

# Construction Assembly Specifications

for 12.5/7.2 kV Distribution Systems

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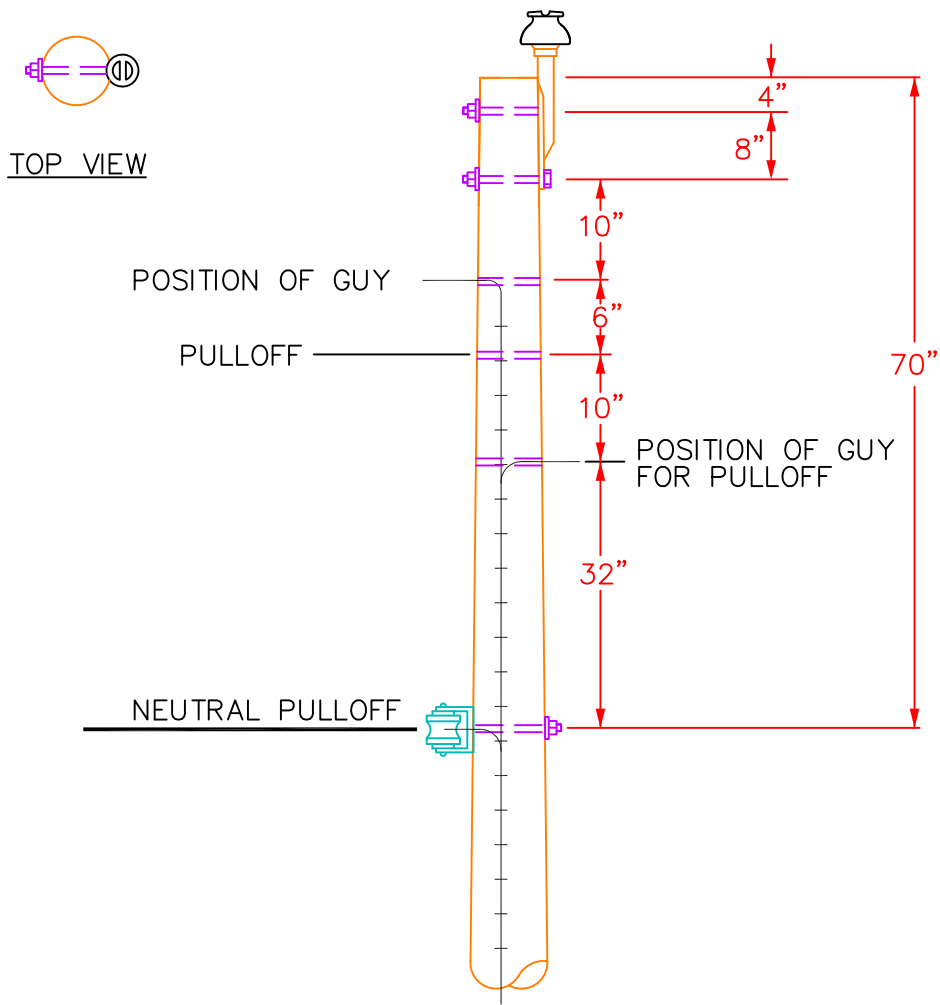
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**0° - 6° LINE ANGLE**

**STANDARD CONFIGURATION,  
STRAIGHT LINE CONSTRUCTION**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



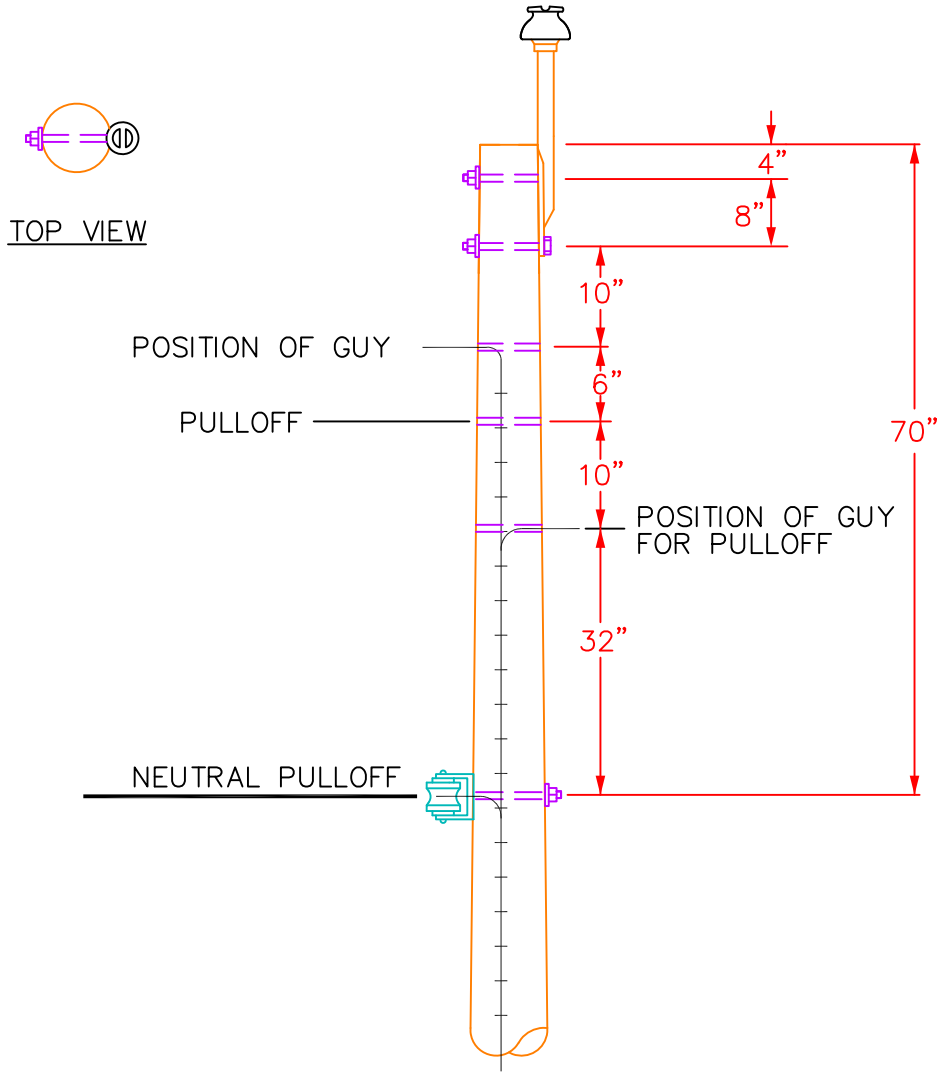
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**A1**







**0° - 6° LINE ANGLE**

**STANDARD CONFIGURATION,**  
**STRAIGHT LINE CONSTRUCTION**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"

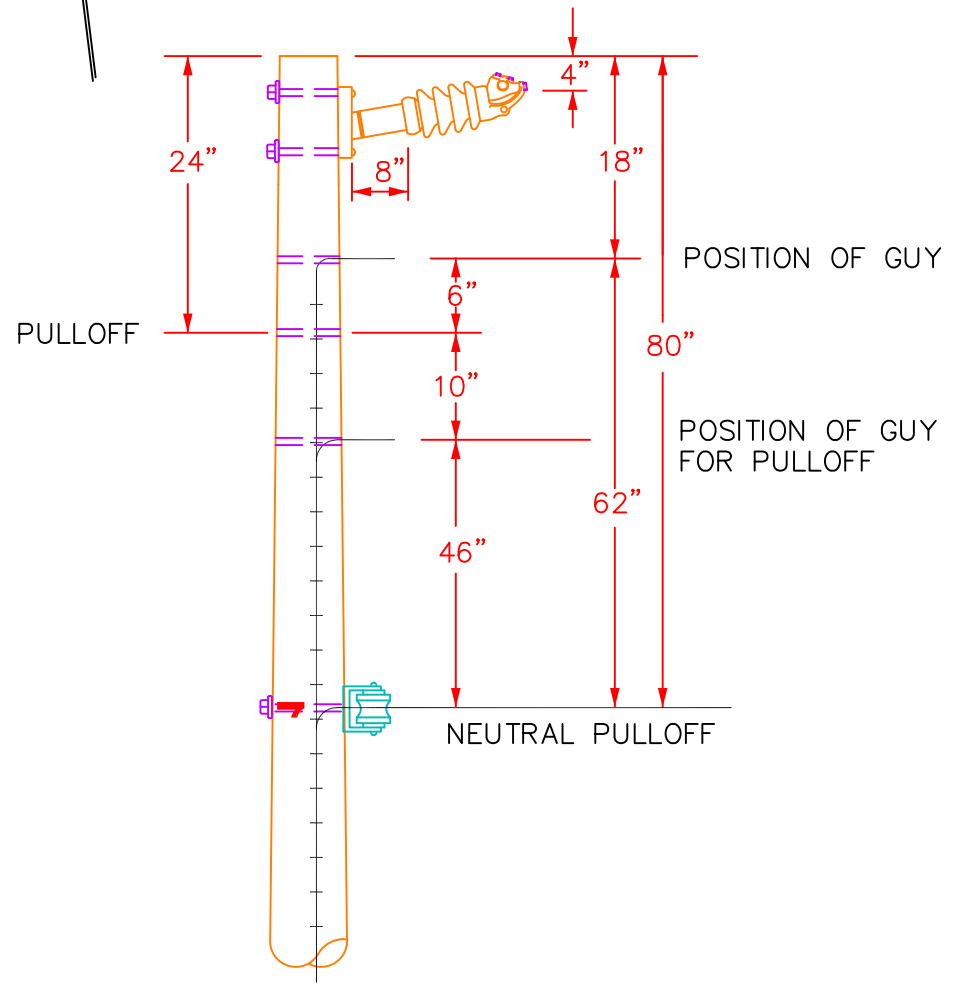
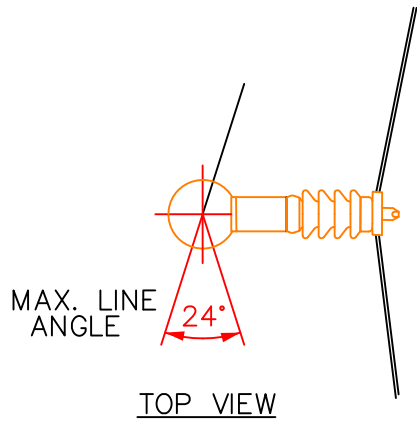


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**A1F**





**0° - 6° LINE ANGLE TIE TYPE**  
**6° - 24° LINE ANGLE CLAMP TYPE**

**STANDARD CONFIGURATION,  
 STRAIGHT LINE TO MEDUIM ANGLE CONSTRUCTION**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"

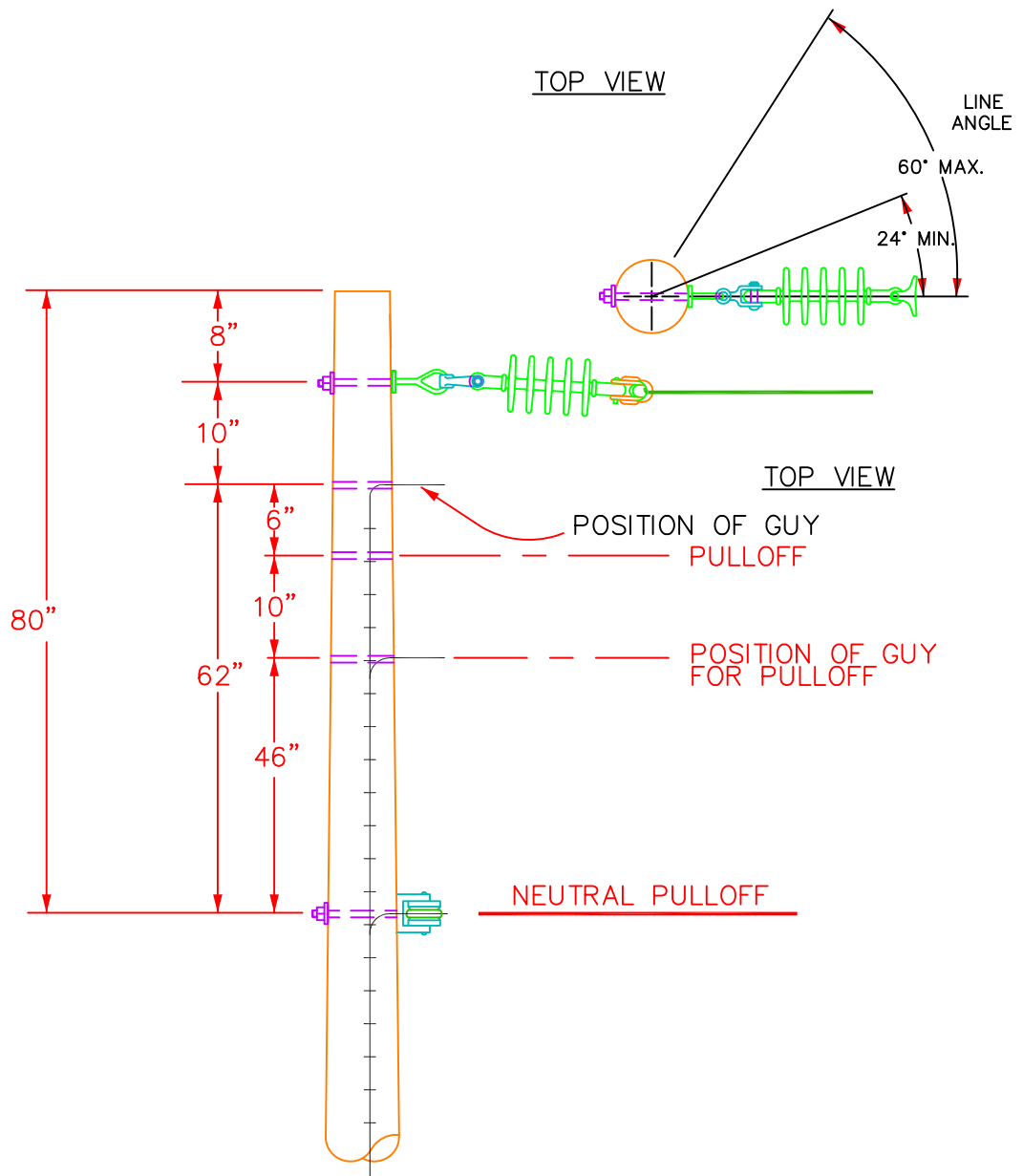


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**A2V**

DATE: OCTOBER, 1992





**24° - 60° LINE ANGLE**

**STANDARD CONFIGURATION,**  
**VERTICAL SUSPENSION**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

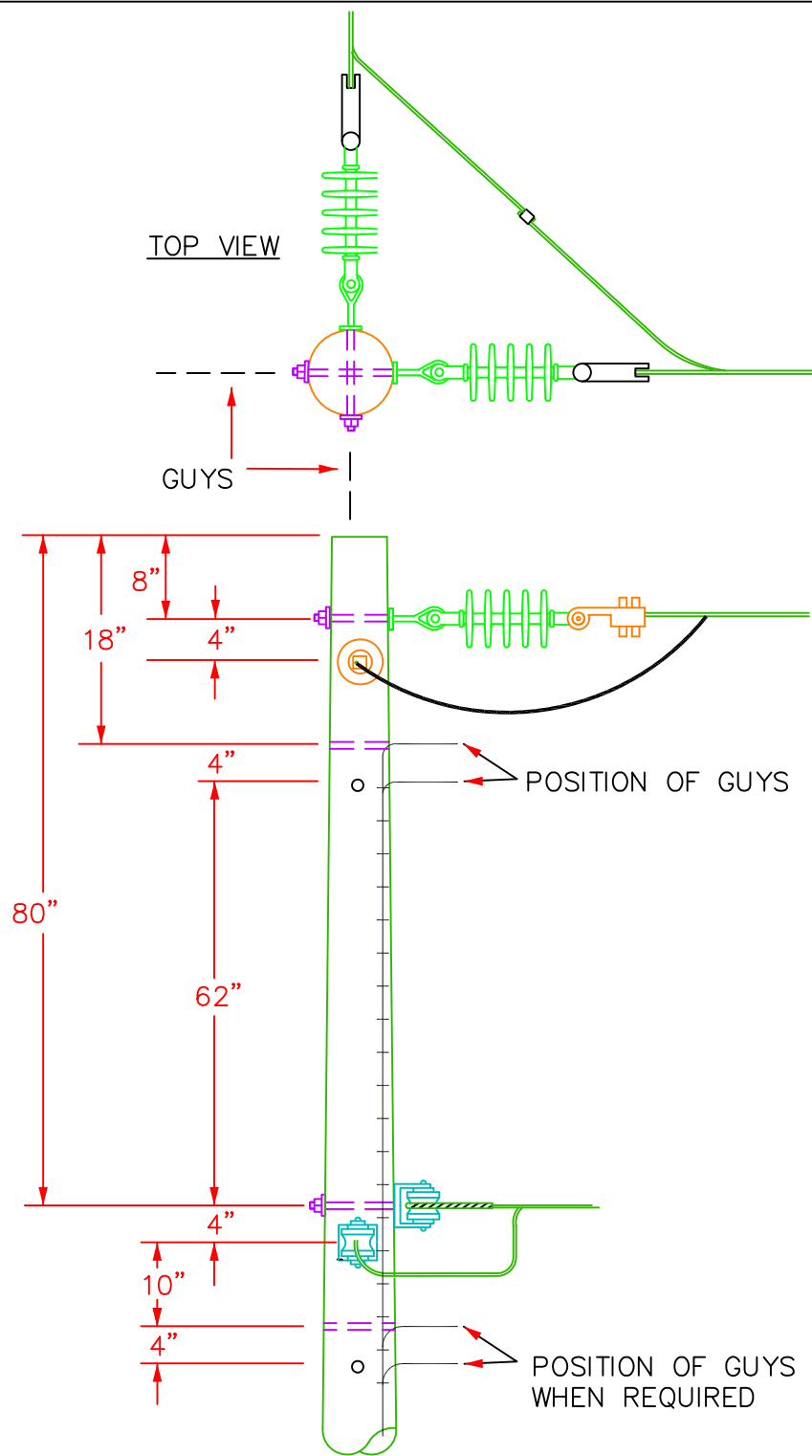


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DATE: OCTOBER, 1992

**A3**





## STANDARD CONFIGURATION, DOUBLE DEADEND ANGLE

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



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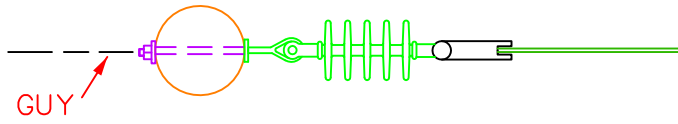
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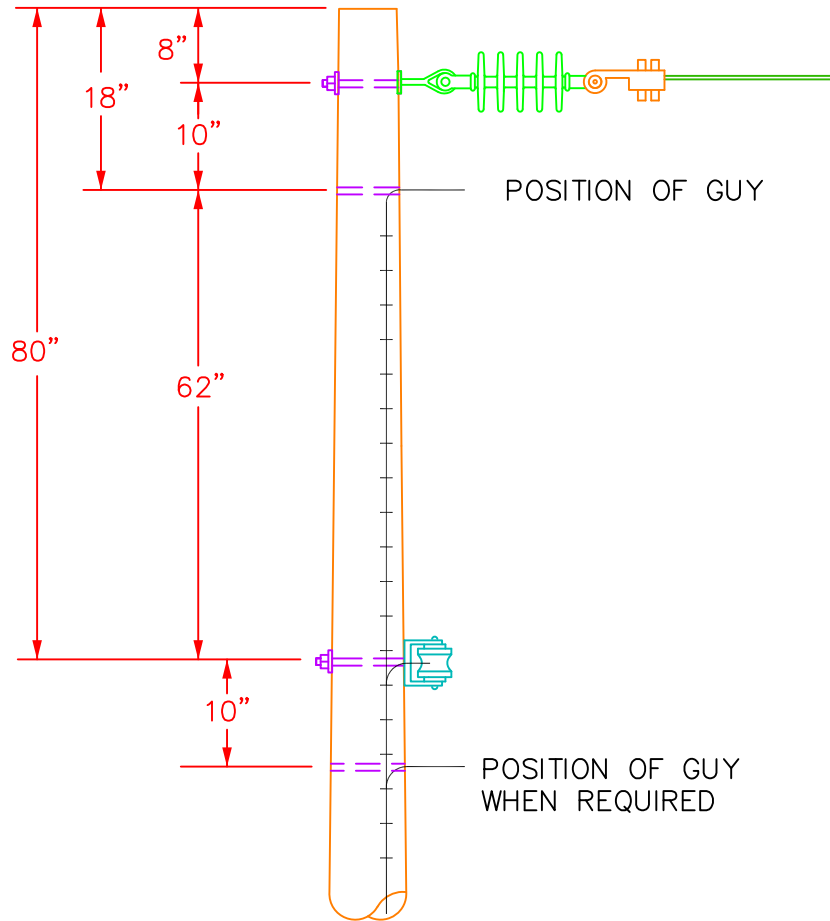
**A4**







TOP VIEW



## STANDARD CONFIGURATION, DEADEND

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



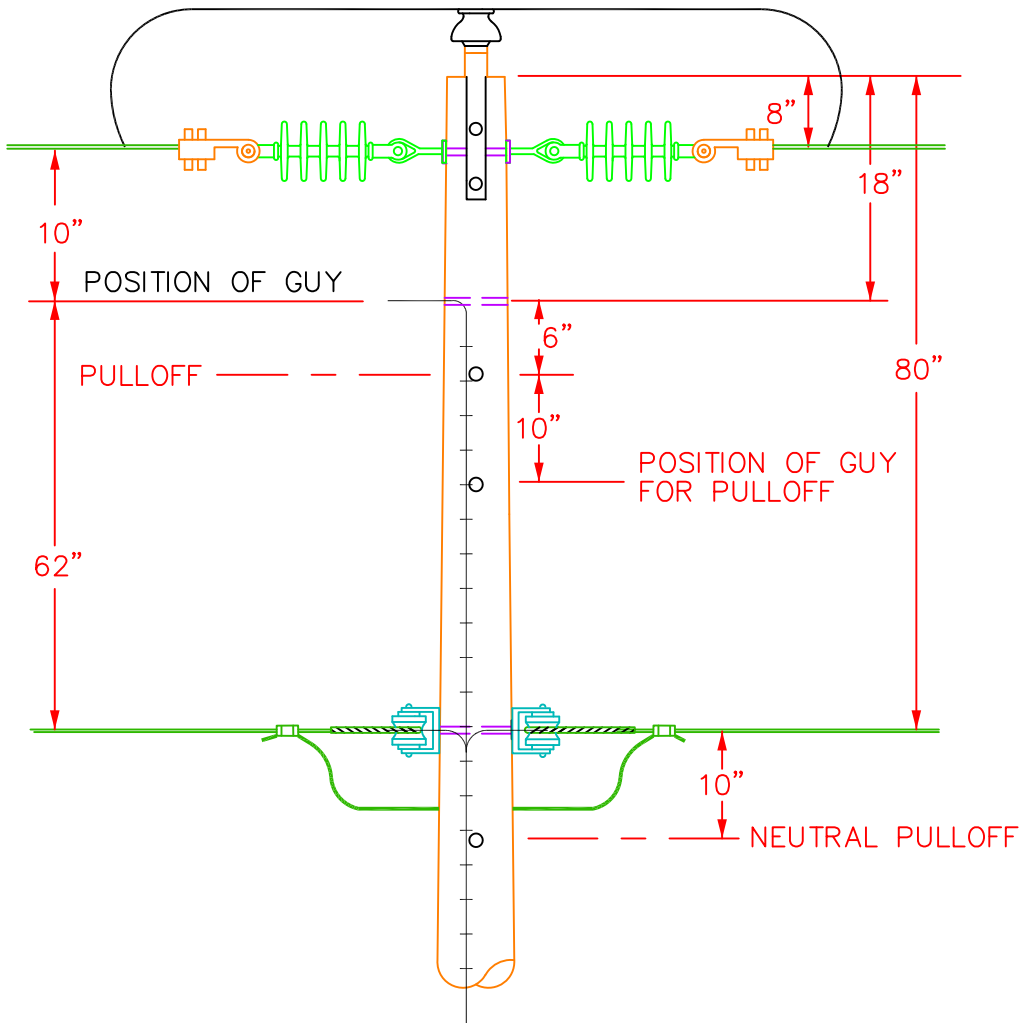
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**A5**





## STANDARD CONFIGURATION, DOUBLE DEADEND

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



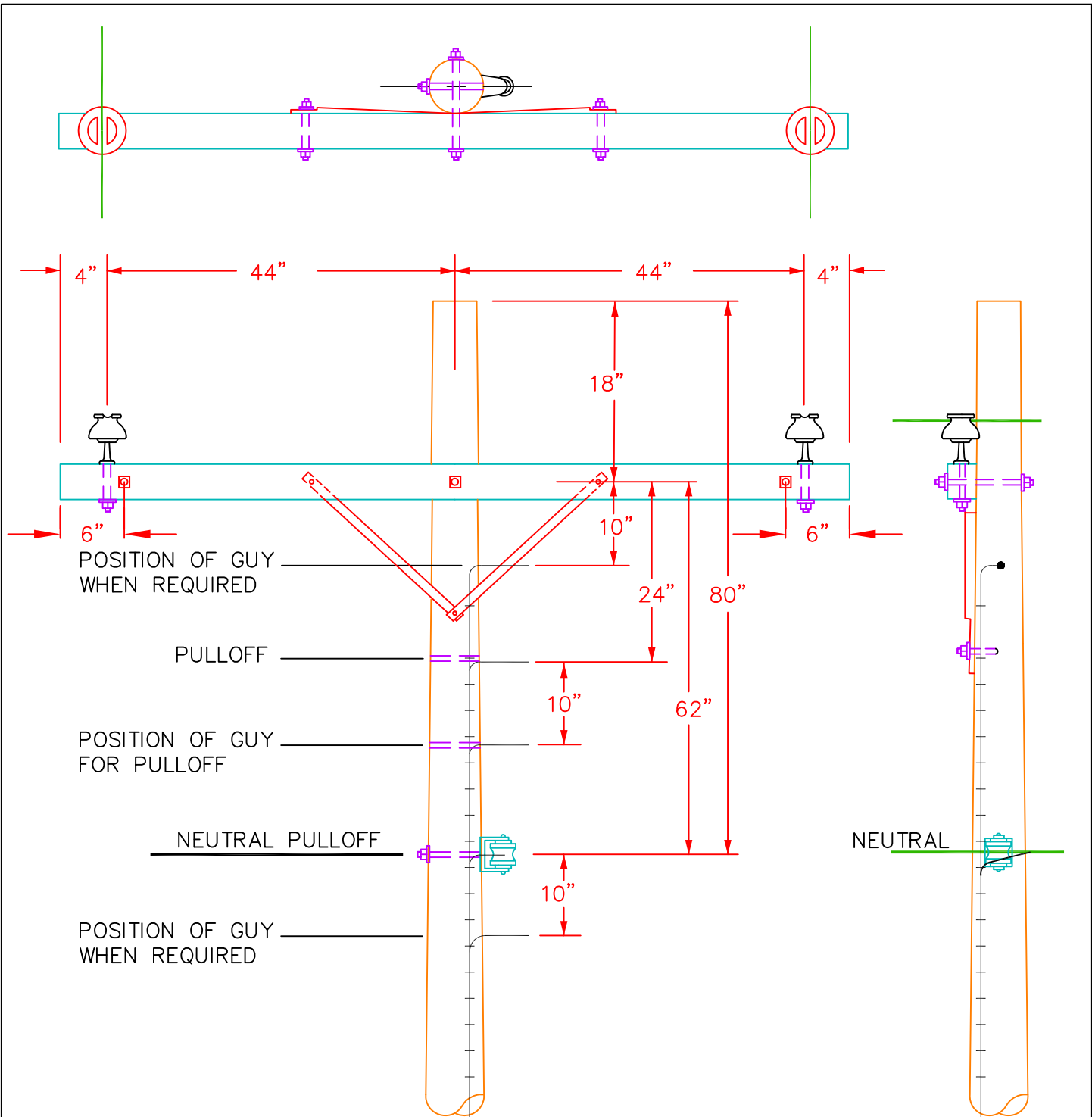
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**A6**





**0° - 6° LINE ANGLE**

**STRAIGHT LINE,**  
**CROSSARM CONSTRUCTION, SINGLE ARM SUPPORT**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"

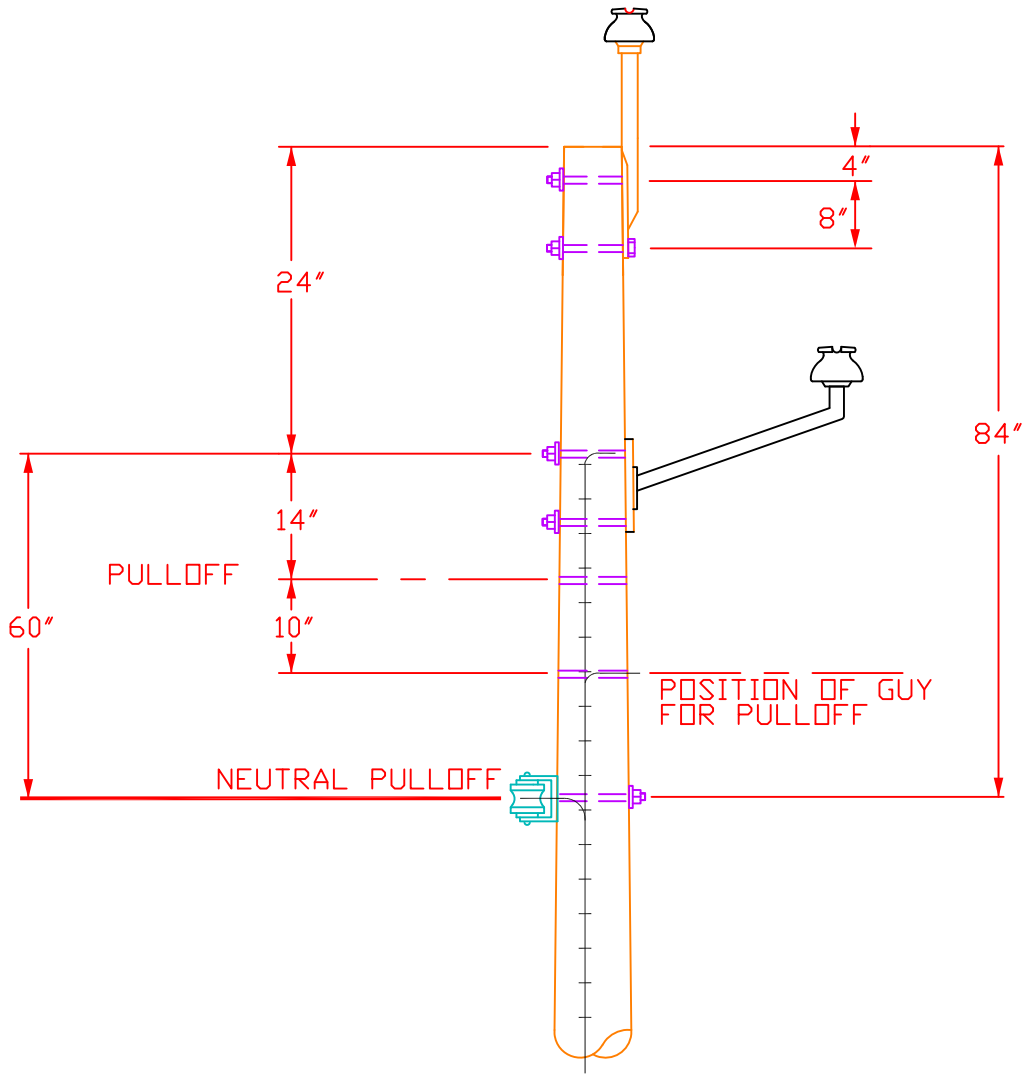


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DATE: OCTOBER, 1992

**B1**





**0° - 6° LINE ANGLE**

**STANDARD CONFIGURATION,**  
**STRAIGHT LINE CONSTRUCTION**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"



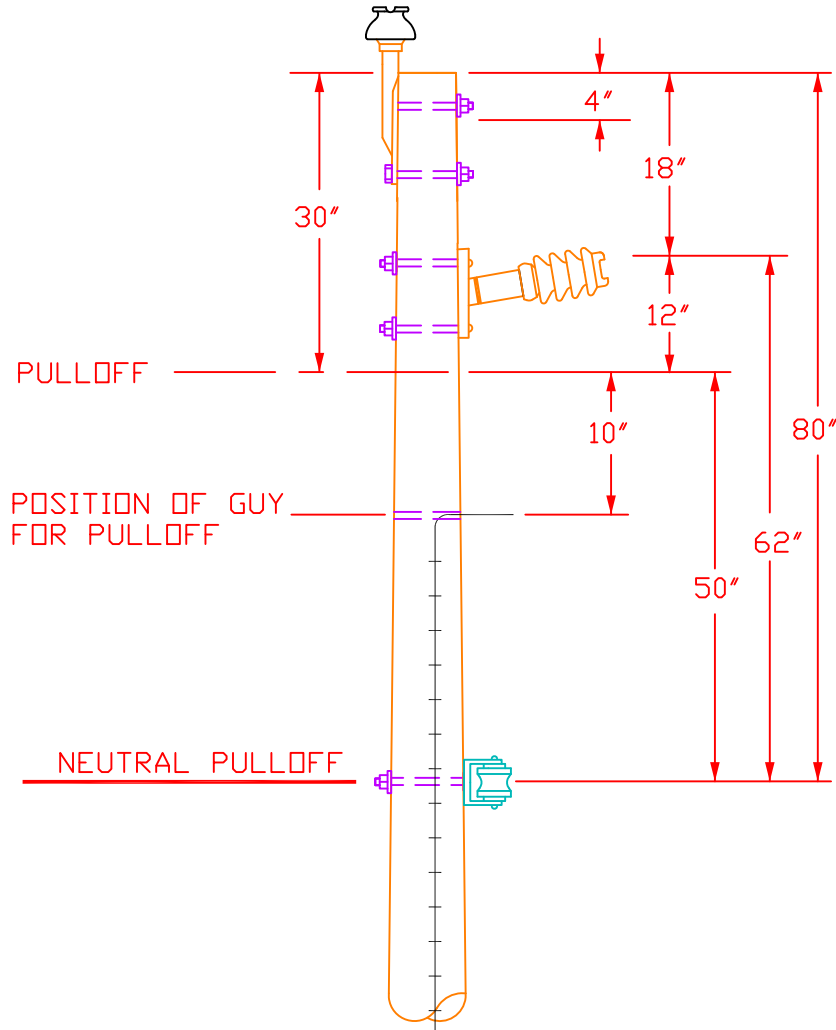
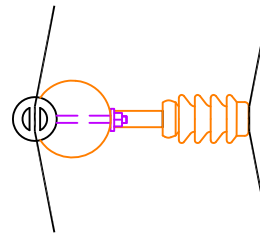
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DATE: OCTOBER, 1992

**B1F**







**0° - 6° LINE ANGLE**

**STANDARD CONFIGURATION,**  
**STRAIGHT LINE CONSTRUCTION**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"

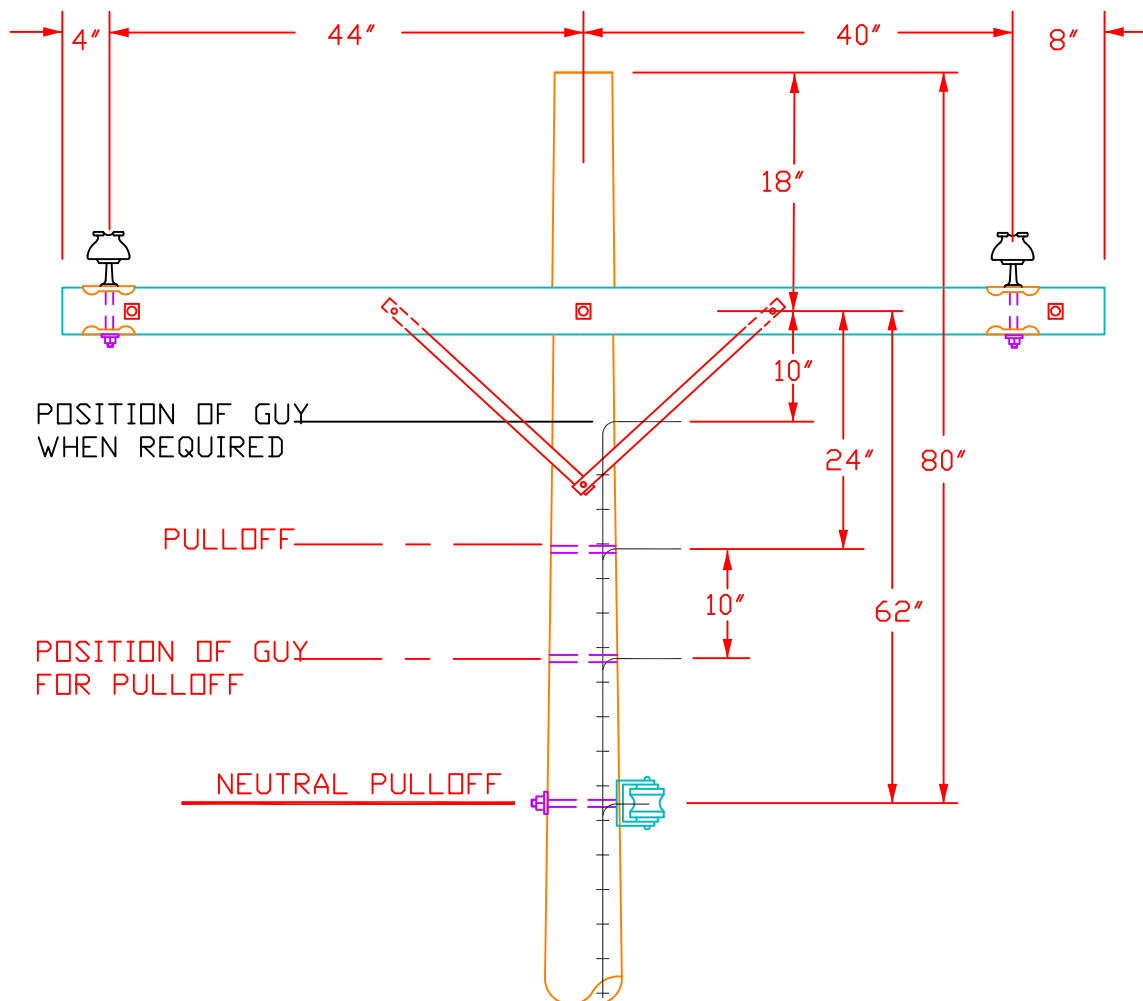
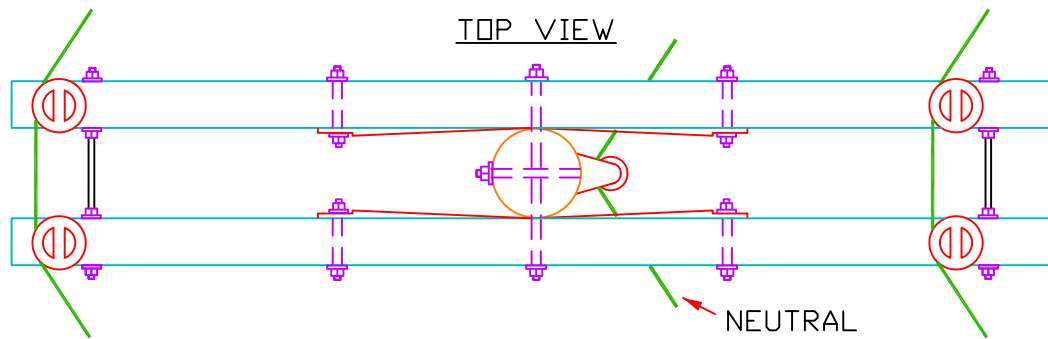


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**B1P**





**6° - 24° LINE ANGLE**

## **STANDARD CONFIGURATION,** **MEDIUM ANGLE, CROSSARM CONSTRUCTION**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



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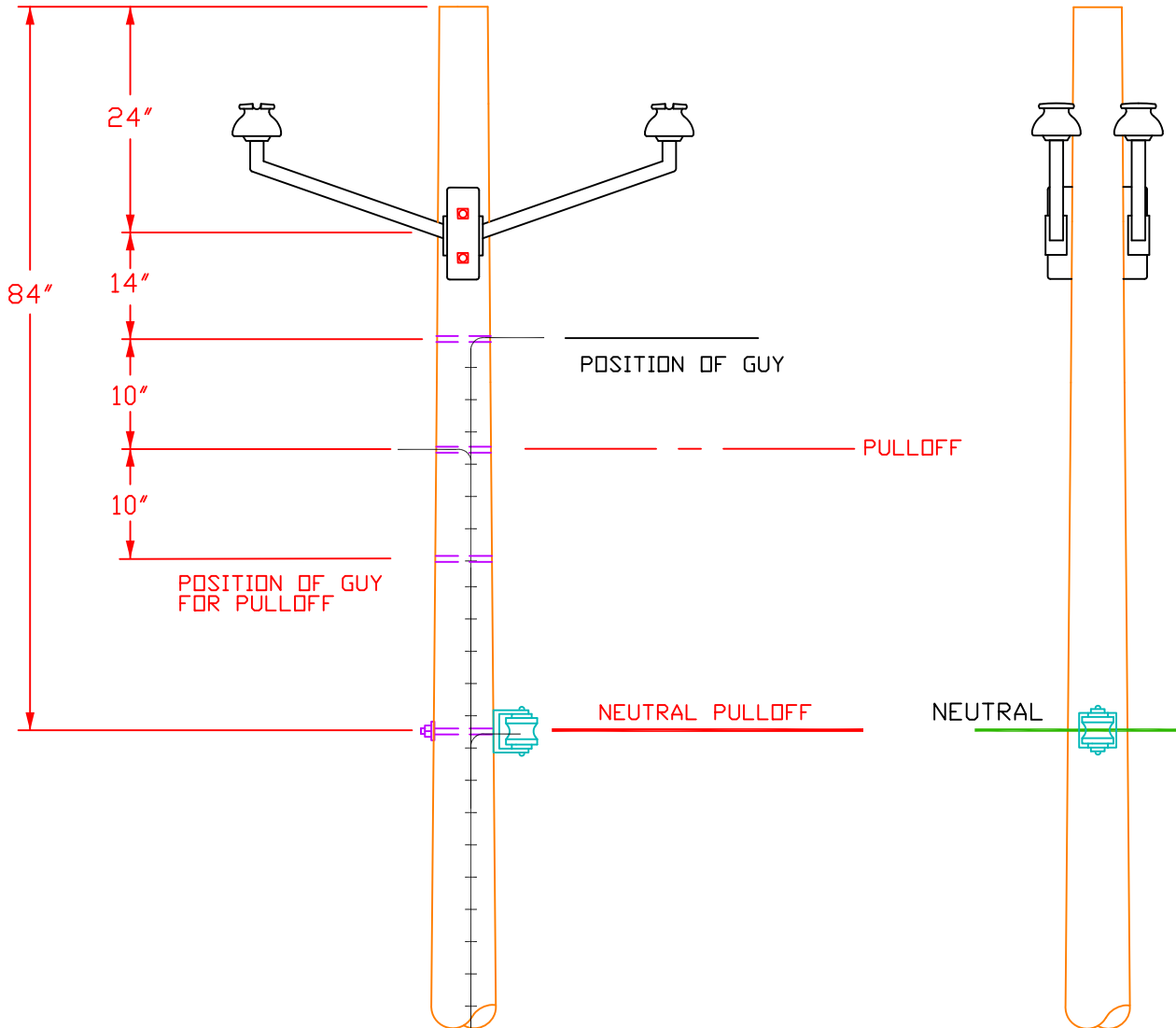
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**B2**



FRONT VIEW

SIDE VIEW



**6° - 24° LINE ANGLE**

**STANDARD CONFIGURATION,**  
**MEDIUM ANGLE CONSTRUCTION**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

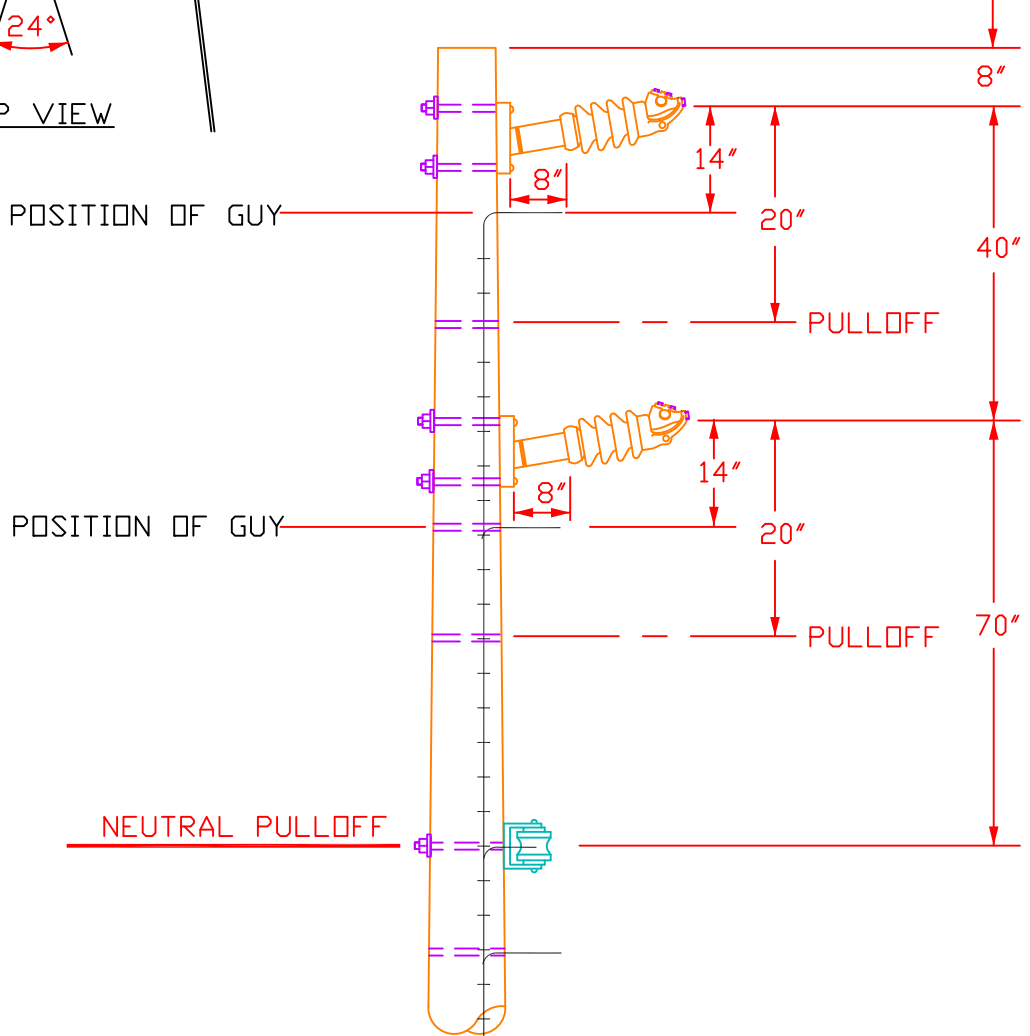
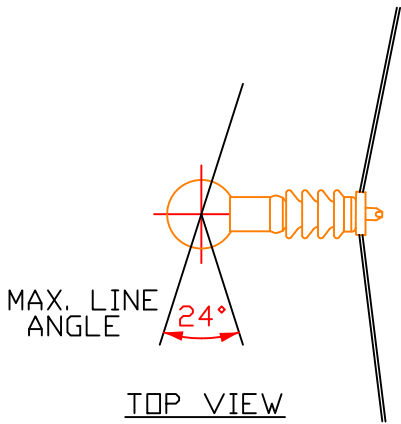


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**B2F**





**0° - 6° LINE ANGLE TIE TYPE**  
**6° - 24° LINE ANGLE CLAMP TYPE**

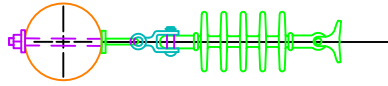
**STANDARD CONFIGURATION, VERTICAL STRAIGHT  
 LINE TO MEDIUM ANGLE CONSTRUCTION**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"

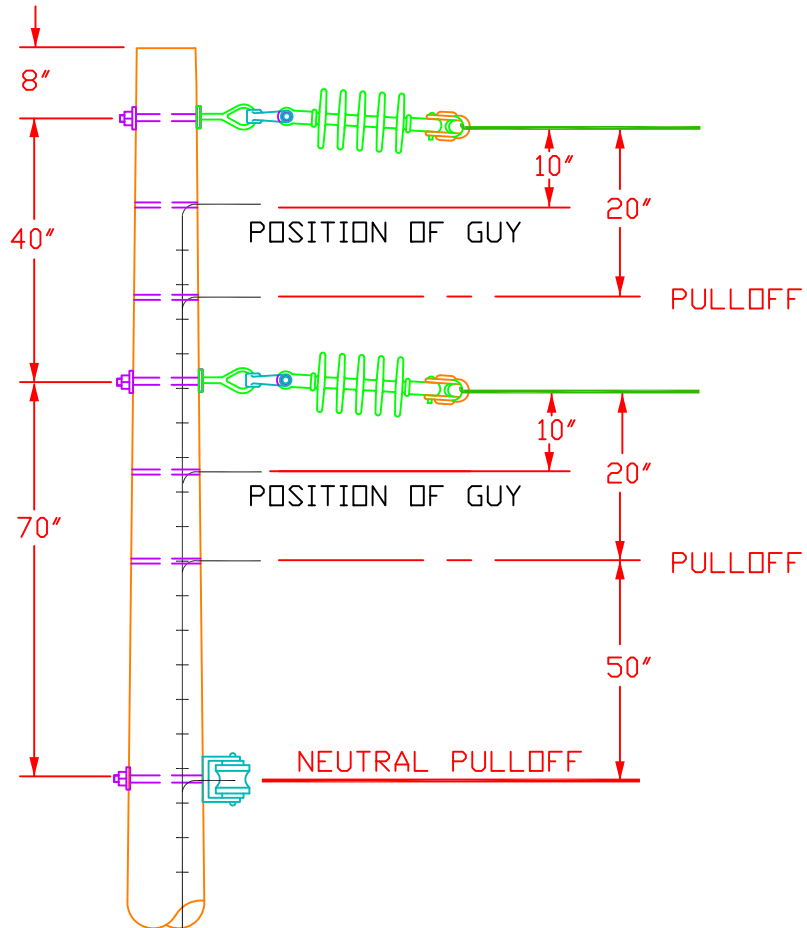
	REVISIONS <u>JULY, 2002</u> <u>JANUARY, 2006</u>	<b>B2V</b>
DATE: <u>OCTOBER, 1992</u>		







TOP VIEW



24° - 60° LINE ANGLE

## STANDARD CONFIGURATION, VERTICAL SUSPENSION

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



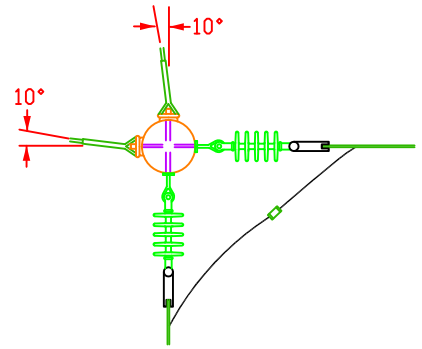
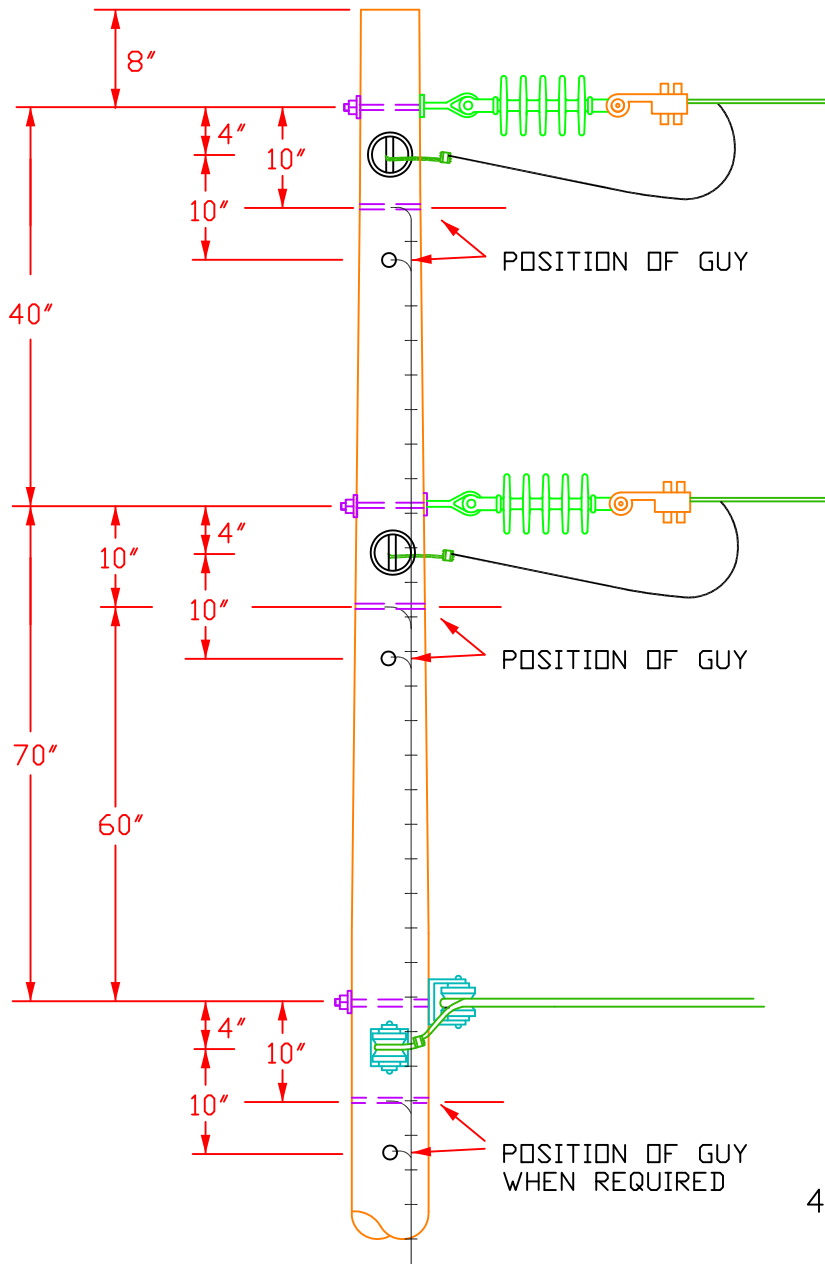
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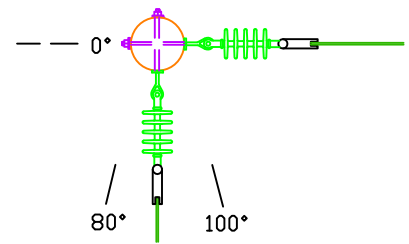
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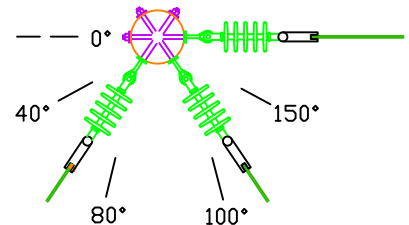


TOP VIEW

NOTE:  
LOCATE ANCHOR 10° OUTSIDE  
OF LINE ANGLE.



80° TO 100°  
LINE ANGLE



40° TO 80° & 100° TO 150°  
LINE ANGLE

**USE BOTTOM GUY POSITION ON WIRE SIZES LARGER THAN 1/0 ACSR**

**STANDARD CONFIGURATION,  
VERTICAL CONSTRUCTION, DOUBLE DEADEND ANGLE**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

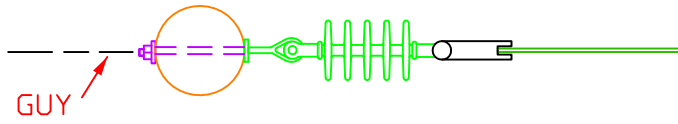


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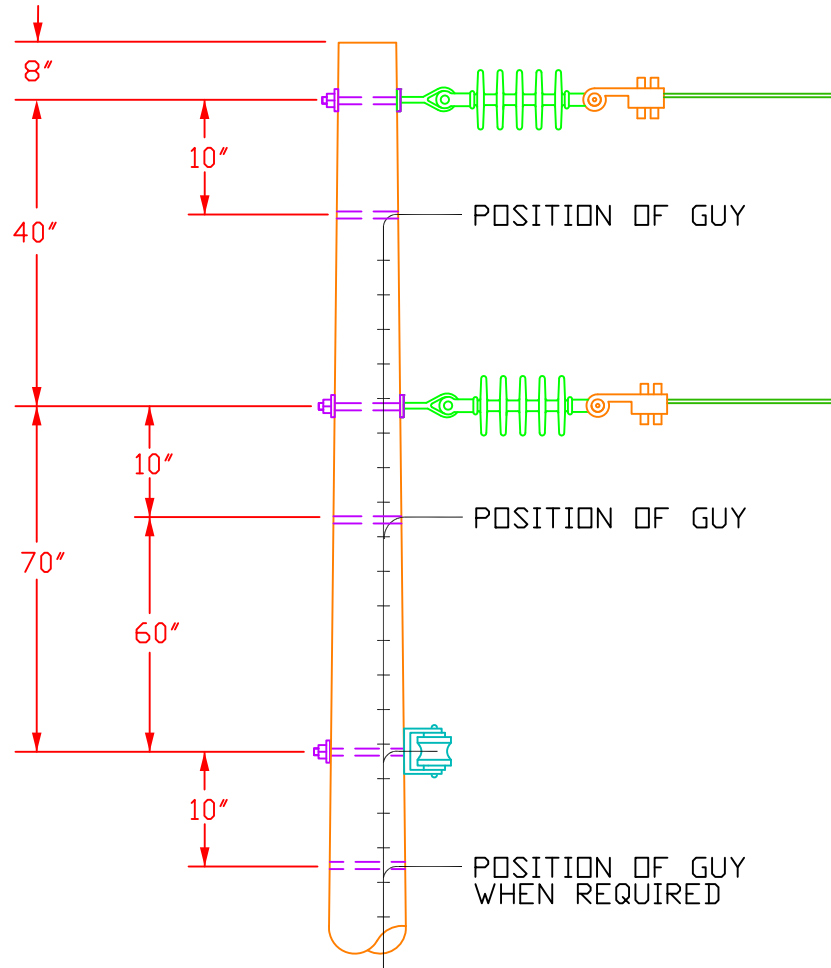
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**B4**





TOP VIEW



## VERTICAL CONSTRUCTION, DEADEND

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

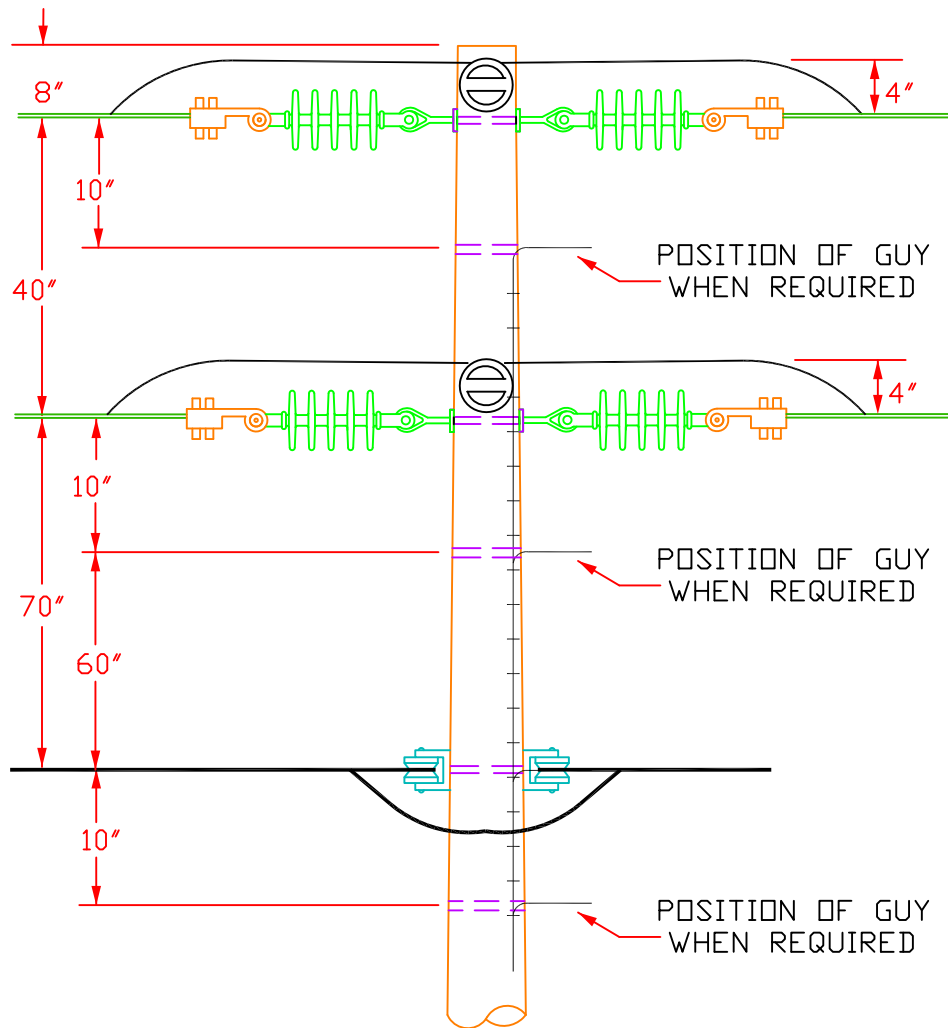


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**B5**





## VERTICAL CONSTRUCTION, DOUBLE DEADEND

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



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REVISIONS JULY, 2002  
JANUARY, 2007

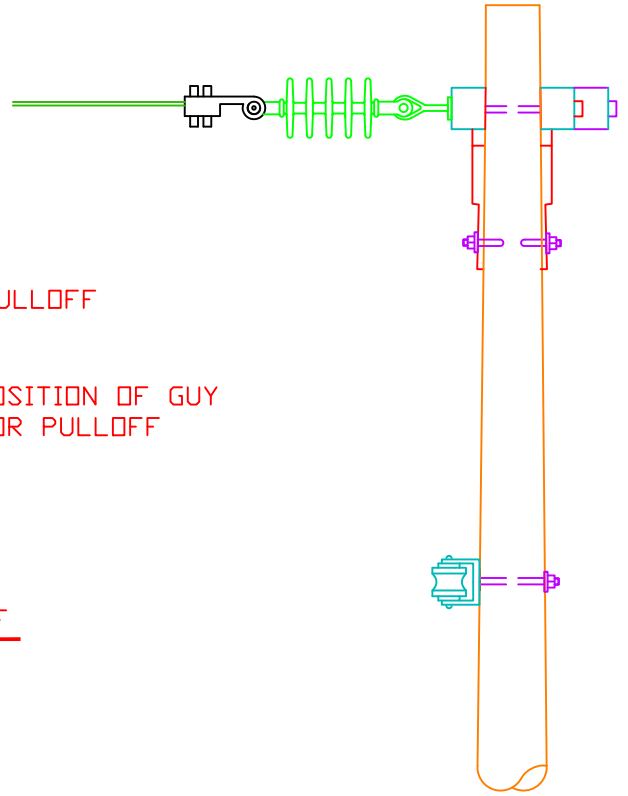
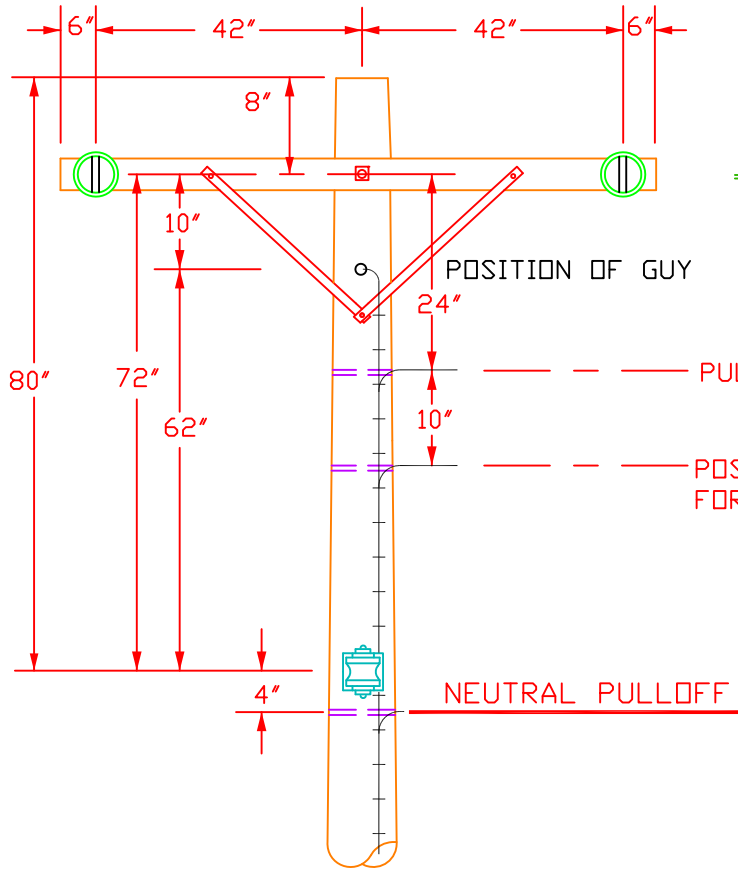
**B6**



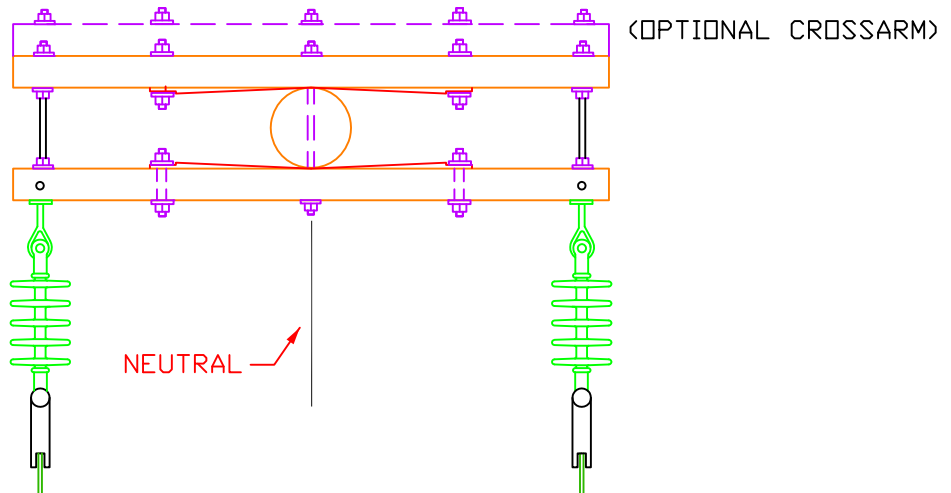


FRONT VIEW

SIDE VIEW



TOP VIEW



**CROSSARM CONSTRUCTION,  
DEADEND ON ARMS**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

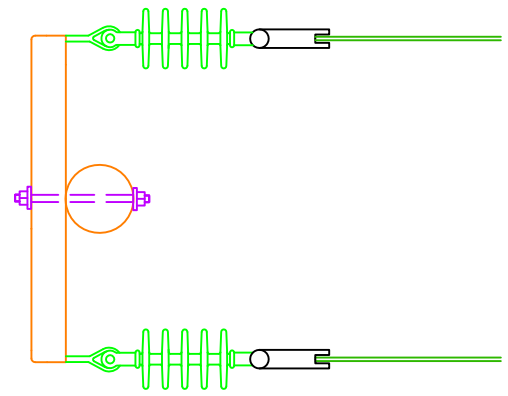


REVISIONS JULY, 2002  
JANUARY, 2007

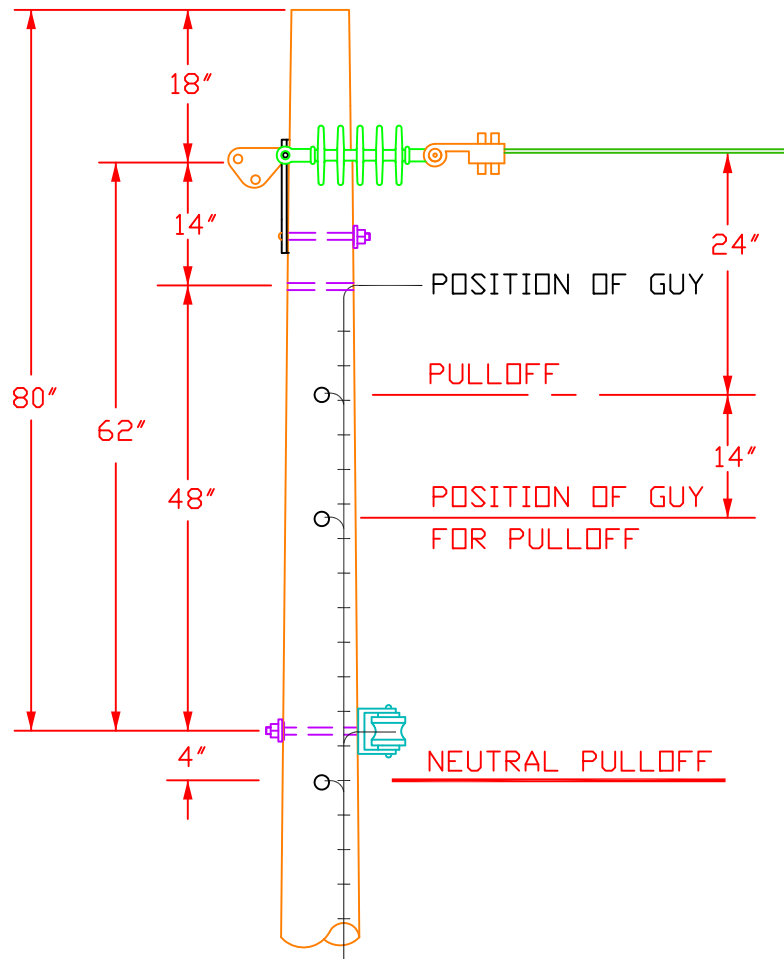
DATE: OCTOBER, 1992

**B7**





TOP VIEW



**STANDARD CONFIGURATION,**  
**HORIZONTAL DEADEND**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

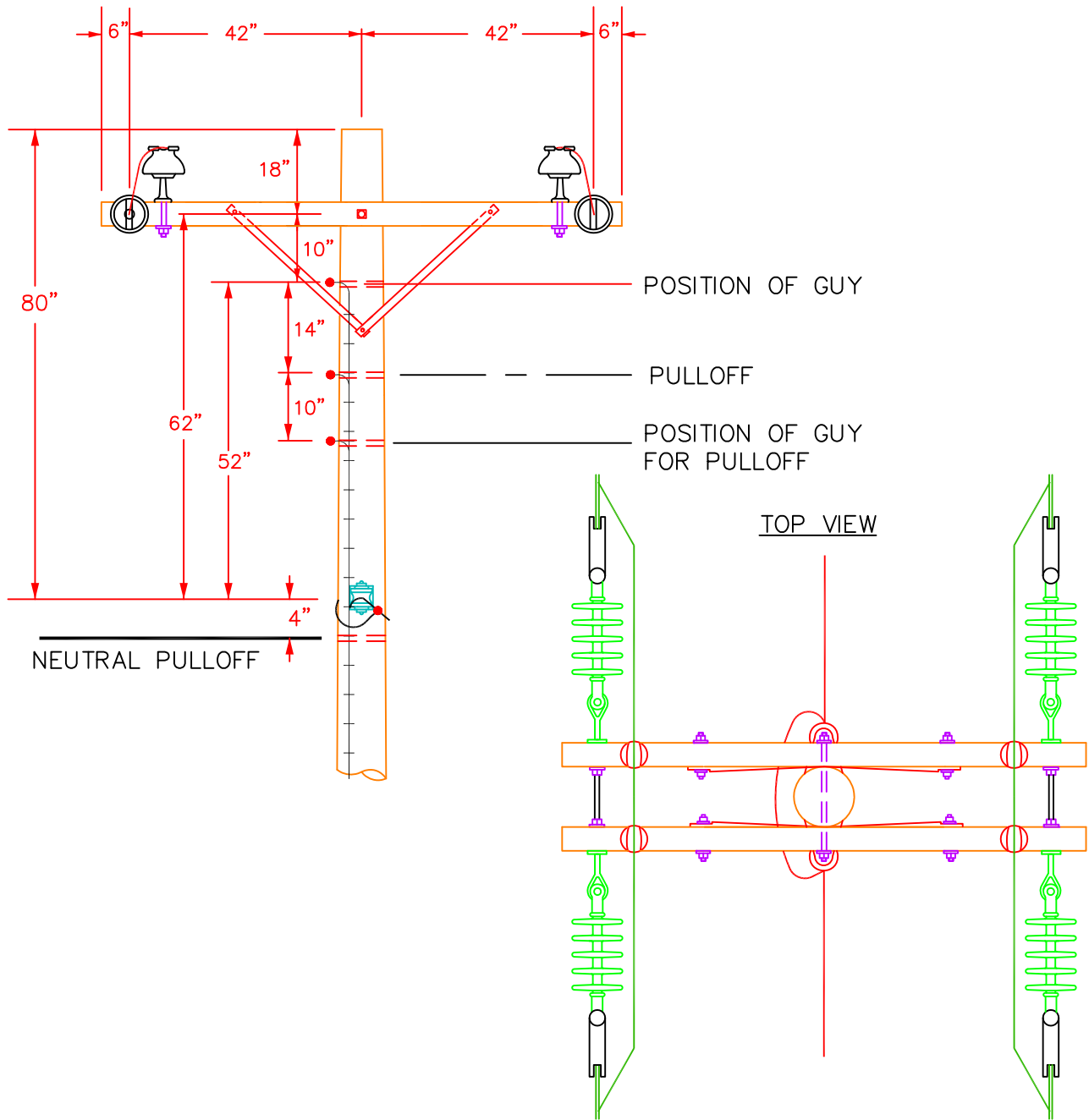


DATE: OCTOBER, 1992

REVISIONS JULY, 2002  
JANUARY, 2007

**B7S**





**0° - 24° LINE ANGLE**

## **CROSSARM CONSTRUCTION, HORIZONTAL DOUBLE DEADEND**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



DATE: OCTOBER, 1992

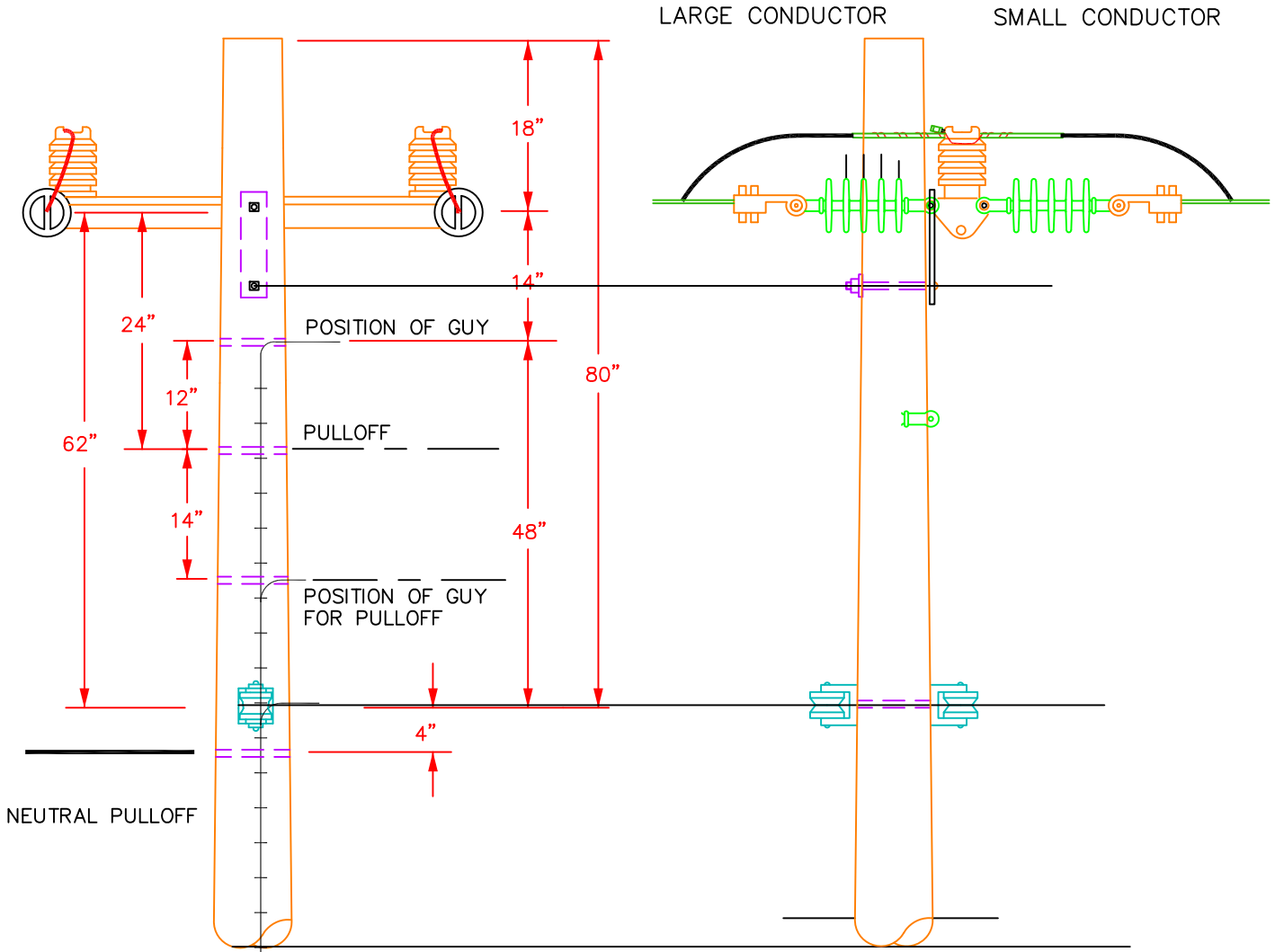
REVISIONS JULY, 2002  
JANUARY, 2007

**B8**



FRONT VIEW

SIDE VIEW



**0° - 24° LINE ANGLE**

**STANDARD CONFIGURATION,  
HORIZONTAL DOUBLE DEADEND, WIRE SIZE CHANGE**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



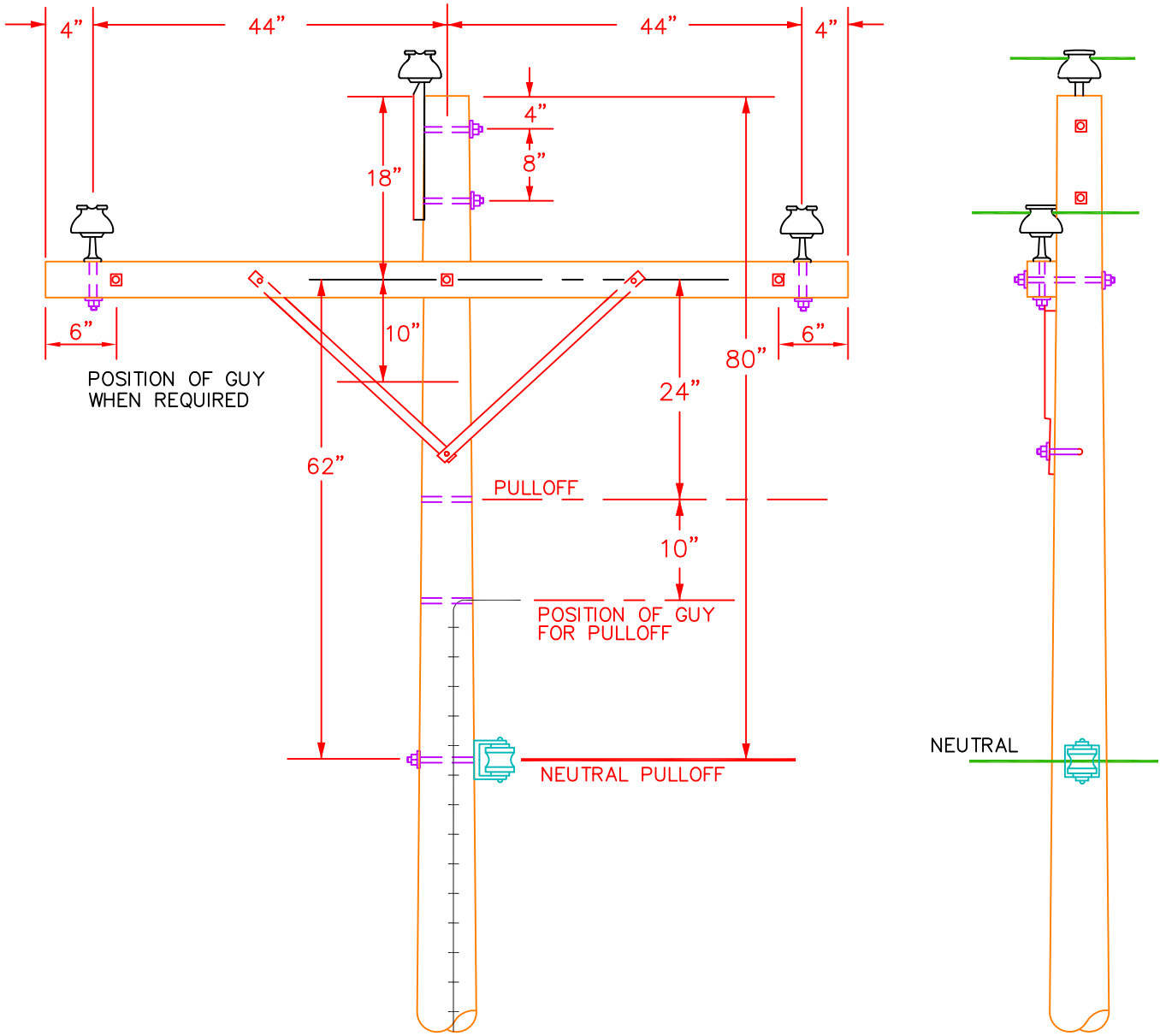
REVISIONS JULY, 2002  
JANUARY, 2007

**B8S**

DATE: OCTOBER, 1992







**0° - 6° LINE ANGLE TIE TYPE**

**STANDARD CONFIGURATION, STRAIGHT LINE CROSSARM CONSTRUCTION, SINGLE ARM SUPPORT**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"

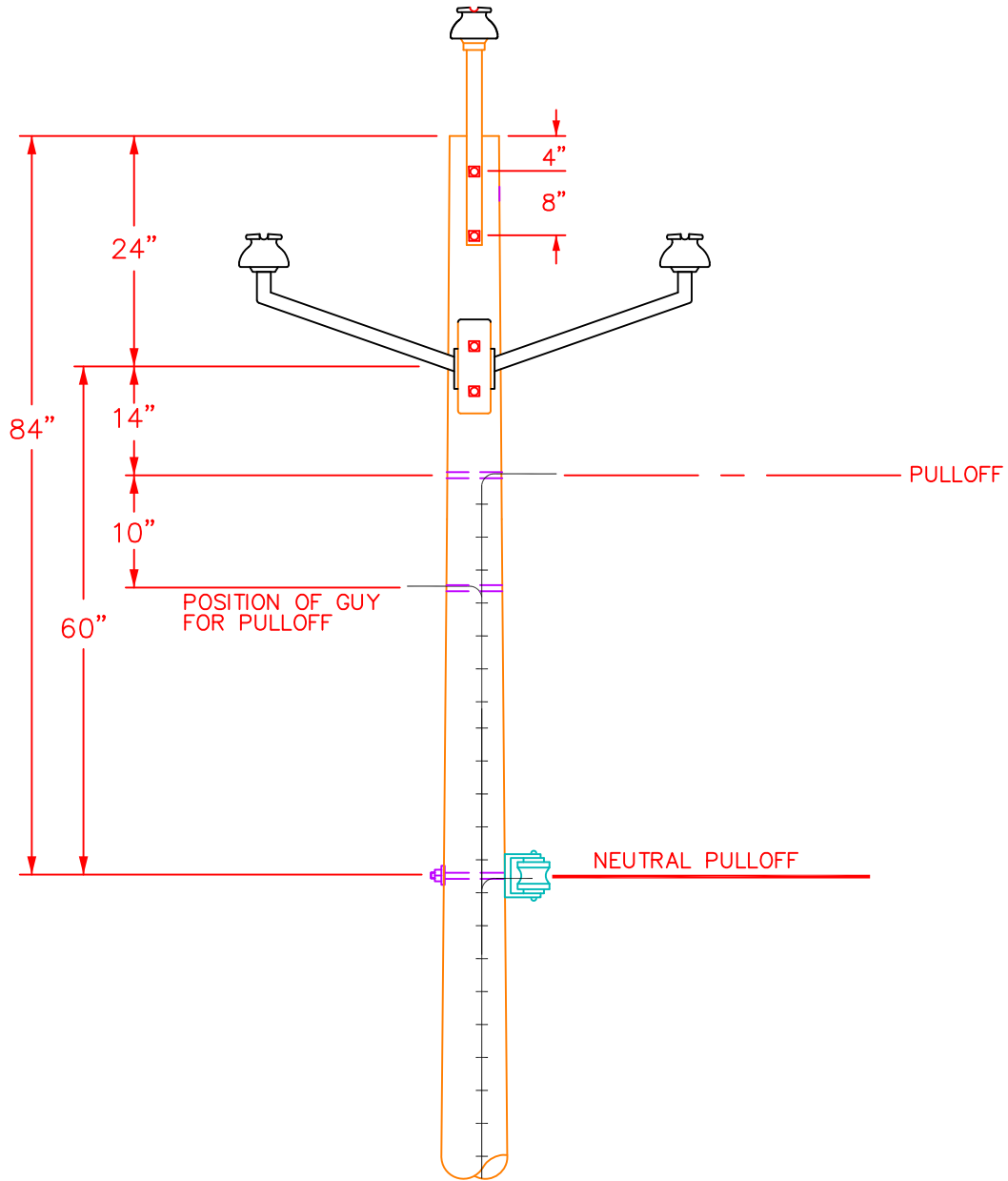


REVISIONS JULY, 2002

DATE: OCTOBER, 1992

**C1**





**0° - 6° LINE ANGLE**

**STANDARD CONFIGURATION,**  
**STRAIGHT LINE CONSTRUCTION**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"

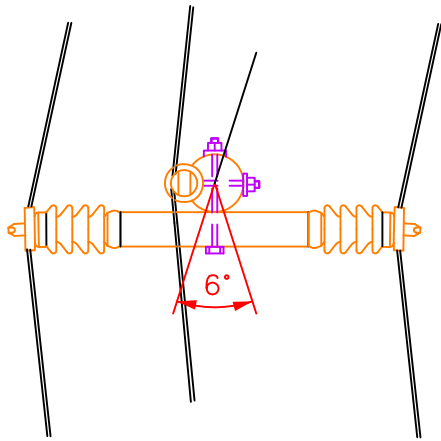


REVISIONS JULY, 2002

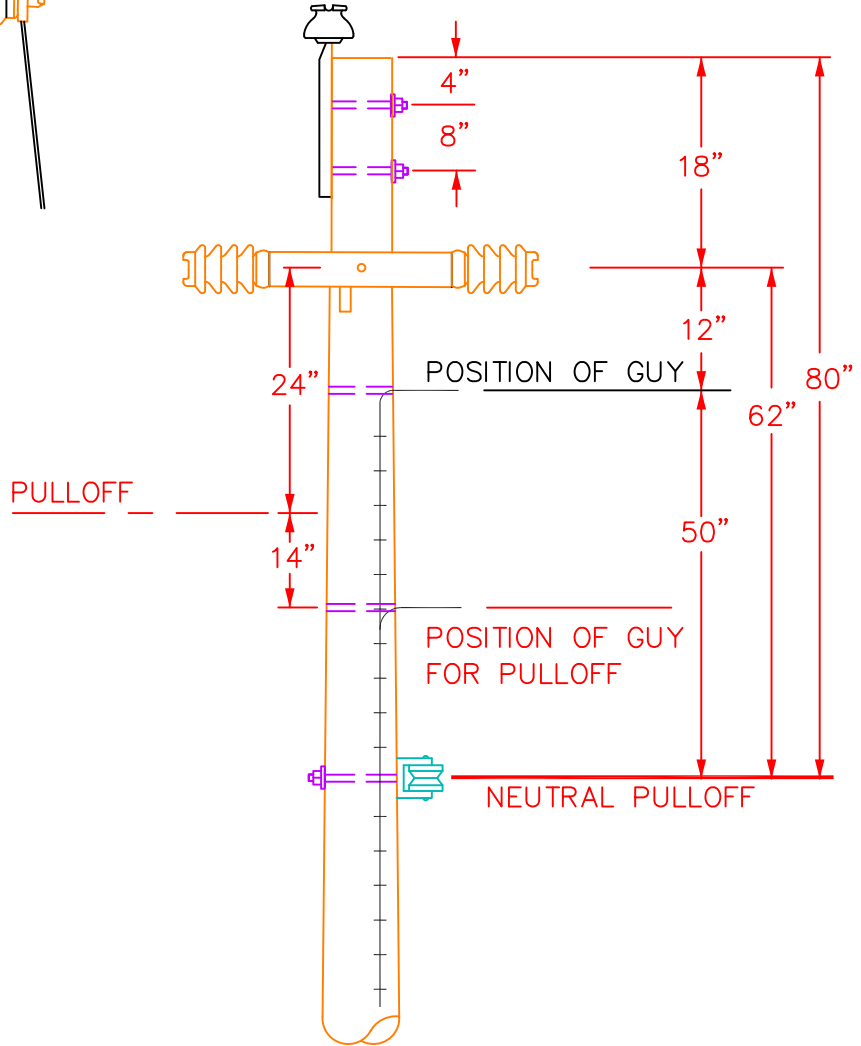
DATE: OCTOBER, 1992

**C1F**





TOP VIEW



**0° - 6° LINE ANGLE**

**STANDARD CONFIGURATION,  
STRAIGHT LINE CONSTRUCTION**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

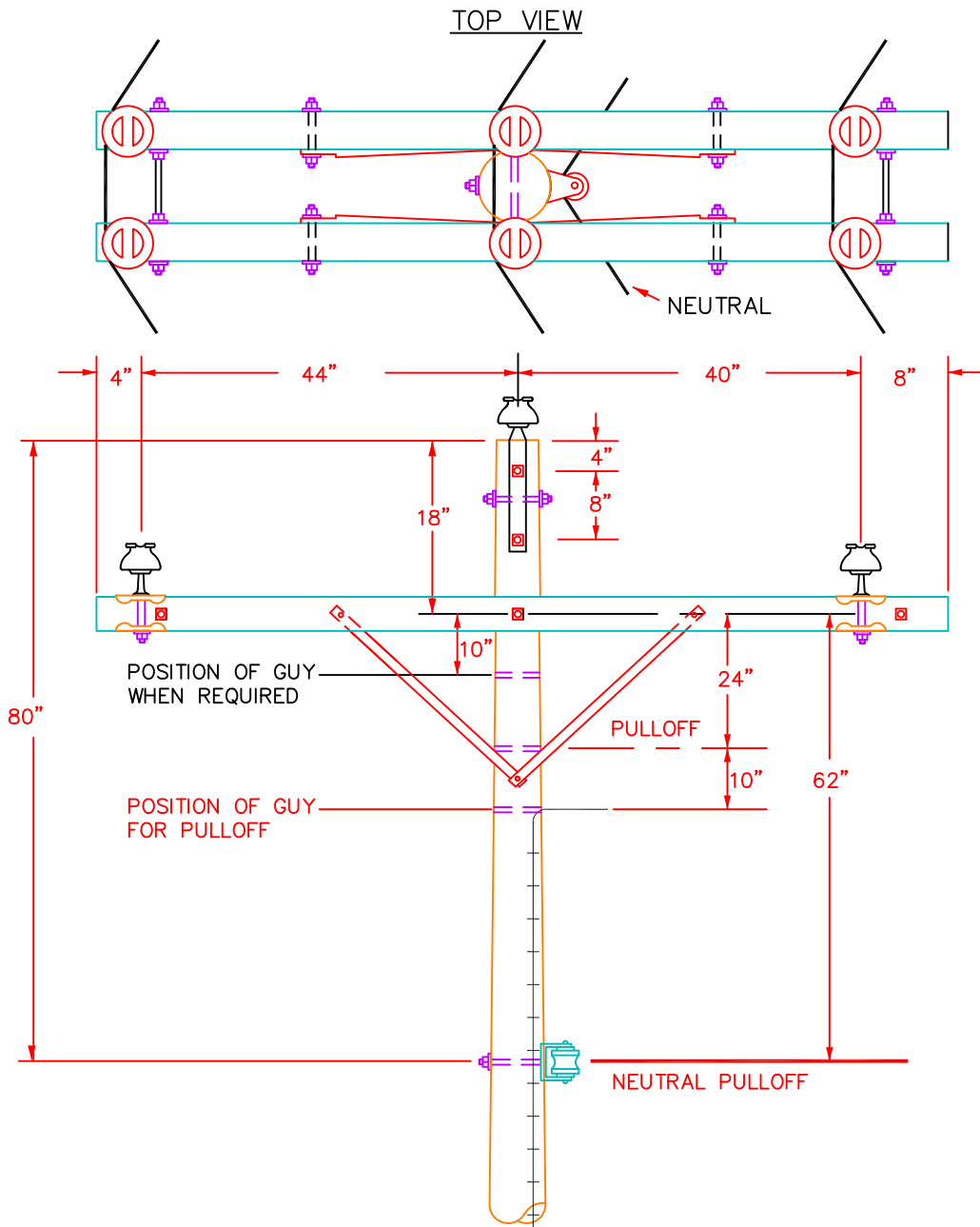


REVISIONS JULY, 2002

DATE: OCTOBER, 1992

**C1PS**





**6° - 24° LINE ANGLE**

**STANDARD CONFIGURATION,**  
**MEDIUM ANGLE, CROSSARM CONSTRUCTION**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"



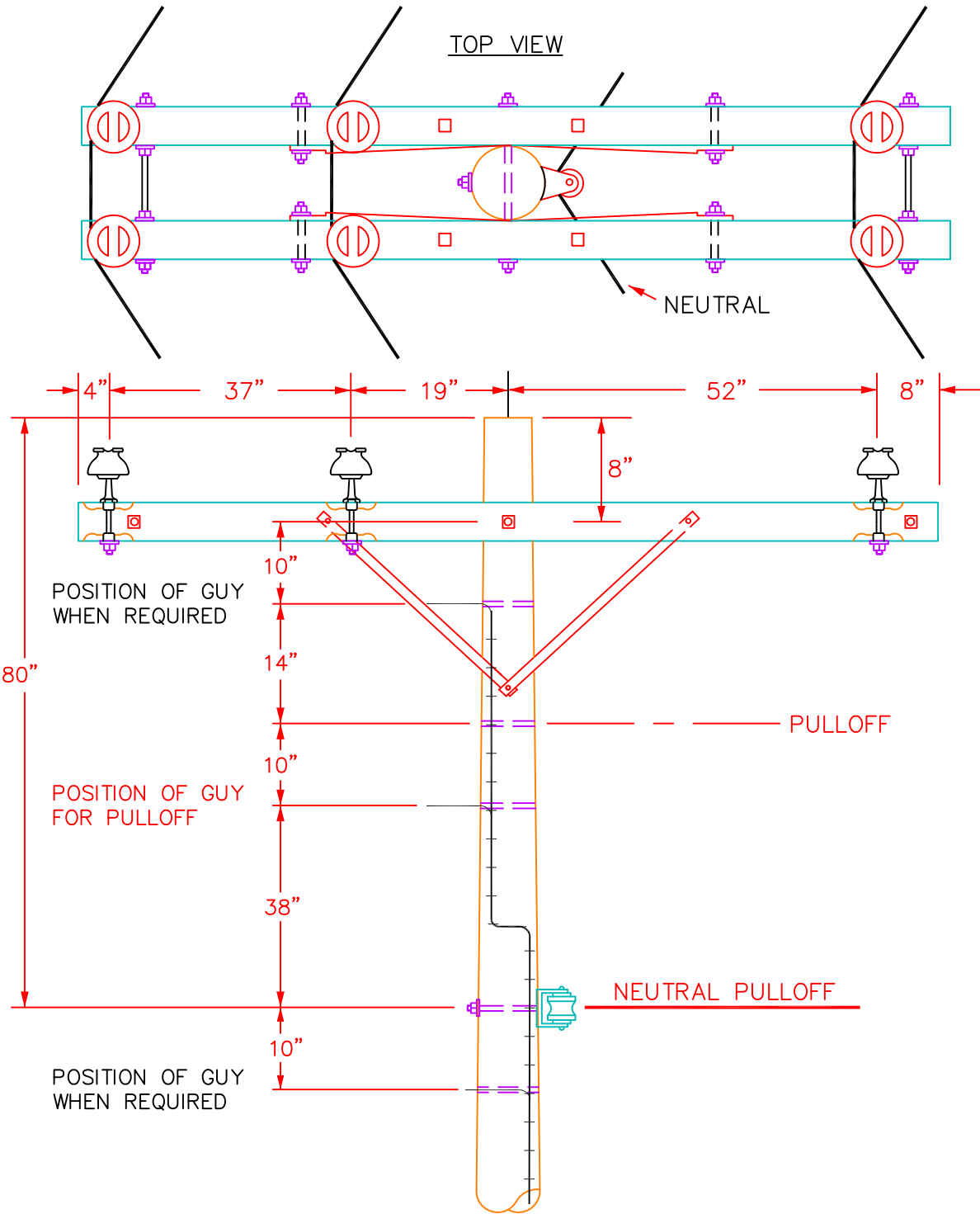
REVISIONS JULY, 2002

DATE: OCTOBER, 1992

**C2**







**6° - 24° LINE ANGLE**

**ALTERNATE CONFIGURATION,**  
**MEDIUM ANGLE, CROSSARM CONSTRUCTION**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"



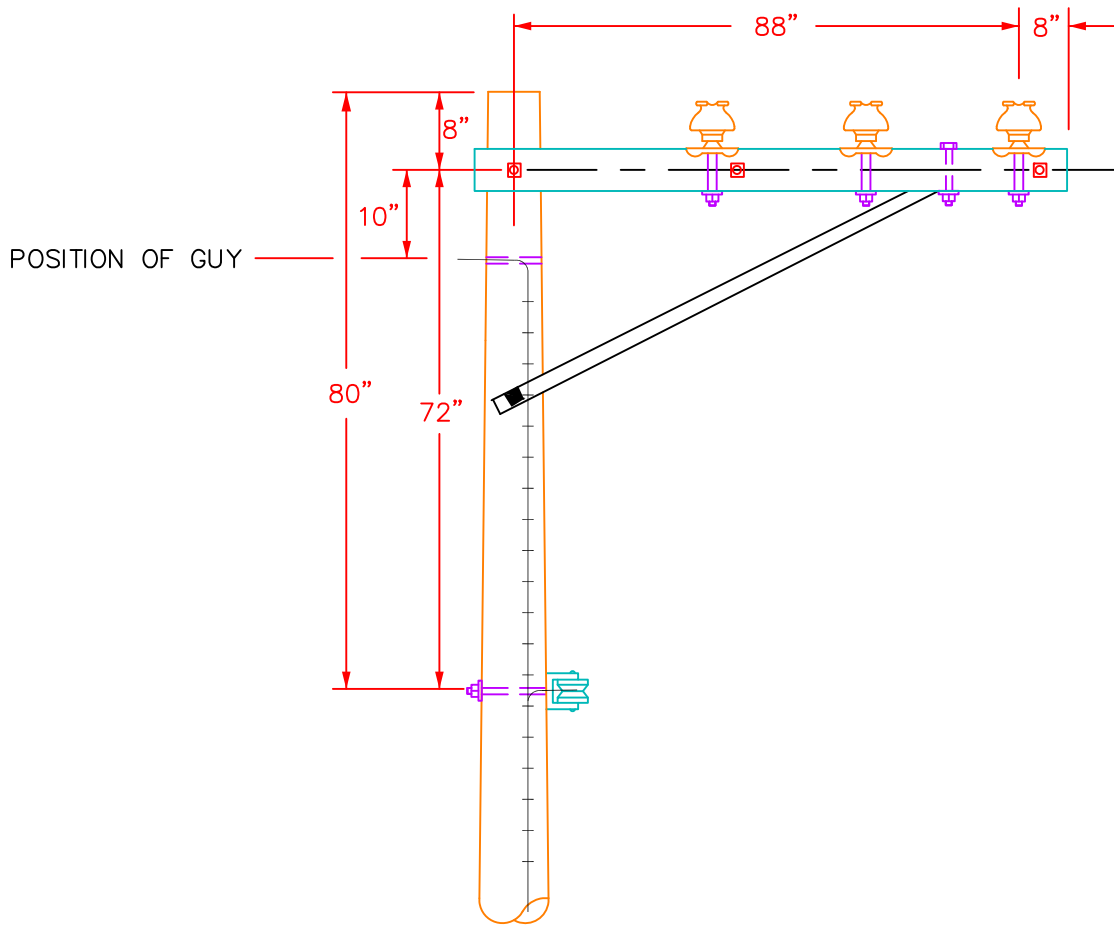
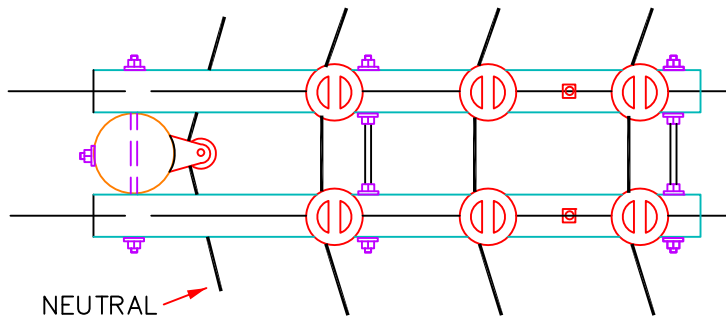
DATE: OCTOBER, 1992

REVISIONS JULY, 2002

**C2-1**



TOP VIEW



**0° - 10° LINE ANGLE THROUGH 1/0 ACSR**  
**0° - 8° LINE ANGLE ABOVE 1/0 ACSR**  
**N/A - 750 AAC**

**ALLEY ARM CONSTRUCTION**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

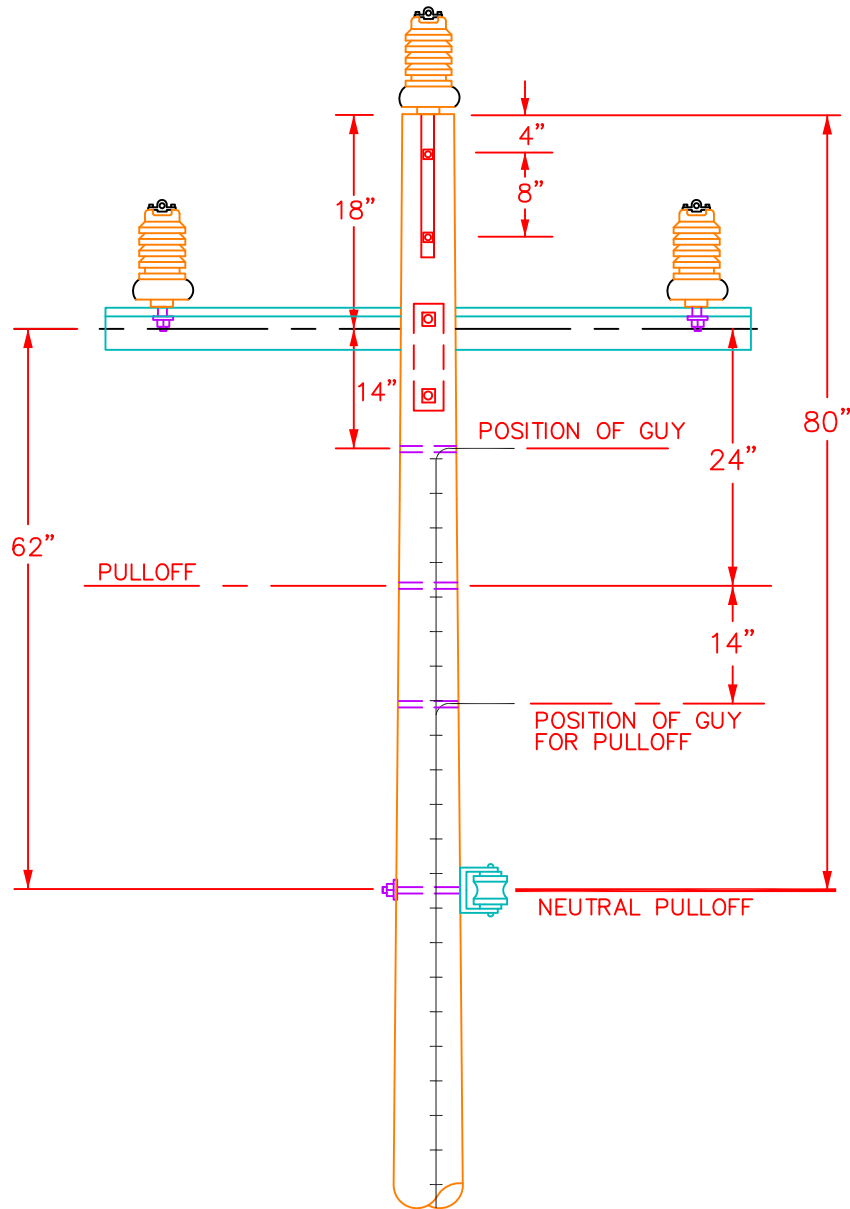


DATE: OCTOBER, 1992

REVISIONS JULY, 2002

**C2-2A**





**0° - 10° LINE ANGLE THROUGH 1/0 ACSR**  
**0° - 20° LINE ANGLE ABOVE 1/0 ACSR**

**STEEL ARM,**  
**MEDIUM ANGLE CONSTRUCTION**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"



DATE: OCTOBER, 1992

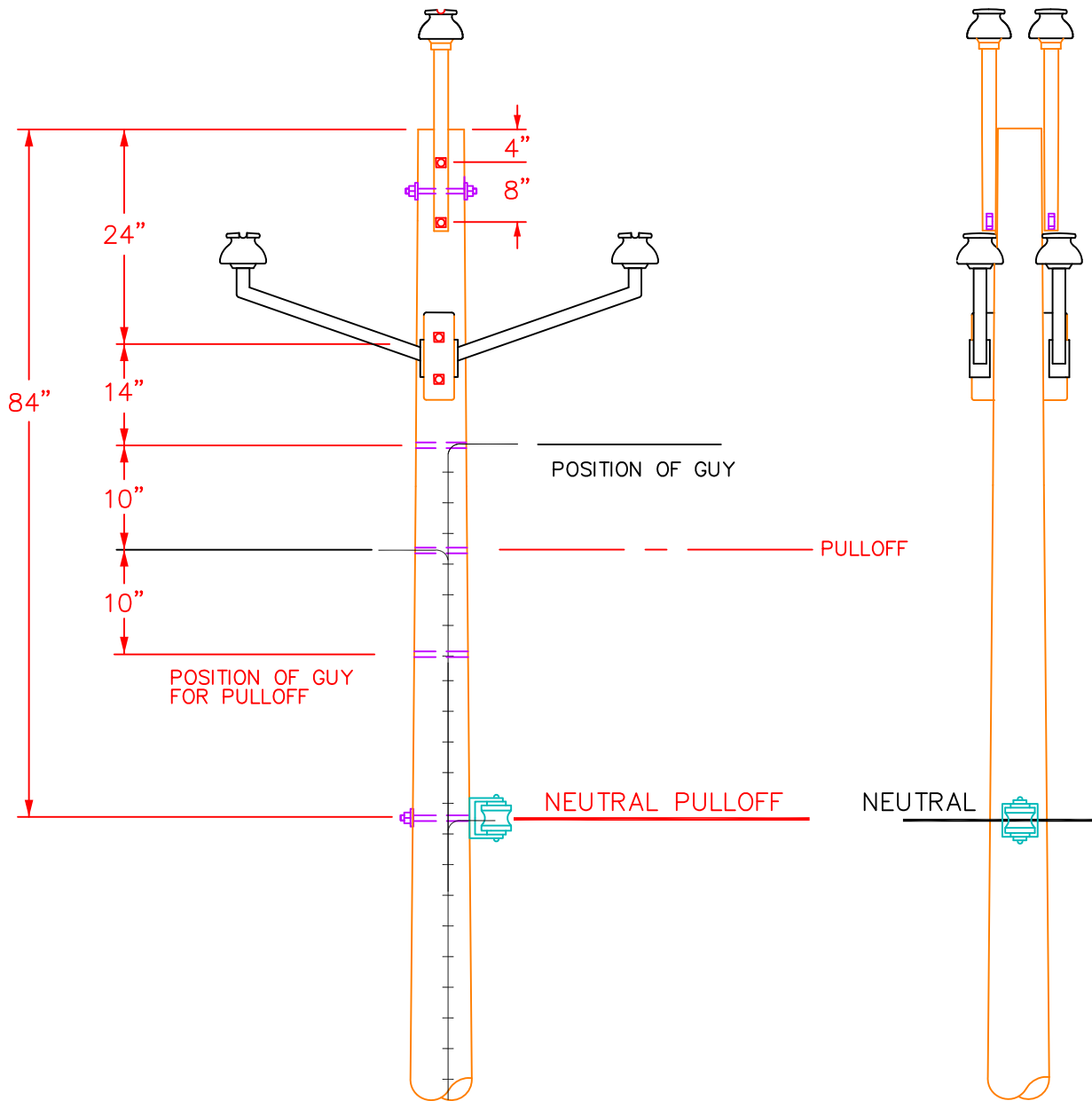
REVISIONS JULY, 2002

**C2-2S**



FRONT VIEW

SIDE VIEW



6° - 24° LINE ANGLE

**STANDARD CONFIGURATION,  
MEDIUM ANGLE CONSTRUCTION**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



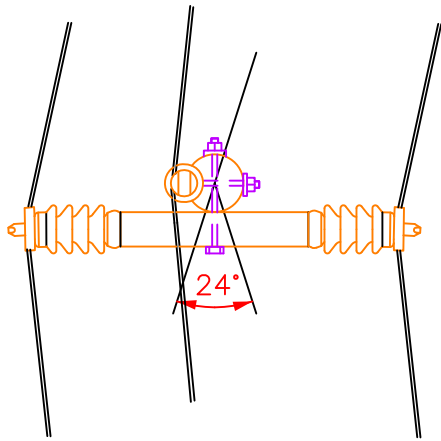
REVISIONS JULY, 2002

DATE: OCTOBER, 1992

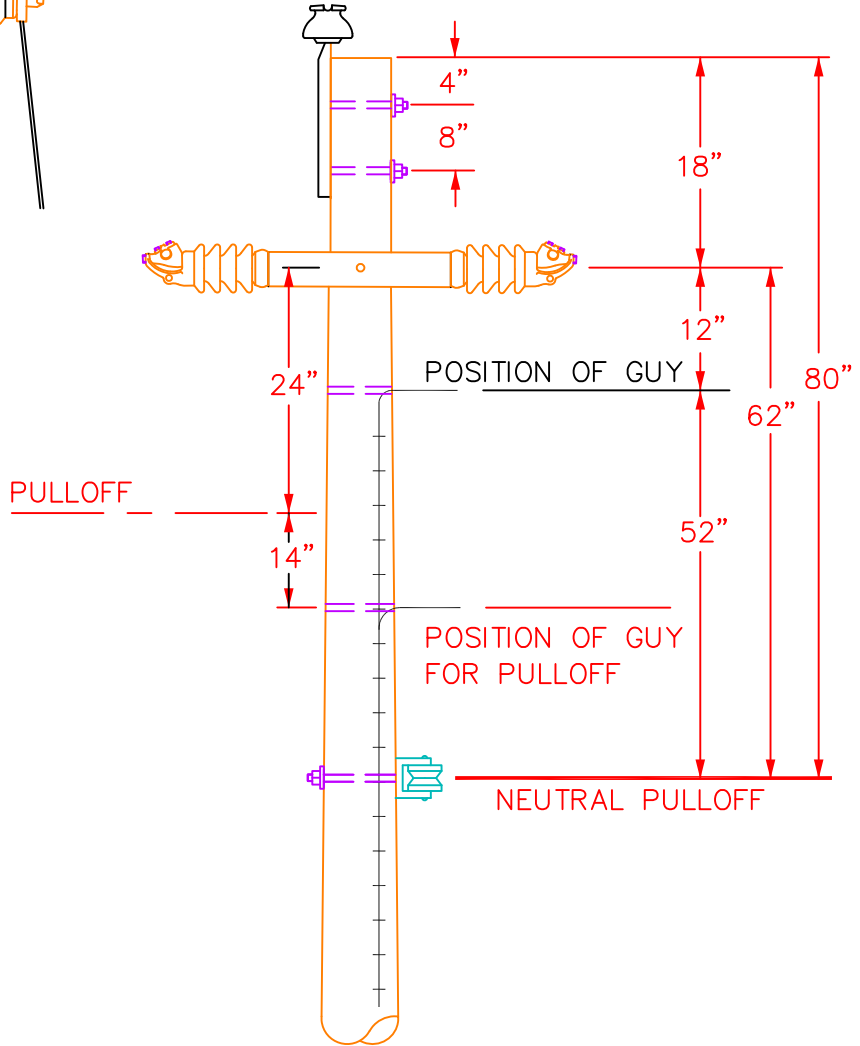
**C2F**







TOP VIEW



**6° - 10° LINE ANGLE ABOVE 1/0 ACSR**  
**6° - 24° LINE ANGLE THROUGH 1/0 ACSR**

**STANDARD CONFIGURATION,  
 MEDIUM ANGLE CONSTRUCTION**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"



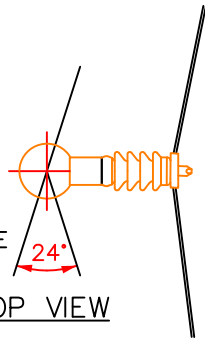
DATE: OCTOBER, 1992

REVISIONS JULY, 2002  
JANUARY, 2006

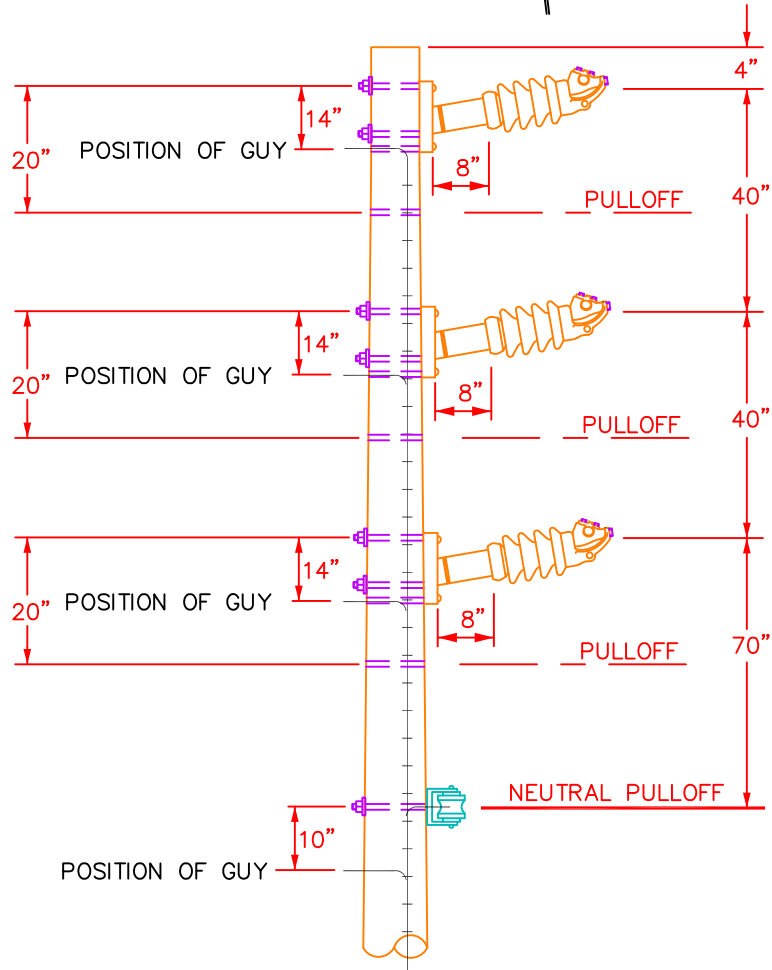
**C2PS**



MAX. LINE  
ANGLE



TOP VIEW



**0° - 6° LINE ANGLE TIE TYPE  
6° - 24° LINE ANGLE CLAMP TYPE  
USE ALL 4 GUY POSITIONS ON WIRE SIZES LARGER THAN 1/0 ACSR  
STANDARD CONFIGURATION, VERTICAL STRAIGHT  
LINE TO MEDIUM ANGLE CONSTRUCTION**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



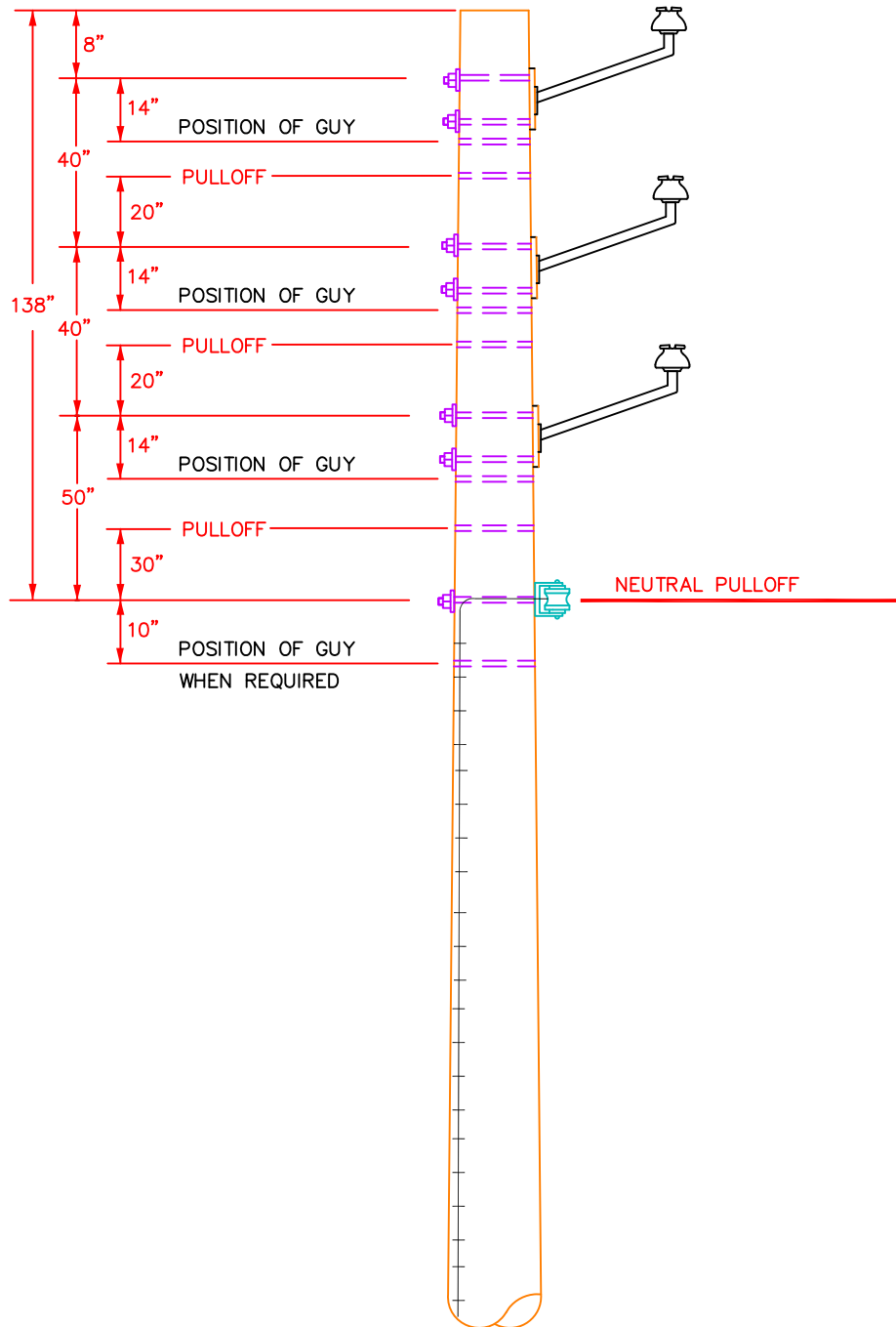
REVISIONS JULY, 2002

JANUARY, 2006

DATE: OCTOBER, 1992

**C2V**





**0° - 10° LINE ANGLE ABOVE 1/0 ACSR**  
**0° - 20° LINE ANGLE THROUGH 1/0 ACSR**

**STANDARD CONFIGURATION,  
 STRAIGHT LINE TO MEDIUM ANGLE CONSTRUCTION**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"

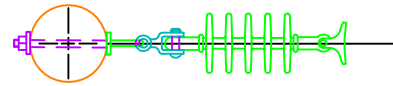


REVISIONS JULY, 2002

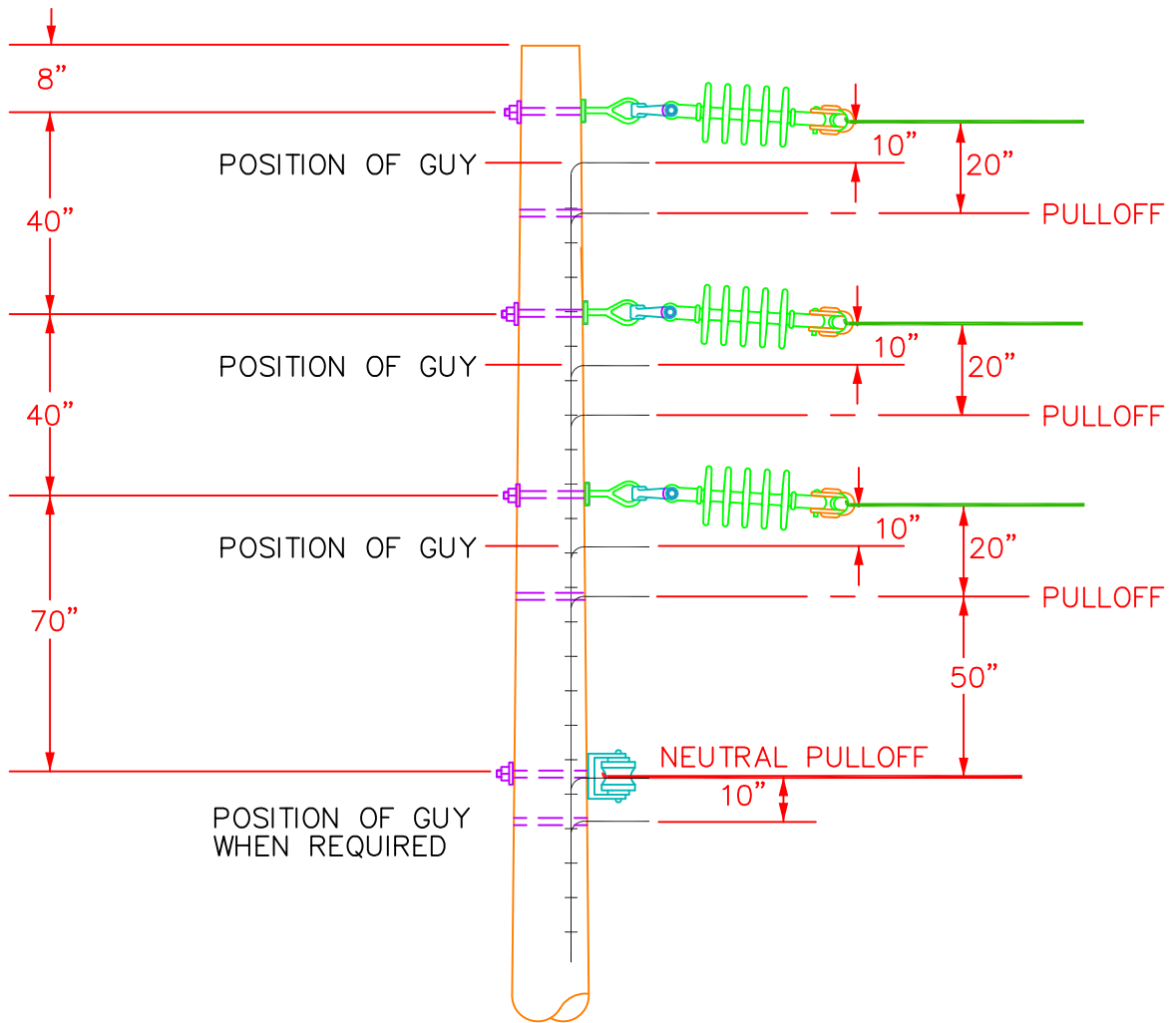
**C2VF**

DATE: OCTOBER, 1992





TOP VIEW



**24° - 60° LINE ANGLE**  
**USE ALL 4 GUY POSITIONS ON WIRE SIZES LARGER THAN 1/0 ACSR**  
**STANDARD CONFIGURATION,**  
**VERTICAL SUSPENSION**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"



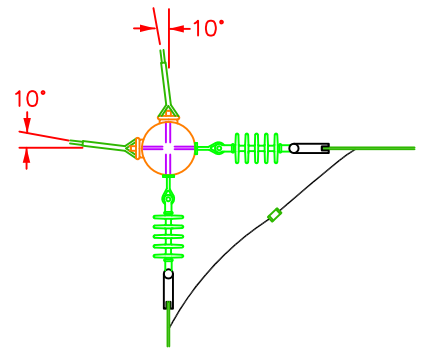
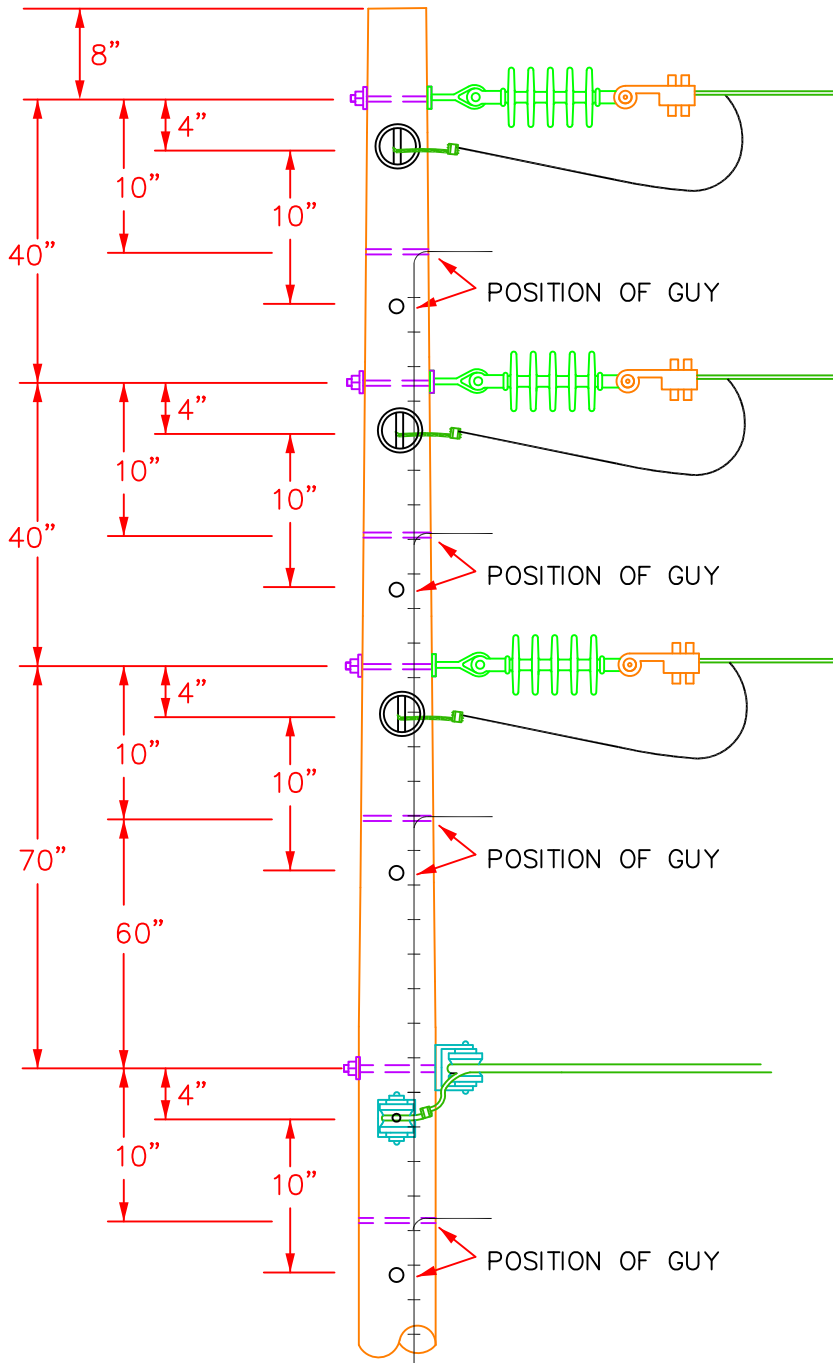
DATE: OCTOBER, 1992

REVISIONS JULY, 2002  
JANUARY, 2007

**C3**

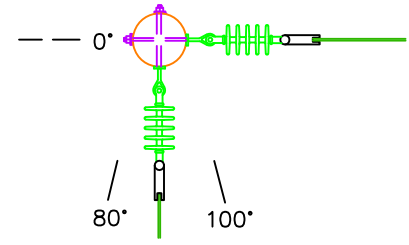




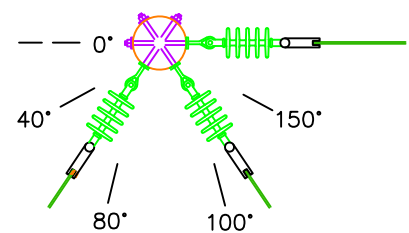


TOP VIEW

NOTE:  
LOCATE ANCHOR 10° OUTSIDE  
OF LINE ANGLE.



80° TO 100°  
LINE ANGLE



40° TO 80° & 100° TO 150°  
LINE ANGLE

**USE ALL 4 GUY POSITIONS ON WIRE SIZES LARGER THAN 1/0 ACSR**  
**STANDARD CONFIGURATION, VERTICAL**  
**CONSTRUCTION, DOUBLE DEADEND ANGLE**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

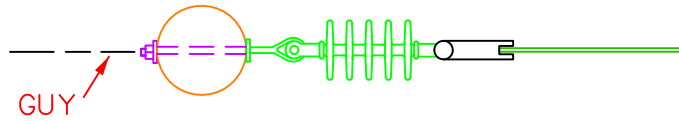


REVISIONS JULY, 2002  
 JANUARY, 2007

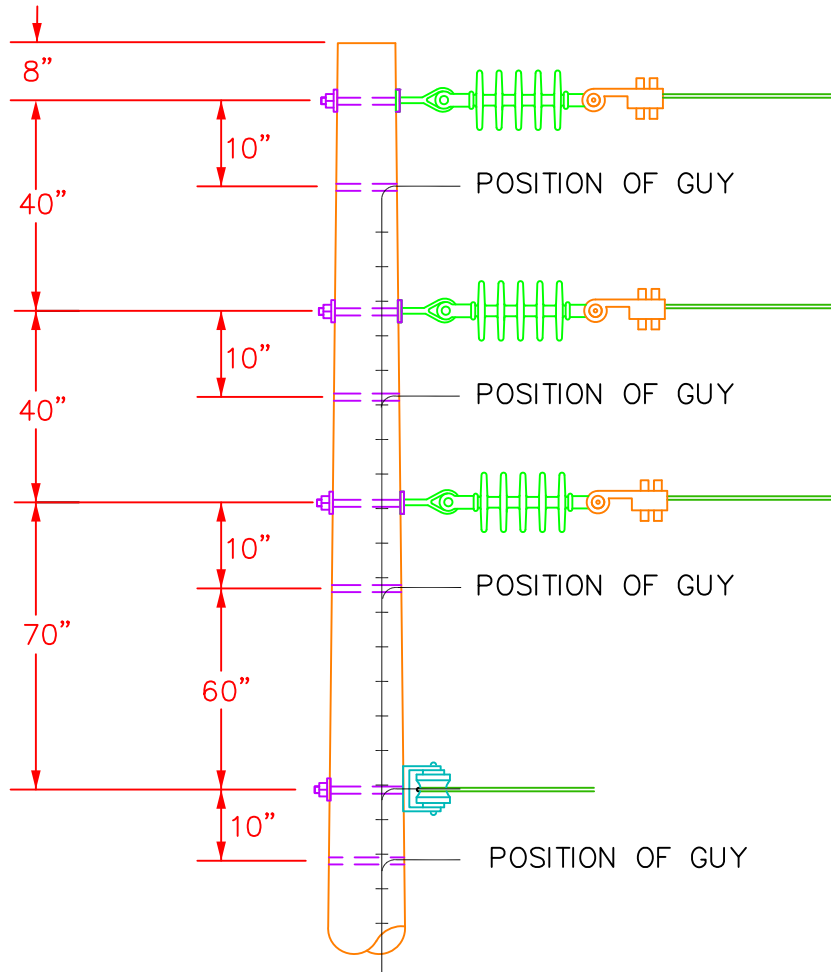
DATE: OCTOBER, 1992

**C4**





TOP VIEW



**USE ALL 4 GUY POSITIONS ON WIRE SIZES LARGER THAN 1/0 ACSR**

**VERTICAL CONSTRUCTION, DEADEND**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

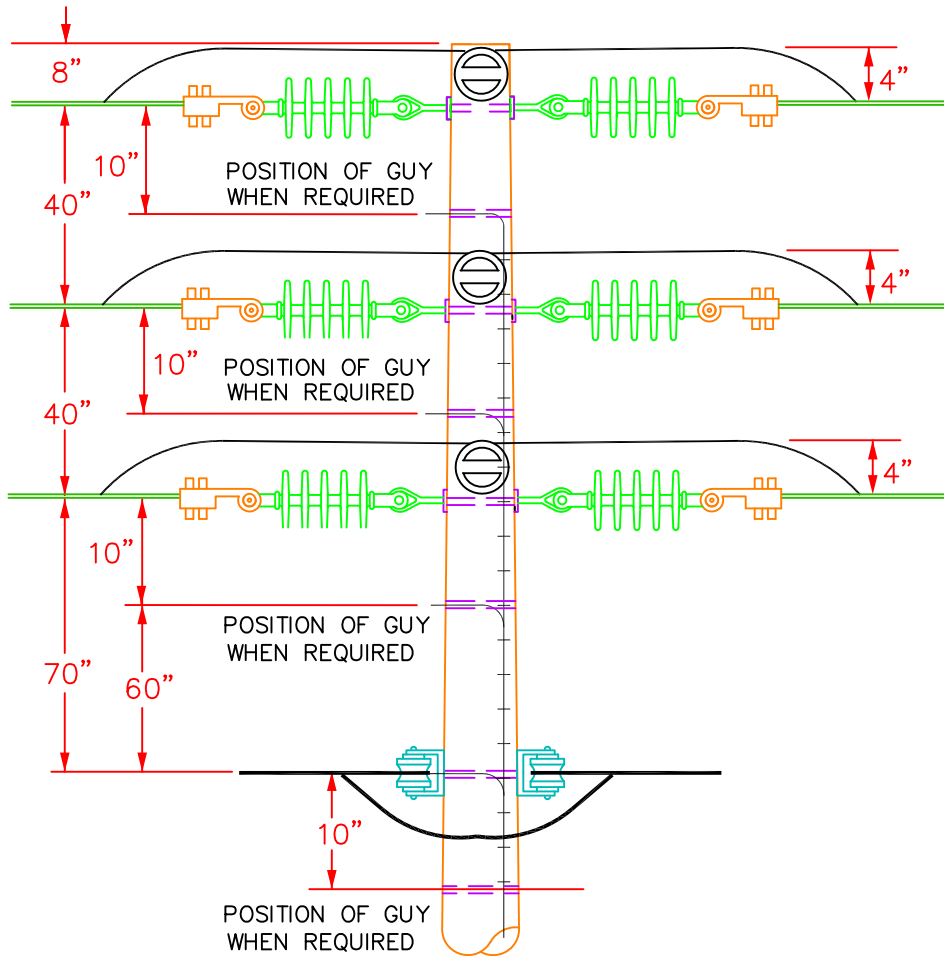


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JANUARY, 2007

DATE: OCTOBER, 1992

**C5**





## VERTICAL CONSTRUCTION, DOUBLE DEADEND

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



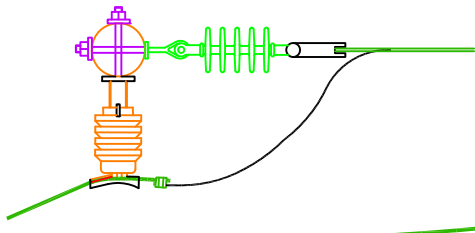
DATE: OCTOBER, 1992

REVISIONS JULY, 2002

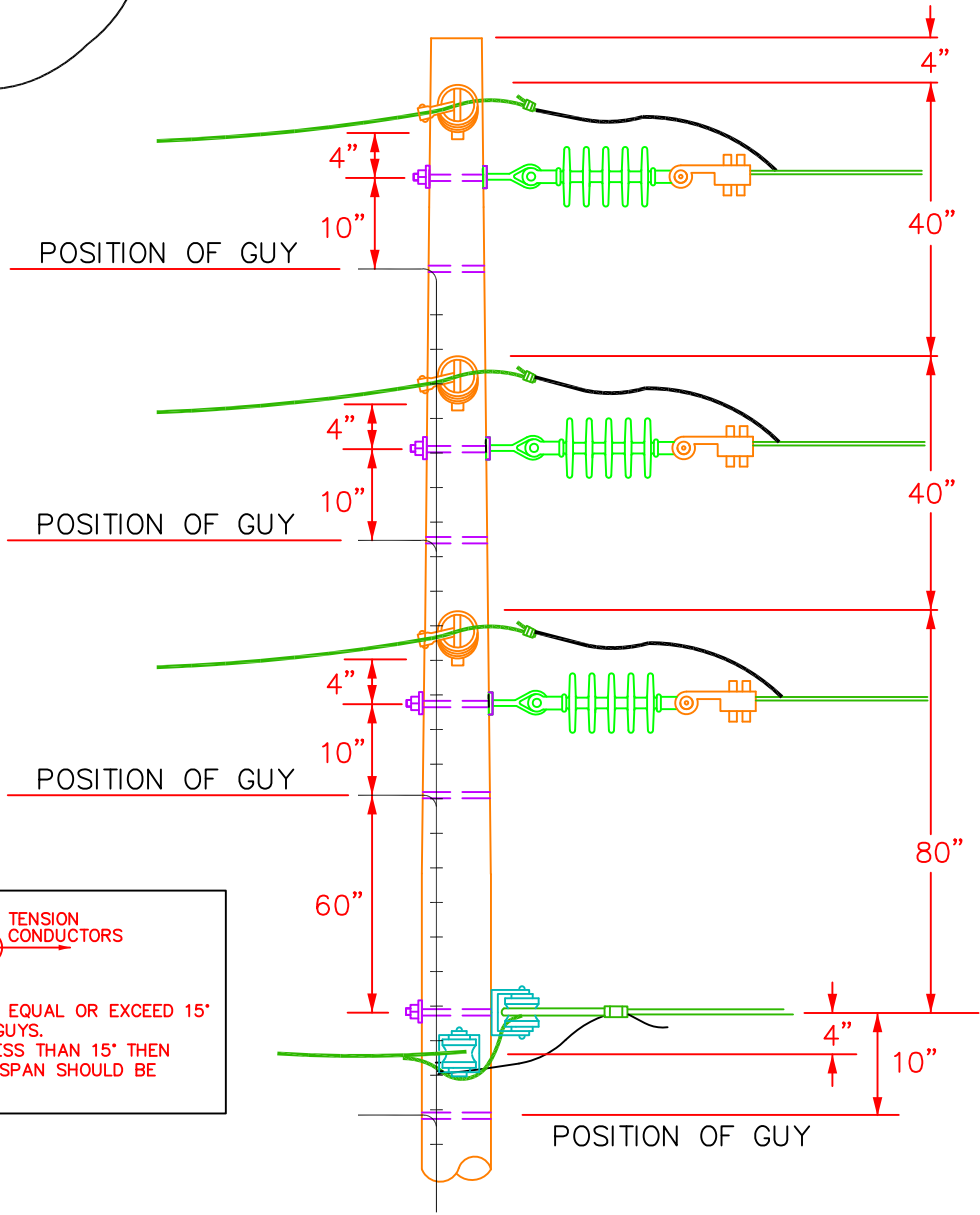
JANUARY, 2007

**C6**





TOP VIEW



SLACK SPAN      TENSION CONDUCTORS  
15°

1. LINE ANGLE SHOULD EQUAL OR EXCEED 15° TO CLEAR ANCHOR GUYS.
2. IF LINE ANGLE IS LESS THAN 15° THEN HORIZONTAL SLACK SPAN SHOULD BE USED.

- NOTES - GENERAL:
1. SLACK SPAN LENGTH SHOULD BE AS SHORT AS POSSIBLE.
  2. SLACK SPAN CONDUCTOR SHOULD BE HAND TENSIONED TO AVOID PULLING OVER THE MAIN LINE POLE.
  3. DO NOT USE HORIZONTAL CONSTRUCTION ON ONE POLE AND VERTICAL CONSTRUCTION ON THE OTHER.
  4. THREE PHASE LINE CUTOUPS SHOULD NOT BE INSTALLED ON THESE POLES.

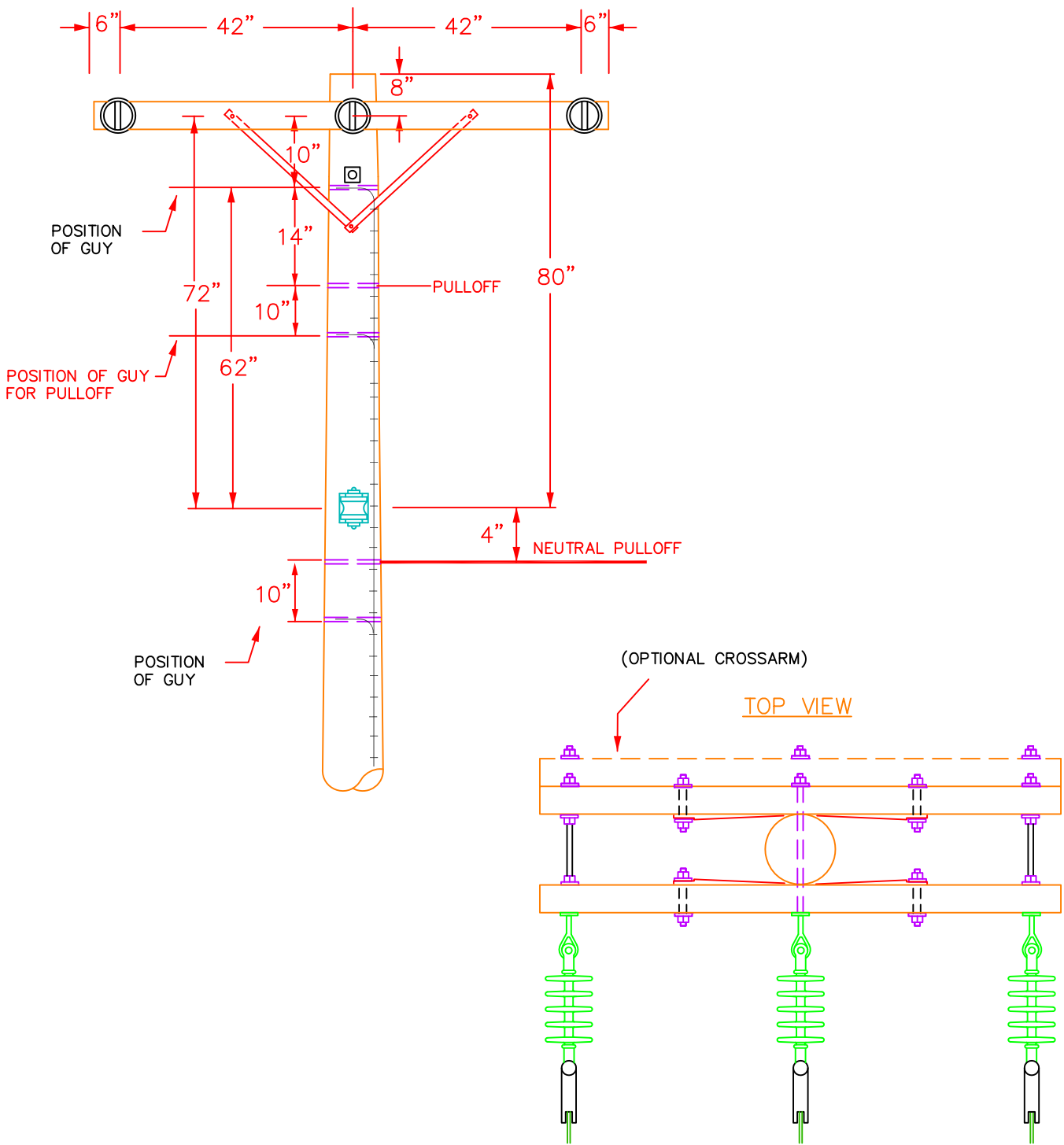
## SLACK SPAN, VERTICAL CONSTRUCTION

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

	REVISIONS <u>      </u> JULY, 2002 <u>      </u> JANUARY, 2007 <u>      </u>	C6SS
DATE: <u>      </u> OCTOBER, 1992		







## CROSSARM CONSTRUCTION, DEADEND ON ARMS

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



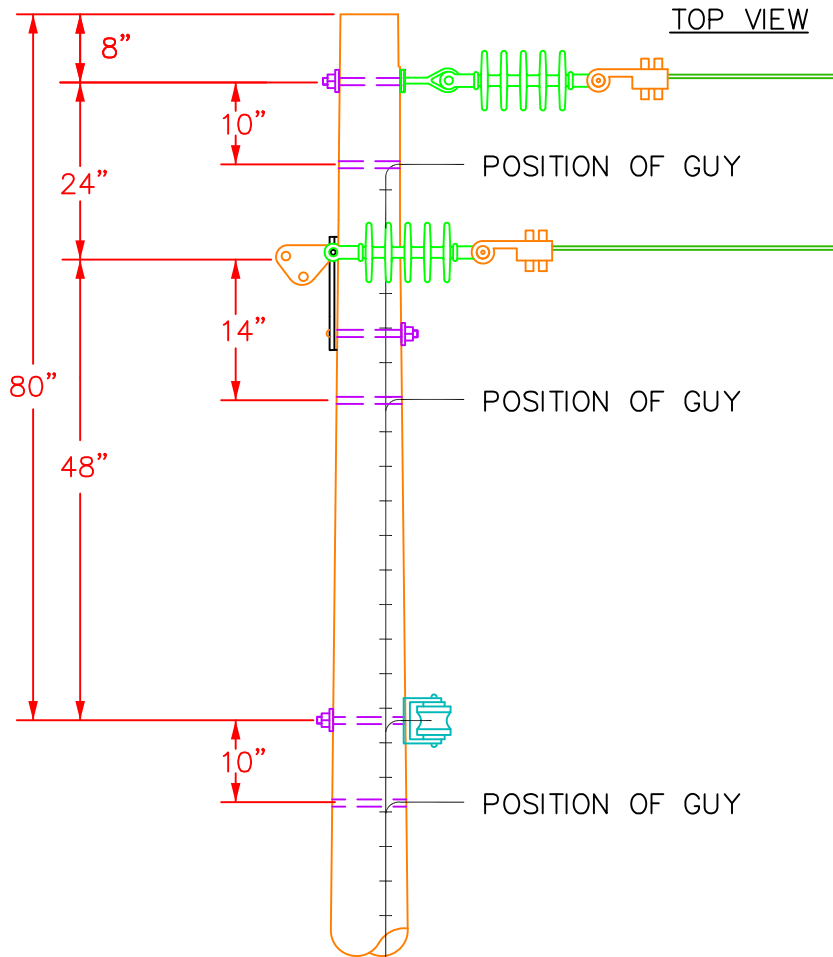
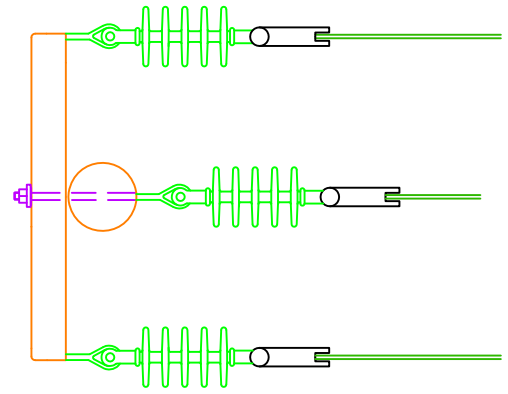
DATE: OCTOBER, 1992

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JANUARY, 2007

C7





**USE BOTTOM GUY ON WIRE SIZES LARGER THAN 1/0 ACSR**  
**NOTE: NOT RECOMMENDED FOR THREE PHASE PULLOFF**  
**STANDARD CONFIGURATION,**  
**HORIZONTAL DEADEND**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"

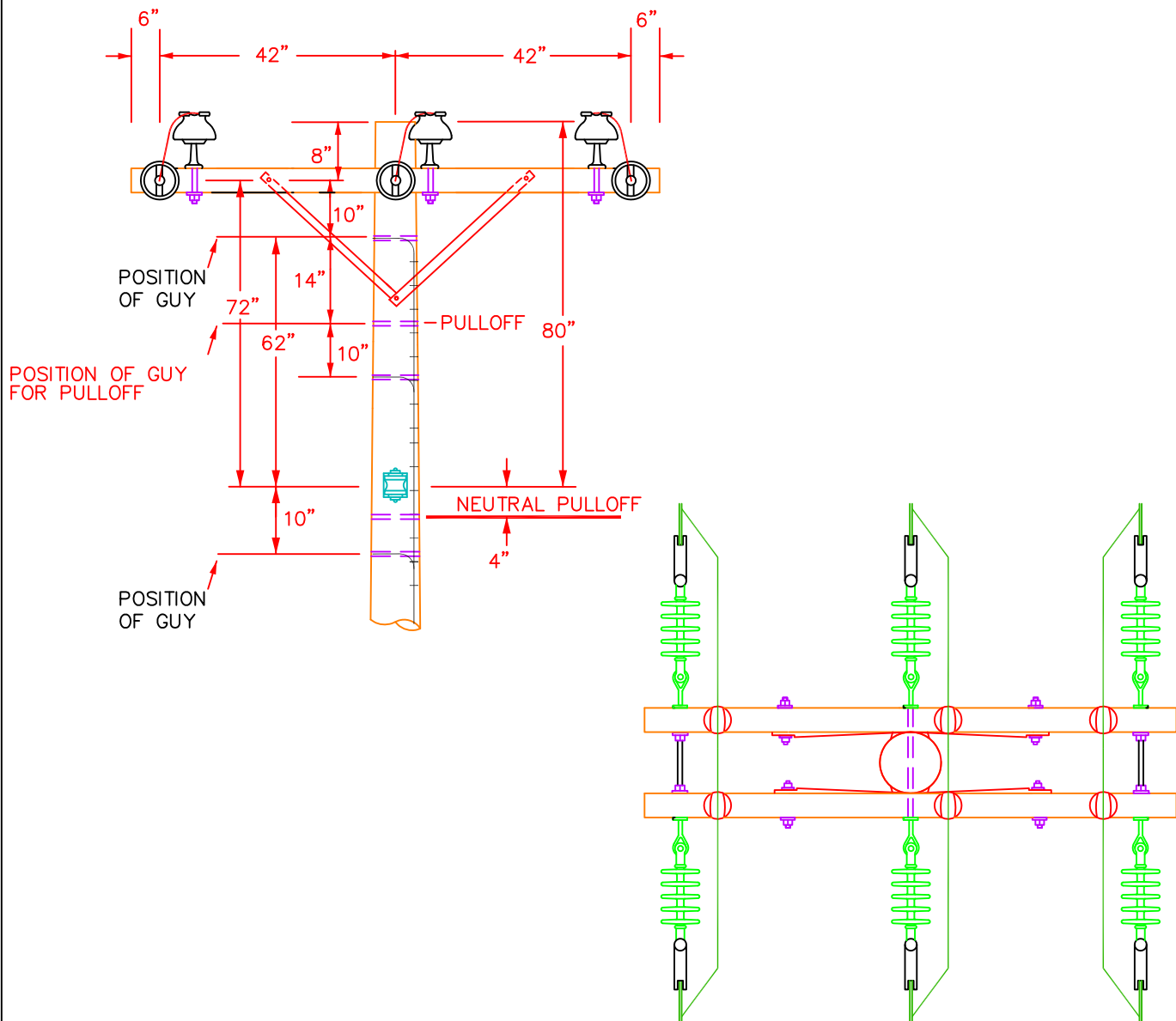


REVISIONS JULY, 2002 \_\_\_\_\_  
 JANUARY, 2007 \_\_\_\_\_

**C7S**

DATE: OCTOBER, 1992 \_\_\_\_\_





TOP VIEW

0° - 24° LINE ANGLE

# CROSSARM CONSTRUCTION, HORIZONTAL DOUBLE DEADEND

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

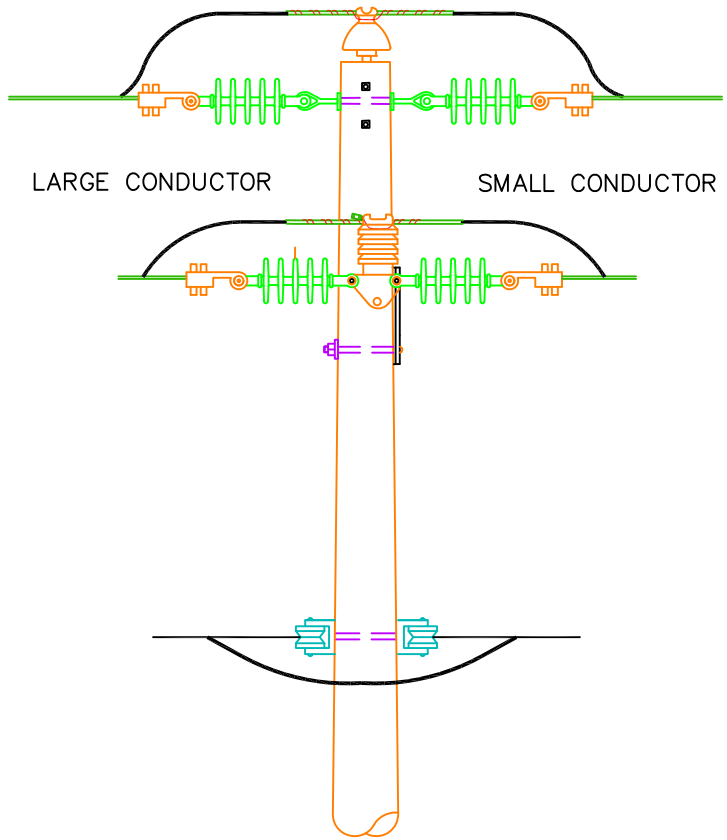
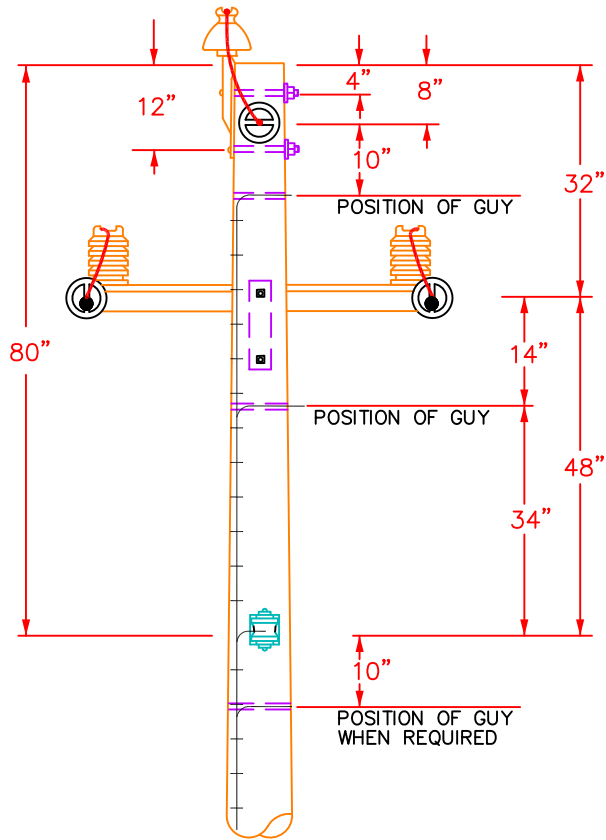


REVISIONS JULY, 2002  
JANUARY, 2007

DATE: OCTOBER, 1992

C8





NOTE:

1. LEAVE DOWN GUYS OFF IF WIRE SIZE REMAINS THE SAME.
2. NOT RECOMMENDED FOR THREE PHASE PULLOFFS.

**0° - 24° LINE ANGLE**

## **STANDARD CONFIGURATION, HORIZONTAL DOUBLE DEADEND WIRE SIZE CHANGE**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



DATE: OCTOBER, 1992

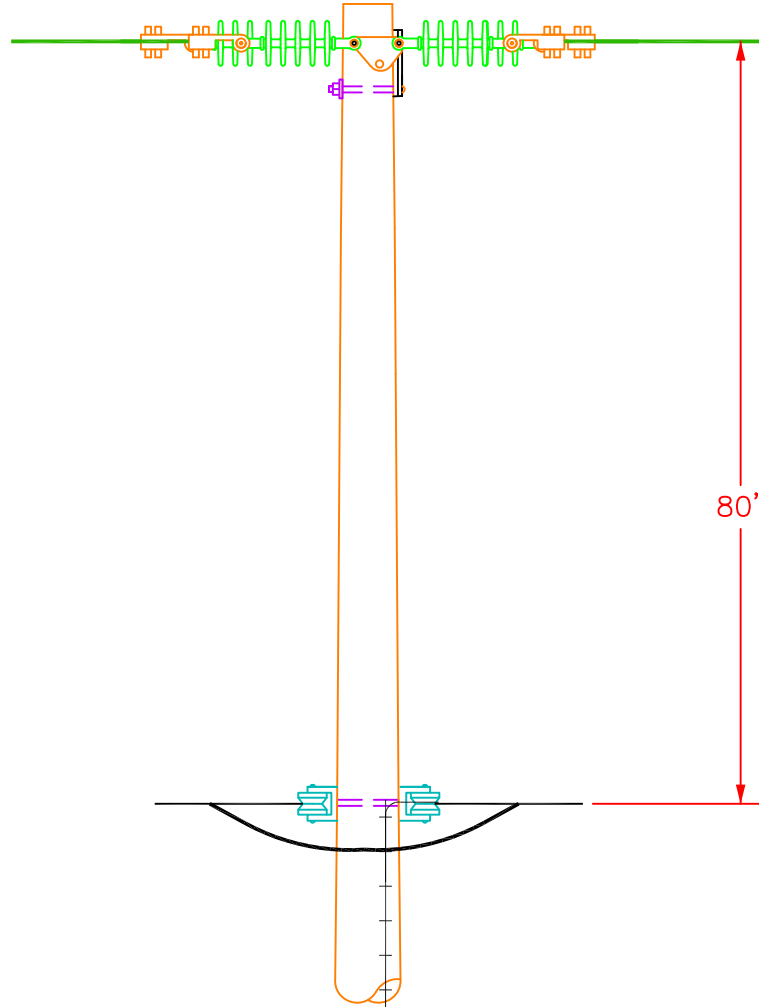
REVISIONS JULY, 2002

JANUARY, 2006

**C8S**







## HORIZONTAL DOUBLE DEADEND



DATE: JANUARY, 2007

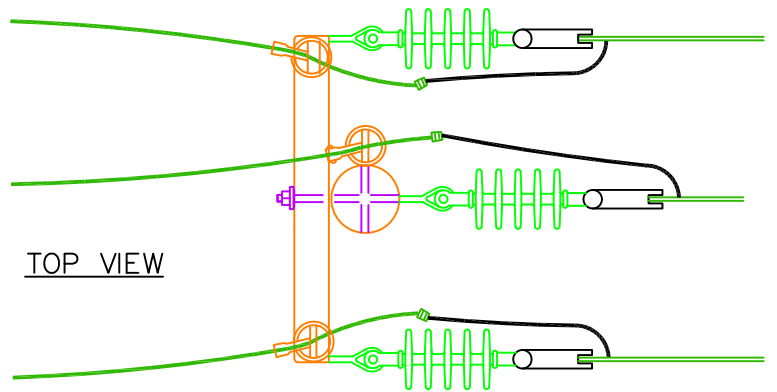
REVISIONS \_\_\_\_\_

\_\_\_\_\_

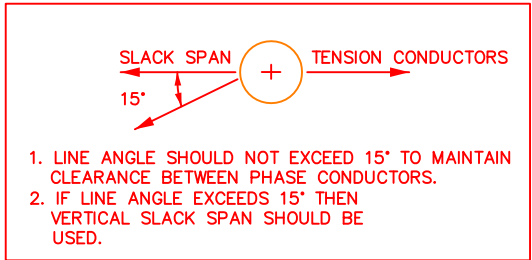
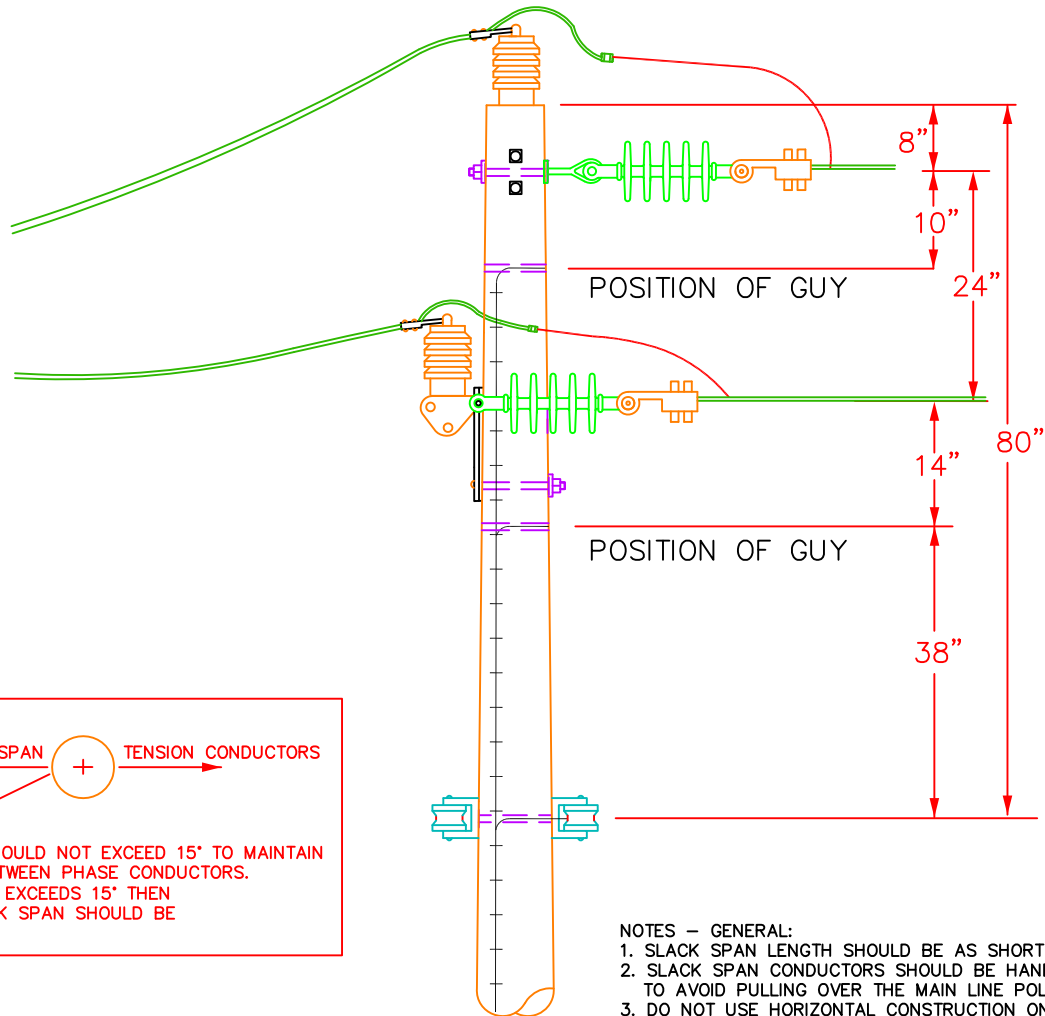
\_\_\_\_\_

**C8SH**





TOP VIEW



- NOTES – GENERAL:
1. SLACK SPAN LENGTH SHOULD BE AS SHORT AS POSSIBLE.
  2. SLACK SPAN CONDUCTORS SHOULD BE HAND TENSIONED TO AVOID PULLING OVER THE MAIN LINE POLE.
  3. DO NOT USE HORIZONTAL CONSTRUCTION ON ONE POLE AND VERTICAL CONSTRUCTION ON THE OTHER.
  4. THREE PHASE LINE CUTOUTS SHOULD NOT BE INSTALLED ON THESE POLES.

# SLACK SPAN, HORIZONTAL DOUBLE DEADEND CONSTRUCTION

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"

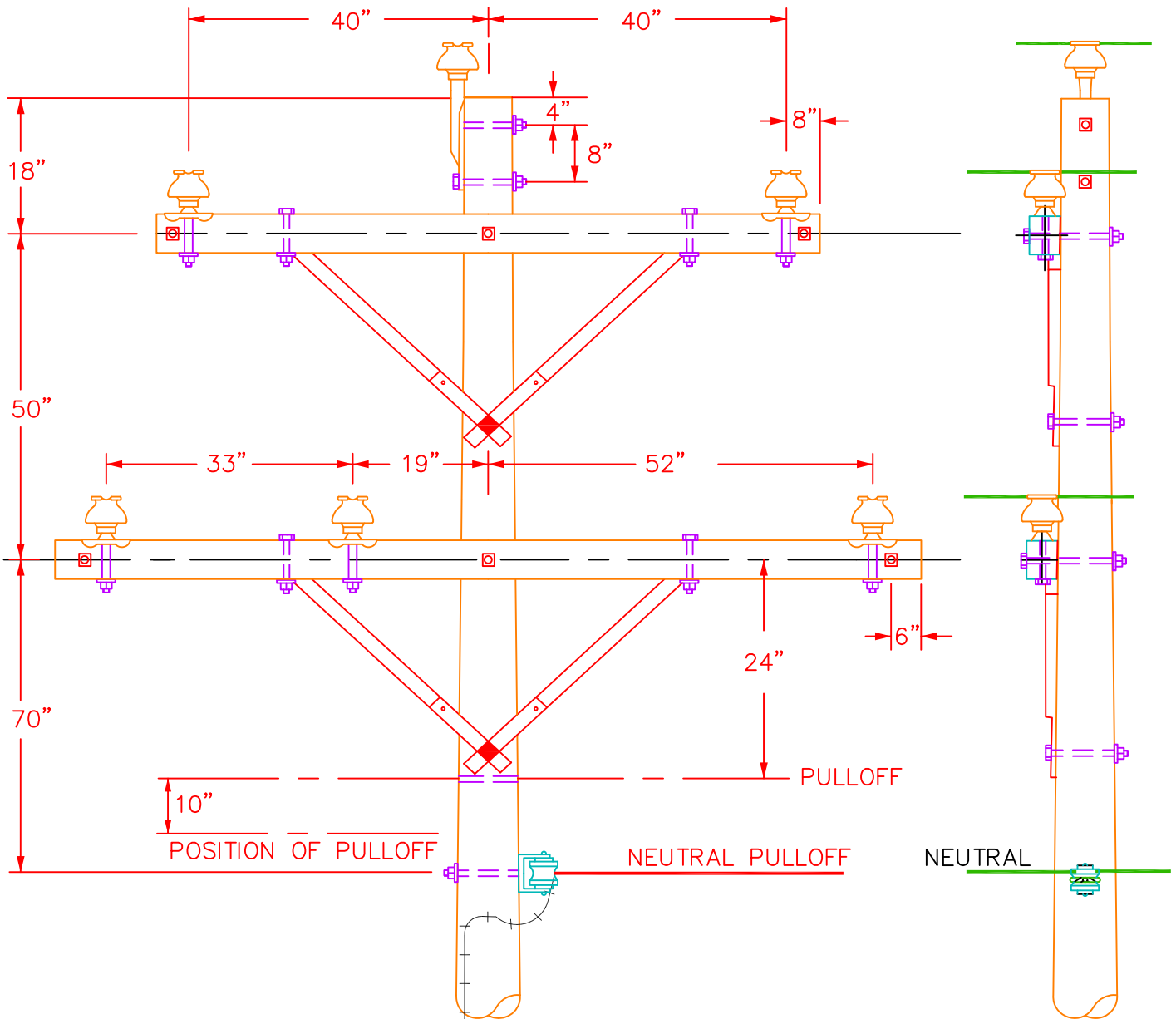


REVISIONS JULY, 2002  
 JANUARY, 2007

**C8SS**

DATE: OCTOBER, 1992





**0° - 6° LINE ANGLE**

**DOUBLE CIRCUIT,  
STRAIGHT LINE CONSTRUCTION**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

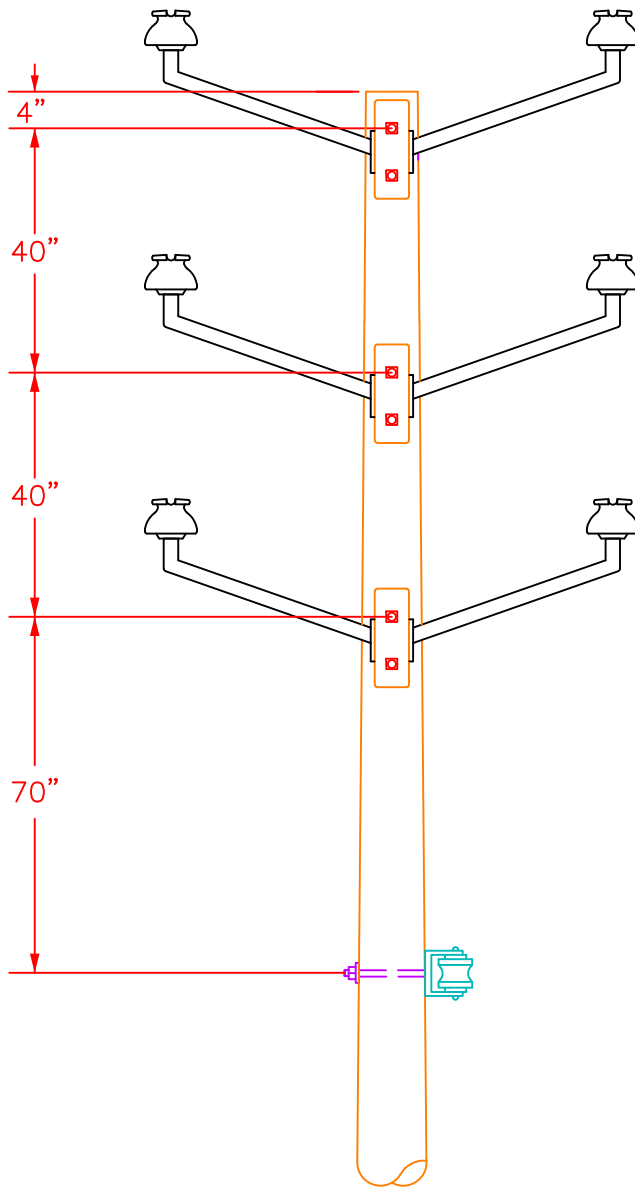


REVISIONS JULY, 2002

DATE: OCTOBER, 1992

**DC-C1**





**0° - 6° LINE ANGLE**

**ALTERNATE CONFIGURATION,**  
**NARROW PROFILE, DOUBLE CIRCUIT**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"



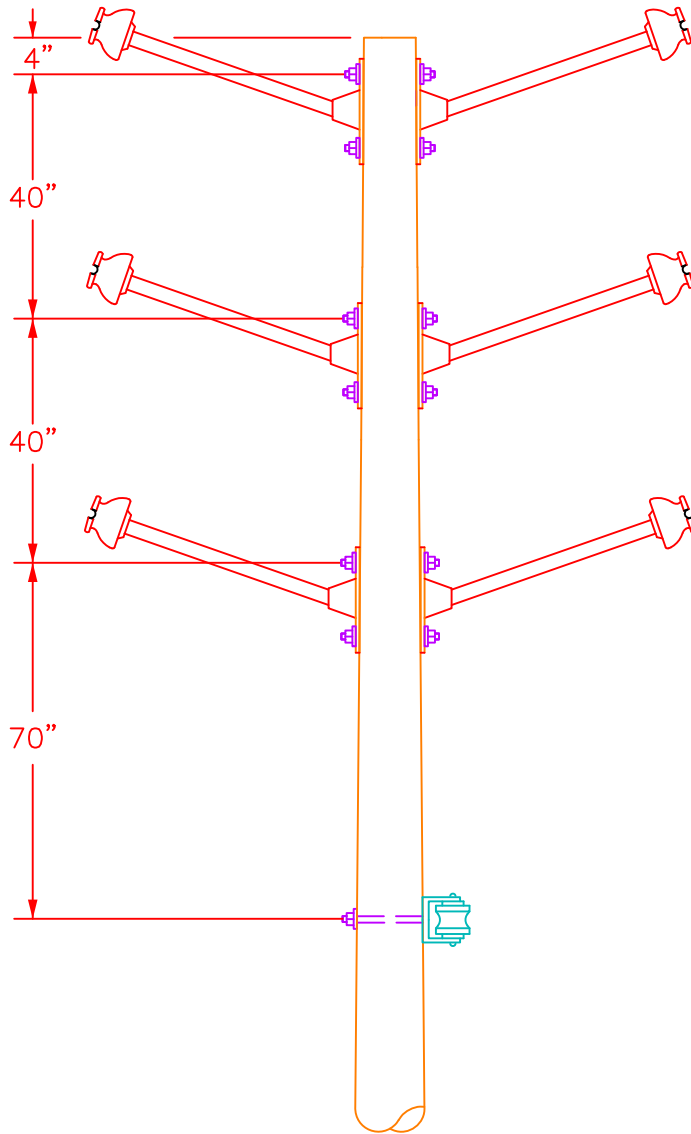
REVISIONS JULY, 2002

DATE: JULY, 2002

**DC-C1F**







**0° - 6° LINE ANGLE**

**ALTERNATE CONFIGURATION,**  
**NARROW PROFILE, DOUBLE CIRCUIT**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"

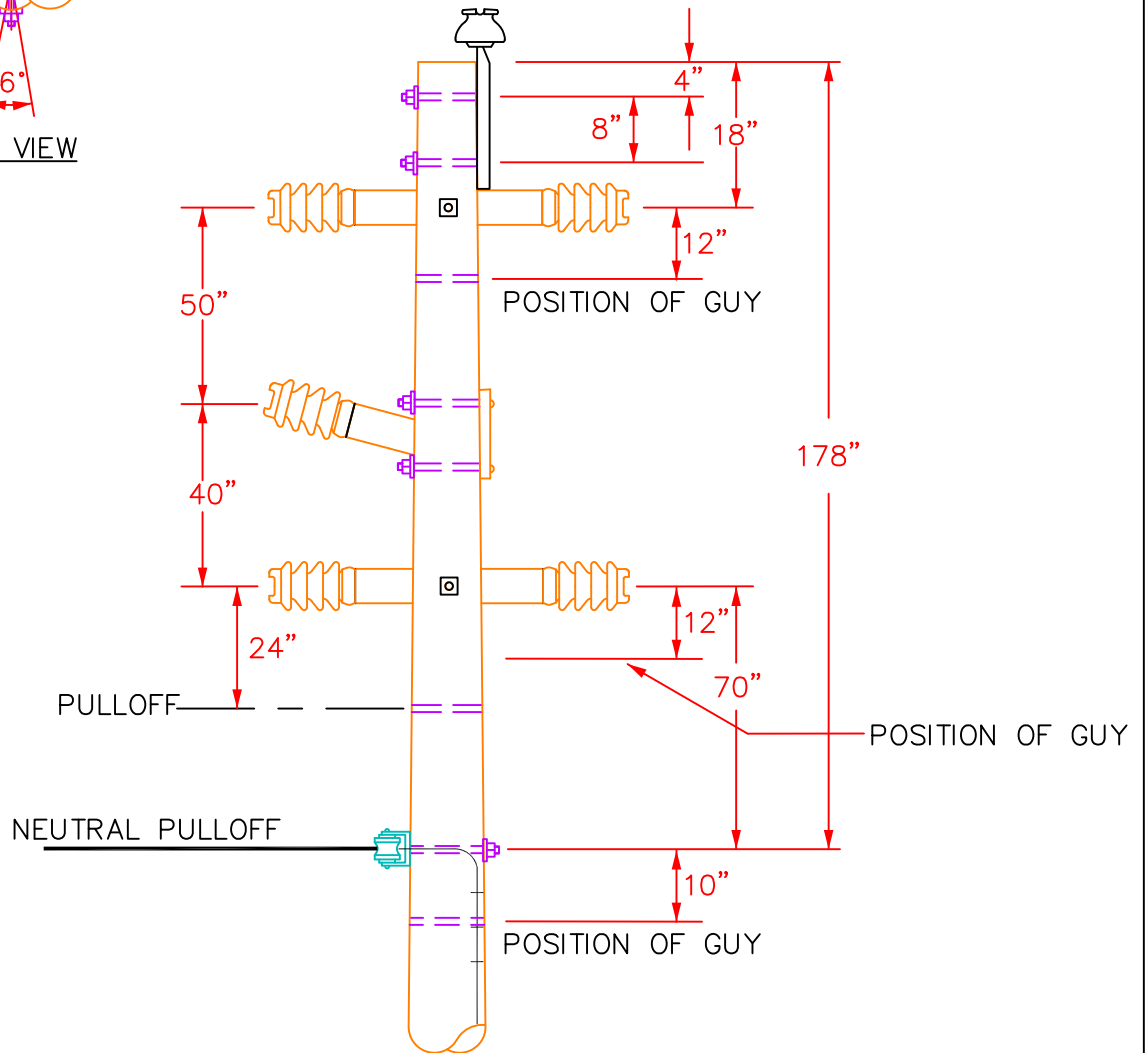
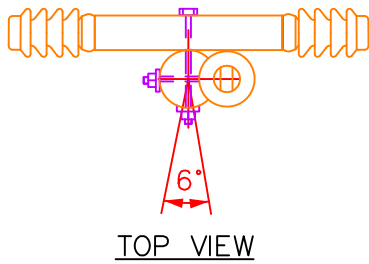


REVISIONS JULY, 2002

DATE: JULY, 2002

**DC-C1F1**





**0° - 6° LINE ANGLE  
PULLOFF ONLY RECOMMENDED FOR BOTTOM CIRCUIT**

**DOUBLE CIRCUIT CONSTRUCTION,  
STRAIGHT LINE**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

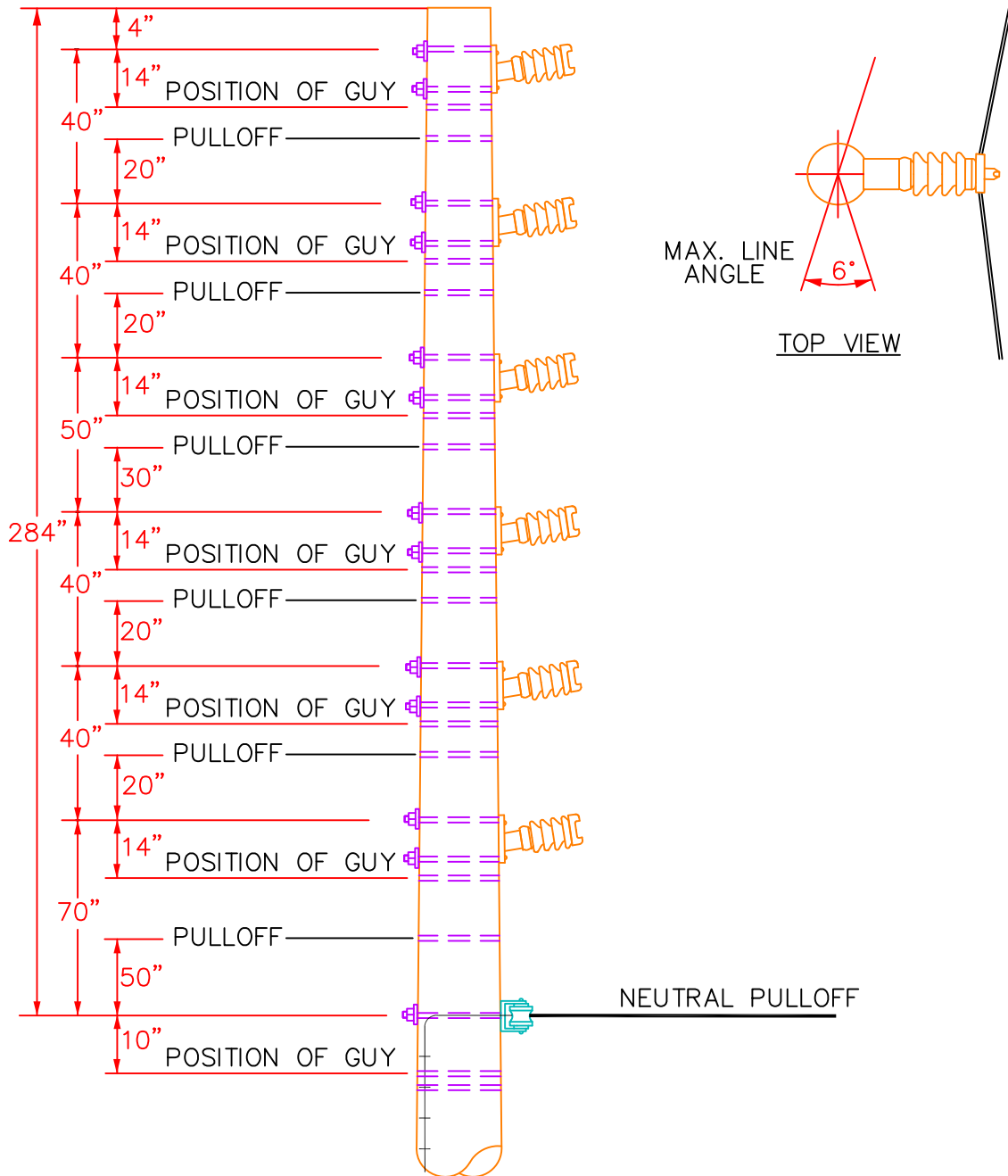


REVISIONS JULY, 2002

DATE: OCTOBER, 1992

**DC-C1PS**





**0° - 6° LINE ANGLE**

**STANDARD CONFIGURATION,  
DOUBLE CIRCUIT STRAIGHT LINE  
VERTICAL CONSTRUCTION**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



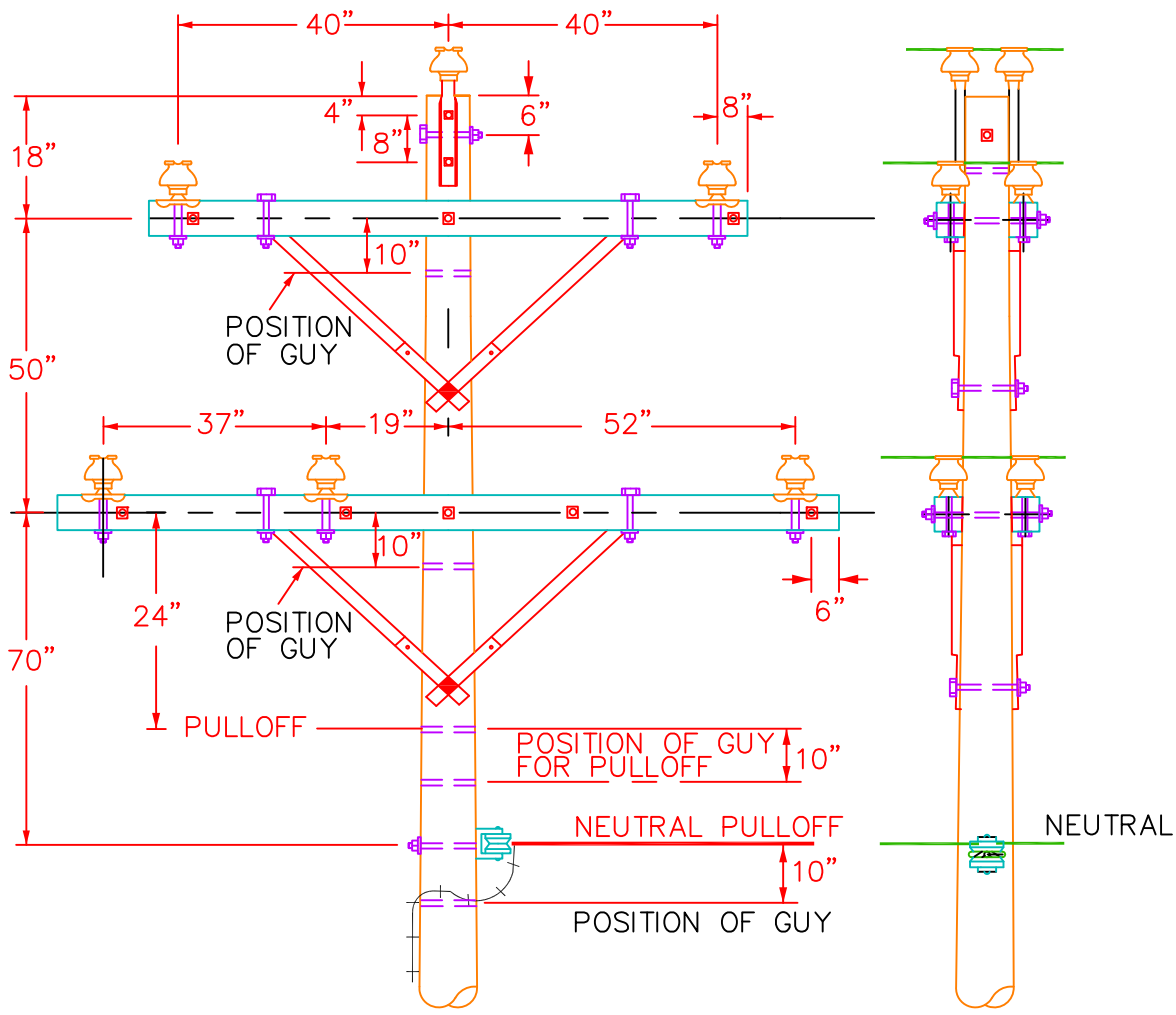
REVISIONS JULY, 2002

JANUARY, 2006

DATE: OCTOBER, 1992

**DC-C1V**





**0° - 10° LINE ANGLE ABOVE 1/0 ACSR**  
**0° - 20° LINE ANGLE THROUGH 1/0 ACSR**

**DOUBLE CIRCUIT, CROSSARM CONSTRUCTION,  
 DOUBLE ARM SUPPORT**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"



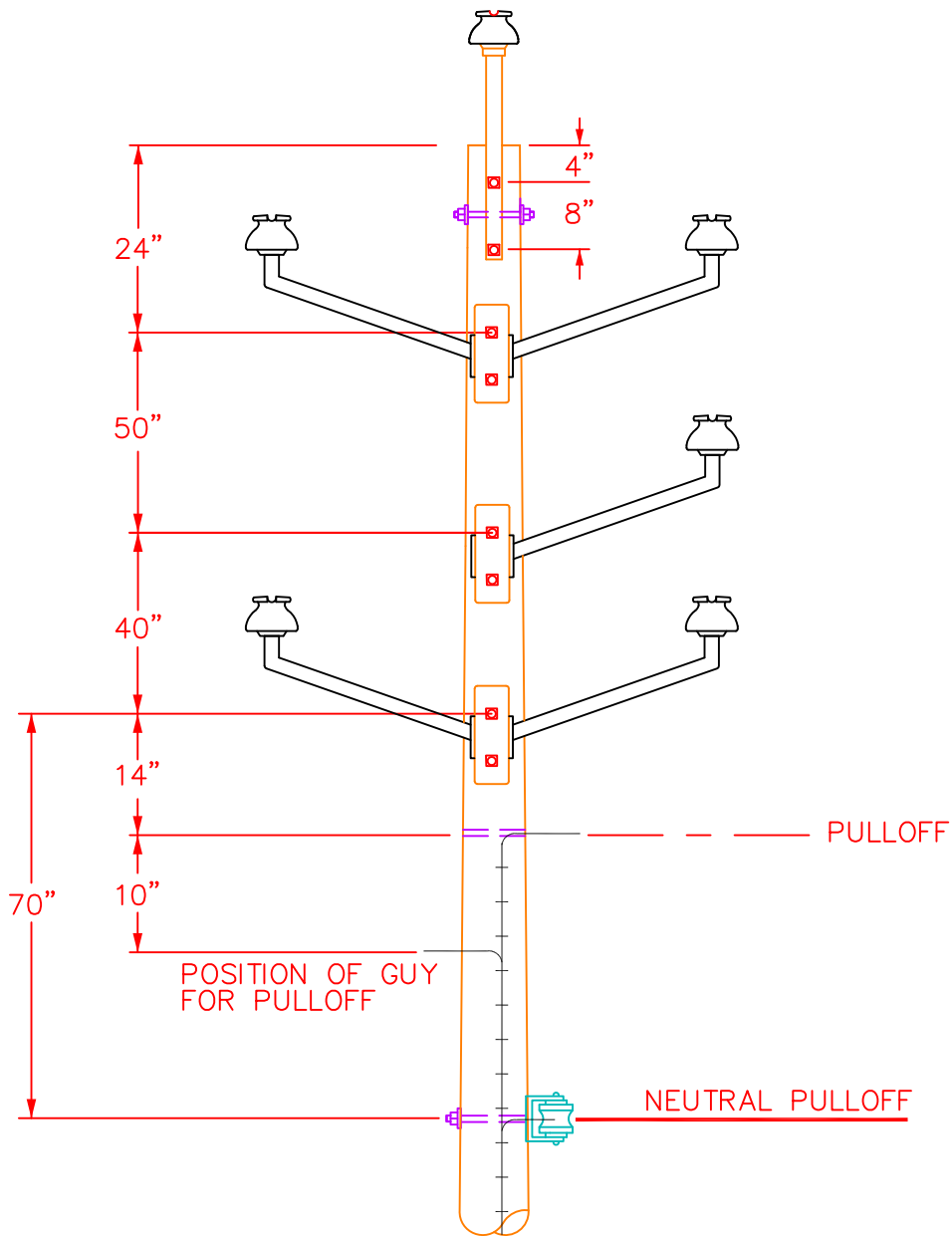
REVISIONS JULY, 2002

DATE: OCTOBER, 1992

**DC-C2**







**6° - 24° LINE ANGLE**

**DOUBLE CIRCUIT,**  
**MEDIUM ANGLE CONSTRUCTION**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"

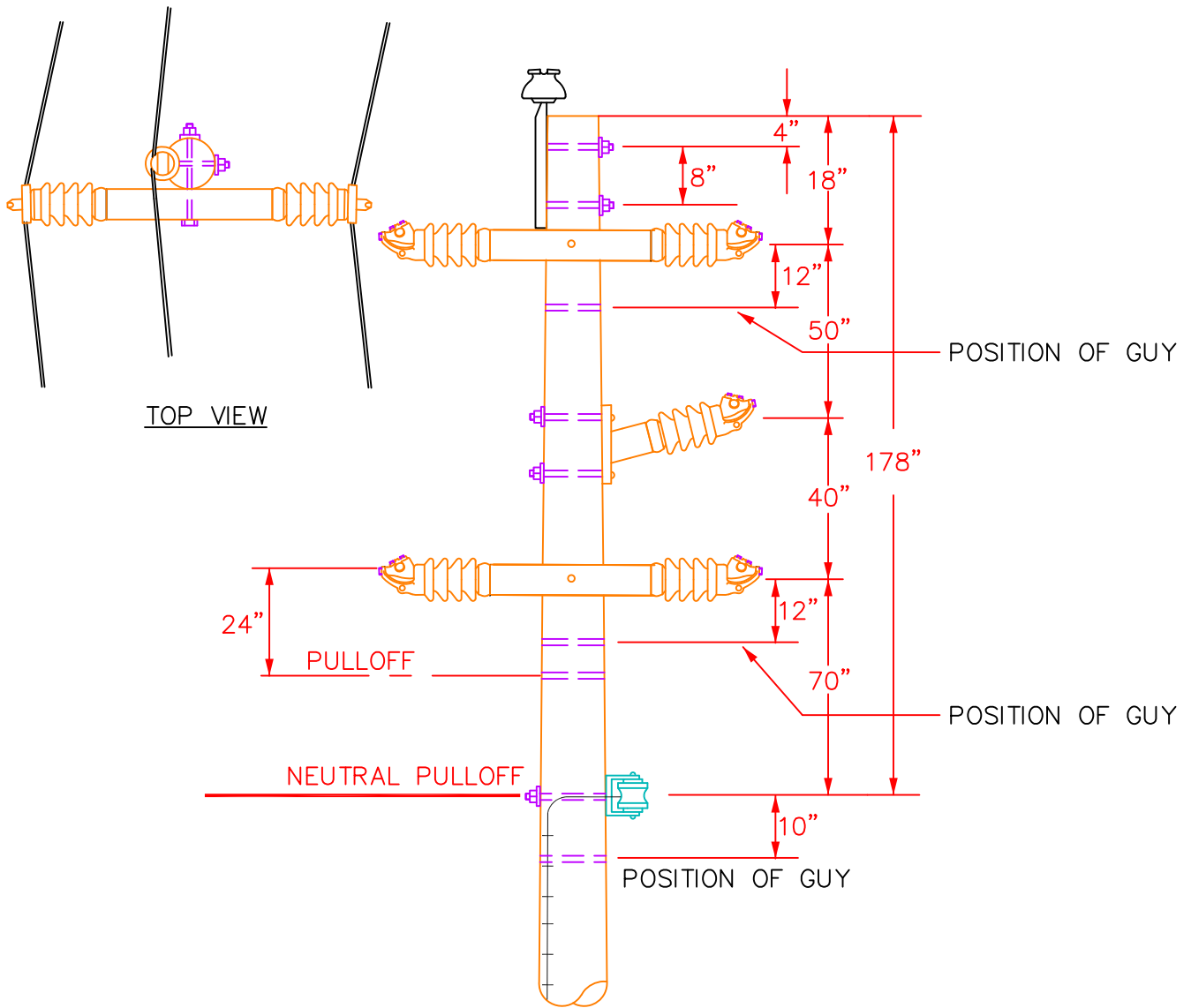


REVISIONS JULY, 2002

**DC-C2F**

DATE: JULY, 2002





**0° - 10° ANGLE ABOVE 1/0 ACSR**  
**0° - 20° ANGLE THROUGH 1/0 ACSR**  
**NOTE: PULLOFF RECOMMENDED FOR BOTTOM CIRCUIT ONLY**

**DOUBLE CIRCUIT CONSTRUCTION,**  
**MEDIUM ANGLE CONSTRUCTION**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"

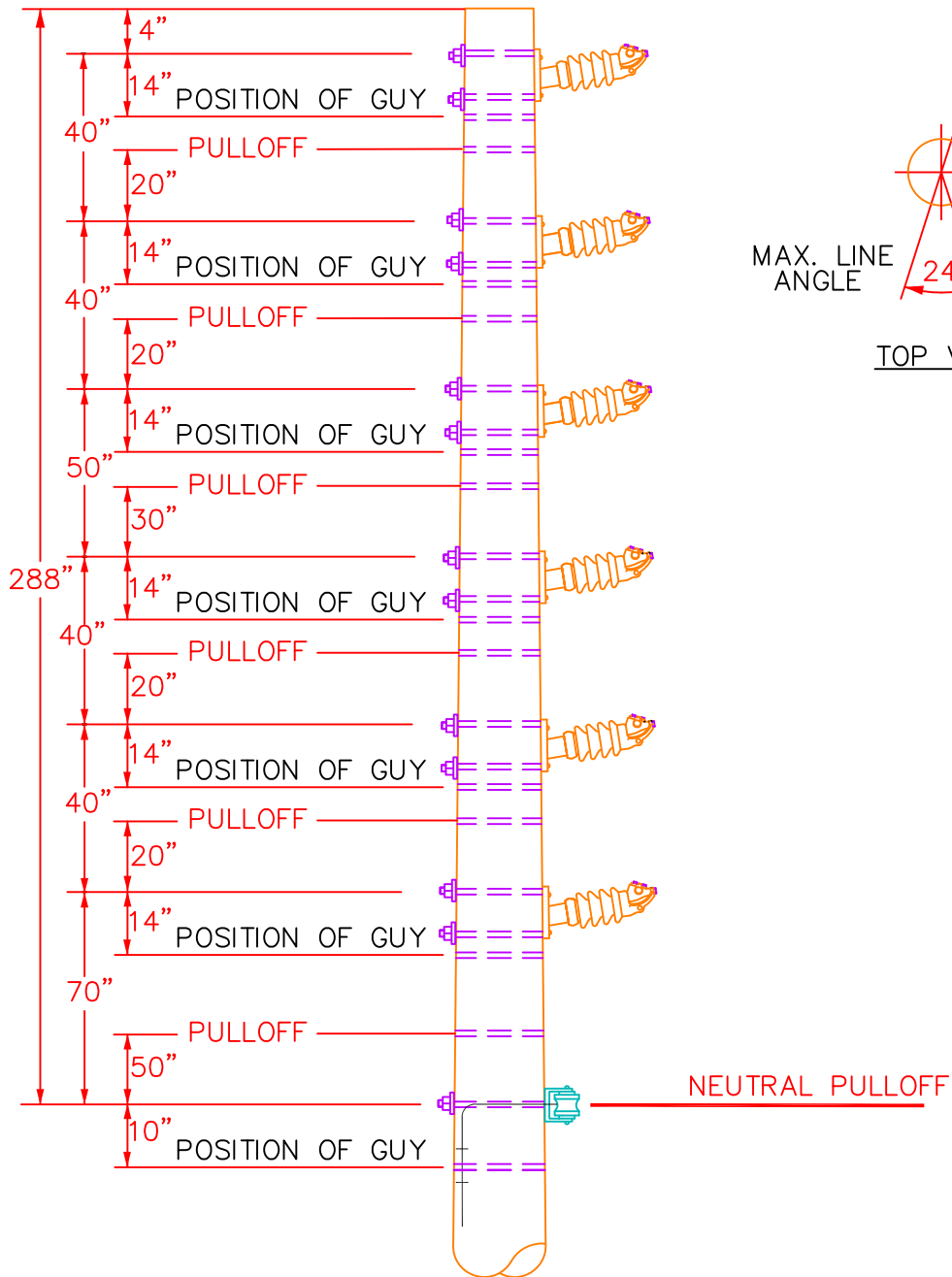


REVISIONS JULY, 2002  
JANUARY, 2006

DATE: OCTOBER, 1992

**DC-C2PS**





**6°-24° LINE ANGLE**

## **STANDARD CONFIGURATION, DOUBLE CIRCUIT MEDIUM ANGLE VERTICAL CONSTRUCTION**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



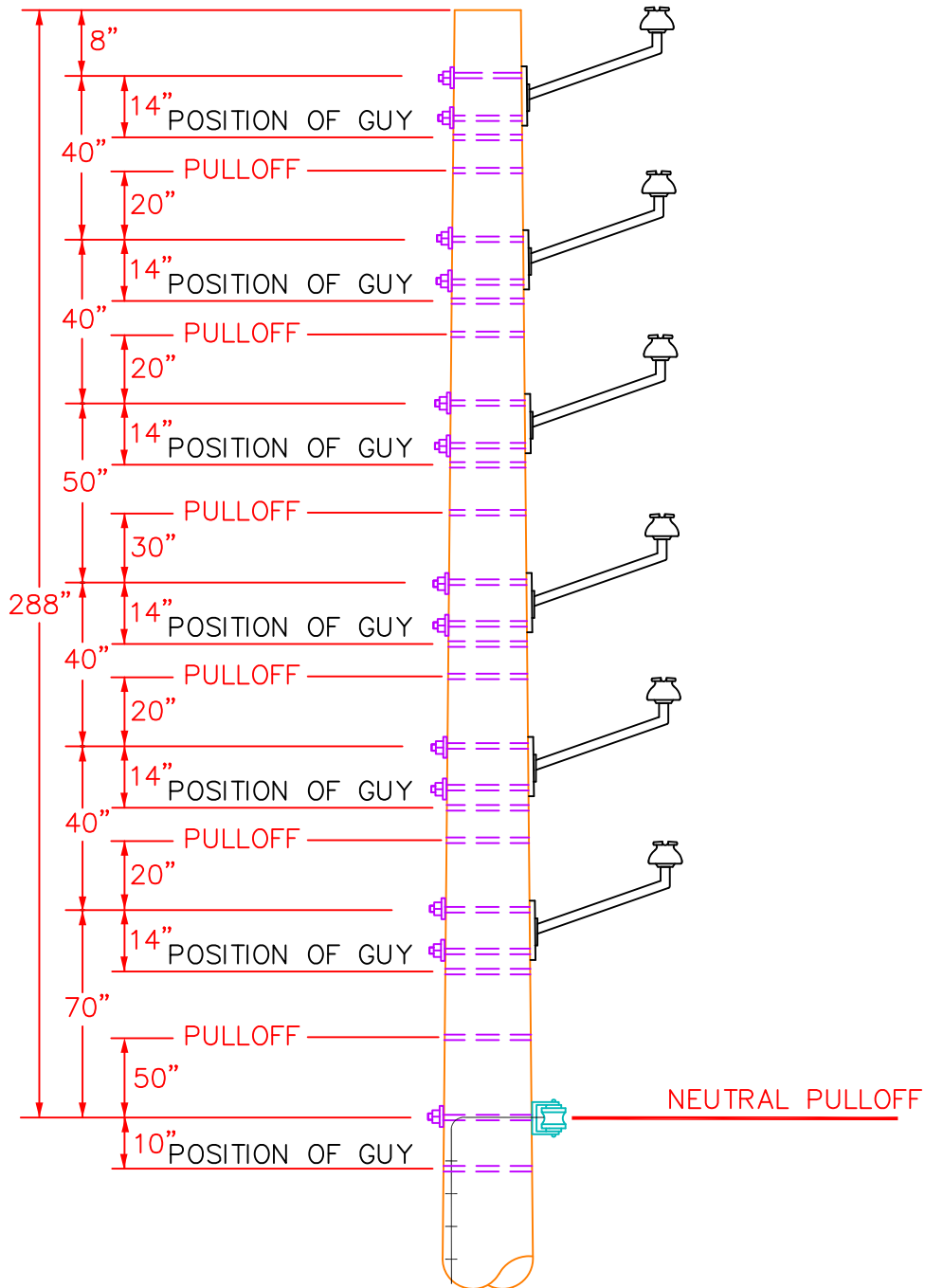
DATE: OCTOBER, 1992

REVISIONS JULY, 2002

JANUARY, 2006

# **DC-C2V**





**0° - 10° LINE ANGLE ABOVE 1/0 ACSR**  
**0° - 20° LINE ANGLE THROUGH 1/0 ACSR**

**STANDARD CONFIGURATION, STRAIGHT LINE TO MEDIUM ANGLE VERTICAL CONSTRUCTION**

NOTE:  
 MINIMUM DISTANCE FROM LOWEST  
 PRIMARY TO NEUTRAL POSITION IS 36"



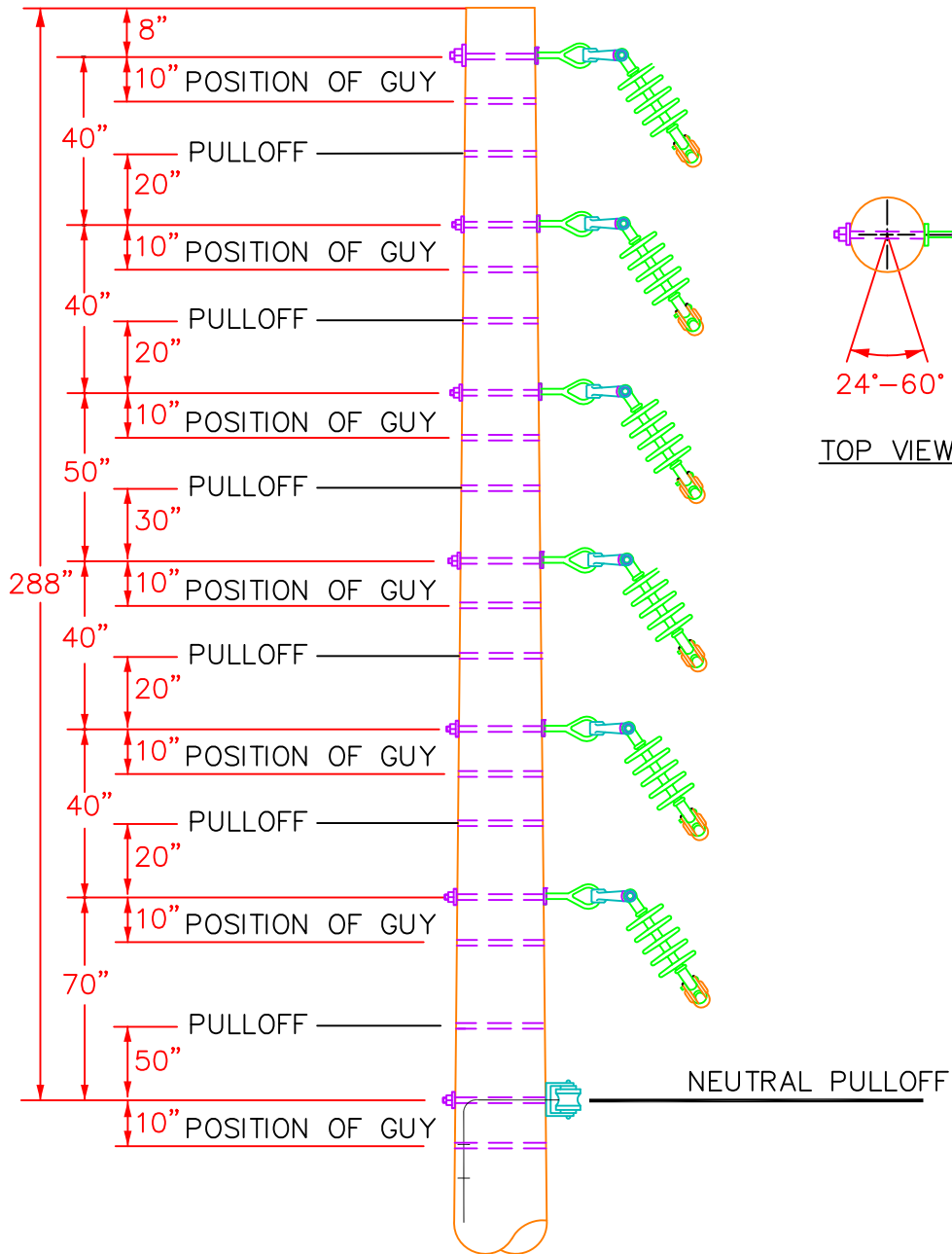
DATE: OCTOBER, 1992

REVISIONS JULY, 2002

**DC-C2VF**







**24° - 60° LINE ANGLE**

**STANDARD CONFIGURATION, DOUBLE CIRCUIT,  
VERTICAL SUSPENSION INSULATOR**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

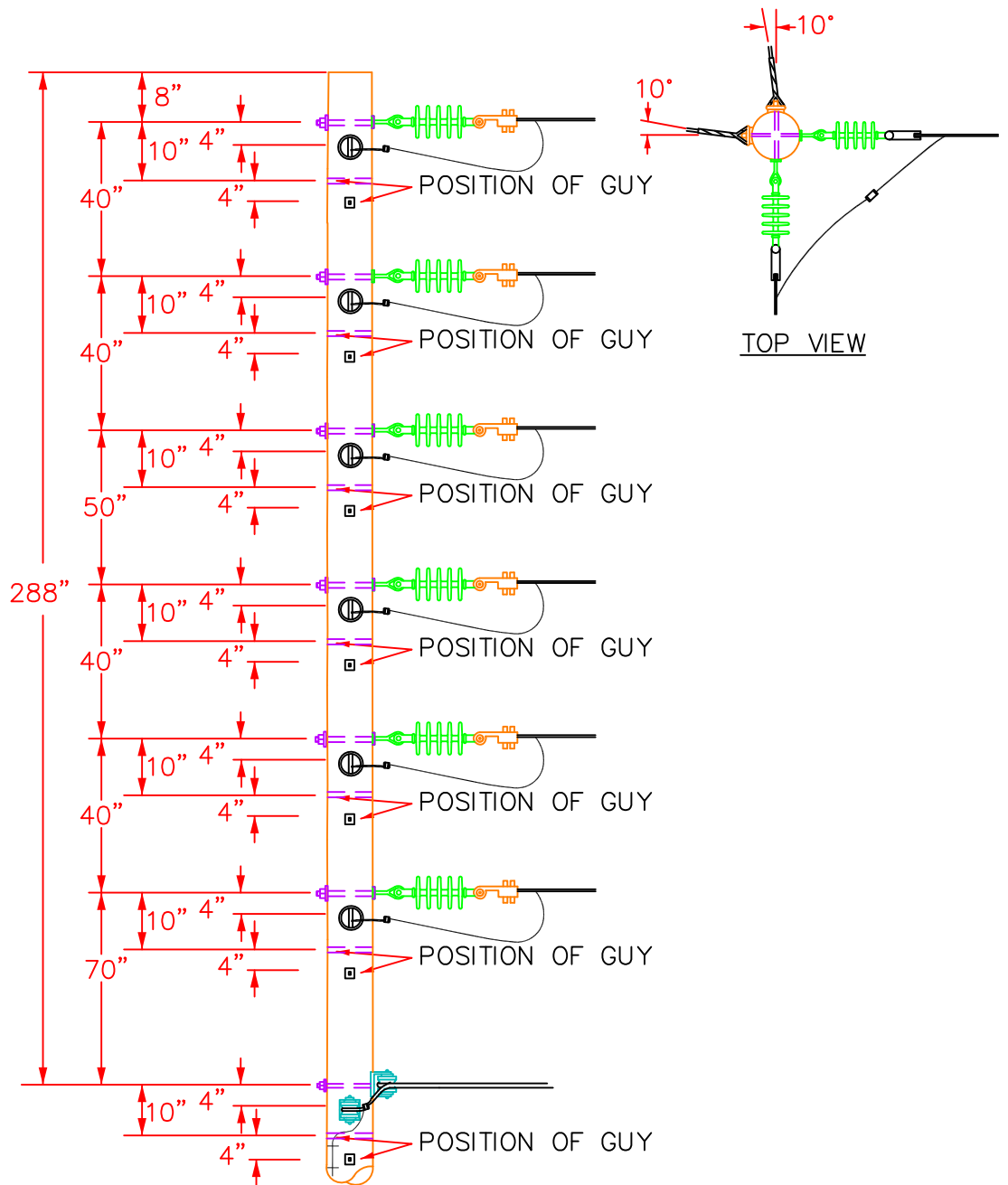


REVISIONS JULY, 2002  
JANUARY, 2007

DATE: OCTOBER, 1992

**DC-C3**





## **STANDARD CONFIGURATION,** **DOUBLE CIRCUIT, VERTICAL DOUBLE DEADEND**

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



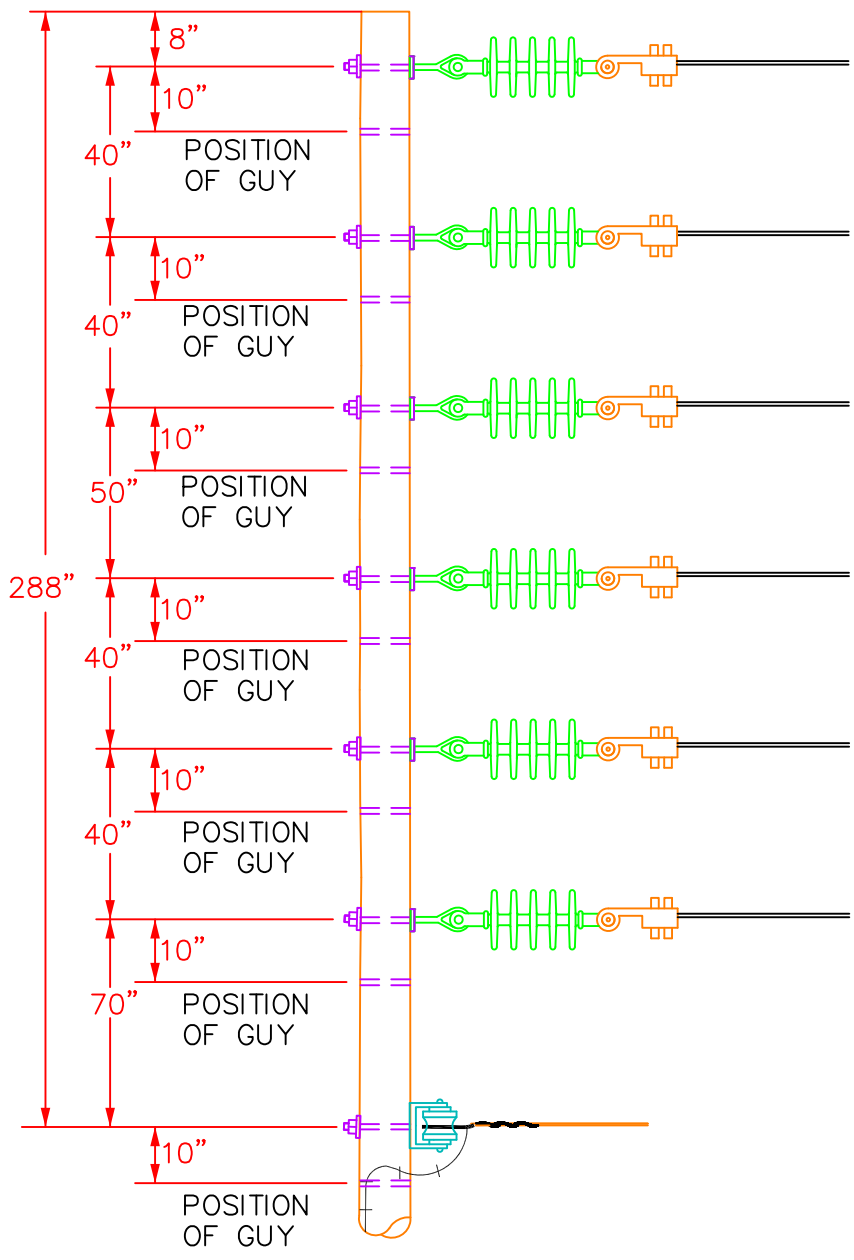
DATE: OCTOBER, 1992

REVISIONS JULY, 2002

JANUARY, 2007

# DC-C4





## DEADEND, DOUBLE CIRCUIT VERTICAL CONSTRUCTION

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

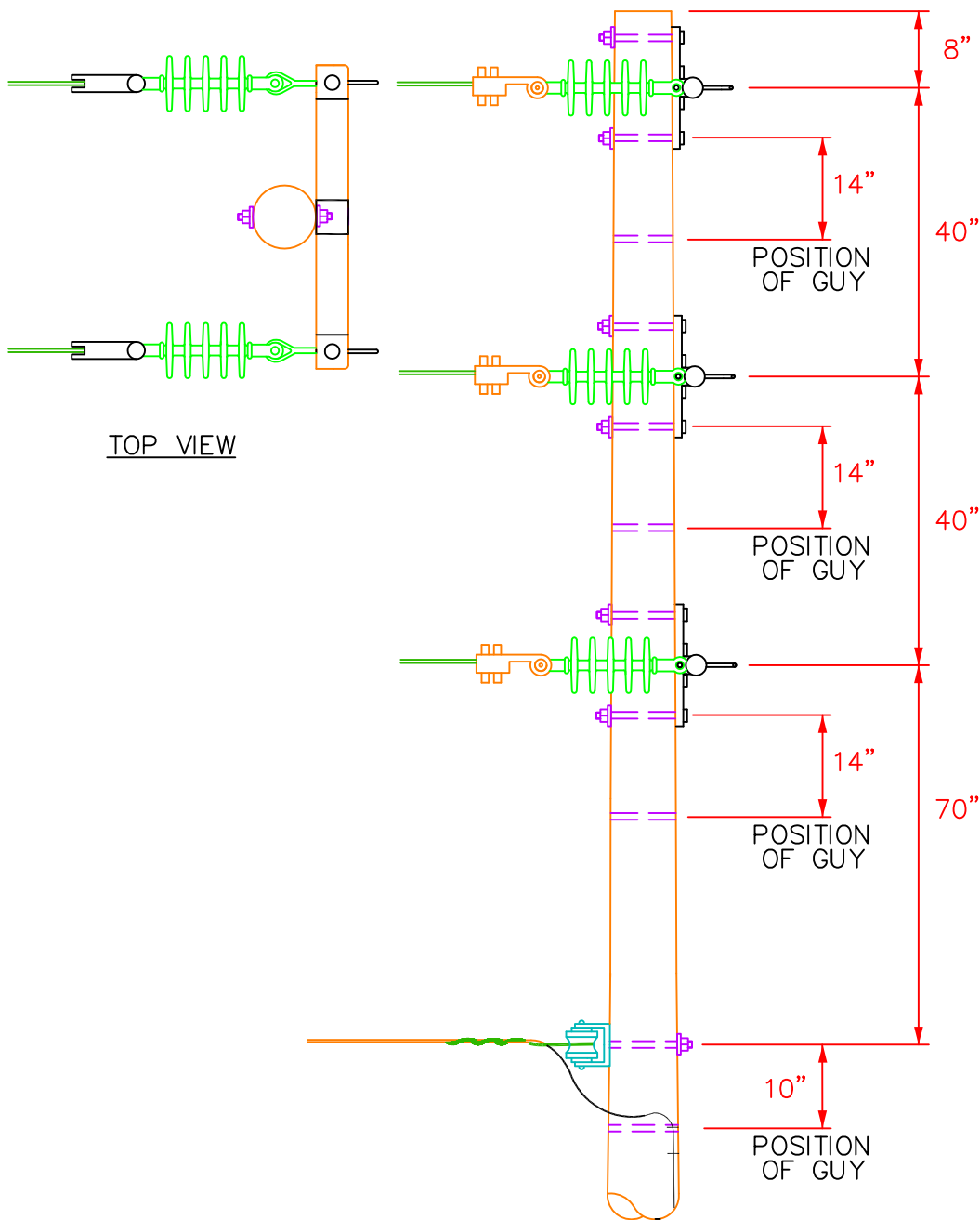


REVISIONS JULY, 2002  
JANUARY, 2007

DATE: OCTOBER, 1992

# DC-C5





**ALTERNATE CONFIGURATION, NARROW PROFILE,  
DOUBLE CIRCUIT, DEADEND CONSTRUCTION**

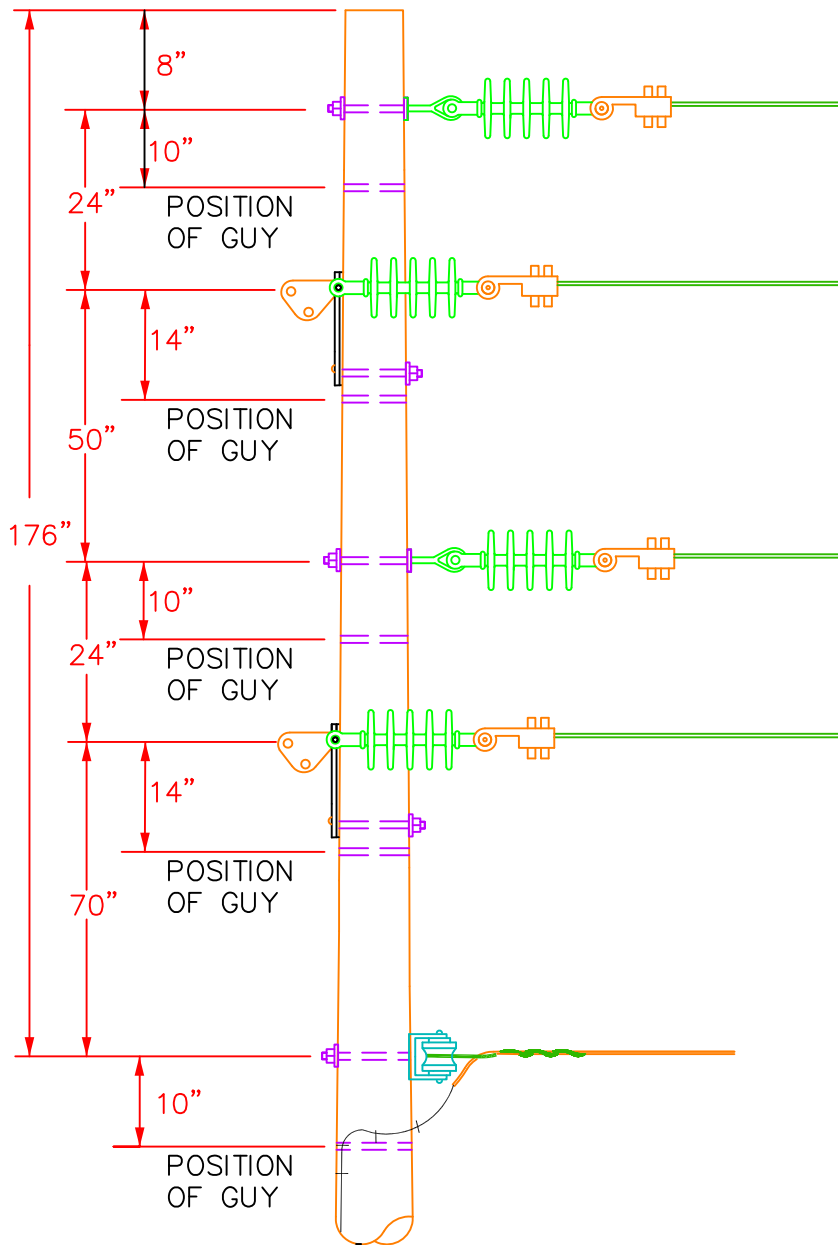
NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



DATE: OCTOBER, 1992

REVISIONS JULY, 2002  
JANUARY, 2007

**DC-C7F**



## HORIZONTAL DEADEND DOUBLE CIRCUIT CONSTRUCTION

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

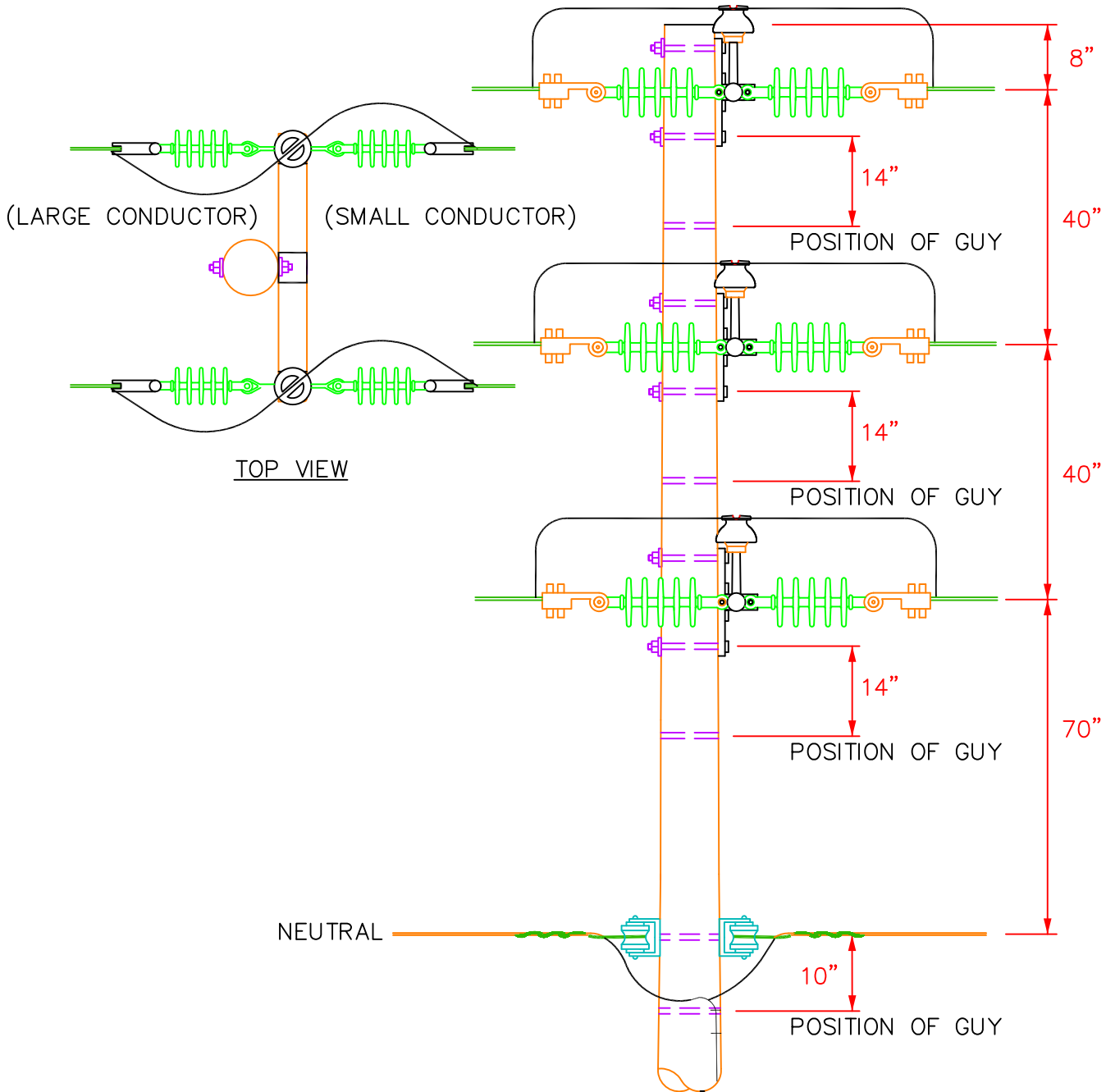


REVISIONS JULY, 2002  
JANUARY, 2007

# DC-C7S

DATE: OCTOBER, 1992





## NARROW PROFILE, DOUBLE CIRCUIT DOUBLE DEADEND CONSTRUCTION

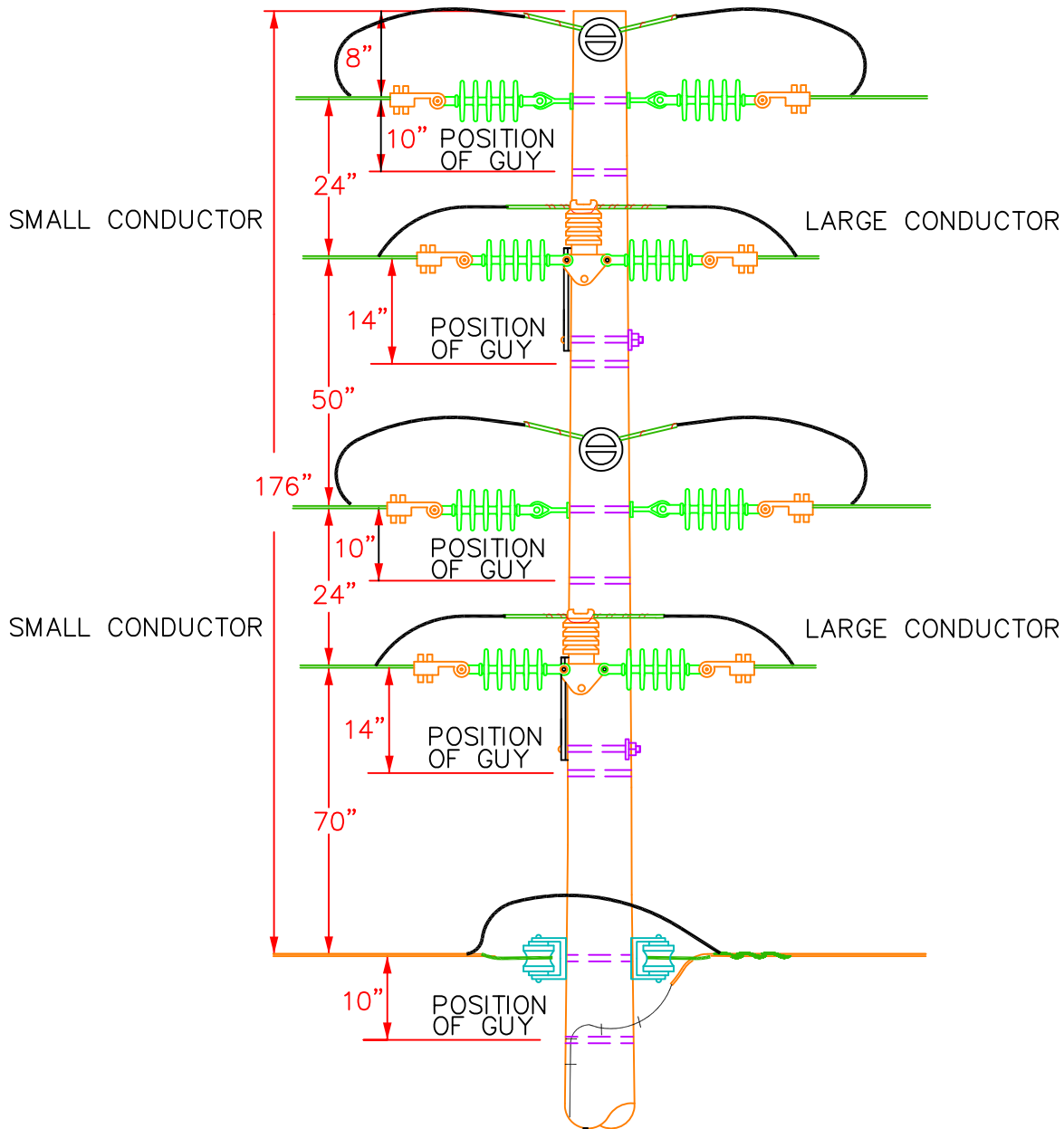
NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"



DATE: OCTOBER, 1992

REVISIONS JULY, 2002  
JANUARY, 2007

# DC-C8F



## HORIZONTAL DOUBLE DEADEND DOUBLE CIRCUIT CONSTRUCTION

NOTE:  
MINIMUM DISTANCE FROM LOWEST  
PRIMARY TO NEUTRAL POSITION IS 36"

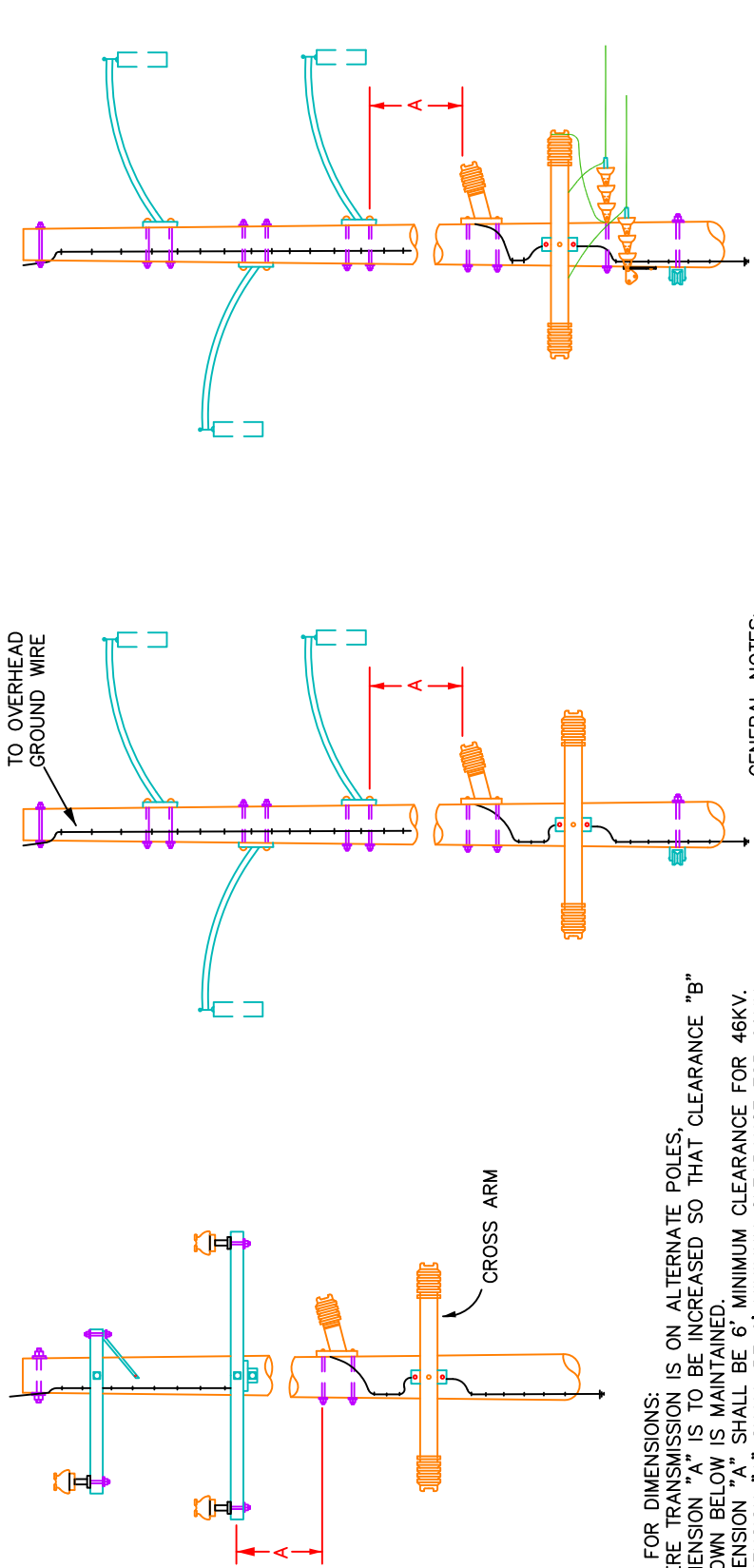


REVISIONS        JULY, 2002  
       JANUARY, 2007

**DC-C8S**

DATE:        OCTOBER, 1992



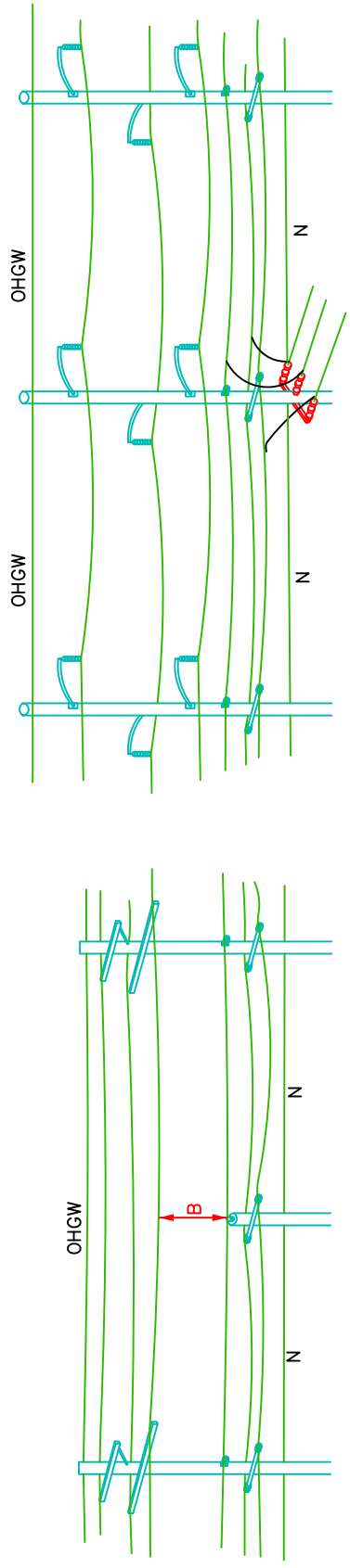


**NOTES FOR DIMENSIONS:**

1. WHERE TRANSMISSION IS ON ALTERNATE POLES, DIMENSION "A" IS TO BE INCREASED SO THAT CLEARANCE "B" SHOWN BELOW IS MAINTAINED.
2. DIMENSION "A" SHALL BE 6' MINIMUM CLEARANCE FOR 46KV. DIMENSION "A" SHALL BE 6' MINIMUM CLEARANCE FOR 69KV. DIMENSION "A" SHALL BE 10' MINIMUM CLEARANCE FOR 115KV & 230KV. DIMENSION "B" SHALL BE 11' MINIMUM CLEARANCE AT 120' FAHR. FOR 115KV AND BELOW. DIMENSION "B" SHALL BE 13' MINIMUM CLEARANCE AT 120' FAHR. FOR 230KV.

**GENERAL NOTES:**

1. ALL HARDWARE SHALL BE BONDED TO TRANSMISSION GROUND.
2. BOND NEUTRAL TO TRANSMISSION GROUND. DO NOT INSTALL ADDITIONAL GROUND LEAD.



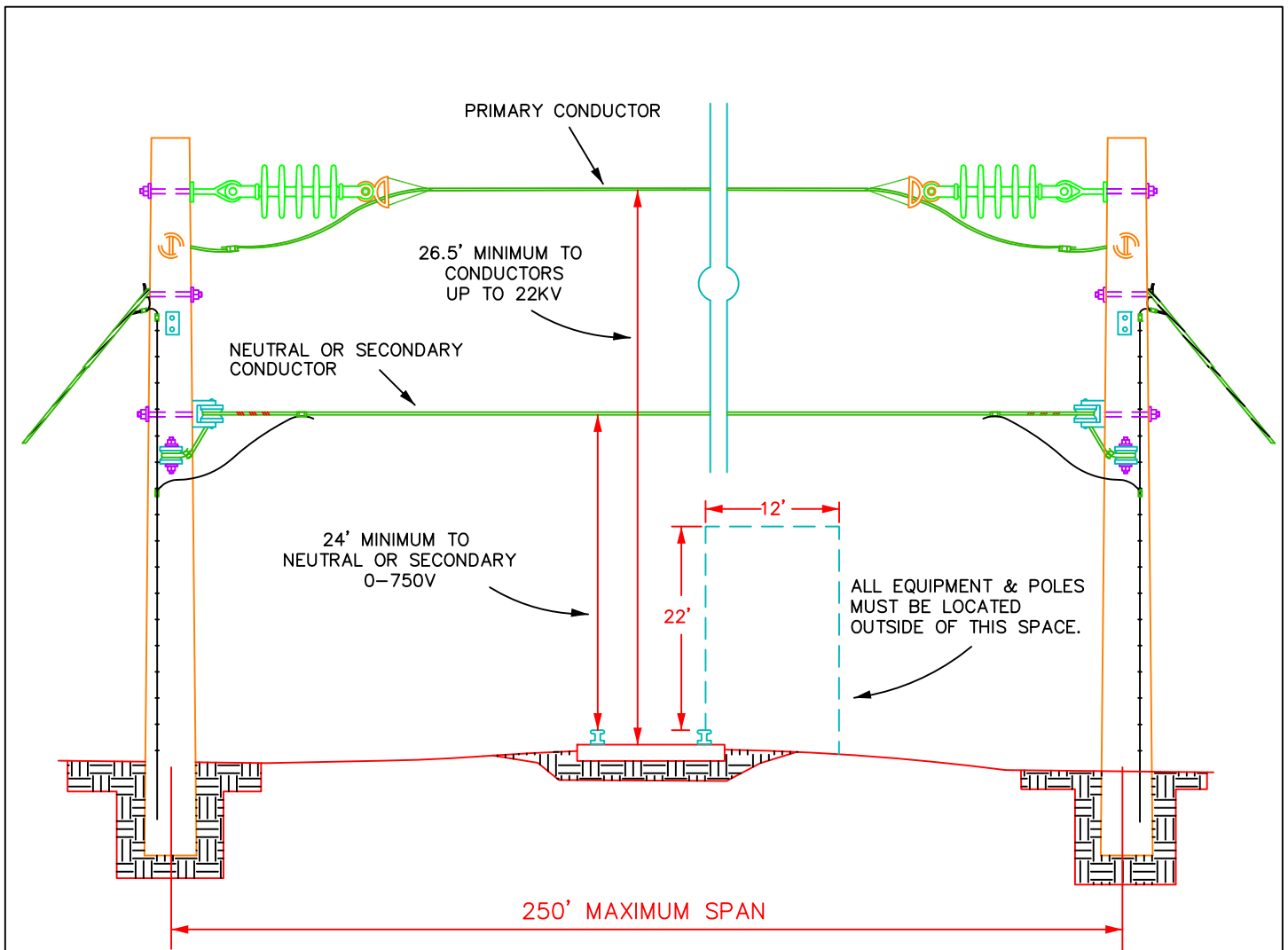
# JOINT TRANSMISSION & DISTRIBUTION



DATE: OCTOBER, 1992

REVISIONS JULY, 2001  
JANUARY, 2007

## JU&C1



1. IF SPAN LENGTH EXCEEDS 250 FEET, CONDUCTOR CLEARANCE IS TO BE INCREASED 0.3 FEET FOR EACH 10 FEET SPAN LENGTH IN EXCESS OF THE 250 FEET.
2. CROSSINGS SHOULD BE MADE ON A COMMON SUPPORT STRUCTURE WHERE PRACTICAL. COOPERATION BETWEEN THE PARTIES CONCERNED SHALL PREVAIL PROPER CLEARANCES.
3. EXCEPTIONS TO 12' HORIZONTAL SIDE CLEARANCE:
  - (a) A CLEARANCE OF NOT LESS THAN 8 FEET MAY BE ALLOWED WHERE NECESSARY IF THE SUPPORTING STRUCTURE IS NOT THE CONTROLLING OBSTRUCTION, PROVIDED SUFFICIENT SPACE FOR A DRIVEWAY IS LEFT WHERE CARS ARE LOADED.
  - (b) WHERE NECESSARY TO PROVIDE SAFE OPERATING CONDITIONS WHICH REQUIRE AN UNINTERRUPTED VIEW OF SIGNALS, SIGNS, ETC. ALONG TRACKS THE PARTIES CONCERNED SHALL COOPERATE IN LOCATING STRUCTURES TO PROVIDE THE NECESSARY CLEARANCE.
  - (c) AT INDUSTRIAL SIDINGS, A CLEARANCE OF NOT LESS THAN 8 FEET SHALL BE PERMITTED, PROVIDED SUFFICIENT SPACE IS LEFT WHERE CARS CAN BE LOADED OR UNLOADED.

## **RAILROAD CROSSING CONSTRUCTION CLEARANCES**



DATE: OCTOBER, 1992

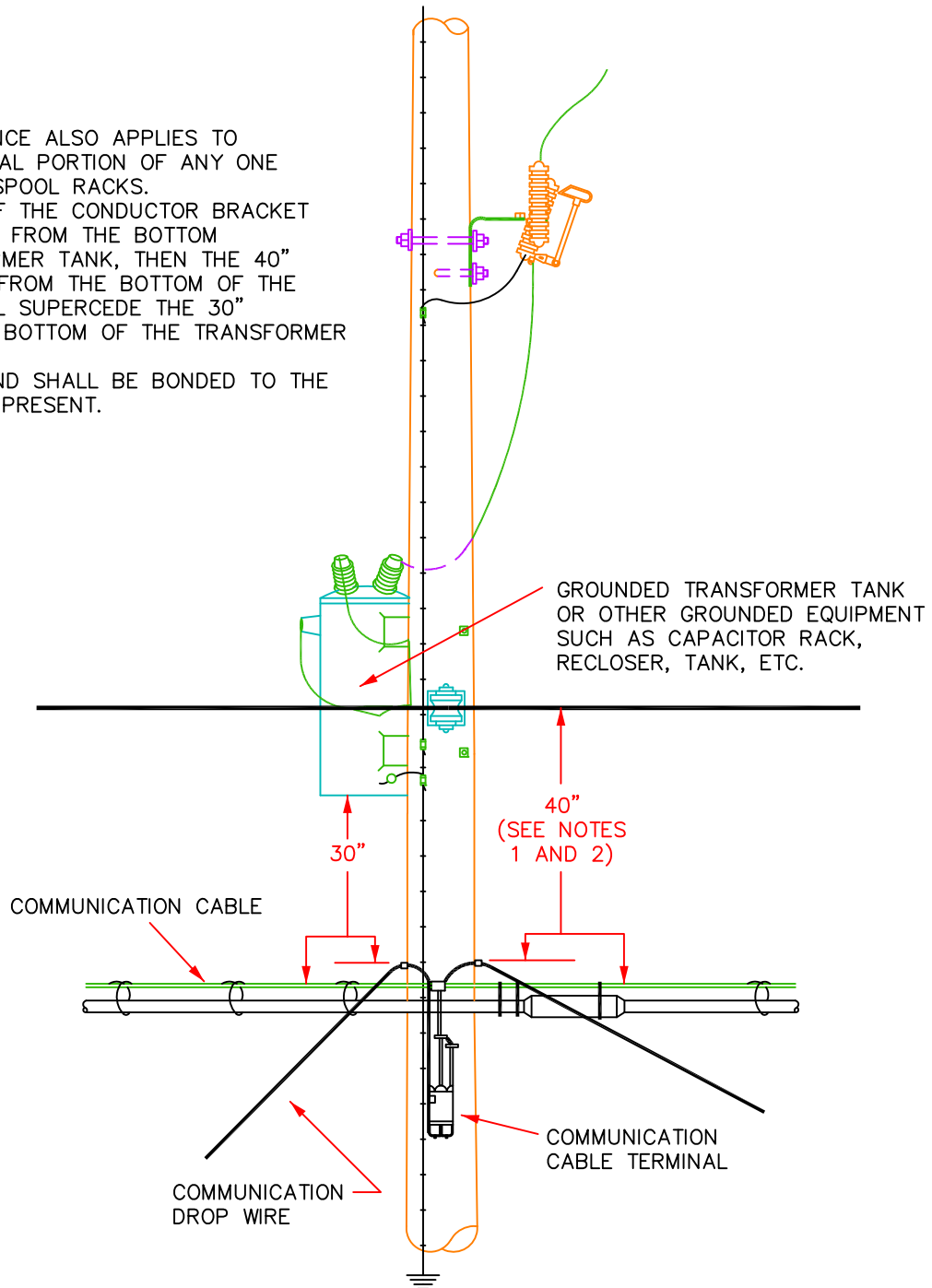
REVISIONS JULY, 2001

JANUARY, 2007

# JU&C2

NOTES:

1. THIS 40" CLEARANCE ALSO APPLIES TO THE CLOSEST METAL PORTION OF ANY ONE SPOOL OR FOUR SPOOL RACKS.
2. IF THE BOTTOM OF THE CONDUCTOR BRACKET IS LESS THAN 10" FROM THE BOTTOM OF THE TRANSFORMER TANK, THEN THE 40" REQUIRED SPACE FROM THE BOTTOM OF THE CONDUCTOR SHALL SUPERCEDE THE 30" SPACE FROM THE BOTTOM OF THE TRANSFORMER TANK.
3. MESSENGER STRAND SHALL BE BONDED TO THE POLE GROUND, IF PRESENT.



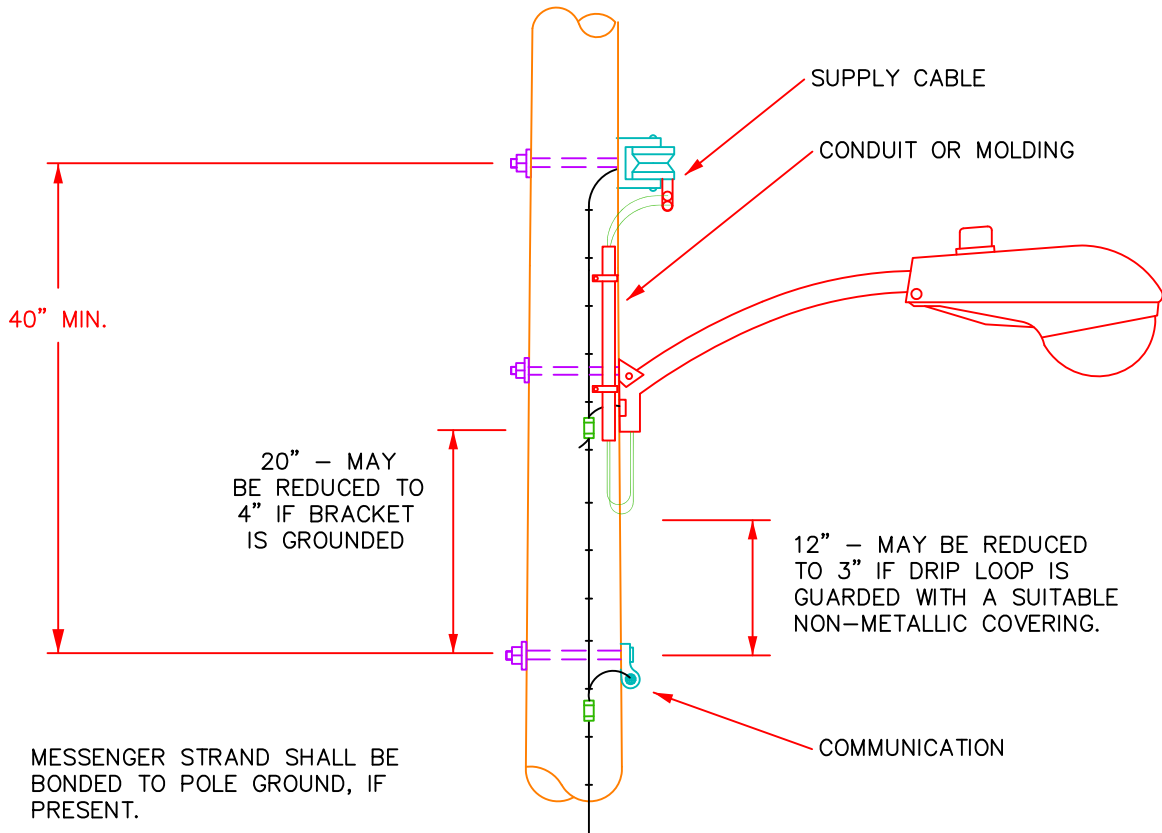
## TRANSFORMER POLE



REVISIONS JULY, 2001

DATE: OCTOBER, 1992

# JU&C3



NOTES:

- 1.) LIGHT FIXTURE SHOWN IS SYMBOLIC ONLY. CLEARANCES SHOWN ARE APPLICABLE TO ANY TYPE FIXTURE USED.
- 2.) LOWEST PART OF LUMINAIRE SHALL BE NOT LESS THAN 15' OVER ROADS, STREETS, PARKING LOTS, OR ALLEYS.

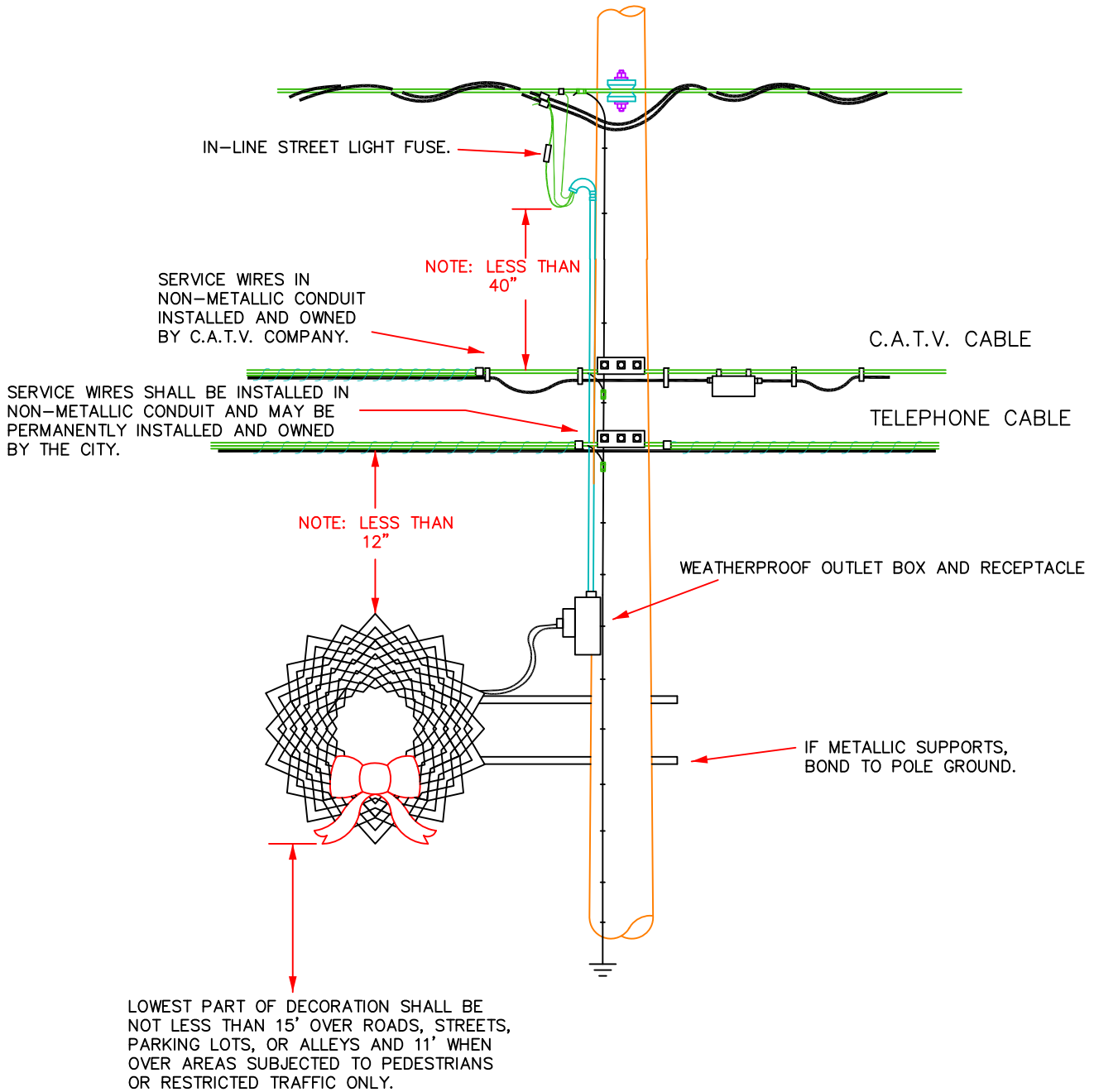
## C.A.T.V., TELEPHONE, OTHER SEPARATION FROM LUMINAIRES



DATE: OCTOBER, 1992

REVISIONS JULY, 2002

**JU&C4**



## DECORATIVE ATTACHMENT INSTALLATION

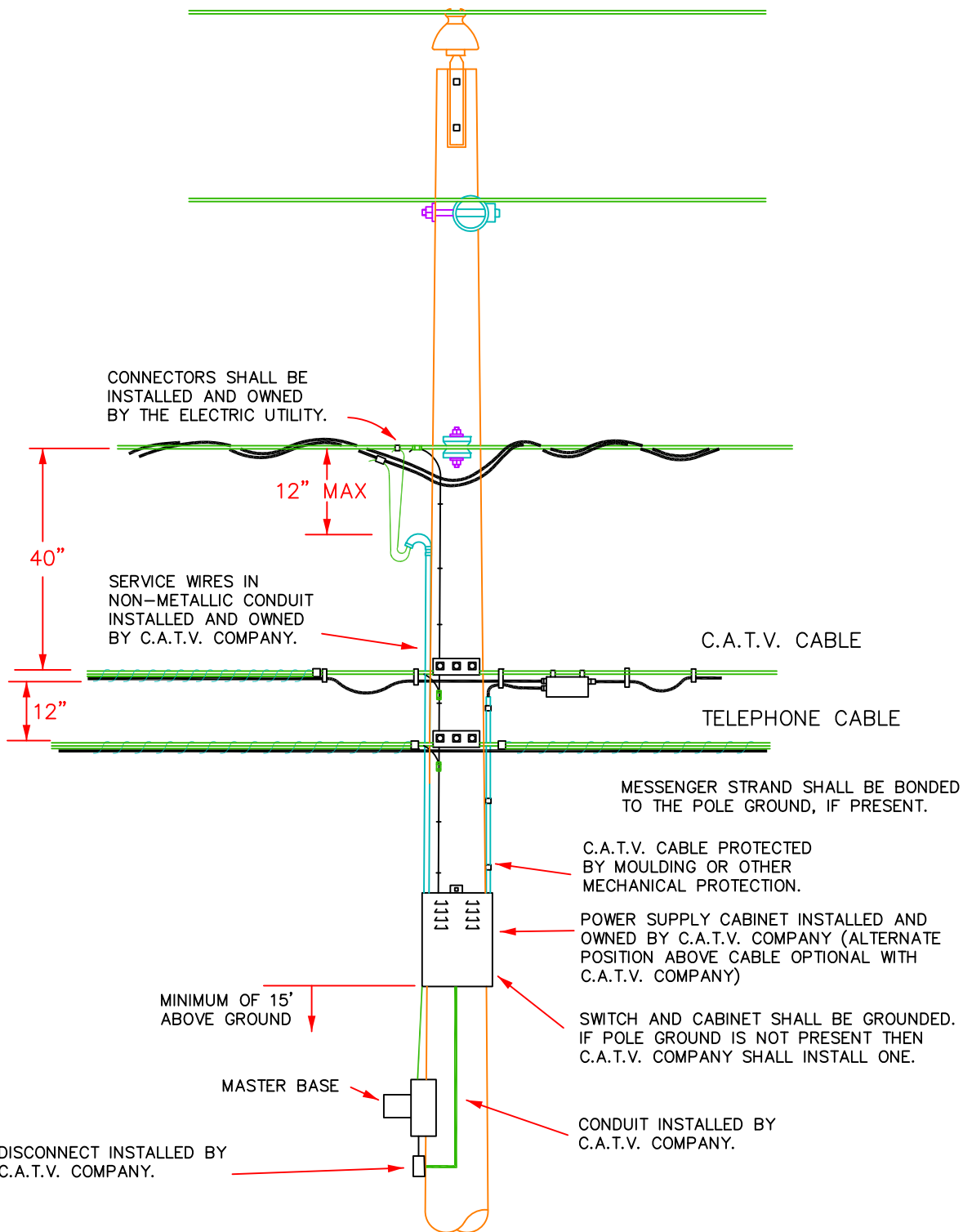


DATE: OCTOBER, 1992

REVISIONS JULY, 2001

# JU&C5





## **COMMUNICATION/SIGNAL TYPE ATTACHMENT C.A.T.V. POWER SUPPLY INSTALLATION**



DATE: OCTOBER, 1992

REVISIONS JULY, 2001

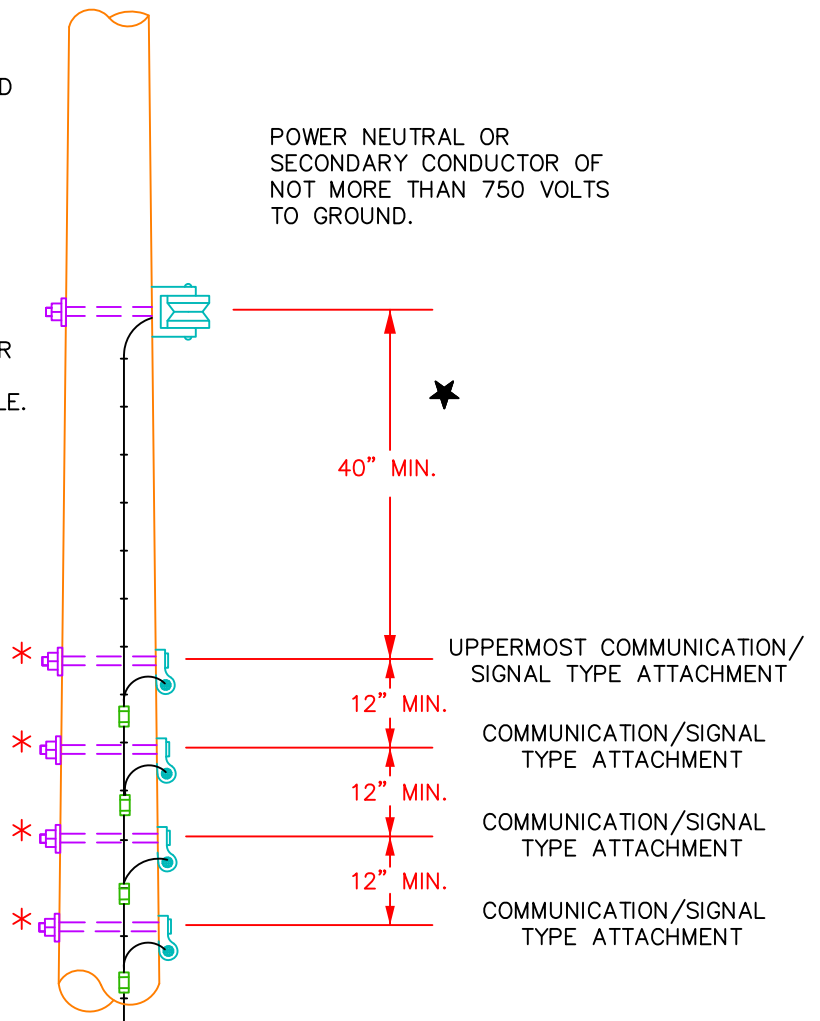
# JU&C6

**\*COMMUNICATION/SIGNAL TYPE ATTACHMENT**

- TELEPHONE CABLE
- C.A.T.V. CABLE
- ALARM CABLE (FIRE, POLICE, WATER TOWER LEVEL, ETC.)
- TRAFFIC SIGNAL CONTROL CABLE
- TELEGRAPH CABLE
- PUBLIC OR PRIVATE COMMUNICATION CABLE

**NOTES:**

- 1.) WHEN C.A.T.V. AND TELEPHONE ARE ATTACHED TO POLE, C.A.T.V.'S PREFERRED POSITION IS ABOVE TELEPHONE (12" MIN.). IF OTHER COMMUNICATION/SIGNAL TYPE CABLES ARE ATTACHED TO POLE WITH C.A.T.V. AND/OR TELEPHONE, THEIR POSITION SHALL BE MUTUALLY AGREED UPON.
- 2.) 12" MIN. SPACING SHOULD BE MAINTAINED BETWEEN CABLES. C.A.T.V. AND TELEPHONE DROPS CAN BE LESS THAN 12" FROM OTHER CABLES. DROPS SHALL BE 40" BELOW POWER NEUTRAL OR SECONDARY AT POLE.
- 3.) ALL CABLES SHALL BE ON SAME SIDE OF POLE.
- 4.) MESSENGER STRAND SHALL BE BONDED TO POLE GROUND, IF PRESENT.



★ FOR SUPPLY NEUTRAL ONLY, THIS MAY BE REDUCED TO 30".

**MULTIPLE COMMUNICATION/SIGNAL TYPE ATTACHMENT**



REVISIONS JULY, 2001

**JU&C7**

DATE: OCTOBER, 1992

FOOTNOTES TABLE 1:

1. Where the height of a building or other installation does not permit service drops to meet these values, the clearances over residential driveways only may be reduced to the following:

	<u>FEET:</u>
a. Service drops limited to 300 V to ground	12.5
b. Service drip loops limited to 300 V to ground	10.5
c. Service limited to 150 V to ground	12.0
d. Drip loops only of service limited to 150 V to ground	10.0

2. Where the height of a building or other installation does not permit service drops to meet these values, the clearances may be reduced to the following:

	<u>FEET:</u>
a. Service drops, including drip loops, limited to 300 V to ground	10.5
b. Service drops, including drip loops, limited to 150 V to ground	10.0

3. Spaces and ways subject to pedestrians or restricted traffic only are those areas where equestrians, vehicles, or other mobile units, exceeding 8ft. in height, are prohibited by regulation or permanent terrain configurations or are otherwise not normally encountered or reasonably anticipated.

4. 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 clearance may be reduced to the following values:

	<u>FEET:</u>
a. Insulated communications cables, neutrals, guys, and multiplex supply cables limited to 150 V to ground	9.5
b. Multiplex supply cables limited to 300 V to ground	12.5

5. This clearance may be reduced to 13 ft. for communication conductors and guys.

6. Where this construction crosses over or runs along alleys, driveways, or parking lots, this clearance may be reduced to 15 ft.

7. For controlled impoundments, the surface area and corresponding clearances shall be based upon the design high water level. For other waters, the service area shall be that enclosed by its annual high water mark, and clearances shall be based on the normal flood level. The clearance over rivers, streams, and canals shall be based upon the largest surface area of any 1 mi. long segment, which 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.

9. 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 or not reasonably anticipated.

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

Note: Footnote 8 and 11 were intentionally omitted

FOOTNOTES TABLE 1: (cont'd)

12. Where the U.S. Army Corps of Engineers, or the state or the surrogate thereof has issued a crossing permit, clearance of that permit shall govern.
13. For controlled impoundments, the surface area and corresponding clearance shall be based upon the design high water level. For other waters, the surface area shall be that enclosed by its annual high water mark, and clearances shall be based upon the largest surface area of any one mile long segment that includes the crossing. The clearance of a canal, river or stream normally used to provide access for sailboats to a larger body of water shall be the same as required for the larger body of water.
14. Where an over water obstruction restricts vessel height to less than the following:

Surface Area (Acres)	Reference Vessel Height (Feet)
less than 20	16
20 to 200	24
200 to 2000	30
over 2000	36

The required clearances may be reduced by the difference between the reference vessel height given above and the over water obstruction height, except that the reduced clearance shall not be less than that required for the surface area on the line crossing side of the obstruction.

The vertical clearance shall be maintained with the conductor at final sag and at the following condition whichever results in the greater vertical sag:

1. 32° F, no wind, with radial thickness of ice of 1/4 inch for medium loading and no ice for light loading.

Or

2. The maximum conductor for which the line is designed to operate, if greater than 120° F.(120° F for all neutrals)

Note:

All clearances shown are design clearances under specified conditions, not measured clearances under ambient conditions.

**VOLTAGES ARE PHASE TO GROUND FOR EFFECTIVELY GROUNDED CIRCUITS**

NATURE OF SURFACE UNDERNEATH WIRES, CONDUCTORS, OR CABLES	INSULATED COMMUNICATION CONDUCTORS AND CABLE; MESSENGERS; GROUNDED GUYS; SYSTEM NEUTRAL  (IN FEET)	DUPLEX, TRIPLEX, & QUADRAPLEX CABLE WITH GROUNDED GUYS; GROUNDED NEUTRAL 0 – 750 VOLTS  (IN FEET)	OPEN WIRE SECONDARY CONDUCTORS 0 – 750 VOLTS  (IN FEET)	OPEN WIRE CONDUCTORS OVER 750 VOLTS TO 22KV  (IN FEET)
WHERE WIRES, CONDUCTORS, OR CABLE CROSS OVER OR OVERHANG				
1. TRACK RAILS OF RAILROADS.	23.5	24	24.5	26.5
2. ROADS, STREETS, AND OTHER AREAS SUBJECT TO TRUCK TRAFFIC. (SEE NOTE 9.)	15.5	16	16.5	18.5
3. DRIVEWAYS, PARKING LOTS, AND ALLEYS	15.5 (SEE NOTES 1 AND 6)	16 (SEE NOTES 1 AND 6)	16.5 (SEE NOTE 1)	18.5
4. OTHER LAND TRAVERSED BY VEHICLES SUCH AS CULTIVATED, GRAZING, FOREST, ORCHARD, ETC.	15.5	16	16.5	18.5
5. SPACES OR WAYS SUBJECT TO PEDESTRIAN OR RESTRICTED TRAFFIC ONLY. (SEE NOTE 3.)	9.5	12 (SEE NOTE 2)	12.5 (SEE NOTE 1)	14.5
6. WATER AREAS NOT SUITABLE FOR SAILBOATS OR WHERE SAILBOATS ARE PROHIBITED. (SEE NOTE 12.)	14	14.5	15	17
7. A) WATER AREAS (NOT REGULATED BY CORPS OF ENGR.) SUITABLE FOR SAILBOATS, INCLUDING LAKES, PONDS, RESERVOIRS, TIDAL WATERS, RIVERS, STREAMS, AND CANALS WITH AN UNOBSTRUCTED SURFACES AREA OF: A. LESS THAN 20 ACRES B. 20 TO 200 ACRES C. 200 TO 2000 ACRES D. OVER 2000 ACRES (SEE NOTES 12, 13, & 14.)	17.5 25.5 31.5 37.5	18 26 32 38	18.5 26.5 32.5 38.5	20.5 28.5 34.5 40.5
7. B) WATER AREAS REGULATED BY CORPS OF ENGINEERS (SEE NOTE 7)	52	55	55	55
8. PUBLIC OR PRIVATE LAND AND WATER AREAS POSTED FOR RIGGING OR LAUNCHING SAILBOATS.	CLEARANCE ABOVE GROUND SHALL BE 5 FEET GREATER THAN IN 7. ABOVE, FOR THE TYPE OF WATER AREAS SERVED BY THE LAUNCHING SITE.			
WHERE WIRES, CONDUCTOR, OR CABLES RUN ALONG AND WITHIN THE LIMITS OF HIGHWAY OR OTHER ROAD RIGHT-OF-WAY BUT DO NOT OVERHANG THE ROADWAY				
9. ROADS, STREET, OR ALLEYS	15.5 (SEE NOTES 6 AND 10)	15.5 (SEE NOTES 6)	16.5	18.5
10. ROADS IN RURAL DISTRICTS WHERE IT IS UNLIKELY THAT VEHICLES WILL BE CROSSING UNDER THE LINE.	15.5 (SEE NOTES 4 AND 5)	14.0 (SEE NOTES 4)	14.5 (SEE NOTES 4)	16.5

\*ALWAYS REFER TO THE LATEST NESC  
(REFERENCE NESC RULE 232, 2007 EDITION, FOR ADDITIONAL INFORMATION)

**VERTICAL CLEARANCES OF WIRES,  
CONDUCTORS, AND CABLES ABOVE GROUND,  
ROADWAYS, RAILS, OR WATER**



REVISIONS JULY, 2002

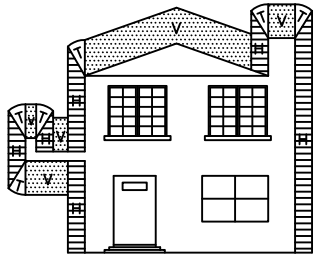
**TABLE 1**

DATE: OCTOBER, 1992

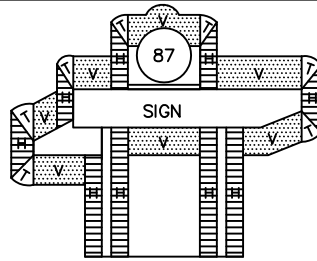
FOOTNOTES TABLE 2:

1. Where a building, sign, chimney, antenna, tank, or other installation does not require maintenance such as painting, washing, changing of sign letters, or other operations which would require persons to work or pass between supply conductors or unguarded rigid live parts and structures, the clearance may be reduced by 2 ft.
3. A roof, balcony, or area is considered readily accessible to pedestrians if the means of access is through a doorway, ramp, window, stairway, or permanently mounted ladder. A permanently mounted ladder is not considered a means of access if its bottom rung is 8 ft. or more from the ground or other permanently installed accessible surface.
4. The required clearances shall be to the closest approach of motorized signs or moving portions of installations.
5. For the purpose of this rule, trucks are defined as any vehicle exceeding 8 ft. in height.
6. This clearance may be reduced to 3 in. for the grounded portions of the guys.
7. Windows not designed to open may have the clearance permitted for the walls and projections.
8. The horizontal clearance shall not be less than 3.5' plus the displacement of the conductor by a 6 lb/ft<sup>2</sup> wind at 60° F, final sag.
9. The horizontal clearance shall not be less than 4.5' plus the displacement of the conductor by a 6 lb/ft<sup>2</sup> wind at 60° F, final sag.
10. Where available space will not permit this value, the clearance may be reduced to 7.0 ft. for conductors limited to 8.7 KV to ground.

Note: Footnote 2 was intentionally omitted.



H - HORIZONTAL CLEARANCE  
T - TRANSITIONAL = VERTICAL (ARC)



V - VERTICAL CLEARANCE

**VOLTAGES ARE PHASE TO GROUND FOR EFFECTIVELY GROUNDED CIRCUITS**

CLEARANCE FROM:	INSULATED COMMUNICATION CONDUCTORS AND CABLES; MESSAGERS; GROUNDED GUYS; NEUTRAL CONDUCTORS (IN FEET)	MULTIPLEX SUPPLY CABLE 0 - 750 VOLTS (IN FEET)	OPEN WIRE CONDUCTORS 0 - 750 VOLTS (IN FEET)	UNGUARDED RIGID LIVE PARTS, OVER 750 VOLTS TO 22 KILOVOLTS (IN FEET)	OPEN WIRE CONDUCTORS OVER 750 VOLTS TO 22 KILOVOLT (IN FEET)
1. BUILDINGS					
A. HORIZONTAL					
(1) TO WALLS, PROJECTIONS, AND GUARDED WINDOWS.	4.5 (SEE NOTE 6)	5.0 (SEE NOTE 1)	5.5 (SEE NOTE 1 & 8)	7.0 (SEE NOTE 1)	7.5 (SEE NOTE 1,9,&10)
(2) TO UNGUARDED WINDOWS. (SEE NOTE 7)	4.5	5.0	5.5 (SEE NOTE 1 & 8)	7.0	7.5 (SEE NOTE 9 & 10)
(3) TO BALCONIES AND AREA ACCESSIBLE TO PEDESTRIANS. (SEE NOTE 3)	4.5	5.0	5.5 (SEE NOTE 8)	7.0	7.5 (SEE NOTE 9 & 10)
B. VERTICAL					
(1) OVER OR UNDER ROOF OR PROJECTIONS NOT READILY ACCESSIBLE TO PEDESTRIANS. (SEE NOTE 3)	3.0	3.5	10.5	12.0	12.5
(2) OVER OR UNDER BALCONIES AND ROOFS READILY ACCESSIBLE TO PEDESTRIANS. (SEE NOTE 3)	10.5	11.0	11.5	13.0	13.5
(3) OVER ROOFS ACCESSIBLE TO VEHICLES, BUT NOT SUBJECT TO TRUCK TRAFFIC. (SEE NOTE 5)	10.5	11.0	11.5	13.0	13.5
(4) OVER ROOFS ACCESSIBLE TO TRUCK TRAFFIC. (SEE NOTE 5)	15.5	16.0	16.5	18.0	18.5
2. SIGNS, CHIMNEYS, BILLBOARDS, RADIO AND TELEVISION ANTENNAS, TANKS, AND OTHER INSTALLATIONS NOT CLASSIFIED AS BUILDINGS OR BRIDGES.					
A. HORIZONTAL; (SEE NOTE 4)					
(1) READILY ACCESSIBLE	4.5	5.0	5.5	7.0	7.5
(2) NOT READILY ACCESSIBLE	3.0	3.5	5.5 (SEE NOTES 1 & 8)	7.0	7.5 (SEE NOTE 1,9,&10)
B. VERTICAL					
(1) OVER OR UNDER CATWALKS AND OTHER SURFACES UPON WHICH PERSONNEL WALK.	10.5	11.0	11.5	13.0	13.5
(2) OVER OR UNDER OTHER PORTIONS OF SUCH INSTALLATIONS.	3.0	3.5	6.0 (SEE NOTE 1)	7.5	8.0

\*ALWAYS REFER TO THE LATEST NESC  
(REFERENCE NESC RULE 232, 2007 EDITION, FOR ADDITIONAL INFORMATION)

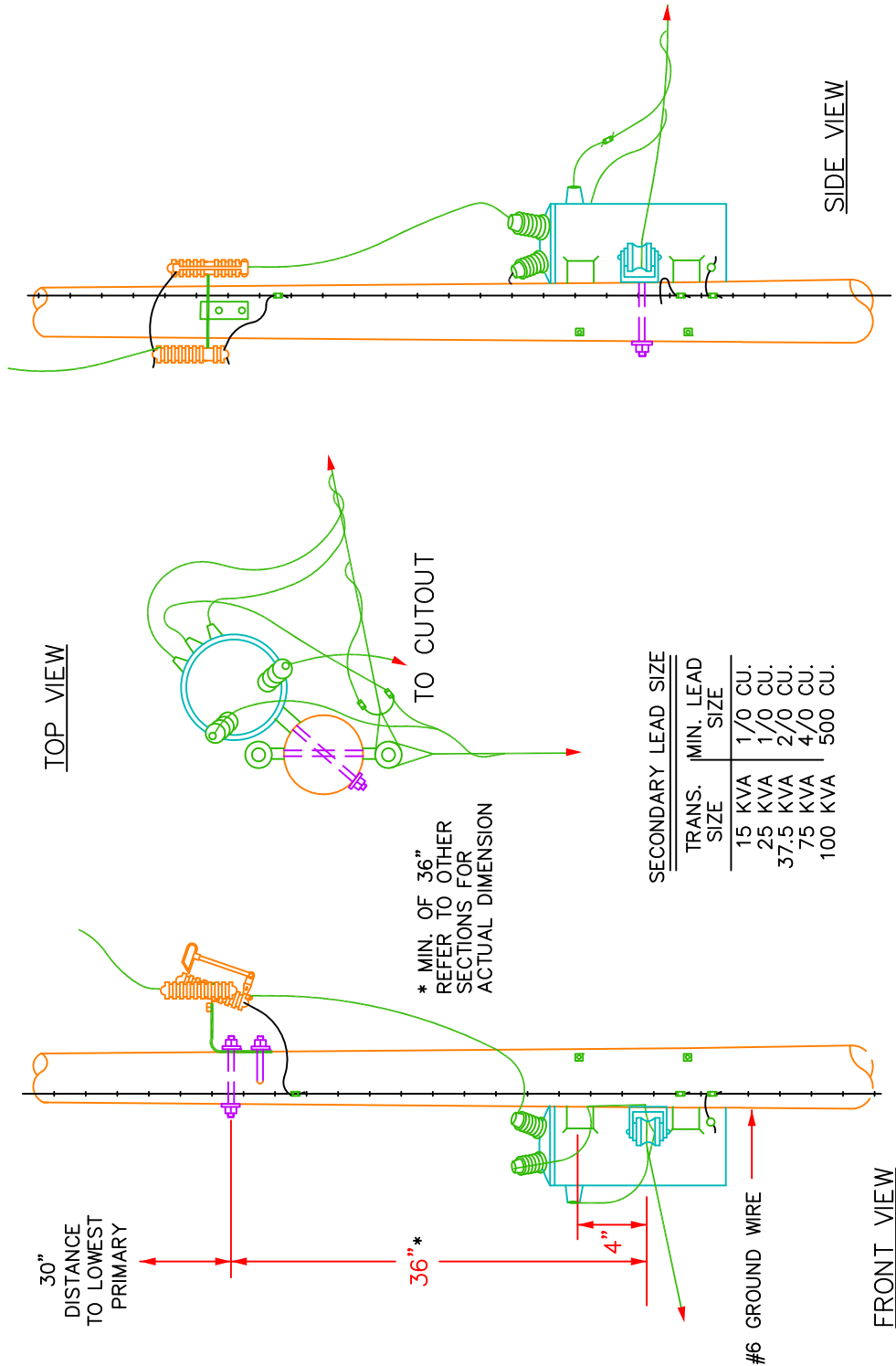
**CLEARANCES OF WIRES, CABLES, AND UNGUARDED RIGID LIVE PARTS ADJACENT BUT NOT ATTACHED TO BUILDINGS AND OTHER INSTALLATIONS EXCEPT BRIDGES**



REVISIONS JULY, 2001

DATE: OCTOBER, 1992

**TABLE 2**



- NOTES:
1. CONNECT TRANSFORMER SECONDARY NEUTRAL LEAD TO SYSTEM AND LEAVE APPROXIMATELY 12 INCH TAIL FOR SERVICE NEUTRAL CONNECTIONS.
  2. IF SECONDARY IS TO EXTEND IN LINE, EXTEND PRIMARY WIRE TO ELIMINATE CONFLICT BETWEEN SECONDARY AND ANCHOR GUY. IF IT IS NOT DESIRABLE TO EXTEND PRIMARY, INSTALL SPAN GUY TO NEXT POLE.
  3. AVOID PLACING CUTOUT DIRECTLY ABOVE TRANSFORMER.
  4. USE WILDLIFE GUARDS AND COVERED RISER WIRE.

# SINGLE TRANSFORMER INSTALLATION, DEADEND POLE



DATE: OCTOBER, 1992

REVISIONS JULY, 2001

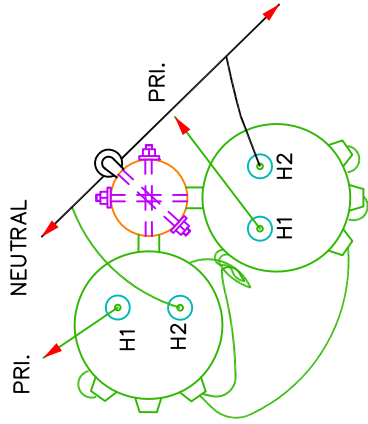
## G110





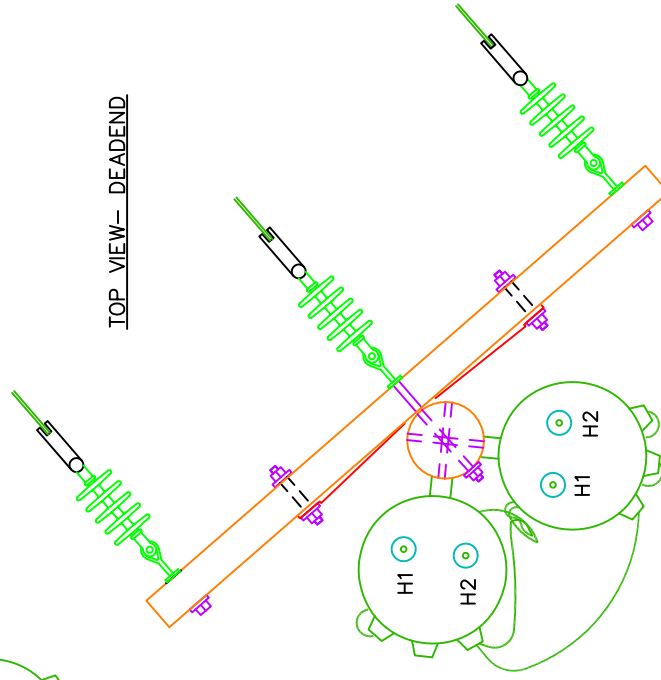
30" DISTANCE TO LOWEST PRIMARY

TOP VIEW— TANGENT



\* MIN. OF 54"  
REFER TO OTHER  
SECTIONS FOR  
ACTUAL DIMENSION

TOP VIEW— DEADEND



**SECONDARY LEAD SIZE**

TRANS. SIZE	MIN. LEAD SIZE
15 KVA	1/0 CU.
25 KVA	1/0 CU.
37.5 KVA	2/0 CU.
75 KVA	4/0 CU.
100 KVA	500 CU.

**NOTES:**

1. CONNECT TRANSFORMER SECONDARY NEUTRAL LEAD TO SYSTEM AND LEAVE APPROXIMATELY 12 INCH TAIL FOR SERVICE NEUTRAL CONNECTIONS.
2. USE WILDLIFE GUARDS AND COVERED RISER WIRE.
3. AVOID PLACING CUTOUT DIRECTLY ABOVE TRANSFORMER.

# TWO TRANSFORMERS, CLUSTER MOUNTED OPEN WYE- OPEN DELTA



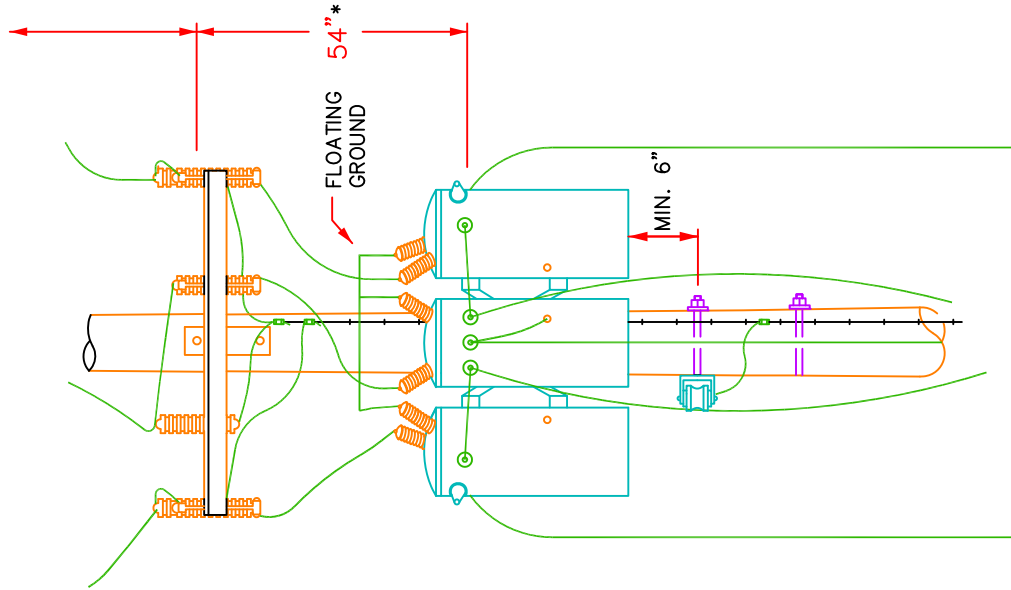
DATE: OCTOBER, 1992

REVISIONS JULY, 2001  
JANUARY, 2007

**G210**

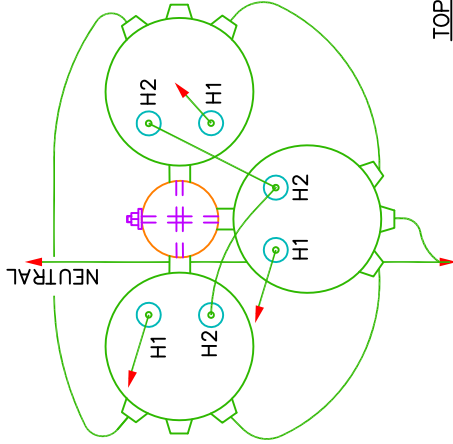


30" DISTANCE TO LOWEST PRIMARY

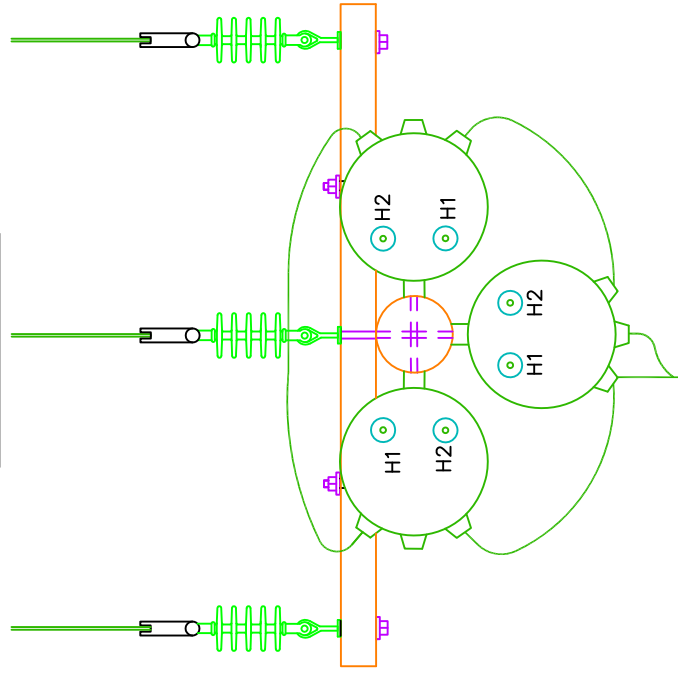


\* MIN. OF 54"  
REFER TO OTHER  
SECTIONS FOR  
ACTUAL DIMENSION

TOP VIEW— TANGENT



TOP VIEW— DEADEND



SECONDARY LEAD SIZE

TRANS. SIZE	MIN. LEAD SIZE
15 KVA	1/0 CU.
25 KVA	1/0 CU.
37.5 KVA	2/0 CU.
75 KVA	4/0 CU.
100 KVA	500 CU.

- NOTES:
1. AVOID PLACING CUTOUTS DIRECTLY ABOVE TRANSFORMERS.
  2. USE WILDLIFE GUARDS AND COVERED RISER WIRE.

# THREE TRANSFORMERS, CLUSTER MOUNTED CLOSED DELTA



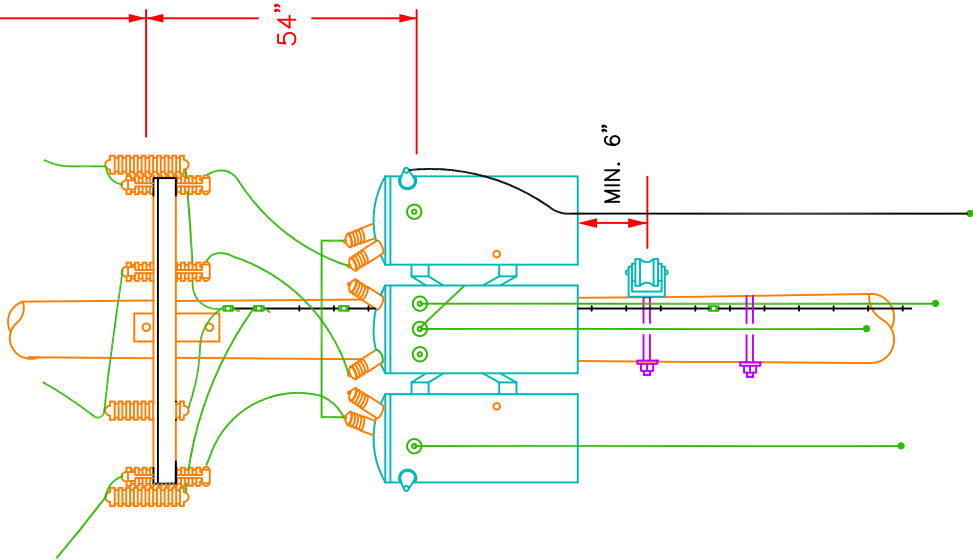
DATE: OCTOBER, 1992

REVISIONS JULY, 2001  
JANUARY, 2007

# G310

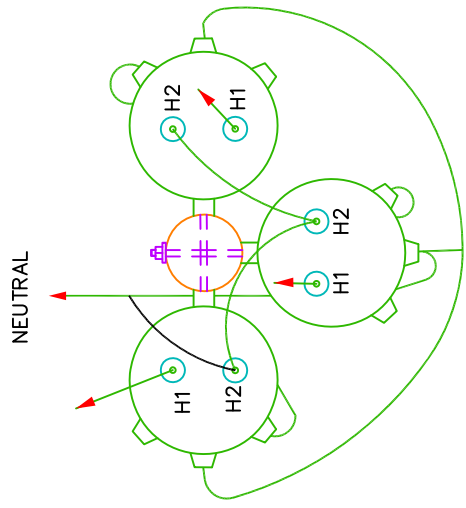


30" DISTANCE TO LOWEST PRIMARY



54" \*  
\* MIN. OF 54" REFER TO OTHER SECTIONS FOR ACTUAL DIMENSION

TOP VIEW



SECONDARY LEAD SIZE

TRANS. SIZE	MIN. LEAD SIZE
15 KVA	1/0 CU.
25 KVA	1/0 CU.
37.5 KVA	2/0 CU.
75 KVA	4/0 CU.
100 KVA	500 CU.

- NOTES:  
 1. AVOID PLACING CUTOUTS DIRECTLY ABOVE TRANSFORMERS.  
 2. USE WILDLIFE GUARDS AND COVERED RISER WIRE.

**THREE TRANSFORMERS, CLUSTER MOUNTED  
 4-WIRE GROUNDED WYE- GROUNDED WYE**



DATE: OCTOBER, 1992

REVISIONS JULY, 2001

**G312**



## FUSE CHART FOR OVERHEAD TRANSFORMERS AND CAPACITORS OPERATING ON A 12470/7200 VOLT WYE SYSTEM

USE SPECIFIC FUSE TYPES TO BE SELECTED TO BE  
WITH OVERALL SYSTEM PROTECTION PLAN

COMPATIBLE

TRANSFORMER KVA	FULL LOAD AMPS	FUSE TYPE "KS" SIZE	FUSE TYPE "QA" SIZE	FUSE TYPE "T" SIZE	FUSE TYPE "N" SIZE	FUSE TYPE "K" SIZE
10	1.39	2	2	2	3	2
15	2.08	3	5	3	5	3
25	3.47	5	7	6	5	6
37.5	5.21	7	10	8	7	8
50	6.94	10	15	10	10	10
75	10.42	15	20	15	15	15
100	13.89	20	30	20	20	20
167	23.19	30	50	30	30	30

CAPACITOR KVAR IN BANK	FULL LOAD AMPS	FUSE TYPE "KS" SIZE	FUSE TYPE "QA" SIZE	FUSE TYPE "T" SIZE	FUSE TYPE "N" SIZE	FUSE TYPE "K" SIZE
150	6.94	10	15	10	10	10
300	13.89	15	20	15	15	15
450	20.83	20	30	20	20	20
600	27.78	25	40	25	25	25
900	41.67	40	60	40	40	40
1200	55.56	50	45	50	50	50
1350	62.50	65	100	65	65	65
1800	83.33	80	125	80	80	80



DATE: JANUARY, 2007

REVISIONS \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**R1**



## SECONDARY LEAD CHART

TRANSFORMER SIZE (KVA)	SECONDARY VOLTAGE				
	120/240	120/208Y	480 Delta	277/480 Y	120/240 Delta
10	#1/0 Cu	#1/0 Cu	#1/0 Al #1/0 Cu	#1/0 Al #1/0 Cu	#1/0 Al #1/0 Cu
15	#1/0 Cu	#4/0 Al #1/0 Cu	#1/0 Al #1/0 Cu	#1/0 Al #1/0 Cu	#1/0 Al #1/0 Cu
25	#1/0 Cu	#4/0 Al #1/0 Cu	#1/0 Al #1/0 Cu	#1/0 Al #1/0 Cu	#1/0 Al #1/0 Cu
37.5	#1/0 Cu	#350 Al #1/0 Cu	#1/0 Al #1/0 Cu	#1/0 Al #1/0 Cu	#350 Al #1/0 Cu
50	#4/0 Cu	#350 Al #4/0 Cu	#4/0 Al #1/0 Cu	#4/0 Al #1/0 Cu	#4/0 Al #1/0 Cu
75	#4/0 Cu	#750 Al	#4/0 Al #1/0 Cu	#4/0 Al #1/0 Cu	#750 Al
100	#500 Cu	#750 Al	#350 Al #4/0 Cu	#350 Al #4/0 Cu	#750 Al
167	#1000 Cu	(2) #750 Al	#750 Al	#750 Al	(2) #750 Al
250	(2) #1000 Al	*	(2) #350 Al	(2) #350 Al	(2) #750 Al
333	*	*	(2) #750 Al	(2) #750 Al	*
500	*	*			*

\*— Leads should be sized case to case. Most transformers 75 kVA and larger have spade terminals for paralleling conductors



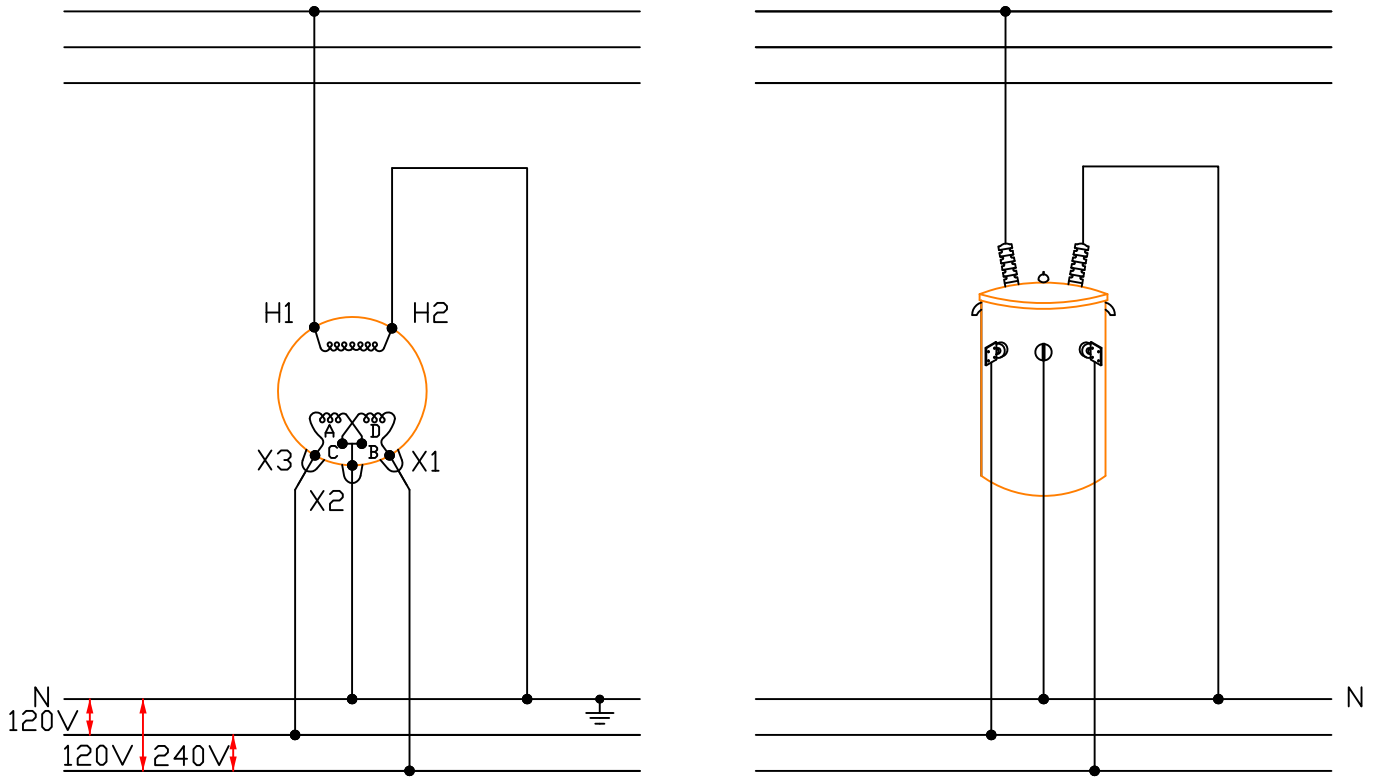
DATE: JANUARY, 2008

REVISIONS \_\_\_\_\_

\_\_\_\_\_

**R2**

**PRIMARY CONDUCTORS**



**SECONDARY CONDUCTORS**

**(ADDITIVE POLARITY)  
PRIMARY WINDING CONNECTED PHASE TO GROUND**

**SINGLE PHASE  
CONNECTION**

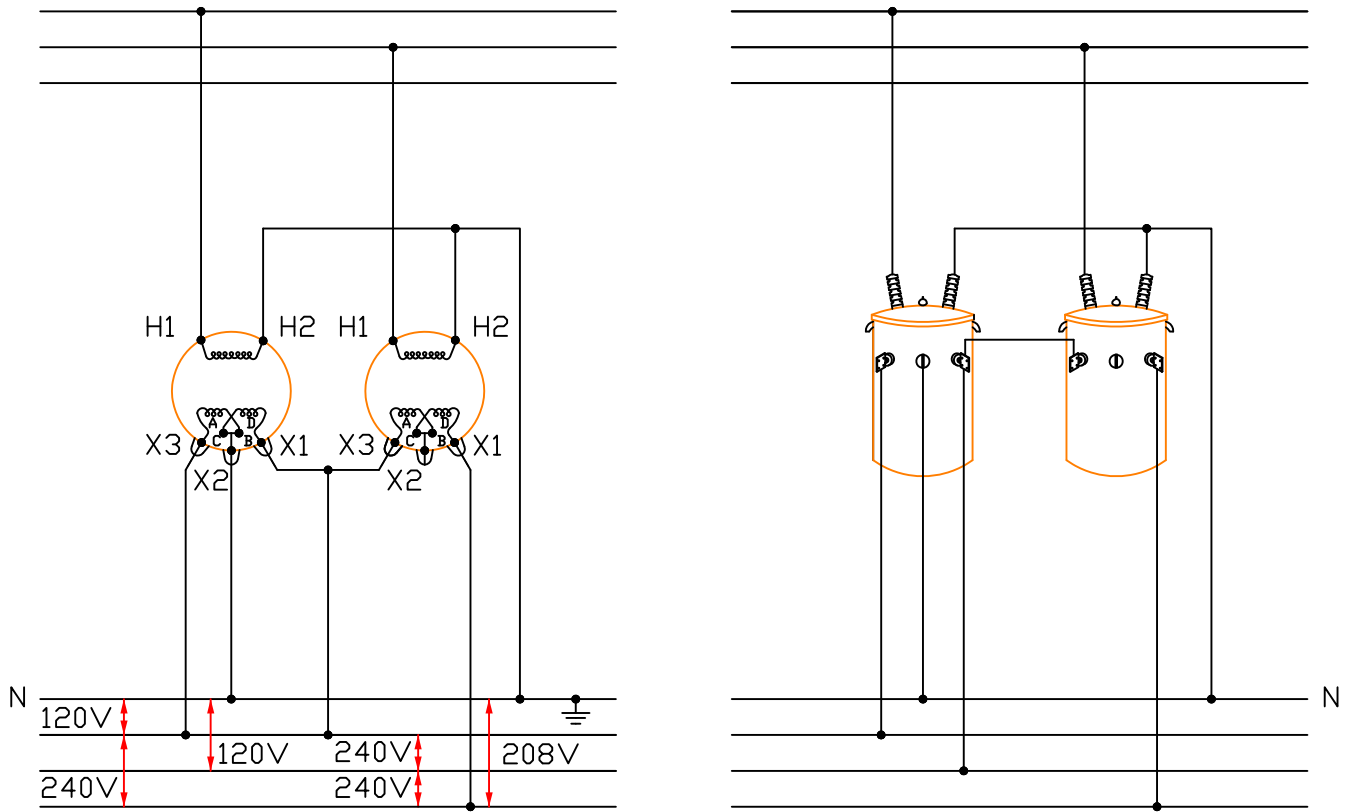


DATE: OCTOBER, 1992

REVISIONS JULY, 2002

**TC1**

**PRIMARY CONDUCTORS**



**SECONDARY CONDUCTORS**

**(ADDITIVE POLARITY)**

**THREE PHASE OPEN WYE- OPEN DELTA CONNECTION**

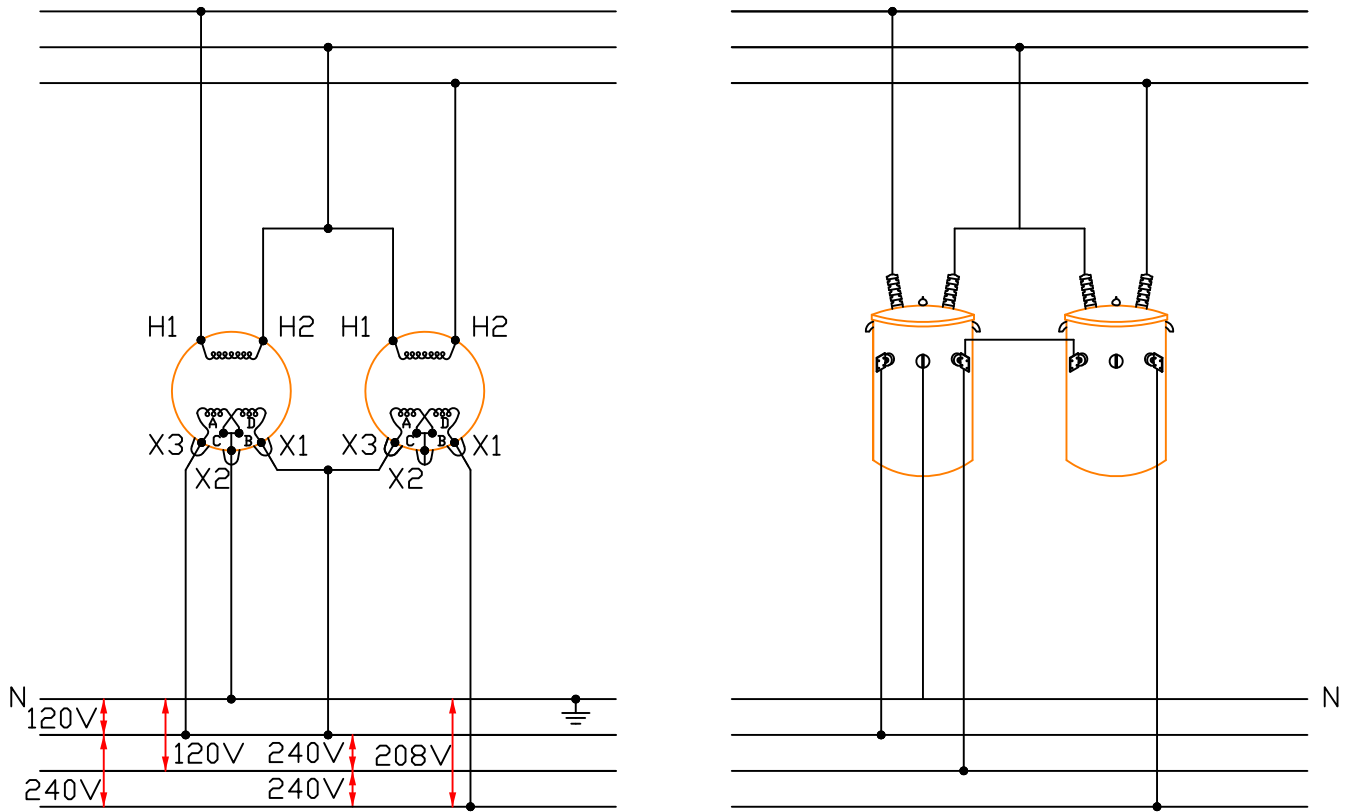


DATE: OCTOBER, 2001

REVISIONS JULY, 2001

**TC10**

**PRIMARY CONDUCTORS**



**SECONDARY CONDUCTORS**

**(ADDITIVE POLARITY)**

**THREE PHASE OPEN DELTA - OPEN DELTA CONNECTION**

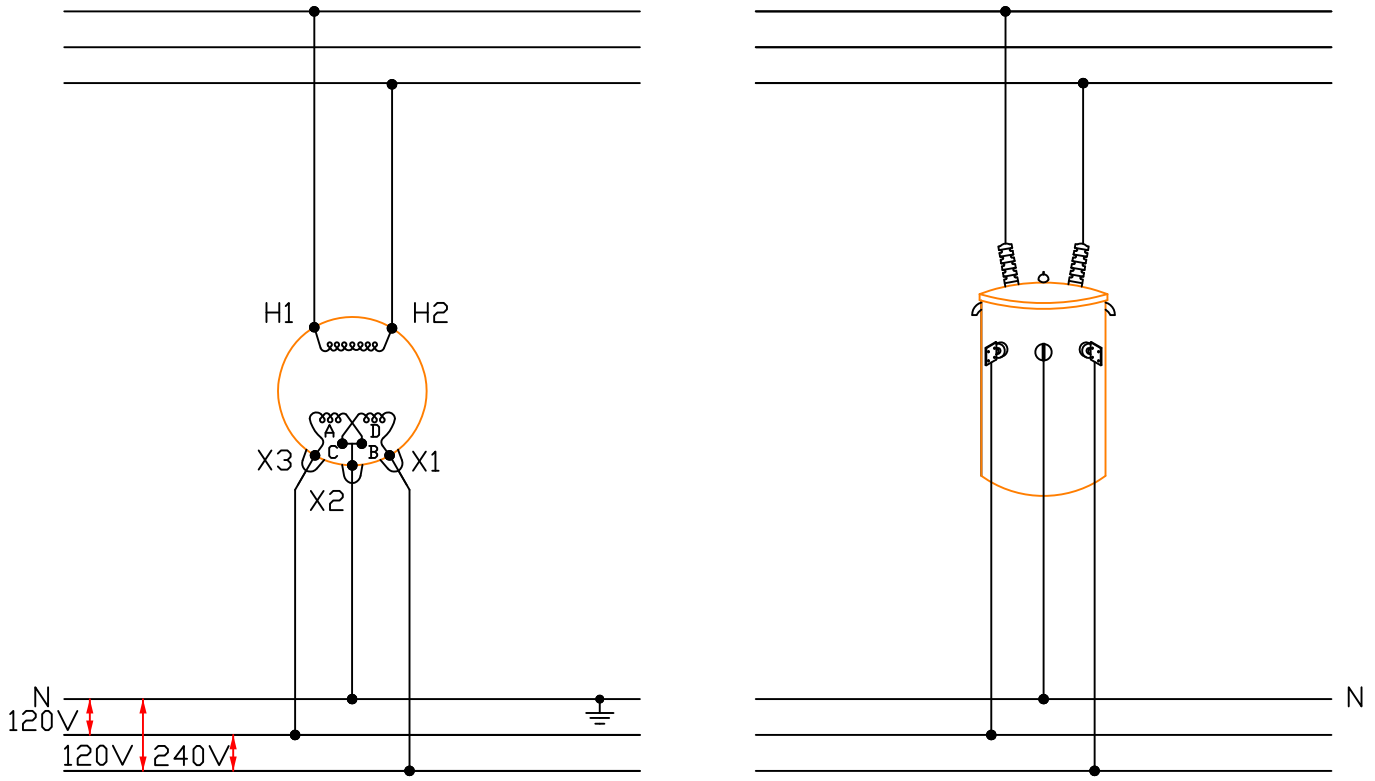


DATE: OCTOBER, 2001

REVISIONS JULY, 2001

**TC11**

**PRIMARY CONDUCTORS**



**SECONDARY CONDUCTORS**

**(ADDITIVE POLARITY)  
PRIMARY WINDING CONNECTED PHASE TO PHASE**

**SINGLE PHASE  
CONNECTION**

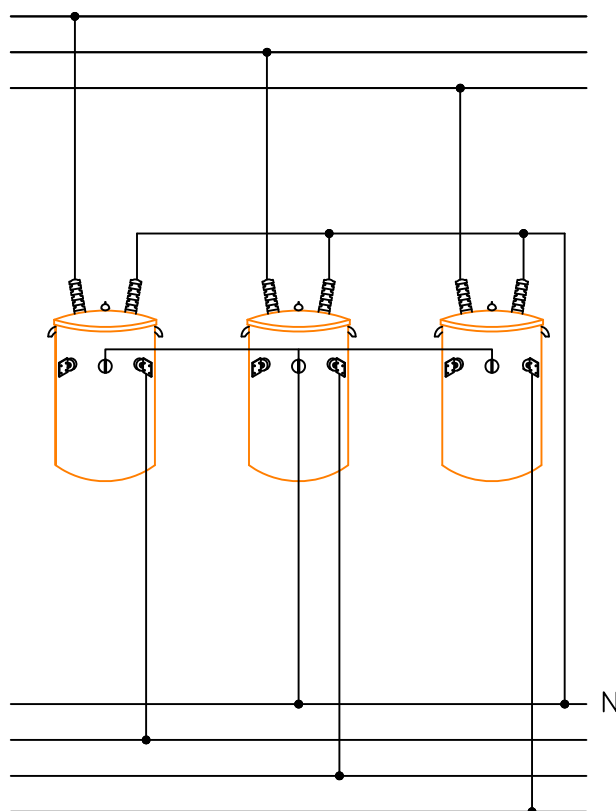
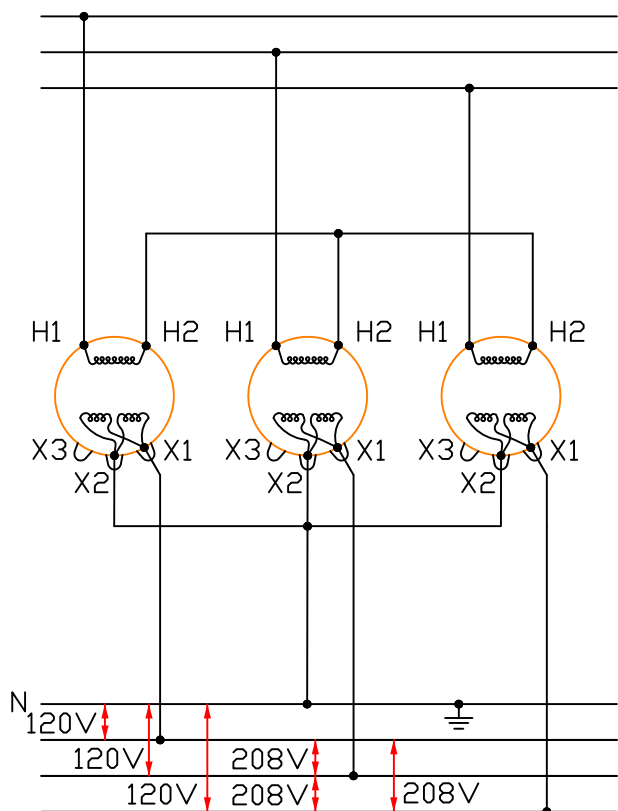


DATE: OCTOBER, 1992

REVISIONS JULY, 2002

**TC2**

**PRIMARY CONDUCTORS**



**SECONDARY CONDUCTORS**

**(ADDITIVE POLARITY)**

**THREE PHASE WYE - WYE CONNECTION**

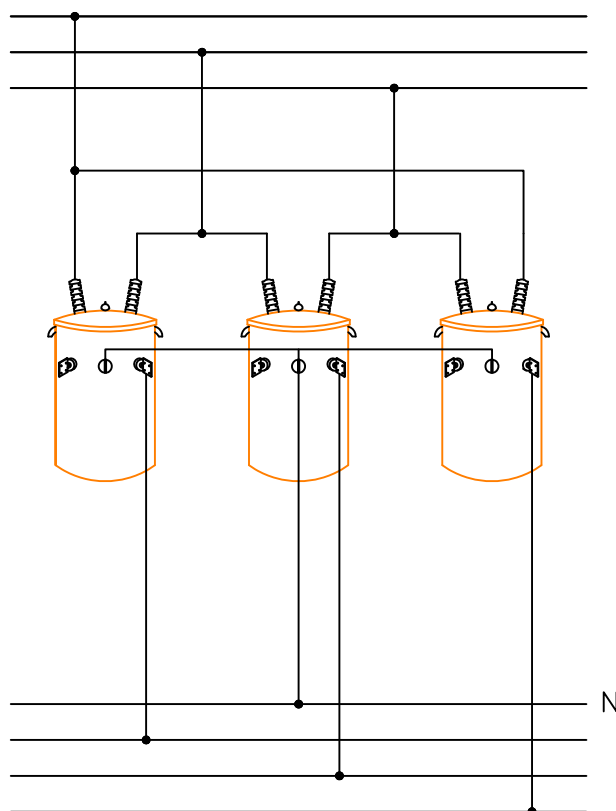
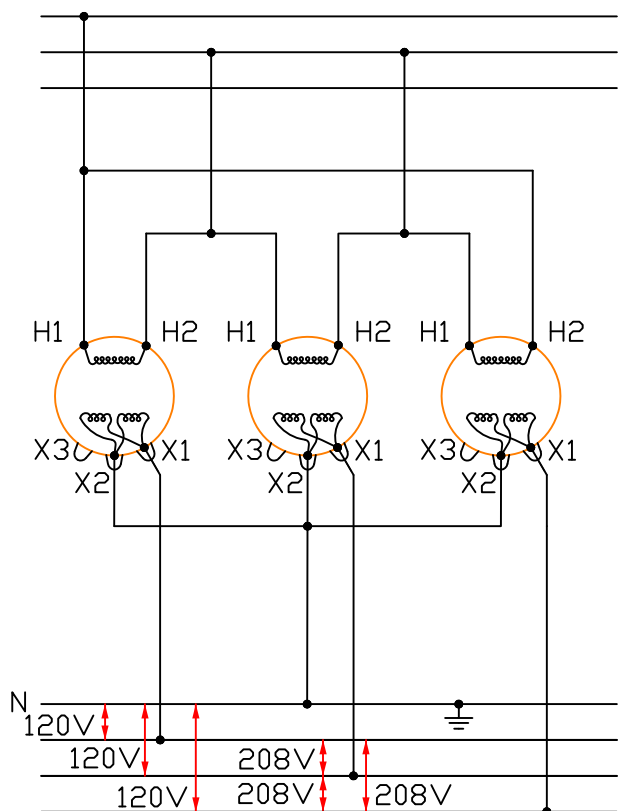


DATE: OCTOBER, 1992

REVISIONS JULY, 2002

**TC3**

**PRIMARY CONDUCTORS**



**SECONDARY CONDUCTORS**

**(ADDITIVE POLARITY)**

**THREE PHASE DELTA - WYE CONNECTION**

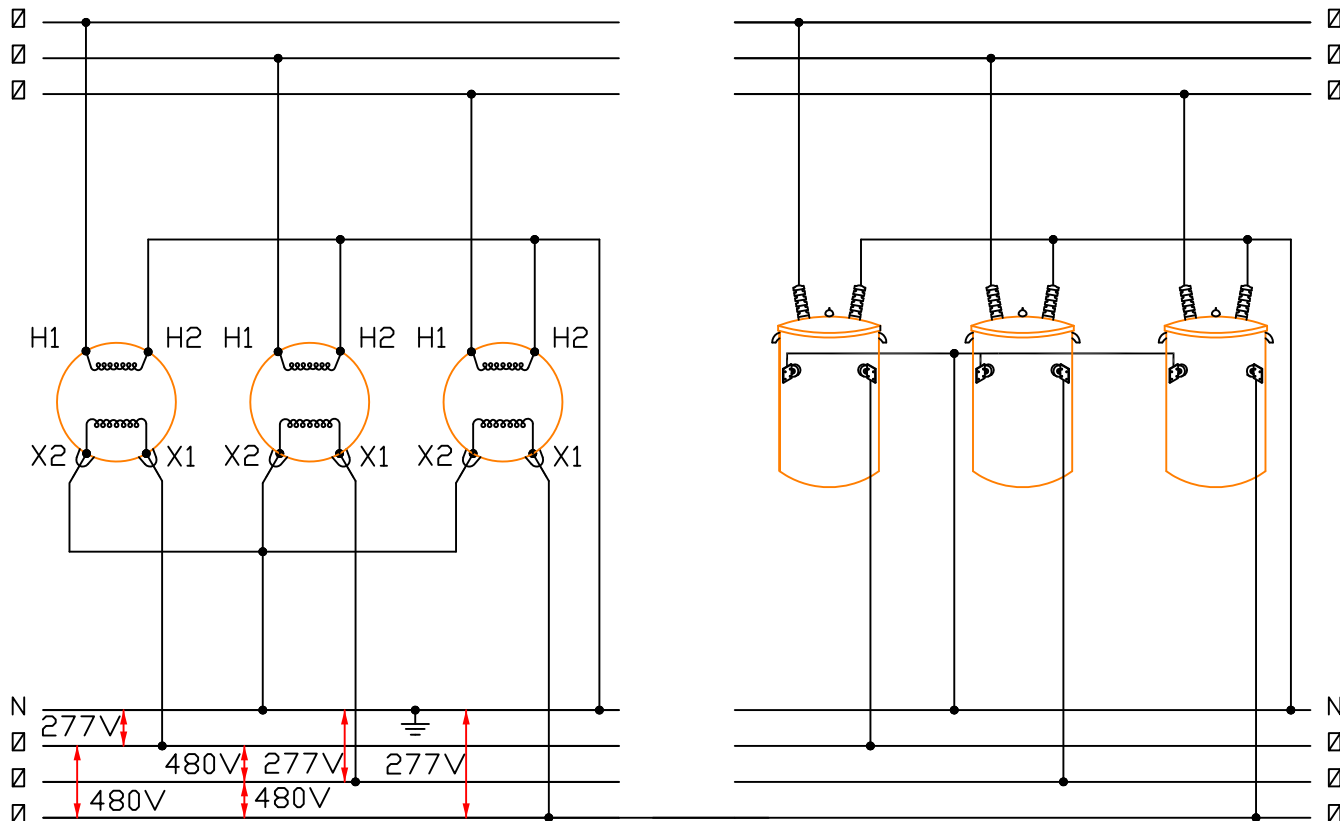


DATE: OCTOBER, 1992

REVISIONS JULY, 2002

**TC4**

**PRIMARY CONDUCTORS**



**SECONDARY CONDUCTORS**

**(ADDITIVE POLARITY)**

**THREE PHASE 4-WIRE 277/480 VOLT**  
**WYE CONNECTION**



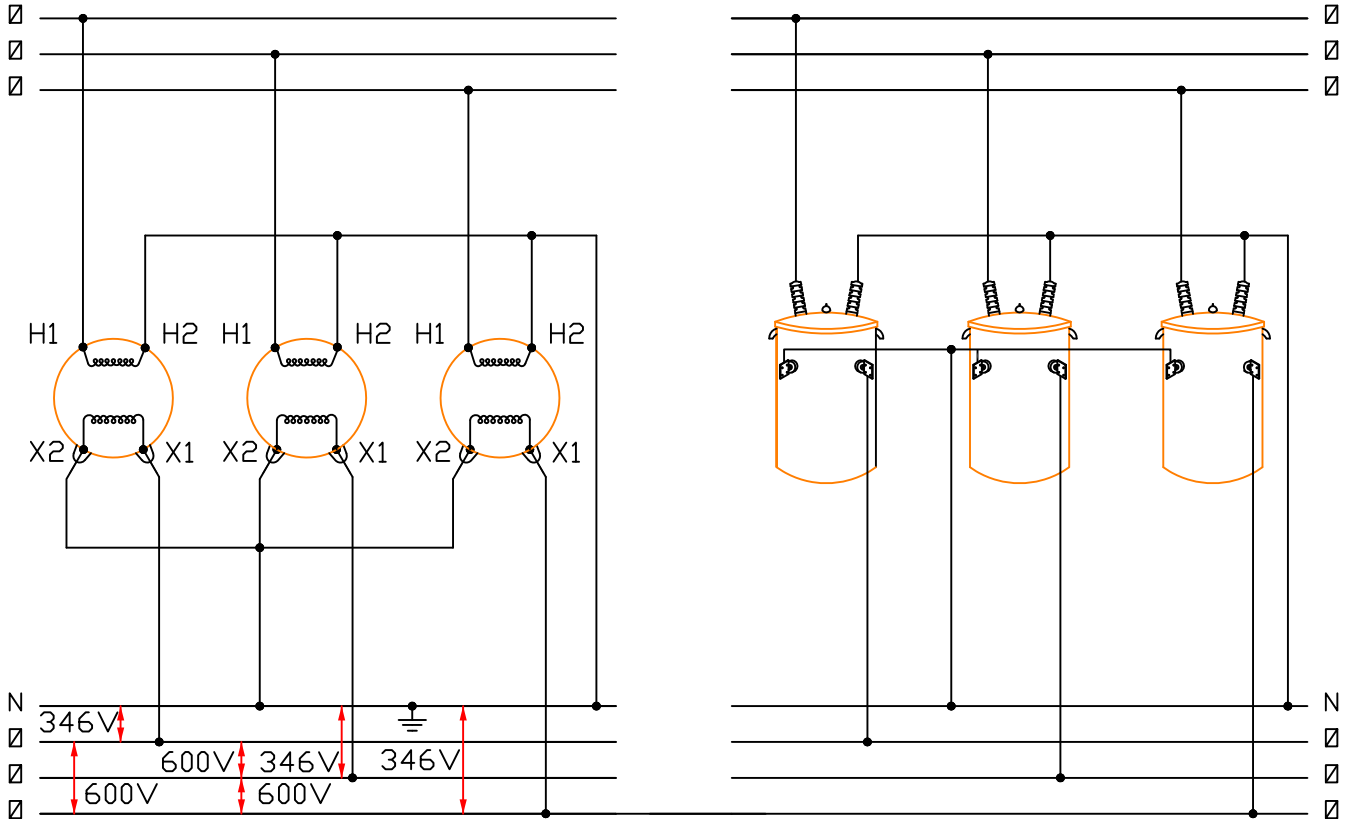
DATE: OCTOBER, 2001

REVISIONS JULY, 2001

**TC5**



**PRIMARY CONDUCTORS**



**SECONDARY CONDUCTORS**

**(ADDITIVE POLARITY)**

**THREE PHASE 4-WIRE 346/600 VOLT**  
**WYE CONNECTION**

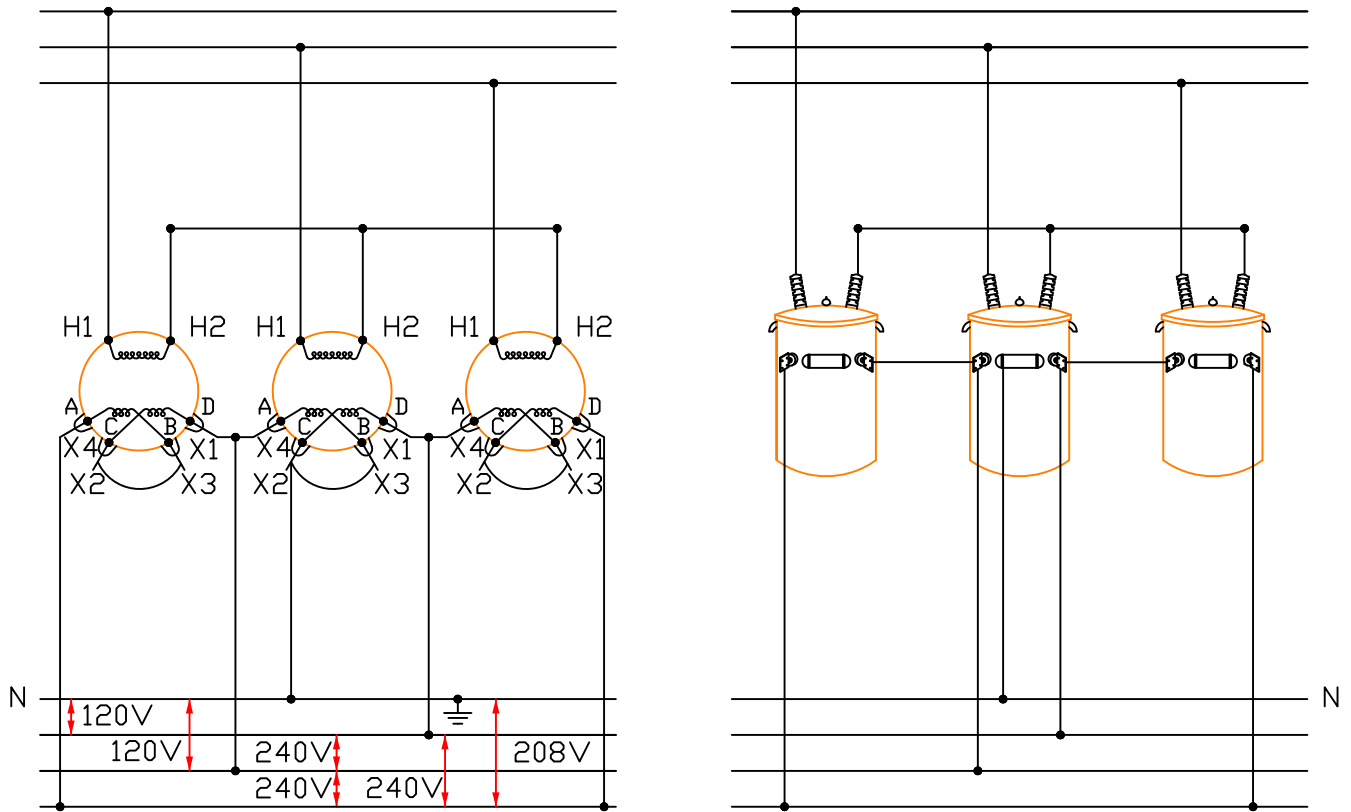


DATE: OCTOBER, 2001

REVISIONS JULY, 2001

**TC6**

**PRIMARY CONDUCTORS**



**SECONDARY CONDUCTORS**

**(ADDITIVE POLARITY)**

**THREE PHASE WYE - DELTA CONNECTION**

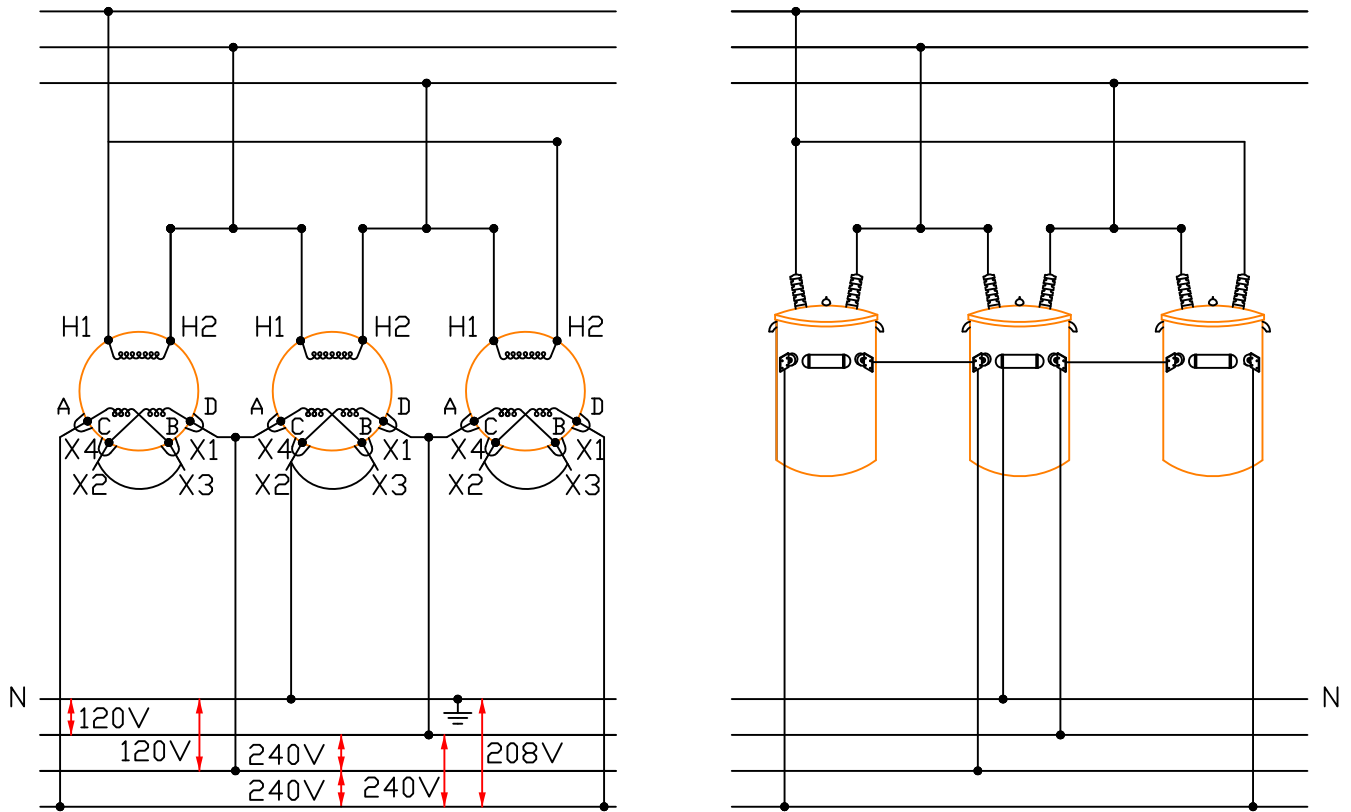


DATE: OCTOBER, 2001

REVISIONS JULY, 2002

**TC7**

**PRIMARY CONDUCTORS**



**SECONDARY CONDUCTORS**

**(ADDITIVE POLARITY)**

**THREE PHASE DELTA - DELTA CONNECTION**

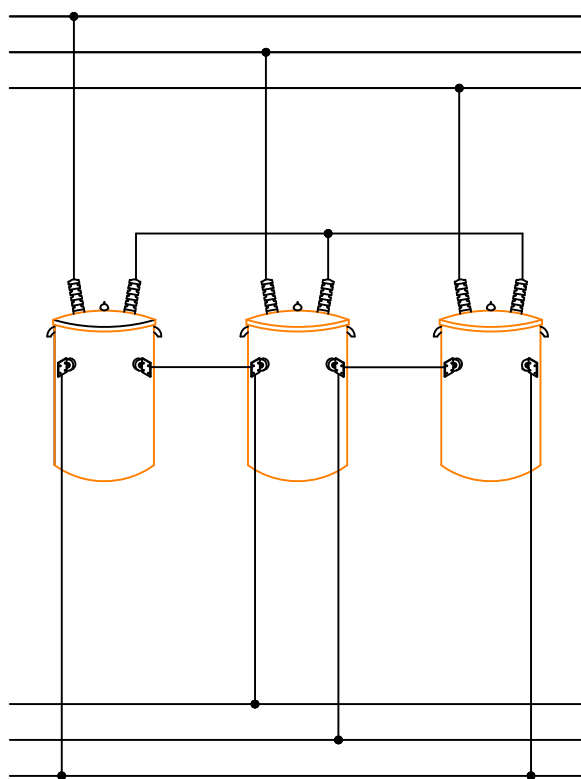
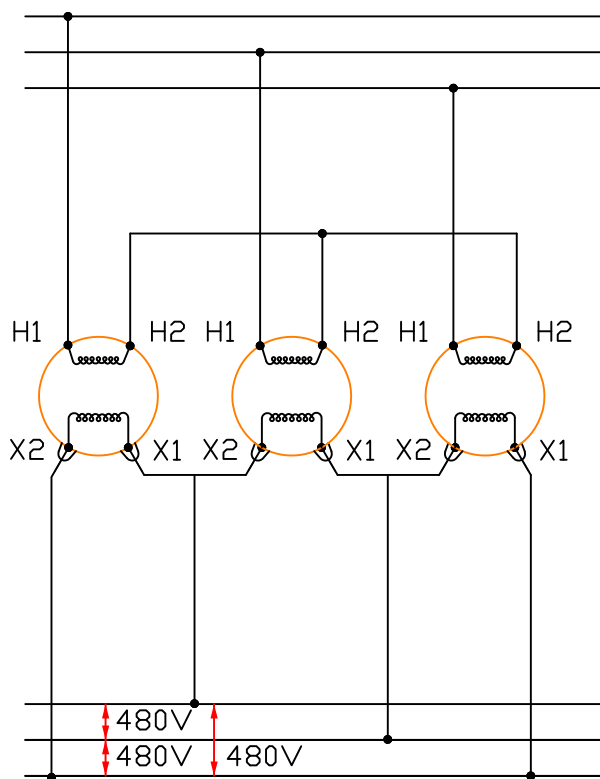


DATE: OCTOBER, 2001

REVISIONS JULY, 2002

**TC8**

**PRIMARY CONDUCTORS**



**SECONDARY CONDUCTORS**

**(ADDITIVE POLARITY)**

**THREE PHASE 3-WIRE 480 VOLT**  
**DELTA CONNECTION**



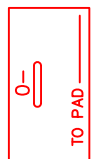
DATE: OCTOBER, 2001

REVISIONS JULY, 2001

**TC9**

CABLE TAGS

PRIMARY TAGS

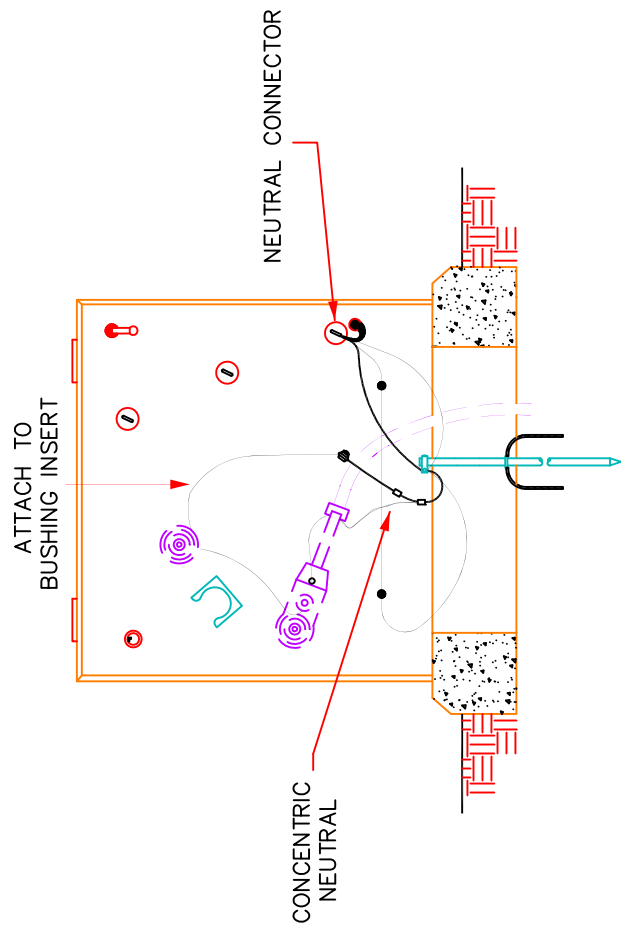
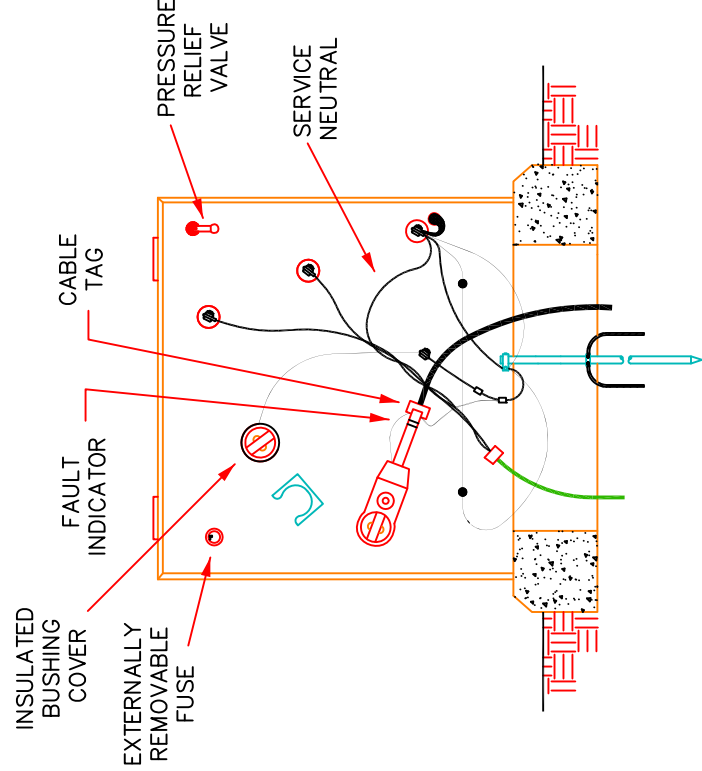


SERVICE TAGS



NOTES:

- 1.) THE INSULATED CAP MUST BE CONNECTED TO GROUND.
- 2.) GROUND RESISTANCE SHOULD BE MEASURED AND REDUCED TO 25 OHMS, IF POSSIBLE.
- 3.) LEAVE CABLE CONCENTRIC NEUTRAL LONG ENOUGH TO ALLOW ELBOW SWITCHING.
- 4.) CONNECT BUSHINGS TO TANK GROUND WITH ONE (1) STRAND OF CONCENTRIC NEUTRAL.
- 5.) USE JOINT COMPOUND ON ALL ALUMINUM FLAT TO FLAT CONNECTIONS.



PRIMARY & SECONDARY CONNECTION DETAILS

GROUNDING & NEUTRAL CONNECTION DETAILS

# SINGLE PHASE PADMOUNTED TRANSFORMER CONNECTION DETAILS, RADIAL FEED



DATE: OCTOBER, 1992

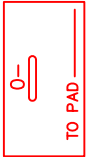
REVISIONS JULY, 2002

# UG6



CABLE TAGS

PRIMARY TAGS

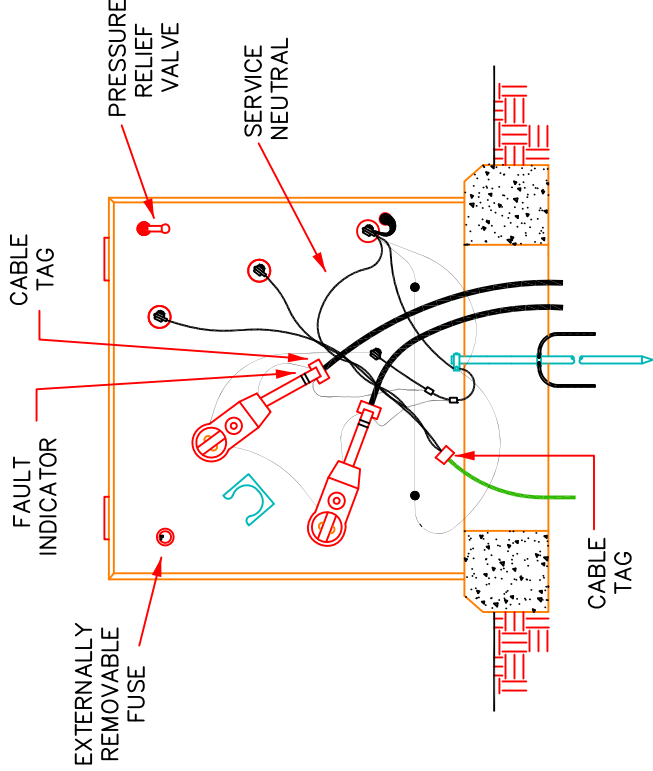


SERVICE TAGS

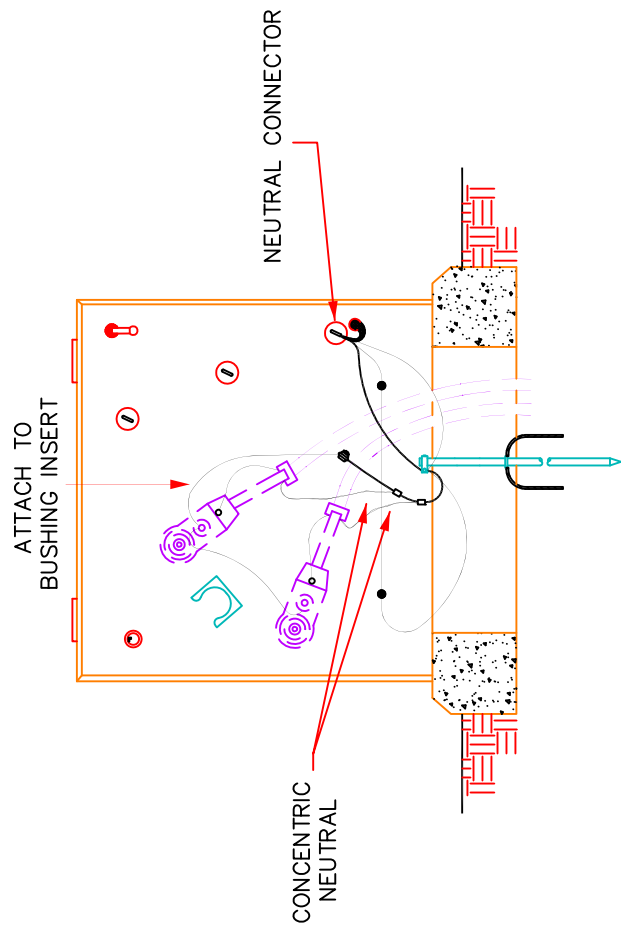


NOTES:

- 1.) IF TRANSFORMER IS A NORMAL OPEN POINT, THE INSULATED BUSHING CAP MUST BE CONNECTED TO GROUND.
- 2.) GROUND RESISTANCE SHOULD BE MEASURED AND REDUCED TO 25 OHMS, IF POSSIBLE.
- 3.) LEAVE CABLE CONCENTRIC NEUTRAL LONG ENOUGH TO ALLOW ELBOW SWITCHING.
- 4.) GROUND RESIST BUSHINGS TANK GROUND WITH ONE (1) STRAND OF CONCENTRIC NEUTRAL.
- 5.) USE JOINT COMPOUND ON ALL ALUMINUM FLAT TO FLAT CONNECTIONS.
- 6.) USE LIGHTNING ARRESTER IF USED AS AN OPEN POINT.



PRIMARY & SECONDARY CONNECTION DETAILS



GROUNDING & NEUTRAL CONNECTION DETAILS

# SINGLE PHASE PADMOUNTED TRANSFORMER CONNECTION DETAILS, LOOP FEED



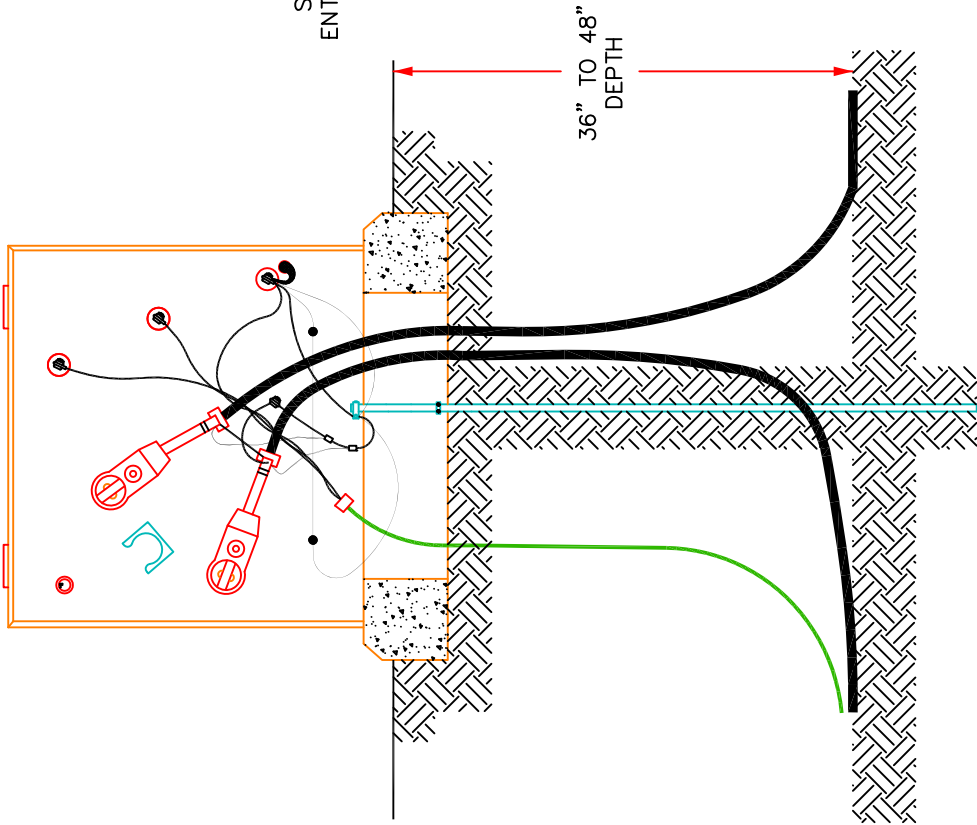
DATE: OCTOBER, 1992

REVISIONS JULY, 2002

# UG7

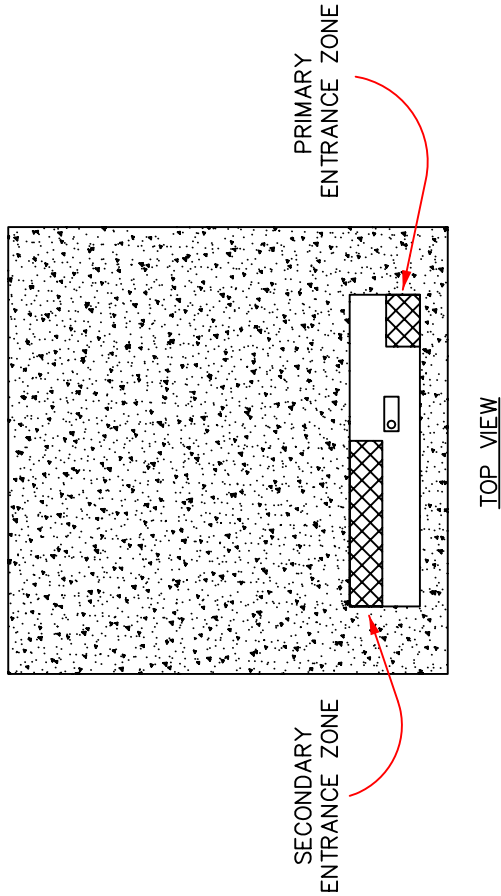






FRONT VIEW

CABLE ARRANGEMENT IN  
SINGLE PHASE LOOP FEED  
PADMOUNTED TRANSFORMER



TOP VIEW

SINGLE PHASE PAD  
CABLE -- ENTRANCE ZONES

NOTE:  
IF PAD IS NOT LOCATED OVER MAIN PRIMARY TRENCH,  
CABLE SHOULD STILL ENTER PAD TO ACCOMMODATE  
ARRANGEMENT SHOWN IN FRONT VIEW

# UNDERGROUND CABLE ENTRANCED ARRANGEMENT FOR SINGLE PHASE PADMOUNTED TRANSFORMER

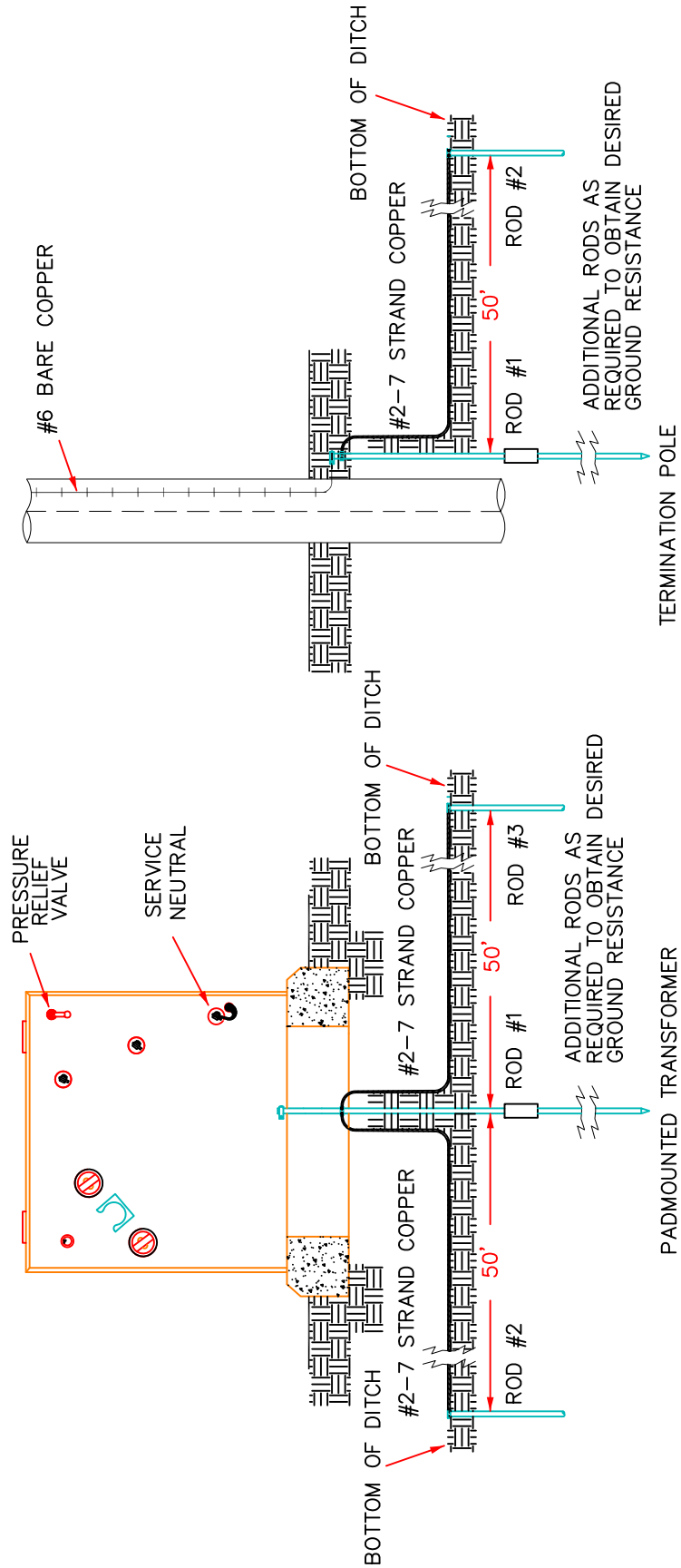


DATE: OCTOBER, 1992

REVISIONS JULY, 2001

## UG8-1

- NOTES:  
 1.) #2-7 STRAND COPPER TO BE PLACED IN DITCH WITH PRIMARY CABLE.  
 2.) GROUND RESISTANCE SHOULD BE MEASURED AND REDUCED TO 25 OHMS, IF POSSIBLE.



# GROUNDING DETAILS FOR PADMOUNTED TRANSFORMERS



REVISIONS JULY, 2002


DATE: OCTOBER, 1992

# UG8-2



SIGN TO BE INSTALLED ON INTERIOR OF TRANSFORMER ONLY.

**⚠ DANGER**



HAZARDOUS VOLTAGE. WILL SHOCK, BURN, OR CAUSE DEATH. KEEP OUT IF OPEN OR UNLOCKED IMMEDIATELY CALL ELECTRIC POWER AND LIGHT COMPANY

CALL  
ELECTRIC UTILITY

RECOMMENDED THAT PADMOUNTED TRANSFORMER LOCATION NUMBERS BE CONSECUTIVE FROM THE POTHEAD POLE ON A RADIAL FEED AND FROM ONE OF THE TWO POTHEAD POLES ON A LOOP FEED.

SIGN TO BE INSTALLED ABOVE PADMOUNTED LOCATION NUMBER

**NOTICE**

DO NOT PLANT TREES/SHRUBBERY OR PLACE OBSTRUCTIONS WITHIN 10 FEET OF THIS SIDE OF CABINET.

PLACE CABLE TAGS BELOW CABLE CONCENTRIC NEUTRAL TERMINATIONS

TRANSFORMER NUMBER

2719183

PHASE NUMBER

**NOTICE**

26  
03

**WARNING**

CAUTION ELECTRICAL EQUIPMENT

**WARNING**

IF FOUND UNLOCKED CALL ELECTRIC UTILITY

USE TRANSFORMER LOCK

SECURITY BOLT MUST BE SECURELY TIGHTENED WHEN TRANSFORMER IS LOCKED.

# SINGLE PHASE TRANSFORMER IDENTIFICATION MARKING DETAILS

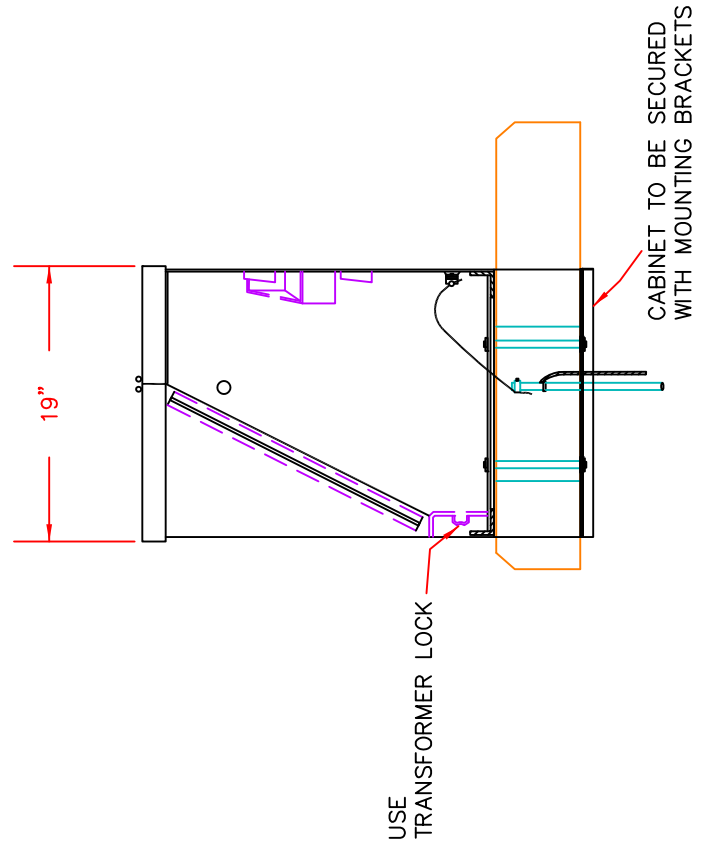
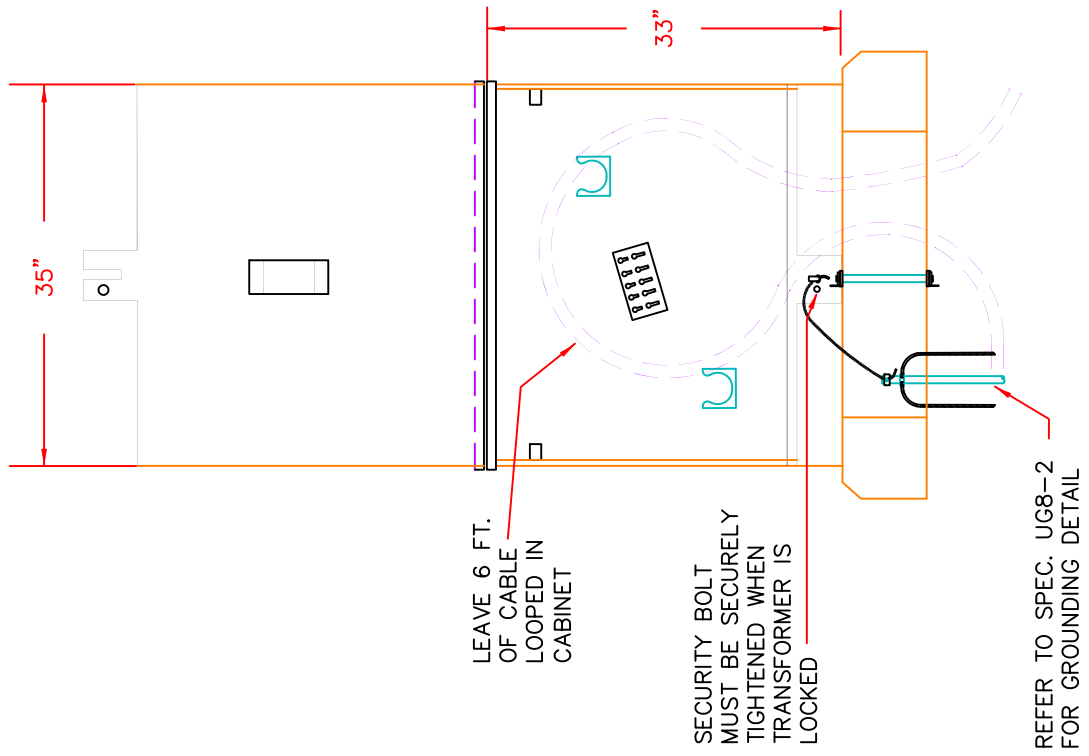


DATE: OCTOBER, 1992

REVISIONS JULY, 2002

**UG8-3**

- NOTES:
- 1.) REFER TO SPEC. UG8-3 FOR MARKING IDENTIFICATION.
  - 2.) SEE SPEC UG8-1 FOR CORRECT LOCATION OF CABLES.
  - 3.) FOR USE WITH STANDARD 1 $\phi$  TRANSFORMER PAD.



# SINGLE PHASE TERMINATING CABINET



DATE: OCTOBER, 1992

REVISIONS JULY, 2002

## UG8-4

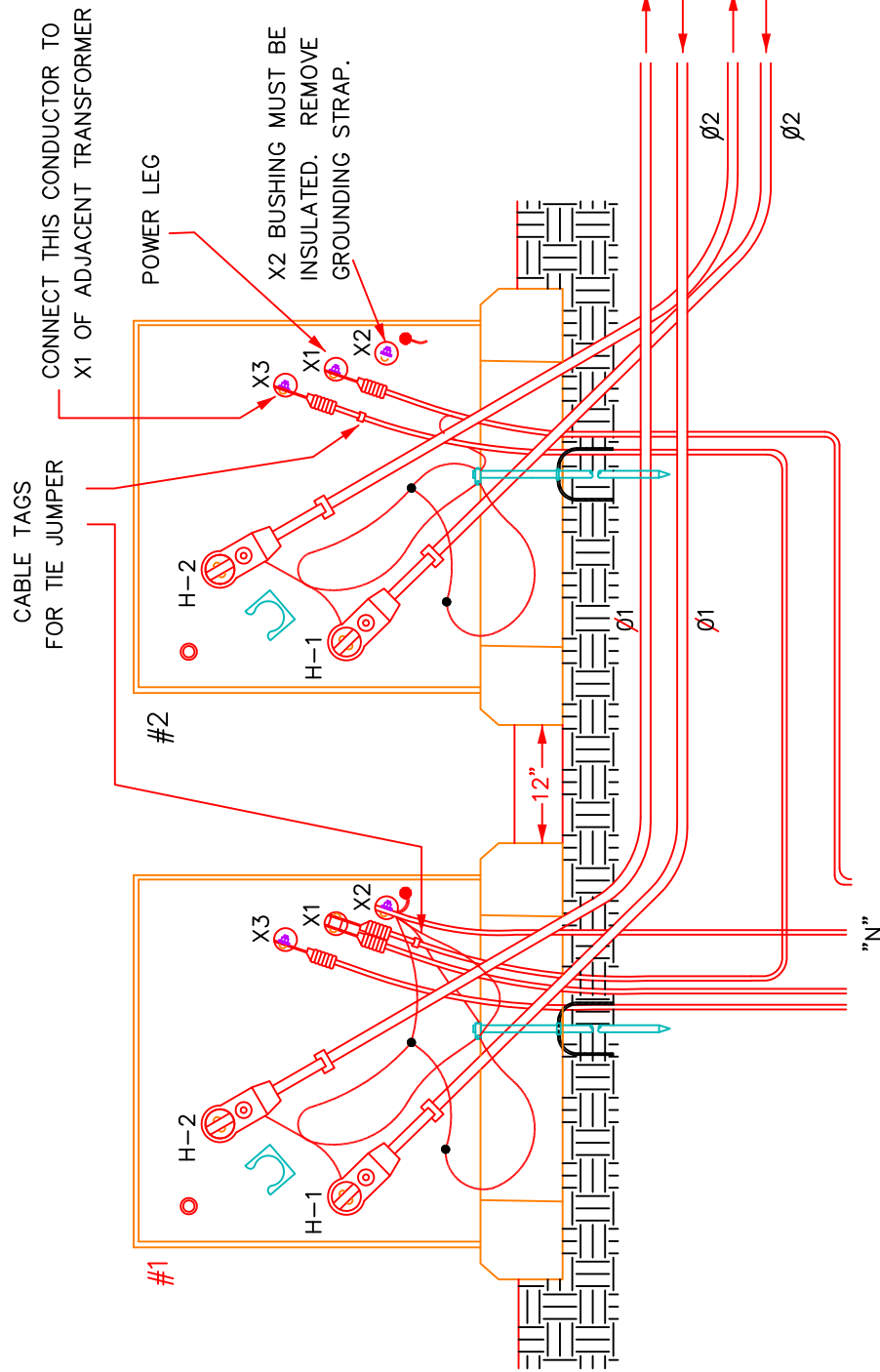


**NOTES:**

1. THE TIE JUMPER SHOULD BE CLEARLY MARKED.
2. CONCENTRIC NEUTRAL AND BARE COPPER NEUTRAL TO BE LOOPED AND RUN ALONG BOTTOM EDGE OF TRANSFORMER #1.
3. CASE GROUND BOTH TRANSFORMERS.
4. GROUND ONLY TRANSFORMER #1 NEUTRAL LUG (X2).
5. REFER TO IDENTIFICATION AND MARKING DETAILS SHEET.

**CABLE TAGS**

TIE JUMPER  
DO NOT REMOVE



**120/240**

**DIAGRAM FOR THREE PHASE OPEN DELTA PADMOUNTED BANK**



DATE: OCTOBER, 1992

REVISIONS JULY, 2002

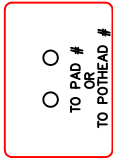
**UG9**



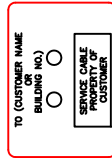


CABLE TAGS

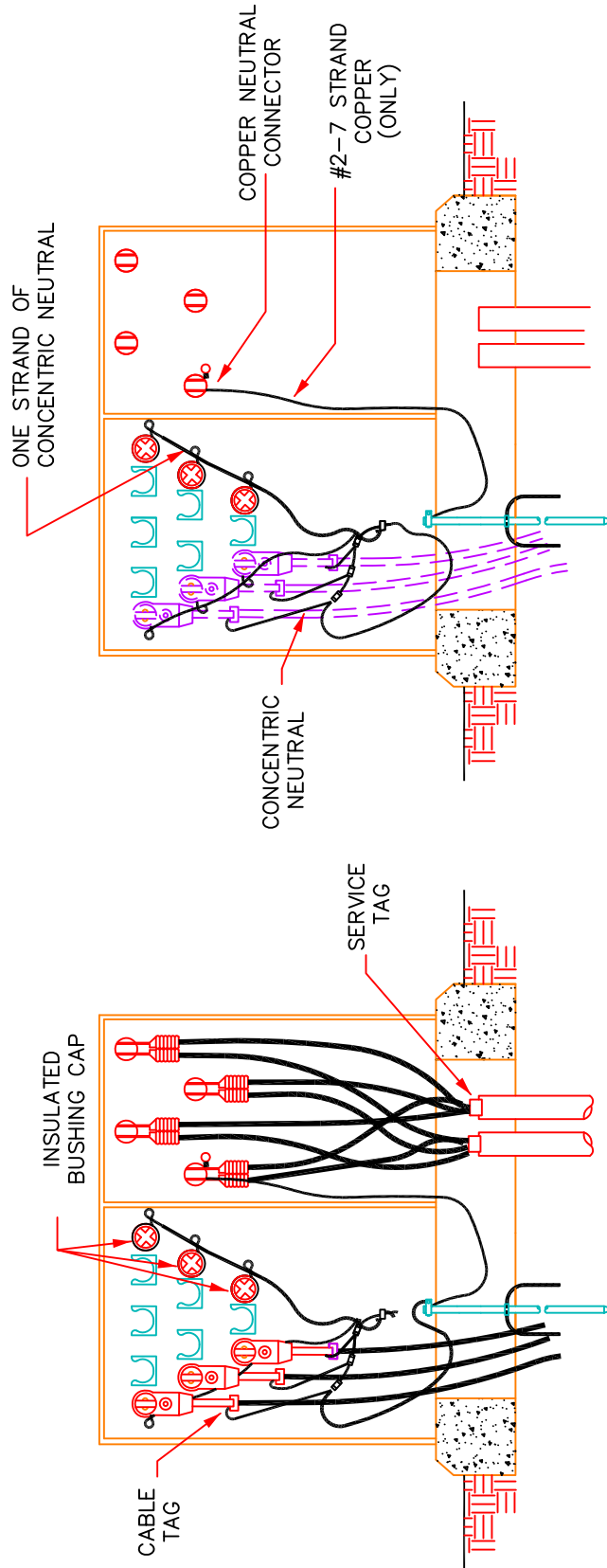
PRIMARY TAGS



SERVICE TAGS



- NOTES:
- 1.) GROUND ALL BUSHING CAPS AND BUSHING INSERTS WITH ONE STRAND OF CONCENTRIC NEUTRAL WIRE ATTACHED TO GROUNDING EYES.
  - 2.) ATTACH CORRECT SERVICE TAG TO SERVICE CONDUCTORS NEAR CONDUIT.
  - 3.) USE JOINT COMPOUND ON ALL ALUMINUM FLAT CONNECTIONS.
  - 4.) GROUND RESISTANCE SHOULD BE MEASURED AND REDUCED TO 25 OHMS, IF POSSIBLE.
  - 5.) LEAVE CABLE CONCENTRIC NEUTRAL LONG ENOUGH TO ALLOW ELBOW SWITCHING.
  - 6.) USE OF LIGHTNING ARRESTERS RECOMMENDED.



REFER TO DISTRIBUTION SPECIFICATION UG8-2 FOR GROUND DETAIL.

CABLE CONNECTION

GROUNDING & NEUTRAL CONNECTION

# THREE PHASE PADMOUNTED TRANSFORMER RADIAL FEED



DATE: OCTOBER, 1992

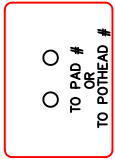
REVISIONS JULY, 2002

# UG12

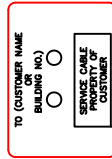


CABLE TAGS

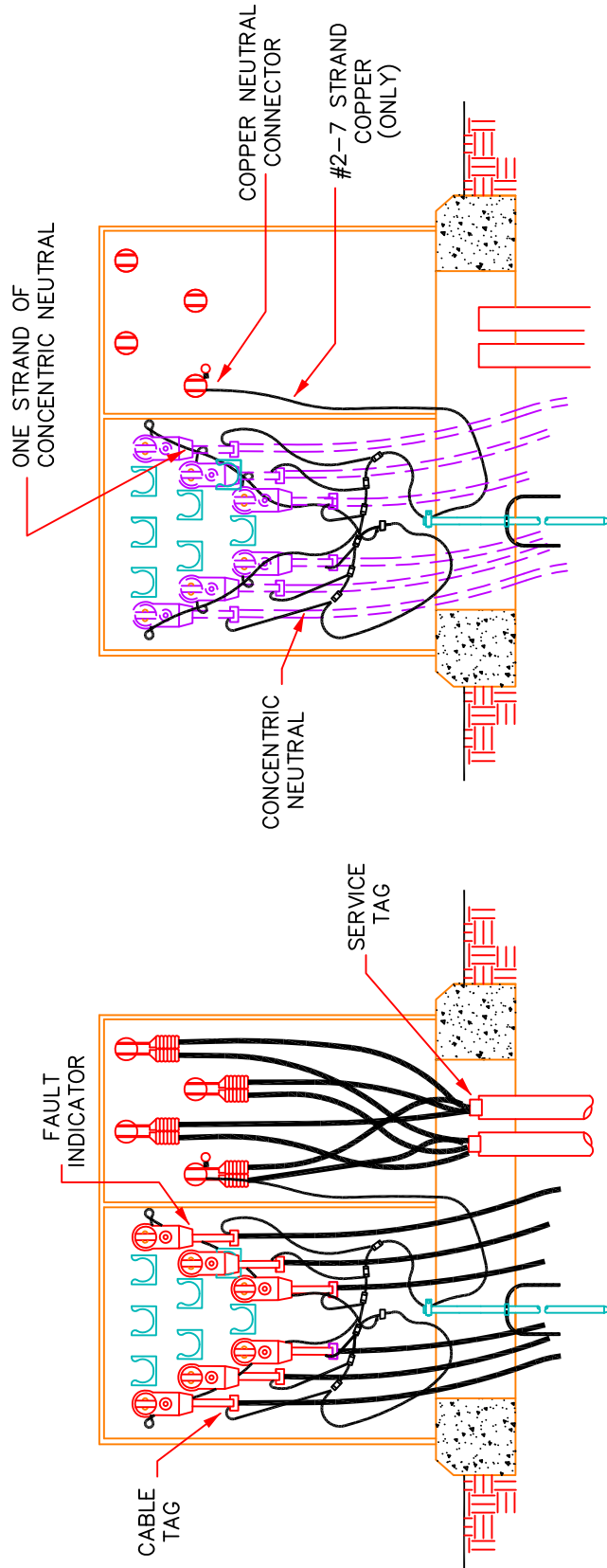
PRIMARY TAGS



SERVICE TAGS



- NOTES:
- 1.) IF TRANSFORMER IS NORMAL OPEN POINT, THE INSULATED BUSHING CAPS MUST BE CONNECTED TO GROUND.
  - 2.) GROUND RESISTANCE SHOULD BE MEASURED AND REDUCED TO 25 OHMS, IF POSSIBLE.
  - 3.) LEAVE CABLE CONCENTRIC NEUTRAL LONG ENOUGH TO ALLOW ELBOW SWITCHING.
  - 4.) CONNECT BUSHINGS TO TANK GROUND WITH ONE (1) STRAND OF CONCENTRIC NEUTRAL.
  - 5.) USE JOINT COMPOUND ON ALL ALUMINUM FLAT CONNECTIONS.
  - 6.) ATTACH CORRECT SERVICE TAG TO SERVICE CONDUCTORS NEAR CONDUIT.



SOURCE LOAD

REFER TO DISTRIBUTION SPECIFICATION UG8-2 FOR GROUND DETAIL.

CABLE CONNECTION

GROUNDING & NEUTRAL CONNECTION

# THREE PHASE PADMOUNTED TRANSFORMER LOOP FEED

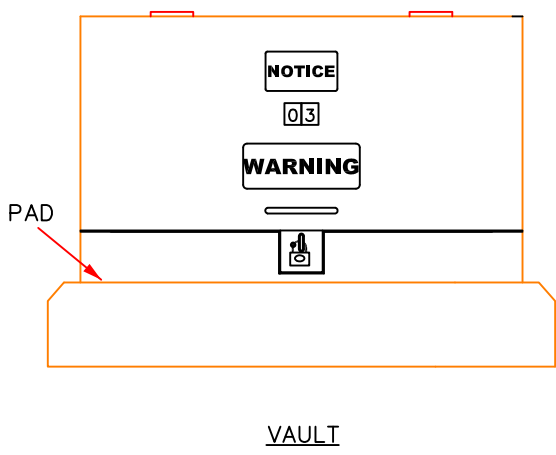
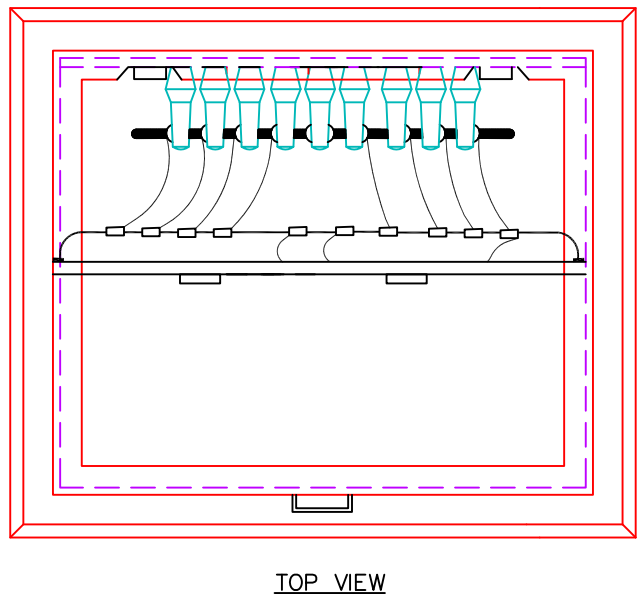
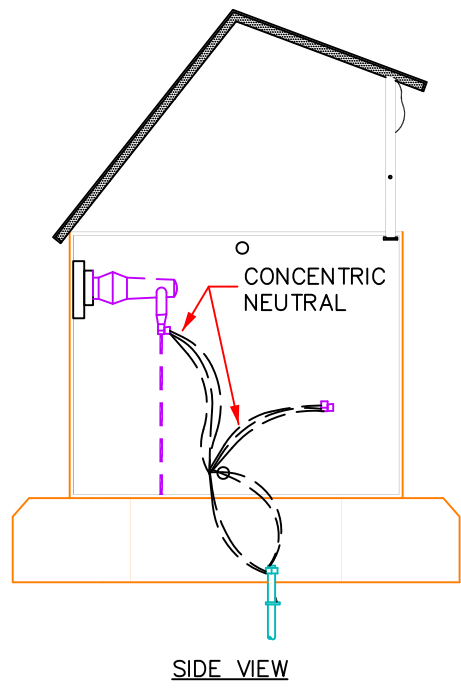
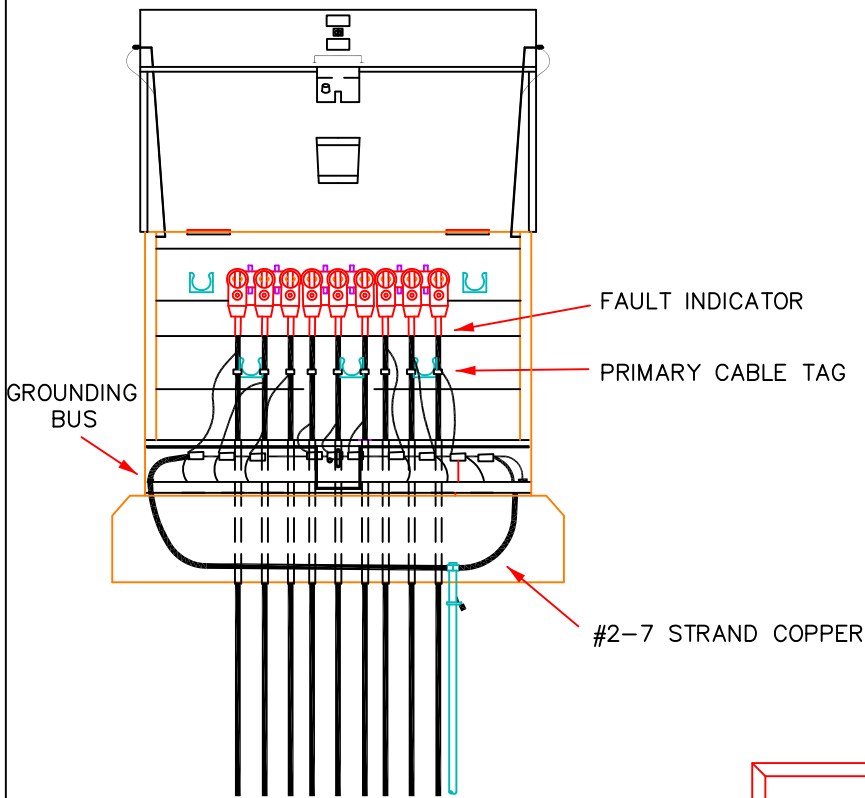


DATE: OCTOBER, 1992

REVISIONS JULY, 2002

# UG13





- NOTES:
- 1.) FOR USE WITH THREE PHASE TERMINATING CABINET PAD OR GROUND SLEEVE
  - 2.) REFER TO SPEC. UG8-2 FOR GROUND DETAIL.
  - 3.) CABINET TO BE BOLTED TO CONCRETE PAD IF USED.

## **THREE PHASE TERMINATING CABINET**



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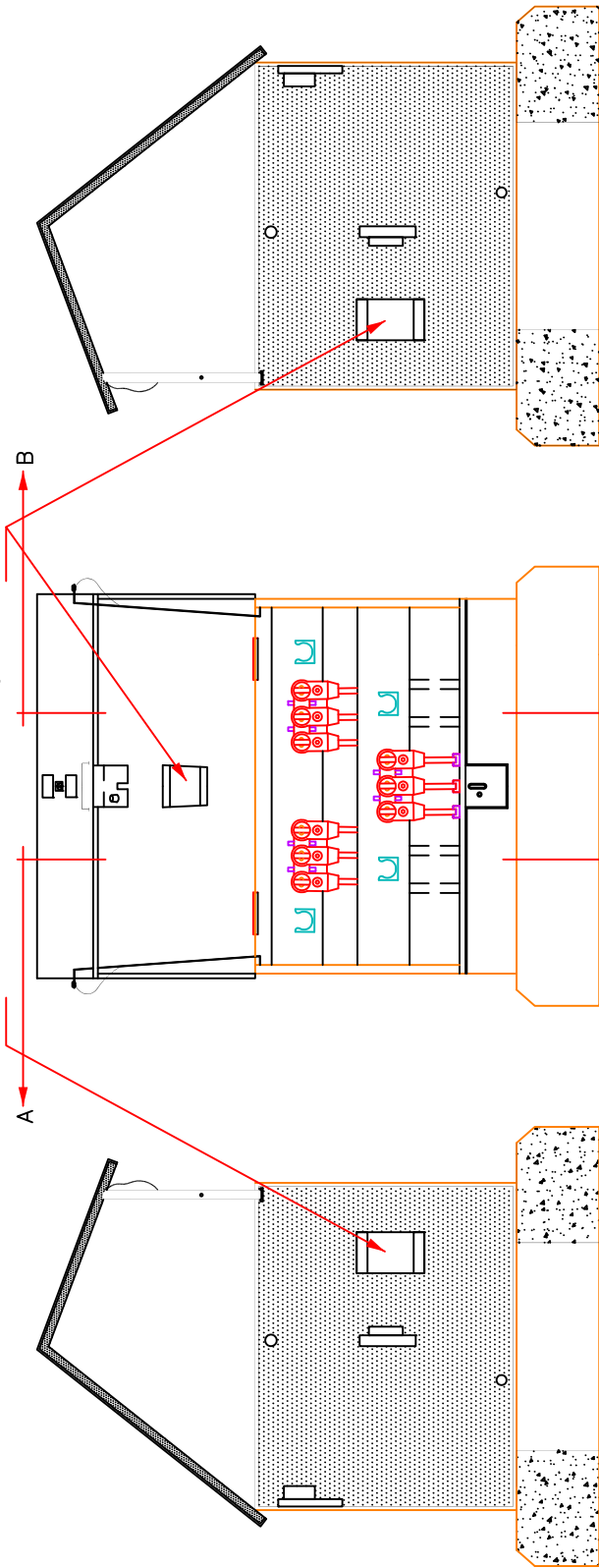
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# UG14

DATE: OCTOBER, 1992



DANGER SIGN TO BE INSTALLED ON INTERIOR OF TERMINATING CABINET



RIGHT INSIDE VIEW  
SECTION B-B

SIGN TO BE INSTALLED ABOVE PADMOUNTED LOCATION NUMBER

**NOTICE**

DO NOT PLANT TREES/SHRUBBERY OR PLACE OBSTRUCTIONS WITHIN 10 FEET OF THIS SIDE OF CABINET.

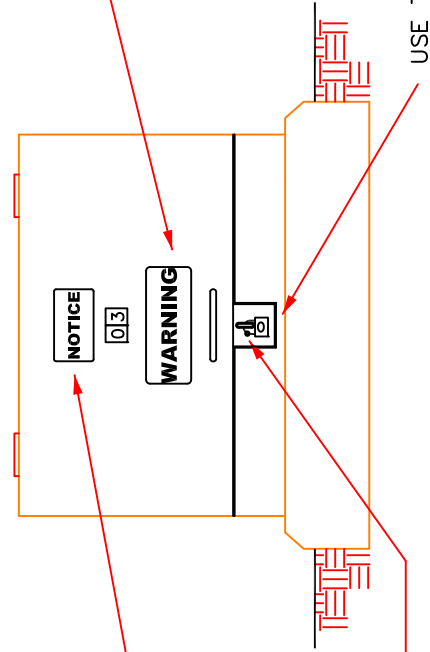
SECURITY BOLT MUST BE SECURELY TIGHTENED WHEN TRANSFORMER IS LOCKED.

LEFT INSIDE VIEW  
SECTION A-A

CAUTION  
ELECTRICAL EQUIPMENT  
**WARNING**  
IF FOUND UNLOCKED CALL  
ELECTRIC UTILITY

**⚠ DANGER**

HAZARDOUS VOLTAGE,  
WILL SHOCK, BURN,  
OR CAUSE DEATH  
KEEP OUT  
IF OPEN OR UNLOCKED  
IMMEDIATELY CALL  
ELECTRIC POWER  
AND LIGHT COMPANY  
CALL  
ELECTRIC UTILITY



USE TRANSFORMER LOCK

**THREE PHASE TERMINATING CABINET IDENTIFICATION MARKING DETAILS**



DATE: OCTOBER, 1992

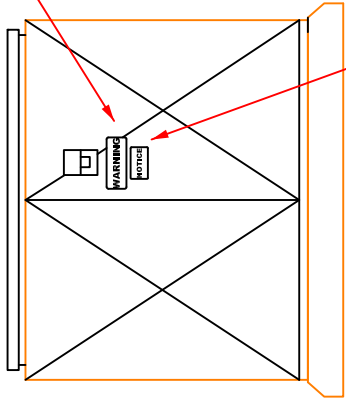
REVISIONS JULY, 2002

**UG15**

SIGN TO BE INSTALLED NEAR HANDLE LOCATION

CAUTION  
ELECTRICAL EQUIPMENT  
**WARNING**  
IF FOUND UNLOCKED CALL  
ELECTRIC UTILITY

PLACE EXTERIOR SIGNS ON FRONT AND REAR DOORS.



SIGN TO BE INSTALLED ON INTERIOR OF SWITCHING CUBICLE (ONE ON EACH INSIDE DOOR)

**△ DANGER**

**HAZARDOUS VOLTAGE, WILL SHOCK, BURN, OR CAUSE DEATH**

KEEP OUT  
IF OPEN OR UNLOCKED  
IMMEDIATELY CALL  
ELECTRIC UTILITY  
AND LIGHT COMPANY

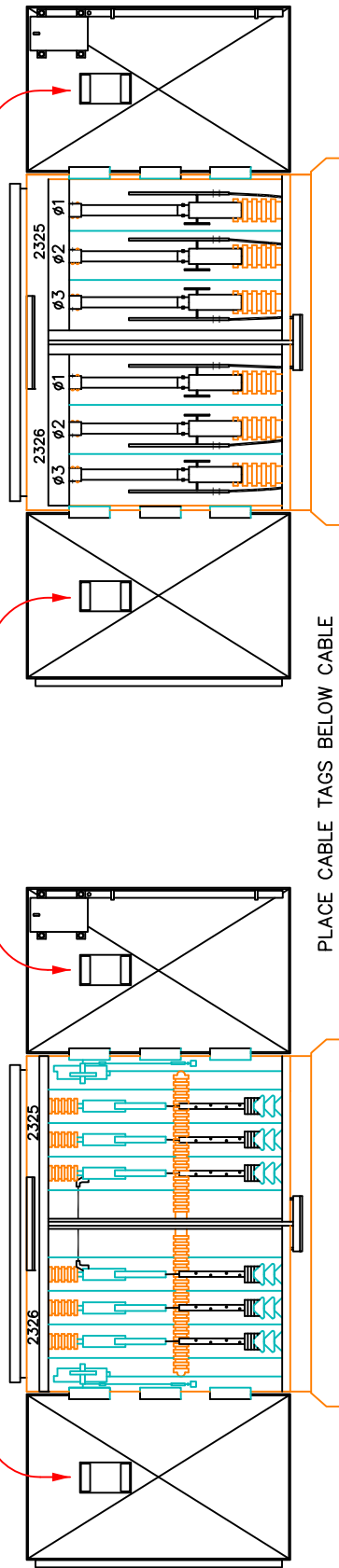
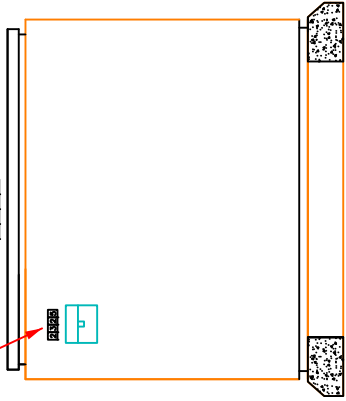
CALL  
ELECTRIC UTILITY

**NOTICE**

DO NOT PLANT TREES/SHRUBBERY OR PLACE OBSTRUCTIONS WITHIN 10 FEET OF THIS SIDE OF CABINET.

SWITCH NUMBER  
600 AMP GANG SWITCH

2325



PLACE CABLE TAGS BELOW CABLE CONCENTRIC NEUTRAL TERMINATIONS

# SWITCHING CUBICLE IDENTIFICATION MARKING DETAILS

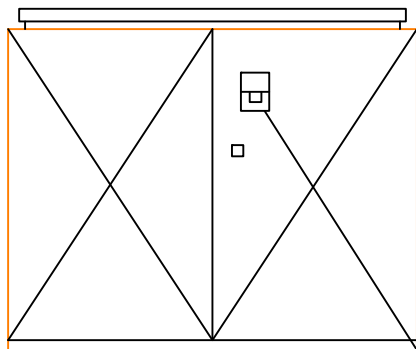


DATE: OCTOBER, 1992

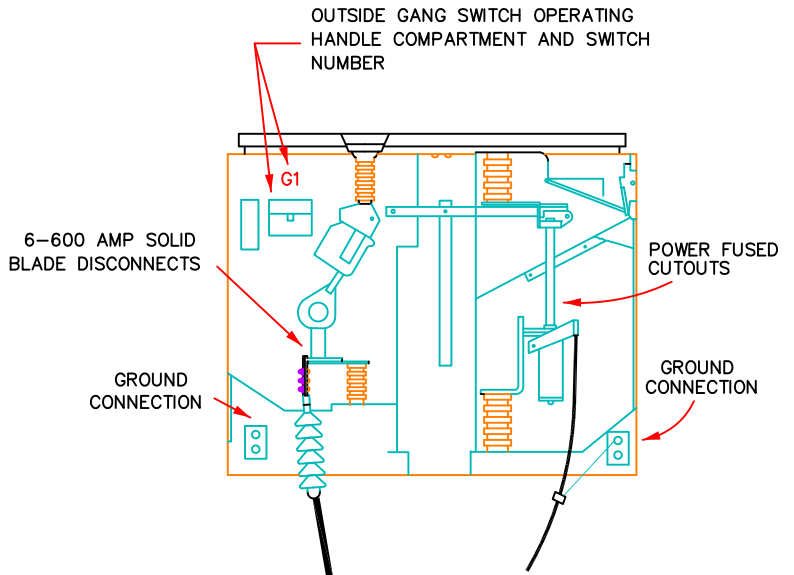
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**UG15-1**

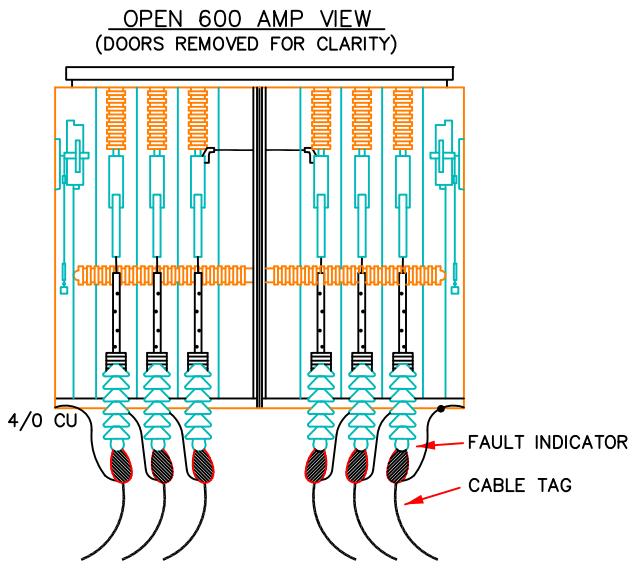




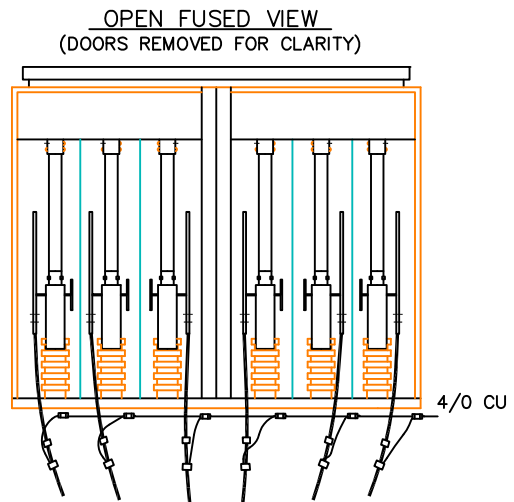
CLOSED VIEW



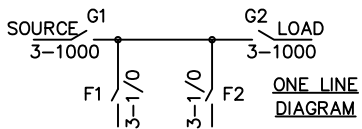
OPEN SIDE VIEW



OPEN 600 AMP VIEW  
(DOORS REMOVED FOR CLARITY)

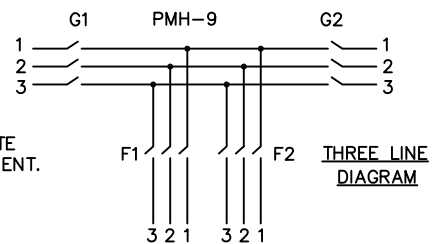


OPEN FUSED VIEW  
(DOORS REMOVED FOR CLARITY)



ONE LINE  
DIAGRAM

NOTE: FOR GANG OPERATED SWITCHING CUBICLES EACH GANG SWITCH NUMBER SHALL BE INSTALLED IMMEDIATELY ADJACENT TO THE APPROPRIATE OPERATING HANDLE COMPARTMENT.



THREE LINE  
DIAGRAM

NOTE:  
CAN BE USED WITH VAULT (PREFERRED) OR GROUND SLEEVE.

# PADMOUNTED SWITCHING CUBICLE FOR 15 KV THREE PHASE PRIMARY GANG - OPERATED 600 AMP DISCONNECTS WITH FUSED TAPS

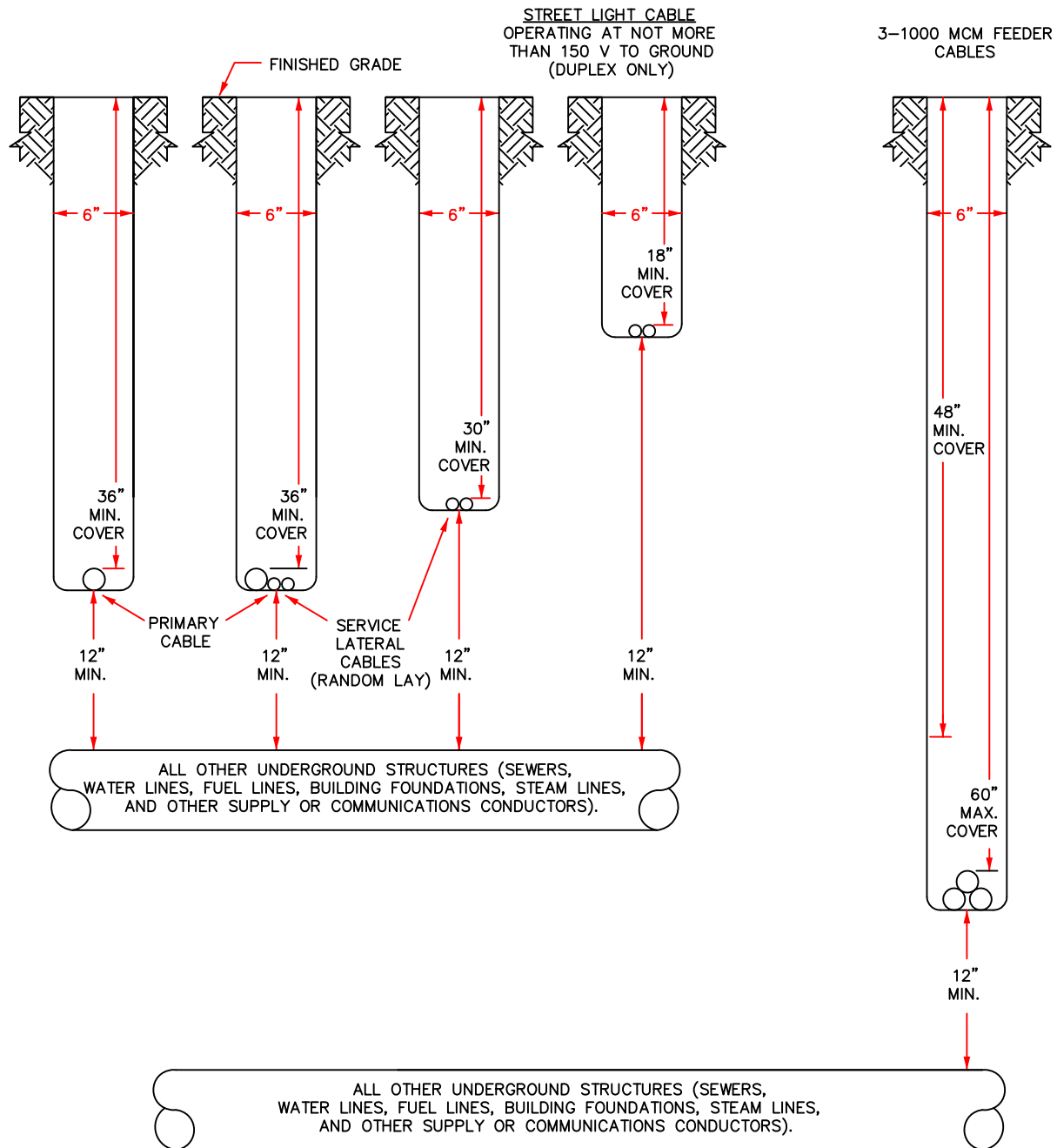


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**UG16**

DATE: OCTOBER, 1992





**NOTES:**

1. 12" ADJACENT TO 1000 MCM CABLES WILL BE TAMPED TO 95% COMPACTION.
2. RUNS OF 1000 MCM CABLE FED FROM DIFFERENT CIRCUIT BREAKERS SHOULD BE INSTALLED IN SEPARATE TRENCHES.
3. 12" MIN. CLEARANCE APPLIES TO BOTH VERTICAL AND HORIZONTAL DIRECTIONS.

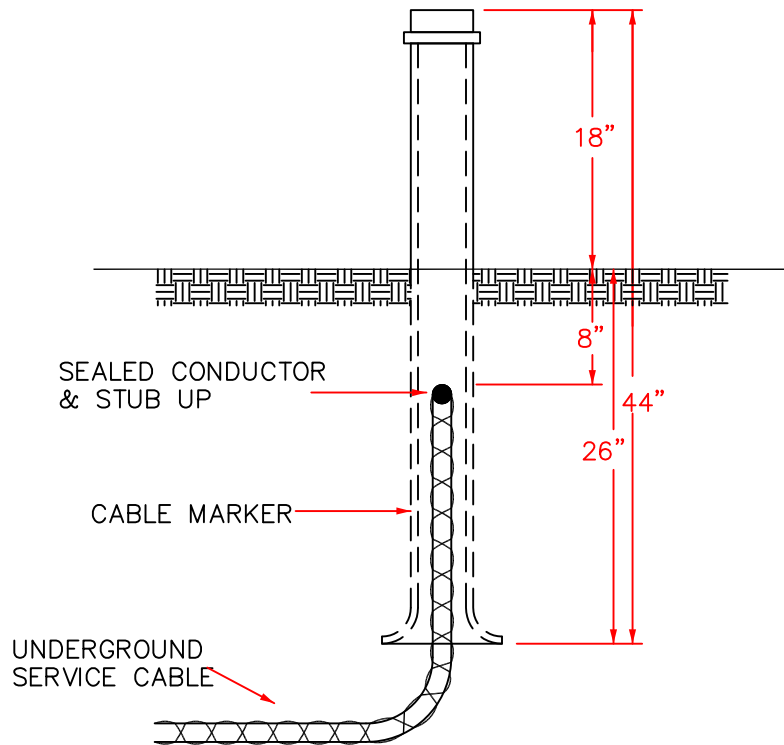
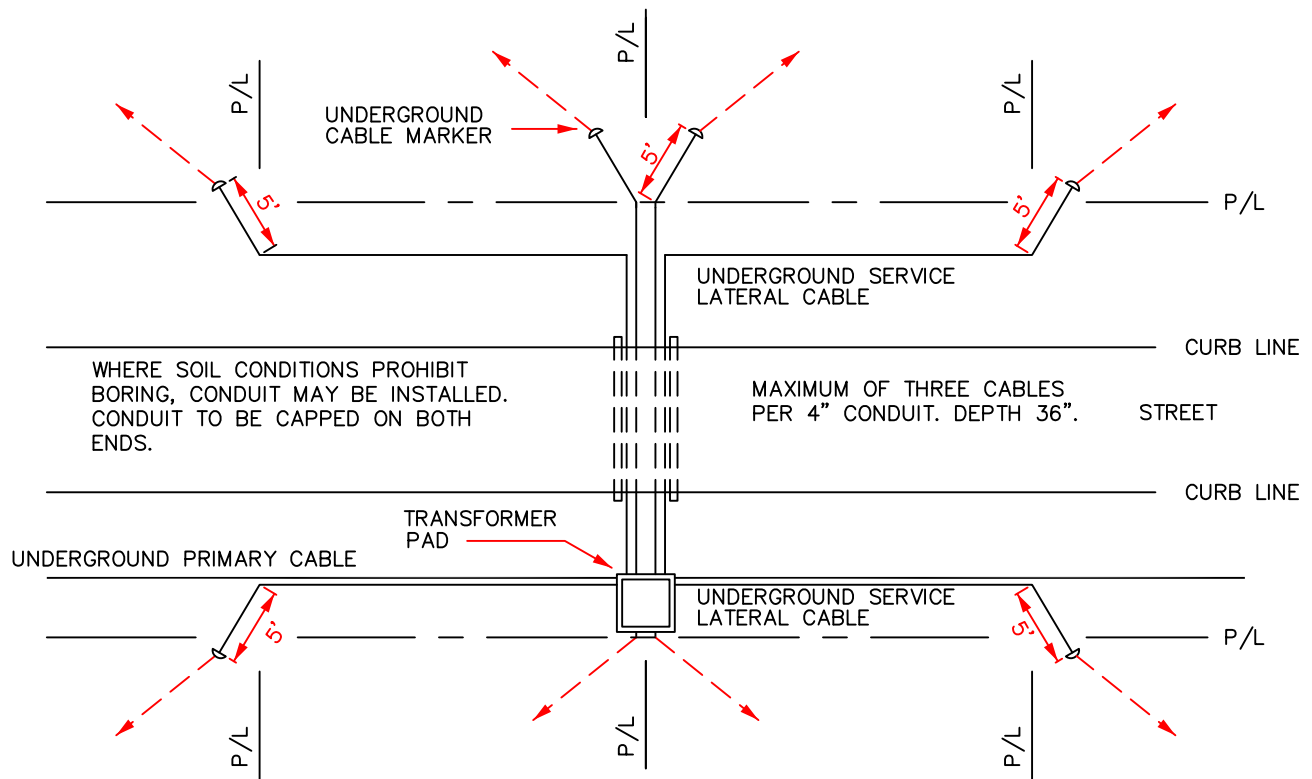
## **UNDERGROUND CABLE LAY IN TRENCH**



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# UM1-1

DATE: OCTOBER, 1992



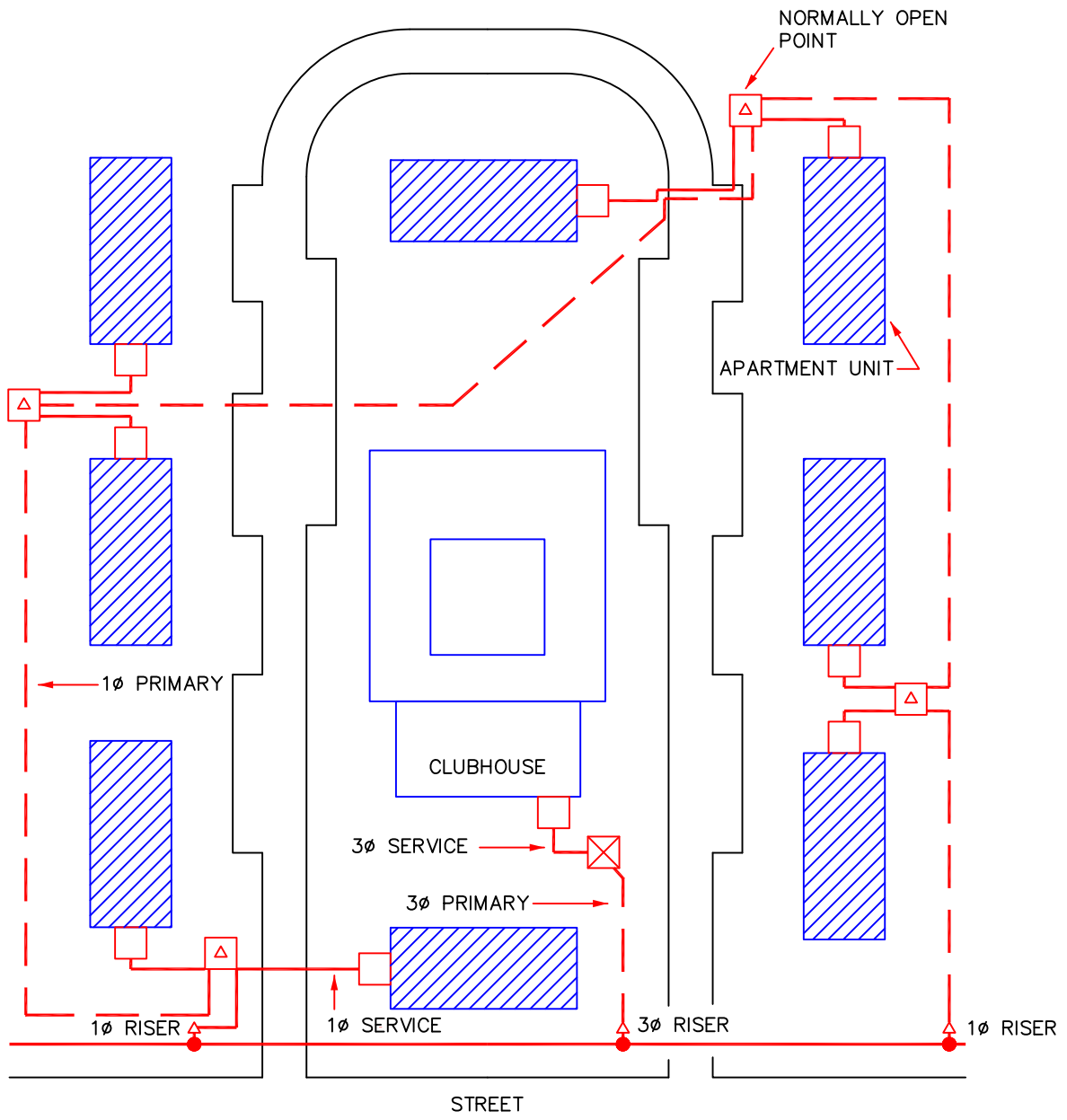
## **TYPICAL LAYOUT AND UNDERGROUND CABLE MARKER**






DATE: OCTOBER, 1992

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# UM1-2



-  TRANSFORMER SINGLE PHASE
-  TRANSFORMER THREE PHASE
-  METER LOCATION

## UNDERGROUND SERVICE TO TYPICAL APARTMENT COMPLEX



REVISIONS JULY, 2002

DATE: OCTOBER, 1992

# UM1-3

6" PVC VENTED RISER SHIELD

2" OR 4" PVC RISER SHIELD

NOTE: USE (1/4" X 2-1/2") LAG SCREWS WITH ROUND WASHERS IN ALL HOLES OF RISER SHIELD.

RISER SHIELD

INSTALLATION SCHEDULE	
SIZE SHIELD	MAX. NO. OF CABLES ACCEPTABLE
2"	1-1/0 PRIMARY
	2-1/0 SECONDARY
	1-4/0 SECONDARY
	1-4/0 SECONDARY
4"	3-1/0 PRIMARY
	4-1/0 SECONDARY
	3-4/0 SECONDARY
	2-4/0 SECONDARY
6"	6-4/0 SECONDARY
	3-1000 MCM PRIMARY

BACKING PLATE REQUIRED BELOW THIS POINT

BACKING PLATE REQUIRED BELOW THIS POINT

STRAPS

VENTILATION BOOT - VENT 6" ABOVE FINAL GRADE.

24" SECTION OF 5" SHIELD

36" RADIUS SWEEP ELBOW

36" MIN. CABLE

**POLE RISER SHIELD INSTALLATION**

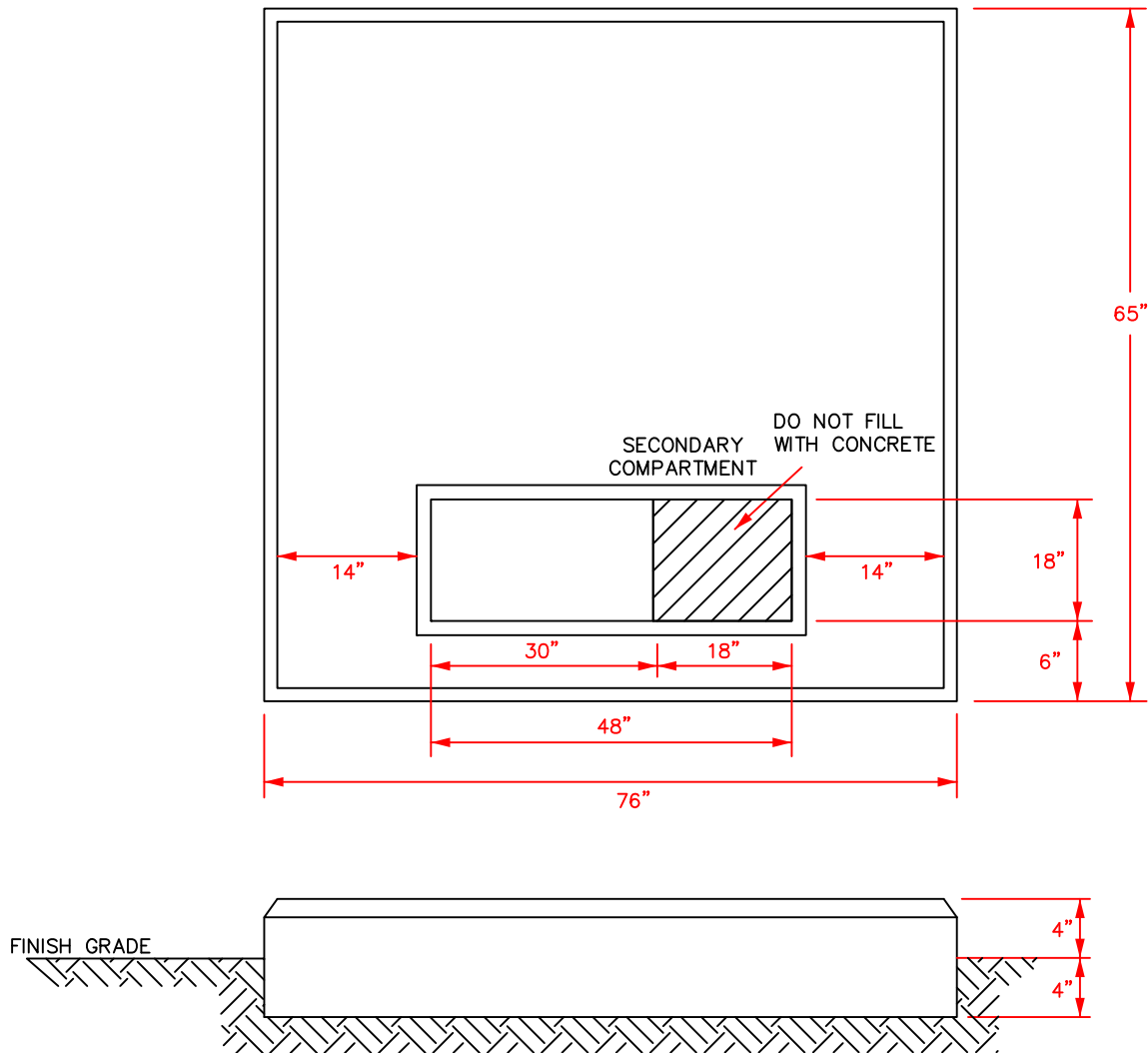


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JANUARY, 2007

**UM1-4**

DATE: OCTOBER, 1992



NOTES:

1. SERVICE DUCT SHALL BE LOCATED IN THE EXTREME RIGHT SIDE OF THE SECONDARY COMPARTMENT.
2. THE PAD SHALL HAVE A MINIMUM CLEARANCE OF 10' FROM ALL BUILDINGS TO PROVIDE SUFFICIENT COOLING. A MINIMUM CLEARANCE OF 3' SHALL BE MAINTAINED FROM ALL OBSTRUCTIONS.
3. REINFORCE WITH #4 BARS WITH A 12"X12" GRID 4" BELOW TOP OF PAD.
4. CONCRETE SHALL HAVE A MINIMUM ULTIMATE 28 DAY COMPRESSIVE STRENGTH OF NOT LESS THAN 3,000 POUNDS. PAD SHALL BE CURED NOT LESS THAN 72 HOURS.

## STANDARD PAD FOR 75 - 1000 KVA RADIAL OR LOOP FEED PADMOUNTED TRANSFORMER



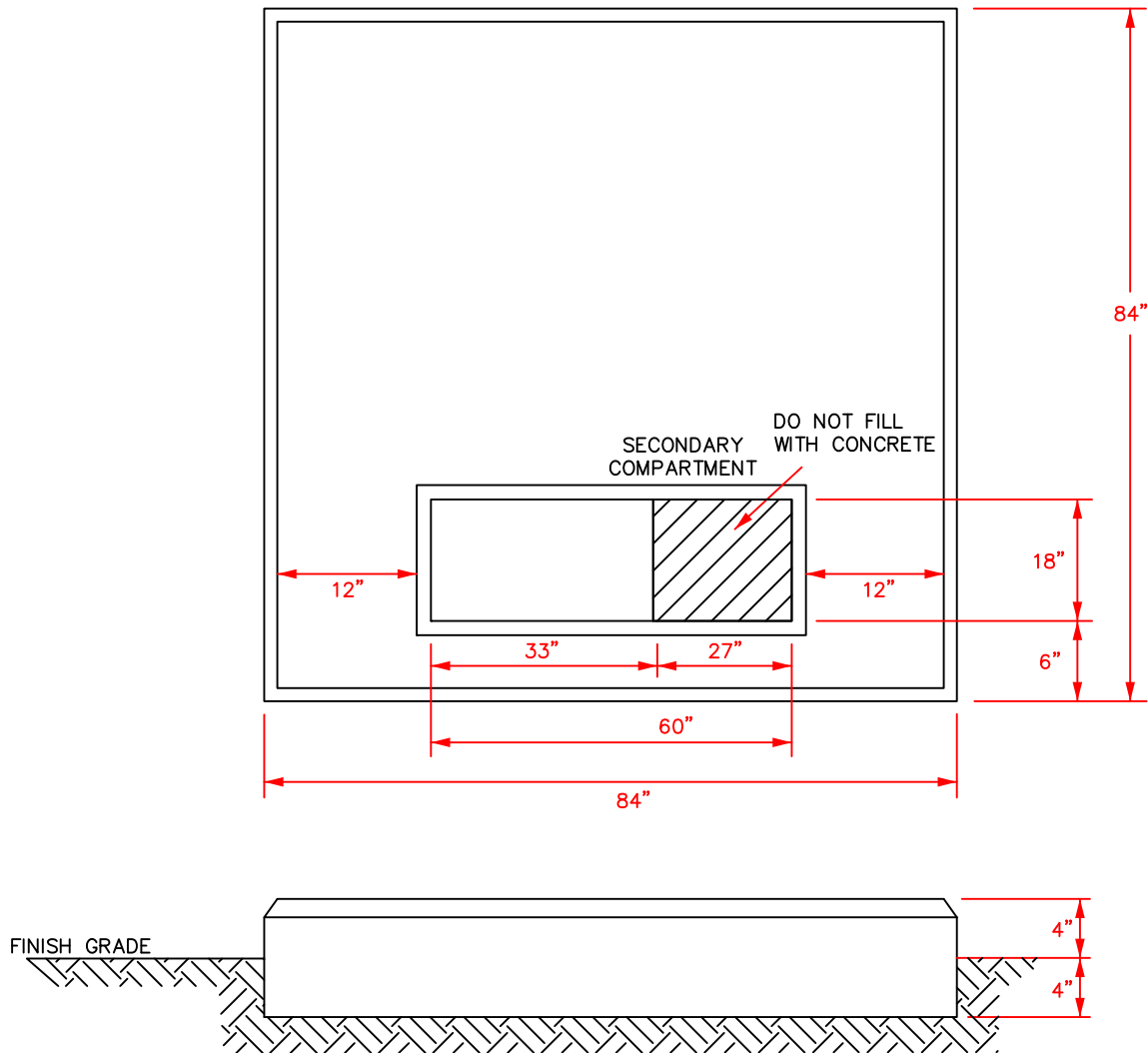
REVISIONS JULY, 2002

DATE: OCTOBER, 1992

# UM1-5







NOTES:

1. SERVICE DUCT SHALL BE LOCATED IN THE EXTREME RIGHT SIDE OF THE SECONDARY COMPARTMENT.
2. THE PAD SHALL HAVE A MINIMUM CLEARANCE OF 10' FROM ALL BUILDINGS TO PROVIDE SUFFICIENT COOLING. A MINIMUM CLEARANCE OF 3' SHALL BE MAINTAINED FROM ALL OBSTRUCTIONS.
3. REINFORCE WITH #4 BARS WITH A 12"X12" GRID 4" BELOW TOP OF PAD.
4. CONCRETE SHALL HAVE A MINIMUM ULTIMATE 28 DAY COMPRESSIVE STRENGTH OF NOT LESS THAN 3,000 POUNDS. PAD SHALL BE CURED NOT LESS THAN 72 HOURS.

## STANDARD PAD FOR 1000 - 2500 KVA RADIAL OR LOOP FEED PADMOUNTED TRANSFORMER

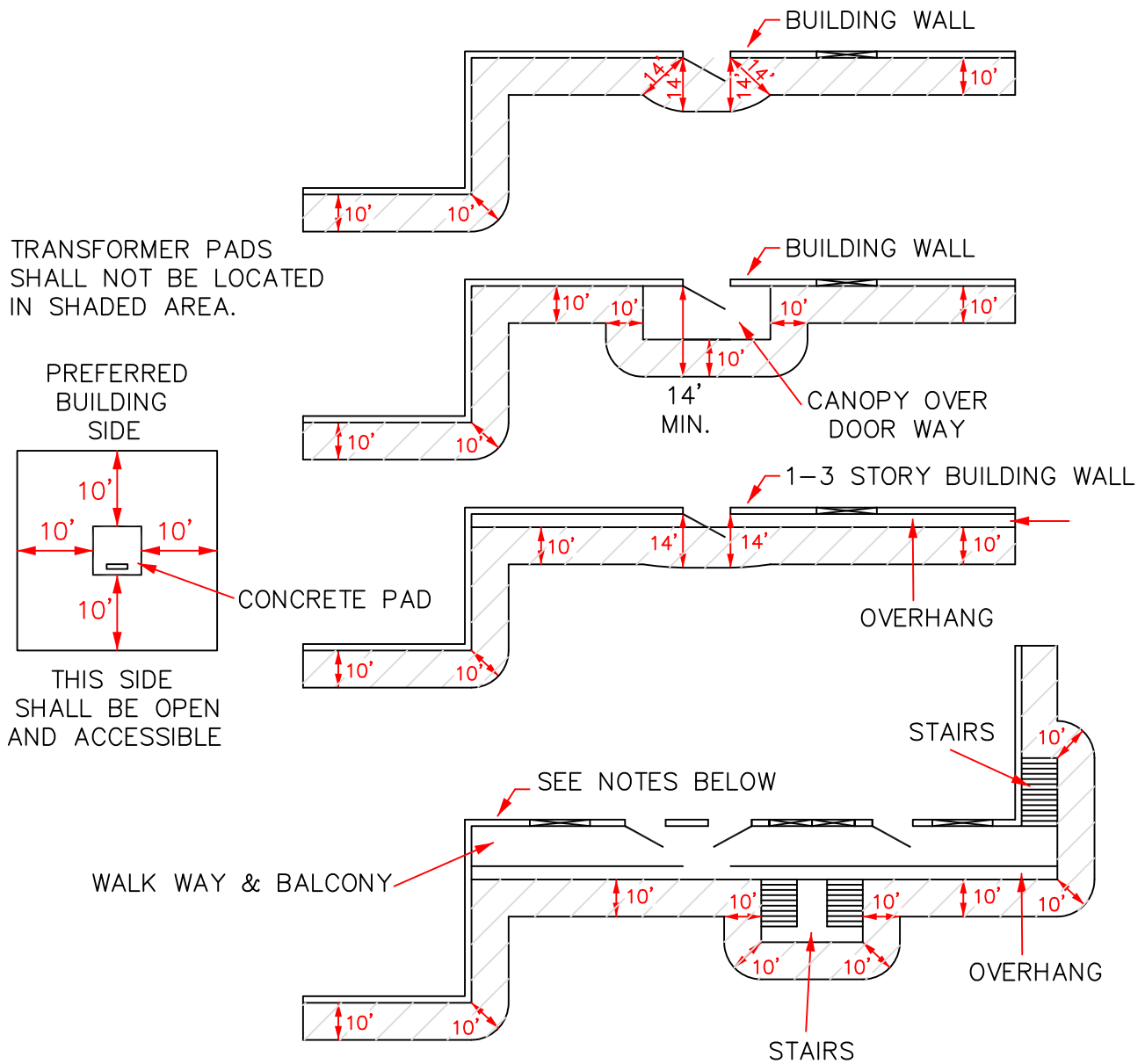


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DATE: OCTOBER, 1992

# UM1-6





NOTES:

1. THE STANDARD PAD LOCATION SHALL BE 10 FEET FROM THE BUILDING WALL.
2. EDGE OF PAD SHALL BE NO LESS THAN 14 FEET FROM DOORWAY.
3. EDGE OF PAD SHALL BE NO LESS THAN 10 FEET FROM WINDOWS OR OTHER OPENINGS.
4. IF THE BUILDING HAS AN OVERHANG AND IS 3 OR LESS FLOORS IN HEIGHT ABOVE THE GROUND, THE 10 FEET CLEARANCE IS MEASURED FROM A POINT BELOW THE EDGE OF THE OVERHANG.
5. IF THE BUILDING HAS AN OVERHANG AND IS 4 OR MORE FLOORS IN HEIGHT ABOVE THE GROUND, THE 10 FEET CLEARANCE MAY BE MEASURED FROM THE BUILDING WALL.
6. FIRE ESCAPES, OUTSIDE STAIRS, AND COVERED WALK WAYS ATTACHED TO OR BETWEEN BUILDINGS SHALL BE CONSIDERED AS PART OF THE BUILDING.
7. ALWAYS MAINTAIN 10 FEET OF CLEARANCE IN FRONT OF THE PAD.

## **TRANSFORMER CLEARANCE FROM BUILDINGS**



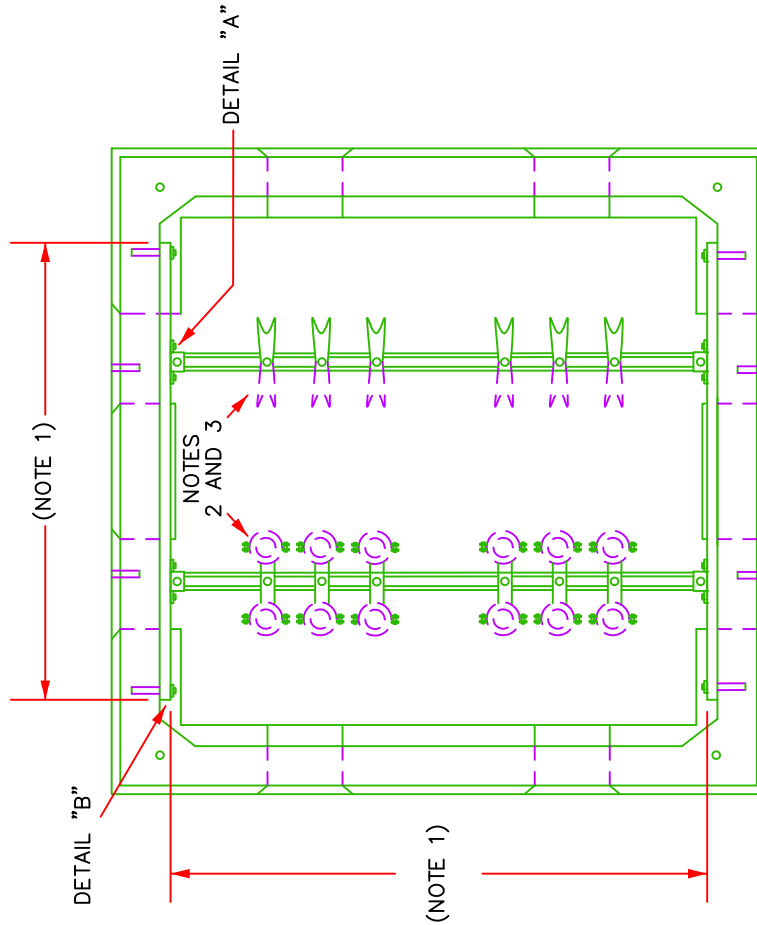
REVISIONS JULY, 2001

# UM1-7

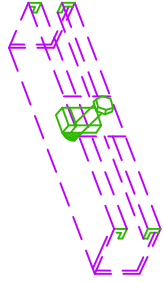
DATE: OCTOBER, 1992

NOTES:

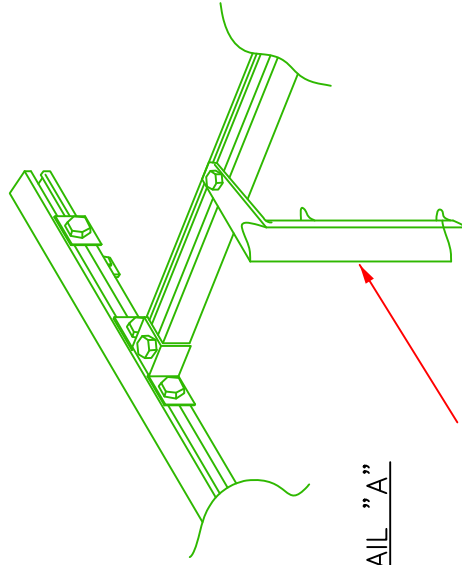
1. DIMENSION MAY VARY— CUT TO FIT.
2. BRACKETS CAN BE INSTALLED ON EITHER SIDE OF STRUT TO LINE UP WITH CABLE.
3. CABLE GUIDES AND STRUTS SHOULD BE POSITIONED TO VERTICALLY ALIGN WITH TERMINATING PADS.



TOP VIEW

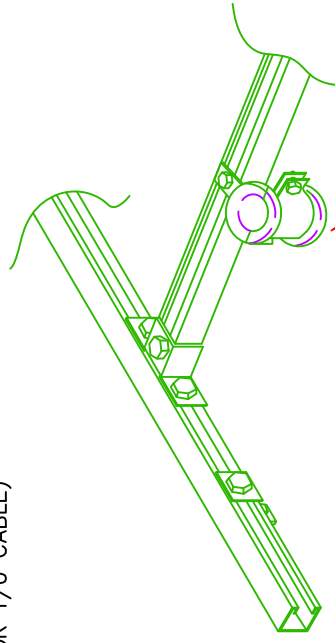


SPRING NUT ASSEMBLY DETAIL



DETAIL "A"

(USE FOR 1/0 CABLE)



DETAIL "B"

(USE FOR 1000MCM CABLE)

# CABLE GUIDES FOR METER & SWITCHING CUBICLE VAULT

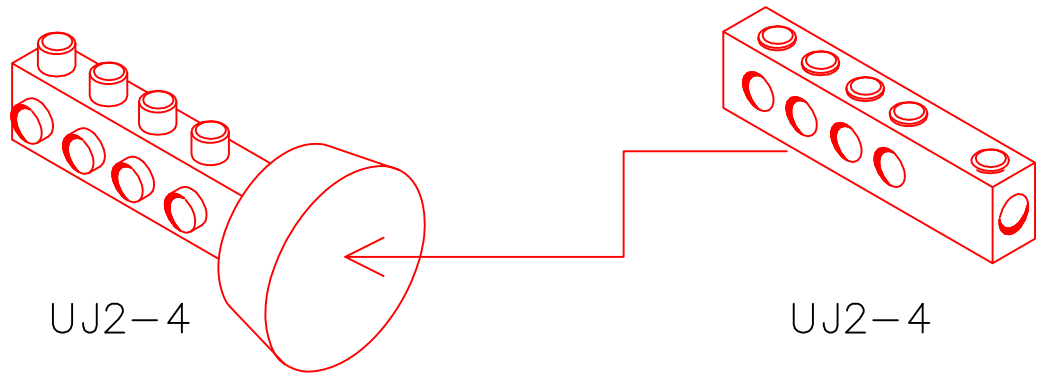


DATE: JULY, 2001

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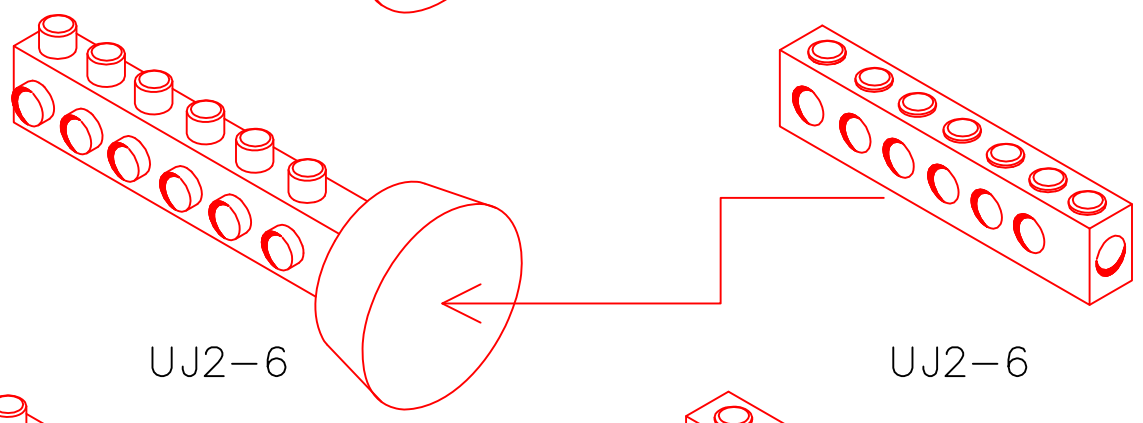
**UM1-8**





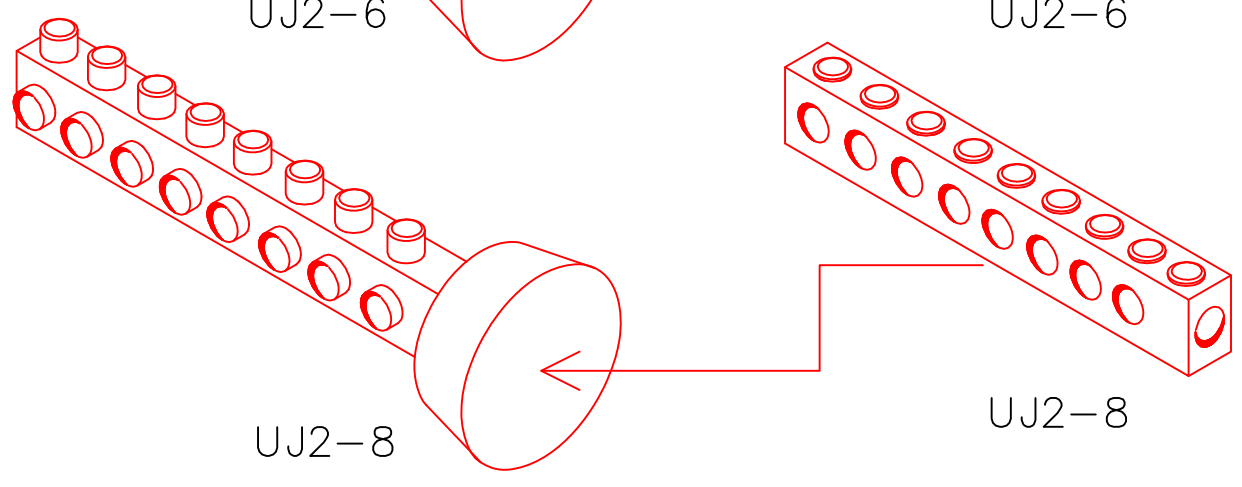
UJ2-4

UJ2-4



UJ2-6

UJ2-6



UJ2-8

UJ2-8

**UJ2-4 THRU UJ2-8**  
**TRANSFORMER SECONDARY CONNECTOR**  
**BARS**

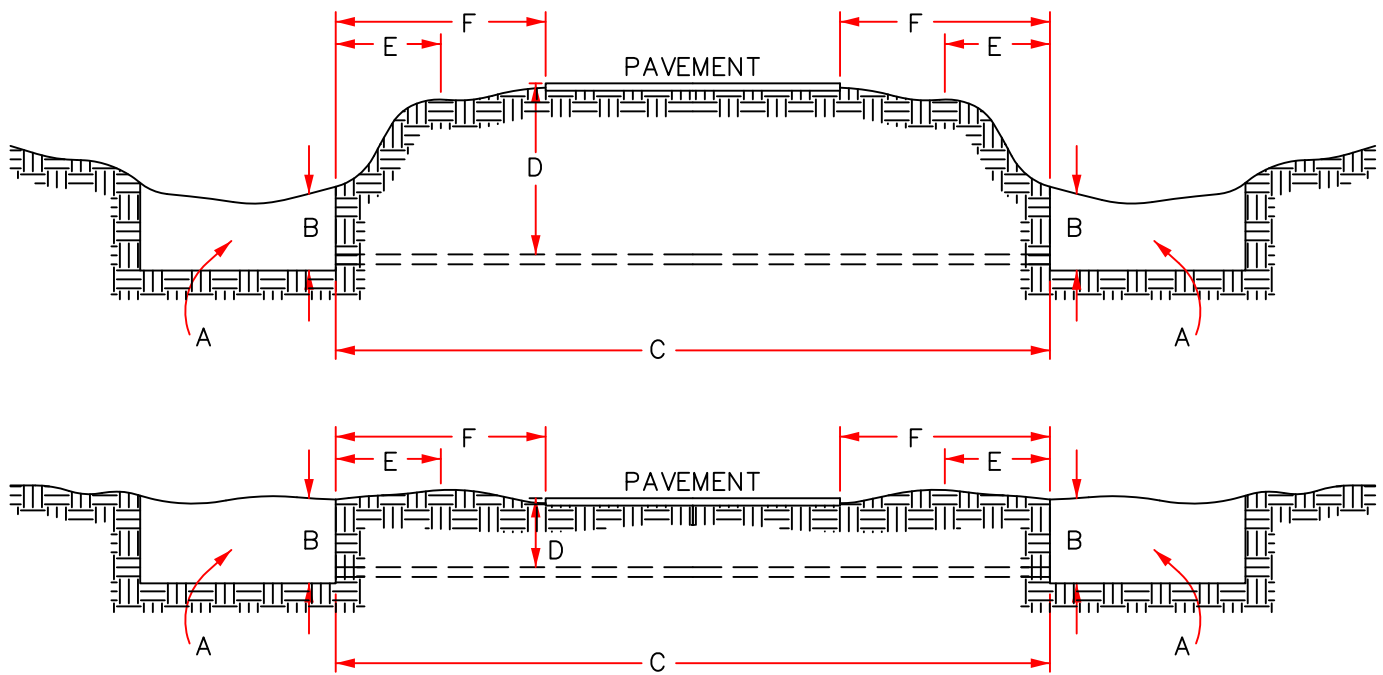


DATE: OCTOBER, 1992

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 \_\_\_\_\_  
 \_\_\_\_\_

**UM1-9**





I. CONDUIT SHALL BE USED WHEN:

1. EXPANDED OPENING IS LARGER THAN 6".
2. BORING MACHINE IS USED WHICH REMOVES DIRT AS IT BORES.
3. WHEN FIELD CONDITIONS EXIST THAT MAKE CONDUIT APPLICABLE.

NOTE: CONDUIT MAY BE PVC MATERIAL.

II. DIMENSIONS

- A. PIT FOR MACHINE INSTALLATION EQUIPMENT.
- B. 3' MINIMUM – 5' MAXIMUM.
- C. FOR ACCURACY, 50' MAXIMUM LENGTH IS RECOMMENDED.  
(SEE DIMENSIONS E & F)
- D. MINIMUM 4'.
- E. SHALL NOT BE LESS THAN "D".
- F. MINIMUM 10' FROM PAVEMENT OR PAVED SHOULDER.

- NOTE: 1. ON CONVENTIONAL HIGHWAYS (IF CONDUIT IS REQUIRED), CONDUIT SHALL BE INSTALLED ON THE FIELD SIDE OF DITCH OR CURB.
2. ON INTERSTATES AND FREEWAYS (IF CONDUIT IS REQUIRED), CONDUIT SHALL BE ON FIELD SIDE OF FENCE UNDER FRONTAGE ROADS, AND ON FIELD SIDE OF DITCH ON FRONTAGE ROADS.
3. ABOVE DIMENSIONS APPLY TO INSTALLATIONS WITH OR WITHOUT CONDUITS.
4. OPENING SHOULD BE SIZED AS CLOSE AS POSSIBLE TO CONDUCTOR SIZE.

## UNDERGROUND HIGHWAY CROSSINGS

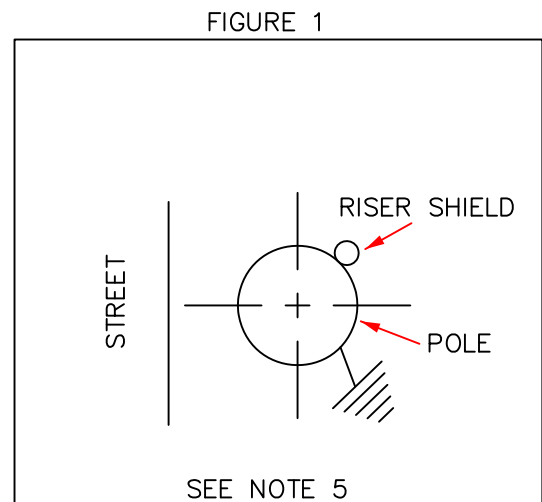
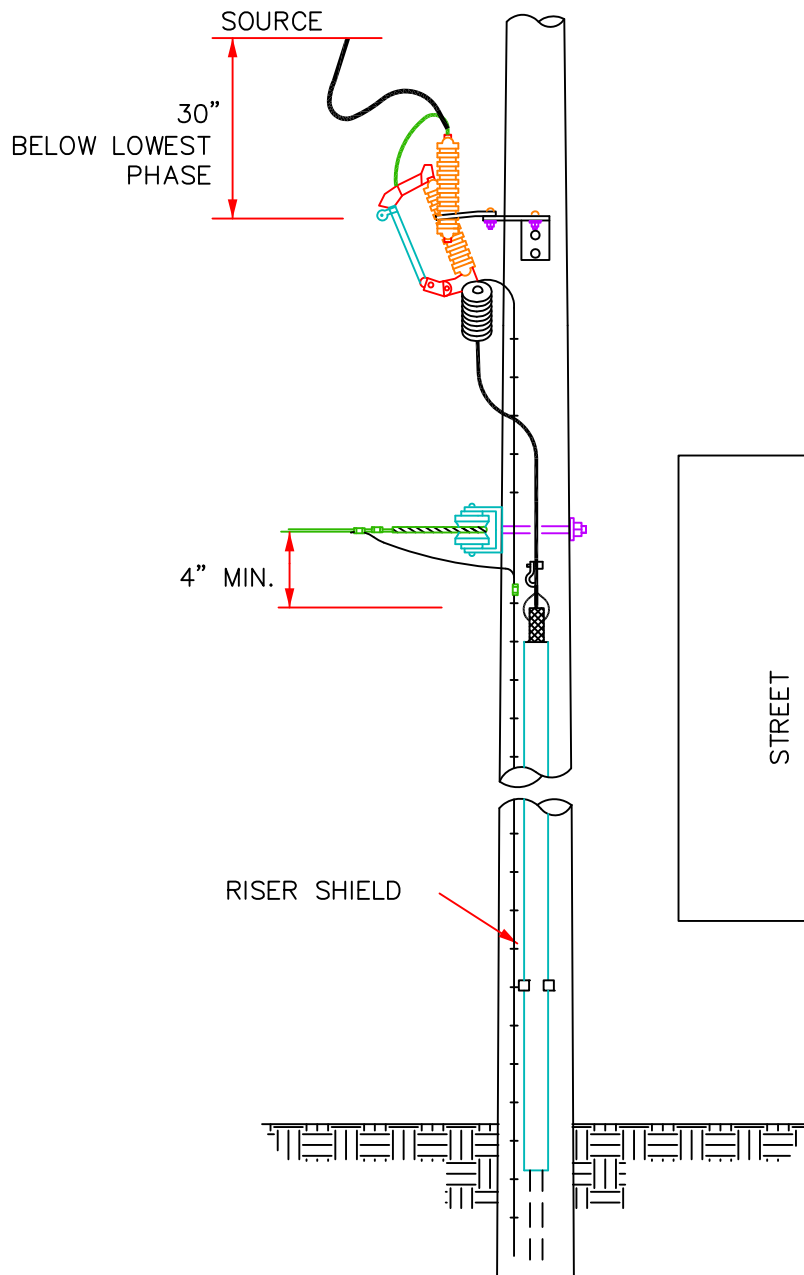


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**UM1-10**





- NOTES:
1. TOTAL ARRESTER LEAD LENGTH MUST BE KEPT AS SHORT AS POSSIBLE.
  2. NO BENDS PERMITTED WITHIN 6" OF TERMINATION.
  3. ALLOW MINIMUM CABLE SLACK OF 24" AT BOTTOM OF RISER.
  4. DO NOT USE CUTOFF TO ESTABLISH NORMAL OPEN POINT.
  5. INSTALL RISER SHIELD IN QUADRANT OF POLE AWAY FROM TRAFFIC FLOW (SEE FIGURE 1).

## **SINGLE PHASE** **OVERHEAD TO UNDERGROUND TERMINATION**



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# UM2



NOTES:

1. TOTAL ARRESTER LEAD LENGTH MUST BE KEPT AS SHORT AS POSSIBLE.
2. NO BENDS PERMITTED WITHIN 6" TERMINATION.
3. ALLOW MINIMUM CABLE SLACK OF 24" AT BOTTOM OF RISER.
4. DO NOT USE CUTOUT TO ESTABLISH NORMAL OPEN POINT.
5. INSTALL RISER SHIELD IN QUADRANT OF POLE AWAY FROM TRAFFIC FLOW (SEE FIGURE 1).
6. IF VERTICAL CONSTRUCTION, CENTER CUTOUT GOES TO BOTTOM PHASE.

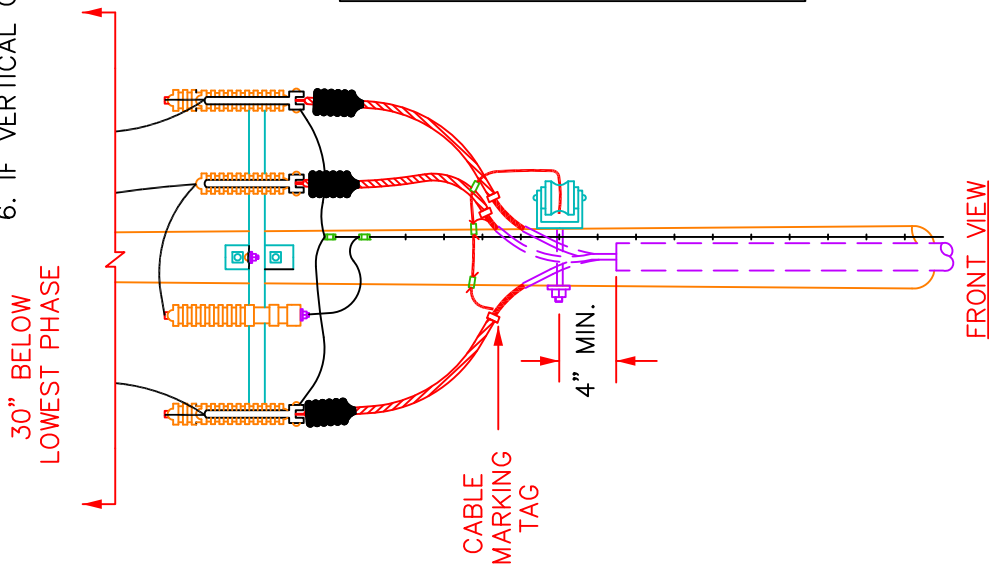
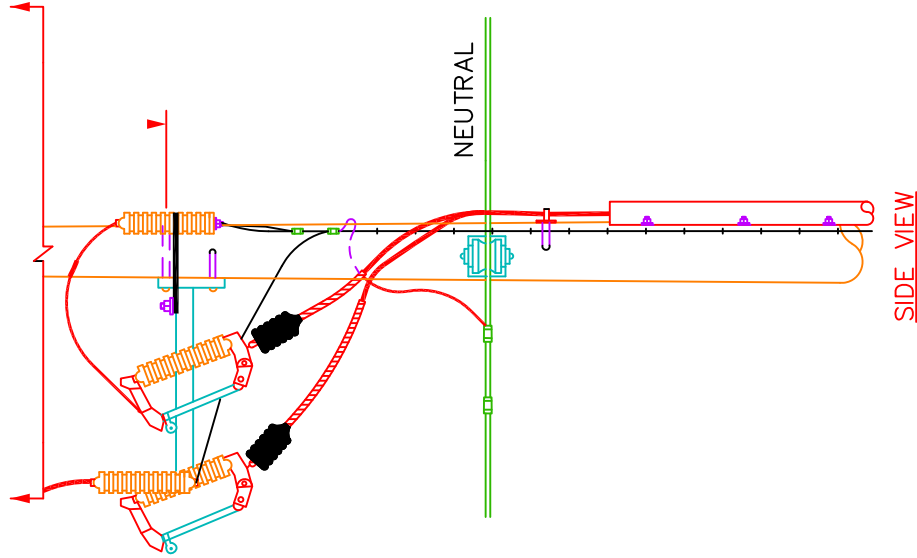
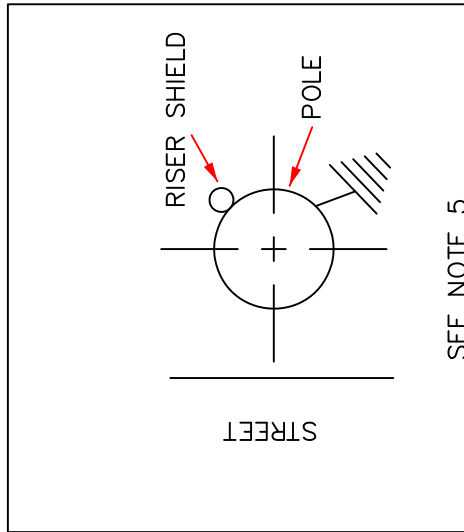


FIGURE 1



# THREE PHASE, OVERHEAD TO UNDERGROUND TERMINATION

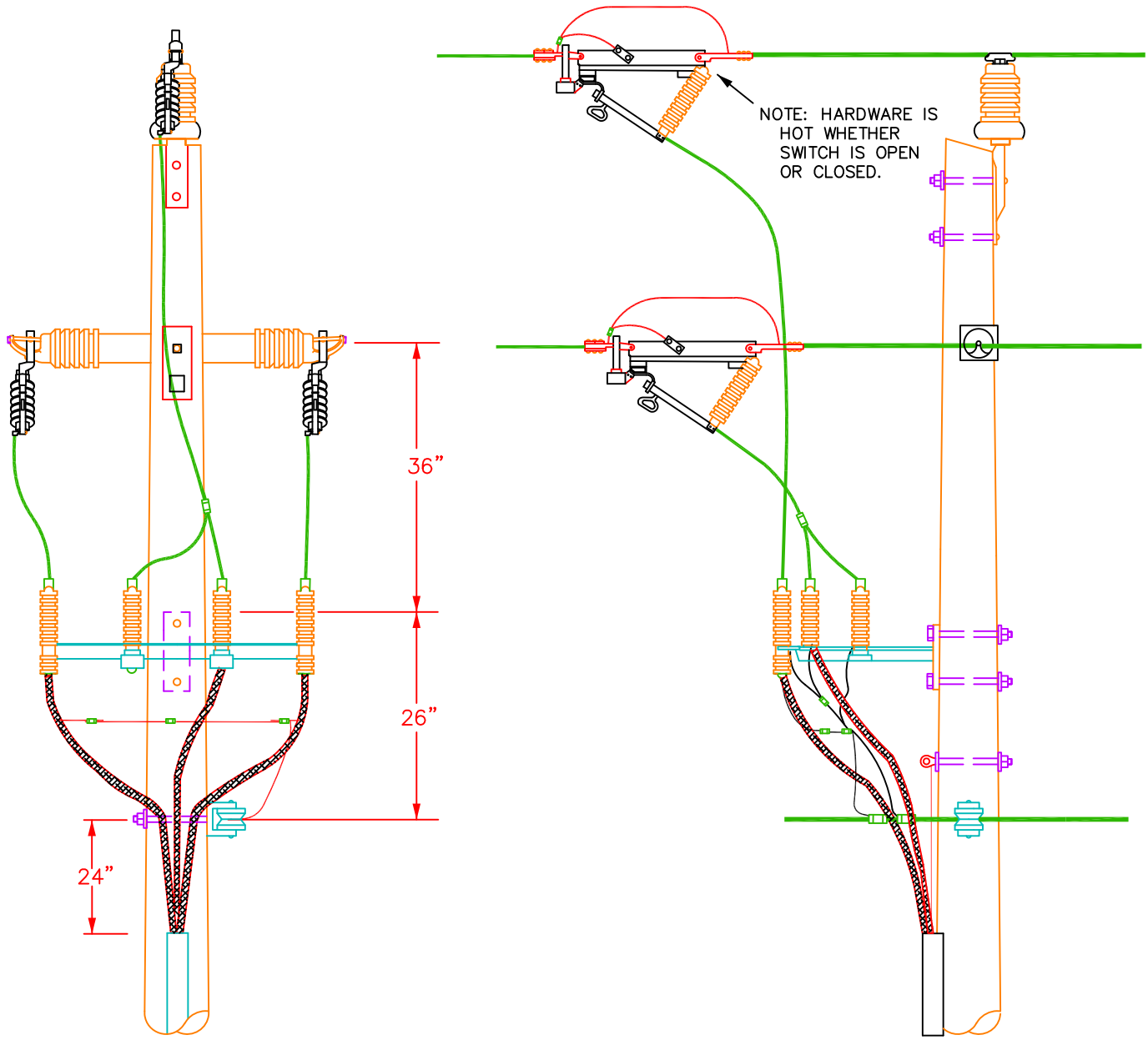


DATE: OCTOBER, 1992

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## UM2-5A





NOTE:  
MATERIAL FOR POLE AND OVERHEAD PRIMARY  
NOT INCLUDED IN MATERIAL LIST.

## THREE PHASE, OVERHEAD TO UNDERGROUND FEEDER TERMINATION

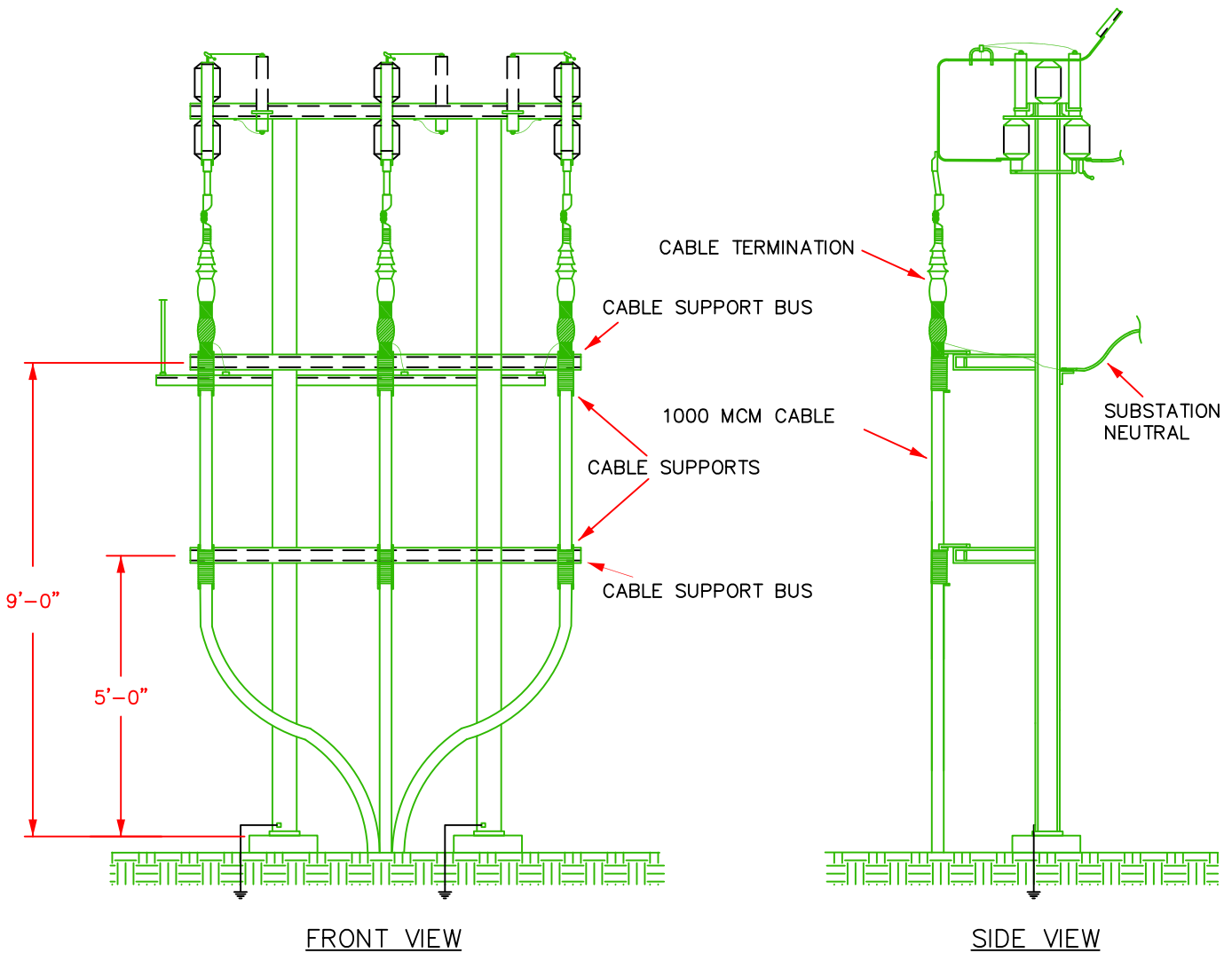


DATE: OCTOBER, 1992

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# UM2-7A





NOTES:

1. CABLE SHALL BE BURIED 48 TO 60 INCHES.

## UNDERGROUND SUBSTATION EXIT FEEDER CABLE



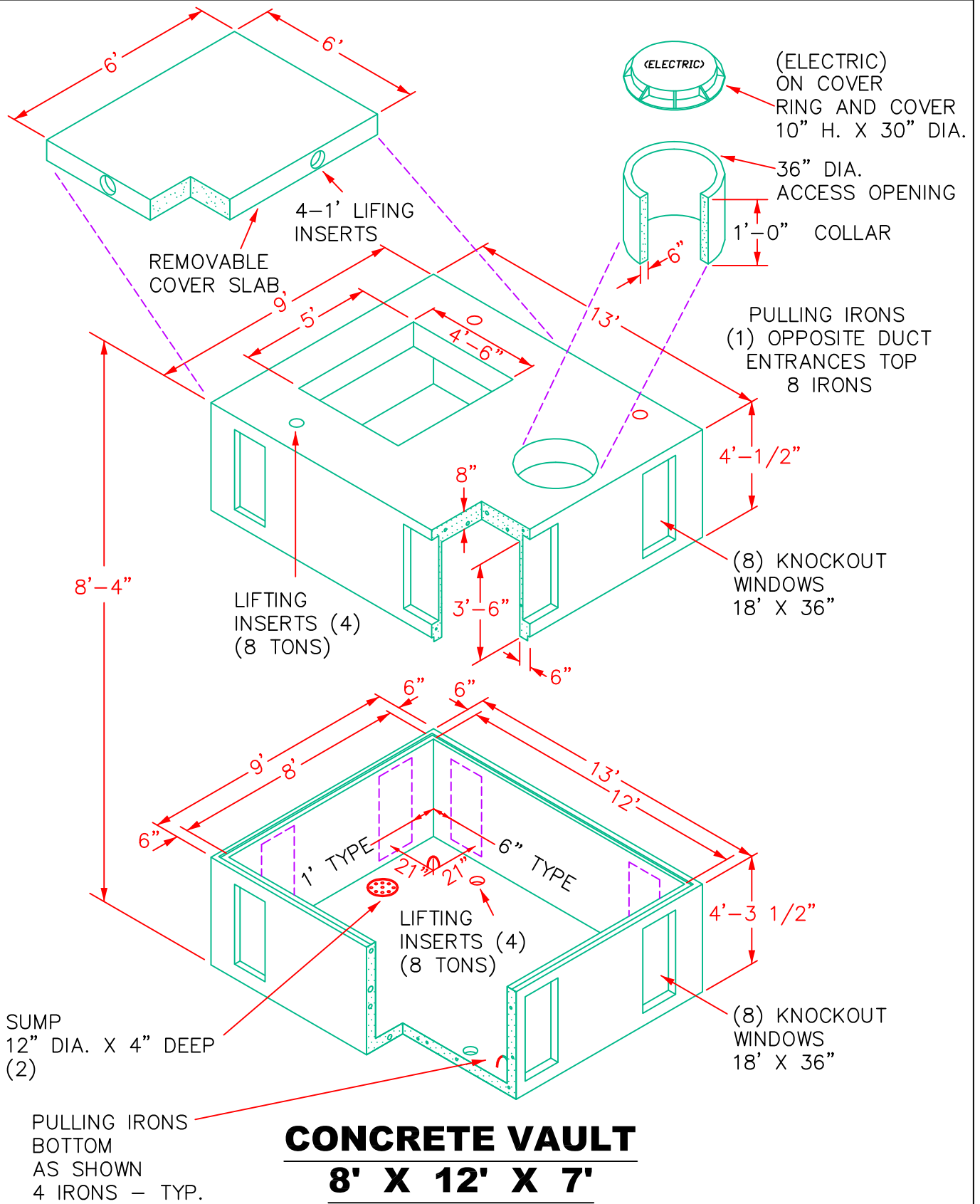
DATE: JULY, 2001

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**UM3**





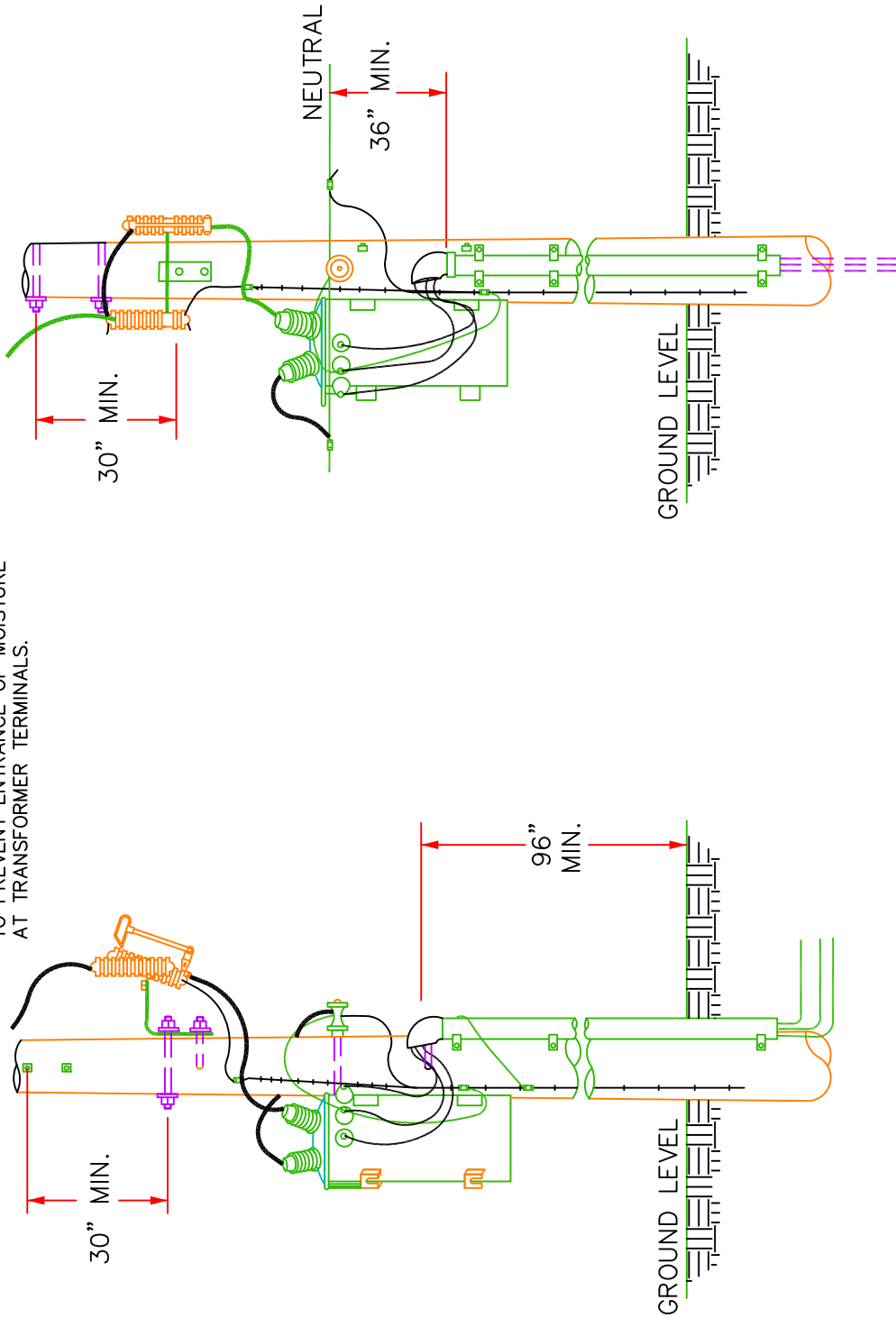


DATE: OCTOBER, 1992

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JANUARY, 2007

**UM3-16-12**

NOTE:  
DRESS OR SEAL SECONDARY CABLES  
TO PREVENT ENTRANCE OF MOISTURE  
AT TRANSFORMER TERMINALS.



## SERVICE INSTALLATION FROM OVERHEAD TRANSFORMER POLE



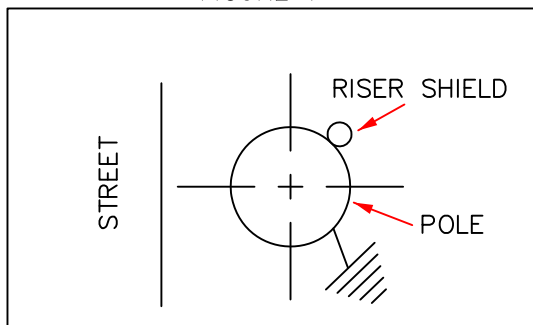
DATE: OCTOBER, 1992

REVISIONS JULY, 2002

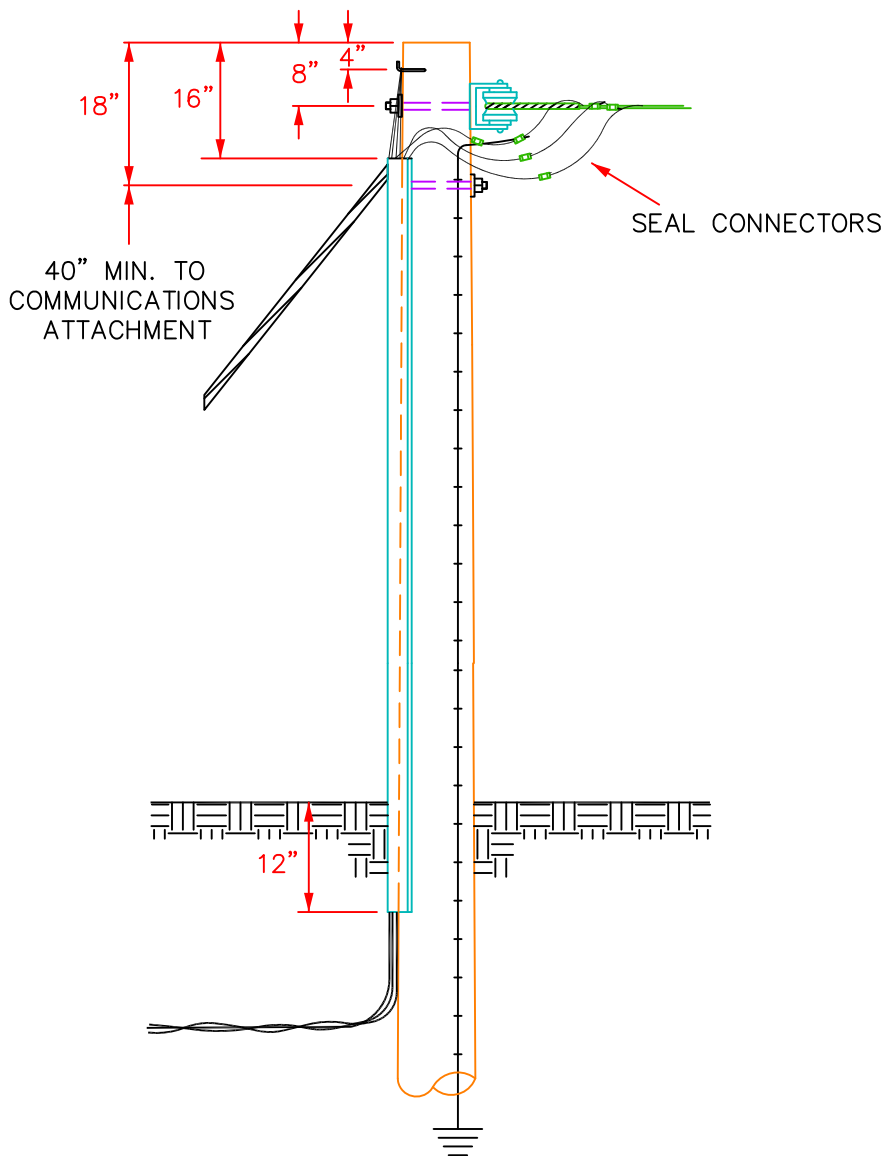
**UM5**



FIGURE 1



PLACE POLE GROUND AND RISER SHIELD ON BACK OF POLE ON OPPOSITE QUARTERS WITH RISER SHIELD AWAY FROM TRAFFIC (SEE FIGURE 1).



## TYPICAL UNDERGROUND SERVICE INSTALLATION FROM OVERHEAD SERVICE POLE

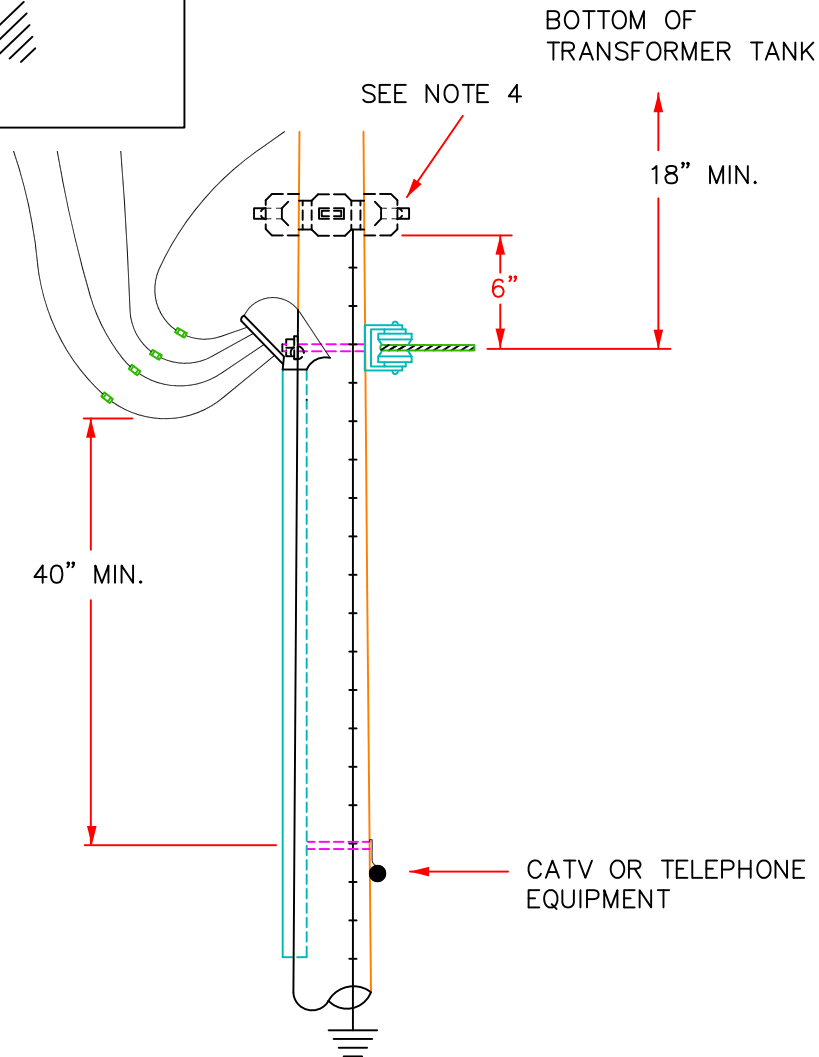
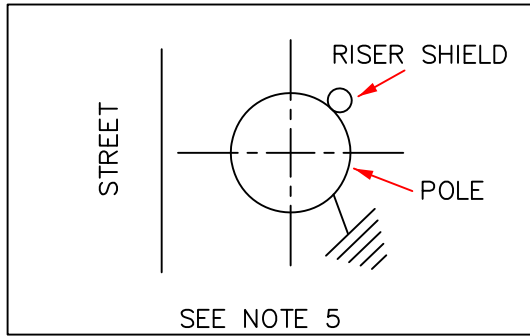


DATE: OCTOBER, 1992

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# UM5-1

FIGURE 1



NOTES:

1. NEUTRAL PLACED A MIN. OF 18" BELOW BOTTOM OF TRANSFORMER TANK.
2. WEATHERHEAD PLACED AT NEUTRAL LEVEL.
3. MAINTAIN 40" BETWEEN DRIP LOOP AND COMMUNICATION COMPANIES.
4. IF CTS ARE REQUIRED, PLACE 6" ABOVE NEUTRAL.
5. CUSTOMER MUST FURNISH AND INSTALL RIGID NON-METALLIC CONDUIT WITH WEATHERHEAD ON QUADRANT OF POLE AWAY FROM TRAFFIC (SEE FIGURE 1).

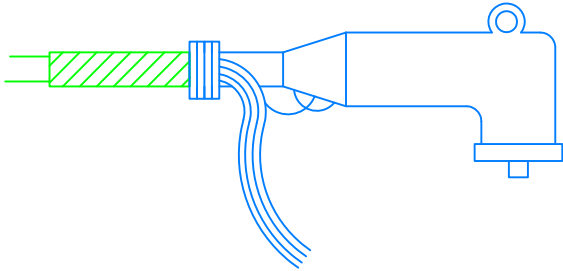
## TYPICAL CUSTOMER THREE PHASE UNDERGROUND SERVICE FROM OVERHEAD TRANSFORMER POLE



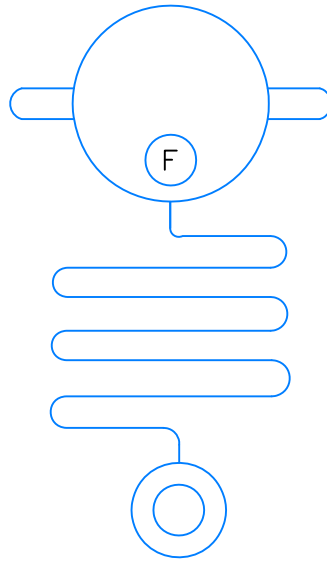
REVISIONS JULY, 2002

DATE: OCTOBER, 1992

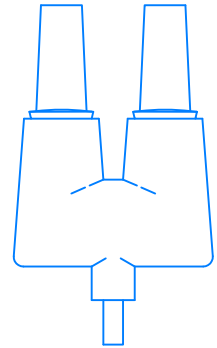
# UM5-2



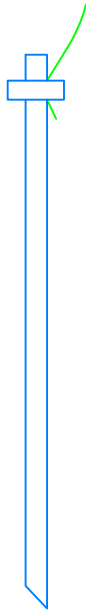
200 AMP  
LOAD BREAK ELBOW  
UM6-1



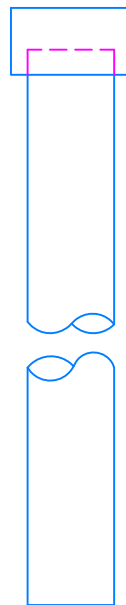
FAULT INDICATOR  
UM6-4



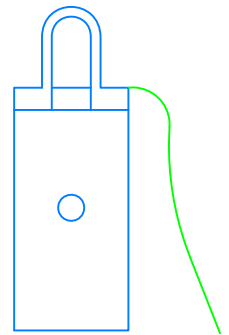
FEED THROUGH  
LOAD BREAK INSERT  
UM6-5



GROUND ROD  
UM6-6



STUB UP  
UM6-9-2



200 AMP  
INSULATED  
PROTECTIVE CAP  
UM6-10

## **MISCELLANEOUS ASSEMBLIES**

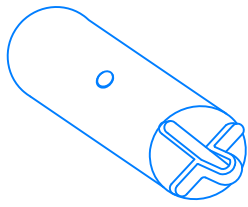
### **UNDERGROUND CABLE**



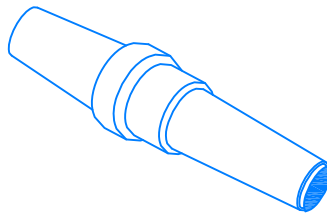
DATE: OCTOBER, 1992

REVISIONS JANUARY, 2007

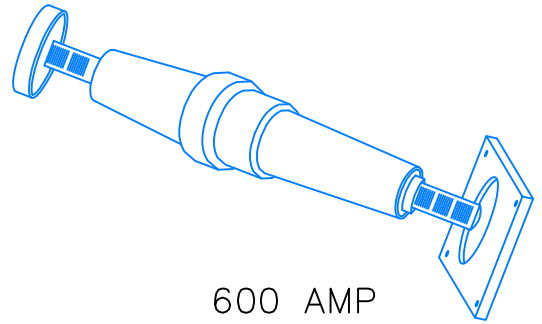
# UM6,1



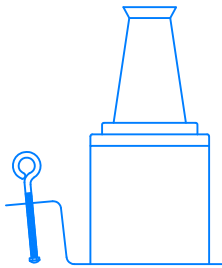
600 AMP  
INSULATED  
PROTECTIVE CAP  
UM6-11



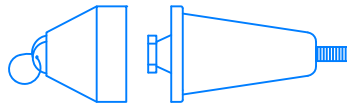
200 AMP  
LOAD BREAK  
INSERT  
UM6-13



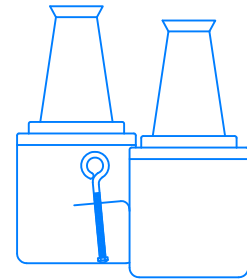
600 AMP  
DEADBREAK  
INSERT  
UM6-14



200 AMP  
STAND-OFF  
INSULATOR  
UM6-15



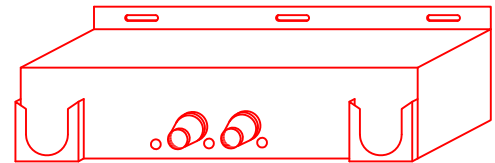
INSULATING PLUG  
600 AMP CONNECTOR  
UM6-17



200 AMP  
STAND-OFF  
INSULATOR  
FEED THROUGH  
UM6-19



200 AMP  
TWO POINT  
JUNCTION  
UM6-20



600 AMP  
TWO POINT  
JUNCTION  
UM6-20-A

## **MISCELLANEOUS ASSEMBLIES**

### **UNDERGROUND CABLE**



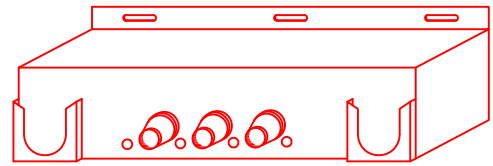
DATE: OCTOBER, 1992

REVISIONS JANUARY, 2007

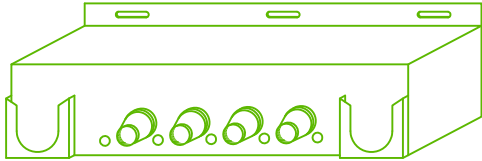
# **UM6,2**



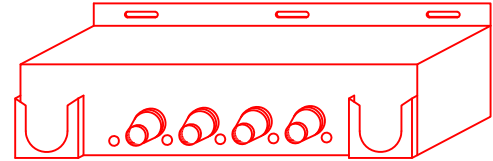
200 AMP  
THREE POINT  
JUNCTION  
UM6-21



600 AMP  
THREE POINT  
JUNCTION  
UM6-21-A



200 AMP  
FOUR POINT  
JUNCTION  
UM6-22



600 AMP  
FOUR POINT  
JUNCTION  
UM6-22-A



NOTE:

APPLICATION RUNS  
FOR 1320 RUNS  
PER NESC CODE  
SET ARTICAL: 0907C

JACKETED CABLE  
GROUNDING KITS  
UM6-39

**MISCELLANEOUS ASSEMBLIES**  
**UNDERGROUND CABLE**

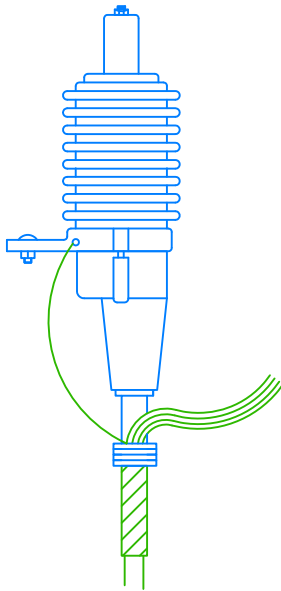


DATE: OCTOBER, 1992

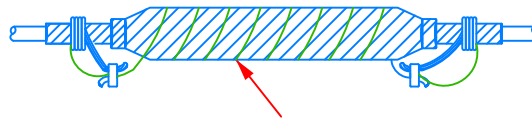
REVISIONS JANUARY, 2007

**UM6,3**





OUTDOOR  
TERMINATION  
UM6-24

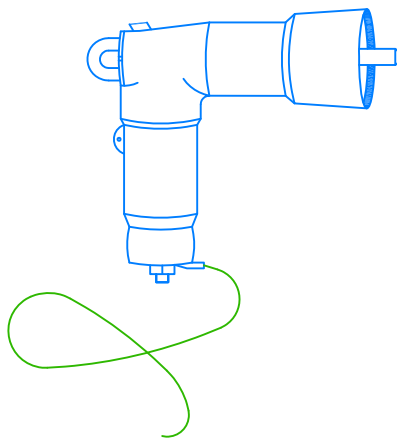


OR EQUIVALENT EXTENSION  
CONCENTRIC NEUTRAL

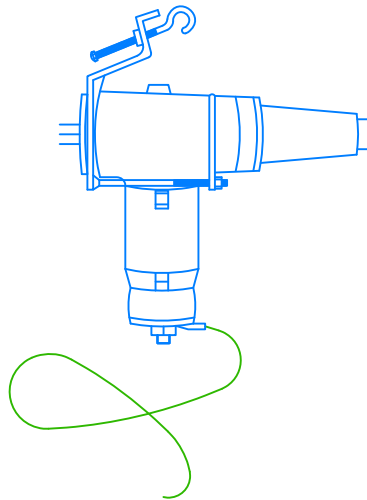
IN LINE  
PRIMARY  
SPLICE  
UM6-28



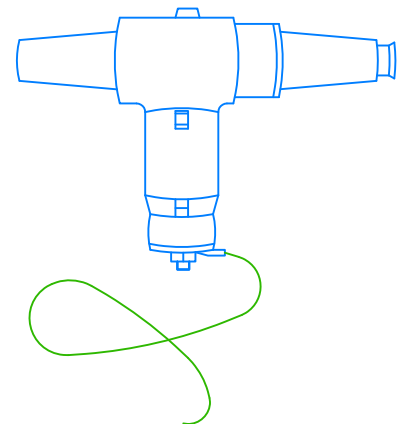
600 VOLT  
BOOT OR  
SLEEVE-INSULATED  
UM6-32



ELBOW  
SURGE  
ARRESTER  
UM6-34



PARKING  
STANDING  
ARRESTER  
UM6-37



BUSHING  
ARRESTER  
UM6-38

## **MISCELLANEOUS ASSEMBLIES**

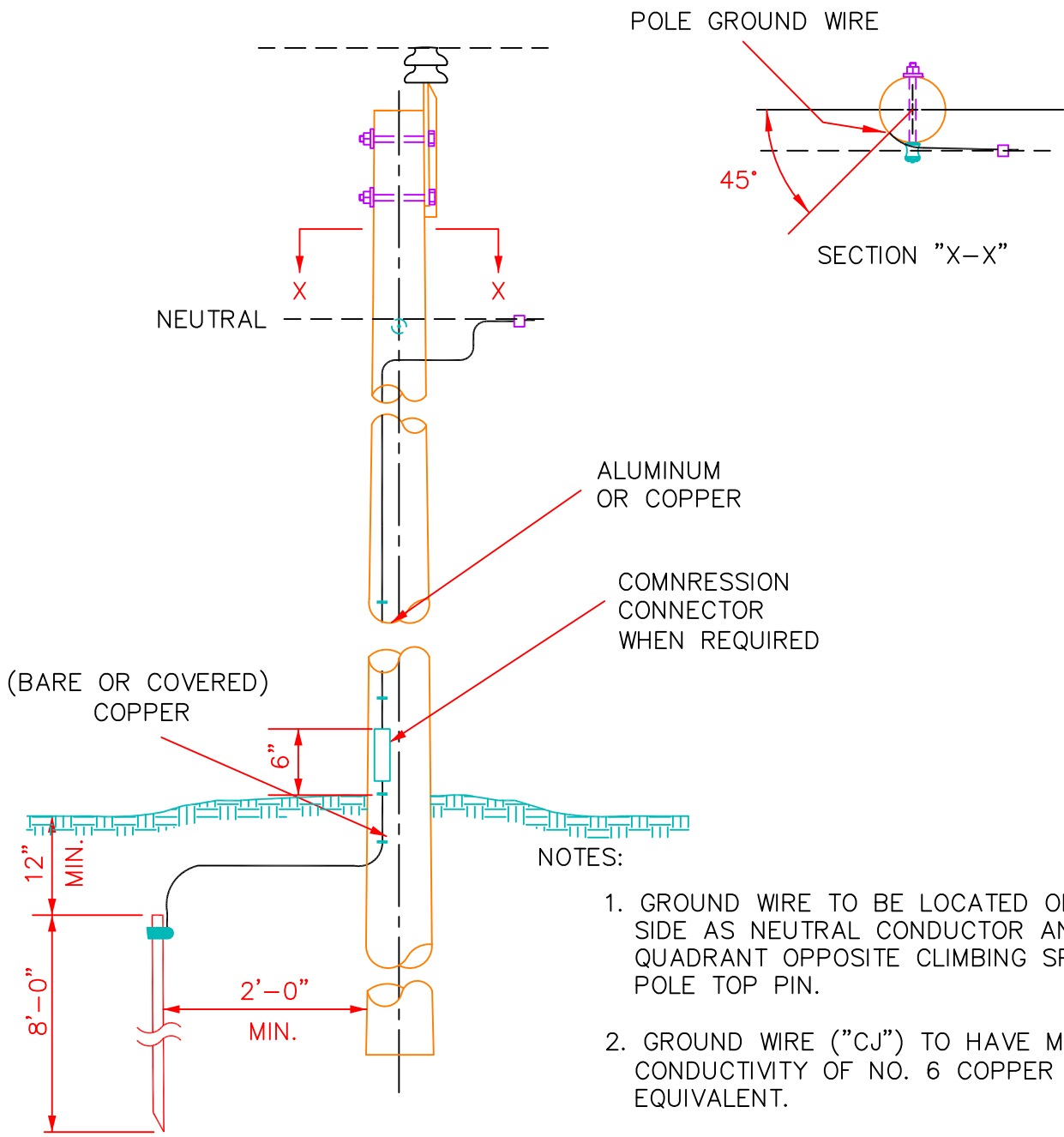
### **UNDERGROUND CABLE**



DATE: OCTOBER, 1992

REVISIONS JANUARY, 2007

**UM6,4**



NOTES:

1. GROUND WIRE TO BE LOCATED ON SAME SIDE AS NEUTRAL CONDUCTOR AND IN QUADRANT OPPOSITE CLIMBING SPACE OR POLE TOP PIN.
2. GROUND WIRE ("CJ") TO HAVE MINIMUM CONDUCTIVITY OF NO. 6 COPPER OR EQUIVALENT.
3. USE COPPER PLATED GROUND ROD AND COPPER GROUND WIRE AND STAPLES, OR USE GALVANIZED STEEL GROUND ROD, STAPLES AND SOFT ANNEALED IRON, 3-STRAND, 5/16" GROUND WIRE WITH CLASS C GALVANIZING.

## GROUNDING ASSEMBLY GROUND ROD TYPE

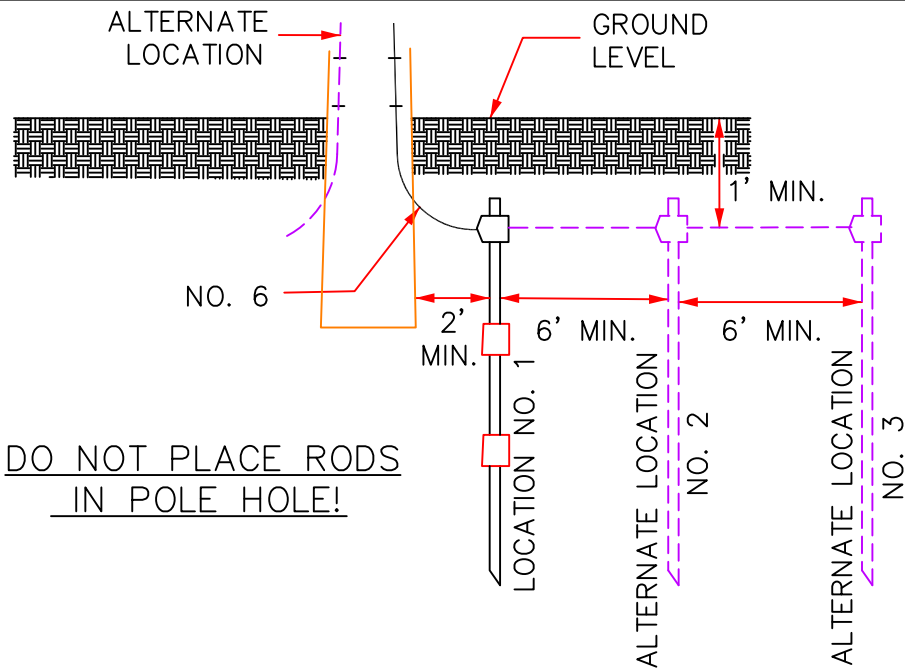


DATE: JUNE 27, 2008

REVISIONS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

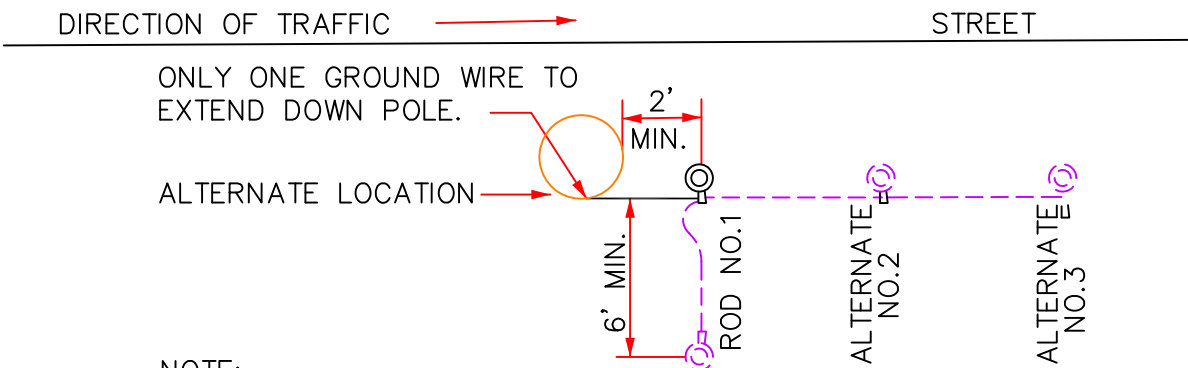
**ADDITION  
M2**





**NOTE:**

1. GROUND RESISTANCE (MEGGER READING) SHOULD BE 25 OHMS OR LESS AT POLES WHICH SUPPORT EQUIPMENT REQUIRING LIGHTNING ARRESTERS.
2. EQUIPMENT POLES SHOULD HAVE A MINIMUM OF 3 RODS EITHER DRIVEN AT LOCATION NO. 1 OR ONE ROD IN THREE LOCATIONS.
3. ALL OTHER POLES SHOULD HAVE AT LEAST ONE GROUND ROD.



**NOTE:**

IF DRIVEWAY OR OTHER OBSTRUCTIONS INTERFERE WITH THE GROUND ROD LOCATION AS SHOWN, THE GROUND LEAD DOWN THE POLE MAY BE PLACED AT ALTERNATE LOCATION.  
 IN CASES WHERE TELEPHONE CABLE IS IN PLACE ON FIELD SIDE OF POLE, INSTALL GROUND ON ROAD SIDE QUADRANT AWAY FROM FLOW OF TRAFFIC.

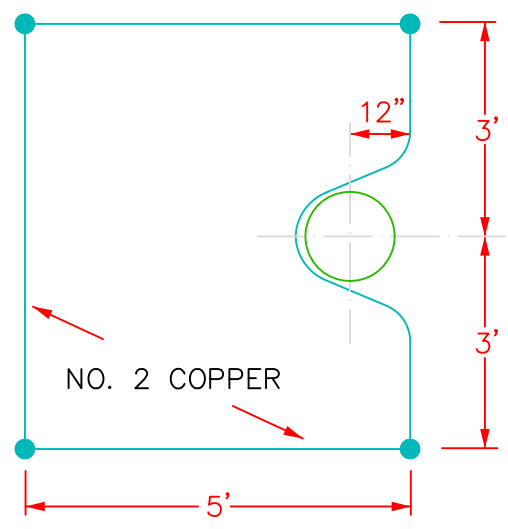
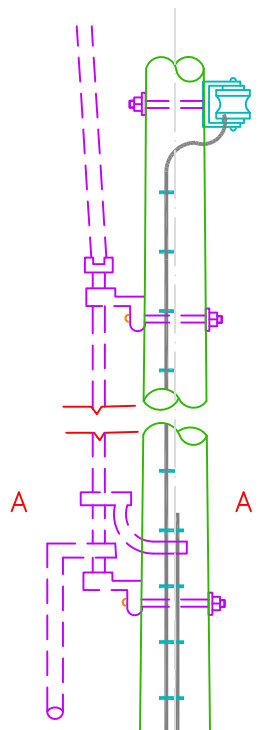
## **UTILITY POLE** **GROUND ROD(S) LOCATION**



REVISIONS JANUARY, 2007

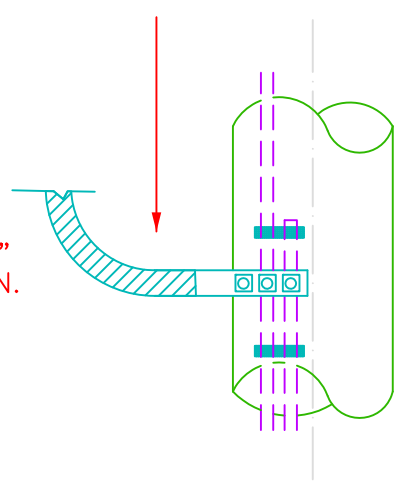
DATE: OCTOBER, 1992

**M2**



SECTION X-X  
DETAIL OF GROUND GRID

CLAMP AND BRAID TO BE  
FURNISHED WITH CONTROLS.



DETAIL OF SECTION A-A

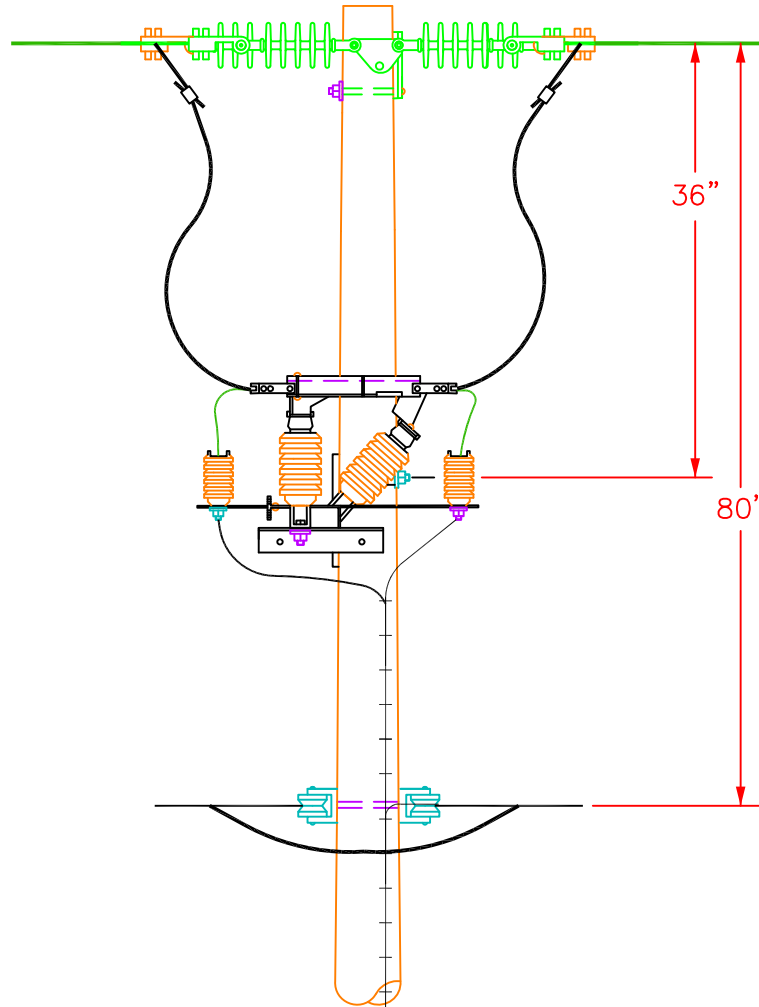
# GROUNDING ASSEMBLY FOR AIR BREAK SWITCH



DATE: OCTOBER, 1992

REVISIONS JANUARY, 2007  
\_\_\_\_\_  
\_\_\_\_\_

## M2-15



## M3-15 ALTERNATE HORIZONTAL DOUBLE DEADEND

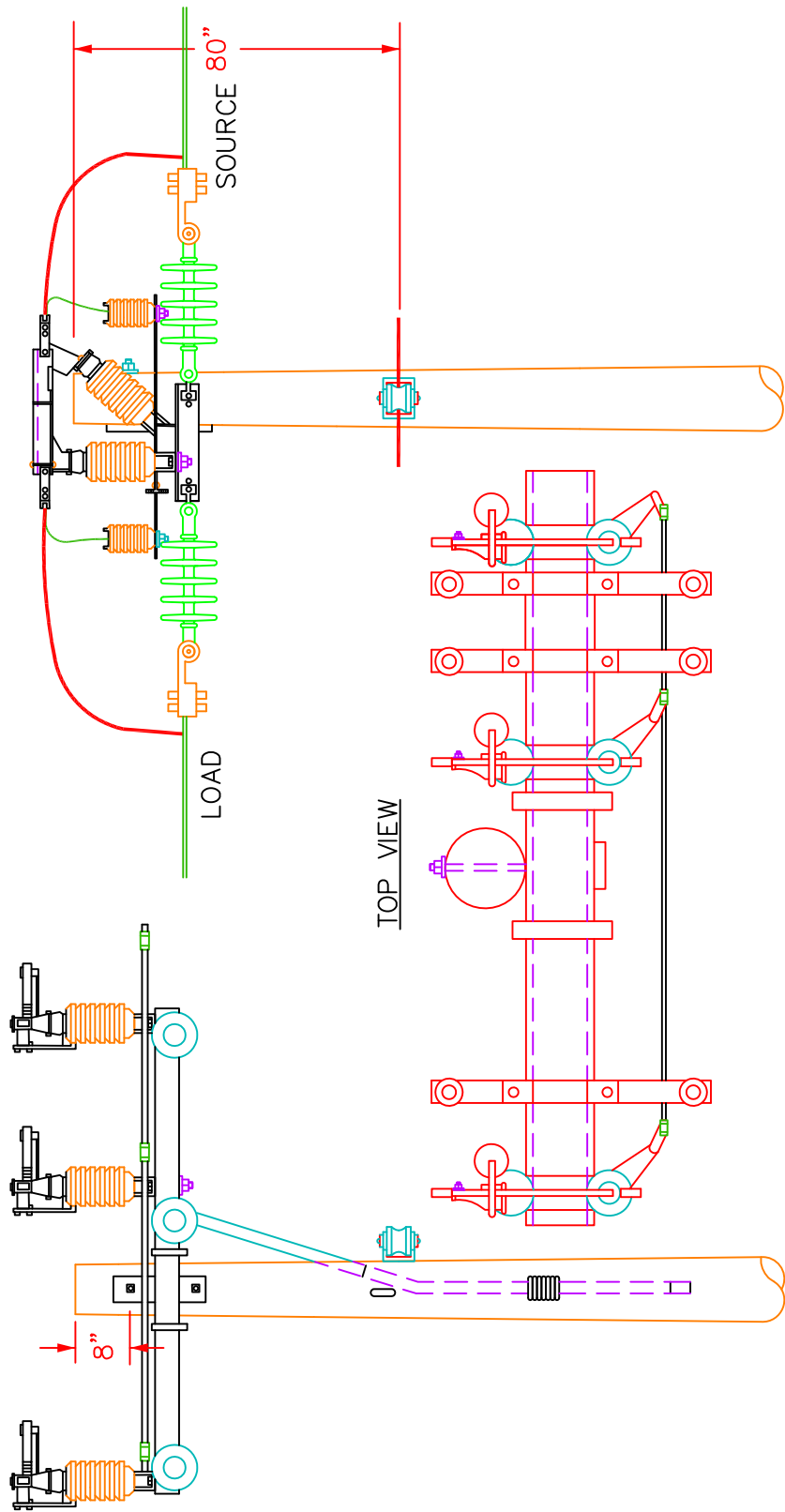


DATE: OCTOBER, 1992

REVISIONS JULY, 2002

JANUARY, 2007

**M3-15 ALTERNATE**



# GANG OPERATED HORIZONTAL SWITCH



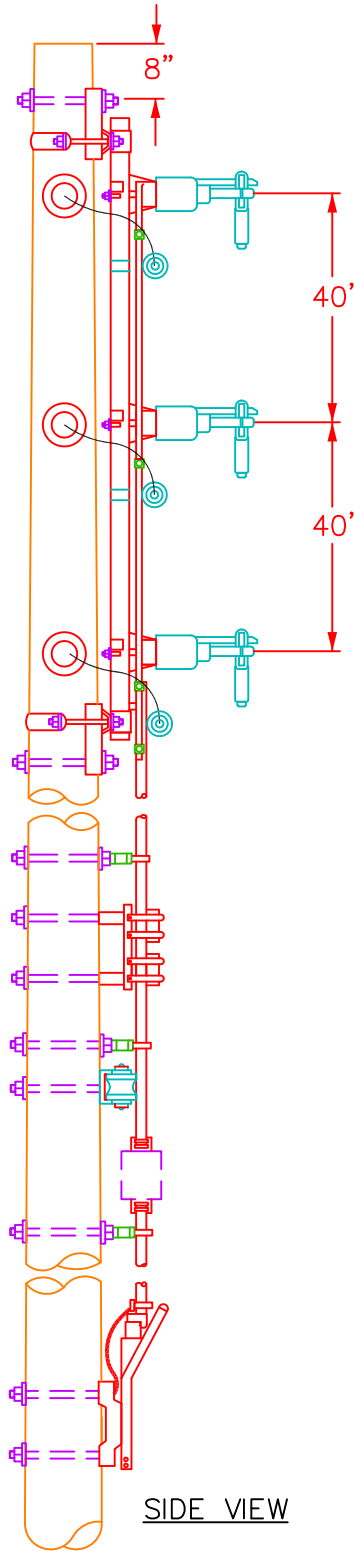
DATE: OCTOBER, 1992

REVISIONS JULY, 2002  
JANUARY, 2007

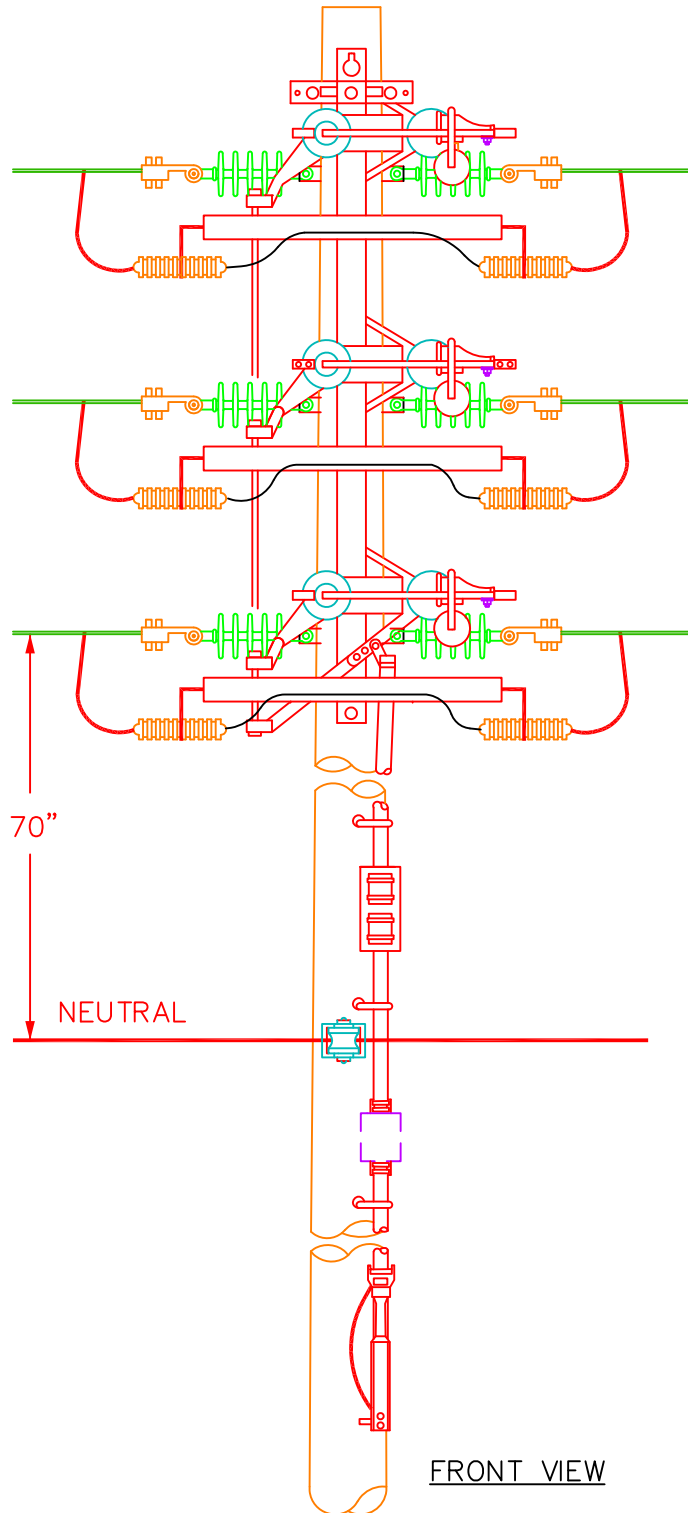
**M3-15**







SIDE VIEW



FRONT VIEW

## GANG OPERATED VERTICAL SWITCH

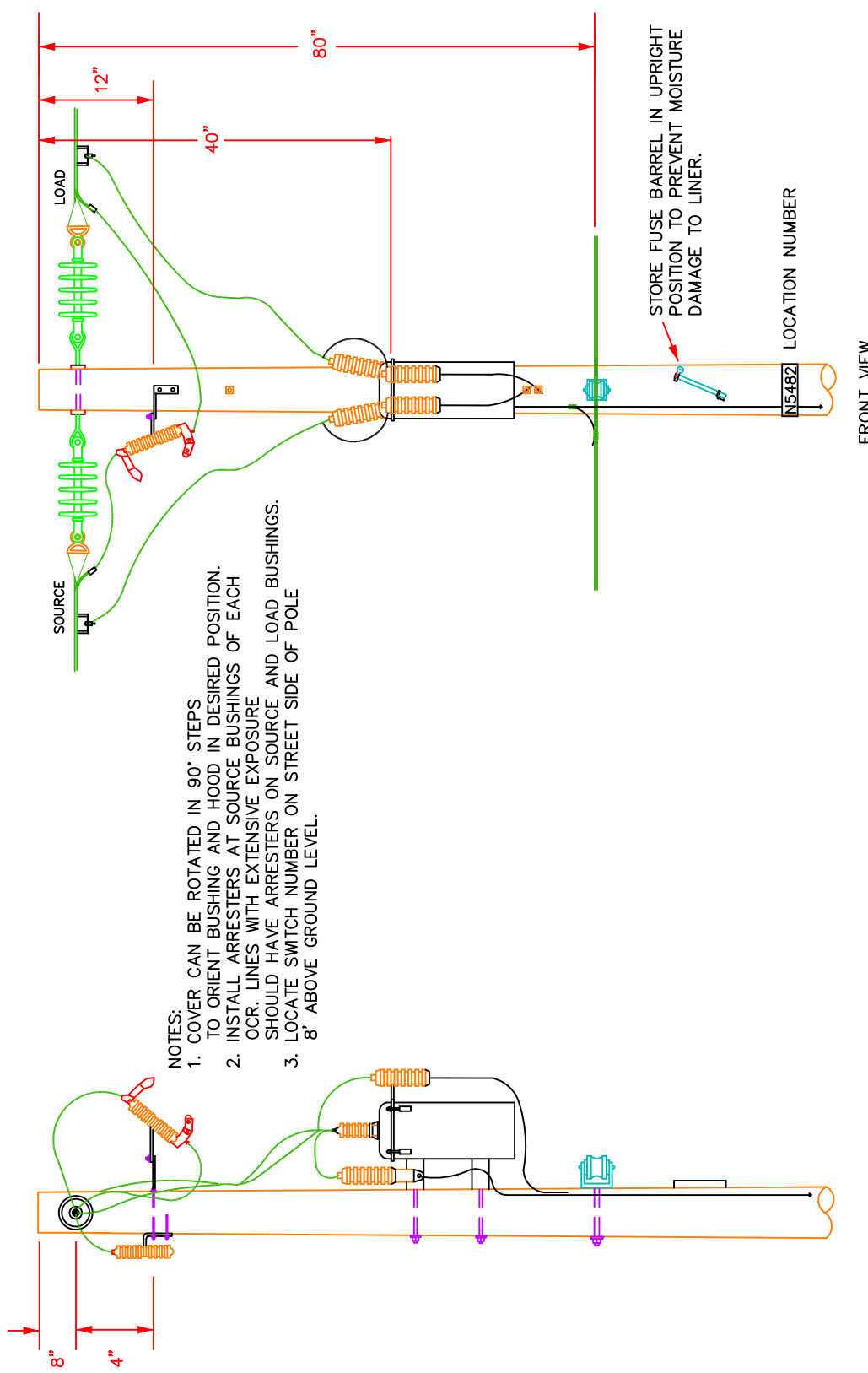


DATE: OCTOBER, 1992

REVISIONS JULY, 2002  
JANUARY, 2007

# M3-15V





- NOTES:
1. COVER CAN BE ROTATED IN 90° STEPS TO ORIENT BUSHING AND HOOD IN DESIRED POSITION.
  2. INSTALL ARRESTERS AT SOURCE BUSHINGS OF EACH OCR. LINES WITH EXTENSIVE EXPOSURE SHOULD HAVE ARRESTERS ON SOURCE AND LOAD BUSHINGS.
  3. LOCATE SWITCH NUMBER ON STREET SIDE OF POLE 8' ABOVE GROUND LEVEL.

SINGLE PHASE INSTALLATION

# OIL CIRCUIT RECLOSER LIGHT DUTY (TYPE "H")

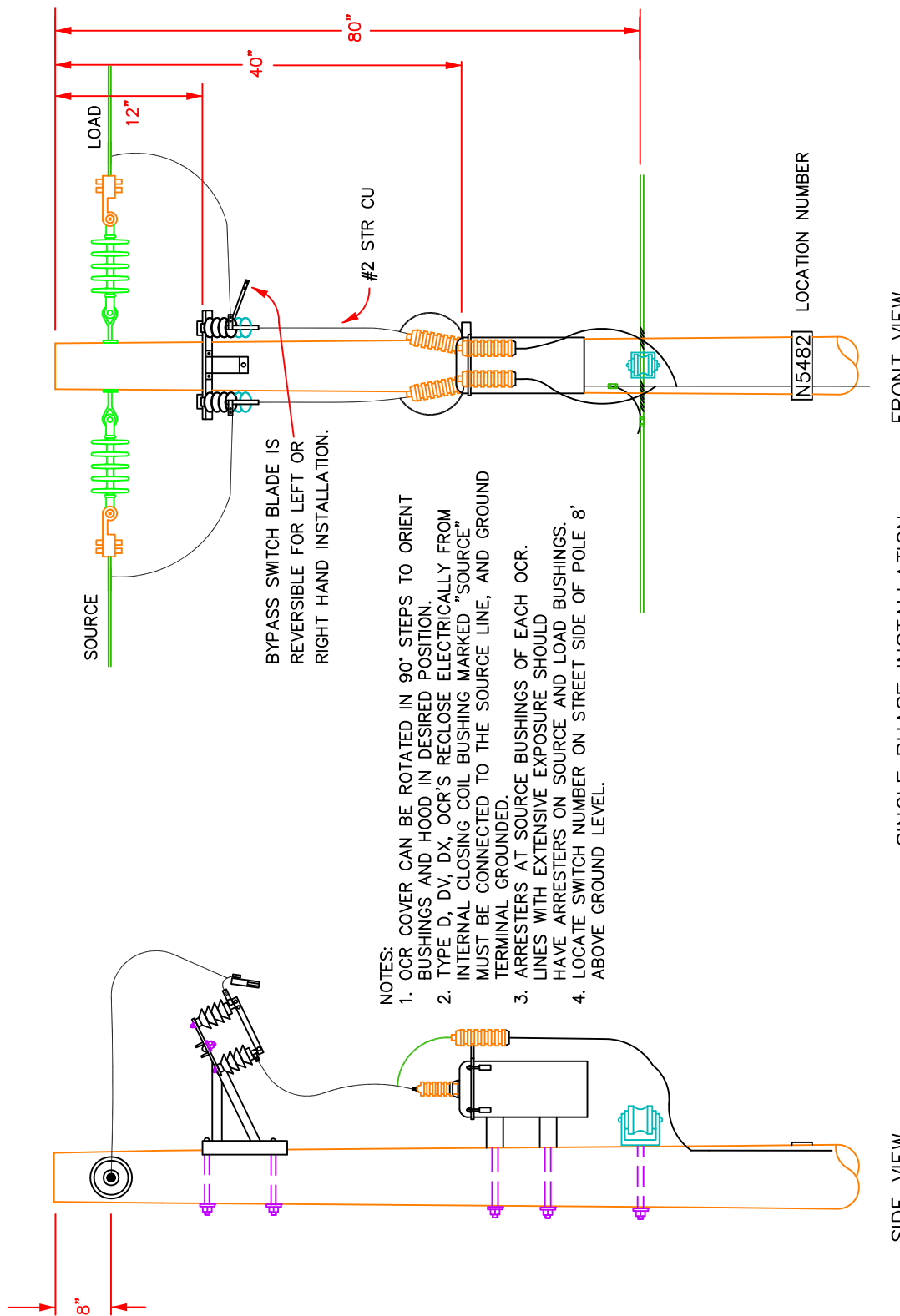


DATE: OCTOBER, 1992

REVISIONS JULY, 2001  
JANUARY, 2007

## M3-23





BYPASS SWITCH BLADE IS REVERSIBLE FOR LEFT OR RIGHT HAND INSTALLATION.

- NOTES:
1. OCR COVER CAN BE ROTATED IN 90° STEPS TO ORIENT BUSHINGS AND HOOD IN DESIRED POSITION.
  2. TYPE D, DV, DX, OCR'S RECLOSE ELECTRICALLY FROM INTERNAL CLOSING COIL BUSHING MARKED "SOURCE" MUST BE CONNECTED TO THE SOURCE LINE, AND GROUND TERMINAL GROUNDED.
  3. ARRESTERS AT SOURCE BUSHINGS OF EACH OCR. LINES WITH EXTENSIVE EXPOSURE SHOULD HAVE ARRESTERS ON SOURCE AND LOAD BUSHINGS.
  4. LOCATE SWITCH NUMBER ON STREET SIDE OF POLE 8' ABOVE GROUND LEVEL.

SIDE VIEW FRONT VIEW

SINGLE PHASE INSTALLATION

# OIL CIRCUIT RECLOSER HEAVY DUTY

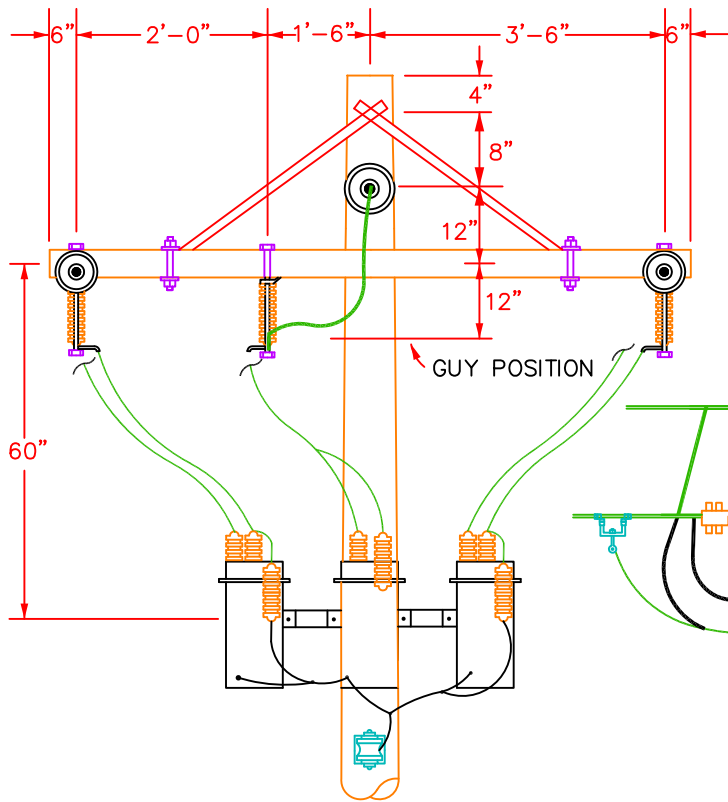


DATE: OCTOBER, 1992

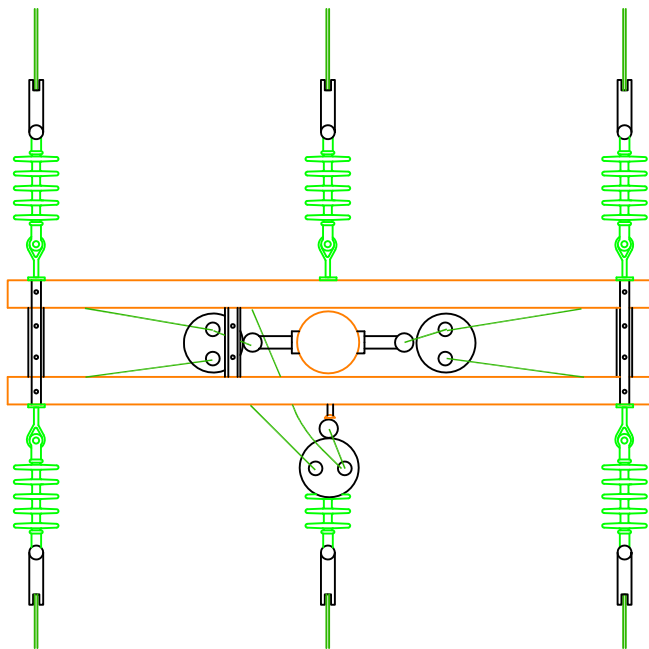
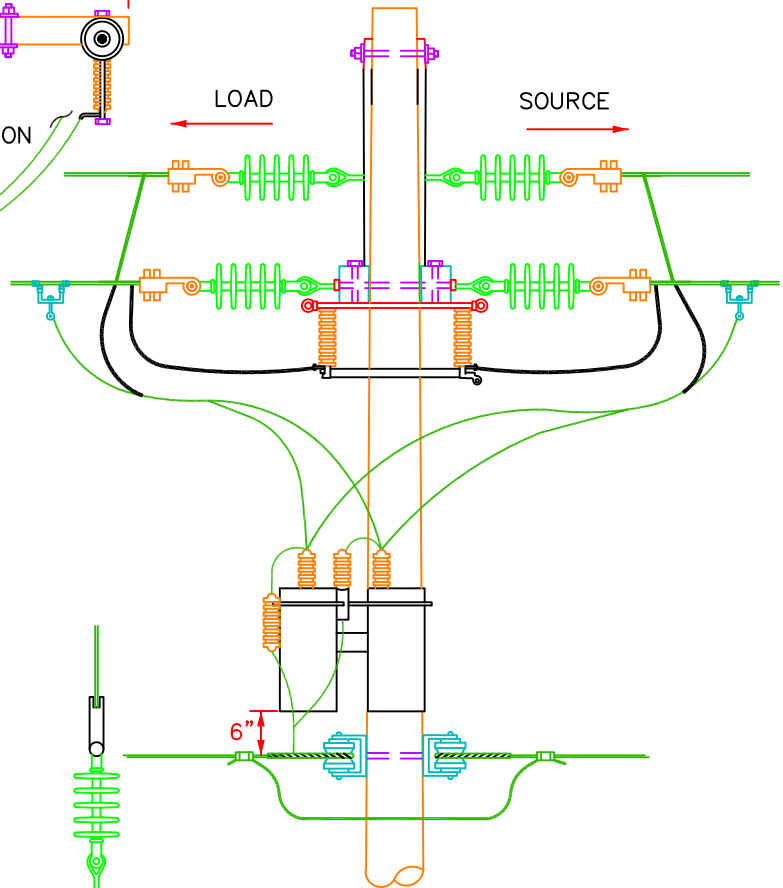
REVISIONS JULY, 2001  
JANUARY, 2007

## M3-23A





BYPASS SWITCH BLADES ARE REVERSIBLE FOR RIGHT/LEFT HANDED INSTALLATION.



NOTE:  
 FOR TWO PHASE INSTALLATIONS OMIT RECLOSER AND RELATED ITEMS ON CENTER PHASE. DESIGNATE AS M3-24A  
 COVER CAN BE ROTATED IN 90° STEPS TO ORIENT BUSHING AND HOOD IN DESIRED POSITION.

## **TWO OR THREE SECTIONALIZING OIL CIRCUIT RECLOSERS WITH BY-PASS SWITCHES**



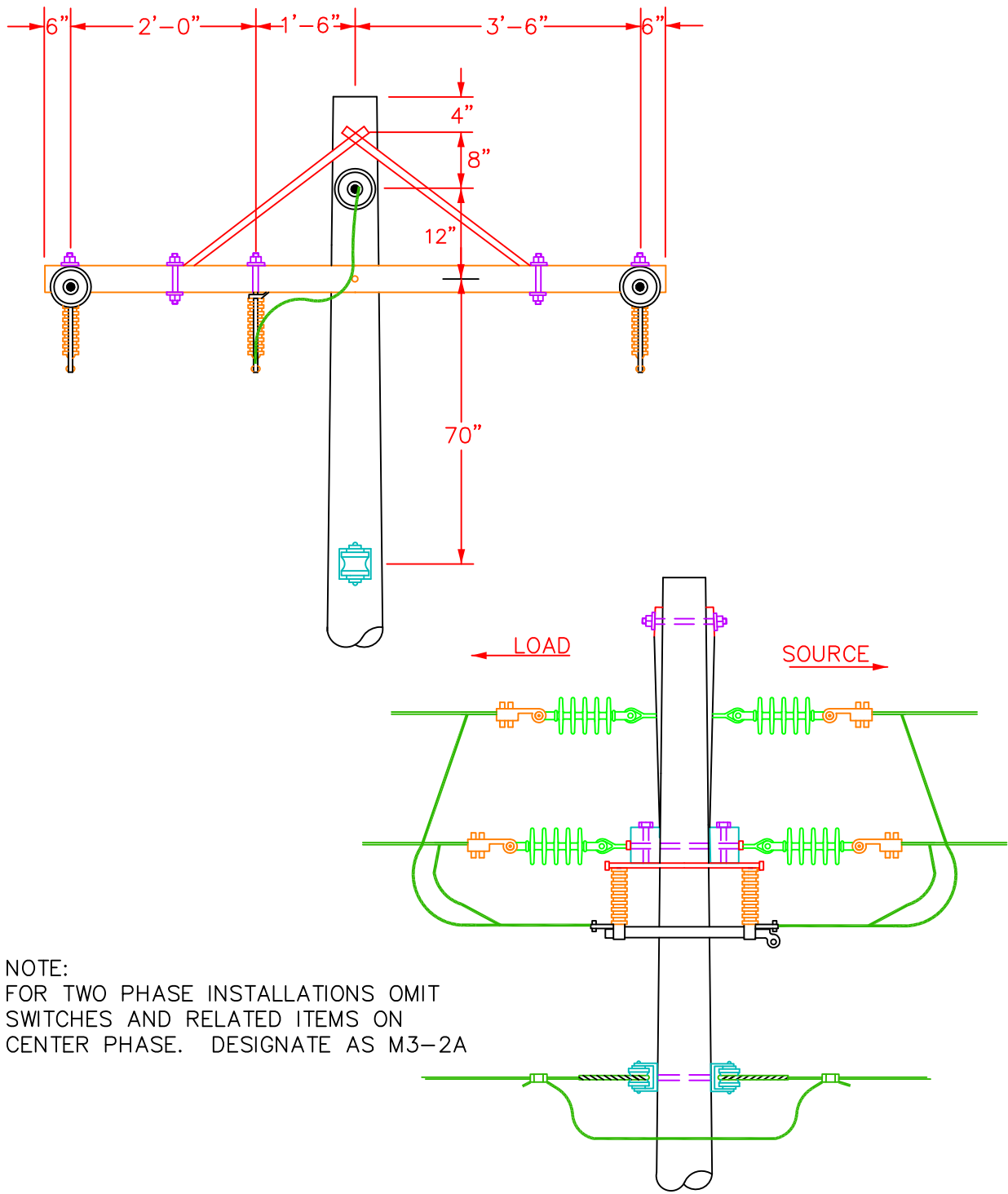
REVISIONS JULY, 2001  
 JANUARY, 2007

**M3-24A, M3-25A**

DATE: OCTOBER, 1992







NOTE:  
 FOR TWO PHASE INSTALLATIONS OMIT  
 SWITCHES AND RELATED ITEMS ON  
 CENTER PHASE. DESIGNATE AS M3-2A

## SECTIONALIZING DISCONNECT SWITCHES

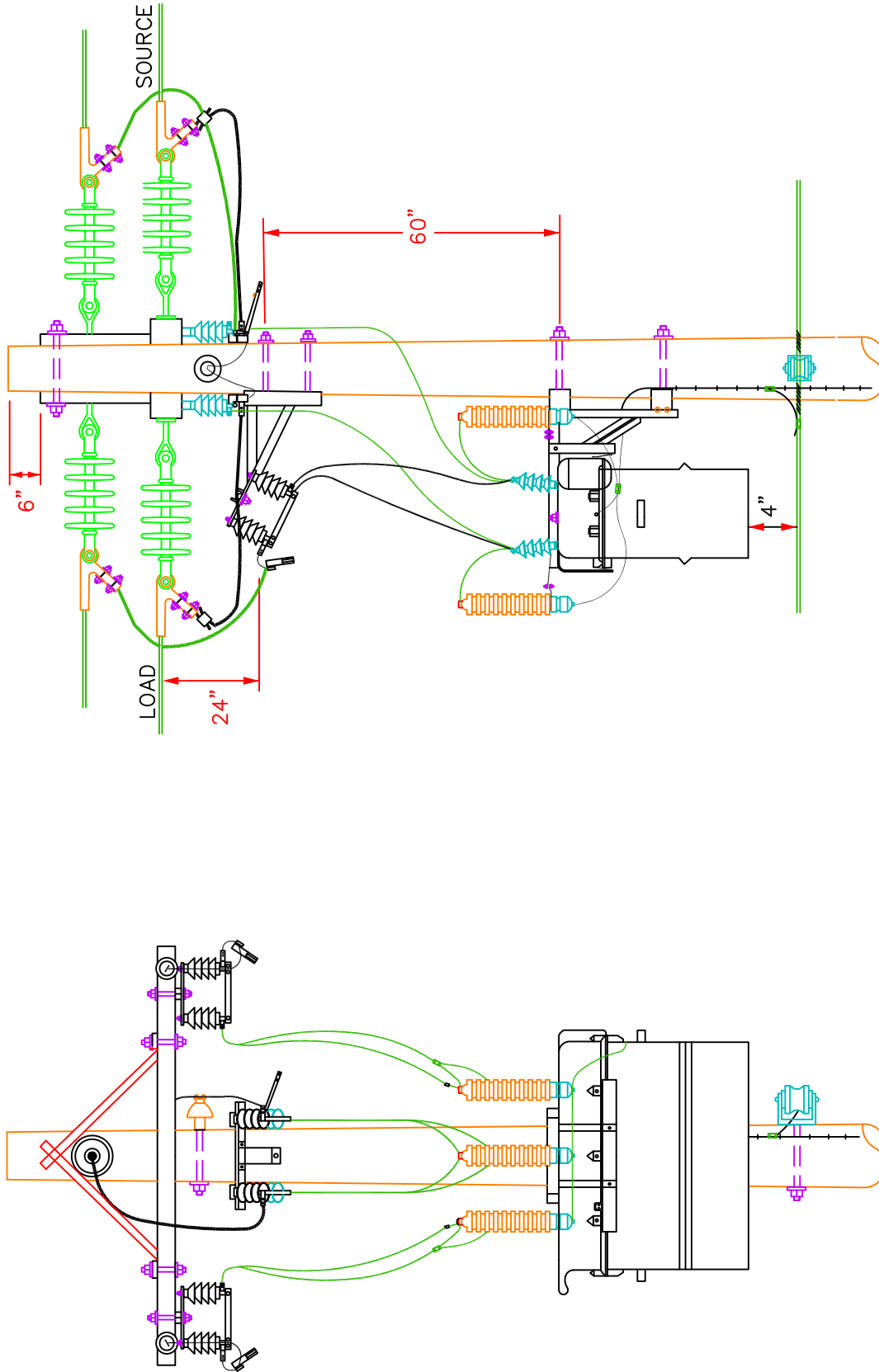


DATE: OCTOBER, 1992

REVISIONS JULY, 2002  
JANUARY, 2007

**M3-2A, M3-3A**





SIDE VIEW

FRONT VIEW

# OIL CIRCUIT RECLOSER, THREE PHASE WITH BY-PASS SWITCHES



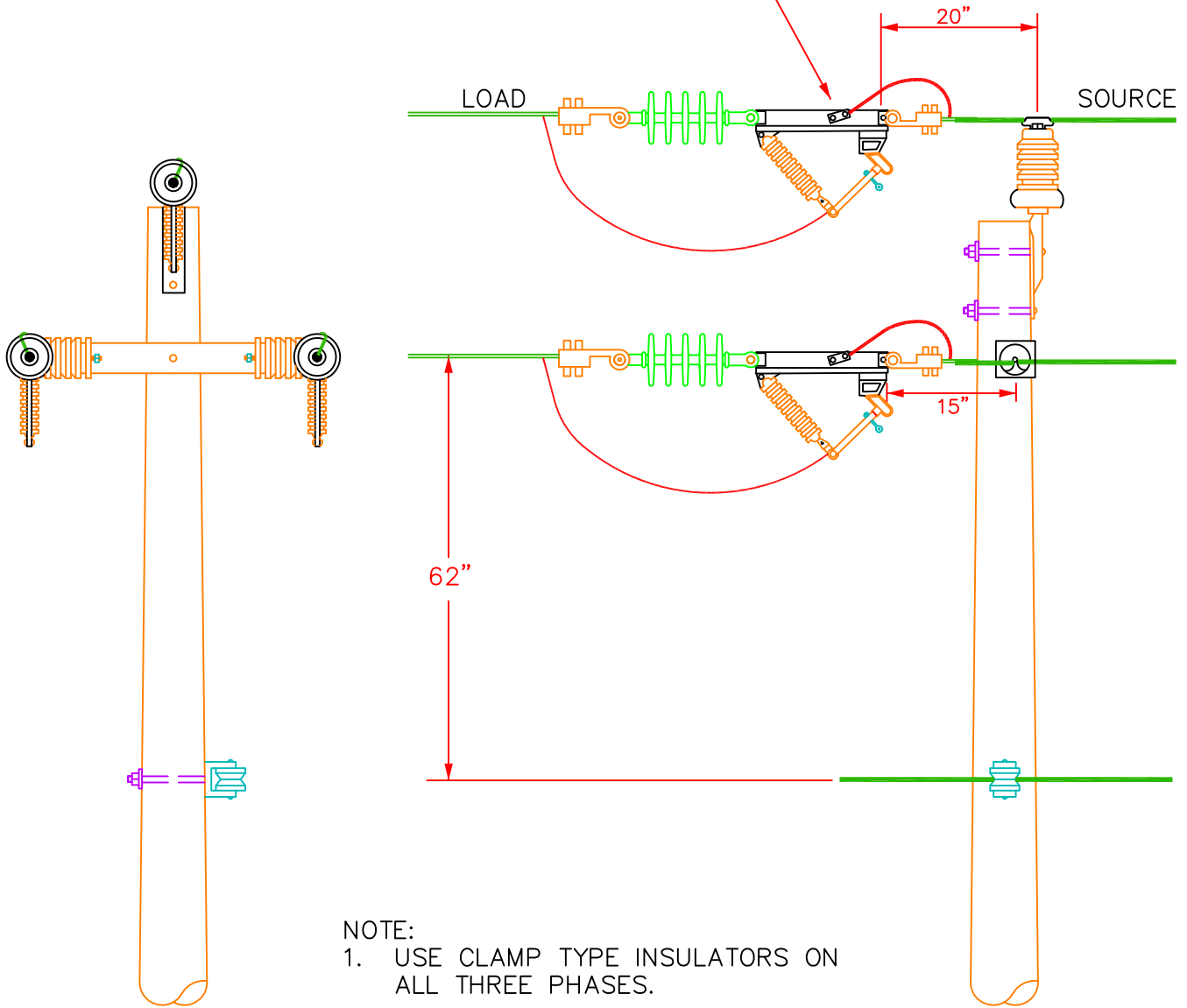
DATE: OCTOBER, 1992

REVISIONS JULY, 2001  
JANUARY, 2007

**M3-30**



HARDWARE HOT WHETHER SWITCHES ARE OPEN OR CLOSED



FRONT VIEW

SIDE VIEW

## SECTIONALIZING IN-LINE SWITCHES



REVISIONS JULY, 2002  
 JANUARY, 2007

**M3-3S**

DATE: \_\_\_\_\_



## WIRE CHARACTERISTICS FOR COPPER, ACSR AND AAC CONDUCTOR

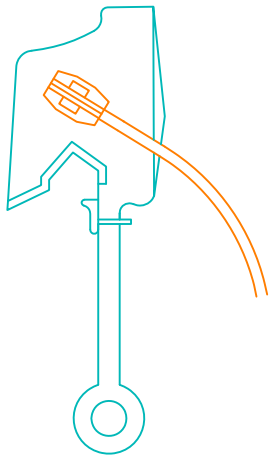
	AMPS	TENSILE STRENGTH	WEIGHT PER 1000 FT.	NO STRANDS	CIRCULAR MILS
<b>COPPER (BARE)</b>					
500 MCM HD	810	22,510	1,544	37	500,000
350 MCM HD	650	15,590	1,081	19	350,000
4/0	480	9,154	653	7	211,600
1/0	310	4,750	325	7	105,500
#2	230	3,050	205	7	66,370
#4 SOLID	170	1,938	126	1	41,740
#6 SOLID	120	1,280	79	1	26,250
<b>ACSR</b>					
795 COOT	884	19,710	884	36	795,000
397.5 MCM	576	9,940	432	18	397,500
336.4 MCM	519	8,680	365	18	336,400
4/0	357	8,350	291	6	211,600
3/0	315	6,620	230	6	167,800
2/0	276	5,310	183	6	133,100
1/0	242	4,380	146	6	105,500
#2	184	2,850	91	6	66,370
#4	140	1,860	58	6	41,740
<b>AAC</b>					
795 MCM LILAC	879	14,300	746	61	795,000
750 MCM CATTAIL	847	13,500	847	61	750,000
500 MCM ZINNA	658	8,760	469	19	500,000



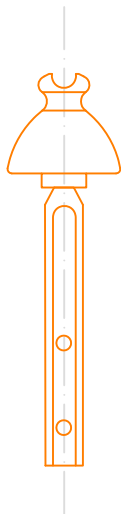
DATE: JANUARY, 2007

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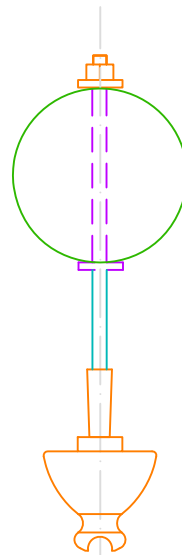
M5,1



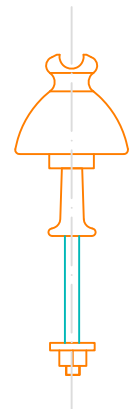
**M5-1**



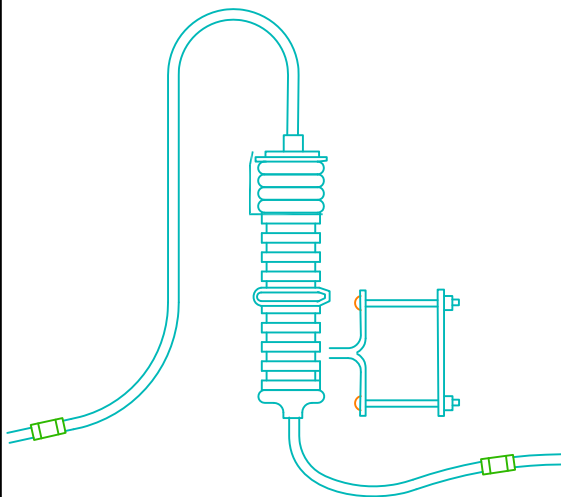
**M5-2**



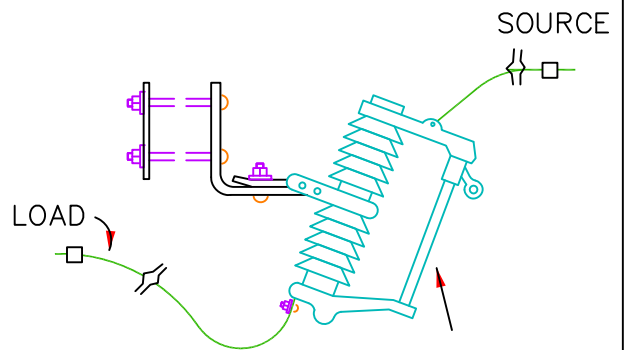
**M5-4**



**M5-5**

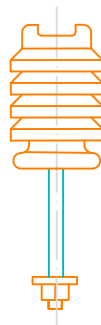


**M5-6**



SPECIFY THIS UNIT TO BE FURNISHED WITH SOLID BLADE. FOR SPEC. M5-9A

**M5-9**



**M5-7**

**MISCELLANEOUS PRIMARY ASSMBLIES**

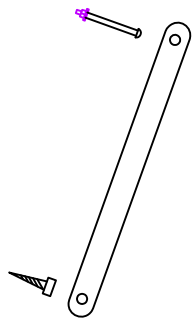


DATE: JANUARY, 2007

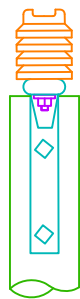
REVISIONS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**M5,2**

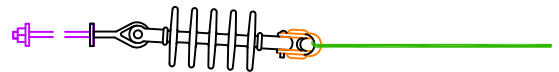




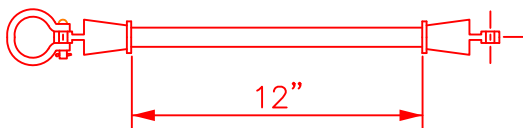
**M5-11**



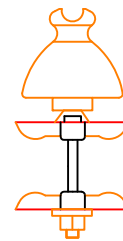
**M5-18**



**M5-20**



**M5-23**



**M5-24**

**MISCELLANEOUS PRIMARY**  
**ASSMBLIES**

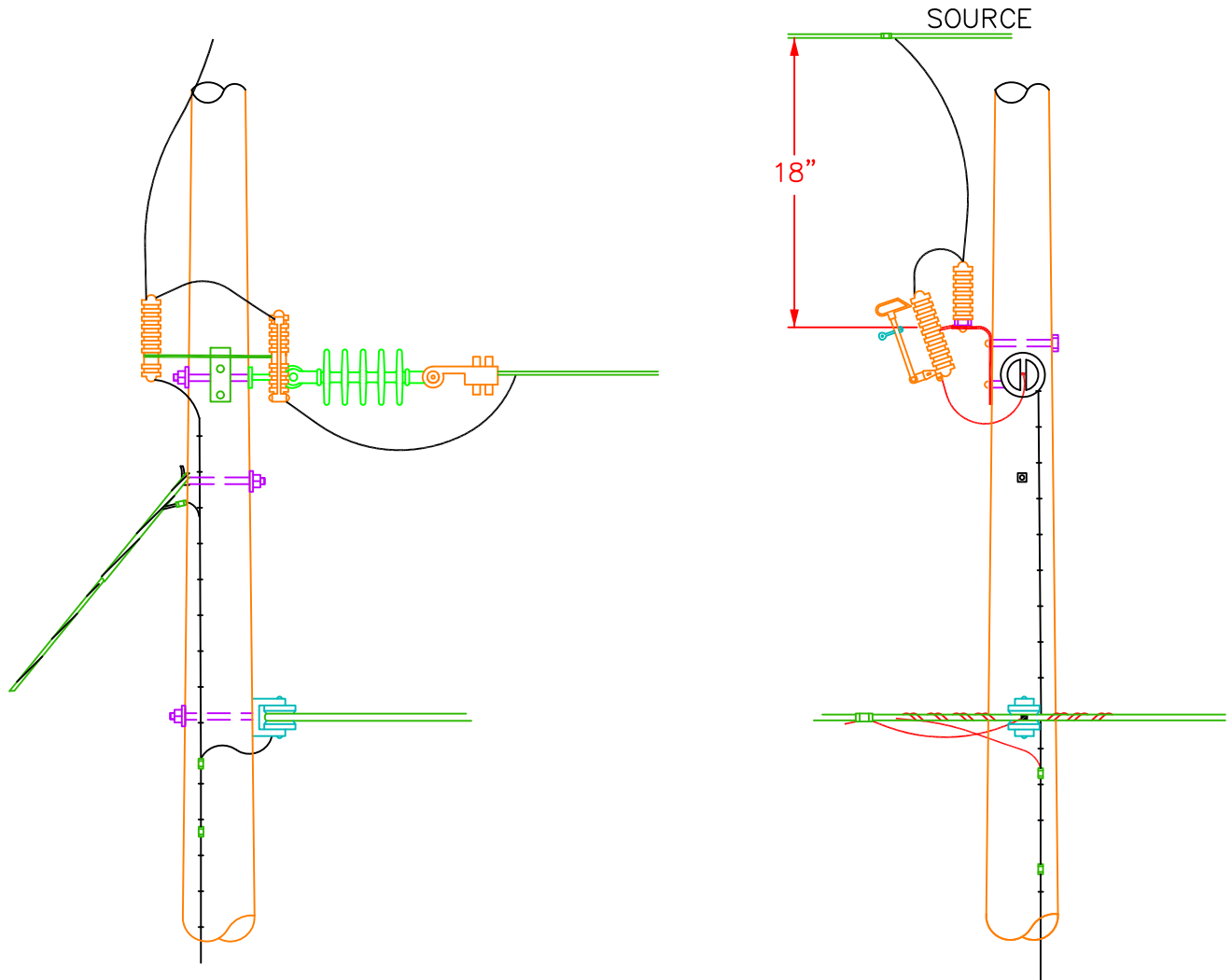


DATE: JANUARY, 2007

REVISIONS \_\_\_\_\_

\_\_\_\_\_

**M5,3**



NOTE:  
 IF PRIMARY IS ON WOOD ARM MOUNT CUTOUT ON WOOD ARM. COMMON 100 A CUTOUT.

## SECTIONALIZING-FUSED, SINGLE PHASE PRIMARY LINE PULL OFF

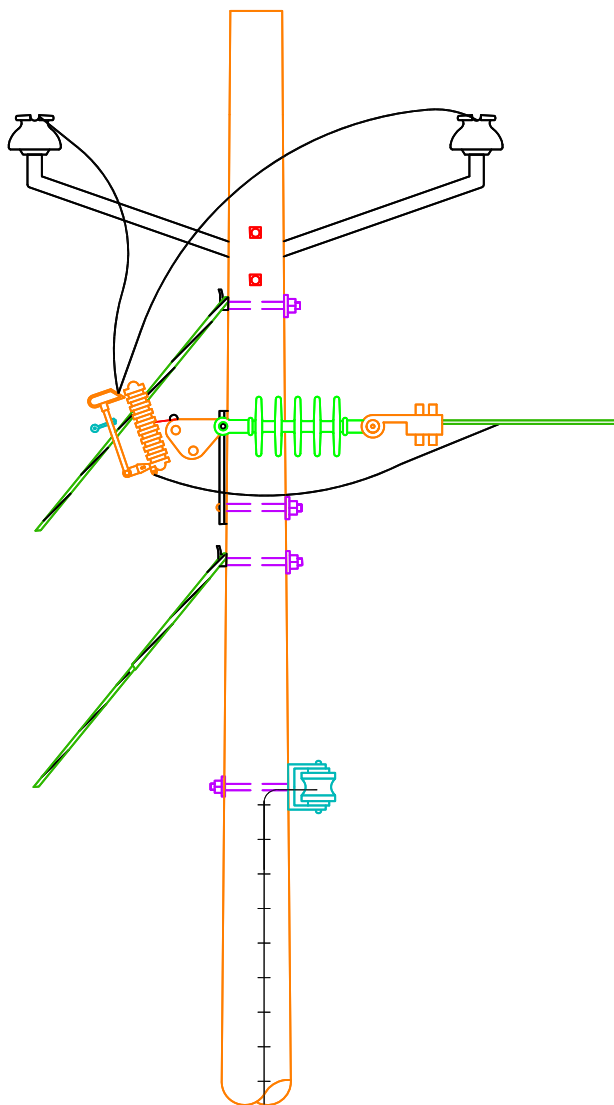


REVISIONS JULY, 2001  
JANUARY, 2007

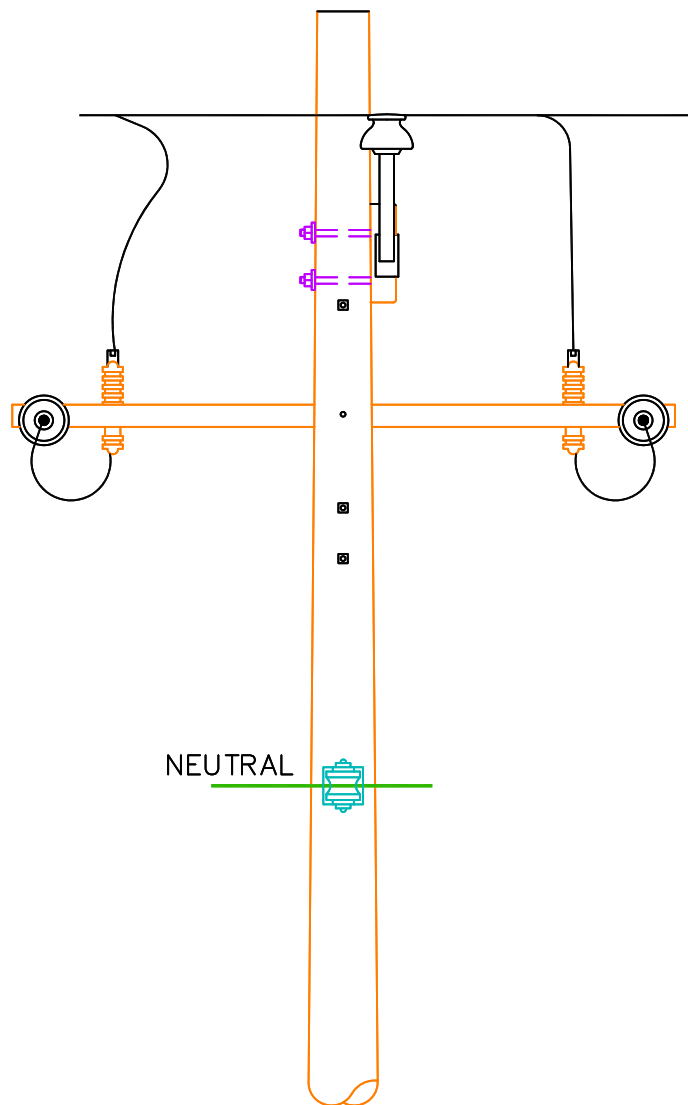
DATE: OCTOBER, 1992

# M5-10





FRONT VIEW



SIDE VIEW

NOTES:

- 1.) MOUNT CUTOUTS ON PULLOFF ARM.
- 2.) PULLOFF ARM SHOULD BE 78" MINIMUM.
- 3.) TRANSFORMER AND U.D. TERMINATIONS SHOULD NOT BE INSTALLED ON THE POLES.

**SECTIONALIZING - TWO PHASE FUSE**  
**PRIMARY LINE PULL OFF**



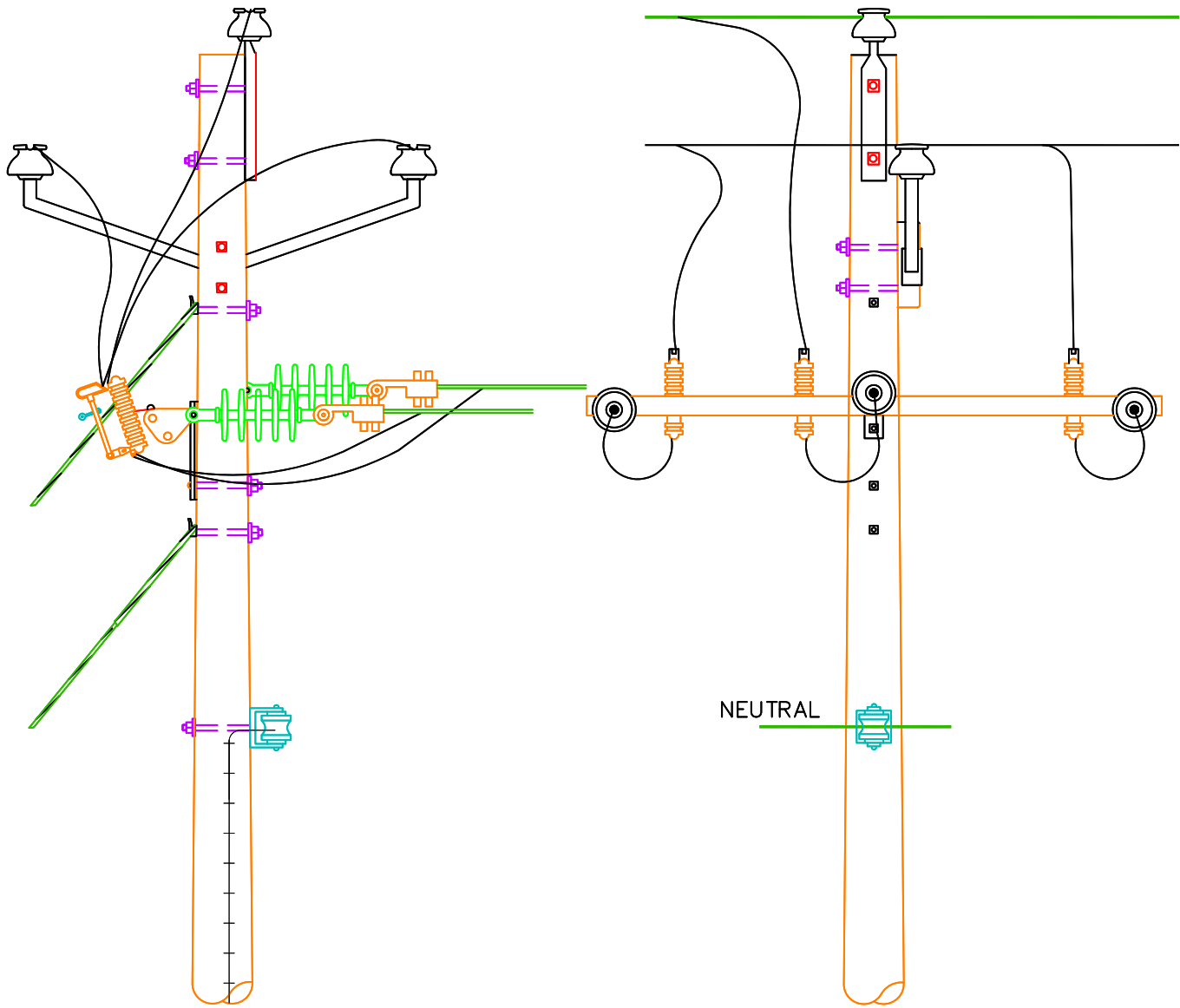
DATE: OCTOBER, 1992

REVISIONS JULY, 2002

JANUARY, 2007

**M5-10-2**





FRONT VIEW

SIDE VIEW

NOTES:

- 1.) MOUNT CUTOUTS ON PULLOFF ARM.
- 2.) PULLOFF ARM SHOULD BE 78" MINIMUM.
- 3.) TRANSFORMER AND U.D. TERMINATIONS SHOULD NOT BE INSTALLED ON THE POLES.

**SECTIONALIZING - FUSED, THREE PHASE**  
**PRIMARY LINE PULL OFF**



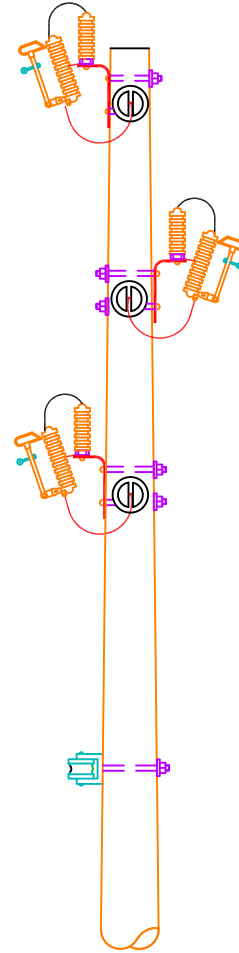
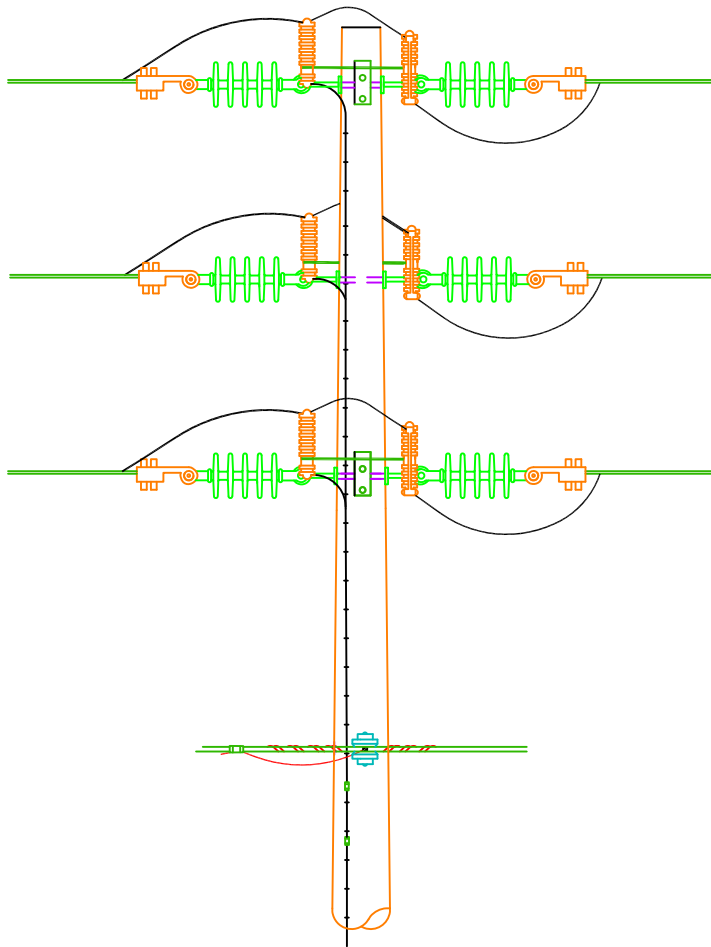
DATE: OCTOBER, 1992

REVISIONS JULY, 2001

JANUARY, 2007

**M5-10-3**





NOTES:

- 1.) USE INSULATORS OF APPROPRIATE CLASS FOR THE REQUIRED VOLTAGE.
- 2.) THE DRAWING SHOWS PROVISIONS FOR INSTALLING ARRESTERS.
- 3.) TRANSFORMER AND UD TERMINATIONS SHOULD NOT BE INSTALLED ON THESE POLES.
- 4.) IF ARRESTERS ARE NOT USED, THE CENTER T BRACKET CAN BE ROTATED TO THE SAME SIDE OF THE POLE AS OTHER BRACKETS. IN THIS POSITION, THE CUTOUTS MUST BE STAGGERED TO PREVENT CUTOUTS FROM DISCHARGING ON EACH OTHER.

## **SECTIONALIZING - FUSED, THREE PHASE VERTICAL PRIMARY**



DATE: OCTOBER, 1992

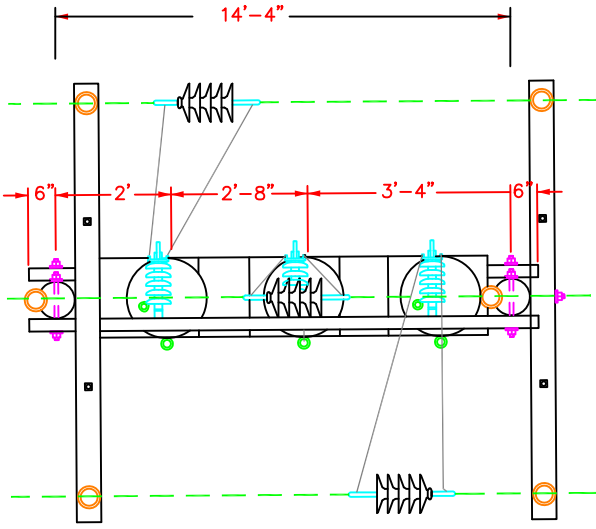
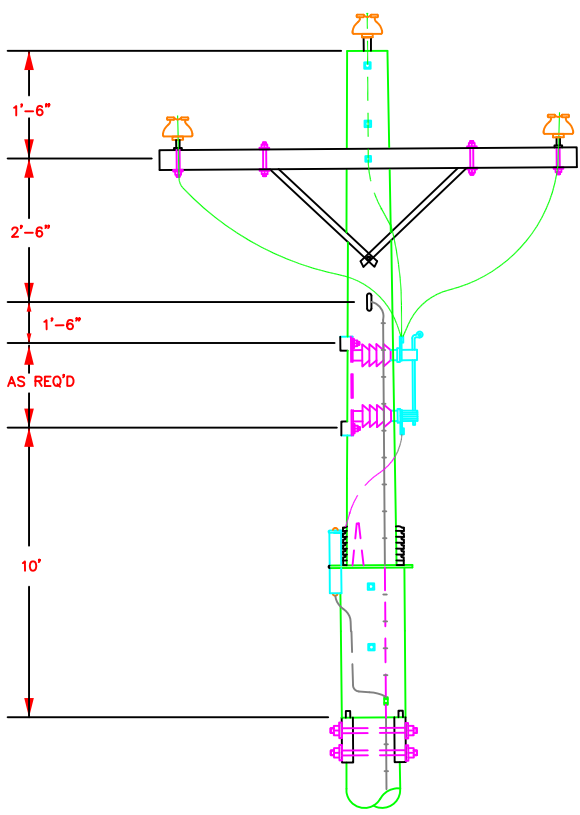
REVISIONS JULY, 2001

JANUARY, 2007

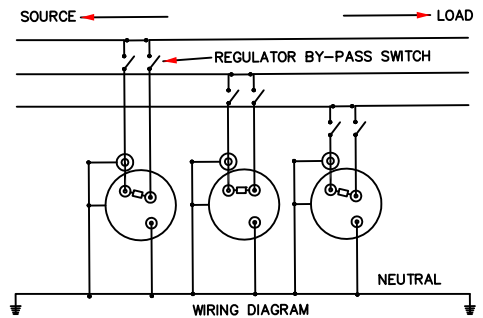
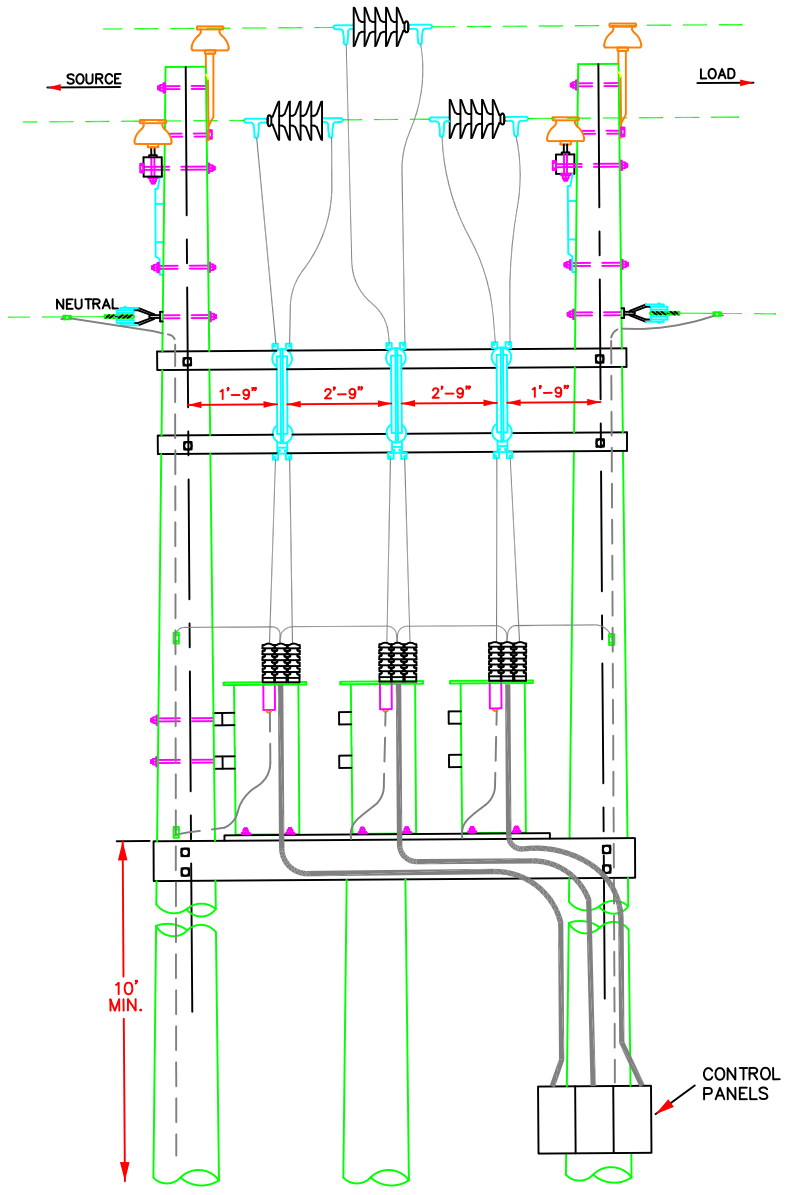
# **M5-10-3V**







PLAN



WIRING DIAGRAM

# THREE VOLTAGE REGULATORS PLATFORM MOUNTED

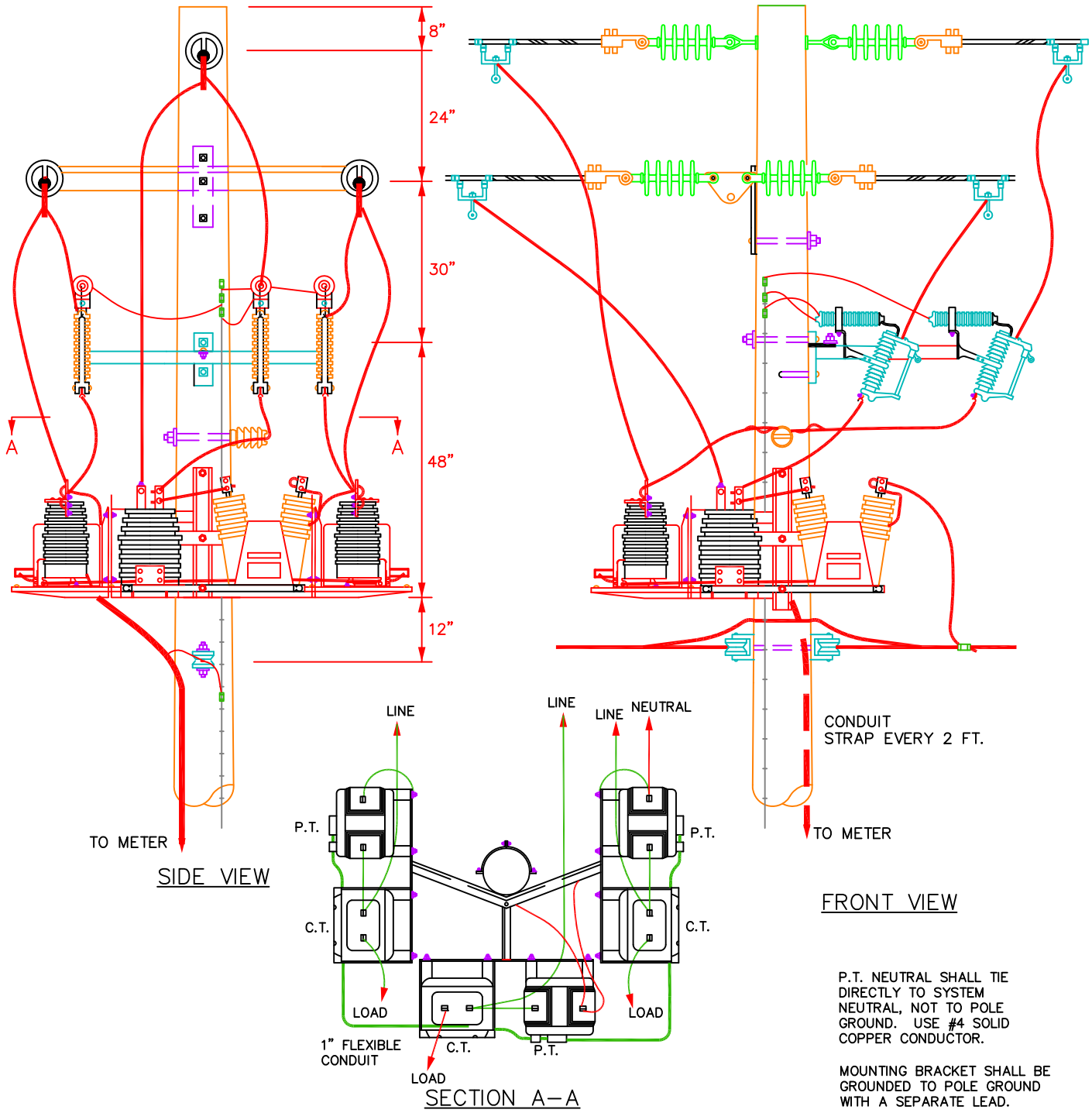


DATE: JANUARY, 2007

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**M7-13**





# OVERHEAD TO OVERHEAD THREE PHASE PRIMARY METERING

P.T. NEUTRAL SHALL TIE DIRECTLY TO SYSTEM NEUTRAL, NOT TO POLE GROUND. USE #4 SOLID COPPER CONDUCTOR.

MOUNTING BRACKET SHALL BE GROUNDED TO POLE GROUND WITH A SEPARATE LEAD.

CONNECT P.T. PRIMARY NEUTRAL DIRECTLY TO SYSTEM NEUTRAL, NOT TO POLE GROUND.

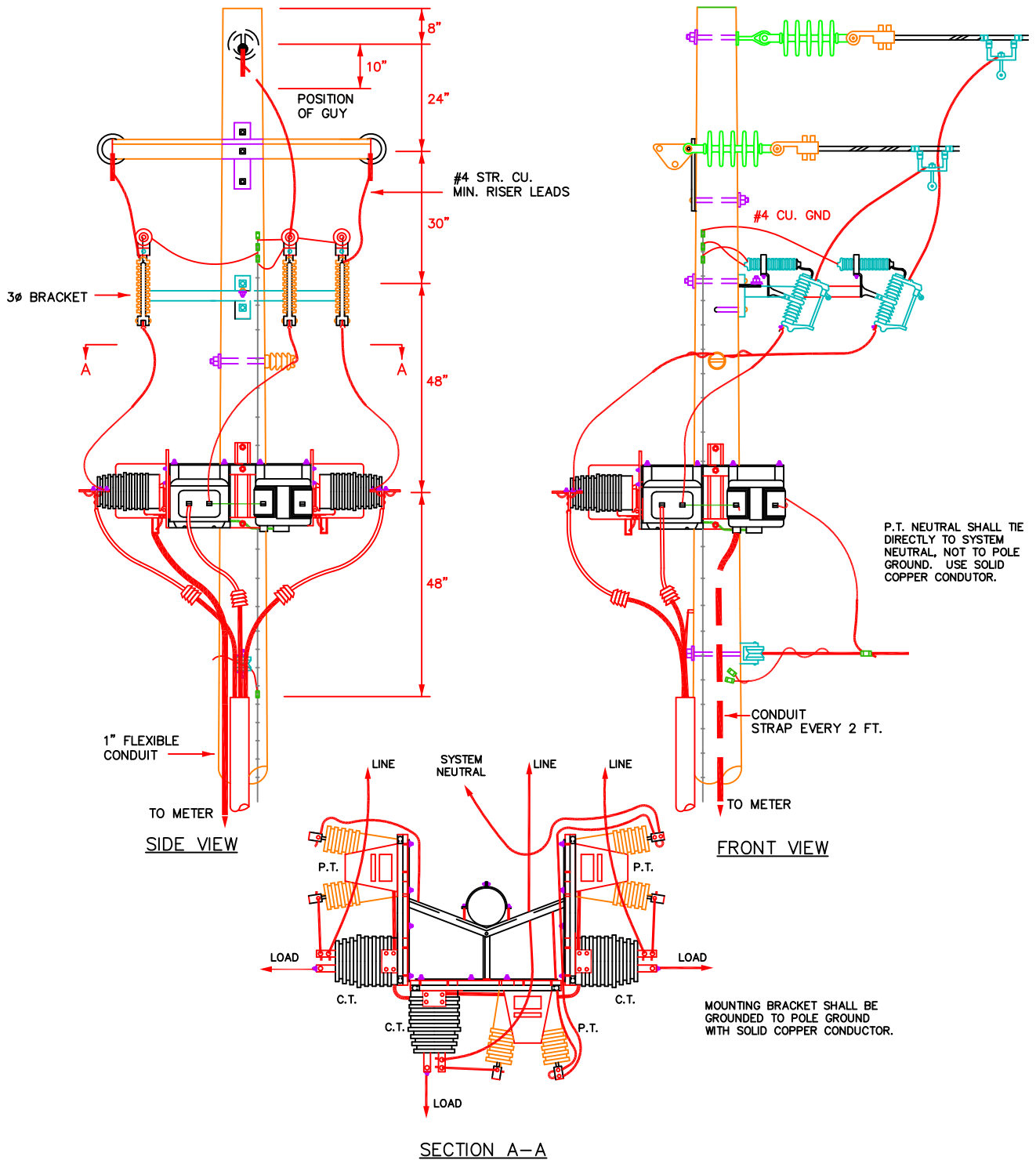


DATE: JANUARY, 2007

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## M8-22-30





# OVERHEAD TO UNDERGROUND THREE PHASE PRIMARY METERING

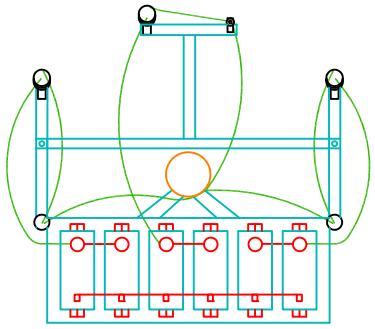
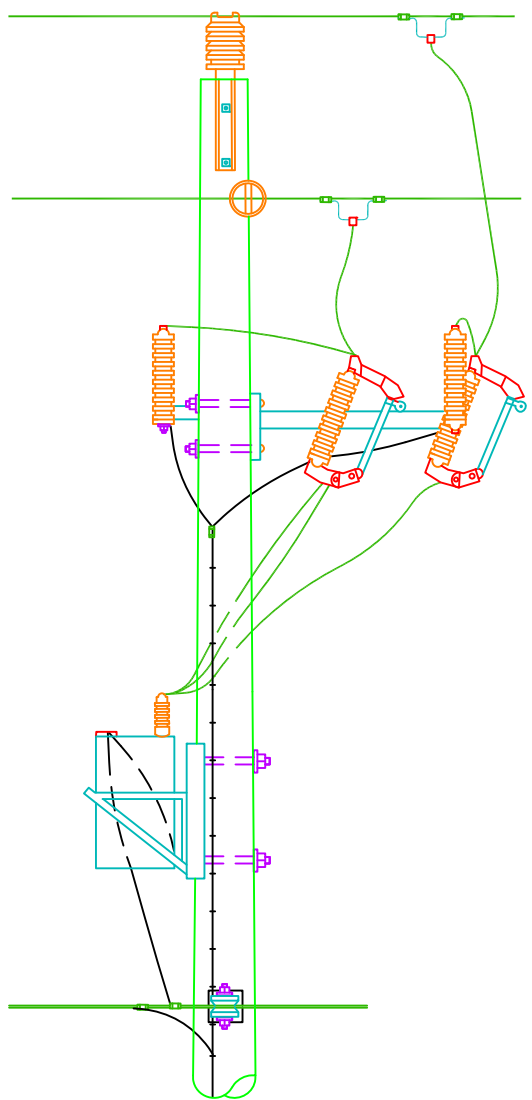
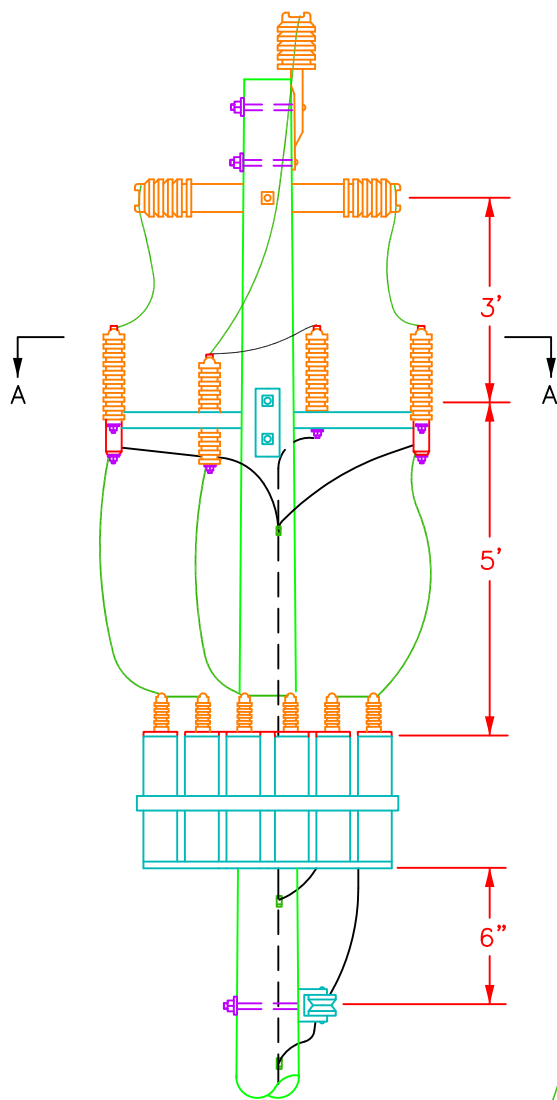


DATE: JANUARY, 2007

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**M8-22-35**





SECTION  
A-A

# POLE MOUNTED FIXED SHUNT CAPACITOR INSTALLATION

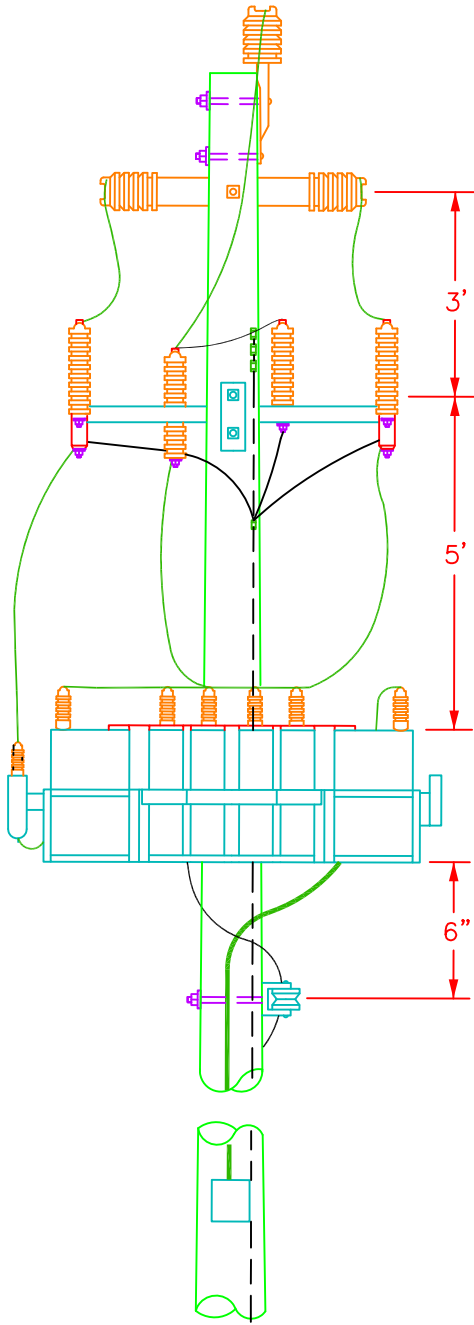


DATE: OCTOBER, 1992

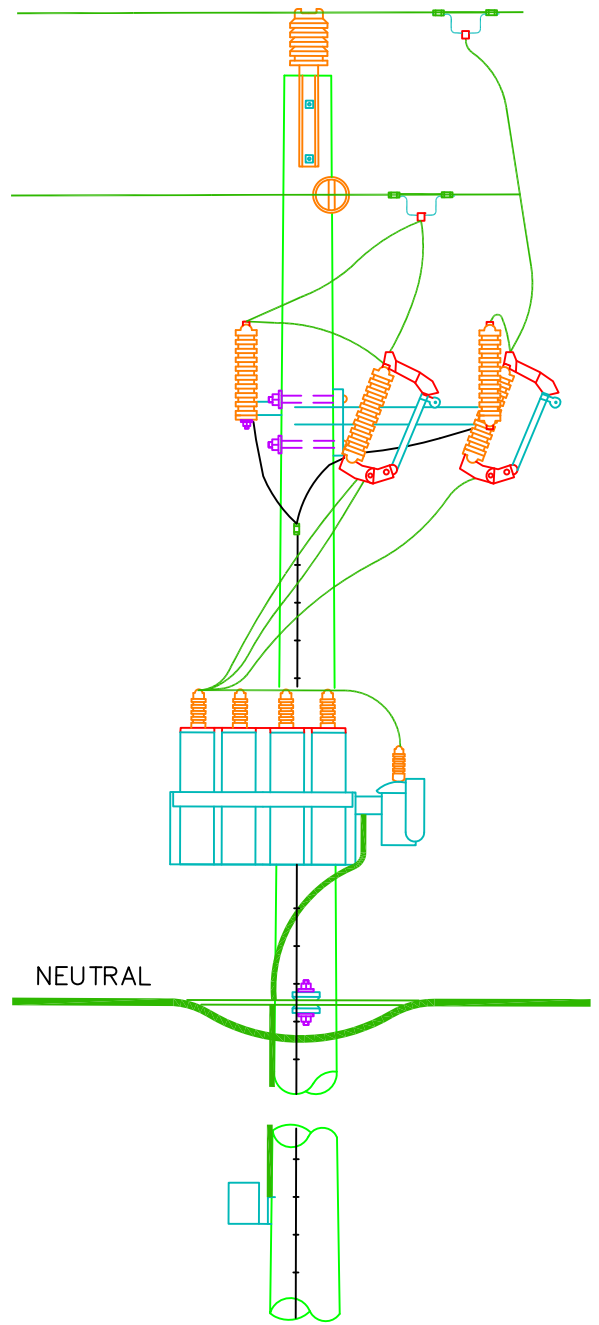
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JANUARY, 2007

**M9-13-M2**





FRONT VIEW



SIDE VIEW

## POLE MOUNTED SWITCH SHUNT CAPACITOR INSTALLATION

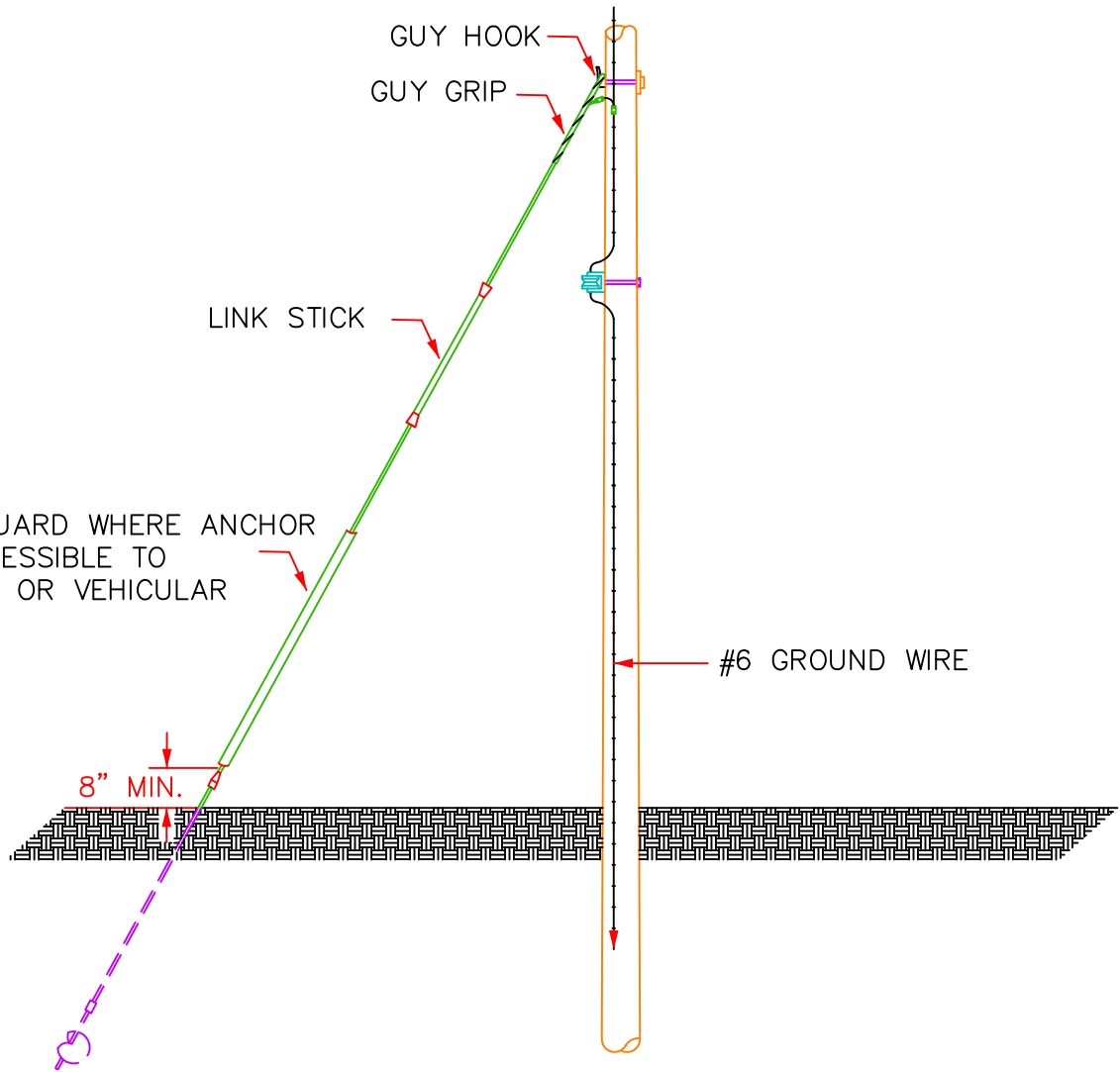


DATE: OCTOBER, 1992

REVISIONS JULY, 2002  
JANUARY, 2007

# M9-13S





USE GUY GUARD WHERE ANCHOR GUY IS ACCESSIBLE TO PEDESTRIAN OR VEHICULAR TRAFFIC.

## ANCHOR GUY DETAIL

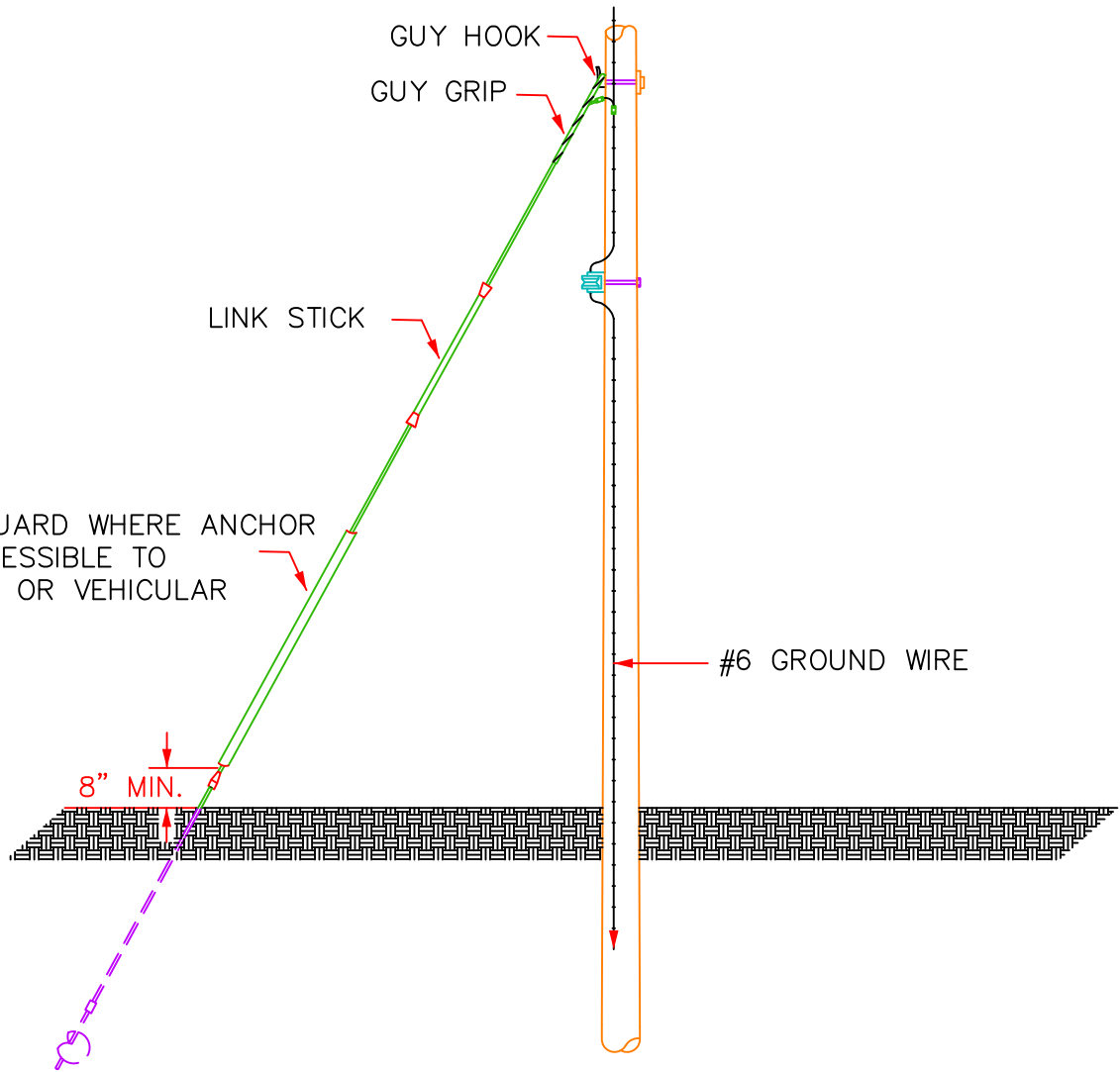


REVISIONS JULY, 2002

DATE: OCTOBER, 1992

**E1**





## ANCHOR GUY DETAIL



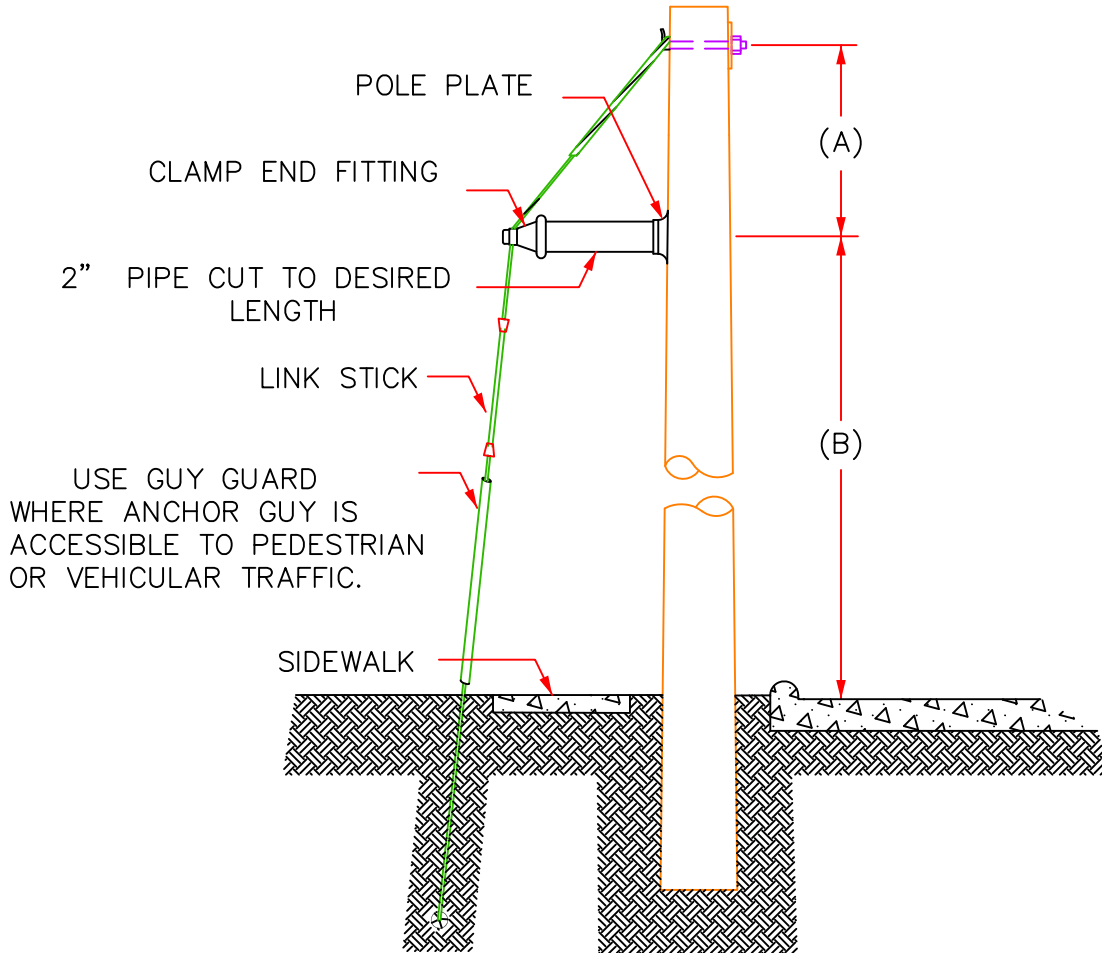
REVISIONS JULY, 2002

DATE: OCTOBER, 1992

**E1**



NOTE:  
 DIMENSION A – TO BE 1/3 OF  
 THE HEIGHT OF THE ANCHOR  
 ATTACHMENT ABOVE THE  
 GROUND.  
 DIMENSION B – TO BE 18' MIN.



USE GUY GUARD  
 WHERE ANCHOR GUY IS  
 ACCESSIBLE TO PEDESTRIAN  
 OR VEHICULAR TRAFFIC.

TO BE USED ONLY WHEN VERTICAL  
 CLEARANCE UNDER GUY IS NECESSARY

## SIDEWALK GUY



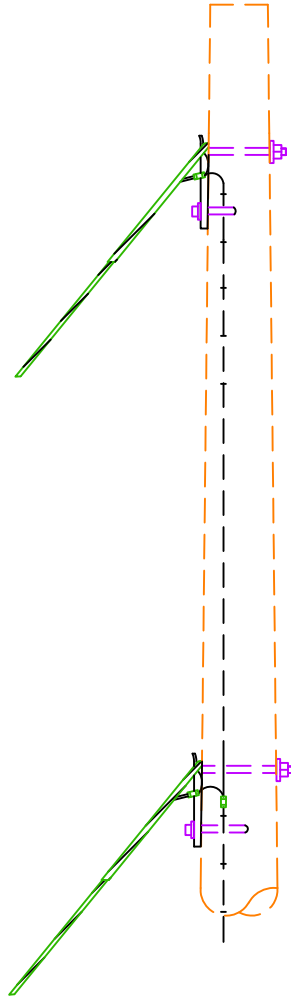
DATE: OCTOBER, 1992

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**E1-S**







## DOUBLE DOWN GUY

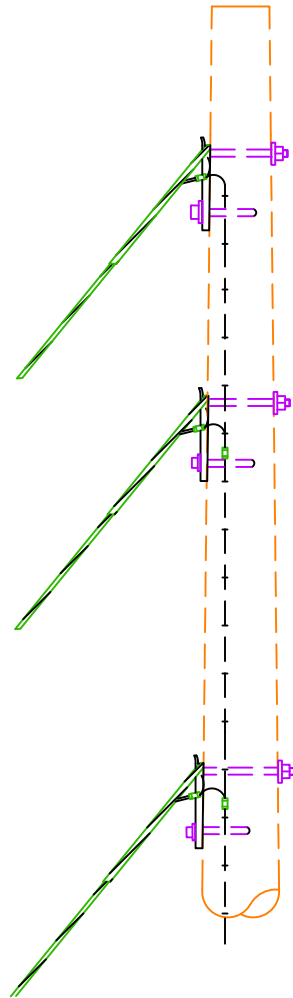


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**E6**





## THREE DOWN GUYS

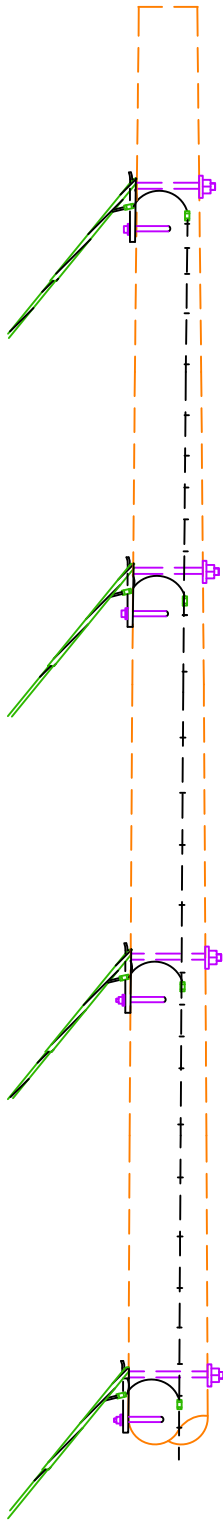


DATE: OCTOBER, 1992

REVISIONS JULY, 2001

**E7**





**FOUR DOWN GUYS**



DATE: OCTOBER, 1992

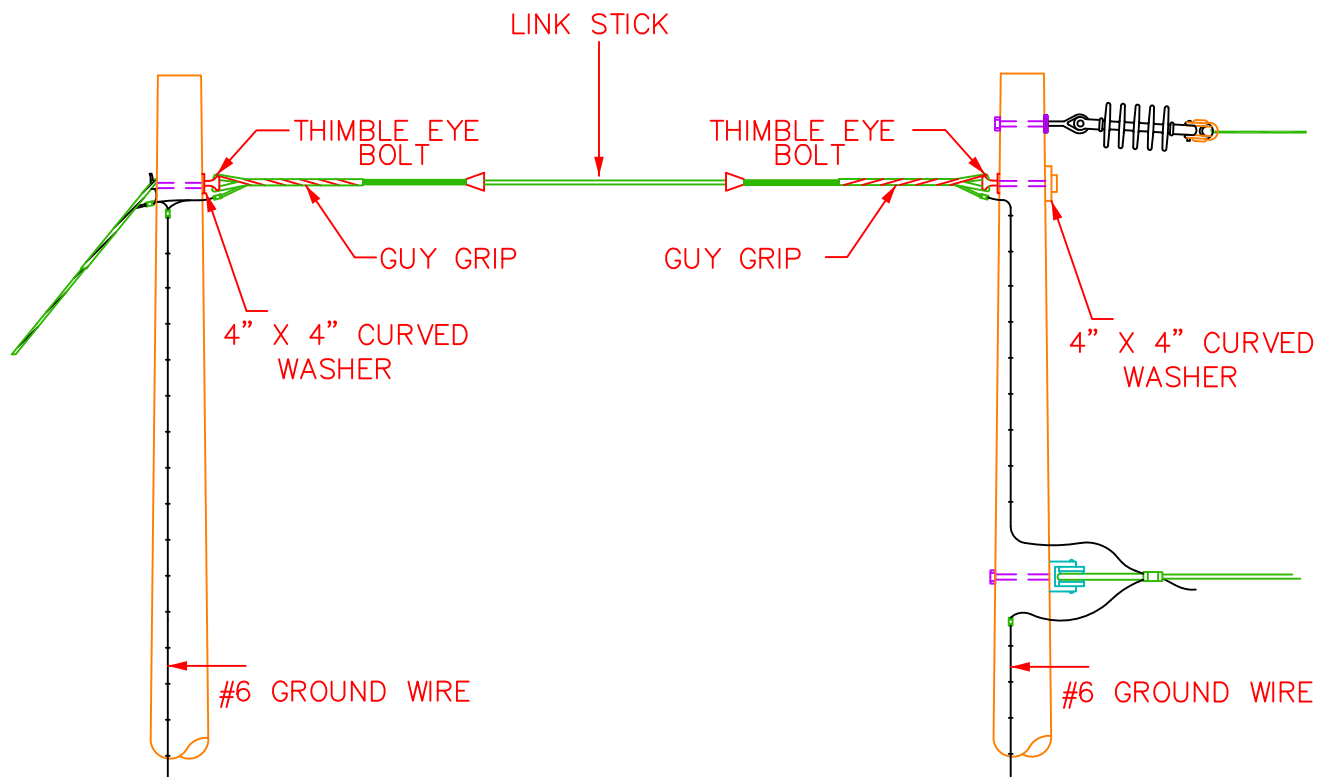
REVISIONS JULY, 2001

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**E8**





NOTE:  
 CONNECT ALL STRANDS OF GUY WIRE  
 TO GROUND OR NEUTRAL.

## **DETAIL** **SPAN GUY**



DATE: OCTOBER, 1992

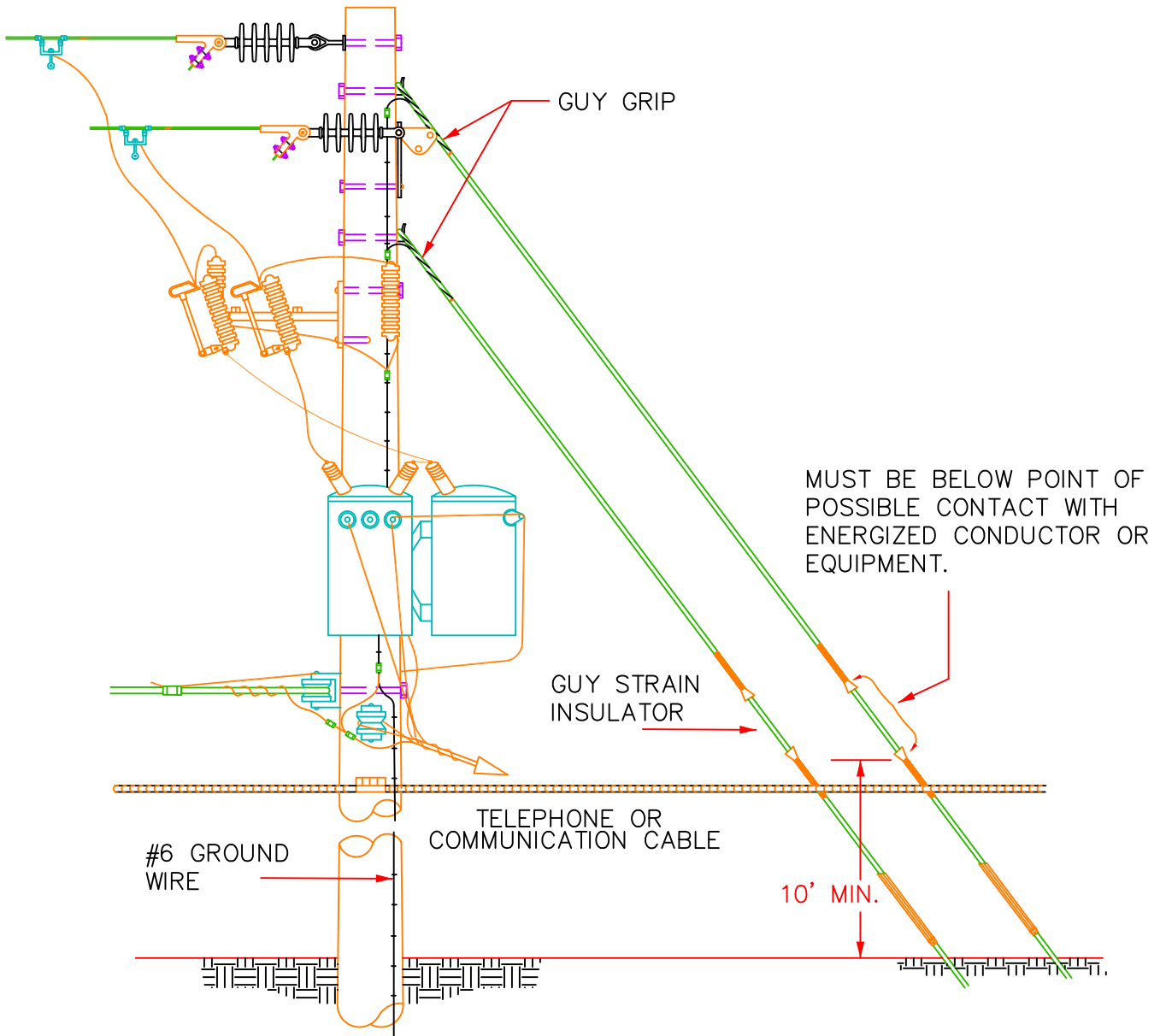
REVISIONS JULY, 2002

JANUARY, 2007

**E9**







NOTE:  
 FIBERGLASS LINK SHOULD BE INSTALLED BELOW ENERGIZED AREA,  
 BUT ABOVE PEDESTRIAN REACH. (MIN. 10' ABOVE GROUND)

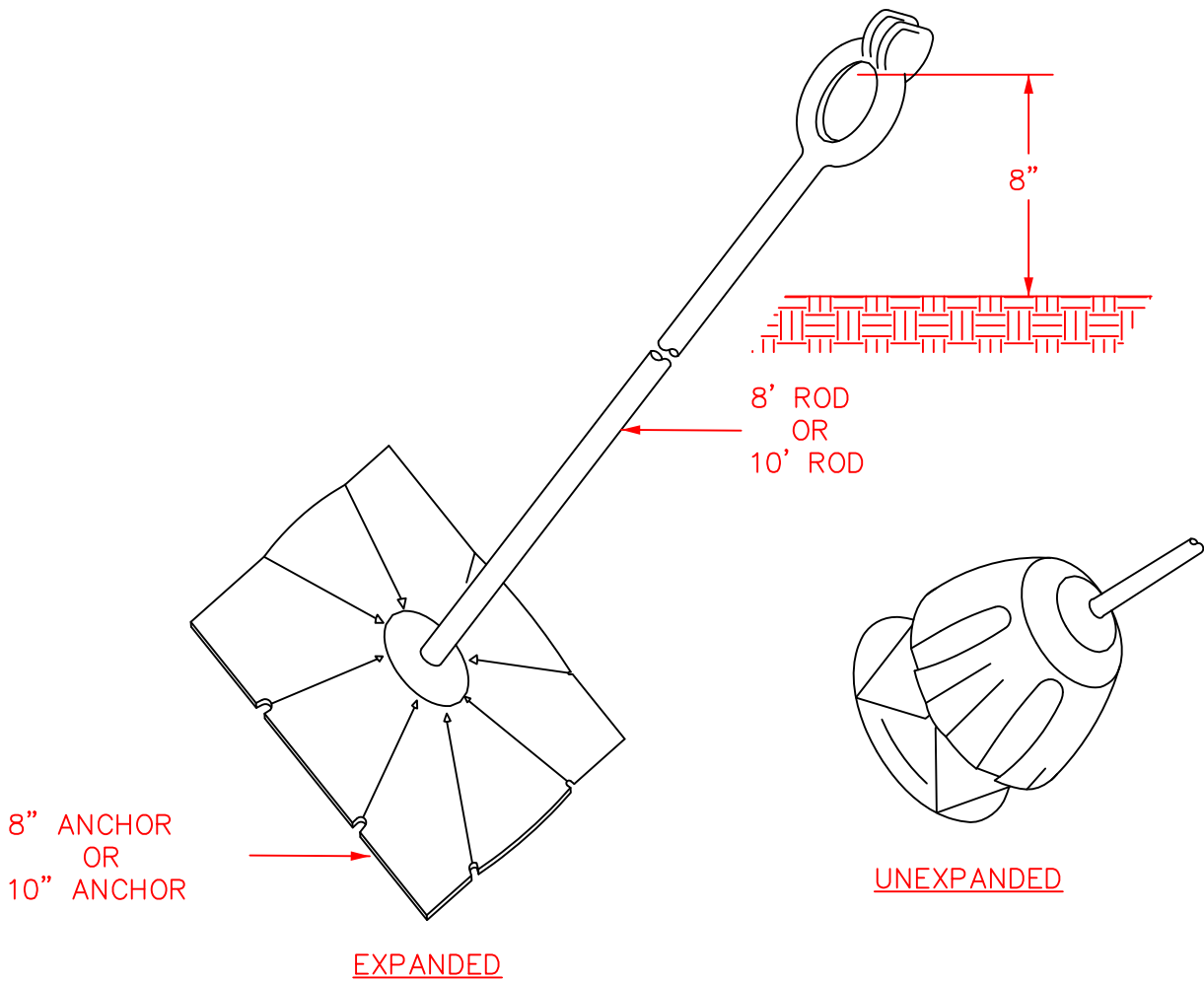
## GUY STRAIN INSULATOR INSTALLATION



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**E10**



## INSTALLATION OF EXPANDING ANCHOR

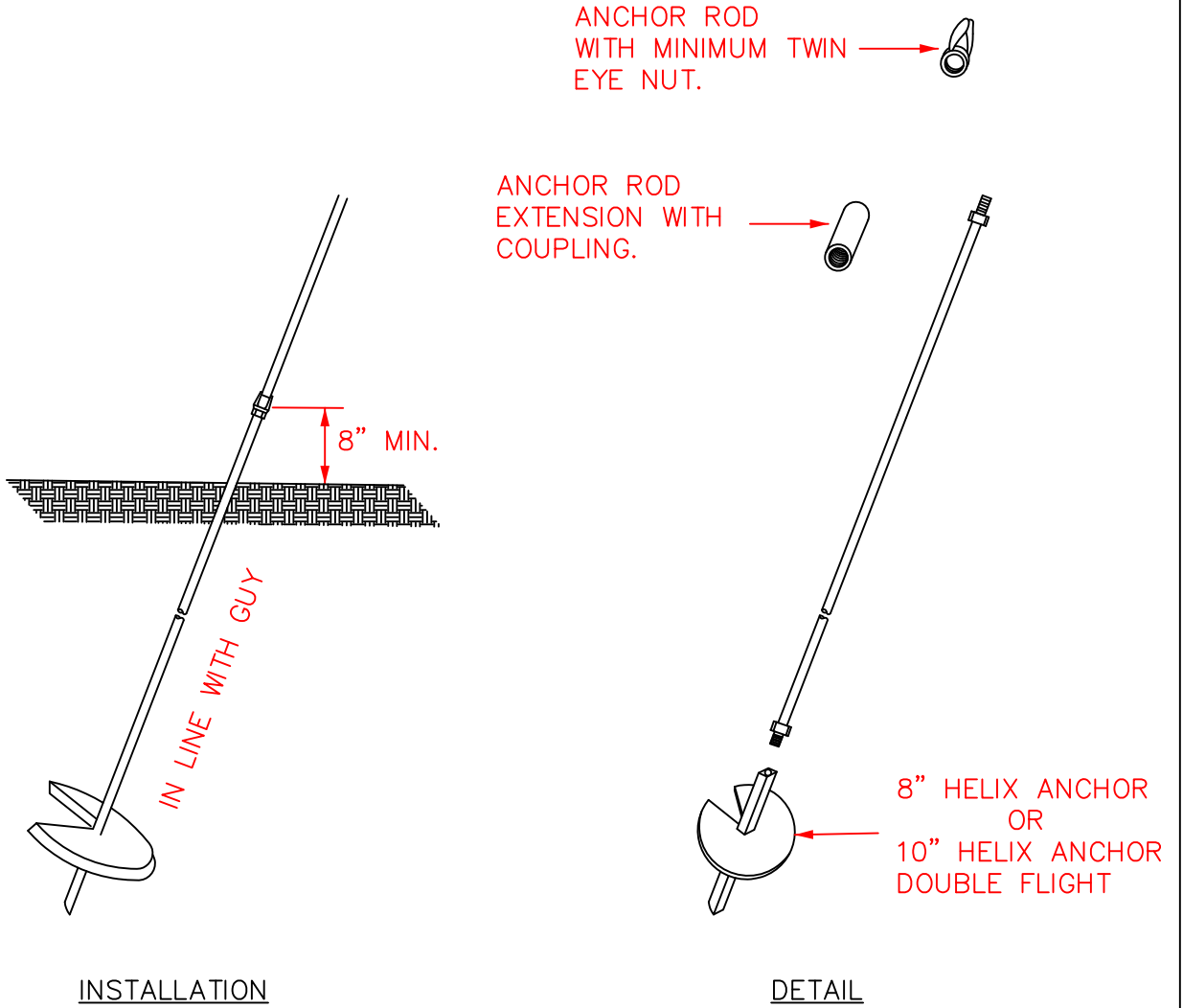


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**F1-E**





## INSTALLATION OF SCREW ANCHOR

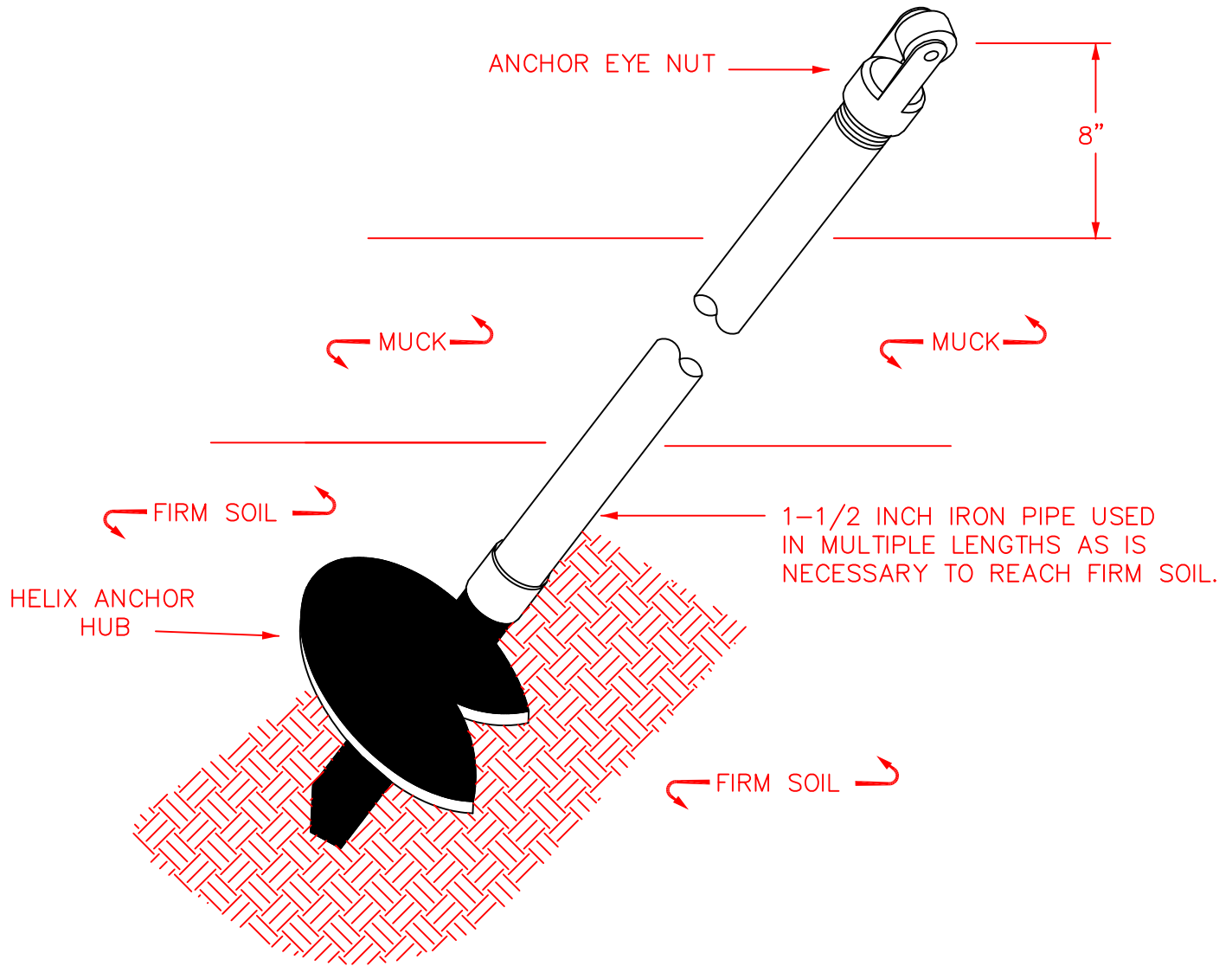


DATE: OCTOBER, 1992

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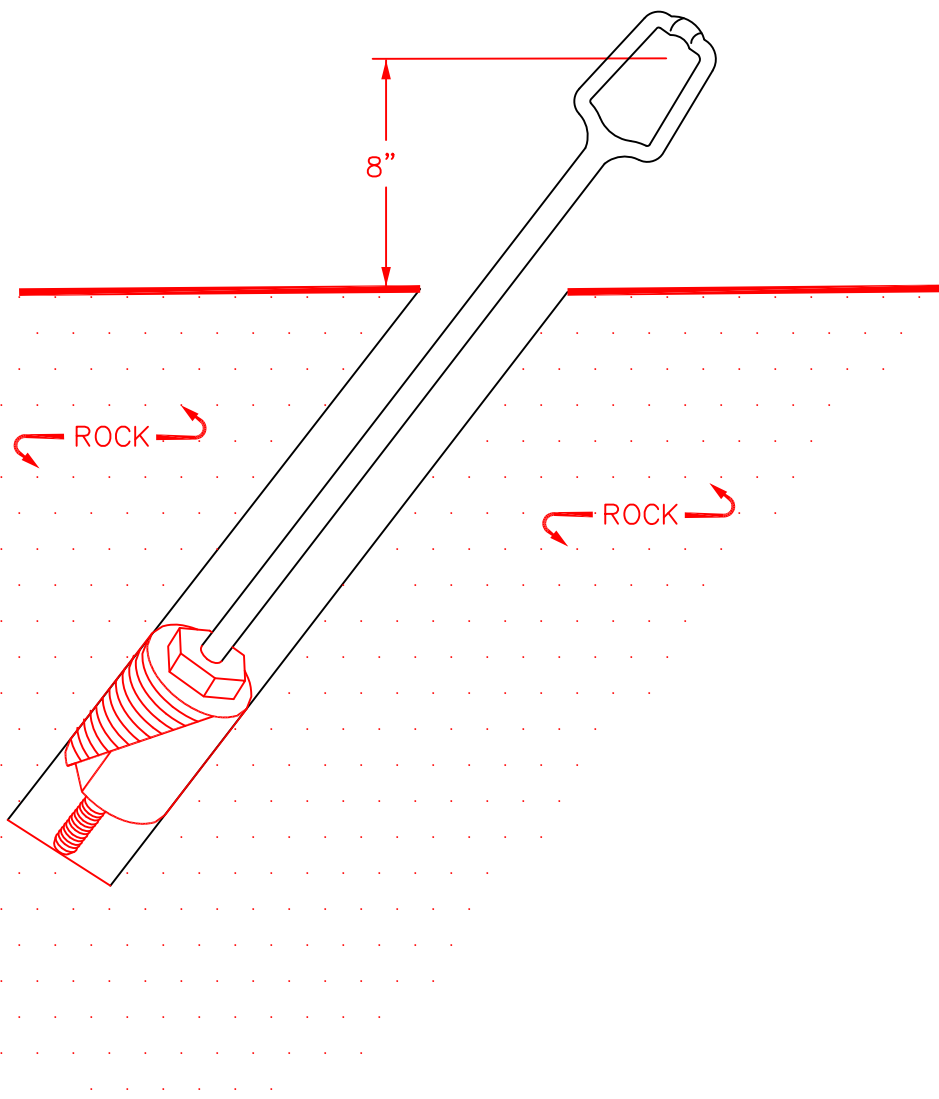
**F1-S**





## INSTALLATION OF SWAMP ANCHOR





## INSTALLATION OF ROCK ANCHOR



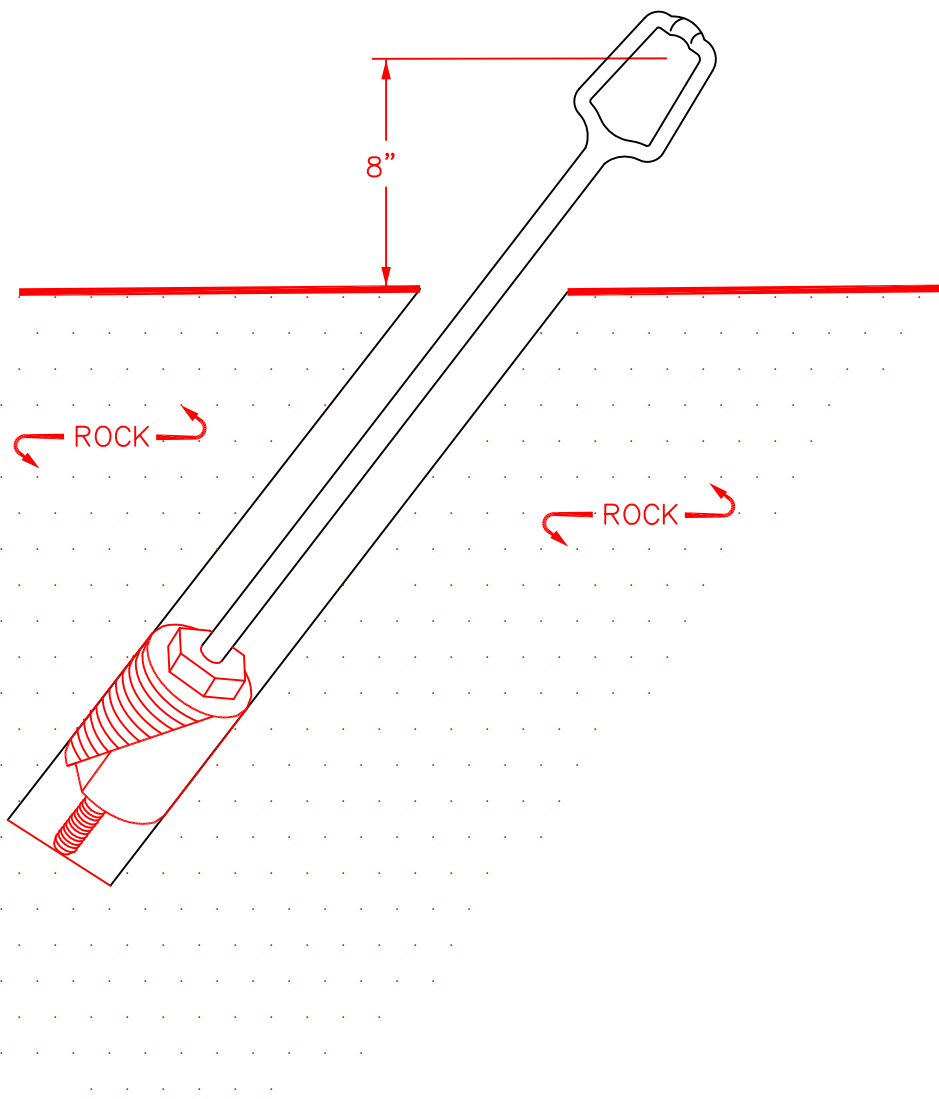
DATE: OCTOBER, 1992

REVISIONS JULY, 2002

**F5**







## INSTALLATION OF ROCK ANCHOR



DATE: OCTOBER, 1992

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**F5**



## TYPE ANCHORS (MATERIAL NO.)

SOIL CLASS NO.	SOIL CLASSIFICATION	8" EXPANDING	8" SCREW	11 5/16" SCREW	8" SQUARE	10" SWAMP ANCHOR	ROCK ANCHOR 3/4" DIA. ROD
CLASS 1	ROCK	23,000	23,000	23,000	23,000	*	23,000
CLASS 2	HARDPAN: VERY DENSE SAND: SANDSTONE	23,000	23,000	23,000	23,000	*	*
CLASS 3	HARDCLAY: DENSE SAND: BROKEN BED ROCK	23,000	18,000	23,000	18,000	*	*
CLASS 4	CLAPAN: MEDIUM DENSE SAND: SANDY GRAVEL	20,000	14,000	20,000	14,000	*	*
CLASS 5	VERY STIFF CLAY: MEDIUM SAND	16,000	10,000	16,000	*	*	*
CLASS 6	STIFF-VERY STIFF CLAY: MEDIUM FINE TO COARSE SAND	12,000	6,000	12,000	*	*	*
CLASS 7	LOOSE FINE SAND	10,000	6,000	10,000	*	*	*
CLASS 8	SWAMP AND MARSHES	*	*	*	*	9,000	*

\* NOT PRACTICAL TO INSTALL IN THIS CLASS SOIL.  
NOTE 3/4" ROD HAS AN ULTIMATE STRENGTH OF 23,000 LBS.

## ANCHORING APPLICATION GUIDE



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# F6