30	6593*	0.54	4791	0.75
35	6404	0.56	4532	0.79
40	6213	0.58	4277	0.84
45	6019	0.60	4026	0.89
50	5823	0.62	3781	0.95
55	5626	0.64	3543	1.01
60	5426	0.66	3312	1.08
65	5225	0.69	3091	1.16
70	5022	0.71	2880	1.24
75	4818	0.74	2681	1.34
80	4614	0.78	2496	1.44
85	4408	0.81	2324	1.54
90	4203	0.85	2167	1.66
95	3997	0.90	2024	1.77
200	1306	2.75	1289	2.78

SAG & TENSION DATA

Bare Aluminum Conductor, Steel Reinforced - 556 Parakeet 24/7 strand
Rated Breaking Strength: 19,800 lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	6715	1.21	5041	1.62
30	6593*	0.85	4767	1.18
35	6407	0.87	4520	1.24
40	6218	0.90	4278	1.31
45	6027	0.93	4042	1.39
50	5835	0.96	3813	1.47
55	5641	0.99	3592	1.56
60	5446	1.03	3380	1.66
65	5250	1.07	3178	1.76
70	505	1.11	2988	1.88
75	4856	1.15	2809	1.99
80	4658	1.20	2642	2.12
85	4460	1.26	2489	2.25
90	4264	1.31	2347	2.39
95	4069	1.38	2218	2.53
200	1476	3.80	1456	3.85

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	6764	1.73	5115	2.29
30	6593*	1.22	4748	1.70
35	6410	1.26	4514	1.79
40	6224	1.30	4286	1.88
45	6037	1.34	4066	1.98
50	5849	1.38	3853	2.09
55	5660	1.43	3649	2.21
60	5470	1.47	3455	2.34
65	5279	1.53	3270	2.47
70	5089	1.59	3097	2.61
75	4898	1.65	2935	2.75
80	4708	1.71	2784	2.90
85	4519	1.79	2643	3.05
90	4332	1.86	2514	3.21
95	4146	1.95	2395	3.37
200	1675	4.82	1612	5.01

SAG & TENSION DATA

Bare Aluminum Conductor, Steel Reinforced - 556 Parakeet 24/7 strand
Rated Breaking Strength: 19,800 lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	6818	2.34	5198	3.07
30	6593*	1.67	4737	2.32
35	6413	1.71	4516	2.43
40	6231	1.76	4303	2.55
45	6048	1.82	4097	2.68
50	5865	1.87	3900	2.82
55	5681	1.93	3712	2.96
60	5496	2.00	3533	3.11
65	5312	2.07	3364	3.26
70	5128	2.14	3206	3.43
75	4944	2.22	3057	3.59
80	4762	2.31	2918	3.76
85	4582	2.40	2789	3.94
90	4403	2.49	2669	4.12
95	4228	2.60	2558	4.29
200	1879	5.85	1757	6.26

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	6876	3.03	5288	3.94
30	6593*	2.18	4733	3.03
35	6417	2.24	4526	3.17
40	6239	2.30	4327	3.32
45	6061	2.37	4136	3.47
50	5882	2.44	3953	3.63
55	5703	2.51	3779	3.80
60	5525	2.60	3614	3.97
65	5346	2.68	3459	4.15
70	5169	2.77	3312	4.33
75	4993	2.87	3175	4.52
80	4819	2.98	3046	4.71
85	4647	3.09	2926	4.90
90	4478	3.20	2815	5.10
95	4312	3.33	2710	5.30
200	2069	6.94	1895	7.58

SAG & TENSION DATA

Bare Aluminum Conductor, Steel Reinforced - 556 Parakeet 24/7 strand
Rated Breaking Strength: 19,800 lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	6938	3.80	5382	4.90
30	6593*	2.75	4738	3.83
35	6421	2.83	4544	4.00
40	6247	2.91	4358	4.17
45	6074	2.99	4180	4.34
50	5900	3.08	4010	4.53
55	5727	3.17	3849	4.72
60	5555	3.27	3696	4.91
65	5383	3.37	3552	5.11
70	5213	3.48	3416	5.32
75	5044	3.60	3289	5.52
80	4878	3.72	3169	5.73
85	4714	3.85	3056	5.94
90	4553	3.99	2951	6.16
95	4395	4.13	2853	6.37
200	2249	8.08	2025	8.98

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	7002	4.65	5479	5.95
30	6593*	3.40	4749	4.72
35	6425	3.49	4568	4.91
40	6256	3.58	4394	5.10
45	6088	3.68	4228	5.30
50	5920	3.79	4070	5.51
55	5752	3.90	3920	5.72
60	5586	4.01	3778	5.93
65	5421	4.14	3644	6.15
70	5257	4.26	3517	6.38
75	5096	4.40	3398	6.60
80	4937	4.54	3285	6.83
85	4781	4.69	3179	7.05
90	4628	4.84	3080	7.28
95	4478	5.01	2986	7.51
200	2418	9.28	2149	10.45

SAG & TENSION DATA

Bare Aluminum Conductor, Steel Reinforced - 556 Parakeet 24/7 strand
Rated Breaking Strength: 19,800 lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	7067	5.58	5577	7.07
30	6593*	4.11	4767	5.69
35	6429	4.22	4597	5.90
40	6266	4.33	4435	6.12
45	6102	4.44	4280	6.34
50	5940	4.57	4133	6.57
55	5778	4.69	3992	6.80
60	5618	4.83	3860	7.03
65	5459	4.97	3734	7.27
70	5302	5.12	3615	7.51
75	5148	5.27	3503	7.75
80	4996	5.43	3396	7.99
85	4847	5.60	3296	8.23
90	4702	5.77	3202	8.48
95	4560	5.95	3113	8.72
200	2579	10.53	2267	11.99

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	7134	6.58	5676	8.27
30	6593*	4.90	4789	6.74
35	6434	5.02	4630	6.97
40	6275	5.14	4479	7.21
45	6117	5.28	4334	7.45
50	5960	5.42	4196	7.70
55	5804	5.56	4064	7.95
60	5650	5.71	3940	8.20
65	5498	5.87	3821	8.45
70	5347	6.04	3709	8.71
75	5200	6.21	3603	8.97
80	5055	6.39	3503	9.22
85	4913	6.57	3408	9.48
90	4774	6.76	3317	9.74
95	4639	6.96	3232	10.00
200	2731	11.84	2380	13.60

SAG & TENSION DATA
All Aluminum Conductor - 636 Orchid, 37 strand
Rated Breaking Strength: 11,400 lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	3893	0.69	3015	0.90
30	3796*	0.44	2795	0.60
35	3619	0.46	2561	0.66
40	3440	0.49	2336	0.72
45	3260	0.52	2122	0.79
50	3079	0.55	1921	0.87
55	2897	0.58	1737	0.97
60	2715	0.62	1572	1.07
65	2534	0.66	1426	1.18
70	2355	0.71	1299	1.29
75	2180	0.77	1190	1.41
80	2010	0.84	1097	1.53
85	1847	0.91	1017	1.65
90	1693	0.99	950	1.77
95	1550	1.08	891	1.89
200	529	3.18	450	3.74

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	3958	1.21	3070	1.57
30	3796*	0.79	2721	1.10
35	3624	0.82	2511	1.19
40	3451	0.87	2313	1.29
45	3278	0.91	2129	1.40
50	3104	0.96	1960	1.52
55	2932	1.02	1806	1.65
60	2761	1.08	1669	1.79
65	2592	1.15	1547	1.93
70	2428	1.23	1440	2.07
75	2268	1.32	1346	2.22
80	2115	1.41	1263	2.36
85	1971	1.52	1191	2.51
90	1835	1.63	1127	2.65
95	1709	1.75	1071	2.79
200	688	4.35	585	5.12

SAG & TENSION DATA
All Aluminum Conductor - 636 Orchid, 37 strand
Rated Breaking Strength: 11,400 lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	4032	1.86	3147	2.39
30	3796*	1.23	2672	1.75
35	3630	1.29	2488	1.88
40	3464	1.35	2316	2.01
45	3298	1.41	2158	2.16
50	3134	1.49	2014	2.32
55	2971	1.57	1883	2.48
60	2812	1.66	1766	2.64
65	2656	1.76	1661	2.81
70	2505	1.86	1567	2.98
75	2360	1.98	1483	3.15
80	2221	2.10	1408	3.31
85	2091	2.23	1341	3.48
90	1969	2.37	1281	3.64
95	1855	2.52	1227	3.81
200	839	5.57	713	6.57

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	4111	2.63	3237	3.34
30	3796*	1.77	2648	2.54
35	3637	1.85	2487	2.70
40	3478	1.93	2338	2.87
45	3321	2.02	2201	3.05
50	3165	2.12	2076	3.24
55	3013	2.23	1963	3.42
60	2865	2.35	1860	3.61
65	2721	2.47	1767	3.80
70	2582	2.60	1683	3.99
75	2449	2.74	1607	4.18
80	2323	2.89	1538	4.37
85	2204	3.05	1476	4.56
90	2093	3.21	1419	4.74
95	1989	3.38	1367	4.92
200	982	6.86	834	8.09

SAG & TENSION DATA

All Aluminum Conductor - 636 Orchid, 37 strand
Rated Breaking Strength: 11,400 lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	4193	3.51	3334	4.42
30	3796*	2.41	2644	3.46
35	3644	2.51	2503	3.65
40	3493	2.62	2372	3.86
45	3344	2.73	2252	4.06
50	3198	2.86	2142	4.27
55	3056	2.99	2042	4.48
60	2918	3.13	1950	4.69
65	2785	3.28	1866	4.90
70	2657	3.44	1790	5.11
75	2535	3.61	1720	5.32
80	2419	3.78	1656	5.53
85	2310	3.96	1597	5.73
90	2207	4.14	1543	5.93
95	2111	4.33	1493	6.13
200	1118	8.20	949	9.67

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	4276	4.50	3433	5.61
30	3796*	3.15	2654	4.50
35	3651	3.27	2529	4.72
40	3508	3.40	2414	4.95
45	3368	3.55	2307	5.18
50	3232	3.70	2209	5.41
55	3099	3.85	2119	5.64
60	2971	4.02	2036	5.87
65	2847	4.20	1959	6.10
70	2729	4.38	1889	6.33
75	2616	4.57	1824	6.56
80	2509	4.76	1764	6.78
85	2408	4.96	1708	7.00
90	2313	5.17	1657	7.22
95	2223	5.38	1609	7.43
200	1246	9.61	1059	11.32

SAG & TENSION DATA
All Aluminum Conductor - 636 Orchid, 37 strand
Rated Breaking Strength: 11,400 lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	4357	5.59	3533	6.90
30	3796*	3.98	2673	5.66
35	3659	4.13	2562	5.90
40	3524	4.29	2459	6.15
45	3392	4.46	2363	6.40
50	3264	4.63	2275	6.65
55	3141	4.81	2193	6.90
60	3021	5.01	2117	7.15
65	2906	5.20	2046	7.40
70	2796	5.41	1981	7.64
75	2692	5.62	1920	7.88
80	2593	5.83	1864	8.12
85	2499	6.05	1811	8.36
90	2410	6.28	1762	8.59
95	2326	6.50	1716	8.83
200	1368	11.08	1164	13.05

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	4437	6.78	3630	8.29
30	3796*	4.92	2699	6.92
35	3666	5.09	2599	7.19
40	3539	5.27	2506	7.45
45	3416	5.47	2419	7.72
50	3296	5.66	2338	7.99
55	3180	5.87	2263	8.26
60	3069	6.08	2193	8.52
65	2962	6.30	2128	8.78
70	2860	6.53	2067	9.04
75	2763	6.76	2010	9.30
80	2670	6.99	1956	9.56
85	2582	7.23	1906	9.81
90	2499	7.47	1859	10.06
95	2420	7.72	1815	10.30
200	1483	12.63	1263	14.84

SAG & TENSION DATA
All Aluminum Conductor - 636 Orchid, 37 strand
Rated Breaking Strength: 11,400 lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	4513	8.06	3725	9.77
30	3796*	5.95	2729	8.28
35	3674	6.15	2638	8.57
40	3554	6.36	2553	8.85
45	3439	6.57	2474	9.14
50	3326	6.79	2400	9.42
55	3218	7.02	2330	9.70
60	3114	7.25	2265	9.98
65	3015	7.50	2204	10.26
70	2919	7.74	2147	10.53
75	2829	7.99	2093	10.81
80	2742	8.24	2042	11.08
85	2659	8.50	1995	11.34
90	2581	8.76	1949	11.61
95	2507	9.02	1907	11.87
200	1592	14.23	1359	16.70

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	4587	9.44	3817	11.36
30	3796*	7.08	2761	9.74
35	3681	7.30	2678	10.05
40	3569	7.53	2600	10.35
45	3460	7.77	2527	10.65
50	3355	8.01	2459	10.95
55	3254	8.26	2394	11.24
60	3157	8.52	2333	11.54
65	3064	8.78	2276	11.83
70	2975	9.04	2222	12.12
75	2890	9.31	2171	12.40
80	2808	9.58	2123	12.68
85	2731	9.85	2077	12.96
90	2657	10.13	2034	13.24
95	2587	10.40	1993	13.52
200	1695	15.91	1449	18.63

SAG & TENSION DATA
All Aluminum Conductor - 336 Tulip, 19 strand
Rated Breaking Strength: 6150 lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2147	0.84	1605	1.12
30	2048*	0.43	1371	0.65
35	1946	0.46	1245	0.71
40	1844	0.48	1126	0.79
45	1741	0.51	1015	0.88
50	1638	0.54	915	0.97
55	1535	0.58	825	1.08
60	1433	0.62	746	1.19
65	1332	0.67	678	1.31
70	1233	0.72	621	1.43
75	1136	0.78	572	1.55
80	1044	0.85	531	1.68
85	956	0.93	495	1.80
90	875	1.02	465	1.91
95	800	1.11	439	2.03
200	278	3.20	232	3.84

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2210	1.45	1675	1.91
30	2048*	0.77	1324	1.19
35	1949	0.81	1215	1.30
40	1850	0.85	1115	1.42
45	1751	0.90	1023	1.55
50	1653	0.96	941	1.68
55	1556	1.02	868	1.82
60	1460	1.08	804	1.97
65	1366	1.16	748	2.11
70	1275	1.24	699	2.26
75	1187	1.33	656	2.41
80	1105	1.43	619	2.56
85	1027	1.54	586	2.70
90	954	1.66	557	2.84
95	888	1.78	531	2.98
200	362	4.38	302	5.25

SAG & TENSION DATA

All Aluminum Conductor - 336 Tulip, 19 strand

Rated Breaking Strength: 6150 lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2279	2.20	1756	2.85
30	2048*	1.21	1300	1.90
35	1953	1.26	1207	2.05
40	1858	1.33	1122	2.20
45	1763	1.40	1046	2.36
50	1670	1.48	977	2.53
55	1579	1.56	915	2.70
60	1489	1.66	861	2.87
65	1403	1.76	812	3.04
70	1319	1.87	769	3.21
75	1240	1.99	731	3.38
80	1165	2.12	696	3.55
85	1094	2.26	665	3.71
90	1029	2.40	638	3.88
95	969	2.55	613	4.03
200	441	5.61	368	6.74

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2351	3.07	1840	3.92
30	2048*	1.74	1294	2.75
35	1957	1.82	1215	2.93
40	1866	1.91	1142	3.11
45	1777	2.00	1077	3.30
50	1689	2.11	1017	3.50
55	1603	2.22	964	3.69
60	1520	2.34	916	3.89
65	1440	2.47	873	4.08
70	1363	2.61	833	4.27
75	1291	2.76	798	4.46
80	1222	2.91	766	4.65
85	1158	3.07	737	4.83
90	1098	3.24	710	5.01
95	1043	3.41	686	5.19
200	517	6.89	431	8.29

SAG & TENSION DATA
All Aluminum Conductor - 336 Tulip, 19 strand
Rated Breaking Strength: 6150 lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2423	4.05	1925	5.11
30	2048*	2.36	1300	3.72
35	1961	2.47	1232	3.93
40	1875	2.58	1169	4.14
45	1790	2.70	1111	4.36
50	1708	2.83	1059	4.57
55	1628	2.97	1012	4.79
60	1551	3.12	968	5.00
65	1477	3.28	929	5.22
70	1406	3.44	893	5.43
75	1339	3.61	860	5.63
80	1276	3.79	830	5.84
85	1217	3.98	802	6.04
90	1162	4.17	777	6.24
95	1111	4.36	753	6.44
200	589	8.24	490	9.91

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2493	5.15	2009	6.39
30	2048*	3.09	1315	4.81
35	1965	3.22	1254	5.04
40	1884	3.36	1198	5.28
45	1804	3.50	1147	5.51
50	1727	3.66	1100	5.75
55	1653	3.83	1058	5.98
60	1581	4.00	1018	6.22
65	1512	4.18	982	6.45
70	1447	4.37	948	6.67
75	1385	4.57	917	6.90
80	1327	4.77	889	7.12
85	1272	4.97	862	7.34
90	1221	5.18	838	7.56
95	1173	5.40	815	7.77
200	657	9.65	548	11.59

SAG & TENSION DATA

All Aluminum Conductor - 336 Tulip, 19 strand

Rated Breaking Strength: 6150 lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2562	6.34	2090	7.78
30	2048*	3.91	1333	6.00
35	1970	4.06	1279	6.26
40	1893	4.23	1229	6.51
45	1818	4.40	1183	6.77
50	1746	4.58	1141	7.02
55	1677	4.77	1101	7.27
60	1610	4.97	1065	7.52
65	1546	5.18	1031	7.77
70	1486	5.39	1000	8.01
75	1428	5.61	971	8.25
80	1374	5.83	944	8.49
85	1323	6.05	918	8.73
90	1274	6.28	895	8.96
95	1229	6.51	873	9.19
200	722	11.12	602	13.34

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2628	7.63	2168	9.26
30	2048*	4.82	1355	7.30
35	1974	5.01	1306	7.57
40	1902	5.20	1261	7.84
45	1832	5.39	1219	8.11
50	1765	5.60	1180	8.38
55	1700	5.81	1143	8.65
60	1637	6.04	1109	8.92
65	1578	6.26	1078	9.18
70	1522	6.50	1048	9.44
75	1468	6.73	1021	9.70
80	1417	6.97	995	9.95
85	1369	7.22	970	10.20
90	1324	7.47	948	10.45
95	1282	7.72	926	10.69
200	783	12.66	655	15.16

SAG & TENSION DATA
All Aluminum Conductor - 336 Tulip, 19 strand
Rated Breaking Strength: 6150 lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2692	9.02	2243	10.83
30	2048*	5.84	1377	8.69
35	1978	6.04	1333	8.98
40	1910	6.26	1292	9.27
45	1845	6.48	1253	9.55
50	1782	6.71	1217	9.84
55	1721	6.95	1183	10.12
60	1663	7.19	1151	10.40
65	1608	7.44	1121	10.68
70	1555	7.69	1093	10.95
75	1505	7.95	1067	11.22
80	1457	8.21	1042	11.49
85	1412	8.47	1019	11.75
90	1370	8.73	997	12.01
95	1330	9.00	976	12.27
200	841	14.26	705	17.04

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2752	10.50	2315	12.49
30	2048*	6.95	1400	10.17
35	1982	7.18	1360	10.47
40	1919	7.42	1322	10.78
45	1857	7.66	1286	11.08
50	1798	7.91	1252	11.38
55	1742	8.17	1220	11.68
60	1688	8.44	1191	11.97
65	1636	8.70	1162	12.26
70	1586	8.97	1136	12.55
75	1539	9.25	1111	12.83
80	1495	9.53	1087	13.11
85	1452	9.81	1065	13.39
90	1412	10.09	1043	13.67
95	1374	10.37	1023	13.94
200	896	15.93	753	18.99

SAG & TENSION DATA
All Aluminum Alloy Conductor - 4/0 Alliance, 7 strand
Rated Breaking Strength: 8560 lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2769	0.54	2216	0.67
30	2730	0.24	2140*	0.30
35	2638	0.25	2029	0.32
40	2547	0.26	1918	0.34
45	2456	0.27	1808	0.36
50	2366	0.28	1698	0.38
55	2275	0.29	1589	0.41
60	2185	0.30	1481	0.44
65	2095	0.31	1375	0.47
70	2006	0.33	1270	0.51
75	1917	0.34	1166	0.56
80	1828	0.36	1066	0.61
85	1741	0.37	969	0.67
90	1654	0.39	877	0.74
95	1568	0.42	791	0.83
200	352	1.85	215	3.05

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2802	0.95	2268	1.17
30	2733	0.42	2140*	0.54
35	2643	0.44	2031	0.57
40	2552	0.45	1922	0.60
45	2462	0.47	1814	0.64
50	2372	0.49	1707	0.68
55	2282	0.51	1601	0.72
60	2193	0.53	1496	0.78
65	2104	0.55	1394	0.83
70	2016	0.58	1294	0.90
75	1928	0.60	1197	0.97
80	1841	0.63	1103	1.05
85	1755	0.66	1014	1.14
90	1670	0.69	930	1.25
95	1586	0.73	852	1.36
200	432	2.69	280	4.15

SAG & TENSION DATA
All Aluminum Alloy Conductor - 4/0 Alliance, 7 strand
Rated Breaking Strength: 8560 lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2841	1.46	2327	1.79
30	2738	0.66	2140*	0.85
35	2648	0.68	2033	0.89
40	2558	0.71	1926	0.94
45	2468	0.73	1821	1.00
50	2379	0.76	1717	1.06
55	2290	0.79	1615	1.12
60	2202	0.82	1514	1.20
65	2114	0.86	1416	1.28
70	2027	0.89	1322	1.37
75	1941	0.93	1230	1.47
80	1855	0.98	1143	1.59
85	1771	1.02	1060	1.71
90	1688	1.07	983	1.84
95	1606	1.13	912	1.99
200	506	3.58	344	5.29

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2885	2.07	2391	2.50
30	2741	0.95	2140*	1.22
35	2652	0.98	2035	1.28
40	2563	1.02	1931	1.35
45	2475	1.05	1829	1.43
50	2387	1.09	1728	1.51
55	2299	1.14	1630	1.60
60	2212	1.18	1534	1.70
65	2125	1.23	1441	1.81
70	2040	1.28	1351	1.93
75	1955	1.34	1265	2.06
80	1872	1.39	1184	2.21
85	1789	1.46	1107	2.36
90	1708	1.53	1036	2.52
95	1629	1.60	969	2.69
200	575	4.55	404	6.47

SAG & TENSION DATA

All Aluminum Alloy Conductor - 4/0 Alliance, 7 strand
Rated Breaking Strength: 8560 lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2933	2.78	2457	3.32
30	2744	1.29	2140*	1.66
35	2656	1.34	2038	1.74
40	2568	1.38	1937	1.83
45	2481	1.43	1838	1.93
50	2394	1.48	1741	2.04
55	2307	1.54	1647	2.16
60	2222	1.60	1555	2.28
65	2137	1.66	1467	2.42
70	2053	1.73	1382	2.57
75	1970	1.80	1301	2.73
80	1888	1.88	1225	2.90
85	1808	1.97	1153	3.08
90	1729	2.05	1086	3.27
95	1652	2.15	1025	3.47
200	640	5.56	463	7.70

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2982	3.57	2525	4.21
30	2747	1.69	2140*	2.17
35	2659	1.74	2041	2.27
40	2573	1.80	1943	2.39
45	2486	1.87	1848	2.51
50	2401	1.93	1754	2.65
55	2316	2.00	1664	2.79
60	2231	2.08	1577	2.94
65	2148	2.16	1493	3.11
70	2066	2.25	1413	3.28
75	1985	2.34	1337	3.47
80	1906	2.44	1265	3.67
85	1827	2.54	1198	3.88
90	1751	2.65	1135	4.09
95	1677	2.77	1077	4.31
200	701	6.63	519	8.97

SAG & TENSION DATA
All Aluminum Alloy Conductor - 4/0 Alliance, 7 strand
Rated Breaking Strength: 8560 lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	3033	4.44	2593	5.19
30	2747	2.14	2140*	2.74
35	2661	2.21	2044	2.87
40	2576	2.28	1949	3.01
45	2491	2.36	1858	3.16
50	2406	2.44	1768	3.32
55	2323	2.53	1682	3.49
60	2241	2.62	1599	3.67
65	2159	2.72	1520	3.87
70	2079	2.83	1444	4.07
75	2000	2.94	1372	4.28
80	1923	3.06	1304	4.50
85	1847	3.18	1241	4.74
90	1773	3.31	1181	4.97
95	1701	3.45	1126	5.22
200	758	7.76	573	10.28

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	3084	5.39	2661	6.25
30	2747	2.64	2140*	3.39
35	2662	2.72	2047	3.54
40	2578	2.81	1956	3.71
45	2494	2.91	1868	3.88
50	2411	3.01	1783	4.07
55	2330	3.11	1700	4.27
60	2249	3.22	1621	4.47
65	2169	3.34	1546	4.69
70	2091	3.47	1474	4.92
75	2014	3.60	1406	5.16
80	1939	3.74	1342	5.41
85	1866	3.89	1282	5.66
90	1794	4.04	1225	5.92
95	1725	4.21	1173	6.19
200	813	8.93	625	11.64

SAG & TENSION DATA

All Aluminum Alloy Conductor - 4/0 Alliance, 7 strand
Rated Breaking Strength: 8560 lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	3135	6.42	2727	7.38
30	2745	3.20	2140*	4.10
35	2661	3.30	2050	4.28
40	2579	3.40	1963	4.47
45	2497	3.51	1878	4.67
50	2415	3.63	1797	4.88
55	2335	3.76	1718	5.11
60	2256	3.89	1643	5.34
65	2179	4.03	1571	5.59
70	2103	4.17	1503	5.84
75	2028	4.33	1439	6.10
80	1955	4.49	1378	6.37
85	1884	4.66	1321	6.65
90	1815	4.84	1267	6.93
95	1748	5.02	1217	7.22
200	865	10.16	675	13.04

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	3186	7.52	2792	8.58
30	2741	3.81	2140*	4.88
35	2659	3.93	2054	5.09
40	2578	4.05	1970	5.30
45	2498	4.18	1889	5.53
50	2418	4.32	1811	5.77
55	2340	4.46	1736	6.02
60	2263	4.61	1664	6.28
65	2188	4.77	1596	6.54
70	2113	4.94	1531	6.82
75	2041	5.12	1470	7.11
80	1970	5.30	1412	7.40
85	1902	5.49	1358	7.70
90	1835	5.69	1307	8.00
95	1770	5.90	1259	8.30
200	915	11.43	723	14.48

SAG & TENSION DATA

All Aluminum Alloy Conductor - 3/0 Amherst, 7 strand
Rated Breaking Strength: 6790 lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2206	0.60	1774	0.74
30	2165	0.24	1697*	0.30
35	2093	0.25	1609	0.32
40	2021	0.26	1522	0.34
45	1949	0.27	1434	0.36
50	1877	0.28	1347	0.38
55	1805	0.29	1261	0.41
60	1733	0.30	1175	0.44
65	1662	0.31	1091	0.47
70	1591	0.33	1007	0.51
75	1521	0.34	926	0.56
80	1451	0.36	846	0.61
85	1381	0.37	769	0.67
90	1313	0.39	696	0.74
95	1244	0.42	628	0.82
200	280	1.85	170	3.05

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2238	1.05	1825	1.29
30	2168	0.42	1698*	0.54
35	2097	0.44	1611	0.57
40	2025	0.45	1524	0.60
45	1953	0.47	1439	0.64
50	1882	0.49	1354	0.68
55	1811	0.51	1270	0.72
60	1740	0.53	1187	0.77
65	1669	0.55	1106	0.83
70	1599	0.58	1027	0.90
75	1530	0.60	950	0.97
80	1461	0.63	875	1.05
85	1392	0.66	804	1.14
90	1325	0.69	738	1.25
95	1258	0.73	676	1.36
200	343	2.68	222	4.14

SAG & TENSION DATA

All Aluminum Alloy Conductor - 3/0 Amherst, 7 strand

Rated Breaking Strength: 6790 lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2276	1.61	1882	1.95
30	2172	0.66	1698*	0.85
35	2100	0.68	1612	0.89
40	2029	0.71	1528	0.94
45	1958	0.73	1444	1.00
50	1888	0.76	1362	1.06
55	1817	0.79	1281	1.12
60	1747	0.82	1201	1.20
65	1677	0.86	1124	1.28
70	1608	0.89	1049	1.37
75	1540	0.93	976	1.47
80	1472	0.98	907	1.59
85	1405	1.02	841	1.71
90	1339	1.07	780	1.84
95	1275	1.13	724	1.99
200	402	3.58	273	5.29

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2318	2.28	1943	2.72
30	2175	0.95	1698*	1.22
35	2104	0.98	1614	1.28
40	2033	1.02	1532	1.35
45	1963	1.05	1451	1.43
50	1893	1.09	1371	1.51
55	1824	1.14	1293	1.60
60	1755	1.18	1217	1.70
65	1686	1.23	1143	1.81
70	1618	1.28	1072	1.93
75	1551	1.33	1004	2.06
80	1485	1.39	940	2.20
85	1420	1.46	879	2.36
90	1355	1.53	822	2.52
95	1292	1.60	769	2.69
200	456	4.54	321	6.47

SAG & TENSION DATA

All Aluminum Alloy Conductor - 3/0 Amherst, 7 strand

Rated Breaking Strength: 6790 lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2364	3.04	2005	3.58
30	2177	1.29	1698*	1.66
35	2107	1.34	1616	1.74
40	2037	1.38	1536	1.83
45	1968	1.43	1458	1.93
50	1899	1.48	1381	2.04
55	1831	1.54	1306	2.16
60	1763	1.60	1234	2.28
65	1695	1.66	1164	2.42
70	1629	1.73	1097	2.57
75	1563	1.80	1033	2.73
80	1498	1.88	972	2.90
85	1435	1.96	915	3.08
90	1372	2.05	862	3.27
95	1311	2.15	813	3.47
200	507	5.56	367	7.70

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2411	3.89	2069	4.54
30	2179	1.69	1698*	2.17
35	2110	1.74	1619	2.27
40	2041	1.80	1541	2.39
45	1972	1.87	1466	2.51
50	1904	1.93	1392	2.64
55	1837	2.00	1320	2.79
60	1770	2.08	1251	2.94
65	1704	2.16	1185	3.11
70	1639	2.25	1121	3.28
75	1575	2.34	1061	3.47
80	1512	2.43	1004	3.67
85	1450	2.54	951	3.87
90	1389	2.65	901	4.09
95	1330	2.77	854	4.31
200	556	6.63	412	8.96

SAG & TENSION DATA

All Aluminum Alloy Conductor - 3/0 Amherst, 7 strand
Rated Breaking Strength: 6790 lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2459	4.83	2132	5.57
30	2179	2.14	1698*	2.74
35	2111	2.21	1621	2.87
40	2043	2.28	1546	3.01
45	1976	2.36	1474	3.16
50	1909	2.44	1403	3.32
55	1843	2.53	1335	3.49
60	1778	2.62	1269	3.67
65	1713	2.72	1206	3.86
70	1649	2.82	1146	4.07
75	1587	2.94	1089	4.28
80	1525	3.05	1035	4.50
85	1465	3.18	984	4.73
90	1407	3.31	937	4.97
95	1350	3.45	894	5.22
200	602	7.75	454	10.28

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2508	5.85	2195	6.69
30	2179	2.64	1697*	3.39
35	2112	2.72	1624	3.54
40	2045	2.81	1552	3.71
45	1979	2.91	1482	3.88
50	1913	3.01	1414	4.07
55	1848	3.11	1349	4.26
60	1784	3.22	1286	4.47
65	1721	3.34	1226	4.69
70	1659	3.47	1169	4.92
75	1598	3.60	1115	5.16
80	1539	3.74	1065	5.40
85	1480	3.89	1017	5.66
90	1424	4.04	972	5.92
95	1368	4.20	931	6.18
200	645	8.93	496	11.63

SAG & TENSION DATA
All Aluminum Alloy Conductor - 3/0 Amherst, 7 strand
Rated Breaking Strength: 6790 lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2556	6.94	2256	7.87
30	2177	3.20	1697*	4.10
35	2111	3.30	1626	4.28
40	2045	3.40	1557	4.47
45	1980	3.51	1490	4.67
50	1916	3.63	1425	4.88
55	1853	3.76	1363	5.11
60	1790	3.89	1303	5.34
65	1729	4.03	1247	5.58
70	1668	4.17	1193	5.84
75	1609	4.33	1141	6.10
80	1551	4.49	1093	6.37
85	1495	4.66	1048	6.65
90	1440	4.83	1005	6.93
95	1387	5.02	965	7.21
200	687	10.15	535	13.03

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2604	8.11	2316	9.13
30	2175	3.81	1697*	4.88
35	2110	3.93	1629	5.08
40	2045	4.05	1563	5.30
45	1981	4.18	1498	5.53
50	1918	4.32	1436	5.77
55	1856	4.46	1377	6.02
60	1795	4.61	1320	6.27
65	1735	4.77	1266	6.54
70	1677	4.94	1215	6.82
75	1619	5.12	1166	7.10
80	1563	5.30	1120	7.40
85	1509	5.49	1077	7.69
90	1456	5.69	1037	8.00
95	1404	5.90	998	8.30
200	726	11.43	574	14.48

SAG & TENSION DATA
All Aluminum Alloy Conductor - 1/0 Azusa, 7 strand
Rated Breaking Strength: 4460 lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	6639	0.44	4927	0.59
30	6593*	0.31	4817	0.42
35	6402	0.31	4548	0.44
40	6209	0.32	4282	0.47
45	6012	0.34	4018	0.50
50	5814	0.35	3759	0.54
55	5613	0.36	3504	0.58
60	5410	0.37	3254	0.62
65	5204	0.39	3012	0.67
70	4997	0.40	2779	0.73
75	4788	0.42	2556	0.79
80	4577	0.44	2347	0.86
85	4365	0.46	2151	0.94
90	4151	0.49	1973	1.02
95	3936	0.51	1811	1.11
200	1122	1.80	1106	1.52

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	6673	0.78	4977	1.05
30	6593*	0.54	4791	0.75
35	6404	0.56	4532	0.79
40	6213	0.58	4277	0.84
45	6019	0.60	4026	0.89
50	5823	0.62	3781	0.95
55	5626	0.64	3543	1.01
60	5426	0.66	3312	1.08
65	5225	0.69	3091	1.16
70	5022	0.71	2880	1.24
75	4818	0.74	2681	1.34
80	4614	0.78	2496	1.44
85	4408	0.81	2324	1.54
90	4203	0.85	2167	1.66
95	3997	0.90	2024	1.77
200	1306	2.75	1289	2.78

SAG & TENSION DATA
All Aluminum Alloy Conductor - 1/0 Azusa, 7 strand
Rated Breaking Strength: 4460 lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	6715	1.21	5041	1.62
30	6593*	0.85	4767	1.18
35	6407	0.87	4520	1.24
40	6218	0.90	4278	1.31
45	6027	0.93	4042	1.39
50	5835	0.96	3813	1.47
55	5641	0.99	3592	1.56
60	5446	1.03	3380	1.66
65	5250	1.07	3178	1.76
70	505	1.11	2988	1.88
75	4856	1.15	2809	1.99
80	4658	1.20	2642	2.12
85	4460	1.26	2489	2.25
90	4264	1.31	2347	2.39
95	4069	1.38	2218	2.53
200	1476	3.80	1456	3.85

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	6764	1.73	5115	2.29
30	6593*	1.22	4748	1.70
35	6410	1.26	4514	1.79
40	6224	1.30	4286	1.88
45	6037	1.34	4066	1.98
50	5849	1.38	3853	2.09
55	5660	1.43	3649	2.21
60	5470	1.47	3455	2.34
65	5279	1.53	3270	2.47
70	5089	1.59	3097	2.61
75	4898	1.65	2935	2.75
80	4708	1.71	2784	2.90
85	4519	1.79	2643	3.05
90	4332	1.86	2514	3.21
95	4146	1.95	2395	3.37
200	1675	4.82	1612	5.01

SAG & TENSION DATA

All Aluminum Alloy Conductor - 1/0 Azusa, 7 strand
Rated Breaking Strength: 4460 lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	6818	2.34	5198	3.07
30	6593*	1.67	4737	2.32
35	6413	1.71	4516	2.43
40	6231	1.76	4303	2.55
45	6048	1.82	4097	2.68
50	5865	1.87	3900	2.82
55	5681	1.93	3712	2.96
60	5496	2.00	3533	3.11
65	5312	2.07	3364	3.26
70	5128	2.14	3206	3.43
75	4944	2.22	3057	3.59
80	4762	2.31	2918	3.76
85	4582	2.40	2789	3.94
90	4403	2.49	2669	4.12
95	4228	2.60	2558	4.29
200	1879	5.85	1757	6.26

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	6876	3.03	5288	3.94
30	6593*	2.18	4733	3.03
35	6417	2.24	4526	3.17
40	6239	2.30	4327	3.32
45	6061	2.37	4136	3.47
50	5882	2.44	3953	3.63
55	5703	2.51	3779	3.80
60	5525	2.60	3614	3.97
65	5346	2.68	3459	4.15
70	5169	2.77	3312	4.33
75	4993	2.87	3175	4.52
80	4819	2.98	3046	4.71
85	4647	3.09	2926	4.90
90	4478	3.20	2815	5.10
95	4312	3.33	2710	5.30
200	2069	6.94	1895	7.58

SAG & TENSION DATA
All Aluminum Alloy Conductor - 1/0 Azusa, 7 strand
Rated Breaking Strength: 4460 lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	6938	3.80	5382	4.90
30	6593*	2.75	4738	3.83
35	6421	2.83	4544	4.00
40	6247	2.91	4358	4.17
45	6074	2.99	4180	4.34
50	5900	3.08	4010	4.53
55	5727	3.17	3849	4.72
60	5555	3.27	3696	4.91
65	5383	3.37	3552	5.11
70	5213	3.48	3416	5.32
75	5044	3.60	3289	5.52
80	4878	3.72	3169	5.73
85	4714	3.85	3056	5.94
90	4553	3.99	2951	6.16
95	4395	4.13	2853	6.37
200	2249	8.08	2025	8.98

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	7002	4.65	5479	5.95
30	6593*	3.40	4749	4.72
35	6425	3.49	4568	4.91
40	6256	3.58	4394	5.10
45	6088	3.68	4228	5.30
50	5920	3.79	4070	5.51
55	5752	3.90	3920	5.72
60	5586	4.01	3778	5.93
65	5421	4.14	3644	6.15
70	5257	4.26	3517	6.38
75	5096	4.40	3398	6.60
80	4937	4.54	3285	6.83
85	4781	4.69	3179	7.05
90	4628	4.84	3080	7.28
95	4478	5.01	2986	7.51
200	2418	9.28	2149	10.45

SAG & TENSION DATA

All Aluminum Alloy Conductor - 1/0 Azusa, 7 strand
Rated Breaking Strength: 4460 lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	7067	5.58	5577	7.07
30	6593*	4.11	4767	5.69
35	6429	4.22	4597	5.90
40	6266	4.33	4435	6.12
45	6102	4.44	4280	6.34
50	5940	4.57	4133	6.57
55	5778	4.69	3992	6.80
60	5618	4.83	3860	7.03
65	5459	4.97	3734	7.27
70	5302	5.12	3615	7.51
75	5148	5.27	3503	7.75
80	4996	5.43	3396	7.99
85	4847	5.60	3296	8.23
90	4702	5.77	3202	8.48
95	4560	5.95	3113	8.72
200	2579	10.53	2267	11.99

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	7134	6.58	5676	8.27
30	6593*	4.90	4789	6.74
35	6434	5.02	4630	6.97
40	6275	5.14	4479	7.21
45	6117	5.28	4334	7.45
50	5960	5.42	4196	7.70
55	5804	5.56	4064	7.95
60	5650	5.71	3940	8.20
65	5498	5.87	3821	8.45
70	5347	6.04	3709	8.71
75	5200	6.21	3603	8.97
80	5055	6.39	3503	9.22
85	4913	6.57	3408	9.48
90	4774	6.76	3317	9.74
95	4639	6.96	3232	10.00
200	2731	11.84	2380	13.60

SAG & TENSION DATA

All Aluminum Alloy Conductor - #2 Ames, 7 strand
Rated Breaking Strength: 2800 lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	935	0.90	772	1.09
30	896	0.23	700*	0.29
35	867	0.24	665	0.31
40	839	0.24	630	0.33
45	810	0.25	596	0.34
50	781	0.26	561	0.37
55	753	0.27	527	0.39
60	725	0.28	493	0.42
65	696	0.29	459	0.45
70	668	0.31	425	0.48
75	640	0.32	393	0.52
80	612	0.34	360	0.57
85	584	0.35	329	0.62
90	557	0.37	299	0.69
95	529	0.39	270	0.76
200	120	1.71	69	2.98

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	963	1.55	814	1.83
30	897	0.41	700*	0.52
35	868	0.42	666	0.55
40	840	0.43	631	0.58
45	811	0.45	597	0.61
50	783	0.47	563	0.65
55	755	0.48	530	0.69
60	727	0.50	497	0.73
65	699	0.52	464	0.79
70	671	0.54	432	0.84
75	643	0.57	401	0.91
80	615	0.59	371	0.99
85	588	0.62	341	1.07
90	561	0.65	314	1.16
95	534	0.68	288	1.27
200	146	2.51	90	4.06

SAG & TENSION DATA

All Aluminum Alloy Conductor - #2 Ames, 7 strand
Rated Breaking Strength: 2800 lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	995	2.34	859	2.71
30	898	0.64	700*	0.81
35	869	0.66	666	0.86
40	841	0.68	632	0.90
45	813	0.70	599	0.95
50	785	0.73	566	1.01
55	757	0.75	534	1.07
60	729	0.78	502	1.14
65	701	0.81	470	1.21
70	674	0.85	440	1.30
75	646	0.88	410	1.39
80	619	0.92	382	1.49
85	592	0.96	355	1.61
90	566	1.01	329	1.73
95	539	1.06	305	1.87
200	169	3.38	110	5.18

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1028	3.26	904	3.71
30	899	0.91	700*	1.17
35	871	0.94	667	1.23
40	843	0.97	634	1.30
45	815	1.01	601	1.37
50	787	1.04	569	1.44
55	759	1.08	538	1.53
60	732	1.12	507	1.62
65	704	1.17	477	1.72
70	677	1.21	448	1.83
75	650	1.26	420	1.95
80	623	1.32	394	2.09
85	597	1.38	368	2.23
90	571	1.44	345	2.38
95	546	1.51	322	2.55
200	191	4.31	130	6.34

SAG & TENSION DATA
All Aluminum Alloy Conductor - #2 Ames, 7 strand
Rated Breaking Strength: 2800 lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1063	4.30	949	4.81
30	899	1.24	700*	1.60
35	872	1.28	668	1.67
40	844	1.32	636	1.76
45	816	1.37	604	1.85
50	789	1.42	573	1.95
55	761	1.47	543	2.06
60	734	1.52	513	2.18
65	707	1.58	485	2.31
70	681	1.64	457	2.45
75	654	1.71	431	2.60
80	628	1.78	406	2.76
85	602	1.86	382	2.93
90	577	1.94	360	3.11
95	552	2.02	339	3.30
200	211	5.30	149	7.54

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1099	5.43	993	6.01
30	900	1.62	700*	2.09
35	872	1.67	668	2.18
40	845	1.73	637	2.29
45	818	1.79	607	2.41
50	791	1.85	577	2.53
55	764	1.91	548	2.67
60	737	1.98	520	2.81
65	710	2.06	492	2.97
70	684	2.13	466	3.13
75	658	2.22	441	3.31
80	633	2.31	418	3.50
85	608	2.40	395	3.70
90	583	2.50	374	3.90
95	559	2.61	355	4.12
200	230	6.35	166	8.79

SAG & TENSION DATA

All Aluminum Alloy Conductor - #2 Ames, 7 strand
Rated Breaking Strength: 2800 lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1134	6.66	1037	7.29
30	900	2.05	700*	2.64
35	873	2.12	669	2.76
40	846	2.18	639	2.89
45	819	2.26	610	3.03
50	792	2.33	581	3.18
55	766	2.41	553	3.34
60	740	2.50	526	3.51
65	714	2.59	500	3.70
70	688	2.69	475	3.89
75	663	2.79	452	4.09
80	638	2.90	429	4.31
85	613	3.01	408	4.53
90	589	3.14	388	4.76
95	566	3.27	370	5.00
200	249	7.44	184	10.08

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1169	7.97	1079	8.64
30	900	2.54	700*	3.26
35	873	2.61	670	3.40
40	846	2.70	641	3.56
45	820	2.78	613	3.72
50	794	2.87	585	3.90
55	768	2.97	558	4.09
60	742	3.08	533	4.28
65	716	3.18	508	4.49
70	691	3.30	484	4.71
75	667	3.42	462	4.94
80	642	3.55	441	5.18
85	619	3.69	421	5.43
90	595	3.83	402	5.68
95	573	3.98	384	5.94
200	266	8.59	200	11.42

SAG & TENSION DATA
All Aluminum Alloy Conductor - #2 Ames, 7 strand
Rated Breaking Strength: 2800 lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1204	9.37	1120	10.08
30	899	3.07	700*	3.94
35	873	3.16	671	4.11
40	847	3.26	643	4.29
45	821	3.36	616	4.48
50	795	3.47	589	4.69
55	769	3.59	564	4.90
60	744	3.71	539	5.12
65	719	3.84	516	5.36
70	695	3.97	493	5.60
75	671	4.12	472	5.85
80	647	4.27	452	6.12
85	624	4.43	433	6.39
90	601	4.59	415	6.66
95	579	4.77	398	6.94
200	283	9.79	216	12.80

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1238	10.85	1160	11.58
30	898	3.66	700*	4.69
35	872	3.77	672	4.89
40	847	3.88	645	5.09
45	821	4.00	619	5.31
50	796	4.13	593	5.54
55	771	4.26	569	5.78
60	746	4.41	545	6.03
65	722	4.55	523	6.28
70	698	4.71	502	6.55
75	674	4.87	481	6.83
80	651	5.05	462	7.11
85	629	5.23	444	7.40
90	607	5.41	427	7.70
95	586	5.61	411	8.00
200	298	11.03	232	14.22

SAG & TENSION DATA

All Aluminum Alloy Conductor - 1/0 Azusa, 7 strand, Aerial Cable (Tree Wire)
Rated Breaking Strength: 4460 lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1600	1.64	1375	1.90
30	1433	0.83	1115*	1.07
35	1391	0.86	1069	1.12
40	1349	0.88	1024	1.16
45	1307	0.91	980	1.22
50	1266	0.94	938	1.27
55	1225	0.97	897	1.33
60	1185	1.01	858	1.39
65	1145	1.04	821	1.45
70	1106	1.08	785	1.52
75	1068	1.12	751	1.59
80	1030	1.16	718	1.66
85	993	1.20	688	1.73
90	957	1.25	659	1.81
95	922	1.29	633	1.89
200	449	2.66	343	3.49

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1682	2.77	1483	3.14
30	1424	1.49	1115*	1.90
35	1385	1.53	1075	1.97
40	1345	1.58	1036	2.05
45	1307	1.62	998	2.13
50	1269	1.67	962	2.21
55	1231	1.72	927	2.29
60	1194	1.78	894	2.37
65	1158	1.83	862	2.46
70	1122	1.89	832	2.55
75	1088	1.95	804	2.64
80	1054	2.01	776	2.73
85	1021	2.08	751	2.83
90	989	2.14	726	2.92
95	958	2.21	703	3.02
200	535	3.97	429	4.96

SAG & TENSION DATA

All Aluminum Alloy Conductor - 1/0 Azusa, 7 strand, Aerial Cable (Tree Wire)
Rated Breaking Strength: 4460 lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1758	4.14	1581	4.60
30	1408	2.35	1115*	2.97
35	1371	2.42	1080	3.07
40	1335	2.48	1047	3.17
45	1300	2.55	1015	3.27
50	1265	2.62	984	3.37
55	1231	2.69	954	3.48
60	1198	2.77	926	3.58
65	1165	2.84	899	3.69
70	1134	2.92	873	3.80
75	1103	3.01	849	3.91
80	1073	3.09	825	4.02
85	1044	3.18	803	4.13
90	1015	3.27	782	4.24
95	988	3.36	762	4.36
200	608	5.46	503	6.61

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1827	5.74	1668	6.28
30	1386	3.44	1115*	4.28
35	1353	3.53	1085	4.40
40	1321	3.62	1057	4.52
45	1289	3.70	1029	4.64
50	1257	3.80	1003	4.76
55	1227	3.89	977	4.89
60	1197	3.99	953	5.01
65	1168	4.09	930	5.14
70	1140	4.19	908	5.26
75	1113	4.29	886	5.39
80	1087	4.39	866	5.52
85	1061	4.50	847	5.64
90	1036	4.61	828	5.77
95	1012	4.72	810	5.90
200	670	7.14	568	8.43

SAG & TENSION DATA

All Aluminum Alloy Conductor - 1/0 Azusa, 7 strand, Aerial Cable (Tree Wire)
Rated Breaking Strength: 4460 lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1888	7.56	1746	8.18
30	1362	4.77	1115*	5.83
35	1332	4.88	1089	5.97
40	1303	4.99	1065	6.11
45	1275	5.10	1041	6.25
50	1247	5.21	1019	6.38
55	1220	5.33	997	6.53
60	1194	5.45	976	6.67
65	1168	5.56	956	6.81
70	1144	5.68	936	6.95
75	1120	5.81	918	7.09
80	1097	5.93	900	7.23
85	1074	6.05	883	7.37
90	1052	6.18	867	7.51
95	1031	6.31	851	7.65
200	723	9.02	626	10.43

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1943	9.60	1815	10.28
30	1336	6.35	1115*	7.62
35	1310	6.48	1093	7.77
40	1284	6.61	1072	7.93
45	1260	6.74	1052	8.08
50	1235	6.88	1032	8.23
55	1212	7.01	1013	8.39
60	1189	7.15	995	8.54
65	1166	7.28	978	8.70
70	1145	7.42	961	8.85
75	1124	7.56	944	9.00
80	1104	7.70	929	9.16
85	1084	7.84	913	9.31
90	1065	7.98	899	9.46
95	1046	8.12	885	9.61
200	768	11.09	676	12.61

SAG & TENSION DATA

All Aluminum Alloy Conductor - 1/0 Azusa, 7 strand, Aerial Cable (Tree Wire)
Rated Breaking Strength: 4460 lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1991	11.87	1876	12.60
30	1312	8.20	1115*	9.65
35	1289	8.34	1096	9.82
40	1266	8.49	1078	9.98
45	1245	8.64	1060	10.15
50	1224	8.79	1043	10.32
55	1203	8.94	1027	10.48
60	1183	9.09	1011	10.65
65	1163	9.25	996	10.81
70	1145	9.40	981	10.98
75	1126	9.55	966	11.14
80	1108	9.71	953	11.31
85	1091	9.86	939	11.47
90	1074	10.02	926	11.63
95	1058	10.17	913	11.79
200	807	13.36	720	14.99

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2034	14.35	1930	15.13
30	1289	10.30	1115*	11.92
35	1269	10.46	1099	12.10
40	1250	10.63	1083	12.28
45	1231	10.79	1068	12.45
50	1212	10.96	1053	12.63
55	1194	11.12	1038	12.81
60	1177	11.29	1024	12.98
65	1160	11.45	1011	13.16
70	1143	11.62	998	13.33
75	1127	11.79	985	13.50
80	1112	11.95	973	13.68
85	1097	12.12	961	13.85
90	1082	12.29	949	14.02
95	1067	12.45	938	14.19
200	840	15.85	759	17.57

SAG & TENSION DATA

All Aluminum Alloy Conductor - 1/0 Azusa, 7 strand, Aerial Cable (Tree Wire)
Rated Breaking Strength: 4460 lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2072	17.06	1978	17.87
30	1269	12.67	1115.*	14.43
35	1252	12.85	1101	14.62
40	1235	13.02	1087	14.81
45	1218	13.20	1074	14.99
50	1202	13.38	1061	15.18
55	1186	13.56	1048	15.36
60	1171	13.73	1036	15.55
65	1156	13.91	1024	15.73
70	1142	14.09	1012	15.91
75	1128	14.27	1001	16.10
80	1114	14.44	990	16.28
85	1101	14.62	979	16.46
90	1088	14.80	968	16.64
95	1075	14.97	958	16.82
200	869	18.55	793	20.36

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2105	20.00	2021	20.84
30	1251	15.30	1115*	17.19
35	1236	15.49	1103	17.38
40	1221	15.68	1090	17.58
45	1207	15.87	1079	17.77
50	1193	16.06	1067	17.96
55	1179	16.24	1056	18.16
60	1166	16.43	1045	18.35
65	1153	16.62	1034	18.54
70	1140	16.81	1024	18.73
75	1128	16.99	1014	18.92
80	1115	17.18	1004	19.11
85	1104	17.37	994	19.29
90	1092	17.55	985	19.48
95	1081	17.74	976	19.67
200	895	21.47	823	23.36

SAG & TENSION DATA
Secondary - #6 al duplex Vizsla
Rated Breaking Strength: 1100lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	472	2.42	440	2.60
30	357	0.54	277*	0.69
35	346	0.55	265	0.72
40	335	0.57	252	0.76
45	324	0.59	240	0.80
50	313	0.61	227	0.84
55	302	0.63	216	0.89
60	291	0.66	204	0.94
65	281	0.68	193	0.99
70	270	0.71	182	1.05
75	260	0.74	171	1.12
80	250	0.77	161	1.19
85	239	0.80	152	1.26
90	229	0.83	143	1.34
95	220	0.87	135	1.42
200	84	2.27	59	3.23

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	521	3.90	499	4.08
30	357	0.95	278*	1.23
35	346	0.98	266	1.28
40	336	1.01	254	1.34
45	325	1.05	242	1.40
50	315	1.08	231	1.47
55	304	1.12	220	1.54
60	294	1.16	210	1.62
65	284	1.20	200	1.70
70	274	1.24	190	1.79
75	264	1.29	181	1.88
80	254	1.34	172	1.97
85	244	1.39	164	2.07
90	235	1.45	156	2.18
95	226	1.51	149	2.28
200	102	3.35	76	4.51

SAG & TENSION DATA
Secondary - #6 al duplex Vizsla
Rated Breaking Strength: 1100lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	555*	5.73	543	5.86
30	334	1.59	261	2.04
35	324	1.64	250	2.12
40	314	1.69	240	2.21
45	304	1.75	230	2.31
50	294	1.81	220	2.41
55	285	1.87	211	2.52
60	275	1.93	202	2.63
65	266	2.00	194	2.74
70	257	2.07	186	2.86
75	248	2.14	179	2.98
80	239	2.22	172	3.10
85	231	2.30	165	3.22
90	222	2.39	159	3.35
95	215	2.48	153	3.48
200	111	4.80	88	6.06

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	555*	8.26	555	8.26
30	253	3.02	204	3.76
35	245	3.12	197	3.89
40	237	3.23	190	4.03
45	230	3.33	183	4.18
50	222	3.44	177	4.32
55	215	3.56	172	4.47
60	209	3.67	166	4.61
65	202	3.79	161	4.76
70	196	3.91	156	4.91
75	190	4.03	152	5.05
80	184	4.16	147	5.20
85	179	4.29	143	5.35
90	173	4.42	140	5.49
95	168	4.55	136	5.64
200	105	7.28	92	8.39

SAG & TENSION DATA
Secondary - #6 al duplex Vizsla
Rated Breaking Strength: 1100lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	555*	11.26	555	11.26
30	191	5.46	158	6.59
35	186	5.61	154	6.76
40	181	5.75	151	6.92
45	177	5.90	147	7.08
50	172	6.05	144	7.23
55	168	6.20	141	7.39
60	164	6.35	138	7.55
65	161	6.49	136	7.70
70	157	6.64	133	7.86
75	154	6.79	130	8.01
80	150	6.94	128	8.16
85	147	7.09	126	8.31
90	144	7.24	123	8.46
95	141	7.38	121	8.61
200	102	10.25	92	11.39

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	555*	14.74	555	14.74
30	155	8.80	135	10.09
35	152	8.96	133	10.25
40	150	9.12	131	10.41
45	147	9.28	129	10.57
50	145	9.44	127	10.73
55	142	9.59	125	10.88
60	140	9.75	124	11.04
65	138	9.90	122	11.19
70	136	10.06	120	11.34
75	134	10.21	119	11.49
80	132	10.36	117	11.64
85	130	10.51	116	11.79
90	128	10.66	115	11.93
95	126	10.81	113	12.08
200	100	13.70	92	14.87

SAG & TENSION DATA
Secondary - #6 al duplex Vizsla
Rated Breaking Strength: 1100lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	555*	18.69	555	18.69
30	135	12.77	123	14.10
35	134	12.93	121	14.25
40	132	13.09	120	14.41
45	131	13.25	119	14.56
50	129	13.40	118	14.71
55	128	13.56	116	14.86
60	126	13.71	115	15.01
65	125	13.86	114	15.16
70	123	14.02	113	15.31
75	122	14.17	112	15.46
80	121	14.32	111	15.60
85	120	14.47	110	15.75
90	118	14.61	109	15.89
95	117	14.76	108	16.03
200	98	17.64	92	18.82

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	555*	23.12	555	23.12
30	124	17.26	115	18.58
35	123	17.41	114	18.73
40	122	17.57	113	18.88
45	121	17.72	113	19.03
50	120	17.87	112	19.18
55	119	18.02	111	19.33
60	118	18.17	110	19.47
65	117	18.32	109	19.62
70	116	18.47	108	19.77
75	115	18.62	108	19.91
80	114	18.77	107	20.05
85	113	18.91	106	20.19
90	112	19.06	105	20.34
95	112	19.20	105	20.48
200	97	22.07	92	23.26

SAG & TENSION DATA
Secondary - #6 al duplex Vizsla
Rated Breaking Strength: 1100lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	555.*	28.05	555	28.05
30	117	22.23	110	23.55
35	116	22.38	110	23.70
40	115	22.53	109	23.84
45	114	22.68	108	23.99
50	114	22.83	108	24.13
55	113	22.98	107	24.28
60	112	23.13	106	24.42
65	112	23.28	106	24.56
70	111	23.42	105	24.71
75	110	23.57	105	24.85
80	110	23.71	104	24.99
85	109	23.86	103	25.13
90	108	24.00	103	25.27
95	108	24.14	102	25.41
200	96	26.99	93	28.18

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Conductor Temp (°F)	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	555*	33.47	555	33.47
30	112	27.70	107	29.00
35	111	27.85	106	29.15
40	111	28.00	106	29.29
45	110	28.14	105	29.44
50	109	28.29	105	29.58
55	109	28.43	104	29.72
60	108	28.58	104	29.86
65	108	28.72	103	30.00
70	107	28.87	103	30.14
75	107	29.01	102	30.28
80	106	29.15	102	30.42
85	106	29.29	102	30.56
90	105	29.43	101	30.70
95	105	29.57	101	30.83
200	96	32.40	93	33.60

SAG & TENSION DATA
Secondary - #2 al duplex Schnauzer
Rated Breaking Strength: 2800lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1009	1.62	874	1.87
30	904	0.49	700*	0.63
35	880	0.50	672	0.66
40	857	0.52	643	0.69
45	833	0.53	615	0.72
50	809	0.55	588	0.75
55	785	0.56	560	0.79
60	762	0.58	534	0.83
65	738	0.60	507	0.87
70	714	0.62	481	0.92
75	691	0.64	456	0.97
80	668	0.66	432	1.02
85	645	0.69	409	1.08
90	621	0.71	386	1.14
95	599	0.74	365	1.21
200	235	1.88	148	2.99

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1068	2.72	953	3.04
30	904	0.87	700*	1.12
35	881	0.89	673	1.17
40	857	0.92	646	1.22
45	834	0.94	620	1.27
50	811	0.97	594	1.32
55	788	1.00	568	1.38
60	765	1.03	544	1.44
65	742	1.06	519	1.51
70	719	1.09	496	1.58
75	696	1.13	473	1.66
80	674	1.16	452	1.74
85	652	1.20	431	1.82
90	630	1.25	411	1.91
95	608	1.29	392	2.00
200	273	2.88	187	4.21

SAG & TENSION DATA
Secondary - #2 al duplex Schnauzer
Rated Breaking Strength: 2800lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1128	4.02	1030	4.40
30	903	1.36	700*	1.75
35	880	1.39	674	1.82
40	857	1.43	649	1.89
45	835	1.47	625	1.96
50	812	1.51	601	2.04
55	790	1.55	577	2.13
60	768	1.60	554	2.21
65	745	1.65	532	2.30
70	724	1.70	511	2.40
75	702	1.75	491	2.50
80	680	1.80	471	2.61
85	659	1.86	452	2.71
90	638	1.92	434	2.83
95	618	1.99	417	2.94
200	307	4.00	222	5.53

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1186	5.50	1104	5.92
30	900	1.96	700*	2.52
35	878	2.01	676	2.61
40	856	2.06	653	2.71
45	834	2.12	630	2.81
50	813	2.17	608	2.91
55	791	2.23	586	3.02
60	770	2.30	565	3.13
65	748	2.36	545	3.24
70	727	2.43	526	3.36
75	707	2.50	507	3.48
80	686	2.57	490	3.61
85	666	2.65	473	3.74
90	647	2.73	456	3.87
95	627	2.82	441	4.01
200	338	5.23	255	6.95

SAG & TENSION DATA
Secondary - #2 al duplex Schnauzer
Rated Breaking Strength: 2800lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1243	7.15	1173	7.58
30	896	2.68	700*	3.44
35	875	2.75	678	3.55
40	854	2.82	656	3.67
45	833	2.89	635	3.79
50	812	2.96	615	3.91
55	791	3.04	595	4.04
60	771	3.12	576	4.18
65	750	3.20	557	4.32
70	731	3.29	540	4.46
75	711	3.38	523	4.60
80	692	3.48	507	4.75
85	673	3.57	491	4.90
90	654	3.68	477	5.05
95	636	3.78	462	5.21
200	366	6.57	285	8.47

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1297	8.96	1238	9.39
30	891	3.53	700*	4.49
35	870	3.61	679	4.63
40	850	3.70	659	4.77
45	830	3.79	640	4.91
50	810	3.88	621	5.06
55	790	3.98	603	5.21
60	771	4.08	586	5.37
65	752	4.18	569	5.52
70	733	4.29	553	5.69
75	714	4.40	537	5.85
80	696	4.51	523	6.02
85	679	4.63	508	6.18
90	661	4.75	495	6.35
95	644	4.88	482	6.53
200	392	8.03	312	10.09

SAG & TENSION DATA
Secondary - #2 al duplex Schnauzer
Rated Breaking Strength: 2800lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1348	10.92	1300	11.32
30	885	4.50	700*	5.68
35	865	4.60	681	5.84
40	845	4.70	663	6.00
45	826	4.81	645	6.17
50	807	4.93	628	6.34
55	789	5.04	611	6.51
60	770	5.16	595	6.69
65	752	5.29	580	6.86
70	734	5.42	565	7.04
75	717	5.55	551	7.23
80	700	5.68	537	7.41
85	683	5.82	524	7.59
90	667	5.96	512	7.78
95	651	6.11	500	7.97
200	415	9.60	337	11.82

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1396	13.02	1358	13.38
30	877	5.60	700*	7.02
35	858	5.72	683	7.20
40	840	5.85	666	7.38
45	822	5.98	649	7.57
50	804	6.11	634	7.75
55	786	6.25	618	7.95
60	769	6.39	604	8.14
65	752	6.53	590	8.33
70	735	6.68	576	8.53
75	719	6.83	563	8.73
80	703	6.99	550	8.93
85	688	7.14	538	9.13
90	672	7.30	527	9.33
95	658	7.47	516	9.54
200	436	11.28	361	13.66

SAG & TENSION DATA
Secondary - #2 al duplex Schnauzer
Rated Breaking Strength: 2800lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1400*	15.71	1375	16.00
30	800	7.43	652	9.12
35	783	7.59	637	9.33
40	767	7.75	623	9.54
45	751	7.91	610	9.75
50	736	8.08	597	9.96
55	720	8.25	585	10.17
60	706	8.42	573	10.39
65	691	8.60	561	10.60
70	677	8.78	550	10.82
75	663	8.96	539	11.03
80	650	9.15	529	11.25
85	637	9.33	519	11.47
90	624	9.52	509	11.68
95	612	9.71	500	11.90
200	430	13.87	368	16.21

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1400*	18.72	1385	18.92
30	724	9.77	606	11.68
35	710	9.96	594	11.91
40	697	10.15	583	12.14
45	684	10.35	573	12.37
50	671	10.55	562	12.60
55	658	10.75	552	12.83
60	646	10.95	543	13.05
65	634	11.16	533	13.28
70	623	11.36	524	13.51
75	612	11.57	516	13.74
80	601	11.78	507	13.97
85	591	11.99	499	14.19
90	581	12.20	492	14.42
95	571	12.41	484	14.64
200	422	16.81	372	19.09

SAG & TENSION DATA
Secondary - #2 al triplex Solaster
Rated Breaking Strength: 1760lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	732	2.51	671	2.74
30	563	1.07	440*	1.37
35	547	1.11	424	1.43
40	531	1.14	408	1.48
45	516	1.17	393	1.54
50	501	1.21	378	1.60
55	486	1.25	364	1.66
60	471	1.28	351	1.72
65	456	1.33	338	1.79
70	442	1.37	326	1.86
75	428	1.41	314	1.93
80	415	1.46	303	2.00
85	401	1.51	293	2.07
90	389	1.56	283	2.14
95	376	1.61	274	2.21
200	206	2.93	164	3.69

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	795	4.11	747	4.38
30	555	1.94	440*	2.45
35	540	1.99	427	2.52
40	526	2.04	414	2.60
45	512	2.10	401	2.68
50	499	2.16	389	2.76
55	486	2.21	378	2.85
60	473	2.28	367	2.93
65	460	2.34	357	3.02
70	448	2.40	347	3.11
75	436	2.47	337	3.19
80	424	2.54	328	3.28
85	413	2.61	319	3.37
90	402	2.68	311	3.46
95	391	2.75	303	3.55
200	243	4.43	202	5.33

SAG & TENSION DATA
Secondary - #2 al triplex Solaster
Rated Breaking Strength: 1760lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	851	6.00	812	6.30
30	543	3.10	440*	3.82
35	531	3.17	429	3.92
40	518	3.24	418	4.02
45	506	3.32	408	4.12
50	495	3.40	398	4.22
55	483	3.48	389	4.32
60	472	3.56	380	4.43
65	461	3.65	372	4.53
70	451	3.73	363	4.63
75	441	3.82	355	4.74
80	431	3.91	348	4.84
85	421	3.99	341	4.94
90	412	4.08	334	5.05
95	403	4.18	327	5.15
200	274	6.16	234	7.20

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	880*	8.37	851	8.66
30	502	4.82	421	5.76
35	492	4.92	412	5.88
40	482	5.02	404	6.00
45	473	5.12	397	6.11
50	464	5.23	389	6.23
55	455	5.33	382	6.35
60	446	5.43	375	6.46
65	437	5.54	368	6.58
70	429	5.64	362	6.70
75	421	5.75	356	6.81
80	414	5.86	350	6.93
85	406	5.97	344	7.04
90	399	6.07	339	7.16
95	392	6.18	334	7.27
200	288	8.42	255	9.53

SAG & TENSION DATA
Secondary - #2 al triplex Solaster
Rated Breaking Strength: 1760lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	880*	11.41	861	11.67
30	440	7.50	385	8.57
35	433	7.62	380	8.70
40	426	7.74	374	8.83
45	420	7.87	369	8.95
50	413	7.99	364	9.08
55	407	8.11	359	9.20
60	401	8.23	354	9.33
65	396	8.35	350	9.45
70	390	8.47	345	9.58
75	385	8.59	341	9.70
80	379	8.71	337	9.82
85	374	8.83	332	9.94
90	369	8.95	329	10.07
95	364	9.07	325	10.19
200	289	11.46	264	12.56

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	880*	14.93	866	15.17
30	398	10.84	361	11.95
35	394	10.97	358	12.08
40	389	11.10	354	12.22
45	385	11.23	350	12.35
50	380	11.35	346	12.48
55	376	11.48	343	12.61
60	372	11.61	339	12.73
65	368	11.74	336	12.86
70	364	11.87	333	12.99
75	360	11.99	330	13.12
80	357	12.12	327	13.24
85	353	12.25	324	13.37
90	349	12.37	321	13.49
95	346	12.50	318	13.62
200	289	14.99	270	16.07

SAG & TENSION DATA
Secondary - #2 al triplex Solaster
Rated Breaking Strength: 1760lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	880*	18.94	870	19.15
30	371	14.74	345	15.87
35	368	14.88	342	16.00
40	365	15.01	340	16.14
45	362	15.14	337	16.27
50	358	15.28	334	16.40
55	355	15.41	332	16.53
60	352	15.54	329	16.66
65	350	15.67	327	16.79
70	347	15.80	324	16.92
75	344	15.93	322	17.05
80	341	16.06	319	17.18
85	339	16.19	317	17.30
90	336	16.32	315	17.43
95	333	16.44	313	17.56
200	289	18.99	274	20.06

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	880*	23.43	873	23.63
30	353	19.19	334	20.31
35	350	19.32	332	20.44
40	348	19.46	329	20.58
45	346	19.59	327	20.71
50	343	19.72	325	20.84
55	341	19.86	323	20.97
60	339	19.99	321	21.10
65	337	20.12	319	21.23
70	335	20.25	318	21.36
75	333	20.38	316	21.49
80	330	20.51	314	21.62
85	328	20.64	312	21.75
90	326	20.77	310	21.88
95	324	20.90	308	22.00
200	289	23.49	277	24.55

SAG & TENSION DATA
Secondary - #2 al triplex Solaster
Rated Breaking Strength: 1760lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	880*	28.42	874	28.61
30	340	24.15	325	25.27
35	338	24.29	324	25.40
40	336	24.42	322	25.53
45	335	24.56	320	25.66
50	333	24.69	319	25.80
55	331	24.82	317	25.93
60	329	24.95	316	26.06
65	328	25.09	314	26.19
70	326	25.22	313	26.32
75	324	25.35	311	26.45
80	323	25.48	310	26.58
85	321	25.61	308	26.71
90	320	25.74	307	26.83
95	318	25.87	305	26.96
200	290	28.48	279	29.54

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	880*	33.92	876	34.09
30	331	29.63	319	30.74
35	329	29.77	318	30.87
40	328	29.90	317	31.00
45	326	30.04	315	31.13
50	325	30.17	314	31.27
55	324	30.30	313	31.40
60	322	30.43	311	31.53
65	321	30.57	310	31.66
70	320	30.70	309	31.79
75	318	30.83	308	31.92
80	317	30.96	306	32.05
85	316	31.09	305	32.18
90	314	31.22	304	32.30
95	313	31.35	303	32.43
200	290	33.98	281	35.03

SAG & TENSION DATA
Secondary - 1/0 al triplex Echinus
Rated Breaking Strength: 2800lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1088	2.19	972	2.46
30	895	1.08	700*	1.38
35	870	1.11	674	1.43
40	845	1.14	649	1.49
45	821	1.18	625	1.54
50	796	1.21	602	1.60
55	773	1.25	580	1.67
60	749	1.29	558	1.73
65	726	1.33	538	1.79
70	703	1.37	519	1.86
75	681	1.42	500	1.93
80	660	1.46	483	2.00
85	639	1.51	466	2.07
90	618	1.56	451	2.14
95	599	1.61	436	2.22
200	329	2.94	262	3.69

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1163	3.65	1065	3.99
30	882	1.95	700*	2.45
35	859	2.00	679	2.53
40	837	2.05	658	2.61
45	815	2.11	638	2.69
50	794	2.16	620	2.77
55	773	2.22	601	2.85
60	752	2.28	584	2.94
65	732	2.34	568	3.03
70	712	2.41	552	3.11
75	693	2.48	537	3.20
80	675	2.54	522	3.29
85	657	2.61	509	3.38
90	640	2.68	496	3.47
95	623	2.76	483	3.56
200	388	4.43	323	5.34

SAG & TENSION DATA
Secondary - 1/0 al triplex Echinus
Rated Breaking Strength: 2800lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1230	5.40	1146	5.79
30	864	3.11	700*	3.83
35	844	3.18	683	3.93
40	824	3.25	666	4.03
45	805	3.33	650	4.13
50	787	3.41	634	4.23
55	768	3.49	619	4.33
60	751	3.57	605	4.44
65	734	3.66	591	4.54
70	717	3.74	578	4.64
75	701	3.83	566	4.75
80	685	3.92	554	4.85
85	670	4.01	542	4.95
90	655	4.10	531	5.06
95	641	4.19	520	5.16
200	436	6.17	373	7.21

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1287	7.43	1216	7.87
30	843	4.58	700*	5.52
35	826	4.68	686	5.64
40	809	4.77	672	5.75
45	793	4.87	659	5.87
50	777	4.97	646	5.99
55	762	5.07	634	6.10
60	747	5.17	622	6.22
65	733	5.28	610	6.34
70	719	5.38	599	6.46
75	705	5.48	589	6.57
80	692	5.59	578	6.69
85	679	5.69	569	6.80
90	667	5.80	559	6.92
95	655	5.91	550	7.04
200	475	8.16	416	9.32

SAG & TENSION DATA
Secondary - 1/0 al triplex Echinus
Rated Breaking Strength: 2800lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1337	9.75	1276	10.22
30	823	6.39	700*	7.52
35	809	6.51	688	7.65
40	795	6.62	677	7.78
45	781	6.74	666	7.91
50	768	6.85	655	8.04
55	755	6.97	645	8.17
60	743	7.09	635	8.30
65	730	7.21	625	8.43
70	719	7.33	616	8.55
75	707	7.45	607	8.68
80	696	7.57	598	8.81
85	685	7.69	590	8.94
90	675	7.81	582	9.06
95	664	7.93	574	9.19
200	507	10.41	453	11.67

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1380	12.34	1328	12.83
30	805	8.54	700*	9.83
35	793	8.67	690	9.97
40	782	8.80	681	10.11
45	770	8.93	671	10.25
50	759	9.06	662	10.39
55	748	9.19	654	10.53
60	738	9.33	645	10.67
65	727	9.46	637	10.81
70	718	9.59	629	10.94
75	708	9.72	622	11.08
80	698	9.85	614	11.22
85	689	9.99	607	11.35
90	680	10.12	600	11.49
95	672	10.25	593	11.62
200	534	12.93	483	14.29

SAG & TENSION DATA
Secondary - 1/0 al triplex Echinus
Rated Breaking Strength: 2800lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1400*	15.42	1357	15.92
30	771	11.30	686	12.70
35	761	11.44	679	12.85
40	752	11.58	671	13.00
45	743	11.73	663	13.15
50	734	11.87	656	13.29
55	726	12.01	649	13.44
60	717	12.15	642	13.58
65	709	12.30	636	13.73
70	701	12.44	629	13.87
75	693	12.58	623	14.02
80	685	12.72	616	14.16
85	678	12.86	610	14.30
90	671	13.00	604	14.44
95	664	13.14	599	14.58
200	547	15.97	503	17.38

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1400*	19.06	1365	19.56
30	729	14.78	664	16.24
35	721	14.93	658	16.39
40	714	15.08	652	16.54
45	707	15.23	646	16.69
50	700	15.38	640	16.85
55	694	15.53	635	17.00
60	687	15.68	629	17.14
65	681	15.83	624	17.29
70	674	15.98	619	17.44
75	668	16.13	613	17.59
80	662	16.27	608	17.74
85	657	16.42	604	17.88
90	651	16.57	599	18.03
95	645	16.71	594	18.17
200	550	19.64	514	21.05

SAG & TENSION DATA
Secondary - 1/0 al triplex Echinus
Rated Breaking Strength: 2800lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1400*	23.11	1371	23.60
30	697	18.72	647	20.20
35	692	18.87	642	20.36
40	686	19.03	637	20.51
45	681	19.18	632	20.66
50	675	19.34	628	20.82
55	670	19.49	623	20.97
60	665	19.64	619	21.12
65	660	19.79	615	21.27
70	655	19.95	610	21.42
75	650	20.10	606	21.57
80	645	20.25	602	21.72
85	640	20.40	598	21.87
90	636	20.55	594	22.02
95	631	20.70	590	22.17
200	553	23.69	522	25.12

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1400*	27.55	1376	28.04
30	674	23.09	633	24.58
35	669	23.25	630	24.74
40	665	23.40	626	24.90
45	661	23.56	622	25.05
50	656	23.72	618	25.21
55	652	23.87	614	25.36
60	648	24.03	611	25.51
65	644	24.18	607	25.67
70	640	24.34	604	25.82
75	636	24.49	600	25.97
80	632	24.64	597	26.12
85	628	24.79	594	26.27
90	624	24.95	590	26.42
95	621	25.10	587	26.57
200	555	28.15	529	29.57

SAG & TENSION DATA
Secondary - #2 quadruplex Belgian
Rated Breaking Strength: 2800lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1088	2.19	972	2.46
30	895	1.08	700*	1.38
35	870	1.11	674	1.43
40	845	1.14	649	1.49
45	821	1.18	625	1.54
50	796	1.21	602	1.60
55	773	1.25	580	1.67
60	749	1.29	558	1.73
65	726	1.33	538	1.79
70	703	1.37	519	1.86
75	681	1.42	500	1.93
80	660	1.46	483	2.00
85	639	1.51	466	2.07
90	618	1.56	451	2.14
95	599	1.61	436	2.22
200	329	2.94	262	3.69

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1163	0.37	1065	3.99
30	882	1.95	700*	2.45
35	859	2.00	679	2.53
40	837	2.05	658	2.61
45	815	2.11	638	2.69
50	794	2.16	620	2.77
55	773	2.22	601	2.85
60	752	2.28	584	2.94
65	732	2.34	568	3.03
70	712	2.41	552	3.11
75	693	2.48	537	3.20
80	675	2.54	522	3.29
85	657	2.61	509	3.38
90	640	2.68	496	3.47
95	623	2.76	483	3.56
200	388	4.43	323	5.34

SAG & TENSION DATA
Secondary - #2 quadruplex Belgian
Rated Breaking Strength: 2800lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1230	5.40	1146	5.79
30	864	3.11	700*	3.83
35	844	3.18	683	3.93
40	824	3.25	666	4.03
45	805	3.33	650	4.13
50	787	3.41	634	4.23
55	768	3.49	619	4.33
60	751	3.57	605	4.44
65	734	3.66	591	4.54
70	717	3.74	578	4.64
75	701	3.83	566	4.75
80	685	3.92	554	4.85
85	670	4.01	542	4.95
90	655	4.10	531	5.06
95	641	4.19	520	5.16
200	436	6.17	373	7.21

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1287	7.43	1216	7.87
30	843	4.58	700*	5.52
35	826	4.68	686	5.64
40	809	4.77	672	5.75
45	793	4.87	659	5.87
50	777	4.97	646	5.99
55	762	5.07	634	6.10
60	747	5.17	622	6.22
65	733	5.28	610	6.34
70	719	5.38	599	6.46
75	705	5.48	589	6.57
80	692	5.59	578	6.69
85	679	5.69	569	6.80
90	667	5.80	559	6.92
95	655	5.91	550	7.04
200	475	8.16	416	9.32

SAG & TENSION DATA
Secondary - #2 quadruplex Belgian
Rated Breaking Strength: 2800lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1337	9.75	1276	10.22
30	823	6.39	700.*	7.52
35	809	6.51	688	7.65
40	795	6.62	677	7.78
45	781	6.74	666	7.91
50	768	6.85	655	8.04
55	755	6.97	645	8.17
60	743	7.09	635	8.30
65	730	7.21	625	8.43
70	719	7.33	616	8.55
75	707	7.45	607	8.68
80	696	7.57	598	8.81
85	685	7.69	590	8.94
90	675	7.81	582	9.06
95	664	7.93	574	9.19
200	507	10.41	453	11.67

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1380	12.34	1328	12.83
30	805	8.54	700*	9.83
35	793	8.67	690	9.97
40	782	8.80	681	10.11
45	770	8.93	671	10.25
50	759	9.06	662	10.39
55	748	9.19	654	10.53
60	738	9.33	645	10.67
65	727	9.46	637	10.81
70	718	9.59	629	10.94
75	708	9.72	622	11.08
80	698	9.85	614	11.22
85	689	9.99	607	11.35
90	680	10.12	600	11.49
95	672	10.25	593	11.62
200	534	12.93	483	14.29

SAG & TENSION DATA
Secondary - #2 quadruplex Belgian
Rated Breaking Strength: 2800lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1400*	15.42	1357	15.92
30	771	11.30	686	12.70
35	761	11.44	679	12.85
40	752	11.58	671	13.00
45	743	11.73	663	13.15
50	734	11.87	656	13.29
55	726	12.01	649	13.44
60	717	12.15	642	13.58
65	709	12.30	636	13.73
70	701	12.44	629	13.87
75	693	12.58	623	14.02
80	685	12.72	616	14.16
85	678	12.86	610	14.30
90	671	13.00	604	14.44
95	664	13.14	599	14.58
200	547	15.97	503	17.38

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1400*	19.06	1365	19.56
30	729	14.78	664	16.24
35	721	14.93	658	16.39
40	714	15.08	652	16.54
45	707	15.23	646	16.69
50	700	15.38	640	16.85
55	694	15.53	635	17.00
60	687	15.68	629	17.14
65	681	15.83	624	17.29
70	674	15.98	619	17.44
75	668	16.13	613	17.59
80	662	16.27	608	17.74
85	657	16.42	604	17.88
90	651	16.57	599	18.03
95	645	16.71	594	18.17
200	550	19.64	514	21.05

SAG & TENSION DATA
Secondary - #2 quadruplex Belgian
Rated Breaking Strength: 2800lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1400*	23.11	1371	23.60
30	697	18.72	647	20.20
35	692	18.87	642	20.36
40	686	19.03	637	20.51
45	681	19.18	632	20.66
50	675	19.34	628	20.82
55	670	19.49	623	20.97
60	665	19.64	619	21.12
65	660	19.79	615	21.27
70	655	19.95	610	21.42
75	650	20.10	606	21.57
80	645	20.25	602	21.72
85	640	20.40	598	21.87
90	636	20.55	594	22.02
95	631	20.70	590	22.17
200	553	23.69	522	25.12

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1400*	27.55	1376	28.04
30	674	23.09	633	24.58
35	669	23.25	630	24.74
40	665	23.40	626	24.90
45	661	23.56	622	25.05
50	656	23.72	618	25.21
55	652	23.87	614	25.36
60	648	24.03	611	25.51
65	644	24.18	607	25.67
70	640	24.34	604	25.82
75	636	24.49	600	25.97
80	632	24.64	597	26.12
85	628	24.79	594	26.27
90	624	24.95	590	26.42
95	621	25.10	587	26.57
200	555	28.15	529	29.57

SAG & TENSION DATA
Secondary - 1/0 al quadruplex Shetland
Rated Breaking Strength: 4460lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1615	1.81	1394	2.10
30	1428	1.03	1115*	1.32
35	1387	1.06	1073	1.37
40	1347	1.09	1032	1.42
45	1308	1.12	993	1.48
50	1268	1.16	955	1.54
55	1230	1.19	918	1.60
60	1192	1.23	883	1.66
65	1155	1.27	850	1.73
70	1118	1.31	818	1.80
75	1082	1.36	788	1.86
80	1047	1.40	760	1.93
85	1013	1.45	733	2.01
90	980	1.50	707	2.08
95	948	1.55	683	2.15
200	510	2.88	404	3.65

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1693	3.07	1500	3.47
30	1410	1.85	1115*	2.34
35	1373	1.90	1080	2.42
40	1336	1.95	1046	2.50
45	1301	2.01	1013	2.58
50	1266	2.06	982	2.66
55	1231	2.12	952	2.74
60	1198	2.18	924	2.83
65	1165	2.24	896	2.92
70	1133	2.31	870	3.00
75	1102	2.37	845	3.09
80	1072	2.44	822	3.18
85	1042	2.51	799	3.27
90	1014	2.58	778	3.36
95	986	2.65	758	3.45
200	603	4.34	498	5.26

SAG & TENSION DATA
Secondary - 1/0 al quadruplex Shetland
Rated Breaking Strength: 4460lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1762	4.61	1593	5.11
30	1383	2.95	1115*	3.66
35	1350	3.02	1086	3.76
40	1318	3.10	1058	3.86
45	1287	3.17	1031	3.96
50	1256	3.25	1005	4.06
55	1226	3.33	981	4.16
60	1197	3.41	957	4.27
65	1169	3.49	934	4.37
70	1141	3.58	912	4.48
75	1114	3.66	892	4.58
80	1088	3.75	872	4.69
85	1063	3.84	853	4.79
90	1039	3.93	834	4.90
95	1016	4.02	817	5.00
200	679	6.03	578	7.09

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1822	6.43	1672	7.01
30	1352	4.35	1115*	5.28
35	1323	4.44	1091	5.39
40	1296	4.54	1068	5.51
45	1269	4.63	1046	5.63
50	1242	4.73	1024	5.75
55	1217	4.83	1004	5.86
60	1192	4.93	984	5.98
65	1168	5.04	965	6.10
70	1144	5.14	946	6.22
75	1122	5.24	929	6.34
80	1100	5.35	912	6.46
85	1078	5.46	895	6.57
90	1058	5.56	880	6.69
95	1038	5.67	865	6.81
200	741	7.95	646	9.14

SAG & TENSION DATA
Secondary - 1/0 al quadruplex Shetland
Rated Breaking Strength: 4460lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1872	8.52	1740	9.18
30	1321	6.06	1115*	7.18
35	1297	6.17	1095	7.32
40	1273	6.29	1076	7.45
45	1250	6.40	1057	7.58
50	1228	6.52	1039	7.71
55	1206	6.64	1022	7.84
60	1185	6.76	1005	7.97
65	1165	6.88	989	8.10
70	1145	7.00	973	8.24
75	1126	7.12	958	8.37
80	1107	7.24	944	8.50
85	1089	7.36	930	8.62
90	1071	7.48	916	8.75
95	1054	7.60	903	8.88
200	793	10.13	704	11.42

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1915	10.89	1798	11.61
30	1292	8.10	1115*	9.39
35	1272	8.23	1098	9.53
40	1252	8.36	1082	9.68
45	1233	8.49	1067	9.82
50	1214	8.62	1051	9.96
55	1196	8.75	1037	10.10
60	1178	8.89	1022	10.25
65	1161	9.02	1009	10.39
70	1144	9.15	995	10.53
75	1127	9.29	982	10.67
80	1111	9.42	970	10.81
85	1096	9.56	958	10.95
90	1081	9.69	946	11.08
95	1066	9.82	934	11.22
200	836	12.56	753	13.95

SAG & TENSION DATA
Secondary - 1/0 al quadruplex Shetland
Rated Breaking Strength: 4460lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1952	13.54	1848	14.31
30	1267	10.45	1115*	11.89
35	1250	10.60	1101	12.05
40	1234	10.74	1087	12.20
45	1217	10.89	1074	12.35
50	1201	11.03	1061	12.50
55	1186	11.18	1049	12.65
60	1171	11.32	1036	12.80
65	1156	11.47	1025	12.95
70	1142	11.61	1013	13.10
75	1128	11.76	1002	13.25
80	1114	11.90	991	13.40
85	1101	12.05	980	13.55
90	1088	12.19	970	13.69
95	1075	12.34	960	13.84
200	872	15.25	796	16.73

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1983	16.47	1891	17.28
30	1246	13.14	1115*	14.70
35	1232	13.30	1103	14.86
40	1217	13.45	1091	15.02
45	1204	13.61	1080	15.18
50	1190	13.76	1069	15.34
55	1177	13.92	1058	15.49
60	1164	14.07	1048	15.65
65	1152	14.23	1037	15.81
70	1139	14.38	1027	15.96
75	1128	14.53	1018	16.12
80	1116	14.69	1008	16.27
85	1104	14.84	999	16.43
90	1093	14.99	990	16.58
95	1082	15.14	981	16.73
200	902	18.22	832	19.77

SAG & TENSION DATA
Secondary - 1/0 al quadruplex Shetland
Rated Breaking Strength: 4460lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2010	19.68	1927	20.53
30	1228	16.15	1115*	17.80
35	1216	16.31	1105	17.97
40	1204	16.47	1095	18.13
45	1192	16.64	1085	18.30
50	1181	16.80	1075	18.46
55	1169	16.96	1066	18.63
60	1158	17.13	1057	18.79
65	1148	17.29	1048	18.95
70	1137	17.45	1039	19.12
75	1127	17.61	1031	19.28
80	1117	17.77	1022	19.44
85	1107	17.93	1014	19.60
90	1097	18.09	1006	19.76
95	1088	18.25	998	19.91
200	927	21.46	863	23.08

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2033	23.19	1959	24.07
30	1213	19.47	1115*	21.21
35	1203	19.64	1106	21.38
40	1192	19.81	1097	21.55
45	1182	19.98	1089	21.72
50	1172	20.15	1081	21.89
55	1163	20.32	1072	22.06
60	1153	20.49	1064	22.23
65	1144	20.66	1057	22.40
70	1135	20.83	1049	22.56
75	1126	21.00	1041	22.73
80	1117	21.16	1034	22.89
85	1109	21.33	1027	23.06
90	1100	21.49	1020	23.22
95	1092	21.66	1013	23.39
200	949	24.98	890	26.66

SAG & TENSION DATA
Secondary - 2/0 al quadruplex Thoroughbred
Rated Breaking Strength: 5390lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1921	1.72	1644	2.01
30	1722	1.05	1348*	1.34
35	1672	1.08	1296	1.40
40	1622	1.12	1245	1.45
45	1573	1.15	1197	1.51
50	1524	1.19	1151	1.57
55	1476	1.23	1106	1.64
60	1429	1.27	1064	1.70
65	1383	1.31	1023	1.77
70	1338	1.35	985	1.84
75	1294	1.40	948	1.91
80	1251	1.45	914	1.98
85	1210	1.50	882	2.05
90	1170	1.55	851	2.13
95	1131	1.60	822	2.20
200	612	2.96	490	3.70

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2001	2.94	1757	3.35
30	1699	1.89	1347*	2.39
35	1653	1.95	1305	2.47
40	1608	2.00	1263	2.55
45	1564	2.06	1224	2.63
50	1521	2.12	1186	2.71
55	1479	2.18	1150	2.80
60	1438	2.24	1115	2.89
65	1398	2.30	1082	2.97
70	1359	2.37	1051	3.06
75	1321	2.44	1021	3.15
80	1284	2.51	992	3.24
85	1248	2.58	965	3.34
90	1214	2.65	940	3.43
95	1181	2.73	915	3.52
200	726	4.44	606	5.33

SAG & TENSION DATA
Secondary - 2/0 al quadruplex Thoroughbred
Rated Breaking Strength: 5390lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2070	4.44	1854	4.96
30	1664	3.02	1347*	3.73
35	1624	3.10	1312	3.83
40	1585	3.17	1278	3.93
45	1546	3.25	1246	4.04
50	1509	3.33	1215	4.14
55	1473	3.41	1185	4.25
60	1437	3.50	1157	4.35
65	1403	3.58	1129	4.46
70	1370	3.67	1103	4.56
75	1338	3.76	1078	4.67
80	1306	3.85	1055	4.77
85	1276	3.94	1032	4.88
90	1247	4.03	1010	4.98
95	1219	4.13	989	5.09
200	819	6.15	703	7.17

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2127	6.23	1937	6.84
30	1625	4.46	1348*	5.38
35	1591	4.55	1319	5.50
40	1557	4.65	1291	5.61
45	1525	4.75	1264	5.73
50	1493	4.85	1238	5.85
55	1462	4.95	1214	5.97
60	1432	5.06	1190	6.09
65	1403	5.16	1167	6.21
70	1375	5.27	1145	6.33
75	1348	5.38	1124	6.45
80	1321	5.48	1104	6.57
85	1296	5.59	1084	6.69
90	1271	5.70	1066	6.81
95	1247	5.81	1048	6.92
200	896	8.10	786	9.25

SAG & TENSION DATA
Secondary - 2/0 al quadruplex Thoroughbred
Rated Breaking Strength: 5390lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2175	8.29	2007	8.99
30	1587	6.21	1348*	7.32
35	1558	6.33	1324	7.46
40	1530	6.45	1301	7.59
45	1502	6.57	1278	7.72
50	1476	6.69	1257	7.85
55	1450	6.81	1236	7.99
60	1425	6.93	1216	8.12
65	1400	7.05	1197	8.25
70	1376	7.17	1179	8.38
75	1353	7.29	1161	8.51
80	1331	7.41	1143	8.64
85	1310	7.54	1126	8.77
90	1289	7.66	1110	8.90
95	1268	7.78	1095	9.03
200	959	10.31	857	11.56

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2215	10.65	2066	11.42
30	1553	8.30	1348*	9.57
35	1528	8.43	1328	9.72
40	1505	8.57	1308	9.86
45	1482	8.70	1290	10.00
50	1459	8.84	1272	10.15
55	1437	8.97	1254	10.29
60	1416	9.11	1237	10.43
65	1396	9.24	1221	10.57
70	1376	9.38	1205	10.71
75	1356	9.51	1190	10.85
80	1337	9.64	1175	10.99
85	1319	9.78	1160	11.13
90	1301	9.91	1146	11.27
95	1284	10.05	1132	11.41
200	1012	12.78	917	14.12

SAG & TENSION DATA
Secondary - 2/0 al quadruplex Thoroughbred
Rated Breaking Strength: 5390lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2248	13.29	2116	14.13
30	1523	10.72	1347*	12.13
35	1502	10.87	1331	12.28
40	1483	11.01	1315	12.43
45	1463	11.16	1299	12.58
50	1444	11.31	1284	12.73
55	1426	11.45	1269	12.88
60	1408	11.60	1254	13.03
65	1391	11.74	1240	13.18
70	1374	11.89	1226	13.33
75	1358	12.03	1213	13.48
80	1342	12.18	1200	13.63
85	1326	12.32	1188	13.77
90	1311	12.47	1175	13.92
95	1296	12.61	1163	14.06
200	1055	15.52	968	16.94

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2275	16.22	2158	17.11
30	1497	13.47	1348*	14.98
35	1480	13.63	1333	15.14
40	1464	13.78	1320	15.30
45	1448	13.94	1306	15.46
50	1432	14.09	1293	15.62
55	1416	14.25	1280	15.78
60	1401	14.40	1268	15.93
65	1386	14.56	1256	16.09
70	1372	14.71	1244	16.25
75	1358	14.87	1232	16.40
80	1344	15.02	1221	16.55
85	1331	15.17	1210	16.71
90	1318	15.33	1199	16.86
95	1305	15.48	1189	17.01
200	1092	18.54	1012	20.03

SAG & TENSION DATA
Secondary - 2/0 al quadruplex Thoroughbred
Rated Breaking Strength: 5390lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2298	19.45	2194	20.39
30	1476	16.55	1348*	18.15
35	1462	16.71	1335	18.31
40	1448	16.88	1324	18.48
45	1434	17.04	1312	18.64
50	1421	17.20	1301	18.81
55	1408	17.36	1290	18.97
60	1395	17.53	1279	19.13
65	1382	17.69	1268	19.30
70	1370	17.85	1258	19.46
75	1358	18.01	1248	19.62
80	1346	18.17	1238	19.78
85	1334	18.33	1228	19.93
90	1323	18.49	1219	20.09
95	1312	18.65	1209	20.25
200	1123	21.83	1050	23.39

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2318	22.98	2224	23.96
30	1459	19.95	1348*	21.62
35	1447	20.12	1337	21.79
40	1435	20.29	1327	21.96
45	1423	20.46	1317	22.13
50	1412	20.63	1307	22.30
55	1400	20.80	1297	22.47
60	1389	20.96	1288	22.64
65	1378	21.13	1279	22.80
70	1368	21.30	1270	22.97
75	1357	21.46	1261	23.13
80	1347	21.63	1252	23.30
85	1337	21.79	1243	23.46
90	1327	21.96	1235	23.62
95	1317	22.12	1227	23.78
200	1149	25.42	1082	27.03

SAG & TENSION DATA
Secondary - 4/0 al quadruplex Walking
Rated Breaking Strength: 8560lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2934	1.48	2447	1.77
30	2738	1.01	2140*	1.29
35	2657	1.04	2056	1.35
40	2577	1.07	1975	1.40
45	2498	1.11	1896	1.46
50	2420	1.14	1821	1.52
55	2343	1.18	1748	1.58
60	2267	1.22	1679	1.65
65	2193	1.26	1613	1.71
70	2121	1.30	1551	1.78
75	2050	1.35	1492	1.85
80	1981	1.40	1436	1.93
85	1913	1.45	1383	2.00
90	1848	1.50	1333	2.08
95	1785	1.55	1287	2.15
200	949	2.92	756	3.67

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	3012	2.56	2573	2.99
30	2705	1.82	2140*	2.30
35	2631	1.87	2070	2.38
40	2558	1.92	2002	2.46
45	2487	1.98	1937	2.54
50	2417	2.03	1875	2.62
55	2349	2.09	1816	2.71
60	2282	2.15	1759	2.80
65	2217	2.22	1706	2.88
70	2154	2.28	1654	2.97
75	2092	2.35	1605	3.07
80	2032	2.42	1559	3.16
85	1975	2.49	1515	3.25
90	1919	2.56	1473	3.34
95	1865	2.64	1434	3.43
200	1128	4.37	936	5.27

SAG & TENSION DATA
Secondary - 4/0 al quadruplex Walking
Rated Breaking Strength: 8560lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	3076	3.91	2684	4.49
30	2654	2.90	2140*	3.59
35	2589	2.97	2082	3.69
40	2525	3.04	2026	3.79
45	2462	3.12	1973	3.90
50	2401	3.20	1922	4.00
55	2341	3.28	1873	4.11
60	2284	3.37	1826	4.21
65	2228	3.45	1781	4.32
70	2173	3.54	1738	4.43
75	2120	3.63	1697	4.53
80	2069	3.72	1658	4.64
85	2020	3.81	1621	4.75
90	1972	3.90	1585	4.85
95	1926	3.99	1551	4.96
200	1276	6.04	1090	7.08

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	3127	5.55	2778	6.24
30	2595	4.27	2140*	5.18
35	2539	4.36	2092	5.29
40	2483	4.46	2046	5.41
45	2429	4.56	2002	5.53
50	2377	4.66	1959	5.66
55	2326	4.76	1918	5.78
60	2277	4.86	1879	5.90
65	2229	4.97	1841	6.02
70	2182	5.07	1805	6.14
75	2138	5.18	1770	6.26
80	2094	5.29	1737	6.38
85	2052	5.40	1705	6.50
90	2011	5.51	1674	6.62
95	1972	5.62	1645	6.74
200	1398	7.94	1221	9.10

SAG & TENSION DATA
Secondary - 4/0 al quadruplex Walking
Rated Breaking Strength: 8560lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	3166	7.46	2858	8.27
30	2536	5.94	2140*	7.05
35	2488	6.06	2100	7.18
40	2441	6.18	2062	7.32
45	2395	6.30	2025	7.45
50	2351	6.41	1989	7.59
55	2308	6.54	1955	7.72
60	2266	6.66	1922	7.85
65	2225	6.78	1890	7.99
70	2186	6.90	1859	8.12
75	2148	7.02	1829	8.25
80	2111	7.15	1801	8.39
85	2075	7.27	1773	8.52
90	2040	7.40	1746	8.65
95	2007	7.52	1720	8.78
200	1499	10.09	1333	11.35

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	3198	9.65	2924	10.56
30	2482	7.94	2140*	9.21
35	2441	8.07	2107	9.36
40	2401	8.21	2075	9.51
45	2362	8.34	2043	9.65
50	2325	8.48	2013	9.80
55	2289	8.61	1984	9.94
60	2253	8.75	1956	10.09
65	2219	8.88	1929	10.23
70	2185	9.02	1902	10.37
75	2153	9.16	1877	10.52
80	2122	9.29	1852	10.66
85	2091	9.43	1828	10.80
90	2061	9.57	1804	10.94
95	2033	9.70	1782	11.08
200	1583	12.48	1429	13.85

SAG & TENSION DATA
Secondary - 4/0 al quadruplex Walking
Rated Breaking Strength: 8560lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	3222	12.13	2980	13.13
30	2433	10.25	2140*	11.67
35	2399	10.40	2112	11.82
40	2366	10.55	2085	11.98
45	2333	10.70	2058	12.14
50	2302	10.84	2033	12.29
55	2271	10.99	2008	12.44
60	2241	11.14	1984	12.60
65	2212	11.29	1960	12.75
70	2183	11.44	1937	12.90
75	2156	11.58	1915	13.05
80	2129	11.73	1893	13.20
85	2103	11.88	1872	13.35
90	2077	12.03	1852	13.50
95	2052	12.17	1832	13.65
200	1654	15.13	1511	16.58

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	3242	14.90	3027	15.97
30	2392	12.89	2140*	14.42
35	2363	13.04	2116	14.58
40	2335	13.20	2093	14.75
45	2308	13.36	2070	14.91
50	2281	13.52	2048	15.07
55	2255	13.68	2027	15.23
60	2229	13.84	2006	15.39
65	2204	13.99	1986	15.55
70	2180	14.15	1966	15.71
75	2156	14.31	1946	15.87
80	2133	14.46	1927	16.02
85	2111	14.62	1909	16.18
90	2089	14.77	1891	16.34
95	2067	14.93	1873	16.49
200	1714	18.05	1582	19.57

SAG & TENSION DATA
Secondary - 4/0 al quadruplex Walking
Rated Breaking Strength: 8560lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	3258	17.96	3066	19.09
30	2358	15.83	2140*	17.46
35	2333	16.00	2120	17.63
40	2309	16.17	2100	17.80
45	2286	16.34	2080	17.97
50	2263	16.50	2061	18.14
55	2241	16.67	2042	18.31
60	2219	16.83	2024	18.47
65	2198	17.00	2007	18.64
70	2177	17.16	1989	18.80
75	2156	17.33	1972	18.97
80	2136	17.49	1956	19.13
85	2117	17.65	1939	19.29
90	2098	17.82	1923	19.45
95	2079	17.98	1908	19.62
200	1764	21.24	1643	22.83

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	3271	21.31	3100	22.50
30	2329	19.10	2140*	20.80
35	2308	19.27	2122	20.98
40	2288	19.45	2105	21.15
45	2268	19.62	2088	21.33
50	2248	19.79	2072	21.50
55	2229	19.96	2055	21.67
60	2210	20.14	2039	21.84
65	2192	20.31	2024	22.01
70	2174	20.48	2009	22.18
75	2156	20.65	1994	22.35
80	2139	20.82	1979	22.52
85	2122	20.99	1964	22.69
90	2105	21.15	1950	22.86
95	2089	21.32	1936	23.02
200	1807	24.70	1696	26.35

SAG & TENSION DATA
Secondary - 2/0 al PAP Mesa Verde
Rated Breaking Strength: 5390lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1592	1.45	1332	1.74
30	1480	0.94	1155*	1.21
35	1436	0.97	1108	1.26
40	1392	1.00	1063	1.31
45	1348	1.03	1019	1.37
50	1305	1.07	976	1.43
55	1263	1.10	936	1.49
60	1221	1.14	897	1.55
65	1180	1.18	860	1.62
70	1140	1.22	825	1.69
75	1101	1.26	791	1.76
80	1063	1.31	760	1.83
85	1026	1.36	730	1.91
90	989	1.41	703	1.98
95	954	1.46	677	2.06
200	490	2.84	387	3.61

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1642	2.51	1407	2.93
30	1466	1.69	1155*	2.14
35	1425	1.74	1115	2.22
40	1385	1.79	1077	2.30
45	1345	1.84	1040	2.38
50	1306	1.90	1005	2.47
55	1268	1.95	971	2.55
60	1231	2.01	939	2.64
65	1194	2.07	908	2.73
70	1159	2.14	879	2.82
75	1124	2.20	851	2.91
80	1091	2.27	825	3.00
85	1058	2.34	800	3.10
90	1027	2.41	777	3.19
95	996	2.49	755	3.28
200	585	4.24	481	5.16

SAG & TENSION DATA
Secondary - 2/0 al PAP Mesa Verde
Rated Breaking Strength: 5390lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1685	3.82	1473	4.37
30	1442	2.68	1155*	3.35
35	1406	2.75	1122	3.45
40	1369	2.83	1090	3.55
45	1334	2.90	1059	3.66
50	1300	2.98	1029	3.76
55	1266	3.06	1001	3.87
60	1233	3.14	974	3.97
65	1201	3.22	949	4.08
70	1170	3.31	924	4.19
75	1140	3.39	901	4.30
80	1111	3.48	878	4.41
85	1083	3.57	857	4.52
90	1056	3.67	837	4.63
95	1030	3.76	818	4.74
200	664	5.84	562	6.91

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1720	5.38	1531	6.05
30	1414	3.94	1155*	4.83
35	1381	4.04	1127	4.95
40	1350	4.13	1100	5.07
45	1319	4.23	1074	5.19
50	1289	4.33	1050	5.31
55	1259	4.43	1026	5.44
60	1231	4.53	1003	5.56
65	1203	4.63	982	5.68
70	1177	4.74	961	5.81
75	1151	4.85	941	5.93
80	1126	4.95	922	6.06
85	1102	5.06	903	6.18
90	1078	5.17	886	6.30
95	1055	5.28	869	6.43
200	730	7.66	632	8.85

SAG & TENSION DATA
Secondary - 2/0 al PAP Mesa Verde
Rated Breaking Strength: 5390lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1750	7.21	1581	7.99
30	1384	5.48	1155*	6.57
35	1356	5.60	1132	6.71
40	1328	5.72	1109	6.85
45	1301	5.83	1087	6.99
50	1276	5.95	1066	7.12
55	1250	6.07	1046	7.26
60	1226	6.19	1027	7.40
65	1202	6.32	1008	7.53
70	1179	6.44	991	7.67
75	1157	6.56	973	7.81
80	1136	6.69	957	7.94
85	1115	6.81	941	8.08
90	1095	6.94	925	8.22
95	1075	7.07	911	8.35
200	785	9.70	692	11.00

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1774	9.29	1623	10.16
30	1355	7.32	1155*	8.59
35	1331	7.45	1135	8.74
40	1307	7.59	1116	8.89
45	1284	7.72	1098	9.04
50	1262	7.86	1080	9.19
55	1241	8.00	1063	9.34
60	1220	8.13	1046	9.49
65	1200	8.27	1030	9.64
70	1180	8.41	1015	9.79
75	1161	8.55	1000	9.93
80	1142	8.69	985	10.08
85	1124	8.83	971	10.23
90	1107	8.97	958	10.37
95	1090	9.11	945	10.52
200	831	11.97	745	13.37

SAG & TENSION DATA
Secondary - 2/0 al PAP Mesa Verde
Rated Breaking Strength: 5390lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1794	11.64	1659	12.60
30	1329	9.45	1155*	10.88
35	1308	9.60	1138	11.04
40	1288	9.75	1122	11.20
45	1269	9.90	1106	11.36
50	1250	10.05	1091	11.52
55	1231	10.20	1076	11.68
60	1214	10.35	1062	11.84
65	1196	10.51	1048	12.00
70	1179	10.66	1035	12.16
75	1163	10.81	1022	12.31
80	1147	10.96	1009	12.47
85	1131	11.11	997	12.62
90	1116	11.26	985	12.78
95	1102	11.41	973	12.93
200	871	14.47	790	15.97

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1811	14.25	1690	15.28
30	1306	11.88	1155*	13.44
35	1288	12.04	1141	13.61
40	1271	12.21	1127	13.78
45	1255	12.37	1113	13.95
50	1238	12.53	1100	14.12
55	1223	12.69	1087	14.29
60	1207	12.86	1075	14.46
65	1192	13.02	1063	14.62
70	1178	13.18	1051	14.79
75	1164	13.34	1040	14.95
80	1150	13.50	1028	15.11
85	1137	13.66	1018	15.28
90	1123	13.82	1007	15.44
95	1111	13.98	997	15.60
200	904	17.22	829	18.80

SAG & TENSION DATA
Secondary - 2/0 al PAP Mesa Verde
Rated Breaking Strength: 5390lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1825	17.12	1716	18.22
30	1286	14.61	1155*	16.28
35	1271	14.78	1143	16.46
40	1257	14.95	1131	16.64
45	1242	15.13	1119	16.81
50	1229	15.30	1107	16.99
55	1215	15.47	1096	17.16
60	1202	15.64	1085	17.33
65	1189	15.81	1075	17.51
70	1176	15.98	1065	17.68
75	1164	16.15	1054	17.85
80	1152	16.32	1045	18.02
85	1140	16.49	1035	18.19
90	1129	16.66	1026	18.36
95	1118	16.83	1016	18.53
200	933	20.21	863	21.87

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	1836	20.27	1738	21.42
30	1269	17.63	1155*	19.39
35	1257	17.81	1144	19.58
40	1244	17.99	1134	19.76
45	1232	18.17	1124	19.94
50	1220	18.35	1114	20.12
55	1208	18.53	1104	20.30
60	1197	18.71	1094	20.48
65	1186	18.89	1085	20.66
70	1175	19.07	1076	20.84
75	1164	19.24	1067	21.02
80	1153	19.42	1058	21.19
85	1143	19.60	1050	21.37
90	1133	19.77	1041	21.54
95	1123	19.95	1033	21.72
200	957	23.46	893	25.18

SAG & TENSION DATA
Secondary - 4/0 al PAP Vicksburg
Rated Breaking Strength: 8560lbs

RULING SPAN - **150** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2449	1.20	1994	1.47
30	2353	0.88	1835*	1.13
35	2282	0.91	1758	1.18
40	2211	0.94	1684	1.24
45	2141	0.97	1612	1.29
50	2072	1.01	1543	1.35
55	2003	1.04	1476	1.41
60	1936	1.08	1412	1.48
65	1869	1.11	1351	1.54
70	1804	1.15	1293	1.61
75	1741	1.20	1238	1.68
80	1679	1.24	1186	1.76
85	1618	1.29	1138	1.83
90	1559	1.34	1092	1.91
95	1502	1.39	1049	1.99
200	749	2.78	585	3.57

RULING SPAN - **200** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2490	2.10	2069	2.53
30	2336	1.58	1835*	2.02
35	2269	1.63	1769	2.09
40	2204	1.68	1706	2.17
45	2139	1.73	1645	2.25
50	2076	1.78	1586	2.33
55	2013	1.84	1530	2.42
60	1952	1.90	1477	2.51
65	1893	1.96	1426	2.60
70	1834	2.02	1377	2.69
75	1778	2.08	1332	2.78
80	1723	2.15	1288	2.88
85	1669	2.22	1247	2.97
90	1618	2.29	1208	3.07
95	1568	2.36	1172	3.16
200	896	4.14	731	5.08

SAG & TENSION DATA
Secondary - 4/0 al PAP Vicksburg
Rated Breaking Strength: 8560lbs

RULING SPAN - **250** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2522	3.24	2137	3.82
30	2304	2.51	1835*	3.15
35	2243	2.58	1779	3.25
40	2184	2.65	1725	3.35
45	2125	2.72	1674	3.46
50	2068	2.80	1624	3.56
55	2013	2.87	1577	3.67
60	1958	2.95	1532	3.78
65	1906	3.04	1489	3.89
70	1854	3.12	1448	4.00
75	1805	3.21	1409	4.11
80	1756	3.30	1372	4.22
85	1710	3.39	1337	4.33
90	1665	3.48	1303	4.44
95	1621	3.57	1271	4.56
200	1020	5.69	857	6.78

RULING SPAN - **300** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2546	4.62	2197	5.36
30	2263	3.68	1835*	4.54
35	2208	3.77	1788	4.66
40	2156	3.87	1742	4.79
45	2104	3.96	1699	4.91
50	2054	4.06	1657	5.03
55	2005	4.16	1617	5.16
60	1957	4.26	1579	5.28
65	1911	4.36	1542	5.41
70	1866	4.47	1507	5.54
75	1823	4.57	1473	5.66
80	1781	4.68	1441	5.79
85	1740	4.79	1411	5.91
90	1701	4.90	1381	6.04
95	1663	5.01	1353	6.17
200	1124	7.43	966	8.65

SAG & TENSION DATA
Secondary - 4/0 al PAP Vicksburg
Rated Breaking Strength: 8560lbs

RULING SPAN - **350** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2563	6.25	2249	7.13
30	2218	5.12	1835*	6.19
35	2170	5.23	1795	6.32
40	2124	5.34	1757	6.46
45	2079	5.46	1720	6.60
50	2035	5.58	1684	6.74
55	1992	5.70	1650	6.88
60	1951	5.82	1617	7.02
65	1911	5.94	1586	7.16
70	1872	6.06	1555	7.30
75	1834	6.19	1526	7.44
80	1798	6.31	1498	7.58
85	1763	6.44	1471	7.72
90	1729	6.57	1445	7.86
95	1696	6.70	1421	8.00
200	1212	9.38	1062	10.72

RULING SPAN - **400** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2575	8.13	2293	9.14
30	2174	6.82	1835*	8.08
35	2132	6.95	1801	8.24
40	2092	7.09	1768	8.39
45	2053	7.22	1737	8.54
50	2015	7.36	1706	8.70
55	1978	7.50	1677	8.85
60	1942	7.64	1649	9.00
65	1908	7.77	1621	9.16
70	1874	7.91	1595	9.31
75	1842	8.05	1570	9.46
80	1810	8.20	1545	9.61
85	1779	8.34	1521	9.76
90	1750	8.48	1499	9.91
95	1721	8.62	1477	10.06
200	1287	11.55	1145	13.00

SAG & TENSION DATA
Secondary - 4/0 al PAP Vicksburg
Rated Breaking Strength: 8560lbs

RULING SPAN - **450** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2582	10.27	2330	11.39
30	2132	8.80	1835*	10.24
35	2097	8.95	1806	10.40
40	2062	9.11	1778	10.57
45	2028	9.26	1751	10.73
50	1996	9.41	1725	10.90
55	1964	9.56	1699	11.06
60	1933	9.72	1675	11.22
65	1903	9.87	1651	11.39
70	1874	10.02	1628	11.55
75	1846	10.18	1606	11.71
80	1818	10.33	1584	11.87
85	1792	10.49	1563	12.03
90	1766	10.64	1543	12.19
95	1741	10.79	1523	12.35
200	1351	13.94	1218	15.48

RULING SPAN - **500** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2588	12.66	2362	13.88
30	2095	11.07	1835*	12.65
35	2065	11.23	1810	12.82
40	2035	11.40	1786	13.00
45	2006	11.56	1762	13.17
50	1978	11.73	1740	13.35
55	1950	11.89	1718	13.52
60	1924	12.06	1696	13.69
65	1898	12.23	1675	13.86
70	1873	12.39	1655	14.03
75	1848	12.56	1635	14.20
80	1824	12.72	1616	14.37
85	1801	12.89	1598	14.54
90	1778	13.05	1580	14.71
95	1756	13.22	1562	14.88
200	1406	16.55	1281	18.18

SAG & TENSION DATA
Secondary - 4/0 al PAP Vicksburg
Rated Breaking Strength: 8560lbs

RULING SPAN - **550** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2591	15.30	2389	16.61
30	2063	13.61	1835*	15.31
35	2036	13.79	1813	15.50
40	2011	13.97	1792	15.68
45	1986	14.14	1772	15.86
50	1962	14.32	1752	16.04
55	1938	14.49	1733	16.23
60	1915	14.67	1714	16.41
65	1892	14.85	1696	16.58
70	1870	15.02	1678	16.76
75	1849	15.20	1660	16.94
80	1828	15.37	1643	17.12
85	1808	15.55	1627	17.29
90	1788	15.72	1611	17.47
95	1769	15.89	1595	17.64
200	1453	19.39	1337	21.10

RULING SPAN - **600** FEET

	INITIAL		FINAL	
Amb. Temp. Deg. F	Tension (lbs)	Sag (ft)	Tension (lbs)	Sag (ft)
30 with 9 lb/ft² wind	2594	18.21	2412	19.60
30	2035	16.43	1835*	18.24
35	2012	16.62	1816	18.43
40	1990	16.81	1798	18.62
45	1968	16.99	1780	18.81
50	1947	17.18	1763	19.00
55	1927	17.36	1746	19.18
60	1907	17.55	1729	19.37
65	1887	17.73	1713	19.56
70	1868	17.91	1697	19.74
75	1849	18.10	1681	19.92
80	1831	18.28	1666	20.11
85	1813	18.46	1651	20.29
90	1796	18.64	1637	20.47
95	1778	18.82	1623	20.65
200	1494	22.47	1386	24.24

BOLTS

INTRODUCTION

1. Bolts, nuts, and washers are part of the individual plates unless otherwise stated.

2. Below the OPTIONS for each construction standard sheet is the list of bolt plates that are available if present. Bolts are provided for normal construction on the appropriate wood pole for the construction standard "plate" that is selected. If a particular plate is to be installed on a larger pole than normal, a bolt plate must be used if available. The bolt plate will automatically itemize out the bolts normally issued and replace them with longer bolts depending on what category. Below are the three categories available:

Class 1 Wood or Type H Concrete:	Category A
Type LT or HT Concrete:	Category B
Type XHT Concrete:	Category C

3. For Example: If you were to install a DC1*636 on a HT concrete pole, you would need to plate a B1*B bolt plate for that station. This would give the appropriate length bolts for this plate to be installed on a Type HT concrete pole. Bolt plates will be used primarily on just three-phase construction.

4. The split bolt (SH30) will come with the pole plate.

5. The following tables list the location and bolt assemblies required for each construction standard. Some assemblies may not be listed if the bolts are issued as part of another construction standard.

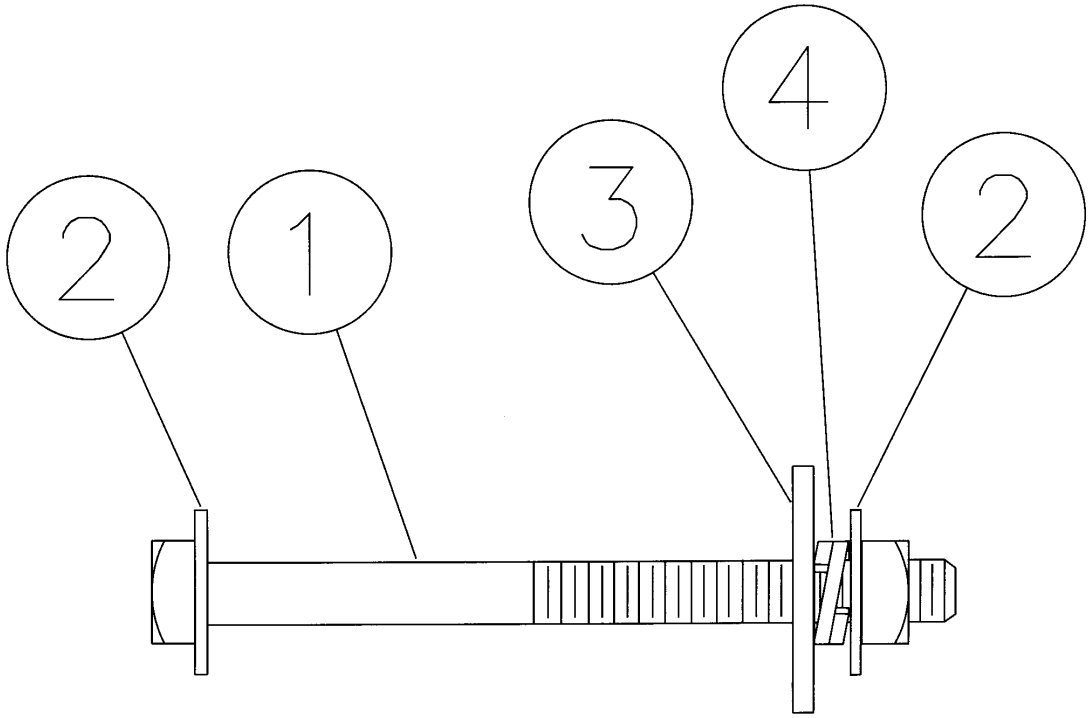
6. The bolt assemblies shown in this section are primarily to be used for construction purposes to show the required nuts, washers and their orientation on the bolt used.

7. Some construction may slightly modify the bolt assemblies of this section. As a rule of thumb, if a washer is in direct contact with either wood or concrete, a square washer shall be used. If a washer is in direct contact with metal, a round washer shall be used.

BA-1

BOLT ASSEMBLY

OPTIONS: NONE
BOLT PLATE: NONE

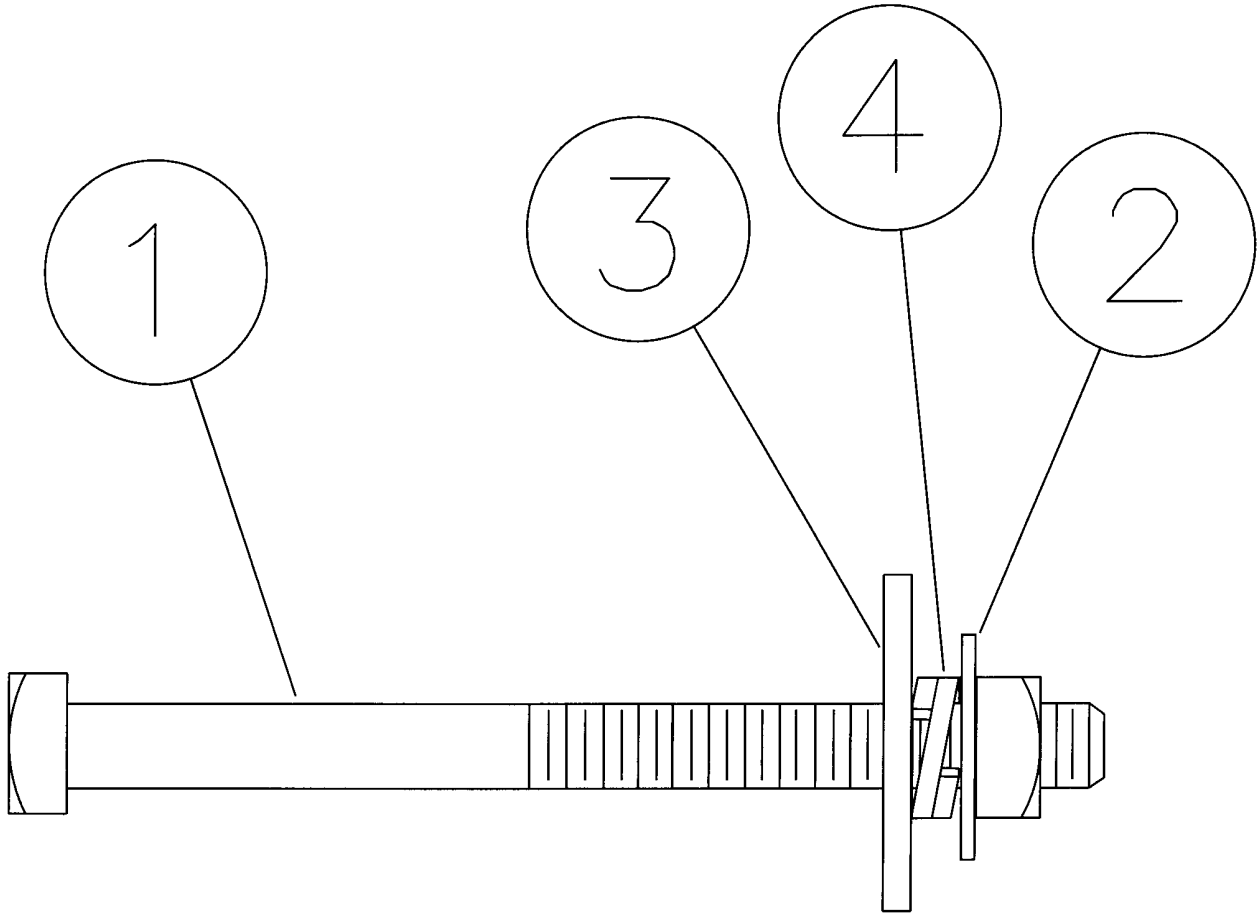


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS ***	1	GENERAL CODE FOR 3/4 IN. DIA. MACHINE BOLT
2	WAS RD 005	2	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
3	WAS SF 003	1	WASHER, SQUARE, 3 IN., FOR 3/4 IN. DIA. BOLT
4	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

BA-2

BOLT ASSEMBLY

OPTIONS: NONE
BOLT PLATE: NONE

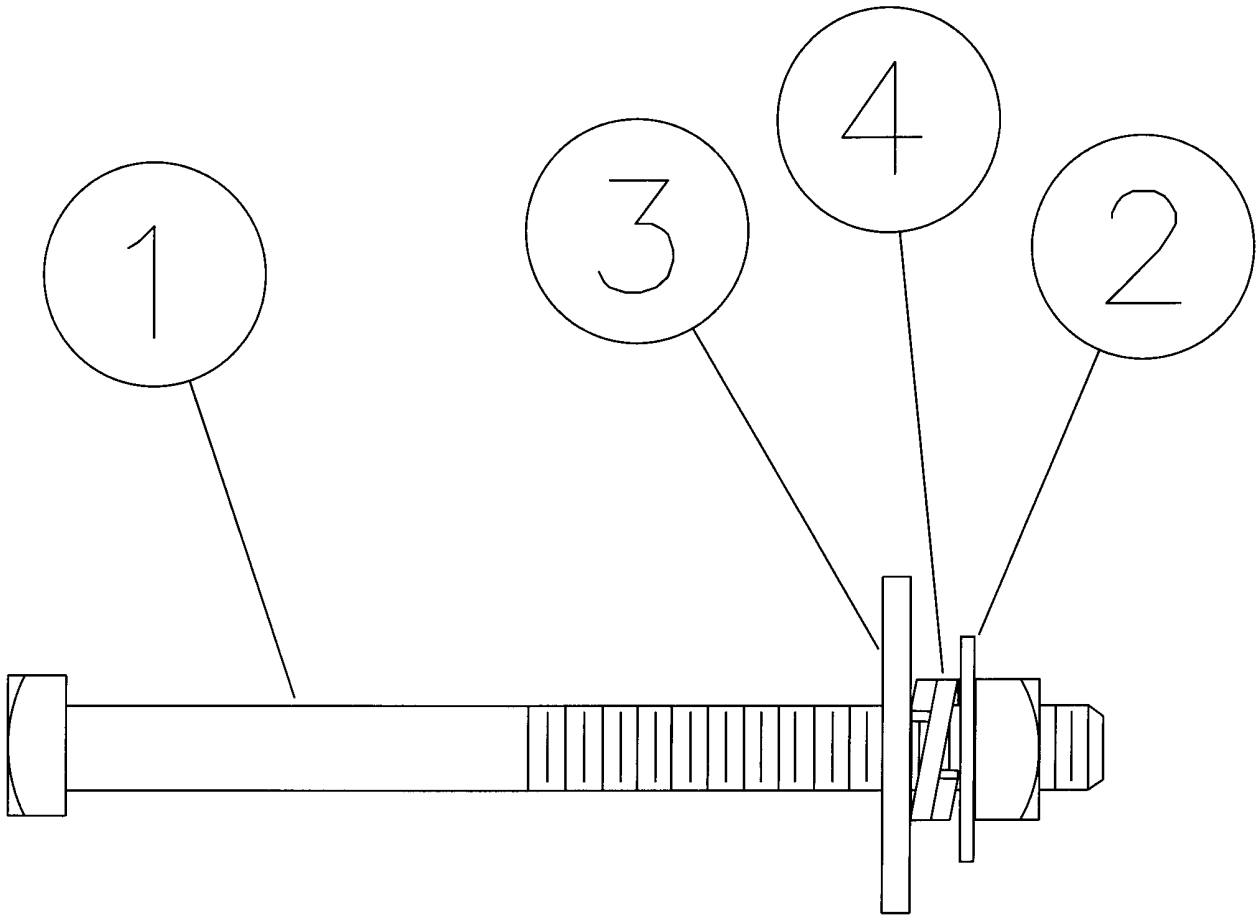


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS ***	1	GENERAL CODE FOR 5/8 IN. DIA. MACHINE BOLT
2	WAS RD 005	1	WASHER, ROUND, 1-3/4 IN. DIA., FOR 3/4 IN. DIA. BOLT
3	WAS SF 003	1	WASHER, SQUARE, 3 IN., FOR 3/4 IN. DIA. BOLT
4	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

BA-3

BOLT ASSEMBLY

OPTIONS: NONE
BOLT PLATE: NONE

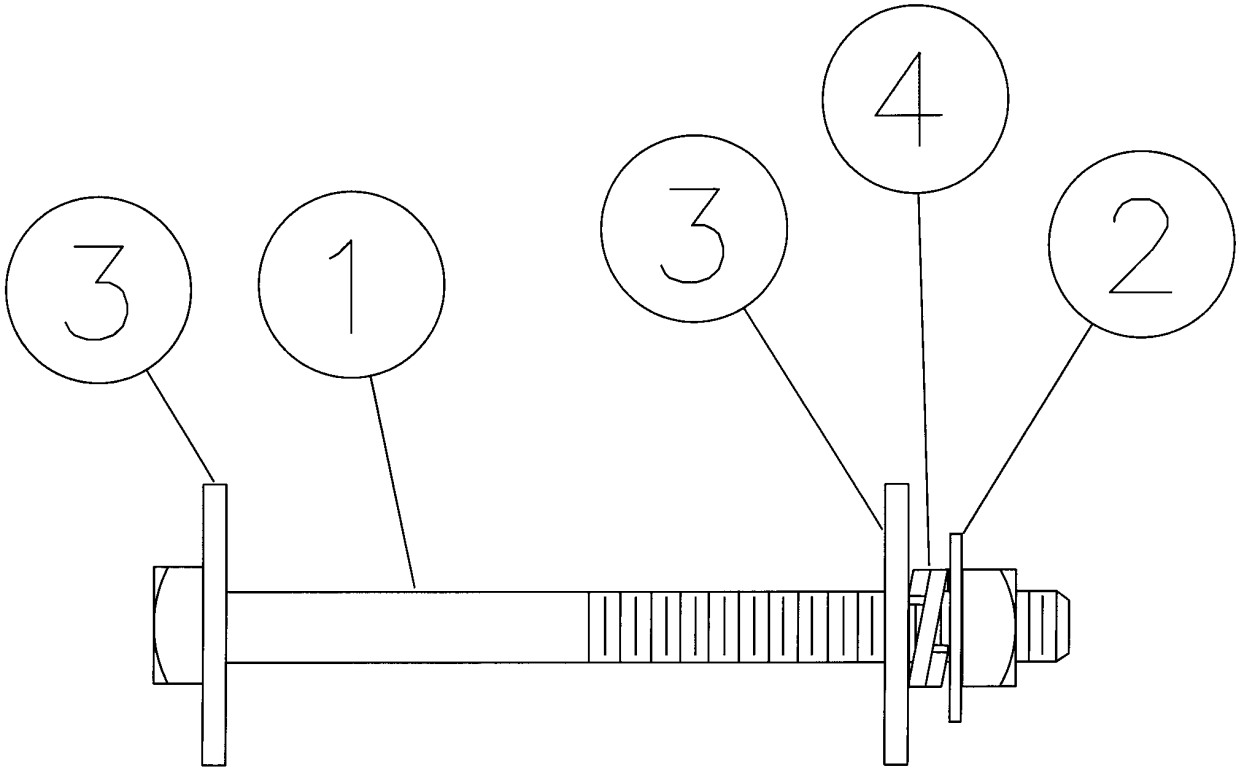


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS ***	1	GENERAL CODE FOR 3/4 IN. DIA. MACHINE BOLT
2	WAS RD 005	1	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
3	WAS SF 003	1	WASHER, SQUARE, 3 IN., FOR 3/4 IN. DIA. BOLT
4	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

BA-4

BOLT ASSEMBLY

OPTIONS: NONE
BOLT PLATE: NONE

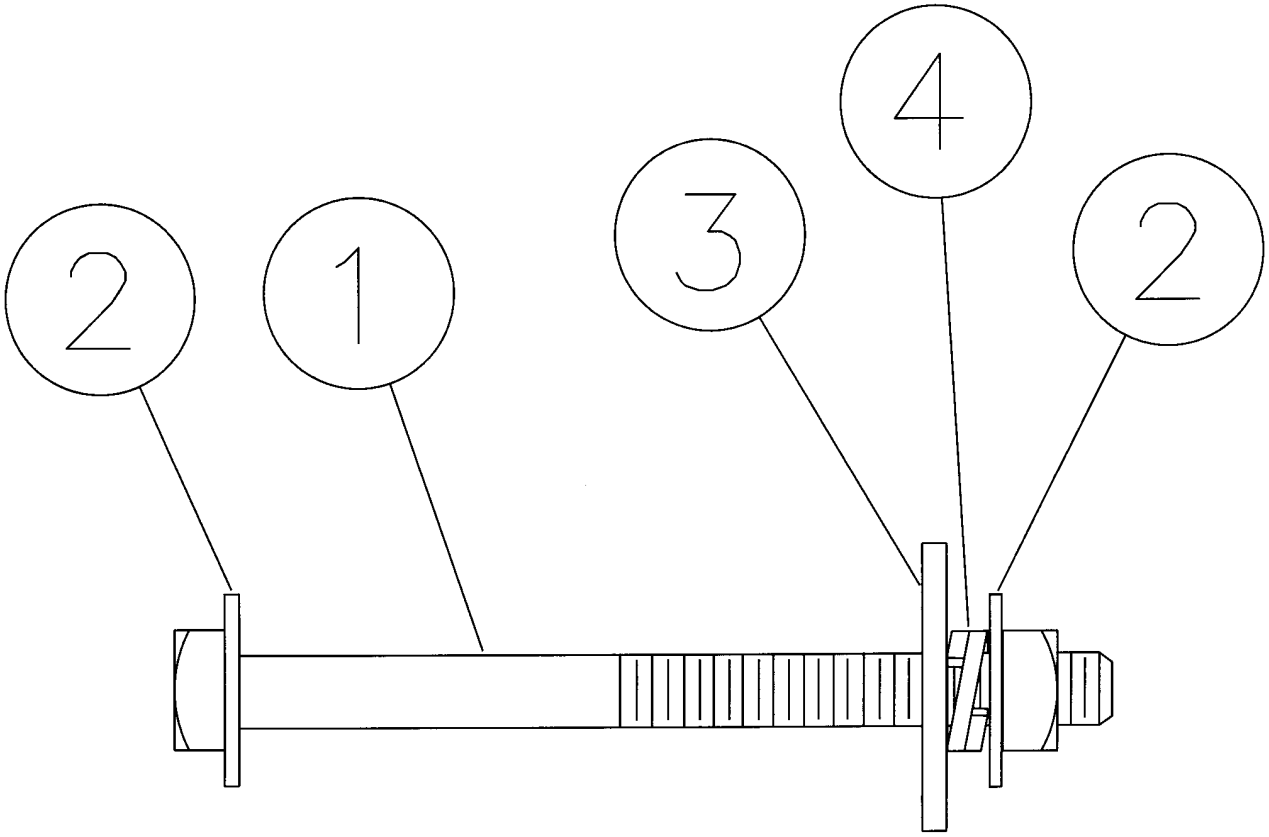


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS ***	1	GENERAL CODE FOR 3/4 IN. DIA. MACHINE BOLT
2	WAS SF 003	2	WASHER, SQUARE, 3 IN., FOR 3/4 IN. DIA. BOLT
3	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

BA-5

BOLT ASSEMBLY

OPTIONS: NONE
BOLT PLATE: NONE

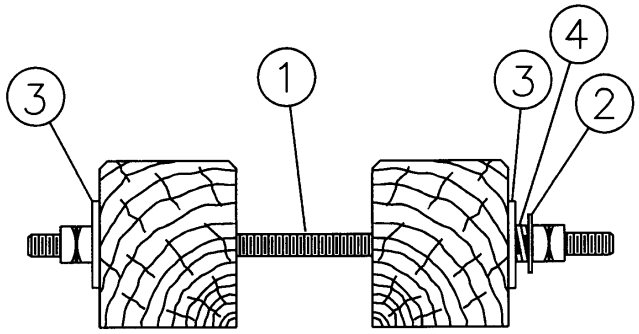


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS ***	1	GENERAL CODE FOR 5/8 IN. DIA. MACHINE BOLT
2	WAS RD 005	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 3/4 IN. DIA. BOLT
3	WAS SF 003	1	WASHER, SQUARE, 3 IN., FOR 3/4 IN. DIA. BOLT
4	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

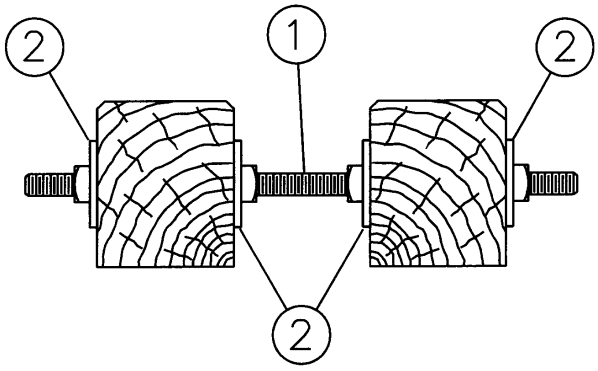
BA-6

BOLT ASSEMBLY

OPTIONS: NONE
BOLT PLATE: NONE



B PHASE X-ARM BOLT



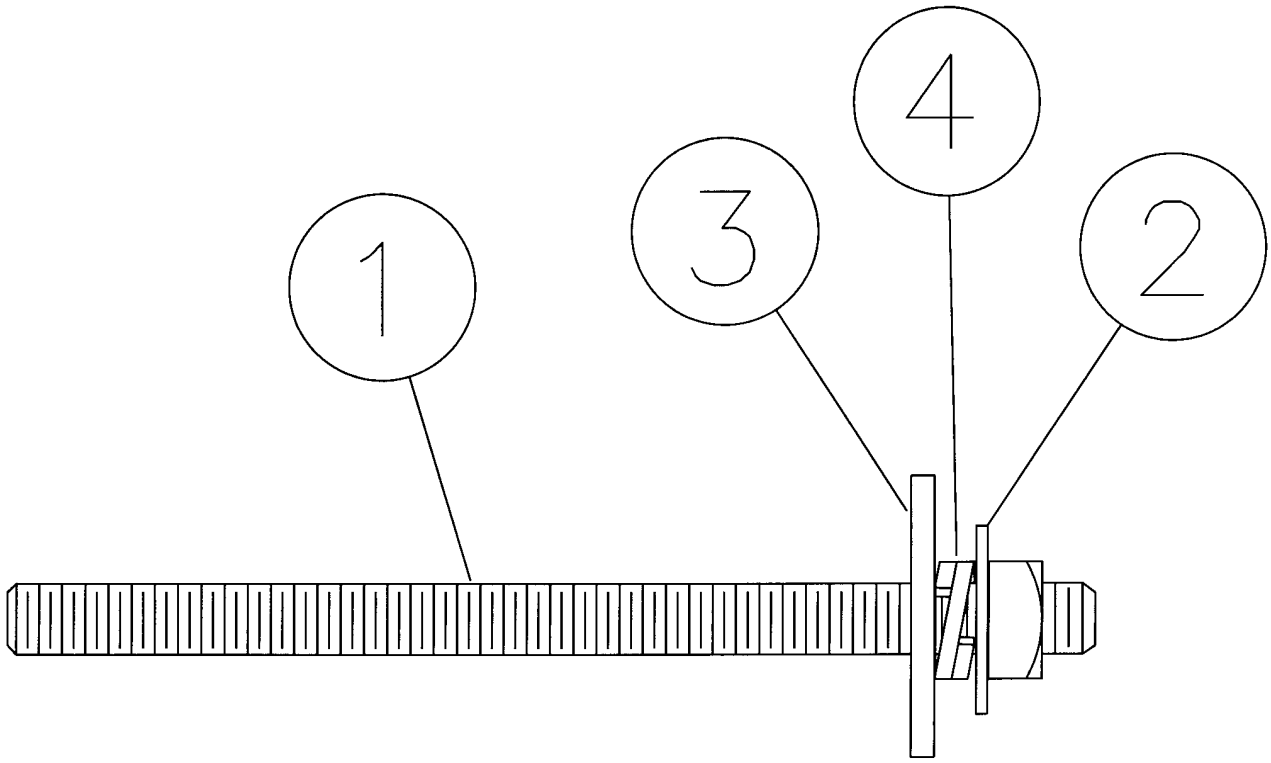
A&C PHASE X-ARM BOLT

NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA ***	1	GENERAL CODE FOR 3/4 IN. DIA. DOUBLE ARMING BOLT
2	WAS RD 005	1	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
3	WAS SF 003	2	WASHER, SQUARE, 3 IN., FOR 3/4 IN. DIA. BOLT
4	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
	OR		
1	BOL DA ***	1	GENERAL CODE FOR 3/4 IN. DIA. DOUBLE ARMING BOLT
2	WAS SF 003	2	WASHER, SQUARE, 3 IN., FOR 3/4 IN. DIA. BOLT

BA-7

BOLT ASSEMBLY

OPTIONS: NONE
BOLT PLATE: NONE

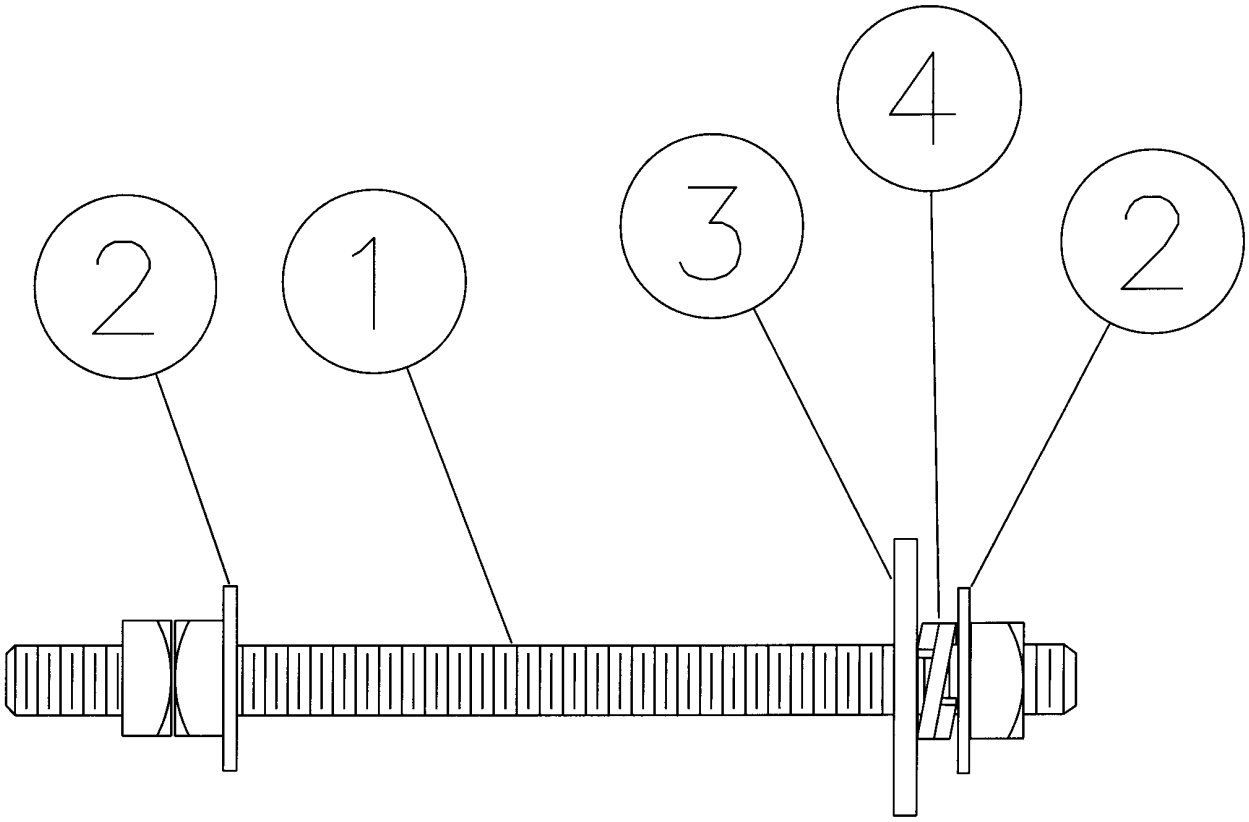


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA ***	1	GENERAL CODE FOR 3/4 IN. DIA. DOUBLE ARMING BOLT
2	WAS RD 005	1	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
3	WAS SF 003	1	WASHER, SQUARE, 3 IN., FOR 3/4 IN. DIA. BOLT
4	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

BA-8

BOLT ASSEMBLY

OPTIONS: NONE
BOLT PLATE: NONE

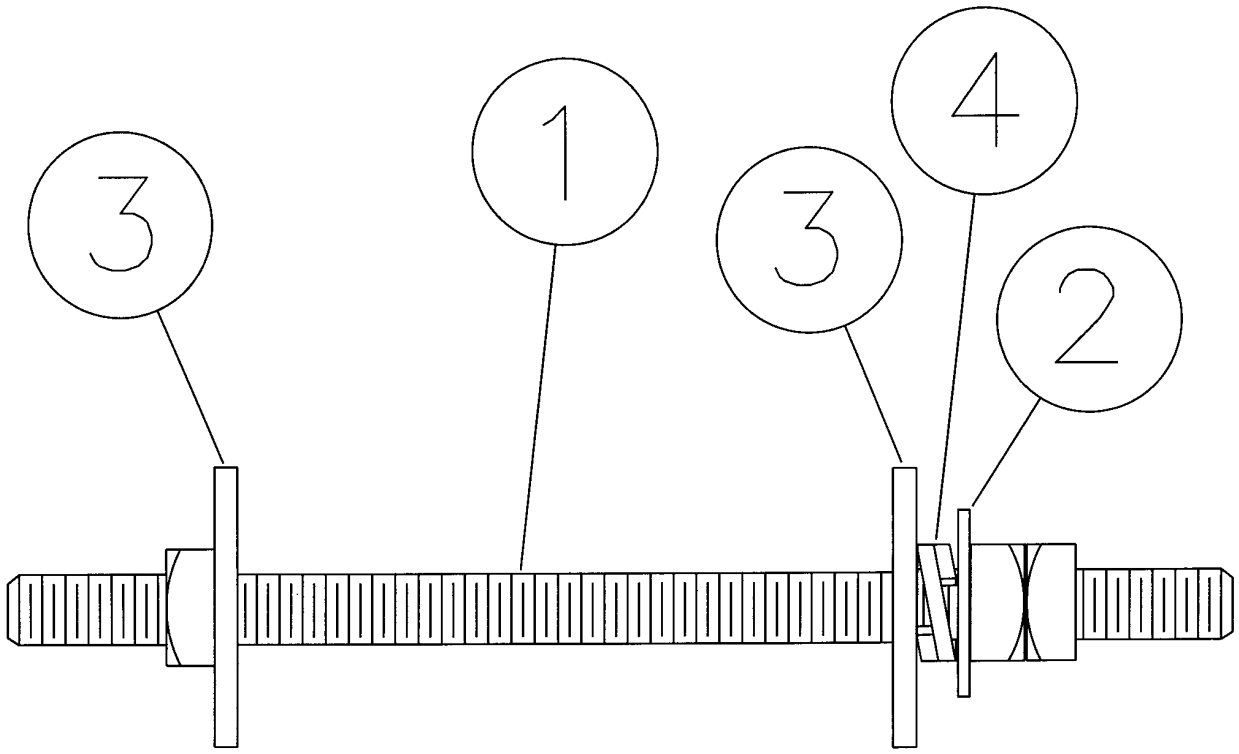


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA ***	1	GENERAL CODE FOR 3/4 IN. DIA. DOUBLE ARMING BOLT
2	WAS RD 005	2	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
3	WAS SF 003	1	WASHER, SQUARE, 3 IN., FOR 3/4 IN. DIA. BOLT
4	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

BA-9

BOLT ASSEMBLY

OPTIONS: NONE
BOLT PLATE: NONE

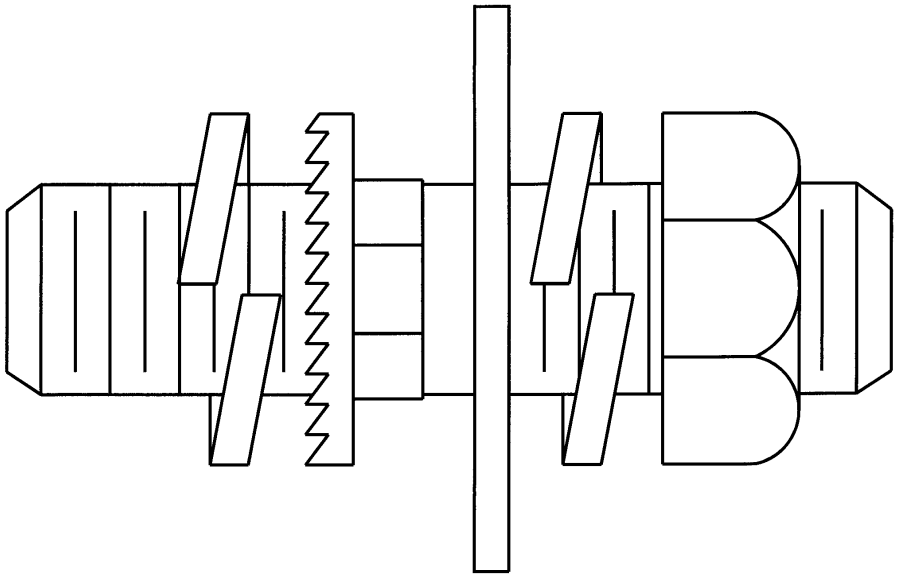


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA ***	1	GENERAL CODE FOR 3/4 IN. DIA. DOUBLE ARMING BOLT
2	WAS RD 005	1	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
3	WAS SF 003	2	WASHER, SQUARE, 3 IN., FOR 3/4 IN. DIA. BOLT
4	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

BA-11

BOLT ASSEMBLY

OPTIONS: NONE
BOLT PLATE: NONE

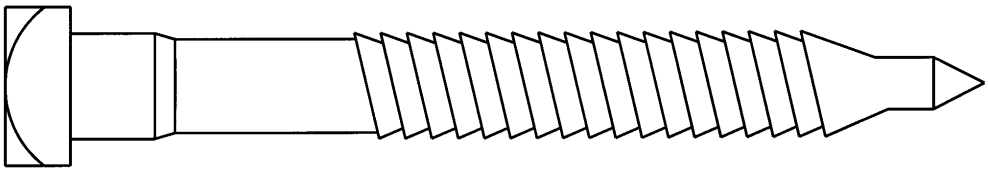


NO.	ITEM ID	QTY	DESCRIPTION
1	STU LI 001	1	STUD, LINE POST, 3/4 IN. DIA. HEAD, 1-3/4 IN. SHANK
2	WAS RD 005	1	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT

BA-12

BOLT ASSEMBLY

OPTIONS: NONE
BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	SCW LA 002	1	SCREW, LAG, 1/2 X 4

CONSTRUCTION PLATE BOLT TABLES

BOLT LOCATION	P1	P1-1	P1-3	P2	P3	P4	P5	P7	P8
B5									
7									
B13	Use BA-1 and BA-8 as Required	Use BA-7 as Required	Use BA-9 as Required	Use BA-1 and BA-8 as Required	Use BA-9 as Required	Use BA-9 as Required	Use BA-9 as Required	Use BA-1 as Required	Use BA-1 as Required
B15									
17									
B20									
25									
B30									
35									
B38									
45									
B48									
51									
53									
B58									
63									
B68									
73									
83									
B96									
101									
B106									
111									
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	SH1	SH3	SH4	SH5	SH8	SH20	DA1	DA1-5	DA2
B5	BA-1	BA-1	BA-1			BA-1	BA-1		BA-1
7			BA-1	BA-1	BA-1				
B13									
B15	BA-1	BA-1	BA-1			BA-1	BA-1		BA-1
17			BA-1	BA-1	BA-1				
B20							BA-1	BA-1	BA-1
25									
B30							BA-8	BA-8	BA-8
35									
B38									
45									
B48									
51									
53									
B58									
63									
B68									
73									
83									
B96									
101									
B106									
111									
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	DA2-5	DA3	DA3-5	DA4	DA4-5	DA5	DA5-5	DA6	DA6-5
B5		BA-1		BA-1					
7				BA-1		BA-1			
B13									
B15		BA-1		BA-1					
17				BA-1		BA-1			
B20	BA-1	BA-9	BA-9	BA-9	BA-9			BA-7	BA-7
25				BA-9	BA-9	BA-9	BA-9		
B30	BA-8								
35									
B38									
45									
B48									
51									
53									
B58									
63									
B68									
73									
83									
B96									
101									
B106									
111									
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	DA6-6	DA7	DA7-5	DA8	DA8-5	DA18	DA18-5	DA20	DA21
B5				BA-1		BA-1		BA-1	
7	BA-1	BA-1							
B13									
B15				BA-1		BA-1		BA-1	
17	BA-1	BA-1							
B20				BA-7	BA-7	BA-9	BA-9		
25		BA-1	BA-1	BA-9	BA-9				BA-1
B30									
35		BA-1	BA-1						BA-8
B38									
45									
B48									
51									
53									
B58									
63									
B68									
73									
83									
B96									
101									
B106									
111									
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	DA21-5	DA22	DA22-5	DB1	DB1-5	DB2	DB2-5	DB3	DB3-5
B5				BA-1		BA-1		BA-1	
7									
B13									
B15				BA-1		BA-1		BA-1	
17									
B20				BA-1	BA-1	BA-1	BA-1	BA-9	BA-9
25	BA-1	BA-1	BA-1						
B30				BA-8	BA-8	BA-8	BA-8		
35	BA-8	BA-8	BA-8						
B38									
45									
B48									
51									
53									
B58				BA-1	BA-1	BA-1	BA-1	BA-9	BA-9
63									
B68				BA-8	BA-8	BA-8	BA-8		
73									
83									
B96									
101									
B106									
111									
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	DB4	DB4-5	DB5	DB5-5	DB6	DB6-5	DB6-6	DB7	DB7-5
B5	BA-1								
7	BA-1		BA-1				BA-1	BA-1	
B13									
B15	BA-1								
17	BA-1		BA-1				BA-1	BA-1	
B20	BA-9	BA-9			BA-7	BA-7			
25	BA-9	BA-9	BA-9	BA-9				BA-1	BA-1
B30									
35								BA-1	BA-1
B38									
45									
B48									
51									
53									
B58	BA-9	BA-9			BA-7	BA-7			
63	BA-9	BA-9	BA-9	BA-9				BA-1	BA-1
B68									
73								BA-1	BA-1
83									
B96									
101									
B106									
111									
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	DB8	DB8-5	DB18	DB18-5	DB20	DB21	DB21-5	DB22	DB22-5
B5	BA-1		BA-1		BA-1				
7									
B13									
B15	BA-1		BA-1		BA-1				
17									
B20	BA-7	BA-7	BA-9	BA-9					
25	BA-9	BA-9				BA-1	BA-1	BA-1	BA-1
B30									
35						BA-8	BA-8	BA-8	BA-8
B38									
45									
B48									
51									
53									
B58	BA-7	BA-7	BA-9	BA-9					
63	BA-9	BA-9				BA-1	BA-1	BA-1	BA-1
B68									
73						BA-8	BA-8	BA-8	BA-8
83									
B96									
101									
B106									
111									
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	DC1	DC1-5	DC2	DC2-5	DC3	DC3-5	DC4	DC4-5	DC5
B5	BA-1		BA-1		BA-1		BA-1		
7							BA-1		BA-1
B13									
B15	BA-1		BA-1		BA-1		BA-1		
17							BA-1		BA-1
B20	BA-1	BA-1	BA-1	BA-1	BA-9	BA-9	BA-9	BA-9	
25							BA-9	BA-9	BA-9
B30	BA-8	BA-8	BA-8	BA-8					
35									
B38									
45									
B48									
51									
53									
B58	BA-1	BA-1	BA-1	BA-1	BA-9	BA-9	BA-9	BA-9	
63							BA-9	BA-9	BA-9
B68	BA-8	BA-8	BA-8	BA-8					
73									
83									
B96	BA-1	BA-1	BA-1	BA-1	BA-9	BA-9	BA-9	BA-9	
101							BA-9	BA-9	BA-9
B106	BA-8	BA-8	BA-8	BA-8					
111									
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	DC5-5	DC6	DC6-5	DC6-6	DC7SL	DC7	DC7-5	DC8	DC8-5
B5								BA-1	
7				BA-1	BA-1	BA-1			
B13									
B15								BA-1	
17				BA-1	BA-1	BA-1			
B20		BA-7	BA-7		BA-1			BA-7	BA-7
25	BA-9				BA-9	BA-1	BA-1	BA-9	BA-9
B30					BA-8				
35						BA-1	BA-1		
B38									
45									
B48									
51									
53									
B58		BA-7	BA-7		BA-1			BA-7	BA-7
63	BA-9				BA-9	BA-1	BA-1	BA-9	BA-9
B68					BA-8				
73						BA-1	BA-1		
83									
B96		BA-7	BA-7		BA-1			BA-7	BA-7
101	BA-9				BA-9	BA-1	BA-1	BA-9	BA-9
B106					BA-8				
111						BA-1	BA-1		
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	DC18	DC18-5	DC20	DC21	DC21-5	DC22	DC22-5	T1	T1-5
B5	BA-1		BA-1						
7								BA-1	
B13									
B15	BA-1		BA-1						
17								BA-1	BA-4
B20	BA-9	BA-9							
25				BA-1	BA-1	BA-1	BA-1		
B30									
35				BA-8	BA-8	BA-8	BA-8		
B38									
47									*BA-5
B48									
51									
53									
B58	BA-9	BA-9							
63				BA-1	BA-1	BA-1	BA-1	BA-4	
B68									
73				BA-8	BA-8	BA-8	BA-8		
93								*BA-5	
B96	BA-9	BA-9							
101				BA-1	BA-8	BA-1	BA-1		
B106									
111				BA-8	BA-8	BA-8	BA-8		
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

* - WILL ADJUST ACCORDING TO THE LENGTH OF THE BRACE.

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	T2	T2-5	T5	T5-5	T6	T6-5	T8	T8-5	T20
B5									BA-1
7	BA-1		BA-1		BA-1		BA-1		
B13									
B15									BA-1
17	BA-1	BA-6	BA-1	BA-6	BA-1	BA-6	BA-1	BA-6	
B20									
25									
B30									
35									
B38									
47		*BA-5		*BA-5		*BA-5		*BA-5	
B48									
51									
53									
B58									
63	BA-6		BA-6		BA-6		BA-6		
B68									
73									
93	*BA-5		*BA-5		*BA-5		*BA-5		
B96									
101									
B106									BA-6
111									
116									
121									
127									
134									
B136									*BA-5
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

* - WILL ADJUST ACCORDING TO THE LENGTH OF THE BRACE.

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	T20-5	T22	T22-5	VA20	VA20-1	VA20-5	VA22	VA22-5	VB1-5
B5				BA-1					
7									
B13									
B15				BA-1					
17									BA-4
B20									
25									
B30									
35									
B38									
47									*BA-5
B48									
51									
B52						*BA-9			
B58									
63								BA-1	
B68	BA-6		BA-4		BA-6				
73								BA-1	
83					*BA-5				
B98	*BA-5		*BA-5						
101				BA-9			BA-1		
B106		BA-4							
111							BA-1		
116									
121									
127									
134									
B139		*BA-5							
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

* - WILL ADJUST ACCORDING TO THE LENGTH OF THE BRACE

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	VB2-5		VB7-5	VB8-5	VB20-5	VB22-5	KA20-F	KA20-1F	KA22-F
B5									
7									
B13									
B15									
17	BA-6		BA-6	BA-6					
B20									
25									
B30									
35									
B38									
45								BA-7	
47	*BA-5		*BA-5	*BA-5					
51									
53									
B58							BA-2	BA-2	BA-2
B63							BA-2	BA-2	BA-2
B68					BA-6	BA-4			
73									
83									
B98					*BA-5	*BA-5			
101									
B106									
111									
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

* - WILL ADJUST ACCORDING TO THE LENGTH OF THE BRACE

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	KB1	KB1-1	KB2	KB3	KB4	KB5	KB20	KB20-1	KB22
B5	BA-2	BA-2	BA-2	BA-1	BA-1		BA-2	BA-2	
7					BA-1	BA-2			
B13	BA-2	BA-2	BA-2				BA-2	BA-2	
B15						BA-2			
17									
B20							BA-2	BA-2	
25		*BA-12							
B30				BA-2	BA-2		BA-2	BA-2	
30								BA-12	
B38				BA-2	BA-2		BA-2	BA-9	
45									
B48									
51									
53									
B58								BA-2	
63							BA-7		BA-2
B68								BA-2	
71									BA-2
83									
B96									
101									
B106									
111									
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	KC1	KC1-1	KC2	KC3	KC4	KC5	KC20	KC20-1	KC22
B5	BA-2	BA-2	BA-2	BA-1	BA-1		BA-2	BA-2	
7					BA-1	BA-2			
B13	BA-2	BA-2	BA-2				BA-2	BA-2	
B15						BA-2			
17									
B20							BA-2	BA-2	
25		BA-12							
B30				BA-2	BA-2		BA-2	BA-2	
30								BA-12	
B38				BA-2	BA-2		BA-2	BA-9	
45									
B48									
51									
53									
B58								BA-2	
63							BA-7		BA-2
B68								BA-2	
71									BA-2
83									
B96									
101									
B106									
111									
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	DA1-2	DA3-2	DA4-2	DA5-2	DA6-2	DA8-2		DA22-2	VPA1-2
B5									BA-1
7									
B13									BA-1
B15									
17									
B20	BA-1		BA-9						
25			BA-9	BA-9		BA-9		BA-1	
B30	BA-1	BA-9							
35								BA-1	
B38					BA-1	BA-1			
45									
B48					BA-1	BA-1			
51									
53									
B58			BA-9						
63				BA-9				BA-1	
B68		BA-9	BA-9						
73								BA-1	
83									
B96			BA-9						
101				BA-9				BA-1	
B106		BA-9	BA-9						
111								BA-1	
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	F1	F2	F3	F4	F5	F5-1	F5-2	F9	F10
B5									
7									
B13									
B15									
17									
B20					BA-1		BA-1		
25	BA-1	BA-9	BA-1	BA-1		BA-1			
B30					BA-1		BA-1		
35	BA-1	BA-9	BA-1	BA-1		BA-1			
B38									
45									
B48									
51									
53									
B58					BA-1		BA-1		
63	BA-1	BA-9	BA-1	BA-1		BA-1			
B68					BA-1		BA-1		
73	BA-1	BA-9	BA-1	BA-1		BA-1			
83									
B96					BA-1		BA-1		BA-1
101	BA-1	BA-9	BA-1	BA-1		BA-1		BA-1	
B106					BA-1		BA-1		BA-1
111	BA-1	BA-9	BA-1	BA-1		BA-1		BA-1	
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	F11	F11-S	F11-SS	FCS-1	FCS	FCR-1	FCR	RGA	RGB
B5									
7									
B13									
B15									
17									
B20									
25	BA-1				BA-9		BA-9		
B30									
35	BA-1	BA-8	BA-8		BA-8		BA-8		
B38									
45									
B48									
51									
53									
B58									
63	BA-1				BA-9		BA-9		
B68									
73	BA-1	BA-8	BA-8		BA-8		BA-8		
83									
B96									
101	BA-1				BA-9		BA-9		
B106									
111	BA-1	BA-8	BA-8		BA-8		BA-8		
116									
121									
127									
134									
B139									
144									
B150				BA-1	BA-1	BA-1	BA-1		BA-5
156								BA-2	BA-5
B162									BA-5
166									
168								BA-2	BA-5
172									
B174				BA-1	BA-1	BA-1	BA-1		
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	RGC	WGA	WGB	WGC	DGA	DGB	DGC	DGRA	DGRB
B5									
7									
B13									
B15									
17									
B20									
25									
B30									
35									
B38									
45									
B48									
51									
53									
B58									
63									
B68									
73									
83									
B96									
101									
B106									
111									
116									
121									
127									
134									
B139									
144									
B150	BA-5		BA-5	BA-5		BA-5	BA-5		BA-5
156	BA-5	BA-2	BA-5	BA-5	BA-2	BA-5	BA-5	BA-2	BA-5
B162	BA-5		BA-5	BA-5		BA-5	BA-5		BA-5
166									
168	BA-5	BA-2	BA-5	BA-5	BA-2	BA-5	BA-5	BA-2	BA-5
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

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CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	DGRC	DS1-5	DS1R-5	DS1RT-5	DS2-5	DS3-5	DS5-5	DS5R-5	DS5RT-5
B5									
7								BA-1	
B13									
B15									
17								BA-1	
B20							BA-1	BA-1	BA-8
25		BA-9	BA-9	BA-1	BA-5	BA-6	BA-9	BA-9	
B30							BA-1	BA-1	BA-8
35		BA-8	BA-8		BA-5		BA-8	BA-8	
B38									
45									
B48									
51									
55						*BA-8			
B58		BA-8	*BA-8	BA-8			BA-1	BA-5	BA-8
63		BA-9	BA-8	BA-5			BA-9	BA-9	BA-5
B68		BA-8	BA-8	BA-8			BA-1	BA-1	BA-8
73		BA-8	BA-8				BA-8	BA-8	
83									
B96		BA-8	*BA-8	BA-8			BA-1	BA-5	BA-8
101		BA-9	BA-8	BA-5			BA-9	BA-9	BA-5
B106		BA-8	BA-8	BA-8			BA-1	BA-1	BA-8
111		BA-8	BA-8				BA-8	BA-8	
116									
121									
127									
B134			*BA-8					BA-5	
139				BA-5					BA-5
144									
B150	BA-5								
156	BA-5								
B162	BA-5								
166									
168	BA-5								
172									
B174									
B192									
198									
B204									
B216									
223		BA-1							
234		BA-1							
B348									
B468									
B480									

* - 5/8 IN. BOLT

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	RS3-5	SCADA	DS1S	DUA2	DUB1	DUB2	DUC1	DUC2	DUC3
B5									
7									
B13									
B15		BA-5							
17									
B20				BA-1					BA-7
25	BA-6	BA-9							
B30				BA-1				BA-7	
35					BA-7		BA-7		
B38									
45									
B48									
51									
53									
B58									BA-9
63		BA-9							
B68									
73									
83									
B96						BA-7		BA-9	
101		BA-9							BA-1
B106		*BA-8							
111									BA-1
116									
121									
127									
134									
B139									
144									
B150									
156			BA-1						
B162									
166									
168			BA-1						
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

* - 5/8 IN. BOLT

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	YDC-6F	YDC-12S	YDC-12SN	YRC-1.5	YRC-3	YRC-6	MD1	MD2	MR1
B5									
7									
B13									
B15									
17							BA-9		BA-9
B20							BA-8		BA-8
25							BA-9	BA-6	BA-9
B30							BA-8		BA-8
35	BA-7	BA-7	BA-7	BA-7	BA-7	BA-7	BA-8	BA-8	BA-8
B38									
45									
B48									
51									
53									
B58							BA-8		BA-8
63							BA-9	BA-8	BA-9
B68							BA-8		BA-8
73	BA-7	BA-7	BA-7	BA-7	BA-7	BA-7	BA-8	BA-6	BA-8
91								BA-8	
B96							BA-8		BA-8
101							BA-9	BA-8	BA-9
B106							BA-8		BA-8
111							BA-8		BA-8
116									
121									
127									
134	BA-7	BA-7	BA-7	BA-7	BA-7	BA-7			
135							BA-9		BA-9
144									
B150									
156									
B162	BA-1	BA-1	BA-1	BA-1	BA-1	BA-1			
166									
168									
172									
B180	BA-1	BA-1	BA-1	BA-1	BA-1	BA-1			
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	MR2	S1	S1-1	L1	L2	L3	LB1	LB2	LB3
B5									
7									
B13									
B15									
17									
B20									
25	BA-6								
B30									
35	BA-8								
B38									
45									
B48									
51									
53									
B58									
63	BA-8								
B68									
73	BA-6								
83	BA-8								
B96									
101	BA-8								
B106									
111									
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192		BA-3	BA-3						
198									
B204				BA-3	BA-3	BA-3	BA-3	BA-3	BA-3
B216				BA-3	BA-3	BA-3	BA-3	BA-3	BA-3
B228					BA-3	BA-3		BA-3	BA-3
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	FCRS	RUA2	RUB1	RUB2	RUC1	RUC2	RUC3	WUA2	WUB1
B5									
7									
B13									
B15									
17									
B20		BA-1					BA-7	BA-1	
25	BA-6								
B30		BA-1				BA-7		BA-1	
35	BA-8		BA-7		BA-7				BA-7
B38									
45									
B48									
51									
53									
B58							BA-9		
63	BA-1								
B68									
73	BA-6								
91	BA-8								
B96				BA-7		BA-9			
101	BA-1						BA-1		
B106									
111							BA-1		
116									
121									
127									
134									
B139									
144									
B150	BA-8								
156	BA-1								
B162	BA-8								
166									
168	BA-1								
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

CONSTRUCTION PLATE BOLT TABLES (CONTINUED)

BOLT LOCATION	WUB2	WUC1	WUC2	WUC3					
B5									
7									
B13									
B15									
17									
B20				BA-7					
25									
B30			BA-7						
35		BA-7							
B38									
45									
B48									
51									
53									
B58				BA-9					
63									
B68									
73									
91									
B96	BA-7		BA-9						
101				BA-1					
B106									
111				BA-1					
116									
121									
127									
134									
B139									
144									
B150									
156									
B162									
166									
168									
172									
B174									
B192									
198									
B204									
B216									
B228									
B336									
B348									
B468									
B480									

SUB-STRUCTURES

INTRODUCTION

1. This section is comprised of insulator and shield plates that are the building blocks to all of the vertical primary plates and parts of others. Plates not including required combinations for overhead construction can be modified by calling for Sub-Structures instead of plates. They can also be used to see a more detailed breakdown of the components that make up a construction standard.

2. Split bolt assembly (SH30) is required on all wood poles 45 feet and larger at seven (7) inches from the tip, 90 degrees from the birthmark side of the pole. Not required for poles with SH4 shield. Split bolts are included with wood pole plates, but can be plated separately if necessary.

3. Jumper pin locations are indicated in the following sections:
   TRANSFORMERS, SYSTEM PROTECTION, REGULATORS & CAPACITORS, AND RISER POLES.
   The plate P1-1 has an option "JP" when using it for this application. Call for the required number as shown on the plates.

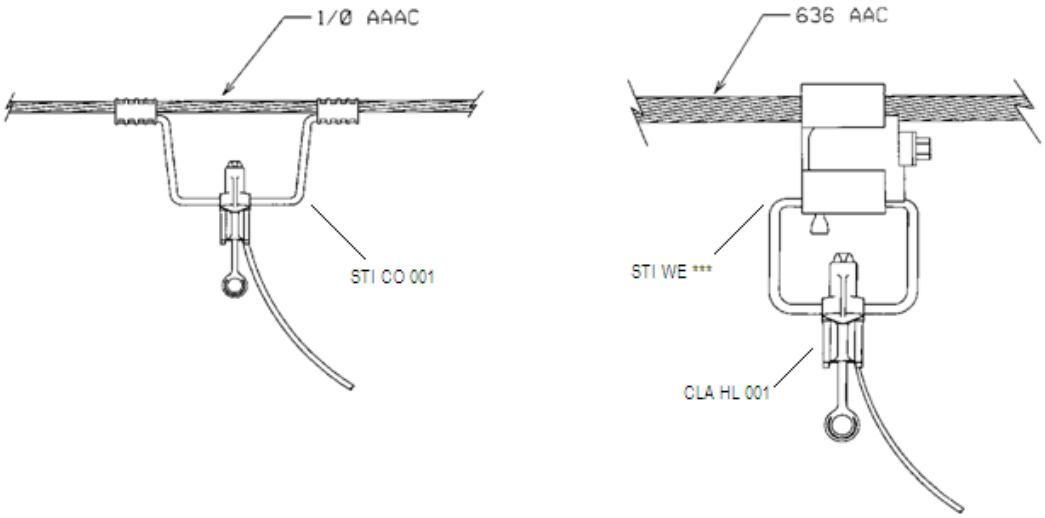
4. Plate options are listed in the upper left-hand corner of each plate sheet. When plating, call for the plate name followed by an asterisk and then the particular option. Other than the JP options mentioned above, the option is the primary conductor size.

   Example: DHLC*636

DHLC

HOT-LINE CLAMP

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2/0CU, 4/0CU, 500CU, 6, 4, 2, 1/0, 2/0, 3/0, 336, 636
BOLT PLATE: NONE



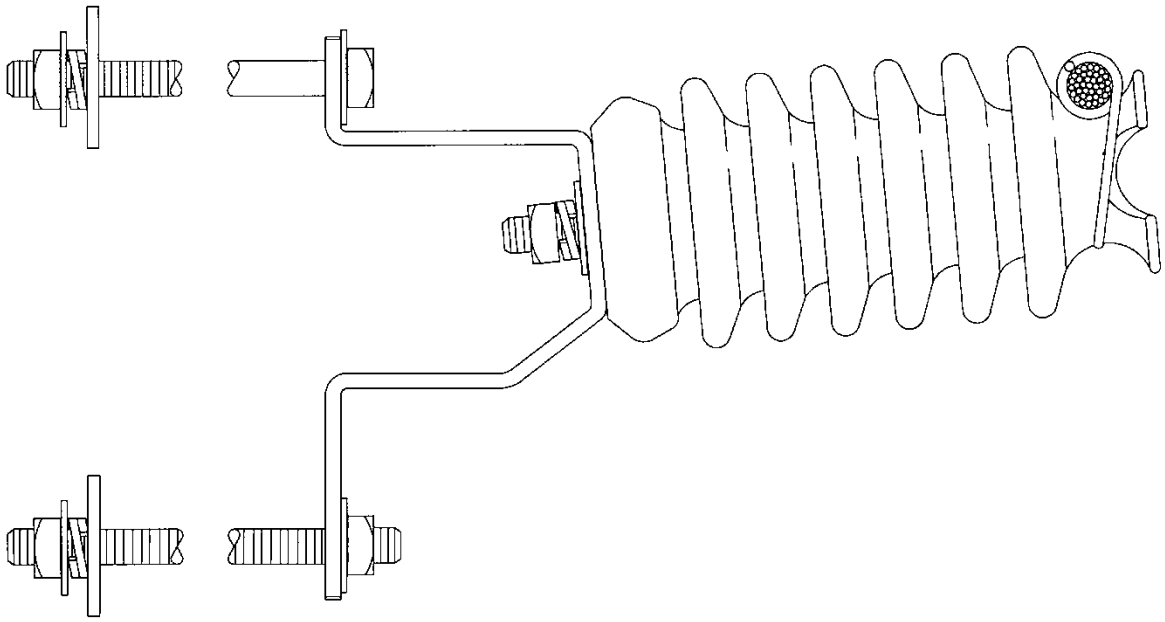
NO.	ITEM ID	QTY	DESCRIPTION
			FOR #2 AND 1/0 AAAC CONDUCTOR
1	CLA HL 001	1	GENERAL CODE FOR HOT-LINE CLAMP
2	STI CO 001	1	GENERAL CODE FOR COMPRESSION STIRRUP
	OR		FOR 336 AND 636 CONDUCTOR
1	CLA HL 001	1	GENERAL CODE FOR HOT-LINE CLAMP
2	STI WE ***	1	GENERAL CODE FOR BOLT-ON STIRRUP
	OR		FOR COPPER CONDUCTOR
1	CLA HL 001	1	GENERAL CODE FOR HOT-LINE CLAMP
2	CNN ** ***	2	GENERAL CODE FOR CONNECTOR

P1

0 TO 10 DEGREE ANGLE

OPTIONS: 2, 1/0, 3/0, 336, 636

BOLT PLATE: NONE

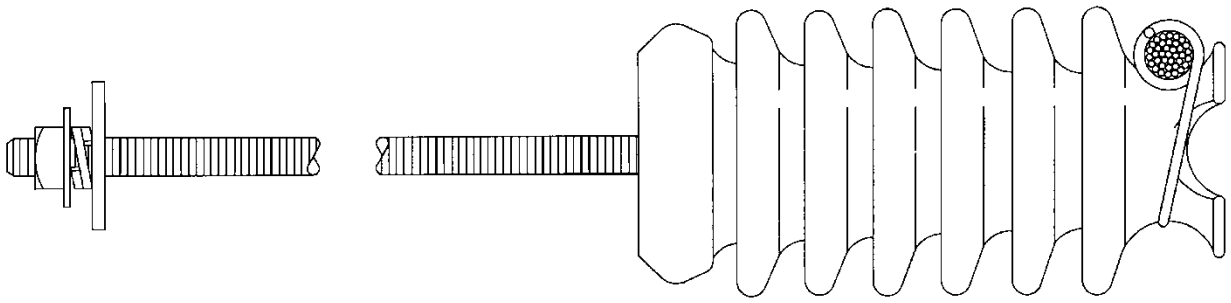


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
2	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
3	BKT IN 007	1	BRACKET, INSULATOR STANDOFF 6 IN.
4	INS VP 001	1	INSULATOR, POST 34.5KV
5	STU LI 001	1	STUD, LINE POST 3/4 HEAD - 3/4 DIA. X 1-3/4 IN. SHANK
6	TIE PR ***	1	GENERAL CODE FOR PREFORMED TIE
7	WAS RD 005	5	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
8	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
9	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

P1-1

0 TO 10 DEGREE ANGLE

OPTIONS: 2, 1/0, 3/0, 336, 636, JP
BOLT PLATE: NONE

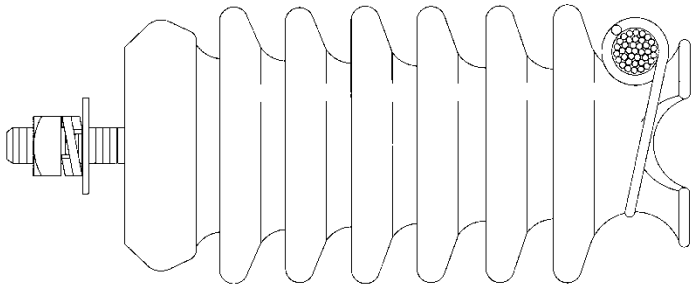


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
2	INS VP 001	1	INSULATOR, POST 34.5KV
3	TIE PR ***	1	GENERAL CODE FOR PREFORMED TIE
4	WAS RD 005	1	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
5	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
6	WAS SF 003	1	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

P1-2

0 TO 10 DEGREE ANGLE

OPTIONS: 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

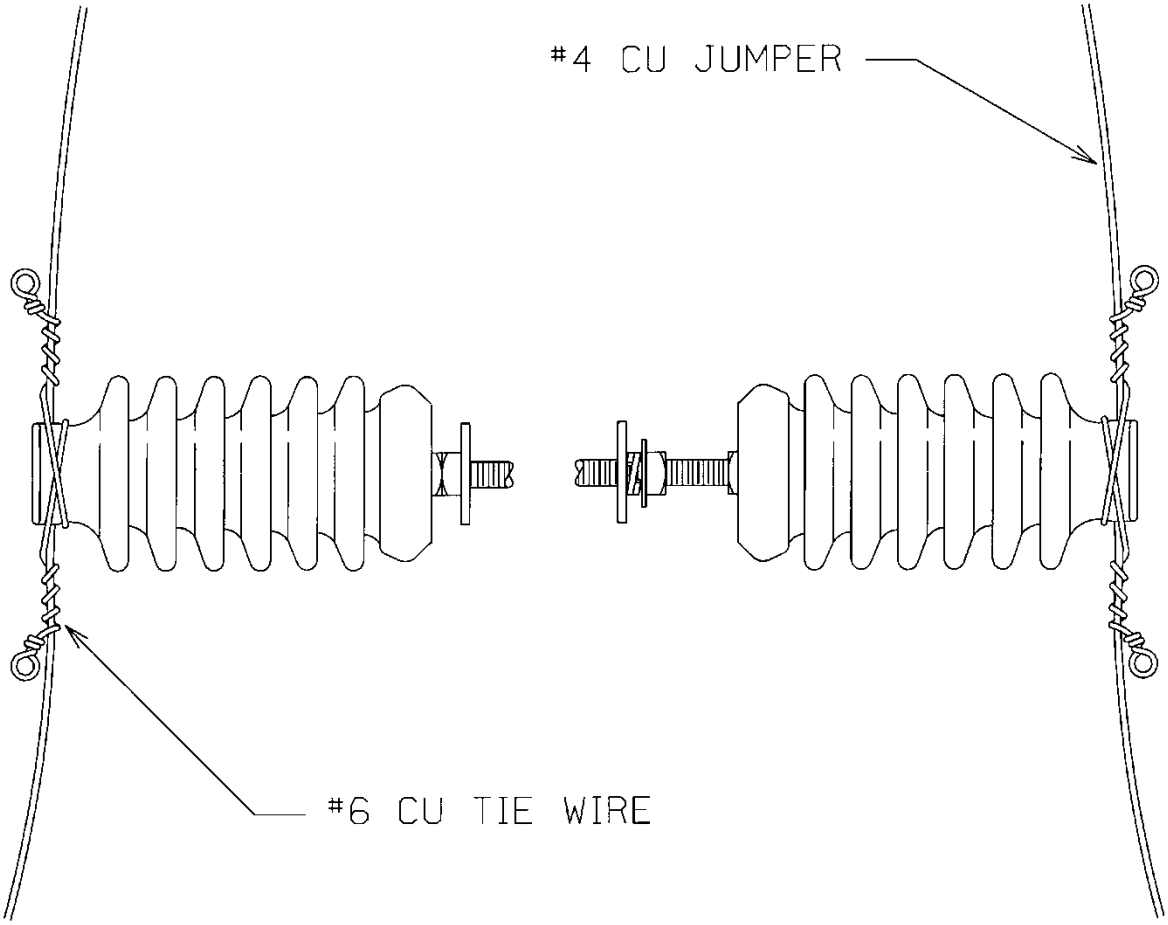


NO.	ITEM ID	QTY	DESCRIPTION
1	INS VP 001	1	INSULATOR, POST 34.5KV
2	STU LI 001	1	STUD, LINE POST 3/4 HEAD - 3/4 DIA. X 1-3/4 IN. SHANK
3	TIE PR ***	1	GENERAL CODE FOR PREFORMED TIE
4	WAS RD 005	1	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT

P1-3

JUMPER SUPPORT

OPTIONS: NONE
BOLT PLATE: NONE

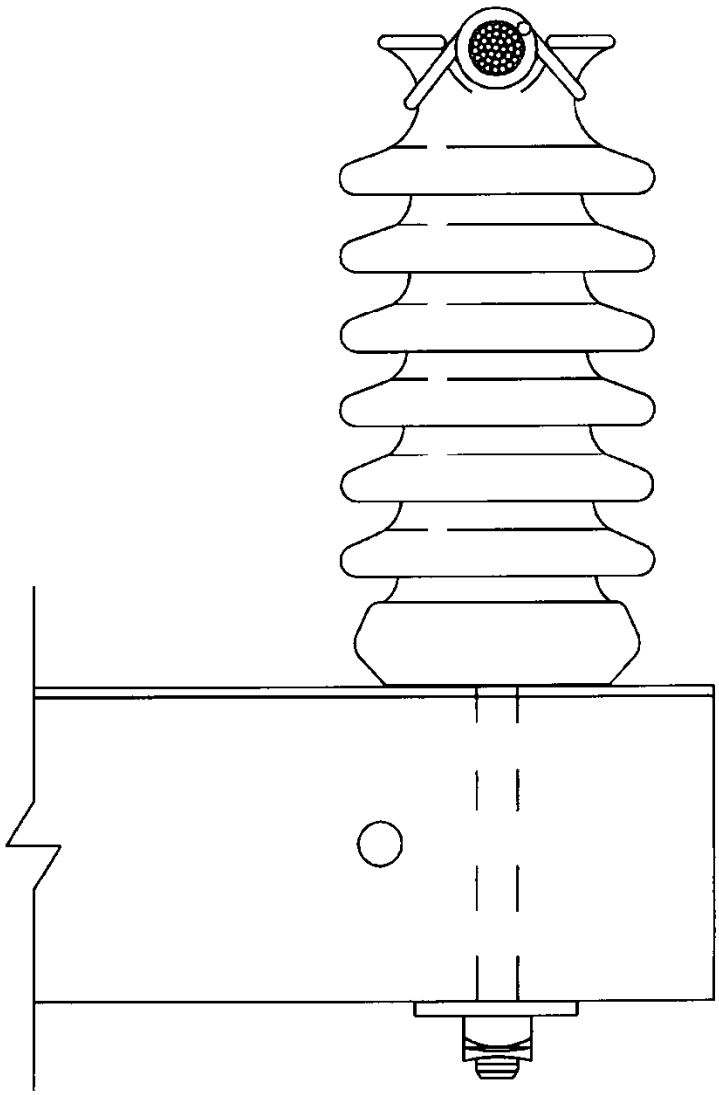


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
2	COB CO 028	5	CONDUCTOR, BARE COPPER #4 SOFT DRAWN
3	INS VP 001	2	INSULATOR, POST 34.5KV
4	WAS RD 005	1	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
5	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
6	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

P1-4

JUMPER PIN

OPTIONS: 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

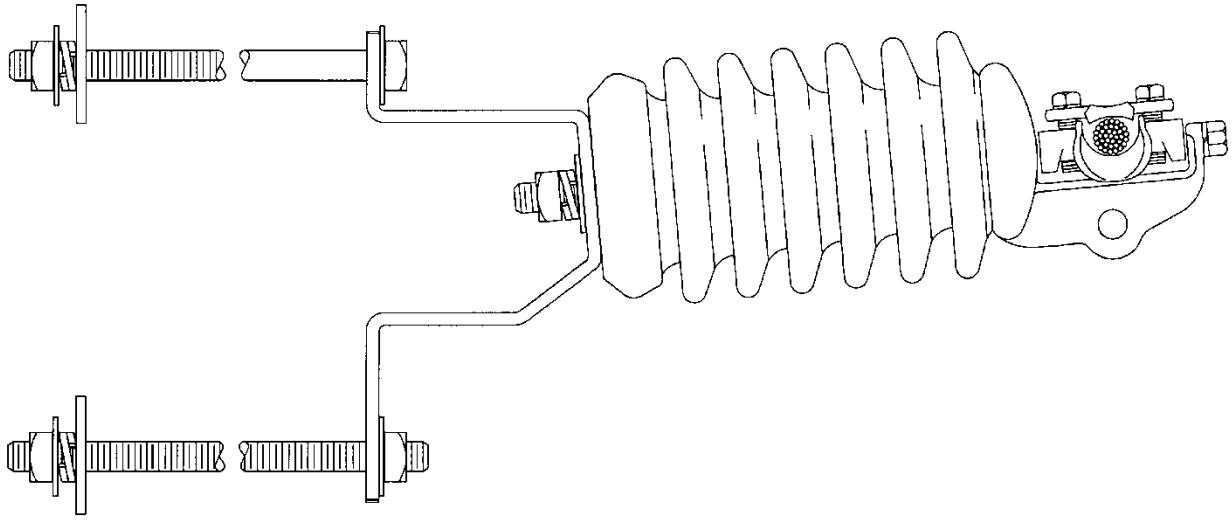


NO.	ITEM ID	QTY	DESCRIPTION
1	INS VP 001	1	INSULATOR, POST 34.5KV
2	STU LI 003	1	STUD, LINE POST 3/4 HEAD - 3/4 DIA. X 7 IN. SHANK
3	TIE PR ***	1	GENERAL CODE FOR PREFORMED TIE
4	WAS SF 003	1	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

P2

10 TO 30 DEGREE ANGLE

OPTIONS: 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

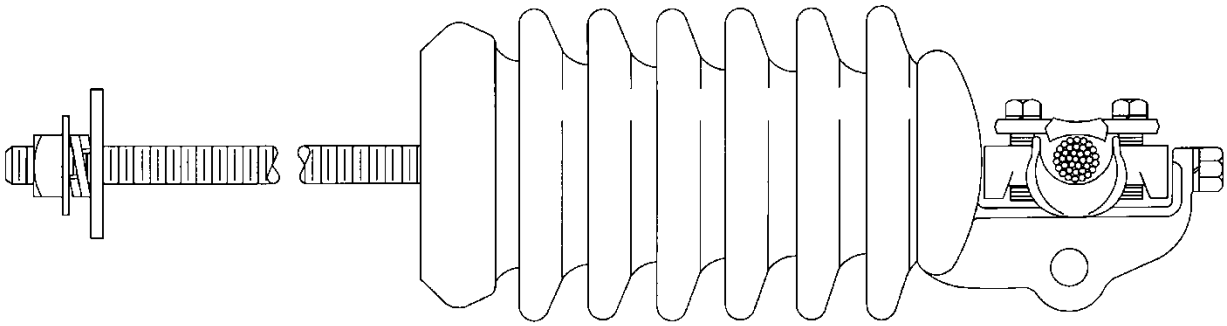


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
2	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
3	BKT IN 007	1	BRACKET, INSULATOR STANDOFF 6 IN.
4	CLA CT ***	1	GENERAL CODE FOR ANGLE CLAMP
5	GUA LI ***	1	GENERAL CODE FOR LINE GUARD
6	INS HP 001	1	INSULATOR, HORIZ. POST 34.5KV CLAMP
7	STU LI 001	1	STUD, LINE POST 3/4 HEAD - 3/4 DIA. X 1-3/4 IN. SHANK
8	WAS RD 005	5	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
9	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
10	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

P2-1

10 TO 30 DEGREE ANGLE

OPTIONS: 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

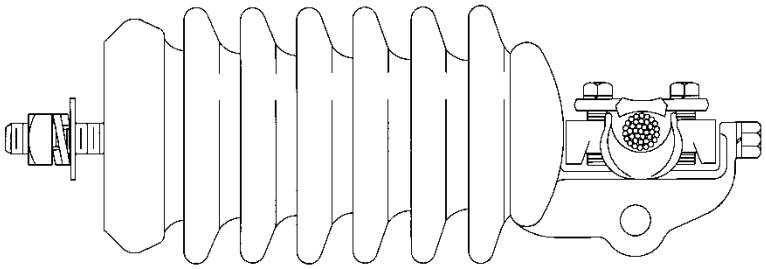


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
2	CLA CT ***	1	GENERAL CODE FOR ANGLE CLAMP
3	GUA LI ***	1	GENERAL CODE FOR LINE GUARD
4	INS HP 001	1	INSULATOR, HORIZ. POST 34.5KV CLAMP
5	WAS RD 005	1	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
6	WAS SF 003	1	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
7	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

P2-2

10 TO 30 DEGREE ANGLE

OPTIONS: 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

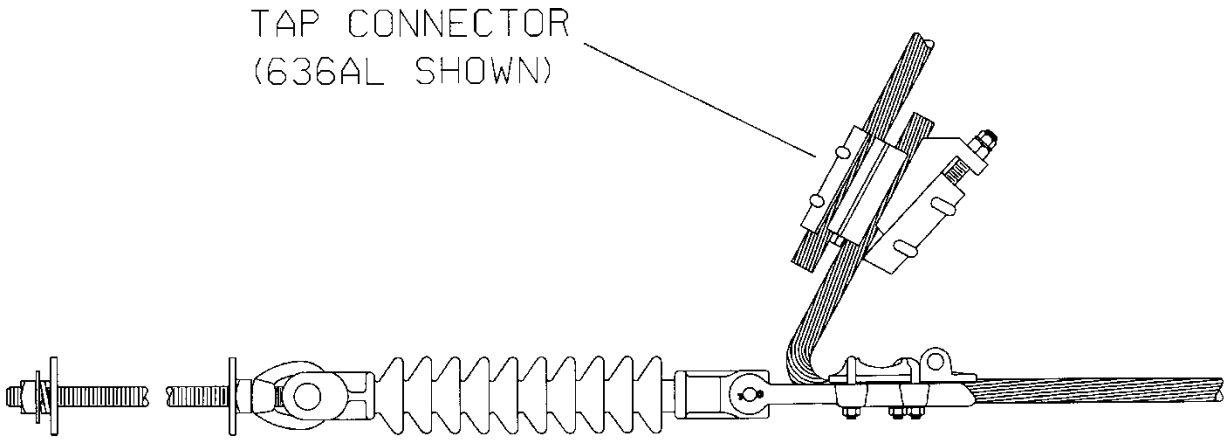


NO.	ITEM ID	QTY	DESCRIPTION
1	CLA CT ***	1	GENERAL CODE FOR ANGLE CLAMP
2	GUA LI ***	1	GENERAL CODE FOR LINE GUARD
3	INS HP 001	1	INSULATOR, HORIZ. POST 34.5KV CLAMP
4	STU LI 001	1	STUD, LINE POST, 3/4" HEAD - 3/4" DIA. X 1-3/4" SHANK
5	WAS RD 005	1	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT

P4

TAP OR 30 TO 60 DEGREE ANGLE

OPTIONS: 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

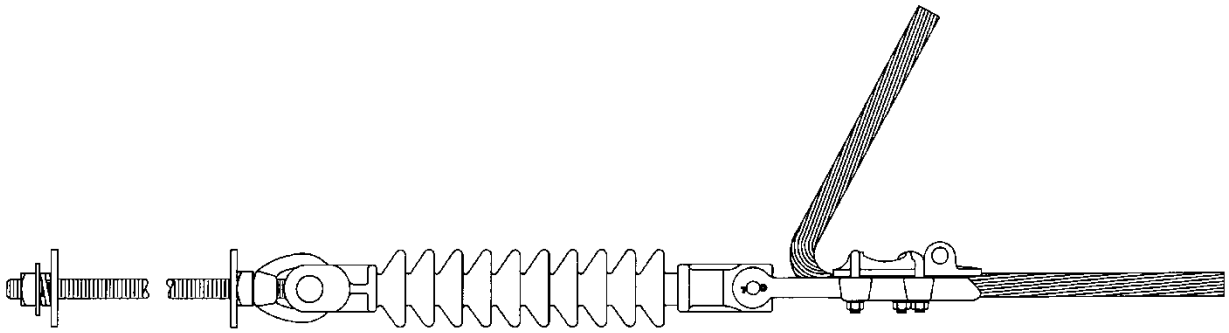


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
2	INS CO 001	1	INSULATOR, DEADEND, POLYMER 27KV
3	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	CNN ** ***	1	GENERAL CODE FOR TAP CONNECTOR
5	NUT EY 003	1	NUT, EYE 3/4
6	WAS RD 005	1	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
7	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
8	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

P5

DEADEND OR 30 TO 60 DEGREE ANGLE

OPTIONS: 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

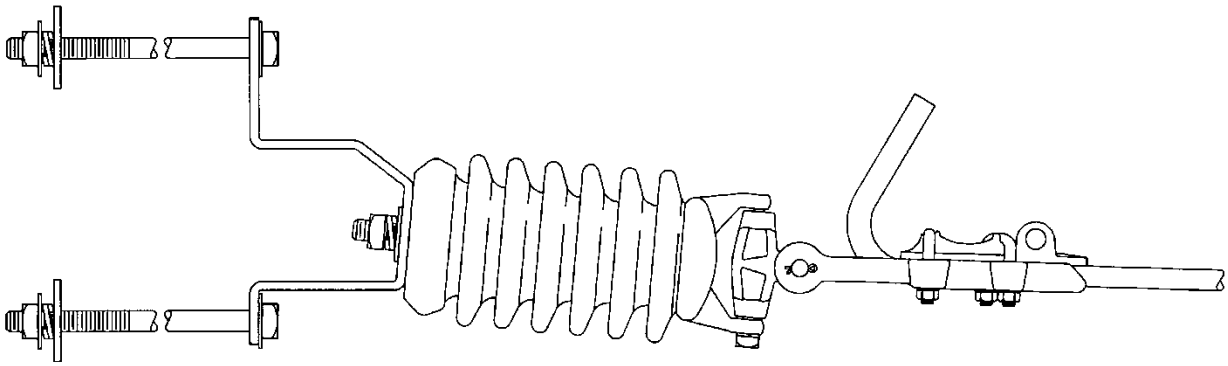


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
2	INS CO 001	1	INSULATOR, DEADEND, POLYMER 27KV
3	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	NUT EY 003	1	NUT, EYE 3/4
5	WAS RD 005	1	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
6	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
7	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

P7

SLACKSPAN DEADEND

OPTIONS: 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

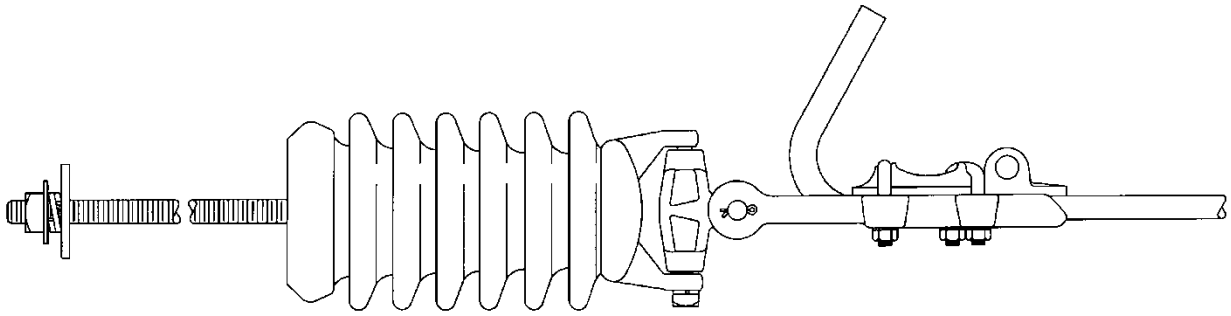


NO.	ITEM ID	QTY	DESCRIPTION
1	ADP TU 001	1	ADAPTER, TRUNION - SLACK SPANNING
2	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD 3/4X12
3	BKT IN 007	1	BRACKET, INSULATOR STANDOFF 6 IN.
4	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
5	INS VP 002	1	INSULATOR, POST 34.5KV CLAMP
6	STU LI 001	1	STUD, LINE POST 3/4 HEAD - 3/4 DIA. X 1-3/4 IN. SHANK
7	WAS RD 005	5	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
8	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
9	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

P7-1

SLACKSPAN DEADEND

OPTIONS: 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

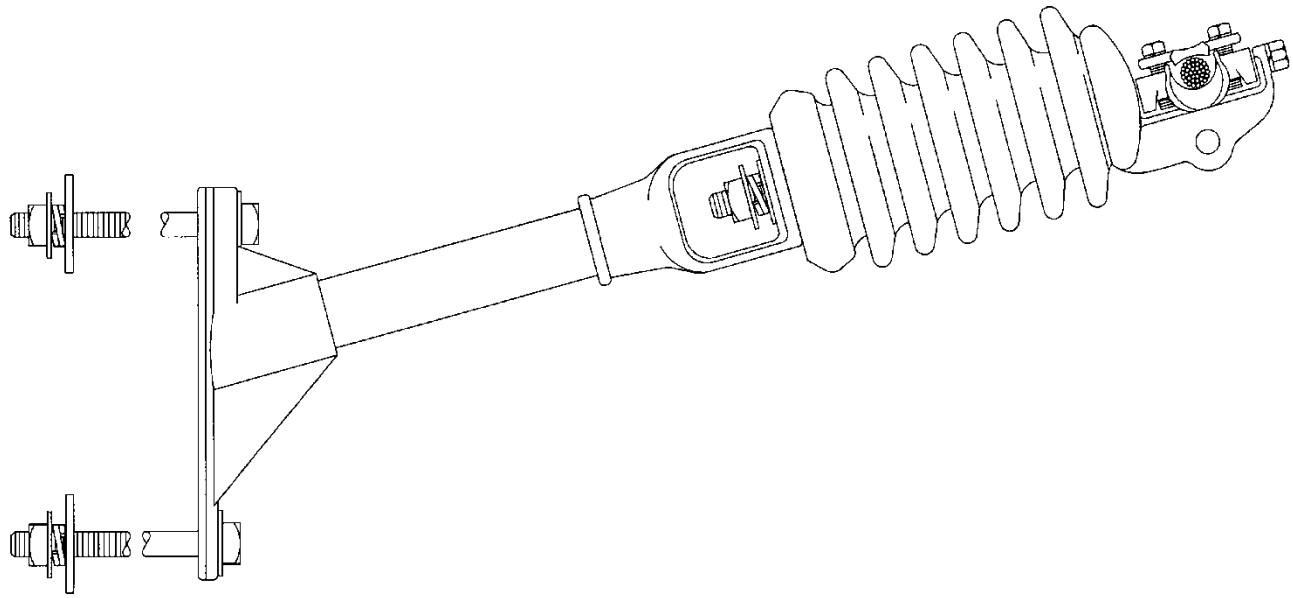


NO.	ITEM ID	QTY	DESCRIPTION
1	ADP TU 001	1	ADAPTER, TRUNION - SLACK SPANNING
2	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
3	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	INS VP 002	1	INSULATOR, POST 34.5KV CLAMP
5	WAS RD 005	1	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
6	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
7	WAS SF 003	1	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

P8

10 TO 30 DEGREE ANGLE - ADDITIONAL CLEARANCE

OPTIONS: 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

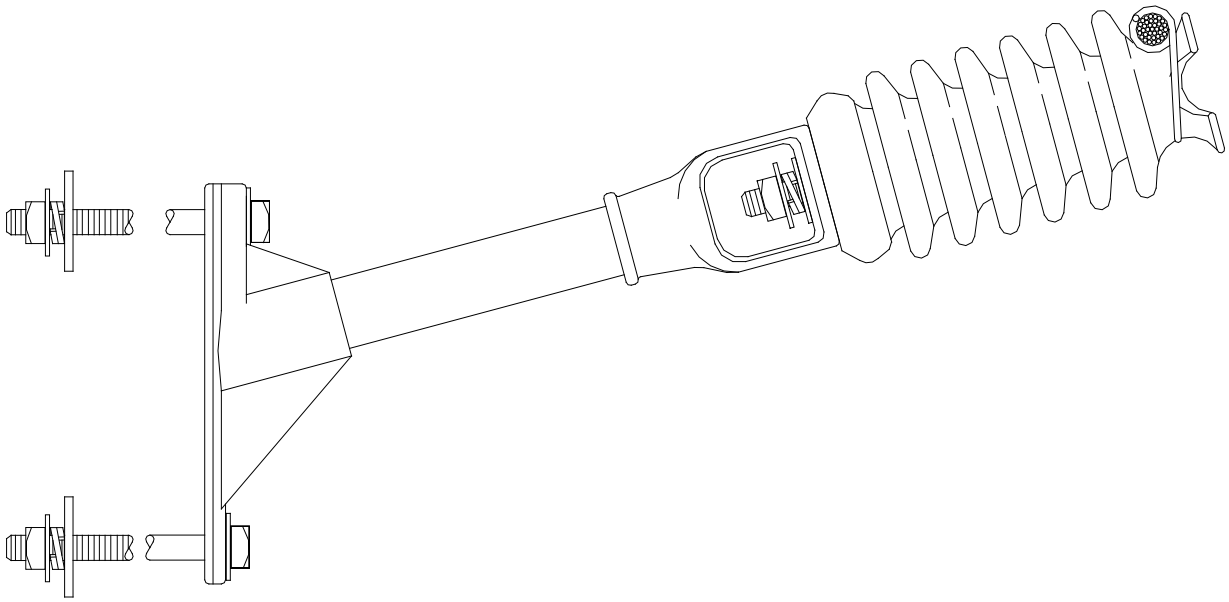


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	1	BRACKET, FIBERGLASS STANDOFF, 18 IN.
2	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD 3/4X12
3	CLA CT ***	1	GENERAL CODE FOR ANGLE CLAMP
4	GUA LI ***	1	GENERAL CODE FOR LINE GUARD
5	INS HP 001	1	INSULATOR, HORIZ. POST 34.5KV CLAMP
6	STU LI 001	1	STUD, LINE POST 3/4 HEAD - 3/4 DIA. X 1-3/4 IN. SHANK
7	WAS RD 005	5	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
8	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
9	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

P8-1

0 TO 10 DEGREE ANGLE - ADDITIONAL CLEARANCE

OPTIONS: 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

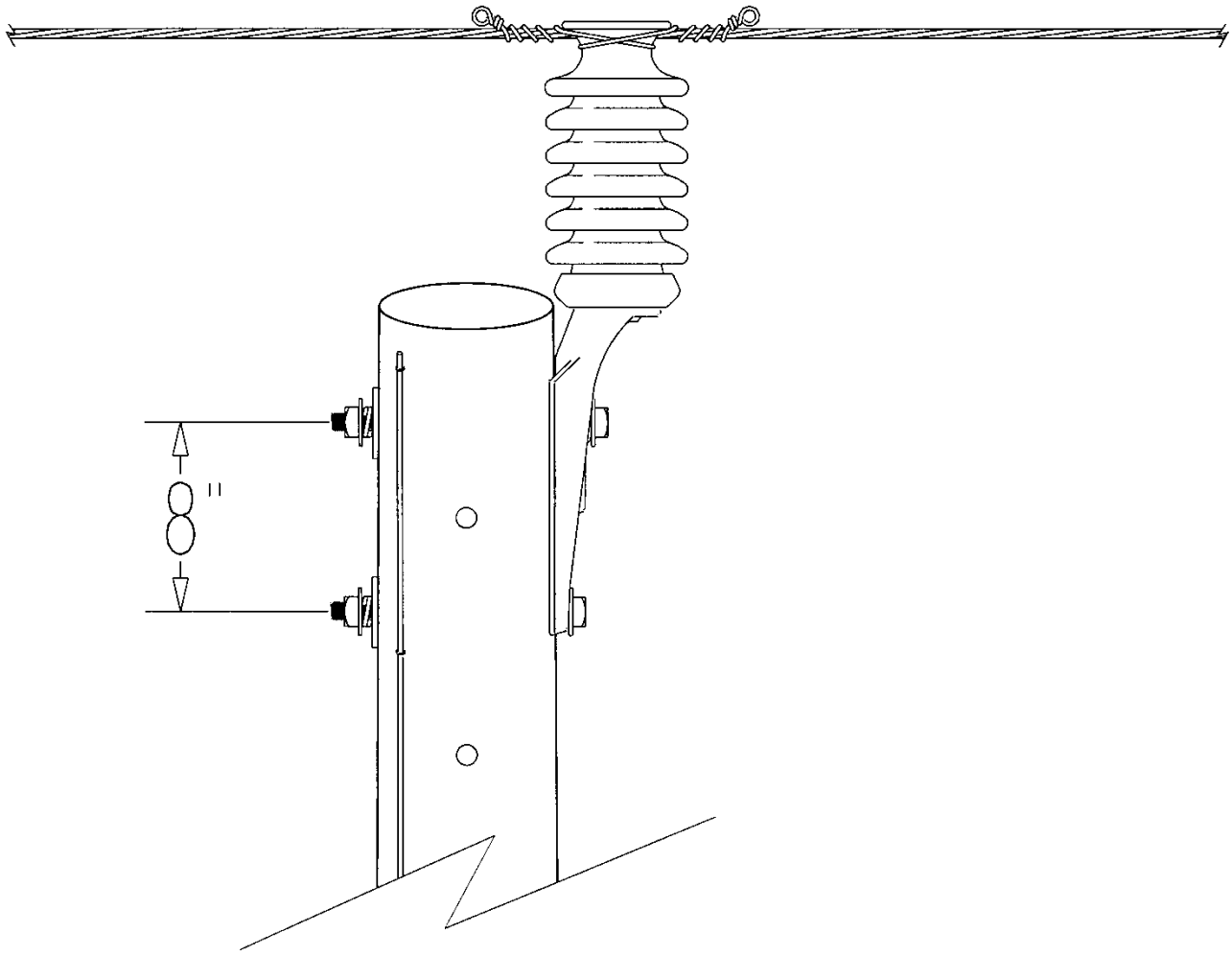


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	1	BRACKET, FIBERGLASS STANDOFF, 18 IN.
2	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD 3/4X12
3	INS VP 001	1	INSULATOR, POST 34.5KV
4	STU LI 001	1	STUD, LINE POST 3/4 HEAD - 3/4 DIA. X 1-3/4 IN. SHANK
5	TIE PR ***	1	GENERAL CODE FOR PREFORMED TIE
6	WAS RD 005	5	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
7	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
8	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

P9

POLE-TOP BRACKET, 0 TO 10 DEGREE ANGLE

OPTIONS: 2, 1/0
BOLT PLATE: NONE

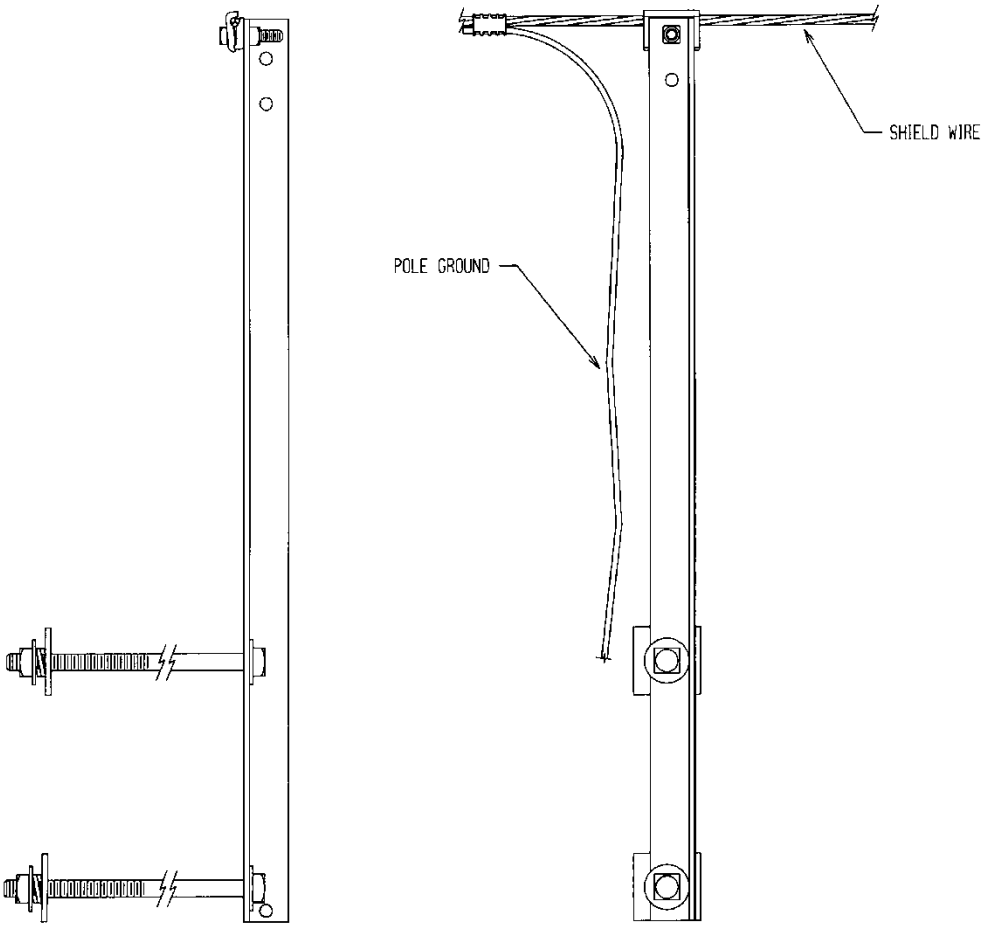


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD 3/4X12
2	BKT IN 005	1	BRACKET, INSULATOR POLETOP
3	COB TW 005	6	CONDUCTOR, #4 SD AL. TIE WIRE
4	INS VP 001	1	INSULATOR, POST 34.5KV
5	STU LI 001	1	STUD, LINE POST 3/4 HEAD - 3/4 DIA. X 1-3/4 IN. SHANK
6	WAS RD 005	5	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
7	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
8	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

SH1

0 TO 10 DEGREE ANGLE - TANGENT

OPTIONS: NONE
BOLT PLATE: NONE

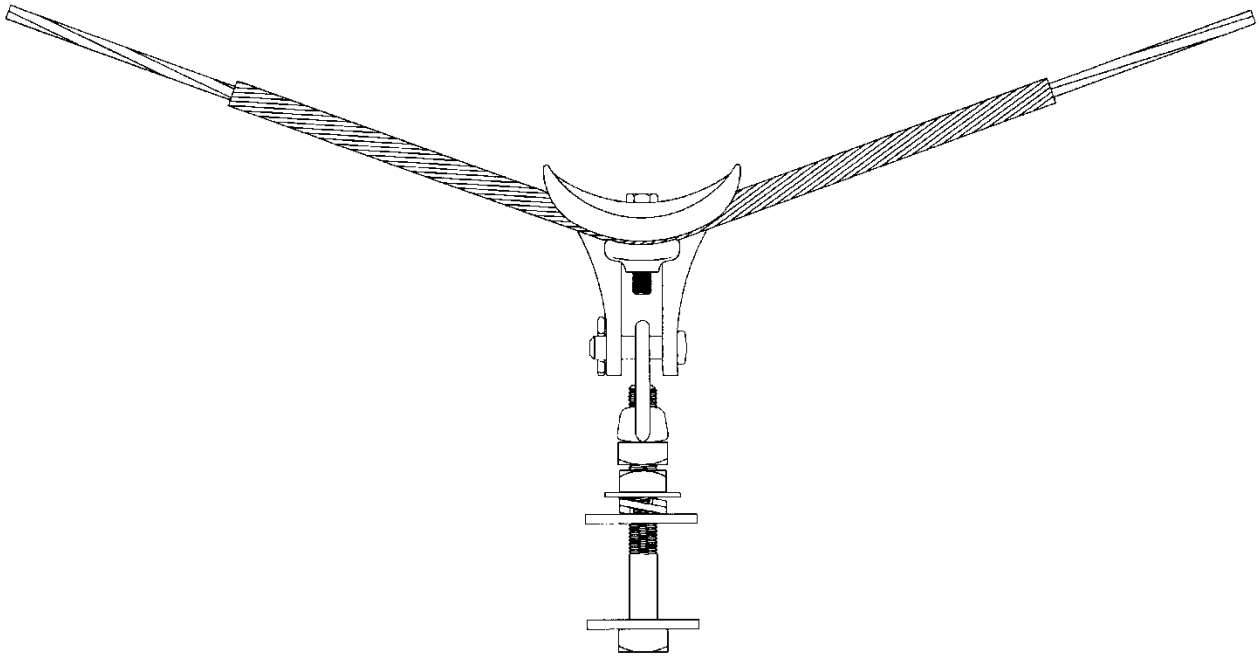


NO.	ITEM ID	QTY	DESCRIPTION
1	BAY SW 004	1	BAYONET, SHIELD WIRE 40 IN. STRAIGHT
2	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD 3/4X12
3	CLA SW 001	1	CLAMP, SHIELD WIRE 3 NO 6 AW, 3 NO 7 CW
4	WAS RD 005	4	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
5	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
6	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

SH2

10 TO 60 DEGREE FLYING ANGLE

OPTIONS: NONE
BOLT PLATE: NONE

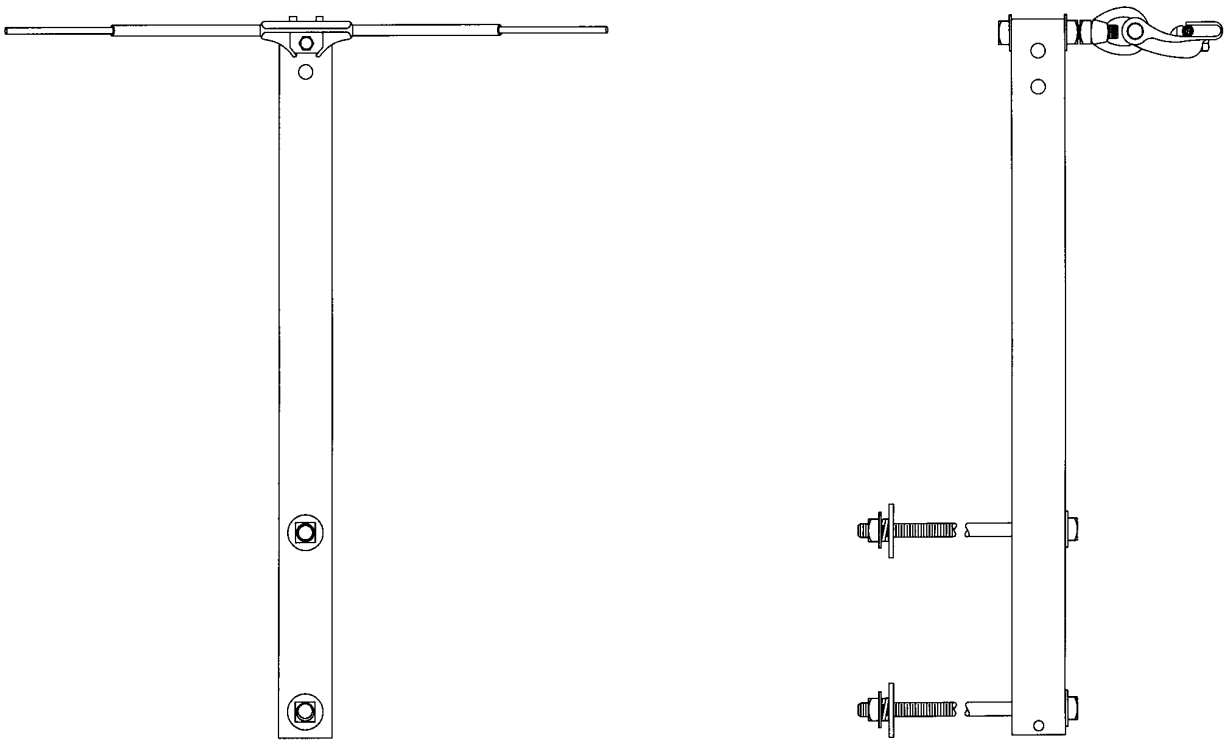


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
2	CLA AN 001	1	CLAMP, ANGLE 4 SOL. - 250 MCM
3	GUA LI 001	1	LINE GUARD, 3 NO 6 AW
4	NUT EY 003	1	NUT, EYE 3/4
5	WAS RD 005	1	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
6	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
7	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

H3

10 TO 60 DEGREE ANGLE

OPTIONS: NONE
BOLT PLATE: NONE

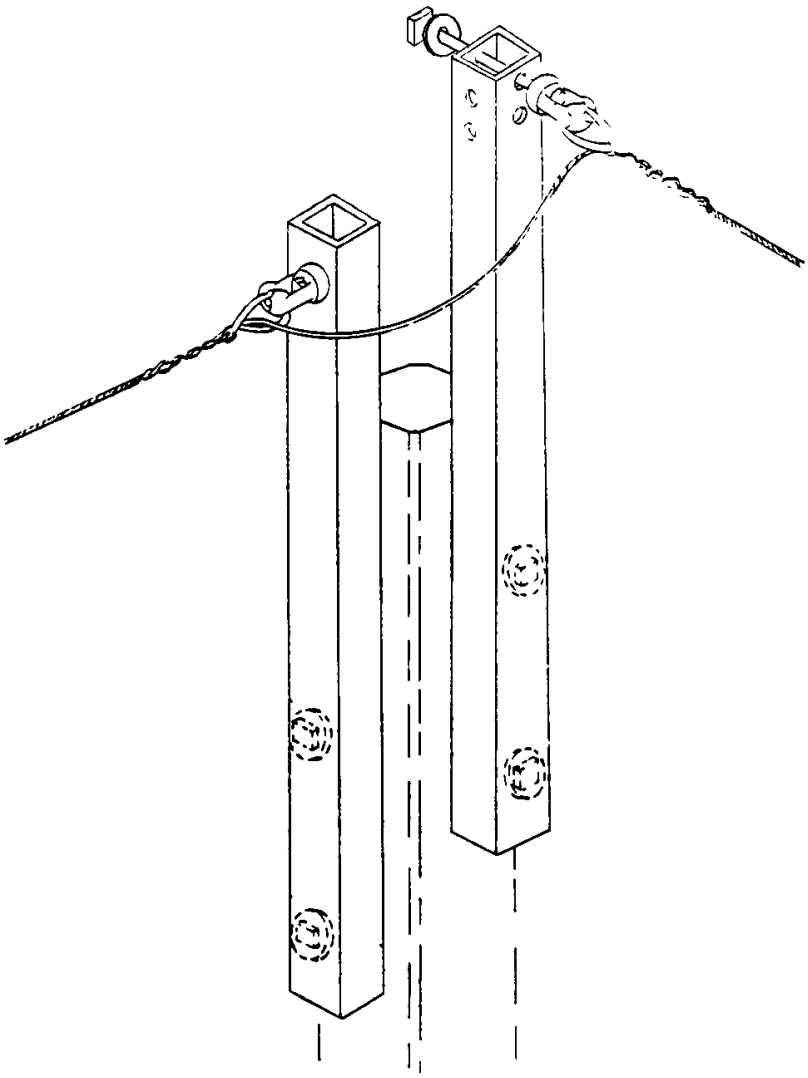


NO.	ITEM ID	QTY	DESCRIPTION
1	BAY SW 003	1	BAYONET, SHIELD WIRE 40 IN. CORNER
2	BOL MS 032	1	BOLT, MACHINE, SQUARE HEAD 3/4X6
3	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD 3/4X14
4	CLA AN 001	1	CLAMP, ANGLE 4 SOL. - 250 MCM
5	GUA LI 001	1	LINE GUARD, 3 NO 6 AW
6	NUT SL 004	1	LOCKNUT, SQUARE M-F 3/4
7	NUT EY 003	1	NUT, EYE 3/4
8	WAS RD 005	6	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
9	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
10	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

SH4

60 TO 90 DEGREE ANGLE - CORNER

OPTIONS: NONE
BOLT PLATE: NONE

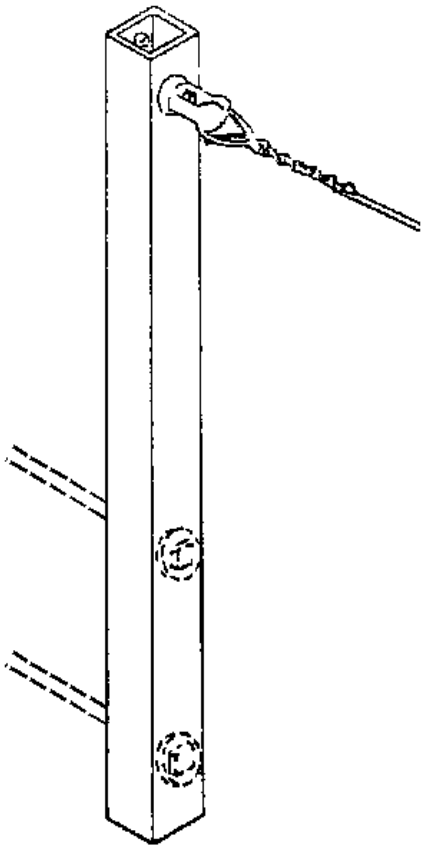


NO.	ITEM ID	QTY	DESCRIPTION
1	BAY SW 003	2	BAYONET, SHIELD WIRE 40 IN. CORNER
2	BOL MS 032	2	BOLT, MACHINE, SQUARE HEAD 3/4X6
3	BOL MS 036	4	BOLT, MACHINE, SQUARE HEAD 3/4X14
4	GRI PR 001	2	GRIP, PREFORMED DEADEND 3 NO 6 AW
5	NUT SL 004	2	LOCKNUT, SQUARE M-F 3/4
6	THI EY 001	2	THIMBLE EYE, 3/4
7	WAS RD 005	10	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
8	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
9	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

SH5

DEADEND

OPTIONS: NONE
BOLT PLATE: NONE

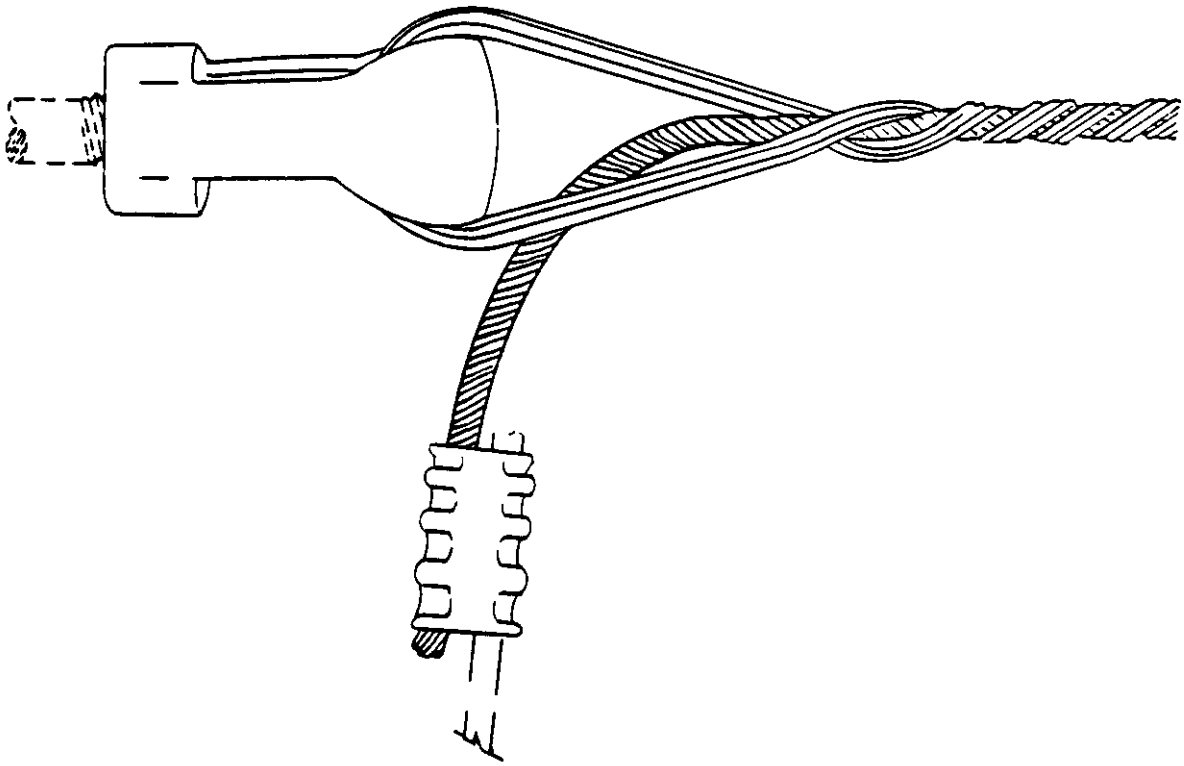


NO.	ITEM ID	QTY	DESCRIPTION
1	BAY SW 003	1	BAYONET, SHIELD WIRE 40 IN. CORNER
2	BOL MS 032	1	BOLT, MACHINE, SQUARE HEAD 3/4X6
3	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD 3/4X14
4	GRI PR 001	1	GRIP, PREFORMED DEADEND 3 NO 6 AW
5	NUT SL 004	1	LOCKNUT, SQUARE M-F 3/4
6	THI EY 001	1	THIMBLE EYE, 3/4
7	WAS RD 005	5	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
8	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
9	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

SH6

CORNER DEADEND/EXTENSION

OPTIONS: NONE
BOLT PLATE: NONE

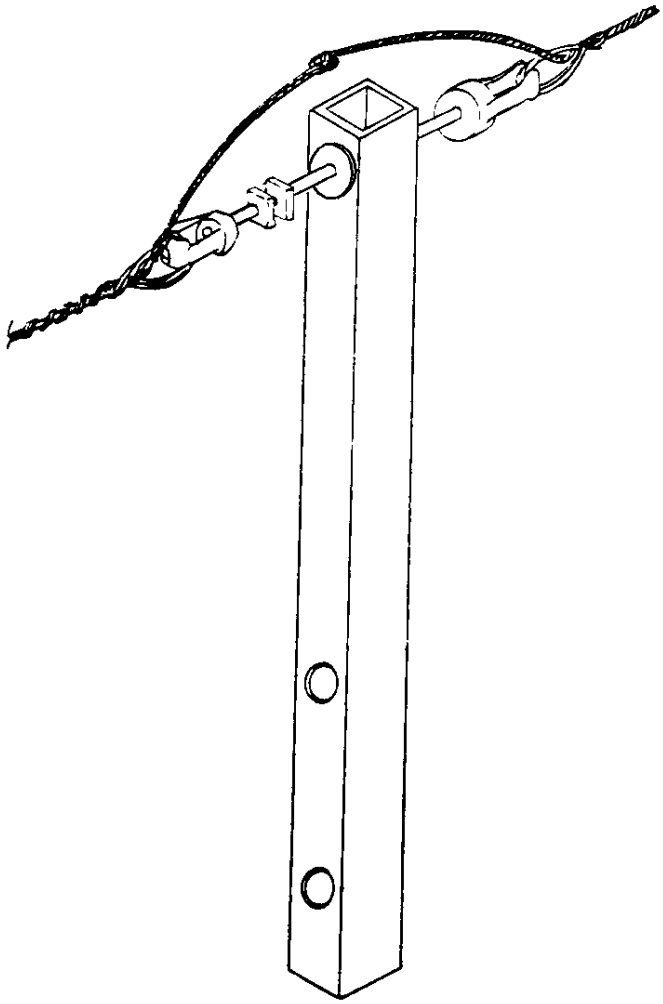


NO.	ITEM ID	QTY	DESCRIPTION
1	CNN CP 003	1	CONNECTOR, AL. COMP. SIDE-BY 2-2/0 2-2/0
2	GRI PR 001	1	GRIP, PREFORMED DEADEND 3 NO 6 AW
3	NUT TE 002	1	THIMBLE EYENUT, 3/4

SH8

DOUBLE DEADEND/ SLACKSPAN

OPTIONS: NONE
BOLT PLATE: NONE

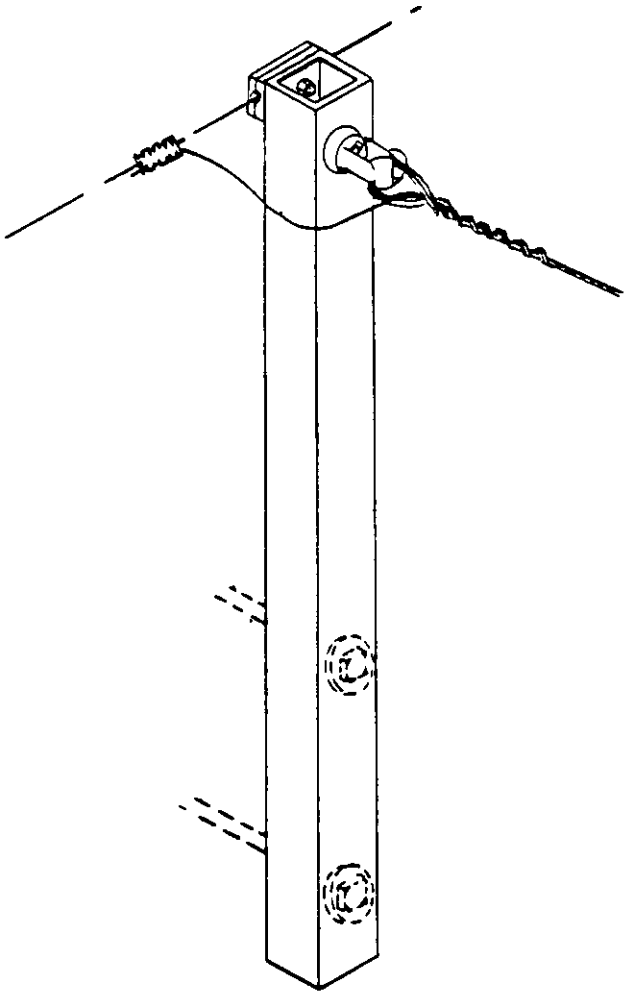


NO.	ITEM ID	QTY	DESCRIPTION
1	BAY SW 003	1	BAYONET, SHIELD WIRE 40 IN. CORNER
2	BOL MS 032	1	BOLT, MACHINE, SQUARE HEAD 3/4X6
3	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD 3/4X14
4	CNN CP 003	1	CONNECTOR, AL. COMP. SIDE-BY 2-2/0 2-2/0
5	GRI PR 001	2	GRIP, PREFORMED DEADEND 3 NO 6 AW
6	NUT SL 004	1	LOCKNUT, SQUARE M-F 3/4
7	NUT TE 002	1	NUT, THIMBLEYE 3/4 SINGLE EYE
8	THI EY 001	1	THIMBLE EYENUT, 3/4
9	WAS RD 005	5	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
10	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
11	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

SH20

TANGENT AND TAP

OPTIONS: NONE
BOLT PLATE: NONE

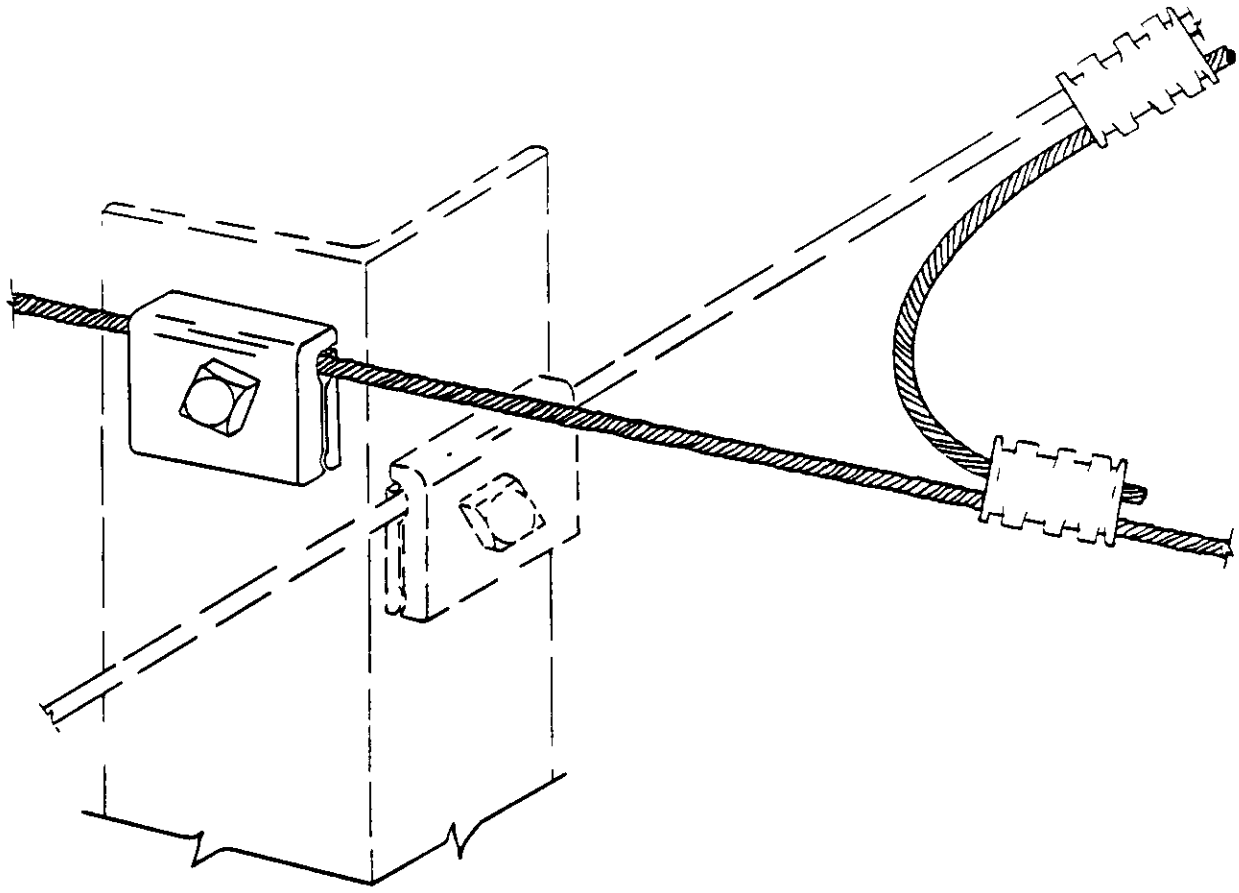


NO.	ITEM ID	QTY	DESCRIPTION
1	BAY SW 003	1	BAYONET, SHIELD WIRE 40 IN. CORNER
2	BOL MS 032	1	BOLT, MACHINE, SQUARE HEAD 3/4X6
3	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD 3/4X14
4	CLA SW 001	1	CLAMP, SHIELD WIRE 3 NO 6 AW, 3 NO 7 CW
5	CNN CP 003	1	CONNECTOR, AL. COMP. SIDE-BY 2-2/0 2-2/0
6	GRI PR 001	1	GRIP, PREFORMED DEADEND 3 NO 6 AW
7	NUT SL 004	1	LOCKNUT, SQUARE M-F 3/4
8	THI EY 001	1	THIMBLE EYE, 3/4
9	WAS RD 005	5	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
10	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
11	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

SH21

CROSS

OPTIONS: NONE
BOLT PLATE: NONE

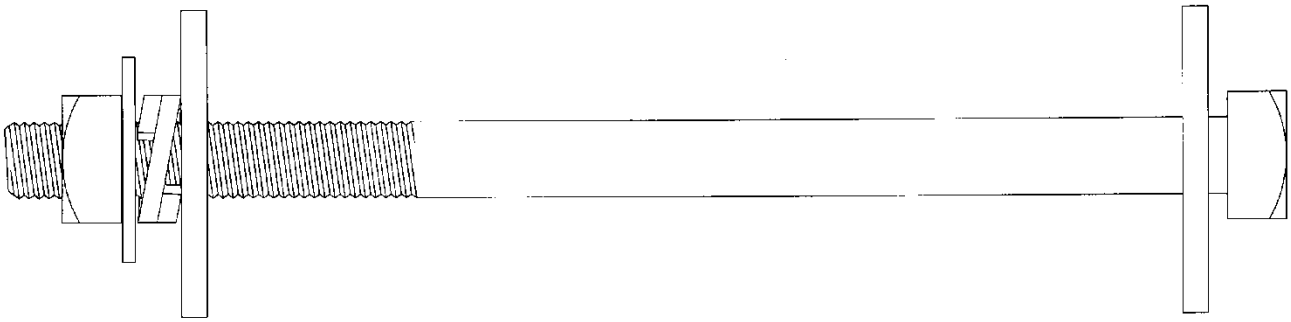


NO.	ITEM ID	QTY	DESCRIPTION
1	CLA SW 001	1	CLAMP, SHIELD WIRE 3 NO 6 AW, 3 NO 7 CW
2	COB AS 005	2	CONDUCTOR, 3 NO 6 AW
3	CNN CP 003	2	CONNECTOR, AL. COMP. SIDE-BY 2-2/0 2-2/0

SH30

SPLIT BOLT ASSEMBLY

OPTIONS: NONE
BOLT PLATE: NONE

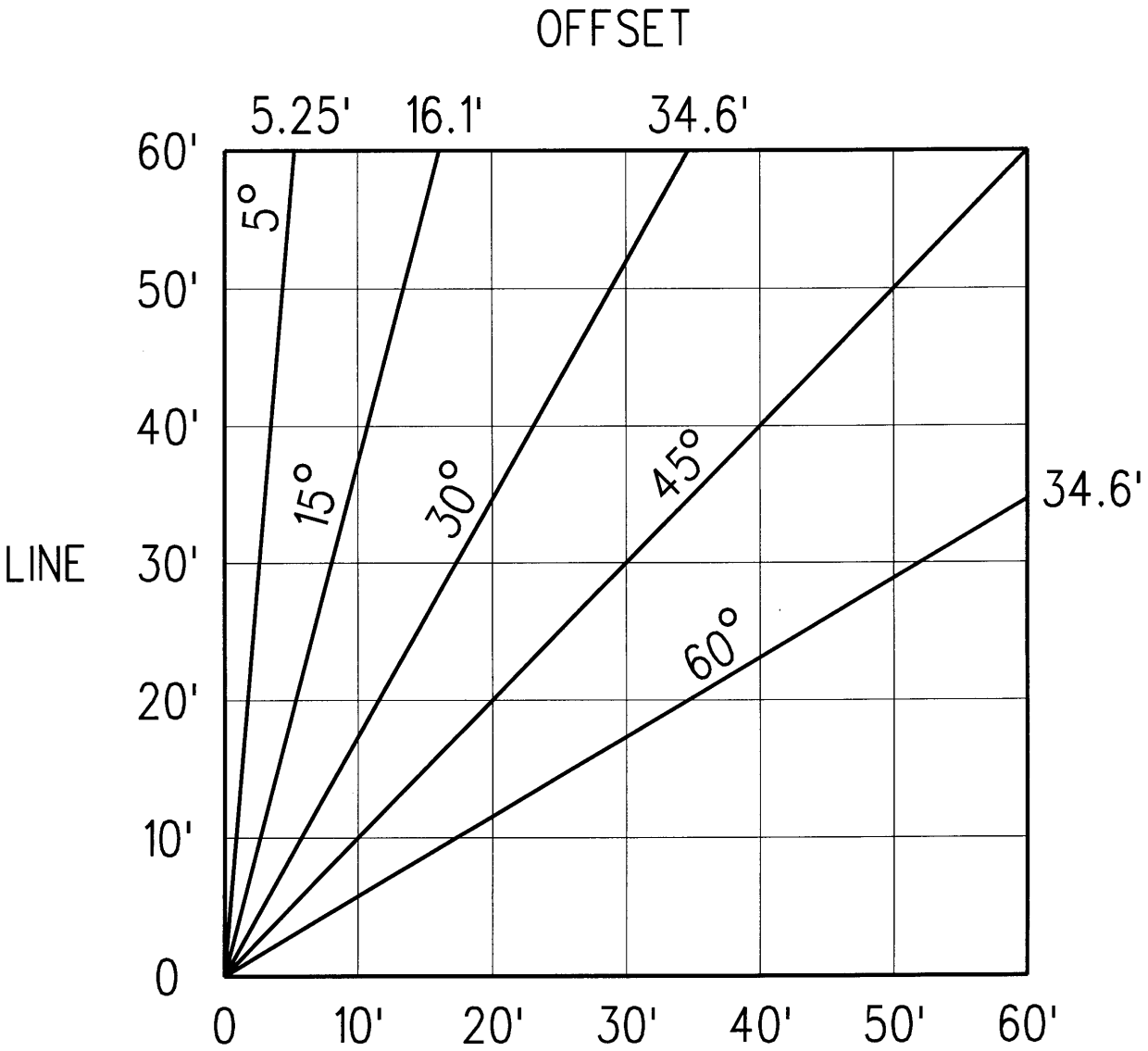


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
2	WAS RD 005	1	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
3	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
4	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

VERTICAL PRIMARY

1. To calculate line angles in the field when plans are not available, use the approximation guide of this section and choose the appropriate plate for that angle.
2. The number(s) in the box indicates the bolt hole location(s) on the pole where the plate is to be installed. Next to this box is also the Sub-Structure used.
3. See SECONDARY Section for neutral locations.
4. Plate Format: The plate name is in bold letters at the top of each construction standard - followed by a brief description. Next, the options for that plate are listed and the corresponding bolt plates if available. The bolt plates are explained in more detail in the BOLT Section. Below the drawing of the construction standard is a complete material list. The structure file will have to be used if the material list for a specific plate option is required.
5. Install mainline insulators always to street side and taps off either street or field side.
6. Install a hot-line clamp (DHLC) on large-wire main lines when small-wire unfused laterals are made.
7. For clearances, see CONDUCTOR Section.
8. Special provisions for clearance should be made when a tap is needed from a pole having an L3 attached.
9. When calling for a tap, the angular or straight bayonet shall be removed. The corner or tubular bayonet is included in the material list of DC20, DC22, and equivalent single and two-phase plates.
10. Split bolt assembly (SH30) is to be used in hole 7 on wood poles only.
11. Plates DC4 and DC4-5 cannot be used with three phase riser plates DUC1, DUC2, and DUC3 due to clearance difficulties with the jumper pin and conductor. DC3 and DC3-5 may be used if suitable.
12. On plates DA21 and DA21-5, if a fused lateral is present, the standoff bracket shall be inverted to give better clearance.
13. FIBERGLASS CONSTRUCTION shall be plated on all feeder poles. Affected feeder poles include those starting at the substation, up to and past the AR (if one exists), and up to (and including) the any Normal Open device or feeder deadend. The fiberglass construction will also extend to (and include) the first lateral protection device poles along that feeder. FIBERGLASS CONSTRUCTION shall also be plated on all concrete and steel poles. FIBERGLASS CONSTRUCTION plates and drawings are displayed here for non-static installation (DC1F-5*636 etc.), but Maximo includes all of the static plates (DC1F*636 etc.).
14. All Fiberglass Construction plates with deadends make use of the 12” fiberglass extension (INS FE 002). The 24” fiberglass extension (INS FE 001) is included only with front side hard taps (DC20F-5, etc.) and double deadends on poles with hook or group switches.

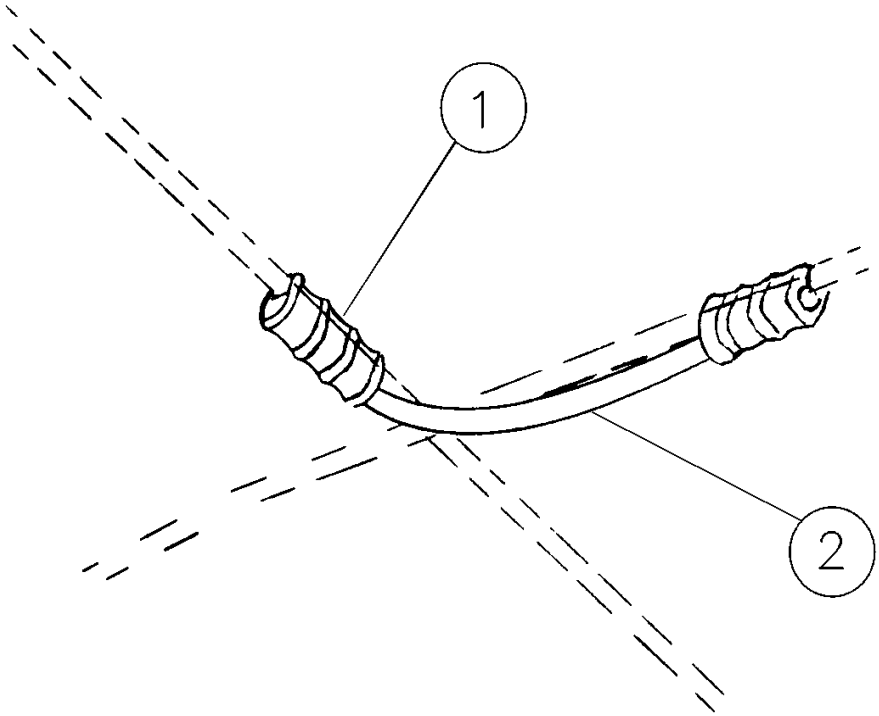
ANGLE APPROXIMATION GUIDE



DX1

FLYING CROSS

OPTIONS: 2-2, 1/0-2, 1/0-1/0, 3/0-2, 3/0-1/0, 3/0-3/0, 4/0-2, 4/0-1/0, 4/0-4/0, 336-3/0, 336-336, 636-2, 636-3/0, 636-336, 636-636, 3NO6AW
BOLT PLATE: NONE

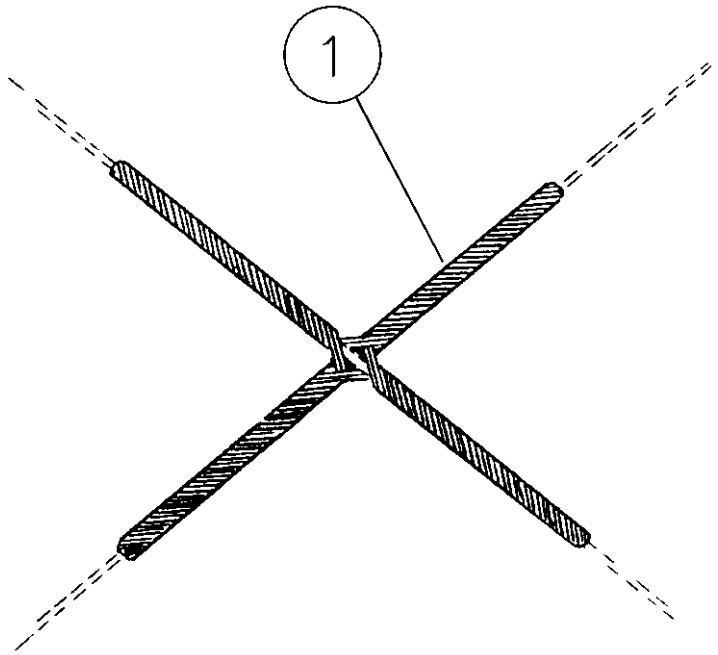


NO.	ITEM ID	QTY	DESCRIPTION
1	CNN ** ***	2	GENERAL CODE FOR TAP CONNECTOR
2	COB ** ***	3	GENERAL CODE FOR CONDUCTOR

DX2

FLYING CROSS

OPTIONS: 4/0-4/0, 336-336, 636-636
BOLT PLATE: NONE

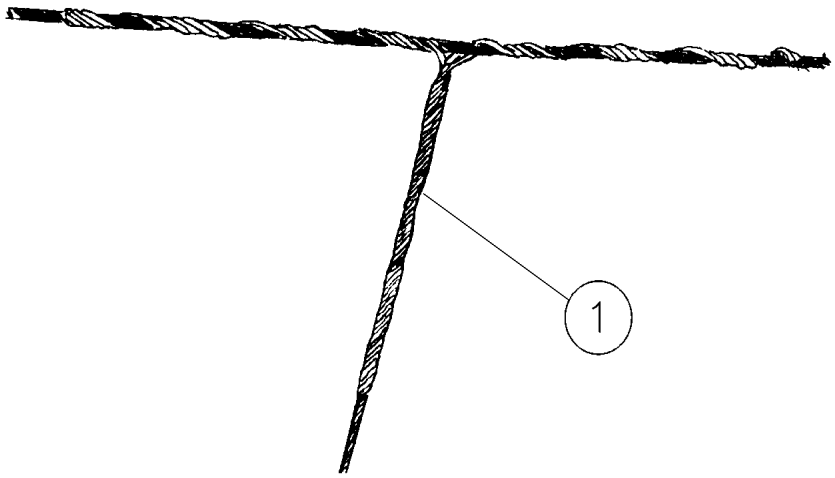


NO.	ITEM ID	QTY	DESCRIPTION
1	CNN PT ***	2	GENERAL CODE FOR PREFORMED TIE

DX3

FLYING CROSS

OPTIONS: 4/0-4/0, 336-336, 636-636
BOLT PLATE: NONE

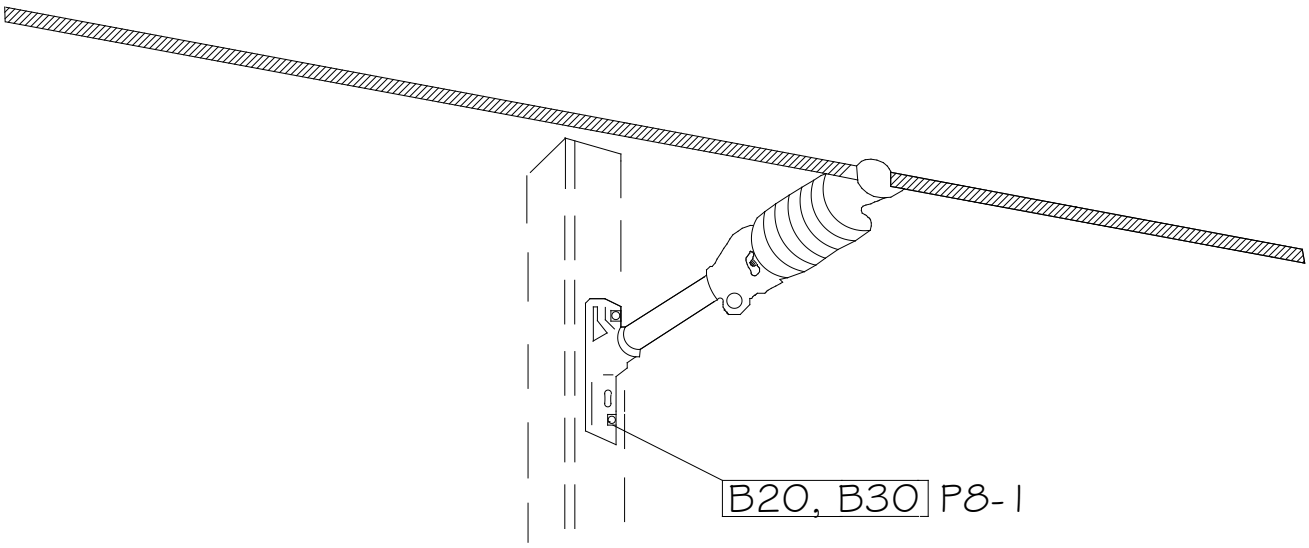


NO.	ITEM ID	QTY	DESCRIPTION
1	CNN PT ***	1	GENERAL CODE FOR PREFORMED TIE

DA1F-5 (FIBERGLASS CONSTRUCTION)

TANGENT TO 10 DEGREE ANGLE – UNSHIELDED

OPTIONS: 2, 4, 6, 6CU, 1/0
BOLT PLATE: NONE

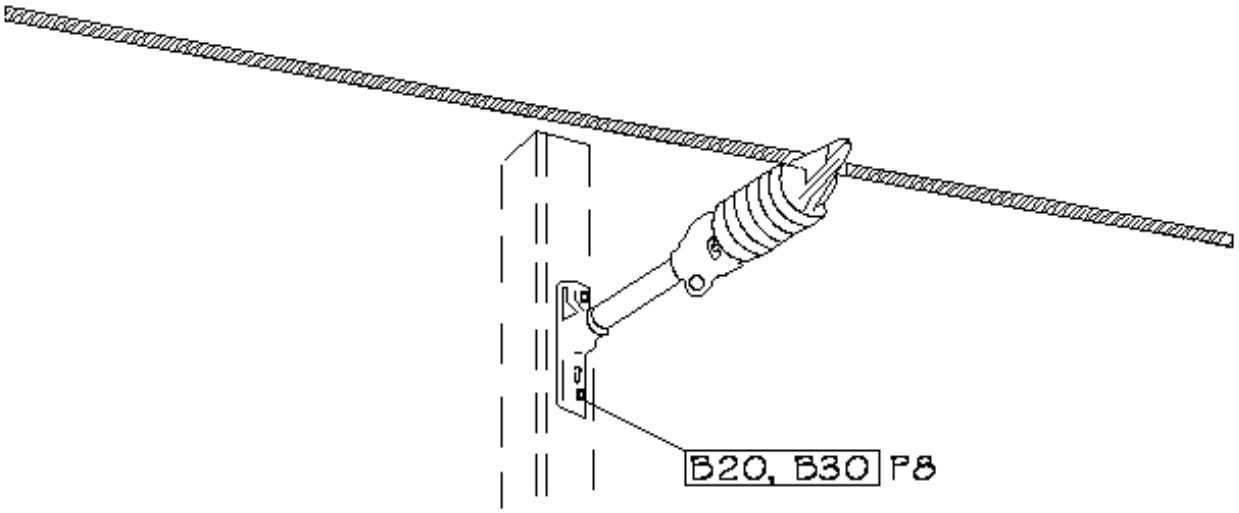


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	1	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
3	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
4	INS HP 001	1	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
5	STU LI 001	1	STUD, LINE POST 3/4 HEAD- 3/4 DIA.X 1-3/4 IN. SHANK
6	TIE PR ***	1	GENERAL CODE FOR PREFORMED TIE
7	WAS RD 005	4	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
8	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DA2F-5 (FIBERGLASS CONSTRUCTION)

10 TO 30 DEGREE ANGLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0
BOLT PLATE: NONE

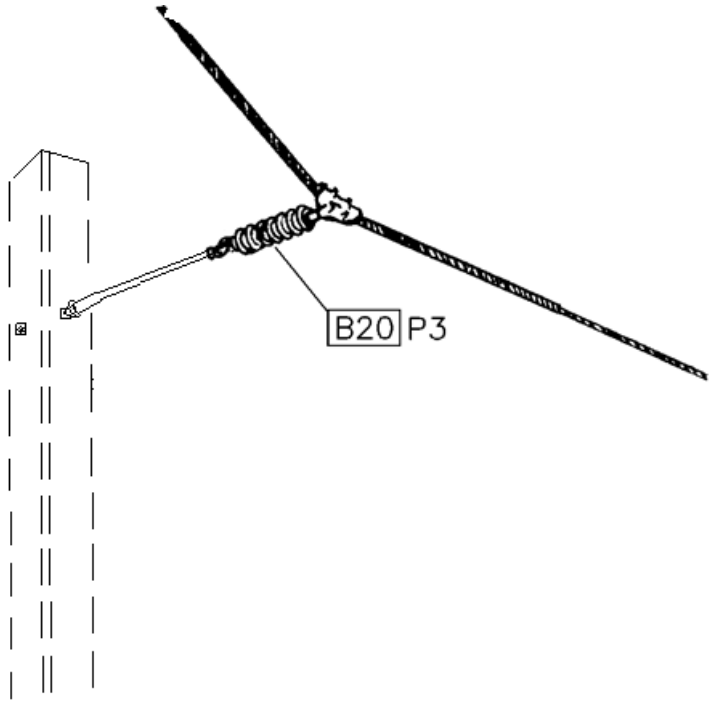


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	1	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
3	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
4	CLA CT ***	1	GENERAL CODE FOR CLAMP TOP INSULATOR CLAMP
5	INS HP 001	1	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
6	GUA LI ***	1	GENERAL CODE FOR LINE GUARD
7	STU LI 001	1	STUD, LINE POST 3/4 HEAD - 3/4 IN. DIA. X 1-3/4 SHANK
8	WAS RD 005	4	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
10	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DA3-5 (FIBERGLASS CONSTRUCTION)

30 TO 60 DEGREE FLYING ANGLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0
BOLT PLATE: NONE



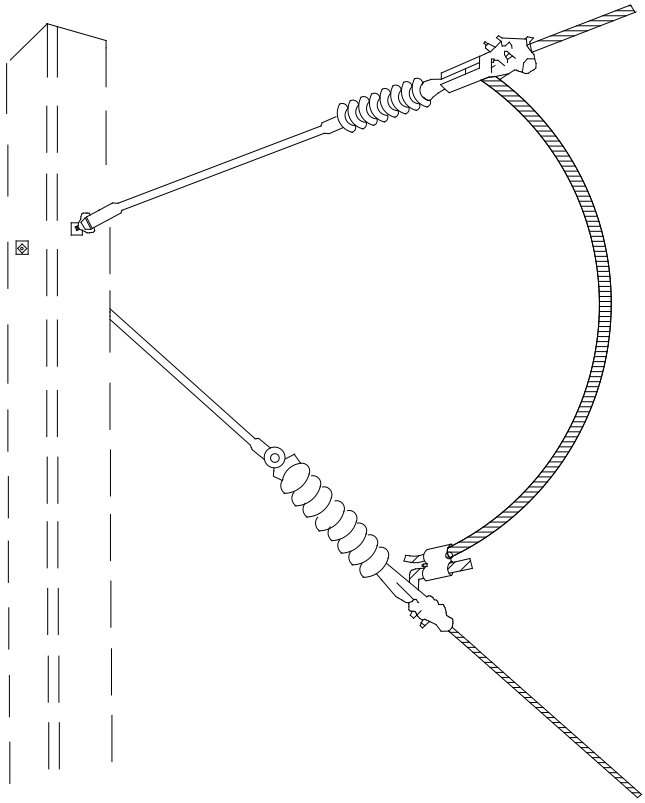
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
2	CLA AN 002	1	CLAMP, ANGLE 2AAAC - 1/0AAAC
3	INS CO 001	1	INSULATOR, DEAD-END, POLYMER 27KV
4	INS FE 002	1	FIBERGLASS EXTENSION LINK, 12”
5	GUA LI ***	1	GENERAL CODE FOR LINE GUARD
6	NUT EY 003	1	NUT, EYE 3/4
7	WAS RD 005	1	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
8	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DA4F-5 (FIBERGLASS CONSTRUCTION)

60 TO 90 DEGREE CORNER – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 636

BOLT PLATE: NONE

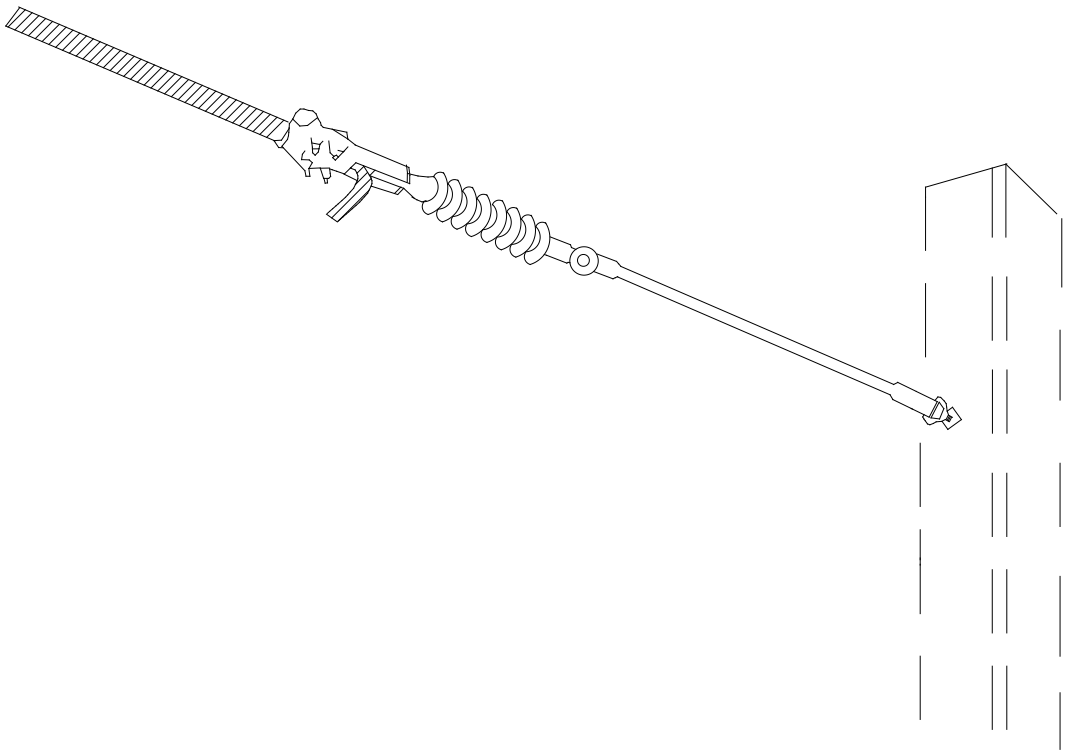


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
2	CLA SS ***	2	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
3	CNN CP ***	1	GENERAL CODE FOR SIDE-BY CONNECTOR
4	INS CO 001	2	INSULATOR, DEAD-END, POLYMER 27KV
5	INS FE 002	2	FIBERGLASS EXTENSION LINK, 12”
5	NUT EY 003	2	NUT, EYE 3/4
6	WAS RD 005	2	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
7	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DA5F-5 (FIBERGLASS CONSTRUCTION)

DEADEND – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0
BOLT PLATE: NONE

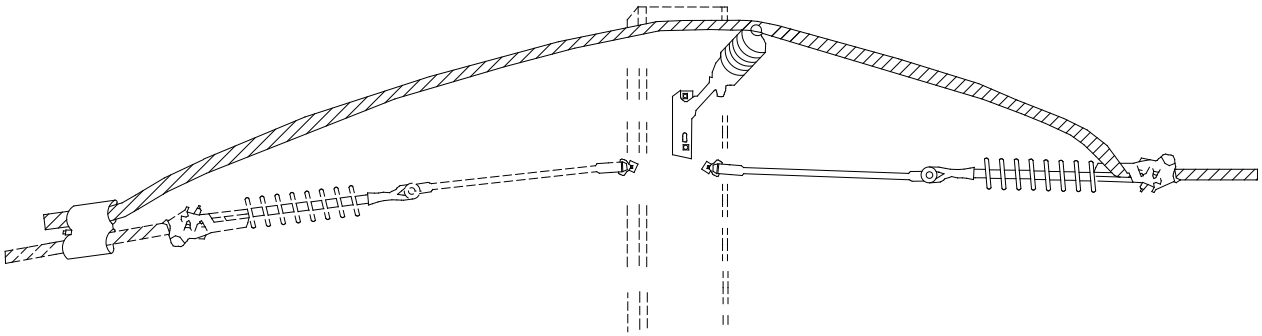


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	1	BOLT, DOUBLE ARMING, ¾X14
2	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
3	INS CO 001	1	INSULATOR, DEAD-END, POLYMER 27KV
4	INS FE 002	1	FIBERGLASS EXTENSION LINK, 12”
5	NUT EY 003	1	NUT, EYE ¾
6	WAS RD 005	1	WASHER, ROUND, 2 IN., FOR ¾ IN. DIA. BOLT
7	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR ¾ IN. DIA. BOLT
8	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR ¾ IN. DIA. BOLT

DA6F-5 (FIBERGLASS CONSTRUCTION)

EXTENSION OFF EXISTING DEADEND – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0
BOLT PLATE: NONE

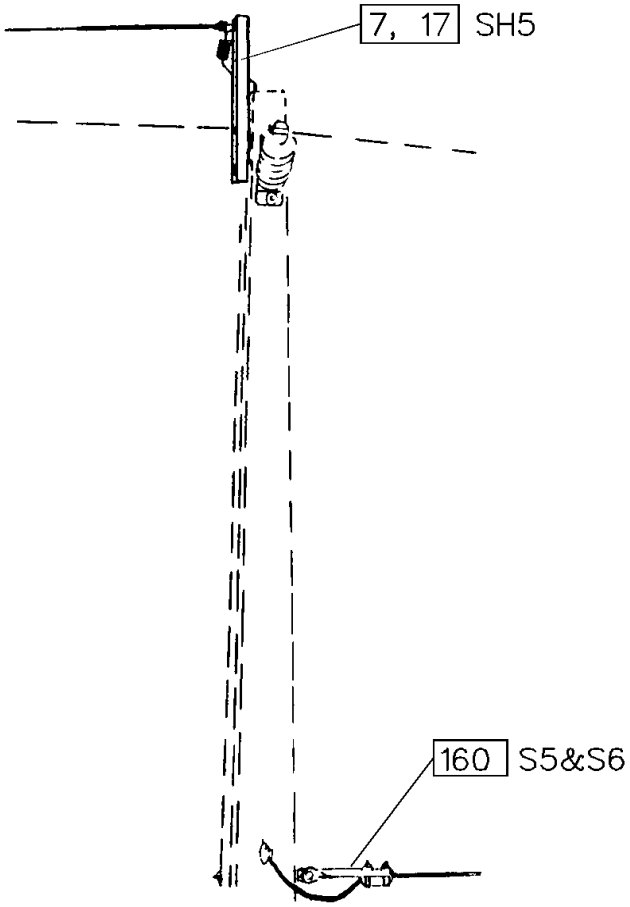


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	1	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	1	BOLT, DOUBLE ARMING, ¾X14
3	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
3	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	CNN CP ***	1	GENERAL CODE FOR SIDE-BY CONNECTOR
5	INS CO 001	1	INSULATOR, DEAD-END, POLYMER 27KV
6	INS FE 002	1	FIBERGLASS EXTENSION LINK, 12”
7	INS HP 001	1	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
8	NUT EY 003	1	NUT, EYE 3/4
9	TIE PR ***	1	GENERAL CODE FOR PREFORMED TIE
10	WAS RD 005	5	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SF 003	3	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
12	WAS SP 002	3	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DA6-6

NEUTRAL TO SHIELD TRANSITION – SINGLE PHASE

OPTIONS: 2, 1/0, 2/0, 3/0, 4/0, 636
BOLT PLATE: NONE

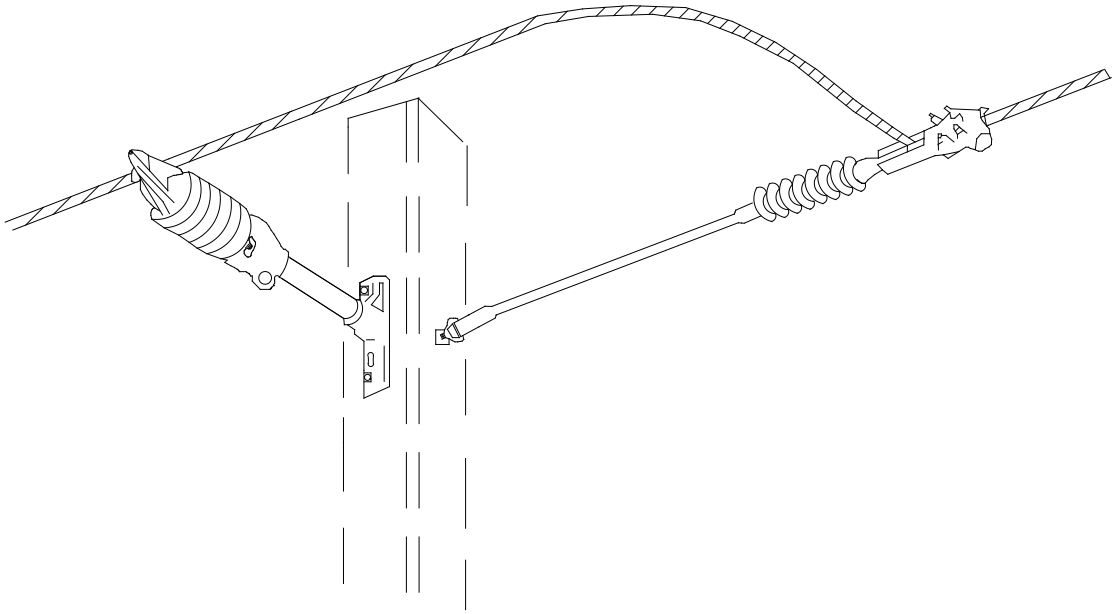


NO.	ITEM ID	QTY	DESCRIPTION
1	BAY SW 003	1	BAYONET, SHIELD WIRE 40 IN. CORNER
2	BOL EY 005	1	BOLT, EYE, 5/8X16
3	BOL MS 032	1	BOLT, MACHINE, SQUARE HEAD 3/4X6
4	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD 3/4X14
5	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
6	CNN ** ***	1	GENERAL CODE FOR TAP CONNECTOR
7	CNN CP 002	1	CONNECTOR, AL. COMP. SIDE-BY 6-2 2-1/0
8	GRI PR 001	1	GRIP, PREFORMED DEADEND 3 NO 6 AW
9	NUT EY 002	1	NUT, EYE, 5/8
10	NUT SL 004	1	LOCKNUT, SQUARE M-F ¾
11	THI EY 001	1	NUT, THIMBLE-EYE ¾
12	WAS RD 005	6	WASHER, ROUND, 2 IN., FOR ¾ IN. DIA. BOLT
13	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR ¾ IN. DIA. BOLT
14	WAS SP 002	3	WASHER, SPRING, DOUBLE HELIX, FOR ¾ IN. DIA. BOLT

DA7FSL-5 (FIBERGLASS CONSTRUCTION)

DEADEND AND SLACK CARRY THRU – UNSHIELDED

OPTIONS: 2, 1/0, 3/0, 336, 636
BOLT PLATE: B13*A, B13*B, B13*C

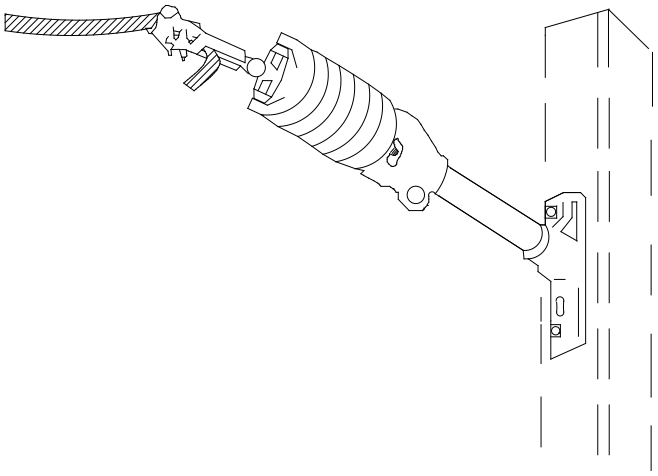


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	1	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	2	BOLT, DOUBLE ARMING, ¾X14
4	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD ¾X12
7	CLA CT ***	1	GENERAL CODE FOR ANGLE CLAMP
8	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
9	GUA LI ***	1	GENERAL CODE FOR LINE GUARD
10	INS CO 001	1	INSULATOR, DEAD-END, POLYMER 27KV
11	INS FE 002	1	FIBERGLASS EXTENSION LINK, 12”
12	INS HP 001	1	INSULATOR, POST 34.5KV CLAMP
13	NUT EY 003	1	NUT, EYE ¾
14	STU LI 001	1	STUD, LINE POST ¾ HEAD – ¾ IN. DIA. X 1-3/4 SHANK
15	WAS RD 005	6	WASHER, ROUND, 2 IN., FOR ¾ IN. DIA. BOLT
16	WAS SF 003	5	WASHER, SQUARE, FLAT, 3 IN., FOR ¾ IN. DIA. BOLT
17	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR ¾ IN. DIA. BOLT

DA7F-5 (FIBERGLASS CONSTRUCTION)

SLACKSPAN DEADEND – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0
BOLT PLATE: NONE

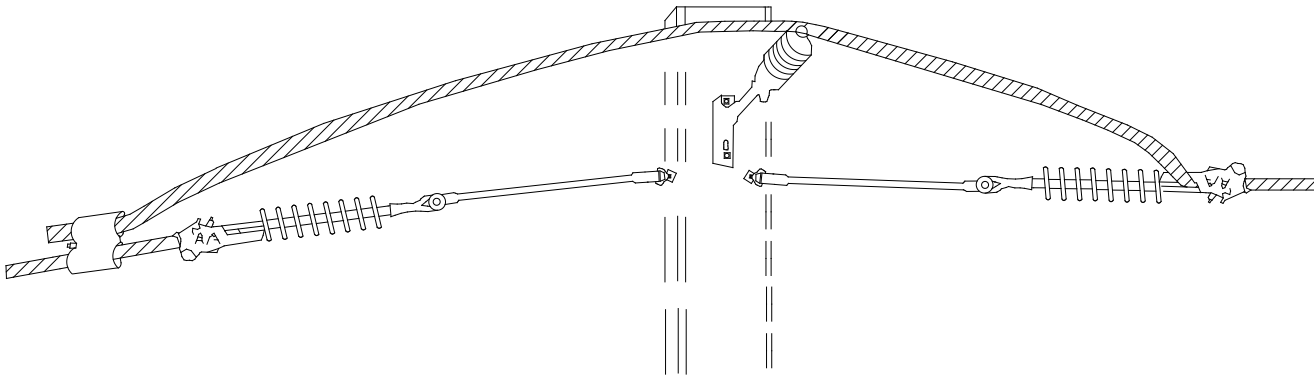


NO.	ITEM ID	QTY	DESCRIPTION
1	ADP TU 001	1	ADAPTER, TRUNNION – SLACK SPANNING
2	BKT FS 001	1	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
3	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD ¾X12
4	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
5	INS VP 002	1	INSULATOR, POST 34.5KV CLAMP
6	STU LI 001	1	STUD, LINE POST ¾ HEAD – ¾ IN. DIA. X 1-3/4 SHANK
7	WAS RD 005	4	WASHER, ROUND, 2 IN., FOR ¾ IN. DIA. BOLT
8	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR ¾ IN. DIA. BOLT
9	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR ¾ IN. DIA. BOLT

DA8F-5 (FIBERGLASS CONSTRUCTION)

DOUBLE DEADEND – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0
BOLT PLATE: NONE

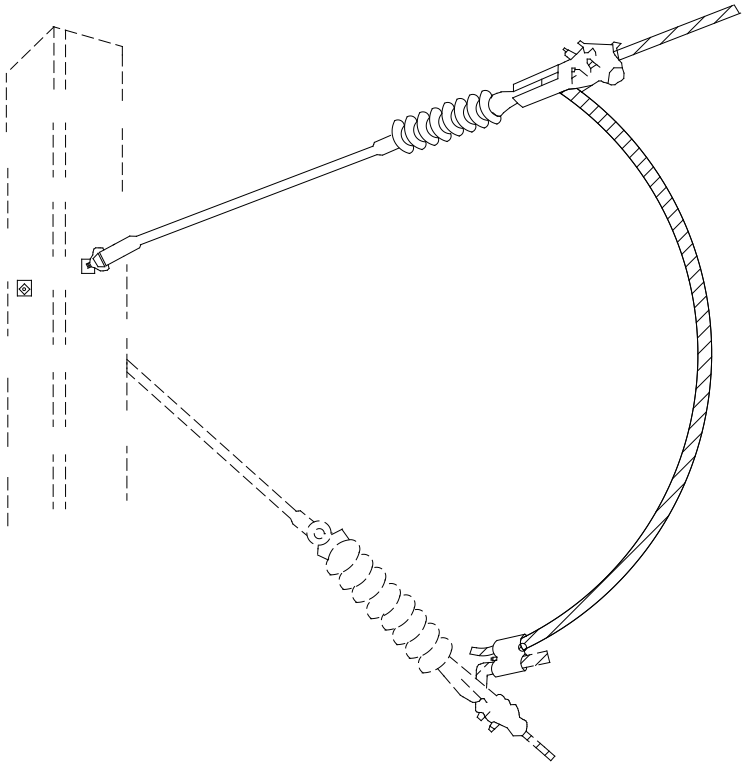


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	1	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	2	BOLT, DOUBLE ARMING ¾X14
3	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
3	CLA SS ***	2	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	CNN CP ***	1	GENERAL CODE FOR SIDE-BY CONNECTOR
5	INS CO 001	2	INSULATOR, DEAD-END, POLYMER 27KV
6	INS FE 002	2	FIBERGLASS EXTENSION LINK, 12”
7	INS HP 001	1	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
8	NUT EY 003	2	NUT, EYE 3/4
9	TIE PR ***	1	GENERAL CODE FOR PREFORMED TIE
10	WAS RD 005	6	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SF 003	5	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
12	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DA18F-5 (FIBERGLASS CONSTRUCTION)

60 TO 90 DEGREE TAP OFF EXISTING DEADEND – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0
BOLT PLATE: NONE

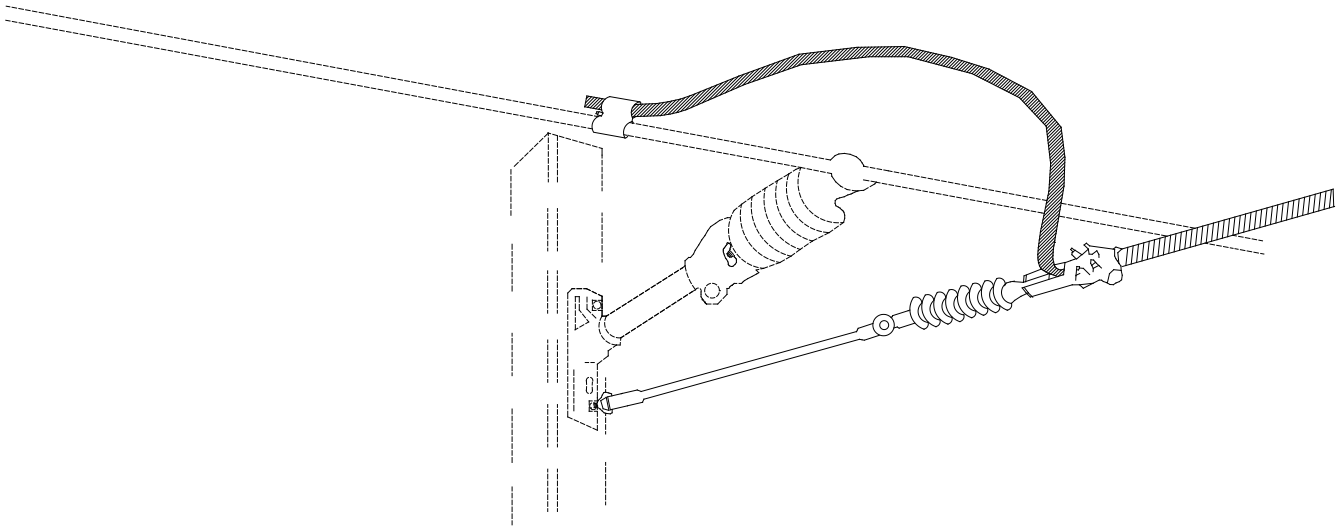


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
2	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
3	CNN CP ***	1	GENERAL CODE FOR SIDE-BY CONNECTOR
4	INS CO 001	1	INSULATOR, DEAD-END, POLYMER 27KV
5	INS FE 002	1	FIBERGLASS EXTENSION LINK, 12”
6	NUT EY 003	1	NUT, EYE 3/4
7	WAS RD 005	1	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
8	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DA20F-5 (FIBERGLASS CONSTRUCTION)

75 TO 90 DEGREE TAP OFF EXISTING POLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0
BOLT PLATE: NONE



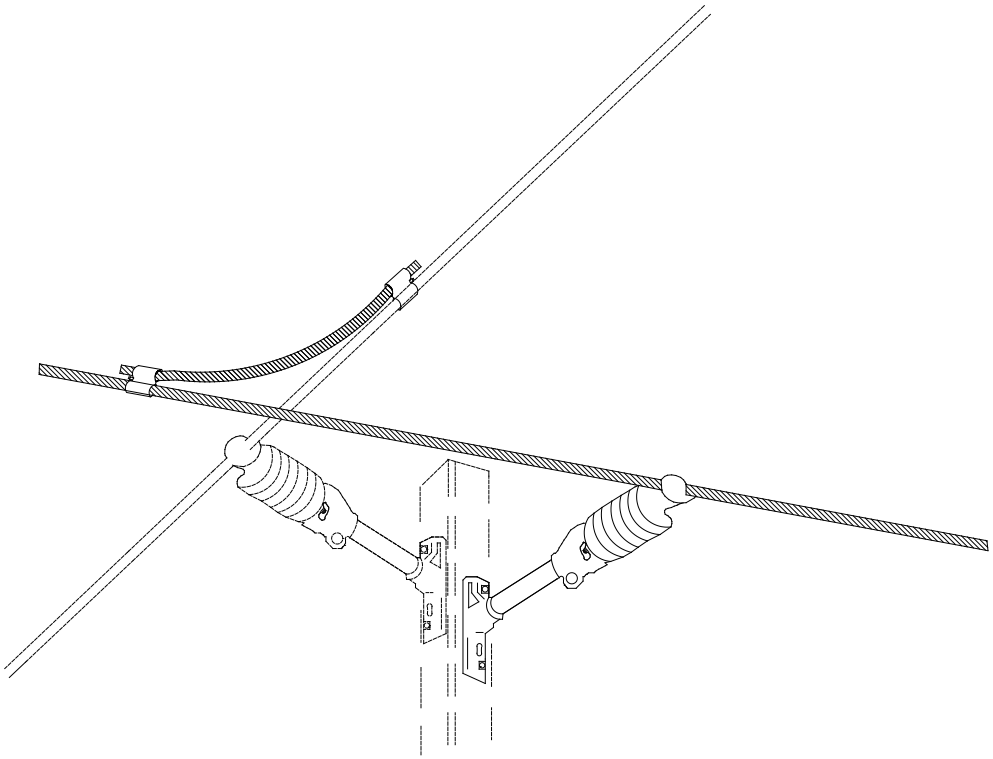
When this tap is oriented off the backside of the pole, 1 BKT FS 001 must be itemized in to support the jumper and 1 INS FE 002 must be itemized in for 1 INS FE 001 to reduce the length of the jumper.

NO.	ITEM ID	QTY	DESCRIPTION
1	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
2	CNN CP ***	1	GENERAL CODE FOR SIDE-BY CONNECTOR
3	COB ** ***	6	GENERAL CODE FOR CONDUCTOR
4	INS CO 001	1	INSULATOR, DEAD-END, POLYMER 27KV
5	INS FE 001	1	FIBERGLASS EXTENSION LINK, 24”
6	NUT EY 003	1	NUT, EYE 3/4

DA21F-5 (FIBERGLASS CONSTRUCTION)

0 TO 10 DEGREE CROSS OFF EXISTING POLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0
BOLT PLATE: NONE

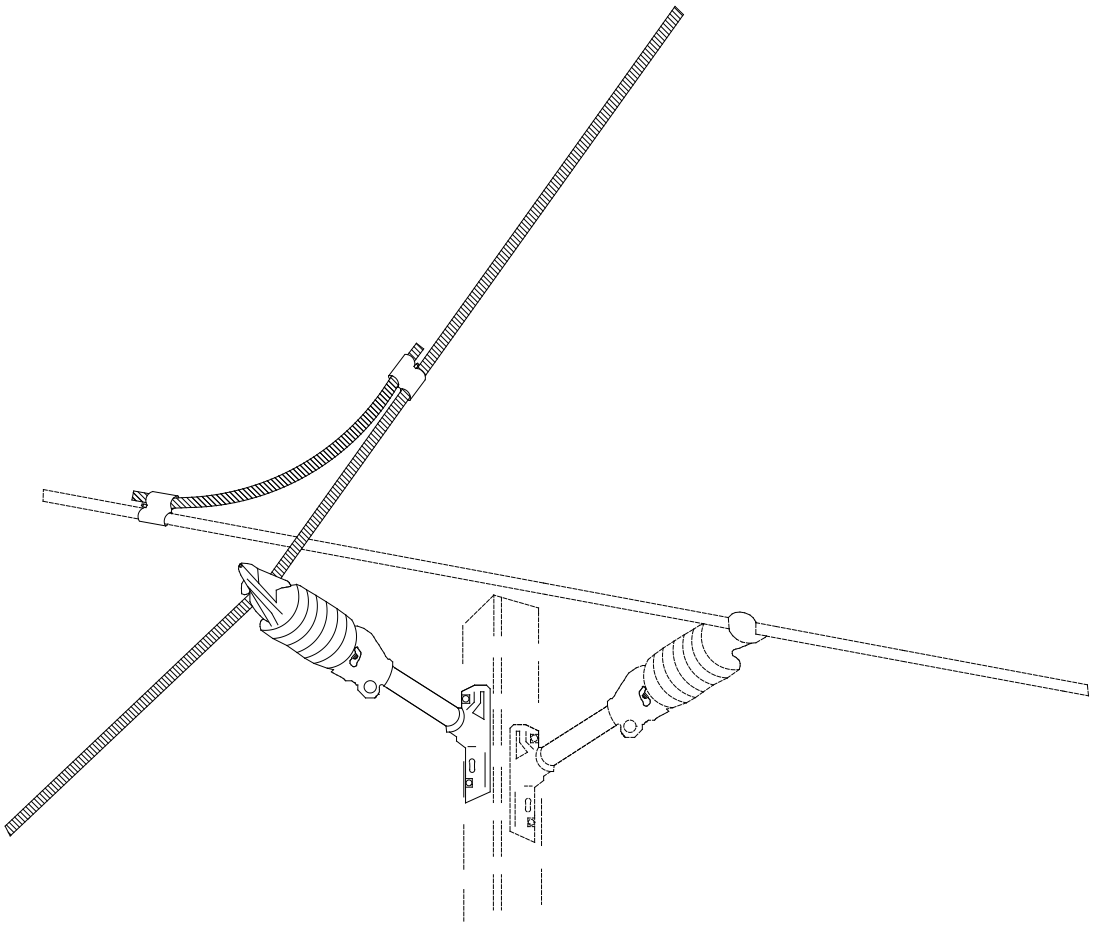


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	1	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
3	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
4	CNN CP 002	2	CONNECTOR, AL. COMP. SIDE-BY 6-2 2-1/0
5	COB ** ***	3	GENERAL CODE FOR CONDUCTOR
6	INS HP 001	1	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
7	STU LI 001	1	STUD, LINE POST 3/4 HEAD- 3/4 DIA.X 1-3/4 IN. SHANK
8	TIE PR ***	1	GENERAL CODE FOR PREFORMED TIE
9	WAS RD 005	4	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
10	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DA22F-5 (FIBERGLASS CONSTRUCTION)

10 TO 30 DEGREE CROSS OFF EXISTING POLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0
BOLT PLATE: NONE

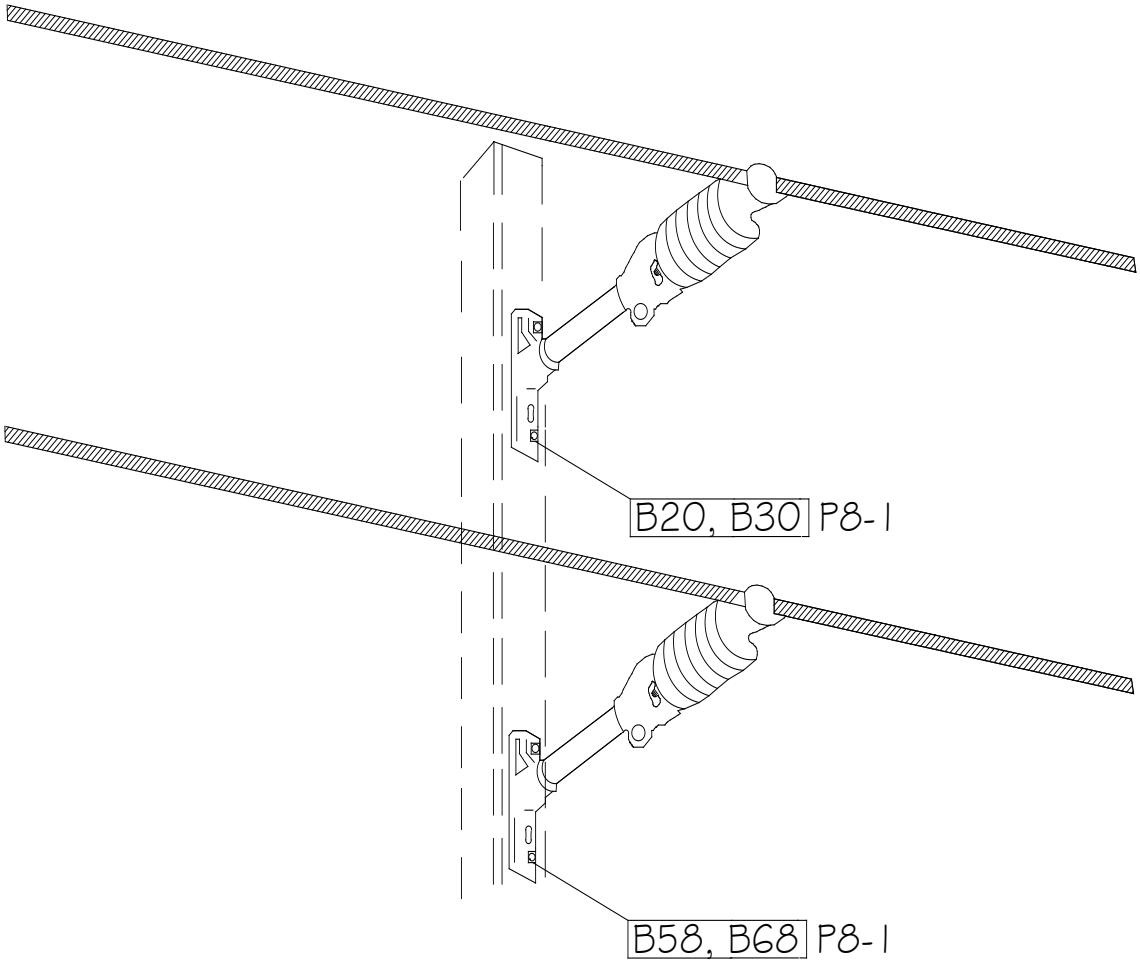


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	1	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
3	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
4	CLA CT ***	1	GENERAL CODE FOR CLAMP TOP INSULATOR CLAMP
5	CNN CP 002	2	CONNECTOR, AL. COMP. SIDE-BY 6-2 2-1/0
6	COB ** ***	3	GENERAL CODE FOR CONDUCTOR
7	INS HP 001	1	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
8	GUA LI ***	1	GENERAL CODE FOR LINE GUARD
9	STU LI 001	1	STUD, LINE POST 3/4 HEAD - 3/4 IN. DIA. X 1-3/4 SHANK
10	WAS RD 005	4	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
12	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DB1F-5 (FIBERGLASS CONSTRUCTION)

TANGENT TO 10 DEGREE ANGLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0
BOLT PLATE: NONE

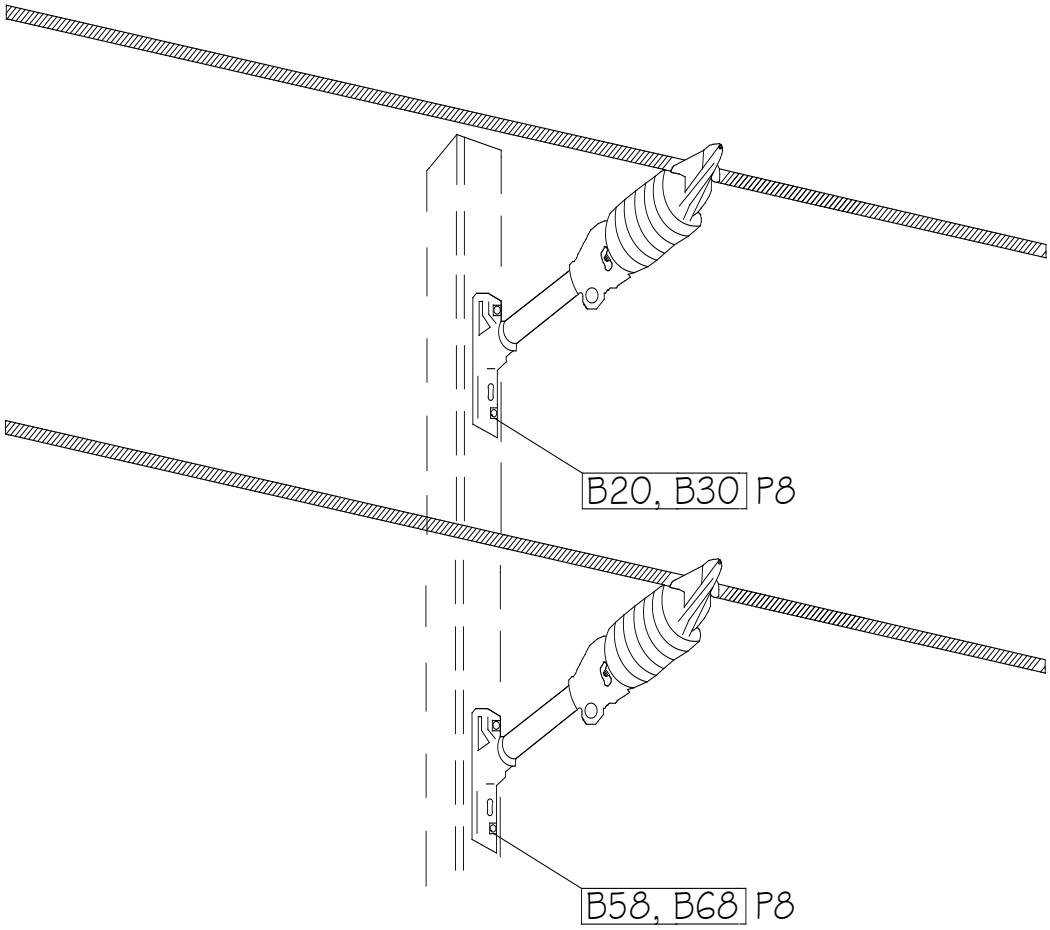


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	2	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
3	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
4	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
5	INS HP 001	2	INSULATOR, POST 34.5KV
6	STU LI 001	2	STUD, LINE POST 3/4 HEAD- 3/4 DIA.X 1-3/4 IN. SHANK
7	TIE PR ***	2	GENERAL CODE FOR PREFORMED TIE
8	WAS RD 005	8	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
9	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
10	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DB2F-5 (FIBERGLASS CONSTRUCTION)

10 TO 30 DEGREE ANGLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0
BOLT PLATE: NONE

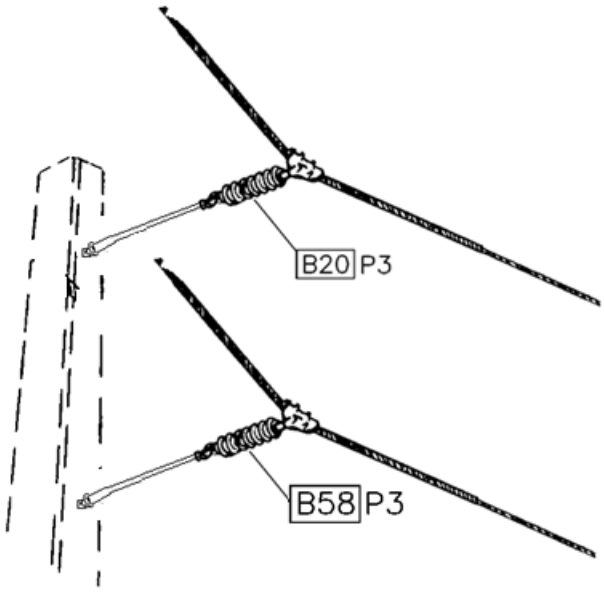


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	2	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
3	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
4	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
5	CLA CT ***	2	GENERAL CODE FOR CLAMP TOP INSULATOR CLAMP
6	INS HP 001	2	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
7	GUA LI ***	2	GENERAL CODE FOR LINE GUARD
8	STU LI 001	2	STUD, LINE POST 3/4 HEAD - 3/4 IN. DIA. X 1-3/4 SHANK
9	WAS RD 005	8	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
10	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DB3-5(FIBERGLASS CONSTRUCTION)

30 TO 60 DEGREE FLYING ANGLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0
BOLT PLATE: NONE



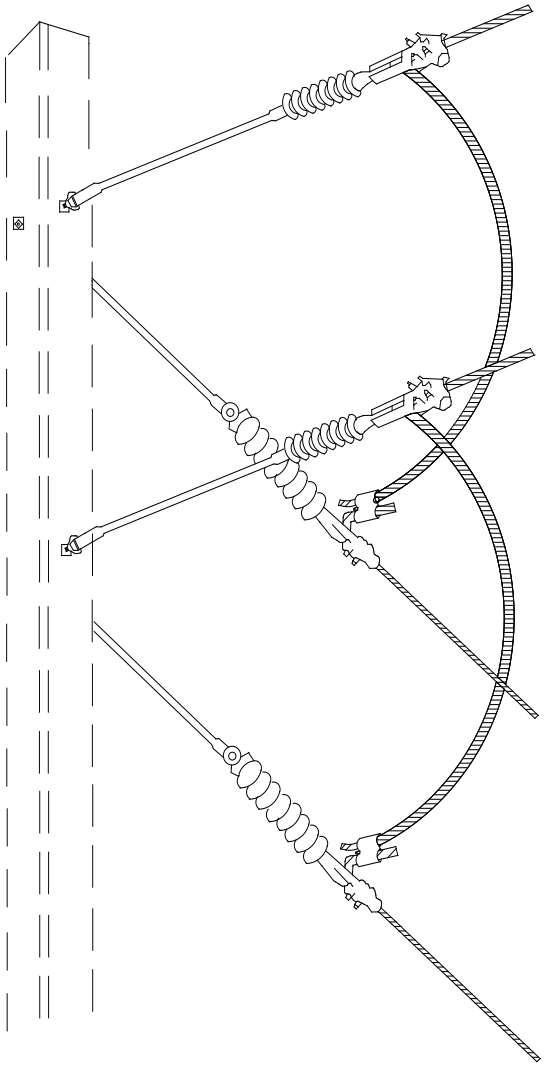
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
2	CLA AN 002	2	CLAMP, ANGLE 2AAAC - 1/0AAAC
3	INS CO 001	2	INSULATOR, DEAD-END, POLYMER 27KV
4	INS FE 002	2	FIBERGLASS EXTENSION LINK, 12”
4	GUA LI ***	2	GENERAL CODE FOR LINE GUARD
5	NUT EY 003	2	NUT, EYE 3/4
6	WAS RD 005	2	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
7	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
8	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DB4F-5 (FIBERGLASS CONSTRUCTION)

60 TO 90 DEGREE CORNER – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0

BOLT PLATE: NONE

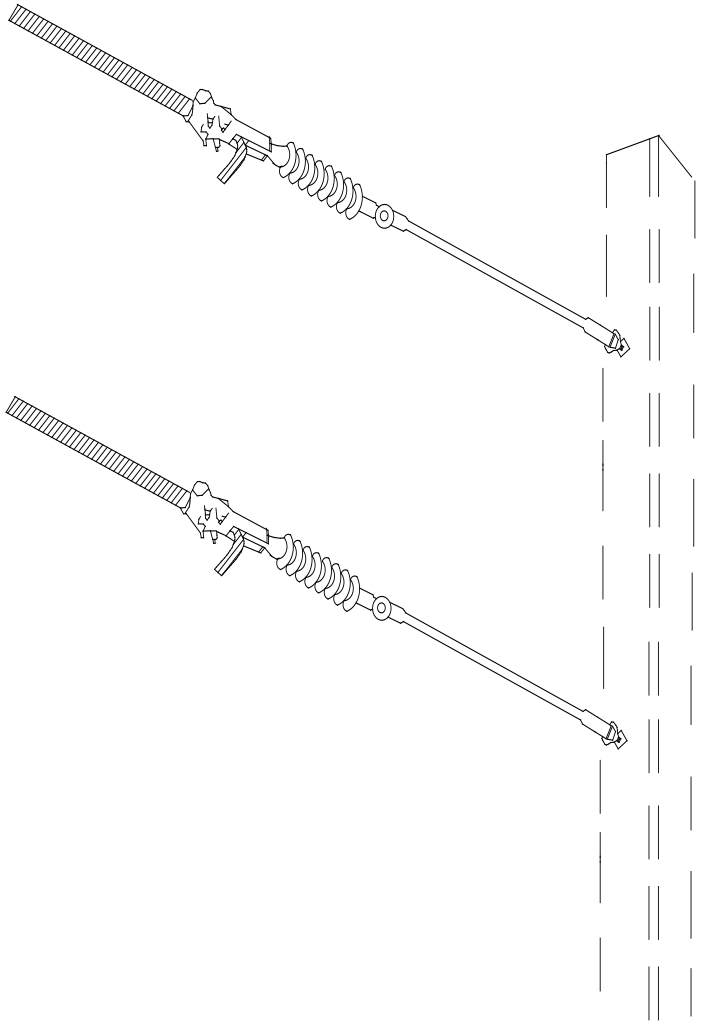


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	4	BOLT, DOUBLE ARMING, 3/4X14
2	CLA SS ***	4	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
3	CNN CP ***	2	GENERAL CODE FOR SIDE-BY CONNECTOR
4	INS CO 001	4	INSULATOR, DEAD-END, POLYMER 27KV
5	INS FE 002	4	FIBERGLASS EXTENSION LINK, 12”
5	NUT EY 003	4	NUT, EYE 3/4
6	WAS RD 005	4	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
7	WAS SF 003	8	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
8	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DB5F-5 (FIBERGLASS CONSTRUCTION)

DEADEND – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0
BOLT PLATE: NONE

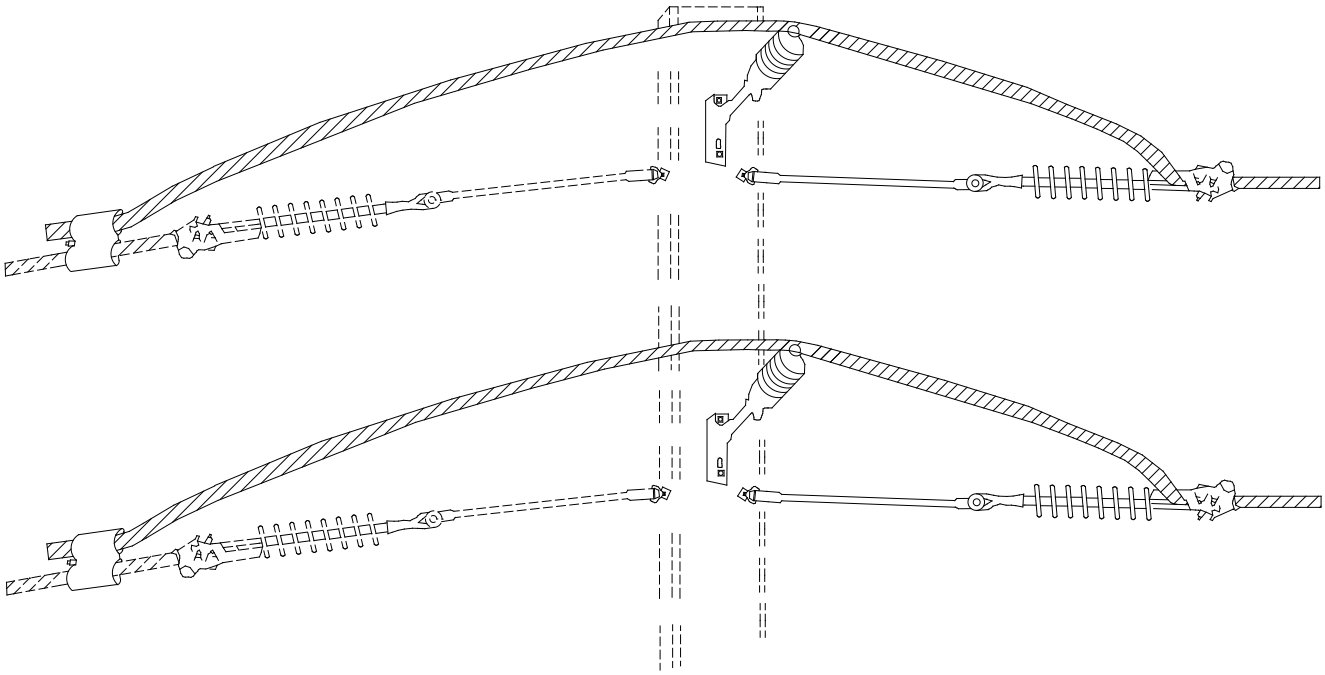


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
2	CLA SS ***	2	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
3	INS CO 001	2	INSULATOR, DEAD-END, POLYMER 27KV
4	INS FE 002	2	FIBERGLASS EXTENSION LINK, 12”
5	NUT EY 003	2	NUT, EYE 3/4
6	WAS RD 005	2	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
7	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
8	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DB6F-5 (FIBERGLASS CONSTRUCTION)

EXTENSION OFF EXISTING DEADEND – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0
BOLT PLATE: NONE

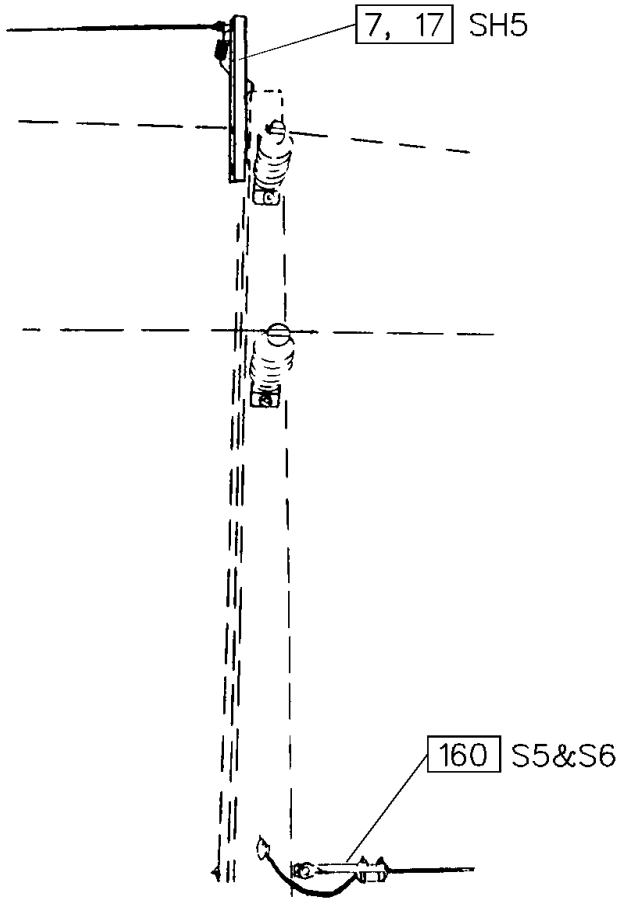


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	2	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
3	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
4	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
5	CLA SS ***	2	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
6	CNN CP ***	2	GENERAL CODE FOR SIDE-BY CONNECTOR
7	INS CO 001	2	INSULATOR, DEAD-END, POLYMER 27KV
8	INS FE 002	2	FIBERGLASS EXTENSION LINK, 12”
9	INS HP 001	2	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
10	NUT EY 003	2	NUT, EYE 3/4
11	TIE PR ***	2	GENERAL CODE FOR PREFORMED TIE
12	WAS RD 005	10	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
13	WAS SF 003	8	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
14	WAS SP 002	6	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DB6-6

NEUTRAL TO SHIELD TRANSITION – TWO PHASE

OPTIONS: 2, 1/0, 2/0, 3/0, 4/0, 636
BOLT PLATE: NONE

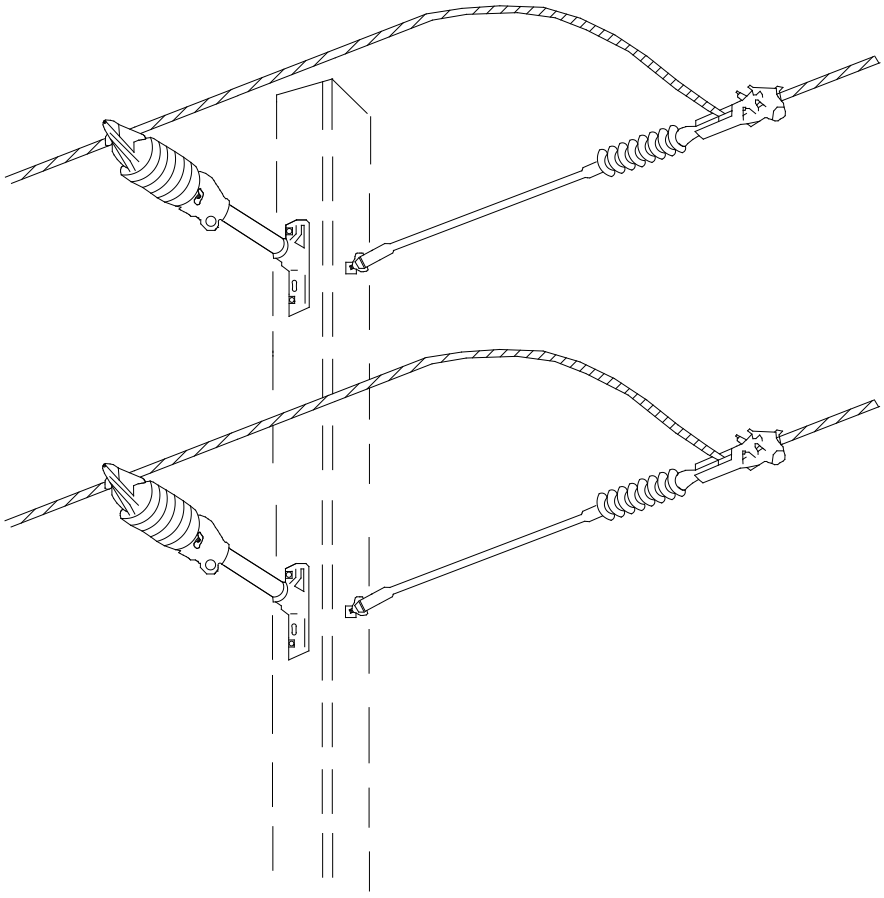


NO.	ITEM ID	QTY	DESCRIPTION
1	BAY SW 003	1	BAYONET, SHIELD WIRE 40 IN. CORNER
2	BOL EY 005	1	BOLT, EYE, 5/8X16
3	BOL MS 032	1	BOLT, MACHINE, SQUARE HEAD 3/4X6
4	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD 3/4X14
5	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
6	CNN ** ***	1	GENERAL CODE FOR TAP CONNECTOR
7	CNN CP 002	1	CONNECTOR, AL. COMP. SIDE-BY 6-2 2-1/0
8	GRI PR 001	1	GRIP, PREFORMED DEADEND 3 NO 6 AW
9	NUT EY 002	1	NUT, EYE 5/8
10	NUT SL 004	1	LOCKNUT, SQUARE, M-F 3/4
11	THI EY 001	1	NUT, THIMBLE-EYE 3/4
12	WAS RD 005	6	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
13	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
14	WAS SP 002	3	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DB7FSL-5 (FIBERGLASS CONSTRUCTION)

DEADEND AND SLACK CARRY THRU – UNSHIELDED

OPTIONS: 2, 1/0, 3/0, 336, 636
BOLT PLATE: B13*A, B13*B, B13*C

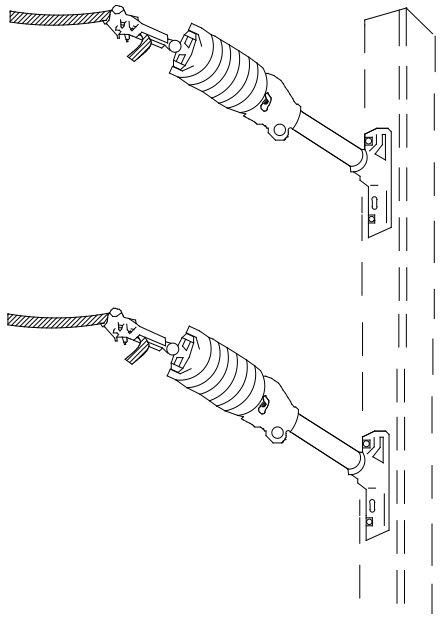


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	2	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	4	BOLT, DOUBLE ARMING, 3/4X14
3	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
4	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
5	CLA CT ***	2	GENERAL CODE FOR ANGLE CLAMP
6	CLA SS ***	2	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
7	GUA LI ***	2	GENERAL CODE FOR LINE GUARD
8	INS CO 001	2	INSULATOR, DEAD-END, POLYMER 27KV
9	INS FE 002	2	FIBERGLASS EXTENSION LINK, 12”
10	INS HP 001	2	INSULATOR, POST 34.5KV CLAMP
11	NUT EY 003	2	NUT, EYE 3/4
12	STU LI 001	2	STUD, LINE POST 3/4 HEAD - 3/4 IN. DIA. X 1-3/4 SHANK
13	WAS RD 005	8	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
14	WAS SF 003	8	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
15	WAS SP 002	5	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DB7F-5 (FIBERGLASS CONSTRUCTION)

SLACKSPAN DEADEND – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0
BOLT PLATE: NONE

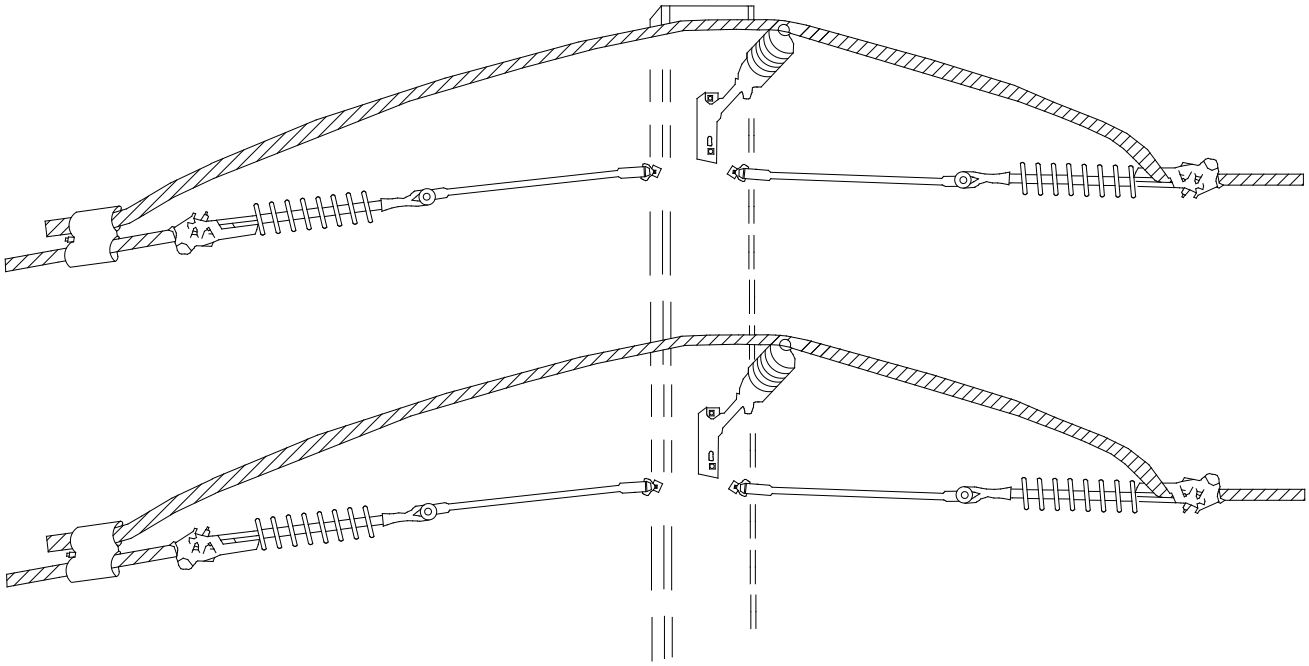


NO.	ITEM ID	QTY	DESCRIPTION
1	ADP TU 001	2	ADAPTER, TRUNNION - SLACK SPANNING
2	BKT FS 001	2	BRACKET, INSULATOR STANDOFF 6 IN.
3	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD 3/4X12
4	BOL MS 036	2	BOLT. MACHINE, SQUARE HEAD 3/4X14
5	CLA SS ***	2	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
6	INS VP 002	2	INSULATOR, POST 34.5KV CLAMP
7	STU LI 001	2	STUD, LINE POST 3/4 HEAD - 3/4 IN. DIA. X 1-3/4 SHANK
8	WAS RD 005	8	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
10	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DB8F-5 (FIBERGLASS CONSTRUCTION)

DOUBLE DEADEND – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0
BOLT PLATE: NONE

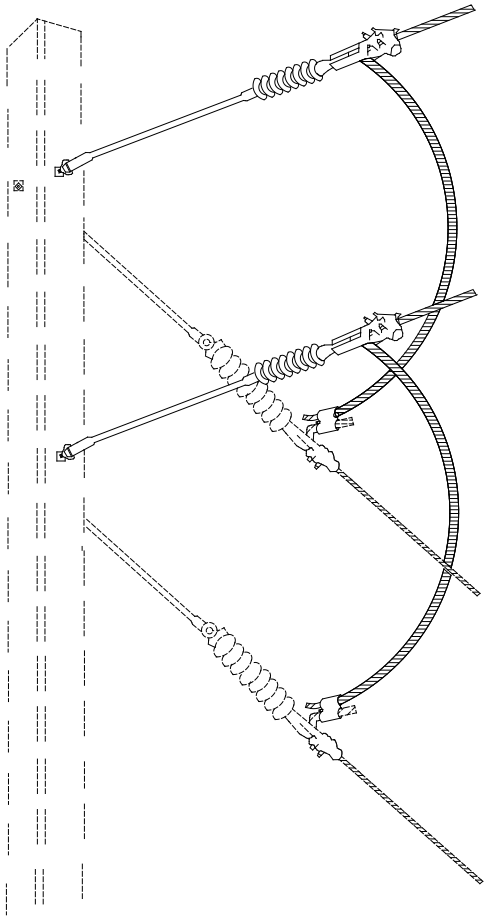


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	2	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	6	BOLT, DOUBLE ARMING 3/4X14
3	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
4	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
3	CLA SS ***	4	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	CNN CP ***	2	GENERAL CODE FOR SIDE-BY CONNECTOR
5	INS CO 001	4	INSULATOR, DEAD-END, POLYMER 27KV
6	INS FE 002	2	FIBERGLASS EXTENSION LINK, 12”
7	INS HP 001	2	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
8	NUT EY 003	4	NUT, EYE 3/4
9	TIE PR ***	2	GENERAL CODE FOR PREFORMED TIE
10	WAS RD 005	14	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SF 003	14	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
12	WAS SP 002	10	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DB18F-5 (FIBERGLASS CONSTRUCTION)

60 TO 90 DEGREE TAP OFF EXISTING DEADEND – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0
BOLT PLATE: NONE

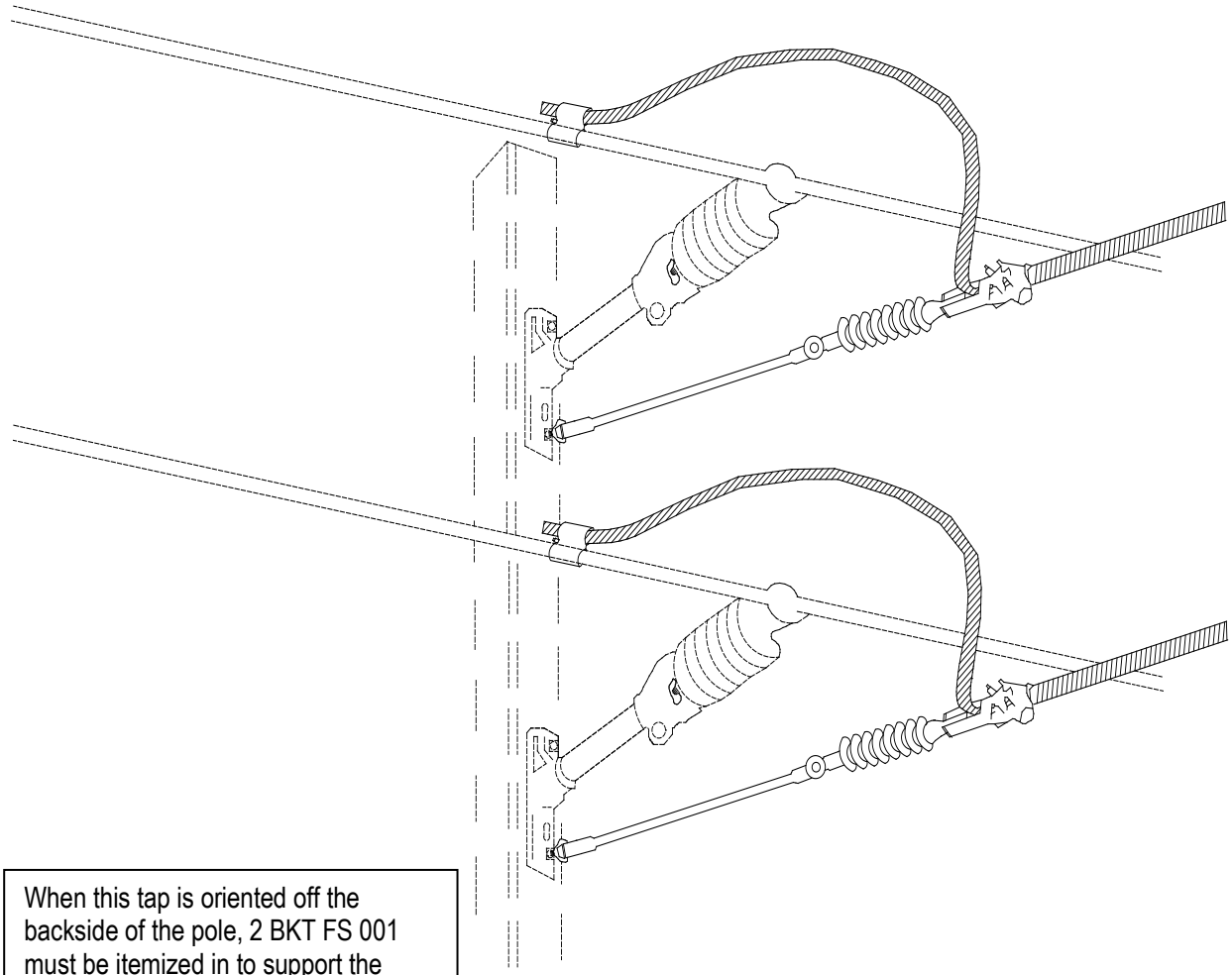


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	2	BOLT, DOUBLE ARMING, ¾X14
2	CLA SS ***	2	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
3	CNN CP ***	2	GENERAL CODE FOR SIDE-BY CONNECTOR
4	INS CO 001	2	INSULATOR, DEAD-END, POLYMER 27KV
5	INS FE 002	2	FIBERGLASS EXTENSION LINK, 12”
5	NUT EY 003	2	NUT, EYE 3/4
6	WAS RD 005	2	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
7	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
8	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DB20F-5 (FIBERGLASS CONSTRUCTION)

75 TO 90 DEGREE TAP OFF EXISTING POLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0
BOLT PLATE: NONE



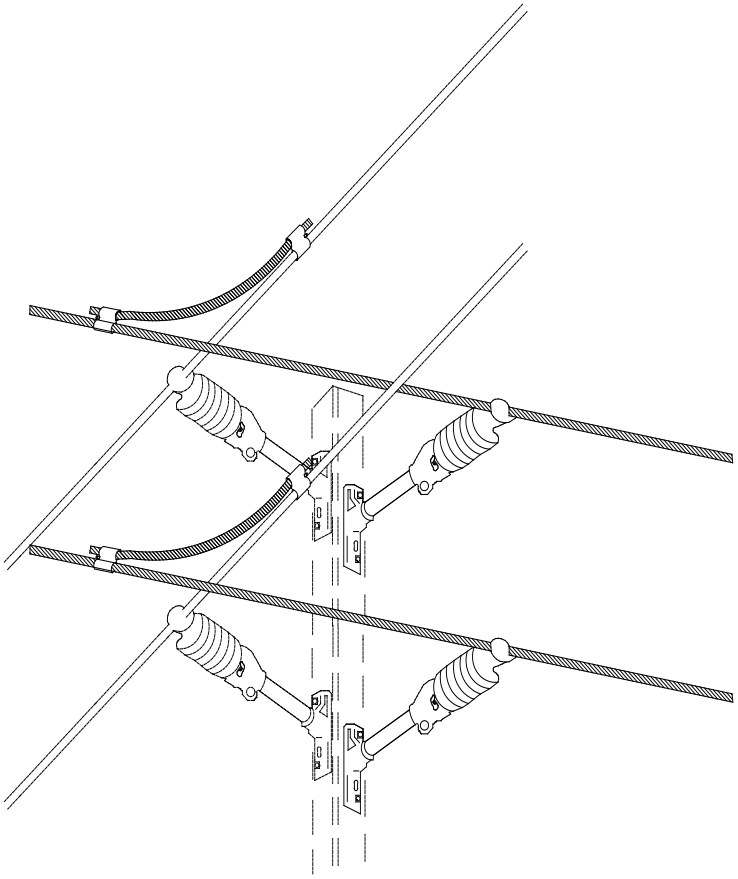
When this tap is oriented off the backside of the pole, 2 BKT FS 001 must be itemized in to support the jumper and 2 INS FE 002 must be itemized in for 2 INS FE 001 to reduce the length of the jumper.

NO.	ITEM ID	QTY	DESCRIPTION
1	CLA SS ***	2	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
2	CNN CP ***	2	GENERAL CODE FOR SIDE-BY CONNECTOR
3	COB ** ***	12	GENERAL CODE FOR CONDUCTOR
4	INS CO 001	2	INSULATOR, DEAD-END, POLYMER 27KV
5	INS FE 001	2	FIBERGLASS EXTENSION LINK, 24”
6	NUT EY 003	2	NUT, EYE 3/4

DB21F-5 (FIBERGLASS CONSTRUCTION)

0 TO 10 DEGREE CROSS OFF EXISTING POLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0
BOLT PLATE: NONE

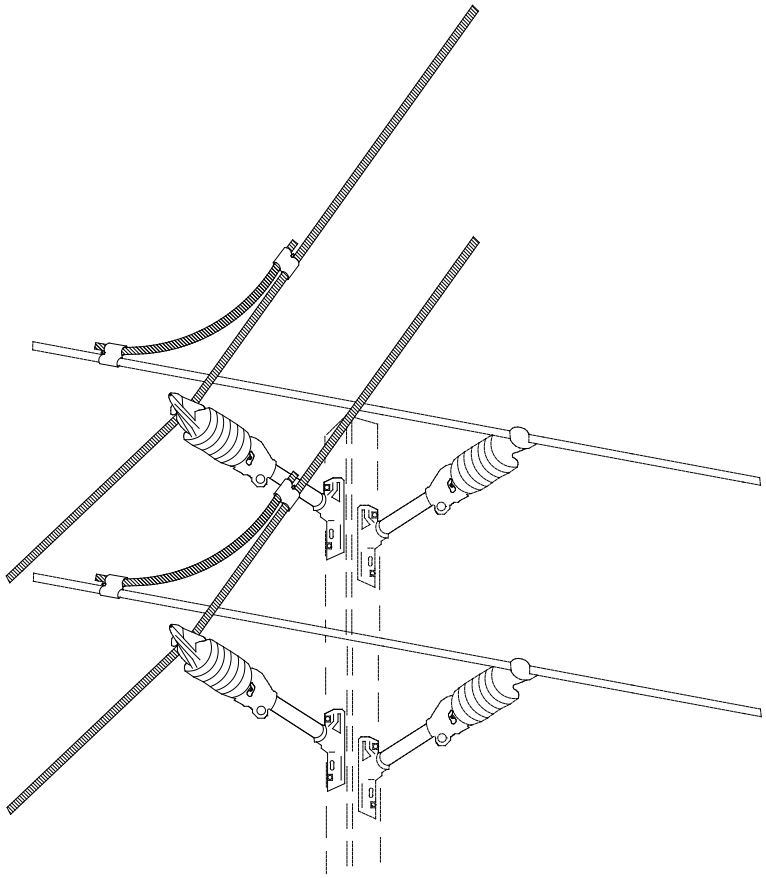


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	2	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
3	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
4	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
5	CNN CP ***	4	GENERAL CODE FOR SIDE-BY CONNECTOR
6	COB ** ***	6	GENERAL CODE FOR CONDUCTOR
7	INS HP 001	2	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
8	STU LI 001	2	STUD, LINE POST 3/4 HEAD- 3/4 DIA.X 1-3/4 IN. SHANK
9	TIE PR ***	2	GENERAL CODE FOR PREFORMED TIE
10	WAS RD 005	8	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
12	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DB22F-5 (FIBERGLASS CONSTRUCTION)

10 TO 30 DEGREE CROSS OFF EXISTING POLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0
BOLT PLATE: NONE

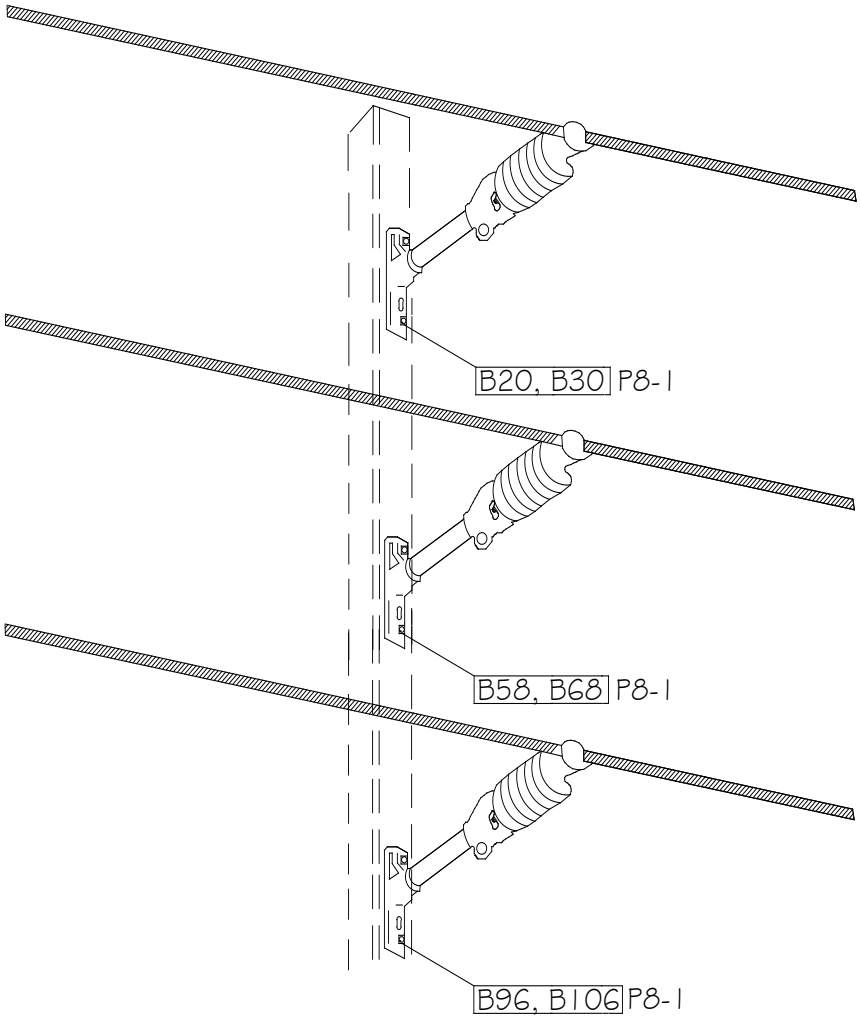


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	2	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
3	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
4	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
5	CLA CT ***	2	GENERAL CODE FOR CLAMP TOP INSULATOR CLAMP
6	CNN CP ***	4	GENERAL CODE FOR SIDE-BY CONNECTOR
7	COB ** ***	6	GENERAL CODE FOR CONDUCTOR
8	INS HP 001	2	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
9	GUA LI ***	2	GENERAL CODE FOR LINE GUARD
10	STU LI 001	2	STUD, LINE POST 3/4 HEAD - 3/4 IN. DIA. X 1-3/4 SHANK
11	WAS RD 005	8	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
12	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
13	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DC1F-5 (FIBERGLASS CONSTRUCTION)

TANGENT TO 10 DEGREE ANGLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0, 4/0CU, 336, 636
BOLT PLATE: B2*A, B2*B, B2*C

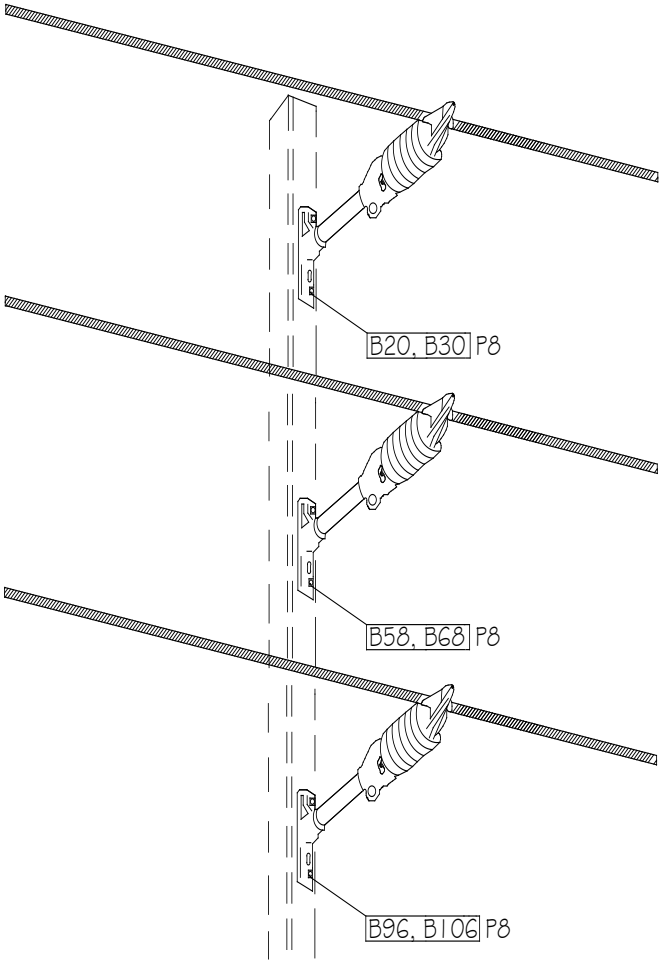


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	3	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
3	BOL DA 016	1	BOLT, DOUBLE ARMING, 3/4X16
4	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
5	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
6	BOL MS 037	1	BOLT, MACHINE, SQUARE HEAD 3/4X16
7	INS HP 001	3	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
8	STU LI 001	3	STUD, LINE POST 3/4 HEAD- 3/4 DIA.X 1-3/4 IN. SHANK
9	TIE PR ***	3	GENERAL CODE FOR PREFORMED TIE
10	WAS RD 005	12	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
11	WAS SF 003	6	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
12	WAS SP 002	6	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DC2F-5 (FIBERGLASS CONSTRUCTION)

10 TO 30 DEGREE ANGLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0, 336, 636
BOLT PLATE: B2*A, B2*B, B2*C

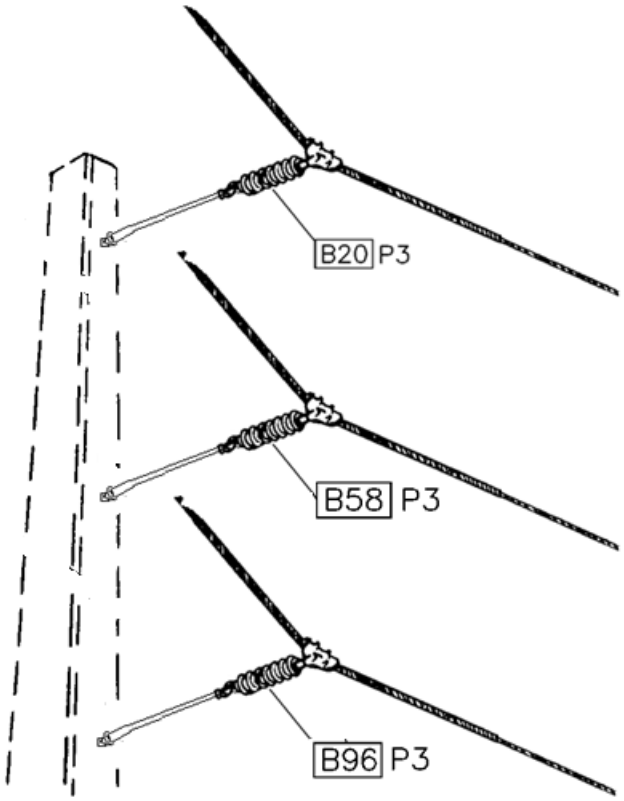


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	3	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
3	BOL DA 016	1	BOLT, DOUBLE ARMING, 3/4X16
4	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
5	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
6	BOL MS 037	1	BOLT, MACHINE, SQUARE HEAD 3/4X16
7	CLA CT ***	3	GENERAL CODE FOR CLAMP TOP INSULATOR CLAMP
8	INS HP 001	3	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
9	GUA LI ***	3	GENERAL CODE FOR LINE GUARD
10	STU LI 001	3	STUD, LINE POST 3/4 HEAD - 3/4 IN. DIA. X 1-3/4 SHANK
11	WAS RD 005	12	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
12	WAS SF 003	6	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
13	WAS SP 002	6	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DC3-5(FIBERGLASS CONSTRUCTION)

30 TO 60 DEGREE FLYING ANGLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0, 336, 636*
BOLT PLATE: B5*A, B5*B, B5*C

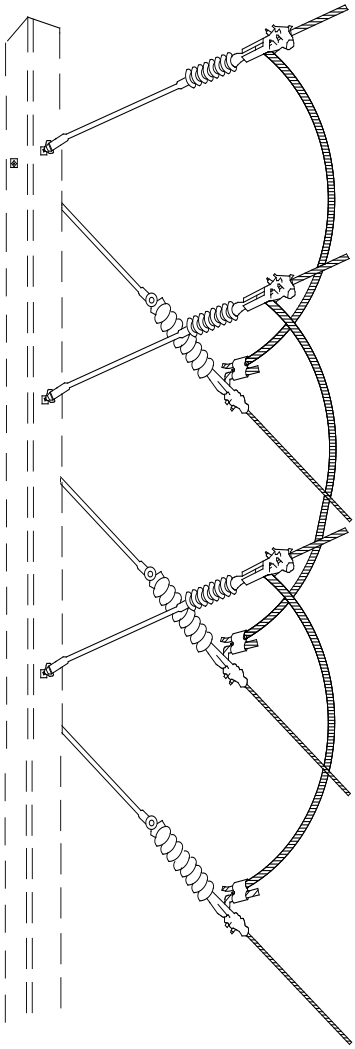


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
2	BOL DA 016	1	BOLT, DOUBLE ARMING, 3/4X16
3	CLA ** ***	3	GENERAL CODE FOR SUSPENSION CLAMP
4	INS CO 001	3	INSULATOR, DEAD-END, POLYMER 27KV
5	INS FE 002	3	FIBERGLASS EXTENSION LINK, 12”
5	GUA LI ***	3	GENERAL CODE FOR LINE GUARD
6	NUT EY 003	3	NUT, EYE 3/4
7	WAS RD 005	3	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SF 003	6	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
8	WAS SP 002	3	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DC4F-5 (FIBERGLASS CONSTRUCTION)

60 TO 90 DEGREE CORNER – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0, 336, 636
BOLT PLATE: B7*A, B7*B, B7*C

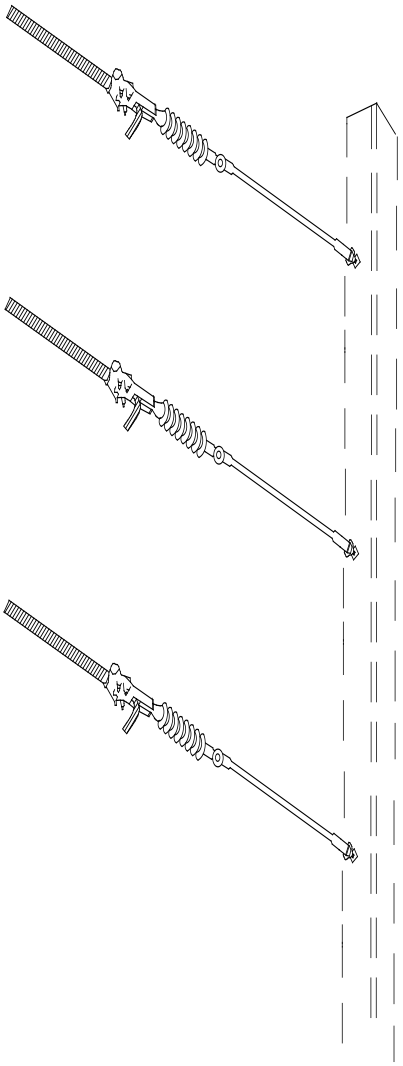


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	4	BOLT, DOUBLE ARMING, 3/4X14
2	BOL DA 016	2	BOLT, DOUBLE ARMING, 3/4X16
3	CLA SS ***	6	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	CNN ** ***	3	GENERAL CODE FOR TAP CONNECTOR
5	INS CO 001	6	INSULATOR, DEAD-END, POLYMER 27KV
6	INS FE 002	6	FIBERGLASS EXTENSION LINK, 12”
7	NUT EY 003	6	NUT, EYE 3/4
8	WAS RD 005	6	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SF 003	12	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
10	WAS SP 002	6	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DC5F-5 (FIBERGLASS CONSTRUCTION)

DEADEND – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 2/0CU, 3/0, 4/0CU, 336, 636
BOLT PLATE: B5*A, B5*B, B5*C

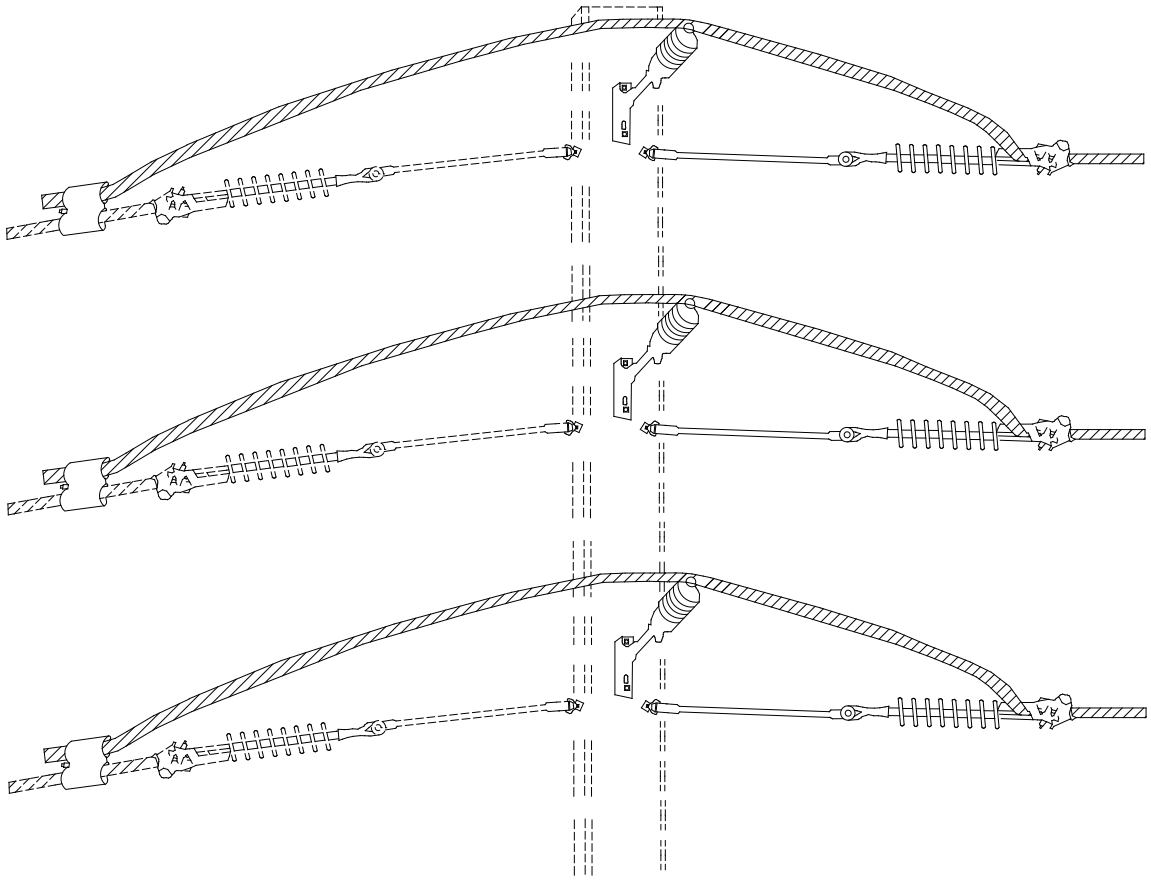


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
2	BOL DA 016	1	BOLT, DOUBLE ARMING, 3/4X16
3	CLA SS ***	3	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	INS CO 001	3	INSULATOR, DEAD-END, POLYMER 27KV
5	INS FE 002	3	FIBERGLASS EXTENSION LINK, 12”
6	NUT EY 003	3	NUT, EYE 3/4
7	WAS RD 005	3	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
8	WAS SF 003	6	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SP 002	3	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DC6F-5 (FIBERGLASS CONSTRUCTION)

EXTENSION OFF EXISTING DEADEND – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 2/0CU, 3/0, 4/0CU, 336, 636
BOLT PLATE: B5*A, B5*B, B5*C

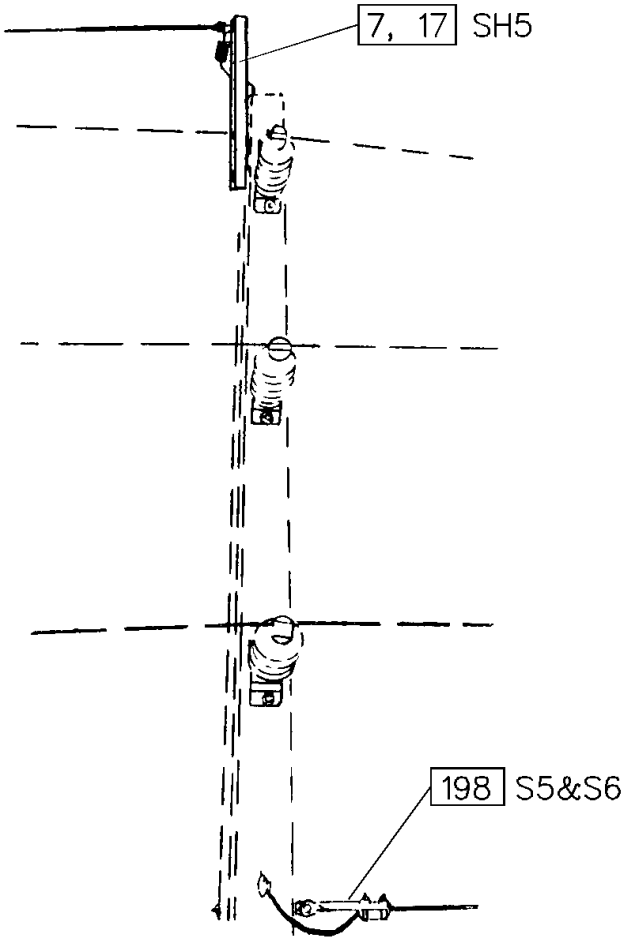


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	3	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
3	BOL DA 016	1	BOLT, DOUBLE ARMING, 3/4X16
4	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
5	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
6	BOL MS 037	1	BOLT, MACHINE, SQUARE HEAD 3/4X16
7	CLA SS ***	3	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
8	CNN ** ***	3	GENERAL CODE FOR TAP CONNECTOR
9	INS CO 001	3	INSULATOR, DEAD-END, POLYMER 27KV
10	INS FE 002	3	FIBERGLASS EXTENSION LINK, 12”
11	INS HP 001	3	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
12	NUT EY 003	3	NUT, EYE 3/4
13	TIE PR ***	3	GENERAL CODE FOR PREFORMED TIE
14	WAS RD 005	15	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
15	WAS SF 003	12	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
16	WAS SP 002	9	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DC6-6

NEUTRAL TO SHIELD TRANSITION

OPTIONS: 2, 1/0, 2/0, 3/0, 4/0, 636
BOLT PLATE: B11*A, B11*B, B11*C

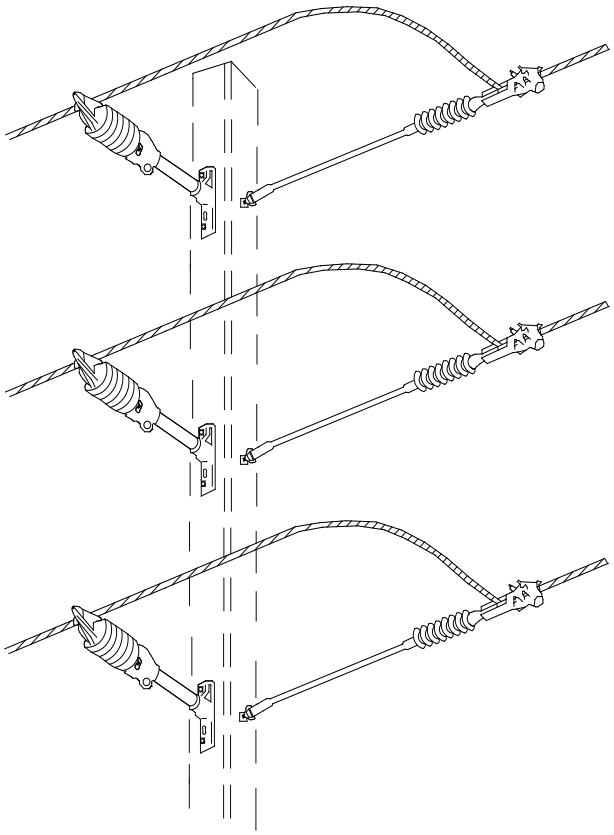


NO.	ITEM ID	QTY	DESCRIPTION
1	BAY SW 003	1	BAYONET, SHIELD WIRE 40 IN. CORNER
2	BOL EY 005	1	BOLT, EYE 5/8X16
3	BOL MS 032	1	BOLT, MACHINE, SQUARE HEAD 3/4X6
4	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD 3/4X12
5	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
6	CNN ** ***	1	GENERAL CODE FOR TAP CONNECTOR
7	CNN CP 002	1	CONNECTOR, AL. COMP. SIDE-BY 6-2 2-1/0
8	GRI PR 001	1	GRIP, PREFORMED DEADEND 3 NO 6 AW
9	NUT EY 002	1	NUT, EYE 5/8
10	NUT SL 004	1	LOCKNUT, SQUARE, M-F 3/4
11	THI EY 001	1	NUT, THIMBLE-EYE 3/4
12	WAS RD 005	6	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
13	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
14	WAS SP 002	3	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DC7FSL-5 (FIBERGLASS CONSTRUCTION)

DEADEND AND SLACK CARRY THRU – UNSHIELDED

OPTIONS: 2, 1/0, 3/0, 336, 636
BOLT PLATE: B13*A, B13*B, B13*C

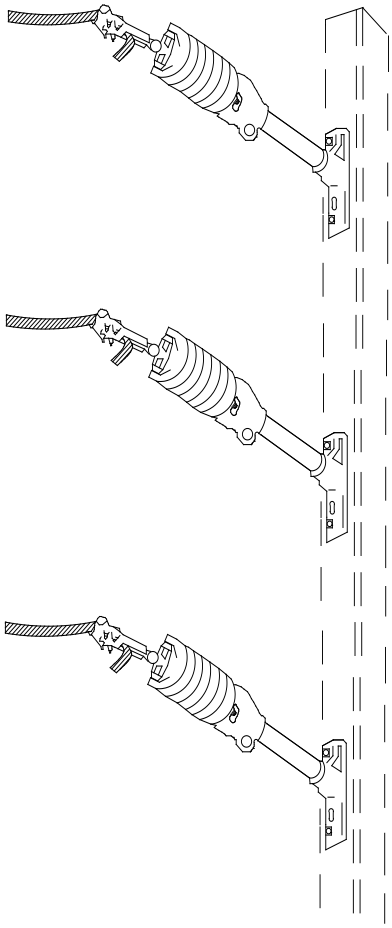


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	3	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	4	BOLT, DOUBLE ARMING, 3/4X14
3	BOL DA 016	2	BOLT, DOUBLE ARMING, 3/4X16
4	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
5	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
6	BOL MS 037	1	BOLT, MACHINE, SQUARE HEAD 3/4X16
7	CLA CT ***	3	GENERAL CODE FOR ANGLE CLAMP
8	CLA SS ***	3	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
9	GUA LI ***	3	GENERAL CODE FOR LINE GUARD
10	INS CO 001	3	INSULATOR, DEAD-END, POLYMER 27KV
11	INS FE 002	3	FIBERGLASS EXTENSION LINK, 12”
12	INS HP 001	3	INSULATOR, POST 34.5KV CLAMP
13	NUT EY 003	3	NUT, EYE 3/4
14	STU LI 001	3	STUD, LINE POST 3/4 HEAD - 3/4 IN. DIA. X 1-3/4 SHANK
15	WAS RD 005	12	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
16	WAS SF 003	10	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
17	WAS SP 002	7	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DC7F-5 (FIBERGLASS CONSTRUCTION)

SLACKSPAN DEADEND – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0, 336, 636
BOLT PLATE: B9*A, B9*B, B9*C

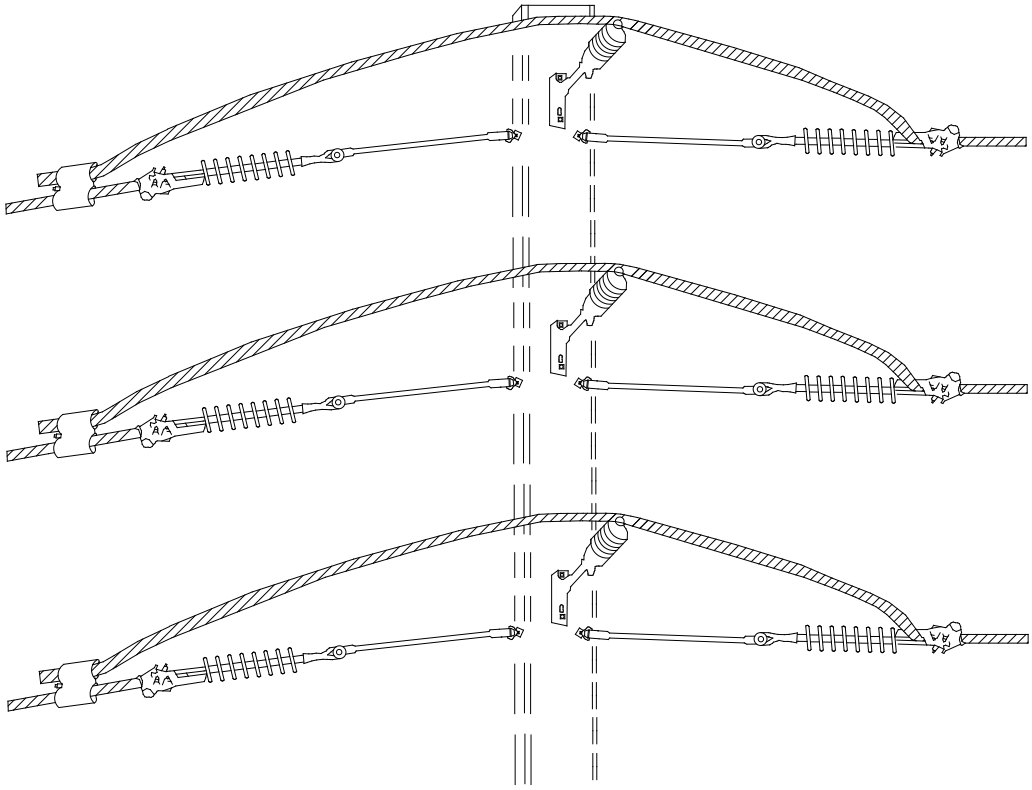


NO.	ITEM ID	QTY	DESCRIPTION
1	ADP TU 001	3	ADAPTER, TRUNNION - SLACK SPANNING
2	BKT FS 001	3	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
3	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD 3/4X12
4	BOL MS 036	3	BOLT. MACHINE, SQUARE HEAD 3/4X14
5	BOL MS 037	1	BOLT, MACHINE, SQUARE HEAD 3/4X16
6	CLA SS ***	3	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
7	INS VP 002	3	INSULATOR, POST 34.5KV CLAMP
8	STU LI 001	3	STUD, LINE POST 3/4 HEAD - 3/4 IN. DIA. X 1-3/4 SHANK
9	WAS RD 005	12	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
10	WAS SF 003	6	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SP 002	6	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DC8F-5 (FIBERGLASS CONSTRUCTION)

DOUBLE DEADEND – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0, 336, 636
BOLT PLATE: B7*A, B7*B, B7*C

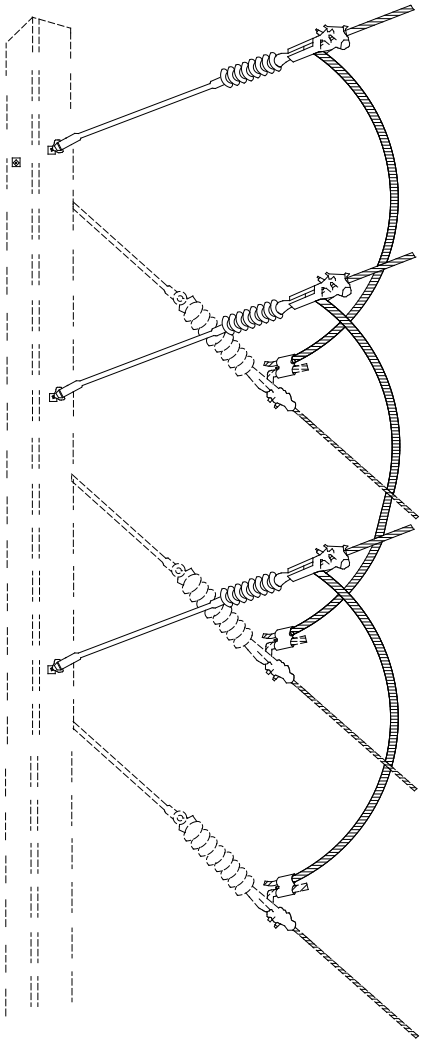


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	3	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	4	BOLT, DOUBLE ARMING 3/4X14
3	BOL DA 016	2	BOLT, DOUBLE ARMING, 3/4X16
4	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
5	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
6	BOL MS 037	1	BOLT, MACHINE, SQUARE HEAD 3/4X16
7	CLA SS ***	6	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
8	CNN ** ***	3	GENERAL CODE FOR TAP CONNECTOR
9	INS CO 001	6	INSULATOR, DEAD-END, POLYMER 27KV
10	INS FE 002	3	FIBERGLASS EXTENSION LINK, 12”
11	INS HP 001	3	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
12	NUT EY 003	6	NUT, EYE 3/4
13	TIE PR ***	3	GENERAL CODE FOR PREFORMED TIE
14	WAS RD 005	18	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
15	WAS SF 003	15	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
16	WAS SP 002	15	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DC18F-5 (FIBERGLASS CONSTRUCTION)

60 TO 90 DEGREE TAP OFF EXISTING DEADEND – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0, 336, 636
BOLT PLATE: B5*A, B5*B, B5*C

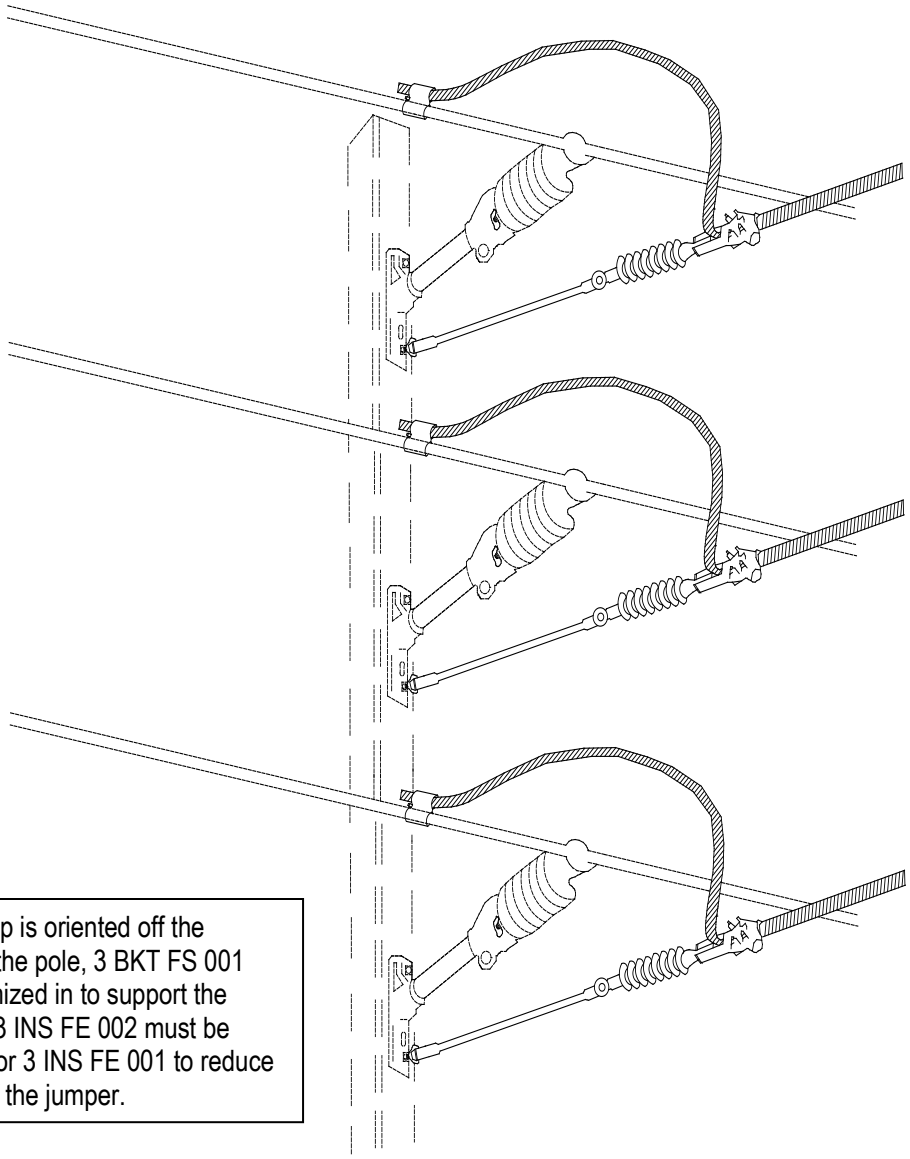


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
2	BOL DA 016	1	BOLT, DOUBLE ARMING, 3/4X16
3	CLA SS ***	3	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	CNN ** ***	3	GENERAL CODE FOR TAP CONNECTOR
5	INS CO 001	3	INSULATOR, DEAD-END, POLYMER 27KV
6	INS FE 002	3	FIBERGLASS EXTENSION LINK, 12”
7	NUT EY 003	3	NUT, EYE 3/4
8	WAS RD 005	3	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SF 003	6	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
10	WAS SP 002	3	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DC20F-5 (FIBERGLASS CONSTRUCTION)

75 TO 90 DEGREE TAP OFF EXISTING POLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0, 336, 636
BOLT PLATE: NONE



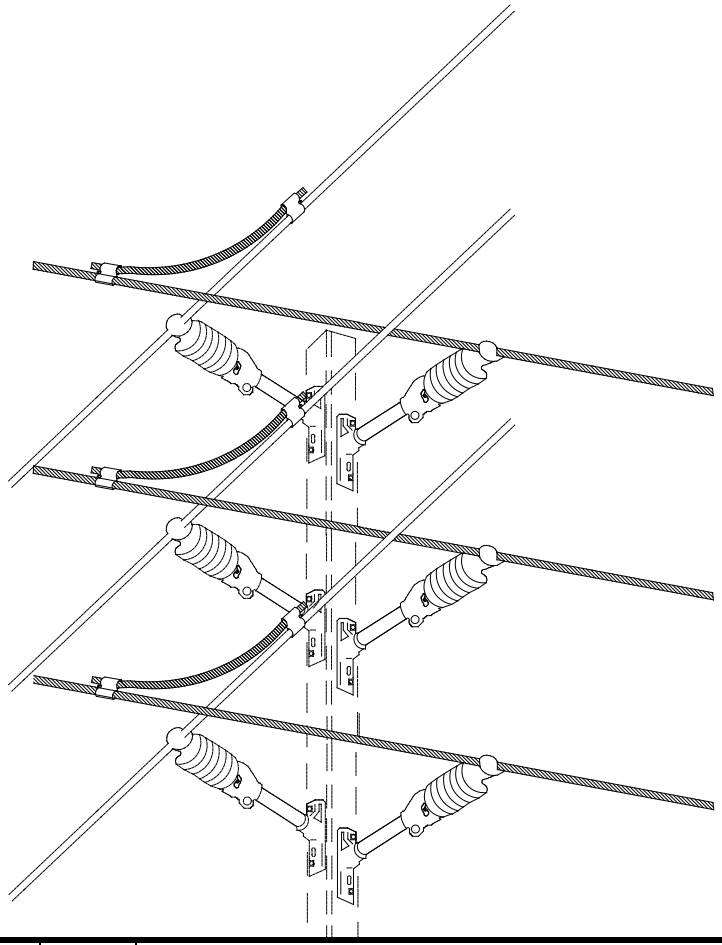
When this tap is oriented off the backside of the pole, 3 BKT FS 001 must be itemized in to support the jumper and 3 INS FE 002 must be itemized in for 3 INS FE 001 to reduce the length of the jumper.

NO.	ITEM ID	QTY	DESCRIPTION
1	CLA SS ***	3	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
2	CNN ** ***	3	GENERAL CODE FOR TAP CONNECTOR
3	COB ** ***	18	GENERAL CODE FOR CONDUCTOR
4	INS CO 001	3	INSULATOR, DEAD-END, POLYMER 27KV
5	INS FE 001	3	FIBERGLASS EXTENSION LINK, 24”
6	NUT EY 003	3	NUT, EYE 3/4

DC21F-5 (FIBERGLASS CONSTRUCTION)

0 TO 10 DEGREE CROSS OFF EXISTING POLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0, 336, 636
BOLT PLATE: B2*A, B2*B, B2*C

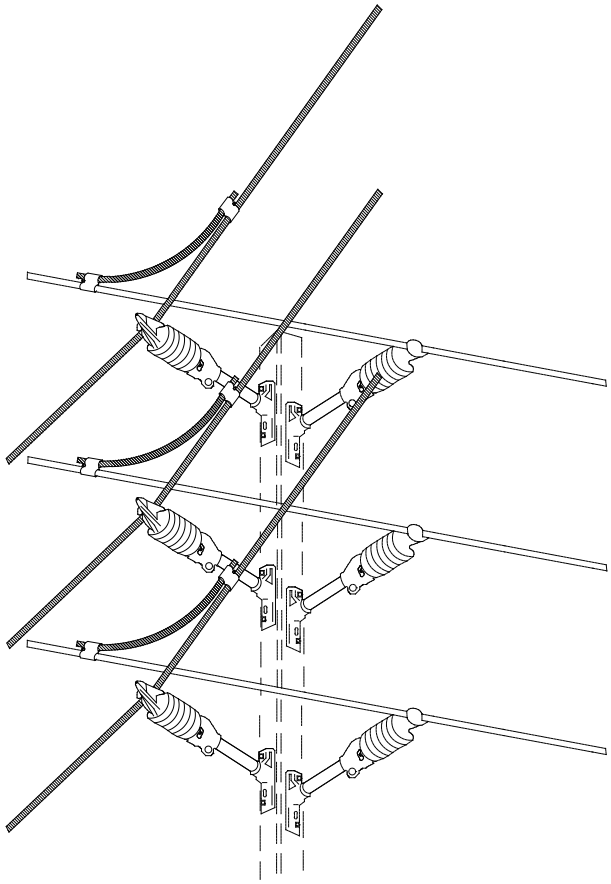


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	3	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
3	BOL DA 016	1	BOLT, DOUBLE ARMING, 3/4X16
4	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
5	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
6	BOL MS 037	1	BOLT, MACHINE, SQUARE HEAD 3/4X16
7	CNN ** ***	6	GENERAL CODE FOR TAP CONNECTOR
8	COB ** ***	9	GENERAL CODE FOR CONDUCTOR
9	INS HP 001	3	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
10	STU LI 001	3	STUD, LINE POST 3/4 HEAD- 3/4 DIA.X 1-3/4 IN. SHANK
11	TIE PR ***	3	GENERAL CODE FOR PREFORMED TIE
12	WAS RD 005	12	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
13	WAS SF 003	6	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
14	WAS SP 002	6	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

DC22F-5 (FIBERGLASS CONSTRUCTION)

10 TO 30 DEGREE CROSS OFF EXISTING POLE – UNSHIELDED

OPTIONS: 2, 4, 6, 1/0, 3/0, 336, 636
BOLT PLATE: B2*A, B2*B, B2*C



NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	3	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
3	BOL DA 016	1	BOLT, DOUBLE ARMING, 3/4X16
4	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD 3/4X12
5	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
6	BOL MS 037	1	BOLT, MACHINE, SQUARE HEAD 3/4X16
7	CLA CT ***	3	GENERAL CODE FOR CLAMP TOP INSULATOR CLAMP
8	CNN ** ***	6	GENERAL CODE FOR TAP CONNECTOR
9	COB ** ***	9	GENERAL CODE FOR CONDUCTOR
10	INS HP 001	3	INSULATOR, HORIZONTAL POST, 34.5KV, CLAMP
11	GUA LI ***	3	GENERAL CODE FOR LINE GUARD
12	STU LI 001	3	STUD, LINE POST 3/4 HEAD - 3/4 IN. DIA. X 1-3/4 SHANK
13	WAS RD 005	12	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
14	WAS SF 003	6	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
15	WAS SP 002	6	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

HORIZONTAL PRIMARY

INTRODUCTION

1. Horizontal Primary will be used for distribution lines crossing over structures, roads, waterways, railroads, and under transmission lines, or any condition that required clearances cannot be maintained by conventional vertical construction.

2. Single-phase taps from existing crossarm structures will not require a crossarm. The tap's pole location will be 40 inches below the centerline of the tangent crossarm. The crossarm for two-phase and three-phase lateral taps will be 40 inches below the centerline of the tangent.

3. If the pole has a shield mounted on a bayonet, the crossarm shall be mounted at 63 and 73 inches (B phase position) from the top of the pole. If there is no shield on the pole, the crossarm shall be mounted at 25 and 35 inches (A phase position) from the top of the pole.

4. Armor rods are issued with the plates T2 and T2-5 when primary conductor is 336KCM or larger.

5. All Horizontal Construction plates now include fiberglass crossarms instead of wood and steel crossarms. Since all the plates include the proper fiberglass crossarms, there is no modification or itemizing required when designing jobs. The details of the two fiberglass crossarms are listed below for reference:

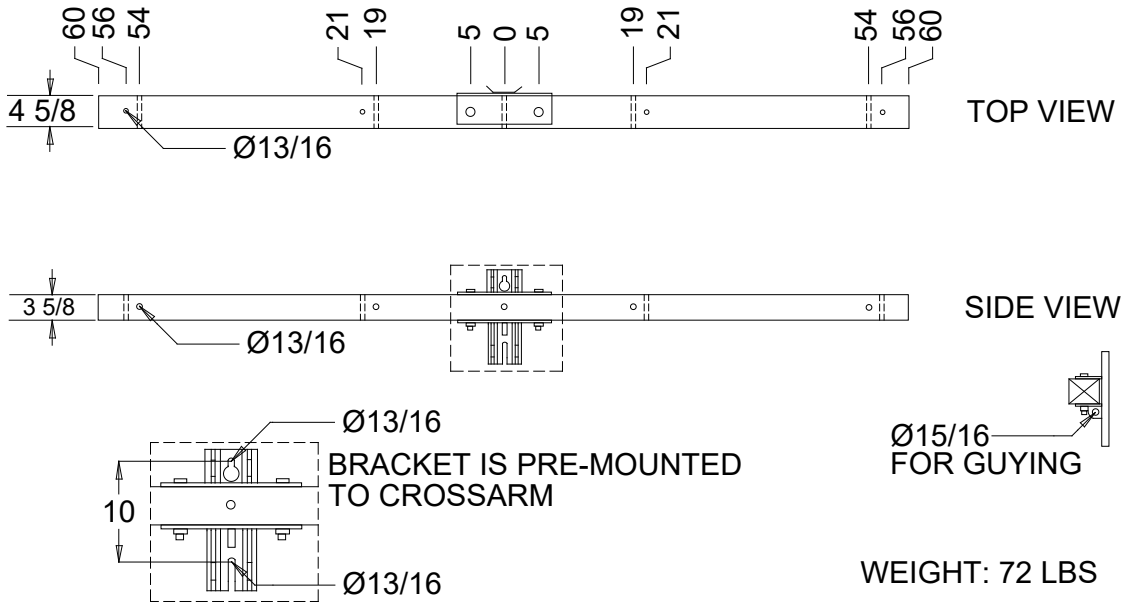
APPLICATION	CROSSARM	DIMENSIONS (H x W x L)	WEIGHT	MOUNTING HARDWARE
Deadend	CXA FG 001	3 5/8" X 4 5/8" X 10'	72 lbs	3/4"
Tangent	CXA FG 002	4 5/8" X 3 5/8" X 10'	39 lbs	3/4"

6. A single deadend fiberglass crossarm CXA FG 001 is included for deadends and double-deadends.

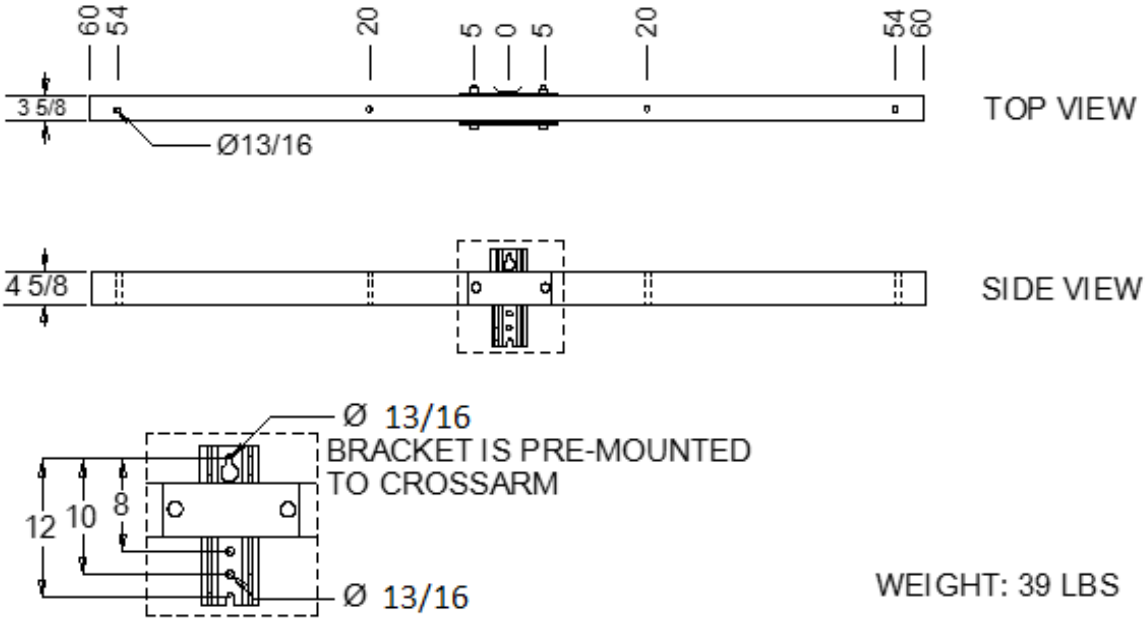
7. For double circuit poles with no static wire, the crossarms should be installed at the static and C phase positions.

II. CROSSARM DRILLING DETAIL (ALL DIMENSIONS ARE INCHES)

CXA FG 001 (DEADEND)



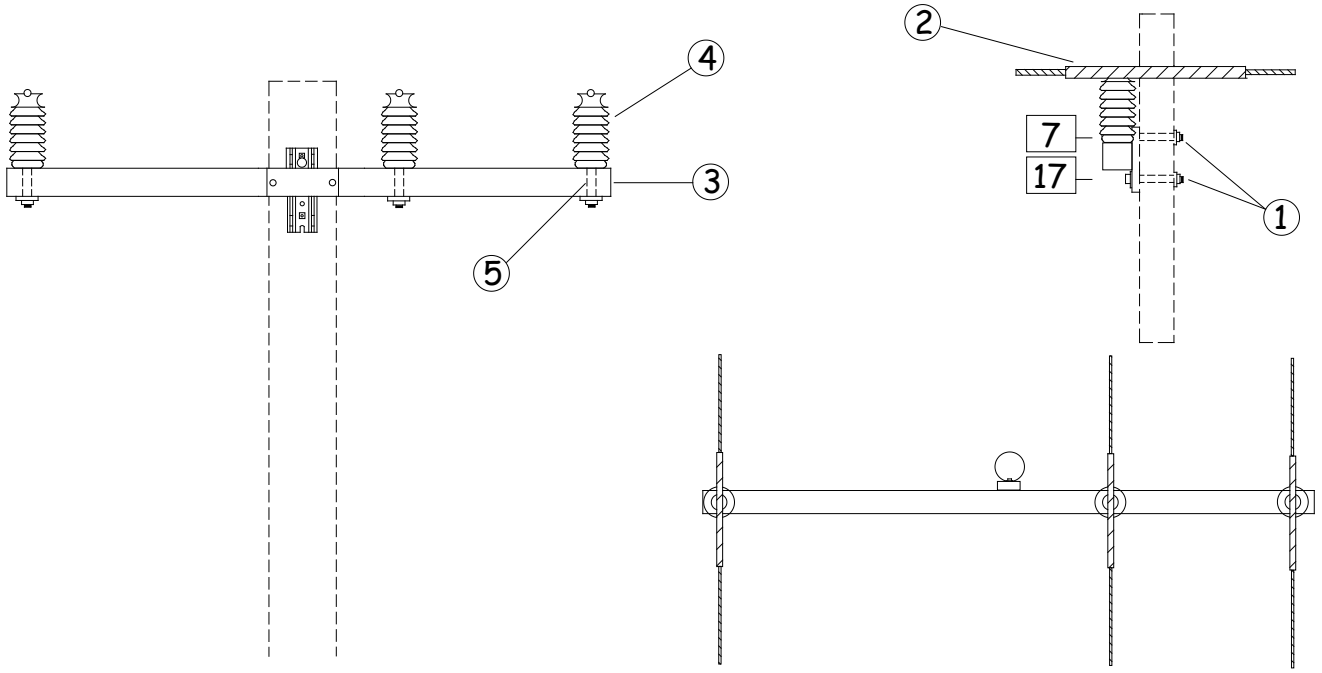
CXA FG 002 (TANGENT)



T1-5

0 TO 5 DEGREE ANGLE – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2/0CU, 4/0CU, 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

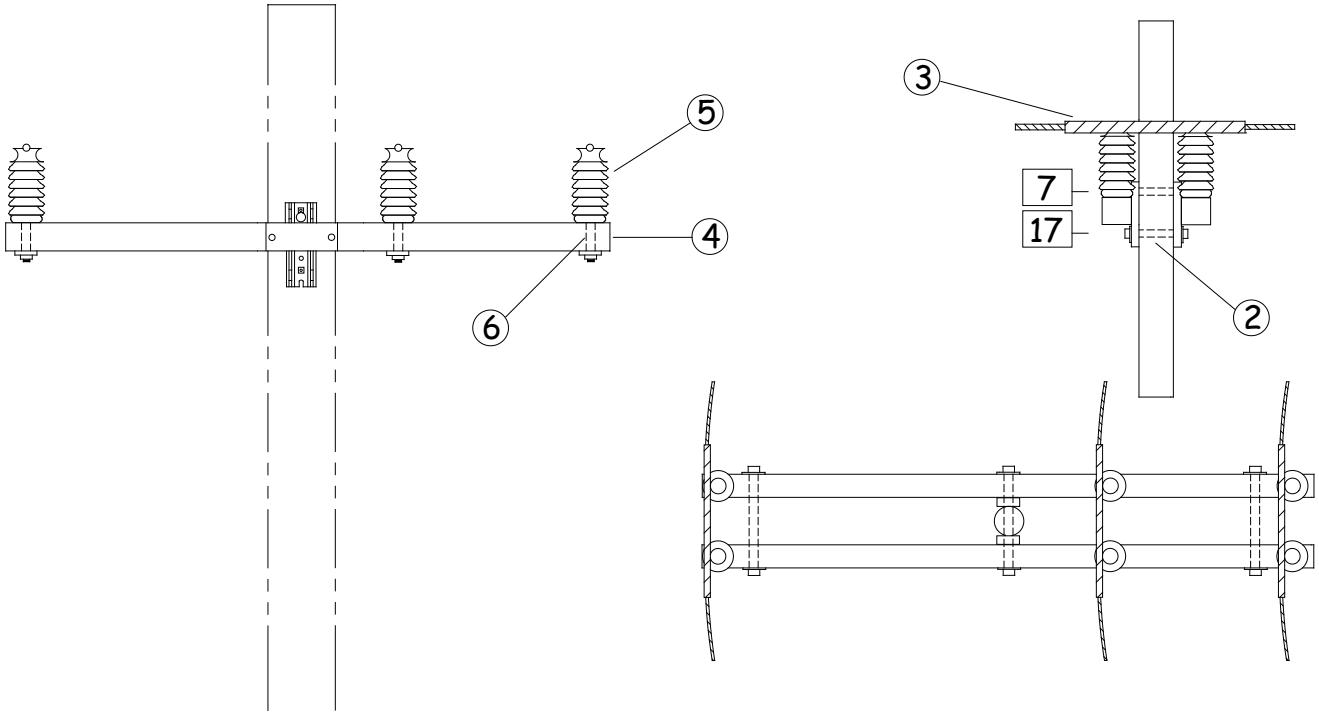


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 021	2	BOLT, MACHINE, 5/8X16
2	COB TW 005	12	CONDUCTOR, EC GRADE 4AAC
3	CXA FG 002	1	CROSSARM, FIBERGLASS TANGENT, 3 5/8" X 4 5/8" X 10', 39 LBS
4	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5KV
5	STU LI 003	3	STUD, LINE POST, 3/4 IN. HEAD, 3/4 IN. DIA. X 7 IN. SHANK
6	WAS RD 004	4	WASHER, ROUND, 1-3/4 IN., FOR 5/8 IN. DIA. BOLT
7	WAS RD 005	6	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
8	WAS SF 003	7	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SP 001	2	WASHER, SPRING, DOUBLE HELIX, FOR 5/8 IN. DIA. BOLT
10	WAS SP 002	5	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

T2-5

5 TO 10 DEGREE ANGLE – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2/0CU, 4/0CU, 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

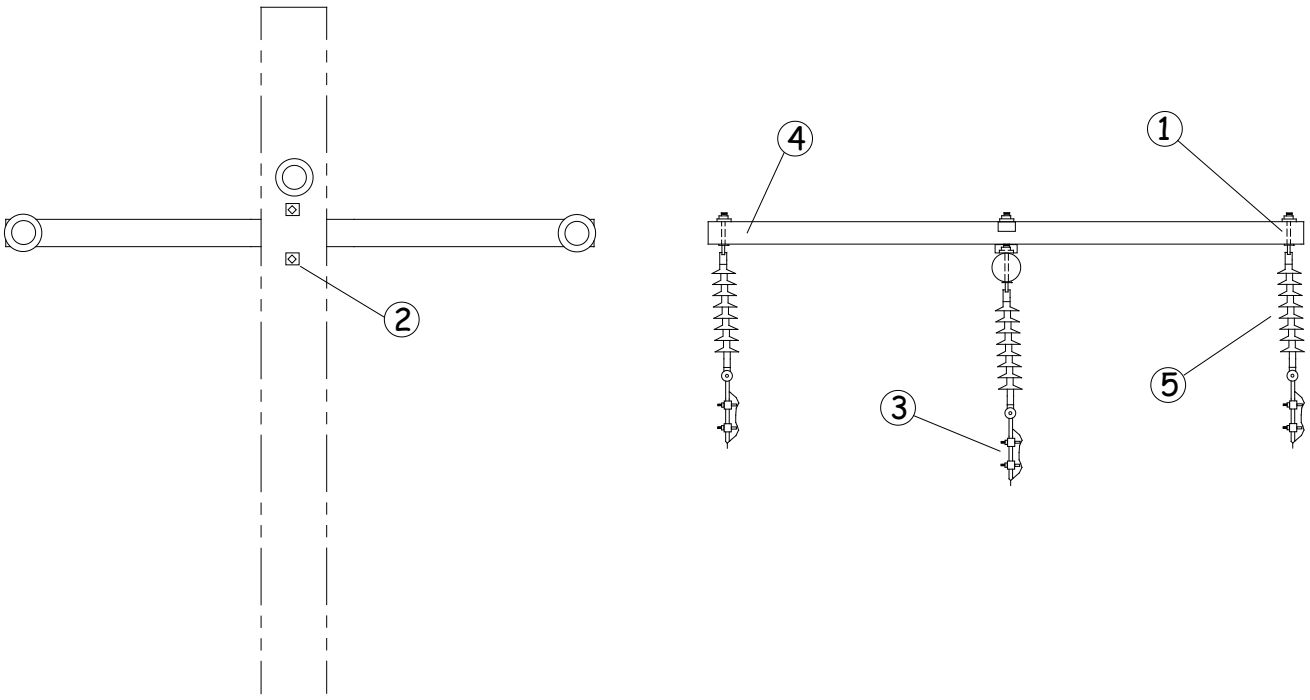


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 021	3	BOLT, DOUBLE ARMING, 3/4X26
2	BOL MS 021	2	BOLT, MACHINE, 5/8X16
3	COB TW 005	24	CONDUCTOR, EC GRADE 4AAC
4	CXA FG 002	2	CROSSARM, FIBERGLASS TANGENT, 3 5/8" X 4 5/8" X 10', 39 LBS
5	INS VP 001	6	INSULATOR, VERTICAL POST, 34.5KV
6	STU LI 003	6	STUD, LINE POST, 3/4 IN. HEAD, 3/4 IN. DIA. X 7 IN. SHANK
7	WAS RD 004	4	WASHER, ROUND, 1-3/4 IN., FOR 5/8 IN. DIA. BOLT
8	WAS RD 005	7	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SF 003	8	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
10	WAS SP 001	2	WASHER, SPRING, DOUBLE HELIX, FOR 5/8 IN. DIA. BOLT
11	WAS SP 002	6	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

T5-5

DEADEND – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2/0CU, 4/0CU, 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

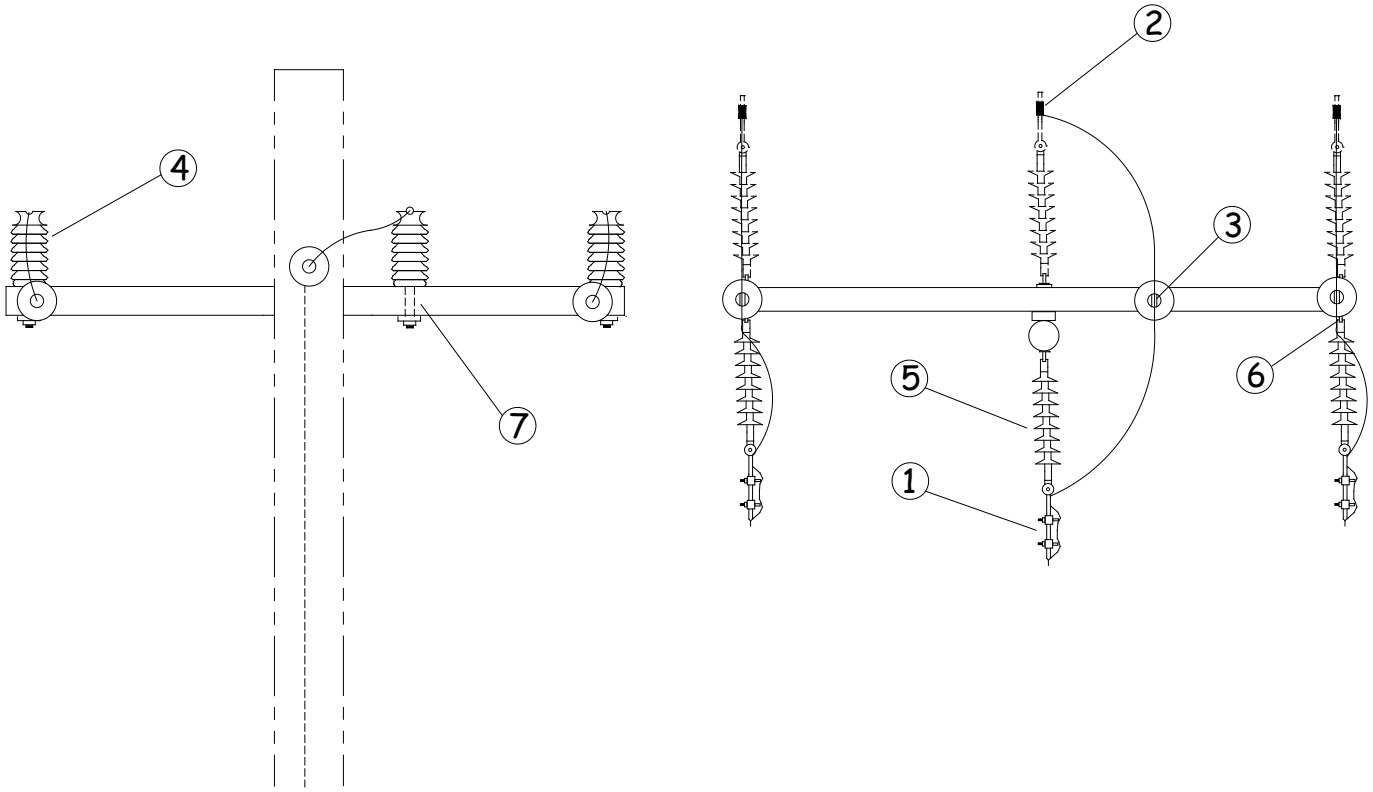


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 021	3	BOLT, DOUBLE ARMING, 3/4X26
2	BOL MS 037	2	BOLT, MACHINE, 3/4X16
3	CLA SS ***	3	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	CXA FG 001	1	CROSSARM, FIBERGLASS DEADEND, 3 5/8" X 4 5/8" X 10', 63 LBS
5	INS CO 001	3	INSULATOR, DEADEND, POLYMER, 27KV
6	NUT EY 003	3	NUT, EYE 3/4
7	WAS RD 005	5	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
8	WAS SF 003	10	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SP 002	5	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

T6-5

EXTENSION OF EXISTING DEADEND – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2/0CU, 4/0CU, 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

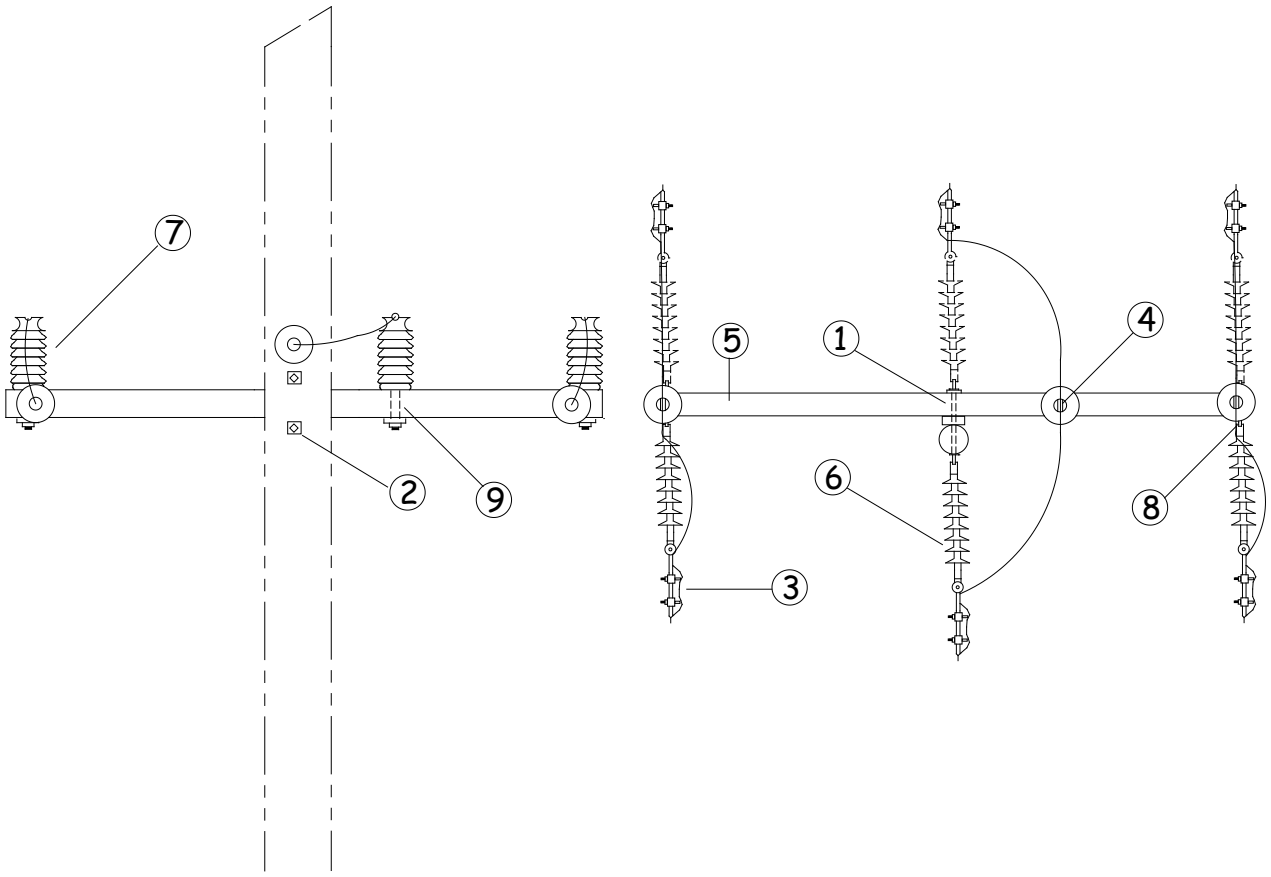


NO.	ITEM ID	QTY	DESCRIPTION
1	CLA SS ***	3	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
2	CNN ** ***	3	GENERAL CODE FOR CONNECTOR
3	COB ** ***	12	GENERAL CODE FOR TIE WIRE
4	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5KV
5	INS CO 001	3	INSULATOR, DEADEND, POLYMER, 27KV
6	NUT EY 003	3	NUT, EYE 3/4
7	STU LI 003	3	STUD, LINE POST, 3/4 IN. DIA. HEAD, 3/4 IN. DIA. X 7 IN. SHANK
8	WAS SF 003	3	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

T8-5

DOUBLE DEADEND – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2/0CU, 4/0CU, 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

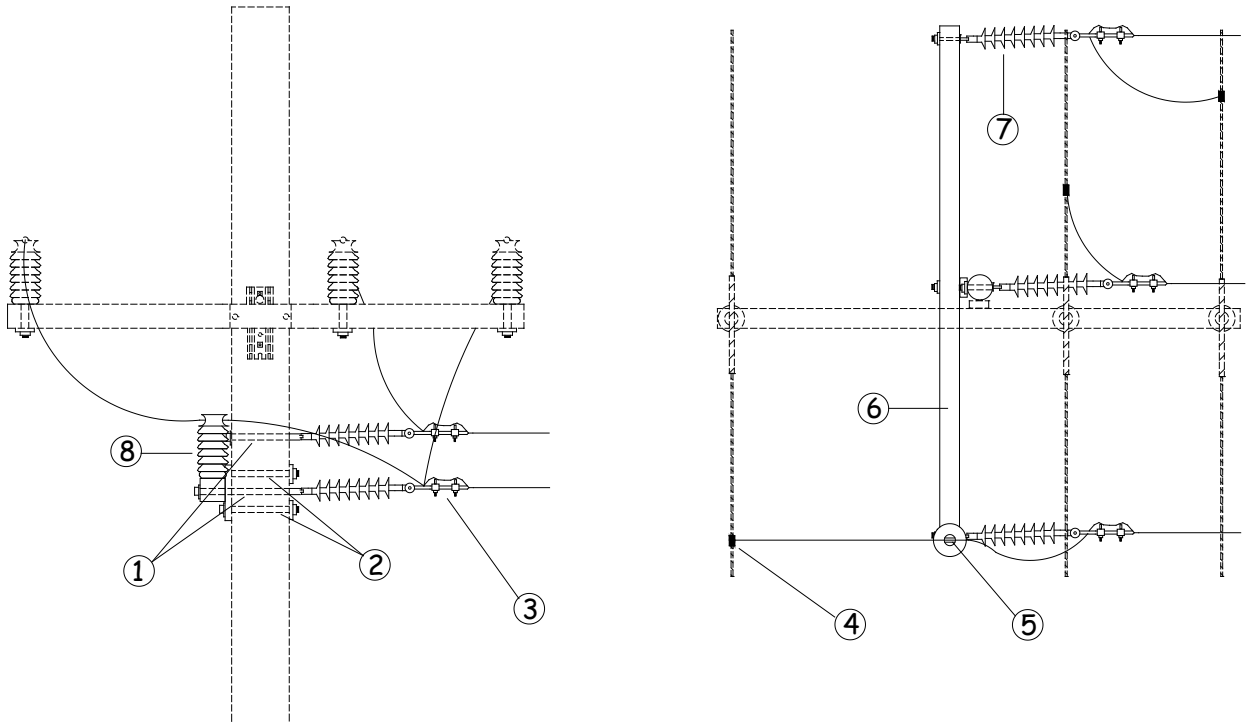


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 021	3	BOLT, DOUBLE ARMING, 3/4X26
2	BOL MS 037	2	BOLT, MACHINE, 3/4X16
3	CLA SS ***	3	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	COB ** ***	12	GENERAL CODE FOR TIE WIRE
5	CXA FG 001	1	CROSSARM, FIBERGLASS DEADEND, 3 5/8" X 4 5/8" X 10', 63 LBS
6	INS CO 001	6	INSULATOR, DEADEND, POLYMER, 27KV
7	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5KV
8	NUT EY 003	6	NUT, EYE 3/4
9	STU LI 003	3	STUD, LINE POST, 3/4 IN. DIA. HEAD, 3/4 IN. DIA. X 7 IN. SHANK
10	WAS RD 005	2	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SF 003	16	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
12	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

T20-5

TAP – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2/0CU, 4/0CU, 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

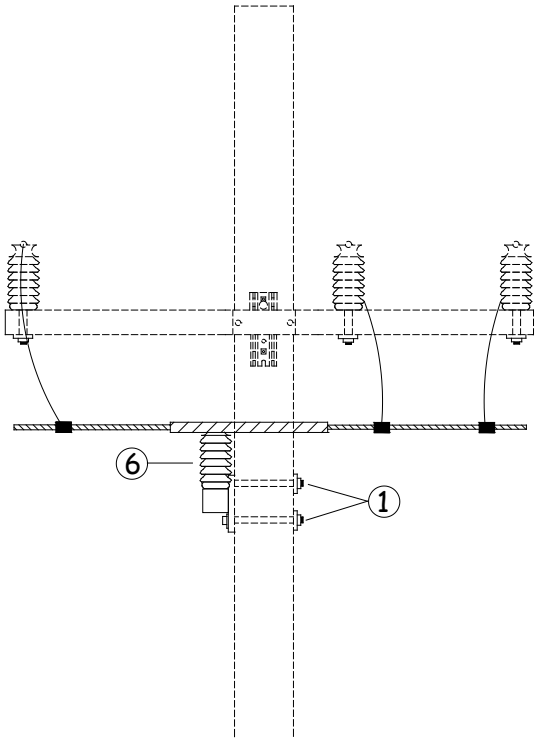


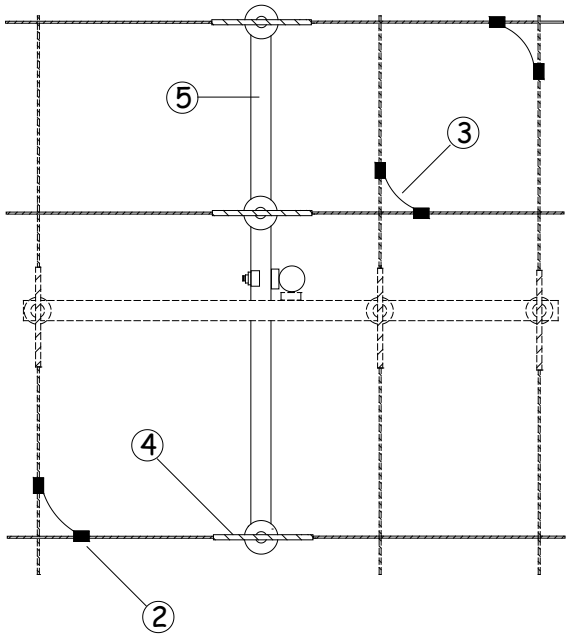
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 021	3	BOLT, DOUBLE ARMING, 3/4X26
2	BOL MS 037	2	BOLT, MACHINE, 3/4X16
3	CLA SS ***	3	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	CNN ** ***	3	GENERAL CODE FOR CONNECTOR
5	COB ** ***	8	GENERAL CODE FOR TIE WIRE
6	CXA FG 001	1	CROSSARM, FIBERGLASS DEADEND, 3 5/8" X 4 5/8" X 10', 63 LBS
7	INS CO 001	3	INSULATOR, DEADEND, POLYMER, 27KV
8	INS VP 001	1	INSULATOR, VERTICAL POST, 34.5KV
9	NUT EY 003	3	NUT, EYE 3/4
10	STU LI 003	1	STUD, LINE POST, 3/4 IN. DIA. HEAD, 3/4 IN. DIA. X 7 IN. SHANK
11	WAS RD 005	2	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
12	WAS SF 003	12	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
13	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

T22-5

0 TO 5 DEGREE ANGLE CROSS TAP – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2/0CU, 4/0CU, 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE



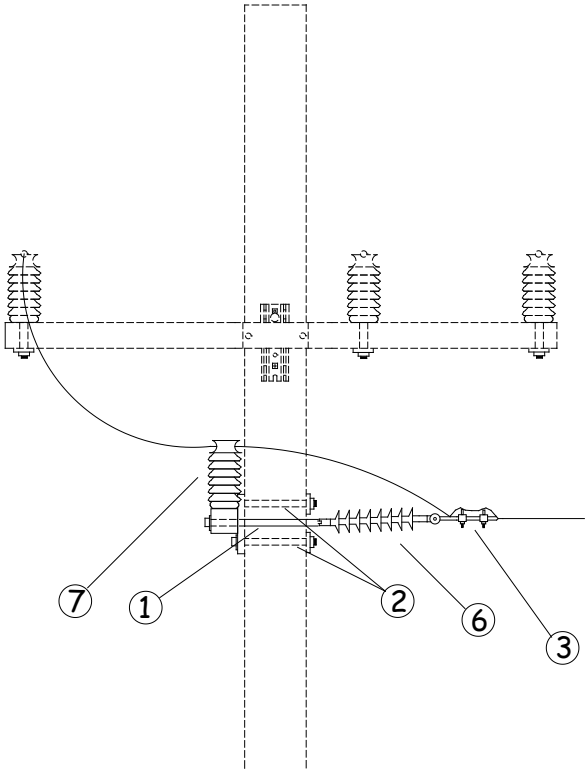


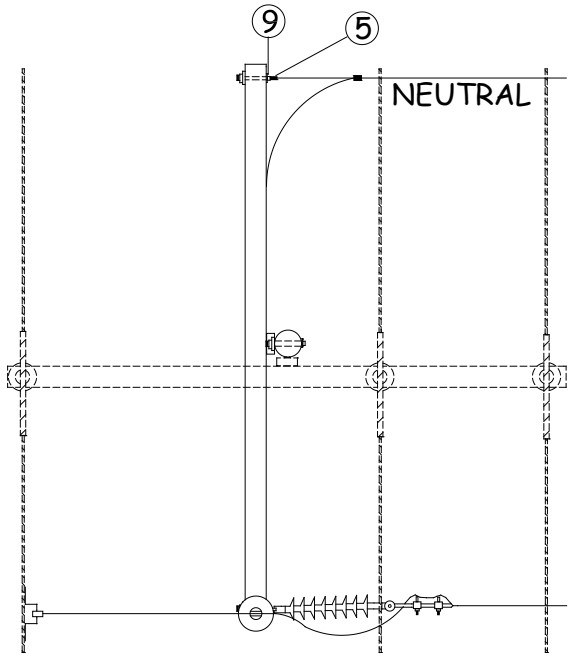
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 021	2	BOLT, MACHINE, 5/8X16
2	CNN ** ***	6	GENERAL CODE FOR CONNECTOR
3	COB CO ***	24	GENERAL CODE FOR CONDUCTOR
4	COB TW 005	12	CONDUCTOR, EC GRADE 4AAC
5	CXA FG 002	1	CROSSARM, FIBERGLASS TANGENT, 3 5/8" X 4 5/8" X 10', 39 LBS
6	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5KV
7	STU LI 003	3	STUD, LINE POST, 3/4 IN. HEAD, 3/4 IN. DIA. X 7 IN. SHANK
8	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN., FOR 5/8 IN. DIA. BOLT
9	WAS RD 005	8	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
10	WAS SF 003	6	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SP 001	2	WASHER, SPRING, DOUBLE HELIX, FOR 5/8 IN. DIA. BOLT
12	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

VA20-1

TAP OFF EXISTING T1-5 OR T2-5 – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2, 1/0
BOLT PLATE: NONE



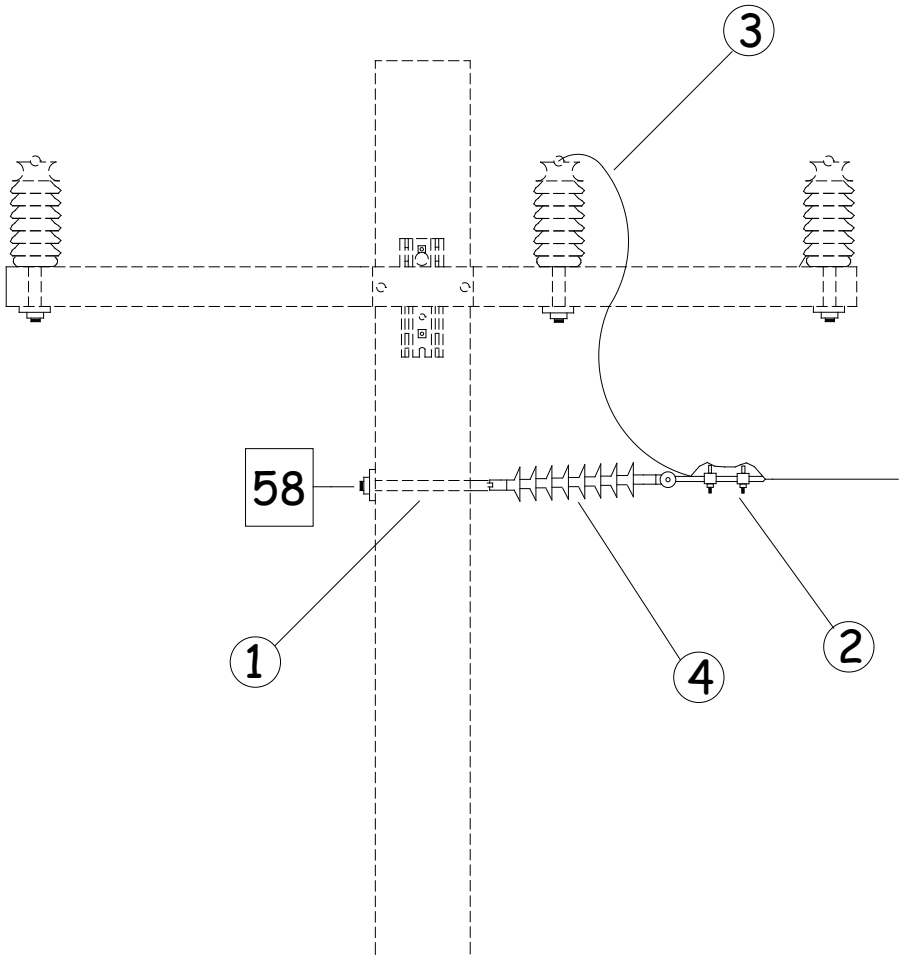


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
2	BOL MS 037	2	BOLT, MACHINE, 3/4X16
3	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	CXA FG 001	1	CROSSARM, FIBERGLASS DEADEND, 3 5/8" X 4 5/8" X 10', 63 LBS
5	GRI PR 001	1	GRIP, PREFORMED, 3 NO 6 AW
6	INS CO 001	1	INSULATOR, DEADEND, POLYMER
7	INS VP 001	1	INSULATOR, VERTICAL POST, 34.5KV
8	NUT EY 003	1	NUT, EYE 3/4
9	NUT TE 002	1	NUT, THIMBLE EYE, 3/4, SINGLE EYE
10	STU LI 002	1	STUD, LINE POST, 3/4 IN. HEAD, 5/8 IN. DIA. X 7 IN. SHANK
11	WAS RD 005	4	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
12	WAS SF 003	11	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
13	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

VA20-5

TAP OFF EXISTING T1 OR T2 – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2, 1/0
BOLT PLATE: NONE

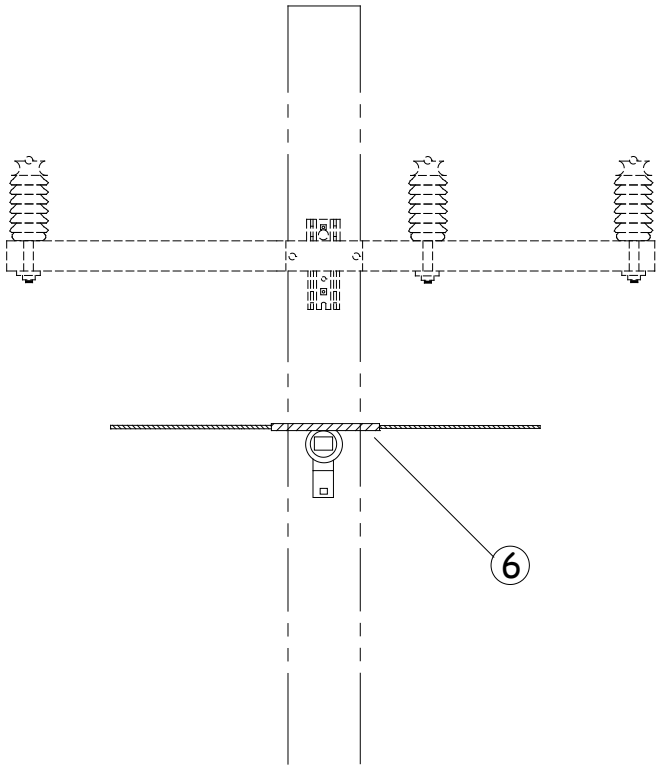


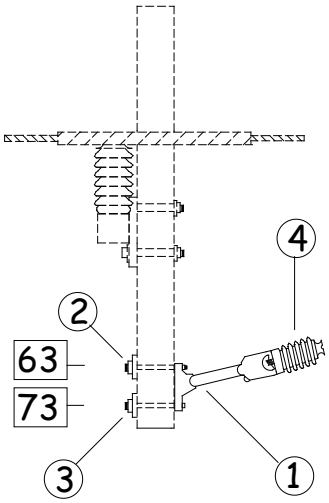
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
2	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
3	COB CO ***	10	GENERAL CODE FOR CONDUCTOR
4	INS CO 001	1	INSULATOR, DEADEND, POLYMER, 27KV
5	NUT EY 003	1	NUT, EYE 3/4
6	WAS RD 005	2	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
7	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
8	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

VA22-5

0 TO 5 DEGREE CROSS – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2, 1/0
BOLT PLATE: NONE



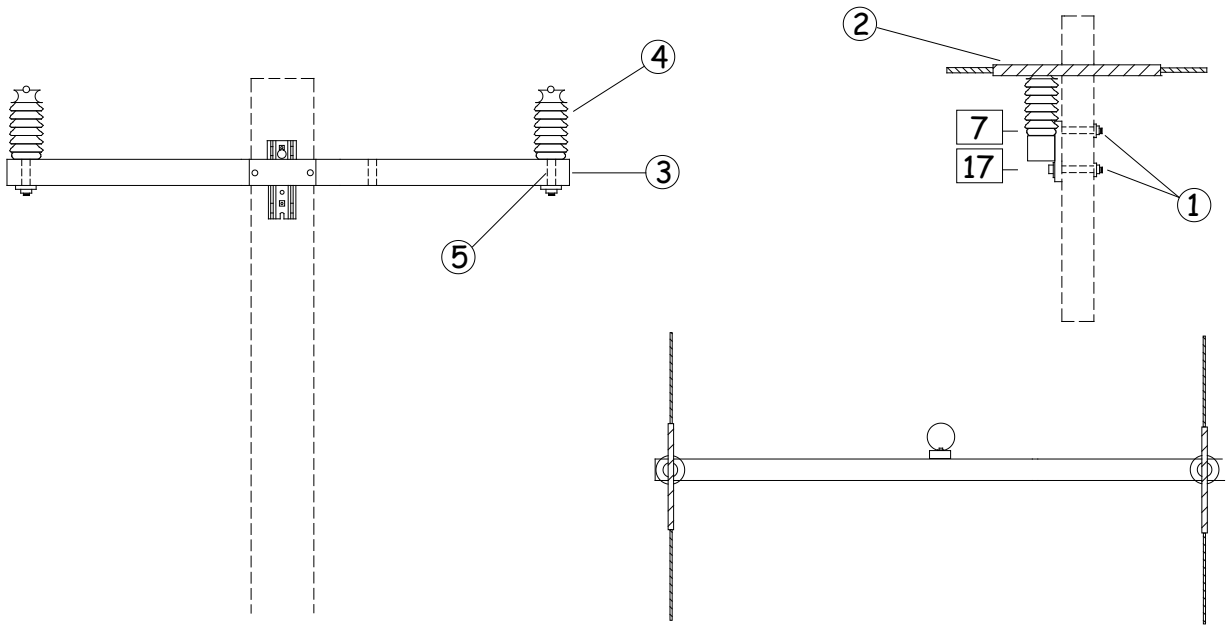


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	1	BRACKET, FIBERGLASS STANDOFF, 18 IN., 2 IN. ROD
2	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
3	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD, 3/4X12
4	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5KV
5	STU LI 001	1	STUD, LINE POST, 3/4 IN. HEAD, 3/4 IN. DIA. X 1-3/4 IN. SHANK
6	TIE PR ***	1	GENERAL CODE FOR PREFORMED TIE
7	WAS RD 005	4	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
8	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

VB1-5

0 TO 5 DEGREE ANGLE – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2, 1/0
BOLT PLATE: NONE

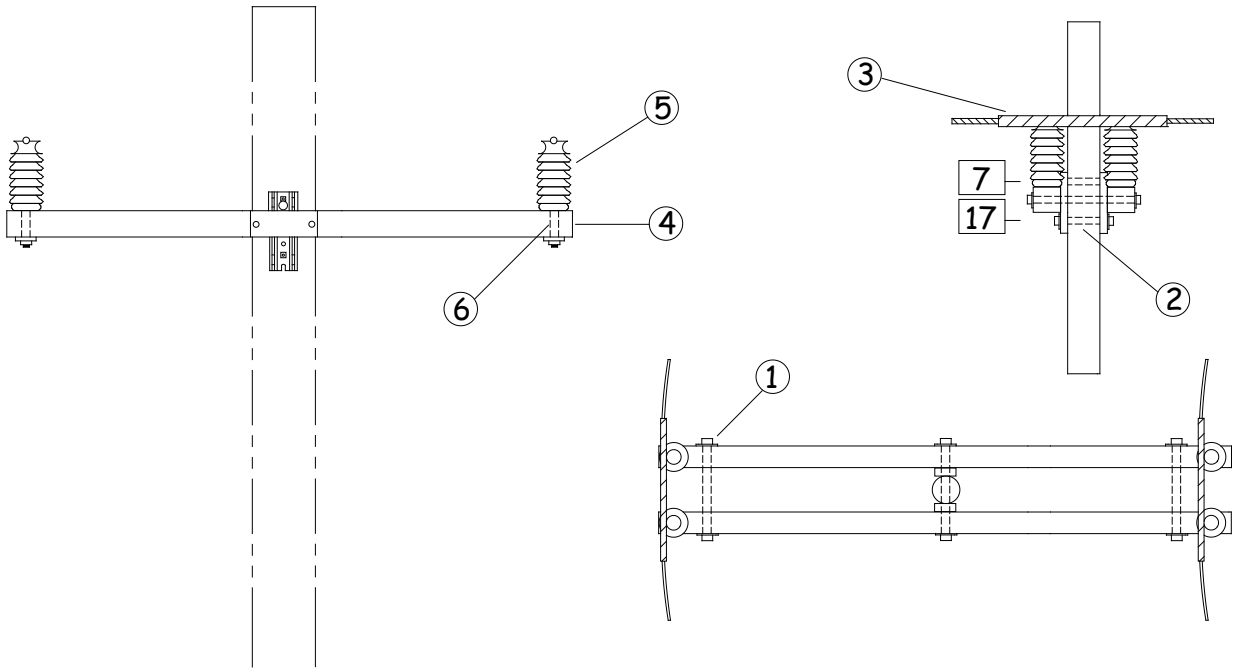


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 021	2	BOLT, MACHINE, 5/8X16
2	COB TW 005	8	CONDUCTOR, EC GRADE 4AAC
3	CXA FG 002	1	CROSSARM, FIBERGLASS TANGENT, 3 5/8" X 4 5/8" X 10', 39 LBS
4	INS VP 001	2	INSULATOR, VERTICAL POST, 34.5KV
5	STU LI 003	2	STUD, LINE POST, 3/4 IN. HEAD, 3/4 IN. DIA. X 7 IN. SHANK
6	WAS RD 004	3	WASHER, ROUND, 1-3/4 IN., FOR 5/8 IN. DIA. BOLT
7	WAS RD 005	5	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
8	WAS SF 003	6	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SP 001	2	WASHER, SPRING, DOUBLE HELIX, FOR 5/8 IN. DIA. BOLT
10	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

VB2-5

5 TO 10 DEGREE ANGLE – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2, 1/0
BOLT PLATE: NONE

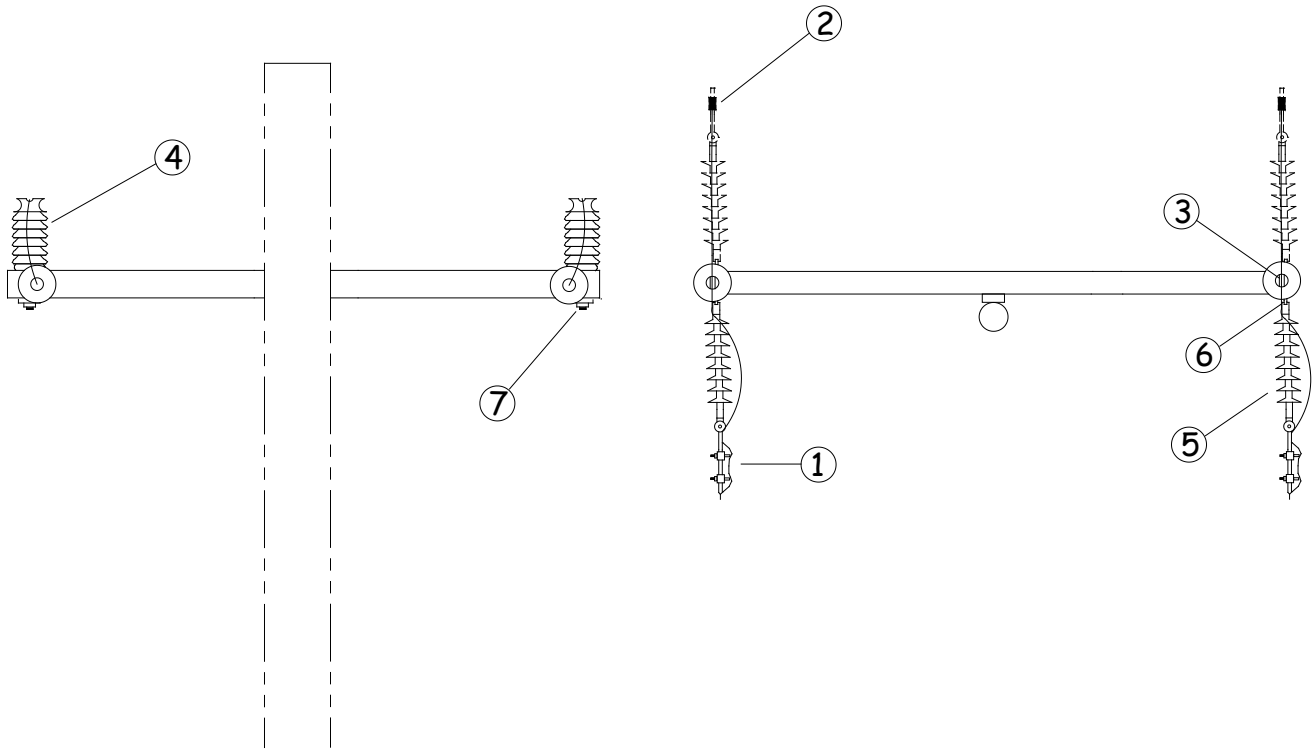


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 021	2	BOLT, DOUBLE ARMING, 3/4X26
2	BOL MS 021	2	BOLT, MACHINE, 5/8X16
3	COB TW 005	16	CONDUCTOR, EC GRADE 4AAC
4	CXA FG 002	2	CROSSARM, FIBERGLASS TANGENT, 3 5/8" X 4 5/8" X 10', 39 LBS
5	INS VP 001	4	INSULATOR, VERTICAL POST, 34.5KV
6	STU LI 003	4	STUD, LINE POST, 3/4 IN. HEAD, 3/4 IN. DIA. X 7 IN. SHANK
7	WAS RD 004	4	WASHER, ROUND, 1-3/4 IN., FOR 5/8 IN. DIA. BOLT
8	WAS RD 005	7	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SF 003	8	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
10	WAS SP 001	2	WASHER, SPRING, DOUBLE HELIX, FOR 5/8 IN. DIA. BOLT
11	WAS SP 002	6	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

VB6-5

EXTENSION OF EXISTING DEADEND – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2, 1/0
BOLT PLATE: NONE

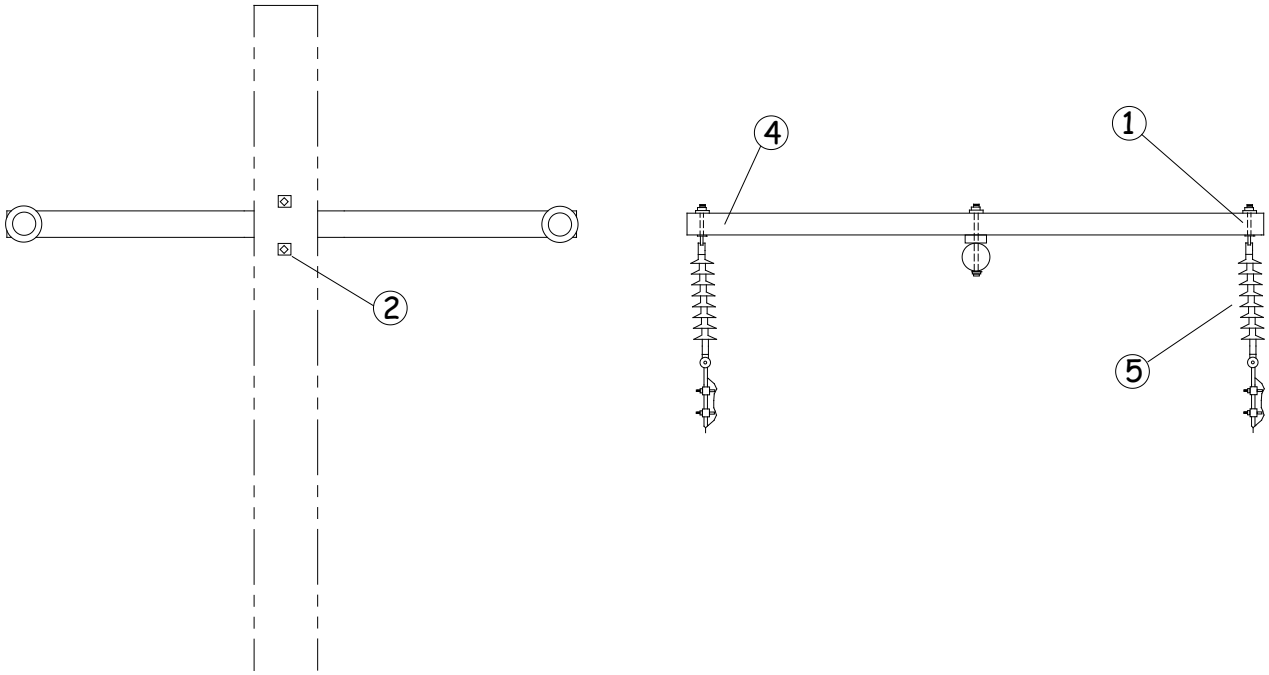


NO.	ITEM ID	QTY	DESCRIPTION
1	CLA SS ***	2	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
2	CNN ** ***	2	GENERAL CODE FOR CONNECTOR
3	COB ** ***	8	GENERAL CODE FOR TIE WIRE
4	INS VP 001	2	INSULATOR, VERTICAL POST, 34.5KV
5	INS CO 001	2	INSULATOR, DEADEND, POLYMER, 27KV
6	NUT EY 003	2	NUT, EYE 3/4
7	STU LI 003	2	STUD, LINE POST, 3/4 IN. DIA. HEAD, 3/4 IN. DIA. X 7 IN. SHANK
8	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

VB7-5

DEADEND – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2, 1/0
BOLT PLATE: NONE

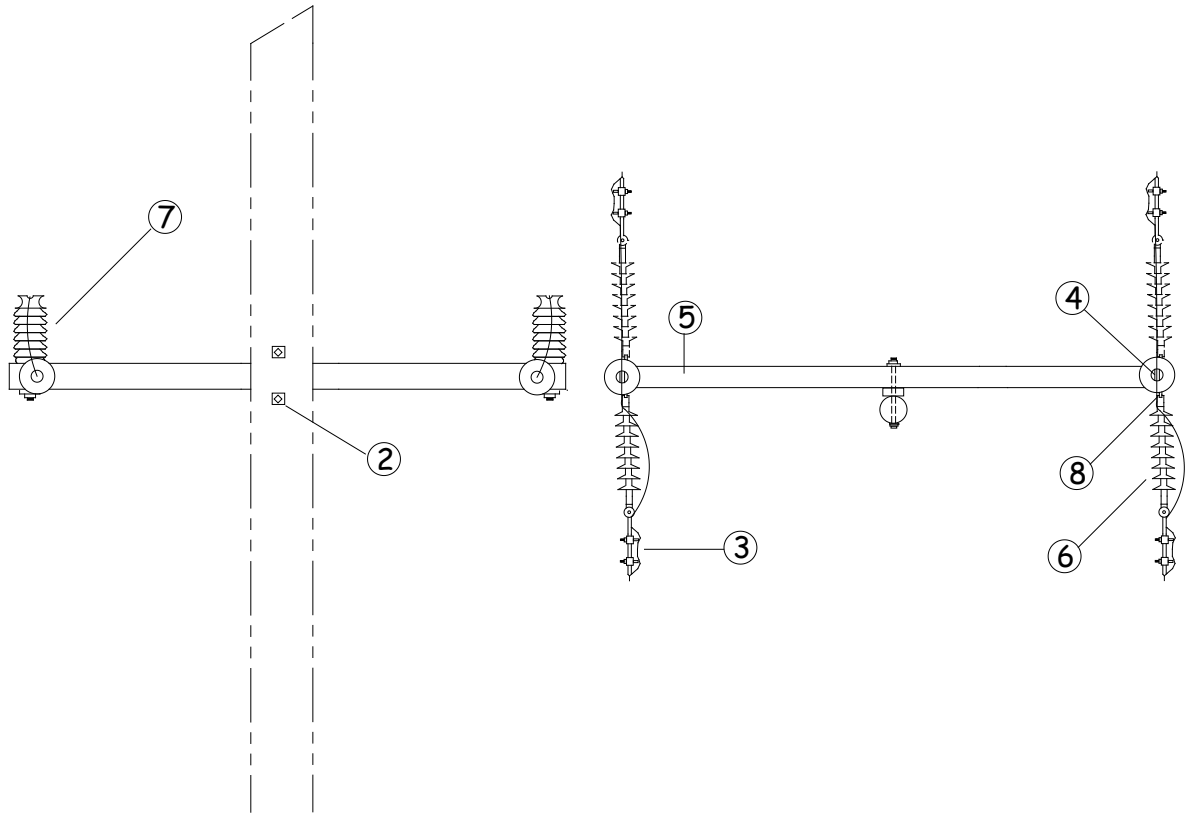


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 021	3	BOLT, DOUBLE ARMING, 3/4X26
2	BOL MS 037	2	BOLT, MACHINE, 3/4X16
3	CLA SS ***	3	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	CXA FG 001	1	CROSSARM, FIBERGLASS DEADEND, 3 5/8" X 4 5/8" X 10', 63 LBS
5	INS CO 001	3	INSULATOR, DEADEND, POLYMER, 27KV
6	NUT EY 003	3	NUT, EYE 3/4
7	WAS RD 005	5	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
8	WAS SF 003	10	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SP 002	5	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

VB8-5

DOUBLE DEADEND – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2, 1/0
BOLT PLATE: NONE

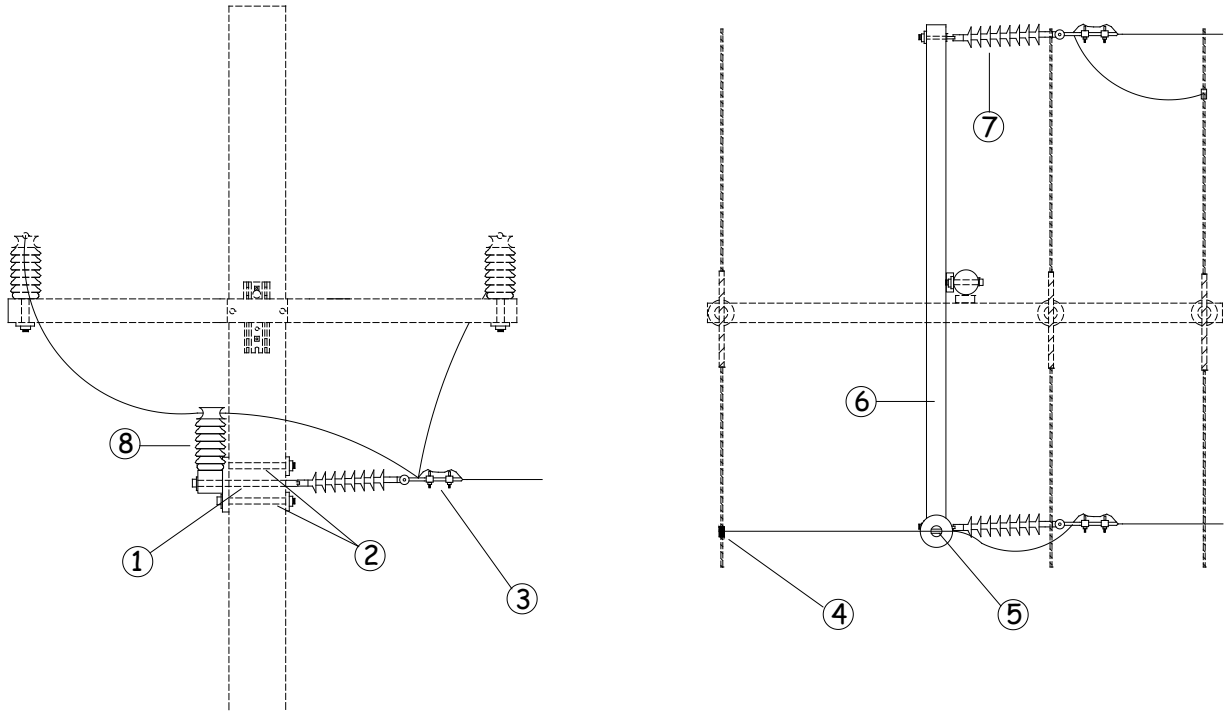


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 021	2	BOLT, DOUBLE ARMING, 3/4X26
2	BOL MS 037	2	BOLT, MACHINE, 3/4X16
3	CLA SS ***	2	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	COB ** ***	8	GENERAL CODE FOR TIE WIRE
5	CXA FG 001	1	CROSSARM, FIBERGLASS DEADEND, 3 5/8" X 4 5/8" X 10', 63 LBS
6	INS CO 001	4	INSULATOR, DEADEND, POLYMER, 27KV
7	INS VP 001	2	INSULATOR, VERTICAL POST, 34.5KV
8	NUT EY 003	4	NUT, EYE 3/4
9	STU LI 003	2	STUD, LINE POST, 3/4 IN. DIA. HEAD, 3/4 IN. DIA. X 7 IN. SHANK
10	WAS RD 005	2	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SF 003	16	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
12	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

VB20-5

TAP – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2, 1/0
BOLT PLATE: NONE

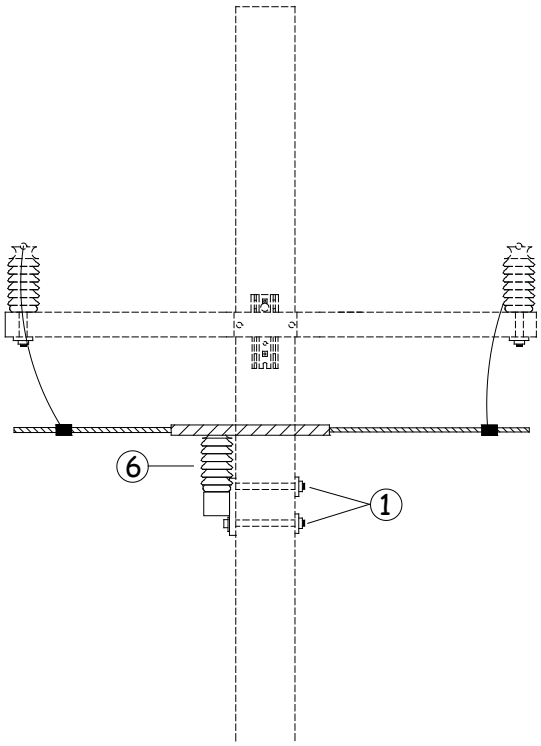


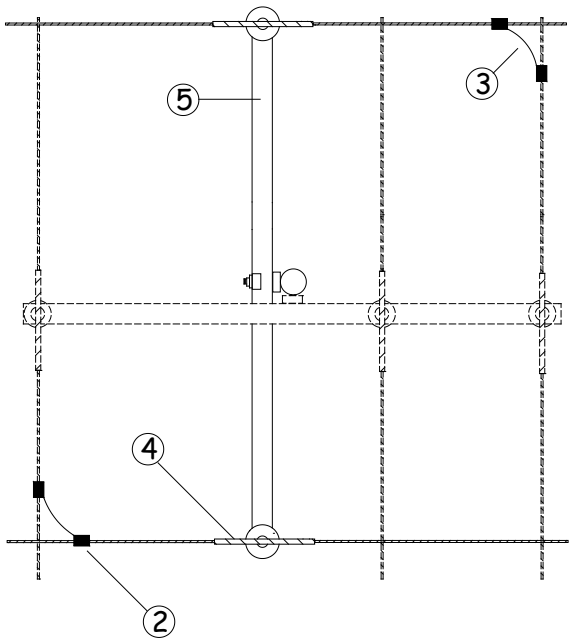
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 021	2	BOLT, DOUBLE ARMING, 3/4X26
2	BOL MS 037	2	BOLT, MACHINE, 3/4X16
3	CLA SS ***	2	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	CNN ** ***	2	GENERAL CODE FOR CONNECTOR
5	COB ** ***	8	GENERAL CODE FOR TIE WIRE
6	CXA FG 001	1	CROSSARM, FIBERGLASS DEADEND, 3 5/8" X 4 5/8" X 10', 63 LBS
7	INS CO 001	2	INSULATOR, DEADEND, POLYMER, 27KV
8	INS VP 001	1	INSULATOR, VERTICAL POST, 34.5KV
9	NUT EY 003	2	NUT, EYE 3/4
10	STU LI 003	1	STUD, LINE POST, 3/4 IN. DIA. HEAD, 3/4 IN. DIA. X 7 IN. SHANK
11	WAS RD 005	2	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
12	WAS SF 003	12	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
13	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

VB22-5

0 TO 5 DEGREE ANGLE – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2, 1/0
BOLT PLATE: NONE





NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 021	2	BOLT, MACHINE, 5/8X16
2	CNN ** ***	6	GENERAL CODE FOR CONNECTOR
3	COB CO ***	24	GENERAL CODE FOR CONDUCTOR
4	COB TW 005	12	CONDUCTOR, EC GRADE 4AAC
5	CXA FG 002	1	CROSSARM, FIBERGLASS TANGENT, 3 5/8" X 4 5/8" X 10', 39 LBS
6	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5KV
7	STU LI 003	3	STUD, LINE POST, 3/4 IN. HEAD, 3/4 IN. DIA. X 7 IN. SHANK
8	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN., FOR 5/8 IN. DIA. BOLT
9	WAS RD 005	8	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
10	WAS SF 003	6	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SP 001	2	WASHER, SPRING, DOUBLE HELIX, FOR 5/8 IN. DIA. BOLT
12	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

AERIAL CABLE

INTRODUCTION

All trees in the proximity of any JEA primary lines are trimmed cyclically. Most of this trimming provides sufficient 10 ft clearance, but there are certain locations where the standard clearance cannot be maintained due to a tree's type, preservation status, configuration, position, or growth rate. The foresters are the experts at analyzing these factors. Since standard clearance is encroached in these locations, primary conductors have the potential to sag or sway into the tree. These cases may provide an opportunity to implement aerial cable in order to prevent contact related faults.

Aerial cable is designed only for these cases in order to withstand intermittent brush contact with trees. The covering cannot tolerate continuous tree contact for prolonged periods and will eventually burn up and breakdown under such conditions. Also, the aerial cable will break if an overhanging branch falls on it (just like a bare conductor) and thus is not intended to protect against falling limbs in heavily canopied areas.

For any application other than this, the design engineer ought to receive input from System Analysis and the forester prior to plating or construction.

This Section has been revised to incorporate new design philosophies with respect to aerial cable or "tree" cable. Compact construction using spacers and a supporting messenger is no longer used. The new design uses our standard spacing and construction other than the new plates added to this Section. The old aerial cable standards are still shown in this Section, but they are for reference only and should not be used for new construction.

CONSTRUCTION GUIDELINES

1) Aerial cable shall NOT be installed on any insulators other than the polyethylene insulators as shown in these standards. Failure to do this, could cause damage to the conductor insulation and jeopardize the integrity of the installation.

2) Only insulated tie-wire (COBTW004) shall be used to tie the conductor to the insulator.

3) Arresters shall be used at ALL points where the insulation is stripped away or the conductor is deadended.

4) Only 1/0 AAAC is available at this time for construction - plate C.1/0SP

5) The preferred construction standard for single-phase installations is plate "AE2". This standard uses the fiberglass standoff bracket for improved structure BIL. The standard metal standoff bracket is utilized for multiple phase construction.

6) Other construction notes can be found on the plate pages themselves.

7) Aerial cable shall NOT be installed where it is in direct contact with trees and other vegetation.

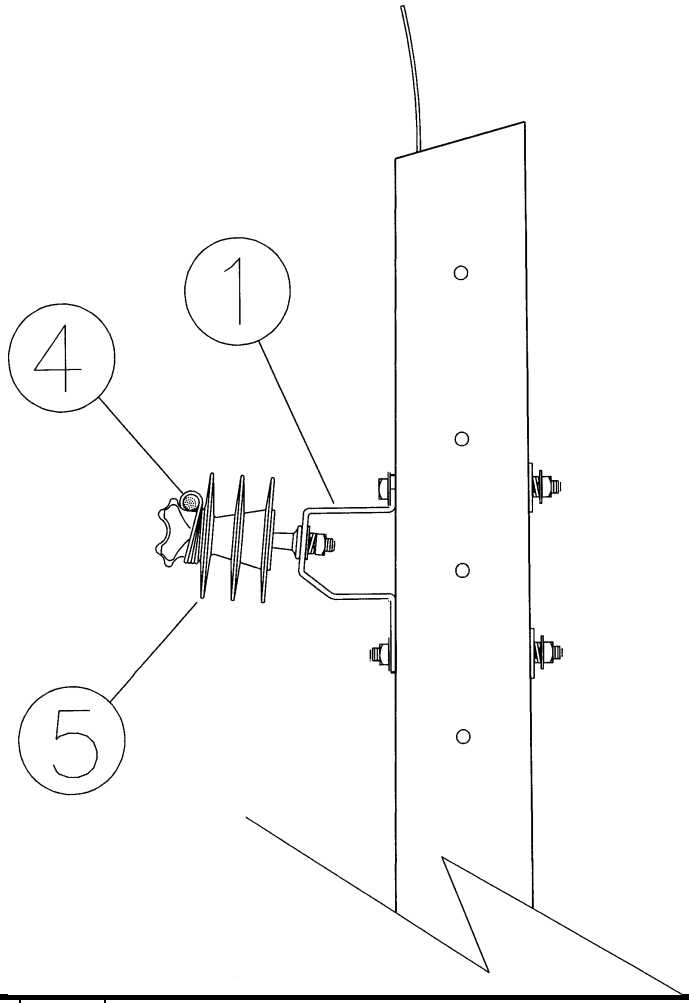
8) For new construction and maintenance, aerial cable is not to be used in situations where a recloser is the upstream protective device.

AE1

TANGENT TO 10 DEGREE ANGLE – UNSHIELDED

OPTIONS: 1/0

BOLT PLATE: NONE

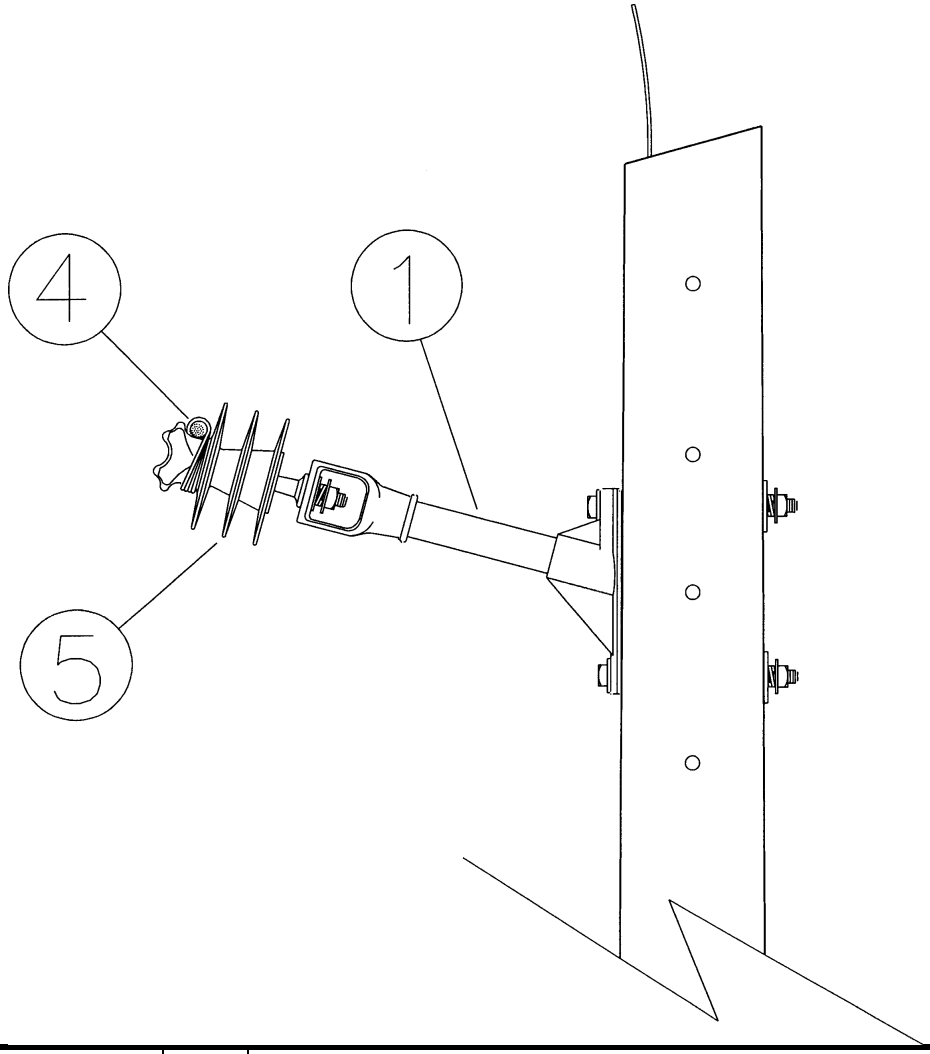


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT IN 007	1	BRACKET, INSULATOR STANDOFF 6 IN.
2	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
3	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD, 3/4X12
4	COB TW 004	6	CONDUCTOR, TIE WIRE, INSULATED, #4 AL.
5	INS PT 002	1	INSULATOR, PIN TYPE, 35KV, POLYETHYLENE
6	PIN IN 003	1	PIN, SHORT SHANK INSULATOR, 15/35KV, 3/4X7
7	WAS RD 005	5	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
8	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

AE2

TANGENT TO 10 DEGREE ANGLE – UNSHIELDED

OPTIONS: 1/0
BOLT PLATE: NONE

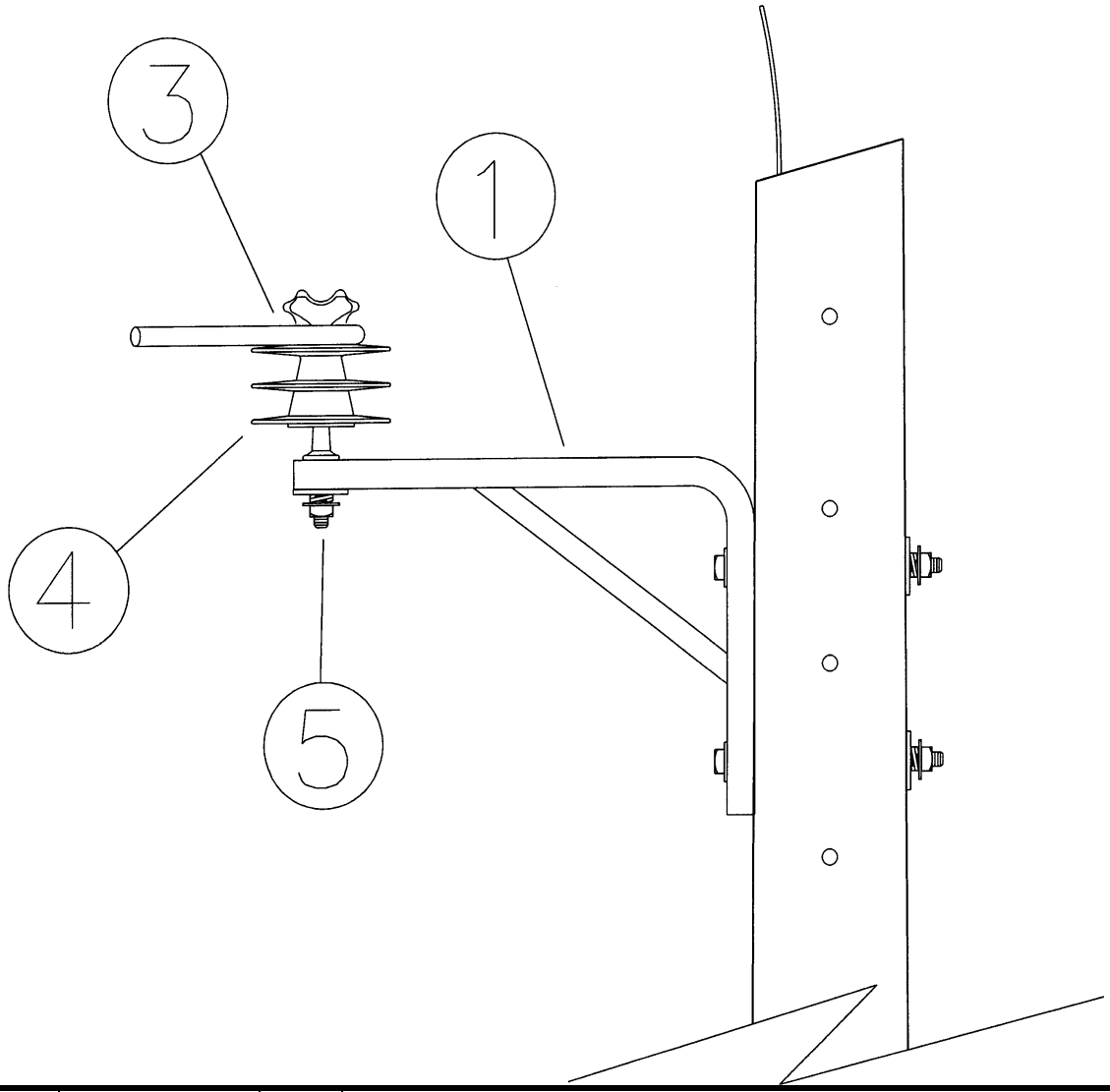


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT FS 001	1	BRACKET, FIBERGLASS STANDOFF, 2 INCH ROD
2	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
3	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD, 3/4X14
4	COB TW 004	6	CONDUCTOR, TIE WIRE, INSULATED, #4 AL.
5	INS PT 002	1	INSULATOR, PIN TYPE, 35KV, POLYETHYLENE
6	PIN IN 003	1	PIN, SHORT SHANK INSULATOR, 15/35KV, 3/4X7
7	WAS RD 005	5	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
8	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
9	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

AE3

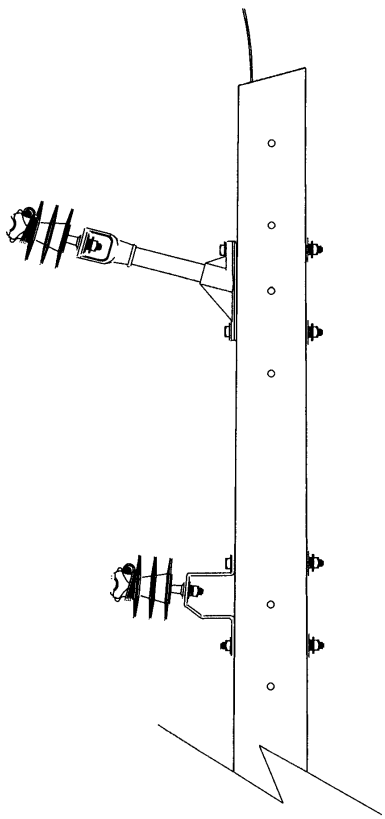
ANGLE – 10 TO 60 DEGREE ANGLE – UNSHIELDED

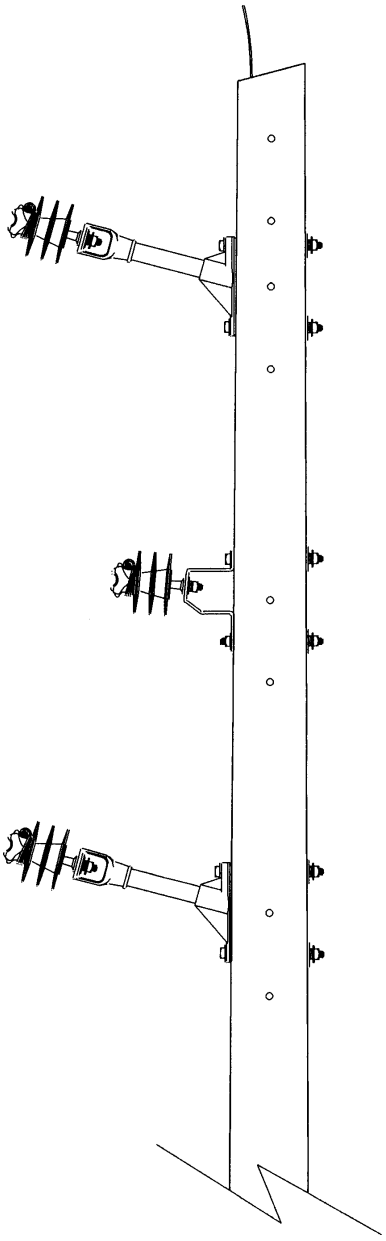
OPTIONS: 1/0
BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	BKT AE 001	1	BRACKET, AERIAL CABLE
2	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
3	COB TW 004	6	CONDUCTOR, TIE WIRE, INSULATED, #4 AL.
4	INS PT 002	1	INSULATOR, PIN TYPE, 35KV, POLYETHYLENE
5	PIN IN 003	1	PIN, SHORT SHANK INSULATOR, 15/35KV, 3/4X7
6	WAS RD 005	5	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
7	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
8	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

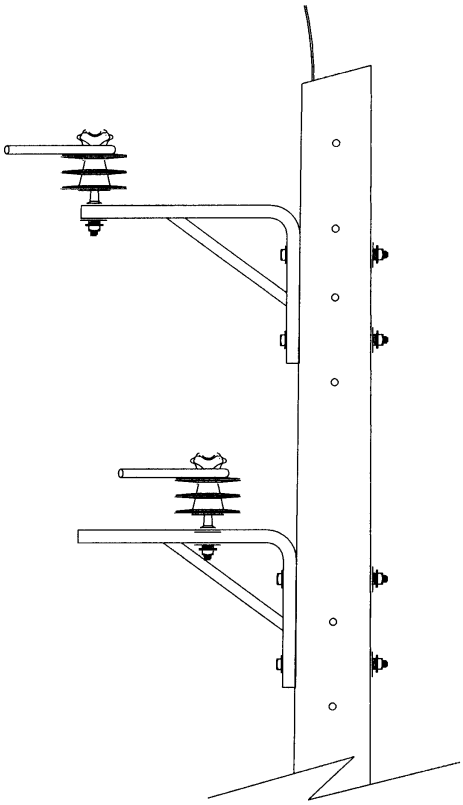
TANGENT TO 10 DEGREE ANGLES – MULTI-PHASES

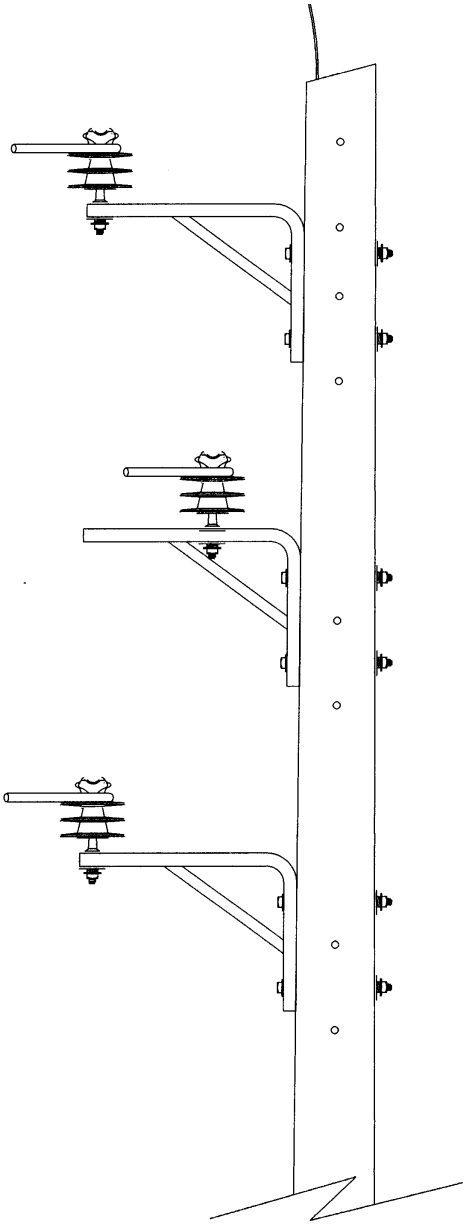




NOTE: AE1 and AE2 plates are used to create multi-phase structures. Conductor is staggered as shown to help prevent a phase-to-phase current path created by Spanish moss or other debris hanging on the conductor.

ANGLE – 10 TO 60 DEGREE ANGLE – UNSHIELDED



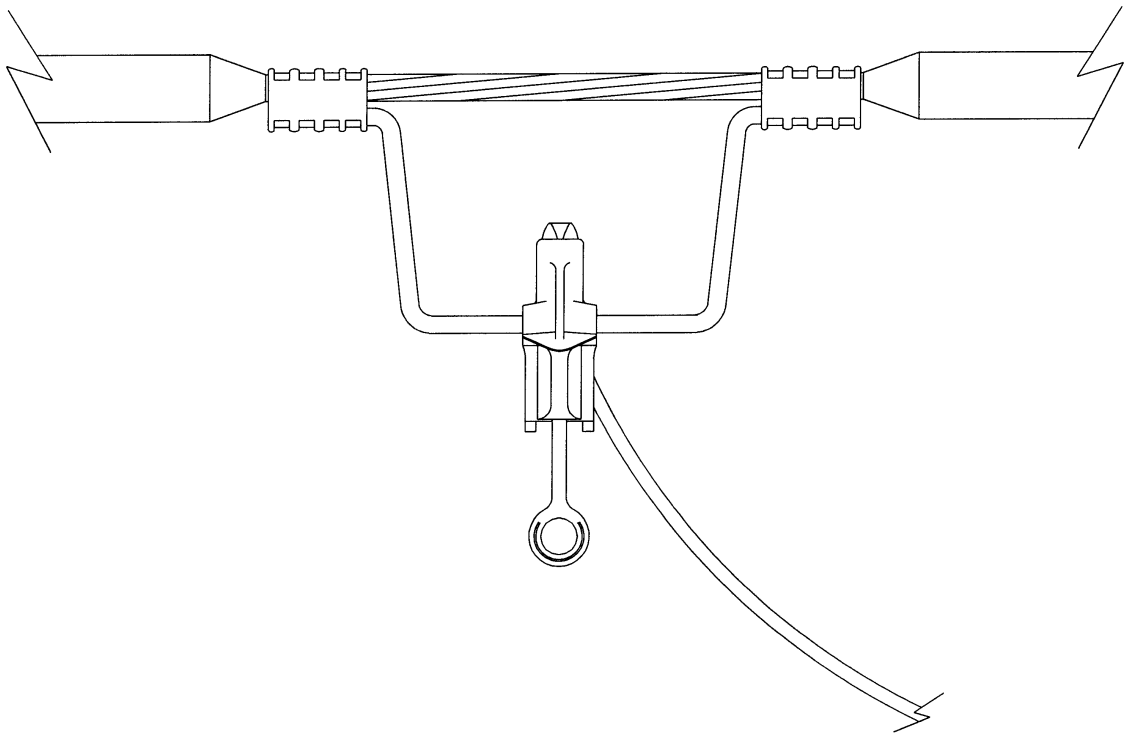


NOTE: AE3 insulator bracket has two insulator mounting points to create multi-phase structures. Conductor is staggered as shown to help prevent a phase-to-phase current path created by Spanish moss or other debris hanging on the conductor.

DHLC

HOT-LINE CLAMP FOR AERIAL CABLE

OPTIONS: 1/0
BOLT PLATE: NONE

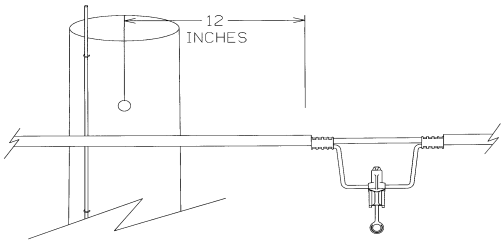


NOTE: Hot-line clamp is the same for normal construction. Remove the insulation as shown or use a stripper to avoid nicking the conductor. Remove only enough insulation in order to install the stirrup. If possible, seal the area between the connector and the insulation with rubber tape covered with 3m "33" pvc tape.

Arresters must be installed wherever the conductor insulation is stripped away or the conductor is deadended.

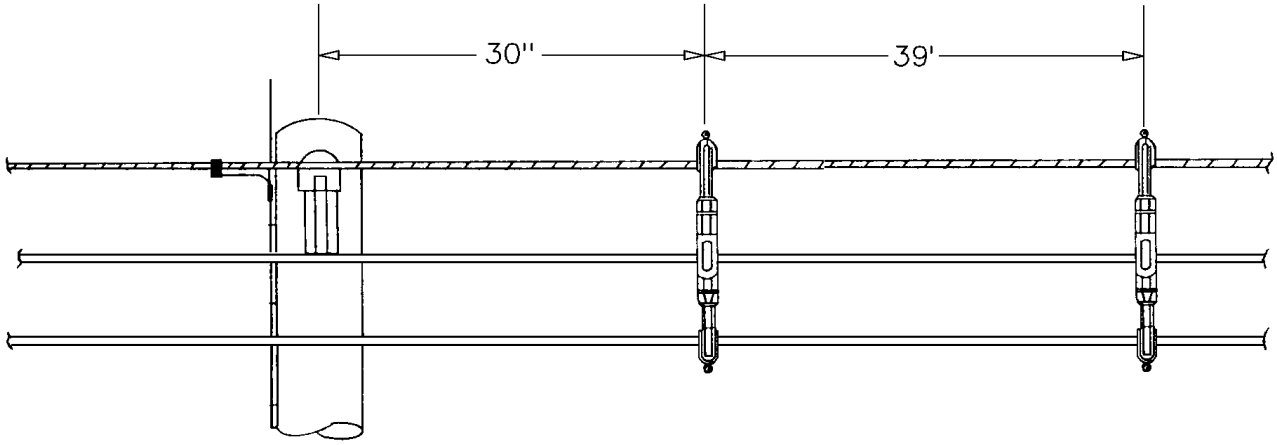
NO.	ITEM ID	QTY	DESCRIPTION
1	CLA HL 001	1	HOT-LINE CLAMP, BRONZE 6-1/0
2	STI CO 001	1	STIRRUP, COMPRESSION, #2-1/0 AL.

SPACER CABLE INSTALLATION GUIDELINES (FOR MAINTENANCE ONLY)



1. Strip insulation at least 12 inches from pole center for bare connections as shown above. Install "LINE DUC" on conductor at bare location 12 inches beyond bare end. Itemize "LINE DUC" as needed.

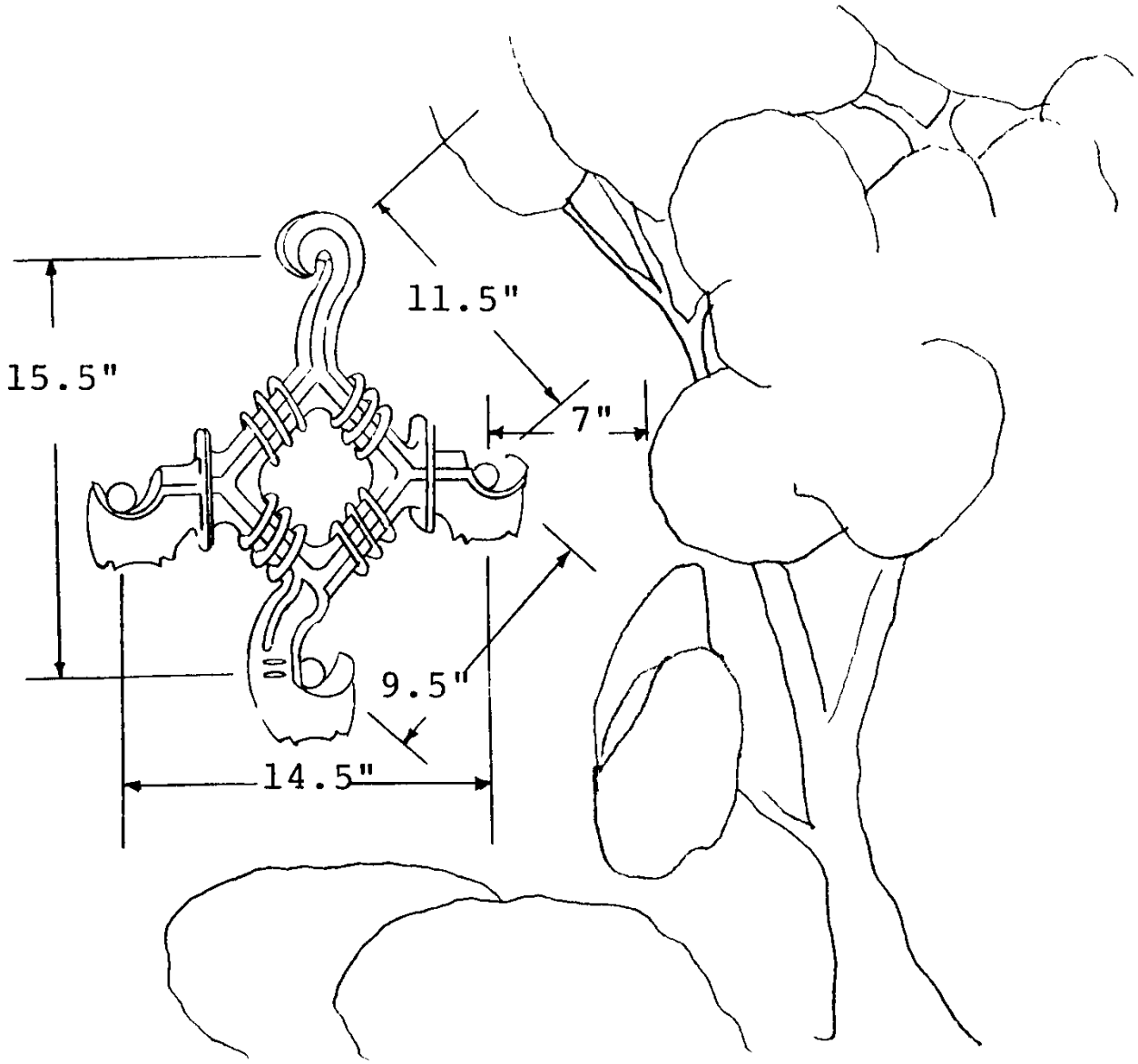
2. Install "LINE DUC" on insulated conductor at abrasion locations such as tree limbs or trunk on a per eight foot stick basis as shown above.



3. Clamp hangers are spaced 39 feet, 39.5 feet, 40 feet, or equidistant between poles. Refer to note #4 on the previous page.

SPACER CABLE INSTALLATION GUIDELINES (FOR MAINTENANCE ONLY)

Aerial cable should not be used to insulate from direct contact to objects such as trees or poles.



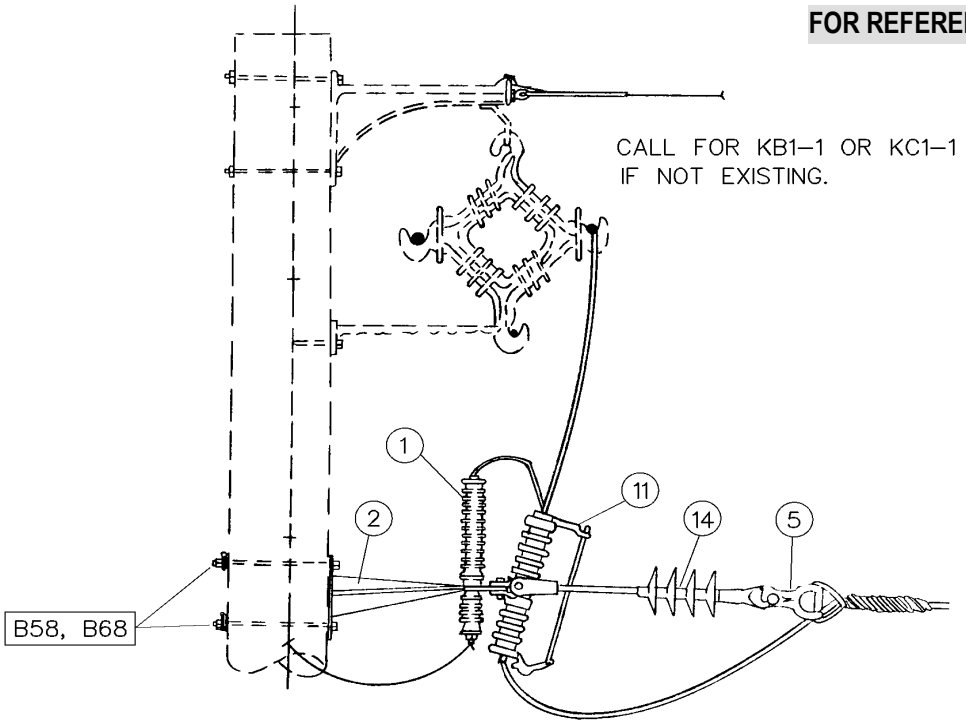
Cable insulation is provided to reduce phase to phase, and phase to ground clearances in limited space areas. Do not use in closer proximities than designed for.

KA20-F

SINGLE-PHASE TAP OFF FRONT OF POLE – SHIELDED

OPTIONS: 2-2, 1/0-2, 1/0-1/0, 2/0-2, 2/0-1/0, 2/0-2/0, 336-2, 336-1/0, 336-2/0
BOLT PLATE: NONE

FOR REFERENCE ONLY



NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	1	ARRESTER, LIGHTNING, 21KV, POLYMER
2	BKT IN 001	1	BRACKET, COMBINATION
3	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
4	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD, 3/4X14
5	CLE TH 001	1	CLEVIS, THIMBLE, 18,000 LBS.
6	CNN CP ***	1	GENERAL CODE FOR CONNECTOR
7	CNN CP 004	1	CONNECTOR, AL. COMP., SIDE-BY, 1/0-2/0 1/0-3/0
8	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 10-2
9	COB CO ***	20	GENERAL CODE FOR CONDUCTOR
10	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
11	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
12	GRI PR 005	1	GRIP, PREFORMED, 7 NO. 7 AW
13	GUA GW 005	2	GUARD, LINE, 8 FEET, POLY INSULATION, 15KV
14	INS CO 002	1	INSULATOR, DEADEND, POLYMER, 50 IN. EXTENTION
15	NUT SL 003	2	NUT, SQUARE, M-F 5/8
16	NUT SL 004	2	NUT, SQUARE, M-F 3/4
17	NUT TE 001	1	NUT, THIMBLE EYE, 5/8 SINGLE EYE
18	SHA AN 001	1	SHACKLE, ANCHOR, 25,000 LBS.
19	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
20	WAS RD 005	2	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
21	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

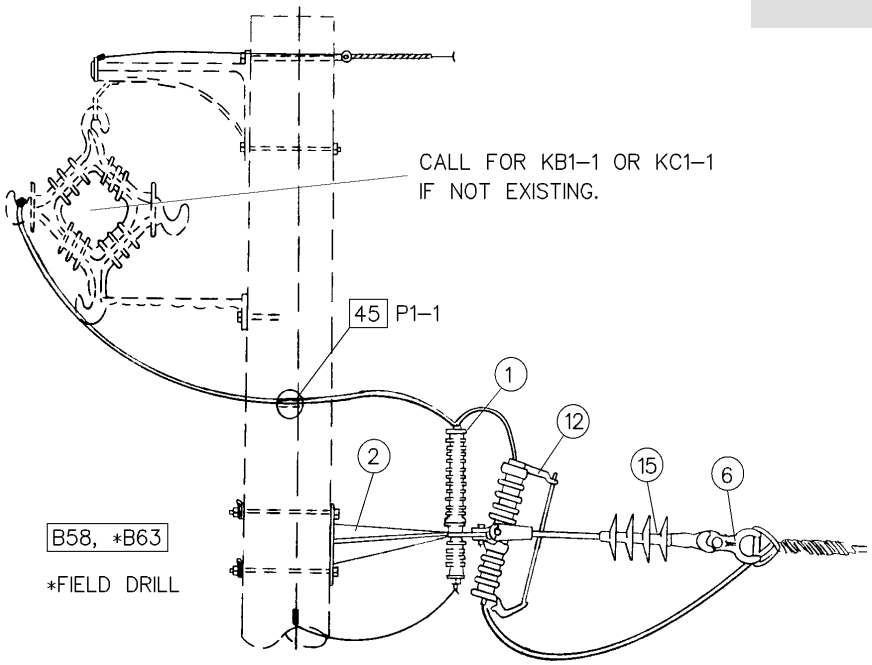
KA20-1F

SINGLE-PHASE TAP OFF BACK OF POLE – SHIELDED

OPTIONS: 2-2, 1/0-2, 2/0-2, 2/0-1/0, 2/0-2/0, 336-2, 336-1/0, 336-2/0

BOLT PLATE: NONE

FOR REFERENCE ONLY



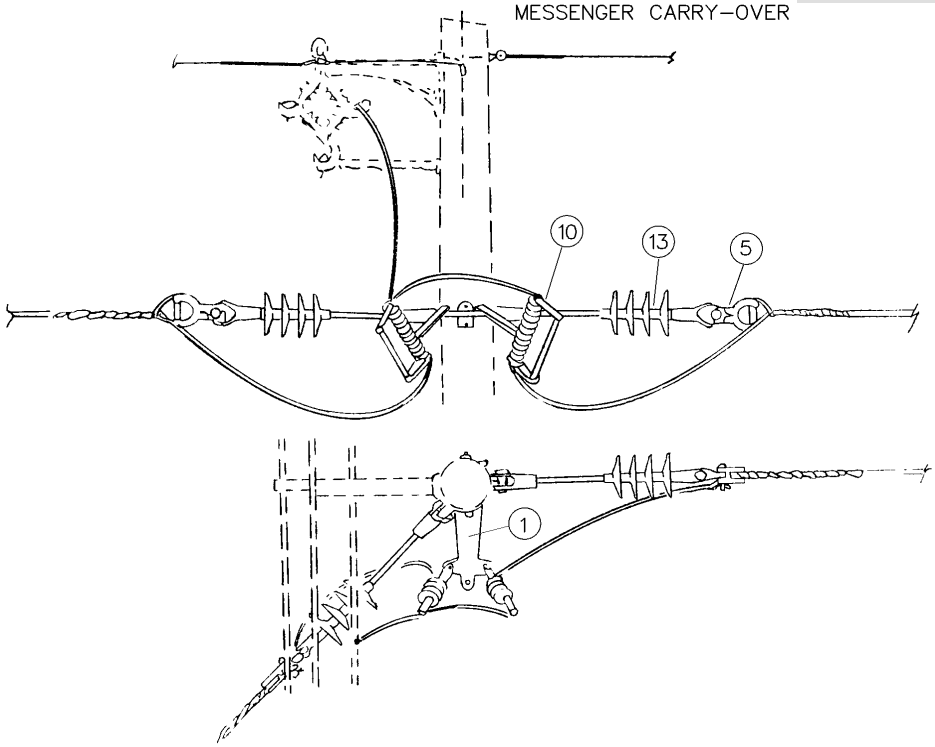
NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	1	ARRESTER, LIGHTNING, 21KV, POLYMER
2	BKT IN 001	1	BRACKET, COMBINATION
3	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
4	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
5	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD, 3/4X14
6	CLE TH 001	1	CLEVIS, THIMBLE, 18,000 LBS.
7	CNN CP ***	1	GENERAL CODE FOR CONNECTOR
8	CNN CP 004	1	CONNECTOR, AL. COMP., SIDE-BY, 1/0-2/0 1/0-3/0
9	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 10-2
10	COB CO ***	20	GENERAL CODE FOR CONDUCTOR
11	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
12	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
13	GRI PR 005	1	GRIP, PREFORMED, 7 NO. 7 AW
14	GUA GW 005	2	GUARD, LINE, 8 FEET, POLY INSULATION, 15KV
15	INS CO 002	1	INSULATOR, DEADEND, POLYMER, 50 IN. EXTENTION
16	INS VP 001	1	INSULATOR, VERTICAL POST, 34.5KV
17	NUT SL 003	2	NUT, SQUARE, M-F 5/8
18	NUT SL 004	3	NUT, SQUARE, M-F 3/4
19	NUT TE 001	1	NUT, THIMBLE EYE, 5/8 SINGLE EYE
20	SHA AN 001	1	SHACKLE, ANCHOR, 25,000 LBS.
21	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
22	WAS RD 005	5	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
23	WAS SP 002	5	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

KA22-F

DOUBLE SINGLE-PHASE TAPS

OPTIONS: 2-2, 1/0-2, 1/0-1/0, 2/0-2, 2/0-1/0, 2/0-2/0, 336-2, 336-2/0
BOLT PLATE: NONE

FOR REFERENCE ONLY



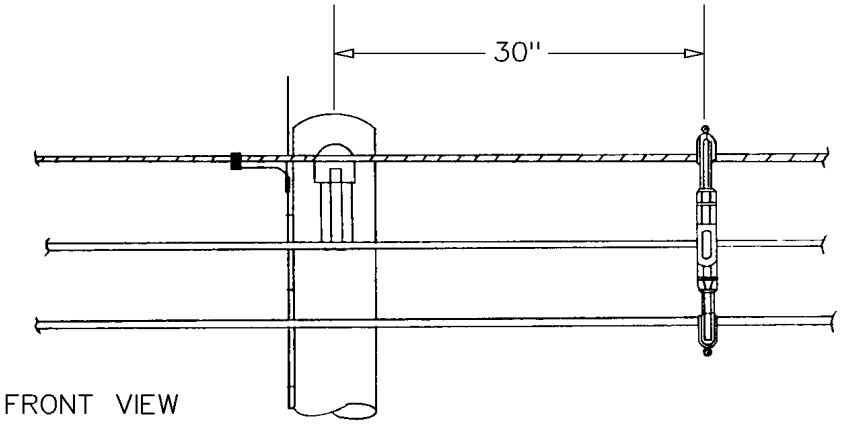
NO.	ITEM ID	QTY	DESCRIPTION
1	BKT IN 001	1	BRACKET, COMBINATION
2	BOL MS 020	3	BOLT, MACHINE, SQUARE HEAD, 5/8X14
3	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD, 3/4X14
4	CLA SS ***	2	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
5	CLE TH 001	2	CLEVIS, THIMBLE, 18,000 LBS.
6	CNN CP ***	2	GENERAL CODE FOR CONNECTOR
7	CNN CP 004	1	CONNECTOR, AL. COMP., SIDE-BY, 1/0-2/0 1/0-3/0
8	CNN VG 006	1	CONNECTOR, VISE TYPE, 1/0-4/0 10-4/0
9	COB CO ***	20	GENERAL CODE FOR CONDUCTOR
10	CUT OT 004	2	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
11	GRI PR 005	2	GRIP, PREFORMED, 7 NO. 7 AW
12	GUA GW 005	2	GUARD, LINE, 8 FEET, POLY INSULATION, 15KV
13	INS CO 002	2	INSULATOR, DEADEND, POLYMER, 50 IN. EXTENTION
14	NUT EY 003	2	NUT, EYE, 3/4
15	NUT SL 003	3	NUT, SQUARE, M-F 5/8
16	NUT SL 004	2	NUT, SQUARE, M-F 3/4
17	NUT TE 001	2	NUT, THIMBLE EYE, 5/8 SINGLE EYE
18	WAS RD 004	3	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
19	WAS RD 005	2	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
20	WAS SP 002	5	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

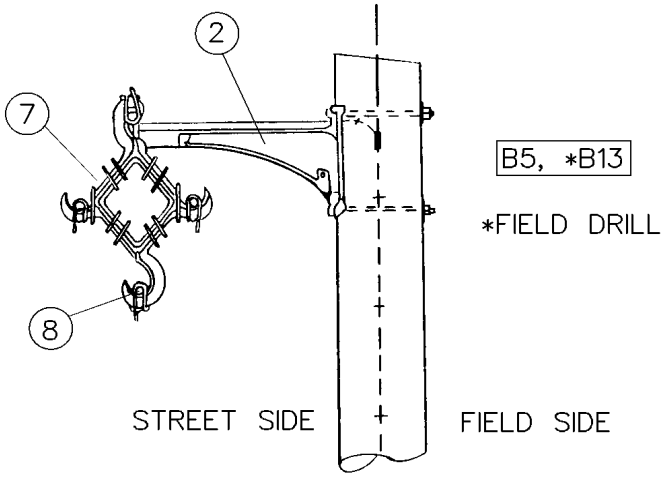
KB1

0 TO 5 DEGREE ANGLE

OPTIONS: NONE
BOLT PLATE: NONE

FOR REFERENCE ONLY





SIDE VIEW

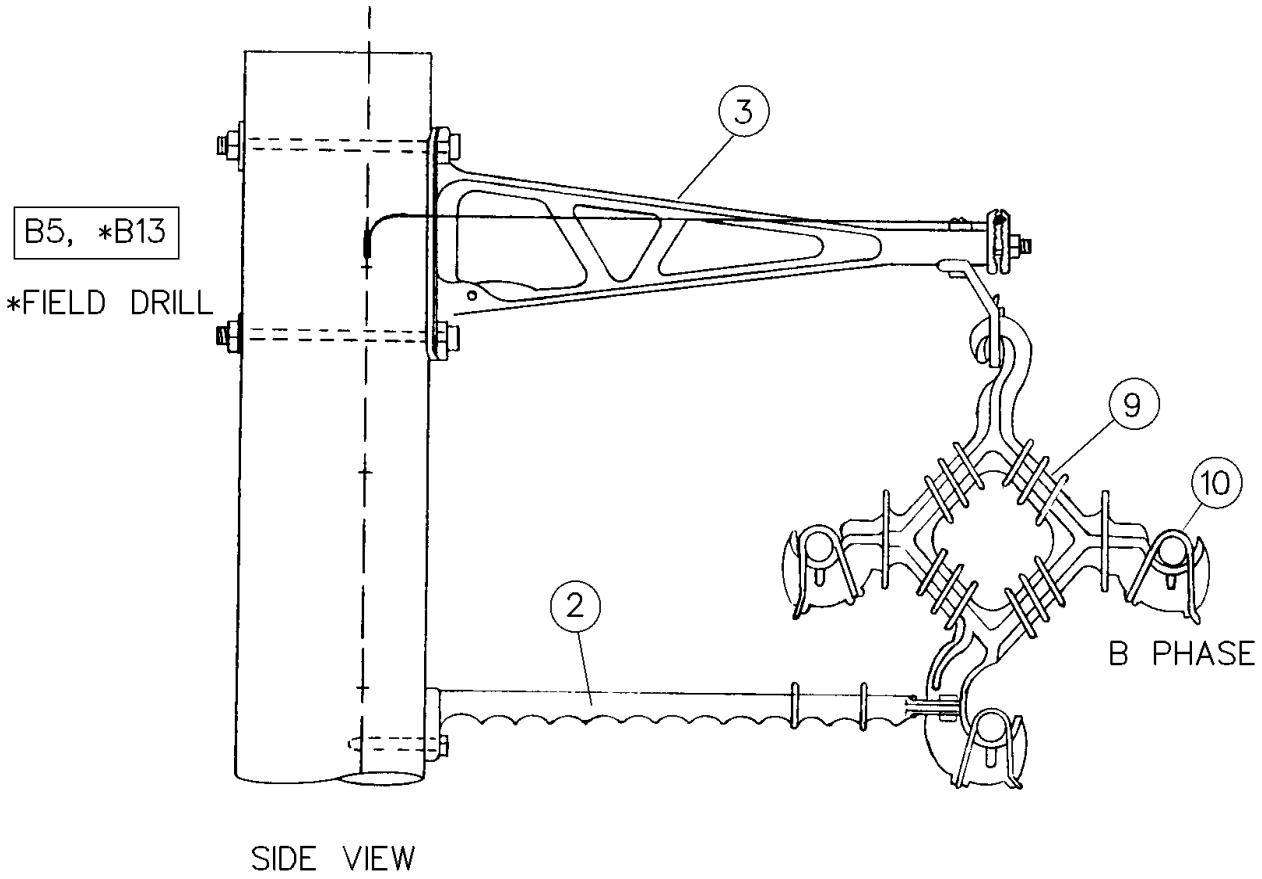
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BKT AE 005	1	BRACKET, AERIAL CABLE, 35KV, 14 IN.
3	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
4	CNN CP 005	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 1/0-2/0
5	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 10-2
6	NUT SL 003	2	NUT, SQUARE, M-F 5/8
7	SPA AC 001	6	SPACER, AERIAL CABLE, 35KV W/O TIES
8	TIE RI 001	18	TIE RING, AERIAL CABLE FOR INSULATOR
9	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
10	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

KB1-1

0 TO 5 DEGREE ANGLE WITH ANTI-SWAY BAR

OPTIONS: NONE
BOLT PLATE: NONE

FOR REFERENCE ONLY



SIDE VIEW

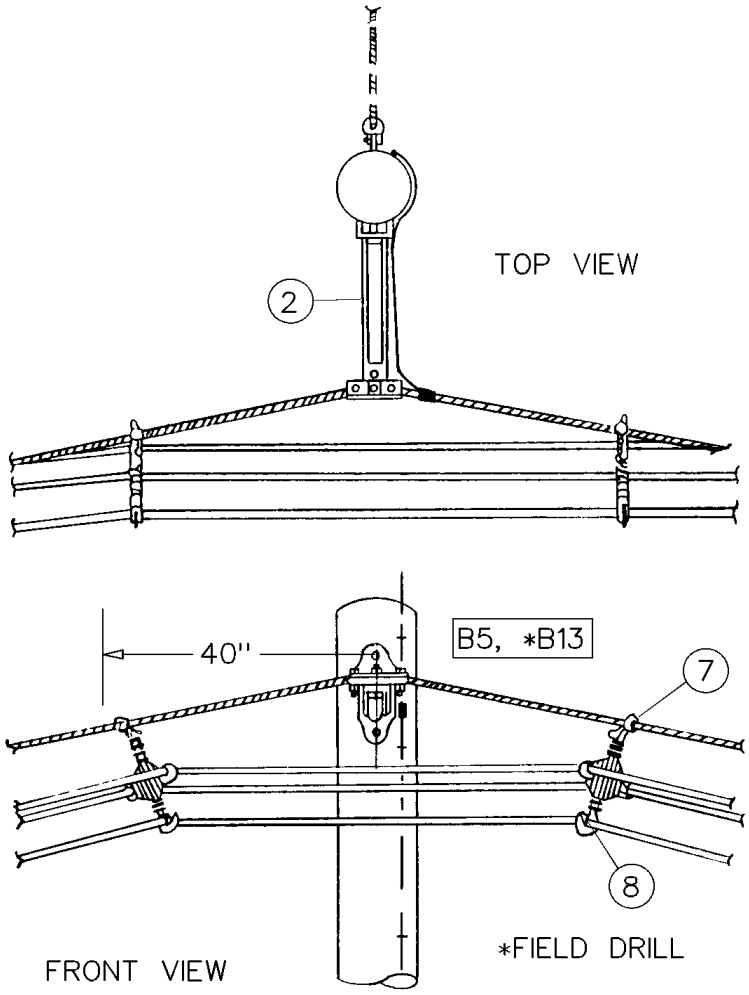
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BKT AE 003	1	BRACKET, ANTI-SWAY, 24 IN. WITH STIRRUP
3	BKT AE 006	1	BRACKET, AERIAL CABLE, 35KV 24 IN.
4	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
5	CNN CP 005	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 1/0-2/0
6	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 10-2
7	NUT SL 003	2	NUT, SQUARE, M-F 5/8
8	SCW LA 002	1	SCREW, LAG, 1/2 IN. X 4 IN.
9	SPA AC 001	6	SPACER, AERIAL CABLE, 35KV W/O TIES
10	TIE RI 001	18	TIE RING, AERIAL CABLE FOR INSULATOR
11	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
12	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

KB2

5 TO 10 DEGREE ANGLE

OPTIONS: NONE
BOLT PLATE: NONE

FOR REFERENCE ONLY



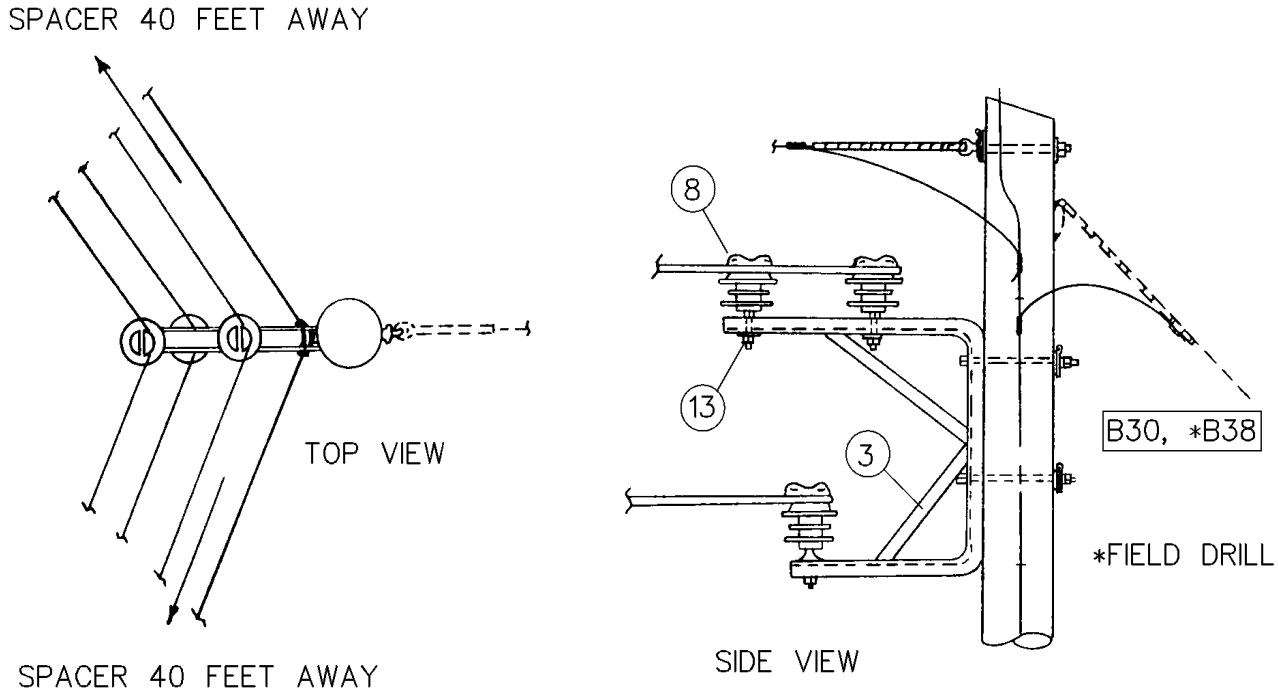
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BKT AE 005	1	BRACKET, AERIAL CABLE, 35KV, 14 IN.
3	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
4	CNN CP 005	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 1/0-2/0
5	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 10-2
6	NUT SL 003	2	NUT, SQUARE, M-F 5/8
7	SPA AC 001	6	SPACER, AERIAL CABLE, 35KV W/O TIES
8	TIE RI 001	18	TIE RING, AERIAL CABLE FOR INSULATOR
9	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
10	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

KB3

10 TO 60 DEGREE ANGLE

OPTIONS: NONE
BOLT PLATE: NONE

FOR REFERENCE ONLY



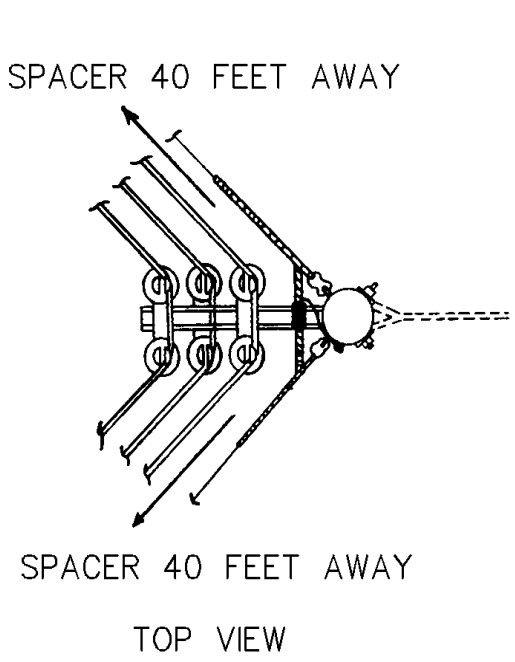
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BOL MS 034	1	BOLT, MACHINE, SQUARE HEAD, 3/4X10
3	BKT AE 001	1	BRACKET, AERIAL CABLE, 35KV, 0-90 DEGREE
4	CLA AN 001	1	CLAMP, ANGLE, 4 SOL. - 250 KCM
5	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
6	CNN CP 005	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 1/0-2/0
7	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 10-2
8	INS PT 002	2	INSULATOR, PIN TYPE, 35KV, POLYETHYLENE
9	GUA LI 005	1	LINE GUARD, 7 NO. 7 AW
10	NUT SL 003	2	LOCKNUT, SQUARE M-F 5/8
11	NUT SL 004	1	LOCKNUT, SQUARE M-F 3/4
12	NUT EY 003	1	NUT, EYE 3/4
13	PIN IN 003	2	PIN, SHORT SHANK INSULATOR, 15/35KV, 3/4X7
14	SPA AC 001	6	SPACER, AERIAL CABLE, 35KV W/O TIES
15	TIE RI 001	18	TIE RING, AERIAL CABLE FOR INSULATOR
16	TIE RI 002	2	TIE RING, AERIAL CABLE FOR SPACER
17	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
18	WAS RD 005	2	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
19	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

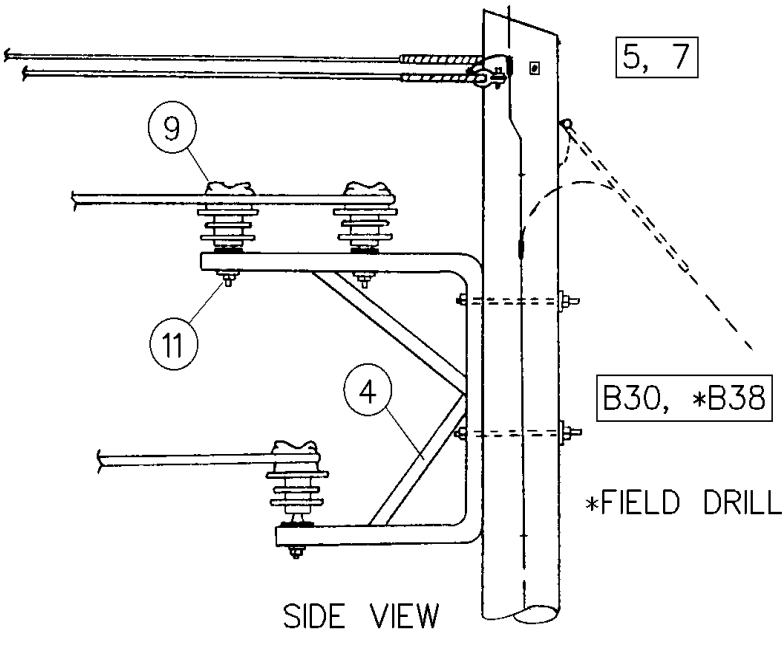
KB4

60 TO 90 DEGREE ANGLE

OPTIONS: NONE
BOLT PLATE: NONE

FOR REFERENCE ONLY





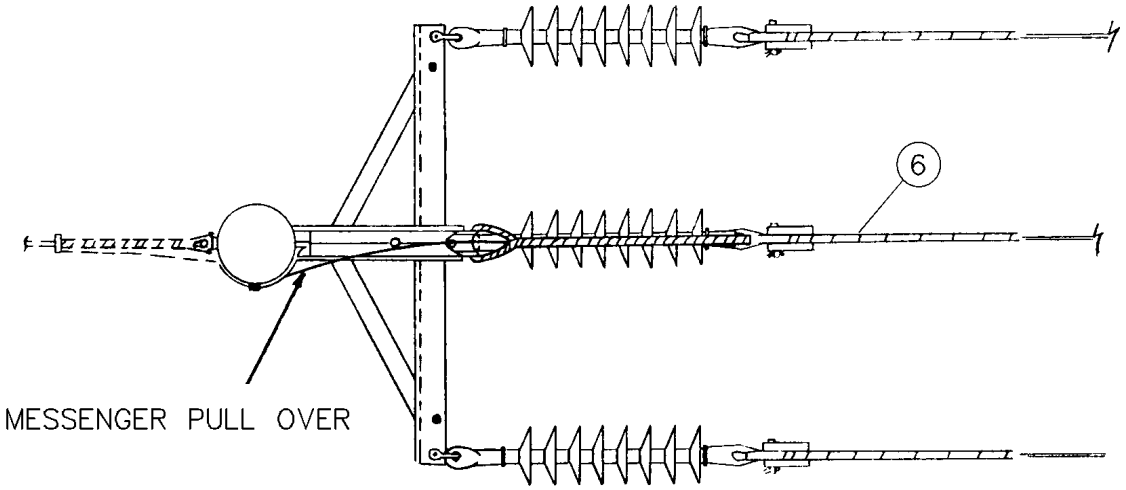
NO.	ITEM ID	QTY	DESCRIPTION
1	ADP AC 001	2	ADAPTER PLATE, USE WITH BKT AE 001 ON 60-90 DEGREE ANGLES
2	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
3	BOL MS 034	2	BOLT, MACHINE, SQUARE HEAD, 3/4X10
4	BKT AE 001	1	BRACKET, AERIAL CABLE, 35KV, 0-90 DEGREE
5	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
6	CNN CP 005	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 1/0-2/0
7	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 10-2
8	GRI PR 005	2	GRIP, PREFORMED, 7 NO. 7 AW
9	INS PT 002	4	INSULATOR, PIN TYPE, 35KV, POLYETHYLENE
10	NUT SL 004	2	LOCKNUT, SQUARE M-F 3/4
11	PIN IN 003	4	PIN, SHORT SHANK INSULATOR, 15/35KV, 3/4X7
12	SPA AC 001	6	SPACER, AERIAL CABLE, 35KV W/O TIES
13	THI EY 001	2	THIMBLE EYELET, 3/4
14	TIE RI 001	18	TIE RING, AERIAL CABLE FOR INSULATOR
15	TIE RI 002	4	TIE RING, AERIAL CABLE FOR SPACER
16	WAS RD 004	4	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
17	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
18	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

KB5

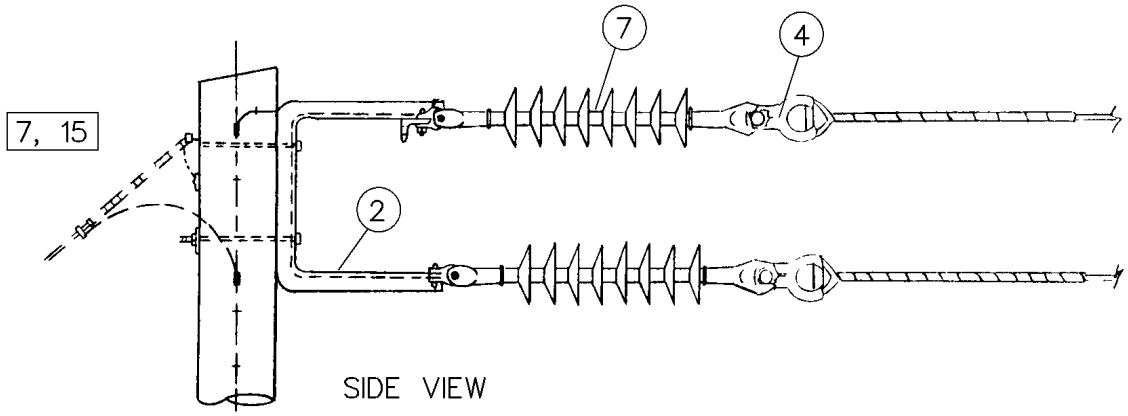
DEADEND

OPTIONS: 2, 1/0, 2/0, 336
BOLT PLATE: NONE

FOR REFERENCE ONLY



TOP VIEW



SIDE VIEW

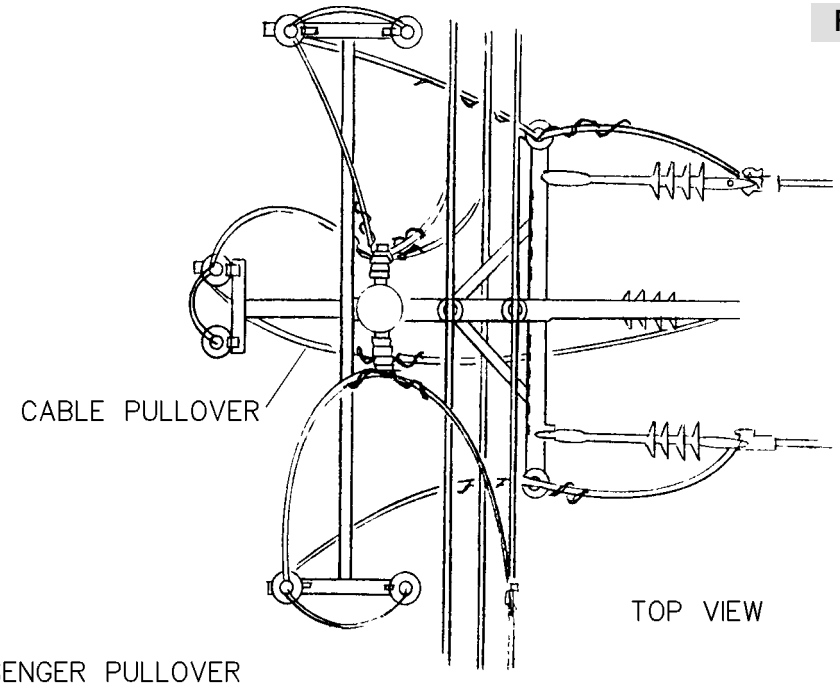
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BKT AE 004	1	BRACKET, AERIAL CABLE, DEADEND
3	CLA SS ***	2	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	CLE TH 001	3	CLEVIS, THIMBLE, 18,000 LBS.
5	CNN VG 005	1	CONNECTOR, VISE TYPE, 2-2/0 10-2/0
6	GRI PR 005	1	GRIP, PREFORMED, 7 NO. 7 AW
7	INS CO 002	2	INSULATOR, DEADEND, POLYMER
8	NUT SL 003	2	LOCKNUT, SQUARE M-F 5/8
9	SHA AN 001	2	SHACKLE, ANCHOR, 25,000 LBS.
10	SPA AC 001	3	SPACER, AERIAL CABLE, 35KV W/O TIES
11	TIE RI 001	9	TIE RING, AERIAL CABLE FOR INSULATOR
12	WAS RD 004	4	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
13	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

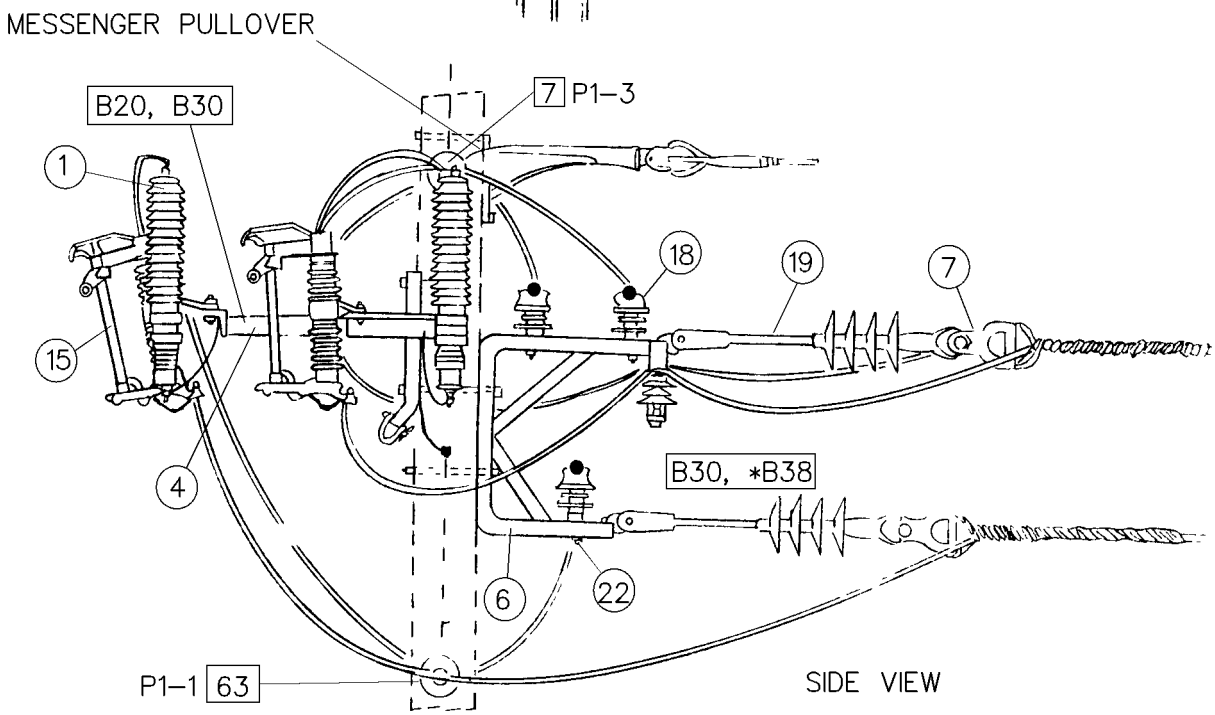
KB20

0 TO 5 DEGREE FUSED TAP OFF FRONT OF POLE

OPTIONS: 2-2, 1/0-2, 1/0-1/0, 2/0-2, 2/0-1/0, 2/0-2/0, 336-2, 336-1/0, 336-2/0, 336-336
BOLT PLATE: NONE

FOR REFERENCE ONLY





KB20

MATERIAL LIST

FOR REFERENCE ONLY

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	2	ARRESTER, LIGHTNING, 21KV, POLYMER
2	BOL MS 020	5	BOLT, MACHINE, SQUARE HEAD, 5/8X14
3	BOL DA 002	1	BOLT, DOUBLE ARMING, 5/8X14
4	BKT AC 002	1	BRACKET, TRI-MOUNT ARRESTER AND CUTOUT
5	BKT AE 005	1	BRACKET, AERIAL CABLE, 35KV, 14 IN.
6	BKT AE 007	1	BRACKET, AERIAL CABLE, 35KV, TANGENT/3-PHASE TAP
7	CLE TH 001	3	CLEVIS, THIMBLE, 18,000 LBS.
8	CNN CP ***	2	GENERAL CODE FOR CONNECTOR
9	CNN CP 004	1	CONNECTOR, AL. COMP., SIDE-BY, 1/0-2/0 1/0-3/0
10	CNN CP 008	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 3/0-4/0
11	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 10-2
12	CNN VG 005	1	CONNECTOR, VISE TYPE, 2-2/0 10-2/0
13	COB CO ***	10	GENERAL CODE FOR CONDUCTOR
14	COB CO 028	10	CONDUCTOR, COPPER, #4 SOFT DRAWN
15	CUT OT 004	2	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
16	GRI PR005	1	GRIP, PREFORMED, 7 NO. 7 AW
17	INS VP 001	2	INSULATOR, VERTICAL POST, 34.5KV
18	INS PT 002	3	INSULATOR, PIN TYPE, 35KV, POLYETHYLENE
19	INS CO 002	2	INSULATOR, DEADEND, POLYMER
20	NUT SL 003	6	LOCKNUT, SQUARE M-F 5/8
21	NUT EY 002	1	NUT, EYE 5/8
22	PIN IN 003	3	PIN, SHORT SHANK INSULATOR, 15/35KV, 3/4X7
23	SHA AN 001	2	SHACKLE, ANCHOR, 25,000 LBS.
24	SPA AC 001	6	SPACER, AERIAL CABLE, 35KV W/O TIES
25	TIE RI 001	18	TIE RING, AERIAL CABLE FOR INSULATOR
26	TIE RI 002	4	TIE RING, AERIAL CABLE FOR SPACER
27	WAS RD 004	5	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
28	WAS SP 002	5	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

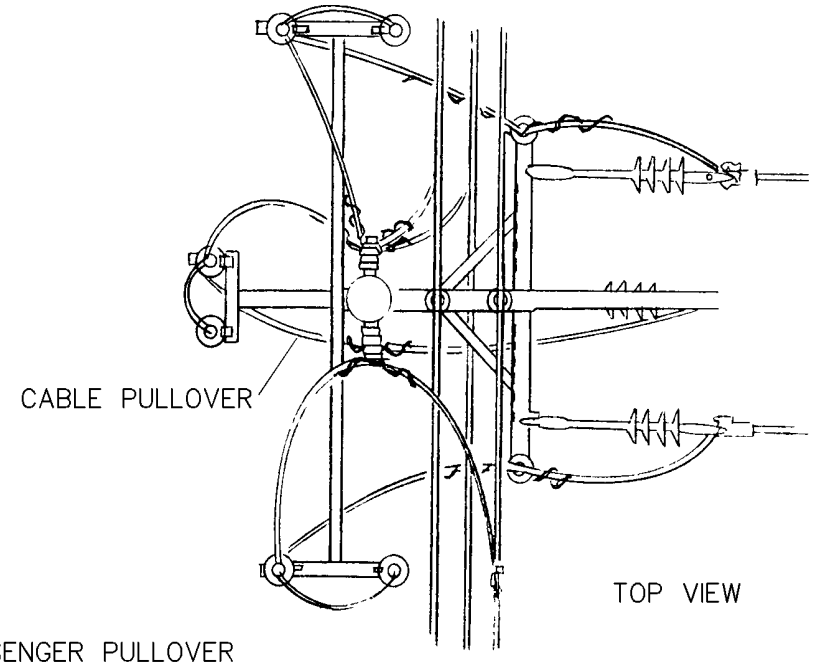
KB20-1

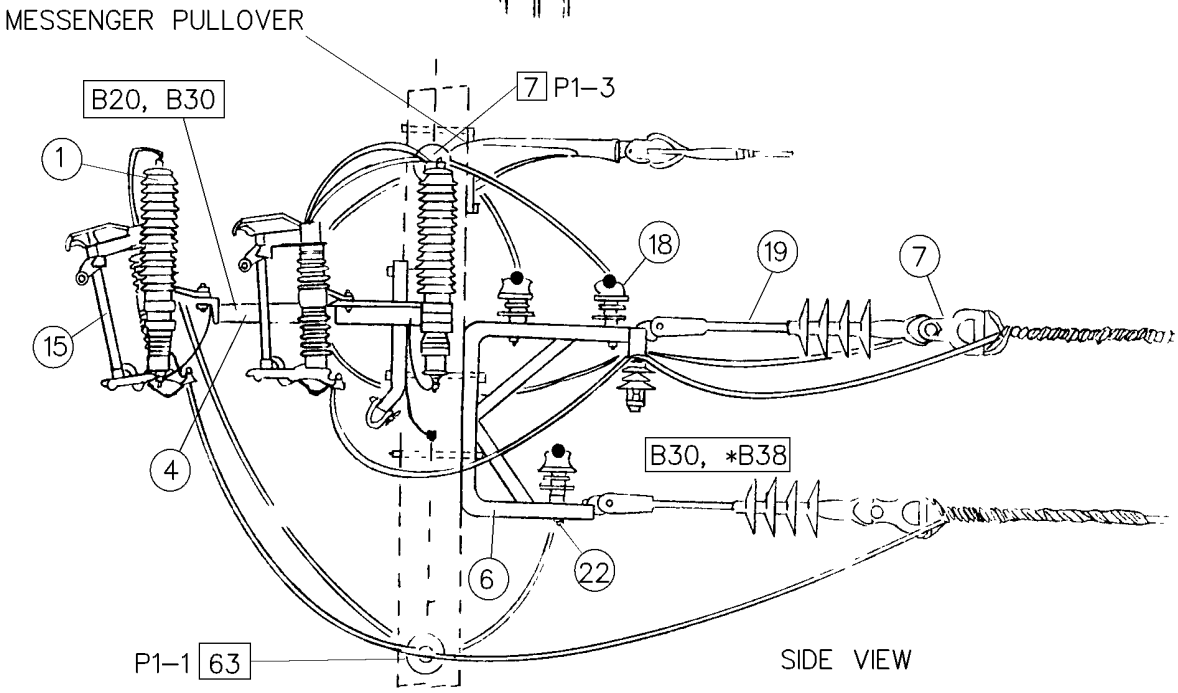
0 TO 5 DEGREE FUSED TAP OFF BACK OF POLE

OPTIONS: 2-2, 1/0-2, 1/0-1/0, 2/0-2, 2/0-1/0, 2/0-2/0, 336-2, 336-1/0, 336-2/0, 336-336

BOLT PLATE: NONE

FOR REFERENCE ONLY





KB20-1

MATERIAL LIST

FOR REFERENCE ONLY

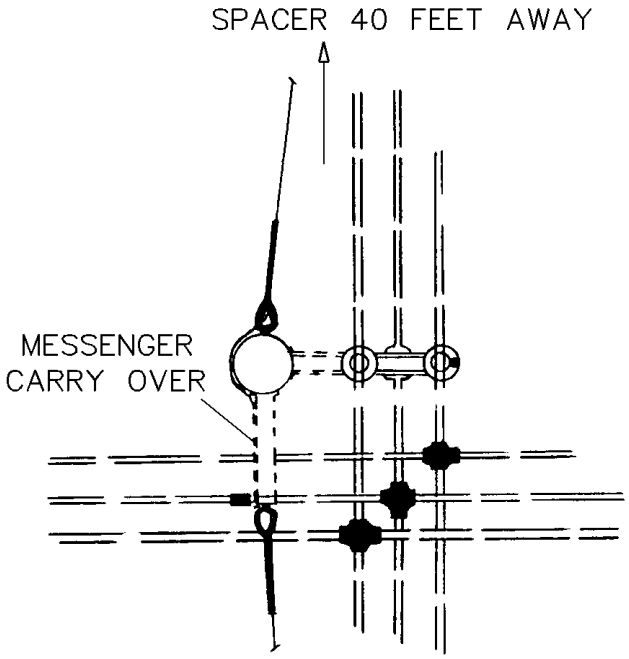
NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	2	ARRESTER, LIGHTNING, 21KV, POLYMER
2	BOL MS 020	6	BOLT, MACHINE, SQUARE HEAD, 5/8X14
3	BOL DA 002	1	BOLT, DOUBLE ARMING, 5/8X14
4	BKT AC 002	1	BRACKET, TRI-MOUNT ARRESTER AND CUTOUT
5	BKT AE 003	1	BRACKET, ANTI-SWAY, 24 IN. WITH STIRRUP
6	BKT AE 004	1	BRACKET, AERIAL CABLE, DEADEND
7	BKT AE 006	1	BRACKET, AERIAL CABLE, 35KV 24 IN.
8	CLE TH 001	3	CLEVIS, THIMBLE, 18,000 LBS.
9	CNN CP ***	2	GENERAL CODE FOR CONNECTOR
10	CNN CP 005	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 1/0-2/0
11	CNN CP 008	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 3/0-4/0
12	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 10-2
13	CNN VG 005	2	CONNECTOR, VISE TYPE, 2-2/0 10-2/0
14	COB CO ***	12	GENERAL CODE FOR CONDUCTOR
15	COB CO 028	12	CONDUCTOR, COPPER, #4 SOFT DRAWN
16	CUT OT 004	2	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
17	GRI PR005	1	GRIP, PREFORMED, 7 NO. 7 AW
18	INS VP 001	2	INSULATOR, VERTICAL POST, 34.5KV
19	INS CO 002	2	INSULATOR, DEADEND, POLYMER
20	NUT SL 003	6	LOCKNUT, SQUARE M-F 5/8
21	SCW LA 002	1	SCREW, LAG, 1/2X4
22	SHA AN 001	3	SHACKLE, ANCHOR, 25,000 LBS.
23	SPA AC 001	7	SPACER, AERIAL CABLE, 35KV W/O TIES
24	TIE RI 001	21	TIE RING, AERIAL CABLE FOR INSULATOR
25	TIE RI 002	2	TIE RING, AERIAL CABLE FOR SPACER
26	WAS RD 004	6	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
27	WAS SP 002	6	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

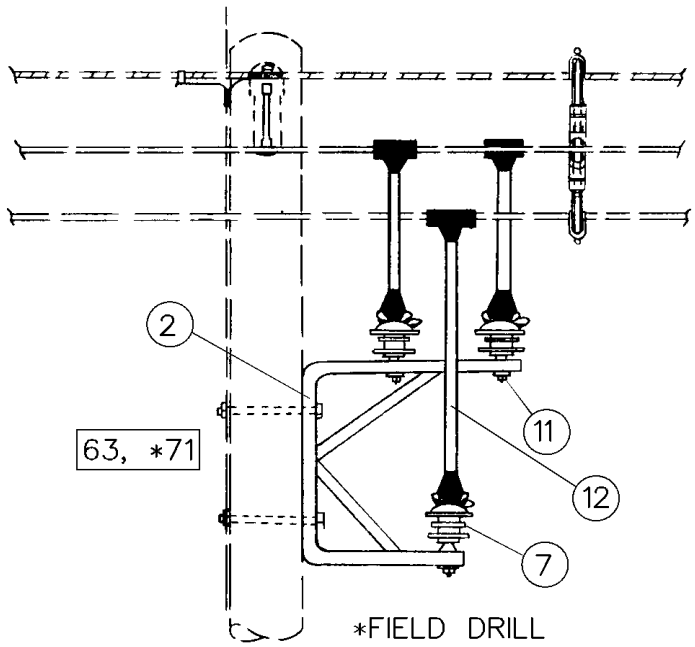
KB22

0 TO 5 DEGREE CROSS

OPTIONS: 2-2, 1/0-2, 1/0-1/0, 2/0-2, 2/0-1/0, 2/0-2/0, 336-2, 336-1/0, 336-2/0, 336-336
BOLT PLATE: NONE

FOR REFERENCE ONLY





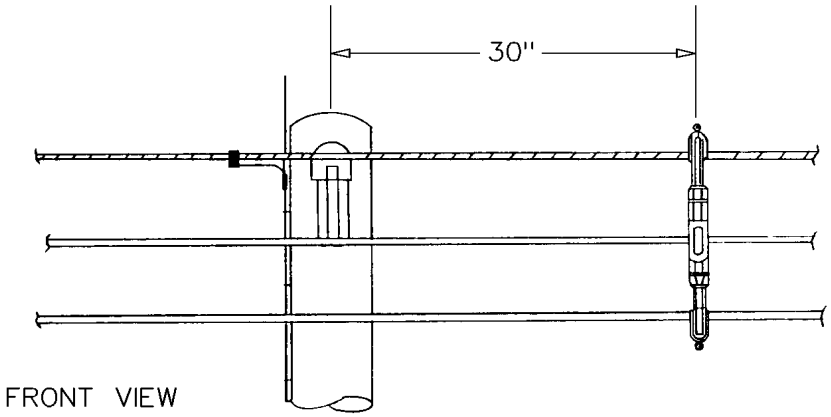
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BKT AE 001	1	BRACKET, AERIAL CABLE, DEADEND
3	CNN CP ***	4	GENERAL CODE FOR CONNECTOR
4	CNN CP 004	2	CONNECTOR, AL. COMP., SIDE-BY,
5	CNN VG 006	1	CONNECTOR, VISE TYPE, 1/0-4/0 10-4/0
6	GRI PR 005	1	GRIP, PREFORMED, 7 NO. 7 AW
7	INS PT 002	2	INSULATOR, PIN TYPE, 35KV, POLYETHYLENE
8	NUT SL 003	2	LOCKNUT, SQUARE M-F 5/8
9	NUT TE 001	1	NUT, THIMBLE EYE, 5/8, SINGLE EYE
10	NUT TE 002	1	NUT, THIMBLE EYE, 3/4, SINGLE EYE
11	PIN IN 003	2	PIN, SHORT SHANK INSULATOR, 15/35KV, 3/4X7
12	SPA AC 001	6	SPACER, AERIAL CABLE, 35KV W/O TIES
13	TIE RI 001	18	TIE RING, AERIAL CABLE FOR INSULATOR
14	TIE RI 02	2	TIE RING, AERIAL CABLE FOR SPACER
15	WAS RD 004	4	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
16	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

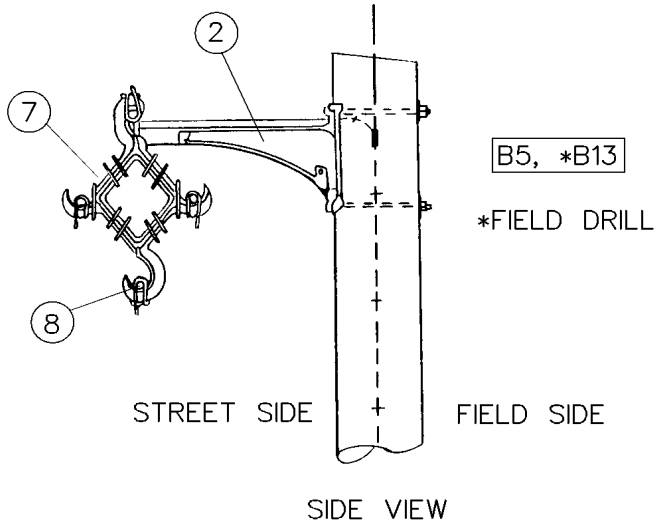
KC1

0 TO 5 DEGREE ANGLE

OPTIONS: NONE
BOLT PLATE: NONE

FOR REFERENCE ONLY





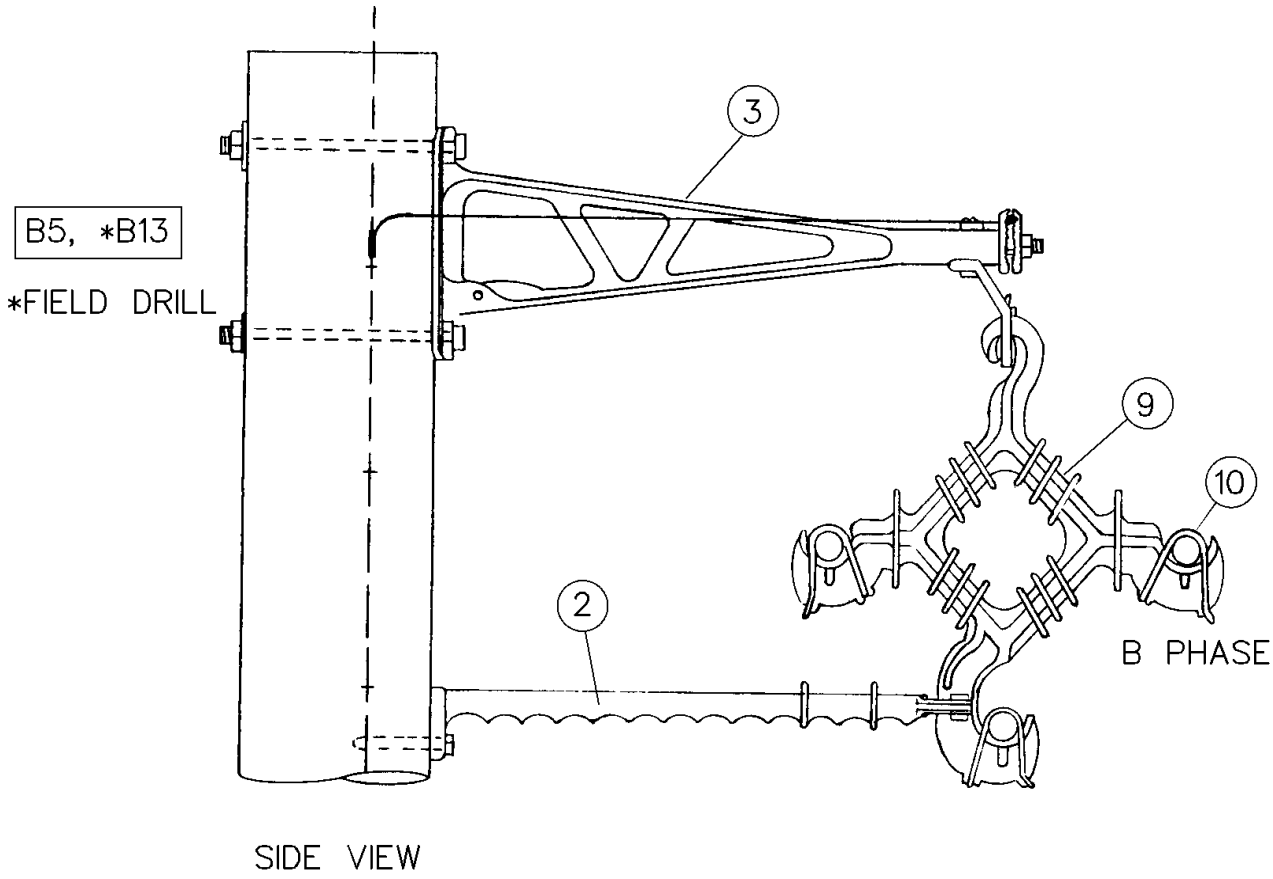
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BKT AE 005	1	BRACKET, AERIAL CABLE, 35KV, 14 IN.
3	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
4	CNN CP 005	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 1/0-2/0
5	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 10-2
6	NUT SL 003	2	NUT, SQUARE, M-F 5/8
7	SPA AC 001	6	SPACER, AERIAL CABLE, 35KV W/O TIES
8	TIE RI 001	24	TIE RING, AERIAL CABLE FOR INSULATOR
9	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
10	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

KC1-1

0 TO 5 DEGREE ANGLE WITH ANTI-SWAY BAR

OPTIONS: NONE
BOLT PLATE: NONE

FOR REFERENCE ONLY



SIDE VIEW

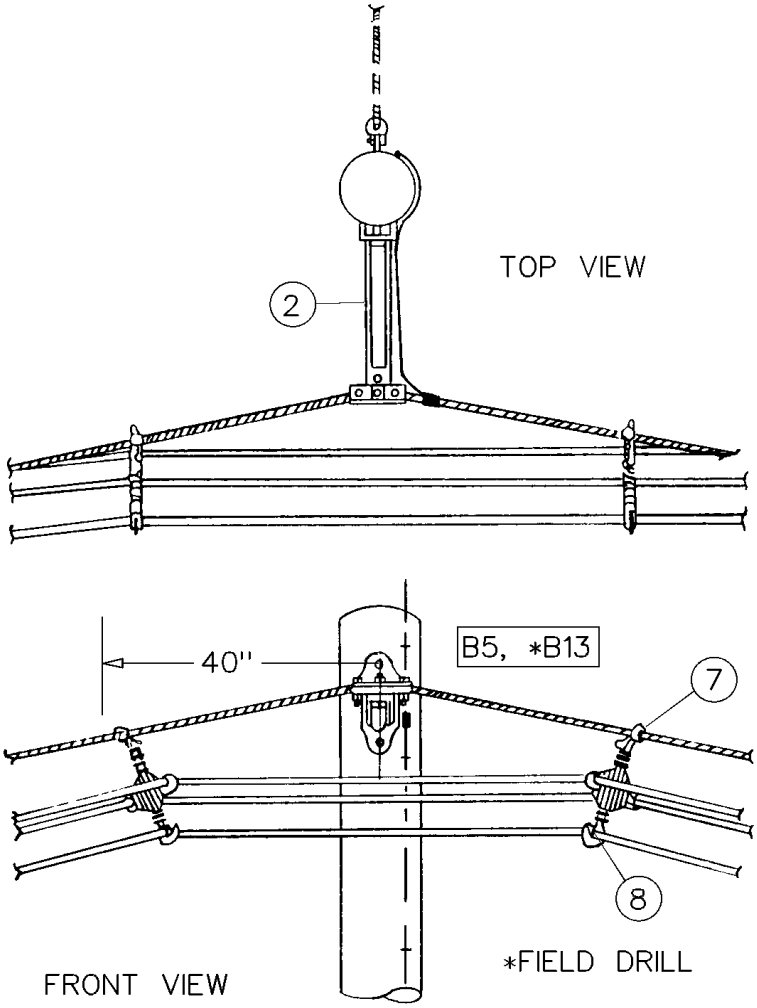
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BKT AE 003	1	BRACKET, ANTI-SWAY, 24 IN. WITH STIRRUP
3	BKT AE 006	1	BRACKET, AERIAL CABLE, 35KV 24 IN.
4	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
5	CNN CP 005	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 1/0-2/0
6	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 10-2
7	NUT SL 003	2	NUT, SQUARE, M-F 5/8
8	SCW LA 002	1	SCREW, LAG, 1/2 IN. X 4 IN.
9	SPA AC 001	6	SPACER, AERIAL CABLE, 35KV W/O TIES
10	TIE RI 001	24	TIE RING, AERIAL CABLE FOR INSULATOR
11	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
12	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

KC2

5 TO 10 DEGREE ANGLE

OPTIONS: NONE
BOLT PLATE: NONE

FOR REFERENCE ONLY



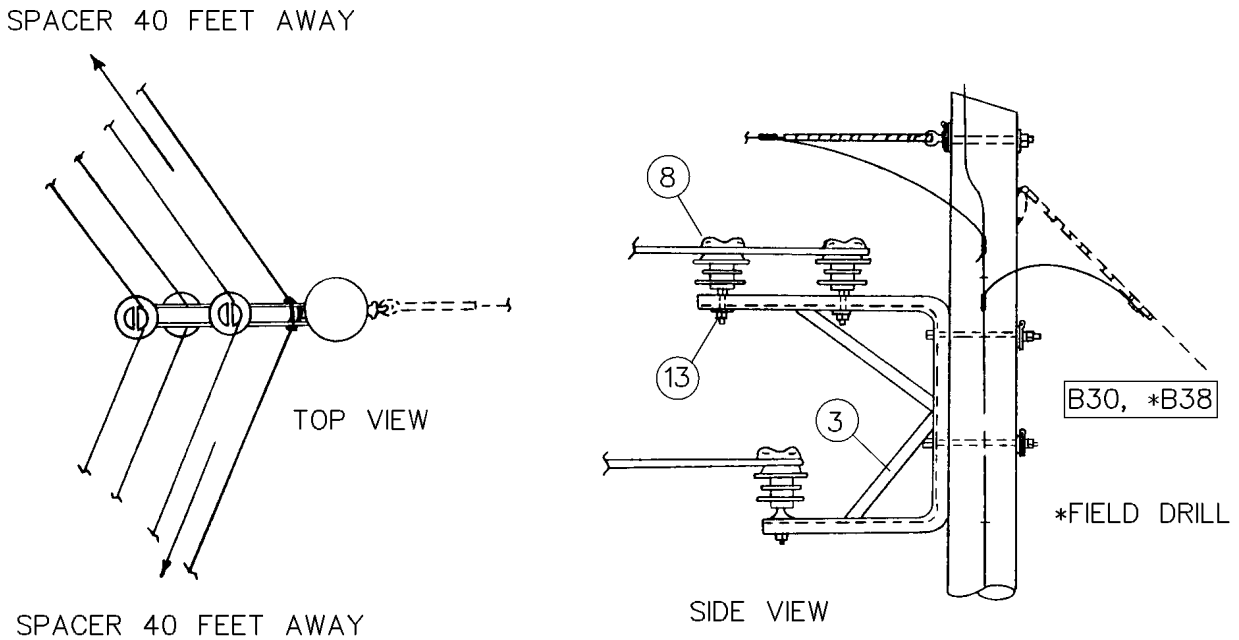
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BKT AE 005	1	BRACKET, AERIAL CABLE, 35KV, 14 IN.
3	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
4	CNN CP 005	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 1/0-2/0
5	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 10-2
6	NUT SL 003	2	NUT, SQUARE, M-F 5/8
7	SPA AC 001	6	SPACER, AERIAL CABLE, 35KV W/O TIES
8	TIE RI 001	24	TIE RING, AERIAL CABLE FOR INSULATOR
9	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
10	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

KC3

10 TO 60 DEGREE ANGLE

OPTIONS: NONE
BOLT PLATE: NONE

FOR REFERENCE ONLY



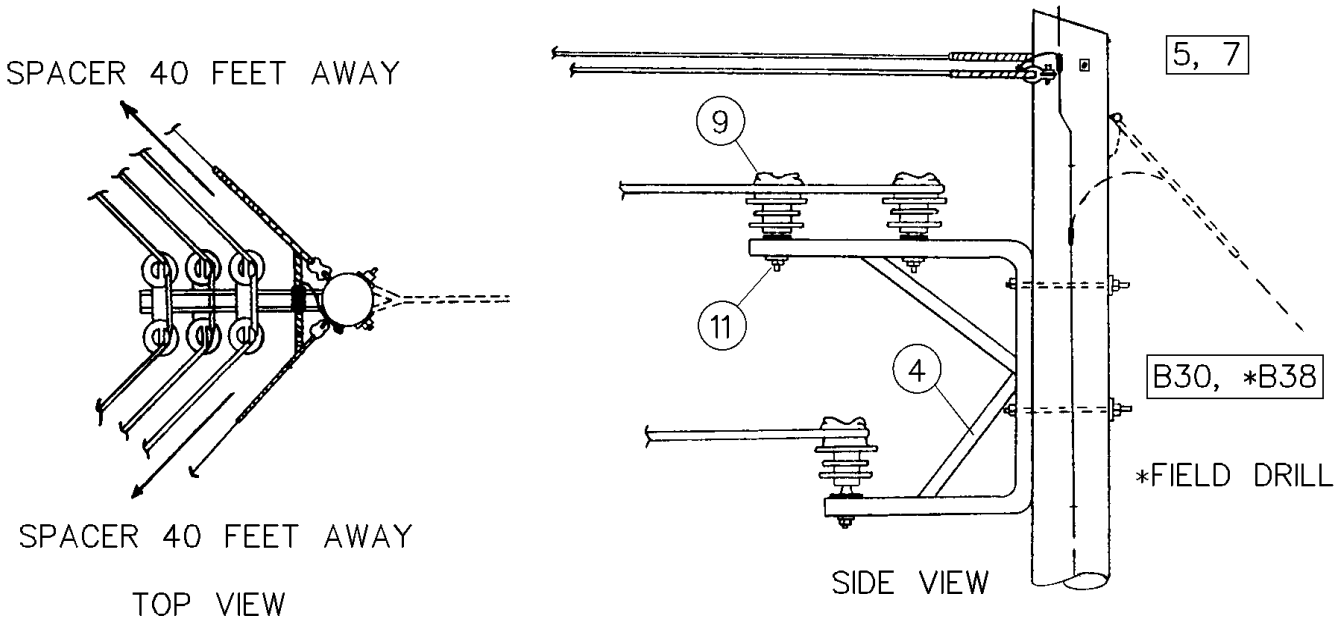
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BOL MS 034	1	BOLT, MACHINE, SQUARE HEAD, 3/4X10
3	BKT AE 001	1	BRACKET, AERIAL CABLE, 35KV, 0-90 DEGREE
4	CLA AN 001	1	CLAMP, ANGLE, 4 SOL. - 250 KCM
5	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
6	CNN CP 005	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 1/0-2/0
7	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 10-2
8	INS PT 002	3	INSULATOR, PIN TYPE, 35KV, POLYETHYLENE
9	GUA LI 005	1	LINE GUARD, 7 NO. 7 AW
10	NUT SL 003	2	LOCKNUT, SQUARE M-F 5/8
11	NUT SL 004	1	LOCKNUT, SQUARE M-F 3/4
12	NUT EY 003	1	NUT, EYE 3/4
13	PIN IN 003	3	PIN, SHORT SHANK INSULATOR, 15/35KV, 3/4X7
14	SPA AC 001	6	SPACER, AERIAL CABLE, 35KV W/O TIES
15	TIE RI 001	24	TIE RING, AERIAL CABLE FOR INSULATOR
16	TIE RI 002	3	TIE RING, AERIAL CABLE FOR SPACER
17	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
18	WAS RD 005	8	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
19	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

KC4

60 TO 90 DEGREE ANGLE

OPTIONS: NONE
BOLT PLATE: NONE

FOR REFERENCE ONLY



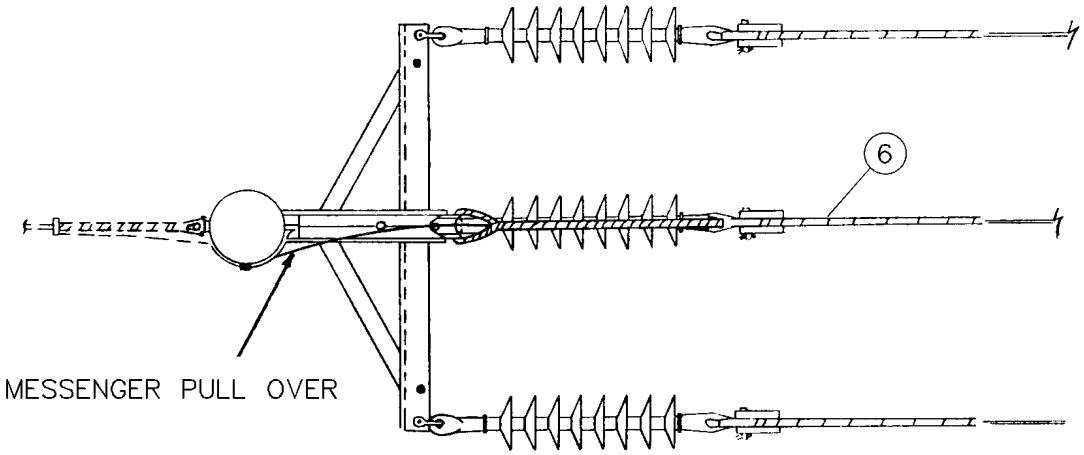
NO.	ITEM ID	QTY	DESCRIPTION
1	ADP AC 001	3	ADAPTER PLATE, USE WITH BKT AE 001 ON 60-90 DEGREE ANGLES
2	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
3	BOL MS 034	2	BOLT, MACHINE, SQUARE HEAD, 3/4X10
4	BKT AE 001	1	BRACKET, AERIAL CABLE, 35KV, 0-90 DEGREE
5	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
6	CNN CP 005	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 1/0-2/0
7	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 10-2
8	GRI PR 005	2	GRIP, PREFORMED, 7 NO. 7 AW
9	INS PT 002	6	INSULATOR, PIN TYPE, 35KV, POLYETHYLENE
10	NUT SL 004	2	LOCKNUT, SQUARE M-F 3/4
11	PIN IN 003	6	PIN, SHORT SHANK INSULATOR, 15/35KV, 3/4X7
12	SPA AC 001	6	SPACER, AERIAL CABLE, 35KV W/O TIES
13	THI EY 001	2	THIMBLE EYELET, 3/4
14	TIE RI 001	24	TIE RING, AERIAL CABLE FOR INSULATOR
15	TIE RI 002	6	TIE RING, AERIAL CABLE FOR SPACER
16	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
17	WAS RD 005	2	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
18	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

KC5

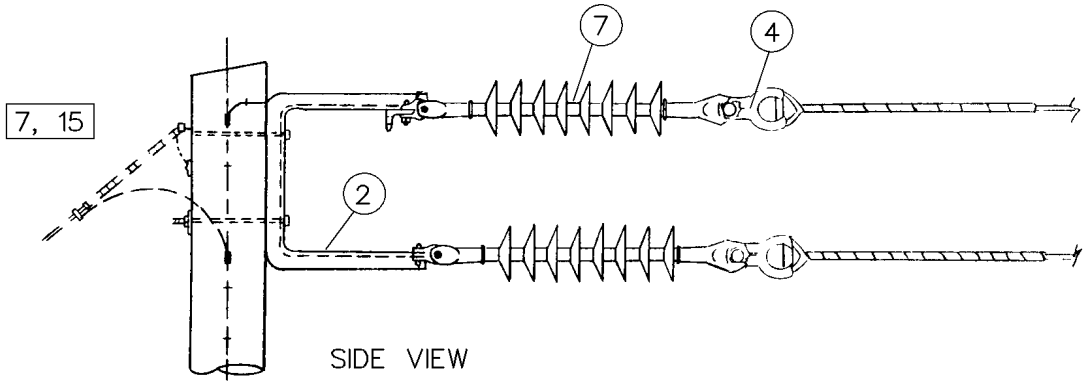
DEADEND

OPTIONS: 2, 1/0, 2/0, 336
BOLT PLATE: NONE

FOR REFERENCE ONLY



TOP VIEW



SIDE VIEW

NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BKT AE 004	1	BRACKET, AERIAL CABLE, DEADEND
3	CLA SS ***	3	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
4	CLE TH 001	3	CLEVIS, THIMBLE, 18,000 LBS.
5	CNN VG 005	1	CONNECTOR, VISE TYPE, 2-2/0 10-2/0
6	GRI PR 005	1	GRIP, PREFORMED, 7 NO. 7 AW
7	INS CO 002	3	INSULATOR, DEADEND, POLYMER
8	NUT SL 003	2	LOCKNUT, SQUARE M-F 5/8
9	SHA AN 001	3	SHACKLE, ANCHOR, 25,000 LBS.
10	SPA AC 001	3	SPACER, AERIAL CABLE, 35KV W/O TIES
11	TIE RI 001	12	TIE RING, AERIAL CABLE FOR INSULATOR
12	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
13	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

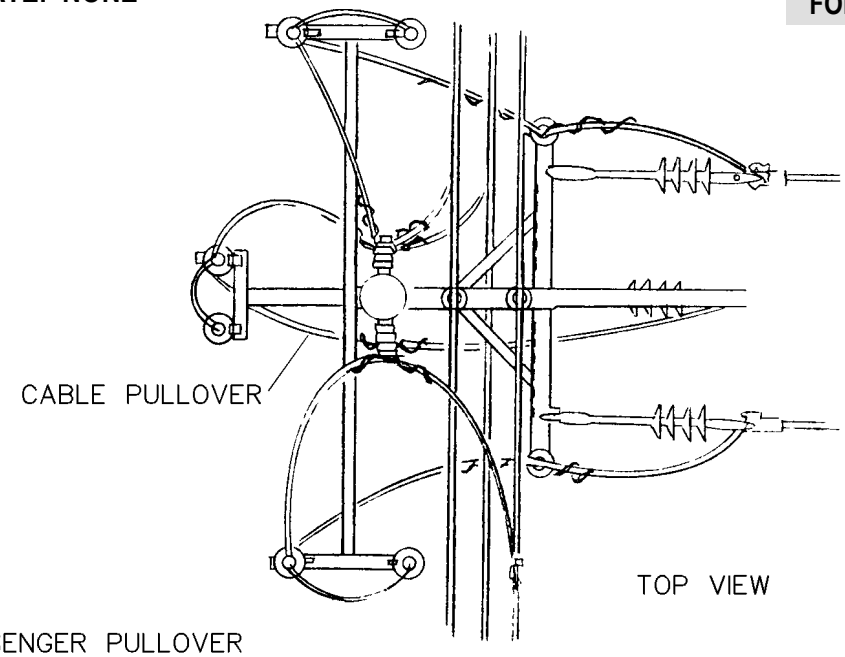
KC20

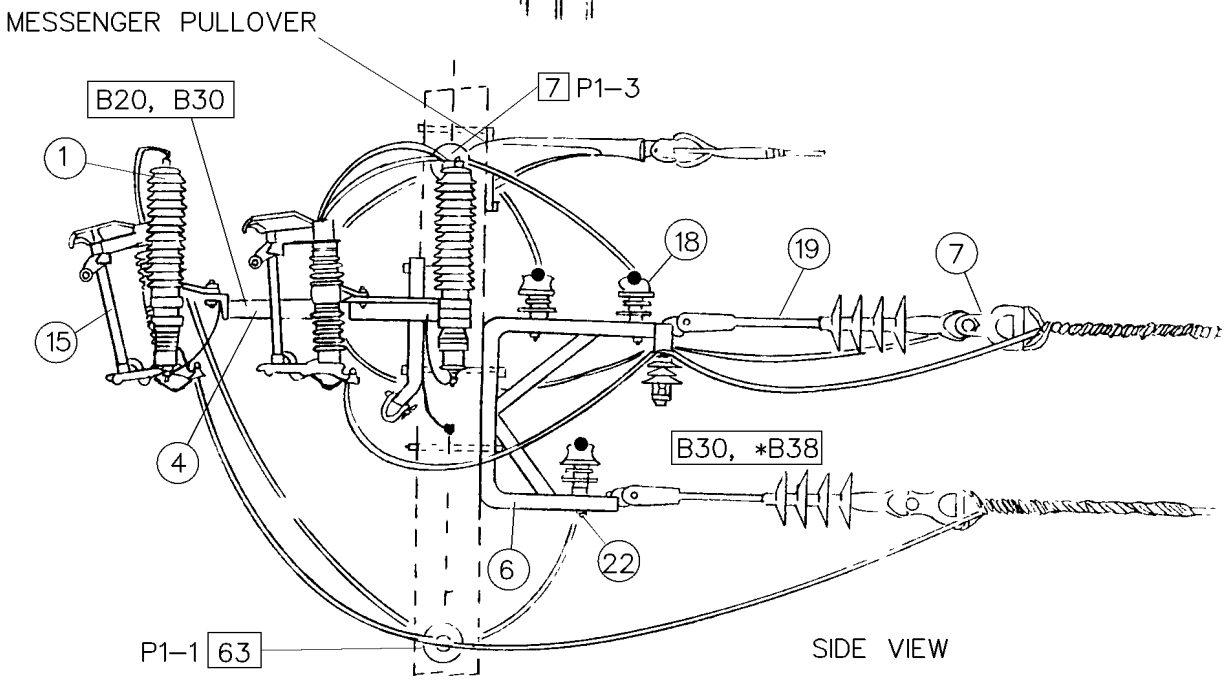
0 TO 5 DEGREE FUSED TAP OFF FRONT OF POLE

OPTIONS: 2-2, 1/0-2, 1/0-1/0, 2/0-2, 2/0-1/0, 2/0-2/0, 336-2, 336-1/0, 336-2/0, 336-336

BOLT PLATE: NONE

FOR REFERENCE ONLY





KC20

MATERIAL LIST

FOR REFERENCE ONLY

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	2	ARRESTER, LIGHTNING, 21KV, POLYMER
2	BOL MS 020	7	BOLT, MACHINE, SQUARE HEAD, 5/8X14
3	BOL DA 002	2	BOLT, DOUBLE ARMING, 5/8X14
4	BKT AC 002	1	BRACKET, TRI-MOUNT ARRESTER AND CUTOUT
5	BKT AE 005	1	BRACKET, AERIAL CABLE, 35KV, 14 IN.
6	BKT AE 007	1	BRACKET, AERIAL CABLE, 35KV, TANGENT/3-PHASE TAP
7	CLE TH 001	4	CLEVIS, THIMBLE, 18,000 LBS.
8	CNN CP ***	3	GENERAL CODE FOR CONNECTOR
9	CNN CP 004	1	CONNECTOR, AL. COMP., SIDE-BY, 1/0-2/0 1/0-3/0
10	CNN CP 008	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 3/0-4/0
11	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 10-2
12	CNN VG 005	1	CONNECTOR, VISE TYPE, 2-2/0 10-2/0
13	COB CO ***	1	GENERAL CODE FOR CONDUCTOR
14	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
15	CUT OT 004	3	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
16	GRI PR 005	1	GRIP, PREFORMED, 7 NO. 7 AW
17	INS VP 001	4	INSULATOR, VERTICAL POST, 34.5KV
18	INS PT 002	5	INSULATOR, PIN TYPE, 35KV, POLYETHYLENE
19	INS CO 002	3	INSULATOR, DEADEND, POLYMER
20	NUT SL 003	7	LOCKNUT, SQUARE M-F 5/8
21	NUT EY 002	1	NUT, EYE 5/8
22	PIN IN 003	4	PIN, SHORT SHANK INSULATOR, 15/35KV, 3/4X7
23	SHA AN 001	3	SHACKLE, ANCHOR, 25,000 LBS.
24	SPA AC 001	6	SPACER, AERIAL CABLE, 35KV W/O TIES
25	TIE RI 001	24	TIE RING, AERIAL CABLE FOR INSULATOR
26	TIE RI 002	6	TIE RING, AERIAL CABLE FOR SPACER
27	WAS RD 004	5	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
28	WAS SP 002	5	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

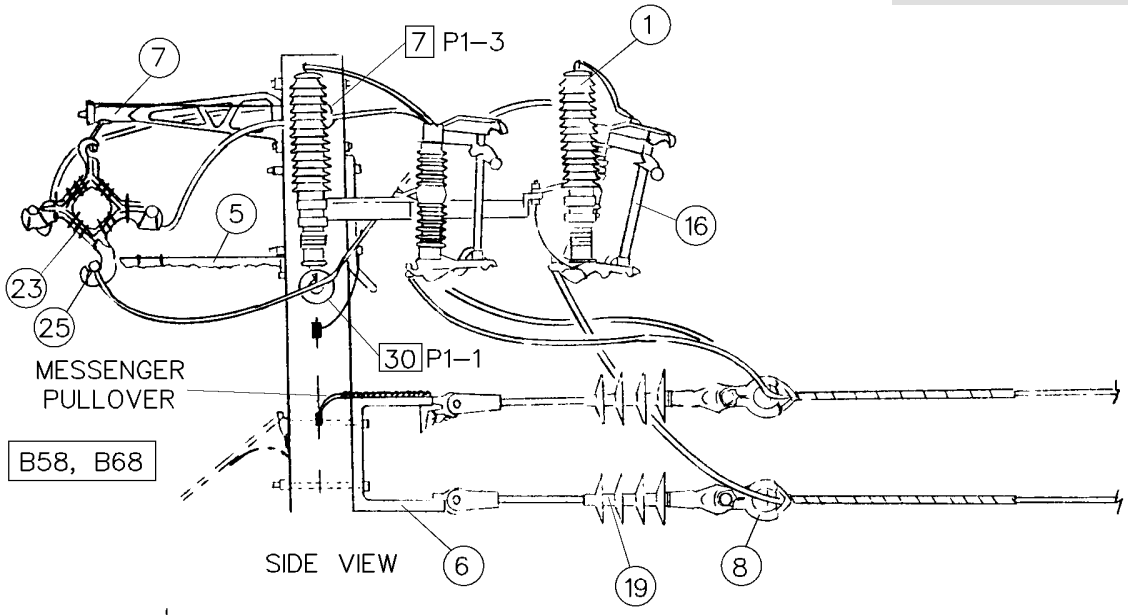
KC20-1

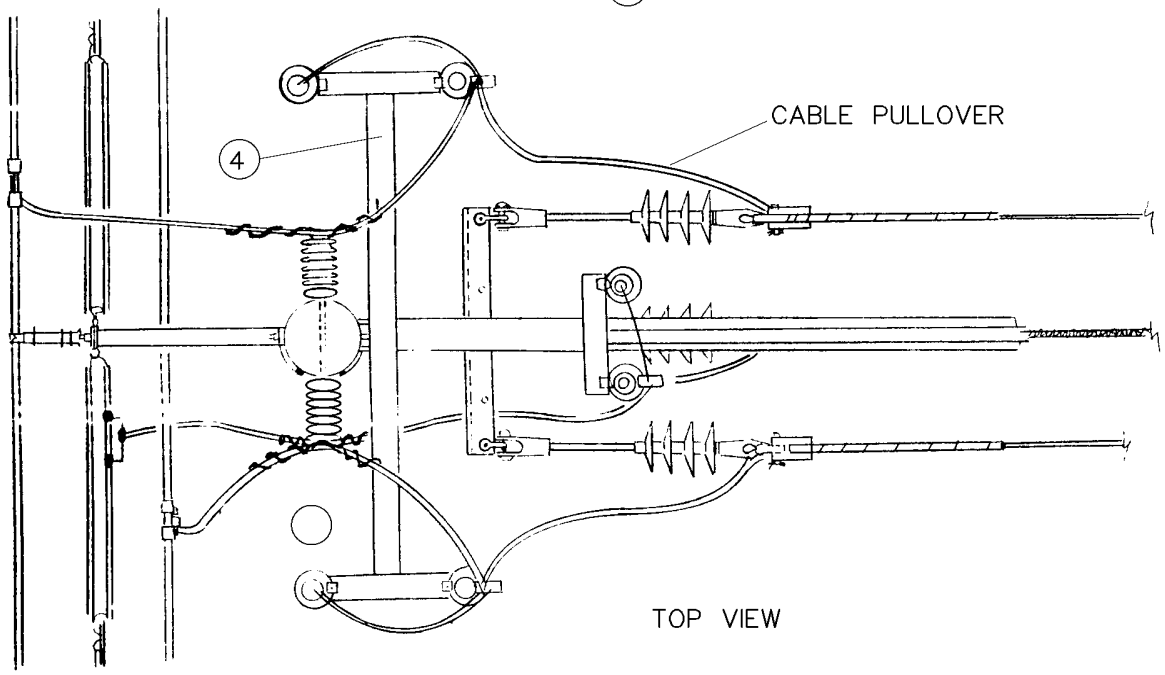
0 TO 5 DEGREE FUSED TAP OFF BACK OF POLE

OPTIONS: 2-2, 1/0-2, 1/0-1/0, 2/0-2, 2/0-1/0, 2/0-2/0, 336-2, 336-1/0, 336-2/0, 336-336

BOLT PLATE: NONE

FOR REFERENCE ONLY





KC20-1

MATERIAL LIST

FOR REFERENCE ONLY

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	2	ARRESTER, LIGHTNING, 21KV, POLYMER
2	BOL MS 020	6	BOLT, MACHINE, SQUARE HEAD, 5/8X14
3	BOL DA 002	1	BOLT, DOUBLE ARMING, 5/8X14
4	BKT AC 002	1	BRACKET, TRI-MOUNT ARRESTER AND CUTOUT
5	BKT AE 003	1	BRACKET, ANTI-SWAY, 24 IN. WITH STIRRUP
6	BKT AE 004	1	BRACKET, AERIAL CABLE, DEADEND
7	BKT AE 006	1	BRACKET, AERIAL CABLE, 35KV 24 IN.
8	CLE TH 001	4	CLEVIS, THIMBLE, 18,000 LBS.
9	CNN CP ***	3	GENERAL CODE FOR CONNECTOR
10	CNN CP 005	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 1/0-2/0
11	CNN CP 008	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 3/0-4/0
12	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 10-2
13	CNN VG 005	2	CONNECTOR, VISE TYPE, 2-2/0 10-2/0
14	COB CO ***	18	GENERAL CODE FOR CONDUCTOR
15	COB CO 028	12	CONDUCTOR, COPPER, #4 SOFT DRAWN
16	CUT OT 004	3	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
17	GRI PR 005	1	GRIP, PREFORMED, 7 NO. 7 AW
18	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5KV
19	INS CO 002	3	INSULATOR, DEADEND, POLYMER
20	NUT SL 003	6	LOCKNUT, SQUARE M-F 5/8
21	SCW LA 002	1	SCREW, LAG, 1/2X4
22	SHA AN 001	4	SHACKLE, ANCHOR, 25,000 LBS.
23	SPA AC 001	7	SPACER, AERIAL CABLE, 35KV W/O TIES
24	TIE RI 001	27	TIE RING, AERIAL CABLE FOR INSULATOR
25	TIE RI 002	3	TIE RING, AERIAL CABLE FOR SPACER
26	WAS RD 004	6	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
27	WAS SP 002	6	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

KC22

0 TO 5 DEGREE CROSS

OPTIONS: 2-2, 1/0-2, 1/0-1/0, 2/0-2, 2/0-1/0, 2/0-2/0, 336-2, 336-1/0, 336-2/0, 336-336
BOLT PLATE: NONE

FOR REFERENCE ONLY

NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BKT AE 001	1	BRACKET, AERIAL CABLE, DEADEND
3	CNN CP ***	6	GENERAL CODE FOR CONNECTOR
4	CNN CP 004	2	CONNECTOR, AL. COMP., SIDE-BY,
5	CNN VG 006	1	CONNECTOR, VISE TYPE, 1/0-4/0 10-4/0
6	GRI PR 005	2	GRIP, PREFORMED, 7 NO. 7 AW
7	INS PT 002	3	INSULATOR, PIN TYPE, 35KV, POLYETHYLENE
8	NUT SL 003	2	LOCKNUT, SQUARE M-F 5/8
9	NUT TE 001	1	NUT, THIMBLE EYE, 5/8, SINGLE EYE
10	NUT TE 002	1	NUT, THIMBLE EYE, 3/4, SINGLE EYE
11	PIN IN 003	3	PIN, SHORT SHANK INSULATOR, 15/35KV, 3/4X7
12	SPA AC 001	6	SPACER, AERIAL CABLE, 35KV W/O TIES
13	TIE RI 001	24	TIE RING, AERIAL CABLE FOR INSULATOR
14	TIE RI 02	3	TIE RING, AERIAL CABLE FOR SPACER
15	WAS RD 004	4	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
16	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

CONTAMINATED ENVIRONMENT

INTRODUCTION

1. The Contaminated Environment construction standards are identical to the Fiberglass Construction, except for cutouts, transformers, and transformer secondary connectors. Contaminated Environment cutouts (CUT OT 006) provide increased leakage distance by way of longer insulators. Contaminated Environment transformers (TRA CO 001-006) have longer bushings. Contaminated Environment transformer secondary connectors (CNN TS 009 for 75kV transformers and under) are a rubber molded version of the standard multi-tap connector.
2. For this reason, no plates are included in this section. Adding the suffix C to any plate that includes cutouts and/or transformers will provide the proper material. Some examples include DGAC, DUAC, and F1C.
3. For plates that do not include transformers or cutouts, the fiberglass construction standard plates should be applied.
4. FUS HO 046 is the 100A replacement barrel for contaminated environment cutouts that require longer barrels (18.25") and should be itemized individually when needed.
5. The ABB triangular shaped cutout is now approved for contaminated environment which provides increased leakage distance without requiring a longer fuse barrel. Standard 14.75" barrels shall be installed in this cutout.
6. Contaminated Environment standards shall be followed in areas including but not limited to:

   All poles to the east of and on the east side of San Pablo Rd.

   Hecksher Dr. on the water

   Blount Island

   Black Hammock Island

   Broward Rd.

   U.S. 17 North of Yellow Bluff Rd.

SINGLE-PHASE STANDARD

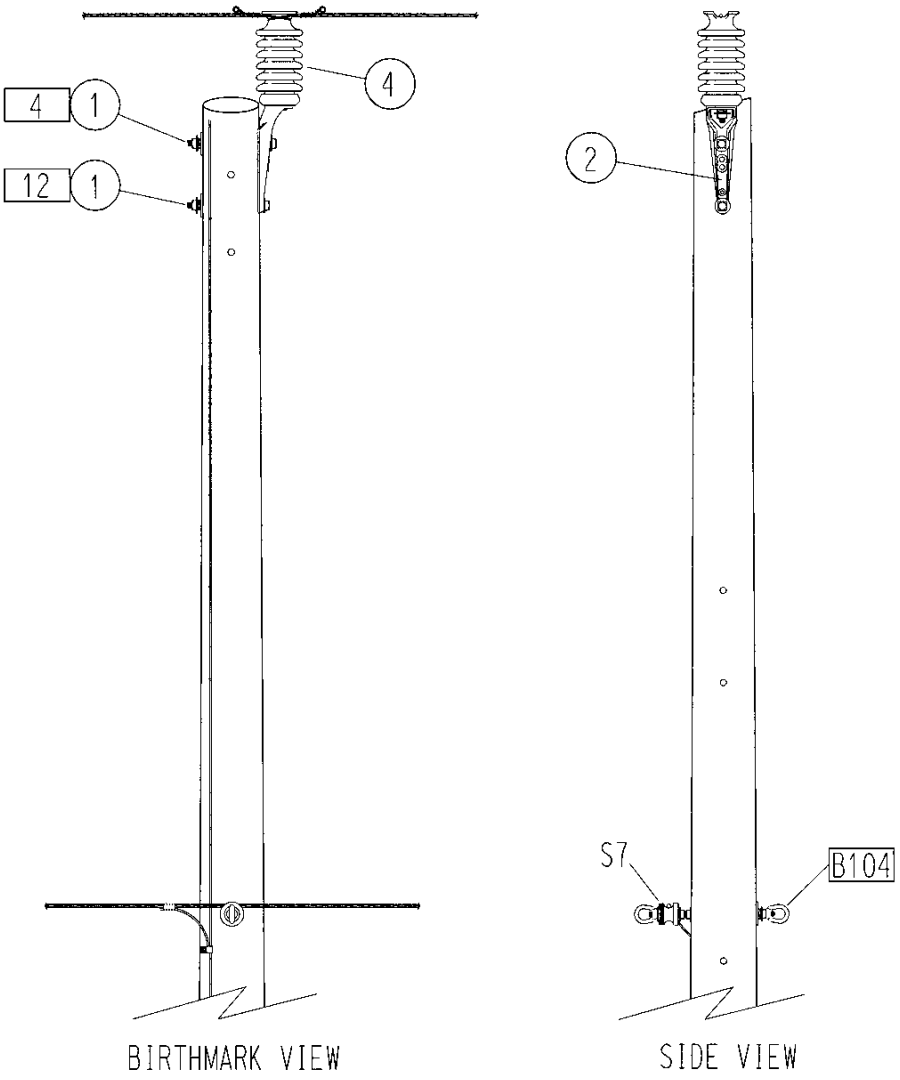
INTRODUCTION

1. The Single-Phase Standard was developed to lower JEA's costs by allowing primary construction on a 40-foot wood pole. However, there are limitations to the use of this standard when installed on a 40-foot wood pole. If there is any question that the pole cannot accommodate every limitation, a taller wood pole should be used. The only exception to this is when a 40-foot wood pole is used underneath a transmission line. The limitations are as follows
   - I.1.1. The 40-foot wood pole shall be used for single-phase construction only.
   - I.1.2. The pole shall be built on private property only.
   - I.1.3. The pole is rated for transformers 50kVA and smaller only.
   - I.1.4. Installations shall be for areas where no joint use attachments are foreseen.
   - I.1.5. The pole is rated for conductors 1/0 or smaller.
   - I.1.6. The pole shall never be used alongside a main road.
   - I.1.7. Its use shall be limited to four spans.
   - I.1.8. Installations shall be for areas where it is anticipated there will not be an increase in system load requiring future additional phases or equipment.
2. The drawings for transformer installations are for illustration only. Use the standard transformer plates (DGA, RGA, etc.) to receive the proper material depending on the system voltage. However, remember the transformer size limitation if installed on the 40-foot wood pole.
3. Because of similar material used, standards are shown in this Section that can be found elsewhere in the OH Standards Book. However, they are shown installed on the 40-foot wood pole
4. The pole-top bracket used for this standard requires 8-inch bolt spacing for attachment to the pole. The 40-foot wood pole is pre-drilled to accommodate this spacing, but if installed on any other pole, drilling will be required.
5. The pole-top bracket and insulator assembly can also be found in the Sub-Structure Section for custom plating applications.
6. Bolt locations are shown on the drawings within a box. The value is the distance from the bottom of the pole roof. A "B" before the number means the material is installed on the birthmark face of the pole. Numbers within a circle correspond to the material listed in the tables.

SP1

TANGENT – 0 TO 10 DEGREE ANGLE

OPTIONS: 2, 1/0
BOLT PLATE: NONE

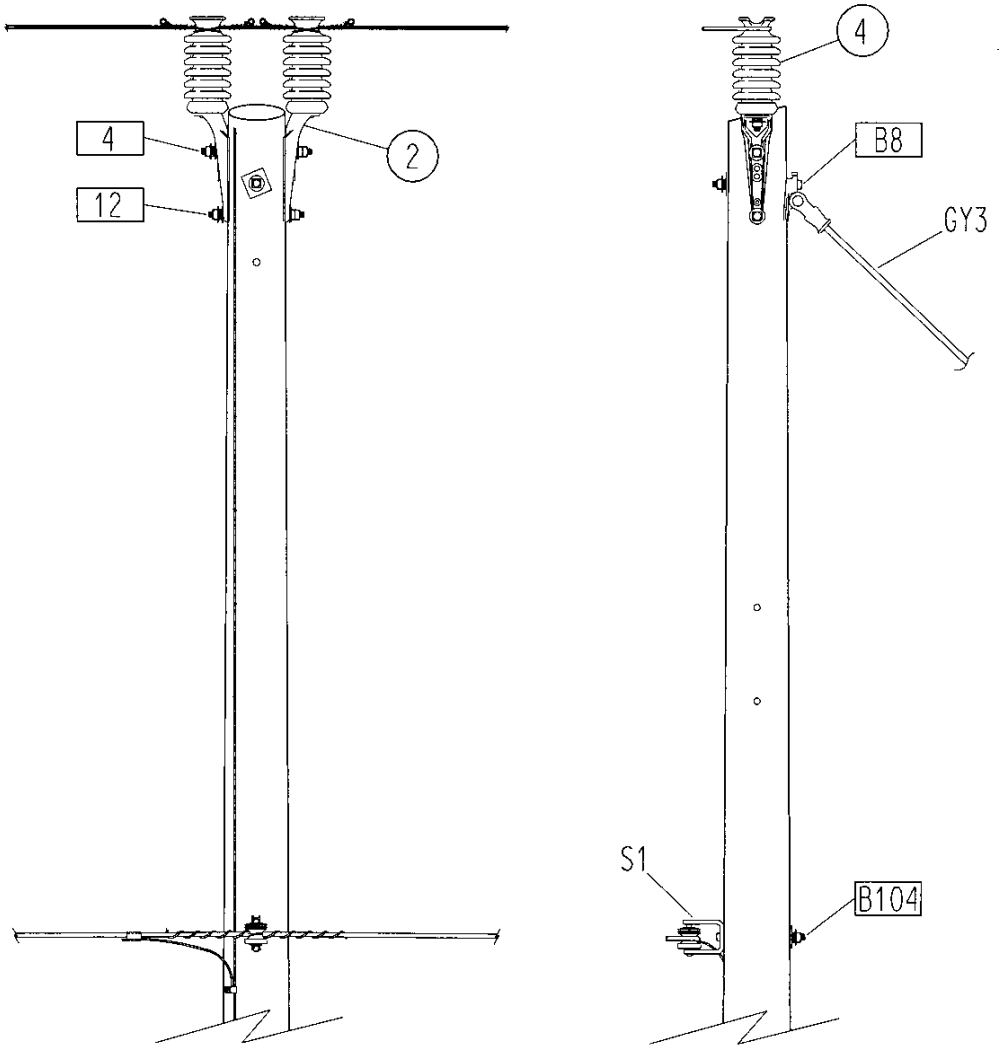


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD 3/4X12
2	BKT IN 005	1	BRACKET, INSULATOR, POLETOP
3	COB TW 005	6	CONDUCTOR, #4 SD AL. TIE WIRE
4	INS VP 001	1	INSULATOR, POST 34.5KV
5	STU LI 001	1	STUD, LINE POST 3/4 HEAD - 3/4 DIA. X 1-3/4 IN. SHANK
6	WAS RD 005	5	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
7	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
8	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

SP2

10 TO 30 DEGREE ANGLE

OPTIONS: 2, 1/0
BOLT PLATE: NONE



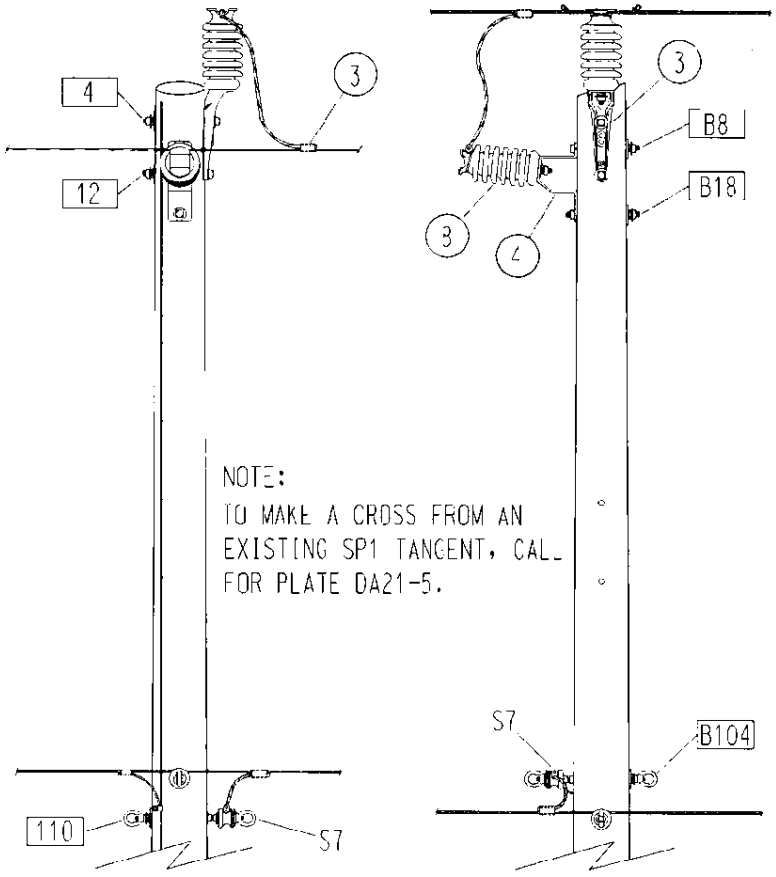
BIRTHMARK VIEW SIDE VIEW

NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
2	BKT IN 005	2	BRACKET, INSULATOR, POLETOP
3	COB TW 005	12	CONDUCTOR, #4 SD AL. TIE WIRE
4	INS VP 001	2	INSULATOR, POST 34.5KV
5	STU LI 001	2	STUD, LINE POST 3/4 HEAD - 3/4 DIA. X 1-3/4 IN. SHANK
6	WAS RD 005	8	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
7	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

SP3

CROSS

OPTIONS: 2, 1/0
BOLT PLATE: NONE

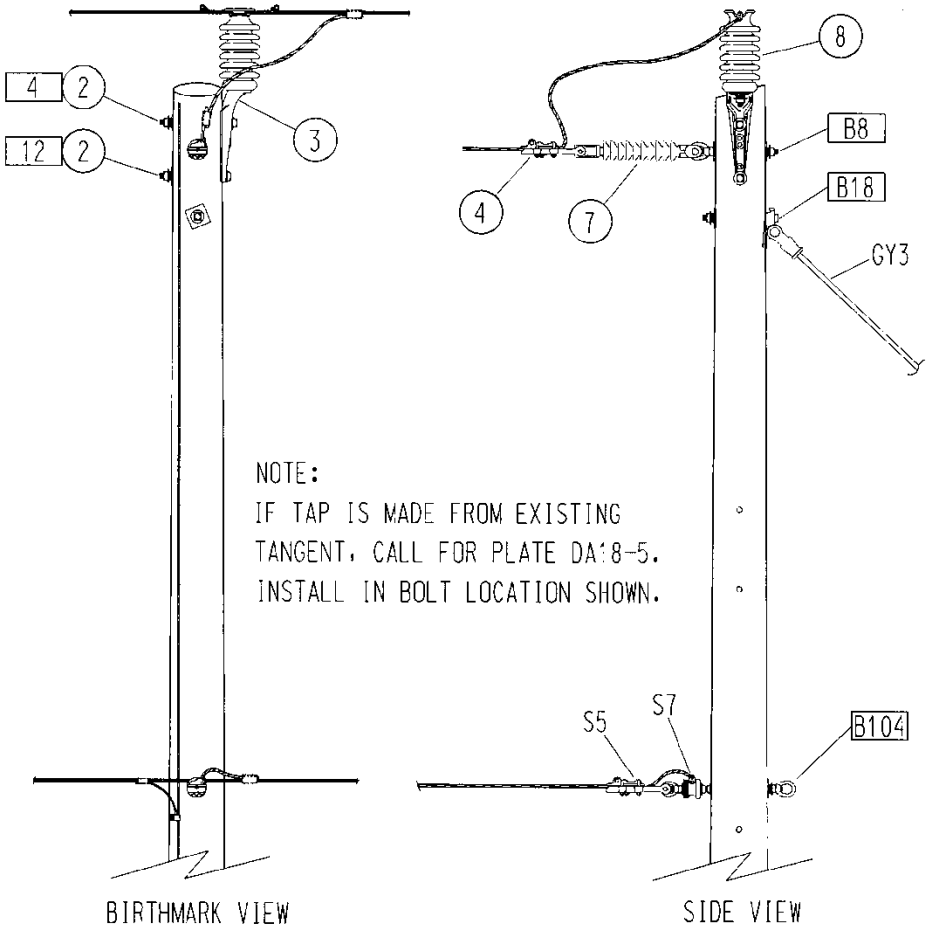


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 035	3	BOLT, MACHINE, SQUARE HEAD 3/4X12
2	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
3	BKT IN 005	1	BRACKET, INSULATOR, POLE-TOP
4	BKT IN 007	1	BRACKET, INSULATOR STANDOFF 6IN.
5	CNN CP ***	2	GENERAL CODE FOR AL. COMPRESSION CONNECTOR
6	COB AA ***	6	GENERAL CODE FOR AL. CONDUCTOR
7	COB TW 005	6	CONDUCTOR, #4 SD AL. TIE WIRE
8	INS VP 001	2	INSULATOR, POST 34.5KV
9	STU LI 001	2	STUD, LINE POST 3/4 HEAD- 3/4 DIA.X 1-3/4 IN. SHANK
10	TIE PR ***	1	GENERAL CODE FOR PREFORMED TIE
11	WAS RD 005	10	WASHER, ROUND, 2 INCH, FOR 3/4 IN. DIA. BOLT
12	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
13	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

SP4

TANGENT WITH SINGLE-PHASE TAP

OPTIONS: 2, 1/0
BOLT PLATE: NONE

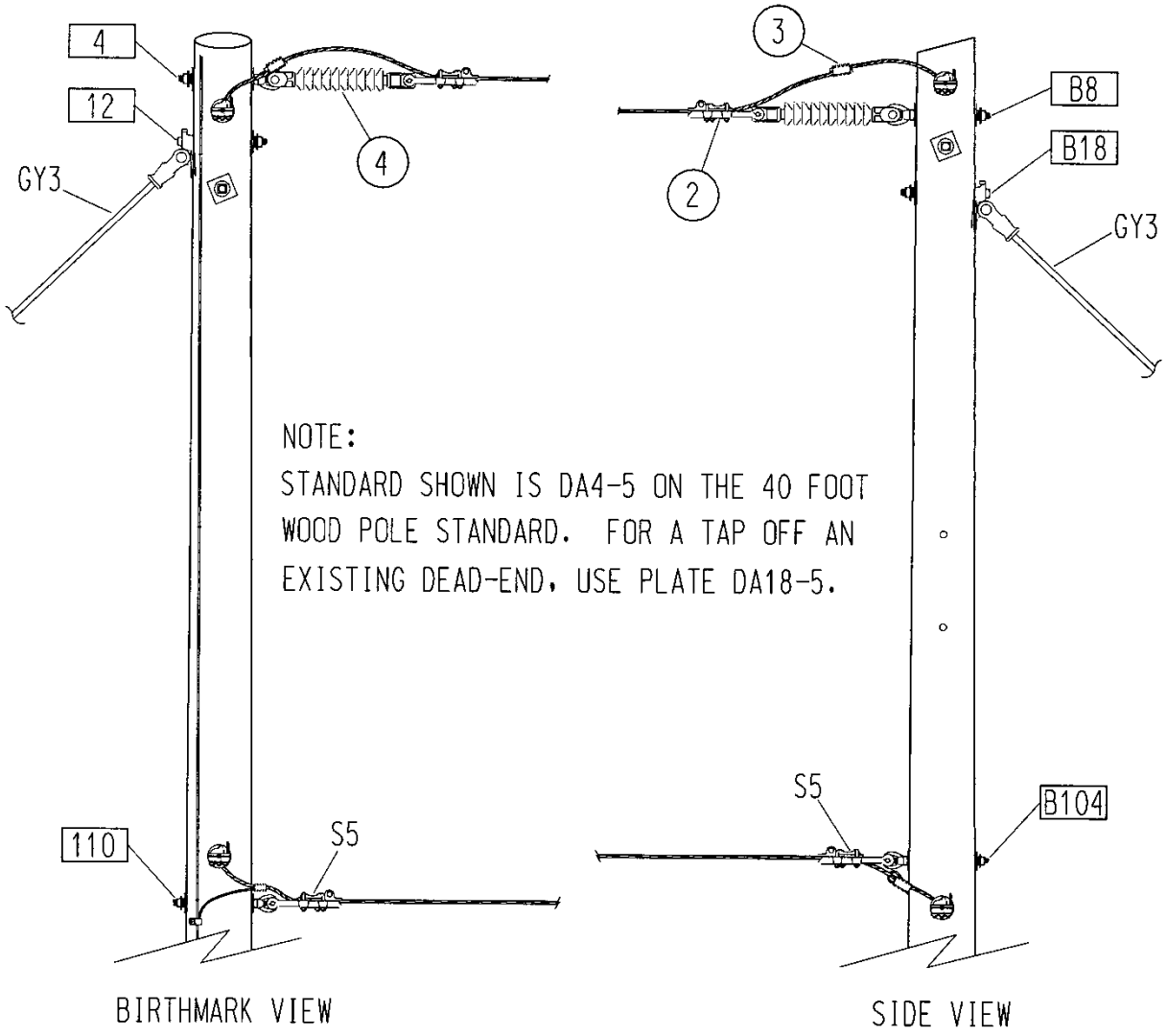


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
2	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD 3/4X12
3	BKT IN 005	1	BRACKET, INSULATOR, POLETOP
4	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
5	CNN CP ***	1	GENERAL CODE FOR AL. COMPRESSION CONNECTOR
6	COB TW 005	6	CONDUCTOR, #4 SD AL. TIE WIRE
7	INS CO 001	1	INSULATOR, DEAD-END, POLYMER 27KV
8	INS VP 001	1	INSULATOR, POST 34.5KV
9	NUT EY 003	1	NUT, EYE 3/4
10	STU LI 001	1	STUD, LINE POST 3/4 HEAD - 3/4 DIA. X 1-3/4 IN. SHANK
11	WAS RD 005	6	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
12	WAS SP 002	3	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
13	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

DA4-5

60 TO 90 DEGREE CORNER – SHOWN ON 40 FOOT POLE STANDARD

OPTIONS: 2, 1/0
BOLT PLATE: NONE

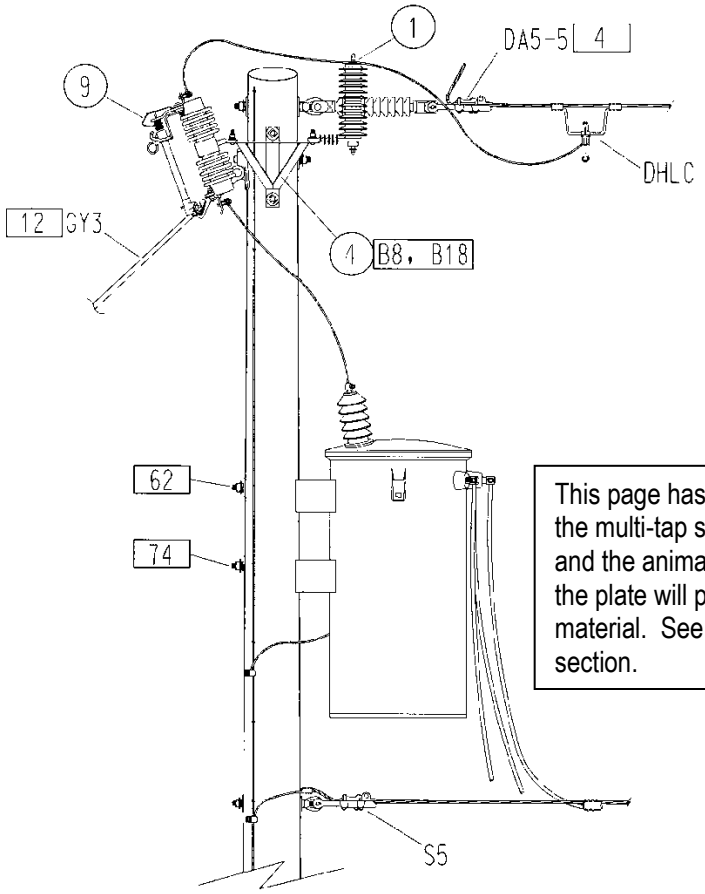


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
2	CLA SS ***	2	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
3	CNN CP ***	1	GENERAL CODE FOR AL. COMPRESSION CONNECTOR
4	INS CO 001	2	INSULATOR, DEAD-END, POLYMER 27KV
5	NUT EY 003	2	NUT, EYE 3/4
12	WAS RD 005	2	WASHER, ROUND, 2 IN., FOR 3/4 IN. DIA. BOLT
13	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
14	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

RGA, DGA, OR WGA

SINGLE-PHASE TRANSFORMER – DEAD-END – 40 FOOT WOOD POLE

OPTIONS: 15, 25, 50
BOLT PLATE: NONE



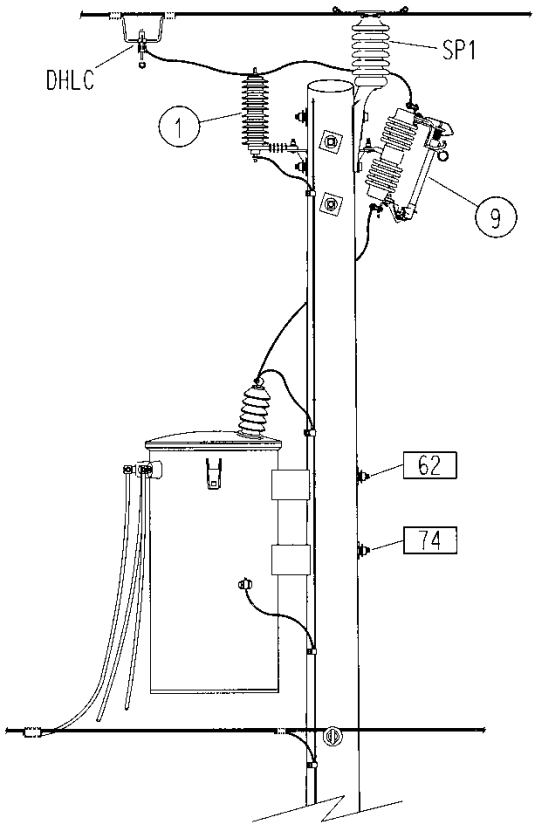
This page has not been updated with the multi-tap secondary connectors and the animal guarding system, but the plate will provide the proper material. See the Transformers section.

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI ***	1	ARRESTER, LIGHTNING, POLYMER MOV (DIST.)
2	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
3	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
4	BKT AC 001	1	BRACKET, ARRESTER AND CUTOUT, POLE MOUNTED
5	CAI RH ***	22	GENERAL CODE FOR COPPER RHW CABLE
6	CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, #6 SOL. - #1 STR.
7	COB CO 028	20	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
8	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 SOL. - 10-2 SOL.
9	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
10	FUS OH ***	1	GENERAL CODE FOR FUSE-LINK
11	TRA CG ***	1	GENERAL CODE FOR TRANSFORMER
12	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
13	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
14	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
15	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

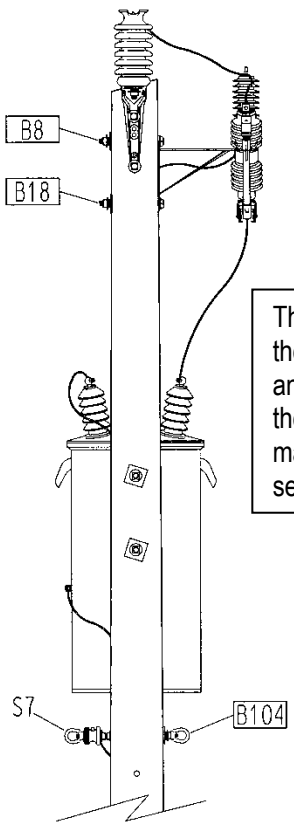
RGA, DGA, OR WGA

SINGLE-PHASE TRANSFORMER – TANGENT – 40 FOOT WOOD POLE

OPTIONS: 15, 25, 50
BOLT PLATE: NONE



BIRTHMARK VIEW



SIDE VIEW

This page has not been updated with the multi-tap secondary connectors and the animal guarding system, but the plate will provide the proper material. See the Transformers section.

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI ***	1	ARRESTER, LIGHTNING, POLYMER MOV (DIST.)
2	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
3	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
4	BKT AC 001	1	BRACKET, ARRESTER AND CUTOUT, POLE MOUNTED
5	CAI RH ***	22	GENERAL CODE FOR COPPER RHW CABLE
6	CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, #6 SOL. - #1 STR.
7	COB CO 028	20	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
8	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 SOL. - 10-2 SOL.
9	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
10	FUS OH ***	1	GENERAL CODE FOR FUSE-LINK
11	TRA CG ***	1	GENERAL CODE FOR TRANSFORMER
12	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
13	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
14	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
15	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

REGULATORS & CAPACITORS

INTRODUCTION

1. Capacitors come in several standard sizes. All banks used on the 26.4kV distribution system are constructed with different quantities of individual 200kVAR capacitors. For example, a 600kVAR bank is made up of three capacitors and a 1200kVAR bank is made up of six capacitors. Capacitor banks used on the 4kV distribution system may include either 50kVAR, 100kVAR, or 150kVAR capacitors depending on the size of the bank. However, all units that make up the bank will be the same size (i.e. all 50's, 100's, or 150's).
2. Jumper pins, where required, are included with each plate.
3. The cutout and arrester bracket will always mount behind the lowest phase regardless if multiple phases are present. For horizontal construction, the bracket will always be 40 inches below the crossarm attachment bolt.
4. Note: Install capacitor banks in a location that has access on both the field and street-side of the pole. Do not install banks where there is heavy tree growth, ditches, or steep slopes that would impede the access to the structure by a 35 foot trouble truck.
5. The plate suffixes F, S, and SN stand for "Fixed", "Switched", and "Switched Neutral".
6. These drawings and item listings have not been updated to include the animal guarding system, but the proper material is included in the plating.
7. Although the plates are not shown, the fiberglass construction plates are available.

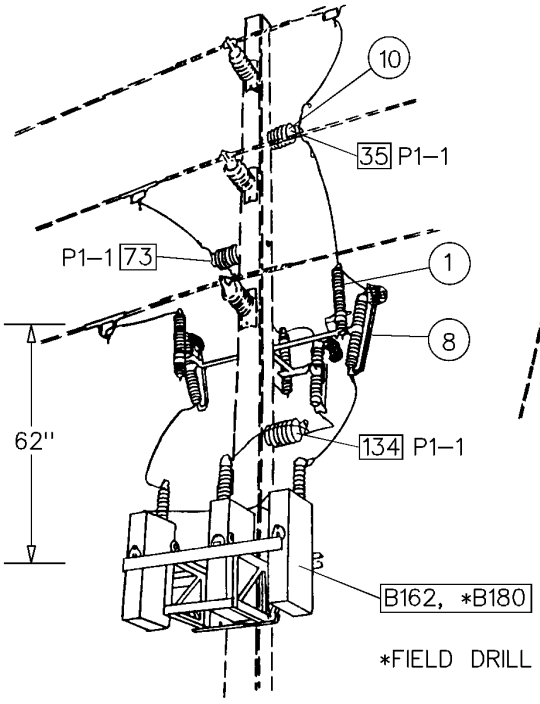
   YDC-6SF - 600kVAR capbank (CAPBA002) and control box (CAPCO002) with no monitoring

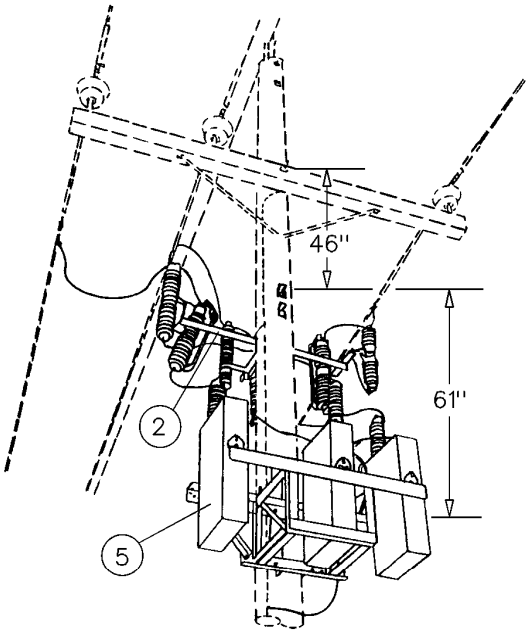
   YDC-6SCF - 600kVAR capbank (CAPBC006) and control box (CAPCO001) with Volt / VAR monitoring

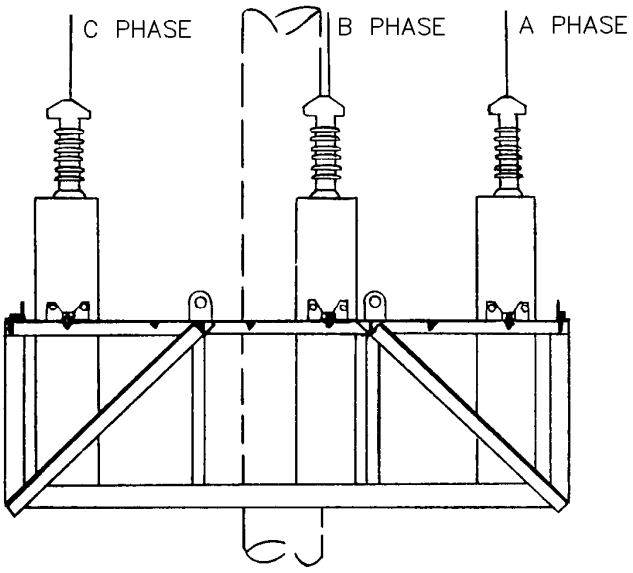
   YDC-12SF - 1200kVAR capbank (CAPBA001) and control box (CAPCO002) with no monitoring

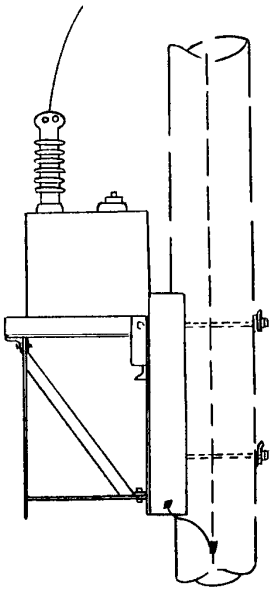
   YDC-12SCF - 1200kVAR capbank (CAPBC012) and control box (CAPCO001) with Volt / VAR monitoring

YDC-6SF (FIXED SWITCH)
YDC-6SCF (SCADA CONTROLLED SWITCH)
600KVAR BANK – 26.4KV SYSTEM







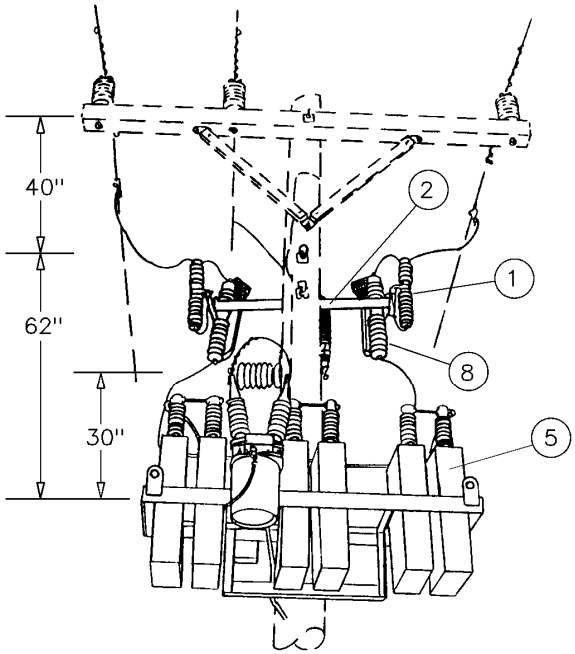


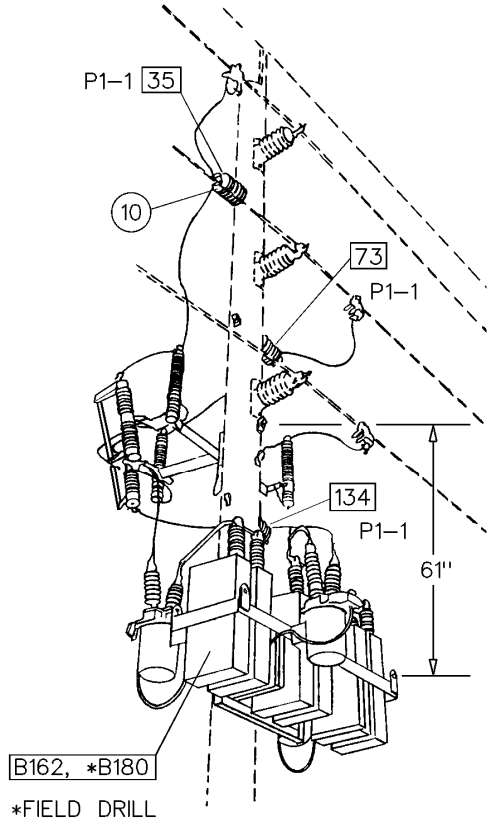
YDC-6SF (FIXED SWITCH)
YDC-6SCF (SCADA CONTROLLED SWITCH)*
600KVAR BANK – 26.4KV SYSTEM

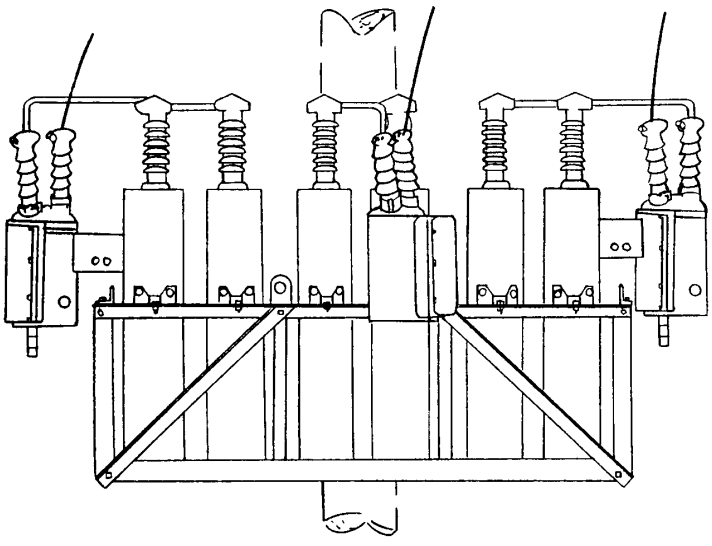
NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	3	ARRESTER, LIGHTNING, POLYMER, 21kV
2	BKT AC 002	1	BRACKET, ARRESTER/CUTOUT, TRI-MOUNT
3	BOL MS 036	4	BOLT, MACHINE, SQUARE HEAD, 3/4X14
4	BOL DA 015	3	BOLT, DOUBLE ARMING, 3/4X14
5	CAP BA 002	1	CAPACITOR BANK, 600kVAR, FIXED, FOR USE ON 26.4kV
6	CAP CO 002	1	CAPACITOR BANK CONTROL BOX WITH NO MONITORING
7	CNN VG 003	3	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
8	COB CO 028	30	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
8	CUT OT 004	3	CUTOUT, FUSED, 150kV BIL, 100 AMP, 27kV
9	FUS OH 014	3	FUSE LINK, TYPE K, 15 AMP
10	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5kV
11	WAS RD 005	5	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
12	WAS SF 003	8	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
13	WAS SP 002	5	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
	OR		
*	CAP BC 006	1	CAPACITOR BANK, 600kVAR, SCADA CONTROLLED, FOR USE ON 26.4kV
*	CAP CO 001	1	CAPACITOR BANK CONTROL BOX WITH VOLT / VAR MONITORING

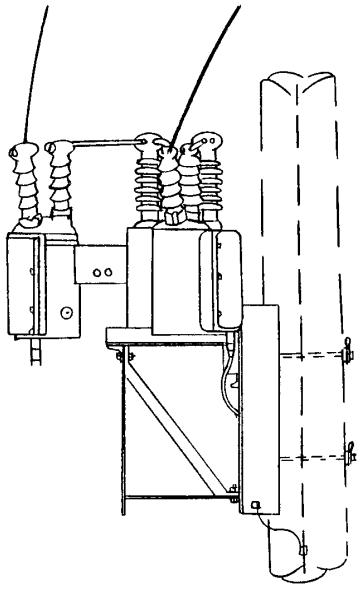
NOTE: THE CAPACITOR BANKS REQUIRE 120V CONTROL POWER.

YDC-12SF (FIXED SWITCH)
YDC-12SCF (SCADA CONTROLLED SWITCH)
1200KVAR BANK – 26.4KV SYSTEM









YDC-12SF (FIXED SWITCH)
YDC-12SCF (SCADA CONTROLLED SWITCH)*

1200KVAR BANK – 26.4KV SYSTEM – SWITCHED

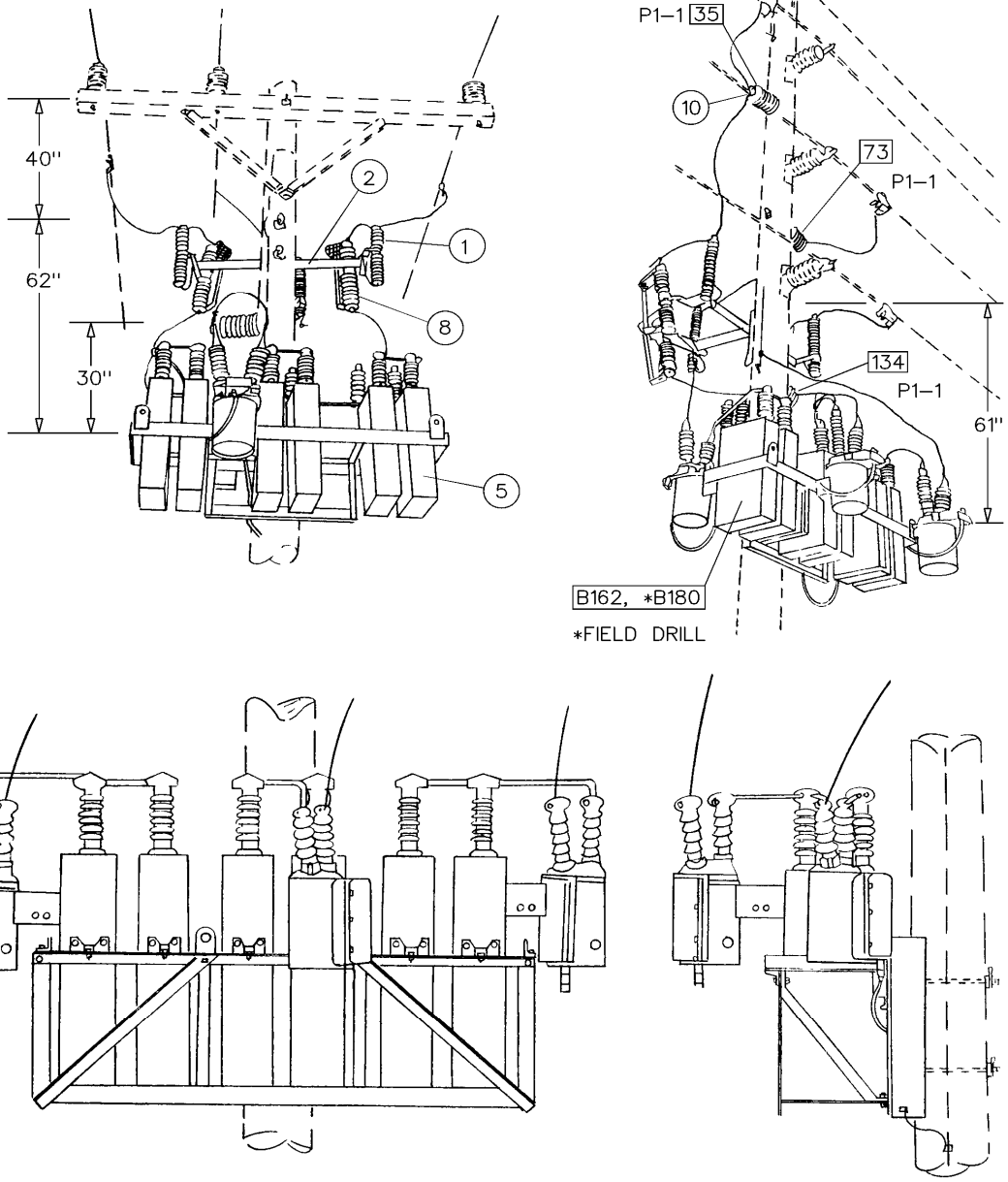
OPTIONS: NONE
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	3	ARRESTER, LIGHTNING, POLYMER, 21kV
2	BKT AC 002	1	BRACKET, ARRESTER/CUTOUT, TRI-MOUNT
3	BOL MS 036	4	BOLT, MACHINE, SQUARE HEAD, 3/4X14
4	BOL DA 015	3	BOLT, DOUBLE ARMING, 3/4X14
5	CAP BA 001	1	CAPACITOR BANK, 1200kVAR, SWITCHED, FOR USE ON 26.4kV
	CAP CO 002	1	CAPACITOR BANK CONTROL BOX WITH NO MONITORING
6	CNN VG 003	3	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
7	COB CO 028	30	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
8	CUT OT 004	3	CUTOUT, FUSED, 150kV BIL, 100 AMP, 27kV
9	FUS OH 016	3	FUSE LINK, TYPE K, 25 AMP
10	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5kV
11	WAS RD 005	5	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
12	WAS SF 003	8	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
	OR		
*	CAP BC 012	1	CAPACITOR BANK, 1200kVAR, SCADA CONTROLLED, FOR USE ON 26.4kV
*	CAP CO 001	1	CAPACITOR BANK CONTROL BOX WITH VOLT / VAR MONITORING

NOTE: THE CAPACITOR BANKS REQUIRE 120V CONTROL POWER.

YDC-12SN

1200KVAR BANK – 26.4KV SYSTEM – SWITCHED NEUTRAL



YDC-12SN

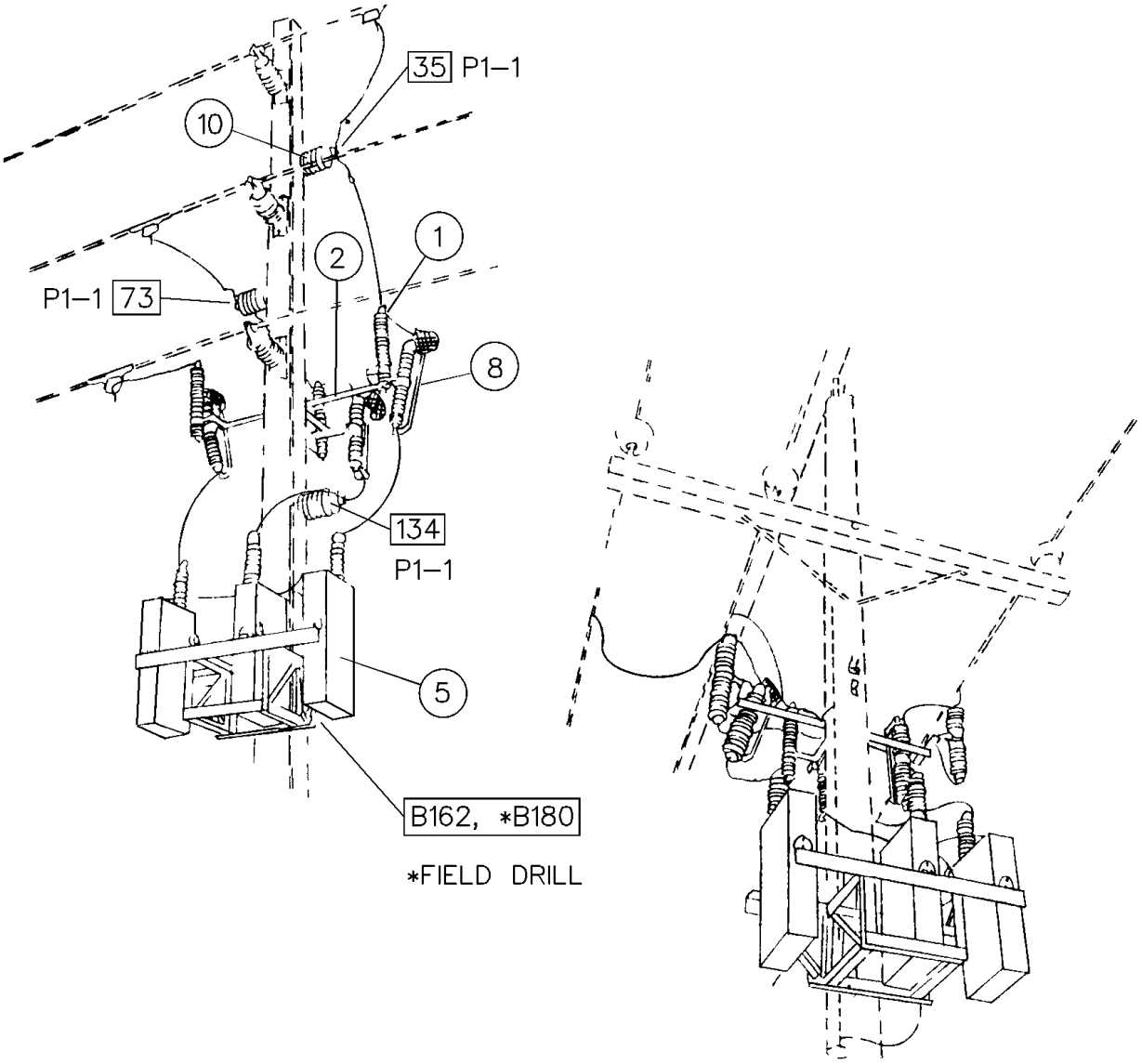
1200KVAR BANK – 26.4KV SYSTEM – SWITCHED NEUTRAL

OPTIONS: NONE
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	3	ARRESTER, LIGHTNING, POLYMER, 21kV
2	BKT AC 002	1	BRACKET, ARRESTER/CUTOUT, TRI-MOUNT
3	BOL MS 036	4	BOLT, MACHINE, SQUARE HEAD, 3/4X14
4	BOL DA 015	3	BOLT, DOUBLE ARMING, 3/4X14
5	CAP BA 003	1	CAPACITOR BANK, 1200kVAR, SWITCHED NEUTRAL, FOR USE ON 26.4kV
6	CNN VG 003	3	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
7	COB CO 028	30	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
8	CUT OT 004	3	CUTOUT, FUSED, 150kV BIL, 100 AMP, 27kV
9	FUS OH 016	3	FUSE LINK, TYPE K, 25 AMP
10	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5kV
11	WAS RD 005	5	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
12	WAS SF 003	8	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
13	WAS SP 002	5	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

YRC-1.5

150KVAR BANK – 4KV SYSTEM



YRC-1.5

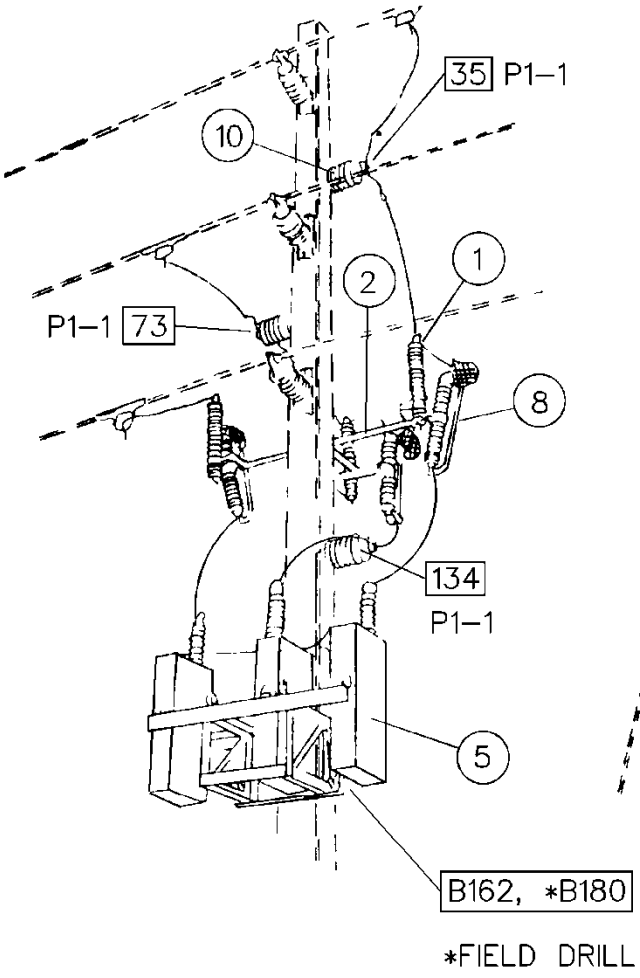
150KVAR BANK – 4KV SYSTEM

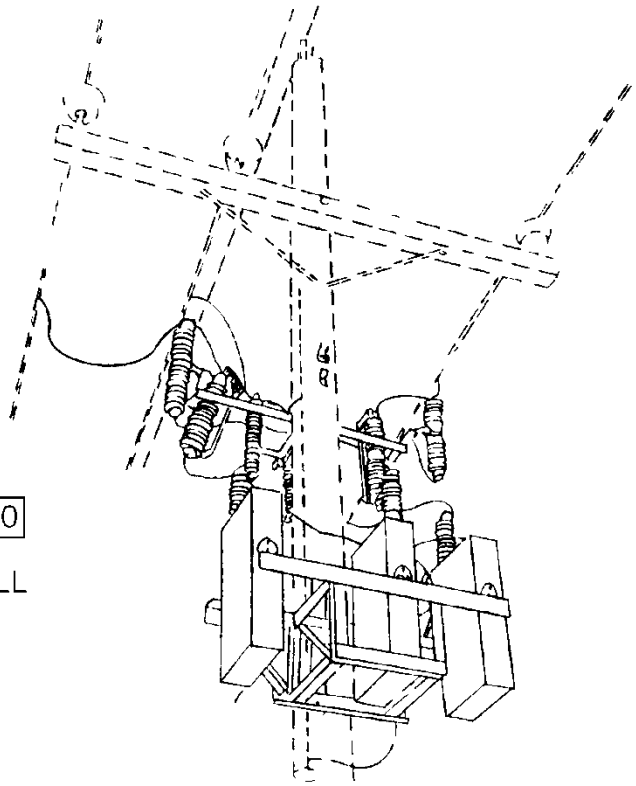
OPTIONS: F, S, SN
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 001	3	ARRESTER, LIGHTNING, POLYMER, 3kV
2	BKT AC 002	1	BRACKET, ARRESTER/CUTOUT, TRI-MOUNT
3	BOL MS 036	4	BOLT, MACHINE, SQUARE HEAD, 3/4X14
4	BOL DA 015	3	BOLT, DOUBLE ARMING, 3/4X14
5	CAP BA ***	1	GENERAL CODE FOR 4kV CAPACITOR BANK
6	CNN VG 003	3	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
7	COB CO 028	50	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
8	CUT OT 004	3	CUTOUT, FUSED, 125kV BIL, 100 AMP, 27kV
9	FUS OH ***	3	GENERAL CODE FOR K-LINK FUSE
10	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5kV
11	WAS RD 005	5	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
12	WAS SF 003	8	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
13	WAS SP 002	5	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

YRC-3

300KVAR BANK – 4KV SYSTEM





YRC-3

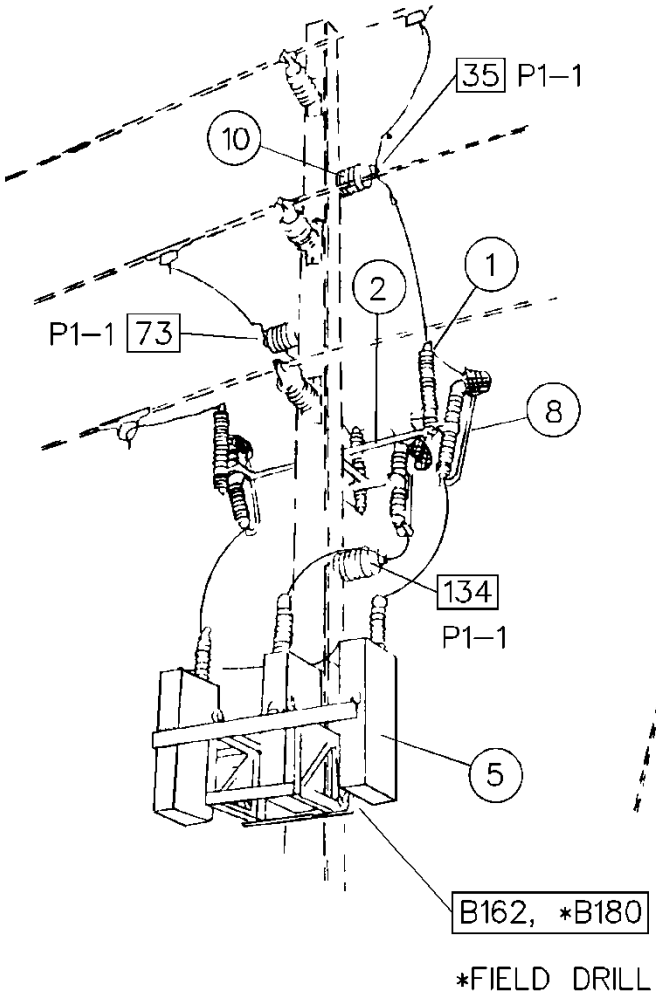
300KVAR BANK – 4KV SYSTEM

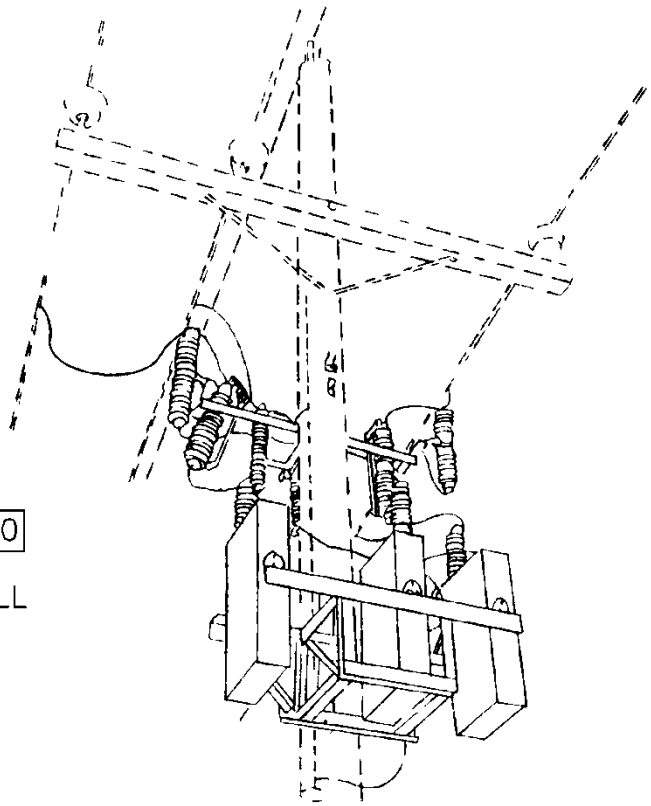
OPTIONS: F, S, SN
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 001	3	ARRESTER, LIGHTNING, POLYMER, 3kV
2	BKT AC 002	1	BRACKET, ARRESTER/CUTOUT, TRI-MOUNT
3	BOL MS 036	4	BOLT, MACHINE, SQUARE HEAD, 3/4X14
4	BOL DA 015	3	BOLT, DOUBLE ARMING, 3/4X14
5	CAP BA ***	1	GENERAL CODE FOR 4kV CAPACITOR BANK
6	CNN VG 003	3	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
7	COB CO 028	50	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
8	CUT OT X01	3	CUTOUT, FUSED, 125kV BIL, 100 AMP, 27kV
9	FUS OH ***	3	GENERAL CODE FOR K-LINK FUSE
10	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5kV
11	WAS RD 005	5	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
12	WAS SF 003	8	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
13	WAS SP 002	5	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

YRC-6

600KVAR BANK – 4KV SYSTEM





YRC-6

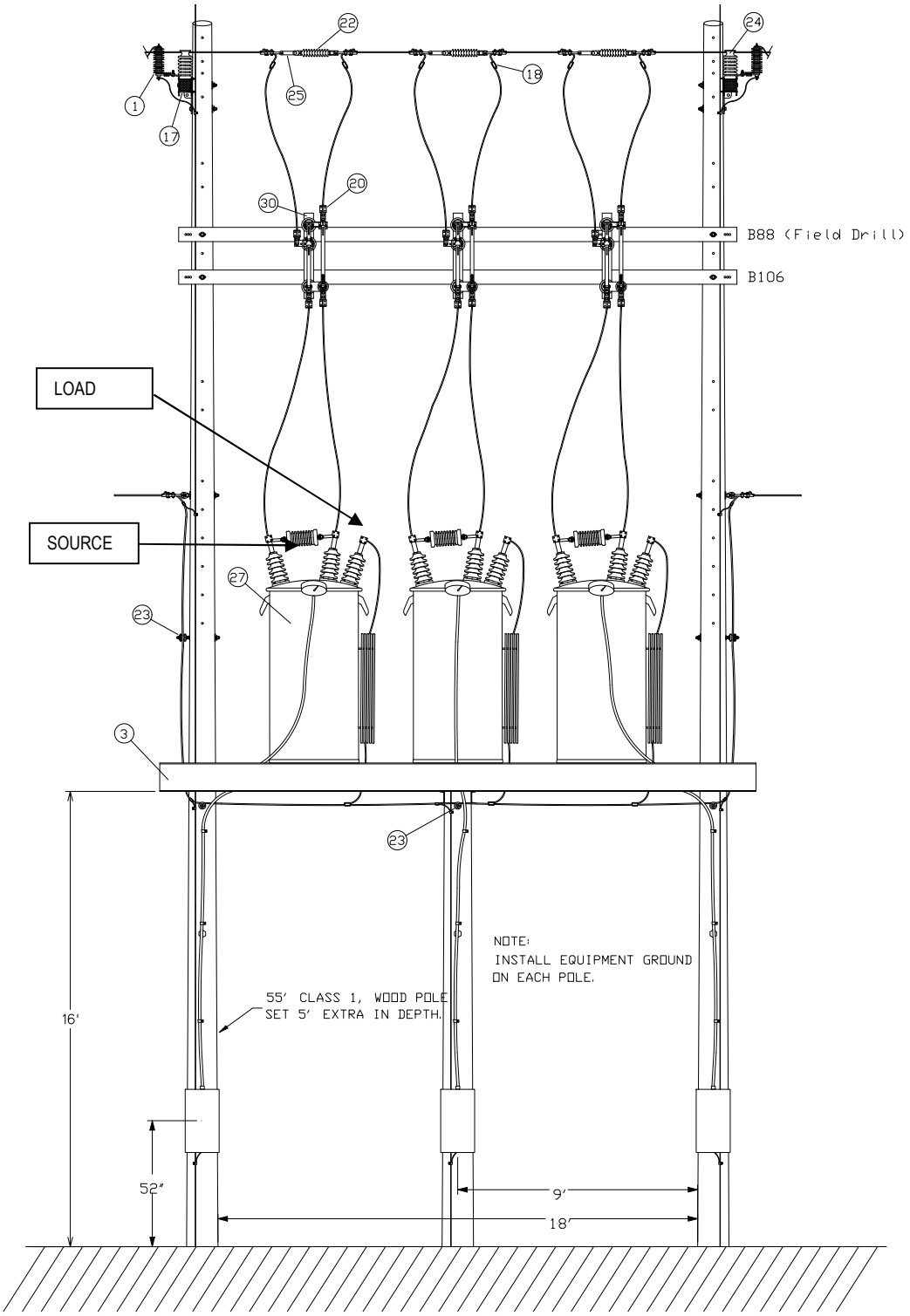
600KVAR BANK – 4KV SYSTEM

OPTIONS: F, S, SN
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 001	3	ARRESTER, LIGHTNING, POLYMER, 3kV
2	BKT AC 002	1	BRACKET, ARRESTER/CUTOUT, TRI-MOUNT
3	BOL MS 036	4	BOLT, MACHINE, SQUARE HEAD, 3/4X14
4	BOL DA 015	3	BOLT, DOUBLE ARMING, 3/4X14
5	CAP BA ***	1	GENERAL CODE FOR 4kV CAPACITOR BANK
6	CNN VG 003	3	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
7	COB CO 028	50	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
8	CUT OT X01	3	CUTOUT, FUSED, 125kV BIL, 100 AMP, 27kV
9	FUS OH ***	3	GENERAL CODE FOR K-LINK FUSE
10	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5kV
11	WAS RD 005	5	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
12	WAS SF 003	8	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
13	WAS SP 002	5	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

REG2

200 AMP VOLTAGE REGULATOR – 26.4KV SYSTEM



REG2

200 AMP VOLTAGE REGULATOR – 26.4KV SYSTEM

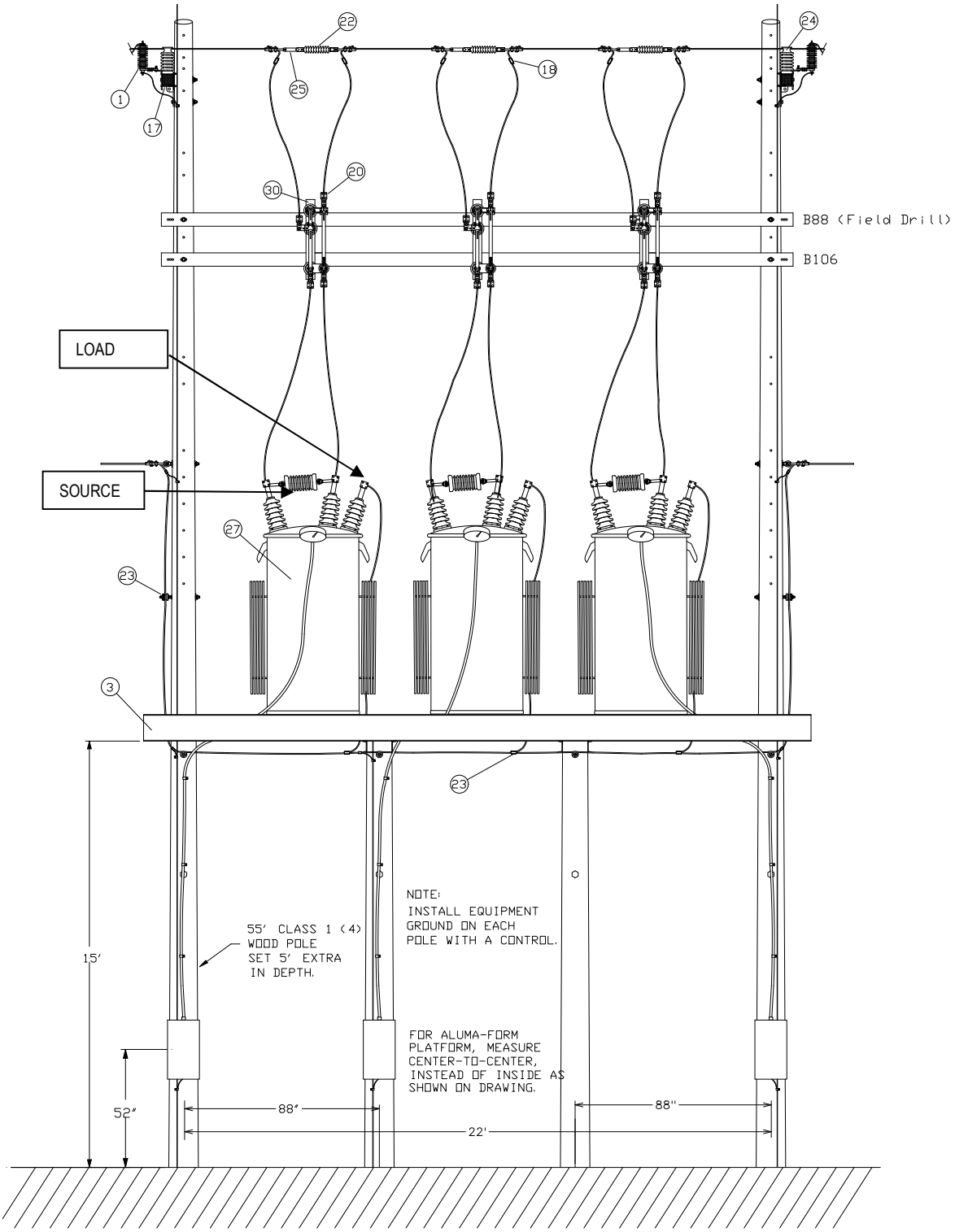
OPTIONS: 2, 1/0, 636

BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	6	ARRESTER, LIGHTNING, POLYMER, 21kV
2	BKT AC 003	6	BRACKET, CROSSARM MOUNTING CUTOUTS-ARRESTERS
3	BKT RG 001	1	BRACKET, 18' REGULATOR PLATFORM W/ BYPASS SWITCH CHANNEL(S)
4	BOL DA 004	5	BOLT, DOUBLE ARMING, 5/8 X 18
5	BOL MS 031	6	BOLT, MACHINE, SQUARE HEAD, 3/4X4
6	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
7	BOL MS 036	4	BOLT, MACHINE, SQUARE HEAD, 3/4X14
8	BOL MS 037	4	BOLT, MACHINE, SQUARE HEAD, 3/4X16
9	BOL MS 038	13	BOLT, MACHINE, SQUARE HEAD, 3/4X18
10	BOL MS 039	13	BOLT, MACHINE, SQUARE HEAD, 3/4X20
11	BOL TE 001	24	BOLT, TERMINAL KIT, S.S. BOLT, WASHERS
12	CLA SS ***	8	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
13	COB AA ***	120	GENERAL CODE FOR PRIMARY CONDUCTOR
14	COB AA ***	60	GENERAL CODE FOR NEUTRAL CONDUCTOR
15	COB CO 028	30	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
16	COB TW 005	50	CONDUCTOR, EC GRADE, 4 AAC
18	CNN ** ***	6	GENERAL CODE FOR PRIMARY CONNECTOR
19	CNN CP ***	6	GENERAL CODE FOR NEUTRAL CONNECTOR
20	CNN TE ***	12	GENERAL CODE FOR TERMINAL CONNECTOR
21	CNN VG 003	8	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
22	INS CO 001	3	INSULATOR, COMPOSITE, DEAD-END, 34.5KV
23	INS ST 002	5	INSULATOR, SPOOL TYPE, WHITE
24	INS VP 001	6	INSULATOR, VERTICAL POST, 34.5kV
25	LIK EX 001	3	LINK, EXTENSION, 18,000LB.
26	NUT PG 500	12	1/2"-13 NUT
27	REG VO 001	3	REGULATOR, VOLTAGE, 200A, 150KV BIL
28	SCW LA 005	24	SCREW, LAG, 1/4" X 2"
29	SCW HG 525	12	SCREW, 1/2"-13 X 4", HEX HEAD CAP, PLATE
30	SWE RB 001	3	SWITCH, REGULATOR BYPASS, 27KV
31	STP ST 002	12	STRAP, CONDUIT, 1 HOLE, 3/4"
32	STU LI 003	6	STUD, LINE POST, 3/4" HEAD- 3/4" DIA. X 7" SHANK
33	WAS RD 003	12	WASHER, ROUND, 1-3/8 IN. DIA., FOR 1/2 IN. BOLT
34	WAS RD 004	15	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
35	WAS RD 005	36	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
36	WAS SF 001	12	WASHER, SQUARE FLAT, 2 IN., FOR 1/2 IN. BOLT
37	WAS SF 003	48	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
38	WAS SL 001	12	WASHER, SPLIT LOCK, FOR 1/2 IN. BOLT
39	WAS SP 002	5	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

REG4

418 AMP VOLTAGE REGULATOR – 26.4KV SYSTEM



REG4

418 AMP VOLTAGE REGULATOR – 26.4KV SYSTEM

OPTIONS: 636

BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	6	ARRESTER, LIGHTNING, POLYMER, 21kV
2	BKT AC 003	6	BRACKET, CROSSARM MOUNTING CUTOUTS-ARRESTERS
3	BKT RG 002	1	BRACKET, 22' REGULATOR PLATFORM W/ BYPASS SWITCH CHANNEL(S)
4	BOL DA 004	5	BOLT, DOUBLE ARMING, 5/8 X 18
5	BOL MS 031	6	BOLT, MACHINE, SQUARE HEAD, 3/4X4
6	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
7	BOL MS 036	4	BOLT, MACHINE, SQUARE HEAD, 3/4X14
8	BOL MS 037	4	BOLT, MACHINE, SQUARE HEAD, 3/4X16
9	BOL MS 038	18	BOLT, MACHINE, SQUARE HEAD, 3/4X18
10	BOL MS 039	18	BOLT, MACHINE, SQUARE HEAD, 3/4X20
11	BOL TE 001	24	BOLT, TERMINAL KIT, S.S. BOLT, WASHERS
12	CLA SS ***	8	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
13	COB AA ***	120	GENERAL CODE FOR PRIMARY CONDUCTOR
14	COB AA ***	60	GENERAL CODE FOR NEUTRAL CONDUCTOR
15	COB CO 028	30	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
16	COB TW 005	50	CONDUCTOR, EC GRADE, 4 AAC
18	CNN ** ***	6	GENERAL CODE FOR PRIMARY CONNECTOR
19	CNN CP ***	6	GENERAL CODE FOR NEUTRAL CONNECTOR
20	CNN TE ***	12	GENERAL CODE FOR TERMINAL CONNECTOR
21	CNN VG 003	8	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
22	INS CO 001	3	INSULATOR, COMPOSITE, DEAD-END, 34.5KV
23	INS ST 002	5	INSULATOR, SPOOL TYPE, WHITE
24	INS VP 001	6	INSULATOR, VERTICAL POST, 34.5kV
25	LIK EX 001	3	LINK, EXTENSION, 18,000LB.
26	NUT PG 500	12	1/2"-13 NUT
27	REG VO 002	3	REGULATOR, VOLTAGE, 418A/833KVA, 150KV BIL
28	SCW LA 005	24	SCREW, LAG, 1/4" X 2"
29	SCW HG 525	12	SCREW, 1/2"-13 X 4", HEX HEAD CAP, PLATE
30	SWE RB 001	3	SWITCH, REGULATOR BYPASS, 27KV
31	STP ST 002	12	STRAP, CONDUIT, 1 HOLE, 3/4"
32	STU LI 003	6	STUD, LINE POST, 3/4" HEAD- 3/4" DIA. X 7" SHANK
33	WAS RD 003	12	WASHER, ROUND, 1-3/8 IN. DIA., FOR 1/2 IN. BOLT
34	WAS RD 004	15	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
35	WAS RD 005	36	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
36	WAS SF 001	12	WASHER, SQUARE FLAT, 2 IN., FOR 1/2 IN. BOLT
37	WAS SF 003	48	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
38	WAS SL 001	12	WASHER, SPLIT LOCK, FOR 1/2 IN. BOLT
39	WAS SP 002	5	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

OPTION 1: JEA NEUTRAL INSTALLATION NOTES

The pictures below shows a 200 amp voltage regulator with the neutral sitting on spool insulators going under the platform and the communication cable is attached to the pole 40 inches below the neutral.

OPTION 1: JEA NEUTRAL INSTALLATION NOTES

OPTION 2: JEA NEUTRAL INSTALLATION NOTES (ROAD SIDE VIEW)

The pictures below shows a 418 amp voltage regulator with the neutral sitting on P8's, attached to a clamp top insulator, going behind the voltage regulators. In the road side picture the JEA fiber was relocated and currently sitting on P8's in fiber box. The communication cable is attached to the pole more than 40 inches below the bottom of the voltage regulators.

OPTION 2: JEA NEUTRAL INSTALLATION NOTES (FIELD VIEW)

OPTION 2: JEA NEUTRAL INSTALLATION NOTES (FIELD VIEW)

TRANSFORMERS

INTRODUCTION

1. This section shows different configurations of one, two, and three-phase transformers for the 4kV, 13.2kV, and 26.4kV primary systems used by JEA.

2. On one, two, and three-phase vertical structures, the cutout/arrester bracket shall always be mounted behind the bottom phase even if the lowest phase is not present. The top transformer bolt will always be 54 inches below the top bolt of the cutout/arrester bracket.

3. For horizontal construction, the cutout/arrester bracket shall always be mounted 43 inches below the crossarm mounting bolt. For step-down application, the second crossarm shall always be 54 inches below the top transformer bolt.

4. Jumper pin locations are listed in a table within this section and must be used to support primary jumpers. Call for the sub-structures as indicated in the table.

5. Caution shall be observed if installing a streetlight with the 8' rise bracket on poles with 100kVA or larger transformers. No other equipment shall be mounted on the same pole with a transformer. Standard clearances will be strictly observed when mounting streetlights and taking primary taps from the same pole.

6. Transformers installed on structures utilizing aerial cable should be treated as if it was bare primary. No special plates are required.

7. Listed below are the general rules and allowable exceptions for transformer installations:
   1. No three-phase corner poles or three-phase tap poles will have transformers installed on them.
   2. On a 90 degree single-phase 45 foot corner pole, with primary mounted in the A phase position, the cutout/arrester bracket for a transformer may be installed in the B phase position and still have 54 inches of clearance to the transformer. A 12' guy breaker will be used at the cutout and arrester bracket on the line side.
   3. On a single-phase tap pole, the lateral fuse cutout can be installed with the transformer cutout, provided they are on opposite sides of the pole.
   4. On a three-phase tangent pole, A and B phase may be tapped, with a single-phase transformer installed on the same pole, provided the transformer is tapped off C phase.

   Transformers should not be installed on poles with other equipment such as group switches, reclosers, capacitors, etc. In general, there are no exceptions to the above criteria. The idea that a structure can be physically constructed should not diminish the fact that it may lead to an unsafe condition. Again, if unusual or nonstandard framing is required, the engineer should always review the design with his/her Manager, the appropriate Standards engineer, and the proper C&M personnel before releasing the job to construction.

8. Hot-line clamps are not part of the transformer plates and must be plated separately.

9. Plate options are listed on each page in the upper left-hand corner of each construction standard.

10. For proper energizing and de-energizing procedures when working with closed-delta transformer banks, refer to the end of this chapter. This procedure also addresses the application and installation of a temporary grounding switch for nuisance banks.

11. Secondary Downleads shall no longer be utilized for all transformer installations, but the copper RHW cable is still used for tying secondaries. Plates for 10, 15, 25 & 50 kVA transformers include the CNNTS007 multi-tap connectors. Plates for 75, 100 & 167 kVA transformers include the CNNTS006 four-hole NEMA pad connector with the terminal hardware kit BOLTE001.

12. Three "NEW" options have been added to the transformer plates. For single-phase transformer plates, options have been added to provide 240/480V transformers. For three-phase transformer plates, options have been added to supply 120/208V or 277/480V transformers. See the following examples:

I.12.1. DGA*50/480 = 26.4kV, 1∅, 50kVA transformer, 240/480V

I.12.2. DGC*50/208 = 26.4kV, 3∅ bank, 3-50kVA transformers, 120/208V

I.12.3. RGC*75/480 = 4kV, 3∅ bank, 3-75kVA transformers, 277/480V

NOTE: Only plates DGC*25/208, DGC*50/208, and DGC*75/208, supply transformers that have already had their secondary internal taps changed to provide 208V. All other 208 transformer options must have their internal taps changed in the field or prior to issue by the storeroom.

13. The plates have been updated with the new animal guarding system. The #4 covered copper (CAI RH 010) is used for all jumpers. The bushing cover (GUA AN 002) is mounted around the top skirt of the transformer and arrester bushings. The cutout guard (GUA AN 006) is installed on the top of each cutout.

14. Transformer 50kVA and below require 5/8" bolts. Transformers 75kVA and above require 3/4" bolts.

MULTI-TAP INSTALLATION

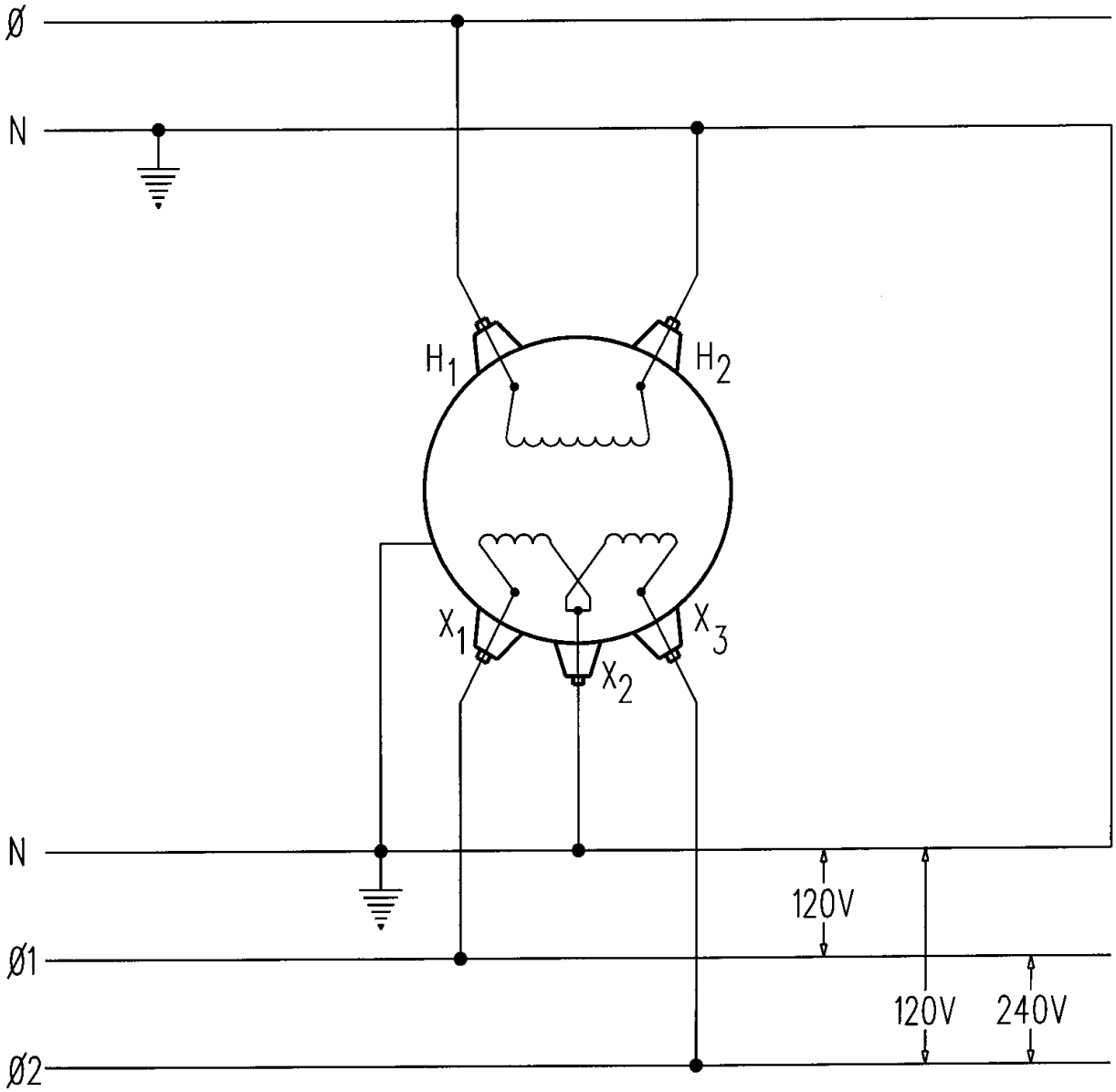
Tie one secondary neutral to the mainline neutral and then continue that secondary neutral to the multi-tap connector.
Tie the remaining secondary neutrals directly to the multi-tap connector.
Take one continuous piece of #4 solid copper and run it from the multi-tap connector to the tank ground then to the pole ground.

JUMPER PIN LOCATION TABLE

CONSTRUCTION	LOCATION	ONE TRANSFORMER				TWO TRANSFORMERS				THREE TRANSFORMERS			
		CONVENTIONAL		STEPDOWN		CONVENTIONAL		STEPDOWN		CONVENTIONAL		STEPDOWN	
		A Ø	B Ø	A Ø	B Ø	A Ø	B Ø	A Ø	B Ø	A Ø	B Ø	A Ø	B Ø
		SUB-STRUCTURES											
TYPE II CROSSARM	127*			P1-1								P1-1	
	192*											P1-1	
TYPE III TANGENT	35	P1-1				P1-1		P1-1		P1-1		P1-1	
	73	P1-1	P1-1			P1-1 / P1-3	P1-1	P1-3	P1-3	P1-3		P1-3	P1-3
	127*											P1-1	
	192*											P1-1	
TYPE IV DEADEND	B30	P1-1				P1-1				P1-1			
	B68	P1-1	P1-1			P1-1 / P1-3	P1-1			P1-3			
	127*										P1-1		

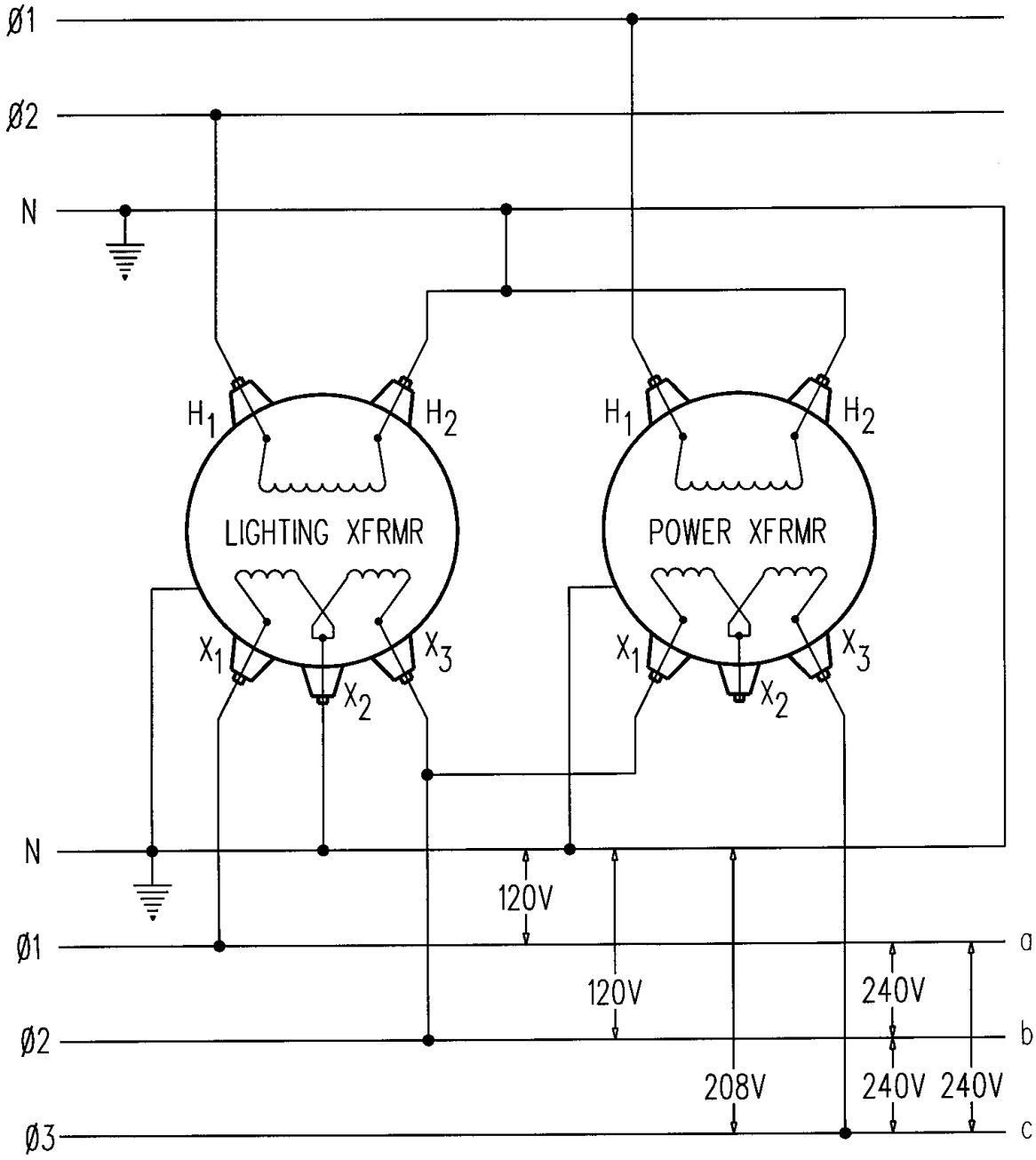
*** Indicates hole must be field drilled**

TRANSFORMER WIRING DIAGRAM



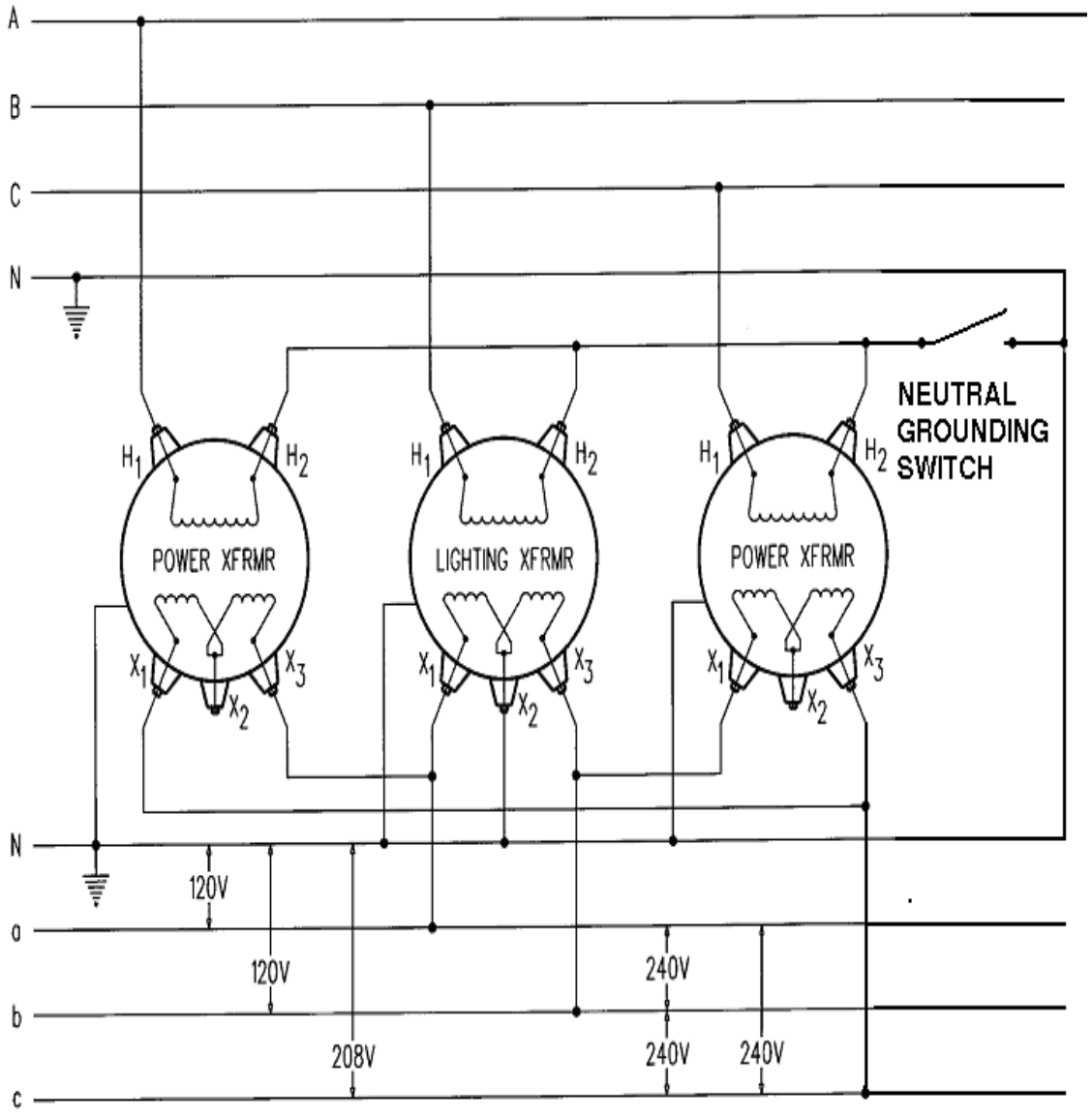
SINGLE-PHASE CONNECTION
120/240 VOLT, 1-PHASE, 3-WIRE SERVICE

TRANSFORMER WIRING DIAGRAM



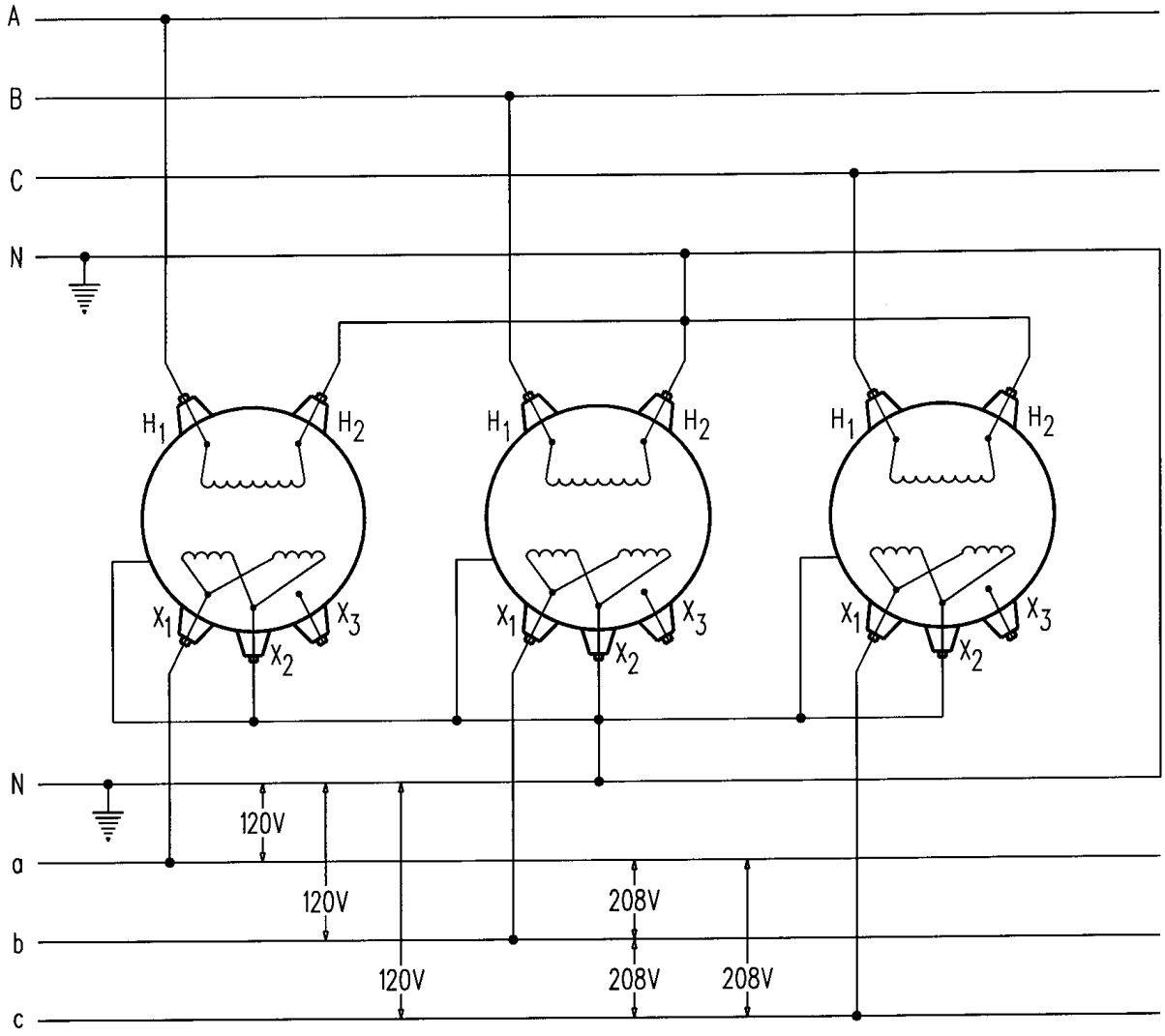
OPEN-WYE, OPEN-DELTA CONNECTION
120/240 VOLT, 3-PHASE, 4-WIRE SERVICE

TRANSFORMER WIRING DIAGRAM



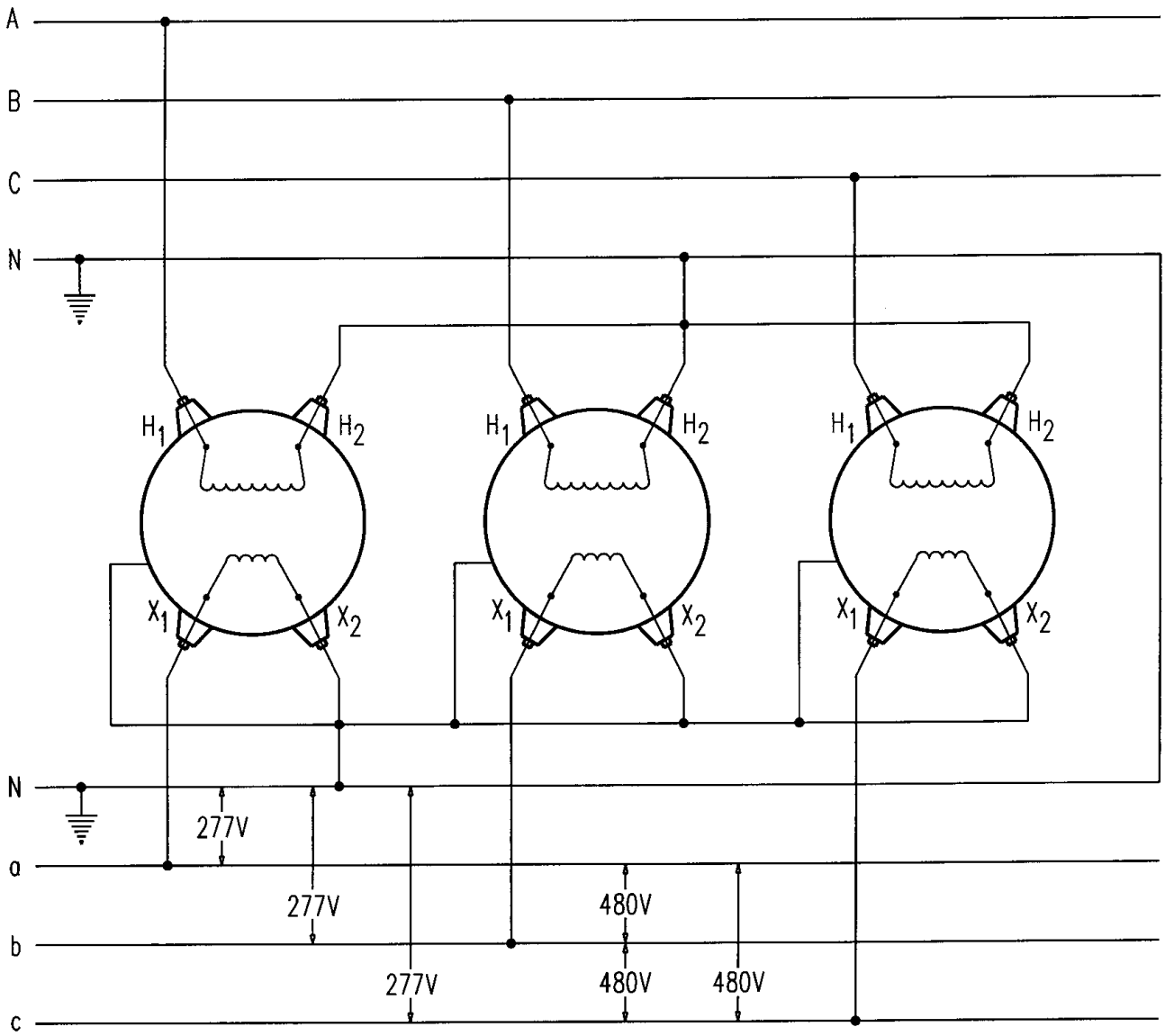
UNGROUNDED WYE-DELTA CONNECTION
120/240 VOLT, 3-PHASE, 4-WIRE SERVICE

TRANSFORMER WIRING DIAGRAM



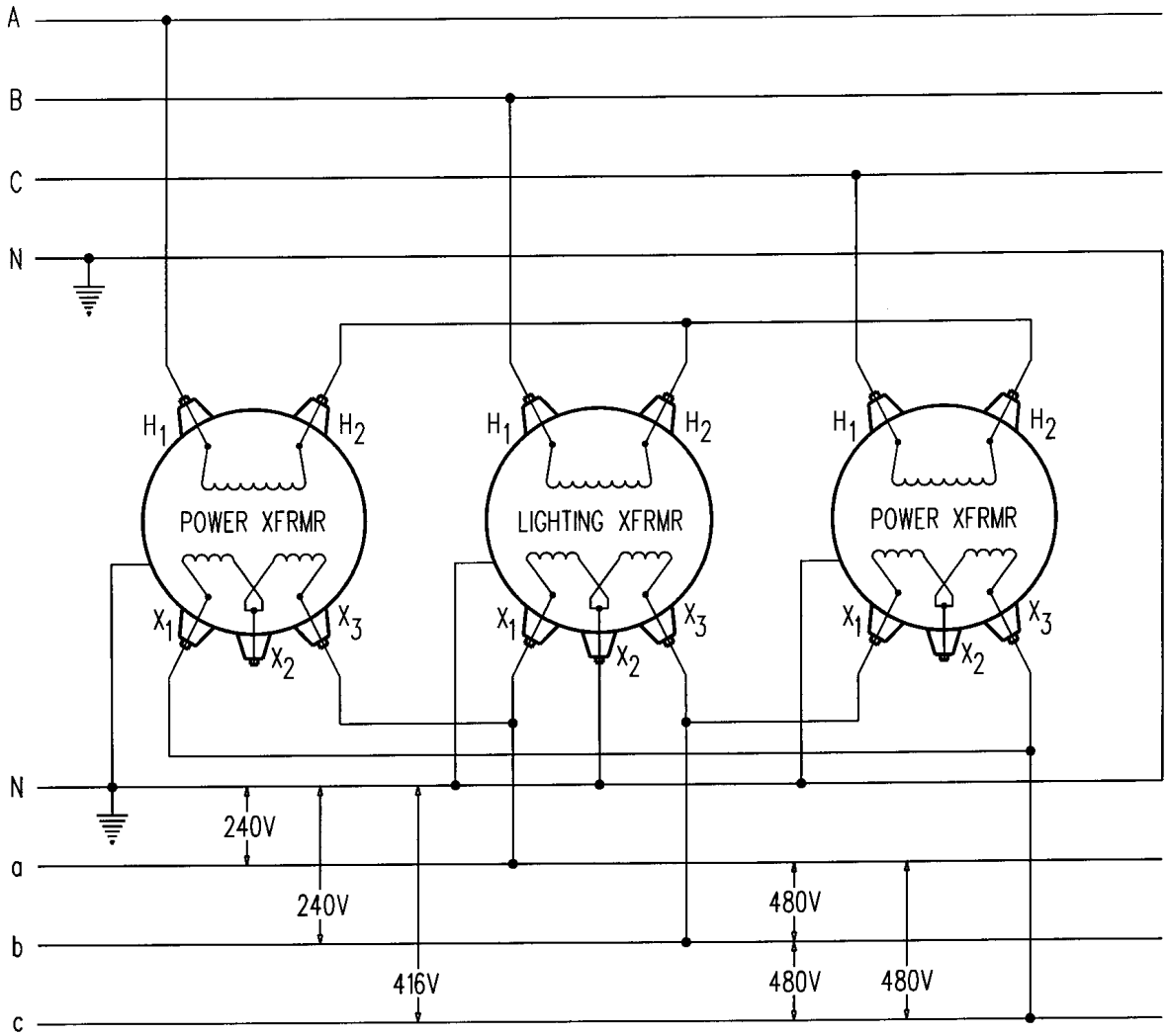
GROUNDED WYE, GROUNDED WYE CONNECTION
120/208 VOLT, 3-PHASE, 4-WIRE SERVICE

TRANSFORMER WIRING DIAGRAM



GROUNDED WYE, GROUNDED WYE CONNECTION
277/480 VOLT, 3-PHASE, 4-WIRE SERVICE

TRANSFORMER WIRING DIAGRAM



FOR REFERENCE ONLY

UNGROUNDED WYE-DELTA CONNECTION
240/480 VOLT, 3-PHASE, 4-WIRE SERVICE

RGAF (FIBERGLASS CONSTRUCTION)

SINGLE-PHASE TRANSFORMER – 4kV

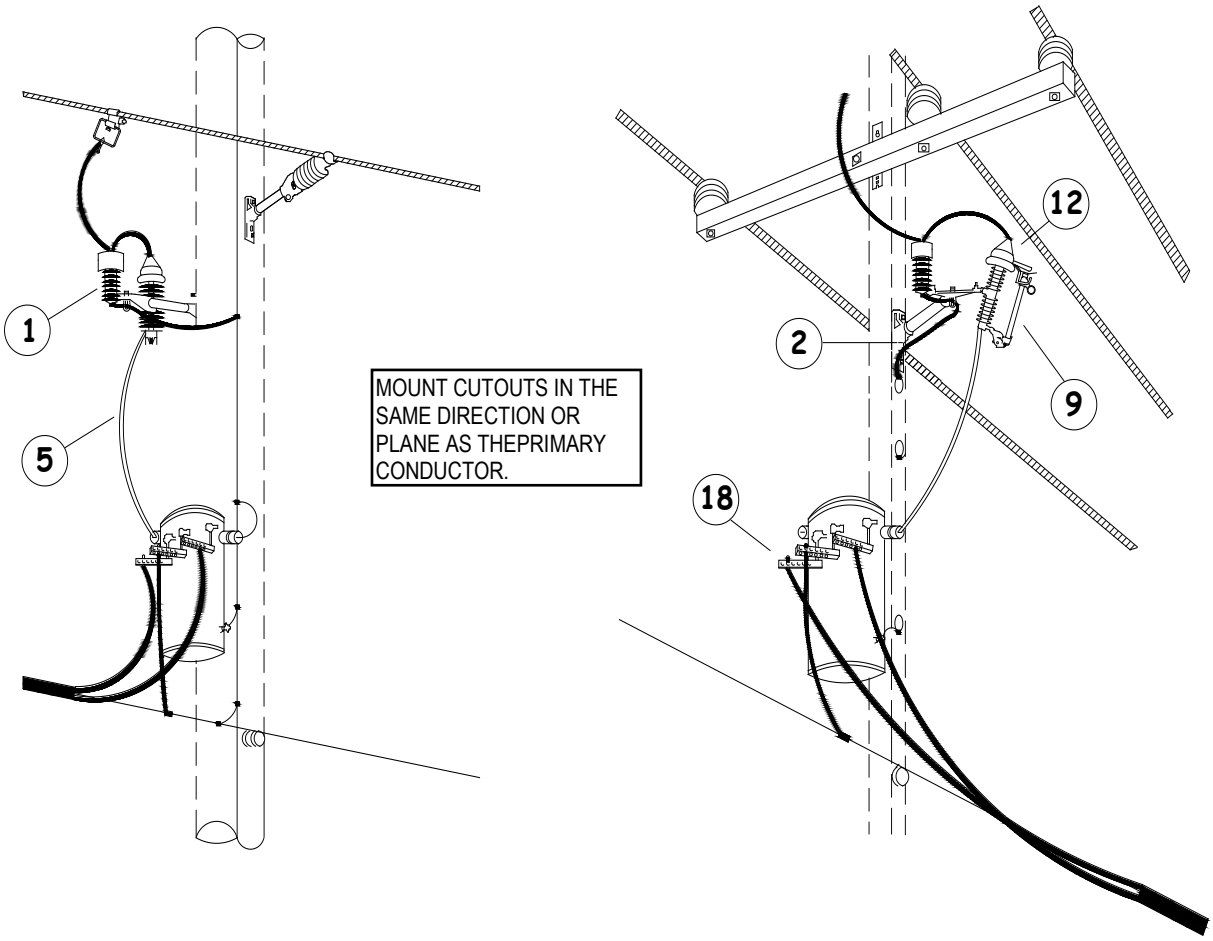
OPTIONS: 10, 15, 25, 50, 75, 100, 167, 25/480, 50/480, 75/480

BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 001	1	ARRESTER, LIGHTNING, 3kV, POLYMER MOV (DIST.)
2	BKT AC 009	1	BRACKET, FIBERGLASS, ARRESTER AND CUTOUT
3	BOL MS ***	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14 OR 3/4X14
4	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
5	CAI RH 010	25	CABLE, NO. 4 COVERED SOFT DRAWN COPPER, FT
6	CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, #6 SOL. - #1 STR.
7	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 SOL. – 10-2 SOL.
8	COB CO 028	4	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
9	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
10	FUS OH ***	1	GENERAL CODE FOR FUSE-LINK
11	GUA AN 002	2	GUARD, ANIMAL, FOR USE WITH TRANSFORMERS AND ARRESTERS
12	GUA AN 006	1	GUARD, ANIMAL, FOR USE WITH FUSE CUTOUTS, SILICONE RUBBER
13	TRA ** ***	1	GENERAL CODE FOR TRANSFORMER
14	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
15	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
16	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
17	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
			FOR 10, 15, 25, AND 50 KVA TRANSFORMERS
18	CNNTS007	3	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR ¾" STUD, RANGE: 10 – 500, 6 PORTS
	OR		FOR 75, 100, AND 167 KVA TRANSFORMERS
18	CNNTS006	3	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR, 4-HOLE NEMA, RANGE: 10 – 500, 3 PORTS
	AND		
19	BOLTE001	12	BOLT; TERMINAL KIT; ½" X 2" BOLT, WASHERS, AND NUT

RGAF (FIBERGLASS CONSTRUCTION)

SINGLE-PHASE TRANSFORMER – 4kV



RGBF (FIBERGLASS CONSTRUCTION)

TWO-PHASE TRANSFORMER BANK – 4kV

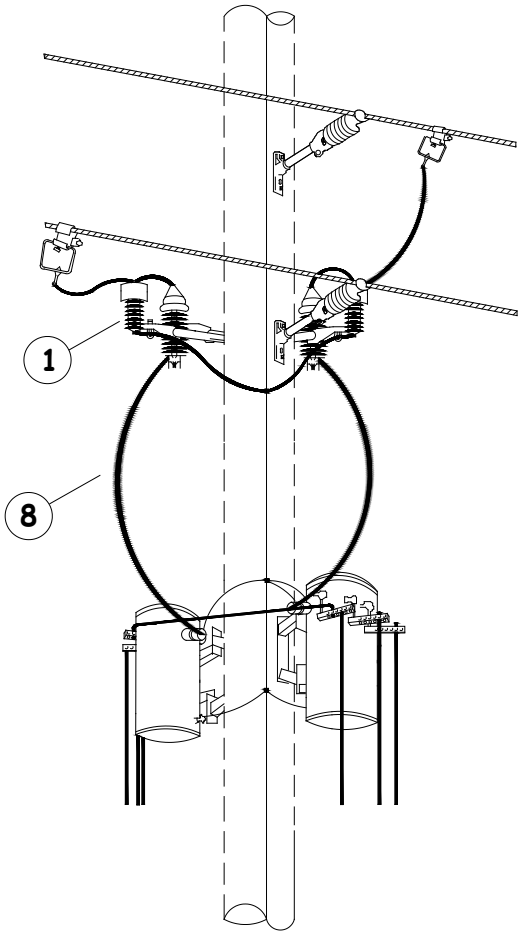
OPTIONS: 10-10, 15-10, 15-15, 25-10, 25-15, 25-25, 50-10, 50-15, 50-25, 50-50, 75-10, 75-15, 75-25, 75-50, 75-75, 100-10, 100-15, 100-25, 100-50, 100-75, 100-100, 167-10, 167-15, 167-25, 167-50, 167-75, 167-100, 167-167

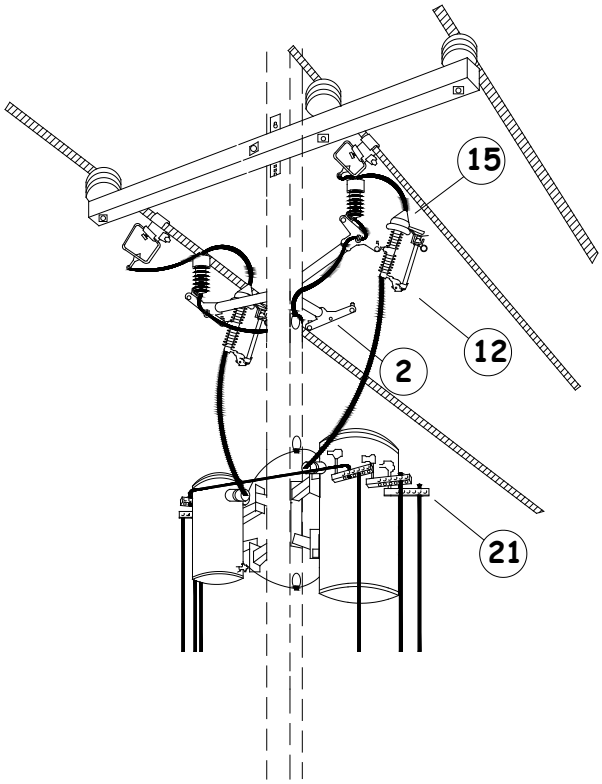
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 001	2	ARRESTER, LIGHTNING, 3kV, POLYMER MOV (DIST.)
2	BKT AC 010	1	BRACKET, FIBERGLASS, ARRESTER AND CUTOUT, TRI-MOUNT
3	BKT TM 001	2	BRACKET, TRANSFORMER MOUNTING
4	BOL MS 015	4	BOLT, MACHINE, SQUARE HEAD, 5/8X2
5	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
6	BOL MS ***	2	BOLT, MACHINE, SQUARE HEAD, 5/8 X 14 OR 3/4X14
7	CAI RH ***	10	GENERAL CODE FOR COPPER RHW CABLE
8	CAI RH 010	30	CABLE, NO. 4 COVERED SOFT DRAWN COPPER, FT
9	CLA TG 001	2	CLAMP, TRANSFORMER TANK GROUND, #6 SOL. - #1 STR.
10	CNN VG 003	4	CONNECTOR, VISE TYPE, 6-2 SOL. – 10-2 SOL.
11	COB CO 028	20	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
12	CUT OT 004	2	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
13	FUS OH ***	2	GENERAL CODE FOR FUSE-LINK
14	GUA AN 002	4	GUARD, ANIMAL, FOR USE WITH TRANSFORMERS AND ARRESTERS
15	GUA AN 006	2	GUARD, ANIMAL, FOR USE WITH FUSE CUTOUTS, SILICONE RUBBER
16	TRA ** ***	2	GENERAL CODE FOR TRANSFORMER
17	WAS RD 004	4	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
18	WAS RD 005	8	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
19	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
20	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
			FOR 10, 15, 25, AND 50 KVA TRANSFORMERS
21	CNNTS007	5	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR ¾" STUD, RANGE: 10 – 500, 6 PORTS
	OR		FOR 75, 100, AND 167 KVA TRANSFORMERS
21	CNNTS006	5	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR, 4-HOLE NEMA, RANGE: 10 – 500, 3 PORTS
	AND		
22	BOLTE001	20	BOLT; TERMINAL KIT; ½" X 2" BOLT, WASHERS, AND NUT

RGBF (FIBERGLASS CONSTRUCTION)

TWO-PHASE TRANSFORMER BANK – 4kV





RGCF (FIBERGLASS CONSTRUCTION)

THREE-PHASE TRANSFORMER BANK – 4kV

OPTIONS: **167-167, 167-100, 167-75, 167-50, 167-25, 100-100, 100-75, 100-50, 100-25, 75-75, 75-50, 75-25, 50-50, 50-25, 25-25, 25/208, 50/208, 75/208, 100/208, 167/208, 50/480, 75/480, 100/480, 167/480**

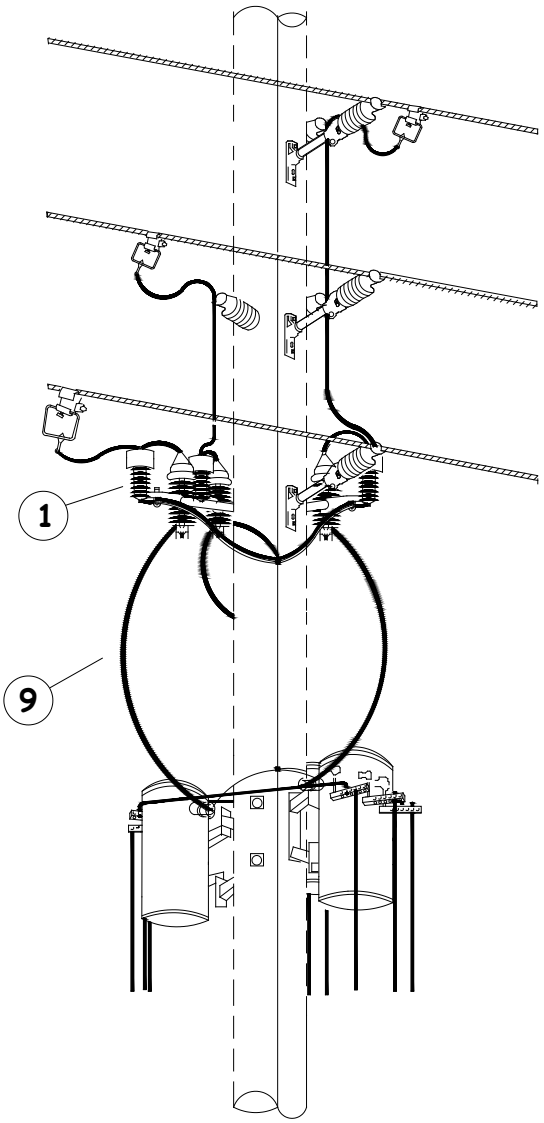
NOTE: **100KVA AND 167KVA TRANSFORMERS MUST HAVE THEIR INTERNAL SECONDARY TAPS CHANGED IN THE FIELD TO PROVIDE 208 VOLTAGE.**

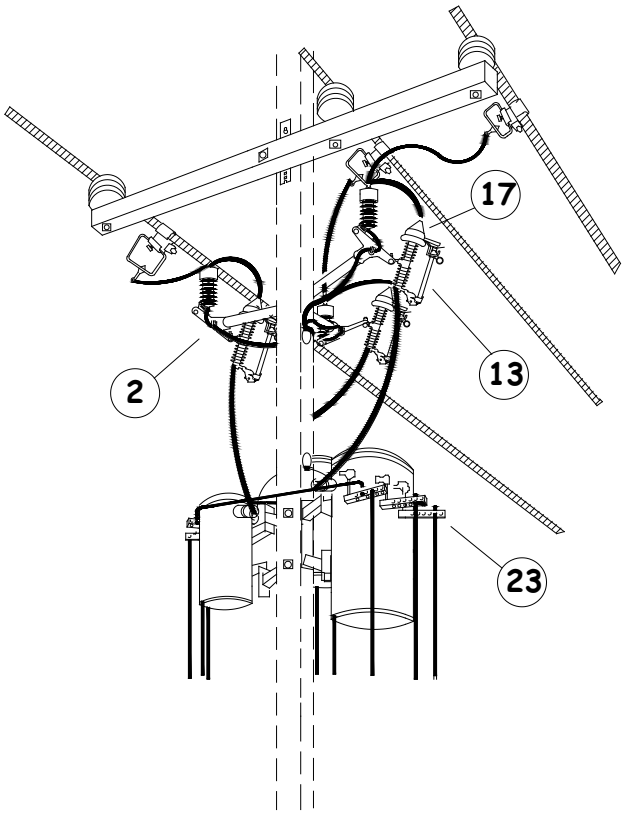
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 001	3	ARRESTER, LIGHTNING, 3kV, POLYMER MOV (DIST.)
2	BKT AC 002	1	BRACKET, ARRESTER AND CUTOUT, TRI-MOUNT
3	BKT AC 008	1	BRACKET, FIBERGLASS, ARRESTER OR CUTOUT (FOR CLOSED DELTA)
4	BKT TM 001	3	BRACKET, TRANSFORMER MOUNTING
5	BOL MS 015	6	BOLT, MACHINE, SQUARE HEAD, 5/8X2
6	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
7	BOL MS ***	4	BOLT, MACHINE, SQUARE HEAD, 5/8 X 14 OR 3/4X14
8	CAI RH ***	20	GENERAL CODE FOR COPPER RHW CABLE
9	CAI RH 010	45	CABLE, NO. 4 COVERED SOFT DRAWN COPPER, FT
10	CLA TG 001	3	CLAMP, TRANSFORMER TANK GROUND, #6 SOL. - #1 STR.
11	CNN VG 003	6	CONNECTOR, VISE TYPE, 6-2 SOL. - 10-2 SOL.
12	COB CO 028	30	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
13	CUT OT 004	4	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV (4TH FOR CLOSED DELTA)
14	FUS OH ***	3	GENERAL CODE FOR FUSE-LINK
15	FUS OH 007	1	FUSE LINK, 40T (FOR CLOSED DELTA GROUNDING SWITCH)
16	GUA AN 002	6	GUARD, ANIMAL, FOR USE WITH TRANSFORMERS AND ARRESTERS
17	GUA AN 006	3	GUARD, ANIMAL, FOR USE WITH FUSE CUTOUTS, SILICONE RUBBER
18	TRA ** ***	3	GENERAL CODE FOR TRANSFORMER
19	WAS RD 004	6	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
20	WAS RD 005	12	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
21	WAS SF 003	6	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
22	WAS SP 002	6	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
			FOR 10, 15, 25, AND 50 KVA TRANSFORMERS
23	CNNTS007	7	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR ¾" STUD, RANGE: 10 – 500, 6 PORTS
	OR		FOR 75, 100, AND 167 KVA TRANSFORMERS
23	CNNTS006	7	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR, 4-HOLE NEMA, RANGE: 10 – 500, 3 PORTS
	AND		
24	BOLTE001	28	BOLT; TERMINAL KIT; ½" X 2" BOLT, WASHERS, AND NUT

RGCF (FIBERGLASS CONSTRUCTION)

THREE-PHASE TRANSFORMER BANK – 4kV





WGAF (FIBERGLASS CONSTRUCTION)

SINGLE-PHASE TRANSFORMER – 13.2kV

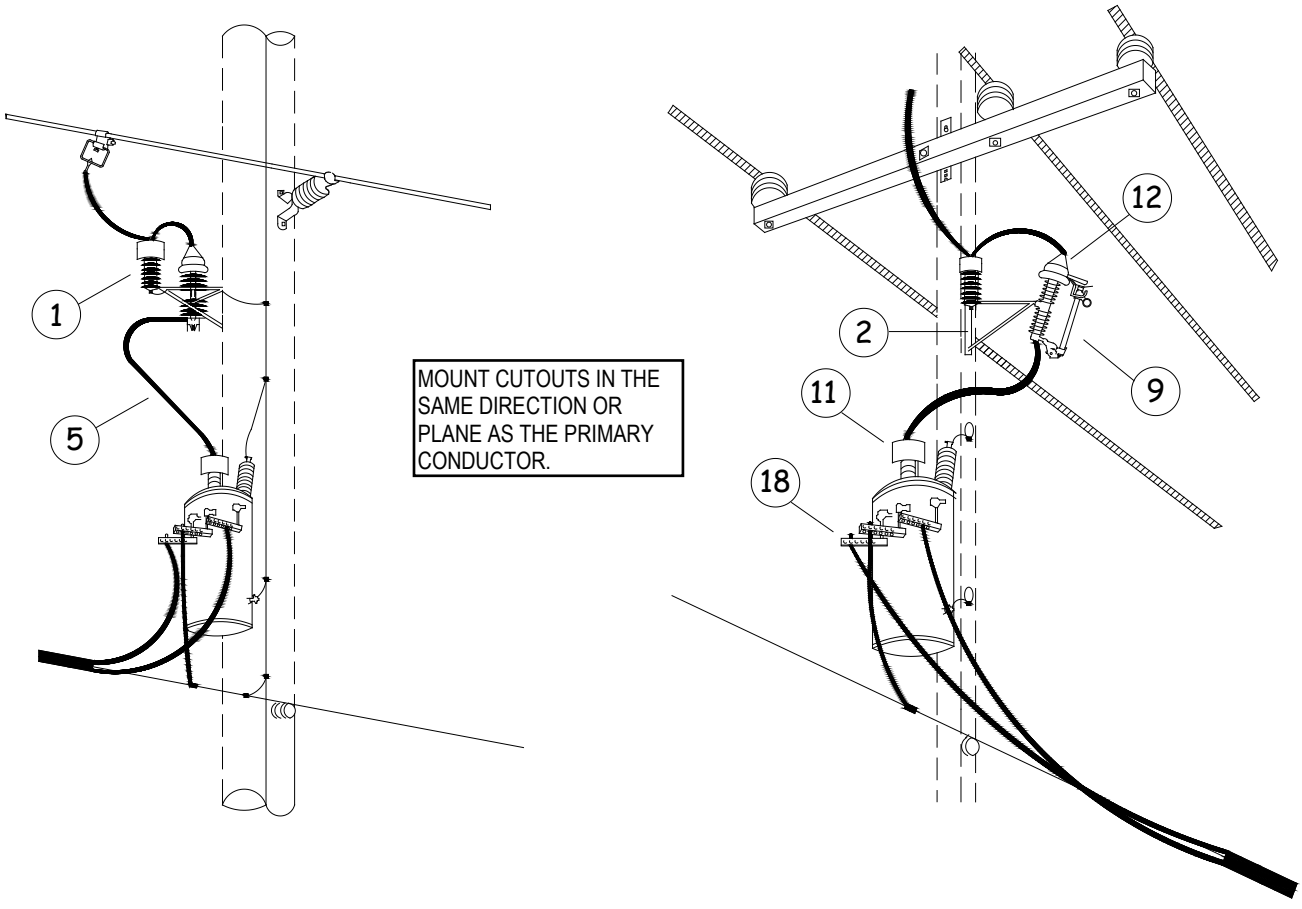
OPTIONS: 10, 15, 25, 50, 75, 100, 167, 25/480, 50/480, 75/480

BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 002	1	ARRESTER, LIGHTNING, 10kV, POLYMER MOV (DIST.)
2	BKT AC 009	1	BRACKET, FIBERGLASS, ARRESTER AND CUTOUT
3	BOL MS ***	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14 OR 3/4X14
4	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
5	CAI RH 010	25	CABLE, NO. 4 COVERED SOFT DRAWN COPPER, FT
6	CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, #6 SOL. - #1 STR.
7	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 SOL. – 10-2 SOL.
8	COB CO 028	4	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
9	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
10	FUS OH ***	1	GENERAL CODE FOR FUSE-LINK
11	GUA AN 002	2	GUARD, ANIMAL, FOR USE WITH TRANSFORMERS AND ARRESTERS
12	GUA AN 006	1	GUARD, ANIMAL, FOR USE WITH FUSE CUTOUTS, SILICONE RUBBER
13	TRA ** ***	1	GENERAL CODE FOR TRANSFORMER
14	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
15	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
16	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
17	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
			FOR 10, 15, 25, AND 50 KVA TRANSFORMERS
18	CNNTS007	3	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR ¾" STUD, RANGE: 10 – 500, 6 PORTS
	OR		FOR 75, 100, AND 167 KVA TRANSFORMERS
18	CNNTS006	3	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR, 4-HOLE NEMA, RANGE: 10 – 500, 3 PORTS
	AND		
19	BOLTE001	12	BOLT; TERMINAL KIT; ½" X 2" BOLT, WASHERS, AND NUT

WGAF (FIBERGLASS CONSTRUCTION)

SINGLE-PHASE TRANSFORMER – 13.2kV



WGBF (FIBERGLASS CONSTRUCTION)

TWO-PHASE TRANSFORMER BANK – 13.2kV

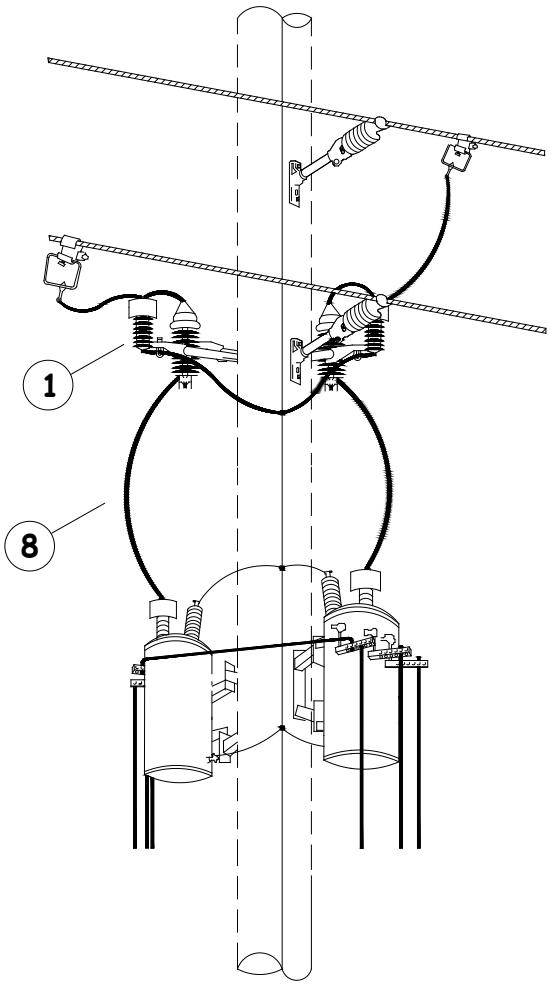
OPTIONS: 10-10, 15-10, 15-15, 25-10, 25-15, 25-25, 50-10, 50-15, 50-25, 50-50, 75-10, 75-15, 75-25, 75-50, 75-75, 100-10, 100-15, 100-25, 100-50, 100-75, 100-100, 167-10, 167-15, 167-25, 167-50, 167-75, 167-100, 167-167

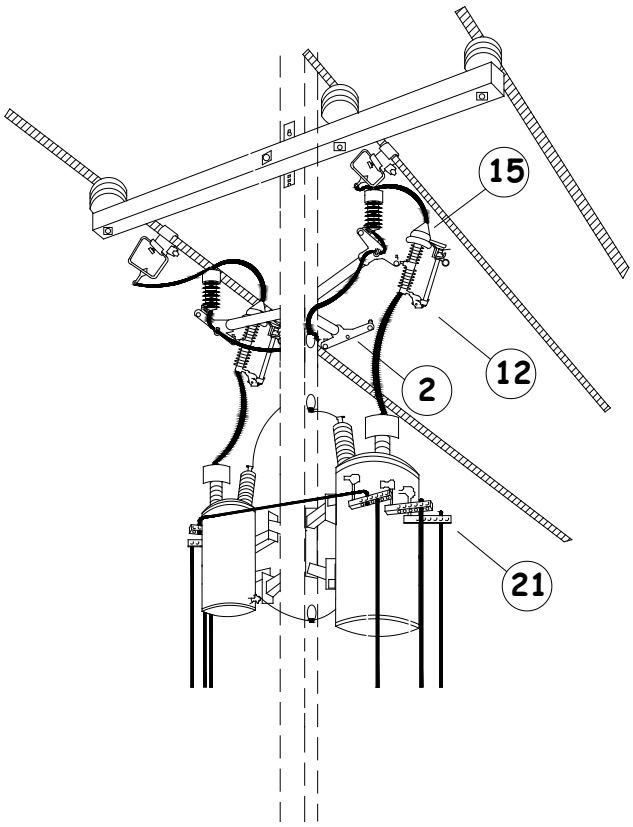
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 002	2	ARRESTER, LIGHTNING, 10kV, POLYMER MOV (DIST.)
2	BKT AC 010	1	BRACKET, FIBERGLASS, ARRESTER AND CUTOUT, TRI-MOUNT
3	BKT TM 001	2	BRACKET, TRANSFORMER MOUNTING
4	BOL MS 015	4	BOLT, MACHINE, SQUARE HEAD, 5/8X2
5	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
6	BOL MS ***	2	BOLT, MACHINE, SQUARE HEAD, 5/8 X 14 OR 3/4X14
7	CAI RH ***	10	GENERAL CODE FOR COPPER RHW CABLE
8	CAI RH 010	30	CABLE, NO. 4 COVERED SOFT DRAWN COPPER, FT
9	CLA TG 001	2	CLAMP, TRANSFORMER TANK GROUND, #6 SOL. - #1 STR.
10	CNN VG 003	4	CONNECTOR, VISE TYPE, 6-2 SOL. – 10-2 SOL.
11	COB CO 028	20	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
12	CUT OT 004	2	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
13	FUS OH ***	2	GENERAL CODE FOR FUSE-LINK
14	GUA AN 002	4	GUARD, ANIMAL, FOR USE WITH TRANSFORMERS AND ARRESTERS
15	GUA AN 006	2	GUARD, ANIMAL, FOR USE WITH FUSE CUTOUTS, SILICONE RUBBER
16	TRA ** ***	2	GENERAL CODE FOR TRANSFORMER
17	WAS RD 004	4	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
18	WAS RD 005	8	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
19	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
20	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
			FOR 10, 15, 25, AND 50 KVA TRANSFORMERS
21	CNNTS007	5	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR ¾" STUD, RANGE: 10 – 500, 6 PORTS
	OR		FOR 75, 100, AND 167 KVA TRANSFORMERS
21	CNNTS006	5	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR, 4-HOLE NEMA, RANGE: 10 – 500, 3 PORTS
	AND		
22	BOLTE001	20	BOLT; TERMINAL KIT; ½" X 2" BOLT, WASHERS, AND NUT

WGBF (FIBERGLASS CONSTRUCTION)

TWO-PHASE TRANSFORMER BANK – 13.2kV





WGCF (FIBERGLASS CONSTRUCTION)

THREE-PHASE TRANSFORMER BANK – 13.2kV

OPTIONS: 167-167, 167-100, 167-75, 167-50, 167-25, 100-100, 100-75, 100-50, 100-25, 75-75, 75-50, 75-25, 50-50, 50-25, 25-25, 25/208, 50/208, 75/208, 100/208, 167/208, 50/480, 75/480, 100/480, 167/480

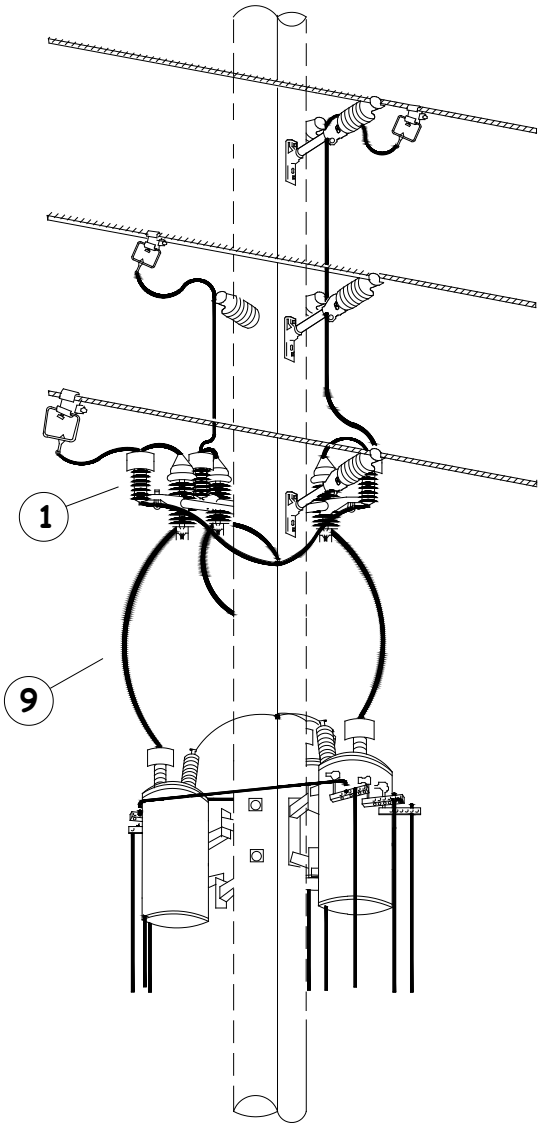
NOTE: 100KVA AND 167KVA TRANSFORMERS MUST HAVE THEIR INTERNAL SECONDARY TAPS CHANGED IN THE FIELD TO PROVIDE 208 VOLTAGE.

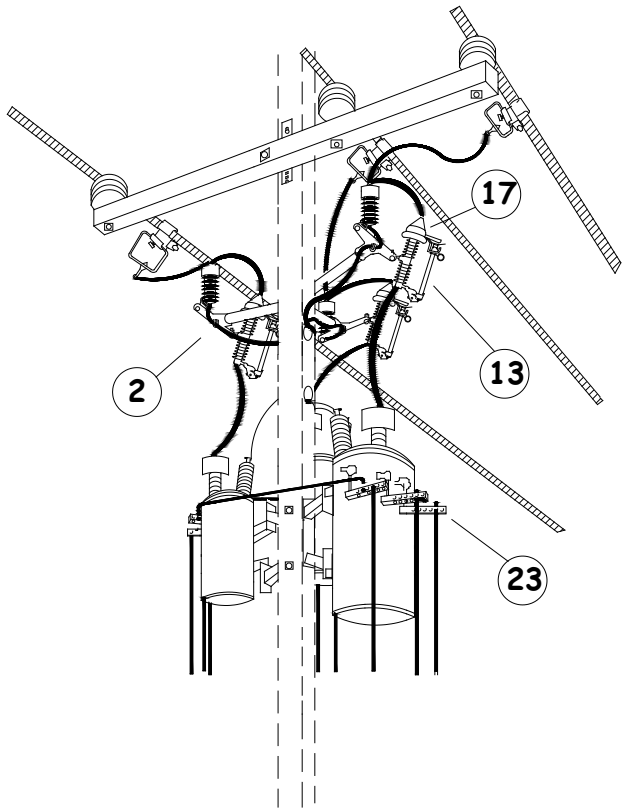
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 002	3	ARRESTER, LIGHTNING, 10kV, POLYMER MOV (DIST.)
2	BKT AC 002	1	BRACKET, ARRESTER AND CUTOUT, TRI-MOUNT
3	BKT AC 008	1	BRACKET, FIBERGLASS, ARRESTER OR CUTOUT (FOR CLOSED DELTA)
4	BKT TM 001	3	BRACKET, TRANSFORMER MOUNTING
5	BOL MS 015	6	BOLT, MACHINE, SQUARE HEAD, 5/8X2
6	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
7	BOL MS ***	4	BOLT, MACHINE, SQUARE HEAD, 5/8 X 14 OR 3/4X14
8	CAI RH ***	20	GENERAL CODE FOR COPPER RHW CABLE
9	CAI RH 010	45	CABLE, NO. 4 COVERED SOFT DRAWN COPPER, FT
10	CLA TG 001	3	CLAMP, TRANSFORMER TANK GROUND, #6 SOL. - #1 STR.
11	CNN VG 003	6	CONNECTOR, VISE TYPE, 6-2 SOL. - 10-2 SOL.
12	COB CO 028	30	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
13	CUT OT 004	4	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV (4TH FOR CLOSED DELTA)
14	FUS OH ***	3	GENERAL CODE FOR FUSE-LINK
15	FUS OH 007	1	FUSE LINK, 40T (FOR CLOSED DELTA GROUNDING SWITCH)
16	GUA AN 002	6	GUARD, ANIMAL, FOR USE WITH TRANSFORMERS AND ARRESTERS
17	GUA AN 006	3	GUARD, ANIMAL, FOR USE WITH FUSE CUTOUTS, SILICONE RUBBER
18	TRA ** ***	3	GENERAL CODE FOR TRANSFORMER
19	WAS RD 004	6	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
20	WAS RD 005	12	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
21	WAS SF 003	6	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
22	WAS SP 002	6	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
			FOR 10, 15, 25, AND 50 KVA TRANSFORMERS
23	CNNTS007	7	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR ¾" STUD, RANGE: 10 – 500, 6 PORTS
	OR		FOR 75, 100, AND 167 KVA TRANSFORMERS
23	CNNTS006	7	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR, 4-HOLE NEMA, RANGE: 10 – 500, 3 PORTS
	AND		
24	BOLTE001	28	BOLT; TERMINAL KIT; ½" X 2" BOLT, WASHERS, AND NUT

WGCF (FIBERGLASS CONSTRUCTION)

THREE-PHASE TRANSFORMER BANK – 13.2kV





DGAF (FIBERGLASS CONSTRUCTION)

SINGLE-PHASE TRANSFORMER – 26.4kV

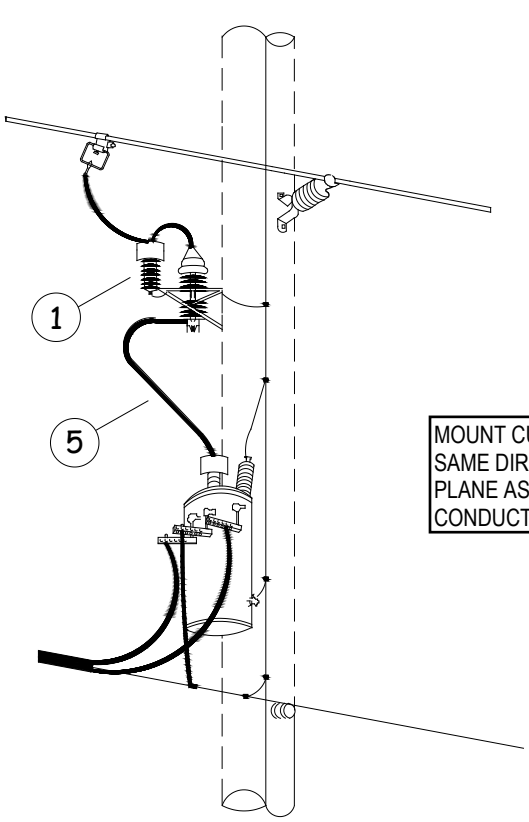
OPTIONS: 10, 15, 25, 50, 75, 100, 167, 25/480, 50/480, 75/480

BOLT PLATE: NONE

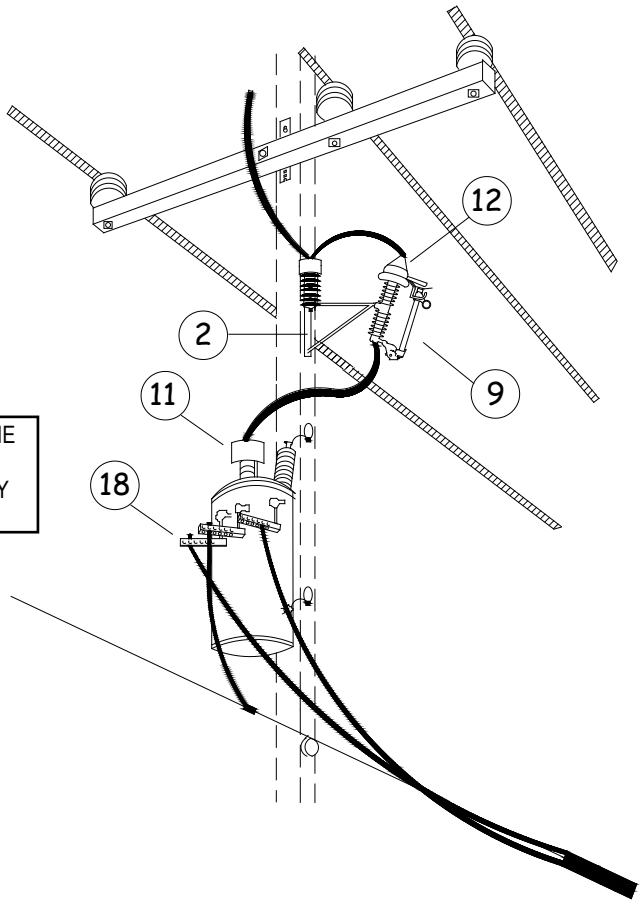
NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	1	ARRESTER, LIGHTNING, 21kV, POLYMER MOV (DIST.)
2	BKT AC 009	1	BRACKET, FIBERGLASS, ARRESTER AND CUTOUT
3	BOL MS ***	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14 OR 3/4X14
4	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
5	CAI RH 010	20	CABLE, NO. 4 COVERED SOFT DRAWN COPPER, FT
6	CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, #6 SOL. - #1 STR.
7	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 SOL. – 10-2 SOL.
8	COB CO 028	4	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
9	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
10	FUS OH ***	1	GENERAL CODE FOR FUSE-LINK
11	GUA AN 002	2	GUARD, ANIMAL, FOR USE WITH TRANSFORMERS AND ARRESTERS
12	GUA AN 006	1	GUARD, ANIMAL, FOR USE WITH FUSE CUTOUTS, SILICONE RUBBER
13	TRA ** ***	1	GENERAL CODE FOR TRANSFORMER
14	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
15	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
16	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
17	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
			FOR 10, 15, 25, AND 50 KVA TRANSFORMERS
18	CNNTS007	3	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR ¾" STUD, RANGE: 10 – 500, 6 PORTS
	OR		FOR 75, 100, AND 167 KVA TRANSFORMERS
18	CNNTS006	3	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR, 4-HOLE NEMA, RANGE: 10 – 500, 3 PORTS
	AND		
19	BOLTE001	12	BOLT; TERMINAL KIT; ½" X 2" BOLT, WASHERS, AND NUT

DGAF (FIBERGLASS CONSTRUCTION)

SINGLE-PHASE TRANSFORMER – 26.4kV



MOUNT CUTOUTS IN THE SAME DIRECTION OR PLANE AS THE PRIMARY CONDUCTOR.



DGBF (FIBERGLASS CONSTRUCTION)

TWO-PHASE TRANSFORMER BANK – 26.4kV

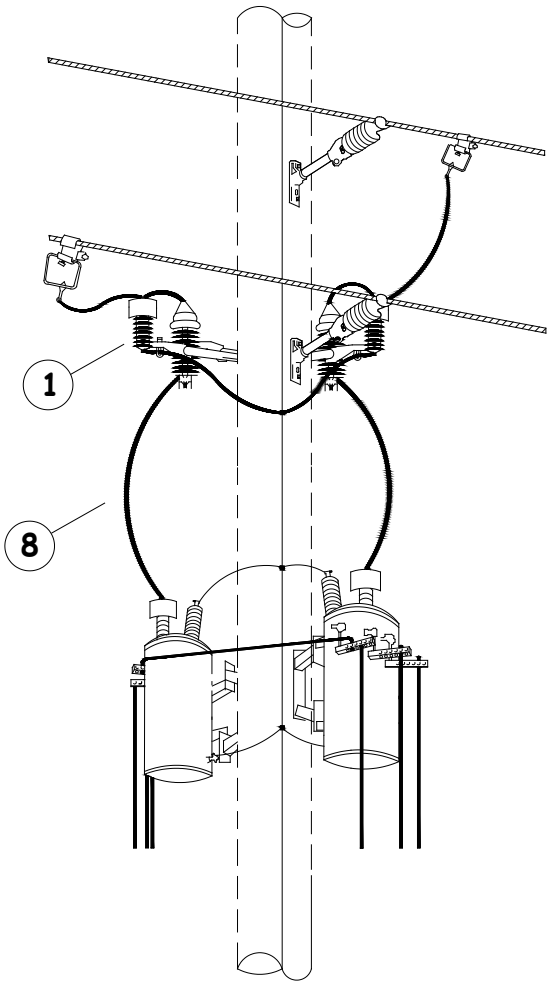
OPTIONS: 10-10, 15-10, 15-15, 25-10, 25-15, 25-25, 50-10, 50-15, 50-25, 50-50, 75-10, 75-15, 75-25, 75-50, 75-75, 100-10, 100-15, 100-25, 100-50, 100-75, 100-100, 167-10, 167-15, 167-25, 167-50, 167-75, 167-100, 167-167

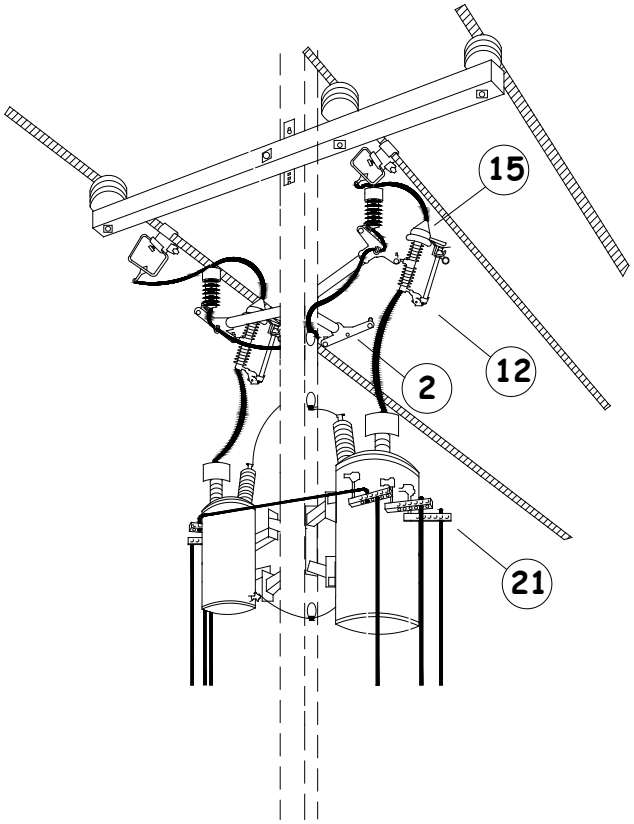
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	2	ARRESTER, LIGHTNING, 21kV, POLYMER MOV (DIST.)
2	BKT AC 010	1	BRACKET, FIBERGLASS, ARRESTER AND CUTOUT, TRI-MOUNT
3	BKT TM 001	2	BRACKET, TRANSFORMER MOUNTING
4	BOL MS 015	4	BOLT, MACHINE, SQUARE HEAD, 5/8X2
5	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
6	BOL MS ***	2	BOLT, MACHINE, SQUARE HEAD, 5/8 X 14 OR 3/4X14
7	CAI RH ***	10	GENERAL CODE FOR COPPER RHW CABLE
8	CAI RH 010	40	CABLE, NO. 4 COVERED SOFT DRAWN COPPER, FT
9	CLA TG 001	2	CLAMP, TRANSFORMER TANK GROUND, #6 SOL. - #1 STR.
10	CNN VG 003	4	CONNECTOR, VISE TYPE, 6-2 SOL. – 10-2 SOL.
11	COB CO 028	20	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
12	CUT OT 004	2	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
13	FUS OH ***	2	GENERAL CODE FOR FUSE-LINK
14	GUA AN 002	4	GUARD, ANIMAL, FOR USE WITH TRANSFORMERS AND ARRESTERS
15	GUA AN 006	2	GUARD, ANIMAL, FOR USE WITH FUSE CUTOUTS, SILICONE RUBBER
16	TRA ** ***	2	GENERAL CODE FOR TRANSFORMER
17	WAS RD 004	4	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
18	WAS RD 005	8	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
19	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
20	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
			FOR 10, 15, 25, AND 50 KVA TRANSFORMERS
21	CNNTS007	5	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR ¾" STUD, RANGE: 10 – 500, 6 PORTS
	OR		FOR 75, 100, AND 167 KVA TRANSFORMERS
21	CNNTS006	5	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR, 4-HOLE NEMA, RANGE: 10 – 500, 3 PORTS
	AND		
22	BOLTE001	20	BOLT; TERMINAL KIT; ½" X 2" BOLT, WASHERS, AND NUT

DGBF (FIBERGLASS CONSTRUCTION)

TWO-PHASE TRANSFORMER BANK – 26.4kV





DGCF (FIBERGLASS CONSTRUCTION)

THREE-PHASE TRANSFORMER BANK – 26.4kV

OPTIONS: **167-167, 167-100, 167-75, 167-50, 167-25, 100-100, 100-75, 100-50, 100-25, 75-75, 75-50, 75-25, 50-50, 50-25, 25-25, 25/208, 50/208, 75/208, 100/208, 167/208, 50/480, 75/480, 100/480, 167/480**

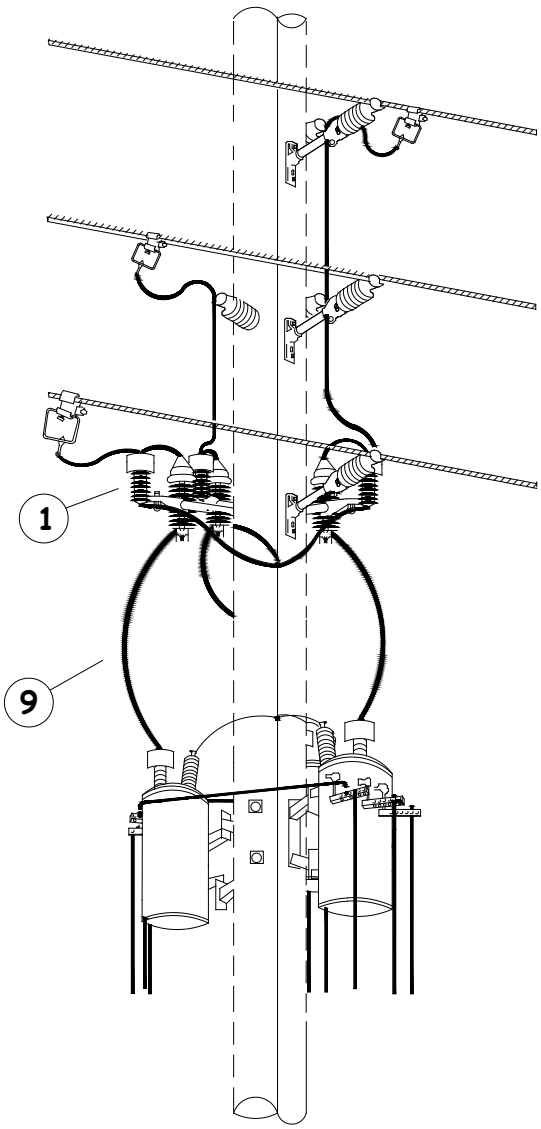
NOTE: **100KVA AND 167KVA TRANSFORMERS MUST HAVE THEIR INTERNAL SECONDARY TAPS CHANGED IN THE FIELD TO PROVIDE 208 VOLTAGE.**

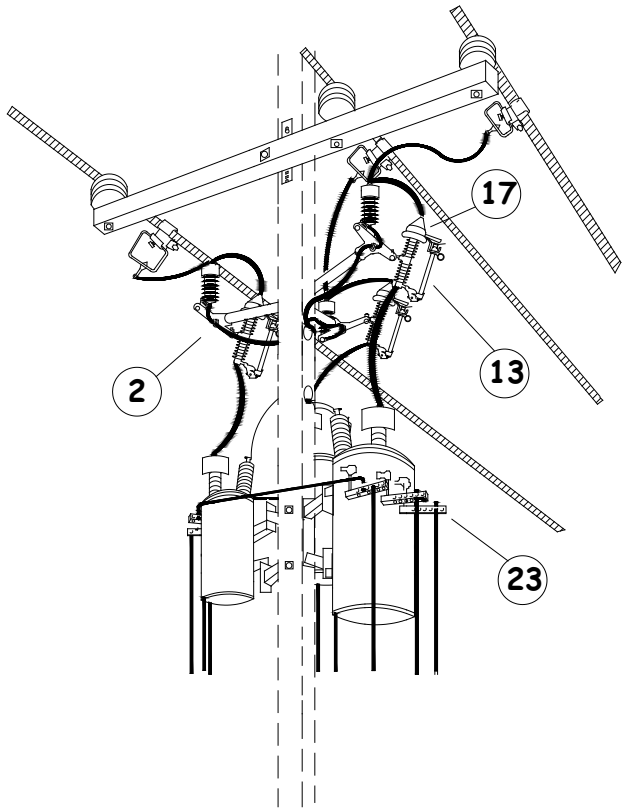
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	3	ARRESTER, LIGHTNING, 21kV, POLYMER MOV (DIST.)
2	BKT AC 010	1	BRACKET, FIBERGLASS, ARRESTER AND CUTOUT, TRI-MOUNT
3	BKT AC 008	1	BRACKET, FIBERGLASS, ARRESTER OR CUTOUT (FOR CLOSED DELTA)
4	BKT TM 001	3	BRACKET, TRANSFORMER MOUNTING
5	BOL MS 015	6	BOLT, MACHINE, SQUARE HEAD, 5/8X2
6	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
7	BOL MS ***	4	BOLT, MACHINE, SQUARE HEAD, 5/8 X 14 OR 3/4X14
8	CAI RH ***	20	GENERAL CODE FOR COPPER RHW CABLE
9	CAI RH 010	60	CABLE, NO. 4 COVERED SOFT DRAWN COPPER, FT
10	CLA TG 001	3	CLAMP, TRANSFORMER TANK GROUND, #6 SOL. - #1 STR.
11	CNN VG 003	6	CONNECTOR, VISE TYPE, 6-2 SOL. - 10-2 SOL.
12	COB CO 028	30	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
13	CUT OT 004	4	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV (4TH FOR CLOSED DELTA)
14	FUS OH ***	3	GENERAL CODE FOR FUSE-LINK
15	FUS OH 007	1	FUSE LINK, 40T (FOR CLOSED DELTA GROUNDING SWITCH)
16	GUA AN 002	6	GUARD, ANIMAL, FOR USE WITH TRANSFORMERS AND ARRESTERS
17	GUA AN 006	3	GUARD, ANIMAL, FOR USE WITH FUSE CUTOUTS, SILICONE RUBBER
18	TRA ** ***	3	GENERAL CODE FOR TRANSFORMER
19	WAS RD 004	6	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
20	WAS RD 005	12	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
21	WAS SF 003	6	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
22	WAS SP 002	6	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
			FOR 10, 15, 25, AND 50 KVA TRANSFORMERS
23	CNNTS007	7	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR ¾" STUD, RANGE: 10 – 500, 6 PORTS
	OR		FOR 75, 100, AND 167 KVA TRANSFORMERS
23	CNNTS006	7	CONNECTOR, TRANSFORMER SECONDARY SET SCREW TYPE WITH INHIBITOR, 4-HOLE NEMA, RANGE: 10 – 500, 3 PORTS
	AND		
24	BOLTE001	28	BOLT; TERMINAL KIT; ½" X 2" BOLT, WASHERS, AND NUT

DGCF (FIBERGLASS CONSTRUCTION)

THREE-PHASE TRANSFORMER BANK – 26.4kV





DGRA

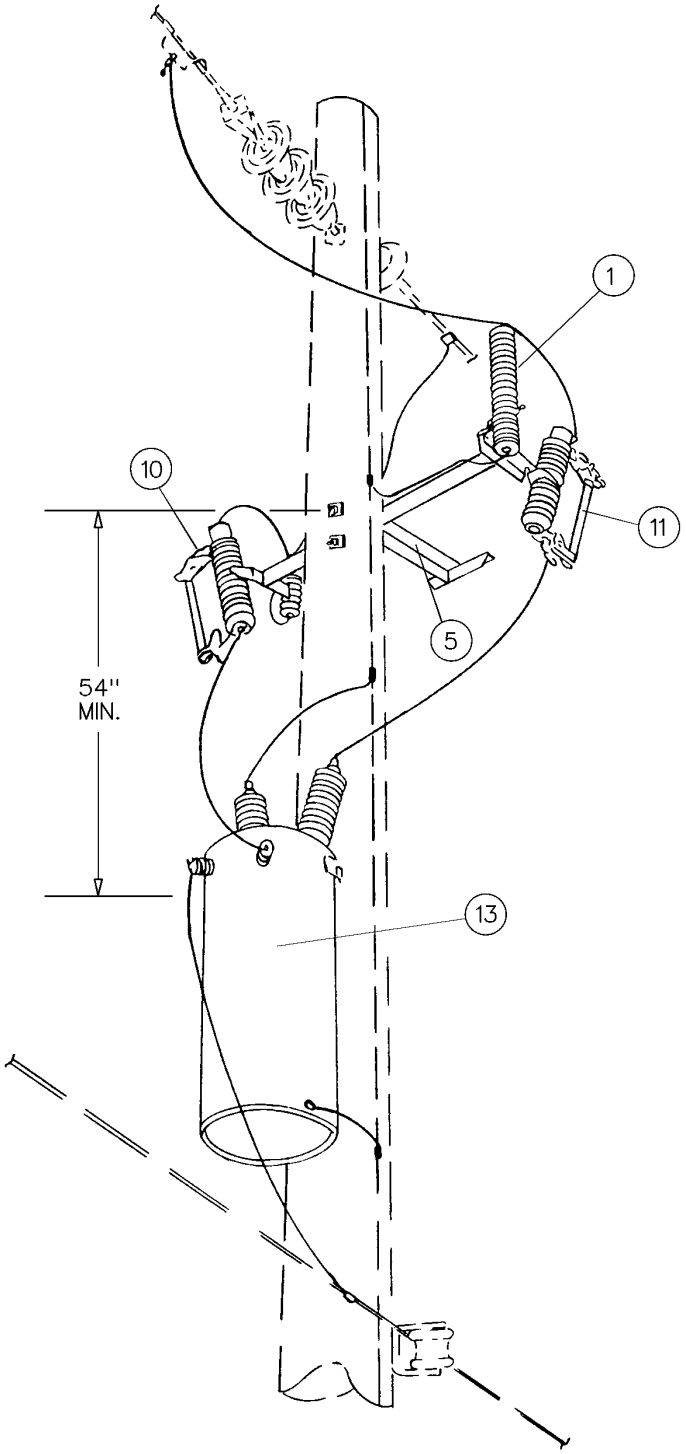
SINGLE-PHASE STEP-DOWN TRANSFORMER – 26.4KV TO 4KV

OPTIONS: 50, 75, 100, 167, 250
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 001	1	ARRESTER, LIGHTNING, 3KV, POLYMER MOV (DIST.)
2	ARR LI 003	1	ARRESTER, LIGHTNING, 21KV, POLYMER MOV (DIST.)
3	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
4	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
5	BKT AC 002	1	BRACKET, ARRESTER AND CUTOUT, TRI-MOUNT
6	CAI RH ***	22	GENERAL CODE FOR COPPER RHW CABLE
7	CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, #6 SOL. - #1 STR.
8	COB CO 028	20	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
9	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 SOL. - 10-2 SOL.
10	CUT OT X01	1	CUTOUT, FUSED, 125KV BIL, 100 AMP, 27KV
11	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
12	FUS OH ***	2	GENERAL CODE FOR FUSE-LINK
13	TRA SB ***	1	GENERAL CODE FOR TRANSFORMER
14	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
15	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
16	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
17	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

DGRA

SINGLE-PHASE STEP-DOWN TRANSFORMER – 26.4KV TO 4KV



DGRB

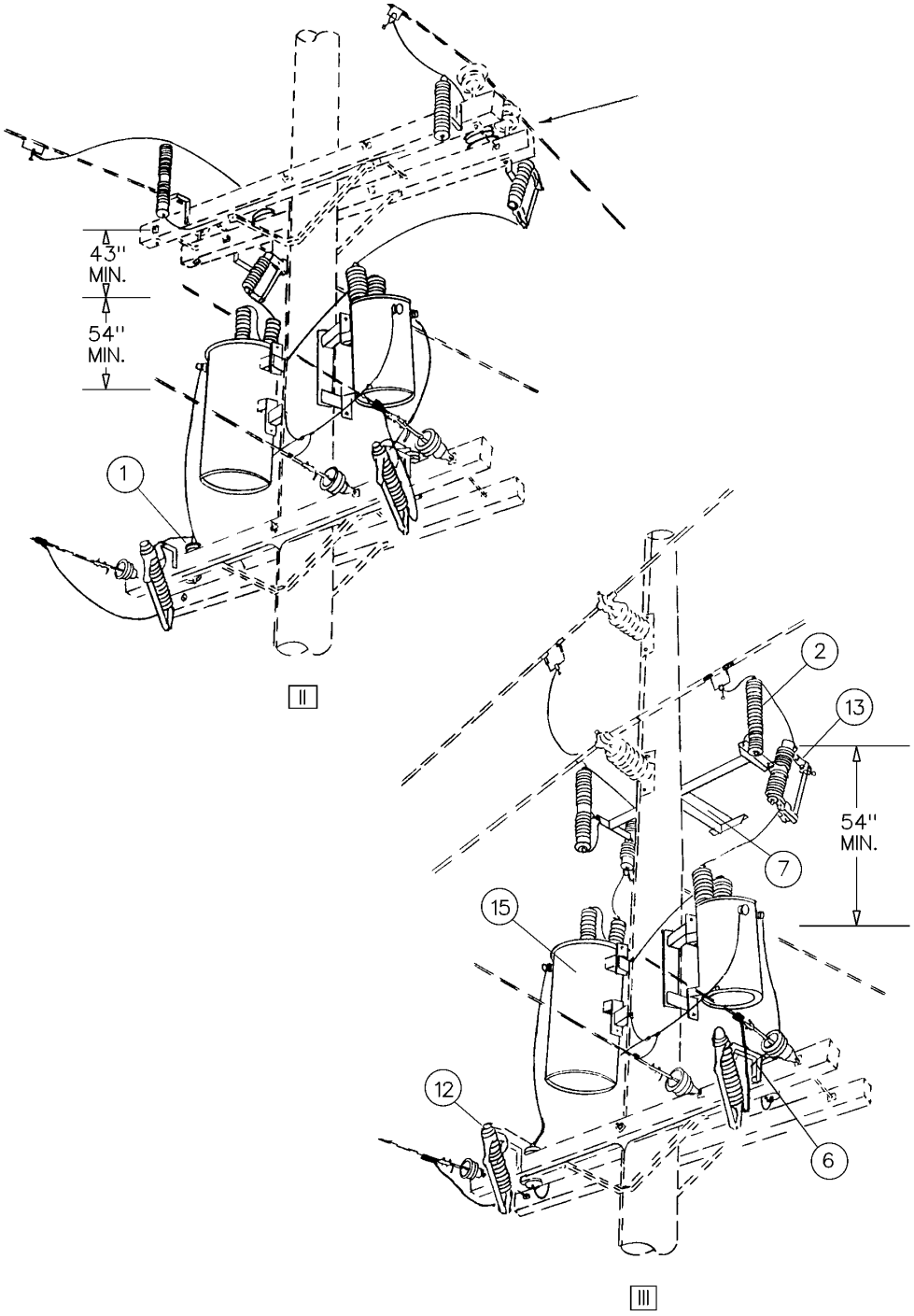
TWO-PHASE STEP-DOWN TRANSFORMER BANK – 26.4KV TO 4KV

OPTIONS: 50, 75, 100, 167, 250
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 001	2	ARRESTER, LIGHTNING, 3KV, POLYMER MOV (DIST.)
2	ARR LI 003	2	ARRESTER, LIGHTNING, 21KV, POLYMER MOV (DIST.)
3	BOL MS 015	4	BOLT, MACHINE, SQUARE HEAD, 5/8X2
4	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
5	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD, 3/4X14
6	BKT AC 003	8	BRACKET, ARRESTER OR CUTOUT, CROSSARM MOUNTING
7	BKT AC 002	1	BRACKET, ARRESTER AND CUTOUT, TRI-MOUNT
8	BKT TM 001	2	BRACKET, TRANSFORMER MOUNTING
9	CLA TG 001	2	CLAMP, TRANSFORMER TANK GROUND, #6 SOL. - #1 STR.
10	COB CO 028	40	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
11	CNN VG 003	4	CONNECTOR, VISE TYPE, 6-2 SOL. - 10-2 SOL.
12	CUT OT X01	2	CUTOUT, FUSED, 125KV BIL, 100 AMP, 27KV
13	CUT OT 004	2	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
14	FUS OH ***	4	GENERAL CODE FOR FUSE-LINK
15	TRA SB ***	2	GENERAL CODE FOR TRANSFORMER
16	WAS RD 004	4	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
17	WAS RD 005	6	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
18	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

DGRB

TWO-PHASE STEP-DOWN TRANSFORMER BANK – 26.4KV TO 4KV



DGRC

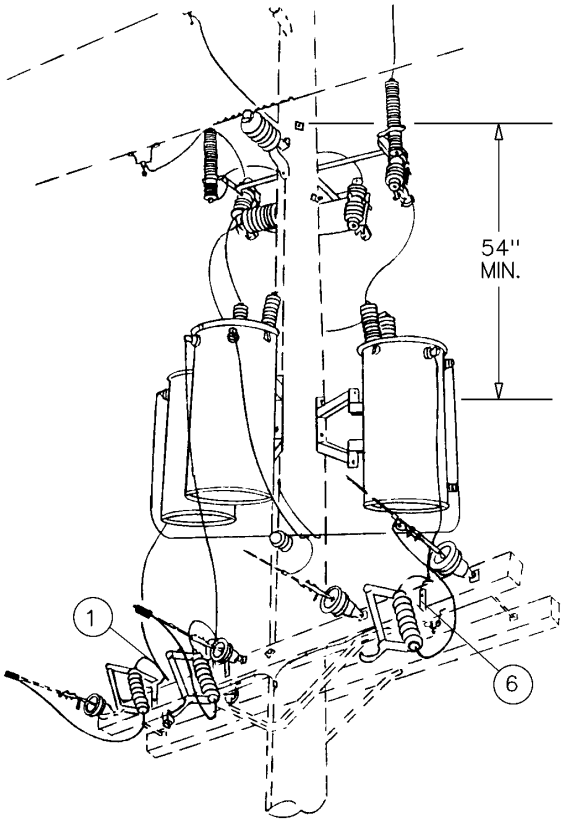
THREE-PHASE STEP-DOWN TRANSFORMER BANK – 26.4KV TO 4KV

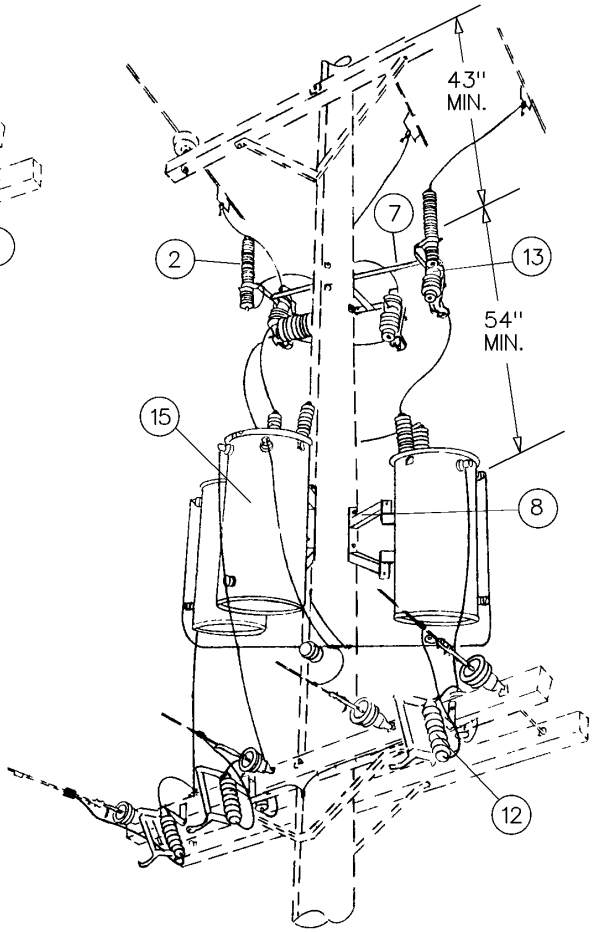
OPTIONS: 50, 75, 100, 167, 250
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 001	3	ARRESTER, LIGHTNING, 3KV, POLYMER MOV (DIST.)
2	ARR LI 003	3	ARRESTER, LIGHTNING, 21KV, POLYMER MOV (DIST.)
3	BOL MS 015	6	BOLT, MACHINE, SQUARE HEAD, 5/8X2
4	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
5	BOL MS 036	4	BOLT, MACHINE, SQUARE HEAD, 3/4X14
6	BKT AC 003	6	BRACKET, ARRESTER OR CUTOUT, CROSSARM MOUNTING
7	BKT AC 002	1	BRACKET, ARRESTER AND CUTOUT, TRI-MOUNT
8	BKT TM 001	3	BRACKET, TRANSFORMER MOUNTING
9	CLA TG 001	2	CLAMP, TRANSFORMER TANK GROUND, #6 SOL. - #1 STR.
10	COB CO 028	60	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
11	CNN VG 003	6	CONNECTOR, VISE TYPE, 6-2 SOL. - 10-2 SOL.
12	CUT OT X01	3	CUTOUT, FUSED, 125KV BIL, 100 AMP, 27KV
13	CUT OT 004	3	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
14	FUS OH ***	6	GENERAL CODE FOR FUSE-LINK
15	TRA SB ***	3	GENERAL CODE FOR TRANSFORMER
16	WAS RD 004	6	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
17	WAS RD 005	14	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
18	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
19	WAS SP 002	6	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

DGRC

THREE-PHASE STEP-DOWN TRANSFORMER BANK – 26.4KV TO 4KV





LG2

CONSTANT CURRENT TRANSFORMER FOR U.G. STREETLIGHT CIRCUIT

OPTIONS: NONE

BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ANC ST 001	24	ANCHOR, STUD BOLT, 1/4X3/4 IN.
2	ARR LI ***	1	GENERAL CODE FOR ARRESTER
3	BKT AC 003	4	BRACKET, ARRESTER AND CUTOUT, CROSSARM MOUNT
4	BKT TM 001	1	BRACKET, TRANSFORMER MOUNTING
5	BKT TM 003	2	BRACKET, TRANSFORMER ADAPTER PLATE
6	BOL DA 020	3	BOLT, DOUBLE ARMING, 3/4X24
7	BOL MS 015	2	BOLT, MACHINE, SQUARE HEAD, 5/8X2
8	BOL MS 037	3	BOLT, MACHINE, SQUARE HEAD, 3/4X16
9	BOL MS 038	1	BOLT, MACHINE, SQUARE HEAD, 3/4X18
10	BOX SE 001	1	BOX, CONCRETE SECONDARY SERVICE, 17”X28”
11	CAI CL 004	60	CABLE, PRIMARY, 5kV, 8CU
12	CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, #6 SOL. - #1 STR.
13	CNN CP 020	2	CONNECTOR, COMPRESSION, CU, 1/0
14	CNN CP 021	2	CONNECTOR, COMPRESSION, CU, #2 STR.
15	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 SOL. - 10-2 SOL.
16	CNN WC 003	2	CONNECTOR, TERMINAL, 12-10 AWG
17	COB CO 028	20	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
18	COD ST 003	20	CONDUIT, STEEL, 1 IN.
19	COD ST 006	20	CONDUIT, STEEL, 2 IN.
20	COI BW 003	10	WIRE, THWN, 12 SOL. BLACK
21	COI BW 005	10	WIRE, THWN, 12 SOL., WHITE
22	COI BW 021	25	WIRE, THWN, 6 STR., BLACK
23	COI BW 022	25	WIRE, THWN, 6 STR., WHITE
24	CUT OT 004	3	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
25	CXA ST 001	3	CROSSARM, STEEL, 5” X 5” X 10’
26	FUS UG 009	1	FUSE, UNDERGROUND, 15A, NON-15
27	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5Kv
28	MET HU 002	1	HUB, CONDUIT, 1 IN., INTERCHANGEABLE
29	STL PC 001	1	PHOTOELECTRIC CONTROL, ELECTRONIC, 105-130V
30	STL PC 004	1	PHOTOELECTRIC CONTROL BRACKET
31	STP ST 001	6	STRAP, CONDUIT, STEEL, 1 IN.
32	STP ST 005	6	STRAP, CONDUIT, STEEL, 2 IN.
33	STU LI 003	3	STUD, LINE POST
34	TRA SL 001	1	6.6 AMP REGULATED OUTPUT TRANSFORMER
35	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
36	WAS RD 005	23	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
37	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
38	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
39	WEA HE 001	1	WEATHERHEAD, 2 IN.
40	--	1	CURRENT TRANSFORMER

LG2 (CONTINUED)

CONSTANT CURRENT TRANSFORMER FOR U.G. STREETLIGHT CIRCUITN (CONTINUED)

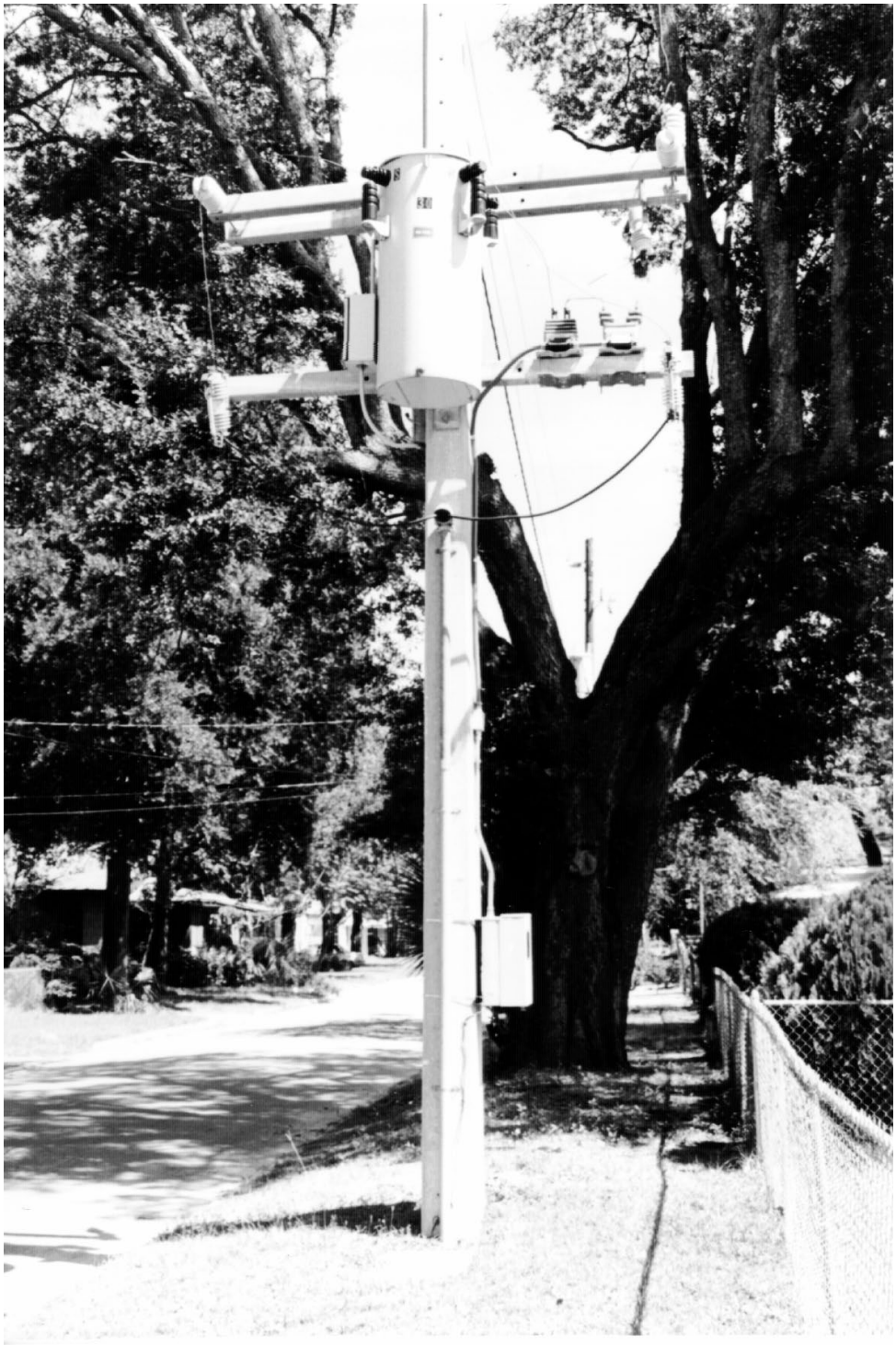
41	--	1	POTENTIAL TRANSFORMER
42	--	20FT	1 INCH EMT
43	--	1	FS BOX
44	--	3	1 INCH SEALTITE STRAIGHT CONNECTOR
45	--	1	1 INCH SEALTITE 45 DEGREE CONNECTOR
46	--	8FT	3/8 IN. THREADED ROD
47	--	8	3/8 IN. NUTS
48	--	8	3/8 IN. WASHERS
49	--	1	1 INCH EMT COUPLING
50	--	2	1 INCH EMT CONNECTORS
51	--	12FT	CONDUCTOR, COPPER, #4 SOFT DRAWN
52	--	4FT	CONDUCTOR, COPPER, #6 SOFT DRAWN
53	--	1	SINGLE GANG METER CAN
54	--	1	4-POLE TEST BLOCK
55	--	2	C.T. TERMINAL CONNECTORS
56	--	6	1 IN. PIPE STRAPS
57	--	8FT	KINDORF OR UNISTRUT CHANNEL

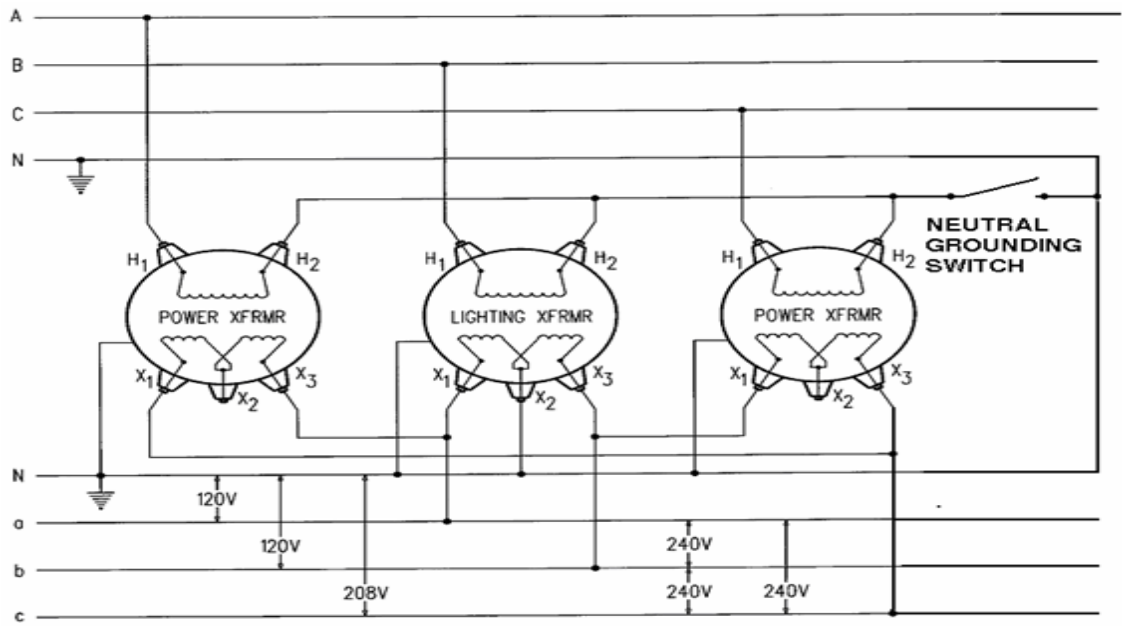
LG2

CONSTANT CURRENT TRANSFORMER FOR U.G. STREETLIGHT CIRCUIT

LG2

CONSTANT CURRENT TRANSFORMER FOR U.G. STREETLIGHT CIRCUIT





UNGROUNDED WYE-DELTA CONNECTION
120/240 VOLT, 3-PHASE, 4-WIRE SERVICE

SWITCHING UNGROUNDED CLOSED-DELTA TRANSFORMER BANKS

INTRODUCTION

The ungrounded Closed-Delta transformer connection is used by the JEA to provide 240 volt delta secondary service. The primary neutral is not grounded to avoid zero-sequence current flow into the bank due to primary feeder voltage imbalance or faults. This procedure is to be followed on all JEA primary voltages.

DISCUSSION

Ferroresonance and extremely light transformer loading are the general major causes of transformer and arrester failures when energizing Closed-Delta banks. Temporarily grounding the high-side neutral will limit the over-voltage which may occur due to ferroresonance, but will not limit over-voltages due to open phases on the line-side of the bank. Over-voltages due to transformer loading can be reduced by properly switching the lighting transformer and power transformers. Larger Closed-Delta banks usually do not experience any problems with ferroresonance.

The following types or scenarios for Closed-Delta banks are covered in this Standards Bulletin:

***Banks with all transformers 75kVA or larger**
***Banks with any transformer less than 75kVA**
Type 1 - (new location)
Type 2 - (power transformer fuse blown, no grounding switch)
Type 3 - (lighting transformer fuse blown, no grounding switch)
Type 4 - (no fuse blown, no grounding switch)
Type 5 - (power transformer fuse blown, grounding switch present)
Type 6 - (lighting transformer fuse blown, grounding switch present)
Type 7 - (no fuse blown, grounding switch present)

SWITCHING PROCEDURE

Banks with all transformers 75kVA or larger

Energization - Energize the power transformers first and the lighting transformer last.

De-energization - De-energize the lighting transformer first and then the power transformers.

Banks with any transformers less than 75kVA

Type 1 - (new location)

Step 1 - A 150kV BIL cutout shall be permanently installed on the side of the pole opposite to the lighting transformer to be used for temporarily grounding the high-side neutral. The cutout shall be mounted using the bracket BKT AC 007 and #4 CU for the jumpers from the cutout to the high-side neutral and the pole ground. Connection of the jumpers to each shall be made using the connector CNN VG 003, and within 12 inches of the H2 bushing closest to the grounding switch, on the floating neutral, for the line side jumper.

Step 2 - Install a 40T or larger fuse-link in the cutout barrel and close it in to ground the high-side neutral.

Step 3 - Energize the power transformers first and the lighting transformer last.

Step 4 - After all three transformers have been energized, the barrel of the cutout temporarily grounding the high-side neutral **MUST** be removed and stored on the pole in a suitable location that is safe to personnel for future access and from hazard to other JEA equipment.

Type 2 - (power transformer fuse blown, no grounding switch)

Step 1 - De-energize the lighting transformer first and then the remaining power transformer.

Step 2 - A 150kV BIL cutout shall be permanently installed on the side of the pole opposite to the lighting transformer to be used for temporarily grounding the high-side neutral. The cutout shall be mounted using the bracket BKT AC 007 and #4 CU for the jumpers from the cutout to the high-side neutral and the pole ground. Connection of the jumpers to each shall be made using the connector CNN VG 003, and within 12 inches of the H2 bushing closest to the grounding switch, on the floating neutral, for the line side jumper.

Step 3 - Install a 40T or larger fuse-link in the cutout barrel and close it in to ground the high-side neutral.

Step 4 - Energize the power transformers first and the lighting transformer last.

Step 5 - After all three transformers have been energized, the barrel of the cutout temporarily grounding the high-side neutral **MUST** be removed and stored on the pole in a suitable location that is safe to personnel for future access and from hazard to other JEA equipment.

Type 3 - (lighting transformer fuse blown, no grounding switch)

Step 1 - De-energize the remaining power transformers.

Step 2 - A 150kV BIL cutout shall be permanently installed on the side of the pole opposite to the lighting transformer to be used for temporarily grounding the high-side neutral. The cutout shall be mounted using the bracket BKT AC 007 and #4 CU for the jumpers from the cutout to the high-side neutral and the pole ground. Connection of the jumpers to each shall be made using the connector CNN VG 003, and within 12 inches of the H2 bushing closest to the grounding switch, on the floating neutral, for the line-side jumper.

Step 3 - Install a 40T or larger fuse-link in the cutout barrel and close it in to ground the high-side neutral.

Step 4 - Energize the power transformers first and the lighting transformer last.

Step 5 - After all three transformers have been energized, the barrel of the cutout temporarily grounding the high-side neutral **MUST** be removed and stored on the pole in a suitable location that is safe to personnel for future access and from hazard to other JEA equipment.

Type 4 – (no fuses blown, no grounding switch – work is required on bank)

Step 1 - De-energize the lighting transformer first and then the power transformers.

Step 2 - A 150kV BIL cutout shall be permanently installed on the side of the pole opposite to the lighting transformer to be used for temporarily grounding the high-side neutral. The cutout shall be mounted using the bracket BKT AC 007 and #4 CU for the jumpers from the cutout to the high-side neutral and the pole ground. Connection of the jumpers to each shall be made using the connector CNN VG 003, and within 12 inches of the H2 bushing closest to the grounding switch, on the floating neutral, for the line side jumper.

Step 3 - Install a 40T or larger fuse-link in the cutout barrel and close it in to ground the high-side neutral.

Step 4 – Perform required work.

Step 5 - Energize the power transformers first and the lighting transformer last.

Step 6 - After all three transformers have been energized, the barrel of the cutout temporarily grounding the high-side neutral **MUST** be removed and stored on the pole in a suitable location that is safe to personnel for future access and from hazard to other JEA equipment.

Type 5 - (power transformer fuse blown, grounding switch present)

Step 1 - De-energize the lighting transformer first and then the remaining power transformer.

Step 2 - Install a 40T or larger fuse-link in the cutout barrel of the grounding switch and close it in to ground the high-side neutral.

Step 3 - Energize the power transformers first and the lighting transformer last.

Step 4 - After all three transformers have been energized, the barrel of the cutout temporarily grounding the high-side neutral **MUST** be removed and stored on the pole in a suitable location that is safe to personnel for future access and from hazard to other JEA equipment.

Type 6 - (lighting transformer fuse blown, grounding switch present)

Step 1 - De-energize the remaining power transformers.

Step 2 - Install a 40T or larger fuse-link in the cutout barrel of the grounding switch and close it in to ground the high-side neutral.

Step 3 - Energize the power transformers first and the lighting transformer last.

Step 4 - After all three transformers have been energized, the barrel of the cutout temporarily grounding the high-side neutral **MUST** be removed and stored on the pole in a suitable location that is safe to personnel for future access and from hazard to other JEA equipment.

Type 7 – (no fuses blown, grounding switch present – work is required on bank)

Step 1 - Install a 40T or larger fuse-link in the cutout barrel and close it in to ground the high-side neutral.

Step 2 - De-energize the lighting transformer first and then the power transformers.

Step 3 – Perform required work.

Step 4 - Energize the power transformers first and the lighting transformer last.

Step 5 - After all three transformers have been energized, the barrel of the cutout temporarily grounding the high-side neutral **MUST** be removed and stored on the pole in a suitable location that is safe to personnel for future access and from hazard to other JEA equipment.

SWITCHING

INTRODUCTION

1. All group-operated switches installed shall be load-break. The interrupters are now included with the plates and no longer need to be itemized as in the past. Arresters shall no longer be mounted on vertical group-operated switches, but on the side of the pole at each phase location due to arrester failures that have caused the switch itself to flashover.

2. Hook disconnect switches shall be identified using the identification plates GN and GNC.

3. All jumpers to switches shall be aluminum and not copper, unless the primary feeding the switch is copper. The jumpers shall be of equal size (AWG) as the primary conductors feeding the switch. Switch plates, both group-operated and hook disconnect, include bolted terminal connectors that are tin-plated and will accommodate all wire sizes, either CU or AL, used on the JEA distribution system. Also included with the switch plates, are a bag of stainless steel terminal bolts and a squeeze bottle of inhibitor. These connectors and bolts shall be used as the means of making terminations to switches even if a terminal connector supplied by the switch manufacturer is present. It is also very important that the inhibitor supplied with the switch plates be used liberally at all connections to minimize oxidation.

4. All group-operated switch handles shall be effectively grounded. The operating pipe shall be grounded using the grounding strap supplied with the switch. This strap shall be installed on the pipe near the system neutral and shall be bonded to it. The switch handle shall be effectively grounded using #4 CU and bonding it to the pole grounding loop found near the groundline.

5. Where #4 CU jumpers from arresters to aluminum switch jumpers are made, the appropriate high-strength aluminum alloy hot-line clamp (CLA AR 001, 002, or 003) shall be used. This is the only application for which these clamps are to be used.

6. As a normal practice, the switch operating handle for group-operated switches should always be installed on the side of the pole away from the flow of vehicular traffic. However, under certain circumstances this may not be practical or the best arrangement for the particular situation.

7. The plate DS1S is to be used for moving the operating pipe of older existing switches to the side of the pole. It is not necessary for new installations.

8. Included with the vertical group-operated switch are three jumper pin brackets. These brackets allow a 34.5kV post insulator to be mounted on the switch to be used as a primary conductor

support for large feeder risers. If no risers are present, these brackets are not necessary and should not be installed on the switch.

9. All switch plates are unshielded. If a shield is required, it must be itemized.

10. Guy breakers (INS GB 002 & 008) and fiberglass extension links (INS FE 001) should be installed on double deadends of different size conductors

11. Hook and group switches shall be installed on either a 50/2 wood or 50/H concrete pole. If this is not possible due to clearance requirements, a group switch may be installed on a maximum 60 ft pole.

12. All plates in this section include the pre-crimped aluminum jumper CNN JU 001, which includes 8 ft of 636 AAC crimped to a 2 hole pad. The pad-to-pad connection shall be torqued to 40 ft-lbs. This assembly replaces the old bolted pad connectors.

13. The ANTENNA plate has been added to the following plates: AS-TSE, AS-TSH

DS1-5

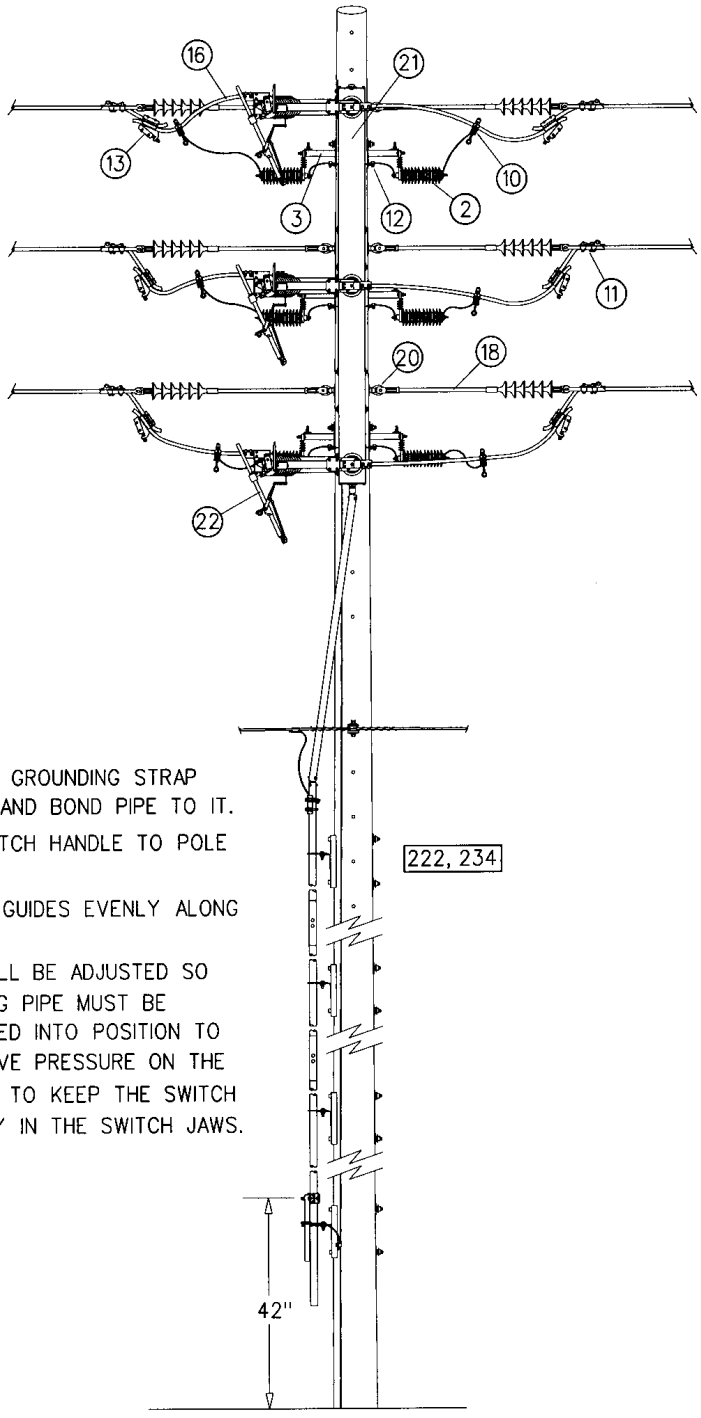
VERTICAL GROUP-OPERATED SWITCH – 26.4KV – UNSHIELDED

OPTIONS: 3/0, 336, 636
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ADC MI 007	1	COMPOUND, INHIBITING, 4 OZ. SQUEEZE BOTTLE
2	ARR LI 003	6	ARRESTER, LIGHTNING, POLYMER, 21kV
3	BKT RP 001	6	BRACKET, RISER POLE ARRESTER
4	BOL DA 014	2	BOLT, DOUBLE ARMING, 3/4X12
5	BOL DA 015	4	BOLT, DOUBLE ARMING, 3/4X14
6	BOL DA 016	4	BOLT, DOUBLE ARMING, 3/4X16
7	BOL MS 036	4	BOLT, MACHINE, SQUARE HEAD, 3/4X14
8	BOL MS 037	2	BOLT, MACHINE, SQUARE HEAD, 3/4X16
9	BOL TE 001	12	BOLT, TERMINAL KIT, S.S. BOLT, WASHERS, S.B. NUT
10	CLA AR ***	6	GENERAL CODE FOR ARRESTER HOT-LINE CLAMP
11	CLA SS ***	6	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
12	CLA TG 001	6	CLAMP, TRANSFORMER TANK GROUND, 6 SOL. - #1 STR.
13	CNN TA ***	6	GENERAL CODE FOR BOLTED TAP CONNECTOR
14	CNN TE 047	6	CONNECTOR, TERMINAL, BOLTED, 2/0-800 MCM CU OR AL
15	CNN VG 003	8	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
16	CNN JU 001	6	PRE-CRIMPED JUMPER, 636AAC, 8 FT, 2 HOLE PAD
17	COB CO 028	25	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
18	INS CO 001	6	34.5KV POLYMER DEADEND INSULATOR
19	INS FE 001	6	FIBERGLASS EXTENSION LINK, 24”
19	LOC PA 001	1	PADLOCK, ALL BRASS, 1-3/4 IN. SHANK OPENING
20	NUT EY 003	6	NUT, EYE, 3/4
21	SWE GR 002	1	SWITCH, GROUP-OPERATED, 34.5kV, VERTICAL MOUNT
23	WAS RD 005	35	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
24	WAS SF 003	13	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
25	WAS SP 002	16	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
26	BOL AN 003	6	BOLT, ANCHOR, ROTANIUM, 3/4 IN. X 5-1/2 IN. LONG

DS1-5

VERTICAL GROUP-OPERATED SWITCH – 26.4KV – UNSHIELDED



NOTES:

1) INSTALL PIPE GROUNDING STRAP NEAR NEUTRAL AND BOND PIPE TO IT.
2) GROUND SWITCH HANDLE TO POLE GROUND WIRE.
3) SPACE PIPE GUIDES EVENLY ALONG POLE.
4) HANDLE SHALL BE ADJUSTED SO THAT THE SWING PIPE MUST BE SLIGHTLY FORCED INTO POSITION TO MAINTAIN POSITIVE PRESSURE ON THE OPERATING PIPE TO KEEP THE SWITCH BLADES TIGHTLY IN THE SWITCH JAWS.

DS1R-5

VERTICAL GROUP-OPERATED SWITCH – FEEDER RISER – 26.4KV – UNSHIELDED

DEADEND

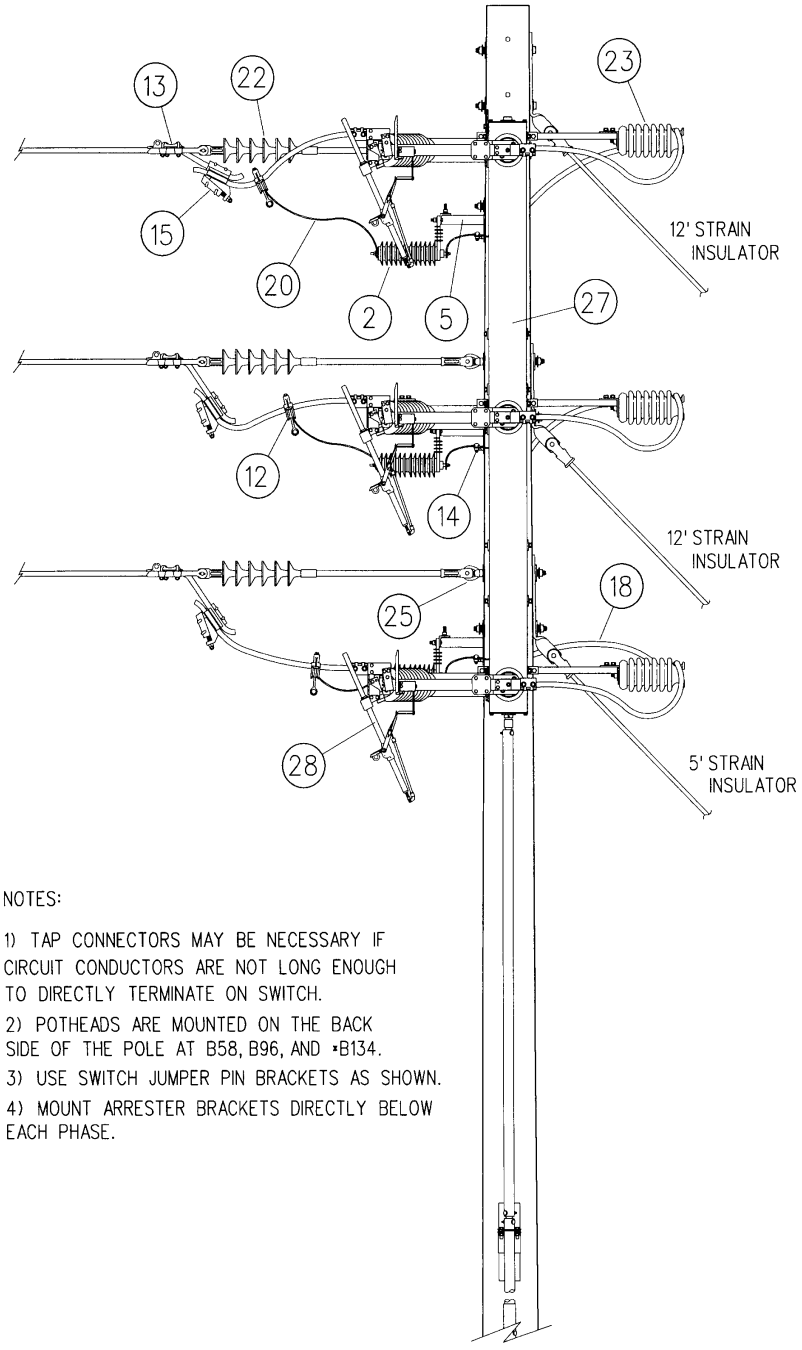
OPTIONS: 3/0, 336, 636
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ADC MI 007	1	COMPOUND, INHIBITING, 4 OZ. SQUEEZE BOTTLE
2	ARR LI 014	3	ARRESTER, LIGHTNING, POLYMER, 21kV, RISER POLE
3	BKT EM 001	3	BRACKET, EQUIPMENT MOUNTING, POTHEAD
4	BKT EM 002	3	BRACKET, EQUIPMENT MOUNTING, POTHEAD (SINGLE)
5	BKT RP 001	3	BRACKET, RISER POLE ARRESTER
6	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
7	BOL DA 016	4	BOLT, DOUBLE ARMING, 3/4X16
8	BOL MS 020	3	BOLT, MACHINE, SQUARE HEAD, 5/8X14
9	BOL MS 036	4	BOLT, MACHINE, SQUARE HEAD, 3/4X14
10	BOL MS 037	4	BOLT, MACHINE, SQUARE HEAD, 3/4X16
11	BOL TE 001	12	BOLT, TERMINAL KIT, S.S. BOLT, WASHERS, S.B. NUT
12	CLA AR ***	3	GENERAL CODE FOR ARRESTER HOT-LINE CLAMP
13	CLA SS ***	3	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
14	CLA TG 001	3	CLAMP, TRANSFORMER TANK GROUND, 6 SOL. - #1 STR.
15	CNN TA ***	3	GENERAL CODE FOR BOLTED TAP CONNECTOR
16	CNN TE 047	6	CONNECTOR, TERMINAL, BOLTED, 2/0-800 MCM CU OR AL
17	CNN VG 003	3	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
18	COB CO ***	36	GENERAL CODE FOR COPPER CONDUCTOR
19	CNN JU 001	6	PRE-CRIMPED JUMPER, 636AAC, 8 FT, 2 HOLE PAD
20	COB CO 028	16	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
21	GUY AT 004	3	GUY, ATTACHMENT, 20,000 LBS.
22	INS CO 001	3	34.5KV POLYMER DEADEND INSULATOR
23	INS FE 001	6	FIBERGLASS EXTENSION LINK, 24”
24	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5kV
25	LOC PA 001	1	PADLOCK, ALL BRASS, 1-3/4 IN. SHANK OPENING
26	NUT EY 003	3	NUT, EYE, 3/4
27	STU LI 001	3	STUD, LINE POST, 3/4 IN. DIA. HEAD, 1-3/4 IN. SHANK
28	SWE GR 002	1	SWITCH, GROUP-OPERATED, 34.5kV, VERTICAL MOUNT
30	WAS RD 004	5	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
31	WAS RD 005	24	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
32	WAS SF 003	12	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
33	WAS SP 002	12	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
34	BOL AN 003	6	BOLT, ANCHOR, ROTANIUM, 3/4 IN. X 5-1/2 IN. LONG

DS1R-5

VERTICAL GROUP-OPERATED SWITCH – FEEDER RISER – 26.4KV – UNSHIELDED - DEADEND

NOTE: INSTALL THE GUY PLATES IN A, B, & C PHASE POSITION. THE JUMPER SUPPORTS WILL VARY BASED ON THE ANCHOR PLACEMENT. AT NO TIME SHALL THE BREAKER COME IN CONTACT WITH THE ENERGIZED FEEDER RISER.



NOTES:

1) TAP CONNECTORS MAY BE NECESSARY IF CIRCUIT CONDUCTORS ARE NOT LONG ENOUGH TO DIRECTLY TERMINATE ON SWITCH.

2) POTHEADS ARE MOUNTED ON THE BACK SIDE OF THE POLE AT B58, B96, AND •B134.

3) USE SWITCH JUMPER PIN BRACKETS AS SHOWN.

4) MOUNT ARRESTER BRACKETS DIRECTLY BELOW EACH PHASE.

DS1RT-5

VERTICAL GROUP-OPERATED SWITCH – FEEDER RISER – 26.4KV – UNSHIELDED

TANGENT

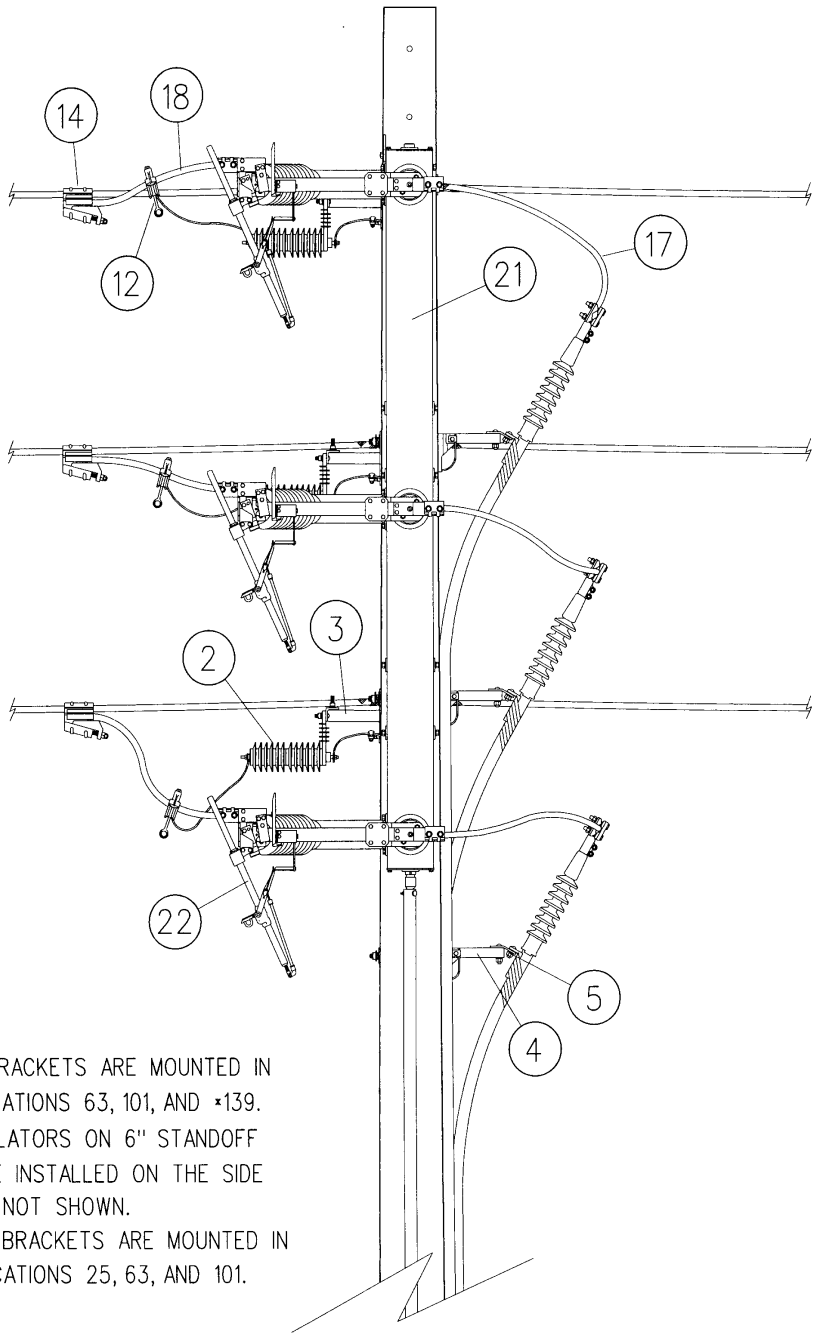
OPTIONS: 3/0, 336, 636
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ADC MI 007	1	COMPOUND, INHIBITING, 4 OZ. SQUEEZE BOTTLE
2	ARR LI 014	3	ARRESTER, LIGHTNING, POLYMER, 21kV, RISER POLE
3	BKT RP 001	3	BRACKET, RISER POLE ARRESTER
4	BKT EM 001	3	BRACKET, EQUIPMENT MOUNTING, POTHEAD
5	BKT EM 002	3	BRACKET, EQUIPMENT MOUNTING, POTHEAD (SINGLE)
6	BOL DA 015	4	BOLT, DOUBLE ARMING, 3/4X14
7	BOL MS 020	3	BOLT, MACHINE, SQUARE HEAD, 5/8X14
8	BOL MS 035	1	BOLT, MACHINE, SQUARE HEAD, 3/4X12
9	BOL MS 036	4	BOLT, MACHINE, SQUARE HEAD, 3/4X14
10	BOL MS 037	2	BOLT, MACHINE, SQUARE HEAD, 3/4X16
11	BOL TE 001	12	BOLT, TERMINAL KIT, S.S. BOLT, WASHERS, S.B. NUT
12	CLA AR ***	3	GENERAL CODE FOR ARRESTER HOT-LINE CLAMP
13	CLA TG 001	3	CLAMP, TRANSFORMER TANK GROUND, 6 SOL. - #1 STR.
14	CNN TA ***	3	GENERAL CODE FOR BOLTED TAP CONNECTOR
15	CNN TE 047	6	CONNECTOR, TERMINAL, BOLTED, 2/0-800 MCM CU OR AL
16	CNN VG 003	6	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
17	COB CO ***	24	GENERAL CODE FOR COPPER CONDUCTOR
18	CNN JU 001	6	PRE-CRIMPED JUMPER, 636AAC, 8 FT, 2 HOLE PAD
19	COB CO 028	16	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
20	INS FE 001	6	FIBERGLASS EXTENSION LINK, 24”
21	LOC PA 001	1	PADLOCK, ALL BRASS, 1-3/4 IN. SHANK OPENING
22	SWE GR 002	1	SWITCH, GROUP-OPERATED, 34.5kV, VERTICAL MOUNT
23	SWE IN 002	3	INTERUPTER, LOADBREAK (BRIDGES SWITCH)
24	WAS RD 004	5	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
25	WAS RD 005	14	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
26	WAS SF 003	5	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
27	WAS SP 002	7	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
28	BOL AN 003	6	BOLT, ANCHOR, ROTANIUM, 3/4 IN. X 5-1/2 IN. LONG

DS1RT-5

VERTICAL GROUP-OPERATED SWITCH – FEEDER RISER – 26.4KV – UNSHIELDED

TANGENT



NOTES:

1) POTHEAD BRACKETS ARE MOUNTED IN THE HOLE LOCATIONS 63, 101, AND ×139.
2) POST INSULATORS ON 6" STANDOFF BRACKETS ARE INSTALLED ON THE SIDE OF THE POLE NOT SHOWN.
3) ARRESTER BRACKETS ARE MOUNTED IN THE HOLE LOCATIONS 25, 63, AND 101.

DS2-5

HORIZONTAL GROUP-OPERATED SWITCH – 26.4KV – UNSHIELDED

OPTIONS: 3/0, 336, 636
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ADC MI 007	1	COMPOUND, INHIBITING, 4 OZ. SQUEEZE BOTTLE
2	ARR LI 003	6	ARRESTER, LIGHTNING, POLYMER, 21kV
3	BKT AC 003	6	ARRESTER, CUTOUT AND ARRESTER, CROSSARM MOUNT
4	BOL MS 020	4	BOLT, MACHINE, SQUARE HEAD, 5/8X14
5	BOL MS 021	2	BOLT, MACHINE, SQUARE HEAD, 5/8X16
6	BOL MS 022	2	BOLT, MACHINE, SQUARE HEAD, 5/8X18
7	BOL TE 001	12	BOLT, TERMINAL KIT, S.S. BOLT, WASHERS, S.B. NUT
8	CLA AR ***	6	GENERAL CODE FOR ARRESTER HOT-LINE CLAMP
9	CLA SS ***	6	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
10	CNN TA ***	6	GENERAL CODE FOR BOLTED TAP CONNECTOR
11	CNN TE 047	6	CONNECTOR, TERMINAL, BOLTED, 2/0-800 MCM CU OR AL
12	CNN VG 003	8	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
13	CNN JU 001	6	PRE-CRIMPED JUMPER, 636AAC, 8 FT, 2 HOLE PAD
14	COB CO 028	25	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
15	INS CO 001	6	34.5KV POLYMER DEADEND INSULATOR
16	INS FE 001	6	FIBERGLASS EXTENSION LINK, 24”
17	LOC PA 001	1	PADLOCK, ALL BRASS, 1-3/4 IN. SHANK OPENING
18	SCW LA 002	1	SCREW, LAG, 1/2X4
19	SWE GR 001	1	SWITCH, GROUP-OPERATED, 34.5kV, HORIZONTAL
21	WAS RD 004	14	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
22	WAS SF 003	8	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
23	WAS SP 002	8	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

DS2-5

HORIZONTAL GROUP-OPERATED SWITCH – 26.4KV – UNSHIELDED

DS3-5

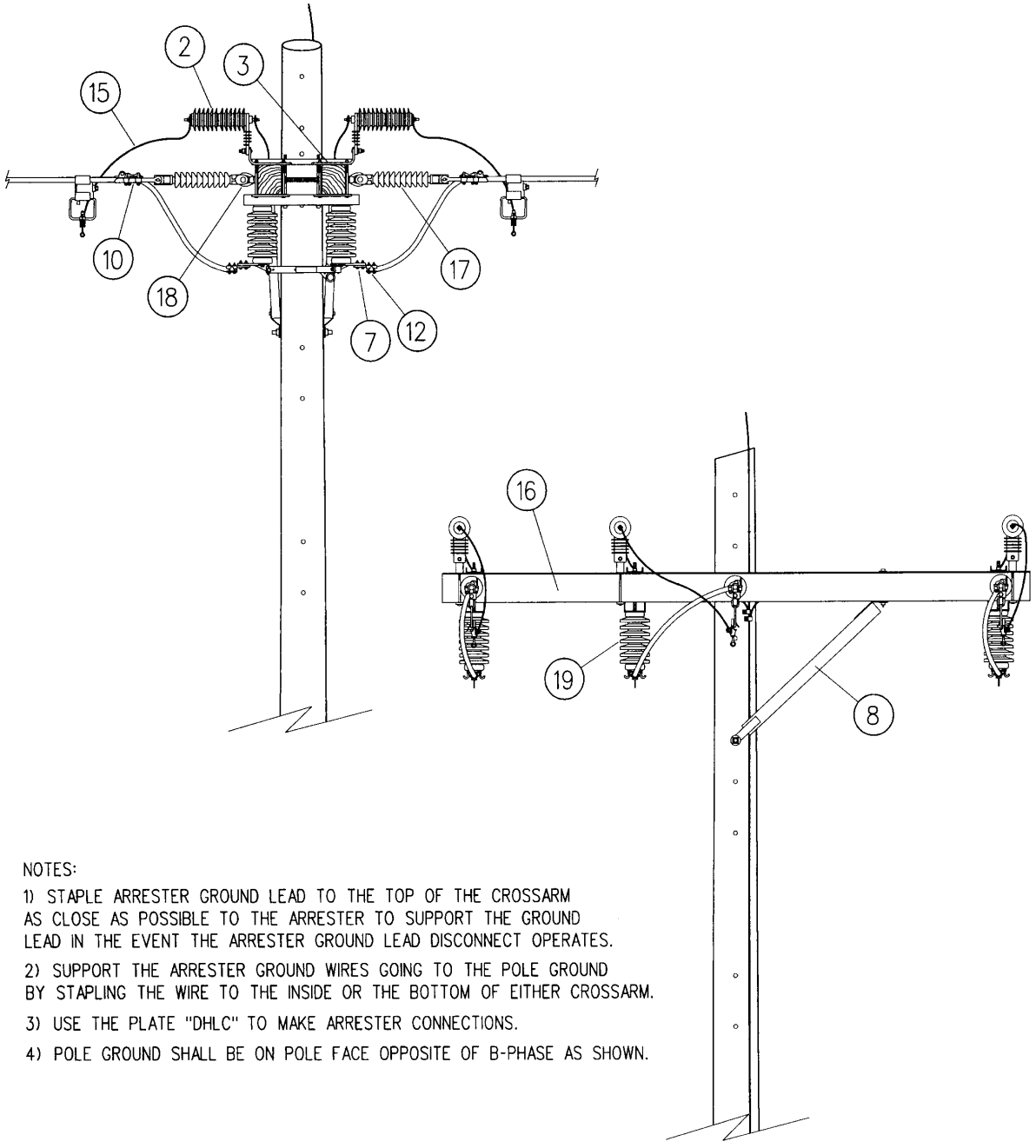
HOOK DISCONNECT SWITCH – 26.4KV – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2/0CU, 4/0CU, 2, 1/0, 3/0, 336, 636
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ADC MI 007	1	COMPOUND, INHIBITING, 4 OZ. SQUEEZE BOTTLE
2	ARR LI 003	6	ARRESTER, LIGHTNING, POLYMER, 21kV
3	BKT AC 003	6	ARRESTER, CUTOUT AND ARRESTER, CROSSARM MOUNT
4	BOL DA 021	3	BOLT, DOUBLE ARMING, 3/4X26
5	BOL MS 002	4	BOLT, MACHINE, SQUARE HEAD, 1/2X7
6	BOL MS 020	4	BOLT, MACHINE, SQUARE HEAD, 5/8X14
7	BOL TE 001	12	BOLT, TERMINAL KIT, S.S. BOLT, WASHERS, S.B. NUT
8	BRC CR 002	1	BRACE, CROSSARM, WOOD, 60 IN. SPAN, 30 IN. DROP (PAIR)
9	CLA AR ***	6	GENERAL CODE FOR ARRESTER HOT-LINE CLAMP
10	CLA SS ***	6	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
11	CNN TA ***	6	GENERAL CODE FOR BOLTED TAP CONNECTOR
12	CNN TE ***	6	GENERAL CODE FOR BOLTED TERMINAL CONNECTOR
13	CNN VG 003	8	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
14	CNN JU 001	6	PRE-CRIMPED JUMPER, 636AAC, 8 FT, 2 HOLE PAD
15	COB CO 028	24	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
16	CXA FG ***	2	GENERAL CODE FOR FIBERGLASS CROSSARM
17	INS CO 001	6	INSULATOR, COMPOSITE, POLYMER DEADEND
18	INS FE 001	6	FIBERGLASS EXTENSION LINK, 24”
19	NUT EY 003	6	NUT, EYE, 3/4
20	SWE UN 002	3	SWITCH, HOOK DISCONNECT, 26.4kV
21	WAS RD 003	8	WASHER, ROUND, 1-3/8 IN. DIA., FOR 1/2 IN. BOLT
22	WAS RD 004	3	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
23	WAS RD 005	1	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
24	WAS SF 001	4	WASHER, SQUARE, FLAT, 2 IN., FOR 1/2 IN. BOLT
25	WAS SF 003	16	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
26	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
27	WAS SP 003	4	WASHER, SPRING, LEAF, FOR 1/2 IN. BOLT

DS3-5

HOOK DISCONNECT SWITCH – 26.4KV – UNSHIELDED



NOTES:

1) STAPLE ARRESTER GROUND LEAD TO THE TOP OF THE CROSSARM AS CLOSE AS POSSIBLE TO THE ARRESTER TO SUPPORT THE GROUND LEAD IN THE EVENT THE ARRESTER GROUND LEAD DISCONNECT OPERATES.

2) SUPPORT THE ARRESTER GROUND WIRES GOING TO THE POLE GROUND BY STAPLING THE WIRE TO THE INSIDE OR THE BOTTOM OF EITHER CROSSARM.

3) USE THE PLATE "DHLC" TO MAKE ARRESTER CONNECTIONS.

4) POLE GROUND SHALL BE ON POLE FACE OPPOSITE OF B-PHASE AS SHOWN.

DS5-5

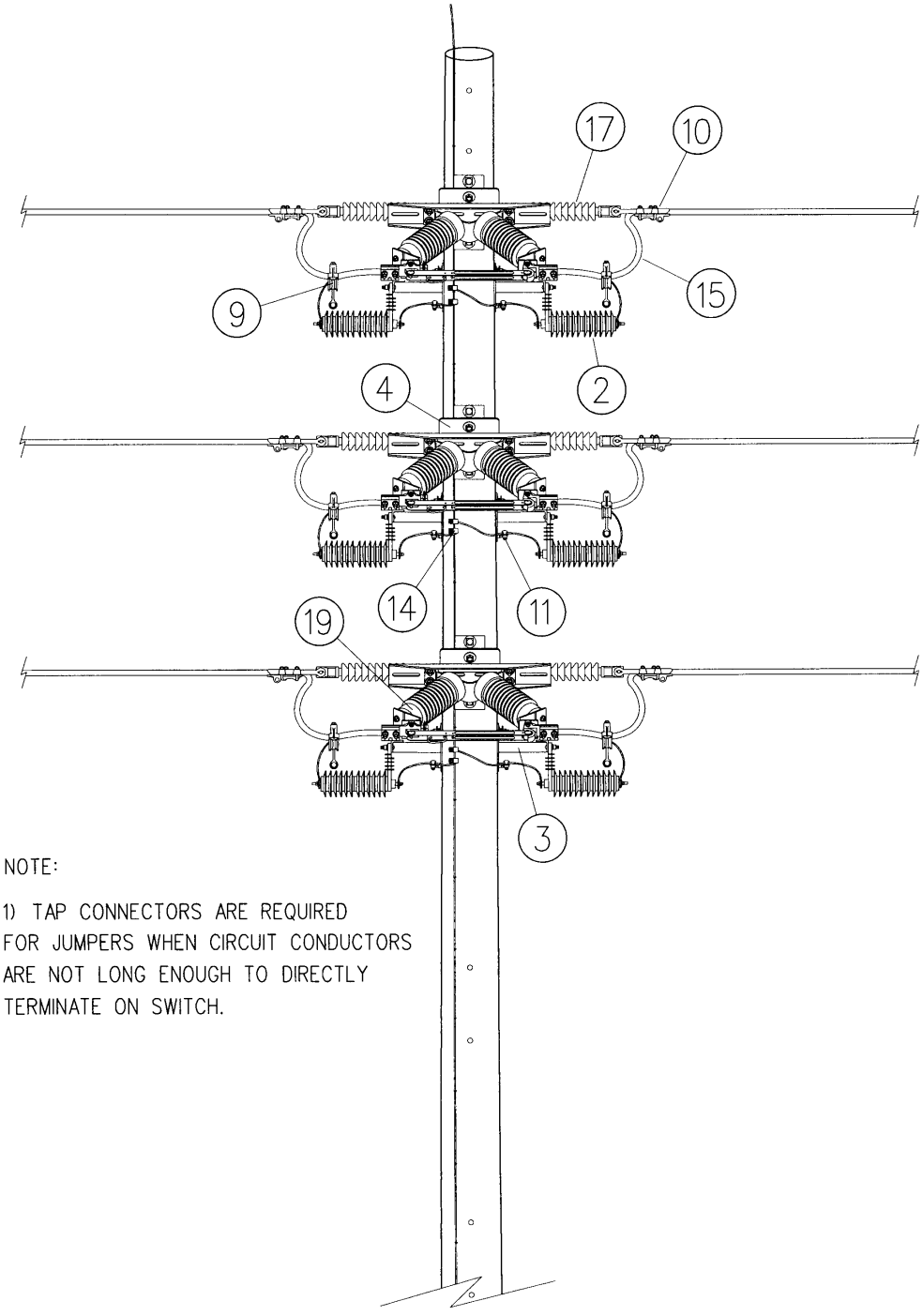
VERTICAL MOUNT HOOK DISCONNECT SWITCH – 26.4KV – UNSHIELDED

OPTIONS: 3/0, 336, 636
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ADC MI 007	1	COMPOUND, INHIBITING, 4 OZ. SQUEEZE BOTTLE
2	ARR LI 003	6	ARRESTER, LIGHTNING, POLYMER, 21kV
3	BKT RP 001	6	BRACKET, RISER POLE ARRESTER
4	BKT SM 004	3	BRACKET, SWITCH MOUNTING
5	BOL CA 002	6	BOLT, CARRIAGE, 3/8X5
6	BOL DA 016	6	BOLT, DOUBLE ARMING, 3/4X16
7	BOL MS 036	6	BOLT, MACHINE, SQUARE HEAD, 3/4X14
8	BOL TE 001	12	BOLT, TERMINAL KIT, S.S. BOLT, WASHERS, S.B. NUT
9	CLA AR ***	6	GENERAL CODE FOR ARRESTER HOT-LINE CLAMP
10	CLA SS ***	6	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
11	CLA TG 001	6	CLAMP, TRANSFORMER TANK GROUND, 6 SOL. - #1 STR.
12	CNN TA ***	6	GENERAL CODE FOR BOLTED TAP CONNECTOR
13	CNN TE 047	6	CONNECTOR, TERMINAL, BOLTED, 2/0-800 MCM CU OR AL
14	CNN VG 003	8	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
15	CNN JU 001	6	PRE-CRIMPED JUMPER, 636AAC, 8 FT, 2 HOLE PAD
16	COB CO 028	24	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
17	INS CO 001	6	INSULATOR, COMPOSITE, POLYMER DEADEND
18	INS FE 001	6	FIBERGLASS EXTENSION LINK, 24”
19	NUT EY 003	6	NUT, EYE, 3/4
20	SWE UN 002	3	SWITCH, HOOK DISCONNECT, 26.4kV
21	WAS RD 002	6	WASHER, ROUND, 1 IN. DIA., FOR 3/8 IN. BOLT
22	WAS RD 005	24	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
23	WAS SF 003	12	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
24	WAS SP 002	12	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

DS5-5

VERTICAL MOUNT HOOK DISCONNECT SWITCH – 26.4KV – UNSHIELDED



NOTE:

1) TAP CONNECTORS ARE REQUIRED FOR JUMPERS WHEN CIRCUIT CONDUCTORS ARE NOT LONG ENOUGH TO DIRECTLY TERMINATE ON SWITCH.

DS5R-5

VERTICAL MOUNT HOOK DISCONNECT SWITCH – FEEDER RISER – 26.4KV – UNSHIELDED

DEADEND

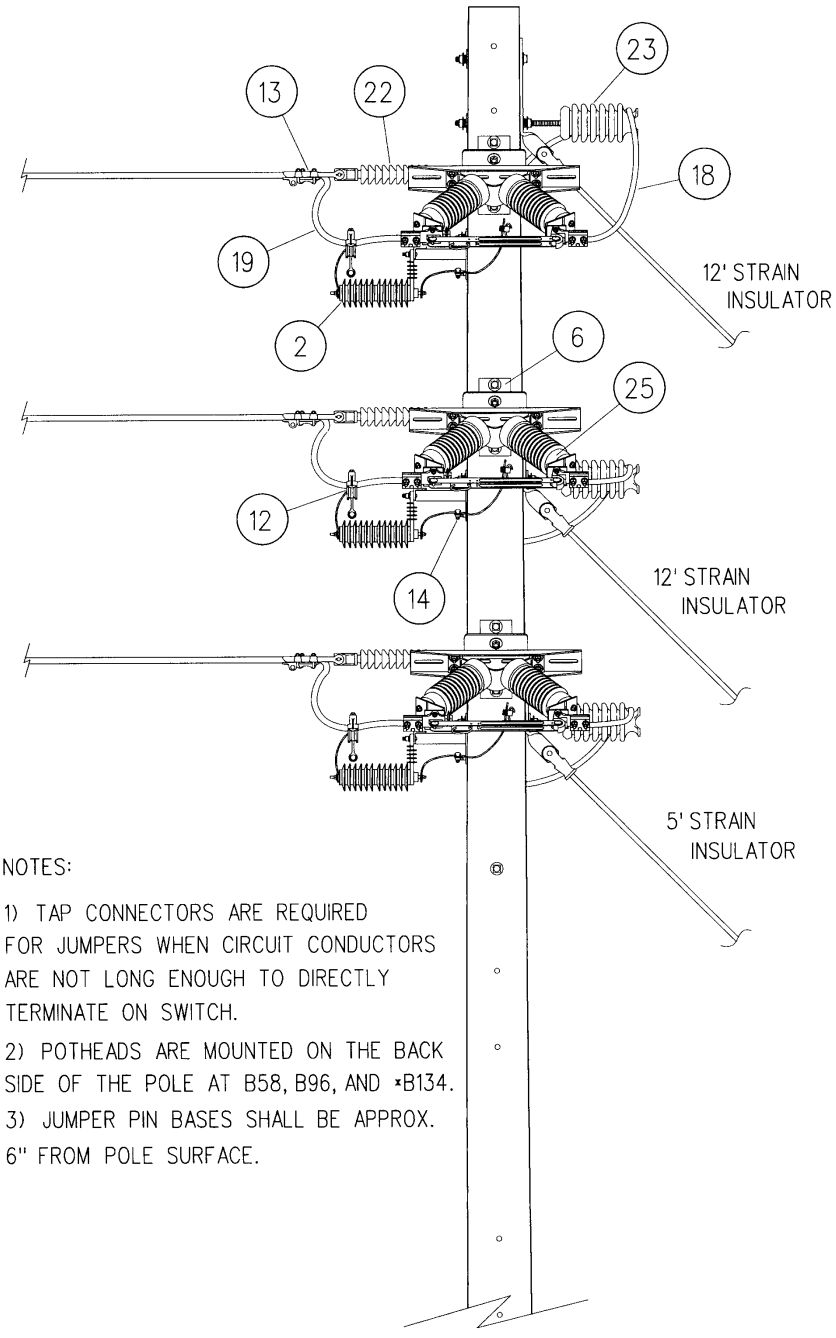
OPTIONS: 3/0, 336, 636
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ADC MI 007	1	COMPOUND, INHIBITING, 4 OZ. SQUEEZE BOTTLE
2	ARR LI 014	3	ARRESTER, LIGHTNING, POLYMER, 21kV, RISER POLE
3	BKT EM 001	3	BRACKET, EQUIPMENT MOUNTING, POTHEAD
4	BKT EM 002	3	BRACKET, EQUIPMENT MOUNTING, POTHEAD (SINGLE)
5	BKT RP 001	3	BRACKET, RISER POLE ARRESTER
6	BKT SM 004	3	BRACKET, SWITCH MOUNTING
7	BOL CA 002	6	BOLT, CARRIAGE, 3/8X5
8	BOL DA 016	3	BOLT, DOUBLE ARMING, 3/4X16
9	BOL DA 018	3	BOLT, DOUBLE ARMING, 3/4X20
10	BOL MS 036	6	BOLT, MACHINE, SQUARE HEAD, 3/4X14
11	BOL TE 001	12	BOLT, TERMINAL KIT, S.S. BOLT, WASHERS, S.B. NUT
12	CLA AR ***	3	GENERAL CODE FOR ARRESTER HOT-LINE CLAMP
13	CLA SS ***	3	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
14	CLA TG 001	3	CLAMP, TRANSFORMER TANK GROUND, 6 SOL. - #1 STR.
15	CNN TA ***	3	GENERAL CODE FOR BOLTED TAP CONNECTOR
16	CNN TE 047	6	CONNECTOR, TERMINAL, BOLTED, 2/0-800 MCM CU OR AL
17	CNN VG 003	3	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
18	COB CO ***	36	GENERAL CODE FOR COPPER CONDUCTOR
19	CNN JU 001	6	PRE-CRIMPED JUMPER, 636AAC, 8 FT, 2 HOLE PAD
20	COB CO 028	16	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
21	GUY AT 004	3	GUY, ATTACHMENT, 20,000 LBS.
22	INS CO 002	3	INSULATOR, COMPOSITE
23	INS FE 001	6	FIBERGLASS EXTENSION LINK, 24”
24	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5kV
25	NUT EY 003	3	NUT, EYE, 3/4
26	SWE UN 002	3	SWITCH, HOOK DISCONNECT, 26.4kV
27	WAS RD 002	6	WASHER, ROUND, 1 IN. DIA., FOR 3/8 IN. BOLT
28	WAS RD 004	5	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
29	WAS RD 005	24	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
30	WAS SF 003	12	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
31	WAS SP 002	12	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

DS5R-5

VERTICAL MOUNT HOOK DISCONNECT SWITCH – FEEDER RISER – 26.4KV – UNSHIELDED

DEADEND



NOTES:

1) TAP CONNECTORS ARE REQUIRED FOR JUMPERS WHEN CIRCUIT CONDUCTORS ARE NOT LONG ENOUGH TO DIRECTLY TERMINATE ON SWITCH.

2) POTHEADS ARE MOUNTED ON THE BACK SIDE OF THE POLE AT B58, B96, AND ×B134.

3) JUMPER PIN BASES SHALL BE APPROX. 6" FROM POLE SURFACE.

DS5RT-5

VERTICAL MOUNT HOOK DISCONNECT SWITCH – FEEDER RISER – 2 6.4KV – UNSHIELDED

TANGENT

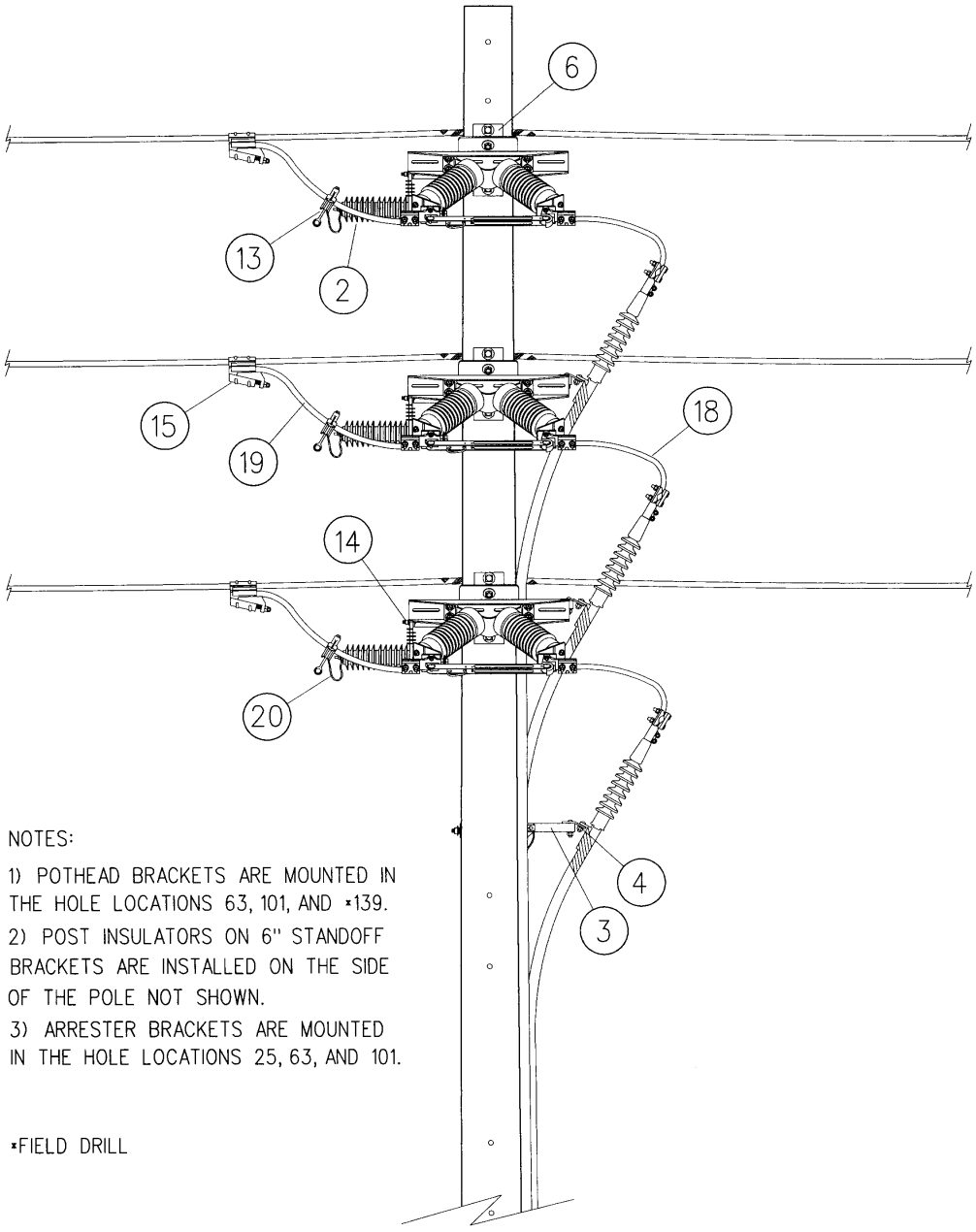
OPTIONS: 3/0, 336, 636
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ADC MI 007	1	COMPOUND, INHIBITING, 4 OZ. SQUEEZE BOTTLE
2	ARR LI 014	3	ARRESTER, LIGHTNING, POLYMER, 21kV, RISER POLE
3	BKT EM 001	3	BRACKET, EQUIPMENT MOUNTING, POTHEAD
4	BKT EM 002	3	BRACKET, EQUIPMENT MOUNTING, POTHEAD (SINGLE)
5	BKT RP 001	3	BRACKET, RISER POLE ARRESTER
6	BKT SM 004	3	BRACKET, SWITCH MOUNTING
7	BOL CA 002	6	BOLT, CARRIAGE, 3/8X5
8	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
9	BOL DA 016	1	BOLT, DOUBLE ARMING, 3/4X16
10	BOL MS 020	3	BOLT, MACHINE, SQUARE HEAD, 5/8X14
11	BOL MS 036	4	BOLT, MACHINE, SQUARE HEAD, 3/4X14
12	BOL TE 001	12	BOLT, TERMINAL KIT, S.S. BOLT, WASHERS, S.B. NUT
13	CLA AR ***	3	GENERAL CODE FOR ARRESTER HOT-LINE CLAMP
14	CLA TG 001	3	CLAMP, TRANSFORMER TANK GROUND, 6 SOL. - #1 STR.
15	CNN TA ***	3	GENERAL CODE FOR BOLTED TAP CONNECTOR
16	CNN TE 047	6	CONNECTOR, TERMINAL, BOLTED, 2/0-800 MCM CU OR AL
17	CNN VG 003	6	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
18	COB CO ***	24	GENERAL CODE FOR COPPER CONDUCTOR
19	CNN JU 001	6	PRE-CRIMPED JUMPER, 636AAC, 8 FT, 2 HOLE PAD
20	COB CO 028	16	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
21	INS FE 001	6	FIBERGLASS EXTENSION LINK, 24”
22	SWE UN 002	3	SWITCH, HOOK DISCONNECT, 26.4kV
23	WAS RD 002	6	WASHER, ROUND, 1 IN. DIA., FOR 3/8 IN. BOLT
24	WAS RD 004	5	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
25	WAS RD 005	14	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
26	WAS SF 003	5	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
27	WAS SP 002	7	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

DS5RT-5

VERTICAL MOUNT HOOK DISCONNECT SWITCH – FEEDER RISER – 26.4KV – UNSHIELDED

TANGENT



NOTES:

1) POTHEAD BRACKETS ARE MOUNTED IN THE HOLE LOCATIONS 63, 101, AND *139.

2) POST INSULATORS ON 6" STANDOFF BRACKETS ARE INSTALLED ON THE SIDE OF THE POLE NOT SHOWN.

3) ARRESTER BRACKETS ARE MOUNTED IN THE HOLE LOCATIONS 25, 63, AND 101.

*FIELD DRILL

RS3-5

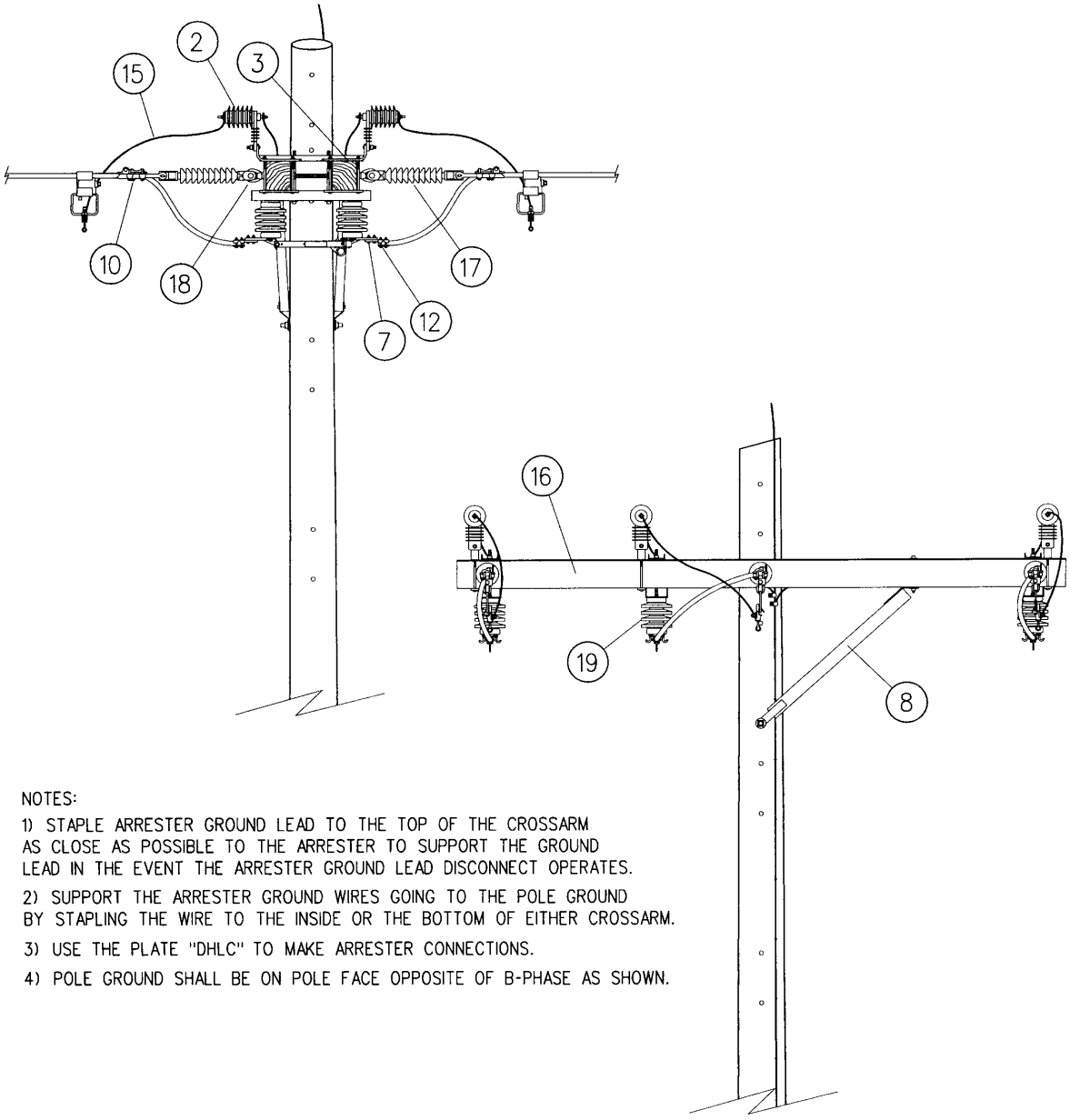
HOOK DISCONNECT SWITCH – 4KV – UNSHIELDED

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2/0CU, 4/0CU, 2, 1/0, 3/0, 336
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ADC MI 007	1	COMPOUND, INHIBITING, 4 OZ. SQUEEZE BOTTLE
2	ARR LI 001	6	ARRESTER, LIGHTNING, POLYMER, 3kV
3	BKT AC 003	6	ARRESTER, CUTOUT AND ARRESTER, CROSSARM MOUNT
4	BOL DA 021	3	BOLT, DOUBLE ARMING, 3/4X26
5	BOL MS 002	4	BOLT, MACHINE, SQUARE HEAD, 1/2X7
6	BOL MS 020	4	BOLT, MACHINE, SQUARE HEAD, 5/8X14
7	BOL TE 001	12	BOLT, TERMINAL KIT, S.S. BOLT, WASHERS, S.B. NUT
8	BRC CR 002	1	BRACE, CROSSARM, WOOD, 60 IN. SPAN, 30 IN. DROP (PAIR)
9	CLA AR ***	6	GENERAL CODE FOR ARRESTER HOT-LINE CLAMP
10	CLA SS ***	6	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
11	CNN ** ***	6	GENERAL CODE FOR TAP CONNECTOR
12	CNN TE ***	6	GENERAL CODE FOR BOLTED TERMINAL CONNECTOR
13	CNN VG 003	8	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
14	CNN JU 001	6	PRE-CRIMPED JUMPER, 636AAC, 8 FT, 2 HOLE PAD
15	COB CO 028	24	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
16	CXA FG ***	2	GENERAL CODE FOR FIBERGLASS CROSSARM
17	INS CO 001	6	INSULATOR, COMPOSITE, POLYMER DEADEND
18	INS FE 001	6	FIBERGLASS EXTENSION LINK, 24”
19	NUT EY 003	6	NUT, EYE, 3/4
20	SWE UN 001	3	SWITCH, HOOK DISCONNECT, 15kV
21	WAS RD 005	8	WASHER, ROUND, 1-3/8 IN. DIA., FOR 1/2 IN. BOLT
22	WAS RD 005	3	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. BOLT
23	WAS RD 005	1	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
24	WAS SF 001	4	WASHER, SQUARE, FLAT, 2 IN., FOR 1/2 IN. BOLT
25	WAS SF 003	16	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
26	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
27	WAS SP 003	4	WASHER, SPRING, LEAF, FOR 1/2 IN. BOLT

RS3-5

HOOK DISCONNECT SWITCH – 4KV – UNSHIELDED



NOTES:

1) STAPLE ARRESTER GROUND LEAD TO THE TOP OF THE CROSSARM AS CLOSE AS POSSIBLE TO THE ARRESTER TO SUPPORT THE GROUND LEAD IN THE EVENT THE ARRESTER GROUND LEAD DISCONNECT OPERATES.

2) SUPPORT THE ARRESTER GROUND WIRES GOING TO THE POLE GROUND BY STAPLING THE WIRE TO THE INSIDE OR THE BOTTOM OF EITHER CROSSARM.

3) USE THE PLATE "DHLC" TO MAKE ARRESTER CONNECTIONS.

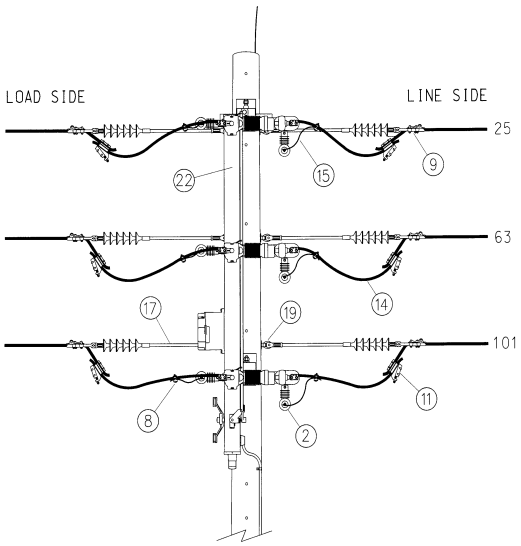
4) POLE GROUND SHALL BE ON POLE FACE OPPOSITE OF B-PHASE AS SHOWN.

SCADA

S&C SCADA-MATE SWITCH – 26.4KV – UNSHIELDED

OPTIONS: 636

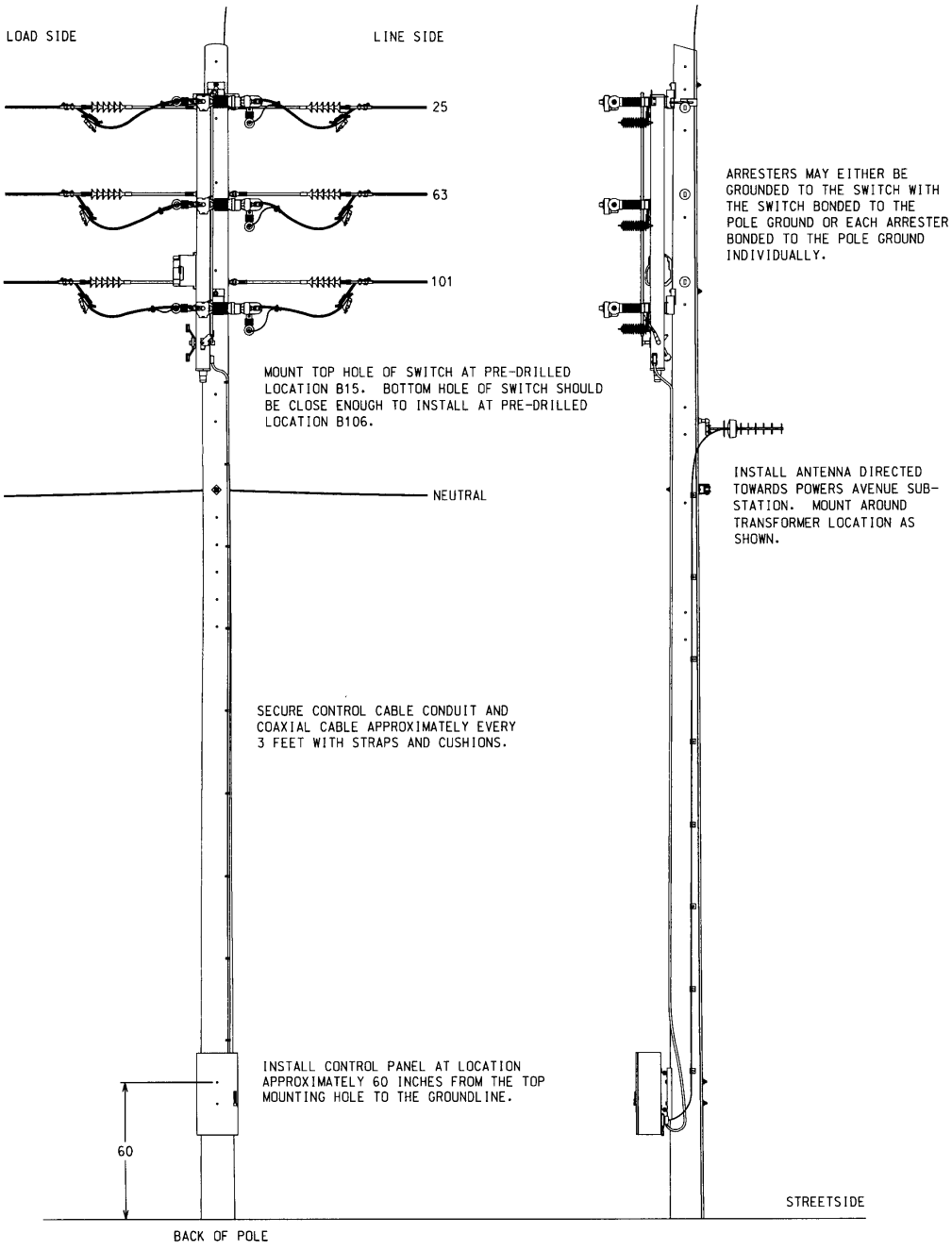
BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	ADC MI 007	1	COMPOUND, INHIBITING, 4 OZ. SQUEEZE BOTTLE
2	ARR LI 003	6	ARRESTER, LIGHTNING, POLYMER, 21kV
3	BOL DA 003	1	BOLT, DOUBLE ARMING, 5/8X16
4	BOL DA 016	3	BOLT, DOUBLE ARMING, 3/4X16
5	BOL MS 020	1	BOLT, MACHINE, SQUARE HEAD, 5/8X14
6	BOL MS 022	2	BOLT, MACHINE, SQUARE HEAD, 5/8X18
7	BOL TE 001	12	BOLT, TERMINAL KIT, S.S. BOLT, WASHERS, S.B. NUT
8	CLA AR 003	6	CLAMP, ARRESTER HOT-LINE, 336-636 MCM AL.
9	CLA SS 007	6	CLAMP, STRAIGHT STRAIN, 397-1000 MCM AL.
10	CLA TG 001	6	CLAMP, TRANSFORMER TANK GROUND, 6 SOL. - #1 STR.
11	CNN TA 010	6	CONNECTOR, TAP, BOLTED, 336-636 MCM AL.
12	CNN TE 047	6	CONNECTOR, TERMINAL, BOLTED, 2/0-800 MCM CU OR AL
13	CNN VG 003	8	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
14	CNN JU 001	6	PRE-CRIMPED JUMPER, 636AAC, 8 FT, 2 HOLE PAD
15	COB CO 028	25	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
16	FIB CU 001	8	FIBER OPTIC CABLE DOWNLEAD CUSHION
17	INS CO 002	6	INSULATOR, COMPOSITE, 50 IN. EXTENSION
18	INS FE 001	6	FIBERGLASS EXTENSION LINK, 24”
19	LOC PA 001	1	PADLOCK, ALL BRASS, 1-3/4 IN. SHANK OPENING
20	NUT EY 003	6	NUT, EYE, 3/4
21	SCW LA 005	20	SCREW, LAG, 1/2X4
22	STP ST 002	12	STRAP, STEEL, CONDUIT, 3/4 IN.
23	SWE SM 001	1	SCADA-MATE SWITCH
24	SWE SM 002	1	SCADA-MATE CONTROL AND ACCESSORIES
25	WAS RD 005	35	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
26	WAS SF 003	13	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
27	WAS SP 002	16	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

SCADA

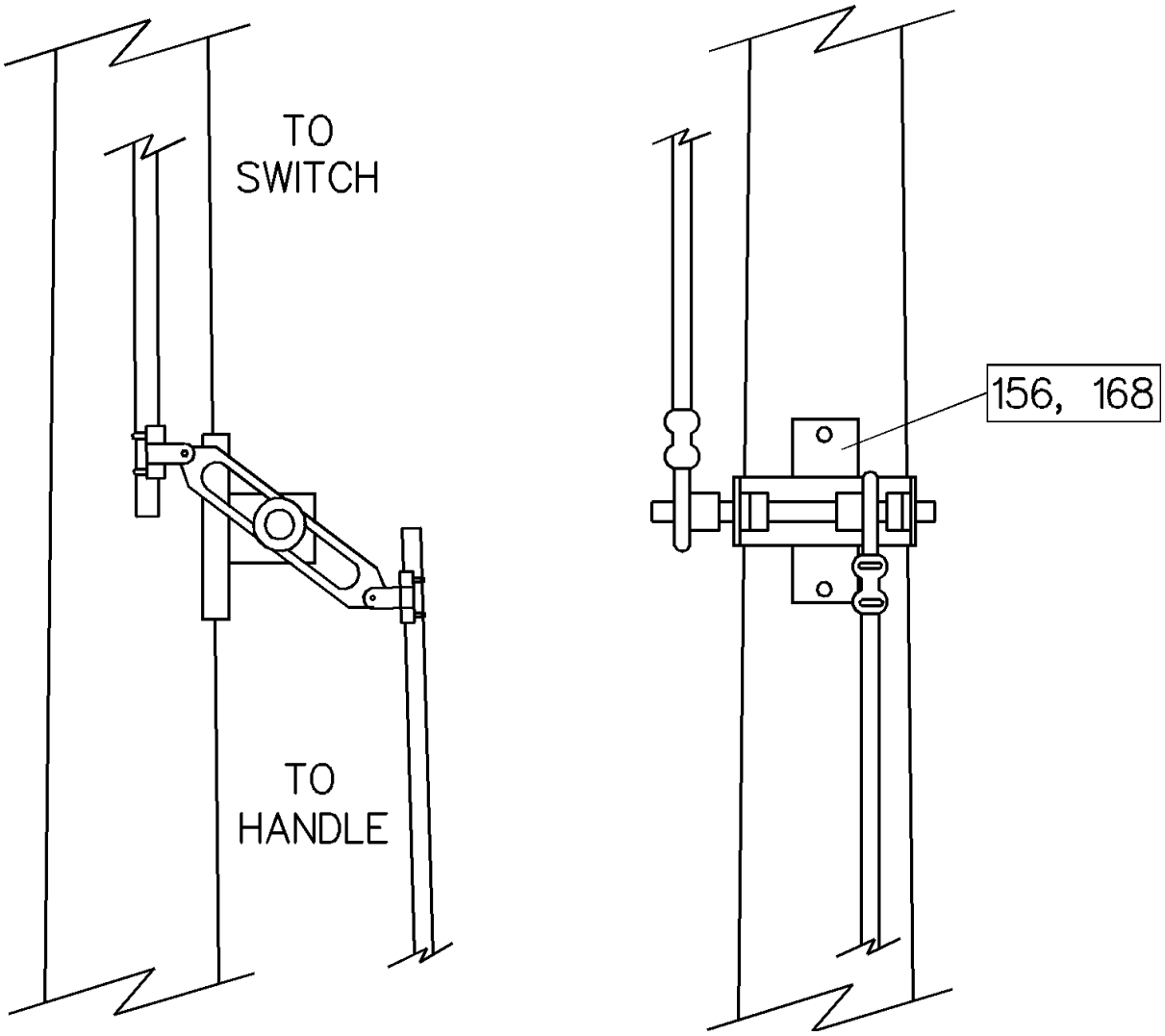
S&C SCADA-MATE SWITCH – 26.4KV – UNSHIELDED



DS1S

SWITCH HANDLE CONVERSION KIT

OPTIONS: NONE
BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD, 3/4X14
2	SWE KT 001	1	SWITCH HANDLE CONVERSION KIT
3	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
4	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
5	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

AS-TSE

OVR-3SP THREE-PHASE SWITCH – VERTICAL CONSTRUCTION

OPTIONS: TIE

BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ANC ST 001	30	ANCHOR, STUD BOLT, 1/4 X 3/4 IN.
2	ADC MI 002	1	CEMENT; PVC PIPE
3	BKT RE 001	1	BRACKET, RECLOSER JUMPER PIN
4	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4 X 14
5	BOL DA 016	5	BOLT, DOUBLE ARMING, 3/4 X 16
6	BOL MS 037	2	BOLT, MACHINE, SQUARE HEAD, 3/4X16
7	BOL MS 038	2	BOLT, MACHINE, SQUARE HEAD, 3/4X18
8	BOL TE 001	24	BOLT, TERMINAL KIT
9	CAI RH 010	30	#4 COVERED COPPER
10	CAI UF 001	40	CABLE, STREETLIGHT UF 12 CU 2/C
11	CLA AR 003	6	CLAMP, ARRESTER HOT-LINE, 336-636
12	CLA TG 001	6	CLAMP, TRANS. TANK GROUND
13	COB AA 026	90	GENERAL CODE FOR 636MCM ALUMINUM CONDUCTOR
14	COB CO 028	40	CONDUCTOR, COPPER, #4 SOFT DRAWN
15	COB TW 004	20	TIE WIRE, ALUMINUM INSULATED
16	CNN TA 004	6	CONNECTOR, TAP, 636-636
17	CNN TL 029	6	TERMINAL; COMPRESSION, 4 HOLE, 636AAC
18	CNN VG 003	8	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
19	COD AF 010	1	1” SCHEDULE 40 PVC LB
20	FUS OH 005	1	FUSE, OVERHEAD DISTRIBUTION, 23" MINIMUM LENGTH, 25T.
21	COD EF 002	2	CONNECTOR, FLEXIBLE PVC, 90 DEGREE; 1 IN
22	COD PC 016	40	CONDUIT; PVC; 1 IN DIA; SCHEDULE 40
23	COD PC 017	10	CONDUIT; FLEXIBLE PVC; 1 IN DIA
24	COD WH 002	1	WEATHERHEAD; PVC; FOR 1 IN DIA PIPE
25	GUA AN 007	6	GUARD, ANIMAL, FOR ARRESTERS
26	INS VP 001	2	INSULATOR, POST, 34.5kV
27	LOC PA 002	2	PADLOCK, BRASS
28	NUT PG 300	30	NUT, 1/4 - 20
29	SWE RC 002	1	RECLOSER, CONTROL, FOR USE WITH SWE RC 001
30	REC GU 001	6	GUARD, ANIMAL, RECLOSER TERMINAL COVER
31	REC GU 002	100	GUARD, ANIMAL, RECLOSER LINE INSULATION
32	SWE RC 001	1	RECLOSER, THREE-PHASE, WITH 3 INTERNAL VOLTAGE SENSORS
33	STP ST 001	25	STRAP, STEEL, 1 IN.
34	FUS UG 046	1	FUSE, 1-TIME, 20-AMP, 125-VOLT, FERRULE TYPE-B
35	TIE CA 002	25	TIE, CABLE, 24” LENGTH
36	WAS RD 002	30	WASHER, ROUND 1 IN. FOR 3/8 BOLT
37	WAS RD 005	17	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
38	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT

AS-TSE

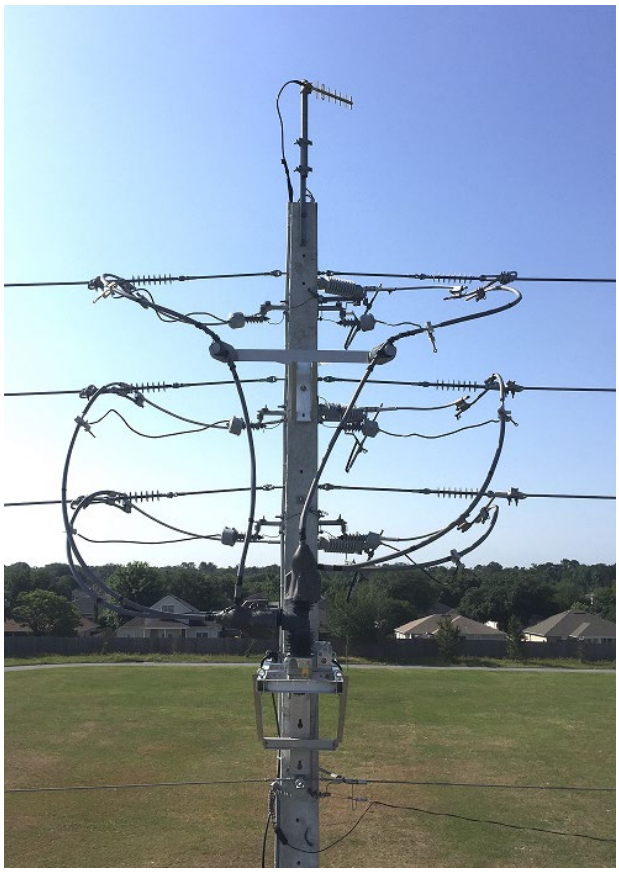
OVR-3SP THREE-PHASE SWITCH – VERTICAL CONSTRUCTION

NOTES:

1) Pre-crimped jumper CNN JU 001 includes the jumper and pad connector.
2) The pad-to-pad connection shall be torqued to 40 ft-lbs.
3) The control box is powered with 120V. Streetlight 12/2 is to be run from the secondary, into the weatherhead, through the 1" PVC pipe, into the PVC LB, to the AC disconnect, then to the control box via 1" flexible PVC and 90 degree connectors. Inside, the hot leg is connected to L1 and the neutral to L2.
4) The control cables are run from each recloser to the junction box at the appropriate phase and a single control cable is run down the pole via 1" steel straps and connected to the bottom of the control box. Any slack should be coiled and tied with cable ties.
5) Each individual recloser and each side frame shall be grounded.
6) The recloser line insulation shall cover the 636AAC jumper from the 4 hole terminal connector to the wedge tap connector. It should only be cut to install the arrester clamp.
7) The recloser channel should be installed in the transformer positions. The top two holes are 12" apart and the third hole is 50.75" from the top hole.

AS-TSE

OVR-3SP THREE-PHASE SWITCH – VERTICAL CONSTRUCTION



AS-TSH

OVR-3SP THREE-PHASE RECLOSER – HORIZONTAL CONSTRUCTION

OPTIONS: TIE

BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ANC ST 001	30	ANCHOR, STUD BOLT, 1/4 X 3/4 IN.
2	ADC MI 002	1	CEMENT; PVC PIPE
3	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4 X 14
4	BOL DA 016	5	BOLT, DOUBLE ARMING, 3/4 X 16
5	BOL MS 037	2	BOLT, MACHINE, SQUARE HEAD, 3/4X16
6	BOL MS 038	2	BOLT, MACHINE, SQUARE HEAD, 3/4X18
7	BOL TE 001	24	BOLT, TERMINAL KIT
8	CAI RH 010	30	#4 COVERED COPPER
9	CAI UF 001	40	CABLE, STREETLIGHT UF 12 CU 2/C
10	CLA AR 003	6	CLAMP, ARRESTER HOT-LINE, 336-636
11	CLA TG 001	6	CLAMP, TRANS. TANK GROUND
12	COB AA 026	90	GENERAL CODE FOR 636MCM ALUMINUM CONDUCTOR
13	COB CO 028	40	CONDUCTOR, COPPER, #4 SOFT DRAWN
14	COB TW 004	20	TIE WIRE, ALUMINUM INSULATED
15	CNN TA 004	6	CONNECTOR, TAP, 636-636
16	CNN TL 029	6	TERMINAL; COMPRESSION, 4 HOLE, 636AAC
17	CNN VG 003	8	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
18	COD AF 010	1	1” SCHEDULE 40 PVC LB
19	FUS OH 005	1	FUSE, OVERHEAD DISTRIBUTION, 23" MINIMUM LENGTH, 25T.
20	COD EF 002	2	CONNECTOR, FLEXIBLE PVC, 90 DEGREE; 1 IN
21	COD PC 016	40	CONDUIT; PVC; 1 IN DIA; SCHEDULE 40
22	COD PC 017	10	CONDUIT; FLEXIBLE PVC; 1 IN DIA
23	COD WH 002	1	WEATHERHEAD; PVC; FOR 1 IN DIA PIPE
24	GUA AN 007	6	GUARD, ANIMAL, FOR ARRESTERS
25	INS VP 001	2	INSULATOR, POST, 34.5kV
26	LOC PA 002	2	PADLOCK, BRASS
27	NUT PG 300	30	NUT, 1/4 - 20
28	SWE RC 002	1	RECLOSER, CONTROL, FOR USE WITH SWE RC 001
29	REC GU 001	6	GUARD, ANIMAL, RECLOSER TERMINAL COVER
30	REC GU 002	100	GUARD, ANIMAL, RECLOSER LINE INSULATION
31	SWE RC 001	1	RECLOSER, THREE-PHASE, WITH 3 INTERNAL VOLTAGE SENSORS
32	STP ST 001	25	STRAP, STEEL, 1 IN.
33	FUS UG 046	1	FUSE, 1-TIME, 20-AMP, 125-VOLT, FERRULE TYPE-B
34	TIE CA 002	25	TIE, CABLE, 24” LENGTH
35	WAS RD 002	30	WASHER, ROUND 1 IN. FOR 3/8 BOLT
36	WAS RD 005	17	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
37	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT

AS-TSH

OVR-3SP THREE-PHASE RECLOSER – HORIZONTAL CONSTRUCTION

RISER POLES

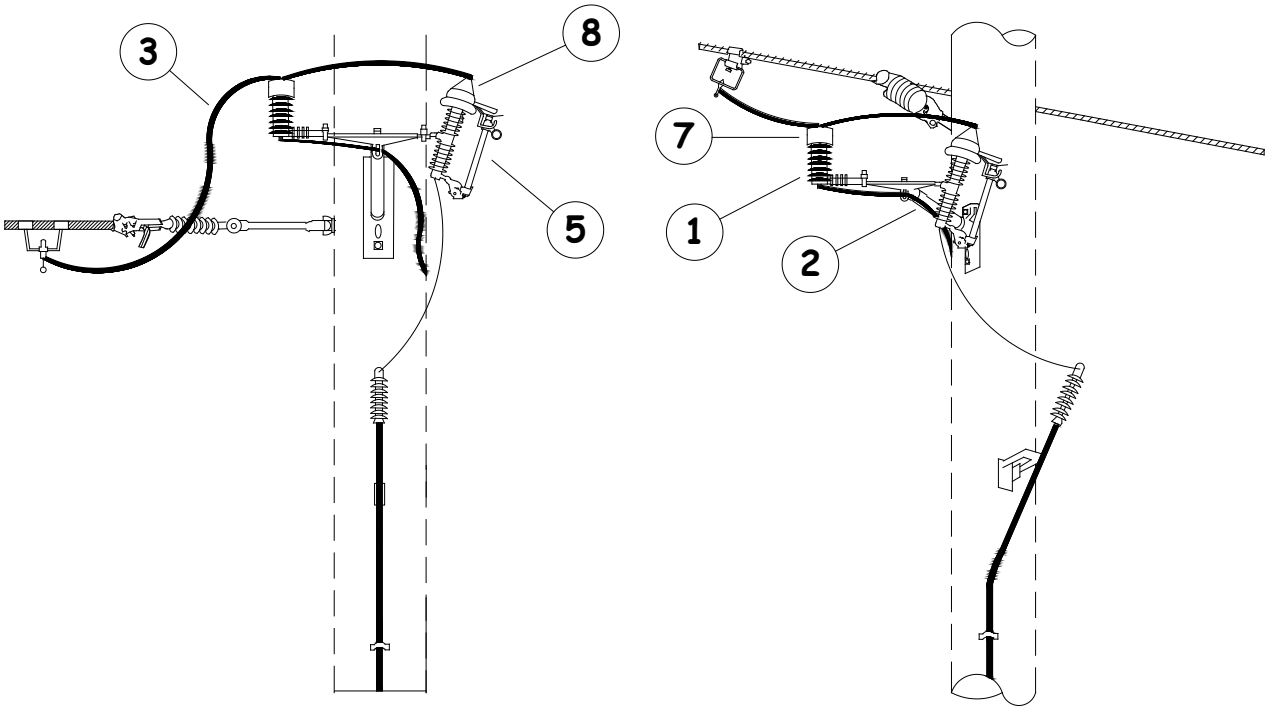
INTRODUCTION

1. For proper fuse coordination, refer to the SYSTEM PROTECTION section to select the appropriate fuse for underground risers.
2. Terminators or “Potheads” and their mounting brackets are included with the associated underground plates.
3. The terminator bracket shall always be installed a minimum of 38 inches below the cutout and arrester bracket.
4. The feeder riser plates are no longer in this section. They have been re-named and are now included in the SWITCHING section of this book.
5. Plate options are listed on each construction standard.
6. The plates within this section have had their names changed slightly to be consistent with other plates within this book.
7. Hot-line clamps are not part of the riser plates and must be plated separately.
8. There is no longer a designation for tangent or deadend riser, so all riser plates can be built on tangent or deadends, as shown in the drawings. For example, for 26.4kV, there is no longer a DUA1 and DUA2. All 26.4kV single phase risers are now built with DUA.
9. The 26.4kV plates are shown, but the 4kV and 13.2kV plate names are also listed on each page. The only difference is the size and kV rating of the arrester.

DUAF (FIBERGLASS CONSTRUCTION)

SINGLE PHASE RISER – 26.4kV (RUAF – 4kV, WUAF – 13.2kV)

OPTIONS: 10T, 12T, 15T, 20T, 25T, 30T, 40T, 50T, 65T, 80T, 100T
BOLT PLATE: NONE

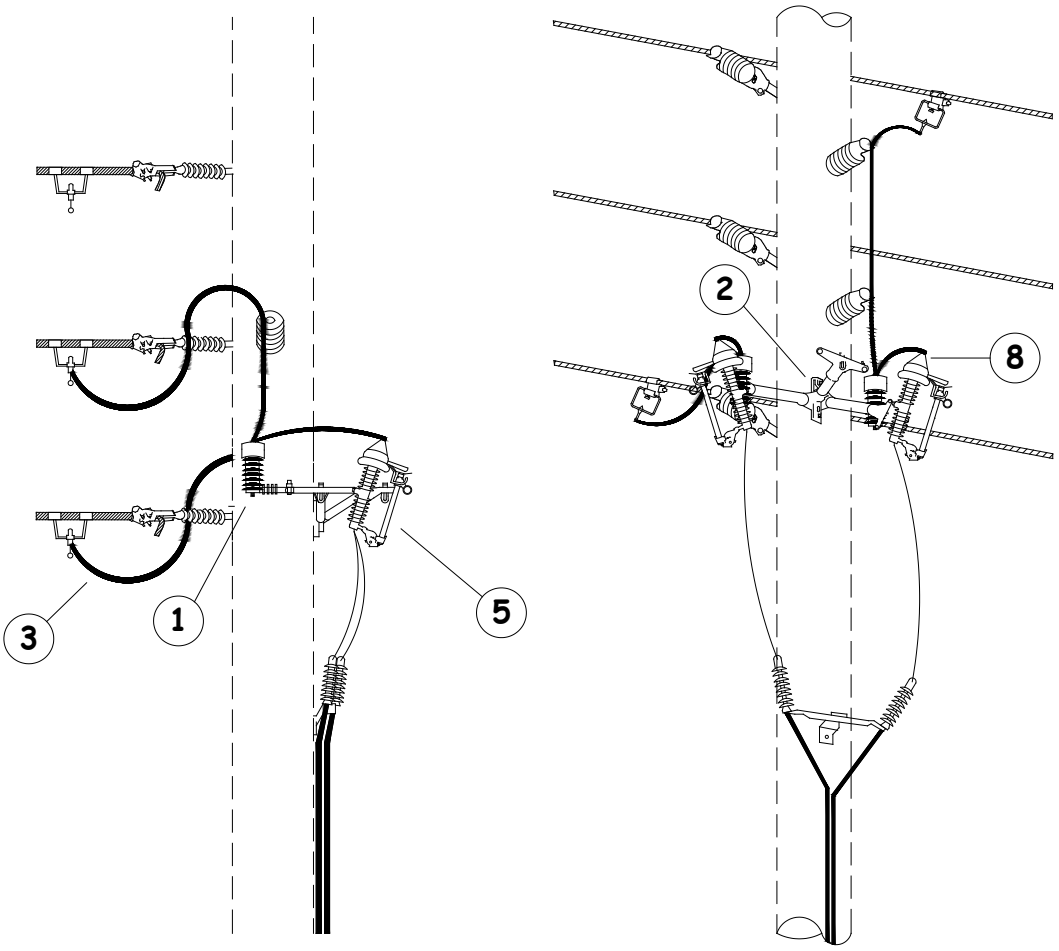


NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI ***	1	ARRESTER, LIGHTNING, POLYMER, 3kV, 10kV, or 21kV
2	BKT AC 009	1	BRACKET, FIBERGLASS, ARRESTER AND CUTOUT
3	CAI RH 010	10	CABLE, NO. 4 COVERED SOFT DRAWN COPPER, FT
4	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
5	CUT OT 004	1	CUTOUT, FUSED, 125kV BIL, 100 AMP, 27kV
6	FUS OH ***	1	GENERAL CODE FOR T-LINK FUSES
7	GUA AN 002	1	GUARD, ANIMAL, FOR USE WITH TRANSFORMERS AND ARRESTERS
8	GUA AN 006	1	GUARD, ANIMAL, FOR USE WITH FUSE CUTOUTS, SILICONE RUBBER

DUBF (FIBERGLASS CONSTRUCTION)

TWO-PHASE RISER – 26.4kV (RUBF – 4kV, WUBF – 13.2kV)

OPTIONS: 10T, 12T, 15T, 20T, 25T, 30T, 40T, 50T, 65T, 80T, 100T
BOLT PLATE: NONE

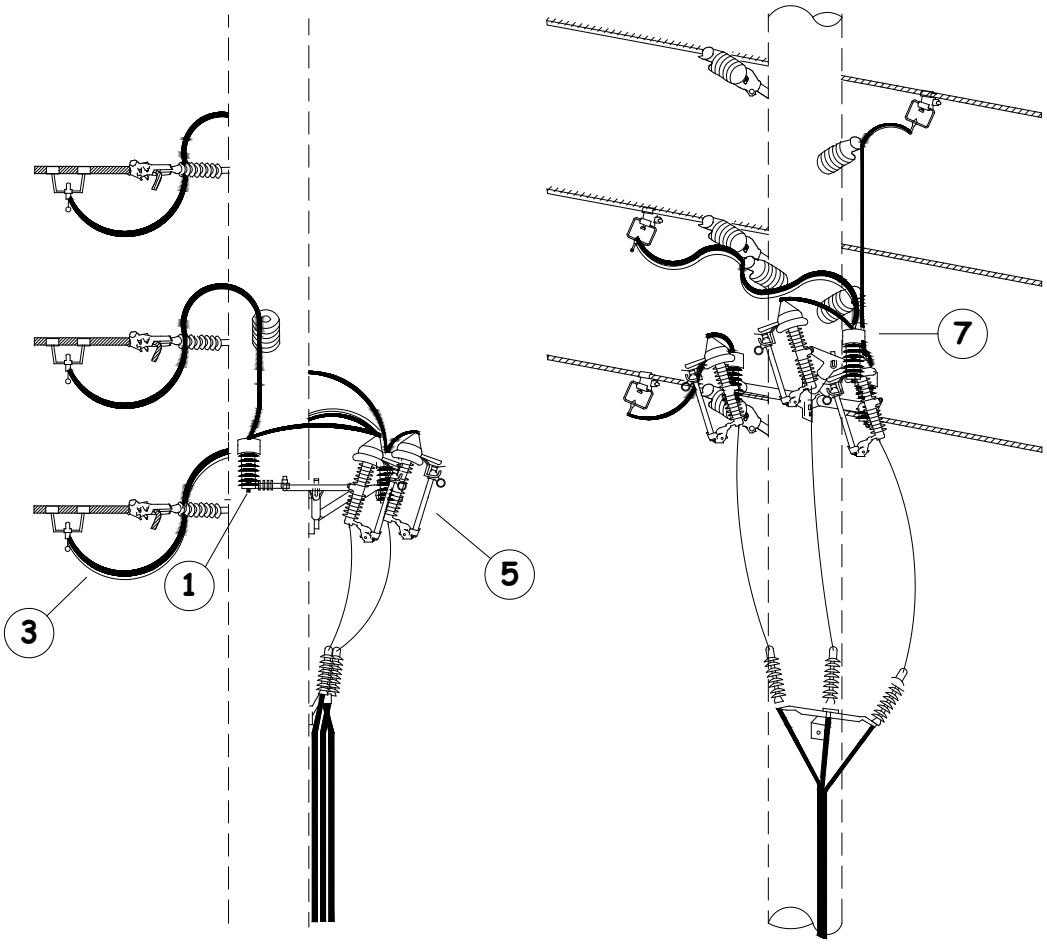


NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI ***	2	ARRESTER, LIGHTNING, POLYMER, 3kV, 10kV, or 21kV
2	BKT AC 010	1	BRACKET, FIBERGLASS, ARRESTER AND CUTOUT, TRI-MOUNT
3	CAI RH 010	20	CABLE, NO. 4 COVERED SOFT DRAWN COPPER, FT
4	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
5	CUT OT 004	2	CUTOUT, FUSED, 125kV BIL, 100 AMP, 27kV
6	FUS OH ***	2	GENERAL CODE FOR T-LINK FUSES
7	GUA AN 002	1	GUARD, ANIMAL, FOR USE WITH TRANSFORMERS AND ARRESTERS
8	GUA AN 006	1	GUARD, ANIMAL, FOR USE WITH FUSE CUTOUTS, SILICONE RUBBER
9	WAS RD 005	3	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
10	WAS SF 003	1	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
11	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

DUCF (FIBERGLASS CONSTRUCTION)

THREE-PHASE RISER – 26.4kV (RUCF – 4kV, WUCF – 13.2kV)

OPTIONS: 10T, 12T, 15T, 20T, 25T, 30T, 40T, 50T, 65T, 80T, 100T
BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI ***	3	ARRESTER, LIGHTNING, POLYMER, 3kV, 10kV, or 21kV
2	BKT AC 010	1	BRACKET, FIBERGLASS, ARRESTER AND CUTOUT, TRI-MOUNT
3	CAI RH 010	30	CABLE, NO. 4 COVERED SOFT DRAWN COPPER, FT
4	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
5	CUT OT 004	3	CUTOUT, FUSED, 125kV BIL, 100 AMP, 27kV
6	FUS OH ***	3	GENERAL CODE FOR T-LINK FUSES
7	GUA AN 002	1	GUARD, ANIMAL, FOR USE WITH TRANSFORMERS AND ARRESTERS
8	GUA AN 006	1	GUARD, ANIMAL, FOR USE WITH FUSE CUTOUTS, SILICONE RUBBER
9	WAS RD 005	3	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
10	WAS SF 003	1	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
11	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

UG FEEDING OH

I. INTRODUCTION

Design, Construction & Material Standards formed a special committee to establish some basic design guidelines for construction alternatives to be used for OH to UG conversion projects. The following guidelines were established to facilitate the conversion of existing overhead lines to an underground system. The completion of the conversion will have underground systems feeding the overhead. The following standards will accomplish this with safety & reliability in mind. For situations not covered by this standard, contact the standards department.

1. For proper fuse coordination, refer to the system protection section to select the appropriate fuse for underground risers.
2. Terminators or "Pot-heads" and their mounting brackets are included with the associated underground plates.
3. The terminator bracket shall always be installed a minimum of 38 inches below the phase conductor.
4. The riser plates require a warning sign indicating that the underground system feeds the overhead. It will be necessary for these signs to clearly mark the underground cables feeding each overhead fuse cutout phase. This is accomplished by attaching a sign to the pole below each fuse cutout and at the base of the pole adjacent to pole address.
5. See the OH Distribution Standards manual for riser pole installations. For the riser plates DUOA, DUOAF, DUOF, DUOBF, DUOCF, and DUOCF, the underground pot-head jumper connects to the arrester first and then to the top of the cutout. The bottom of the cutout connects to the hot-line clamp. This jumper connection insures that the bottom of the cutout is de-energized in the event of a blown fuse.
6. Plate options are listed on each construction standard.
7. Install fuse cutouts on the street side of the pole for the DUOA plates. Install the top fuse cutout on the street side of the pole for the DUOB plates. Install the top and bottom (A&C phase) fuse cutouts on the street side of the pole for the DUOC plates.
8. Where possible, above grade enclosures (see plate UO-PM) should be utilized when there are easements available, provided the enclosure is not so close to the road or other objects where it presents a safety hazard.
9. See the UG Distribution Standards manual for manhole installations. The manhole needs to be installed as close to the base of the riser pole as possible to maintain consistency for troubleshooting. This will facilitate outage restoration by enabling JEA to know where these manholes are located, and also reduces the length of the radial feed to the riser pole. The PVC manhole should be placed within the sidewalk, where sidewalks are available. The manhole (I. MANH005) shall be sized adequately to permit removal of the elbows in the 3 point junction module (I.JUNLO001) from above the ground with a hot stick without having to enter the manhole or stand on the roadway. The junction module is allowed for use in the PVC

manhole. Warning: do not use the junction module in the pre-cast manholes or make the junction a normal open point.

10. The Engineer shall add "UG FEEDS OH" on the preliminary circuit maps. The circuit map manhole address shall begin with the letter "T", designating an underground termination (in manhole) feeding the overhead.

11. The 21kV surge arresters are included in the plate. The 21kV arresters are used on the 26.4kV system. The 4kV system requires a 3kV arrester and the 13.2kV system require a 10kV arrester. When building for a system other than the 26.4kV system, itemize out the 21kV arrester(s) – ARR LI 014 – and itemize in the 4kV arrester(s) – ARR LI 008 – or the 10kV arrester(s) – ARR LI 011.

12. Pothead bracket bolt holes:

    Tangent: A phase – 58", B phase – 96", C phase – 134"

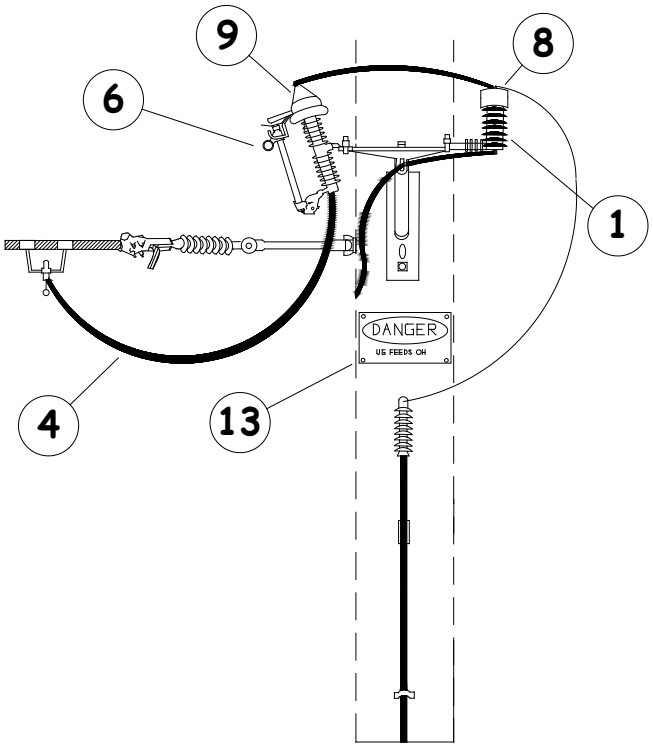
    Deadend: A phase – 63", B phase – 101", C phase – 139"

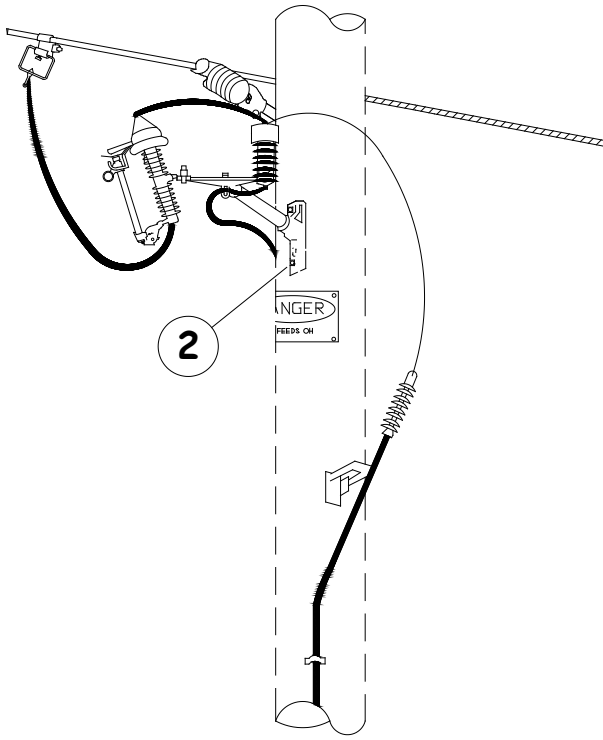
DUOAF (FIBERGLASS CONSTRUCTION)

SINGLE PHASE, UNDERGROUND FEEDS OVERHEAD TANGENT

OPTIONS: 10T, 12T, 15T, 20T, 30T, 40T, 50T, 65T, 80T, 100T

BOLT PLATE: NONE



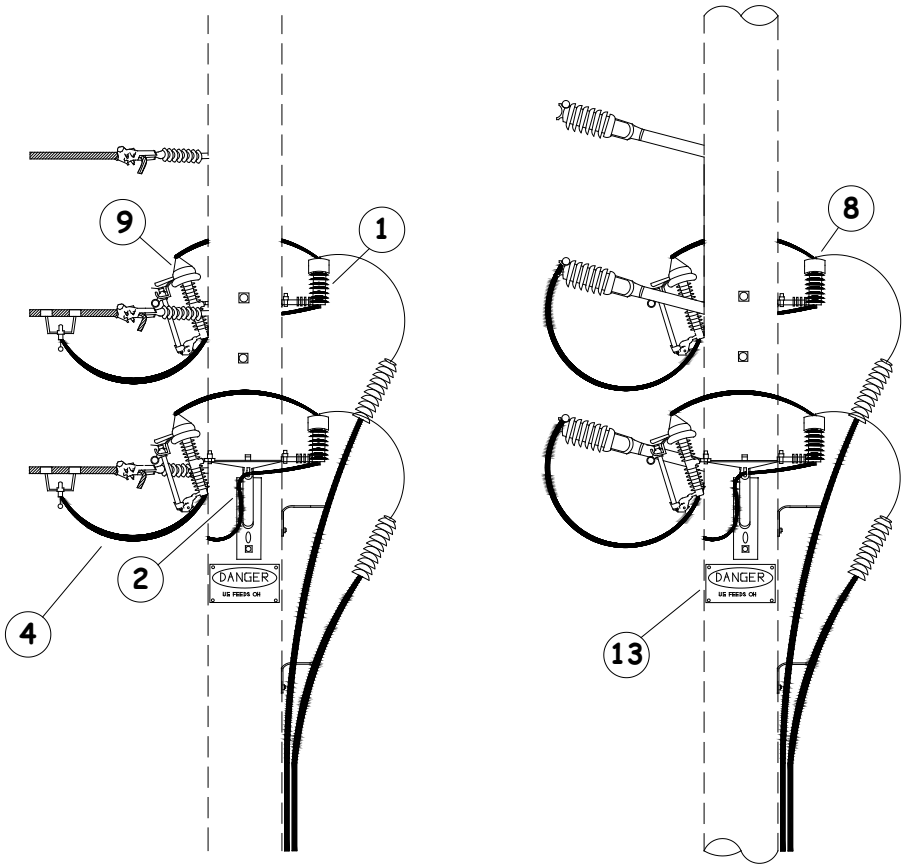


NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 014	1	ARRESTER, LIGHTNING, POLYMER, 21kV, RISER POLE
2	BKT AC 008	1	BRACKET, FIBERGLASS, ARRESTER OR CUTOUT
3	BOL MS 035	2	BOLT, MACHINE, SQUARE HEAD, 3/4X12
4	CAI RH 010	10	CABLE, NO. 4 COVERED SOFT DRAWN COPPER, FT
5	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL
6	CUT OT 004	1	CUTOUT, FUSED, 150kV BIL, 100 AMP, 27kV
7	FUS OH ***	1	GENERAL CODE FOR T-LINK FUSES
8	GUA AN 002	1	GUARD, ANIMAL, FOR USE WITH TRANSFORMERS AND ARRESTERS
9	GUA AN 006	1	GUARD, ANIMAL, FOR USE WITH FUSE CUTOUTS, SILICONE RUBBER
10	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
11	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
12	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
13	SIG DA 009	2	SIGN, UG FEEDS OH

DUOBF

TWO PHASE, UNDERGROUND FEEDS OVERHEAD TANGENT

OPTIONS: 10T, 12T, 15T, 20T, 30T, 40T, 50T, 65T, 80T, 100T
BOLT PLATE: NONE



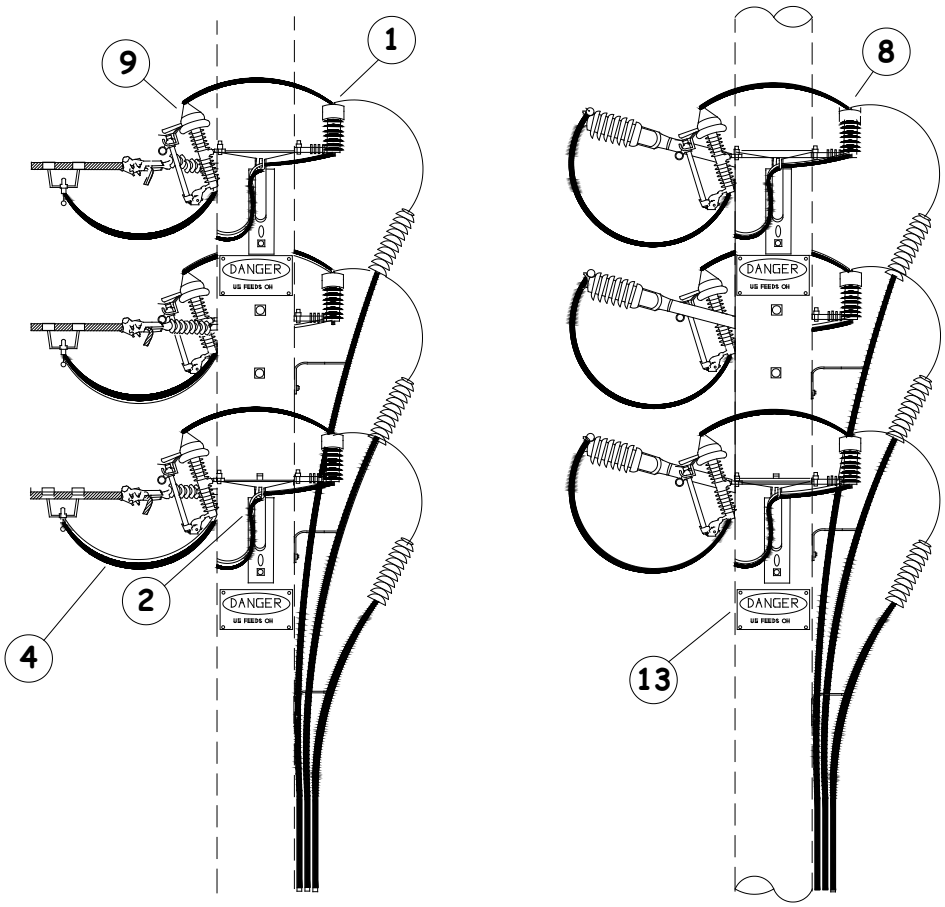
NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 014	2	ARRESTER, LIGHTNING, POLYMER, 21kV, RISER POLE
2	BKT AC 008	2	BRACKET, FIBERGLASS, ARRESTER OR CUTOUT
3	BOL MS 035	4	BOLT, MACHINE, SQUARE HEAD, 3/4X12
4	CAI RH 010	20	CABLE, NO. 4 COVERED SOFT DRAWN COPPER, FT
5	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL
6	CUT OT 004	2	CUTOUT, FUSED, 150kV BIL, 100 AMP, 27kV
7	FUS OH ***	2	GENERAL CODE FOR T-LINK FUSES
8	GUA AN 002	1	GUARD, ANIMAL, FOR USE WITH TRANSFORMERS AND ARRESTERS
9	GUA AN 006	1	GUARD, ANIMAL, FOR USE WITH FUSE CUTOUTS, SILICONE RUBBER
10	WAS RD 005	8	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
11	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
12	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
13	SIG DA 009	3	SIGN, UG FEEDS OH

DUOCF

THREE PHASE, UNDERGROUND FEEDS OVERHEAD TANGENT

OPTIONS: 10T, 12T, 15T, 20T, 30T, 40T, 50T, 65T, 80T, 100T

BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 014	3	ARRESTER, LIGHTNING, POLYMER, 21kV, RISER POLE
2	BKT AC 001	3	BRACKET, ARRESTER/CUTOUT, SINGLE PHASE, POLE MOUNT
3	BOL MS 035	6	BOLT, MACHINE, SQUARE HEAD, 3/4X12
4	CAI RH 010	30	CABLE, NO. 4 COVERED SOFT DRAWN COPPER, FT
5	CNN VG 003	3	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL
6	CUT OT 004	3	CUTOUT, FUSED, 150kV BIL, 100 AMP, 27kV
7	FUS OH ***	3	GENERAL CODE FOR T-LINK FUSES
8	GUA AN 002	1	GUARD, ANIMAL, FOR USE WITH TRANSFORMERS AND ARRESTERS
9	GUA AN 006	1	GUARD, ANIMAL, FOR USE WITH FUSE CUTOUTS, SILICONE RUBBER
10	WAS RD 005	12	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
11	WAS SF 003	6	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
12	WAS SP 002	6	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
13	SIG DA 009	4	SIGN, UG FEEDS OH

PRIMARY METERING

INTRODUCTION

1. Many large industrial/commercial customers request primary voltage for their service -- utilizing their own transformers to step-down the voltage for their requirements. For these installations, the primary must be metered in order to bill the customer for their power consumption.
2. A current transformer (CT) and a potential transformer (PT) are installed on each phase.
3. This section has undergone numerous changes. Some of the brackets shown in this section may not be available in our storerooms at the time of this printing. Almost all of the brackets have been re-designed or newly created.
4. Bypass switches have a new base with holes that can accommodate 3/4 inch bolts and are spaced 16 to 18 inches apart depending on the switch voltage class. For horizontal construction, fiberglass crossarms shall be installed such that the bypass switches can be bolted to each crossarm (See plate MD2).
5. Material listed that does not have a Item ID shown is for information only and is not issued as part of the plate. This material is used by Equipment Services to build the various structures.
6. DHLC plates are not included as part of the primary metering plates.
7. Place by-pass switches on the field side of the pole and place the primary conductor on the roadside of the pole.

MD1

PRIMARY METER EQUIPMENT – VERTICAL CONST. – TANGENT – 26.4KV

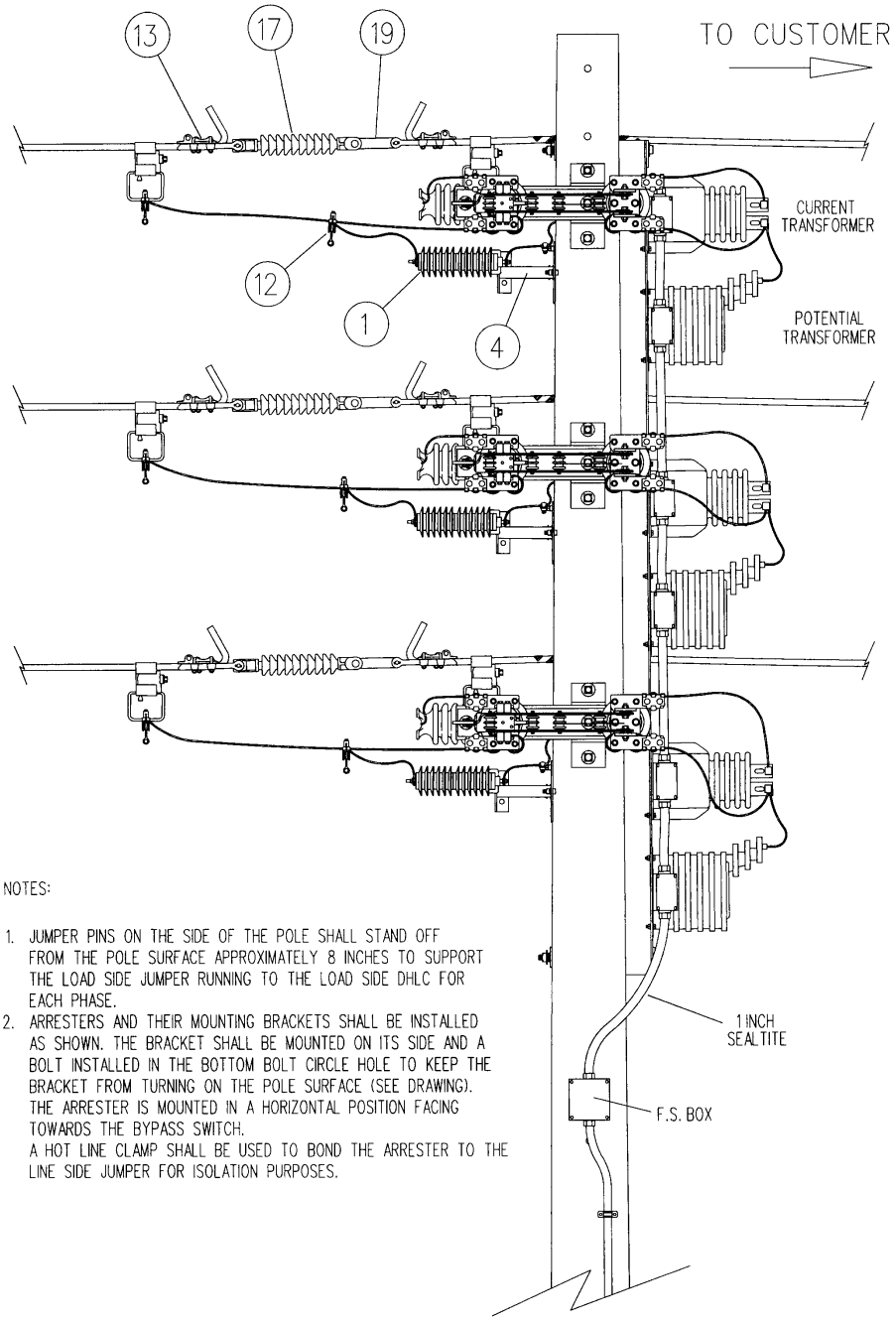
OPTIONS: 1/0, 636
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	3	ARRESTER, LIGHTNING, POLYMER, 21kV
2	BKT FS 001	3	BRACKET, FIBERGLASS STANDOFF, 2 IN. ROD
3	BKT PC 001	1	BRACKET, PRIMARY CLUSTER RACK
4	BKT RP 001	3	BRACKET, RISER POLE ARRESTER
5	BKT SM 005	3	BRACKET, SWITCH MOUNTING, FOR BYPASS SWITCHES
6	BOL DA 015	3	BOLT, DOUBLE ARMING, 3/4X14
7	BOL DA 016	6	BOLT, DOUBLE ARMING, 3/4X16
8	BOL DA 017	2	BOLT, DOUBLE ARMING, 3/4X18
9	BOL DA 018	3	BOLT, DOUBLE ARMING, 3/4X20
10	BOL MS 001	3	BOLT, MACHINE, SQUARE HEAD, 1/2X2
11	BOL MS 031	6	BOLT, MACHINE, SQUARE HEAD, 3/4X4
12	CLA HL 001	3	CLAMP, HOT-LINE
13	CLA SS ***	6	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
14	CLA TG 001	3	CLAMP, TRANSFORMER TANK GROUND, 6 SOL. - 1/0 STR.
15	CNN VG 003	6	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
16	COB CO 028	36	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
17	INS CO 001	3	INSULATOR, COMPOSITE, POLYMER DEADEND
18	INS VP 001	6	INSULATOR, VERTICAL POST, 34.5kV
19	LIK EX 001	3	LINK, EXTENSION, STRAIGHT, 18,000 LBS.
20	STU LI 001	3	STUD, LINE POST, 3/4 IN. DIA. HEAD, 1-3/4 IN. SHANK
21	TIE PR ***	3	GENERAL CODE FOR PREFORMED TIE
22	SWE HO 017	3	SWITCH, HOOK BYPASS, 25.8kV NOMINAL
23	WAS RD 005	46	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
24	WAS SF 003	5	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
25	WAS SP 002	17	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
26	--	3	CURRENT TRANSFORMERS
27	--	3	POTENTIAL TRANSFORMERS
28	--	24	3/8 IN. DIA. X 1-1/2 IN. BOLT
29	--	48	3/8 IN. FLAT WASHERS
30	--	24	3/8 IN. NUTS
31	--	1	WORK BOX BLANK PLUG
32	--	12	1 IN. SEAL-TIGHT STRAIGHT CONNECTORS
33	--	1	F.S. BOX
34	--	12	1 IN. SEAL-TIGHT CONDUIT
35	--	6	C.T. BUSHING CONNECTORS
36	--	7	#2 VISE-GRIP CONNECTORS

MD1

PRIMARY METER EQUIPMENT – VERTICAL CONST. – TANGENT – 26.4KV

VIEW 1



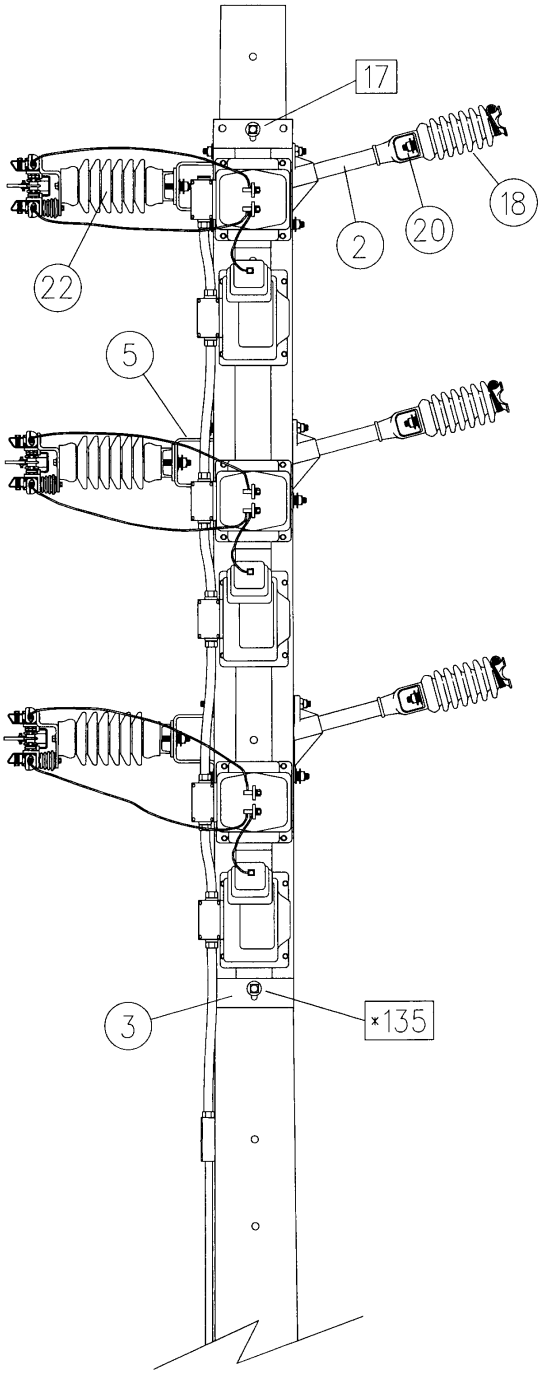
NOTES:

1. JUMPER PINS ON THE SIDE OF THE POLE SHALL STAND OFF FROM THE POLE SURFACE APPROXIMATELY 8 INCHES TO SUPPORT THE LOAD SIDE JUMPER RUNNING TO THE LOAD SIDE DHLC FOR EACH PHASE.
2. ARRESTERS AND THEIR MOUNTING BRACKETS SHALL BE INSTALLED AS SHOWN. THE BRACKET SHALL BE MOUNTED ON ITS SIDE AND A BOLT INSTALLED IN THE BOTTOM BOLT CIRCLE HOLE TO KEEP THE BRACKET FROM TURNING ON THE POLE SURFACE (SEE DRAWING). THE ARRESTER IS MOUNTED IN A HORIZONTAL POSITION FACING TOWARDS THE BYPASS SWITCH.
   A HOT LINE CLAMP SHALL BE USED TO BOND THE ARRESTER TO THE LINE SIDE JUMPER FOR ISOLATION PURPOSES.

MD1

PRIMARY METER EQUIPMENT – VERTICAL CONST. – TANGENT – 26.4KV

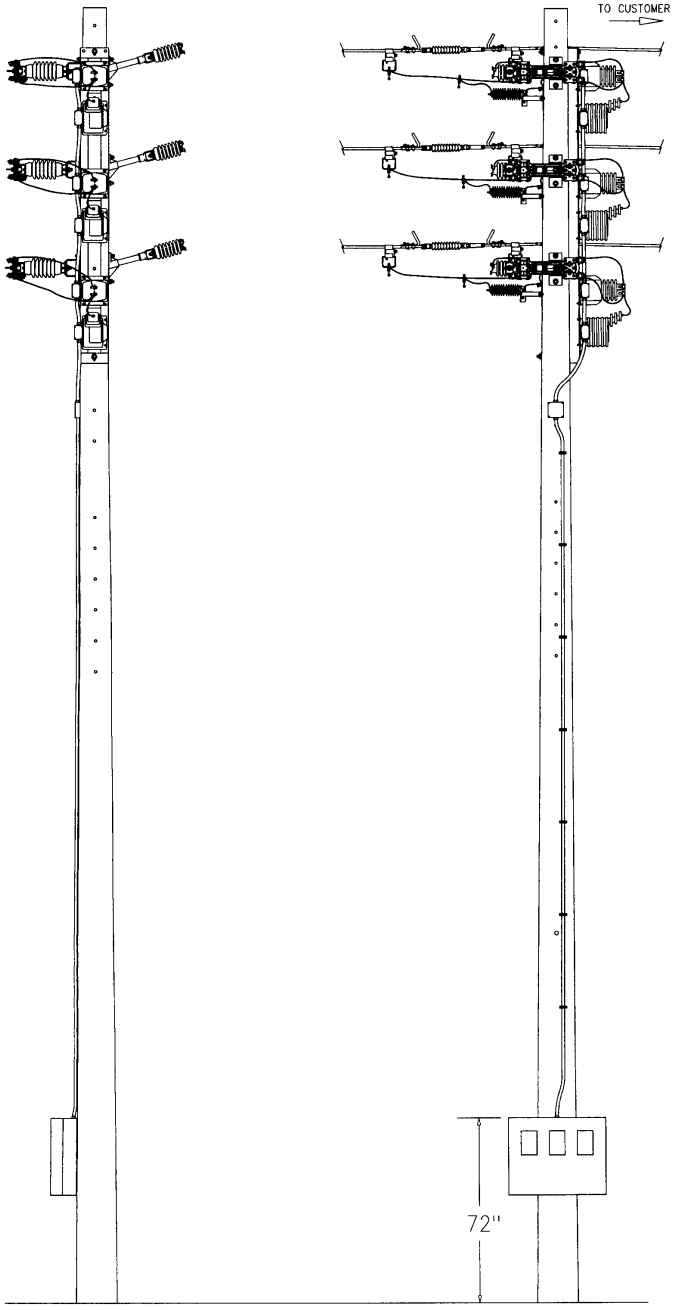
VIEW 2



MD1

PRIMARY METER EQUIPMENT – VERTICAL CONST. – TANGENT – 26.4KV

VIEW 3



MD2

PRIMARY METER EQUIPMENT – HORIZONTAL CONST. – TANGENT – 26.4KV

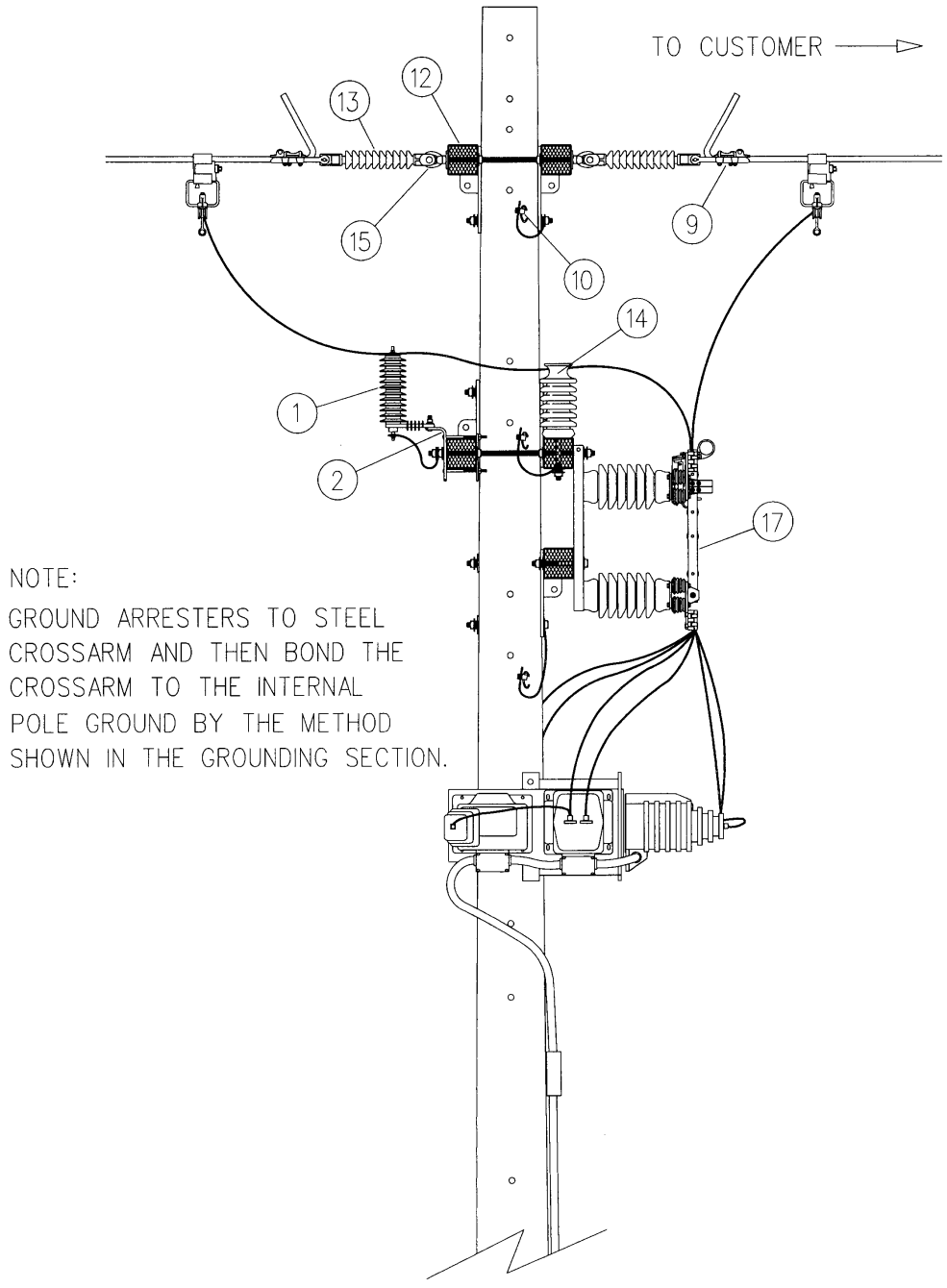
OPTIONS: , 1/0, 636
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	3	ARRESTER, LIGHTNING, POLYMER, 21kV
2	BKT AC 003	3	BRACKET, ARRESTER/CUTOUT, CROSSARM MOUNT
3	BOL DA 016	2	BOLT, DOUBLE ARMING, 3/4X16
4	BOL DA 021	6	BOLT, DOUBLE ARMING, 3/4X26
5	BOL MS 034	2	BOLT, MACHINE, SQUARE HEAD, 3/4X10
6	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD, 3/4X14
7	BOL MS 037	2	BOLT, MACHINE, SQUARE HEAD, 3/4X16
8	BOL MS 038	1	BOLT, MACHINE, SQUARE HEAD, 3/4X18
9	CLA SS ***	6	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
10	CNN VG 003	3	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
11	COB CO 028	50	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
12	CXA FG ***	5	GENERAL CODE FOR FIBERGLASS CROSSARM
13	INS CO 001	6	INSULATOR, COMPOSITE, POLYMER DEADEND
14	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5kV
15	NUT EY 003	6	NUT, EYE, 3/4
16	STU LI 003	3	STUD, LINE POST, 3/4 IN. HEAD, 3/4 IN. DIA. X 7 IN. SHANK
17	SWE HO 017	3	SWITCH, HOOK BYPASS, 25.8kV NOMINAL
18	WAS RD 005	30	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
19	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
20	WAS SP 002	8	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
21	--	3	“H” BRACKETS
22	--	6	TRANSFORMER MOUNTING PLATES
23	--	12	1/2 IN. DIA. X 2 IN. BOLTS AND NUTS
24	--	3	CURRENT TRANSFORMERS
25	--	3	POTENTIAL TRANSFORMERS
26	--	24	3/8 IN. DIA. X 1-1/2 IN. BOLT
27	--	48	3/8 IN. FLAT WASHERS
28	--	24	3/8 IN. NUTS
29	--	1	WORK BOX BLANK PLUG
30	--	12	1 IN. SEAL-TIGHT STRAIGHT CONNECTORS
31	--	1	F.S. BOX
32	--	12	1 IN. SEAL-TIGHT CONDUIT
33	--	6	C.T. BUSHING CONNECTORS
34	--	7	#2 VISE-GRIP CONNECTORS

MD2

PRIMARY METER EQUIPMENT – HORIZONTAL CONST. – TANGENT – 26.4KV

VIEW 1

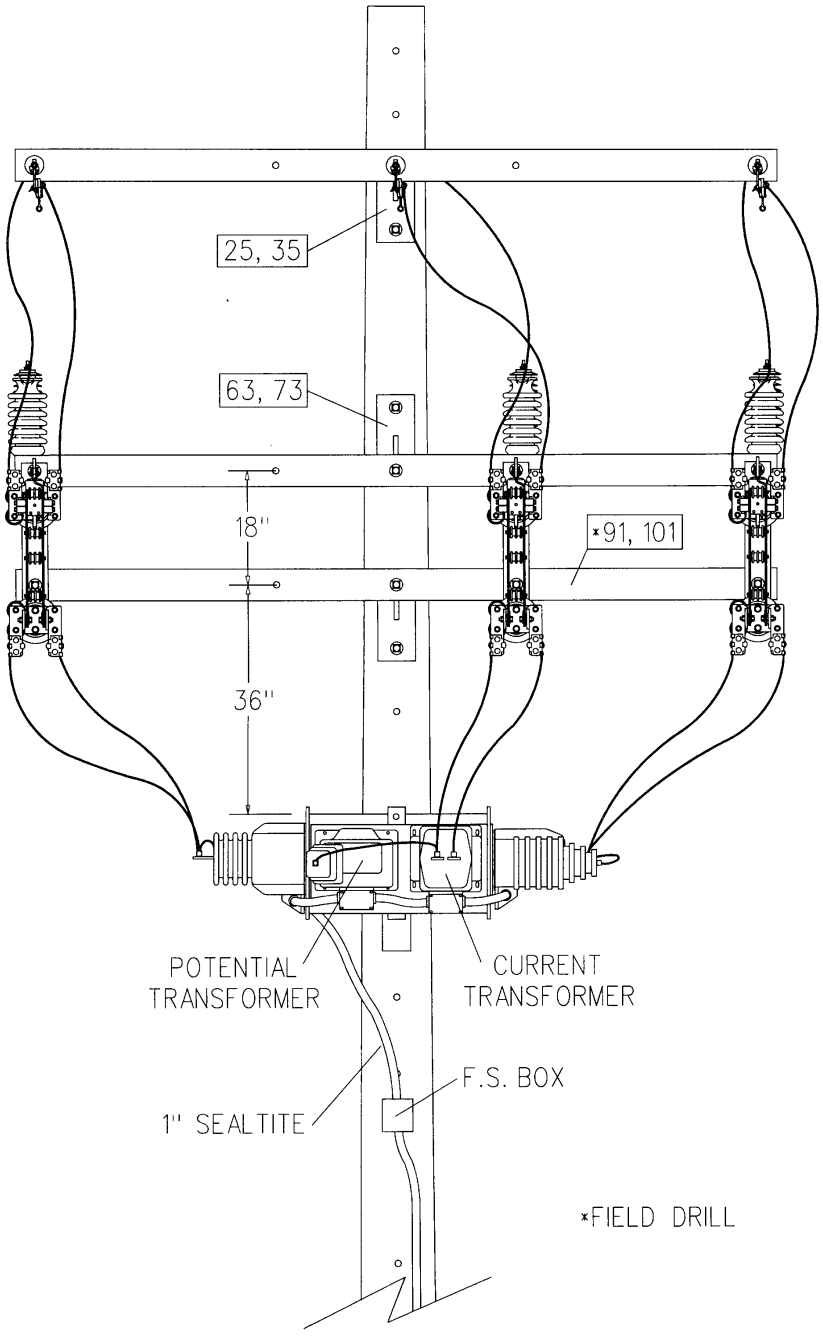


NOTE:
GROUND ARRESTERS TO STEEL CROSSARM AND THEN BOND THE CROSSARM TO THE INTERNAL POLE GROUND BY THE METHOD SHOWN IN THE GROUNDING SECTION.

MD2

PRIMARY METER EQUIPMENT – HORIZONTAL CONST. – TANGENT – 26.4KV

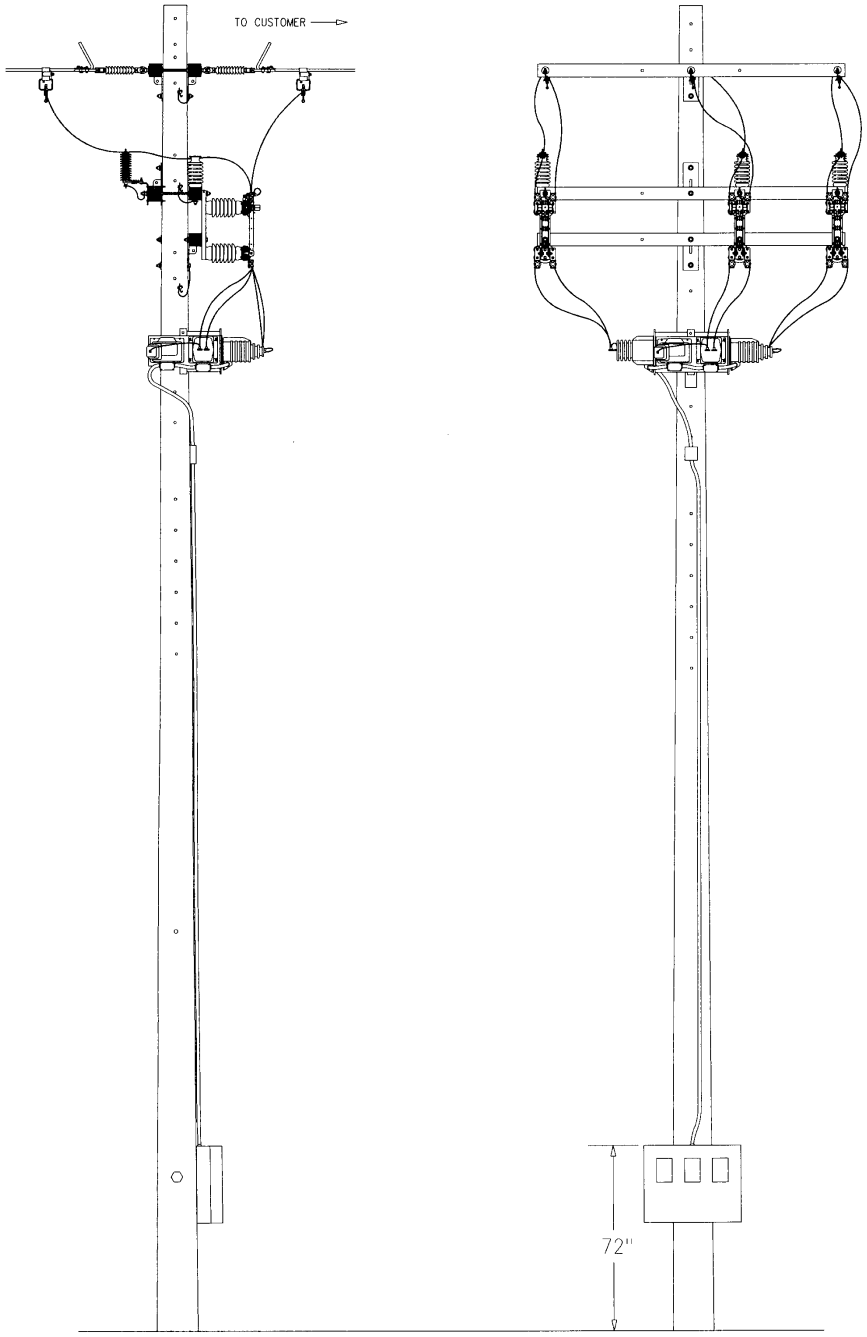
VIEW 2



MD2

PRIMARY METER EQUIPMENT – HORIZONTAL CONST. – TANGENT – 26.4KV

VIEW 3



MR1

PRIMARY METER EQUIPMENT – VERTICAL CONST. – TANGENT – 4KV

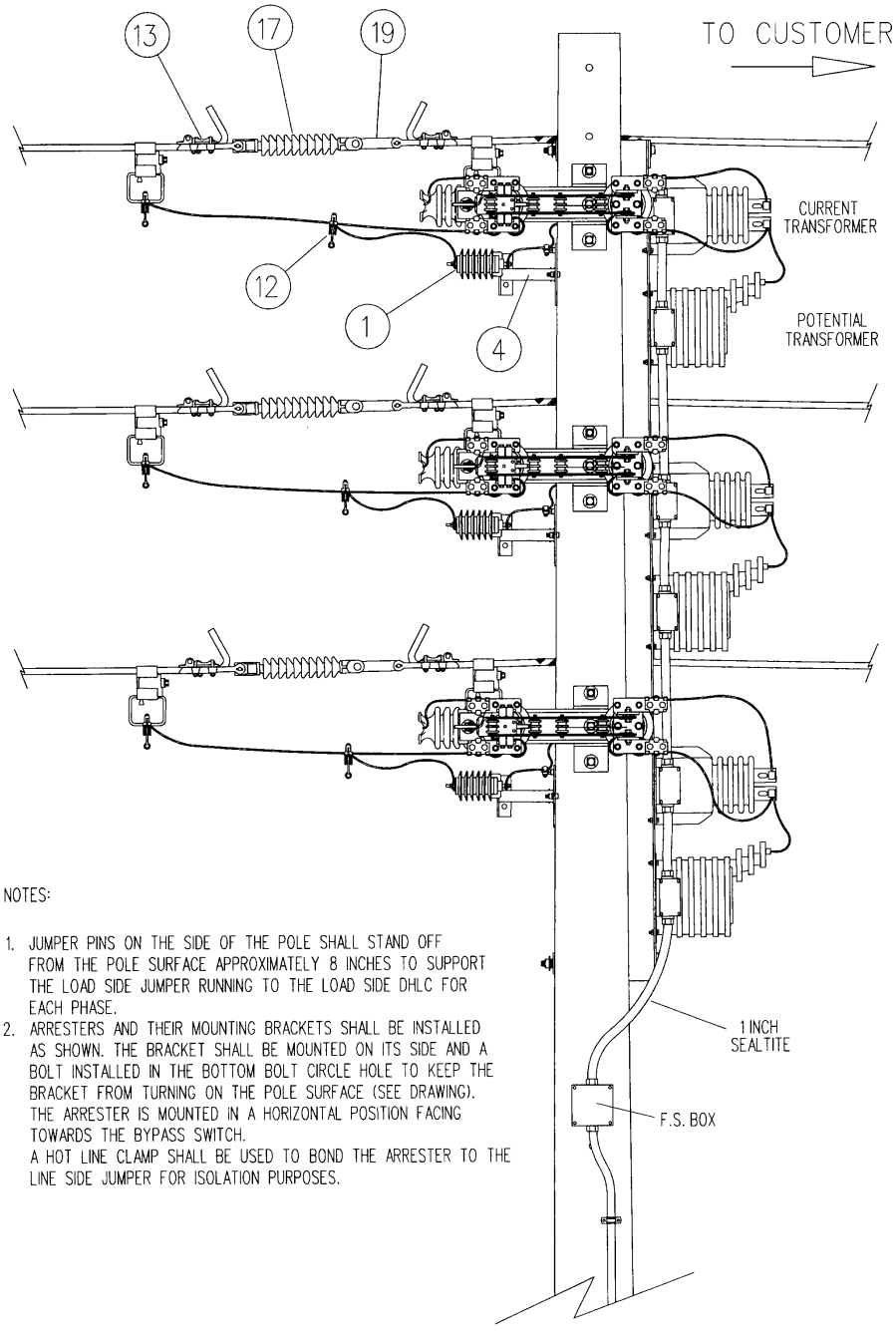
OPTIONS: 2, 1/0, 636
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 001	3	ARRESTER, LIGHTNING, POLYMER, 3kV
2	BKT FS 001	3	BRACKET, FIBERGLASS STANDOFF, 2 IN ROD
3	BKT PC 001	1	BRACKET, PRIMARY CLUSTER RACK
4	BKT RP 001	2	BRACKET, RISER POLE ARRESTER
5	BKT SM 005	2	BRACKET, SWITCH MOUNTING, FOR BYPASS SWITCHES
6	BOL DA 015	3	BOLT, DOUBLE ARMING, 3/4X14
7	BOL DA 016	6	BOLT, DOUBLE ARMING, 3/4X16
8	BOL DA 017	2	BOLT, DOUBLE ARMING, 3/4X18
9	BOL DA 018	3	BOLT, DOUBLE ARMING, 3/4X20
10	BOL MS 001	3	BOLT, MACHINE, SQUARE HEAD, 1/2X2
11	BOL MS 031	6	BOLT, MACHINE, SQUARE HEAD, 3/4X4
12	CLA HL 001	3	CLAMP, HOT LINT
13	CLA SS ***	6	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
14	CLA TG 001	3	CLAMP, TRANSFORMER TANK GROUND, 6 SOL – 1/0 STR
15	CNN VG 003	6	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
16	COB CO 028	36	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
17	INS CO 001	3	INSULATOR, COMPOSITE, POLYMER DEADEND
18	INS VP 001	6	INSULATOR, VERTICAL POST, 34.5Kv
19	LIX EX 001	3	LINK, EXTENSION, STRAIGHT, 18,000 LBS.
20	STU LI 001	3	STUD, LINE POST, 3/4 IN. HEAD, 3/4 IN. DIA. X 1-3/4 IN. SHANK
21	TIE PR ***	3	GENERAL CODE FOR PREFORMED TIE
22	SWE HO 016	3	SWITCH, HOOK BYPASS, 15Kv
23	WAS RD 005	46	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
24	WAS SF 003	3	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
25	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
26	--	3	CURRENT TRANSFORMERS
27	--	3	POTENTIAL TRANSFORMERS
28	--	24	3/8 IN. DIA. X 1-1/2 IN. BOLT
29	--	48	3/8 IN. FLAT WASHERS
30	--	24	3/8 IN. NUTS
31	--	1	WORK BOX BLANK PLUG
32	--	12	1 IN. SEAL-TIGHT STRAIGHT CONNECTORS
33	--	1	F.S. BOX
34	--	12	1 IN. SEAL-TIGHT CONDUIT
35	--	6	C.T. BUSHING CONNECTORS
36	--	7	#2 VISE-GRIP CONNECTORS

MR1

PRIMARY METER EQUIPMENT – VERTICAL CONST. – TANGENT – 4KV

VIEW 1



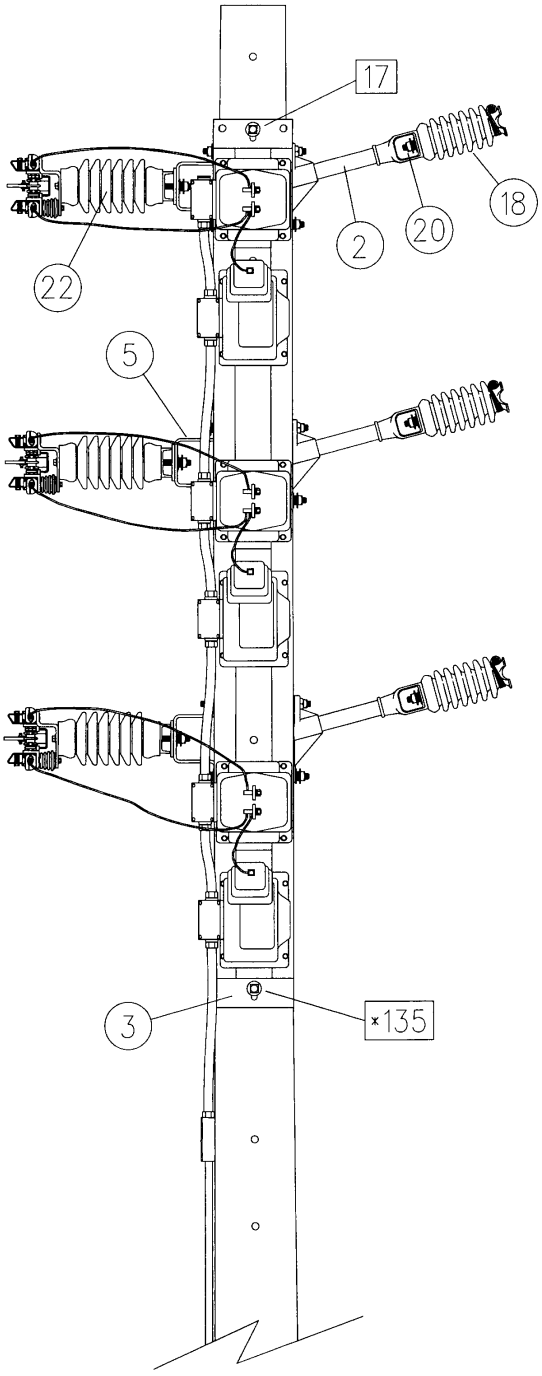
NOTES:

1. JUMPER PINS ON THE SIDE OF THE POLE SHALL STAND OFF FROM THE POLE SURFACE APPROXIMATELY 8 INCHES TO SUPPORT THE LOAD SIDE JUMPER RUNNING TO THE LOAD SIDE DHLC FOR EACH PHASE.
2. ARRESTERS AND THEIR MOUNTING BRACKETS SHALL BE INSTALLED AS SHOWN. THE BRACKET SHALL BE MOUNTED ON ITS SIDE AND A BOLT INSTALLED IN THE BOTTOM BOLT CIRCLE HOLE TO KEEP THE BRACKET FROM TURNING ON THE POLE SURFACE (SEE DRAWING). THE ARRESTER IS MOUNTED IN A HORIZONTAL POSITION FACING TOWARDS THE BYPASS SWITCH.
   A HOT LINE CLAMP SHALL BE USED TO BOND THE ARRESTER TO THE LINE SIDE JUMPER FOR ISOLATION PURPOSES.

MR1

PRIMARY METER EQUIPMENT – VERTICAL CONST. – TANGENT – 4KV

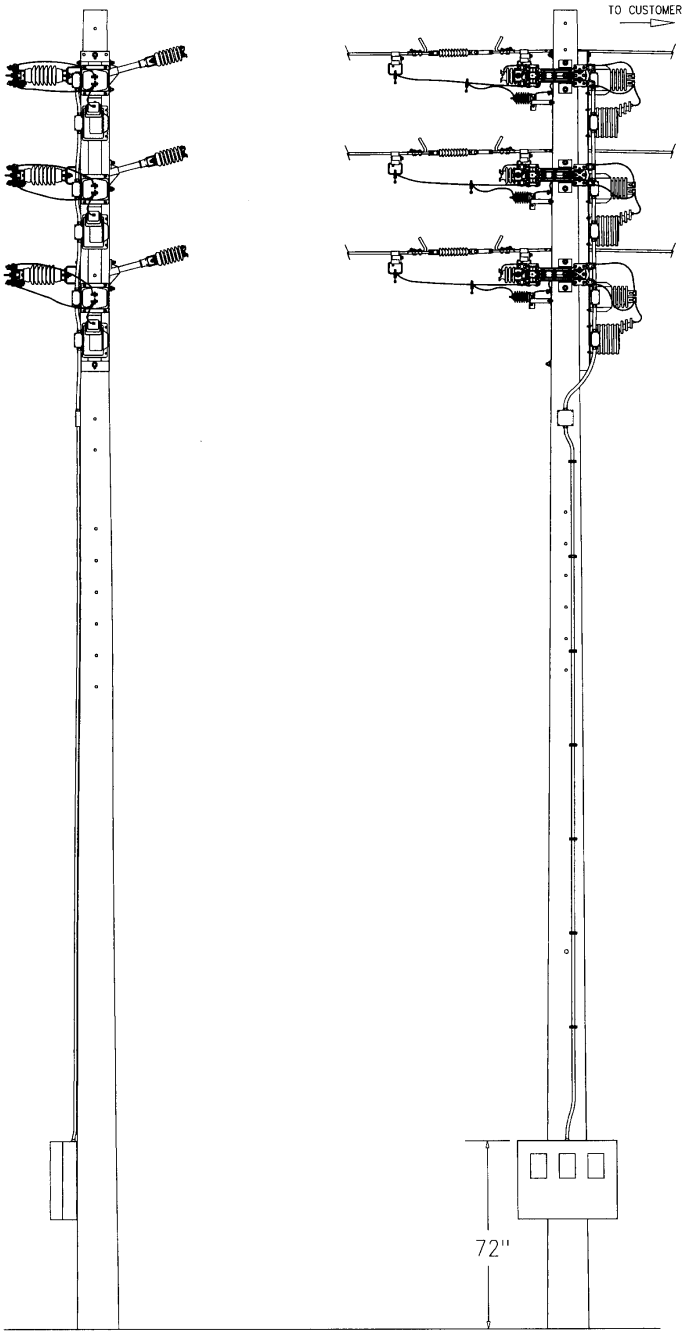
VIEW 2



MR1

PRIMARY METER EQUIPMENT – VERTICAL CONST. – TANGENT – 4KV

VIEW 3



MR2

PRIMARY METER EQUIPMENT – HORIZONTAL CONST. – TANGENT – 4KV

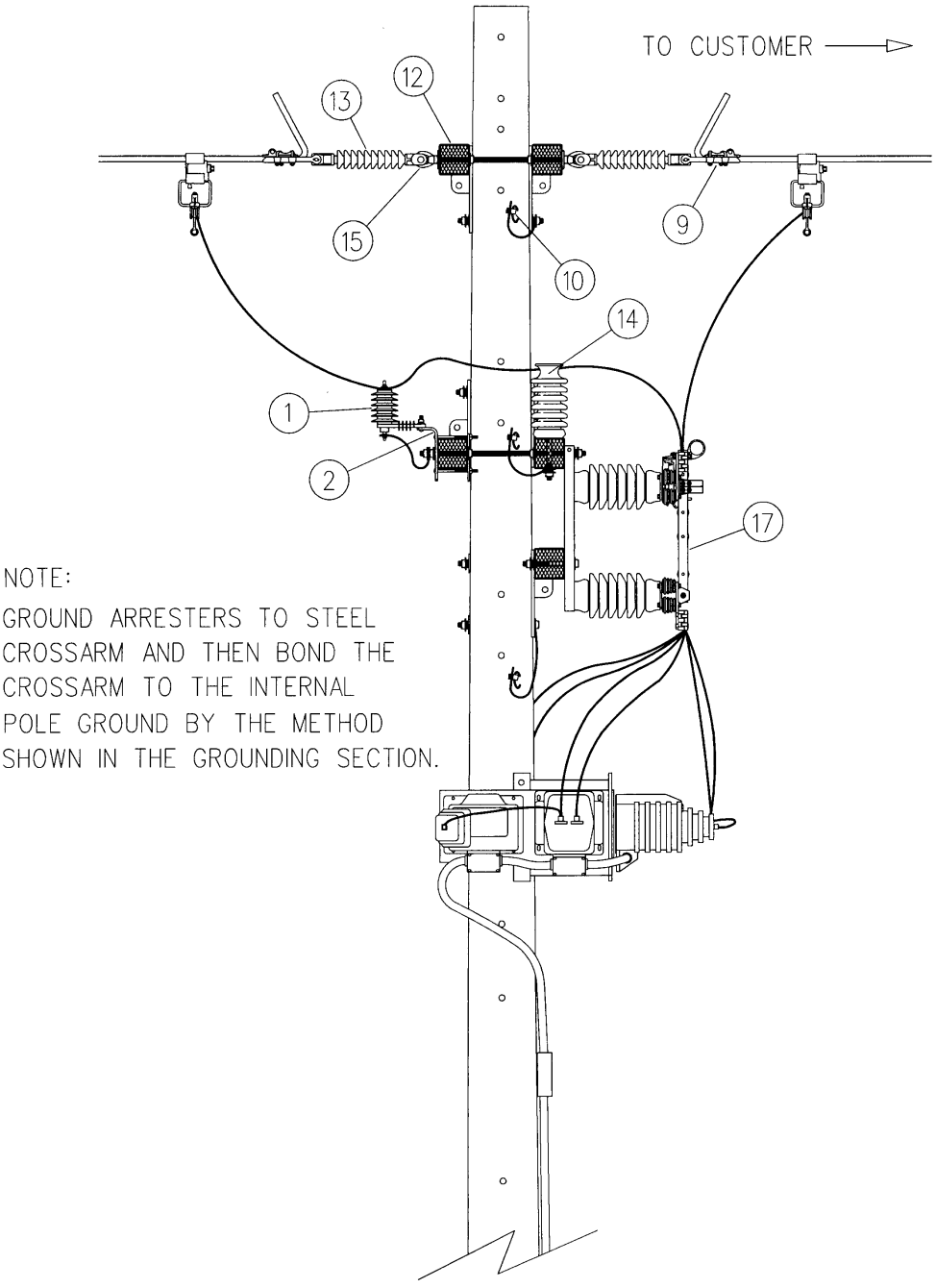
OPTIONS: 2, 1/0, 636
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 001	3	ARRESTER, LIGHTNING, POLYMER, 3kV
2	BKT AC 003	3	BRACKET, ARRESTER/CUTOUT, CROSSARM MOUNT
3	BOL DA 016	2	BOLT, DOUBLE ARMING, 3/4X16
4	BOL DA 021	6	BOLT, DOUBLE ARMING, 3/4X26
5	BOL MS 034	2	BOLT, MACHINE, SQUARE HEAD, 3/4X10
6	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD, 3/4X14
7	BOL MS 037	2	BOLT, MACHINE, SQUARE HEAD, 3/4X16
8	BOL MS 038	1	BOLT, MACHINE, SQUARE HEAD, 3/4X18
9	CLA SS ***	6	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
10	CNN VG 003	3	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
11	COB CO 028	50	CONDUCTOR, BARE COPPER, #4 SOFT DRAWN
12	CXA FG ***	5	GENERAL CODE FOR FIBERGLASS CROSSARM
13	INS CO 001	6	INSULATOR, COMPOSITE, POLYMER DEADEND
14	INS VP 001	3	INSULATOR, VERTICAL POST, 34.5kV
15	NUT EY 003	6	NUT, EYE, 3/4
16	STU LI 003	3	STUD, LINE POST, 3/4 IN. HEAD, 3/4 IN. DIA. X 7 IN. SHANK
17	SWE HO 016	3	SWITCH, HOOK BYPASS, 15kV
18	WAS RD 005	30	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
19	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
20	WAS SP 002	8	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
21	--	3	“H” BRACKETS
22	--	6	TRANSFORMER MOUNTING PLATES
23	--	12	1/2 IN. DIA. X 2 IN. BOLTS AND NUTS
24	--	3	CURRENT TRANSFORMERS
25	--	3	POTENTIAL TRANSFORMERS
26	--	24	3/8 IN. DIA. X 1-1/2 IN. BOLT
27	--	48	3/8 IN. FLAT WASHERS
28	--	24	3/8 IN. NUTS
29	--	1	WORK BOX BLANK PLUG
30	--	12	1 IN. SEAL-TIGHT STRAIGHT CONNECTORS
31	--	1	F.S. BOX
32	--	12	1 IN. SEAL-TIGHT CONDUIT
33	--	6	C.T. BUSHING CONNECTORS
34	--	7	#2 VISE-GRIP CONNECTORS

MR2

PRIMARY METER EQUIPMENT – HORIZONTAL CONST. – TANGENT – 4KV

VIEW 1

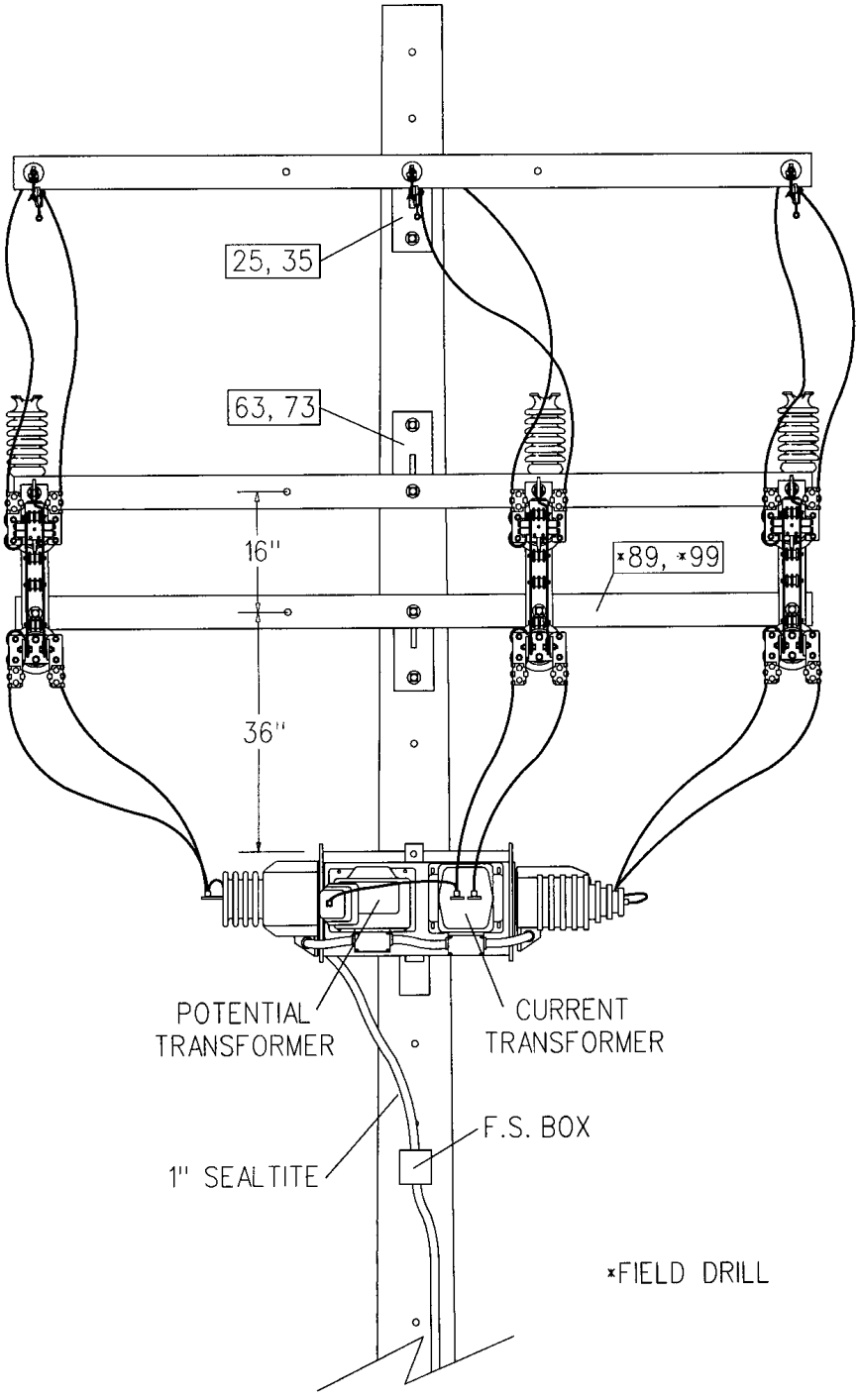


NOTE:
GROUND ARRESTERS TO STEEL CROSSARM AND THEN BOND THE CROSSARM TO THE INTERNAL POLE GROUND BY THE METHOD SHOWN IN THE GROUNDING SECTION.

MR2

PRIMARY METER EQUIPMENT – HORIZONTAL CONST. – TANGENT – 4KV

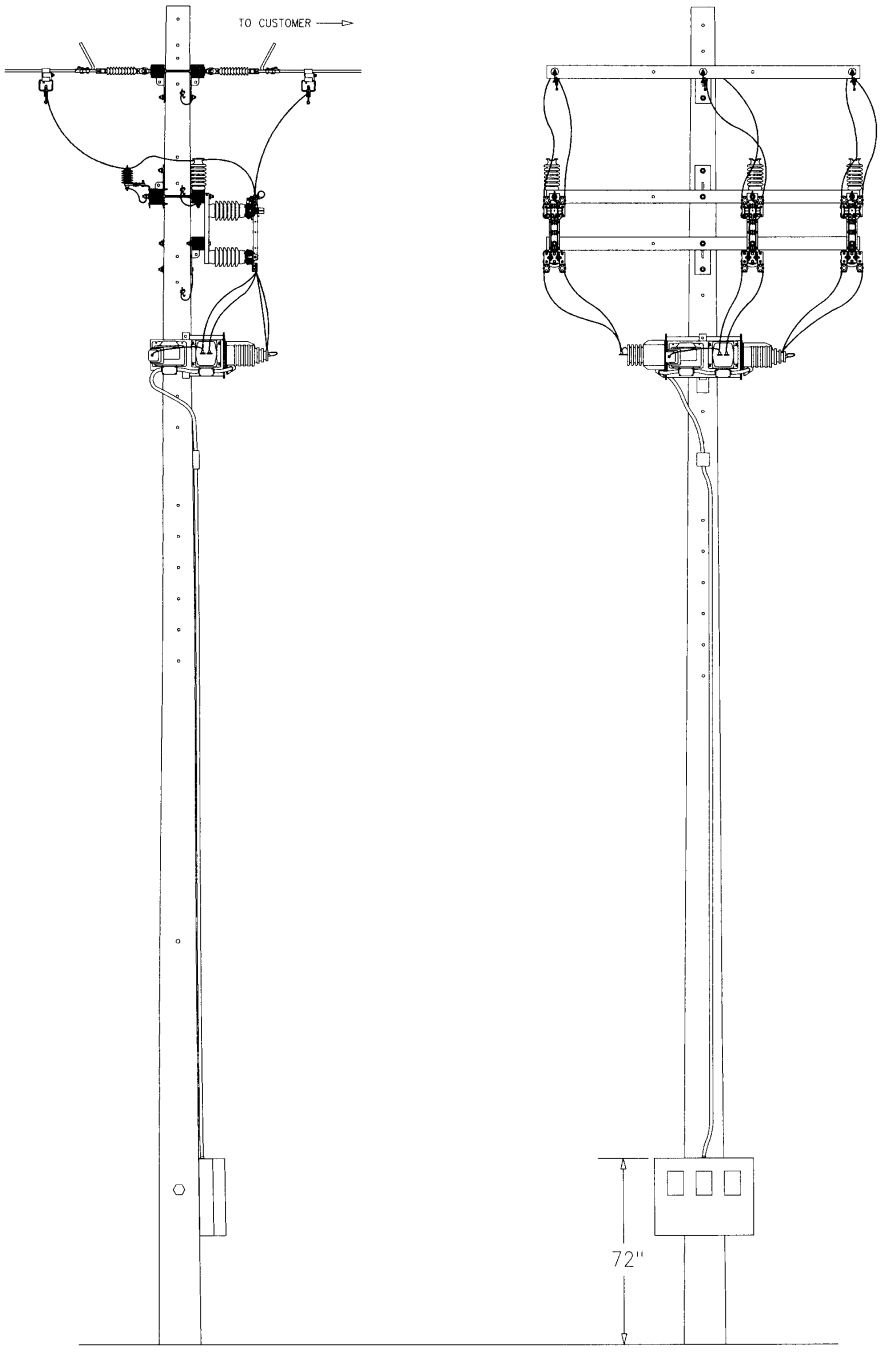
VIEW 2



MR2

PRIMARY METER EQUIPMENT – HORIZONTAL CONST. – TANGENT – 4KV

VIEW 3



SYSTEM PROTECTION FUSE COORDINATION AND TRANSFORMER FUSING

INTRODUCTION

1. The purpose of protective coordination is to provide isolation of a fault as close to the fault as possible so that a minimum of customers will be affected. The workhorse of the JEA protection scheme is the fuse. By following the fuse tables given in this section, the fuse closest to a fault will melt first providing proper coordination and fault isolation.

2. The fuse tables are divided into three major groups:

   GROUP A: LATERAL FUSING presents the required fuses for the fusing of laterals and sub-laterals. Tables for overhead and underground laterals behind substation breakers and reclosers are given for each system voltage.

   GROUP B: EQUIPMENT PROTECTION FUSING gives the fuse sizes for the protection of transformers and capacitors.

   GROUP C: FUSE-FUSE COORDINATION presents various tables for coordinating one type of fuse link behind another type of fuse link.

3. In order to maintain a properly functioning fuse coordination system, the fuse tables presented in this section must be followed in both system design and maintenance. Any suspected mis-coordination events should be reported to System Analysis for investigation.

4. If an installed fuse will not hold the connected load and a larger fuse is installed, the party installing the larger size fuse shall notify the System Analysis section of Technical Support Engineering of (1) the location, (2) the old fuse size, and (3) the new fuse size.

5. If a fuse is replaced with a different size fuse because the required size was not available, the party installing the different size fuse shall notify the Systems Operation Control Center so the proper size fuse can be reinstalled.

6. Do not install Sectionalizers on multiphase laterals (See System Analysis).

GROUP A: LATERAL FUSING

1. OVERHEAD LATERALS ON PRIVATE PROPERTY:
   - A. Fuse the lateral at the road with the correct size lateral fuse if the lateral meets ANY of the following conditions:
     - i. More than one transformer is served.
     - ii. The lateral is longer than two spans.
     - iii. The transformer pole cannot be seen from the cutout at the road.
     - iv. Trees could cause outage problems.
   - B. Fuse the lateral at the road with the correct size transformer fuse if the lateral meets ALL of the following conditions:
     - i. Only one transformer is served.
     - ii. The lateral is two spans or less in length.
     - iii. The transformer pole can be seen from the cutout at the road.
     - iv. Trees will not cause any outage problems.
2. UNDERGROUND LATERALS:
   - A. Fuse the lateral at the tap with the correct size lateral fuse if the lateral meets ANY of the following conditions:
     - i. The tap occurs in an underground fusing cabinet.
     - ii. The transformer served is equipped with bay-o-net fuses.
     - iii. More than one transformer is served.
     - iv. There are provisions for extending the lateral.
   - B. Fuse the lateral at the tap with the correct size transformer fuse if the lateral meets ALL of the following conditions:
     - i. The fused tap consists of overhead cutout(s).
     - ii. The transformer served is not equipped with bay-o-net fuses.
     - iii. Only one transformer is served.
     - iv. The lateral is a radial without provisions for extension.
3. FUSING BEHIND SECTIONALIZERS:

   Sectionalizers do not have time-current characteristics and therefore do not affect coordination between a fuse and an upstream breaker or recloser. When selecting fuses behind a sectionalizer, the presence of the sectionalizer should be ignored.
4. FUSING BEHIND SINGLE PHASE RECLOSERS:

   The largest fuse that can be used behind a 200A single phase recloser is a 65T. The largest fuse that can be used behind a 70A single phase recloser is a 25T. These fuse values allow for maximum coordination.

GROUP A: LATERAL FUSING (CONTINUED)

15.2/26.4KV DISTRIBUTION SYSTEM

Notes:

1) In the event that the tap off the main line fuse or sublateral fuse does not provide adequate current carrying capacity, notify the System Analysis section of Technical Support Engineering.
2) TABLE 1:

   The fuse size listed in this table is only for a tap off the main line feeder. The first sublateral fuse (Overhead) will be half or the next smaller standard size that JEA has in stock. For example: If a tap off the main line is a 65T fuse, then the first sublateral fuse will be a 30T, and the second sublateral fuse will be a 15T. See Table 1, Group C, for the first sublateral and second sublateral fuse off a cable pole.

TABLE 1: OVERHEAD LATERAL & CABLE POLE FUSING (T-LINK)
26.4kV System Behind Station Breaker

CONDUCTOR SIZE	TAP OFF MAIN LINE	1ST SUB-LATERAL FUSE	2ND SUB-LATERAL FUSE
1/0 AL. OR 2 CU. OR 2 AL.	100T	50T	25T
4 CU.	80T	40T	20T
4 AL. OR 6 CU. OR SMALLER	65T	30T	15T
CABLE POLE 1/0 AL. CABLE OR SMALLER	100T	SIZE PER TABLE 1 GROUP C - (1)	SIZE PER TABLE 1 GROUP C - (1)

TABLE 2: UNDERGROUND LATERAL FUSING (E-LINK)
26.4kV System Behind Station Breaker

CABLE SIZE	TAP OFF MAIN LINE	1ST SUB-LATERAL FUSE	2ND SUB-LATERAL FUSE
1/0 AL. OR SMALLER	150E	100E	50E

GROUP B: EQUIPMENT PROTECTION FUSING

TABLE 3: LINE CAPACITOR BANK FUSING

3 - PHASE BANK KVAR	SYSTEM VOLTAGE 2.4/4.16kV	SYSTEM VOLTAGE 7.62/13.2kV	SYSTEM VOLTAGE 15.2/26.4kV
150	25T	–	–
300	50T	15T	–
600	100T	25T	15T
1200	–	–	25T

TABLE 4: TRANSFORMER FUSING – 15.2/26.4kV

TRANSFORMER			FUSE LINKS – OVERHEAD				FUSE LINKS – UNDERGROUND	
KVA 1 PHASE	KVA 3 PHASE PADS	FULL LOAD AMPS	JEA ITEM ID	CHANCE TYPE	KEARNEY TYPE	COOPER TYPE	JEA ITEM ID WYE	RTE TYPE
5	–	0.33	FUSOH019	0.4 SF	1/2 X	–	–	–
10	–	0.66	FUSOH020	0.7 SF	1 X	–	–	–
15	–	0.98	FUSOH021	1.0 SF	1-1/2 X	–	–	–
25	–	1.64	FUSOH022	1.6 SF	2-1/2 X	–	FUSUG021	4000358C03B
37.5	–	2.46	FUSOH023	2.1 SF	3-1/2 X	–	–	–
50	–	3.28	FUSOH024	3.1 SF	4 X	–	FUSUG022	4000358C05B
75	–	4.92	FUSOH026	5.2 SF	7 X	–	FUSUG022	4000358C05B
100	–	6.56	FUSOH027	7.0 SF	10 X	–	FUSUG023	4000358C08B
167	–	10.96	FUSOH028	10.4 SF	15 X	–	FUSUG023	4000358C08B
250	–	16.40	FUSOH029	14 SF	25 KS	25 S	FUSUG024	4000358C10B
–	75	1.64	–	–	–	–	FUSUG021	4000358C03B
–	150	3.28	–	–	–	–	FUSUG022	4000358C05B
–	225	4.92	–	–	–	–	FUSUG022	4000358C05B
–	300	6.56	–	–	–	–	FUSUG023	4000358C08B
–	500	10.96	–	–	–	–	FUSUG024	4000358C10B
BALDWIN	500	10.96	–	–	–	–	FUSUG025	4000358C12B
–	750	16.40	–	–	–	–	FUSUG025	4000358C12B
BALDWIN	750	16.40	–	–	–	–	FUSUG024	4000358C10B
–	1,000	21.87	–	–	–	–	FUSUG025	4000358C12B
–	1,500	32.80	–	–	–	–	FUSUG026	4000358C14B

GROUP B: EQUIPMENT PROTECTION FUSING – (CONTINUED)

TABLE 5: TRANSFORMER FUSING – 15.2/26.4kV - (CONTINUED)

TRANSFORMER			FUSE LINKS – OVERHEAD				FUSE LINKS – UNDERGROUND	
KVA 1 PHASE	KVA 3 PHASE PADS	FULL LOAD AMPS	JEA ITEM ID	CHANCE TYPE	KEARNEY TYPE	COOPER TYPE	JEA ITEM ID WYE	RTE TYPE
–	2,000	43.74	–	–	–	–	NO ITEM ID *	4000358C12B
–	2,500	54.67	–	–	–	–	NO ITEM ID *	4000358C14B
–	3,750	82.01	–	–	–	–	FUSUG048	4000353C17B
	500kVA DELTA	–	–	–	–	–	NO ITEM ID	FA9H18

* These transformers can be fused with FUSUG026 until the 4038361C04CB is in stock. Then the new fuse should then be used. *This fuse comes with a new fuse cartridge. The complete unit should be used to replace the old fuse and cartridge.*

- FUSE LINKS - Overhead applies to pole mounted transformers as well as padmounted transformers not equipped with BAY-O-NET fuses that are fused at the cable pole. See Group A, General Comments on underground laterals.

TABLE 6: TRANSFORMER FUSING – 7.6/13.2kV

TRANSFORMER			FUSE LINKS – OVERHEAD				FUSE LINKS – UNDERGROUND	
KVA 1 PHASE	KVA 3 PHASE PADS	FULL LOAD AMPS	JEA ITEM ID	CHANCE TYPE	KEARNEY TYPE	COOPER TYPE	JEA ITEM ID WYE	RTE TYPE
5	–	0.66	FUSOH020	0.7 SF	1 X	–	–	–
10	–	1.31	FUSOH022	1.6 SF	2-1/2 X	–	–	–
15	–	1.97	FUSOH023	2.1 SF	3-1/2 X	–	–	–
25	–	3.28	FUSOH024	3.1 SF	4 X	–	FUSUG022	4000358C05B
37.5	–	4.92	FUSOH026	5.2 SF	7 X	–	–	–
50	–	6.56	FUSOH027	7.0 SF	10 X	–	FUSUG023	4000358C08B
75	–	9.84	FUSOH028	10.4 SF	15 X	–	FUSUG023	4000358C08B
100	–	13.12	FUSOH029	14 SF	25 KS	25 S	FUSUG024	4000358C10B
167	–	21.91	FUSOH030	21 SF	30 KS	30 S	FUSUG024	4000358C10B
250	–	32.80	FUSOH031	32 SF	50 KS	50 S	FUSUG025	4000358C12B
333	–	43.69	FUSOH032	46 SF	65 KS	65 S	FUSUG025	4000358C12B
500	–	65.61	FUSOH033	100 MS	100 KS	100 S	FUSUG026	4000358C14B
–	75	3.28	–	–	–	–	FUSUG022	4000358C05B
–	150	6.56	–	–	–	–	FUSUG022	4000358C05B
–	300	13.12	–	–	–	–	FUSUG025	4000358C12B
–	500	21.91	–	–	–	–	FUSUG025	4000358C12B
–	750	32.80	–	–	–	–	FUSUG026	4000358C14B
–	1,000	43.69	–	–	–	–	FUSUG026	4000358C14B

GROUP B: EQUIPMENT PROTECTION FUSING – (CONTINUED)

TABLE 7: TRANSFORMER FUSING – 7.6/13.2kV – (CONTINUED)

TRANSFORMER			FUSE LINKS – OVERHEAD				FUSE LINKS – UNDERGROUND	
KVA 1 PHASE	KVA 3 PHASE PADS	FULL LOAD AMPS	JEA ITEM ID	CHANCE TYPE	KEARNEY TYPE	COOPER TYPE	JEA ITEM ID WYE	RTE TYPE
–	1,500	65.61	–	–	–	–	NO ITEM ID **	4000353C18B
–	2,000	87.48	–	–	–	–	NO ITEM ID *	4038361C05CB
–	2,500	109.3	–	–	–	–	NO ITEM ID *	4038361C05CB

* These transformers can be fused with FUSUG026 until the 353c17 is in stock. Then the new fuse should be used.

** These transformers can be fused with FUSUG048 until the 4038361C05CB is in stock. Then the new fuse should be used. . *This fuse comes with a new fuse cartridge. The complete unit should be used to replace the old fuse and cartridge.*

- FUSE LINKS - Overhead applies to pole mounted transformers as well as padmounted transformers not equipped with BAY-O-NET fuses that are fused at the cable pole. See Group A, General Comments on underground laterals.

TABLE 8: TRANSFORMER FUSING – 13.2kV DELTA

TRANSFORMER			FUSE LINKS – OVERHEAD				FUSE LINKS – UNDERGROUND	
KVA 1 PHASE	KVA 3 PHASE PADS	FULL LOAD AMPS	JEA ITEM ID	CHANCE TYPE	KEARNEY TYPE	COOPER TYPE	JEA ITEM ID WYE	RTE TYPE
–	500kVA DELTA		–	–	–	_	FUSUG025	4000358C12B
–	750kVA DELTA		–	–	–	_	FUSUG026 *	4000358C14B
	1500kVA DELTA		–	–	–	–	NO ITEM ID *	4038361C04CB
	2500kVA DELTA		–	–	–	–	NO ITEM ID **	4038361C05CB

* These transformers can be fused with FUSUG048 until the 4038361C04CB is in stock. Then the new fuse should be used.

** These transformers can be fused with FUSUG048 until the 4038361C05CB is in stock. Then the new fuse should be used. *This fuse comes with a new fuse cartridge. The complete unit should be used to replace the old fuse and cartridge.*

- FUSE LINKS - Overhead applies to pole mounted transformers as well as padmounted transformers not equipped with BAY-O-NET fuses that are fused at the cable pole. See Group A, General Comments on underground laterals.

GROUP B: EQUIPMENT PROTECTION FUSING – (CONTINUED)

TABLE 9: TRANSFORMER FUSING – 2.4/4.16kV

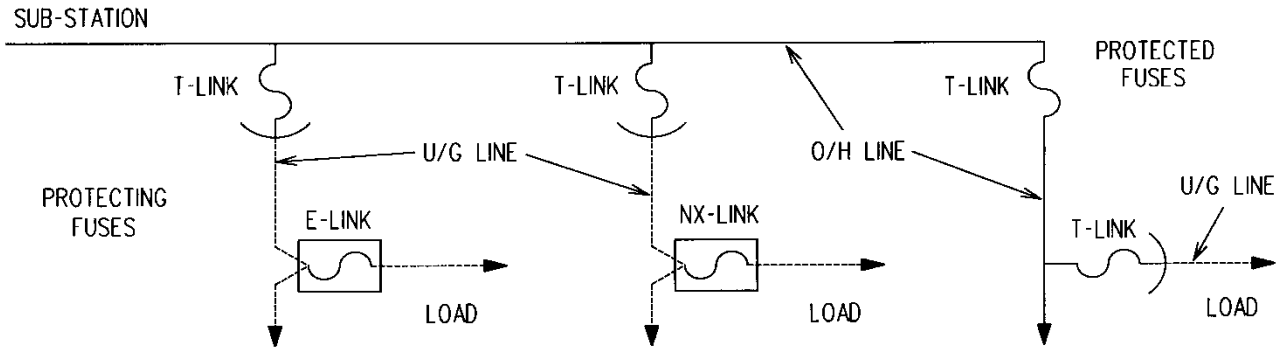
TRANSFORMER			FUSE LINKS – OVERHEAD				FUSE LINKS – UNDERGROUND	
KVA 1 PHASE	KVA 3 PHASE PADS	FULL LOAD AMPS	JEA ITEM ID	CHANCE TYPE	KEARNEY TYPE	COOPER TYPE	JEA ITEM ID WYE	RTE TYPE
3	–	1.25	FUSOH022	1.6 SF	2-1/2 X	–	–	–
5	–	2.08	FUSOH023	2.1 SF	3-1/2 X	–	–	–
7.5	–	3.12	FUSOH024	3.1 SF	5-1/2 X	–	–	–
10	–	4.16	FUSOH025	4.2 SF	7 X	–	–	–
15	–	6.25	FUSOH027	7.0 SF	10 X	–	–	–
25	–	10.41	FUSOH028	10.4 SF	15 X	–	FUSUG023	4000358C10B
37.5	–	15.61	FUSOH029	14 SF	25 KS	25 S	–	–
50	–	20.82	FUSOH030	21 SF	30 KS	30 S	FUSUG024	4000358C12B
75	–	31.23	FUSOH031	32 SF	50 KS	50 S	FUSUG025	4000358C12B
100	–	41.64	FUSOH032	46 SF	65 KS	65 S	FUSUG025	4000358C12B
167	–	69.53	FUSOH033	100 MS	100 KS	100 S	FUSUG025	4000358C14B
250	–	104.09	FUSOH034	125 MS	125 KS	125 S	–	–
333	–	138.65	FUSOH035	150 MS	150 KS	150 S	–	–
500	–	208.18	FUSOH036	200 MS	200 KS	200 S	–	–
	75	10.41	–	–	–	–	FUSUG023	4000358C10B
	150	20.82	–	–	–	–	FUSUG024	4000358C12B
	300	41.64	–	–	–	–	FUSUG025	4000358C12B
	500	69.53	–	–	–	–	NO ITEM ID	4000358C18B
	750	104.09	–	–	–	–	NO ITEM ID	4000358C18B
	1000kVA DELTA		–	–	–	–	NO ITEM ID	4000358C18B

* These transformers can be fused with FUSUG025 at a reduced load capability until the 4038361C04CB is in stock. Then the new fuse should be used. *This fuse comes with a new fuse cartridge. The complete unit should be used to replace the old fuse and cartridge.*

- FUSE LINKS - Overhead applies to pole mounted transformers as well as padmounted transformers not equipped with BAY-O-NET fuses that are fused at the cable pole. See Group A, General Comments on underground laterals.

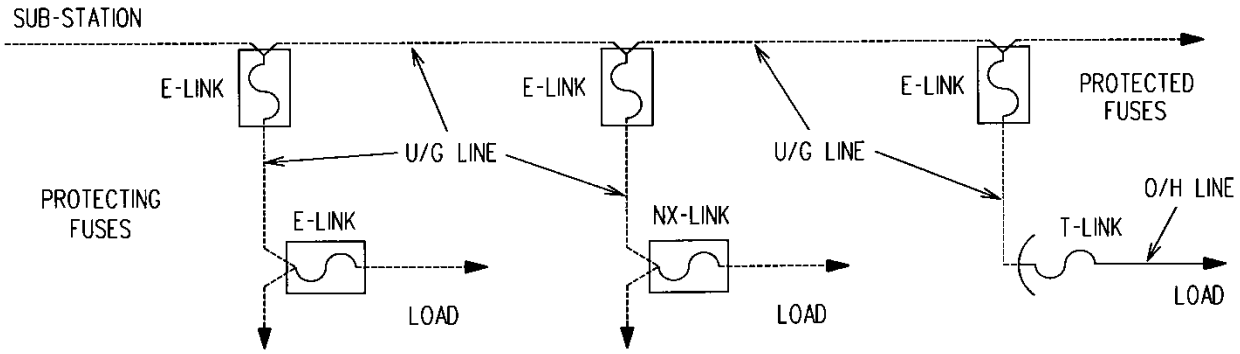
GROUP C: FUSE COORDINATION

TABLE 10: LATERAL FUSING OFF OF FUSED OVERHEAD LATERALS



PROTECTING FUSE	PROTECTED FUSE (T-LINK)							
	100T	80T	65T	50T	40T	30T	25T	20T
E-LINK (3-PHASE)	80	65	50	40	30	25	20	15
NX-LINK (1-PHASE)	50	40	30	25	20	12	12	10
T-LINK	50	40	30	25	20	12	12	10

TABLE 11: LATERAL FUSING OFF OF FUSED UNDERGROUND LATERALS



PROTECTING FUSE	PROTECTED FUSE (E-LINK)							
	150E	100E	80E	65E	50E	40E	30E	25E
E-LINK (3-PHASE)	100	50	50	40	25	20	20	15
NX-LINK (1-PHASE)	65	30	25	25	20	12	12	10
T-LINK	65	40	30	25	20	15	12	10

SYSTEM PROTECTION - PLATING

INTRODUCTION

1. Plates F1 thru F10 supply only the material required for one-phase. Therefore, for three-phase construction, you will be required to call for the specified plate three times at that station.

2. Plate options are listed on each construction standard page.

3. Single-phase sectionalizers consist of an electronic barrel assembly that replaces the standard fuse barrel that is supplied with the fuse cutout. Two options for this unit are available -- 2S and 3S. The first is for a two-shot sectionalizer and the other is for a three-shot sectionalizer. These options are available for plates F1 thru F10. Application of sectionalizers shall only be initiated by the System Analysis section of Technical Support Engineering.

4. Recloser Options:

   I.4.1. FCRDA (NOVA)

   The plate name is followed by the type of recloser and the corresponding conductor size.

   AVAILABLE RECLOSERS: TIE For new construction/ Distribution Automation (NOVA)

5. Reclosers and Sectionalizers:

   I.5.1. Reclosers both single phase and three phase shall only be plated by System Analysis personnel.

   I.5.2. Include the following note on your construction drawings for each recloser or sectionalizer installation:

6. 150QR fuses (FUSOH052) are only to be installed in 200A barrels (FUSHO150). This fuse and barrel are to be itemized individually. These barrels fit into our 100A cutout (CUTOT004).

7. The plates have been updated with the new animal guarding system. The #4 covered copper (CAI RH 010) is used for all jumpers. The bushing cover (GUA AN 002) is used on the top skirt of the recloser bushings. The cutout guard (GUA AN 006) is installed on the top of each cutout.

8. Add the suffix F for Fiberglass Construction. Examples: F1F, F11F, FCRSVF.

9. All the plates in the section can be plated as Fiberglass Construction or Contaminated Environment simply by adding an F or C suffix.

10. Do not install Sectionalizers on multiphase laterals (See System Analysis).

11. The ANTENNA plate has been added to the following plates: AR-TSE, AR-TSH

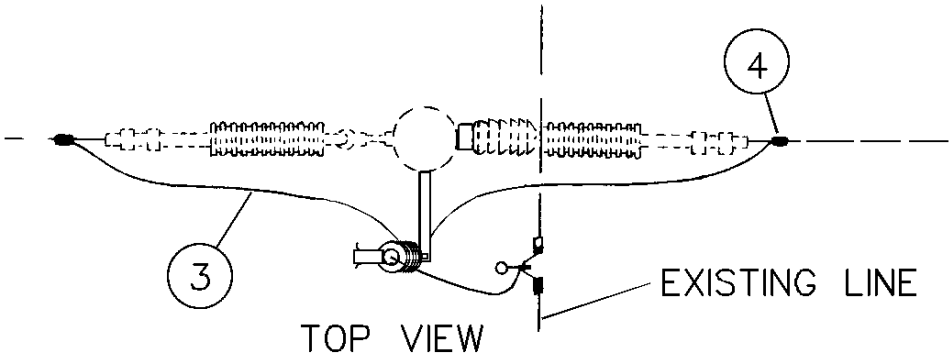
12. 200QR fuses (FUSOH012) are only to be installed in 200A cutouts (CUTOT007).

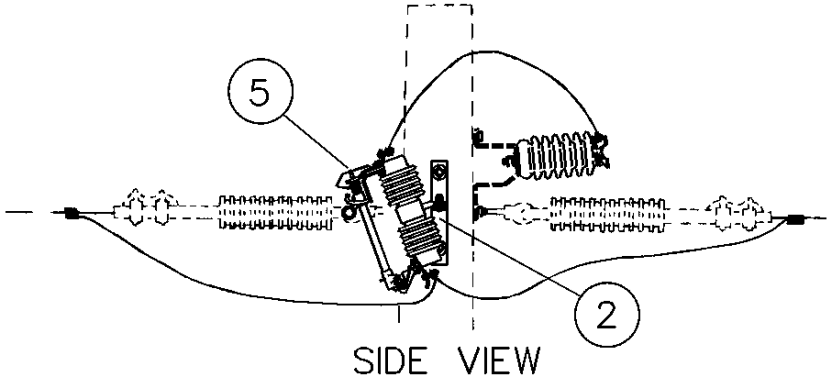
13. The T&B recloser should be installed with the internal PT's on the source side (JEA) of the recloser and the external PT's facing the load side (customer).

F1

WISHBONE MOUNTED FUSE FOR TAP

OPTIONS: 2S, 3S, 10T, 12T, 15T, 20T, 25T, 30T, 40T, 50T, 65T, 80T, 100T, 100TS
BOLT PLATE: NONE



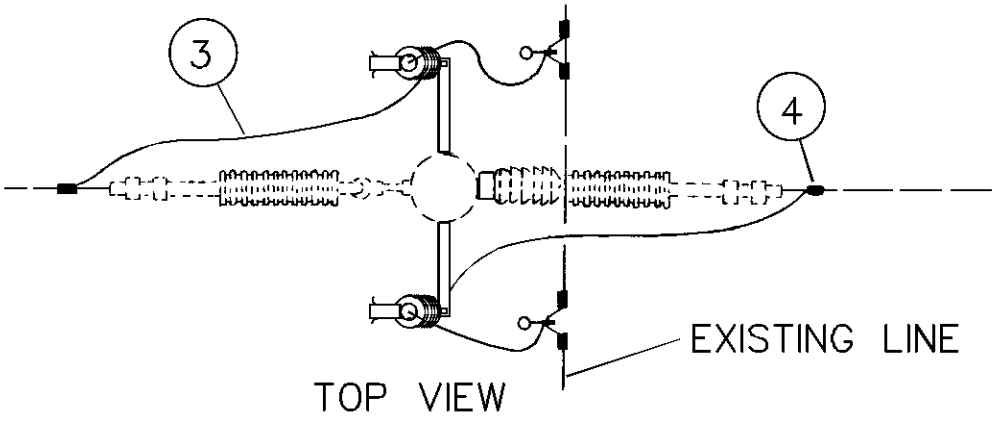


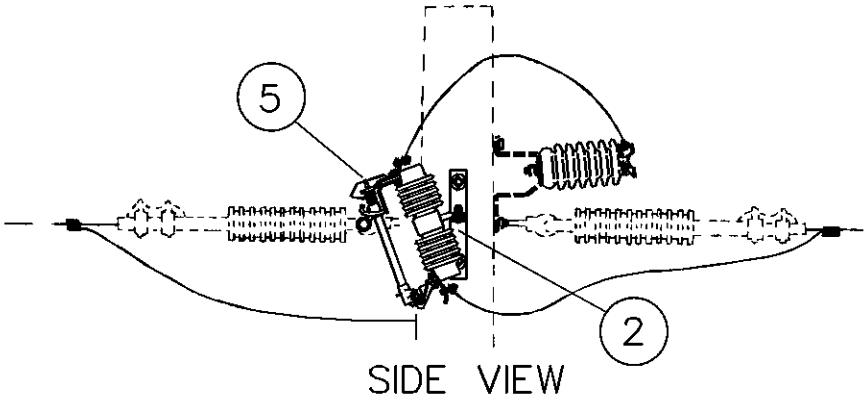
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD, 3/4X14
2	BKT AC 007	1	BRACKET, CUTOUT OR ARRESTER, MODIFIED WISHBONE
3	COB CO 029	12	CONDUCTOR, COPPER, #2 SOLID
4	CNN CP 002	2	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
5	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
6	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
7	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
8	WAS SF 004	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
9	FUS OH ***	1	GENERAL CODE FOR T-LINK FUSE
	OR		
9	SEC EL 001	1	SECTIONALIZER, ELECTRONIC, 2-SHOT
	OR		
9	SEC EL 004	1	SECTIONALIZER, ELECTRONIC, 3-SHOT

F2

WISHBONE MOUNTED FUSE FOR DOUBLE TAP

OPTIONS: 2S, 3S, 10T, 12T, 15T, 20T, 25T, 30T, 40T, 50T, 65T, 80T, 100T
BOLT PLATE: NONE



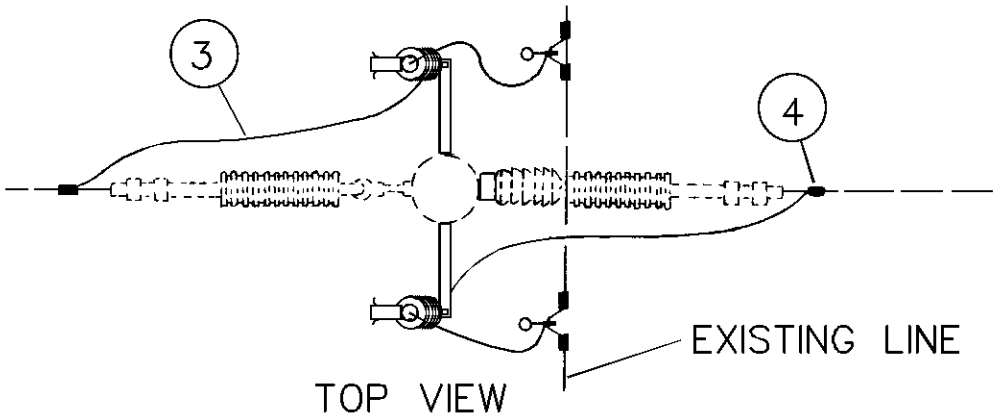


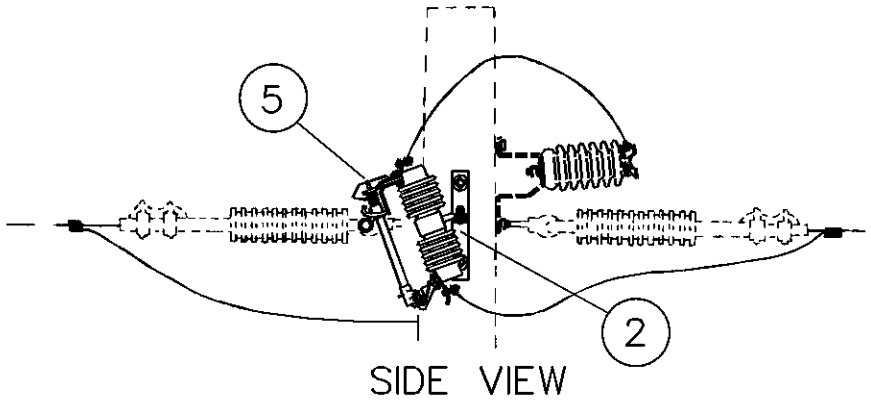
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4X14
2	BKT AC 007	2	BRACKET, CUTOUT OR ARRESTER, MODIFIED WISHBONE
3	COB CO 029	24	CONDUCTOR, COPPER, #2 SOLID
4	CNN CP 002	2	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
5	CUT OT 004	2	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
6	WAS RD 005	6	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
7	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
8	FUS OH ***	2	GENERAL CODE FOR T-LINK FUSE
	OR		
8	SEC EL 001	2	SECTIONALIZER, ELECTRONIC, 2-SHOT
	OR		
8	SEC EL 004	2	SECTIONALIZER, ELECTRONIC, 3-SHOT

F3

WISHBONE MOUNTED FUSE FOR CROSS

OPTIONS: 2S, 3S, 10T, 12T, 15T, 20T, 25T, 30T, 40T, 50T, 65T, 80T, 100T
BOLT PLATE: NONE



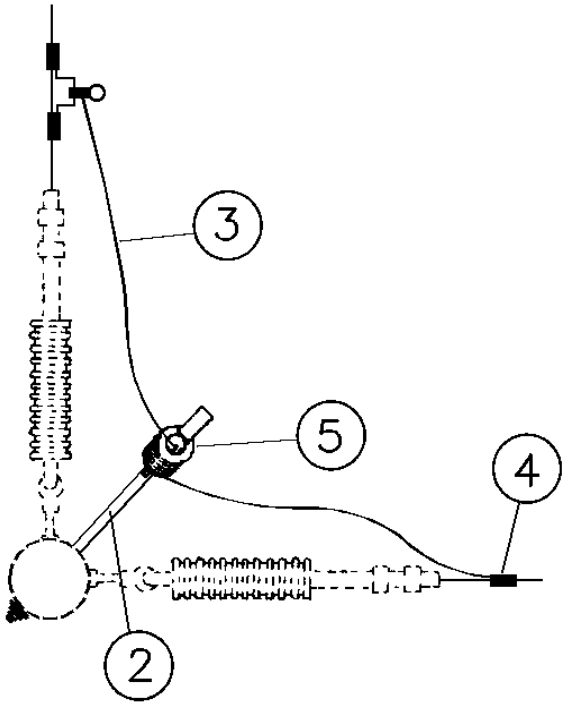


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD, 3/4X14
2	BKT AC 007	1	BRACKET, CUTOUT OR ARRESTER, MODIFIED WISHBONE
3	COB CO 029	12	CONDUCTOR, COPPER, #2 SOLID
4	CNN CP 002	2	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
5	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
6	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
7	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
8	FUS OH ***	1	GENERAL CODE FOR T-LINK FUSE
	OR		
8	SEC EL 001	1	SECTIONALIZER, ELECTRONIC, 2-SHOT
	OR		
8	SEC EL 004	1	SECTIONALIZER, ELECTRONIC, 3-SHOT

F5

WISHBONE MOUNTED FUSE FOR SECTIONALIZING

OPTIONS: 2S, 3S, 10T, 12T, 15T, 20T, 25T, 30T, 40T, 50T, 65T, 80T, 100T
BOLT PLATE: NONE

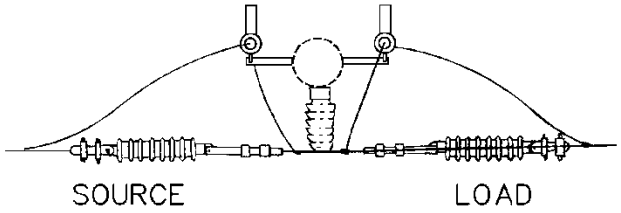


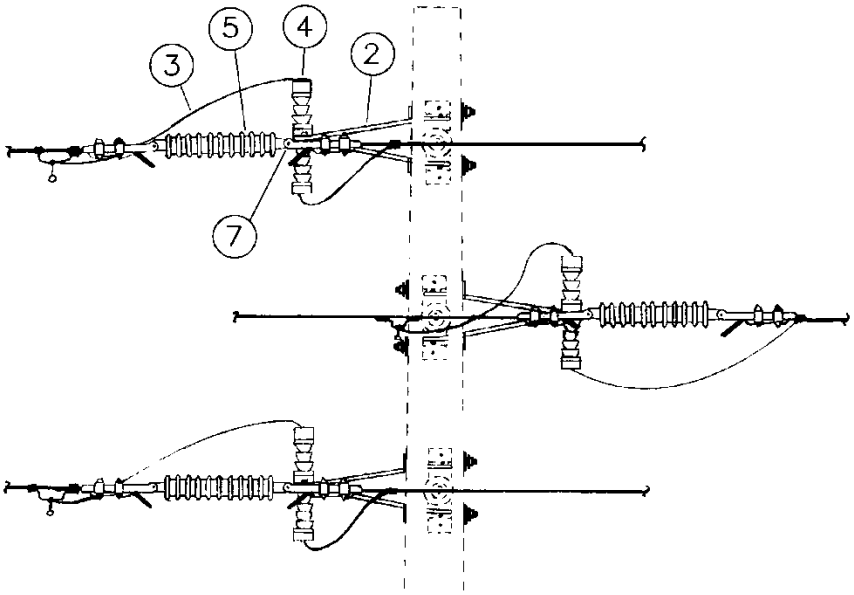
NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD, 3/4X14
2	BKT AC 007	1	BRACKET, CUTOUT OR ARRESTER, MODIFIED WISHBONE
3	COB CO 029	12	CONDUCTOR, COPPER, #2 SOLID
4	CNN CP 002	2	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
5	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
6	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
7	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
8	WAS SF 004	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
9	FUS OH ***	1	GENERAL CODE FOR T-LINK FUSE
	OR		
9	SEC EL 001	1	SECTIONALIZER, ELECTRONIC, 2-SHOT
	OR		
9	SEC EL 002	1	SECTIONALIZER, ELECTRONIC, 3-SHOT

F5-1

WISHBONE MOUNTED FUSE FOR SECTIONALIZING

OPTIONS: 2S, 3S, 10T, 12T, 15T, 20T, 25T, 30T, 40T, 50T, 65T, 80T, 100T
BOLT PLATE: NONE





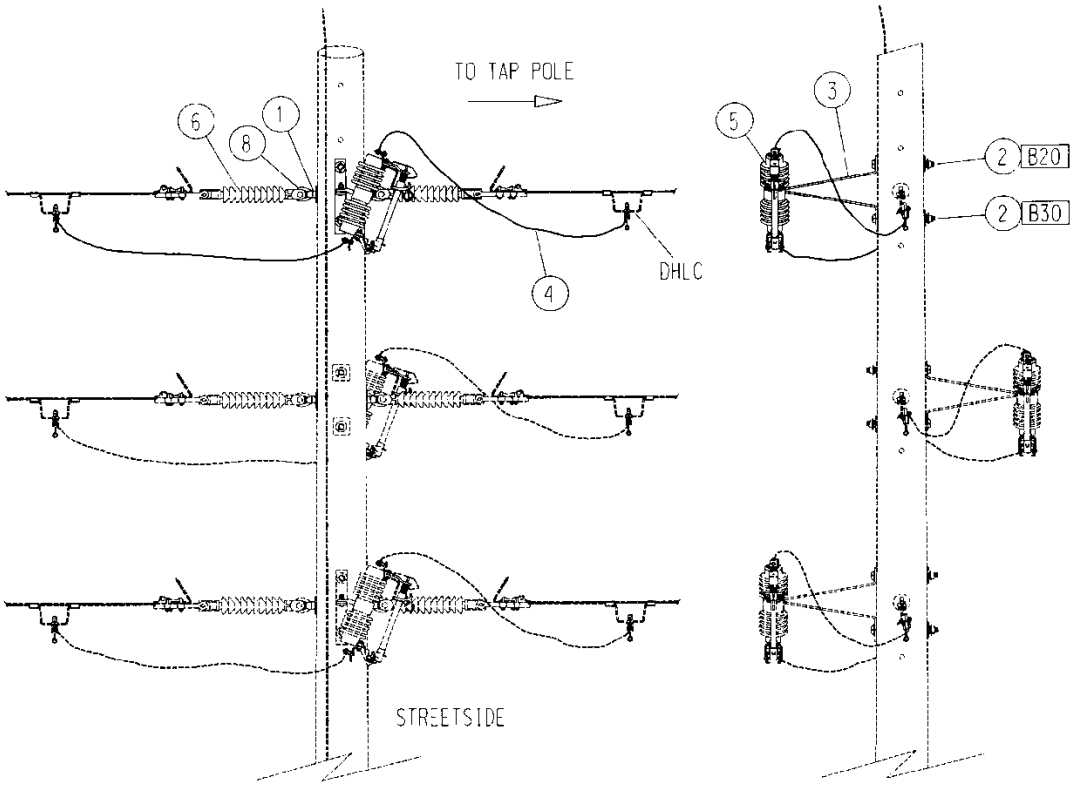
NOTE: STRAIGHT STRAIN CLAMPS MUST BE ITEMIZED ACCORDING TO CONDUCTOR SIZE

NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD, 3/4X14
2	BKT AC 007	1	BRACKET, CUTOUT OR ARRESTER, MODIFIED WISHBONE
3	COB CO 029	12	CONDUCTOR, COPPER, #2 SOLID
4	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
5	INS CO 001	1	INSULATOR, DEADEND, POLYMER
6	LIK EX 001	1	EXTENSION LINK, 6 IN.
7	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
8	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
9	WAS SF 004	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
10	FUS OH ***	1	GENERAL CODE FOR T-LINK FUSE
	OR		
10	SEC EL 001	1	SECTIONALIZER, ELECTRONIC, 2-SHOT
	OR		
10	SEC EL 002	1	SECTIONALIZER, ELECTRONIC, 3-SHOT

F5-2

WISHBONE MOUNTED FUSE FOR SECTIONALIZING

OPTIONS: 2S, 3S, 10T, 12T, 15T, 20T, 25T, 30T, 40T, 50T, 65T, 80T, 100T
BOLT PLATE: NONE



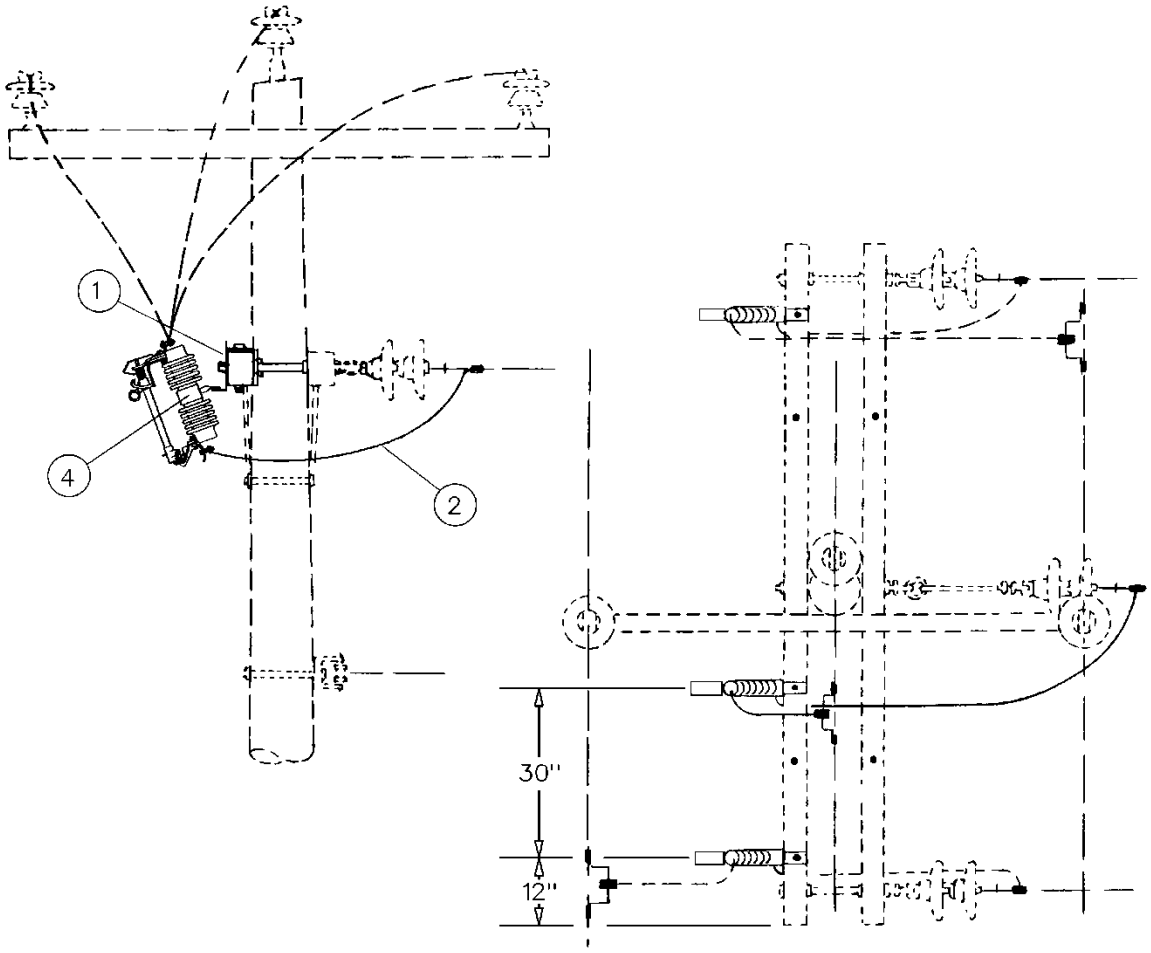
NOTE: STRAIGHT STRAIN CLAMPS MUST BE ITEMIZED ACCORDING TO CONDUCTOR SIZE
NOTE: DRAWING IS FOR REFERENCE, PLATING IS DONE ONE PHASE AT A TIME

NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
2	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD, 3/4X14
3	BKT AC 007	1	BRACKET, CUTOUT OR ARRESTER, MODIFIED WISHBONE
4	COB CO 029	12	CONDUCTOR, COPPER, #2 SOLID
5	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
6	INS CO 001	2	INSULATOR, DEADEND, POLYMER
7	NUT EY 003	2	NUT, EYE, 3/4
8	WAS RD 005	5	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
9	WAS SP 002	3	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
10	WAS SF 004	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
11	FUS OH ***	1	GENERAL CODE FOR T-LINK FUSE
	OR		
11	SEC EL 001	1	SECTIONALIZER, ELECTRONIC, 2-SHOT
	OR		
11	SEC EL 002	1	SECTIONALIZER, ELECTRONIC, 3-SHOT

F6

CROSSARM MOUNTED FUSE FOR TAP

OPTIONS: 2S, 3S, 10T, 12T, 15T, 20T, 25T, 30T, 40T, 50T, 65T, 80T, 100T
BOLT PLATE: NONE

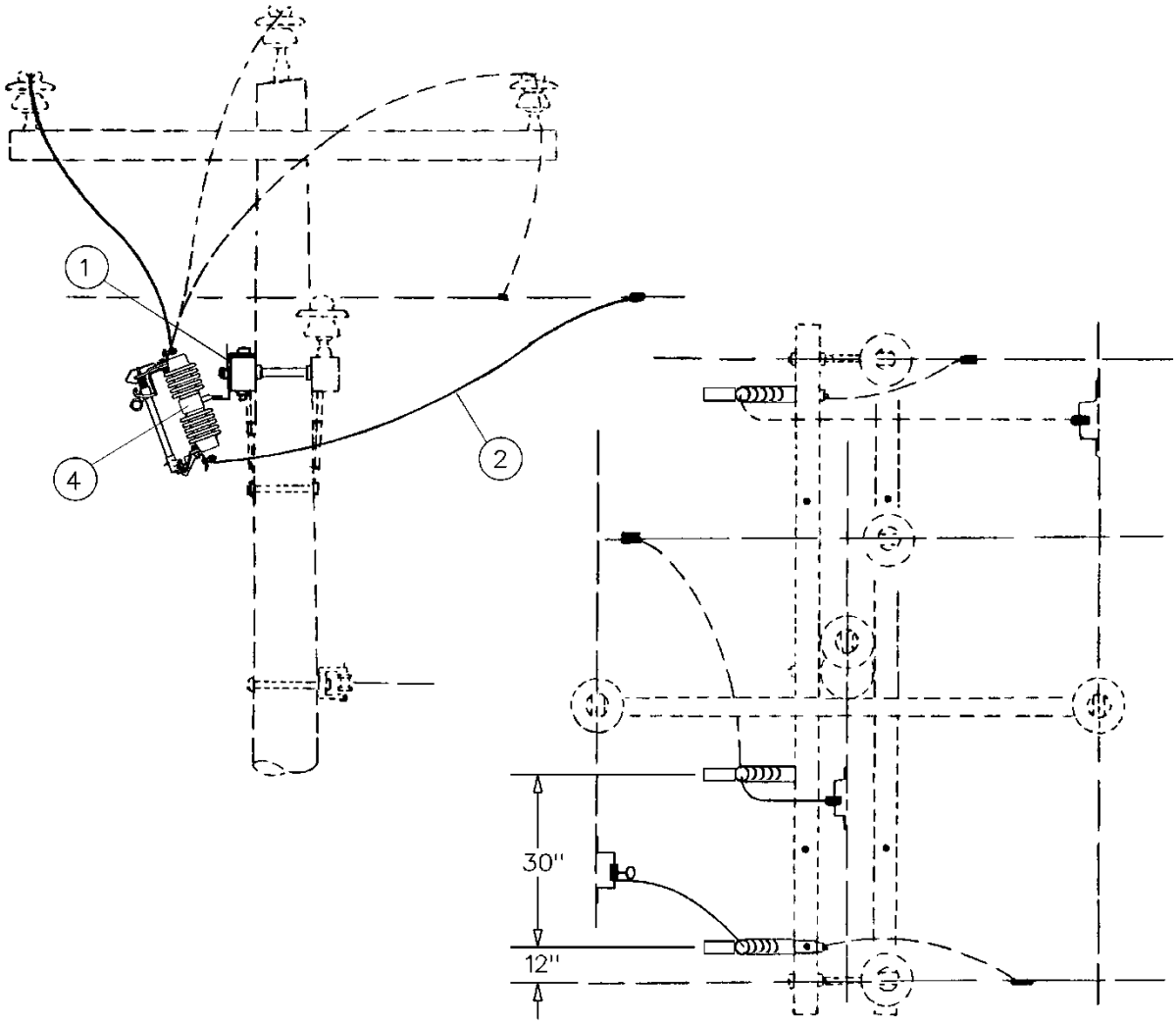


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT AC 003	1	BRACKET, CUTOUT OR ARRESTER, CROSSARM
2	COB CO 029	24	CONDUCTOR, COPPER, #2 SOLID
3	CNN CP 002	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
4	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
5	FUS OH ***	1	GENERAL CODE FOR T-LINK FUSE
	OR		
5	SEC EL 001	1	SECTIONALIZER, ELECTRONIC, 2-SHOT
	OR		
5	SEC EL 002	1	SECTIONALIZER, ELECTRONIC, 3-SHOT

F7

CROSSARM MOUNTED FUSE FOR CROSS

OPTIONS: 2S, 3S, 10T, 12T, 15T, 20T, 25T, 30T, 40T, 50T, 65T, 80T, 100T
BOLT PLATE: NONE

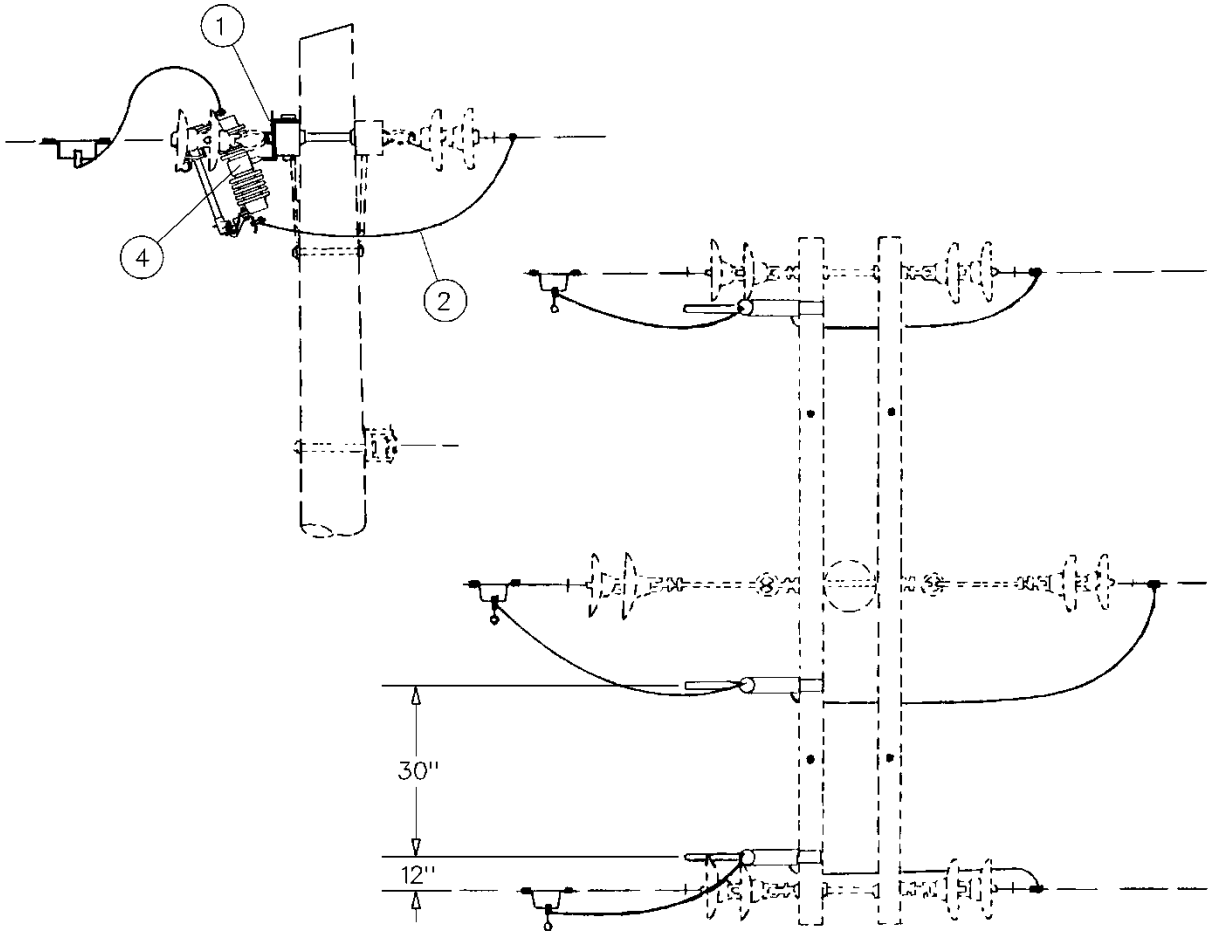


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT AC 003	1	BRACKET, CUTOUT OR ARRESTER, CROSSARM
2	COB CO 029	24	CONDUCTOR, COPPER, #2 SOLID
3	CNN CP 002	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
4	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
5	FUS OH ***	1	GENERAL CODE FOR T-LINK FUSE
	OR		
5	SEC EL 001	1	SECTIONALIZER, ELECTRONIC, 2-SHOT
	OR		
5	SEC EL 002	1	SECTIONALIZER, ELECTRONIC, 3-SHOT

F8

CROSSARM MOUNTED FUSE FOR SECTIONALIZING

OPTIONS: 2S, 3S, 10T, 12T, 15T, 20T, 25T, 30T, 40T, 50T, 65T, 80T, 100T
BOLT PLATE: NONE

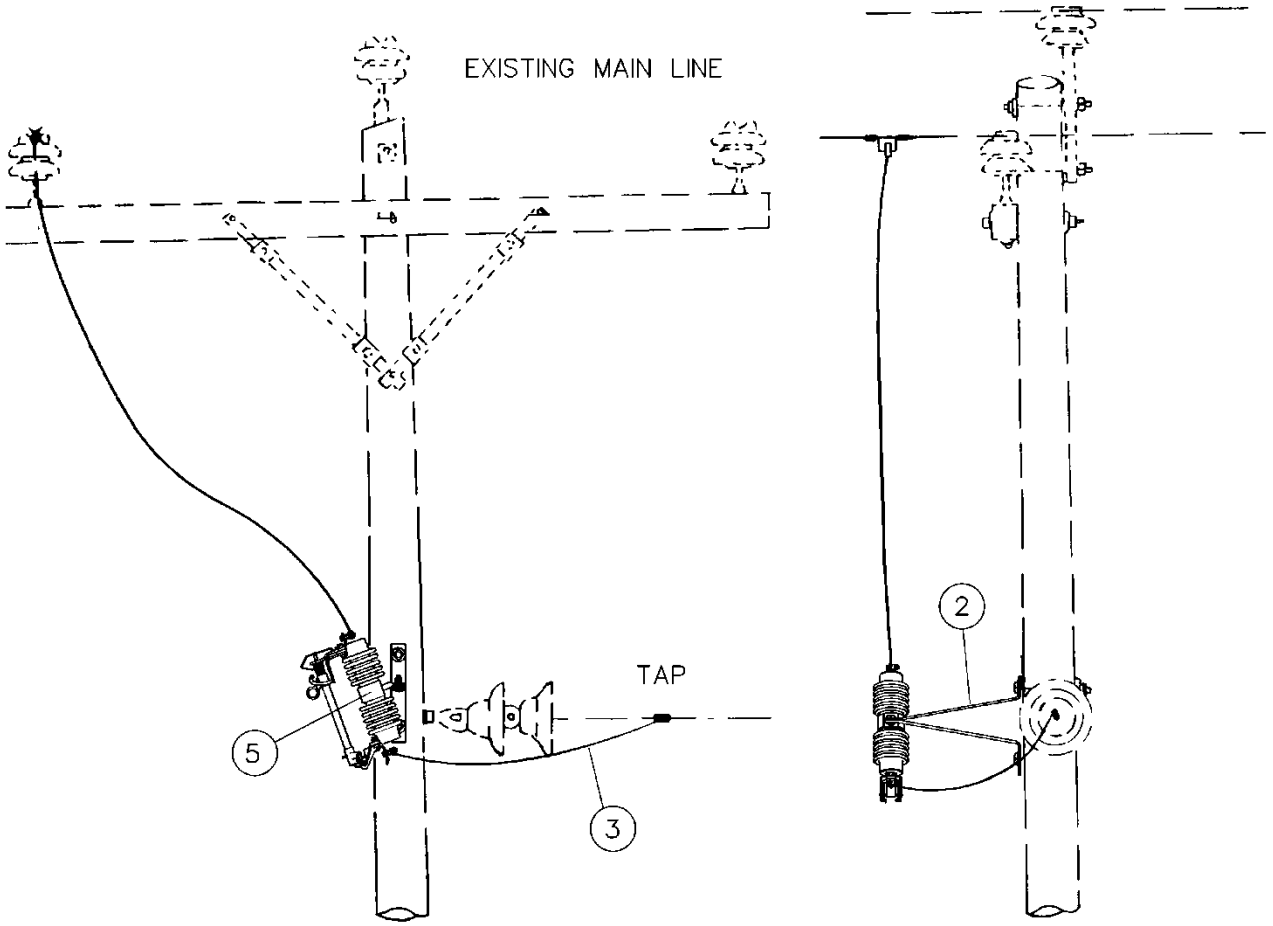


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT AC 003	1	BRACKET, CUTOUT OR ARRESTER, CROSSARM
2	COB CO 029	24	CONDUCTOR, COPPER, #2 SOLID
3	CNN CP 002	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
4	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
5	FUS OH ***	1	GENERAL CODE FOR T-LINK FUSE
	OR		
5	SEC EL 001	1	SECTIONALIZER, ELECTRONIC, 2-SHOT
	OR		
5	SEC EL 002	1	SECTIONALIZER, ELECTRONIC, 3-SHOT

F9

SINGLE PHASE TAP FUSE FROM CROSSARM OR POLETOP PIN

OPTIONS: 2S, 3S, 10T, 12T, 15T, 20T, 25T, 30T, 40T, 50T, 65T, 80T, 100T
BOLT PLATE: NONE

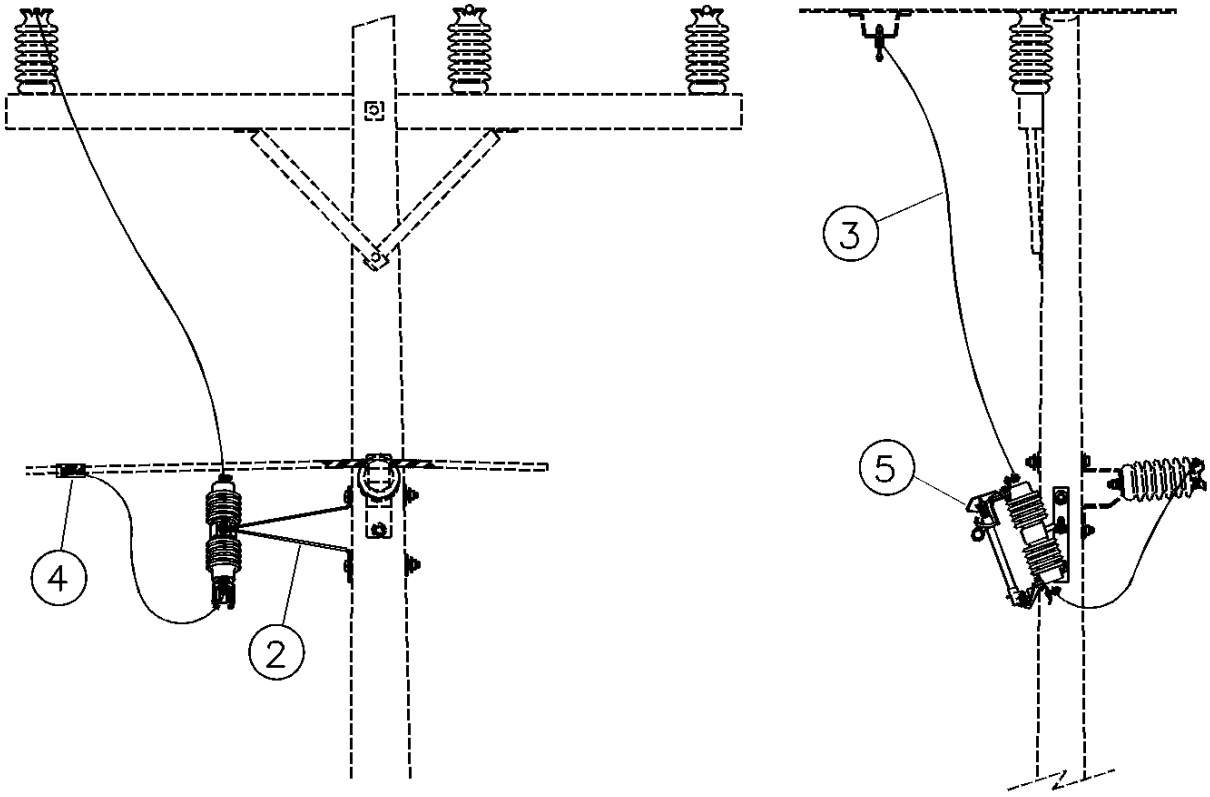


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD, 3/4X14
2	BKT AC 007	1	BRACKET, CUTOUT OR ARRESTER, MODIFIED WISHBONE
3	COB CO 029	12	CONDUCTOR, COPPER, #2 SOLID
4	CNN CP 002	2	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
5	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
6	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
7	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
8	WAS SF 004	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
9	FUS OH ***	1	GENERAL CODE FOR T-LINK FUSE
	OR		
9	SEC EL 001	1	SECTIONALIZER, ELECTRONIC, 2-SHOT
	OR		
9	SEC EL 002	1	SECTIONALIZER, ELECTRONIC, 3-SHOT

F10

SINGLE PHASE CROSS FUSE FROM CROSSARM OR POLETOP PIN

OPTIONS: 2S, 3S, 10T, 12T, 15T, 20T, 25T, 30T, 40T, 50T, 65T, 80T, 100T
BOLT PLATE: NONE

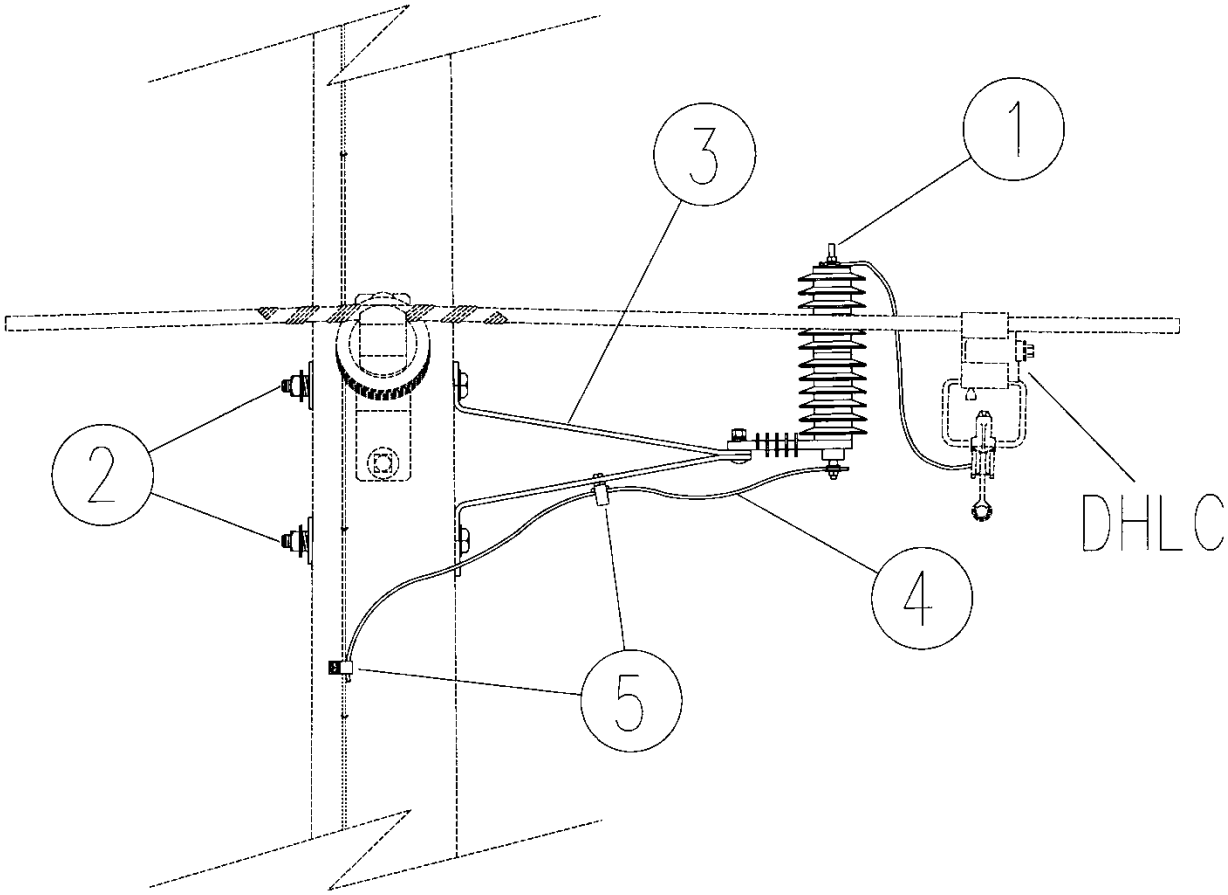


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD, 3/4X14
2	BKT AC 007	1	BRACKET, CUTOUT OR ARRESTER, MODIFIED WISHBONE
3	COB CO 029	12	CONDUCTOR, COPPER, #2 SOLID
4	CNN CP 002	2	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
5	CUT OT 004	1	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
6	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
7	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
8	WAS SF 004	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
9	FUS OH ***	1	GENERAL CODE FOR T-LINK FUSE
	OR		
9	SEC EL 001	1	SECTIONALIZER, ELECTRONIC, 2-SHOT
	OR		
9	SEC EL 002	1	SECTIONALIZER, ELECTRONIC, 3-SHOT

F11

ARRESTER STATION – VERTICAL CONSTRUCTION

OPTIONS: 3, 10, 21
BOLT PLATE: NONE

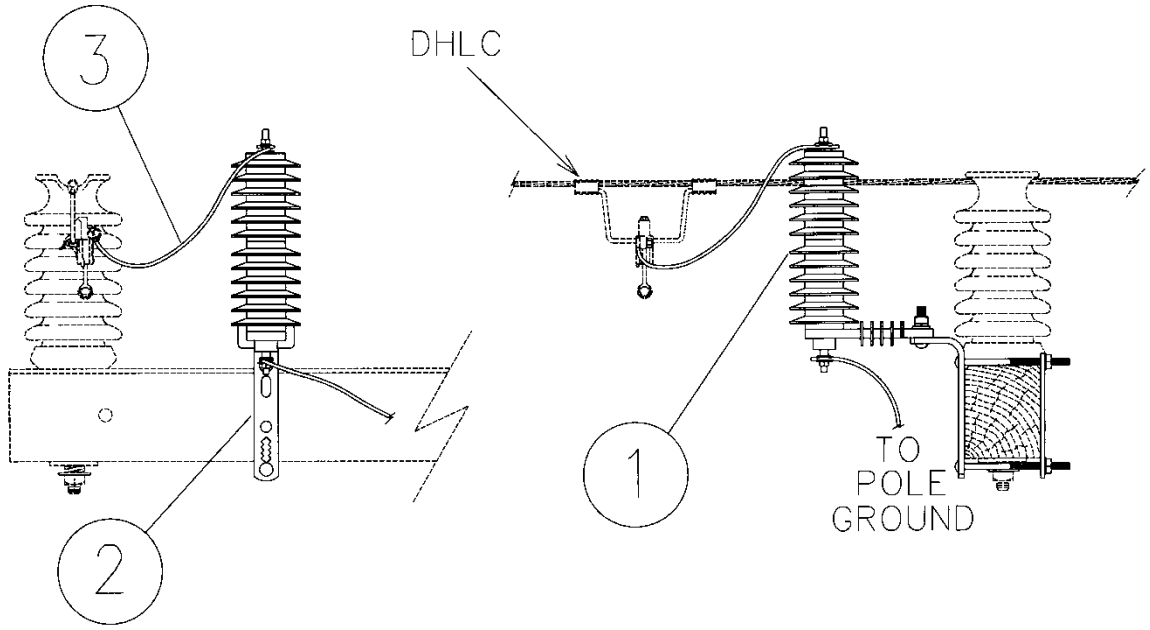


NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI ***	1	GENERAL CODE FOR ARRESTER, DISTRIBUTION CLASS, POLYMER
2	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD, 3/4X14
3	BKT AC 008	1	BRACKET, ARRESTER OR CUTOUT, SINGLE MOUNT, FIBERGLASS WITH RAYCHEM MATERIAL OVER ROD, TYPE: SINGLE PHASE
4	COB CO 028	12	CONDUCTOR, COPPER, #4 SOFT DRAWN
5	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
6	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
7	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
8	WAS SF 004	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT

F11-H

ARRESTER STATION – HORIZONTAL CONSTRUCTION

OPTIONS: 3, 10, 21
BOLT PLATE: NONE

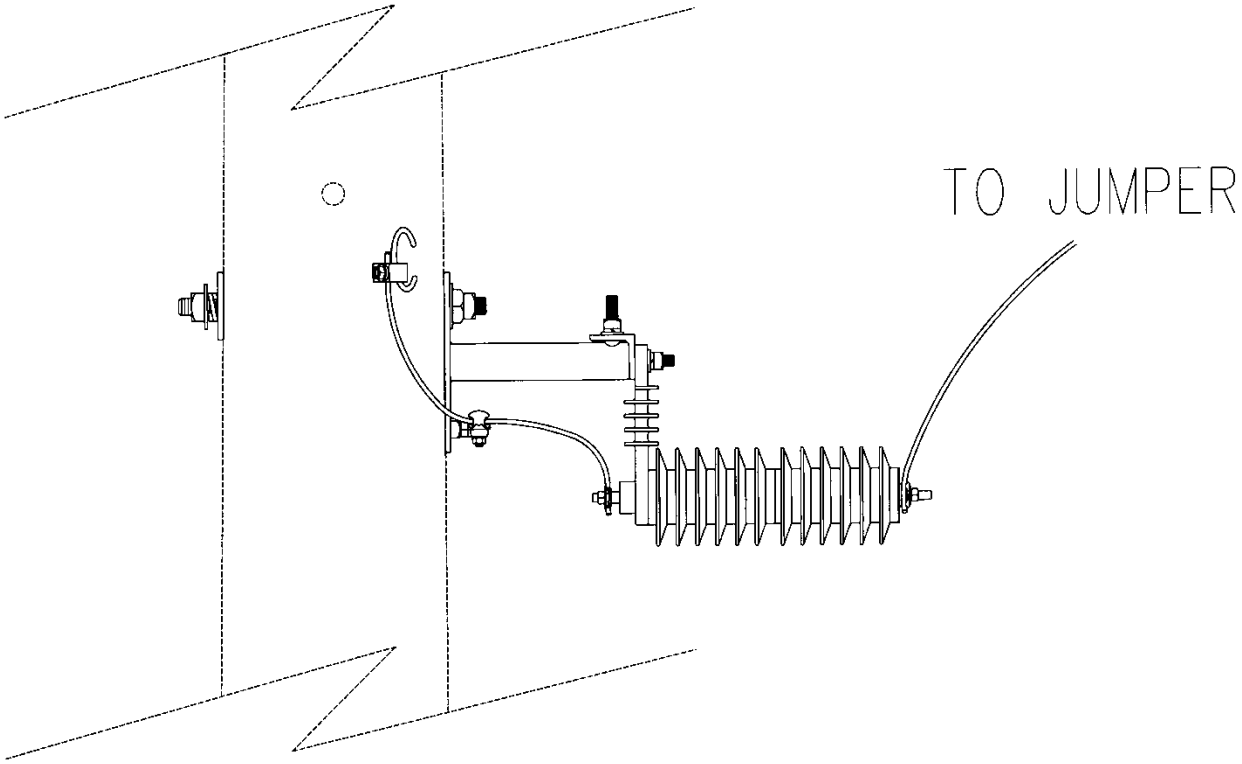


NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI ***	1	GENERAL CODE FOR ARRESTER, DISTRIBUTION CLASS, POLYMER, 21KV
2	BKT AC 003	1	BRACKET, CUTOUT OR ARRESTER, CROSSARM
3	COB CO 028	6	CONDUCTOR, COPPER, #4 SOFT DRAWN
4	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.

F11-S

SWITCH ARRESTER STATION – ONE SIDE

OPTIONS: 3, 10, 21
BOLT PLATE: NONE

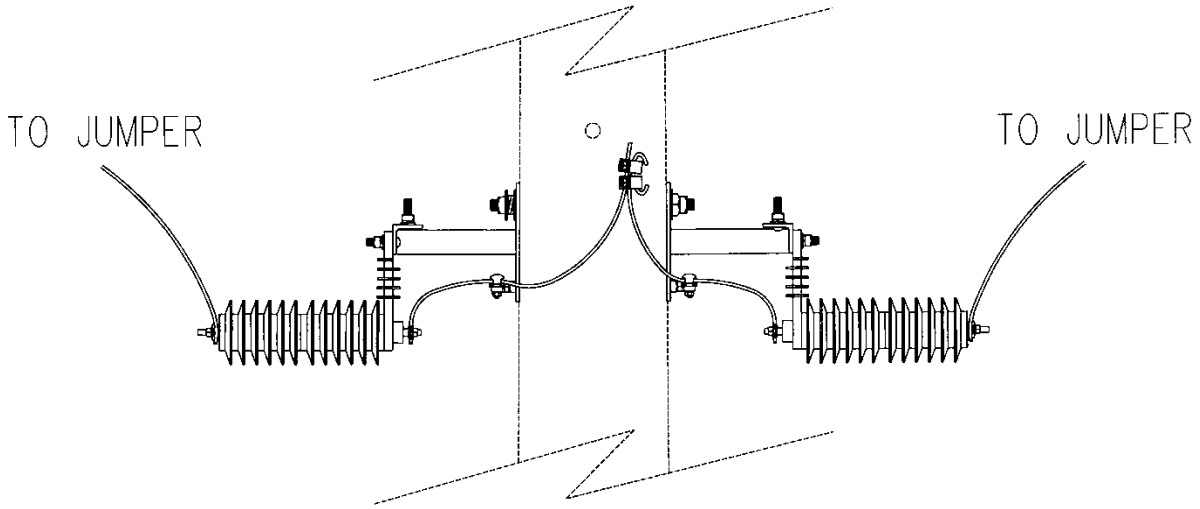


NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI ***	1	GENERAL CODE FOR ARRESTER, DISTRIBUTION CLASS, POLYMER, 21KV
2	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
3	BKT RP OO1	1	BRACKET, RISER POLE ARRESTER
4	CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND
5	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
6	COB CO 028	6	CONDUCTOR, COPPER, #4 SOFT DRAWN
7	WAS RD 005	2	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
8	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
9	WAS SF 004	1	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT

F11-SS

SWITCH ARRESTER STATION – TWO SIDES

OPTIONS: 3, 10, 21
BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI ***	2	GENERAL CODE FOR ARRESTER, DISTRIBUTION CLASS, POLYMER, 21KV
2	BOL DA 015	1	BOLT, DOUBLE ARMING, 3/4X14
3	BKT RP OO1	2	BRACKET, RISER POLE ARRESTER
4	CLA TG 001	2	CLAMP, TRANSFORMER TANK GROUND
5	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
6	COB CO 028	12	CONDUCTOR, COPPER, #4 SOFT DRAWN
7	WAS RD 005	3	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
8	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

FCRDA (FOR REFERENCE ONLY)

NOVA THREE-PHASE RECLOSER

OPTIONS: TIE
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ANC ST 001	30	ANCHOR, STUD BOLT, 1/4 X 3/4 IN.
2	BKT RE 001	1	BRACKET, RECLOSER JUMPER PIN
3	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4 X 14
4	BOLDA 016	4	BOLT, DOUBLE ARMING, 3/4 X 16
5	BOL MS 037	2	BOLT, MACHINE, SQUARE HEAD, 3/4X16
6	BOL MS 038	2	BOLT, MACHINE, SQUARE HEAD, 3/4X18
7	BOL TE 001	12	BOLT, TERMINAL KIT
8	CLA AR 003	6	CLAMP, ARRESTER HOT-LINE, 336-636
9	CLA TG 001	6	CLAMP, TRANS. TANK GROUND
10	COB AA 026	60	GENERAL CODE FOR 636MCM ALUMINUM CONDUCTOR
11	COB CO 028	20	CONDUCTOR, COPPER, #4 SOFT DRAWN
12	CNN TA 004	6	CONNECTOR, TAP, 636-636
13	CNN TE 047	6	CONNECTOR, TERMINAL, 2/0-800MCM
14	CNN VG 003	8	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
15	INS VP 001	2	INSULATOR, POST, 34.5kV
16	LOC PA 002	2	PADLOCK, BRASS
17	NUT PG 300	30	NUT, 1/4 - 20
18	REC CK 001	1	NOVA RECLOSER CABLE KIT
19	REC CO 001	1	NOVA FORM 5 CONTROL
20	REC DA 002	1	NOVA RECLOSER W/ 6 PT'S
21	STP ST 001	20	STRAP, STEEL, 1 IN.
22	WAS RD 002	30	WASHER, ROUND 1 IN. FOR 3/8 BOLT
23	WAS RD 005	17	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
24	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
25	WAS SP 002	7	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT

NOTES:

Recloser must be installed on a Class H concrete pole only.
The plate DS3-5 is used for bypassing the recloser for horizontal construction, and must be plated in addition to this construction standard. Also, the wood crossarms and braces need to be itemized out, and the steel crossarms itemized in. The plate DS5-5 is used for bypassing with vertical construction.
The plate ANTENNA must be plated separate also.
The new NOVA design is self-powered. Therefore, NO external 120V source is required.

FCRDA (FOR REFERENCE ONLY)

NOVA THREE-PHASE RECLOSER – VERTICAL CONSTRUCTION

NOTE: Antenna shown is not correct. A Yagi-type antenna is supplied with the ANTENNA plate as shown on the NOVA horizontal construction standard. Notice DS5-5 plate on back of pole used for bypassing the recloser.

FCRDA (FOR REFERENCE ONLY)

NOVA THREE-PHASE RECLOSER – HORIZONTAL CONSTRUCTION

NOTE: Use steel crossarms on concrete pole as shown. Plate DS3-5 must be modified using item plates to do this. Aim yagi-type antenna as directed by Communications Group. Antenna is plated separately using the ANTENNA plate.

FCRDA (FOR REFERENCE ONLY)

NOVA THREE-PHASE RECLOSER – CONTROL INSTALLATION

ANTENNA

ANTENNA FOR RECLOSER COMMUNICATION

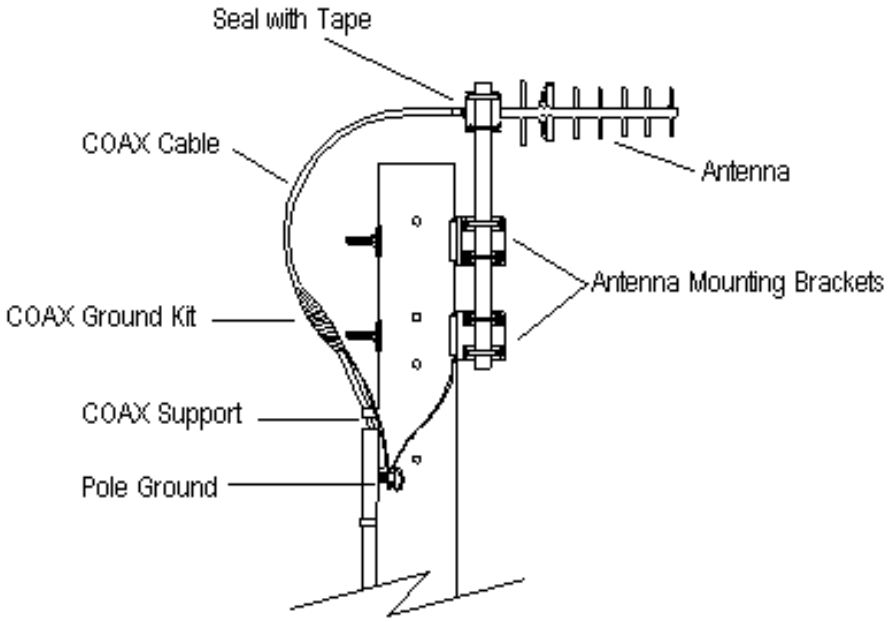
NO.	ITEM ID	QTY	DESCRIPTION
1	ANC ST 001	16	ANCHOR, STUD BOLT 1/4X3/4 IN.
2	BOL AN 002	16	BOLT, ANCHOR 1/4 IN. DIA. W/ WASHER
3	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD, 3/4X14
4	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
5	COD PC 016	20	CONDUIT, PVC, 1 IN. SCH40
6	COD SC 002	6	STRAP, PVC CONDUIT, 1 IN.
7	NUT PG 300	16	NUT, 1/4 IN.-20
8	RAD AN 002	1	ANTENNA, YAGI, 10DBI GAIN, 890-960 MHZ
9	RAD GR 001	2	ANTENNA GROUNDING KIT
10	RAD HG 001	1	COAXIAL CABLE HANGER KIT
11	RAD MP 001	1	1-1/2 IN. MOUNTING PIPE FOR ANTENNA
12	RAD MT 001	1	CLAMP, ANTENNA MOUNTING
13	STP ST 001	6	STRAP, CONDUIT, STEEL, 1 IN.
14	WAS RD 002	16	WASHER, ROUND, 1 IN. DIA. FOR 3/8 IN. BOLT
15	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
16	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT
17	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. BOLT
18	CO AKT 001	1	COAXIAL CABLE, GROUND KIT, PRE-MADE COAXIAL CONNECTOR

ANTENNA

ANTENNA FOR RECLOSER COMMUNICATION

OPTIONS: NONE
BOLT PLATE: NONE

POLETOP DETAIL



INSTALLATION NOTES:

1. The coaxial cable kit (COAKT001) is now supplied with the plate. The kit consists of the coaxial cable, pre-cold shrunk ground kit, and pre-made coaxial connector for antenna connection.
2. The antenna is to be mounted to the pipe and the pipe connected to the bayonet with the antenna mounting brackets rather than mounting the pipe to the pole.
3. Aim Yagi antenna as directed by the individual jobs. A compass is to be provided by the coordinator.
4. Install a coaxial support bracket above PVC pipe. Space the other supports four to five feet apart below the PVC pipe. Support the PVC pipe every 3 to 4 feet.
5. Bond the grounding strap installed on the coaxial cable to the pole ground using the connector "CNNVG003". Cut the Ground wire from the Coax to make the ground as short as possible, Do not make a curve in the ground wire. Orient the strap as shown. Ground antenna pipe to pole ground.
6. The PVC shall be run all the way down to the top of the control box.
7. The coaxial cable is to be coiled up and tie-wrapped to the control box.
8. The Telecommunications Group will then connect the coaxial cable to the box and install the radio.

FARS

SINGLE-PHASE RECLOSERS – VERTICAL CONSTRUCTION

SINGLE-PHASE APPLICATION

NO.	ITEM ID	QTY	DESCRIPTION
1	BKT AC 007	1	BRACKET; CUTOUT OR ARRESTER
2	ARR LI 003	2	ARRESTER; LIGHTNING 21KV POLYMER
3	BKT RP 001	2	BRACKET; RISER POLE ARRESTER
4	BKT TM 001	1	BRACKET; TRANSFORMER MOUNTING SIGNLE MOUNT
5	BOL MS 015	2	BOLT; MACHINE; SQUARE HEAD 5/8 X 2
6	BOL MS 036	5	BOLT; MACHINE; SQUARE HEAD ¾ X 14
7	CLA TG 001	3	CONNECTOR; TRANSFORMER TANK GROUND
8	CNN VG 003	3	CONNECTOR; VISE TYPE 6-2 SOL 10-2 SOL
9	COB CO 025	6	CONDUCTOR; BARE CU 6 SOL SOFT DRAWN
10	COB CO 028	30	CONDUCTOR; BARE CU 4 SOL SOFT DRAWN
11	CUT OT 004	1	CUTOUT; FUSED; 150KV BIL; 100 AMP; 27KV
12	FUS OH 011	1	FUSE LINK; TYPE T 100 AMP
13	INS VP 001	1	INSULATOR; POST 35KV
14	REC SP 001	1	70-A, 26 INCH CREEP BUSHINGS
15	STU LI 001	1	STUD; LINE POST ¾ HEAD-3/4 DIAX1-3/4
16	WAS RD 005	16	WASHER; ROUND 2 DIA. ¾ BOLT
17	WAS SF 004	4	WASHER; SQ. FLAT 4 SQ. X ¼ IN. 7/8 BOLT
18	WAS SP 002	8	WASHER; SPRING DOUBLE HELIX FOR ¾ IN.

FARS

SINGLE-PHASE RECLOSERS – VERTICAL CONSTRUCTION

SINGLE-PHASE APPLICATION

FBRS

SINGLE-PHASE RECLOSERS – VERTICAL CONSTRUCTION

2-PHASE APPLICATION

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	4	ARRESTER; LIGHTNING 21KV POLYMER
2	BKT AC 007	2	BRACKET; CUTOUT OR ARRESTER
3	BKT RE 001	1	BRACKET; 3-PHASE RECLOSER OR SECT. JUMPER
4	BKT RP 001	4	BRACKET; RISER POLE ARRESTER
5	BKT TM 001	2	BRACKET; TRANSFORMER MOUNTING SIGNLE MOUNT
6	BOL MS 015	4	BOLT; MACHINE; SQUARE HEAD 5/8 X 2
7	BOL MS 036	10	BOLT; MACHINE; SQUARE HEAD ¾ X 14
8	CLA TG 001	6	CONNECTOR; TRANSFORMER TANK GROUND
9	CNN VG 003	6	CONNECTOR; VISE TYPE 6-2 SOL 10-2 SOL
10	COB CO 025	6	CONDUCTOR; BARE CU 6 SOL SOFT DRAWN
11	COB CO 028	40	CONDUCTOR; BARE CU 4 SOL SOFT DRAWN
12	CUT OT 004	2	CUTOUT; FUSED; 150KV BIL; 100 AMP; 27KV
13	FUS OH 011	2	FUSE LINK; TYPE T 100 AMP
14	INS VP 001	2	INSULATOR; POST 35KV
15	REC SP 001	2	70-A, 26 INCH CREEP BUSHINGS
16	STU LI 001	2	STUD; LINE POST ¾ HEAD-3/4 DIAX1-3/4
17	WAS RD 005	24	WASHER; ROUND 2 DIA. ¾ BOLT
18	WAS SF 004	4	WASHER; SQ. FLAT 4 SQ. X ¼ IN. 7/8 BOLT
19	WAS SP 002	10	WASHER; SPRING DOUBLE HELIX FOR ¾ IN.

FBRS

SINGLE-PHASE RECLOSERS – VERTICAL CONSTRUCTION

2-PHASE APPLICATION

OPTIONS: 2
BOLT PLATE: NONE

FCRSH

SINGLE-PHASE RECLOSERS – HORIZONTAL CONSTRUCTION

3-PHASE APPLICATION

OPTIONS: 70*2, 70*1/0, 200*2, 200*1/0

NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	6	ARRESTER; LIGHTNING 21KV POLYMER
2	BKT AC 003	9	BRACKET; CROSSARM MOUNTING CUTOUTS OR ARRESTERS
3	BKT TM 001	3	BRACKET; TRANSFORMER MOUNTING SINGLE MOUNT
4	BOL DA 015	1	BOLT; DOUBLE ARMING ¾ x 14
5	BOL DA 016	2	BOLT; DOUBLE ARMING ¾ x 16
6	BOL DA 021	8	BOLT; DOUBLE ARMING ¾ x 26
7	BOL MS 015	6	BOLT; MACHINE; SQUARE HEAD 5/8 x 2
8	BOL MS 036	3	BOLT; MACHINE; SQUARE HEAD 3/4 x 14
9	CLA HL 001	12	CLAMP; HOTLINE 6SOL-1/0STR
10	CLA SS 004	6	CLAMP; STRAIGHT STRAIN 4-3/0 AL
11	CLA TG 001	3	CONNECTOR; TRANSFORMER TANK GROUND
12	CNN VG 003	6	CONNECTOR; VISE TYPE 6-2 SOL 10-2 SOL
13	COB CO 028	24	CONDUCTOR; BARE CU 4 SOL SOFT DRAWN
14	CUT OT 004	3	CUTOUT; FUSED, 150KV BIL, 100 AMP, 27KV
15	FUS OH 011	3	FUSE, OVERHEAD DISTRIBUTION, 100T FULL LINK DESIGNATION
16	CXA FG 001	1	CROSSARM; FIBERGLASS, 3 5/8" x 4 5/8" X 10'
17	GUA AN 002	6	GUARD; ANIMAL, MINI SHED MOUNT
18	GUA AN 006	3	GUARD; ANIMAL, FOR FUSE CUTOUTS, JEA UNIVERSAL DESIGN
19	INS CO 001	6	INSULATOR; DEADEND, SILICONE RUBBER, 34.5 KV
20	INS VP 001	1	INSULATOR; POST 35KV
21	NUT EY 003	6	NUT; EYE 3/4
22	WAS RD 005	35	WASHER; ROUND 2 DIA. ¾ BOLT
23	WAS SF 003	4	WASHER; SQ. FLAT 3 SQ. x ¼ in. 5/8 & ¾ BOLT
24	WAS SP 002	10	WASHER; SPRING DOUBLE HELIX FOR ¾ in.
25	REC SP ***	3	GENERAL CODE FOR RECLOSER, SINGLE-PHASE, 150KV BIL
26	CAI RH ***	75	GENERAL CODE FOR COVERED TAP WIRE

FCRSH

SINGLE-PHASE RECLOSERS – HORIZONTAL CONSTRUCTION

3-PHASE APPLICATION

OPTIONS: 70*2, 70*1/0, 200*2, 200*1/0

FCRSV

SINGLE-PHASE RECLOSERS – VERTICAL CONSTRUCTION

3-PHASE APPLICATION

OPTIONS: 70*2, 70*1/0, 200*2, 200*1/0

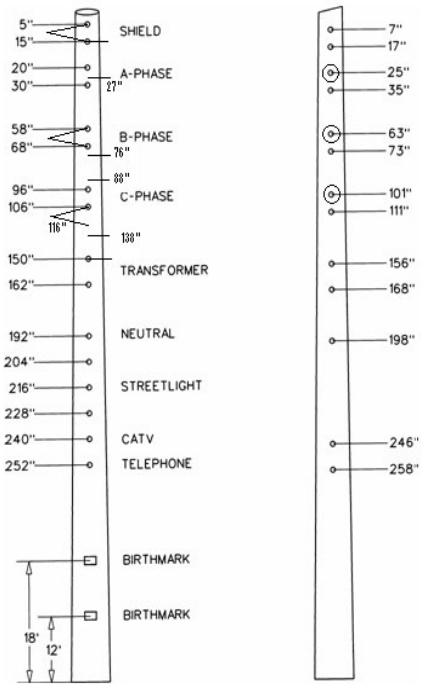
NO.	ITEM ID	QTY	DESCRIPTION
1	ARR LI 003	6	ARRESTER; LIGHTNING 21KV POLYMER
2	BKT AC 007	3	BRACKET, ARRESTER OR CUTOUT, MODIFIED WISHBONE TYPE
3	BKT RP 001	6	BRACKET, RISER POLE ARRESTER
4	BKT TM 001	3	BRACKET; TRANSFORMER MOUNTING SINGLE MOUNT
5	BOL DA 015	2	BOLT; DOUBLE ARMING ¾ x 14
6	BOL DA 016	8	BOLT; DOUBLE ARMING ¾ x 16
7	BOL MS 015	6	BOLT; MACHINE; SQUARE HEAD 5/8 x 2
8	BOL MS 036	3	BOLT; MACHINE; SQUARE HEAD 3/4 x 14
9	BOL MS 037	4	BOLT; MACHINE; SQUARE HEAD 3/4 x 16
10	CLA HL 001	12	CLAMP, HOTLINE 6SOL-1/0STR
11	CLA SS 004	6	CLAMP; STRAIGHT STRAIN 4-3/0 AL
12	CLA TG 001	3	CONNECTOR; TRANSFORMER TANK GROUND
13	CNN VG 003	6	CONNECTOR; VISE TYPE 6-2 SOL 10-2 SOL
14	COB CO 028	24	CONDUCTOR; BARE CU 4 SOL SOFT DRAWN
15	CUT OT 004	3	CUTOUT, FUSED, 150KV BIL, 100 AMP, 27KV
16	FUS OH 011	3	FUSE, OVERHEAD DISTRIBUTION, 100T FULL LINK DESIGNATION
17	GUA AN 002	6	GUARD, ANIMAL, FOR USE WITH ENGERGIZED TRANSFORMERS
18	GUA AN 006	3	GUARD, ANIMAL, FOR FUSE CUTOUTS, JEA UNIVERSAL DESIGN
19	INS CO 001	6	INSULATOR; DEADEND, SILICONE RUBBER, 34.5 KV
20	NUT EY 003	6	NUT; EYE 3/4
21	WAS RD 005	35	WASHER; ROUND 2 DIA. ¾ BOLT
22	WAS SF 003	4	WASHER; SQ. FLAT 3 SQ. x ¼ in. 5/8 & ¾ BOLT
23	WAS SP 002	10	WASHER; SPRING DOUBLE HELIX FOR ¾ in.
24	REC SP ***	3	GENERAL CODE FOR RECLOSER, SINGLE-PHASE, 150KV BIL
25	CAI RH ***	75	GENERAL CODE FOR COVERED TAP WIRE

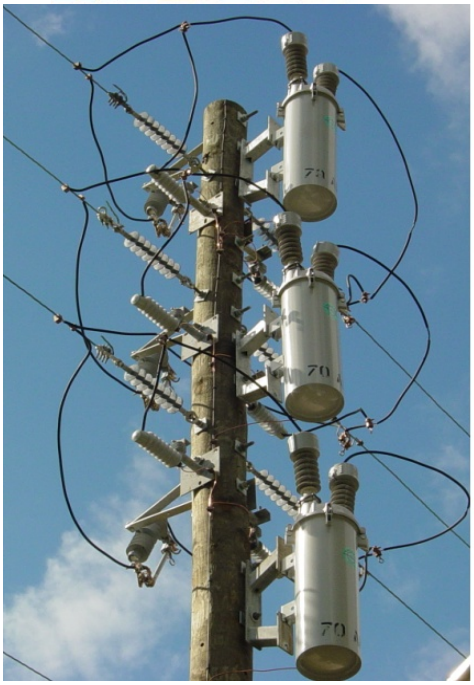
FCRSV

SINGLE-PHASE RECLOSERS – VERTICAL CONSTRUCTION

3-PHASE APPLICATION

OPTIONS: 70*2, 70*1/0, 200*2, 200*1/0





AR-TSE

OVR-3SP THREE-PHASE RECLOSER – VERTICAL CONSTRUCTION

OPTIONS: TIE

BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ANC ST 001	30	ANCHOR, STUD BOLT, 1/4 X 3/4 IN.
2	ADC MI 002	1	CEMENT; PVC PIPE
3	BKT RE 001	1	BRACKET, RECLOSER JUMPER PIN
4	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4 X 14
5	BOL DA 016	5	BOLT, DOUBLE ARMING, 3/4 X 16
6	BOL MS 037	2	BOLT, MACHINE, SQUARE HEAD, 3/4X16
7	BOL MS 038	2	BOLT, MACHINE, SQUARE HEAD, 3/4X18
8	BOL TE 001	24	BOLT, TERMINAL KIT
9	CAI RH 010	30	#4 COVERED COPPER
10	CAI UF 001	40	CABLE, STREETLIGHT UF 12 CU 2/C
11	CLA AR 003	6	CLAMP, ARRESTER HOT-LINE, 336-636
12	CLA TG 001	6	CLAMP, TRANS. TANK GROUND
13	COB AA 026	90	GENERAL CODE FOR 636MCM ALUMINUM CONDUCTOR
14	COB CO 028	40	CONDUCTOR, COPPER, #4 SOFT DRAWN
15	COB TW 004	20	TIE WIRE, ALUMINUM INSULATED
16	CNN TA 004	6	CONNECTOR, TAP, 636-636
17	CNN TL 029	6	TERMINAL; COMPRESSION, 4 HOLE, 636AAC
18	CNN VG 003	8	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
19	COD AF 010	1	1” SCHEDULE 40 PVC LB
20	FUS OH 005	1	FUSE, OVERHEAD DISTRIBUTION, 23" MINIMUM LENGTH, 25T.
21	COD EF 002	2	CONNECTOR, FLEXIBLE PVC, 90 DEGREE; 1 IN
22	COD PC 016	40	CONDUIT; PVC; 1 IN DIA; SCHEDULE 40
23	COD PC 017	10	CONDUIT; FLEXIBLE PVC; 1 IN DIA
24	COD WH 002	1	WEATHERHEAD; PVC; FOR 1 IN DIA PIPE
25	GUA AN 007	6	GUARD, ANIMAL, FOR ARRESTERS
26	INS VP 001	2	INSULATOR, POST, 34.5kV
27	LOC PA 002	2	PADLOCK, BRASS
28	NUT PG 300	30	NUT, 1/4 - 20
29	SWE RC 002	1	RECLOSER, CONTROL, FOR USE WITH SWE RC 001
30	REC GU 001	6	GUARD, ANIMAL, RECLOSER TERMINAL COVER
31	REC GU 002	100	GUARD, ANIMAL, RECLOSER LINE INSULATION
32	SWE RC 001	1	RECLOSER, THREE-PHASE, WITH 3 INTERNAL VOLTAGE SENSORS
33	STP ST 001	25	STRAP, STEEL, 1 IN.
34	FUS UG 046	1	FUSE, 1-TIME, 20-AMP, 125-VOLT, FERRULE TYPE-B
35	TIE CA 002	25	TIE, CABLE, 24” LENGTH
36	WAS RD 002	30	WASHER, ROUND 1 IN. FOR 3/8 BOLT
37	WAS RD 005	17	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
38	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT

AR-TSE

OVR-3SP THREE-PHASE RECLOSER – VERTICAL CONSTRUCTION

NOTES:

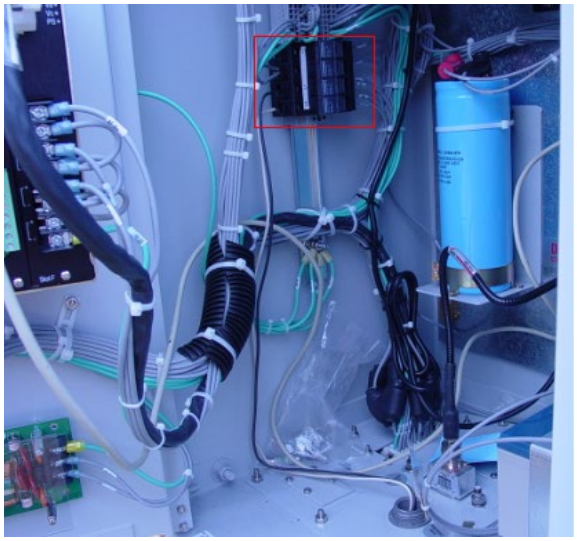
1) Pre-crimped jumper CNN JU 002 includes the jumper and pad connector.
2) The pad-to-pad connection shall be torqued to 40 ft-lbs.
3) The control box is powered with 120V. Streetlight 12/2 is to be run from the secondary, into the weatherhead, through the 1" PVC pipe, into the PVC LB, to the AC disconnect, then to the control box via 1" flexible PVC and 90 degree connectors. Inside, the hot leg is connected to L1 and the neutral to L2.
4) The control cables are run from each recloser to the junction box at the appropriate phase and a single control cable is run down the pole via 1" steel straps and connected to the bottom of the control box. Any slack should be coiled and tied with cable ties.
5) Each individual recloser and each side frame shall be grounded.
6) The recloser line insulation shall cover the 636AAC jumper from the 4 hole terminal connector to the wedge tap connector. It should only be cut to install the arrester clamp.
7) The recloser channel should be installed in the transformer positions. The top two holes are 12" apart and the third hole is 50.75" from the top hole.

AR-TSE

OVR-3SP THREE-PHASE RECLOSER – VERTICAL CONSTRUCTION

AR-TSE

OVR-3SP THREE-PHASE RECLOSER – CONTROL INSTALLATION



AR-TSH

OVR-3SP THREE-PHASE RECLOSER – HORIZONTAL CONSTRUCTION

OPTIONS: TIE

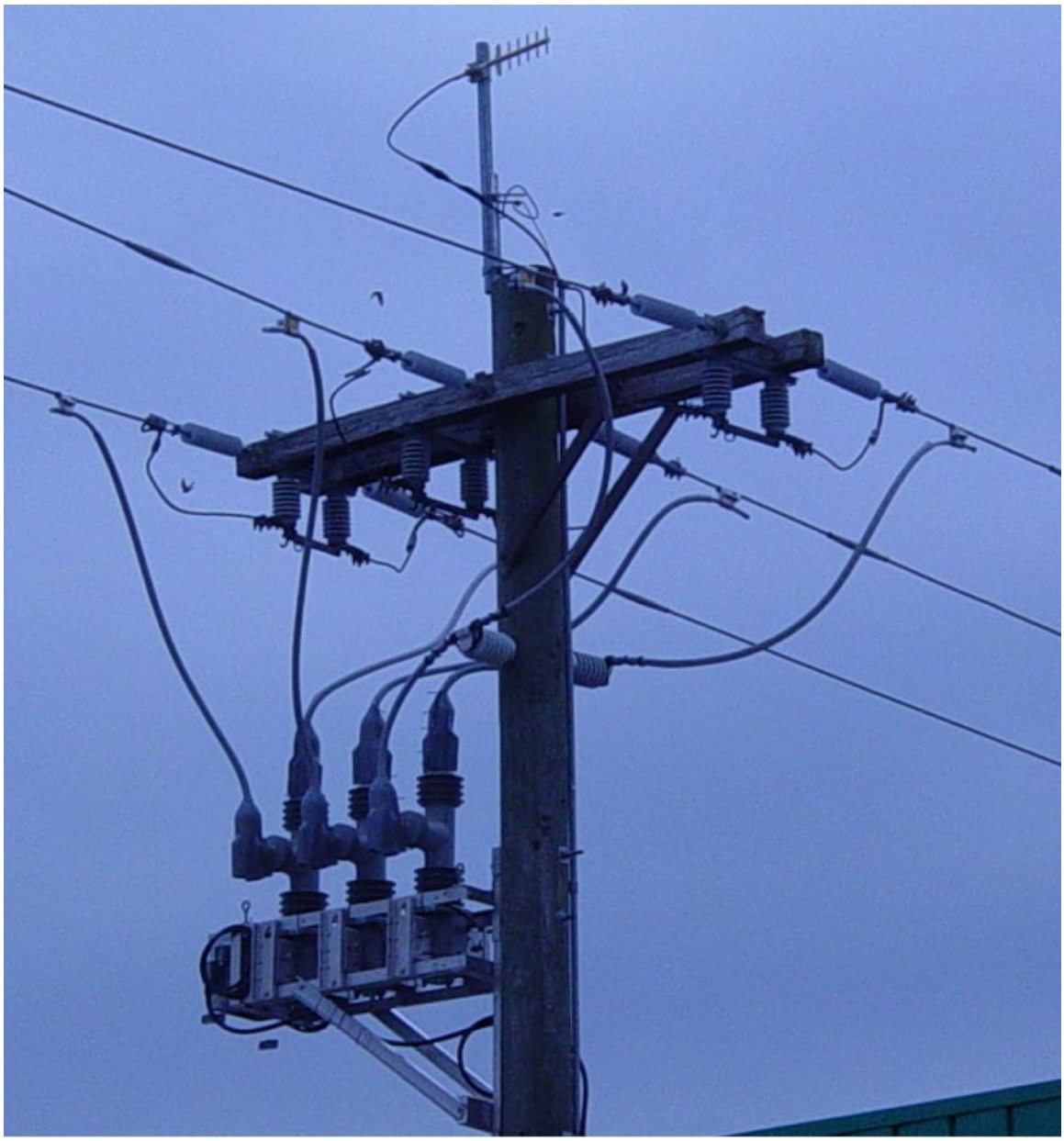
BOLT PLATE: NONE

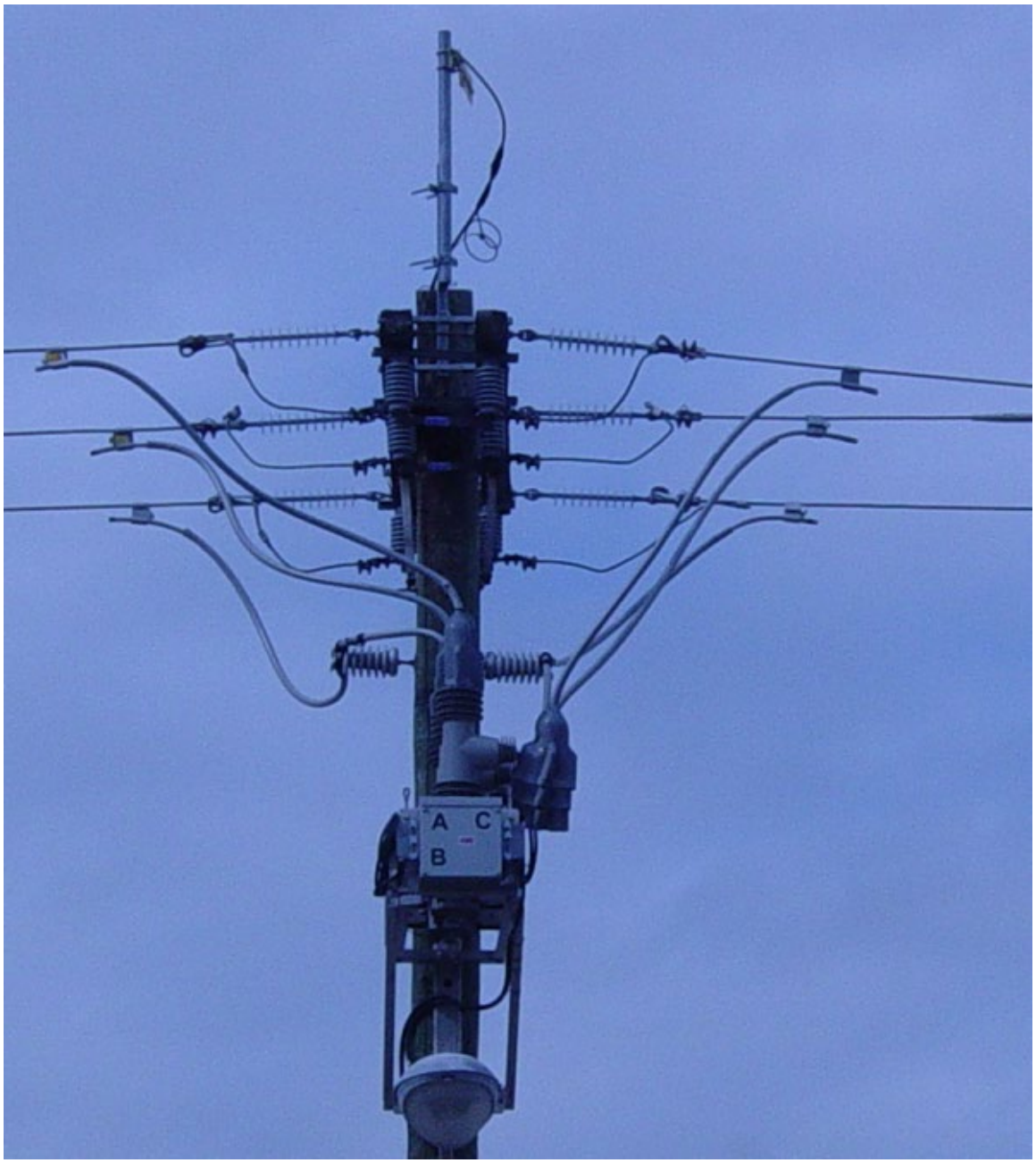
NO.	ITEM ID	QTY	DESCRIPTION
1	ANC ST 001	30	ANCHOR, STUD BOLT, 1/4 X 3/4 IN.
2	ADC MI 002	1	CEMENT; PVC PIPE
3	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4 X 14
4	BOL DA 016	5	BOLT, DOUBLE ARMING, 3/4 X 16
5	BOL MS 037	2	BOLT, MACHINE, SQUARE HEAD, 3/4X16
6	BOL MS 038	2	BOLT, MACHINE, SQUARE HEAD, 3/4X18
7	BOL TE 001	24	BOLT, TERMINAL KIT
8	CAI RH 010	30	#4 COVERED COPPER
9	CAI UF 001	40	CABLE, STREETLIGHT UF 12 CU 2/C
10	CLA AR 003	6	CLAMP, ARRESTER HOT-LINE, 336-636
11	CLA TG 001	6	CLAMP, TRANS. TANK GROUND
12	COB AA 026	90	GENERAL CODE FOR 636MCM ALUMINUM CONDUCTOR
13	COB CO 028	40	CONDUCTOR, COPPER, #4 SOFT DRAWN
14	COB TW 004	20	TIE WIRE, ALUMINUM INSULATED
15	CNN TA 004	6	CONNECTOR, TAP, 636-636
16	CNN TL 029	6	TERMINAL; COMPRESSION, 4 HOLE, 636AAC
17	CNN VG 003	8	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
18	COD AF 010	1	1” SCHEDULE 40 PVC LB
19	FUS OH 005	1	FUSE, OVERHEAD DISTRIBUTION, 23" MINIMUM LENGTH, 25T.
20	COD EF 002	2	CONNECTOR, FLEXIBLE PVC, 90 DEGREE; 1 IN
21	COD PC 016	40	CONDUIT; PVC; 1 IN DIA; SCHEDULE 40
22	COD PC 017	10	CONDUIT; FLEXIBLE PVC; 1 IN DIA
23	COD WH 002	1	WEATHERHEAD; PVC; FOR 1 IN DIA PIPE
24	GUA AN 007	6	GUARD, ANIMAL, FOR ARRESTERS
25	INS VP 001	2	INSULATOR, POST, 34.5kV
26	LOC PA 002	2	PADLOCK, BRASS
27	NUT PG 300	30	NUT, 1/4 - 20
28	SWE RC 002	1	RECLOSER, CONTROL, FOR USE WITH SWE RC 001
29	REC GU 001	6	GUARD, ANIMAL, RECLOSER TERMINAL COVER
30	REC GU 002	100	GUARD, ANIMAL, RECLOSER LINE INSULATION
31	SWE RC 001	1	RECLOSER, THREE-PHASE, WITH 3 INTERNAL VOLTAGE SENSORS
32	STP ST 001	25	STRAP, STEEL, 1 IN.
33	FUS UG 046	1	FUSE, 1-TIME, 20-AMP, 125-VOLT, FERRULE TYPE-B
34	TIE CA 002	25	TIE, CABLE, 24” LENGTH
35	WAS RD 002	30	WASHER, ROUND 1 IN. FOR 3/8 BOLT
36	WAS RD 005	17	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
37	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT

The material in plate is the same as AR-TSE, except that there is no recloser spreader bracket BKT RE 001.

AR-TSH

OVR-3SP THREE-PHASE RECLOSER – HORIZONTAL CONSTRUCTION

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DG-TSE

OVR-3SP THREE-PHASE RECLOSER – VERTICAL CONSTRUCTION

OPTIONS: TIE

BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ANC ST 001	30	ANCHOR, STUD BOLT, 1/4 X 3/4 IN.
2	ADC MI 002	1	CEMENT; PVC PIPE
3	BKT RE 001	1	BRACKET, RECLOSER JUMPER PIN
4	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4 X 14
5	BOL DA 016	5	BOLT, DOUBLE ARMING, 3/4 X 16
6	BOL MS 037	2	BOLT, MACHINE, SQUARE HEAD, 3/4X16
7	BOL MS 038	2	BOLT, MACHINE, SQUARE HEAD, 3/4X18
8	BOL TE 001	24	BOLT, TERMINAL KIT
9	CAI RH 010	30	#4 COVERED COPPER
10	CAI UF 001	40	CABLE, STREETLIGHT UF 12 CU 2/C
11	CLA AR 003	6	CLAMP, ARRESTER HOT-LINE, 336-636
12	CLA TG 001	6	CLAMP, TRANS. TANK GROUND
13	COB AA 026	90	GENERAL CODE FOR 636MCM ALUMINUM CONDUCTOR
14	COB CO 028	40	CONDUCTOR, COPPER, #4 SOFT DRAWN
15	COB TW 004	20	TIE WIRE, ALUMINUM INSULATED
16	CNN TA 004	6	CONNECTOR, TAP, 636-636
17	CNN TL 029	6	TERMINAL; COMPRESSION, 4 HOLE, 636AAC
18	CNN VG 003	8	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
19	COD AF 010	1	1” SCHEDULE 40 PVC LB
20	FUS OH 005	1	FUSE, OVERHEAD DISTRIBUTION, 23" MINIMUM LENGTH, 25T.
21	COD EF 002	2	CONNECTOR, FLEXIBLE PVC, 90 DEGREE; 1 IN
22	COD PC 016	40	CONDUIT; PVC; 1 IN DIA; SCHEDULE 40
23	COD PC 017	10	CONDUIT; FLEXIBLE PVC; 1 IN DIA
24	COD WH 002	1	WEATHERHEAD; PVC; FOR 1 IN DIA PIPE
25	GUA AN 007	6	GUARD, ANIMAL, FOR ARRESTERS
26	INS VP 001	2	INSULATOR, POST, 34.5kV
27	LOC PA 002	2	PADLOCK, BRASS
28	NUT PG 300	30	NUT, 1/4 - 20
29	SWE RC 002	1	RECLOSER, CONTROL, FOR USE WITH SWE RC 003
30	REC GU 001	6	GUARD, ANIMAL, RECLOSER TERMINAL COVER
31	REC GU 002	100	GUARD, ANIMAL, RECLOSER LINE INSULATION
32	SWE RC 003	1	RECLOSER, THREE-PHASE, WITH 6 INTERNAL VOLTAGE SENSORS
33	STP ST 001	25	STRAP, STEEL, 1 IN.
34	FUS UG 046	1	FUSE, 1-TIME, 20-AMP, 125-VOLT, FERRULE TYPE-B
35	TIE CA 002	25	TIE, CABLE, 24” LENGTH
36	WAS RD 002	30	WASHER, ROUND 1 IN. FOR 3/8 BOLT
37	WAS RD 005	17	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
38	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT

NOTES:

1. The T&B recloser should be installed with the internal PT's on the source side (JEA) of the recloser and the external PT's facing the load side (customer).

DG-TSH

OVR-3SP THREE-PHASE RECLOSER – HORIZONTAL CONSTRUCTION

OPTIONS: TIE

BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	ANC ST 001	30	ANCHOR, STUD BOLT, 1/4 X 3/4 IN.
2	ADC MI 002	1	CEMENT; PVC PIPE
3	BOL DA 015	2	BOLT, DOUBLE ARMING, 3/4 X 14
4	BOL DA 016	5	BOLT, DOUBLE ARMING, 3/4 X 16
5	BOL MS 037	2	BOLT, MACHINE, SQUARE HEAD, 3/4X16
6	BOL MS 038	2	BOLT, MACHINE, SQUARE HEAD, 3/4X18
7	BOL TE 001	24	BOLT, TERMINAL KIT
8	CAI RH 010	30	#4 COVERED COPPER
9	CAI UF 001	40	CABLE, STREETLIGHT UF 12 CU 2/C
10	CLA AR 003	6	CLAMP, ARRESTER HOT-LINE, 336-636
11	CLA TG 001	6	CLAMP, TRANS. TANK GROUND
12	COB AA 026	90	GENERAL CODE FOR 636MCM ALUMINUM CONDUCTOR
13	COB CO 028	40	CONDUCTOR, COPPER, #4 SOFT DRAWN
14	COB TW 004	20	TIE WIRE, ALUMINUM INSULATED
15	CNN TA 004	6	CONNECTOR, TAP, 636-636
16	CNN TL 029	6	TERMINAL; COMPRESSION, 4 HOLE, 636AAC
17	CNN VG 003	8	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
18	COD AF 010	1	1” SCHEDULE 40 PVC LB
19	FUS OH 005	1	FUSE, OVERHEAD DISTRIBUTION, 23" MINIMUM LENGTH, 25T.
20	COD EF 002	2	CONNECTOR, FLEXIBLE PVC, 90 DEGREE; 1 IN
21	COD PC 016	40	CONDUIT; PVC; 1 IN DIA; SCHEDULE 40
22	COD PC 017	10	CONDUIT; FLEXIBLE PVC; 1 IN DIA
23	COD WH 002	1	WEATHERHEAD; PVC; FOR 1 IN DIA PIPE
24	GUA AN 007	6	GUARD, ANIMAL, FOR ARRESTERS
25	INS VP 001	2	INSULATOR, POST, 34.5kV
26	LOC PA 002	2	PADLOCK, BRASS
27	NUT PG 300	30	NUT, 1/4 - 20
28	SWE RC 002	1	RECLOSER, CONTROL, FOR USE WITH SWE RC 003
29	REC GU 001	6	GUARD, ANIMAL, RECLOSER TERMINAL COVER
30	REC GU 002	100	GUARD, ANIMAL, RECLOSER LINE INSULATION
31	SWE RC 003	1	RECLOSER, THREE-PHASE, WITH 6 INTERNAL VOLTAGE SENSORS
32	STP ST 001	25	STRAP, STEEL, 1 IN.
33	FUS UG 046	1	FUSE, 1-TIME, 20-AMP, 125-VOLT, FERRULE TYPE-B
34	TIE CA 002	25	TIE, CABLE, 24” LENGTH
35	WAS RD 002	30	WASHER, ROUND 1 IN. FOR 3/8 BOLT
36	WAS RD 005	17	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. BOLT
37	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. BOLT

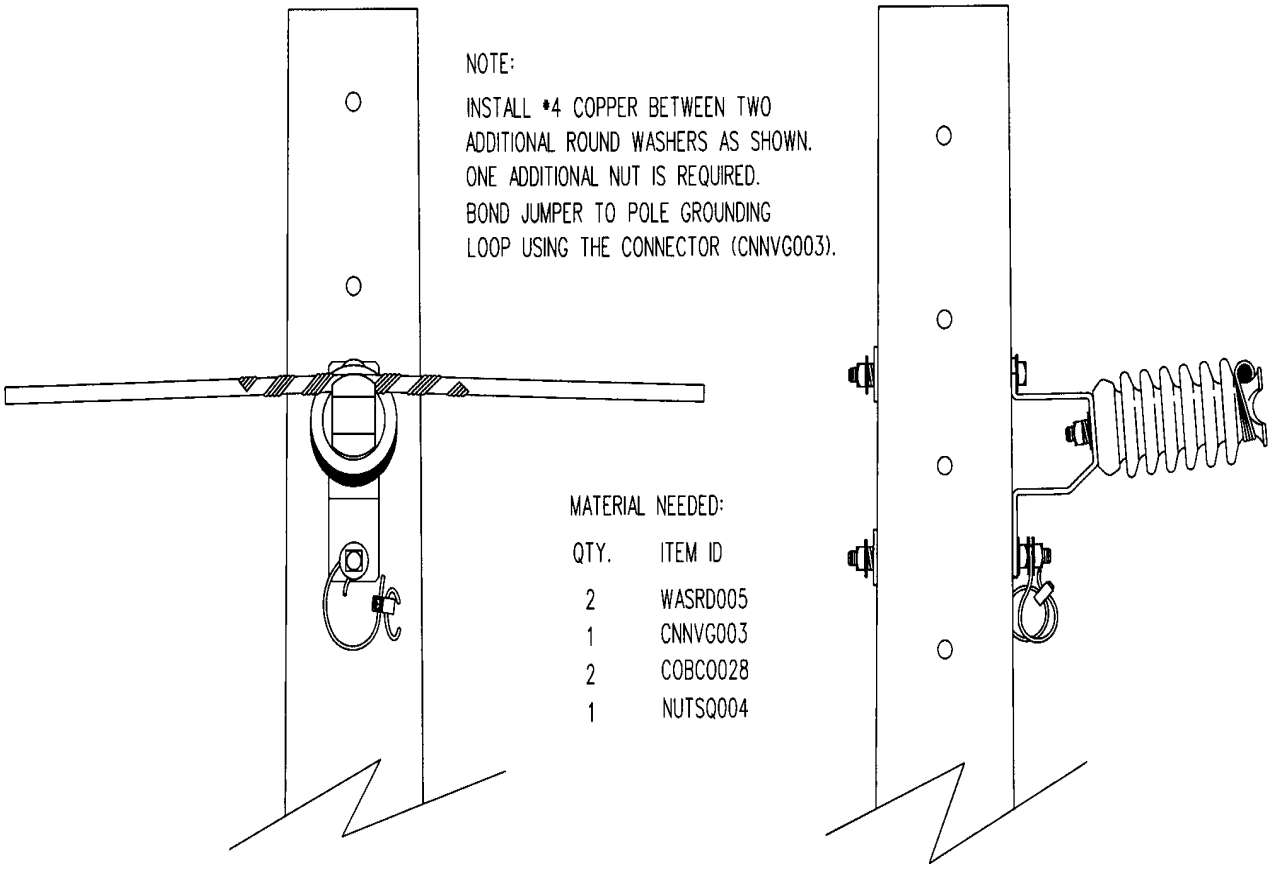
The material in plate is the same as AR-TSE, except that there is no recloser spreader bracket BKT RE 001.

GROUNDING

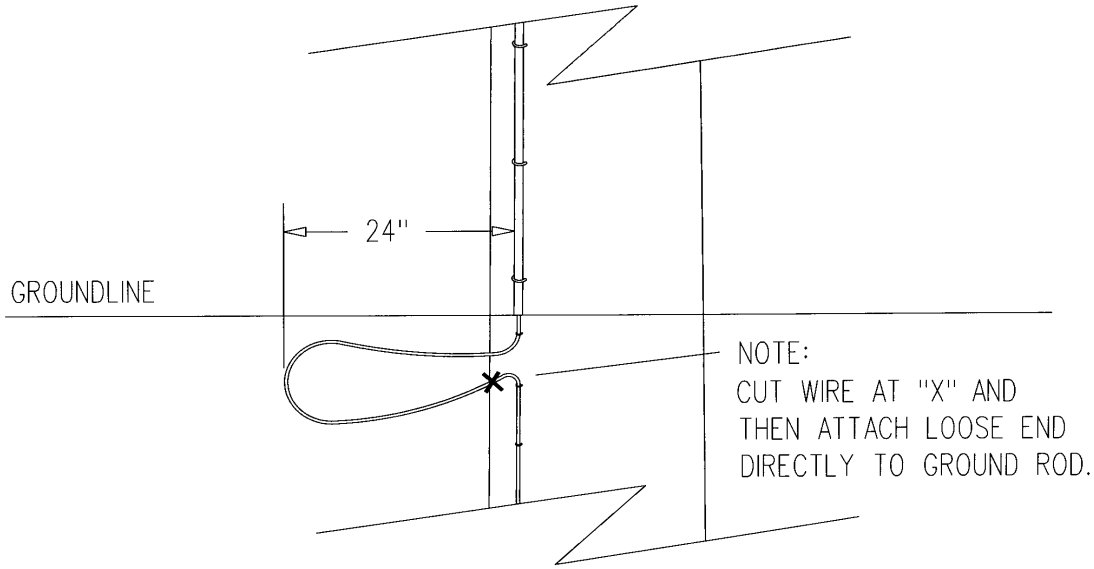
INTRODUCTION

1. The staples on wood poles shall be 12 inches apart from the top of the pole to the neutral.
2. The staples on wood poles shall be 24-36 inches apart from the neutral to the base of the pole.
3. Double staple the #4CU ground wire 12 inch above and 12 inch below the neutral. Cut the ground wire 3 inches below the top double staple.
4. Larger staples (STA PL 003) are to be used to attach the ground-wire guard to wood poles and shall be spaced every 8 inches. A two inch cable guard is to be used to shield the ground-wire on concrete poles that have an external pole ground.
5. ALL hardware on concrete poles shall be effectively grounded using #4 CU (See next page for grounding details). The additional material needed for grounding the hardware at each phase location is included with the pole plate. Insulator brackets, shield bracket if present, or hook disconnect switches installed on wood poles shall NOT be grounded.
6. When installing the #4 CW ground-wire on wood poles, a loop extending at least 2 feet from the pole surface shall be made near the ground-line of the pole (See next page for details). Once the pole has been set, the lower portion of this loop is to be cut, and the free end of the loop is to attach directly to the ground rod using the clamp (CLA GR 001). This will eliminate the #4 CU jumper from the ground-wire to the ground rod and the additional connector -- thus improving the grounding path.
7. The ground wire is to be located on the same side of the pole as the neutral conductor, and for horizontal construction shall be on opposite side of the pole from the B-phase conductor.
8. Three 8 foot copper-clad grounding rods are given with the equipment grounding plates. However, additional rods may be necessary to achieve a resistance to ground of 25 ohms or less. Chemically treating the ground surrounding the grounding electrode to achieve this value is not acceptable.
9. As a minimum, a non-equipment ground shall be installed on every distribution pole.
10. When installing an external pole ground on a concrete pole, if the ground loop cannot be found at groundline, the neutral ground loop shall be used.
11. G1W equipment grounds are to be used on poles with equipment that has grounding provisions: transformers, recloser, capacitors, and switches. Arrester stations also receive equipment grounds.

GROUNDING DETAIL FOR HARDWARE INSTALLED ON CONCRETE POLE



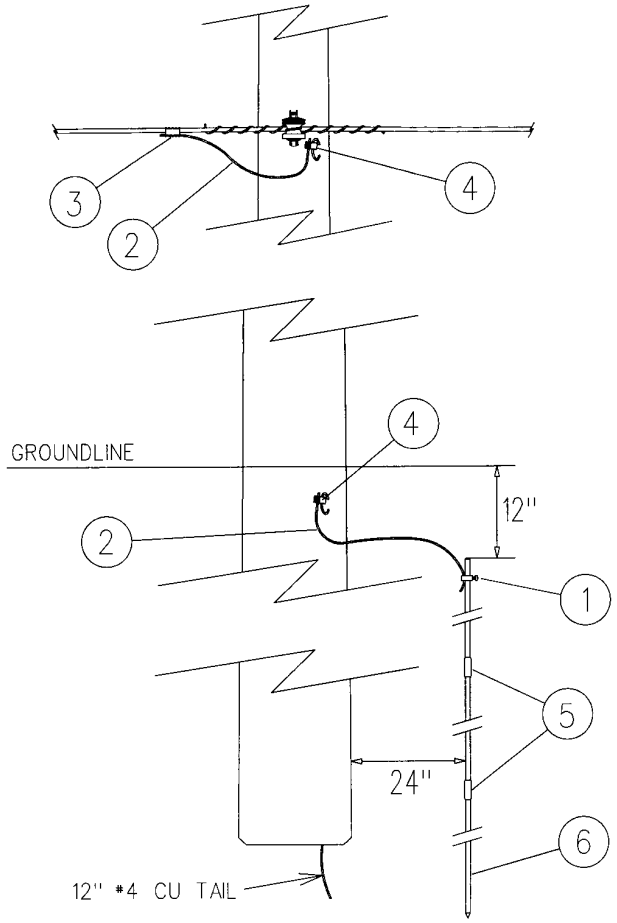
GROUND LOOP DETAIL FOR WOOD POLES



G1C

CONCRETE POLE – EQUIPMENT GROUND

OPTIONS: 6, 4, 2, 1/0, 2/0, 3/0, 4/0, 3#6
BOLT PLATE: NONE

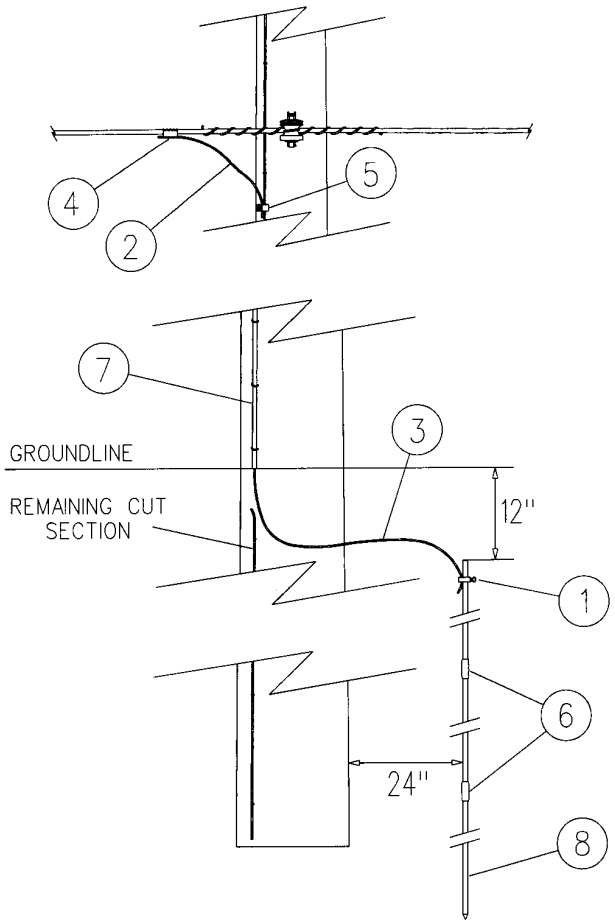


NO.	ITEM ID	QTY	DESCRIPTION
1	CLA GR 001	1	CLAMP, GROUND ROD, FOR 5/8 IN. ROD
2	COB CO 028	6	CONDUCTOR, COPPER, #4 SOFT DRAWN
3	CNN CP ***	1	GENERAL CODE FOR AL. COMP. SIDE-BY CONNECTOR
4	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
5	CNN GR 002	2	COUPLING, GROUND ROD, FOR 5/8 IN. DIA. THREADLESS ROD
6	ROD GR 003	3	ROD, GROUND, 5/8 IN. DIA., 8 FT. LONG, THREADLESS

G1W

WOOD POLE – EQUIPMENT GROUND

OPTIONS: 6, 4, 2, 1/0, 2/0, 3/0, 4/0, 3#6
BOLT PLATE: NONE

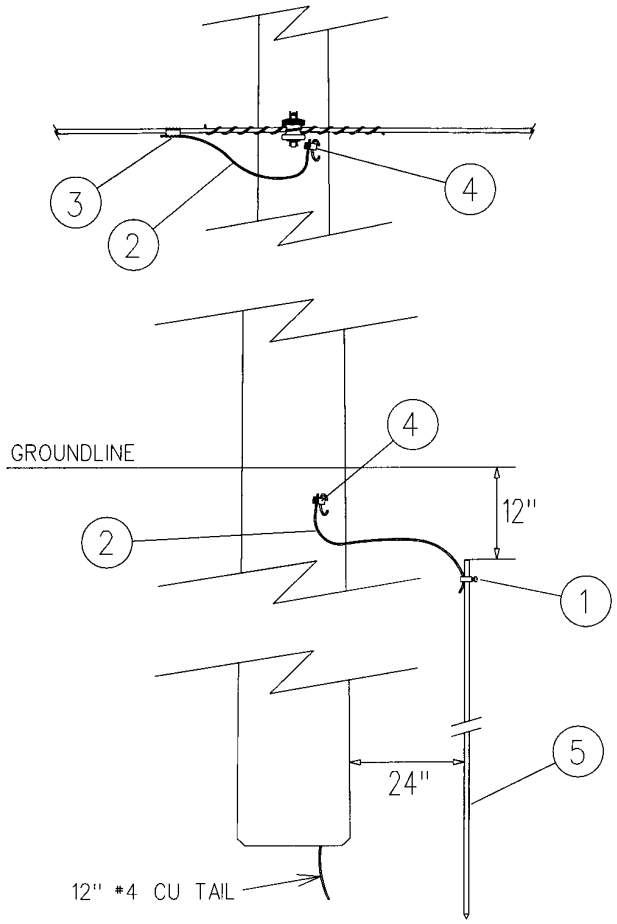


NO.	ITEM ID	QTY	DESCRIPTION
1	CLA GR 001	1	CLAMP, GROUND ROD, FOR 5/8 IN. ROD
2	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
3	COB CW 014	70	CONDUCTOR, COPPERWELD, #4 DSA
4	CNN CP ***	1	GENERAL CODE FOR AL. COMP. SIDE-BY CONNECTOR
5	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
6	CNN GR 002	2	COUPLING, GROUND ROD, FOR 5/8 IN. DIA. THREADLESS ROD
7	GUA GW 001	1	GUARD, GROUND WIRE, GREY PVC
8	ROD GR 003	3	ROD, GROUND, 5/8 IN. DIA., 8 FT. LONG, THREADLESS

G3C

CONCRETE POLE – NON-EQUIPMENT GROUND

OPTIONS: 6, 4, 2, 1/0, 2/0, 3/0, 4/0, 3#6
BOLT PLATE: NONE

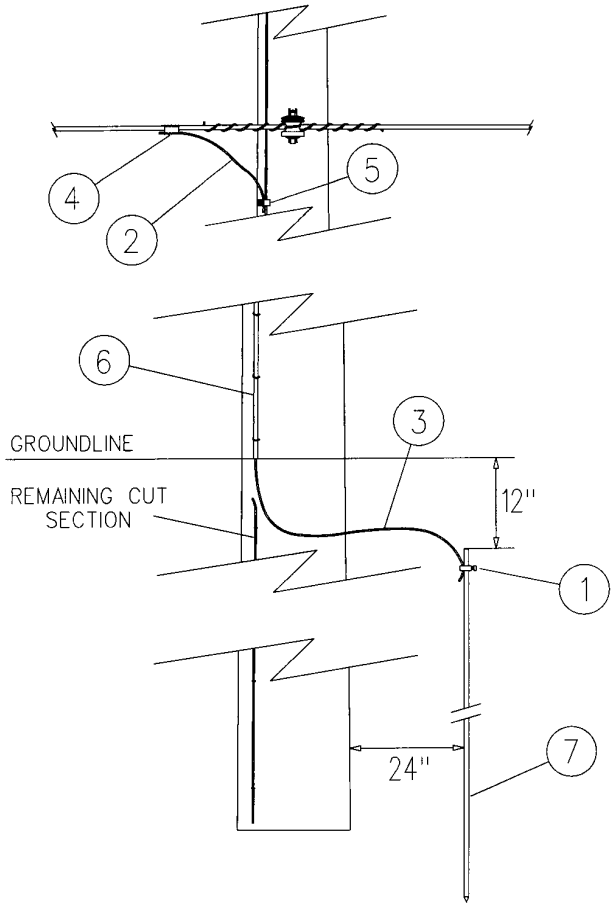


NO.	ITEM ID	QTY	DESCRIPTION
1	CLA GR 001	1	CLAMP, GROUND ROD, FOR 5/8 IN. ROD
2	COB CO 028	6	CONDUCTOR, COPPER, #4 SOFT DRAWN
3	CNN CP ***	1	GENERAL CODE FOR AL. COMP. SIDE-BY CONNECTOR
4	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
5	ROD GR 003	1	ROD, GROUND, 5/8 IN. DIA., 8 FT. LONG, THREADLESS

G3W

WOOD POLE – NON-EQUIPMENT GROUND

OPTIONS: 6, 4, 2, 1/0, 2/0, 3/0, 4/0, 3#6
BOLT PLATE: NONE

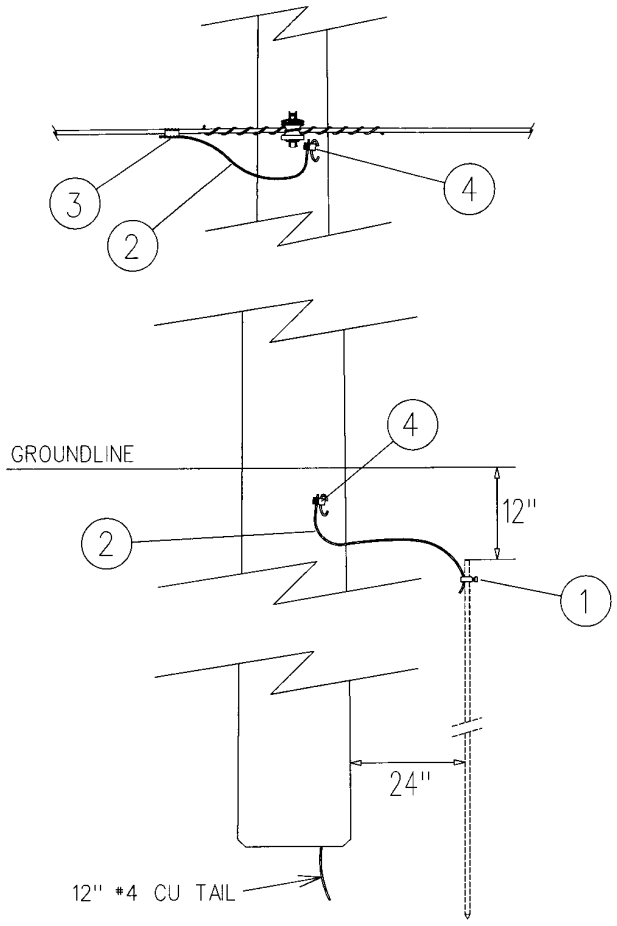


NO.	ITEM ID	QTY	DESCRIPTION
1	CLA GR 001	1	CLAMP, GROUND ROD, FOR 5/8 IN. ROD
2	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
3	COB CW 014	70	CONDUCTOR, COPPERWELD, #4 DSA
4	CNN CP ***	1	GENERAL CODE FOR AL. COMP. SIDE-BY CONNECTOR
5	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
6	GUA GW 001	1	GUARD, GROUND WIRE, GREY PVC
7	ROD GR 003	1	ROD, GROUND, 5/8 IN. DIA., 8 FT. LONG, THREADLESS

G4C

CONCRETE POLE – GROUND USING EXISTING ROD

OPTIONS 6, 4, 2, 1/0, 2/0, 3/0, 4/0, 3#6
BOLT PLATE: NONE

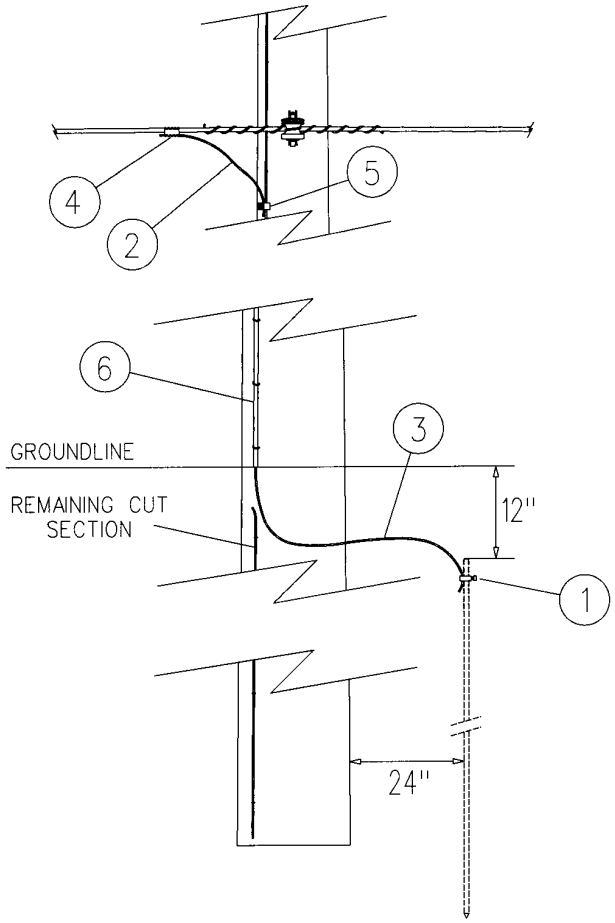


NO.	ITEM ID	QTY	DESCRIPTION
1	CLA GR 001	1	CLAMP, GROUND ROD, FOR 5/8 IN. ROD
2	COB CO 028	6	CONDUCTOR, COPPER, #4 SOFT DRAWN
3	CNN CP ***	1	GENERAL CODE FOR AL. COMP. SIDE-BY CONNECTOR
4	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.

G4W

WOOD POLE – GROUND USING EXISTING ROD

OPTIONS: 6, 4, 2, 1/0, 2/0, 3/0, 4/0, 3#6
BOLT PLATE: NONE

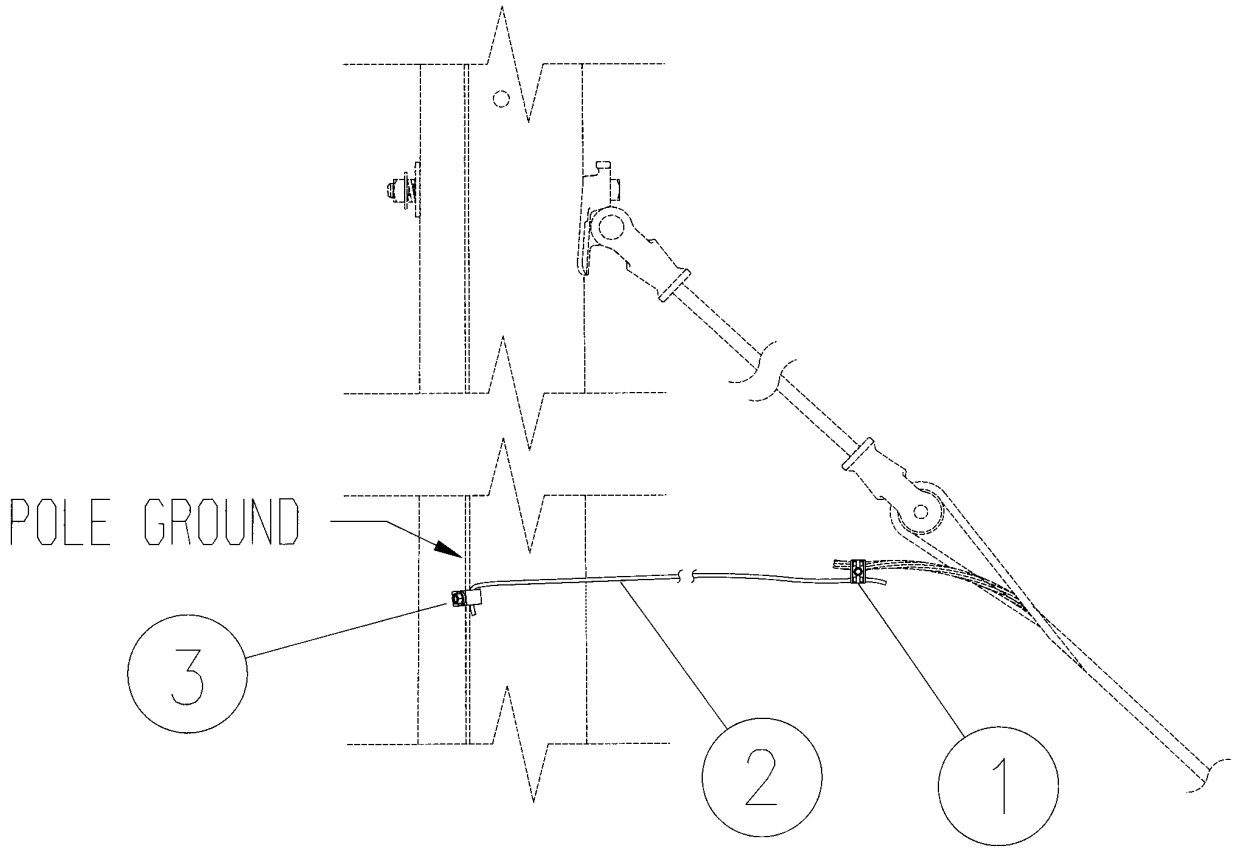


NO.	ITEM ID	QTY	DESCRIPTION
1	CLA GR 001	1	CLAMP, GROUND ROD, FOR 5/8 IN. ROD
2	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
3	COB CW 014	70	CONDUCTOR, COPPERWELD, #4 DSA
4	CNN CP ***	1	GENERAL CODE FOR AL. COMP. SIDE-BY CONNECTOR
5	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
6	GUA GW 001	1	GUARD, GROUND WIRE, GREY PVC

G6

GUY BOND – INSULATED

OPTIONS: NONE
BOLT PLATE: NONE

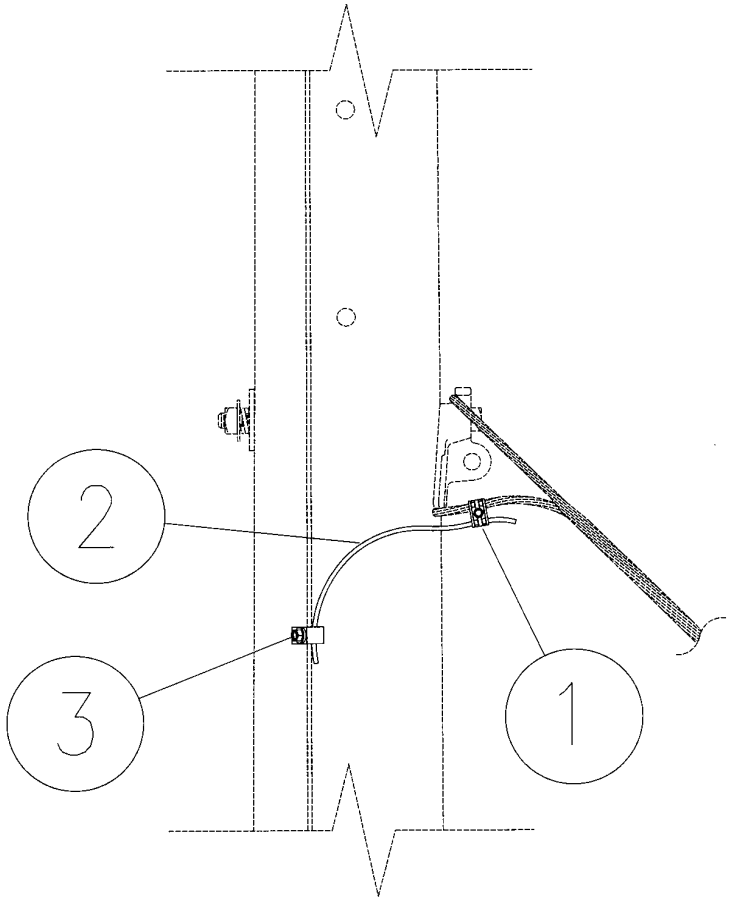


NO.	ITEM ID	QTY	DESCRIPTION
1	CNN CP 002	1	CONNECTOR, #2, 6-2 MAIN, 2-1/0 TAP, ALUMINUM COMPRESSION, PARALLEL TAP,
2	COB CO 028	10	CONDUCTOR, COPPER, #4 SOFT DRAWN
3	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.

G7

GUY BOND – NON-INSULATED

OPTIONS: NONE
BOLT PLATE: NONE

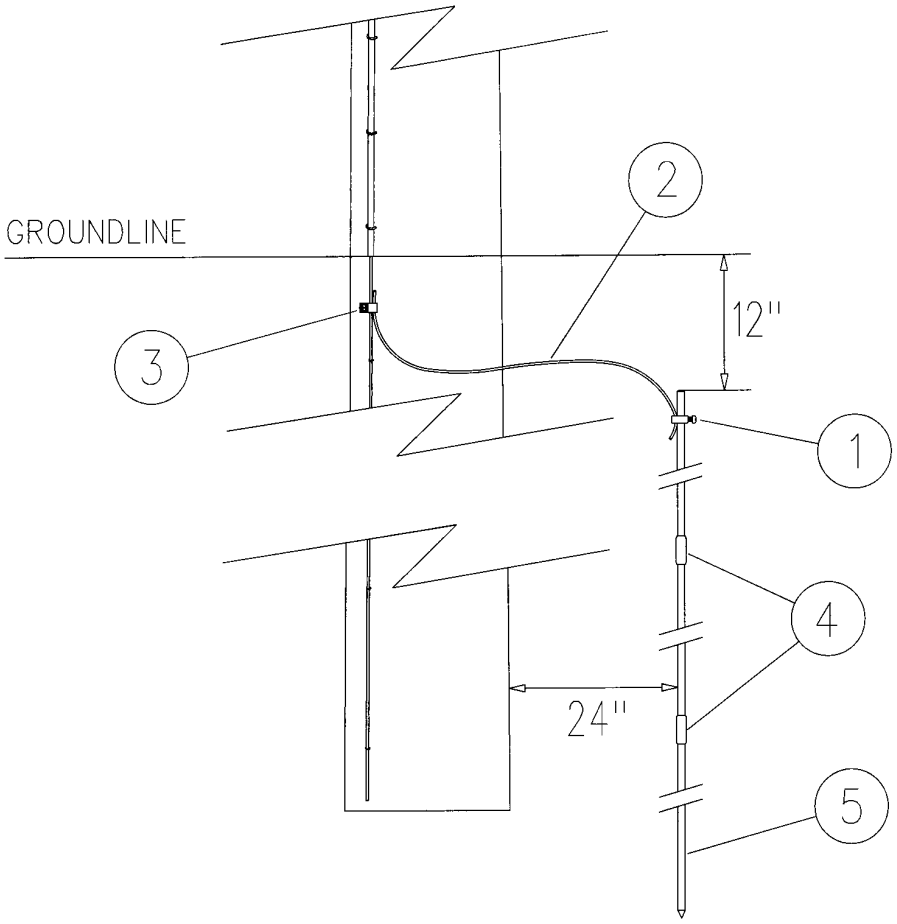


NO.	ITEM ID	QTY	DESCRIPTION
1	CNN CP 002	1	CONNECTOR, #2, 6-2 MAIN, 2-1/0 TAP, ALUMINUM COMPRESSION, PARALLEL TAP,
2	COB CO 028	3	CONDUCTOR, COPPER, #4 SOFT DRAWN
3	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.

G8

ROD FOR EXISTING POLE GROUND

OPTIONS: NONE
BOLT PLATE: NONE



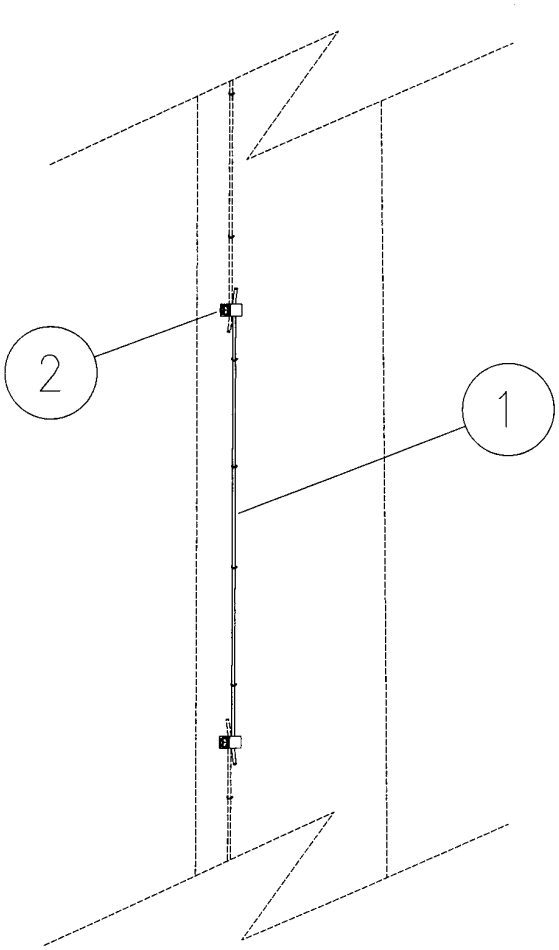
NOTE: EXISTING GROUND-WIRE SHOULD BE CUT AND ATTACHED DIRECTLY TO THE GROUND ROD IF POSSIBLE. IF THIS CANNOT BE DONE, BUILD AS SHOWN.

NO.	ITEM ID	QTY	DESCRIPTION
1	CLA GR 001	1	CLAMP, GROUND ROD, FOR 5/8 IN. ROD
2	COB CO 028	4	CONDUCTOR, COPPER, #4 SOFT DRAWN
3	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
4	CNN GR 002	2	COUPLING, GROUND ROD, FOR 5/8 IN. DIA. THREADLESS ROD
5	ROD GR 003	3	ROD, GROUND, 5/8 IN. DIA., 8 FT. LONG, THREADLESS

G9

POLE GROUND REPAIR

OPTIONS: NONE
BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	COB CW 014	5	CONDUCTOR, COPPERWELD, #4 DSA
2	CNN VG 003	2	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.

GUYS AND ANCHORS

I. DESIGN

The guying systems and specifications in this section have been designed according to the requirements set forth in the National Electrical Safety Code (NESC) (1993 Edition). Section 26 of the NESC gives the details to be considered when designing guying systems. The factors included in the design are:

A. CONDUCTOR TENSIONS (MAXIMUM)

B. SHIELD AND NEUTRAL TENSIONS (MAXIMUM)

C. WIND LOADING

D. COLUMNAR LOADING OF POLE (MAXIMUM BOWING MOMENT)

E. NESC GRADE B CONSTRUCTION (SEE NOTE BELOW)

F. NESC OVERLOAD CAPACITY FACTORS (TABLE 264-1)

Note: JEA designs all Overhead Electric Facilities to NESC Grade B construction even when a lower grade may be allowable by Code.

II. GROUNDING

JEA design criterion requires that all downguys be grounded whether they contain insulators or not. This grounding is accomplished by installing a #4 CU jumper between the guy strand and the pole ground. This connection would be below the lowest guy insulator if one or more are installed in the guy strand. Section 215C2 of the NESC allows for some exceptions in this area that the JEA chooses not to allow.

III. MATERIAL AND USES

A. GUY STRAND

JEA uses two sizes of guy strand to accomplish all distribution guying requirements. They are 3/8" and 7/16" in diameter and are made of galvanized steel and conform to ASTM specification A475-72. The minimum breaking strengths are 11,500 pounds and 20,800 pounds respectively.

B. STRAIN INSULATORS

Strain insulators come in two lengths, 60" and 144". They are to be used in downguys and spanguys that are in close proximity to energized conductor or equipment on the pole. The purpose for these is so that if a guy system failed and the guy strand fell against energized conductor, the guy strand itself would not become energized. The 144" insulator is normally used in the A and B phase positions, with the 60" normally used at the C phase position. The 144" insulator is also used on poles where the conductor size changes (i.e., 636 KCM aluminum deadends vertically and 1/0 aluminum conductor continues on) and on deadend poles with equipment (i.e., transformers, risers, etc.). Strain insulators (guy breakers) shall not touch primary conductors or insulators.

C. BOLTS

Guy plates are provided with bolts for each plate, but may not be needed if already supplied with another plate. Bolts are provided to attach to a standard 50 foot, class 2 wood pole for normal construction. If a downguy is installed on a larger pole, a bolt plate will need to plated if available.

D. GUY ATTACHMENTS

The guy strand is attached to the pole by use of one of two different pole attachment plates. These plates are stackable at one location on the pole to allow for installing two downguys at one point on the pole (i.e., 636 KCM aluminum deadended on crossarms requires two 7/16" downguys at bolt hole 73) - See plate GY7SPL. Provisions for downguys are also provided on the steel crossarm and the 3-phase cutout and arrester bracket if required.

E. GUY ANCHORS

Two basic types of anchoring systems are used for downguys -- one is the screw type and the other is the "Manta-Ray" type. The screw anchors come in two different styles, a single-helix and a multi or double-helix. The single-helix anchor is 8 feet long with a 10" diameter screw. The multi-helix anchor is 5 feet long and comes with a 10" and 11.3" diameter screws. The "Manta-Ray" anchoring system is a patented system that allows for the installation of a high-strength anchor in areas not accessible to large trucks or equipment. The "Manta-Ray" holding strength is equivalent to that of the multi-helix anchor. Holding strengths for guy anchors are very dependent on the type of soil conditions in which the anchor is placed. Below is a table to quantify typical holding strengths for anchors.

TABLE 1: ANCHOR HOLDING STRENGTH

Anchor Type	Holding Strength	
	Poor Soil	Good Soil
Single-Helix	6,000 pounds	10,000 pounds
Multi-Helix	*18,000 pounds	*18,000 pounds
Manta-Ray	>15,000 pounds	>15,000 pounds

Poor soil includes: Loose sand, wet clay, loam and marsh lands.
Good soil includes: Compacted clay and gravel, hardpan, claypan, and compacted sand.

- Depends on obtaining one (1) full twist in the anchor rod upon installation.

F. SECONDARY GUYS

These guidelines are for the normal construction practices. For secondary attachments at higher than normal levels, guy leads would need to be adjusted accordingly.

III.F.1. For #2 Triplex or Quadraplex and 1/0 Triplex secondary busses between distribution line poles, a "GY3" with a 12 foot guy lead is required.

III.F.2. For 2/0 or 4/0 PAP or Quadraplex secondary busses between distribution line poles, a "GY3" with a 15 foot guy lead is required.

III.F.3. If a downguy is required for a secondary drop form a distribution line pole to the customer, a "GY3" with a 10 foot guy lead would be adequate.

III.F.4. For #6 Duplex busses or drops, the Engineer will decide on a case to case basis if any guying is required.

G. SIDEWALK GUYS

These utilize 3/8" guy strand only and are to be used only when a normal guy lead cannot be obtained. This type of downguy exerts a very large moment on the pole in the area of the stand-off pipe, often exceeding the minimum bowing moment for the pole if used in heavy strain situations. The limitations of the guy strand and all the components of the guy system are usually exceeded if used on more than single-phase primary or secondary drop installations. It may be necessary to install a strain pole if conditions exceed the above.

H. POLE KEYS

These are for use on concrete poles where a conventional downguy and anchor cannot be installed. They are for loose soil conditions and should only be used as a last resort method for resisting light strains. The heavy duty key is for use on LT class and larger poles. The light duty key is for class 3 and class H poles.

- Before requesting that a pole key be installed, please review the design with your supervisor.

I. BOG SHOES

These are for poles being set in "Muck" areas. Their use is limited and is usually reserved for smaller wire installations. It is much more preferable to increase the setting depth of the pole to reach a more stable layer than to utilize bog shoes. When these type areas are encountered it may be necessary to obtain a soil boring to determine the required setting depth.

- Before requesting that a bog shoe be installed, please review the design with your supervisor.

J. POLE BRACES

These are used to secure a pole that may be undermined by an excavation operation. They shall always be installed perpendicular to the overhead wires. The heavy duty brace is for three-phase lines and larger poles. The light duty brace is for single and two-phase lines and smaller poles or poles being partially exposed. The use of these braces is not an exact science. There are many factors to be considered when evaluating a construction site and making a determination as to what method of pole support to use. NEVER GUESS!!!. Always know that the method chosen will accomplish the task required.

K. BUTT GUYS

These guys have very little application and should be only used if you are well experienced in their use. The heavy duty butt guy is mainly used for soft earth areas where pole settlement is a possibility. The light duty butt guy is for use where very little of the pole is to be exposed and where at least three (3) feet of the pole butt is in solid ground not to be disturbed. As with pole braces, always know that the method chosen will accomplish the task.

L. PUSH POLES

The basic use of this type installation is where a downguy has to be temporarily removed. This should not be considered a permanent installation. Push poles do have limitations. If you have any questions at all about their ability to accomplish the task, consult your supervisor.

IV. PLACEMENT

Guys are required on many different types of structures and installations. They are basically used to offset an unbalanced force exerted on the pole by the conductors. The tables in this section cover most all the installations you will encounter on the JEA distribution system. However, there are some that will not fall into a description found in the tables. If you have any question about the structure type or guy requirements, please consult your supervisor.

V. STRAIN POLES

Strain poles are not practical for all situations. Wood poles are not strain poles, and class 3 concrete poles should also not be considered as strain poles. Please consult with your supervisor about the use of strain poles and the limitations that may apply to your situation.

VI. DOWNGUY ANCHOR PLACEMENT

TABLE 2: ANCHOR PLACEMENT

POLE SIZE	TOP GUY LEAD ANCHOR PLACEMENT FROM BASE OF POLE (FT) *
30	15
35	20
40	20
45	25
50	25
55	30
60	30
65	35
70	35
75	40
80	40

* This is based on a normal setting depth.
** 3 feet is the minimum anchor separation.
5 feet is desired.

GA (Guy Angle) - A guy angle of 30 degrees is required. If an angle of less than 30 degrees is to be installed, please review with your supervisor.

The eye of the anchor (or extension) should be at one foot above grade to prevent the guy grip from being damaged at the eye by landscaping and from being covered by plant growth.

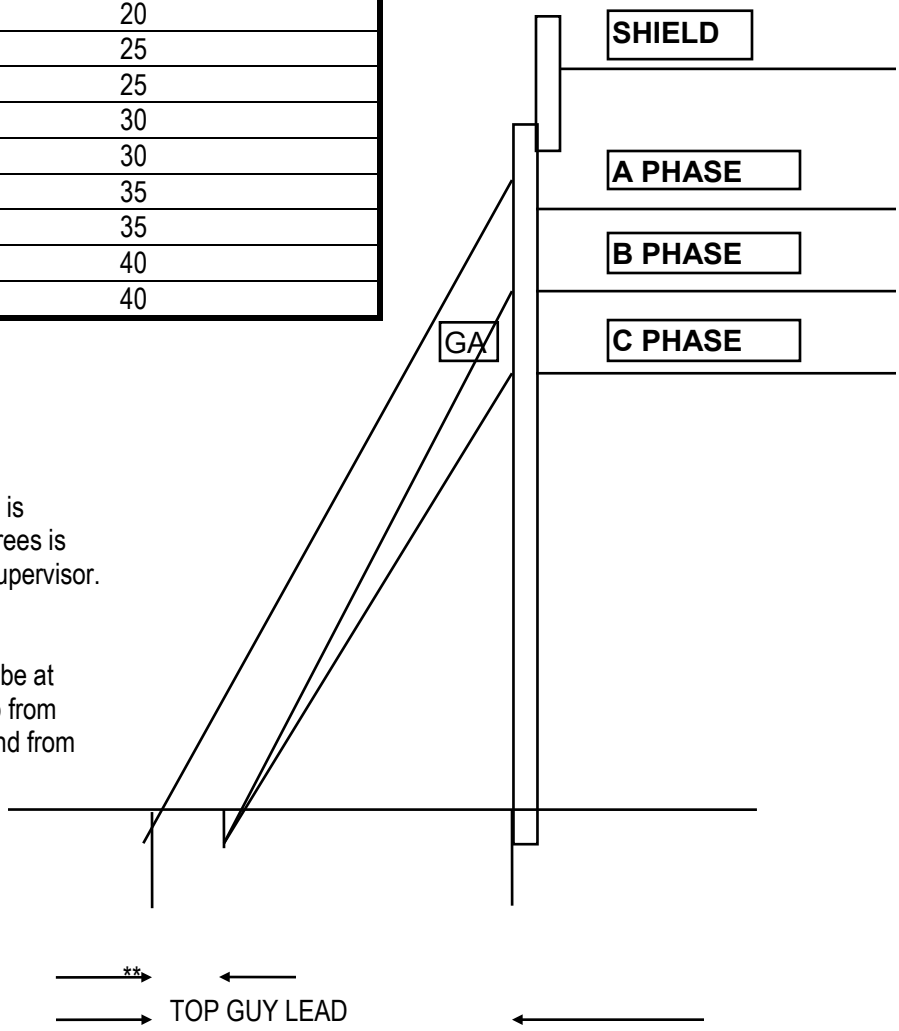


TABLE 3: GUYS AND SUPPORT PLATES

PLATE	DESCRIPTION
GY3	3/8" DOWNGUY WITH 8 FOOT SCREW ANCHOR
GY3-A	3/8" DOWNGUY WITHOUT ANCHOR
GY3SPN	3/8" SPANGUY
GY3BK	BREAKER ADDITION FOR EXISTING 3/8" SPANGUY AT POLE
GY3MBK	BREAKER ADDITION FOR EXISTING 3/8" SPANGUY MIDSPAN
GY3SW	3/8" SIDEWALK DOWNGUY
GY7	7/16" DOWNGUY WITH MULTI-HELIX ANCHOR
GY7-A	7/16" DOWNGUY WITHOUT ANCHOR
GY7SPN	7/16" SPANGUY
GY7BK	BREAKER ADDITION FOR EXISTING 7/16" SPANGUY AT POLE
GY7MBK	BREAKER ADDITION FOR EXISTING 7/16" SPANGUY MIDSPAN
GY7SPL	7/16" SPECIAL DOWNGUY FOR HORIZONTAL CONSTRUCTION
GY7MR	7/16" DOWNGUY WITH MANTA-RAY ANCHOR
GYX3.5	MULTI-HELIX ANCHOR EXTENSION 3'-6"
GYX5	MULTI-HELIX ANCHOR EXTENSION 5'-0"
GYX3.5MR	MANTA-RAY ANCHOR EXTENSION 3'-6"
GYX7MR	MANTA-RAY ANCHOR EXTENSION 7'-0"
GYBOG-C	BOGSHOE FOR CONCRETE POLE
GYBOG-W	BOGSHOE FOR WOOD POLE
GYBRACE-LD	POLE BRACE, LIGHT DUTY
GYBRACE-HD	POLE BRACE, HEAVY DUTY
GYBUTT-LD	BUTTGUY, LIGHT DUTY
GYBUTT-HD	BUTTGUY, HEAVY DUTY
GYKEY-LD	POLE KEY, LIGHT DUTY
GYKEY-HD	POLE KEY, HEAVY DUTY
GYPUSH	PUSH POLE

OPTIONS

*5 – 60" Strain Insulator

*12 – 144" Strain Insulator

PLATE EXAMPLES

GY7*5	7/16" Downguy with 60" strain insulator and a multi-helix anchor
GY3-A*5	3/8" Downguy with 60" strain insulator and no anchor
GY3SPN*12	3/8" Spanguy with a 144" strain insulator
GY3	3/8" Downguy with 8 foot screw anchor

VII. DOWNGUY REQUIREMENTS – VERTICAL CONSTRUCTION

TABLE 4 : SINGLE PHASE

STRUCTURE TYPE	GUY PLATE FOR 1/0 OR SMALLER	BOLT HOLE	GUY PLATE FOR 2/0 TO 636 KCM	BOLT HOLE
DA1	GY3	B5	N/A	N/A
DA1-5	GY3	B30	N/A	N/A
DA2	GY3	B5	N/A	N/A
DA2-5	GY3	B30	N/A	N/A
DA3	GY3	B5	N/A	N/A
DA3-5	GY3	B30	N/A	N/A
DA4	GY3(2)	B5, 7	N/A	N/A
DA4-5	GY3(2)	B30, 35	N/A	N/A
DA5	GY3	7	N/A	N/A
DA5-5	GY3	35	N/A	N/A
DA18(A)	GY3	B5	N/A	N/A
DA18(B)	GY3 GY3-A	B5 B68	N/A	N/A
DA18(C)	GY3 GY3-A	B5 B106	N/A	N/A
DA18-5(A)	GY3	B30	N/A	N/A
DA18-5(B)	GY3	B68	N/A	N/A
DA18-5(C)	GY3	B106	N/A	N/A
DA20(A)	GY3	B5	N/A	N/A
DA20(B)	GY3 GY3-A	B5 B68	N/A	N/A
DA20(C)	GY3 GY3-A	B5 B106	N/A	N/A
DA20-5(A)	GY3	B30	N/A	N/A
DA20-5(B)	GY3	B68	N/A	N/A
DA20-5(C)	GY3	B106	N/A	N/A
DA22(A)	GY3	7	N/A	N/A
DA22(B)	GY3 GY3-A	7 73	N/A	N/A
DA22(C)	GY3 GY3-A	7 111	N/A	N/A
DA22-5(A)	GY3	35	N/A	N/A
DA22-5(B)	GY3	73	N/A	N/A
DA22-5(C)	GY3	111	N/A	N/A

VII. DOWNGUY REQUIREMENTS – VERTICAL CONSTRUCTION (CONTINUED)

TABLE 5 : TWO PHASE

STRUCTURE TYPE	GUY PLATE FOR 1/0 OR SMALLER	BOLT HOLE	GUY PLATE FOR 2/0 TO 636 KCM	BOLT HOLE
DB1	GY3	B5	N/A	N/A
DB1-5	GY3	B30	N/A	N/A
DB2	GY3 GY3-A	B5 B68	N/A	N/A
DB2-5	GY3 GY3-A	B30 B68	N/A	N/A
DB3	GY3(2)	B5, B68	N/A	N/A
DB3-5	GY3(2)	B30, B68	N/A	N/A
DB4	GY3(4)	B5, 7, B68, 73	N/A	N/A
DB4-5	GY3(4)	B30, 35, B68, 73	N/A	N/A
DB5	GY3(2)	7, 73	N/A	N/A
DB5-5	GY3(2)	35, 73	N/A	N/A
DB18(A&B)	GY3(2)	B5, B68	N/A	N/A
DB18(A&C)	GY3(2)	B5, B106	N/A	N/A
DB18(B&C)	GY3(2)	B5, B68	N/A	N/A
DB18-5(A&B)	GY3(2)	B30, B68	N/A	N/A
DB18-5(A&C)	GY3(2)	B30, B106	N/A	N/A
DB18-5(B&C)	GY3(2)	B68, B106	N/A	N/A
DB20(A&C)	GY3(2)	B5, B68	N/A	N/A
DB20(A&C)	GY3(2)	B5, B106	N/A	N/A
DB20(B&C)	GY3(2)	B5, B68	N/A	N/A
DB20-5(A&B)	GY3(2)	B30, B68	N/A	N/A
DB20-5(A&C)	GY3(2)	B30, B106	N/A	N/A
DB20-5(B&C)	GY3(2)	B68, B106	N/A	N/A
DB22(A&B)	GY3 GY3-A	7 73	N/A	N/A
DB22(A&C)	GY3 GY3-A	7 111	N/A	N/A
DB22(B&C)	GY3 GY3-A	7 73	N/A	N/A
DB22-5(A&B)	GY3 GY3-A	35 73	N/A	N/A
DB22-5(A&C)	GY3 GY3-A	35 111	N/A	N/A
DB22-5(B&C)	GY3 GY3-A	73 111	N/A	N/A

VII. DOWNGUY REQUIREMENTS – VERTICAL CONSTRUCTION (CONTINUED)

TABLE 6: THREE PHASE

STRUCTURE TYPE	GUY PLATE FOR 1/0 OR SMALLER	BOLT HOLE	GUY PLATE FOR 2/0 TO 636 KCM	BOLT HOLE
DC1	GY3 GY3-A	B5 B106	GY3(2) GY3-A	B5, B68 B106
DC1-5	GY3 GY3-A	B30 B106	GY3(2) GY3-A	B30, B68 B106
DC2	GY3(2) GY3-A	B5, B68 B106	GY3(3) GY3-A	B5, B68, B106 B192
DC2-5	GY3(2) GY3-A	B30, B68 B106	GY3(3) GY3-A	B30, B68, B106 B192
DC3(30-45)	GY3(2) GY3-A	B5, B68 B106	GY7(2) GY7-A(2)	B5, B106 B68, B192
DC3(45-60)	GY3(2) GY3-A	B5, B68 B106	GY7(3) GY7-A	B5, B68, B106 B192
DC3-5(30-45)	GY3(2) GY3-A	B30, B68 B106	GY7(2) GY7-A(2)	B30, B106 B68, B192
DC3-5(45-60)	GY3(2) GY3-A	B30, B68 B106	GY7(3) GY7-A	B30, B68, B106 B192
DC4	GY3(4) GY3-A(2)	B5, 7, B68, 73 B106, 111	GY7(6) GY7-A(2)	B5, 7, B73, B106, 111, B192, 198
DC4-5	GY3(4) GY3-A(2)	B30, 35, B68, 73 B106, 111	GY7(6) GY7-A(2)	B30, 35, B68, 73, B106, 111 B192, 198
DC5	GY3(2) GY3-A	7,73 111	GY7(3) GY7-A	7, 73, 111 198
DC5-5	GY3(2) GY3-A	35, 73 111	GY7(3) GY7-A	35, 73, 111 198
DC7SL	GY3(2) GY3-A	7,73 111	GY7(3) GY7-A	7, 73, 111 198
DC18	GY3(2) GY3-A	B5, B68 B106	GY7(3) GY7-A	B5, B68, B106 B192
DC18-5	GY3(2) GY3-A	B30, B68 B106	GY7(3) GY7-A	B30, B68, B106 B192
DC20	GY3(2) GY3-A	B5, B68 B106	GY7(3) GY7-A	B5, B68, B106 B192
DC20-5	GY3(2) GY3-A	B30, B68 B106	GY7(3) GY7-A	B30, B68, B106 B192
DC22	GY3(2) GY3-A	7, 73 111	GY3(3) GY3-A	7, 73, 111 198
DC22-5	GY3(2) GY3-A	35, 73 111	GY3(3) GY3-A	35, 73, 111 198

VIII. SPANGUY & STUBGUY REQUIREMENTS – VERTICAL CONSTRUCTION

TABLE 7: ONE & TWO PHASE - 1/0 OR SMALLER

STRUCTURE TYPE	GUY PLATE FOR 1/0 OR SMALLER	BOLT HOLE	STUB POLE *DOWNGUY
DA1	GY3SPN	B5	GY3
DA1-5	GY3SPN	B30	GY3
DA2	GY3SPN	B5	GY3
DA2-5	GY3SPN	B30	GY3
DA3	GY3SPN	B5	GY3
DA3-5	GY3SPN	B30	GY3
DA4	GY3SPN(2)	B5, 7	GY3
DA4-5	GY3SPN(2)	B30, 35	GY3
DA5	GY3SPN	7	GY3
DA5-5	GY3SPN	35	GY3
DA18(A)	GY3SPN	B5	GY3
DA18(B)	GY3SPN(2)	B5, B68	GY3
DA18(C)	GY3SPN(2)	B5, B106	GY3
DA18-5(A)	GY3SPN	B30	GY3
DA18-5(B)	GY3SPN	B68	GY3
DA18-5(C)	GY3SPN	B106	GY3
DA20(A)	GY3SPN	B5	GY3
DA20(B)	GY3SPN(2)	B5, B68	GY3
DA20(C)	GY3SPN(2)	B5, B106	GY3
DA20-5(A)	GY3SPN	B30	GY3
DA20-5(B)	GY3SPN	B68	GY3
DA20-5(C)	GY3SPN	B106	GY3
DB1	GY3SPN	B5	GY3
DB1-5	GY3SPN	B30	GY3
DB2	GY3SPN(2)	B5, B68	GY3
DB2-5	GY3SPN(2)	B30, B68	GY3
DB3	GY3SPN(2)	B5, B68	GY3
DB3-5	GY3SPN(2)	B30, B68	GY3
DB4	GY3SPN(4)	B5, 7, B68, 73	GY3(2)
DB4-5	GY3SPN(4)	B30, 35, B68, 73	GY3
DB5	GY3SPN(2)	B5, B68	GY3(2)
DB5-5	GY3SPN(2)	B30, B68	GY3
DB18(A&B)	GY3SPN(2)	B5, B68	GY3(2)
DB18(A&C)	GY3SPN(2)	B5. B106	GY3(2)
DB18(B&C)	GY3SPN(2)	B5, B68	GY3(2)
DB18-5(A&B)	GY3SPN(2)	B30, B68	GY3
DB18-5(A&C)	GY3SPN(2)	B30, B106	GY3
DB18-5(B&C)	GY3SPN(2)	B68, B106	GY3
DB20(A&B)	GY3SPN(2)	B5, B68	GY3(2)
DB20(A&C)	GY3SPN(2)	B5, B106	GY3(2)
DB20(B&C)	GY3SPN(2)	B5, B68	GY3(2)
DB20-5(A&B)	GY3SPN(2)	B30, B68	GY3
DB20-5(A&C)	GY3SPN(2)	B30, B106	GY3
DB20-5(B&C)	GY3SPN(2)	B68, B106	GY3

* Where more than one stub pole is required, use size and number of downguys shown at each stub pole location.

VIII. SPANGUY & STUBGUY – VERTICAL CONSTRUCTION (CONTINUED)

TABLE 8: THREE PHASE - 1/0 OR SMALLER

STRUCTURE TYPE	GUY PLATE FOR 1/0 OR SMALLER	BOLT HOLE	STUB POLE *DOWNGUY
DC1	GY3SPN(2)	B5, B68	GY3
DC1-5	GY3SPN(2)	B30, B106	GY3
DC2	GY3SPN(2)	B5, B68	GY3
DC2-5	GY3SPN(2)	B30, B106	GY3
DC3(30-45)	GY3SPN(2)	B5, B68	GY3
DC3(45-60)	GY3SPN(2)	B5, B68	GY3(2)
DC3-5(30-45)	GY3SPN(2)	B30, B106	GY3
DC3-5(45-60)	GY3SPN(2)	B30, B106	GY3
DC4	GY3SPN(4)	B5, 7, B68, 73	GY3(2)
DC4-5	GY3SPN(4)	B30, 35, B106, 111	GY3
DC5	GY3SPN(2)	7, 73	GY3(2)
DC5-5	GY3SPN(2)	35, 111	GY3
DC7SL	GY3SPN(2)	7, 73	GY3(2)
DC18	GY3SPN(2)	B5, B68	GY3(2)
DC18-5	GY3SPN(2)	B30, B106	GY3
DC20	GY3SPN(2)	B5, B68	GY3(2)
DC20-5	GY3SPN(2)	B30, B106	GY3

* Where more than one stub pole is required, use size and number of downguys shown at each stub pole location.

TABLE 9: THREE-PHASE - 2/0 TO 636 KCM

STRUCTURE TYPE	GUY PLATE FOR 2/0 to 636 KCM	BOLT HOLE	STUB POLE *DOWNGUY
DC1	GY3SPN(2)	B5, B68	GY3
DC1-5	GY3SPN(2)	B30, B106	GY3
DC2	GY3SPN(3)	B5, B68, B106	GY3(2)
DC2-5	GY3SPN(2)	B30, B106	GY3(2)
DC3(30-45)	GY3SPN(3)	B5, B68, B106	GY3(3)
DC3(45-60)	GY3SPN(4)	B5, B30, B68, B106	GY7
DC3-5(30-45)	GY3SPN(2)	B30, B106	GY3(2)
DC3-5(45-60)	GY3SPN(3)	B30, B68, B106	GY7(2)
DC4	GY3SPN(8)	B5, 7, B68, 73, B106, 111, B192, 198	GY7(2)
DC4-5	GY3SPN(8)	B30, 35, B68, 73, B106, 111, B192, 198	GY7(2)
DC5	GY3SPN(4)	7, 73, 111, 198	GY7(2)
DC5-5	GY3SPN(4)	35, 73, 111, 198	GY7(2)
DC7SL	GY3SPN(4)	7, 73, 111, 198	GY7(2)
DC18	GY3SPN(4)	B5, B68, B106, B192	GY7(2)
DC18-5	GY3SPN(4)	B30, B68, B106, B192	GY7(2)
DC20	GY3SPN(4)	B5, B68, B106, B192	GY7(2)
DC20-5	GY3SPN(4)	B30, B68, B106, B192	GY7(2)

* Where more than one stub pole is required, use size and number of downguys shown at each stub pole location.

VIII. SPANGUY & STUBGUY (CONTINUED)

TABLE 10: HORIZONTAL - 1/0 OR SMALLER

STRUCTURE TYPE	GUY PLATE FOR 1/0 OR SMALLER	BOLT HOLE	STUB POLE *DOWNGUY
T1	GY3SPN	B68	GY3
T1-5	GY3SPN	B20	GY3
T2(5-30)	GY3SPN(2)	B5, B68	GY3(2)
T2-5(5-30)	GY3SPN	B20	GY3
T5	GY3SPN(2)	7,73	GY3(2)
T5-5	GY3SPN	25	GY3
T8(30-60)	GY3SPN(2)	B5, B68	GY3(2)
T8-5(30-60)	GY3SPN	B20	GY3
T20	GY3SPN(2)	B5, B106	GY3(2)
T20-5	GY3SPN	B68	GY3
T22	GY3SPN	111	GY3
T22-5	GY3SPN	73	GY3
VB1-5	GY3SPN	B20	GY3
VB2-5(5-30)	GY3SPN	B20	GY3
VB7-5	GY3SPN	25	GY3
VB8-5(30-60)	GY3SPN	B20	GY3
VB20-5	GY3SPN	B68	GY3
VB22-5	GY3SPN	73	GY3

IX. DOWNGUY REQUIREMENTS – HORIZONTAL CONSTRUCTION

TABLE 11: HORIZONTAL - 2/0 TO 636 KCM

STRUCTURE TYPE	GUY PLATE FOR 1/0 OR SMALLER	BOLT HOLE	STUB POLE *DOWNGUY
T1	GY3SPN	B68	GY3
T1-5	GY3SPN	B20	GY3
T2(5-30)	GY3SPN	B5, B68	GY3(2)
T2-5(5-30)	GY3SPN(2)	B20	GY3(2)
T5	GY7SPN(3)	7, 73, 198	GY7(2)
T5-5	GY7SPN(2)	25, 198	GY7(2)
T8(30-60)	GY7SPN(3)	B5, B68, B192	GY7(2)
T8-5(30-60)	GY7SPN(2)	B20, B192	GY7(2)
T20	GY7SPN(3)	B5, B105, B192	GY7(2)
T20-5	GY7SPN(2)	B68, B192	GY7(2)
T22	GY3SPN	111	GY3
T22-5	GY3SPN	73	GY3

* Where more than one stub pole is required, use size and number of downguys shown at each stub pole location.

IX. DOWNGUY REQUIREMENTS – HORIZONTAL CONSTRUCTION

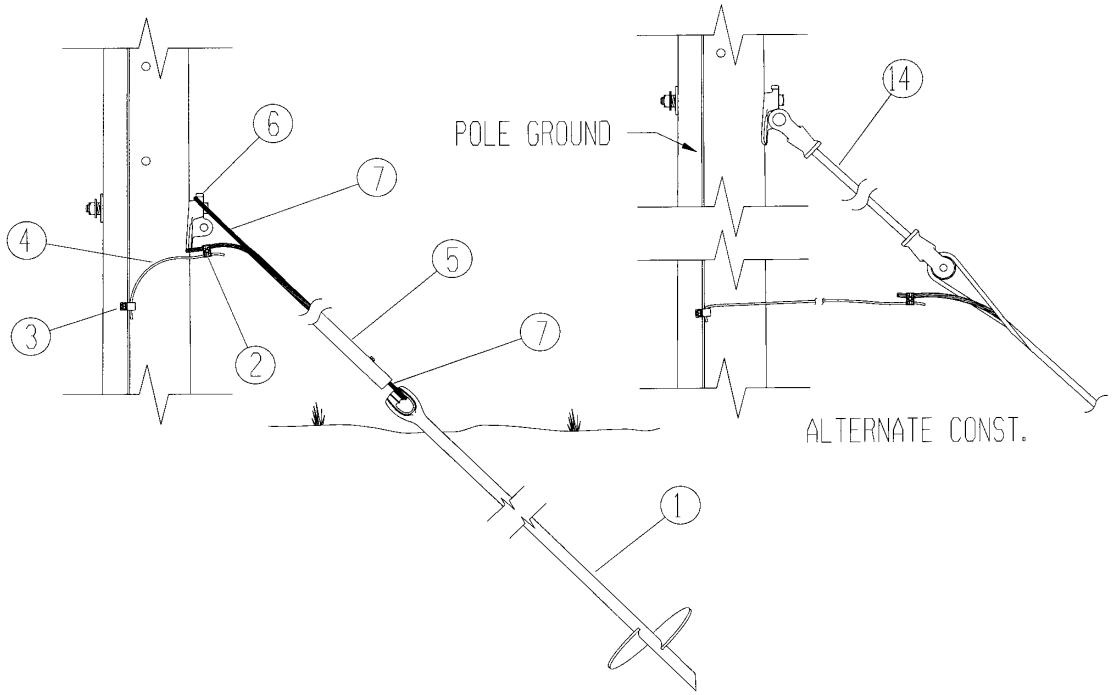
TABLE 12: 1/0 OR SMALLER & 2/0 TO 636 KCM

STRUCTURE TYPE	GUY PLATE FOR 1/0 OR SMALLER	BOLT HOLE	GUY PLATE FOR 2/0 TO 636 KCM	BOLT HOLE
T1	GY3	B68	GY3	B68
T1-5	GY3	B20	GY3	B20
T2(5-30)	GY3(2)	B5, B68	GY3(2)	B5, B68
T2-5(5-30)	GY3	B20	GY7	B20
T5	GY3(2)	7, 73	GY7 GY7SPL GY7-A	7, 73 73 198
T5-5	GY3	25	GY7 GY7SPL GY7-A	25 25 198
T8(30-60)	GY3(2)	B5, B68	GY7(2) GY7SPL	B5, B68 B68
T8-5(30-60)	GY3	B20	GY7(2) GY7SPL	B20, B192 B20
T20	GY3(2)	B5, B106	GY7(2) GY7SPL GY7-A	B5, B106 B106 B192
T20-5	GY3	B68	GY7 GY7SPL GY7-A	B68 B68 B192
T22	GY3	111	GY3	111
T22-5	GY3	73	GY3	73
VB1-5	GY3	B20	N/A	N/A
VB2-5(5-30)	GY3	B20	N/A	N/A
VB7-5	GY3	25	N/A	N/A
VB8-5(30-60)	GY3	B20	N/A	N/A
VB20-5	GY3	B68	N/A	N/A
VB22-5	GY3	73	N/A	N/A

GY3

3/8" DOWNGUY WITH 8 FOOT SCREW ANCHOR

OPTIONS: *5, *12
BOLT PLATE: NONE

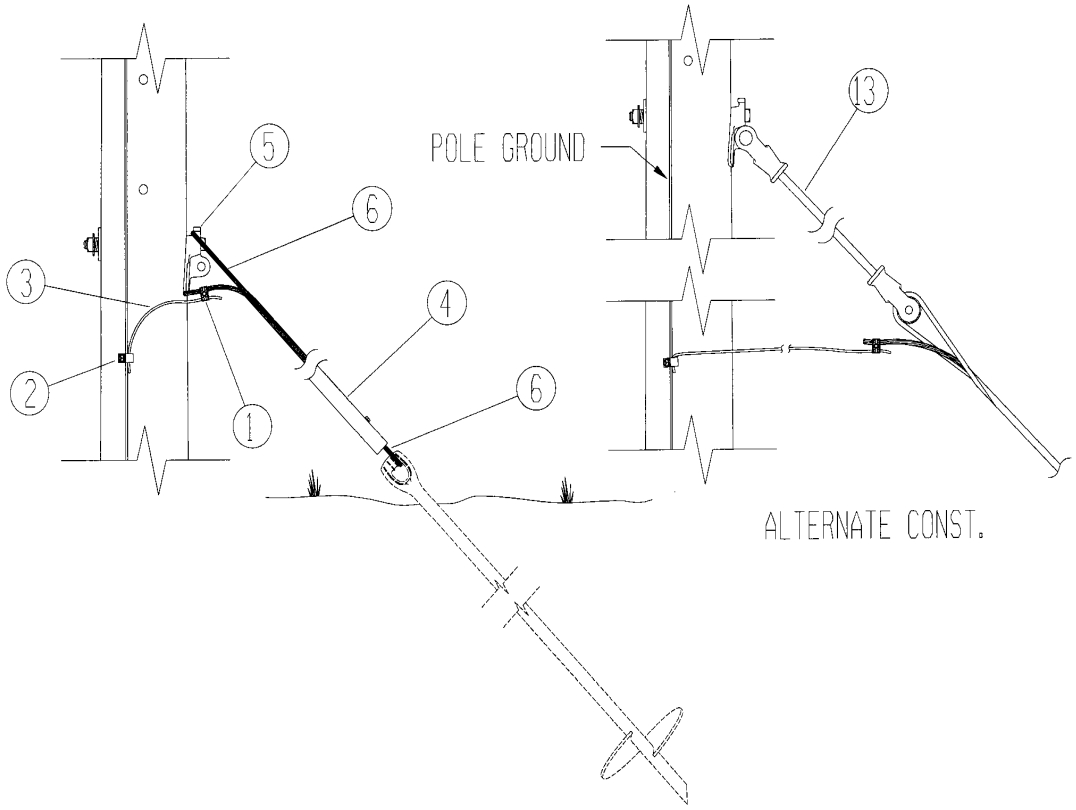


NO.	ITEM ID	QTY	DESCRIPTION
1	ANC SS 002	1	ANCHOR, SINGLE HELIX, 8 FOOT LENGTH
2	CNN CP 002	1	CONNECTOR, #2, 6-2 MAIN, 2-1/0 TAP, ALUMINUM COMPRESSION, PARALLEL TAP,
3	CNN VG 003	1	CONNECTOR, VISE TYPE, #6- #2 SOL., #10- #2 SOL.
4	COB CO 028	3	CONDUCTOR, BARE COPPER, #4 SOL.
5	GUA GW 002	1	GUARD, GUY WIRE (YELLOW)
6	GUY AT 008	1	GUY ATTACHMENT (COMBINATION) 20,000 POUNDS
7	GUY GR 001	2	GUY GRIP, FOR 3/8" GUY STRAND
8	GUY ST 005	50	GUY STRAND, 3/8"
9	WAS RD 005	1	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
10	WAS SF 003	1	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
12	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
13	COB CO 028	10	CONDUCTOR, BARE COPPER, #4 SOL.
14	INS GB ***	1	GENERAL CODE FOR STRAIN INSULATOR

GY3-A

3/8" DOWNGUY WITHOUT ANCHOR

OPTIONS: *5, *12
BOLT PLATE: NONE

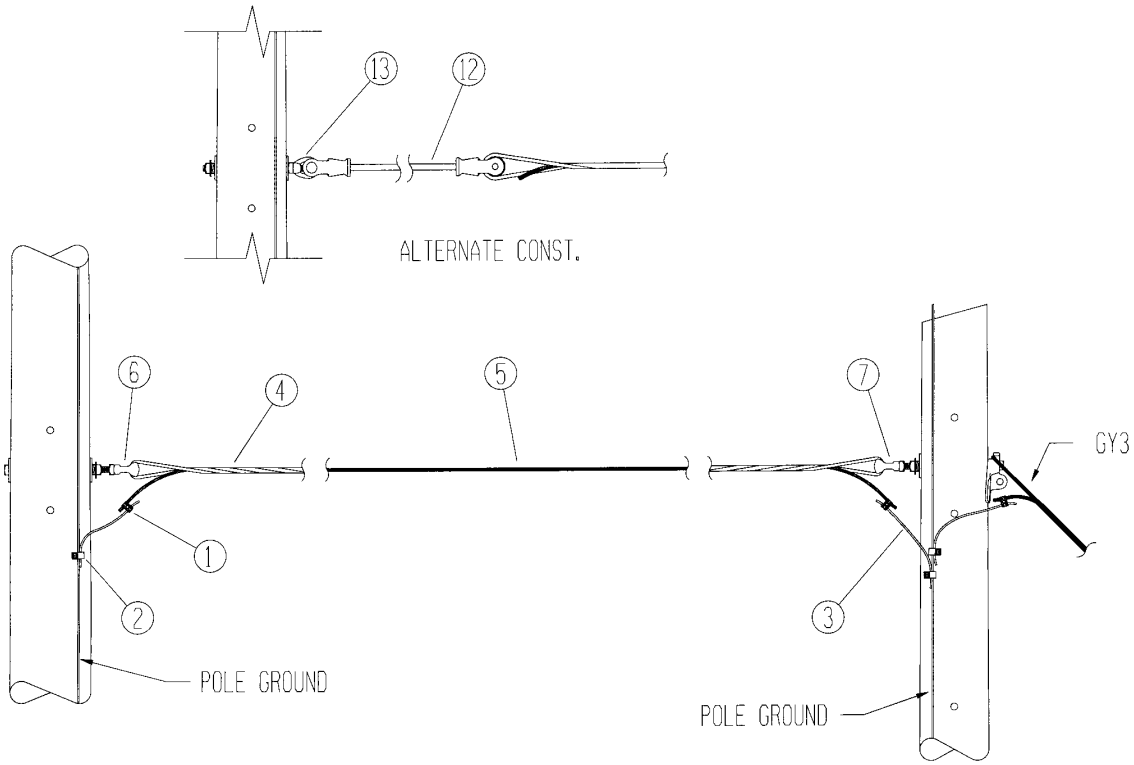


NO.	ITEM ID	QTY	DESCRIPTION
1	CNN CP 002	1	CONNECTOR, #2, 6-2 MAIN, 2-1/0 TAP, ALUMINUM COMPRESSION, PARALLEL TAP,
2	CNN VG 003	1	CONNECTOR, VISE TYPE, #6- #2 SOL., #10- #2 SOL.
3	COB CO 028	3	CONDUCTOR, BARE COPPER, #4 SOL.
4	GUA GW 002	1	GUARD, GUY WIRE (YELLOW)
5	GUY AT 008	1	GUY ATTACHMENT (COMBINATION) 20,000 POUNDS
6	GUY GR 001	2	GUY GRIP, FOR 3/8" GUY STRAND
7	GUY ST 005	50	GUY STRAND, 3/8"
8	WAS RD 005	1	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
9	WAS SF 003	1	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
10	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
11	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
12	COB CO 028	10	CONDUCTOR, BARE COPPER, #4 SOL.
13	INS GB ***	1	GENERAL CODE FOR STRAIN INSULATOR

GY3SPN

3/8" SPANGUY

OPTIONS: *5, *12
BOLT PLATE: NONE

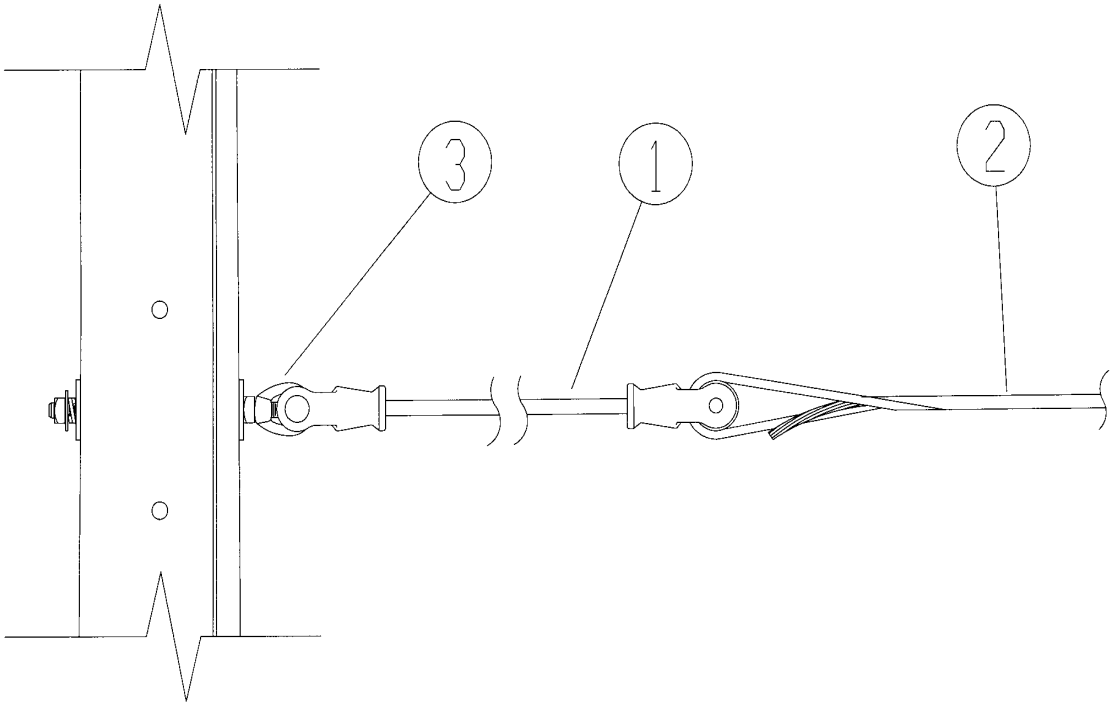


NO.	ITEM ID	QTY	DESCRIPTION
1	CNN CP 002	2	CONNECTOR, #2, 6-2 MAIN, 2-1/0 TAP, ALUMINUM COMPRESSION, PARALLEL TAP,
2	CNN VG 003	2	CONNECTOR, VISE TYPE, #6- #2 SOL., #10- #2 SOL.
3	COB CO 028	5	CONDUCTOR, BARE COPPER, #4 SOL.
4	GUY GR 001	2	GUY GRIP, FOR 3/8" GUY STRAND
5	GUY ST 005	80	GUY STRAND, 3/8"
6	NUT TE 002	1	NUT, THIMBLE EYE, 3/4, SINGLE
7	NUT TE 003	1	NUT, THIMBLE EYE, 3/4, TWIN
8	WAS RD 005	1	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
9	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
10	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
11	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
12	INS GB ***	1	GENERAL CODE FOR STRAIN INSULATOR
13	NUT EY 003	1	NUT, EYE, 3/4

GY3BK

BREAKER ADDITION FOR EXISTING 3/8" SPANGUY AT POLE

OPTIONS: *5, *12
BOLT PLATE: NONE

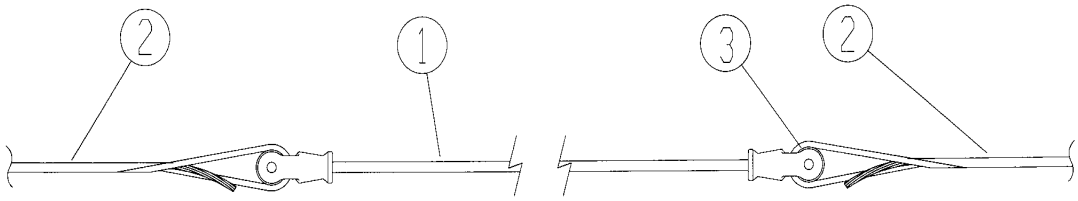


NO.	ITEM ID	QTY	DESCRIPTION
1	INS GB ***	1	GENERAL CODE FOR STRAIN INSULATOR
2	GUY GR 001	1	GUY GRIP, FOR 3/8" GUY STRAND
3	NUT EY 003	1	NUT, EYE, 3/4

GY3MBK

BREAKER ADDITION FOR EXISTING 3/8" SPANGUY AT MIDSPAN

OPTIONS: *5, *12
BOLT PLATE: NONE



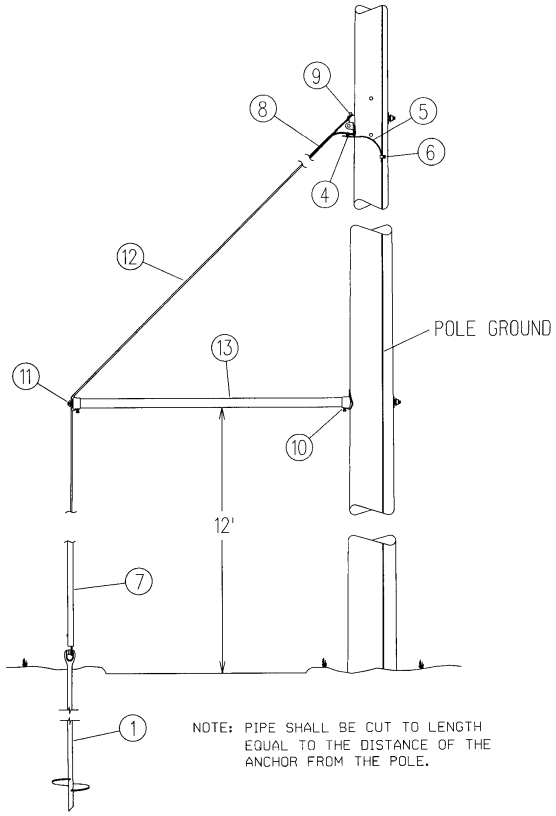
NO.	ITEM ID	QTY	DESCRIPTION
1	INS GB ***	1	GENERAL CODE FOR STRAIN INSULATOR
2	GUY GR 001	2	GUY GRIP, FOR 3/8" GUY STRAND
3	GUY RO 001	1	GUY ROLLER, 13/16" HOLE

GY3SW

3/8" SIDEWALK DOWNGUY

OPTIONS: *5, *12

BOLT PLATE: NONE



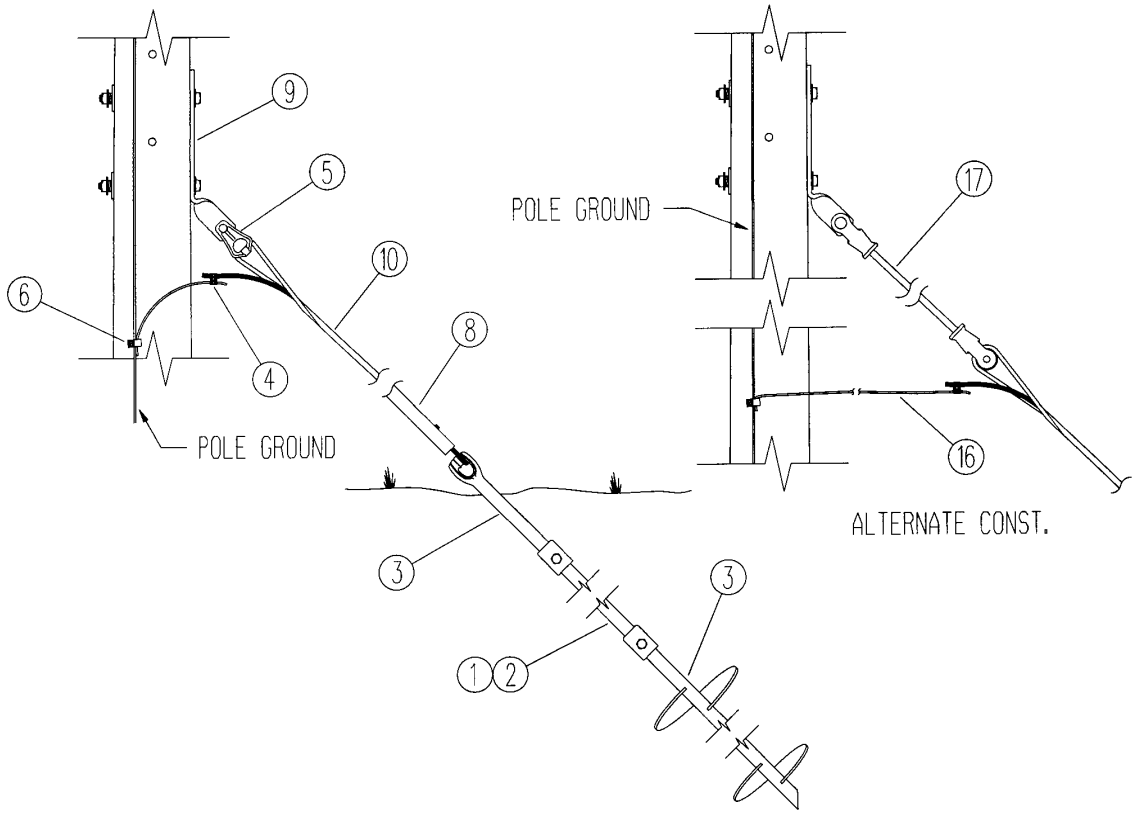
NO.	ITEM ID	QTY	DESCRIPTION
1	ANC SS 002	1	ANCHOR, SINGLE HELIX, 8 FOOT LENGTH
2	BOL MS 020	1	BOLT, MACHINE, SQUARE HEAD, 5/8X14
3	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
4	CNN CP 002	1	CONNECTOR, #2, 6-2 MAIN, 2-1/0 TAP, ALUMINUM COMPRESSION,
5	COB CO 028	3	CONDUCTOR, BARE COPPER, #4 SOL.
6	CNN VG 003	1	CONNECTOR, VISE TYPE, #6- #2 SOL., #10- #2 SOL.
7	GUA GW 002	1	GUARD, GUY WIRE (YELLOW)
8	GUY GR 001	2	GUY GRIP, FOR 3/8" GUY STRAND
9	GUY AT 008	1	GUY ATTACHMENT (COMBINATION) 20,000 POUNDS
10	GUY FI 001	1	GUY FITTING, SIDEWALK, POLE PLATE
11	GUY FI 002	1	GUY FITTING, SIDEWALK, SINGLE GUY CLAMP
12	GUY ST 005	50	GUY STRAND, 3/8"
13		1	PIPE, GALVANIZED, 2 IN. DIA., 6 FOOT LONG
14	SCW LA 002	1	SCREW, LAG, 1/2 IN. DIA., 4 IN. LONG
15	WAS RD 005	2	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
16	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
17	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

GY7

7/16" DOWNGUY WITH MULTI-HELIX ANCHOR

OPTIONS: *5, *12

BOLT PLATE: NONE

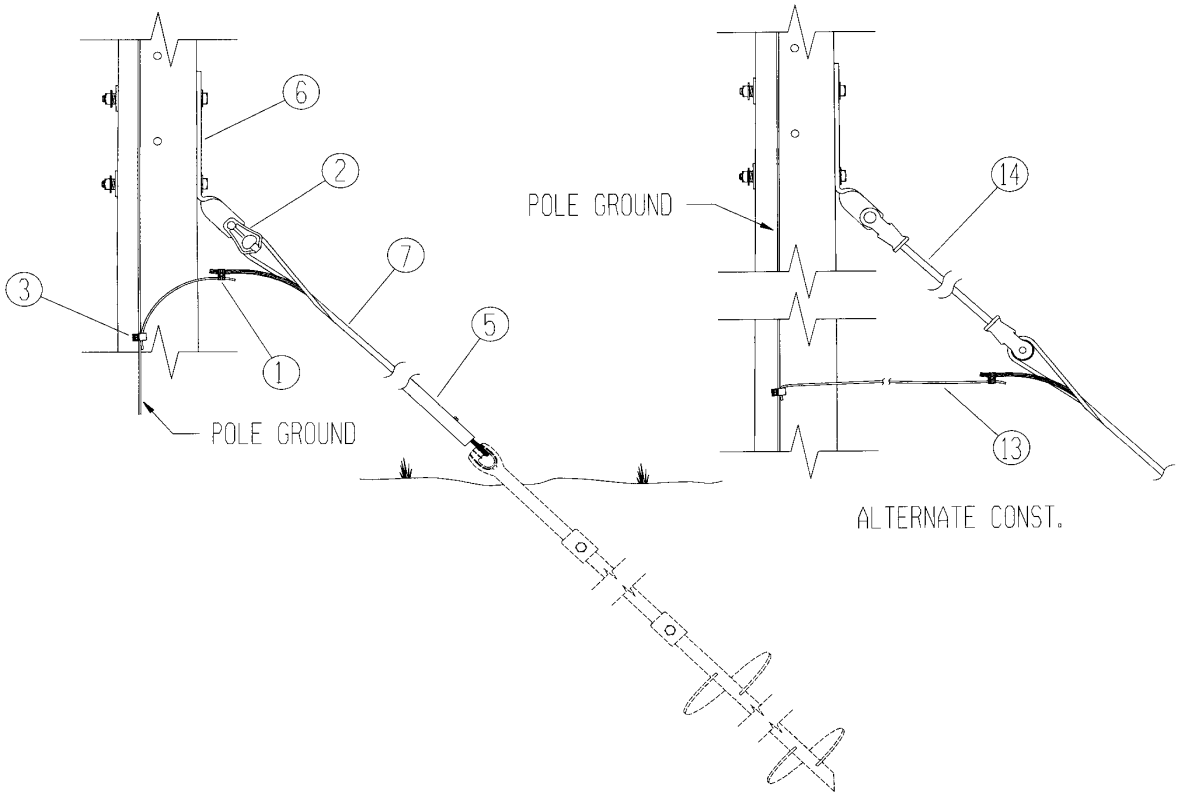


NO.	ITEM ID	QTY	DESCRIPTION
1	ANC EX 002	1	ANCHOR EXTENSION, 3-1/2 FOOT
2	ANC EX 003	3	ANCHOR EXTENSION, 5 FOOT
3	ANC MS 002	1	ANCHOR, MULTI-HELIX, 5 FOOT LONG, 10/11.3 IN. DIA. HELIX
4	CNN CP 005	1	CONNECTOR, #3, 6-2 MAIN, 2/0-3/0 TAP, COMPRESSION, PARALLEL
5	CLE TH 001	1	CLEVIS, THIMBLE, 20,000 POUNDS
6	CNN VG 003	1	CONNECTOR, VISE TYPE, #6- #2 SOL., #10- #2 SOL.
7	COB CO 028	3	CONDUCTOR, BARE COPPER, #4 SOL.
8	GUA GW 002	1	GUARD, GUY WIRE (YELLOW)
9	GUY AT 004	1	GUY ATTACHMENT, 20,000 POUNDS MIN. ULTIMATE
10	GUY GR 002	2	GUY GRIP, FOR 7/16" GUY STRAND
11	GUY ST 006	50	GUY STRAND, 7/16"
12	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
13	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
14	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
15	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD 3/4X14
16	COB CO 028	10	CONDUCTOR, BARE COPPER, #4 SOL.
17	INS GB ***	1	GENERAL CODE FOR STRAIN INSULATOR

GY7-A

7/16" DOWNGUY WITHOUT ANCHOR

OPTIONS: *5, *12
BOLT PLATE: NONE



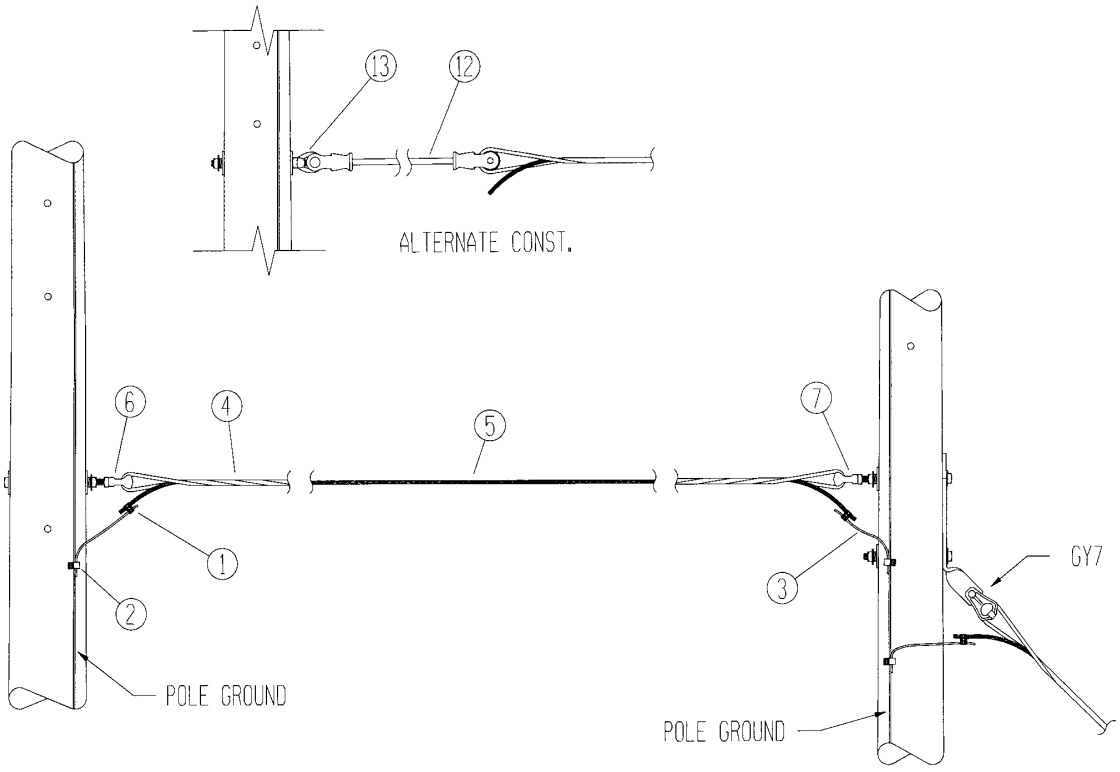
NO.	ITEM ID	QTY	DESCRIPTION
1	CNN CP 005	1	CONNECTOR, #3, 6-2 MAIN, 2/0-3/0 TAP, COMPRESSION, PARALLEL TAP, ALUMINUM,
2	CLE TH 001	1	CLEVIS, THIMBLE, 20,000 POUNDS
3	CNN VG 003	1	CONNECTOR, VISE TYPE, #6- #2 SOL., #10- #2 SOL.
4	COB CO 028	3	CONDUCTOR, BARE COPPER, #4 SOL.
5	GUA GW 002	1	GUARD, GUY WIRE (YELLOW)
6	GUY AT 004	1	GUY ATTACHMENT, 20,000 POUNDS MIN. ULTIMATE
7	GUY GR 002	2	GUY GRIP, FOR 7/16" GUY STRAND
8	GUY ST 006	50	GUY STRAND, 7/16"
9	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
10	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
12	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD 3/4X14
13	COB CO 028	10	CONDUCTOR, BARE COPPER, #4 SOL.
14	INS GB ***	1	GENERAL CODE FOR STRAIN INSULATOR

GY7SPN

7/16" SPANGUY

OPTIONS: *5, *12

BOLT PLATE: NONE

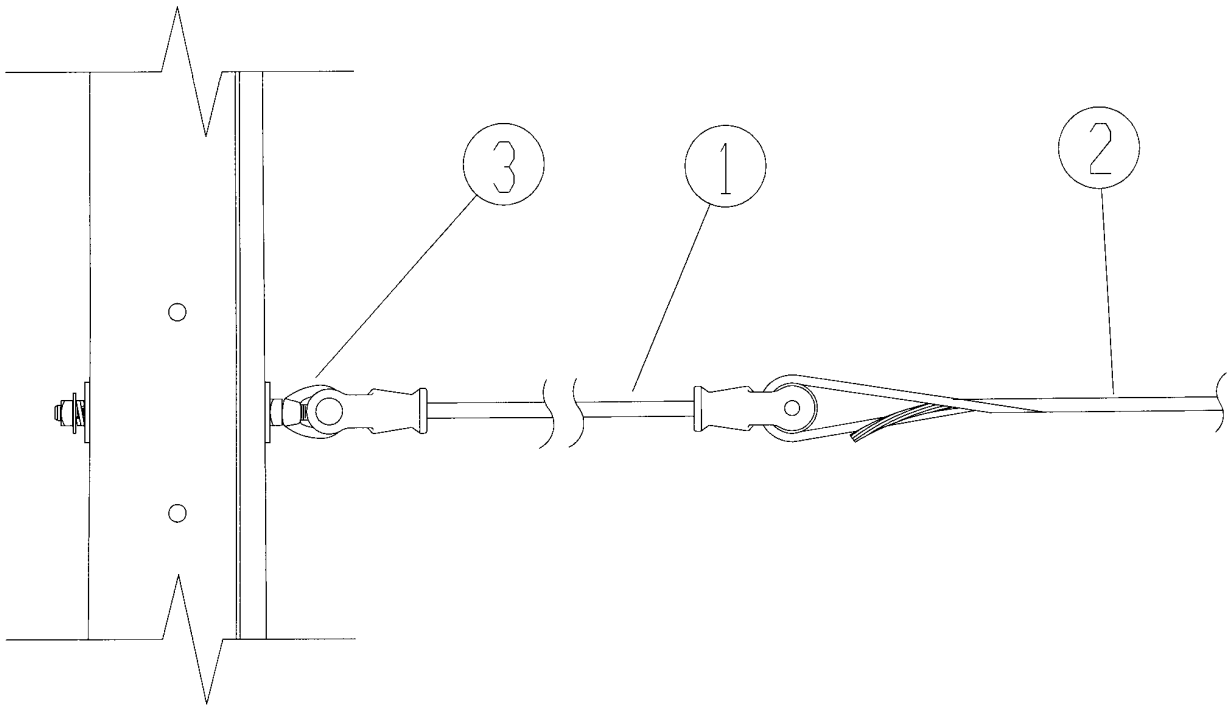


NO.	ITEM ID	QTY	DESCRIPTION
1	CNN CP 005	2	CONNECTOR, #3, 6-2 MAIN, 2/0-3/0 TAP, COMPRESSION, PARALLEL TAP, ALUMINUM,
2	CNN VG 003	2	CONNECTOR, VISE TYPE, #6- #2 SOL., #10- #2 SOL.
3	COB CO 028	5	CONDUCTOR, BARE COPPER, #4 SOL.
4	GUY GR 002	2	GUY GRIP, FOR 7/16" GUY STRAND
5	GUY ST 006	80	GUY STRAND, 7/16"
6	NUT TE 002	1	NUT, THIMBLE EYE, 3/4, SINGLE
7	NUT TE 003	1	NUT, THIMBLE EYE, 3/4, TWIN
8	WAS RD 005	1	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
9	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
10	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
11	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
12	INS GB ***	1	GENERAL CODE FOR STRAIN INSULATOR
13	NUT EY 003	1	NUT, EYE, 3/4

GY7BK

BREAKER ADDITION FOR EXISTING 7/16" SPANGUY AT POLE

OPTIONS: *5, *12
BOLT PLATE: NONE

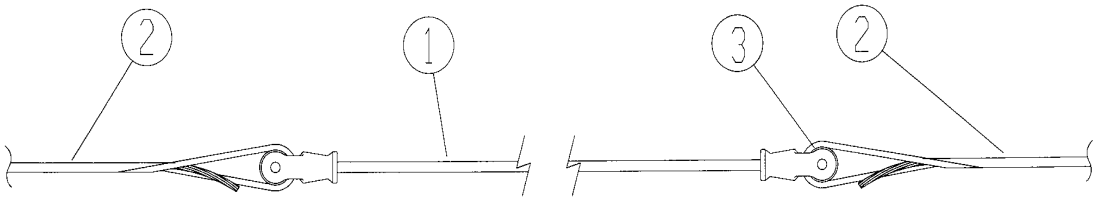


NO.	ITEM ID	QTY	DESCRIPTION
1	INS GB ***	1	GENERAL CODE FOR STRAIN INSULATOR
2	GUY GR 002	1	GUY GRIP, FOR 7/16" GUY STRAND
3	NUT EY 003	1	NUT, EYE, 3/4

GY7MBK

BREAKER ADDITION FOR EXISTING 7/16" SPANGUY AT MIDSPAN

OPTIONS: *5, *12
BOLT PLATE: NONE

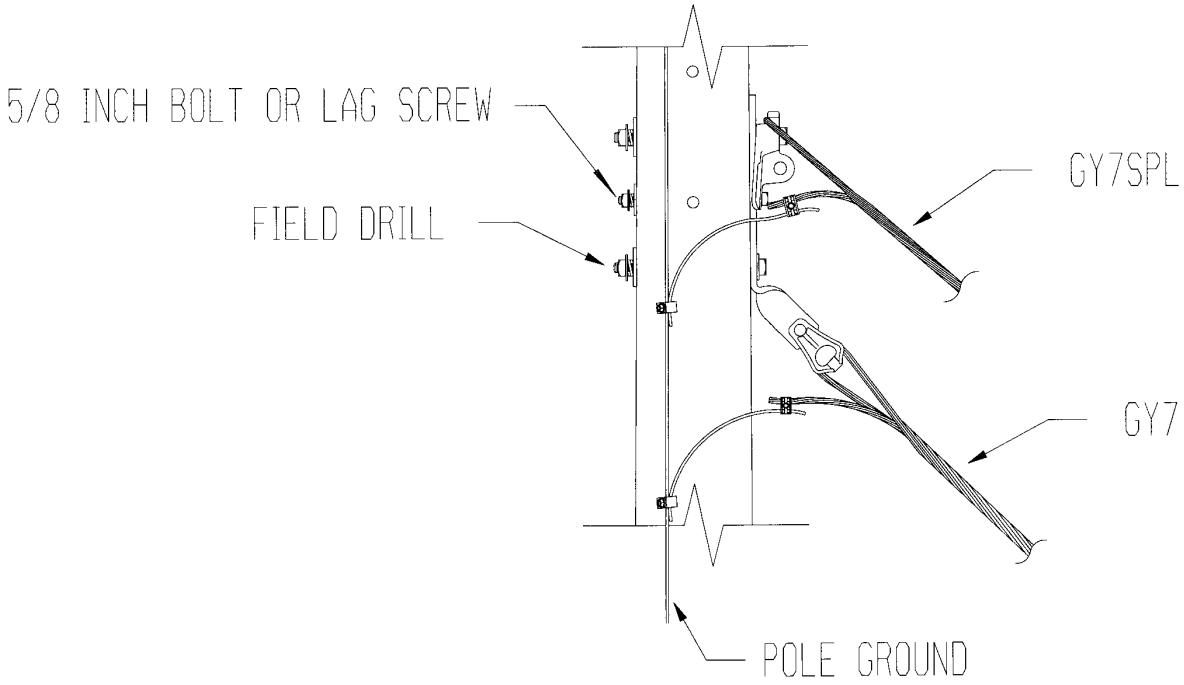


NO.	ITEM ID	QTY	DESCRIPTION
1	INS GB ***	1	GENERAL CODE FOR STRAIN INSULATOR
2	GUY GR 002	2	GUY GRIP, FOR 7/16" GUY STRAND
3	GUY RO 001	1	GUY ROLLER, 13/16" HOLE

GY7SPL

7/16" SPECIAL DOWNGUY FOR HORIZONTAL CONSTRUCTION

OPTIONS: *5, *12
BOLT PLATE: NONE

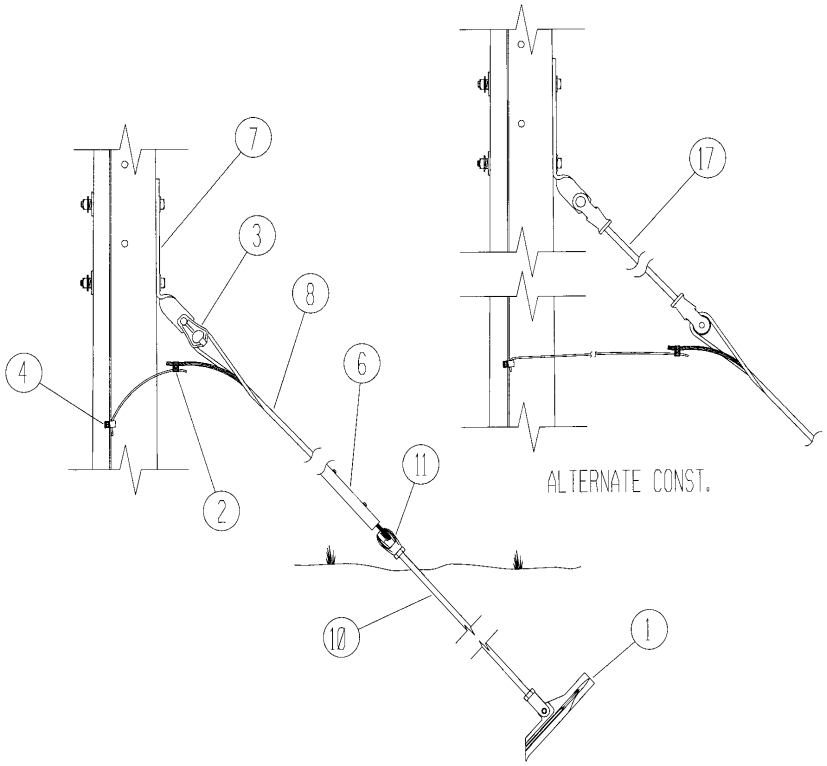


NO.	ITEM ID	QTY	DESCRIPTION
1	ANC AE 001	1	ANCHOR, EYEBOLT ASSEMBLY, TRIPLE EYE
2	ANC EX ***	*	GENERAL CODE FOR EXTENSION (PLATED SEPARATE)
3	ANC MS 002	1	ANCHOR, MULTI-HELIX, 5 FOOT LONG, 10/11.3 IN. DIA. HELIX
4	CNN CP 005	1	CONNECTOR, #3, 6-2 MAIN, 2/0-3/0 TAP, COMPRESSION, PARALLEL
5	CNN VG 003	1	CONNECTOR, VISE TYPE, #6- #2 SOL., #10- #2 SOL.
6	COB CO 028	3	CONDUCTOR, BARE COPPER, #4 SOL.
7	GUA GW 002	1	GUARD, GUY WIRE (YELLOW)
8	GUY AT 008	1	GUY ATTACHMENT (COMBINATION) 20,000 POUNDS
9	GUY GR 002	2	GUY GRIP, FOR 7/16" GUY STRAND
10	GUY ST 006	50	GUY STRAND, 7/16"
11	WAS RD 004	1	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. DIA. BOLT
12	WAS RD 005	1	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
13	WAS SF 002	1	WASHER, SQUARE, FLAT, 2-1/4 IN., FOR 5/8 IN. DIA. BOLT
14	WAS SF 003	1	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
15	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
16	BOL MS 020	1	BOLT, MACHINE, SQUARE HEAD 5/8X14
17	BOL MS 036	1	BOLT, MACHINE, SQUARE HEAD 3/4X14
18	COB CO 028	10	CONDUCTOR, BARE COPPER, #4 SOL.
19	INS GB ***	1	GENERAL CODE FOR STRAIN INSULATOR

GY7MR

7/16" DOWNGUY WITH MANTA-RAY ANCHOR

OPTIONS: *5, *12
BOLT PLATE: NONE

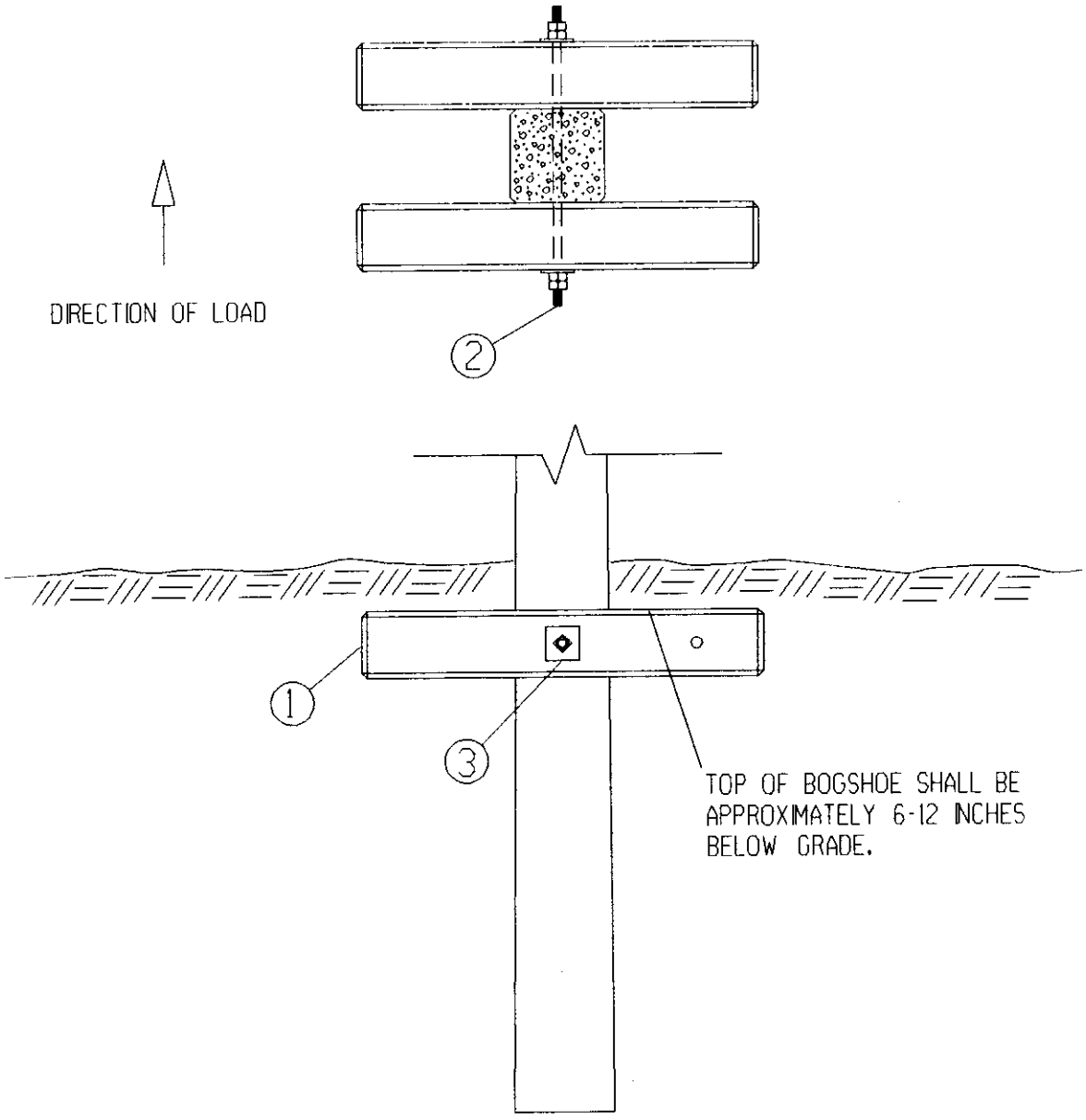


NO.	ITEM ID	QTY	DESCRIPTION
1	ANC MR 001	1	ANCHOR, MANTA-RAY
2	CNN CP 005	1	CONNECTOR, #3, 6-2 MAIN, 2/0-3/0 TAP, COMPRESSION, PARALLEL
3	CLE TH 001	1	CLEVIS, THIMBLE, 20,000 POUNDS
4	CNN VG 003	1	CONNECTOR, VISE TYPE, #6- #2 SOL., #10- #2 SOL.
5	COB CO 028	3	CONDUCTOR, BARE COPPER, #4 SOL.
6	GUA GW 002	1	GUARD, GUY WIRE (YELLOW)
7	GUY AT 004	1	GUY ATTACHMENT, 20,000 POUNDS MIN. ULTIMATE
8	GUY GR 002	2	GUY GRIP, FOR 7/16" GUY STRAND
9	GUY ST 006	50	GUY STRAND, 7/16"
10	ROD ** ***	*	GENERAL CODE FOR EXTENSION (PLATED SEPERATE)
11	THI EY 002	1	THIMBLE EYE, TWIN, FOR MANTA-RAY ANCHOR
12	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
13	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
14	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
15	BOL MS 036	2	BOLT, MACHINE, SQUARE HEAD 3/4X14
16	COB CO 028	10	CONDUCTOR, BARE COPPER, #4 SOL.
17	INS GB ***	1	GENERAL CODE FOR STRAIN INSULATOR

GYBOG-C

BOGSHOE FOR CONCRETE POLE

OPTIONS: NONE
BOLT PLATE: NONE

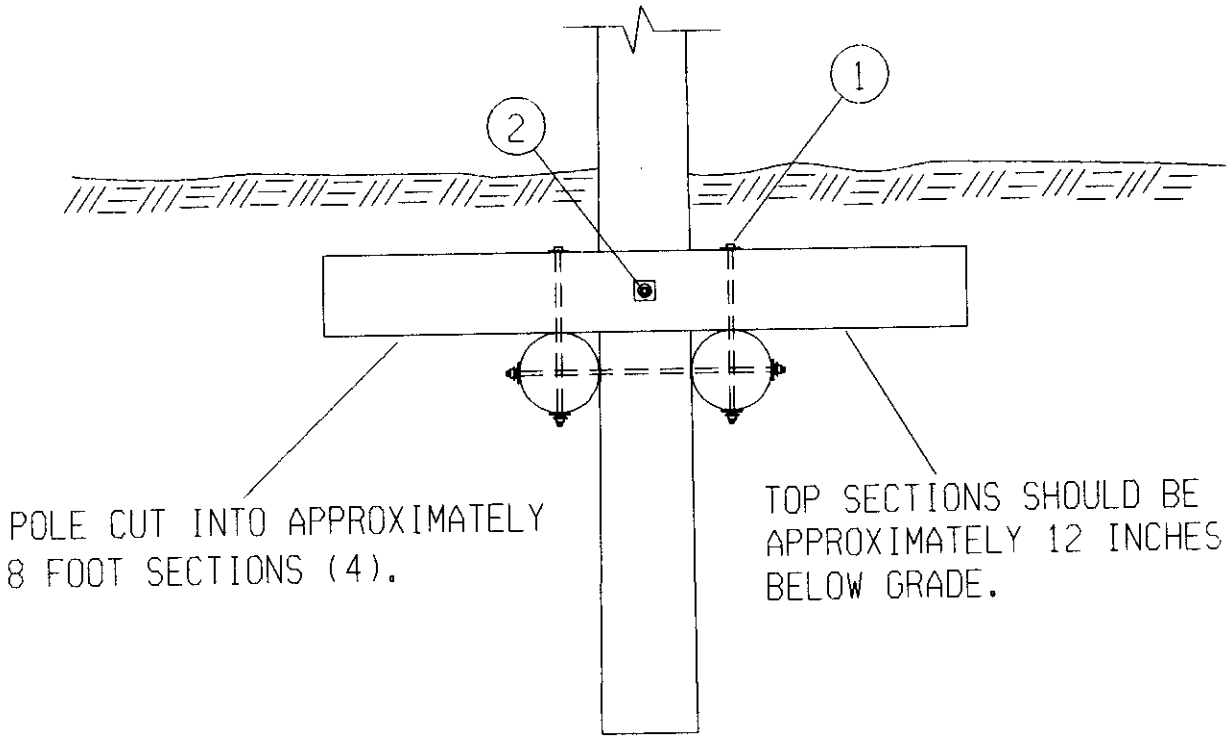


NO.	ITEM ID	QTY	DESCRIPTION
1	ANC BS 001	2	ANCHOR, BOGSHOE, CONCRETE
2	ROD HA 007	1	ROD, HANGER, 1-1/2 IN. DIA., 60 IN. LONG
3	WAS SF 008	2	WASHER, 6 IN. SQUARE, FLAT, FOR 1-1/2 IN. DIA. BOLT

GYBOG-W

BOGSHOE FOR WOOD POLE

OPTIONS: NONE
BOLT PLATE: NONE

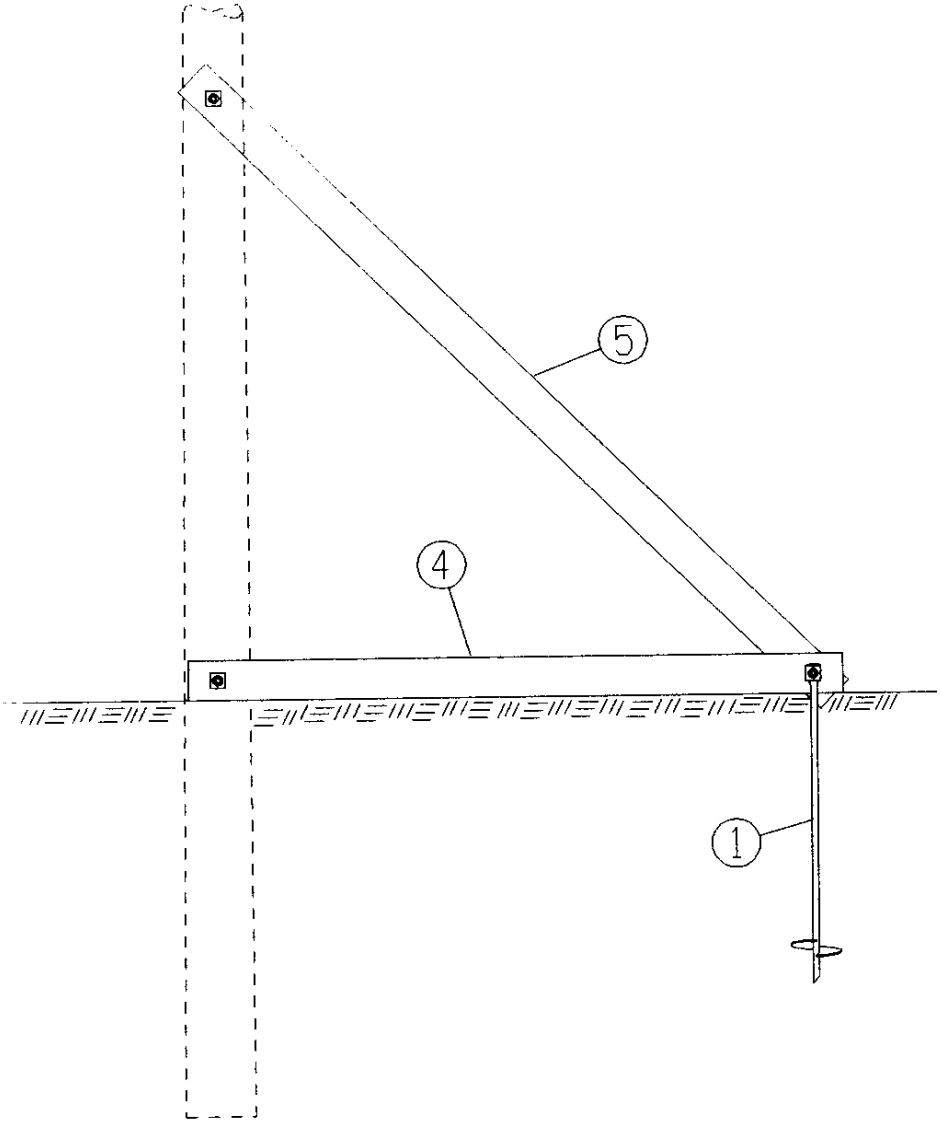


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 043	4	BOLT, MACHINE, SQUARE HEAD 3/4X28
2	POL WO 003	1	POLE, WOOD, 35 FOOT, CLASS 4, CCA TREATED
3	ROD HA 004	2	ROD, HANGER, 1 IN. DIA., 40 IN. LONG
4	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
5	WAS SC 003	4	WASHER, SQUARE, CURVED, 4 IN., FOR 1 IN. DIA. BOLT
6	WAS SF 003	8	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
7	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

GYBRACE-LD

POLE BRACE – LIGHT DUTY

OPTIONS: NONE
BOLT PLATE: NONE

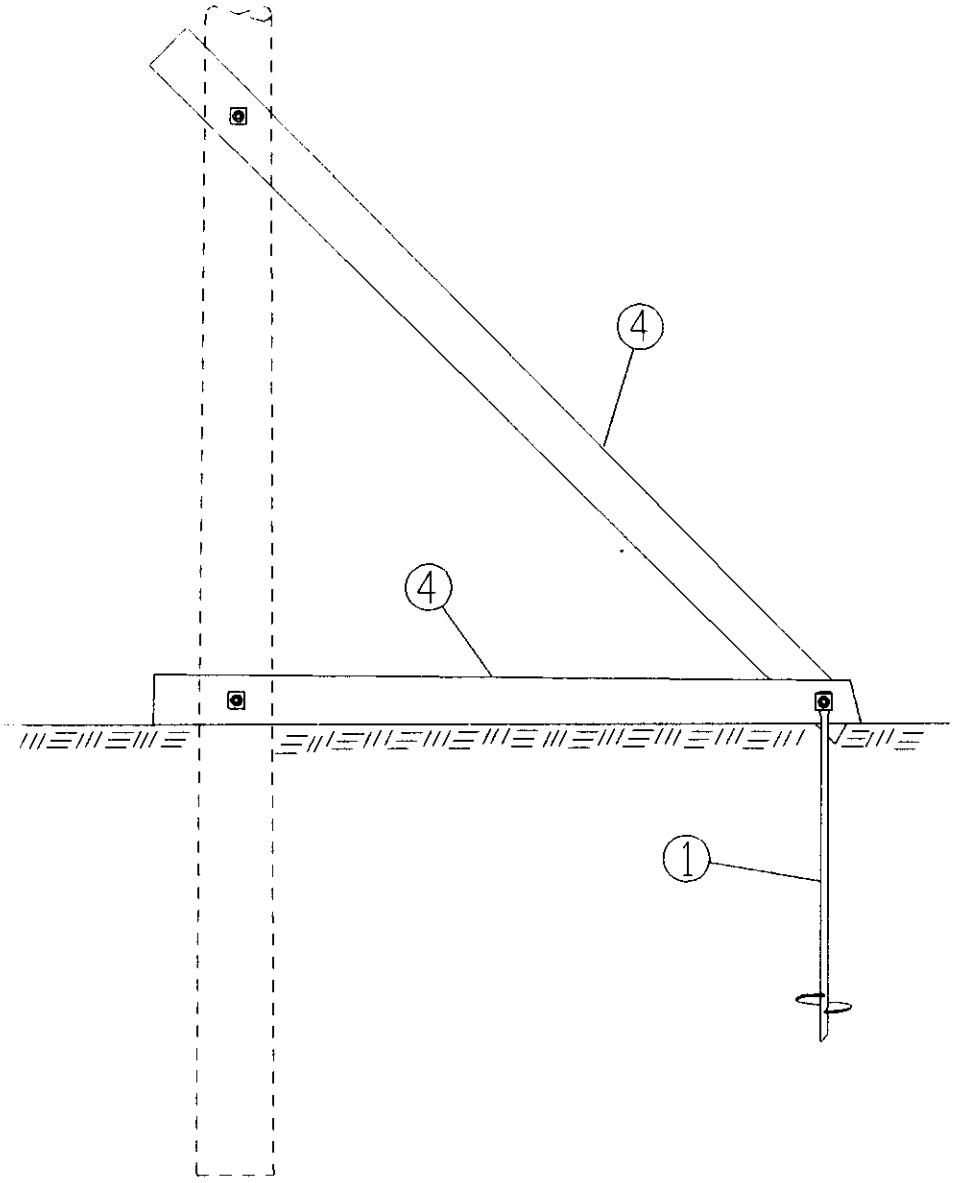


NO.	ITEM ID	QTY	DESCRIPTION
1	ANC SS 002	1	ANCHOR, SINGLE HELIX, 8 FOOT LENGTH
2	BOL DA 016	2	BOLT, DOUBLE ARMING 3/4X16
3	BOL DA 017	1	BOLT, DOUBLE ARMING 3/4X17
4	CXA WO 008	1	CROSSARM, WOOD, 6” X 8” X 11’
5	CXA WO 009	1	CROSSARM, WOOD, 6” X 8” X 15”
6	WAS RD 005	5	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
7	WAS SF 003	7	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

GYBRACE-HD

POLE BRACE – HEAVY DUTY

OPTIONS: NONE
BOLT PLATE: NONE

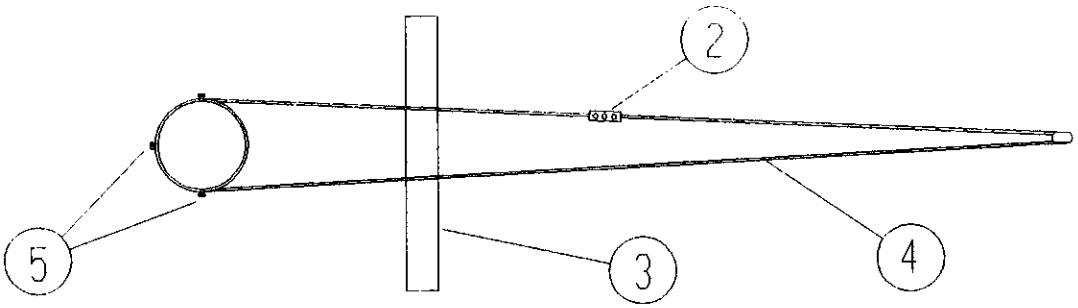


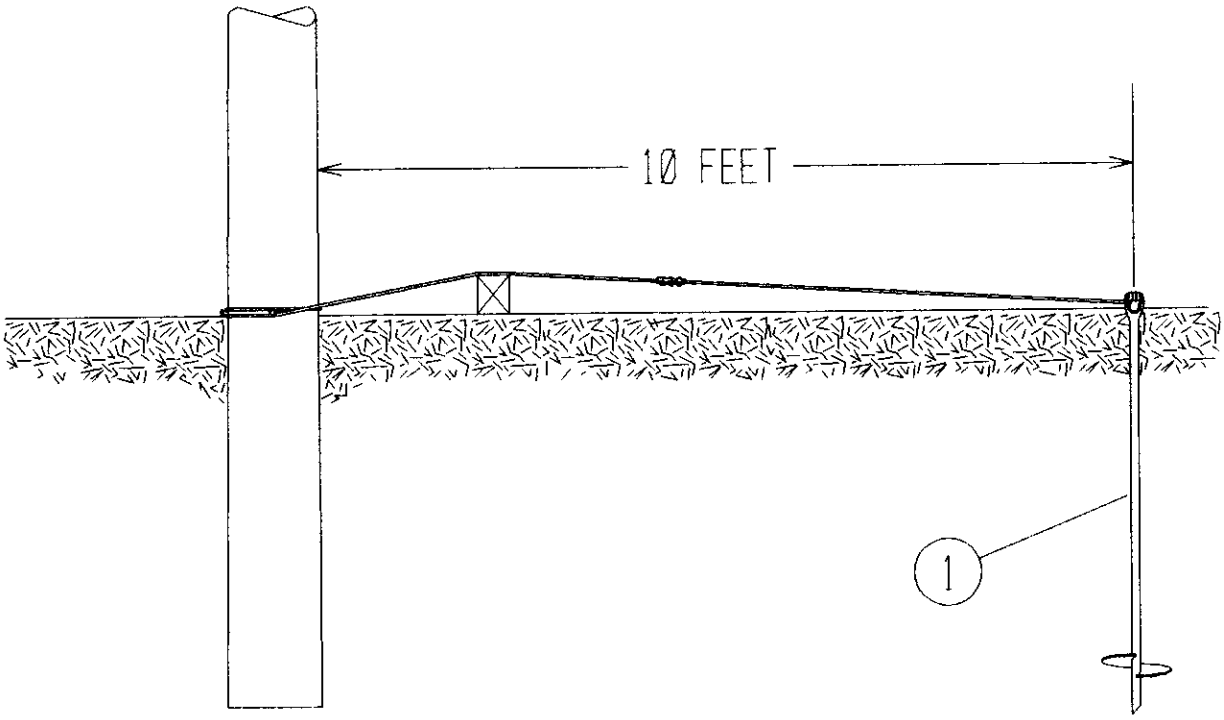
NO.	ITEM ID	QTY	DESCRIPTION
1	ANC SS 002	1	ANCHOR, SINGLE HELIX, 8 FOOT LENGTH
2	BOL DA 021	1	BOLT, DOUBLE ARMING 3/4X26
3	BOL DA 022	2	BOLT, DOUBLE ARMING 3/4X28
4	POL WO 001	2	POLE, WOOD, CLASS 4, CCA TREATED
5	WAS SF 003	6	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

GYBUTT-LD

BUTTGUY – LIGHT DUTY

OPTIONS: NONE
BOLT PLATE: NONE



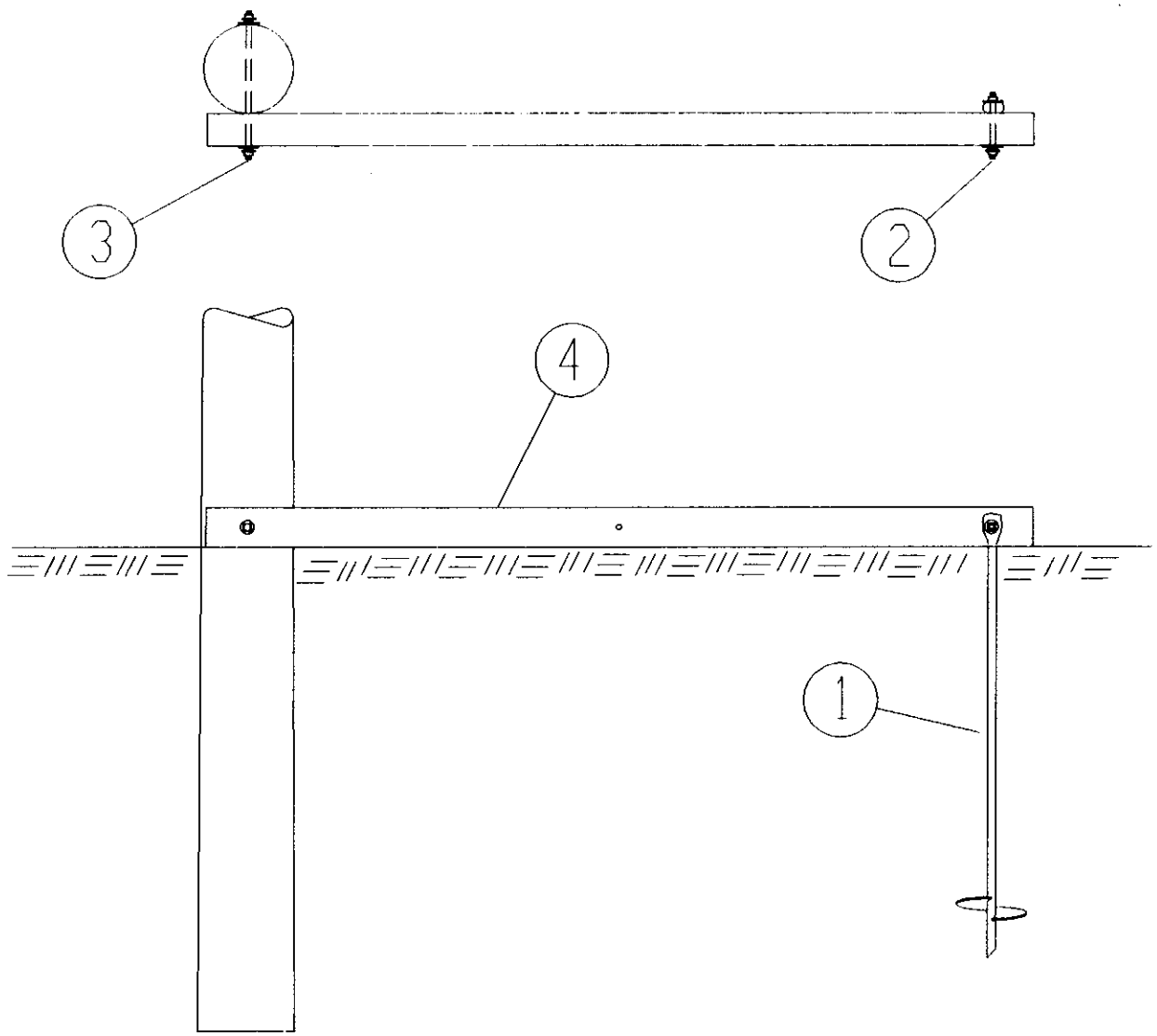


NO.	ITEM ID	QTY	DESCRIPTION
1	ANC SS 002	1	ANCHOR, SINGLE HELIX, 8 FOOT LENGTH
2	CLA CS 001	1	CLAMP, SUSPENSION, 3-BOLT TYPE
3	CXA WO 004	1	CROSSARM, WOOD, 5-3/4" X 4-3/4" X 10'
4	GUY ST 005	30	GUY STRAND, 3/8 IN.
5	SCW LA 002	3	SCREW, LAG, 1/2 IN. DIA., 4 IN. LENGTH

GYBUTT-HD

BUTTGUY – HEAVY DUTY

OPTIONS: NONE
BOLT PLATE: NONE

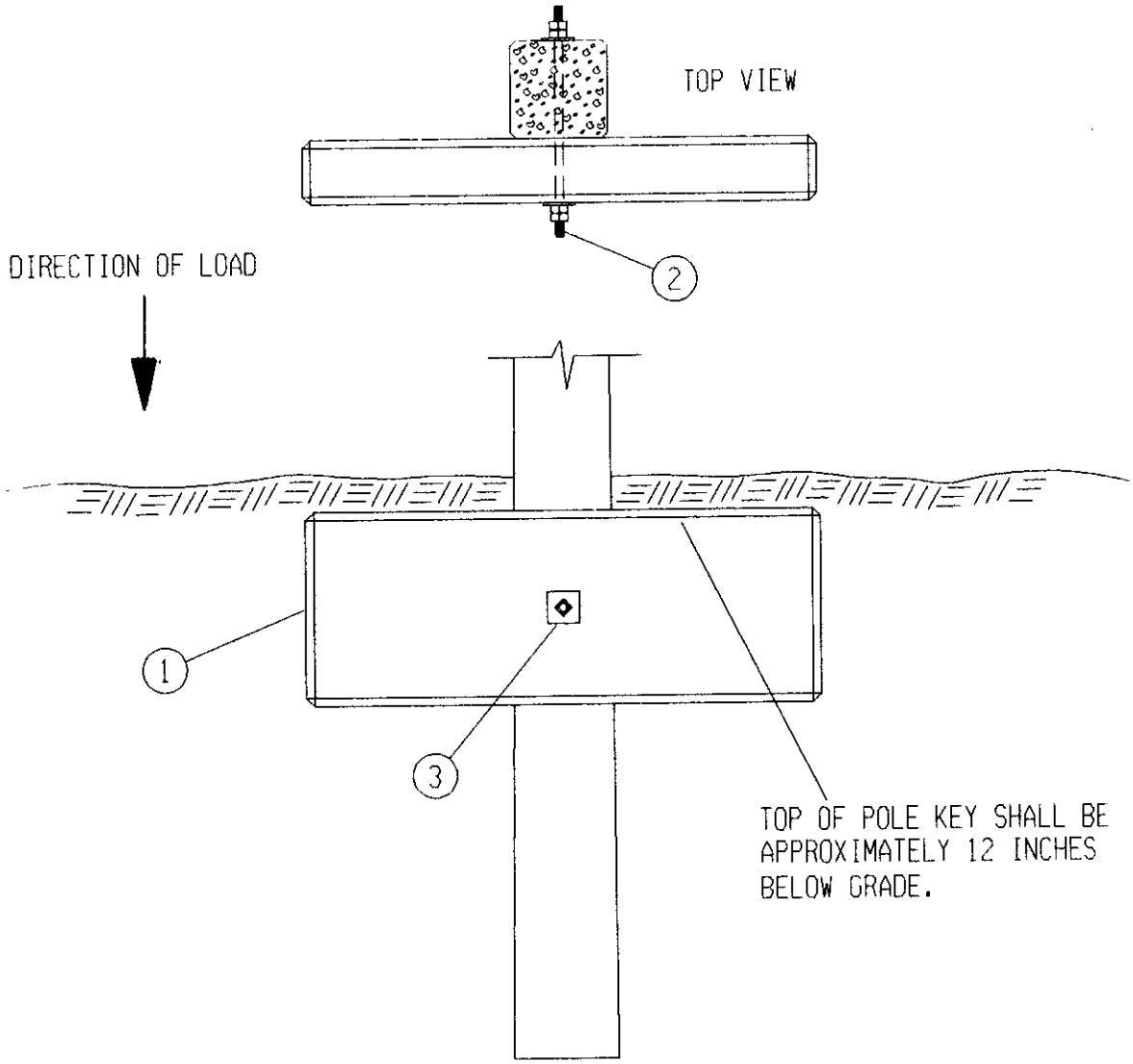


NO.	ITEM ID	QTY	DESCRIPTION
1	ANC SS 002	1	ANCHOR, SINGLE HELIX, 8 FOOT LENGTH
2	BOL DA 014	1	BOLT, DOUBLE ARMING 3/4X12
3	BOL DA 020	1	BOLT, DOUBLE ARMING 3/4X24
4	CXA WO 005	1	CROSSARM, WOOD, 5-3/4" X 5-3/4" X 10'
5	WAS RD 005	4	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
6	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
7	WAS SP 002	4	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

GYKEY-LD

POLE KEY – LIGHT DUTY

OPTIONS: NONE
BOLT PLATE: NONE

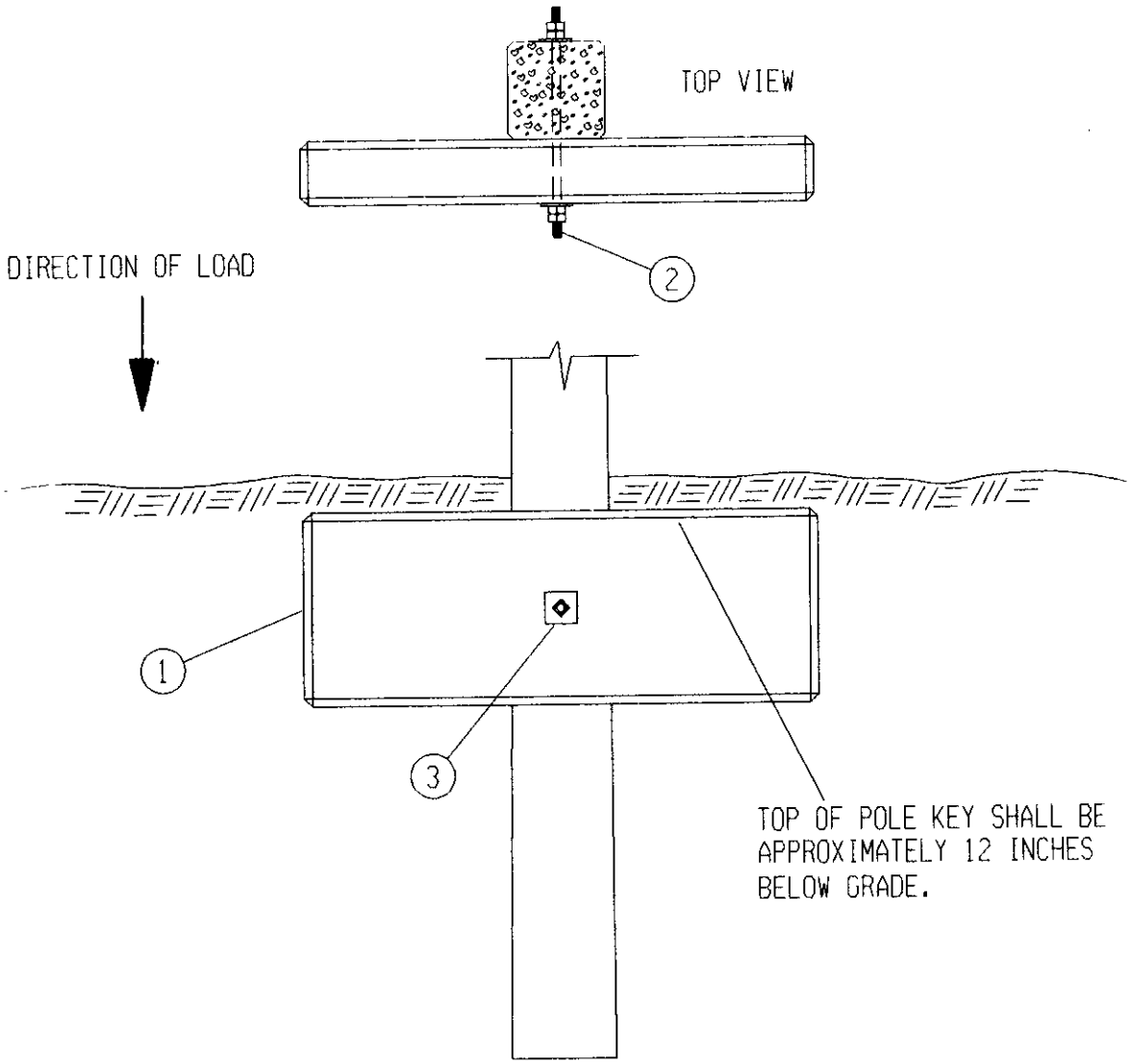


NO.	ITEM ID	QTY	DESCRIPTION
1	ANC KY 001	1	ANCHOR KEY, 6 FOOT LENGTH
2	ROD HA 008	1	ROD, HANGER, 1-1/2 IN. DIA., 40 IN. LENGTH
3	WAS SF 008	2	WASHER, 6 IN. SQUARE, FLAT, FOR 1-1/2 IN. DIA. BOLT

GYKEY-HD

POLE KEY – HEAVY DUTY

OPTIONS: NONE
BOLT PLATE: NONE

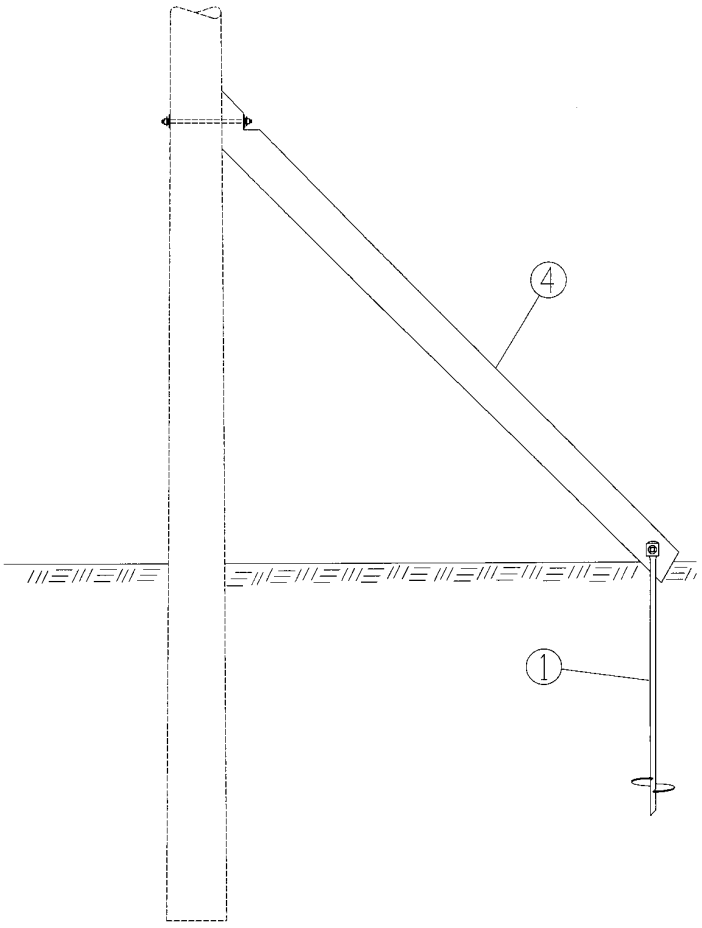


NO.	ITEM ID	QTY	DESCRIPTION
1	ANC KY 002	1	ANCHOR KEY, 8 FOOT LENGTH
2	ROD HA 008	1	ROD, HANGER, 1-1/2 IN. DIA., 40 IN. LENGTH
3	WAS SF 008	2	WASHER, 6 IN. SQUARE, FLAT, FOR 1-1/2 IN. DIA. BOLT

GYPUSH

PUSH POLE

OPTIONS: NONE
BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	ANC SS 002	1	ANCHOR, SINGLE HELIX, 8 FOOT LENGTH
2	BOL DA 018	1	BOLT, DOUBLE ARMING 3/4X20
3	BOL DA 019	1	BOLT, DOUBLE ARMING 3/4X22
4	POL WO 003	1	POLE, WOOD, 35 FOOT, CLASS 4
5	WAS RD 005	2	WASHER, ROUND, 2 IN. DIA., FOR 3/4 IN. DIA. BOLT
6	WAS SF 003	4	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
7	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

GENERAL LIGHTING NOTES:

1. MERCURY VAPOR

   Mercury vapor luminaire plates are shown for the purpose of removal only. Any work will constitute replacement with the appropriate High Pressure Sodium (HPS) or Light Emitting Diode (LED) fixture.

2. HIGH PRESSURE SODIUM (HPS)

   HPS fixtures are available in three wattages – 70, 200, and 250. The 70W HPS fixture is used almost exclusively for residential roadway lighting. The 200W HPS fixture is used primarily for light to moderately traveled roadways and the 250W HPS fixture for moderate to heavily traveled roadways.

3. METAL HALIDE (MH)

   MH roadway lighting and floodlight fixtures are available in 320W (previously 400W). Decorative acorn lighting fixtures are available in 150W (previously 175W). The 400W and 175W fixtures can still be maintained with the appropriate lamp and/or ballast replacement. If the ballast or fixture is upgraded to the new wattage, then the lamp must be upgraded as well.

4. LIGHT EMITTING DIODE (LED)

   LED lighting fixtures are available in multiple options. Cobra-head fixtures are available in 40W (70W HPS Equivalent), 115W (200/250W HPS Equivalent), and 275W (400W HPS Equivalent). The 115W LED cobra-head will replace both the 200W HPS and the 250W HPS. A LED post-top fixture is available in 40W (70W HPS Equivalent) as a direct replacement, as well as a retrofit. Decorative acorn lighting fixtures are also available in 100W (150W/175W MH). Currently, LED is the most efficient roadway lighting system.

5. PLATE SUFFIXES:

   Add a "U" suffix to indicate underground lighting for L1, L2, and L3 (Example: L1U). The "U" suffix will include all the material on the plate, plus 30' of cable, the concrete pole, the fuse, fuse holder, and cover.
   Add an "R" suffix to indicate a high pressure sodium replacement for L1, L2, L3 and L4 (Example: L1R). The "R" suffix will include a fixture, lamp, and photocontrol.

6. POLES

   All non-decorative concrete street light poles should be plated with a G3C non-equipment ground, which will provide the necessary ground rod, clamps, and connectors. All metal poles should include a CLATG001 installed in the pole and connected to the ground wire.

   All decorative aluminum street light poles with provisions for banner arms should be placed at a minimum of thirty-inches (30”) from face of curb to face of pole to avoid banner arm overhang into the active roadway. JEA maintains the banner arm assembly, but is not responsible for hanging banners.

7. CONDUCTOR

   12-2 UF without ground is the conductor used to supply voltage to the fixture. All fixtures, besides Series Type, have ballasts that require a 120V supply. Every streetlight bracket shall be grounded for personnel safety.

8. MAINTENANCE PLATES

STREET LIGHT MAINTENANCE PLATES		
PLATE	**DESCRIPTION**	**UNIT**
LUMIN	INSTALL LUMINAIRE	EA
ULAMP	INSTALL LAMP	EA
UPHOTO	INSTALL PHOTO CONTROL	EA
BKTARM	INSTALL BRACKET ARM	EA
SLPOLE	INSTALL STREET LIGHT POLE	EA
PAINT-SLP	PAINT STREET LIGHT POLE	EA
PAINT-SLP1	PAINT L4 STREET LIGHT POLE	EA

UNDERGROUND FED LIGHTING NOTES:

1. If possible, the fuse shall be installed in the pole. All fiberglass and aluminum pole plates thus include the fuse, fuse holder, and cover. The cover is the smaller COVSP003. If the fuse must be installed in the pullbox, the USTSL plate should be used. The USTSL plate makes use of the larger COVSP002 which is waterproof.
2. The anchor base shall extend 1 inch maximum above final grade and must be set parallel to established reference line (back of curb, back of walk, survey base line, etc.) with a maximum deviation of ½ inch every 18 inches.
3. The pole opening at the base shall be in the direction of the feed. Three feet of slack shall be coiled at the bottom of the pole.
4. Secondary conductor for underground lighting systems shall be at least 2/0 aluminum triplex (CAIUS002) installed in 3" schedule 40 conduit (CODPC020) with elevations and warning tape as shown in the Direct Buried Conduit section of Underground Distribution Construction Standards.
5. Conduit should enter pullbox as shown in the Secondary Systems section of Underground Distribution Construction Standards.
6. Secondary connections should meet the standard as shown in the Secondary Systems section of Underground Distribution Construction Standards.

OVERHEAD FED LIGHTING NOTES:

7. LIGHT SHIELDS

   Light shields are available, but only for the General Electric fixtures. These shields will reduce the amount of side light projected from the fixture, which may be a nuisance. Light shields must be itemized. The 70W shield is item STLLS001 and the 200/250W shield is item STLLS002.

8. FLOODLIGHTS

   a) Floodlights are available in 200W HPS (STLFL001), 400W HPS (STLFL002), and 320W MH (STLFL004). They can be mounted as a single fixture on one bracket or two fixtures on a single bracket with the use of an adapter bracket. They all require a 120V supply and are individually controlled by a photocontrol. They are to be installed on the back-side of the pole in the streetlight mounting holes. Plates FL1 and FL2 are to be used when there are NO secondary obstructions. This is the preferred installation because the "L" bracket is the least expensive. Plates FL3 and FL4 are to be used if there are secondary obstructions on the back-

side of the pole such as service drops. The NEMA labels on the front of the fixtures designate the lamp wattage and type. A yellow label designates High Pressure Sodium (HPS), and a red label designates Metal Halide (MH). All floodlight brackets shall be grounded.

b) Floodlights are directional fixtures and must be aimed to satisfy the specific lighting requirements. Each fixture has an angle adjustment guide on the side. For most installations, the fixture will be aimed downwards at a 30 to 45 degree angle from the vertical plane. The easiest way to aim the floodlight is to visualize a line extending perpendicular from the front of the fixture. Where this line strikes the ground, or the side of a building, is where the light will be the most intense. Floodlights produce a wedge-shaped light distribution pattern on the ground, as opposed to an elliptical pattern for a roadway fixture.

9. CUTOFF

The L9R standard is a HPS cut-off fixture that can be converted to work as a 250W or a 400W fixture. They are for special applications where "light pollution" is an issue. The plate option issues the correct lamp. The fixture is converted from one wattage to the other by disconnecting the "quick-disconnect" lead across the fixture capacitor. They come pre-wired as standard for 120V operation, but they can be converted to work at 208, 240, or 277V by changing the tap on the ballast.

10. Overhead-fed streetlighting shall be feed by a minimum #6 aluminum duplex, Vizsla (CAIOS001).

SPECIAL AREAS:

11. STEEL SQUARE POLES AROUND EVERBANK STADIUM

JEA is not responsible for the maintenance of the steel square poles around Everbank Stadium. COJ is responsible for these poles. JEA is still responsible for maintaining the shoebox fixture which includes the ballast, lamp, photocontrol, etc.

12. CYLINDRICAL ALUMINUM POLES AT CECIL COMMERCE CENTER

JEA is not responsible for the maintenance of the cylindrical aluminum poles at Cecil Commerce Center. JEDC is responsible for these poles. JEA is still responsible for maintaining the shoebox fixture which includes the ballast, lamp, photocontrol, etc.

ADDITIONAL NOTES:

13. STANDARD MATERIAL

Any material installed by JEA personnel or contractors on the JEA system, where the intention is for JEA to ultimately maintain the installed product, must be JEA approved standard material. This is accomplished by strictly adhering to the item ID's shown in this section.

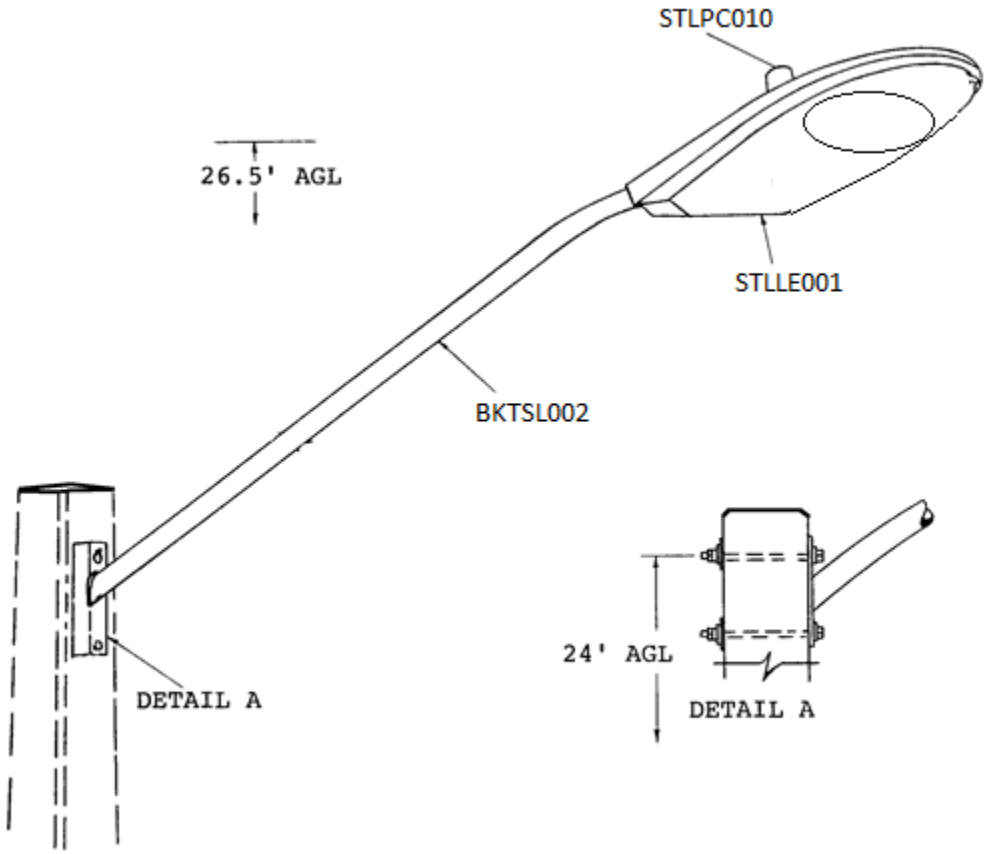
14. APPROVED MANUFACTURERS AND PART NUMBERS

The approved manufacturers and part numbers for the various item ID's are shown in the Electric Master Material Catalog. For an up-to-date listing of these items, please visit the online catalog at:
HTTPS://APPS.JEA.COM/MATERIALSCATALOG/EMMC.PDF

15. AS-BUILTS REQUIREMENTS

The construction As-Built record drawings for all street light projects shall be provided to JEA prior to scheduled installation of conductors. All street light installations shall be constructed per applicable standards. New street light installations will not be energized until the JEA Project Engineer has approved final As-Built drawings of the lighting system.

L101 - 40W LED COBRAHEAD (70W HPS EQUIVALENT)

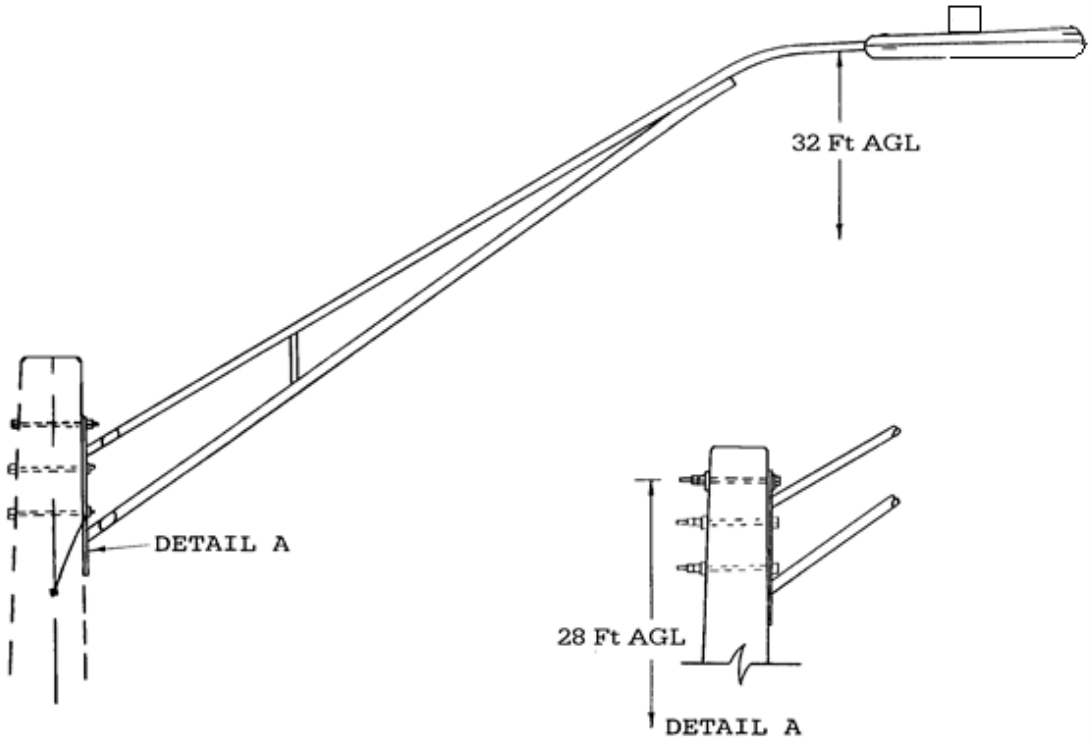


NOTE: 24' AGL = 24' ABOVE GROUND LEVEL

ITEM	QTY	DESCRIPTION
BKT SL 002	1	BRACKET 8FT. 3FT. RISE JEA #DMD-31
CAI UF 001	13	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
CNN CP 002	1	CONNECTOR ALUM. COMP. SIDE BY 6-2 2-1/0
CNN CP 008	1	CONNECTOR ALUM. COMP SIDE BY 6-2 3/0-4/0
CNN VG 003	2	CONNECTOR VISE TYPE 6-2 SOL. 10-2 SOL.
COB CO 028	3	CONDUCTOR BARE COPPER #4 SOL. SOFT DRAWN
COV IC 002	1	COVER COMP. CONNECTORS INSULATING
STL LE 001	1	LUMINAIRE LED 120 V 40 WATT HORIZONTAL
STL PC 010	1	PHOTOCONTROL, LONG LIFE FOR LED, TWIST-LOCK

PLATE OPTIONS: (INCLUDES WIRE IF NECESSARY)
L101 (Mount to existing pole), L101R (LED Luminaire & Photocell Only), L101U (Includes 30/1C Pole – Pg. 8)

L201 - 115W LED COBRAHEAD (200/250W HPS EQUIVALENT)

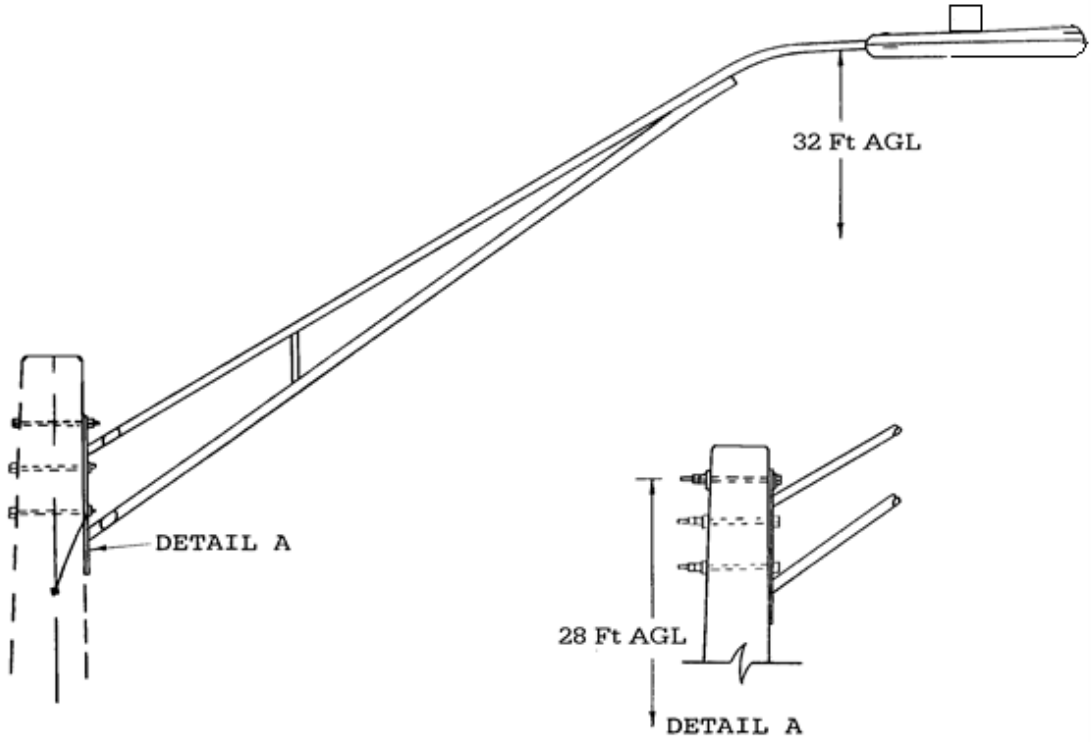


NOTE: 28' AGL = 28' ABOVE GROUND LEVEL

ITEM	QTY	DESCRIPTION
BKT SL 007	1	BRACKET, TRUSSARM 12FT. 4FT. RISE JEA #DMD-67
CAI UF 001	18	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
CNN CP 002	1	CONNECTOR, ALUM. COMP. SIDE BY 6-2 2-1/0
CNN CP 008	1	CONNECTOR, ALUM. COMP SIDE BY 6-2 3/0-4/0
CNN VG 003	2	CONNECTOR, VISE TYPE 6-2 SOL. 10-2 SOL.
COB CO 028	3	CONDUCTOR, BARE COPPER #4 SOL. SOFT DRAWN
COV IC 002	1	COVER COMP. CONNECTORS INSULATING
STL LE 002	1	LUMINARE, LED. IES TYPE M.N. III
STL PC 010	1	PHOTOCONTROL, LONG LIFE FOR LED, TWIST-LOCK

PLATE OPTIONS: (INCLUDES WIRE IF NECESSARY)
L201 (Mount to existing pole), L201R (LED Luminaire & Photocell Only), L201U (Includes 35/1C Pole – Pg. 8)

L301 - 275W LED COBRAHEAD (400W HPS EQUIVALENT)



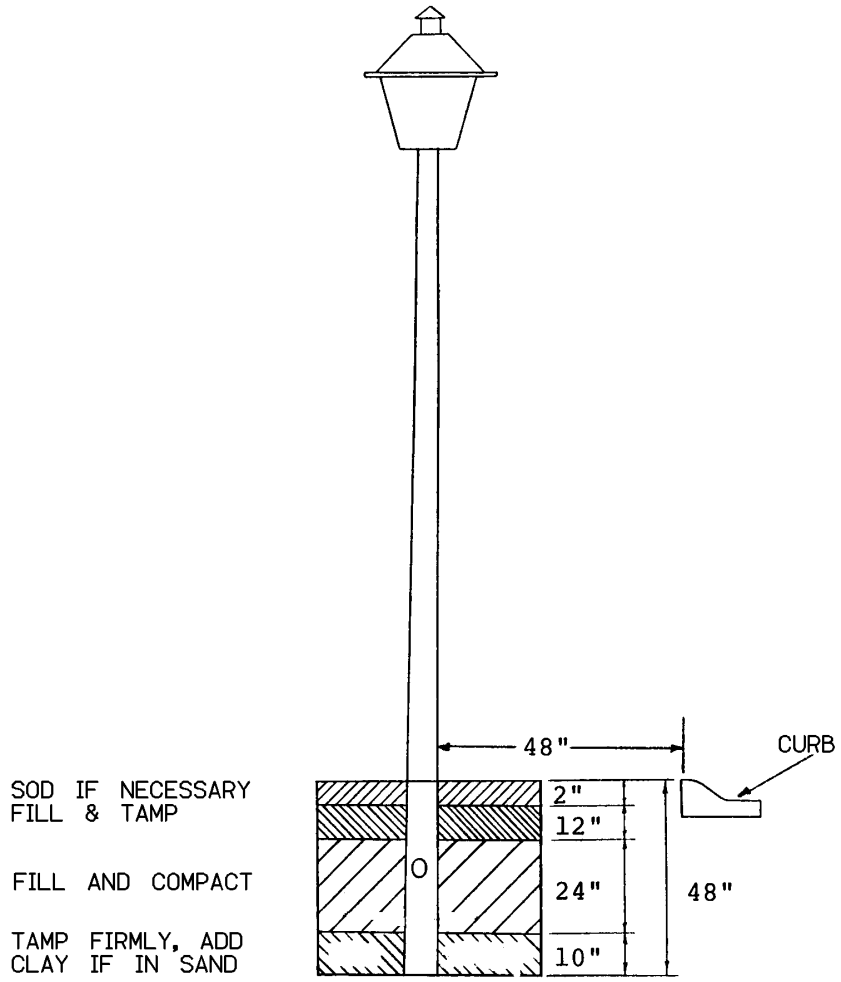
NOTE: 28' AGL = 28' ABOVE GROUND LEVEL

ITEM	QTY	DESCRIPTION
BKT SL 007	1	BRACKET, TRUSSARM 12FT. 4FT. RISE JEA #DMD-67
CAI UF 001	18	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
CNN CP 002	1	CONNECTOR, ALUM. COMP. SIDE BY 6-2 2-1/0
CNN CP 008	1	CONNECTOR, ALUM. COMP SIDE BY 6-2 3/0-4/0
CNN VG 003	2	CONNECTOR, VISE TYPE 6-2 SOL. 10-2 SOL.
COB CO 028	3	CONDUCTOR, BARE COPPER #4 SOL. SOFT DRAWN
COV IC 002	1	COVER COMP. CONNECTORS INSULATING
STL LE 003	1	LUMINARE, LED IES TYPE M.N. III
STL PC 010	1	PHOTOCONTROL, LONG LIFE FOR LED, TWIST-LOCK

PLATE OPTIONS: (INCLUDES WIRE IF NECESSARY)
L301 (Mount to existing pole), L301R (LED Luminaire & Photocell Only), L301U (Includes 35/1C Pole – Pg. 8)

L40_ – 40W / 72W LED POST TOP (70W HPS / 150W MH EQUIVALENT)

NOTE: RETROFIT PLATE OPTION AVAILABLE



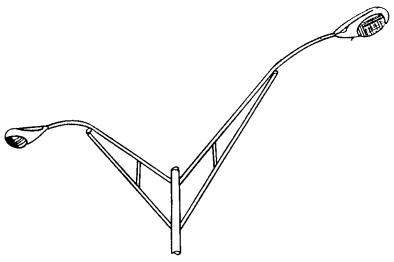
ITEM	QTY	DESCRIPTION
CAI UF 001	22	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
POL FG 001	1	POLE, 18FT. FIBERGLASS
STL LE ___	1	LUMINAIRE, POLE TOP, SEE PLATE OPTIONS, 120 VOLTS
STL PC 010	1	PHOTOCONTROL, LONG LIFE FOR LED, TWIST-LOCK

PLATE OPTIONS:

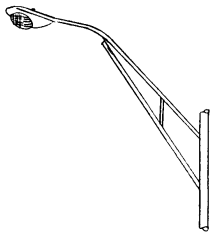
L401 (includes FG pole)	**L401R** (Post Top LED Luminaire & Photocell only)	STL LE 004 (40W LED – 70W HPS equiv.)
	L402 (Retrofit LED Luminaire & Photocell only)	STL LE 006 (40W LED – 70W HPS equiv.)
L403 (includes FG pole)	**L403R** (Post Top LED Luminaire & Photocell only)	STL LE 010 (72W LED – 150W MH equiv.)

L601_ - 40W LED COBRAHEAD

(on a 27' ALUMINUM POLE)



DOUBLE TRUSS (DT)



TRUSS (T)

AVAILABLE BRACKET LENGTHS
8 FT
12 FT
15 FT

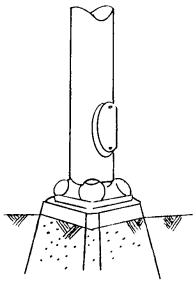


PLATE	ITEM	QTY	DESCRIPTION
L601T	BKT SL ___	1	BRACKET, STREET LIGHT, TRUSS (8' – 004, 12' – 005, 15' – 006)
	CAI UF 001	50	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
	CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, "BRONZE" 6 SOL - 1 STR.
	POL AL 002	1	POLE, STREET LIGHT 27 FT SINGLE TRUSS
	STL LE 001	1	LUMINAIRE LED 120 V 40 WATT HORIZONTAL
	STL PC 010	1	PHOTOCONTROL, ELECTRONIC, TWIST-LOCK
PLATE OPTIONS: *8, *12, *15 EXAMPLE: L601T*12			
L601DT	BKT SL ___	2	BRACKET, STREET LIGHT, TRUSS (8' – 004, 12' – 005, 15' – 006)
	CAI UF 001	50	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
	CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, "BRONZE" 6 SOL - 1 STR.
	POL AL 003	1	POLE, STREET LIGHT 27 FT DOUBLE TRUSS
	STL LE 001	2	LUMINAIRE LED 120 V 40 WATT HORIZONTAL
	STL PC 010	2	PHOTOCONTROL, ELECTRONIC, TWIST-LOCK
PLATE OPTIONS: *8, *12, *15 EXAMPLE: L601DT*12			

NOTE:
Locations that require a new base, Plate ANCBASE2. (See ANCBASE_). Height of fixture above ground level is 28.75-ft with respect to anchor base.

L1501_ – 115W / 275W LED COBRAHEAD FIXTURE ON 37' ALUMINUM POLE

(200/250W HPS EQUIVALENT) / (400W HPS OR 320W MH EQUIVALENT)

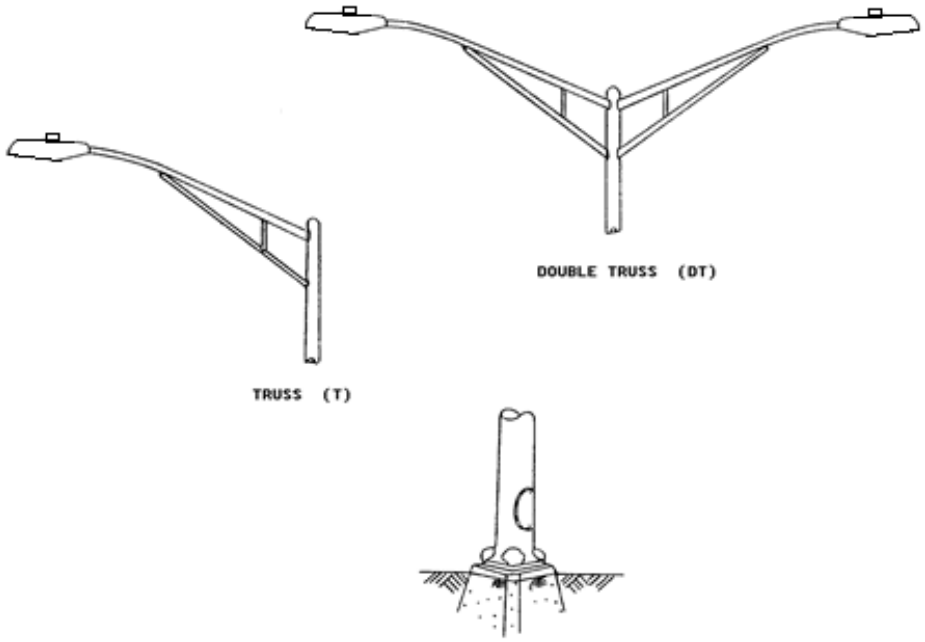


PLATE	ITEM	QTY	DESCRIPTION
L1501T	BKT SL 005	1	BRACKET, STREET LIGHT 12 FT. ALUM. TRUSS STYLE, 3FT. RISE
	CAI UF 001	55	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
	CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, "BRONZE" 6 SOL - 1 STR.
	POL AL 004	1	POLE, STREET LIGHT ALUM-TRUSS ARM 37 FT.
	STL LE ___	1	GENERAL CODE FOR LED LUMINAIRE
	STL PC 010	1	PHOTOCONTROL, LONG LIFE FOR LED FIXTURE
L1501DT	BKT SL 005	2	BRACKET, STREET LIGHT 12 FT. ALUM. TRUSS STYLE
	CAI UF 001	75	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
	CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, "BRONZE" 6 SOL - 1 STR.
	POL AL 005	1	POLE, STREET LIGHT ALUM-TWIN TRUSS ARM 37 FT.
	STL LE ___	2	GENERAL CODE FOR LED LUMINAIRE
	STL PC 010	2	PHOTOCONTROL, LONG LIFE FOR LED FIXTURE

OPTIONS:

L1501T*115	L1501DT*115
L1501T*275	L1501DT*275

NOTE:
Locations that require a new base, Plate ANCBASE4. (See ANCBASE_). Height of fixture above ground level is 39.5-ft with respect to anchor base.

L1601_ - 115W LED COBRAHEAD FIXTURE ON 27' ALUMINUM POLE

(200/250W HPS EQUIVALENT)

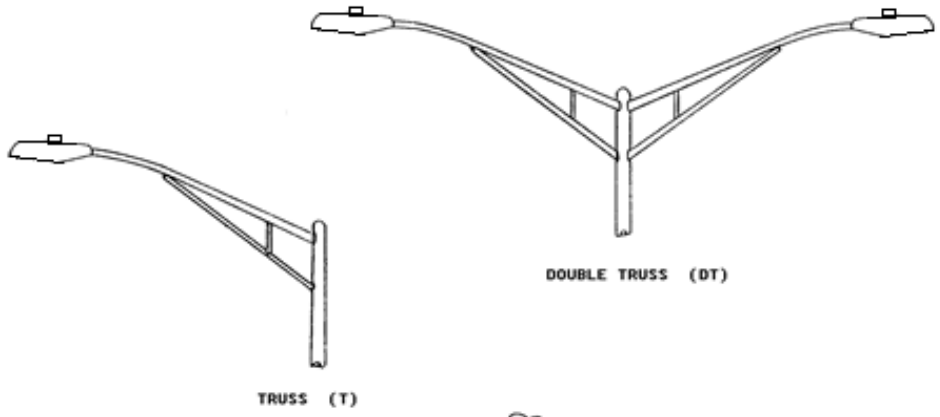


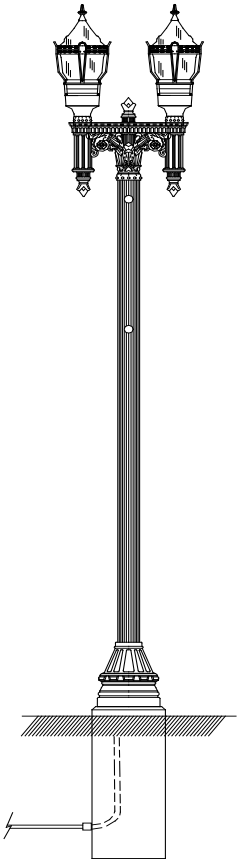
PLATE	ITEM	QTY	DESCRIPTION
L1601T	BKT SL ___	1	GENERAL CODE FOR STREET LIGHT BRACKET
	CAI UF 001	65	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
	CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, "BRONZE" 6 SOL - 1 STR.
	POL AL 002	1	POLE, STREET LIGHT ALUM-TRUSS ARM 27 FT.
	STL LE 002	1	LUMINARE, LED. IES TYPE M.N. III
	STL PC 010	1	PHOTOCONTROL, LONG LIFE FOR LED FIXTURE
L1601DT	BKT SL ___	2	GENERAL CODE FOR STREET LIGHT BRACKET
	CAI UF 001	85	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
	CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, "BRONZE" 6 SOL - 1 STR.
	POL AL 003	1	POLE, STREET LIGHT ALUM-TWIN TRUSS ARM 27 FT.
	STL LE 002	2	LUMINARE, LED. IES TYPE M.N. III
	STL PC 010	2	PHOTOCONTROL, LONG LIFE FOR LED FIXTURE

OPTIONS:

L1601T*8	L1601DT*8
L1601T*12	L1601DT*12

NOTE:
Locations that require a new base, Plate ANCBASE2. (See ANCBASE_) Height of fixture above ground level is 28.75-ft with respect to anchor base.

LDDA01 – 100W LED (150W MH EQUIVALENT) DOUBLE DECORATIVE ACORN PEDESTRIAN LIGHT



ITEM	QTY	DESCRIPTION
CAI UF 001	30	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, "BRONZE" 6 SOL - 1 STR.
POL AL 006	1	AL. POLE, 14FT., 6 IN. DIA., BANNER ARM
STL DE 004	1	SUNFLOWER ARM
STL LE 008	2	100W LED DECORATIVE UTILITY ACORN FIXTURE W/ GOLD BANDS
STL PC 010	2	PHOTOCONTROL, LONG LIFE FOR LED, TWIST-LOCK

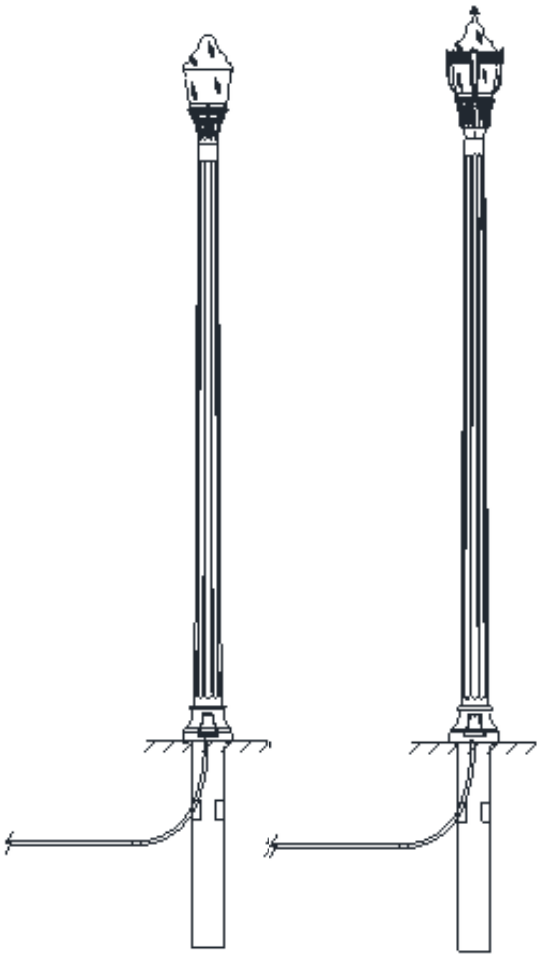
Options: **LDDA01R** – 100W LED DECORATIVE ACORN REPLACEMENT

NOTES:

1. This pole requires a concrete base, NOT INCLUDED (Plate ANCBASE6).
2. Contractors are required to install JEA's standard concrete base with the conduit system.
3. See Note 6 in the GENERAL LIGHTING NOTES section about pole placement & banner arms.
4. 12/2 cable will be brought up to each head from the splay opening at the bottom of the pole. At this opening, there should be one wire nut with the three neutrals and one with the three hot legs. Each hot leg feed from the wire nut to the fixture shall be protected by a fuse.
5. Use plate ID, ***LDA01*RETRO***, for retro-fit kit option with a quantity of ***two (2)*** for the double acorn.

LPA01*DC OR LDA01*DC – 100WLED PLAIN ACORN OR DECORATIVE ACORN ON DECORATIVE CONCRETE POLE

OPTIONS: LPA01*DC, LDA01*DC

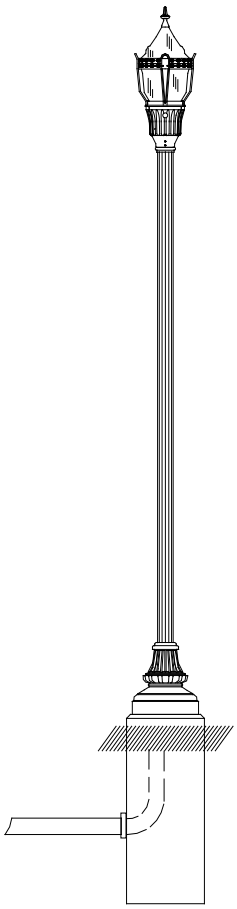


OPTION	ITEM
LPA01*DC (PLAIN ACORN)	STLLE009
LDA01*DC (DECORATIVE ACORN)	STLLE008

ITEM	QTY	DESCRIPTION
STLLE00 _	1	GENERAL CODE FOR FIXTURE (SEE OPTIONS ABOVE)
*STLRF070	1	REFRACTOR FOR PLAIN ACORN-STYLE FIXTURE
STLPC010	1	PHOTOCONTROL, LONG LIFE FOR LED, TWIST-LOCK
CAIUF001	22	CABLE; STREET LIGHT UF 12 CU 2/C
CODCO025	1	COUPLING; PLASTIC IC CONDUIT 1 IN. SCH40
CODPC017	5	CONDUIT; FLEXIBLE PVC; 1 INCH DIAMETER
POLCO040	1	13 FT. DECORATIVE CONC. POLE

*Note: Refractor is included with STLLE008 fixture.
Options: LPA01R, LDA01R

LDA01*14 - 14FT AL POLE W/DECORATIVE ACORN 100W LED (150W MH EQUIVALENT) FIXTURE



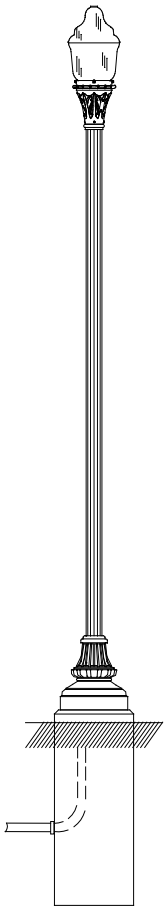
ITEM	QTY	DESCRIPTION
CAI UF 001	22	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, "BRONZE" 6 SOL - 1 STR.
POL AL 006	1	AL. POLE, 14FT., 6 IN. DIA., BANNER ARM
STL LE 008	1	100W LED DECORATIVE UTILITY ACORN FIXTURE W/ GOLD BANDS
STL PC 010	1	PHOTOCONTROL, LONG LIFE FOR LED, TWIST-LOCK

Options: **LDA01R** (fixture only for LED replacement), **LDA01*RETRO** (retro-fit kit)

NOTES:

This pole requires a concrete base, NOT INCLUDED (Plate ANCBASE6).
The developer's contractors are required to install a concrete base with the conduit system.
For 14-ft AL pole without banner rod provisions, use POLAL008 instead of POLAL006.
See Note 6 in the GENERAL LIGHTING NOTES section about pole placement & banner arms.

LPA01*14 - 14FT AL POLE W/PLAIN ACORN 100W LED (150W MH EQUIVALENT) FIXTURE



ITEM	QTY	DESCRIPTION
CAI UF 001	22	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, "BRONZE" 6 SOL - 1 STR.
POL AL 006	1	AL. POLE, 14FT., 6 IN. DIA., BANNER ARM
STL LE 009	1	100W LED PLAIN ACORN-STYLE FIXTURE
STL PC 010	1	PHOTOCONTROL, LONG LIFE FOR LED, TWIST-LOCK
STL RF 070	1	REFRACTOR FOR PLAIN ACORN-STYLE FIXTURE

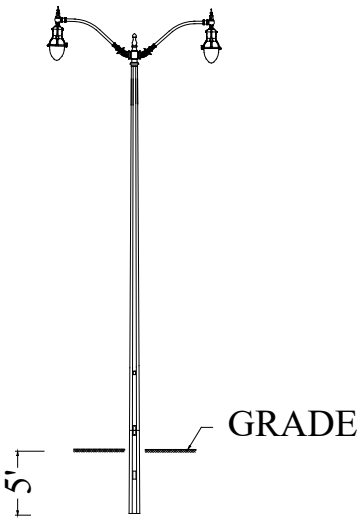
Options: **LPA01*DC**(w/ 13-ft decorative concrete pole), **LPA01R** (fixture only for LED replacement), **LPA01*RETRO** (retro-fit kit)

NOTES:

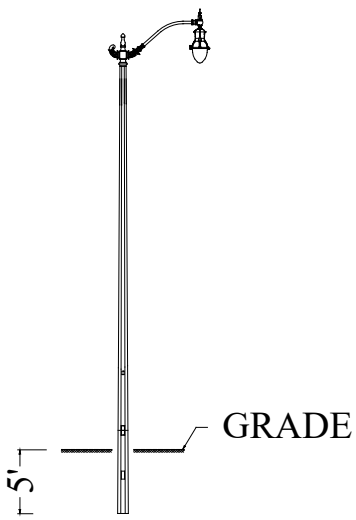
This pole requires a concrete base, NOT INCLUDED (Plate ANCBASE6).
The developer's contractors are required to install a concrete base with the conduit system.
For 14-ft AL pole without banner rod provisions, use POLAL008 instead of POLAL006.
See Note 6 in the GENERAL LIGHTING NOTES section about pole placement & banner arms.

LTDT01 & LTDS01 - 35 FT OCTAGONAL CONCRETE POLE W/ 150W / LED TEAR DROP FIXTURES

OPTIONS: LTDT01*150, LTDS01*150



TWIN ARM (T)



SINGLE ARM (S)

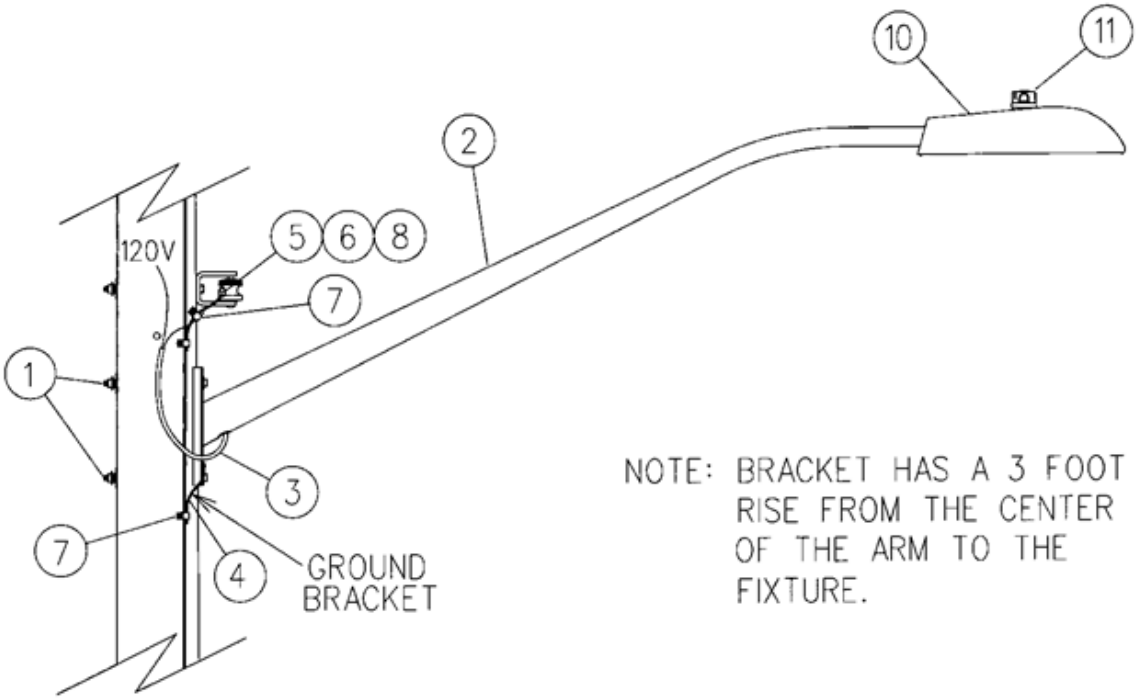
PLATE	ITEM	QTY	DESCRIPTION
LTDT01	BKT SL 015	1	TWIN 72" AL. CROSSARM FOR TEAR DROP
	CAI UF 001	100	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
	CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, "BRONZE" 6 SOL - 1 STR.
	POL CO 041	1	POLE, STREET LIGHT 35 FT. OCTAGONAL POLE
	STL LE 011	2	LUMINAIRE, 150W LED (250W HPS EQUIVALENT), TEAR DROP
	STL PC 010	2	PHOTOCONTROL, LONG LIFE FOR LED FIXTURE
LTDS01	BKT SL 014	1	SINGLE 72" AL. CROSSARM FOR TEAR DROP
	CAI UF 001	50	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
	CLA TG 001	1	CLAMP, TRANSFORMER TANK GROUND, "BRONZE" 6 SOL - 1 STR.
	POL CO 041	1	POLE, STREET LIGHT 35 FT. OCTAGONAL POLE
	STL LE 011	1	LUMINAIRE, 150W LED (250W HPS EQUIVALENT), TEAR DROP
	STL PC 010	1	PHOTOCONTROL, LONG LIFE FOR LED FIXTURE

NOTE:

1. Install G3C
2. 12/2 and a green #10 ground shall be brought up to each head from the splay opening at the bottom of the pole. At this opening, there should be one wire nut with the three neutrals, one with the three grounds, and one with the three hot legs. Each hot leg feed from the wire nut to the fixture shall be protected by a fuse. The #10 ground feed shall be grounded at the handhole and at the base of the pole.
3. For LED replacement of fixtures only use: **LTDT01R*150**, **LTDS01R*150**

L101 – 40W LED (70W HPS EQUIVALENT) ROADWAY FIXTURE

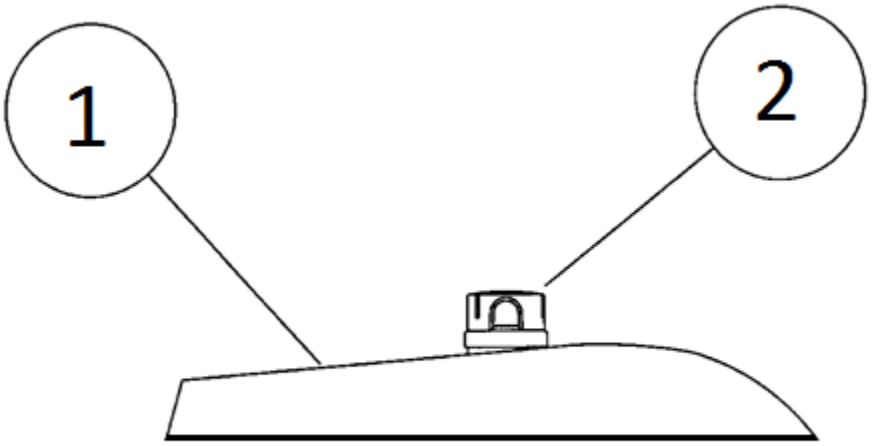
OPTIONS: NONE
BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BKT SL 002	1	BRACKET, STREETLIGHT, 8 FT. LENGTH, 3 FT. RISE, UNIVERSAL BASE
3	CAI UF 001	13	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
4	COB CO 028	3	CONDUCTOR, COPPER, BARE, #4
5	CNN CP 002	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
6	CNN CP 008	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 3/0-4/0
7	CNN VG 003	2	CONNECTOR, VISE GRIP, 6-2 SOL. 10-2 SOL.
8	COV IC 002	1	COVER, INSULATED, “D” SIZE CONNECTORS/SLEEVES
10	STL LE 001	1	LUMINAIRE, 40W, LED, ROADWAY
11	STL PC 010	1	PHOTOCONTROL, LONG LIFE FOR LED, TWIST-LOCK
12	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. DIA. BOLT
13	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
14	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

L101R - 40 WATT LED (70W HPS EQUIVALENT) ROADWAY FIXTURE – WITHOUT BRACKET

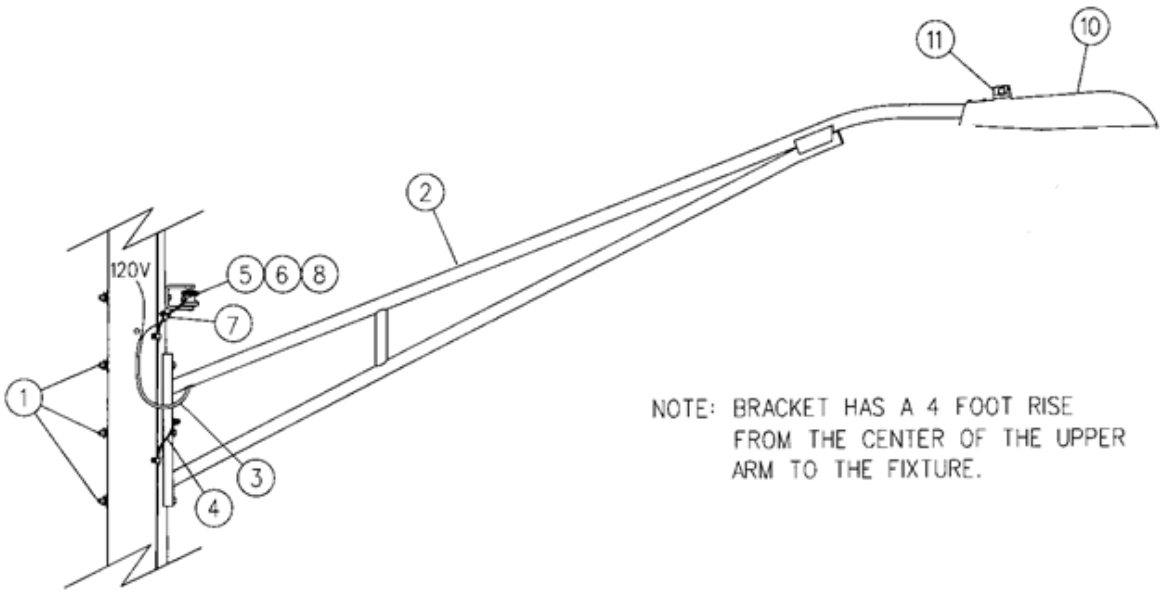
OPTIONS: NONE
BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	STL LE 001	1	LUMINAIRE, 40W, LED, ROADWAY
2	STL PC 010	1	PHOTOCONTROL, LONG LIFE FOR LED, TWIST-LOCK

L201 - 115 WATT LED (200W/250W HPS EQUIVALENT) ROADWAY FIXTURE

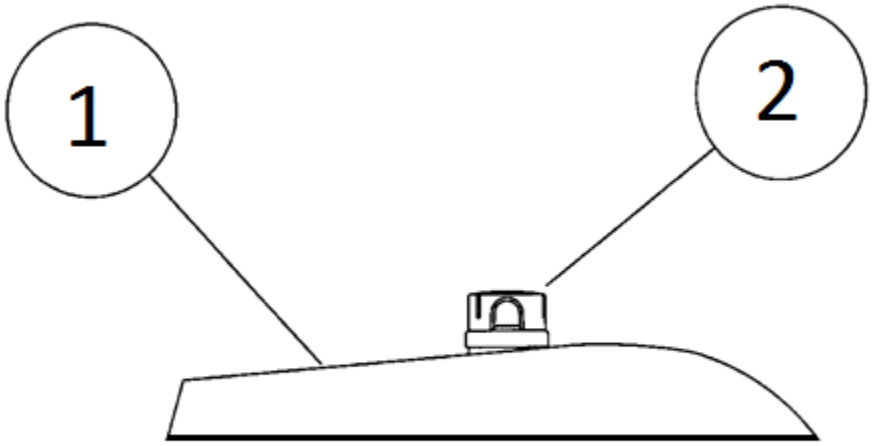
OPTIONS: NONE
BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	3	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BKT SL 007	1	BRACKET, STREETLIGHT, 12 FT. LENGTH, 4 FT. RISE, UNIVERSAL BASE
3	CAI UF 001	18	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
4	COB CO 028	3	CONDUCTOR, COPPER, BARE, #4
5	CNN CP 002	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
6	CNN CP 008	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 3/0-4/0
7	CNN VG 003	2	CONNECTOR, VISE GRIP, 6-2 SOL. 10-2 SOL.
8	COV IC 002	1	COVER, INSULATED, “D” SIZE CONNECTORS/SLEEVES
10	STL LE 002	1	LUMINAIRE, 115W, LED, ROADWAY
11	STL PC 010	1	PHOTOCONTROL, LONG LIFE FOR LED, TWIST-LOCK
12	WAS RD 004	3	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. DIA. BOLT
13	WAS SF 003	3	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
14	WAS SP 002	3	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

L201R - 115 WATT LED (200W/250W HPS EQUIVALENT) ROADWAY FIXTURE – WITHOUT BRACKET

OPTIONS: NONE
BOLT PLATE: NONE

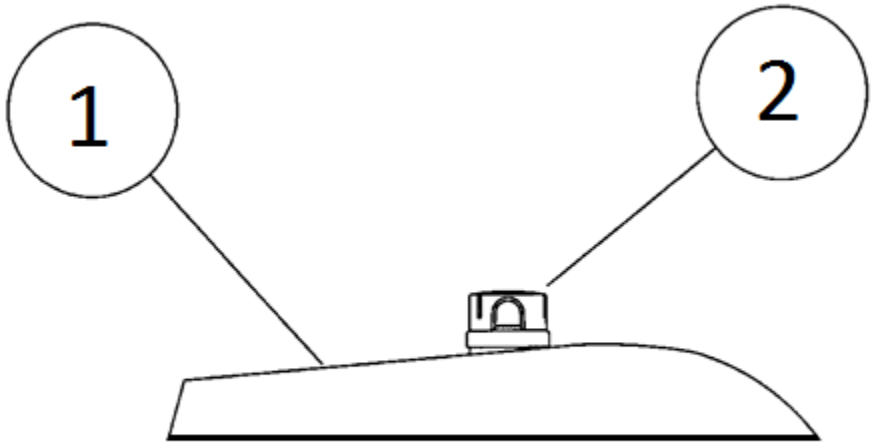


NO.	ITEM ID	QTY	DESCRIPTION
1	STL LE 002	1	LUMINAIRE, 115W, LED, ROADWAY
2	STL PC 010	1	PHOTOCONTROL, LONG LIFE FOR LED, TWIST-LOCK

L301R – 275W LED (320W MH/400W HPS EQUIVALENT) CUT-OFF ROADWAY FIXTURE

WITHOUT BRACKET

OPTIONS: NONE
BOLT PLATE: NONE

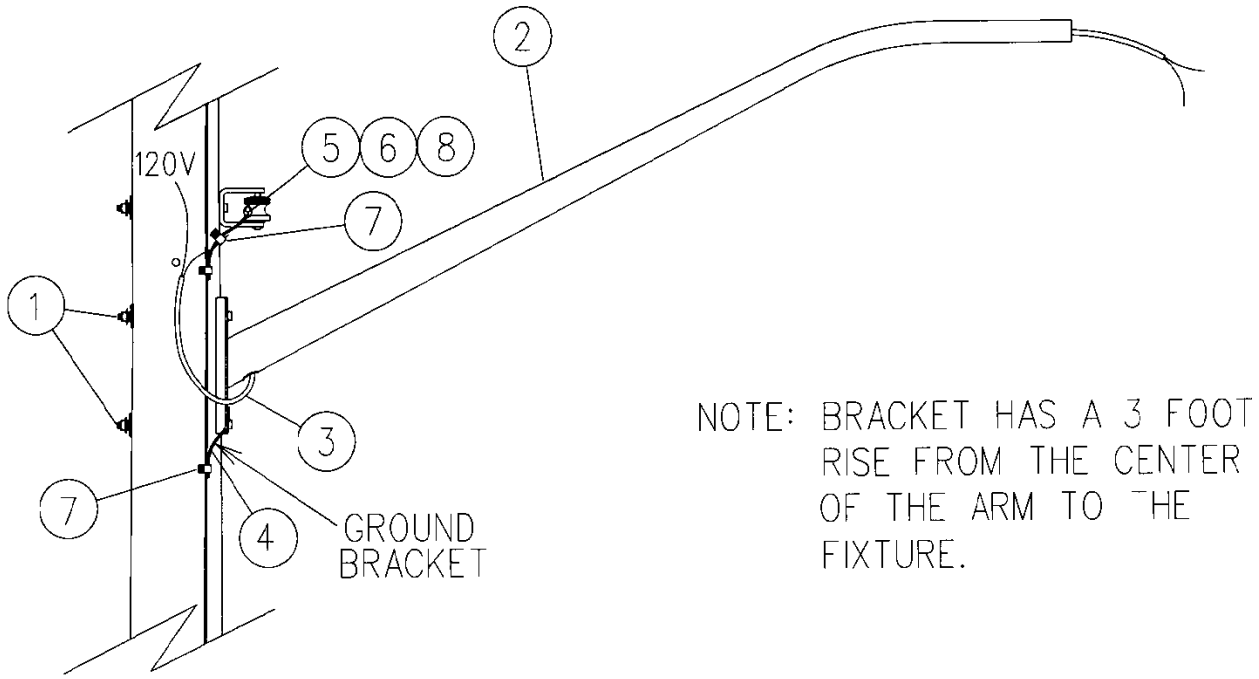


NO.	ITEM ID	QTY	DESCRIPTION
1	STL LE 003	1	LUMINAIRE, 275W, LED, ROADWAY, CUT-OFF
2	STL PC 010	1	PHOTOCONTROL, LONG LIFE FOR LED, TWIST-LOCK

LB1- 8 FOOT BRACKET

WITHOUT FIXTURE

OPTIONS: NONE
BOLT PLATE: NONE

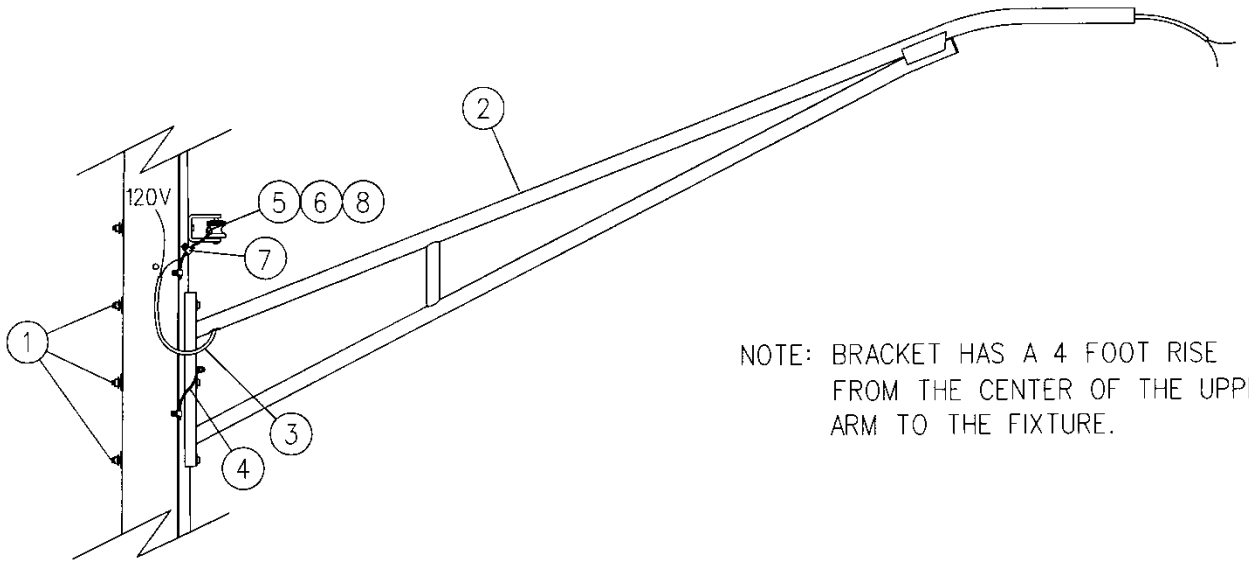


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BKT SL 002	1	BRACKET, STREETLIGHT, 8 FT. LENGTH, 3 FT. RISE, UNIVERSAL BASE
3	CAI UF 001	13	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
4	COB CO 028	3	CONDUCTOR, COPPER, BARE, #4
5	CNN CP 002	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
6	CNN CP 008	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 3/0-4/0
7	CNN VG 003	2	CONNECTOR, VISE GRIP, 6-2 SOL. 10-2 SOL.
8	COV IC 002	1	COVER, INSULATED, “D” SIZE CONNECTORS/SLEEVES
9	WAS RD 004	2	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. DIA. BOLT
10	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

LB2 - 12 FOOT BRACKET

WITHOUT FIXTURE

OPTIONS: NONE
BOLT PLATE: NONE



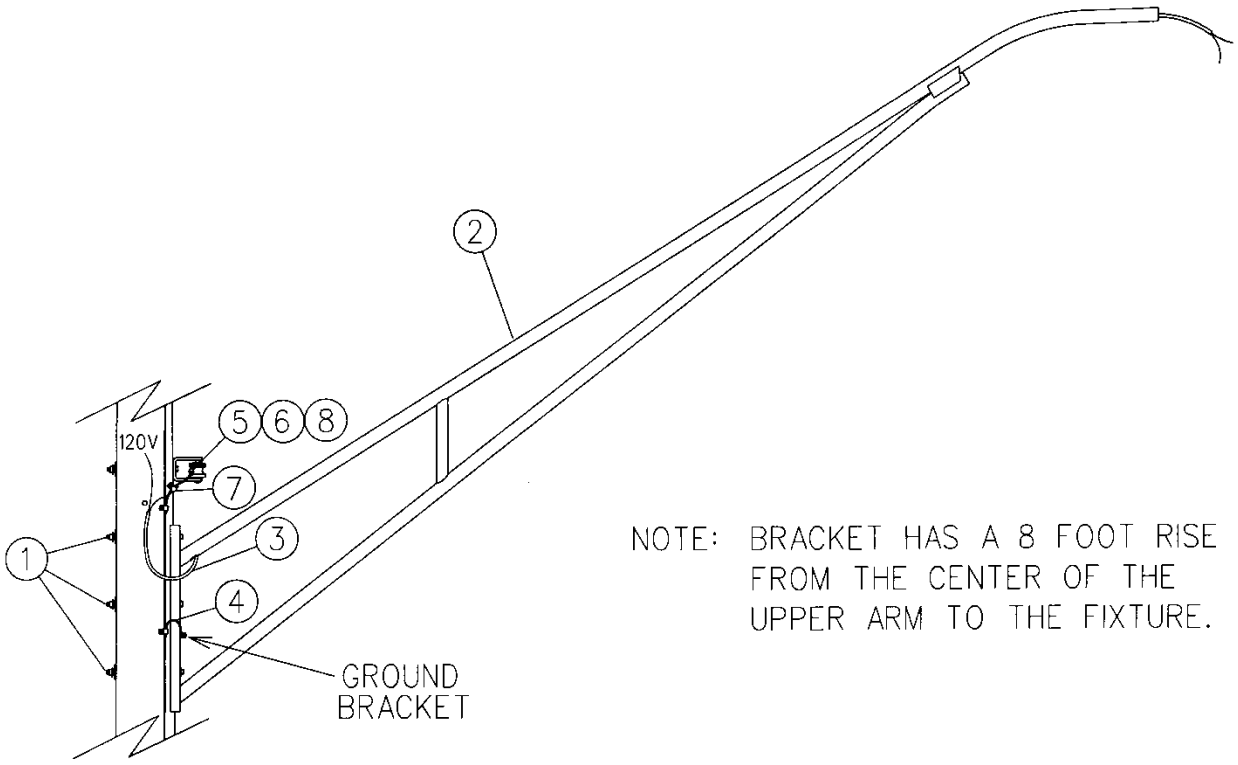
NOTE: BRACKET HAS A 4 FOOT RISE FROM THE CENTER OF THE UPPER ARM TO THE FIXTURE.

NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	3	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BKT SL 007	1	BRACKET, STREETLIGHT, 12 FT. LENGTH, 4 FT. RISE, UNIVERSAL BASE
3	CAI UF 001	18	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
4	COB CO 028	3	CONDUCTOR, COPPER, BARE, #4
5	CNN CP 002	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
6	CNN CP 008	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 3/0-4/0
7	CNN VG 003	2	CONNECTOR, VISE GRIP, 6-2 SOL. 10-2 SOL.
8	COV IC 002	1	COVER, INSULATED, “D” SIZE CONNECTORS/SLEEVES
9	WAS RD 004	3	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. DIA. BOLT
10	WAS SF 003	3	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SP 002	3	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

LB3 - 15 FOOT BRACKET

WITHOUT FIXTURE

OPTIONS: NONE
BOLT PLATE: NONE

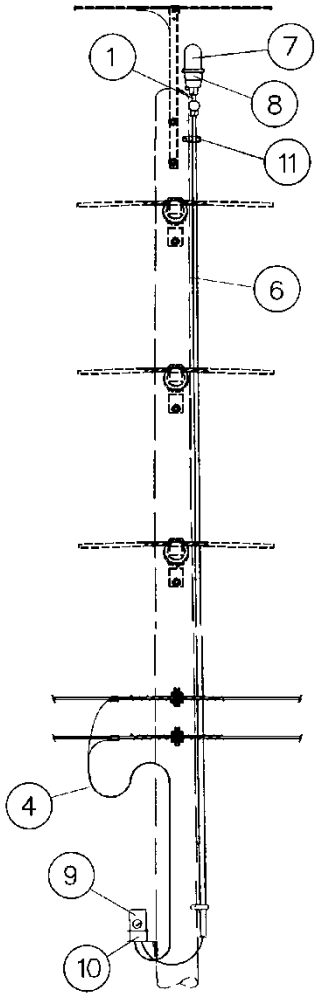


Note: This bracket shall only be installed on stand-alone poles, not distribution

NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	3	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	BKT SL 008	1	BRACKET, STREETLIGHT, 15 FT. LENGTH, 8 FT. RISE, UNIVERSAL BASE
3	CAI UF 001	18	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
4	COB CO 028	3	CONDUCTOR, COPPER, BARE, #4
5	CNN CP 002	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
6	CNN CP 008	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 3/0-4/0
7	CNN VG 003	2	CONNECTOR, VISE GRIP, 6-2 SOL. 10-2 SOL.
8	COV IC 002	1	COVER, INSULATED, “D” SIZE CONNECTORS/SLEEVES
9	WAS RD 004	3	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. DIA. BOLT
10	WAS SF 003	3	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
11	WAS SP 002	3	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

L13 - OBSTRUCTION LIGHT

OPTIONS: NONE
BOLT PLATE: NONE

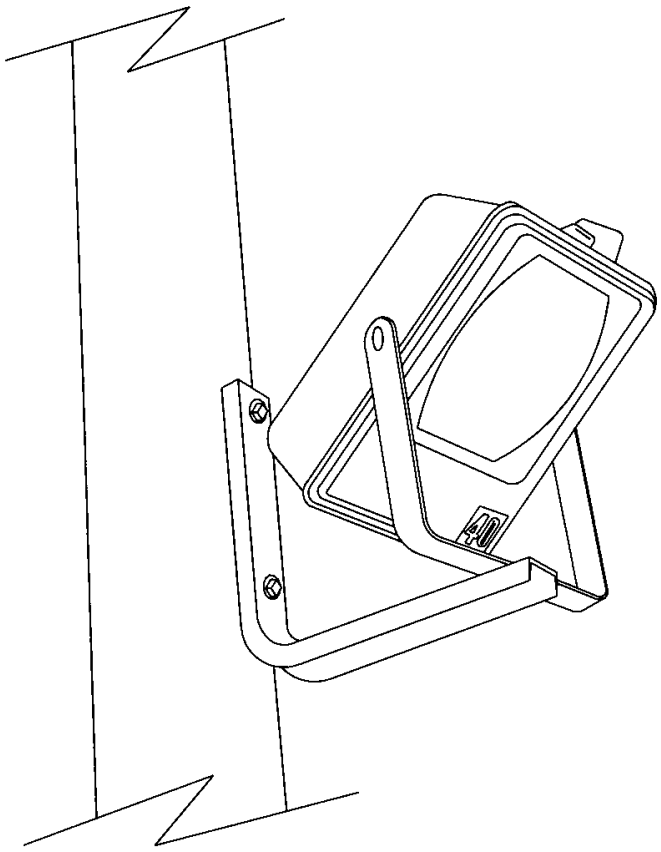


NO.	ITEM ID	QTY	DESCRIPTION
1	XXX ZZ 075	8	NIPPLE, 1/2" X 1-1/2"
2	XXX ZZ 076	1	T CONNECTOR, 1/2"
3	XXX ZZ 077	2	ELBOW, 1/2"
4	CAI UF 001	30	CABLE, STREET LIGHT 12/2 UF CU W/O GROUND
5	CNN CP 002	2	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
6	COD ST 001	30	CONDUIT, STEEL, 1/2"
7	LAM IN 001	2	LAMP, INCANDESCENT, 69 WATT, 120V
8	LIG OB 001	1	LIGHT, OBSTRUCTION
9	STL PC 001	1	PHOTOCONTROL, ELECTRONIC
10	STL PC 004	1	PHOTOCONTROL BRACKET W/ RECEPTACLE
11	STP ST 002	8	STRAP, CONDUIT, 3/4"

FL1 - SINGLE MOUNT FLOODLIGHT

NO SECONDARY OBSTRUCTIONS
200W HPS, 400W HPS, 320W MH

OPTIONS: 2H, 4H, 32M
BOLT PLATE: NONE

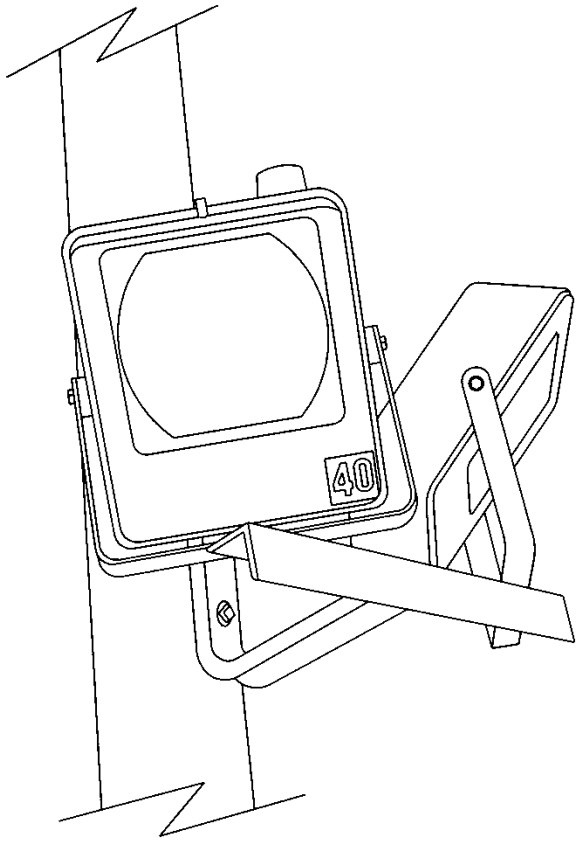


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT SL 013	1	BRACKET, SINGLE MOUNT, FOR FLOODLIGHT
2	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
3	CNN CP 002	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
4	CNN CP 008	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 3/0-4/0
5	CNN VG 002	2	CONNECTOR, VISE GRIP, 8-4 SOL. 12-4 SOL.
6	COB CO 028	3	CONDUCTOR, COPPER, BARE, #4
7	COV IC 002	1	COVER, INSULATED, "D" SIZE CONNECTORS/SLEEVES
8	STL FL ***	1	GENERAL CODE FOR FLOODLIGHT FIXTURE
9	STL LA ***	1	GENERAL CODE FOR LAMP
10	STL PC 001	1	PHOTOCONTROL, ELECTRONIC, TWIST-LOCK
11	WAS RD 004	4	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. DIA. BOLT
12	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
13	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

FL2 - DOUBLE MOUNT FLOODLIGHT

NO SECONDARY OBSTRUCTIONS
200W HPS, 400W HPS, 320W MH

OPTIONS: 2H, 4H, 32M
BOLT PLATE: NONE

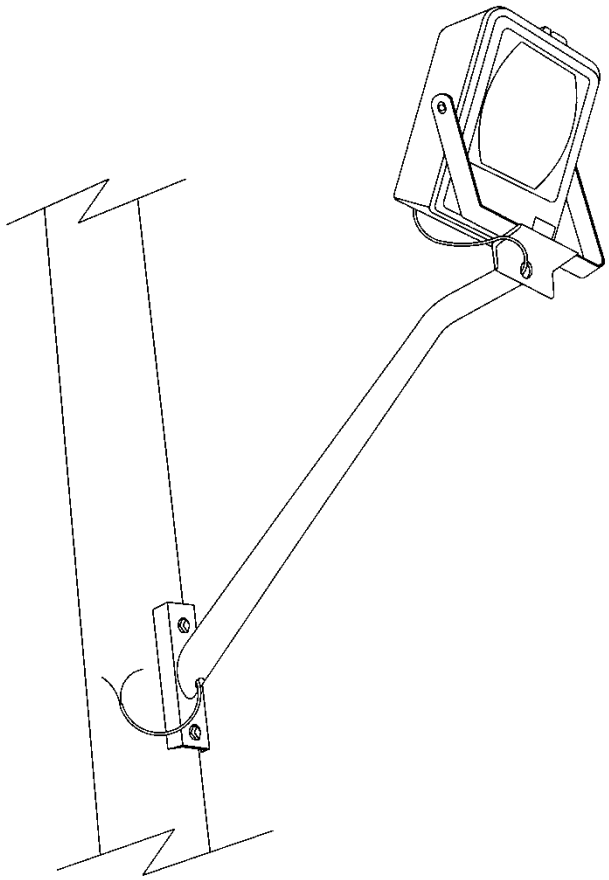


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT SL 012	1	BRACKET, FLOODLIGHT ADAPTER
2	BKT SL 013	1	BRACKET, SINGLE MOUNT, FOR FLOODLIGHT
3	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
4	CNN CP 002	2	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
5	CNN CP 008	2	CONNECTOR, AL. COMP., SIDE-BY, 6-2 3/0-4/0
6	CNN VG 002	3	CONNECTOR, VISE GRIP, 8-4 SOL. 12-4 SOL.
7	COB CO 028	3	CONDUCTOR, COPPER, BARE, #4
8	COV IC 002	2	COVER, INSULATED, “D” SIZE CONNECTORS/SLEEVES
9	STL FL ***	2	GENERAL CODE FOR FLOODLIGHT FIXTURE
10	STL LA ***	2	GENERAL CODE FOR LAMP
11	STL PC 001	2	PHOTOCONTROL, ELECTRONIC, TWIST-LOCK
12	WAS RD 004	4	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. DIA. BOLT
13	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
14	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

FL3 - SINGLE MOUNT FLOODLIGHT

WITH SECONDARY OBSTRUCTIONS
200W HPS, 400W HPS, 320W MH

OPTIONS: 2H, 4H, 32M
BOLT PLATE: NONE

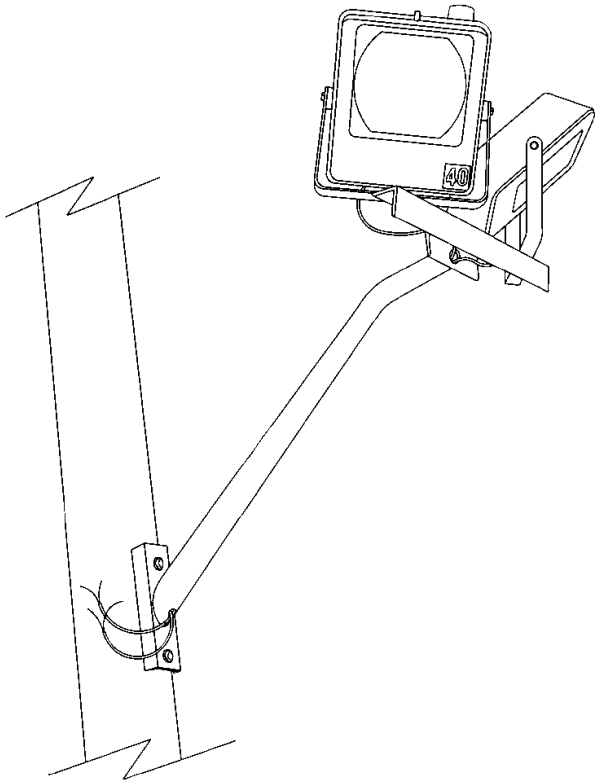


NO.	ITEM ID	QTY	DESCRIPTION
1	BKT SL 011	1	BRACKET, SINGLE MOUNT, FOR FLOODLIGHT, 4 FOOT LENGTH
2	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
3	CNN CP 002	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
4	CNN CP 008	1	CONNECTOR, AL. COMP., SIDE-BY, 6-2 3/0-4/0
5	CNN VG 002	2	CONNECTOR, VISE GRIP, 8-4 SOL. 12-4 SOL.
6	COB CO 028	3	CONDUCTOR, COPPER, BARE, #4
7	COV IC 002	1	COVER, INSULATED, "D" SIZE CONNECTORS/SLEEVES
8	STL FL ***	1	GENERAL CODE FOR FLOODLIGHT FIXTURE
9	STL LA ***	1	GENERAL CODE FOR LAMP
10	STL PC 001	1	PHOTOCONTROL, ELECTRONIC, TWIST-LOCK
11	WAS RD 004	4	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. DIA. BOLT
12	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
13	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

FL4 - DOUBLE MOUNT FLOODLIGHT

WITH SECONDARY OBSTRUCTIONS
200W HPS, 400W HPS, 320W MH

OPTIONS: 2H, 4H, 4M
BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	BKT SL 011	1	BRACKET, SINGLE MOUNT, FOR FLOODLIGHT, 4 FOOT LENGTH
2	BKT SL 012	1	BRACKET, FLOODLIGHT ADAPTER
3	BOL MS 020	2	BOLT, MACHINE, SQUARE HEAD, 5/8X14
4	CNN CP 002	2	CONNECTOR, AL. COMP., SIDE-BY, 6-2 2-1/0
5	CNN CP 008	2	CONNECTOR, AL. COMP., SIDE-BY, 6-2 3/0-4/0
6	CNN VG 002	3	CONNECTOR, VISE GRIP, 8-4 SOL. 12-4 SOL.
7	COB CO 028	3	CONDUCTOR, COPPER, BARE, #4
8	COV IC 002	2	COVER, INSULATED, “D” SIZE CONNECTORS/SLEEVES
9	STL FL ***	2	GENERAL CODE FOR FLOODLIGHT FIXTURE
10	STL LA ***	2	GENERAL CODE FOR LAMP
11	STL PC 001	2	PHOTOCONTROL, ELECTRONIC, TWIST-LOCK
12	WAS RD 004	4	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. DIA. BOLT
13	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
14	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

SECONDARY

INTRODUCTION

1. All Secondary willl attach at the location shown in the box. If no location is shown, special provisions may be necessary, such as drilling an additional hole, and must be called for by the engineer.
2. Open-wire secondary shall be maintained only and should be removed if possible and replaced with multiplex cable. In some situations, such as supplying overhead power to streetlighting poles with long spans, open-wire secondary may be more practical from a design standpoint. However, consult your supervisor before plating any open-wire secondary.
3. Plate options are listed under the brief description for each construction standard and the bolt plates if available.
4. The S8 plate is to be used on angle main-line structures only. Do not use this plate on clearance poles. Instead, use the S6 plate and itemize two wedge clamps to attach the cut-in to the clearance pole.
5. When working with quadraplex, the plates S20 and S21 can be modified to include an additional connector and cover by adding a "Q" to the plate name. Example: S20Q*2/0-1/0
6. Plate options for the S20 and S21 plates are explained as follows: The first number after the asterisk is the secondary buss size, and the second number is the service drop size.
7. The S20 plate has been copied into the S20ES (Existing Service) and is used for all existing (and new) services that require side-by connectors. The S20NS (New Service) is for all new services fed from multi-tap transformer connectors. For S20NS, only the service drop size is required because only the wedge clamp is needed. These two new designations will force the plating engineer to choose existing or new service so that the appropriate connectors will be included with the job. Examples of the new plates are listed below.

S20ES*1/0-1/0 for existing services that require connectors

item	#	description
I.CLASR003	1	CLAMP, STRAIN RELIEF WEDGE MESSENGER, SIZE: #6 - 2/0
I.CNNCP002	1	CONNECTOR, #2, 6-2 MAIN, 2-1/0 TAP, COMPRESSION PARALLEL TAP, ALUMINUM
I.CNNCP004	2	CONNECTOR, #4, 1/0-2/0 MAIN, 1/0-3/0 TAP COMPRESSION PARALLEL TAP, ALUMINUM
I.COVIC002	2	COVER, "D" DIE, INSULATING, 2-1/2"

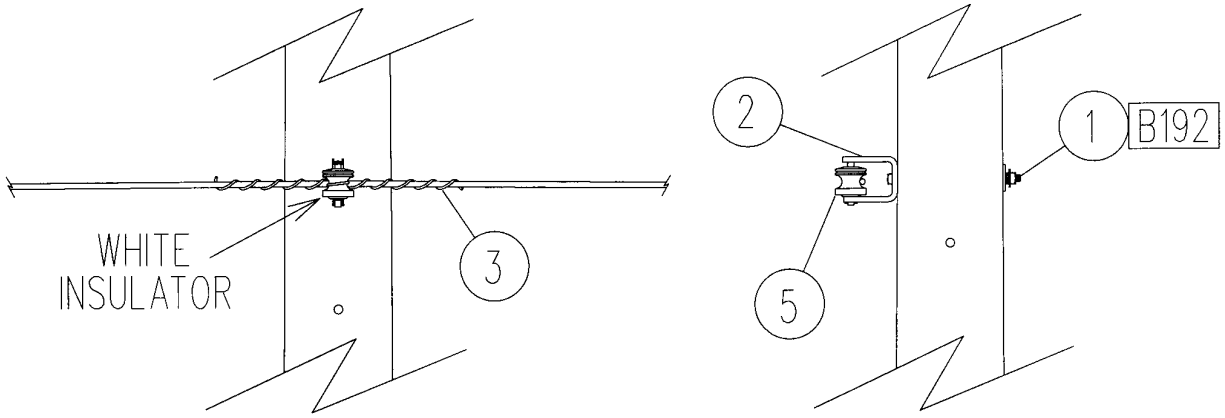
S20NS*1/0 for all new services fed from multi-taps

item	#	description
I.CLASR003	1	CLAMP, STRAIN RELIEF WEDGE MESSENGER, SIZE: #6 - 2/0

S1

OPEN WIRE SPOOL – NEUTRAL

OPTIONS: NONE
BOLT PLATE: NONE

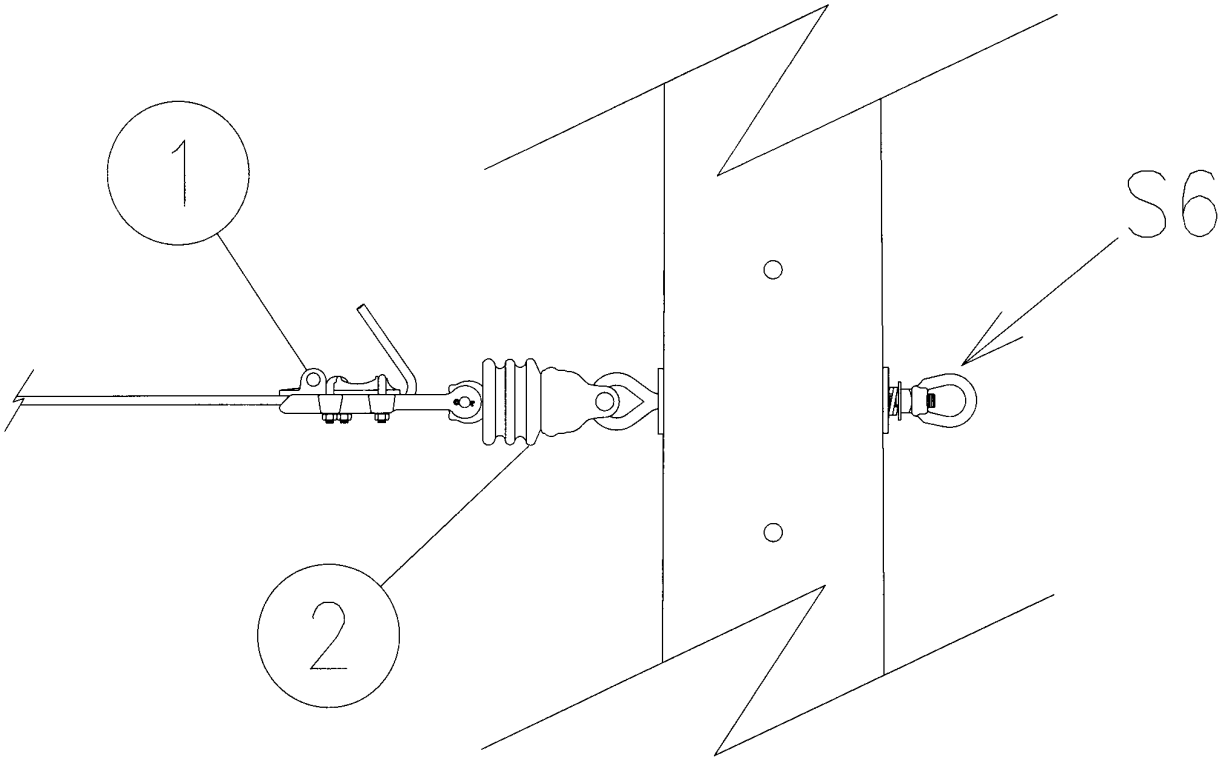


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL MS 020	1	BOLT, MACHINE, SQUARE HEAD, 5/8X14
2	CLE IN 001	1	CLEVIS, SECONDARY FORK
3	COB TW 006	1	CONDUCTOR, EC GRADE #2AAC
4	CNN VG 003	1	CONNECTOR, VISE TYPE, 6-2 SOL. 10-2 SOL.
5	INS ST 002	1	INSULATOR, SPOOL, WHITE
6	WAS RD 004	1	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. DIA. BOLT
7	WAS SF 003	1	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 OR 5/8 IN. DIA. BOLT
8	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

S4

SECONDARY DEADEND

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2/0CU, 4/0CU, 2, 1/0, 2/0, 3/0, 4/0
BOLT PLATE: NONE

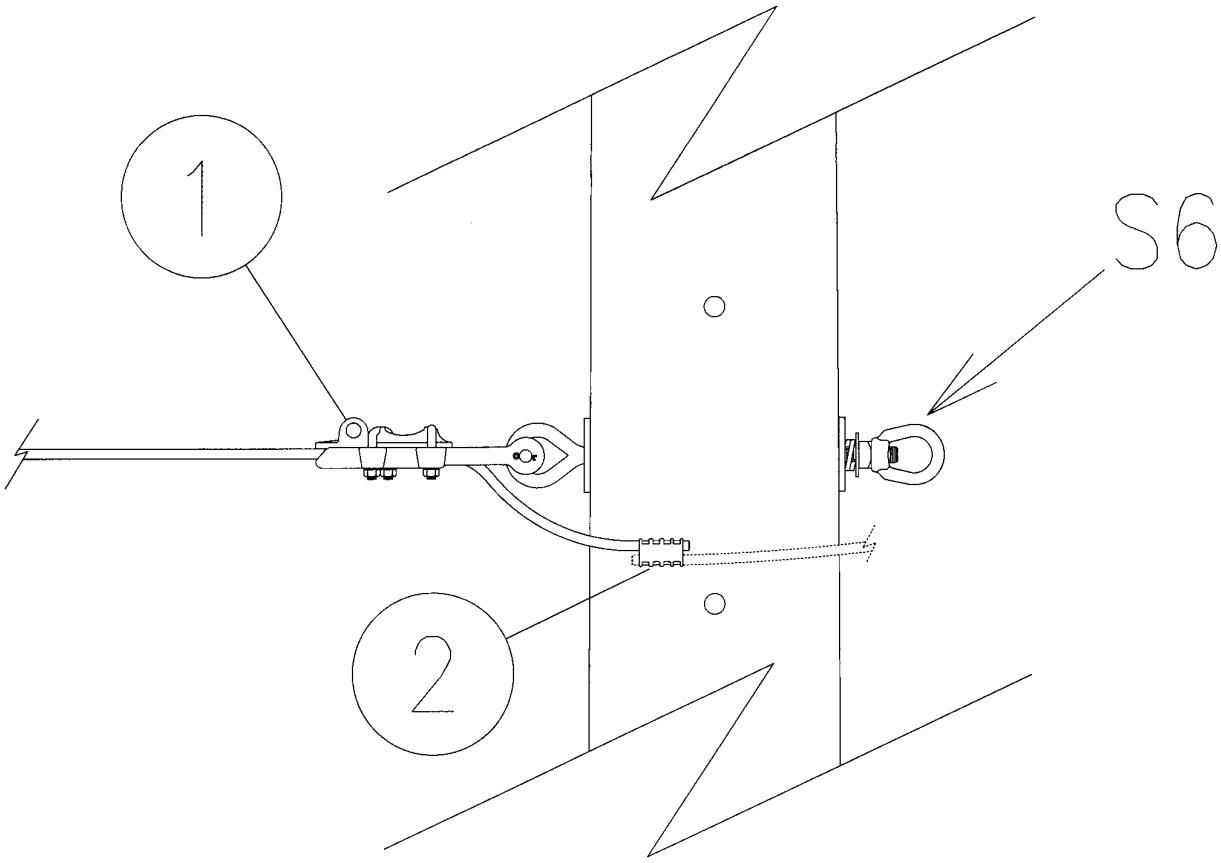


NO.	ITEM ID	QTY	DESCRIPTION
1	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
2	INS SU 002	1	INSULATOR, SUSPENSION, 4 IN., 10,000 LB

S5

NEUTRAL DEADEND

OPTIONS: 6CU, 4CU, 2CU, 1/0CU, 2/0CU, 4/0CU, 6, 4, 2, 1/0, 2/0, 3/0, 4/0, 636
BOLT PLATE: NONE

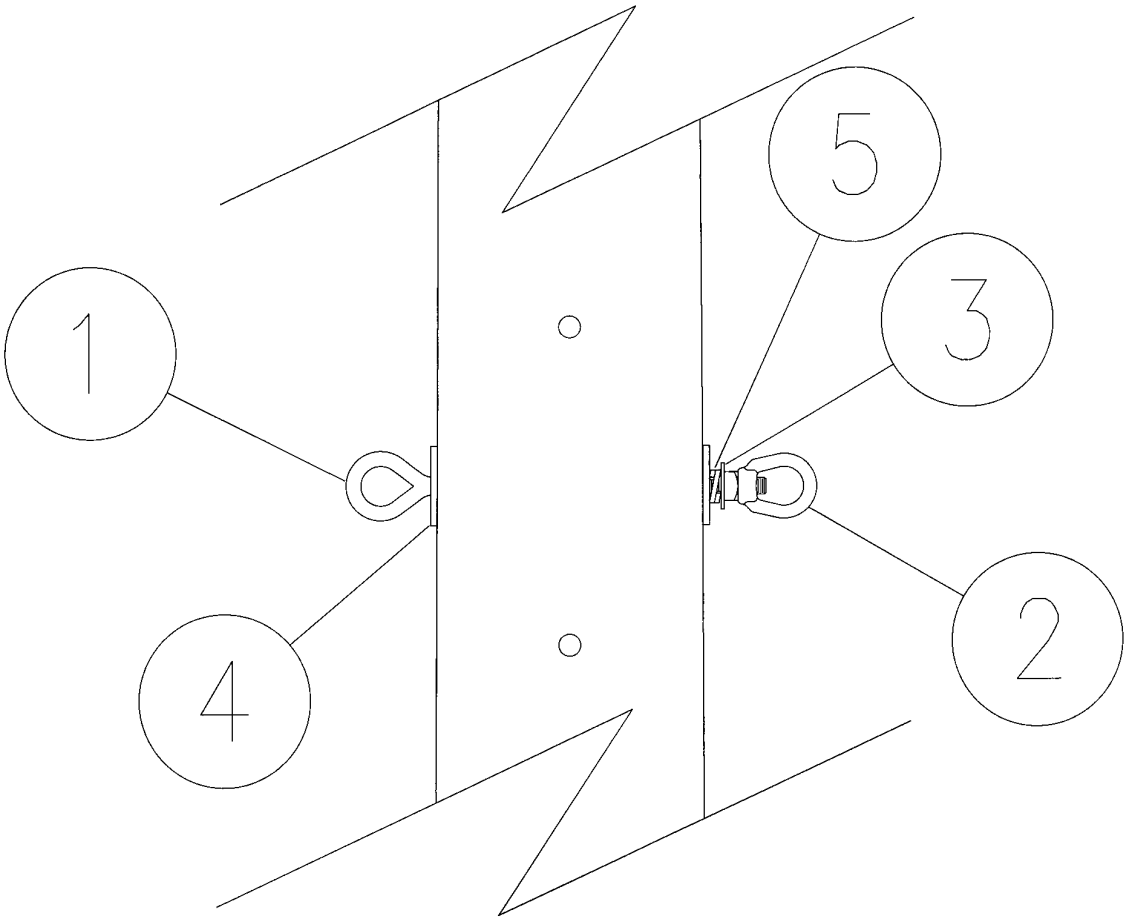


NO.	ITEM ID	QTY	DESCRIPTION
1	CLA SS ***	1	GENERAL CODE FOR STRAIGHT STRAIN CLAMP
2	CNN ** ***	1	GENERAL CODE FOR CONNECTOR

S6

DOUBLE EYEBOLT

OPTIONS: NONE
BOLT PLATE: NONE

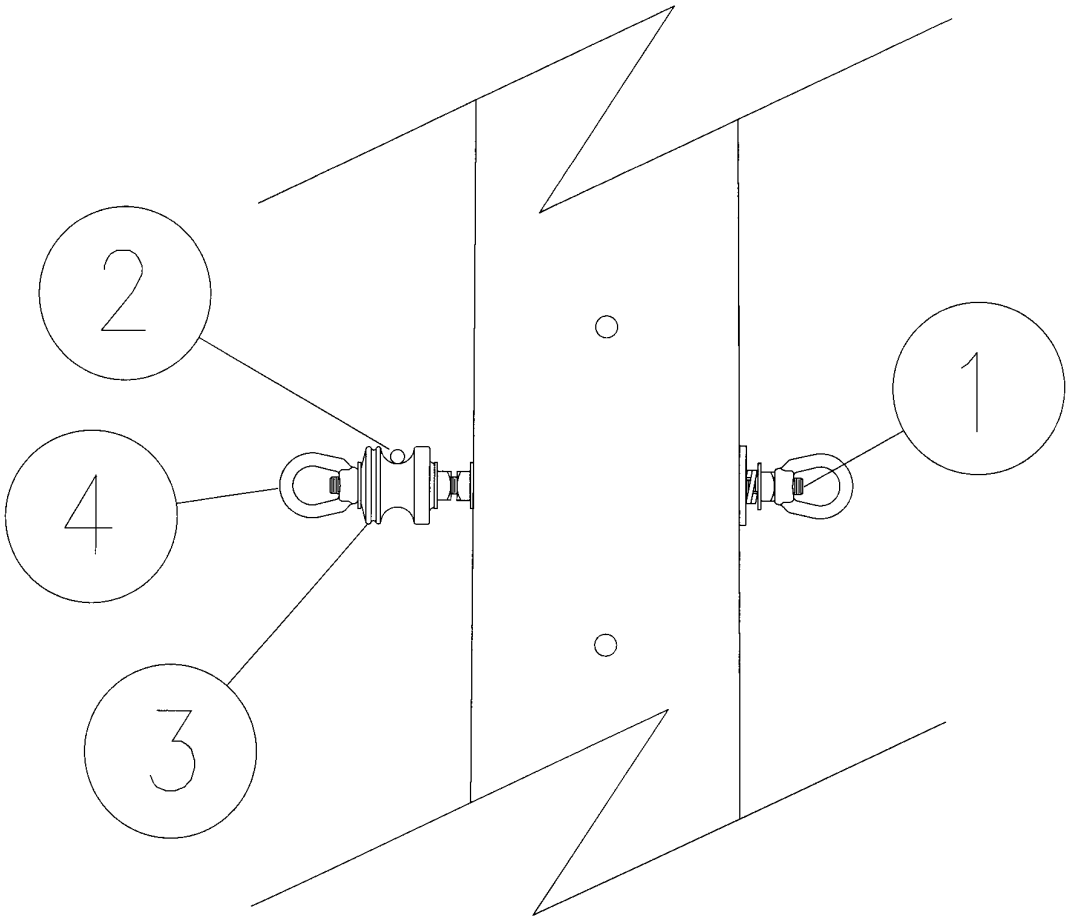


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL EY 003	1	BOLT, EYE, 5/8X12
2	NUT EY 002	1	NUT, EYE, 5/8
3	WAS RD 004	1	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. DIA. BOLT
4	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 OR 5/8 IN. DIA. BOLT
5	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

S7

TANGENT ASSEMBLY

OPTIONS: NONE
BOLT PLATE: NONE

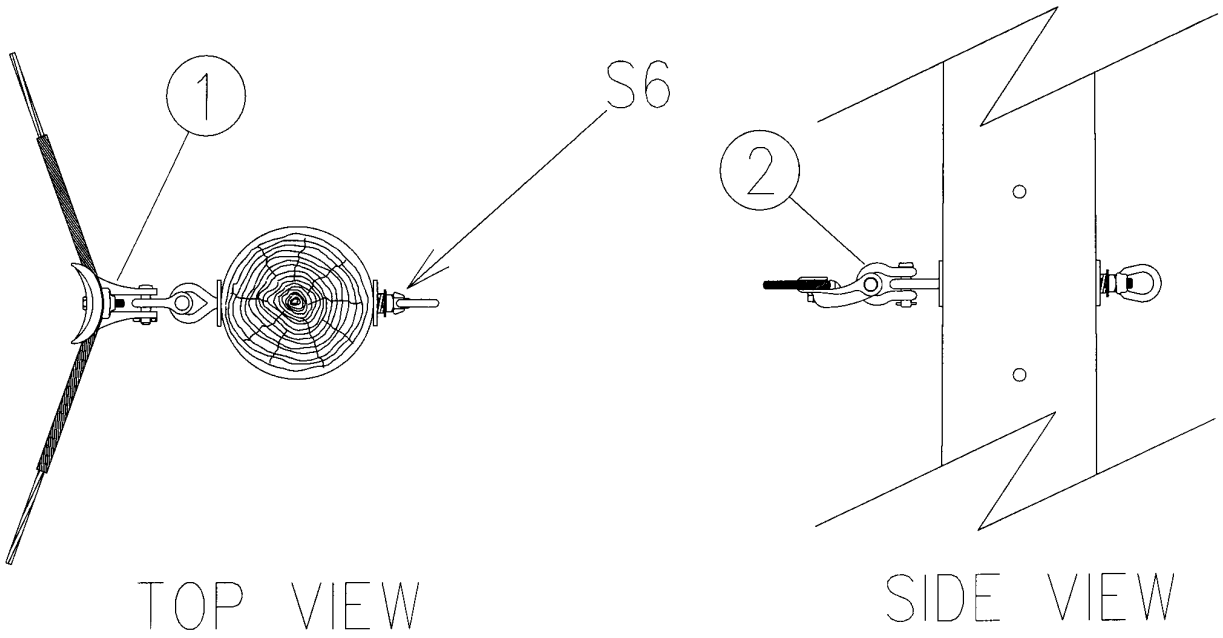


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 004	1	BOLT, DOUBLE ARMING, 5/8X18
2	COB TW 006	1	CONDUCTOR, EC GRADE #2AAC
3	INS ST 002	1	INSULATOR, SPOOL, WHITE
4	NUT EY 002	2	NUT, EYE, 5/8
5	WAS RD 004	3	WASHER, ROUND, 1-3/4 IN. DIA., FOR 5/8 IN. DIA. BOLT
6	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 OR 5/8 IN. DIA. BOLT
7	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

S8

FLYING ANGLE ASSEMBLY

OPTIONS: 2, 1/0, 2/0, 3/0, 4/0
BOLT PLATE: NONE

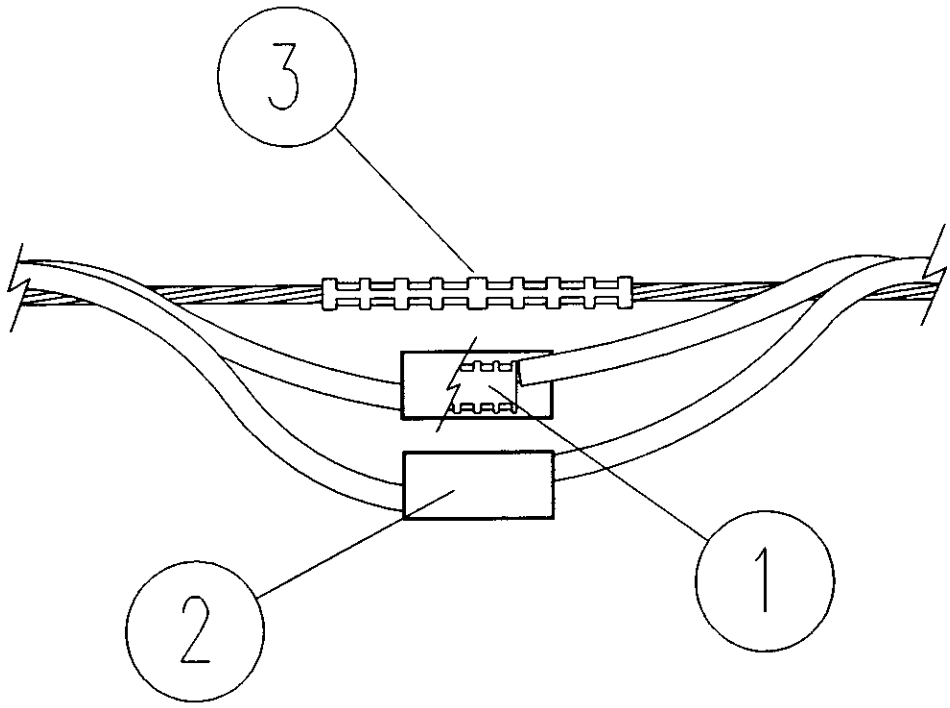


NO.	ITEM ID	QTY	DESCRIPTION
1	CLA ** ***	1	GENERAL CODE FOR SUSPENSION OR ANGLE CLAMP
2	SHA AN 002	1	SHACKLE, ANCHOR, 20,000 LBS.

S9

SECONDARY SPLICE

OPTIONS: 6, 4, 2, 1/0, 2/0, 4/0, 2/0Q, 4/0Q
BOLT PLATE: NONE

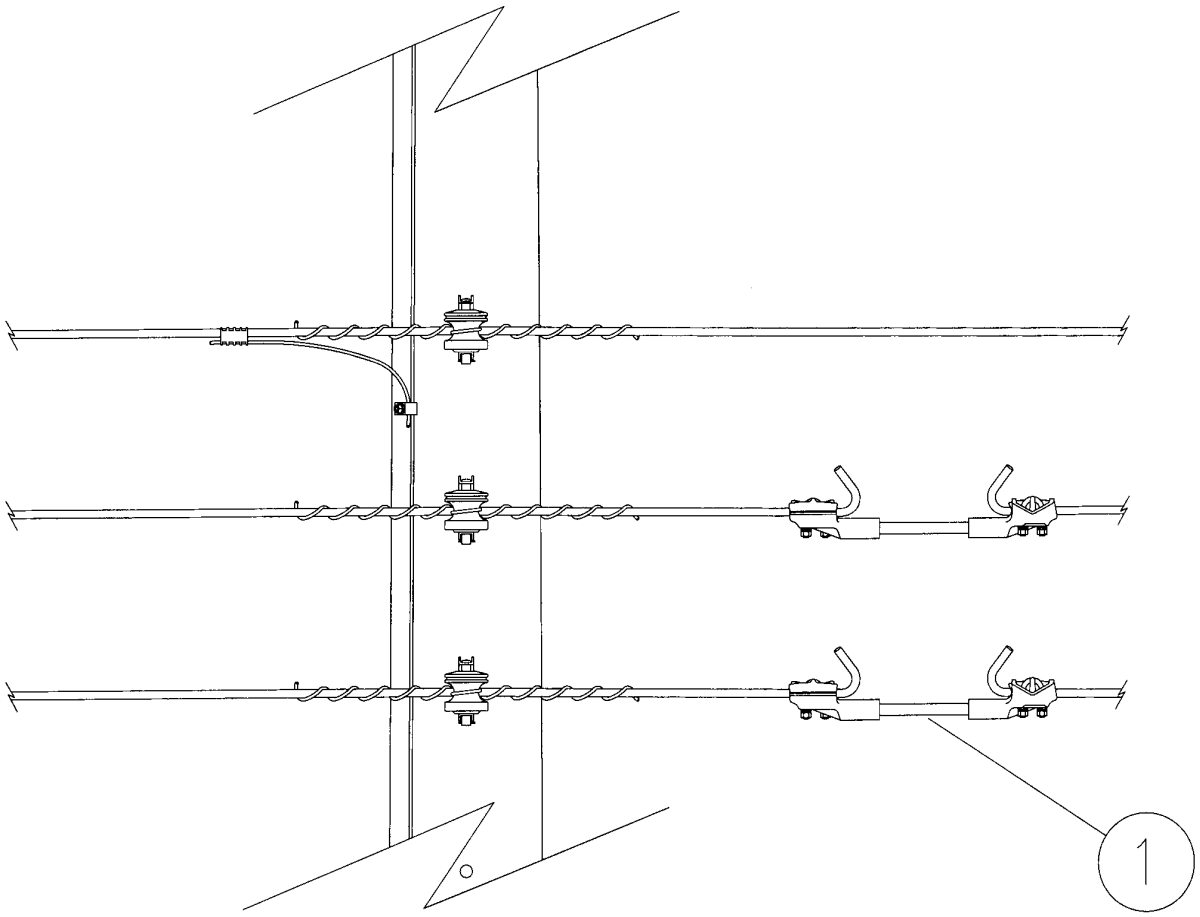


NO.	ITEM ID	QTY	DESCRIPTION
1	CNN CP ***	2	GENERAL CODE FOR AL. COMP. SIDE-BY CONNECTOR
2	COV IC ***	2	GENERAL CODE FOR CONNECTOR COVER
3	SLE ** ***	1	GENERAL CODE FOR SLEEVE
	OR		
1	CNN CP ***	3	GENERAL CODE FOR AL. COMP. SIDE-BY CONNECTOR
2	COV IC ***	3	GENERAL CODE FOR CONNECTOR COVER
3	SLE ** ***	1	GENERAL CODE FOR SLEEVE

S10

SECONDARY BREAK

OPTIONS: NONE
BOLT PLATE: NONE



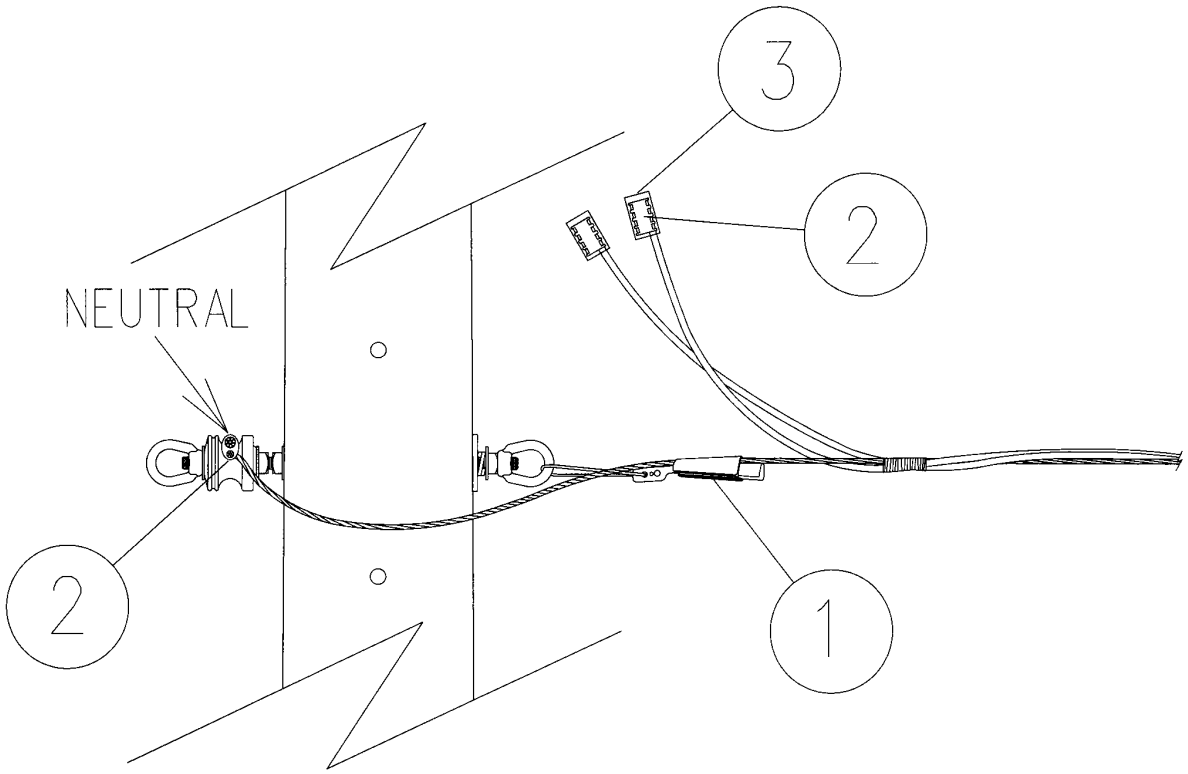
NO.	ITEM ID	QTY	DESCRIPTION
1	BRE SE 002	1	BREAKER, SECONDARY, #2-336 KCM

S20

SECONDARY DEADEND CONNECTION AT POLE AND TRANSFORMER CONNECTION

OPTIONS: 6 – 6, 4 – 4, 4 – 6, 2 – 6, 2 – 4, 2 – 2, 1/0 – 6, 1/0 – 4, 1/0 – 2, 1/0 – 1/0, 2/0 – 6, 2/0 – 4, 2/0 – 2, 2/0 – 1/0, 2/0 – 2/0, 4/0 – 6, 4/0 – 4, 4/0 – 2, 4/0 – 1/0, 4/0 – 2/0, 4/0 – 4/0, 500 – 6, 500 – 2,500 – 1/0, 500 – 2 /0, 500 – 4/0

BOLT PLATE: NONE



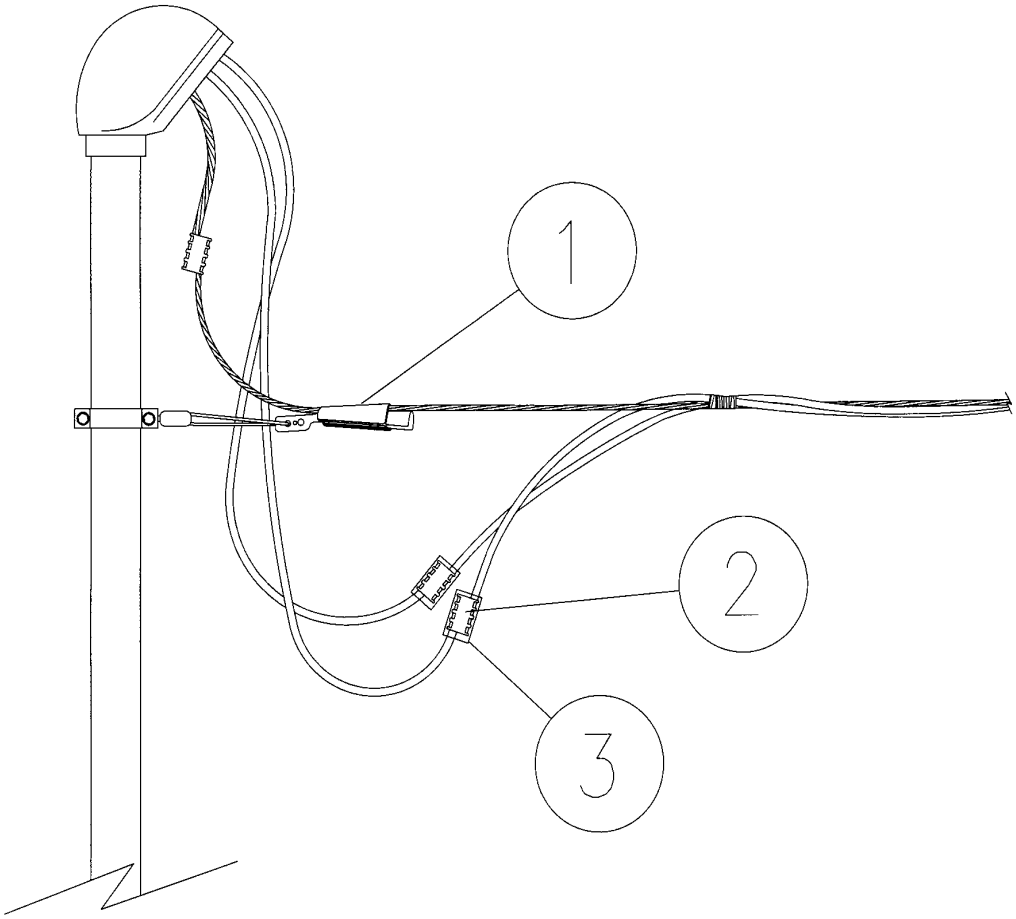
NO.	ITEM ID	QTY	DESCRIPTION
1	CLA SR ***	1	GENERAL CODE FOR STRAIN RELIEF WEDGE CLAMP
2	CNN CP ***	3	GENERAL CODE FOR AL. COMP. SIDE-BY CONNECTOR
3	COV IC ***	2	GENERAL CODE FOR CONNECTOR COVER

S21

SECONDARY CONNECTION AT HOUSE

OPTIONS: 6 – 6, 4 – 4, 4 – 6, 2 – 6, 2 – 4, 2 – 2, 1/0 – 6, 1/0 – 4, 1/0 – 2, 1/0 – 1/0, 2/0 – 6, 2/0 – 4, 2/0 – 2, 2/0 – 1/0, 2/0 – 2/0, 4/0 – 6, 4/0 – 4, 4/0 – 2, 4/0 – 1/0, 4/0 – 2/0, 4/0 – 4/0

BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	CLA SR ***	1	GENERAL CODE FOR STRAIN RELIEF WEDGE CLAMP
2	CNN CP ***	3	GENERAL CODE FOR AL. COMP. SIDE-BY CONNECTOR

IDENTIFICATION

INTRODUCTION

1. All letter designations in this section are for wood pole application. If concrete poles are to be used, then call for plate designations and add a "C" at the end of the plate name.

   Example: VN – Wood

   VNC – Concrete

   The "C" option gives adhesive to hold the tag on the pole instead of nails.

2. Plates GN, SN, RN, and CN for numbering Switches, Sectionalizers, Reclosers, and Capacitors will have the actual numbers assigned by the System Analysis Section of Technical Support Engineering. These numbers shall be indicated on the construction drawing by the responsible engineer.

3. Plate CRN shall only be used on the first riser pole or disconnect out of a sub-station. It should not be used at all switches because circuit boundaries may change.

4. Tags shall be mounted a minimum of 6 feet above grade. If there are multiple tags on a pole, the pole address tag shall be the left-most.

5. The plate GN should be used for hook disconnect switches. However, the prefix for a hook disconnect switch will be an "H" instead of a "G" on the tag itself. The plate GNLB should be used for group-operated switches to identify them as load-break. If a group-operated switch is re-tagged and it cannot be determined if it is load-break or not, then the plate GN should be used.

6. After tags are inserted into the tag holder, the ends of the tag holder shall be hammered flat to insure the tags do not fall out of the holder.

7. Refer to Standards Bulletin SB-18 for proper selection of pole addresses and tag application.

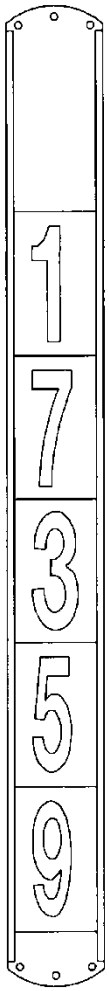
8. Plates "WARN" and "WARNC" shall be used for locations where energized primary may be in close proximity to facilities accessible by the general public. For example, an energized line that is running parallel to a bridge crossing or overpass may be close to an individual walking across the bridge near the top of the span. In this case, a sign or signs attached to the pole directly beneath the primary would be appropriate.

9. Aluminum pole street light address shall be mounted at eye level.

10. A tag holder is issued with each pole plate for the purpose of identifying the pole address when the pole is installed. Adhesive for these tag holders is also issued with concrete poles. Pole address identification comes with the pole installation.

VN
VNC

POLE ADDRESS
OPTIONS: NONE
BOLT PLATE: NONE

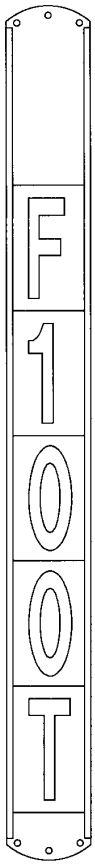


NO.	ITEM ID	QTY	DESCRIPTION
1	TAG HO 007	1	TAG HOLDER, 6 CHARACTER, VERTICAL, FOR 2 IN. TAGS
2	TAG NA 002	2	ALUMINUM NAILS SUPPLIED BY TRUCK STOCK
3	TAG RU ***	*	TAGS SUPPLIED BY TRUCK STOCK
	OR		
1	ADC MI 001	1	ADHESIVE FOR POLE TAG HOLDER
2	TAG HO 001	1	TAG HOLDER, 6 CHARACTER, VERTICAL, FOR 2 IN. TAGS
3	TAG RU ***	*	TAGS SUPPLIED BY TRUCK STOCK

FN
FNC

FUSE SIZE

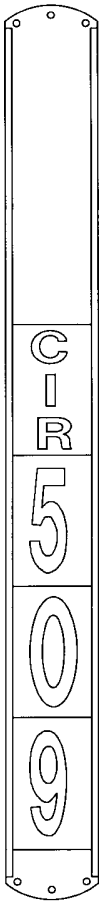
OPTIONS: NONE
BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	TAG HO 007	1	TAG HOLDER, 6 CHARACTER, VERTICAL, FOR 2 IN. TAGS
2	TAG NA 002	2	ALUMINUM NAILS SUPPLIED BY TRUCK STOCK
3	TAG RU 017	1	TAG, POLYETHYLENE, LETTER “T”
4	TAG RU 038	1	TAG, POLYETHYLENE, LETTER “F”
5	TAG AR ***	*	TAGS SUPPLIED BY TRUCK STOCK
	OR		
1	ADC MI 001	1	ADHESIVE FOR POLE TAG HOLDER
2	TAG HO 007	1	TAG HOLDER, 6 CHARACTER, VERTICAL, FOR 2 IN. TAGS
3	TAG RU 017	1	TAG, POLYETHYLENE, LETTER “T”
4	TAG RU 038	1	TAG, POLYETHYLENE, LETTER “F”
5	TAG AR ***	*	TAGS SUPPLIED BY TRUCK STOCK

CRN
CRNC
CIRCUIT NUMBER

OPTIONS: NONE
BOLT PLATE: NONE



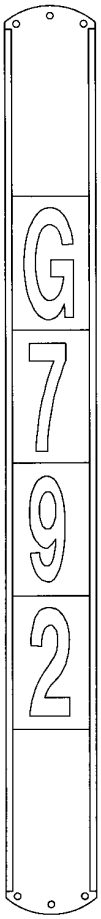
NO.	ITEM ID	QTY	DESCRIPTION
1	TAG HO 007	1	TAG HOLDER, 6 CHARACTER, VERTICAL, FOR 2 IN. TAGS
2	TAG NA 002	2	ALUMINUM NAILS SUPPLIED BY TRUCK STOCK
3	TAG YX 010	1	TAG, POLYETHYLENE, LETTER “CIR”
4	TAG RU ***	*	TAGS SUPPLIED BY TRUCK STOCK
	OR		
1	ADC MI 001	1	ADHESIVE FOR POLE TAG HOLDER
2	TAG HO 007	1	TAG HOLDER, 6 CHARACTER, VERTICAL, FOR 2 IN. TAGS
3	TAG YX 010	1	TAG, POLYETHYLENE, LETTER “CIR”
4	TAG RU ***	*	TAGS SUPPLIED BY TRUCK STOCK

GN
GNC

SWITCH NUMBER

OPTIONS: NONE

BOLT PLATE: NONE

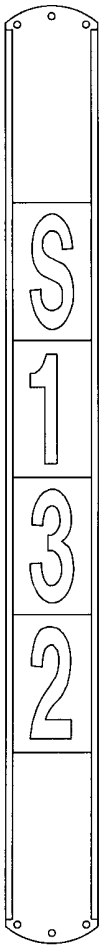


NO.	ITEM ID	QTY	DESCRIPTION
1	TAG HO 007	1	TAG HOLDER, 6 CHARACTER, VERTICAL, FOR 2 IN. TAGS
2	TAG NA 002	2	ALUMINUM NAILS SUPPLIED BY TRUCK STOCK
3	TAG RU 013	1	TAG, POLYETHYLENE, LETTER “G”
4	TAG RU ***	*	TAGS SUPPLIED BY TRUCK STOCK
	OR		
1	ADC MI 001	1	ADHESIVE FOR POLE TAG HOLDER
2	TAG HO 007	1	TAG HOLDER, 6 CHARACTER, VERTICAL, FOR 2 IN. TAGS
3	TAG RU 013	1	TAG, POLYETHYLENE, LETTER “G”
4	TAG RU ***	*	TAGS SUPPLIED BY TRUCK STOCK

SN
SNC

SECTIONALIZER NUMBER

OPTIONS: NONE
BOLT PLATE: NONE

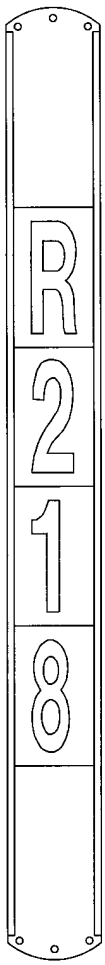


NO.	ITEM ID	QTY	DESCRIPTION
1	TAG HO 007	1	TAG HOLDER, 6 CHARACTER, VERTICAL, FOR 2 IN. TAGS
2	TAG NA 002	2	ALUMINUM NAILS SUPPLIED BY TRUCK STOCK
3	TAG RU 009	1	TAG, POLYETHYLENE, LETTER “S”
4	TAG RU ***	*	TAGS SUPPLIED BY TRUCK STOCK
	OR		
1	ADC MI 001	1	ADHESIVE FOR POLE TAG HOLDER
2	TAG HO 007	1	TAG HOLDER, 6 CHARACTER, VERTICAL, FOR 2 IN. TAGS
3	TAG RU 009	1	TAG, POLYETHYLENE, LETTER “S”
4	TAG RU ***	*	TAGS SUPPLIED BY TRUCK STOCK

RN
RNC

RECLOSER NUMBER

OPTIONS: NONE
BOLT PLATE: NONE

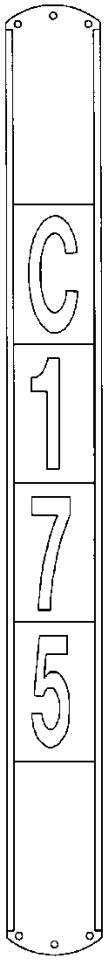


NO.	ITEM ID	QTY	DESCRIPTION
1	TAG HO 007	1	TAG HOLDER, 6 CHARACTER, VERTICAL, FOR 2 IN. TAGS
2	TAG NA 002	2	ALUMINUM NAILS SUPPLIED BY TRUCK STOCK
3	TAG RU 016	1	TAG, POLYETHYLENE, LETTER “R”
4	TAG RU ***	*	TAGS SUPPLIED BY TRUCK STOCK
	OR		
1	ADC MI 001	1	ADHESIVE FOR POLE TAG HOLDER
2	TAG HO 007	1	TAG HOLDER, 6 CHARACTER, VERTICAL, FOR 2 IN. TAGS
3	TAG RU 016	1	TAG, POLYETHYLENE, LETTER “R”
4	TAG RU ***	*	TAGS SUPPLIED BY TRUCK STOCK

CN
CNC

CAPACITOR NUMBER

OPTIONS: NONE
BOLT PLATE: NONE

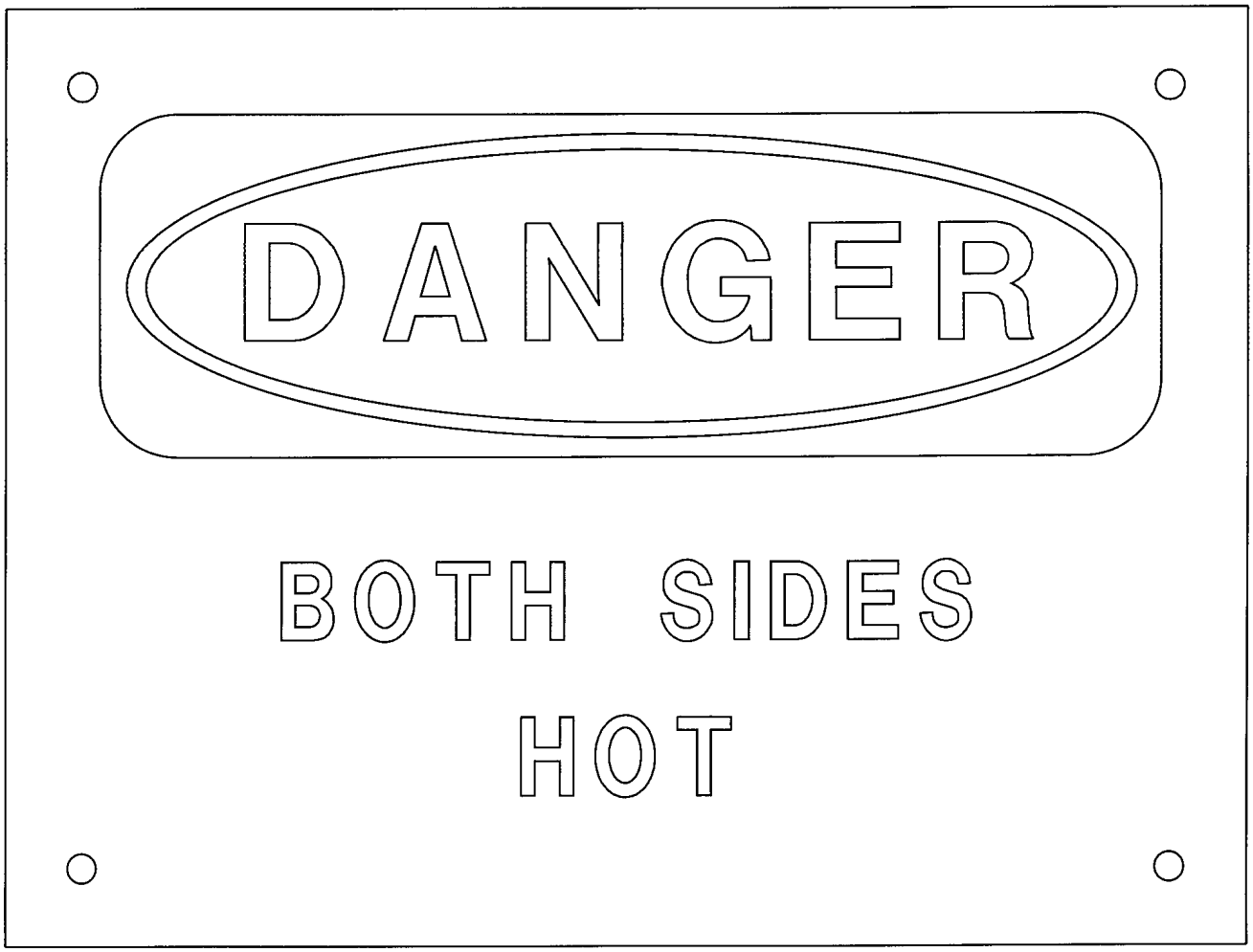


NO.	ITEM ID	QTY	DESCRIPTION
1	TAG HO 007	1	TAG HOLDER, 6 CHARACTER, VERTICAL, FOR 2 IN. TAGS
2	TAG NA 002	2	ALUMINUM NAILS SUPPLIED BY TRUCK STOCK
3	TAG RU 012	1	TAG, POLYETHYLENE, LETTER “C”
4	TAG RU ***	*	TAGS SUPPLIED BY TRUCK STOCK
	OR		
1	ADC MI 001	1	ADHESIVE FOR POLE TAG HOLDER
2	TAG HO 001	1	TAG HOLDER, 6 CHARACTER, VERTICAL, FOR 2 IN. TAGS
3	TAG RU 012	1	TAG, POLYETHYLENE, LETTER “C”
4	TAG RU ***	*	TAGS SUPPLIED BY TRUCK STOCK

DBSH

SIGN – DANGER BOTH SIDES HOT

OPTIONS: NONE
BOLT PLATE: NONE

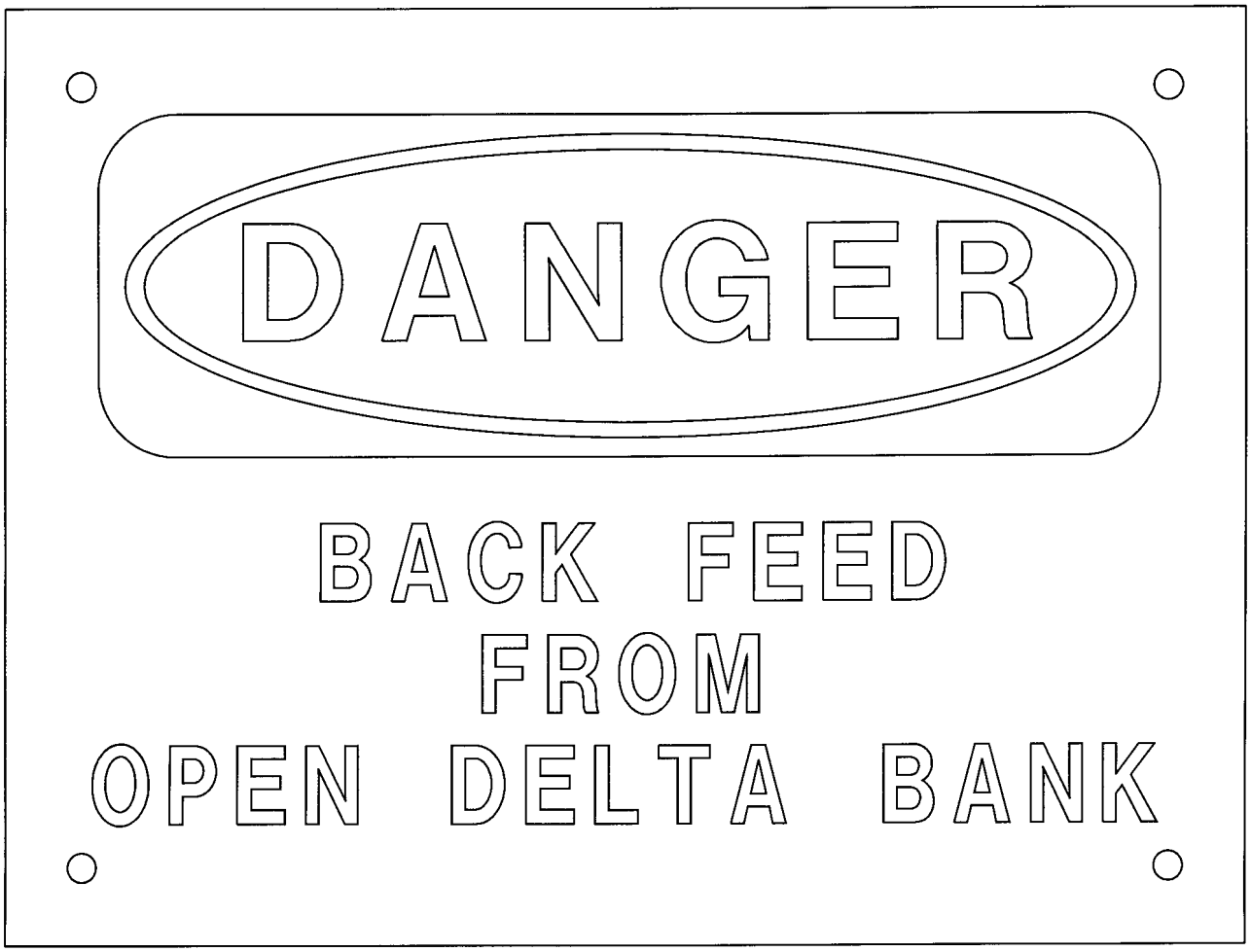


NO.	ITEM ID	QTY	DESCRIPTION
1	SIG DA 002	1	SIGN "DANGER BOTH SIDES HOT"

DFS

SIGN – DANGER BACK FEED FROM OPEN DELTA BANK

OPTIONS: NONE
BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	SIG DA 001	1	SIGN "DANGER BACK FEED FROM OPEN DELTA BANK"

WARN
WARNC

SIGN – WARNING – HIGH VOLTAGE ABOVE – KEEP OFF

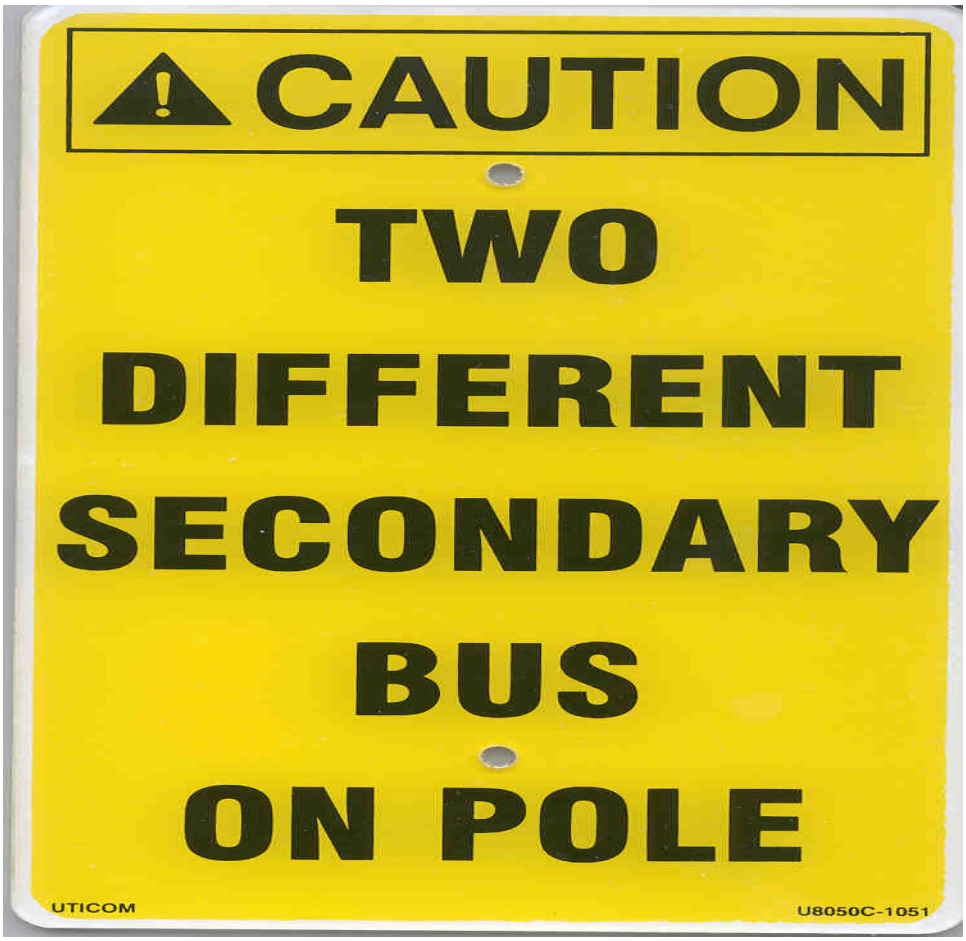
OPTIONS: NONE
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	SIG DA 006	1	SIGN - WARNING - HIGH VOLTAGE ABOVE - KEEP OFF
2	TAG NA 002	4	ALUMINUM NAILS SUPPLIED BY TRUCK STOCK
	OR		
1	ADC MI 001	1	ADHESIVE FOR POLE TAG HOLDER
2	SIG DA 006	1	SIGN - WARNING - HIGH VOLTAGE ABOVE - KEEP OFF

CAUT
CAUTC

SIGN – CAUTION – TWO DIFFERENT SECONDARY BUS ON POLE

OPTIONS: NONE
BOLT PLATE: NONE



NO.	ITEM ID	QTY	DESCRIPTION
1	SIG CA 001	1	SIGN – CAUTION – TWO DIFFERENT SECONDARY BUS ON POLE
2	TAG NA 002	2	ALUMINUM NAILS SUPPLIED BY TRUCK STOCK
	OR		
1	ADC MI 001	1	ADHESIVE FOR POLE TAG HOLDER
2	SIG CA 001	1	SIGN – CAUTION – TWO DIFFERENT SECONDARY BUS ON POLE

ASN
ASNC

AUTOMATIC SWITCH NUMBER

OPTIONS: NONE
BOLT PLATE: NONE

NO.	ITEM ID	QTY	DESCRIPTION
1	TAG HO 007	1	TAG HOLDER, 6 CHARACTER, VERTICAL, FOR 2 IN. TAGS
2	TAG NA 002	2	ALUMINUM NAILS SUPPLIED BY TRUCK STOCK
3	TAG RU 010	1	TAG, POLYETHYLENE, LETTER “A”
4	TAG RU 009	1	TAG, POLYETHYLENE, LETTER “S”
5	TAG RU ***	*	TAGS SUPPLIED BY TRUCK STOCK
	OR		
1	ADC MI 001	1	ADHESIVE FOR POLE TAG HOLDER
2	TAG HO 001	1	TAG HOLDER, 6 CHARACTER, VERTICAL, FOR 2 IN. TAGS
3	TAG RU 010	1	TAG, POLYETHYLENE, LETTER “A”
4	TAG RU 009	1	TAG, POLYETHYLENE, LETTER “S”
5	TAG RU ***	*	TAGS SUPPLIED BY TRUCK STOCK

FIBER OPTIC STANDARDS

I. ENGINEERING

I.1. ENGINEERING DEFINITIONS

I.1.1. Fiber Optic Cable:

A cable that contains individual glass fibers, designed for the transmission of digital information, using light pulses.

I.1.2. All Dielectric Self Support (ADSS) Cable:

A cable designed and constructed with non-metallic components, that is designed for aerial applications and does not require a separate cable messenger.

OTDR:

I.1.3. Optical Time Domain Reflectometer.

A device used for characterizing a fiber, wherein an optical pulse is transmitted through the fiber and the resulting backscatter and reflections are measured as a function of time.

I.1.4. Single-mode Fiber:

An optical fiber with a small core diameter in which only a single mode of light is capable of propagation.

I.1.5. Multi-mode Fiber:

An optical fiber whose core diameter is large compared with the optical wavelength and which, consequently, a large number of light modes are capable of propagation.

I.1.6. Splicing:

A permanent junction between optical fibers. May be thermally fused or mechanically applied.

Minimum Bend Radius: The minimum radius a fiber may be bent before optical losses are induced.

I.2. FIBER OPTIONS:

I.2.1. The following plates are used to order/issue the fiber optic cable itself.

C.FIBER24 (24 Count Single-Mode Fiber, ADSS)

C.FIBER36 (36 Count, 30 Single-Mode/6Mulit-Mode, ADSS)

*For Special DOT Projects.

C.FIBER48 (48 Count Single-Mode Fiber, ADSS)

C.FIBER72 (72 Count Single-Mode Fiber, ADSS)

C.FIBERTR24 (ADSS, Track resistant, 24 count)

C.FIBERTR48 (ADSS, Track resistant, 48 count)

C.FIBERTR72 (ADSS, Track resistant, 24 count)

I.2.2. The plate RC.FIBER is used for relocating any fiber optic cable from one location to another. It should be plated for each cable once per station, not per foot.

I.3. JEA fiber optic cable should be located at least 40 inches from any other utility. Field conditions will vary, so the actual location of the FO cable on the pole must be considered by the person designing the project. Typically, the FO cable is installed on or near the neutral location, on the birthmark face of the pole.

I.4. Included at the end of this Section are the cable specifications and some installation guidelines from the manufacturer.

II. JEA FIBER OPTIC CABLE STANDARDS

JEA has standardized on two types of fiber optic cable designs. One type is for aerial installations and the other for underground. JEA has standardized on All Dielectric Self Support (ADSS) fiber cables for aerial installations and Cable-in-Conduit type for underground applications.

II.1. REQUIREMENTS FOR UNDERGROUND FIBER CABLE:

The cable-in-conduit cable shall be a fiber optic cable with a one-inch diameter polyethylene conduit extruded around it. The cable shall be a telecommunications grade, all dielectric optical cable designed for the high speed transmission of voice and data communications. The cable shall combine a loose tube fiber cable with a UV rated outer jacket and be designed for underground installations. The optical cable shall be furnished with twelve (12) single-mode, glass fibers. The glass fibers in the cable shall be distributed such that there are six (6) fibers per buffer tube. The glass fibers shall be manufactured by Corning Glass Company, SMF-28 CPC3. The annealed polyethylene conduit shall be formed by continually extruding it as a pipe over the fiber optic cable. There shall be no adhesion between the fiber cable jacket and the conduit's inner surface. The installed cable in the conduit shall be lubricated for easy pulling, if required in the future.

II.2. REQUIREMENTS FOR AERIAL FIBER CABLE:

JEA has standardized on four fiber cables for aerial applications. All the cables are Telecommunications grade fiber optic, all dielectric, self-supporting cables, designed for aerial installation on electric transmission structures. The cables are round and constructed according to the loose tube concept. The cables utilize standard utility hardware for installation. The cables shall combine a loose tube fiber cable with a UV rated outer jacket that reduces corona and tracking problems. The cables shall have sufficient jacket dielectric strength and resistance to tracking such that it can be located in a radial and axial electric field of 12 kV per meter. The cable designs provided shall be shown to exhibit zero fiber strain at maximum load. The optical cables shall be furnished with 16 single-mode glass fibers. The glass fibers in the cable shall be distributed such that there are four (4) fibers per buffer tube. The glass fibers shall be manufactured by Corning Glass Company, SMF-28 CPC3. The different cables are classified by the installation requirements:

II.2.1. Short Span Cable (CAI-FO-S24):

This cable is primarily for installation on distribution poles or short transmission lines. The cable is designed for a pole line span of 350 feet with a 3.5 foot nominal sag. The cable is a 24 fiber single-mode ADSS fiber cable, with a nominal cable diameter of .52 inches. Alcoa # FE924211C8.

II.2.2. Medium Span Cable (CAI-FO-001):

This cable is primarily for installation on transmission lines. The cable is designed for a pole line span of 600 feet with a 4 foot nominal sag. The cable is a 16 fiber, single mode, ADSS fiber cable with a nominal cable diameter of .52 inches. Alcoa # FE816211K3.

II.2.3. Long Span Cable (CAI-FO-003):

This cable is primarily for installation on long span transmission lines. The cable is designed for a pole line span of 1200 feet with a 10 foot nominal sag. The cable is a 16-fiber, single-mode, ADSS fiber cable with a nominal cable diameter of .54 inches. Alcoa # FE816211L5.

II.2.4. Long Span Cable (CAI-FO-L46):

This cable is primarily for installation on long span transmission lines. The cable is designed for a pole line span of 1000 feet with a 8 foot nominal sag. The cable is a 46 fiber, single-mode, ADSS fiber cable with a nominal cable diameter of .594 inches. This cable is used for AAV contracts. Alcoa # FE946211L4.

II.2.5. Track Resistant ADSS (CAI FOT 24)

II.2.6. Track Resistant ADSS (CAI FOT 48)

II.2.7. Track Resistant ADSS (CAI FOT 72)

III. JEA FIBER OPTIC AERIAL HARDWARE STANDARDS

III.1. FIB-SU-001:

All dielectric tangent attachment for distribution or transmission line spans up to 400'. For use with JEA standard fiber cable CAI-FO-001 & CAI-FO-S24 (.52" diameter), may be used for angles up to 15 degrees.

III.2. FIB-SU-002:

All dielectric tangent attachment for distribution or transmission line spans up to 400'. For use with JEA standard fiber cable CAI-FO-003 (.54" diameter), may be used for angles up to 15 degrees.

III.3. FIB-SU-003:

Armor Grip Suspension tangent attachment for transmission line spans over 400'. For use with JEA standard fiber cable CAI-FO-001 (.52" diameter), may be used for angles up to 30 degrees.

III.4. FIB-SU-004:

Armor Grip Suspension tangent attachment for transmission line spans over 400'. For use with JEA standard fiber cable CAI-FO-003 (.54" diameter), may be used for angles up to 30 degrees.

III.5. FIB-SU-005:

Armor Grip Suspension tangent attachment for transmission line spans over 400'. For use with JEA standard fiber cable CAI-FO-L46, CAI-FI-T24, CAI-FO-T48 (.594" diameter), may be used for angles up to 30 degrees.

III.6. FIB-SU-006:

All dielectric tangent attachment for distribution or transmission line spans over 400'. For use with JEA standard fiber cable CAI-FO-L72, CAI-FO-T72 (0.701" diameter), may be used for angles up to 15 degrees.

III.7. FIB-DE-001:

Armor Grip Suspension dead-end attachment, for distribution or transmission lines. For use with JEA standard fiber cable CAI-FO-001 & CAI-FO-S24 (.52" diameter).

III.8. FIB-DE-002:

Armor Grip Suspension dead-end attachment for distribution or transmission lines. For use with JEA standard fiber cable CAI-FO-003 (.54" diameter).

III.9. FIB-DE-003:
Armor Grip Suspension dead-end attachment for distribution or transmission lines. For use with JEA standard fiber cable CAI-FO-L46, CAI-FO-T24, CAI-FO-T48 (0.594" diameter).

III.10. FIB-DE-007:
Armor Grip Suspension dead-end attachment for distribution or transmission lines. For use with JEA standard fiber cable CAI-FO-L72, CAI-FO-T72 (0.701" diameter).

III.11. FIB-CR-001:
Corona Ring for use when engineering analysis indicates it is required on 25kV track resistant ADSS cable. CAI-FO-T24, CAI-FO-T48 (0.549" diameter).

III.12. FIB-CR-002
Corona Ring for use when engineering analysis indicates it is required on 25kV track resistant ADSS cable. CAI-FO-T72 (0.701" diameter).

IV. INSTALLATION

IV.1. PLANNING

IV.1.1. General planning guidelines to be considered prior to the installation of the cable

IV.1.1.1. Number of 90 Degree Turns:

The number of 90 degree turns on a pull shall not exceed 6 for aerial cables and 4 for underground cable-in-conduit.

IV.1.1.2. Attachment Point:

The attachment location and method, drill, band, etc., shall be selected based on the type of structure to which the cable is to be attached. The attachment point will be established based on electric field predictions (< 12 kV/meter), blow out characteristics of the fiber cable in relation to energized lines, sag, tension and congestion on the Transmission and/or Distribution structures.

IV.2. AERIAL FIBER OPTIC CABLE PULLING GUIDELINES

IV.2.1. Bend Radius:

The main risk of damage to the fiber optic cable is by overlooking the minimum bending radius. It is important to know that the damage occurs more easily when the cable is bent under tension, so when the installation is in the process be sure to allow for a 13 inch bending radius. This is a problem when the cable drapes over the pulling blocks because of improper back tensioning, or during pulls around corners.

IV.2.2. Turns and Tangents:

Twenty-three inch diameters stringing blocks or the special fiber optic blocks, should be used on all turns or angles, however, seven inch stringing blocks may be used on tangent pulls if the pull remains taut at all times and the spans are less than 600'. Smaller stringing blocks are not be used. Pulling block assemblies from Sherman & Reilly (constructed of three seven inch dollies) must be used at all turns in the route that exceed 20 degrees and for spans that are greater than 700'.

IV.2.3. Reel Placement:

Have the reel set back from the first pole by 70 or more feet or use a pulling block assembly from Sherman & Reilly (constructed of three seven inch dollies) at the first structure. Use the breaking system on the drum feeder at all times, damage will occur if the cable sags severely off any of the dollies.

IV.2.4. Strength:

IV.2.4.1. The fibers in the cable will shatter under considerable impact, pressure or if pulling tensions exceed 1900 lbs., although from the outside of the cable this will not be apparent.

IV.2.4.2. With fiber optic cable, the jacket of the cable and the Kevlar layer directly beneath give the cable its strength; so please be sure to note and repair all nicks and cuts.

IV.2.5. Hardware and Vibration Dampers:

Note that the cable strength is designed for each route's requirements and that hardware may change with each cable although some hardware appears identical. The substitution of attachment hardware is not acceptable under any circumstances. Contact the project engineer if there are any questions about the hardware. All dead-ended assemblies should be grounded to the structure ground. Install a spiral vibration damper at all spans that exceed 440 feet. One damper per span for spans 450 to 550 feet, two dampers per span for spans 560 to 1100 feet and four dampers per span for spans above 1200 feet. All vibration dampers should be installed 12 inches from the long span tangent or deadend.

IV.2.6. Installation:

Use a swivel, the tightening tool provided for the all-dielectric small span tangent units, the fiber optic dead-end fully wrapped and clipped in for tensioning the cable.

IV.2.7. Precautions:

Please review the manufacturer's installation instructions prior to commencing with the installation. If any questions arise during installation, please refer to the manufacturer's installation instructions, or notify the project engineer. Always ground a cable that is installed prior to handling. If the fiber cable is to be installed closer than 6' away from an energized line of 138 kV or higher, a slip ground should be used during pulling.

IV.2.8. Testing:

Perform OTDR test on each fiber in the installed cable, to verify that the parameters of each fiber meet the system design criteria.

IV.3. JEA GUIDELINES FOR PULLING UNDERGROUND FIBER OPTIC CABLE

IV.3.1. Bend Radius:

The main risk of damage to the fiber optic cable is by overlooking the minimum bending radius. It is important to know that the damage occurs more easily when the cable is bent under tension, so when the installation is in process, be sure to allow for a 13 inch bending radius.

IV.3.2. Turns and Tangents:

Special fiber optic blocks should be used on all turns or angles.

Reel Placement:

Have the reel set back from the manhole and use a fiber optic manhole pulling block assembly from Sherman & Reilly.

IV.3.3. Strength:

The fibers in the cable will shatter under considerable impact, pressure or if pulling tensions exceed 600 lbs., although from the outside of the cable this will not be apparent. With fiber optic cable the jacket of the cable and the Kevlar layer directly beneath give the cable its strength so please be sure to not and repair all nicks and cuts.

IV.3.4. Installation:

When installing use a swivel eye for pulling the fiber optic cable and conduit system.

IV.3.5. Precautions:

Please review the manufacturer's installation instructions prior to commencing with the installation. If any questions arise during installation, please refer to the manufacturer's installation instructions, or notify the project engineer.

IV.3.6. Testing:

Perform OTDR test on each fiber in the installed cable to verify that the parameters of each fiber meet the system design criteria.

V. SAFETY

V.1. The fiber optic cables used by JEA, being constructed entirely of non-conducting, all-dielectric materials are designed for installation around high voltage lines. In this application the fiber cable is classified as a fiber supply cable, and can only be installed, maintained and handled by electric utility employees trained and equipped to work on an around electric supply lines.

V.2. Although the fiber cable is made entirely of non-conducting materials, under certain conditions it is still capable of having induced or static charges on its surface. These fields can, however, induce a static surface charge that can be dangerous if touched bare handed. To ensure the safety of field operations personnel, it is recommended that all fiber cable installed near and around JEA electric facilities, be treated as an energized conductor and that it be grounded prior to handling. It should be made clear that fiber cable is more susceptible to crushing than regular conductors, so proper grounding techniques should be observed. See cable manufacturer's literature in Section III.

VI. INSTALLATION LOCATIONS

VI.1. Distribution

The fiber optic cables may be attached to distribution poles at various elevations, as determined by the appropriate process owner within Utility Service Capacity (USC). This attachment location may be in the supply space of the pole, as determined by NESC rules. Installation and maintenance of cable facilities in this location must be performed by qualified electric utility personnel, or an approved electric utility contractor.

VI.2. JEA Transmission Poles

The fiber cables may be installed on JEA transmission line poles at locations as determined by the appropriate process owner within USC. The attachment of communication cables to transmission line poles is limited to JEA owned fiber optic cables only. The installation and maintenance of cable facilities in this location must be performed by qualified transmission line utility personnel, or approved transmission line contractors.

VI.3. JEA Conduits and Building Entrances

The installation of fiber cable in JEA's downtown underground conduit system and building entrances is determined by USC. As a general guideline, if 3 or more spare power conduits are available between any two manholes in the downtown underground conduit system, one of the spare conduits may be reserved for JEA fiber communications. USC is responsible for determining what constitutes a spare conduit. The installation and maintenance of fiber cable in JEA's underground conduit system, must be performed by qualified electric utility personnel, or approved electric utility contractors.

VI.4. Location of Fiber Optic Attachments for Joint Use Agreements:

All fiber optic facilities associated with Joint Use applications must be capable of being installed in the JEA Communication Use Location as it is determined by USC. In addition, joint use requests in the JEA underground conduit system, will be subject to the following additional requirements:

VI.4.1. Joint Use Conduit Requirements:

If a joint use request is granted, the first joint use party, in addition to bearing all costs for the installation of the fiber cable, shall bear all the costs of installing a 5-way inner-duct system in the spare conduit reserved for JEA communications. The 5-way inner-duct system shall be used for the JEA fiber cable, the first joint use party and any other future joint use parties.

VI.4.2. Joint Use Building Entrances Requirements:

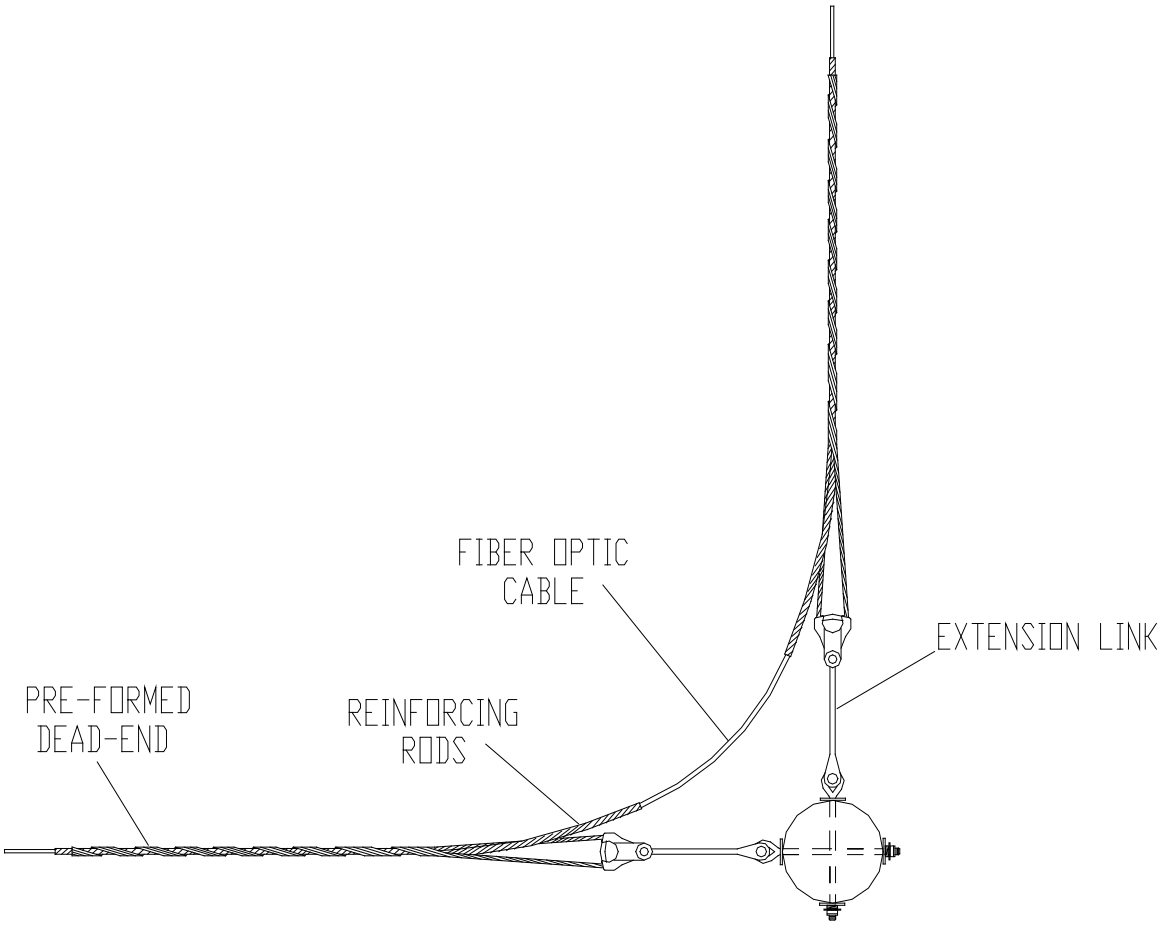
If a joint use request is granted, the first joint use party in addition to bearing all costs for the installation of the fiber cable, shall bear all the costs of installing a 5-way inner-duct system in the spare conduit reserved for JEA communications. The 5-way inner-duct system shall be used for the JEA fiber cable, the first joint use party and any other future joint use parties. In all cases, the joint use party must submit with their joint use request written documentation from the Owner of the building or facility that the joint use party is granted access to the building via the JEA power entrance

FO-A (MAINTENANCE ONLY)

90 DEGREE ANGLE

OPTIONS:24, 36, 48, 72

BOLT PLATE: NONE

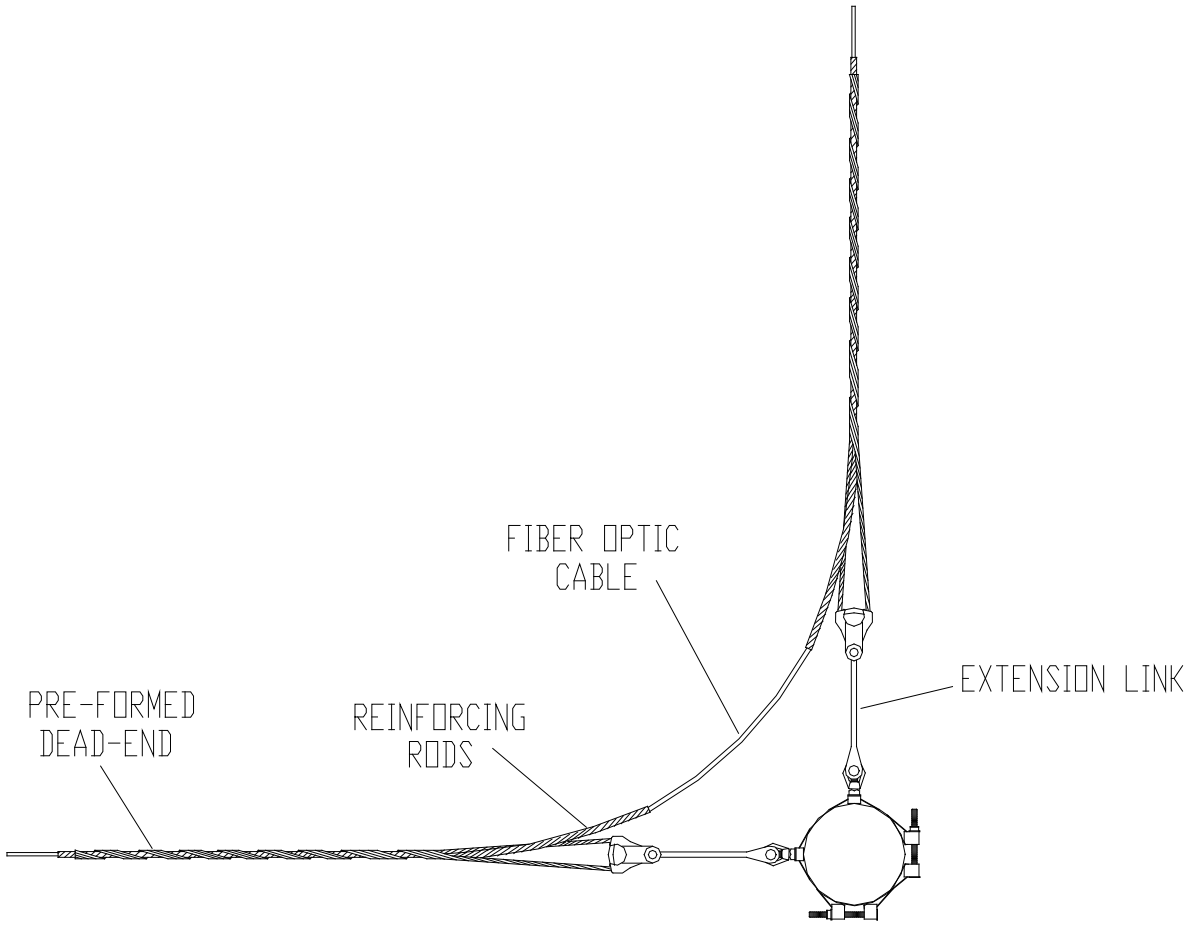


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL EY 005	2	BOLT, EYE, 5/8 X 16
2	FIB CL 001	2	CLEVIS, THIMBLE (FOR FIBER OPTIC CABLE)
3	FIB DE ***	2	DEAD-END, PREFORMED FOR FIBER OPTIC CABLE
4	LIK EX 002	2	LINK, EXTENSION, CLEVIS EYE
5	WAS RD 004	2	WASHER, ROUND, 1-3/4 INCH, FOR 5/8 IN. DIA. BOLT
6	WAS SF 002	4	WASHER, SQUARE, FLAT, 2-1/4", FOR 5/8 IN. DIA. BOLT
7	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

FO-ABD (MAINTENANCE ONLY)

90 DEGREE ANGLE, BANDED

OPTIONS: 24, 36, 48, 72
BOLT PLATE: NONE

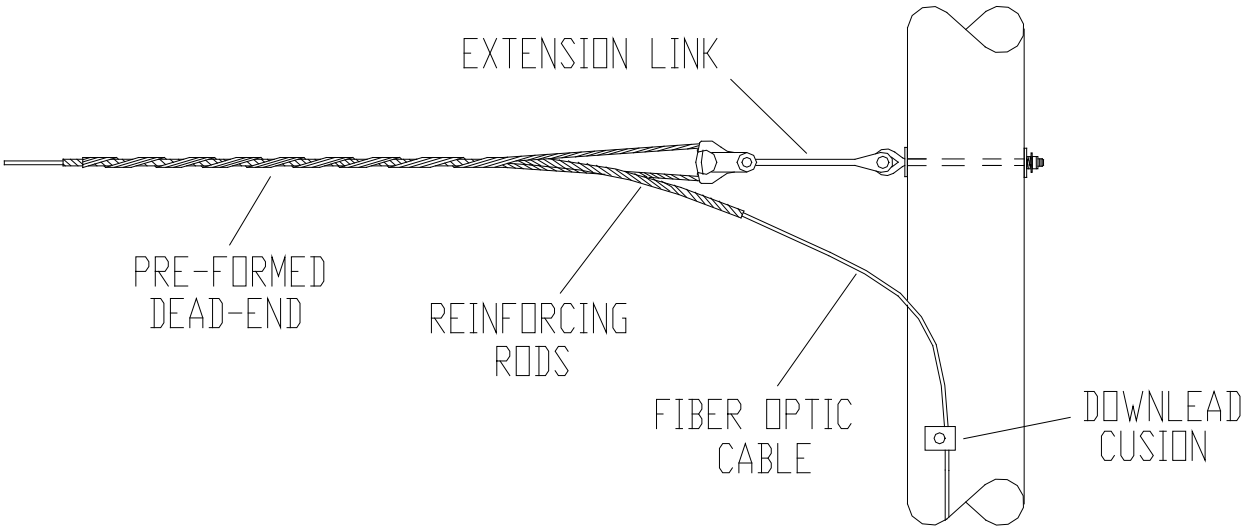


NO.	ITEM ID	QTY	DESCRIPTION
1	FIB BD 001	12	1.25 IN. STAINLESS STEEL BANDING
2	FIB BK 002	4	BOLTED RETAINER FOR S.S. BANDING
3	FIB DE ***	2	DEAD-END, PREFORMED FOR FIBER OPTIC CABLE
4	FIB CL 001	2	CLEVIS, THIMBLE (FOR FIBER OPTIC CABLE)
5	FIB MT 001	2	FIBER OPTIC MOUNTING PLATE
6	LIK EX 002	2	LINK, EXTENSION, CLEVIS EYE
7	NUT EY 002	2	NUT, EYE, 5/8 IN.

FO-D (MAINTENANCE ONLY)

DEAD-END

OPTIONS: 24, 36, 48, 72
BOLT PLATE: NONE

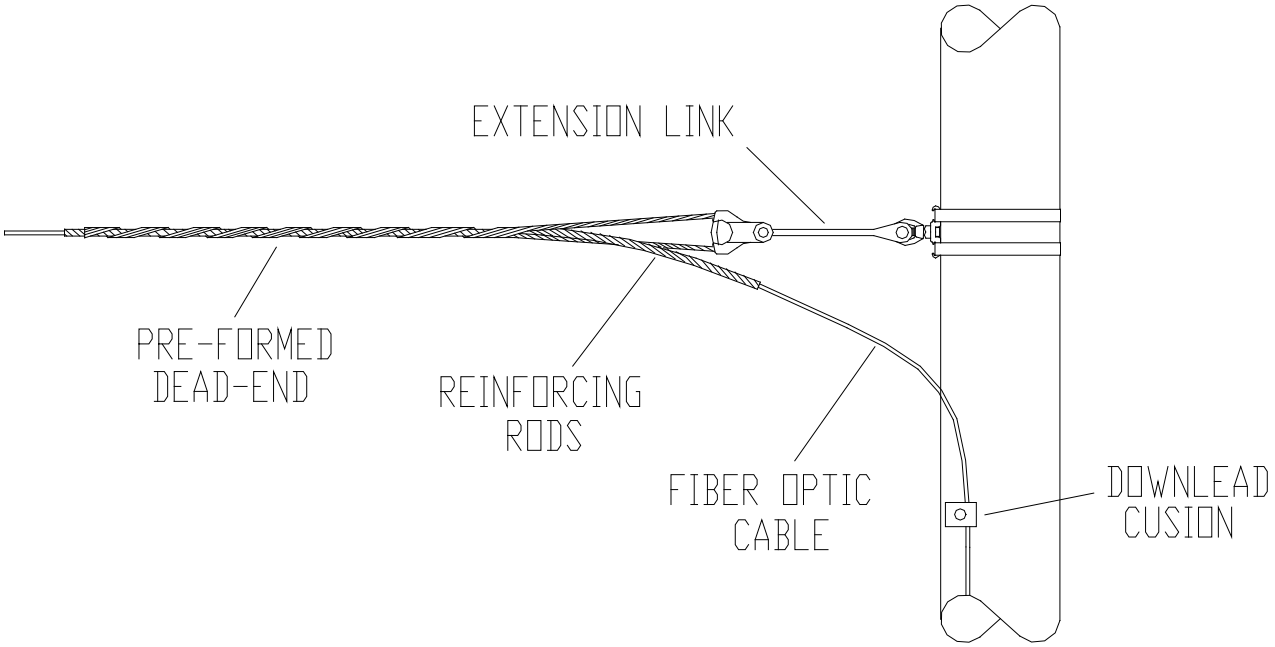


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL EY 005	1	BOLT, EYE, 5/8 X 16
2	FIB CL 001	1	CLEVIS, THIMBLE (FOR FIBER OPTIC CABLE)
3	FIB CU 001	3	CUSHION, FIBER OPTIC CABLE DOWNLEAD
4	FIB DE ***	1	DEAD-END, PREFORMED FOR FIBER OPTIC CABLE
5	LIK EX 002	1	LINK, EXTENSION, CLEVIS EYE
6	WAS RD 004	1	WASHER, ROUND, 1-3/4 INCH, FOR 5/8 IN. DIA. BOLT
7	WAS SF 002	2	WASHER, SQUARE, FLAT, 2-1/4", FOR 5/8 IN. DIA. BOLT
8	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

FO-DBD (MAINTENANCE ONLY)

DEAD-END, BANDED

OPTIONS: 4, 36, 48, 72
BOLT PLATE: NONE

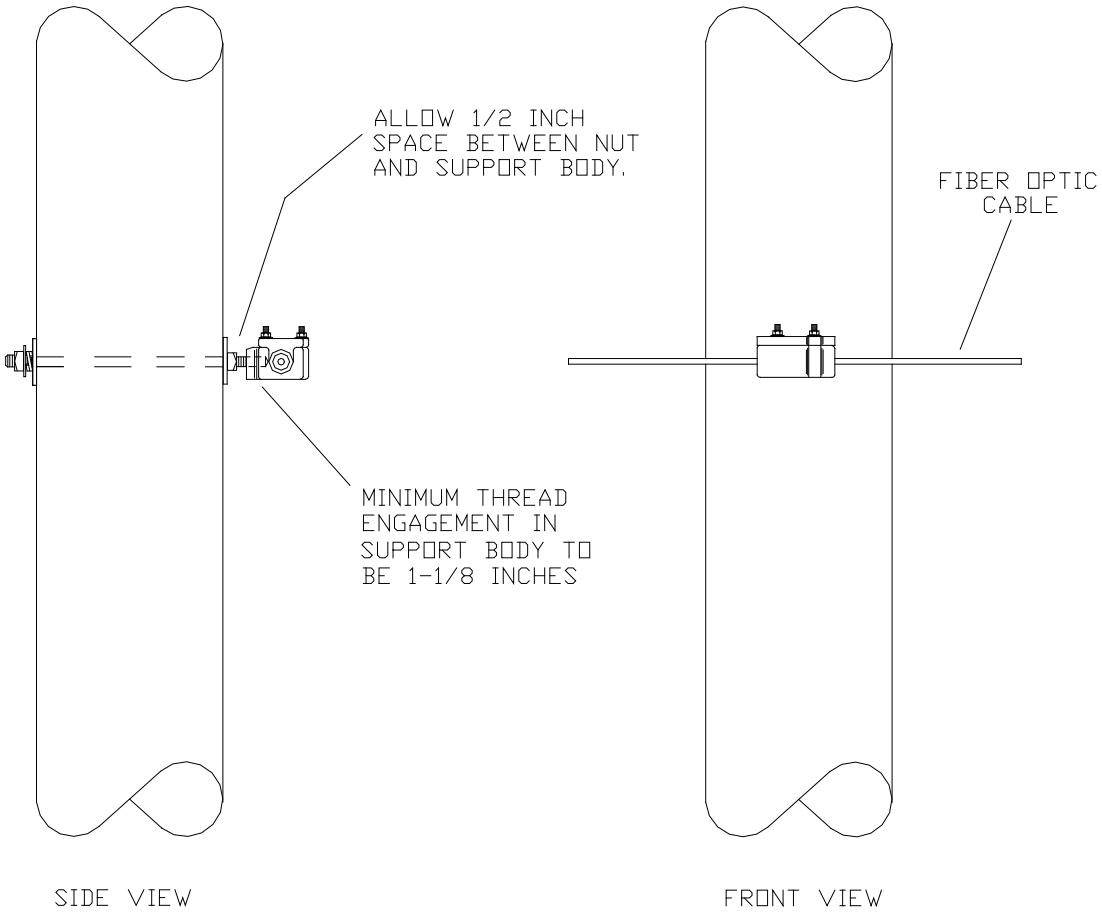


NO.	ITEM ID	QTY	DESCRIPTION
1	FIB BD 001	6	1.25 IN. STAINLESS STEEL BANDING
2	FIB BK 002	2	BOLTED RETAINER FOR S.S. BANDING
3	FIB CL 001	1	CLEVIS, THIMBLE (FOR FIBER OPTIC CABLE)
4	FIB CU 001	3	CUSHION, FIBER OPTIC CABLE DOWNLEAD
5	FIB DE ***	1	DEAD-END, PREFORMED FOR FIBER OPTIC CABLE
6	FIB MT 001	1	FIBER OPTIC MOUNTING PLATE
7	LIK EX 002	1	LINK, EXTENSION, CLEVIS EYE
8	NUT EY 002	1	NUT, EYE, 5/8 IN.

FO-T (MAINTENANCE ONLY)

0 TO 15 DEGREE ANGLE

OPTIONS: 24, 36, 48, 72
BOLT PLATE: NONE

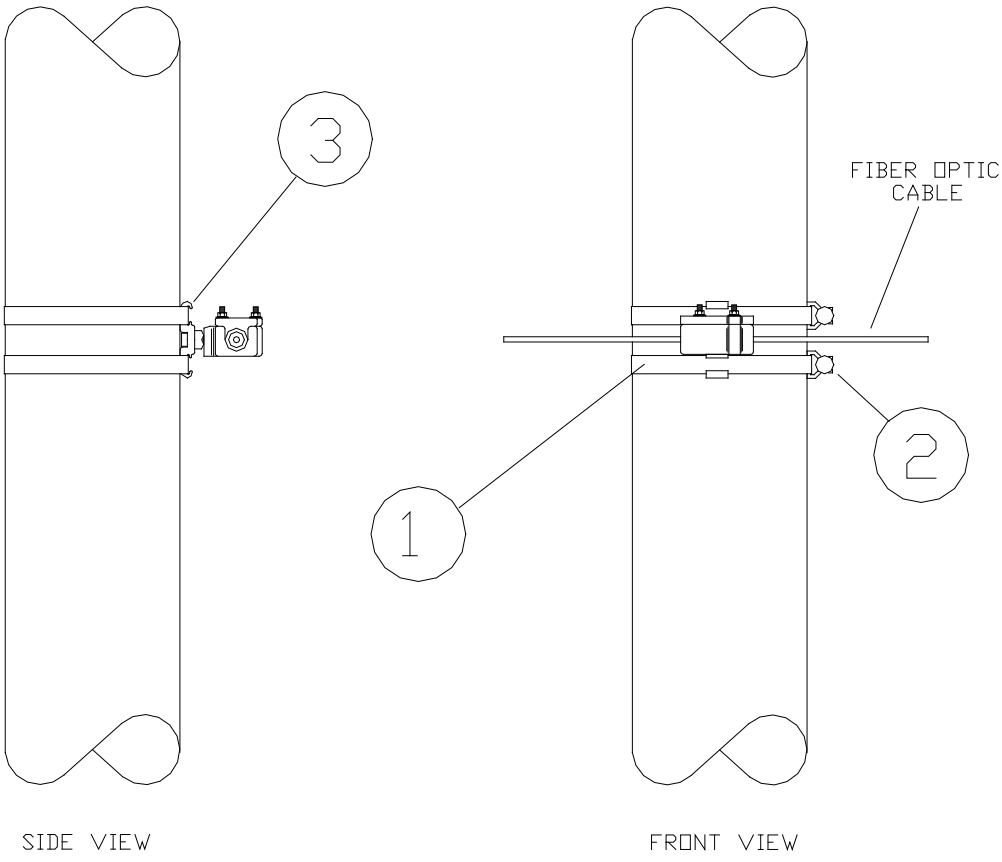


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 003	1	BOLT, DOUBLE ARMING, 5/8 X 16
2	FIB SU ***	1	GENERAL CODE FOR FIBER OPTIC CABLE SUPPORT
3	WAS RD 004	1	WASHER, ROUND, 1-3/4 INCH, FOR 5/8 IN. DIA. BOLT
4	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
5	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT

FO-TBD (MAINTENANCE ONLY)

0 TO 15 DEGREE ANGLE, BANDED

OPTIONS: 24, 36, 48, 72
BOLT PLATE: NONE

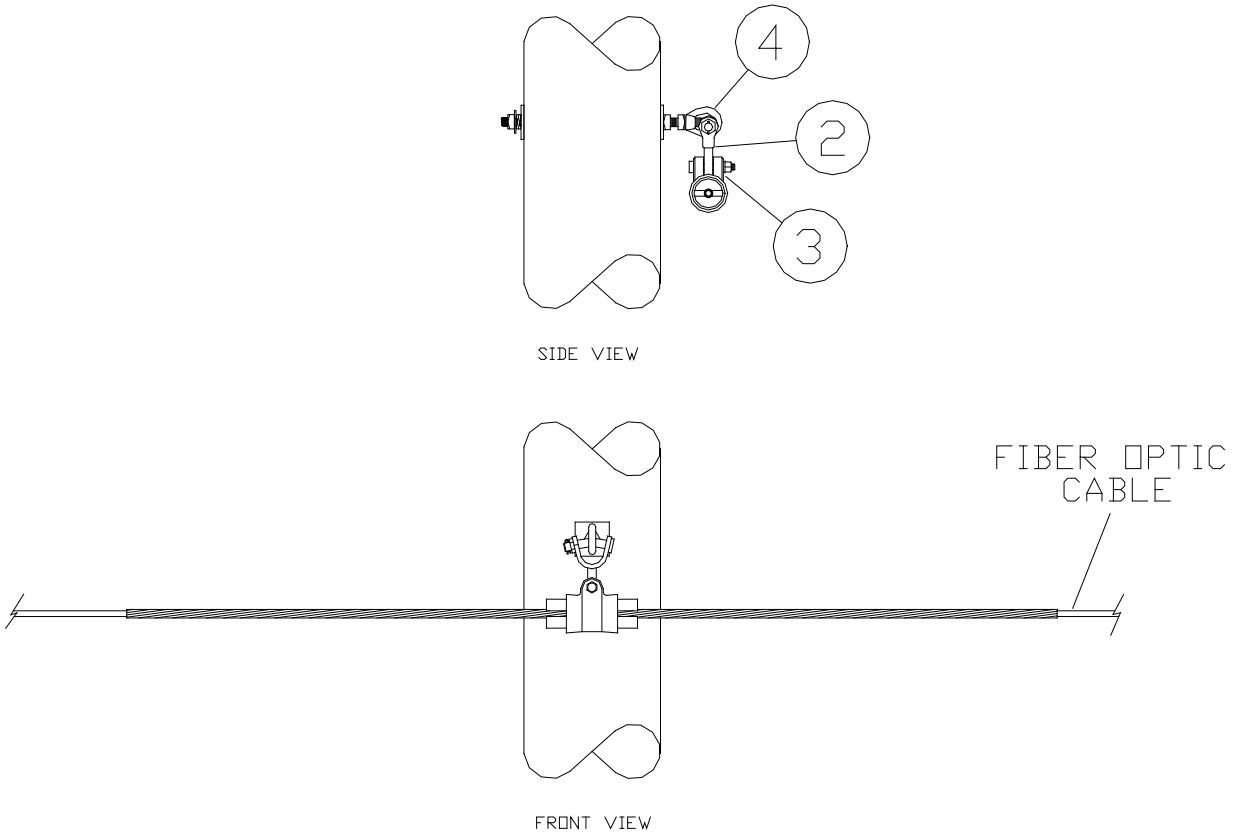


NO.	ITEM ID	QTY	DESCRIPTION
1	FIB BD 001	6	1.25 IN. STAINLESS STEEL BANDING
2	FIB BK 002	2	BOLTED RETAINER FOR S.S. BANDING
3	FIB MT 001	1	FIBER OPTIC MOUNTING PLATE
4	FIB SU ***	1	GENERAL CODE FOR FIBER OPTIC CABLE SUPPORT

FO-TL (MAINTENANCE ONLY)

0 TO 15 DEGREE ANGLE – LONG SPAN

OPTIONS: 24, 36, 48, 72
BOLT PLATE: NONE

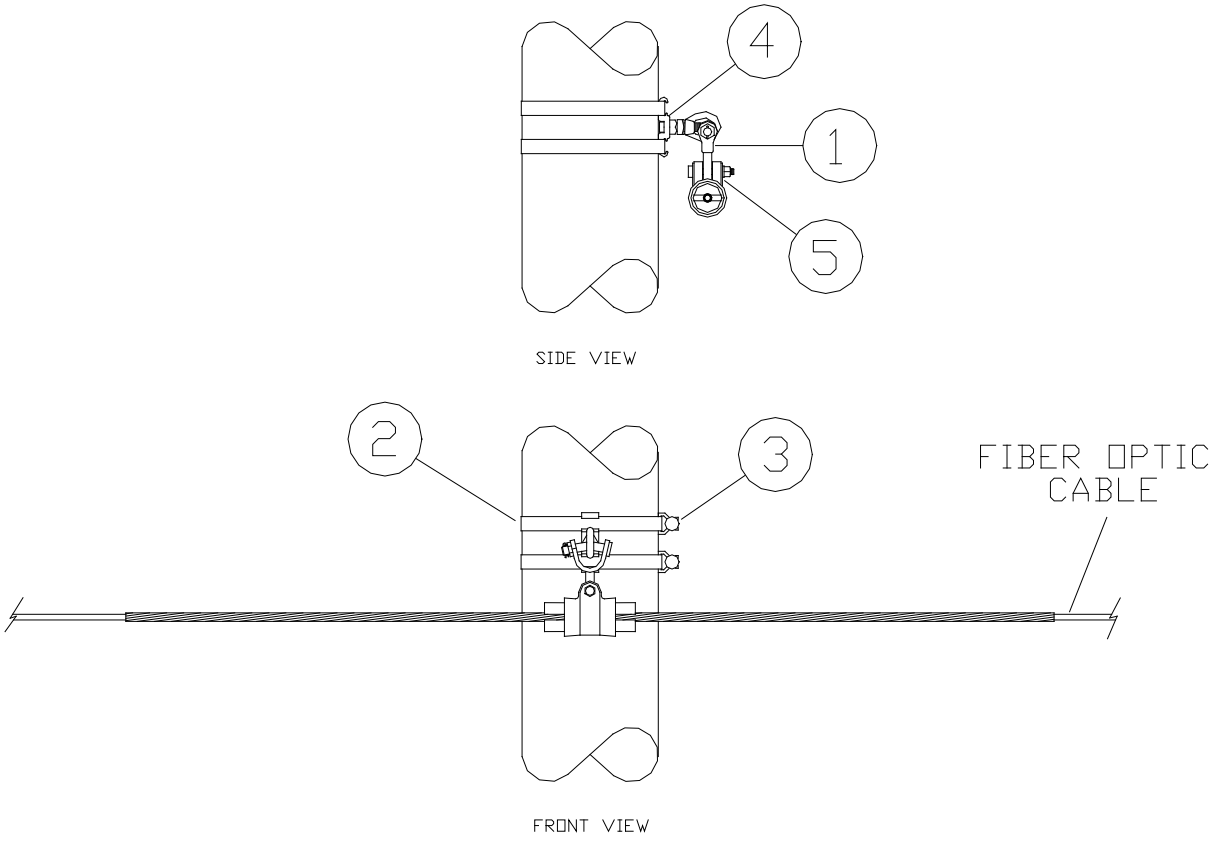


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 003	1	BOLT, DOUBLE ARMING, 5/8 X 16
2	CLE TE 004	1	CLEVIS, TOWER EYE, 90 DEGREE
3	FIB SU ***	1	GENERAL CODE FOR FIBER OPTIC CABLE SUPPORT
4	NUT EY 002	1	NUT, EYE, 5/8 IN.
5	WAS RD 004	1	WASHER, ROUND, 1-3/4 INCH, FOR 5/8 IN. DIA. BOLT
6	WAS SF 003	2	WASHER, SQUARE, FLAT, 3 IN., FOR 3/4 IN. DIA. BOLT
7	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

FO-TLBD (MAINTENANCE ONLY)

0 TO 15 DEGREE ANGLE, LONG SPAN, BANDED

OPTIONS: 24, 36, 48, 72
BOLT PLATE: NONE

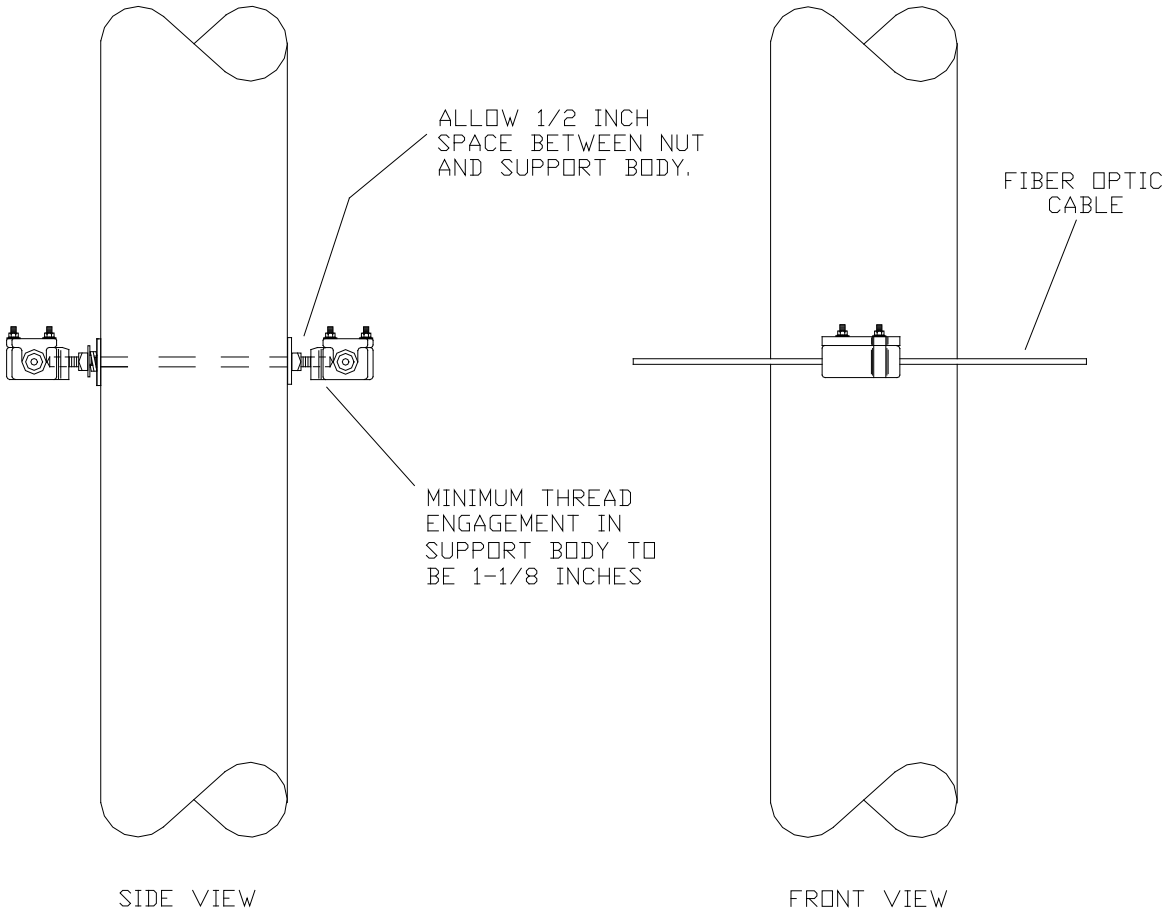


NO.	ITEM ID	QTY	DESCRIPTION
1	CLE TE 004	1	CLEVIS, TOWER EYE, 90 DEGREE
2	FIB BD 001	6	1.25 IN. STAINLESS STEEL BANDING
3	FIB BK 002	2	BOLTED RETAINER FOR S.S. BANDING
4	FIB SU ***	1	GENERAL CODE FOR FIBER OPTIC CABLE SUPPORT
5	FIB MT 001	1	FIBER OPTIC MOUNTING PLATE
6	NUT EY 002	1	NUT, EYE, 5/8 IN.

FO-TP (MAINTENANCE ONLY)

0 TO 15 DEGREE ANGLE, PARALLEL

OPTIONS: 24, 36, 48, 72
BOLT PLATE: NONE

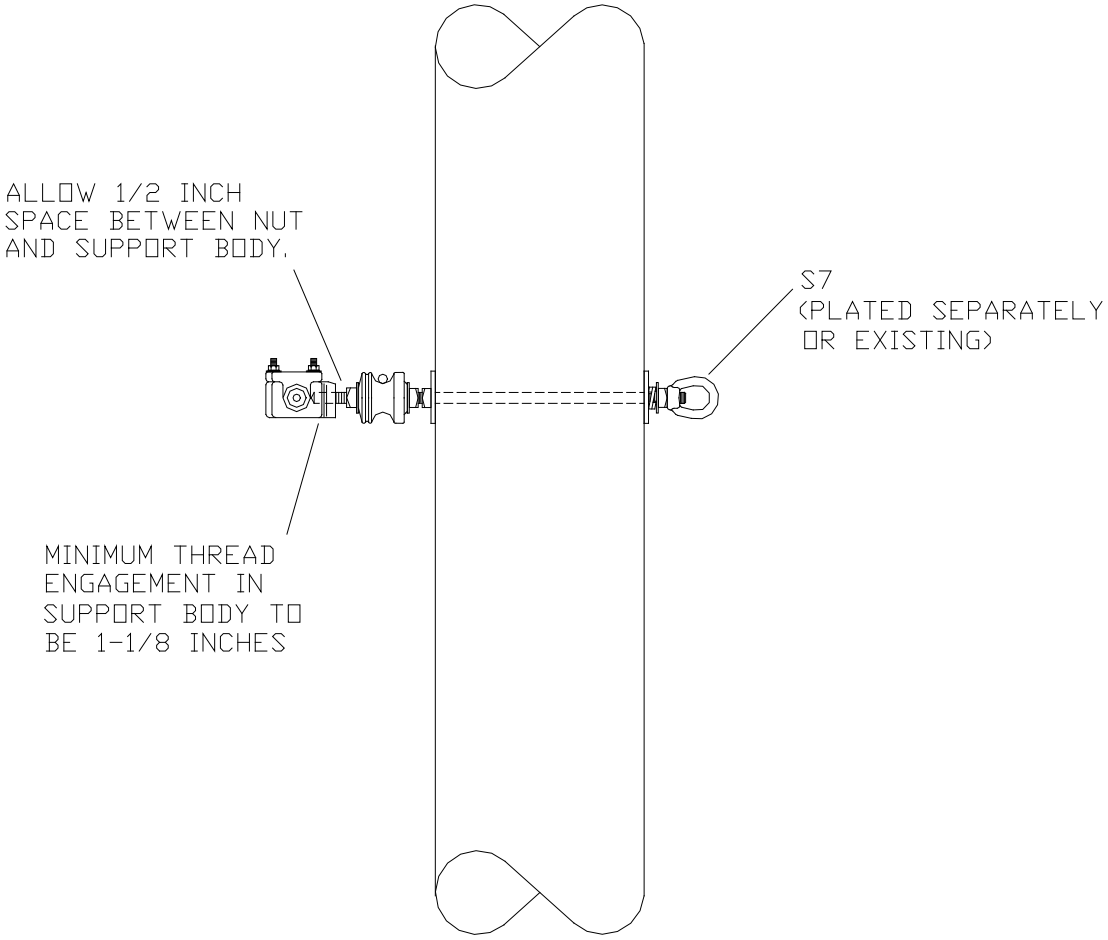


NO.	ITEM ID	QTY	DESCRIPTION
1	FIB SU ***	1	GENERAL CODE FOR FIBER OPTIC CABLE SUPPORT

FO-TN (MAINTENANCE ONLY)

0 TO 15 DEGREE ANGLE AT NEUTRAL

OPTIONS: 24, 36, 48, 72
BOLT PLATE: NONE



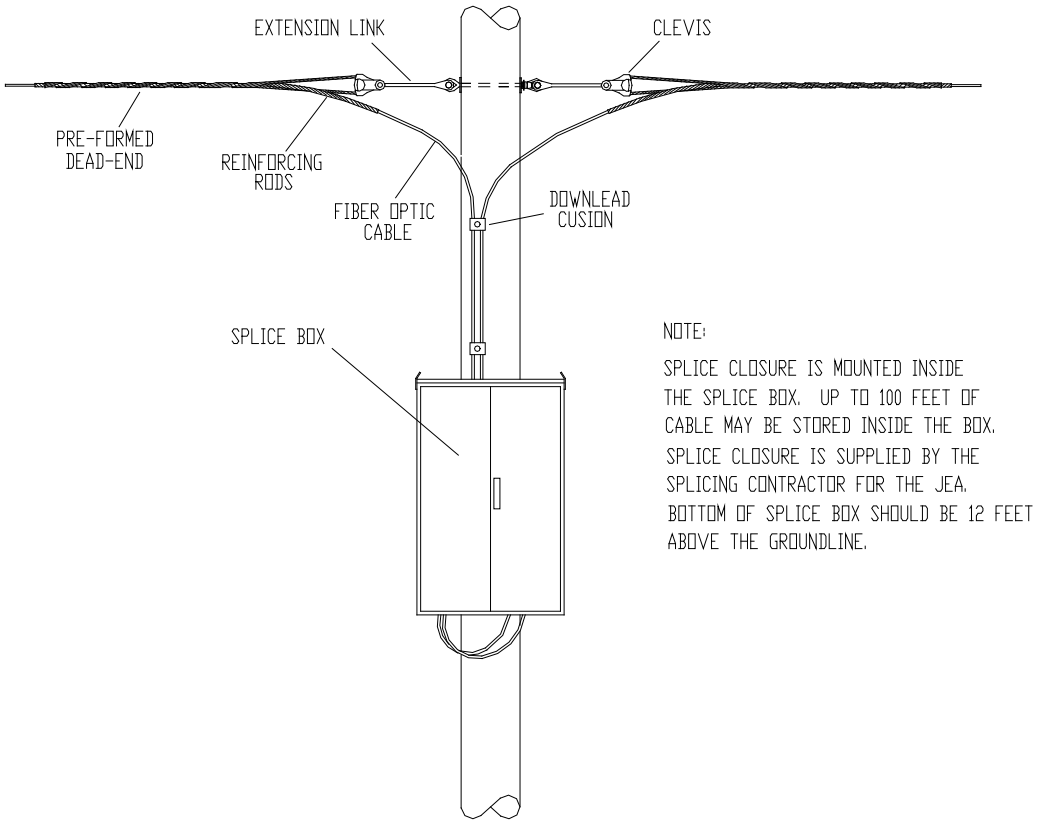
SIDE VIEW

NO.	ITEM ID	QTY	DESCRIPTION
1	FIB SU ***	1	GENERAL CODE FOR FIBER OPTIC CABLE SUPPORT

FO-SB (MAINTENANCE ONLY)

FIBER OPTIC SPLICE BOX

OPTIONS: 24, 36, 48, 72
BOLT PLATE: NONEFO-CS

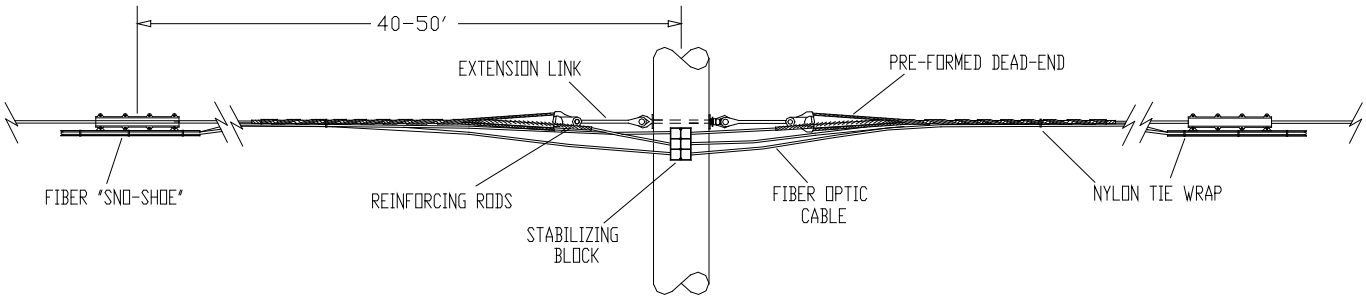


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL EY 005	1	BOLT, EYE, 5/8 X 16
2	BOL MS 006	2	BOLT, MACHINE, 1/2"x16"
3	FIB BX 001	1	FIBER OPTIC CABLE STORAGE CLOSURE
4	FIB CL 001	2	CLEVIS, THIMBLE (FOR FIBER OPTIC CABLE)
5	FIB CU 001	3	CUSHION, FIBER OPTIC CABLE DOWNLEAD
6	FIB DE ***	2	DEAD-END, PREFORMED FOR FIBER OPTIC CABLE
7	LIK EX 002	2	LINK, EXTENSION, CLEVIS EYE
8	NUT EY 002	1	NUT, EYE, 5/8 IN.
9	WAS RD 003	2	WASHER, ROUND, 1-3/8 INCH, FOR 1/2 IN. DIA. BOLT
10	WAS RD 004	1	WASHER, ROUND, 1-3/4 INCH, FOR 5/8 IN. DIA. BOLT
11	WAS SF 002	2	WASHER, SQUARE, FLAT, 2-1/4", FOR 5/8 IN. DIA. BOLT
12	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT
13	WAS SP 003	2	WASHER, SPRING, 1/2"

FO-CS (MAINTENANCE ONLY)

CABLE STORAGE

OPTIONS: 24, 36, 48, 72
BOLT PLATE: NONE

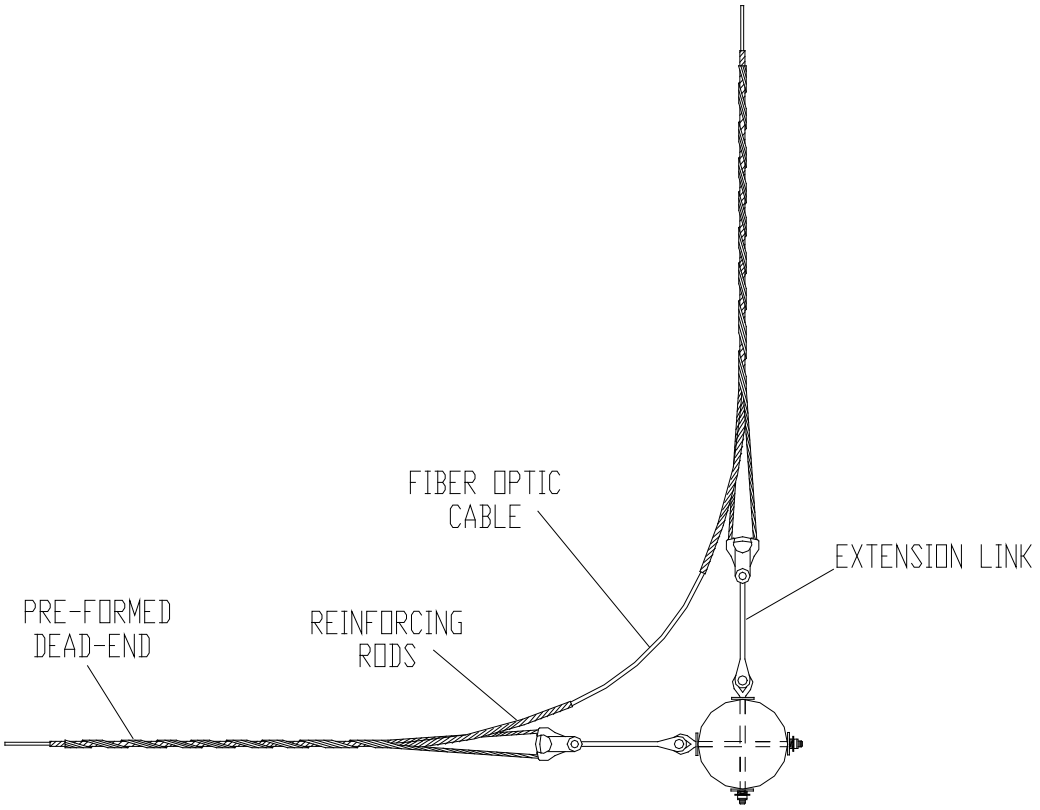


NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 003	1	BOLT, DOUBLE ARMING, 5/8 X 16
2	FIB CL 001	2	CLEVIS, THIMBLE (FOR FIBER OPTIC CABLE)
3	FIB CS ***	1	FIBER OPTIC CABLE STORAGE SYSTEM
4	FIB CU 001	3	CUSHION, FIBER OPTIC CABLE DOWNLEAD
5	FIB DE ***	2	DEAD-END, PREFORMED FOR FIBER OPTIC CABLE
6	LIK EX 002	2	LINK, EXTENSION, CLEVIS EYE
7	NUT EY 002	2	NUT, EYE, 5/8 IN.
8	TIE CA 001	40	TIE, CABLE, HEAVY DUTY, 28"-33" LONG
9	WAS RD 004	1	WASHER, ROUND, 1-3/4 INCH, FOR 5/8 IN. DIA. BOLT
10	WAS SF 002	2	WASHER, SQUARE, FLAT, 2-1/4", FOR 5/8 IN. DIA. BOLT
11	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR 3/4 IN. DIA. BOLT

FO-TX-A

90 DEGREE ANGLE

OPTIONS: 24, 48, 72
BOLT PLATE: NONE



FO-TX-A Base

NO.	ITEM ID	QTY	DESCRIPTION
1	BOL EY 015	2	BOLT, EYE, $^{5}/_{8}$"X 36"
	CNN VG 003	2	CONNECTOR, 6-2 SOL/10-2 SOL, VISE GRIP PARALLEL
	COB CO 028	20	CONDUCTOR, #4 SOLID
2	FIB CL 001	2	CLEVIS, THIMBLE (FOR FIBER OPTIC CABLE)
4	LIK EX 002	2	LINK, EXTENSION, CLEVIS EYE
	LUG GR 001	2	LUG, 4 SOLID WIRE SIZE, 3/4" BOLT SIZE, TIN PLATED COPPER COMP
	NUT EY 002	2	NUT, EYE, $^{5}/_{8}$"
5	WAS RD 004	2	WASHER, ROUND, $1^{3}/_{4}$ ", FOR $^{5}/_{8}$" DIA. BOLT
6	WAS SF 002	4	WASHER, SQUARE, FLAT, $2^{1}/_{4}$ " FOR $^{5}/_{8}$" DIA. BOLT
7	WAS SP 002	2	WASHER, SPRING, DOUBLE HELIX, FOR $^{3}/_{4}$" DIA. BOLT

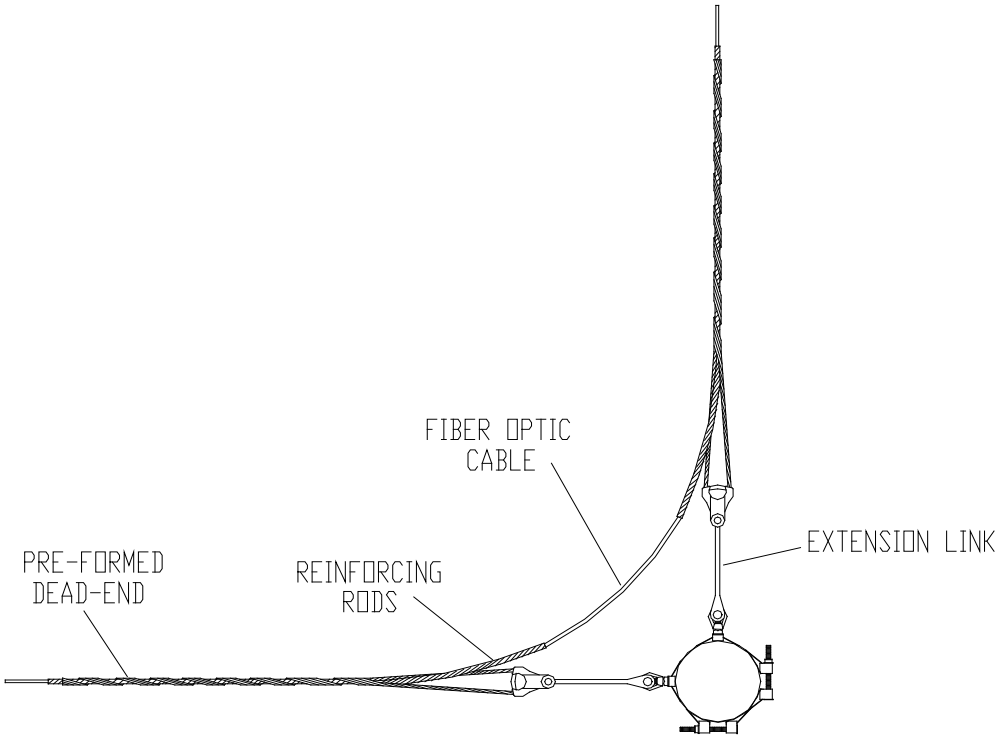
FO-TX-A* 24, 48, 72

OPTION.	ITEM ID	QTY	DESCRIPTION
24	FIB DE 003	2	DEADEND, FIBER OPTIC CABLE FOR .594" DIAMETER FIBER CABLE
48	FIB DE 003	2	DEADEND, FIBER OPTIC CABLE FOR .594" DIAMETER FIBER CABLE
72	FIB DE 007	2	DEADEND, PREFORMED, FOR 0.701" DIAMETER FIBER OPTIC CABLE

FO-TX-ABD

90 DEGREE ANGLE, BANDED

OPTIONS: 24, 48, 72
BOLT PLATE: NONE



FO-TX-ABD Base

NO.	ITEM ID	QTY	DESCRIPTION
	CNN VG 003	1	CONNECTOR, 6-2 SOL/10-2 SOL, VISE GRIP PARALLEL
	COB CO 028	10	CONDUCTOR, #4 SOLID
1	FIB BD 001	12	1.25" STAINLESS STEEL BANDING
2	FIB BK 002	4	BOLTED RETAINER FOR S.S. BANDING
4	FIB CL 001	2	CLEVIS, THIMBLE (FOR FIBER OPTIC CABLE)
5	FIB MT 001	2	FIBER OPTIC MOUNTING PLATE
6	LIK EX 002	2	LINK, EXTENSION, CLEVIS EYE
	LUG GR 001	1	LUG, 4 SOLID WIRE SIZE, 3/4" BOLT SIZE, TIN PLATED COPPER COMP
7	NUT EY 002	2	NUT, EYE, $^{5}/_{8}$"
	WAS RD 004	2	WASHER, ROUND, $1^{3}/_{4}$ ", FOR $^{5}/_{8}$"DIA. BOLT

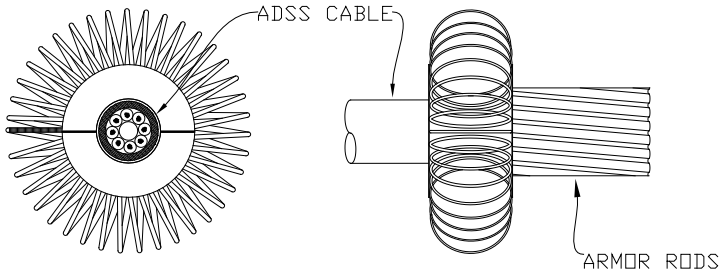
FO-TX-ABD* 24, 48, 72

OPTION.	ITEM ID	QTY	DESCRIPTION
24	FIB DE 003	2	DEADEND, FIBER OPTIC CABLE FOR .594" DIAMETER FIBER CABLE
48	FIB DE 003	2	DEADEND, FIBER OPTIC CABLE FOR .594" DIAMETER FIBER CABLE
72	FIB DE 007	2	DEADEND, PREFORMED, FOR 0.701" DIAMETER FIBER OPTIC CABLE

FO-TX-CR

CORONA RING

OPTIONS: 24, 48, 72



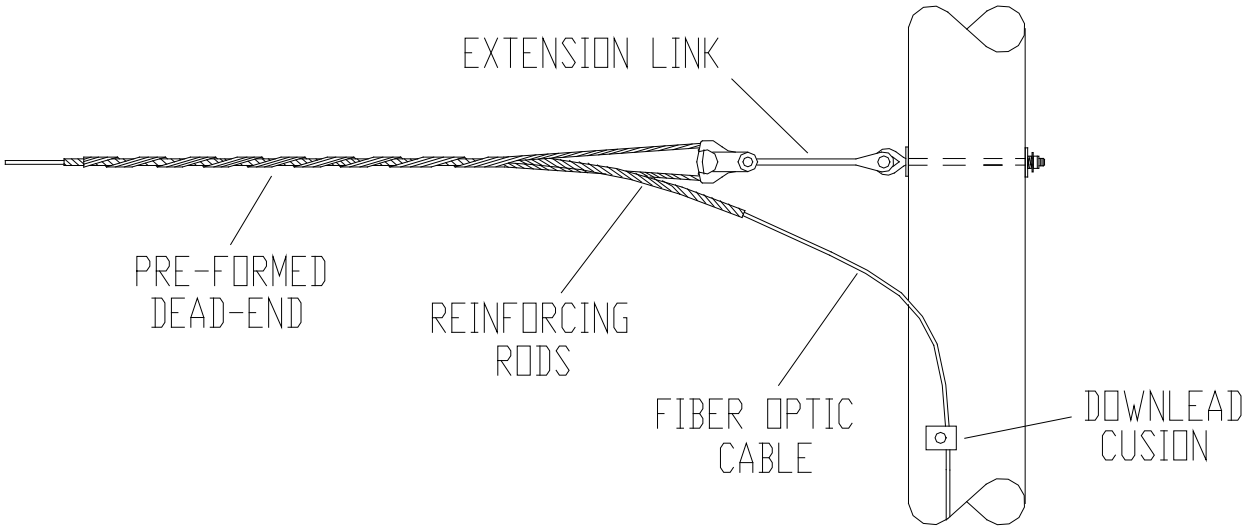
FO-TX-CR* 24, 48, 72

OPTION.	ITEM ID	QTY	DESCRIPTION
24	FIB CR 001	1	CORONA RING, FIBER OPTIC, FOR 0.549 INCH DIAMETER CABLE.
48	FIB CR 001	1	CORONA RING, FIBER OPTIC, FOR 0.549 INCH DIAMETER CABLE.
72	FIB CR 002	1	CORONA RING, FIBER OPTIC, FOR 0.701 INCH DIAMETER CABLE.

FO-TX-D

DEAD-END

OPTIONS: 24, 48, 72
BOLT PLATE: NONE



FO-TX-D Base

NO.	ITEM ID	QTY	DESCRIPTION
1	BOL EY 015	1	BOLT, EYE, $^{5}/_{8}$" X 36"
	CNN VG 003	1	CONNECTOR, 6-2 SOL/10-2 SOL, VISE GRIP PARALLEL
	COB CO 028	10	CONDUCTOR, #4 SOLID
2	FIB CL 001	1	CLEVIS, THIMBLE (FOR FIBER OPTIC CABLE)
3	FIB CU 001	3	CUSHION, FIBER OPTIC CABLE DOWNLEAD
5	LIK EX 002	1	LINK, EXTENSION, CLEVIS EYE
	LUG GR 001	1	LUG, 4 SOLID WIRE SIZE, 3/4" BOLT SIZE, TIN PLATED COPPER COMP
	NUT SQ 003	1	NUT, SQUARE, $^{5}/_{8}$"
6	WAS RD 004	1	WASHER, ROUND, $1^{3}/_{4}$ ", FOR $^{5}/_{8}$"DIA. BOLT
7	WAS SF 002	2	WASHER, SQUARE, FLAT, $2^{1}/_{4}$", FOR $^{5}/_{8}$"DIA. BOLT
8	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR $^{3}/_{4}$" DIA. BOLT

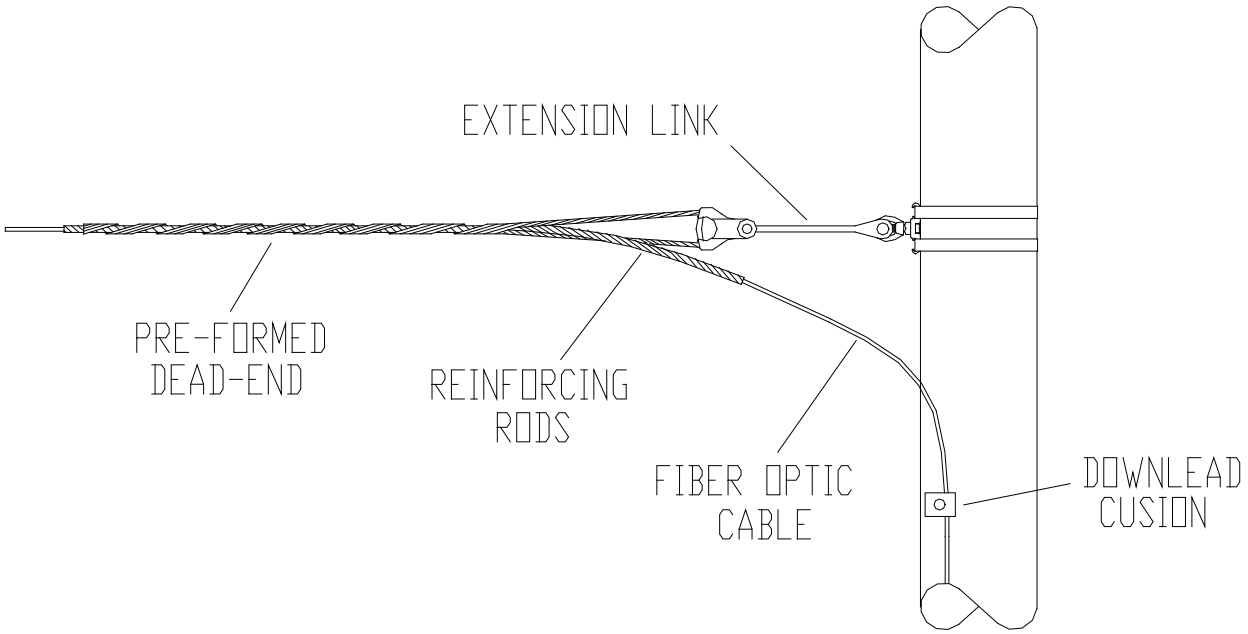
FO-TX-D* 24, 48, 72

OPTION.	ITEM ID	QTY	DESCRIPTION
24	FIB DE 003	1	DEADEND, PREFORMED, FOR .594" DIAMETER FIBER OPTIC CABLE
48	FIB DE 003	1	DEADEND, PREFORMED, FOR .594" DIAMETER FIBER OPTIC CABLE
72	FIB DE 007	1	DEADEND, PREFORMED, FOR 0.701" DIAMETER FIBER OPTIC CABLE

FO-TX-DBD

DEAD-END, BANDED

OPTIONS: 24, 48, 72
BOLT PLATE: NONE



FO-TX-DBD Base

NO.	ITEM ID	QTY	DESCRIPTION
	CNN VG 003	1	CONNECTOR, 6-2 SOL/10-2 SOL, VISE GRIP PARALLEL
	COB CO 028	10	CONDUCTOR, #4 SOLID
1	FIB BD 001	6	1.25 IN. STAINLESS STEEL BANDING
2	FIB BK 002	2	BOLTED RETAINER FOR S.S. BANDING
3	FIB CL 001	1	CLEVIS, THIMBLE (FOR FIBER OPTIC CABLE)
4	FIB CU 001	3	CUSHION, FIBER OPTIC CABLE DOWNLEAD
6	FIB MT 001	1	FIBER OPTIC MOUNTING PLATE
7	LIK EX 002	1	LINK, EXTENSION, CLEVIS EYE
	LUG GR 001	1	LUG, 4 SOLID WIRE SIZE, 3/4" BOLT SIZE, TIN PLATED COPPER COMP
8	NUT EY 002	1	NUT, EYE, $^{5}/_{8}$"
	WAS RD 004	2	WASHER, ROUND, $1^{3}/_{4}$ ", FOR $^{5}/_{8}$"DIA. BOLT

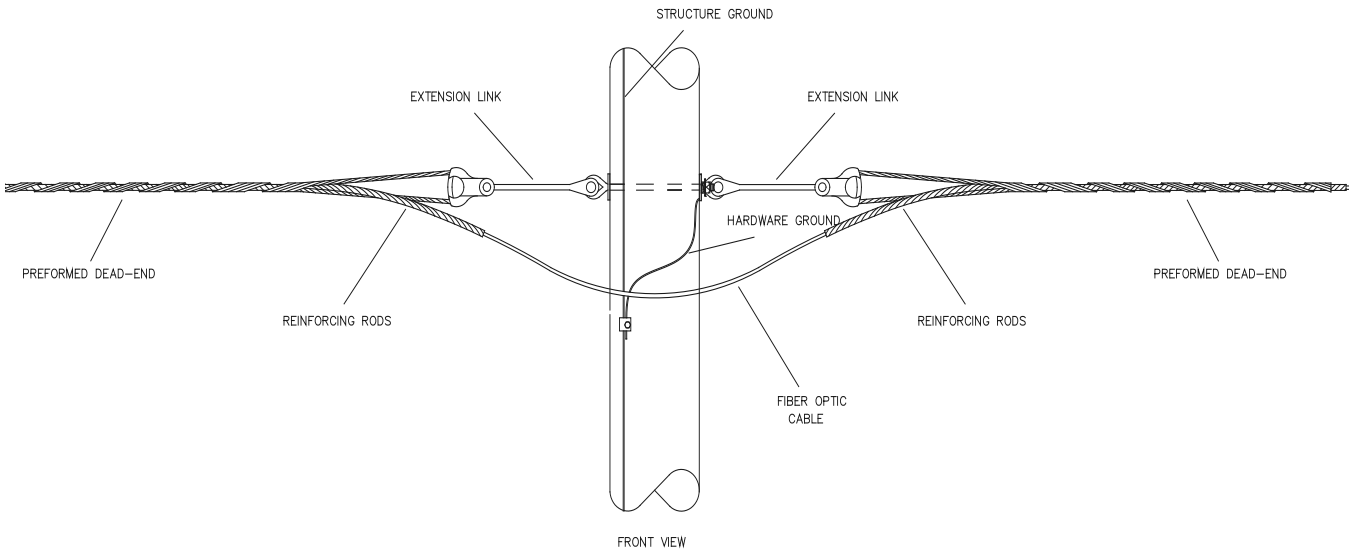
FO-TX-DBD* 24, 48, 72

OPTION.	ITEM ID	QTY	DESCRIPTION
24	FIB DE 003	1	DEADEND, FIBER OPTIC CABLE FOR .594" DIAMETER FIBER CABLE
48	FIB DE 003	1	DEADEND, FIBER OPTIC CABLE FOR .594" DIAMETER FIBER CABLE
72	FIB DE 007	1	DEADEND, PREFORMED, FOR 0.701" DIAMETER FIBER OPTIC CABLE

FO-TX-DDE

DOUBLE DEAD-END

OPTIONS: 24, 48, 72
BOLT PLATE: NONE



FO-TX-DDE Base

NO.	ITEM ID	QTY	DESCRIPTION
1	BOL EY 015	1	BOLT, EYE, $^{5}/_{8}$" X 36"
	CNN VG 003	1	CONNECTOR, 6-2 SOL/10-2 SOL, VISE GRIP PARALLEL
	COB CO 028	10	CONDUCTOR, #4 SOLID
2	FIB CL 001	2	CLEVIS, THIMBLE (FOR FIBER OPTIC CABLE)
5	LIK EX 002	2	LINK, EXTENSION, CLEVIS EYE
	LUG GR 001	1	LUG, 4 SOLID WIRE SIZE, 3/4" BOLT SIZE, TIN PLATED COPPER COMPRESSI
	NUT EY 002	1	NUT, EYE, $^{5}/_{8}$"
6	WAS RD 004	2	WASHER, ROUND, $1^{3}/_{4}$ ", FOR $^{5}/_{8}$"DIA. BOLT
7	WAS SF 002	2	WASHER, SQUARE, FLAT, $2^{1}/_{4}$", FOR $^{5}/_{8}$"DIA. BOLT
8	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR $^{3}/_{4}$" DIA. BOLT

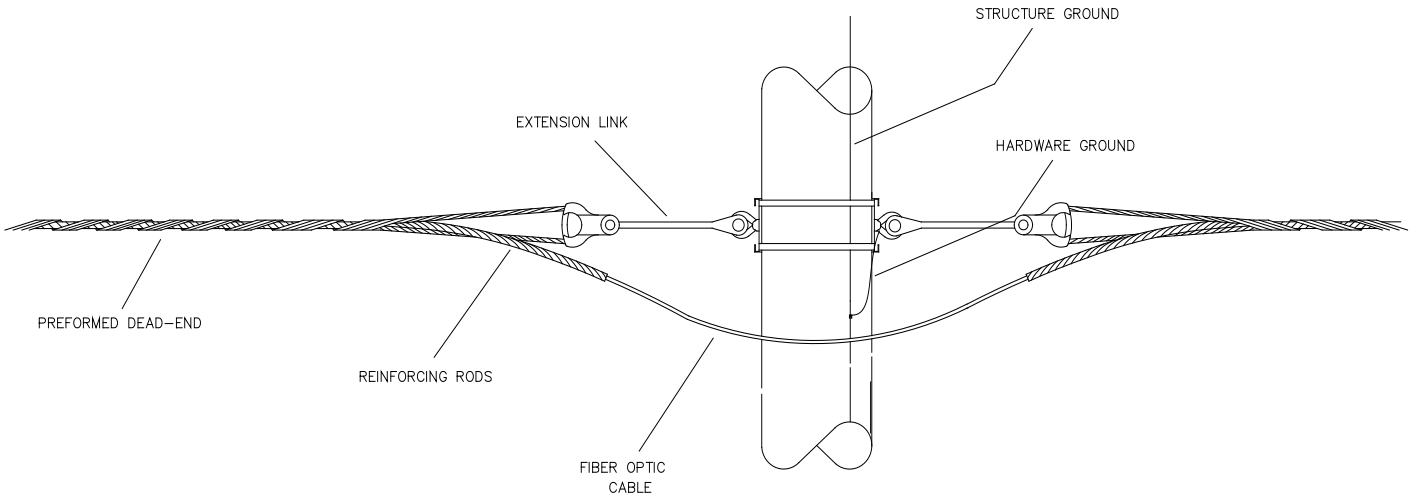
FO-TX-DDE* 24, 48, 72

OPTION.	ITEM ID	QTY	DESCRIPTION
24	FIB DE 003	2	DEADEND, PREFORMED, FOR .594" DIAMETER FIBER OPTIC CABLE
48	FIB DE 003	2	DEADEND, PREFORMED, FOR .594" DIAMETER FIBER OPTIC CABLE
72	FIB DE 007	2	DEADEND, PREFORMED, FOR 0.701" DIAMETER FIBER OPTIC CABLE

FO-TX-DDEBD

DOUBLE DEAD-END, BANDED

OPTIONS: 24, 48, 72
BOLT PLATE: NONE



FO-TX-DDEBD Base

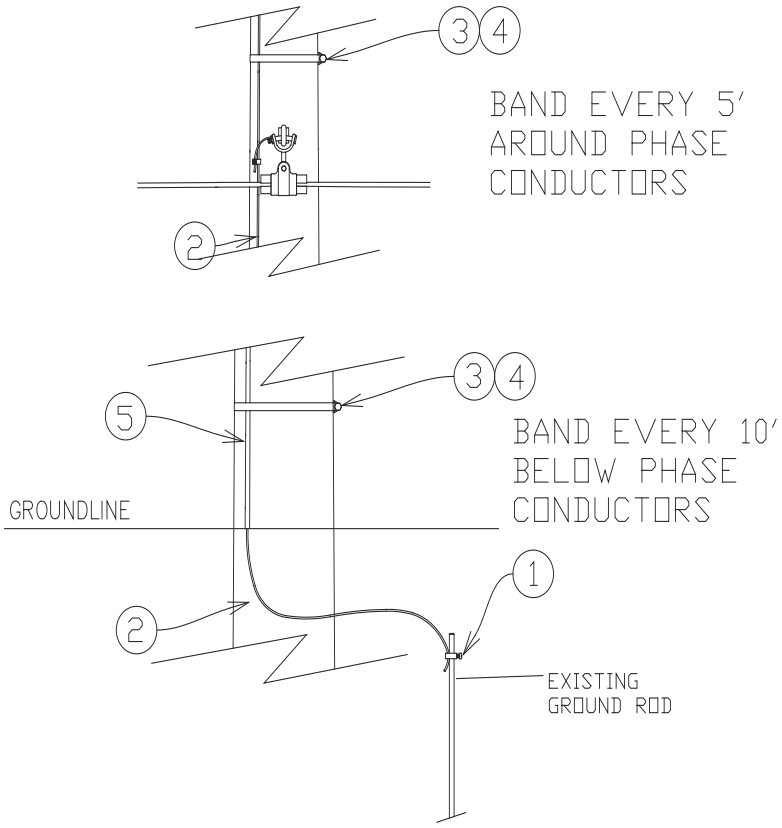
NO.	ITEM ID	QTY	DESCRIPTION
	CNN VG 003	1	CONNECTOR, 6-2 SOL/10-2 SOL, VISE GRIP PARALLEL
	COB CO 028	10	CONDUCTOR, #4 SOLID
1	FIB BD 001	6	1.25 IN. STAINLESS STEEL BANDING
2	FIB BK 002	2	BOLTED RETAINER FOR S.S. BANDING
3	FIB CL 001	2	CLEVIS, THIMBLE (FOR FIBER OPTIC CABLE)
6	FIB MT 001	2	FIBER OPTIC MOUNTING PLATE
7	LIK EX 002	2	LINK, EXTENSION, CLEVIS EYE
	LUG GR 002	1	LUG, 4 SOLID, ¾"
8	NUT EY 002	2	NUT, EYE, $^{5}/_{8}$"
	WAS RD 004	1	WASHER, ROUND, $1^{3}/_{4}$ ", FOR $^{5}/_{8}$"DIA. BOLT

FO-TX-DDEBD* 24, 48, 72

OPTION.	ITEM ID	QTY	DESCRIPTION
24	FIB DE 003	2	DEADEND, PREFORMED, FOR .594" DIAMETER FIBER OPTIC CABLE
48	FIB DE 003	2	DEADEND, PREFORMED, FOR .594" DIAMETER FIBER OPTIC CABLE
72	FIB DE 007	2	DEADEND, PREFORMED, FOR 0.701" DIAMETER FIBER OPTIC CABLE

FO-TX-GRD

REPLACEMENT GROUND

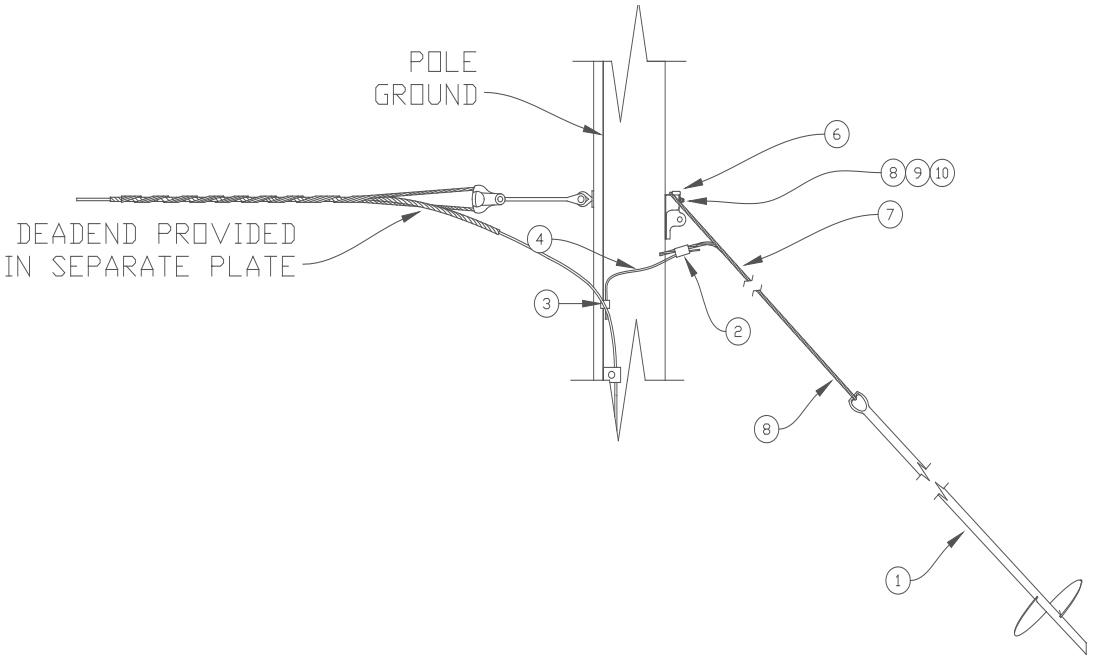


FO-TX-GRD

NO.	ITEM ID	QTY	DESCRIPTION
1	CLA GR 002	1	CLAMP, GROUND ROD, 5/8", 8 SOL - 1/0 STR. "WEDDING BAND"
2	COB CO 028	50	CONDUCTOR, #4 SOLID
3	FIB BD 001	40	1.25 IN. STAINLESS STEEL BANDING
4	FIB BK 002	6	BOLTED RETAINER FOR S.S. BANDING
5	GUA GW 001	2	GUARD, GROUND WIRE, 1/2" X 1/2" X 96", GRAY PLASTIC

FO-TX-GUY

FIBER OPTIC GUY

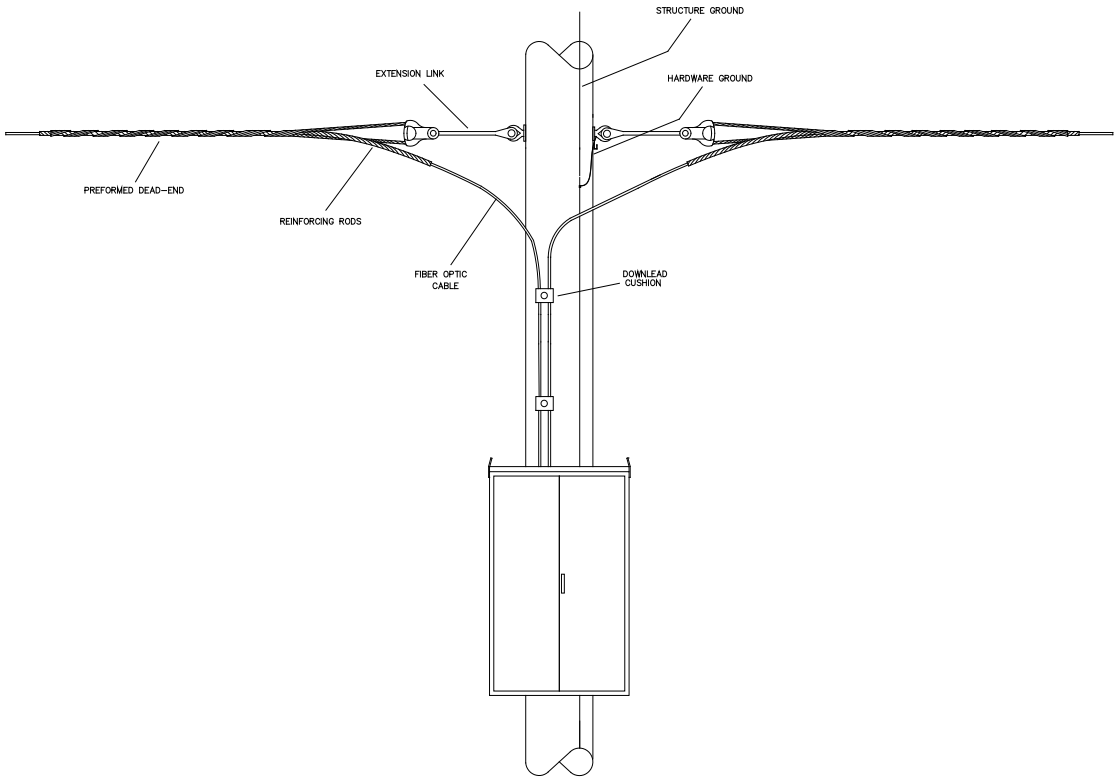


NO.	ITEM ID	QTY	DESCRIPTION
1	ANC SS 002	1	ANCHOR, SINGLE HELIX, 8 FOOT LENGTH
2	CLA PJ 001	1	CLAMP, PARALLEL JUMPER
3	CNN VG 003	1	CONNECTOR, VISE TYPE, #6- #2 SOL., #10- #2 SOL.
4	COB CO 028	3	CONDUCTOR, BARE COPPER, #4 SOL.
5	GUY AT 008	1	GUY ATTACHMENT (COMBINATION) 20,000 POUNDS
6	GUY GR 001	2	GUY GRIP, FOR $^{3}/_{8}$" GUY STRAND
7	GUY ST 005	50	GUY STRAND, $^{3}/_{8}$"
8	NUT SQ 003	1	NUT, SQUARE, $^{5}/_{8}$"
9	WAS RD 004	1	WASHER, ROUND, $^{5}/_{8}$" BOLT SIZE X $1^{3}/_{4}$" DIAMETER, GALVANIZED
10	WAS SP 001	1	WASHER, SPRING, $^{5}/_{8}$" BOLT SIZE, DOUBLE COIL HELICAL TYPE

FO-TX-SB

FIBER OPTIC SPLICE BOX

OPTIONS: 24, 48, 72
BOLT PLATE: NONE



FO-TX-SB Base

NO.	ITEM ID	QTY	DESCRIPTION
1	BOL EY 010	1	BOLT, EYE, $^{5}/_{8}$" X 26"
2	BOL MS 028	2	BOLT, MACHINE, $^{5}/_{8}$"x 30"
	CNN VG 003	1	CONNECTOR, 6-2 SOL/10-2 SOL, VISE GRIP PARALLEL
	COB CO 028	10	CONDUCTOR, #4 SOLID
3	FIB BX 001	1	FIBER OPTIC CABLE STORAGE CLOSURE
4	FIB CL 001	2	CLEVIS, THIMBLE (FOR FIBER OPTIC CABLE)
5	FIB CU 001	3	CUSHION, FIBER OPTIC CABLE DOWNLEAD
7	LIK EX 002	2	LINK, EXTENSION, CLEVIS EYE
	LUG GR 001	1	LUG, 4 SOLID WIRE SIZE, 3/4" BOLT SIZE, TIN PLATED COPPER COMP
8	NUT EY 002	1	NUT, EYE, $^{5}/_{8}$"
	NUT SQ 003	2	NUT, SQUARE, $^{5}/_{8}$"
10	WAS RD 004	3	WASHER, ROUND, $1^{3}/_{4}$" FOR $^{5}/_{8}$" DIA. BOLT
11	WAS SF 002	2	WASHER, SQUARE, FLAT, $2^{1}/_{4}$", FOR $^{5}/_{8}$" DIA. BOLT
12	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR $^{3}/_{4}$" DIA. BOLT

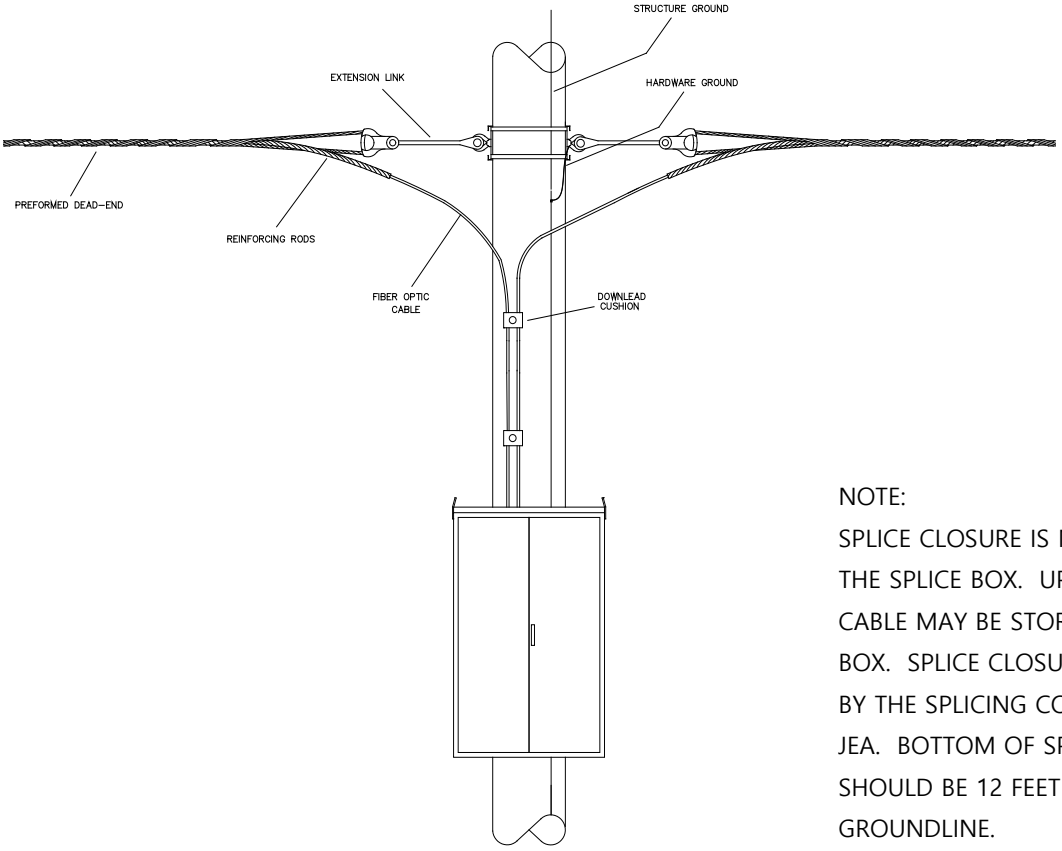
FO-TX-SB* 24, 48, 72

OPTION.	ITEM ID	QTY	DESCRIPTION
24	FIB DE 003	2	DEADEND, FIBER OPTIC CABLE "FOR .594" DIAMETER FIBER CABLE
48	FIB DE 003	2	DEADEND, FIBER OPTIC CABLE "FOR .594" DIAMETER FIBER CABLE
72	FIB DE 007	2	DEADEND, PREFORMED, FOR 0.701" DIAMETER FIBER OPTIC CABLE

FO-TX-SBBD

FIBER OPTIC SPLICE BOX, BANDED

OPTIONS: 24, 48, 72
BOLT PLATE: NONE



NOTE:
SPLICE CLOSURE IS MOUNTED INSIDE THE SPLICE BOX. UP TO 100 FEET OF CABLE MAY BE STORED INSIDE THE BOX. SPLICE CLOSURE IS SUPPLIED BY THE SPLICING CONTRACTOR FOR JEA. BOTTOM OF SPLICE BOX SHOULD BE 12 FEET ABOVE THE GROUNDLINE.

FO-TX-SBDB Base

NO.	ITEM ID	QTY	DESCRIPTION
	CNN VG 003	1	CONNECTOR, 6-2 SOL/10-2 SOL, VISE GRIP PARALLEL
	COB CO 028	10	CONDUCTOR, #4 SOLID
	FIB BD 001	12	1.25 IN. STAINLESS STEEL BANDING
	FIB BK 002	6	BOLTED RETAINER FOR S.S. BANDING
	FIB BX 001	1	FIBER OPTIC CABLE STORAGE CLOSURE
	FIB CL 001	2	CLEVIS, THIMBLE (FOR FIBER OPTIC CABLE)
	FIB CU 001	3	CUSHION, FIBER OPTIC CABLE DOWNLEAD
	FIB MT 001	4	FIBER OPTIC MOUNTING PLATE
	LIK EX 002	2	LINK, EXTENSION, CLEVIS EYE
	LUG GR 001	1	LUG, 4 SOLID WIRE SIZE, 3/4" BOLT SIZE, TIN PLATED COPPER COMP
	NUT EY 002	2	NUT, EYE, $^{5}/_{8}$"
	NUT SQ 003	2	NUT, SQUARE, $^{5}/_{8}$"
	WAS RD 004	2	WASHER, ROUND, $1^{3}/_{4}$", FOR $^{5}/_{8}$" DIA. BOLT

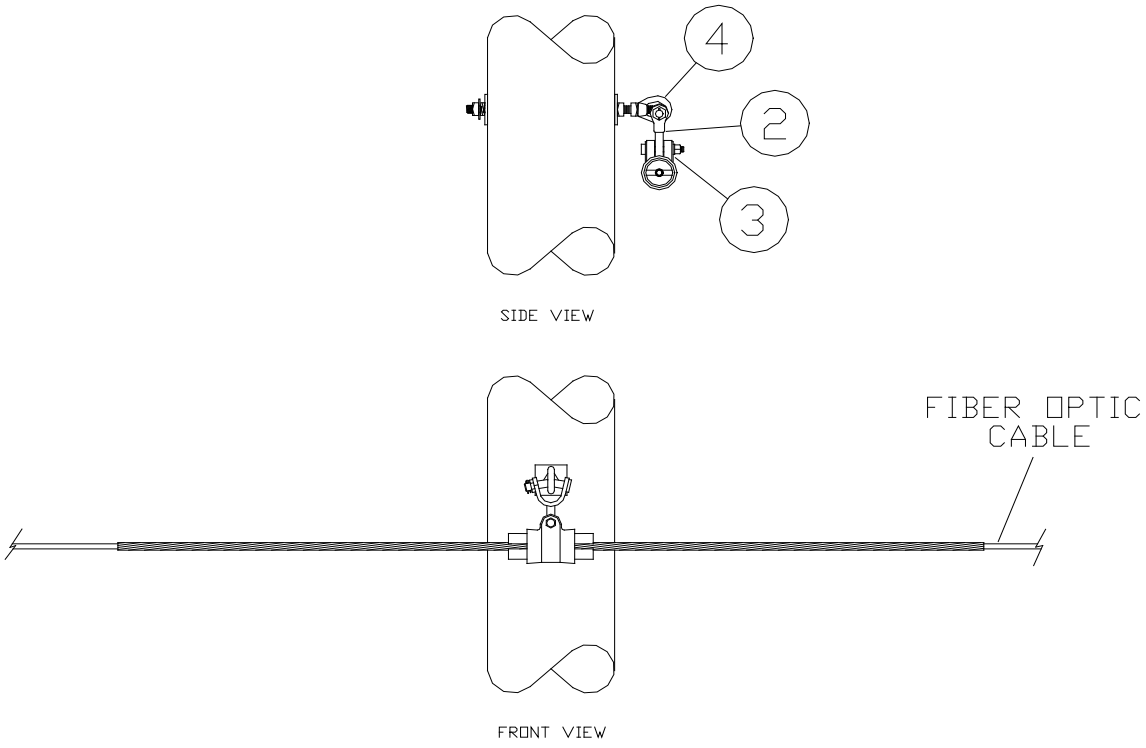
FO-TX-SBBD* 24, 48, 72

OPTION.	ITEM ID	QTY	DESCRIPTION
24	FIB DE 003	2	DEADEND, FIBER OPTIC CABLE "FOR .594" DIAMETER FIBER CABLE
48	FIB DE 003	2	DEADEND, FIBER OPTIC CABLE "FOR .594" DIAMETER FIBER CABLE
72	FIB DE 007	2	DEADEND, PREFORMED, FOR 0.701" DIAMETER FIBER OPTIC CABLE

FO-TX-TL

0 TO 15 DEGREE ANGLE – LONG SPAN

OPTIONS: 24, 48, 72
BOLT PLATE: NONE



Note: Vibration dampers should be installed 12 inches from the long span tangent or deadend.

FO-TX-TL Base

NO.	ITEM ID	QTY	DESCRIPTION
1	BOL DA 013	1	BOLT, DOUBLE ARMING, $^{5}/_{8}$" X 36'
2	CLE TE 004	1	CLEVIS, TOWER EYE, 90 DEGREE
	CNN VG 003	1	CONNECTOR, 6-2 SOL/10-2 SOL, VISE GRIP PARALLEL
	COB CO 028	10	CONDUCTOR, #4 SOLID
	LUG GR 001	1	LUG, 4 SOLID WIRE SIZE, 3/4" BOLT SIZE, TIN PLATED COPPER COMP
4	NUT EY 002	1	NUT, EYE, $^{5}/_{8}$"
	NUT SQ 003	1	NUT, LOCK, SQUARE, $^{5}/_{8}$"
5	WAS RD 004	1	WASHER, ROUND, $1^{3}/_{4}$", FOR $^{5}/_{8}$" DIA. BOLT
6	WAS SF 002	2	WASHER, SQUARE, FLAT, $2^{1}/_{4}$", FOR $^{5}/_{8}$" DIA. BOLT
7	WAS SP 002	1	WASHER, SPRING, DOUBLE HELIX, FOR $^{3}/_{4}$", DIA. BOLT

FO-TX-TL* 24, 48, 72

OPTION.	ITEM ID	QTY	DESCRIPTION
24	FIB SU 005	1	SUPPORT, LONG SPAN TANGENT, FOR .594" DIAMETER FIBER OPTIC CABLE
48	FIB SU 005	1	SUPPORT, LONG SPAN TANGENT, FOR .594" DIAMETER FIBER OPTIC CABLE
72	FIB SU 006	1	SUPPORT, LONG SPAN TANGENT, FOR 0.701" DIAMETER FIBER OPTIC CABLE

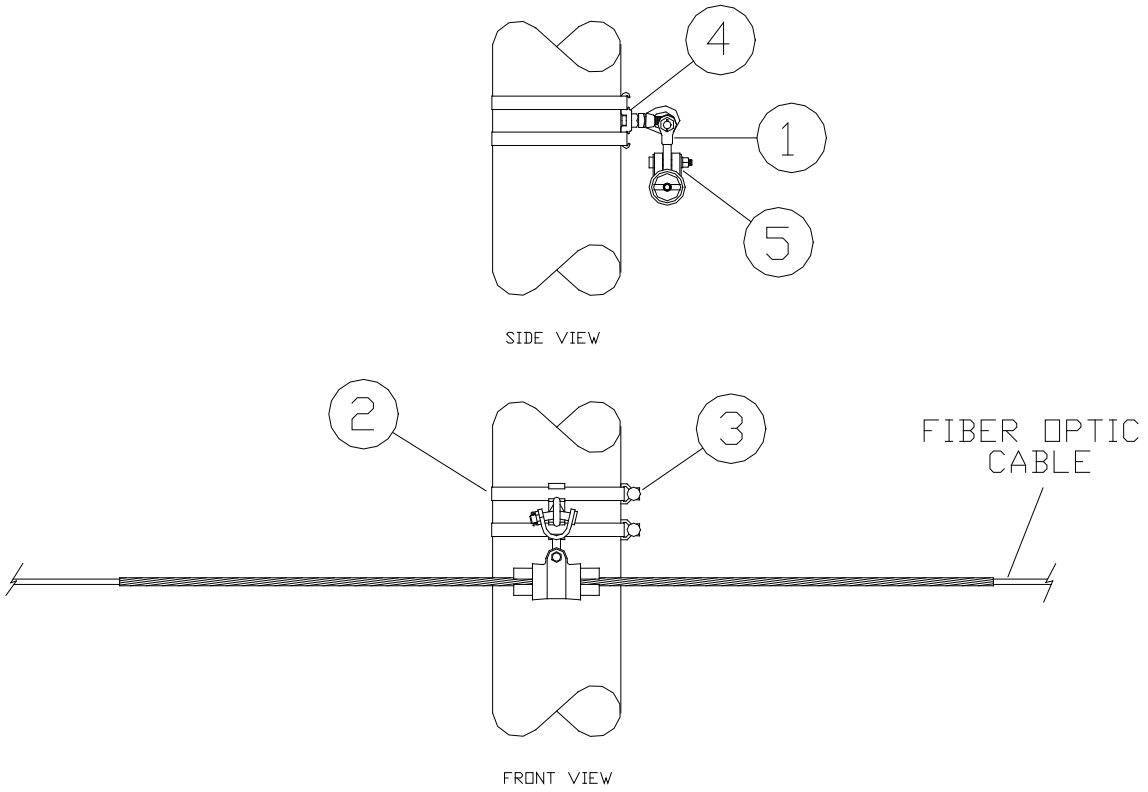
FO-TX-TLBD

0 TO 15 DEGREE ANGLE, LONG SPAN, BANDED

OPTIONS: 24, 48, 72

BOLT PLATE: NONE

Note: Vibration dampers should be installed 12 inches from the long span tangent or deadend.



FO-TX-TLBD Base

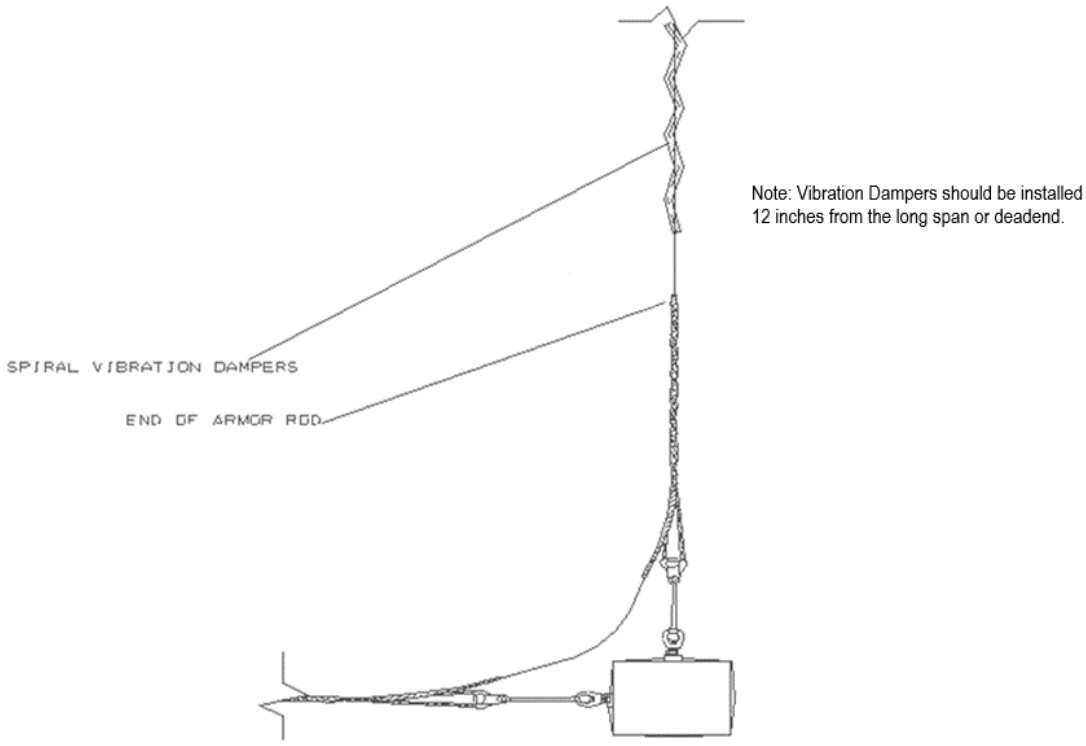
NO.	ITEM ID	QTY	DESCRIPTION
1	CLE TE 004	1	CLEVIS, TOWER EYE, 90 DEGREE
	CNN VG 003	1	CONNECTOR, 6-2 SOL/10-2 SOL, VISE GRIP PARALLEL
	COB CO 028	10	CONDUCTOR, #4 SOLID
2	FIB BD 001	6	1.25 IN. STAINLESS STEEL BANDING
3	FIB BK 002	2	BOLTED RETAINER FOR S.S. BANDING
5	FIB MT 001	1	FIBER OPTIC MOUNTING PLATE
	LUG GR 001	1	LUG, 4 SOLID WIRE SIZE, 3/4" BOLT SIZE, TIN PLATED COPPER COMP
6	NUT EY 002	1	NUT, EYE, $^{5}/_{8}$"
	WAS RD 004	2	WASHER, ROUND, $1^{3}/_{4}$ ", FOR $^{5}/_{8}$"DIA. BOLT

FO-TX-TLBD* 24, 48, 72

OPTION.	ITEM ID	QTY	DESCRIPTION
24	FIB SU 005	1	SUPPORT, LONG SPAN TANGENT, FOR 0.594" DIAMETER FIBER OPTIC CABLE
48	FIB SU 005	1	SUPPORT, LONG SPAN TANGENT, FOR 0.594" DIAMETER FIBER OPTIC CABLE
72	FIB SU 006	1	SUPPORT, LONG SPAN TANGENT, FOR 0.701" DIAMETER FIBER OPTIC CABLE

FO-TX-VIB

FIBER OPTIC VIBRATION DAMPER



FO-TX-VIB

NO.	ITEM ID	QTY	DESCRIPTION
	FIB VD 002	1	DAMPER, SPIRAL VIBRATION, FOR .564" - .760" FIBER OPTIC CABLE

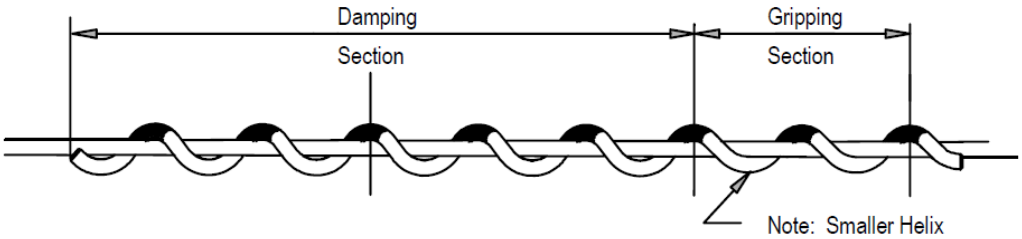
GENERAL GUIDELINES FOR THE USE OF VIBRATION DAMPERS ON AFL-ADSS CABLES

The table below is a general guideline for the application of spiral-shaped dielectric dampers on AFL ADSS cable. To use this matrix, take the initial sagging tension and divide by the cable's rated breaking strength (RBS) to determine the percentage ratio of the initial sagging tension to rated breaking strength. Then look in the column for the appropriate span range of the application, then move across the row to the appropriate tension percentage to find the recommended total number of dampers per span. Follow the guidelines after the table for the proper installation of the dampers.

	Initial Tension as % of Cable RBS				
Span Length(ft)	**0-10%**	**11-15%**	**16-20%**	**21-25%**	**25+%**
< 350	0	1/s	1/s	2/s	2/s
351-600	1/s	1/s	2/s	2/s	4/s
601-1000	1/s	2/s	2/s	4/s	4/s
1001-1500	2/s	2/s	4/s	4/s	6/s
1501-2000	2/s	4/s	4/s	6/s	6/s
2001-2500	4/s	4/s	6/s	6/s	8/s

1/s = 1 damper per span (either end)
2/s = 2 dampers per span, one on each end of the span
4/s = 2 dampers in tandem on each end of the span
6/s = 3 dampers in tandem on each end of the span
8/s = 2 dampers in tandem + 2 dampers in tandem on each end of the span

The term "in tandem" means that the dampers are "nested" or "stacked" together in a bundle. To achieve this orientation, the first damper is wrapped onto the cable. The second damper is then wrapped inside the first damper. So essentially the two dampers are "side-by-side" as opposed to "end-to-end". This can be repeated for up to three dampers being mounted in tandem.



VII. FREE-SPAN AERIAL ALL DIELECTRIC SELF-SUPPORTING FIBER OPTIC CABLE INSTALLATION

VII.1. GENERAL

VII.1.1. This practice provides general information for design engineers and construction forces on the methods for placement of aerial, all-dielectric, self-supporting, FREE-SPAN fiber optic cable. These methods and instructions are intended as guidelines, as each installation will be influenced by local conditions, customer's existing procedures and requirements.

VII.1.2. Information such as minimum separation and clearance, sag tables, and specific cable data are found in other documents. This information is generally provided to customers based on specific application of FREE-SPAN fiber optic cable.

VII.1.3. Installation equipment not mentioned in this practice is not approved for use with FREE-SPAN and its use without specific approval by Superior Optics, Inc. shall be at the risk of the customer.

VII.1.4. Methods used for placement of aerial, all-dielectric, self-supporting, FREE-SPAN fiber optic cable are essentially the same as those used for placing power utility phase conductors. Refer to ANSI/IEEE Std. 524-1980, IEEE Guide to the Installation of Overhead Transmission Line Conductors, for additional detail on installation techniques.

VII.2. PRECAUTIONS

VII.2.1. Upon receipt of the cable reels, remove all reel lagging and packing material from the reel and inspect the reel and outer coils of cable carefully. Check the inside edges of the reel for any sharp edges or obstructions that may have occurred during shipment and could potentially damage the cable sheath, or interfere with turning the reel and the cable deployment.

VII.2.2. Prior to starting construction, use an optical time domain reflectometer (OTDR) to verify that the cable has not been damaged during shipment. Readings obtained may be useful later for comparison with test acceptance data and as part of a records package that will assist in emergency restoration.

VII.2.3. FREE-SPAN fiber optic cable is very strong and robust. However, care must be taken to assure that the cable is not mishandled or installed improperly causing subsequent damage. Ensure that the cable is not kinked or that the minimum bend radius (typically 20 times the cable diameter) is not exceeded. Take all precautions that the cable is never crushed or twisted. Any such damage will alter the transmission characteristic of the fiber and may require replacement of that cable section.

VII.2.4. Prior to starting construction, survey the proposed cable route to assure that he right-of-way is clear of obstructions that may interfere with the installation. During installation, be sure that the cable jacket is not damaged due to abrasion. Do not drag the cable over obstructions in the span or on the ground. It is recommended that if obstructions are observed, they should be removed, or a series of hold-down blocks be used to prevent contact with the obstruction. Before installing the cable, be sure all installation personnel understand the cable parameters such as handling requirements, minimum bend diameters and maximum pull tensions.

VII.2.5. When placing FREE-SPAN, all precautions and safety requirements of the respective company shall be followed. When required, use of warning signs and traffic warning

cones shall clearly define the work area to safely channel the traffic. On streets or highways, always place the cable in the same direction as the traffic flow and use flagmen to control traffic.

VII.2.6. Do not allow the cable to twist as it is pulled through travelers or sheaves. Observe the cable markings of the cable as it is first pulled through the traveler or sheave. If continuous twist in a constant direction is observed, stop the installation immediately, ease off the tension, and readjust the traveler. Due to the light weight of FREE-SPAN and relative low stringing tensions, the traveler may require support at the base to help prevent the cable from riding out of the traveler or excessive twisting during installation. Proper feed of the cable through travelers or sheaves is diagrammed in Figure 1.

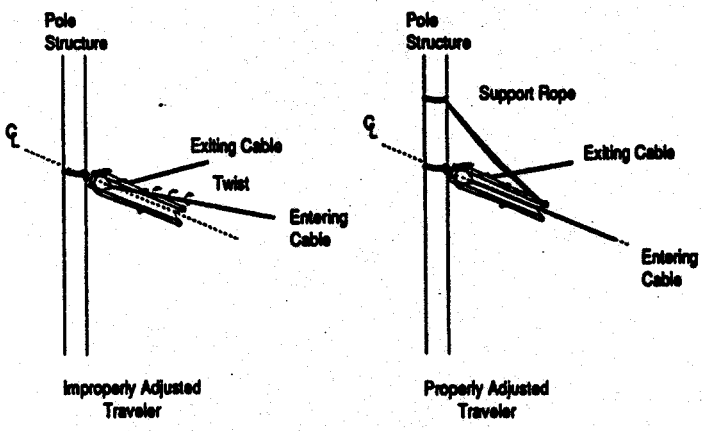


Figure 1. Proper Traveler Adjustment.

VII.2.7. Control the rotation of the pay off reel to prevent over running. Apply only a minimal amount of braking. Braking should be applied to the reel through the support shaft, and not by methods such as wedging a 2 x 4 under the reel flange. As the reel empties, the tension will have to be periodically adjusted.

VII.2.8. Do not cut the cable under any circumstances without prior approval of the engineer responsible for the transmission of the project. Changes to the total number of spice points can potentially degrade quality of transmission of the system. The number and location of splices are usually determined in the initial design.

VII.2.9. Do not allow vehicles to pass over the cable. At road crossings, the cable should be suspended above roads, driveways, etc. during installation. Travelers or blocks placed on a temporary slack span of rope, or steel strand, may be used to suspend the cable above such road crossings.

VII.2.10. When placing FREE-SPAN on active structures, or structures involving power crossings, observe the safety precautions outlined in your company's applicable procedures. When pulling up and tensioning self-supporting cable, observe the same precautions used when pulling up and tensioning metallic phase conductors. When aerial lift equipment is used for placing self-support cable, all precautions outlined for placing phase conductors, as well as the instructions covering the equipment must be observed.

VII.2.11. Permanent or temporary guys must be used when needed at any location where self-supporting cable is tensioned to avoid placing any unbalanced load on those support structures.

VII.2.12. Use only approved gripping and pulling devises when tensioning, or temporarily holding fully tensioned self-support cable. Wire mesh grips are intended only for pulling the cable through the system. Do not use wire mesh grips to tension or to hold cable under tension.

VII.2.13. Adequate electrical protection must be established at all work sites. The method required, and the equipment used, will be determined by the degree of exposure to electrical hazards and the soil conditions at the site. All metallic equipment, hardware, anchors and structures within such work sites must be common bonded together, and then grounded to assure worker safety.

VII.3. SAFETY ISSUES

VII.3.1. Although FREE-SPAN is an all-dielectric cable, some conductivity can result from moisture on the cable and in the surrounding air. As a precaution, it is recommended that the installed cable is grounded prior to touching it. The precautions in the following paragraphs must be observed to assure safety during and after the cable installation.

VII.3.2. Choosing Cable Location:

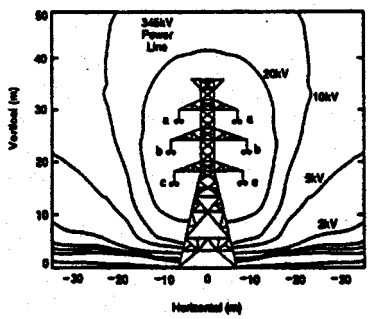


Figure 2. Equipotential Contours Surrounding Power Lines.

VII.3.2.1. It is recommended that Superior Optics suggest the desired mounting location of FREE-SPAN in relation to the phase conductors at the structure. Superior Optics has developed a computer program to determine the optimum position for FREE-SPAN cable. The program investigates the physical relationship of the structure and the electrical phenomena of the phase conductors and provides a profile with plotted equipotential contours, as shown in Figure 2.

VII.3.2.2. Careful selection of the suspension position of the FREE-SPAN cable prevents dangerous scintillation. Scintillation is a surface arc that may pose a cable and personnel hazard. These scintillations occur mainly at the suspension position of the cable; therefore, minimum clearance between the cable and phase conductors should be determined at this joint. This is determined by considering the FREE-SPAN cable a grounded metallic conductor, and using currently acceptable methods for determining its placement.

VII.3.2.3. The recommended position must be such that there will be no contact between the FREE-SPAN cable and the phase conductors or static wires, either during installation or under maximum environmental load conditions. If during a rare case of galloping conductors contact should occur, there may be a potential for scintillation. However, the potential for subsequent cable damage is minimal.

VII.3.3. During Installation:

VII.3.3.1. Leakage current can be induced onto FREE-SPAN even when the cable is a relatively long distance from the phase conductors. Superior Optics can calculate the leakage current based upon the cable position relative to the phase conductors and to the ground, the transmission voltage and the surface resistivity of the cable jacket. The cable surface resistivity is dependent on the moisture and contaminants on the cable. Since a clean, dry cable has a surface resistance of 1014 Ω/ft and a dirty, wet cable has a surface resistance of 106 Ω/ft., do not install cables on active towers during wet environmental conditions.

VII.3.3.2. When the cable is too close to the phase conductors, scintillation can occur through the air from phase conductors to the cable. This scintillation from a phase conductor to FREE-SPAN cable can occur only when the resistance of the cable sheath to the grounding location is low enough to lower the induced voltage. In the worse case condition, the cable resistance is zero, at which time it will be similar to a grounded metal rod. A grounded rod configured in air has a flashover voltage of 15kV/in. for large gaps. Hence, the distance to keep the phase conductors away from the FREE-SPAN cable can be calculated by:

$$SD = E/15$$

Where: SD = distance (inches)
E = phase to ground (kilovolts)

Note: The work rules of the NESC Section 43 and 44 should be used to determine safe approach to live systems.

VII.3.3.3. Specific safe approach distance to active phase conductors are defined in the National Electrical Safety Code (NESC) Work Rules Sections. The safe approach distance is different for electrical personnel and telecommunications personnel. These should be the minimum safe approach distances to active phase conductors.

VII.3.4. During Splicing:

When splicing FREE-SPAN cable during rain conditions near active phase conductors, it is advised to ground the cable between the work area and the spans. This will prevent dangerous leakage currents and transients from flowing through personnel. In dry weather, there is little induced charge on the cable; however, as a personnel safety practice, the cable should be grounded between the work area and the spans.

VII.3.5. During Routine Maintenance:

Dry Weather Conditions: When the cable is suspended by insulators or on wooden poles, a voltage potential may be induced in the metal suspension grips and support hardware. To avoid dangerous electrical shock, ground the metal grips before

touching. The cable can be touched anywhere when it is dry, because there is little charge induced on the small area that is touched.

VII.3.6. Wet Weather Conditions

When the cable is wet, the resistance to ground is low near the tower or grounded structure, so there is little voltage potential on the metal grips or cable at these points. However, at distances of 10 to 15 feet or further from the metal grips, a voltage potential may exist. To avoid dangerous electrical hazards, ground the cable within 3 to 5 feet on both sides of the area to be touched.

VII.4. INSTALLATION EQUIPMENT

VII.4.1. FREE-SPAN fiber optic cable is normally supplied on non-returnable wooden reels. The cable is covered with protective covering and the cable reels are lagged with 2 x 4 lagging to provide additional protection during transportation. The following Table 1 provides dimensions and un-cabled weight of the standard reel sizes:

Table 1. Dimensions of Standard Reels

Flange Diameter (in.)	Drum Diameter (in.)	Width Inside (in.)	Width Outside (in.)	Shaft Hole Diameter (in.)	Uncabled Weight (lbs.)
72	36	36	41	2 ¾	480
60	36	36	41	2 ¾	320
48	24	30	35	2 ¾	160
36	18	18	23	2 ¾	75

Note: Custom reel sizes can be provided per customer request.

VII.4.1.1. Reel Handling:

The type and construction of the reel stand determines the method and tools for handling. Reels are constructed so that they must be supported either on an axle, supported from above, or by the reel flange. When the reels are lifted by an axle supported from above, a spreader bar must be employed to maintain smooth payoff and to prevent damage to the cable or reel, or both, by inward pressure on the reel flange. Proper equipment rated for the maximum load must be available to lift the reel. If the reel stand is not self-loading, a crane, forklift or other suitable equipment should be used to load the cable reel into the stand.

VII.4.1.2. Reel Stands:

Reel stands are designed to be used with tensioners to supply the necessary hold-back tension to the cable. The stand(s) should be selected to accommodate the cable reel dimensions and gross weight. Superior Optics standard reels are not designed to withstand the forces developed by braking during high tension stringing operations. Direct tension stringing from the reel at cable installationstringing tensions should not be attempted. The cable may be pulled directly from the reel stand only when employing slack stringing methods that allow minimal tension to be applied directly to the reel of cable.

VII.4.2. Pulling Machines:

Both bullwheel and reel type pulling machines may be used to install FREE-SPAN fiber optic cable. Availability and previous experience with a particular type of pulling

machine should be a factor when determining the type of pulling machine to be utilized.

VII.4.2.1. Bullwheel Characteristics:

he depth and flare of grooves in the bullwheels are not critical; however, there are some recommended guidelines. Semicircular grooves with depths of 50% or more than the cable diameter, and with a flare angle of 5 degrees to 15 degrees from the vertical center line reference, generally have been found to be satisfactory. The minimum diameter at the bottom of the groove should be at least 35 times the diameter of the cable. Tandem bullwheels should be aligned with the offset approximately one-half the groove spacing. The material and finish of the grooves should not mar the surface of the cable. Elastomer lined grooves are recommended.

VII.4.2.2. Puller and Tensioner Operating Characteristics:

The pulling and braking system should be operated smoothly to prevent any sudden jerking or bouncing of the cable during deployment. Each system should be readily controllable and capable of maintaining a constant and even tension. Pullers and tensioners should be equipped with tension indicating tension and the actual cable weight and length to be installed. Tensioner bullwheels should be retarded so that the cable maintains a constant hold-back tension at various pulling speeds. Positive braking systems are required for pullers and tensioners to maintain cable tension when pulling is stopped. Fail safe type braking systems are recommended.

VII.4.3. Travelers/Stringing Blocks:

VII.4.3.1. Sheave Diameter:

The diameter of the sheave should not be less than 20 inches at mid-span suspension points, see Figure 3. Where the cable line makes an angle of 45 degrees or greater, and at the first position after the pay-off reel and the final position before the take-up reel, the minimum diameter of the sheave should not be less than 24 inches. Sheave diameters that are larger than those specified are acceptable, and offer some advantages by reducing the load applied to the cable.

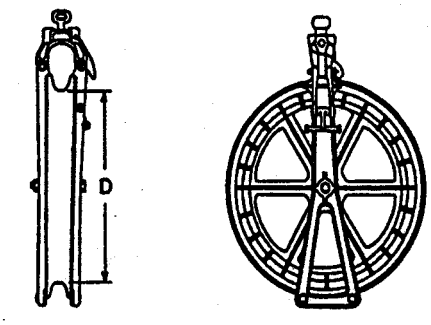


Figure 3. Sheave Diameter

VII.4.4. Travelers/Stringing Blocks:

VII.4.4.1. Sheave Groove Configuration:

The minimum radius of the sheave groove is recommended to be 55% greater than the diameter of the cable. The minimum depth of the groove should be 25% greater than the diameter of the cable. The sides of the groove should flare between 15 degrees to 20 degrees from the vertical, to facilitate passage of grips, swivels, etc. and to contain the cable within the groove, see Figure 4.

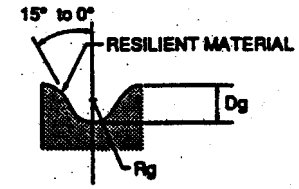


Figure 4. Sheave Groove

VII.4.4.2. Traveler Construction and Material:

Travelers may be made of any suitable material, such as heat treated aluminum, with consideration for the weight. It is recommended that the safe working load and suitable margin be matched with the maximum installation load of the fiber cable. The traveler should be in good working order and properly lubricated. The cable release should work smoothly with minimal pressure. It is recommended that the traveler be lined with an elastomeric liner that will provide cushioning and minimizes abrasion to the cable jacket. Elastomers of neoprene or urethane are acceptable. The liner should not be torn or loose.

VII.4.4.3. Traveler Grounds:

Grounding attachments are recommended when stringing fiber optic cable under active phase conductors. As a minimum, the first and last traveler of a pull should be equipped with a traveler ground attached to the structure grounding system.

VII.4.5. Uplift and Hold Down Blocks:

At positions where uplift may occur, it is recommended that uplift rollers or hold down blocks be used. This will minimize any potential for scintillation during installation on active systems and protect the cable jacket from abrasion on non-active systems. A series of travelers 12 inches to 14 inches in diameter will maintain minimum bend radius. These devises should have a cable breakaway feature to easily remove the blocks.

VII.4.6. Running Grounds:

When installing FREE-SPAN fiber optic cable under active power systems, a running ground should be used to protect personnel from electrical hazards. The running ground shall provide constant contact with the moving cable without excessive tension. It should be located prior to first support structure. The spring tension on the running ground should be adjustable, and the rollers should be sized for the diameter of the cable.

VII.4.7. Chain Hoist:

Chain hoists are used to tension and sag each cable span. The hoist should be rated for the maximum installation load of the FREE-SPAN cable, plus a desired safety factor. It shall be in good working order and properly maintained. Assure the chain is not deformed, twisted, or corroded. Inspect release levers and cam action for proper operation. Any suspect unit should not be used.

VII.4.8. Dynamometers:

Dynamometers are used to measure the tension at each cable span. The dynamometer should be rated above the maximum installation load of the FREE-SPAN cable. Typically, the accuracy of the dynamometer is .5% of the full scale rating. If the full scale rating is too high above the installation load, the degree of accuracy is questionable. To assure a high degree of accuracy, two comparable dynamometers can be attached in tandem, and the two readings averaged.

VII.4.9. Grips:

Wire mesh grips are utilized to pull the fiber optic cable through the travelers. The grip should be a double or triple weave design and be rated to match the cable diameter. The load rating shall match the maximum anticipated load on the cable during cable pull-in. This is typically well under the sagging tension, but is dependent on cable design. The grip should have a swivel link that will minimize cable twisting and is rated to separate prior to the wire mesh grip breaking, see Figure 5. Grips can be banded or un-banded and shall be applied per the manufacturer's instructions. Do not use the wire mesh grip to tension or to hold cable under tension.

Figure 5. Wire Mesh Grip With Swivel Link

VII.5. INSTALLATION METHODS

VII.5.1. Methods used for placement of aerial, all-dielectric, self-supporting, FREE-SPAN fiber optic cable are essentially the same as those utilized to place power utility phase conductors. However, there are handling and bend radius requirements that are more restrictive for FREE-SPAN. The two basic methods for the placement of FREE-SPAN fiber optic cable are: the stationary reel, sometimes called the "Back-pull Method," and the moving reel, sometimes called the "Drive-off Method". The drive-off method is acceptable but is rarely used.

VII.5.1.1. Drive-off Method:

As stated in previous paragraphs, this method is not utilized very frequently. Its primary application is in construction of new lines with clear right-of-way and no obstacles. This method is not very economical in urban areas where traffic hazards and obstacles would slow cable deployment.

VII.5.1.1.1. Place cable reel in a reel trailer or line truck equipped with reel carrier, supported by the arbor holes. The cable should pay off the top of reel from the back for reel trailers and off the bottom of the reel to the front quadrant for the line trucks. A braking device, set on minimum, is utilized to brake the reel rotation by friction to the arbor shaft. This is used to prevent overrun of the reel when stopping at the support structures.

VII.5.1.1.2. Holes are drilled and machine bolts, or comparable hardware, are placed on the structures at the appropriate mounting height. At dead-end and tensioning locations, down-guys of an appropriate loading factor are placed.

VII.5.1.1.3. Travelers are placed above or below the desired framing location of each support structure and the cable is dead-ended at the starting location.

VII.5.1.1.4. With minimal tension applied to the reel brake, the reel of cable is transported along the construction route and the cable is played out. As the reel empties, the back tension will have to be periodically adjusted to account for the difference in reel mass.

VII.5.1.1.5. As the moving reel passes a support structure, the pulling is stopped and the cable is placed into the traveler attached to the structure at the desired framing height.

VII.5.1.1.6. The reel proceeds on to the next support structure where the process is continued until the cable is completely deployed.

VII.5.1.1.7. With the cable deployed, starting at the end location, each span can be sagged and tensioned and support hardware applied according to the installation requirements. An alternative procedure would sag and tension each span and install permanent hardware as the cable is being deployed.

VII.5.1.2. Back-pull Method:VIII.5.1.2

This method of cable installation is most frequently used for FREE-SPAN fiber optic cable. Its primary application is for long spans on EHV power facilities. It also is most effective for application on distribution facilities, where there are many obstacles such as lateral branches or taps. This method is very economical in urban areas and offers the fastest deployment of cable.

VII.5.1.2.1. The cable reel is placed on a reel stand or reel trailer, supported by the arbor holes at a stationary location. A braking device applies minimal tension to the reel to prevent overrun.

VII.5.1.2.2. At the same location as the cable reel, the tensioner is placed in-line between the cable reel and the first two structures. The FREE-SPAN cable is then fed through the tensioner.

VII.5.1.2.3. Holes are drilled, and machine bolts or comparable hardware are mounted to the structure at the appropriate mounting height. At dead-end and tangent locations, down-guys are placed at the desired framing location of each support structure.

VII.5.1.2.4. Travelers are placed just above or below the desired cable framing location of each support structure.

VII.5.1.2.5. Small pilot lines are run through the travelers at each support structure. The pulling line is pulled from the pulling location back through each traveler using the small pilot lines. After the pulling line is fed through the entire section to be pulled, it

is attached to the FREE-SPAN cable with a swivel link and a wire mesh grip as seen in Figure 4.

VII.5.1.2.6. The FREE-SPAN cable is then pulled through the entire section with the puller and tensioner. Care must be exercised to keep the cable under minimal load.

VII.5.1.2.7. Several pulling stages may be required to place the cable through the entire system.

VII.5.1.2.8. With the cable deployed, starting at an end location, each span can be sagged and tensioned and support hardware applied according to the installation requirements.

VII.5.1.3. Communications:

Proper communications during fiber cable deployment are critical to assure safe and efficient installations.

VII.5.1.3.1. The Drive-off Method requires minimal communication between different personnel on the installation crew. It is recommended to have good communications between the operator of the vehicle used to deploy the cable, and the individual at the cable reel. If traffic control is necessary, the flagman shall also have communication with the vehicle operator to assure safe traffic routing.

VII.5.1.3.2. The Back-pull Method requires good communications between the operator of the tensioner and the operator of the puller. In addition, intermediate check points such as road crossing and obstacles, i.e.; power conflicts, should have spotters to inform the puller and tensioner of potential problems. The types of communication devices are dependent on local availability. Maintenance radio, cellular telephone and dedicated talk circuits over copper pair facilities with temporary station wire, are all viable alternatives. Systems such as civilian band radio or power line carrier systems are not recommended.

VII.6. INSTALLATION CONSIDERATIONS

VII.6.1. Pull, Tension, Anchor, and Splicing Sites:

The selection of pull, tension, anchor and splicing sites must consider many factors from system design issues to logistics and capability of equipment. In the Back-pull method, the reel is stationary, thus the cable for the system is pulled in several segments. These segment lengths are dependent on allowable splices, accessibility of the sites for vehicles, capability of the installation equipment, obstacles in the right-of-way, and cable reel length. Other factors that will affect the site selection are the maximum load the cable can handle, maximum structure load and availability of adequate grounding systems when necessary.

VII.6.2. Equipment Locations:

The location of the tensioner and puller relative to the structure must be selected so that the structure is not overloaded. Where possible, a pulling slope of four or five horizontal to one vertical is considered good practice. This ratio will minimize the load on the cable, traveler, and structure. Refer to ANSI/IEEE 524 for calculations of

structure loads. It may also be necessary to place temporary guys to prevent overloading the structures. The tensioner and reel stand must be placed in-line with the first two structures to prevent twisting of the cable or any abrasion to the cable by rubbing on the sides of the traveler groove.

VII.6.3. Anchors and Hardware:

Anchors and support structure hardware shall be rated above the anticipated environmental load of the cable, plus a safety factor. The amount of the safety factor is dependent on the utilities' existing procedures. In applications where aeolian vibration becomes an issue, the safety factor shall be increased due to the potential for degradation of the hardware. At locations where the cable is tensioned to achieve proper cable sag, the structure may require a temporary down-guy and anchor to prevent unbalance of the structure. At these locations a minimum ration of two horizontal to one vertical for the slope of the guy is considered good practice. Anchor types shall match the soil conditions and loading considerations. All down-guys shall be properly tensioned or re-tensioned prior to starting the cable installation.

VII.6.4. Crossing Structures:

When crossing roads, highways, railroads, energized lines, etc., some supplemental support is necessary to prevent the minimum clearance from not being met, and posing a safety hazard. One method is to erect "H" frame structures on both sides of the crossing point. With these guard posts, the cable can be maintained above the minimum height. In some cases rope nets can be strung between the two structures to provide more positive protection. Another method is to string travelers on temporary ropes or guys at the crossing point, that will maintain clearance if tension should be lost. It is recommended that a spotter with communications to the puller and tensioner be at the crossing location, while the cable is being pulled into place.

VII.6.5. Terrain Considerations:

The terrain of each pull section must be analyzed to assure there are no potential conflict areas that would impair installation. In areas where ground clearance or minimum clearance under power facilities becomes a concern, a spotter with communications to the puller and tensioner should be utilized to assure no abrasion to the cable.

VII.6.6. Travelers Installation:

Travelers are typically attached directly to the structure. On pole structures, a standoff pole bracket may be considered to allow free movement of the traveler. The socket eyes, used to support the traveler, shall be consistent with ultimate working load and rating of the traveler. Shackles used on towers to support the traveler shall be rated above the ultimate working load, to assure a safety factor. The need for traveler grounds and required grounding locations must be based on the degree of exposure to electrical hazards. When hazards exist, observe local practices for the placement of traveler grounds. As a minimum, traveler grounds should be installed at the first and last tower between the tensioner and puller.

VII.6.7. Grip Installation:

The pulling grip, as described in the apparatus section, shall be rated above the maximum pulling tension anticipated. Use the manufacturer's instructions for the proper application. When installed properly, no special preparation of the cable end, or aramid yams, are required. It may be recommended by the grip manufacturer to

band the end of the grip to prevent slippage. Apply vinyl tape over the banding to minimize damage to the traveler coatings.

A matched clevis type swivel is recommended to help prevent twisting of the cable during pulling. The swivel shall be at the rating of the grip, to assure breakaway prior to the grip failing. It is not recommended to pull the swivel through bullwheels under any significant tension. When removing the grip after the cable has been pulled in, cut off a minimum of twenty (20) feet past the end of the grip to assure no stressed cable is used.

VII.6.8. Cable Pulling:

Pulling rates of 2 to 5 miles per hour usually provide safe, smooth, efficient passage of cable. Once the cable movement has started, it should be maintained at a constant rate until the cable segment has been pulled into place. At all times during the pull, the tensioner operator should monitor the tensionometer to assure that the maximum pulling tension is not exceeded. The maximum tension during the pulling operation should not exceed that which is necessary to clear obstacles. In general, pulling tension should not exceed more than one-half the maximum initial sagging tension. If greater tensions are required, consideration must be given to the fact that when long lengths of cable are pulled, the tension at the pulling end may exceed the tension at the tensioner by significant amounts. This difference is due to the length of cable to be strung, changes in the line angle, number of travelers and differences in elevation of the route and structures. Light and steady back tension is required at the cable pay-off reel to prevent overrunning of the reel. It may be necessary to periodically loosen the brake on the pay-off reel as it empties. As the reel empties, the moment arm available to overcome the brake drag is reduced, and the tension rises.

VII.6.9. Aeolian Vibration:

Aeolian vibration is a resonant vibration caused by low velocity wind blowing across a cylindrical conductor under tension, see Figure 5. Although the vibration will not typically affect the optical or mechanical performance of the FREE-SPAN fiber optic cable, it can cause severe degradation to the cable support hardware. Vibration dampers can be very effective in controlling aeolian vibration when used on FREE-SPAN fiber optic cable. Both resonant and interference type vibration control systems will work when properly applied.

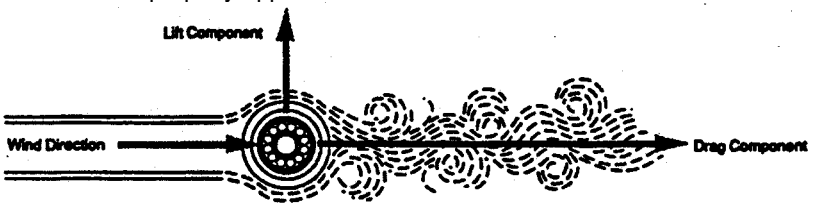


Figure 6. Aeolian Vibration Effect

Superior Optics recommends that vibration dampers be utilized to protect attachment hardware when the cable spans exceed 350 feet and/or the cable tension exceeds 15% of the calculated cable breaking strength, and there is a prevailing laminar wind between 2 and 20 mph.

VII.6.10. Splicing:

At the locations where a splice is required, additional cable must be provided to provide extra fiber and cable to physically accommodate the splicing process. In the outdoor environment, Superior Optics recommends that splicing be accomplished on the ground and not in an aerial bucket. Consideration must be made to the type of splicing, mechanical or fusion, and the respective environmental requirements of each. If fusion is the method, a splice vehicle may be required and subsequently enough cable will be required to reach the vehicle. In general, enough cable should be provided to reach the base of the structure and reach the intended splicing site. Do not forget to remove 20 feet of cable from the grip to remove any stressed cable. Superior Optics also recommends that the spare cable at splice points be stored in an enclosure, either mounted to the pole or in an underground housing, see Figure 7. Superior Optics also recommends cable guards along the entire height of the structure.

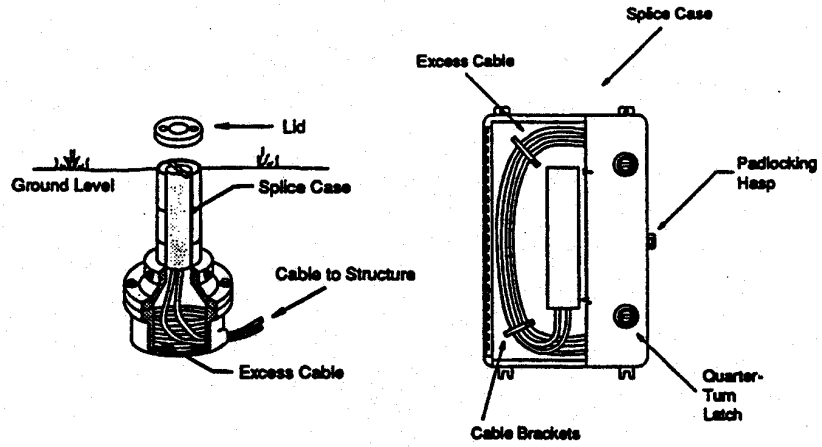


Figure 7. Underground and Pole Mounted Housing

After the excess cable length is determined, coil the cable and store at the structure until the splice housing has been installed. Be sure to place end caps on the exposed cable ends or seal with vinyl tape to prevent water penetration.

VII.7. CABLE SUPPORT HARDWARE

VII.7.1. Hardware Types:

The hardware used to support the cable at the structure is very similar in appearance and application to the type used for power utility metal conductors. This hardware is available from several different manufacturers that Superior Optics has coordinated the design requirements with. Dependent on the applications, Superior Optics can provide recommendations and, if required, procure the hardware for customers. In general, there are three basic types of supports: dead-ends, suspension and tangent assemblies.

VII.7.2. Dead-end Assemblies:

Dead-end assemblies are used at points of cable termination, or on structures where the line angle is greater than 25 degrees. The basic elements that are included in a dead-end assembly, refer to Figure 8, are the Structural Reinforcement Layer (SRL), the dead-end grip, the thimble clevis and an extension link.

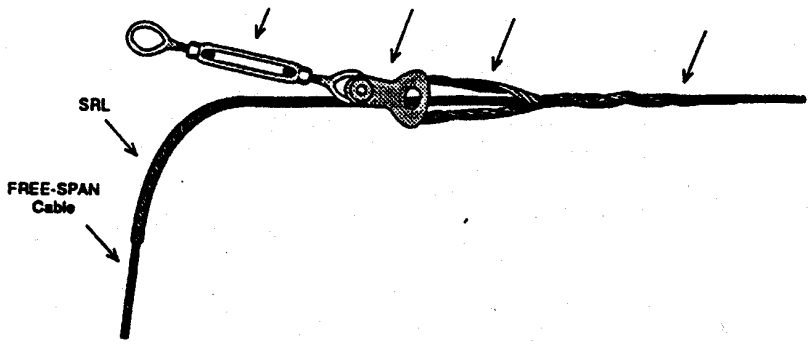


Figure 8. Dead-End Assembly

VII.7.3. Structural Reinforcement:

VII.7.3.1. Structural Reinforcement Layer (SRL):

The SRL is a straight subset of armor rod that is the first layer applied to the FREE-SPAN cable. They are spiraled in a precise twist lay to address the diameter and maximum anticipated load of a specific cable. Typically, they are grouped together in a sub-set of four to five individual rods, with grit applied to the inside for better slip resistance.

VII.7.3.2. Dead-end Grip:

The dead-end grip is a set of armor rods that have been formed with a loop in the center. It, too, has a precise twist lay that matches the diameter of the SRL and cable. Its length is dependent on the maximum anticipated load. It has grit applied to the inside and also has a color band 18 inches from the loop.

VII.7.3.3. Thimble Clevis:

The thimble clevis, sometimes called the clevis shackle, is a cast aluminum or steel piece of hardware used to maintain the seat diameter of the dead-end loop and attach the dead-end loop to the extension link, and ultimately the structure.

VII.7.3.4. Assembly:

The dead-end hardware is assembled by the following steps:

VII.7.3.4.1. There is a color band that is closer to one end of SRL. The rods should be installed with that made (at the attachment end of the span).

VII.7.3.4.2. Wind one subset of rods on the cable. Wind on subsequent sets of SRL by utilizing the color marker as a guide to proper alignment. The rods should be placed close together to assure room for all sets.

VII.7.3.4.3. At the end of the SRL, the rod tips should align. Do not use tools to snap the rod tips in place, as this may damage the cable jacket.

VII.7.3.4.4. Align the color band of the dead-end grip with the color band on the SRL, and wind one leg on approximately two feet.

VII.7.3.4.5. Insert the thimble clevis into the loop, by removing the pin and sliding the clevis arms into the loop.

VII.7.3.4.6. Align the color band of the second dead-end leg with the first that is already partially wound on the SRL. Wind the second leg over the SRL for approximately two feet.

VII.7.3.4.7. Continue winding on the legs of the dead-end, either one at a time or together. Snap the ends of the rods in place. Do not use a tool to snap them in.

VII.7.3.4.8. Apply a band of vinyl tape on both ends of the SRL to assure all SRL ends are seated properly.

VII.7.3.4.9. Secure the thimble clevis to the extension link and then secure the extension link to the structure.

VII.7.4. Suspension Assembly:

Suspension assemblies, sometimes called Armor Grip Suspensions (AGS) units, are used where the line angle is from 0 degrees to 25 degrees. The basic elements that are included in the suspension assembly, refer to Figure 9, are the Structural Reinforcement Layer (SRL), the AGS rods, the neoprene insert, the housing strap, and nuts/bolts. The suspension assembly is typically supported with an appropriately rated shackle.

Figure 9. Suspension Assembly

VII.7.4.1. Structural Reinforcement Layer (SRL):

The SRL for the suspension assembly is very similar in function as the SRL for the dead-end. However, the color band is at the center of the rods.

VII.7.4.2. Armor Grip Suspension (AGS) Rods:

The AGS rods are individual rods that are typically larger in diameter than the SRL rods. They too have a color code band at the center of each rod.

VII.7.4.3. Insert, Housing, Strap and Nuts/Bolts:

The neoprene insert cushions the load transfer from the SRL to the AGS rods. The housing is a cast steel clamp that acts as the main support element with the strap, nuts and bolts completing the assembly.

VII.7.4.4. Assembly:

The AGS suspension unit is assembled by the following steps:

VII.7.4.4.1. There is a color band in the center of the SLR rods. Apply the SRL subunit from the center point, winding in both directions. Add each individual subunit by using the color marker as a guide to line the SRL subunits properly.

VII.7.4.4.2. Apply the neoprene insert at the center color band of the installed SLR rods. Ensure that the seam of the two halves is horizontal and not vertical. A band of vinyl tape at the center of insert will hold it in place.

VII.7.4.4.3. Center the AGS rod in the insert. Apply two wraps of rod on each side of the insert. The curvature of the rod should follow

the curvature of the insert. The AGS rod should be parallel with the insert, not wrapped around the insert.

VII.7.4.4.4. Apply the remainder of the AGS rods on the insert. Make sure that no rods are crossed. They should all be parallel to the insert. Complete the application of the rods and assure the ends are snapped into place. Do not use tools, such as screwdrivers, to snap in place.

VII.7.4.4.5. Place the two halves of the AGS housing on either side of the center of the assembly and slide the AGS strap into place. Insert the bolt through the ears, and tighten. Do not over tighten the ears of the AGS housing against the suspension shackle or fitting.

VII.7.4.4.6. Attach suspension shackle or fitting to structure.

VII.7.4.5. Tangent Support Assemblies:

Tangent support assemblies come in several varieties, some as dielectric blocks and others as metal housing with an insert that pad and protect the cable. These units are in distribution applications where the span is less than 400 feet and the line angle is from 0 degrees to 15 degrees.

VII.8. SAGGING AND TENSIONING

VII.8.1. General:

After the cable has been placed throughout the entire length of the system, sagging and tensioning can now be started. Sagging and tensioning of a system is worked progressively from one end of the system towards the opposite end. Typically, the cable slack is worked back toward the payoff reel in order to recover as much cable as possible.

VII.8.2. Termination Point:

Pull enough cable into the building to assure that the termination location is reached and enough fiber optic cable is spared to facilitate cable splicing. The spare fiber required in the splice tray is dependent on type of fiber organizer and splicing method. Typically, four to six feet of fiber is required to facilitate splicing. Assure that 20 feet of cable is cut off at the wire mesh grip to assure that no damaged fiber is used. Some excess cable may also be required to provide sufficient cable to splice it on the ground, and not in the cable rack.

VII.8.3. Termination Structure:

At the last structure establish a dead-end assembly per the instruction paragraph 7. Assure that the bend radius requirements are maintained where the cable is run down the structure. If the FREE-SPAN fiber cable is run down the structure, it is recommended that cable riser guards are used to protect the cable as it makes the transition of aerial cable to the building entrance conduit.

VII.8.4. Remove all excess cable sack out of the span; or if in the case of several in-line structures, series of spans. This is not prestressing or even tensioning. This removal of excess cable slack is necessary to properly position the temporary dead-end pulling grip. To remove the slack, reverse the tensioner and pull the cable back toward the reel, being careful not to exceed the pulling criteria of one-half the maximum installation tension.

VII.8.5. With the cable slack removed, apply a temporary dead-end assembly 1.5 to 2 dead-end assembly lengths (approximately six to ten feet) from the structure. This will be utilized as a tensioning grip to achieve the proper span sag and tension, prior to installing the permanent dead-end assembly. Attach the tensioning rig, comprised of a sufficiently rated chain hoist, dynamometer and bull chain, to the structure and the temporary dead-end. Take up the load and begin to tension the span per the provided sag and tension charts.

VII.8.6. Typically, the cable is worked span by span back to the payoff reel. If several structures are in-line, then a series of spans may be tensioned at one time. After the spans are close to proper tension, the suspension or tangent hardware is installed and attached to the structures by working back to the temporary dead-end, a span at a time. The tension will have to be adjusted at the temporary dead-end to assure proper sag of each span. Superior Optics recommends that no more than 4 spans be attempted in this manner. If more spans are attempted at once, the temporary tensioning rig will have to be moved several times, costing time.

VII.8.7. The permanent dead-end can now be applied. Measure the length of the extension link, thimble clevis, and dead-end loop up to the color band. Keep this measurement as a reference to determine where to install the permanent dead-end. Once the span has been tensioned, measure the reference length from the structure and start applying the structural reinforcing layer at that point, with the color band at the measured location on the cable. Once the permanent dead-end is installed, and the hardware is attached to the structure, the tension can be released on the tensioning rig and the temporary dead-end removed. As the next permanent dead-end is installed on the adjacent span, make sure that the expansion loop under the dead-ends is properly formed, maintaining minimum bend radius. This means the cable is typically 14 inches lower than the cable framing location. This process is repeated until all spans are sagged and tensioned for the complete system.

VII.9. ROUTE IDENTIFICATION

VII.9.1. General:

Identification of the fiber optic cable and the cable route with warning signs helps prevent inadvertent cable damage caused by company personnel or the general public. This is most important on joint-use distribution pole lines where more than one company may have facilities on the structure. The proper warning signs should use industry accepted wording and visual indicators stating warnings.

VII.9.2. Fiber Optic Cable Warning Signs:

At each structure the cable should be tagged with a cable warning sign. These signs can be a snap around plastic tag in high visibility orange, sating “WARNING – FIBER OPTIC CABLE” or similar wording. The tags are typically applied to the expansion loop under the double dead-ends. Other types of cable warning signs are small plastic or painted metal signs with the same type of wording, but are affixed to the structure at the cable framing locations.

VII.9.3. Fiber Optic Cable Route Warning Signs:

At locations where the cable may go underground or change to adherent structure type, it is recommended to identify the cable route direction with a fiber optic cable route warning sign. This helps to identify the route during an emergency restoration and during preventative maintenance programs, when the cable route is periodically inspected. Again, the use of industry accepted wording and colors are recommended.

VII.10. RECORDS

VII.10.1. General:

Records are an integral part of the equipment required to maintain and restore a fiber optic system. During outage conditions, having a records package readily available eliminates unnecessary delays locating and accumulating information required for the restoration process.

VII.10.2. Coordination:

Due to the number of departments involved in the design, construction, turn-up, and maintenance of fiber optic systems, records can be lost or misplaced after the initial installation of the fiber optic system. This can be a catastrophe during a system outage, because this information is necessary for comparison against trouble-shooting information.

VII.10.3. Documentation

For each fiber optic system the following information should be included in the documentation package.

VII.10.3.1. Engineering Design Package

The Engineering Design Package typically includes some or all of the items below depending on the magnitude of the project. These include a Cover sheet & Key Map, Composite Schematic, Route Map Construction sheets, Construction Detail Sheets, Fiber Splice Plans, Circuit Diagrams and Manufacturer Provided Documentation.

VII.10.3.1.1. Cover Sheet & Key Map:

The Cover sheet & key map shows the project title along with a geographical map showing the system route in relation to roads and highways. Its purpose is to provide general bearings to quickly access key areas of the system, such as field splice points and major road crossings. Sheath meter marks should be indicated on the map for splice points, road crossings, river crossings, etc.

VII.10.3.1.2. Composite Schematic:

The composite schematic is a straight line schematic identifying the construction sequence of cable reels by reel number, meter markings to major construction points such as splice points, and major road crossings. The cable reel section length and a cumulative cable length should be marked at each of these points. In addition, the cable and fiber type and count shall be identified for each reel section.

VII.10.3.1.3. Route Map Construction Sheets:

The Route Map construction sheets identify the actual apparatus units at each structure. Other information such as

the structure type and dimensions, cumulative distance to each termination point from the structure, any grounding or bonding detail, etc. Overhead route maps should typically be prepare at a scale of 1 inch to 100 feet. Underground route maps should typically be prepare at a scale of 1 inch to 50 feet or less when applicable.

VII.10.3.1.4. Construction Detail Sheets:

These sheets show details of JEA Fiber optic Standards as well as specific details for a particular location on the route map that may require greater clarity.

VII.10.3.1.5. Fiber Splice Plans:

These plans detail how individual fiber optic strands shall be Spliced (at field splices) or Terminated (at a Fiber Patch Panel). For Field splices, typically the buffer tubes and strands are shown in an assigned splice tray. For terminations, typically a preterm pigtail is shown with the applicable buffer tubes/strands/ splice tray on one side and the applicable Connector Panel Bulkhead position on the other side.

VII.10.3.1.6. Circuit Diagram:

The circuit diagram is a schematic that identifies the actual fiber circuits, system number, working and protect fibers, fiber/buffer colors, priority sequence during restoration and other pertinent information such as transposed fibers.

VII.10.3.1.7. Manufacturer Provided Documentation:

The manufacturer provided documentation would include cable data sheets of each cable reel, documentation provided on the fiber, equipotential plots of the field strength levels relative to different structure types, and sag and tension charts provided for construction.

VII.10.3.2. Contractor & JEA Crew Redline Mark-ups:

The Redline Mark-ups are produced during and finalized at the completion of construction. A copy of the Engineering Design Package is updated and corrected to reflect any changes during construction. Examples may include Overhead additions, deletions, revisions of attachment locations, Underground additions, deletions, revisions of conduit and vaults, slack loop and splice location changes. Specific cable jacket data should be added at this time. This shall include cable Manufacturer, Build

Year/Month, Cable designator, Footage/Meter markings at splice cases, patch panels, and slack loops.

A Contractor Stamp with the Forman's signature and Date of completion shall be include on the cover page in case follow-up is needed to produce the As built. Redline mark-ups are required documents for acceptance of work and receipt of payment.

VII.10.3.2.1. Splice Plan Redline Markup and Test Acceptance Sheets:

A different group than cable installation normally completes Fiber optic splicing work. However, Splice Plans should be Relined and stamped as described in the previous paragraph. . Splice plan Redline mark-ups are required documents for acceptance of work and receipt of payment.

The test acceptance sheets are the recorded values of the transmitter output power, receiver input power, and measured attenuation levels at the receiver. Other information to be included in the test acceptance package are the Optical Time Domain Reflectometer (OTDR) plots or photographs of each fiber and its terminated pigtail, shot in both directions at both 1300nm and 1550nm. Other recommended documentation includes the bi-directional average of the loss of each splice, including pigtail spices with connector insertion loss.

VII.10.3.3. Records Documentation Package "As-Built":

These sheets are typically the Engineering Design Package: that have been corrected to reflect any changes during construction. The As built should be prepared by the engineering group as part of the closing package.

VII.10.4. The original copy should be maintained by the engineering group and a copy (Both PDF and CAD Drawing) distributed to the maintenance group. One copy of the records package should be placed at each end of the termination points of the fiber optic system. When changes in the system are required due to supplemental construction or emergency restoration, the records package should be revised and redistributed.

VII.10.5. Annual System Check:

Periodically, the system attenuation level shall be verified against the turn-up attenuation measurement. If this attenuation level has changed more than 3db, it is recommended that the cause be investigated and corrective action taken.