United States
Department of
Agriculture

Rural
Electrification
Administration

REA Bulletin
50-5 (D-803)

Specifications and Drawings for 14.4/24.9 kV Line Construction

SPECIFICATIONS FOR CONSTRUCTION

1. General

All construction work shall be done in a thorough and workman-like manner in accordance with the Staking Sheets, Plans and Specifications, and the Construction Drawings.

The Sixth Edition of the National Electrical Safety Code shall be followed except where local regulations are more stringent, in which case local regulations shall govern.

2. Distributing Poles

In distributing the poles, large, choice, close-grained poles shall be used for transformer, deadend, angle, and corner poles.

3. Pole Setting

The minimum depth for setting poles shall be as follows:

Length of Pole (feet)	Setting in Soil (feet)	Setting in All Solid Rock (feet)
20	4.0	3.0
25	5.0	3.5
30	5.5	3.5
35	6.0	4.0
40	6.0	4.0
45	6.5	4.5
50	7.0	4.5
55	7.5	5.0
60	8.0	5.0

"Setting in Soil" specifications shall apply:

a. Where poles are to be set in soil.

b. Where there is a layer of soil of more than two (2) feet in depth over solid rock.

c. Where the hole in solid rock is not substantially vertical or the diameter of the hole at the surface of the rock exceeds approximately twice the diameter of the pole at the same level.

"Setting in All Solid Rock" specifications shall apply where poles are to be set in solid rock and where the hole is substantially vertical, approximately uniform in diameter and large enough to permit the use of tamping bars the full depth of the hole.

Where there is a layer of soil two (2) feet or less in depth over solid rock, the depth of the hole shall be the depth of the soil in addition to

the depth specified under "Setting in All Solid Rock" provided, however, that such depth shall not exceed the depth specified under "Setting in Soil."

On sloping ground, the depth of the hole always shall be measured from the low side of the hole.

Poles shall be set so that alternate crossarm gains face in opposite directions, except at terminals and deadends where the gains of the last two poles shall be on the side facing the terminal or deadend. On unusually long spans, the poles shall be set so that the crossarm comes on the side of the pole away from the long span. Where pole top pins are used, they shall be on the opposite side of the pole from the gain, with the flat side against the pole.

Poles shall be set in alignment and plumb except at corners, terminals, angles, junctions, or other points of strain, where they shall be set and raked against the strain so that the conductors shall be in line.

Poles shall be raked against the conductor strain not less than one inch for each ten feet of pole length nor more than two inches for each ten feet of pole length after conductors are installed at the required tension.

Pole backfill must be thoroughly tamped the full depth. Excess dirt must be banked around the pole.

4. Grading of Line

When using high poles to clear obstacles such as buildings, foreign wire crossings, railroads, etc., there shall be no upstrain on pin-type insulators in grading the line each way to lower poles.

5. Guys and Anchors

Guys shall be placed before the conductors are strung and shall be attached to the pole as shown in the Construction Drawings.

All anchors and rods shall be in line with the strain and shall be so installed that approximately six inches of the rod remain out of the ground. In cultivated fields or other locations, as deemed necessary, the projection of the anchor rod above earth may be increased to a maximum of 12 inches to prevent burial of the rod eye. The backfill of all anchor holes must be thoroughly tamped the full depth.

When a cone anchor is used, the hole, after the anchor has been set in place, shall be backfilled with coarse crushed rock for two feet above the anchor, tamping during the filling with the remainder of the hole to be backfilled and tamped with dirt.

6. Locknuts

A locknut shall be installed with each nut, eyenut or other fastener on all bolts or threaded hardware such as insulator pins, upset bolts, double arming bolts, etc.

7. Conductors

Conductors must be handled with care. Conductors shall not be tramped on nor run over by vehicles. Each reel shall be examined and the wire shall be inspected for cuts, kinks, or other injuries. Injured portions shall be cut out and the conductor spliced. The conductors shall be pulled over suitable rollers or stringing blocks properly mounted on pole or crossarm if necessary to prevent binding while stringing.

The neutral conductor should be maintained on one side of the pole (preferably the road side) for tangent construction and for angles not exceeding 30 degrees.

With pin-type insulators the conductors shall be tied in the top groove of the insulator on tangent poles and on the side of the insulator away from the strain at angles. Pin-type insulators shall be tight on the pins and on tangent construction the top groove must be in line with the conductor after tying in.

For neutral and secondary conductors on poles, insulated brackets (Material Item da) may be substituted for the single and double upset bolts on angles of 0° to 5° in locations known to be subject to considerable conductor vibration.

All conductors shall be cleaned thoroughly by wirebrushing before splicing or the installation of a connector or clamp. A suitable inhibitor shall be used before splicing or applying connectors over aluminum conductor.

8. Splices and Deadends

Conductors shall be spliced and deadended as shown on the Construction Drawings. There shall be not more than one splice per conductor in any span and splicing sleeves shall be located at least ten feet from the conductor support. No splices shall be located in Grade B crossing spans and preferably not in the adjacent spans.

9. Taps and Jumpers

Jumpers and other leads connected to line conductors shall have sufficient slack to allow free movement of the conductors. Where slack is not shown on the Construction Drawings it will be provided by at least two bends in a vertical plane, or one in a horizontal plane, or the equivalent. In areas where aeolian vibration occurs, special measures to minimize the effects of jumper breaks shall be used as specified.

All leads on equipment such as transformers, reclosers, etc., shall be a minimum of #6 copper conductivity. Where aluminum jumpers are used, a

connection to an unplated bronze terminal shall be made by splicing a short stub of copper to the aluminum jumper using a suitable aluminum compression sleeve.

10. Hot-Line Clamps and Connectors

Connectors and hot-line clamps suitable for the purpose shall be installed as shown on Guide Drawings. On all hot-line clamp installations, the clamp and jumper shall be so installed so that they are permanently bonded to the load side of the line, allowing the jumper to be de-energized when the clamp is disconnected. This applies in all cases, even where the line layout is such that the tap line is in actuality the main back to the power source.

11. Lightning Arrester Gap Settings

The external gap electrodes of lightning arresters, combination arrester-cutout units, and transformer mounted arresters shall be adjusted to the manufacturers' recommended spacing. Care shall be taken that the adjusted gap is not disturbed when the equipment is installed.

12. Conductor Ties

Ties shall be in accordance with Construction Drawings. Hot-line ties shall not be used at Grade "B" crossings.

13. Sagging of Conductors

Conductors shall be sagged in accordance with the conductor manufacturers' recommendation. All conductors shall be sagged evenly. The air temperature at the time and place of sagging shall be determined by a certified etched glass thermometer.

The sag of all conductors after stringing shall be in accordance with the conductor manufacturers' recommendations, except that a maximum increase of three inches of the specified sag in any span will be acceptable. However, under no circumstances will a decrease in the specified sag be allowed.

14. Secondaries and Service Drops

Secondary conductors may be bare or covered wires or multi-conductor service cable. The conductors shall be sagged in accordance with the manufacturers' recommendations.

Conductors for secondary underbuild on primary lines will normally be bare except in those instances where prevailing conditions may limit primary span lengths to the extent that covered wires or service cables may be used. Service drops shall be covered wire or service cable.

Secondaries and service drops shall be so installed as not to obstruct climbing space. There shall not be more than one splice per conductor in

any span, and splicing sleeves shall be located at least ten feet from the conductor support. Where the same covered conductors or service cables are to be used for the secondary and service drop, they may be installed in one continuous run.

15. Grounds

Ground rods shall be driven full length in undisturbed earth in accordance with the Construction Drawings. The top shall be at least 12 inches below the surface of the earth. The ground wire shall be attached to the rod with a clamp and secured to the pole with staples. The staples on the ground wire shall be spaced two feet apart except for a distance of eight feet above the ground and eight feet down from the top of the pole where they shall be six inches apart.

All equipment shall have at least two connections from the frame, case or tank to the multi-grounded neutral conductor.

The equipment ground, neutral wires, and lightning-protective equipment shall be interconnected and attached to a common ground wire.

16. Clearing Right-of-Way

In preparing the right-of-way, trees shall be removed, underbrush cleared and trees trimmed so that the right-of-way shall be clear from the ground up and of the width required. Trees fronting each side of the right-of-way shall be trimmed symmetrically unless otherwise specified. Dead trees beyond the right-of-way which would strike the line in falling shall be removed. Leaning trees beyond the right-of-way which would strike the line in falling and which would require topping if not removed shall either be removed or topped except that shade, fruit, or ornamental trees shall be trimmed and not removed unless otherwise authorized.

Where RC1 units are specified, the right-of-way shall be cleared in accordance with the specifications and, in addition, all stumps one-half inch in diameter and larger shall be sprayed in accordance with the following specifications:

> A mixture consisting of eight pounds acid equivalent of a low volatile 2, 4, 5-T ester (2 gallons of concentrate) mixed with 48 gallons of No. 2 fuel oil shall be used for spraying. The mixture shall be agitated thoroughly during mixing and application to ensure a uniform distribution of the chemical throughout the oil.
>
> The entire periphery of each stump to be treated shall be sprayed by thoroughly saturating the bark from freshly cut surface to ground line, including exposed roots, until runoff is effected at ground line. Bark shall not be wet from dew, fog or rain at time spraying is done.

Spraying shall be performed in such manner, at such pressure, and under such wind conditions that drift of spray material to adjacent vegetation will be avoided. Spraying should be performed the same day that brush and tree cutting removal work is completed but in no event later than 72 hours from the time tree cutting is performed. If moisture or wind conditions prevent treatment in accordance with the above, spraying shall be performed as soon thereafter as possible.

To facilitate application, supervision and inventory of RC assembly units, the spray solution shall be colored by the addition of an oil soluble red dye suitable for use in the 2, 4, 5-T ester and oil mixture. The dye shall be equivalent to "Oil Red" or "Red O."

INDEX OF CONSTRUCTION DRAWINGS

Single-Phase:

VA1, VA1A	0° to 5° angle, single primary support
VA1-1, VA1-1A	0° to 5° angle, double primary support
VA1-2	0° to 5° angle, double primary and neutral supports
VA2	Double primary supports, maximum transverse loading -- 500 Lbs./pin (5° to 30° maximum angle)
VA2-3	Double primary and neutral supports, maximum transverse loading -- 500 Lbs./pin (5° to 30° maximum angle)
VA3	Vertical construction, 30° to 60° angle
VA4	Vertical construction, 60° to 90° angle
VA5	Vertical deadend (single)
VA5-1, VA5-2, VA5-2A	Single phase tap
VA5-3, VA5-4	Single phase tap
VA6	Vertical Deadend (double)
VA7, VA7-1	Crossarm construction--deadend (single)
VA8	Crossarm construction--deadend (double)
VA9	Crossarm construction--double line arm
VA9-1	Crossarm construction--single line arm

Two-Phase:

VB1, VB1A	Crossarm construction--0° to 5° angle, single primary support
VB1-1, VB1-1A	Crossarm construction--0° to 5° angle, double primary support
VB2	Crossarm construction--double primary supports, maximum transverse loading--750 Lbs./pin (5° to 30° maximum angle)
VB3, VB3A	Vertical construction--30° to 60° angle
VB4-1, VB4-1A	Vertical construction--60° to 90° angle
VB5-1, VB5-1A	Vertical construction--deadend (single)
VB7, VB7-1	Crossarm construction--deadend (single)
VB8	Crossarm construction--deadend (double)
VB9, VB9-2	Crossarm construction--double line arm
VB9-1, VB9-3	Crossarm construction--single line arm

Three-Phase:

VC1, VC1B	Crossarm construction--0° to 5° angle, single primary support
VC1-1, VC1-1A	Crossarm construction--0° to 5° angle, double primary support
VC1-2	Crossarm construction--0° to 2° angle (large conductors)
VC1-3	Crossarm construction--0° to 5° angle, double primary support (large conductors)

VC1-4	Crossarm construction--2° to 5° angle (large conductors)
VC1-5	Crossarm construction--single primary support with overhead neutral
VC-2	Crossarm construction--double primary support, maximum transverse loading--500 Lbs./pin (5° to 30° maximum angle)
VC2-1	Crossarm construction--double primary support, maximum transverse loading--750 Lbs./pin (5° to 30° maximum angle)
VC2-2	Crossarm construction--double primary support, large conductors, maximum transverse loading--1000 Lbs./pin (5° to 30° maximum angle)
VC3	Vertical construction--30° to 60° angle
VC3L	Vertical construction--30° to 60° angle (large conductors)
VC3-1	Vertical construction--10° to 20° angle (large conductors)
VC4-1	Vertical construction--60° to 90° angle
VC4-1L	Vertical construction--60° to 90° angle (large conductors)
VC5-1	Vertical construction--deadend (single)
VC5-1L	Vertical construction--deadend (single) (large conductors)
VC7, VC7-1	Crossarm construction--deadend (single)
VC8	Crossarm construction--deadend (double)
VC8-1	Crossarm construction--deadend (double)
VC8-2	Crossarm construction--deadend (double) (large conductors)
VC8-3	Crossarm construction--deadend (double) (large conductors with unbalanced loads)
VC9	Crossarm construction--double line arm
VC9-1	Crossarm construction--single line arm
VC9-2	Crossarm construction--double line arm, 0° to 5° angle (large conductors)
VC9-3	Crossarm construction--single line arm (large conductors)

Three-Phase, Double Circuit:

VDC-C1	Crossarm construction--0° to 5° angle, single primary support (2 crossarm type)
VDC-C1B	Crossarm construction--0° to 5° angle, single primary support with overhead neutral (2 crossarm type)
VDC-C1L	Crossarm construction--0° to 5° angle, single primary support (2 crossarm type) (large conductors)
VDC-C2-1	Crossarm construction--5° to 30° angle (2 crossarm type)
VDC-C2-1L	Crossarm construction--double primary supports, maximum transverse loading--1000 Lbs./pin (2 crossarm type) (large conductors) 5° to 30° maximum angle
VDC-C3	Vertical construction--30° to 60° angle
VDC-C4-1	Vertical construction--60° to 90° angle
VE1-1, VE1-2, VE1-3	Single down guy, through-bolt type
E2-1, E2-2, E2-3	Single overhead guy, through-bolt type
E3-2, E3-3, E3-10	Single down guy, wrapped type
E4-2, E4-3	Single overhead guy, wrapped type
VE5-1, VE5-2	Deadend guy, crossarm construction
VE6-2, VE6-3	Double down guy

VE7-2L, VE7-3L	Three down guys (large conductors)
VE8-2L, VE8-3L	Four down guys (large conductors)
E11, E12	Single loop guy, wrapped type

Anchor Assemblies:

F1-1 to F1-4	Line anchor assemblies
F2-1 to F2-4	Log anchor assemblies
F4-1	Service anchor assemblies
F5-1, F5-2, F5-3	Rock anchor assemblies
F6-1, F6-2, F6-3	Swamp anchor assembly

Transformer Assemblies:

VG10, VG66, VG106	Single phase transformer at deadend
VG10	Conventional transformer with tank-mounted cutout and arrester
VG66	Transformer with double gap and internal fuse
VG106	Self protected transformer
VG19, VG65, VG105	Single phase transformer at one-phase tangent
VG19	Conventional transformer with tank mounted cutout and arrester
VG65	Transformer with double gap and internal fuse
VG105	Self protected transformer
VG39, VG67, VG136	Single phase transformer on three-phase circuit
VG39	Conventional transformer with tank mounted cutout and arrester
VG67	Transformer with double gap and internal fuse
VG136	Self protected transformer
G150, VG150	One autotransformer
VG210	Two transformers, cluster-mounted, open wye, for 120/240 volt power loads
VG310	Three transformers, cluster-mounted, ungrounded wye delta, for 120/240 volt power loads
VG311	Three transformers, cluster-mounted, three wire, grounded delta, for 240 or 480 volt power loads
VG312	Three transformers, cluster-mounted, four wire, grounded wye-grounded wye, for 120/208 volt power loads

Secondary Assemblies:

J5 to J12	Secondary assemblies

Service Assemblies:

K10, K11, K14	Single conductors
K10C	Cable
K10L, K11L, K14L	Large conductors

K11C, K14C, K15C	Cable
K16C, K17L, K17	Ranch-type houses

Miscellaneous Assemblies:

VM2-11	Grounding assembly--ground rod type
VM2-11A	Grounding assembly--ground rod type
VM2-12	Pole protection assembly--butt type
VM2-12A, VM2-12A2	Pole protection assembly--wrap-around type(A): Plate type (A2)
M2-15	Grounding assembly--ground rod type for sectionalizing air break switch
VM3-1A, VM3-4	One sectionalizing fuse cutout
VM3-2, VM3-3	Two or three sectionalizing disconnect switches
VM3-10A	One sectionalizing oil circuit recloser
VM3-16	Sectionalizing airbreak switch
VM3-19, VM3-20	Two or three sectionalizing oil circuit reclosers
VM3-19A, VM3-20A	Two or three sectionalizing oil circuit reclosers
VM3-23	One sectionalizing oil circuit recloser with by-pass switch
VM3-24, VM3-25	Two or three sectionalizing oil circuit reclosers with by-pass switches
VM3-24A, VM3-25A	Two or three sectionalizing oil circuit reclosers with by-pass switches
VM5-1 to 8	Miscellaneous primary assemblies
M5-9 to 16	Miscellaneous primary assemblies
M5-17 to 23	Miscellaneous primary assemblies

Regulators:

VM7-1	One voltage regulator assembly, platform mounted
VM7-3	Three voltage regulators, platform mounted

Metering Assembly Guide Drawings:

M8	Secondary metering, single phase, 120/240 volts
M8-6	Secondary metering, three phase, 120/240 volts, 4-wire delta
M8-9	Yard pole meter installation, pump service carried underground
M8-10	Yard pole meter installation, all building services carried underground
M8-11	Secondary metering, three phase, 120/208 volts, 4-wire grounded wye
M8-12	Secondary metering, three phase, 240 volts, 3-wire corner grounded delta

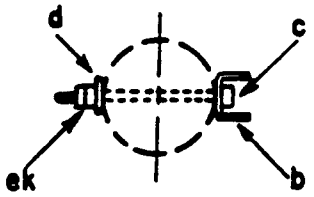
cing Horn Assemblies:

VM10-14	Single phase, arcing horn assembly guide
VM10-15	Three phase, arcing horn assembly guide

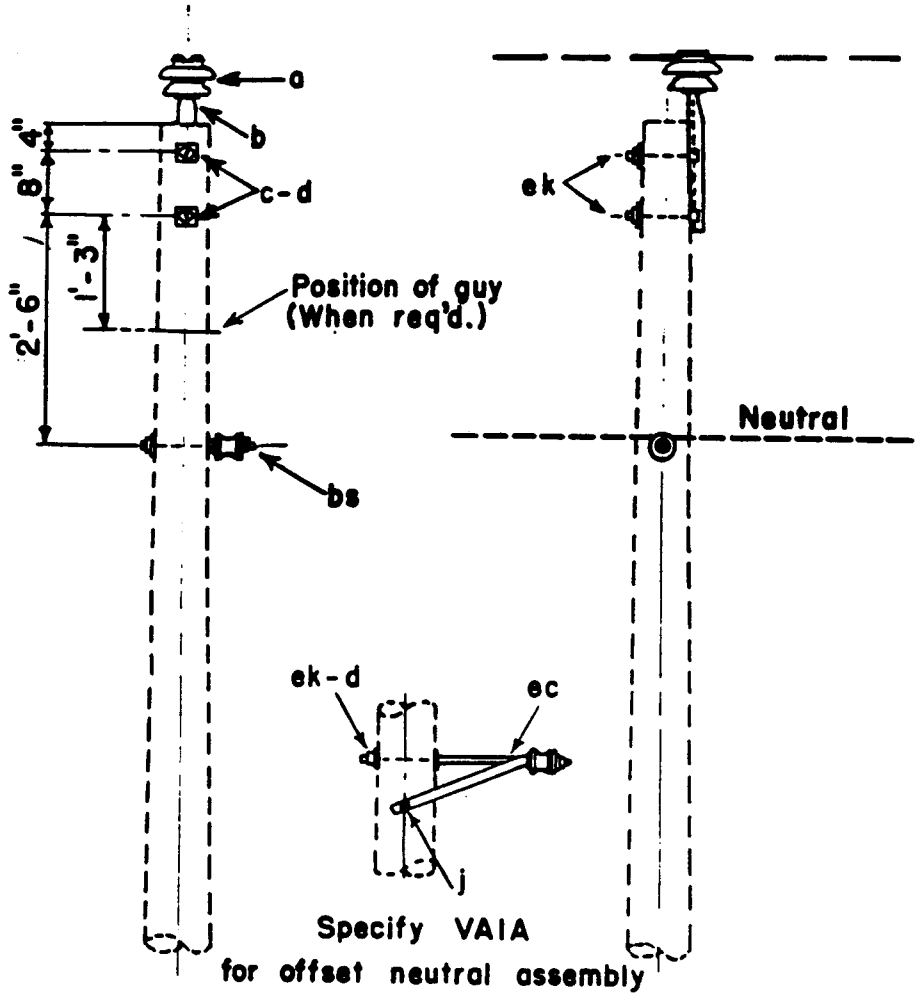
ide Drawings:

M19	Crossarm drilling guide
M20	Pole framing guide
M21	Angle construction guide, crossarm to vertical construction, 30° to 60° angle
M22-1	Tree trimming guide
M22-2	Tree trimming guide
M24	Cable service assembly guide
M24-1	Open wire service assembly guide
M24-10	Assembly guide of service mast for ranch-type house
M26-5	Security light installation guide (unmetered)
M27	Transformer connection guide, open wire services
M27-1	Transformer connection guide, triplex cable services
M27-2	Transformer connection guide, secondary underbuild
M28	Transformer connection and service take-off guide from secondary
VM29-1	Tap assembly guide
VM33-1 to VM33-6	Side arm assemblies
M40-1A	Tying guide--single insulator, one piece tie--copper type conductors with preformed armor rods
M40-1A2	Tying guide--single insulator, two piece tie, copper type conductors with preformed armor rods
M40-8	Hot line tying guide--copper type conductors with preformed armor rods
M40-10	Tying guide--single insulator, aluminum tie wire, ACSR conductor, straight or preformed armor rods
M40-11	Armor rods, ACSR conductors
M40-12	Preformed armor rods, ACSR conductors
M40-13	Preformed armor rods, copper type conductors
M40-17	Tying guide--double insulator, aluminum tie wire, ACSR conductor, straight or preformed armor rods
M40-6	Hot line tying guide, single insulator aluminum tie wire, ACSR conductor with straight or preformed armor rods
M40-16	Hot line tying guide, double insulator aluminum tie wire, ACSR conductor with straight or preformed armor rods
M40-19	Hot line tying guide, single insulator pre-coiled aluminum tie wire, ACSR conductor with straight or preformed armor rods

M41-1	Angle assembly guide, vertical construction, 30° to 60° angle, copper type conductors with preformed rods
M41-10	Angle assembly guide, vertical construction, 30° to 60° angle, ACSR conductors with straight or preformed armor rods
M42-3	Deadend assembly guide, deadend clamp method, copperweld copper and copper conductors
M42-11	Deadend assembly guide, deadend clamp method, ACSR conductors
M42-13	Deadend assembly guide, large conductors
M42-21	Deadend assembly guide, compression method, copper type conductors
M43-4	Tap assembly guide, copperweld copper and copper conductors
M43-10	Tap assembly guide, ACSR conductors
M45-20	Splicing guide, compression type, copper type conductors
M45-21	Splicing guide, compression type, ACSR conductor
M45-22	Splicing guide, compression type, ACSR conductors, 2/0 and larger 1/0 optional
M52-3, M52-4	Neutral identification and pole numbering guide
R1	Clearing right-of-way guide



POLE TOP PIN ASSEMBLY



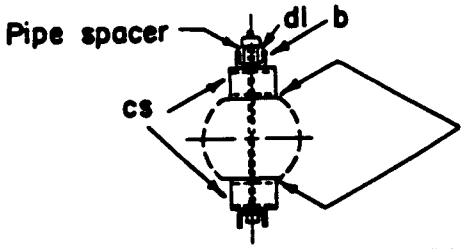
Specify VAIA
for offset neutral assembly

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	1	Insulator, pin type		d	3	Washer, square, 2 1/4"	
b	1	Pin, pole top, 20"		bs	1	Bolt, single upset, insulated, (VA1	only)
c	2	Bolt, machine, 5/8" x req'd. length		ek		Locknuts	
j	2	Screw, lag, 1/2" x 4", (VA1A only)					
ec	1	Bracket, offset, insulated,					
		(VA1A only)					

14.4/24.9 KV PRIMARY 1-PHASE,
0° TO 5° ANGLE, SINGLE PRIMARY SUPPORT

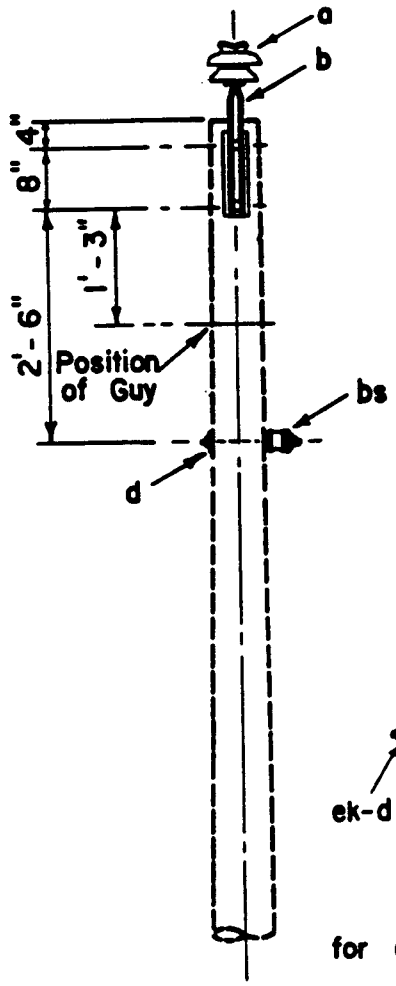
Jan. 1, 1963

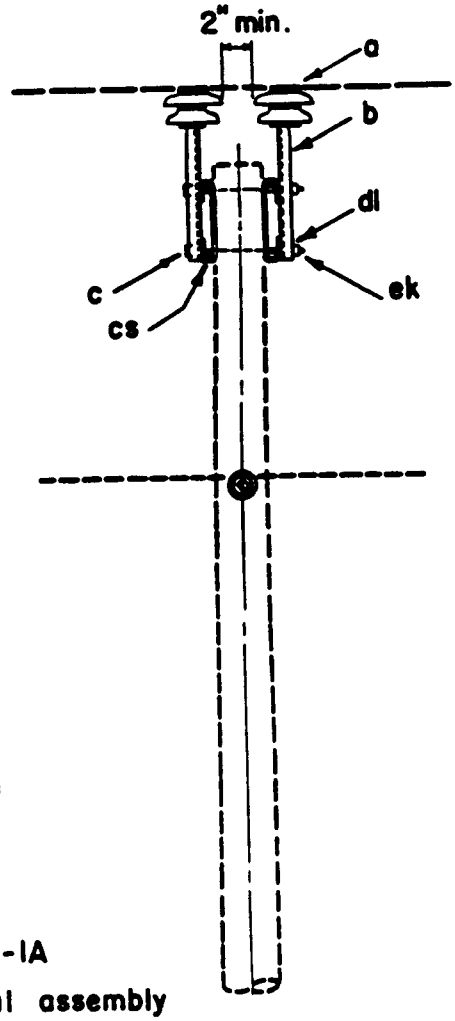
VA1, VA1A

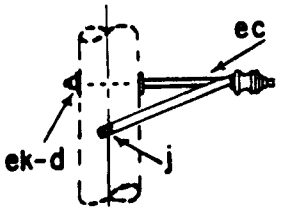


Pole to be gained on both sides, to provide flat surfaces for the brackets.

POLE TOP PIN ASSEMBLY







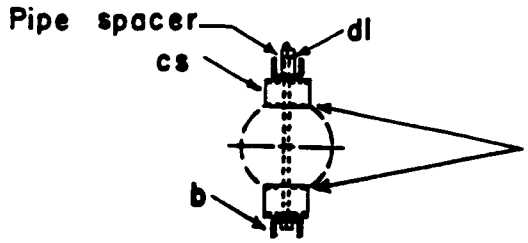
Specify VAI-IA
for offset neutral assembly

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	2	Insulator, pin type		bs	1	Bolt, single upset, insulated (VAI-1	only)
b	2	Pin, pole top, 20"		cs	2	Bracket, pole top, 1/4" x 3"	
c	2	Bolt, machine, 5/8" x req'd. length		dl	2	Pipe spacer, 3/4" dia. x 1 1/2"	
d	1	Washer, square 2 1/4"		ek		Locknuts	
j	2	Screw, lag, 1/2" x 4", (VAI-IA only)		ec	1	Bracket, offset, insulated, (VAI-IA only)	

14.4/24.9 KV PRIMARY, 1-PHASE
0° TO 5° ANGLE, DOUBLE PRIMARY SUPPORT

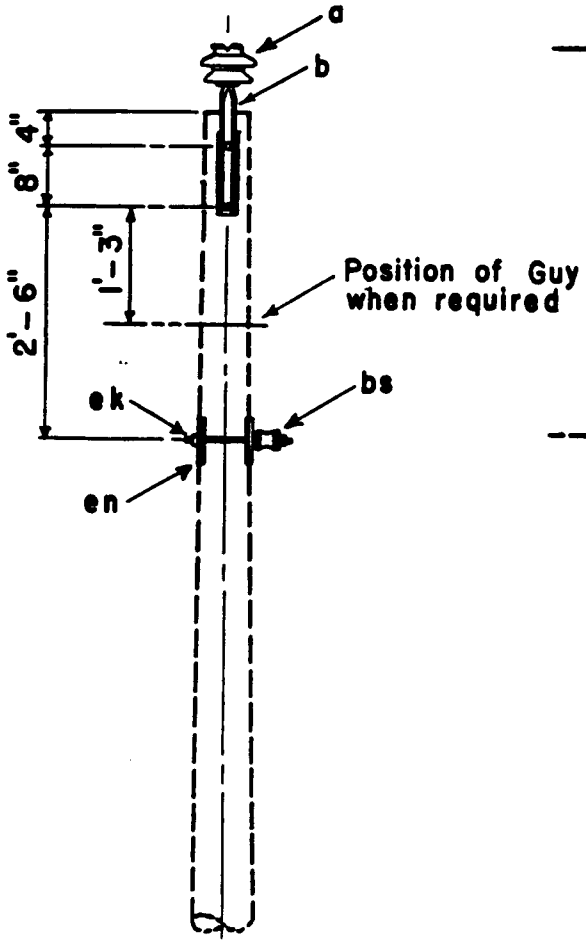
Jan. 1, 1963

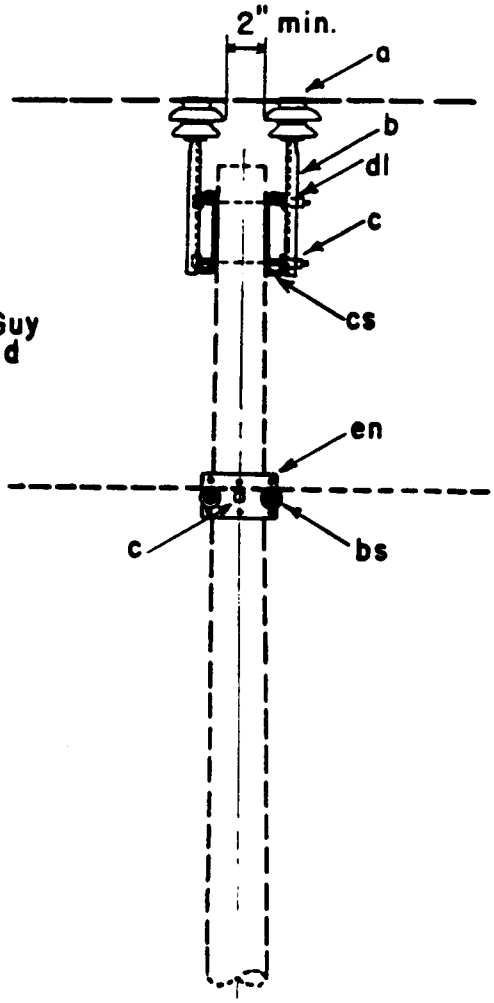
VAI-1, VAI-1A



POLE TOP PIN ASSEMBLY

Note:
Pole to be gained on both sides to provide flat surfaces for brackets



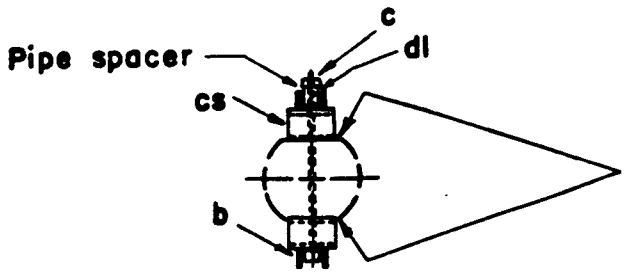


ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	2	Insulator, pin type		cs	2	Bracket, pole top, 1/4"x 3"	
b	2	Pin, pole top, 20"		ek		Locknuts	
c	3	Bolt, machine, 5/8"x req'd length		en	2	Plate, double support	
bs	2	Bolt, single upset, insulated		dl	2	Pipe spacer, 3/4" dia. x 1 1/2"	

14.4/24.9 KV PRIMARY, 1-PHASE, 0° TO 5° ANGLE
DOUBLE PRIMARY AND NEUTRAL SUPPORTS

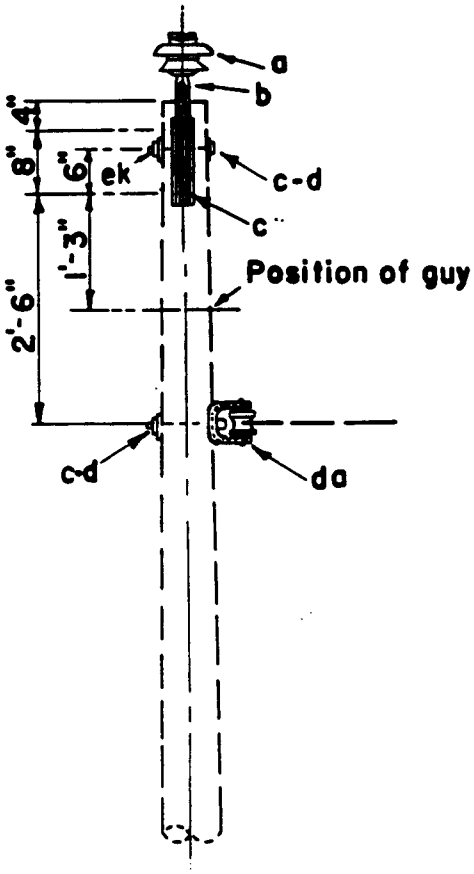
Jan. 1, 1963

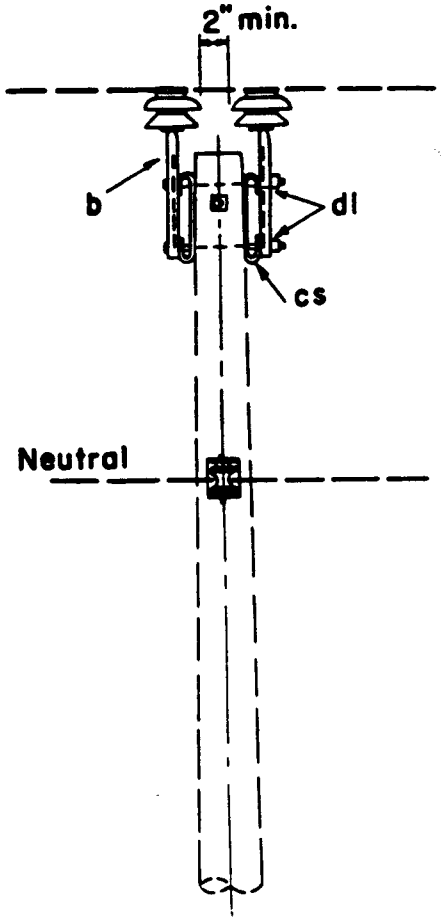
VA1-2



POLE TOP PIN ASSEMBLY

Note:
Pole to be gained on both sides to provide flat surfaces for brackets.



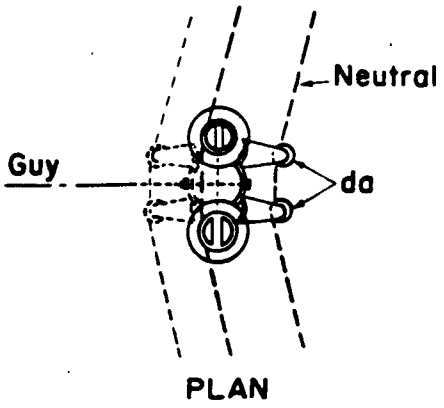


ITEM	NO. REQ'D	MATERIAL		ITEM	NO. REQ'D	MATERIAL	
a	2	Insulator, pin type		cs	2	Bracket, pole top, 1/4" x 3"	
b	2	Pin, pole top, 20"		da	1	Bracket, insulated	
c	4	Bolt, machine, 5/8" x req'd length		dl	2	Pipe spacer, pole pin, 3/4" dia. x 1 1/2"	
d	3	Washer, square 2 1/4"		ek		Locknuts	

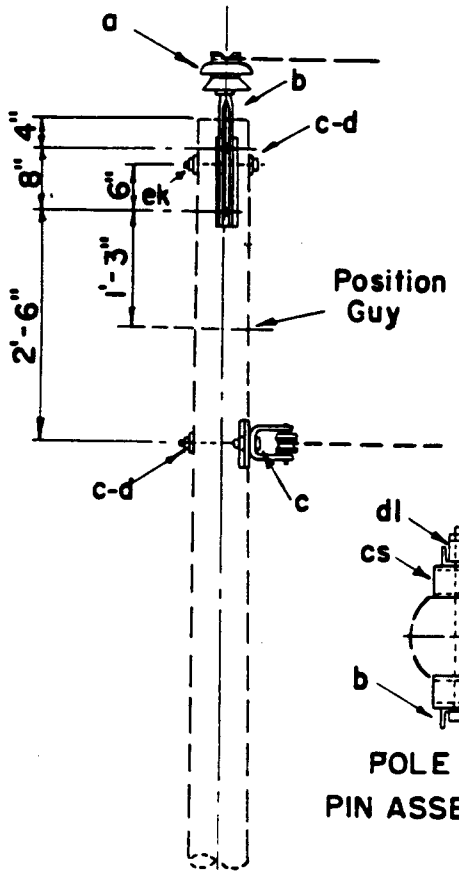
14.4/24.9 KV. PRIMARY, 1 PHASE
DOUBLE PRIMARY SUPPORTS
MAX. TRANSVERSE LOADING 500 LBS./PIN
5° TO 30° (MAX. ANGLE)

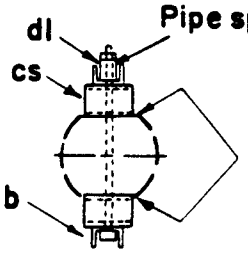
Jan. 1, 1963

VA 2



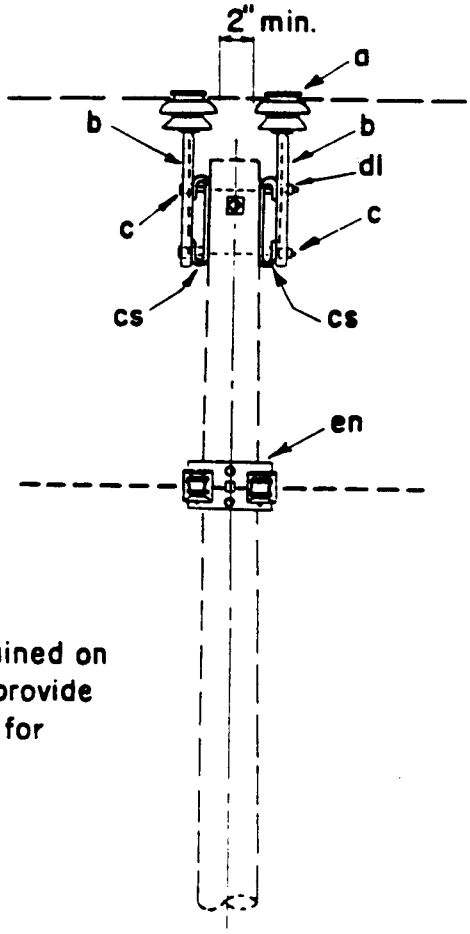
PLAN





POLE TOP
PIN ASSEMBLY

Note:
Pole to be gained on both sides to provide flat surfaces for brackets.

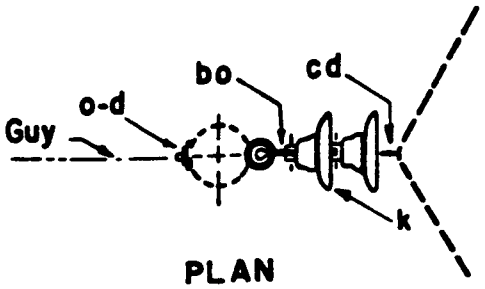


ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	2	Insulator, pin type		da	2	Bracket, insulated	
b	2	Pin, pole top, 20"		dl	2	Pipe spacer, pole pin, 3/4" dia. x 1 1/2"	
c	6	Bolt, machine, 5/8" x req'd length		ek		Locknut	
d	3	Washer, square 2 1/4"		en	1	Plate, double support	
cs	2	Bracket, pole top, 1/4" x 3"					

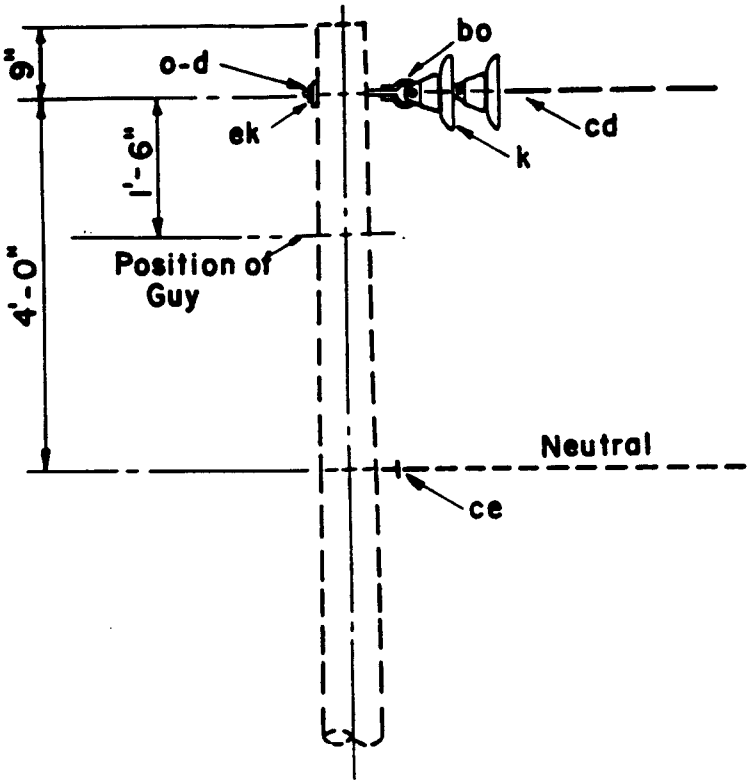
14.4/24.9 KV. PRIMARY, 1-PHASE
DOUBLE PRIMARY AND NEUTRAL SUPPORTS
MAX. TRANSVERSE LOADING 500 LBS./PIN
5° TO 30° (MAX. ANGLE)

Jan. 1, 1963

VA2-3



PLAN

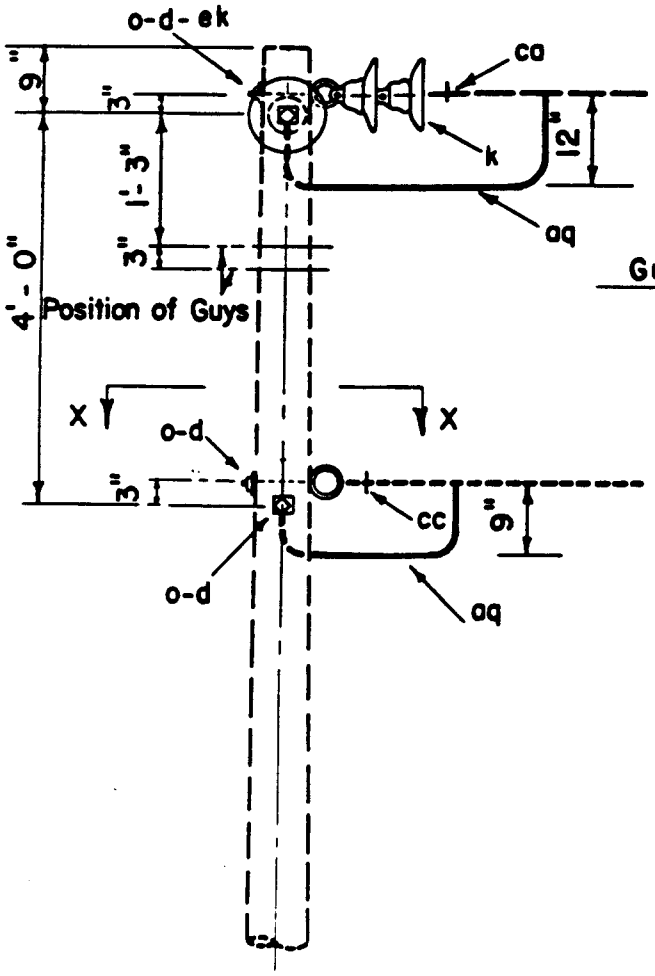


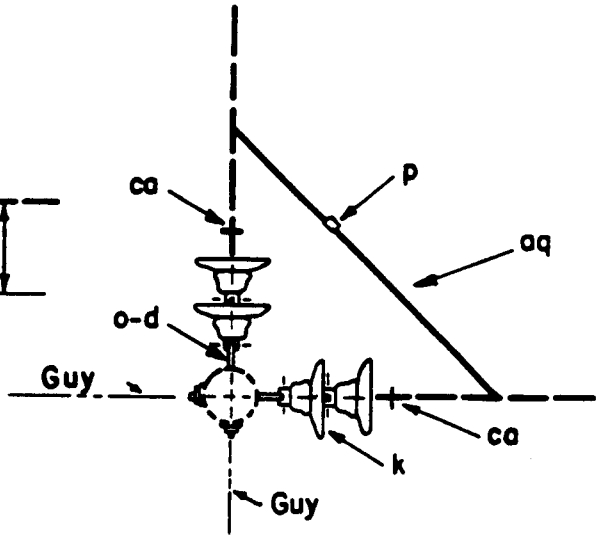
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
d	1	Washer, square 2 1/4"		cd	1	Angle assembly, primary	
k	2	Insulator, suspension, 10"		ce	1	Angle assembly, neutral	
o	1	Bolt, eye, 5/8" x req'd length		ek		Locknuts	
bo	1	Shackle, anchor					

14.4/24.9 KV. PRIMARY, 1-PHASE
30° TO 60° ANGLE

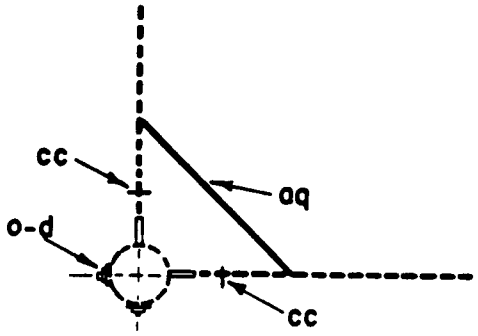
Jan. 1, 1963

VA3





PLAN



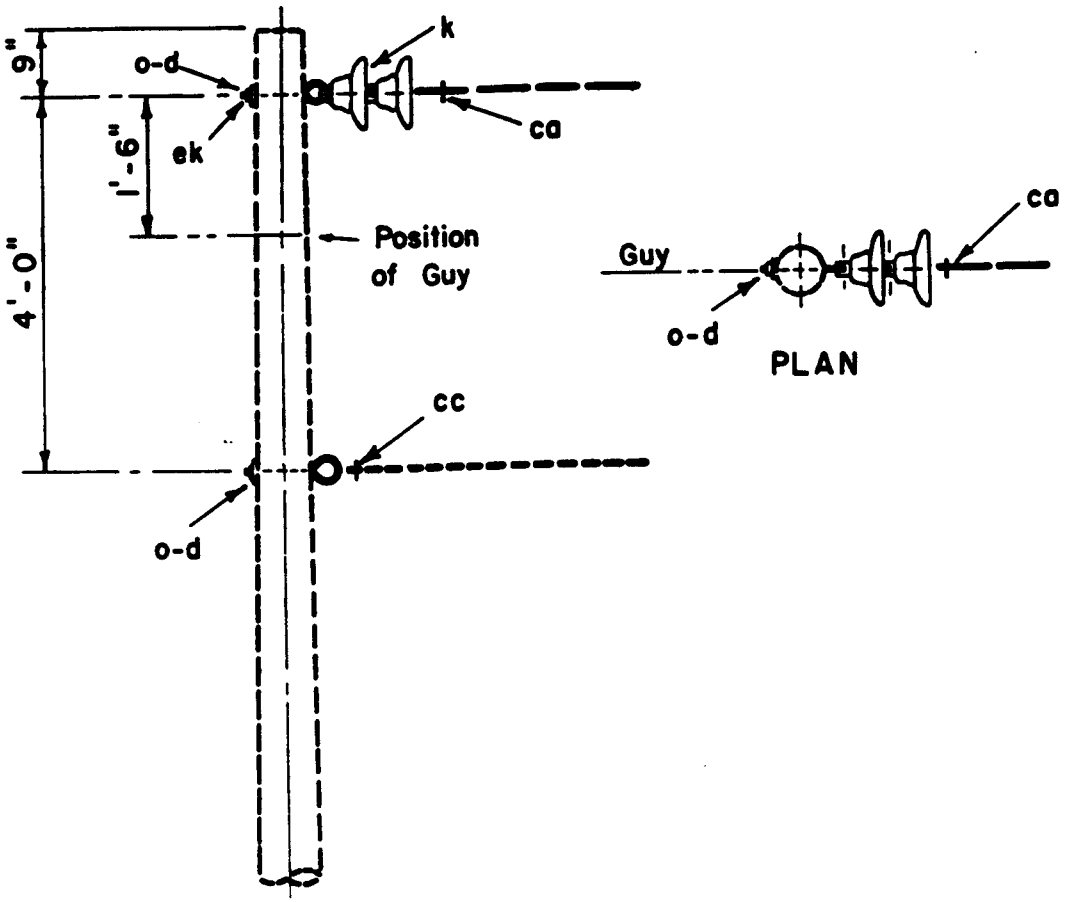
SECTION X-X

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
d	4	Washer, square, 2 1/4"		ca	2	Deadend assembly, primary	
k	4	Insulator, suspension, 10"		cc	2	Deadend assembly, neutral	
o	4	Bolt, eye, 5/8" x req'd. length		ek		Locknuts	
p		Connectors, as req'd.		aq		Jumpers, as required	

14.4/24.9 KV PRIMARY
1- PHASE , 60° TO 90° ANGLE

Jan. 1, 1963

VA4

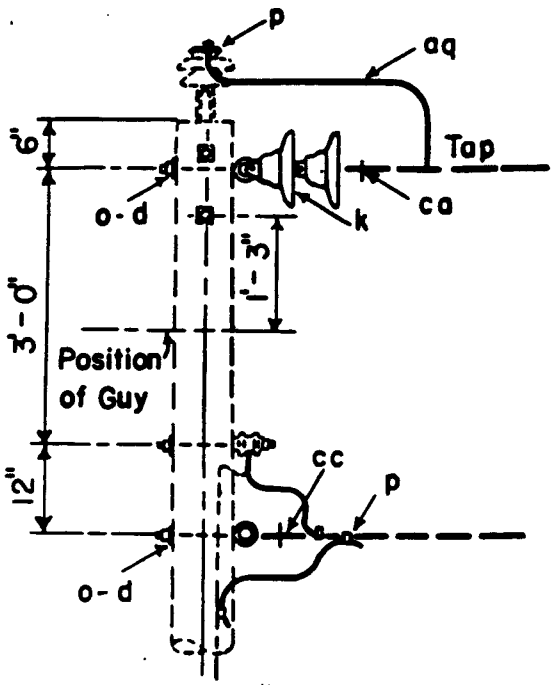


ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
d	2	Washer, square 2 1/4"		cc	1	Deadend assembly, neutral	
k	2	Insulator, suspension, 10"		ek		Locknuts	
o	2	Bolt, eye, 5/8" x req'd. length					
ca	1	Deadend assembly, primary					

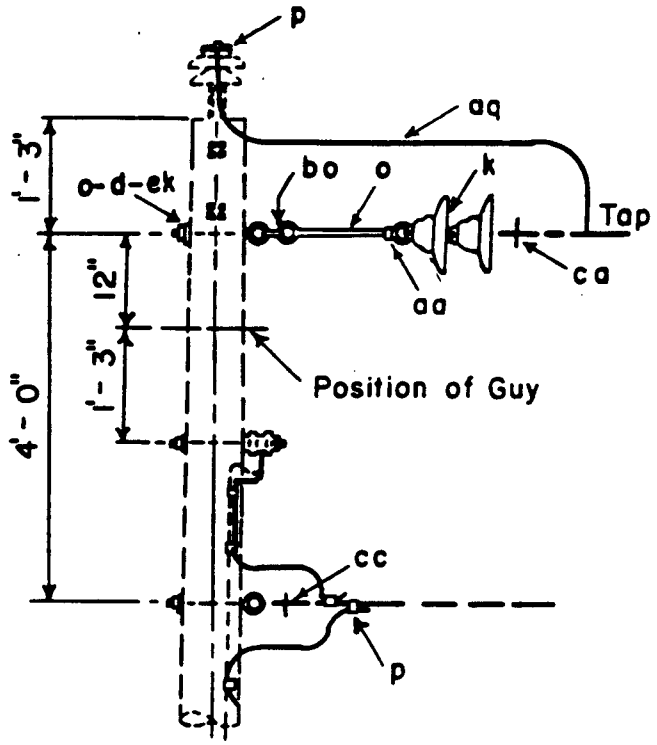
14.4/12.9 KV PRIMARY
1-PHASE, DEADEND (SINGLE)

Jan. 1, 1963

VA5



VA5-1



VA5-2

Notes:

1. VA5-1 and VA5-2 assemblies may be used with the following drawings: VA1, VA1-1, VA1-2, VA2 and VA2-3.

2. See drawings VM29-1 for tap assembly guide.

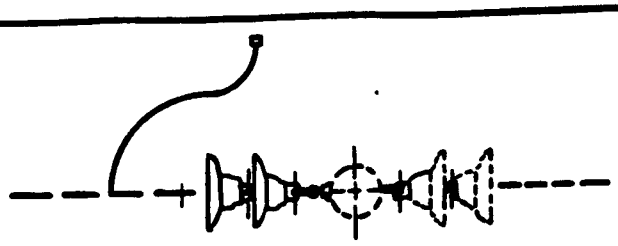
3. Specify VA5-2A for tap to existing eyebolt.

		ASSEMBLY UNIT		
		VA5-1	VA5-2	VA5-2A
ITEM	MATERIAL	Nº REQ'D	Nº REQ'D	Nº REQ'D
d	Washer, square, 2 1/4"	2	2	
k	Insulator, suspension, 10"	2	2	2
o	Bolt, eye, 5/8" x req'd. length	2	3	1
p	Connectors, as required			
aa	Nut, eye, 5/8"		1	3
aq	Jumpers, as required			
ca	Deadend assembly, primary	1	1	1
cc	Deadend assembly, neutral	1	1	1
bo	Shackle, anchor		1	1
ek	Locknuts			

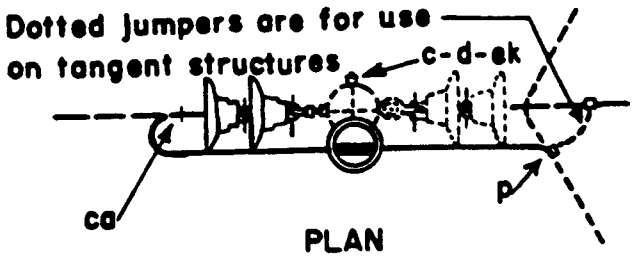
14.4/24.9 KV. PRIMARY
SINGLE PHASE TAP

Jan. 1, 1963

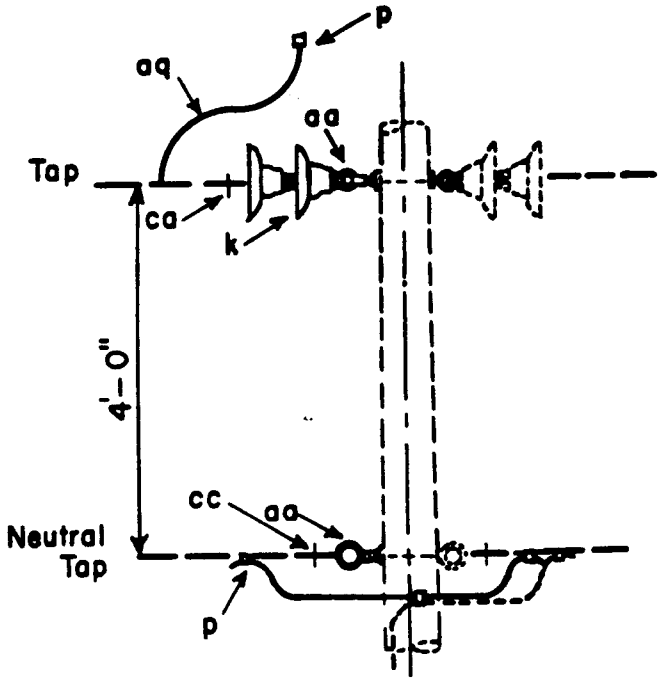
VA5-1, VA5-2, VA5-2A



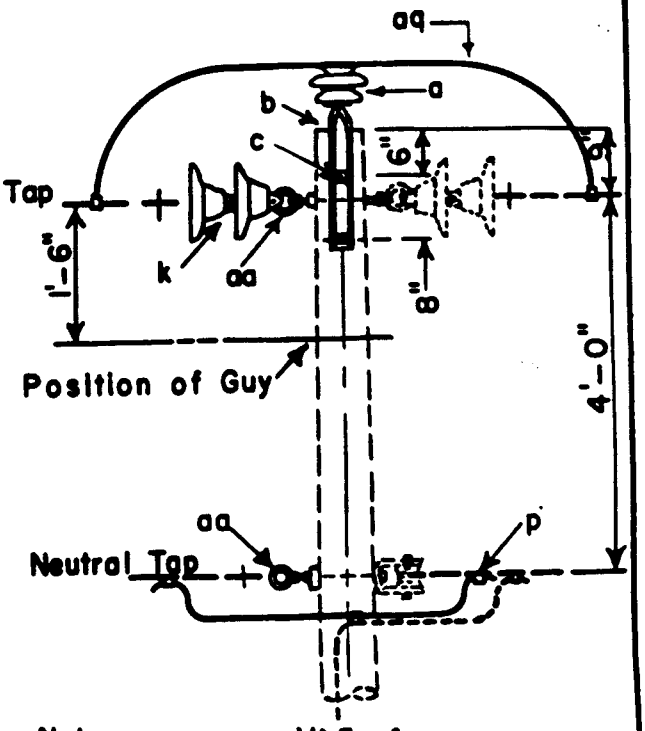
PLAN



PLAN



VA5-3



VA5-4

Note: VA5-3 assembly may be used with the following drawings: VA4, VA5, VB4-1, and VC4-1.

See drawing VM29-1 for tap assembly guide.

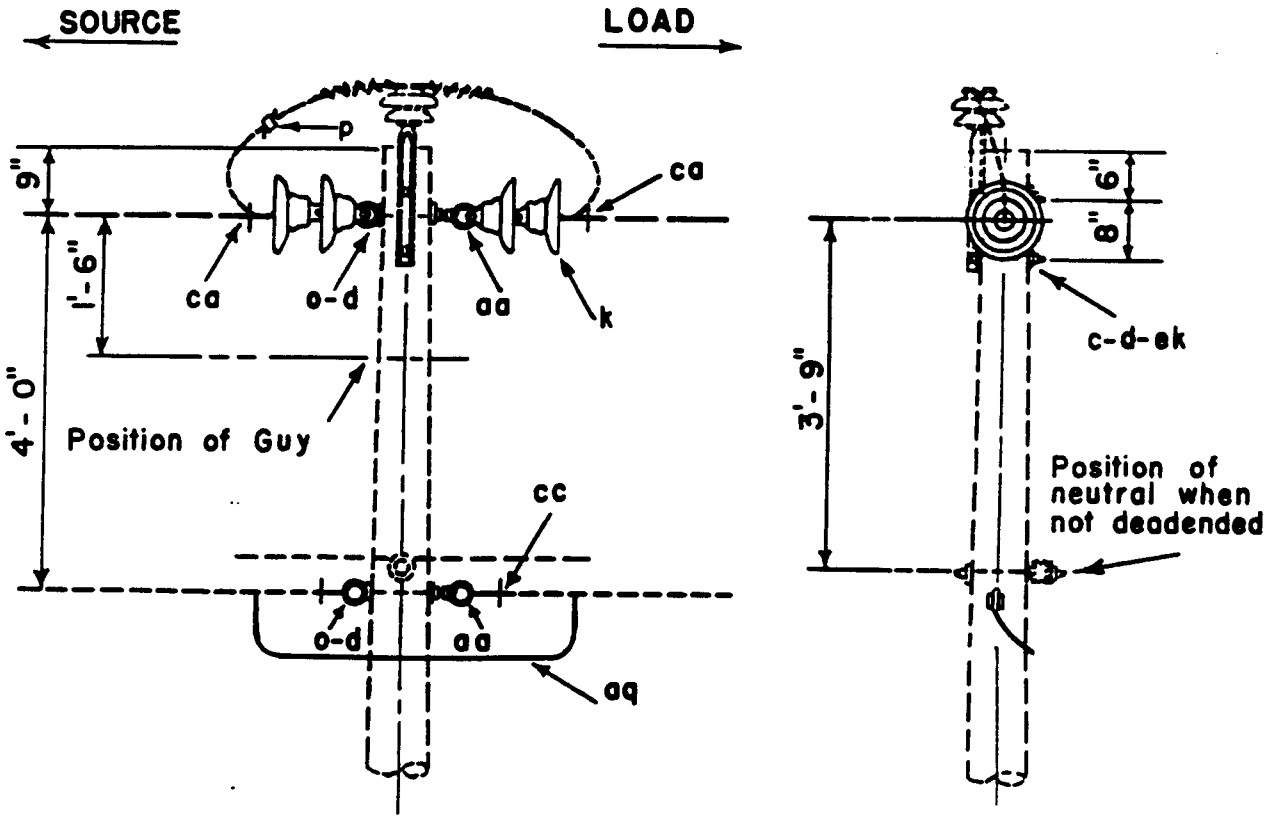
Note: VA5-4 assembly may be used with the following: VA3, VA5, VB3, VB5-1, VC3, and VC5-1.

ITEM	MATERIAL	ASSEMBLY UNIT VA5-3 No. REQ'D	ASSEMBLY UNIT VA5-4 No. REQ'D
a	Insulator, pin type		1
b	Pin, pole top, 20"		1
c	Bolt, machine, 5/8" x required length		2
d	Washer, square, 2 1/4"		2
k	Insulator, suspension, 10"	2	2
p	Connectors, as required		
aa	Nut, eye, 5/8"	2	2
aq	Jumpers and leads, as required		
ca	Deadend assembly, primary	1	1
cc	Deadend assembly, neutral	1	1
ek	Locknuts		

14.4/24.9 KV. PRIMARY
SINGLE PHASE TAP

Jan. 1, 1963

VA5-3, VA5-4



Note:

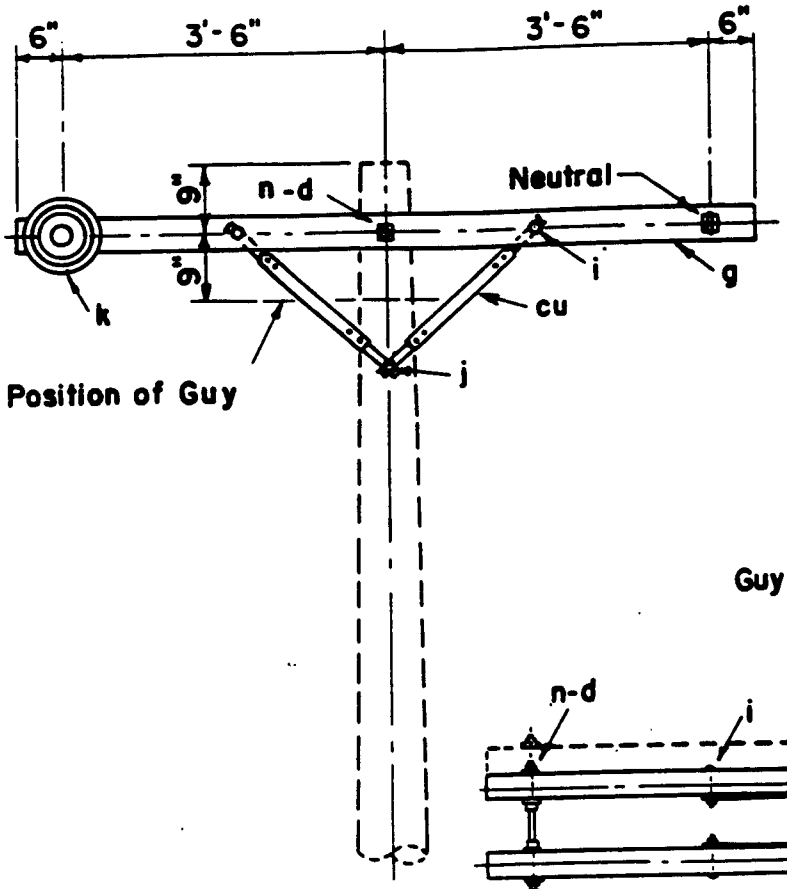
VA6 may be used with drawings such as VM3-1, VM3-1A, VM3-10, VM3-23, VM5-1, VM5-4, VM5-2 (as shown).

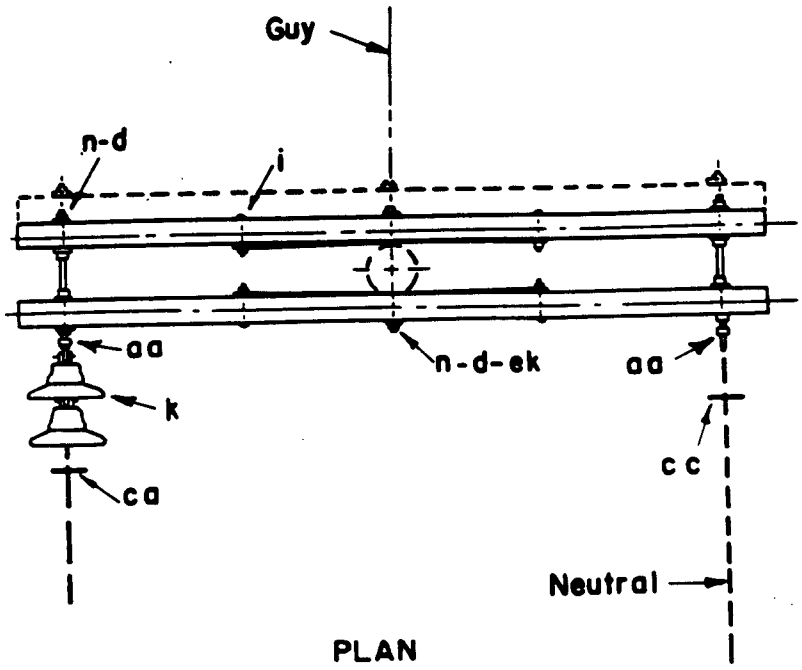
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
				aa	2	Nut, eye, 5/8"	
				aq		Jumpers, as required	
				ca	2	Deadend assembly, primary	
d	4	Washer, square, 2 1/4"		cc	2	Deadend assembly, neutral	
k	4	Insulator, suspension, 10"		ek		Locknuts	
o	2	Bolt, eye, 5/8"x required length					
p		Connectors, as required					

14.4/24.9 KV PRIMARY, 1-PHASE, VERTICAL DEADEND (DOUBLE)

Jan. 1, 1963

VA6





PLAN

Notes:

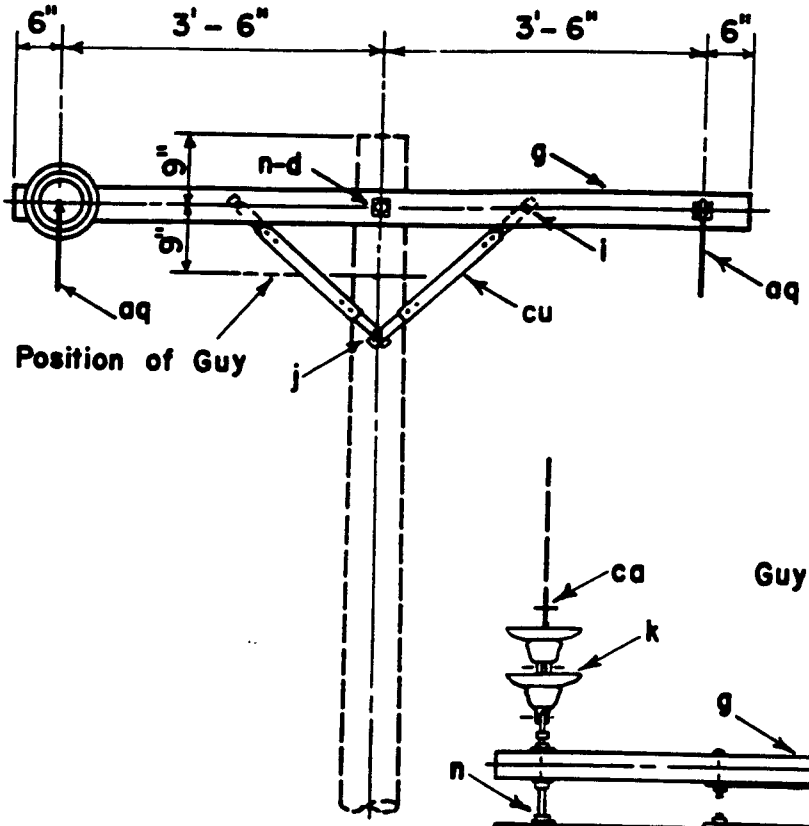
1. See drawing E5-1 for crossarm loading limitations.
2. Designate as VA7-1 for assembly with three crossarms.

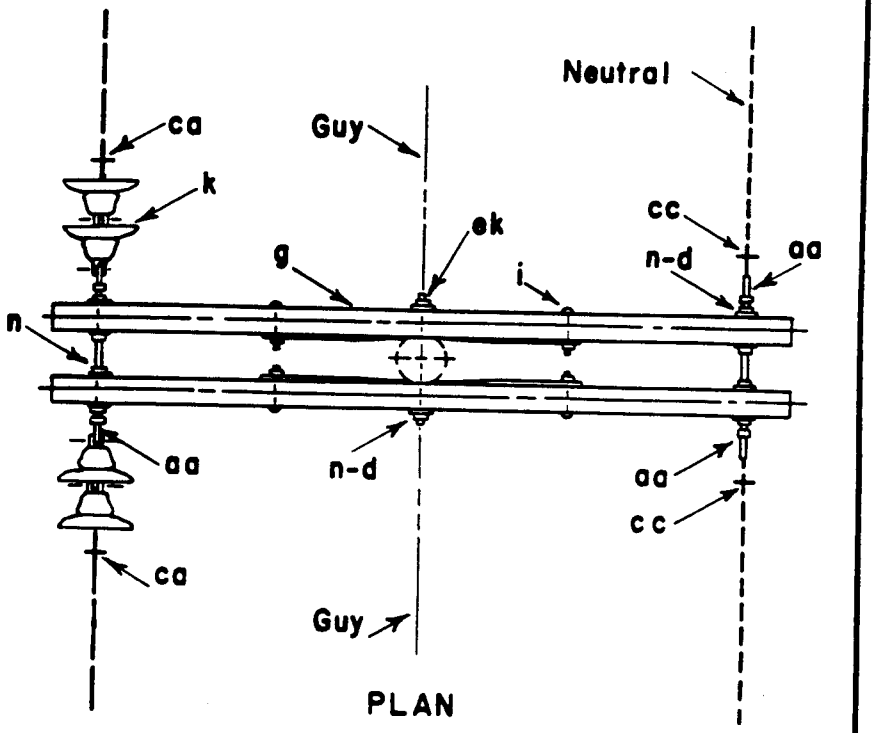
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
				k	2	Insulator, suspension; 10"	
d	10	Washer, square, 2 1/4"		n	3	Bolt, double arming, 5/8" x req'd length	
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"		aa	2	Nut, eye, 5/8"	
cu	4	Brace, wood, 28"		ca	1	Deadend assembly, primary	
l	4	Bolt, carriage, 5/8" x 4 1/4"		cc	1	Deadend assembly, neutral	
j	2	Screw, lag, 1/2" x 4"		ek		Locknuts	

14.4/24.9 KV. PRIMARY, 1-PHASE CROSSARM CONSTR.-DEADEND (SINGLE)

Jan. 1, 1963

VA7, VA7-1





PLAN

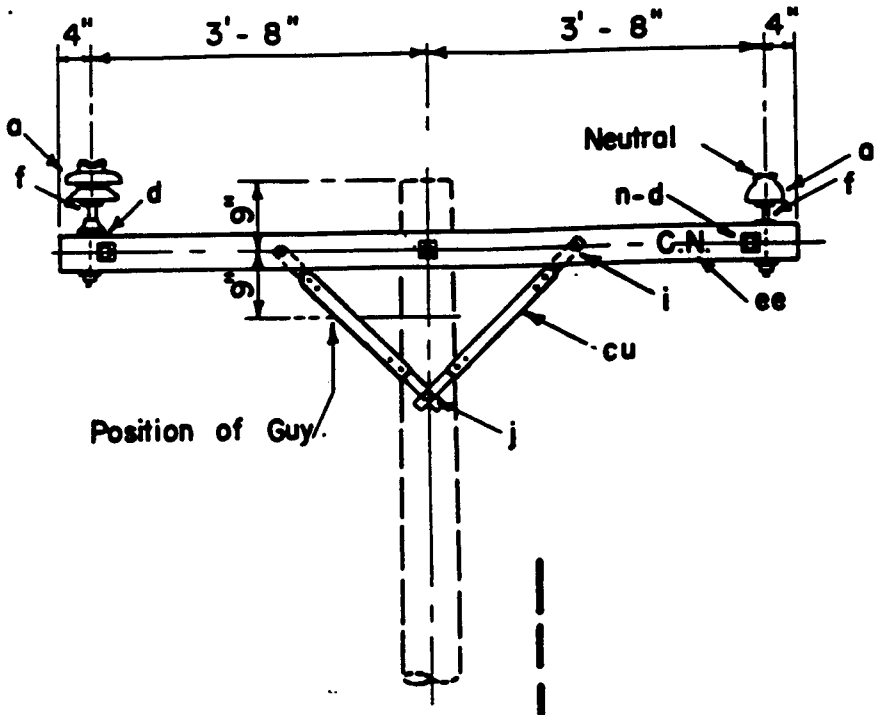
ITEM	NO.	MATERIAL
d	10	Washer, square, 2 1/4"
g	2	Crossarm, 3 1/2"x 4 1/2"x 8'-0"
cu	4	Brace, wood, 28"
i	4	Bolt, carriage, 3/8"x 4 1/2"
j	2	Screw, lag, 1/2"x 4"
k	4	Insulator, suspension, 10"
n	3	Bolt, double arming, 5/8"x req'd. length

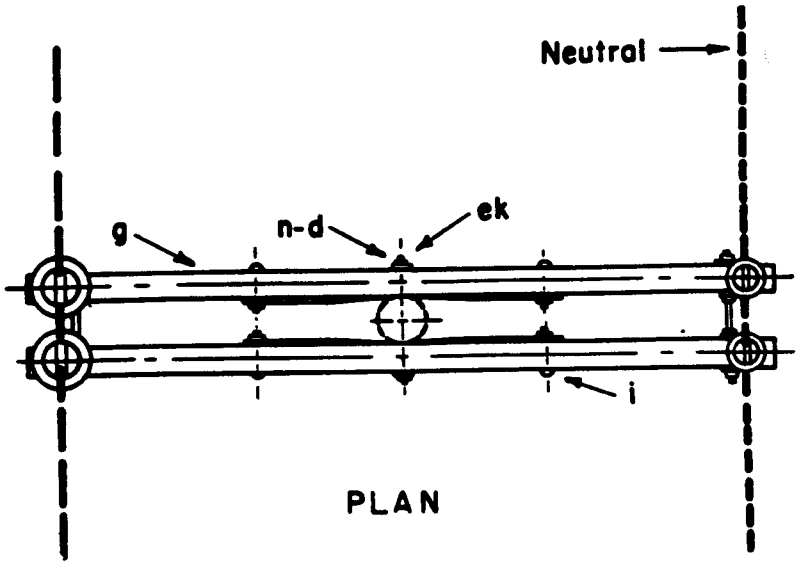
ITEM	NO.	MATERIAL
p		Connectors, as required
aa	4	Nut, eye, 5/8"
aq		Jumpers, as required
ca	2	Deadend assembly, primary
cc	2	Deadend assembly, neutral
ek	2	Locknuts

14.4/24.9 KV. PRIMARY, 1-PHASE CROSSARM CONSTRUCTION – DEADEND (DOUBLE)

Jan. 1, 1963

VA8





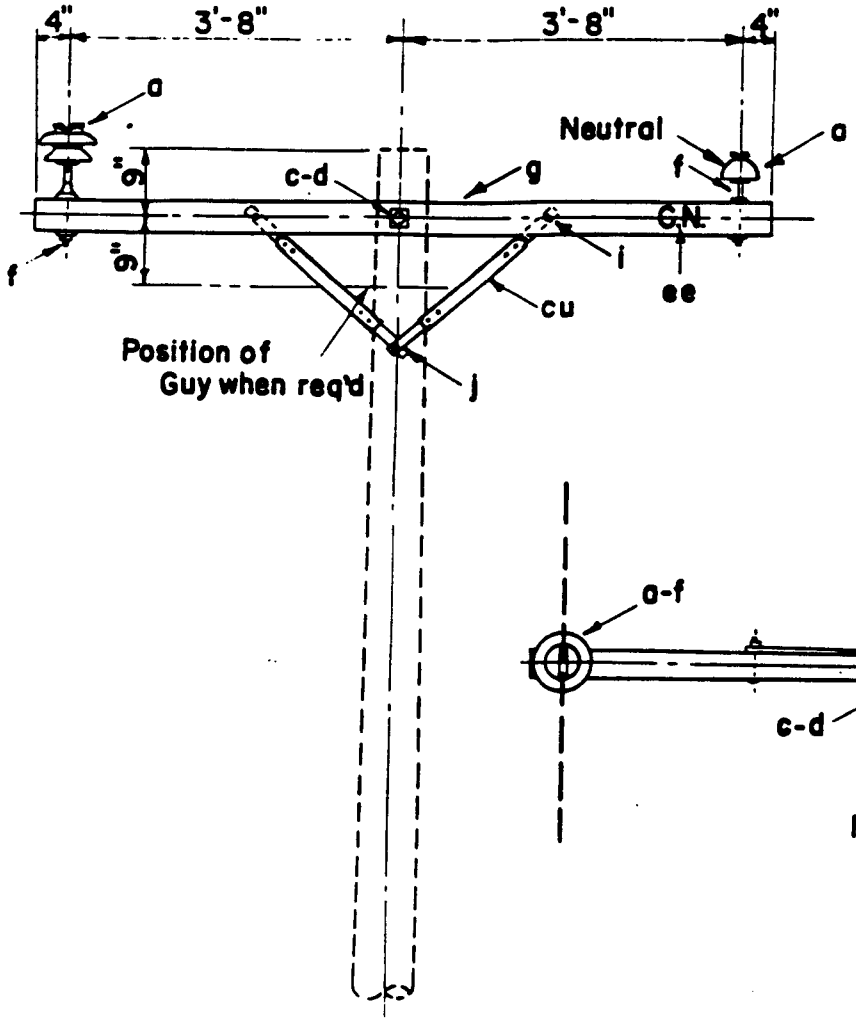
PLAN

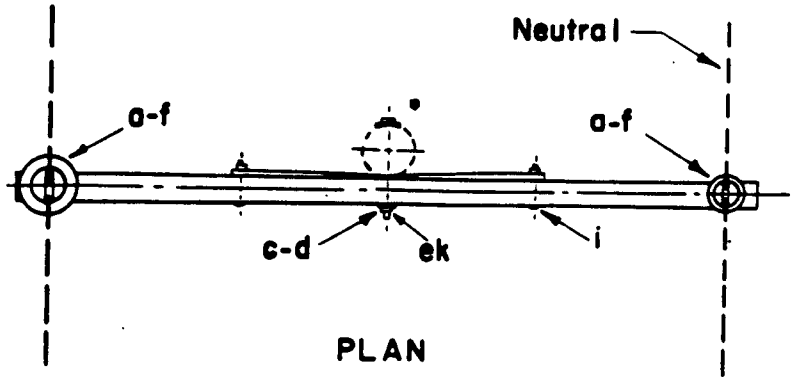
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	2	Insulator, pin type		i	4	Bolt, carriage, 3/8" x 4 1/2"	
ee	4	Letters, 2 "C", 2 "N", with 1" nails		j	2	Screw, lag, 1/2" x 4"	
d	10	Washer, square, 2 1/4"		n	3	Bolt, double arming, 5/8" x req'd. length	
f	2	Pin, crossarm, steel, 5/8" x 14"		f	2	Pin, crossarm, steel, 5/8" x 10 3/4"	
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"		d	2	Washer, square, 3"	
cu	4	Brace, wood, 28"		ek		Locknuts	
a	2	Insulator, pin type, (7.2 / 12.5KV)					

14.4/24.9 KV, 1-PHASE
CROSSARM CONSTRUCTION-DOUBLE LINE ARM

Jan. 1, 1963

VA9





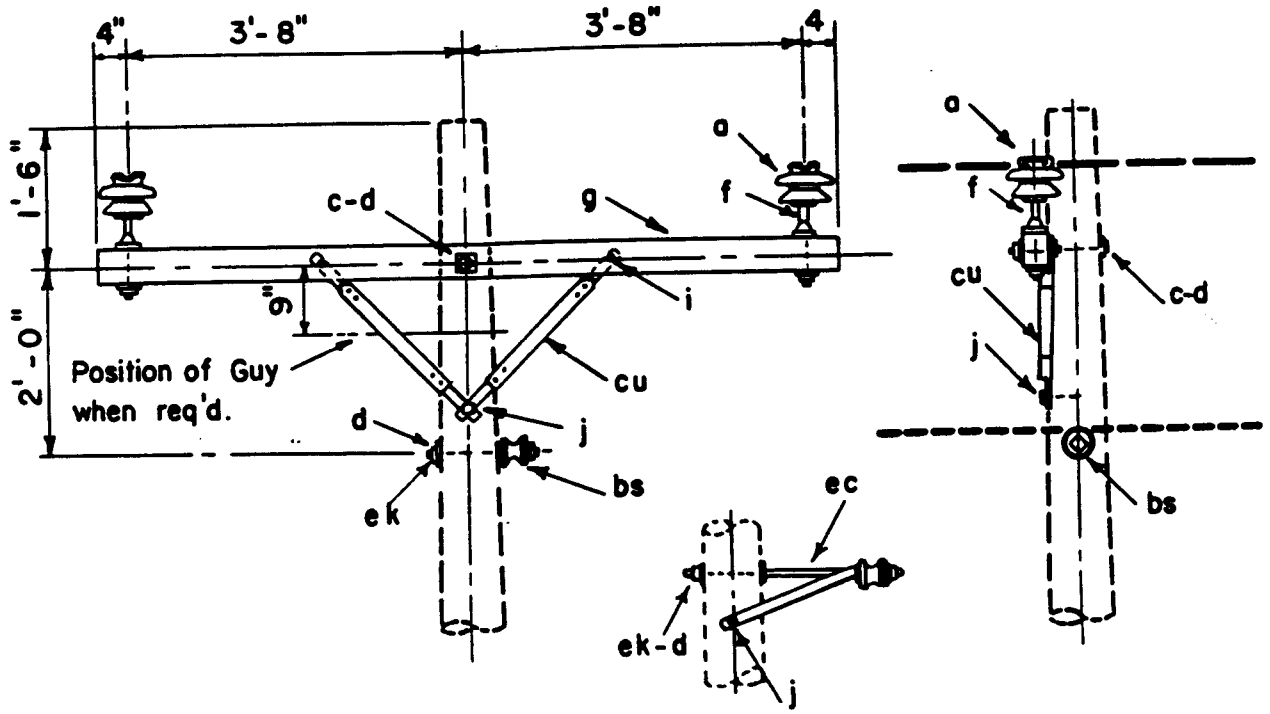
PLAN

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	1	Insulator, pin type		cu	2	Brace, wood, 28"	
c	1	Bolt, machine, $\frac{5}{8}$" x reqd length		i	2	Bolt, carriage, $\frac{3}{8}$" x $4\frac{1}{2}$"	
d	2	Washer, square; 2 1/4"		j	1	Screw, lag, $\frac{1}{2}$" x 4"	
f	1	Pin, crossarm, steel, $\frac{5}{8}$" x 14"		ee	4	Letters, 2 "C", 2 "N", with 1" nails	
f	1	Pin, crossarm, steel, $\frac{5}{8}$" x $10\frac{3}{4}$"		ek		Locknuts	
g	1	Crossarm, $3\frac{1}{2}$" x $4\frac{1}{2}$" x 8'-0"		a	1	Insulator, pin type, (7.2/12.5 KV)	

14.4/24.9 KV., 1-PHASE
CROSSARM CONSTRUCTION-SINGLE LINE ARM

Jan. 1, 1963

VA9-1



Specify VBIA for
offset neutral assembly

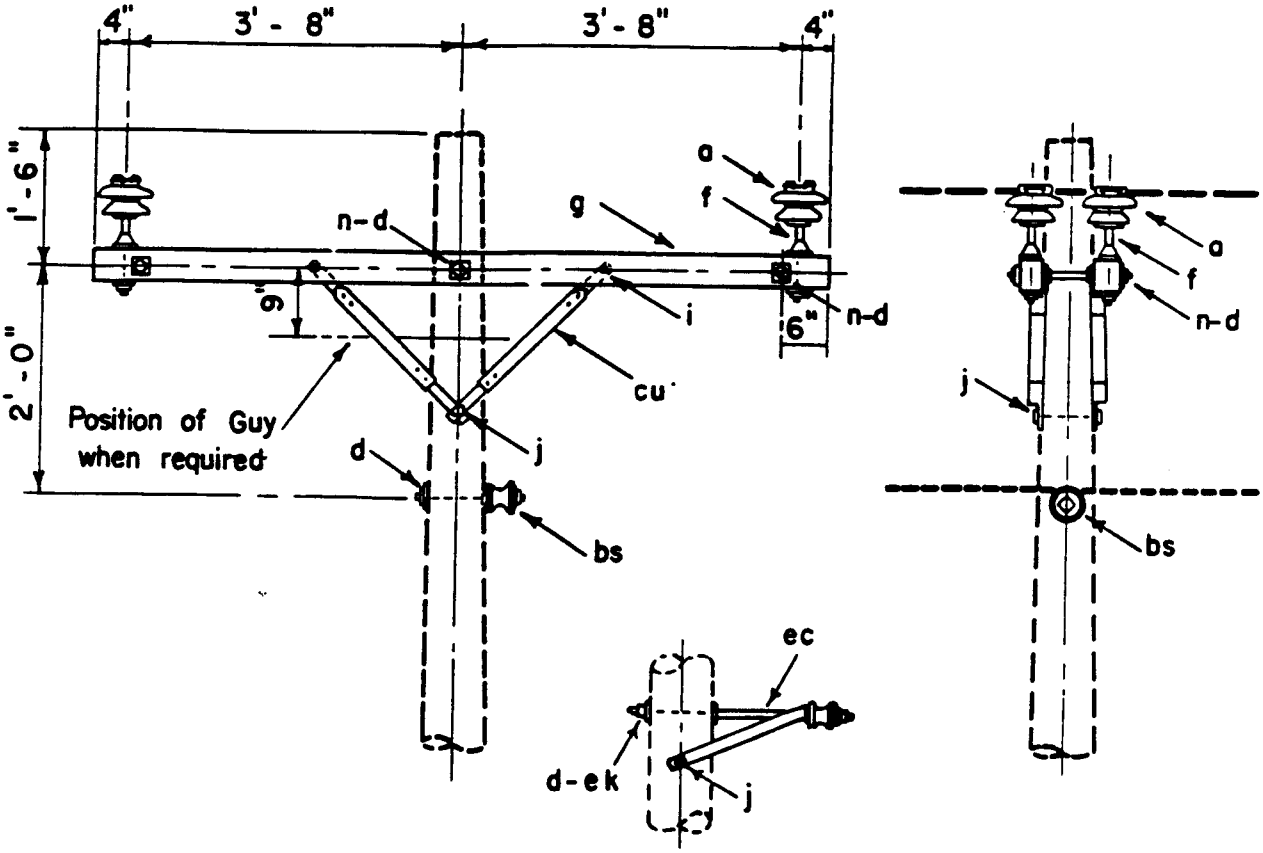
ITEM	NO.	MATERIAL
a	2	Insulator, pin type
c	1	Bolt, machine, 5/8" x req'd. length
d	3	Washer, square 2 1/4"
f	2	Pin, crossarm, steel, 5/8" x 14"
g	1	Crossarm, 3 1/2" x 4 1/2" x 8'-0"
j	3	Screw, lag, 1/2" x 4" (VBIA only)
ek		Locknuts

ITEM	NO.	MATERIAL
cu	2	Brace, wood, 28"
i	2	Bolt, carriage, 3/8" x 4 1/2"
j	1	Screw, lag, 1/2" x 4" (VBI only)
bs	1	Bolt, single upset, insulated (VBI only)
ec	1	Bracket, offset, neutral (VBIA only)

14.4/24.9 KV, TWO PHASE CROSSARM CONSTRUCTION, 0° TO 5° ANGLE SINGLE PRIMARY SUPPORT

Jan. 1, 1963

VBI, VBIA



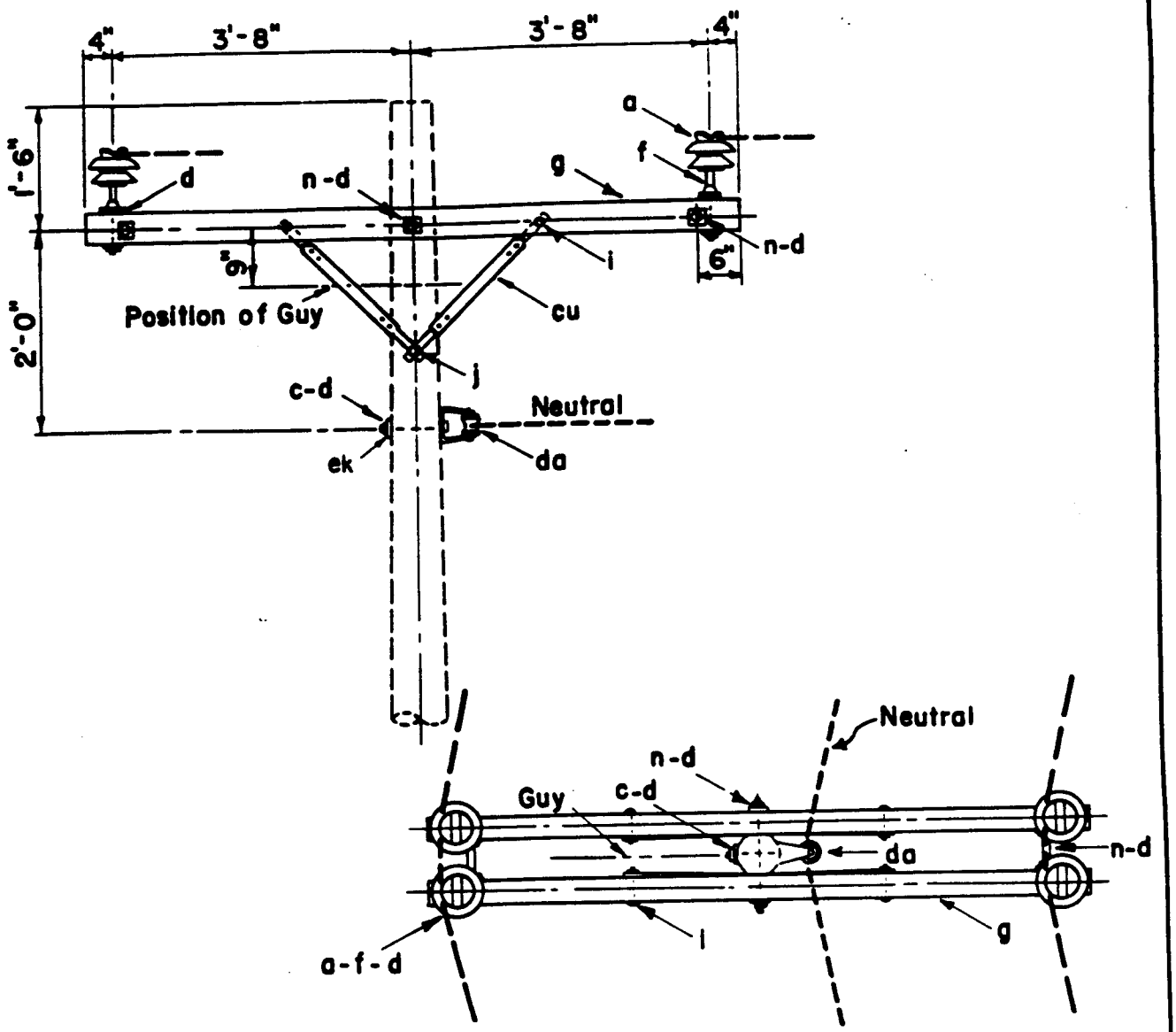
Specify VBI-1A for
offset neutral assembly

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	4	Insulator, pin type		i	4	Bolt, carriage, 3/8" x 4 1/2"	
ek		Locknuts		j	2	Screw, lag, 1/2" x 4", (VBI-1 only)	
d	11	Washer, square 2 1/4"		n	3	Bolt, double arming, 5/8" x req'd. length	
f	4	Pin, crossarm, steel, 5/8" x 14"		bs	1	Bolt, single upset, insulated, (VBI-1	only)
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"		ec	1	Bracket, offset, insulated, (VBI-1A only)	
cu	4	Brace, wood, 28"		j	4	Screw, lag, 1/2" x 4", (VBI-1A only)	

14.4/24.9 KV, TWO PHASE
CROSSARM CONSTRUCTION, 0° TO 5° ANGLE
DOUBLE PRIMARY SUPPORT

Jan. 1, 1963

VBI-1, VBI-1A

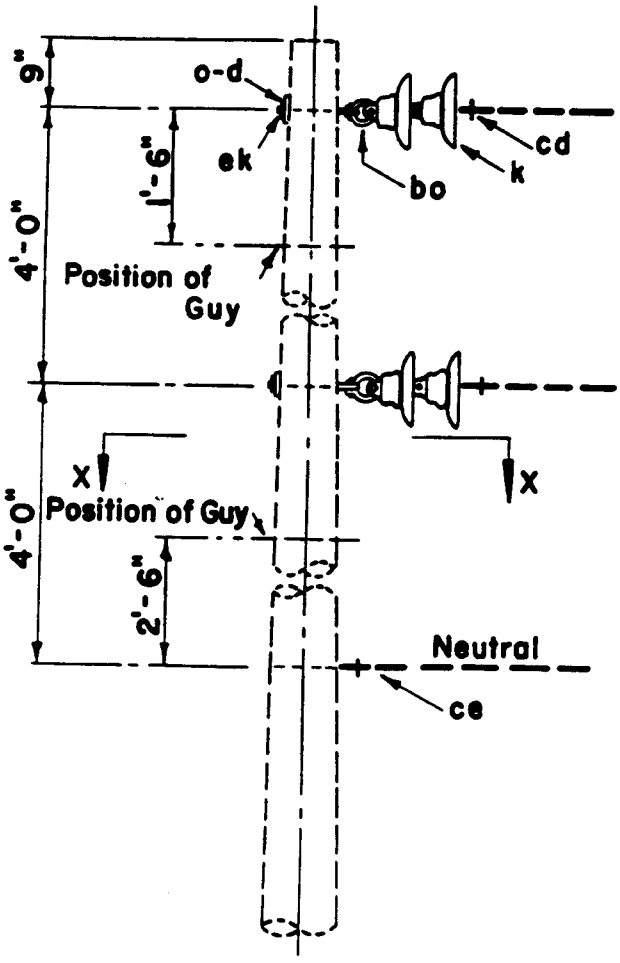


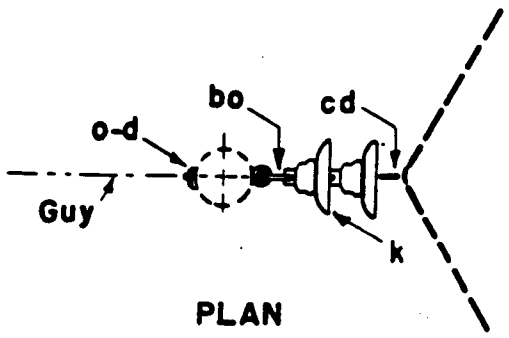
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	4	Insulator, pin type		cu	4	Brace, wood, 28"	
c	1	Bolt, machine, 5/8" x reqd length		l	4	Bolt, carriage, 3/8" x 4 1/2"	
d	11	Washer, square 2 1/4"		j	2	Screw, lag, 1/2" x 4"	
d	4	Washer, 3"x3"x1/4", 13/16" hole		n	3	Bolt, double arming, 5/8" x req'd length	
f	4	Pin, crossarm, steel, 5/8" x 14"		da	1	Bracket, insulated	
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"		ek		Locknuts	

14.4/24.9 KV. TWO PHASE CROSSARM CONSTR.- DOUBLE PRIMARY SUPPORT MAX. TRANSVERSE LOADING 750 LBS./PIN (5° TO 30° MAX. ANGLE)

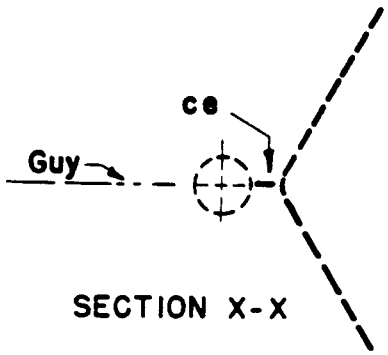
Jan. 1, 1963

VB2





PLAN



SECTION X-X

Note:

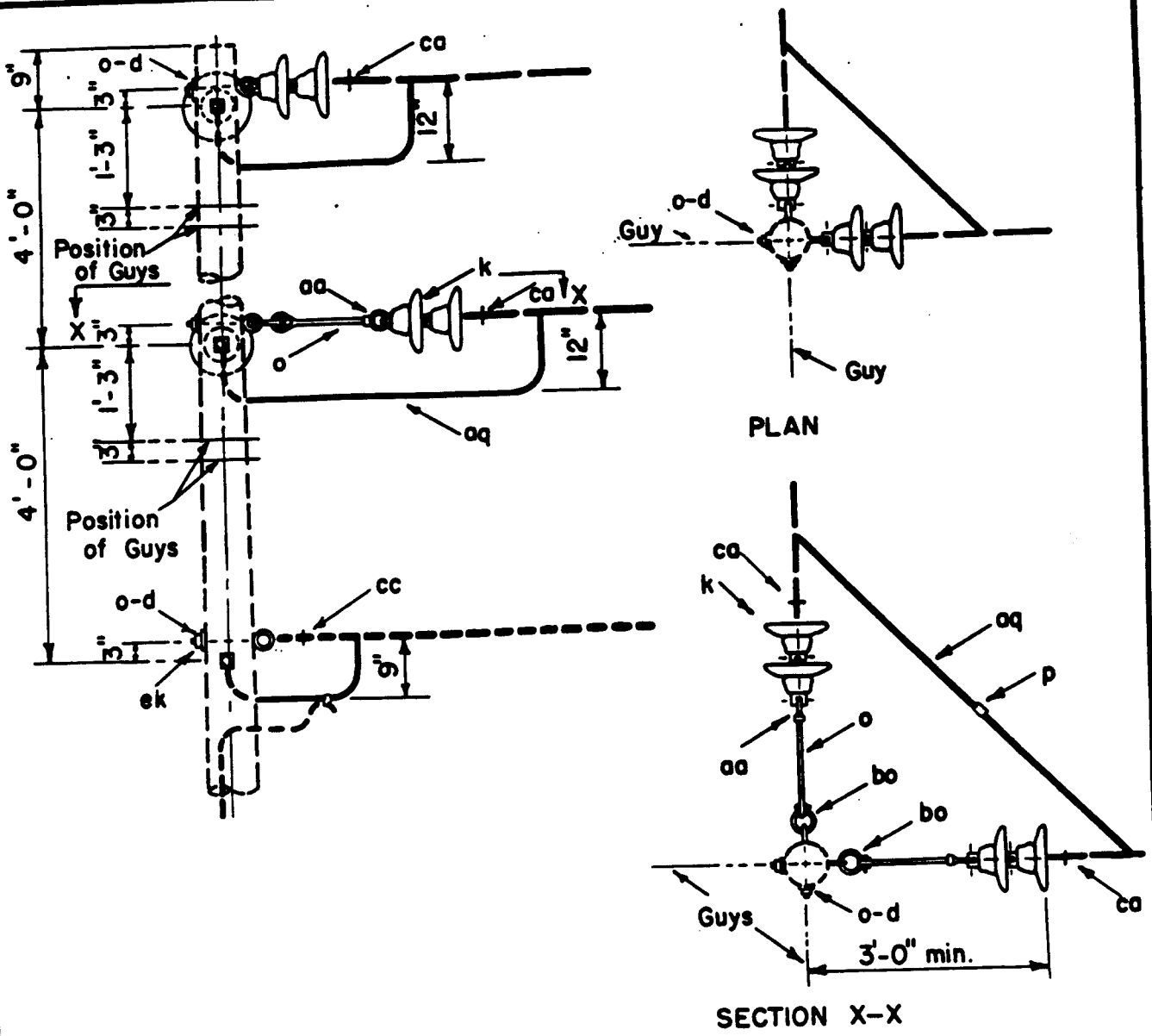
If future conversion is likely, allow space at top of pole for middle phase. Designate as VB3A for this construction.

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
d	2	Washer, 2¼" square		ce	1	Angle assembly, neutral	
k	4	Insulator, suspension, 10"		ek		Locknuts	
o	2	Bolt, eye, 5/8" x req'd length					
bo	2	Shackle, anchor					
cd	2	Angle assembly, primary					

14.4/24.9 KV., TWO PHASE
VERTICAL CONSTRUCTION- 30° TO 60° ANGLE

Jan. 1 1963

VB3, VB3A



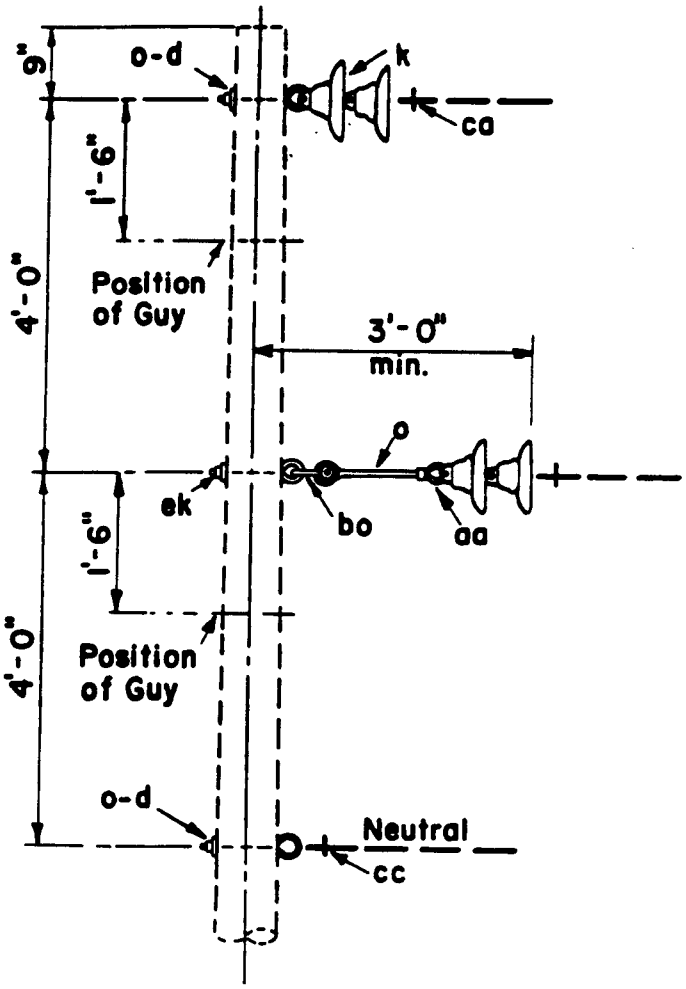
Note:
If future conversion is likely, allow space at top of pole for middle phase. Designate as VB4-1A for this construction.

ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
d	6	Washer, 2 1/4" square	bo	2	Shackle, anchor
k	8	Insulator, suspension, 10"	ca	4	Deadend assembly, primary
o	8	Bolt, eye, 5/8" x req'd. length	cc	2	Deadend assembly, neutral
p		Connectors, as required	ek		Locknuts
aa	2	Nut, eye, 5/8"			
aq		Jumpers, as required			

14.4/24.9 KV, TWO PHASE VERTICAL CONSTRUCTION-60° TO 90° ANGLE

Jan. 1, 1963

VB4-1, VB4-1A



Note:

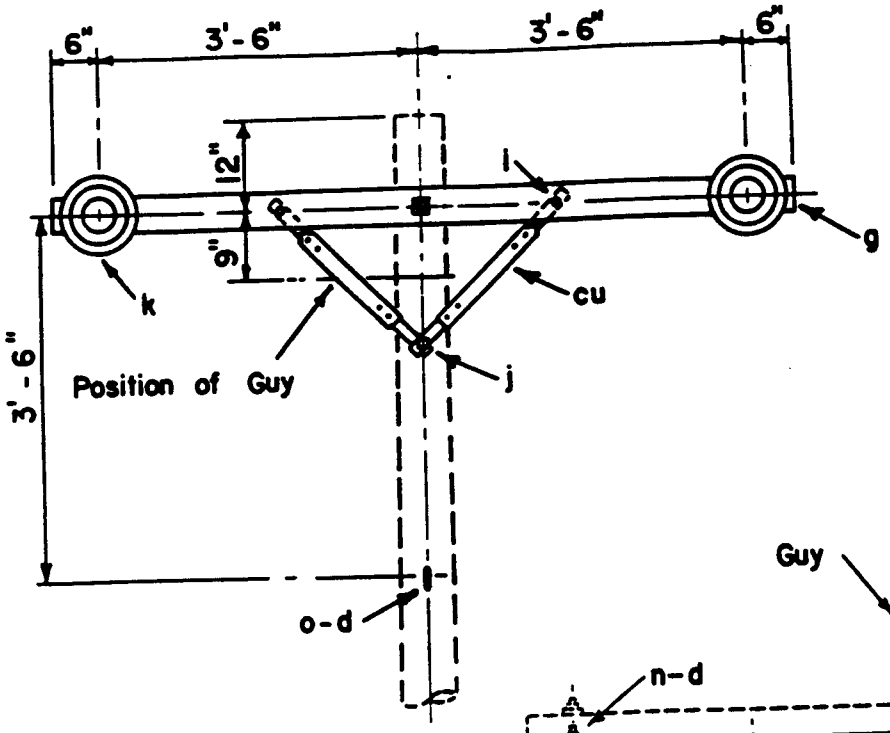
If future conversion to three phase is likely, allow space at top of pole for middle phase. Designate as VB5-1A for this construction.

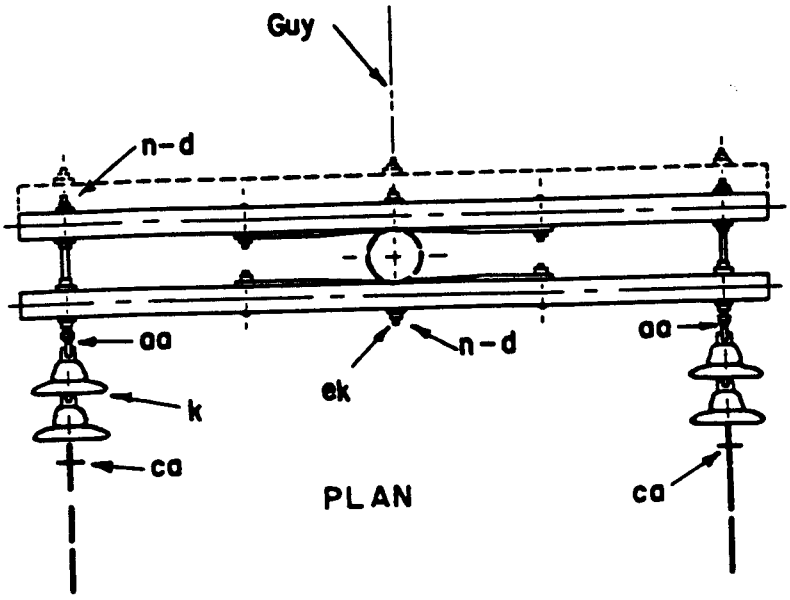
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
d	3	Washer, square, 2 1/4"		ca	2	Deadend assembly, primary	
k	4	Insulator, suspension, 10"		cc	1	Deadend assembly, neutral	
o	4	Bolt, eye, 5/8" x req'd length		bo	1	Shackle, anchor	
aa	1	Nut, eye, 5/8"		ek		Locknuts	

14.4/24.9 KV., TWO PHASE
VERTICAL CONSTRUCTION - DEADEND (SINGLE)

Jan. 1, 1963

VB5-1, VB5-1A





Notes:

1. See drawing VE5-1 for crossarm loading limitations.

2. Designate as VB7-1 for assembly with three crossarms.

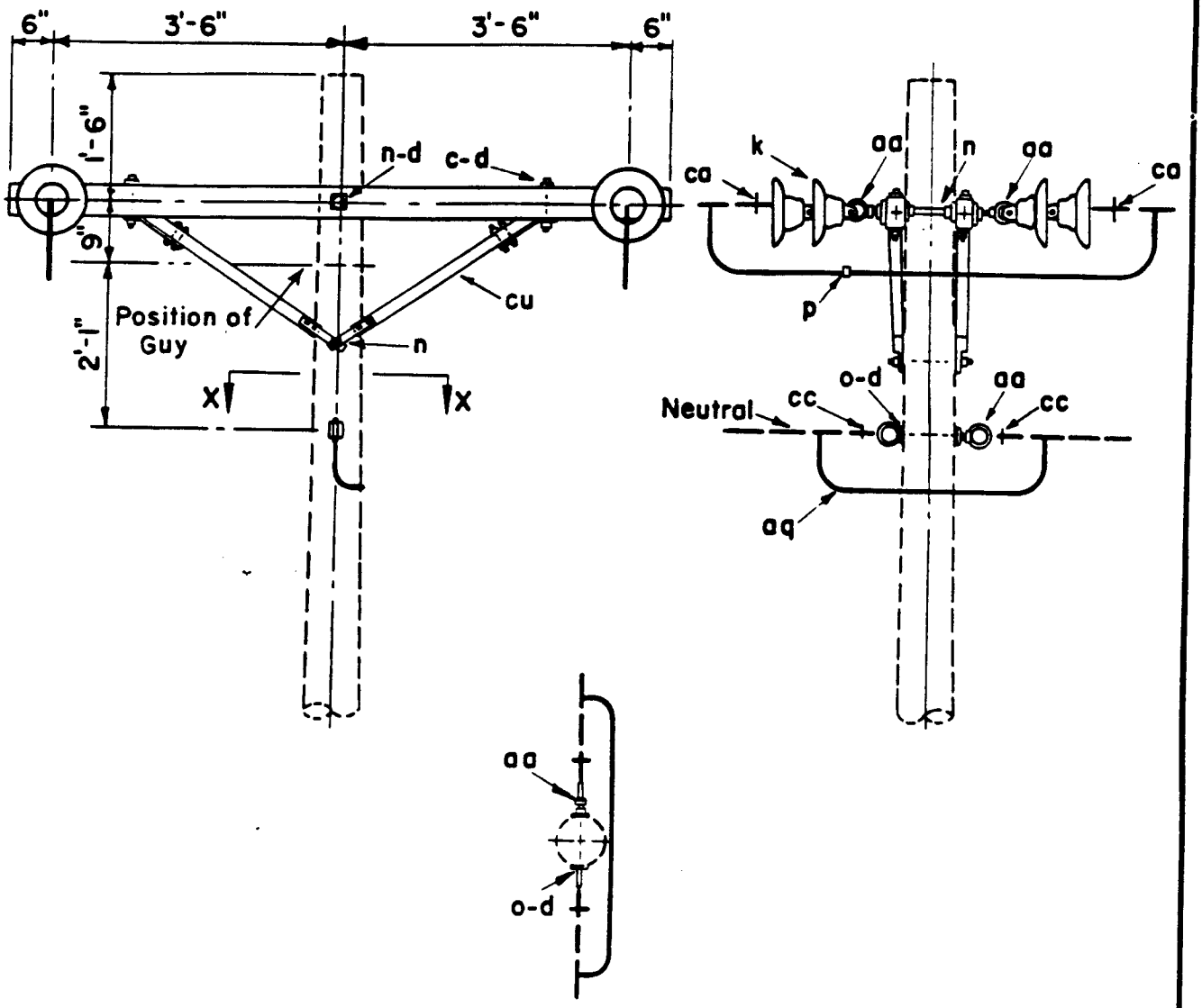
ITEM	NO.	MATERIAL
d	11	Washer, square, 2 1/4"
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"
cu	4	Brace, wood, 28"
i	4	Bolt, carriage, 3/8" x 4 1/2"
j	2	Screw, lag, 1/2" x 4
k	4	Insulator, suspension, 10"

ITEM	NO.	MATERIAL
n	3	Bolt, double arming, 5/8" x req'd. length
o	1	Bolt, eye, 5/8" x req'd. length
aa	2	Nut, eye, 5/8"
ca	2	Deadend assembly, primary
cc	1	Deadend assembly, neutral
ek		Locknuts

14.4/24.9 KV, TWO PHASE CROSSARM CONSTRUCTION- DEADEND (SINGLE)

Jan. 1, 1963

VB7, VB7-1



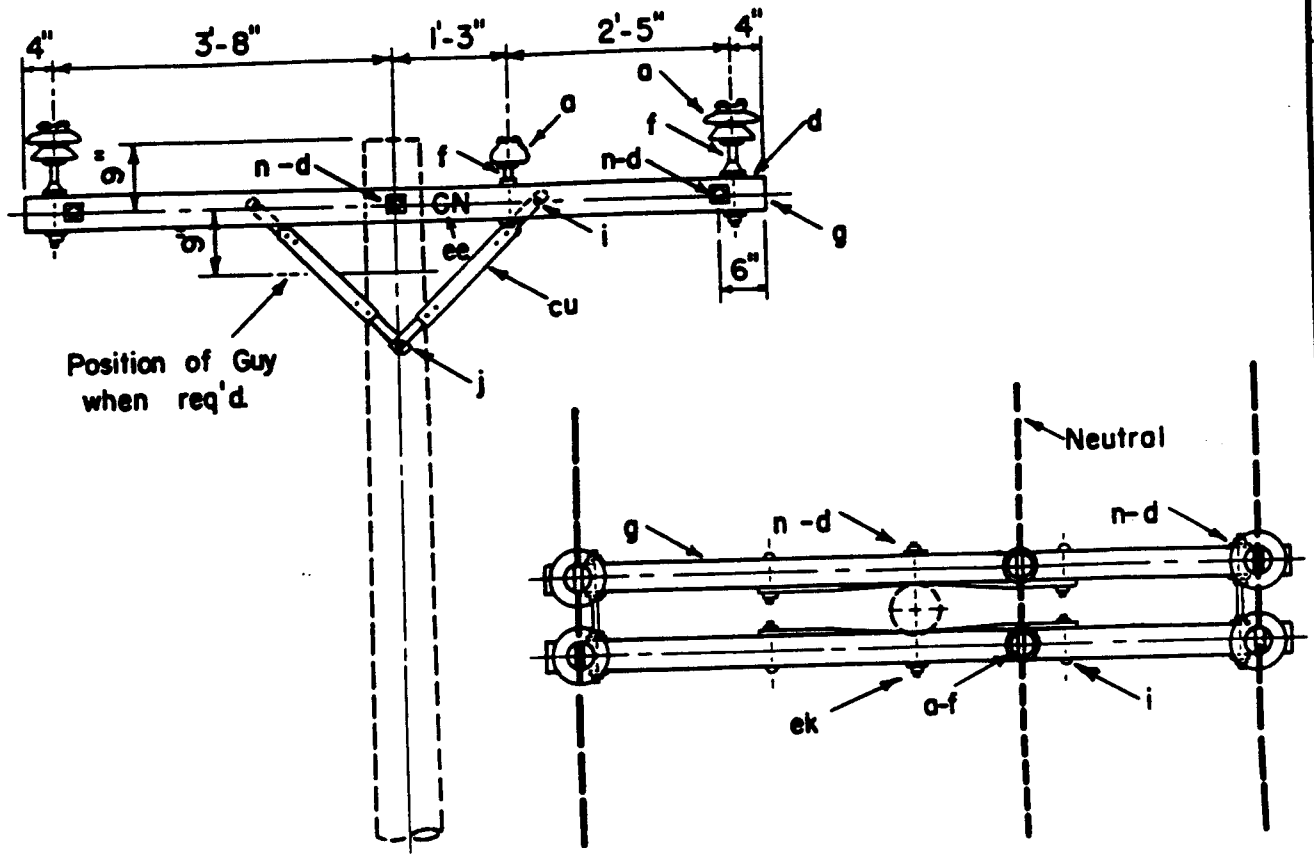
SECTION X-X

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
c	4	Bolt, machine, ½" x req'd length		aq		Jumpers, as required	
d	12	Washer, square 2 ¼"		ca	4	Deadend assembly, primary	
g	2	Crossarm, 3½" x 4½" x 8'-0"		cc	2	Deadend assembly, neutral	
k	8	Insulator, suspension, 10"		cu	2	Brace, wood, 60" span	
n	4	Bolt, double arming, ⅝" x req'd length		ek		Locknuts	
o	1	Bolt, eye, ⅝" x req'd length		d	4	Washer, round, 1 3/8" dia.	
p		Connectors, as required					
aa	5	Nut, eye, ⅝"					

14.4/24.9 KV., TWO PHASE
CROSSARM CONSTRUCTION - DEADEND (DOUBLE)

Jan. 1, 1963

VB8



Note :

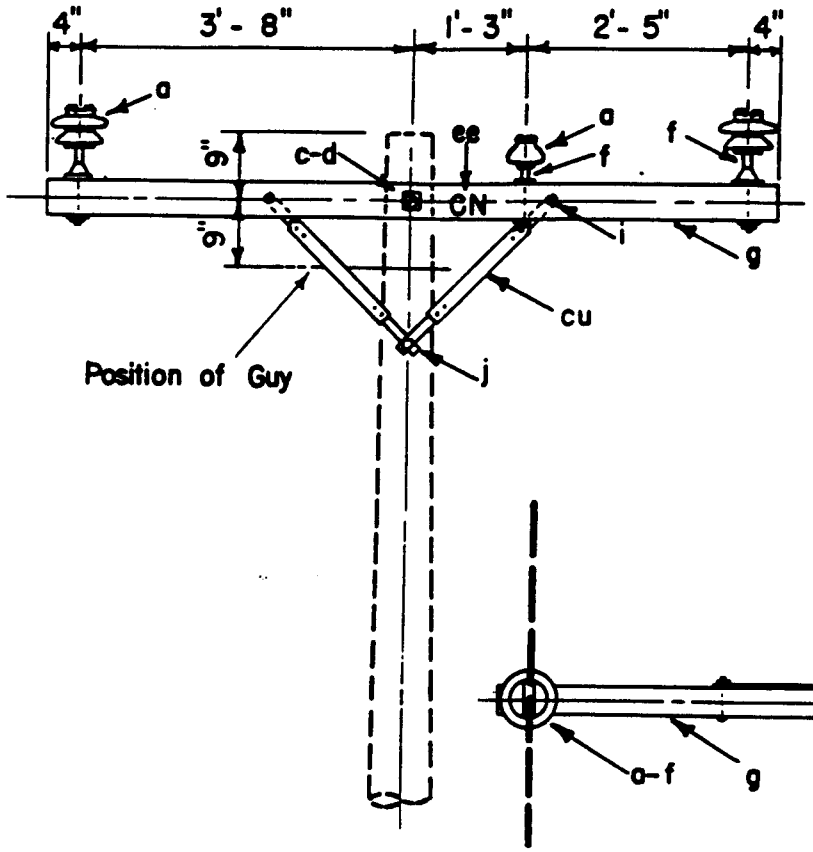
Where future conversion to three phase is likely, use construction similar to VC9 and designate as VB9-2.

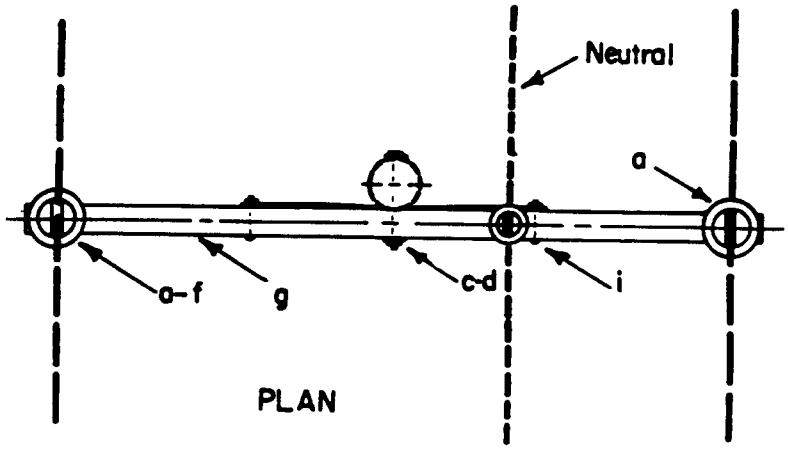
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	2	Insulator, pin type, (7.2 / 12.5 KV)		g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"	
a	4	Insulator, pin type		cu	4	Brace, wood, 28"	
				i	4	Bolt, carriage, 3/8" x 4 1/2"	
d	10	Washer, square 2 1/4"		j	2	Screw, lag, 1/2" x 4"	
d	4	Washer, square 3"		n	3	Bolt, double arming, 5/8" x req'd. length	
f	4	Pin, crossarm, steel, 5/8" x 14"		ee	4	Letters, 2"C", 2"N", with 1" nails	
f	2	Pin, crossarm, steel, 5/8" x 10 3/4"		ek		Locknuts	

14.4/24.9 KV, TWO PHASE CROSSARM CONSTRUCTION-DOUBLE LINE ARM

Jan. 1, 1963

VB9,VB9-2





PLAN

Note :

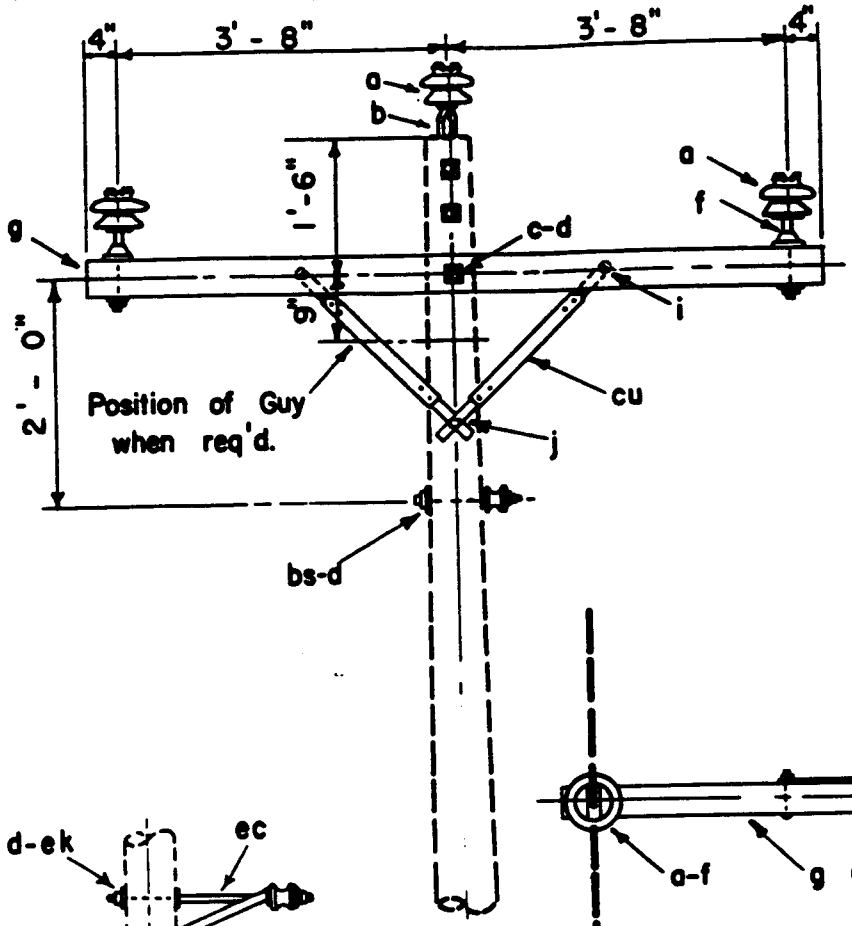
Where future conversion to three phase is likely, use construction similar to VC9-1 and designate as VB9-3

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	1	Insulator, pin type, (7.2 / 12.5 KV)		g	1	Crossarm, 3 1/2" x 4 1/2" x 8'-0"	
a	2	Insulator, pin type		cu	2	Brace, wood, 28"	
c	1	Bolt, machine, 5/8" x req'd. length		i	2	Bolt, carriage, 3/8" x 4 1/2"	
d	2	Washer, square 2 1/4"		j	1	Screw, lag, 1/2" x 4"	
f	2	Pin, crossarm, steel, 5/8" x 14"		ee	1	Letters, 2 "C", 2 "N", with 1" nails	
f	1	Pin, crossarm, steel, 5/8" x 10 3/4"		ek		Locknuts	

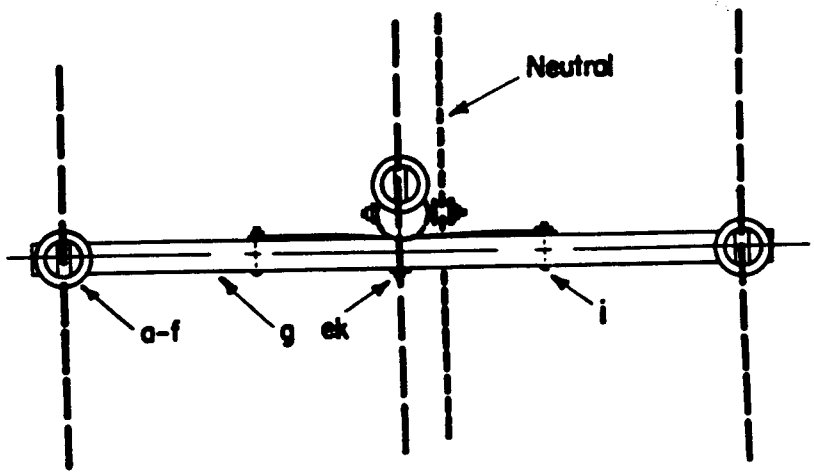
14.4/24.9 KV, TWO PHASE CROSSARM CONSTRUCTION- SINGLE LINE ARM

Jan. 1, 1963

VB9-1, VB9-3



Specify VCIB for offset neutral assembly



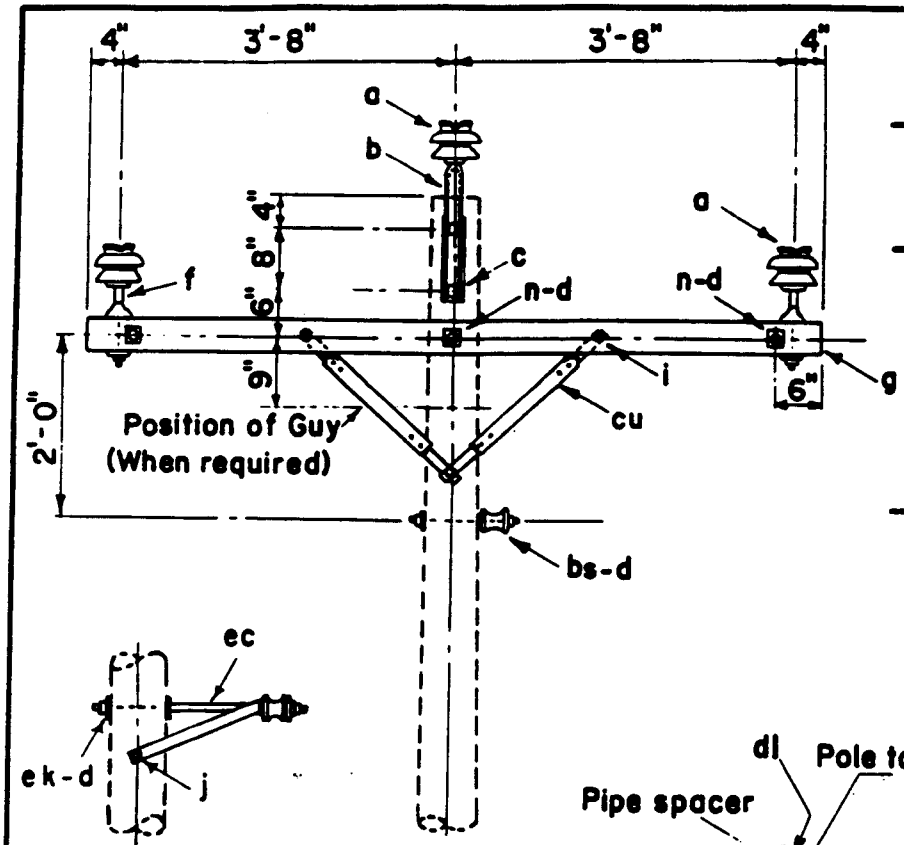
PLAN

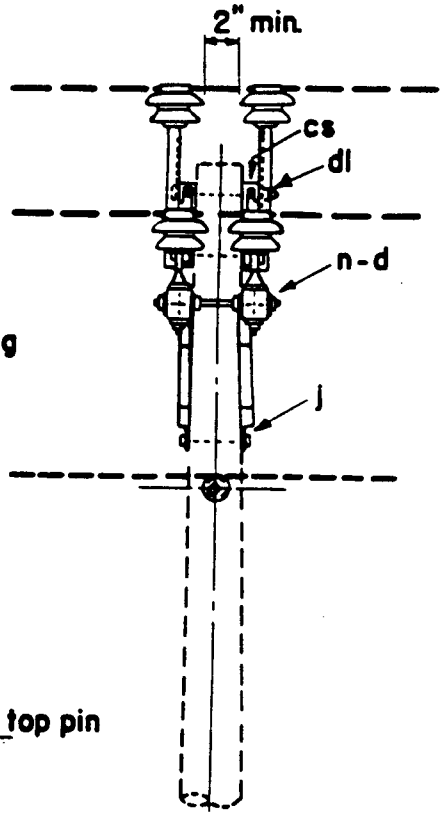
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	3	Insulator, pin type		cu	2	Brace, wood, 28"	
b	1	Pin, pole top, 20"		i	2	Bolt, carriage, 3/8" x 4 1/2"	
c	3	Bolt, machine, 5/8" x req'd. length		j	1	Screw, lag, 1/2" x 4", (VCI only)	
d	4	Washer, square 2 1/4"		bs	1	Bolt, single upset, insulated, (VCI only)	
f	2	Pin, crossarm, steel, 5/8" x 14"		ek		Locknuts	
g	1	Crossarm, 3 1/2" x 4 1/2" x 8'-0"		ec	1	Bracket, offset, insulated, (VCIB only)	
j	3	Screw, lag, 1/2" x 4", (VCIB only)					

14.4/24.9 KV, 3-PHASE
CROSSARM CONSTRUCTION-SINGLE PRIMARY SUPPORT
0° TO 5° ANGLE

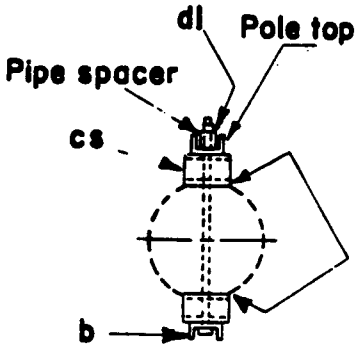
Jan. 1, 1963

VCI, VCIB





Specify VCI-IA for offset neutral assembly



Pole to be gained on both sides to provide flat surfaces for brackets.

POLE TOP PIN ASSEMBLY

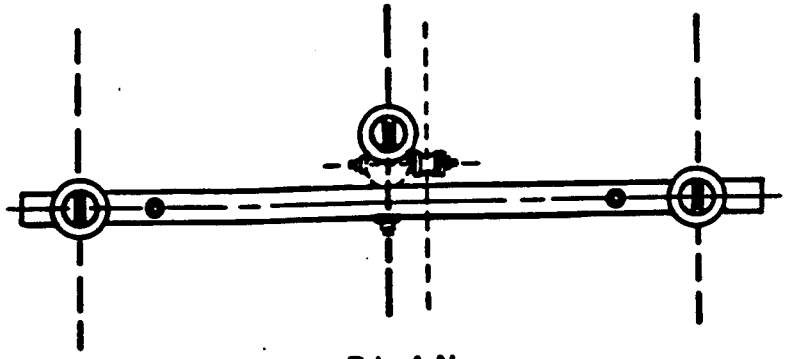
ITEM	NO.	MATERIAL
a	6	Insulator, pin type
b	2	Pin, pole top, 20"
c	2	Bolt, machine, 5/8" x req d length
d	11	Washer, square 2 1/4"
f	4	Pin, crossarm, steel, 5/8" x 14"
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"
cu	4	Brace, wood, 28"
i	4	Bolt, carriage, 5/8" x 4 1/2"

ITEM	NO.	MATERIAL
n	3	Bolt, double arming, 5/8" x req d length
bs	1	Bolt, single upset, insulated (VCI-1 only)
cs	2	Pole top bracket
dl	2	Pipe spacer, 3/4" dia. x 1 1/2"
ek		Locknuts
j	2	Screw, lag, 1/2" x 4" (VCI-1 only)
ec	1	Bracket, offset, insulated (VCI-1A only)
j	4	Screw, lag, 1/2" x 4" (VCI-1A only)

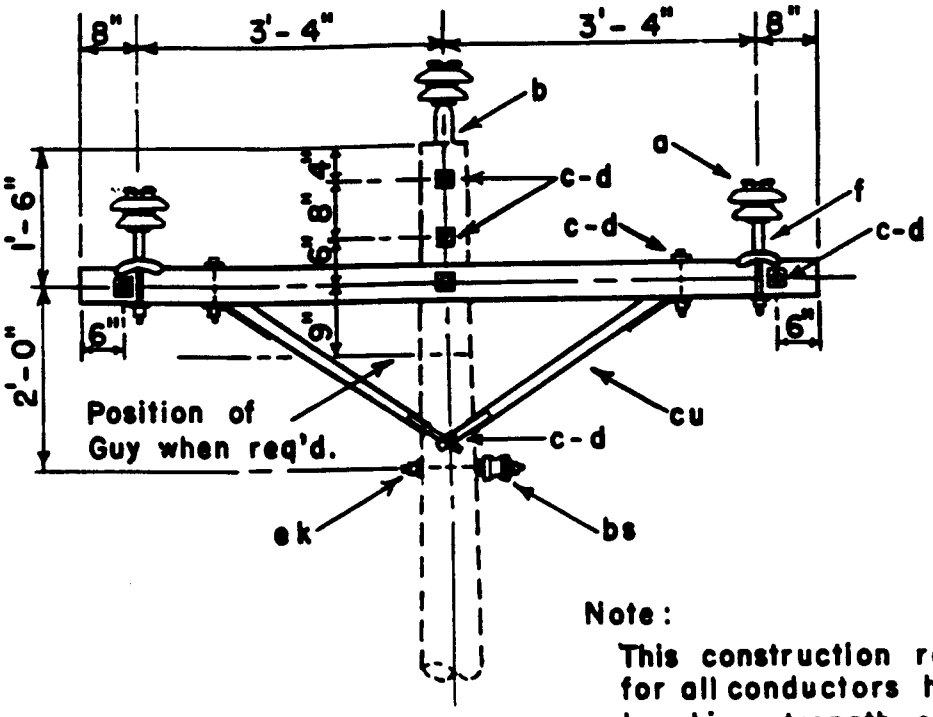
144/249 KV., 3-PHASE
CROSSARM CONSTRUCTION
DOUBLE PRIMARY SUPPORT AT 0° TO 5° ANGLE

Jan. 1, 1963

VCI-1, VCI-1A



PLAN



Note:

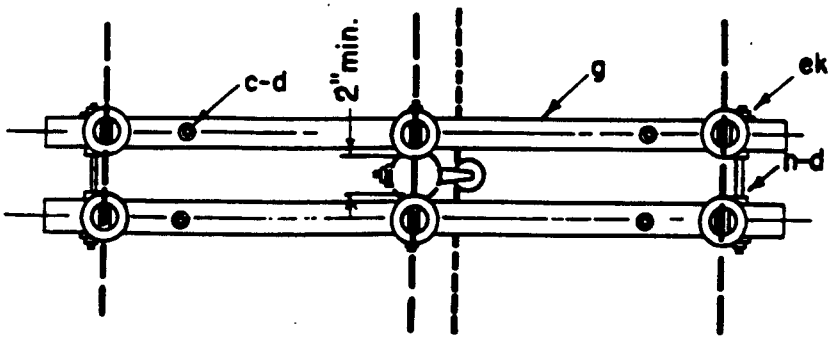
This construction required for all conductors having a breaking strength of more than 4500 pounds

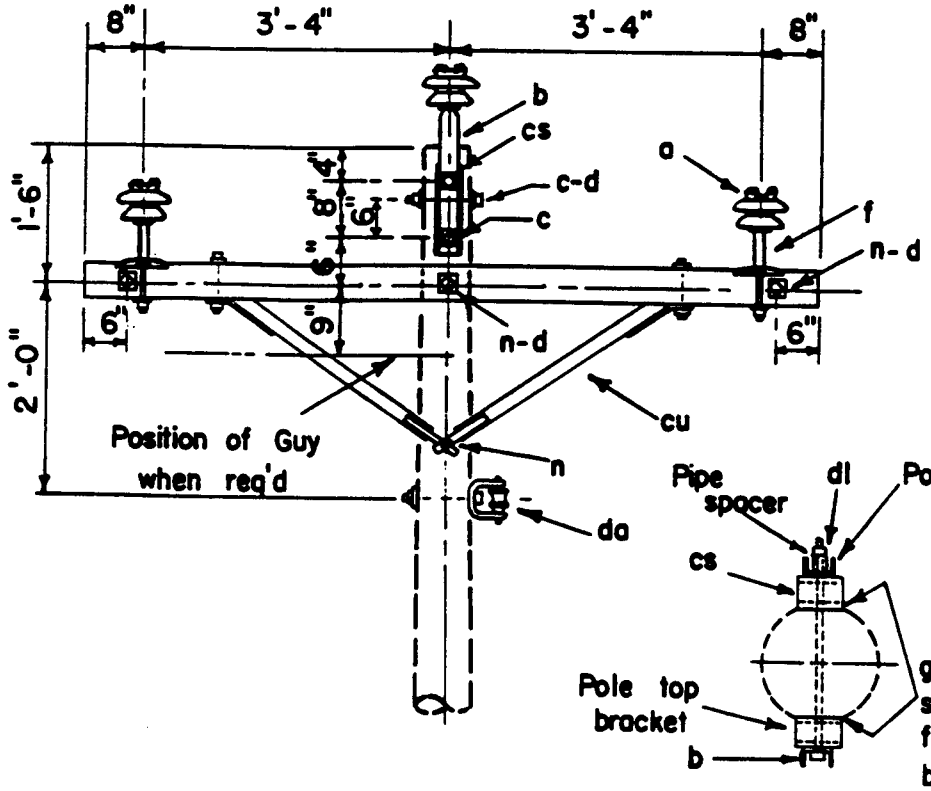
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	3	Insulator, pin type		f	2	Pin, crossarm, clamp type	
b	1	Pin, pole top, 20"		g	1	Crossarm, 3 3/4"x 4 3/4"x8'-0"	
c	2	Bolt, machine, 1/2"x req'd. length		bs	1	Bolt, single upset, insulated	
c	6	Bolt, machine, 5/8"x req'd. length		cu	1	Brace, wood, 60" span	
d	2	Washer, round, 1 3/8" dia.		ek		Locknuts	
d	10	Washer, square, 2 1/4"					

14.4 / 24.9 KV.
3-PHASE CROSSARM CONSTRUCTION- 0° TO 2° ANGLE
(LARGE CONDUCTORS)

Jan. 1, 1963

VC1-2





POLE TOP PIN ASSEMBLY

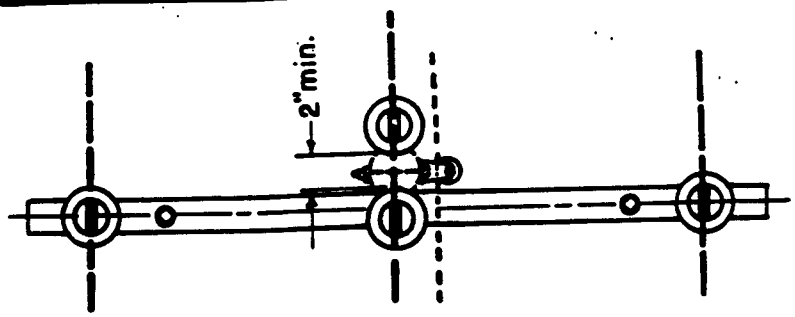
ITEM	NO.	MATERIAL
a	6	Insulator, pin type
b	2	Pin, pole top, 20"
c	4	Bolt, machine, 5/8" x req'd. length
c	4	Bolt, machine, 1/2" x req'd. length
d	13	Washer, square 2 1/4"
d	4	Washer, rd., 1 3/8" diam.
f	4	Pin, crossarm, steel, clamp type

ITEM	NO.	MATERIAL
g	2	Crossarm, 3 3/4" x 4 3/4" x 8'-0"
n	4	Bolt, double arming, 5/8" x req'd. length
cs	2	Pole top bracket
cu	2	Brace, wood, 60" span
da	1	Bracket, insulated
dl	2	Pipe spacer, 3/4" dia. x 1 1/2"
ek		Locknuts

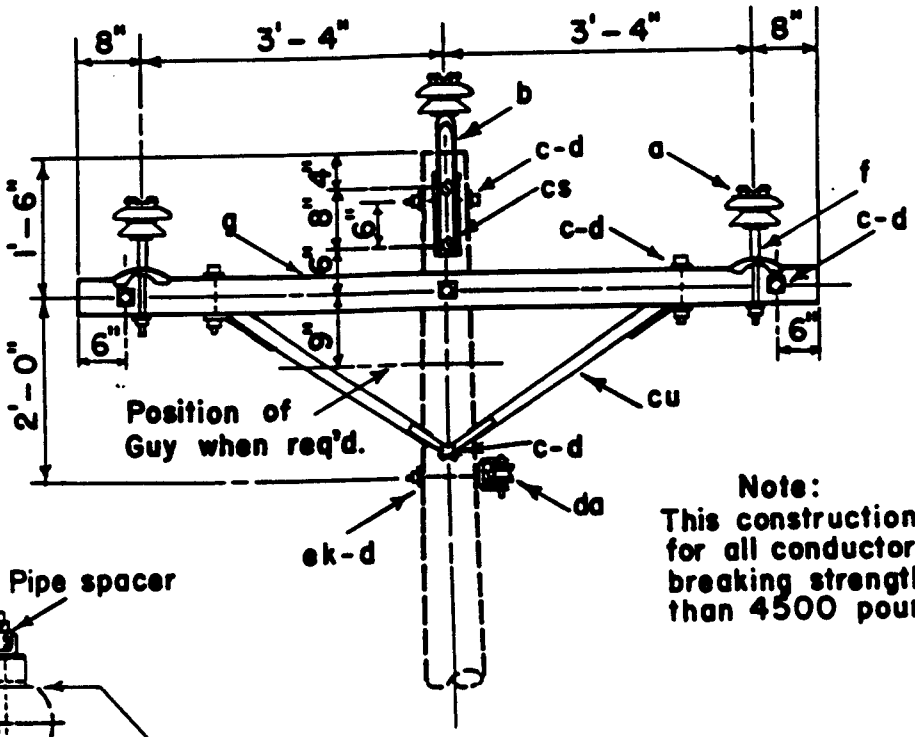
14.4/24.9 KV, 3- PHASE CROSSARM CONSTRUCTION-DOUBLE PRIMARY SUPPORT 0° TO 5° ANGLE (LARGE CONDUCTORS)

Jan. 1, 1963

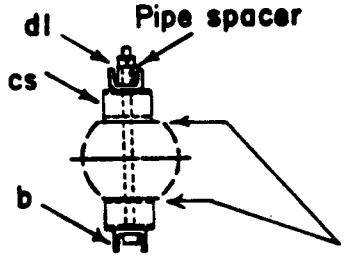
VC1-3



PLAN



Note:
This construction required for all conductors having a breaking strength of more than 4500 pounds.



POLE TOP PIN ASSEMBLY

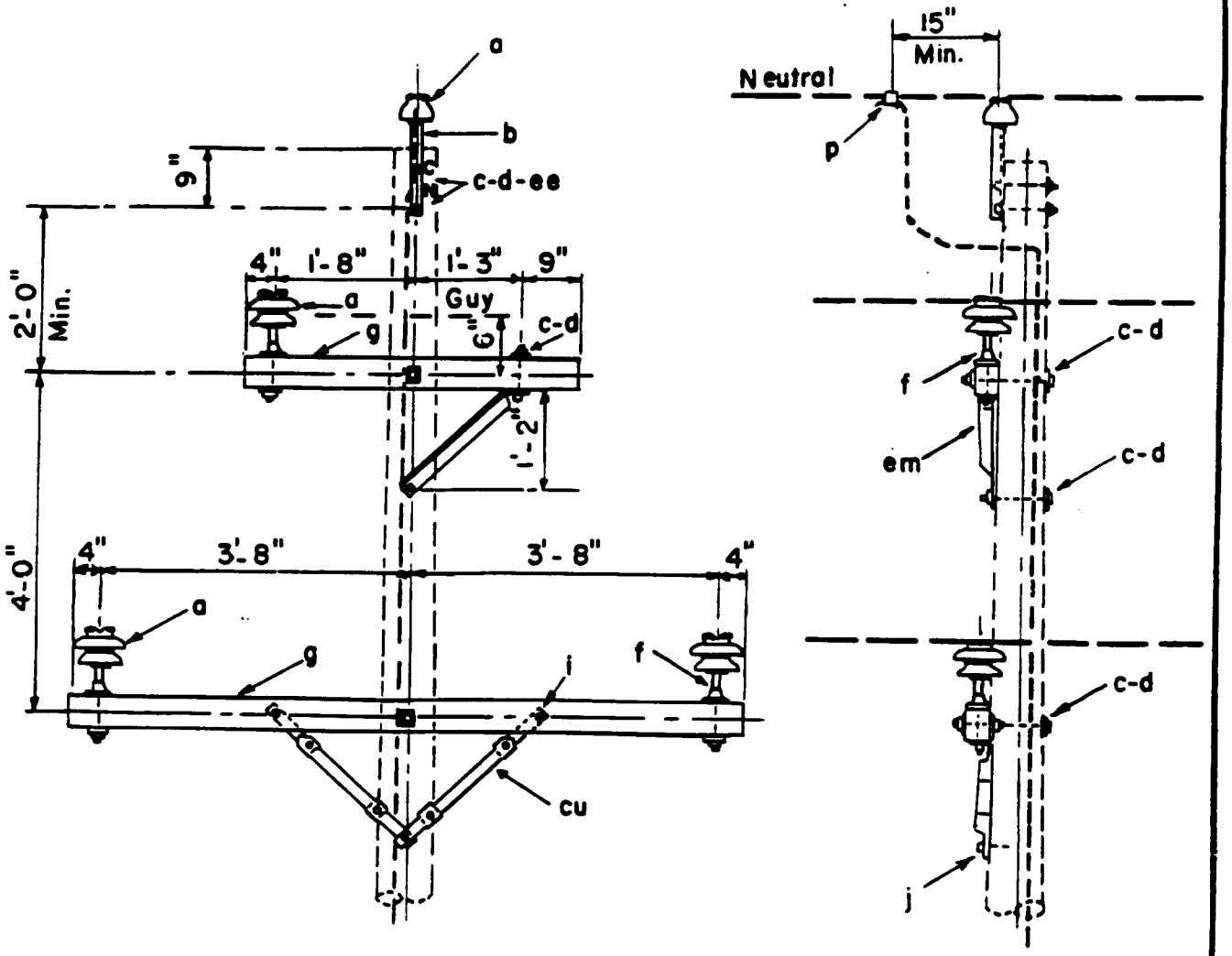
Note:
Pole to be gained on both sides to provide flat surfaces for brackets.

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	4	Insulator, pin type		f	2	Pin, crossarm, clamp type	
b	2	Pin, pole top, 20"		g	1	Crossarm, 3 3/4"x 4 3/4"x 8'-0"	
c	8	Bolt, machine, 5/8"x req'd. length		cu	1	Brace, wood, 60" span	
c	2	Bolt, machine, 1/2"x req'd. length		da	1	Bracket, insulated	
d	10	Washer, square, 2 1/4"		dl	2	Pipe spacer, 3/4" dia. x 1 1/2"	
d	2	Washer, round, 1 3/8" dia.		ek		Locknuts	
cs	2	Pole top bracket					

14.4 / 24.9 KV.
3-PHASE CROSSARM CONSTRUCTION-2° TO 5° ANGLE
(LARGE CONDUCTORS)

Jan. 1, 1963

VC1-4



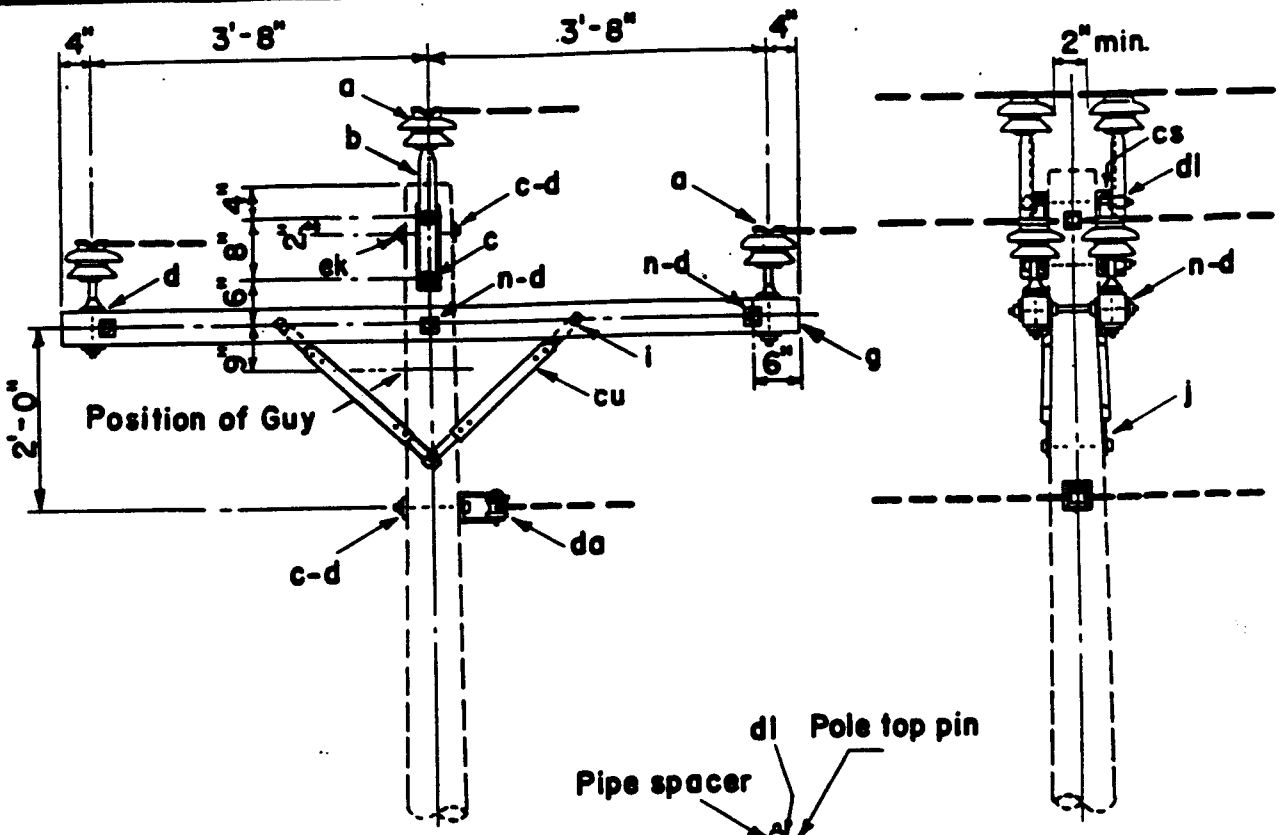
ITEM	NO.	MATERIAL
a	3	Insulator, pin type
e	1	Insulator, pin type, (7.2/12.5 KV)
b	1	Pin, pole top
c	6	Bolt, machine; 5/8" x req'd length
d	8	Washer, 2-1/4" square
f	3	Pin, crossarm, steel, 5/8" x 14"
g	1	Crossarm, 3-1/2" x 4-1/2" x 4'-0"

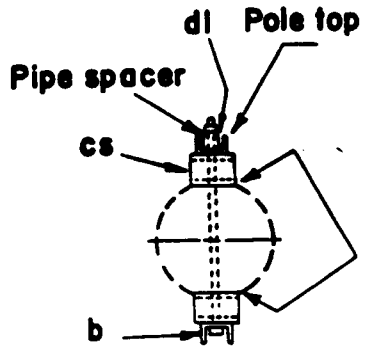
ITEM	NO.	MATERIAL
g	1	Crossarm, 3-1/2" x 4-1/2" x 8'-0"
i	2	Bolt, carriage, 3/8" x 4-1/2"
j	1	Screw, lag 1/2" x 4"
p		Connectors, as required
em	1	Brace, crossarm, special
cu	2	Brace, wood 28"
ee	4	Letters 2-"C", 2-"N" with 1" nolls

14.4/24.9 KV., SINGLE PRIMARY SUPPORT WITH OVERHEAD NEUTRAL

Jan. 1, 1963

VC1-5





Pole to be gained on both sides to provide flat surfaces for brackets.

POLE TOP PIN ASSEMBLY

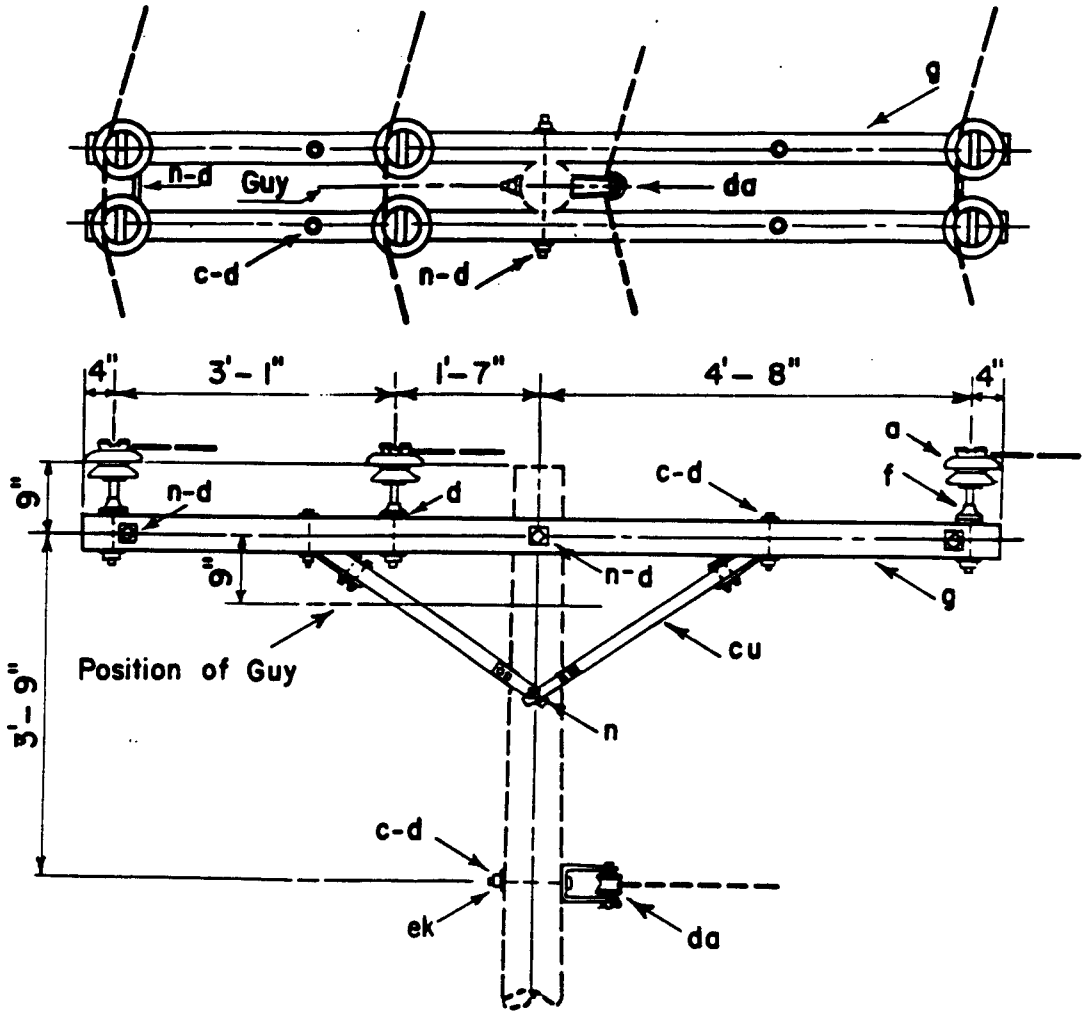
Note:
When the transverse load is more than 500 pounds per pin, substitute VC2-1 or VC2-2 as required.

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	6	Insulator, pin type		i	4	Bolt, carriage, 3/8" x 4 1/2"	
b	2	Pin, pole top, 20"		j	2	Screw, lag, 1/2" x 4"	
c	4	Bolt, machine, 5/8" x req'd length		n	3	Bolt, double arming, 5/8" x req'd length	
d	13	Washer, square 2 1/4"		cs	2	Pole top bracket	
d	4	Washer, square, 3"		da	1	Bracket, insulated	
f	4	Pin, crossarm, steel, 5/8" x 14"		dl	2	Pipe spacer, 3/4" dia. x 1 1/2"	
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"		ek		Locknuts	
cu	4	Brace, wood, 28"					

14.4/24.9 KV., 3-PHASE
CROSSARM CONSTR.-DOUBLE PRIMARY SUPPORT
MAX. TRANSVERSE LOADING 500 LBS./PIN
(5° TO 30° MAX. ANGLE)

Jan. 1, 1963

VC2



Notes:

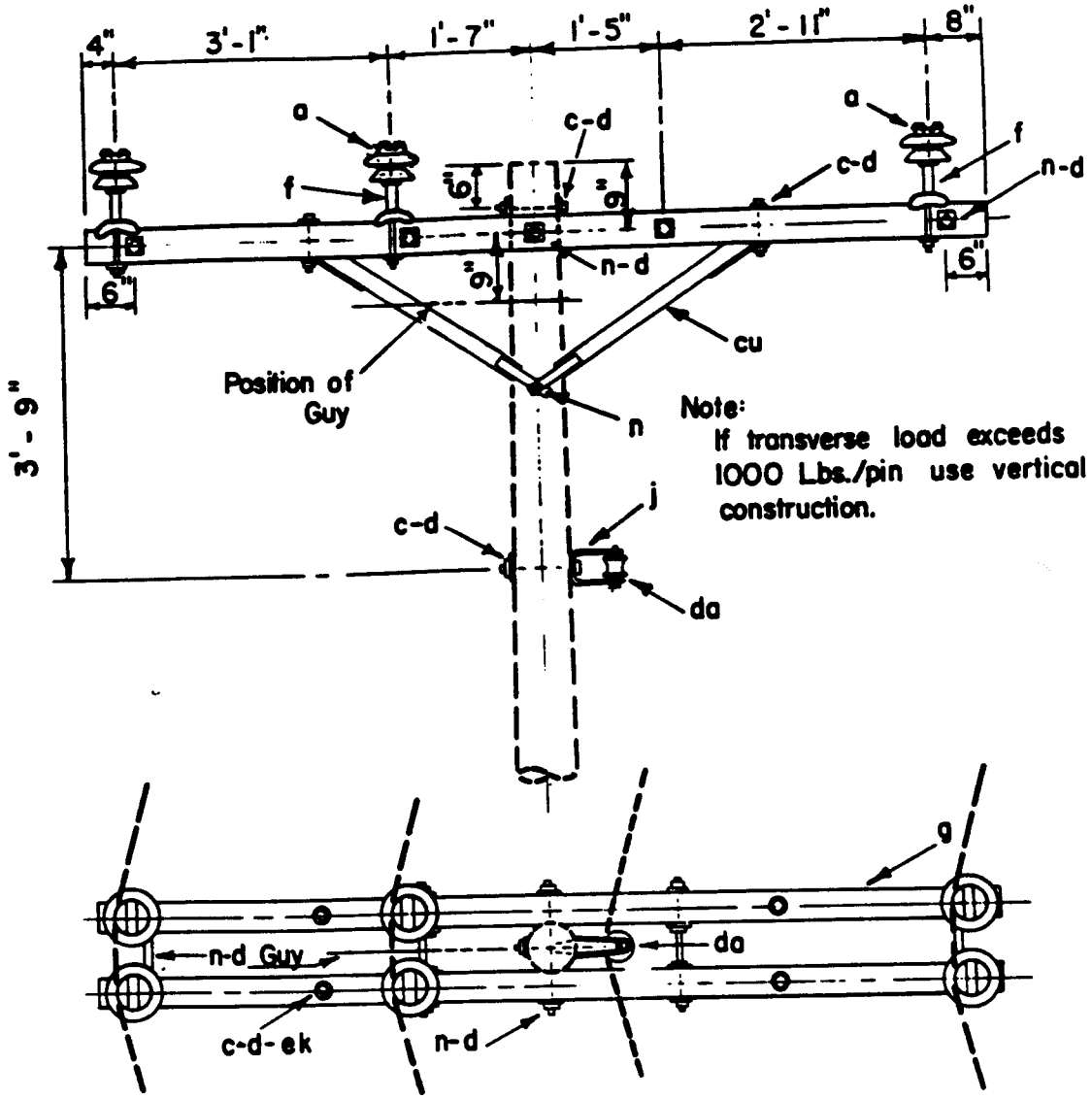
1. Center phase wire or neutral wire may be located on the opposite side of the pole where necessary to avoid crossing of wires in midspan.
2. Neutral may also be mounted on the crossarm.
3. When the transverse load is more than 750 pounds per pin, construction similar to VC2-2 should be used.

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	6	Insulator, pin type		f	6	Pin, crossarm, steel, 5/8"x 14"	
c	1	Bolt, machine, 5/8"x req'd. length		g	2	Crossarm, 3 3/4"x 4 3/4"x 10'-0"	
c	4	Bolt, machine, 1/2" x req'd. length		n	4	Bolt, double arming, 5/8"x req'd. l'gth.	
d	11	Washer, square, 2 1/4"		cu	2	Brace, wood, 60" span	
d	4	Washer, round, 1 3/8" dia.		da	1	Bracket, insulated	
d	6	Washer, square, 3"		ek		Locknuts	

14.4/24.9 KV. 3 PHASE
CROSSARM CONSTR. DOUBLE PRIMARY SUPPORT
MAX. TRANSVERSE LOADING 750 LBS/PIN
5° TO 30° MAX. ANGLE

Jan. 1, 1963

VC2-1



PLAN

Notes:

1. Side groove of insulator must always be larger than the overall diameter of conductor including armor rods when required.
2. Center phase wire or neutral wire may be located on the opposite side of the pole where necessary to avoid crossing of wires in midspan.
3. This construction required for all conductors having a breaking strength of more than 4,500 pounds.

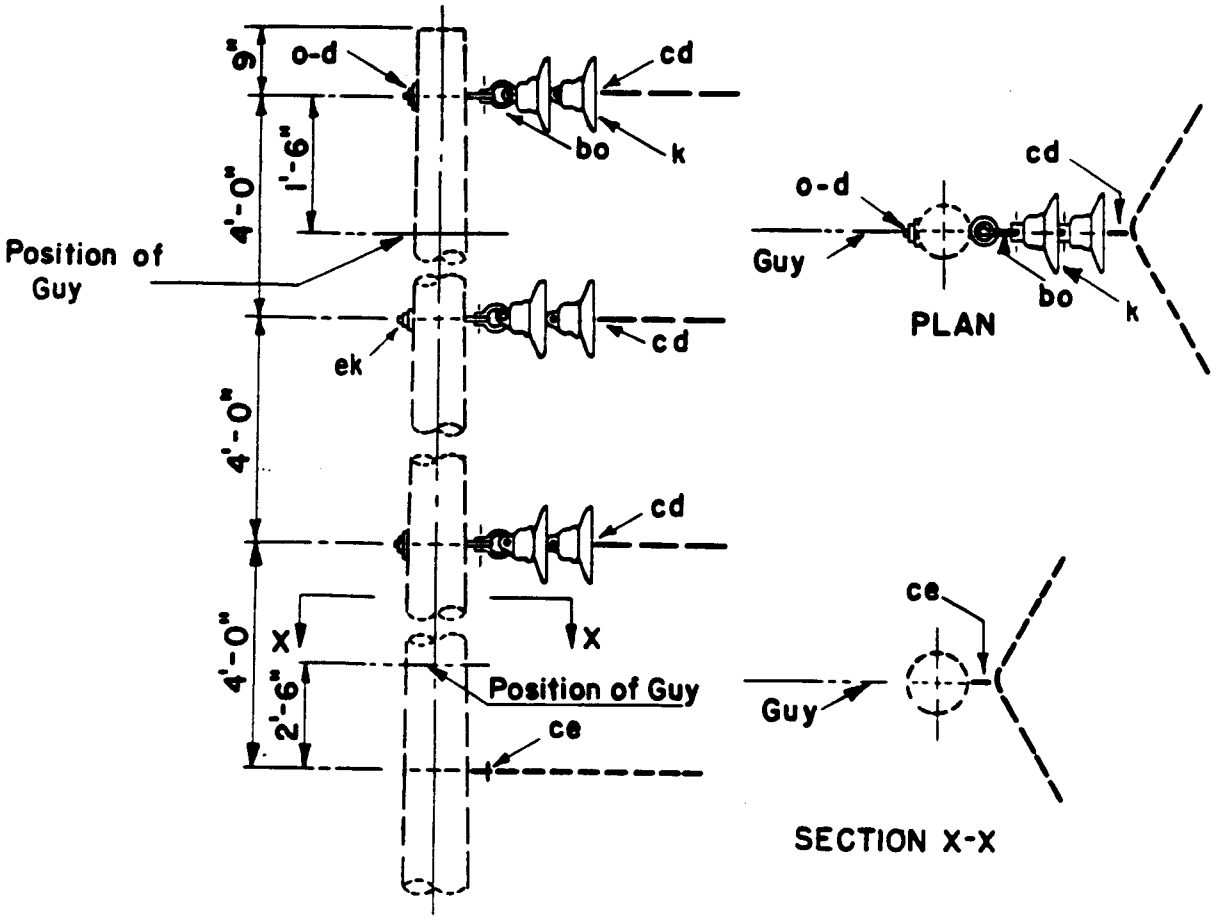
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	6	Insulator, pin type		g	2	Crossarm, 3 3/4" x 4 3/4" x 10'-0"	
c	2	Bolt, machine, 5/8" x req'd. length		j	2	Screw, lag, 1/2" x 4"	
c	4	Bolt, machine, 1/2" x req'd. length		n	6	Bolt, double arming, 5/8" x req'd. length	
d	21	Washer, square 2 1/4"		cu	2	Brace, wood, 60" span	
d	4	Washer, rd., 1 3/8" diam.		da	1	Bracket, insulated	
f	6	Pin, crossarm, steel, clamp type		ek		Locknuts	

14.4/24.9 KV, 3- PHASE
CROSSARM CONSTRUCTION- DOUBLE PRIMARY SUPPORT
(LARGE CONDUCTORS)
MAXIMUM TRANSVERSE LOADING— 1000 LBS. / PIN

5° TO 30° MAX. ANGLE

Jan. 1, 1963

VC2-2

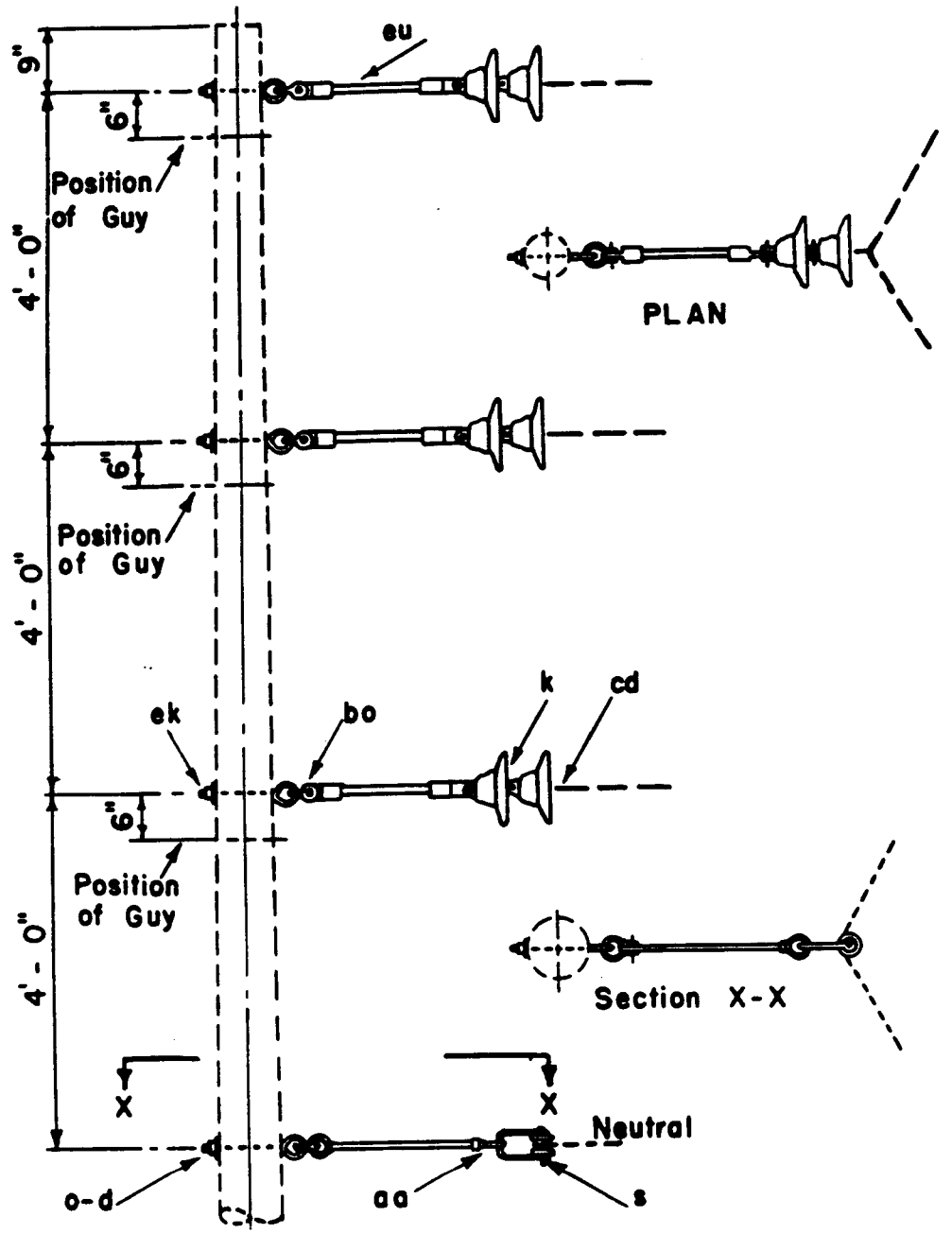


ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
				bo	3	Shackle, anchor	
d	3	Washer, square 2 1/4"		cd	3	Angle assembly, primary	
k	6	Insulator, suspension, 10"		ce	1	Angle assembly, neutral	
o	3	Bolt, eye, 5/8" x req'd length		ek		Locknuts	

14.4/24.9 KV. PRIMARY, 3-PHASE VERTICAL CONSTRUCTION - 30° TO 60° ANGLE

Jan. 1, 1963

VC3

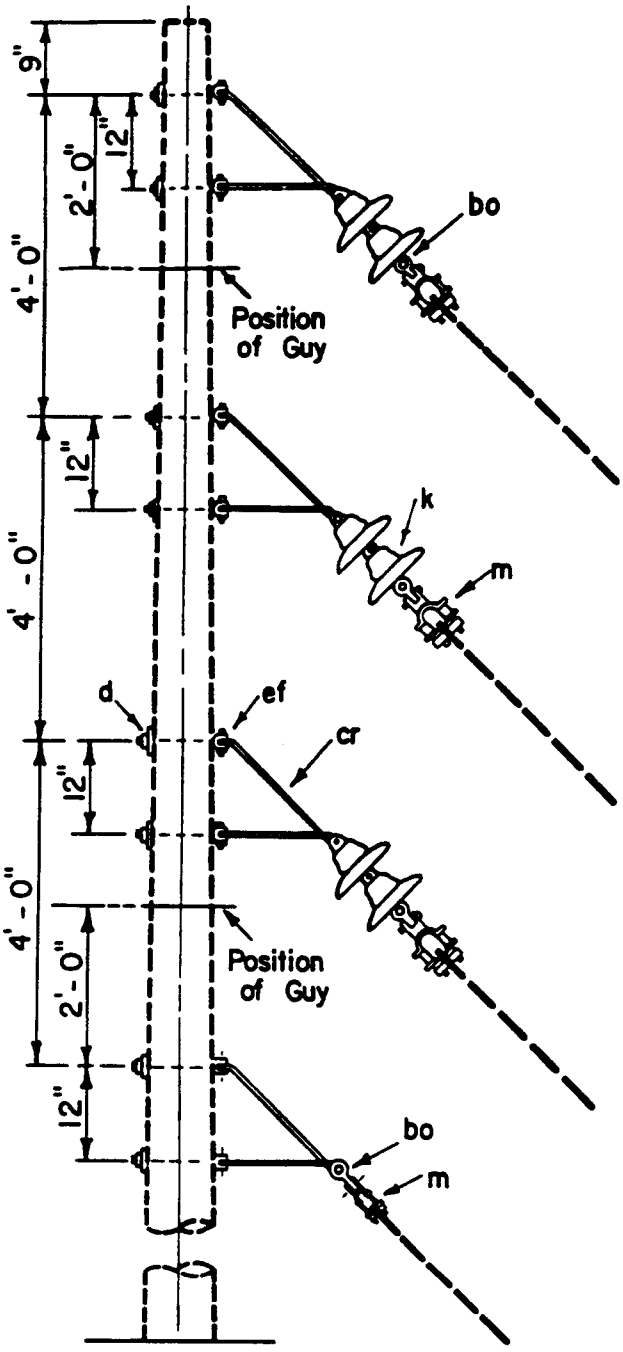


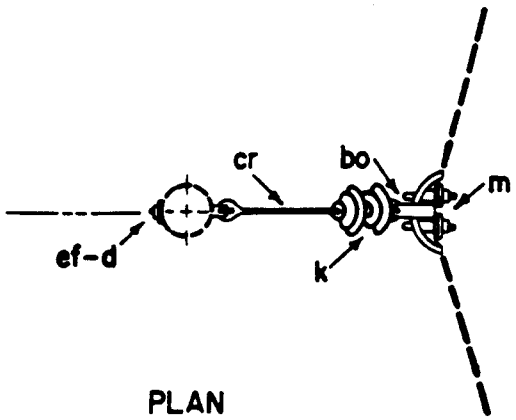
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
d	4	Washer, square, 2 1/4"		bo	4	Shackle, anchor	
k	6	Insulator, suspension, 10"		cd	3	Angle assembly, primary	
o	5	Bolt, eye, 5/8" x required length		ek		Locknuts	
s	1	Clevis, secondary, swinging, insulated		eu	3	Link, extension, insulated	
aa	1	Nut, eye, 5/8"					

14.4/24.9 KV - THREE PHASE VERTICAL CONSTRUCTION, 30° TO 60° ANGLE LARGE CONDUCTORS

Jan. 1, 1963

VC3 L





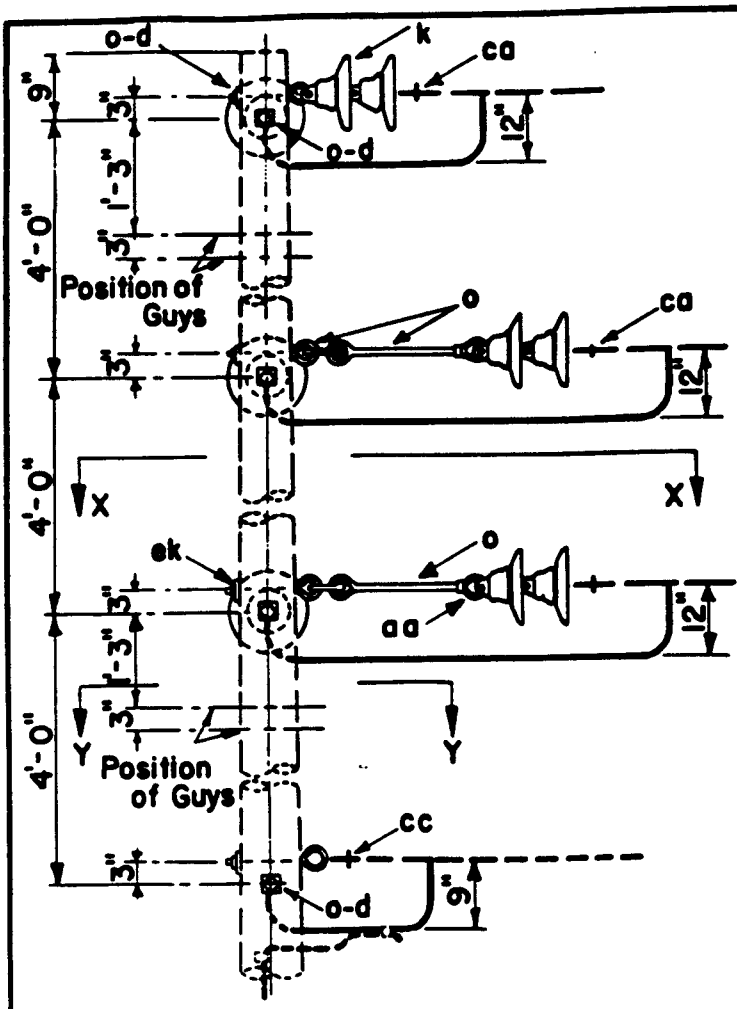
PLAN

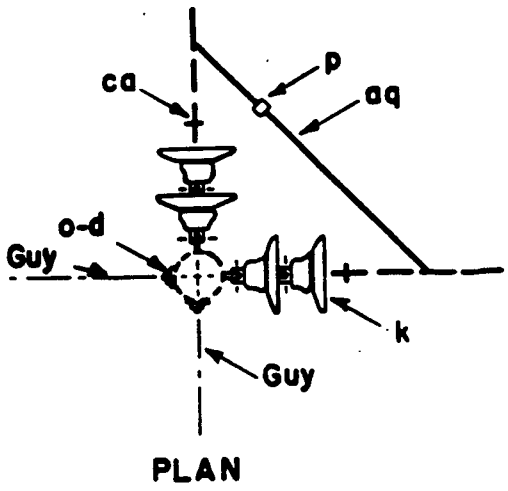
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
d	8	Washer, square, 2 1/4"		cr	4	Bracket, angle, 5/8"	
k	6	Insulator, suspension, 10"		ef	8	Bolt, clevis, 5/8" x req'd. length	
m	4	Clamp, suspension		ek		Locknuts	
bo	4	Shackle, anchor					

14.4/24.9 KV
VERTICAL CONSTRUCTION 10° TO 20° ANGLE
(LARGE CONDUCTORS)

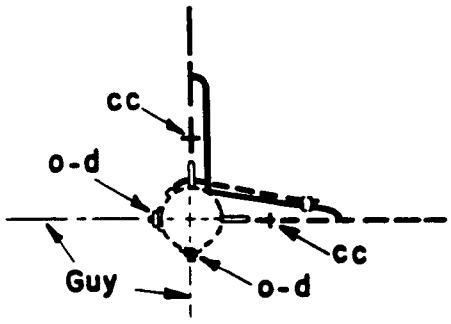
Jan. 1, 1963

VC3-1

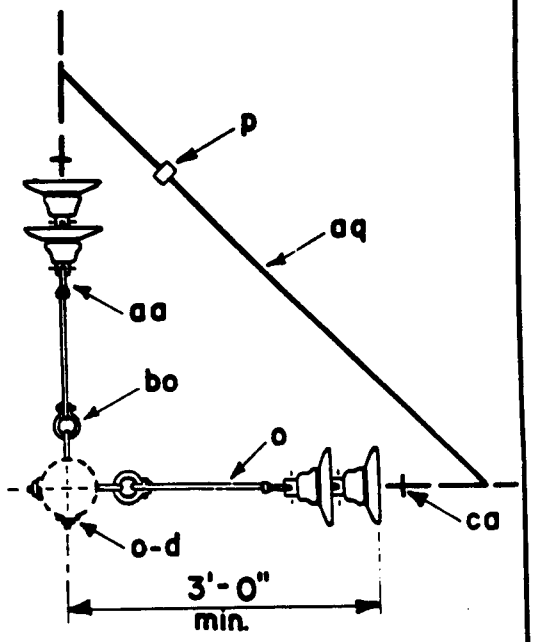




PLAN



SECTION Y-Y



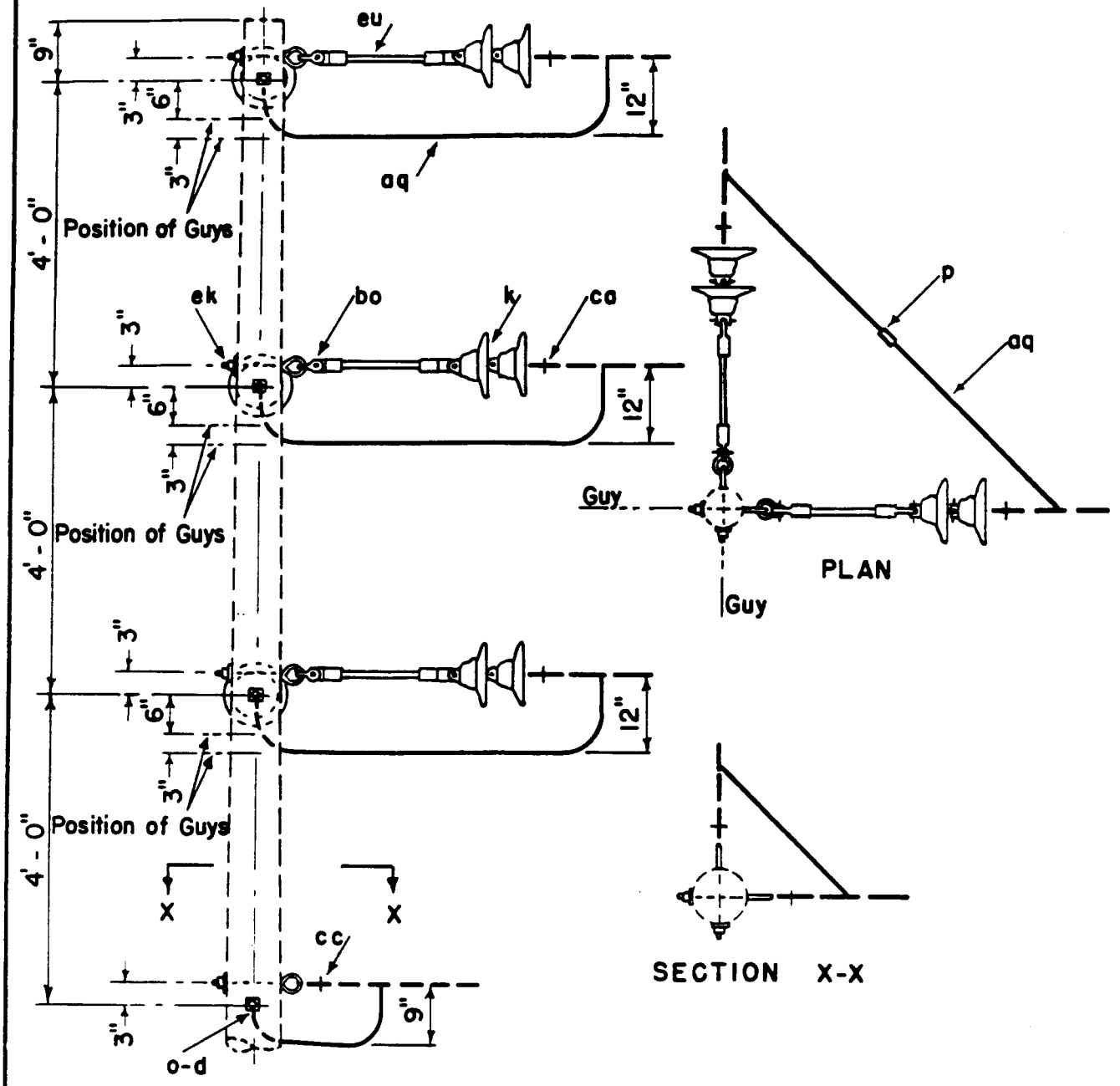
SECTION X-X

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
d	8	Washer, square 2 1/4"		bo	4	Shackle, anchor	
k	12	Insulator, suspension, 10"		ca	6	Deadend assembly, primary	
o	12	Bolt, eye, 5/8" x req'd length		cc	2	Deadend assembly, neutral	
p		Connectors, as required		ek		Locknut	
aa	4	Nut, eye, 5/8"					
aq		Jumpers, as required					

14.4/24.9 KV., 3-PHASE VERTICAL CONSTRUCTION - 60° TO 90° ANGLE

Jan. 1, 1963

VC4-1

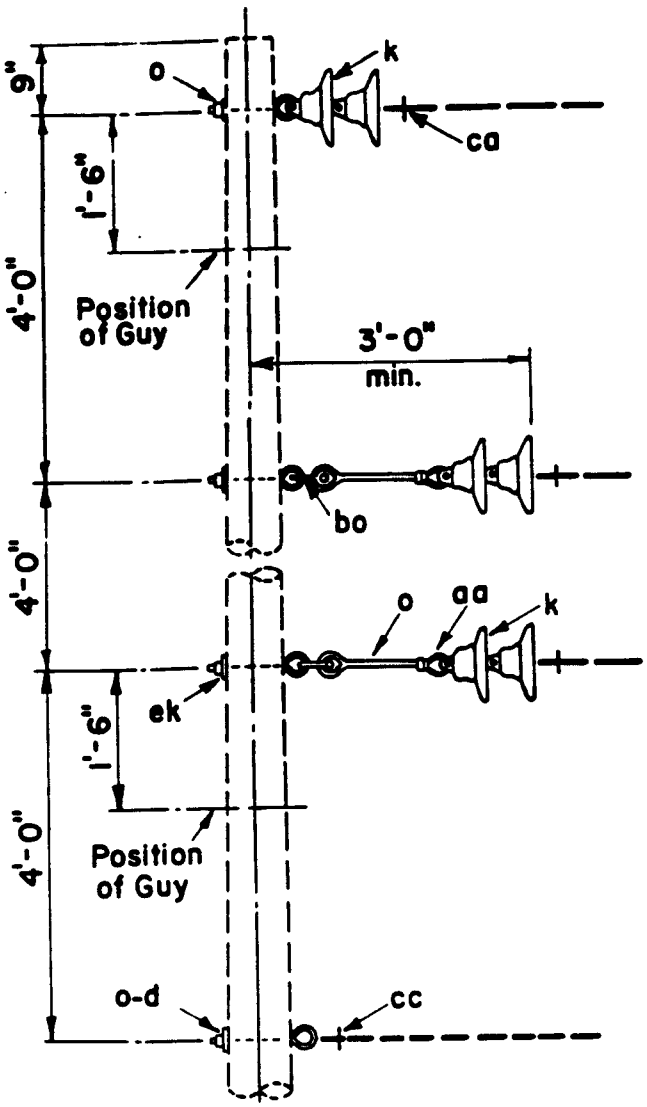


ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
d	8	Washer, Square, 2 1/4"		ca	6	Deadend assembly, primary	
k	12	Insulator, suspension, 10"		cc	2	Deadend assembly, neutral	
o	8	Bolt, eye, 5/8" x required length		ek		Locknuts	
p		Connectors, as required		eu	6	Link, extension, insulated	
aq		Jumpers, as required					
bo	6	Shackle, anchor					

14.4/24.9 KV - THREE PHASE VERTICAL CONSTRUCTION, 60° To 90° ANGLE LARGE CONDUCTORS

Jan. 1, 1963

VC4 - 1L

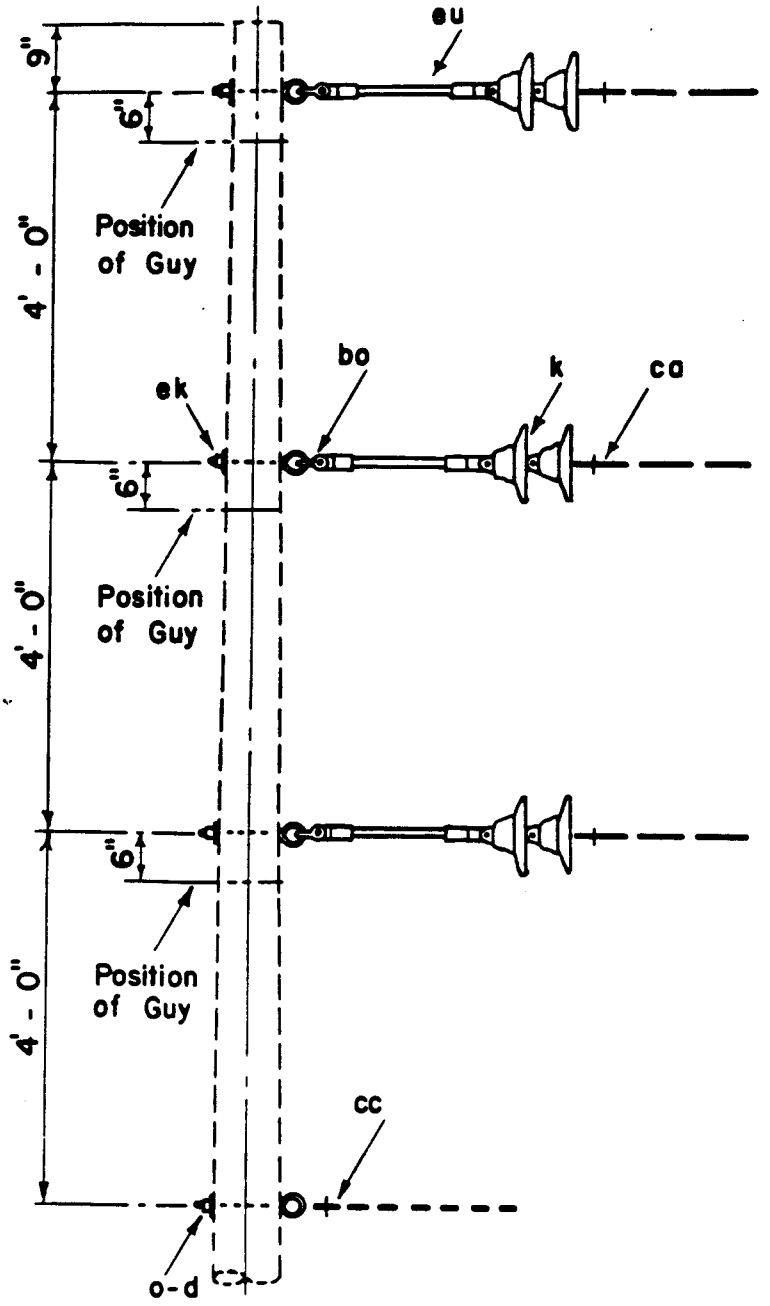


ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
d	4	Washer, square 2 1/4"		ca	3	Deadend assembly, primary	
k	6	Insulator, suspension, 10"		cc	1	Deadend assembly, neutral	
o	6	Bolt, eye, 5/8" x req'd length		ek		Locknuts	
aa	2	Nut, eye, 5/8"					
bo	2	Shackle, anchor					

14.4/24.9 KV., 3-PHASE
VERTICAL CONSTRUCTION-DEADEND (SINGLE)

Jan. 1, 1963

VC5-1

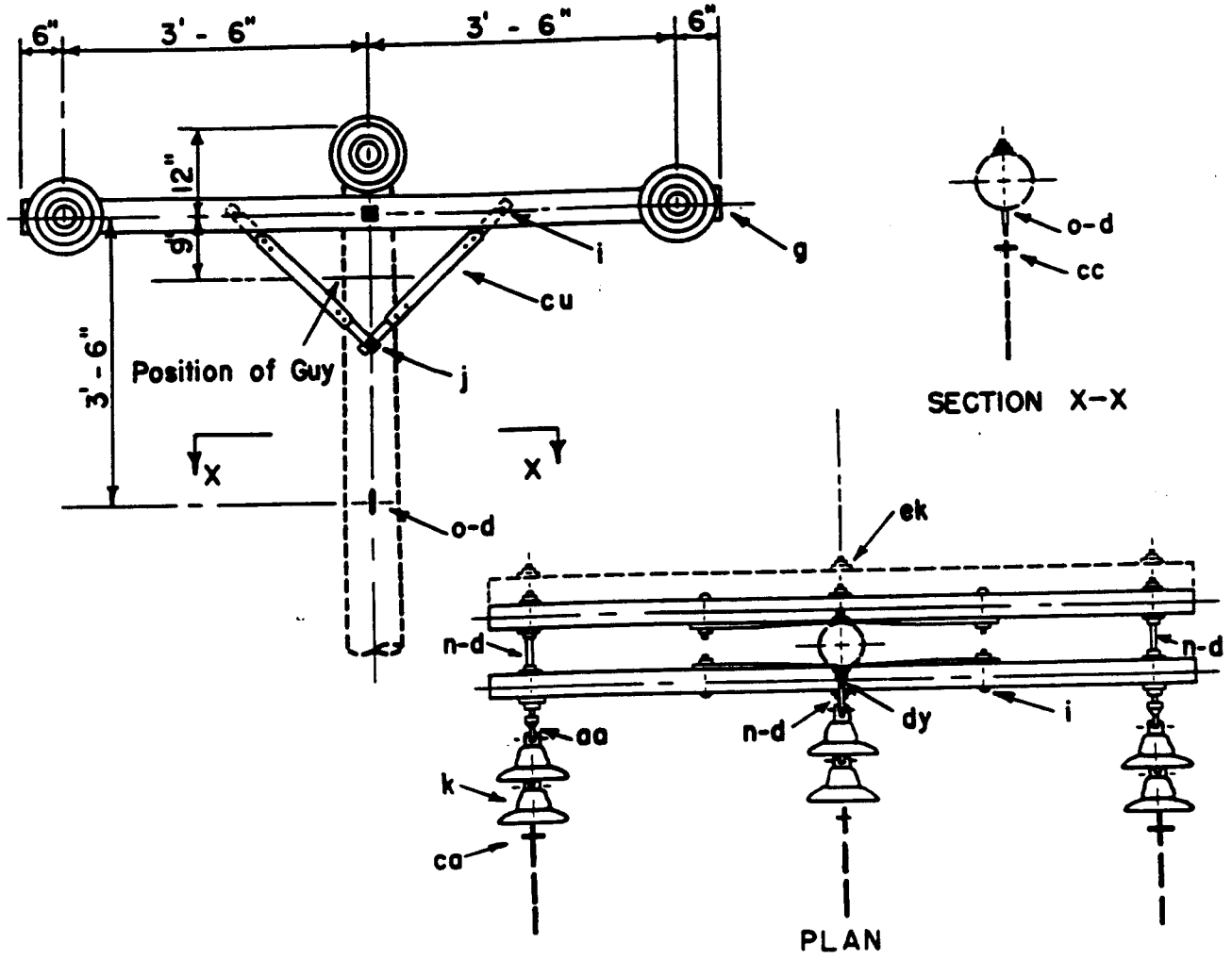


ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
d	4	Washer, square, 2 1/4"		cc	1	Deadend assembly, neutral	
k	6	Insulator, suspension, 10"		ek		Locknuts	
o	4	Bolt, eye, 5/8" x required length		eu	3	Link, extension, insulated	
bo	3	Shackle, anchor					
ca	3	Deadend assembly, primary					

14.4/24.9 KV - THREE PHASE VERTICAL CONSTRUCTION, DEADEND (SINGLE) LARGE CONDUCTORS

Jan. 1, 1963

VC5-1L



Notes:

1. See drawing VE5-1 for crossarm loading limitations.
2. Designate as VC7-1 for assembly with three crossarms.

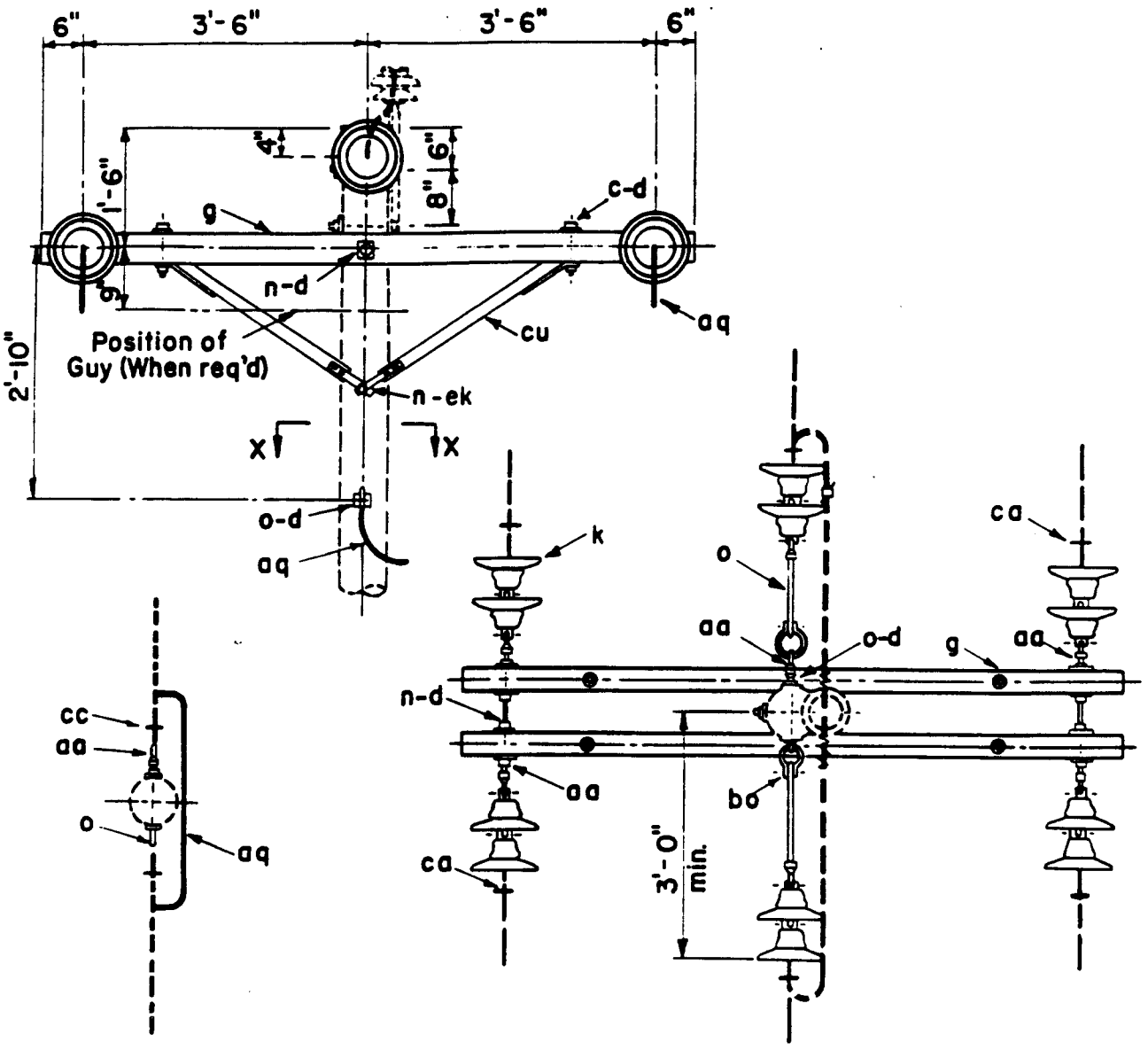
ITEM	NO.	MATERIAL
d	13	Washer, square, 2 1/4"
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"
cu	4	Brace, wood, 28"
i	4	Bolt, carriage, 3/8" x 4 1/2"
j	2	Screw, lag, 1/2" x 4"
k	6	Insulator, suspension, 10"
dy	1	Bolt, eye, double arming 5/8"

ITEM	NO.	MATERIAL
n	3	Bolt, double arming, 5/8" x req'd. length
o	1	Bolt, eye, 5/8" x req'd. length
aa	2	Nut, eye, 5/8"
ca	3	Deadend assembly, primary
cc	1	Deadend assembly, neutral
ek		Locknuts

14.4/24.9 KV, 3- PHASE CROSSARM CONSTRUCTION- DEADEND (SINGLE)

Jan.1, 1963

VC7, VC7-1



SECTION X-X

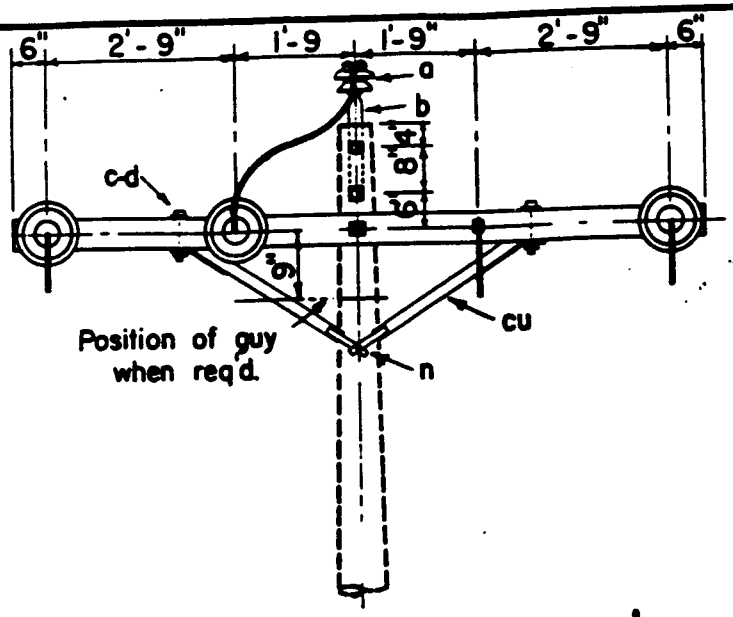
PLAN

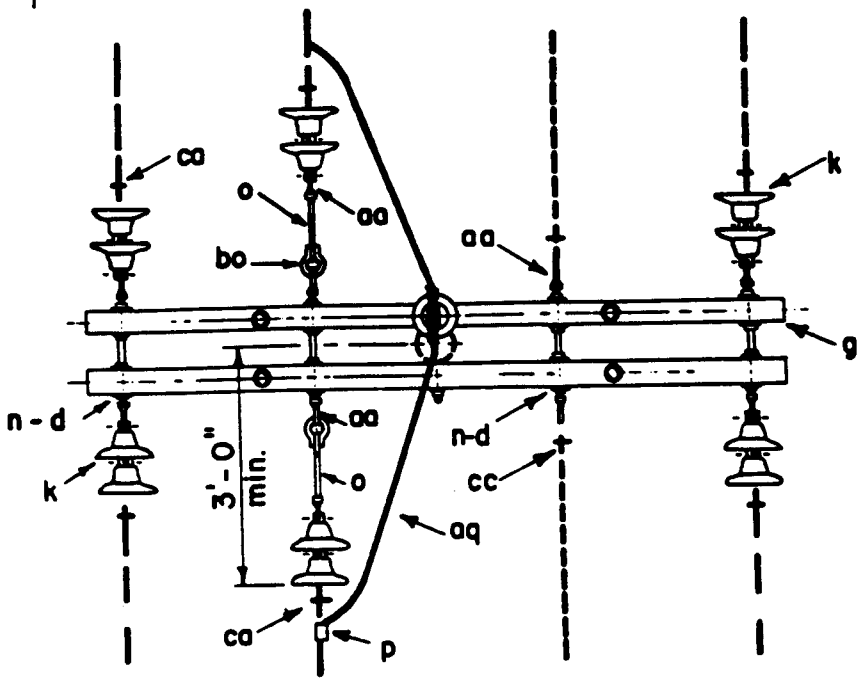
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
				p		Connectors, as required	
c	4	Bolt, machine, 1/2" x req'd length		aa	8	Nut, eye, 5/8"	
d	14	Washer, square 2 1/4"		aq		Jumpers and leads as required	
d	4	Washer, round, 1 3/8" diam.		bo	2	Shackle, anchor	
				ca	6	Deadend assembly, primary	
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"		cc	2	Deadend assembly, neutral	
k	12	Insulator, suspension, 10"		cu	2	Brace, wood, 60" span	
n	4	Bolt, double arming, 5/8" x req'd length		ek		Locknuts	
o	4	Bolt, eye, 5/8" x req'd length					

14.4/24.9 KV., 3-PHASE
CROSSARM CONSTRUCTION-DEADEND (DOUBLE)

Jan. 1, 1963

VC8



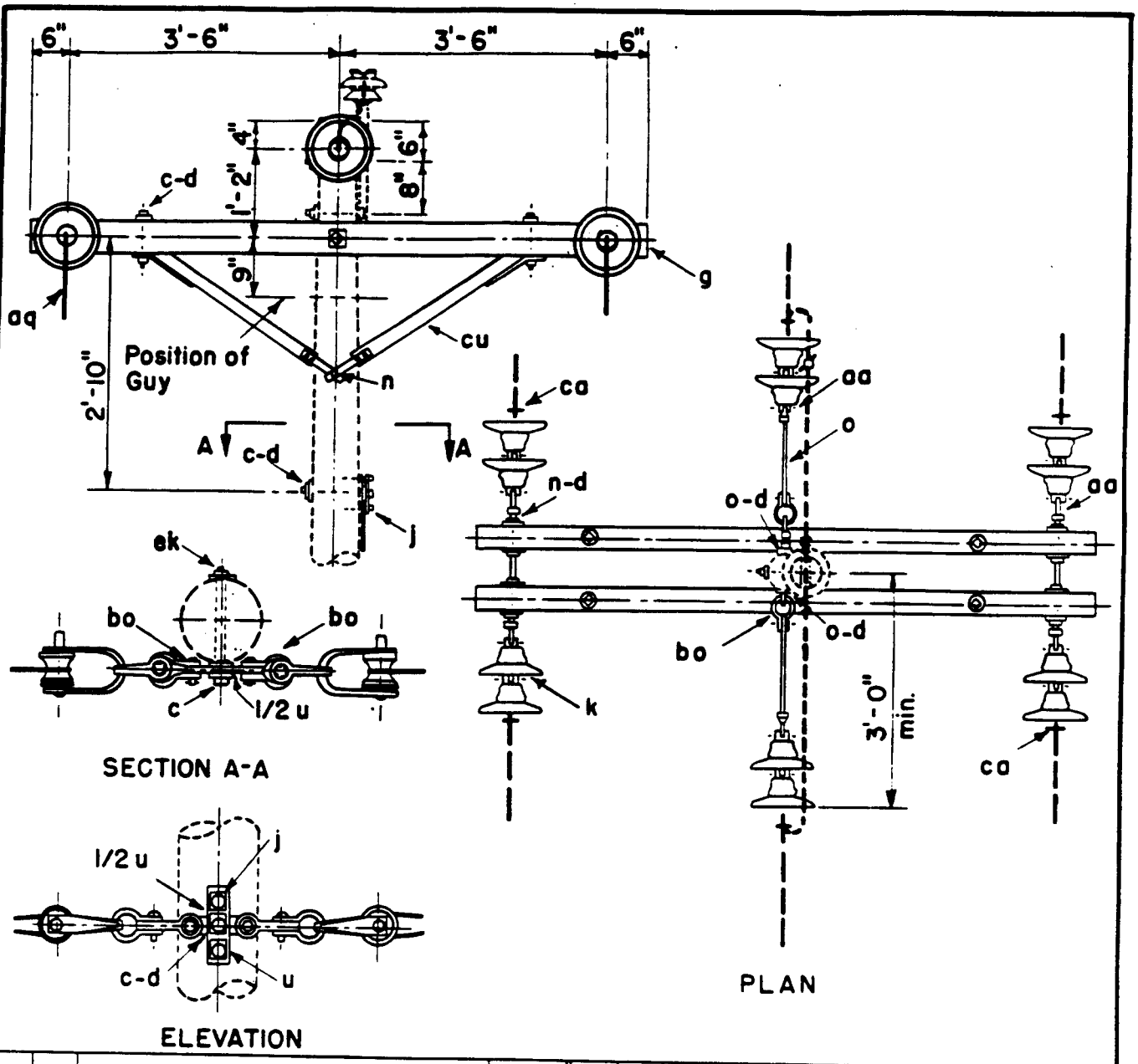


ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	1	Insulator, pin type		o	2	Bolt, eye, 5/8" x req'd. length	
c	2	Bolt, machine, 5/8" x req'd. length		p		Connectors, as req'd.	
c	4	Bolt, machine, 1/2" x req'd. length		aa	10	Nut, eye, 5/8"	
d	4	Washer, round, 1 3/8" dia.		aq		Jumpers or leads as required	
d	20	Washer, square, 2 1/4"		bo	2	Shackle, anchor	
b	1	Pin, pole top, 20"		ca	6	Deadend assembly, primary	
g	2	Crossarm, 3 3/4" x 4 3/4" x 10'-0"		cc	2	Deadend assembly, neutral	
k	12	Insulator, suspension, 10"		cu	2	Brace, crossarm, wood, 60" span	
n	6	Bolt, double arming, 5/8" x req'd. length		ek		Locknuts	

14.4/24.9 KV, 3- PHASE CROSSARM CONSTRUCTION- DEADEND (DOUBLE)

Jan. 1, 1963

VC8-1



SECTION A-A

ELEVATION

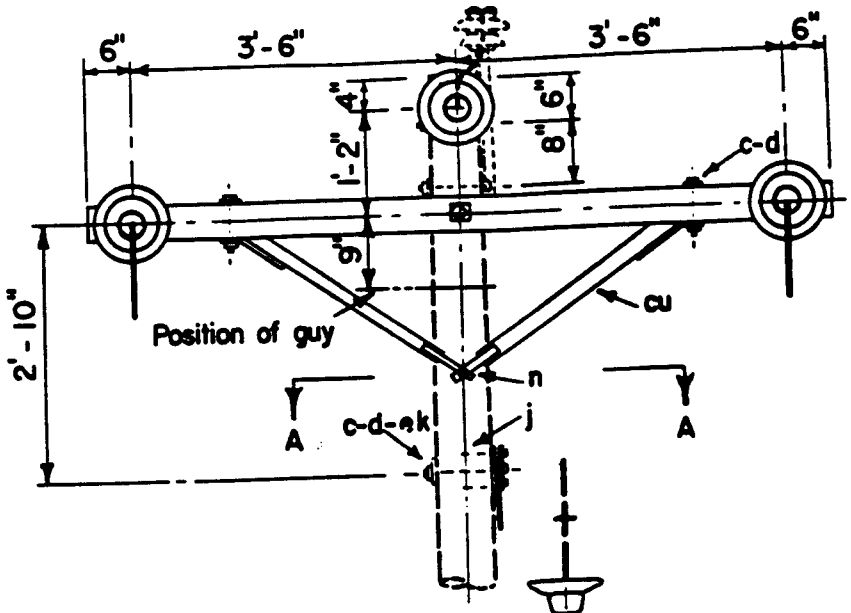
PLAN

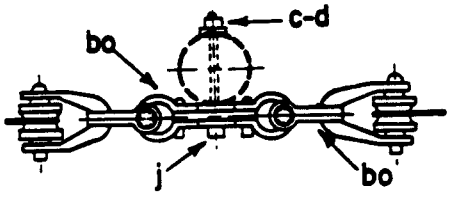
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
c	1	Bolt, machine, 5/8" x req'd length		u	1 1/2	Clamp, guy, 6" - heavy duty	
c	4	Bolt, machine, 1/2" x req'd length		aa	7	Nut, eye, 5/8"	
d	13	Washer, square, 2 1/4"		aq		Jumpers, as required	
d	4	Washer, round, 1 3/8" dia.		bo	6	Shackle, anchor	
g	2	Crossarm, 3 3/4" x 4 3/4" x 8'-0"		ca	6	Deadend assembly, primary	
j	2	Screw, lag, 1/2" x 4"		cc	2	Deadend assembly, neutral	
k	12	Insulator, suspension, 10"		cu	2	Brace, wood, 60" span	
n	4	Bolt, double arming, 5/8" x req'd length		ek		Locknuts	
o	3	Bolt, eye, 5/8" x req'd length					
p		Connectors, as required					

14.4/24.9 KV., 3-PHASE CROSSARM CONSTRUCTION-DEADEND (DOUBLE) (LARGE CONDUCTORS)

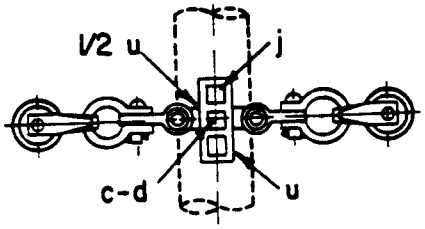
Jan. 1, 1963

VC8-2

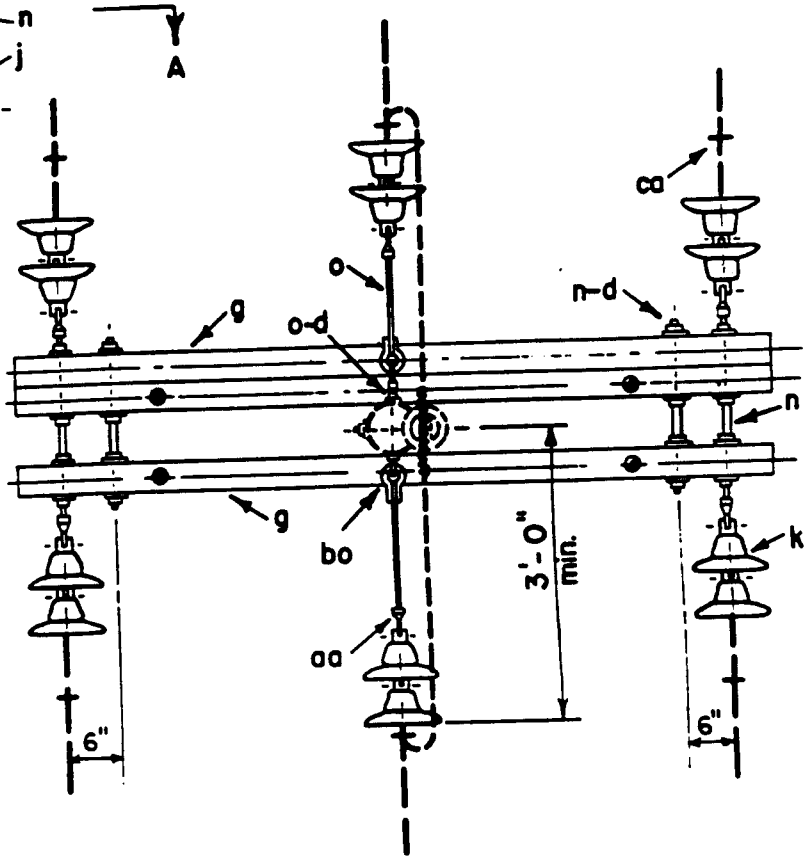




SECTION A-A



ELEVATION



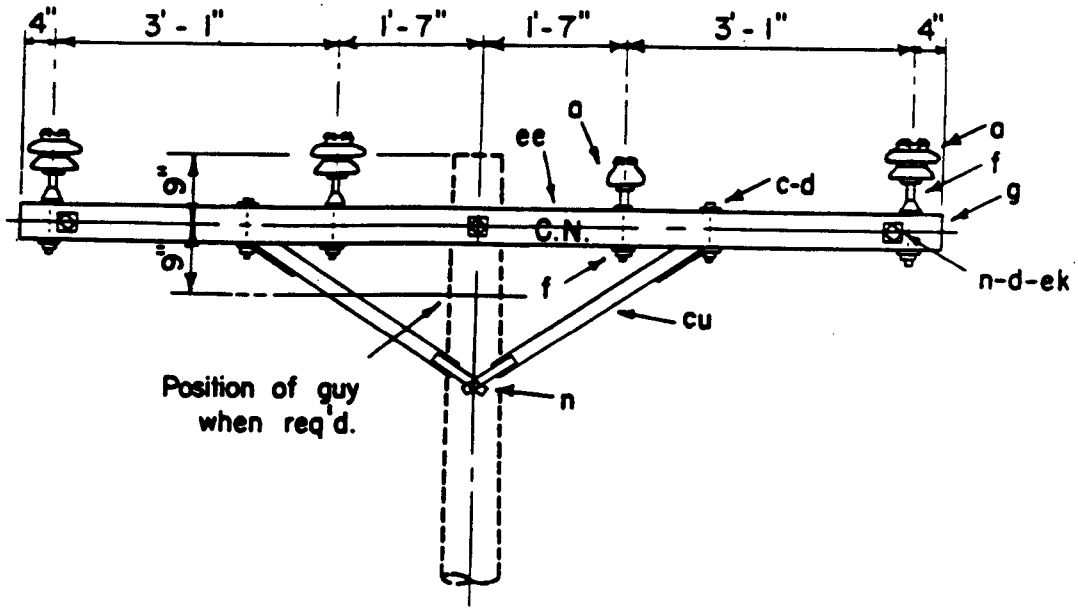
PLAN

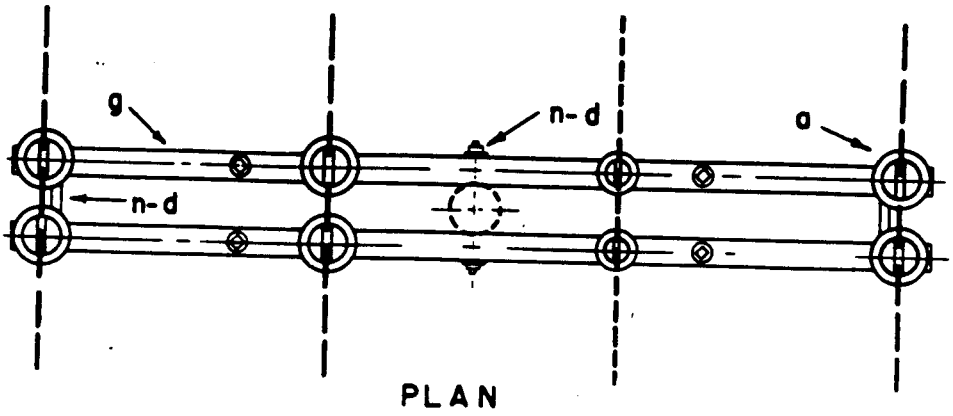
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
c	1	Bolt, machine, 5/8" x req'd. length	u	1 1/2	Clamp, guy, 6" heavy duty
c	4	Bolt, machine, 1/2" x req'd. length	aa	7	Nut, eye, 5/8"
d	21	Washer, square, 2 1/4"	ag		Jumpers, as req'd.
d	4	Washer, round, 1 3/8"	bo	6	Shackle, anchor
g	3	Crossarm, 3 3/4" x 4 3/4" x 8'-0"	ca	6	Deadend assembly, primary
j	2	Screw, lag, 1/2" x 4"	cc	6	Deadend assembly, neutral
k	12	Insulator, suspension, 10"	cu	2	Brace, wood, 60" span
n	6	Bolt, double arming, 5/8" x req'd. length	ek		Locknuts
o	3	Bolt, eye, 5/8" x req'd. length			
p		Connectors, as req'd.			

14.4/24.9 KV, 3-PHASE
CROSSARM CONSTRUCTION- DEADEND (DOUBLE)
LARGE CONDUCTORS WITH UNBALANCED LOADS

Jan. 1, 1963

VC8-3





PLAN

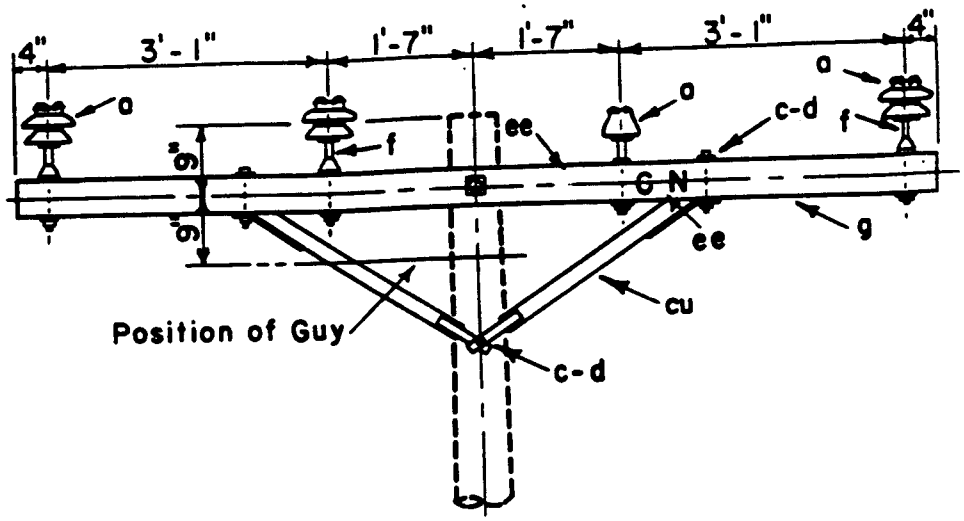
ITEM	NO.	MATERIAL
a	2	Insulator, pin type, 12.5 Kv.
a	6	Insulator, pin type
c	4	Bolt, machine, 1/2" x req'd. length
d	10	Washer, square, 2 1/4"
d	4	Washer, round, 1 3/8" dia.
f	6	Pin, crossarm, steel, 5/8" x 14"
f	2	Pin, crossarm, steel, 5/8" x 10 3/4"

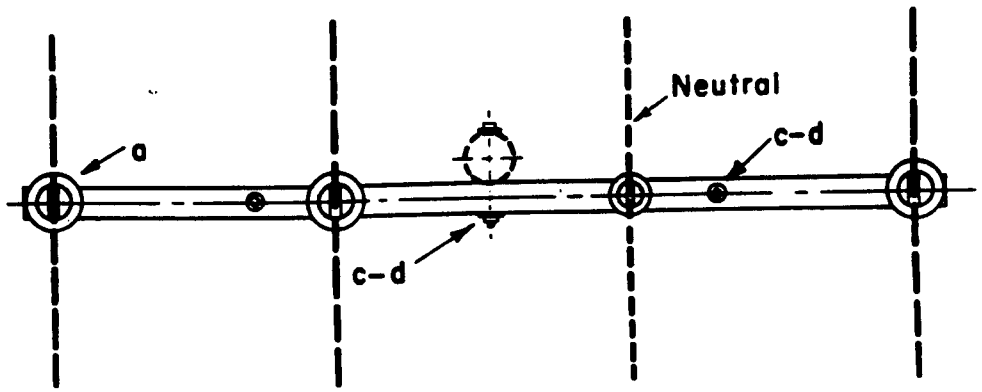
ITEM	NO.	MATERIAL
g	2	Crossarm, 3 3/4" x 4 3/4" x 10'-0"
n	4	Bolt, double arming, 5/8" x req'd. length
cu	2	Brace, crossarm, wood, 60" span
ee	4	Letters, 2 "C", 2 "N", with 1" nails
ek		Locknuts

14.4/24.9 KV, 3-PHASE CROSSARM CONSTRUCTION- DOUBLE LINE ARM

Jan. 1, 1963

VC9





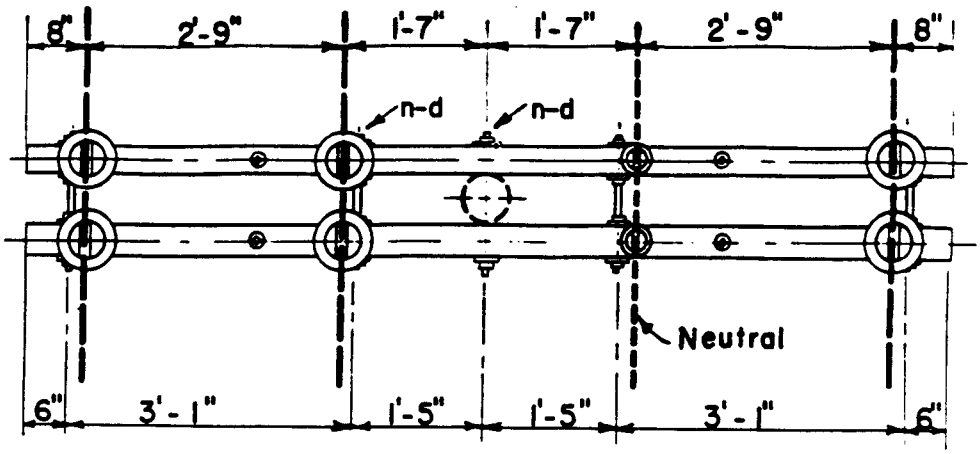
PLAN

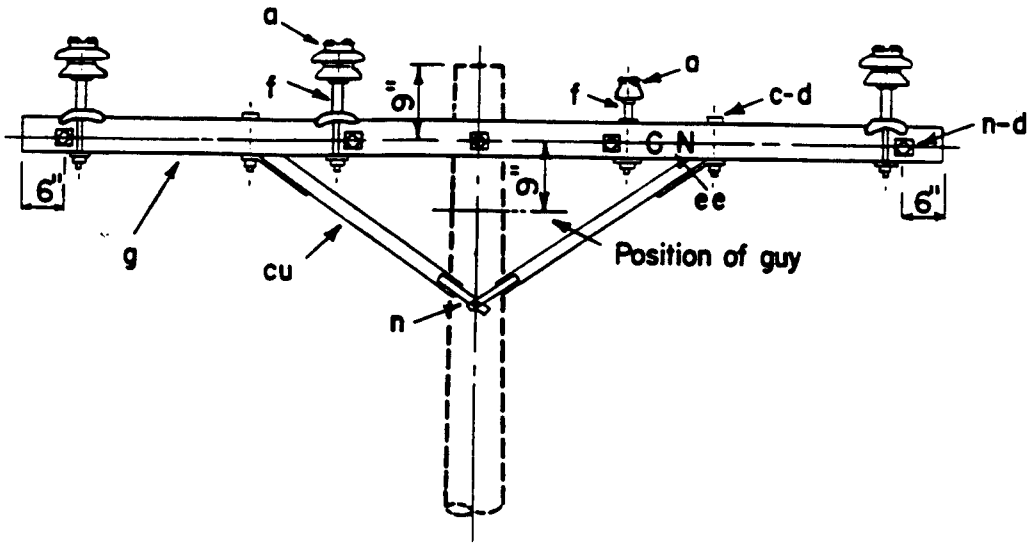
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	3	Insulator, pin type		f	3	Pin, crossarm, steel, 5/8" x 14"	
a	1	Insulator, pin type, 12.5 Kv.		f	1	Pin, crossarm, steel, 5/8" x 10 3/4"	
c	2	Bolt, machine, 5/8" x req'd. length		g	1	Crossarm, 3 3/4" x 4 3/4" x 10'-0"	
c	2	Bolt, machine, 1/2" x req'd. length		cu	1	Brace, crossarm, wood, 60" span	
d	3	Washer, square, 2 1/4"		ee	4	Letters, 2 "C", 2 "N", with 1" nails	
d	2	Washer, round, 1 3/8"		ek		Locknuts	

14.4/24.9 KV, 3-PHASE
CROSSARM CONSTRUCTION-SINGLE LINE ARM

Jan. 1, 1963

VC9-1





Note:

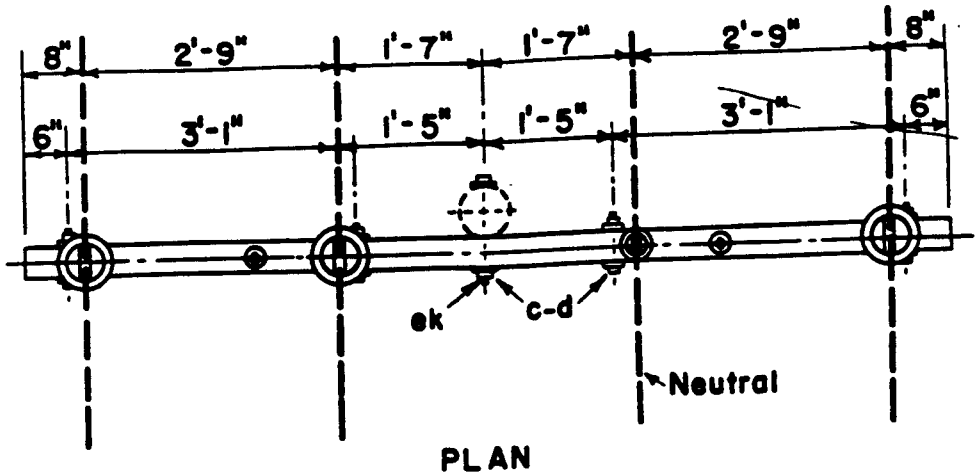
This construction required for all conductors having a breaking strength of more than 4,500 pounds.

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	6	Insulator, pin type		g	2	Crossarm, 3 3/4" x 4 3/4" x 10'-0"	
a	2	Insulator, pin type, 12.5 Kv.		n	6	Bolt, double arming, 5/8" x req'd. length	
c	4	Bolt, machine, 1/2" x req'd. length		cu	2	Brace, wood, 60" span	
d	18	Washer, square, 2 1/4"		ee	4	Letters, 2"C", 2"N", with 1" nails	
d	4	Washer, round, 1 3/8"		ek		Locknuts	
f	2	Pin, crossarm, steel, 5/8" x 10 3/4"					
f	6	Pin, crossarm, steel, clamp type					

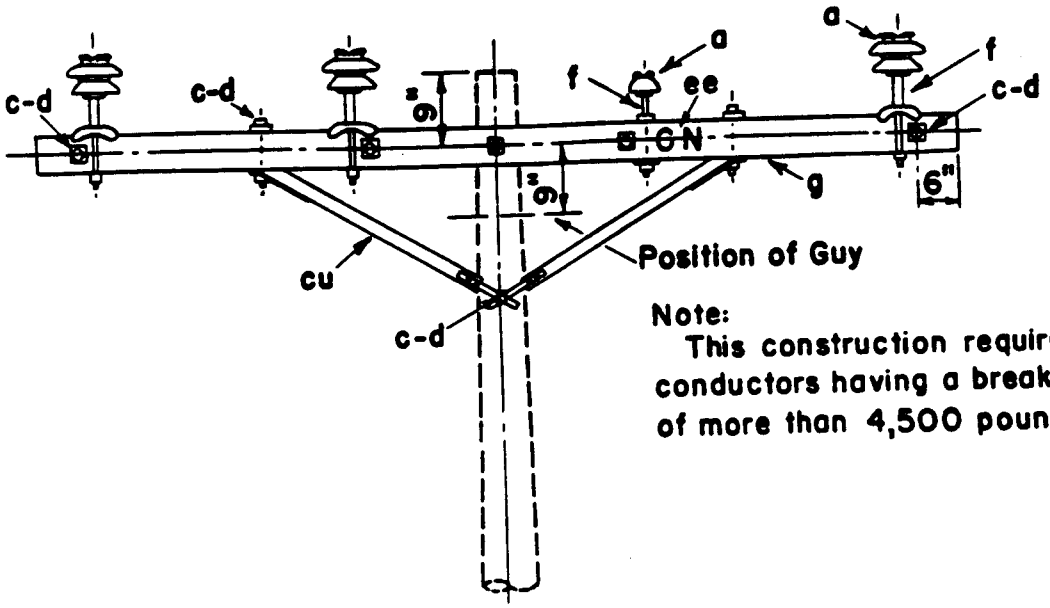
14.4/24.9 KV, 3-PHASE
CROSSARM CONSTRUCTION-DOUBLE LINE ARM
0° TO 5° ANGLE (LARGE CONDUCTORS)

Jan. 1, 1963

VC9-2



PLAN



Note:
This construction required for all conductors having a breaking strength of more than 4,500 pounds.

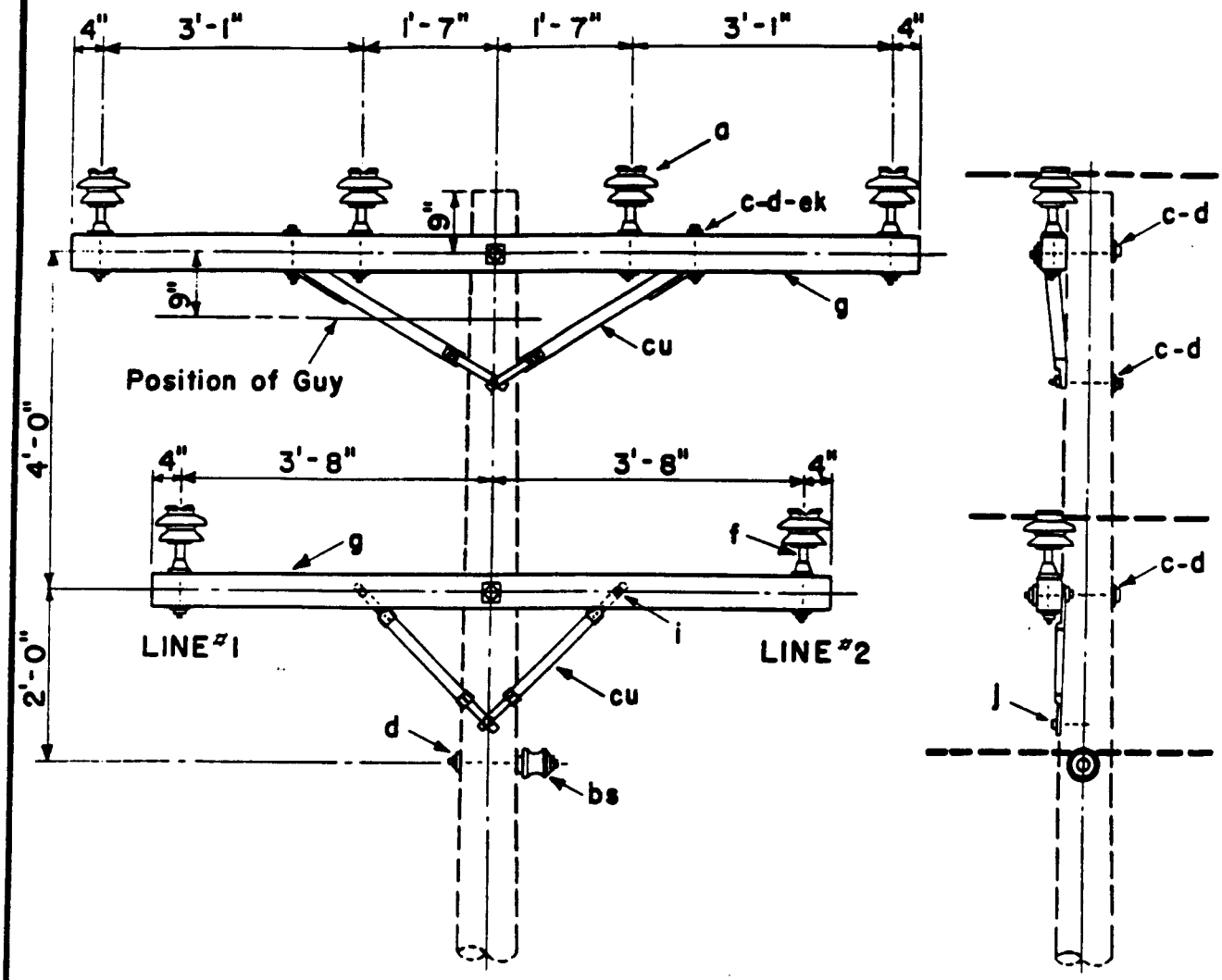
ITEM	NO.	MATERIAL
a	3	Insulator, pin type
a	1	Insulator, pin type, 12.5 KV.
c	6	Bolt, machine, 5/8" x req'd length
c	2	Bolt, machine, 1/2" x req'd length
d	11	Washer, square 2 1/4"
d	2	Washer, rd., 1 3/8" diam.

ITEM	NO.	MATERIAL
f	3	Pin, crossarm, steel, clamp type
g	1	Crossarm, 3 3/4" x 4 3/4" x 10'-0"
f	1	Pin, crossarm, steel, 5/8" x 10 3/4"
cu	1	Brace, wood, 60" span
ek		Locknuts
ee	4	Letters, 2"C", 2"N" with 1" nails

14.4/24.9 KV., 3-PHASE CROSSARM CONSTRUCTION- SINGLE LINE ARM (LARGE CONDUCTORS)

Jan. 1, 1963

VC9-3



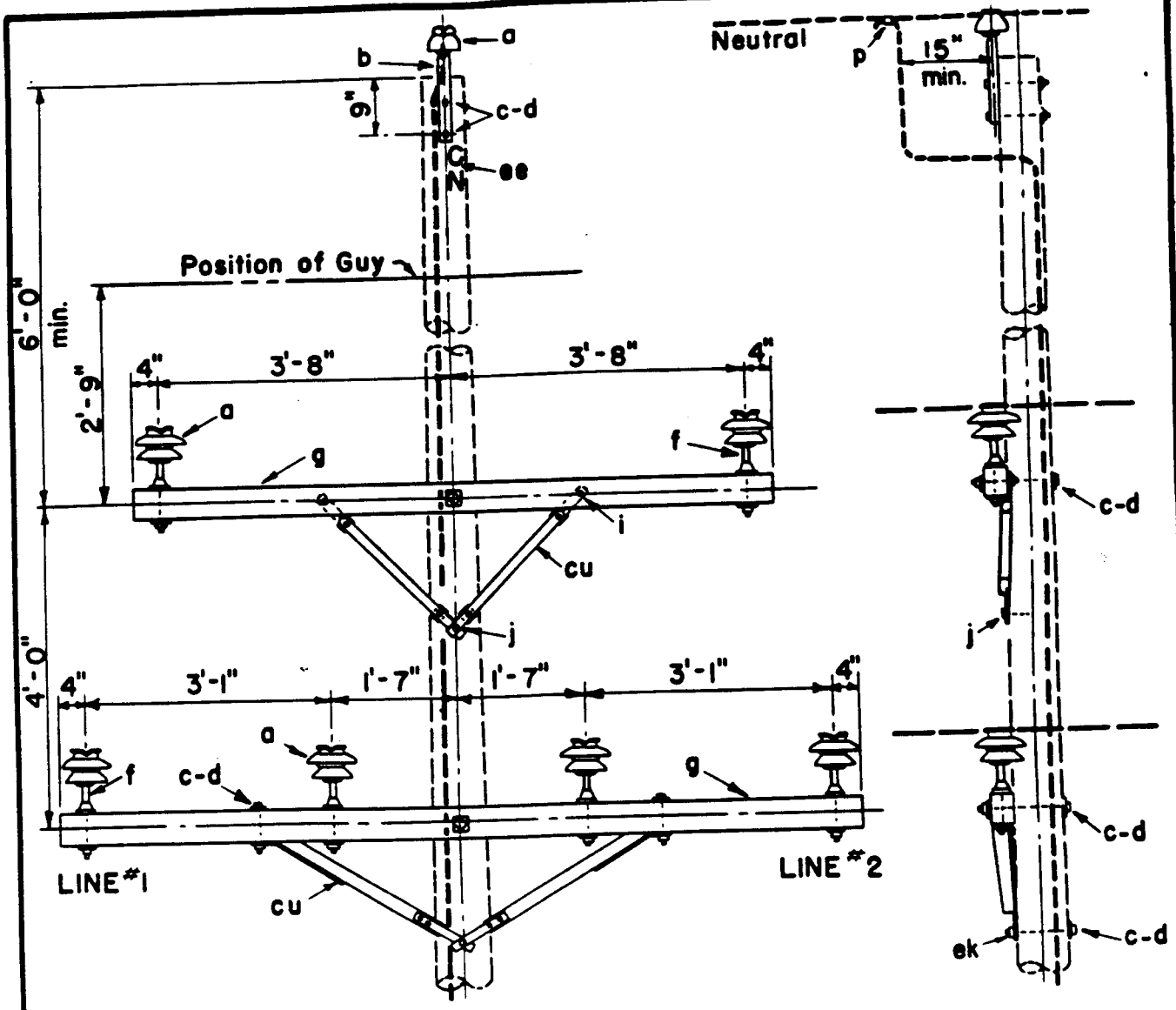
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	6	Insulator, pin type		i	2	Bolt, carriage, 3/8" x 4 1/2"	
c	3	Bolt, machine, 5/8" x req'd length		j	1	Screw, lag, 1/2" x 4"	
c	2	Bolt, machine, 1/2" x req'd length		bs	1	Bolt, single upset, insulated	
d	6	Washer, square, 2 1/4"		cu	1	Brace, wood, 60" span	
d	2	Washer, 1 3/8" diam.		ek		Locknuts	
f	6	Pin, crossarm, steel, 5/8" x 14"		g	1	Crossarm, 3 1/2" x 4 1/2" x 8'-0"	
g	1	Crossarm, 3 3/4" x 4 3/4" x 10'-0"					
cu	2	Brace, wood, 28"					

14.4/24.9 KV., 3-PHASE
CROSSARM CONSTRUCTION-DOUBLE CIRCUIT
SINGLE PRIMARY SUPPORT AT 0° TO 5° ANGLE

Jan. 1, 1963

2X-ARM TYPE

VDC-C1



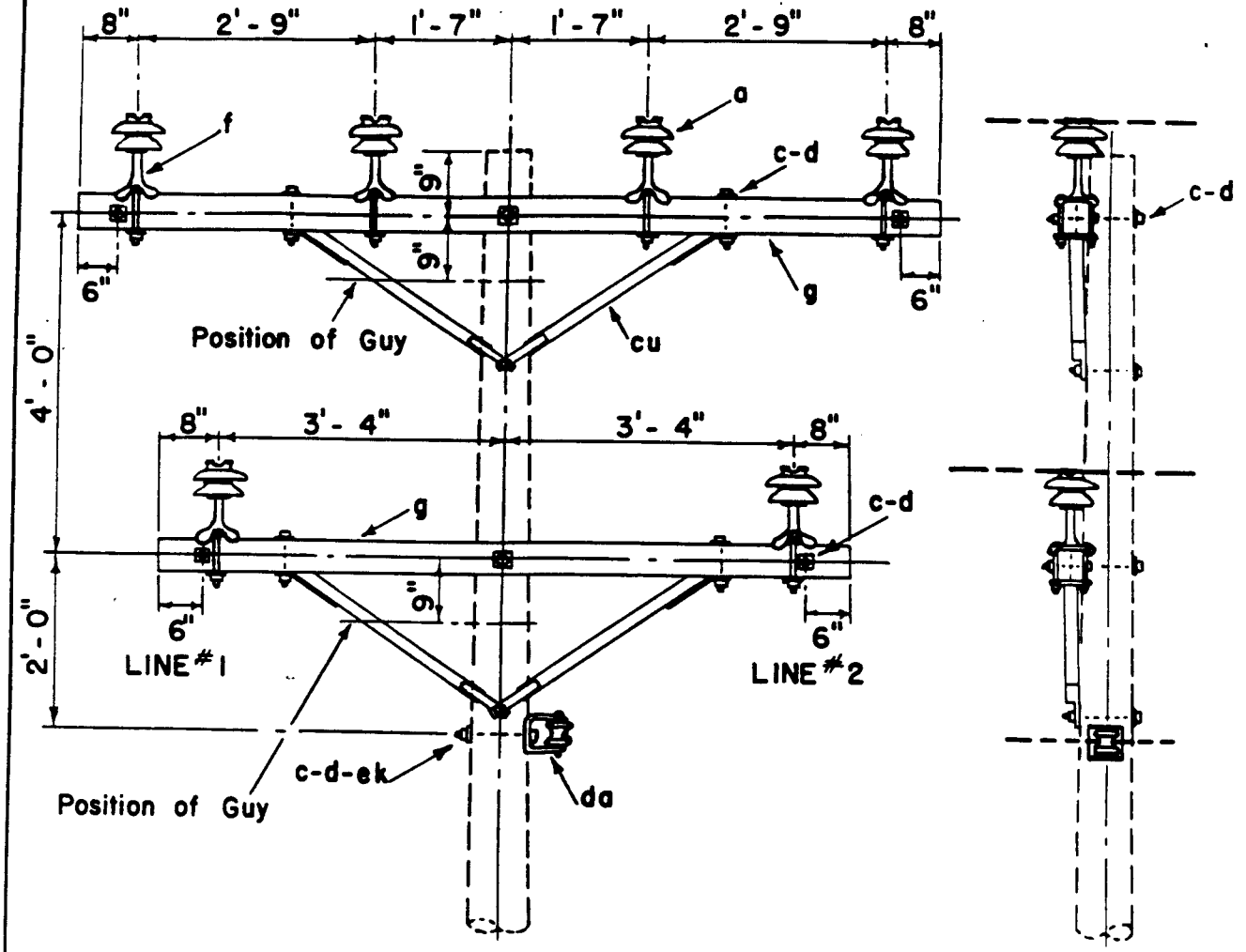
ITEM	NO.	MATERIAL
a	6	Insulator, pin type
a	1	Insulator, pin type, 12.5 KV.
b	1	Pin, pole top
c	5	Bolt, machine, 5/8" x req'd length
c	2	Bolt, machine, 1/2" x req'd length
d	7	Washer, square 2 1/4"
d	2	Washer, rd., 1 3/8" dia.
f	6	Pin, crossarm, steel, 5/8" x 14"
ek		Locknuts

ITEM	NO.	MATERIAL
g	1	Crossarm, 3 3/4" x 4 3/4" x 10'-0"
g	1	Crossarm, 3 1/2" x 4 1/2" x 8'-0"
i	2	Bolt, carriage, 3/8" x 4 1/2"
j	1	Screw, lag, 1/2" x 4"
p		Connectors, as required
cu	2	Brace, wood, 28"
cu	1	Brace, wood, 60" span
ee	4	Letters, 2"C", 2"N" with 1" nails

14.4/24.9 KV., 3-PHASE CROSSARM CONSTRUCTION - DOUBLE CIRCUIT SINGLE PRIMARY SUPPORT WITH OVERHEAD NEUTRAL AT 0° TO 5° ANGLE

Jan. 1, 1963

VDC-CIB



Note:

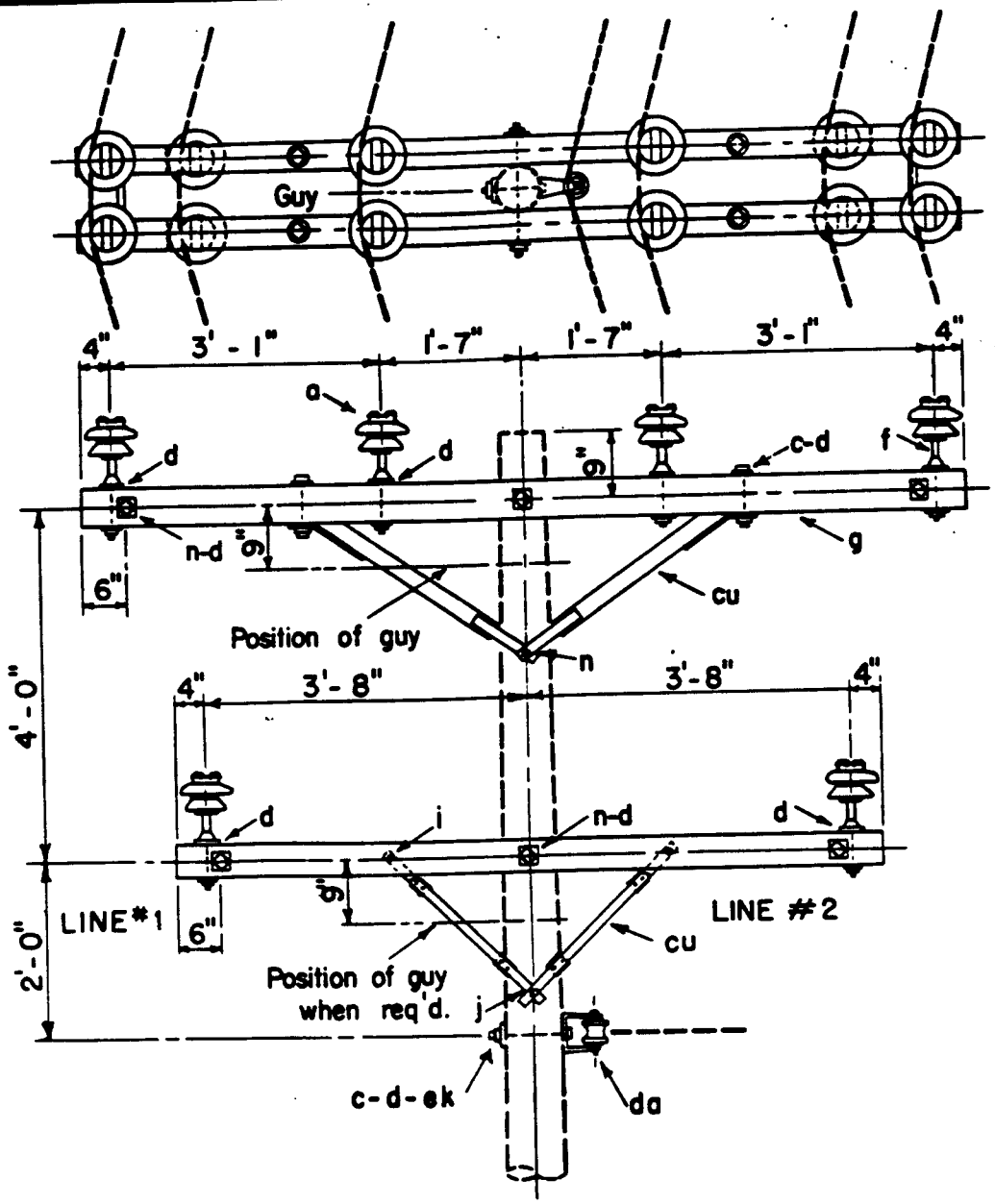
This construction required for all conductors having a breaking strength of more than 4500 pounds.

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	6	Insulator, pin type		g	1	Crossarm, 3 3/4" x 4 3/4" x 8'-0"	
c	9	Bolt, machine, 5/8" x req'd. length		cu	2	Brace, wood, 60" span	
c	4	Bolt, machine, 1/2" x req'd. length		da	1	Bracket, insulated	
d	15	Washer, square, 2 1/4"		ek		Locknuts	
d	4	Washer, round, 1 3/8" diam.					
f	6	Pin, crossarm, steel, clamp type					
g	1	Crossarm, 3 3/4" x 4 3/4" x 10'-0"					

14.4/24.9 KV 3-PHASE CROSSARM CONSTRUCTION
DOUBLE CIRCUIT
(LARGE CONDUCTORS)
0° TO 5° ANGLE

Jan. 1, 1963

VDC-CIL

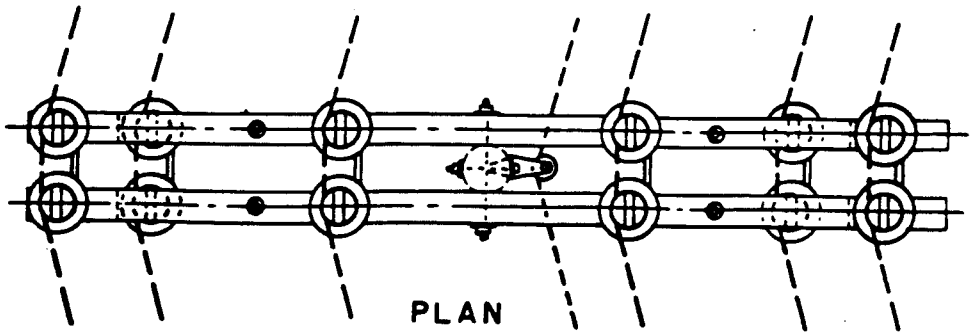


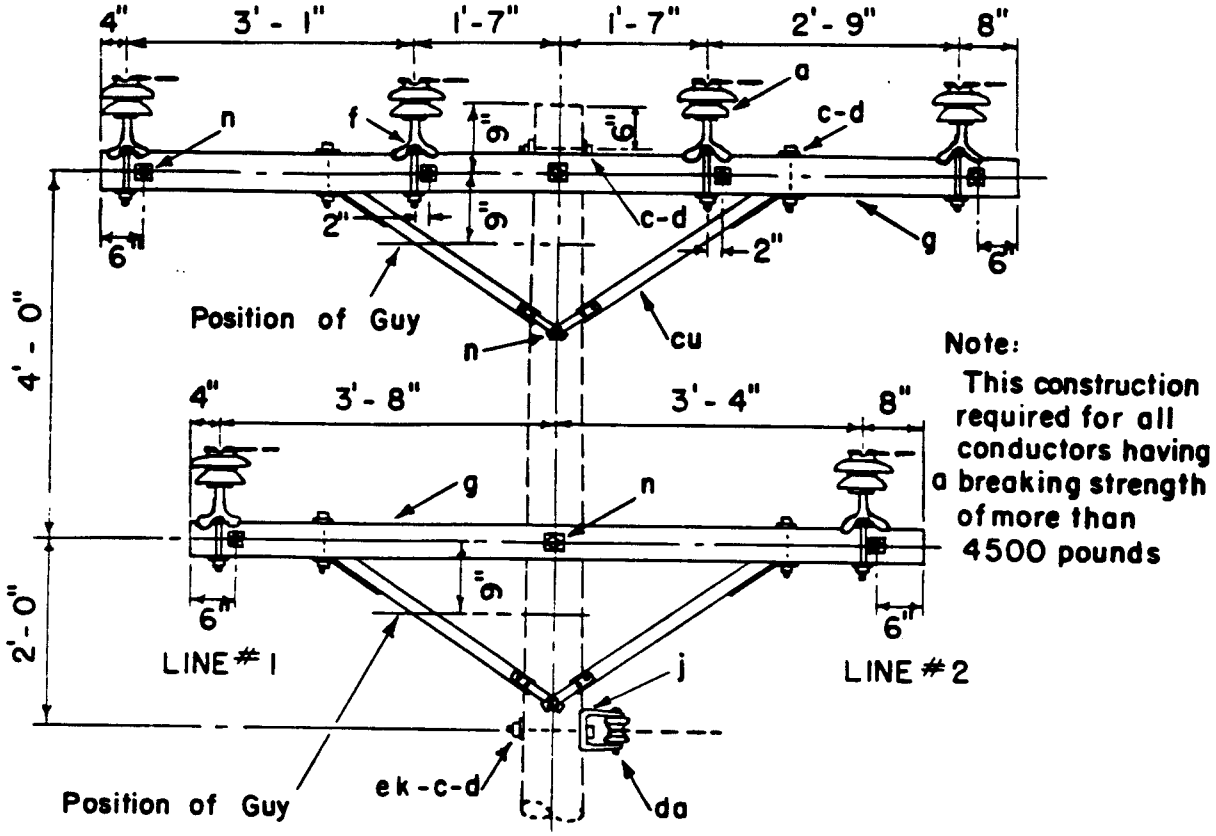
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	12	Insulator, pin type		g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"	
c	1	Bolt, machine, 5/8" x req'd. length		cu	4	Brace, wood 28"	
c	4	Bolt, machine, 1/2" x req'd. length		i	4	Bolt, carriage, 3/8" x 4 1/2"	
d	21	Washer, square, 2 1/4"		j	2	Screw, lag, 1/2" x 4"	
d	4	Washer, round, 1 3/8"		n	7	Bolt, double arming, 5/8" x req'd. length	
d	12	Washer, square 3"		cu	2	Brace, wood, 60" span	
f	12	Pin, crossarm, steel, 5/8" x 14"		da	1	Bracket, insulated	
g	2	Crossarm, 3 3/4" x 4 3/4" x 10'-0"		ek		Locknuts	

14.4/24.9 KV, 3-PHASE CROSSARM CONSTRUCTION - DOUBLE CIRCUIT 5° TO 30° ANGLE

Jan. 1, 1963

VDC-C2-1





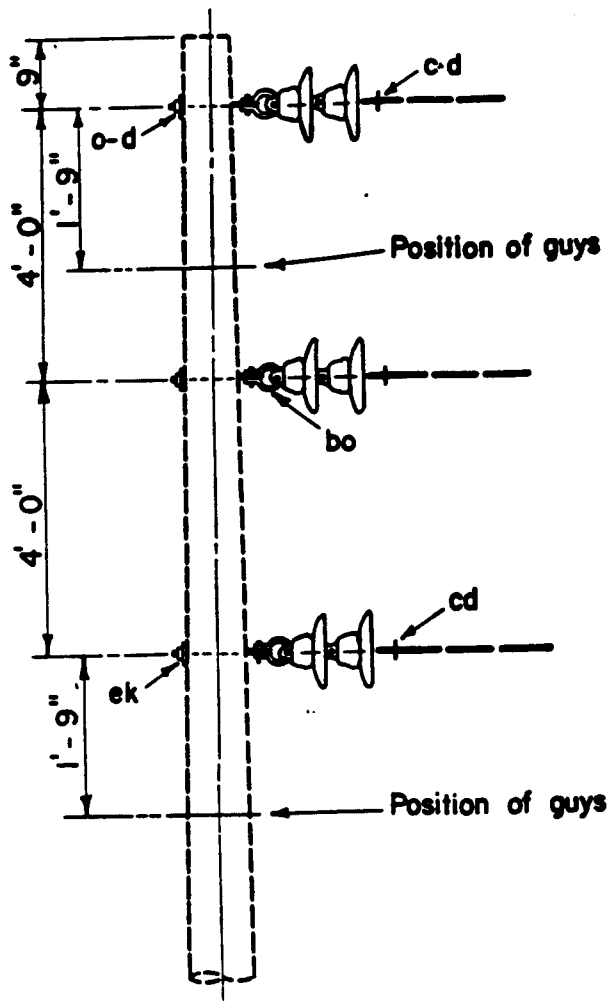
Note:
This construction required for all conductors having a breaking strength of more than 4500 pounds

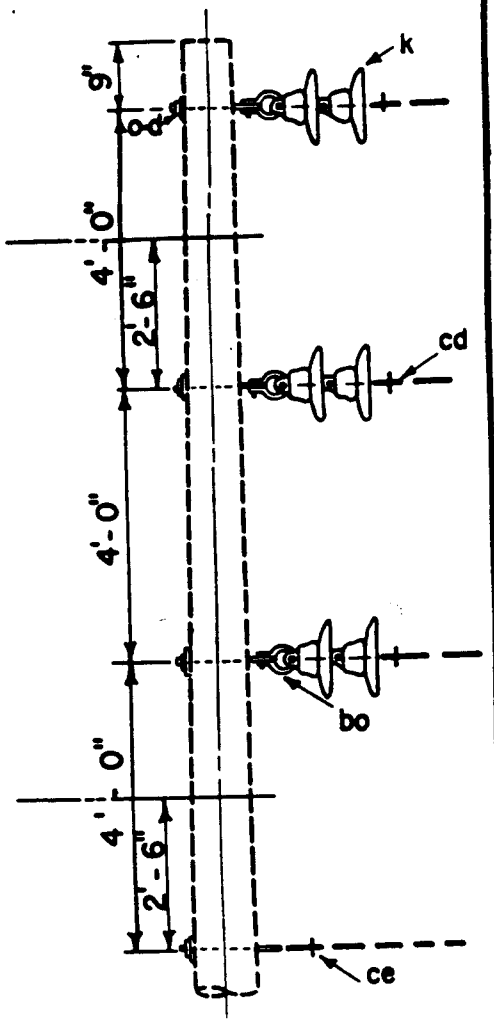
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
a	12	Insulator, pin type		g	2	Crossarm, 3 3/4" x 4 3/4" x 8'-0"	
c	2	Bolt, machine, 5/8" x req'd. length		n	10	Bolt, double arming, 5/8" x req'd lgth.	
c	8	Bolt, machine, 1/2" x req'd. length		cu	4	Brace, wood, 60" span	
d	31	Washer, square, 2 1/4"		da	1	Bracket, insulated	
d	8	Washer, round, 1 3/8" diam.		ek		Locknuts	
f	12	Pin, crossarm, steel, clamp type		j	2	Screw, lag, 1/2" x 4"	
g	2	Crossarm, 3 3/4" x 4 3/4" x 10'-0"					

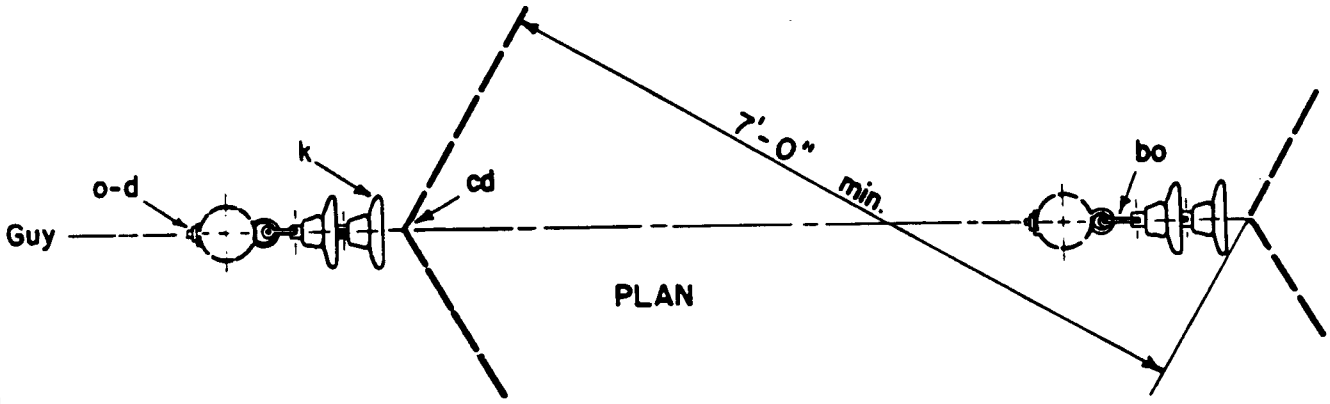
14.4/24.9 KV 3-PHASE CROSSARM CONSTRUCTION
DOUBLE CIRCUIT (LARGE CONDUCTORS)
MAX. TRANSVERSE LOADING 1000 LBS. / PIN
5° TO 30° MAXIMUM ANGLE

Jan. 1, 1963

VDC-C2-IL





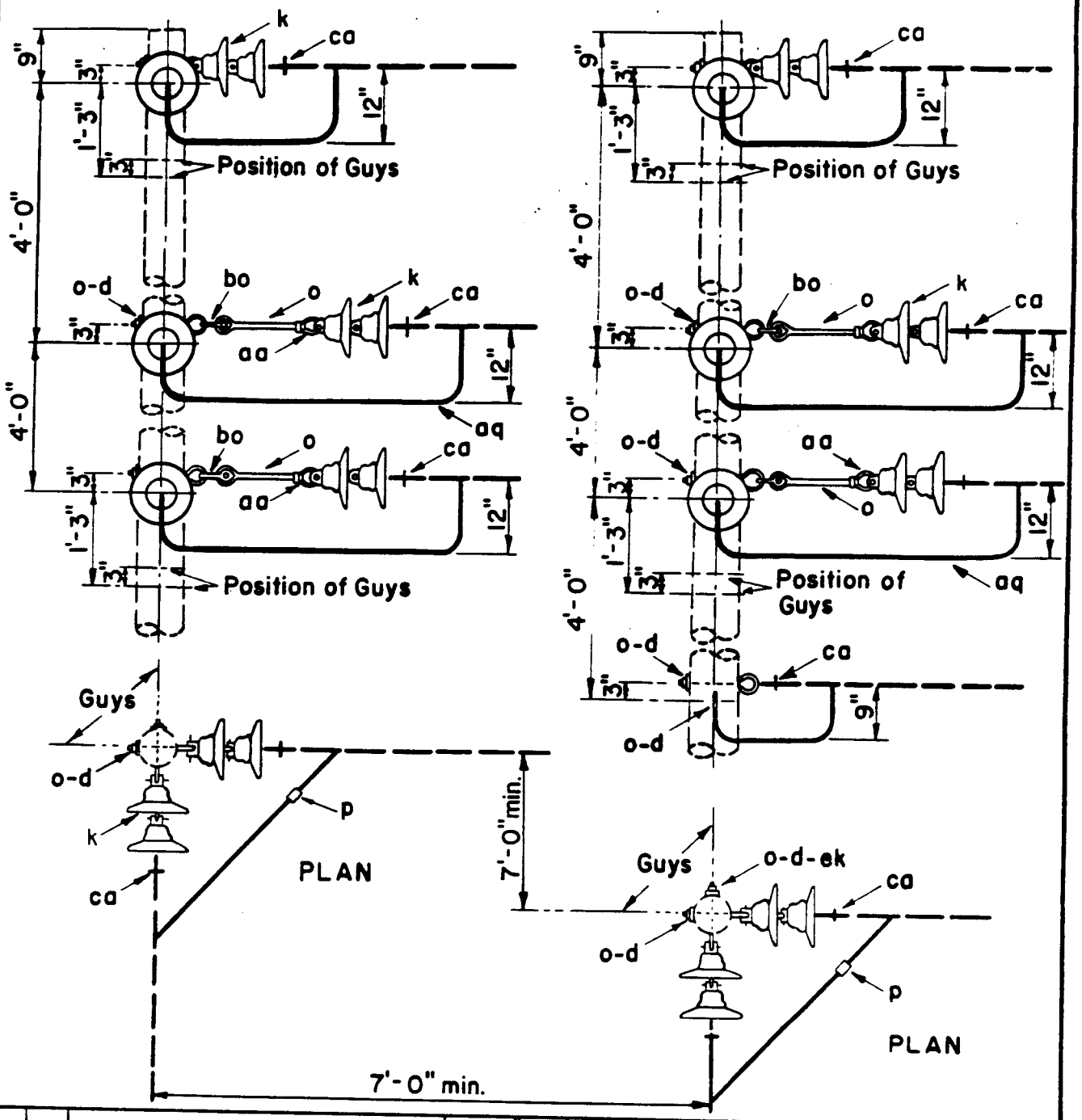


ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
d	6	Washer, square, 2 1/4"		cd	6	Angle assembly, primary	
k	12	Insulator, suspension, 10"		ce	1	Angle assembly, neutral	
o	6	Bolt, eye, 5/8" x req'd. length		ek		Locknuts	
bo	6	Shackle, anchor					

14.4/24.9 KV, 3- PHASE VERTICAL CONSTRUCTION- DOUBLE CIRCUIT 30° TO 60° ANGLE

Jan. 1, 1963

VDC-C3

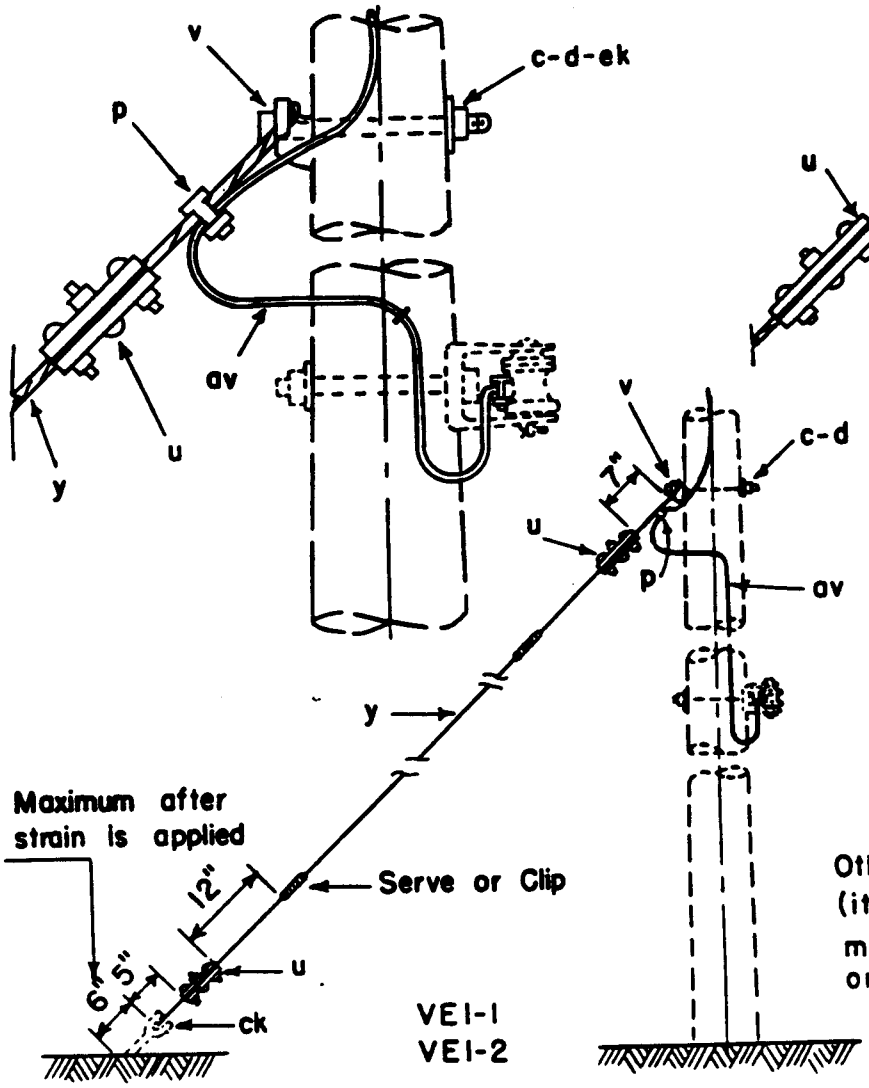


ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
d	14	Washer, 2¼" x 2¼" x 3/16", 13/16" hole		bo	8	Shackle, anchor	
k	24	Insulator, suspension, 10"		ca	12	Deadend assembly, primary	
o	22	Bolt, eye, 5/8" x req'd length		cc	2	Deadend assembly, neutral	
p		Connectors, as required		ek		Locknuts	
aa	8	Nut, eye, 5/8"					
aq		Jumpers, as required					

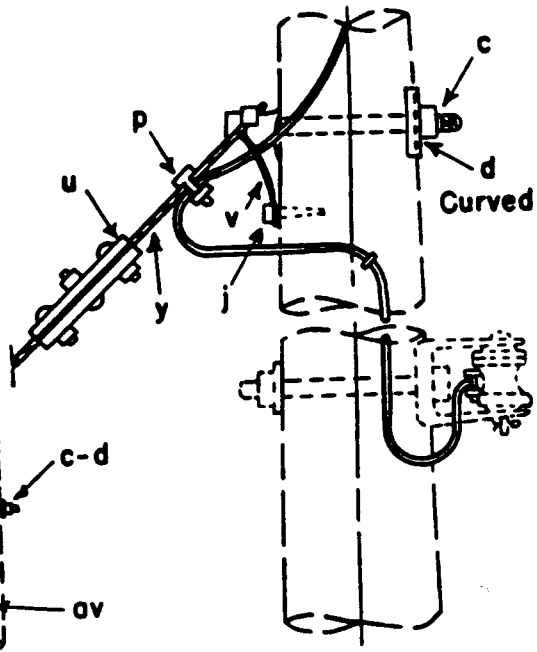
14.4/24.9 KV, 3-PHASE, DOUBLE CIRCUIT
VERTICAL CONSTRUCTION 60° TO 90° ANGLE

Jan. 1, 1963

VDC-C4-1



VE1-1
VE1-2



VE1-3

This may be substituted for wrapped type guy provided guy tension will not exceed 8500 lbs.

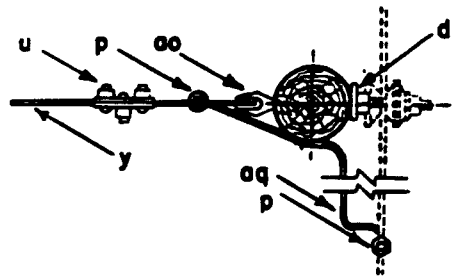
Other accepted and equivalent (item u) dead-end material may be substituted for the ones shown.

ITEM	MATERIAL	ASSEMBLY UNIT VE1-1 1/4" Guy Wire Nº. REQ'D.	VE1-2 3/8" Guy Wire Nº. REQ'D.	VE1-3 7/16" Guy Wire Nº. REQ'D.
c	Bolt, machine, 5/8" x required length	1	1	1
d	Washer, square, 2 1/4"	1	1	
d	Washer, curved, 3" x 3"			1
j	Screw, lag, 1/2" x 4"			1
p	Connectors, as required			
u	Deadend for guy strand	2- Light Duty	2-Heavy Duty	2-Heavy Duty
v	Guy attachment	1	1	1-Heavy Duty
y	Guy wire, S.M., 7 Strand	req'd. length	req'd. length	req'd. length
ck	Clamp, anchor rod bonding	1	1	1
av	Jumper, No.4 stranded Al. alloy or equiv.	1	1	1
ek	Locknuts			

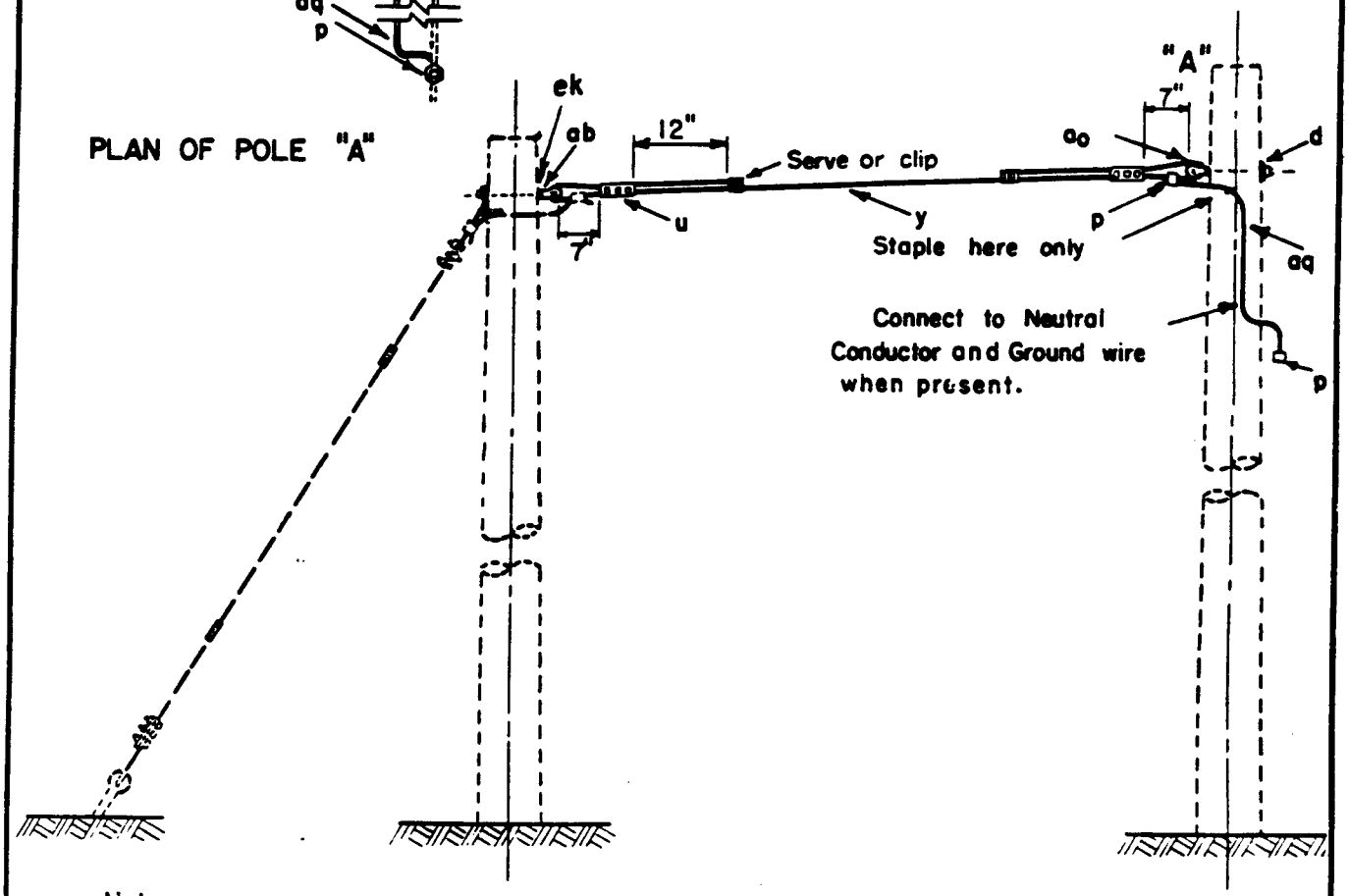
14.4/24.9 KV.
SINGLE DOWN GUY, THROUGH BOLT TYPE

July 12, 1968

VE1-1, VE1-2, VE1-3



PLAN OF POLE "A"



Note:

Other accepted and equivalent items of deadend material may be substituted for the 3-bolt clamp shown.

ITEM	MATERIAL	ASSEMBLY UNIT E2-1 1/4" GUY WIRE Nº. REQ'D.	E2-2 3/8" GUY WIRE Nº. REQ'D.	E2-3 7/16" GUY WIRE Nº. REQ'D.
d	Washer, 2 1/4" x 2 1/4" x 3/16", 13/16" hole	1		
d	Washer, curved, 3" x 3" x 5/16", 11/16" hole		1	1
u	Deadend for guy strand	2- Light Duty req'd. length	2- Heavy Duty req'd. length	2- Heavy Duty req'd. length
y	Guy wire, S.M., 7-strand			
ab	Nut, thimble type eye, 5/8"	1	1	1
ao	Bolt, thimbleye, 5/8" x req'd. length	1	1	1
aq	Jumper, #6 S.D. or equivalent	1	1	1
p	Connectors, as req'd.			
ek	Locknuts			

7.2/12.5 KV

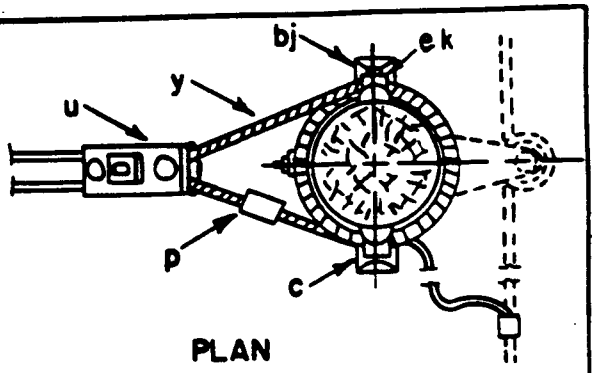
SINGLE OVERHEAD GUY, THROUGH BOLT TYPE

Jan 1, 1962

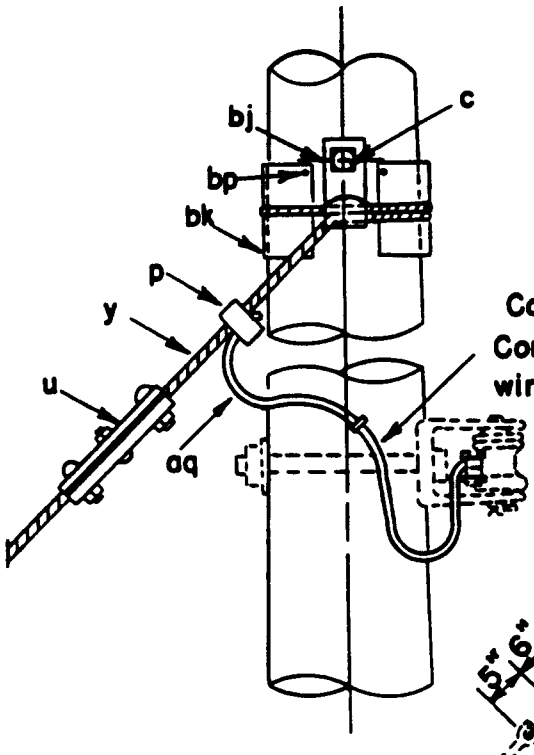
E2-1, E2-2, E2-3

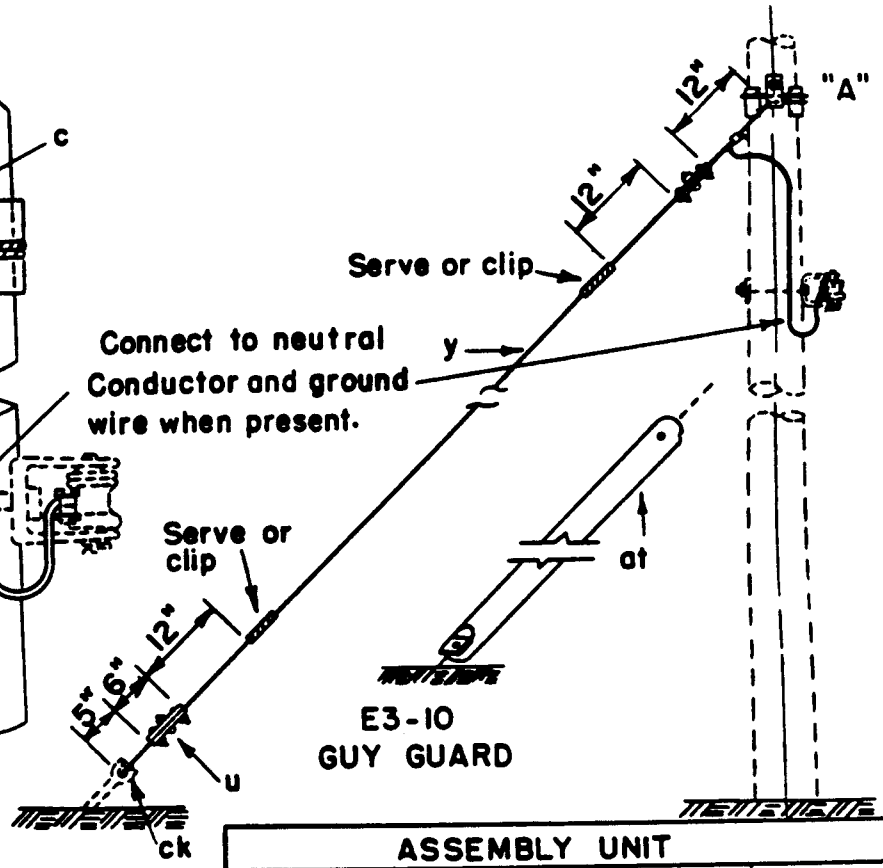
NOTES:

1. Other accepted and equivalent (item u) guy clamps may be substituted for the 3-bolt clamps shown.
2. Assemblies E1-2 and E1-3 (throughbolt type) are preferred units.



PLAN





E3-10
GUY GUARD

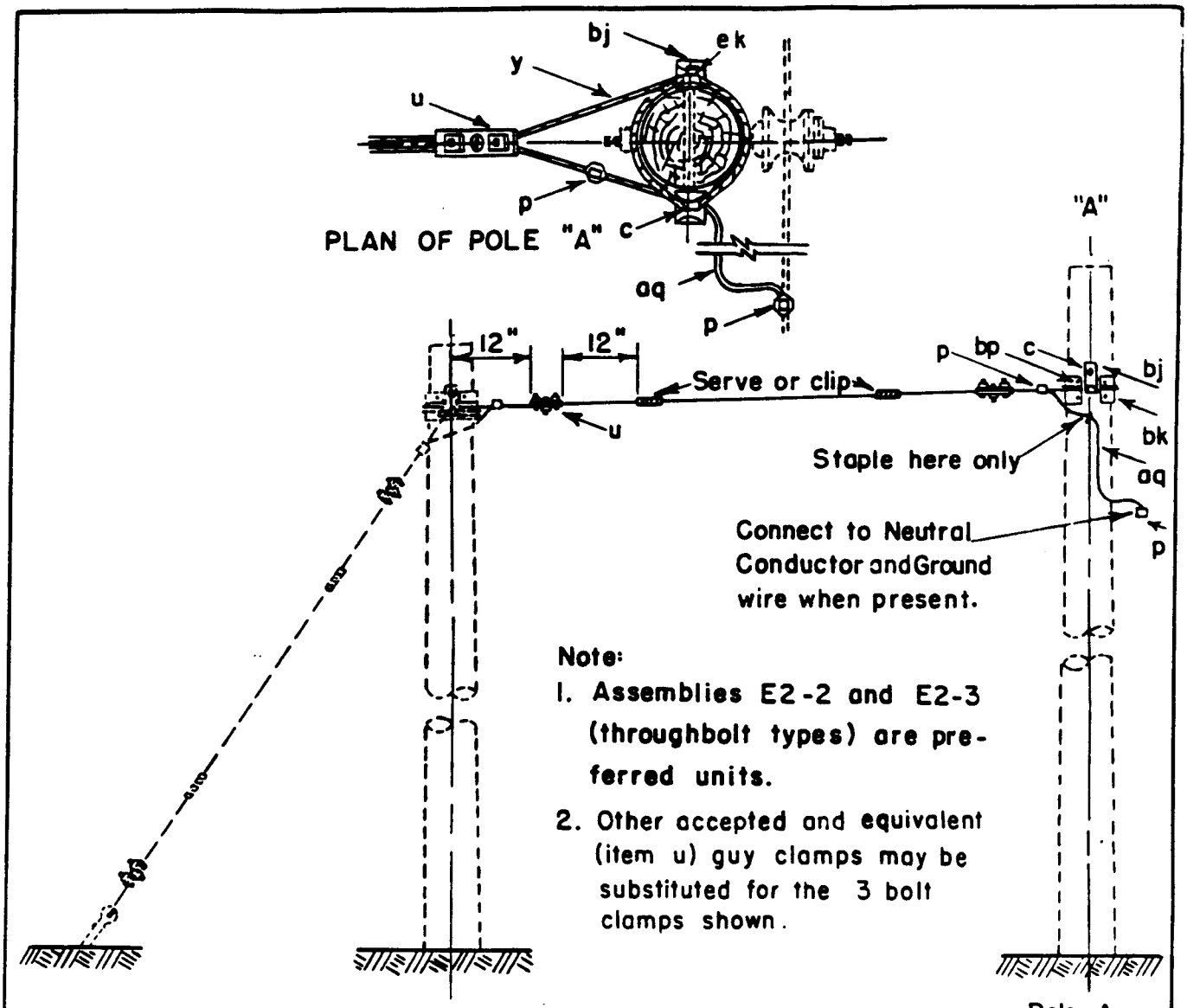
See guide drawings M30-1 and M30-2.

ITEM	MATERIAL		ASSEMBLY UNIT E3-2 3/8" Guy Wire No. REQ'D	E3-3 7/16" Guy Wire No. REQ'D	E3-10 Guy Guard
c	Bolt, machine, 5/8" x req'd length		1	1	
p	Connectors, as req'd				
u	Clamp, guy		2-Heavy Duty	2-Heavy Duty	
y	Guy Wire, S-M, 7-strand		req'd length	req'd length	
aq	Jumper, #6 S.D. copper or equiv.				
at	Guy guard, 8' min. length				1
bj	Guy Hook, J		2	2	
bk	Guy Plate, 4" x 8", 14 gauge		2	2	
bp	Nail, 8 penny, galv.		8	8	
ck	Clamp, anchor rod bonding		1	1	
ek	Locknuts				

7.2/12.5 KV.
SINGLE DOWN GUY, WRAPPED TYPE

Jan 1, 1962

E3-2, E3-3, E3-10



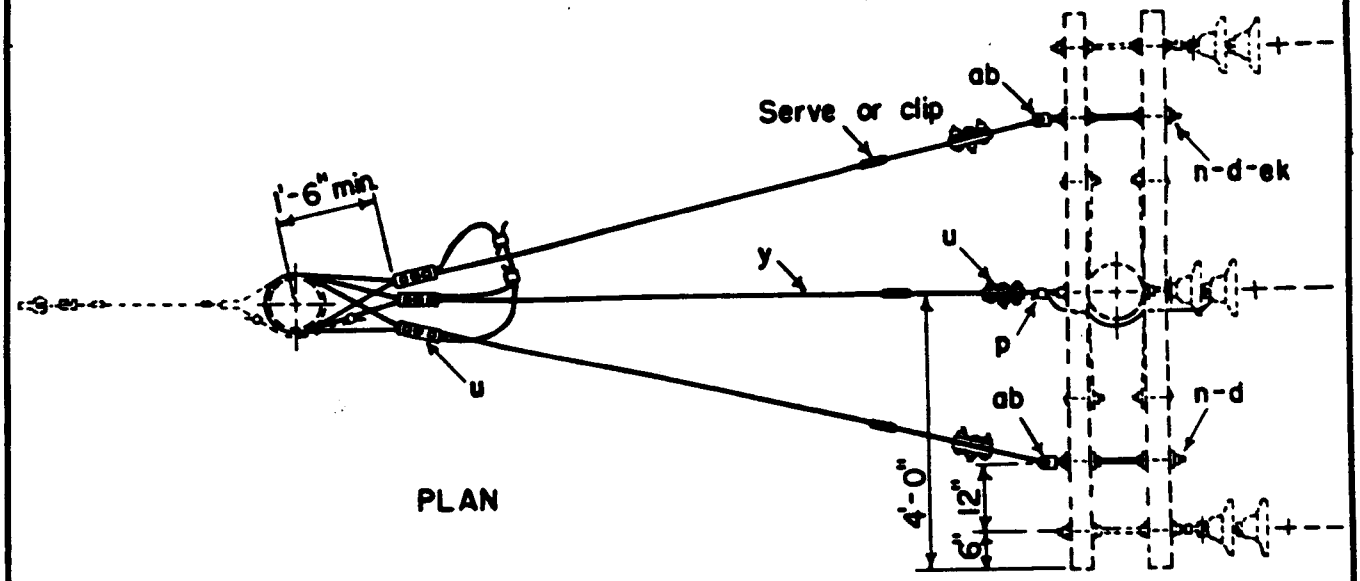
ITEM	MATERIAL	ASSEMBLY UNIT		
			E4-2 3/8" Guy Wire	E4-3 7/16" Guy Wire
			No. REQ'D	No. REQ'D
c	Bolt, machine, 5/8" x req'd length		1	1
p	Connectors, as req'd			
u	Deadend for guy strand		2-Heavy Duty	2-Heavy Duty
y	Guy Wire, S. M., 7 strand		req'd length	req'd length
aq	Jumper, #6 S. D. or equivalent		1	1
bj	Guy Hook, J		2	2
bk	Guy Plate, 4"x 8", 14 gauge		2	2
bp	Nail, 8 penny, galv.		8	8
ek	Locknuts			

7.2 / 12.5 KV.

SINGLE OVERHEAD GUY, WRAPPED TYPE

Jan 1, 1962

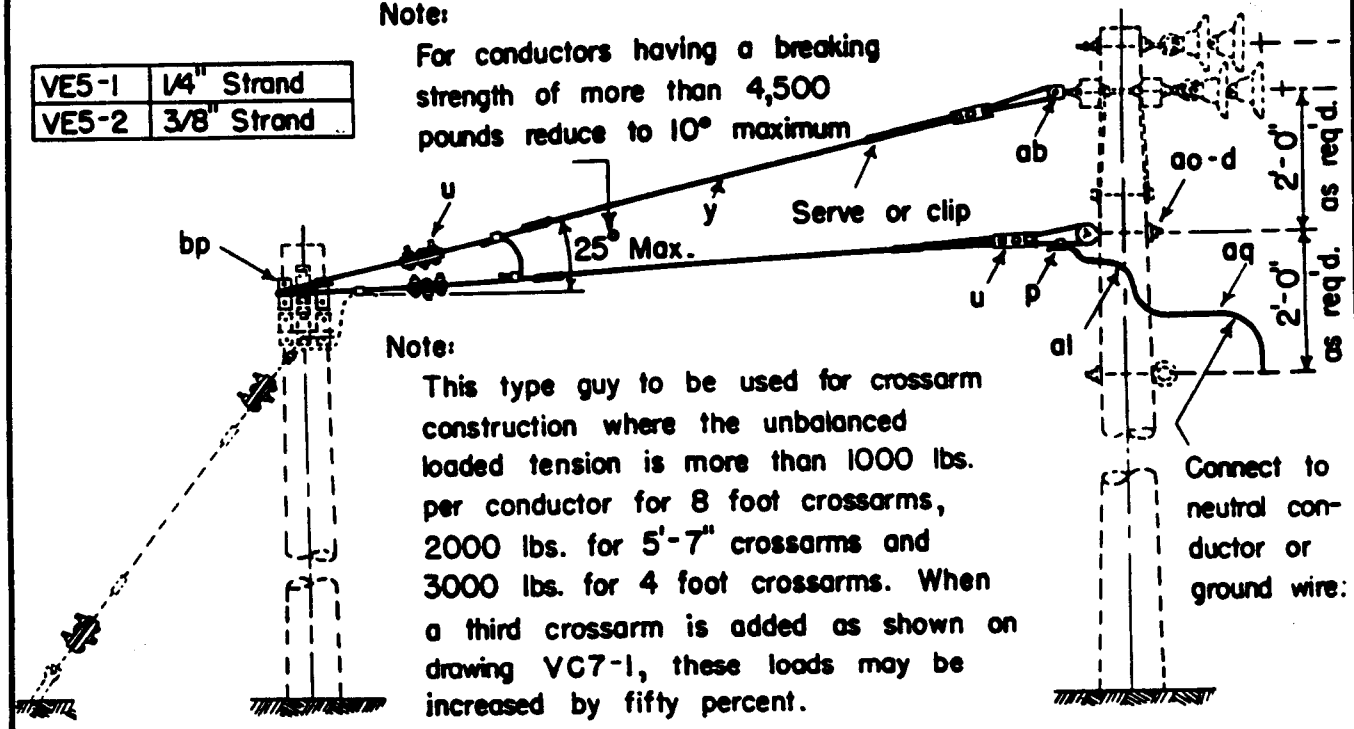
E4-2, E4-3



PLAN

VE5-1	1/4" Strand
VE5-2	3/8" Strand

Note:
For conductors having a breaking strength of more than 4,500 pounds reduce to 10° maximum



Note:
This type guy to be used for crossarm construction where the unbalanced loaded tension is more than 1000 lbs. per conductor for 8 foot crossarms, 2000 lbs. for 5'-7" crossarms and 3000 lbs. for 4 foot crossarms. When a third crossarm is added as shown on drawing VC7-1, these loads may be increased by fifty percent.

Connect to neutral conductor or ground wire:

ITEM	No.	MATERIAL		ITEM	No.	MATERIAL	
c	1	Bolt, machine, 5/8" x required length		al	1	Staple, ground wire	
d	9	Washer, square, 2 1/4"		ao	1	Bolt, thimble type eye, 5/8" x req'd. lg.	
n	2	Bolt, double arming, 5/8" x req'd. lg.		aq		Jumper, #6 S.D. or equivalent	
p		Connectors, as required		bj	2	Guy Hook, J	
u	6	Deadend for guy strand		bk	2	Guy Plate, 4"x8", 14 guage	
y		Wire, guy, S.M. 7 strand, as req'd.		bp	8	Nail, 8 penny, gal.	
ab	2	Nut, thimble type eye, 5/8"		ek		Locknuts	

14.4/24.9 KV.
DEADEND GUY
CROSSARM CONSTRUCTION

Jan. 1, 1963

VE5-1, VE5-2

NOTES:

1. When two guys are attached to one anchor rod use 3/4" x 8'-0" twin thimble type eye rod.

2. Spacing between anchors shall be sufficient to provide maximum holding power for each anchor.

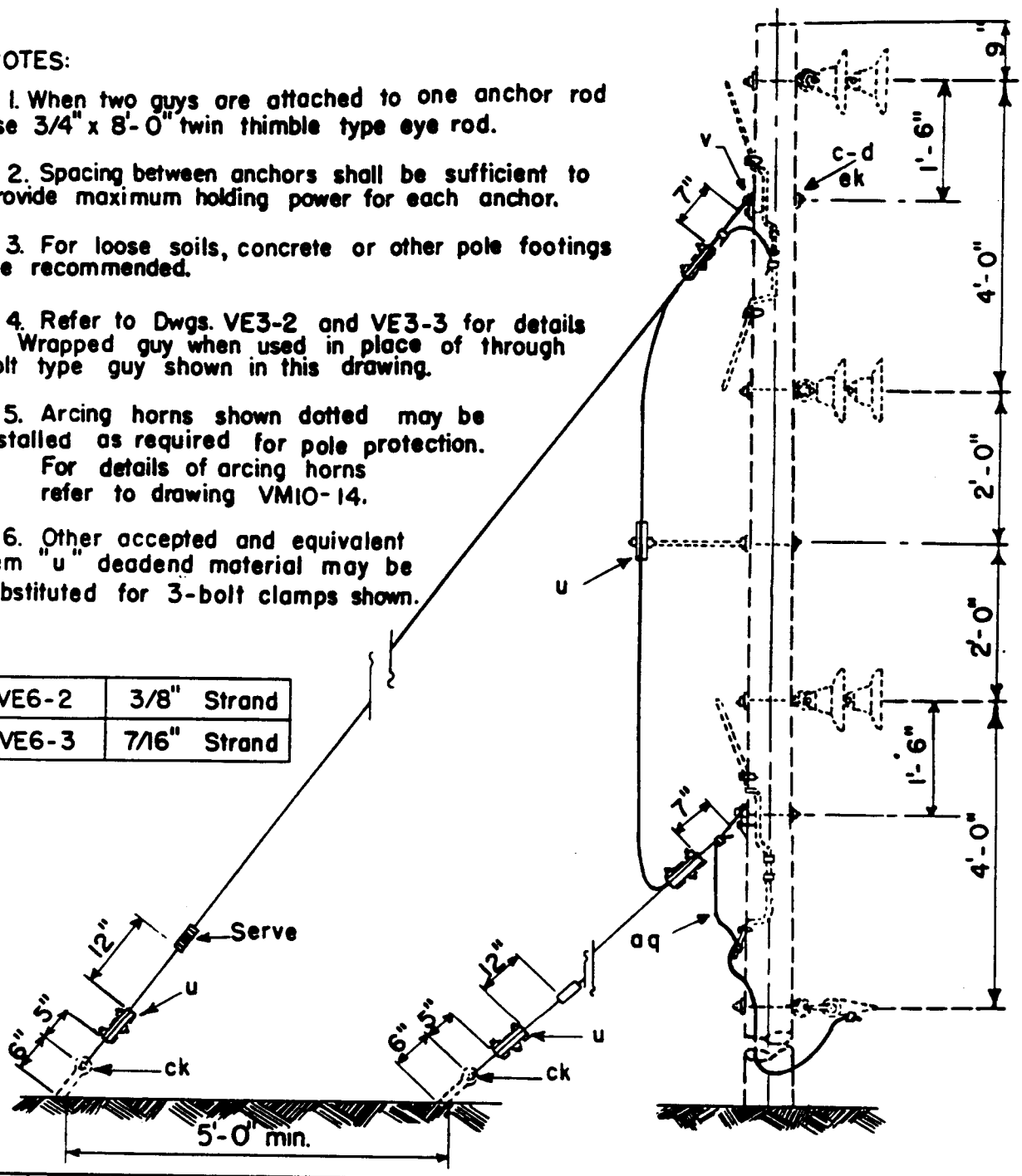
3. For loose soils, concrete or other pole footings are recommended.

4. Refer to Dwgs. VE3-2 and VE3-3 for details of Wrapped guy when used in place of through bolt type guy shown in this drawing.

5. Arcing horns shown dotted may be installed as required for pole protection. For details of arcing horns refer to drawing VM10-14.

6. Other accepted and equivalent item "u" deadend material may be substituted for 3-bolt clamps shown.

VE6-2	3/8" Strand
VE6-3	7/16" Strand



ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
c	2	Bolt, machine, 5/8" x req'd. length		y		Guy wire, S.M., 7 strand	
d	2	Washer, square, 2 1/4"		ck		Clamp, guy band, as required	
u	5	Deadend for guy strand, heavy duty		p		Connectors, as req'd.	
v	2	Guy attachment, (heavy duty for VE6-3)		aq		Jumpers, as required	
ek		Locknuts					

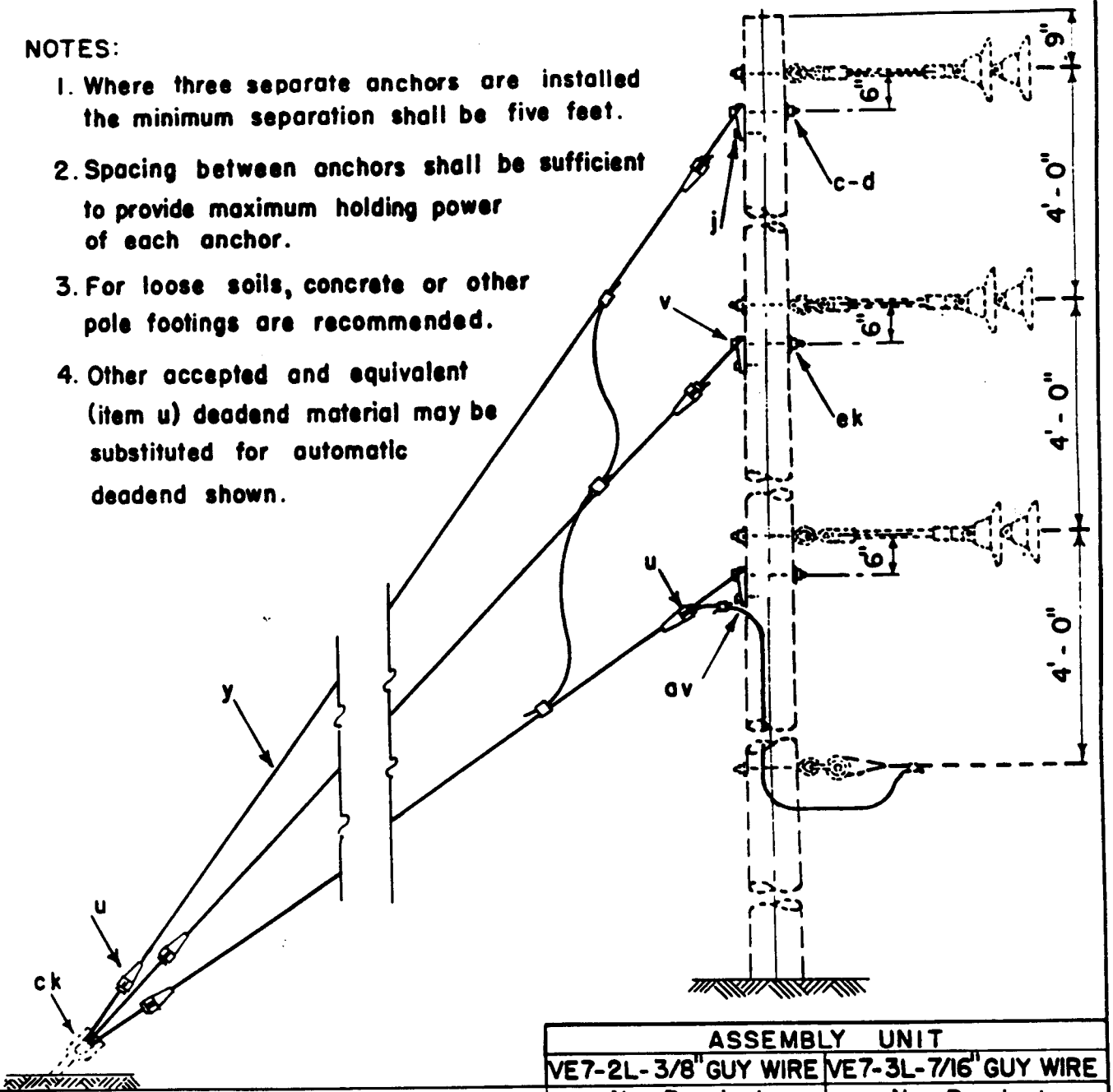
14.4/24.9 KV
DOUBLE DOWN GUY

Jan. 1, 1963

VE6-2, VE6-3

NOTES:

1. Where three separate anchors are installed the minimum separation shall be five feet.
2. Spacing between anchors shall be sufficient to provide maximum holding power of each anchor.
3. For loose soils, concrete or other pole footings are recommended.
4. Other accepted and equivalent (item u) deadend material may be substituted for automatic deadend shown.



ITEM	MATERIAL	ASSEMBLY UNIT VE7-2L-3/8" GUY WIRE No. Required	ASSEMBLY UNIT VE7-3L-7/16" GUY WIRE No. Required
c	Bolt, machine, 5/8" x required length	3	3
d	Washer, curved, 3" x 3" x 5/16"	3	3
j	Screw, lag, 1/2" x 4"	3	3
p	Connectors, as required		
u	Deadend for guy strand	6	6
v	Guy attachment, Mall. Iron, Heavy Duty	3	3
y	Guy wire, S.M., 7 Strand	required length	required length
av	Jumpers, No. 4 stranded Al. alloy or equiv.	as required	as required
ck	Clamp, guy bonding, as required		
ek	Locknuts		

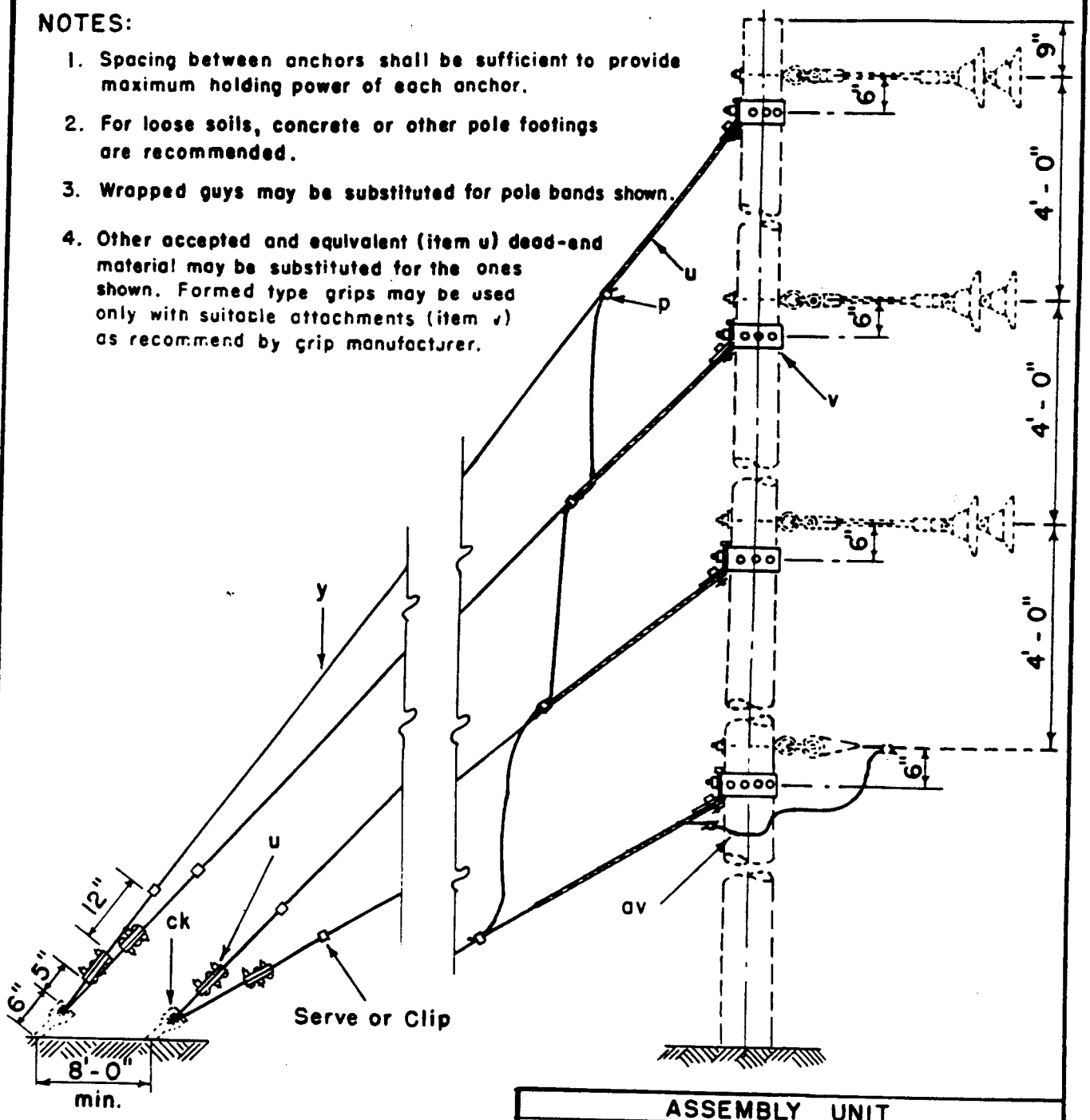
14.4/24.9 KV- THREE DOWN GUYS
(LARGE CONDUCTORS)

Jan. 1, 1963

VE7-2L, VE7-3L

NOTES:

1. Spacing between anchors shall be sufficient to provide maximum holding power of each anchor.
2. For loose soils, concrete or other pole footings are recommended.
3. Wrapped guys may be substituted for pole bands shown.
4. Other accepted and equivalent (item u) dead-end material may be substituted for the ones shown. Formed type grips may be used only with suitable attachments (item v) as recommend by grip manufacturer.

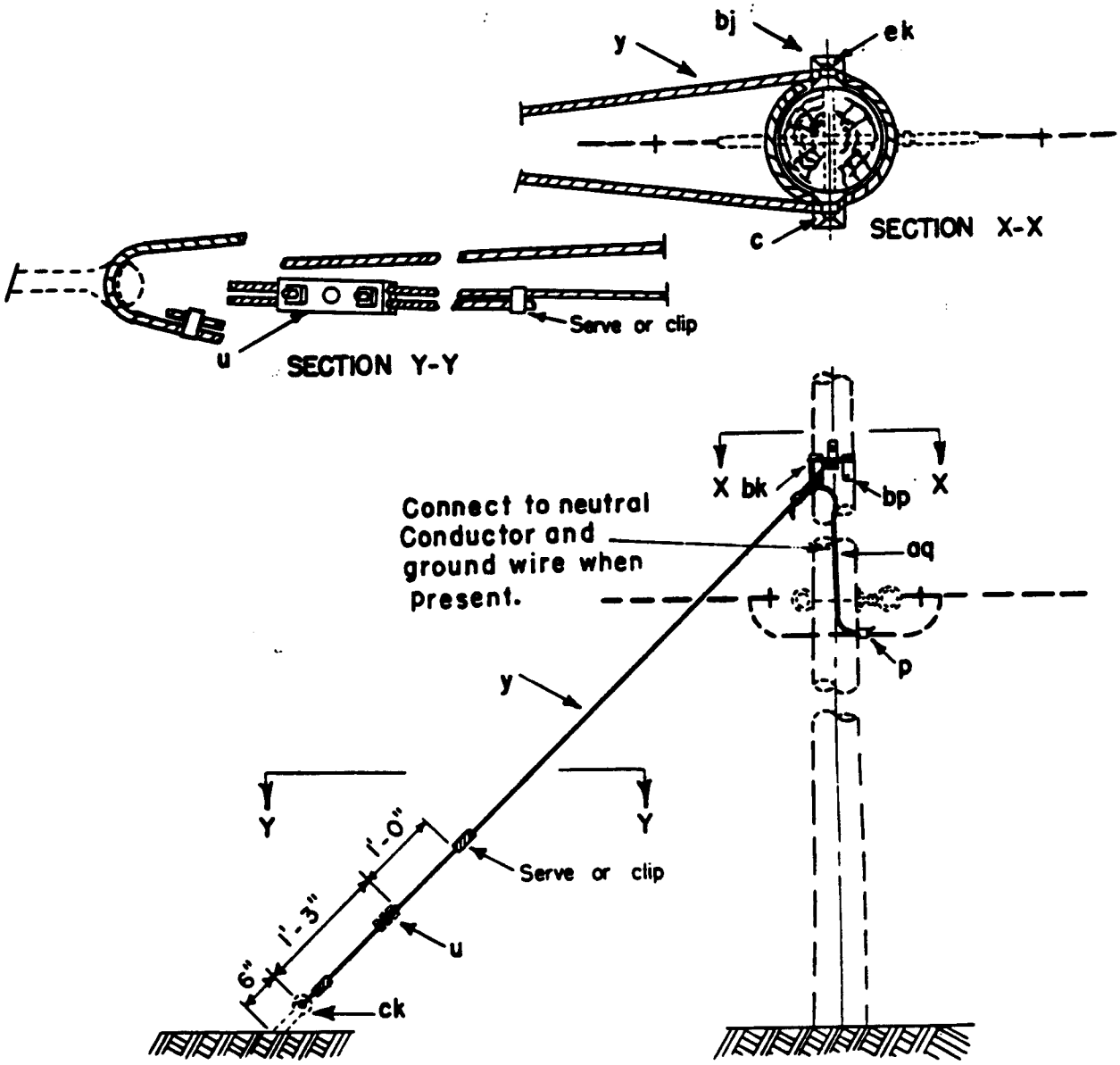


ITEM	MATERIAL	ASSEMBLY UNIT VE8-2L-3/8" GUY WIRE No. Required	ASSEMBLY UNIT VE8-3L-7/16" GUY WIRE No. Required
p	Connectors, as required		
u	Deadend for guy strand	8	8
v	Guy attachment, pole band type	4	4
y	Guy Wire, S.M. 7 strand	required length	required length
av	Jumpers, No.4 stranded Al. alloy or equiv.	as required	as required
ck	Clamp, guy bonding	2	2

14.4/24.9 KV
FOUR DOWN GUYS
(LARGE CONDUCTORS)

July 12, 1968

VE8-2L, VE8-3L

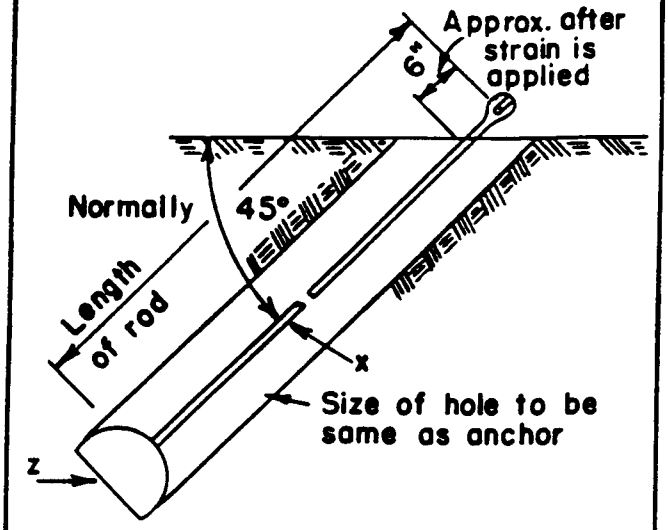


		ASSEMBLY UNIT			
		E11 1/4" GUY WIRE	E12 3/8" GUY WIRE		
ITEM	MATERIAL	No. REQ'D.	No. REQ'D.		
c	Bolt, machine, 5/8" x req'd. length	1	1		
u	Clamp, guy	1- Light Duty	1- Heavy Duty		
y	Guy wire, S. M., 7 strand	Req'd. Length	Req'd. Length		
ck	Clamp, anchor rod bonding	1	1		
bj	Guy hook, J	2	2		
bk	Guy plate, 4" x 8", 14 guage	2	2		
bp	Nail, 8 penny, galv.	8	8		
aq	Jumper, #6 S.D. copper or equivalent				
p	Connectors, as req'd.				
ek	Locknuts				

7.2/12.5 KV
SINGLE LOOP GUY, WRAPPED TYPE

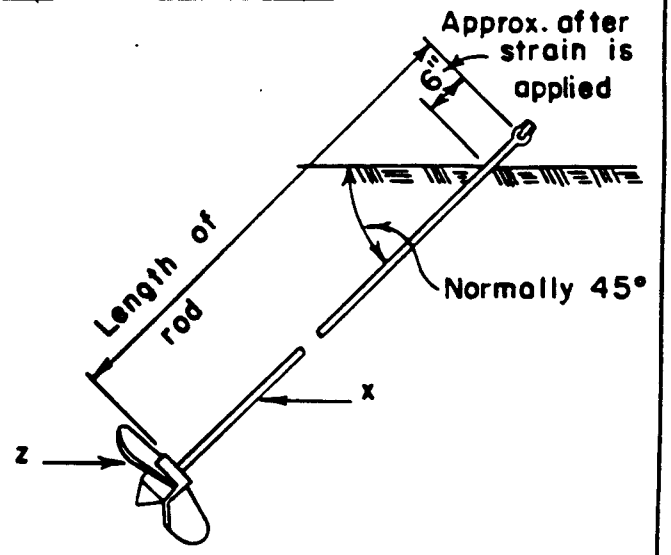
Jan 1, 1962

E11, E12



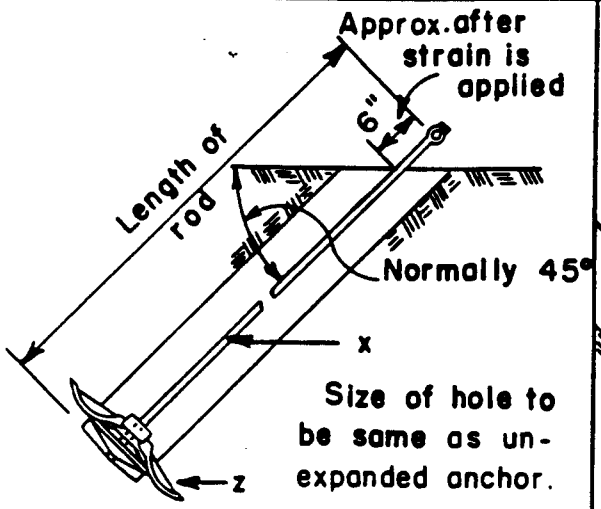
CONE

FI-1C, FI-2C, FI-3C,



SCREW

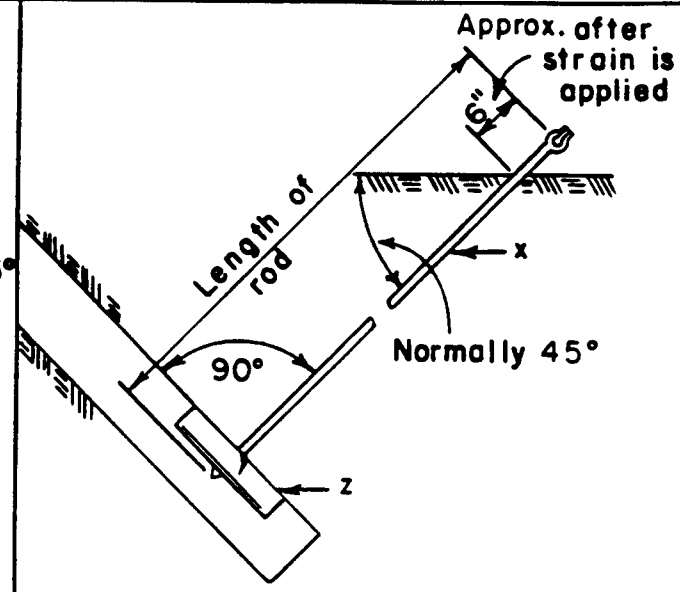
FI-1S, FI-2S, FI-3S, FI-4S



EXPANDING

FI-1, FI-2, FI-3, FI-4

Note: Projection of anchor rods above earth may be increased to a max. of 12" in cultivated fields or other locations where necessary to prevent burying of the rod eye.



PLATE

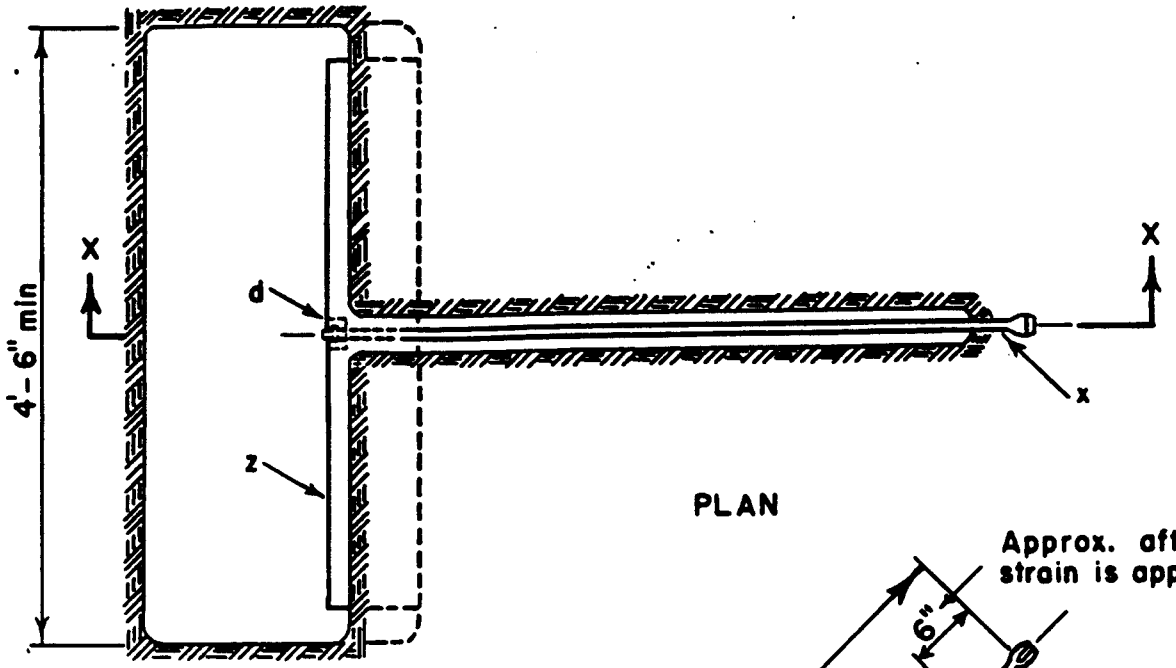
FI-1P, FI-2P, FI-3P, FI-4P

		ASSEMBLY UNIT							
		FI-1		FI-2		FI-3		FI-4	
Holding Power in Ordinary Soil (pounds)		6000		8000		10,000		12,000	
ITEM	MATERIAL	NO.		NO.		NO.		NO.	
x	Rod, anchor, thimble eye	1	5/8" x 7'-0"	1	5/8" x 7'-0"				
x	Rod, anchor, twin eye					1	3/4" x 8'-0"	1	3/4" x 8'-0"
z	Anchor ---------- type	1		1		1		1	

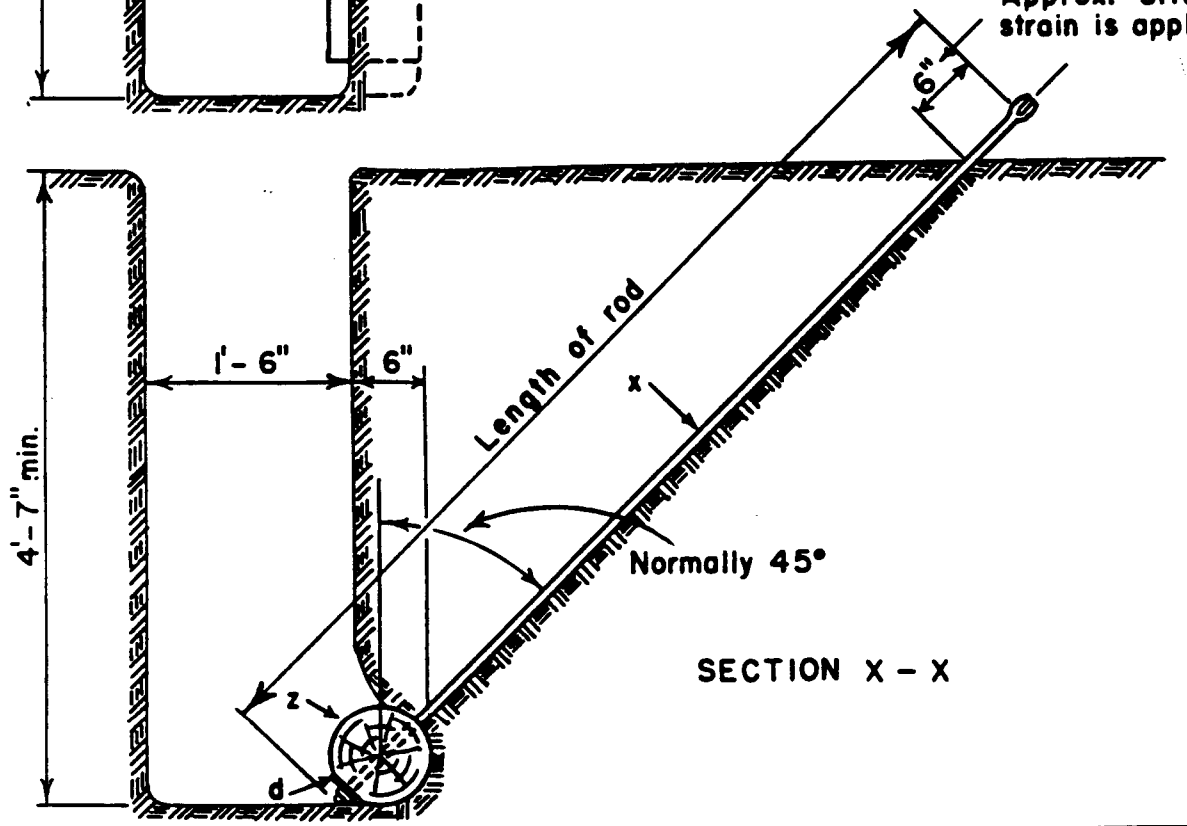
LINE ANCHOR ASSEMBLIES

Jan 1, 1962

FI-1 TO 4



PLAN



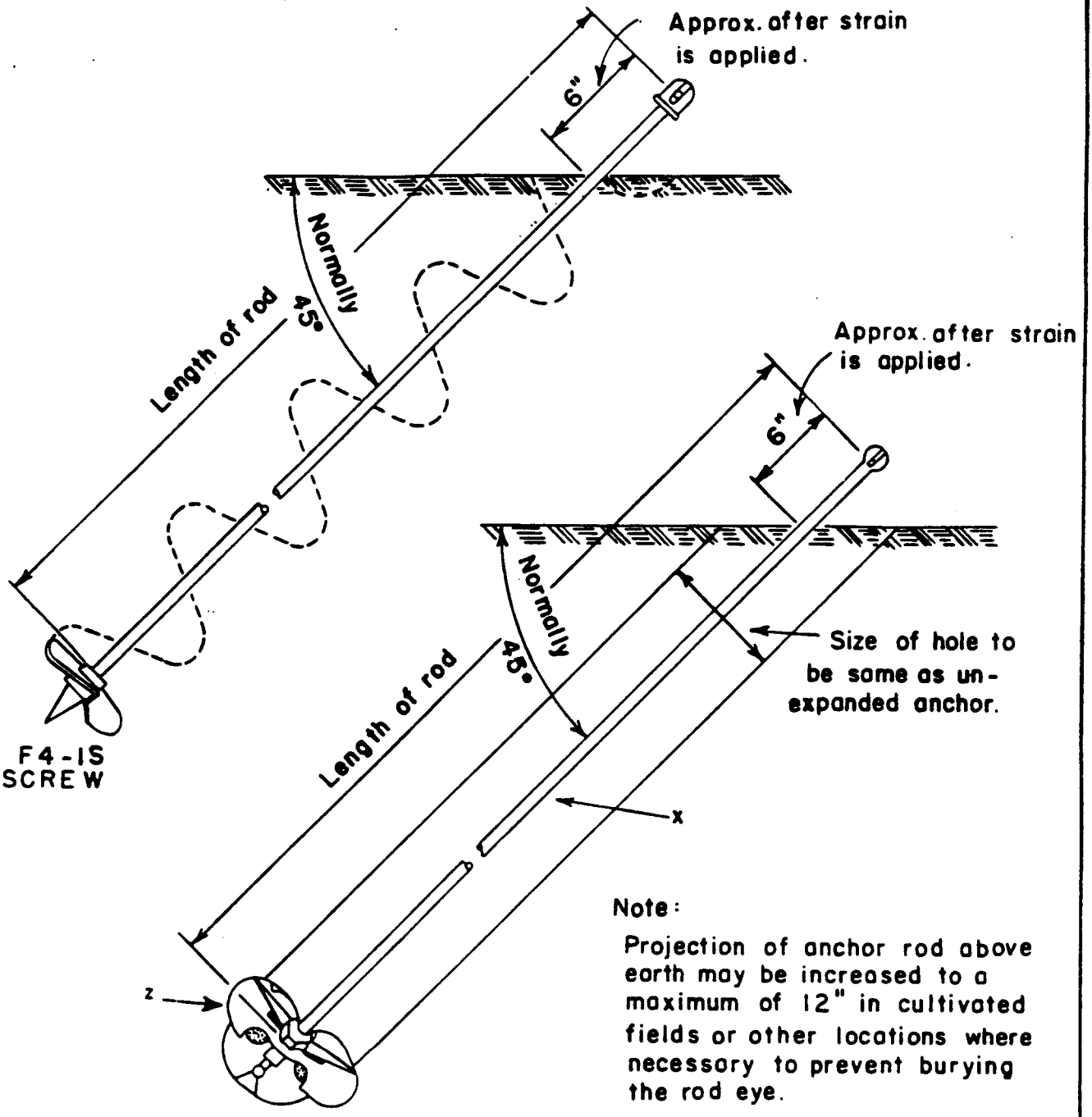
SECTION X - X

		ASSEMBLY UNIT							
		F2-1		F2-2		F2-3		F2-4	
ITEM	MATERIAL	NO.	TYPE	NO.	TYPE	NO.	TYPE	NO.	TYPE
d	Washer, 13/16" hole, (1 1/8" min. for F2-4)	1	4"x 4"x1/2"	1	4"x 4"x1/2"	1	4"x 4"x1/2"	1	4"x 4"x1/2"
x	Rod, anchor, thimble type eye	1	5/8"x 7'-0"	1	3/4"x8'-0"	1	3/4"x8'-0"	1	1"x9'-0"
z	Anchor, (creosoted log)	1	8"dia.x4'-0"	1	9"dia.x4'-6"	1	10"dia.x5'-0"	1	12"dia.x5'-0"
	Holding power in ordinary soil, (pounds)		8000		10,000		12,000		16,000

LOG ANCHOR ASSEMBLY

Jan. 1, 1962

F2-1 To F2-4



Note:

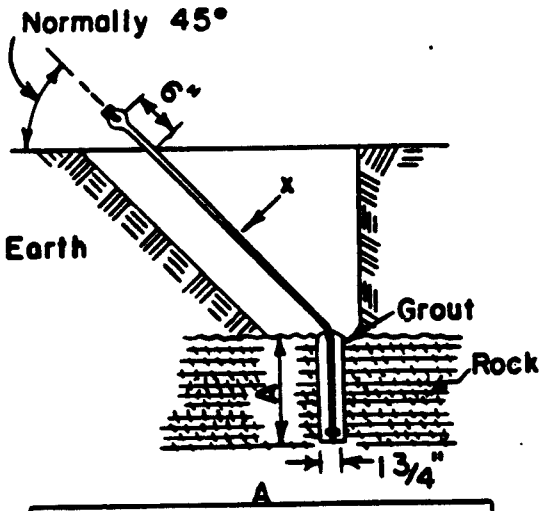
Projection of anchor rod above earth may be increased to a maximum of 12" in cultivated fields or other locations where necessary to prevent burying the rod eye.

		ASSEMBLY UNIT							
		F4-1S		F4-1E					
ITEM	MATERIAL	NO.		NO.					
x	Rod, anchor, thimble type eye			1	5/8" x 6'-0"				
z	Anchor, service	1		1					
	Holding power		2500#		2500#				

SERVICE ANCHOR ASSEMBLY

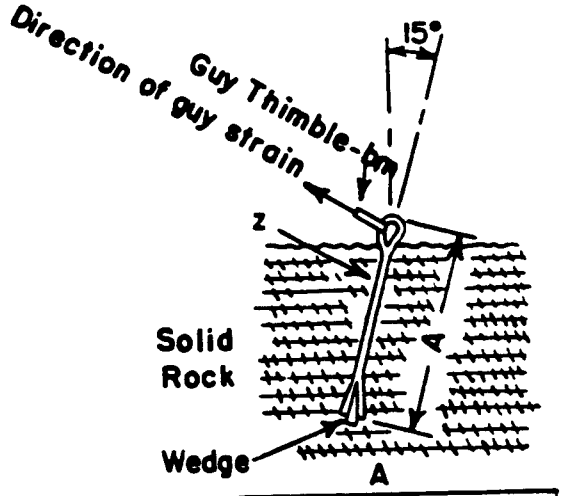
Jan 1, 1962

F4-1



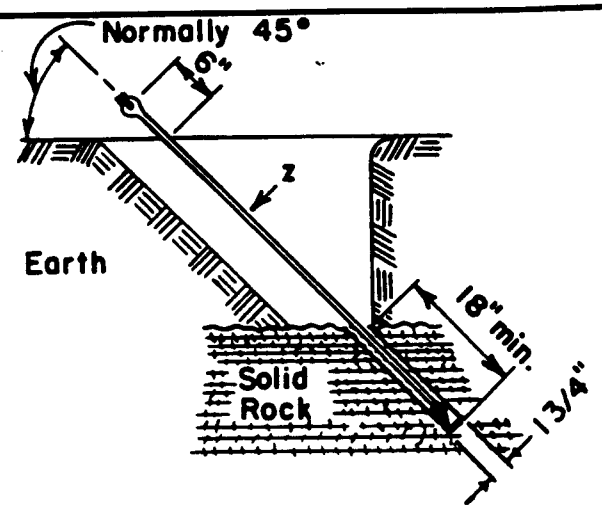
18" min. for sound solid rock
30" min. for stratified rock

F5-1



Guy Bolt 18"
Rock Anchor 15"

F5-2



F5-3

Notes:

1. Only one guy shall be attached to a rock anchor. Where more than one guy is required space anchors 2 ft. minimum and where practical they shall be in direct line with pole.

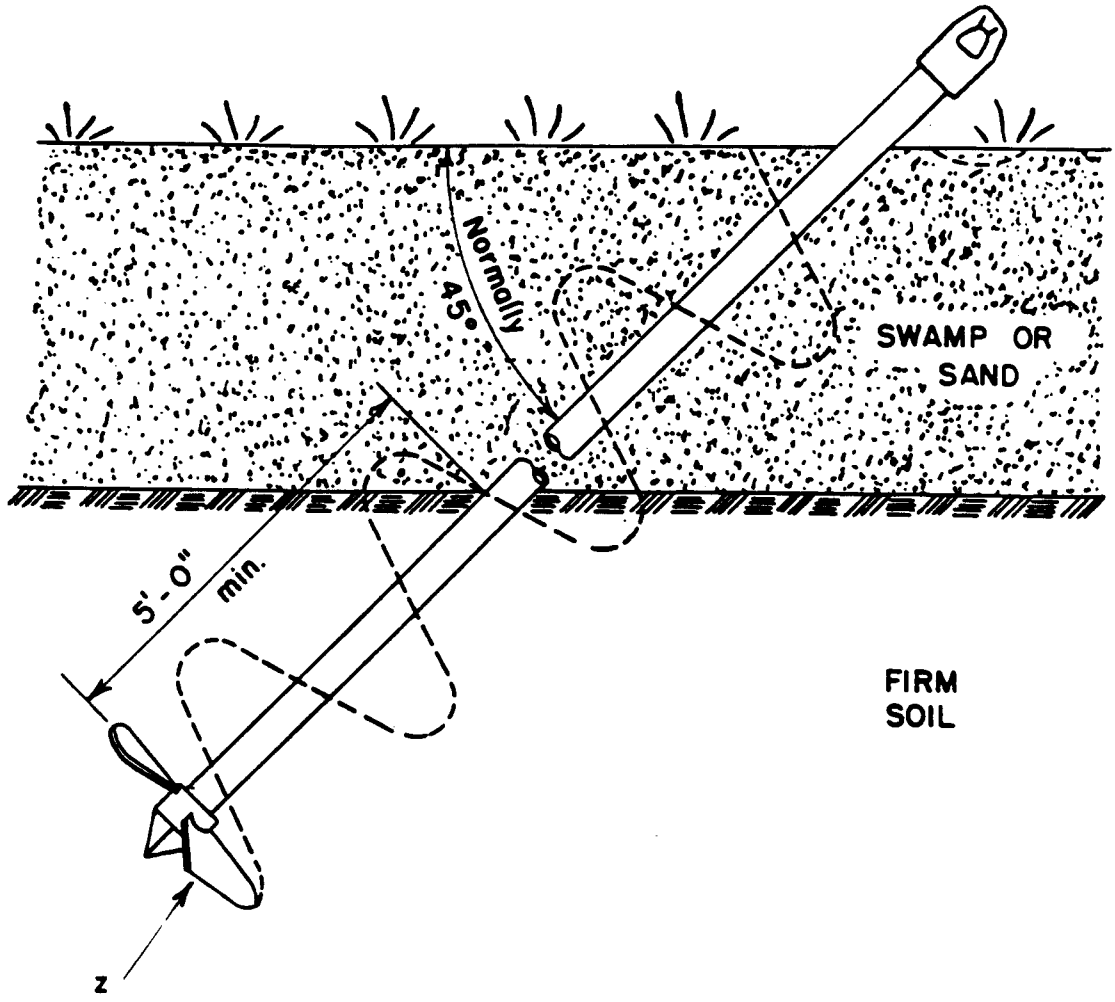
2. Do not anchor to any boulder measuring less than 5ft. in two directions at right angles to each other.

		ASSEMBLY UNIT			
		F5-1	F5-2	F5-3	
ITEM	MATERIAL	No. REQ'D	No. REQ'D	No. REQ'D	
x	Rod, anchor or thimble type eye	1			
z	Anchor, rock		1	1	
bm	Thimble, guy		1		

ROCK ANCHOR ASSEMBLIES

Jan 1, 1962

F5-1, F5-2, F5-3



		ASSEMBLY UNIT							
		F6-1		F6-2		F6-3			
ITEM	MATERIAL	NO.	TYPE	NO.	TYPE	NO.	TYPE	NO.	TYPE
Z	Anchor, swamp	1	10"	1	12"	1	15"		
	Holding power		6000#		8000#		10,000#		
	Nut, thimble type eye	1		1		1			
	Pipe, galvanized, as req'd								

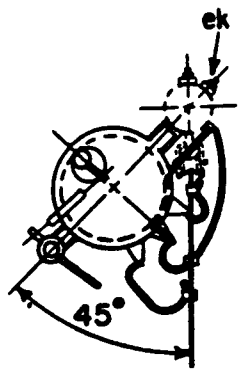
SWAMP ANCHOR ASSEMBLY

Jan 1, 1962

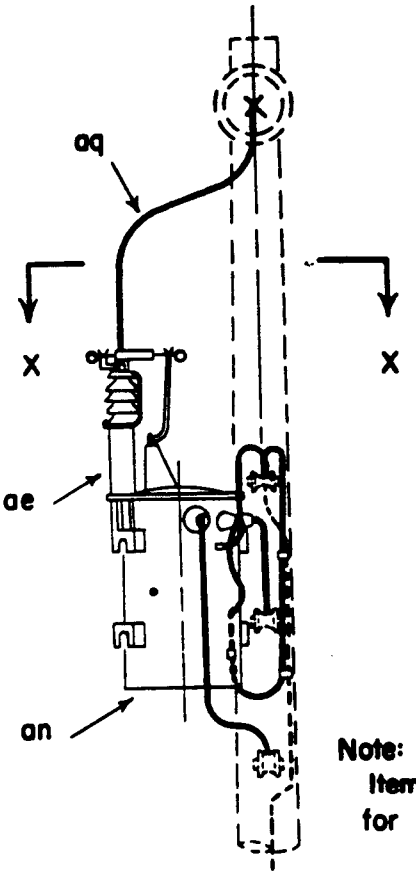
F6-1, F6-2, F6-3

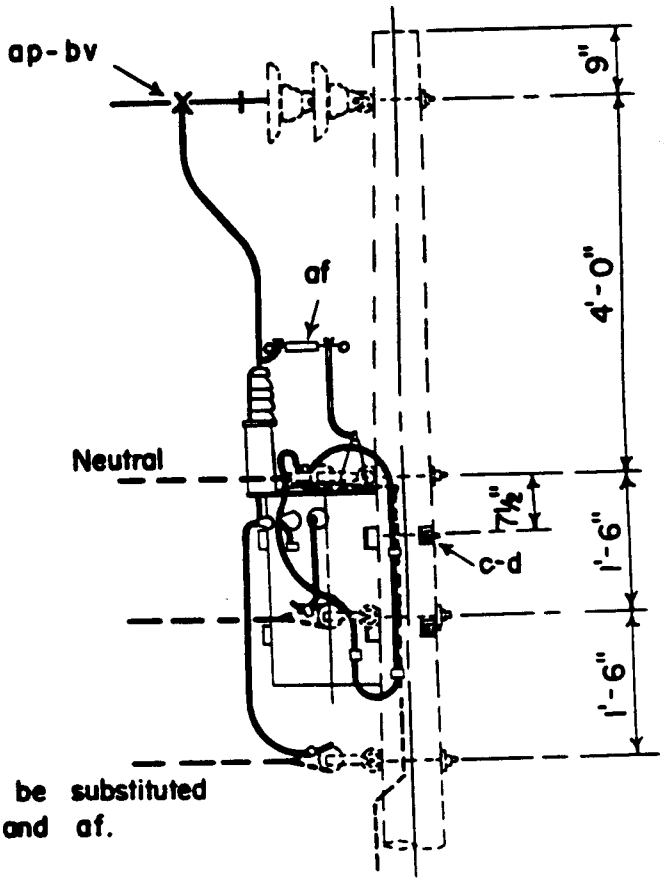
Notes:

1. Designate VG10 for conventional transformer with tank mounted cutout and arrester, VG66 for transformer with double gaps and internal fuse, VG106 for self protected transformer.
2. See guide drawings for details of transformer secondary and service connections.



SECTION X-X





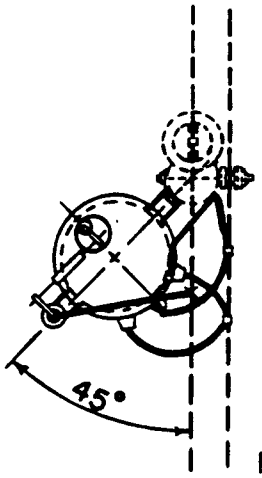
Note:
Item ax may be substituted for items ae and af.

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
c	2	Bolt, machine, 5/8" x req'd. length		an	1	Transformer	
d	2	Washer, square, 2 1/4"		ap	1	Clamp, hot line, tap assembly	
p		Connectors, as required		aq		Jumpers, stranded, as required	
ae	1	Lightning arrester (VG10 only)		bv	1	Rods, armor	
af	1	Cutout, fuse, open link (VG10 only)		ek		Locknuts	

14.4/24.9 KV.
SINGLE PHASE TRANSFORMER
AT DEADEND

Jan. 1, 1963

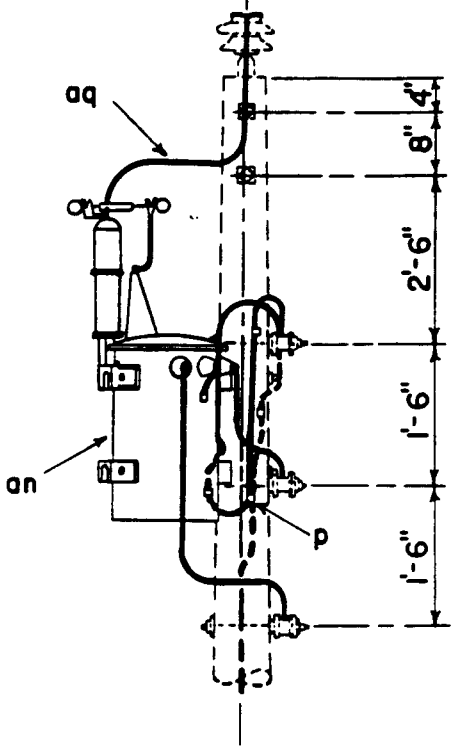
VG10, VG66, VG106

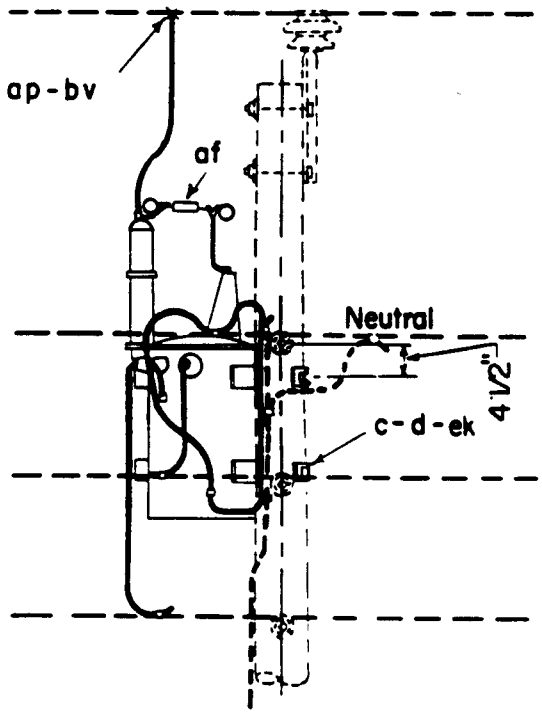


PLAN

Notes:

1. Designate VG19 for conventional transformer with tank mounted cutout and arrester, VG65 for transformer with double gap and internal fuse, VG105 for self protected transformer.
2. See guide drawings for details of transformer secondary and service connections.





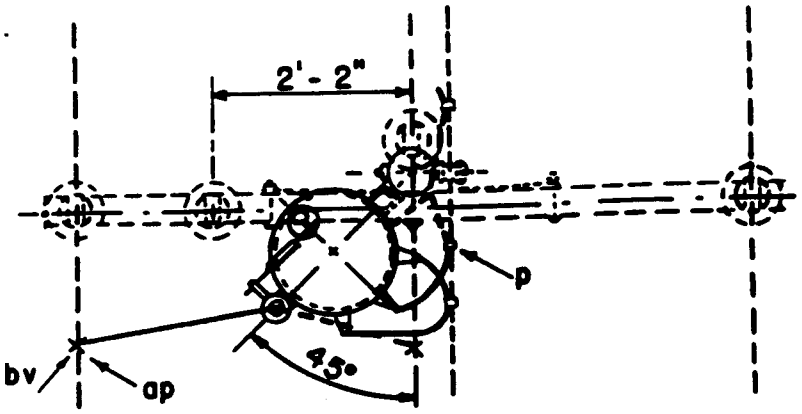
ITEM	No.	MATERIAL		ITEM	No.	MATERIAL	
c	2	Bolt, machine, 5/8" x req'd. length		an	1	Transformer	
d	2	Washer, square, 2 1/4"		ap	1	Clamp, hot line, tap assembly	
p		Connectors, as required		aq		Jumpers, stranded, as required	
ae	1	Lightning arrester (VG19 only)		bv	1	Rods, armor	
af	1	Cutout, fuse, single shot (VG19 only)		ek		Locknuts	

14.4/24.9 KV.
SINGLE PHASE TRANSFORMER
AT 1-PHASE TANGENT

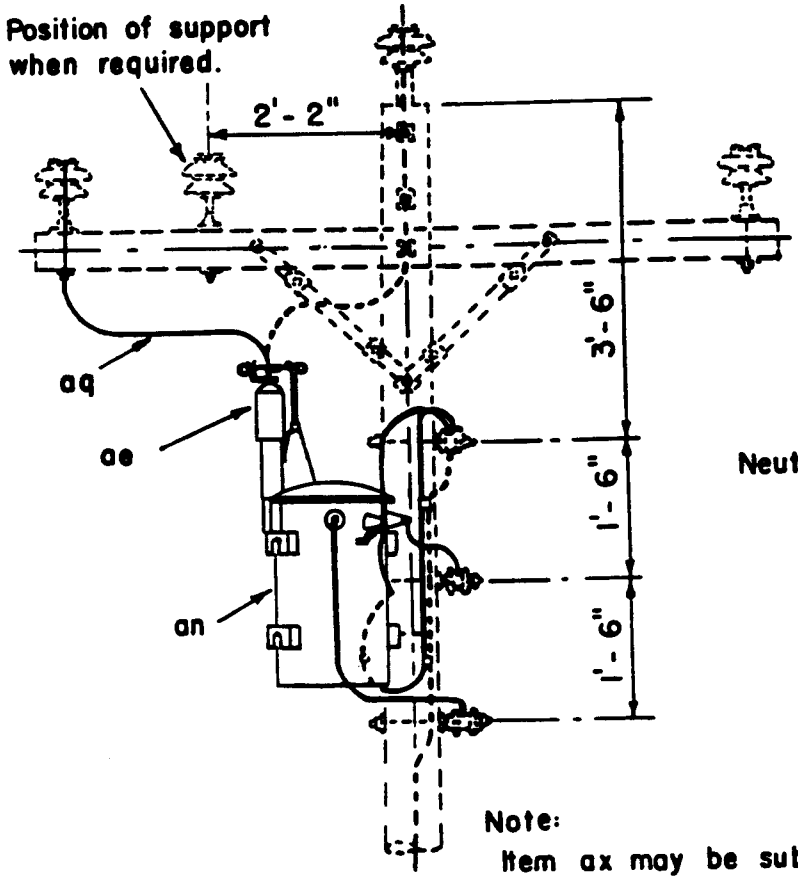
Jan. 1, 1963

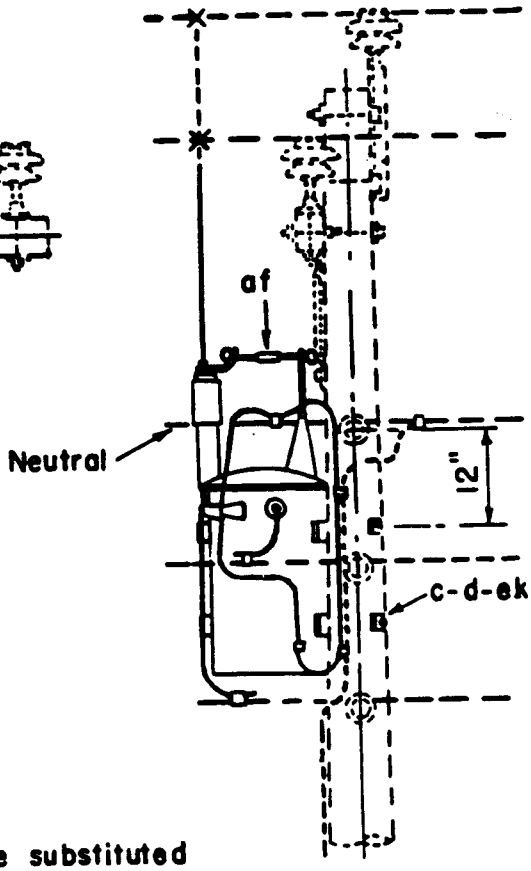
VG19, VG65, VG105

Notes: 1. Designate VG39 for conventional transformer with tank mounted cutout and arrester, VG67 for transformer with double gap and internal fuse and VG136 for self protected transformer.
2. See guide drawings for details of transformer secondary and service connections.
3. Reverse for connection to other outside phase.



PLAN





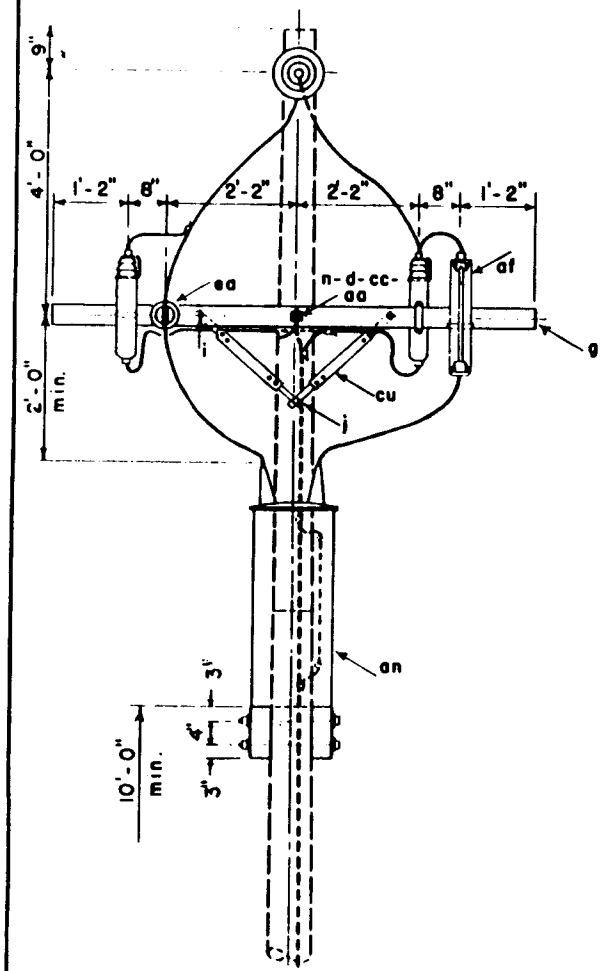
Note:
Item ax may be substituted for items ae and af.

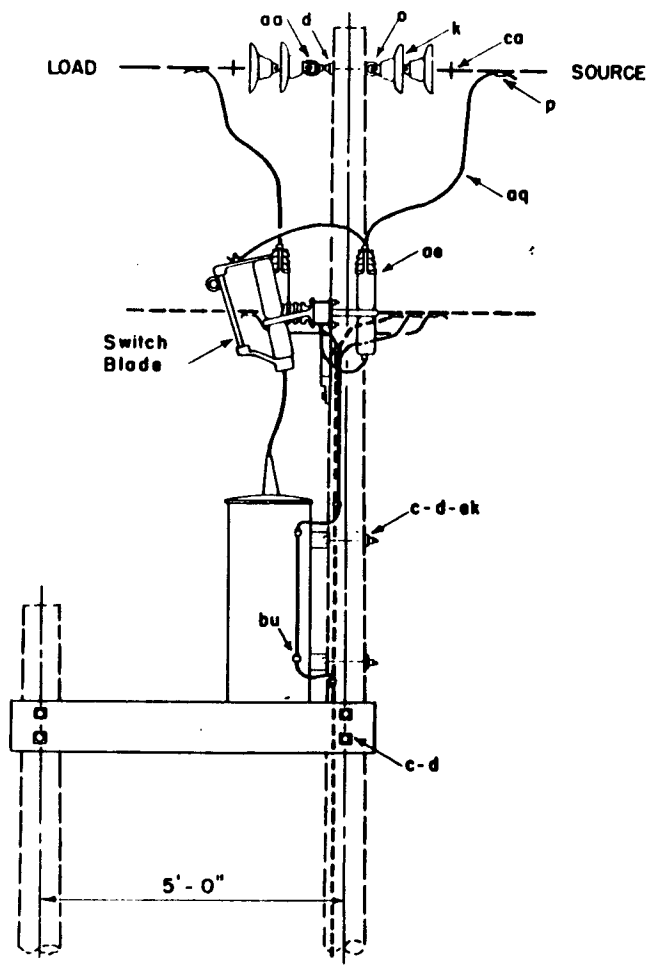
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
c	2	Bolt, machine, 5/8" x req'd length	aq		Jumpers, stranded, as required
d	2	Washer, square 2 1/4"	af	1	Cutout, fuse, open link (VG 39 only)
p		Connectors, as required	ae	1	Lightning arrester (VG 39 only)
an	1	Transformer	bv	1	Rods, armor
ap	1	Clamp, hot line, tap assembly	ek		Locknuts

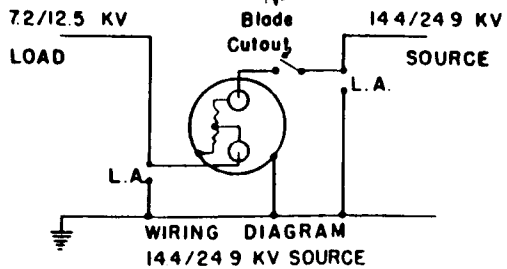
14.4/24.9 KV.
SINGLE PHASE TRANSFORMER
ON THREE PHASE CIRCUIT

Jan. 1, 1963

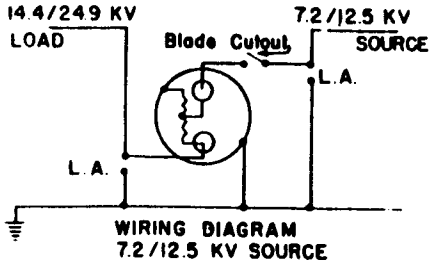
VG39-,VG67-,VG136-







WIRING DIAGRAM
14.4/24.9 KV SOURCE



WIRING DIAGRAM
7.2/12.5 KV SOURCE

ITEM	NO.	MATERIAL
c	2	Bolt, machine, 5/8" x required length
c	4	Bolt, machine, 3/4" x required length
d	13	Washer, square, 2 1/4"
g	1	Crossarm, 3 1/2" x 4 1/2" x 8'-0"
i	2	Bolt, carriage, 3/8" x 4 1/2"
j	1	Screw, lag, 1/2" x 4"
k	2	Insulator, suspension, 6"
k	2	Insulator, suspension, 10"
n	1	Bolt, double arming, 5/8" x req'd. length
o	1	Bolt, eye, 5/8" x required length
p	2	Connector, compression type
p		Connectors, as required
aa	3	Nut, eye, 5/8"
ae	1	Arrester, lightning, 9 KV
ae	1	Arrester, lightning, 18 KV
af	1	Cutout, blade, 9 KV (G150 only)
af	1	Cutout, blade, 18 KV (VG150 only)
aq		Jumpers, stranded, as required
an	1	Transformer, auto, 14.4 - 7.2
* bu	2	Connector, solderless
ca	2	Deadend assembly, primary
cc	2	Deadend assembly, neutral
cu	2	Brace, wood, 28"
ea	1	Insulator, post type, with 7" stud - 12 KV. (G150 only)
ea	1	Insulator, post type, with 7" stud - 25 KV. (VG150 only)
ek		Locknuts
	2	Structural timber, 4" x 10" x 6'-0"

* Specify this item to be furnished by the transformer manufacturer.

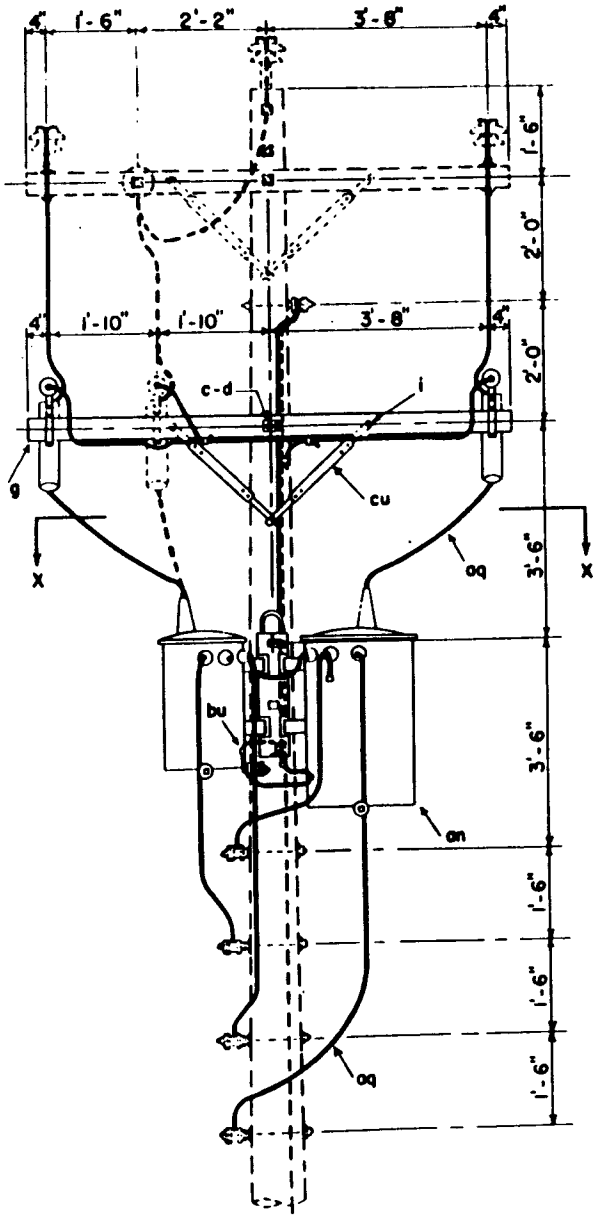
Notes:

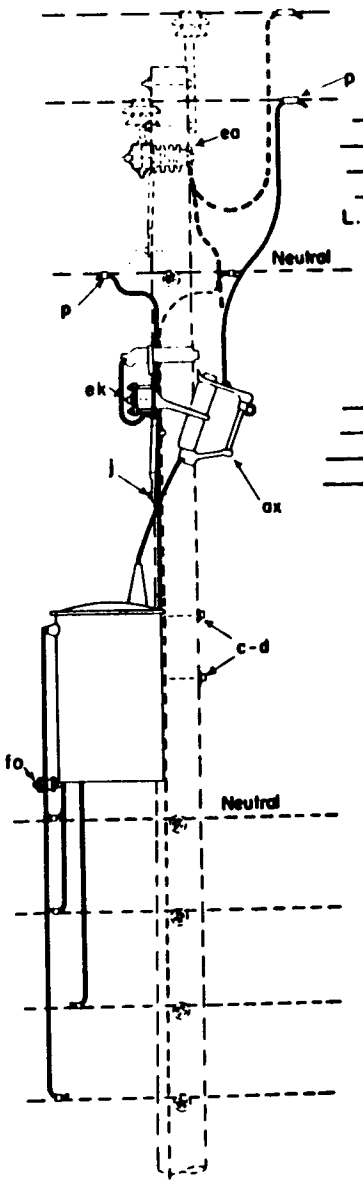
1. All structural timbers to be treated per REA specifications.
2. Designate as G150 when 7.2/12.5 KV is the source and VG150 when 14.4/24.9 KV is the source. Strike out items, (af and ea) in material list which do not apply.

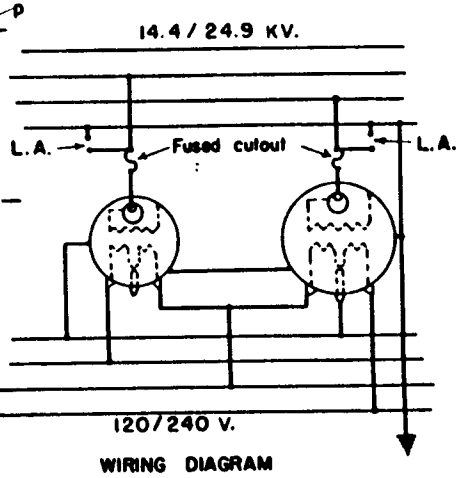
14.4/24.9 KV – 7.2/12.5 KV
ONE AUTO TRANSFORMER

Jan. 1, 1963

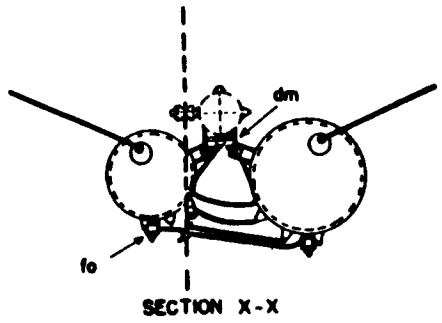
G150, VG150







WIRING DIAGRAM



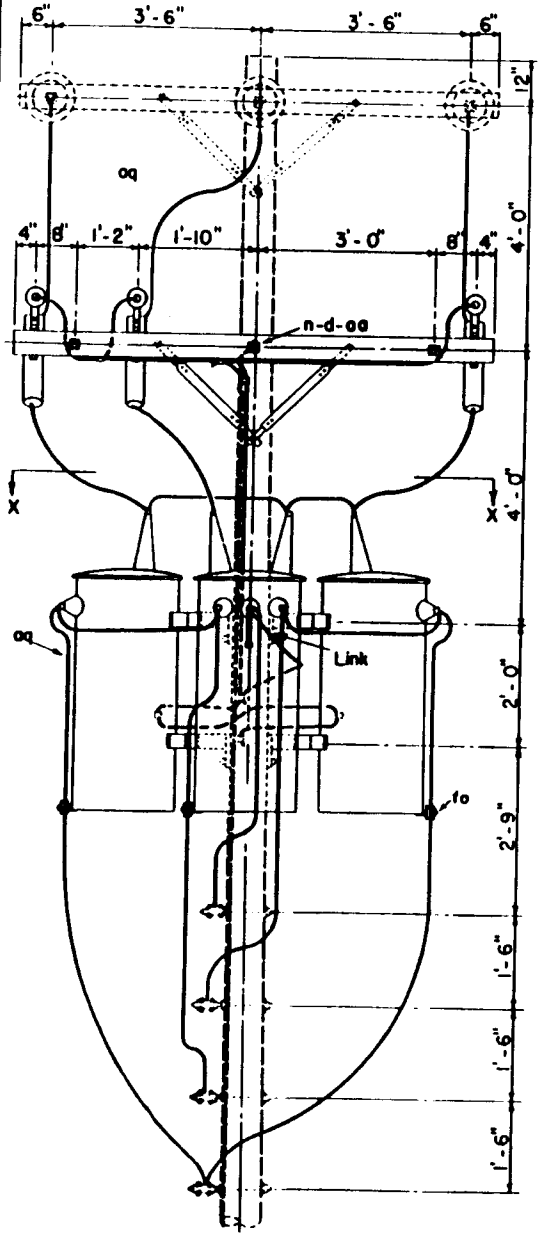
SECTION X-X

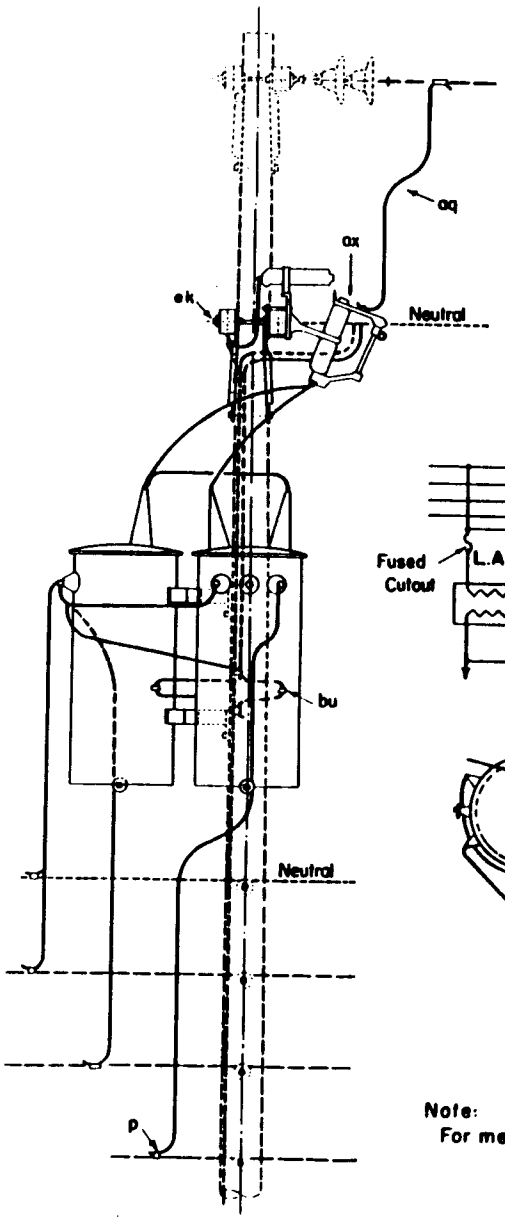
ITEM	NO.	MATERIAL
c	3	Bolt, machine, 5/8" x req'd. length
d	4	Washer, square, 2 1/4"
g	1	Crossarm, 3 1/2" x 4 1/2" x 8'-0"
i	2	Bolt, carriage, 3/8" x 4 1/2"
j	1	Screw, lag, 1/2" x 4"
p	2	Connector, compression type
p		Connectors, as required
an	2	Transformer, conventional 25 kva max.
oq		Jumper, secondary, weather-proof
oq		Jumper, bare, stranded, as required
as	2	Cutout and arrester, combination
cu	2	Brace, wood, 28"
dm	1	Bracket, transformer
ea		Insulator, post type, with 7" stud
fo	3	Transformer secondary bracket
ek		Locknuts

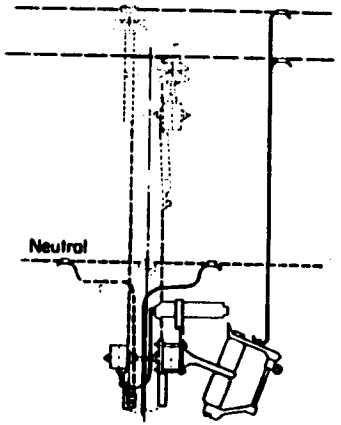
14.4/24.9 KV
TWO TRANSFORMERS, CLUSTER MOUNTED
OPEN WYE – OPEN DELTA
SINGLE PHASE AND THREE PHASE POWER LOAD

Jan. 1, 1963

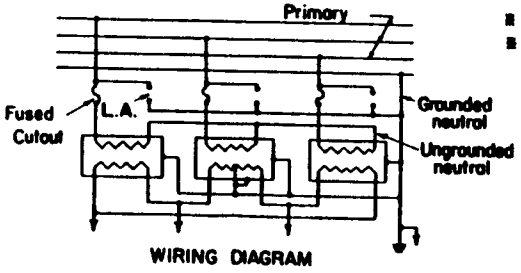
VG210-



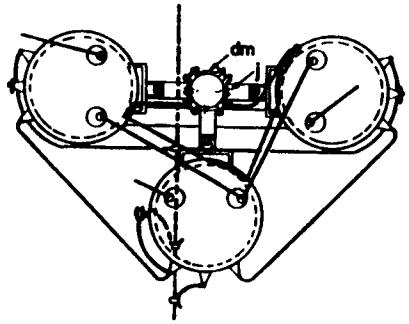




TANGENT LINE ASSEMBLY



WIRING DIAGRAM



SECTION X–X

Note:
For metering see drawing M8-6

ITEM	NO.	MATERIAL
d	10	Washer, square, 2 1/4"
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"
i	4	Bolt, carriage, 3/8" x 4 1/2"
j		Screw, lag, 1/2" x 4" as required
n	3	Bolt, double arming, 5/8" x req'd length
p	3	Connectors, compression type
p		Connectors as required
oa	1	Nut, eye, 5/8"
on	3	Transformer, 100 kva maximum
oq		Jumper, bare, stranded, as required
oq		Jumper, secondary, weather-proof
os	3	Cutout and arrester, combination
cu	4	Brace, wood, 28"
dm		Bracket, transformer, cluster-type with adapter plates as required
bu	4	Connector, solderless
	1	Link, neutral, grounding
ek		Locknuts
fo	3	Transformer secondary bracket

* Specify these items to be furnished by the transformer manufacturer.

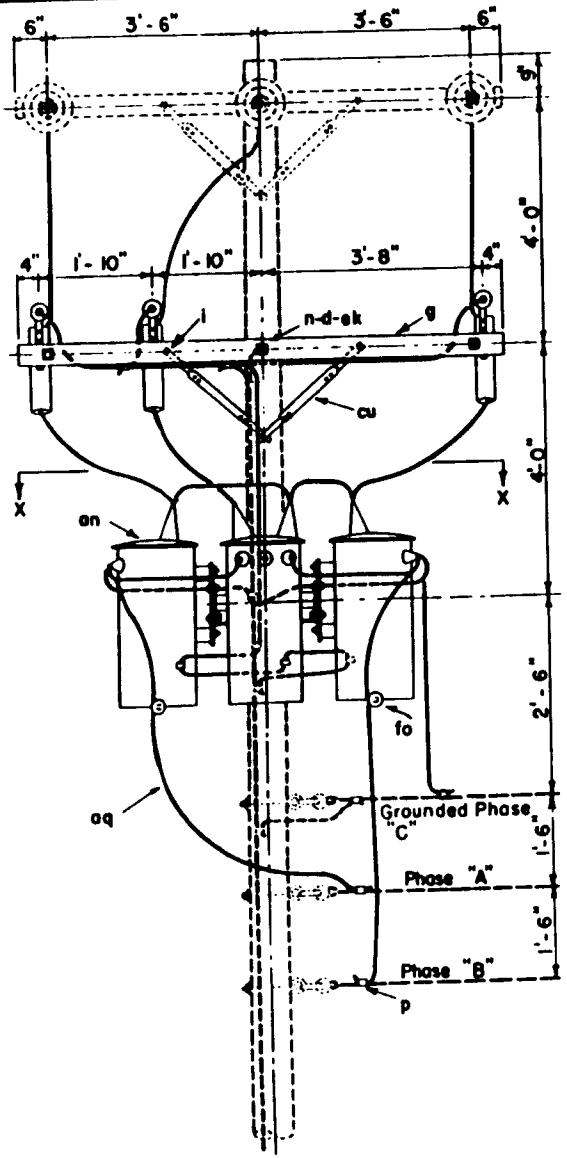
Notes

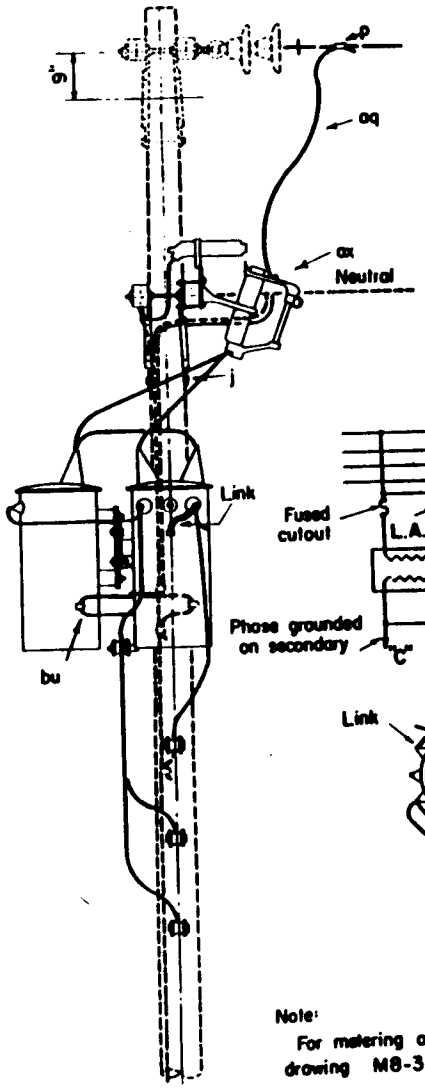
1. For transformers 25 KVA and smaller use one cluster bracket with adapter plates and dimension as shown on VG312.
2. All tanks to be grounded.
3. Secondary neutrals of all transformers except one shall be disconnected from tanks and not grounded.
4. When used for combined single phase and three phase load the transformer for the single phase load shall not be larger than twice the capacity of one of the others.

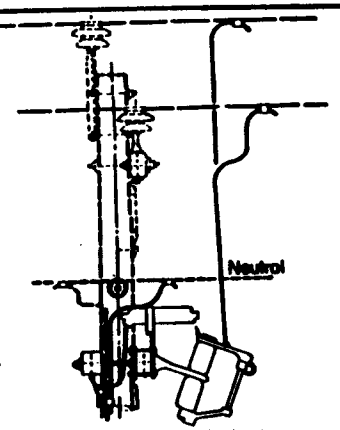
144/249 KV
THREE TRANSFORMERS CLUSTER MOUNTED
UNGROUNDED WYE DELTA FOR
120/240 VOLT POWER LOADS

Jan. 1, 1963

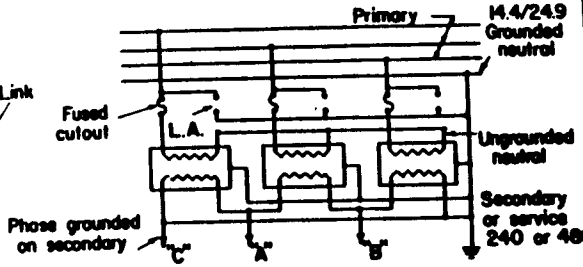
VG310-



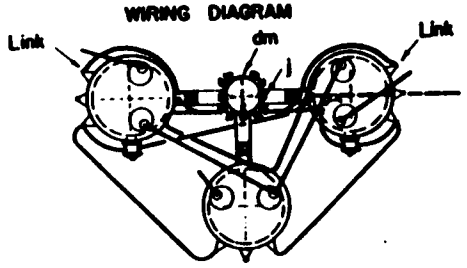




TANGENT LINE ASSEMBLY



WIRING DIAGRAM



SECTION X-X

ITEM	NO.	MATERIAL	
d	2	Washer, square, 2 1/4"	
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"	
i	4	Bolt, carriage, 3/8" x 4 1/2"	
j		Screw, lag, 1/2" x 4", as required	
n	3	Bolt, double arming, 5/8" x req'd. length	
p	3	Connector, compression type	
p		Connectors, as req'd.	
an	3	Transformer, 100 kva max.	
aq		Jumper, bare, stranded, as required	
aq		Jumper, secondary, weather-proof	
ax	3	Cutout and arrester, combination	
bu	5	Connector, solderless	*
cu	4	Brace, wood, 28"	
dm		Bracket, transformer, cluster and adapter plates, as req'd.	
ak		Lockknute	
fo	2	Transformer secondary bracket	
	2	Link, grounding	*
aa	1	Nut, eye, 5/8"	

* Specify these items to be furnished by the manufacturer.

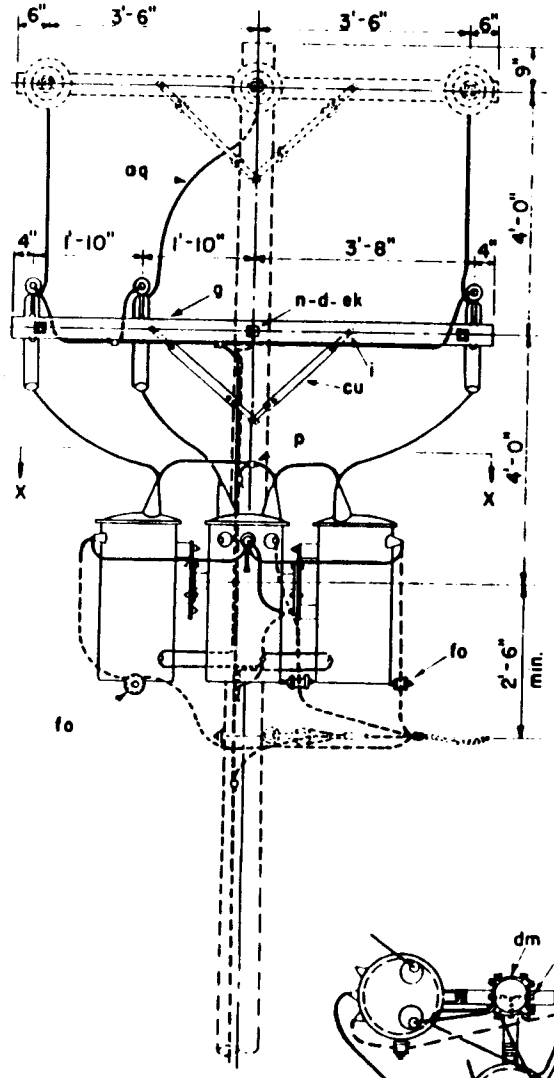
Notes:
1. All tanks to be grounded.
2. Secondary neutrals shall be disconnected from tanks and not grounded.
3. Grounded secondary phase wire must be identified throughout circuit run.
4. For transformers 37 1/2 KVA and larger, use two cluster brackets and dimension as shown on VG310.

Note:
For metering assembly, refer to drawing M8-3.

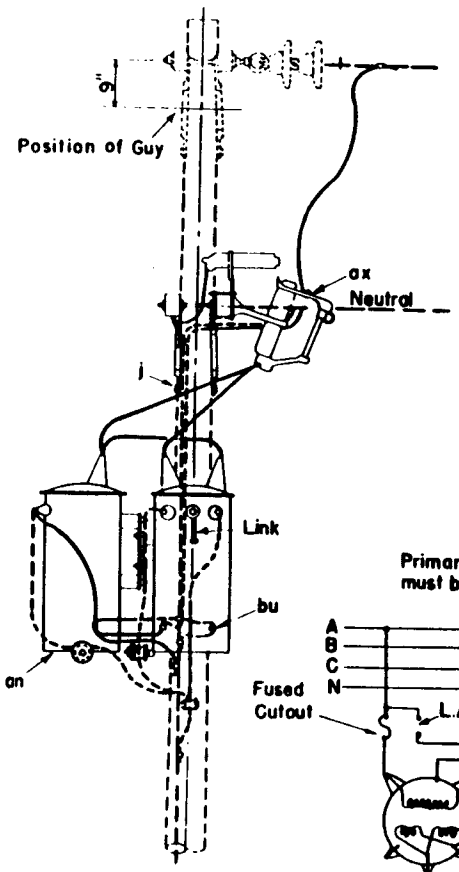
14.4/24.9 KV THREE TRANSFORMERS, CLUSTER MOUNTED 3 WIRE GROUNDED DELTA FOR 240 OR 480V POWER LOADS

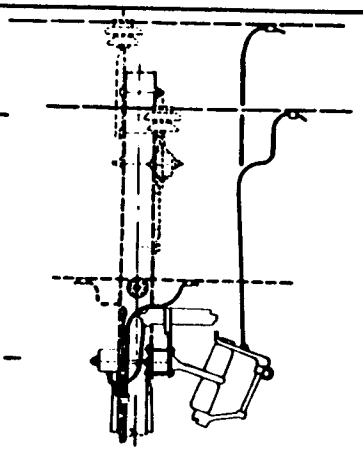
Jan. 1, 1963

VG311 -

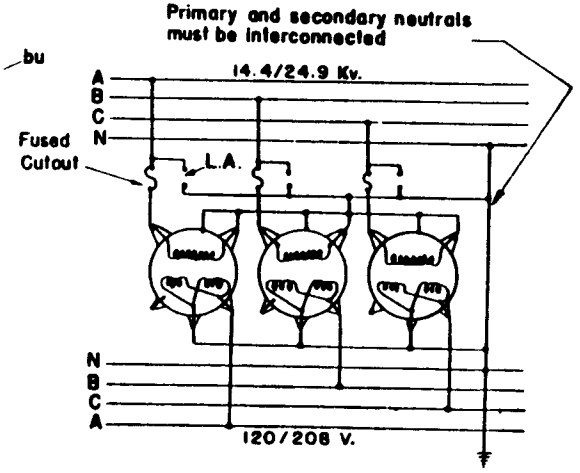


SECTION X-X

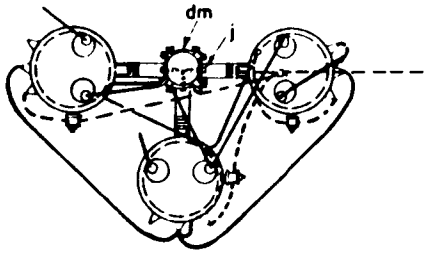




TANGENT LINE ASSEMBLY



WIRING DIAGRAM



ITEM	NO.	MATERIAL
d	10	Washer, square, 2 1/4"
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"
i	4	Bolt, carriage, 3/8" x 4 1/2"
j		Screw, lag, 1/2" x 4" as required
n	3	Bolt, double arming, 5/8" x req'd length
p	3	Connector, compression type
p		Connectors, as required
an	3	Transformer, 100 KVA max.
aq		Jumper, secondary, weather proof
aq		Jumper, bare, stranded, as required
ax	3	Cutout and arrester, combination
	3	Link, grounding *
bu	3	Connector, solderless *
cu	4	Brace, wood, 28"
dm		Bracket, transformer, cluster and adapter
		plates as required
ek		Lockнuts
fo	3	Transformer secondary bracket
		insulated

*Specify these items to be furnished by the manufacturer.

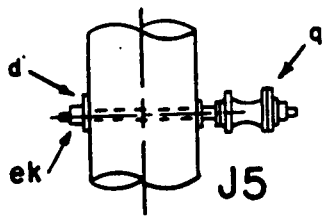
Notes:

1. For transformers 37 1/2 KVA & larger use two cluster brackets and dimension as shown on VG 310.
2. Single bushing transformers may be used if desired.
3. Re-connect internal windings of secondary as shown.
4. For metering, see drawing M8-11.

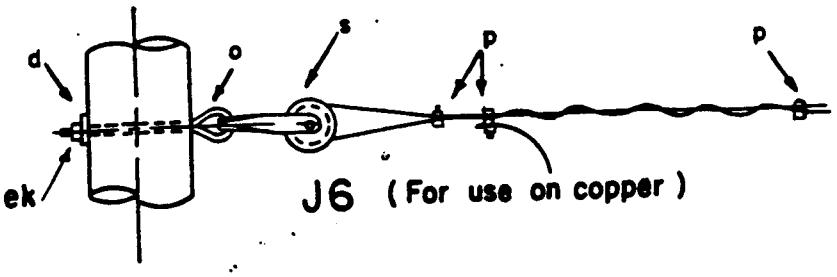
14.4/24.9 KV
THREE TRANSFORMERS, CLUSTER MOUNTED
4-WIRE GROUNDED WYE - GROUNDED WYE
FOR 120/208 VOLT POWER LOADS

Jan. 1, 1963

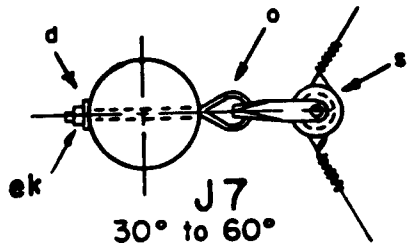
VG 312-



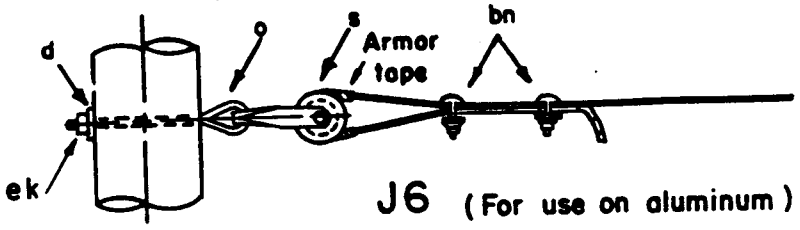
J5



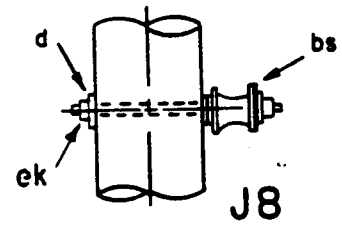
J6 (For use on copper)



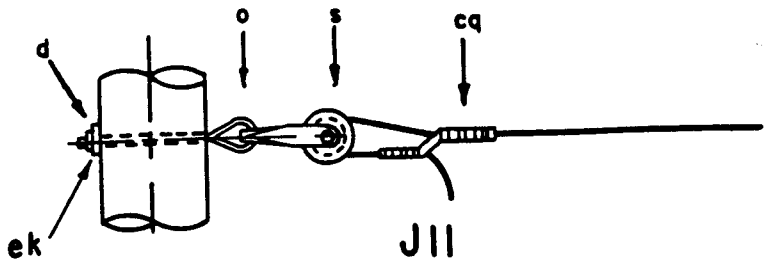
J7
30° to 60°



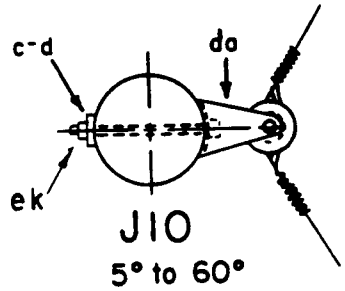
J6 (For use on aluminum)



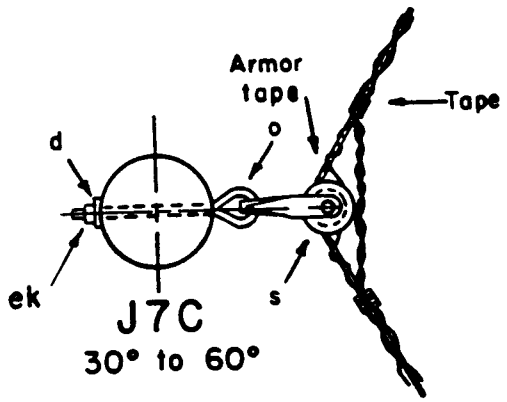
J8



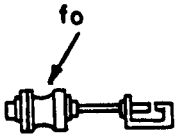
J11



J10
5° to 60°



J7C
30° to 60°



J12

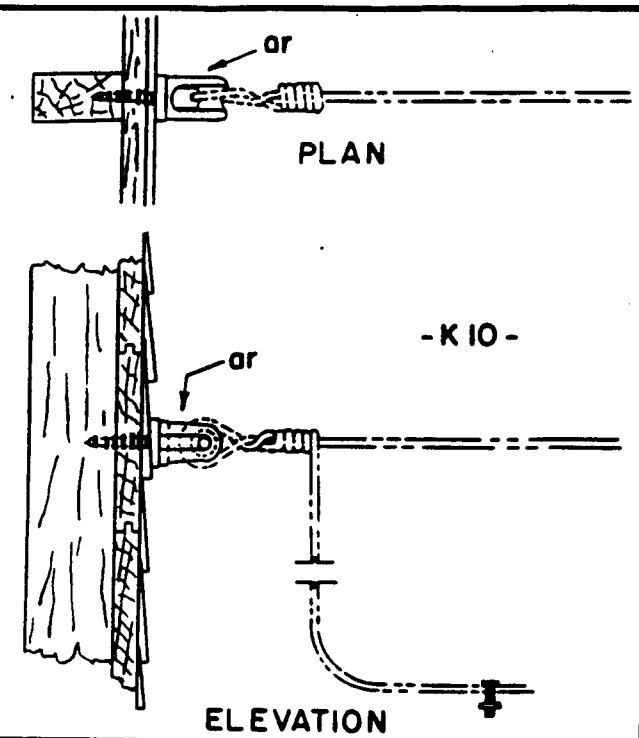
For use on Self Supporting Service Cable

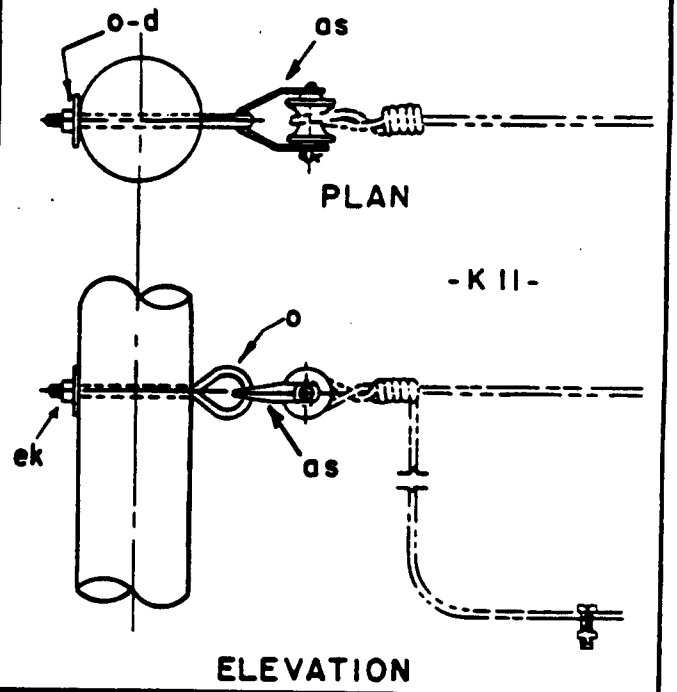
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL
c		Bolt, machine, 5/8" x required length		bs		Bolt, single upset insulated
d		Washer, 2 1/4" x 2 1/4" x 3/16", 13/16" hole		bn		Clamp, loop, deadend
o		Bolt, eye, 5/8" x required length		cq		Sleeve, offset, splicing
p		Connectors, as required		da		Bracket, insulated
q		Bolt, double upset, insulated		fo		Transformer secondary bracket
s		Clevis, secondary, swinging, insulated		ek		Locknuts

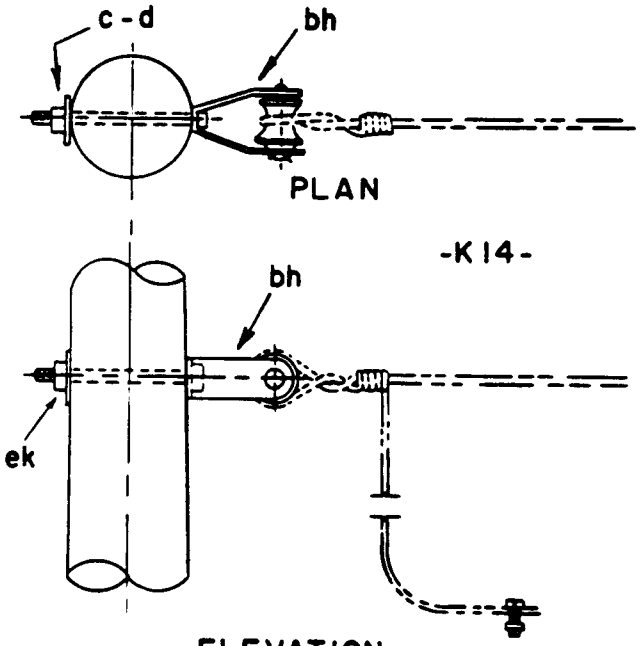
SECONDARY ASSEMBLIES

Jan 1, 1962

J5 to J12







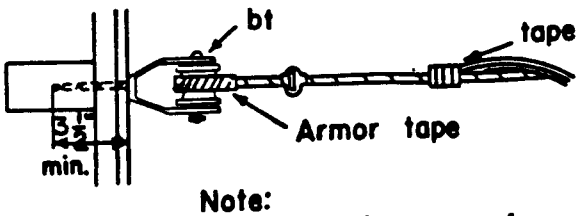
ITEM	NO.	MATERIAL
c		Bolt, machine, 5/8" x req'd length
d		Washer, 2 1/4" x 2 1/4" x 3/16", 13/16" hole
o		Bolt, eye, 5/8" x req'd length
ar		Wire holder

ITEM	NO.	MATERIAL
as		Clevis, service, swinging, insulated
bh		Clevis, service, deadend, insulated
ek		Locknuts

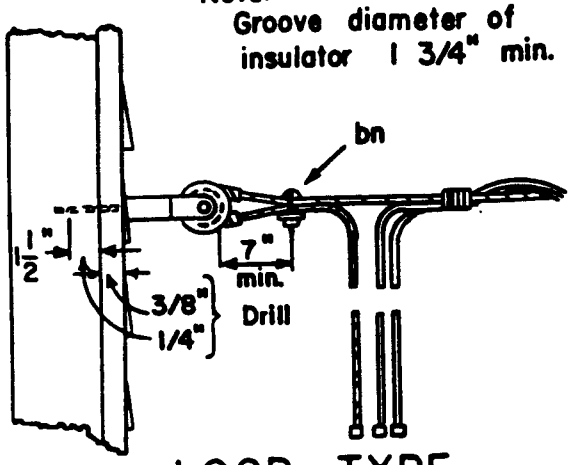
SERVICE ASSEMBLIES

Jan 1, 1962

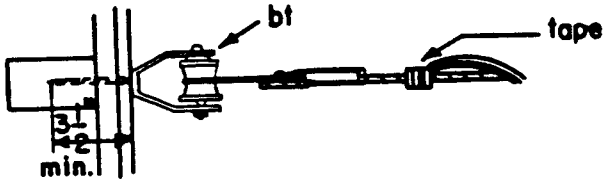
K10, K11, K14

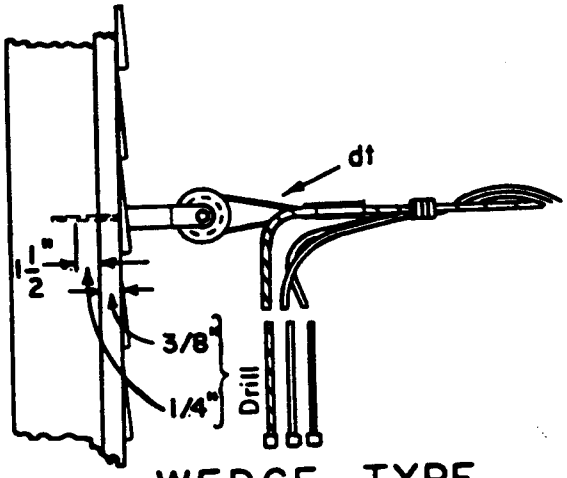


Note:
Groove diameter of insulator 1 3/4" min.

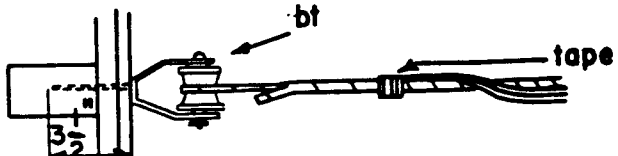


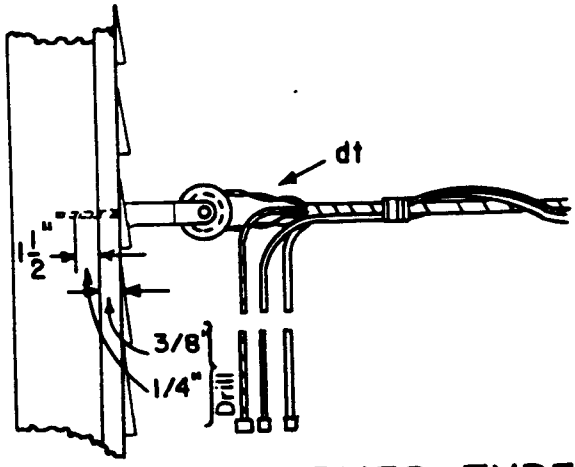
LOOP TYPE



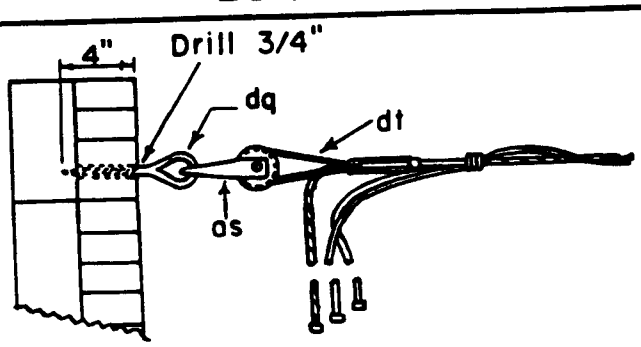


WEDGE TYPE





PREFORMED TYPE



BRICK OR MASONRY

Notes:

Wedge and preformed service deadends in sizes shown on page d1 of the List of Materials may be subst. for those shown on K11C, K14C, K15C, and K16C. This type construction should be used for 3 or 4 conductor service cables with bare ACSR neutral.

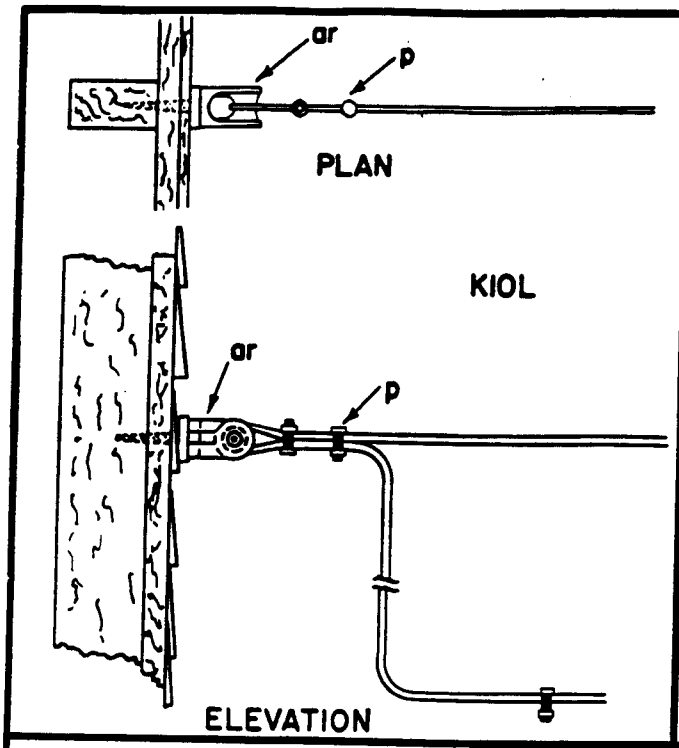
ITEM	MATERIAL
bt	Wireholder, clevis type.
	#24 woodscrew, insulated.
p	Connectors, as required.
bn	Clamp, loop deadend.
as	Clevis, service, insulated

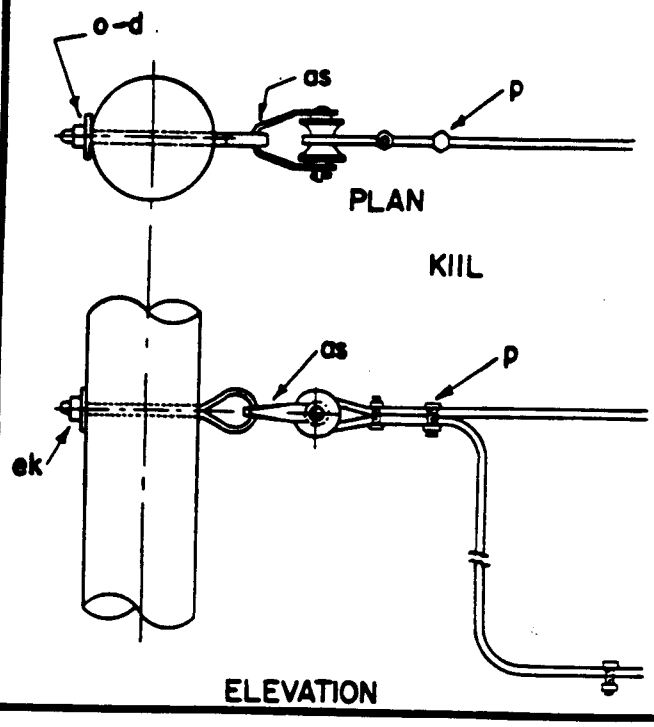
ITEM	MATERIAL
dt	Service deadend, wedge type.
dt	Service deadend, preformed type.
dq	Eye screw, elliptical, 1/2" x 6"
	3/4" x 3 1/2" expansion shield

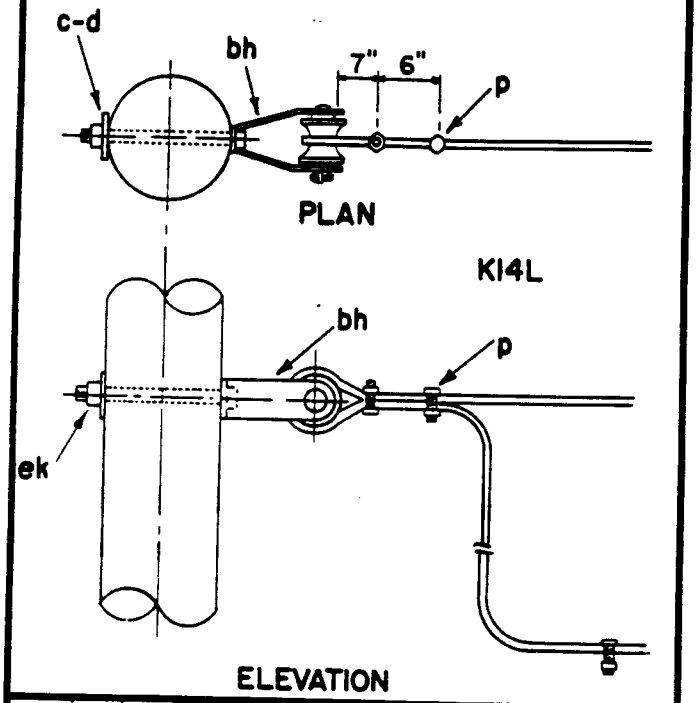
SERVICE ASSEMBLIES, CABLE

Jan 1, 1962

K10C







NOTE 1:

This type construction should be used for No. 2 aluminum weatherproof conductor and larger.

NOTE 2:

Connectors to be applied over bare wire and then taped as required.

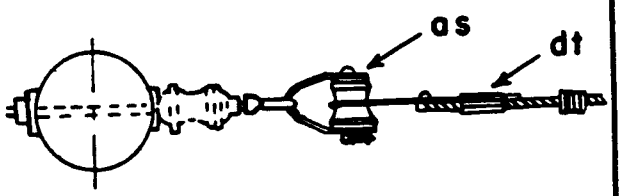
ITEM	NO.	MATERIAL
c		Bolt, machine, 5/8" x req'd. length
d		Washer, 2 1/4" x 2 1/4" x 3/16", 13/16" hole
o		Bolt, eye, 5/8" x req'd. length
p		Connectors, as req'd.

ITEM	NO.	MATERIAL
ar		Wireholder
as		Clevis, service, swinging, insulated
bh		Clevis, service, deadend, insulated
ek		Locknuts

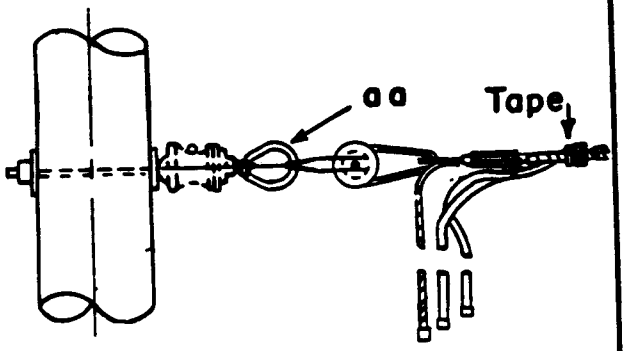
SERVICE ASSEMBLIES
(LARGE CONDUCTORS)

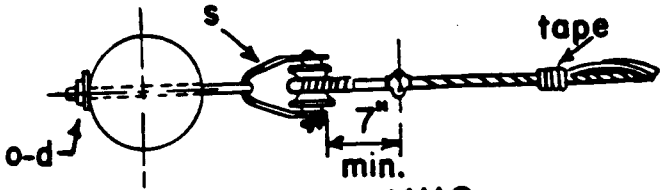
Jan 1, 1962

K1OL, KIIL, KI4L

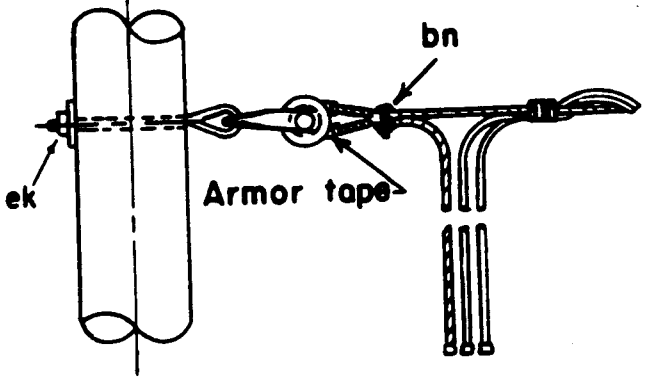


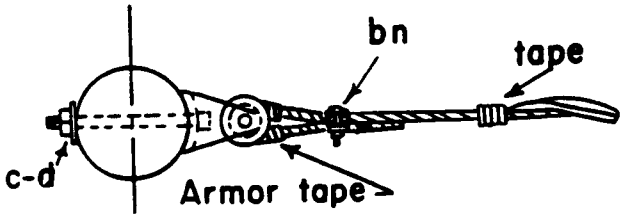
-K15C-

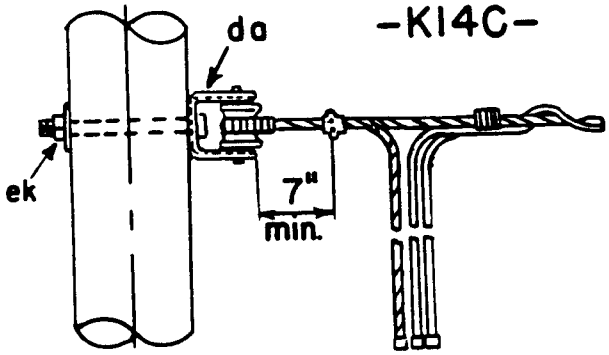




-K11C-







-K14C-

NOTES

This type construction should be used for 3 or 4 conductor service cables with bare A.C.S.R. neutral.

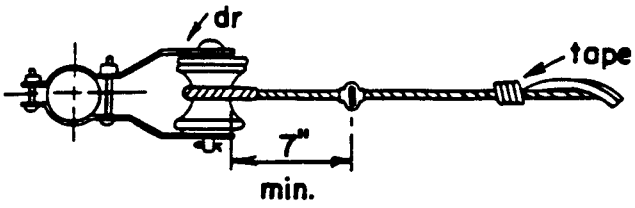
Groove diameter of insulators $1\frac{3}{4}$" minimum for loop deadends.

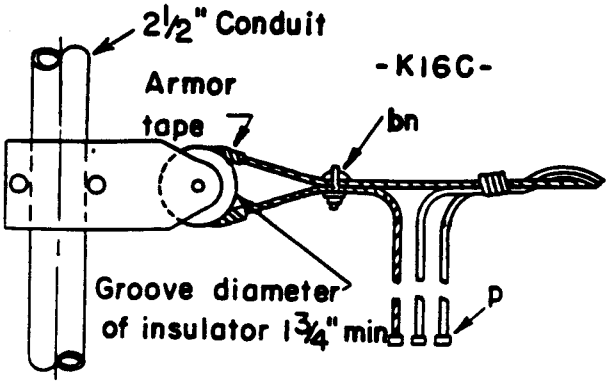
ITEM		MATERIAL		ITEM		MATERIAL	
c		Bolt, machine, $\frac{5}{8}$" x req'd. length		bn		Clamp, loop deadend	
d		Washer, $2\frac{1}{4}$" x $2\frac{1}{4}$" x $\frac{3}{16}$", $\frac{13}{16}$" hole		da		Bracket, insulated	
o		Bolt, eye, $\frac{5}{8}$" x req'd. length		as		Clevis, service swinging	
s		Clevis, secondary, swinging, insul.		p		Connectors, as required	
aa		Nut, eye		dt		Service deadend	
ek		Locknuts					

SERVICE ASSEMBLIES, CABLE

Jan 1, 1962

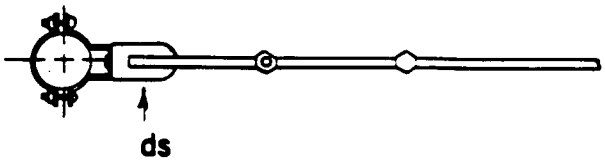
K11C, K14C, K15C

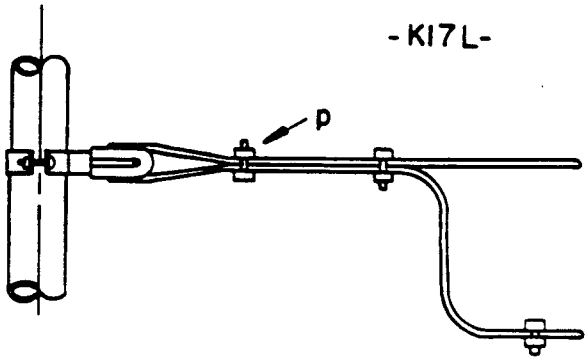




-K16C-

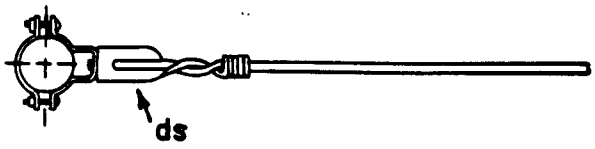
NOTE: This type constr. should be used for three conductor service cables with bare ACSR neutral.



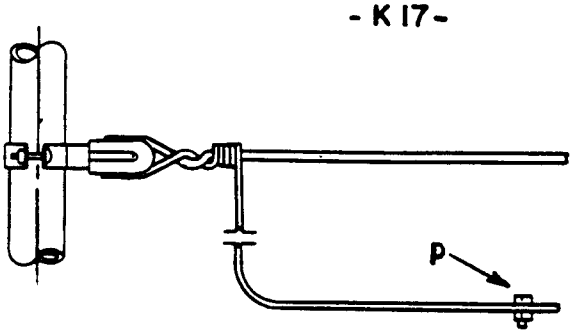


-K17L-

NOTE: This type constr. should be used for No. 2 aluminum weather-proof conductor.



-K17-



NOTES:

1. Connectors to be applied over bare wire and then taped as req'd.
2. For arrangement of service assembly units see drawing M24-10.

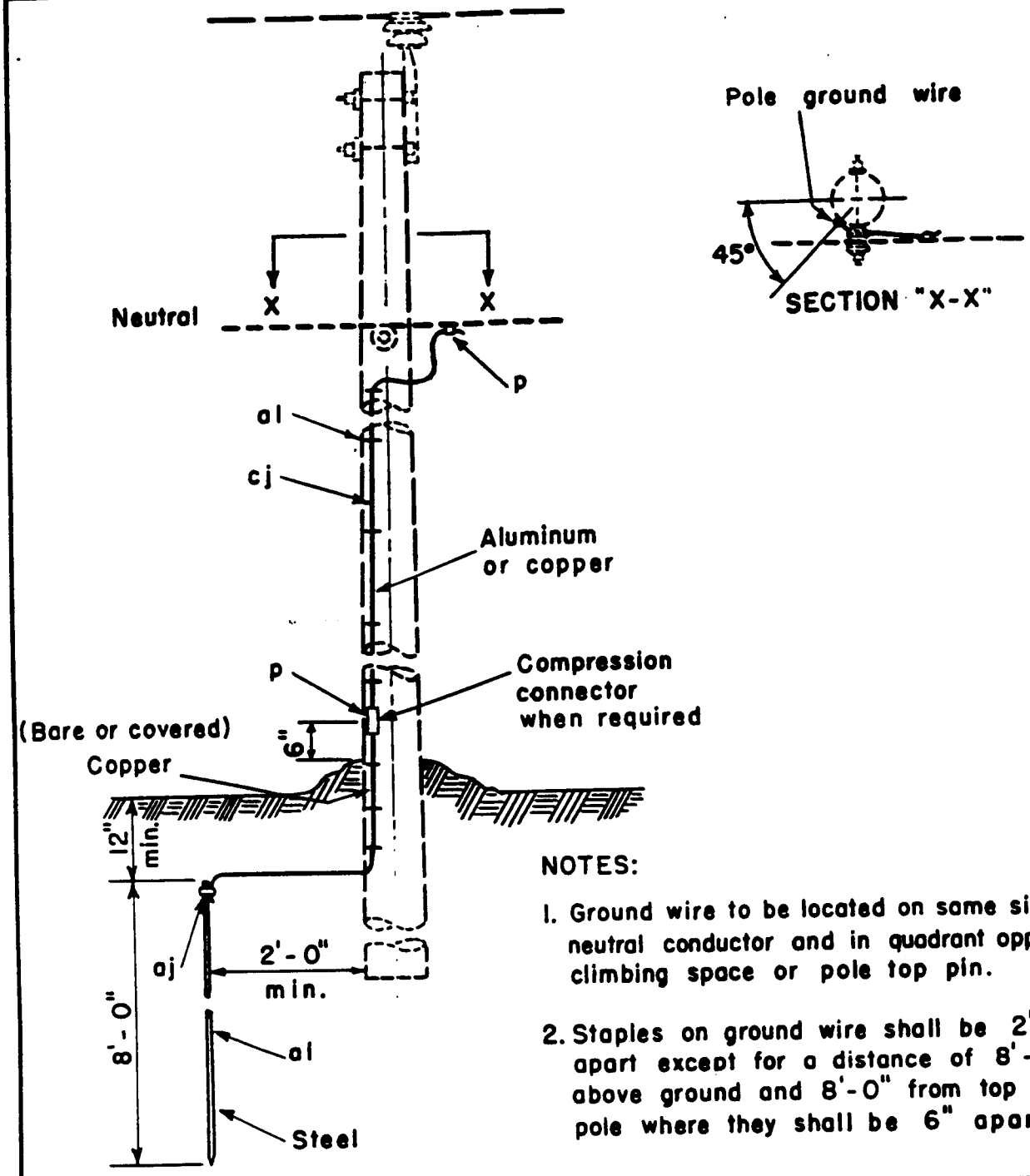
ITEM	NO.	MATERIAL	
p		Connectors, as req'd	
bn		Clamp, loop deadend	

ITEM	NO.	MATERIAL	
dr		Clevis, conduit insulated	
ds		Wireholder, conduit	

SERVICE ASSEMBLIES
(FOR RANCH TYPE HOUSES)

Jan 1, 1962

K16C, K17L, K17



NOTES:

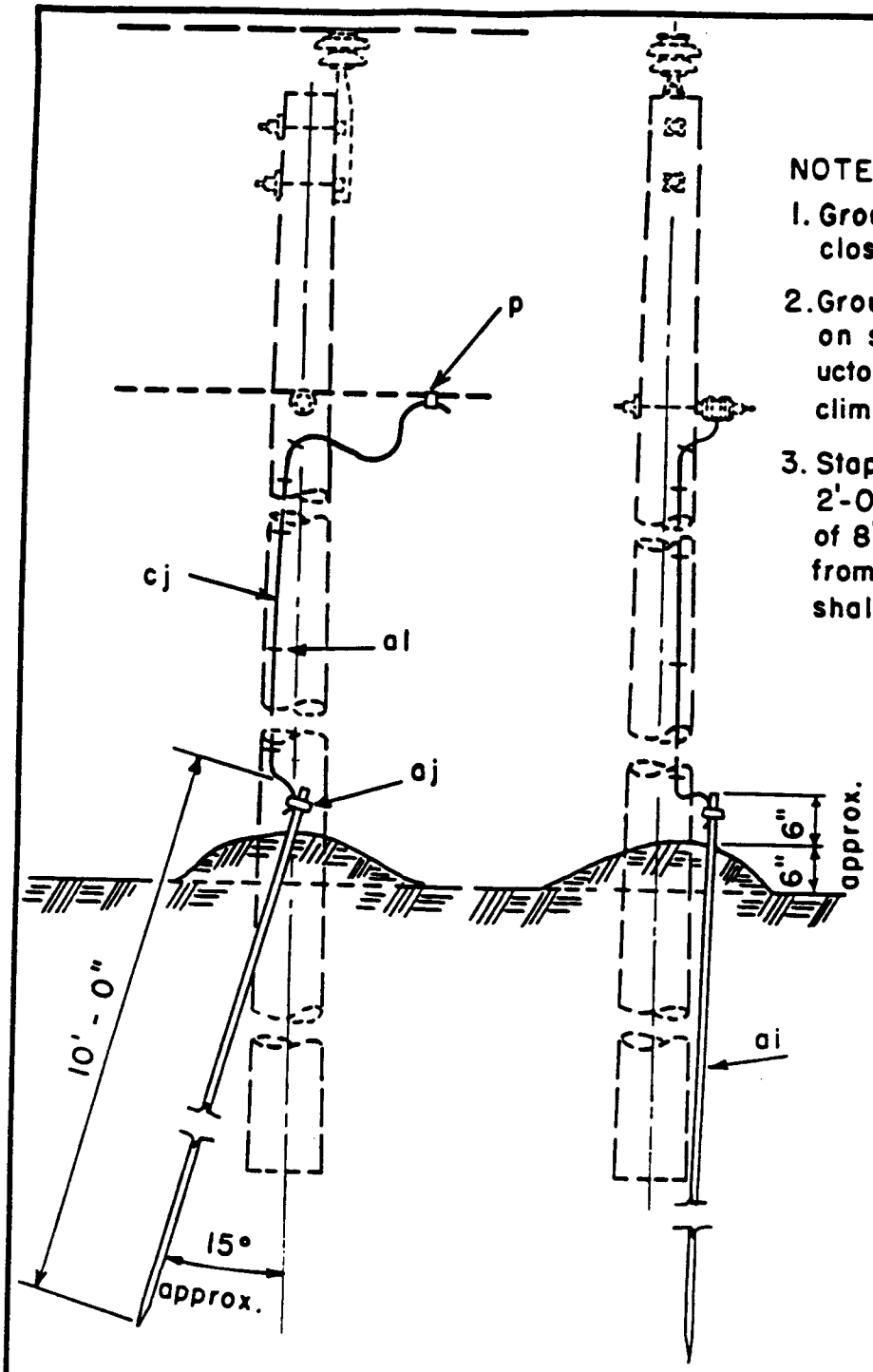
1. Ground wire to be located on same side as neutral conductor and in quadrant opposite climbing space or pole top pin.
2. Staples on ground wire shall be 2'-0" apart except for a distance of 8'-0" above ground and 8'-0" from top of pole where they shall be 6" apart.

ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
p		Connectors, as required	cj		Ground wire, No. 6 copper or equiv.
					conductivity, as required
ai	1	Rod, ground, steel, 5/8" dia. min.			
aj	1	Clamp, ground rod			
al		Staples, ground wire, as required			

GROUNDING ASSEMBLY - GROUND ROD TYPE

Apr., 1969

VM2-11



NOTES:

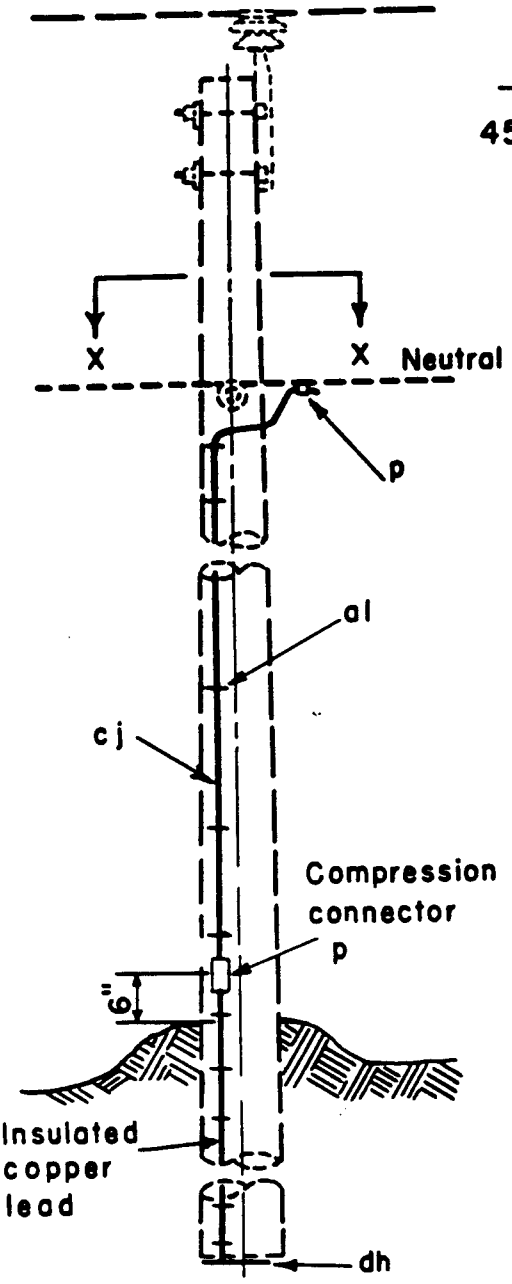
1. Ground rod to be driven as close to pole as practical.
2. Ground wire to be located on same side as neutral conductor and in quadrant opposite climbing space or pole top pin.
3. Staples on ground wire shall be 2'-0" apart except for a distance of 8'-0" above ground and 8'-0" from top of pole where they shall be 6" apart.

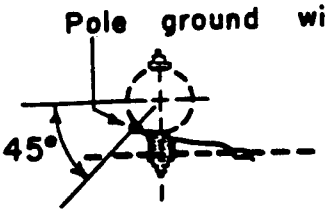
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
p		Connectors, as required	al		Staples, ground wire, as required
ai	1	Rod, ground, galv. steel, 10'-0" x 5/8" dia.,	cj		Ground wire, No. 4 AWG aluminum,
		minimum			as required
aj	1	Clamp, ground rod, tamper proof			

GROUNDING ASSEMBLY - GROUND ROD TYPE

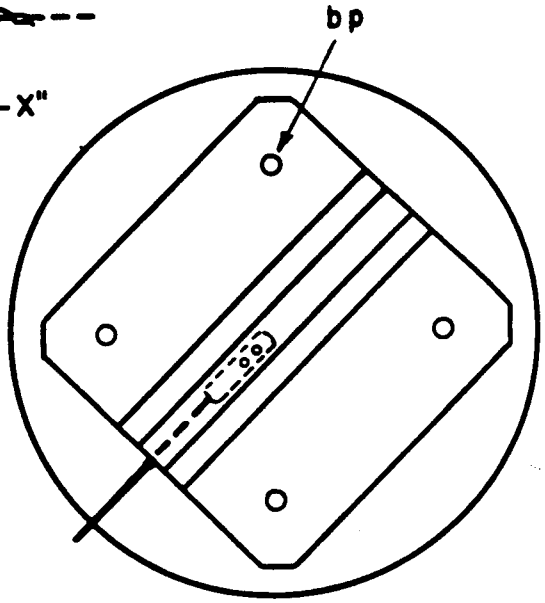
Apr., 1969

VM2-11A





SECTION "X-X"



PLAN OF PLATE TYPE GROUND

NOTES:

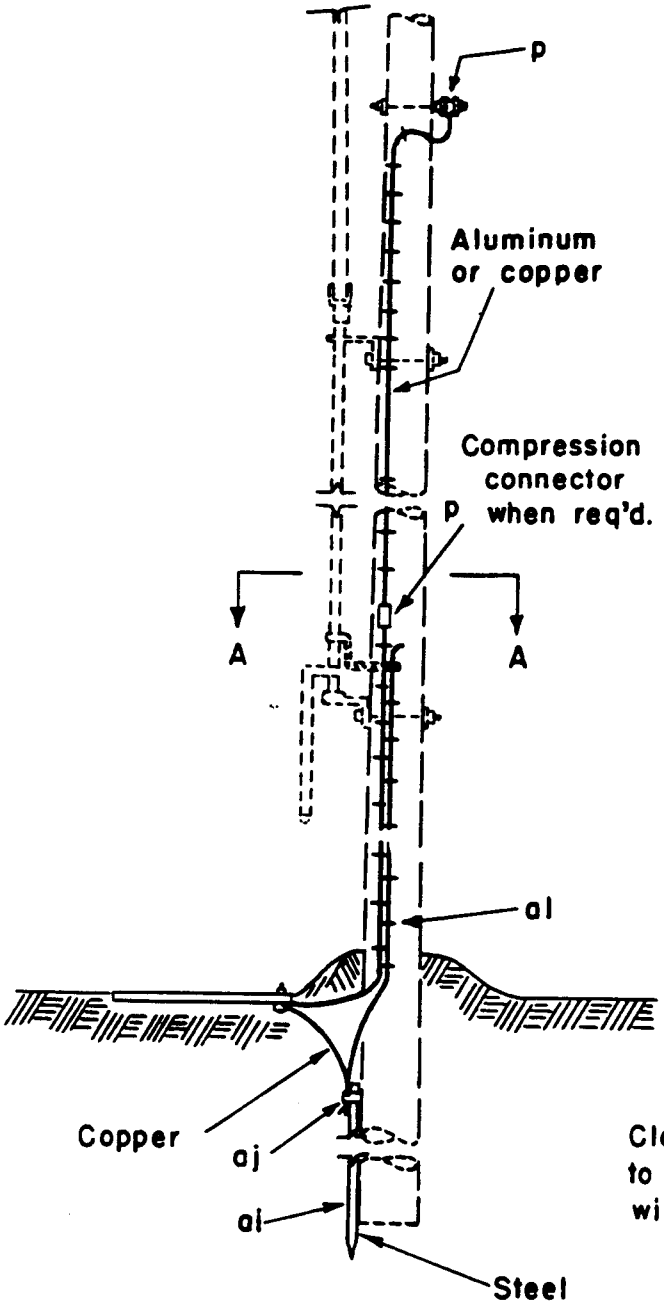
1. Ground wire to be located on same side as neutral conductor and in quadrant opposite climbing space or pole top pin.
2. Staples on ground wire shall be 2'-0" apart except for a distance of 8'-0" above ground and 8'-0" from top of pole where they shall be 6" apart.

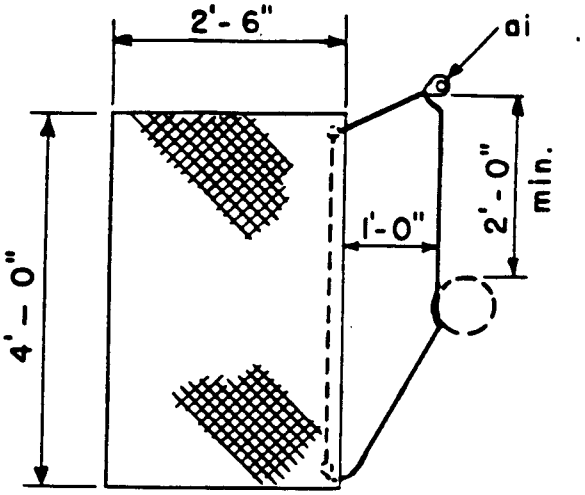
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
p		Connectors, as required	cj		Ground wire, No. 4 aluminum, or
p	1	Connector, compression			equivalent, as required
al		Staples, ground wire, as required	dh	1	Grounding plate, butt type, galv. steel,
					with insulated copper lead
bp	4	Nails, galvanized, 1", roofing			

POLE PROTECTION ASSEMBLY - PLATE TYPE

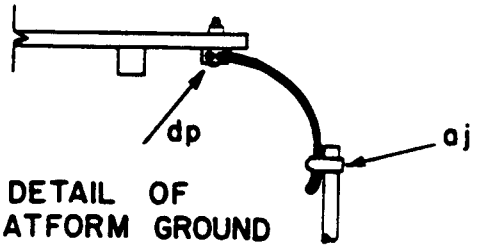
Apr., 1969

VM2-12

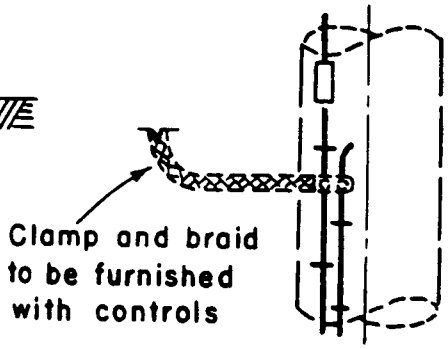




DETAIL OF PLATFORM



DETAIL OF
PLATFORM GROUND



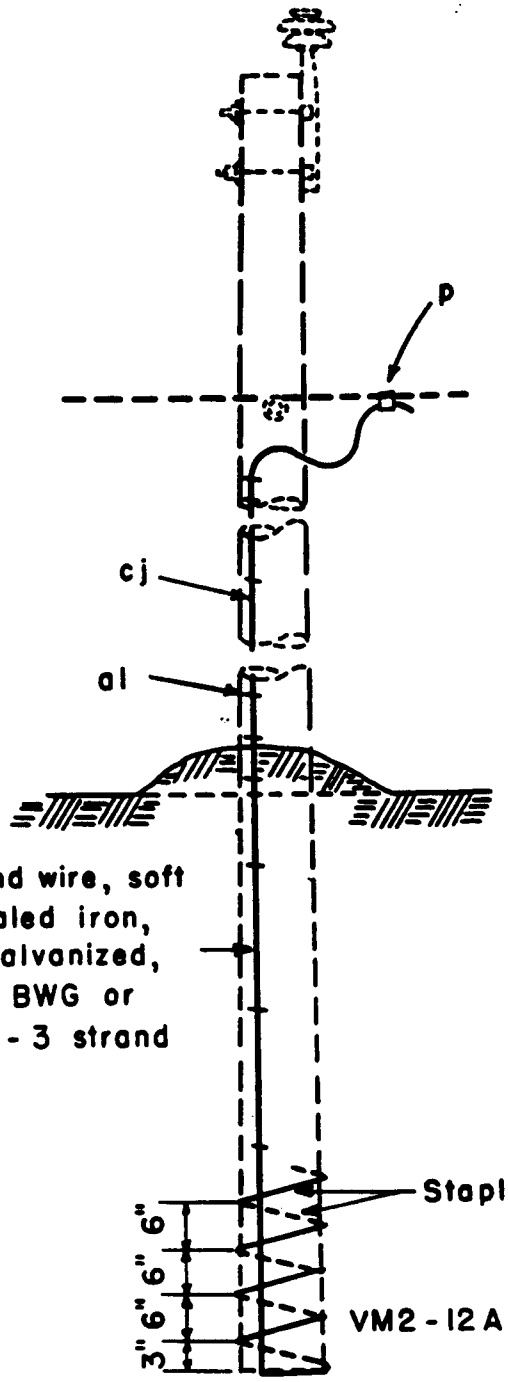
DETAIL OF SECTION "A-A"

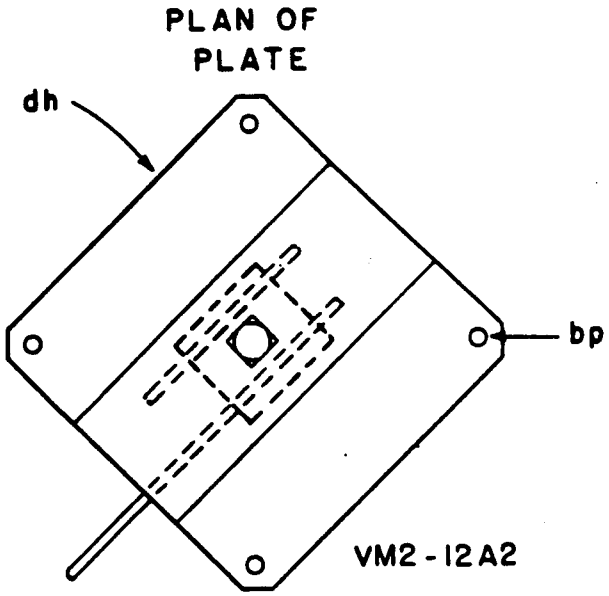
ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
p		Connectors, as required	cj		Ground wire, No. 2 copper or equiv.
ai	1	Rod, ground, steel, 5/8" dia. x 8'-0"			conductivity, as required
aj	1	Clamp, ground rod	dp	2	Grounding connector and lockwasher
al		Staples, ground wire, as required		1	Grounding iron platform plate

GROUNDING ASSEMBLY – PLATFORM TYPE FOR SECTIONALIZING AIR BREAK SWITCH

Apr. 1969

M2-15





NOTES:

1. Ground wire to be located on same side as neutral conductor and in quadrant opposite climbing space or pole top pin.
2. Staples on ground wire shall be 2'-0" apart except for a distance of 8'-0" above ground and 8'-0" from top of pole where they shall be 6" apart.

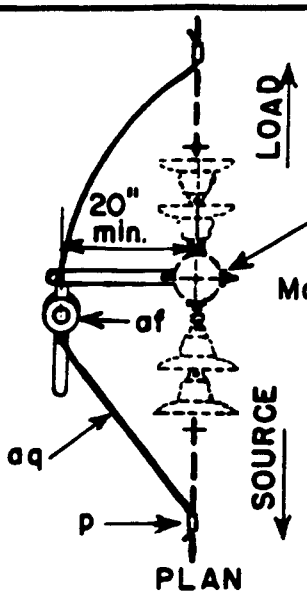
ITEM	MATERIAL	ASSEMBLY UNIT	
		VM2 - 12 A	VM2 - 12A2
p	Connectors	as req'd.	as req'd.
al	Staples, ground wire	as req'd.	as req'd.
bp	Nails, galvanized, 1", round head	—	4
cj	Ground wire, soft annealed iron, "C" galvanized, No. 5 BWG		
	or 5/16" - 3 strand	as req'd.	as req'd.
dh	Grounding plate, butt type, galvanized steel	—	1

POLE PROTECTION ASSEMBLY

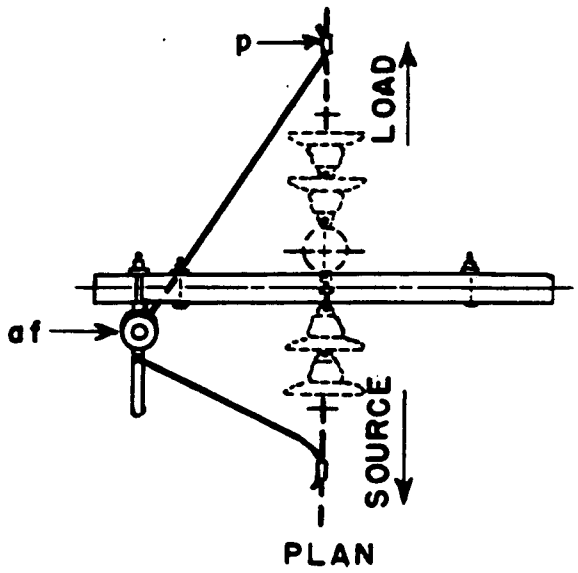
WRAP-AROUND TYPE (A): PLATE TYPE (A2)

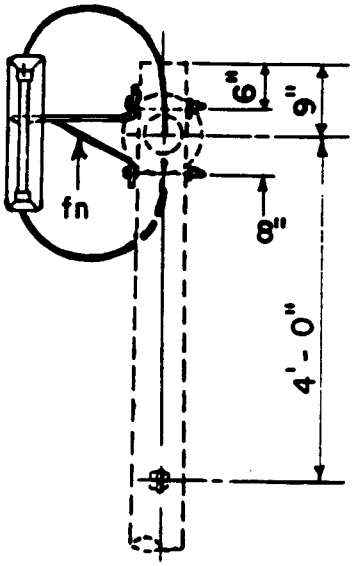
Apr. 1969

VM2-12A, VM2-12A2

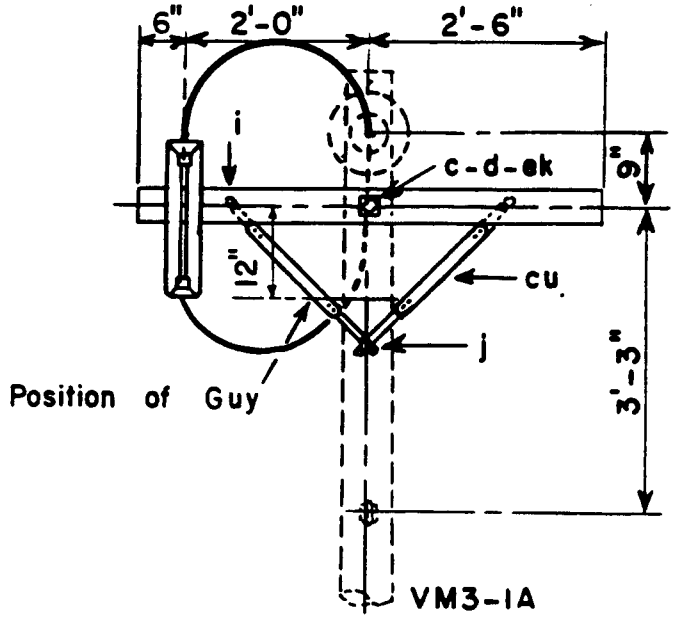


Mount cutout so that exhaust blast of arc is directed away from lineman.





VM3-4



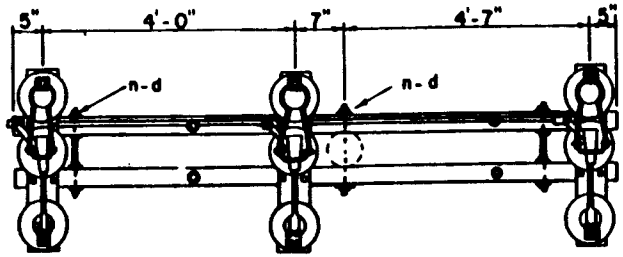
VM3-1A

ITEM	MATERIAL	VM3-4 NO. REQUIRED	VM3-1A NO. REQUIRED
c	Bolt, machine, 5/8" x required length	2	1
d	Washer, square, 2 1/4"	2	2
g	Crossarm, 3 1/2" x 4 1/2" x 5'-0"		1
i	Bolt, carriage, 3/8" x 4 1/2"		2
j	Screw, lag, 1/2" x 4"		1
p	Connector, compression type	2	2
af	Cutout, fuse, single shot	1	1
aq	Leads or jumpers as required		
cu	Brace, wood, 28"		2
ek	Locknuts		
fn	Bracket, extension	1	

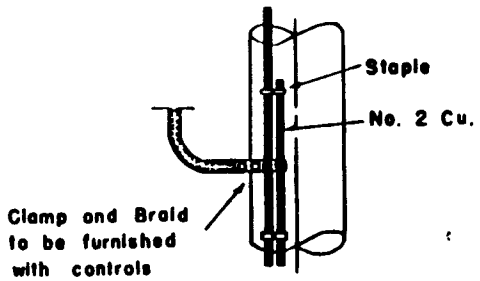
14.4/24.9 KV., 1-PHASE
ONE SECTIONALIZING FUSE CUTOUT

Jan. 1, 1963

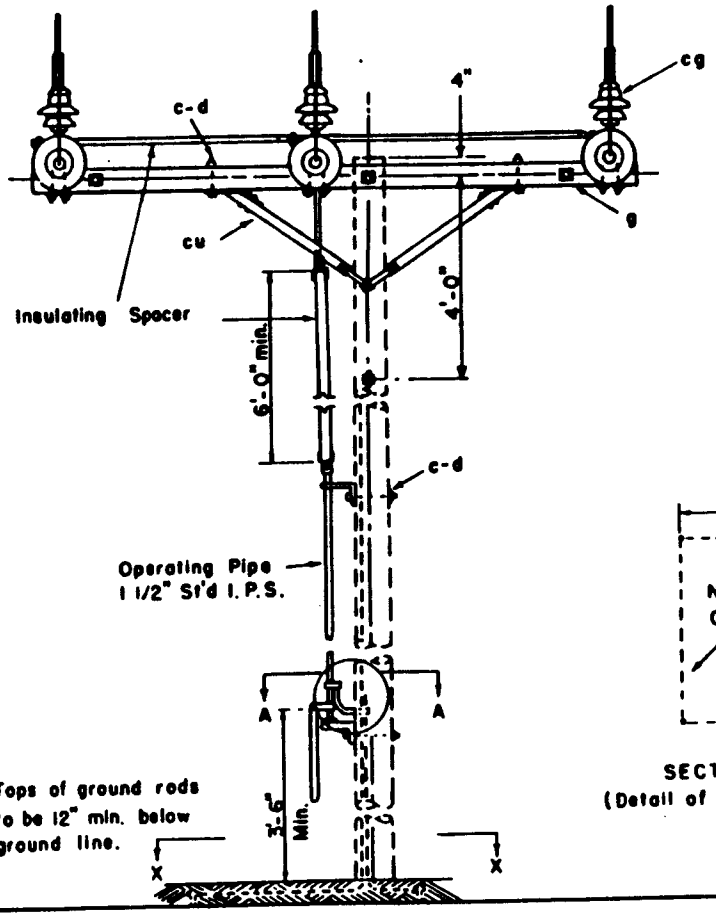
VM3-1A, VM3-4

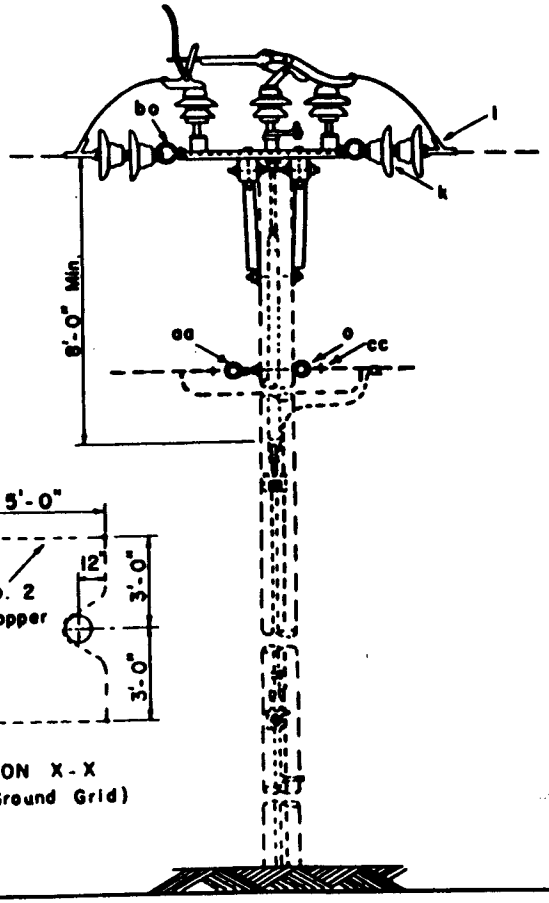


PLAN VIEW
OF SWITCH ARRANGEMENT



DETAIL OF A-A





SECTION X-X
(Detail of Ground Grid)

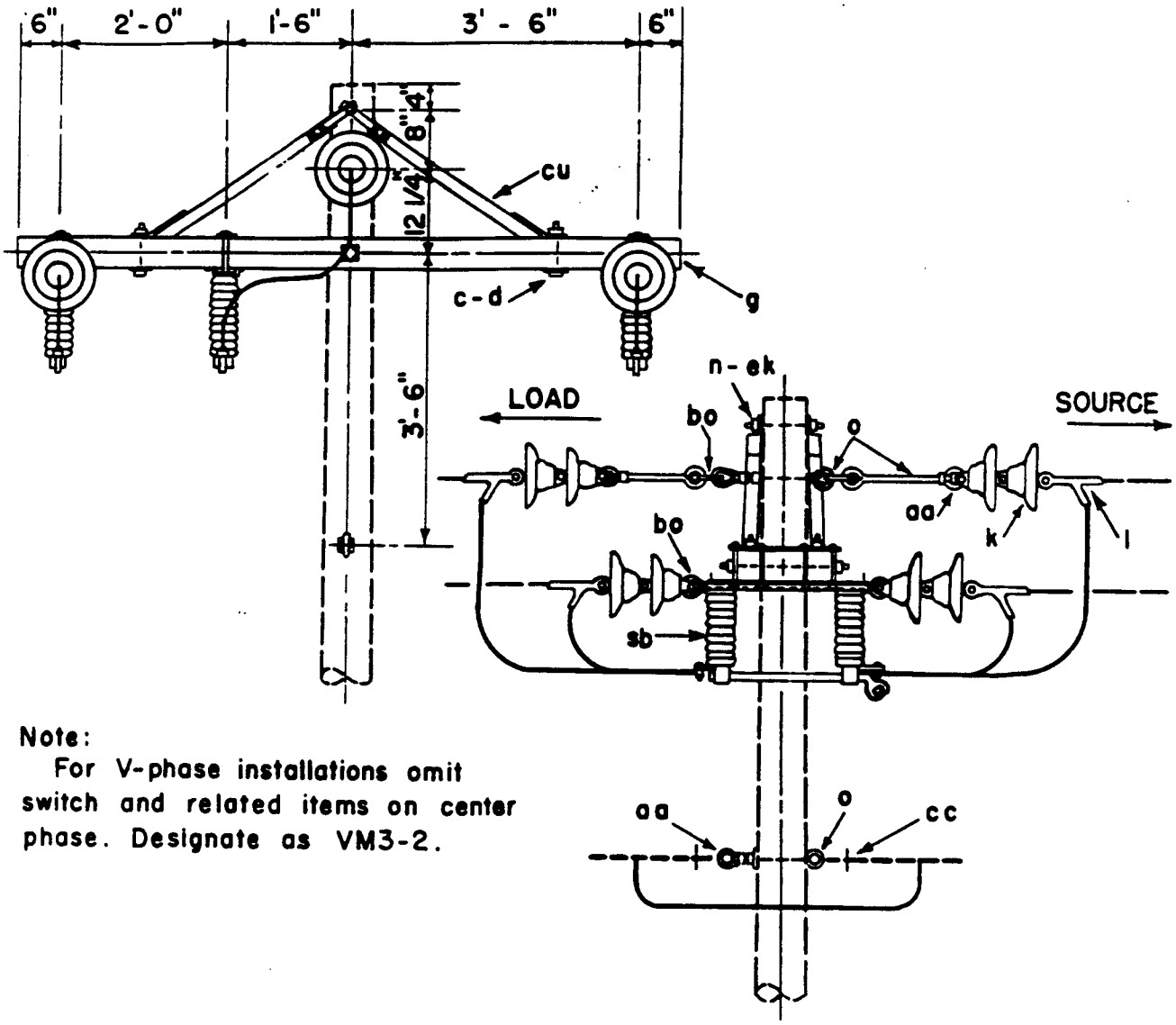
ITEM	NO	MATERIAL
c	14	Bolt, machine, 5/8" x req'd length
c	4	Bolt, machine, 1/2" x req'd length
d	25	Washer, 2-1/4" x 2-1/4" 13/16" hole
d	4	Washer, rd., 1-3/8" dia., 9/16" hole
g	2	Crossarm, 3-3/4" x 4-3/4" x 10'-0"
h	12	Insulator, suspension, 10"
l	6	Clamp, deadend
n	4	Bolt, double arming, 5/8" x req'd. lgth
bo	6	Shackle, anchor
cg	1	Switch, airbreak, 3 pole unit
		25 kv. with operating mechanism
cu	1	Brace, wood, 60" span
cc	2	Deadend assembly, neutral
o	1	Bolt, eye, 5/8"
aa	1	Nut, eye, 5/8"
ak		Locknuts

Note:
For grounding assembly, see
drawing M2-15

14.4/24.9 KV. PRIMARY, 3-PHASE 4-WIRE STAR
SECTIONALIZING AIR BREAK SWITCH

Jan. 1, 1963

VM3-16



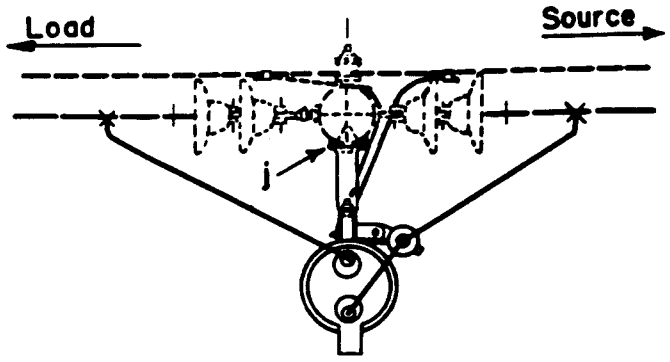
Note:
For V-phase installations omit switch and related items on center phase. Designate as VM3-2.

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
c	4	Bolt, machine, 1/2"x req'd. length		aq		Jumpers, as required	
d	4	Washer, round, 1 3/8" dia.		bo	6	Shackle, anchor	
d	3	Washer, square, 2 1/4"		cc	2	Deadend assembly, neutral	
g	2	Crossarm, 3 1/2"x 4 1/2"x 8'-0"		cu	2	Brace, crossarm, wood, 60" span	
l	6	Clamp, deadend		ek		Locknuts	
n	2	Bolt, double arming, 5/8"x req'd. lgth.		sb	3	Switch, disconnect, 25 KV, with	
o	4	Bolt, eye, 5/8"x required length				mounting hardware	
p		Connectors, as required		k	12	Insulator, suspension, 10"	
aa	4	Nut, eye, 5/8"					

14.4/24.9 KV TWO OR THREE SECTIONALIZING DISCONNECT SWITCHES

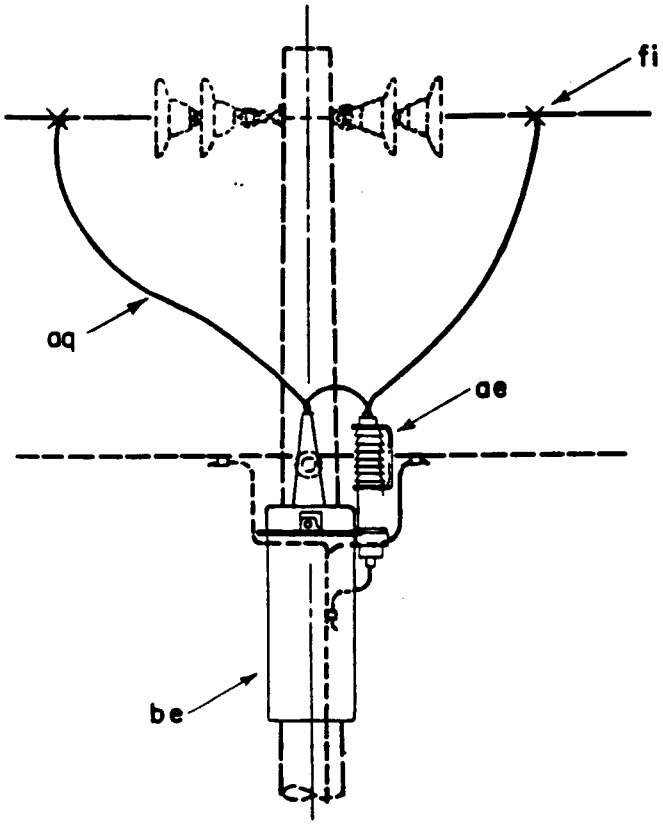
Jan. 1, 1963

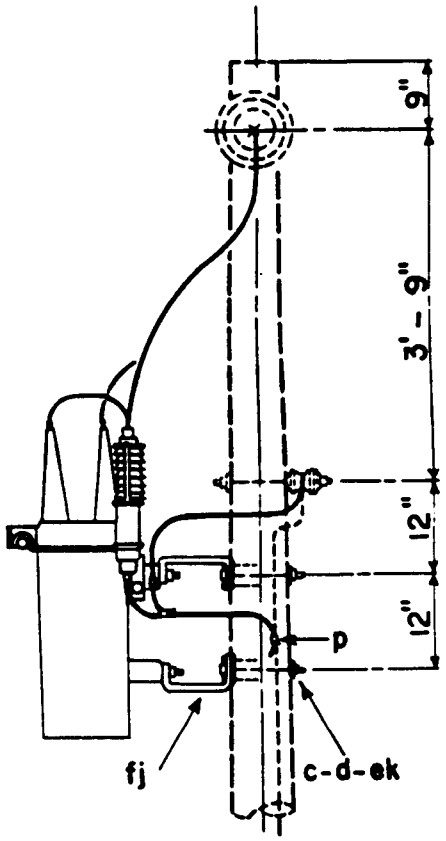
VM3-2, VM3-3



PLAN

Note:
The recloser terminal bushing connected directly to the coil should be connected to the source.



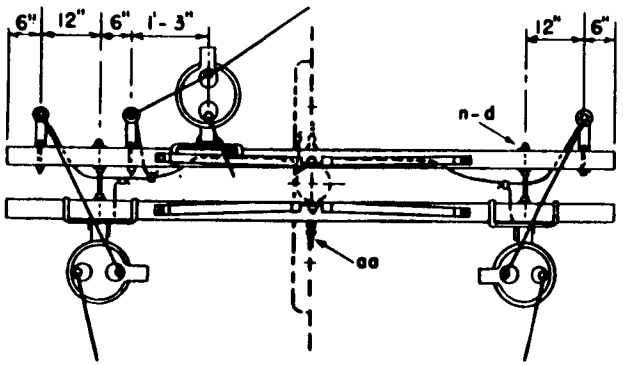


ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
c	2	Bolt, machine, 5/8" x req'd. length		be	1	Recloser, oil circuit	
d	2	Washer, square, 2 1/4"		ek		Locknuts	
j	4	Screw, lag, 1/2" x 4"		fi	2	Connector, hot line	
ae	1	Arrester, lightning		fj	2	Bracket, extension, 9" long	
aq		Jumpers, stranded, as required		p		Connectors, as required	

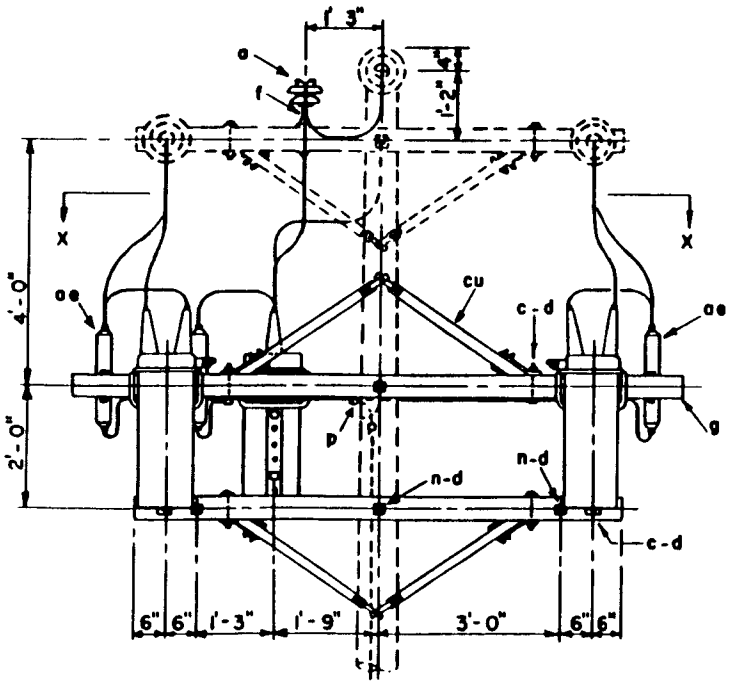
14.4 / 24.9 KV
ONE SECTIONALIZING OIL CIRCUIT RECLOSER

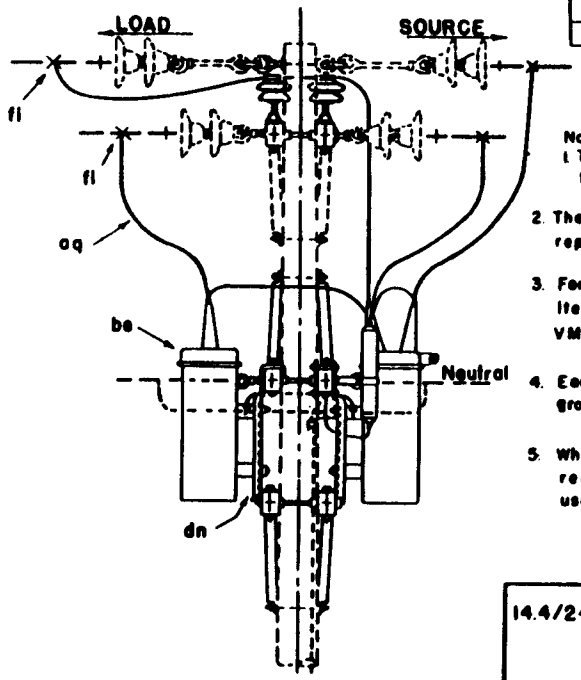
Jan. 1, 1963

VM3-10A



SECTION X-X





ITEM	NO REQ.	MATERIAL	
a	2	Insulator, pin type	
c	3	Bolt, machine, 5/8" x req'd length	
c	8	Bolt, machine, 1/2" x req'd. length	
d	23	Washer, square 2 1/4"	
d	8	Washer, 13/8" diam., 9/16" hole	
f	2	Pin, crossarm, steel, 5/8" x 14"	
g	2	Crossarm, 3 3/4" x 4 3/4" x 10'- 0"	
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'- 0"	
n	8	Bolt, double arming, 5/8" x req'd lg'th	
p		Connectors, as required	
aa	1	Nut, eye, 5/8"	
fl	6	Connector, hot line, tap assembly	
aq		Jumpers, stranded, as required	
ae	3	Lightning arrester	
be	3	Recloser, oil circuit	
cu	4	Brace, wood, 60" span	
* dn	3	Hanger, T-Crossarm, as required	

* Specify this item to be furnished by the manufacturer.

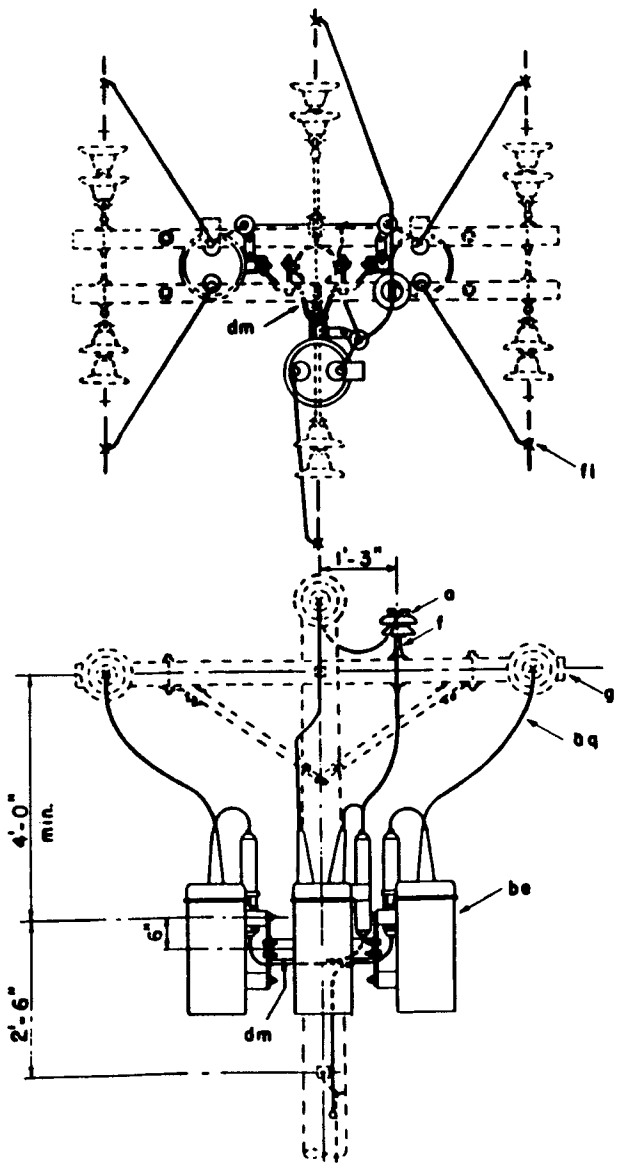
Notes:

1. The recloser terminal bushing connected directly to the coil should be connected to the source.
2. The two 10-inch suspension insulators shown may be replaced by three 6-inch insulators.
3. For V-Phase installations omit recloser and related items on center phase. Designate as assembly VM 3-19.
4. Each recloser tank shall have two connections to ground.
5. Where suitable hanger is not furnished with the recloser a standard transformer hanger may be used as indicated.

14.4/24.9 KV. TWO OR THREE SECTIONALIZING OIL CIRCUIT RECLOSERS

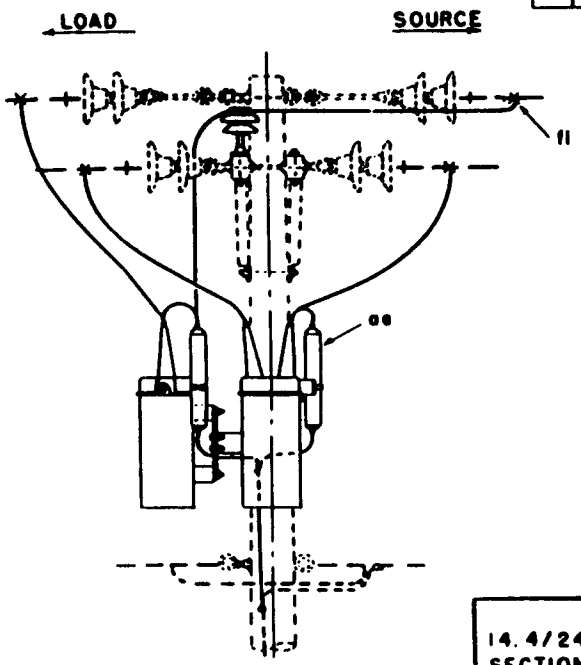
Jan. 1, 1963

VM 3-19, VM 3-20



Notes:
1. The recloser terminal bushing connected directly to the coil should be connected to the source.
2. The two 10-inch suspension insulators shown may be replaced by three 6-inch insulators.
3. For V-Phase installations omit recloser and related items on center phase. Designate as assembly VM3-19A.
4. Each recloser tank shall have two connections to ground.

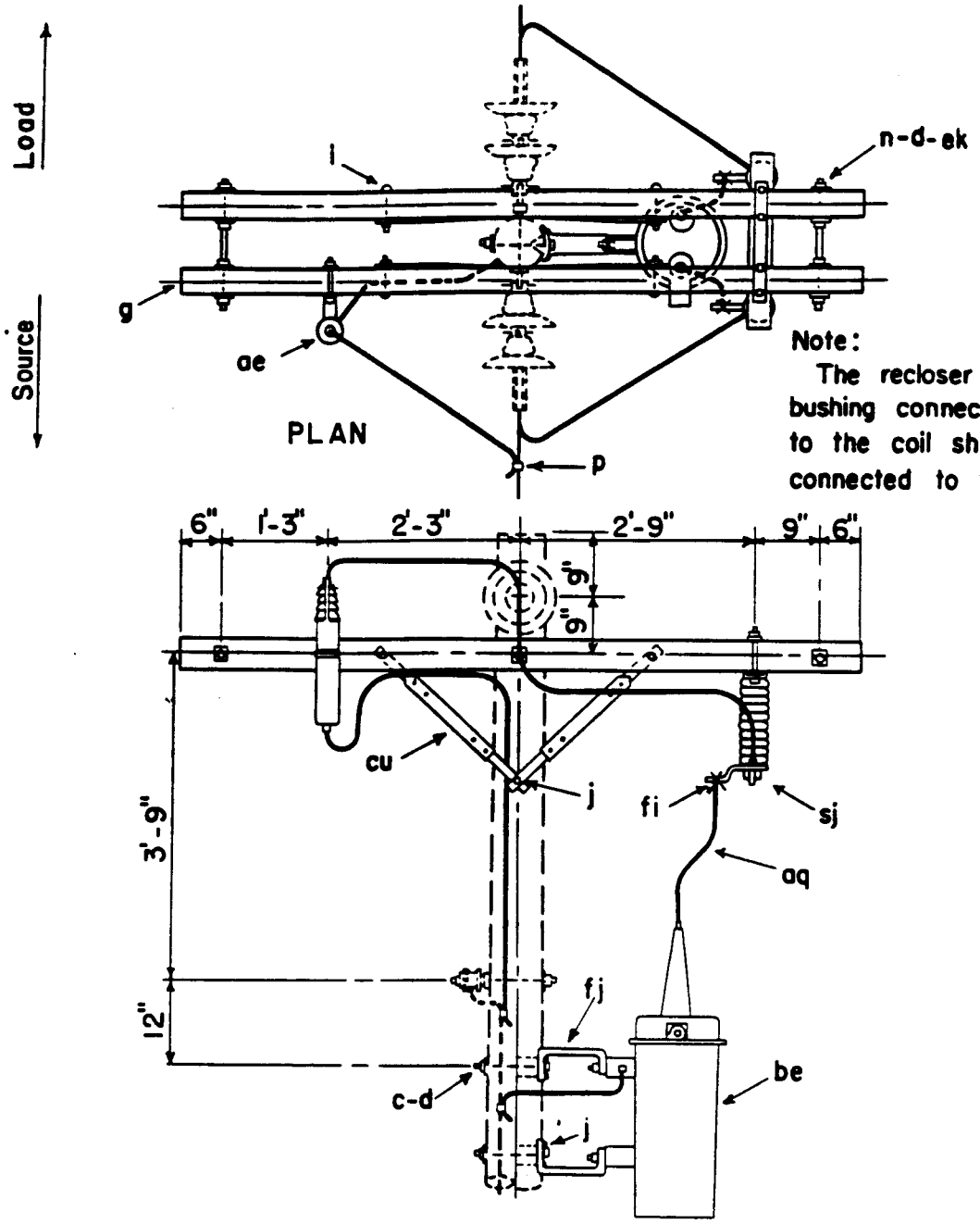
ITEM	NO.	MATERIAL
a	1	Insulator, pin type
f	1	Pin, crossarm, steel, 5/8" x 14"
p		Connectors, as required
ae	3	Lightning arrester
ff	6	Connector, hot line
aq		Jumpers, stranded, as required
be	3	Recloser, oil circuit
dm	1	Bracket, cluster type, with 14"-adapter plate



14.4/24.9 KV. TWO OR THREE SECTIONALIZING OIL CIRCUIT RECLOSERS

Jan.1,1963

VM3-19A,VM3-20A



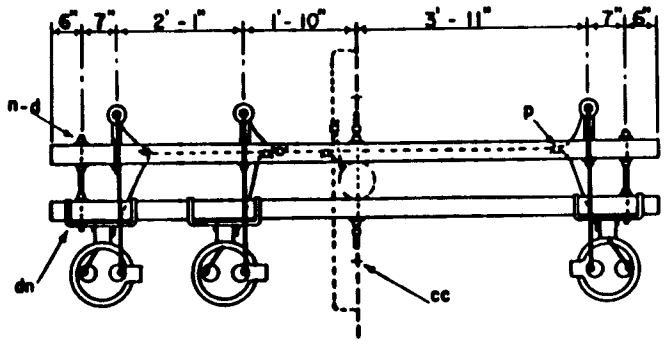
Note:
The recloser terminal bushing connected directly to the coil should be connected to the source.

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
c	2	Bolt, machine, 5/8"x req'd. length		p		Connectors, as required	
d	12	Washer, square, 2 1/4"					
g	2	Crossarm, 3 1/2"x 4 1/2"x 8'-0"		ae	1	Lightning arrester	
cu	4	Brace, wood, 28"		fi	2	Connector, hot line	
i	4	Bolt, carriage, 3/8"x 4 1/2"					
j	6	Screw, lag, 1/2"x 4"		sj	1	Switch, recloser, by-pass	
ek		Locknuts		aq		Jumpers, stranded, as required	
				be	1	Recloser, oil circuit	
n	3	Bolt, double arming, 5/8"x req'd. lgth.					

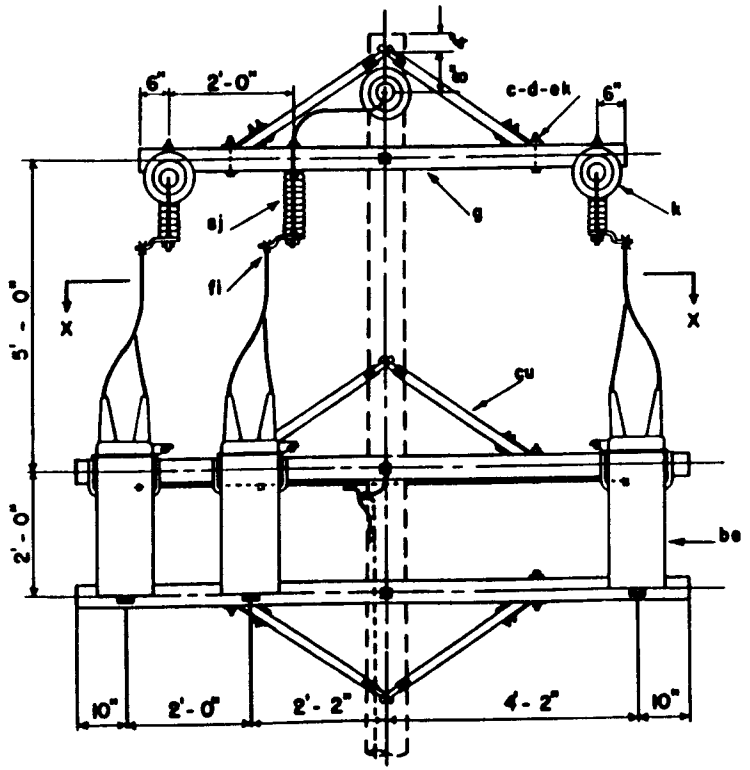
14.4/24.9 KV
ONE SECTIONALIZING OIL CIRCUIT RECLOSER WITH BY-PASS SWITCH

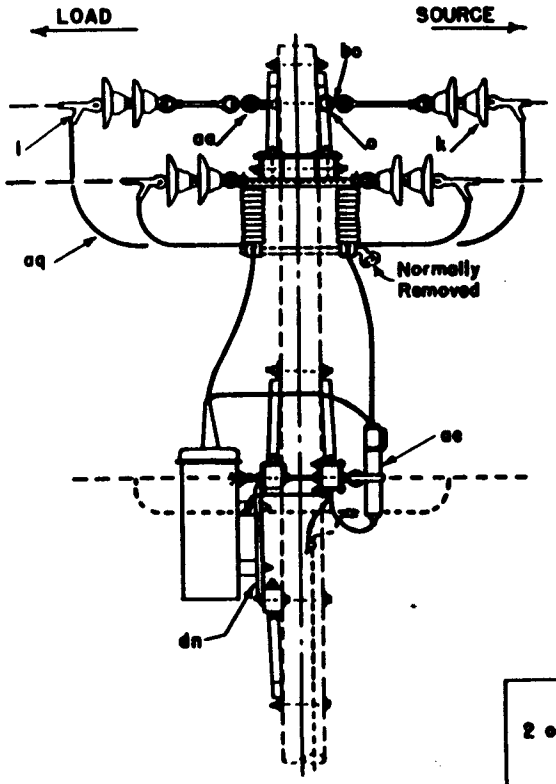
Jan. 1, 1963

VM3-23



SECTION X X





ITEM	NO.	MATERIAL	
c	10	Bolt, machine, 1/2" x req'd. length	
c	14	Bolt, machine, 5/8" x req'd. length	
d	10	Washer, round, 1 3/8" dia.	
d	14	Washer, square, 2 1/4"	
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"	
g	3	Crossarm, 3 3/4" x 4 3/4" x 10'-0"	
k	12	Insulator, suspension, 10"	
l	6	Clamp, deadend	
n	6	Bolt, double arming, 5/8" x req'd. length	
o	3	Bolt, eye, 5/8"	
p		Connectors, as required	
aa	5	Nut, eye, 5/8"	
ee	3	Lightning arrester	
aq		Jumpers, stranded, as required	
be	3	Recloser, oil circuit	
bg	6	Shackle, anchor	
cc	2	Deadend assembly, neutral	
cu	5	Brace, crossarm, wood, 60" span	
dn	3	Hanger, T-crossarm, as required *	
ek		Lockwire	
fl	6	Connector, hot line	
gj	3	Switch, recloser by-pass	

* Specify this item to be furnished by the recloser manufacturer.

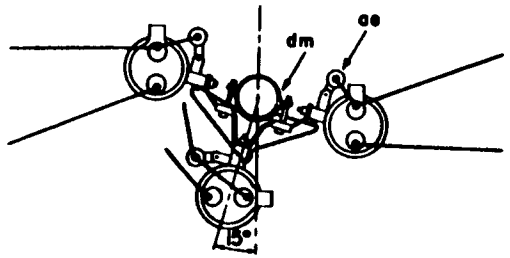
Notes:

1. The recloser terminal bushing connected directly to the coil should be connected to the source.
2. For V-Phase installations omit recloser and related items on center phase. Designate as VM3-24.
3. Each recloser tank shall have two connections to ground.
4. Where suitable hanger is not furnished with the recloser a standard transformer hanger may be used as indicated.

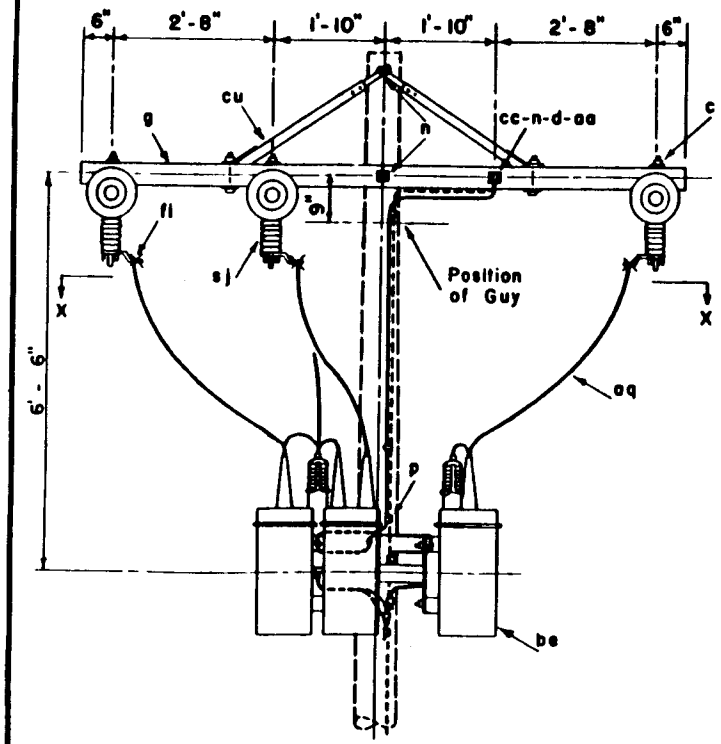
14.4 / 24.9 KV
2 or 3 SECTIONALIZING OIL CIRCUIT RECLOSERS WITH BY-PASS SWITCHES

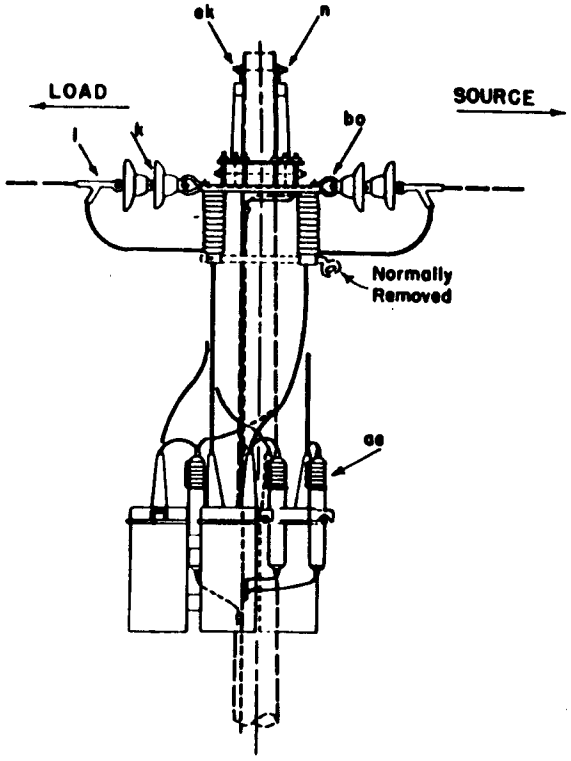
Jan. 1, 1963

VM3-24, VM3-25



SECTION X X





ITEM	NO.	MATERIAL	
c	12	Bolt, machine, 5/8" x required length	
e	4	Bolt, machine, 1/2" x required length	
d	6	Washer, square, 2 1/4"	
d	4	Washer, round, 1 3/8" dia.	
g	2	Crossarm, 3 3/4" x 4 3/4" x 10'-0"	
h	12	Insulator, suspension, 10"	
l	6	Clamp, deadend	
n	3	Bolt, double arming, 5/8" x req'd. length	
p		Connectors, as required	
aa	2	Nut, eye, 5/8"	
ae	3	Lightning arrester	
aq		Jumpers, stranded, as required	
bg	3	Recloser, oil circuit	
be	6	Shackle, anchor	
cc	2	Deadend assembly, neutral	
cu	2	Brace, crossarm, wood, 60" span	
dm	1	Bracket, cluster type, with adapter plate as req'd.	
ak		Lockнuts	
fl	6	Connector, hot line, tap assembly	
sj	3	Switch, recloser by-pass	

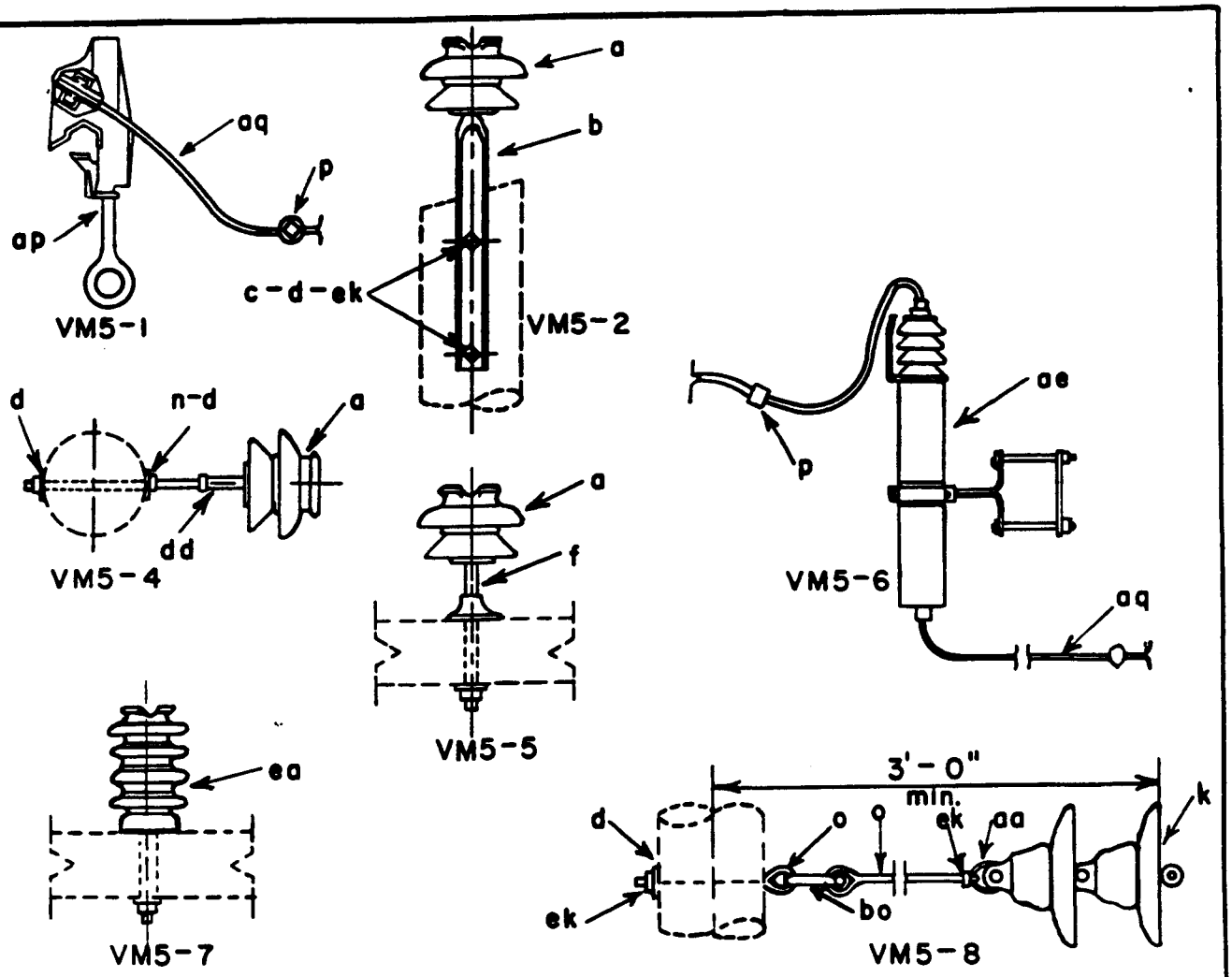
Notes:

1. The recloser terminal bushing connected directly to the coil should be connected to the source.
2. For V-Phase installations omit recloser and related items on center phase. Designate as VM3-24A.
3. Each recloser tank shall have two connections to ground.
4. Where suitable hanger is not furnished with the recloser a standard transformer hanger may be used as indicated.

14.4 / 24.9 KV
2 or 3 SECTIONALIZING OIL CIRCUIT RECLOSERS
WITH BY-PASS SWITCHES

Jan. 1, 1963

VM3-24A, VM3-25A

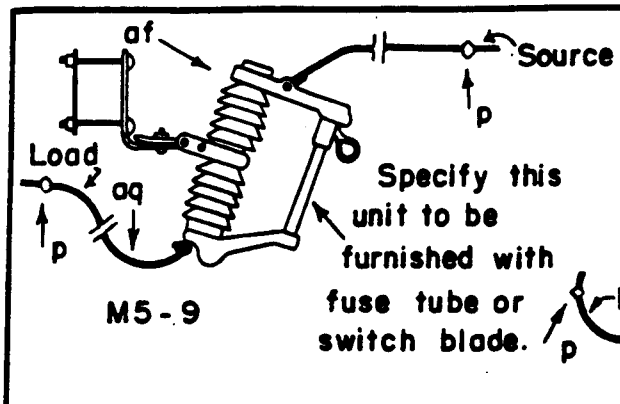


ITEM	MATERIAL	VM5-1	VM5-2		VM5-4	VM5-5	VM5-6	VM5-7	VM5-8
a	Insulator, pin type		1		1	1			
b	Pin, pole top		1-20"						
c	Bolt, machine, 5/8" x req'd length		2						
d	Washer, 2 1/4" sq.		2		2				1
f	Pin, crossarm, steel, 5/8" x 14"					1			
k	Insulator, suspension								2
n	Bolt, double arming, 5/8" x req'd length				1				
o	Bolt, eye, 5/8" x req'd length								2
p	Connector	1					2		
aa	Nut, eye, 5/8"								1
ae	Lightning arrester						1		
ap	Clamp, hot line	1							
aq	Jumper	1					2		
bo	Shackle, anchor								1
dd	Adapter, insulator				1				
ea	Insulator, post type, 7" stud							1	
ek	Locknuts		2		3				2

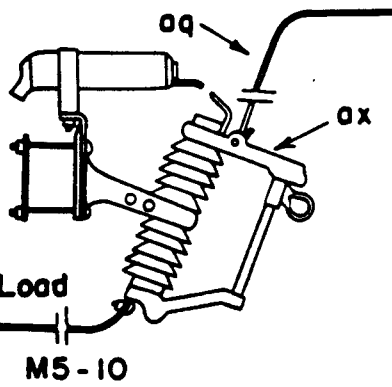
14.4/24.9 KV.
MISCELLANEOUS PRIMARY ASSEMBLIES

Jan. 1, 1963

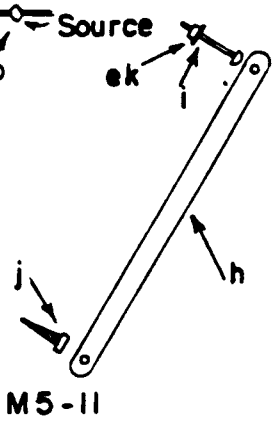
VM5-1 TO 8



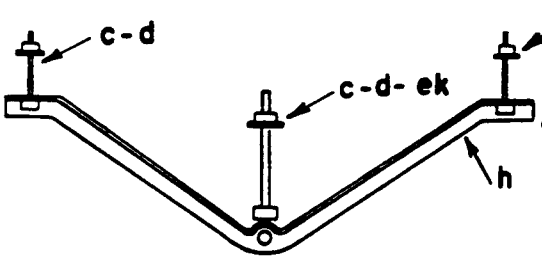
M5-9



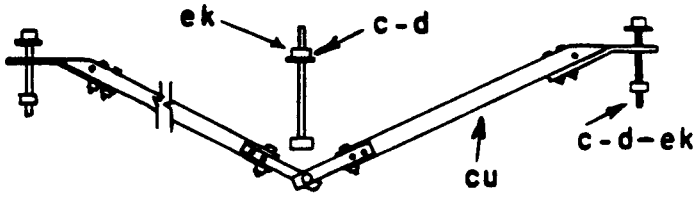
M5-10



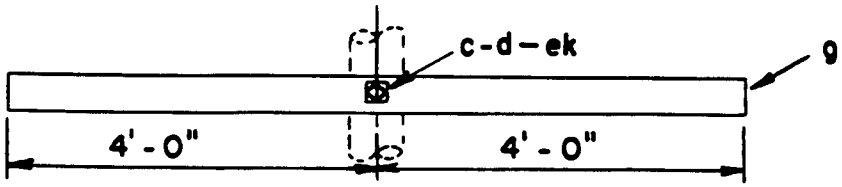
M5-11



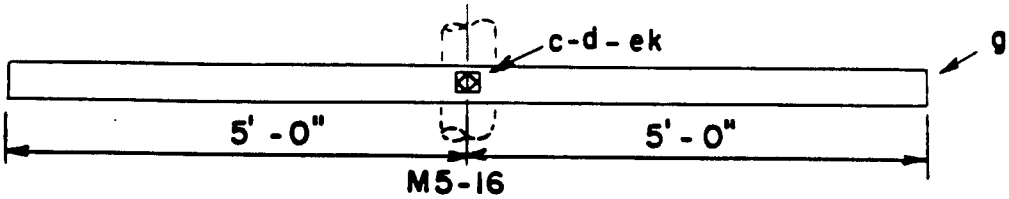
M5-12



M5-13



M5-14, M5-15



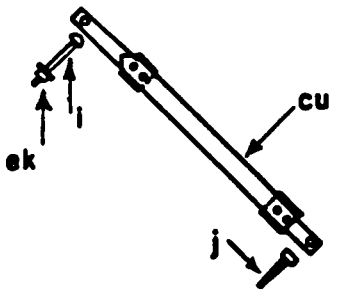
M5-16

ITEM	MATERIAL	NUMBER REQUIRED							
		M5-9	M5-10	M5-11	M5-12	M5-13	M5-14	M5-15	M5-16
c	Bolt, machine, 5/8" x req'd length				1	1	1	1	
c	Bolt, machine, 1/2" x req'd length				2	2			
d	Washer, 2 1/4" x 2 1/4" x 3/16", 13/16" hole				1	1	2	2	2
d	Washer, round, 1 3/8" dia., 9/16" hole				2	2			
g	Crossarm, 3 1/2" x 4 1/2" x 8'-0"						1		
g	Crossarm, 3 3/4" x 4 3/4" x 10'-0"								1
h	Brace, flat, 1 1/4" x 1/4" x 28"			1					
h	Brace, angle, 1 1/2" x 1 1/2" x 3/16", 60" span				1				
i	Bolt, carriage, 3/8" x 4 1/2"			1					
j	Screw, lag, 1/2" x 4"			1					
p	Connector	2	2						
af	Cutout, single-shot	1							
aq	Jumper	2	2						
ax	Cutout and arrester combination		1						
cu	Brace, wood, 60" span					1			
ek	Locknuts			1	3	3	1	1	1
g	Crossarm, 3 3/4" x 4 3/4" x 8'-0"							1	

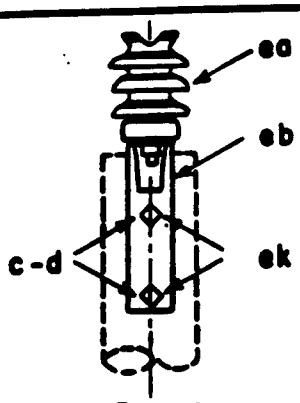
MISCELLANEOUS PRIMARY ASSEMBLIES

Jan 1, 1962

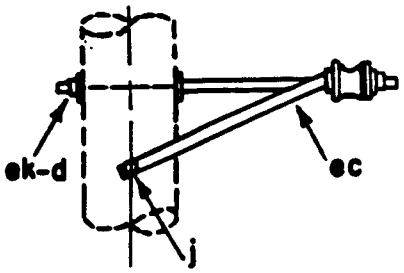
M5-9 TO 16



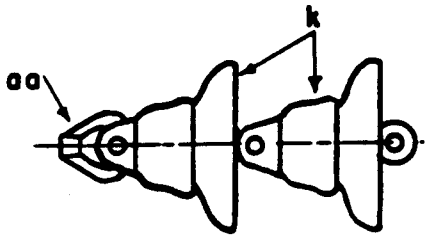
M5 – 17



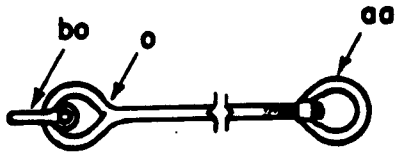
M5 – 18



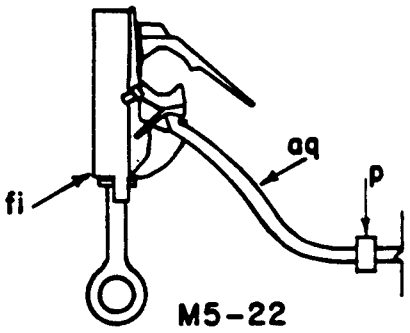
M5 – 19



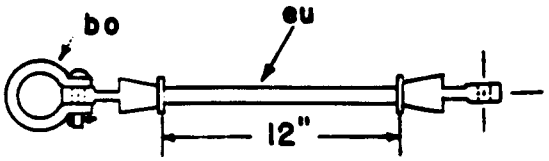
M5 – 20



M5-21



M5-22



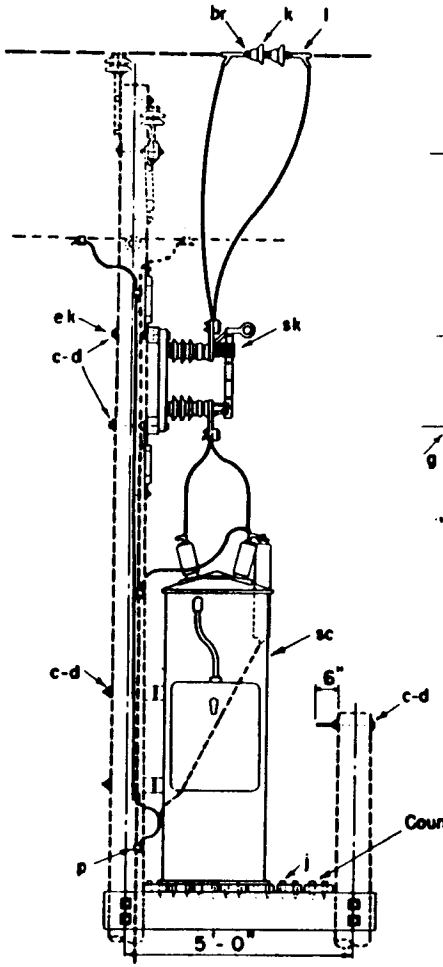
M5 - 23

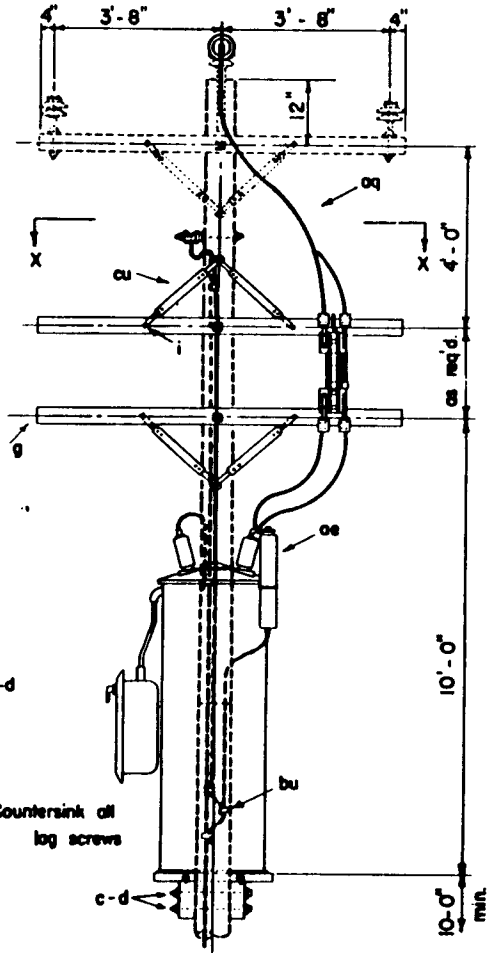
ITEM	MATERIAL	M5-17	M5-18	M5-19	M5-20	M5-21	M5-22	M5-23
c	Bolt, machine, 5/8"x required length		2					
d	Washer, 2 1/4" square		2	1				
l	Bolt, carriage, 3/8"x 4 1/2"	1						
j	Screw, lag, 1/2" x 4"	1		2				
k	Insulator, suspension				2			
ea	Insulator, post type, 1 3/4" stud		1					
eb	Bracket, for post type insulator		1					
ec	Bracket, offset, neutral, insulated			1				
ek	Locknuts	1	2	1				
cu	Brace, wood, 28"	1						
aa	Eye nut				1	1		
bo	Shackle, anchor					1		1
o	Bolt, eye, 5/8" x req'd. length					1		
fi	Connector, hot line						1	
aq	Jumper						1	
p	Connector						1	
eu	Link, extension, insulated							1

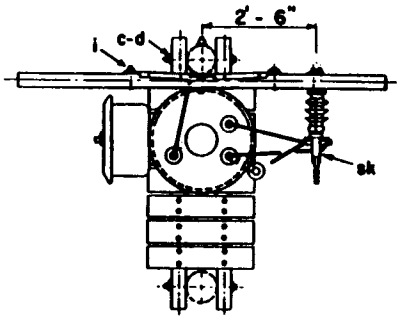
MISCELLANEOUS PRIMARY ASSEMBLIES

Jan. 1, 1962

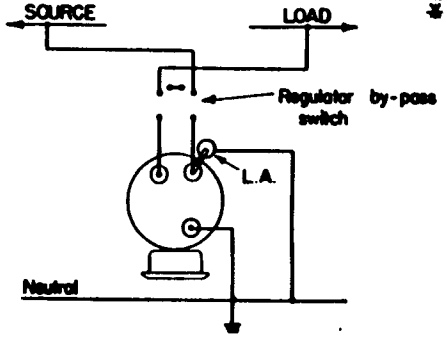
M5-17T023







SECTION X-X



WIRING DIAGRAM

ITEM	NO.	MATERIAL
c	4	Bolt, machine, 1/2" x req'd. length
c	5	Bolt, machine, 5/8" x req'd. length
c	4	Bolt, machine, 3/4" x req'd. length
d	4	Washer, round, 1 3/8"
d	16	Washer, square, 2 1/4"
g	2	Crossarm, 3 1/2" x 4 1/2" x 8'-0"
i	4	Bolt, carriage, 3/8" x 4 1/2"
j	2	Screw, lag, 1/2" x 4"
j		Screw, lag, 1/2" x 5", as req'd
l	2	Clamp, deadend
p		Connectors, as req'd
oe	1	Lightning arrester
oe	1	By-pass arrester
oq		Jumpers, stranded, as required
br	1	Chain link, 5/8" x 3/4"
bu	1	Connector, solderless
cu	4	Brace, wood, 28"
sc	1	Regulator, step type
sk	1	Regulator by-pass switch
k	2	Insulator, suspension, 6"
	2	Structural timber, 4" x 10" x 6'-0"
		Planks, 2" or 3" thick, length as req'd.
e k		Locknuts

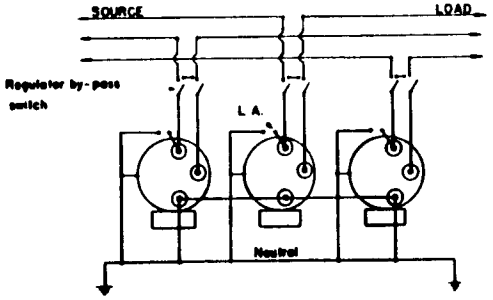
* Specify this item to be furnished by the manufacturer.

Note
All structural timber and planks to be treated per REA specification

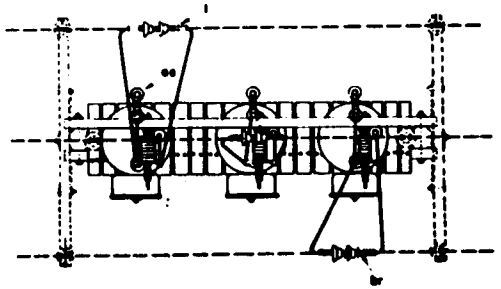
14.4/24.9 KV
ONE STEP VOLTAGE REGULATOR
PLATFORM MOUNTED

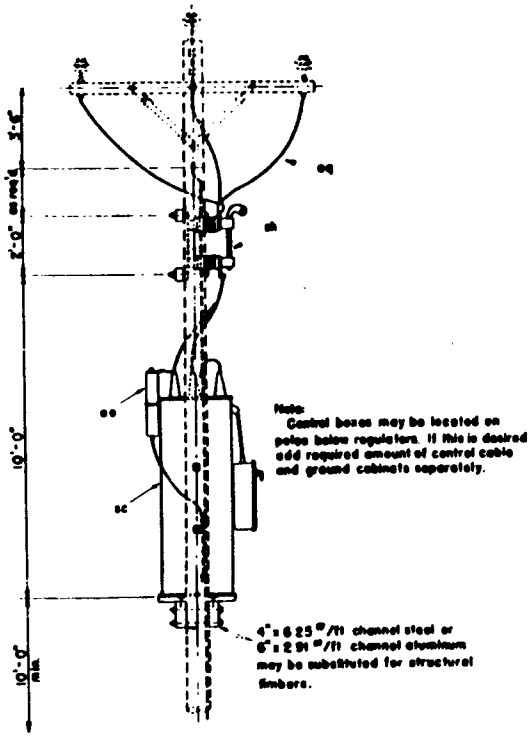
Jan. 1, 1963

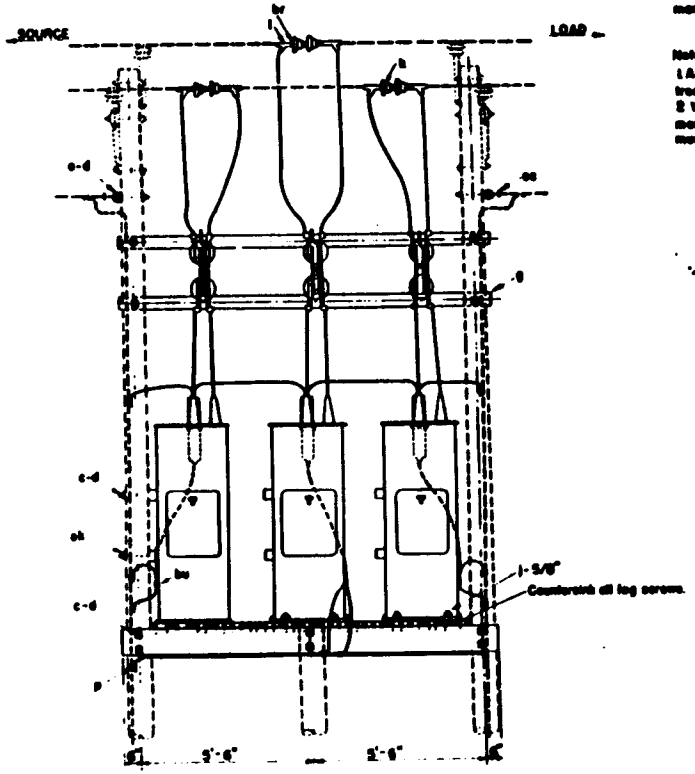
VM7-1



WIRING DIAGRAM







Item	Qty.	MATERIAL	
c	12	Bolt, machine, 1/2" x req'd length	
c	12	Bolt, machine, 5/8" x req'd length	
c	6	Bolt, machine, 3/4" x req'd length	
d	12	Washer, round, 13/16" dia., 5/16" hole	
e	16	Washer, square, 2 1/4"	
h	2	Crossarm, 3 3/4" x 4 3/4" x 12'	
j		Brace, iron, 1/2" x 8", as required	
k	6	Brace, iron, 5/8" x 8"	
l	6	Insulator, suspension, 8"	
l	6	Clamp, dead-end	
o	2	Bolt, eye, 5/8" x req'd length	
p		Connectors, as required	
qq	3	Lightning arrester	
qq	3	By-pass arrester *	
qq		Leads or jumpers as required	
qr	3	Shackle bolt, 5/8" x 3 1/4"	
qu	3	Connector, solderless *	
qz	6	Standard assembly, neutral	
ab		Lockwasher	
ad	3	Regulator, step type	
ah	1	Regulator by-pass switch	
	6	Structural timber, 4" x 12" x 12'-0"	
		Planks, 2" or 3" thick, length as req'd.	

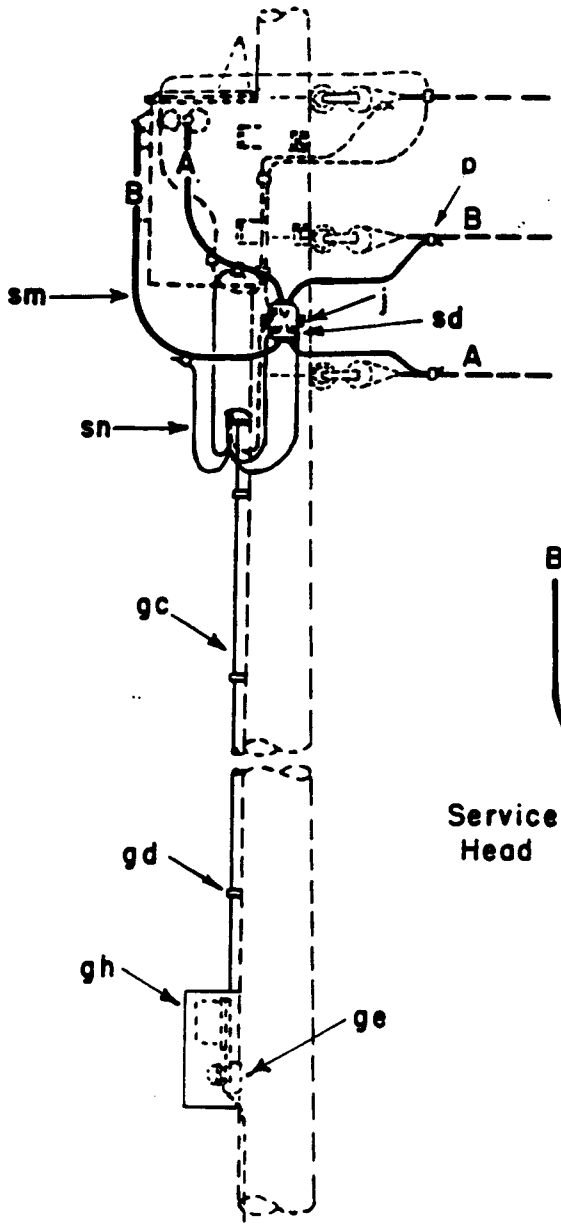
* Specify this item to be furnished by the manufacturer.

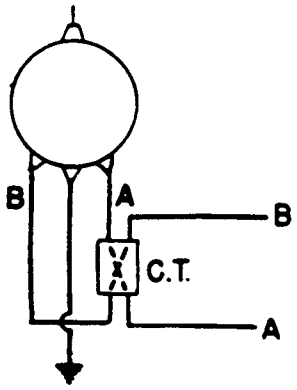
Notes:
1 All structural timber and planks to be treated as per REA specifications.
2 When mounting lugs for direct pole mounting are not provided, all regulators must be bolted to platform.

14/24.9 KV., 3-PHASE
STEP VOLTAGE REGULATOR ASSEMBLY

Jan. 1, 1963

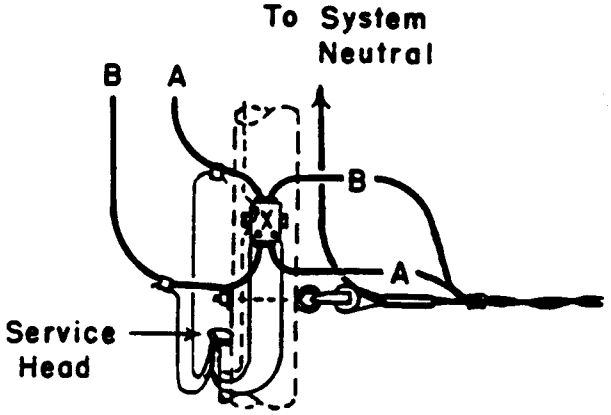
VM 7-3





WIRING DIAGRAM

Note: For more detailed wiring diagram, see REA Bulletin 161 - 12



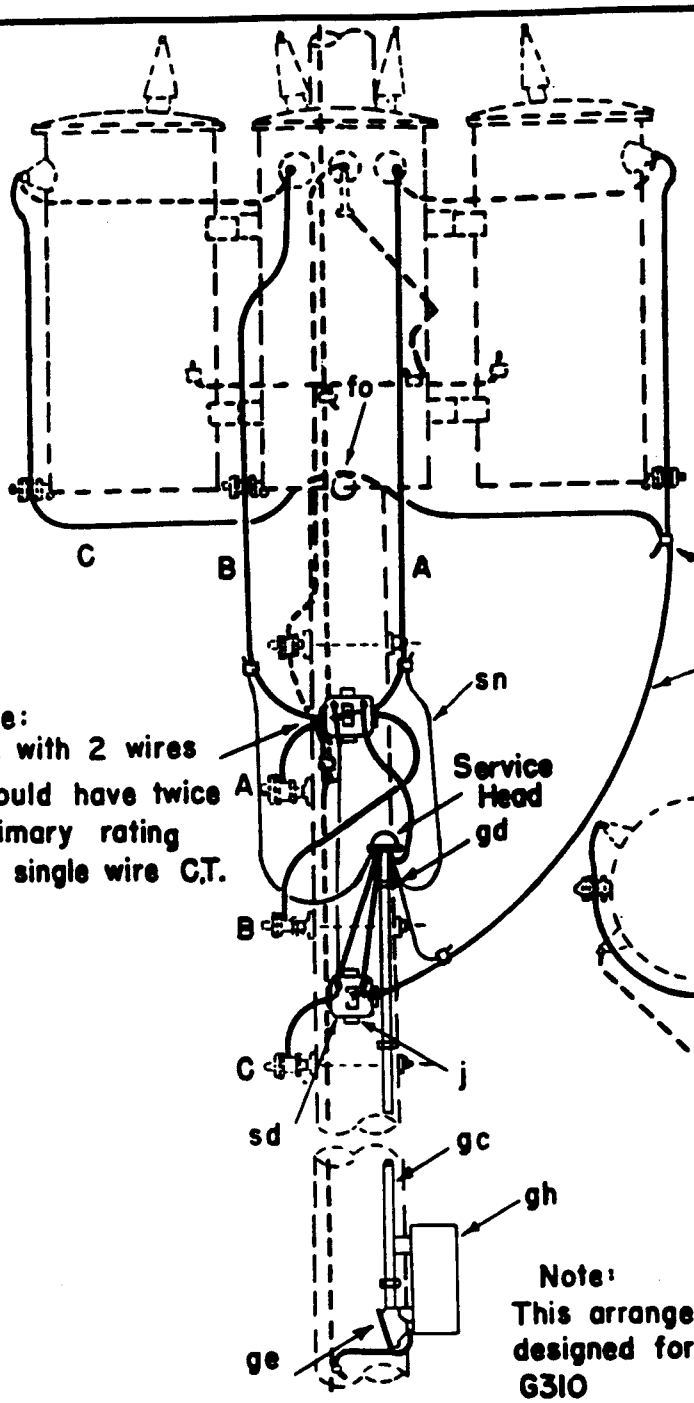
TRIPLEX SERVICE

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
j	2	Screw, lag, 1/2" x 4"		sd	1	Transformer, current	
p		Connectors, as required		sm		Wire, No. 12, insul. for current	
gc		Conduit, 1 1/4", as required		sn		Wire, No. 14, insul. for potential	
gd		Straps, conduit, as required			1	Service head	
ge	1	Conduiet, type "LB"					
gh	1	Meter box, meter and test block					

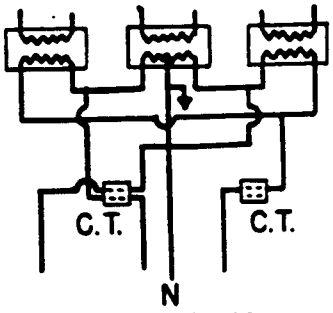
SECONDARY METERING GUIDE
SINGLE PHASE 120 / 240 VOLTS

Jan 1, 1962

M8

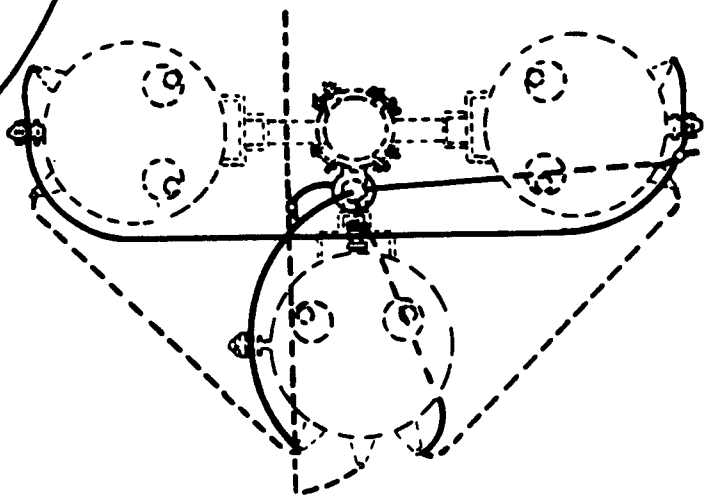


Note:
C.T. with 2 wires should have twice primary rating of single wire C.T.



WIRING DIAGRAM
FOR INSTRUMENT TRANSFORMERS

Note:
For more detailed wiring diagram, see REA Bulletin 161-12



PLAN

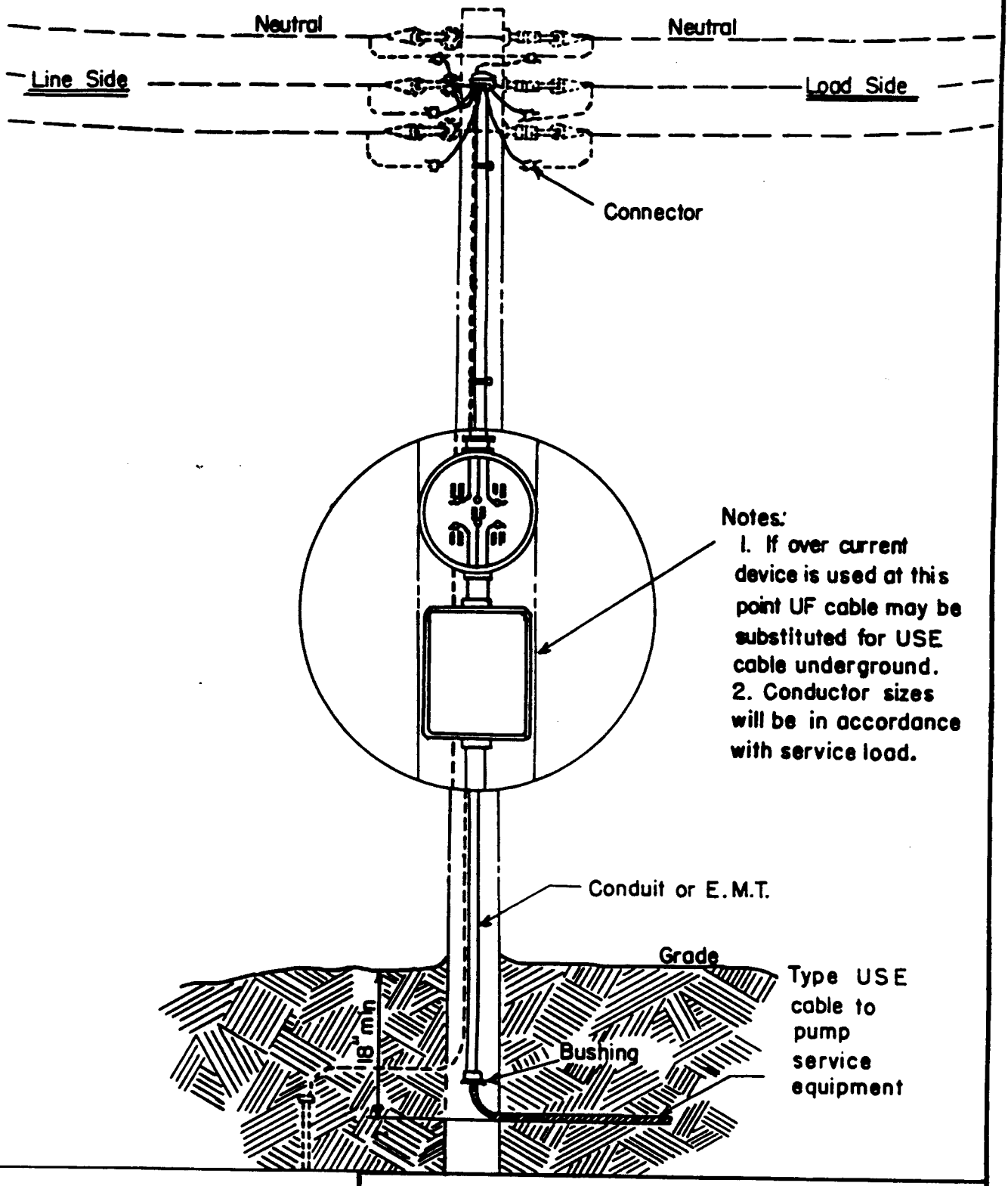
Note:
This arrangement of metering equipment is designed for use with the transformer drawings G310

ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
j	4	Screw, lag, 1/2" x 4"	gh	1	Meter box, meter and test block
p		Connectors, as required	sd	2	Transformer, current
				1	Service Head
gc		Conduit, 1 1/4" as required	sm		Wire, No. 12, insul. for current
ge	1	Conduit, type "LB"	sn		Wire, No. 14, insul. for potential
gd		Straps, conduit, as required			
fo	1	Transformer secondary bracket			

SECONDARY METERING GUIDE
THREE PHASE 120/240 VOLTS
4 WIRE DELTA

Jan 1, 1962

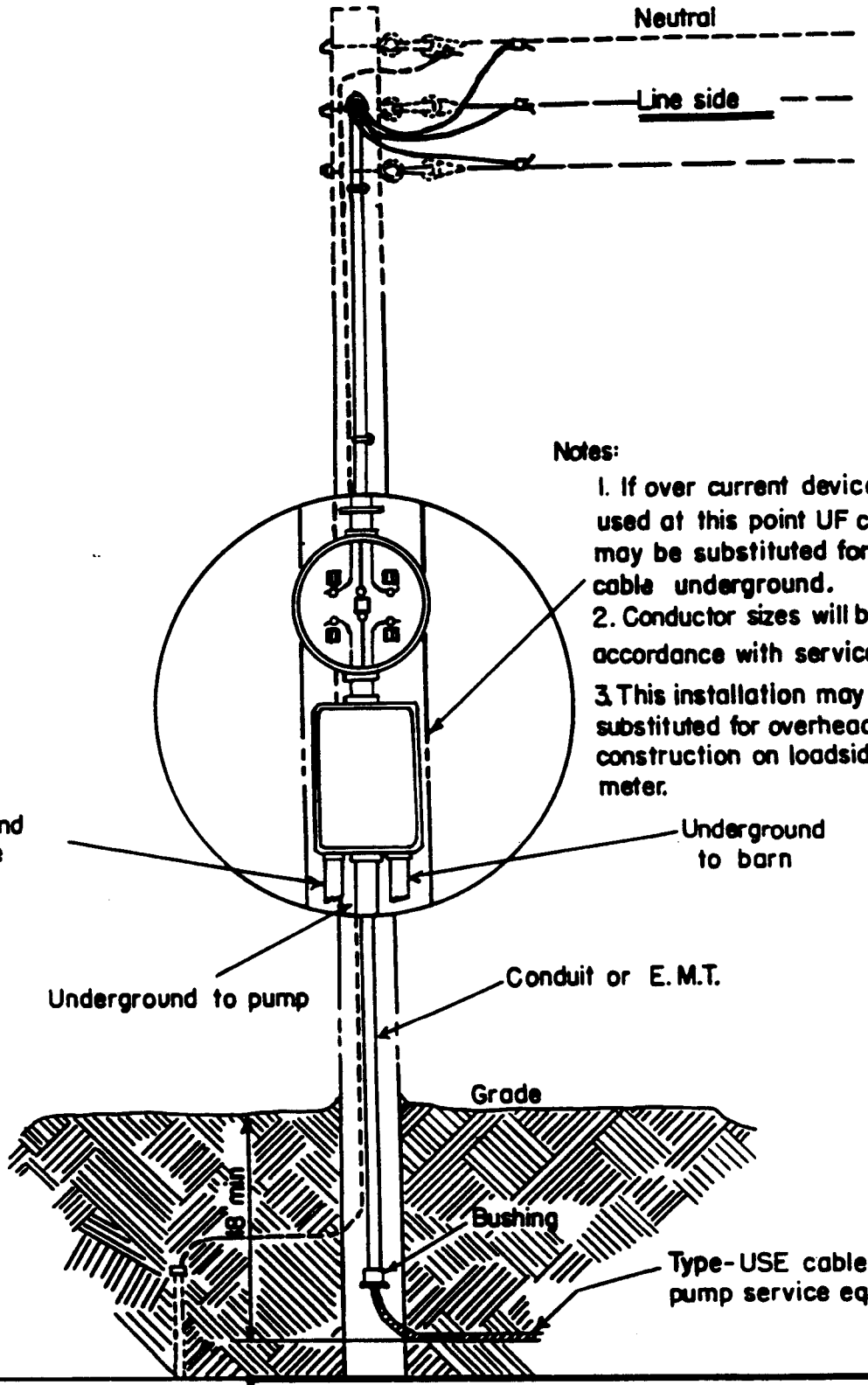
M8-6



GUIDE TO YARD POLE METER INSTALLATION
(SHOWING PUMP SERVICE CARRIED UNDERGROUND)

Jan 1, 1962

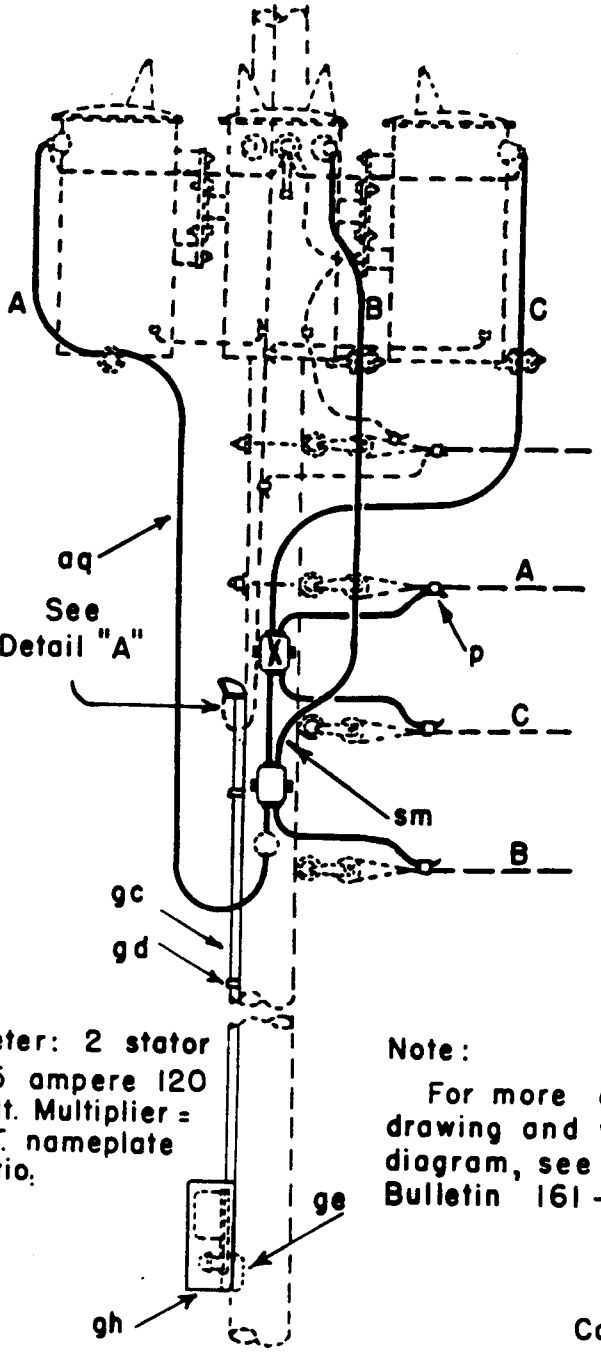
M8-9



GUIDE TO YARD POLE METER INSTALLATION (SHOWING ALL BUILDING SERVICES CARRIED UNDERGROUND)

Jan 1, 1962

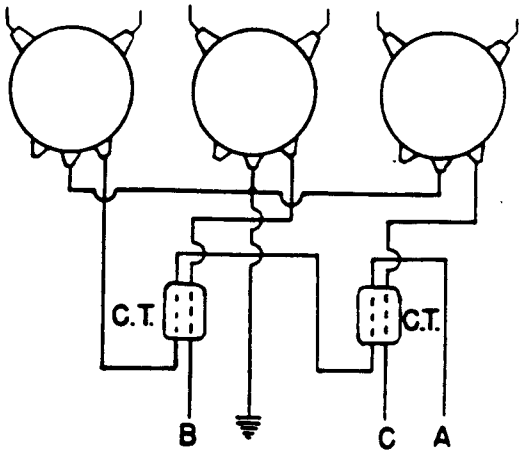
M8-10



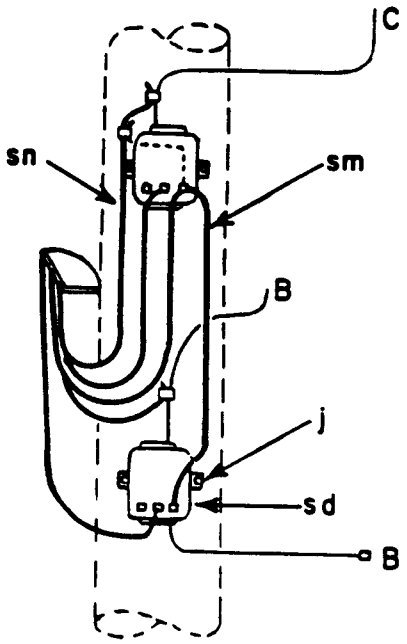
Meter: 2 stator 2.5 ampere 120 volt. Multiplier = C.T. nameplate ratio.

Note:

For more detailed drawing and wiring diagram, see REA Bulletin 161 – 12



WIRING DIAGRAM



DETAIL "A"
Connections from C.T.'s. to Service Head

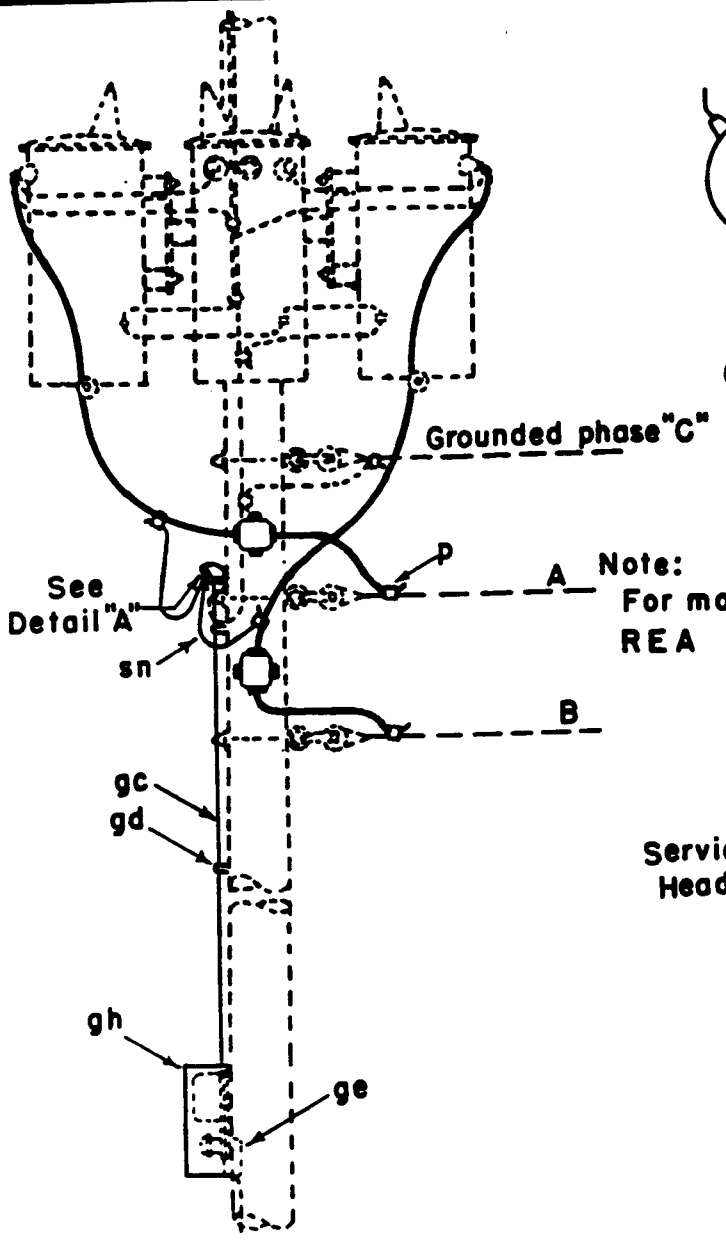
ITEM	NO.	MATERIAL
j	4	Screw, lag
p		Connectors, as required
aq		Jumpers, insulated
gc		Conduit, 1 1/4", as required
gd		Straps, conduit, as required
ge	1	Conduiet, type "LB"

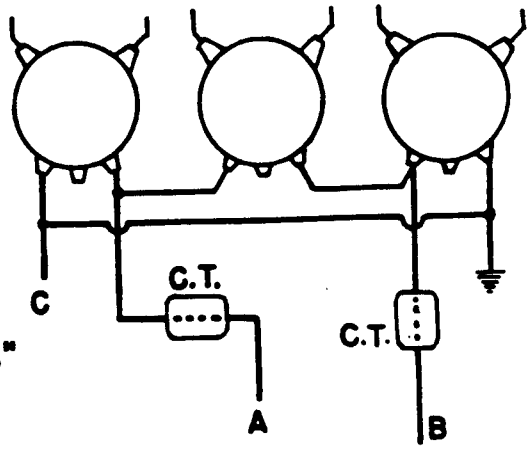
ITEM	NO.	MATERIAL
gh	1	Meter box, meter and test block
sd	2	Transformer, current
sm		Wire, No. 12, insul. for current
sn		Wire, No. 14, insul. for potential
	1	Service Head

SECONDARY METERING GUIDE
THREE PHASE, 120/208 VOLTS
4 WIRE GROUNDED WYE

Jan 1, 1962

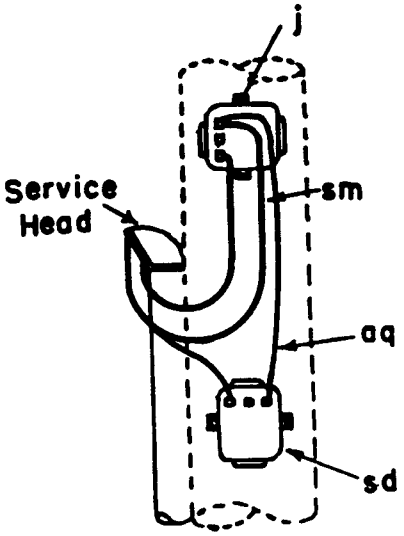
M8-11





WIRING DIAGRAM

Note: For more detailed wiring diagram, see REA Bulletin 161–12



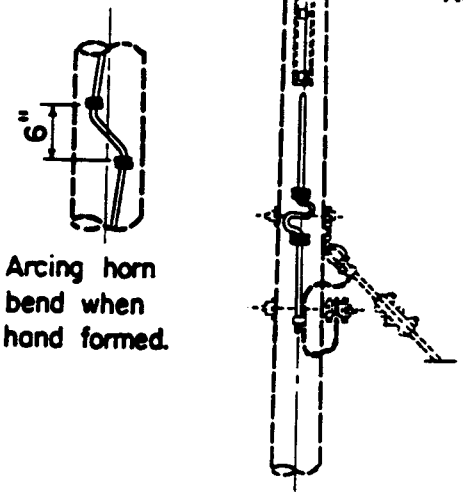
DETAIL "A"
Connections from C.T's. to Service Head

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
j	4	Screw, lag, 1/2" x 4"		sd	2	Transformer, current	
p		Connectors, as required		sm		Wire, No. 12, Insul. for current	
	1	Service head		sn		Wire, No. 14, Insul. for potential	
gc		Conduit, 1 1/4", as required		aq		Jumper	
gd		Straps, conduit, as required					
ge	1	Condulet, type "LB"					
gh	1	Meter box, meter and test block					

SECONDARY METERING GUIDE
THREE PHASE 240 VOLTS
3 WIRE CORNER GROUNDED DELTA

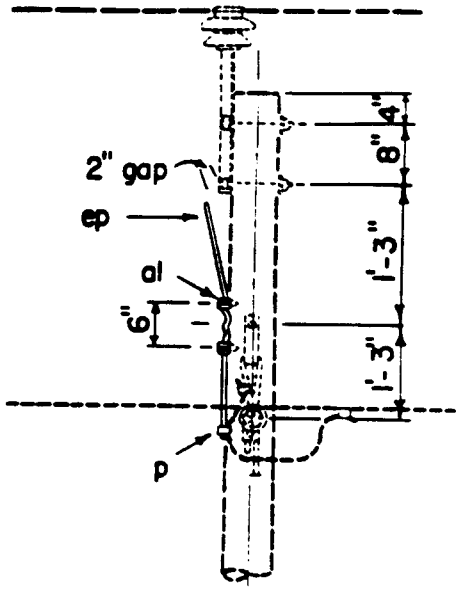
Jan 1, 1962

M8-12



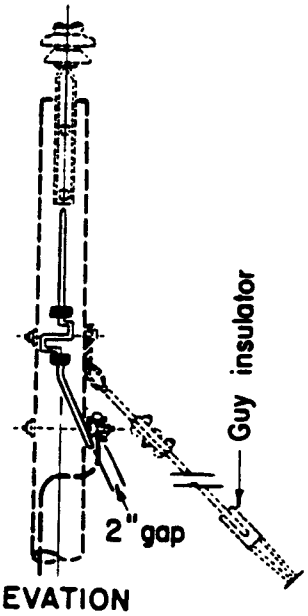
ELEVATION

Note:
Bend arcing horns to provide 2" gaps.

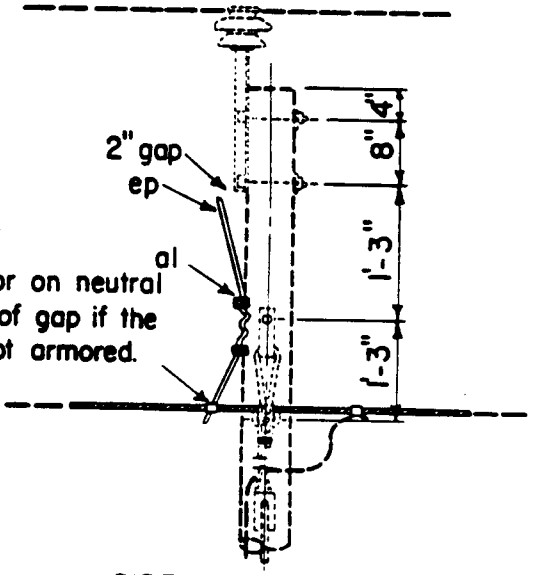


SIDE ELEVATION

ARCING HORN ARRANGEMENT FOR GROUNDED GUY



ELEVATION



SIDE ELEVATION

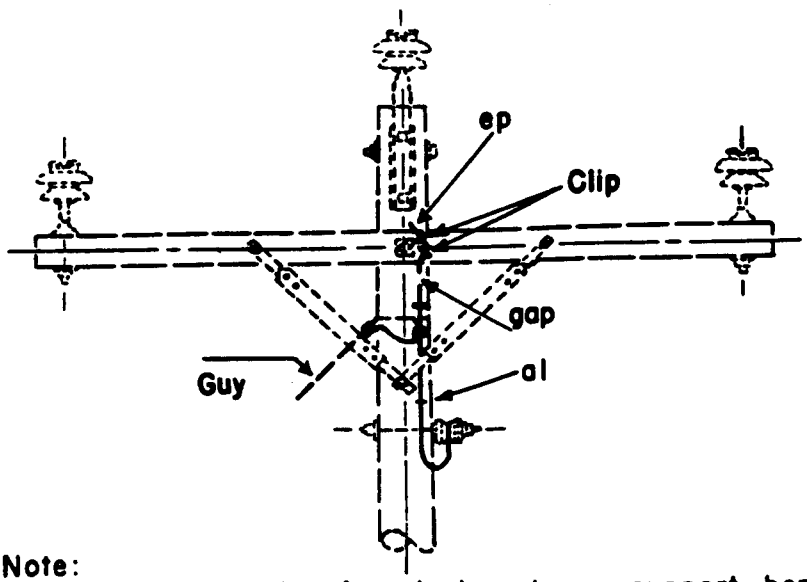
ARCING HORN ARRANGEMENT FOR INSULATED GUY OR UNGUYED POLE

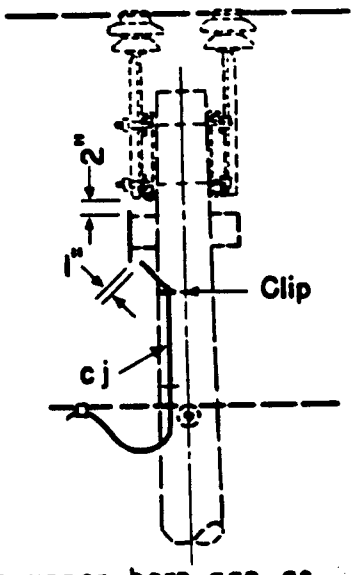
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
p		Connectors, as req'd.		ep	1	Arcing horn #4 or #2 HD copper, as req'd.	
al	2	Ground wire clip					

14.4/24.9 KV, 1- PHASE
VERTICAL CONSTRUCTION - 0° TO 30° ANGLE
ARCING HORN ASSEMBLIES

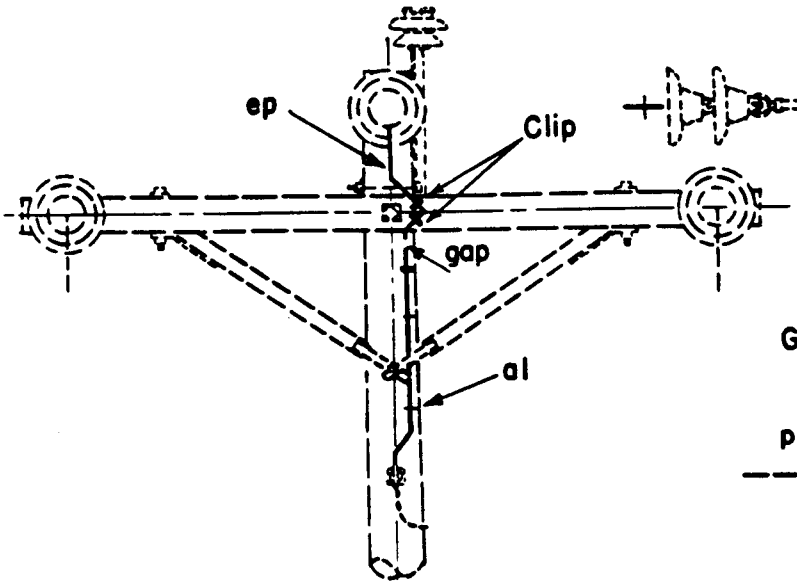
Jan. 1, 1963

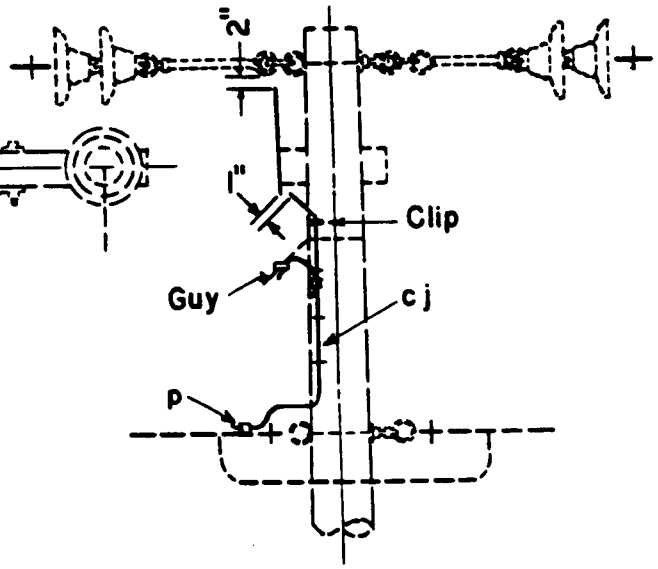
VM10-14





Note:
Use similar design for single primary support, bending upper horn gap as necessary to form 2" gap to pole top pin through bolt.





ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL
p		Connectors, as required		cj	1	Ground wire, #6 S.D. Copper or equiv.
al	3	Ground wire clip		ep	1	Arcing horn, #4 H.D. Copper, as req'd.
al		Staples, ground wire, 3/16"x 1 1/2"x #9,	as req'd.			

14.4/24.9 KV - THREE PHASE ARCING HORN ASSEMBLY GUIDE

Jan. 1, 1963

VM10-15

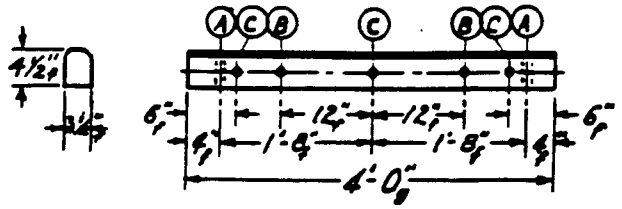


FIG. 1

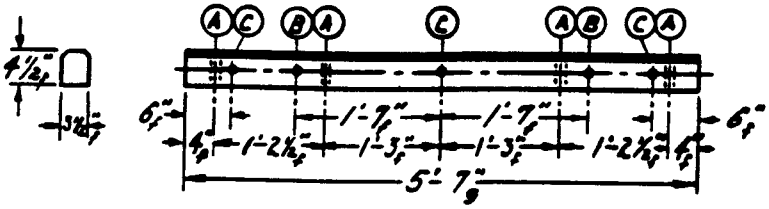


FIG. 2

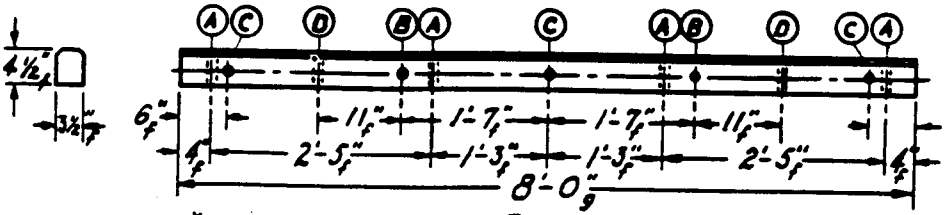


FIG. 3

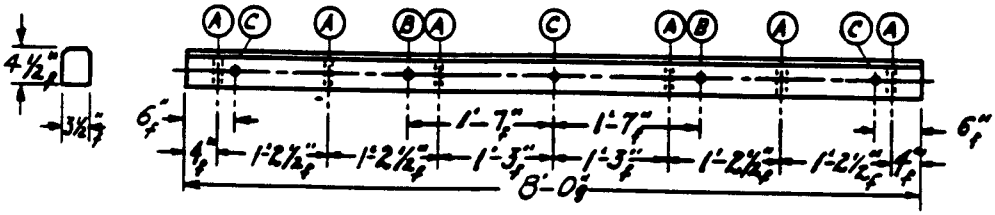


FIG. 4

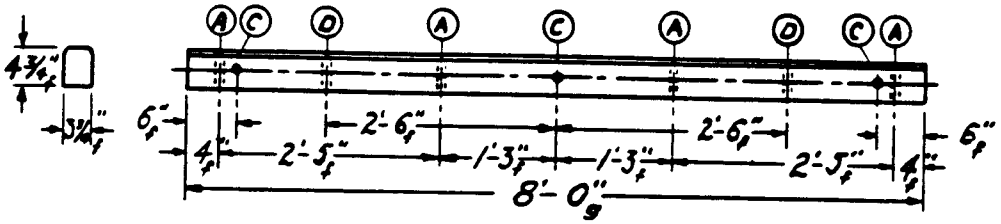


FIG. 5

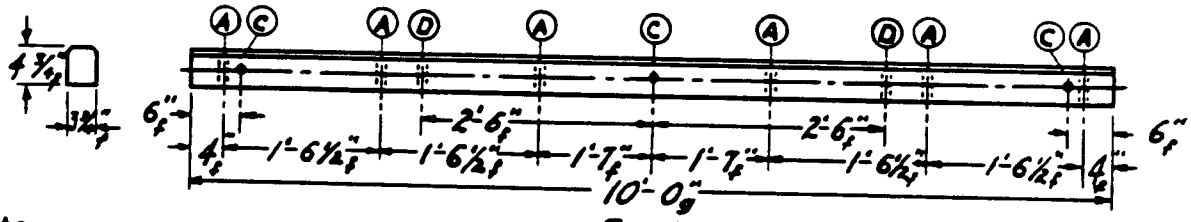
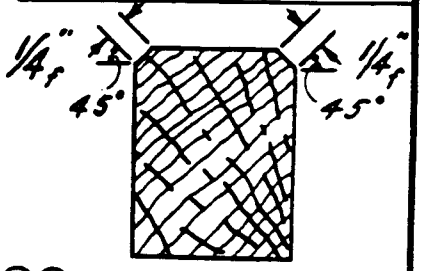


FIG. 6

TOLERANCES
SIZES OF HOLES

	Nominal	Go	No Go
A	1 1/16"	5/8"	3/4"
B	2 1/16"	3/8"	1/2"
C	11/16"	5/8"	3/4"
D	2 1/16"	1/2"	5/8"



TYPICAL ENLARGED SECTION

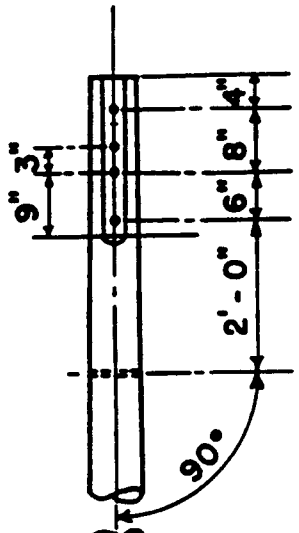
f ---- 1/8" ±
g ---- 1/4" ±

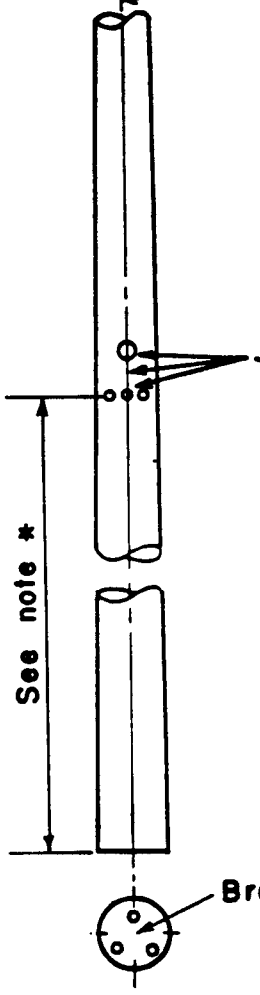
Note:
Eight foot crossarms may be drilled for 42" span angle braces, if so specified.

CROSSARM DRILLING GUIDE

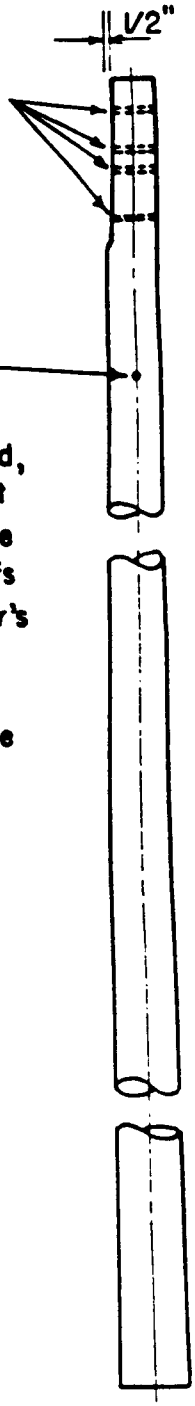
Jan. 1, 1962

M19





Brand butt with proper length and class.



Through-bolt holes must be parallel and in the same plane.

HOLES: Drill 11/16" diameter.

GAINS: Gains are to be flat with plane at right angles to bolt hole.

Neutral bolt hole must be at 90° angle with through-bolt holes.

All poles treated full-length must be bored, roofed and gained before treatment, except that Class 7 and smaller poles need not be gained unless requested by purchaser. Roofs may be flat or at a 15° angle at the producer's option.

* Bottom of brand or center of metal disk shall be 10' ± 1" from pole butt; 14' ± 1" mark for poles 55' and longer.

If insured warranted pole, Brand "IW".

Manufacturer's Mark and Date of Treatment, (Month and Year).

Brand with proper length and class.

Brand with species, preservative code and retention.

POLE FRAMING GUIDE

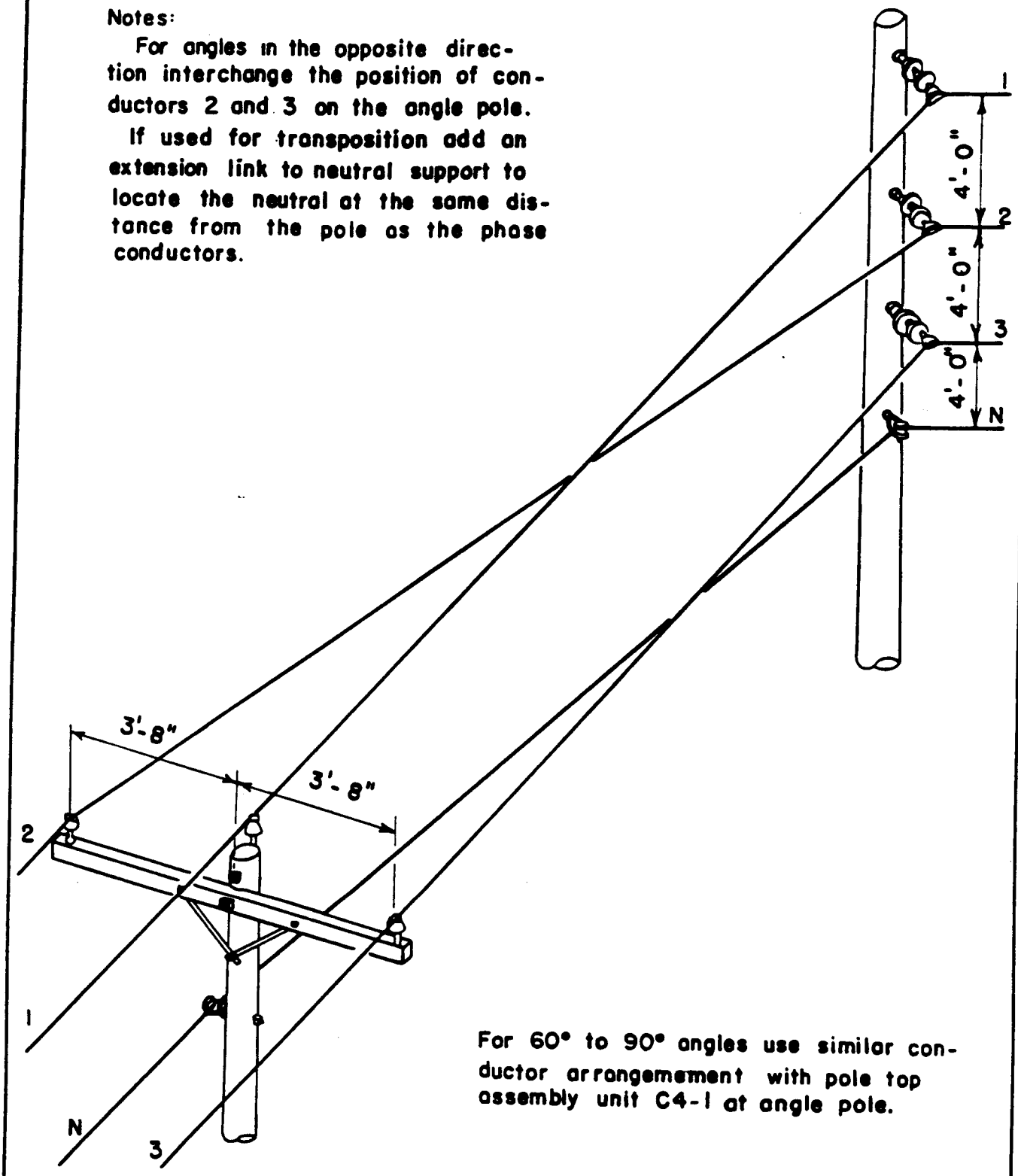
Jan. 1, 1962

M20

Notes:

For angles in the opposite direction interchange the position of conductors 2 and 3 on the angle pole.

If used for transposition add an extension link to neutral support to locate the neutral at the same distance from the pole as the phase conductors.



For 60° to 90° angles use similar conductor arrangemement with pole top assembly unit C4-1 at angle pole.

ANGLE CONSTRUCTION GUIDE
CROSSARM TO VERTICAL CONST.- 30° TO 60° ANGLE

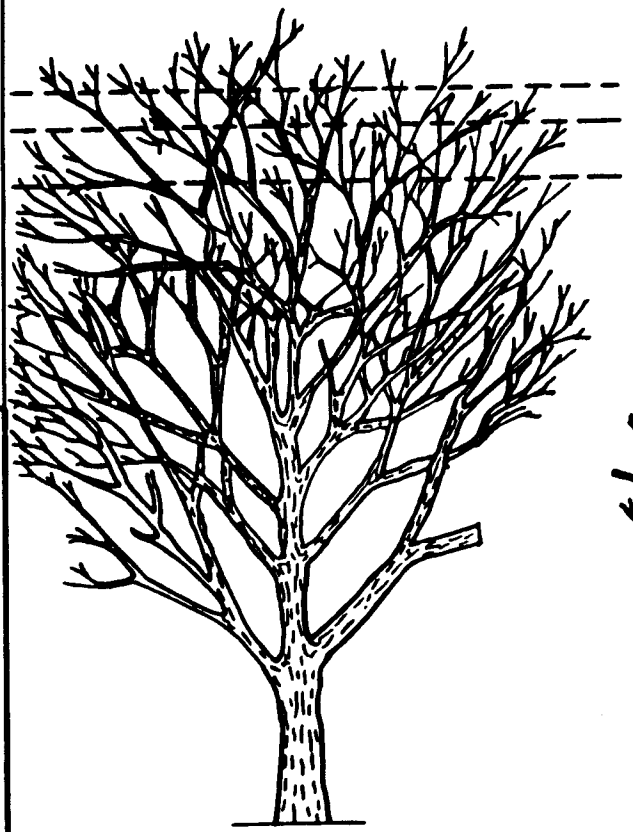
Jan 1, 1962

M21

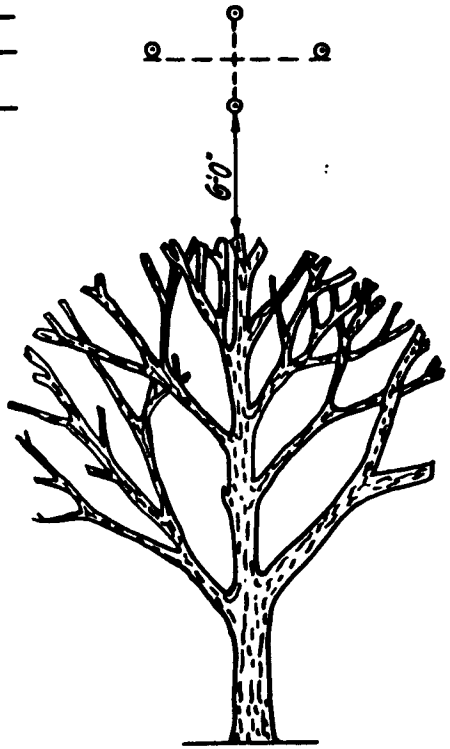
TREE TRIMMING GUIDE

Jan 1, 1962

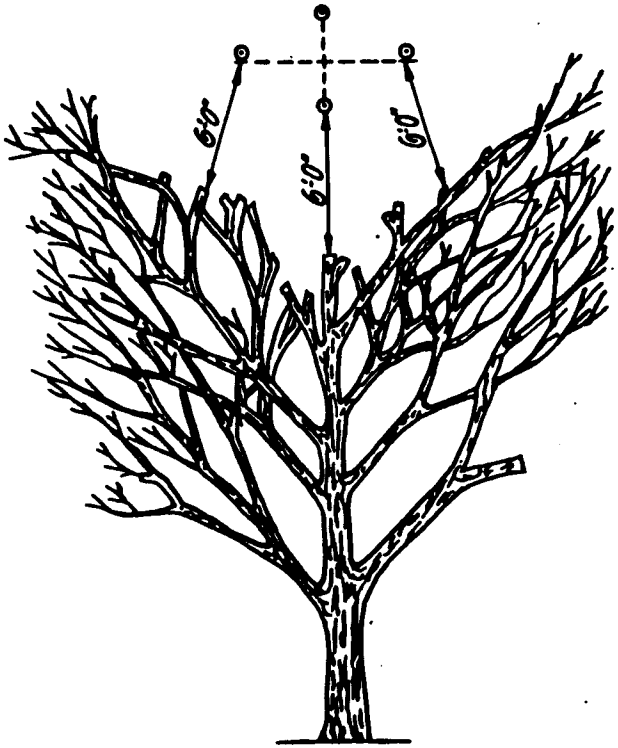
M22-1



Before Trimming

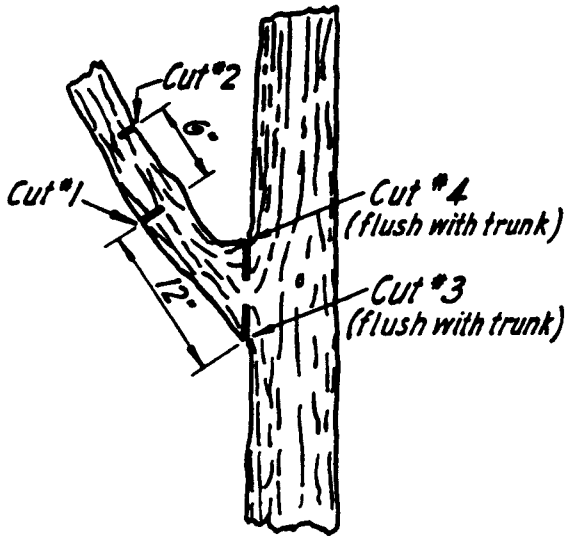


Right Way

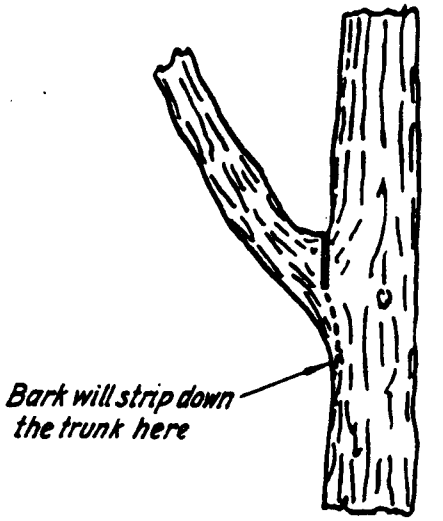


Wrong Way

Note:
No parts of tree should be closer than 6'-0" from open wiring.
Trimming should leave tree with symmetrical appearance.



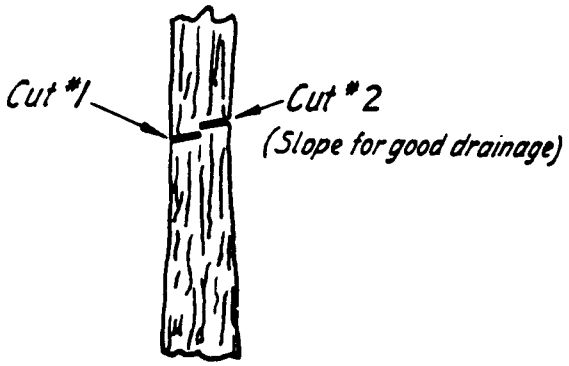
Right Way



Wrong Way

For small branches
omit Cuts #1 and #2

REMOVAL OF HEAVY SIDE LIMB



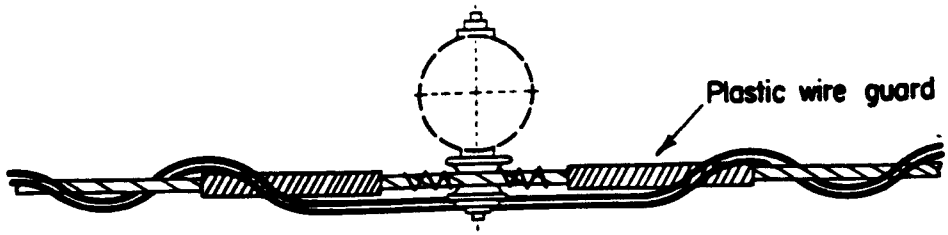
Right Way

Wrong Way

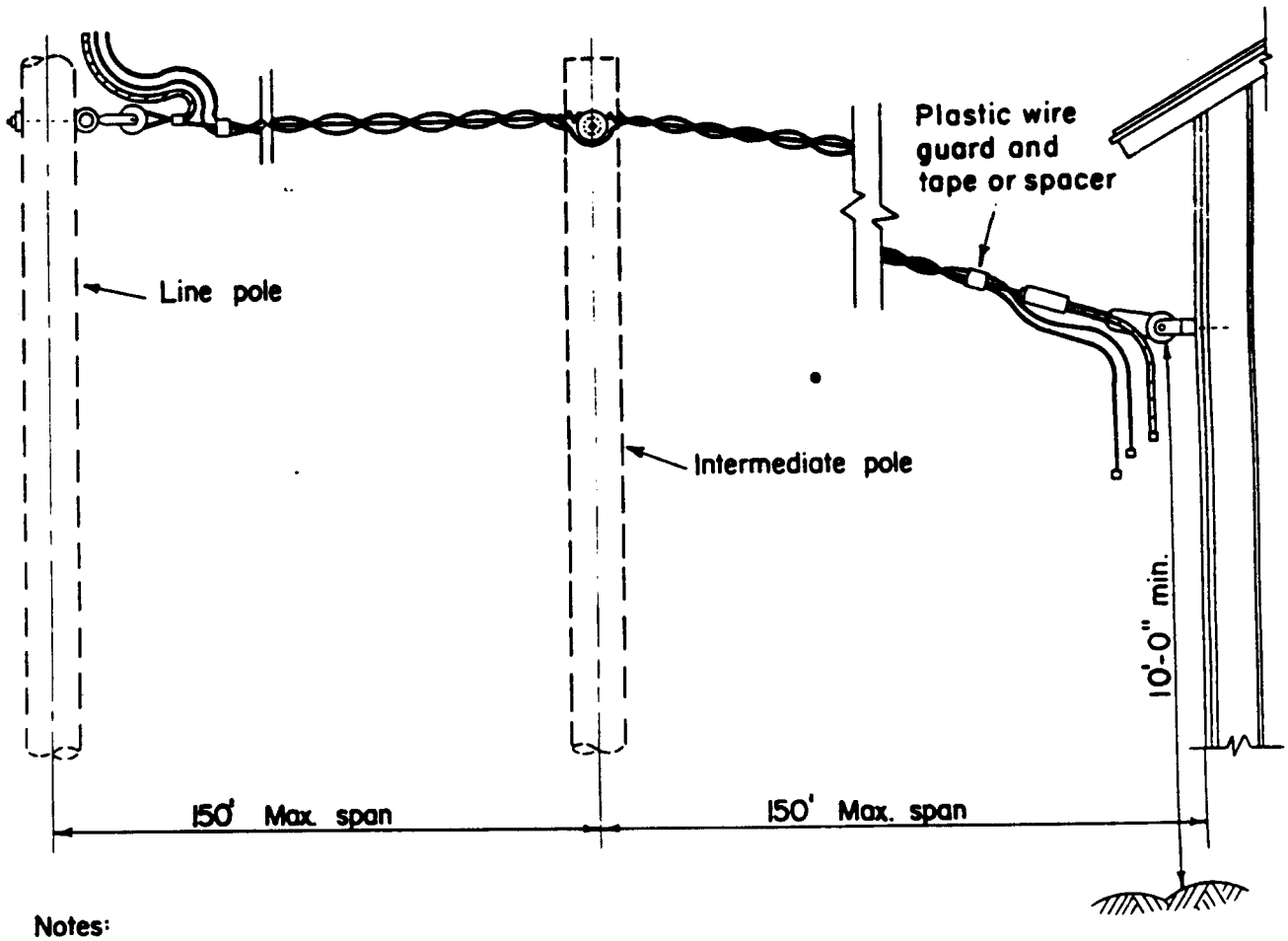
REMOVAL OF VERTICAL LIMB

NOTE: Coat final cut with tree paint.

	TREE TRIMMING GUIDE	
	Jan 1, 1962	M22-2



PLAN

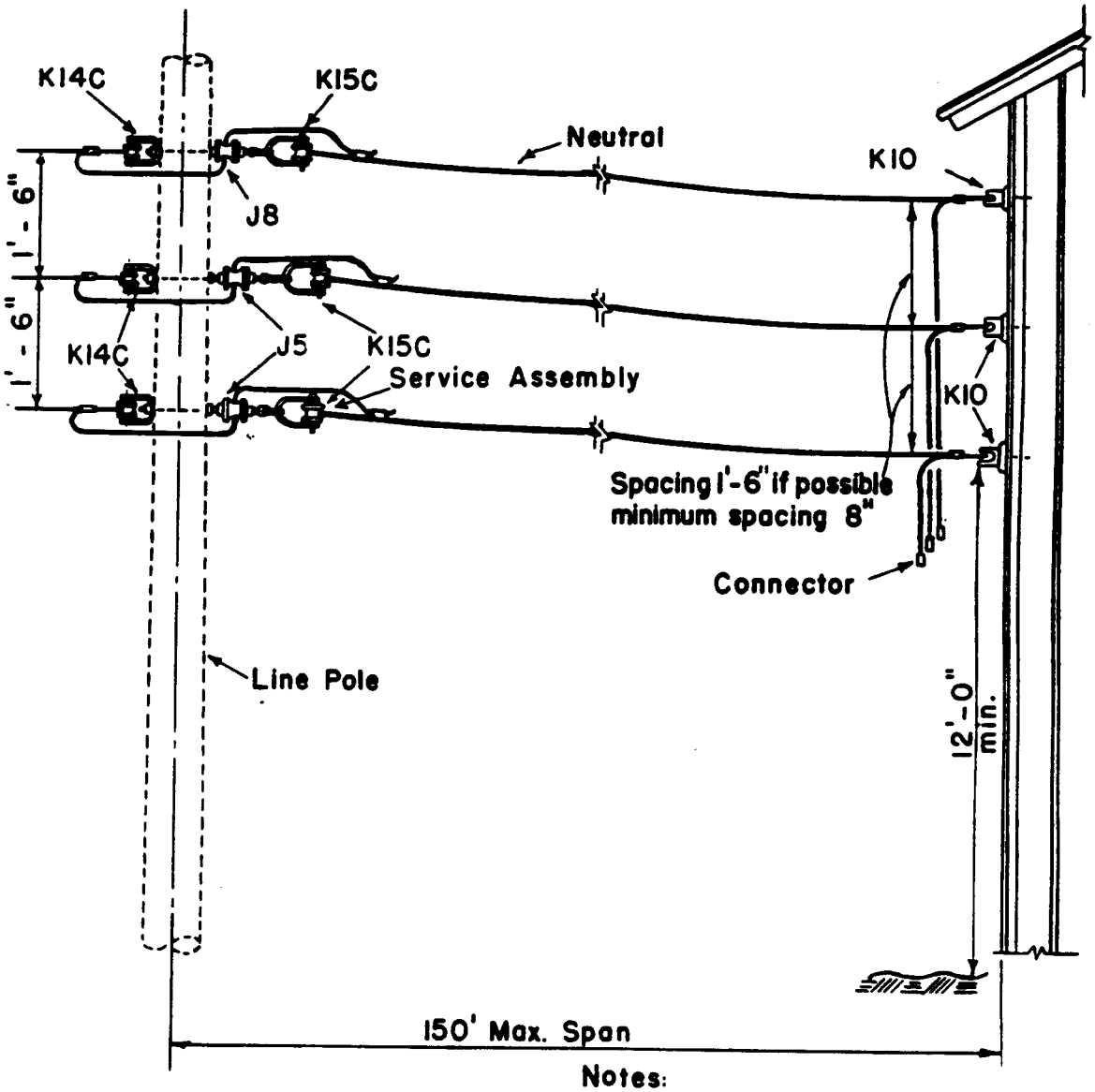


Notes:

1. Services as short as possible are preferred.
2. Refer to secondary and service assemblies for construction details.

CABLE SERVICE ASSEMBLY GUIDE

M24



Notes:

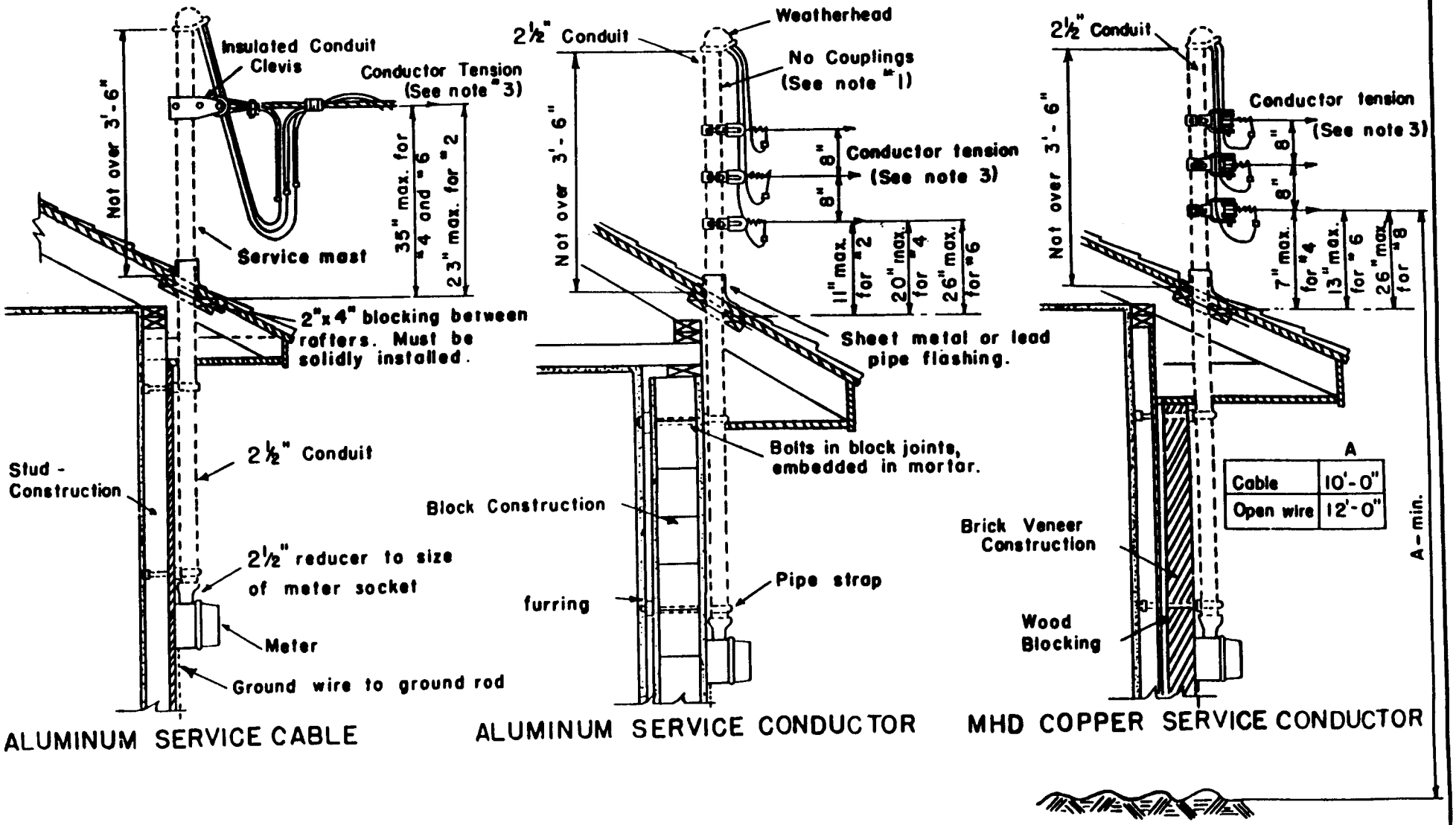
Insulation on covered conductor that is under strain should not be cut.

In brick or concrete walls use 3/8" expansion bolts or shields in 5/8" holes at least 2½" deep, or wedge expanded eyebolts.

OPEN WIRE
SECONDARY OR SERVICE ASSEMBLY GUIDE

Jan 1, 1962

M24-1

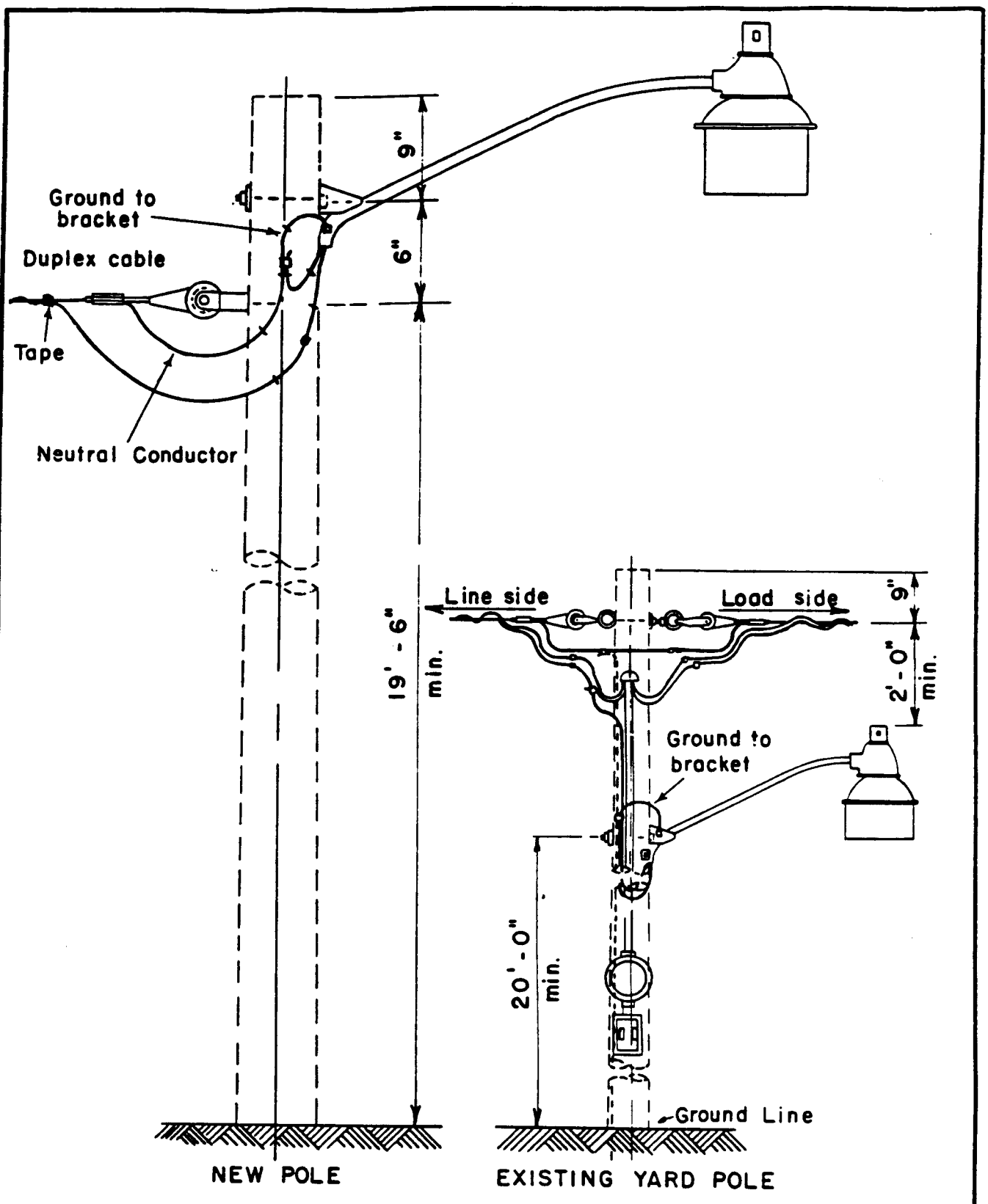


Notes:

1. If length of conduit exceeds ten feet, coupling will be permitted on end adjacent to meter.
2. Meter to be located 5'-6" from ground level.
3. Maximum tension of conductor not to exceed 50% of ultimate strength.
4. For service assemblies see drawings K16C, K17, K17L.

ASSEMBLY GUIDE OF SERVICE MAST FOR RANCH TYPE HOUSE

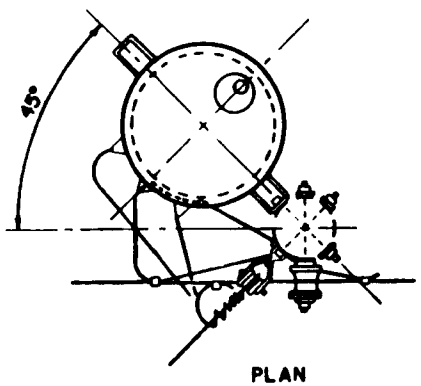
Jan 1, 1962		M24-10



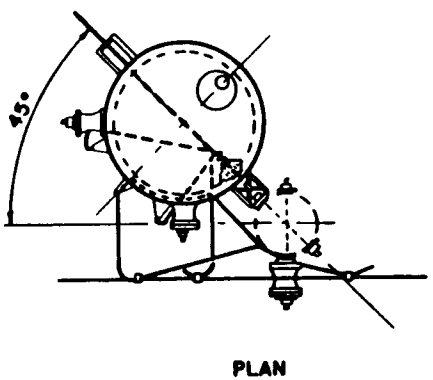
SECURITY LIGHT INSTALLATION GUIDE
(UNMETERED)

Jan 1, 1962

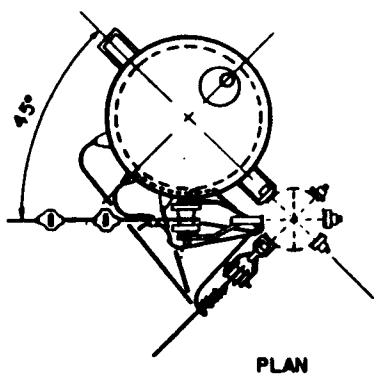
M26-5



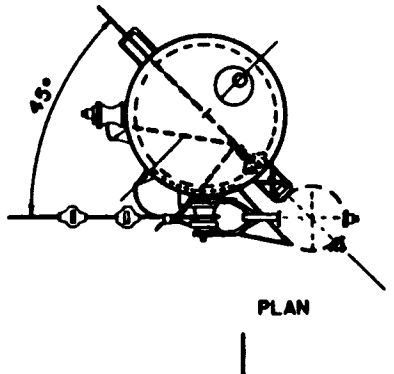
PLAN



PLAN

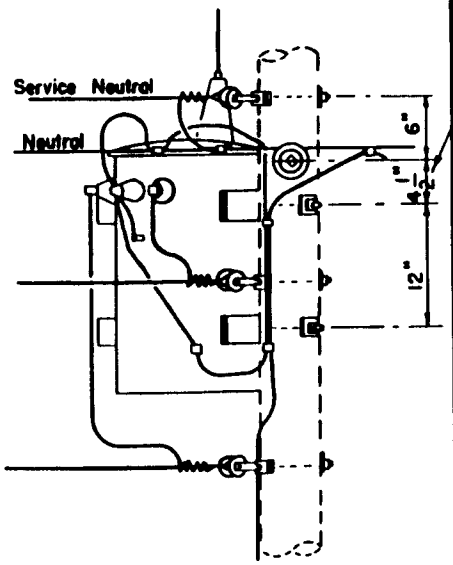


PLAN

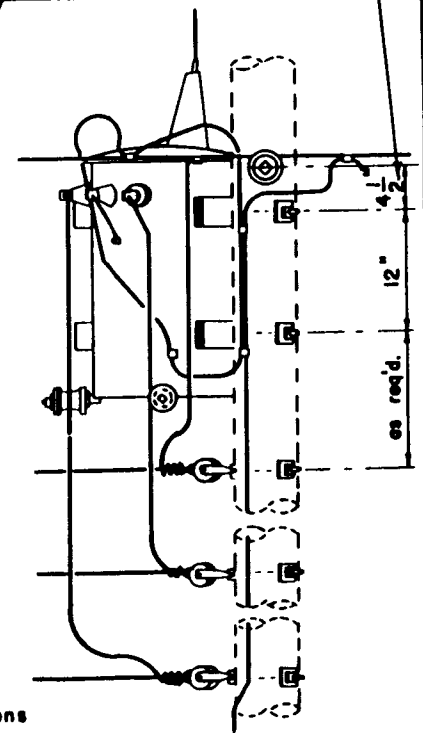


PLAN

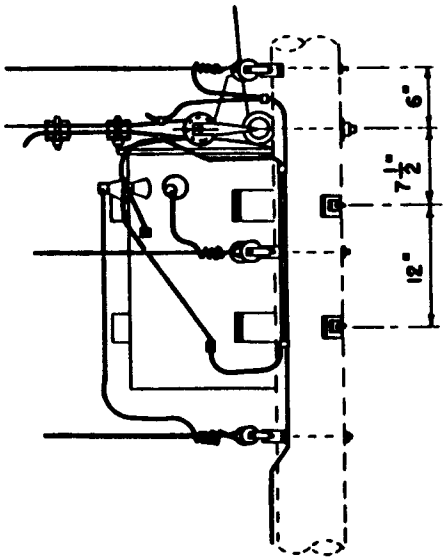
For multiphase primary line construction with the crossarm in the revised lower position, change this dimension to 12 inches.



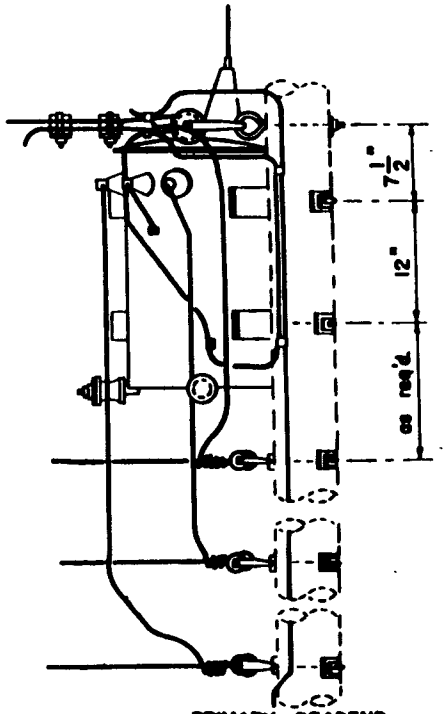
PRIMARY TANGENT
SERVICE TAKE-OFF AT
TRANSFORMER LEVEL



PRIMARY TANGENT
SERVICE TAKE-OFF BELOW
TRANSFORMER



PRIMARY DEADEND
SERVICE TAKE-OFF AT
TRANSFORMER LEVEL



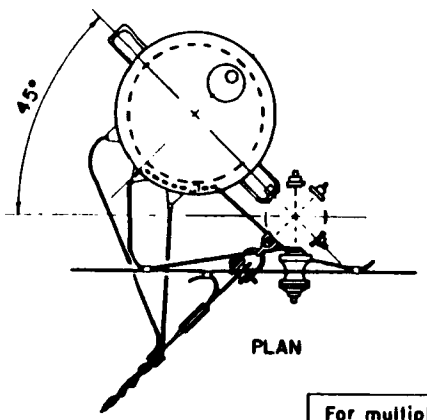
PRIMARY DEADEND
SERVICE TAKE-OFF BELOW TRANSFORMER

Note:
Transformers may be mounted in alternate positions and quadrants as practical in order to facilitate services in directions not shown.

TRANSFORMER CONNECTION GUIDE
OPEN WIRE SERVICES

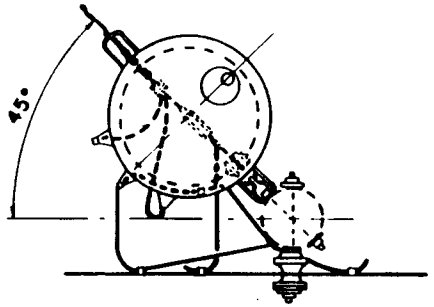
Jan 1, 1962

M27



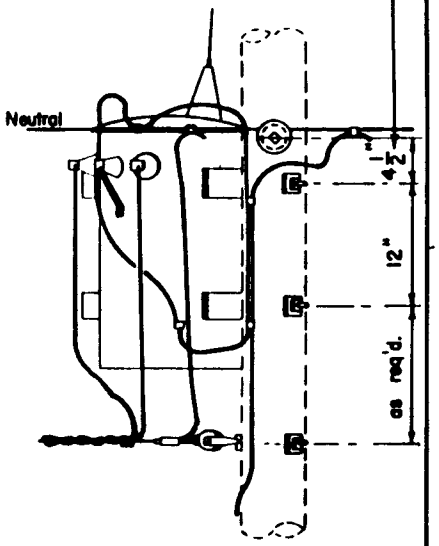
PLAN

PRIMARY TANGENT
SERVICE TAKE-OFF AT
TRANSFORMER.

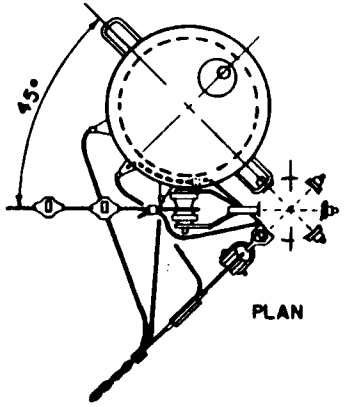


PLAN

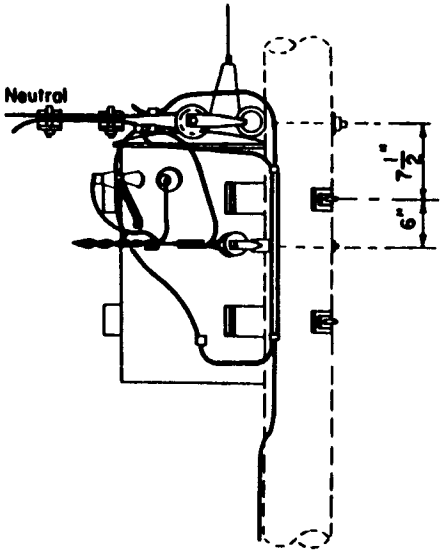
For multiphase primary line construction with the crossarm in the revised lower position, increase this dimension to 12".



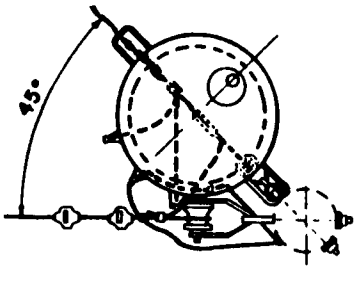
PRIMARY TANGENT
SERVICE TAKE-OFF
BELOW TRANSFORMER.



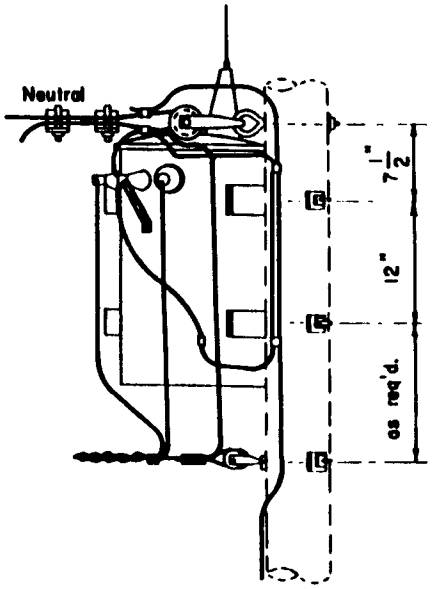
PLAN



PRIMARY DEADEND
SERVICE TAKE-OFF AT
TRANSFORMER.



PLAN



PRIMARY DEADEND
SERVICE TAKE-OFF BELOW
TRANSFORMER.

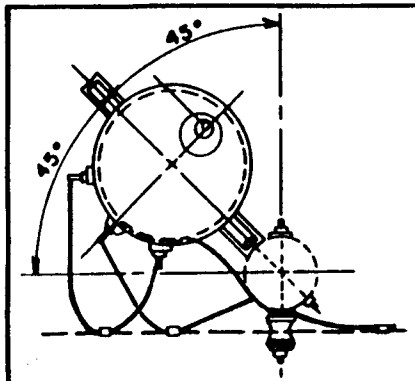
NOTES:

1. Secondary bushing not to be used for bi-metal connection.
2. Transformers may be mounted in alternate positions and quadrants as practical in order to facilitate services in directions not shown.
3. For transformers 10 KVA and larger see Guide Drawing No. M27-1A.

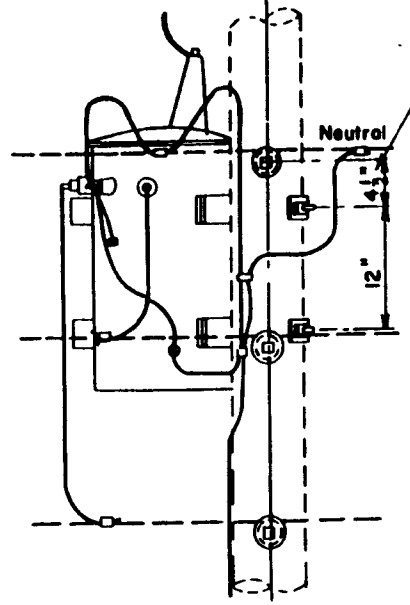
TRANSFORMER CONNECTION GUIDE
TRIPLEX CABLE SERVICES

Jan 1, 1962

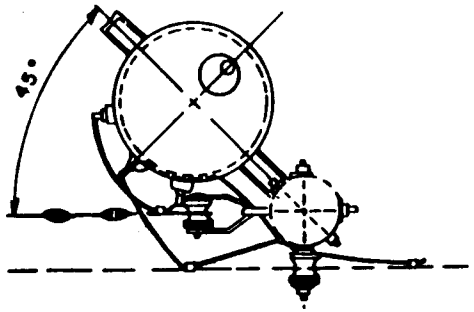
M27-1



PLAN

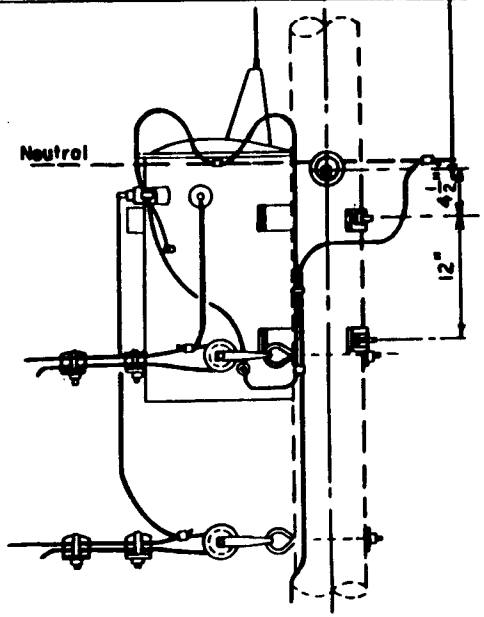


PRIMARY TANGENT
SECONDARY TANGENT

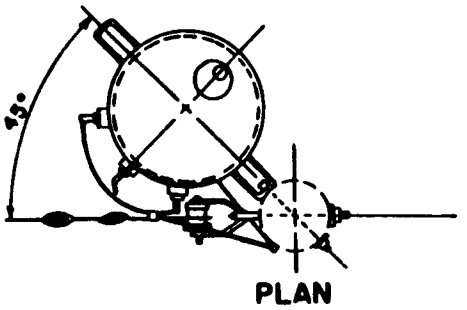


PLAN

For multiphase primary line construction with the crossarm in the revised lower position, increase this dimension to 12 inches.



PRIMARY TANGENT
SECONDARY DEADEND



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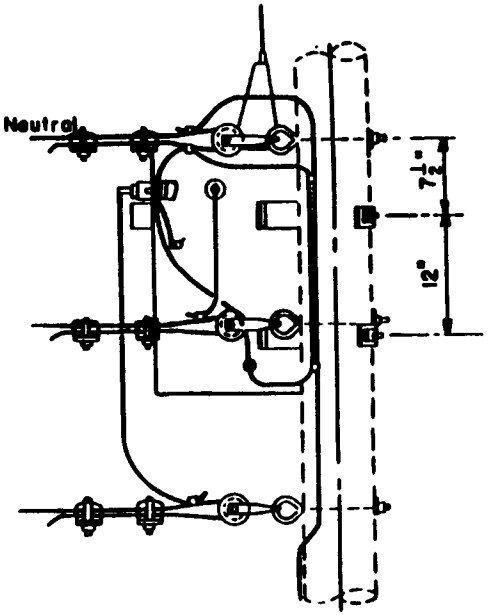
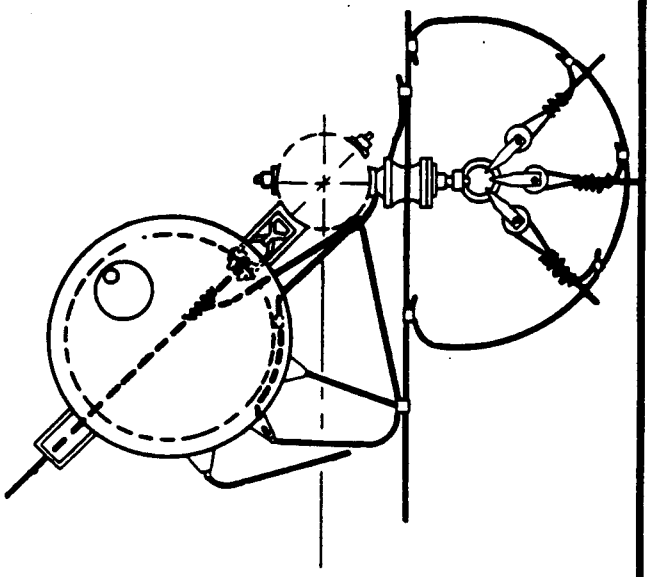


PRIMARY DEADEND
SECONDARY DEADEND

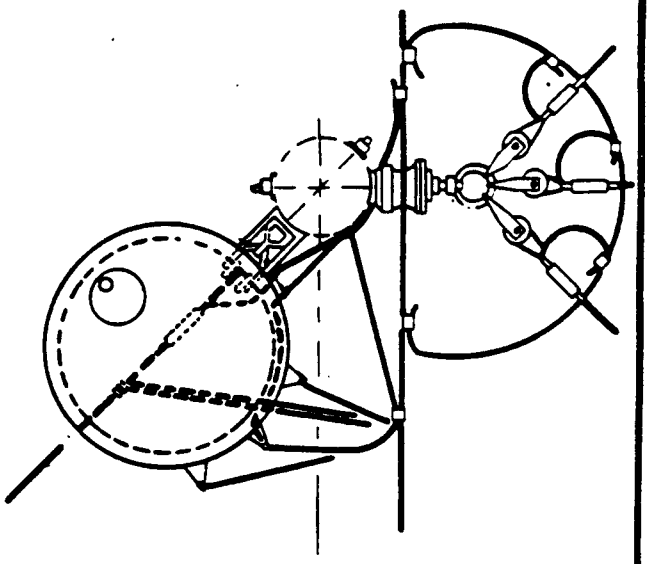
TRANSFORMER CONNECTION GUIDE
SECONDARY UNDERBUILD

Jan 1, 1962

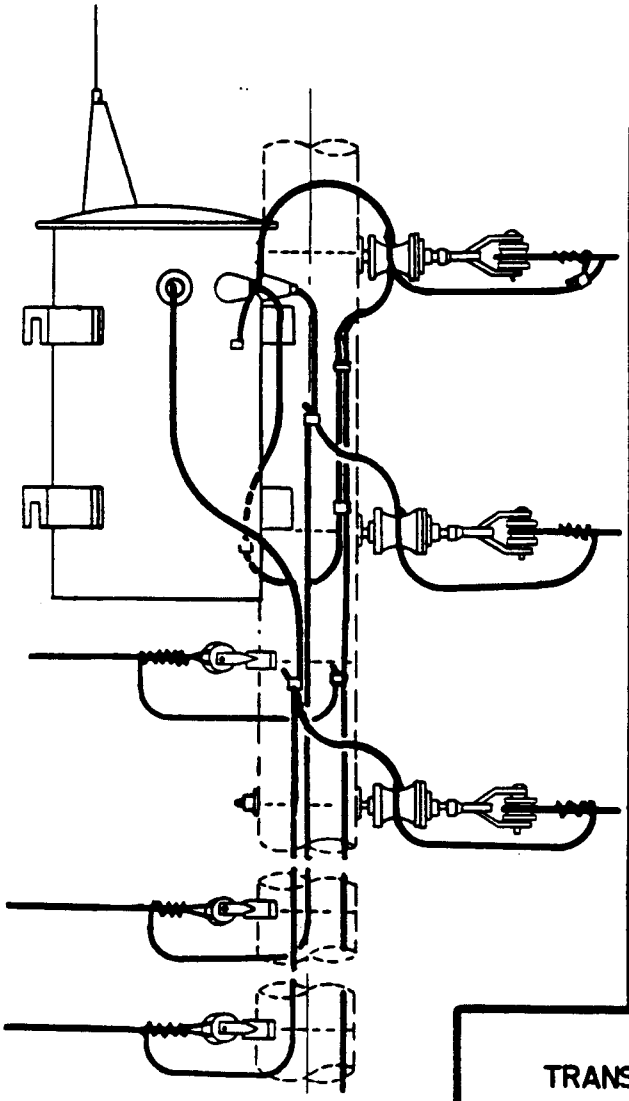
M27-2



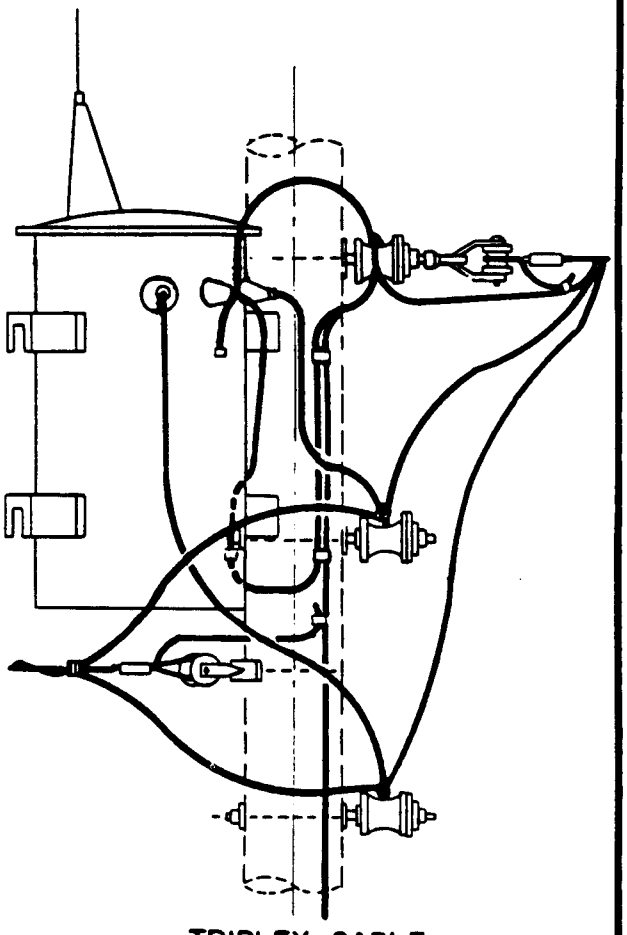
PLAN



PLAN



OPEN WIRE

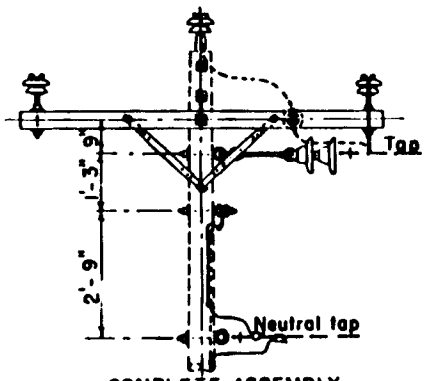


TRIPLEX CABLE

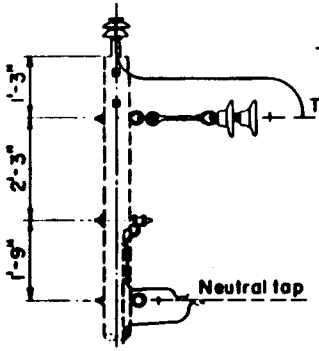
TRANSFORMER CONNECTION AND SERVICE TAKE-OFF GUIDE FROM SECONDARY

Jan 1, 1962

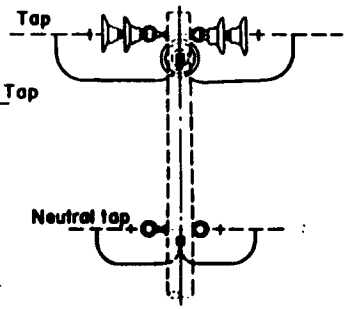
M28



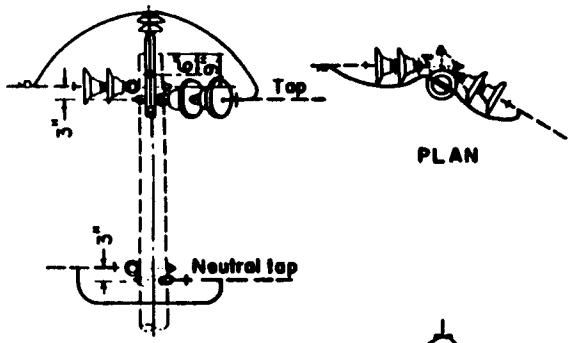
COMPLETE ASSEMBLY
VC1, VA5-2 and VM5-7 (if needed)



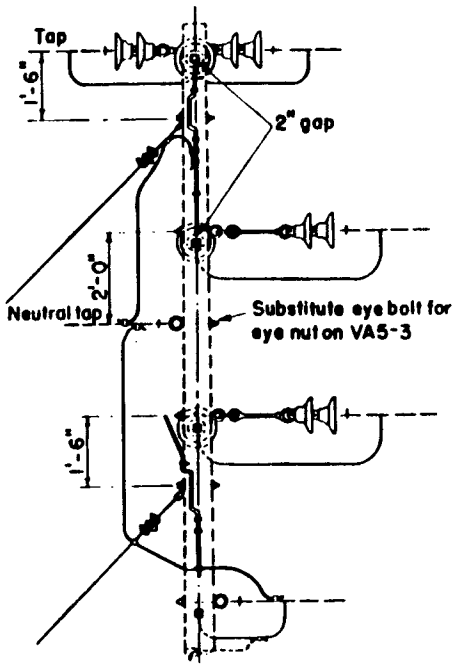
COMPLETE ASSEMBLY
VA5-2 AND VA1



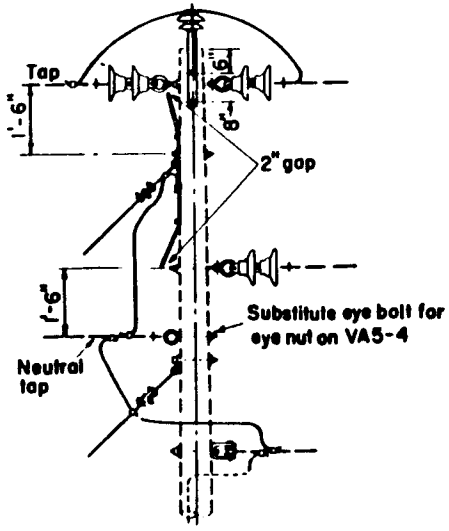
COMPLETE ASSEMBLY
VA5-3 AND VA4



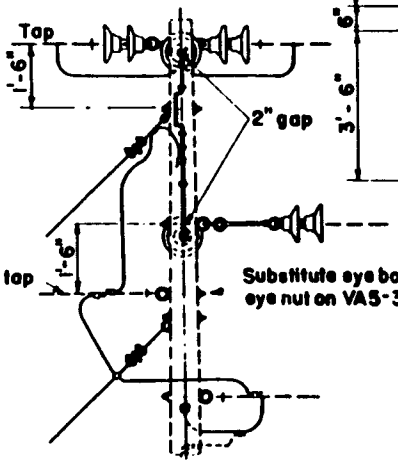
COMPLETE ASSEMBLY
VA5-1 AND VA5



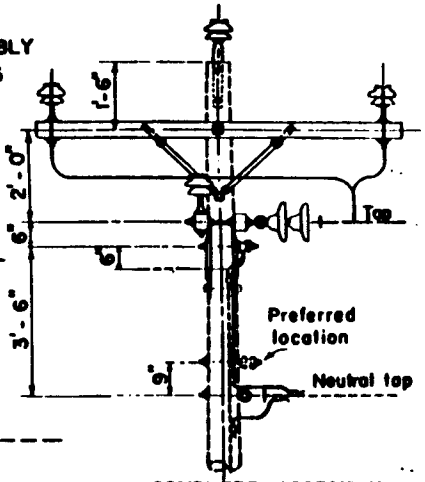
COMPLETE ASSEMBLY
VA5-3, VC4-1 AND VM10-14



COMPLETE ASSEMBLY
VA5-4, VB3 AND VM10-14



COMPLETE ASSEMBLY
VA5-3, VB4-1 AND VM10-14



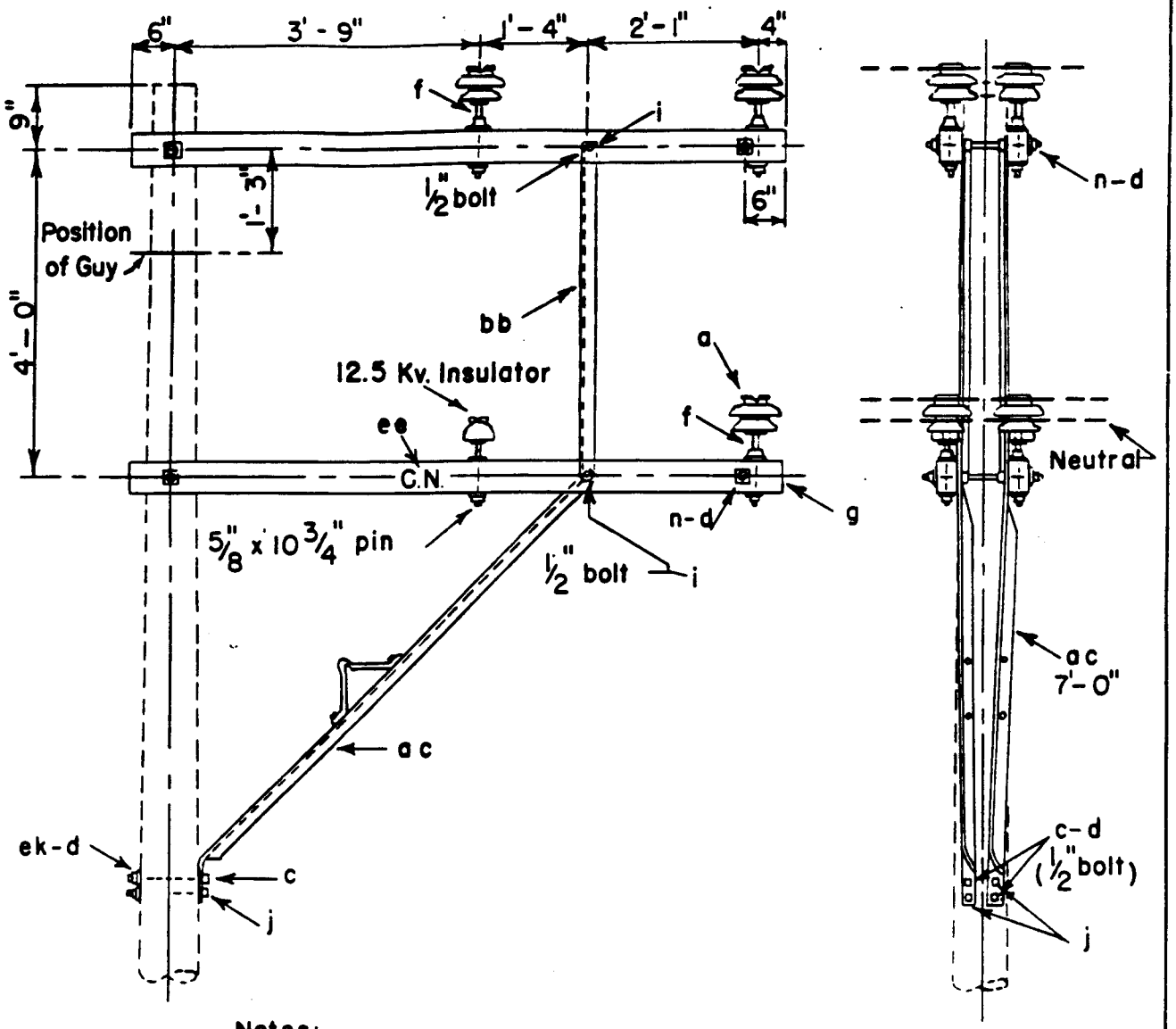
COMPLETE ASSEMBLY
VC1 AND VB7

Note:
This drawing illustrates the addition of standard tap assemblies to other standard pole top assemblies.

TAP ASSEMBLY GUIDE

Jan. 1, 1963

VM29-1



Notes:

1. Where these assemblies are required, span shall be shortened, as at crossings.
2. Position of conductors on single phase and V phase to be as directed.

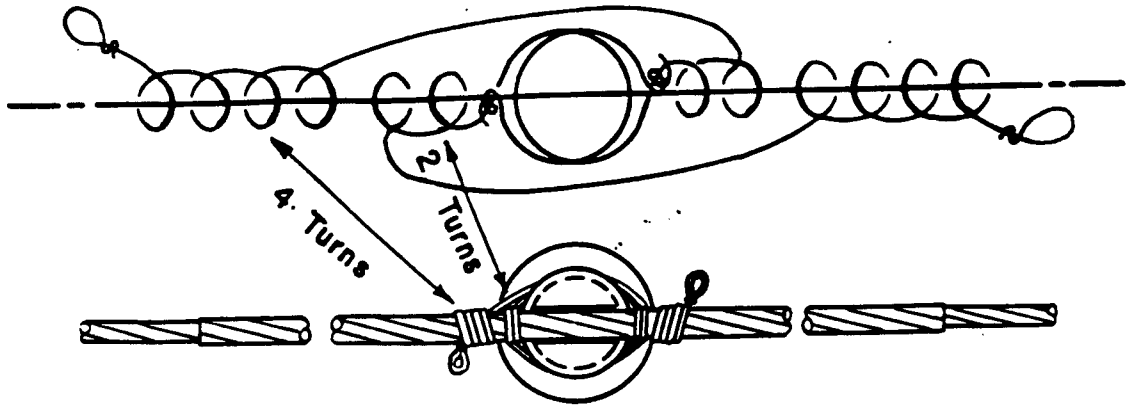
UNIT	ASSEMBLY	NUMBER OF EACH ITEM REQUIRED											
	DESCRIPTION	ek	a	c	d	f	g	i	j	n	ac	bb	ee
VM33-1	Single arm single phase	5	2	3	5	2	2	2	1	0	1	1	2
VM33-2	Double arm single phase	18	4	2	14	4	4	4	2	4	2	2	2
VM33-3	Single arm two phase	5	3	3	5	3	2	2	1	0	1	1	2
VM33-4	Double arm two phase	18	6	2	14	6	4	4	2	4	2	2	2
VM33-5	Single arm three phase	5	4	3	5	4	2	2	1	0	1	1	2
VM33-6	Double arm three phase	18	8	2	14	8	4	4	2	4	2	2	2

14.4/24.9 KV. PRIMARY

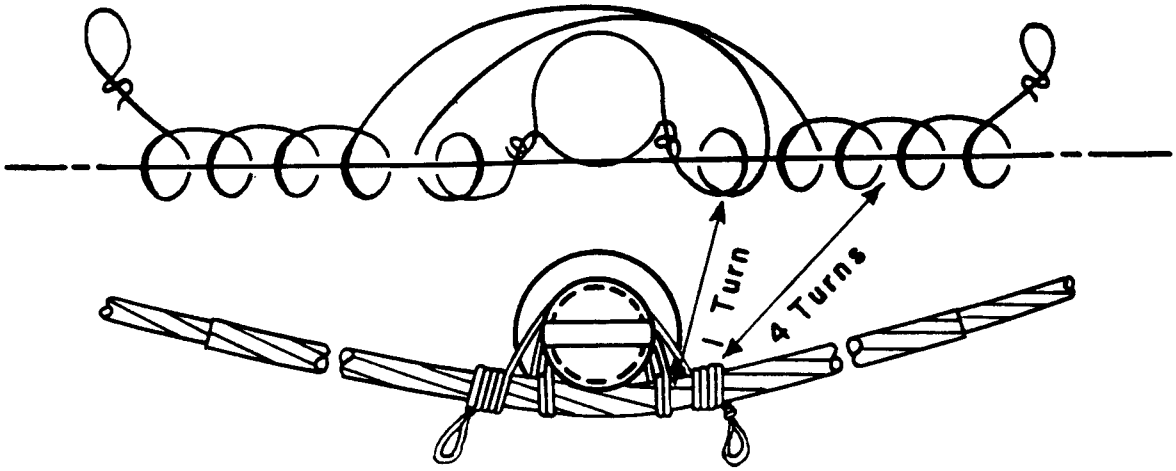
TWO SIDE ARMS (DOUBLE) FOR PRIMARY

Jan. 1, 1963

VM 331 TO VM33-6



TOP GROOVE TIE



SIDE GROOVE TIE

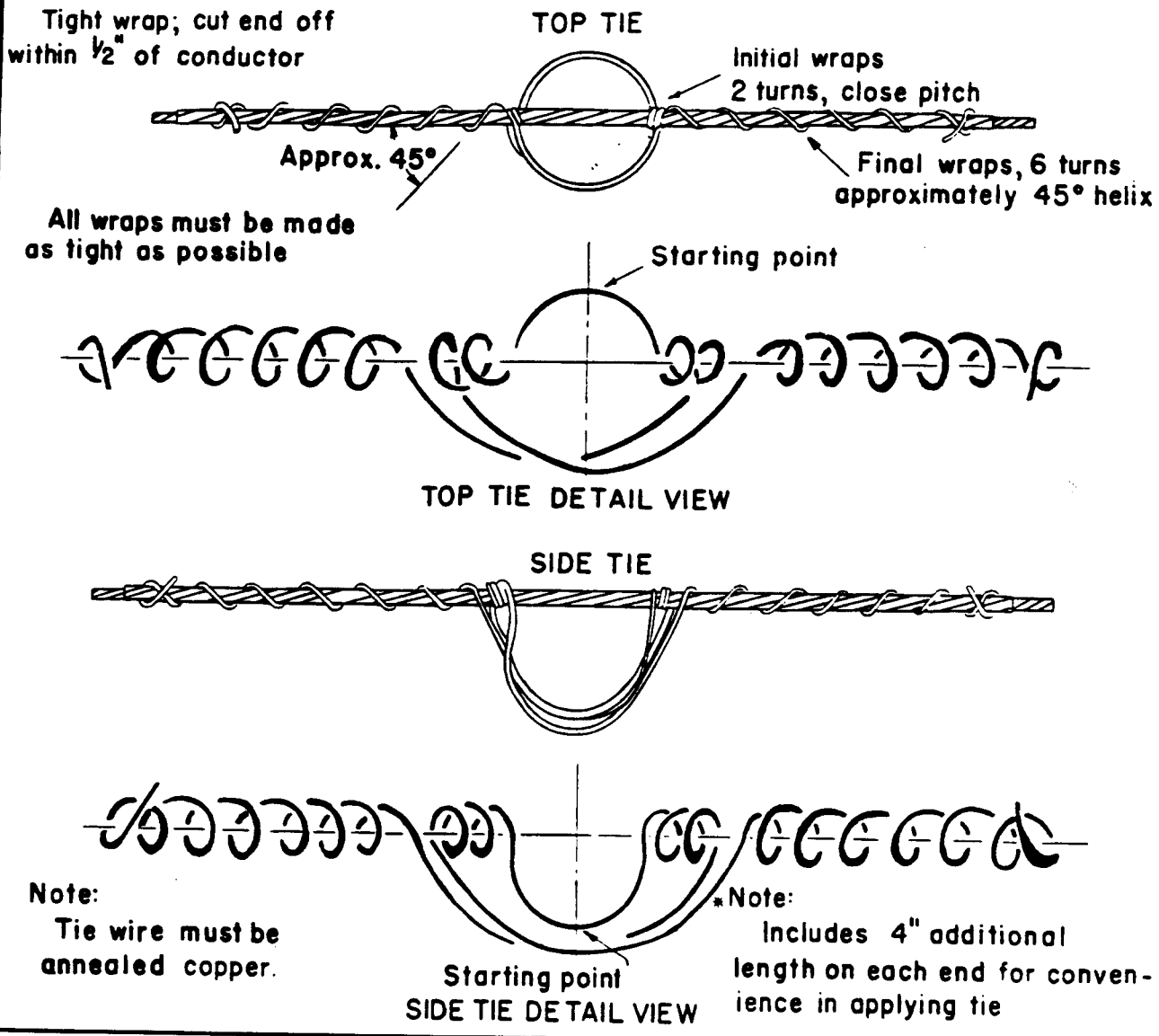
NOTES:

1. Tie wire assembly should be as tight as can be wrapped with hot line tools.
2. Tie wire lengths listed below can be used with insulators having a neck diameter up to and including 3 1/2 inches.
3. Turns may be made in either direction, as long as one - half the turns oppose the other half to prevent loosening of the tie.

A.C.S.R.		DIAM. OVER ARMOR RODS	ALUMINUM TIE WIRE		A.C.S.R.		DIAM. OVER ARMOR RODS	ALUMINUM TIE WIRE	
SIZE AWG	COND. DIAM.		SIZE AWG	LENGTH (each piece)	SIZE AWG	COND. DIAM.		SIZE AWG	LENGTH (each piece)
4/0	0.563"	0.939"	4	4'- 1"	2	0.325"	0.595"	4	3'-6"
3/0	0.502"	0.836"	4	3'-11"	4	0.257"	0.555"	4	3'-5"
2/0	0.447"	0.745"	4	3'- 9"					
1/0	0.398"	0.744"	4	3'- 9"					

HOT LINE TYING GUIDE, SINGLE INSULATOR
ALUMINUM TIE WIRE, A.C.S.R. CONDUCTOR
WITH STRAIGHT OR PREFORMED ARMOR RODS

M40-6

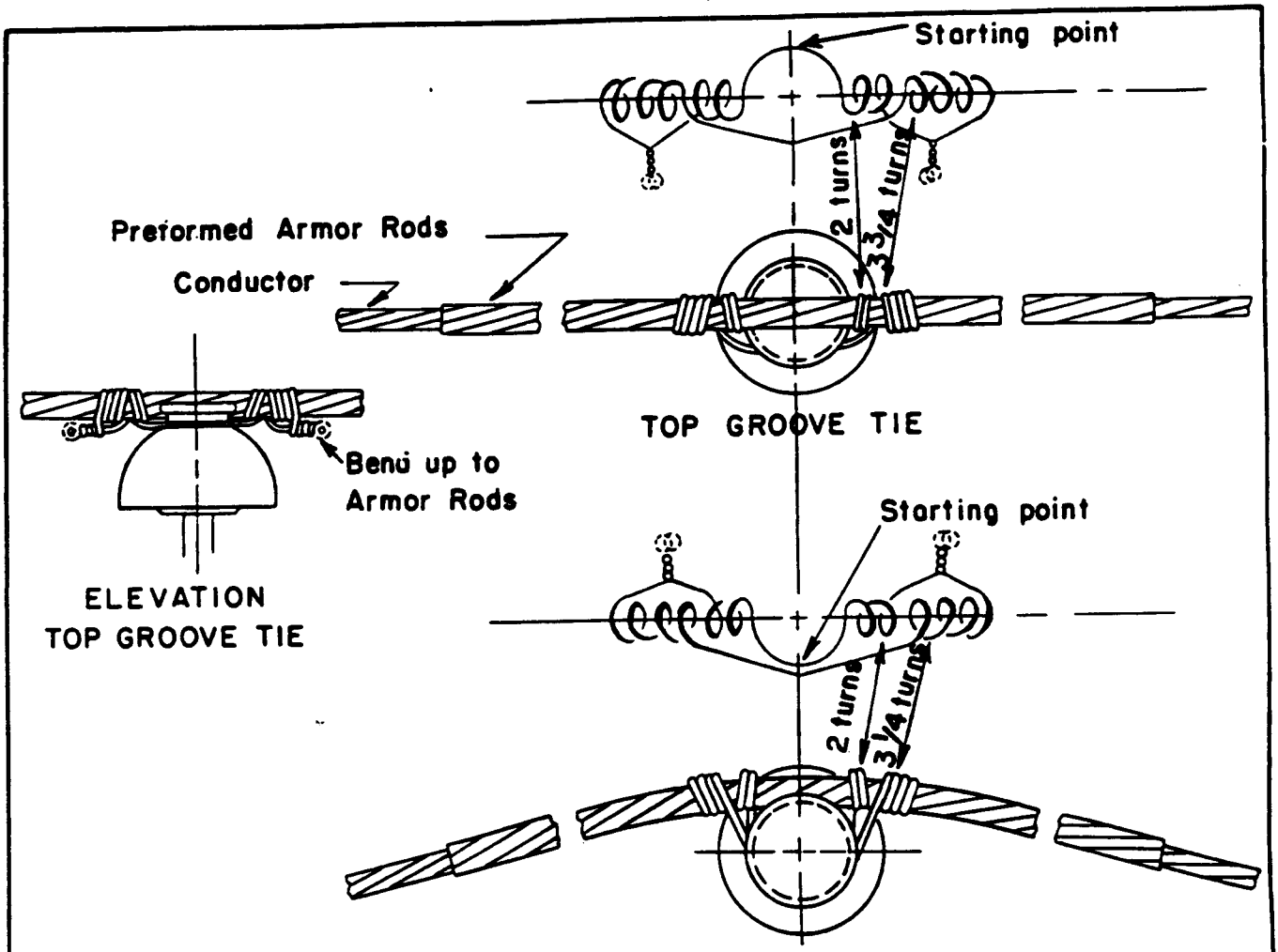


CONDUCTOR	CONDUCTOR DIAMETER	ARMOR ROD DIAMETER	OVERALL DIAMETER	SIZE OF COPPER TIE WIRE AWG.	TOP TIE *LENGTH	SIDE TIE *LENGTH
3/0-7 Strand HD copper	.464"	.162"	.788"	4	110"	116"
2/0-7 Strand HD copper	.414"	.162"	.738"	4	104"	110"
1/0-7 Strand HD copper	.368"	.128"	.624"	4	90"	96"
2-3 Strand copper	.320"	.128"	.576"	6	82"	88"
4A Copperweld - copper	.290"	.102"	.494"	6	72"	78"
4 Copper wire	.204"	.102"	.408"	6	66"	72"
6 Copper wire	.162"	.102"	.366"	8	60"	66"
6A Copperweld - copper	.230"	.102"	.434"	8	65"	71"
8A & 8D Copperweld - copper	.219"	.102"	.423"	8	64"	70"

TYING GUIDE, SINGLE INSULATOR
ONE PIECE TIE - COPPER TYPE CONDUCTORS
WITH PREFORMED ARMOR RODS

Jan 1, 1962

M40-1A



Note:

Tie wire assembly should be as tight as can be wrapped by hand, and ends twisted with pliers or hot line tools. Twist lefthand ends clockwise, righthand counterclockwise. With hot line loops, tie wires must be 8" longer than shown.

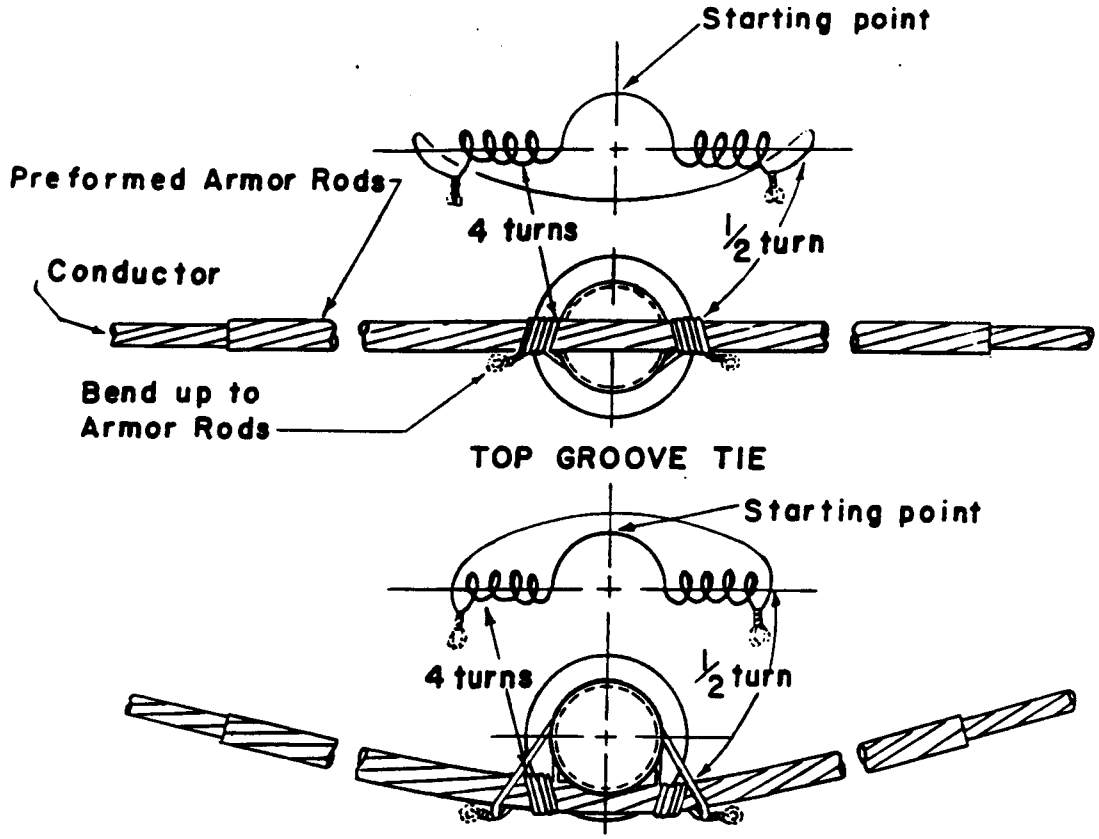
Tie wires lengths listed below can be used with insulators having neck diameter up to and including 3½".

CONDUCTOR	CONDUCTOR DIAMETER	ARMOR ROD DIAMETER	OVERALL DIAMETER	ANNEALED COPPER TIE WIRE		
				SIZE	LENGTH SHORT PIECE	LENGTH LONG PIECE
3/0 - 7 Strand HD Copper	.464"	.162"	.788"	4	27"	40"
2/0 - 7 Strand HD Copper	.414"	.162"	.738"	4	27"	40"
1/0 - 7 Strand HD Copper	.368"	.128"	.624"	4	27"	40"
2-3 Strand Copper	.320"	.128"	.576"	6	23"	35"
4A Copperweld - Copper	.290"	.102"	.494"	6	23"	35"
4 Copper wire	.204"	.102"	.408"	6	23"	35"
6 Copper wire	.162"	.102"	.366"	8	21"	30"
6A Copperweld - Copper	.230"	.102"	.434"	8	21"	30"
8A & 8D Copperweld - copper	.219"	.102"	.423"	8	21"	30"

TYING GUIDE, SINGLE INSULATOR TWO-PIECE TIE. COPPER TYPE CONDUCTORS WITH PREFORMED ARMOR RODS

Jan 1, 1962

M40-1A2



TOP GROOVE TIE

SIDE GROOVE TIE

NOTE:

Tie wire assembly should be as tight as can be wrapped and ends twisted with hot line tools. Twist lefthand ends clockwise righthand counterclockwise.

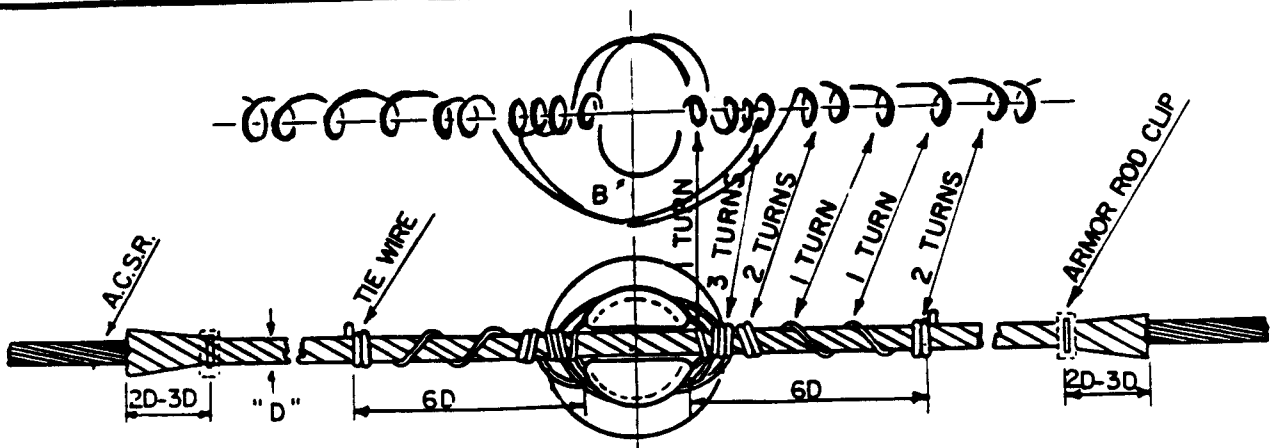
Tie wire lengths listed below can be used with insulators having a neck diameter up to and including 3½ inches.

COPPERWELD COPPER		DIAM. OVER ARMOR RODS	ANNEALED COPPER TIE WIRE			COPPER		DIAM. OVER ARMOR RODS	ANNEALED COPPER TIE WIRE		
SIZE	COND. DIAM.		SIZE AWG	1st PIECE	2nd PIECE	SIZE	COND. DIAM.		SIZE AWG	1st PIECE	2nd PIECE
2F	.308"	.560"	6	34"	24"	4/0-7w	.522"	.846"	6	38"	29"
2A	.366	.622	6	36	24	3/0-7w	.464	.788	6	37	28
3A	.326	.582	6	34	24	2/0-7w	.414	.738	6	37	28
4A	.290	.494	6	33	24	1/0-7w	.368	.624	6	36	27
5A	.258	.462	6	33	24	2-3w	.320	.576	6	34	25
6A	.230	.434	8	32	23	2-Sol.	.258	.462	6	33	24
7A	.223	.427	8	32	23	4-Sol.	.204	.408	6	32	23
8A	.199	.403	8	31	23	6-Sol.	.162	.366	8	30	22

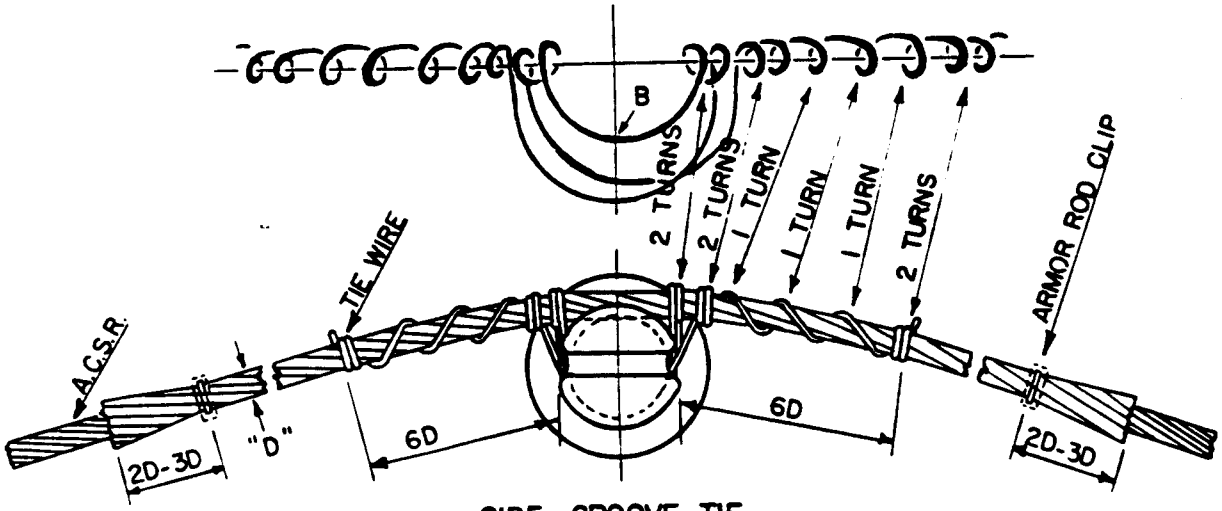
HOT LINE TYING GUIDE
COPPER TYPE CONDUCTORS
WITH PREFORMED ARMOR RODS

Jan 1, 1962

M40-8



TOP GROOVE DOUBLE TIE



SIDE GROOVE TIE

Note:

In making ties, start with middle of length of tie wire at position marked "B".

To complete tie, cinch up last two turns at each end with pliers until tie wire is snug and tight.

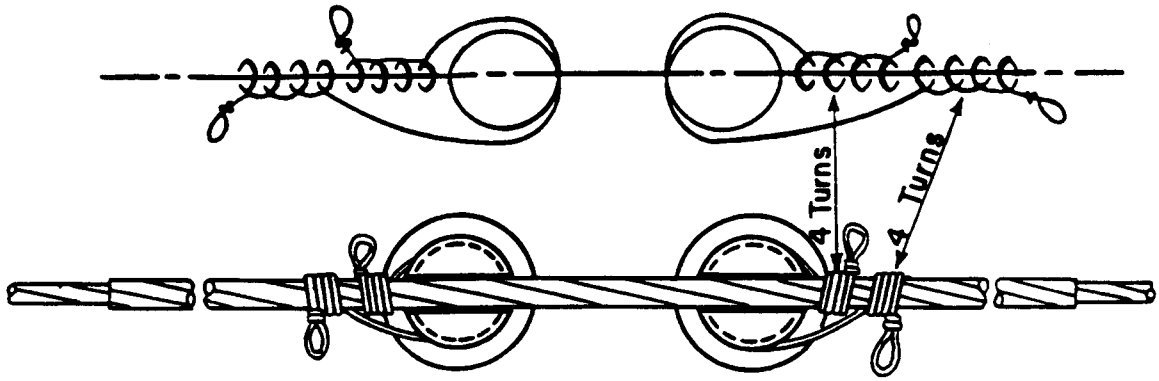
Use the flat face of the pliers against the armor rods.

A.C.S.R.		ARMOR RODS	TIE WIRE ALUMINUM		A.C.S.R.		ARMOR RODS	TIE WIRE ALUMINUM	
Size	DIAM. INCHES	"D" DIAM. INCHES	Size	LENGTH FEET	Size	DIAM. INCHES	"D" DIAM. INCHES	Size	LENGTH FEET
4/0	0.563	0.939	4	9'3"	1/0	0.398	0.744	4	8'3"
3/0	0.502	0.836	4	8'9"	2	0.325	0.595	4	7'5"
2/0	0.447	0.745	4	8'3"	4	0.257	0.555	4	7'3"

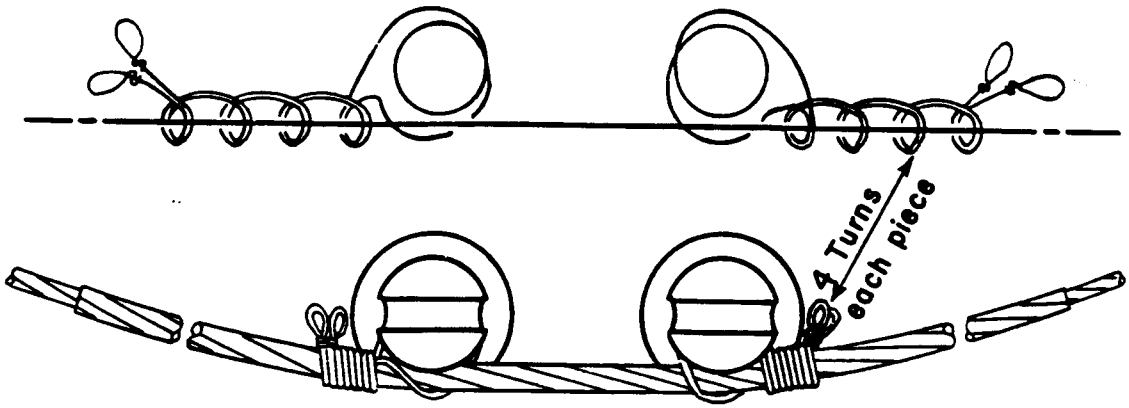
TYING GUIDE, SINGLE INSULATOR, ALUMINUM TIE WIRE, A.C.S.R. CONDUCTOR, STRAIGHT OR PREFORMED ARMOR RODS

Jan 1, 1962

M40-10



TOP GROOVE DOUBLE TIE



SIDE GROOVE DOUBLE TIE

NOTES:

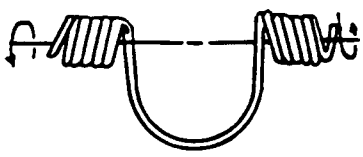
1. Tie wire assembly should be as tight as can be wrapped with hot line tools.
2. Tie wire lengths listed below can be used with insulators having a neck diameter up to and including 3 1/2 inches.
3. Turns may be made in either direction, as long as one-half the turns oppose the other half to prevent loosening of the tie.

A. C. S. R.		DIAM. OVER ARMOR RODS	ALUMINUM TIE WIRE		A.C.S.R.		DIAM. OVER ARMOR RODS	ALUMINUM TIE WIRE	
SIZE AWG	COND. DIAM.		SIZE AWG	LENGTH (each piece)	SIZE AWG	COND. DIAM.		SIZE AWG	LENGTH (each piece)
4/0	0.563"	0.939"	4	5' - 3"	2	0.325"	0.595"	4	4' - 7"
3/0	0.502"	0.836"	4	5' - 0"	4	0.257"	0.555"	4	4' - 6"
2/0	0.447"	0.745"	4	4' - 10"					
1/0	0.398"	0.744"	4	4' - 10"					

HOT LINE TYING GUIDE, DOUBLE INSULATOR ALUMINUM TIE WIRE, A.C.S.R. CONDUCTOR WITH STRAIGHT OR PREFORMED ARMOR RODS

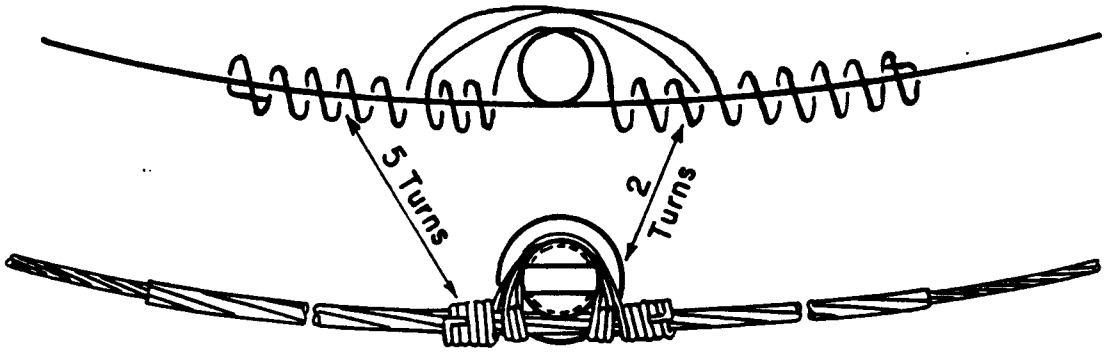
Feb. 1,1965

M40 - 16



Pre - Coiled Wire

TOP GROOVE TIE



SIDE GROOVE TIE

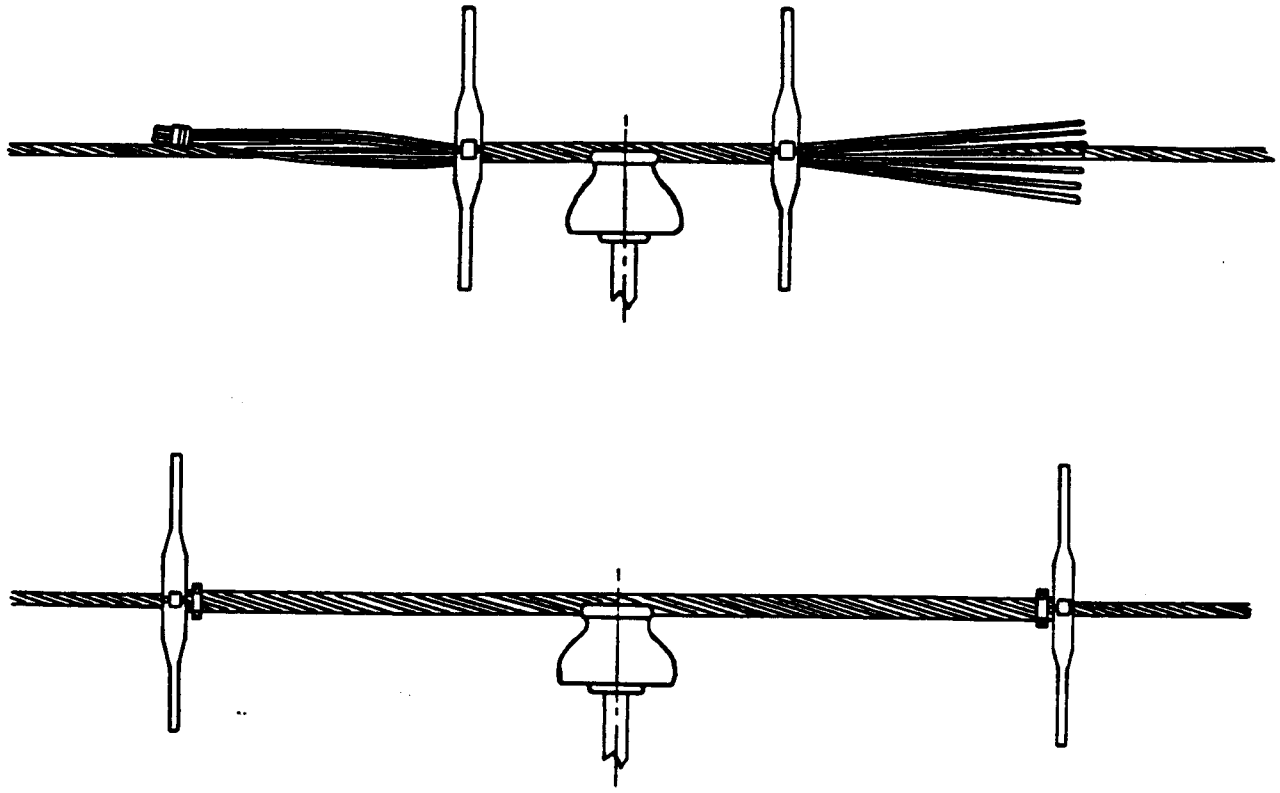
NOTES:

1. Tie wire assembly should be as tight as can be wrapped with hot line tools.
2. Tie wire lengths listed below can be used with insulators having a neck diameter up to and including 3 1/2 inches.

A.C.S.R.		DIAM. OVER ARMOR RODS	ALUMINUM TIE WIRE		A.C.S.R.		DIAM. OVER ARMOR RODS	ALUMINUM TIE WIRE	
SIZE AWG	COND. DIAM.		SIZE AWG	LENGTH	SIZE AWG	COND. DIAM.		SIZE AWG	LENGTH
4/0	0.563"	0.939"	4	6' - 4"	2	0.325"	0.595"	4	5' - 9"
3/0	0.502"	0.836"	4	6' - 2"	4	0.257"	0.555"	4	5' - 8"
2/0	0.447"	0.745"	4	6' - 0"					
1/0	0.398"	0.744"	4	6' - 0"					

HOT LINE TYING GUIDE, SINGLE INSULATOR
PRE-COILED ALUMINUM TIE WIRE, A.C.S.R. CONDUCTOR
WITH STRAIGHT OR PREFORMED ARMOR RODS

M40-19



Note:

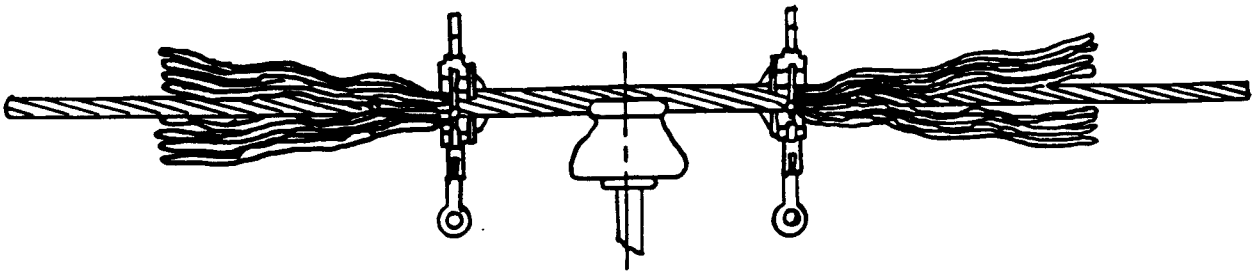
With tape still on one end of rods and other end threaded through wrenches so they open between the same two rods, center on conductor over point of support and close around conductor as shown above. Twist rods enough to give permanent set. Remove tape and slide wrenches half way to ends and repeat. Move wrenches to end of rods and twist Attach clips and tighten before removing so end of rods will flare after removal. Rods should be twisted snugly with a smooth lay in same direction as lay of conductor. For further information and method of installing rods on angle see manufacturer's instructions for Construction

Conductor Size	Support	
	Single	Double
	Twists	
#4 A.C.S.R.(6Al/1St.)&(7Al/1St.)	5-6	7-8
#2 A.C.S.R.(6Al/1St.)&(7Al/1St.)	6-7	8-9
#1/0 A.C.S.R. (6Al/1St.)	4-5	6-7
#2/0 A.C.S.R. (6Al/1St.)	5-6	7-8
#3/0 A.C.S.R. (6Al/1St.)	5-6	7-8
#4/0 A.C.S.R. (6Al/1St.)	5-6	7-8

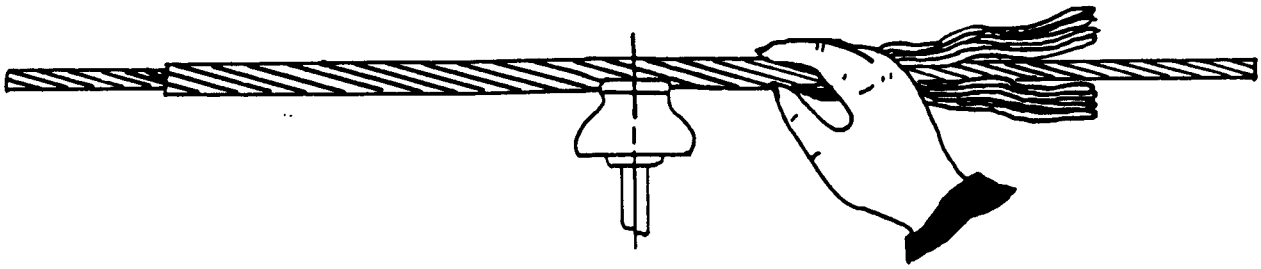
ARMOR RODS
A.C.S.R. CONDUCTOR

Jan 1, 1962

M40-11



For tool application, insert half the reinforcements in one cavity and the other half in the other cavity of the open wrenches, keeping the ends even. Hook wrenches over the conductor and close jaws. Space wrenches approximately one reinforcement pitch apart and twist them in the same direction as the lay of the conductor. Wind each wrench to the end of the reinforcements and remove.



For hand application, hold one or more reinforcements against the conductor with midpoint at the insulator, and rotate in same direction as the lay of the conductor, for three or four inches each side of center. In like manner apply remaining reinforcements to center section. After all have been started, complete the application by a rotary outward wiping motion of the hand. Make certain that the ends snap into place in proper order.

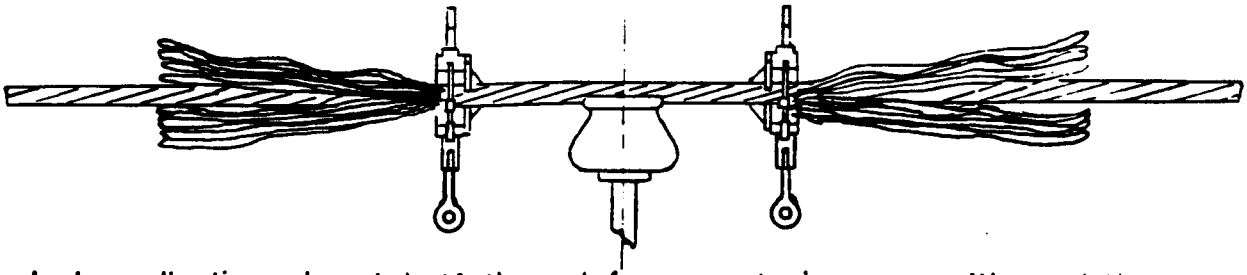
PREFORMED ALUMINUM ALLOY ARMOR RODS

A. C. S. R.	LENGTH SINGLE SUPPORT	LENGTH DOUBLE SUPPORT	NO. PER SET	WIRE DIAM. (IN.)	DIAM. PLUS RODS	A. C. S. R.	LENGTH SINGLE SUPPORT	LENGTH DOUBLE SUPPORT	NO. PER SET	WIRE DIAM. (IN.)	DIAM. PLUS RODS
4/0(6x1)	60"	72"	11	.182	.927	2 (7x1)	44"	56"	9	.146	.613
3/0(6x1)	56"	68"	11	.167	.836	2 (6x1)	44"	56"	9	.146	.604
2/0(6x1)	54"	66"	10	.167	.781	4 (7x1)	40"	52"	7	.146	.545
1/0(6 x1)	52"	64"	9	.167	.732	4(6x1)	40"	52"	7	.146	.538
1(6x1)	48"	60"	9	.146	.643						

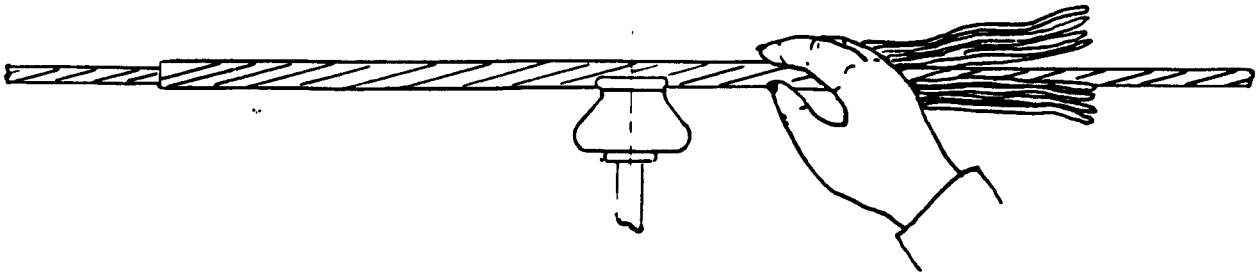
PREFORMED ARMOR RODS
A.C.S.R. CONDUCTORS

Jan 1, 1962

M40—12



For tool applications, insert half the reinforcements in one cavitiy and the other half in the other cavity of the open wrenches, keeping the ends even. Hook wrenches over the conductor and close jaws. Space wrenches approximately one reinforcement pitch apart and twist them in the same direction as the lay of the conductor. Wind each wrench to the end of the reinforcements and remove.



For hand application, hold one or more reinforcements against the conductor with midpoint at the insulator and rotate in same direction as the lay of the conductor, for three or four inches each side of center. In like manner apply remaining reinforcements to center section. After all have been started, complete the application by a rotary outward wiping motion of the hand. Make certain that the ends snap into place in proper order.

If lay of conductor is right-hand instead of as indicated, special armor rods should be obtained with the same lay.

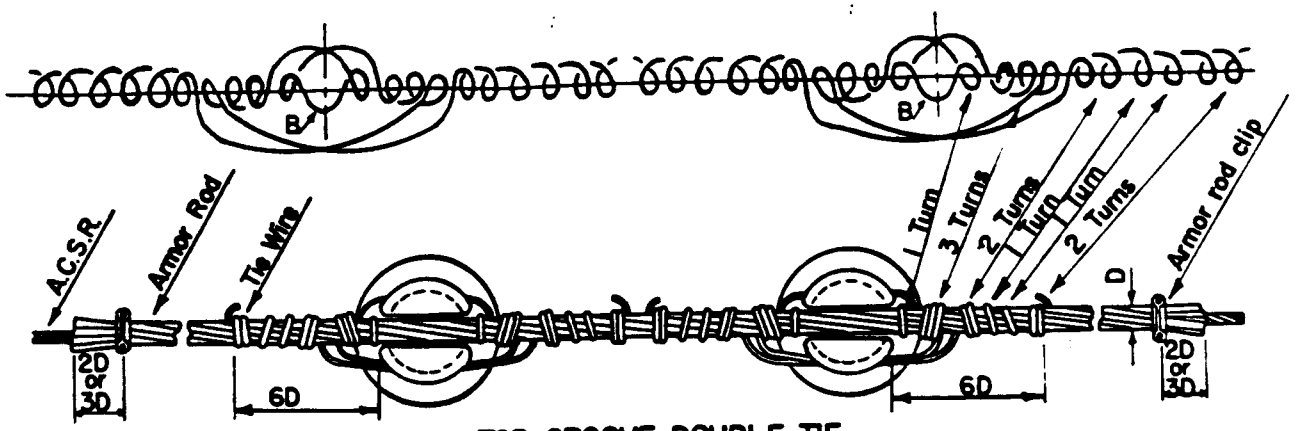
PREFORMED BRONZE OR COPPER TYPE ARMOR RODS

CONDUCTOR	LENGTH SINGLE SUPPORT	LENGTH DOUBLE SUPPORT	NO. PER SET	WIRE DIAM IN.	DIAM. PLUS RODS	CONDUCTOR	LENGTH SINGLE SUPPORT	LENGTH DOUBLE SUPPORT	NO. PER SET	WIRE DIAM IN.	DIAM. PLUS RODS
3/0 x 7	56"	68"	11	.162	.788	4 Solid	40"	52"	8	.102	.408
2/0 x 7	56"	68"	10	.162	.738	6 Solid	40"	52"	7	.102	.366
1/0 x 7	50"	62"	10	.128	.624	6 A.CWC	40"	52"	9	.102	.434
2 x 3	46"	58"	9	.128	.576	8 A.CWC	40"	52"	8	.102	.403
4 A.CWC	42"	54"	10	.102	.494						

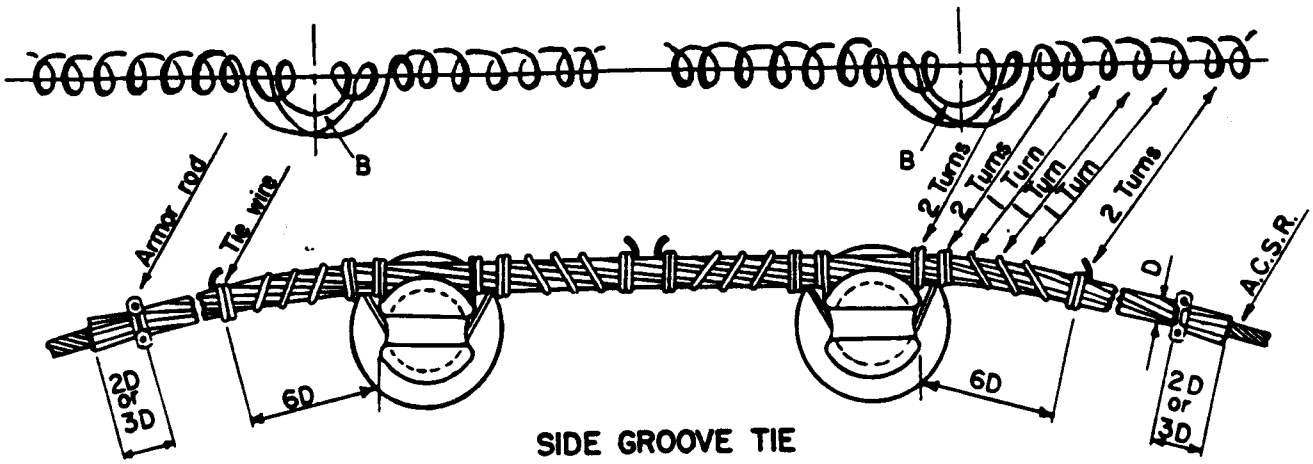
PREFORMED ARMOR RODS
COPPER TYPE CONDUCTORS

Jan 1, 1962

M40-13



TOP GROOVE DOUBLE TIE



SIDE GROOVE TIE

Note:

In making ties, start with middle of length of tie wire at position marked "B".

To complete tie, cinch up last two turns at each end with pliers until tie wire is snug and tight.

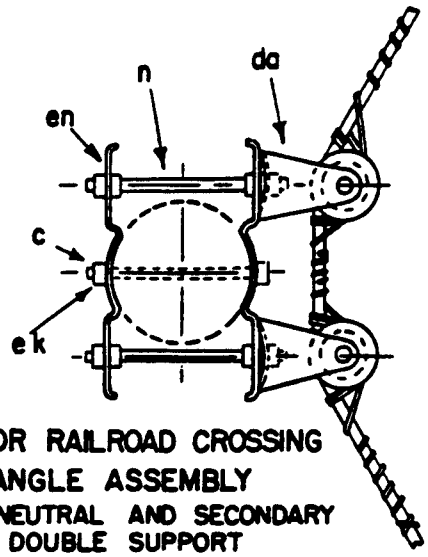
Use the flat face of the pliers against the armor rods.

A.C.S.R.		ARMOR RODS	TIE WIRE ALUMINUM		A.C.S.R.		ARMOR RODS	TIE WIRE ALUMINUM	
SIZE	DIAM. INCHES	"D" DIAM. INCHES	SIZE	LENGTH FEET	SIZE	DIAM. INCHES	"D" DIAM. INCHES	SIZE	LENGTH FEET
4/0	0563	0.939	4	9'-3"	1/0	0398	0.744	4	8'-3"
3/0	0.502	0.836	4	8'-9"	2	0.325	0.595	4	7'-5"
2/0	0.447	0.745	4	8'-3"	4	0.257	0.555	4	7'-3"

TYING GUIDE, DOUBLE INSULATOR, ALUMINUM TIE WIRE, A.C.S.R. CONDUCTOR, STRAIGHT OR PREFORMED ARMOR RODS

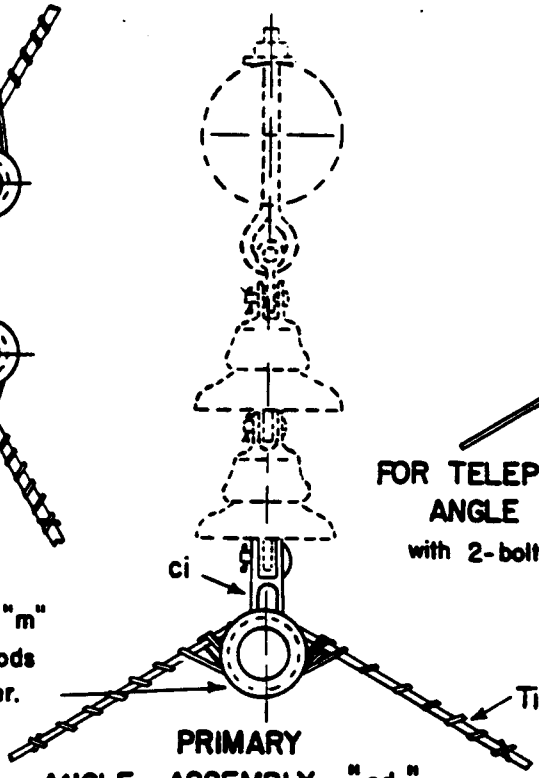
Jan 1, 1962

M40-17

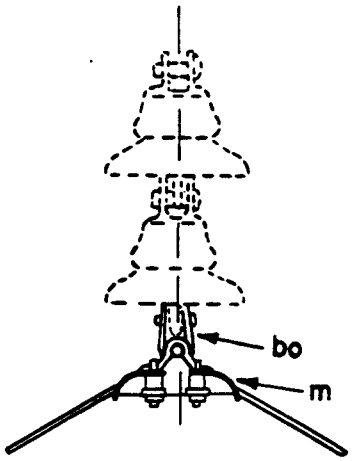


FOR RAILROAD CROSSING
ANGLE ASSEMBLY
NEUTRAL AND SECONDARY
DOUBLE SUPPORT

Use suspension clamp item "m" for conductors with armor rods exceeding 3/4" overall diameter.

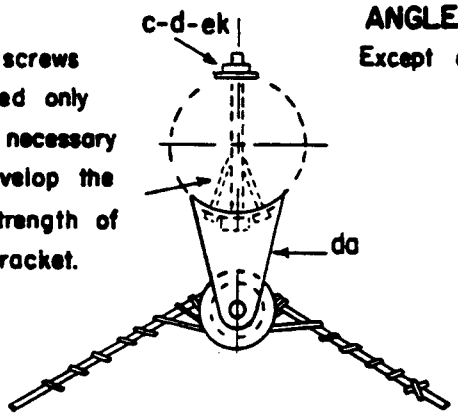


PRIMARY
ANGLE ASSEMBLY "cd"
Except at telephone crossings

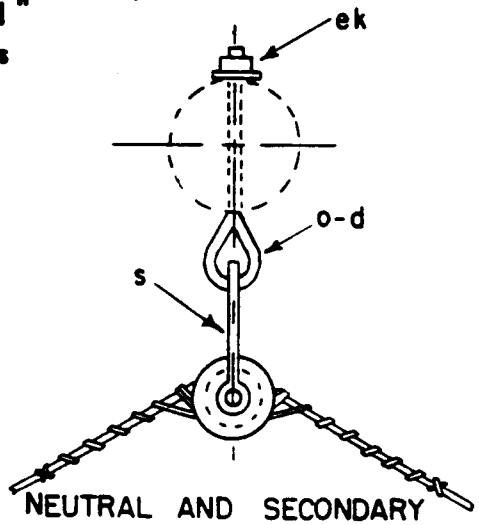


FOR TELEPHONE CROSSING
ANGLE ASSEMBLY "cd"
with 2-bolt suspension clamp

Lag screws required only when necessary to develop the full strength of the bracket.



NEUTRAL AND SECONDARY
ASSEMBLY "ce"
Except at railroad crossings



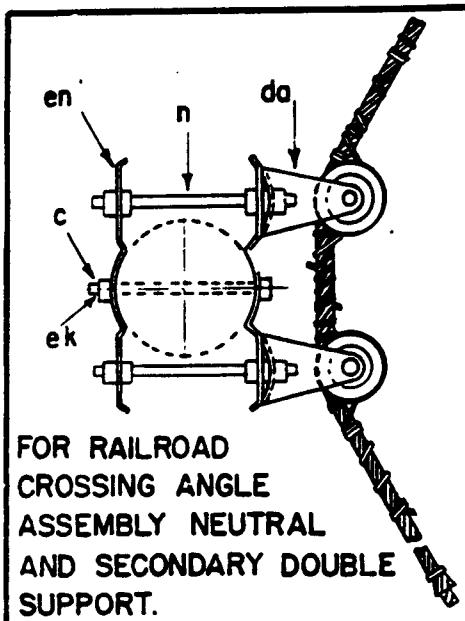
NEUTRAL AND SECONDARY
ANGLE ASSEMBLY "ce"
Except at railroad crossings

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
c		Bolt, machine, 5/8" x req'd. length		bo		Shackle, anchor	
m		Clamp, suspension		da		Bracket, insulated	
n		Bolt, double arming		ci		Clevis, thimble, side opening	
s		Clevis, secondary, swinging, insulated		en		Plates, double support	
ek		Locknuts					
d		Washer, square, 2 1/4"					
j		Screw, lag, 1/2" x 4"					
o		Bolt, eye, 5/8" x req'd. length					

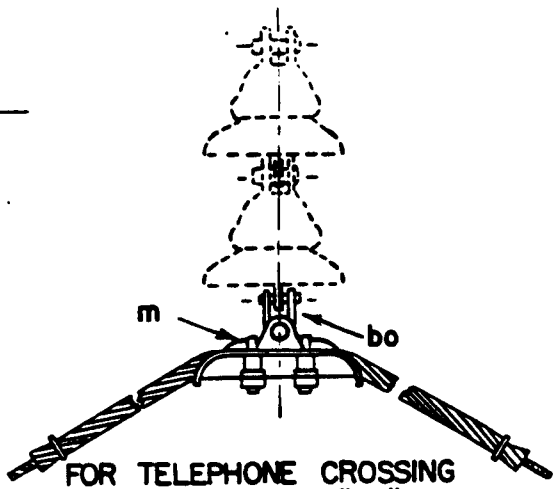
ANGLE ASSEMBLY GUIDE, VERTICAL CONSTRUCTION 30° TO 60° ANGLE, COPPER TYPE CONDUCTORS WITH PREFORMED RODS

Jan 1, 1962

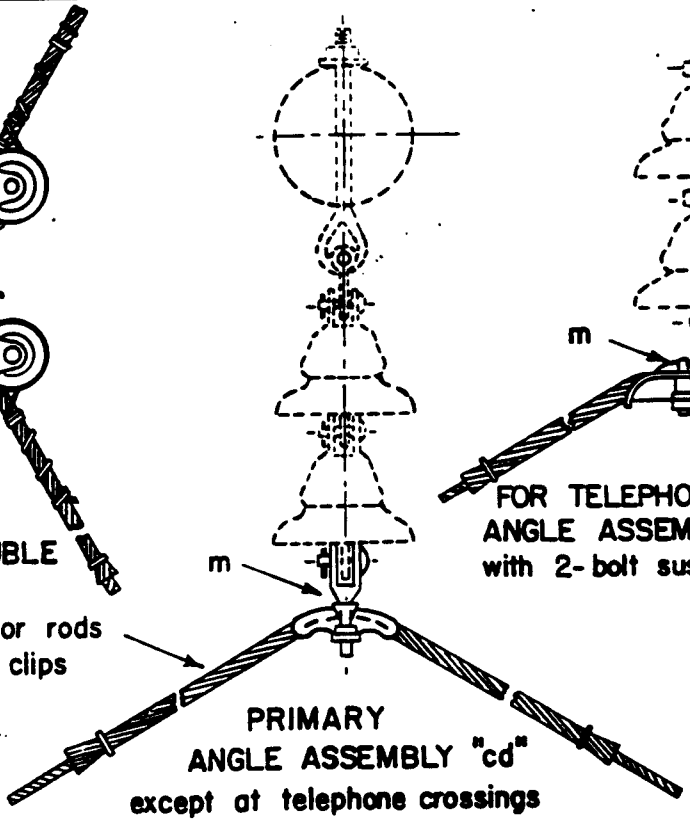
M41-1



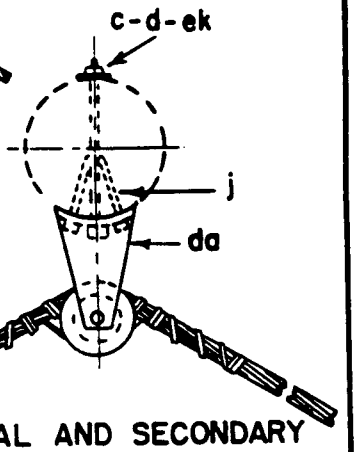
FOR RAILROAD CROSSING ANGLE ASSEMBLY NEUTRAL AND SECONDARY DOUBLE SUPPORT.



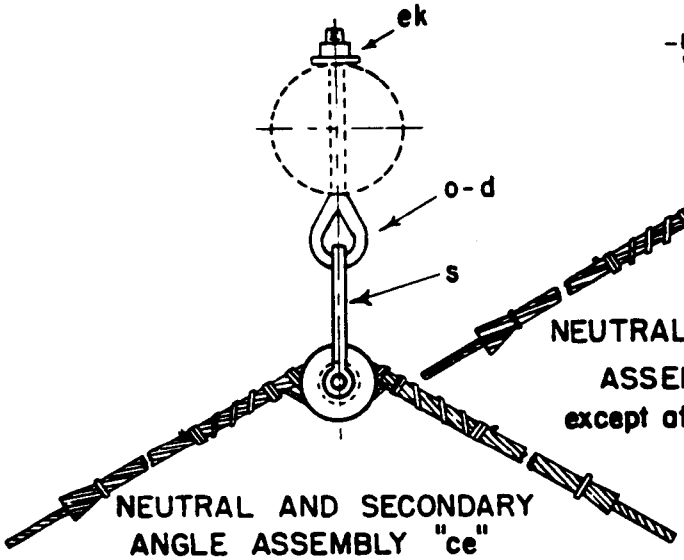
FOR TELEPHONE CROSSING ANGLE ASSEMBLY "cd" with 2-bolt suspension clamp



PRIMARY ANGLE ASSEMBLY "cd" except at telephone crossings



NEUTRAL AND SECONDARY ASSEMBLY "ce" except at railroad crossings



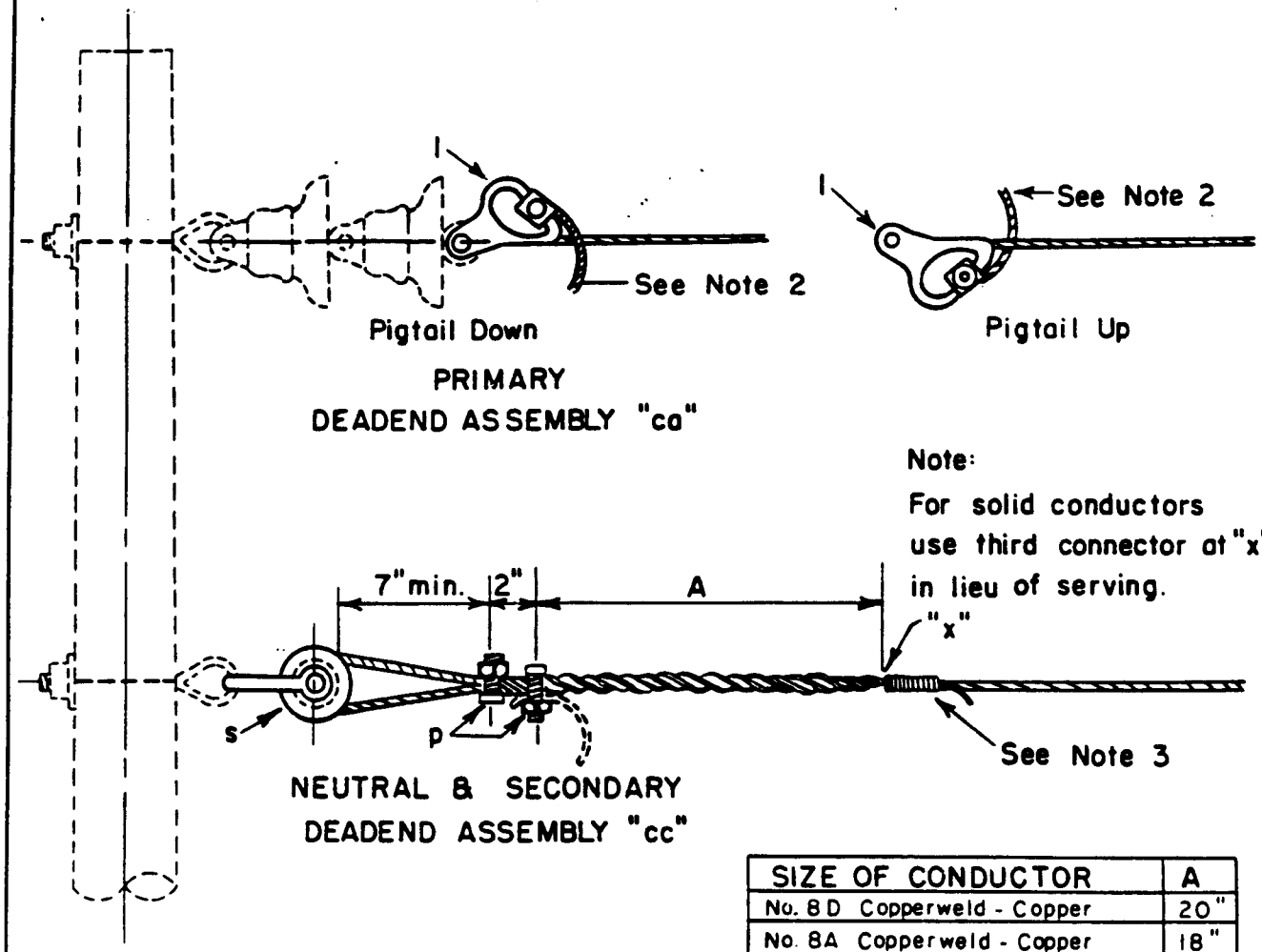
NEUTRAL AND SECONDARY ANGLE ASSEMBLY "ce" except at railroad crossings

ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
c		Bolt, machine, 5/8" x req'd. length	bo		Shackle, anchor
m		Clamp, suspension	da		Bracket, insulated
n		Bolt, double arming	en		Plates, double support
s		Clevis, secondary, swinging, insulated	o		Bolt, eye, 5/8" x required length
ek		Locknuts			
d		Washer, square, 2 1/4"			
j		Screw, lag, 1/2" x 4"			

ANGLE ASSEMBLY GUIDE, VERTICAL CONSTRUCTION 30° TO 60° ANGLE, ACSR CONDUCTORS WITH STRAIGHT OR PREFORMED ARMOR RODS

Jan 1, 1962

M41-10



SIZE OF CONDUCTOR	A
No. 8 D Copperweld - Copper	20"
No. 8A Copperweld - Copper	18"
No. 6A Copperweld - Copper	20"
No. 4A Copperweld - Copper	22"
No. 2 Copper, 3 - Strand	22"

Notes:

1. - For alternate method of deadending primary conductors, see Drawing M 42 - 21.
2. - Bend pigtail away from line conductor to avoid chafing.
3. - Wrap free end of conductor along line conductor using same lay. Extend one strand of free end (for copperweld - copper this is the copperweld strand) against line conductor. Serve the other two strands six turns each and cut them off. (Always serve copper strand (s) first.) Bend extended strand away from line conductor and cut off.

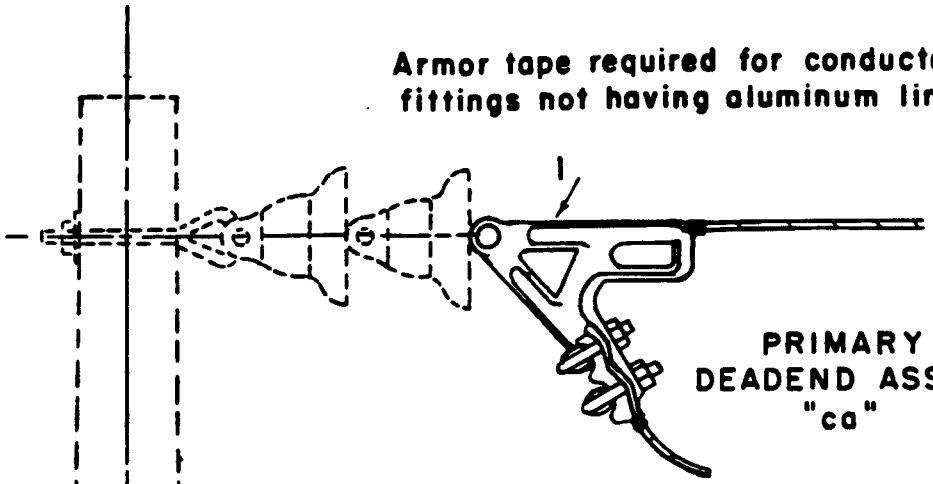
ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
I		Clamp, deadend		s		Clevis, secondary, swinging, insul.	
p		Connectors, as req'd					

DEADEND ASSEMBLY GUIDE - DEADEND CLAMP METH.
COPPERWELD COPPER & COPPER CONDUCTORS

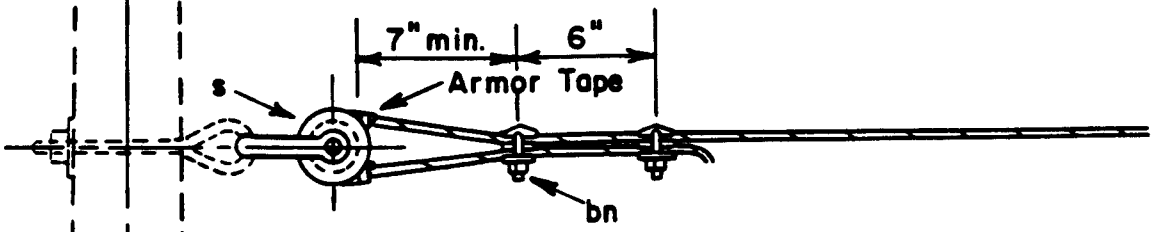
Jan 1, 1962

M42-3

Armor tape required for conductors in galvanized fittings not having aluminum liners.



PRIMARY
DEADEND ASSEMBLY
"ca"



NEUTRAL AND SECONDARY
DEADEND ASSEMBLY "cc"

Notes:

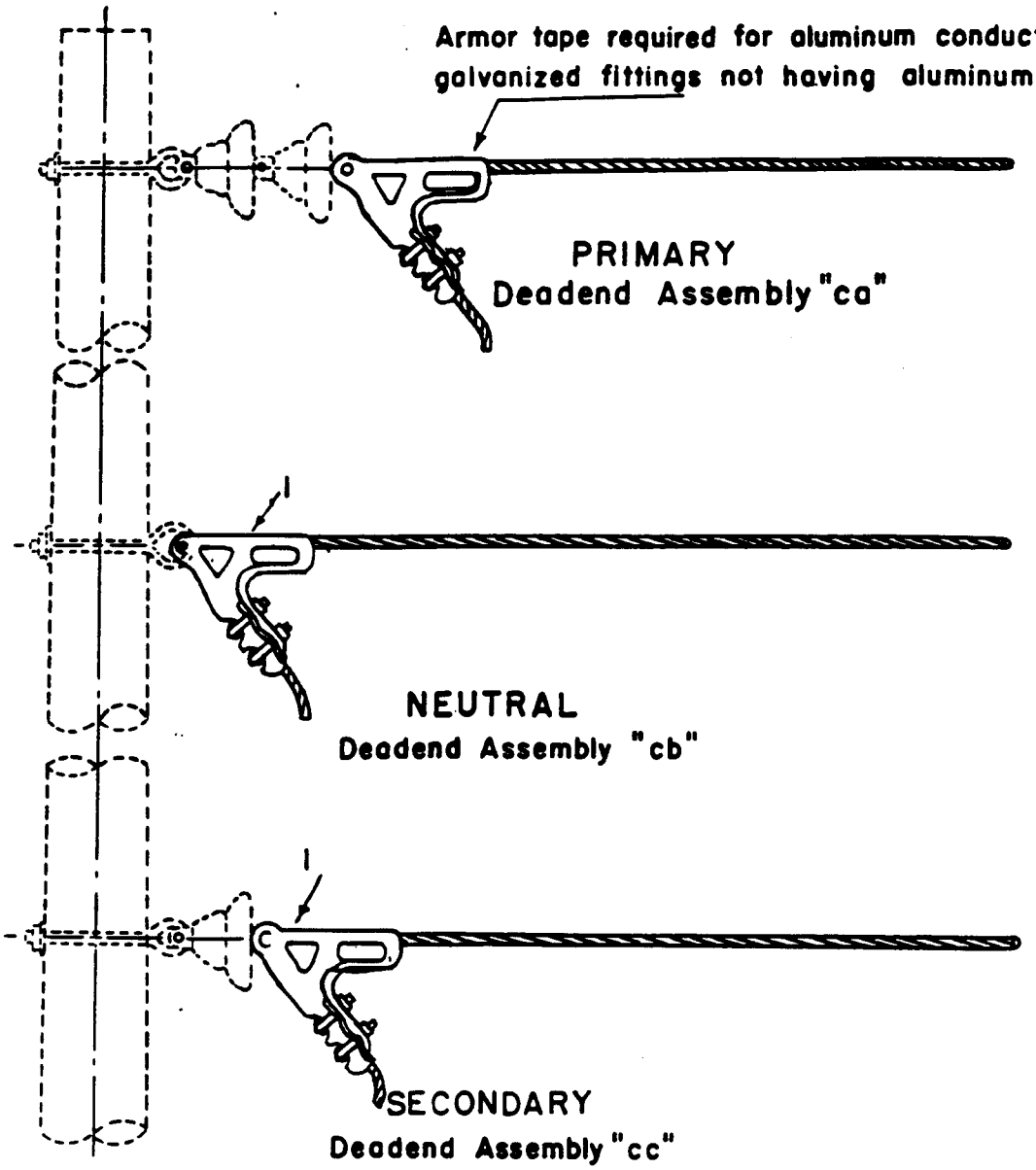
1. - Armor tape wrapping to extend not more than two wraps beyond the mouth of deadend clamp or spool insulator.
2. For 1/0 and larger use spool of 3" min. groove diameter on neutral and secondary deadends.

ITEM		MATERIAL		ITEM		MATERIAL	
1		Clamp, deadend					
s		Clevis, secondary, swinging, insulated					
bn		Clamp, loop deadend					

DEADEND ASSEMBLY GUIDE
DEADEND CLAMP METHOD
A.C.S.R. CONDUCTORS

Jan 1, 1962

M42-11



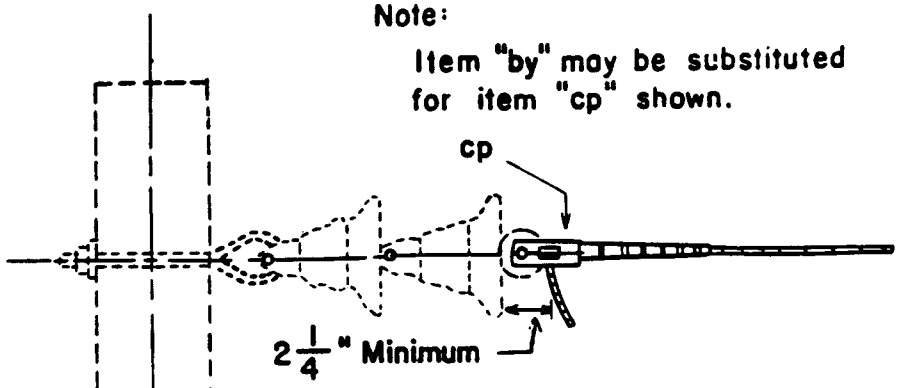
ITEM	NO. REQ'D	MATERIAL		ITEM	NO. REQ'D	MATERIAL	
1		Clamp, deadend					

DEADEND ASSEMBLY GUIDE (LARGE CONDUCTORS)

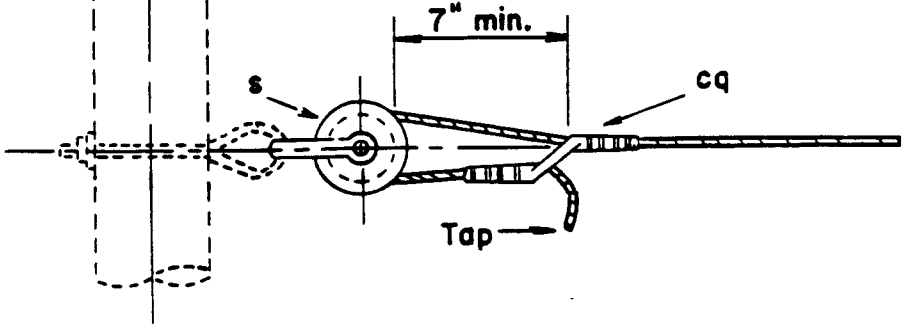
Jan 1, 1962

M42-13

Note:
Item "by" may be substituted for item "cp" shown.



PRIMARY
DEADEND ASSEMBLY "ca"



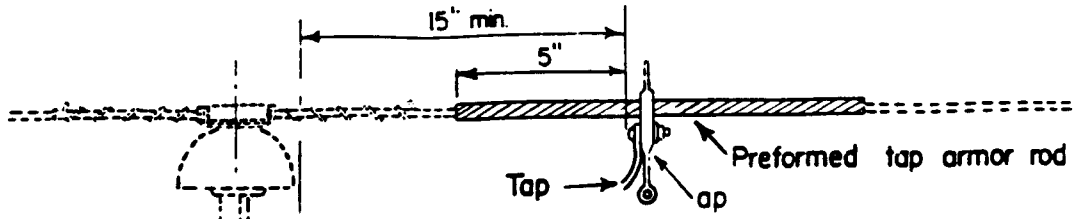
NEUTRAL AND SECONDARY
DEADEND ASSEMBLY "cc"

ITEM	NO. REQD	MATERIAL	ITEM	NO. REQD	MATERIAL
s		Clevis, secondary, swinging, insulated	cq		Sleeve, offset, splicing
cp		Sleeve, deadend, compression			

DEADEND ASSEMBLY GUIDE-COMPRESSION METHOD
COPPER TYPE CONDUCTORS

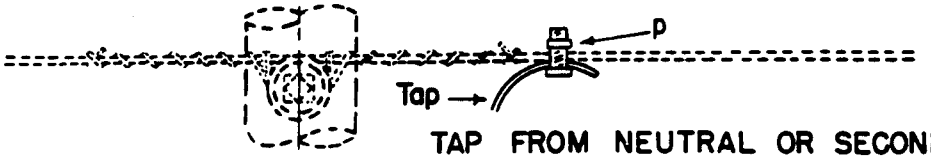
Jan 1, 1962

M42-21

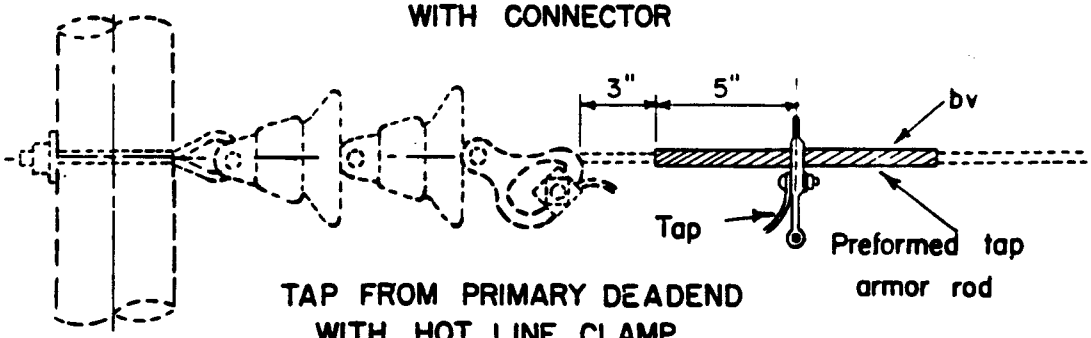


TAP FROM PRIMARY LINE

Note:
To be used on existing construction where full length armor rods were not installed.



TAP FROM NEUTRAL OR SECONDARY LINE WITH CONNECTOR

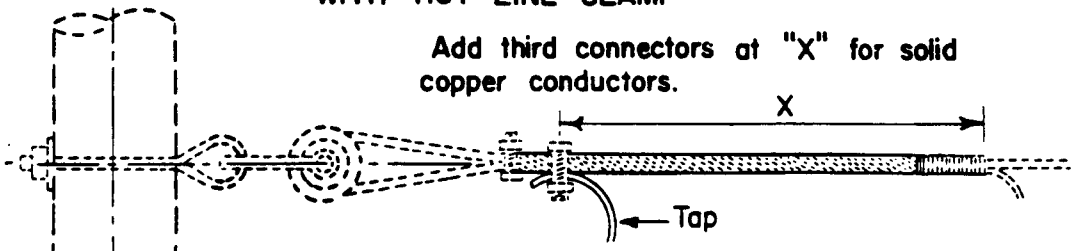


TAP FROM PRIMARY DEADEND WITH HOT LINE CLAMP

Notes:

1. Arrangement shown on M42-11 may be used for neutral and secondary deadend if preferred.

Add third connectors at "X" for solid copper conductors.



TAP FROM NEUTRAL OR SECONDARY DEADEND

2. When installing armor rods on existing lines, both conductor and armor rods should be wire brushed to provide clean contact surfaces. A corrosion inhibitor should be applied before or immediately after brushing.
3. Taps to be slack.

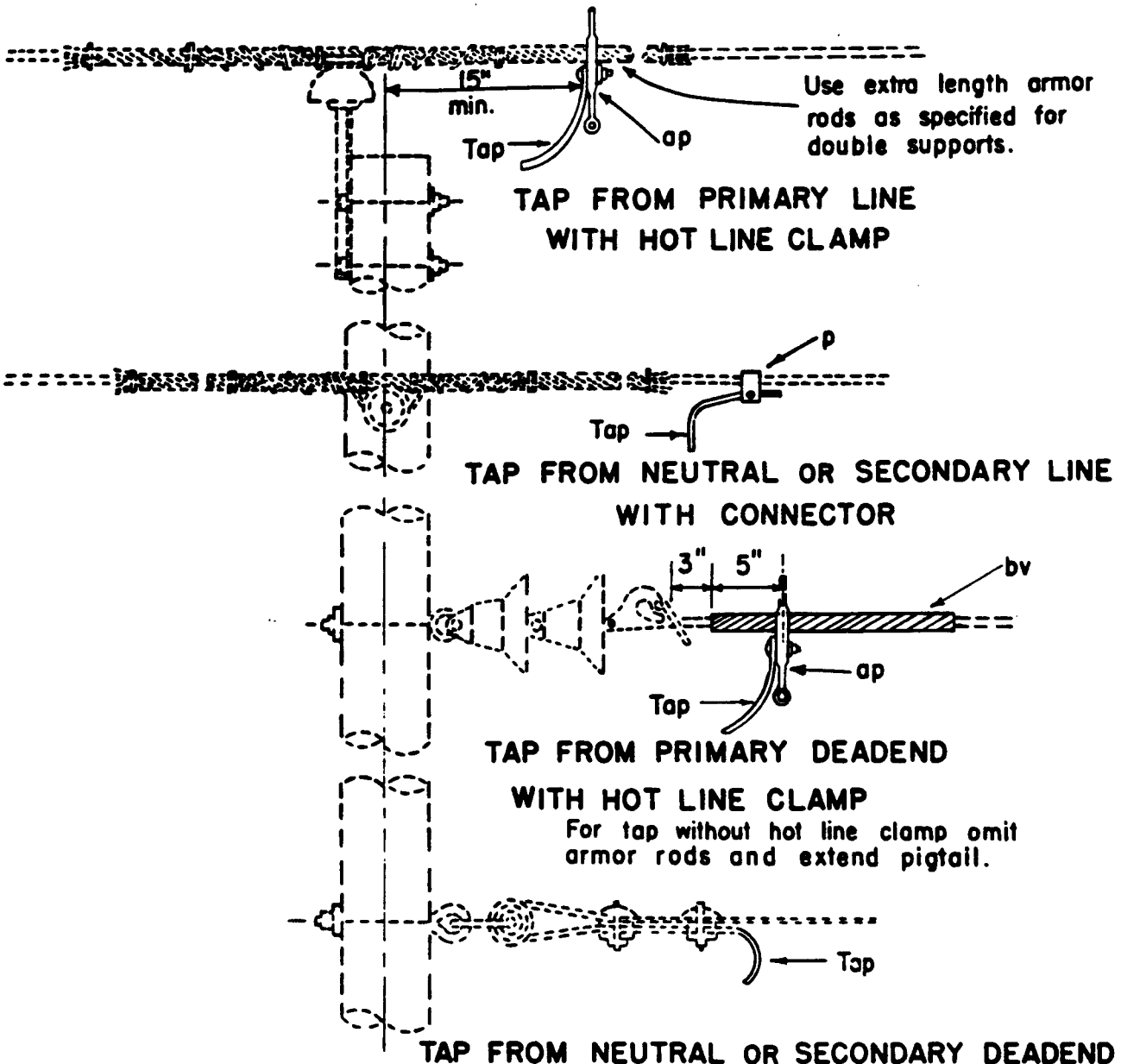
Size of solid conductor	X
No. 6 Copper	18"
No. 4 Copper	20"

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
p		Connectors, as required		bv		Tap armor rods, bronze	
ap		Clamp, hot line, tap assembly					

TAP ASSEMBLY GUIDE
COPPERWELD-COPPER AND COPPER CONDUCTORS

Jan 1, 1962

M43-4



Notes:

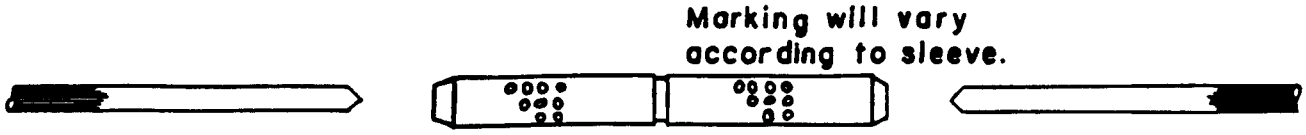
1. On new construction, tap may be made directly over armor rods provided conductor is thoroughly cleaned and inhibitor used before installing rods.
2. When installing armor rods on existing lines, conductor should be wire brushed thoroughly and inhibitor used before installing rods.

ITEM	NO.	MATERIAL		ITEM	NO.	MATERIAL	
p		Connector		bv		Tap armor rods, preformed	
op		Clamp, hot line, tap assembly					

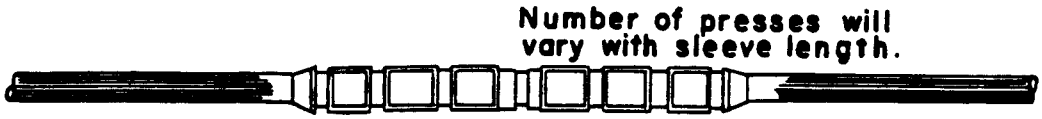
TAP ASSEMBLY GUIDE
A.C.S.R. CONDUCTORS

Jan 1, 1962

M43-10



COPPER COMPRESSION SLEEVE
BEFORE SPLICING



COPPER COMPRESSION SPLICE COMPLETE

NOTE:

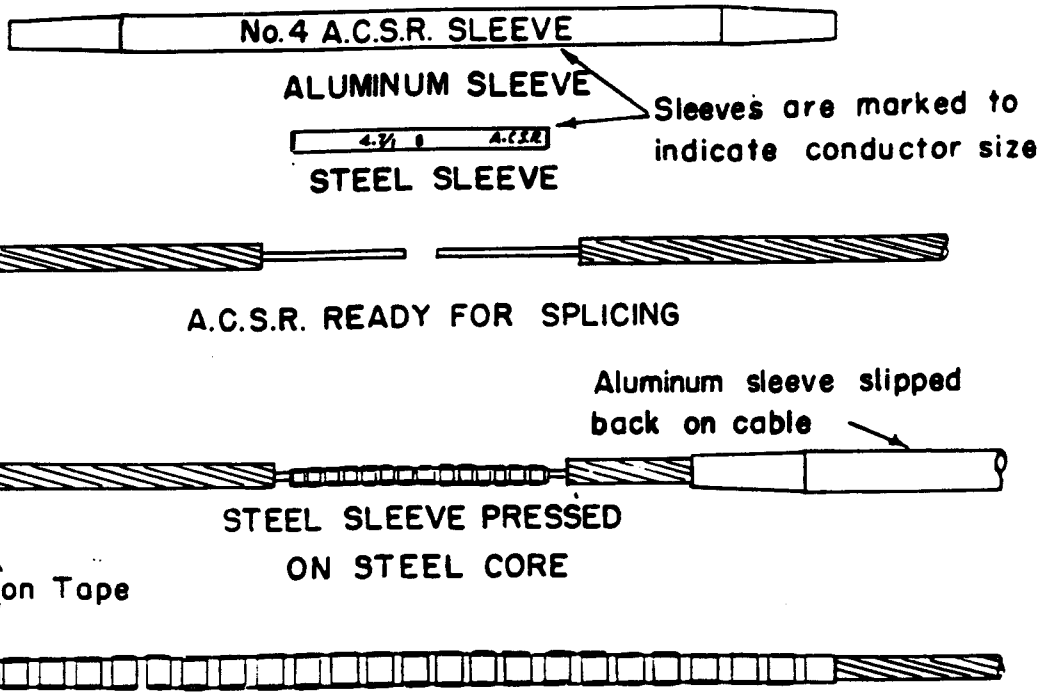
Clean the wire with abrasive cloth before making the splice.

Splice shall not be within 10 feet of insulator.

Begin presses at center of sleeve and work toward ends, press entire length of sleeve, spacing presses about 1/16" to 1/8" apart.

Groove letters printed on sleeves correspond to groove letters printed on tool.

	SPLICING GUIDE-COMPRESSION TYPE COPPER TYPE CONDUCTORS	
	Jan 1, 1962	M45-20



COMPLETED SPLICE

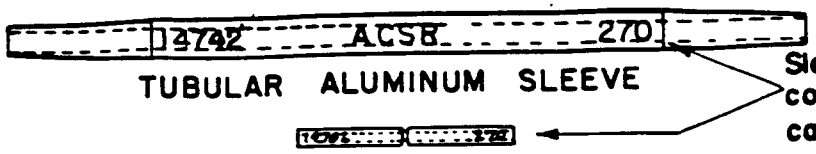
DIRECTIONS FOR MAKING A.C.S.R. SPLICE

1. Slip Aluminum Sleeve on cable far enough back to be out of the way. Cut back Aluminum Strands at end of cable 3/8" more than half the length of steel sleeve.
2. Insert steel core wires in the steel sleeve and press with inner groove of tool. Press entire length of sleeve starting at the middle and working toward the ends. Leave about 1/16" space between presses.
3. Straighten steel sleeve by hammering carefully against a suitable block.
4. Place a piece of friction tape on the cable to mark the position of the end of the Aluminum sleeve such that it will be centered on the splice.
5. Clean conductor by wirebrushing, paint the steel sleeve and the adjacent cable that will be covered by the aluminum sleeve, with a suitable corrosion inhibitor.
6. Slip the Aluminum sleeve in place and press with the outer groove of tool using the same procedure as with the steel sleeve.
7. Straighten entire splice by hammering carefully against a suitable block.
8. Splice shall not be within 10 feet of insulator.

SPLICING GUIDE-COMPRESSION TYPE
A.C.S.R. CONDUCTOR

Jan 1, 1962

M45-21



TUBULAR ALUMINUM SLEEVE

Sleeves marked for conductor size and catalog number

TUBULAR STEEL SLEEVE

A.C.S.R. READY FOR SPLICING

BEFORE COMPRESSION- TUBULAR COMPRESSION JOINT FOR A.C.S.R.

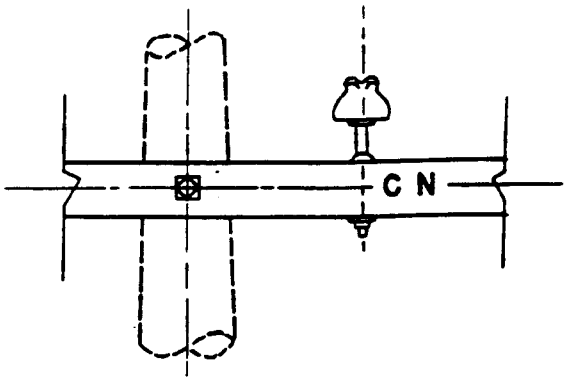
AFTER COMPRESSION - TUBULAR COMPRESSION JOINT FOR A.C.S.R.

METHOD OF APPLYING TUBULAR COMPRESSION JOINT

Caution: Before applying make sure the bores are thoroughly clean.

1. Slip the aluminum compression sleeve over one cable end and back it out of the way along the cable.
2. Using a hack saw, cut off the aluminum strands from each cable end, exposing the steel core for a distance of about $\frac{3}{8}$" more than half the length of the steel compression sleeve. Use care not to nick the steel core with the saw. Before cutting serve the cable with wire just back of the cut.
3. Insert the steel core ends into the steel compression sleeve, making sure that the ends are jammed against the stop in the middle of the sleeve.
4. Compress the steel sleeve over its entire length, using the proper size compression dies, making the first compression at the center and working out to the ends, allowing dies to always overlap their previous position.
5. Remove serving from the cable, clean conductor by wirebrushing and slip the aluminum sleeve over the steel joint. Center the aluminum sleeve by sighting the ends of the steel joint through the filler holes provided in the aluminum sleeve.
6. Using pressure gun equipped with tapered nozzle, inject corrosion inhibitor through both holes in the aluminum sleeve until the space between it and the steel joint is completely filled. This can be observed through the filler holes. The nozzle of the pressure gun should be jammed tightly in the filler holes to prevent the paste from oozing back during injection.
7. Insert the plugs in the filler holes and hammer them firmly in place. They will be securely locked in, compressing the aluminum joint.
8. Compress the aluminum sleeve, using the proper size dies. Make the first two compressions with the inner edges of the dies matching the positions stencilled on the aluminum sleeve. Make additional compressions advancing to ends, allowing dies to always overlap previous position.

	SPLICING GUIDE - COMPRESSION TYPE A.C.S.R. CONDUCTORS 2/0, AND LARGER 1/0 OPTIONAL	
	Jan 1, 1962	M45-22

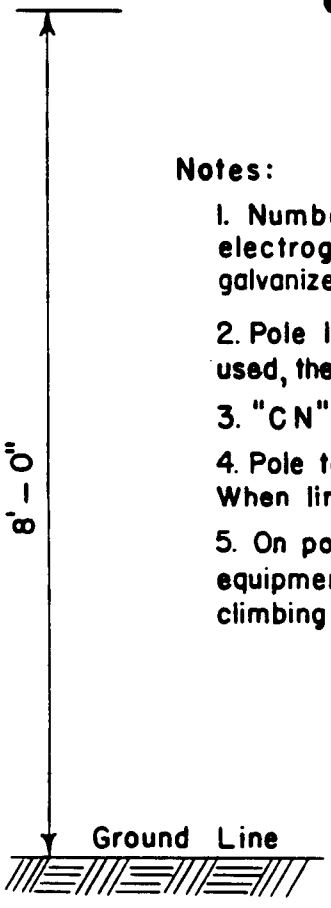


M52 – 4

1A 23

May be placed
1A
23
instead of as shown

M52 – 3

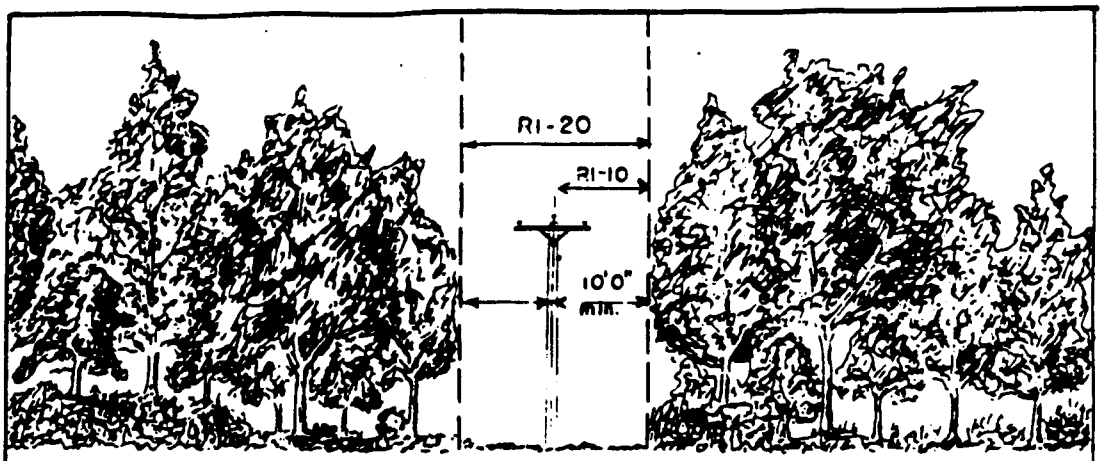


Notes:

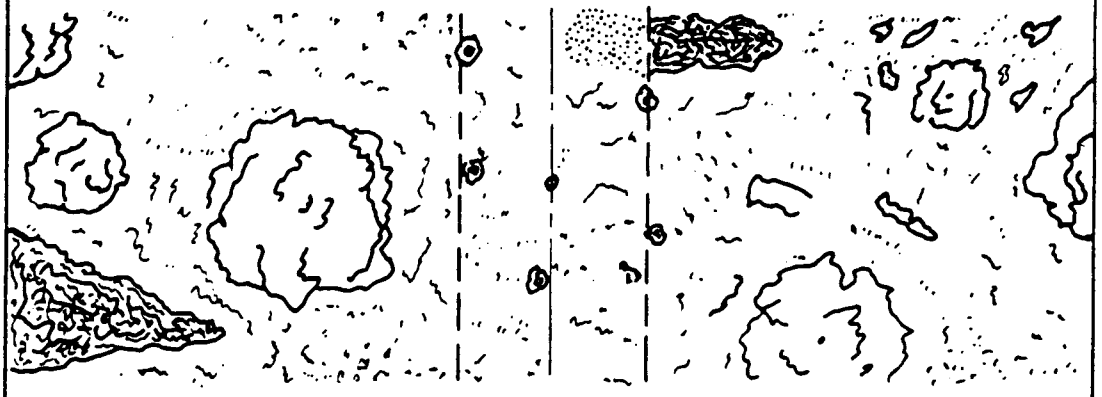
1. Numbers and letters shall be of cutout aluminum or electrogalvanized soft steel, fastened to pole with galvanized or aluminum, barbed 1" round head nails.
2. Pole legends to be 1 1/2" to 3" high. If 3" characters are used, they should be placed vertically instead of as shown.
3. "CN" to be 2" high.
4. Pole to be staggered 30° from direct facing highway. When line crosses highway or R.R., legend should face same.
5. On poles having limited climbing space due to special equipment, pole legend should be so located as to leave climbing space quadrant unobstructed.

NEUTRAL IDENTIFICATION AND POLE NUMBERING GUIDE

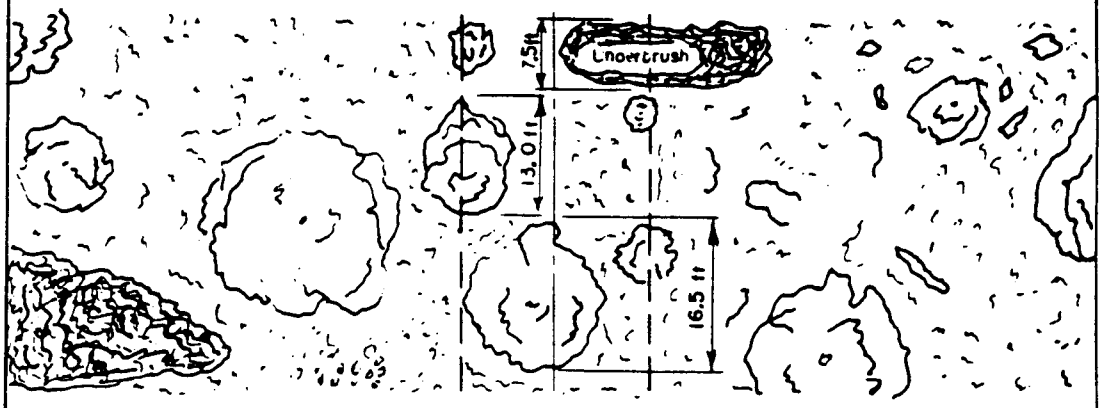
Jan 1, 1962		M52-3, M52-4



ELEVATION



AFTER CLEARING



BEFORE CLEARING

CLEARING RIGHT-OF-WAY GUIDE

Jan 1, 1962

R1

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