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Table 1 - Single Phase Transformers				
kVA	System Voltage ◇1◇			
	2400V Delta 4160V Grd. Y/2400V	7200V Delta 12470V Grd. Y/7200V 13200V Grd. Y/7620V 13800V Grd. Y/7970V	14400V Delta 24940V Grd. Y/14400V	34500V Grd. Y/19920V
1	-	3/4X	-	-
3	3-1/2X	3-1/2X	3-1/2X	-
5	3-1/2X	3-1/2X	3-1/2X	-
7.5	3-1/2X	3-1/2X	3-1/2X	-
10	6T	3-1/2X	3-1/2X	3/4X
15	7X	3-1/2X	3-1/2X	1X
25	15T	8T	3-1/2X	1-1/2X
37.5	25T	10T	3-1/2X	-
50	30T	10T	5-1/2X	3-1/2X
75	50T	15T	7X	4X
100	65T	20T	10T	7X
150	100T	30T	15T	-
167	100T	30T	15T	-
200	100T	40T	20T	-
250	140T	40T	25T	-
333	140T	50T	25T	-
500	-	80T	50K	-

DESIGN NOTE(s):

◇1.◇ Link fuses (T and X) shall be used in fused switches to isolate most Conventional (C), Protected (P), and Completely Self Protected (CSP) transformers which are: 1) pole mounted, or 2) pad mounted and isolated by a fused terminal pole. Power fuses shall be used to protect transformers when available fault current levels exceed the rating of a cutout.

2. Padmount transformers with bayonet fuses should have their upstream fuse sized with the largest fuse size that coordinates with upstream protection device.

REV	DATE	ENG	DESCRIPTION
14	01/01/24	JMW	Converted to new format
13	07/01/20	DT	

Table 2 - Three Phase Transformers - Single Unit or Banks				
kVA ◇3◇	System Voltage (Phase-to-Phase) ◇1◇			
	2400V	4160V	7200V	12470V, 12000V, 13200V, 13800V,14400V
9	3-1/2X	3-1/2X	3-1/2X	3-1/2X
15	5-1/2X	3-1/2X	3-1/2X	3-1/2X
30	10T	5-1/2X	3-1/2X	3-1/2X
45	15T	7X	5-1/2X	3-1/2X
75	25T	12T	7X	8T
112	40T	20T	12T	7X
150	50K	25T	15T	10T
225	65T	40T	25T	15T
300	100T	50T	30T	20T
450	140T	100T	50K	30T
500	140T	100T	50K	30T
600	200T	100T	65T	40T
750	200T	140T	65T	40T
1000	-	140T	100T	50T
1500	-	-	-	80T
2000	-	-	-	100T
2500	-	-	-	140T

DESIGN NOTE(s):

◇3.◇ Three-phase kVA or 3x single phase kVA.

4. For three-phase banks with closed delta secondary where one of the transformers is larger than the other two (grounded mid-tap 120/240 Volt), select fuse for each transformer from the above fuse link table based on the individual transformer kVA and system voltage.

   Example: 1-100kVA and 2-25kVA transformers on 4160 GrdY/2400V circuit
   From above fuse link chart:
   100kVA - use 300kVA row and 4160V column to select 50T fuse.
   2-25kVA - use 75kVA row and 4160V column to select 12T fuses.

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13	07/01/20	DT	

Table 3 - Power Fuses for Single-Phase Pole Mounted Transformers				
kVA	SMU-20 Fusing		SM-4 Fusing	SM-5 Fusing
	4.16kV	12.47kV	4.16kV	4.16kV
10	7 E Std.	5 E Std.	7 E Std.	7 E Std.
25	15 E Slow	10 E Std.	15 E Slow	15 E Slow
37.5	25 E Slow	10 E Std.	25 E Slow	25 E Slow
50	30 E Slow	10 E Std.	30 E Slow	30 E Slow
75	50 E Slow	15 E Slow	50 E Slow	50 E Slow
100	65 E Slow	20 E Slow	65 E Slow	65 E Slow
167	125 E Slow	30 E Slow	125 E Slow	125 E Slow
250	150 E Slow	40 E Slow	150 E Slow	150 E Slow
333	200 E Std.	50 E Slow	200 E Std.	200 E Std.
500	-	80 E Slow	-	300 E Std.

Table 4 - Power Fuses for Three-Phase Transformers				
kVA	SMU-20 Fusing		SM-4 Fusing	SM-5 Fusing
	4.16kV	12.47kV	4.16kV	4.16kV
75	15 E Slow	10 E Std.	15 E Slow	15 E Slow
150	25 E Slow	10 E Std.	25 E Slow	25 E Slow
300	50 E Slow	20 E Slow	50 E Slow	50 E Slow
500	80 E Slow	30 E Slow	80 E Slow	80 E Slow
750	150 E Slow	40 E Slow	150 E Slow	150 E Slow
1000	200 E Slow ◇5	50 E Slow	200 E Slow ◇5	200 E Std. ◇5
1500	◇5	80 E Slow ◇6	◇5	300 E Std. ◇5
2000	◇5	100 E Slow ◇6	◇5	400 E Std. ◇5
2500	◇5	150 E Slow ◇6	◇5	400 E Std. ◇5

DESIGN NOTE(s):

◇5. 4.16kV transformers over 750kVA, or feeders over 2 miles in length will require further review by Energy Delivery Technical Services.

◇6. 12.47kV transformers over 1000kVA, or feeders over 5 miles in length will require further review by Energy Delivery Technical Services.

7. Padmounted switchgear shall use SMU refills. For switchgear made prior to 2001, AmerenUE used SM-4 refills.

8. Bay-O-Net Fuses for Loop Feed Pad Mounted Transformers - See DCS **59 51 53 40**

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13	07/01/20	DT	

Table 5 - Three-Phase Pole Mounted Capacitor Banks								
Three Phase kVAR	Phase to Phase Voltage							
	2400 V	4160 V	7200 V	12470 V	13200 V	13800 V	14400 V	34500 V
150	40T	25T	12T	10T	10T	10T	-	-
300	100K	40T	25T	15T	15T	12T	12T	-
450	-	65T	-	25T	20T	-	-	-
600	140T	80T	50K	30T	30T	25T	25T	-
900 ◇12◇	-	-	65T	40T	40T	-	-	-
1200 ◇13◇	-	-	-	65T	65T	-	50K	-
2400	-	-	-	-	-	-	-	◇10◇
4500	-	-	-	-	-	-	-	◇11◇

DESIGN NOTE(s):

9. Capacitor banks should be fused with link fuses except when fault current exceeds rating of cutout or as otherwise noted.

◇10◇ If available fault current does not exceed 16kA asymm/ 10kA symm use a 50K fast refill, Stock #20 04 343, in a SMD-20 fused switch, Stock #54 06 052.

If available fault current is greater than 16kA asymm/ 10kA symm but less than 28kA asymm/ 17.5kA symm, use a 50 Std. refill, Stock #20 04 340, in a SMS fuse mounting, Stock #54 03 048, if available current is greater than 16kA asymm. Contact Distribution Standards for construction details. Symmetrical fault current ratings are based on x/r ratios of 15 or less.

◇11◇ If available fault current does not exceed 16kA asymm/ 10kA symm, use a 80 E Slow refill, Stock #20 04 355, in a SMD-20 fused switch, Stock #54 06 052.

If available fault current is greater than 16kA asymm/ 10kA symm but less than 28kA asymm/ 17.5kA symm, use a 80 E Slow refill, Stock #20 04 233, in a SMS fuse mounting, Stock #54 03 048.

Contact Distribution Standards for construction details. Symmetrical fault current ratings are based on x/r ratios of 15 or less.

◇12◇ Bank composed of 6 - 150 kVAR units.

◇13◇ Bank may be composed of 6 - 200 kVAR units.

REV	DATE	ENG	DESCRIPTION
14	01/01/24	JMW	Converted to new format
13	07/01/20	DT	

1. Fused Switches for 2.4kV - 14.4kV Circuits (for link type expulsion fuses)

   All fused switches are stocked with a cartridge (fuse tube). Cartridges are available for replacement only. The 15kV, 100A, 100kV BIL, open style fused switch, Stock #54 07 208, may be used on 2.4kV through 14.4kV circuits where symmetrical fault current does not exceed 16,000A asymmetricl / 8,000A symmetrical. This switch will be used in nearly all new installations and replacements where practical.

   The 15kV, 200A, 100kV BIL, open style fused switch, Stock #54 07 209, may be used on 2.4kV through 14.4kV circuits where symmetrical fault current does not exceed 12,000A asymmetricla/8,000A symmetrical. This switch will be used in nearly all new installations and replacements where practical.

   The 27kV, 100A, 125kV BIL, open style fused switch, Stock #54 07 240, may be used on 7.2kV through 14.4kV circuits where symmetrical fault current does not exceed 5kA. It shall not be used on 2.4/4.16kV circuits. This switch (for years the most commonly installed) will not be frequently used.

2. Solid Blade Switches for 2.4kV - 14.4kV Circuits

   The 15kV, 300A, 100kV BIL, open style switch, Stock #54 07 210, may be used on 2.4kV through 14.4kV circuits where symmetrical fault current does not exceed 7.5kA. The 15kV, 100 or 200 amp fused switch can be converted to a 300 amp device by removing the cartridge and inserting a solid blade, Stock #54 07 243.

   The 27kV, 100A fused switch, Stock #54 07 240, can be converted to a 300 amp device by removing the cartridge and inserting a solid blade, Stock #54 07 199 where symmetrical fault current does not exceed 7.5kA.

   The 15kV, 600A underslung switch,Stock #54 07 204, may be used on 2.4kV through 14.4kV circuits. The switch blade is attached and cannot be removed.

   The 15kV, 600A single insulator disconnect switch, Stock #54 07 296, may be used on 2.4kV through 14.4kV circuits. The switch blade is attached and cannot be removed.

   The 15kV, 600A open style in line switch, Stock #54 07 205, may be used on 2.4kV through 14.4kV circuits only where special conditions warrant.

3. Group Operated Switches for 2.4kV - 13.8kV Circuits

   The 15kV, 600A group operated switch, Stock #54 07 239, may be used on terminal poles serving padmount transformers to prevent ferroresonance, or on primary metering poles where three phase disconnection is required. The switch is equipped with load interrupters. The switch mounts on the face of the pole on a horizontal beam below the overhead connections. It may be used on 2.4kV through 13.8kV circuits.

4. Single Phase 19.9/34,5kV Switches

   The 27kV, 100A, 150kV BIL fused cutout, Stock #54 07 234, can be used for applications through 34.5kV for single and three phase line to neutral applications on effectively grounded WYE connected circuits. They may be used where symmetrical fault current does not exceed 7.5kA.

   The 34.5kV, 200A, SMD-20 fused switch, Stock #54 06 052, may be used on 19.9/34.5kV capacitor banks or conventional transformers if symmetrical fault current is greater tan 7.5kA but not more than 10kA. For symmetrical fault currents above 10kA contact Standards.

   The 34.5kV, 900A underslung switch, Stock #54 07 302, may be used on 14.4/24.8kV and 19.9/34.5kV circuits or lower distribution voltage circuits where loads in excess of 600 amps are anticipated and clearance permit. The switch blade is attached and cannot be removed.

5. 34.5kV Group Operated Switches

The 34.5kV, 1200A, group operated switches with loadbreak interrupters should be used on circuits where sectionalizing requires simultaneous interruption of all three phases. Standard switches listen in Table 1 come pre-assembled on a unitized frame.

An existing non-loadbreak switch may be converted to loadbreak interrupting by the addition of loadbreak interrupters. These switches have a mounting bracket to attach the load interrupter units. Installation instructions are included with each switch and kit.

Table 1 - 34.5kV Standard Group Operated Switches

Stock #	kV	Amp	Switch without or with interrupters	Weight (lbs.)
54 08 433	34.5	1200	Turner TS2, Three Phase with LBRK - Vertical Mount	999
54 08 437 ◇2◇	34.5	1200	Turner TS2, Three Phase with LBRK - Flat Top Mount	999
54 08 438	34.5	1200	Turner TS2, Three Phase with LBRK - Terminal Pole Mount	999
54 08 442	34.5	1200	Seeco, Three Phase with LBRK - Vertical Mount	1400
54 08 447 ◇1◇	34.5	1200	Seeco, Three Phase with LBRK - Flat Top Mount	1300
54 08 446	34.5	1200	Seeco, Three Phase with LBRK - Terminal Pole Mount	1150

6. 69kV Group Operated Switches

The 69kV, 1200A, group operated switches without loadbreak interrupter shall only be used on circuits that do not require load break switches.

The 69kV, 1200A, group operated switches with loadbreak interrupters shall be used on circuits where sectionalizing requires simultaneous interruption of all three phases and where interruption of load or circulating current is required.

The 69kV group operated switches come pre-assembled as as single phase assembly. Load break interrupers, if equipped, must be installed on each phase assembly and each phase assembly must be installed and adjusted.

2-way and 3-way 69kV group operated switches are also available.

Table 2 - 69kV Group Operated Switches

Stock #	kV	Amp	Switch Without or With Interrupters	Configuration
54 09 393	69	1200	Turner, CS2, Three-Phase GOP Switch without LBRK Interrupter	Triangle or Delta
54 09 395	69	1200	Turner, CS2, Three-Phase GOP Switch with LBRK Interrupter	Triangle or Delta
54 09 392	69	1200	Turner, CS2, Three-Phase GOP Switch without Interrupter	Phase over Phase
54 09 394	69	1200	Turner, CS2, Three-Phase GOP Switch with LBRK	Phase over Phase
54 09 369	69	1200	SEECO, Three-Phase GOP Switch without Interrupters	Triangle or Delta
54 09 035	69	1200	SEECO, Three-Phase GOP Switch with Interrupters	Triangle or Delta
54 09 368	69	1200	SEECO, Three-Phase Switch without Interrupters	Phase over Phase
54 09 370	69	1200	SEECO, Three-Phase Switch with Interrupters	Phase over Phase

REV	DATE	ENG	DESCRIPTION
0	01/01/24	JMW	New Standard

7. Switch Motor Operators for 34.5kV and 69kV Group Operated Switches

Motor operators include a 24V battery (or two 12V batteries in series), battery charger (powered by 120 VAC), a 24VDC to 12VDC converter (if single 24V battery provided) to power RTU and radio, a swing-out door to mount radio and RTU, remote/local switch with position terminal to provide dispatch status, low voltage DC and loss of AC alarm relays. Motor operators must be supplied with 120 VAC.

The following stock coded motor operators come pre-wired for an RTU. The RTU is optional and has to be ordered separately.

Table 3 - Switch Motor Operators and RTU's

Stock #	kV		Description
54 08 416	34	24VDC	Motor operator for Turner 34kV D switch
54 08 430	34 or 69	24VDC	Motor operator for Turner 34kV (TSB) or 69kV (CSB) switch
54 09 349	69	24VDC	Motor operator for Turner 69kV D switch
54 09 371	34 or 69	24VDC	Motor operator for SEECO 34kV or 69kV switch
54 02 011	-	-	GE Ibox RTU
54 02 031	-	-	Novatech Orion RTU

8. Standard Equipment Lead Size

When a switch is used for sectionalizing circuits, the tap conductor (load side of switch) will determine the size of the switch leads. Poly covered soft drawn copper wire shall be used for leads to open style switches, as indicated in DCS **07 00 80 00**. EPR, 2400V, insulated copper wire shall be used to connect porcelain enclosed switches, as indicated in DCS 07 00 81 00. Conductor size may be restricted in some applications due to the equipment connector.

When a switch is used for underground cable feeds, the lead from the open style switch to the line conductor shall be poly covered soft drawn copper wire, while the lead to the terminator shall be poly covered hard drawn or soft drawn copper wire as indicated in the appropriate terminal pole Standard.

When a fused switch is used to connect a device such as a transformer or capacitor, the lead size will be specified in that particular equipment section of the Standards books.

Group operated 34.5kV & 69kV, 1200A switch leads shall be the same as the line conductor, when line conductor is larger than 556 kcmil. The leads will be attached to the switch per DCS **07 00 30 00** with 556 kcmil or 954 kcmil lugs. When poly covered copper is used for switch leads a bolted bronze lug shall be used to attach to the switch.

9. Fuse Links - Expulsion Type

Fuse links are used in fused cutouts to protect the circuit by isolating overheard feeder taps, underground cable circuits, conventional transformers, and capacitor banks on the distribution system.

The use of 200A fuses shall be reviewed by a System Protection Engineer for coordination.

10. Power Fuses (Solid Material) and Mountings

Power fuses are used for higher current ratings, greater interrupting capacity, coordination requirements, and other special conditions such a contaminated atmosphere and limited space. See Table 4 for interrupting ratings.

The solid material fuse element is called a Refill. The Refill is held by a fuseholder, which is place in a Mounting. The stock number of the Mounting includes the Fuseholder.

Solid material fuses are specified by voltage and current. The Mountings are also specific to these Refills.

Liquid power fuses are no longer available.

Table 4 - Overhead and Switchgear Power Fuse Interrupting Ratings					
Refill Type	Rated Voltage	Refill Amperage Available	Interrupting Amps Asymm./Symm. ◇3◇	Overhead Mounting Stock #	Padmount Swgr. Mounting Stock #
SM-4	7.5kV	15-200	27,500/15,600	54 03 050	-
SM-4	14.4kV	20-200	20,000/12,500	54 03 060	◇5◇
SM-4	34.5kV	65-125	10,000/6,250	54 03 054	-
SM-5	7.5kV	50-400	44,500/26,000	54 03 051	-
SM-5	14.4kV	30-250	40,000/25,000	54 03 064	54 07 226/233
SM-5	25kV	30-250	32,000/20,000	54 03 053	-
SM-5	34.5kV	1-250	28,000/17,500	54 03 048	-
SMU ◇4◇	14.4kV	100-200	22,400/14,000	54 06 050	54 07 212/213/216/217
SMU ◇4◇	34.5kV	1-200	16,000/10,000	54 06 052	-

11. Reclosers

Reclosers are used to protect circuits by isolating a faulted section of a circuit. They shall be used on circuits 14.4kV and below. Available reclosers are identified in the applicable standards. Refer to EDD (Electrical Distribution Design) article PS-50 covering reclosers.

12. Tripsavers

Tripsavers are cutout mounted electronic reclosers that are powered by line current using an internal CT. There are 40A, 100A, and 200A models that can carry their rated current continuously. Common size fuse T-links have stock numbers for Tripsavers that are already programmed with T-link TCC curves. There are also stock numbers for Tripsavers that are not already programmed.

Tripsavers have a fault current rating of 6.3kA symmentrical. Ameren's standard 100A fused switch is rated 6,000A asymmetrical / 10,600A symmetrical. Ameren's standard 200A fused switch is rated 12,000A asymmetrical / 8,000 symmetrical.

Tripsaver requires a minimum level of current to power the LCD screen or the Local Manual Open function, if enabled: 1A for 40A model, 4A for 100A model, and 8 amps for 200A model. To power the control, the current must not fall below: 0.5A for 40A model, 1.5A for 100A model, and 3A for the 200A model. If the current falls below this threshold, the Tripsaver can rely on fault current to power up the Tripsaver, but there could be a delay in operation depending on the fault current level.

REV	DATE	ENG	DESCRIPTION
0	01/01/24	JMW	New Standard

13. Transformer Fusing

Types of Fuses

Link fuses (T and X) shall be used in fused switches to isolate most Conventional (C), Protected (P), and Completely Self Protected (CSP) transformers which are: 1) pole mounted, or 2) pad mounted and isolated by a fused terminal pole.

Power fuses (SMU, SM-4, or SM-5) shall be used to isolate Conventional (C), Protected (P), and Completely Self Protected (CSP) transformers when any of the following conditions exist.

1) The fault interrupting requirements are above the capacity of the link type fused switch
   -100A fused switch, Stock #54 07 208, 10,000A symmetrical
   -100A fused switch, Stock #54 07 234, 7,500A symmetrical
   -200A fused switch, Stock #54 07 209, 7,500A symmetrical

2) A pole mounted transformer and the fuse rating is greater than 100 amps (three phase transformers larger than 500kVA @4.16kV, or 1500kVA @12.47kV)

3) The transformer is fed by padmounted switchgear

Contact Distribution Standard Engineer for fuses rated above 100A.

External fuses shall be used to isolate Completely Self Protected (CSP) transformers, unless the transformer is not installed on the backbone, existing pole space does not allow for installation of a fused switch, and the number of customers that could be affected by transformer failure is deemed acceptable.

See DCS **10 00 01 01** for fuse application table

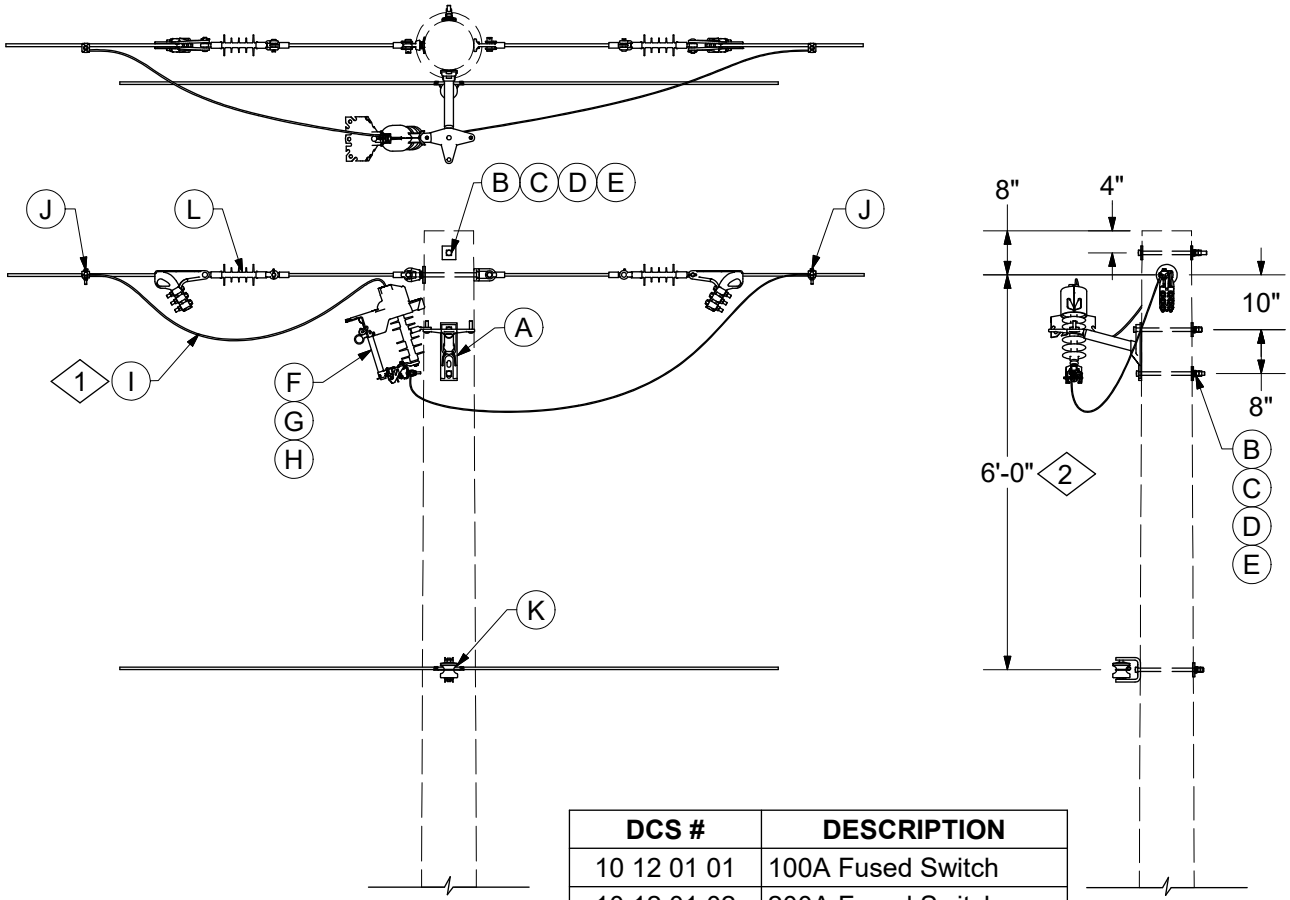
DESIGN NOTE(s):

1. Differential tension shall not exceed 333 pounds per phase using the DE tension listed in DCS **07 00 07 03**.
2. Differental tension shall not exceed 1,000 pounds per phase using the DE tension listed in DC **07 00 07 03**.
3. Asymmetrical amperages shown are at normal applied system voltages (2.4/4.16 kV, 7.2/12/47 kV, 14.4/24.9 kV, 19.9/34.5 kV), not the nominal rated voltage of the device.
4. The SMU Refills do not have separate fuseholders. They fit directly into the SMD-20 units. The end fittings on the old Refill is reused on the new Refill.
5. Ameren Missouri switchgear prior to 2001 contains SM-4 fusing.
6. The overhead SM-4 and SM-5 fuse holders are not loadbreak devices but may be opened and closed with a hook stick.
7. The 14.4kV, SMD-20 switch (which uses the SMU fuses) is a loadbreak device and may be opened and closed with a hook stick while using the Loadbuster tool. Mount spare refill holder (mounting: Stock #40 04 242) 10'-0" above ground on pole.

FUSES AND SWITCHES

Single Phase Sectionalizing
100-300 Amp

10 12 01 **
5,15kV
1 of 1



DCS #	DESCRIPTION
10 12 01 01	100A Fused Switch
10 12 01 02	200A Fused Switch
10 12 01 03	300A Solid Blade Switch

CONSTRUCTION NOTE(s):

1. Maximum lead size shall be 1/0 Cu.

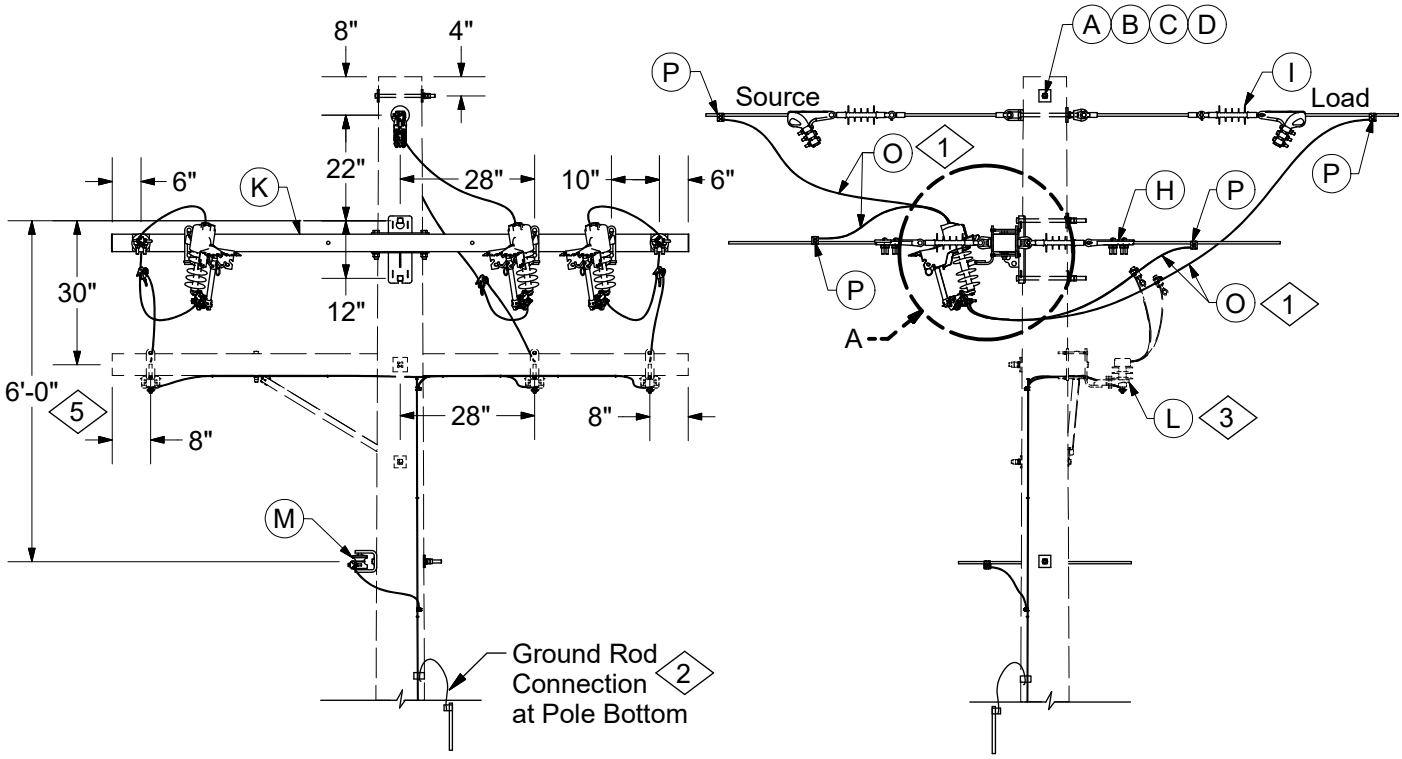
	ITEM	STK / DCS #	DESCRIPTION 10 12 01 **	01	02	03
	A	23 56 063	Bracket - Equipment Mount 3 Position	1	1	1
	B	23 52 065	Bolt, Mach., 5/8" x 12" w/ square nut	3	3	3
	C	23 66 207	Washer, Curved, Square, 5/8"	3	3	3
	D	23 66 134	Lock Washer - 5/8" Double Coil	3	3	3
	E	23 65 043	Lock Nut - 5/8" Square	3	3	3
	F	23 17 411	Wildlife Guard - Cover Cutout	1	1	1
	G	54 07 208	Switch, Fused, 100A, 15kV	1	-	-
		54 07 209	Switch, Fused, 200A, 15kV	-	1	-
		54 07 210	Switch, Solid Blade, 300A 15kV	-	-	1
@	H	**10 00 01 01**	Link, Fuse (Sized by Engineer)	1	1	1
1,@	I	**07 00 80 00**	Wire, CU, Poly. SD. (ft.)	15	15	15
@	J	**07 00 21 00**	Hot Line Clamp	1	1	1
		07 00 25 00	Clamp, Parallel Groove	1	1	1
@	K	**03 01 ** ** @**	Neutral Configuration	1	1	1
@	L	**06 12 30 03 @**	Dbl Deadend on Pole w/ FG Extension	1	1	1
		06 12 30 13 @	Dbl Deadend on Pole w/o FG Extension	1	1	1

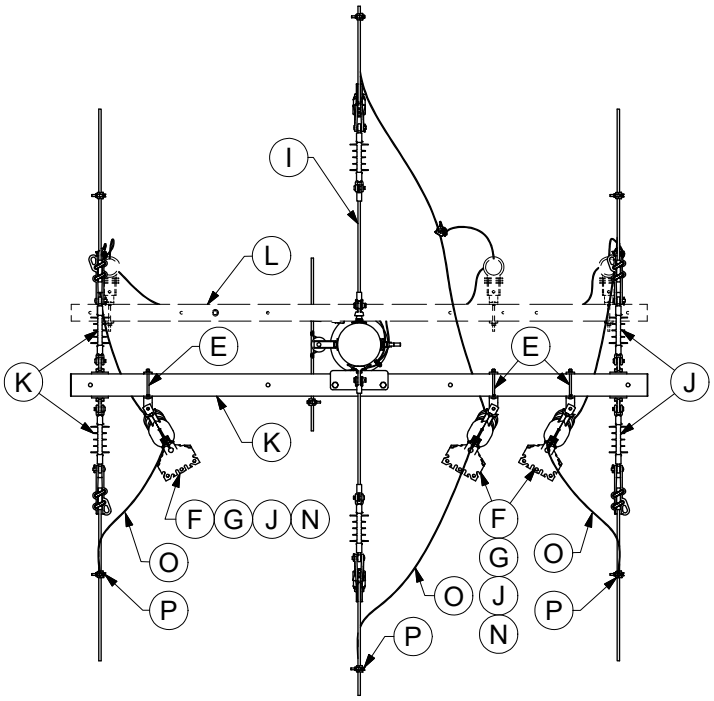
DESIGN NOTE(s):

2. This dimension may be reduced to 40" for existing poles to prevent replacement of otherwise serviceable poles.

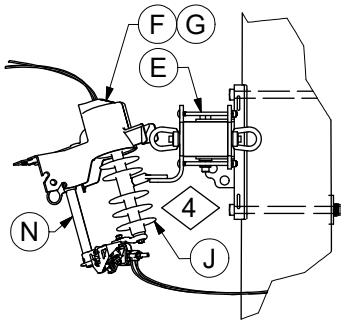
DISTRIBUTION CONSTRUCTION STANDARDS

REV	DATE	ENG	DESCRIPTION
11	01/01/24	DT	Converted to new format
10	06/29/16	WYW	





Top View



Detail A

DCS #	DESCRIPTION
10 12 10 01	100A Fused Switch
10 12 10 02	200A Fused Switch
10 12 10 03	300A Solid Blade Switch
10 12 10 04	600A Disconnect Switch

REV	DATE	ENG	DESCRIPTION
7	01/01/24	DT	Converted to new format
6	06/30/16	WYW	

CONSTRUCTION NOTE(s):

1. Minimum lead size shall be 1/0 Cu for 600A switch. Maximum lead size shall be 1/0 Cu for 100A, 200A, and 300A cutouts.

2. Pole ground is only required when arresters are installed on switch pole.

	ITEM	STK / DCS #	DESCRIPTION 10 12 10 **	01	02	03	04
	A	23 52 065	Bolt, Mach., 5/8" x 12" w/ square nut	1	1	1	1
	B	23 66 207	Washer, Curved, Square, 5/8"	2	2	2	2
	C	23 66 134	Lock Washer - 5/8" Double Coil	1	1	1	1
	D	23 65 043	Lock Nut - 5/8" Square	1	1	1	1
	E	17 58 054	Bracket, Arrester/Cutout Mounting	6	6	6	6
	F	23 17 411	Wildlife Guard - Cover Cutout	3	3	3	-
	G	23 17 512	Wildlife Guard - Vertical Switch 600 Amp	-	-	-	3
	H	**06 12 35 02 @**	Double Deadend on FG Arm	2	2	2	2
	I	**06 12 30 13 @**	Dbl Deadend on Pole w/o FG Extension	1	1	1	1
	J	54 07 208	Open Type Fused Switch	3	-	-	-
		54 07 209	200A Fused Switch, 15kV	-	3	-	-
		54 07 210	300A Solid Blade Switch	-	-	3	-
		54 07 296	Switch - Disconnect 15kV 600 Amp	-	-	-	3
4,@	K	**04 00 42 02**	Crossarm - Deadend, F/G 8'	1	1	1	1
		04 00 42 03	Crossarm - Deadend, F/G 10'	1	1	1	1
3,@	L	**12 12 01 07 @**	Lightning Arrester Installation	#	#	#	#
@	M	**03 01 ** ** @**	Secondary Configuration	1	1	1	1
@	N	**10 00 01 01**	Link, Fuse (Sized by Designer)	3	3	-	-
1,@	O	**07 00 80 00**	Wire - Poly Covered, S.D. (ft)	30	30	30	30
@	P	**07 00 21 00**	Clamp, Hot Line	6	6	6	6
		07 00 25 00	Clamp, Parallel Groove	6	6	6	6
6,@	Q	60 55 041	FCI, Non Communicating, 8hr or 3A reset, 100A min Trip	#	#	#	#

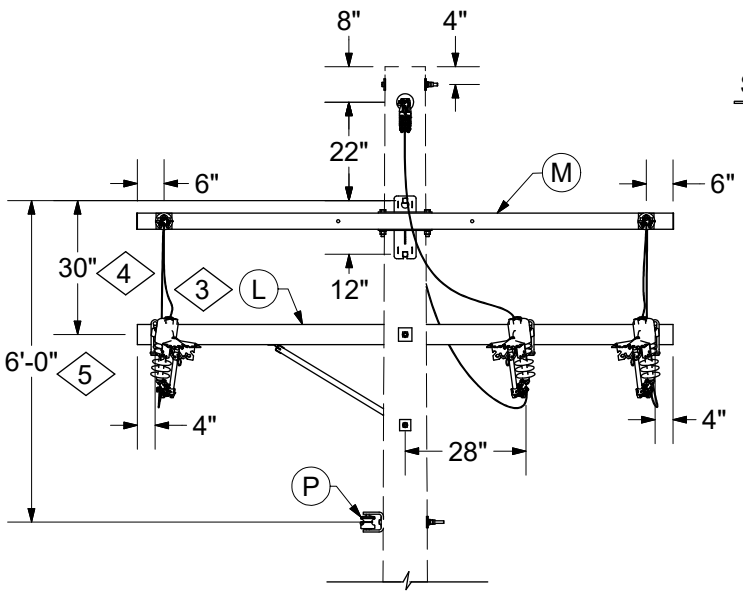
DESIGN NOTE(s):

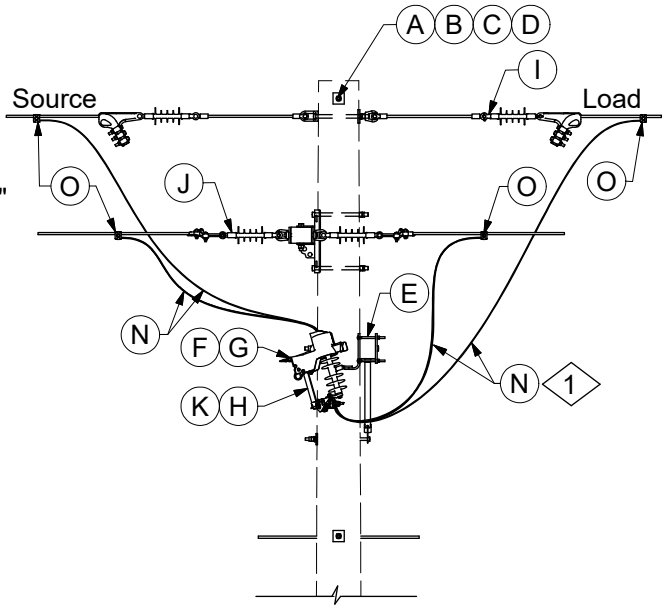
3. Arresters are not required for normally closed switch installations. Where switches are normally open, install arresters on adjacent poles on both sides of switch. When installing arresters on adjacent poles is not practical, arresters may be installed on a crossarm below the switch arm for one side of the switch. Refer to DCS **12 00 01 01** for arresters selection.

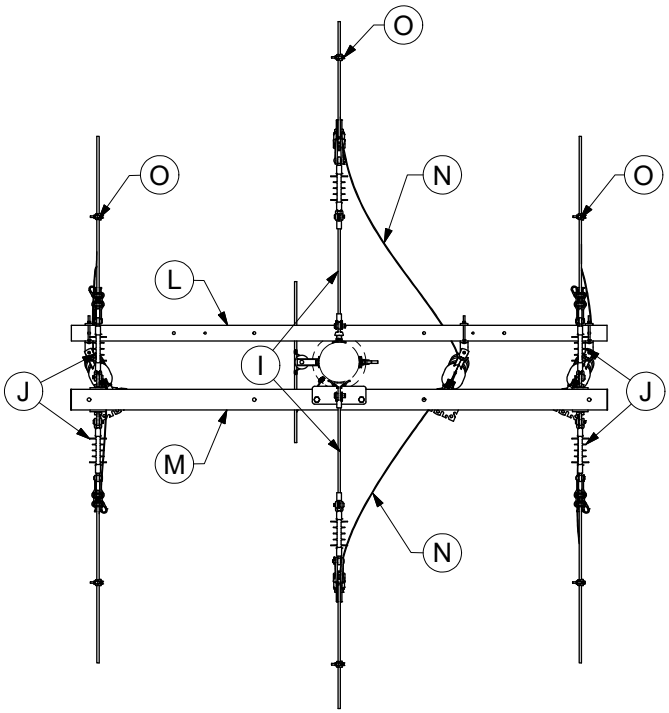
4. Switches may be installed on existing serviceable double wood arms.

5. This dimension may be reduced to 40" on existing poles to avoid replacing otherwise serviceable poles unless arresters are installed on same pole.

6. FCI's may be installed on line conductor from 1/0 and larger when solid blade switches are installed.







Top View

DCS #	DESCRIPTION
10 12 11 01	100A Fused Switch
10 12 11 02	200A Fused Switch
10 12 11 03	300A Fused Switch
10 12 11 04	600A Disconnect Switch

CONSTRUCTION NOTE(s):

1. Minimum lead size shall be 1/0 cu for 600A switches. Maximum lead size shall be 1/0 Cu for 100A, 200A, and 300A switches.

	ITEM	STK / DCS #	DESCRIPTION 10 12 11 **	01	02	03	04
	A	23 52 065	Bolt - Mach., 5/8" x 12" w/ square nut	1	1	1	1
	B	23 66 207	Washer - Curved, Square, 5/8"	2	2	2	2
	C	23 66 134	Lock Washer - 5/8" Double Coil	1	1	1	1
	D	23 65 043	Lock Nut - 5/8" Square	1	1	1	1
	E	17 58 054	Bracket, Arrester/Cutout Mounting	3	3	3	3
	F	23 17 411	Wildlife Guard - Cover Cutout	3	3	3	-
	G	23 17 512	Wildlife Guard - Vertical Switch 600 Amp	-	-	-	3
	H	54 07 208	100A Fused Switch	3	-	-	-
		54 07 209	200A Fused Switch	-	3	-	-
		54 07 210	300A Solid Blade Switch	-	-	3	-
		54 07 296	600A Disconnect Switch	-	-	-	3
	I	**06 12 30 03 @**	Dbl Deadend on Pole w/ FG Extension	1	1	1	1
	J	**06 12 35 02 @**	Dbl Deadend on F/G Crossarm	2	2	2	2
@	K	**10 00 01 01**	Link - Fuse (Sized by Engineer)	3	3	-	-
3,@	L	**04 00 20 03**	Crossarm - Wood, 10' (use only half of V-brace)	1	1	1	1
		04 00 41 16	Crossarm - Tangent, F/G 10'	1	1	1	1
@	M	**04 00 42 03**	Crossarm - Deadend, F/G 10'	1	1	1	1
1,@	N	**07 00 80 00**	Wire - Poly Covered, S.D. (ft.)	30	30	30	30
@	O	**07 00 25 00**	Clamp - Parallel Groove	6	6	6	6
		07 00 21 00	Clamp - Hot Line	6	6	6	6
@	P	**03 01 ** ** @**	Secondary Configuration	1	1	1	1
6,@	Q	60 55 041	FCI, Non Communicating, 8hr or 3A reset, 100A min Trip	#	#	#	#

DESIGN NOTE(s):

2. Arresters are not required for normally closed switch installations. For normally open switches, install a set of arresters on adjacent poles on both sides of the switch. Refer to DCS **12 00 01 01** for arresters selection.

3. 8'-0" crossarms may be substituted when required.

4. This dimension may be reduced to 24" on existing poles to avoid replacing otherwise serviceable poles.

5. If switch crossarm is installed at 24", this dimension may be reduced to 40" on existing poles to avoid replacing otherwise serviceable poles.

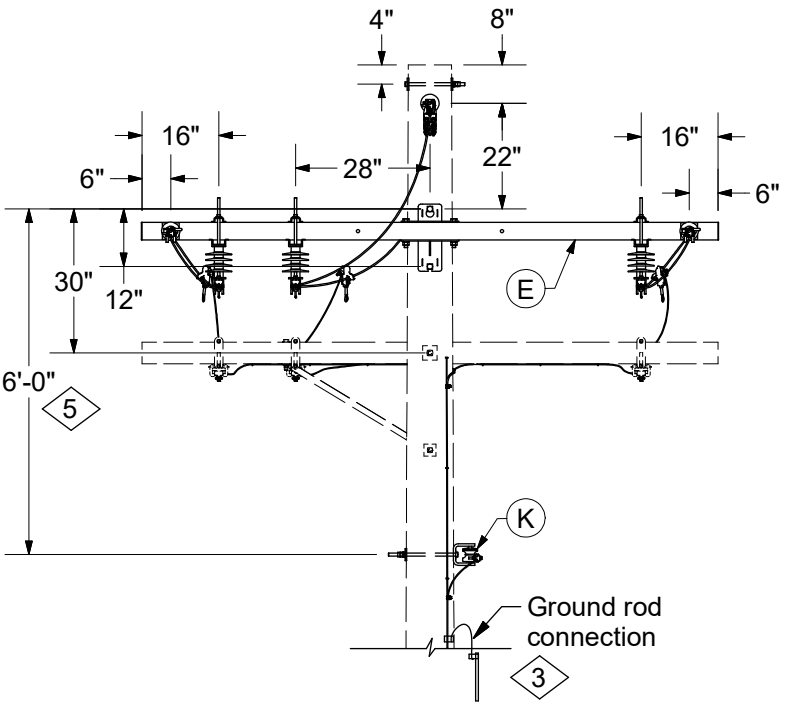
6. FCI's may be installed on line conductor from 1/0 and larger when solid blade switches are installed.

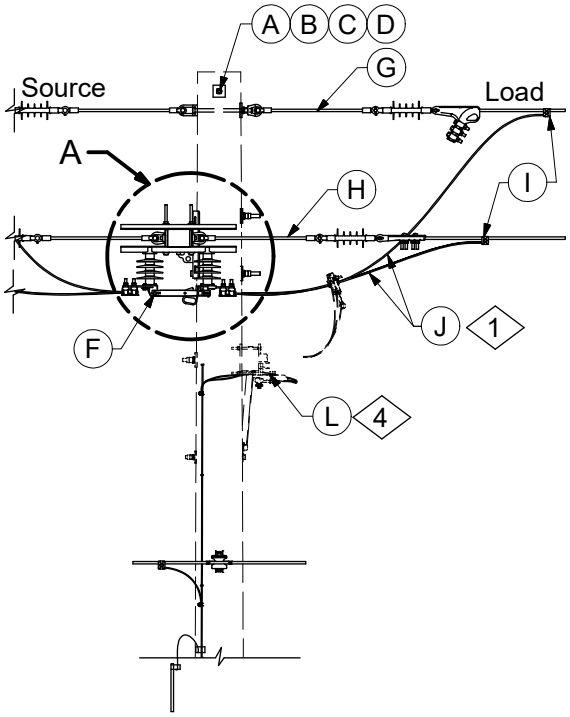
REV	DATE	ENG	DESCRIPTION
14	01/01/24	DT	Converted to new format
13	08/30/16	WYW	

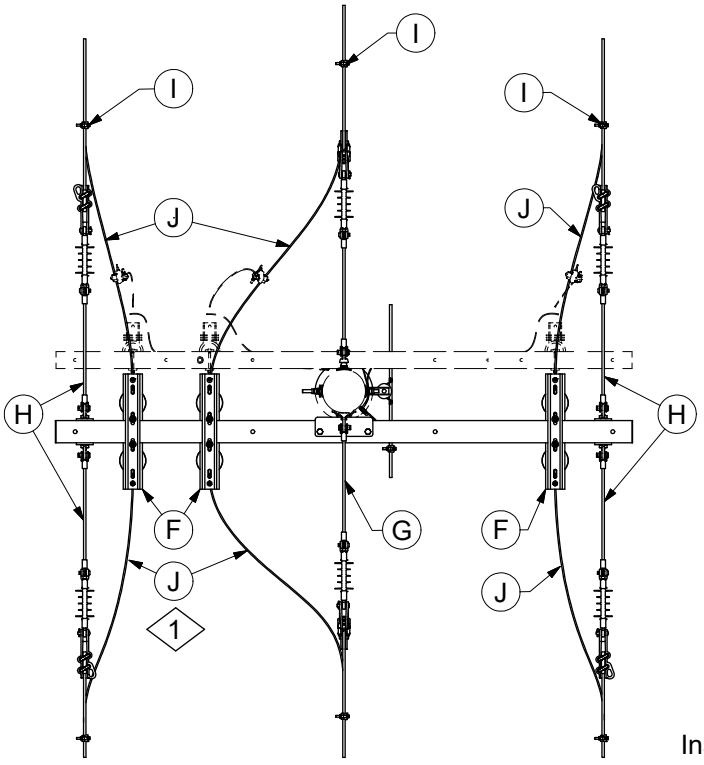
FUSES AND SWITCHES

Three Phase Sectionalizing
Underhung Mount, 600 Amp

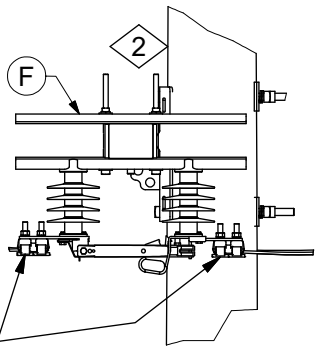
10 12 13 **
5, 15kV
1 of 2







Top View



Detail A

DCS#	DESCRIPTION
10 12 13 01	600A, on 8' FG Crossarm
10 12 13 02	600A, on 10' FG Crossarm

DISTRIBUTION CONSTRUCTION STANDARDS

REV	DATE	ENG	DESCRIPTION
5	01/01/24	DT	Converted to new format
4	06/30/16	WYW	

CONSTRUCTION NOTE(s):

1. Minimum lead size shall be 1/0 Cu.

2. Outer mounting bolts for switch shall not be installed when switch is installed on single crossarm. Inner mounting bolts should be installed in closest position to crossarm possible.

3. Pole ground is only required when arresters are installed on switch pole.

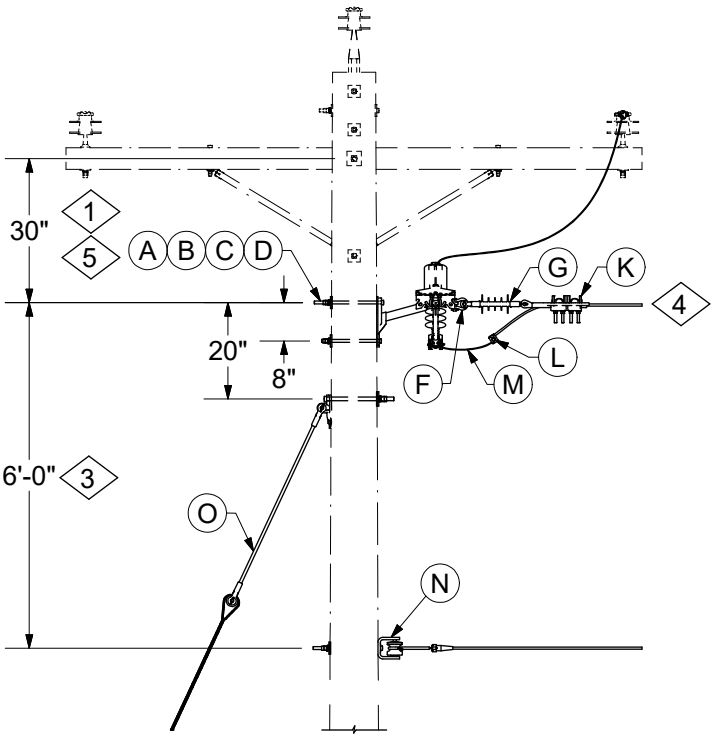
	ITEM	STK / DCS #	DESCRIPTION 10 12 13 **	01	02
	A	23 52 065	Bolt, Mach., 5/8" x 12" w/ square nut	2	2
	B	23 66 207	Washer, Curved, Square, 5/8"	2	2
	C	23 66 134	Lock Washer - 5/8" Double Coil	1	1
	D	23 65 043	Lock Nut - 5/8" Square	1	1
	E	**04 00 42 02**	Crossarm - Deadend, F/G 8'	1	-
		04 00 42 03	Crossarm - Deadend, F/G 10'	-	1
	F	54 07 204	Switch, Disc. 600A., 15 kV	3	3
	G	**06 12 30 03 @**	Dbl Deadend on Pole w/ FG Extension	1	1
	H	**06 12 35 04 @**	Dbl Deadend on FG Crossarm w/ FG Extension	2	2
@	I	**07 00 25 00**	Clamp, Parallel Groove	6	6
1,@	J	**07 00 80 00**	Wire, Poly Covered (ft.)	15	15
@	K	**03 01 ** ** @**	Secondary Configuration	1	1
@	L	**12 12 01 07 @**	Lightning Arrester Installation	-	-
6,@	M	60 55 041	FCI, Non Communicating, 8hr or 3A reset, 100A min Trip	#	#

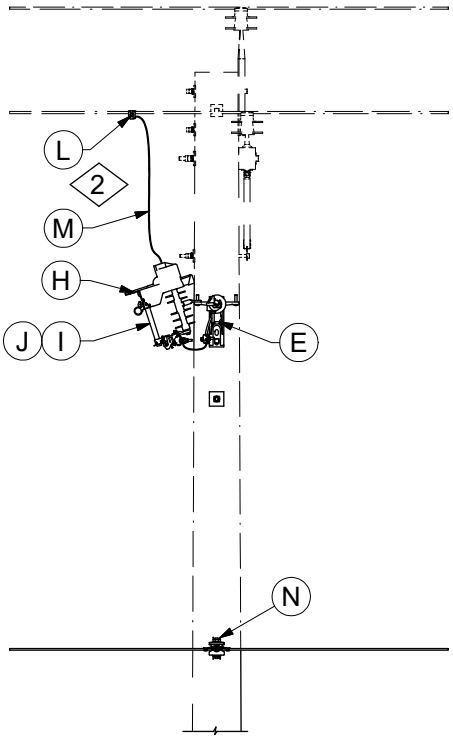
DESIGN NOTE(s):

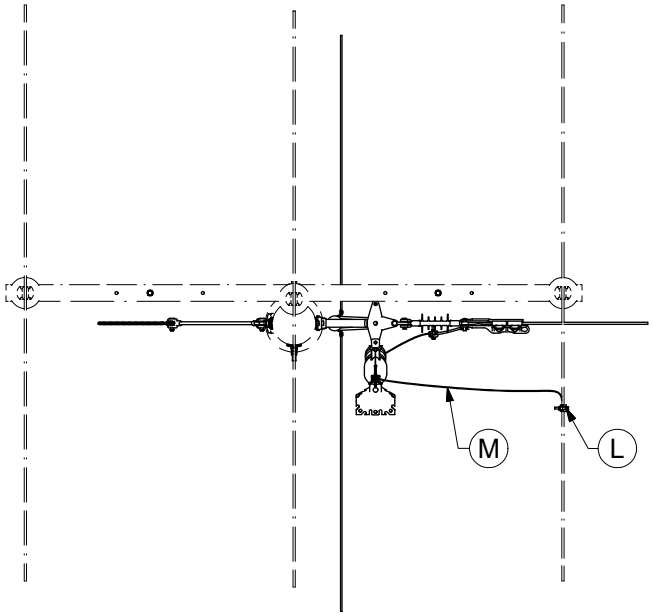
4. Arresters are not required for normally closed switch installations. Where switches are normally open, install arresters on adjacent poles on both sides of the switch. When installing arresters on adjacent poles is not practical, arresters may be installed on a crossarm 24" below deadend crossarm for one side of the switch as long as there is 6'-0" of clearance between deadend crossarm and neutral. See DCS **12 00 01 01** for arresters selection.

5. This dimension may be reduced to 40" on existing poles to avoid replacing otherwise serviceable poles.

6. FCI's may be installed on line conductor from 1/0 and larger when switches are installed.







Top View

DCS #	DESCRIPTION
10 12 22 01	100A Fused Switch
10 12 22 02	200A Fused Switch
10 12 22 03	300A Solid Blade Switch

REV	DATE	ENG	DESCRIPTION
12	01/01/24	DT	Converted to new format
11	03/21/17	WYW	

CONSTRUCTION NOTE(s):

1. For armless construction, apply dimension shown to upper bolt of lowest insulator. For single phase pole, use 36" from the top of the pole.

2. Maximum lead size shall be 1/0 Cu.

	ITEM	STK / DCS #	DESCRIPTION 10 12 22 **	01	02	03
	A	23 52 065	Bolt - Mach., 5/8" x 12" w/ square nut	2	2	2
	B	23 66 207	Washer - Curved, Square, 5/8"	2	2	2
	C	23 66 134	Lock Washer - 5/8" Double Coil	2	2	2
	D	23 65 043	Lock Nut - 5/8" Square	2	2	2
4	E	23 56 063	Bracket - Equipment Mount 3 Position	1	1	1
	F	23 68 181	Shackle - Deadend	1	1	1
	G	25 06 052	Insulator - Deadend, 12kV	1	1	1
	H	23 17 411	Wildlife Guard - Cover Cutout	1	1	1
	I	54 07 208	100A Fused Switch	1	-	-
		54 07 209	200A Fused Switch	-	1	-
		54 07 210	300A Solid Blade Switch	-	-	1
@	J	**10 00 01 01 @**	Link - Fused (Sized by Engineer)	1	1	1
@	K	**07 00 11 00**	Clamp - Deadend	1	1	1
@	L	**07 00 21 00**	Clamp - Hot Line	1	1	1
		07 00 25 00	Clamp - Parallel Groove	2	2	2
2,@	M	**07 00 80 00**	Wire - Poly Covered (ft.)	10	10	10
@	N	**03 01 ** ** @**	Secondary Configuration	1	1	1
@	O	**11 00 ** ** @**	Guy Unit	1	1	1
6,@	P	60 55 041	FCI, Non Communicating, 8hr or 3A reset, 100A min Trip	#	#	#

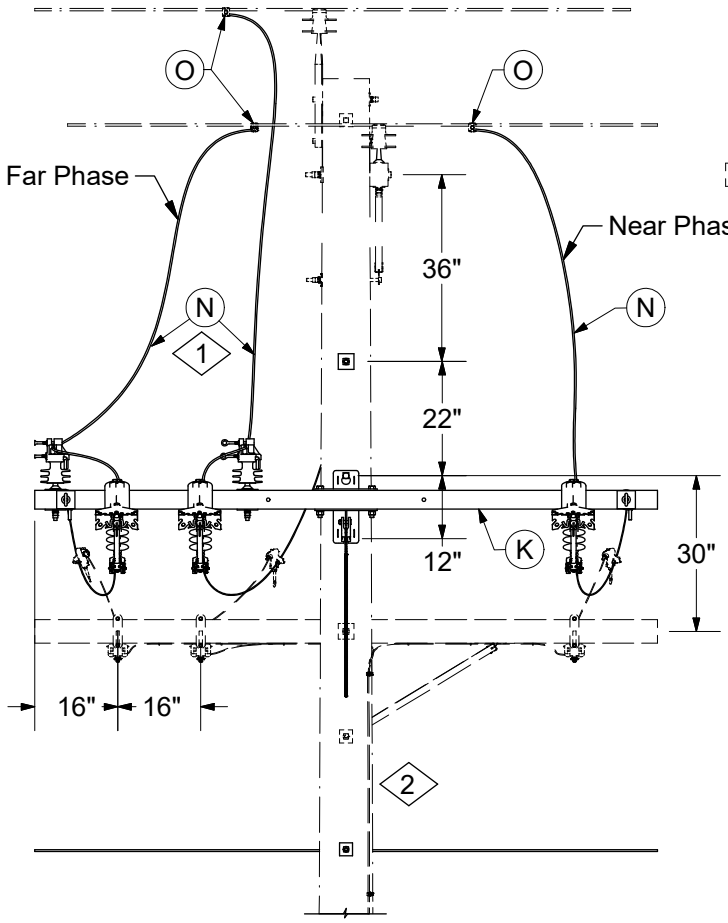
DESIGN NOTE(s):

3. This dimension may be reduced to 40" for an existing pole to prevent replacement of otherwise serviceable poles.

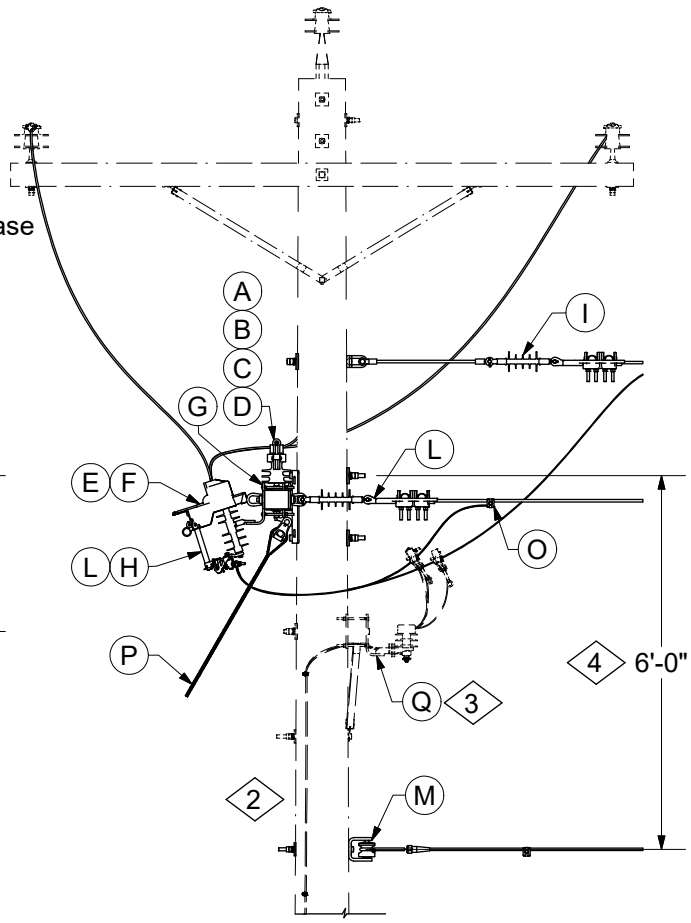
4. Maximum line tension of 5,000 pounds for Item E.

5. This dimension may be reduced to 24" for an existing pole to prevent replacement of otherwise serviceable poles.

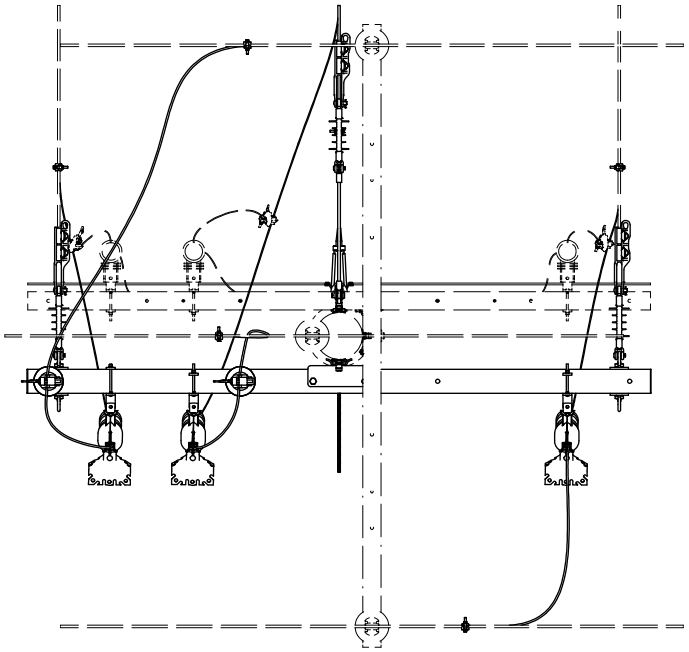
6. FCI's may be installed on line conductors from 1/0 and larger when solid blade switches are installed.



Front View



Side View



Top View

DCS #	Description
10 12 23 01	2-Phase, 100A Switch, Fused
10 12 23 02	2-Phase, 200A Switch, Fused
10 12 23 03	2-Phase, 300A Switch, Solid Blade
10 12 23 04	2-Phase, 600A Disconnect Switch
10 12 23 05	3-Phase, 100A Switch, Fused
10 12 23 06	3-Phase, 200A Switch, Fused
10 12 23 07	3-Phase, 300A Switch, Solid Blade
10 12 23 08	3-Phase, 600A Disconnect Switch

REV	DATE	ENG	DESCRIPTION
12	01/01/24	DT	Converted to new format
11	06/01/17	WYW	

CONSTRUCTION NOTE(s):

1. Maximum lead size for 100-300A switches shall be 1/0 Cu. Minimum lead size for 600A switches shall be 1/0 Cu.

2. Pole ground is only required when arresters are installed on switch pole.

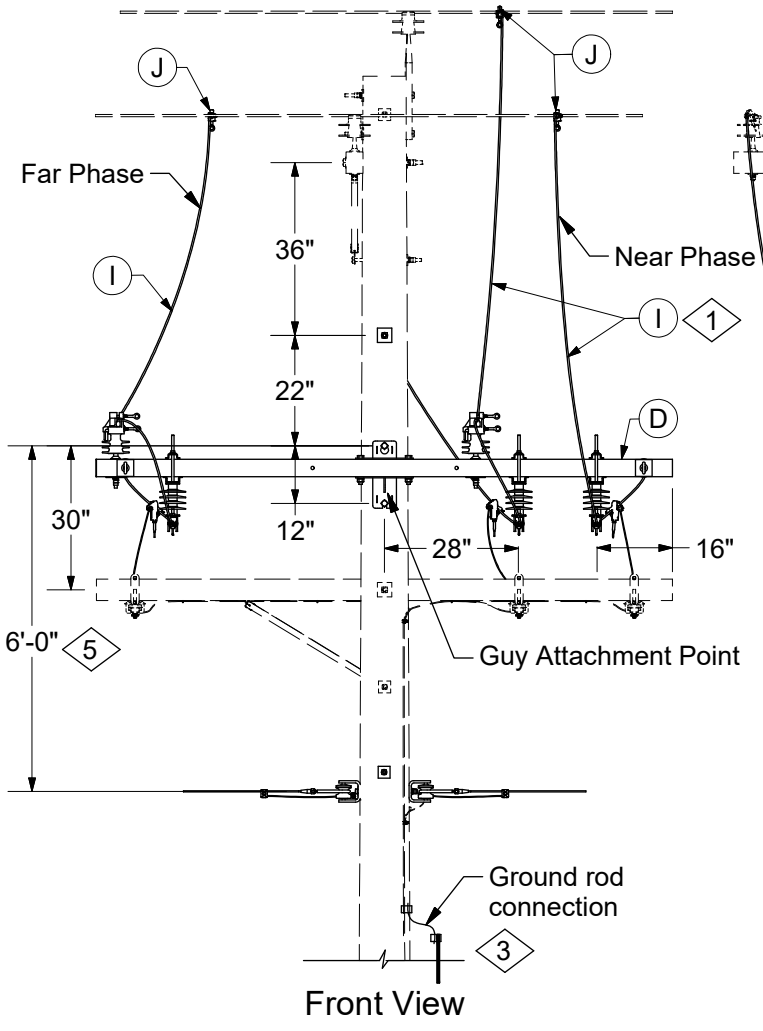
	ITEM	STK / DCS #	DESCRIPTION 10 12 23 **	01	02	03	04	05	06	07	08
	A	25 05 143	Insulator, Vice Top, 12kV	1	1	1	1	2	2	2	2
	B	23 62 028	Pin, Insulator, Long Shank	1	1	1	1	2	2	2	2
	C	23 66 132	Washer, Flat, Sq., 4" x 4", w/ 13/16" Hole	2	2	2	2	4	4	4	4
	D	23 65 043	Lock Nut - 5/8" Square	1	1	1	1	2	2	2	2
	E	23 17 411	Wildlife Guard - Cover Cutout	2	2	2	-	3	3	3	-
	F	23 17 512	Wildlife Guard - Vertical Switch 600 Amp	-	-	-	2	-	-	-	3
	G	10 01 133	Bracket NEMA, Switch	2	2	2	2	3	3	3	3
	H	54 07 208	100A Fused Switch, 15kV	2	-	-	-	3	-	-	-
		54 07 209	200A Fused Switch, 15kV	-	2	-	-	-	3	-	-
		54 07 210	300A Solid Body Switch, 15kV	-	-	2	-	-	-	3	-
		54 07 296	Switch - Disconnect 15kV 600 Amp	-	-	-	2	-	-	-	3
	I	**06 12 30 01 @**	Deadend on Pole w/ F/G Extension	1	1	1	1	1	1	1	1
	J	**06 12 35 01 @**	Single Deadend on F/G Arm	2	2	2	2	2	2	2	2
@	K	**04 00 42 02**	Crossarm - Deadend, F/G 8'	1	1	1	1	1	1	1	1
		04 00 42 03	Crossarm - Deadend, F/G 10'	1	1	1	1	1	1	1	1
@	L	**10 00 01 01 @**	Link - Fused (Sized by Designer)	2	2	-	-	3	3	-	-
1,@	M	**03 01 ** ** @**	Secondary Configuration	1	1	1	1	1	1	1	1
@	N	**07 00 80 00**	Wire, Poly Covered, S.D. (ft.)	20	20	20	20	30	30	30	30
	O	**07 00 21 00**	Clamp - Hot Line	4	4	4	4	6	6	6	6
@		**07 00 25 00**	Clamp, Parallel Groove	4	4	4	4	6	6	6	6
@	P	**11 00 4* ** @**	Guying Unit (Down, Span, or Sidewalk)	1	1	1	1	1	1	1	1
@	Q	**12 12 01 07 @**	Lightning Arrester Installation	1	1	1	1	1	1	1	1
5,@	R	60 55 041	FCI, Non Communicating, 8hr or 3A reset, 100A min Trip	#	#	#	#	#	#	#	#

DESIGN NOTE(s):

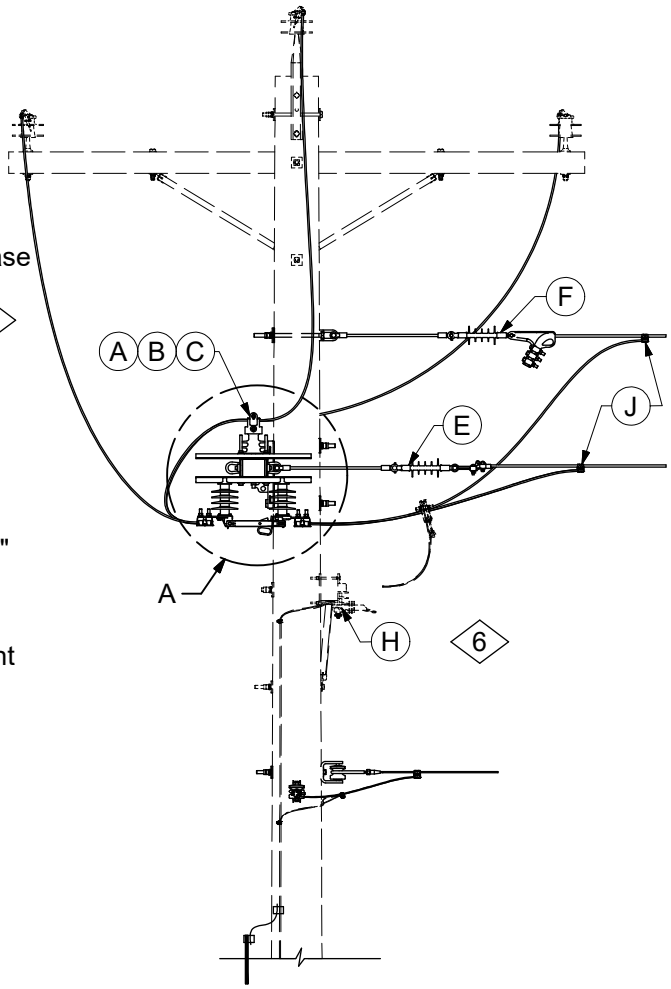
3. Arresters are not required for normally closed switch installations. Where switches are normally open, install arresters on adjacent pole if the circuit on that side of the switch does not extend in both directions. When installing arresters on adjacent pole for lower circuit is not practical, arresters may be installed on a crossarm 30" below the buckarm for that side of the switch if there is 6'-0" of clearance between buckarm and neutral. See DCS **12 00 01 01** for arresters selection.

4. This dimension may be reduced to 40" on existing poles to avoid replacing otherwise serviceable poles.

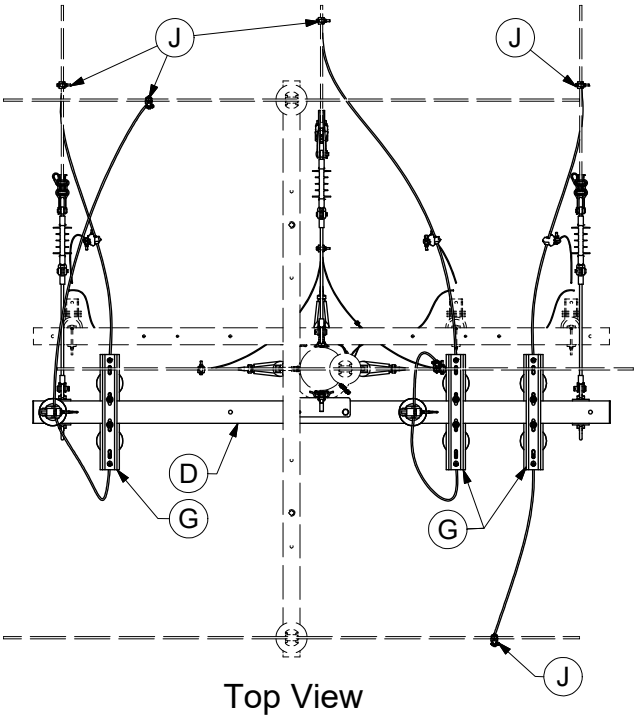
5. FCI's may be installed on line conductor from 1/0 and larger when solid blade switches are installed.



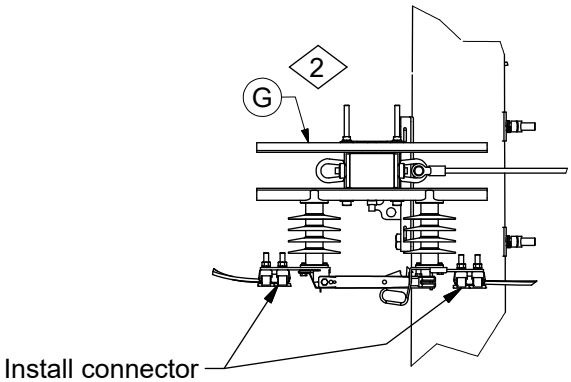
Front View



Side View



Top View



Detail A

REV	DATE	ENG	DESCRIPTION
10	01/01/24	DT	Converted to new format
9	06/30/16	WYW	

CONSTRUCTION NOTE(s):

1. Minimum lead wire size shall be 1/0 Cu.

2. Outer mounting bolts for switch shall not be installed when switch is mounted on single crossarm. Inner mounting bolts should be installed in closest position to crossarm possible.

3. Pole ground is only required when arresters are installed on switch pole.

	ITEM	STK / DCS #	DESCRIPTION 10 12 24 **	02
	A	23 62 028	Pin, Insulator, Long Shank	2
	B	23 66 132	Washer, Flat, Sq., 4" x 4", w/ 13/16" Hole	4
	C	25 05 143	Insulator, Vice Top, 15kV	2
	D	**04 00 42 03**	Crossarm - Deadend, F/G 10'	1
	E	**06 12 35 03 @**	Single Deadend on Crossarm with FG Extention	2
	F	**06 12 30 01 @**	Deadend on Pole with FG Extention	1
2,4	G	54 07 204	Switch, Disc. 600A., 15 kV	3
6,@	H	**12 12 01 07 @**	Arrester Installation	1
@	I	**07 00 80 00**	Wire, Poly covered	20
@	J	**07 00 25 00**	Clamp, Parallel Groove	3
7,@	K	60 55 041	FCI, Non Communicating, 8hr or 3A reset, 100A min Trip	#

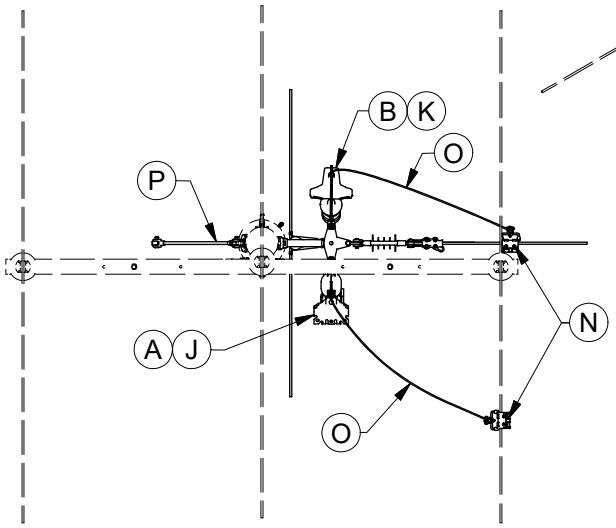
DESIGN NOTE(s):

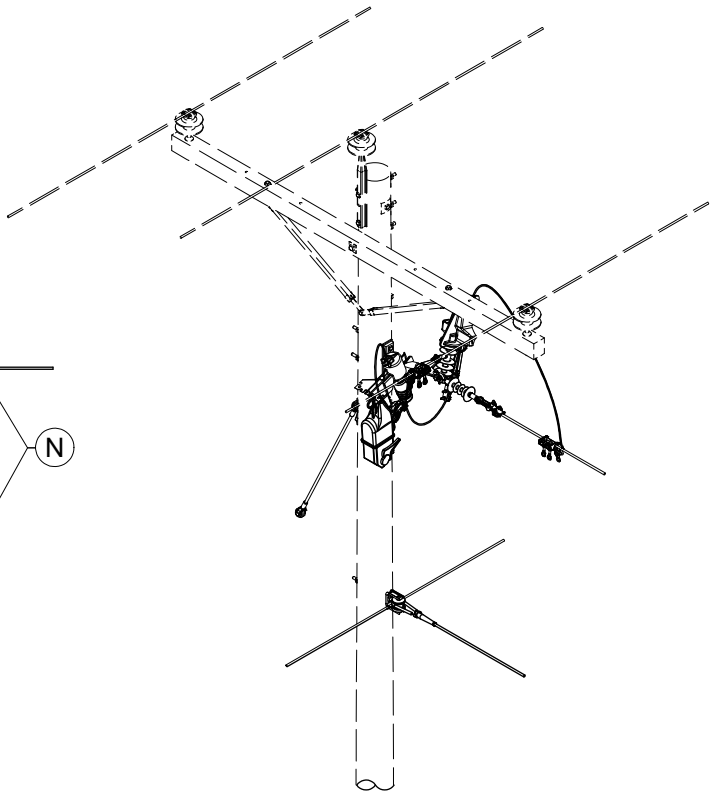
4. Switches may be installed on existing serviceable double wood crossarms.

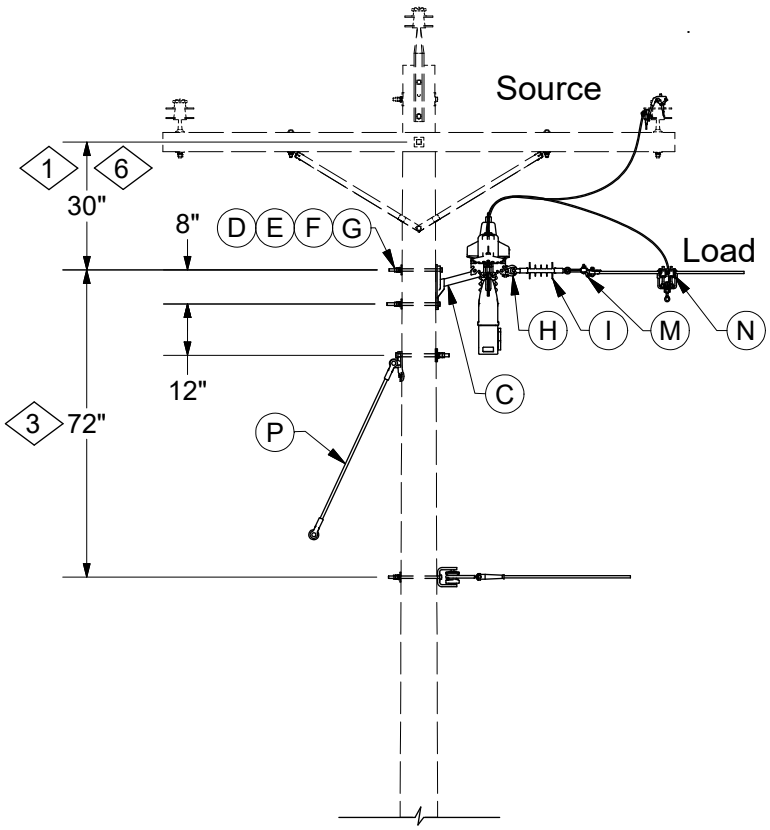
5. This dimension may be reduced to 40" on existing poles to avoid replacing otherwise serviceable poles.

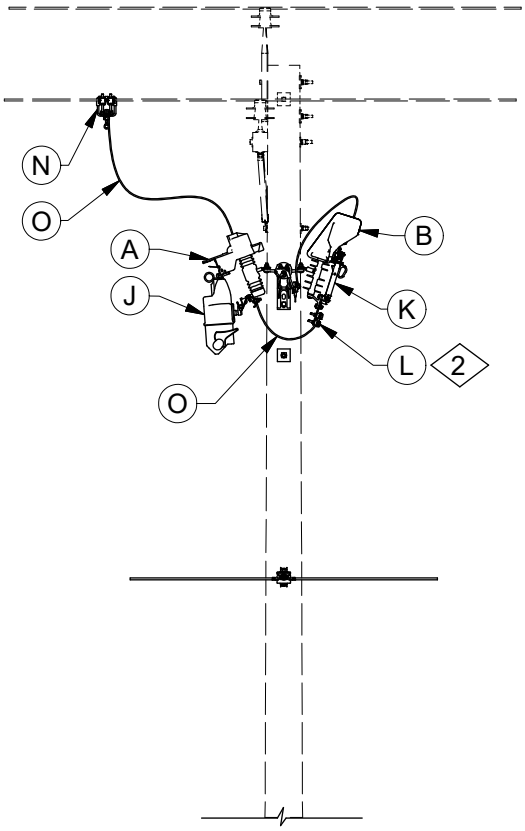
6. Arresters are not required for normally closed switch installations. Where switches are normally open, install arresters on adjacent pole if the circuit on that side of the switch does not extend in both directions. When installing arresters on adjacent pole for lower circuit is not practical, arresters may be installed on a crossarm 30" below the buckarm for that side of the switch if there is 6'-0" of clearance between buckarm and neutral. See DCS **12 00 01 01** for arresters selection.

7. FCI's may be installed on line conductor from 1/0 and larger when switches are installed.



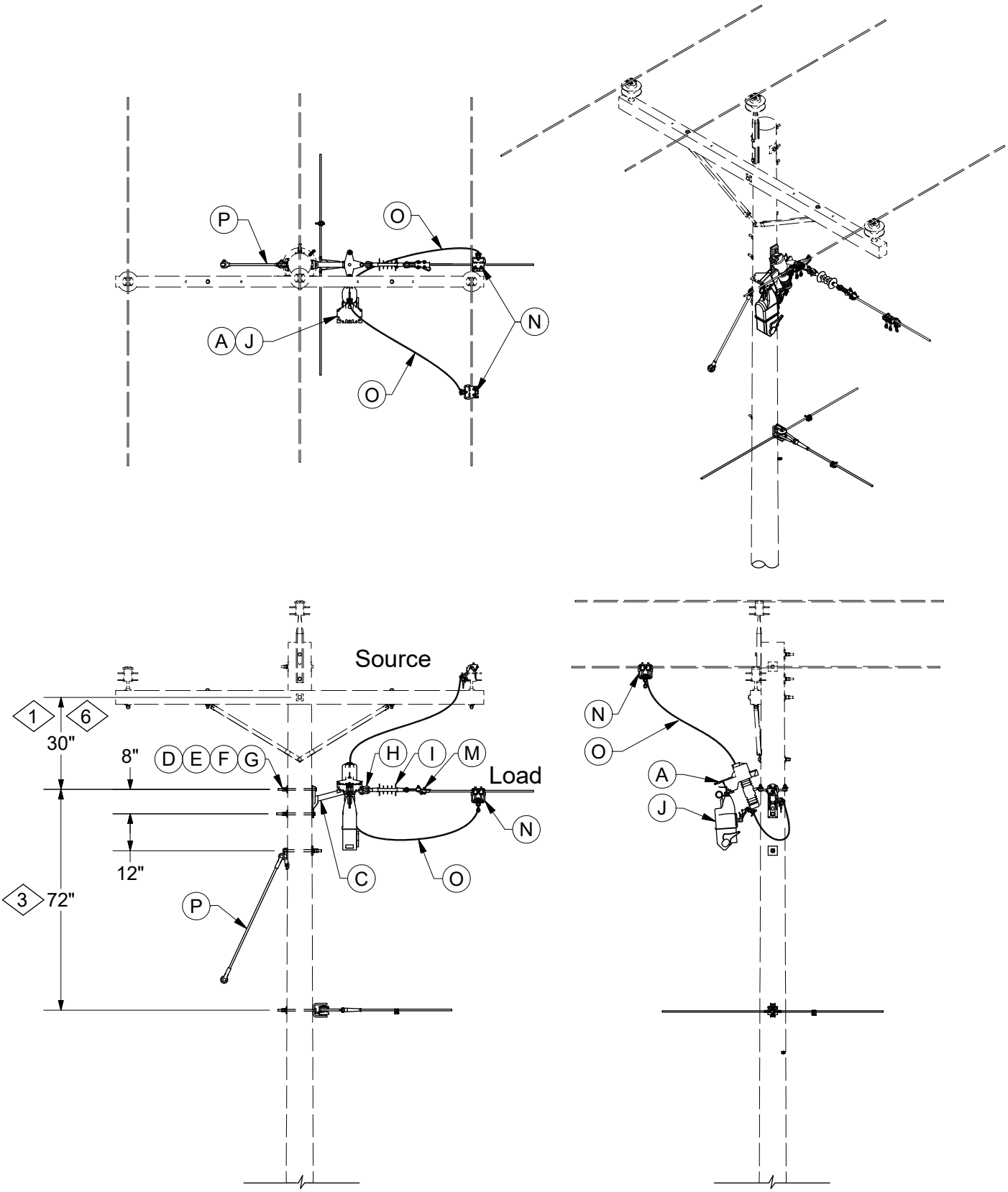






10 12 25 01
Tripsaver with 600 Amp Switch

REV	DATE	ENG	DESCRIPTION
005	07/01/20	DT	Conversion to new standard book format
004	04/01/19	DT	Added Connector 17 51 114 and replaced switch avian protection



10 12 25 02
Tripsaver Without 600 Amp Switch 8

REV	DATE	ENG	DESCRIPTION
005	07/01/20	DT	Conversion to new standard book format
004	04/01/19	DT	Added Connector 17 51 114 and replaced switch avian protection

Tripsaver Stock Numbers	
STK #	**DESCRIPTION**
69 10 279	10T trip - 10T drop open, 40A continuous
69 10 280	20T trip - 20T drop open, 40A continuous
69 10 281	25T trip - 25T drop open, 40A continuous
69 10 282	30T trip - 30T drop open, 40A continuous
69 10 283	40T trip - 40T drop open, 40A continuous (IL only)
69 10 258	40T trip - 40T drop open, 100A continuous (MO only)
69 10 278	50T trip - 50T drop open, 100A continuous
69 10 253	65T trip - 65T drop open, 100A continuous
69 10 254	80T trip - 80T drop open, 100A continuous
69 10 255	100T trip - 100T drop open, 100A continuous
69 10 269	100T trip - 100T drop open, 200A continuous
69 10 270	140T trip - 140T drop open, 200A continuous
69 10 264	User Programmed, 40A continuous
69 10 260	User Programmed, 100A continuous
69 10 267	User Programmed, 200A continuous

CONSTRUCTION NOTE(s):

1. For armless construction, apply dimension shown to upper bolt of lowest insulator. For single phase pole, use 36" from the top of the pole.

2. When Conductor is smaller than 1/0, replace two bolt connectors on 600A switch with Stock #17 51 114.

	ITEM	STK / DCS #	DESCRIPTION 10 12 25 **	01	02
	A	23 17 411	Wildlife Guard - Cover Cutout	1	1
	B	23 17 512	Wildlife Guard - Vertical Switch 600 Amp	1	-
5	C	23 56 063	Bracket - Equipment Mount 3 Position	1	1
	D	23 52 065	Bolt, Mach., 5/8" x 12" w/ square nut	2	2
	E	23 66 027	Washer, Flat, Square 5/8"	2	2
	F	23 66 134	Lock Washer - 5/8" Double Coil	2	2
	G	23 65 043	Lock Nut - 5/8" Square	2	2
	H	23 68 181	Shackle - Deadend	1	1
	I	25 06 052	Insulator, Deadend, 12kV	1	1
	J	-	Tripsaver II - See Stock Number Table Above	1	1
	K	54 07 296	Switch - Disconnect 15kV 600 Amp	1	-
@	L	17 51 114	Connector - One Bolt #8 to 2/0	2	-
@	M	**07 00 11 00 @**	Clamp, Deadend	1	1
@	N	**07 00 21 00 @**	Hotline Clamp and Stirrup	2	2
@	O	**07 00 80 00 @**	Wire - Poly Covered (ft.)	10	10
@	P	**11 00 ** ** @**	Guy Unit	1	1

REV	DATE	ENG	DESCRIPTION
005	07/01/20	DT	Conversion to new standard book format
004	04/01/19	DT	Added Connector 17 51 114 and replaced switch avian protection

DESIGN NOTE(s):

3. This dimension may be reduced to 40" for existing poles to prevent replacement of otherwise serviceable poles.

4. Stock #69 10 260, stock #69 10 264 and stock #69 10 267 must be programmed before installation. The programming kit is stock #69 10 259 if needed.

5. Maximum line tension of 5,000 pounds for item C.

6. This dimension may be reduced to 24" for existing pole to prevent replacement of otherwise serviceable poles.

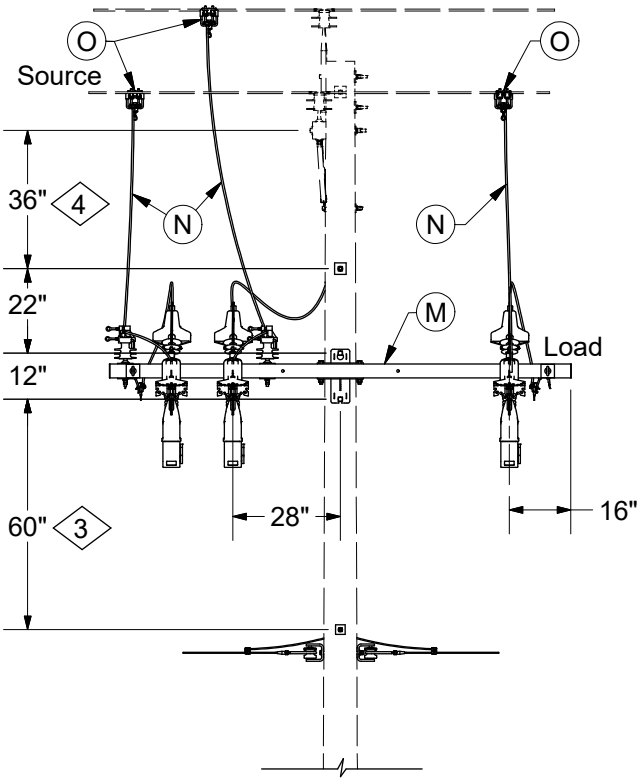
7. If fused switches are currently installed on a three point bracket with this configuration, tripsavers may be installed using existing dimensions.

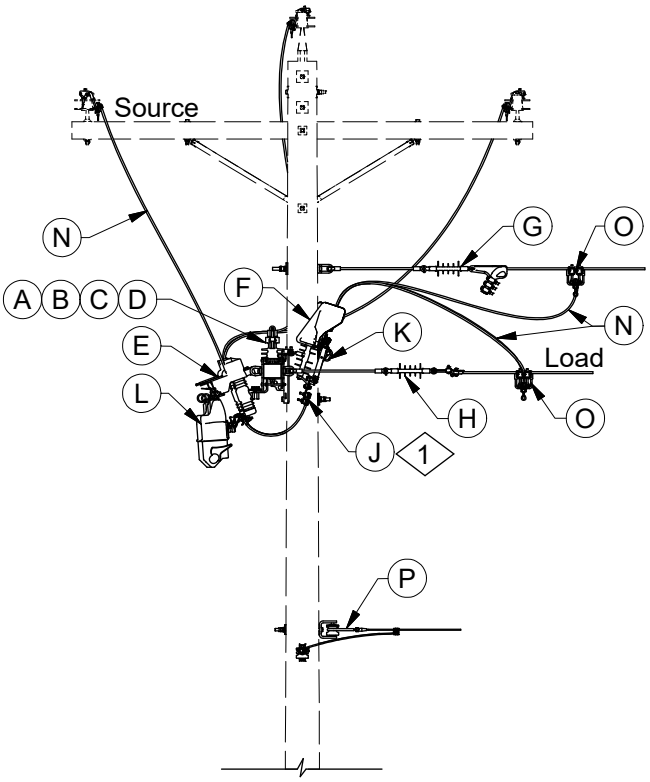
8. DCS 10 12 25 02 (omitting 600 amp switch) MUST be installed in locations that are bucket truck accessible and only available in Illinois.

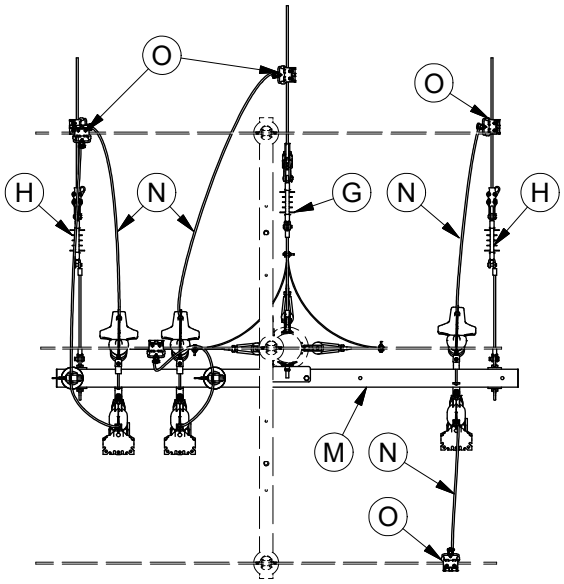
OPERATIONS NOTE(s):

9. If equipped with 600 amp switch, when closing Tripsaver, do not pick up load.
   - Open solid blade switch.
   - Close Tripsaver.
   - Close solid blade switch.

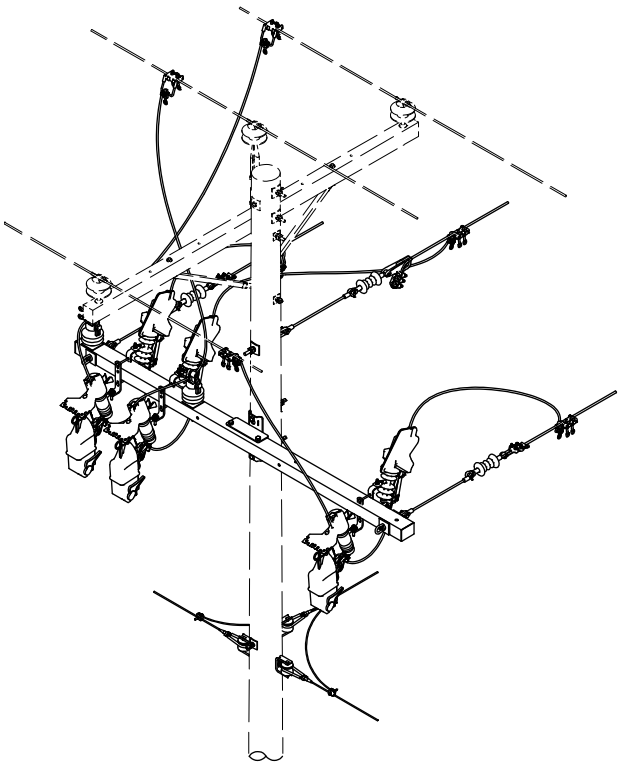
10. When 600 amp switch is omitted, do not close Tripsaver using extendo stick.







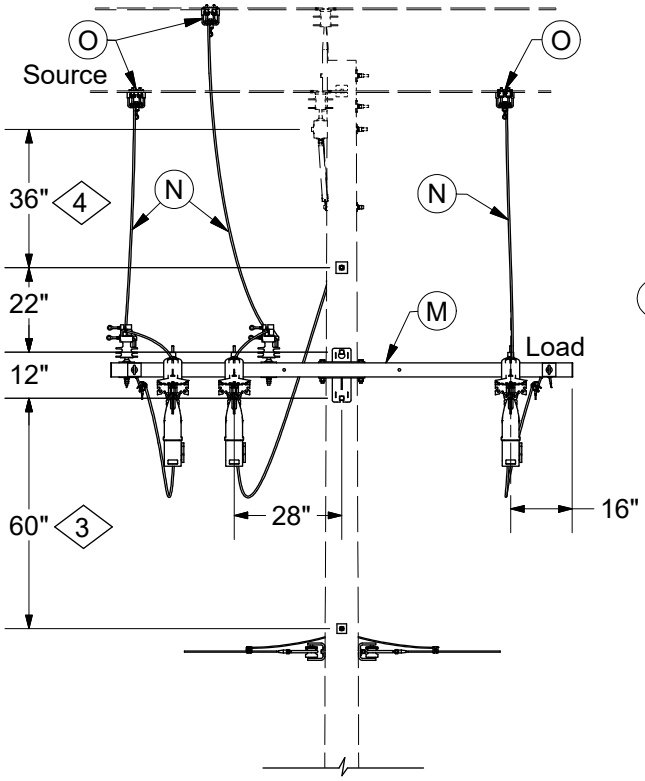
Top View

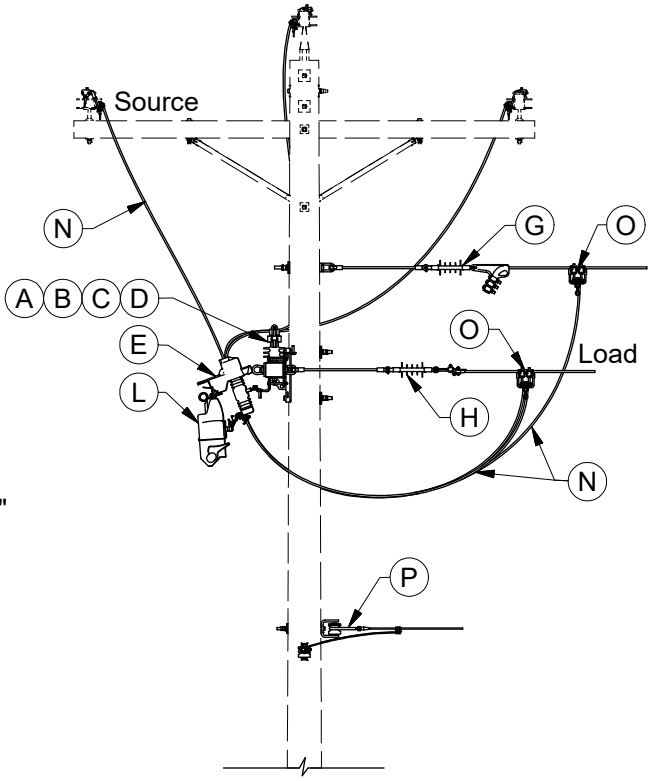


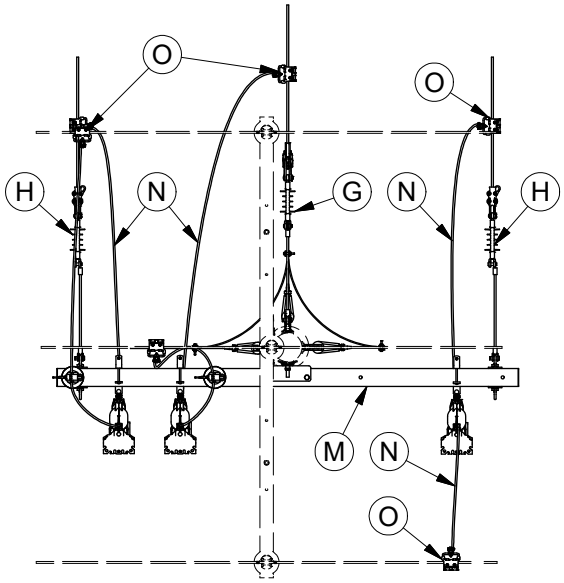
Isometric View

DCS#	DESCRIPTION
10 12 26 01	2-Phase Tripsavers with 600A Switches
10 12 26 02	3-Phase Tripsavers with 600A Switches

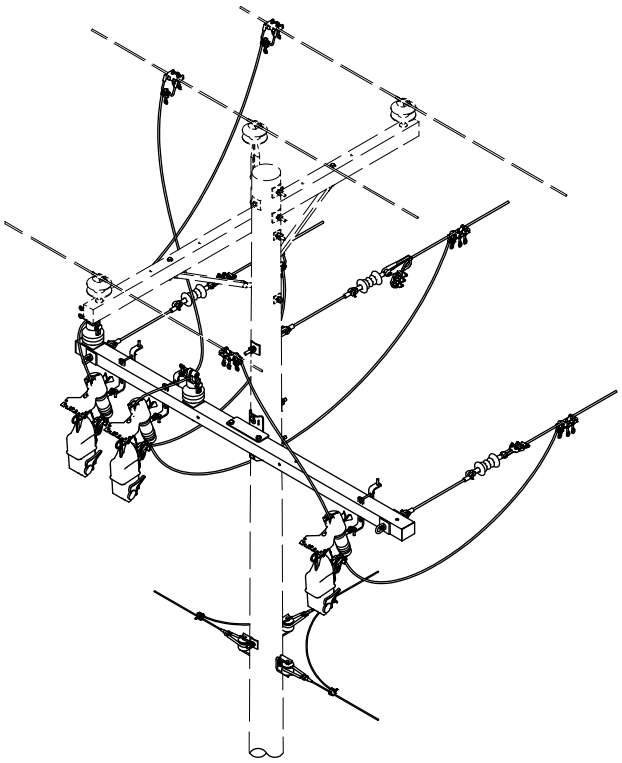
REV	DATE	ENG	DESCRIPTION
4	01/01/24	JMW	Updated to new book format
3	04/01/19	DT	Updates to switch connectors and avian protection







Top View



Isometric View

DCS#	DESCRIPTION	
10 12 26 03	2-Phase Tripsavers without 600A Switches	6
10 12 26 04	3-Phase Tripsavers without 600A Switches	

REV	DATE	ENG	DESCRIPTION
4	01/01/24	JMW	Updated to new book format
3	04/01/19	DT	Updates to switch connectors and avian protection

Tripsaver Stock Numbers	
STK #	**DESCRIPTION**
69 10 279	10T trip - 10T drop open, 40A continuous
69 10 280	20T trip - 20T drop open, 40A continuous
69 10 281	25T trip - 25T drop open, 40A continuous
69 10 282	30T trip - 30T drop open, 40A continuous
69 10 283	40T trip - 40T drop open, 40A continuous (IL only)
69 10 258	40T trip - 40T drop open, 100A continuous (MO only)
69 10 278	50T trip - 50T drop open, 100A continuous
69 10 253	65T trip - 65T drop open, 100A continuous
69 10 254	80T trip - 80T drop open, 100A continuous
69 10 255	100T trip - 100T drop open, 100A continuous
69 10 269	100T trip - 100T drop open, 200A continuous
69 10 270	140T trip - 140T drop open, 200A continuous
69 10 264	User Programmed, 40A continuous
69 10 260	User Programmed, 100A continuous
69 10 267	User Programmed, 200A continuous

CONSTRUCTION NOTE(s):

1. Replace two bolt connectors on 600A switch with Stock #17 51 114, when conductor (item N) is smaller than 1/0.

	ITEM	STK / DCS #	DESCRIPTION **10 12 26 ****	01	02	03	04
	A	25 05 143	Insulator, Vice Top, 12kV	1	2	1	2
	B	23 62 028	Pin, Insulator, Long Shank	1	2	1	2
	C	23 66 132	Washer, Flat, Sq., 4" x 4", w/ 13/16" Hole	2	4	2	4
	D	23 65 043	Lock Nut - 5/8" Square	1	2	1	2
	E	23 17 411	Wildlife Guard - Cover Cutout	2	3	3	2
	F	23 17 512	Wildlife Guard - Vertical Switch 600 Amp	2	3	3	2
	G	**06 12 30 01 @**	Deadend on Pole w/FG Extension	-	1	-	1
	H	**06 12 35 01 @**	Deadend on FG Single Arm	2	2	2	2
	I	17 58 054	Bracket - Arrester/Cutout Mounting	-	-	2	3
		23 56 088	Bracket - Crossarm Double Sided NEMA	2	3	-	-
	J	17 51 114	Connector - One Bolt #8 to 2/0	4	4	6	4
	K	54 07 296	Switch - Disconnect 15kV 600 Amp	2	3	-	-
@	L	-	Tripsaver II - See stock number table above	2	3	2	3
@	M	**04 00 42 02**	Crossarm - Deadend FG 8'	1	1	1	1
		04 00 42 03	Crossarm - Deadend FG 10'	1	1	1	1
1,@	N	**07 00 80 00 @**	Wire -Poly Covered S.D. (ft.)	20	30	20	30
@	O	**07 00 21 00 @**	Hotline Clamp and Stirrup	4	6	4	6
@	P	**03 01 ** ** @**	Secondary Configuration	1	1	1	1

REV	DATE	ENG	DESCRIPTION
4	01/01/24	JMW	Updated to new book format
3	04/01/19	DT	Updates to switch connectors and avian protection

DESIGN NOTE(s):

2. Stock #69 10 260, Stock #69 10 264, and Stock #69 10 269 must be programmed by the end user.

3. This dimension may be reduced to 40" for existing poles to prevent replacement of otherwise serviceable poles.

4. This dimension may be reduced to 24" for existing poles to prevent replacement of otherwise serviceable poles.

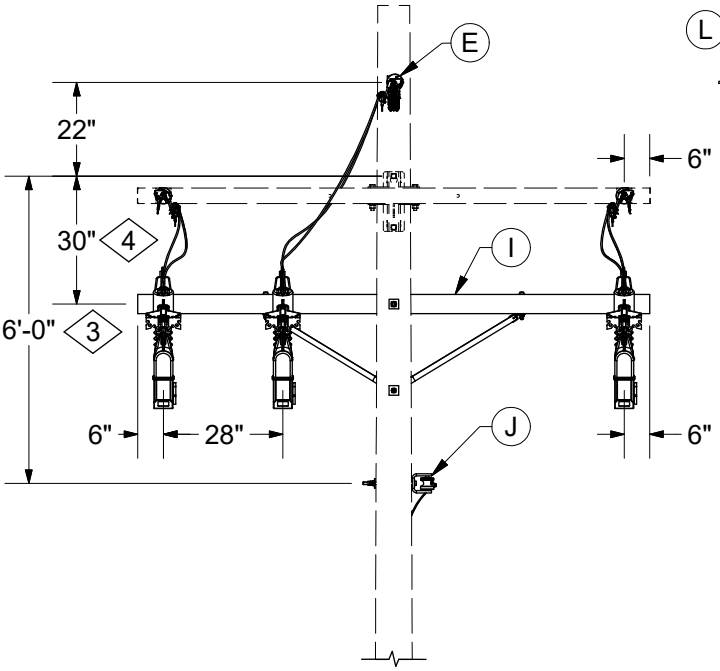
5. If fused cutout are currently installed on a crossarm with this configuration, Tripsavers may be installed using existing crossarm dimensions.

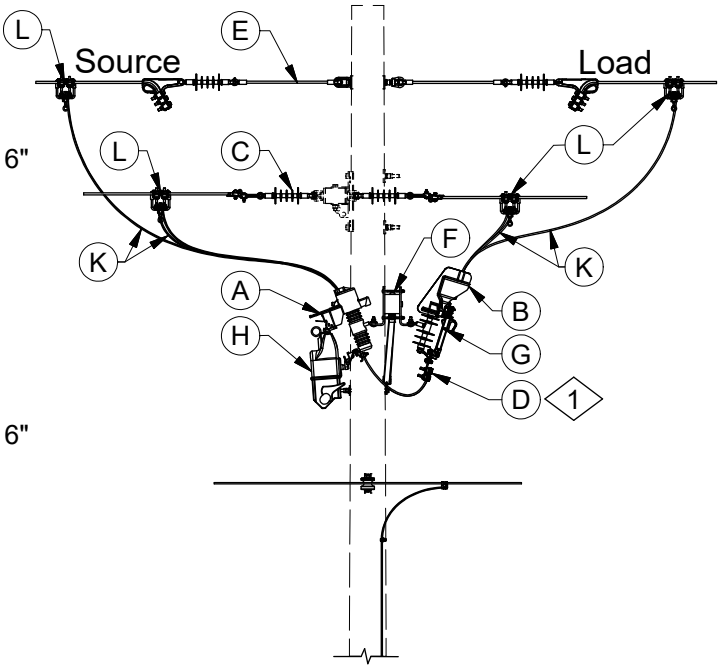
6. DCS **10 12 26 03** and **10 12 26 04** (omitting 600 amp switch) MUST be installed in locations that are bucket truck accessible and only available in Illinois.

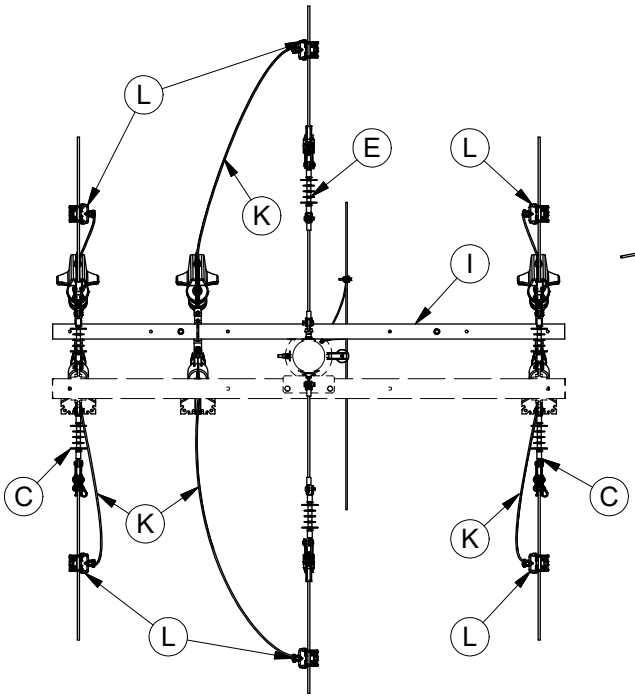
OPERATIONS NOTE(s):

7. If equipped with 600A switch, when closing Tripsaver, do not pick up load.
   - Open solid blade switch.
   - Close Tripsaver.
   - Close solid blade switch.

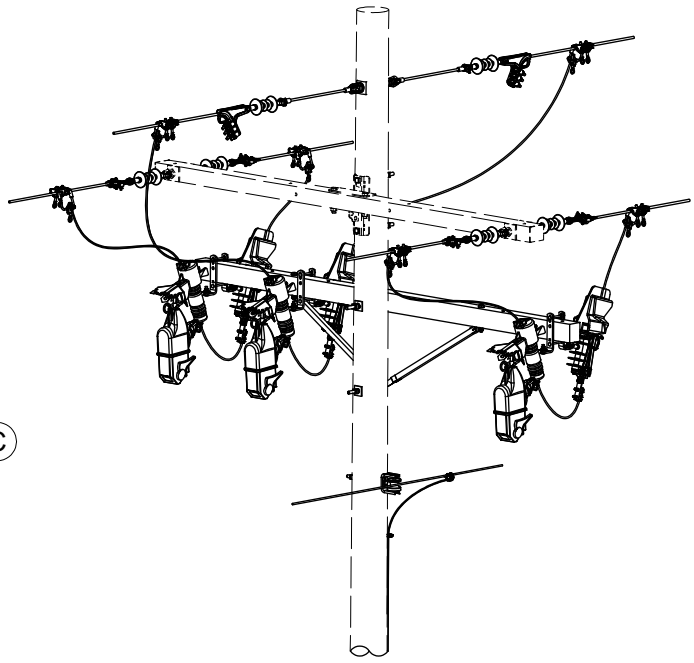
8. When 600A switch is omitted, do not close Tripsaver using Extendo Stick.





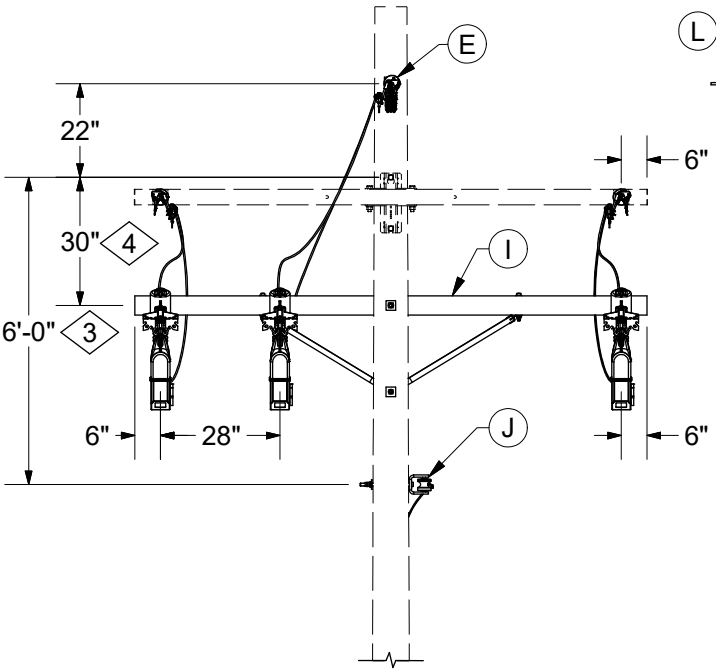


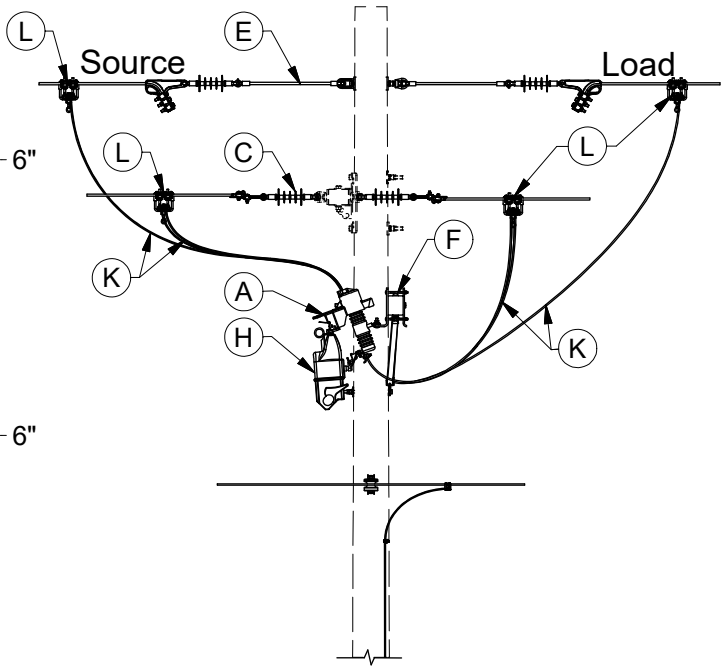
Top View

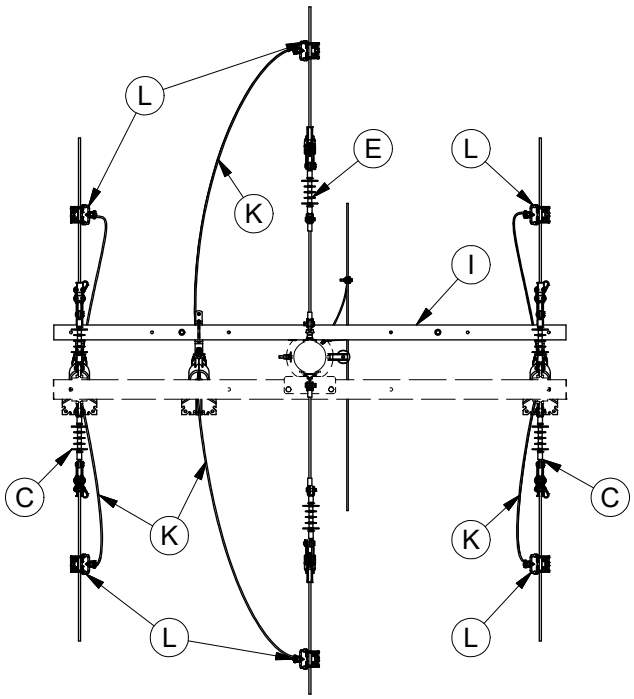


Isometric View

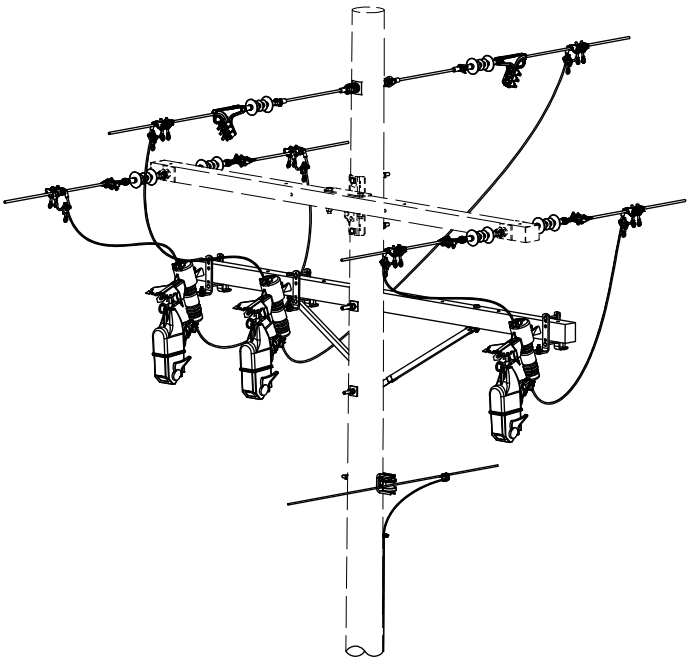
DCS #	DESCRIPTION
10 12 27 01	2-Phase Tripsavers with 600A Switches
10 12 27 02	3-Phase Tripsavers with 600A Switches







Top View



Isometric View

DCS #	DESCRIPTION	
10 12 27 03	2-Phase Tripsavers without 600A Switches	6
10 12 27 04	3-Phase Tripsavers without 600A Switches	

REV	DATE	ENG	DESCRIPTION
1	01/01/24	DT	Converted to new format
0	07/01/20	DT	New Issue

Tripsaver Stock Numbers	
STK #	**DESCRIPTION**
69 10 279	10T trip - 10T drop open, 40A continuous
69 10 280	20T trip - 20T drop open, 40A continuous
69 10 281	25T trip - 25T drop open, 40A continuous
69 10 282	30T trip - 30T drop open, 40A continuous
69 10 283	40T trip - 40T drop open, 40A continuous (IL only)
69 10 258	40T trip - 40T drop open, 100A continuous (MO only)
69 10 278	50T trip - 50T drop open, 100A continuous
69 10 253	65T trip - 65T drop open, 100A continuous
69 10 254	80T trip - 80T drop open, 100A continuous
69 10 255	100T trip - 100T drop open, 100A continuous
69 10 269	100T trip - 100T drop open, 200A continuous
69 10 270	140T trip - 140T drop open, 200A continuous
69 10 264	User Programmed, 40A continuous
69 10 260	User Programmed, 100A continuous
69 10 267	User Programmed, 200A continuous

CONSTRUCTION NOTE(s):

1. Replace two bolt connectors on 600A switch with stock #17 51 114, when conductor (Item K) is smaller than 1/0.

	ITEM	STK / DCS #	DESCRIPTION 10 12 27 **	01	02	03	04
	A	23 17 411	Wildlife Guard - Cover Cutout	2	3	2	3
	B	23 17 512	Wildlife Guard - Vertical Switch 600 Amp	2	3	-	-
	C	**06 12 35 02 @**	Double Deadend on FG Arm	2	2	2	2
	D	17 51 114	Connector - One Bolt #8 to 2/0	4	6	-	-
	E	**06 12 30 03 @**	Dbl Deadend on Pole w/FG Extension	4	6	4	6
	F	17 58 054	Bracket - Arrester/Cutout Mounting	2	3	-	-
		23 56 088	Bracket - Crossarm Double Sided NEMA	-	-	2	3
6	G	54 07 296	Switch - Disconnect 15kV 600 Amp	2	3	-	-
@	H	-	Tripsaver II - See stock number table above	2	3	2	3
@	I	**04 00 20 03**	10' Single Wood Crossarm	1	1	1	1
		04 00 41 16	10' F/G Tangent Crossarm	1	1	1	1
@	J	**03 01 ** ** @**	Secondary Configuration	1	1	1	1
@	K	**07 00 80 00**	Wire - Poly Covered S.D. (ft.)	20	30	20	30
@	L	**07 00 21 00**	Hotline Clamp and Stirrup	4	6	4	6

REV	DATE	ENG	DESCRIPTION
1	01/01/24	DT	Converted to new format
0	07/01/20	DT	New Issue

DESIGN NOTE(s):

2. Stock #69 10 260, stock #69 10 264, and stock #69 10 267 must be programmed by user.

3. This dimension may be reduced to 40" for existing poles to prevent replacement of otherwise serviceable poles.

4. This dimension may be reduced to 24" for existing poles to prevent replacement of otherwise serviceable poles.

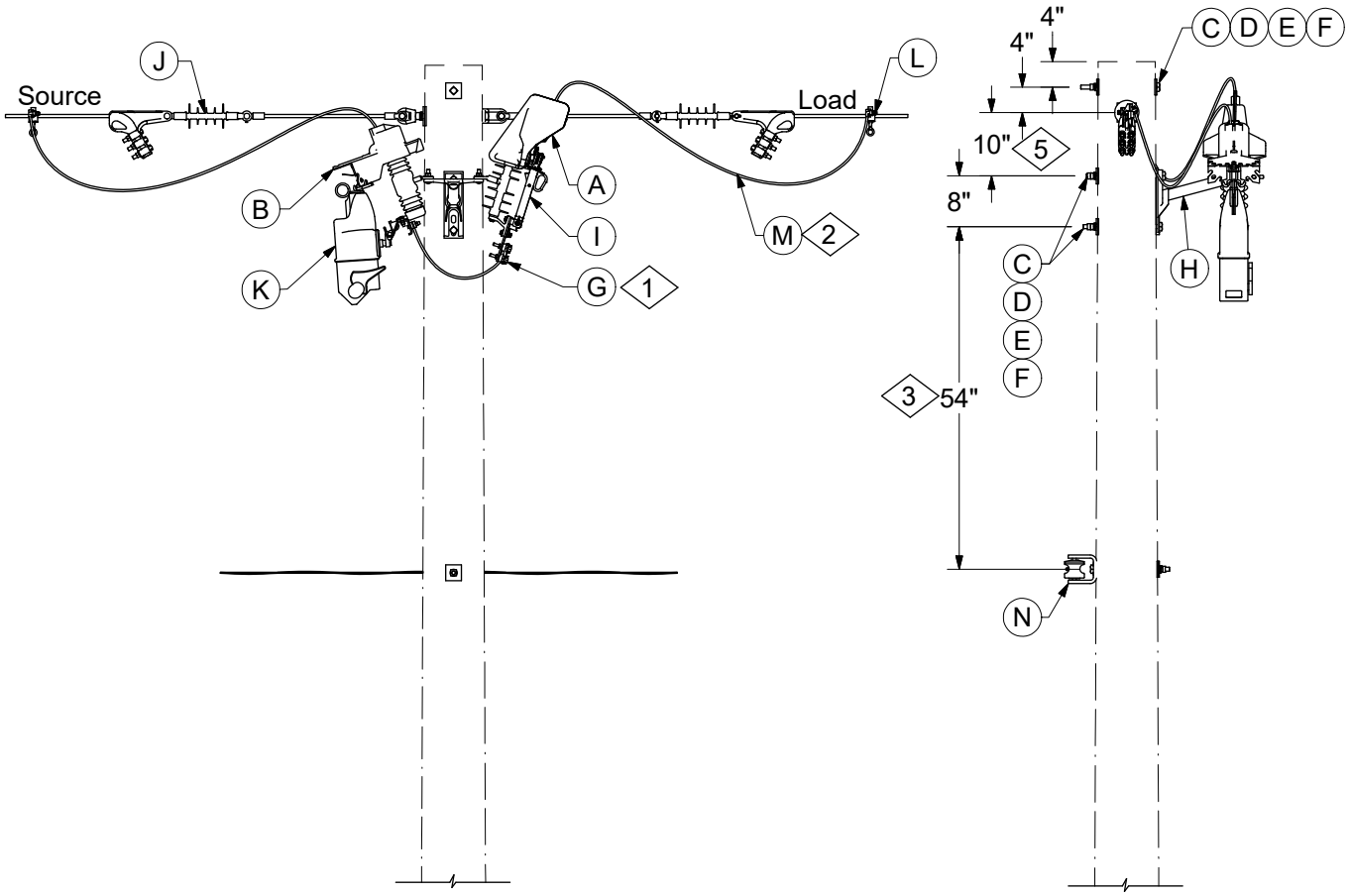
5. If fused cutouts are currently installed on a crossarm with this configuration, tripsavers may be installed using existing crossarm dimensions.

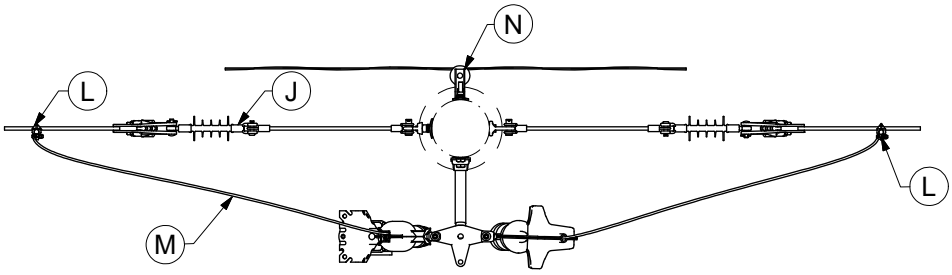
6. DCS 10 12 27 03 and 10 12 27 04 (omitting 600 amp switch) MUST be installed in locations that are bucket truck accessible and only available in Illinois.

OPERATIONS NOTE(s):

7. Tripsavershave a symmetrical fault current rating 6.3kA while Ameren's standard 100A fused switch has a symmetrical fault current rating of 10kA and the 200A switch is rated for 7.5kA.

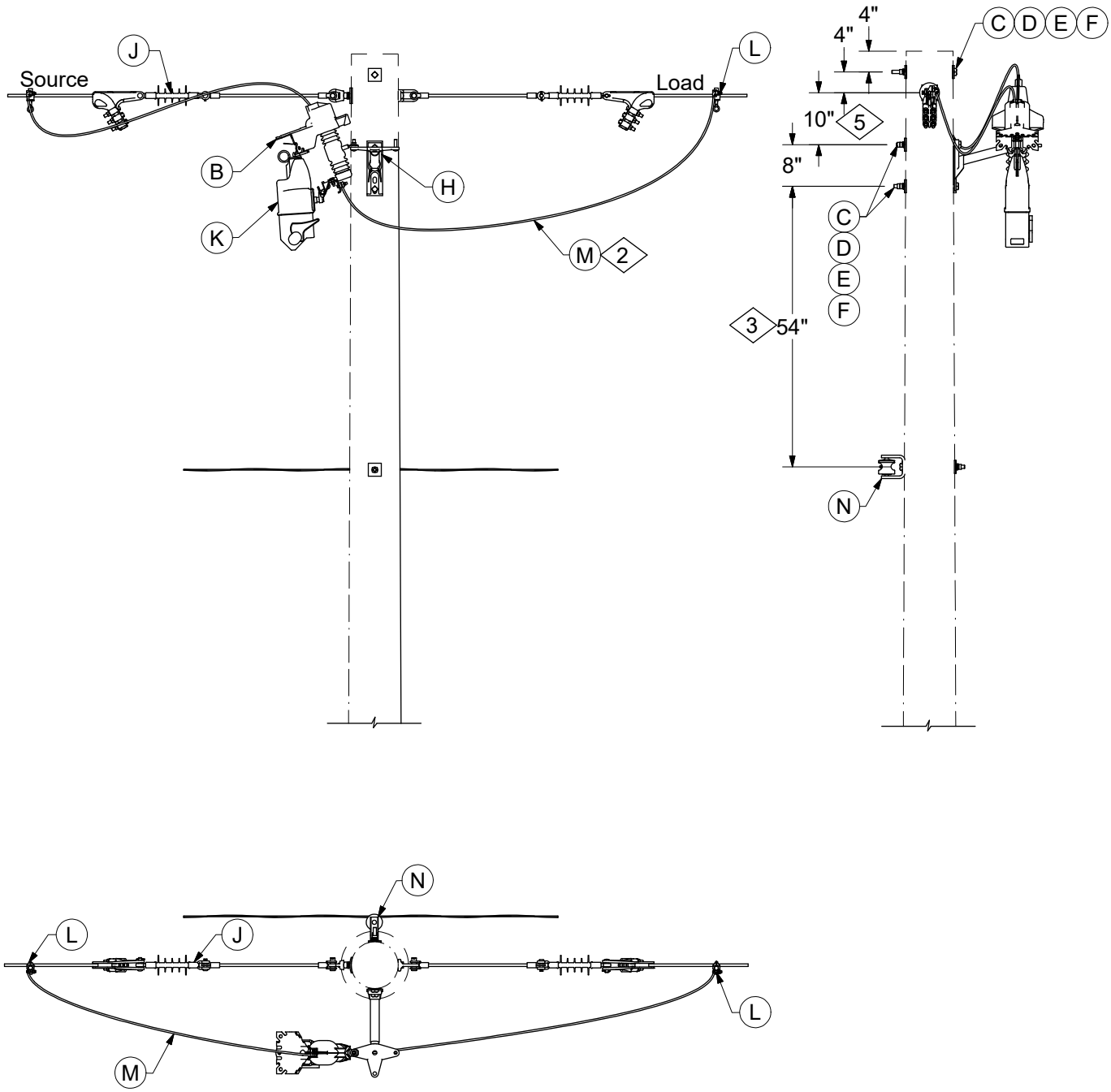
8. When 600A switch is omitted, do not close Tripsaver using extendo stick.





Top View

REV	DATE	ENG	DESCRIPTION
1	01/01/24	DT	Converted to new format
	xx/xx/xx	xxx	



Top View

10 12 28 02
Tripsaver without 600A Switch 7

Tripsaver Stock Numbers	
STK #	**DESCRIPTION**
69 10 279	10T trip - 10T drop open, 40A continuous
69 10 280	20T trip - 20T drop open, 40A continuous
69 10 281	25T trip - 25T drop open, 40A continuous
69 10 282	30T trip - 30T drop open, 40A continuous
69 10 283	40T trip - 40T drop open, 40A continuous (IL only)
69 10 258	40T trip - 40T drop open, 100A continuous (MO only)
69 10 278	50T trip - 50T drop open, 100A continuous
69 10 253	65T trip - 65T drop open, 100A continuous
69 10 254	80T trip - 80T drop open, 100A continuous
69 10 255	100T trip - 100T drop open, 100A continuous
69 10 269	100T trip - 100T drop open, 200A continuous
69 10 270	140T trip - 140T drop open, 200A continuous
69 10 264	User Programmed, 40A continuous
69 10 260	User Programmed, 100A continuous
69 10 267	User Programmed, 200A continuous

CONSTRUCTION NOTE(s):

1. Replace two bolt connectors on 600A switch with Stock #17 51 114. When conductor (item M) is smaller than 1/0.

2. Maximum wire size shall be 1/0 Cu for item M.

	ITEM	STK / DCS #	DESCRIPTION 10 12 28 **	01	02
	A	23 17 512	Wildlife Guard - Vertical Switch 600 Amp	1	-
	B	23 17 411	Wildlife Guard - Cover Cutout	1	1
	C	23 52 065	Bolt, Mach., 5/8" x 12" w/ square nut	3	3
	D	23 66 207	Washer, Curved, Square, 5/8"	4	4
	E	23 66 134	Lock Washer - 5/8" Double Coil	3	3
	F	23 65 043	Lock Nut - 5/8" Square	3	3
	G	17 51 114	Connector - One Bolt #8 to 2/0	2	-
	H	23 56 063	Bracket - Equipment Mount 3 Position	1	1
	I	54 07 296	Switch - Disconnect 15kV 600 Amp	1	-
	J	**06 12 30 03 @**	Dbl Deadend on Pole w/ FG Extention	1	1
@	K	-	Tripsaver II - See stock numbers table above	1	1
@	L	**07 00 21 00**	Hotline Clamp and Stirrup	2	2
2,@	M	**07 00 80 00 @**	Wire - Poly Covered (ft)	10	10
@	N	**03 01 ** ** @**	Secondary Configuration	1	1

REV	DATE	ENG	DESCRIPTION
1	01/01/24	DT	Converted to new format
	xx/xx/xx	xxx	

DESIGN NOTE(s):

3. This dimension may be reduced to 28” for existing poles to prevent replacement of otherwise serviceable poles.

4. Stock # 69 10 260, stock #69 10 267 and stock #69 10 264 must be programmed. The programming kit is stock # 69 10 259.

5. This dimension may be reduced to 4” for existing poles to prevent replacement of otherwise serviceable poles.

6. If fused cutouts are currently installed on a three point bracket with this configuration the Tripsaver may be installed using existing dimensions.

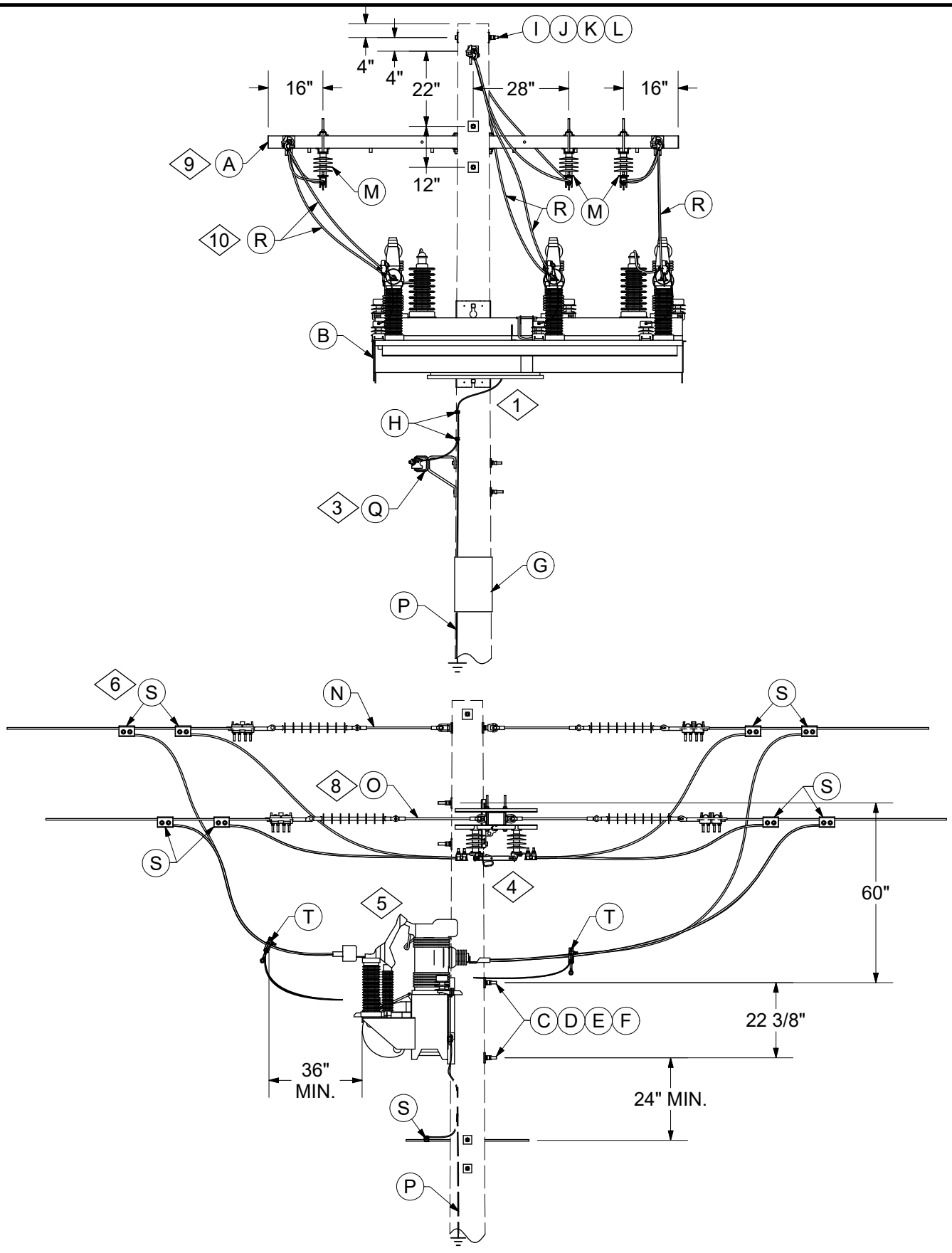
7. DCS **10 12 28 02** (omitting 600 amp switch) MUST be installed in locations that are bucket truck accessible and only available in Illinois.

OPERATIONS NOTE(s):

8. Tripsavers have a symmetrical fault current rating 6.3kA while Ameren's standard 100A fused cutout has a symmetrical fault current rating of 10kA and the 200A cutout is rated for 7.5kA.

9. If equipped with 600 amp switch, when closing Tripsaver, do not pick up load.
   - Open solid blade switch.
   - Close Tripsaver.
   - Close solid blade switch.

10. When 600A switch is omitted, do not close Tripsaver using extendo stick.


I J K L
4"
4"
22"
28"
16"
16"
12"
9 A
M
R M R
10 R
B
1
H
3 Q
G
P
6 S
N
S
8 O
S
S
4
5
T
T
60"
C D E F
22 3/8"
36" MIN.
24" MIN.
S
P

CONSTRUCTION NOTE(s):

1. Intellirupter recloser frame must be connected to ground with #2 Cu. Pole ground to neutral connection must be #2 Cu.

2. Tool for removal / install of radio module and control module is Stock #46 01 645.

3. Install neutral/secondary using extension brackets on the side of the pole with only one phase to allow access to the compartments on the bottom of the Intellirupter. The neutral/secondary may be dead-ended to the pole as long as they are mounted 36 inches below the bottom mounting bolt of the Intellirupter.

4. Bypass switch shall be installed to open towards climbing side of pole. Only install the two inside bolts on the switch and slide them as close to the crossarm as possible, when installing switches on single crossarm.

5. Integral disconnect switches on recloser shall be in the open position while connecting primary leads to the recloser.

6. The recloser leads shall be connected to the line connector with a piggy-back clamp (Stock #85 38 392) during the installation. The lightning arresters shall be connected to the recloser leads with hot line clamps and the hot line clamps must be installed 36” away from the aluminum base of the Intellirupter. Then, the recloser leads shall be permanently connected with parallel groove clamps and the piggy-back clamps shall be removed.

7. Intellirupter Recloser weighs 1010 lbs.

8. Install 26” fiberglass extension to provide clearance between insulator and switch.

9. When differential tension is present, fiberglass crossarm shall be installed on the side of the pole with lower tension. Intellirupter shall be installed on opposite side of the pole as fiberglass crossarm.

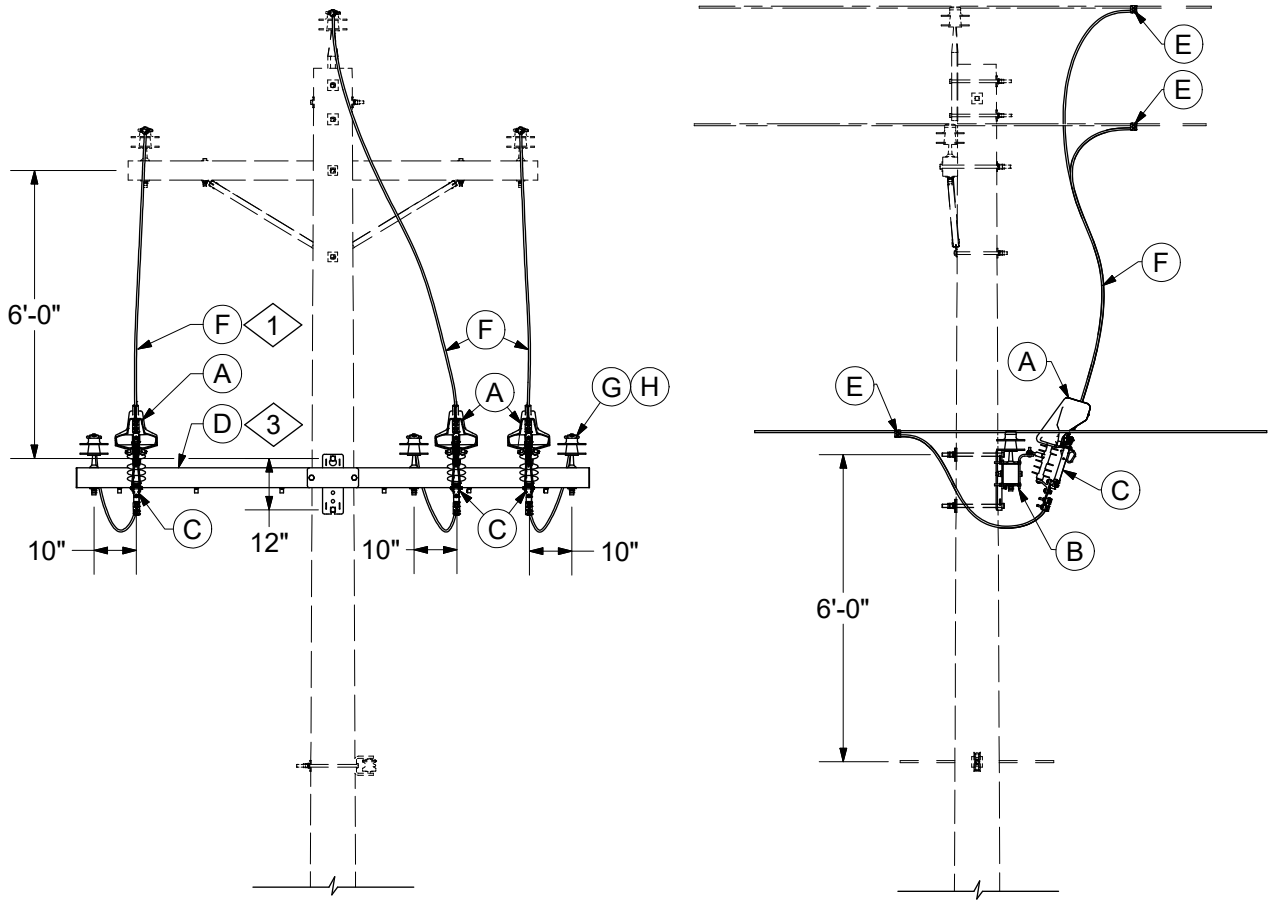
10. Wire sizes smaller than 1/0 shall not be used.

	ITEM	STK / DCS #	DESCRIPTION 10 12 33 **	01
9	A	**04 00 42 03**	Crossarm - Deadend, F/G 10'	1
	B	69 10 250	Recloser, S&C Intellirupter, 15kV, 600A w/Comm Module	1
	C	23 52 219	Bolt, Mach., 3/4" x 14" w/ square nut	4
	D	23 66 031	Washer, Curved, Square, 3/4"	8
	E	23 66 135	Lock Washer - 3/4" Double Coil	6
	F	23 65 042	Lock Nut - 3/4" Square	5
	G	23 17 473	Animal Guard, Pole Wrap	1
	H	17 54 373	Connector - Split Bolt, #14 AWG Str. to #2 AWG Str.	3
	I	23 52 097	Bolt, Mach., 3/4" x 12" w/ square nut	2
	J	23 66 207	Washer, Curved, Square, 5/8"	2
	K	23 66 134	Lock Washer - 5/8" Double Coil	2
	L	23 65 043	Lock Nut - 5/8" Square	2
	M	54 07 204	Switch, Disc. 600A., 15 kV	3
	N	**06 12 30 03 @**	Dbl Deadend on Pole F/G Extension	1
@	O	**06 12 35 04 @**	Dbl Deadend on FG Arm w/ F/G Extension	1
@	P	**12 00 10 03**	Grounding Unit (with #2 S.D. Cu) - Ground Rod	1
		12 00 10 04	Grounding Unit (with #2 S.D. Cu) - Ground Coil	1
3,@	Q	**03 01 ** ** @**	Neutral Configuration	1
10,@	R	**07 00 80 00**	Wire, Poly, S.D., (ft.)	100'
@	S	**07 00 25 00**	Clamp, Parallel Groove	13
@	T	**07 00 21 00**	Clamp, Hot line	6
12,@	U	69 10 252	4 kV Power Supply	1
13,@	V	16 16 060	Speednet Radio	1

DESIGN NOTE(s):

11. 8'-0" crossarms can be used if existing on pole in Missouri.
13. Speednet radio may be required for communications.

REV	DATE	ENG	DESCRIPTION
13	01/01/24	DT	Converted to new format
12	10/01/19	DT	



CONSTRUCTION NOTE(s):

1. Wire sizes for leads shall be a minimum of 1/0.

	ITEM	STK / DCS #	DESCRIPTION 10 12 50 **	01
	A	23 17 512	Wildlife Guard - Vertical Switch 600 Amp	3
	B	17 58 054	Bracket, Arrester/Cutout Mounting	3
	C	54 07 296	Switch - Disconnect 15kV 600 Amp	3
3,@	D	**04 00 20 03**	Crossarm, 10', Single Wood Arm	1
		04 00 41 16	Crossarm, Tangent, F/G, 10'	1
@	E	**07 00 25 00**	Clamp, Parallel Groove	6
1,@	F	**07 00 80 00**	Wire, Poly, S.D. (ft.)	40'
@	G	**06 12 01 01**	Single Pin & Insulator - Wood Crossarm	3
		06 12 01 12	Single Pin & Insulator - FG Crossarm	3
@	H	**07 00 41 00**	Top Tie, Single Pin	3

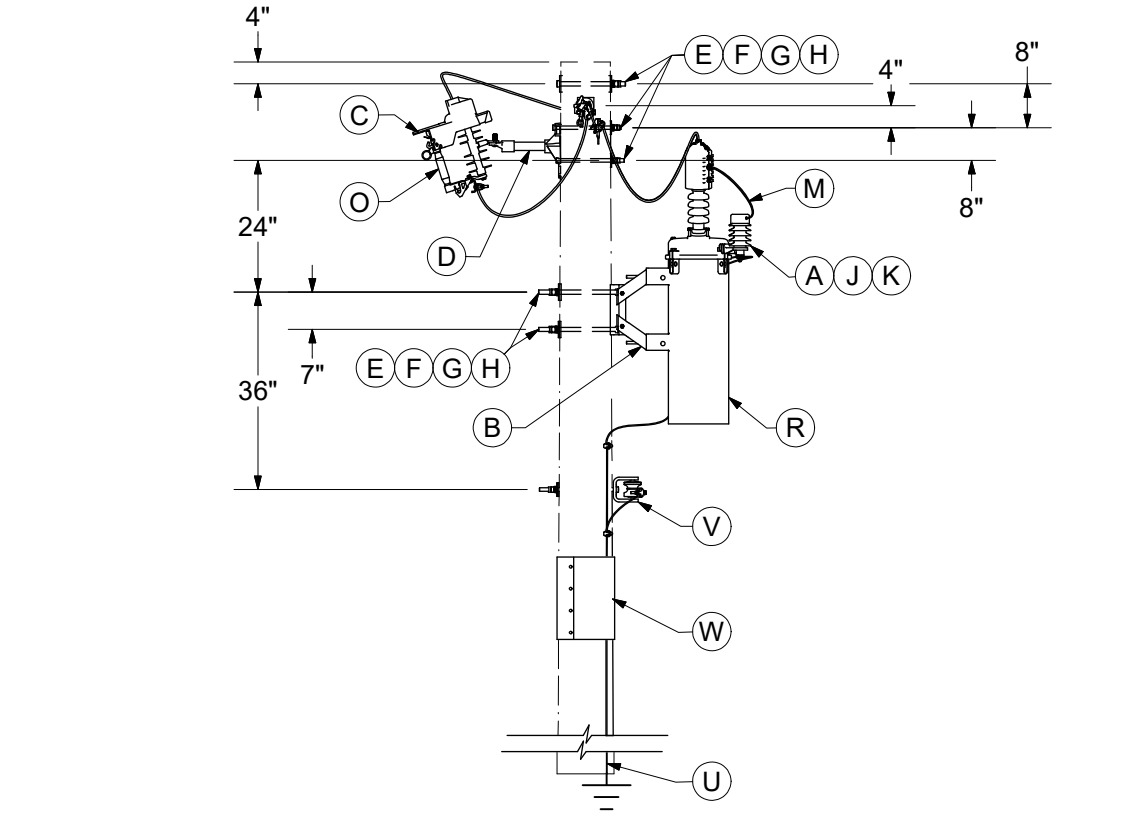
DESIGN NOTE(s):

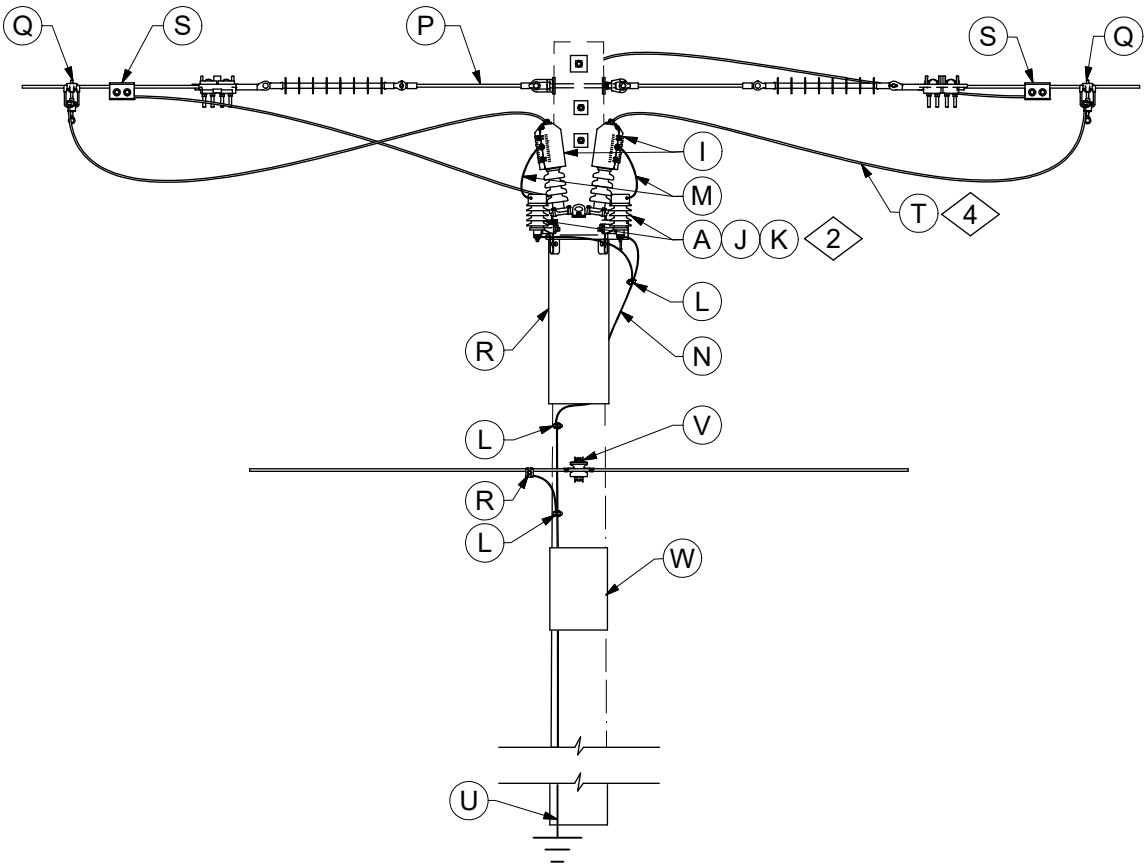
2. Arresters are not required for normally closed switch installations. If both upper and lower circuits continue in both directions, arresters are not required when switches are normally open. If a circuit does not continue in both directions, an arrester is required on an adjacent pole for that circuit. Refer to DCS **12 00 01 01** for arrester selection.

3. 8'-0" crossarms may be used when required.

4. For existing poles with crossarms in this configuration, switches may be installed using existing clearances between crossarms to avoid replacing otherwise serviceable poles.

REV	DATE	ENG	DESCRIPTION
7	01/01/24	DT	Conveted to new format
6	06/30/16	WYW	


4"
E F G H
4"
8"
C
O
M
8"
24"
D
A J K
7"
E F G H
36"
B
R
V
W
U


Q
S
P
S
Q
I
M
T
4
A J K
2
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U

CONSTRUCTION NOTE(s):

1. Recloser shall be turned in tank to position shown.

2. Lightning arrester shall be mounted on tank cover lug for both source and load sides of the recloser. Factory bolts can be replaced with 1/2" x 4" machine bolts and flat washers.

3. Each recloser weighs 205 pounds.

4. Maximum lead size shall be 1/0 Cu.

Recloser Stock Numbers			
STK #	**DESCRIPTION**	**STK #**	**DESCRIPTION**
69 10 210	25A V4L	69 10 214	100A V4L
69 10 211	35A V4L	69 10 142	140A V4L
69 10 212	50A V4L	69 10 215	200A V4L
69 10 213	70A V4L	69 10 143	280A V4L

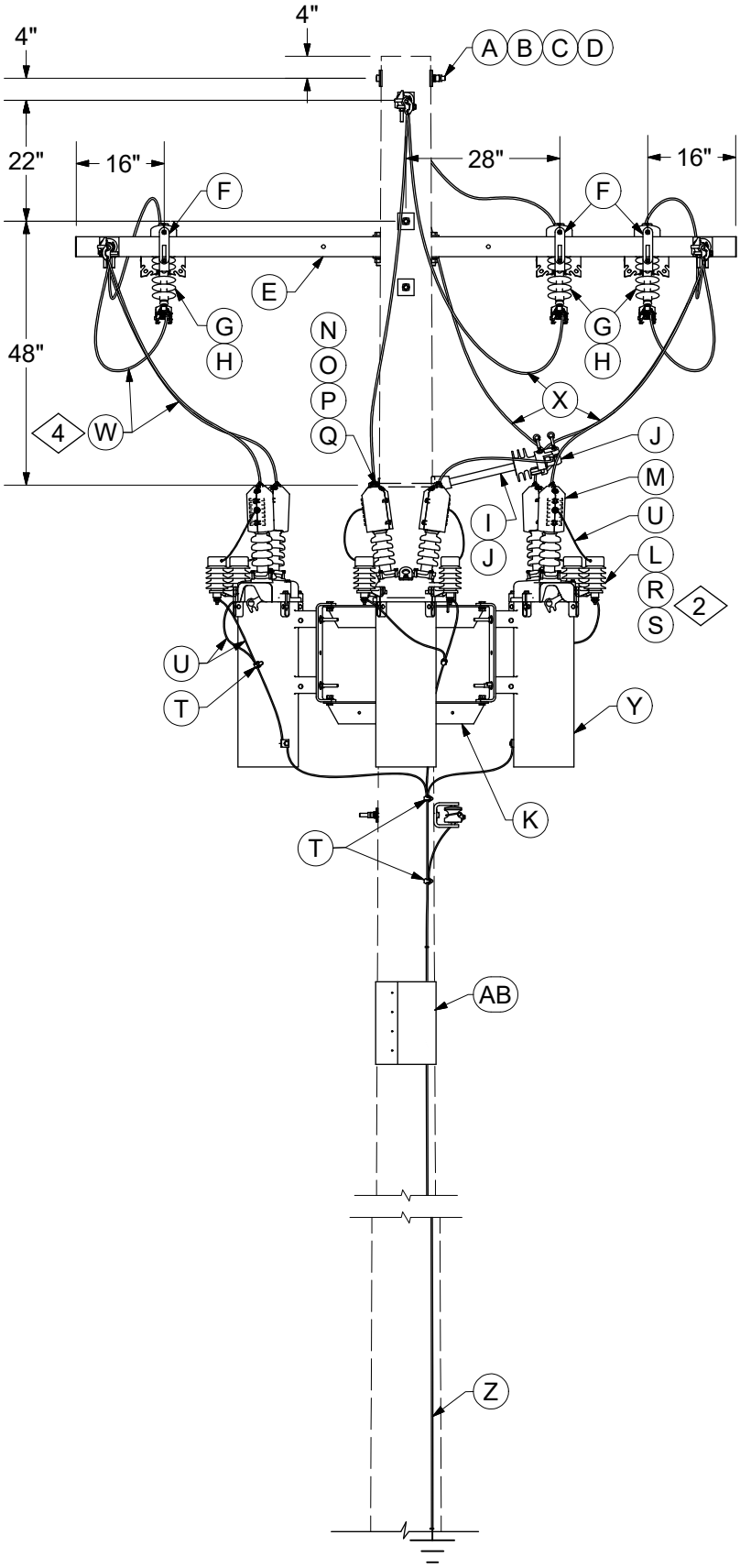
	ITEM	STK / DCS #	DESCRIPTION 10 12 60 **	01
	A	10 01 144	Arrestor, Lightning 10kV/8.4kV MCOV	2
	B	23 17 291	Mounting, Recloser	1
	C	23 17 411	Wildlife Guard - Cover Cutout	1
	D	23 06 127	Bracket - Standoff, 12" FG	1
	E	23 52 065	Bolt, Mach., 5/8" x 12" w/ square nut	5
	F	23 66 207	Washer, Curved, Square, 5/8"	6
	G	23 66 134	Lock Washer - 5/8" Double Coil	5
	H	23 65 043	Lock Nut - 5/8" Square	5
	I	69 58 181	Guard, Clam−shell, Wildlife	2
	J	23 52 034	Bolt, Mach., 1/2" x 4" w/ square nut	2
	K	23 66 017	Washer - Round 1/2"	2
	L	17 54 182	Connector, Split Bolt, 3-#2 Str. CU	3
	M	18 51 021	Wire, Poly #6 Cu (ft.)	7
	N	18 51 025	Wire, Poly #4 Cu (ft.)	3
	O	54 07 210	300A Solid Blade Switch	1
	P	**06 12 30 03 @**	Double Deadend on Pole w/ FG Extension	1
@	Q	**07 00 21 00**	Clamp, Stirrup, with Hot Line Clamp	2
@	R	69 10 ***	Recloser, See recloser stock numbers table	1
@	S	**07 00 25 00**	Clamp - Parallel Groove	3
4,@	T	**07 00 80 00**	Wire, Poly Covered, S.D. (ft.)	15
@	U	**12 00 10 01**	Grounding Unit, Ground Coil	1
		12 00 10 02	Grounding Unit, Ground Rod	1
@	V	**03 01 ** ** @**	Neutral Configuration	1
6,@	W	23 17 473	Wood Pole Wrap	#

DESIGN NOTE(s):

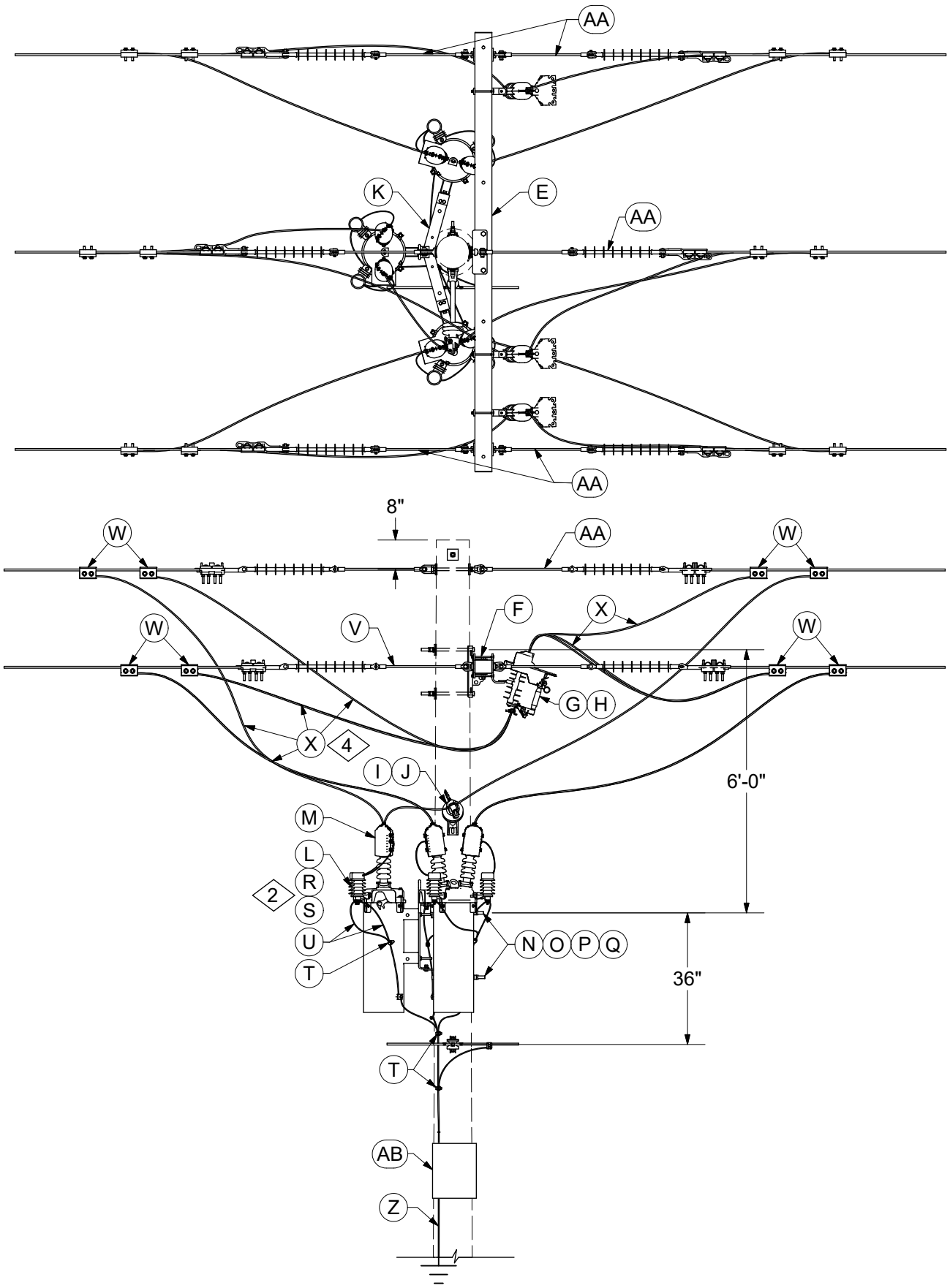
5. Fuse tube may be substituted for solid blade for sensitive circuits or if extended outage is anticipated.

6. Pole wrap is received in 100' rolls. Cut to size and wrap around pole approximately 12" below neutral or secondary.

REV	DATE	ENG	DESCRIPTION
9	01/01/24	DT	Converted to new format
8	11/30/16	WYW	



REV	DATE	ENG	DESCRIPTION
14	01/01/24	DT	Converted to new format
13	06/28/17	WYW	



REV	DATE	ENG	DESCRIPTION
14	01/01/24	DT	Converted to new format
13	06/28/17	WYW	

CONSTRUCTION NOTE(s):

1. Recloser shall be turned in tank position shown.
2. Lightning arrester shall be mounted on tank cover lug for both source and load sides of the recloser. Factory bolts can be replaced with 1/2" x 4" machine bolts and flat washers.
3. Each recloser weighs 205 pounds.
4. Largest conductor size shall be 1/0 for item W.
5. Fiberglass crossarm shall be installed on side of pole with lower tension when differential tension is present.

Recloser Stock Numbers			
STK #	**DESCRIPTION**	**STK #**	**DESCRIPTION**
69 10 210	25 A V4L	69 10 214	100 A V4L
69 10 211	35 A V4L	69 10 142	140 A V4L
69 10 212	50 A V4L	69 10 215	200 A V4L
69 10 213	70 A V4L	69 10 143	280 A V4L

	ITEM	STK / DCS #	DESCRIPTION 10 12 62 **	01
	A	23 52 065	Bolt, Mach., 5/8" x 12" w/ square nut	2
	B	23 66 207	Washer, Curved, Square, 5/8"	3
	C	23 66 134	Lock Washer - 5/8" Double Coil	2
	D	23 65 043	Lock Nut - 5/8" Square	2
	E	**04 00 42 03**	Crossarm - Deadend, F/G 10'	1
	F	17 58 054	Bracket, Arrester/Cutout Mounting	3
	G	54 07 210	300A Solid Blade Switch	3
	H	23 17 411	Wildlife Guard - Cover Cutout	3
	I	23 12 123	Bracket, FG, Standoff, LD, 18"	1
	J	25 05 143	Insulator, Vice Top, 12kV	1
	K	23 17 209	Mounting Unit 3 Pos. Light (Up to Three 50 KVA Trans)	1
	L	10 01 144	Arrester, Lightning 10kV	6
	M	69 58 181	Guard, Clam−shell, Wildlife	6
	N	23 52 219	Bolt, Mach., 3/4" x 14" w/ square nut	2
	O	23 66 031	Washer, Curved, Square, 3/4"	2
	P	23 66 135	Lock Washer - 3/4" Double Coil	2
	Q	23 65 042	Lock Nut - 3/4" Square	2
	R	23 52 034	Bolt, Mach., 1/2" x 4" w/ Square nut	6
	S	23 66 017	Washer - Round 1/2"	6
	T	17 54 182	Connector, Split Bolt	5
	U	18 51 021	Wire, Poly, #6 Cu (ft.)	20
	V	**06 12 35 02 @**	Double Deadend on Arm	2
4,@	W	**07 00 25 00**	Clamp - Parallel Groove	13
@	X	**07 00 80 00**	Wire, Poly Covered, S.D. (ft.)	60
@	Y	69 10 ***	Hydraulic Recloser, See recloser stock numbers table	3
@	Z	**12 00 10 03**	Grounding Unit, Ground Rod	1
		12 00 10 04	Grounding Unit, Ground Coil	1
@	AA	**06 12 30 03 @**	Double Deadend on Pole w/FG Extension	1
		06 12 30 13 @	Double Deadend on Pole w/o FG Extention	1
8,@	AB	23 17 473	Wood Pole Wrap	#

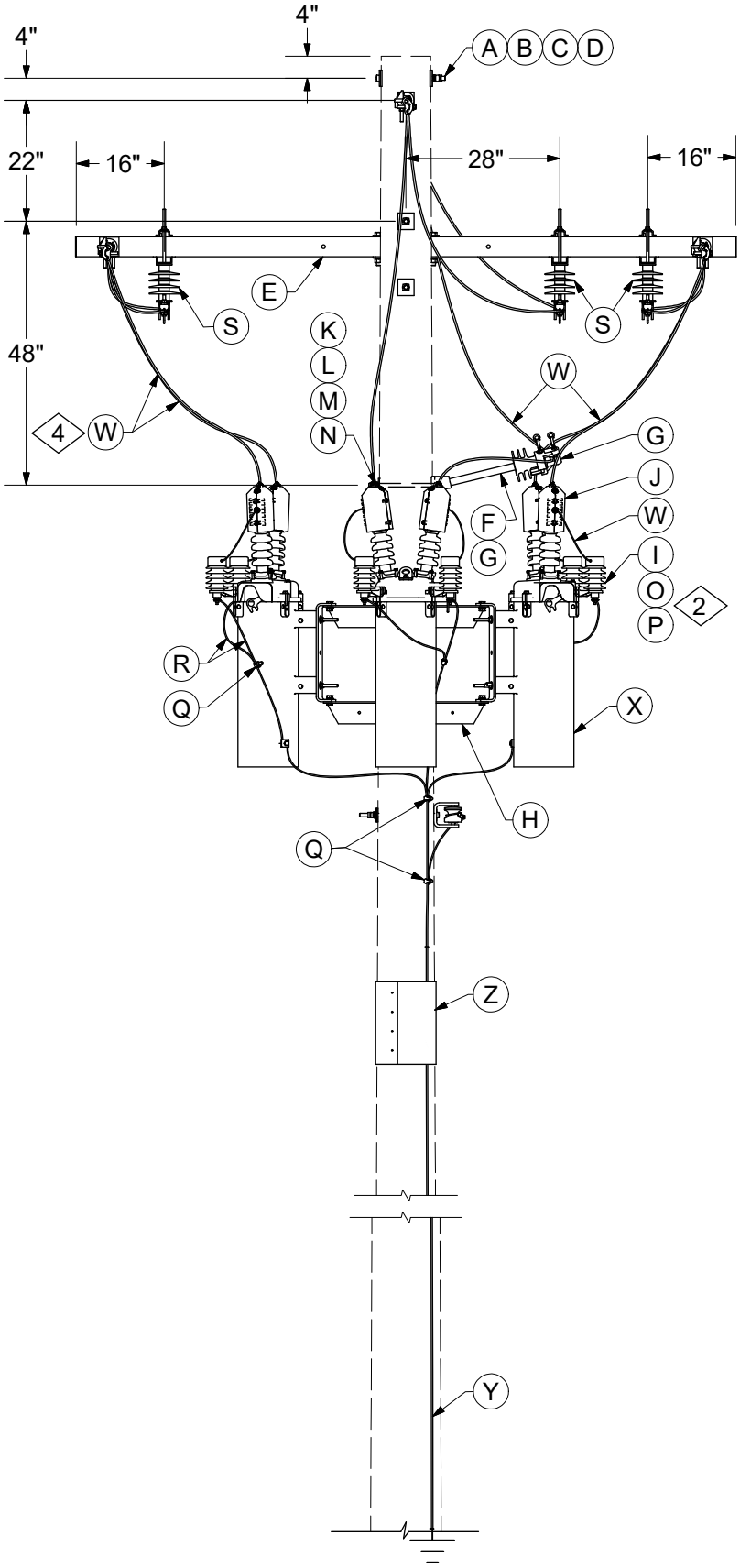
REV	DATE	ENG	DESCRIPTION
14	01/01/24	DT	Converted to new format
13	06/28/17	WYW	

DESIGN NOTE(s):

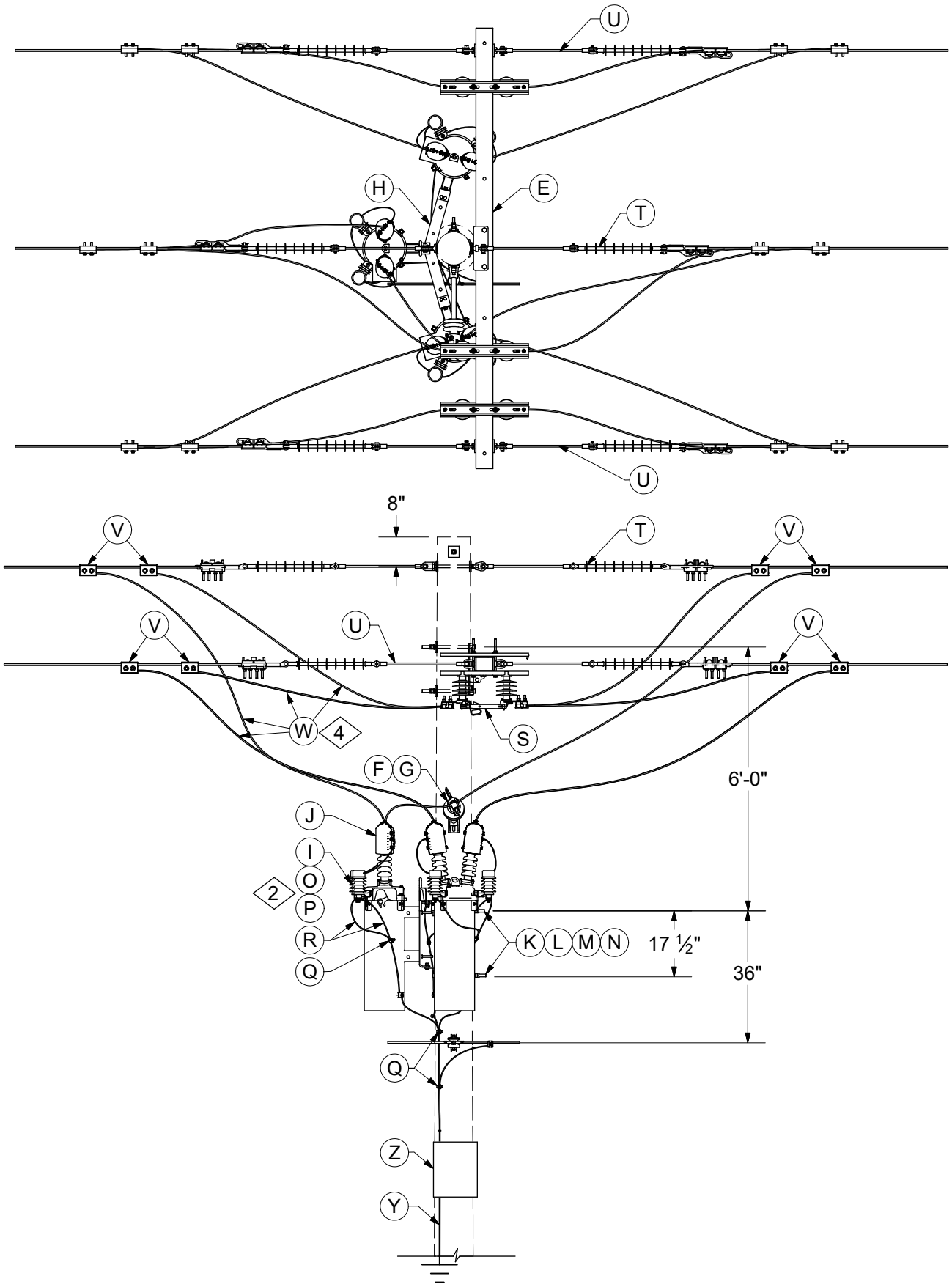
6. Fuse cartridge may be substituted for solid blade if sensitive circuit or extended outage anticipated.

7. Underbuild construction requires deadend on pole w/ FG extension.

8. Pole wrap is received in 100'-0" rolls. Cut roll to size and wrap around pole approximately 12" below neutral or secondary.



REV	DATE	ENG	DESCRIPTION
14	01/01/24	DT	Converted to new format
13	06/28/17	WYW	



REV	DATE	ENG	DESCRIPTION
14	01/01/24	DT	Converted to new format
13	06/28/17	WYW	

CONSTRUCTION NOTE(s):

1. Recloser shall be turned in tank position shown.

2. Lightning arrester shall be mounted on tank cover lug for both source and load sides of the recloser. Factory bolts can be replaced with 1/2" x 4" machine bolts and flat washers.

3. Each recloser weighs 205 pounds.

4. Only wire sizes between 1/0 and 350 kcmil shall be used.

5. Fiberglass crossarm shall be installed on side of pole with lower tension when differential tension is present.

Recloser Stock Numbers			
STK #	**DESCRIPTION**	**STK #**	**DESCRIPTION**
69 10 210	25 A V4L	69 10 214	100 A V4L
69 10 211	35 A V4L	69 10 142	140 A V4L
69 10 212	50 A V4L	69 10 215	200 A V4L
69 10 213	70 A V4L	69 10 143	280 A V4L

	ITEM	STK / DCS #	DESCRIPTION 10 12 62 **	03
	A	23 52 065	Bolt, Mach., 5/8" x 12" w/ square nut	2
	B	23 66 207	Washer, Curved, Square, 5/8"	3
	C	23 66 134	Lock Washer - 5/8" Double Coil	2
	D	23 65 043	Lock Nut - 5/8" Square	2
	E	**04 00 42 03**	Crossarm - Deadend, F/G 10'	1
	F	23 12 123	Bracket, FG, Standoff, LD, 18"	1
	G	25 05 143	Insulator, Vice Top, 12kV	1
	H	23 17 209	Mounting Unit 3 Pos. Light (Up to Three 50 KVA Trans)	1
	I	10 01 144	Arrester, Lightning 10kV	6
	J	69 58 181	Guard, Clam−shell, Wildlife	6
	K	23 52 219	Bolt, Mach., 3/4" x 14" w/ square nut	2
	L	23 66 031	Washer, Curved, Square, 3/4"	2
	M	23 66 135	Lock Washer - 3/4" Double Coil	2
	N	23 65 042	Lock Nut - 3/4" Square	2
	O	23 52 034	Bolt, Mach., 1/2" x 4" w/ Square nut	6
	P	23 66 017	Washer - Round 1/2"	6
	Q	17 54 182	Connector, Split Bolt	7
	R	18 51 021	Wire, Poly, #6 Cu (ft.)	20
	S	54 07 204	Switch, Disc. 600A., 15 kV	3
	T	**06 12 30 03 @**	Double Deadend on Pole w/FG Extension	1
	U	**06 12 35 02 @**	Double Deadend on Arm	2
@	V	**07 00 25 00**	Clamp - Parallel Groove	13
4,@	W	**07 00 80 00**	Wire, Poly Covered, S.D. (ft.)	60
@	X	69 10 ***	Hydraulic Recloser, See recloser stock numbers table	3
@	Y	**12 00 10 03**	Grounding Unit, Ground Rod	1
		12 00 10 04	Grounding Unit, Ground Coil	1
6,@	Z	23 17 473	Wood Pole Wrap	#

DESIGN NOTE(s):

6. Pole wrap is received in 100'-0" rolls. Cutt roll to size and wrap around pole approximately 12" below neutral or secondary

REV	DATE	ENG	DESCRIPTION
14	01/01/24	DT	Converted to new format
13	06/28/17	WYW	

1. For normally closed switch mounted on a steel pole with or without motor operator:

A pole ground wire is not required but there must be provisions (Rivnuts) for grounding a shield wire, primary system neutral, a motor operator cabinet, and the base of the pole. The manually operated switch handle must be grounded directly to the driven ground rod or the field formed electrode riser with a #2 Cu ground wire. The motor operator cabinet, if present, can be bonded to a steel pole or connected to the ground electrode.

A ground mat is required for a steel pole. Refer to DCS **12 69 11 02**.

Operating rod TR-210 porcelain insulator, Stock #25 09 045, and 8'-0" fiberglass section that come with the switch may be omitted on a steel pole.

2. For normally closed manually operated switch mounted on a wood pole.

Pole ground wire shall be omitted/removed from pole.

The 8'-0" fiberglass pipe section shall be installed with a minimum of 24" above distribution primary and a minimum of 12" below the lowest primary. One 34.5kV, TR-210 porcelain operating rod insulator shall be installed at minimum of 8' above the ground between the lowest electric/communications and manually operated handle.

Attach the switch operating handle to a driven ground rod or a field formed ground electrode with #2 cu ground wire.

A ground mat is not required as long as pole ground is not connected to static or neutral. Refer to DCS **12 69 11 04**.

3. For normally closed motor operated switch mounted on a wood pole:

A #2 cu pole ground wire is required to extend up the pole for grounding of motor operator cabinet, switch operating handle, primary system neutral (if present), and static wire.

The 8'-0" fiberglass pipe section shall be installed with a minimum of 24" above distribution primary and a minimum of 12" below the lowest primary. One 34.5kV, TR-210 porcelain operating rod insulator shall be installed at minimum of 8'-0" above the ground between the lowest electric/communications and manually operated handle.

A ground mat is required. Refer to DCS **12 69 11 01**.

4. For normally closed manually operated switch mounted on a composite pole:

Composite pole internal pole ground should not be connected to static or neutral.

The 8'-0" fiberglass pipe section shall be installed with a minimum of 24" above distribution primary and a minimum of 12" below the lowest primary. One 34.5kV, TR-210 porcelain operating rod insulator shall be installed at minimum of 8'-0" above ground between the lowest electric/communications and manually operated handle.

Attach the switch operating handle to a driven ground rod or a field formed ground electrode with #2 cu ground wire.

A ground mat is not required as long as pole ground is not connected to static or neutral. Refer to DCS **12 69 11 04**.

5. For normally closed motor operated switch mounted on a composite pole:

A ground mat is required. See DCS **12 69 11 03**.

Static wire, primary system neutral (if present), switch operating handle, and motor operator (if present) must be bonded to the #2 cu pole ground wire which comes with a pole.

The 8'-0" fiberglass pipe section shall be installed with a minimum of 24" above distribution primary and a minimum of 12" below the lowest primary. One 34.5kV, TR-210 porcelain operating rod insulator shall be installed at minimum of 8'-0" above the ground between the lowest electric/communications and manually operated handle.

6. For normally open switches:

In addition to the grounding requirement stated above, arresters on both sides of the switch are required. Install a set of arresters on adjacent poles on each side of the switch, see DCS section 12. When installing arresters on adjacent poles is not practical, arresters may be installed suspended from deadend insulator on switch pole.

Refer to DCS **10 34 05 ****, DCS **10 34 07 ****, DCS **10 69 05 ****, DCS **10 69 07 ****, DCS **10 69 09 ****, DCS **10 69 20 ****, and DCS **10 69 30 **** for arresters installation on switch pole.

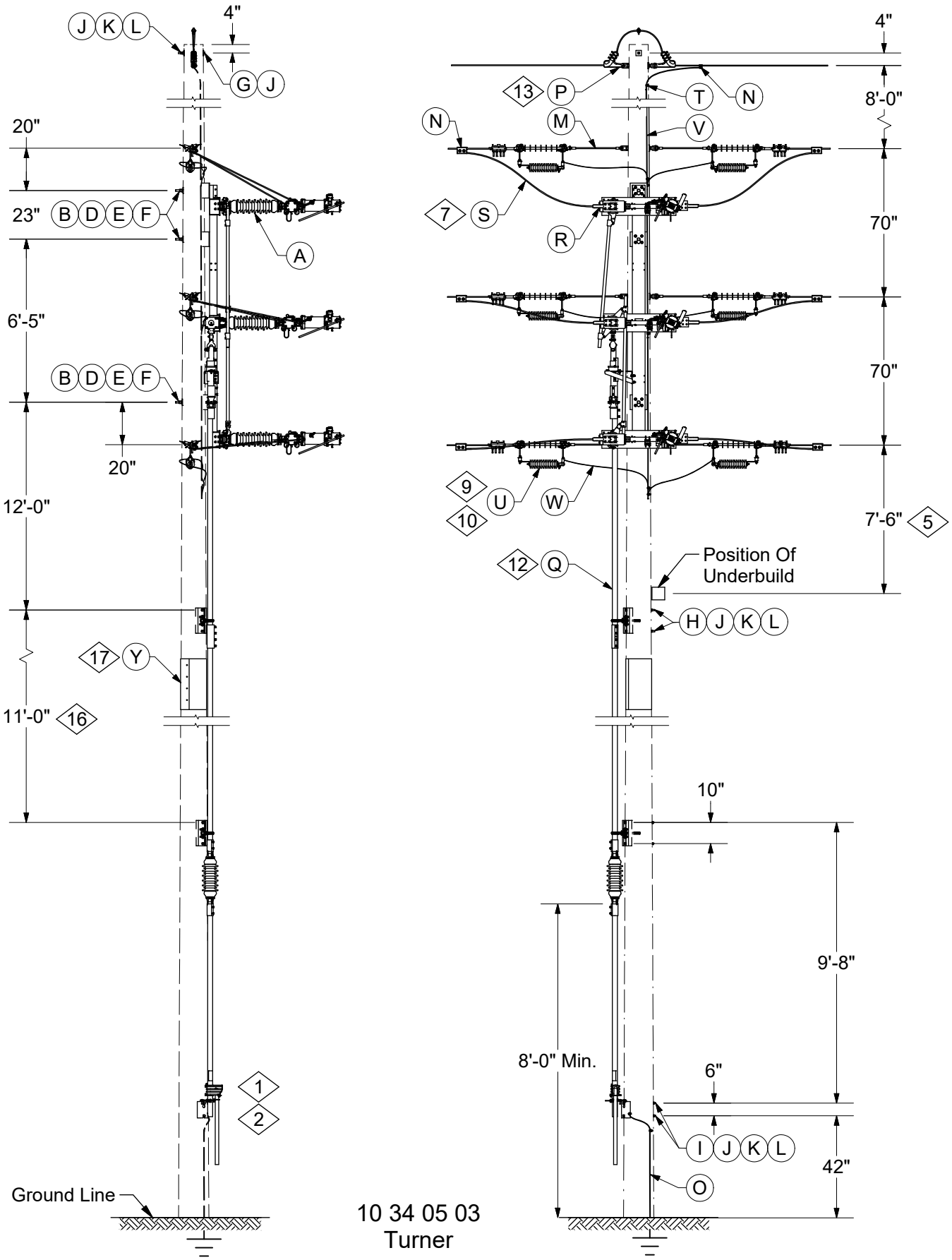
When arresters are installed on switch poles that do not require grounding mat:

If distribution neutral is present, arrester ground should be connected to distribution neutral and pole grounds installed on adjacent poles. If neutral is not present but static is present, arrester grounds should be connected to static and pole grounds installed on adjacent poles. If neither distribution or static is present, either a ground mat may be installed and arresters connected to pole ground or a neutral may be installed to adjacent poles with pole grounds and arrester grounds connected to neutral.

FUSES AND SWITCHES

Single Circuit Group Operated Switch
Vertical Construction - 1200 Amp

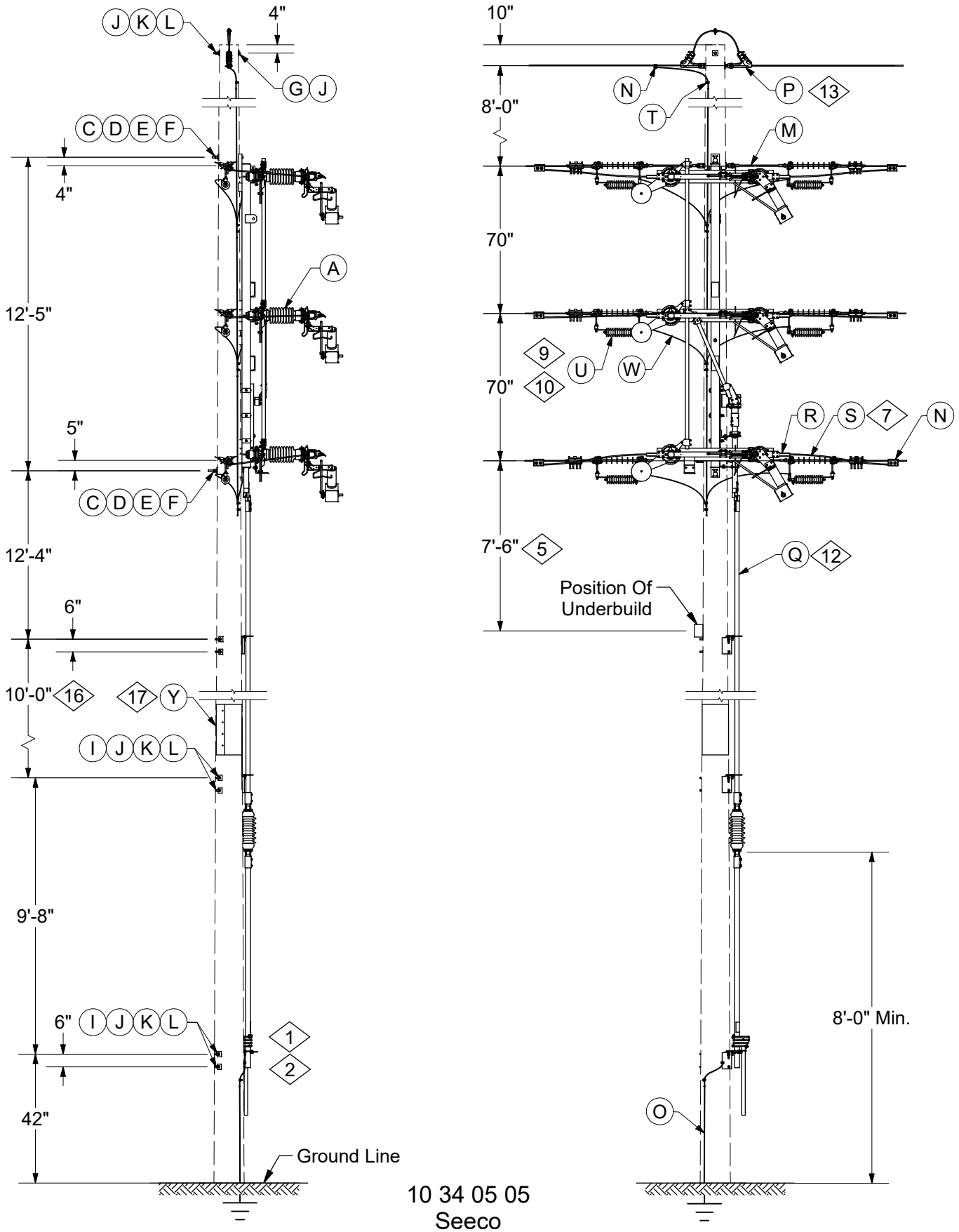
10 34 05 **
35kV
1 of 4



10 34 05 03
Turner

DISTRIBUTION
CONSTRUCTION STANDARDS

REV	DATE	ENG	DESCRIPTION
18	01/01/24	DT	Converted to new format
17	09/29/17	WYW	



10 34 05 05
Seeco

REV	DATE	ENG	DESCRIPTION
18	01/01/24	DT	Converted to new format
17	09/29/17	WYW	

CONSTRUCTION NOTE(s):

1. Switch handle must be grounded. For pole ground, operating pipe insulator, fiberglass section and ground mat requirements, refer to DCS **10 34 01 01**, Section C.

2. Install operating handle in best position possible for unobstructed safe operation of the switch.

3. Install padlock on handle to prevent switch operation by the public.

4. The Turner switch weighs 980 lbs with interrupters. Seeco switch weighs 1,400 lbs with interrupters.

5. 7'-6" clearance between 34kV and underbuild applies to lowest 34kV deadend or lowest bolt of switch (whichever is lower) and highest distribution crossarm bolt or deadend (whichever is higher).

6. Remove switch lifting bracket after installation.

7. For switch leads, use line conductor for sizes larger than 556. For smaller line conductors, use poly covered copper, see DCS **07 00 80 00**.

8. Field cut pipe lengths as needed.

9. The line arrester shown in the drawing is suspended from the compressed on end fittings of the polymer deadend insulator and supported by aluminum hot line clamps, and will not work with porcelain deadend bells. The disconnector coupling assembly detaches the line end of the arrester should the arrester fail and will cause the arrester to pivot and drop down into a vertical position which makes the failed arrester much more visible. The disconnect coupling assembly with a 3/8” threaded stud that can be inserted into the tap lead eyebolt of the hotline clamp on the line end and an eyebolt with 3/8” stud that can be inserted into the tap lead eyebolt of the hotline clamp on the ground end. One of the tinned copper leads (on the pole end of the assembly) is to shunt the clevis-eye connection to eliminate radio noise. The longer tinned copper lead is for connection to a pole ground wire. Use a 3/8” carriage head bolt through the hot line clamp eyebolt to keep the assembly from falling if the hot line clamp tap lead eyebolt should loosen.

	ITEM	STK / DCS #	DESCRIPTION 10 34 05 **	03	05
	A	54 08 433	Turner TS2, Three Phase with LBRK – Vertical Mount	1	-
		54 08 442	SEECO 34kV, 1200A w/LBRK Vertical	-	1
	B	23 52 103	Bolt, Mach., 3/4" x 18" w/ square nut	3	-
	C	23 52 254	Bolt, Mach., 3/4" x 16" w/ square nut	-	2
	D	23 66 031	Washer, Curved, Square, 3/4"	3	2
	E	23 66 135	Lock Washer - 3/4" Double Coil	3	2
	F	23 65 042	Lock Nut - 3/4" Square	3	2
	G	23 52 066	Bolt, Mach., 5/8" x 14" w/ square nut	1	1
	H	23 52 068	Bolt, Mach., 5/8" x 16" w/ square nut	4	4
	I	23 52 069	Bolt, Mach., 5/8" x 18" w/ square nut	4	4
	J	23 66 207	Washer, Curved, Square, 5/8"	10	10
	K	23 66 134	Lock Washer - 5/8" Double Coil	9	9
	L	23 65 043	Lock Nut - 5/8" Square	9	9
	M	**06 34 60 15 @**	Pole, Deadend, 34kV w/ FG Extension	6	6
@	N	**07 00 25 00**	Clamp - Parallel Groove	6	6
1,@	O	**12 69 11 ****	Grounding Unit - Switching Pole	1	1
13,@	P	**06 00 11 ** @**	Static Wire Attachment	#	#
		18 05 10 01 @	OPGW Static	#	#
12,@	Q	32 01 821	2" x 10' Steel Pipe w/Coupling	#	#
@	R	**07 00 30 00**	Lug, Compression	6	6
7,@	S	**07 00 80 00**	Wire, Switch Lead	45	45
10,@	T	17 54 373	Connector - Split Bolt, #14 AWG Str. to #2 AWG Str.	8	8
10,@	U	10 01 248	Arrester, Line protection, 36kV Rated	6	6
10,@	V	18 51 019	Wire, #2 Cu SD Poly Covered (ft.)	20	20
10,@	W	18 51 021	Wire, #6 Cu SD Poly Covered (ft.)	20	20
10,@	X	23 64 001	Staple 3/8" x 2"	20	20
17,@	Y	23 17 473	Wood Pole Wrap	#	#
15,@	Z	60 55 041	FCI, Non Communicating, 8 hr or 3A Reset, 100A min Trip	#	#

DESIGN NOTE(s):

10. Arresters are not required for normally closed switch installation. Where switches are normally open, install a set of arresters on adjacent poles on both sides of the switch. When installing arresters on adjacent poles is not practical, both sets of arresters may be installed as described in note 9. Items T, U, V, W, and X are only required when arresters are installed.

11. If motor operator is required, refer to DCS **10 69 10 ****.

12. Item Q required if additional vertical pipe is required. Turner switch comes with four 10'-6" sections of pipe. Seeco switch comes with one 21'-0" and one 12'-6" section of pipe. Add extra pipe if upper mounting bolt is higher than 63'-0" for Turner switch and 59'-0" for Seeco switch.

13. Item P required if static wire is present.

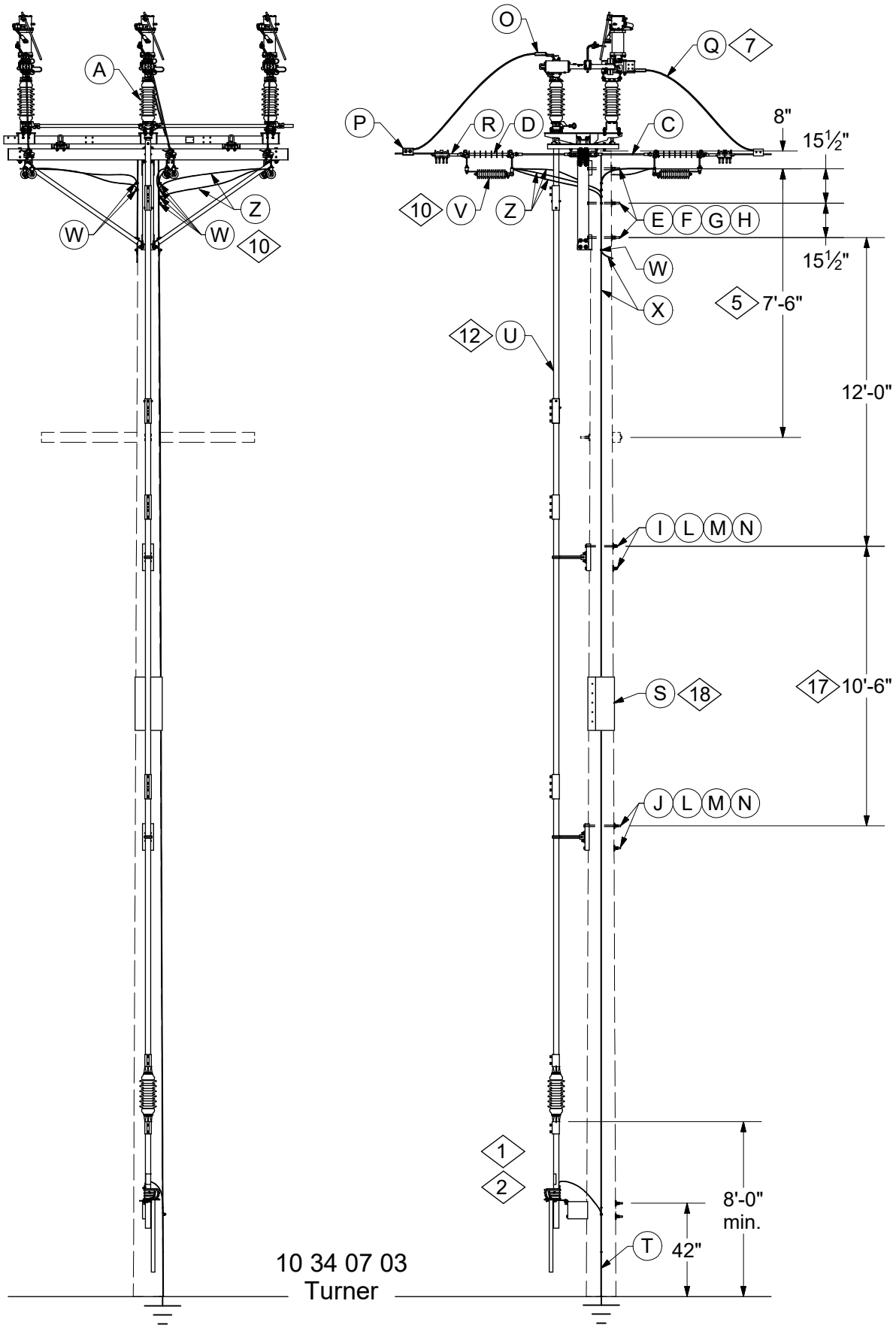
14. Switch should be installed on a pole that does not require guying.

15. FCI's may be installed on line conductor from 1/0 to 954 when switches are installed.

16. Pipe guide spacing may be adjusted from 8'-0" to 15'-0" to account for pole height.

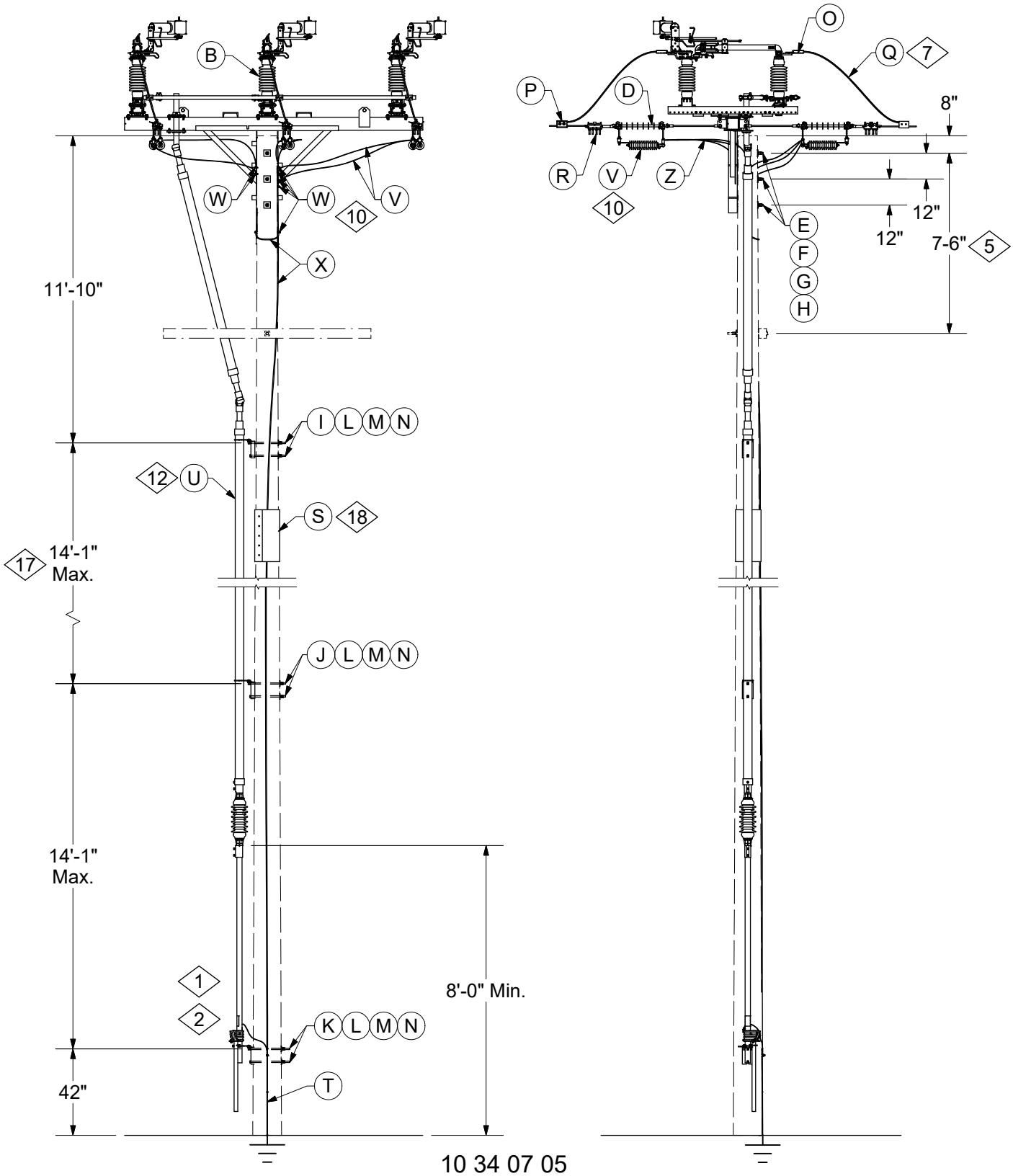
17. Pole wrap is received in 100'-0" rolls.

REV	DATE	ENG	DESCRIPTION
18	01/01/24	DT	Converted to new format
17	09/29/17	WYW	



10 34 07 03
Turner

REV	DATE	ENG	DESCRIPTION
12	01/01/24	DT	Converted to new format
11	06/30/16	WYW	



10 34 07 05
Seeco

REV	DATE	ENG	DESCRIPTION
12	01/01/24	DT	Converted to new format
11	06/30/16	WYW	

CONSTRUCTION NOTE(s):

1. Switch handle must be grounded. For pole ground, operating pipe insulator, fiberglass section and ground mat requirements, refer to DCS **10 34 01 01**, Section C.

2. Install operating handle in best position possible for unobstructed safe operation of the switch.

3. Install padlock on handle to prevent switch operation by the public.

4. The Turner switch weighs 980 lbs with interrupters. Seeco switch weighs 1,300 lbs with interrupters.

5. 7'-6" clearance between 34kV and underbuild applies to the top bolt for the switch pole mount bracket and the highest distribution crossarm bolt or deadend (whichever is higher).

6. Remove switch lifting bracket after installation.

7. For switch leads, use line conductor for sizes larger than 556. For smaller line conductors, use poly covered copper, see DCS **07 00 80 00**.

8. Field cut pipe lengths as needed.

9. The line arrester shown in the drawing is suspended from the compressed on end fittings of the polymer deadend insulator and supported by aluminum hot line clamps, and will not work with porcelain deadend bells. The disconnector coupling assembly detaches the line end of the arrester should the arrester fail and will cause the arrester to pivot and drop down into a vertical position which makes the failed arrester much more visible. The disconnect coupling assembly with a 3/8" threaded stud that can be inserted into the tap lead eyebolt of the hotline clamp on the line end and an eyebolt with 3/8" stud that can be inserted into the tap lead eyebolt of the hotline clamp on the ground end. One of the tinned copper leads (on the pole end of the assembly) is to shunt the clevis-eye connection to eliminate radio noise. The longer tinned copper lead is for connection to a pole ground wire. Use a 3/8" carriage head bolt through the hot line clamp eyebolt to keep the assembly from falling if the hot line clamp tap lead eyebolt should loosen.

	ITEM	STK / DCS #	DESCRIPTION 10 34 07 **	03	05
	A	54 08 437	Turner TS2 Switch, 34kV, 1200A w/LBRK-Flat Top Mount	1	-
	B	54 08 447	Seeco, Three Phase with LBRK – Flat Top Mount	-	1
	C	25 56 076	Insulator, Guy Strain, 26"	6	6
	D	25 06 053	Insulator, Suspension, 34kV	6	6
	E	23 52 219	Bolt, Mach., 3/4" x 14" w/ square nut	3	3
	F	23 66 031	Washer, Curved, Square, 3/4"	4	4
	G	23 66 135	Lock Washer - 3/4" Double Coil	4	4
	H	23 65 042	Lock Nut - 3/4" Square	4	4
	I	23 52 066	Bolt, Mach., 5/8" x 14" w/ square nut	2	2
	J	23 52 068	Bolt, Mach., 5/8" x 16" w/ square nut	4	4
	K	23 52 069	Bolt, Mach., 5/8" x 18" w/ square nut	2	2
	L	23 66 207	Washer, Curved, Square, 5/8"	8	8
	M	23 66 134	Lock Washer - 5/8" Double Coil	8	8
	N	23 65 043	Lock Nut - 5/8" Square	8	8
@	O	**07 00 30 00**	Lug, Compression	6	6
@	P	**07 00 25 00**	Clamp - Parallel Groove	6	6
7,@	Q	**07 00 80 00**	Wire, Switch Lead	45	45
@	R	**07 00 11 00**	Clamp, Deadend	6	6
18,@	S	23 17 473	Wood Pole Wrap	#	#
@	T	**12 69 11 ** @**	Grounding Unit - Switch Pole	1	1
12,@	U	32 01 821	Pipe, Steel Galv. 2" x 10' w Coupling, Turner	#	#
10,@	V	10 01 248	Arrester, Lightning, 36kV, Metal Oxide	6	6
10,@	W	17 54 373	Split Bolt, Bronze, #2 Str - #14 Str	8	8
10,@	X	18 51 019	Wire, #2 Cu Covered S.D. (ft.)	20	20
10,@	Y	23 64 001	Staple, Cu Coated Steel	20	20
10,@	Z	18 51 021	Wire, #6 Cu SD Poly Covered (ft.)	20	20
16,@	AA	60 55 041	FCI, Non Communicating, 8 hr or 3A Reset, 100A min. Trip	#	#

DESIGN NOTE(s):

10 Arresters are not required for normally closed switch installation. Where switches are normally open, install a set of arresters on adjacent poles on both sides of the switch. When installing arresters on adjacent poles is not practical, both sets of arresters may be installed as described in note 9. Items V, W, X, Y, and Z are only required when arresters are installed.

11. If motor operator is required, refer to DCS **10 69 10 ****.

12 Item U required if additional vertical pipe is required. Turner switch comes with four 10'-6" sections of pipe. Seeco switch comes with two 21'-0" sections of pipe. Add extra pipe if upper mounting bolt is higher than 59-'0" for either switch.

13. Maximum differential tension for Seeco switch shall not exceed 333 pounds per phase under NESC Heavy conditions. Maximum line tension shall not exceed 10,000 pounds under NESC Heavy conditions.

14. Maximum differential tension for Turner switch shall not exceed 1,000 pounds per phase under NESC Heavy conditions. Maximum line tension shall not exceed 10,000 pounds under NESC Heavy conditions.

15. Switch should be installed on a pole that does not require guying.

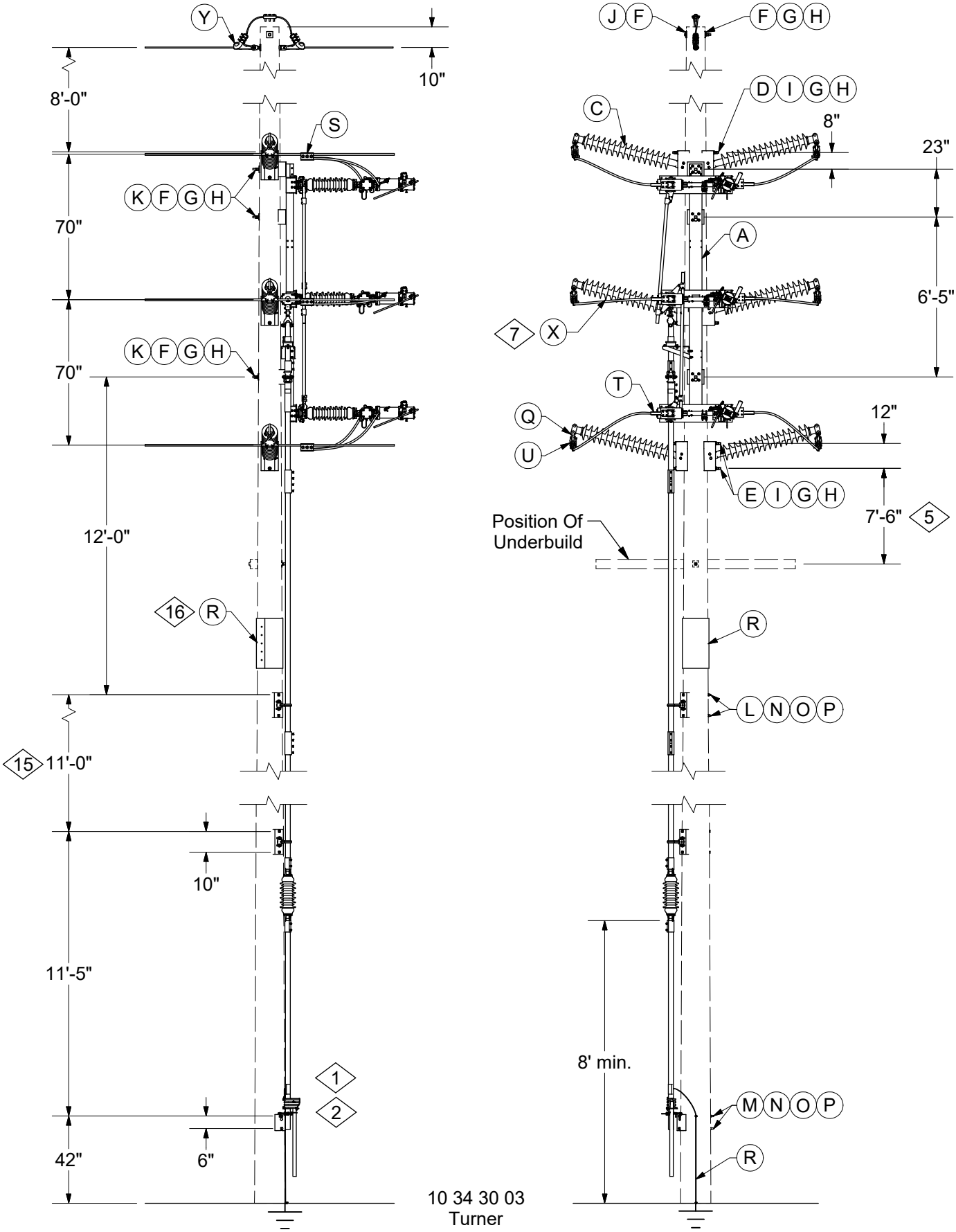
REV	DATE	ENG	DESCRIPTION
12	01/01/24	DT	Converted to new format
11	06/30/16	WYW	

DESIGN NOTE(s):

16. FCI's may be installed on line conductor from 1/0 to 954 when switches are installed.

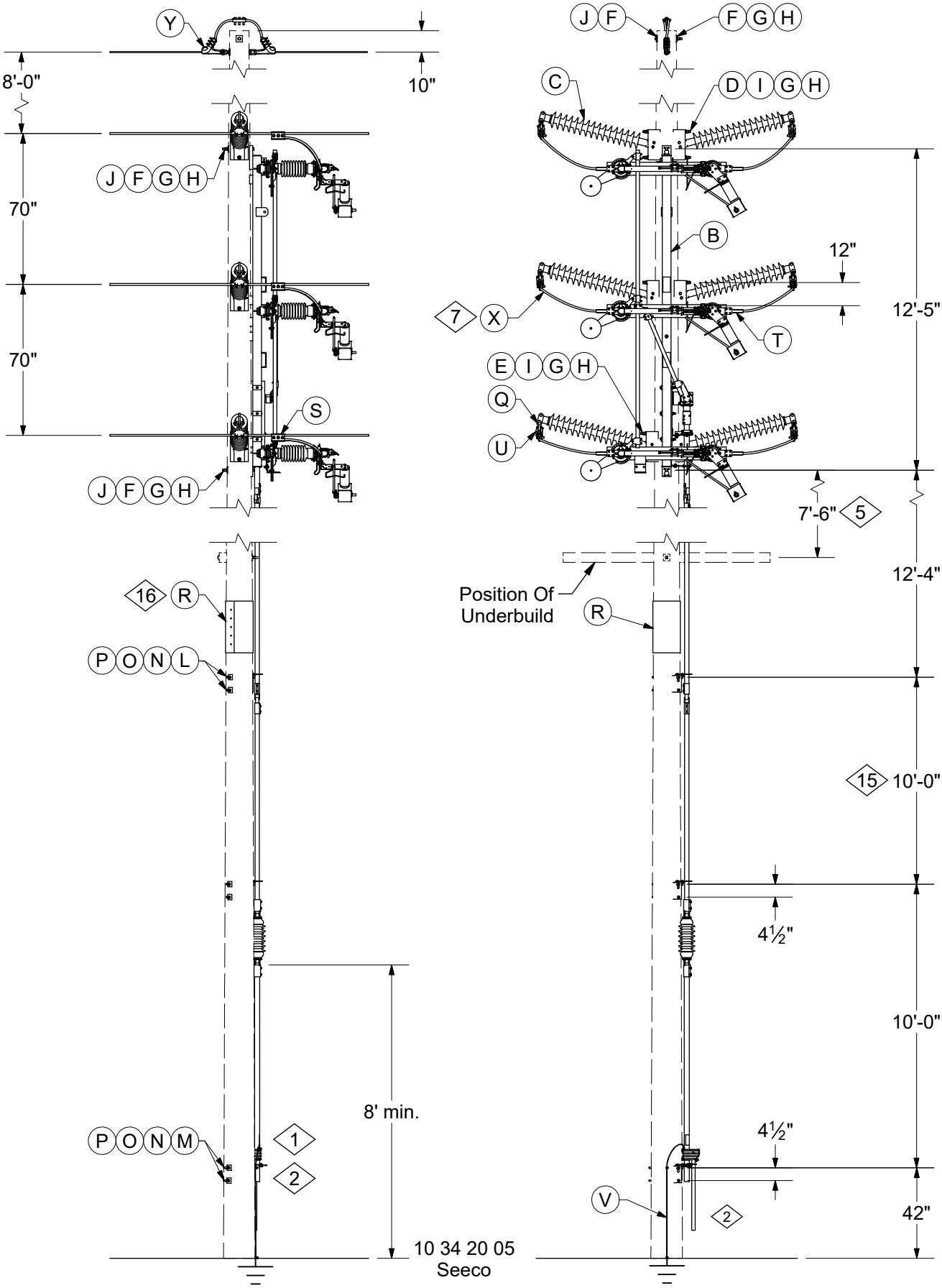
17. Pipe guide spacing may be adjusted from 8'-0" to 15'-0" to account for pole height.

18. Pole wrap is received in 100'-0" rolls. Cut roll to size and wrap around pole approximately 12" below neutral or secondary.



10 34 30 03
Turner

REV	DATE	ENG	DESCRIPTION
13	01/01/24	DT	Converted to new format
12	11/04/16	WYW	



REV	DATE	ENG	DESCRIPTION
13	01/01/24	DT	Converted to new format
12	11/04/16	WYW	

CONSTRUCTION NOTE(s):

1. Switch handle must be grounded. For pole ground, operating pipe insulator, fiberglass section and ground mat requirements, refer to DCS **10 34 01 01**, Section C.

2. Install operating handle in best position possible for unobstructed safe operation of the switch.

3. Install padlock on handle to prevent switch operation by the public.

4. The Turner switch weighs 980 lbs including interrupters. Seeco switch weighs 1,400 lbs.

5. 7'-6" clearance between 34kV and underbuild applies to lowest 34kV deadend, insulator bolt or lowest bolt of switch (whichever is lower) and highest distribution crossarm bolt or deadend (whichever is higher).

6. Remove switch lifting bracket after installation.

7. For switch leads, use line conductor for sizes larger than 556. For smaller line conductors, use poly covered copper, see DCS **07 00 80 00**.

8. Field cut pipe lengths as needed.

	ITEM	STK / DCS #	DESCRIPTION 10 34 20 **	03	05
	A	54 08 433	Turner TS2, Three Phase with LBRK – Vertical Mount	1	-
	B	54 08 442	SEECO 34kV, 1200A w/LBRK Vertical	-	1
	C	25 05 132	Insulator, Line Post, Horizontal, 138kV	6	6
	D	23 53 061	Bolt, DA, 3/4" Dia x 22" w/ 4 square nuts	4	4
	E	23 53 062	Bolt, DA, 3/4" Dia x 24" w/ 4 square nuts	2	2
	F	23 66 031	Washer, Curved, Square, 3/4"	5	4
	G	23 66 135	Lock Washer - 3/4" Double Coil	16	15
	H	23 65 042	Lock Nut - 3/4" Square	16	15
	I	23 66 030	Washer, Square, 3/4" Bolt	12	12
	J	23 52 219	Bolt, Mach., 3/4" x 14" w/ square nut	1	3
	K	23 52 103	Bolt, Mach., 3/4" x 18" w/ square nut	3	-
	L	23 52 068	Bolt, Mach., 5/8" x 16" w/ square nut	4	4
	M	23 52 069	Bolt, Mach., 5/8" x 18" w/ square nut	4	4
	N	23 66 207	Washer, Curved, Square, 5/8"	8	8
	O	23 66 134	Lock Washer - 5/8" Double Coil	8	8
	P	23 65 043	Lock Nut - 5/8" Square	8	8
	Q	23 58 063	Wye Clevis − (Rotated) Eye Fitting	6	6
16,@	R	23 17 473	Wood Pole Wrap	#	#
@	S	**07 00 25 00**	Clamp - Parallel Groove	6	6
@	T	**07 00 30 00**	Lug, Compression	6	6
@	U	**07 00 20 00**	Clamp, Suspension	6	6
@	V	**12 69 11 ** @**	Grounding Unit - Switch Pole	1	1
10,@	W	32 01 821	2" x 10' Galv. Steel Pipe with Coupling	#	#
7,@	X	**07 00 80 00**	Wire, Switch Lead	60	60
11,@	Y	**06 00 11 ** @**	Static Wire Attchment	#	#
		18 05 10 01 @	OPGW Static	#	#
14,@	Z	60 55 041	FCI, Non Communicating, 8 hr or 3A reset, 100A min Trip	#	#

REV	DATE	ENG	DESCRIPTION
13	01/01/24	DT	Converted to new format
12	11/04/16	WYW	

DESIGN NOTE(s):

9. If motor operator is required, refer to DCS **10 69 10 ****.

10. Item W required if additional vertical pipe is required. Turner switch comes with four 10'-6" sections of pipe. Seeco switch comes with one 21'-0" and one 12'-6" section of pipe. Add extra pipe if upper mounting bolt is higher than 63'-0" for Turner switch and 59'-0" for Seeco switch.

11. Item Y required if static wire is present.

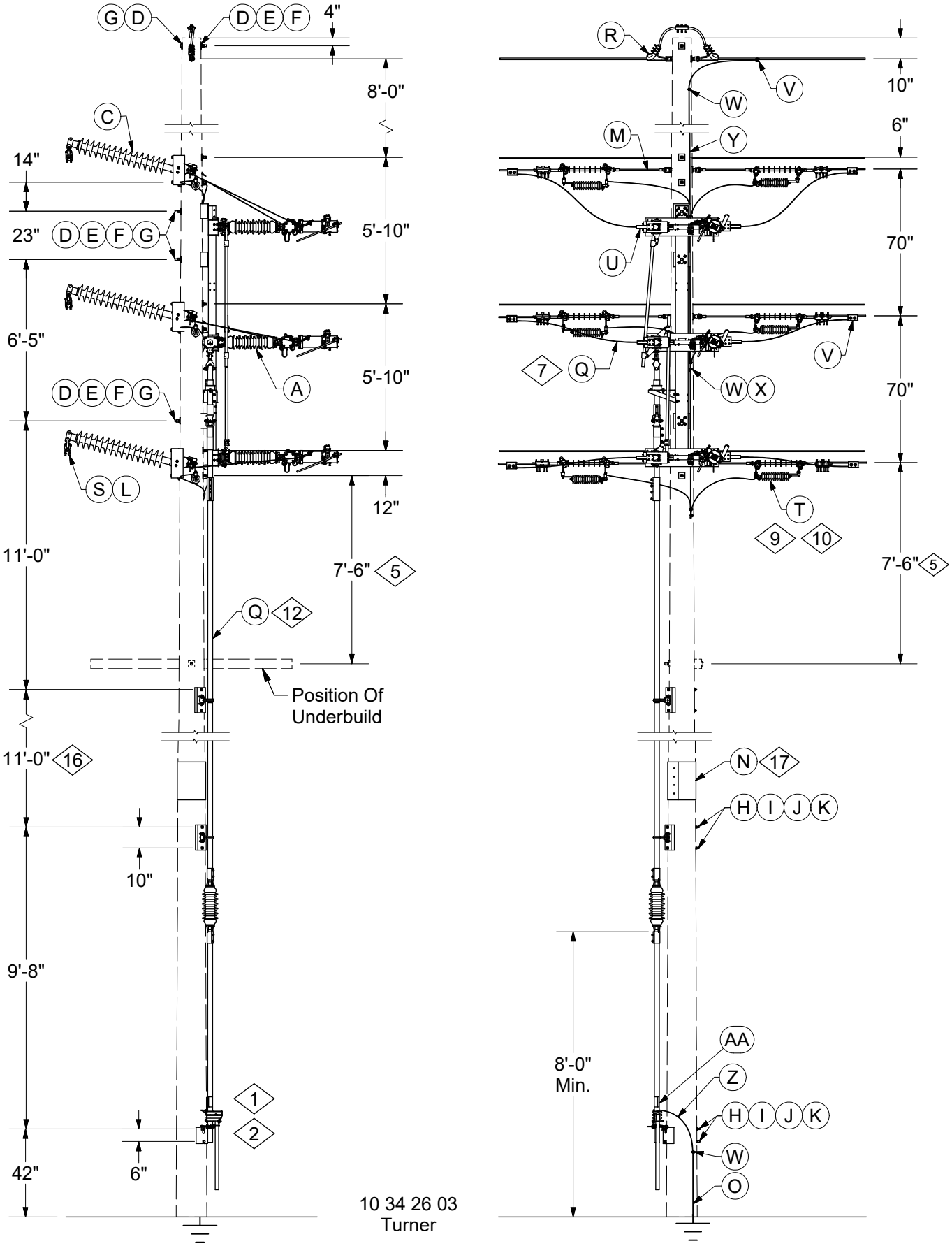
12. Switch should be installed on a pole that does not require guying.

13. Arresters are not required for normally closed switch installation. If switch is normally open, arresters are only needed on a circuit that does not continue in both directions. Install arresters when required on pole that circuits ends on, see DCS **12 00 01 01**.

14. FCI's may be installed on line conductor Larger than 1/0 when switches are installed.

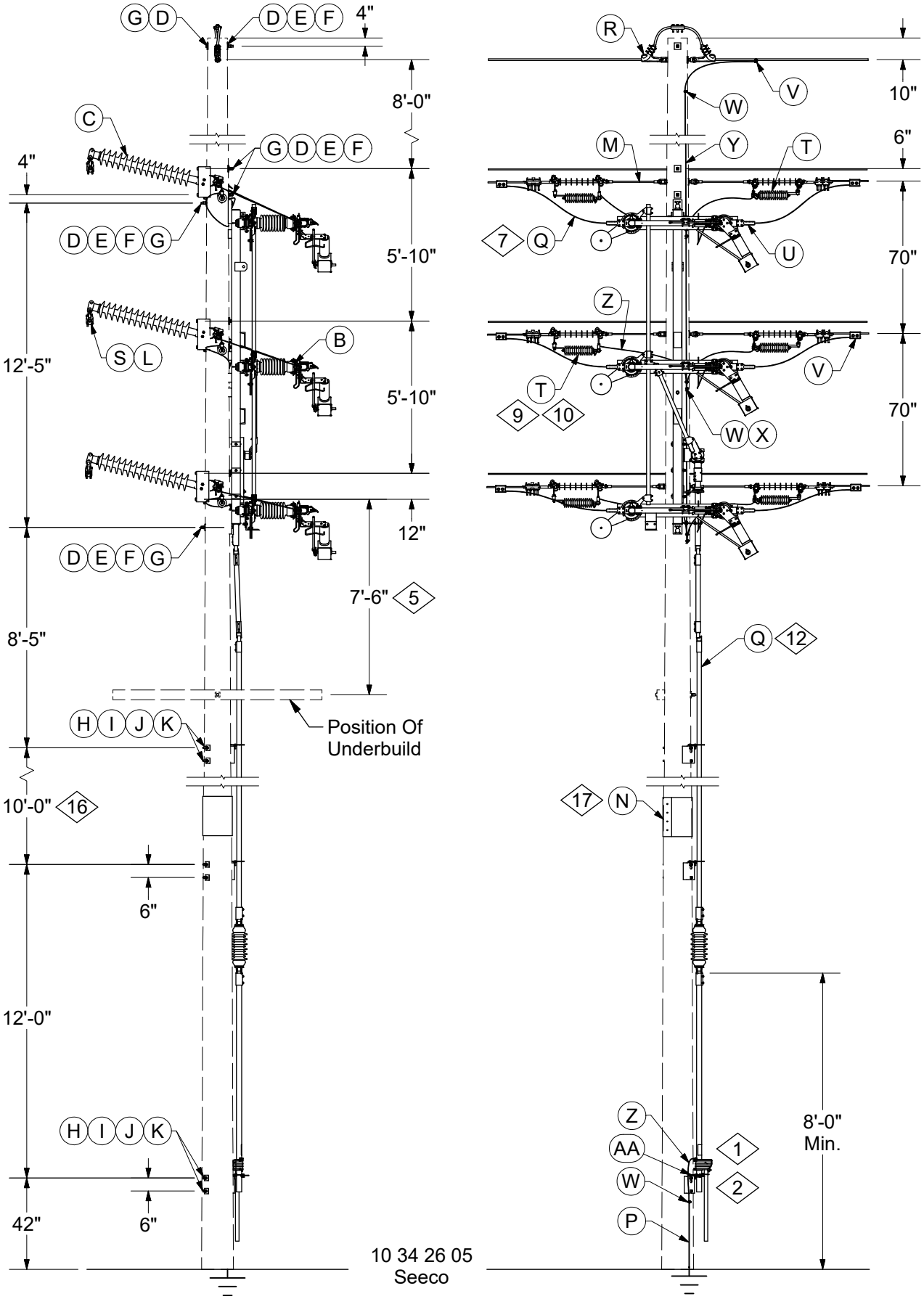
15. Pipe guide spacing may be adjusted from 8'-0" to 15'-0" to account for pole height.

16. Pole wrap is received in 100'-0" rolls. Cut roll to size and wrap around pole approximately 12" below neutral or secondary.



10 34 26 03
Turner

REV	DATE	ENG	DESCRIPTION
12	01/01/24	DT	Converted to new format
11	11/04/16	WYW	



10 34 26 05
Seeco

REV	DATE	ENG	DESCRIPTION
12	01/01/24	DT	Converted to new format
11	11/04/16	WYW	

CONSTRUCTION NOTE(s):

1. Switch handle must be grounded. For pole ground, operating pipe insulator, fiberglass section and ground mat requirements, refer to DCS **10 34 01 01**, Section C.

2. Install operating handle in best position possible for unobstructed safe operation of the switch.

3. Install padlock on handle to prevent switch operation by the public.

4. The Turner switch weighs 980 lbs including interrupters. Seeco switch weighs 1,400 lbs.

5. 7'-6" clearance between 34kV and underbuild applies to lowest 34kV deadend, insulator bolt or lowest bolt of switch (whichever is lower) and highest distribution crossarm bolt or deadend (whichever is higher).

6. Remove switch lifting bracket after installation.

7. For switch leads, use line conductor for sizes larger than 556. For smaller line conductors, use poly covered copper, see DCS **07 00 80 00**.

8. Field cut pipe lengths as needed.

9. The line arrester shown in the drawing is suspended from the compressed-on end fittings of the polymer deadend insulator and supported by aluminum hot line clamps, and will not work with porcelain deadend bells. The disconnector coupling assembly detaches the line end of the arrester should the arrester fail and will cause the arrester to pivot and drop down into a vertical position which makes the failed arrester much more visible. The disconnect coupling assembly with a 3/8" threaded stud that can be inserted into the tap lead eyebolt of the hot line clamp on the line end and an eyebolt with 3/8" stud that can be inserted into the tap lead eyebolt of the hot line clamp on the ground end. One of the tinned copper leads (on the pole end of the assembly) is to shunt the clevis-eye connection to eliminate radio noise. The longer tinned copper lead is for connection to a pole ground wire. Use a 3/8" carriage head bolt through the hot line clamp eyebolt to keep the assembly from falling if the hot line clamp tap lead eyebolt should loosen.

	ITEM	STK / DCS #	DESCRIPTION 10 34 26 **	03	05
	A	54 08 433	Turner TS2, Three Phase with LBRK – Vertical Mount	1	-
	B	54 08 442	SEECO 34kV, 1200A w/LBRK Vertical	-	1
	C	25 05 132	Insulator, Line Post, Horizontal, 138kV	3	3
	D	23 66 031	Washer, Curved, Square, 3/4"	11	10
	E	23 66 135	Lock Washer - 3/4" Double Coil	10	9
	F	23 65 042	Lock Nut - 3/4" Square	10	9
	G	23 52 219	Bolt, Mach., 3/4" x 14" w/ square nut	1	3
		23 52 254	Bolt, Mach., 3/4" x 16" w/ square nut	6	6
		23 52 103	Bolt, Mach., 3/4" x 18" w/ square nut	3	-
	H	23 52 068	Bolt, Mach., 5/8" x 16" w/ square nut	4	4
		23 52 069	Bolt, Mach., 5/8" x 18" w/ square nut	4	4
	I	23 66 207	Washer, Curved, Square, 5/8"	6	8
	J	23 66 134	Lock Washer - 5/8" Double Coil	6	8
	K	23 65 043	Lock Nut - 5/8" Square	6	8
	L	23 58 063	Wye Clevis − (Rotated) Eye Fitting	3	3
	M	**06 34 60 15 @**	Deadend, Pole, 34.5 kV	6	6
17,@	N	23 17 473	Wood Pole Wrap	#	#
@	O	**12 69 11 ** @**	Grounding Unit - Switch Pole	1	1
7,@	P	**07 00 80 00**	Wire, Switch Leads	45	45
12,@	Q	32 01 821	2" x 10' Steel Pipe w/coupling	#	#
13,@	R	**06 00 11 ** @**	Static Wire Attachment	#	#
		18 05 10 01 @	OPGW Static	#	#
@	S	**07 00 20 00**	Clamp, Suspension	3	3
10,@	T	10 01 248	Arrester, Line protection, 36kV Rated	6	6
@	U	**07 00 30 00**	Lug, Connecting	6	6
@	V	**07 00 25 00**	Clamp - Parallel Groove	6	6
10,@	W	17 54 373	Connector - Split Bolt, #14 AWG Str. to #2 AWG Str.	8	8
10,@	X	23 64 001	Staple 3/8" x 2"	20	20
10,@	Y	18 51 019	Wire, #2 Cu S.D. Poly Covered (ft.)	20	20
10,@	Z	18 51 021	Wire, #6 Cu S.D. Poly Covered (ft.)	20	20
15,@	AA	60 55 041	FCI, Non Communicating, 8 hr or 3A Reset, 100A min Trip	#	#

DESIGN NOTE(s):

10. Arresters are not required for normally closed switch installation. Where switches are normally open, install a set of arresters on adjacent poles on both sides of the switch. When installing arresters on adjacent poles is not practical, both sets of arresters may be installed as described in note 9. Refer to DCS **12 00 01 01** for arrester/s selection. Items T,W,X,Y, and Z are only required when arrester/s are installed.

11. If motor operator is required, refer to DCS **10 69 10 ****.

12. Item Q required if additional vertical pipe is required. Turner switch comes with four 10'-6" sections of pipe. Seeco switch comes with one 21'-0" and one 12'-6" section of pipe. Add extra pipe if upper mounting bolt is higher than 63'-0" for Turner switch and 59'-0" for Seeco switch.

13. Item R required if static wire is present.

14. Switch should be installed on a pole that does not require guying.

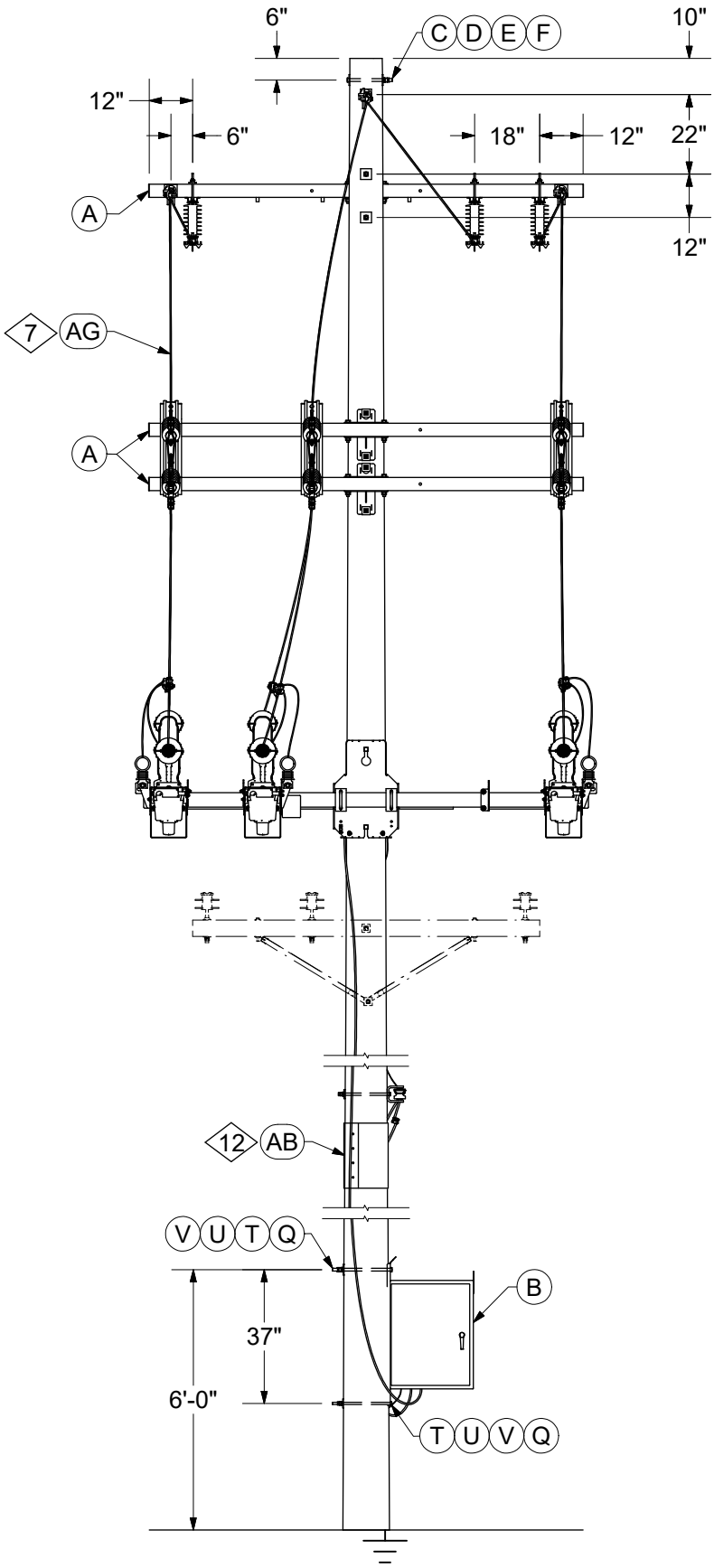
REV	DATE	ENG	DESCRIPTION
12	01/01/24	DT	Converted to new format
11	11/04/16	WYW	

DESIGN NOTE(s):

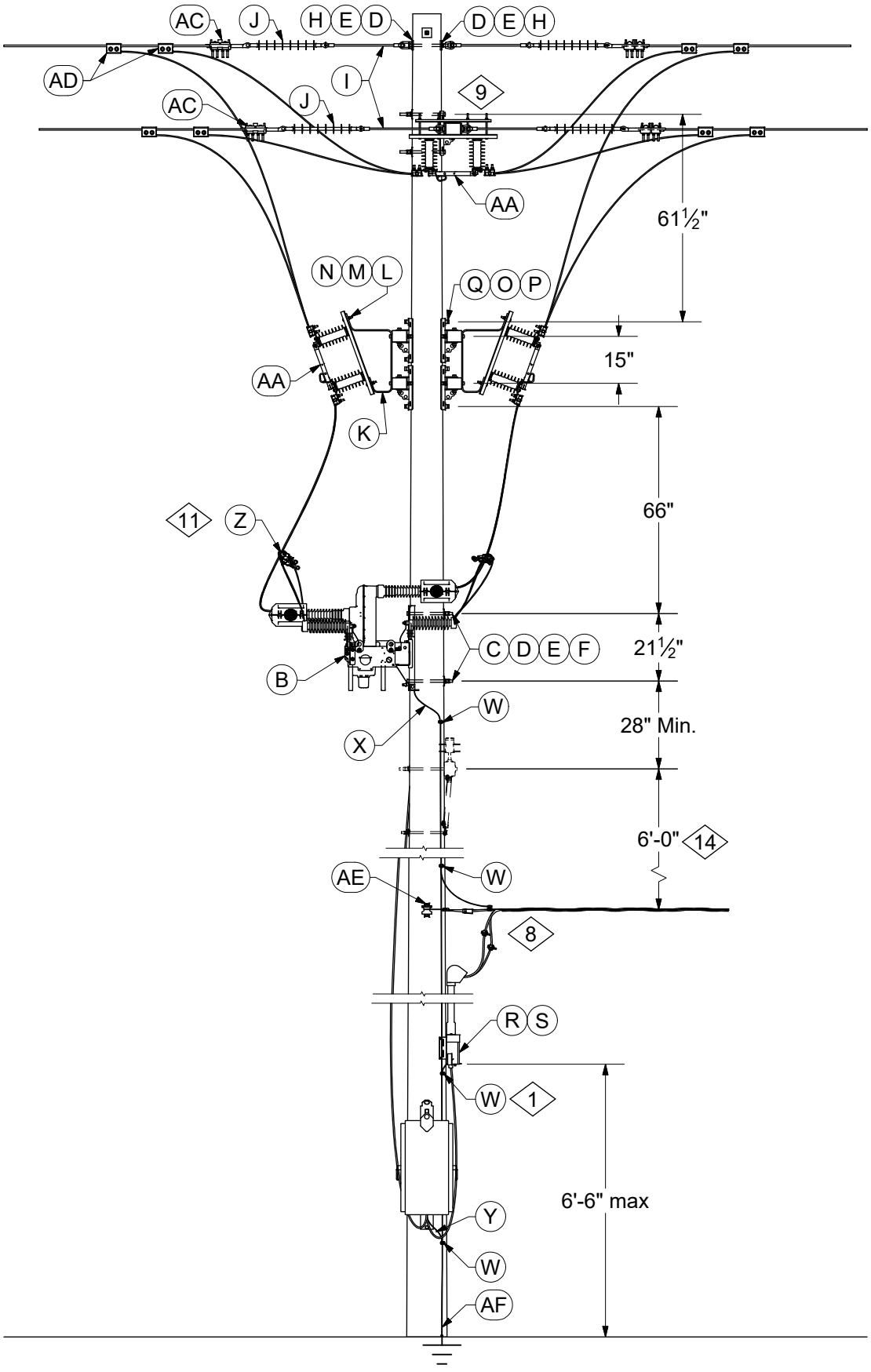
15. FCI's may be installed on line conductor 1/0 and larger when switches are installed.

16. Pipe guide spacing may be adjusted from 8'-0" to 15'-0" to account for pole height.

17. Pole wrap is received in 100'-0" rolls.Cut roll to size and wrap around pole approximately 12" below neutral or secondary.



REV	DATE	ENG	DESCRIPTION
17	01/01/24	DT	Converted to new format
16	09/29/17	WYW	



REV	DATE	ENG	DESCRIPTION
17	01/01/24	DT	Converted to new format
16	09/29/17	WYW	

CONSTRUCTION NOTE(s):

1. Secondary breaker box and recloser control cabinet shall be connected to pole ground with #6, S.D. Cu. Recloser shall be bonded to pole ground with #2 Cu.

2. Position lugs so the cable enters the animal guard through the side entry point, in order to direct cables to the switches.

3. If static present, maintain 8' separation from the static wire to the upper bolt phase crossarm.

4. The middle arresters should always be mounted on the pole side, the outside phase arresters should be mounted to the outside of the Viper arm. The arrangement will maximize the phase-phase spacing of energized parts.

5. The 36 kV lightning arresters come pre-installed on the Viper recloser from the factory with 36" of #4 cu poly covered wire that must be connected to the recloser leads with hot line clamps at least 36" away from the base of recloser or any exposed component. The replacement 36 kV arrester is Stock #10 01 252.

6. If system neutral is present, bond #2 Cu ground to the system neutral. If system neutral is not present and a static/shield wire is present, then bond the #2 Cu ground to the static/shield wire. If system neutral and static wire are both present, only bond the #2 Cu ground to the system neutral.

7. Minimum conductor size shall be 1/0 Cu.

8. If communications is present, 40" clearance to communication applies to the lowest secondary or drip loop at weatherhead, whichever is lowest.

9. If differential tension is present, fiberglass deadend crossarm shall be installed on the side of the pole with lower tension. The Viper shall be installed on the opposite side of the pole as the crossarm. Bypass switches shall open away from recloser.

10. If secondary neutral is not common to primary neutral and/or static, drive an additional ground rod for the secondary neutral not less than 20'-0" from the pole ground rod and connect the ground lead through an isolation arrester (Stock #10 01 019) to the pole ground. The secondary grounding conductor shall be installed for 600V (use riser wire Stock #18 53 011). Both ground leads must be covered with plastic moulding for a distance of 8' from the ground. The resistance of both grounds should not exceed 25 ohms.

11. If recloser leads are 1/0, use (6) hotline clamps, Stock #23 78 183.

12. Wood pole wrap comes on 100'-0" rolls. Install rough side of wrap against pole.

	ITEM	STK / DCS #	DESCRIPTION 10 34 50 **	03
	A	**04 00 42 03**	Crossarm - Deadend, F/G 10'	5
	B	69 10 248	Recloser, 35kV, 800 Amp (G&W) Z Style	1
	C	23 52 219	Bolt, Mach., 3/4" x 14" w/ square nut	2
		23 52 254	Bolt, Mach., 3/4" x 16" w/ square nut	2
	D	23 66 031	Washer, Curved, Square, 3/4"	6
	E	23 66 135	Lock Washer - 3/4" Double Coil	4
	F	23 65 042	Lock Nut - 3/4" Square	3
	G	23 59 095	Eyelet, 3/4"	1
	H	23 65 018	Eyenut, 3/4"	1
	I	25 56 076	Insulator, Guy Strain, 26"	6
	J	25 06 053	Insulator, Suspension, 34kV	6
	K	23 06 131	Bracket, Angle Mount	6
	L	23 52 003	Carriage Bolt, 3/8" x 5" w/ square nut	12
	M	23 66 016	Flat Washer, 3/8", Galvanized	12
	N	23 66 003	Washer - Lock, Galv. Steel, 3/8"	12
	O	23 52 256	Bolt, Mach., 5/8" x 7" w/ square nut	12
	P	23 66 132	Washer, Flat, Sq., 4" x 4", w/ 13/16" Hole	12
	Q	23 65 043	Lock Nut - 5/8" Square	14
	R	54 17 486	Circuit Breaker, Receptical Box, w/Riser 120V, 15A	1
	S	23 60 002	Lag Screw - 1/4" x 4"	4
	T	23 52 068	Bolt, Mach., 5/8" x 16" w/ square nut	2
	U	23 66 207	Washer, Curved, Square, 5/8"	2
	V	23 66 134	Lock Washer - 5/8" Double Coil	2
	W	17 54 373	Connector - Split Bolt, #14 AWG Str. to #2 AWG Str.	4
	X	18 51 019	Wire, #2 Cu Poly (ft.)	10
	Y	18 51 021	Wire, #6 Cu Poly (ft.)	6
	Z	17 02 175	Clamp, Hotline, 500 kCMIL to #4 Cu	6
11	AA	54 07 302	Disc., Switch, 900 A, 34 kV,	9
@	AB	23 17 473	Wood Pole Wrap	1
@	AC	**07 00 20 00**	Clamp, Deadend	6
@	AD	**07 00 25 00**	Clamp - Parallel Groove	15
@	AE	**03 01 ** ** @**	Secondary Configuration	1
@	AF	**12 00 10 03 @**	Ground Unit, #2 Cu Poly, Ground Rod	1
		12 00 10 04 @	Ground Unit, #2 Cu Ploy, Ground Coil	1
@	AG	**07 00 80 00**	Wire, Cu, Poly (ft.)	110

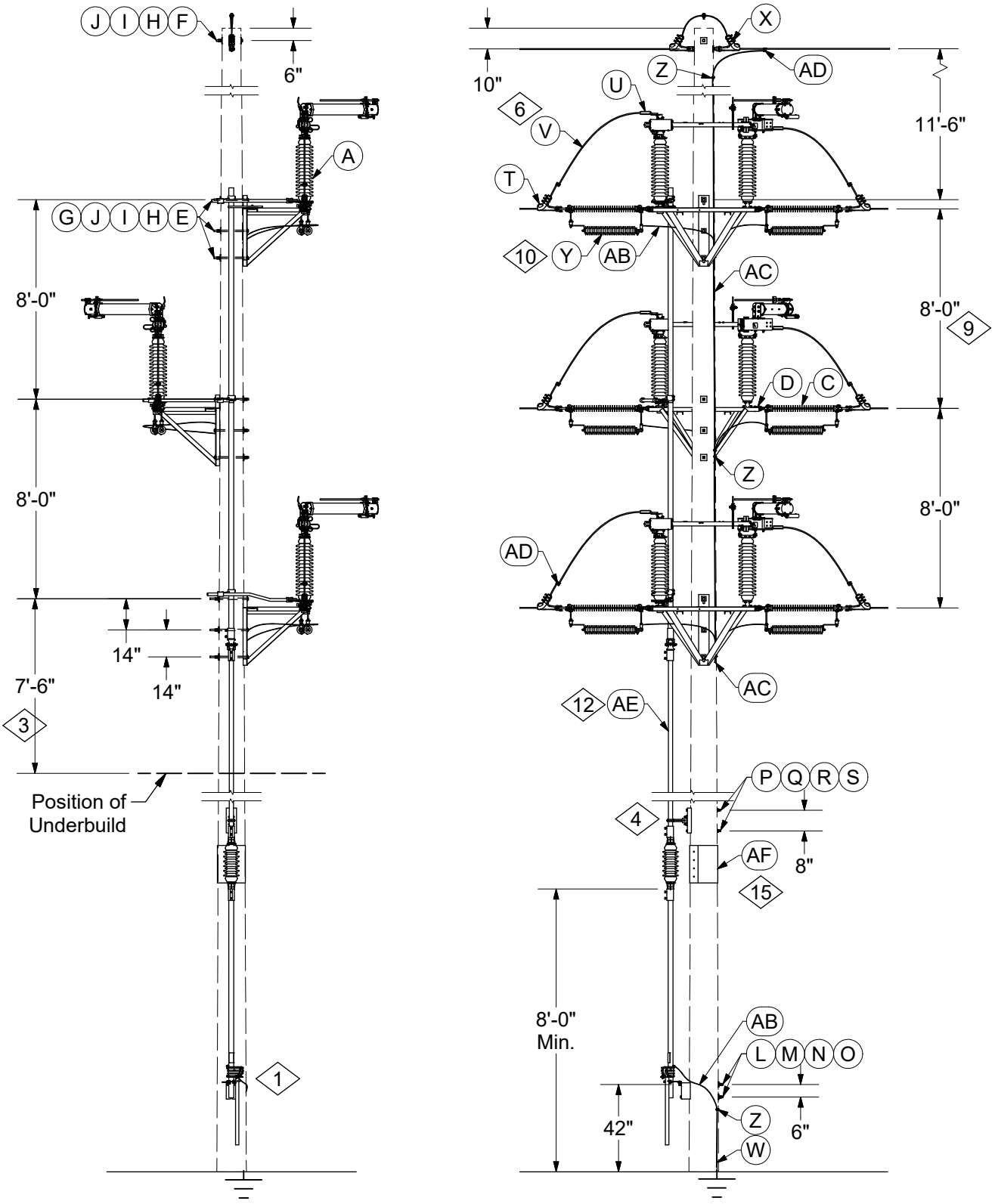
DESIGN NOTE(s):

13. The Viper comes with a 50'-0" control cable. If the lower Viper mounting bolt is higher than 47'-0", a 75'-0" control cable, Stock #69 10 263, is required. If a shorter cable is needed, a 35'-0" cable is available under Stock #69 10 234. Replacement 50'-0" cable is Stock #69 10 233.

<14> See DCS **03 00 01 00** for spacing information. May be reduced to 40" if pole space is limited.

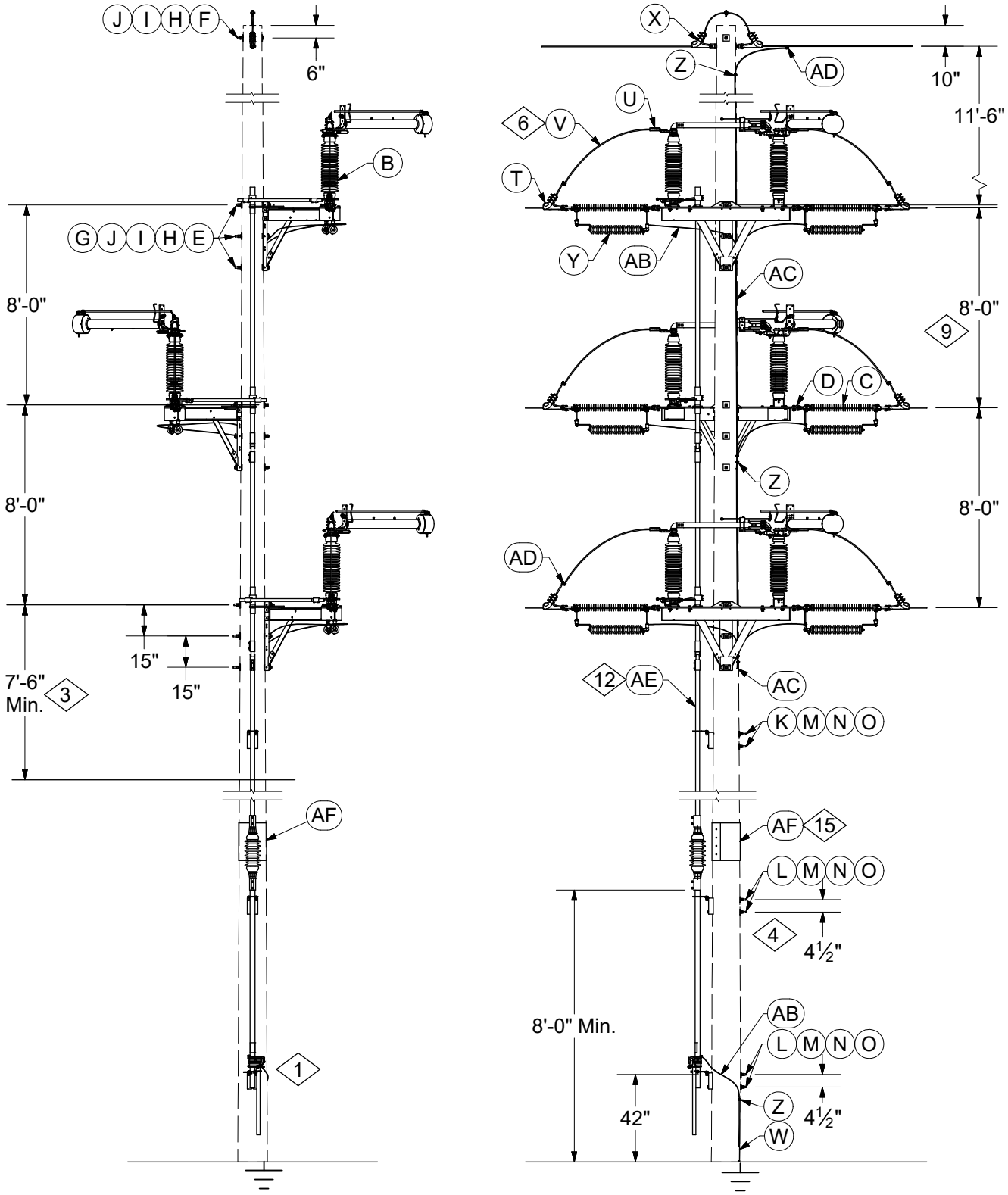
15. 120V AC is required to power recloser control cabinet. If secondary is not present, a 1 kVa or larger transformer may be installed on nearby pole.

REV	DATE	ENG	DESCRIPTION
17	01/01/24	DT	Converted to new format
16	09/29/17	WYW	



DCS #	DESCRIPTION
10 69 05 01	Turner Switch 69kV 1200A w/Load Interrupters
10 69 05 02	Turner Switch 69kV 1200A w/o Load Interrupters

REV	DATE	ENG	DESCRIPTION
6	01/01/24	DT	Converted to new format
5	07/27/17	WYW	



DCS #	DESCRIPTION
10 69 05 03	SEECO Switch 69kV 1200A w/Load Interrupters
10 69 05 04	SEECO Switch 69kV 1200A w/o Load Interrupters

REV	DATE	ENG	DESCRIPTION
6	01/01/24	DT	Converted to new format
5	07/27/17	WYW	

CONSTRUCTION NOTE(s):

1. Switch handle must be grounded. For pole ground, operating pipe insulator, fiberglass section and ground mat requirements, refer to DCS **10 34 01 01**, Section C.

2. Install padlock on handle to prevent switch operation by the public.

3. 7'-6" clearance between 69kV and underbuild applies to upper mounting bolt on lowest switch frame and highest distribution crossarm bolt or deadend (whichever is higher).

4. Evenly space pipe guides 10'-0" to 15'-0" apart.

5. Each Seeco phase assembly weighs 600 pounds without interrupter and 700 pounds with interrupter. Each Turner phase assembly weighs 350 pounds without interrupter and 400 pounds with interrupter.

6. For switch leads, use line conductor for sizes larger than 556. For smaller line conductors, use poly covered copper, see DCS **07 00 80 00**.

7. Field cut pipe lengths as needed.

8. The line arrester shown in the drawing is suspended from the compressed on end fittings of the polymer deadend insulator and supported by aluminum hot line clamps, and will not work with porcelain deadend bells. The disconnector coupling assembly detaches the line end of the arrester should the arrester fail and will cause the arrester to pivot and drop down into a vertical position which makes the failed arrester much more visible. The disconnect coupling assembly with a 3/8" threaded stud that can be inserted into the tap lead eyebolt of the hotline clamp on the line end and an eyebolt with 3/8" stud that can be inserted into the tap lead eyebolt of the hotline clamp on the ground end. One of the tinned copper leads (on the pole end of the assembly) is to shunt the clevis-eye connection to eliminate radio noise. The longer tinned copper lead is for connection to a pole ground wire.

9. For 8'-0" spacing, the interrupter (if equipped) must be horizontally mounted to the insulator, as shown in the standards; otherwise the spacing shall be 10'-0" for vertically mounted interrupters, as shown in Figure 1. All new load break switches come with horizontally mounted interrupters. The vertically mounted interrupter can be replaced with horizontally mounted interrupters.

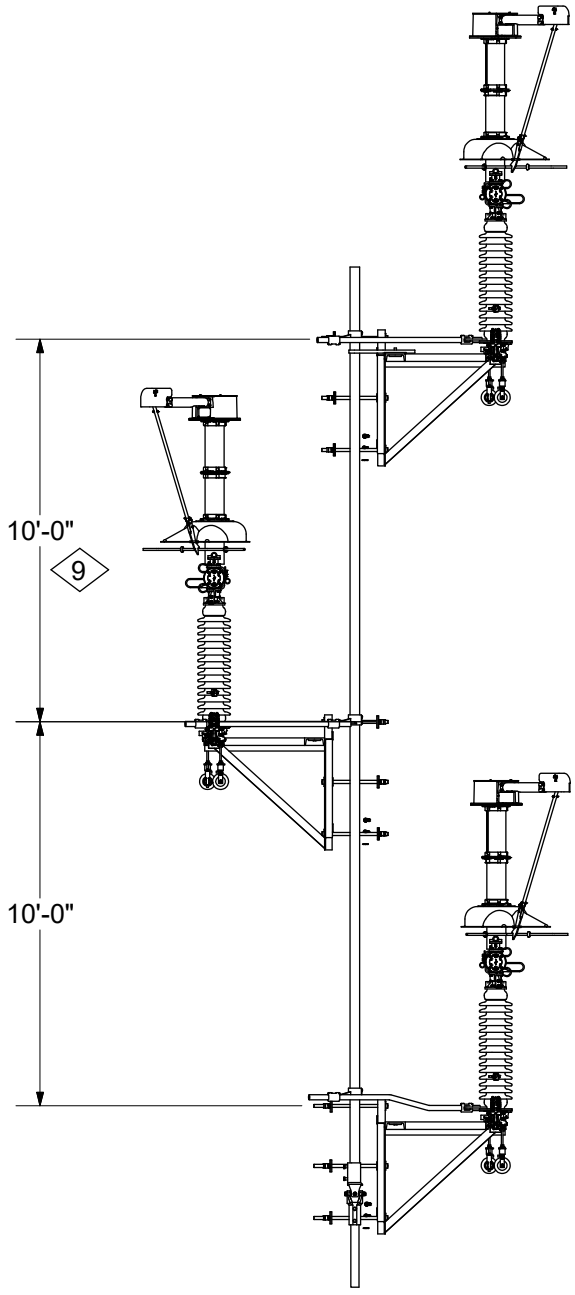


Figure 1

REV	DATE	ENG	DESCRIPTION
6	01/01/24	DT	Converted to new format
5	07/27/17	WYW	

	ITEM	STK / DCS #	DESCRIPTION 10 69 05 **	01	02	03	04
	A	54 09 393	Turner CS2 Switch, 69kV, 1200A, w/o Interrupters	-	1	-	-
		54 09 395	Turner CS2 Switch, 69kV, 1200A, w/Interrupters	1	-	-	-
	B	54 09 035	SEECO Switch, 69kV, 1200A, w/ Interrupters	-	-	1	-
		54 09 369	SEECO Switch, 69kV, 1200A, w/o Interrupters	-	-	-	1
	C	25 06 113	Insulator, Suspension, 69kV	6	6	6	6
	D	23 68 440	Shackle, Anchor, 3/4" Pin, 1-1/16" opening, Galv.	6	6	6	6
	E	23 52 254	Bolt, Mach., 3/4" x 16" w/ square nut	6	6	6	6
	F	23 52 219	Bolt, Mach., 3/4" x 14" w/ square nut	1	1	1	1
	G	23 66 131	Washer, Square, 3/4"	9	9	9	9
	H	23 66 031	Washer, Curved, Square, 3/4"	11	11	11	11
	I	23 66 135	Lock Washer - 3/4" Double Coil	10	10	10	10
	J	23 65 042	Lock Nut - 3/4" Square	10	10	10	10
	K	23 52 068	Bolt, Mach., 5/8" x 16" w/ square nut	-	-	8	8
	L	23 52 069	Bolt, Mach., 5/8" x 18" w/ square nut	2	2	4	4
	M	23 66 207	Washer, Curved, Square, 5/8"	2	2	12	12
	N	23 66 134	Lock Washer - 5/8" Double Coil	2	2	12	12
	O	23 65 043	Lock Nut - 5/8" Square	2	2	12	12
	P	23 52 309	Bolt, Mach., 1/2" x 16" w/ square nut	6	6	-	-
	Q	23 66 017	Washer - Round 1/2"	6	6	-	-
	R	23 66 133	Lock Washer - Double Coil 1/2"	6	6	-	-
	S	23 65 056	Lock Nut - 1/2" Square	6	6	-	-
@	T	**07 00 20 00**	Clamp, Deadend	6	6	6	6
@	U	**07 00 30 00**	Lug, Compr. Terminal, AL.	6	6	6	6
6,@	V	**07 00 80 00**	Wire, Switch Leads	45	45	45	45
1,@	W	**12 69 11 ** @**	Grounding Unit	1	1	1	1
@	X	**06 00 11 ** @**	Static Wire Attachment	#	#	#	#
		18 05 10 01 @	OPGW Static	#	#	#	#
10,@	Y	10 01 236	Arrester, Line Protection, 60kV Duty Cycle, 48kV MCOV	6	6	6	6
10,@	Z	17 54 373	Connector - Split Bolt, #14 AWG Str. to #2 AWG Str.	8	8	8	8
10,@	AA	18 51 019	Wire, #2 Cu SD Poly Covered (ft.)	40	40	40	40
10,@	AB	18 51 021	Wire, #6 Cu SD Poly Covered (ft.)	42	42	42	42
10,@	AC	23 64 001	Staple 3/8" x 2"	20	20	20	20
@	AD	**07 00 25 00**	Clamp, Parallel Groove	6	6	6	6
12,@	AE	32 01 821	2" x 10' Steel Pipe w/Coupling	#	#	#	#
15,@	AF	23 17 473	Wood pole Wrap	#	#	#	#
14,@	AG	60 55 041	FCI, Non Communicating, 8 hr or 3A Reset, 100A min. Trip	#	#	#	#

REV	DATE	ENG	DESCRIPTION
6	01/01/24	DT	Converted to new format
5	07/27/17	WYW	

DESIGN NOTE(s):

10. Arresters are not required for normally closed switch installation. Where switches are normally open, install a set of arresters on adjacent poles on both sides of the switch. When installing arresters on adjacent poles is not practical, both sets of arresters may be installed as described in note 8. Refer to DCS **12 00 01 01** for arrester selection. Items AA, AB, AC, AD, and AE are only required when arresters are installed.

11. If motor operator is required, refer to DCS **10 69 10 ****.

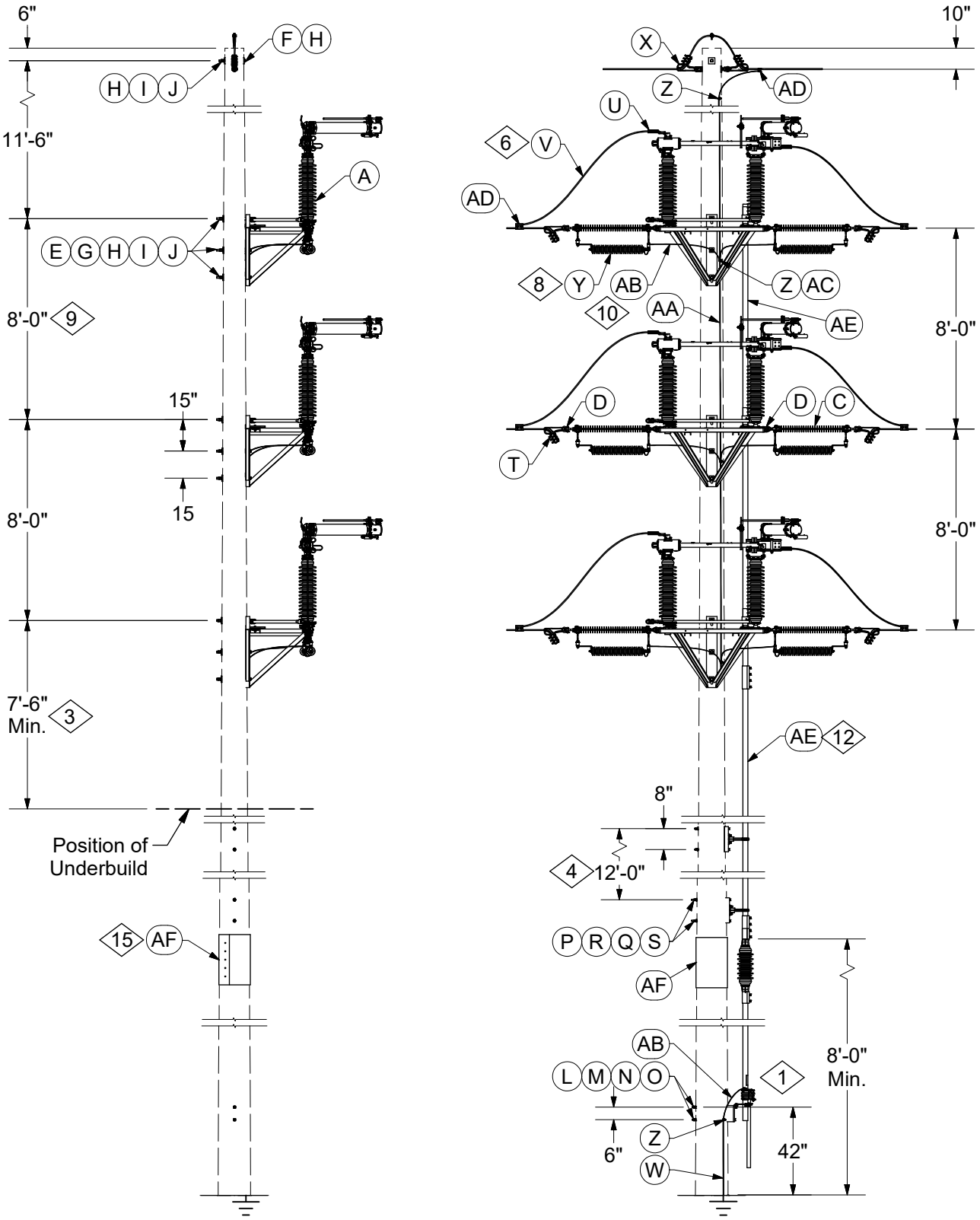
12. Stock #32 01 821 required if additional vertical pipe is required. Turner switch comes with three 21'-0" sections of pipe. Seeco switch comes with four 21'-0" sections of pipe. Add extra pipe if upper switch mounting bolt for top phase is higher than 76'-0" for Turner switch and 97'-0" for Seeco switch.

13. Switch should be installed on a pole that does not require guying.

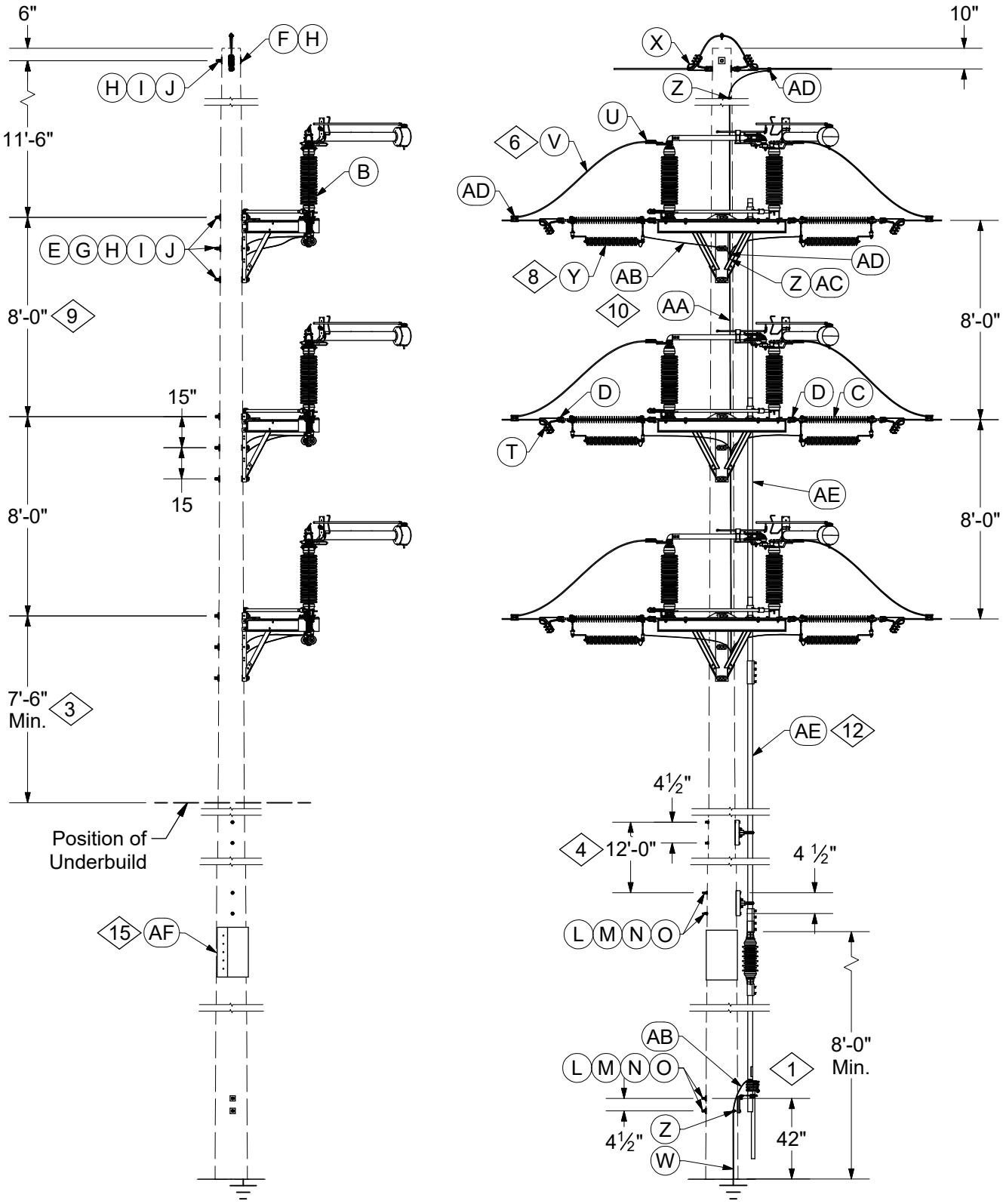
14. FCI's may be installed on line conductor larger than 1/0 when switches are installed.

15. Pole wrap is received in 100'-0" rolls. Cut roll to size and wrap around pole approximately 12" below neutral or secondary.

16. Switch frames are designed to have equal line tension on both sides of swtich with a maximum DE tension of 10,000 lbs. and a maximum line angle of 10°.



DCS#	DESCRIPTION
10 69 07 01	Turner Switch 69kV 1200A w/ Load Interrupters
10 69 07 02	Turner Switch 69kV 1200A w/o Load Interrupters



DCS#	DESCRIPTION
10 69 07 03	SEECO Switch 69kV 1200A w/ Load Interrupters
10 69 07 04	SEECO Switch 69kV 1200A w/o Load Interrupters

REV	DATE	ENG	DESCRIPTION
6	01/01/24	DT	Converted to new format
5	07/27/17	WYW	

CONSTRUCTION NOTE(s):

1. Switch handle must be grounded. For pole ground, operating pipe insulator, fiberglass section and ground mat requirements, refer to DCS **10 34 01 01**, Section C.

2. Install padlock on handle to prevent switch operation by the public.

3. 7'-6" clearance between 69kV and underbuild applies to upper mounting bolt on lowest switch frame and highest distribution crossarm bolt or deadend (whichever is higher).

4. Evenly space pipe guides 10'-0" to 15'-0" apart.

5. Each Seeco phase assembly weighs 600 pounds without interrupter and 700 pounds with interrupter. Each Turner phase assembly weighs 350 pounds without interrupter and 400 pounds with interrupter.

6. For switch leads, use line conductor for sizes larger than 556. For smaller line conductors, use poly covered copper, see DCS **07 00 80 00**.

7. Field cut pipe lengths as needed.

8. The line arrester shown in the drawing is suspended from the compressed on end fittings of the polymer deadend insulator and supported by aluminum hot line clamps, and will not work with porcelain deadend bells. The disconnector coupling assembly detaches the line end of the arrester should the arrester fail and will cause the arrester to pivot and drop down into a vertical position which makes the failed arrester much more visible. The disconnect coupling assembly with a 3/8" threaded stud that can be inserted into the tap lead eyebolt of the hotline clamp on the line end and an eyebolt with 3/8" stud that can be inserted into the tap lead eyebolt of the hotline clamp on the ground end. One of the tinned copper leads (on the pole end of the assembly) is to shunt the clevis-eye connection to eliminate radio noise. The longer tinned copper lead is for connection to a pole ground wire.

9. For 8'-0" spacing, the interrupter (if equipped) must be horizontally mounted to the insulator, as shown in the standards; otherwise the spacing shall be 10'-0" for vertically mounted interrupters, as shown in Figure 1. All new load break switches come with horizontally mounted interrupters. The vertically mounted interrupter can be replaced with horizontally mounted interrupters

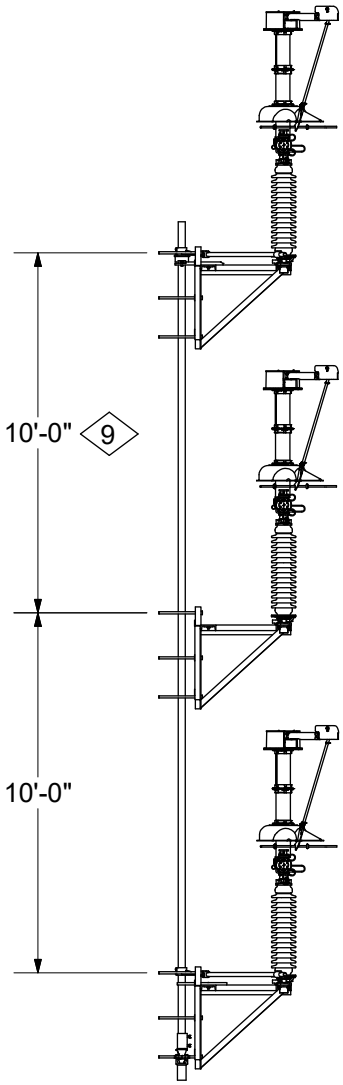


Figure 1

REV	DATE	ENG	DESCRIPTION
6	01/01/24	DT	Converted to new format
5	07/27/17	WYW	

	ITEM	STK / DCS #	DESCRIPTION 10 69 07 **	01	02	03	04
	A	54 09 392	Turner Switch, CS2 69kV, 1200A, w/o Interrupters	-	1	-	-
		54 09 394	Turner Switch, CS2 69kV, 1200A, w/Interrupters	1	-	-	-
	B	54 09 368	SEECO Switch, 69kV, 1200A, w/o Interrupters	-	-	-	1
		54 09 370	SEECO Switch, 69kV, 1200A, w/Interrupters	-	-	1	-
	C	25 06 113	Insulator, Suspension, 69kV	6	6	6	6
	D	23 68 440	Shackle, Anchor, 3/4” Pin, 1-1/16” opening, Galv.	6	6	6	6
	E	23 52 254	Bolt, Mach., 3/4" x 16" w/ square nut	9	9	9	9
	F	23 52 219	Bolt, Mach., 3/4" x 14" w/ square nut	1	1	1	1
	G	23 66 131	Washer, Square, 3/4"	9	9	9	9
	H	23 66 031	Washer, Curved, Square, 3/4"	11	11	11	11
	I	23 66 135	Lock Washer - 3/4" Double Coil	10	10	10	10
	J	23 65 042	Lock Nut - 3/4" Square	10	10	10	10
	K	23 52 068	Bolt, Mach., 5/8" x 16" w/ square nut	-	-	6	6
	L	23 52 069	Bolt, Mach., 5/8" x 18" w/ square nut	2	2	4	4
	M	23 66 207	Washer, Curved, Square, 5/8"	2	2	10	10
	N	23 66 134	Lock Washer - 5/8" Double Coil	2	2	10	10
	O	23 65 043	Lock Nut - 5/8" Square	2	2	10	10
	P	23 52 309	Bolt, Mach., 1/2" x 16" w/ square nut	6	6	-	-
	Q	23 66 133	Lock Washer - Double Coil 1/2"	6	6	-	-
	R	23 66 017	Washer - Round 1/2"	6	6	-	-
	S	23 65 056	Lock Nut - 1/2" Square	6	6	-	-
@	T	**07 00 20 00**	Clamp, Deadend	6	6	6	6
@	U	**07 00 30 00**	Lug, Compr. Terminal, AL	6	6	6	6
6,@	V	**07 00 80 00**	Wire, Switch Leads	45	45	45	45
1,@	W	**12 69 11 ** @**	Grounding Unit	1	1	1	1
@	X	**06 00 11 ** @**	Static Wire Attachment	#	#	#	#
	X	**18 05 10 01 @**	OPGW Static	#	#	#	#
10,@	Y	10 01 236	Arrester, Line Protection, 60kV Duty Cycle, 48kV MCOV	6	6	6	6
10,@	Z	17 54 373	Connector - Split Bolt, #14 AWG Str. to #2 AWG Str.	9	9	9	9
10,@	AA	18 51 019	Wire, #2 Cu SD Poly Covered (ft.)	40	40	40	40
10,@	AB	18 51 021	Wire, #6 Cu SD Poly Covered (ft.)	42	42	42	42
10,@	AC	23 64 001	Staple 3/8" x 2"	3	3	3	3
@	AD	**07 00 25 00**	Clamp, Parallel Groove, PG*	6	6	6	6
12,@	AE	32 01 821	2" x 10' Steel Pipe w/Coupling	#	#	#	#
15,@	AF	23 17 473	Wood Pole Wrap	#	#	#	#
14,@	AG	60 55 041	FCI, Non Communicating, 8 hr or 3A Reset, 100A min Trip	#	#	#	#

REV	DATE	ENG	DESCRIPTION
6	01/01/24	DT	Converted to new format
5	07/27/17	WYW	

DESIGN NOTE(s):

10. Arresters are not required for normally closed switch installation. Where switches are normally open, install a set of arresters on adjacent poles on both sides of the switch. When installing arresters on adjacent poles is not practical, both sets of arresters may be installed as described in note 8. Refer to DCS **12 00 01 01** for arrester selection. Items Y, Z, AA, AB, and AC are only required when arresters are installed.

11. If motor operator is required, refer to DCS **10 69 10 ****.

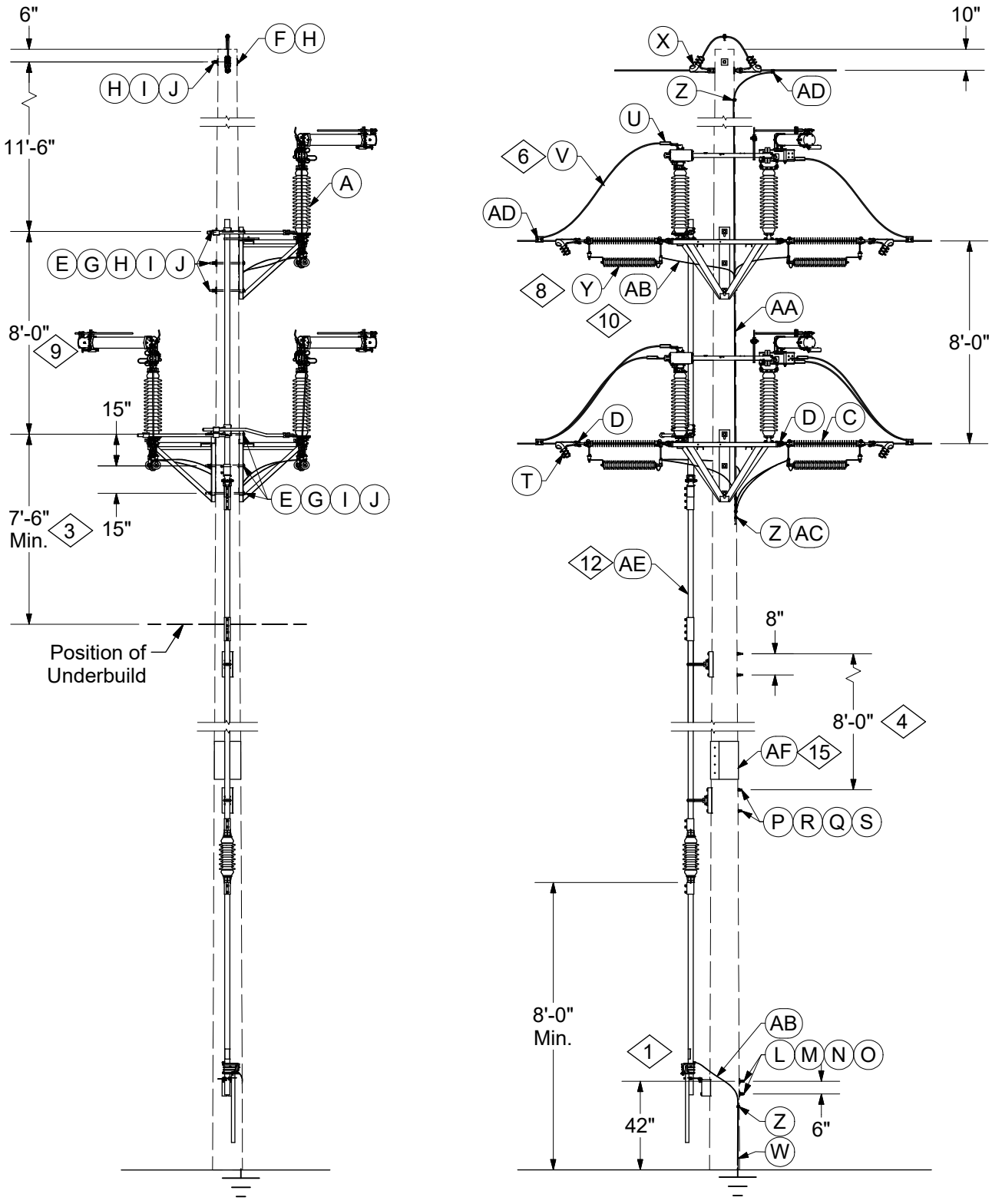
12. Stock #32 01 821 required if additional vertical pipe is required. Turner switch comes with three 21'-0" sections of pipe. Seeco switch comes with one 18'-0" pipe, one 12'-0" pipe, and three 21'-0" pipes. Add extra pipe if upper switch mounting bolt for top phase is higher than 74'-0" for Turner switch and 104'-0" for Seeco switch.

13. Switch should be installed on a pole that does not require guying.

14. FCI"s may be installed on line conductor larger than 1/0 when switches are installed.

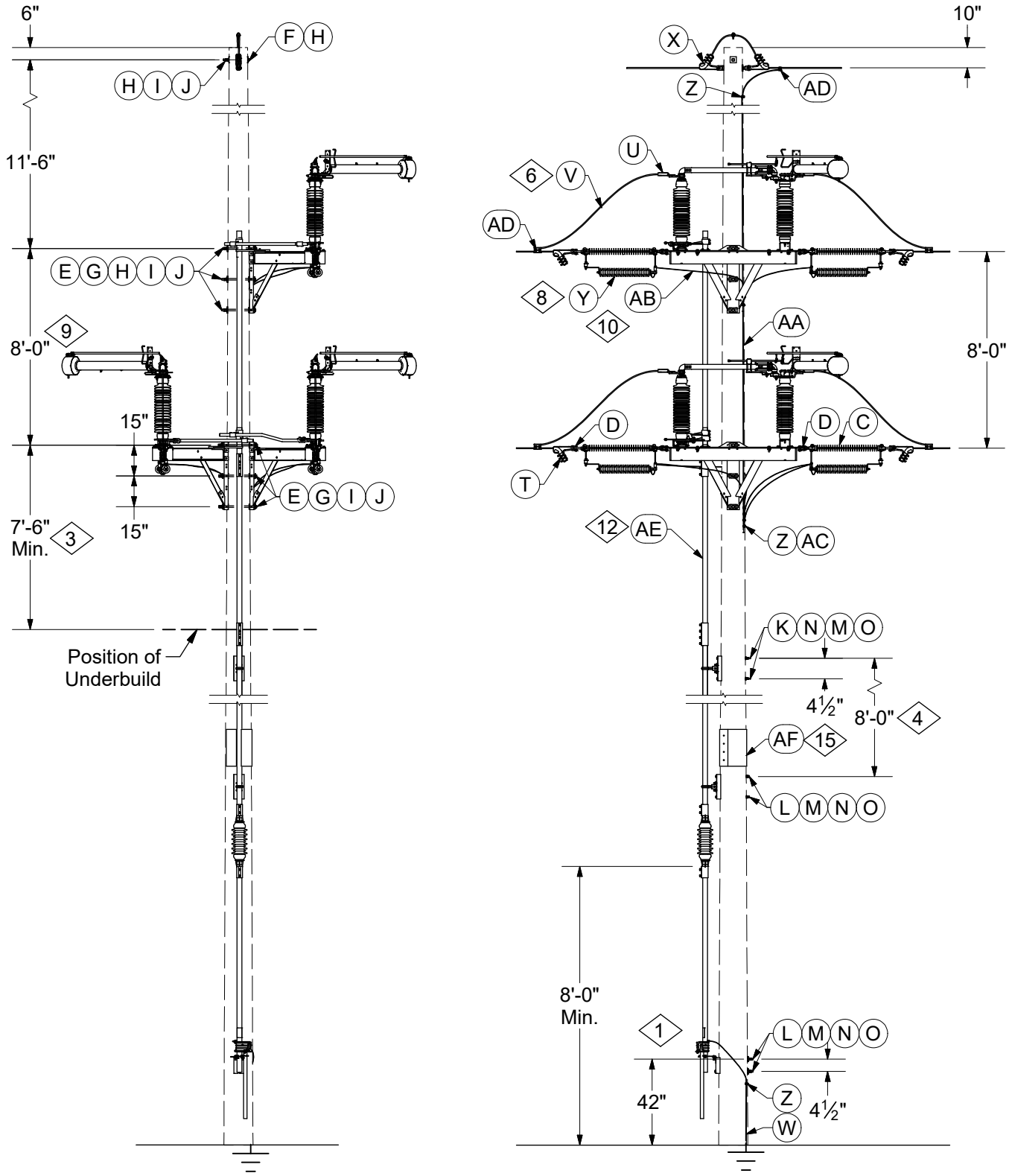
15. Pole wrap is recieved in 100-0" rolls. Cut roll to size and wrap around pole approximately 12" below neutral or secondary

16. Switch frames are designed to have equal line tension on both side of switch with a maximum deadend tension of 10,000 lbs and a maximum line angle of 10°.



DCS#	DESCRIPTION
10 69 09 01	Turner 69kV 1200A w/Load Interrupters
10 69 09 02	Turner 69kV 1200A w/o Load Interrupters

REV	DATE	ENG	DESCRIPTION
5	01/01/24	DT	Converted to new format
4	11/04/16	WYW	



DCS#	DESCRIPTION
10 69 09 03	SEECO 69kV 1200A w/Load Interrupters
10 69 09 04	SEECO 69kV 1200A w/o Load Interrupters

REV	DATE	ENG	DESCRIPTION
5	01/01/24	DT	Converted to new format
4	11/04/16	WYW	

CONSTRUCTION NOTE(s):

1. Switch handle must be grounded. For pole ground, operating pipe insulator, fiberglass section and ground mat requirements, refer to DCS **10 34 01 01**, Section C.

2. Install padlock on handle to prevent switch operation by the public.

3. 7'-6" clearance between 69kV and underbuild applies to upper mounting bolt on lowest switch frame and highest distribution crossarm bolt or deadend (whichever is higher).

4. Evenly space pipe guides 10'-0" to 15'-0" apart.

5. Each Seeco phase assembly weighs 600 pounds without interrupter and 700 pounds with interrupter. Each Turner phase assembly weighs 350 pounds without interrupter and 400 pounds with interrupter.

6. For switch leads, use line conductor for sizes larger than 556. For smaller line conductors, use poly covered copper, see DCS **07 00 80 00**.

7. Field cut pipe lengths as needed.

8. The line arrester shown in the drawing is suspended from the compressed on end fittings of the polymer deadend insulator and supported by aluminum hot line clamps, and will not work with porcelain deadend bells. The disconnector coupling assembly detaches the line end of the arrestor should the arrestor fail and will cause the arrester to pivot and drop down into a vertical position which makes the failed arrester much more visible. The disconnect coupling assembly with a 3/8" threaded stud that can be inserted into the tap lead eyebolt of the hotline clamp on the line end and an eyebolt with 3/8" stud that can be inserted into the tap lead eyebolt of the hotline clamp on the ground end. One of the tinned copper leads (on the pole end of the assembly) is to shunt the clevis-eye connection to eliminate radio noise. The longer tinned copper lead is for connection to a pole ground wire.

9. For 8'-0" spacing, the interrupter (if equipped) must be horizontally mounted to the insulator, as shown in the standards; otherwise the spacing shall be 10'-0" for vertically mounted interrupters, as shown in Figure 1. All new load break switches come with horizontally mounted interrupters. The vertically mounted interrupter can be replaced with horizontally mounted interrupters.

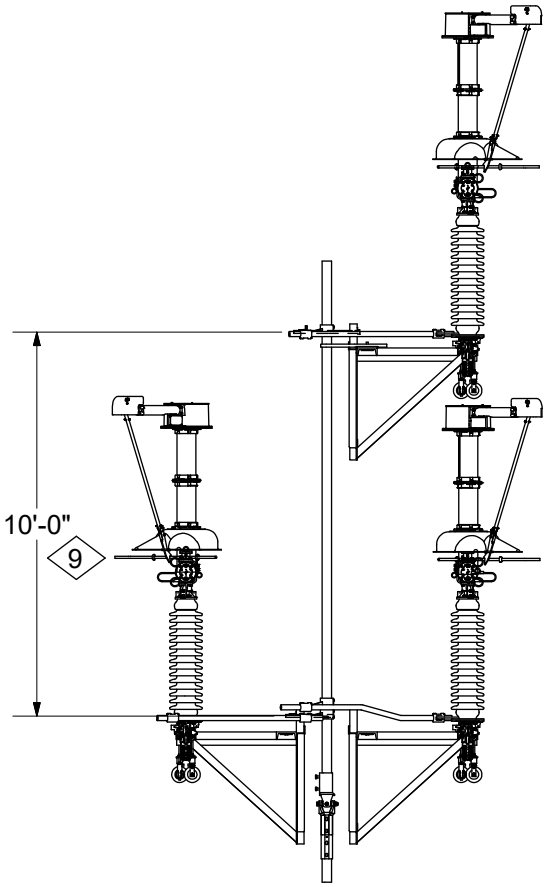


Figure 1

	ITEM	STK / DCS #	DESCRIPTION 10 69 09 **	01	02	03	04
	A	54 09 393	Turner CS2 Switch, 69kV, 1200A, w/o Interrupters	-	1	-	-
		54 09 395	Turner CS2 Switch, 69kV, 1200A, w/Interrupters	1	-	-	-
	B	54 09 035	SEECO Switch, 69kV, 1200A, w/ Interrupters	-	-	1	-
		54 09 369	SEECO Switch, 69kV, 1200A, w/o Interrupters	-	-	-	1
	C	25 06 113	Insulator, Suspension, 69kV	6	6	6	6
	D	23 68 440	Shackle, Anchor, 3/4” Pin, 1-1/16” opening, Galv.	6	6	6	6
	E	23 52 254	Bolt, Mach., 3/4" x 16" w/ square nut	6	6	6	6
	F	23 52 219	Bolt, Mach., 3/4" x 14" w/ square nut	1	1	1	1
	G	23 66 131	Washer, Square, 3/4"	9	9	9	9
	H	23 66 031	Washer, Curved, Square, 3/4"	5	5	5	5
	I	23 66 135	Lock Washer - 3/4" Double Coil	7	7	7	7
	J	23 65 042	Lock Nut - 3/4" Square	7	7	7	7
	K	23 52 068	Bolt, Mach., 5/8" x 16" w/ square nut	-	-	8	8
	L	23 52 069	Bolt, Mach., 5/8" x 18" w/ square nut	2	2	4	4
	M	23 66 207	Washer, Curved, Square, 5/8"	-	-	12	12
	N	23 66 134	Lock Washer - 5/8" Double Coil	-	-	12	12
	O	23 65 043	Lock Nut - 5/8" Square	-	-	12	12
	P	23 52 309	Bolt, Mach., 1/2" x 16" w/ square nut	6	6	-	-
	Q	23 66 133	Lock Washer - Double Coil 1/2"	6	6	-	-
	R	23 66 017	Washer - Round 1/2"	6	6	-	-
	S	23 65 056	Lock Nut - 1/2" Square	6	6	-	-
@	T	**07 00 20 00**	Clamp, Deadend	6	6	6	6
@	U	**07 00 30 00**	Lug, Compr. Terminal, AL	6	6	6	6
6,@	V	**07 00 80 00**	Wire, Switch Leads	45	45	45	45
1,@	W	**12 69 11 ** @**	Grounding Unit	1	1	1	1
@	X	**06 00 11 ** @**	Static Wire Attachment	#	#	#	#
	X	**18 05 10 01 @**	OPGW Static	#	#	#	#
10,@	Y	10 01 236	Arrester, Line Protection, 60kV Duty Cycle, 48kV MCOV	6	6	6	6
10,@	Z	17 54 373	Connector - Split Bolt, #14 AWG Str. to #2 AWG Str.	8	8	8	8
10,@	AA	18 51 019	Wire, #2 Cu SD Poly Covered (ft.)	40	40	40	40
10,@	AB	18 51 021	Wire, #6 Cu SD Poly Covered (ft.)	42	42	42	42
10,@	AC	23 64 001	Staple 3/8" x 2"	20	20	20	20
@	AD	**07 00 25 00**	Clamp, Parallel Groove	6	6	6	6
12,@	AE	32 01 821	2" x 10' Steel Pipe w/Coupling	#	#	#	#
15,@	AF	23 17 473	Wood Pole Wrap	#	#	#	#
14,@	AG	60 55 041	FCI, Non Communicating, 8 hr or 3A Reset, 100A min Trip	#	#	#	#

REV	DATE	ENG	DESCRIPTION
5	01/01/24	DT	Converted to new format
4	11/04/16	WYW	

DESIGN NOTE(s):

10. Arresters are not required for normally closed switch installation. Where switches are normally open, install a set of arresters on adjacent poles on both sides of the switch. When installing arresters on adjacent poles is not practical, both sets of arresters may be installed as described in note 8. Refer to DCS **12 00 01 01** for arrester selection. Items Y, Z, AA, AB, and AC are only required when arresters are installed.

11. If motor operator is required, refer to DCS **10 69 10 ****.

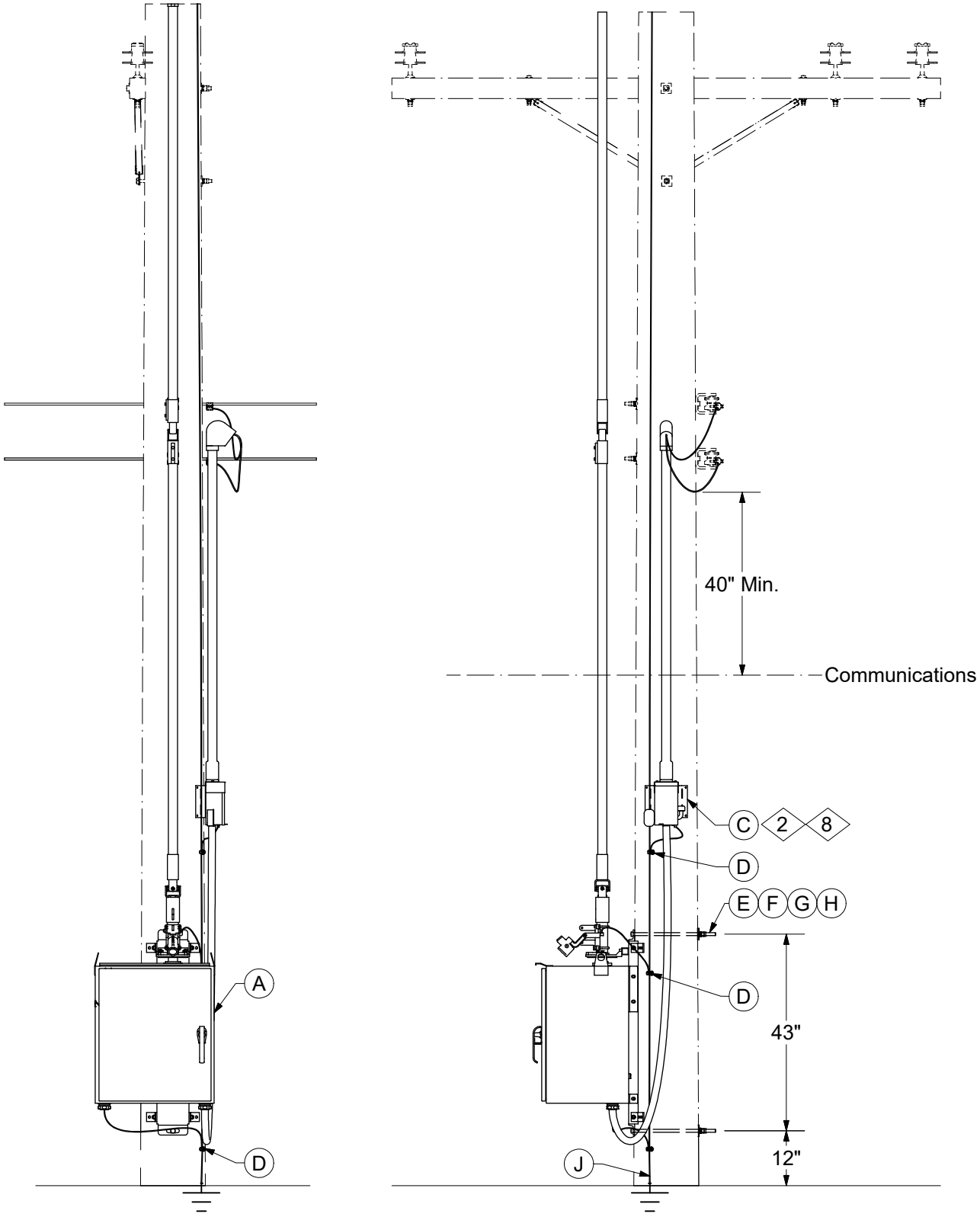
12. Stock #32 01 821 required if additional vertical pipe is required. Turner switch comes with three 21'-0" sections of pipe. Seeco switch comes with four 21'-0" sections of pipe. Add extra pipe if upper switch mounting bolt for top phase is higher than 76'-0" for Turner switch and 97'-0" for Seeco switch.

13. Switch should be installed on a pole that does not require guying.

14. FCI's may be installed on line conductor larger than 1/0 when switches are installed.

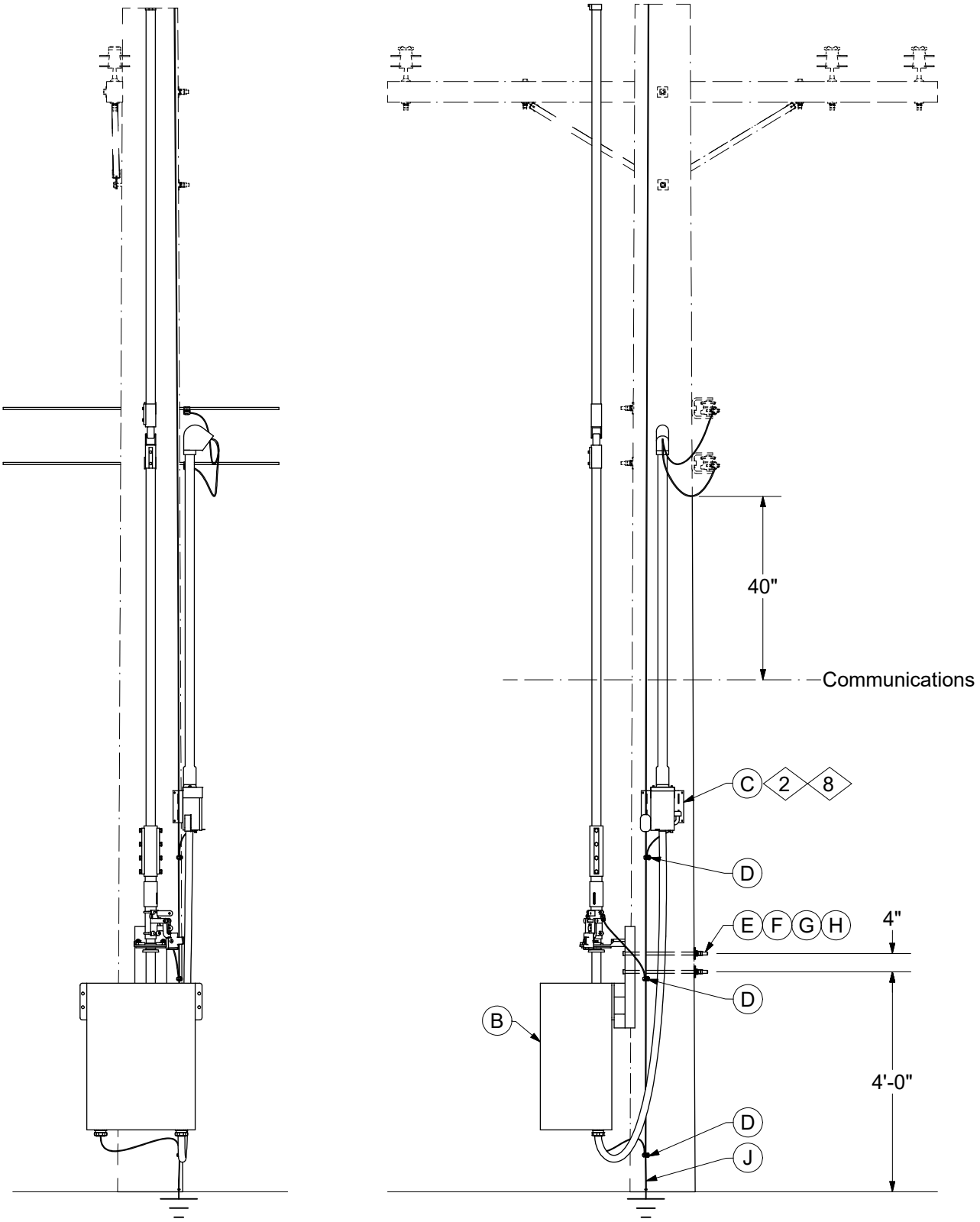
15. Pole wrap is received in 100'-0" rolls. Cut roll to size and wrap around pole approximately 12" below neutral or secondary

16. Switch frames are designed to have equal line tension on both sides of switch with a maximum DE tension of 10,000 lbs and a maximum line angle of 10°.



34 & 69kV - 1200A - Turner Motor Operator

REV	DATE	ENG	DESCRIPTION
8	01/01/24	DT	Converted to new format
7	10/01/19	DT	



34 & 69kV - 1200A - SEECO Motor Operator

REV	DATE	ENG	DESCRIPTION
8	01/01/24	DT	Converted to new format
7	10/01/19	DT	

CONSTRUCTION NOTE(s):

1. If a motor operator is to be installed on a new or existing switch, the switch should be completely and properly adjusted and operating satisfactorily prior to motor operator installation. If the motor operator is to be mounted on an existing switch, proper maintenance should be performed. (Contact Distribution Automation to schedule adjustment and commissioning of motor operator and RTU.)

2. Open circuit breaker to disconnect power to the motor operator before working inside cabinet to avoid hazard of electric shock.

3. Use the aluminum support channel for lifting the motor operator.

4. Align operator power shaft with vertical operating pipe, with a level. Mount the motor operator securely to the switch structure or pole with through bolts and lag screws.

5. If motor operator is mounted on wood pole:

   A. A #2 Cu pole ground wire is required for grounding of motor operator cabinet, static wire, circuit breaker box, and switch handle.
   B. Operating rod insulators between circuits are required, See DCS **10 34 01 01**.
   C. A ground mat is required, See DCS **12 69 11 01**.
   D. The motor operator cabinet and switch operating handle must be grounded to the driven ground rod or a field formed ground electrode with a #2 Cu wire, See DCS **12 69 11 ****.

6. If motor operator is mounted on steel pole:

   A. A pole ground wire is not required but there must be provisions (Rivnuts) for grounding a shield wire, a primary system neutral (if present), a motor operator cabinet, circuit breaker box, and the base of the pole.
   B. The motor operator cabinet must be grounded to the pole ground wire.
   C. TR-210 porcelain operating rod insulator, Stock #25 09 048 and 8 ft. fiberglass insulator, Stock #54 08 324 which comes with the switch may be omitted on a steel pole, and both items should be put back in the stock with the stock # assigned.
   D. The operating handle shall be grounded to a driven ground rod or a field formed ground electrode with a #2 Cu wire.
   E. A ground mat is required. See DCS **12 69 11 02**.

7. If motor operator is mounted on composite pole:

   A. The #2 Cu pole ground wire comes with the pole must be bonded to the grounding electrode at the base of the pole, motor operator, circuit breaker box and shield wire, and a primary system neutral (if present).
   B. Operating rod insulators between circuits are required, See DCS **10 34 01 01**.
   C. The operating handle shall be grounded to a driven ground rod or a field formed ground electrode with a #2 Cu wire.
   D. A ground mat is required. See DCS **12 69 11 03**.

8. Attach secondary breaker box to pole and route black, white, and green wires in 10'-0" of 1/2" liquid tight conduit to controller and route black and white wires in 20'-0" of 3/4" liquid tight conduit to the weatherhead.

9. If antenna installation is required in supply space, See DCS **25 90 00 00** for clearance requirement. If antenna installation is required in communications zone, See DCS **29 00 17 11** for clearance requirement.

DCS#	DESCRIPTION
10 69 10 01	34kV Turner D Switch
10 69 10 02	69kV Turner D Switch
10 69 10 03	34 & 69kV Seeco Switch
10 69 10 04	34 & 69kV Turner TSB or TS2

	ITEM	STK / DCS #	DESCRIPTION 10 69 10 **	01	02	03	04
	A	54 08 416	Motor Operator for Turner D 34kV Switch	1	-	-	-
		54 09 349	Motor Operator for Turner D 69kV Switch	-	1	-	-
		54 08 430	Motor Op. for Turner TSB or TS2 34kV and 69kV Switch	-	-	-	1
	B	54 09 731	Motor Operator for SEECO 34kV or 69kV Switch	-	-	1	-
	C	54 17 486	Circuit Breaker, Receptical Box, w/Riser 120V, 15A	1	1	1	1
	D	17 54 373	Connector - Split Bolt, #14 AWG Str. to #2 AWG Str.	3	3	3	3
	E	23 52 069	Bolt, Mach., 5/8" x 18" w/ square nut	2	2	2	2
	F	23 66 207	Washer, Curved, Square, 5/8"	2	2	2	2
	G	23 66 134	Lock Washer - 5/8" Double Coil	2	2	2	2
	H	23 65 043	Lock Nut - 5/8" Square	2	2	2	2
@	I	54 02 031	NovaTech Orion LXm	#	#	#	#
		54 02 032	NovaTech Orion MX	#	#	#	#
@	J	**12 69 11 ** @**	Grounding Unit	1	1	1	1

REV	DATE	ENG	DESCRIPTION
8	01/01/24	DT	Converted to new format
7	10/01/19	DT	

NOTES