

# CLARK PUBLIC UTILITIES CONTRACTOR HANDBOOK

This handbook provides information regarding current Clark Public Utilities standards, diagrams, and specifications for approved high voltage contractors. The information in this handbook is also part of Clark Public Utilities' Construction Standards book and the Residential and Commercial Electric Service Handbook.

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1400	UG Transformers
1500	UG J-Boxes & Vaults
1600	1000 MCM Cable
1700	UG Secondary

<b>N</b>	New Standard
<b>R</b>	Redrawn Standard
<b>C</b>	Changed Standard
<b>~</b>	No Change


## Meter Department Pre-Made Wire Bundles (All are Solid Copper Wire)

1ø	Potentials	#14 gauge	Black, Green, White
	Currents	#12 Gauge	Blue, Yellow, Brown
3ø	Potentials	#14 gauge	Black, Green, White, Orange
	Currents	#12 Gauge	Blue, Yellow, Brown, Red

Note:

Maximum distance for #12 current wire is 35 feet one way to meet burden of 0.2 on rating factor 4 CTs. For CT conduit runs over 35 feet use #10 current wire to a maximum of 60 feet for a burden of 0.2. If a longer conduit run than 60 feet is unavoidable, see meter department for CT and burden charts and CT sizing.

Distance Chart				
	CT to Meter Distance	Total Wire Distance	Solid State Meter	Add Electrical Mechanical
#12 Wire @ .01588 Ohm per 10 ft			.01	.05
			.002 <MISC>	.002
			.009 <TEST SW>	.009
	35'	70'	.132	.17216
	50'	100'	.1798	.2198
	70'	140'	.243	.28332
	100'	200'	.3386	.3786
	125'	250'	.418	.458
	150'	300'	.4974	.5374
#10 Wire @ .009989 Ohm per 10 ft	60'	120'	.1408	.1808
	75'	150'	.1708	.2108
	80'	160'	.1808	.2208
	100'	200'	.2208	.2608
	200'	400'	.4206	.461

	METERING REQUIREMENTS			REVISION # 0	
				APPROVED	DATE
				JEH	7/19/05
				GDW	7/19/05
				CAM	7/19/05
				CRM	7/19/05
METERING MANUAL	PAGE: 1 of 1	M		CAD FILE: M	LAB 7/19/05

# CLARK PUBLIC UTILITY

## METERING REQUIREMENTS BASED ON EUSERC SPECIFICATIONS

TYPE OF SERVICE OR SOURCE VOLTAGES		SIZE	NUMBER OF TERMINALS	BYPASS PROVISION	TEST SWITCH	DEMAND METERING	REACTIVE METERING
SINGLE PHASE 120/240 VOLTS  (Swimming pools over 35kw will be C.T.'d or 320 amp)	Commercial	200 amp	4	BLOCK BYPASS *	NO	20KW OR GREATER	NO
	Residential	200 amp	4	NO	NO	NO	NO
		320 amp	4	BLOCK BYPASS	NO	COMMERCIAL ONLY	NO
	Commercial	C.T.	6	NO	YES	20KW OR GREATER	NO
	Residential	C.T.	6	NO	NO	NO	NO
NETWORK 120/208V (2 LEGS OF Y)	Commercial	200 amp	5	SAFETY SOCKET	NO	NO	NO
	Residential	200 amp	5	NO	NO	NO	NO
	Commercial	C.T.	8	NO	YES	NO	NO
4 WIRE WYE 120/208 VOLTS		200 amp	7	SAFETY SOCKET	NO	YES	NO
		C.T.	13	NO	YES	YES	YES *
4 WIRE DELTA 240/120 VOLTS		200 amp	7	SAFETY SOCKET	NO	YES	NO
		C.T.	13	NO	YES	YES	YES *
3 WIRE 3Ø DELTA 240V (Existing service only. New services, current trans. Will be 4 wire 240/120)		200 amp	5	SAFETY SOCKET	NO	YES	NO
		C.T.	8	NO	YES	YES	YES *
3 WIRE 3Ø DELTA 480V (Existing service only. New services, current trans. Will be 4 wire 240/480)		200 amp	5	SAFETY SOCKET	NO	YES	NO
		(Contact district about type of socket and whether or not current transformers and reactive metering will be required before making any 480 volt installations)					
4 WIRE 3Ø 277/480 VOLTS		200 amp B/base	7	SAFETY SOCKET	NO	YES	NO
		C.T. & V.T.	13	NO	YES	YES	YES *
		Prim. Met. 7200/120 P.T. & C.T.	13	NO	YES	YES	YES *

C.T. - Current Transformer

V.T. - Voltage Transformer

Rev 2 - Changed blocks marked with a \*.



## CONSTRUCTION STANDARDS

### METERING REQUIREMENTS GENERAL

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**M**

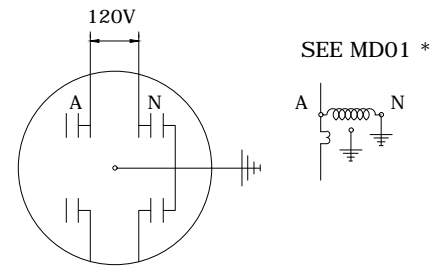
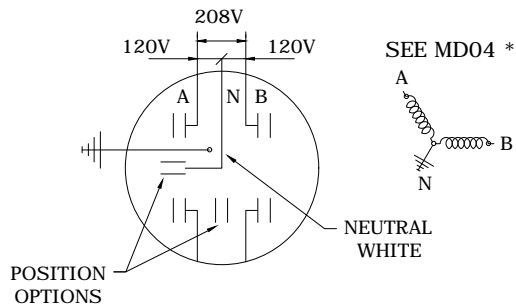
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1	8/2/05	LB	AH
2	1/13/10	CM	AH
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120/208V  
1 PHASE NETWORK

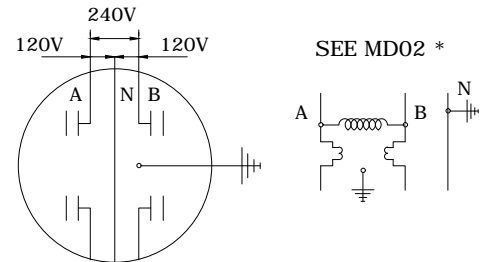
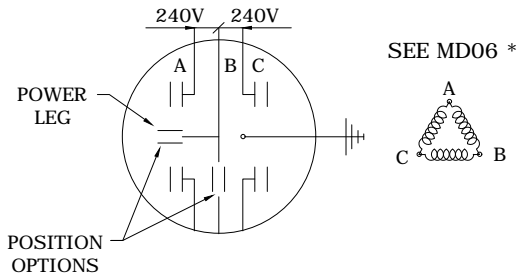
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120V 2  
WIRE



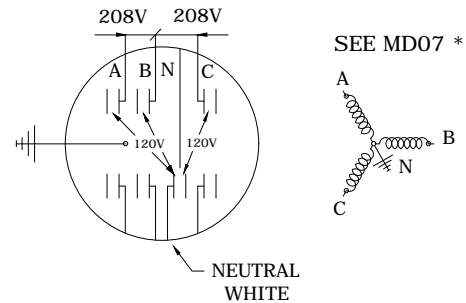
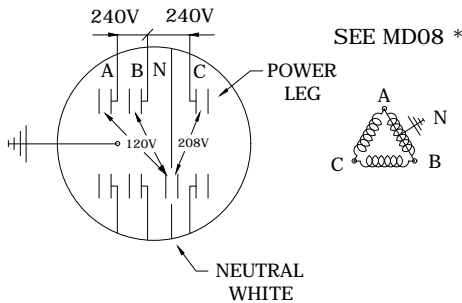
3 PHASE  
3 WIRE 240V

SINGLE PHASE  
3 WIRE 120/240V



3 PHASE 4 WIRE  
DELTA 240/120V

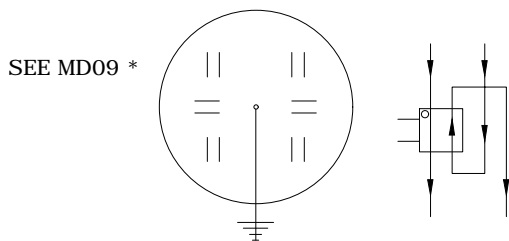
3 PHASE 4 WIRE  
WYE 120/208V  
(or 277/480V)



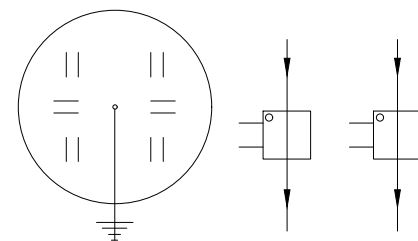
3 WIRE SERVICE USING ONE  
C.T. 6 TERMINAL SOCKET

C.T. RATED

3 WIRE SINGLE SERVICE USING 2  
C.T.'s 6 TERMINAL SOCKET



SEE MD11 \*  
MD11A



LEGEND

~ CURRENT COIL  
~ VOLTAGE COIL

ALL METER SOCKETS TO BE GROUNDED

\* REV. 1 - Added Metering Diagram Numbers.



CONSTRUCTION STANDARDS  
METERING REQUIREMENTS  
GENERAL

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REVISIONS			
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1	8/2/05	LB	AH
REDRAWN IN CAD			
APP:	JEH	SECTION	
DATE:	2/22/00	900	



## Clark Public Utilities Metering Requirements Commercial Applications

Source Voltage	Ampacity	Reference Circle AW P/N	Meter Diagram Numbers	Number of Terminals	Bypass Provision Required	Test Switch Required
120 Volt 1ø 2 Wire	0-100 Amps	U12134*	MD01	4	Yes	No
120/240 Volt 1ø 3 Wire	0-200 Amps	U264*	MD02	4	Yes	No
120/240 Volt 1ø 3 Wire	0-400 Amps	324N, 324NF	MD03	4	Yes	No
120/240 Volt 1ø 3 Wire	Over 200 Amps	12146	MD10, MD11	6	No	Yes
240/480 Volt 1ø 3 Wire	0-200 Amps	124TB	MD02, MD05 Dmd	4	Yes	No
240/480 Volt 1ø 3 Wire	Over 200 Amps	12146	MD10, MD11	6	No	Yes
120/208 Volt 3 Wire Network	0-200 Amps	125TB	MD04	5	Yes	No
120/208 Volt 3 Wire Network	Over 200 Amps	12148	MD12	8	No	Yes
240 Volt 3ø 3 Wire Delta	0-200 Amps	125TB	MD06	5	Yes	No
120/208 Volt 3ø 4 Wire Wye	0-200 Amps	127TB	MD07	7	Yes	No
120/208 Volt 3ø 4 Wire Wye	Over 200 Amps	121413	MD13	13	No	Yes
240/120 Volt 3ø 4 Wire Delta	0-200 Amps	127TB	MD08	7	Yes	No
240/120 Volt 3ø 4 Wire Delta	Over 200 Amps	121413	MD14	13	No	Yes
277/480 Volt 3ø 4 Wire Wye	0-200 Amps	127TB	MD07	7	Yes	No
277/480 Volt 3ø 4 Wire Wye	Over 200 Amps	121413	MD13	13	No	Yes
480 Volt 3ø 3 Wire Delta	0-200 Amps	125TB	MD06	5	Yes	No
480 Volt 3ø 3 Wire Delta	Over 200 Amps	12148	MD12	8	No	Yes

-Circle AW part numbers are for cross reference only


-All Commercial current transformer cabinets shall have hinged doors

Current Transformer Cabinet Dimensions, CT Mounting Base		
Amperes	Dimensions	Circle AW or Equivalent
200 Amps - 400 Amps 1ø	24" X 30" X 11"	6019-HAL (LUG LUG)
401 Amps - 800 Amps 1ø	30" X 36" X 11"	6019-HEL (LUG LUG)
200 Amps - 400 Amps 3ø	30" X 36" X 11"	6019-HAL or 6067-HAL
401 Amps - 800 Amps 3ø	36" X 48" X 11"	6019-HEL or 6067-HEEL

-Over 800 Amps Switchgear Required

-Maximum wire size 600 MCM per lug or parallel per EUSERC SPEC. & UL label

Rev. 3 - Changed cells with asterisks.

	CONSTRUCTION STANDARDS		REVISIONS			
	METERING REQUIREMENTS COMMERCIAL APPLICATION		DATE	ENGR	OPS	
			1	8/2/05	LB	AH
			2	12/19/07	LB	AH
			3	1/13/10	CM	AH
		4	6/18/10	KJP		
PAGE: 3 of 4		M	CAD FILE: M		APP: JEH DATE: 2/22/00	
					SECTION <b>900</b>	

## Clark Public Utilities Metering Requirements Residential Applications

Source Voltage	Ampacity	Reference Circle AW P/N	Meter Diagram Numbers	Number of Terminals	Bypass Provision Required	Test Switch Required
120 Volt 1Ø 2Wire	0-100 Amps	011	MD01	4	No	No
120/240 Volt 1Ø 3Wire	0-200 Amps	204, U204	MD02	4	No	No
120/240 Volt 1Ø 3Wire	0-400 Amps	324N, 324NF	MD03	4	Yes	No
120/240 Volt 1Ø 3Wire	Over 400 Amps	UO11, 011, 925 or 926	MD09, MD11A	5 or 6	No	No

-Circle AW part numbers are for cross reference only

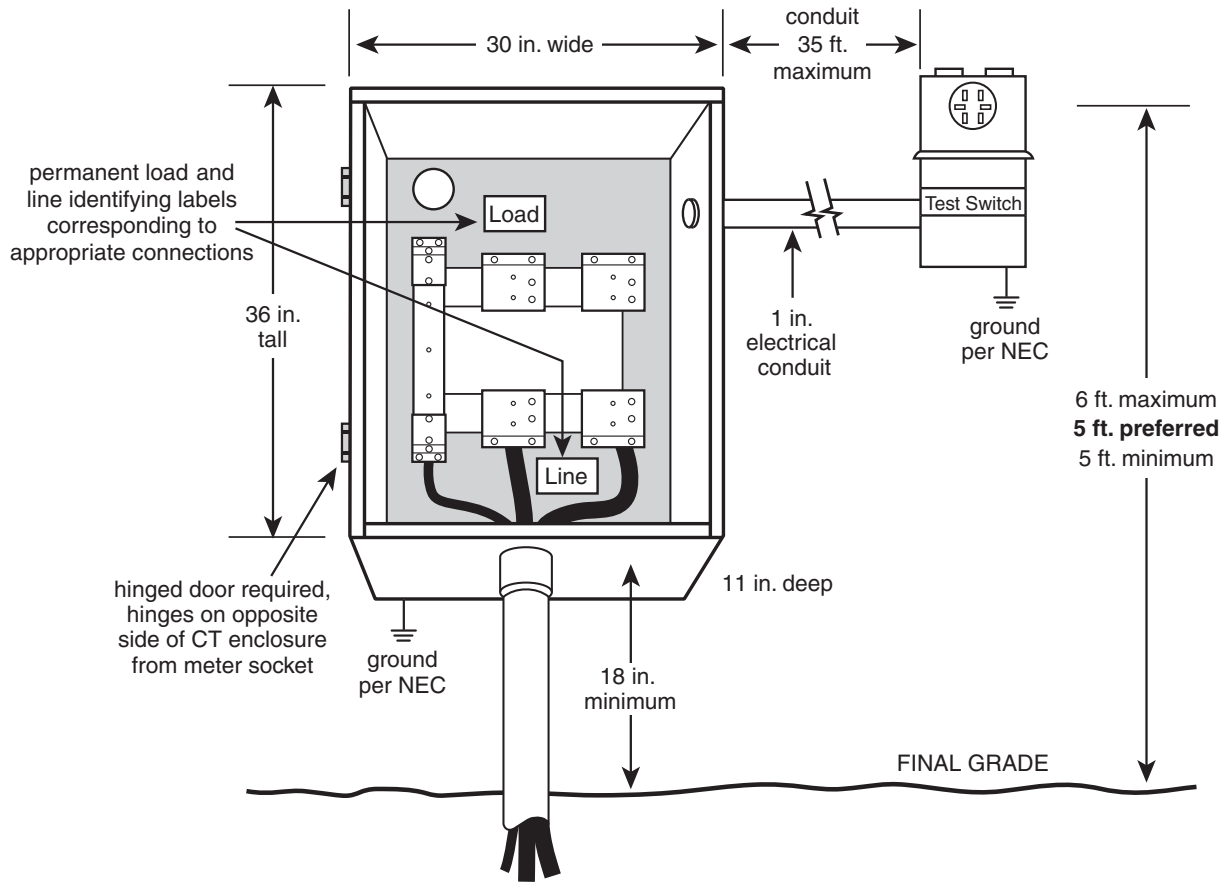
Current Transformer Cabinet Dimensions, CT Mounting Base		
Amperes	Dimensions	Circle AW or Equivalent
200 Amps - 400 Amps 1Ø	24" X 30" X 11"	6019-HAL (LUG LUG)
*401 Amps - 800 Amps 1Ø Buss Mt	30" X 36" X 11"	6019-HEL (LUG LUG)
200 Amps - 400 Amps 3Ø Window	30" X 36" X 11"	6019-HAL or 6067-HAL
401 Amps - 800 Amps 3Ø Buss Mt	36" X 48" X 11"	6019-HEL or 6067-HEEL

\* Optional

- Notes:**
1. CT Metering for 200- 400 Amp panels required pre-approval from Clark Public Utilities
  2. All CT cans shall be mounted outside.

Rev. 2 - Added optional CT cabinet dimensions and notes.

<div><div>Clark Public Utilities</div><div></div></div>	<div>CONSTRUCTION STANDARDS</div> <div>METERING REQUIREMENTS</div> <div>RESIDENTIAL</div>			REVISIONS			
				<div><div><div></div><div></div></div></div>	DATE	ENGR	OPS
				0	8/20/02		
				1	8/2/05	LB	AH
				2	12/19/07	LB	AH
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PAGE: 4 of 4	M	CAD FILE: M	APP: JEH	SECTION 900			
			DATE: 2/22/00				

**Figure 8** Typical 401–800 amp single-phase current transformer (CT) metering

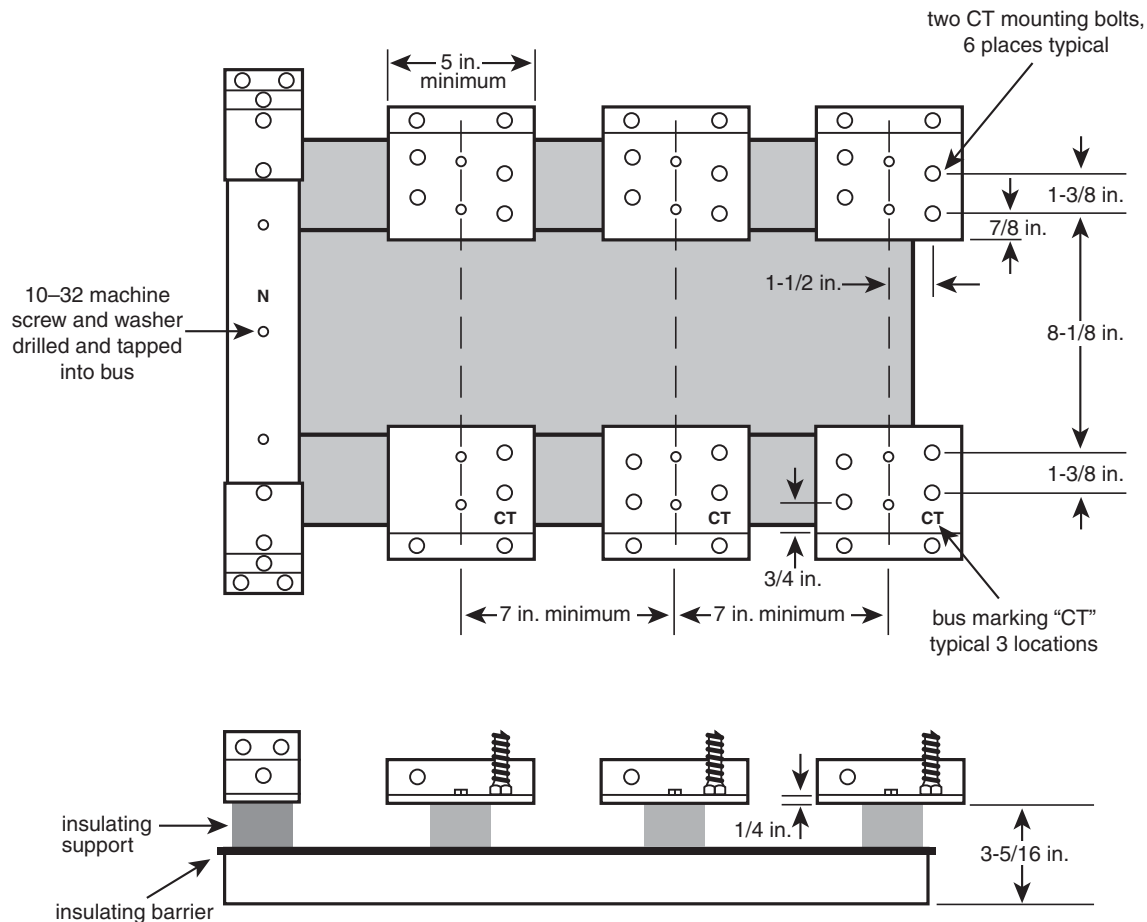
### ***CT mounting base***

Installation requirements for current transformer mounting bases are as follows (*Figure 9*):

- ▶ Mounting base is rated for a minimum of 50k amps fault current.
- ▶ Line and load side terminations require two bolts per connector and two bolts on the **neutral** bus.
- ▶ The customer furnishes all lugs and terminates both load and line side conductors to the bus.
- ▶ A 4-wire delta service requires orange marking of the high leg.

### ***Switchboard metering***

Switchboard metering is required for three-phase services over 800 amps. At the customer's option, this type of metering may be installed for services sized 201 to 800 amps. The customer-installed equipment must be EUSERC-approved.

**Figure 9** Commercial three-phase CT mounting base

**NOTE:** For additional information see EUSERC drawing 329B.

All customer-installed switchboards require a:

- ▶ Current transformer (CT) mounting base.
- ▶ Service section.
- ▶ Set of bus bars/links.
- ▶ Panel(s).
- ▶ Meter base with provisions for a test switch.
- ▶ Means for locking the meter enclosure with independent 24-hour access to utility personnel.
- ▶ Concrete mounting pad.
- ▶ Case ground as required per the NEC.

**NOTE:** Customers requiring more than 480 volts of service will have primary metering. Ownership and maintenance agreements for primary metered services will be mutually agreed upon with Clark Public Utilities.

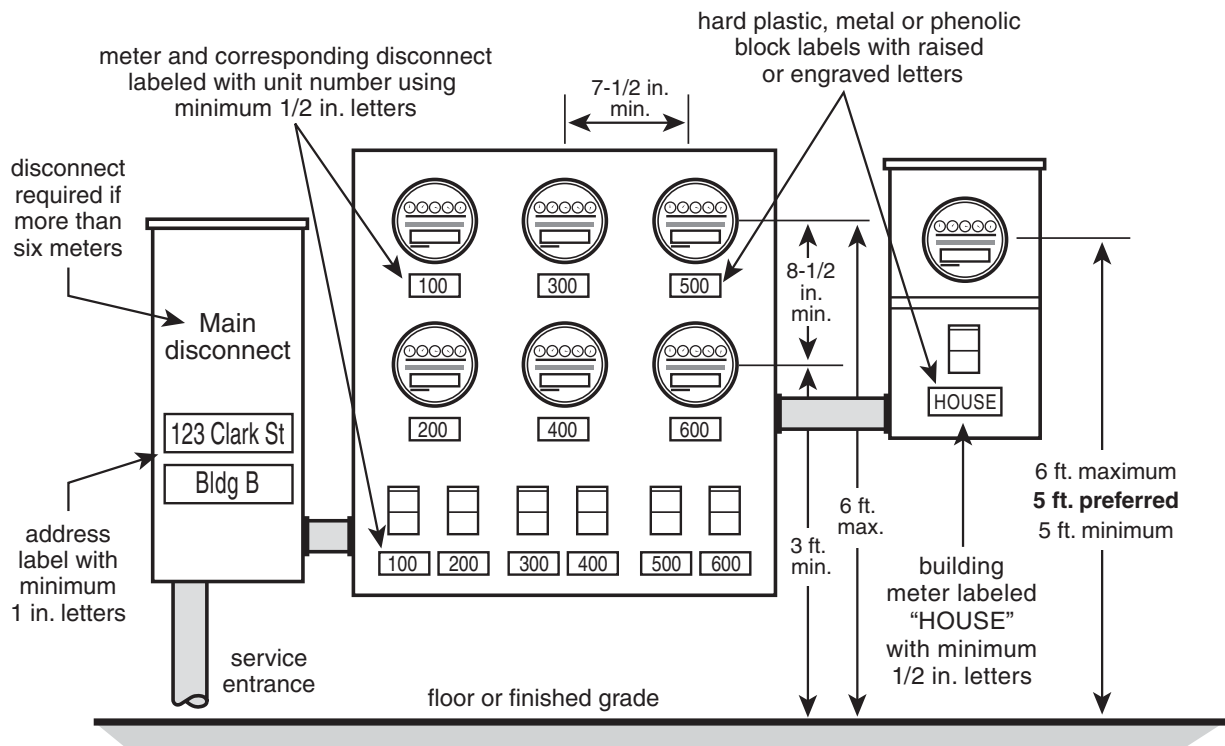
## Multiple metered services

### Commercial tenant spaces

Non-residential multiple meter installations such as ganged, modular and switch-board metering have the following requirements:

- ▶ Spacing to socket centers a minimum of 3 feet and a maximum of 6 feet above the finished grade or the floor of an approved equipment room (factory-built meter packs require meters installed at least 3 feet above the ground).
- ▶ Meter packs with more than six meters require a main disconnect per the NEC (*Figure 10*).
- ▶ All self-contained meter bases require a safety socket or a manual link bypass.
- ▶ Each metered service is permanently labeled. (See *Multiple meter labeling* section for additional information.)
- ▶ Panel covers must be secured prior to connection of the service.

**Figure 10** Multiple meter socket detail



**NOTE:** See page 31 for meter base bypass requirements.

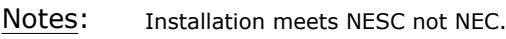
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## STREETLIGHTING

6/1/2022

<b>C</b>	DLLED	Decorative LED Area Lighting, Single Acorn, Fiberglass Pole
<b>C</b>	DLTLED	Decorative LED Area Lighting, Twin Acorn, Fiberglass Pole
<b>C</b>	DLSH	Decorative HPS Area Lighting, Shepherds Hook Fiberglass Pole, For Maintenance Only
<b>N</b>	FL200LED- FL400LED	Area LED Light, Floodlight, Wood Pole Mounted
<b>N</b>	HLLED	Area LED Light, High Light, Wood Pole Mounted
<b>C</b>	SL	General Streetlighting, Light Patterns
<b>N</b>	SL100LED- SL200LED	Streetlight, 100/200W Equiv. LED Cobrahead, Wood Pole Mounted
<b>N</b>	SL100ALED- SL200ALED	Streetlight, 100/200W Equiv. LED Cobrahead, Single Arm, Aluminum Pole, Direct Burial
<b>N</b>	SL100SALED	Streetlight, 100W Equiv. LED Cobrahead, Short Mast Arm, Aluminum Pole, Direct Burial
<b>N</b>	SL100SFLED- SL200SFLED	Streetlight, 100/200W Equiv. LED Cobrahead, Single Arm, Aluminum Pole, Anchor Base
<b>M</b>	SL200SFDLED	Streetlight, 200W Equiv. LED Cobrahead, Twin Arm, Aluminum Pole, Anchor Base
<b>C</b>	SLARM6- SLARM22	Streetlight, Mast Arm Installation, Wood Pole Mounted
<b>C</b>	SLF	Streetlight Foundation, Steel - 6" Diameter
<b>~</b>	SLPT	Streetlight Pole Tagging
<b>C</b>	SLR	Secondary Overhead to Underground Riser Assembly, For Streetlight Feeder

**N** New Standard  
**R** Redrawn Standard  
**C** Changed Standard  
**~** No Change



ITEM NO	DESCRIPTION	DLLED	
		QTY	S/N
1	Pole, Streetlight, Fiberglass, Direct Burial, 14.5' Mounting Height, Fluted Shaft, Clamshell Base	1	2219
2	Luminaire, Post Top Acorn, LED, 60W, 120V, Type 3, 3000K	1	2845
3	Cable, 600V, Cu, #12, 19-Str, Black, 1C	25 ft	386
4	Cable, 600V, Cu, #12, 19-Str, White, 1C	25 ft	387
5	Connector, H-Tap, Al/Cu, Run #6-#2 Str - Tap #14-#8 Str	1	416
6	Fuse, 10A, 250V, Time Delay, Streetlight	1	2389
7	Holder, Fuse, Streetlight	1	2388
8	Photoeye, LED and HPS, 120V, 3-pin	1	2872



# CONSTRUCTION STANDARDS

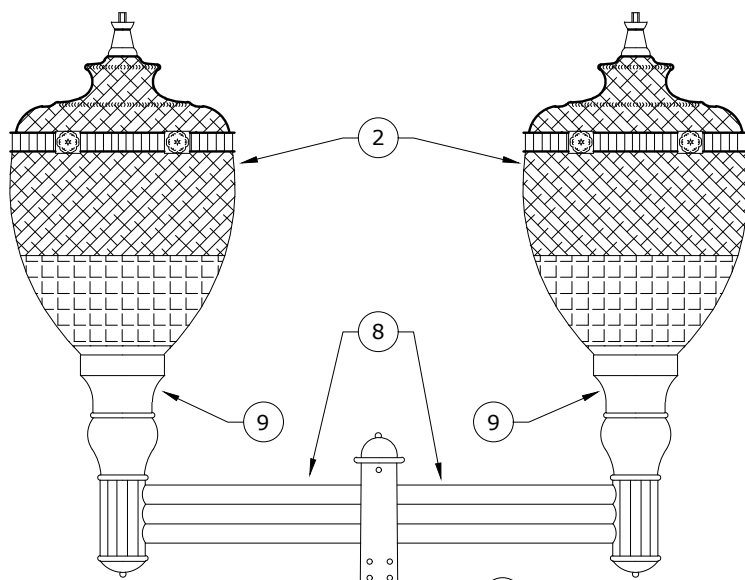
DECORATIVE LED AREA LIGHTING  
SINGLE ACORN  
FIBERGLASS POLE

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DLLED

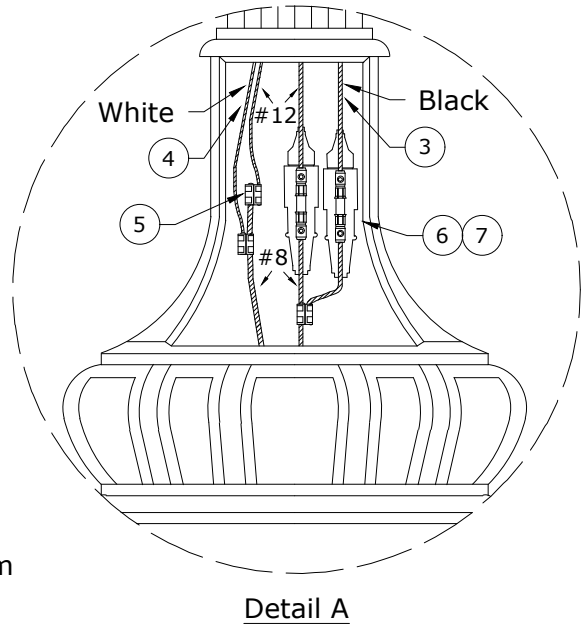
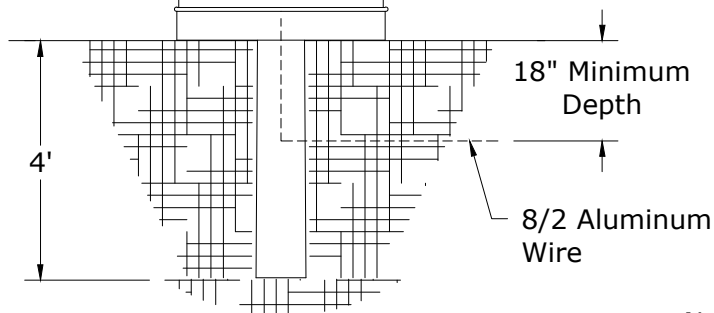
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<b>APP:</b>		<b>DRK/KJP</b>	<b>SECTION 1000</b>
<b>DATE:</b>		<b>6/1/22</b>	



See Detail A

Hand Hole Cover



Detail A

**Notes:** Installation meets NESC not NEC.

ITEM NO	DESCRIPTION	DLTLED	
		QTY	S/N
1	Pole, Streetlight, Fiberglass, Direct Burial, 14.5' Mounting Height, Fluted Shaft, Clamshell Base	1	2219
2	Luminaire, Post Top Acorn, LED, 60W, 120V, Type 3, 3000K	2	2845
3	Cable, 600V, Cu, #12, 19-Str, Black, 1C	25 ft	386
4	Cable, 600V, Cu, #12, 19-Str, White, 1C	25 ft	387
5	Connector, H-Tap, AL/CU, Run #6-#2 Str - Tap #14-#8 Str	3	416
6	Fuse, 10A, 250V, Time Delay, Streetlight	2	2389
7	Holder, Fuse, Streetlight	2	2388
8	Arm, Twin Fixture, 3" O.D. x 2-7/8" Tenon, Black	1	2200
9	Photoeye, LED and HPS, 120V, 3-pin	2	2872



## CONSTRUCTION STANDARDS

DECORATIVE LED AREA LIGHTING  
TWIN ACORN  
FIBERGLASS POLE

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DLTLED

CAD FILE:  
DLTLED

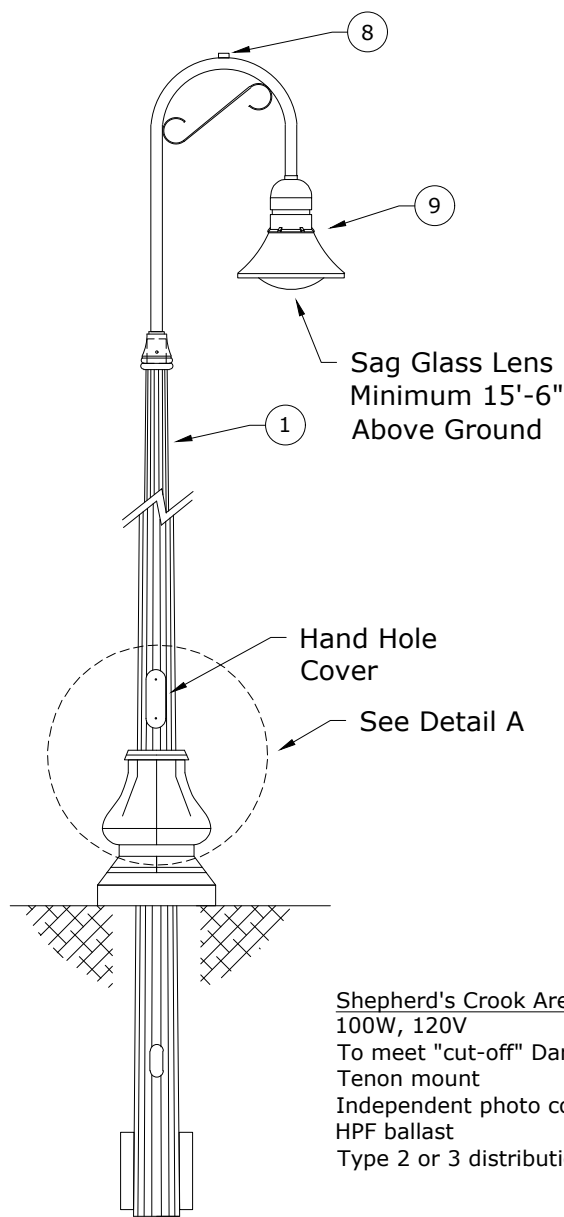
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DATE: 6/1/22

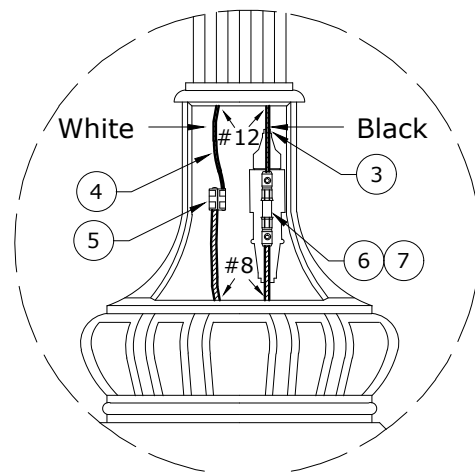
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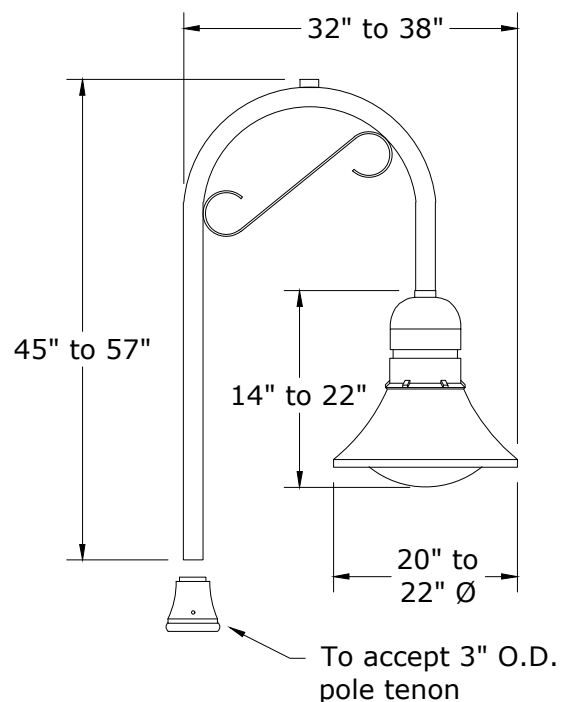


Shepherd's Crook Area Light Specifications  
 100W, 120V  
 To meet "cut-off" Dark Skies designation  
 Tenon mount  
 Independent photo control  
 HPF ballast  
 Type 2 or 3 distribution pattern

- Notes:
1. For maintenance only.
  2. Dimensions are approximate.
  3. Color: Black matte or semi-gloss.



Detail A



ITEM NO	DESCRIPTION	DLSH	
		QTY	S/N
1	Pole, Streetlight, Fiberglass, Direct Burial, 14.5' Mounting Height, Fluted Shaft, Clamshell Base	1	2219
2	Luminaire, Shepherd Hook, HPS, 100W 120V, Med. Base, Type 2&3	1	2565
3	Cable, 600V, Cu, #12, 19-Str, Black, 1C	35 ft	386
4	Cable, 600V, Cu, #12, 19-Str, White, 1C	35 ft	387
5	Connector, H-Tap, Al/Cu, Run #6-#2 Str - Tap #14-#8 Str	1	416
6	Fuse, 10A, 250V, Time Delay, Streetlight	1	2389
7	Holder, Fuse, Streetlight	1	2388
8	Photoeye, LED and HPS, 120V, 3-pin	1	2872
9	Lamp, HPS, 100W, 55V	1	1745



## CONSTRUCTION STANDARDS

DECORATIVE HPS AREA LIGHTING  
 SHEPHERDS HOOK FIBERGLASS POLE  
 FOR MAINTENANCE ONLY

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**DLSH**

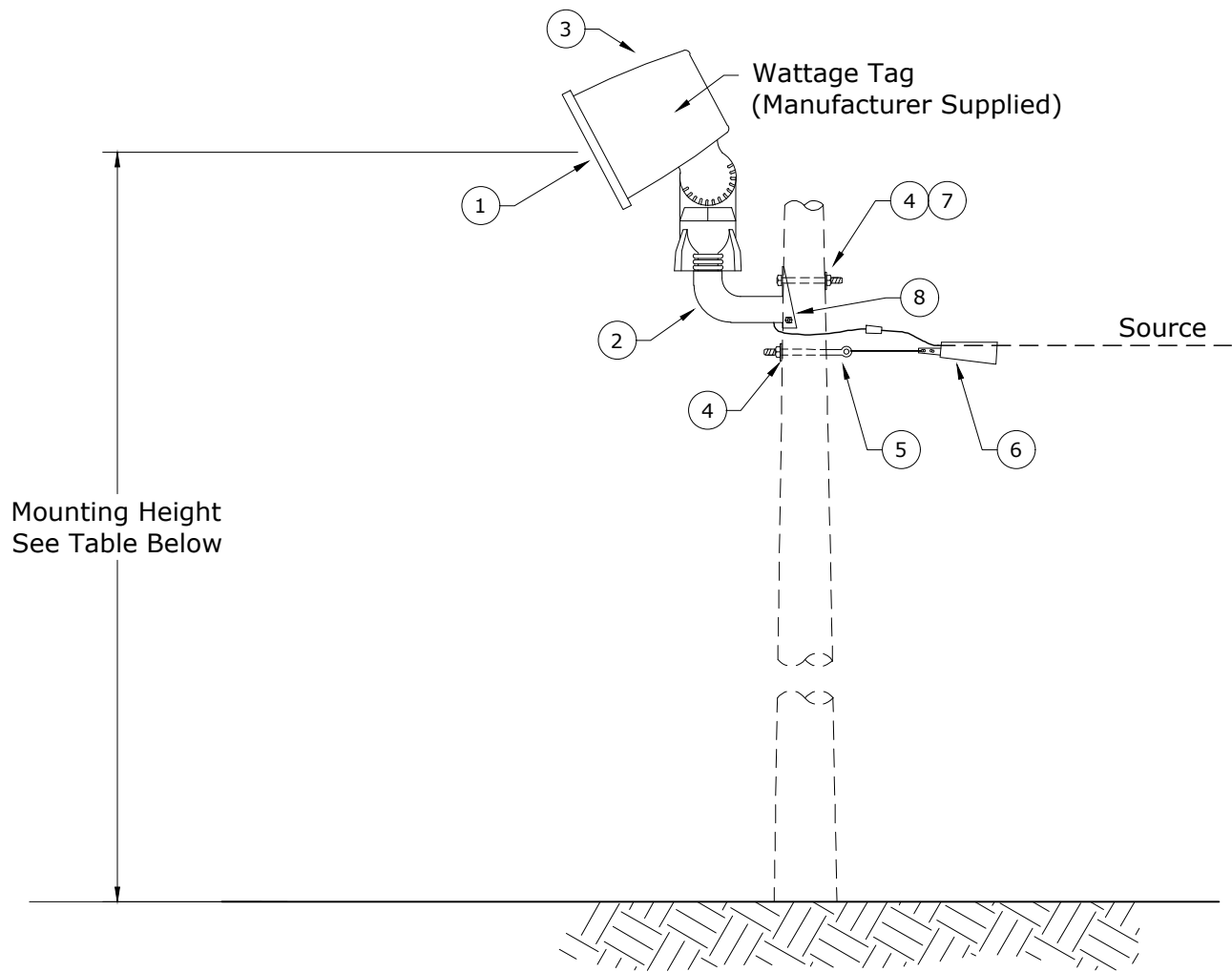
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### REVISIONS

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DATE: 8/13/04

SECTION  
**2200**



RECOMMENDED MOUNTING HEIGHTS			
TYPE	PREFERRED	MINIMUM	MAXIMUM
200W	30 ft	20 ft	32 ft
400W	35 ft	25 ft	37 ft

**Notes:** Installation meets NESC not NEC.

ITEM NO	DESCRIPTION	FL200LED		FL400LED	
		QTY	S/N	QTY	S/N
1	Luminaire, Floodlight, LED, 3000k, HPS-Equivalent	1	2906	1	2907
2	Bracket, Floodlight, PM1, Single Pole Mt.	1	211	1	211
3	Photoeye, LED and HPS, 120V, 3-pin	1	2872	1	2872
4	Washer, Square Flat 5/8" x 2 1/4" x 2 1/4"	2	1412	2	1412
5	Bolt, Eye, 5/8" x 12", Galv, 12,400 LB Ultimate Tensile	1	107	1	107
6	Clamp, Wedge #6-#2 ACSR, Solid Bail	1	310	1	310
7	Bolt, Machine, 5/8" x 12", Galv, 12,400 LB, Ultimate Tensile	1	155	1	155
8	Screw, Lag 1/2" x 3", Fetter Drive, Drive Point	2	1131	2	1131



## CONSTRUCTION STANDARDS

AREA LED LIGHT  
FLOODLIGHT  
WOOD POLE MOUNTED

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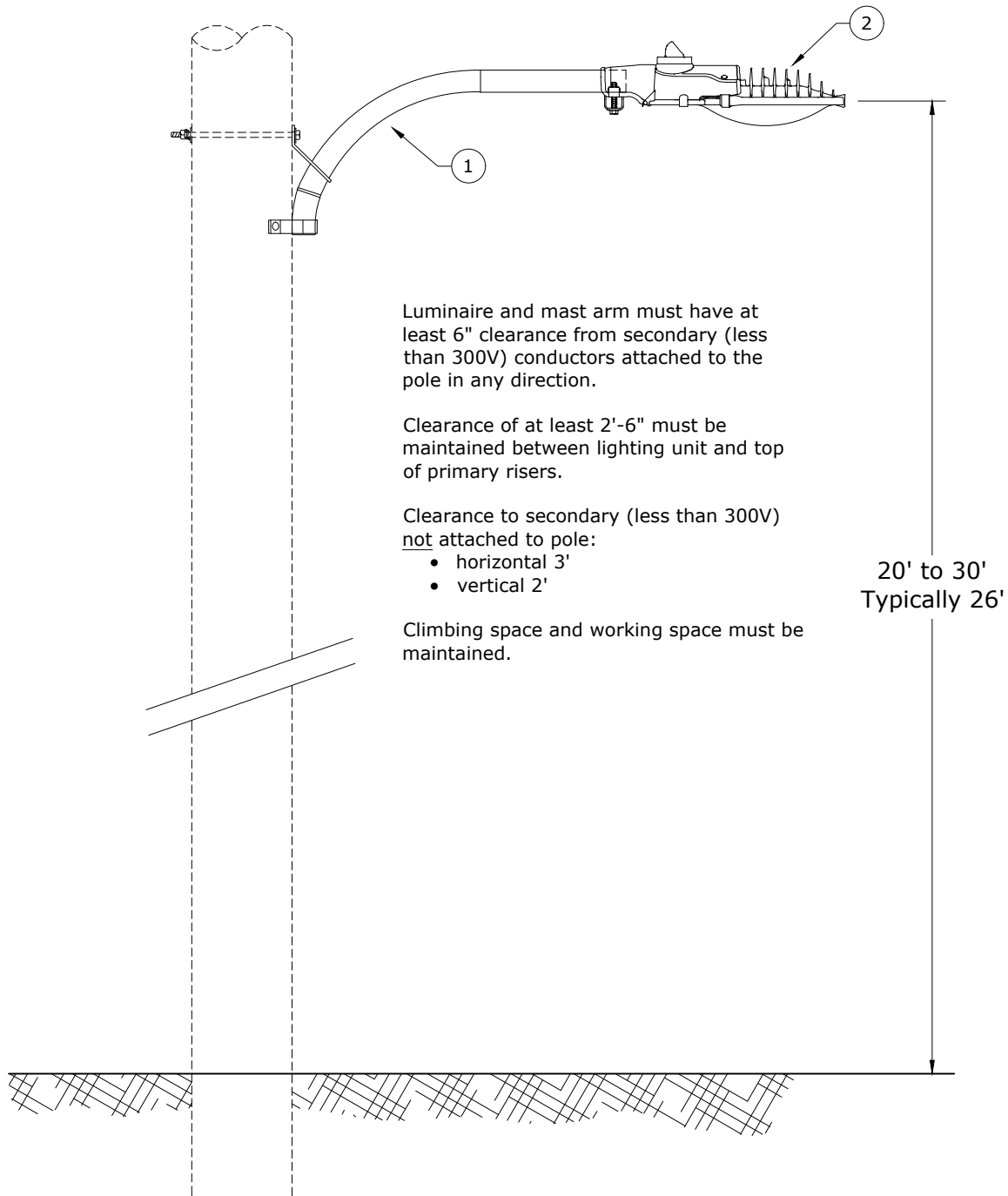
FL200LED, FL400LED

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FL200LED

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APP: DRK/KJP  
DATE: 6/1/22

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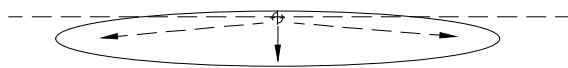


Notes: Installation meets NESC not NEC.

ITEM NO	DESCRIPTION	HLLED	
		QTY	S/N
1	Arm, Mast Al 2', Highlite, Wood Pole	1	44
2	Luminaire, High Light, LED, 3000K, Integrated Photoeye, HPS Equivalent	1	2890

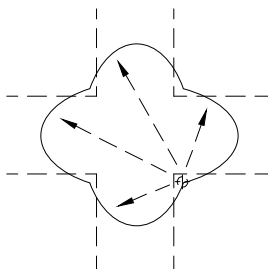
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				DATE	ENGR	OPS				
	PAGE: 1 of 1		HLLED		CAD FILE: HLLED		APP: DRK/KJP DATE: 6/1/22		SECTION 1000	

# X. LIGHTING TYPES



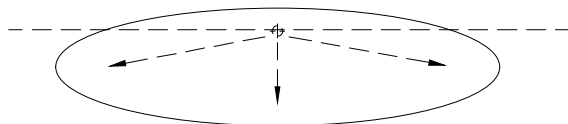
## IES TYPE II

For use on narrow to medium width street using mast arm mounted luminaire. Mount at right angle (90°) with centerline of street. Not a CPU standard.



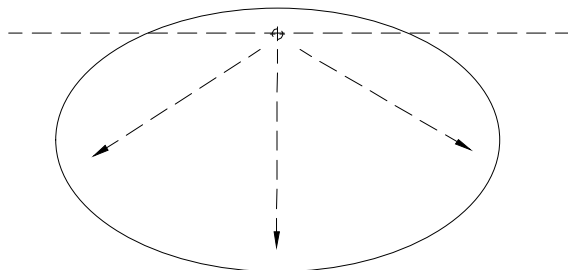
## IES TYPE II 4-WAY

For use at intersections when only one mast arm mounted luminaire can be used. Mount luminaire as near as possible to center of intersection. Not a CPU standard.



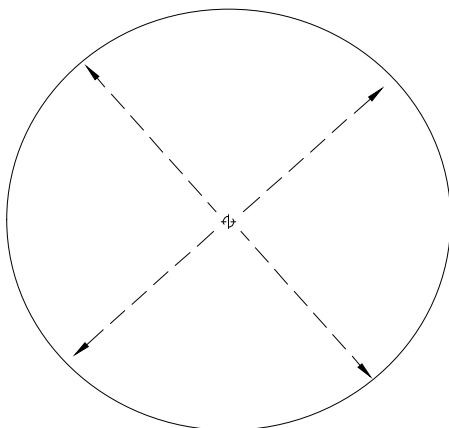
## IES TYPE III

For use on wide width streets using mast arm mounted luminaires. Mount at right angle (90°) with centerline of street. Cobrahead and decorative acorns use this pattern.



## IES TYPE IV

For use in subdivision cul-de-sacs using specialized cobrahead luminaires. Aim luminaire as near as possible to center of cul-de-sac. Not a CPU standard.





## IES TYPE V

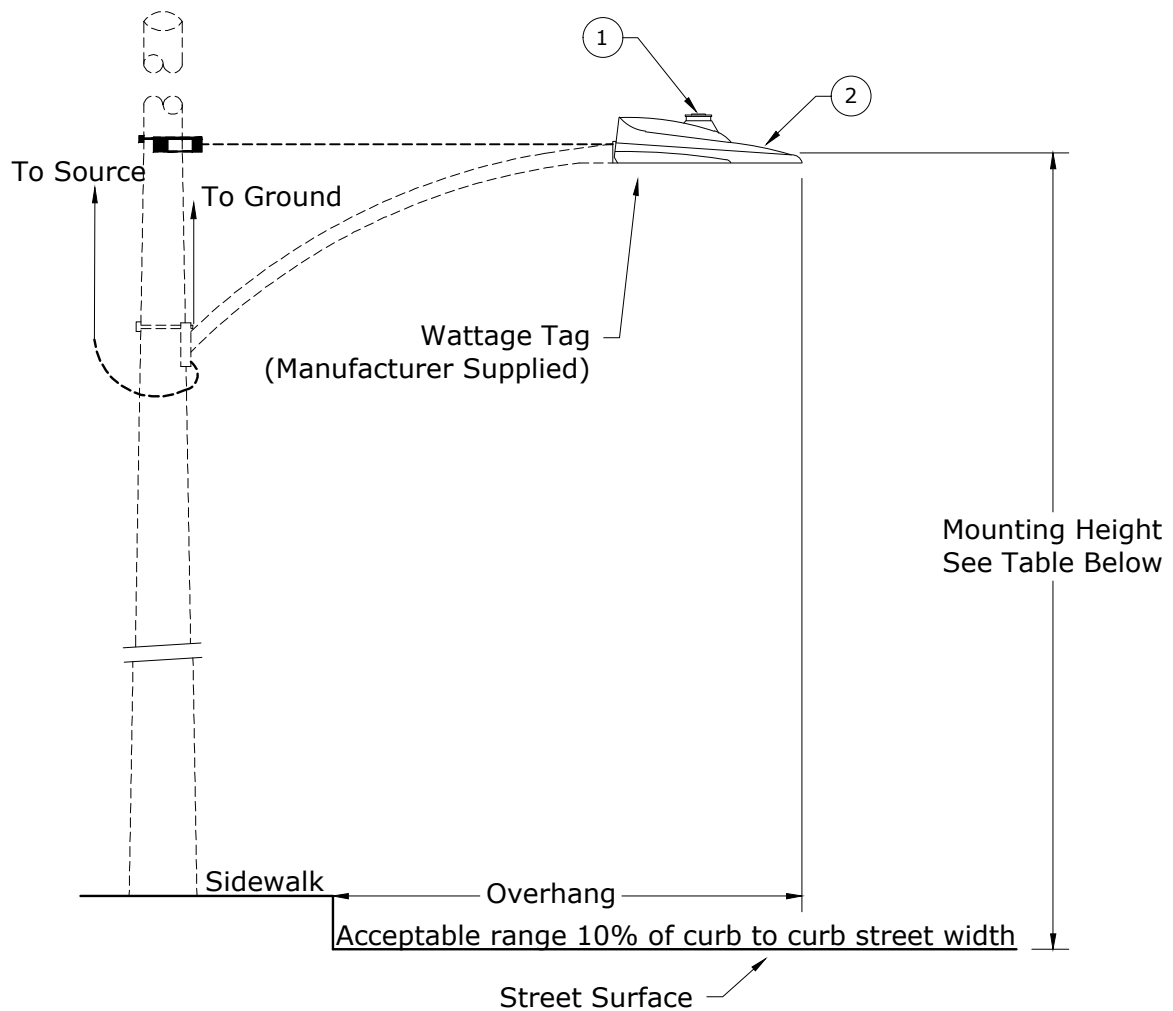
Yard lights (HLLLED) use this pattern when located in center of area to be illuminated.

## FLOODLIGHTS

1. To be used for parking lots, storage areas, etc. Not to be used for streetlighting.
2. Always take into account unintentional light trespass on surrounding areas prior to installation.
3. Floodlights used by CPU have a beam spread of 65° both vertically and horizontally.
4. Aiming of floodlight should be 1/2 to 2/3 of distance across area to be illuminated.

Rev. 2 - Added type of light to IES type and replaced Std. SL.

	<b>CONSTRUCTION STANDARDS</b> GENERAL STREETLIGHTING LIGHT PATTERNS			REVISIONS			
					DATE	ENGR	OPS
				0	2/23/00	HWH	MA
				1	8/24/04	LB	AH
				2	4/21/22	DRK	
PAGE: 1 of 1			SL		CAD FILE: SL		APP: HWH/RGH
					DATE: 1/13/82		SECTION 1000



RECOMMENDED MOUNTING HEIGHTS		
TYPE	MINIMUM	MAXIMUM
100W	25 ft	27 ft
200W	30 ft	32 ft

- Notes:**
1. Installation meets NESC not NEC.
  2. Mast arm attachment height varies with type of arm and must be positioned so luminaire is level.

Rev. 1 - Updated to LED and added note #1.

ITEM NO	DESCRIPTION	SL100LED		SL200LED	
		QTY	S/N	QTY	S/N
1	Photoeye, LED and HPS, 120V, 3-Pin	1	2872	1	2872
2	Luminaire, Cobrahead, LED, Type 3, 3000K, HPS Equivalent	1	2889	1	2895

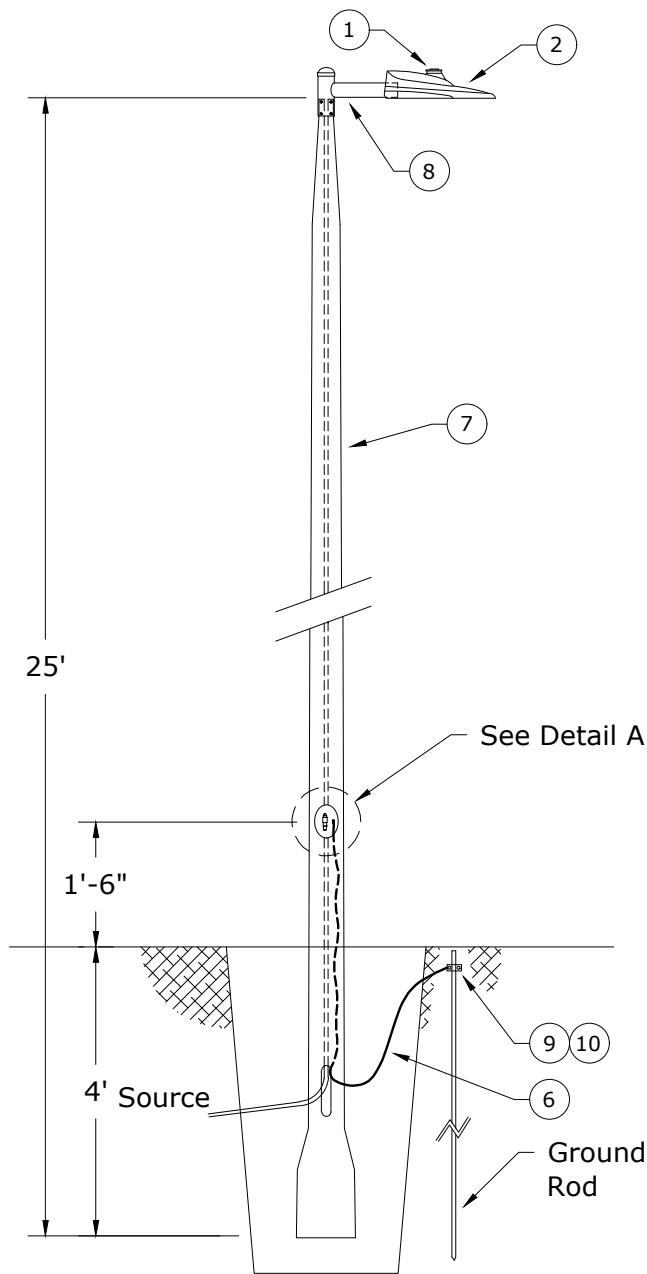
  

		<b>CONSTRUCTION STANDARDS</b> STREETLIGHT 100/200W EQUIV. LED COBRAHEAD WOOD POLE MOUNTED		REVISIONS			
				△	DATE	ENGR	OPS
				1	6/1/22	DRK	

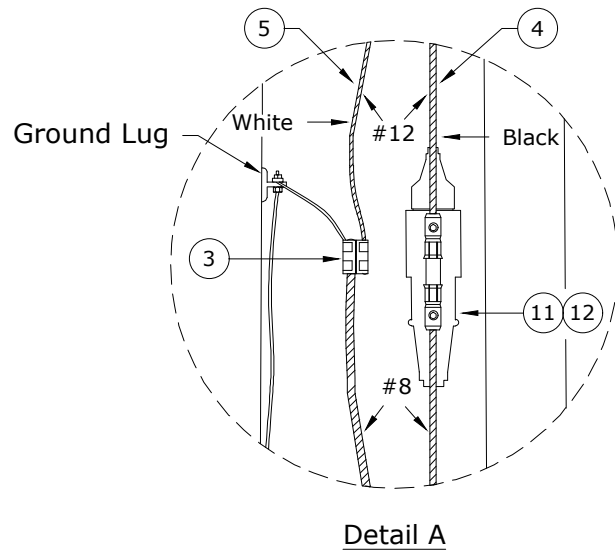
  

PAGE: 1 of 1	SL100LED,SL200LED	CAD FILE: SL100LED	APP: HWH/GLE DATE: 1/31/80	SECTION 1000
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All splices shall be compression  
DO NOT USE WIRE NUTS



Notes: Installation meets NESC not NEC.

ITEM NO	DESCRIPTION	SL100SALED	
		QTY	S/N
1	Photoeye, LED and HPS, 120V, 3-pin	1	2872
2	Luminaire, Cobrahead, LED Type 3, 3000K, HPS Equivalent	1	2889
3	Connector, H-Tap, Al/Cu, Run #6-#2 Str - Tap #14-#8 Str	1	416
4	Cable, 600V, Cu, #12, 19-Str, Black, 1C	20 ft	386
5	Cable, 600V, Cu, #12, 19-Str, White, 1C	20 ft	387
6	Conductor, Cu, #6, Solid, Bare, Soft Drawn, 1C	2 ft	374
7	Pole, Streetlight, Al, Direct Burial, 25' Mounting Height, Post Top ✱	1	2947
8	Arm, Tenon-mount, Streetlight	1	2901
9	Clamp, Ground Rod, 5/8", Bronze, Small	1	281
10	Rod, Ground, 5/8" x 8'	1	1124
11	Fuse, 10A, 250V, Time Delay, Streetlight	1	2389
12	Holder, Fuse, Streetlight	1	2388



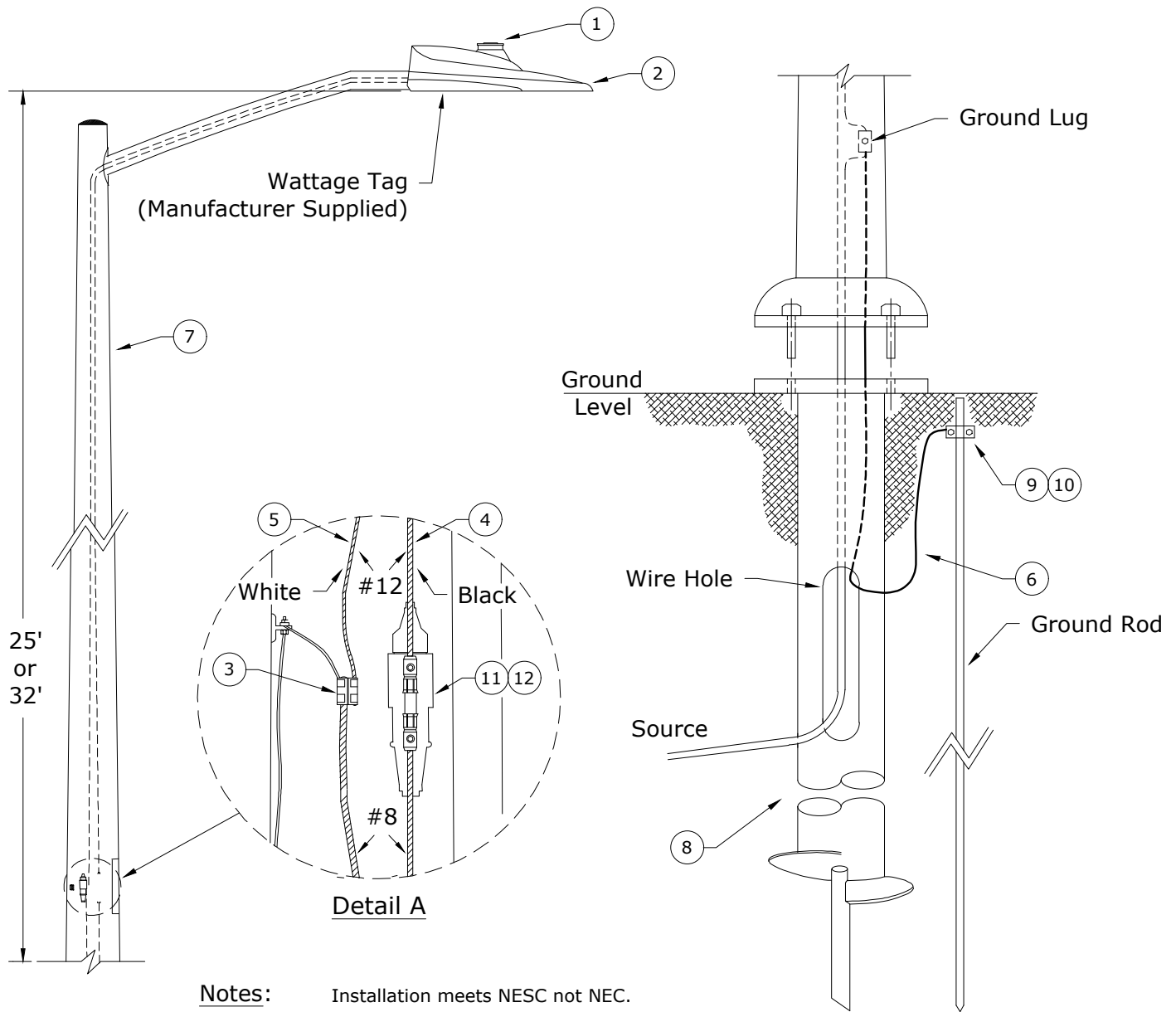
**CONSTRUCTION STANDARDS**  
 STREETLIGHT, 100W EQUIV. LED COBRAHEAD  
 SHORT MAST ARM  
 ALUMINUM POLE, DIRECT BURIAL

PAGE:  
1 of 1

**SL100SALED**

CAD FILE:  
SL100SALED

REVISIONS			
DATE	ENGR	OPS	
APP: DRK/KJP	SECTION		
DATE: 6/1/22	2200		



**Notes:** Installation meets NESC not NEC.

ITEM NO	DESCRIPTION	SL100SFLED		SL200SFLED	
		QTY	S/N	QTY	S/N
1	Photoeye, LED and HPS, 120V, 3-pin	1	2872	1	2872
2	Luminaire, Cobrahead, LED, Type 3, 3000K, HPS Equivalent	1	2889	1	2895
3	Connector, H-Tap, Al/Cu, #6 Solid, Bare, Soft Drawn, 1C	1	416	1	416
4	Cable, 600V, Cu, #12, 19-Str, Black, 1C	42 ft	386	42 ft	386
5	Cable, 600V, Cu, #12, 19-Str, White, 1C	42 ft	387	42 ft	387
6	Conductor, Cu, #6 Solid, Bare, Soft Drawn, 1C	2 ft	374	2 ft	374
7	Pole, Streetlight, Al, Anchor base 11-1/2" bolt circle, 25' mounting height, 6' arm	1	1225	—	N/A
7	Pole, Streetlight, Al, Anchor base 11-1/2" bolt circle, 32' mounting height, 6' arm	—	N/A	1	1226
8	Anchor, Streetlight foundation (rocky soil), 6" Diameter	1	20	1	20
9	Clamp, Ground Rod, 5/8", Bronze, Small	1	281	1	281
10	Rod, Ground 5/8" x 8'	1	1124	1	1124
11	Fuse, 10A, 250V, Time Delay, Streetlight	1	2389	1	2389
12	Holder, Fuse, Streetlight	1	2388	1	2388



## CONSTRUCTION STANDARDS

STREETLIGHT  
100/200W EQUIV. LED COBRAHEAD, SINGLE ARM  
ALUMINUM POLE, ANCHOR BASE

PAGE:  
1 of 1

SL100SFLED,SL200SFLED

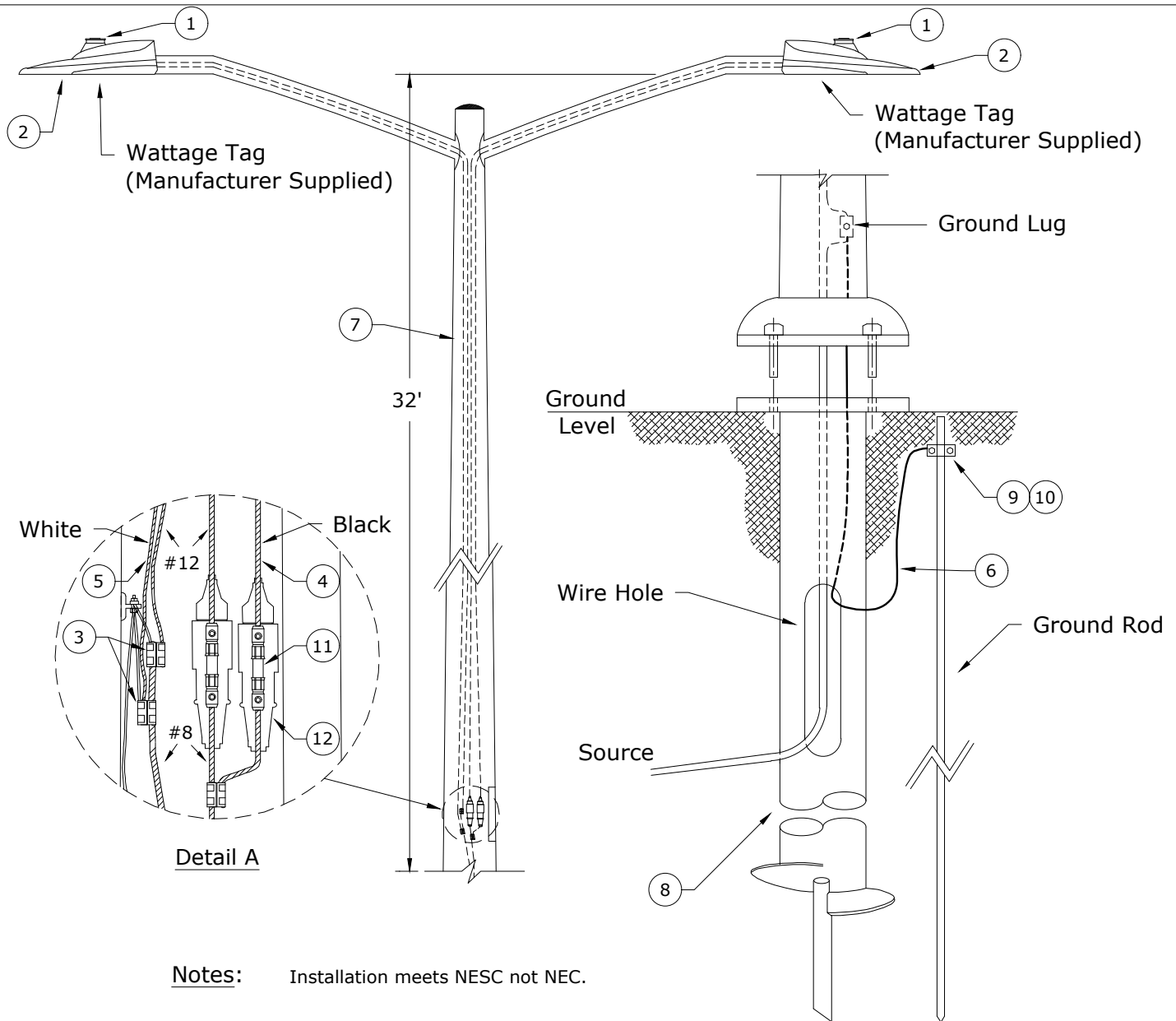
CAD FILE:  
SL100SFLED

REVISIONS			
DATE	ENGR	OPS	

APP: DRK/KJP  
DATE: 6/1/22

SECTION  
1000





Rev. 2 - Changed to LED lights.

ITEM NO	DESCRIPTION	SL200SFDLED	
		QTY	S/N
1	Photoeye, LED and HPS, 120V, 3-pin	2	2872
2	Luminaire, Cobrahead, LED, Type 3, 3000K, HPS Equivalent	2	2895
3	Connector, H-Tap, Al/Cu, #6 Solid, Bare, Soft Drawn, 1C	2	416
4	Cable, 600V, Cu, #12, 19-Str, Black, 1C	84 ft	386
5	Cable, 600V, Cu, #12, 19-Str, White, 1C	84 ft	387
6	Conductor, Cu, #6 Solid, Bare, Soft Drawn, 1C	3 ft	374
7	Pole, Streetlight, Al, Anchor base 11-1/2" bolt circle, 32' mounting height, Double 6' arm	1	1227*
8	Anchor, Streetlight foundation (rocky soil), 6" Diameter	1	20 *
9	Clamp, Ground Rod, 5/8", Bronze, Small	1	281
10	Rod, Ground 5/8" x 8'	1	1124
11	Fuse, 10A, 250V, Time Delay, Streetlight	2	2389
12	Holder, Fuse, Streetlight	2	2388



## CONSTRUCTION STANDARDS

STREETLIGHT, 200W EQUIV.  
LED COBRAHEAD, TWIN ARM  
ALUMINUM POLE, ANCHOR BASE

PAGE:  
1 of 1

SL200SFDLED

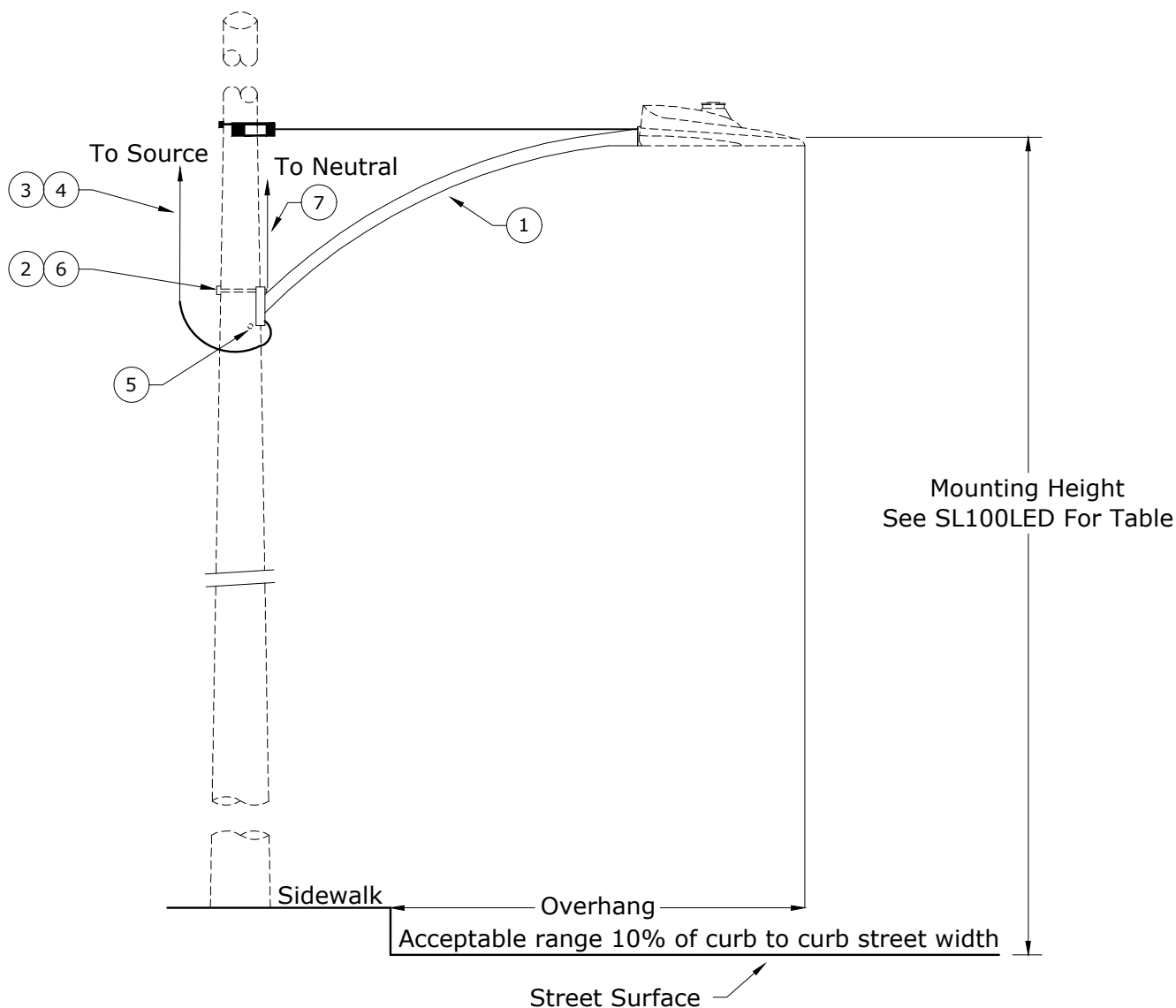
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### REVISIONS

DATE	ENGR	OPS
2/23/00	HWH	MA
6/1/22	DRK	

APP: JEH  
DATE: 2/22/00

SECTION  
1000



**Notes:**

1. Installation meets NESC not NEC.
2. Mast of arm attachment height varies with type of arm and must be positioned so luminaire is level. SLARM6, 8, 12, 14, 16, 18, 20 & 22. Ending numbers specify mast arm length. Conductor wire length will be adjusted to match mast arm size.

Rev. 2 - Obsoleted 4' arm.

ITEM NO	DESCRIPTION	SLARM16	
		QTY	S/N
1	Arm, Mast, Steel, 16' Streetlight, Double Guy	1	51
2	Bolt, Machine, 5/8" x 12" Galv, 12,400 lb Ultimate	2	155
3	Cable, 600V, Cu, #12, 19-Str, Black, 1C	19	386
4	Cable, 600V, Cu, #12, 19-Str, White, 1C	19	387
5	Screw, Lag, 1/2" x 3", Fetter Drive, Drive Point	2	1131
6	Washer, Square Flat, 5/8" x 2-1/4" x 2-1/4"	2	1412
7	Conductor, Cu, #6, Solid, Bare, Soft Drawn, 1C	5*	374



## CONSTRUCTION STANDARDS

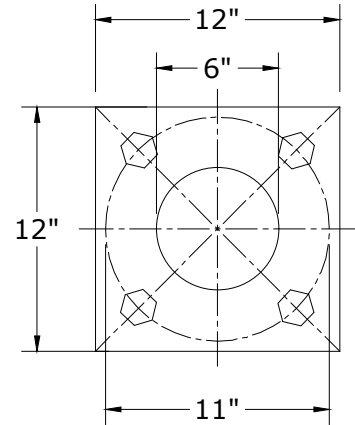
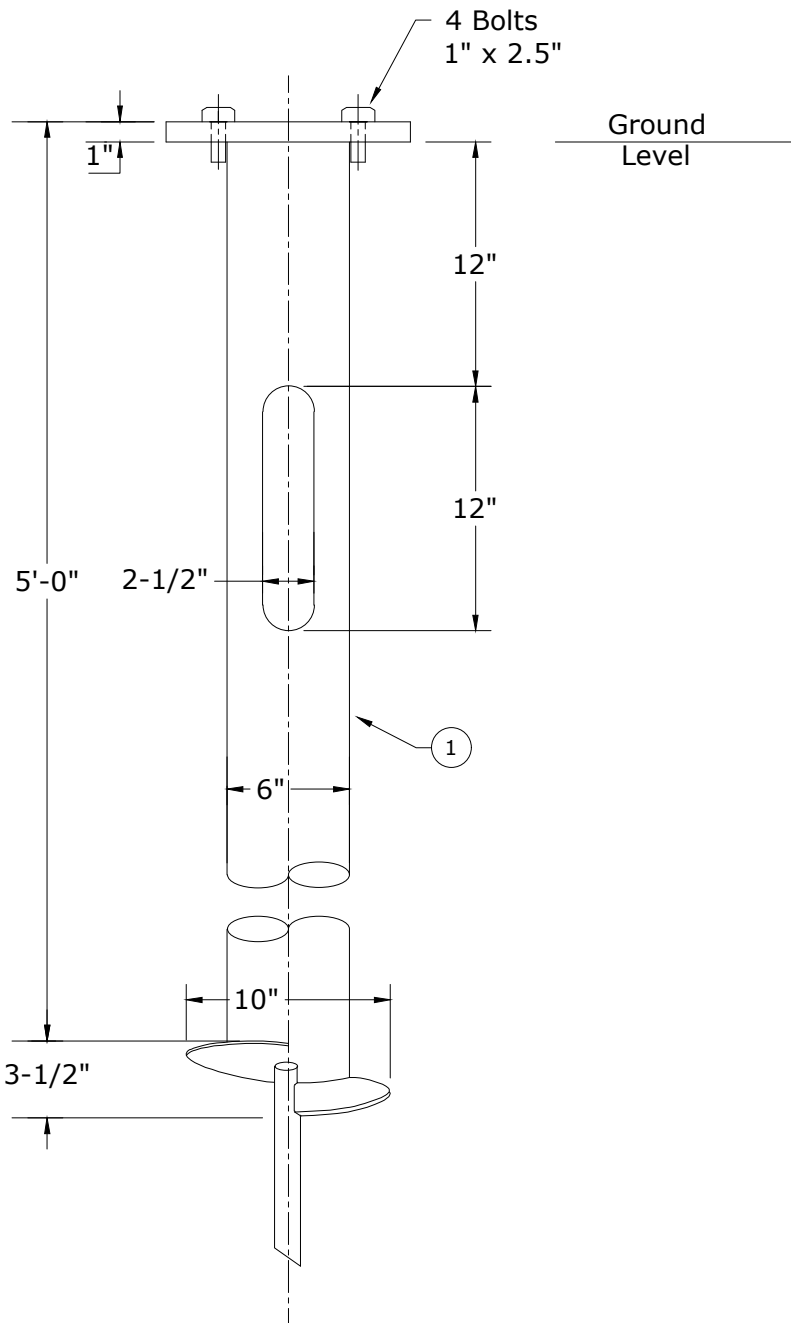
STREETLIGHT  
MAST ARM INSTALLATION  
WOOD POLE MOUNTED

PAGE:  
1 of 1

SLARM6-SLARM22


CAD FILE:  
SLARM6

REVISIONS			
Δ/R	DATE	ENGR	OPS
1	2/23/00	HWH	MA
2	4/20/22	DRK	
APP:		SECTION	
DATE:		1000	



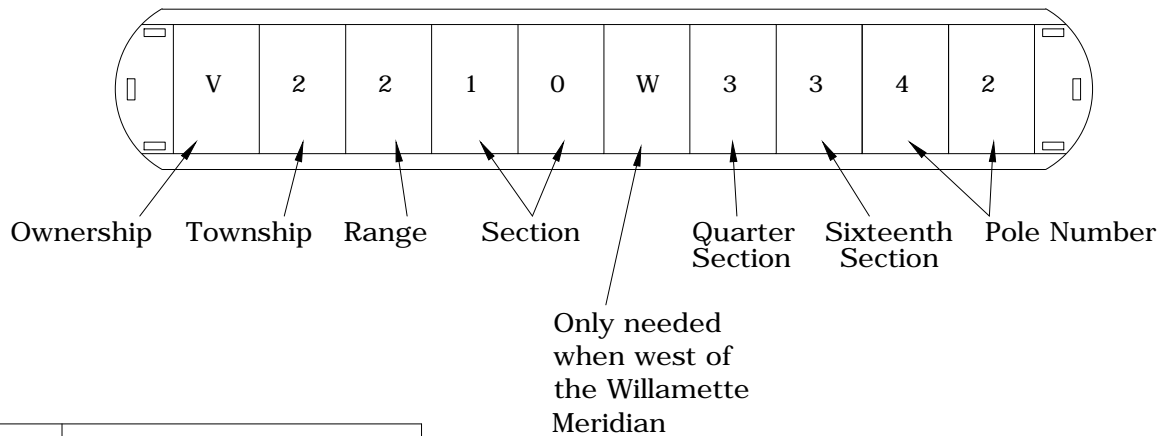
Rev. 2 - Updated dimension formatting.

ITEM NO	DESCRIPTION	SLF	
		QTY	S/N
1	Anchor, Streetlight Foundation (Rocky Soil), 6" Diameter	1	20

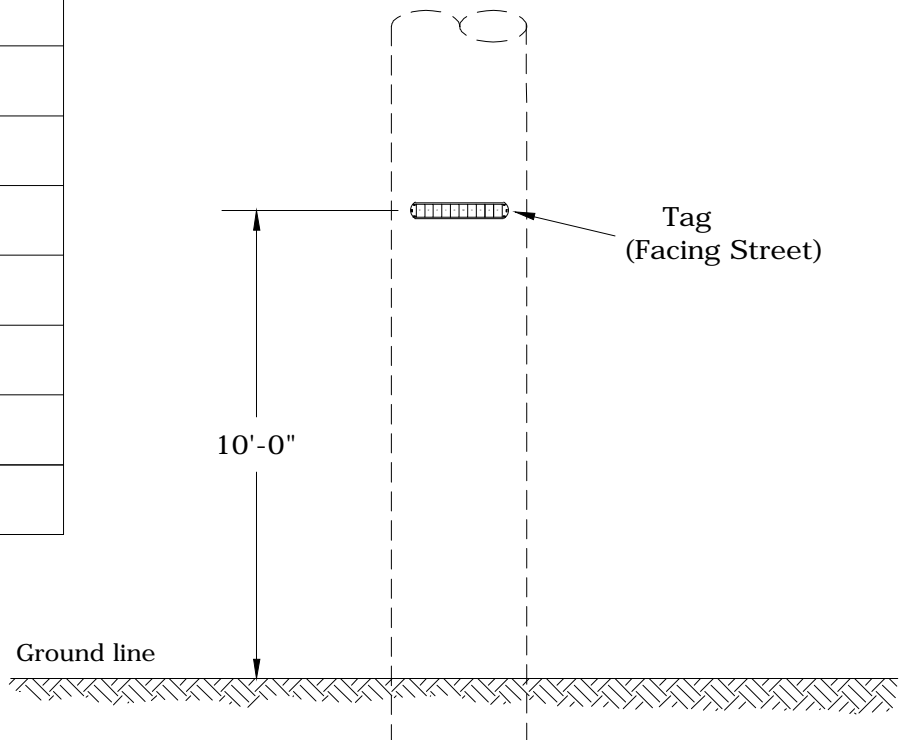
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	STREETLIGHT FOUNDATION			
	STEEL - 6" DIAMETER			
	REVISIONS			
	<div><div>R</div><div>1</div></div>	DATE	ENGR	OPS
	1	2/23/00	HWH	MA
2	4/20/22	DRK		

PAGE:	SLF	CAD FILE:	APP:	HWH/GW	SECTION
1 of 1			SLF	DATE:	1/31/80

## STREETLIGHT POLE TAGGING



CODE	OWNERSHIP
V	Vancouver
P	Clark Public Utilities
B	Battle Ground
R	Ridgefield
W	Washougal
C	Camas
L	La Center
A	Amboy
Y	Yacolt
U	Unincorporated Clark County
D	WA Dot



## CONSTRUCTION STANDARDS

### STREETLIGHT POLE TAGGING

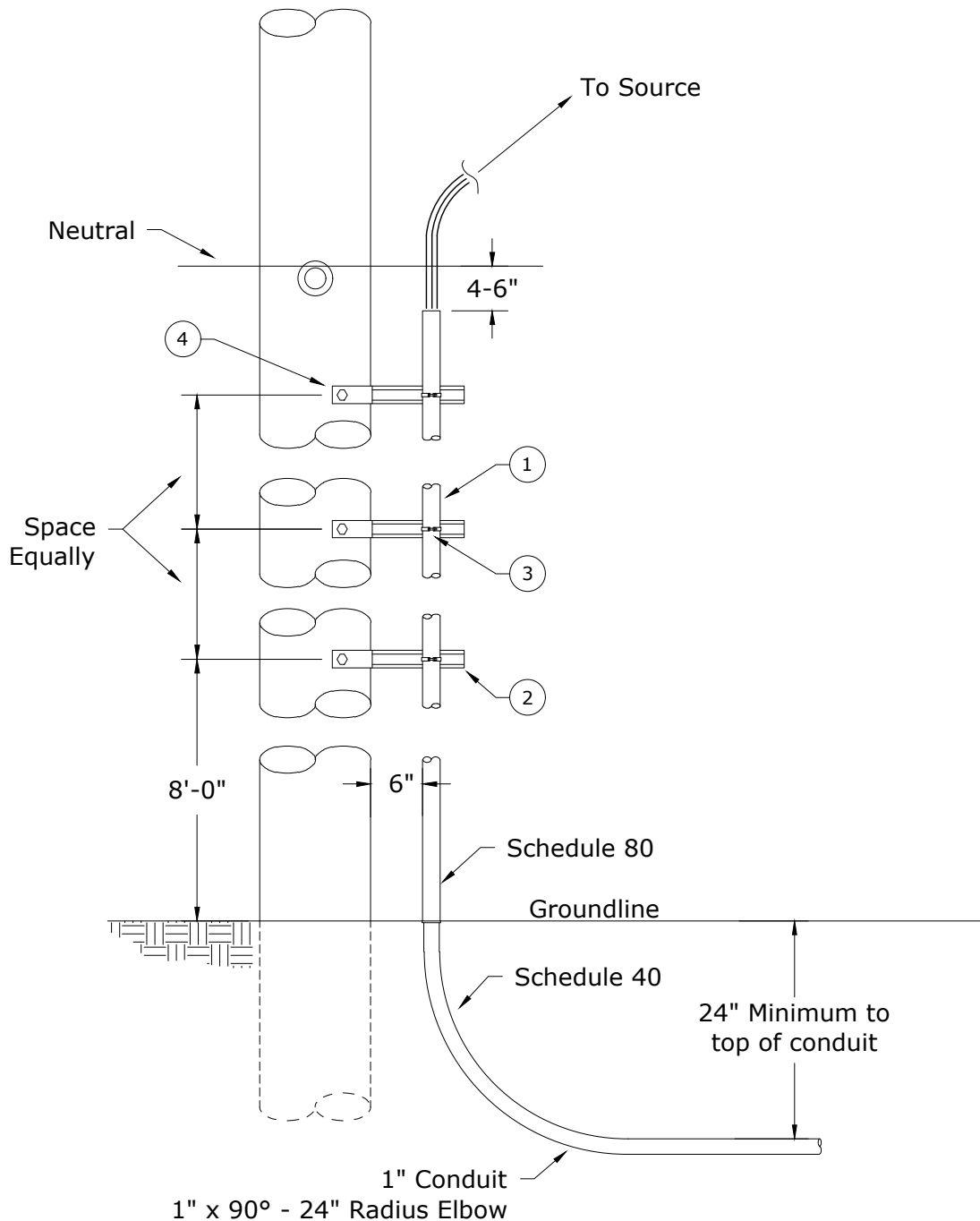
PAGE:  
1 of 1

SLPT

CAD FILE:  
SLPT

#### REVISIONS

△	DATE	ENGR	OPS
△			
APP:	CM/AH	SECTION	
DATE:	10/17/08	1000	



Rev. 3 - Updated to 2017 NESC, added lag screws, corrected material quantity, and reformatted.

ITEM NO	DESCRIPTION	SLR	
		QTY	S/N
1	Conduit, PVC, 1" x 10', Sch 80, (1) Bell End	30*	2482
2	Bracket, Standoff, 10.5", w/Stop	3 *	226
3	Clamp, Standoff Bracket, 1" Conduit	3	292
4	Screw, Lag, 1/2" x 3", Fetter Drive, Drive Point	6	1131



## CONSTRUCTION STANDARDS

SECONDARY OVERHEAD TO  
UNDERGROUND RISER ASSEMBLY  
FOR STREETLIGHT FEEDER

PAGE:  
1 of 1

SLR

CAD FILE:  
SLR

### REVISIONS

Δ	DATE	ENGR	OPS
1	2/23/00	HWH	MA
2	10/17/08	CM	AH
3	4/20/22	DRK	

APP: HWH/GW  
DATE: 1/22/80

SECTION  
1000

# **1200**

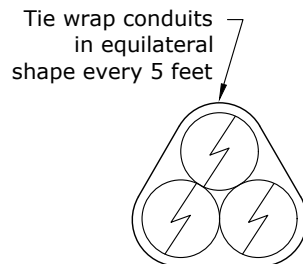
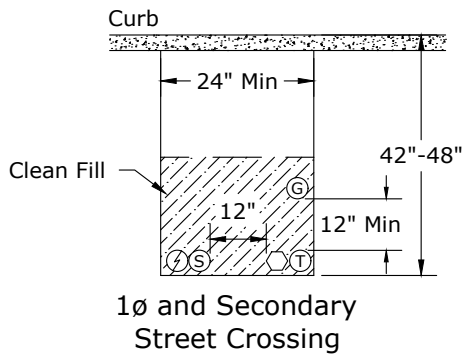
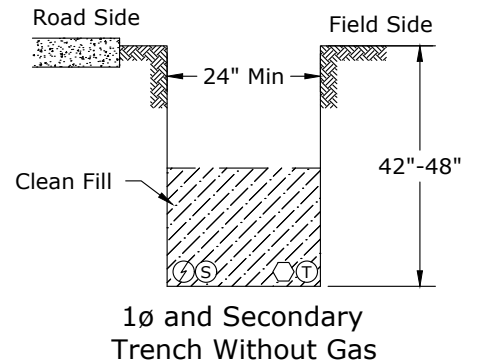
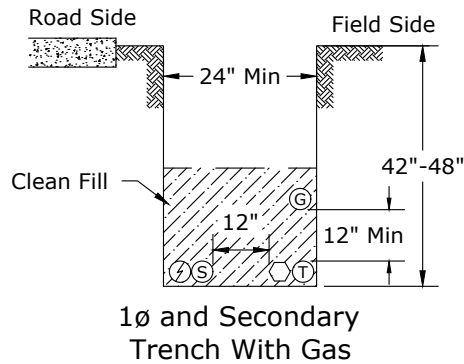
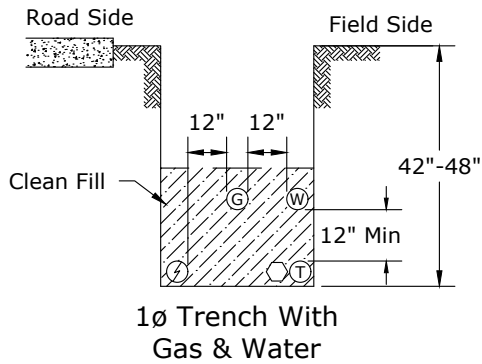
## **UNDERGROUND GENERAL AND TRENCHING**

9/2/2019

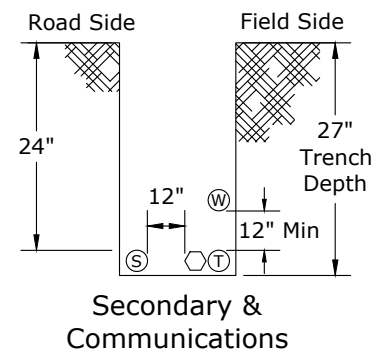
<b>C</b>	UA1	Basic Trench Requirements
<b>~</b>	UC1	Conduit Requirements
<b>~</b>	UD1	Directional Boring Specifications
<b>~</b>	UVE1	Underground Vault 120 V Wiring
<b>~</b>	UVSP1	Underground Vault - Sump Pump

<b>N</b>	New Standard
<b>R</b>	Redrawn Standard
<b>C</b>	Changed Standard
<b>~</b>	No Change

The trench configurations below are shown with 1ø primary. Conduits for 2ø primary cable should lay side-by-side. Conduits for 3ø primary cable should be tie-wrapped to form an equilateral triangle (see Detail A).



DETAIL A  
Additional Requirements  
for 3ø Trenches



- Notes:**
1. All primary and secondary power cables are in conduit.
  2. Select backfill or controlled density fill (CDF) may be required.
  3. Construction scrap material or trash of any kind is not allowed in any part of the trench.

**Legend:**

- |                          |             |                      |
|--------------------------|-------------|----------------------|
| ⚡ Primary Power          | Ⓣ Telephone | Ⓔ Gas                |
| Ⓢ Secondary Power        | ⬡ TV Cable  | Ⓜ Water Service Only |
| Ⓡ CPU Fiber (2" conduit) |             |                      |

Rev. 6 - Updated secondary trench depths.



## CONSTRUCTION STANDARDS

### BASIC TRENCH REQUIREMENTS

PAGE:  
1 of 2

UA1

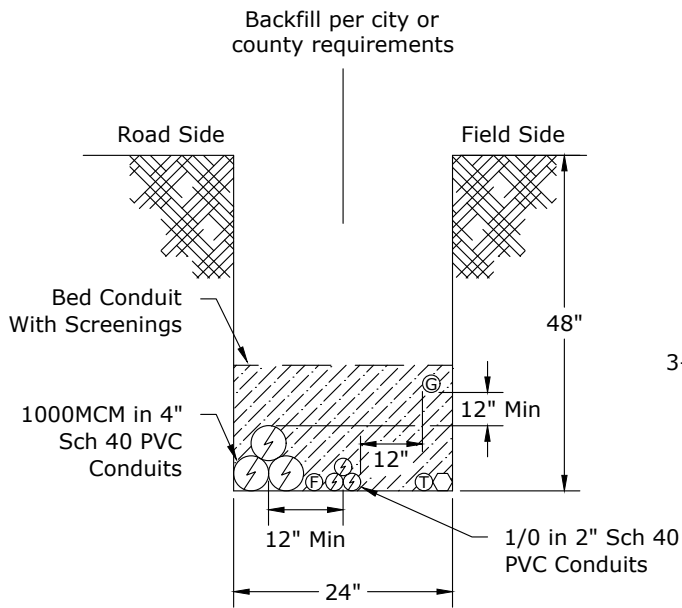
CAD FILE:  
UA1

#### REVISIONS

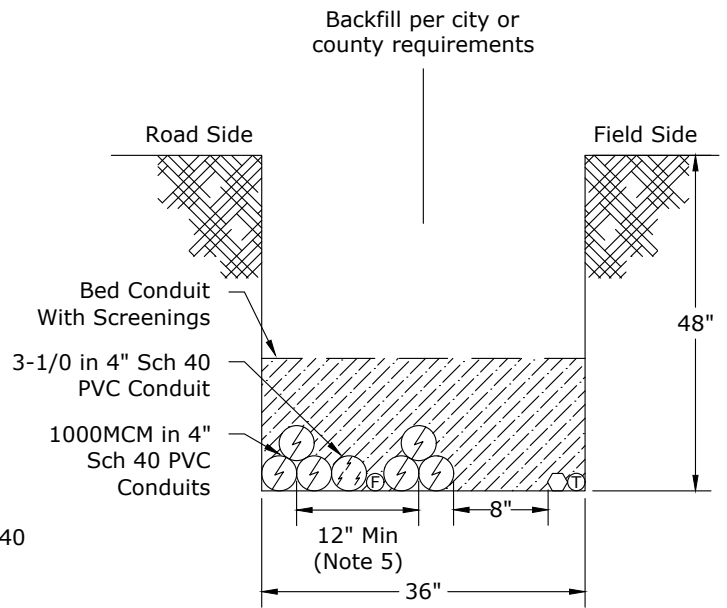
Δ/R	DATE	ENGR	OPS
3	5/30/07	LB	AH
4	12/14/09	KJP	
5	8/22/19	CM	GM
6	5/19/21	KJP	

APP: HWH/GW  
DATE: 1/22/80

SECTION  
1200



1000MCM With 1/0 Trench



2-1000MCM With 3Ø-1/0 Trench

**Note: 3Ø conduits (4" and 2") are to be tie wrapped in a triangular configuration every 5 feet. See Detail A on page 1.**

**Notes:**

1. All primary and secondary power cables are in conduit.
2. Select backfill or controlled density fill (CDF) may be required.
3. Construction scrap material or trash of any kind is not allowed in any part of the trench.
4. Caution tape is required one foot above the top 1000 MCM conduit (on screenings).
5. 12-inch minimum horizontal separation applies to both parallel feeders and to different feeders.

**Legend:**

- |                          |             |                      |
|--------------------------|-------------|----------------------|
| ⚡ Primary Power          | Ⓣ Telephone | Ⓔ Gas                |
| Ⓢ Secondary Power        | ⬡ TV Cable  | Ⓜ Water Service Only |
| ⓕ CPU Fiber (2" conduit) |             |                      |

Rev. 6 - Upated secondary trench depths.



# CONSTRUCTION STANDARDS

## BASIC TRENCH REQUIREMENTS

PAGE:  
2 of 2

UA1

CAD FILE:  
UA1

### REVISIONS

Δ	DATE	ENGR	OPS
3	5/30/07	LB	AH
4	12/14/09	KJP	
5	8/22/19	CM	GM
6	5/19/21	KJP	

APP: HWH/GW  
DATE: 1/22/80


SECTION  
1200



ALL CONDUIT SHALL BE GRAY ELECTRICAL CONDUIT AND SHALL BE UL LISTED AND NEMA TC-2 OR TC-3 LABELED -- NO OTHER PIPE IS ACCEPTABLE.

1. All primary and secondary cables shall be in conduit.
2. All road and street crossings shall be in schedule 40, PVC, gray electrical conduit or polyethylene of equal or greater strength specifications. Pipe with other designated use is not acceptable.
3. All risers above finished grade shall be in schedule 80 PVC.
4. Acceptable conduit sizes are as follows:
  - 1Ø, 1/0 primary cable in 1-2" conduit
  - 3Ø, 1/0 primary cable in 1-4" or 3-2" conduits
  - Triplex secondary cable in 1-3" conduit
  - 3Ø, 1000MCM cable in 3-4" conduits
5. Where rock is encountered and the depths shown on UA1 cannot be accomplished, a lesser depth with schedule 80 conduit\* and/or control density fill (CDF) may be approved.\* Contact CPU Engineering.
6. All conduit terminations shall have end bells or bushings.
7. All conduits that terminate into energized enclosures shall be installed by qualified personnel with a CPU standby person.
8. All conduit runs shall be designed to limit pulling tension to the values specified on UCP1.
9. All conduit ends shall be chamfered 45° x 1/4" internally at all straight ends (not belled ends).
10. All conduits installed for future use shall be marked with 3M electrical markers within six inches at both ends. All ends shall be elbowed up as per Std. ULE (section 1500). The elbow shall NOT be glued to the conduit. The elbow shall be covered with a CPU loop enclosure.
11. Sufficient select backfill shall be placed to prevent crushing of the conduits due to trucks and other heavy equipment.
12. Unused conduits shall have removable plugs designed for that purpose in both ends.
13. Road and street crossings may be either trenched and backfilled, bored or pushed whichever is acceptable to the governing agency.
14. All street and road crossings shall be at property lines.
15. Where conduit bends are required, they shall meet the requirements for cable pulling in the construction specifications. Only manufactured radii are acceptable. No heated bends.
16. A conduit (LB) shall never be used.
17. Conduit sweeps shall be 24" secondary\* and 36" primary radius.
18. Conduits installed for futures should be plumbed into transformer with elbows and capped. Flex pipe is not acceptable.
19. Conduits shall be installed so that cable is pulled toward the end bells to avoid scraping cable on sharp edges of conduit.
20. All cut ends of conduits shall be square.
21. Steel mandrels shall be pulled through the conduits to detect damage and debris.

Rev 3: Updated Notes Have A \*




	<div>CONSTRUCTION STANDARDS</div> <div>CONDUIT REQUIREMENTS</div>			REVISIONS				
				<div><div>R</div></div>	DATE	ENGR	OPS	
				1	2/23/00	HWH	MA	
				2	12/29/04	LB	AH	
				3	5/30/07	LB	AH	
					<div><div>1</div></div>	REVISIONS MARKED WITH STAR		

PAGE:	UC1	CAD FILE:	SECTION
1 of 1		UC1	1200
			DATE: 9/94

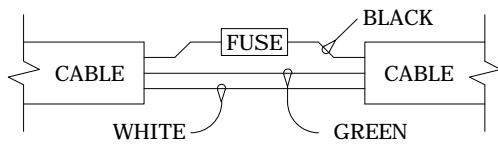
## DIRECTIONAL BORING SPECIFICATIONS

1. DIRECTIONAL DRILLING SHALL BE PERFORMED ONLY BY CPU APPROVED ELECTRICAL CONTRACTORS ON JOBS THAT HAVE BEEN PRE-APPROVED FOR DIRECTIONAL DRILLING.
2. DIRECTIONAL DRILLING EQUIPMENT SHALL BE PRE-APPROVED BY CPU.
3. DIRECTIONAL DRILLING EQUIPMENT SHALL BE OPERATED ONLY BY PERSONNEL WHO HAVE BEEN CERTIFIED OR APPROVED BY CPU OR A CPU ACCEPTED AGENCY.
4. CONDUIT INSTALLATIONS SHALL BE 2", 4" OR 6" GRAY\*\*POLYETHYLENE PIPE OF NOT-LESS-THAN STANDARD RADIUS DIMENSION (SDR) 13.5. (OUTSIDE DIAMETER DIVIDED BY WALL THICKNESS NLT 13.5). ALL CONDUIT WILL MEET ASTM STANDARDS FOR CONSTRUCTION AND INSTALLATION OF POLYETHYLENE (PE) CONDUIT. CONDUIT INSTALLATIONS USING PVC CONDUIT SHALL HAVE DESIGNS, MATERIAL AND INSTALLATION PRACTICES PRE-APPROVED BY CPU.
5. ALL CONNECTION TO PVC SWEEPS OR CONDUIT WILL BE FULLY GLUED USING IRS WELD-ON 600 ADHESIVE OR CPU APPROVED EQUIVALENT. GLUE USED TO FASTEN PVC TO PVC SHALL BE IRS WELD ON 721 WITH A COMPATIBLE PRIMER (OR APPROVED EQUIVALENT GLUE AND PRIMER).
6. A PLOT AND TRACK OF THE BORE USING THE BORE EQUIPMENT SOFTWARE, OR A CERTIFIED COPY OF A SURVEYED PROFILE OF THE BORE, SHALL BE PROVIDED TO CPU BEFORE ACCEPTANCE OF THE INSTALLATION.
7. THE DEPTH OF THE CONDUIT SHALL BE IDENTIFIED BY A STAKE WITH THE DEPTH EVERY 10 FEET ALONG THE ROUTE IN UNPAVED AREAS AND BY THE DEPTH WRITTEN IN MARKER PAINT EVERY 10 FEET ALONG THE ROUTE IN PAVED AREAS.
8. THE CONDUIT DEPTHS SHALL CONFORM TO THE CPU STANDARDS OF 42" NOMINAL DEPTH, NOT LESS THAN 36", NOR GREATER THAN 48". ANY OTHER DEPTH SHALL REQUIRE PRIOR APPROVAL BY CPU.
9. ALL INSTALLED CONDUITS SHALL BE "PROOFED" USING THE APPROPRIATE MANDREL, AND HAVE A 2500 POUND, 3/4" SEQUENTIALLY-NUMBERED, CONTINUOUS "MULE TAPE" INSTALLED FOR FUTURE CABLE PULLING. CERTIFICATION OF THE TEST MANDRELING SHALL BE PROVIDED TO CPU PRIOR TO ACCEPTANCE BY THE UTILITY.
10. CPU RESERVES THE OPTION TO REQUIRE "POTHOLING" TO DETERMINE DEPTH AND LOCATION FOR ANY INSTALLATIONS THAT ARE QUESTIONABLE. THE "POTHOLING" WILL BE AT THE CONTRACTOR'S EXPENSE.

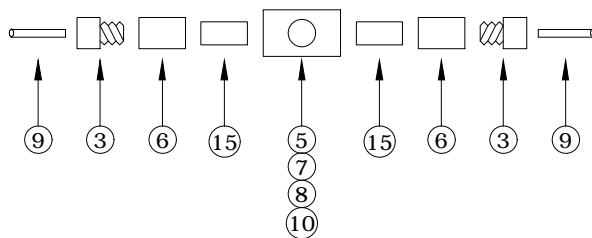
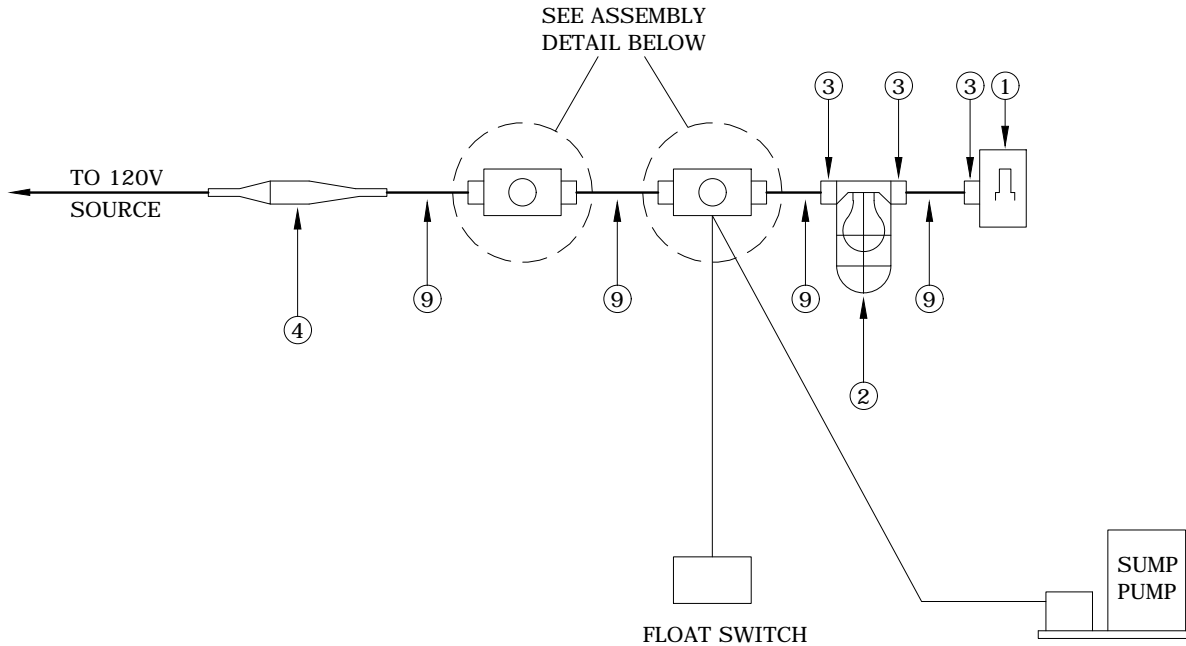
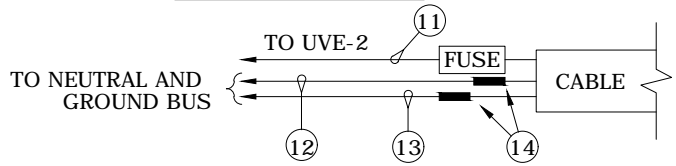
Rev 2: Added "Gray" to Item #4 and 3/4" mule tape in all conduit in Item #9

	<b>CONSTRUCTION STANDARDS</b>		<b>REVISIONS</b>			
	<b>DIRECTIONAL BORING SPECIFICATIONS</b>			DATE	ENGR	OPS
			1	12/29/04	LB	AH
			2	12/14/09	KJP	
						
PAGE: 1 of 1	<b>UD1</b>	CAD FILE: UD1	APP:	SECTION		
			DATE: 4/24/01	<b>1200</b>		

**DETAIL ITEM 4  
REMOTE SOURCE**



**DETAIL ITEM 4  
IN VAULT SOURCE**



STORE ITEM 10 NEAR RECEPTACLE  
WHEN NOT IN USE.

**RECEPTACLE ASSEMBLY  
(TYPICAL)**

R1 - REDRAWN IN CAD



**CONSTRUCTION STANDARDS**  
UNDERGROUND VAULT  
120 VOLT WIRING

PAGE:  
1 of 3

**UVE1**

CAD FILE:  
UVE1

**REVISIONS**

DATE	ENGR	OPS
2/23/00	HW	MA

1 REDRAWN IN CAD

APP:	SECTION
DATE: 4/94	1200

## MATERIAL LIST

ITEM	QTY.	DESCRIPTION	TDM.
1	1	SWITCH, DUST-TIGHT, WATER-TIGHT, 125V, 20A SQUARE 'D' CAT #KW-1	2290
2	1	LIGHT FIXTURE, VAPOR-TIGHT, 150V WITH GLOBE, GUARD AND BASE WITH 2 - 3/4" NPT HUBS HUBBELL CAT #NVX15CHG	2291
3	7	CONNECTOR, STRAIGHT, 3/4" NPT HUB SIZE, MALE, NYLON HUBBELL #SHC-1037-CR	2292
4	1	FUSE HOLDER, HOMAC #SLK	2309
5	2	BOX, CONDUIT, PVC, TYPE FSC, 3/4"	2293
6	4	ADAPTER, FEMALE, 3/4", PVC	1586
7	2	POWER OUTLET, CHROME PLATED BRASS 30A, 3 WIRE, 125V, HUBBELL #60CM63	2294
8	2	ADAPTER, HUBBELL #60CM75 FOR ITEM #7	2295
9	A.R.	CORD, PORTABLE, TYPE STO 3 CONDUCTOR 10 AWG	2296
10	2	ADAPTER, TWIST LOCK MALE 30A TO STRAIGHT BLADE FEMALE 30A, HUBBELL #31CM29	2297
11	A.R.	CONDUCTOR #10 CU BLACK	2298
12	A.R.	CONDUCTOR #10 CU WHITE	2299
13	A.R.	CONDUCTOR #10 CU BARE	2300
14	2	SPLICE COVER, STREET LIGHT, HOMAC FSS20	2115
15	A.R.	CONDUIT, PVC, SCH 40, 3/4"	1564



### CONSTRUCTION STANDARDS

UNDERGROUND VAULT  
120 VOLT WIRING

PAGE:  
2 of 3

UVE1




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UVE1

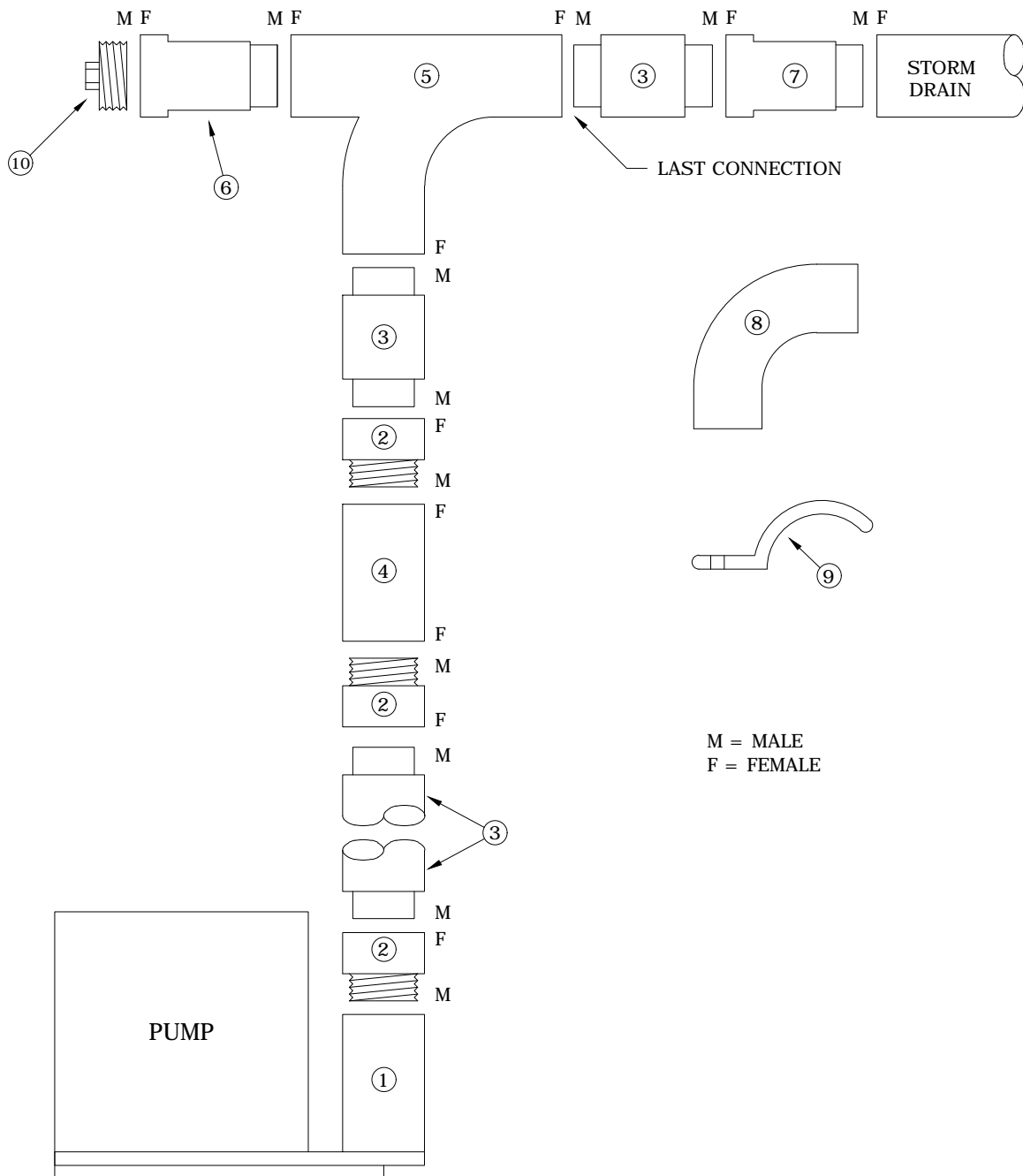
#### REVISIONS

△	DATE	ENGR	OPS
1	2/23/00	HWH	MA
△ REDRAWN IN CAD			
APP:			SECTION
DATE: 4/94			1200

NOTES:

1. THIS WIRING DIAGRAM IS TYPICAL ONLY. EACH VAULT REQUIRES SPECIAL CONSIDERATION TO LOCATE EACH COMPONENT FOR OPTIMUM UTILIZATION.
2. LOCATE THE LIGHT SWITCH AS CLOSE TO THE LADDER AS POSSIBLE BUT PROTECT IT FROM DAMAGE WHEN EQUIPMENT IS BEING MOVED IN OR OUT.
3. THE 120 VOLT SOURCE MAY BE FROM A TRANSFORMER IN THE VAULT OR FROM AN EXTERNAL SOURCE.
4. THE FLOAD SWITCH LOCATION MUST BE CALCULATED FOR EACH VAULT SEPARATELY. THE LOCATION DEPENDS UPON THE AMOUNT OF OIL IN THE EQUIPMENT IN THE VAULT. REFER THIS TO ENGINEERING.
5. LOCATE RECEPTACLES AS HIGH AS POSSIBLE TO MINIMIZE THE PROBABILITY OF BEING SUBMERGED.
6. LOCATE FUSE ON OR NEAR THE CEILING
7. FUSE IS 600 VOLT, 30 AMP, 13/32" x 1 1/2" NON-GLASS TYPE.
8. CONNECTOR, ITEM 3, SCREWS DIRECTLY INTO HUB.
9. THE NEUTRAL MAY COME FROM ANY AVAILABLE SOURCE WITHIN THE VAULT IF THE 120 VOLT SOURCE IS INTERNAL. IF THE SOURCE IS EXTERNAL, IT MUST INCLUDE A NEUTRAL.

	<b>CONSTRUCTION STANDARDS</b> UNDERGROUND VAULT 120 VOLT WIRING		REVISIONS			
				DATE	ENGR	OPS
			1	2/23/00	HWH	MA
		 REDRAWN IN CAD				
PAGE: 3 of 3	<b>UVE1</b>	CAD FILE: UVE1	APP:	SECTION		
		DATE: 4/94	<b>1200</b>			



NOTES:

1. ALL PIPE AND FITTINGS MUST BE SCHEDULE 40 SEWER TYPE. SEWER AND WATER FITTINGS DON'T FIT TOGETHER EXCEPT AT THREADED JOINTS.
2. THIS SPECIFICATION IS TYPICAL ONLY. LOCATION OF STORM DRAIN WILL DICTATE PIPE ROUTING.
3. LOCATE CHECK VALVE CLOSE TO PUMP AND IN THE VERTICAL POSITION.
4. PUMP MUST BE IN VAULT SUMP.
5. SEE UVE FOR ELECTRICAL CONNECTIONS.

R1 - REDRAWN IN CAD



# CONSTRUCTION STANDARDS UNDERGROUND VAULT SUMP PUMP

PAGE:  
1 of 2

UVSP1

CAD FILE:  
UVSP1

REVISIONS			
△	DATE	ENGR	OPS
1	2/23/00	HWH	MA
△ REDRAWN IN CAD			
APP:		SECTION	
DATE: 4/92		1200	

## MATERIAL LIST

ITEM	QTY.	DESCRIPTION	TDM.
1	1	SUMP PUMP	1955
2	3	ADAPTER, MALE, 2" PLASTIC, SEWER	2353
3	A. R.	PIPE, SEWER, PLASTIC, 2"	2301
4	1	CHECK VALVE, 2", BRONZE	2354
5	1	COMBINATION Y, 2", PLASTIC	2355
6	1	CLEANOUT FITTING 2", PLASTIC	2356
7	1	REDUCER, PLASTIC, SEWER, 2" x ____	A. R.
8	A. R.	1/4 BEND, PLASTIC, SEWER, 2"	2308
9	A. R.	CLAMP, PIPE, 2", ONE BOLT	2307
10	1	CLEANOUT PLUG 2"	2358





### CONSTRUCTION STANDARDS

UNDERGROUND VAULT  
SUMP PUMP

PAGE:  
2 of 2

UVSP1

CAD FILE:  
UVSP1

REVISIONS			
	DATE	ENGR	OPS
1	2/23/00	HWH	MA
 REDRAWN IN CAD			
APP:	SECTION		
DATE: 4/92	1200		

# 1300

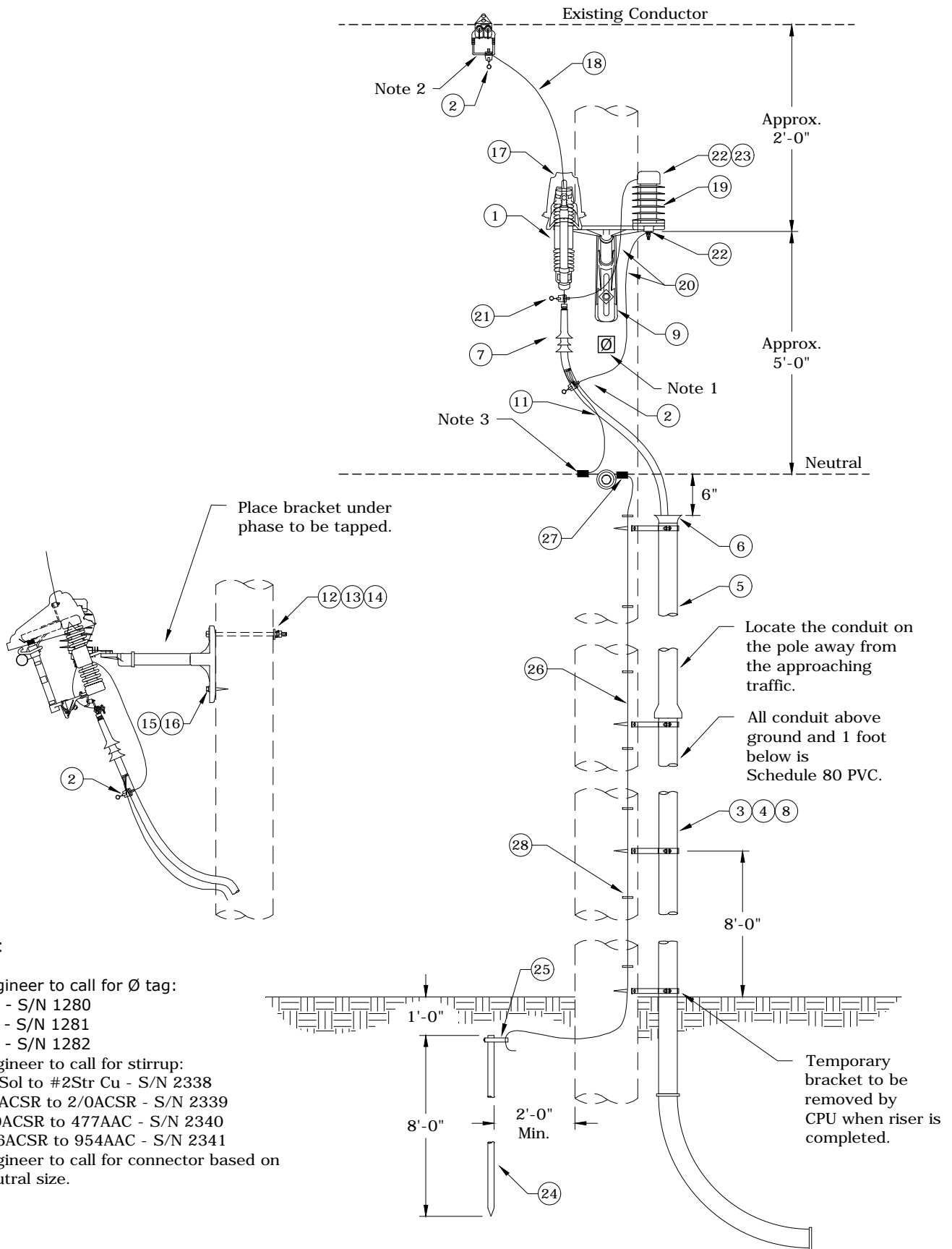
## UNDERGROUND RISERS, CABLES AND CONNECTORS

12/19/2022

~	U1	1Ø Primary Riser
~	U1R	1Ø Primary Riser, Reverse Feed
~	U2	2Ø Primary Riser
~	U2R	2Ø Primary Riser, Reverse Feed
~	U3	3Ø Primary Riser
~	U3R	3Ø Primary Riser, Reverse Feed
~	U83,U84	Secondary Overhead to Underground Riser Assembly
~	U8P	Secondary OH to UG Riser Assembly with Secondary Pedestal
~	U9	Riser Bracket Assembly
~	U10	1Ø Primary (U1) & Secondary (U8) Riser Guidelines
~	UB20-UB28	Underground Primary Basic Units
~	UCA1-UCA6	Underground Primary Cable Accessories - 200 Amp
~	UCH-0	Underground Cable Reel Handling
~	UCH-1	Underground Cable Handling and Storage
~	UCP1	Underground Cable Pulling Requirements
~	UEP2	Primary Elbow Assembly 200A w/ Current-Reset Fault Indicator
~	UEP3	Primary Elbow Assembly 200A w/ Voltage-Reset Fault Indicator
~	UFI	Underground Fault Indicators
~	UFI2	Underground Cable Current-Reset Fault Indicators Installation
C	UID2	Underground Conductor Identification Tags

**N** New Standard  
**R** Redrawn Standard  
**C** Changed Standard  
**~** No Change





Rev. 6 - Corrected drawing and material.



## CONSTRUCTION STANDARDS

### SINGLE PHASE PRIMARY RISER

PAGE:  
1 of 2

U1

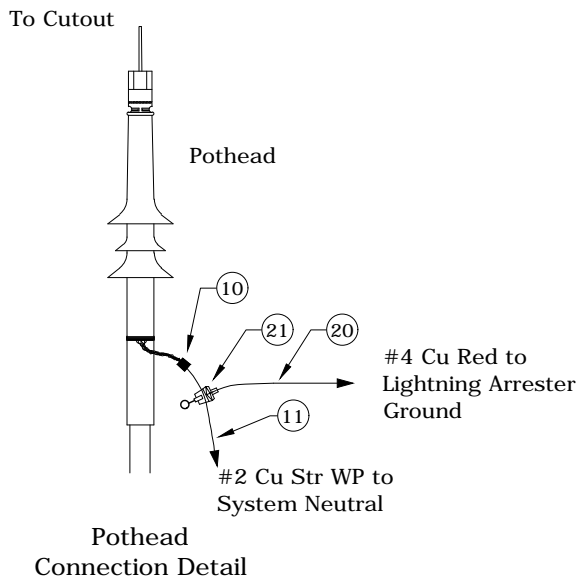
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#### REVISIONS

REVISION	DATE	ENGR	OPS
3	12/29/04	LB	AH
4	12/14/09	KJP	
5	10/31/17	CM	DK
6	1/16/19	CM	DK

APP: ELM  
DATE: 1/31/80

SECTION  
1300



#### Notes:

4. Connect concentric neutrals to arrester ground using #4 Cu, Red.
5. Make arrester ground terminal-to-concentric neutral jumper as short as possible.

Rev. 6 - Corrected drawing and material.

ITEM NO.	DESCRIPTION	U1	
		QTY.	S/N
1	Cutout, Polymer, Universal, 100A, 16kA Asym.	1	2532
2	Clamp, Hotline, GP 1520, #8 to 2/0 Str, Cu Only	1*	283
3	Screw, Lag, 1/2" x 3", Fetter Drive, Drive Point	6	1131
4	Bracket, Standoff Riser, 10 1/2"	3	226
5	Conduit, PVC, 2" X 10', Sch 80	30*	2205
6	End Bell, 2", Sch 40	1*	2206
7	Terminator, 15kV, Cold-Shrink JCN & CN, 1/0	1	2214
8	Clamp, Standoff Bracket, Conduit, 2"	3	295
9	Bracket, Arrester/Cutout Mounting, 1ø Fiberglass 18"	1	2537
10	Connector, Crimpet, Cu 2/2 - 2/2 (2C2)	1	455
11	Conductor, Cu #2, 1/C, 7-Str, SD, 600V, HMP	10	393
12	Bolt, Machine, 5/8" x 12", 12,400 lbs. Ultimate Tensile	1	155
13	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole	1	1392
14	Washer, Lock, Spring, Double Coil, Galv. 5/8"	1	2217
15	Screw, Lag, 1/2" x 4 1/2", Twist Drive, Drive Point	1	1132
16	Washer, Flat, Round Galv., 1/2"	1	1394
17	Guard, Wildlife, Cutout, Polymer	1	2928 *
18	Conductor, Cu 1/C #2, 7-Str, 600V, Red, THW	3	2513
ITEM NO.	DESCRIPTION	LA2	
		QTY.	S/N
19	Arrester, Surge, 9kV, MOV, Riser Pole	1	58
20	Conductor, Cu 1/C #4, 7-Str, 600V, Red, THW	7	2512
21	Clamp, Hotline, GP 1520, #8 to 2/0 Str, Cu Only	2	283
22	Connector, Compression Lug, #4, Cu/Al, One-Hole, Tin-Plated, For Arrester	2	2548
23	Guard, Wildlife, Polymer Arrester	1	2583
ITEM NO.	DESCRIPTION	N1	
		QTY.	S/N
24	Rod, Ground, 5/8" x 8'	1	1124
25	Clamp, Ground Rod, 5/8", Bronze Small	1	281
26	Conductor, Copper-Clad Steel, #4 Cu Equivalent, Covered	40	1512
27	Connector, Cabelok, Al/Cu, #2-2/0 Run, #6-#1 Tap	1	413
28	Staple, Ground, Barbed, Galv. 1 1/2"	24	2707



## CONSTRUCTION STANDARDS

### SINGLE PHASE PRIMARY RISER

PAGE:  
2 of 2

U1

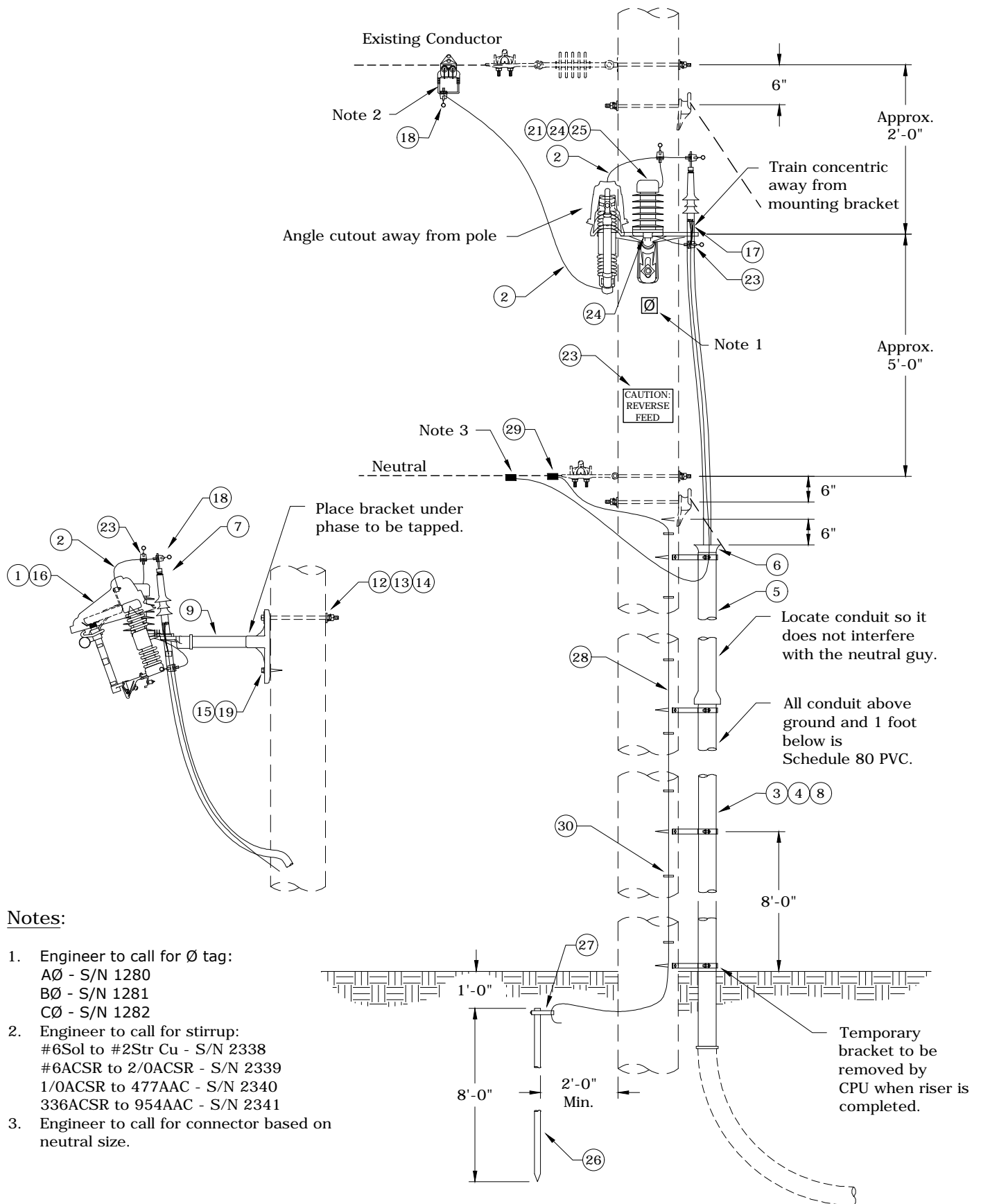
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#### REVISIONS

REV	DATE	ENGR	OPS
3	12/29/04	LB	AH
4	12/14/09	KJP	
5	10/31/17	CM	DK
6	1/16/19	CM	DK

APP: ELM  
DATE: 1/31/80

SECTION  
1300



Rev. 2 - Moved arrester to middle of bracket, added cutout direction note, and updated materials.



## CONSTRUCTION STANDARDS

SINGLE PHASE  
PRIMARY RISER  
REVERSE FEED

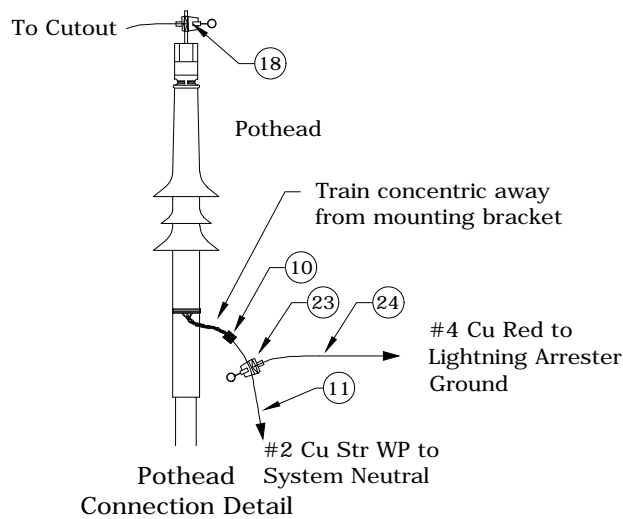
PAGE:  
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U1R

CAD FILE:  
U1R

### REVISIONS

REV	DATE	ENGR	OPS
1	10/31/17	CM	DK
2	1/16/19	CM	DK
APP: HWH/MA		SECTION	
DATE: 2/23/00		1300	



**Notes:**

4. Connect concentric neutrals to arrester ground using #4 Cu, Red.
5. Make arrester ground terminal-to-concentric neutral jumper as short as possible.

Rev. 2 - Moved arrester to middle of bracket, added cutout direction note, and updated materials.

ITEM NO.	DESCRIPTION	U1R	
		QTY.	S/N
1	Cutout, Polymer, Universal, 100A, 16kA Asym.	1	2532
2	Conductor, Cu 1/C #2, 7 Str, 600V, Red, THW	6	2513
3	Screw, Lag, 1/2" x 3", Fetter Drive, Drive Point	6	1131
4	Bracket, Standoff Riser, 10 1/2"	3	226
5	Conduit, PVC, 2" x 10', Sch 80	30	2205
6	End Bell, 2", Sch 40	1	2206
7	Terminator, 15kV, Cold-Shrink, JCN & CN, 1/0	1	2214
8	Clamp, Standoff Bracket, 2" Conduit	3	295
9	Bracket, Arrester/Cutout Mounting, 1Ø, Fiberglass 18"	1	2537
10	Connector, Crimpet, Cu, 2/2 - 2/2 (2C2)	1	455
11	Conductor, Cu #2, 1/C, 7-Str, SD, 600V, HMP	10	393
12	Bolt, Machine 5/8" x 12", 12,400 lbs. Ultimate Tensile	1	155
13	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole	1	1392
14	Washer, Lock, Spring, Double Coil, Galv. 5/8"	1	2217
15	Screw, Lag 1/2" x 4 1/2", Twist Drive, Drive Point	1	1132
16	Guard, Wildlife, Cutout, Polymer	1	2928
17	Clamp, 2-Bolt, for 1/0 Terminator	1	1858
18	Clamp, Hotline, GP 1520, #8 to 2/0 Str, Cu Only	2	283
19	Washer, Flat, Round Galv. 1/2"	1	1394
20	Sign, "Caution: Reverse Feed"	1	2719
ITEM NO.	DESCRIPTION	LA2	
		QTY.	S/N
21	Arrester, Surge, 9kV, MOV, Riser Pole	1	58
22	Conductor, Cu 1/C #4, 7-Str, 600V, Red, THW	7	2512
23	Clamp, Hotline, GP 1520, #8 to 2/0 Str, Cu Only	2	283
24	Connector, Compression Lug, #4, Cu/Al, One-Hole, Tin-Plated, For Arrester	2	2548
25	Guard, Wildlife, Polymer Arrester	1	2583
ITEM NO.	DESCRIPTION	N1	
		QTY.	S/N
26	Rod, Ground, 5/8" x 8'	1	1124
27	Clamp, Ground Rod, 5/8", Bronze Small	1	281
28	Conductor, Copper-Clad Steel, #4 Cu Equivalent, Covered	40	1512
29	Connector, Cabelok, Al/Cu, #2-2/0 Run, #6-#1 Tap	1	413
30	Staple, Ground, Barbed, Galvanized, 1 1/2"	24	2707



## CONSTRUCTION STANDARDS

SINGLE PHASE  
PRIMARY RISER  
REVERSE FEED

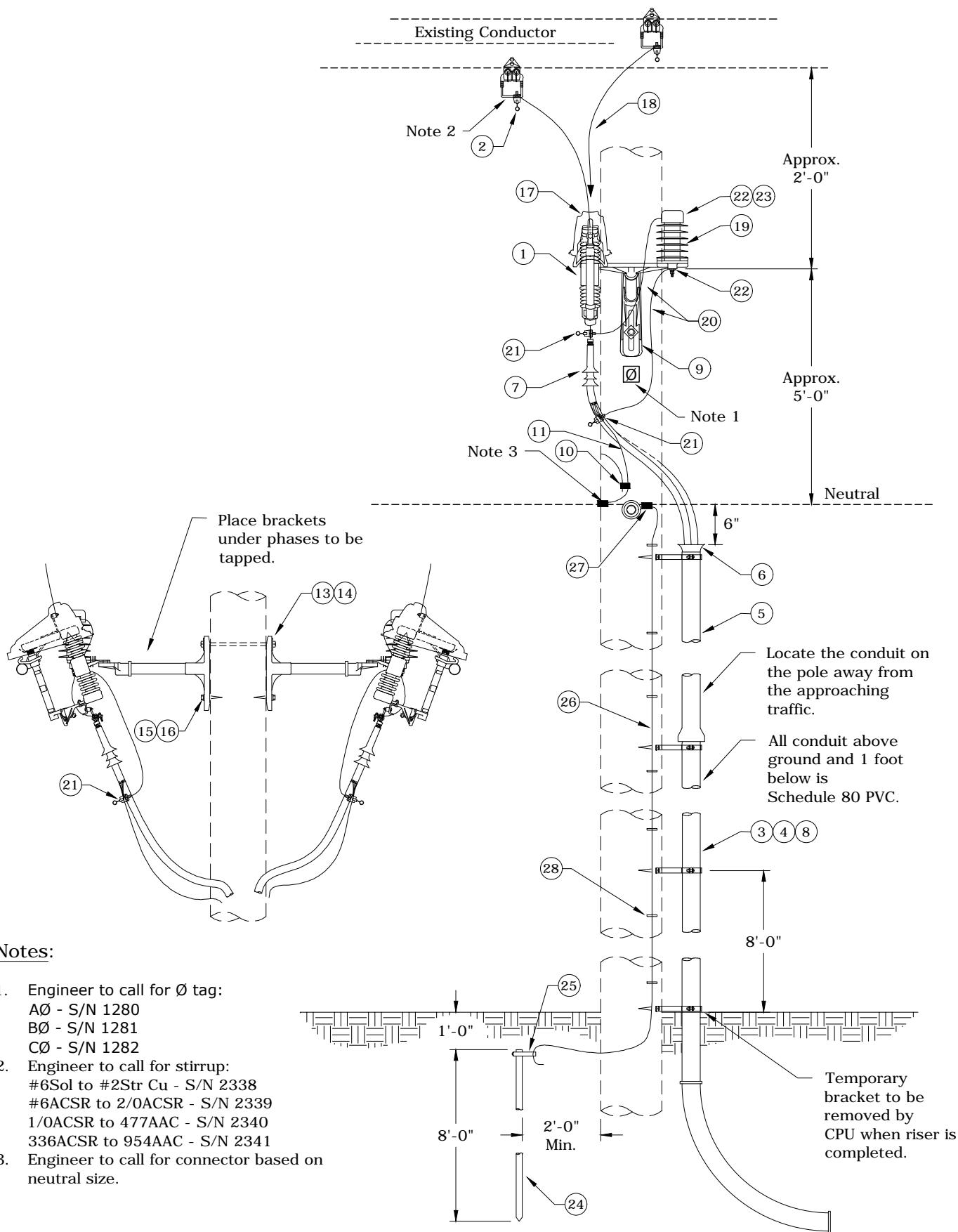
PAGE:  
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U1R

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U1R

### REVISIONS

REV	DATE	ENGR	OPS
1	10/31/17	CM	DK
2	1/16/19	CM	DK
APP: HWH/MA		SECTION	
DATE: 2/23/00		1300	

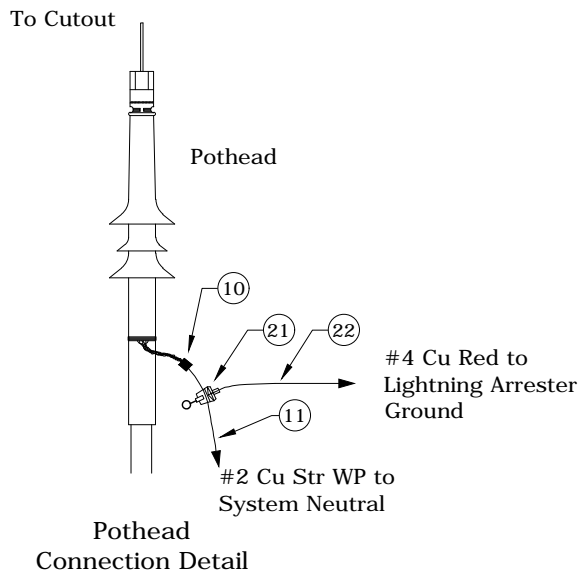


**Notes:**

1. Engineer to call for Ø tag:  
AØ - S/N 1280  
BØ - S/N 1281  
CØ - S/N 1282
2. Engineer to call for stirrup:  
#6Sol to #2Str Cu - S/N 2338  
#6ACSR to 2/0ACSR - S/N 2339  
1/0ACSR to 477AAC - S/N 2340  
336ACSR to 954AAC - S/N 2341
3. Engineer to call for connector based on neutral size.

Rev. 5 - Corrected drawing and material issue.

		<b>CONSTRUCTION STANDARDS</b>  TWO PHASE PRIMARY RISER		REVISIONS			
				2 3 4 5	DATE 12/29/04 12/14/09 10/31/17 1/16/19	ENGR LB KJP CM CM	OPS AH DK DK DK
PAGE: 1 of 2		U2		CAD FILE: U2		APP: ELM DATE: 2/22/00	
						SECTION 1300	



#### Notes:

4. Connect concentric neutrals to arrester ground using #4 Cu, Red.
5. Make arrester ground terminal-to-concentric neutral jumper as short as possible.

Rev. 5 - Corrected drawing and material.

ITEM NO.	DESCRIPTION	U2	
		QTY.	S/N
1	Cutout, Polymer, Universal, 100A, 16kA Asym.	2	2532
2	Clamp, Hotline, GP 1520, #8 to 2/0 Str, Cu Only	2*	283
3	Screw, Lag, 1/2" x 3", Fetter Drive, Drive Point	6	1131
4	Bracket, Standoff Riser, 10 1/2"	3	226
5	Conduit, PVC, 4" X 10', Sch 80	30*	2203
6	End Bell, 4", Sch 40	1*	2204
7	Terminator, 15kV, Cold-Shrink JCN & CN, 1/0	2	2214
8	Clamp, Standoff Bracket, Conduit, 4"	3	297
9	Bracket, Arrester/Cutout Mounting, 1ø Fiberglass 18"	2	2537
10	Connector, Crimpet, Cu 2/2 - 2/2 (2C2)	2	455
11	Conductor, Cu #2, 1/C, 7-Str, SD, 600V, HMP	20	393
13	Bolt, Machine, 5/8" x 14", 12,400 lb Ultimate	1	156
14	Washer, Lock, Spring, Double Coil, Galv. 5/8"	1	2217
15	Screw, Lag, 1/2" x 4 1/2", Twist Drive, Drive Point	2	1132
16	Washer, Flat, Round Galv., 1/2"	2	1394
17	Guard, Wildlife, Cutout, Polymer	2	2928 *
18	Conductor, Cu 1/C #2, 7-Str, 600V, Red, THW	6	2513
ITEM NO.	DESCRIPTION	LA2 (2)	
		QTY.	S/N
19	Arrester, Surge, 9kV, MOV, Riser Pole	2	58
20	Conductor, Cu 1/C #4, 7-Str, 600V, Red, THW	14	2512
21	Clamp, Hotline, GP 1520, #8 to 2/0 Str, Cu Only	4	283
22	Connector, Compression Lug, #4, Cu/Al, One-Hole, Tin-Plated, For Arrester	4	2548
23	Guard, Wildlife, Polymer Arrester	2	2583
ITEM NO.	DESCRIPTION	N1	
		QTY.	S/N
24	Rod, Ground, 5/8" x 8'	1	1124
25	Clamp, Ground Rod, 5/8", Bronze Small	1	281
26	Conductor, Copper-Clad Steel, #4 Cu Equivalent, Covered	40	1512
27	Connector, Cabelok, Al/Cu, #2-2/0 Run, #6-#1 Tap	1	413
28	Staple, Ground, Barbed, Galvanized, 1 1/2"	24	2707



## CONSTRUCTION STANDARDS

### TWO PHASE PRIMARY RISER

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U2

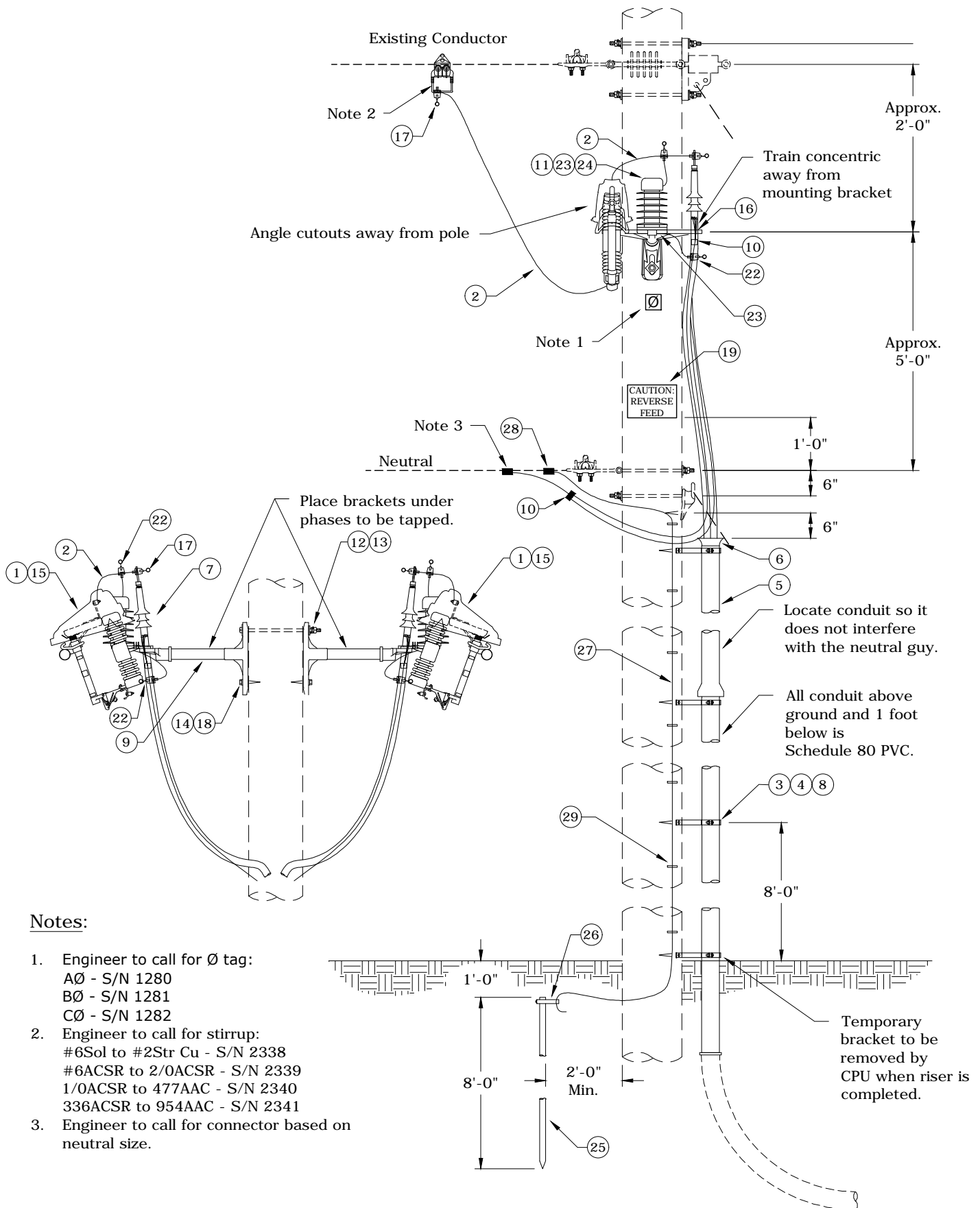
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#### REVISIONS

REV	DATE	ENGR	OPS
2	12/29/04	LB	AH
3	12/14/09	KJP	
4	10/31/17	CM	DK
5	1/16/19	CM	DK

APP: ELM  
DATE: 2/22/00

SECTION  
1300



### Notes:

1. Engineer to call for Ø tag:  
AØ - S/N 1280  
BØ - S/N 1281  
CØ - S/N 1282
2. Engineer to call for stirrup:  
#6Sol to #2Str Cu - S/N 2338  
#6ACSR to 2/0ACSR - S/N 2339  
1/0ACSR to 477AAC - S/N 2340  
336ACSR to 954AAC - S/N 2341
3. Engineer to call for connector based on neutral size.

Rev. 1 - Moved arrester to middle of bracket, added cutout direction note, and updated materials.



## CONSTRUCTION STANDARDS

TWO PHASE  
PRIMARY RISER  
REVERSE FEED

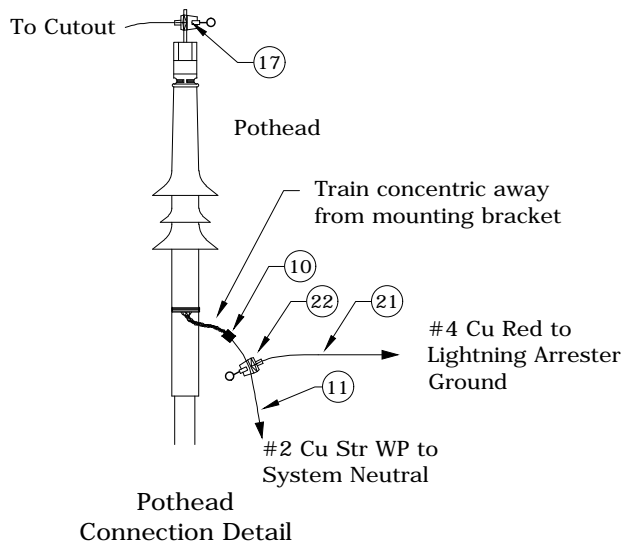
PAGE:  
1 of 2

U2R

CAD FILE:  
U2R

### REVISIONS

DATE	ENGR	OPS
1/16/19	CM	DK
APP:	CM/DK	SECTION
DATE:	10/31/17	1300



#### Notes:

4. Connect concentric neutrals to arrester ground using #4 Cu, Red.
5. Make arrester ground terminal-to-concentric neutral jumper as short as possible.

Rev. 1 - Moved arrester to middle of bracket, added cutout direction note, and updated materials.

		U2R	
ITEM NO.	DESCRIPTION	Additional Material	
		QTY.	S/N
1	Cutout, Polymer, Universal, 100A, 16kA Asym.	2	2532
2	Conductor, Cu 1/C #2, 7-Str, 600V, Red, THW	12	2513
3	Screw, Lag, 1/2" x 3", Fetter Drive, Drive Point	6	1131
4	Bracket, Standoff Riser, 10 1/2"	3	226
5	Conduit, PVC, 4" x 10', Sch 80	30	2203
6	End Bell, 4", Sch 40	2	2204
7	Terminator, 15kV, Cold-Shrink, JCN & CN, 1/0	2	2214
8	Clamp, Standoff Bracket, 4" Conduit	3	297
9	Bracket, Arrester/Cutout Mounting, 1Ø, Fiberglass 18"	2	2537
10	Connector, Crimpet, Cu, 2/2 - 2/2 (2C2)	4	455
11	Conductor, Cu #2, 1/C, 7-Str, SD, 600V, HMP	20	393
12	Bolt, Machine 5/8" x 14", 12,400 lbs. Ultimate Tensile	1	156
13	Washer, Lock, Spring, Double Coil, Galv. 5/8"	1	2217
14	Screw, Lag 1/2" x 4 1/2", Twist Drive, Drive Point	2	1132
15	Guard, Wildlife, Cutout, Polymer	2	2928
16	Clamp, 2-Bolt, for 1/0 Terminator	2	1858
17	Clamp, Hotline, GP 1520, #8 to 2/0 Str, Cu Only	4	283
18	Washer, Flat, Round Galv. 1/2"	2	1394
19	Sign, "Caution: Reverse Feed"	1	2719
ITEM NO.	DESCRIPTION	LA2 (2)	
		QTY.	S/N
20	Arrester, Surge, 9kV, MOV, Riser Pole	2	58
21	Conductor, Cu 1/C #4, 7-Str, 600V, Red, THW	14	2512
22	Clamp, Hotline, GP 1520, #8 to 2/0 Str, Cu Only	4	283
23	Connector, Compression Lug, #4, Cu/Al, One-Hole, Tin-Plated, For Arrester	4	2548
24	Guard, Wildlife, Polymer Arrester	2	2583
ITEM NO.	DESCRIPTION	N1	
		QTY.	S/N
25	Rod, Ground, 5/8" x 8'	1	1124
26	Clamp, Ground Rod, 5/8", Bronze Small	1	281
27	Conductor, Copper-Clad Steel, #4 Cu Equivalent, Covered	40	1512
28	Connector, Cabelok, Al/Cu, #2-2/0 Run, #6-#1 Tap	1	413
29	Staple, Ground, Barbed, Galvanized, 1 1/2"	24	2707



## CONSTRUCTION STANDARDS

TWO PHASE  
PRIMARY RISER  
REVERSE FEED

PAGE:  
2 of 2

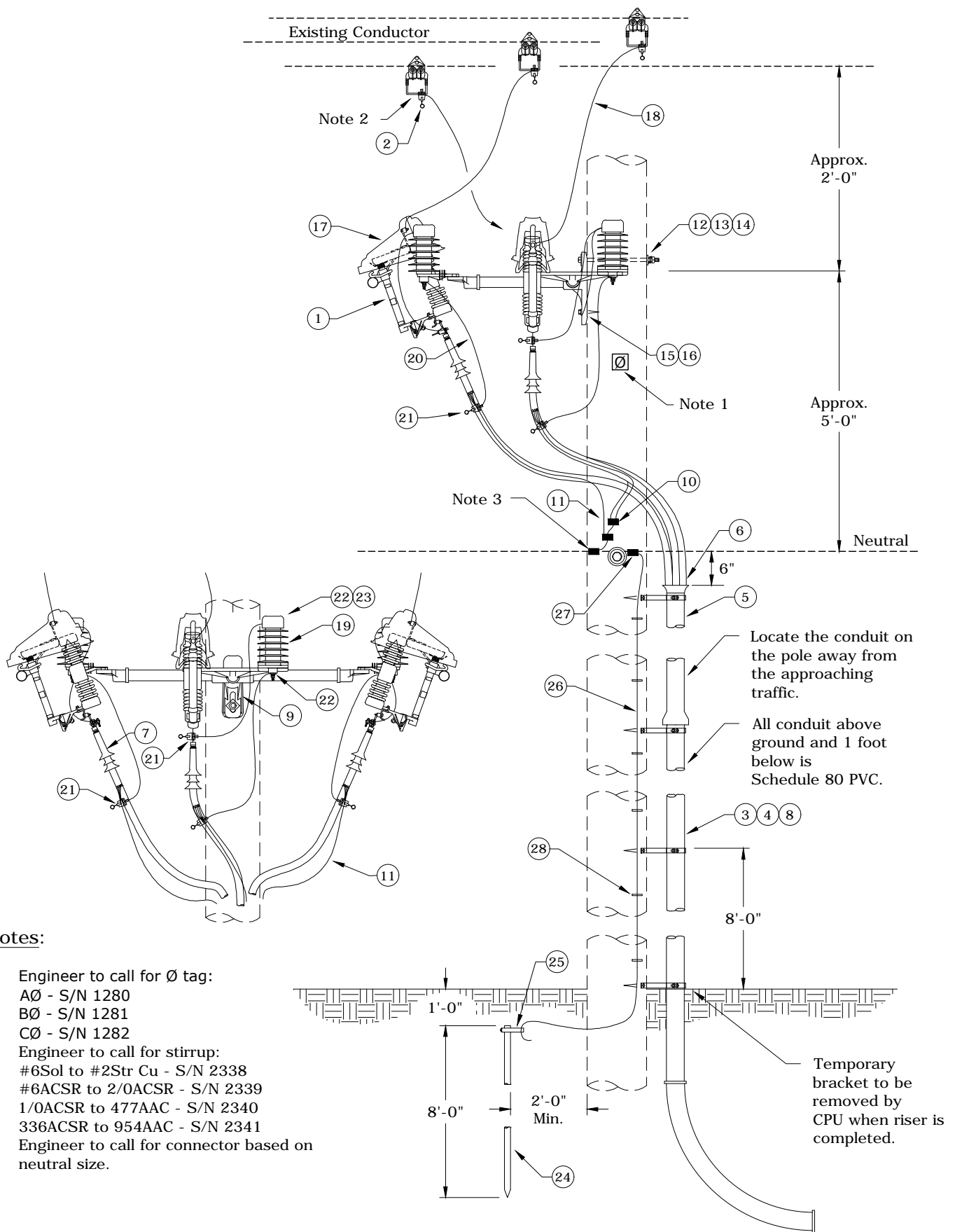
U2R

CAD FILE:  
U2R

#### REVISIONS

DATE	ENGR	OPS
1/16/19	CM	DK
APP:	CM/DK	SECTION
DATE: 10/31/17		1300





#### Notes:

1. Engineer to call for Ø tag:  
AØ - S/N 1280  
BØ - S/N 1281  
CØ - S/N 1282
2. Engineer to call for stirrup:  
#6Sol to #2Str Cu - S/N 2338  
#6ACSR to 2/0ACSR - S/N 2339  
1/0ACSR to 477AAC - S/N 2340  
336ACSR to 954AAC - S/N 2341
3. Engineer to call for connector based on neutral size.

Rev. 6 - Corrected drawing and material issue.



## CONSTRUCTION STANDARDS

### THREE PHASE PRIMARY RISER

PAGE:  
1 of 2

U3

CAD FILE:  
U3

#### REVISIONS

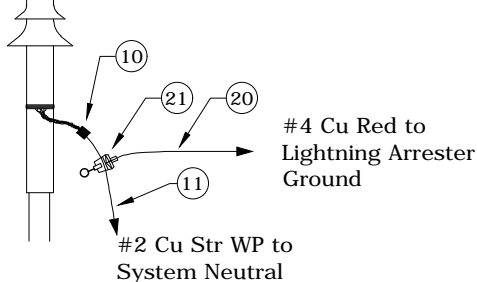
REV	DATE	ENGR	OPS
3	12/29/04	LB	AH
4	12/14/09	KJP	
5	10/31/17	CM	DK
6	1/16/19	CM	DK

APP: ELM  
DATE: 1/31/80

SECTION  
1300

To Cutout

Pothead

Pothead  
Connection DetailNotes:

4. Connect concentric neutrals to arrester ground using #4 Cu, Red.
5. Make arrester ground terminal-to-concentric neutral jumper as short as possible.

Rev. 6 - Corrected drawing and material issue.

		U3	
ITEM NO.	DESCRIPTION	Additional Material	
		QTY.	S/N
1	Cutout, Polymer, Universal, 100A, 16kA Asym.	3	2532
2	Clamp, Hotline, GP 1520, #8 to 2/0 Str, Cu Only	3	283*
3	Screw, Lag, 1/2" x 3", Fetter Drive, Drive Point	6	1131
4	Bracket, Standoff Riser, 10 1/2"	3	226
5	Conduit, PVC, 4" x 10', Sch 80	30	2203
6	End Bell, 4", Sch 40	1	2204
7	Terminator, 15kV, Cold-Shrink, JCN & CN, 1/0	3	2214
8	Clamp, Standoff Bracket, 4" Conduit	3	297*
9	Bracket, Arrester/Cutout Mounting, 3Ø Fiberglass 18"	1	2538
10	Connector, Crimpet, Cu 2/2 - 2/2 (2C2)	3	455
11	Conductor, Cu #2, 1/C, 7-Str, SD, 600V, HMP	30	393
12	Bolt, Machine, 5/8" x 12", 12,400 lbs. Ultimate Tensile	1	155
13	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole	1	1392
14	Washer, Lock Spring, Double Coil, Galv. 5/8"	1	2217
15	Screw, Lag, 1/2" x 4 1/2", Twist Drive, Drive Point	1	1132
16	Washer, Flat, Round, Galv., 1/2"	1	1394
17	Guard, Wildlife, Cutout, Polymer	3	2928*
18	Conductor, Cu 1/C #2, 7 STR, 600V, Red	9	2513
ITEM NO.	DESCRIPTION	LA2(3)	
		QTY.	S/N
19	Arrester, Surge, 9kV, MOV, Riser Pole	3	58
20	Conductor, Cu 1/C #4, 7-Str, 600V, Red, THW	21	2512
21	Clamp, Hotline, GP 1520, #8 to 2/0 Str, Cu Only	6	283
22	Connector, Compression Lug, #4, Cu/Al, One-Hole, Tin-Plated, For Arrester	6	2548
23	Guard, Wildlife, Polymer Arrester	3	2583
ITEM NO.	DESCRIPTION	N1	
		QTY.	S/N
24	Rod, Ground, 5/8" x 8'	1	1124
25	Clamp, Ground Rod, 5/8" Bronze Small	1	281
26	Cond, Copper-Clad Steel, #4 Cu Equivalent, Covered	40	1512
27	Connector, Cabelok, Al/Cu, #2-2/0 Run, #6-#1 Tap	1	413
28	Staple, Ground, Barbed, Galvanized, 1 1/2"	24	2707



## CONSTRUCTION STANDARDS

THREE PHASE  
PRIMARY RISERPAGE:  
2 of 2

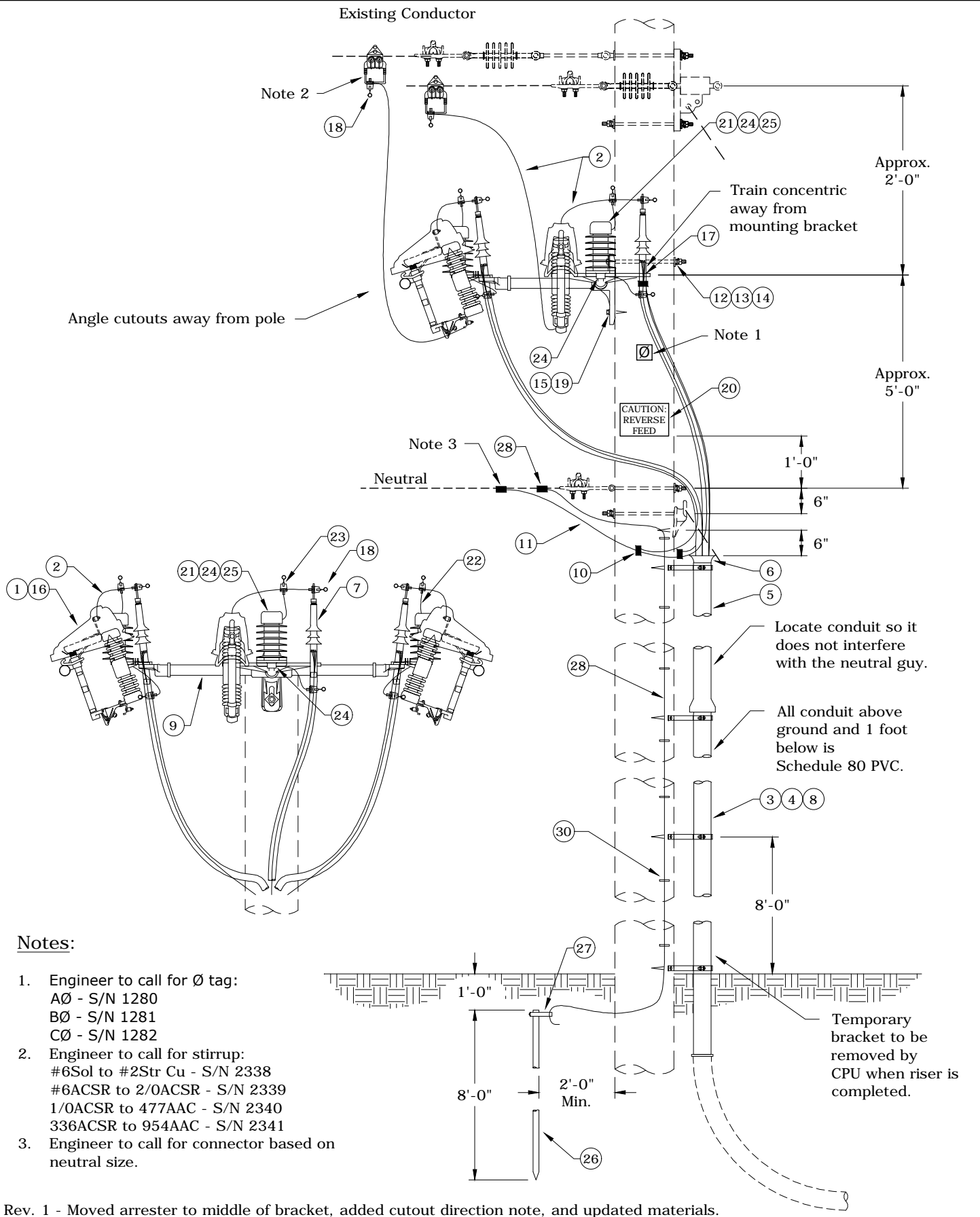
U3

CAD FILE:  
U3

## REVISIONS

REV	DATE	ENGR	OPS
3	12/29/04	LB	AH
4	12/14/09	KJP	
5	10/31/17	CM	DK
6	1/16/19	CM	DK

APP: ELM  
DATE: 1/31/80SECTION  
1300



Rev. 1 - Moved arrester to middle of bracket, added cutout direction note, and updated materials.



## CONSTRUCTION STANDARDS

THREE PHASE  
PRIMARY RISER  
REVERSE FEED

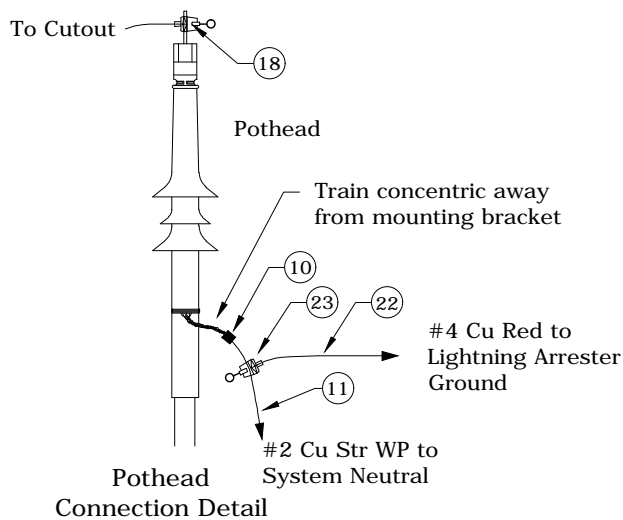
PAGE:  
1 of 2

U3R

CAD FILE:  
U3R

### REVISIONS

REVISION	DATE	ENGR	OPS
1	1/16/19	CM	DK
APP:	CM/DK	SECTION	
DATE:	10/31/17	1300	



#### Notes:

4. Connect concentric neutrals to arrester ground using #4 Cu, Red.
5. Make arrester ground terminal-to-concentric neutral jumper as short as possible.

Rev. 1 - Moved arrester to middle of bracket, added cutout direction note, and updated materials.

ITEM NO.	DESCRIPTION	U3R	
		QTY.	S/N
1	Cutout, Polymer, Universal, 100A, 16kA Asym.	3	2532
2	Conductor, Cu 1/C #2, 7 Str, 600V, Red, THW	18	2513
3	Screw, Lag, 1/2" x 3", Fetter Drive, Drive Point	6	1131
4	Bracket, Standoff Riser, 10 1/2"	3	226
5	Conduit, PVC, 4" x 10', Sch 80	30	2203
6	End Bell, 4", Sch 40	1	2204
7	Terminator, 15kV, Cold-Shrink, JCN & CN, 1/0	3	2214
8	Clamp, Standoff Bracket, 4" Conduit	3	297
9	Bracket, Arrester/Cutout Mounting, 3Ø, Fiberglass 18"	1	2538
10	Connector, Crimpet, Cu, 2/2 - 2/2 (2C2)	5	455
11	Conductor, Cu #2, 1/C, 7-Str, SD, 600V, HMP	30	393
12	Bolt, Machine 5/8" x 12", 12,400 lbs. Ultimate Tensile	1	155
13	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole	1	1392
14	Washer, Lock, Spring, Double Coil, Galv. 5/8"	1	2217
15	Screw, Lag 1/2" x 4 1/2", Twist Drive, Drive Point	1	1132
16	Guard, Wildlife, Cutout, Polymer	3	2928
17	Clamp, 2-Bolt, for 1/0 Terminator	3	1858
18	Clamp, Hotline, GP 1520, #8 to 2/0 Str, Cu Only	6	283
19	Washer, Flat, Round Galv. 1/2"	1	1394
20	Sign, "Caution: Reverse Feed"	1	2719
ITEM NO.	DESCRIPTION	LA2(3)	
		QTY.	S/N
21	Arrester, Surge, 9kV, MOV, Riser Pole	3	58
22	Conductor, Cu 1/C #4, 7-Str, 600V, Red, THW	21	2512
23	Clamp, Hotline, GP 1520, #8 to 2/0 Str, Cu Only	6	283
24	Connector, Compression Lug, #4, Cu/Al, One-Hole, Tin-Plated, For Arrester	6	2548
25	Guard, Wildlife, Polymer Arrester	3	2583
ITEM NO.	DESCRIPTION	N1	
		QTY.	S/N
26	Rod, Ground, 5/8" x 8'	1	1124
27	Clamp, Ground Rod, 5/8", Bronze Small	1	281
28	Conductor, Copper-Clad Steel, #4 Cu Equivalent, Covered	40	1512
29	Connector, Cabelok, Al/Cu, #2-2/0 Run, #6-#1 Tap	1	413
30	Staple, Ground, Barbed, Galvanized, 1 1/2"	24	2707



## CONSTRUCTION STANDARDS

THREE PHASE  
PRIMARY RISER  
REVERSE FEED

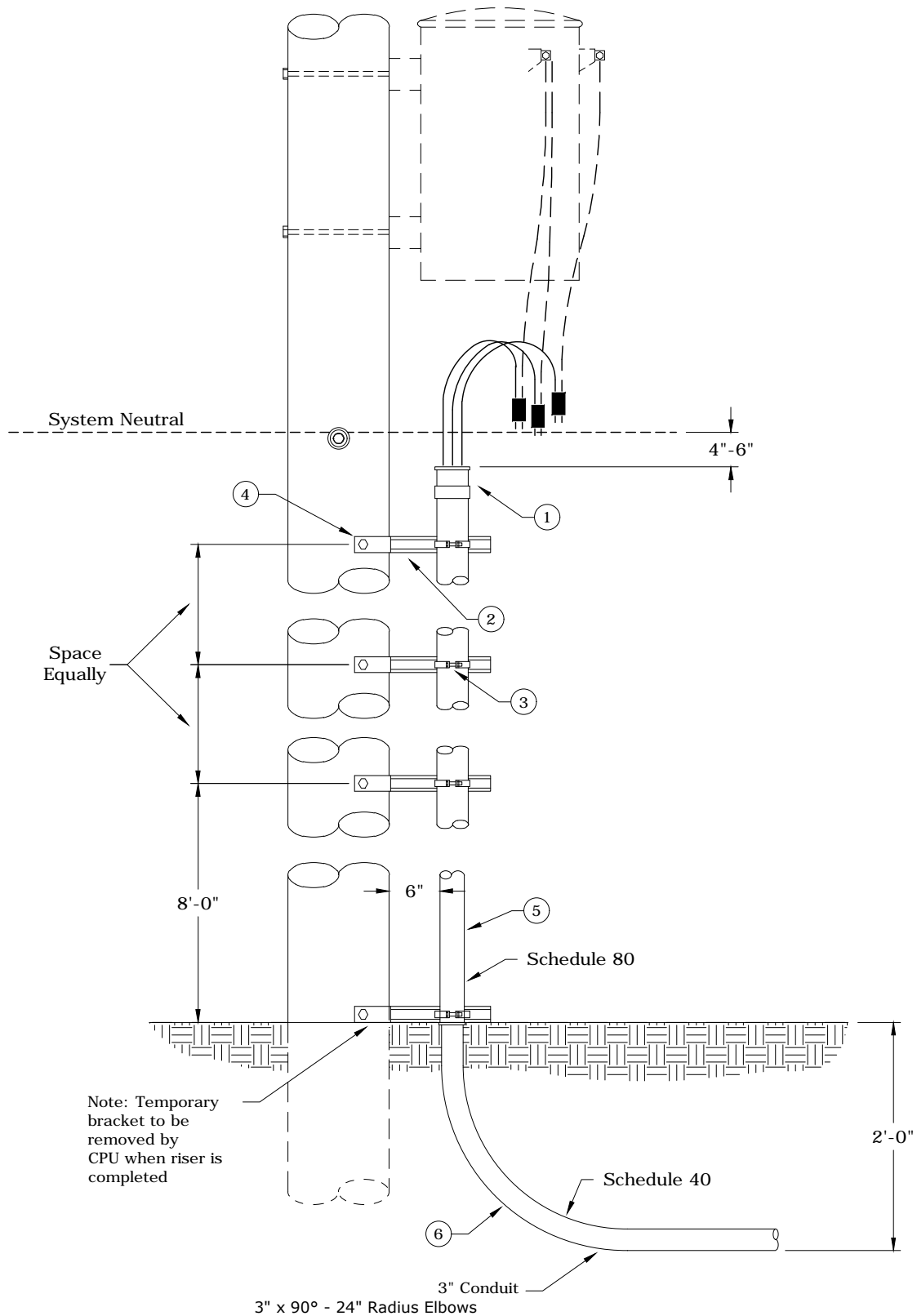
PAGE:  
2 of 2

U3R

CAD FILE:  
U3R

#### REVISIONS

DATE	ENGR	OPS
1/16/19	CM	DK
APP:	CM/DK	SECTION
DATE:	10/31/17	1300



Rev 2: Material corrections.



# CONSTRUCTION STANDARDS SECONDARY OVERHEAD TO UNDERGROUND RISER ASSEMBLY

PAGE:  
1 of 2

U83,U84

CAD FILE:  
U83

## REVISIONS



REVISION	DATE	ENGR	OPS
1	5/30/07	LB	AH
2	6/8/18	KJP	

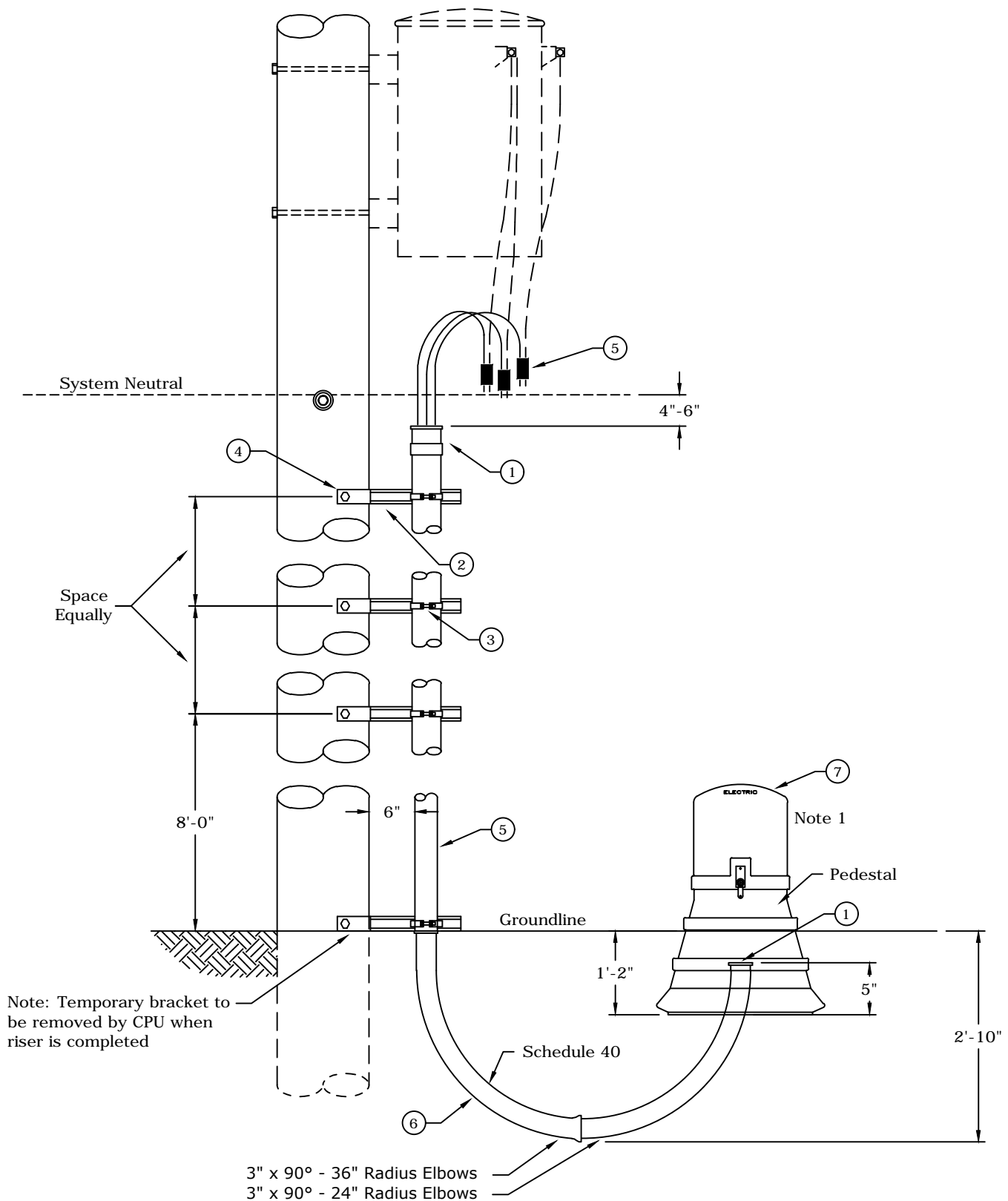
APP: KJP	SECTION
DATE: 12/29/04	1300

Rev 2: Material corrections.

ITEM NO.	DESCRIPTION	U83	
		QTY.	S/N
1	End Bell, 3", Sch. 40	1	2317
2	Bracket, Standoff Riser 10-1/2" U.G.	3	226
3	Clamp, Standoff Bracket, 3"	3	296
4	Screw, Lag 1/2" X 3"	6	1131
5	Conduit, PVC, Sch 80, 3" x 10'	30	2313
6	Elbow, PVC, 3", 90°, 24" Radius, Sch. 40	1	2574

ITEM NO.	DESCRIPTION	U84	
		QTY.	S/N
1	End Bell, 4", Sch. 40	1	2204
2	Bracket, Standoff Riser 10-1/2" U.G.	3	226
3	Clamp, Standoff Bracket, 4"	3	297
4	Screw, Lag 1/2" X 3"	6	1131
5	Conduit, PVC, Sch 80, 4" x 10'	30	2203
6	Elbow, PVC, 4", 90°, 24" Radius, Sch. 40	1	1536

		<b>CONSTRUCTION STANDARDS</b> SECONDARY OVERHEAD TO UNDERGROUND RISER ASSEMBLY		REVISIONS			
					DATE	ENGR	OPS
				1	5/30/07	LB	AH
				2	6/8/18	KJP	
				APP: KJP		SECTION	
				DATE: 12/29/04		1300	



Note: Direction of the pedestal will be determined by the CPU Engineer.

Rev 4: Material corrections.



# CONSTRUCTION STANDARDS SECONDARY OVERHEAD TO UNDERGROUND RISER ASSEMBLY W/ SECONDARY PEDESTAL

PAGE:  
1 of 2

U8P

CAD FILE:  
U8P




## REVISIONS

REVISION	DATE	ENGR	OPS
1	4/26/04	LB	AH
2	12/29/04	LB	AH
3	12/14/09	KJP	
4	10/6/14	KJP	

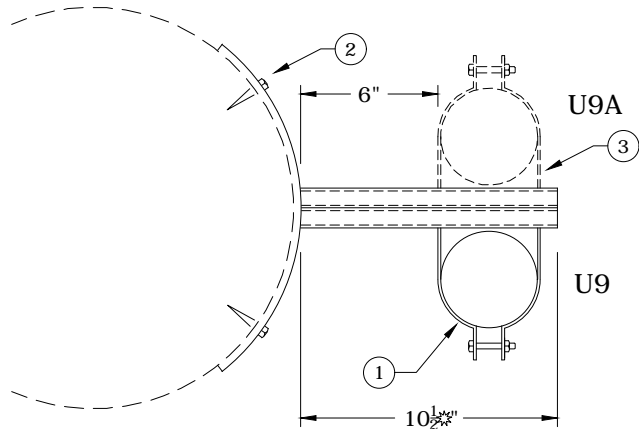
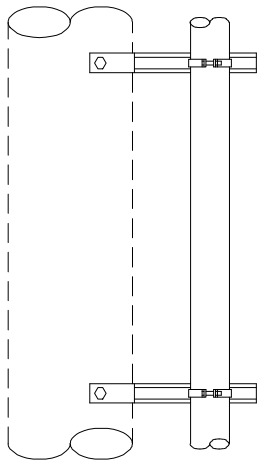
APP:	SECTION
DATE: 1/80	1300

Rev 4: Material corrections.

ITEM NO.	DESCRIPTION	U8P	
		QTY.	S/N
1	End Bell, 3", Sch. 40	2	2317
2	Bracket, Standoff Riser 10-1/2" U.G.	3	226
3	Clamp, Standoff Bracket, 3"	3	296
4	Screw, Lag 1/2" X 3"	6	1131
5	Connector	3	as req*
6	Conduit, PVC, Sch 80, 3" x 10'	30*	2313
7	Pedestal, Secondary, Aboveground W/ Connectors and Covers	1	2562
8	350MCM AL Triplex UG Secondary	40	362
9	Elbow, PVC, 3", 90°, 24" Radius, Sch. 40 Straight	1	2713
10	Elbow, PVC, 3", 90°, 36" Radius, Sch. 40	1	1534




<div>Clark Public Utilities</div> 	CONSTRUCTION STANDARDS			REVISIONS							
	SECONDARY OVERHEAD TO UNDERGROUND RISER ASSEMBLY W/ SECONDARY PEDESTAL				DATE	ENGR	OPS				
				1	4/26/04	LB	AH				
				2	12/29/04	LB	AH				
				3	12/14/09	KJP					
				4	10/6/14	KJP					
	PAGE: 2 of 2			U8P			CAD FILE: U8P				
APP:									SECTION		
DATE: 1/80									1300		

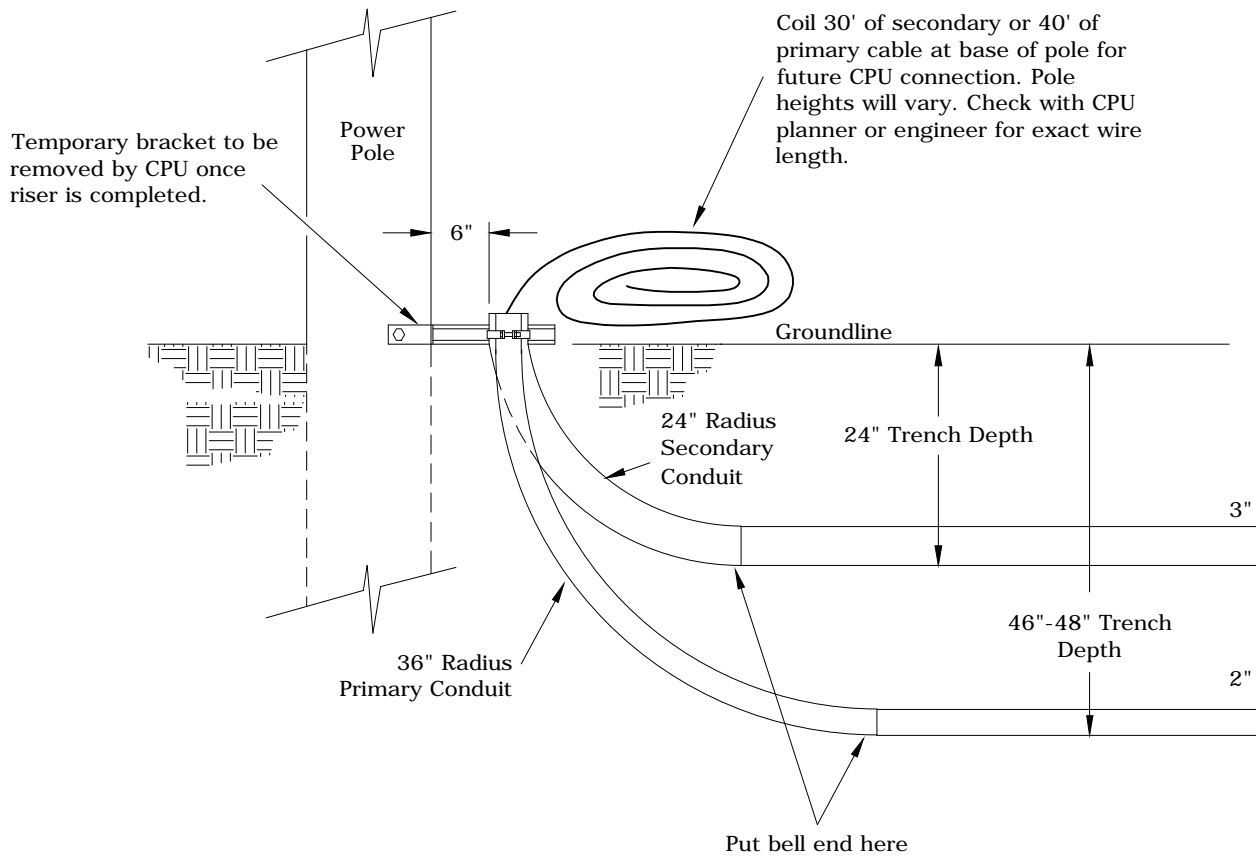




Rev 3: Corrected drawing and material list to 10 1/2" standoff riser bracket.

ITEM NO.	DESCRIPTION	U9	
		QTY.	S/N
1	Clamp, Standoff Bracket 4"	2	297
2	Screw, Lag 1/2" x 4-1/2"	4	1132
3	Bracket, Standoff Riser 10-1/2" ✱	2	226
ITEM NO.	DESCRIPTION	U9A	
		QTY.	S/N
1	Clamp, Standoff Bracket 4"	2	297
ITEM NO.	DESCRIPTION	U9B	
		QTY.	S/N
1	Clamp, Standoff Bracket 2"	2	295
2	Screw, Lag 1/2" x 4-1/2"	4	1132
3	Bracket, Standoff Riser 10-1/2" ✱	2	226
ITEM NO.	DESCRIPTION	U9C	
		QTY.	S/N
1	Clamp, Standoff Bracket 2"	2	295

<div>Clark Public Utilities</div> 	CONSTRUCTION STANDARDS RISER BRACKET ASSEMBLY		REVISIONS			
				DATE	ENGR	OPS
			1	2/23/00	HWH	MA
			2	7/15/02	JEH	TR
			3	12/14/09	KJP	
						
PAGE: 1 of 1	U9	CAD FILE: U9	APP: DATE: 2/3/82		SECTION 1300	



Rev. 2 - Change title for clarity, corrected secondary trench, and corrected Note 2.



## CONSTRUCTION STANDARDS

### 1Ø PRIMARY (U1) & SECONDARY (U8) RISER GUIDELINES

PAGE:  
1 of 2

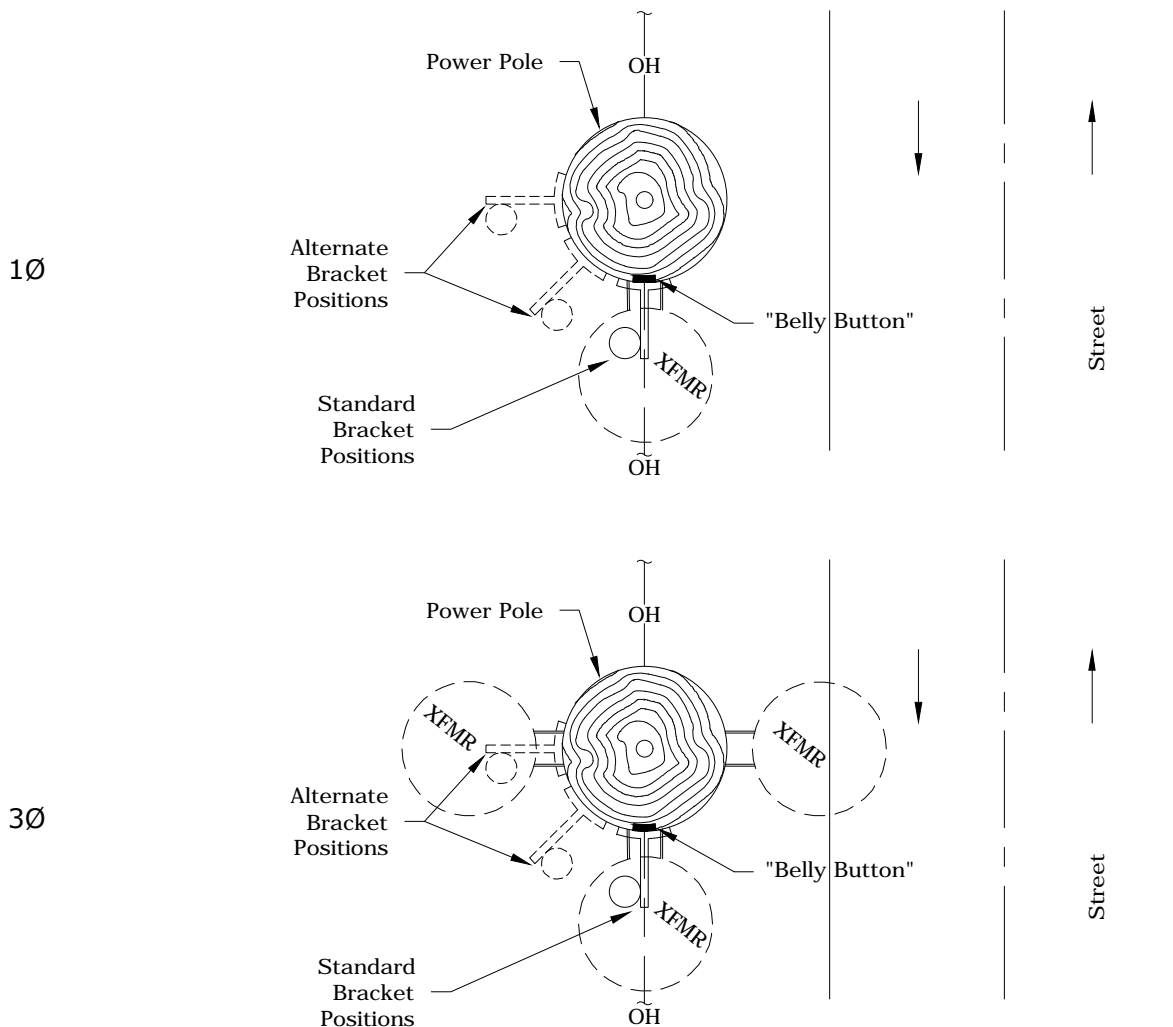
U10

CAD FILE:  
U10

REVISIONS			
REVISION	DATE	ENGR	OPS
1	12/29/04	LB	AH
2	1/16/19	KJP	
APP:		SECTION	
DATE:	8/00	1300	

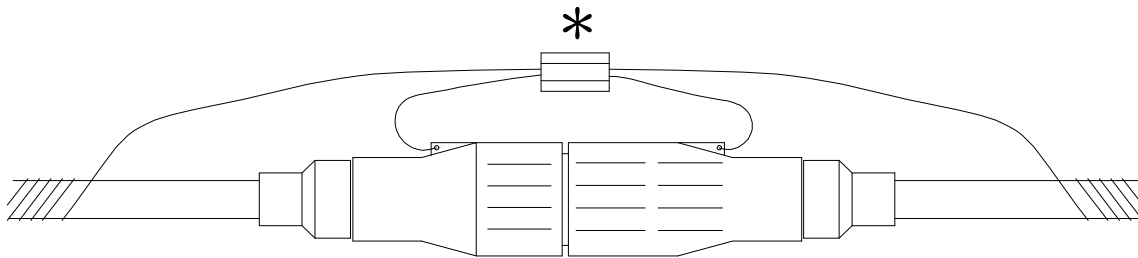
# STANDOFF BRACKET PLACEMENT

- 1) Basic Rule: On poles without anchors or existing clean poles, 1Ø primary and secondary riser brackets should be installed on the "belly button" side of the pole. Typically, a transformer would also be installed on the "belly button" side above the 1Ø primary or secondary riser.
- 2) On poles with an existing transformer or transformer bank, the bracket should be installed under the transformer or center transformer on a bank with the alternative position being 45°-90° away from street side. If the existing transformer is located on the opposite side of the "belly button," place the bracket under the transformer.
- 3) Standoffs are typically not installed under guy wires no matter where the "belly button" is located.
- 4) Standoffs and risers should be placed to avoid conflict with overhead communication wires and guy wires.
- 5) For poles with an existing riser, use the brackets that are installed to maintain climbing space.



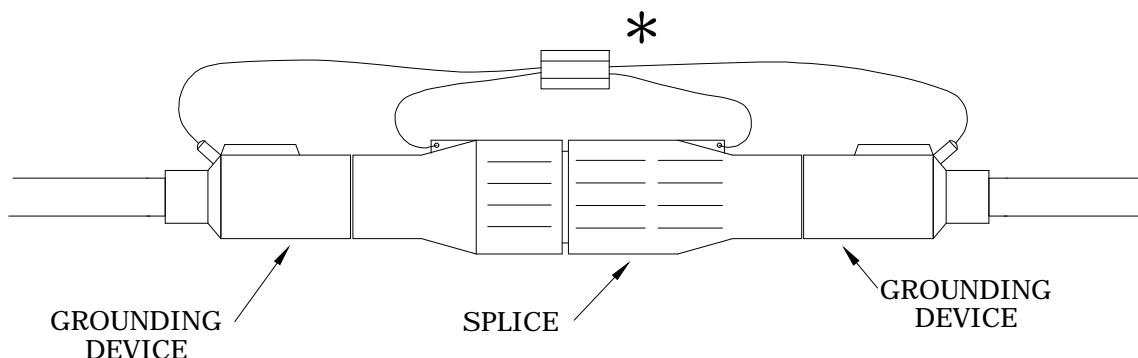
Rev. 2 - Change title for clarity, corrected secondary trench, and corrected Note 2.

<div><div>Clark Public Utilities</div><div></div></div>	<div>CONSTRUCTION STANDARDS</div> <div>1Ø PRIMARY (U1) &amp; SECONDARY (U8)</div> <div>RISER GUIDELINES</div>			REVISIONS			
				<div><div><div>R</div><div></div></div></div>	DATE	ENGR	OPS
				1	12/29/04	LB	AH
				2	1/16/19	KJP	
PAGE: 2 of 2	U10	CAD FILE: U10	APP: DATE: 8/00		SECTION 1300		



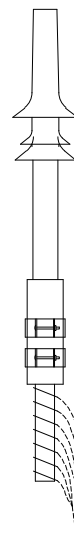
ITEM	MATERIAL DESCRIPTION	S/N
UB20	SPLICE, KIT S 15KV UG 2 AWG	1206

\* NOTE: CONST SPEC. NO. UB20 & UB21 INCLUDE CONNECTOR, CRIMPET YC4C4



ITEM	MATERIAL DESCRIPTION	S/N
UB22	SPLICE, KIT S 15KV UG 1000 MCM	1210
UB23	DEVICE, GROUNDING, 1000 MCM (FOR TAPE SHIELD ONLY)	608

\* NOTE: CONST SPEC. NO. UB22 & UB23 INCLUDE CONNECTOR, CRIMPET YC4C4



ITEM	MATERIAL DESCRIPTION	S/N	ITEM	MATERIAL DESCRIPTION	S/N
UB22	TERMINATOR, OUTDOOR MOLDED RUBBER, #2, 200A	1305	UB26	TERMINATOR, OUTDOOR BUTYL, 1000 MCM, 600A	2225
UB23	TERMINATOR, OUTDOOR MOLDED RUBBER, 1/0, 200A	2214			



## CONSTRUCTION STANDARDS

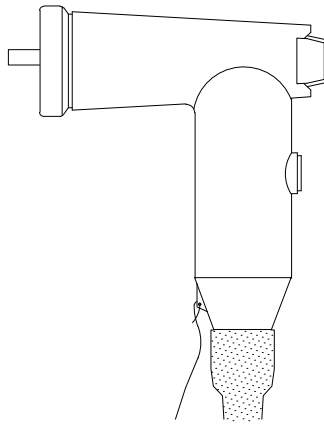
### UNDERGROUND PRIMARY BASIC UNITS

PAGE:  
1 of 1

**UB20-UB26**

CAD FILE:  
UB20-UB26

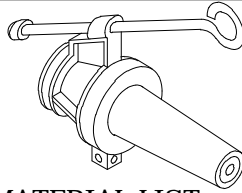
REVISIONS			
Δ	DATE	ENGR	OPS
0	6/14/02		
Δ REDRAWN IN CAD			
APP:	ELM	SECTION	
DATE:	1/31/80	<b>1300</b>	



MATERIAL LIST

UCA1, UCA2

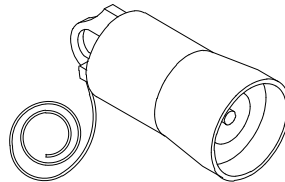
ITEM	QTY.	DESCRIPTION	SIN
UCA1	1	TERMINATOR, ELBOW L.B. 1/0 220MIL ONLY	2186
UCA2	1	TERMINATOR, ELBOW L.B. 1/0 OR 2AL EXCEPT 1/0 220MIL ONLY	1312



MATERIAL LIST

UCA3

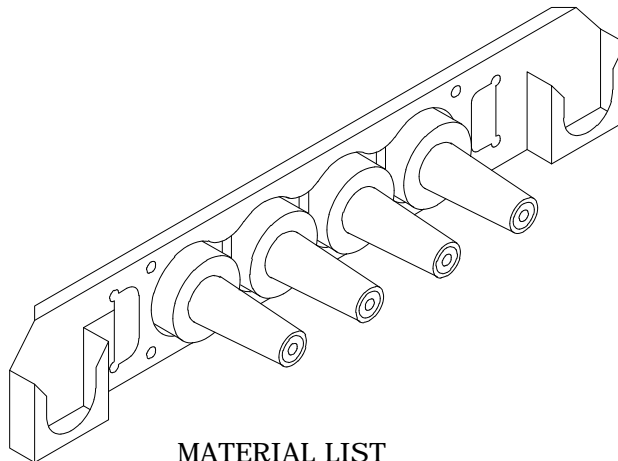
ITEM	QTY.	DESCRIPTION	SIN
UCA3	1	BUSHING, STANDOFF INSUL, 200A	252



MATERIAL LIST

UCA4

ITEM	QTY.	DESCRIPTION	SIN
UCA4	1	CAP, PROTECTIVE GRD. 200A	265



MATERIAL LIST

UCA5, UCA6

ITEM	QTY.	DESCRIPTION	SIN
UCA5	1	MODULE 4 POSITION W/ BRACKET	900
UCA6	1	MODULE 4 POSITION W/O BRACKET	901



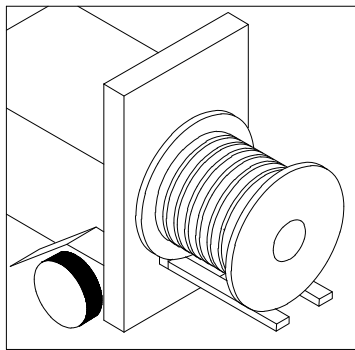
# CONSTRUCTION STANDARDS UNDERGROUND PRIMARY CABLE ACCESSORIES 200A

PAGE:  
1 of 1

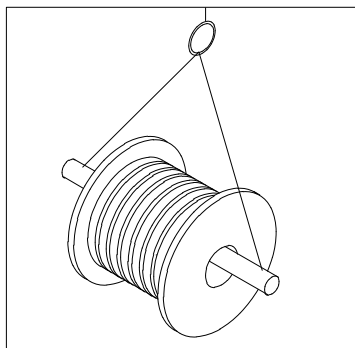
UCA1-UCA6

CAD FILE:  
UCA1

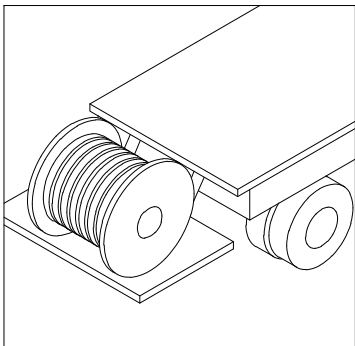
REVISIONS			
ΔR	DATE	ENGR	OPS
0	2/23/00	HWH	MA
Δ0			
APP:		SECTION	
DATE:	9/94	1300	



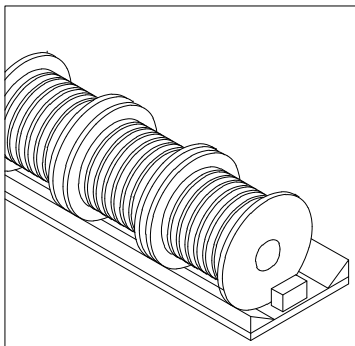
CRADLE BOTH REEL FLANGES  
BETWEEN FORKS.



REELS CAN BE HOISTED WITH  
A SHAFT EXTENDING THROUGH  
BOTH FLANGES.



LOWER REELS FROM TRUCK  
USING HYDRAULIC GATE, HOIST  
OR FORK LIFT. (LOWER CAREFULLY)

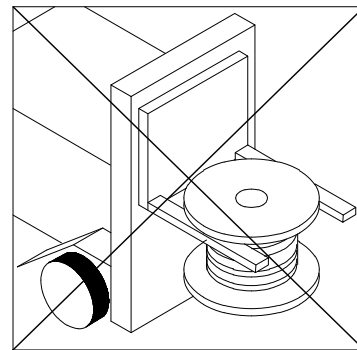


ALWAYS LOAD WITH FLANGES  
ON EDGE AND CHOCK AND BLOCK  
SECURELY.

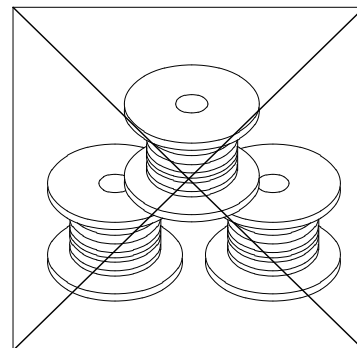
# HOW TO HANDLE CABLE REELS

← YES

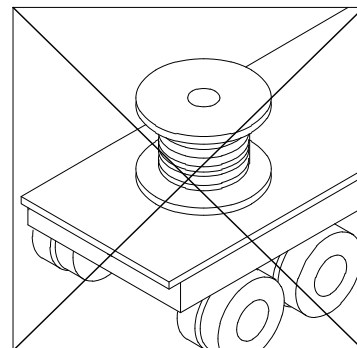
NO →



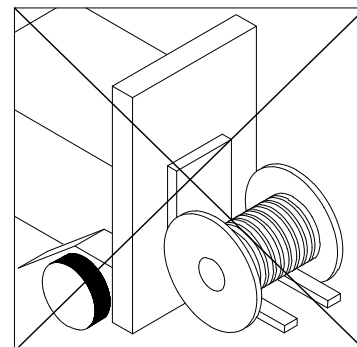
DO NOT LIFT BY TOP FLANGE.  
CABLE OR REEL WILL BE DAMAGED.



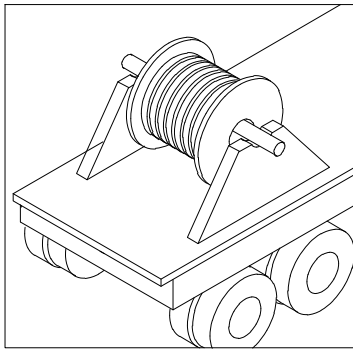
UPENDED HEAVY REELS WILL OFTEN  
ARRIVE DAMAGED. REFUSE OR  
RECEIVE SUBJECT TO INSPECTION FOR  
HIDDEN DAMAGE.



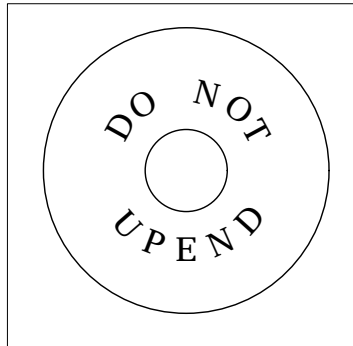
DO NOT UPEND REELS



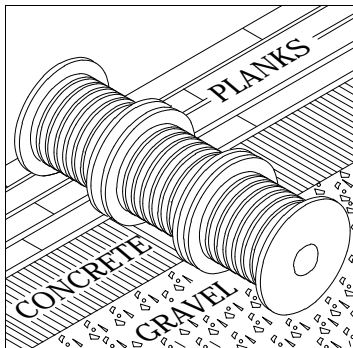
NEVER ALLOW FORKS TO TOUCH  
CABLE SURFACE OR REEL WRAP.



REELS GOING TO JOBS SHALL ALWAYS BE MOUNTED ON A HORIZONTAL AXLE.



THIS SIGN APPLIES FOR ANY REEL HANDLING. NOT JUST FACTORY DELIVERY.

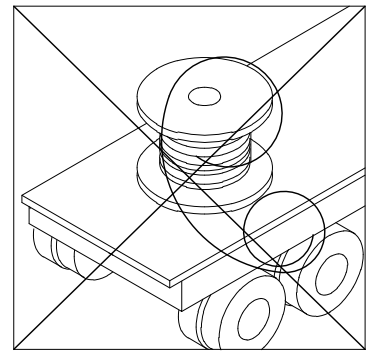


ALWAYS STORE REELS ON A HARD SURFACE.

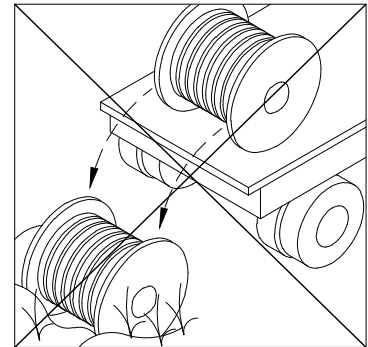
# HOW TO HANDLE CABLE REELS

← YES

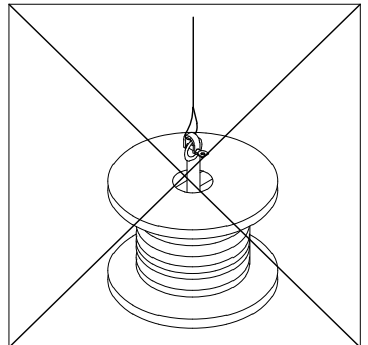
NO →



NEVER REMOVE CABLE FROM A REEL THIS WAY. IT WILL KINK.



NEVER DROP A CABLE REEL FROM ANY HEIGHT WITH EVEN A SMALL AMOUNT OF CABLE ON THE REEL.



NEVER USE A SWIVEL TO REMOVE CABLE FROM A REEL.

## MOVEMENT, STORAGE, AND HANDLING OF CABLE

### MOVEMENT OF REELS OF CABLE

1. REELS OF CABLE MUST NOT BE DROPPED FROM ANY HEIGHT, PARTICULARLY FROM TRUCKS OR OTHER TRANSPORTING EQUIPMENT.
2. LIFT REELS USING FOLLOWING METHODS:
  - A) CRANE OR BOOM TYPE EQUIPMENT--INSERT SHAFT (HEAVY ROD OR PIPE) THROUGH REEL HUBS AND LIFT WITH SLINGS ON SHAFT, PREFERABLY UTILIZING SPREADER OR YOKE TO REDUCE OR AVOID SLING PRESSURE AGAINST REEL HEAD.
  - B) FORK LIFT TYPE OF EQUIPMENT MAY BE USED TO MOVE SMALLER, NARROWER WIDTH REELS. FORK TINES SHALL BE PLACED SO THAT LIFT PRESSURE IS ON REEL HEADS, NOT ON CABLE, AND MUST REACH ALL THE WAY ACROSS REELS SO LIFT IS AGAINST BOTH REEL HEADS.
3. REELS MAY BE MOVED SHORT DISTANCES BY ROLLING. REELS SHOULD BE ROLLED IN THE DIRECTION INDICATED BY ARROWS PAINTED ON REEL HEADS. SURFACES OVER WHICH THE REELS ARE TO BE ROLLED SHALL BE FIRM, CLEAR OF DEBRIS, AND ALSO CLEAR OF PROTRUDING STONES, HUMPS, ETC. WHICH MIGHT DAMAGE THE CABLE IF THE REEL STRADDLED THEM.

### STORAGE OF REELS OF CABLE

1. CABLE ENDS ARE SEALED PRIOR TO SHIPMENT, IF FACTORY SEALS ARE CUT OFF, NEW SEALS MUST BE APPLIED TO PREVENT MOISTURE ENTRY INTO CABLE.
2. WHENEVER POSSIBLE, THE FACTORY APPLIED PROTECTIVE COVER SHOULD BE LEFT IN PLACE UNTIL REMOVAL IS ABSOLUTELY NECESSARY. ADDITIONAL COVERING SUCH AS TARPAULIN, PLASTIC SHEETING, ETC., MAY BE USED IF CABLE IS TO BE STORED FOR LONG PERIODS OUTDOORS OR IN EXCESSIVELY DIRTY, DUSTY AREAS.
3. STORE REELS OF CABLE ON A FIRM SURFACE, PAVED IF POSSIBLE, OR ON PLANKING TO PREVENT SETTLING INTO SOFT GROUND.
4. THE STORAGE AREAS SHALL HAVE GOOD DRAINAGE.
5. USE FENCING OR OTHER BARRIERS TO PROTECT CABLES AND REELS AGAINST DAMAGE BY VEHICLES OR OTHER EQUIPMENT MOVING ABOUT IN THE STORAGE AREA.
6. NEVER STORE REELS ON END.



## CONSTRUCTION STANDARDS



### UNDERGROUND CABLE HANDLING & STORAGE

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## HANDLING DURING INSTALLATION

1. COLD WEATHER HANDLING AND PULLING-IN CABLE CAN BE MORE DIFFICULT, DEPENDING ON THE CABLE CONSTRUCTION AND INSTALLATION LOCATION. COLD-INDUCED STIFFNESS OF CABLE MUST BE CONSIDERED ALONG WITH RADIUS AND NUMBER OF BENDS IN THE PROPOSED INSTALLATION RUN.

IN GENERAL MOST CABLES CAN BE SAFELY HANDLED WITHOUT DAMAGE IF NOT SUBJECTED TO TEMPERATURE LOWER THAN 10°F (-12°C) IN THE 24 HOUR PERIOD PRECEDING PULLING AND BENDING. IF IT IS ANTICIPATED THAT STORE TEMPERATURES WILL BE BELOW THIS LEVEL DURING THE 24 HOUR PRE-PULL PERIOD, ARRANGEMENTS SHOULD BE MADE TO MOVE THE REEL, AVOIDING IMPACT, TO A WARMER AREA. IF NO INDOOR WARMING AREA IS AVAILABLE, A PLASTIC SHEETING-COVERED SHELTER MAY BE CONSTRUCTED AND HEATED. THE REEL SHOULD BE HELD IN THE WARM STORAGE AREA AT A TEMPERATURE OF AT LEAST 60°F (16°C) FOR 24 HOURS TO ENSURE TOTAL WARMUP. APPLY PULLING EYES OR GRIPS WHILE CABLE IS IN THE WARMING AREA, PRIOR TO MOVEMENT OUTDOORS OR UNCOVERING.

2. FACTORY APPLIED SEALS ON CABLE ENDS MAY BE DISRUPTED DURING THE PULLING OPERATIONS AND, THEREFORE, SHOULD BE CHECKED AND REPLACED IF THE CABLES ARE NOT GOING TO BE SPLICED OR TERMINATED RIGHT AFTER PULL-IN. THIS IS ESPECIALLY IMPORTANT FOR UNDERGROUND RUNS WHERE CABLE ENDS MAY BE LEFT IN ENCLOSURES WHICH ARE SUBJECT TO FLOODING.
3. THE CABLES SHOULD BE LAID INTO THE TRENCH BEING CAREFUL NOT TO TWIST OR KINK THEM. CARE SHOULD BE TAKEN NOT TO ABRASE OR IMPACT THE CABLE SURFACE AS IT LEAVES THE PAY-OFF EQUIPMENT AND ENTERS THE TRENCH. OVER-BENDING THE CABLE TO A POINT LESS THAN THE RECOMMENDED MINIMUM BENDING RADIUS ALSO SHALL BE AVOIDED. CABLES CAN BECOME EASILY OVER-BENT AT GUIDE POINTS SUCH AS SMALL SHEAVES OR ROLLERS LOCATED ON THE CABLE LAYING EQUIPMENT.

AFTER LAYING THE CABLES INTO THE TRENCH, THEY SHOULD BE COVERED WITH A LAYER OF SELECTED BACKFILL TO A LEVEL OF APPROXIMATELY THREE TO FOUR INCHES ABOVE THE CABLES' SURFACES. "SELECTED BACKFILL" IS DEFINED AS EITHER THERMAL SAND OR SAND-CLAY-GRAVEL MIXTURE CONTAINING SOME SMALL STONES NO GREATER IN SIZE THAN ONE-QUARTER TO ONE-HALF INCH ACROSS AT THEIR LARGEST DIMENSION.



## CONSTRUCTION STANDARDS



### UNDERGROUND CABLE HANDLING & STORAGE

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CAD FILE:  
UCH-1


#### REVISIONS

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APP:			SECTION
DATE:	9/94	1300	

FOLLOWING ARE THE MINIMUM REQUIREMENTS FOR ANY CABLE PULL:

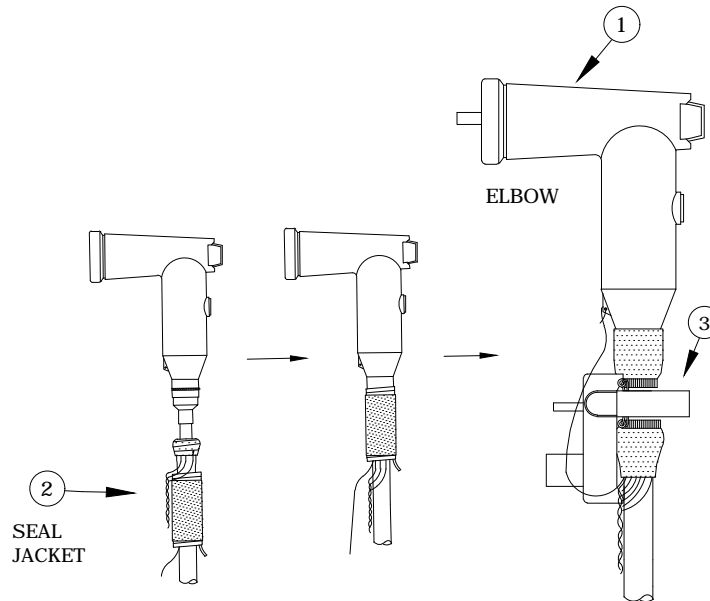
1. THE ENTIRE CONDUIT LENGTH INCLUDING BENDS AND RISERS SHALL BE CLEAN AND SMOOTH. THE TOTAL NUMBER OF ANGLES SHALL NOT EXCEED 270° \* WITHOUT PRIOR CPU ENGINEERING APPROVAL.
2. THE ENTIRE CONDUIT LENGTH INCLUDING BENDS AND RISERS SHALL BE SECURED IN THE FINAL LOCATION WITH ALL ACCESSORIES FIRMLY ATTACHED.
3. A PULLING TENSION CALCULATION SHALL BE COMPLETED TO ASSURE THAT MAXIMUM TENSION LIMITS WILL NOT BE EXCEEDED. SEE TABLE 1 FOR LIMITS.
4. SUFFICIENT APPROVED CABLE LUBRICANT SHALL BE USED AT THE START OF THE PULL.
5. THE CABLE SHALL NEVER BE BENT TO A RADIUS LESS THAN 12 TIMES THE CABLE DIAMETER. ALL SHEAVES SHALL HAVE A GROOVE DIAMETER OF NOT LESS THAN 24 TIMES THE CABLE DIAMETER.
6. NEVER ALLOW CABLE TENSION AT THE CABLE REELS. THE REELS SHALL BE TURNED BY HAND OR BY A POWER DEVICE SO THAT THE CABLE IS SLACK GOING INTO THE CONDUIT ENTRANCE.
7. LUBRICANT SHALL BE APPLIED TO THE CONDUIT BEFORE THE CABLE ENTERS THE CONDUIT. IT MAY BE POURED IN OR A PLASTIC BAG OF LUBRICANT MAY BE ATTACHED TO THE PULLING LINE AHEAD OF THE CABLE.
8. ALL CABLE ENDS SHALL BE SEALED TO PREVENT THE ENTRY OF MOISTURE OR DIRT.
9. FOR 1000 MCM CABLE, THE PULLING LINE SHALL BE 2500 LB, SEQUENTIALLY-NUMBERED, CONTINUOUS MULE TAPE.
10. CABLE ATTACHMENT MAY BE WITH KELLEMS (CABLE OR BASKET) \* GRIP OR CONDUCTOR (PULLING EYE) GRIP WHICHEVER THE PULLING TENSION CALCULATION DICTATES.
11. ALL CONDUIT ENTRANCES AND EXITS SHALL HAVE PROTECTIVE BUSHINGS IN PLACE THAT WILL ASSURE THAT CABLE DAMAGE DOES NOT OCCUR DURING THE PULL. AT RISER LOCATIONS, DO NOT GLUE PROTECTIVE BUSHING TO CONDUIT.
12. CABLE PULLING SPEED SHALL NOT EXCEED 50 FEET PER MINUTE.
13. ALL CABLE ENDS SHALL BE EITHER TERMINATED OR SEALED IMMEDIATELY AFTER THE PULL. NO CABLE ENDS SHALL BE LEFT EXPOSED OVER NIGHT OR DURING INCLEMENT WEATHER.

REV 1 - CORRECTIONS MARKED WITH A \*.

	<h2 style="text-align: center;">CONSTRUCTION STANDARDS</h2> <h3 style="text-align: center;">UNDERGROUND CABLE PULLING REQUIREMENTS</h3>		REVISIONS				
			△ <sub>A</sub>	DATE	ENGR	OPS	
	0	2/23/00	HWH	MA			
	1	12/29/04	LB	AH			
		△ <sub>0</sub>					
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## TYPICAL ASSEMBLY




FOR REFERENCE ONLY  
 OLD INSTALLATIONS WITHOUT VOLTAGE-TEST POINT  
 NEW INSTALLATIONS HAVE VOLTAGE-TEST POINT

- NOTES:**
1. INDIVIDUALLY PACKAGED INSTRUCTIONS COME WITH EACH OF THE THREE MOULDED RUBBER COMPONENTS.
  2. THE FAULT INDICATOR SHALL BE INSTALLED AS SHOWN. NEUTRAL WIRES MUST BE TRAINED AS SHOWN SO THAT THE FAULT INDICATOR WILL FIT.

Rev 3: Added Current-Reset fault indicator to title and made "Reference Only."

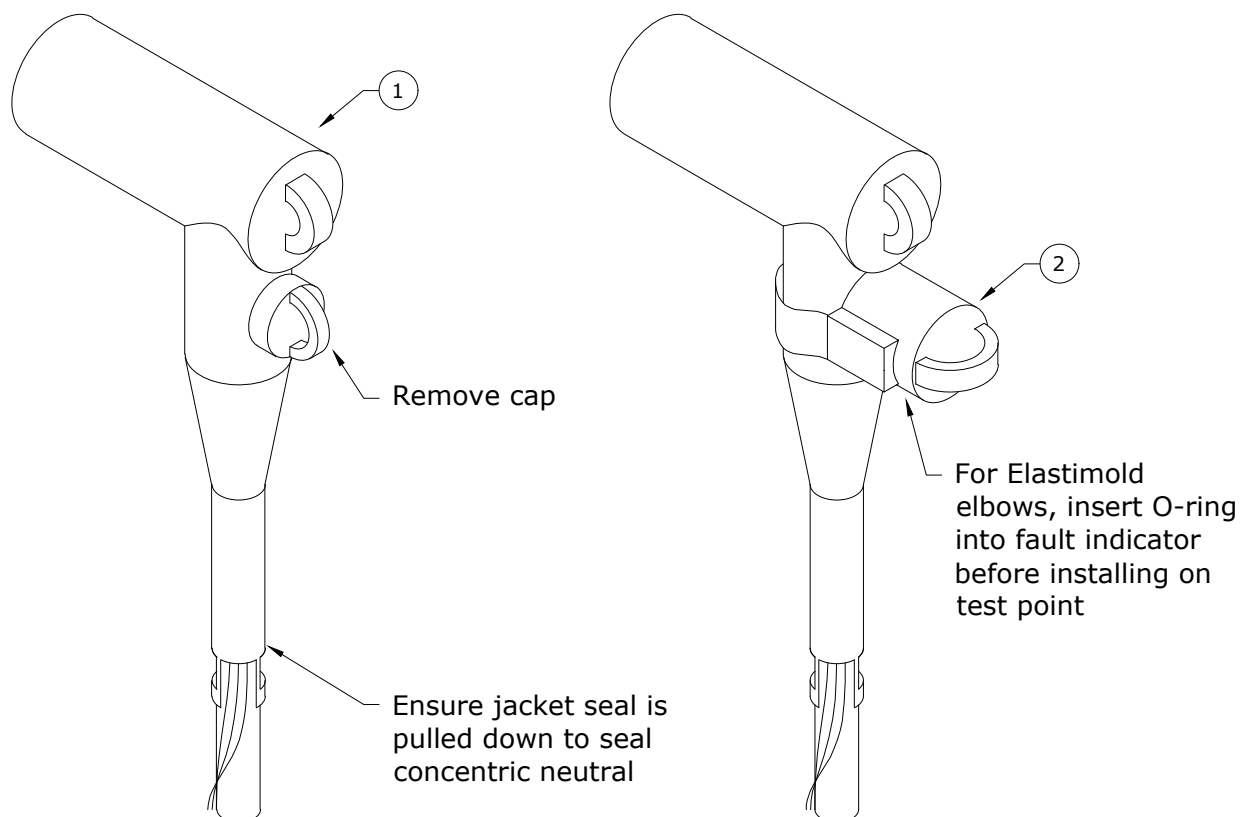
ITEM NO.	DESCRIPTION	UEP2	
		QTY.	S/N
1	Elbow, Loadbreak, 1/0, 200A, 175 MIL	1	1312
2	Kit, Cable Sealing, 15KV, 200A	1	2391
3	Fault Indicator, Current-reset, 400A, 1Ø UG	1	2581

		<b>CONSTRUCTION STANDARDS</b> PRIMARY ELBOW ASSEMBLY 200A WITH CURRENT-RESET FAULT INDICATOR		REVISIONS			
				DATE	ENGR	OPS	
0	2/23/00	HW	MA				
1	9/23/04	LB	AH				
2	8/2/05	LB	AH				
3	4/29/09	CM	AH				

PAGE: 1 of 1	UEP2		CAD FILE: UEP2	APP:	SECTION
				DATE: 9/94	1300





Note: Follow manufacturer's cutbacks and use template provided. Do NOT use a metal tape measure.

Rev. 1 - Changed to elbow with integrated jacket seal.

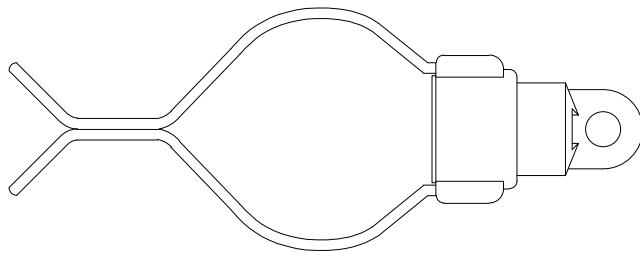
ITEM NO.	DESCRIPTION	UEP3	
		QTY.	S/N
1	Elbow, 200A, LB, 1/0, 175 & 220 mil, Test Point, 15 kV, Integrated Jacket Seal	1	1312
2	Fault Indicator, Voltage-reset, 400A Trip, 1Ø UG	1	2694

		<b>CONSTRUCTION STANDARDS</b> PRIMARY ELBOW ASSEMBLY 200A WITH VOLTAGE-RESET FAULT INDICATOR		REVISIONS			
					DATE	ENGR	OPS
				1	11/19/20	CM	GM

PAGE: 1 of 1	UEP3		CAD FILE: UEP3	APP: CM/AH	SECTION
				DATE: 4/29/09	1300



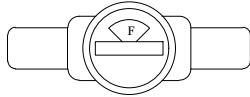
S/N# 2694 - VOLTAGE-RESET FLAG INDICATION

USE: 1Ø AND 3Ø PADMOUNT TRANSFORMERS AND J-BOXES (1/0 CABLE)

TRIP CURRENT: 400A

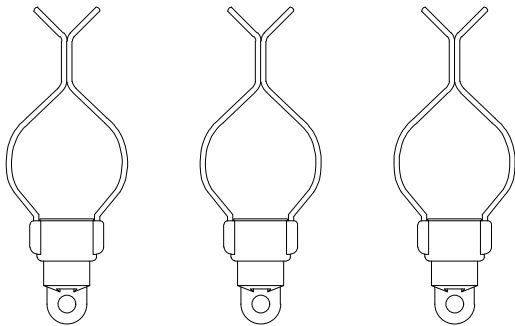
RESET VOLTAGE AND TIME: 5KV (UP TO 4 MIN.)

SEE: UT21-UT22, UT24-UT28, UT30-UT32, UJ1, UJ3, AND UJM



Note: Elastimold elbows (used for Cable Cure) need the ring adapter provided with the fault indicator.

ITEM NO.	DESCRIPTION	UFIV400	
		QTY.	S/N
1	VOLTAGE-RESET FAULT INDICATOR, 400A TRIP, 1Ø UG	1	2694



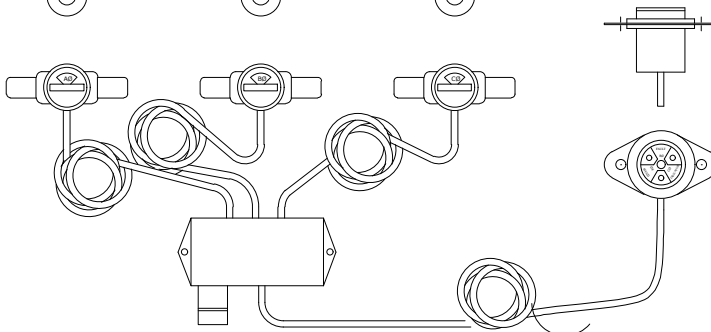
S/N# 2695 - VOLTAGE-RESET FLAG AND BLINKING LIGHT INDICATION

USE: SWITCHGEAR (1000 MCM CABLE)

TRIP CURRENT: 800A

RESET VOLTAGE AND TIME: 5KV (UP TO 4 MIN.) REPLACEABLE BATTERY FOR FLASHING LIGHT

SEE: USG1

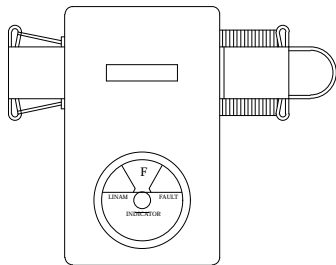


Note: Elastimold elbows (used for Cable Cure) need the ring adapter provided with the fault indicator.

ITEM NO.	DESCRIPTION	UFIV800	
		QTY.	S/N
1	VOLTAGE-RESET FAULT INDICATOR, 800A TRIP, 3Ø UG SWG	1	2695

REV 3 - ADDED VOLTAGE-RESET FAULT INDICATORS AND CHANGED FROM "UFI1" TO "UFI"

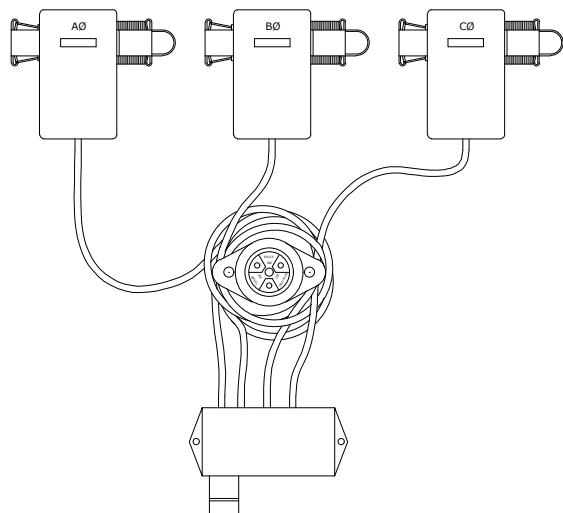
<div><div>Clark Public Utilities</div><div></div></div>	CONSTRUCTION STANDARDS			REVISIONS			
	UNDERGROUND FAULT INDICATORS			<div><div></div><div>R</div></div>	DATE	ENGR	OPS
				1	2/23/00	HWH	MA
				2	9/23/04	LB	AH
				3	4/29/09	CM	AH
				<div><div></div><div>A</div></div>			
PAGE: 1 of 2	UFI	CAD FILE: UFI	APP: DATE: 10/94		SECTION 1300		



S/N# 2581 - CURRENT RESET-FLAG INDICATION  
 USE: 1Ø AND 3Ø PADMOUNT  
 TRANSFORMERS AND J-BOXES (1/0  
 CABLE)  
 TRIP CURRENT: 400A  
 RESET CURRENT AND TIME: 1.5A (40  
 SEC)  
 SEE: UT21-UT22, UT24-UT28,  
 UT30-UT32, UJ1, UJ3, AND UJM

NOTE: ONLY USE ON ELBOWS WITHOUT A VOLTAGE TEST POINT

ITEM NO.	DESCRIPTION	UFIA400	
		QTY.	S/N
1	INDICATOR, FAULT, CURRENT-RESET, 400A, 1Ø UG	1	2581



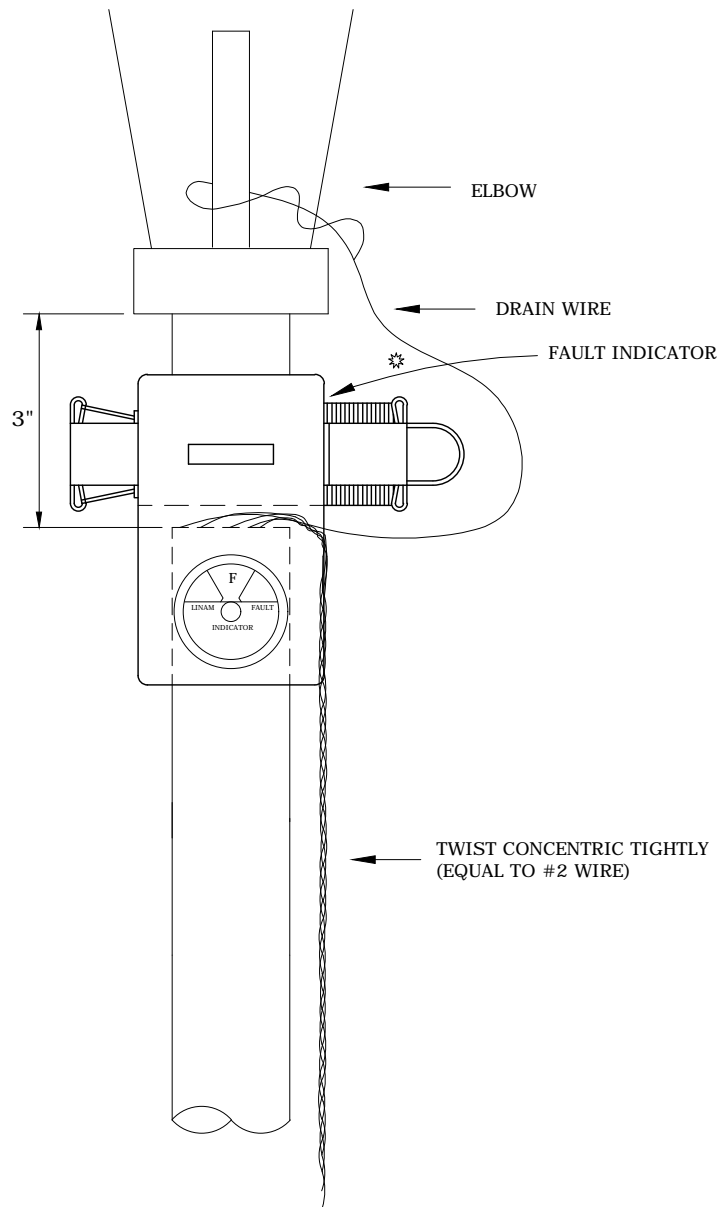
S/N# 2463 - CURRENT RESET-FLAG  
 AND FLASHING LIGHT INDICATION  
 USE: SWITCHGEAR (1000 MCM CABLE)  
 TRIP CURRENT: 800A  
 RESET CURRENT AND TIME: 3A (25 SEC)  
 REPLACEABLE BATTERY FOR FLASHING LIGHT  
 SEE: USG1

NOTE: ONLY USE ON ELBOWS WITHOUT A VOLTAGE TEST POINT

ITEM NO.	DESCRIPTION	UFIA800	
		QTY.	S/N
1	INDICATOR, FAULT, CURRENT-RESET, 800A, 3Ø	1	2463

REV 3 - ADDED VOLTAGE-RESET FAULT INDICATORS AND CHANGED FROM "UFI1" TO "UFI"

	<b>CONSTRUCTION STANDARDS</b> UNDERGROUND FAULT INDICATORS	REVISIONS			
		△	DATE	ENGR	OPS
		1	2/23/00	HWH	MA
		2	9/23/04	LB	AH
PAGE: 2 of 2	<b>UFI</b>	CAD FILE: UFI	APP:		
			DATE: 10/94		
			SECTION		
			<b>1300</b>		



## JACKETED CABLES

### NOTES

1. GRAY CLAMP OF FAULT INDICATOR MUST BE ABOVE CONCENTRIC NEUTRAL. IF NOT, INDICATOR WILL NOT WORK.
2. NEUTRALS MUST BE FORMED AS SHOWN SO THAT INDICATOR WILL FIT.

REV 1 - REFLECT JACKETED CABLE - REVISIONS ARE MARKED WITH STAR  
 REV 2 - CHANGED TO CURRENT-RESET FAULT INDICATOR



## CONSTRUCTION STANDARDS

### UNDERGROUND CABLE CURRENT-RESET FAULT INDICATOR INSTALLATION

PAGE:  
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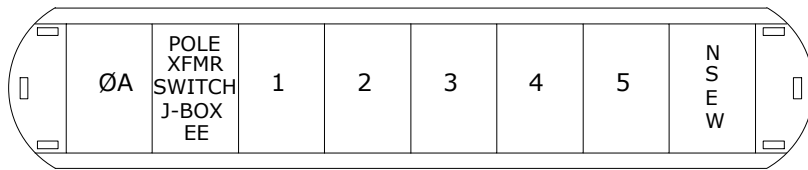
UFI2

CAD FILE:  
UFI

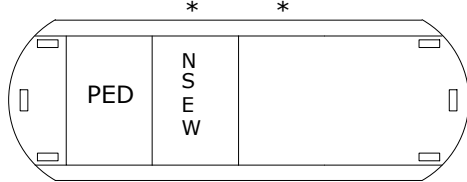
REVISIONS			
△	DATE	ENGR	OPS
1	2/23/00	HWH	MA
2	9/23/04	LB	AH
△ REVISIONS MARKED WITH STAR			
APP:		SECTION	
DATE: 10/94		1300	



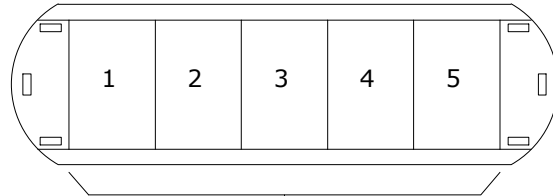
## Primary



## Secondary

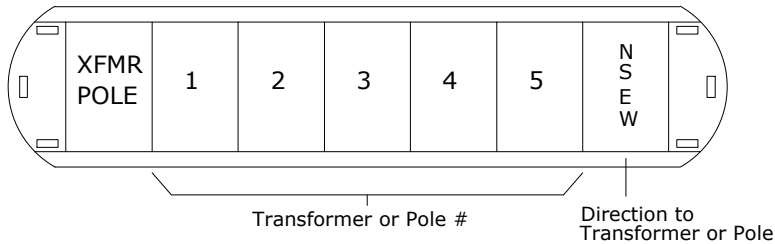


In transformer to secondary pedestal.

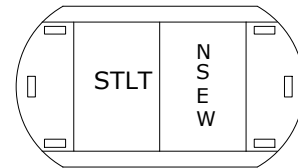


House #

In secondary pedestal to house.

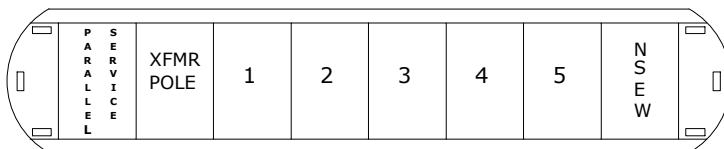


In secondary pedestal from transformer or pole.

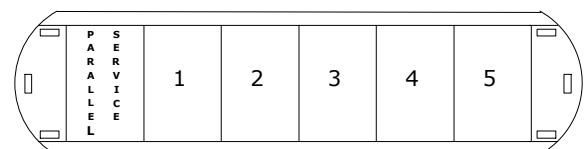


In transformer or pedestal to streetlight.

## Parallel Secondary



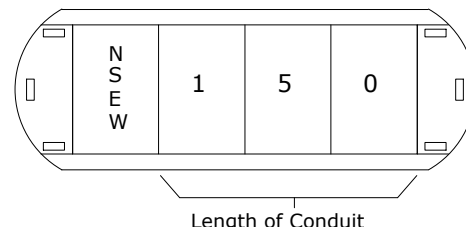
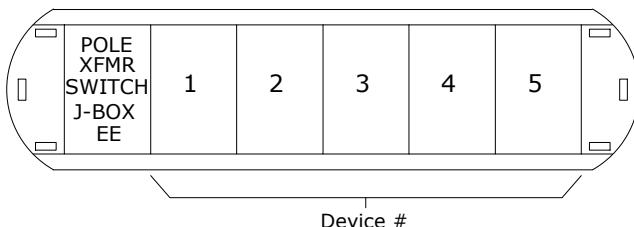
In secondary pedestal from transformer or pole.



In secondary pedestal to house.

Note: Zip tie ONE tag around each set of parallel cables.

## Future Conduits (Normally Will Require Two Tag Holders)



### Notes:

1. These tags are for URD primary and secondary cables. Tag all cables.
2. Parallel cables shall have one tag zip tied around both cables.

Rev 4: Added tagging for parallel conductors.



## CONSTRUCTION STANDARDS

### UNDERGROUND CONDUCTOR IDENTIFICATION TAGS

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# UID2

CAD FILE:  
UID2

### REVISIONS

Δ	DATE	ENGR	OPS
1	2/23/00	HWH	MA
2	9/23/04	LB	AH
3	1/16/19	KJP	
4	12/9/22	CRM	GM

APP:  
DATE: 1/31/80

SECTION  
1300

# 1400

## UNDERGROUND TRANSFORMERS

3/13/2023

~	F1A	Fuse Schedule – Padmount Transformers
~	HB16,HB32	Hillside Barrier
~	UID1	Padmounted Equipment Identification Tags & Safety Signs
~	UT2	1Ø Padmount Transformer Radial Feed
<b>C</b>	UT4	Open Y - Open Δ Padmount Transformer Installation
~	UT21,UT22	1Ø Padmount Transformer Assemblies, Loop Feed
~	UT24-UT28	1Ø Pad Xfmr Assembly, Radial or Loop w/ Feed-Thru Bushing
~	UT30-UT32	3Ø Padmount Transformer Assemblies
~	UTB	1Ø Padmount Transformer Boypad (Basement)
~	UTP1	1Ø Transformer Pad – 25 to 75kVA
~	UTP2	1Ø Transformer Pad – 100kVA
~	UTP3	1Ø Transformer Pad Orientation & Conduit Installation
~	UTP4	3Ø Transformer Pad – 75 to 1500kVA
~	UTP5	Precast Pad & Vault for 3Ø Transformers
~	UTP6	3Ø Transformer Pad Orientation & Conduit Installation
~	UTP9	Typical Barrier Installation to Protect Padmounted Equipment

<b>N</b>	New Standard
<b>R</b>	Redrawn Standard
<b>C</b>	Changed Standard
~	No Change

### 1Ø Padmounted Transformers

kVA	Transformer Stock Number		Transformer Primary Protection			Minimum Upstream OH Fuse Size <sup>*2</sup>	
	BM 240/120	BR 480/120	Bayonet Fuse No	S/N	Isolation Link	Size	S/N
25 <sup>*1</sup>	1317		4000358C05 (8 A)	653	3001861A02	25 A	683
50	1318	2016	4000358C08 (15 A)	654	3001861A03	30 A	684
75	1320		4000358C10 (25 A)	655	3001861A05	65 A	687
100	1322		4000358C10 (25 A)	655	3001861A05	65 A	687

### 3Ø Padmounted Transformers



kVA	Transformer Stock Number		Transformer Primary Protection			Minimum Upstream OH Fuse <sup>*2</sup>	
	BL 208/120	BW 480/277	Bayonet Fuse No	S/N	Isolation Link	Size	S/N
75	1328	1337	4000358C05 (8 A)	653	3001861A02	25 A	683
150	1329	1338	4000358C08 (15 A)	654	3001861A03	30 A	684
300	1331	1340	4000358C10 (25 A)	655	3001861A05	50 A	686
500	1332	1341	4000358C12 (50 A)	656	3001861A06	100 A	689
750	1333	1342	4000358C12 (50 A)	656	3001861A06	100 A	689
1000	1334	1343	4000358C14 (65 A) <sup>*3</sup>	657	3001861A07	100 A <sup>*4</sup>	689
1500		1344	4000353C17 (140 A)	658	3001861A05	100 A <sup>*4*5</sup>	689
					ELSP Fuse <sup>*6</sup>		
2000 <sup>*</sup>		2164	4038361C05C (125 A)	2976	CBUC08250D100 <sup>*</sup>	See Systems Engineering	
2500 <sup>*</sup>		1345	4038361C05C (125 A)	2976	CBUC08250D100 <sup>*</sup>		

Spare fuses are kept in each transformer. It is the responsibility of the person using the spare fuse to replace it. Fuses are in free issue.

#### Notes:

- \*1 Fuses for 25 kVA livefront transformers are stocked for maintenance only (RTE 476B1, S/N 1664).
- \*2 Use largest fuse size for applications while considering up/downstream fuses, conductor, and loading. Check with Systems Engineering as needed.
- \*3 Recommended fuse will result in some loss of overload capability.
- \*4 Transformer and upstream protection may miscoordinate, therefore each transformer should ideally be on separate feeders/protection.
- \*5 Fuse will limit overload capability of transformer.
- \*6 The use of these fuses will provide 175% of rated load for 2 hours and 150% of rated load for 7 hours.

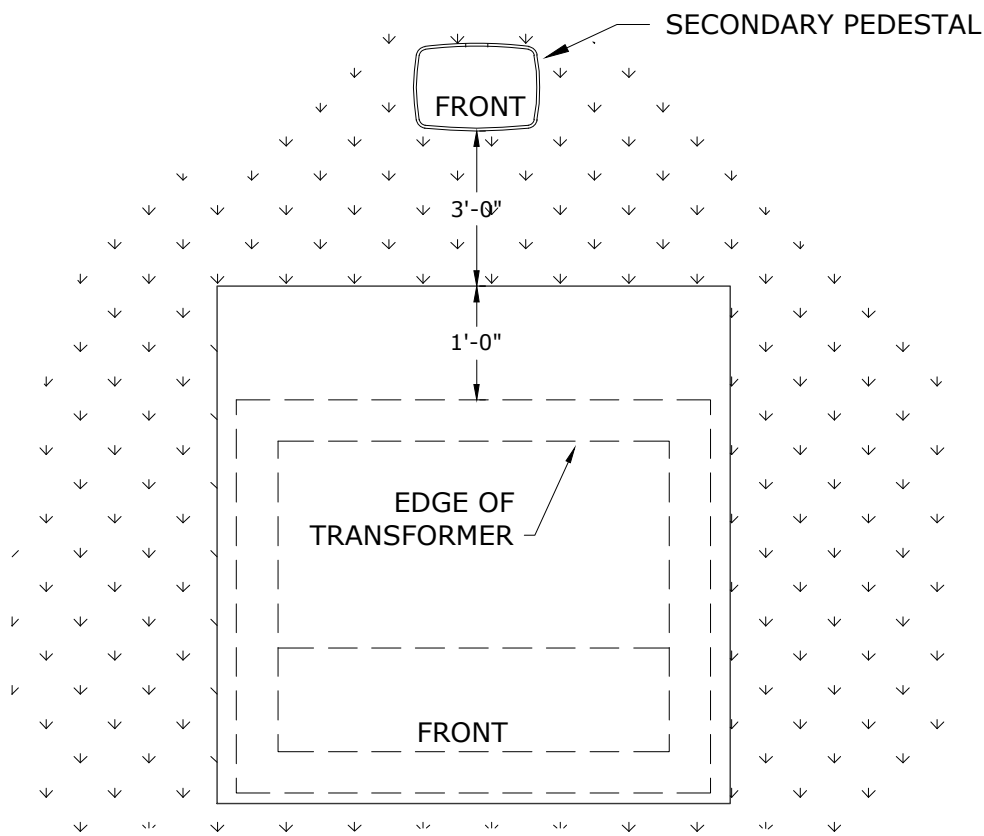
Rev. 3 - Added 2000 & 2500 kVA, stock numbers, upstream fuses and notes.

		<h2 style="text-align: center;">CONSTRUCTION STANDARDS</h2> <h3 style="text-align: center;">FUSE SCHEDULE PADMOUNT TRANSFORMERS</h3>		REVISIONS			
					DATE	ENGR	OPS
				1	3/02	DRAWN	IN CAD
				2	2/11/10	KJP	
				3	7/10/20	KJP	
				APP: ELM		SECTION	
				DATE: 1/31/80		1400	

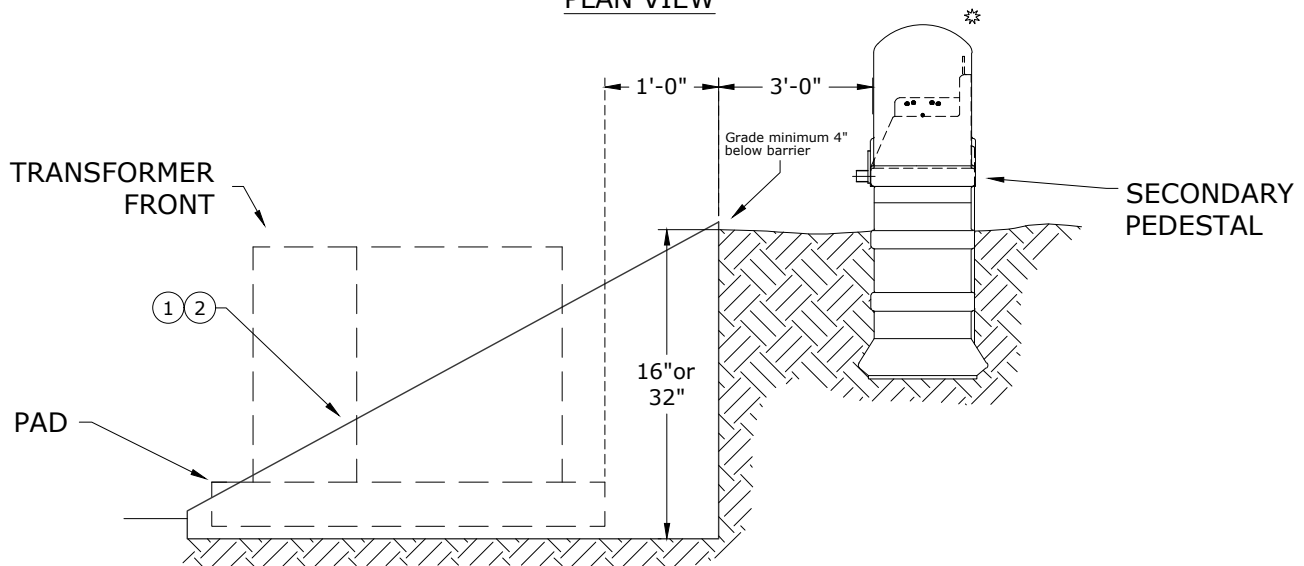
PAGE:  
1 of 1

**F1A**

CAD FILE:  
F1A



PLAN VIEW



SIDE VIEW

REV 2: Corrected Measurement Behind Pad, and changed title from HB1 to HB16,HB32.

ITEM NO.	DESCRIPTION	HB16		HB32	
		QTY.	S/N	QTY.	S/N
1	BARRIER, 16" Height	1	2460		
2	BARRIER, 32" Height			1	2461



## CONSTRUCTION STANDARDS


### HILLSIDE BARRIER

PAGE:  
1 of 1

HB16,HB32

CAD FILE:  
HB16

REVISIONS				
DATE	ENGR	OPS		
4/26/04	LB	AH		
5/30/07	LB	AH		
APP:			SECTION	
DATE:			1400	

**WARNING**



**Hazardous voltage inside.  
Will shock, burn,  
or cause death.**

**If unlocked or open  
Immediately call  
Clark Public Utilities  
360-992-3000.**


**NOTICE**





We need room to work safely on this electrical supply device.

Please keep shrubs and structures 10 ft. away from this side and 3 ft. from all other sides.


Obstructions cause delays when restoring electric service and will be removed at the owner's expense.


**CAUTION**

UNDERGROUND POWER CABLES  
ARE LOCATED IN THE AREA  
CALL BEFORE YOU DIG  
1-800-424-5536



Label for inside of padmounted equipment S/N 2569

**DANGER**




**Hazardous voltage.  
Will shock, burn,  
or cause death.**

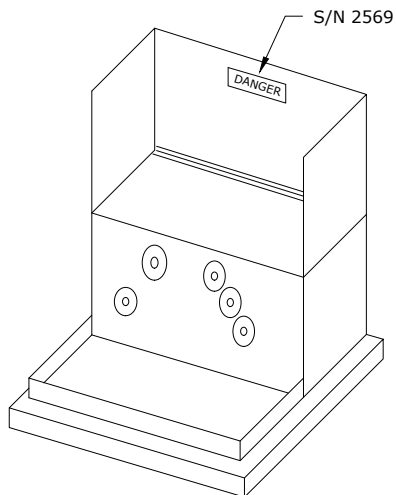
**KEEP OUT!**

**If open or unlocked  
Immediately call  
Clark Public Utilities  
360-992-3000.**

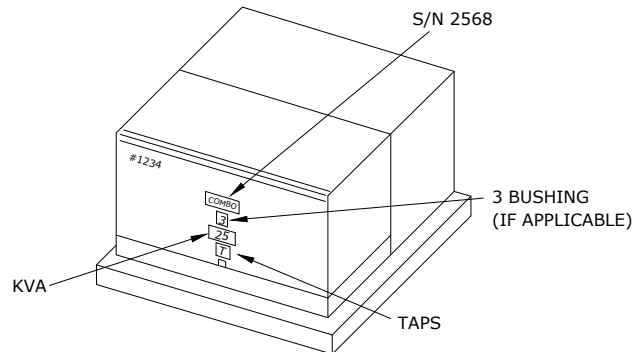
REV 1: ADDED ANSI SAFETY SIGNS

<div><div>Clark Public Utilities</div></div>	<div>CONSTRUCTION STANDARDS</div> <div>PADMOUNTED EQUIPMENT IDENTIFICATION TAGS AND SAFETY SIGNS</div>			REVISIONS					
				<div><div><div></div></div></div>	DATE	ENGR	OPS		
				0	6/13/02				
				1	6/23/04	LB	AH		
	<div><div><div></div></div></div> REDRAWN IN CAD								
	PAGE: 1 of 3		UID1		CAD FILE: UID1		APP: ELM		SECTION 1400
						DATE: 1/31/80			

### 1. SINGLE-PHASE PADMOUNTED TRANSFORMERS

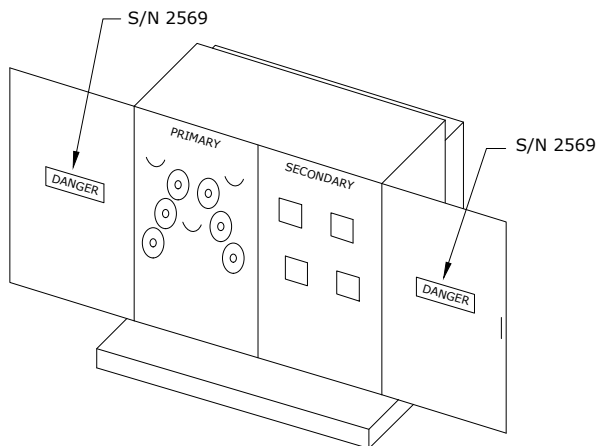


VIEW WITH LID OPEN

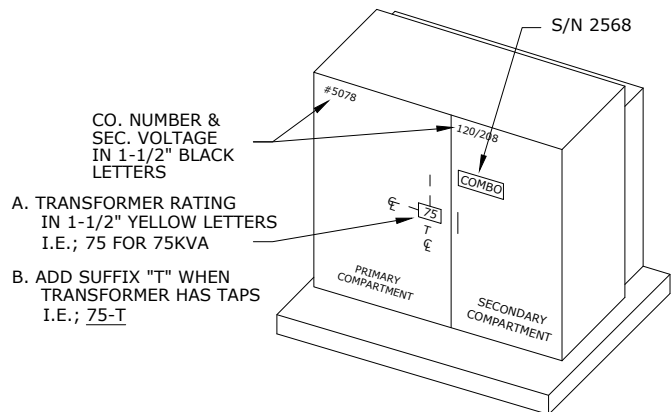


VIEW WITH LID CLOSED

### 2. THREE-PHASE PADMOUNTED TRANSFORMERS

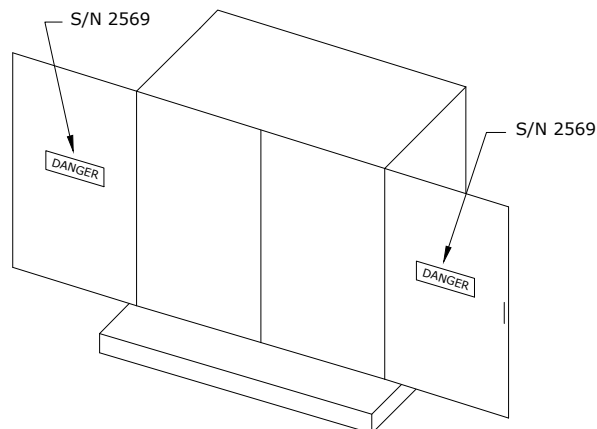


VIEW WITH DOOR OPEN

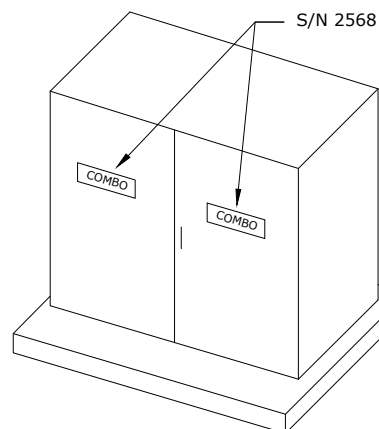


VIEW WITH DOOR CLOSED

### 3. OTHER PADMOUNT EQUIPMENT



VIEW WITH DOOR OPEN



VIEW WITH DOOR CLOSED

REV 1: ADDED ANSI SAFETY SIGNS



## CONSTRUCTION STANDARDS

PADMOUNTED EQUIPMENT  
IDENTIFICATION TAGS AND  
SAFETY SIGNS

PAGE:  
2 of 3

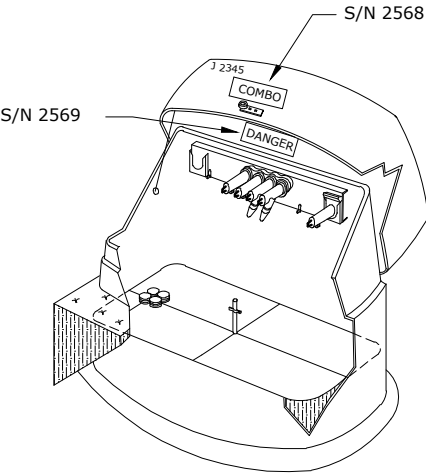
UID1

CAD FILE:  
UID1

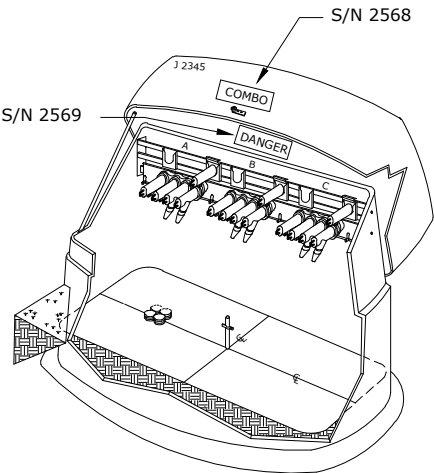
#### REVISIONS

REV	DATE	ENGR	OPS
0	6/13/02		
1	6/23/04	LB	AH
REDRAWN IN CAD			
APP:	ELM	SECTION	
DATE:	1/31/80	1400	


4. SINGLE-PHASE J-BOX



4. THREE-PHASE J-BOX



REV 1: ADDED ANSI SAFETY SIGNS





CONSTRUCTION STANDARDS

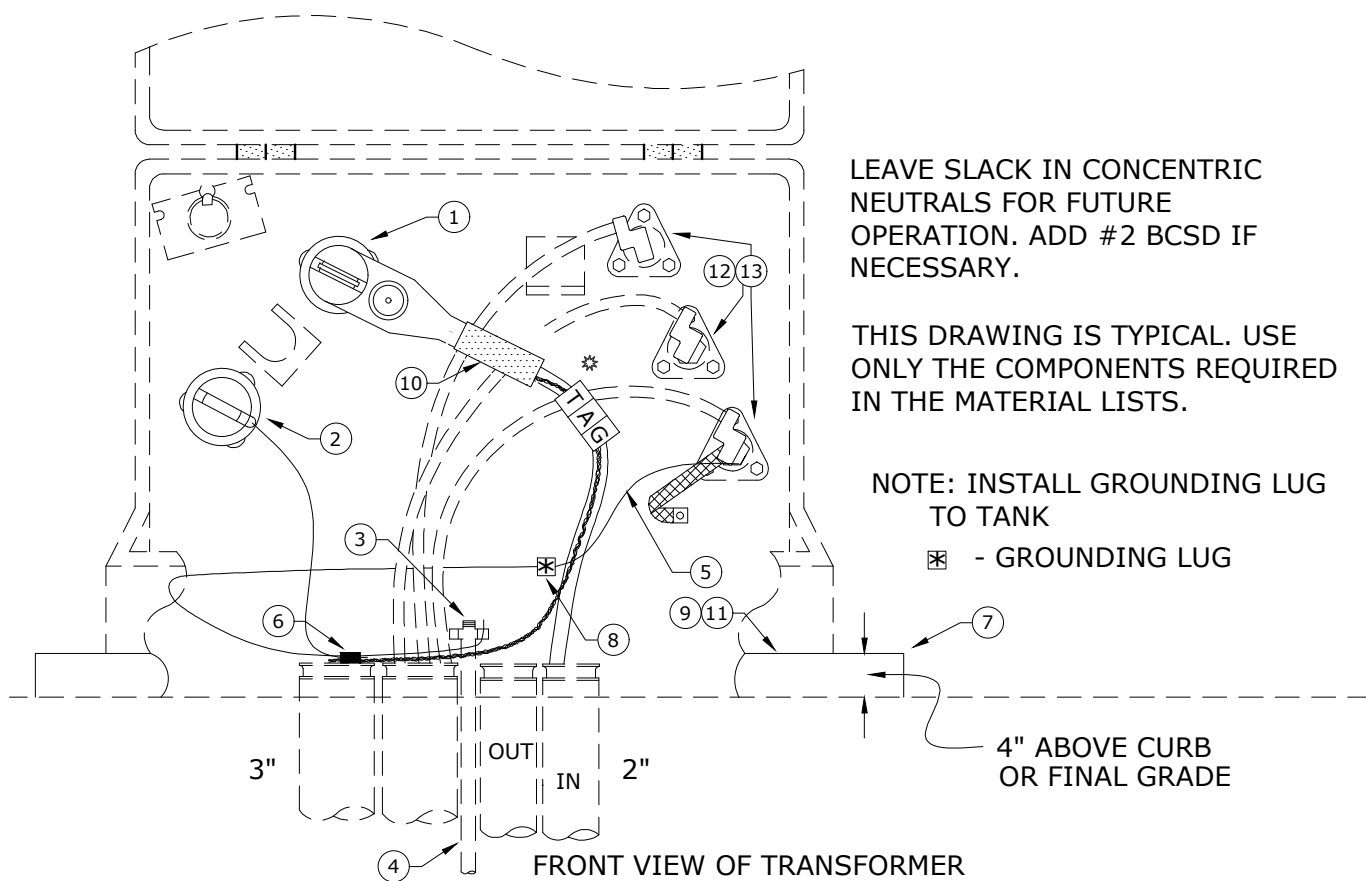
PADMOUNTED EQUIPMENT  
IDENTIFICATION TAGS AND  
SAFETY SIGNS

PAGE:  
3 of 3

UID1

CAD FILE:  
UID1

REVISIONS			
	DATE	ENGR	OPS
0	6/13/02		
1	6/23/04	LB	AH
 REDRAWN IN CAD			
APP: ELM		SECTION	
DATE: 1/31/80		1400	



RADIAL FEED

UT2

SEE US6 FOR SECONDARY CONNECTIONS DETAILS  
MATERIAL LIST

ITEM NO.	DESCRIPTION		
		QTY.	S/N
1	Elbow, Loadbreak, 1/0, 200A, 175 mil	1	1312
2	Cap, Protective Insulated, 200A	1	265
3	Clamp, Ground Rod 5/8", Small	1	281
4	Rod, Ground 5/8" x 8'	1	1124
5	Conductor, Wire BSDC #4 SLD	6	376
6	Connector, Crimpet, #4 to #2	1	454
7	Pad, Transformer 42" x 42"	1	929
8	Ground Lug	1	842
9	Bolt, Machine, 1/2" x 1-1/2" SS	2	131*
10	Elbow, Sealing Kit, 1/0, 175 & 220 mil	1	2391*
11	Washer, 2" x 3" x 3/16" w/ 9/16" Slotted Hole	2	1415
12	Connector, z-bar #2-500 MCM + Streetlight	3	2265
13	Cover, Connector U.G.	3	2266

Rev. 4 - Corrected material issue.



CONSTRUCTION STANDARDS

SINGLE PHASE  
PADMOUNT TRANSFORMER  
RADIAL FEED

PAGE:  
1 of 1

UT2

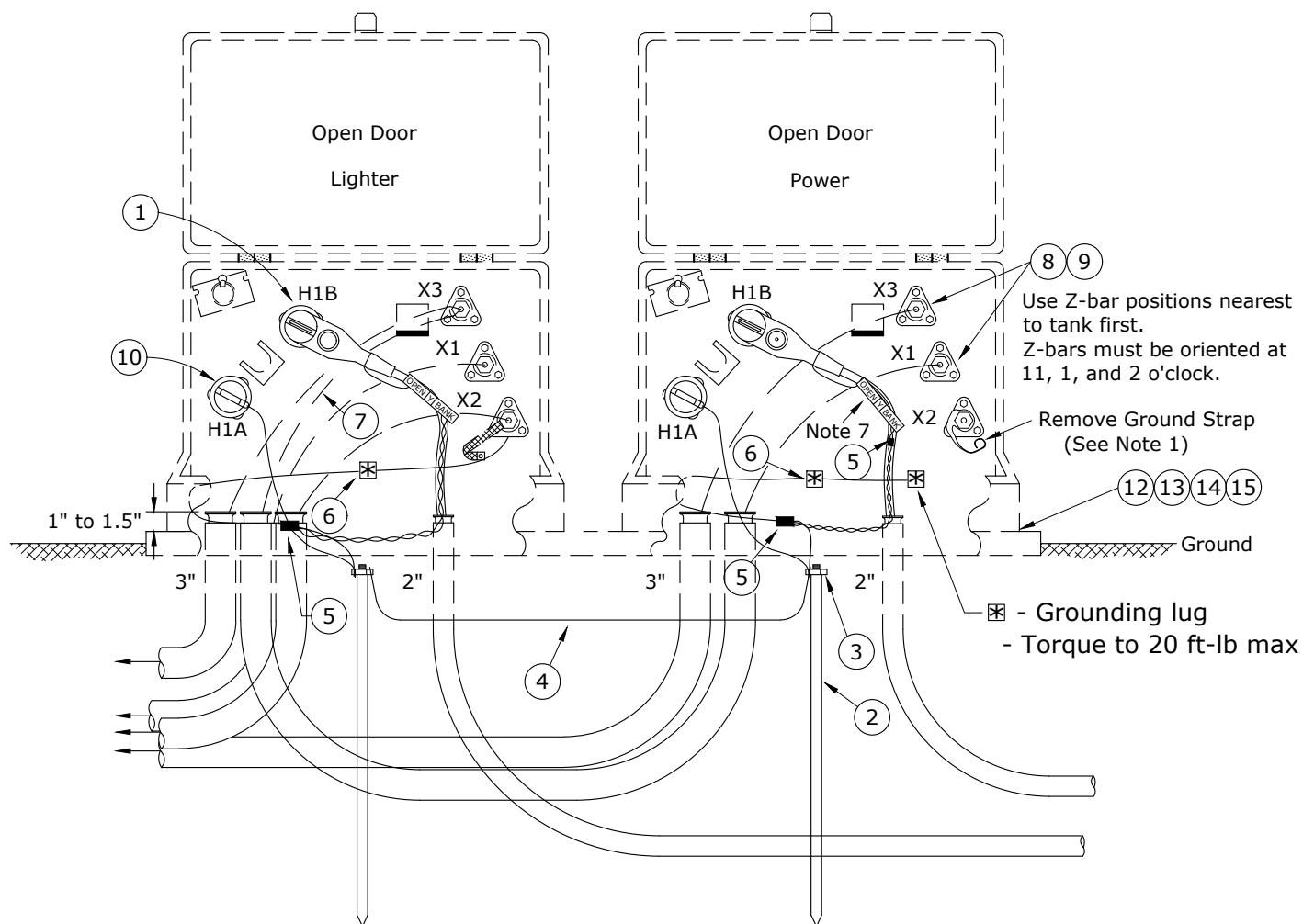
CAD FILE:  
UT2

REVISIONS

Δ	DATE	ENGR	OPS
1	2/23/00	HWH	MA
2	9/23/04	LB	AH
3	12/29/04	LB	AH
4	11/11/16	KJP	

APP: JEH	SECTION
DATE: 2/22/00	1400





#### Notes:

1. Remove ground strap from one secondary neutral bushing.  
Caution: Measure resistance from bushing to tank. There may be an internal ground.
2. Ground rods may be driven in trench.
3. Primary and secondary cables may be arranged as required to fit job site.
4. For 2-25kVA only.
5. See Std UTP1 for pad specifications.
6. Both phases must come from the same source and direction.
7. Put tags on cables that say "Open Y Bank".
8. Maximum motor size shall be 15 horsepower.

Rev 6 - Changed to 200A elbow with integral jacket seal, and added pad to material list.



## CONSTRUCTION STANDARDS

OPEN WYE - OPEN DELTA  
PADMOUNT TRANSFORMER  
INSTALLATION

PAGE:  
1 of 2

UT4

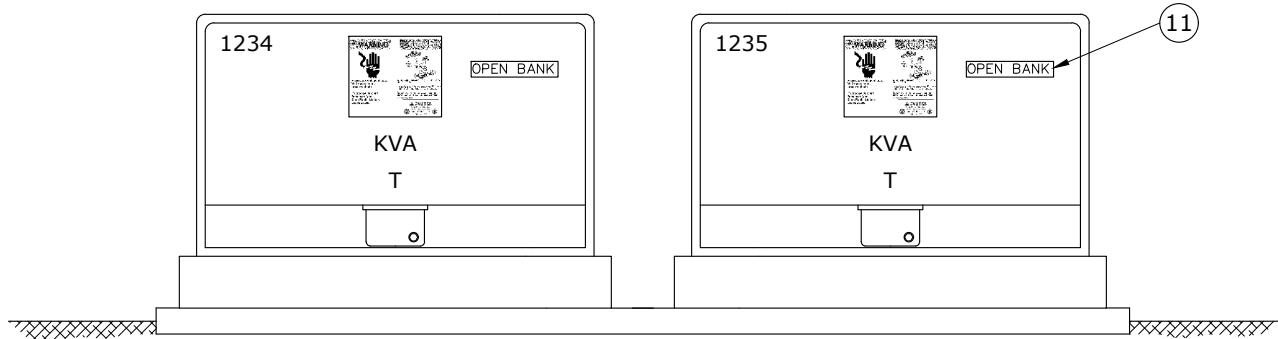
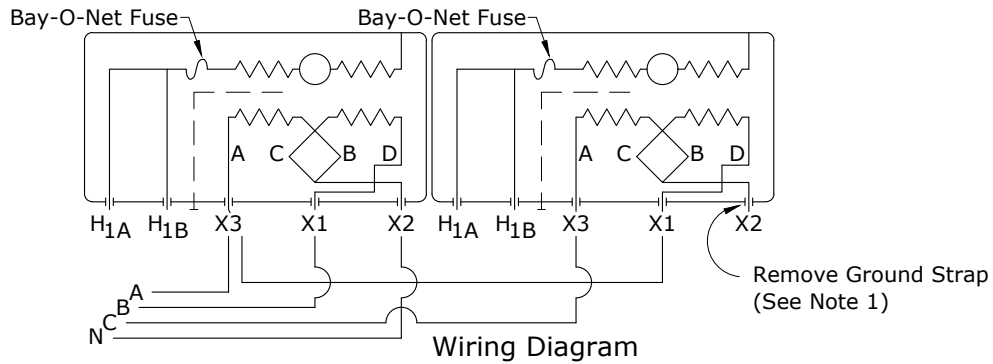
CAD FILE:  
UT4

#### REVISIONS

Δ	DATE	ENGR	OPS
3	12/2/22	LB	AH
4	12/14/09	KJP	
5	2/4/14	CM	AH
6	3/7/23	CM	GM

APP: TR/GM  
DATE: 1/2/80

SECTION  
1400



Rev 6 - Changed to 200A elbow with integral jacket seal, and added pad to material list.

ITEM NO.	DESCRIPTION	UT4	
		QTY.	S/N
1	Elbow, 200A, Loadbreak, 1/0, 200A, 175 & 200 mil, Test Point, 15 kV, w/ Jacket Seal	2	1312 ✱
2	Rod, Ground, 5/8" x 8'	2	1124
3	Clamp, Ground Rod 5/8", Bronze, Small	2	281
4	Conductor, Cu, #4 Solid, Bare, Soft-Drawn, 1C	30	376
5	Connector, Crimpet, Cu, Run #2 Sol/Str, Tap #8 Sol - #4 Str (2C4)	2	454
6	Lug, Grounding, #8 Sol-2/0 Str, 4-way	3	842
7	Cable, UG, 600v, Al, 4/0, USE, 1C	13	353
8	Connector, Z-Bar, 5/8" Stud, Al/Cu, 6-position, #2 - 500 MCM + Streetlight	5	2265
9	Cover, Connector, Z-Bar, 6-position	5	2266
10	Cap, Protective Insulated, 200A, 15 kV	2	265
11	Label, "Open Bank"	2	2781
12	Pad, Transformer 42" x 42", 1Ø, 25-75 kVA	2	929 ✱
13	Bolt, Machine, 1/2" x 1-1/2" SS	4	131 ✱
14	Washer, 2" x 3" x 3/16" w/ 9/16" Slotted Hole	4	1415 ✱
15	Nut, Spring Loaded, Galv, 1/2" (Unistrut)	4	920 ✱



## CONSTRUCTION STANDARDS

OPEN WYE - OPEN DELTA  
PADMOUNT TRANSFORMER  
INSTALLATION

### REVISIONS

R	DATE	ENGR	OPS
3	12/29/04	LB	AH
4	12/14/09	KJP	
5	2/4/14	CM	AH
6	3/7/23	CM	GM

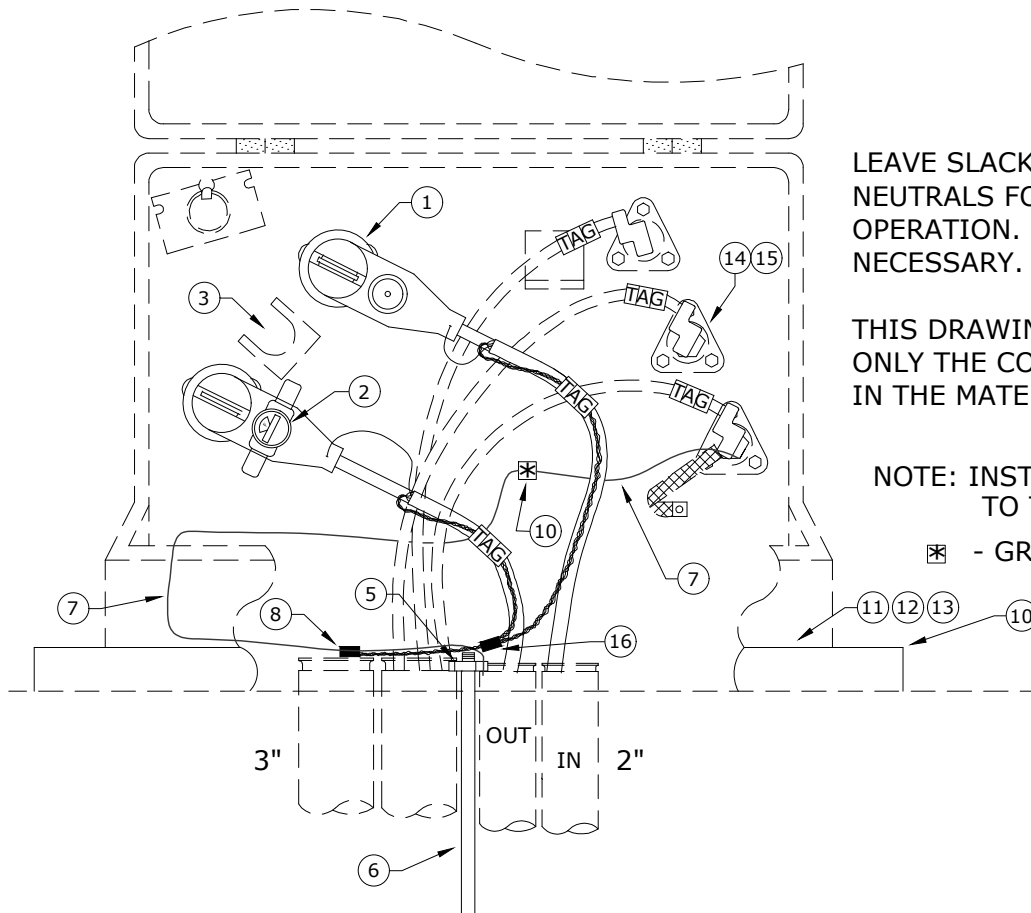
PAGE:  
2 of 2

UT4

CAD FILE:  
UT4

APP: TR/GM  
DATE: 9/94

SECTION  
1400



LEAVE SLACK IN CONCENTRIC  
NEUTRALS FOR FUTURE  
OPERATION. ADD #2 BSDC IF  
NECESSARY.

THIS DRAWING IS TYPICAL. USE  
ONLY THE COMPONENTS REQUIRED  
IN THE MATERIAL LISTS.

NOTE: INSTALL GROUNDING LUG  
TO TANK

⊠ - GROUNDING LUG

FRONT VIEW OF TRANSFORMER (UT22 SHOWN)

SEE US6 FOR SECONDARY CONNECTIONS DETAILS

Rev 3: Changed to Voltage-reset fault indicator.



## CONSTRUCTION STANDARDS

SINGLE PHASE  
PADMOUNT TRANSFORMER ASSEMBLIES  
LOOP FEED

PAGE:  
1 of 2

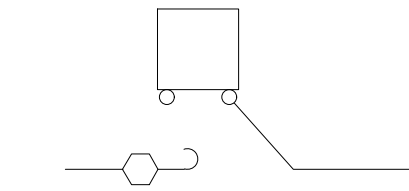
UT21-UT22

CAD FILE:  
UT21-UT22

### REVISIONS

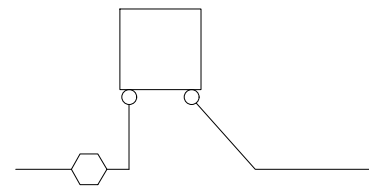
REV	DATE	ENGR	OPS
0	2/22/00	HWH	MA
1	9/23/04	LB	AH
2	12/29/04	LB	AH
3	4/29/09	CM	AH

APP:	SECTION
DATE: 10/98	1400



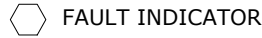
FUTURE  
N.O. LOOP FEED

UT21

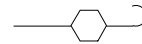


LOOP FEED

UT22



FAULT INDICATOR



NORMALLY OPEN

Rev 3: Changed to Voltage-reset fault indicator.

ITEM NO.	DESCRIPTION	UT21	
		QTY.	S/N
1	Elbow, Loadbreak, 1/0, 175 mil (Includes Sealing Kit #2391)	2	1312
2	Voltage-Reset Fault Indicator, 400A Trip, 1Ø UG	1	2694 *
3	Bushing, Standoff Insulated 200A	1	252
4	Cap, Protective Insulated 200A	1	265
5	Clamp, Ground Rod 5/8", Small	1	281
6	Rod, Ground 5/8" x 8'	1	1124
7	Conductor, Wire BSDC #4 SLD	12	376
8	Connector, Crimpet, #4 to #2 (2C4)	1	454
9	Pad, Transformer 42" x 42"	1	929
10	Ground Lug	1	842
11	Bolt, Unistrut, Padmount Tie Down	2	193
12	Nut, Spring-Loaded, Galv, 1/2", Unistrut	2	920
13	Washer, 2" x 3" x 3/16" w/ 9/16" Slotted Hole	2	1415
14	Connector, Z-Bar #6-500 MCM + St. Lt	3	2265
15	Cover, Connector Z-Bar	3	2266

ITEM NO.	DESCRIPTION	UT22	
		QTY.	S/N
1	Elbow, Loadbreak, 1/0, 175 mil (Includes Sealing Kit #2391)	2	1312
2	Voltage-Reset Fault Indicator, 400A Trip, 1Ø UG	1	2694 *
5	Clamp, Ground Rod 5/8", Small	1	281
6	Rod, Ground 5/8" x 8'	1	1124
7	Conductor, Wire BSDC #4 SLD	12	376
8	Connector, Crimpet, #4 to #2 (2C4)	1	454
9	Pad, Transformer 42" x 42"	1	929
10	Ground Lug	1	842
11	Bolt, Unistrut, Padmount Tie Down	2	193
12	Nut, Spring-Loaded, Galv, 1/2", Unistrut	2	920
13	Washer, 2" x 3" x 3/16" w/ 9/16" Slotted Hole	2	1415
14	Connector, Z-Bar #6-500 MCM + St. Lt	3	2265
15	Cover, Connector Z-Bar	3	2266
16	Connector, Crimpet, #2 to #2 (2C2)	1	455



## CONSTRUCTION STANDARDS

SINGLE PHASE  
PADMOUNT TRANSFORMER ASSEMBLIES  
LOOP FEED

PAGE:  
2 of 2

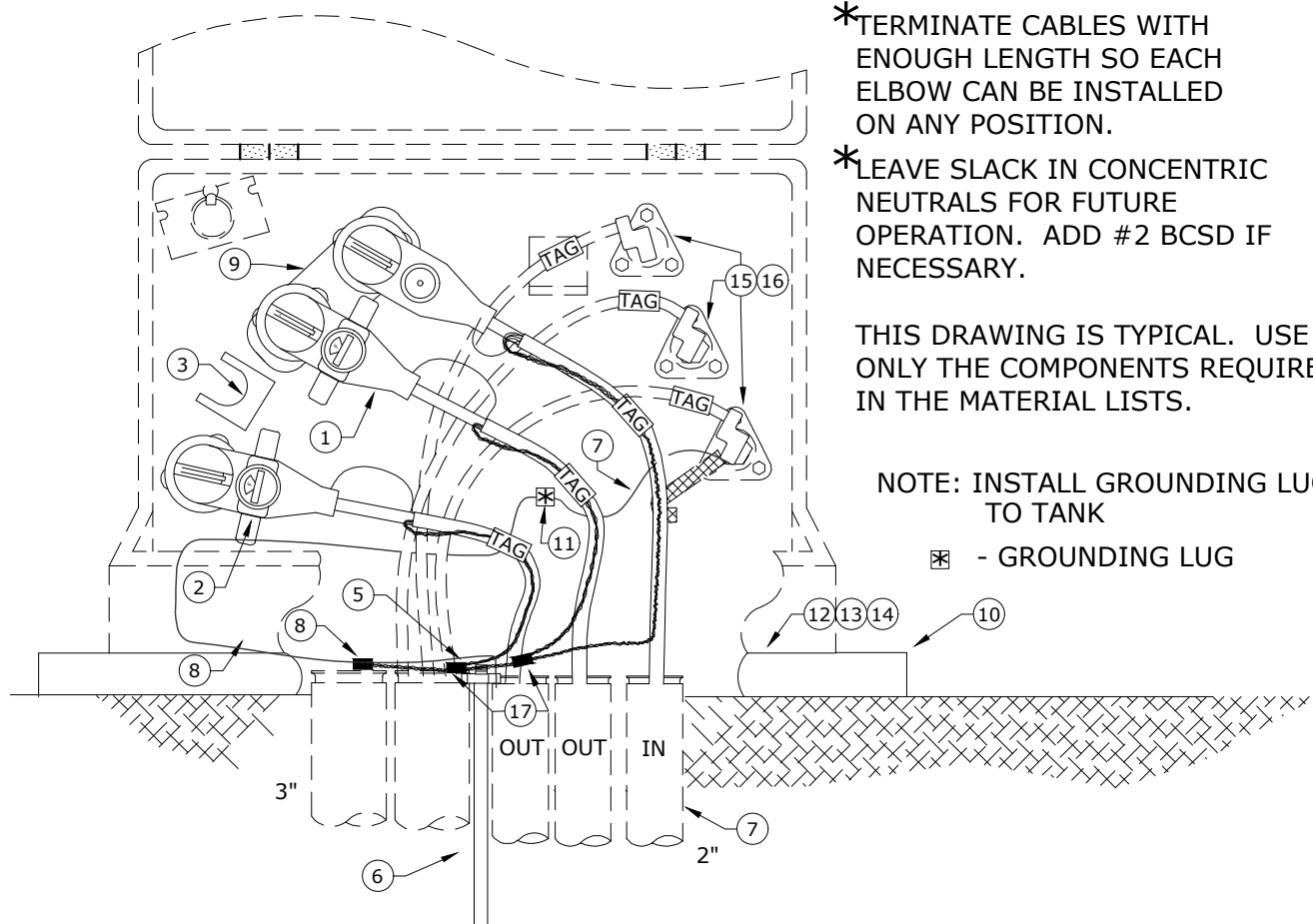
UT21-UT22

CAD FILE:  
UT21-UT22

### REVISIONS

REV	DATE	ENGR	OPS
0	2/22/00	HWH	MA
1	9/23/04	LB	AH
2	12/29/04	LB	AH
3	4/29/09	CM	AH

APP:	SECTION
DATE: 10/98	1400



\*TERMINATE CABLES WITH ENOUGH LENGTH SO EACH ELBOW CAN BE INSTALLED ON ANY POSITION.

\*LEAVE SLACK IN CONCENTRIC NEUTRALS FOR FUTURE OPERATION. ADD #2 BCSD IF NECESSARY.

THIS DRAWING IS TYPICAL. USE ONLY THE COMPONENTS REQUIRED IN THE MATERIAL LISTS.

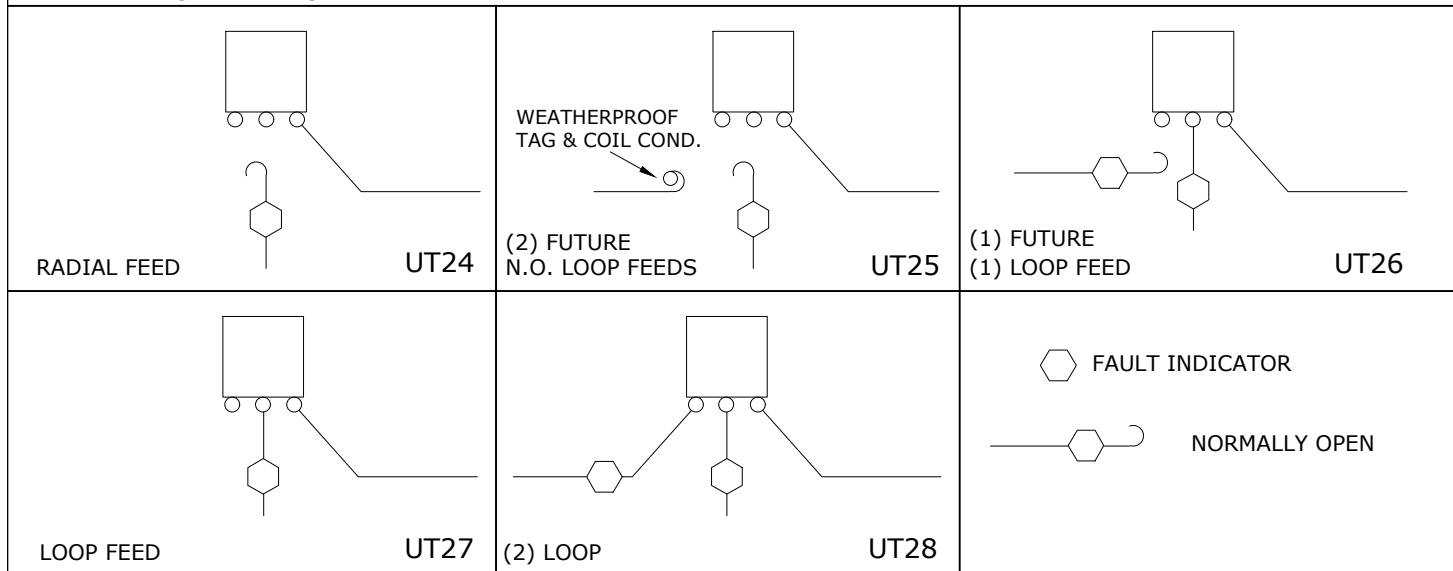
NOTE: INSTALL GROUNDING LUG TO TANK

⊠ - GROUNDING LUG

FRONT VIEW OF TRANSFORMER UT28

SEE US6 FOR SECONDARY CONNECTORS DETAILS

Rev 4: Changed to Voltage-reset fault indicators.



## CONSTRUCTION STANDARDS

SINGLE PHASE  
PADMOUNT TRANSFORMER ASSEMBLIES RADIAL  
OR LOOP FEED WITH FEED-THROUGH BUSHING

PAGE:  
1 of 4

UT24-UT28




CAD FILE:  
UT24-UT28

REVISIONS			
Δ	DATE	ENGR	OPS
1	7/15/02	JEH	TR
2	9/23/04	LB	AH
3	12/29/04	LB	AH
4	4/29/09	CM	AH
APP: DATE: 10/94			
SECTION			1400

Rev 4: Changed to Voltage-reset fault indicators.

ITEM NO.	DESCRIPTION	UT24	
		QTY.	S/N
1	Elbow, Loadbreak. 1/0, 200A, 175 mil	2	1312
2	Voltage-Reset Fault Indicator, 400A Trip, 1Ø UG	1	2694 ✱
3	Bushing, Standoff Insulated 200A	1	252
4	Cap, Protective Insulated 200A	2	265
5	Clamp, Ground Rod 5/8", Small	1	281
6	Rod, Ground 5/8" x 8'	1	1124
7	Conductor, Wire BSDC #4 SLD	6	376
8	Connector, Crimpet, #4 to #2 (2C4)	1	454
9	Insert, Feed-Through	1	237
10	Pad, Transformer 42" x 42"	1	929
11	Ground Lug	1	842
12	Bolt, Unistrut, Padmount Tie Down	2	193
13	Nut, Spring-loaded, Galv, 1/2", Unistrut	2	920
14	Washer, 2" X 3" X 3/16" w/ 9/16" slotted hole	2	1415
15	Connector, Z-Bar #6-500 MCM + St. Lt	3	2265
16	Cover, Connector U.G.	3	2266
17	Connector, Crimpet, #2 to #2 (2C2)	1	455




ITEM NO.	DESCRIPTION	UT25	
		QTY.	S/N
1	Elbow, Loadbreak. 1/0, 200A, 175 mil	2	1312
2	Voltage-Reset Fault Indicator, 400A Trip, 1Ø UG	1	2694 ✱
3	Bushing, Standoff Insulated 200A	1	252
4	Cap, Protective Insulated 200A	2	265
5	Clamp, Ground Rod 5/8", Small	1	281
6	Rod, Ground 5/8" x 8'	1	1124
7	Conductor, Wire BSDC #4 SLD	6	376
8	Connector, Crimpet, #4 to #2 (2C4)	1	454
9	Insert, Feed-Through	1	237
10	Pad, Transformer 42" x 42"	1	929
11	Ground Lug	1	842
12	Bolt, Unistrut, Padmount Tie Down	2	193
13	Nut, Spring-loaded, Galv, 1/2", Unistrut	2	920
14	Washer, 2" X 3" X 3/16" w/ 9/16" slotted hole	2	1415
15	Connector, Z-Bar #6-500 MCM + St. Lt	3	2265
16	Cover, Connector U.G.	3	2266
17	Connector, Crimpet, #2 to #2 (2C2)	1	455

		<b>CONSTRUCTION STANDARDS</b> SINGLE PHASE PADMOUNT TRANSFORMER ASSEMBLIES RADIAL OR LOOP FEED WITH FEED-THROUGH BUSHING		REVISIONS			
					DATE	ENGR	OPS
				1	7/15/02	JEH	TR
				2	9/23/04	LB	AH
				3	12/29/04	LB	AH
				4	4/29/09	CM	AH
							
PAGE: 2 of 4		UT24-UT28		CAD FILE: UT24-UT28		APP: DATE: 10/94	SECTION 1400

Rev 4: Changed to Voltage-reset fault indicators.

ITEM NO.	DESCRIPTION	UT26	
		QTY.	S/N
1	Elbow, Loadbreak, 1/0, 200A, 175 mil	3	1312
2	Voltage-Reset Fault Indicator, 400A Trip, 1Ø UG	2	2694 ✱
3	Bushing, Standoff Insulated 200A	1	252
4	Cap, Protective Insulated 200A	1	265
5	Clamp, Ground Rod 5/8", Small	1	281
6	Rod, Ground 5/8" x 8'	1	1124
7	Conductor, Wire BSDC #4 SLD	6	376
8	Connector, Crimpet, #4 to #2 (2C4)	1	454
9	Insert, Feed-Through	1	237
10	Pad, Transformer 42" x 42"	1	929
11	Ground Lug	1	842
12	Bolt, Unistrut, Padmount Tie Down	2	193
13	Nut, Spring-loaded, Galv, 1/2", Unistrut	2	920
14	Washer, 2" X 3" X 3/16" w/ 9/16" slotted hole	2	1415
15	Connector, Z-Bar #6-500 MCM + St. Lt	3	2265
16	Cover, Connector U.G.	3	2266
17	Connector, Crimpet, #2 to #2 (2C2)	2	455

ITEM NO.	DESCRIPTION	UT27	
		QTY.	S/N
1	Elbow, Loadbreak, 1/0, 200A, 175 mil	2	1312
2	Voltage-Reset Fault Indicator, 400A Trip, 1Ø UG	1	2694 ✱
3	Bushing, Standoff Insulated 200A	1	252
4	Cap, Protective Insulated 200A	1	265
5	Clamp, Ground Rod 5/8", Small	1	281
6	Rod, Ground 5/8" x 8'	1	1124
7	Conductor, Wire BSDC #4 SLD	6	376
8	Connector, Crimpet, #4 to #2 (2C4)	1	454
9	Insert, Feed-Through	1	237
10	Pad, Transformer 42" x 42"	1	929
11	Ground Lug	1	842
12	Bolt, Unistrut, Padmount Tie Down	2	193
13	Nut, Spring-loaded, Galv, 1/2", Unistrut	2	920
14	Washer, 2" X 3" X 3/16" w/ 9/16" slotted hole	2	1415
15	Connector, Z-Bar #6-500 MCM + St. Lt	3	2265
16	Cover, Connector U.G.	3	2266
17	Connector, Crimpet, #2 to #2 (2C2)	1	455

		<b>CONSTRUCTION STANDARDS</b> SINGLE PHASE PADMOUNT TRANSFORMER ASSEMBLIES RADIAL OR LOOP FEED WITH FEED-THROUGH BUSHING		REVISIONS			
					DATE	ENGR	OPS
				1	7/15/02	JEH	TR
				2	9/23/04	LB	AH
				3	12/29/04	LB	AH
				4	4/29/09	CM	AH
							
PAGE: 3 of 4		UT24-UT28		CAD FILE: UT24-UT28		APP: DATE: 10/94	
						SECTION 1400	

Rev 4: Changed to Voltage-reset fault indicators.

ITEM NO.	DESCRIPTION	UT28	
		QTY.	S/N
1	Elbow, Loadbreak, 1/0, 200A, 175 mil	3	1312
2	Voltage-Reset Fault Indicator, 400A Trip, 1Ø UG	2	2694 ✱
3	Bushing, Standoff Insulated 200A	1	252
4	Cap, Protective Insulated 200A	-	265
5	Clamp, Ground Rod 5/8", Small	1	281
6	Rod, Ground 5/8" x 8'	1	1124
7	Conductor, Wire BSDC #4 SLD	6	376
8	Connector, Crimpet, #4 to #2 (2C4)	1	454
9	Insert, Feed-Through	1	237
10	Pad, Transformer 42" x 42"	1	929
11	Ground Lug	1	842
12	Bolt, Unistrut, Padmount Tie Down	2	193
13	Nut, Spring-loaded, Galv, 1/2", Unistrut	2	920
14	Washer, 2" X 3" X 3/16" w/ 9/16" slotted hole	2	1415
15	Connector, Z-Bar #6-500 MCM + St. Lt	3	2265
16	Cover, Connector U.G.	3	2266
17	Connector, Crimpet, #2 to #2 (2C2)	2	455



## CONSTRUCTION STANDARDS

SINGLE PHASE  
PADMOUNT TRANSFORMER ASSEMBLIES RADIAL  
OR LOOP FEED WITH FEED-THROUGH BUSHING

PAGE:  
4 of 4

UT24-UT28

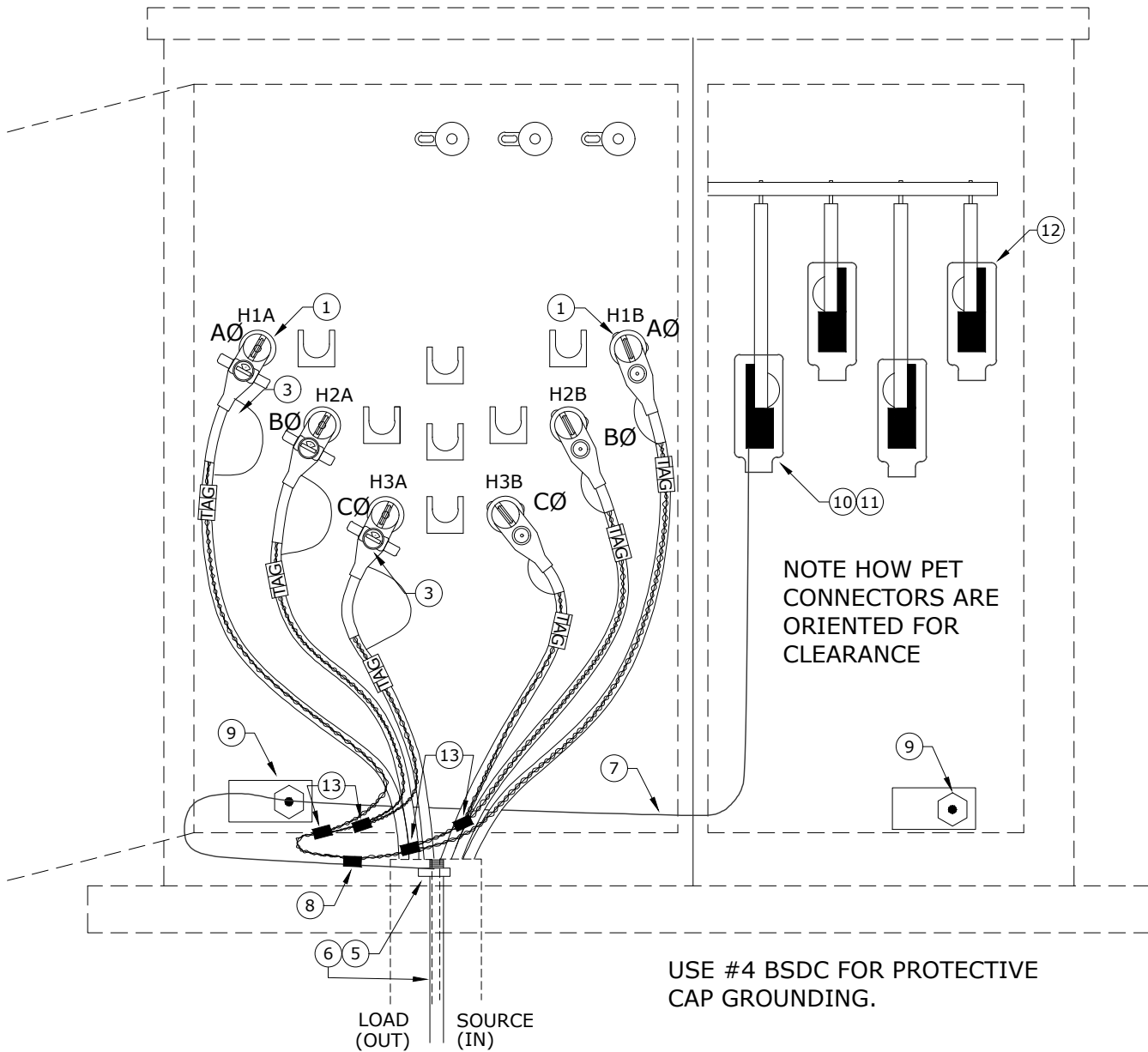
CAD FILE:  
UT24-UT28

### REVISIONS

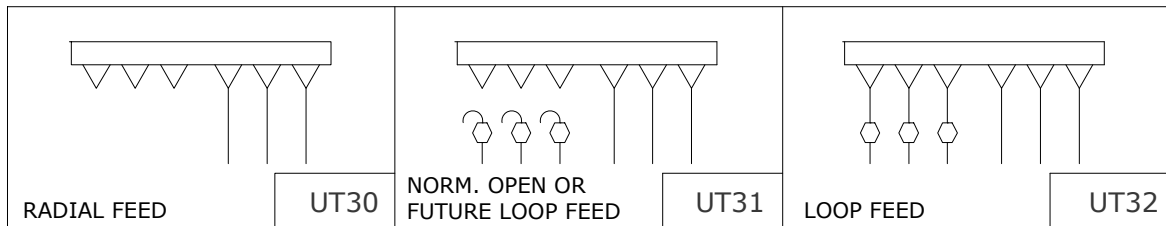
△	DATE	ENGR	OPS
1	7/15/02	JEH	TR
2	9/23/04	LB	AH
3	12/29/04	LB	AH
4	4/29/09	CM	AH

△	APP:	SECTION
	DATE: 10/94	1400





**FRONT VIEW OF TRANSFORMER**  
(UT32 SHOWN)



NOTE: SPECIFY I.D. TAGS AS REQUIRED.

Rev 3: Changed to Voltage-reset fault indicators.



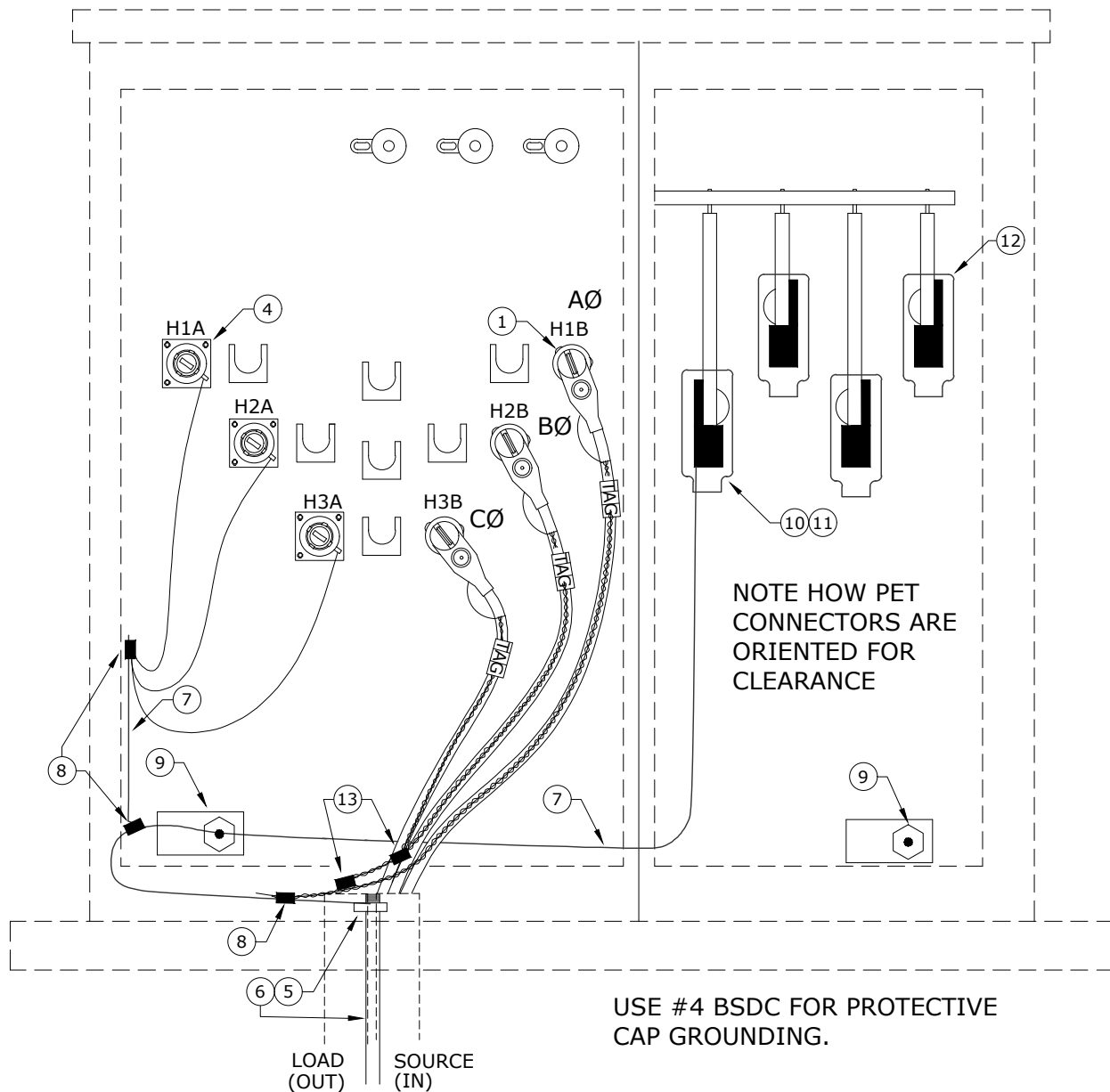
# **CONSTRUCTION STANDARDS** THREE PHASE PADMOUNT TRANSFORMER ASSEMBLIES

PAGE:  
1 of 3

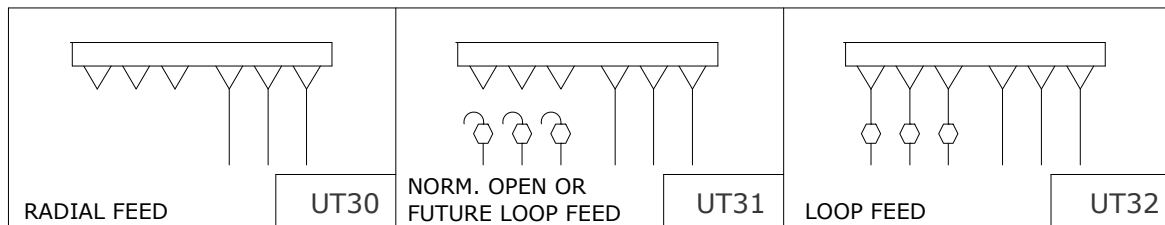
**UT30-UT32**

CAD FILE:  
UT30

REVISIONS			
Δ	DATE	ENGR	OPS
1	2/23/00	HWH	MA
2	9/23/04	LB	AH
3	4/29/09	CM	AH
Δ			
APP:		SECTION	
DATE: 10/99		1400	



**FRONT VIEW OF TRANSFORMER**  
(UT30 SHOWN)



NOTE: SPECIFY I.D. TAGS AS REQUIRED.

Rev 3: Changed to Voltage-reset fault indicators.



# **CONSTRUCTION STANDARDS** THREE PHASE PADMOUNT TRANSFORMER ASSEMBLIES

PAGE:  
2 of 3

**UT30-UT32**

CAD FILE:  
UT30

REVISIONS			
Δ	DATE	ENGR	OPS
1	2/23/00	HWH	MA
2	9/23/04	LB	AH
3	4/29/09	CM	AH
Δ			
APP:		SECTION	
DATE: 10/99		1400	

Rev 3: Changed to Voltage-reset fault indicators.

ITEM NO.	DESCRIPTION	UT30	
		QTY.	S/N
1	Elbow, Loadbreak, 1/0, 200A, 175 mil	3	1312
4	Cap, Protective Insulated 200A	3	265
5	Clamp, Ground Rod 5/8", Small	1	281
6	Rod, Ground 5/8" x 8'	1	1124
7	Conductor, Wire BSDC #4 SLD	10	376
8	Connector, Crimpet, #4 to #2 (2C4)	1	454
9	Ground Lug	2	842
10	Connector, PET, #2-750 Al/Cu, 6 Position	4	2129
11	Bolt, Machine, 1/2 x 2" SS w/ Bronze Nut & Belleville Washer	16	1389
12	Cover, PET, 8 Position	4	2182
13	Connector, Crimpet, #2 to #2 (2C2)	2	455

ITEM NO.	DESCRIPTION	UT31	
		QTY.	S/N
1	Elbow, Loadbreak, 1/0, 200A, 175 mil	6	1312
2	Bushing, Standoff Insulated 200A	3	252
3	Voltage-Reset Fault Indicator, 400A Trip, 1Ø UG	3	2694 *
4	Cap, Protective Insulated, 200A	3	265
5	Clamp, Ground Rod 5/8", Small	1	281
6	Rod, Ground 5/8" x 8'	1	1124
7	Conductor, Wire BSDC #4 SLD	10	376
8	Connector, Crimpet, #4 to #2 (2C4)	1	454
9	Ground Lug	2	842
10	Connector, PET, #2-750 Al/Cu, 6 Position	4	2129
11	Bolt, Machine, 1/2 x 2" SS w/ Bronze Nut & Belleville Washer	16	1389
12	Cover, PET, 8 Position	4	2182
13	Connector, Crimpet, #2 to #2 (2C2)	4	455

ITEM NO.	DESCRIPTION	UT32	
		QTY.	S/N
1	Elbow, Loadbreak, 1/0, 200A, 175 mil	6	1312
3	Voltage-Reset Fault Indicator, 400A Trip, 1Ø UG	3	2694 *
5	Clamp, Ground Rod 5/8", Small	1	281
6	Rod, Ground 5/8" x 8'	1	1124
7	Conductor, Wire BSDC #4 SLD	10	376
8	Connector, Crimpet, #4 to #2 (2C4)	1	454
9	Ground Lug	2	842
10	Connector, PET, #2-750 Al/Cu, 6 Position	4	2129
11	Bolt, Machine, 1/2 x 2" SS w/ Bronze Nut & Belleville Washer	16	1389
12	Cover, PET, 8 Position	4	2182
13	Connector, Crimpet, #2 to #2 (2C2)	4	455



## CONSTRUCTION STANDARDS

### THREE PHASE PADMOUNT TRANSFORMER ASSEMBLIES

PAGE:  
3 of 3

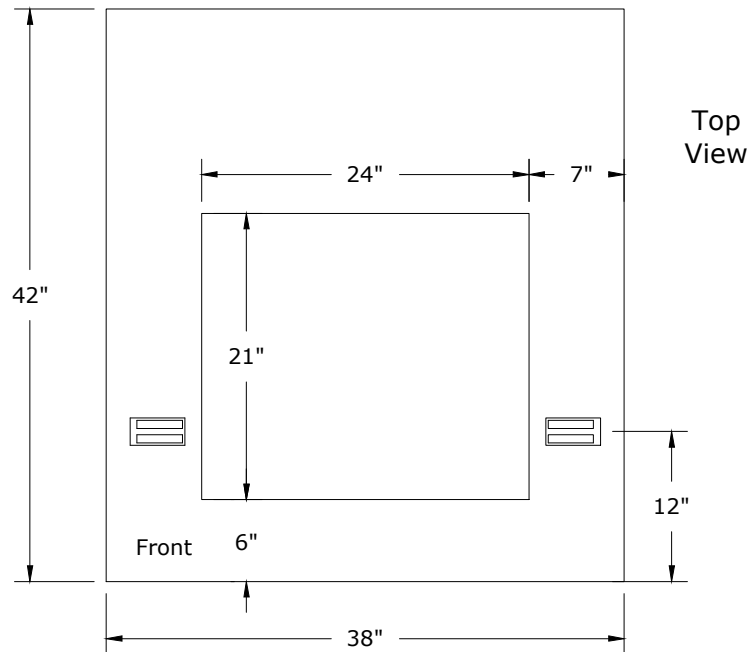
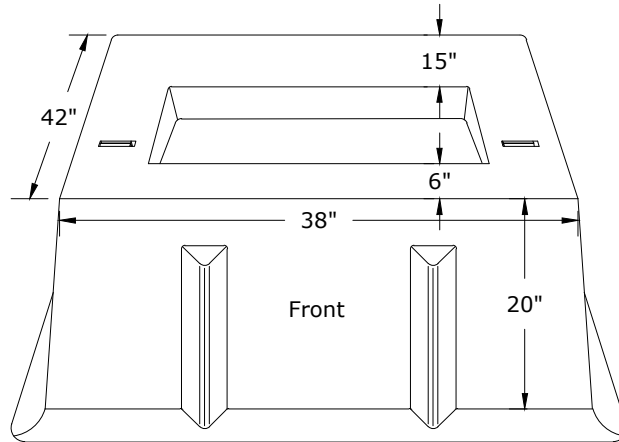
UT30-UT32


CAD FILE:  
UT30

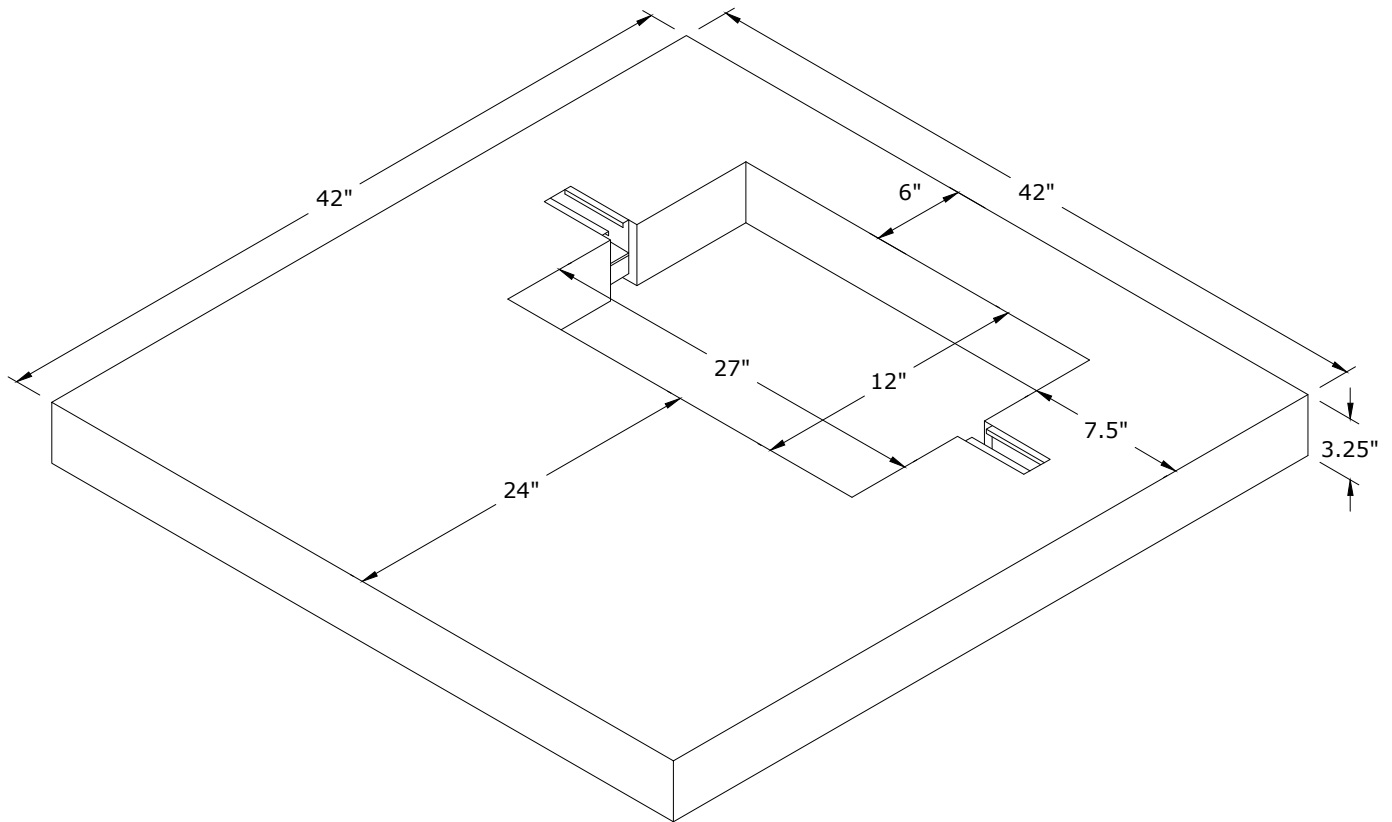
#### REVISIONS

△	DATE	ENGR	OPS
1	2/23/00	HWH	MA
2	9/23/04	LB	AH
3	4/29/09	CM	AH

△	APP:	SECTION
DATE:	10/99	1400





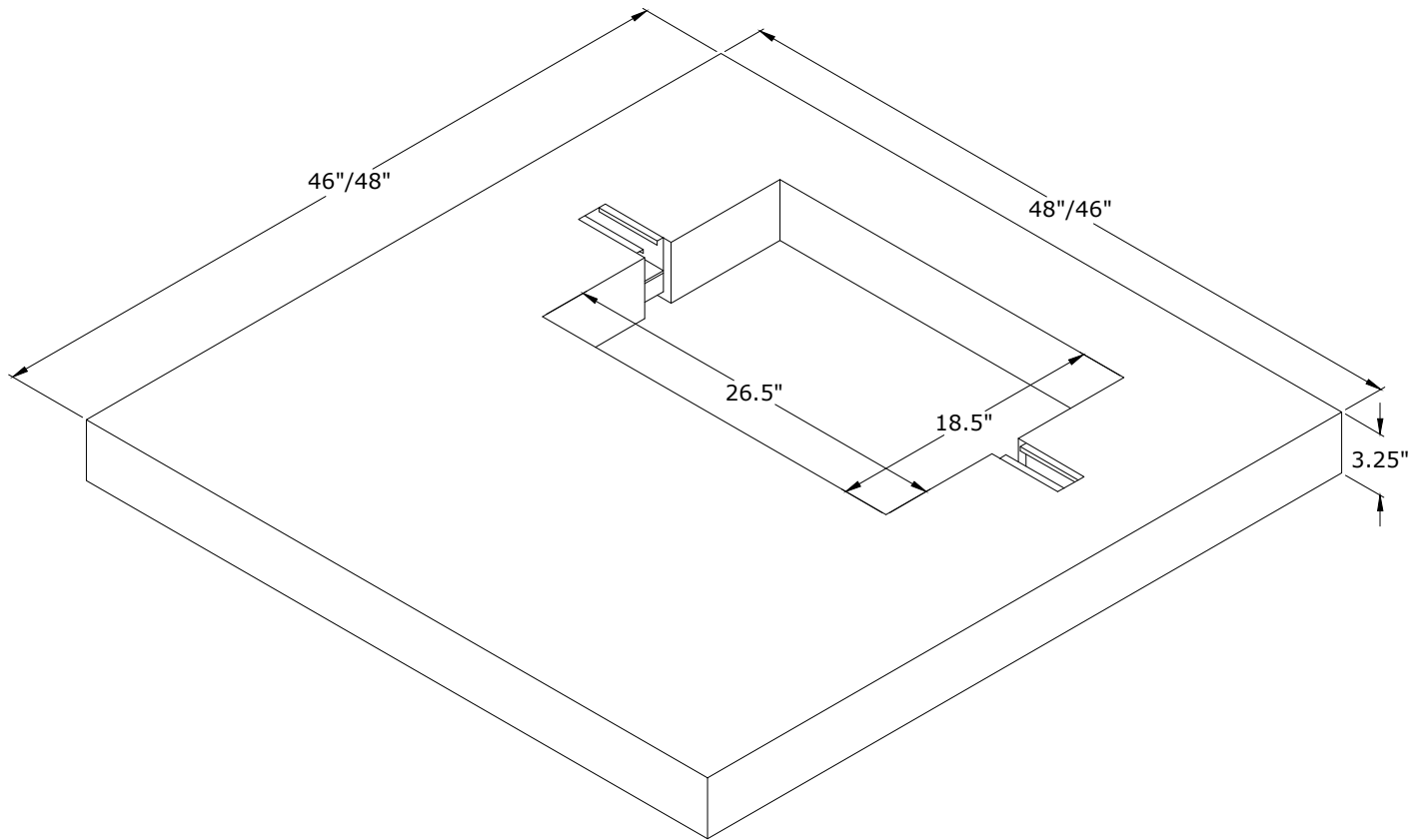
ITEM NO.	DESCRIPTION	REVISIONS	
		QTY.	S/N
1	Box Pad, 1Ø Transformer, Fiberglass	1	2433
<div>  <div> <div>CONSTRUCTION STANDARDS</div> <div>SINGLE PHASE PADMOUNT TRANSFORMER BOXPAD (BASEMENT)</div> </div> </div>		<div> <div> <div>△</div> <div>DATE</div> </div> <div> <div>ENGR</div> <div>OPS</div> </div> </div>	
		<div> <div>APP: KJP</div> <div>DATE: 12/29/04</div> </div>	<div>SECTION 1400</div>
<div> <div>PAGE: 1 of 1</div> <div>UTB</div> </div>		<div> <div>CAD FILE: UTB</div> </div>	



Note: See Std UTP3 - 1Ø Transformer Pad Orientation and Conduit Installation 25-75kVA (page 1) - for installation instructions. ✱

Rev. 2 - Changed from plastic pad to polyconcrete, updated note, and added material issue.

ITEM NO.		DESCRIPTION	UTP1				
			QTY.	S/N			
1		Pad, Transformer, 42" x 42", 1Ø, 25-75kVA		1	929		
<div>Clark Public Utilities</div> 		CONSTRUCTION STANDARDS  1Ø TRANSFORMER PAD 25 to 75 kVA		REVISIONS			
					DATE	ENGR	OPS
				1	2/23/00	HWH	MA
				2	12/9/20	CM	GM
PAGE: 1 of 1		UTP1		CAD FILE: UTP1			
				APP: HWH/GW DATE: 1/22/80			
				SECTION 1400			




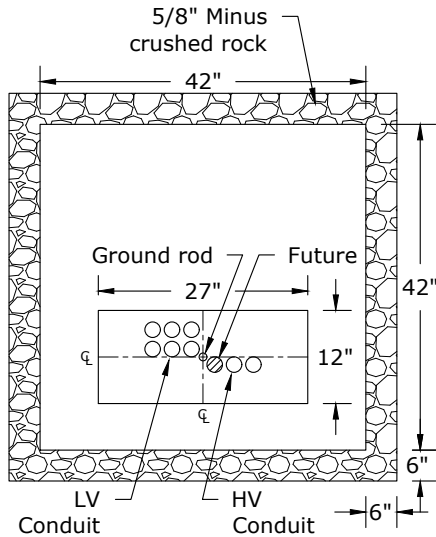
**Notes:** \*

1. See Std UTP3 - 1Ø Transformer Pad Orientation and Conduit Installation 100KVA (page 2) - for installation instructions.
2. Armorcast pad is 48" W x 46" L. Quazite pad is 46" W x 48" L.

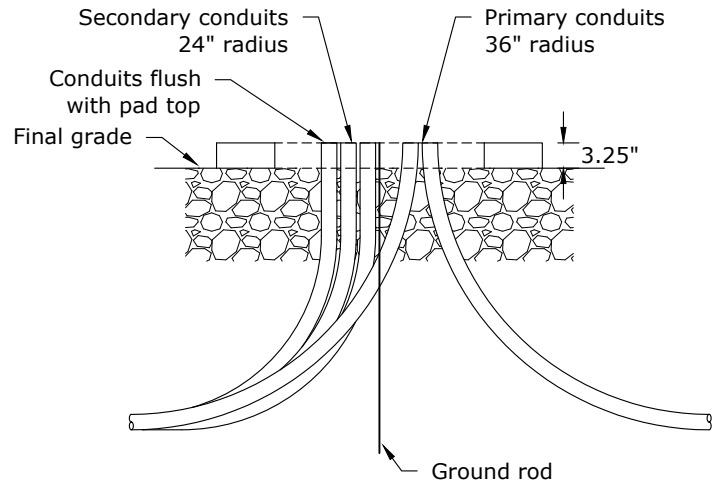
Rev. 2 - Updated drawing, notes, and added material issue.

ITEM NO.	DESCRIPTION	UTP2	
		QTY.	S/N
1	Pad, Transformer, 48" x 46", 1Ø, 100kVA only	1	930

<div>Clark Public Utilities</div> 	<div>CONSTRUCTION STANDARDS</div> <div>1Ø TRANSFORMER PAD</div> <div>100 kVA</div>		REVISIONS						
			<div><div>R</div></div>	DATE	ENGR	OPS			
			1	2/23/00	HWH	MA			
			2	12/9/20	CM	GM			
PAGE: 1 of 1		UTP2		CAD FILE: UTP2		APP: HWH/GW DATE: 1/22/80		SECTION 1400	



25-75 KVA PAD  
PLAN VIEW



FRONT VIEW

### 1Ø PADMOUNT TRANSFORMER CONDUIT ORIENTATION (25-75 KVA)

#### Notes:

1. AIC for 25 to 75 kVA transformers is 10,000 A.
2. High and low voltage conduits must be within their designated areas.
3. All conduits shall be in place and approved prior to transformer installation.
4. It shall be the responsibility of the owner or owner's representative to comply with all applicable code requirements.
5. The pad shall be furnished by the customer.
6. The front side must have 10 feet clear access for maintenance. See Std UTPC - Padmount Transformer Clearances.
7. All future conduit ends shall extend past the edge of the pad by 48 inches minimum.
8. Radius of secondary conduit elbow shall be 24 inches.
9. Depth of burial of conduits shall be as shown on Std UA1.
10. The pad shall be located so that no part of the transformer is closer than 10 feet to a combustible surface, windows or doors, or 3 feet to a non-combustible structure. See clearances in CPU Residential Handbook.
11. Minimum primary conduit size shall be 2 inches.
12. Backfill under the transformer pad must be 5/8" minus crushed rock compacted in multiple lifts. The rock layer must be a minimum of 12-inches thick below the pad. Soil stability may require more. The rock base shall extend 6 inches beyond the pad on all four sides.

Rev. 2 - Added 100kVA from UTP6, updated drawing and notes.



## CONSTRUCTION STANDARDS

### 1Ø TRANSFORMER PAD ORIENTATION AND CONDUIT INSTALLATION 25-75 KVA

PAGE:  
1 of 2

UTP3

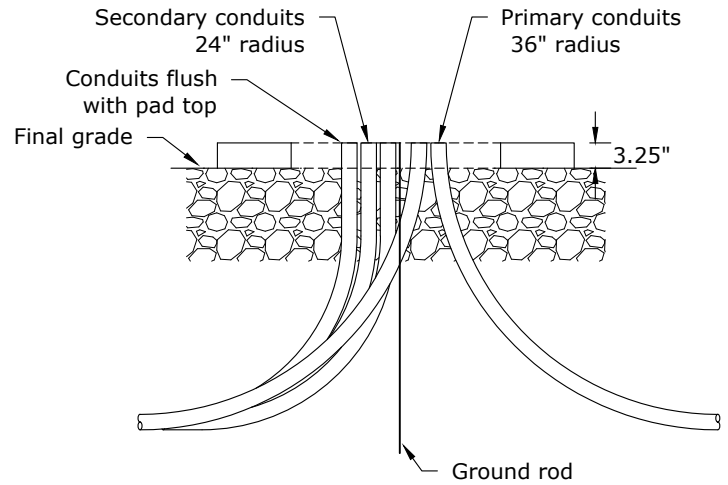
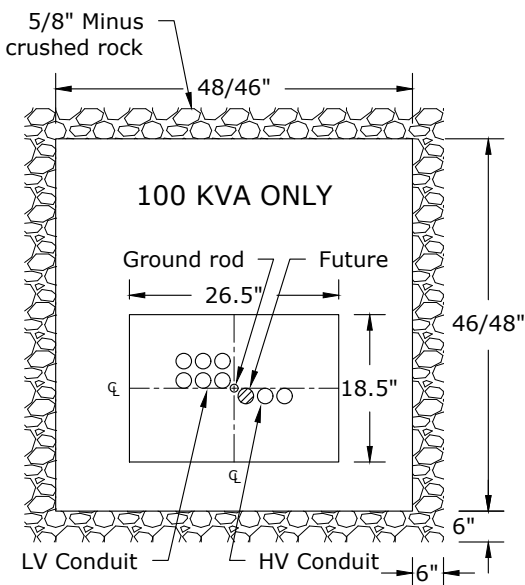
CAD FILE:  
UTP3

#### REVISIONS

Δ	DATE	ENGR	OPS
0	2/23/00	HWH	MA
1	1/26/04	LB	AH
2	12/9/20	CM	GM

APP: HWH/GW  
DATE: 1/22/80

SECTION  
1400



### 1Ø PADMOUNT TRANSFORMER CONDUIT ORIENTATION (100 KVA)

Notes:


1. AIC for 100 kVA transformer is 14,000 A.
2. High and low voltage conduits must be within their designated areas.
3. All conduits shall be in place and approved prior to transformer installation.
4. It shall be the responsibility of the owner or owner's representative to comply with all applicable code requirements.
5. The pad shall be furnished by the customer.
6. The front side must have 10 feet clear access for maintenance. See Std UTPC - Padmount Transformer Clearances.
7. All future conduit ends shall extend past the edge of the pad by 48 inches minimum.
8. Radius of secondary conduit elbows shall be 24 inches.
9. Depth of burial of conduits shall be as shown on Std UA1.
10. The pad shall be located so that no part of the transformer is closer than 10 feet to a combustible surface, windows or doors or 3 feet to a non-combustible structure. See clearances in CPU Residential Handbook.
11. Minimum primary conduit size shall be 2 inches.
12. Backfill under the transformer pad must be 5/8" minus crushed rock compacted in multiple lifts. The rock layer must be a minimum of 12-inches thick below the pad. Soil stability may require more. The rock base shall extend 6 inches beyond the pad on all four sides.

Rev. 2 - Added 100kVA from UTP6, updated drawing and notes.

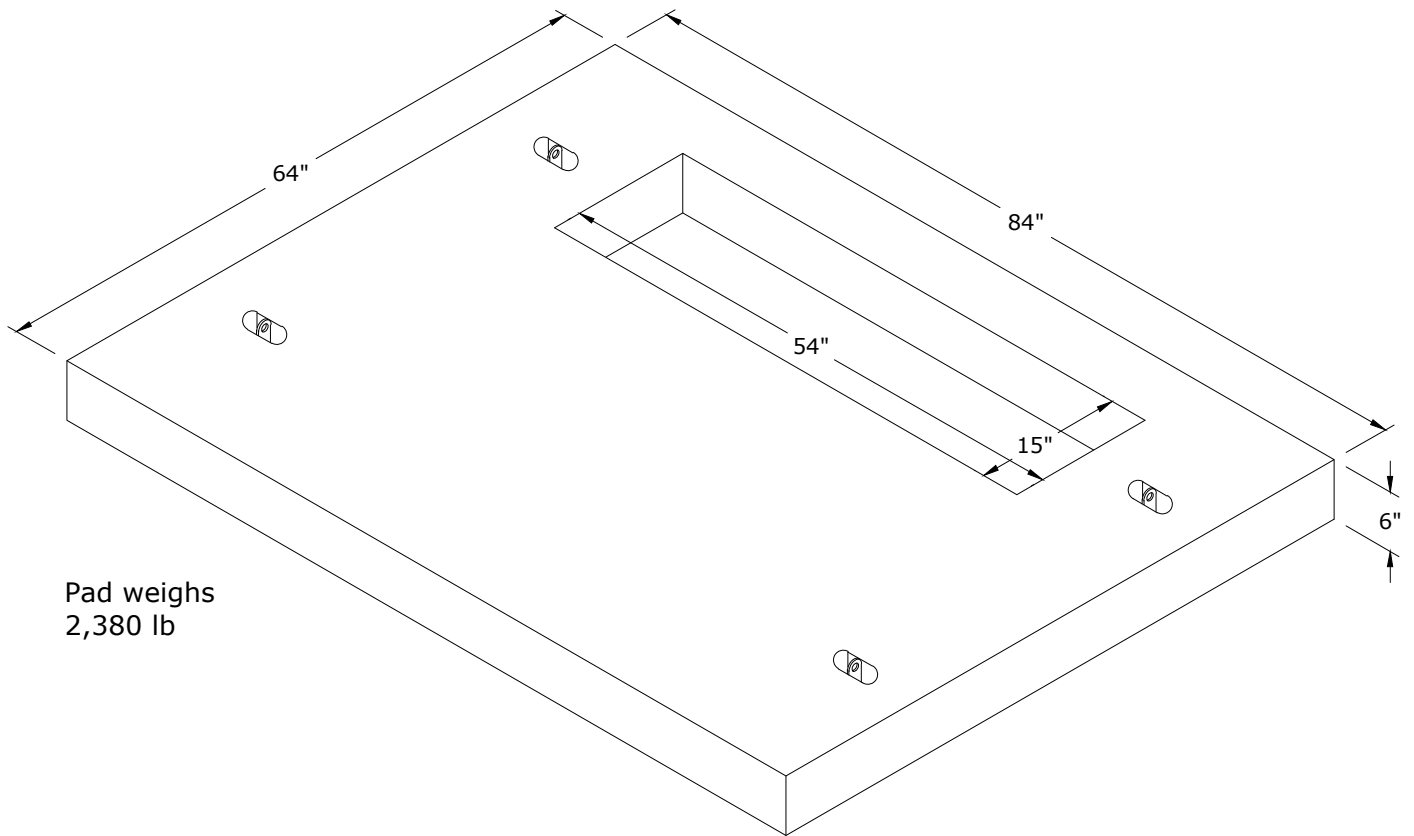


## CONSTRUCTION STANDARDS

# 1Ø TRANSFORMER PAD ORIENTATION AND CONDUIT INSTALLATION 100 KVA

REVISIONS			
	DATE	ENGR	OPS
0	2/23/00	HWH	MA
1	1/26/04	LB	AH
2	12/9/20	CM	GM
APP: HWH/GW		SECTION	
DATE: 1/22/80		1400	





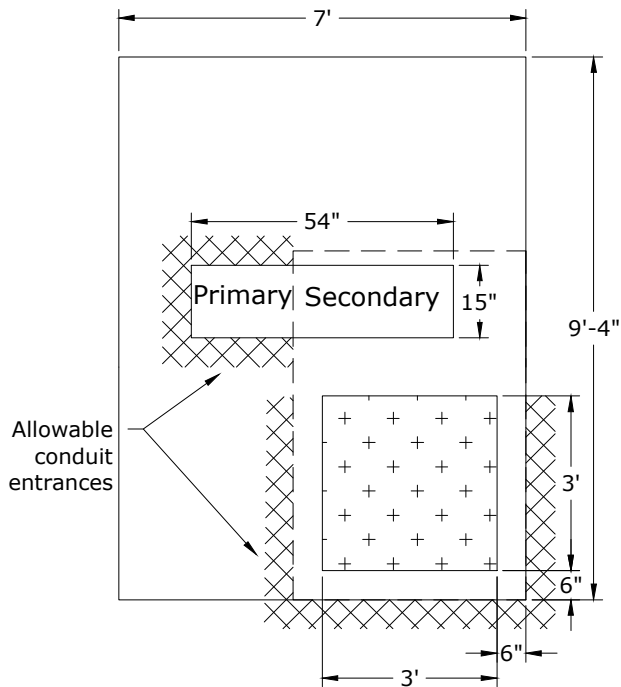


**Notes:**

1. This pad is available from Utility Vault/OldCastle catalog #UTP4 (CPU S/N 2170).
2. This pad is adequate up to 6 conductors per phase. See Std UTP5 - Precast Pad and Vault for 3Ø Transformers - if more conductors are required.
3. See Std UPT6 - 3Ø Transformer Pad Orientation and Conduit Installation - for installation instructions.

Rev. 2 - Updated dimensions, added weight, and removed reinforcement detail.

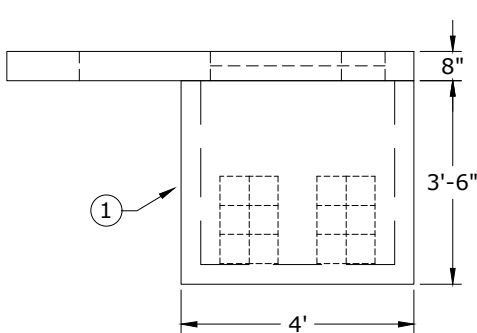
		<b>CONSTRUCTION STANDARDS</b> 3Ø TRANSFORMER PAD 75 to 1500 kVA		REVISIONS			
					DATE	ENGR	OPS
				0	2/23/00	HWH	MA
				1	8/17/03	LB	DK
				2	12/9/20	CM	GM
PAGE: 1 of 1		UTP4		CAD FILE: UTP4		APP: HWH/GW DATE: 1/22/80	SECTION 1400



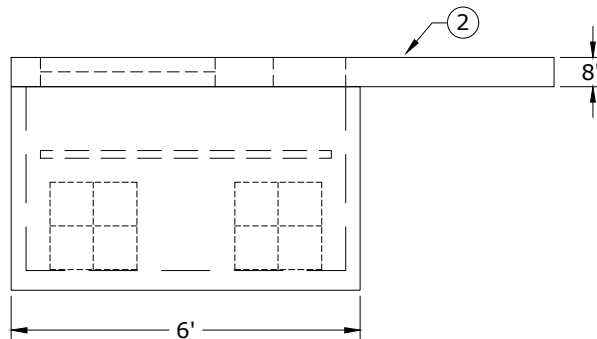
Top View

**Materials:**

1. Vault 6' x 4' x 3'-6" - Oldcastle Part #644LA
2. Pad 7' x 9'-4" x 8" with 15" x 54" opening - Oldcastle Part #0370133.



Front View



Side View

**Notes:**

1. Locking bolts shall be 1/2" pentahead bolt.
2. Backfill under the vault and transformer pad must be 5/8" minus crushed rock compacted in lifts. The rock layer must be a minimum of 12-inches thick below the pad and vault. Soil stability may require more. The rock base shall extend 6 inches beyond the pad on all four sides.
3. Customer shall install both components shown. All secondary conduits go into 644 vault and enter only in the areas shown. All secondary cables shall have a minimum 10 feet of excess in vault for makeup.
4. All primary conduits shall enter the pad from outside of the vault and only in the locations shown.
5. This pad and vault are required if more than 6 cables per leg are being installed. The maximum number of secondary runs is 8.
6. Install bell ends in conduit in knockouts and grout inside and outside to be even with vault walls.

Rev. 1 - Renamed from UTP4-6, and updated drawing.



**CONSTRUCTION STANDARDS**

PRECAST PAD AND VAULT  
FOR 3Ø TRANSFORMERS

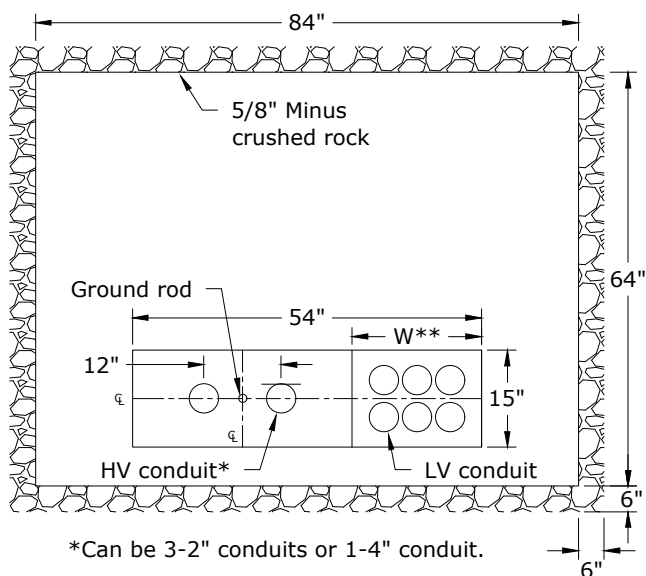
PAGE:  
1 of 1

**UTP5**

CAD FILE:  
UTP5

**REVISIONS**

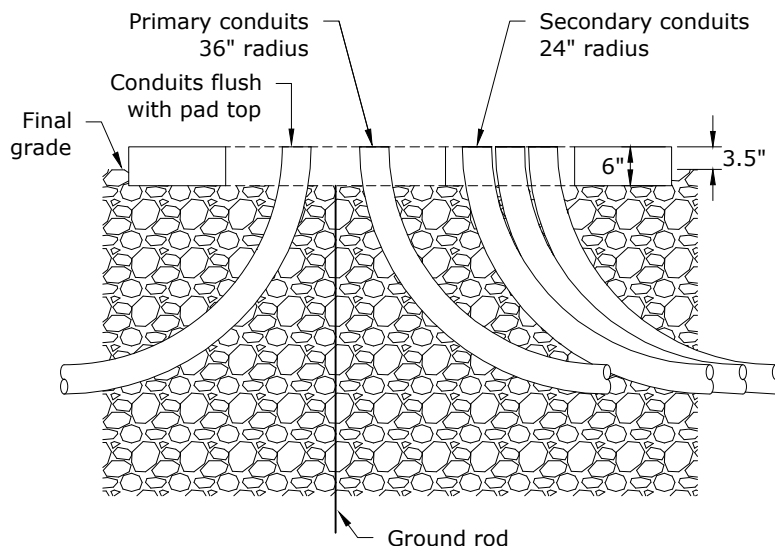
Δ	DATE	ENGR	OPS
1	12/9/20	CM	GM
APP:	GW	SECTION	
DATE:	12/18/87	<b>1400</b>	



KVA	TYPICAL ** "W" INCHES
75 - 300	20
500	22
750 - 1500	28

\*\*Varies by manufacturer

PLAN VIEW




FRONT VIEW

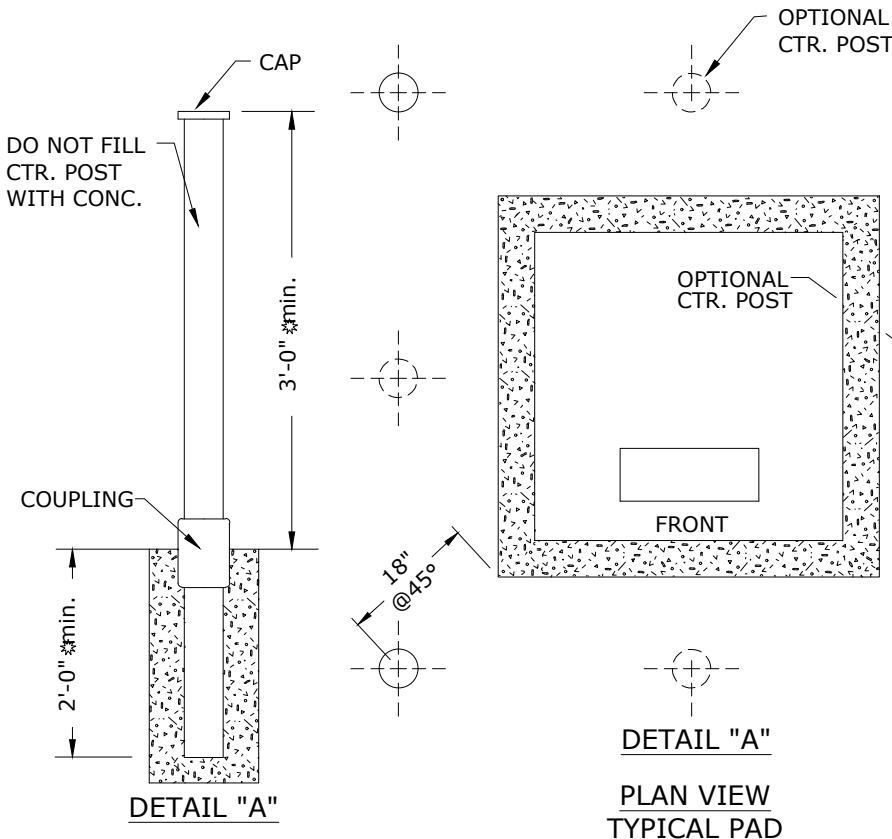
### 3Ø Padmount Transformer Conduit Orientation

#### Notes:

1. The concrete pad and all conduits shall be in place and approved by the CPU Inspector prior to transformer installation.
2. Refer to Std UPTC - Padmount Transformer Clearances - and the CPU Commercial Handbook for clearances.
3. See Std UTP4 - 3Ø Transformer Pad 75 to 1500 kVA - for concrete pad details.
4. Backfill under the transformer pad must be 5/8" minus crushed rock compacted in multiple lifts. The rock layer must be a minimum of 12-inches thick below the pad. Soil stability may require more. The rock base shall extend 6 inches beyond the pad on all four sides.

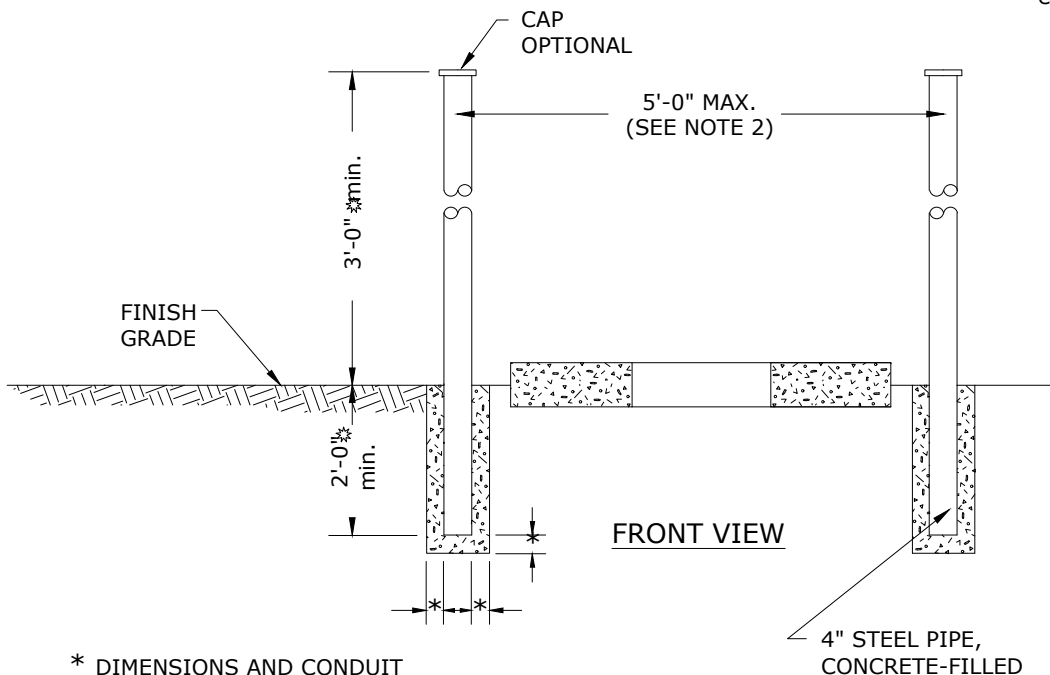
Rev. 5 - Added 4" primary conduit drawing, moved 1Ø to UTP3, and updated drawing and notes.

	<h1>CONSTRUCTION STANDARDS</h1> <h2>3Ø TRANSFORMER PAD ORIENTATION AND CONDUIT INSTALLATION</h2>			REVISIONS			
				<div><div></div><div></div></div>	DATE	ENGR	OPS
				2	7/15/02	JEH	TR
				3	1/26/04	LB	AH
				4	12/29/04	LB	AH
	5	12/9/20	CM	GM			
	PAGE: 1 of 1	UTP6			CAD FILE: UTP6		APP: DATE: 10/98



### Notes:

1. Typical locations of barriers positioning will vary depending on the following conditions.
  - a. Physical location of equipment with respect to hazards.
  - b. Type of equipment to be protected and accessibility required.
2. If distance between corner barriers exceeds 5 ft., A ctr. post may be required similar to corner post except center post on front side of padmount device may be constructed as det. "A".
3. Project Engineer will determine and indicate number, size, and position of barrier posts.
4. Posts of 4" steel pipe, concrete-filled or substitute of equal strength to be set in concrete. Use same mixture as pad.
5. See WAC 296-46-480 Para. 4, rules and regulations for installing electric wires and equipment.



\* DIMENSIONS AND CONDUIT SIZE TO BE PROVIDED BY PROJECT ENGINEER.

Rev 2: Corrected dimensions on barrier to match Commercial Electric Service Handbook.



## CONSTRUCTION STANDARDS

TYPICAL BARRIER INSTALLATION TO PROTECT PADMOUNTED EQUIPMENT

PAGE:  
1 of 1

UTP9

CAD FILE:  
UTP9

### REVISIONS

DATE	ENGR	OPS
2/23/00	HWH	MA
5/30/07	LB	AH
12/14/09	KJP	

APP:	SECTION
DATE: 9/94	1400

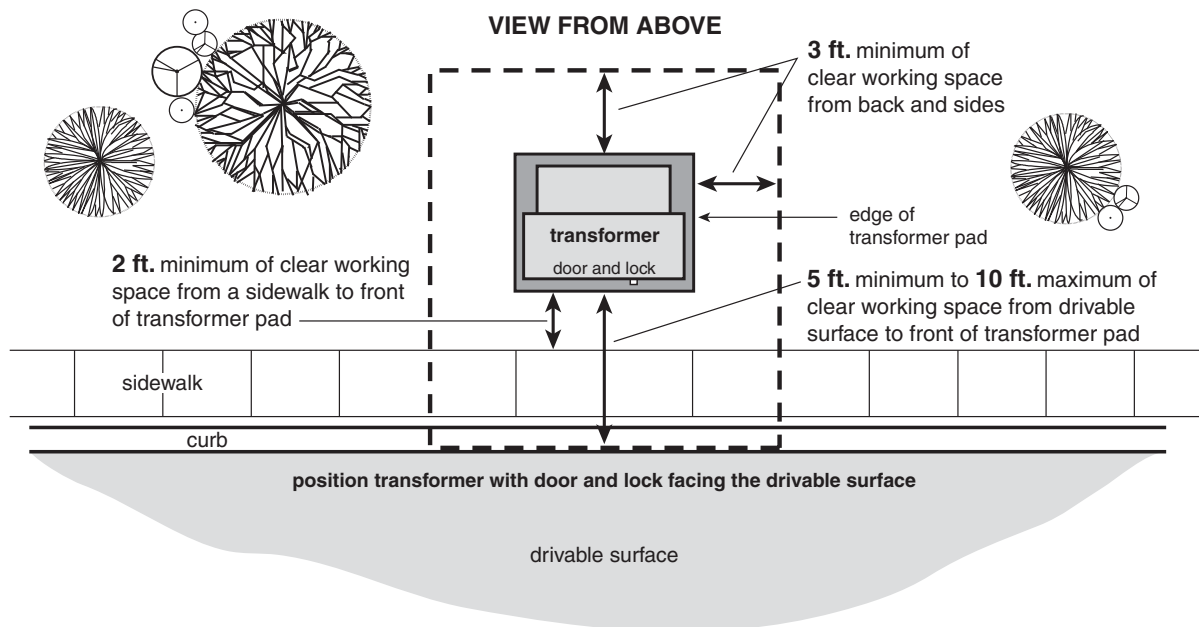
### ***Transformer location and access***

Underground electrical facilities must be readily accessible by the utility during construction and for future operation and maintenance. The area around padmounted electrical equipment must provide a clear and level working space and remain free from obstructions such as landscaping, poles, retaining walls, structures, fences, etc.

All transformers and padmounted equipment are to be located:

- ▶ Within 10 feet of a drivable surface but not closer than 5 feet (**Figure 3**).
- ▶ With the front of the equipment (door and lock side) facing toward the drivable surface.
- ▶ With the transformer pad parallel to the edge of the drivable surface.
- ▶ Allowing 10 feet of clearance in front and 3 feet from the back and sides of the equipment (**Figure 3**).
- ▶ At least 2 feet from a sidewalk for pedestrian safety.

**Figure 3** Commercial padmounted transformer location and access

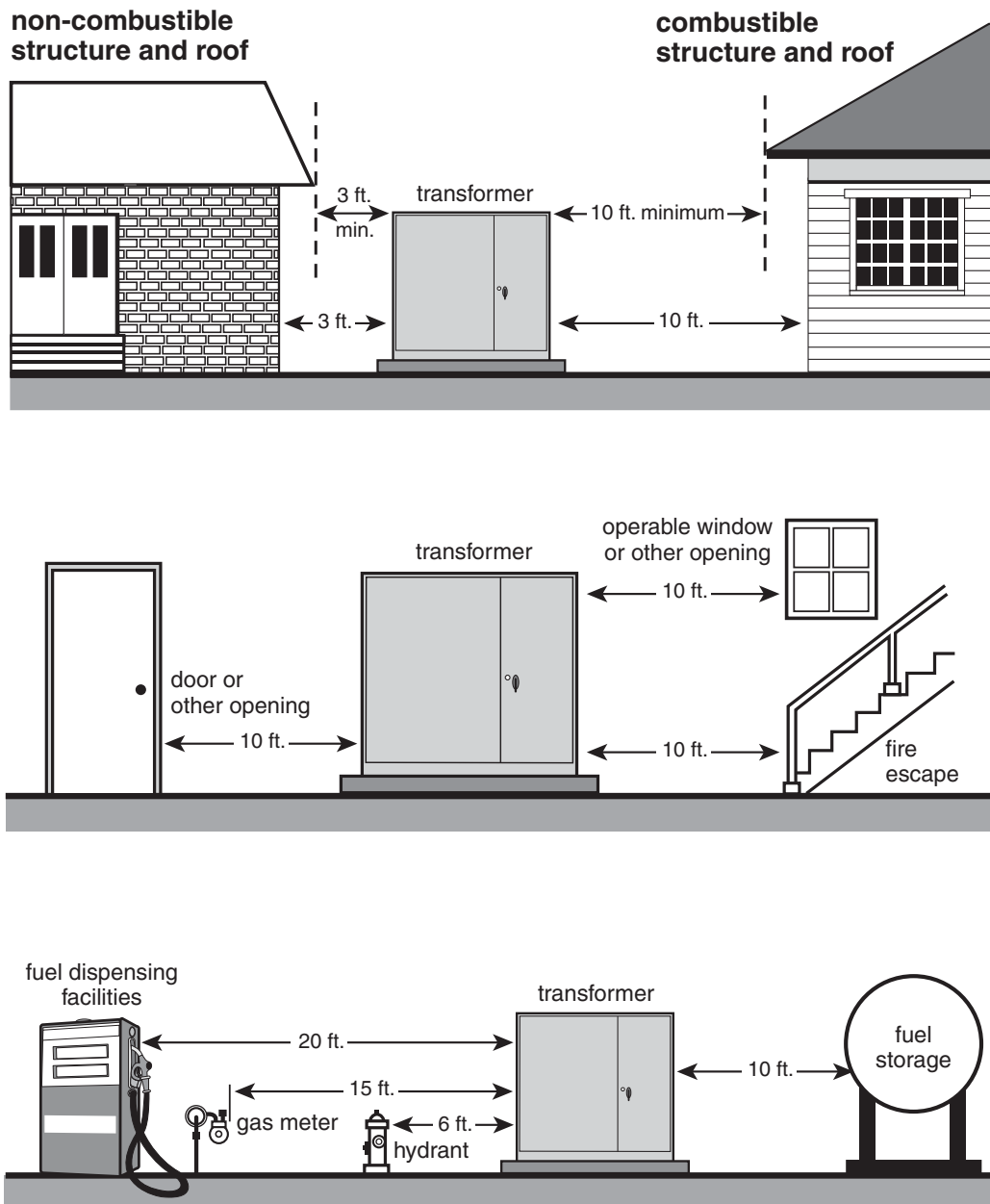


### ***Transformer safety clearances***

Clearances from padmounted transformers to structures are measured from the nearest metal portion of the transformer to the structure or any overhang. The clearance from a building is 10 feet if the building has combustible walls, and 3 feet if the building has non-combustible walls as shown in **Figure 4**.

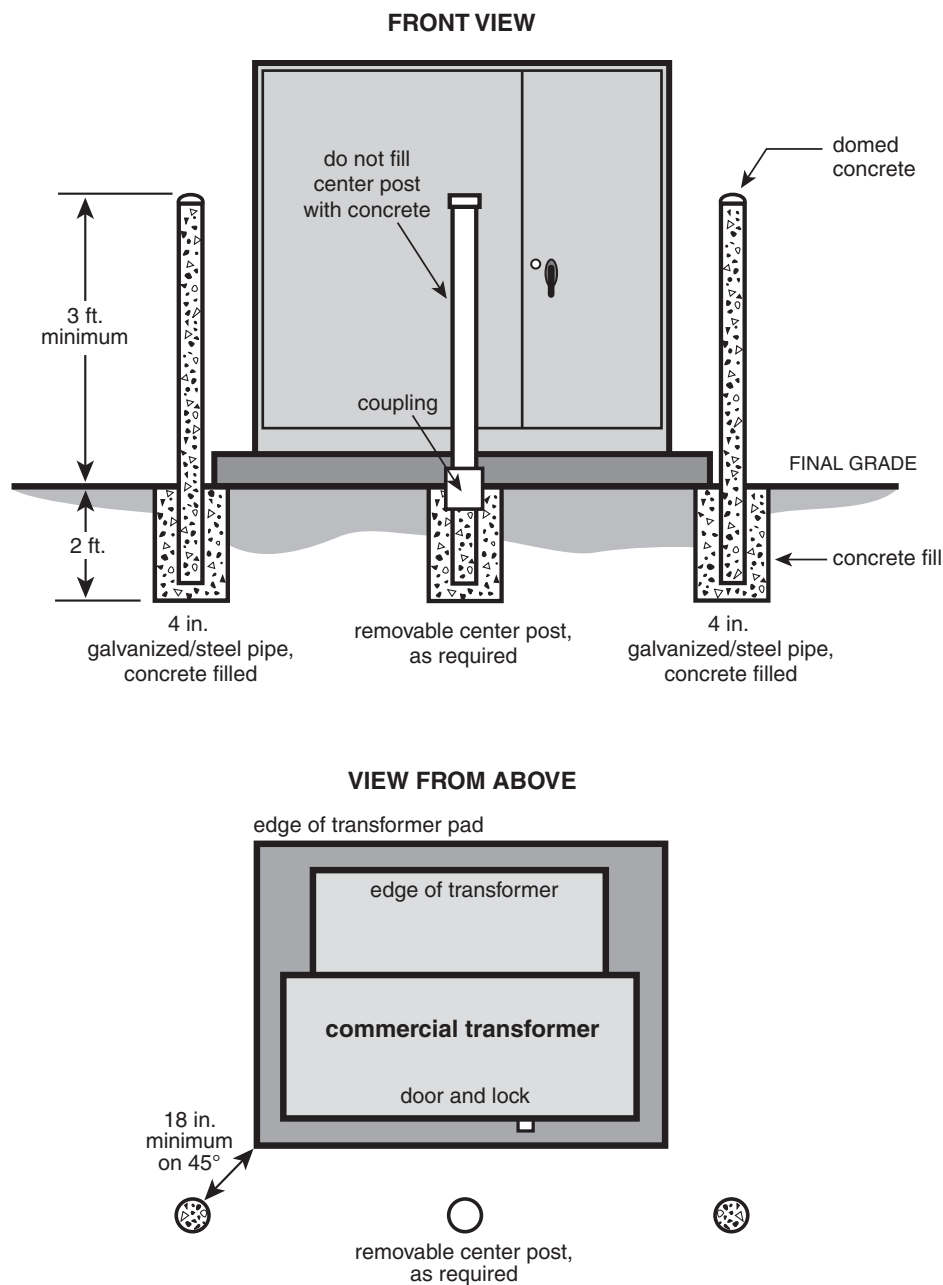
**Table 4** provides additional safety clearances that apply to any oil-filled electrical equipment.

**Figure 4** Commercial padmounted transformer minimum safety clearances



- ▶ If the distance between the corner posts exceeds 5 feet, a removable center post is required (*Figure 5*).
- ▶ If a removable center post is installed, the threaded joint requires treatment with an anti-seizing agent.
- ▶ Paint exposed section of post “traffic yellow.”

**Figure 5** Guard post (bollard) installation for commercial transformers



**NOTE:** Additional guard posts may be required at back and sides of transformer.

# 1500

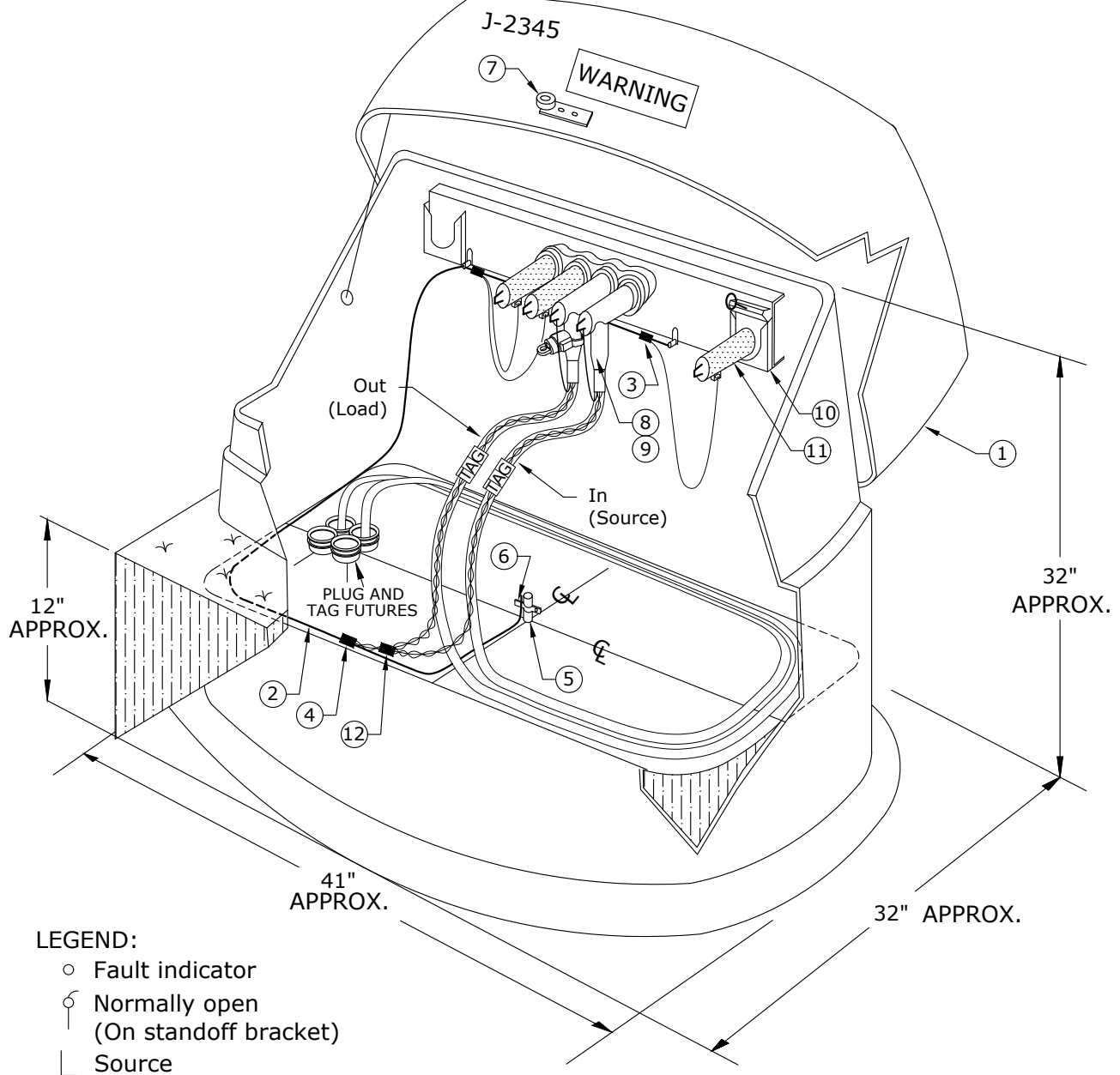
## UNDERGROUND J-BOXES & VAULTS

12/19/2022

~	UJ1	1Ø Junction Box 4-Way
~	UJ2	1Ø Junction Box 5-Way
~	UJ3	3Ø Junction Box 4-Way
<b>C</b>	UJ3F	3Ø Junction Box 4-Way Flush-Mount
~	UJ4	3Ø Junction Box 5-Way
~	UJM	Primary Junction Box 1Ø & 3Ø Material List
~	UJMP	Junction Box Marker
~	ULE	Loop Enclosure
~	UVG1,UVG2	Underground Vault Grounding System

<b>N</b>	New Standard
<b>R</b>	Redrawn Standard
<b>C</b>	Changed Standard
~	No Change





Rev. 5 - Added "Plug and Tag Future Conduits" to drawings, added Notes #4-6, and corrected material issue.

UJM4	UJM41	UJM42	UJM44	UJM45	UJM46	UJM47	UJM48	UJM49

ITEM NO.	DESCRIPTION	QTY	S/N
1	Box, Junction, 10", Fiberglass w/LBC4 Installed	1	194
2	Conductor, Cu, #4 Solid, 1C, Bare, Soft-Drawn	15	376
3	Connector, Crimpet, Cu, Run & Tap #6 Sol - #4 Str (4C4)	3	450
4	Connector, Crimpet, Cu, Run #4 Sol - #2 Str, Tap #8 Sol - #4 Str (2C4)	1	454
5	Rod, Ground 5/8" x 8'	1	1124
6	Clamp, Ground Rod, 5/8", Bronze, Small	1	281
7	Lock, Equipment, UG	1	837



## CONSTRUCTION STANDARDS

### 10" JUNCTION BOX 4-WAY

#### REVISIONS

Δ	DATE	ENGR	OPS
2	9/23/04	LB	AH
3	12/29/04	LB	AH
4	4/29/09	CM	AH
5	3/12/20	CM	GM

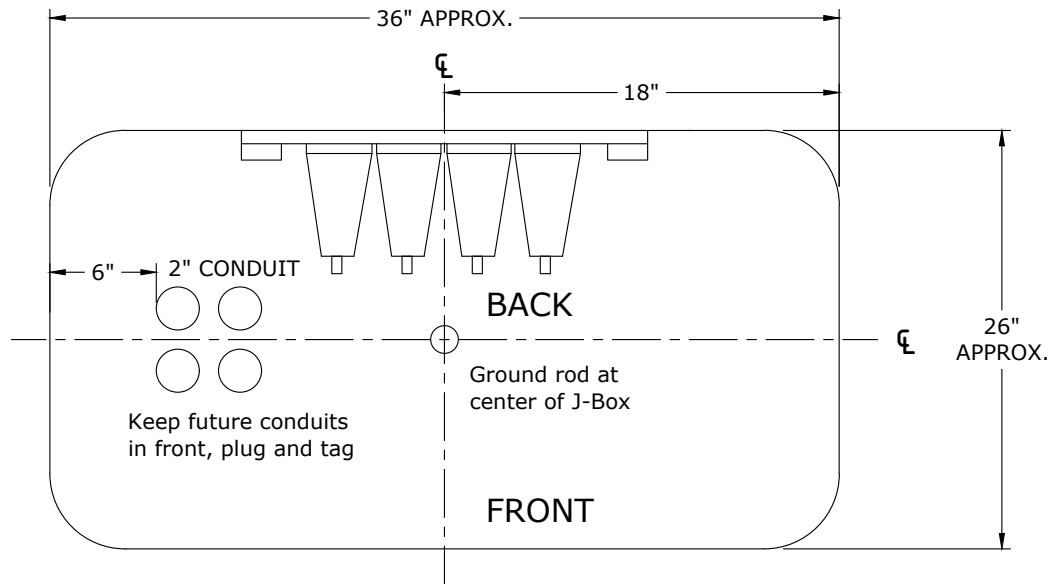
PAGE:  
1 of 2

UJ1

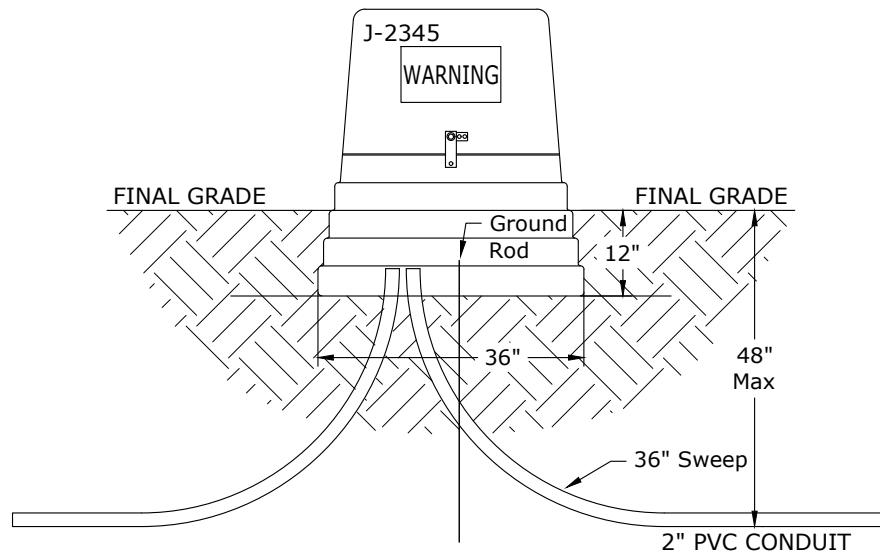
CAD FILE:  
UJ1

APP: HWH/GGW  
DATE: 1/22/80

SECTION  
1500



**Plan View 1-Phase J-Box**



**Primary J-Box Conduit Arrangement**

**Notes:**

1. Typical elbow arrangement is shown.
2. Do not put dirt inside junction box. Space is required for cable slack and operating clearance.
3. Leave cable slack for future operations.
4. Future conduits shall be plugged w/  
S/N 2697- 2" plastic conduit plug, or  
S/N 2698- 4" plastic conduit plug.
5. Futures should be tagged with direction and length of conduit. See Std UID2.
6. Proof conduit and install sequentially numbered, 2500 lb mule tape in all futures.

Rev. 5 - Added "Plug and Tag Future Conduits" to drawings, added Notes #4-6, and corrected material issue.



**CONSTRUCTION STANDARDS**

1Ø JUNCTION BOX  
4-WAY

PAGE:  
2 of 2

**UJ1**

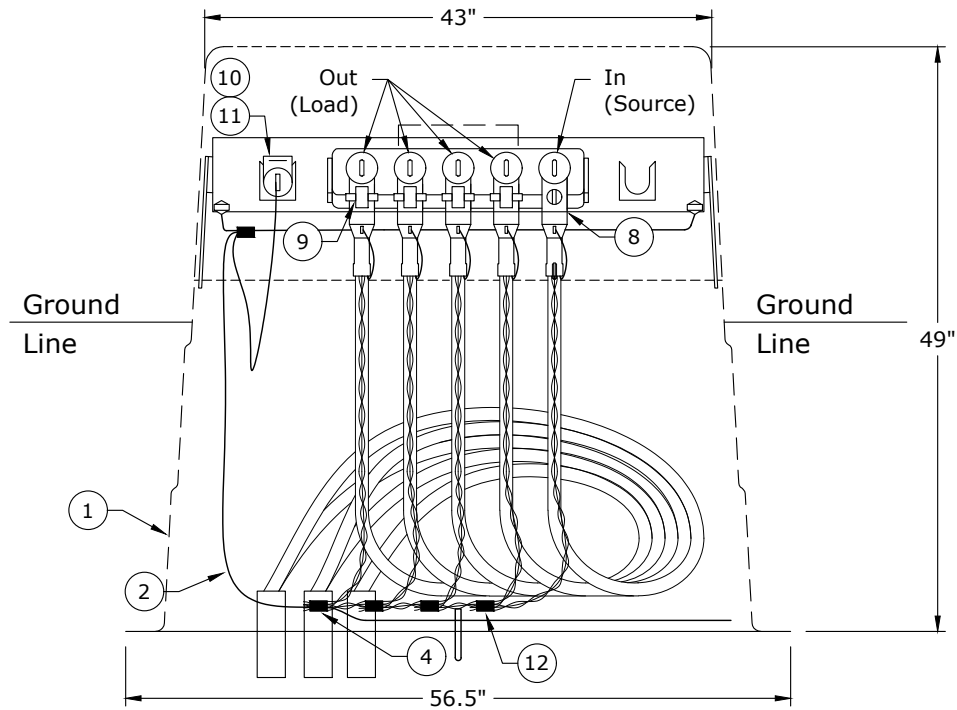
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UJ1

**REVISIONS**

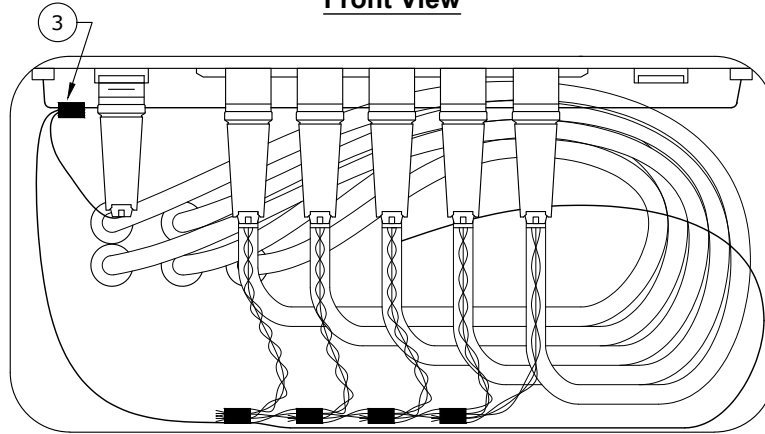
△ R	DATE	ENGR	OPS
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3	12/29/04	LB	AH
4	4/29/09	CM	AH
5	3/12/20	CM	GM

APP: HWH/GGW  
DATE: 1/22/80

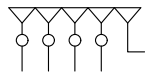
SECTION  
**1500**



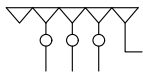
**Front View**



**Top View**



UJM5



UJM51

**LEGEND:**

○ Fault indicator

└ Source

ITEM	DESCRIPTION	QTY	S/N
1	Box, Jct., 1Ø, Fiberglass w/ LBC5 and 200A bushing inserts installed	1	2940
2	Conductor, Cu, #4 Sol, 1C, Bare, Soft Drawn	25	376
3	Connector, Crimpet, Cu, Run & Tap #6 Sol - #4 Str (4C4)	1	450
4	Connector, Crimpet, Cu, Run #4 Sol - #2 Str, Tap #8 Sol - #4 Str (2C4)	1	454
5	Rod, Ground 5/8" x 8'	1	1124
6	Clamp, Ground Rod 5/8", Bronze, Small	1	281
7	Lock, Equipment UG	1	837



**CONSTRUCTION STANDARDS**

1Ø JUNCTION BOX  
5-WAY

**REVISIONS**

DATE	ENGR	OPS

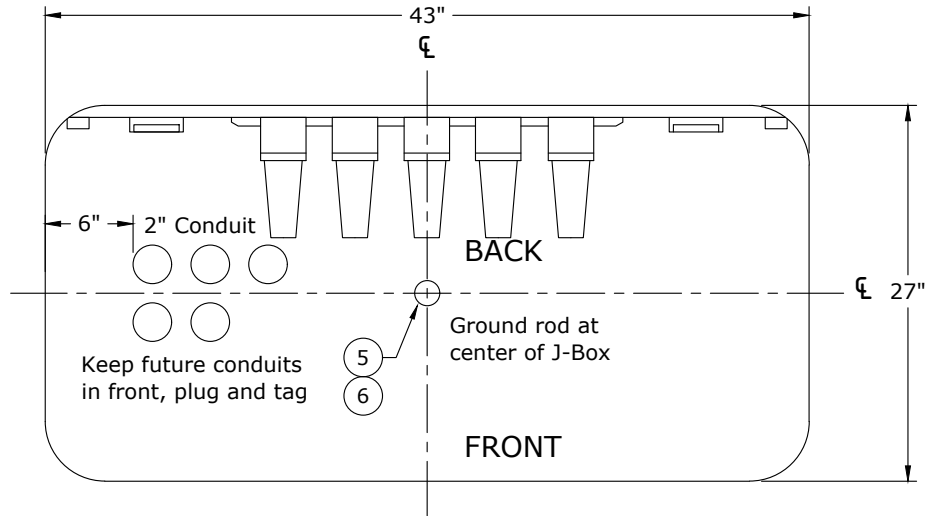
PAGE:  
1 of 2

**UJ2**

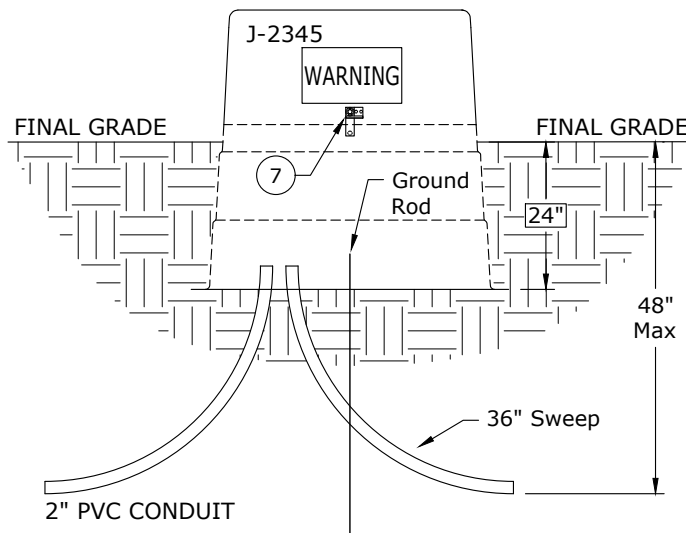
CAD FILE:  
UJ2

APP: CM/GM  
DATE: 3/12/20

SECTION  
**1500**



**Plan View**



**Primary J-Box Conduit Arrangement**

**Notes:**

1. Typical elbow arrangement is shown.
2. Do not put dirt inside junction box. Space is required for cable slack and operating clearance.
3. Leave cable slack for future operations.
4. Future conduits shall be plugged with S/N 2697 - 2" plastic conduit plug, or S/N 2698 - 4" plastic conduit plug.
5. Futures should be tagged with direction and length of conduit. See Std UID2.
6. Proof conduit and install sequentially numbered, 2500 lb mule tape in all futures.



**CONSTRUCTION STANDARDS**

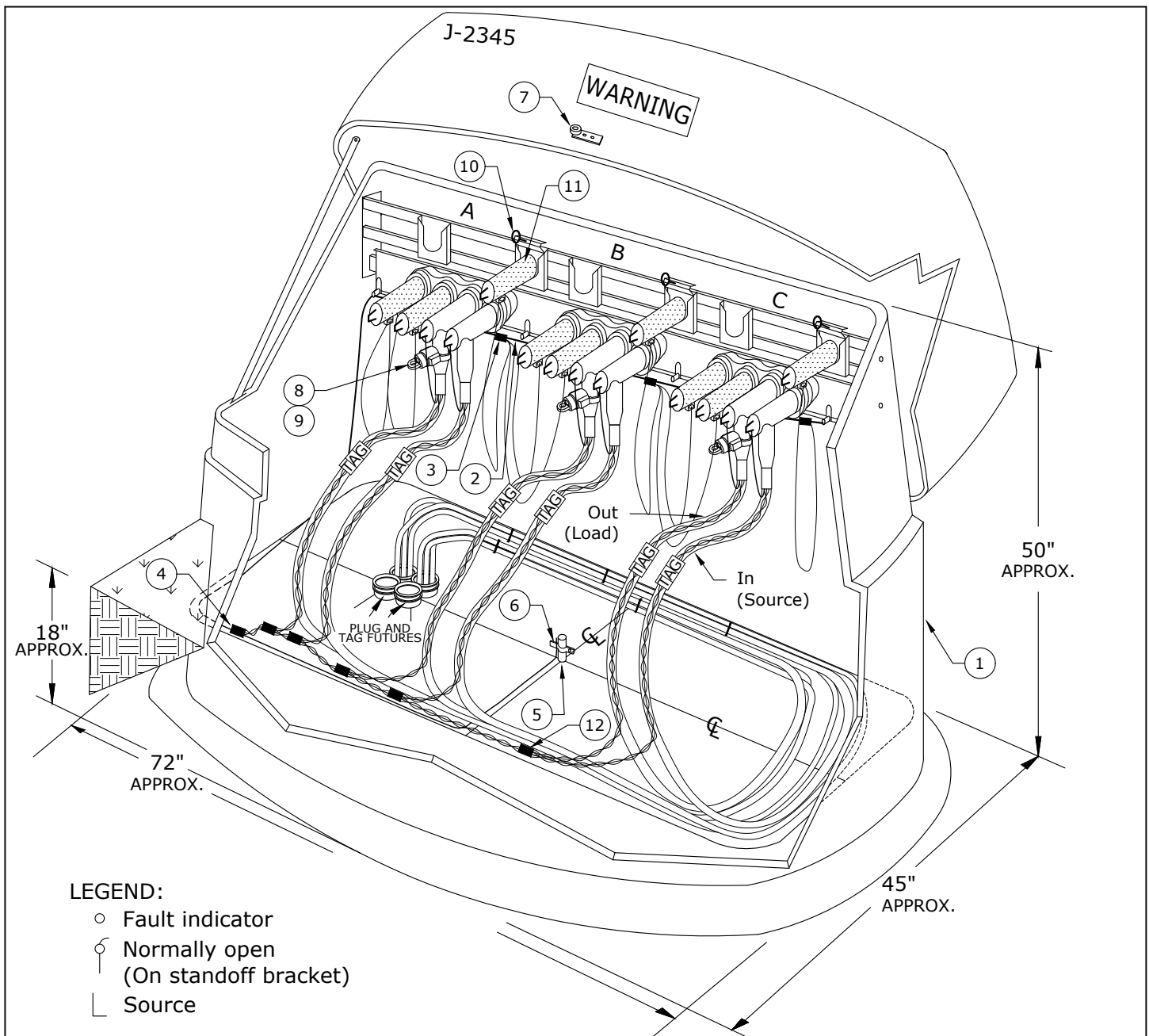
1Ø JUNCTION BOX  
5-WAY

PAGE:  
2 of 2

**UJ2**

CAD FILE:  
UJ2

REVISIONS			
Δ	DATE	ENGR	OPS
APP: CM/GM		SECTION	
DATE: 3/12/20		1500	



Rev. 4 - Added "Plug and Tag Future Conduits" to drawings and Notes #4 - #6.

UJM4	UJM41	UJM42	UJM44	UJM45	UJM46	UJM47	UJM48	UJM49

ITEM NO.	DESCRIPTION	QTY	S/N
1	Box, Junction, 3Ø, Fiberglass w/LBC4 Installed, 49" High	1	2047
2	Conductor, Cu, #4 Solid, 1C, Bare, Soft-Drawn	25	376
3	Connector, Crimpet, Cu, Run & Tap #6 Sol - #4 Str (4C4)	5	450
4	Connector, Crimpet, Cu, Run #4 Sol - #2 Str, Tap #8 Sol - #4 Str (2C4)	1	454
5	Rod, Ground 5/8" x 8'	1	1124
6	Clamp, Ground Rod, 5/8", Bronze, Small	1	281
7	Lock, Equipment, UG	1	837



## CONSTRUCTION STANDARDS

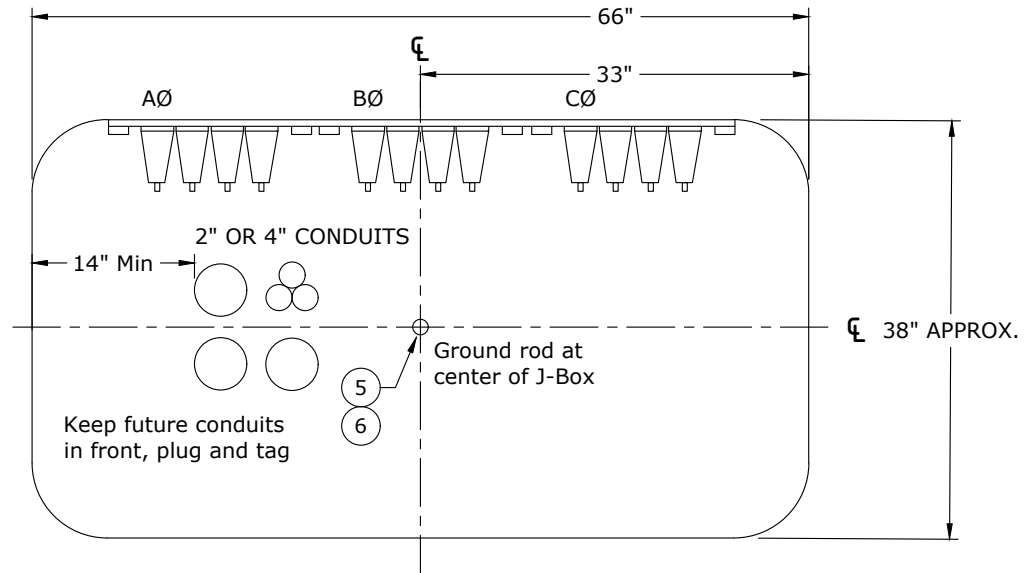
### 3Ø JUNCTION BOX 4-WAY

PAGE:  
1 of 2

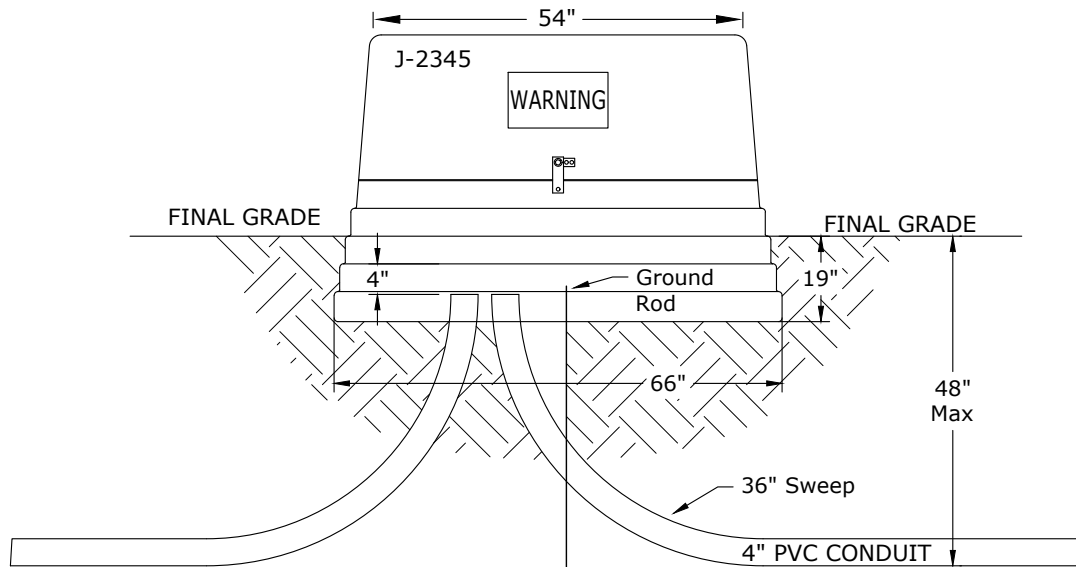
UJ3

CAD FILE:  
UJ3

REVISIONS			
Δ	DATE	ENGR	OPS
1	9/23/04	LB	AH
2	12/29/04	LB	AH
3	4/29/09	CM	AH
4	3/12/20	CM	GM
APP: HWH/GGW			
DATE: 1/22/80			
SECTION			1500



**Plan View 3-Phase J-Box**



**Primary J-Box Conduit Arrangement**

**Notes:**

1. Typical elbow arrangement is shown.
2. Do not put dirt inside junction box. Space is required for cable slack and operating clearance.
3. Leave cable slack for future operations.
4. Future conduits shall be plugged w/  
S/N 2697- 2" plastic conduit plug, or  
S/N 2698- 4" plastic conduit plug.
5. Futures should be tagged with direction and length of conduit. See Std UID2.
6. Proof conduit and install sequentially-numbered, 2500 lb, mule tape in all futures.

Rev. 4 - Added "Plug and Tag Future Conduits" to drawings and Notes #4 - #6.



**CONSTRUCTION STANDARDS**

3Ø JUNCTION BOX  
4-WAY

PAGE:  
2 of 2

**UJ3**

CAD FILE:  
UJ3

**REVISIONS**

△	DATE	ENGR	OPS
1	9/23/04	LB	AH
2	12/29/04	LB	AH
3	4/29/09	CM	AH
4	3/12/20	CM	GM

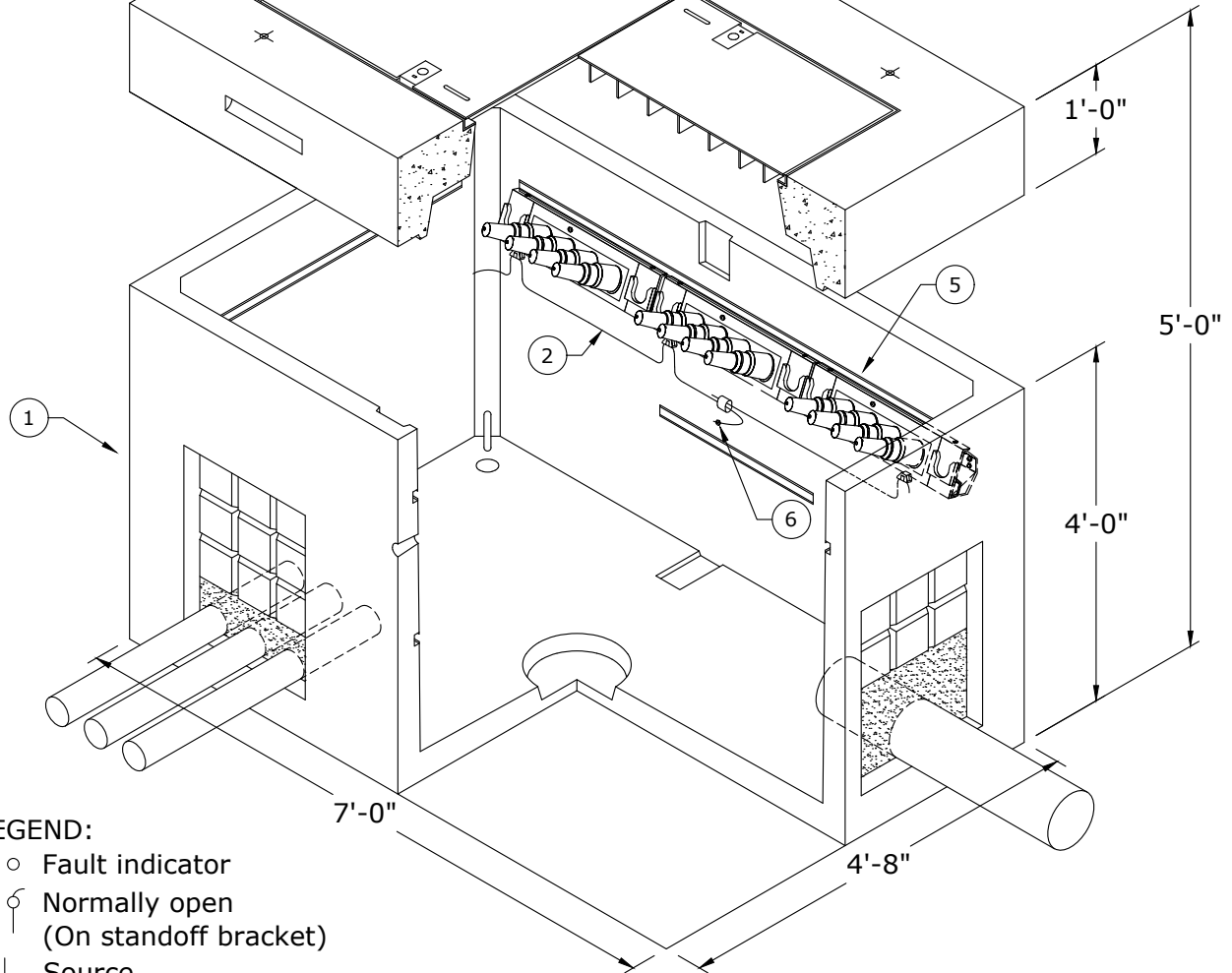
APP: HWH/GGW  
DATE: 1/22/80

SECTION  
**1500**

Lid  
2,400 lb

Full 180° Open

NOTE: CPU will engrave J-box #  
on brass plate



LEGEND:

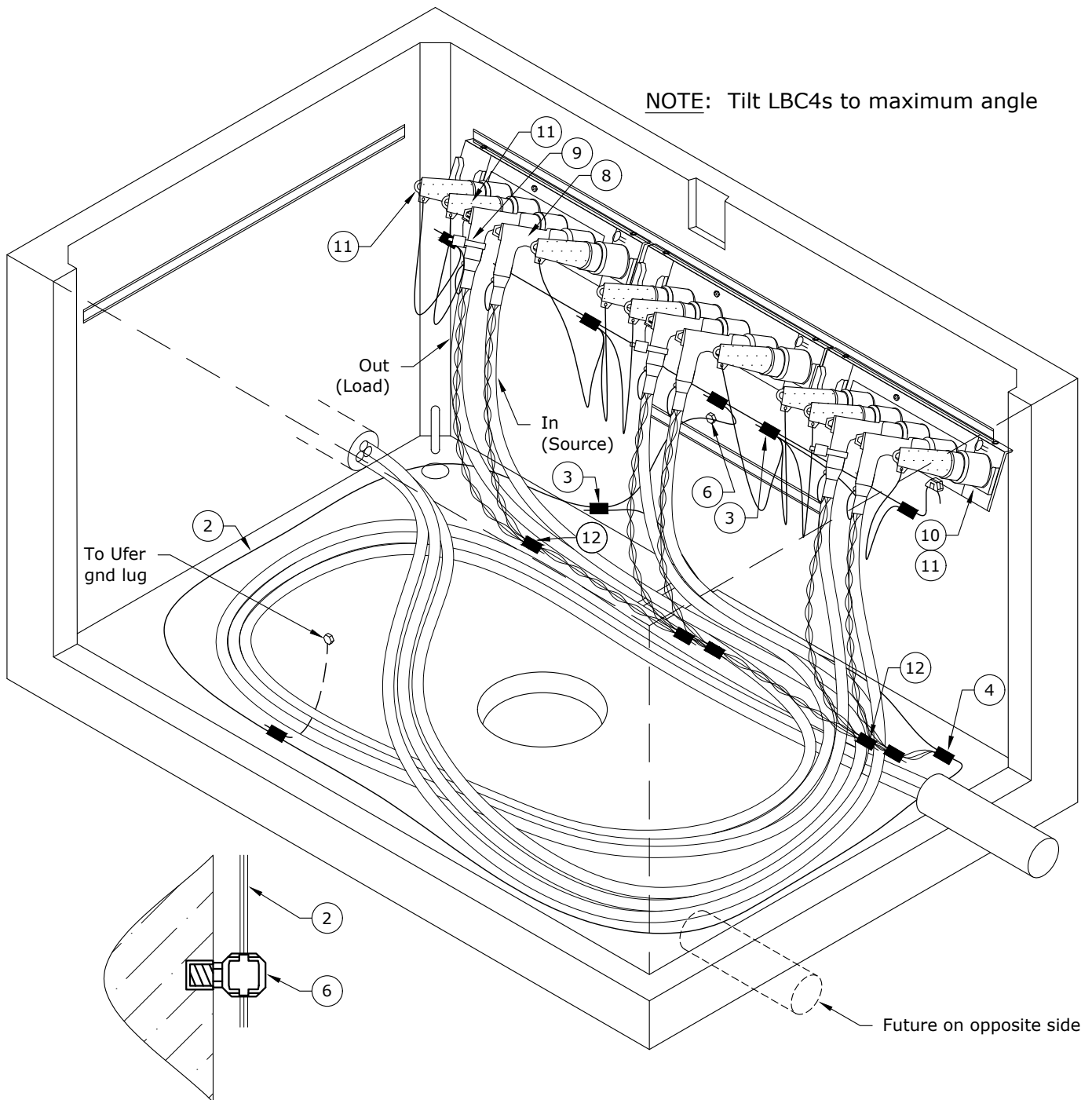
- Fault indicator
- Normally open  
(On standoff bracket)
- └ Source

UJM4	UJM41	UJM42	UJM44	UJM45	UJM46	UJM47	UJM48	UJM49

ITEM NO.	DESCRIPTION	QTY	S/N
1	Vault, 575LA, Flush Mount J-box or EE, Ufer Ground, Non-Slip Lid	1	2722
2	Conductor, Cu, #4 Solid, 1C, Bare, Soft-Drawn	30	376
3	Connector, Crimpet, Cu, Run & Tap #6 Sol - #4 Str	7	450
4	Connector, Crimpet, Cu, Run #4 Sol - #2 Str, Tap #8 Sol - #4 Str	1	454
5	Module, LBC4 UG w/Bracket	3	900
6	Lug, Grounding, #8 Sol - 2/0 Str, 4-way	2	842

		<b>CONSTRUCTION STANDARDS</b> 3Ø JUNCTION BOX 4-WAY FLUSH-MOUNT		REVISIONS			
					DATE	ENGR	OPS
PAGE: 1 of 2		UJ3F		APP: CM/GM		SECTION 1500	
		CAD FILE: UJ3F		DATE: 3/12/20			

**NOTE:** Tilt LBC4s to maximum angle



### UFER GROUND CONNECTION

**Notes:**

1. Fully seal knockouts with grout around conduit.
2. Std UJM44 configuration shown in drawing.
3. See Std UJM for cable configurations and material items #8-12.
4. Bring concentrics down on front side of elbows. Leave cable slack for future operations.
5. Future conduits shall be plugged w/  
S/N 2697 - 2" plastic conduit plug, or  
S/N 2698 - 4" plastic conduit plug.
6. Futures should be tagged with direction and length of conduit. See Std UID2.
7. Proof conduit and install sequentially-marked, 2500 lb mule tape in all futures.



## CONSTRUCTION STANDARDS

3Ø JUNCTION BOX  
4-WAY  
FLUSH-MOUNT

PAGE:  
2 of 2

**UJ3F**

CAD FILE:  
UJ3F

### REVISIONS

Δ	DATE	ENGR	OPS
1	12/9/22	CRM	GM


APP: CM/GM  
DATE: 3/12/20

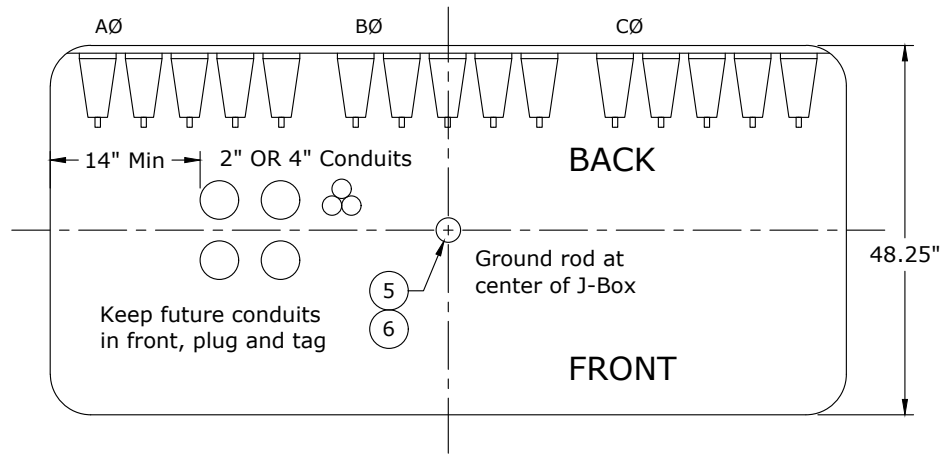
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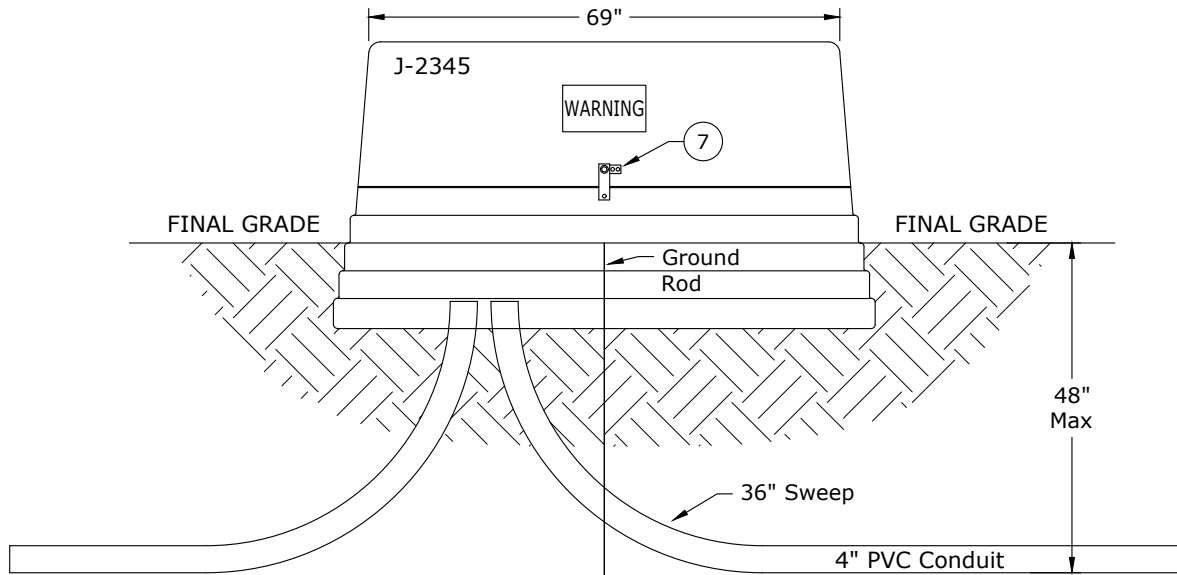


Clark  
Public  
Utilities

REVISIONS			
	DATE	ENGR	OPS
APP: CM/GM		SECTION	
DATE: 3/12/20		1500	



**Plan View 3-Phase J-Box**



**Primary J-Box Conduit Arrangement**

**Notes:**

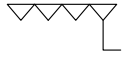
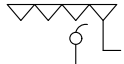
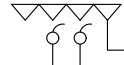
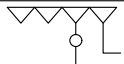
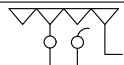
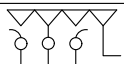
1. Typical elbow arrangement is shown.
2. Do not put dirt inside junction box. Space is required for cable slack and operating clearance.
3. Leave cable slack for future operations.
4. Future conduits shall be plugged with S/N 2697- 2" plastic conduit plug, or S/N 2698- 4" plastic conduit plug.
5. Futures should be tagged with direction and length of conduit. See Std UID2.
6. Proof conduit and install sequentially numbered, 2500 lb mule tape in all futures.

**LEGEND:**

- Fault indicator
- ⌋ Normally open  
(On standoff bracket)
- └ Source

The following are for Standards UJ1, UJ3, and UJ3F:

Rev. 4 - Removed LBC4 (installed at factory) from material issue, corrected material issue, and added LBC5 configurations.

ITEM NO.	DESCRIPTION		UJM4	
			QTY.	S/N
8	Elbow, 200A, LB, 1/0, 175 & 220 mil, Test Point, 15kV, w/Jacket Seal		1	1312
10	Bushing, Standoff Insulated, 200A		1	252
11	Cap, Protective Insulated, 200A, 15kV UG		4	265
12	Connector, Crimpet, Cu, Run & Tap #2 Sol - #2 Str (2C2)		1	455
ITEM NO.	DESCRIPTION		UJM41	
			QTY.	S/N
8	Elbow, 200A, LB, 1/0, 175 & 220 mil, Test Point, 15kV, w/Jacket Seal		2	1312
9	Indicator, Fault, UG, 400A, Test Point, Voltage Reset, 1Ø		1	2694
10	Bushing, Standoff Insulated, 200A		1	252
11	Cap, Protective Insulated, 200A, 15kV UG		3	265
12	Connector, Crimpet, Cu, Run & Tap #2 Sol - #2 Str (2C2)		2	455
ITEM NO.	DESCRIPTION		UJM42	
			QTY.	S/N
8	Elbow, 200A, LB, 1/0, 175 & 220 mil, Test Point, 15kV, w/Jacket Seal		3	1312
9	Indicator, Fault, UG, 400A, Test Point, Voltage Reset, 1Ø		2	2694
10	Bushing, Standoff Insulated, 200A		2	252
11	Cap, Protective Insulated, 200A, 15kV UG		3	265
12	Connector, Crimpet, Cu, Run & Tap #2 Sol - #2 Str (2C2)		3	455
ITEM NO.	DESCRIPTION		UJM44	
			QTY.	S/N
8	Elbow, 200A, LB, 1/0, 175 & 220 mil, Test Point, 15kV, w/Jacket Seal		2	1312
9	Indicator, Fault, UG, 400A, Test Point, Voltage Reset, 1Ø		1	2694
10	Bushing, Standoff Insulated, 200A		1	252
11	Cap, Protective Insulated, 200A, 15kV UG		3	265
12	Connector, Crimpet, Cu, Run & Tap #2 Sol - #2 Str (2C2)		2	455
ITEM NO.	DESCRIPTION		UJM45	
			QTY.	S/N
8	Elbow, 200A, LB, 1/0, 175 & 220 mil, Test Point, 15kV, w/Jacket Seal		3	1312
9	Indicator, Fault, UG, 400A, Test Point, Voltage Reset, 1Ø		2	2694
10	Bushing, Standoff Insulated, 200A		1	252
11	Cap, Protective Insulated, 200A, 15kV UG		2	265
12	Connector, Crimpet, Cu, Run & Tap #2 Sol - #2 Str (2C2)		3	455
ITEM NO.	DESCRIPTION		UJM46	
			QTY.	S/N
8	Elbow, 200A, LB, 1/0, 175 & 220 mil, Test Point, 15kV, w/Jacket Seal		4	1312
9	Indicator, Fault, UG, 400A, Test Point, Voltage Reset, 1Ø		3	2694
10	Bushing, Standoff Insulated, 200A		2	252
11	Cap, Protective Insulated, 200A, 15kV UG		2	265
12	Connector, Crimpet, Cu, Run & Tap #2 Sol - #2 Str (2C2)		4	455



## CONSTRUCTION STANDARDS

PRIMARY JUNCTION BOX  
SINGLE AND THREE PHASE  
MATERIAL LIST

PAGE:  
1 of 2

**UJM**

CAD FILE:  
UJM

### REVISIONS

REV	DATE	ENGR	OPS
1	9/23/04	LB	AH
2	12/29/04	LB	AH
3	4/29/09	CM	AH
4	3/12/20	CM	GM

APP: HWH/GGD  
DATE: 1/22/80

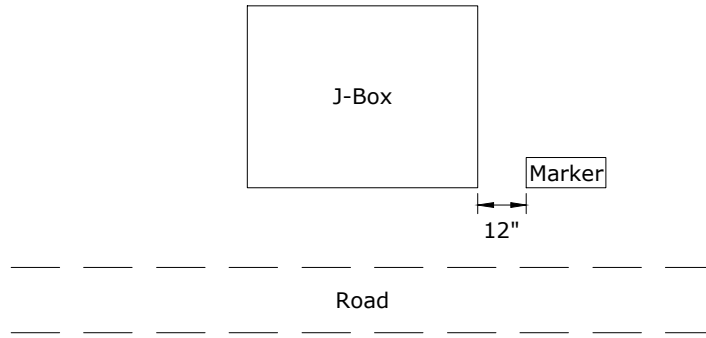
SECTION  
**1500**

Rev. 4 - Removed LBC4 (installed at factory) from material issue, corrected material issue, and added LBC5 configurations.

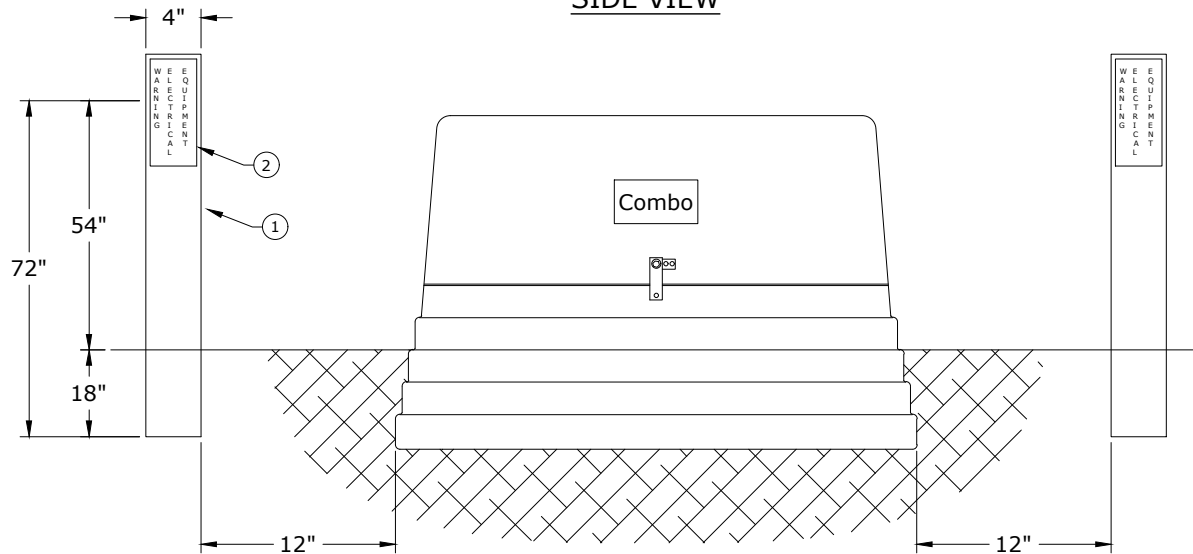
The following are for Standards UJ2 and UJ4:

<div><div>Clark Public Utilities</div><div></div></div>	<div>CONSTRUCTION STANDARDS</div> <div>PRIMARY JUNCTION BOX SINGLE AND THREE PHASE MATERIAL LIST</div>			REVISIONS			
				<div><div><div>R</div></div></div>	DATE	ENGR	OPS
				1	9/23/04	LB	AH
				2	12/29/04	LB	AH
				3	4/29/09	CM	AH
	4	3/12/20	CM	GM			
PAGE: 2 of 2	UJM		CAD FILE: UJM	APP: HWH/GGD DATE: 1/22/80	SECTION 1500		

## TOP VIEW



## SIDE VIEW





### Notes:

1. Use marker when view of J-box may be obscured by terrain or foliage.
2. Call for locates before installing.

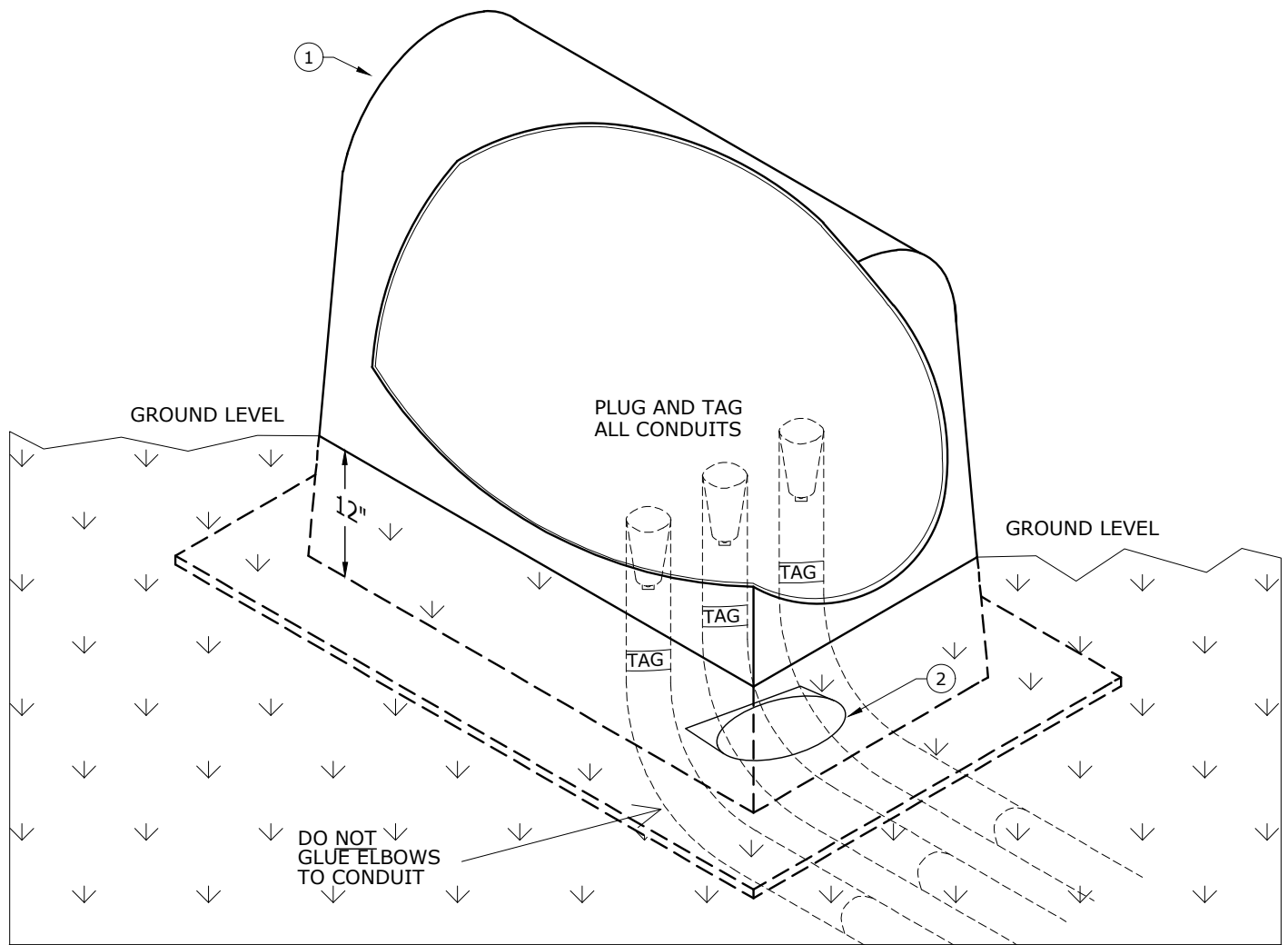
ITEM NO.	DESCRIPTION	UJMP	
		QTY.	S/N
1	Marker, Post, Red, 6', Electrical Equipment	2	2896
2	Marker, Post, Marker, Electrical Equipment	2	2893

		<b>CONSTRUCTION STANDARDS</b> JUNCTION BOX MARKER		REVISIONS			
					DATE	ENGR	OPS

PAGE: 1 of 1	UJMP	CAD FILE: UJMP	APP: CM/GM DATE: 3/12/20	SECTION 1500
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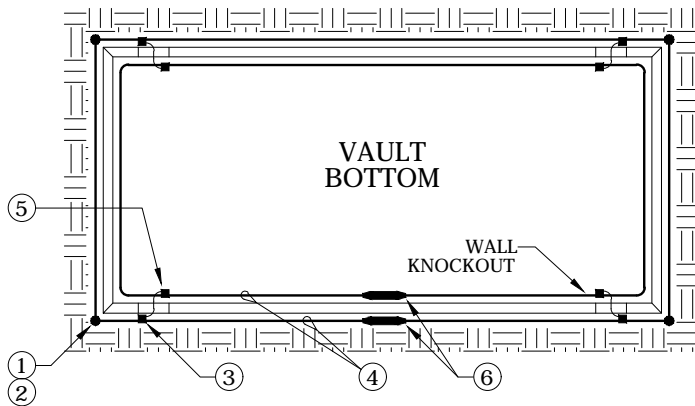
#### Notes:

1. Bury approximately one foot of the enclosure.
2. Conduits shall be buried 42" to 48" deep unless otherwise approved by CPU.
3. The disc marker is to be installed flat with the instructions facing up.
4. The disc should be placed in radius of elbow.
5. CPU has the locator for finding these markers.
6. The markers are reusable.
7. Loop enclosures and marker discs provided by CPU.
8. All conduits shall be plugged w/  
S/N 2697- 2" plastic conduit plug or  
S/N 2698- 4" plastic conduit plug.
9. All conduits should be tagged with direction and length of conduit. See Std. UID2.
10. Proof conduit and install sequentially-numbered, 2500 lb, mule tape in all futures.

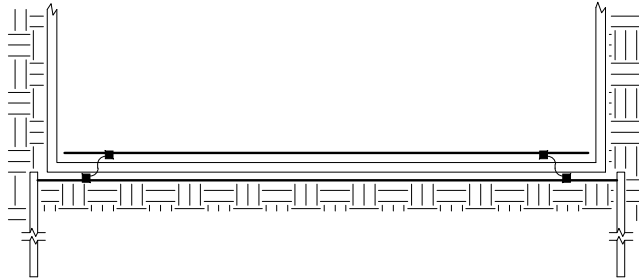
Rev. 2 - Added Notes #8, #9, & #10 and added plugs and tags to drawings.

ITEM	DESCRIPTION	QTY	S/N
1	Enclosure, Cable Loop, Fiberglass, 30" x 30" x 8" w/ 5" Flange	1	1821
2	Marker, UG, Disc, Full Range	1	2210

<div><div>Clark Public Utilities</div><div></div></div>	CONSTRUCTION STANDARDS		REVISIONS						
			<div><div><div>⚠</div></div></div>	DATE	ENGR	OPS			
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			1	12/29/04	LB	AH			
	2	3/12/20	CM	GM					
PAGE: 1 of 1		ULE		CAD FILE: ULE		APP: HWH/GGW DATE: 9/94		SECTION 1500	

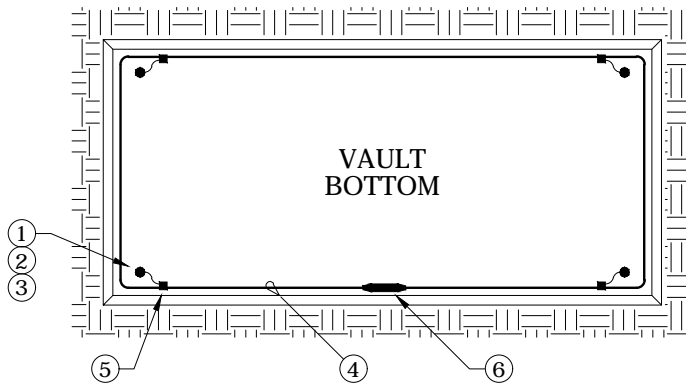


INSTALL GROUND RODS AND OUTSIDE 2/0 COPPER BEFORE VAULT IS INSTALLED. FEED 2/0 TAPS FROM OUTSIDE GROUND THROUGH VAULT WALL KNOCKOUTS.

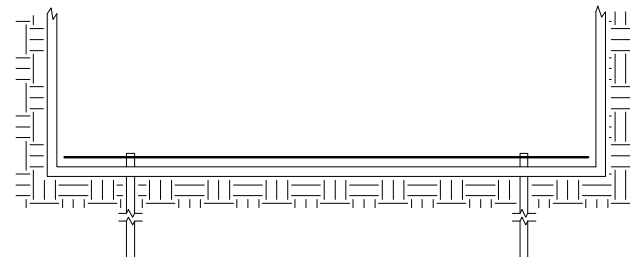


FOR NEW VAULTS

UVG-1



CUT GROUND RODS IN HALF. DRIVE ONE HALF. COUPLE ON SECOND HALF AND DRIVE SO THAT ONLY THE CLAMP IS EXPOSED ABOVE THE FLOOR.



FOR EXISTING VAULTS

UVG-2





## CONSTRUCTION STANDARDS

### UNDERGROUND VAULT GROUNDING SYSTEM

PAGE:  
1 of 1

UVG-1, UVG-2

CAD FILE:  
UVG-1

REVISIONS			
	DATE	ENGR	OPS
0	2/23/00	HWH	MA
			
APP:	JEH	SECTION	
DATE:	2/22/00	1500	

# **1600**

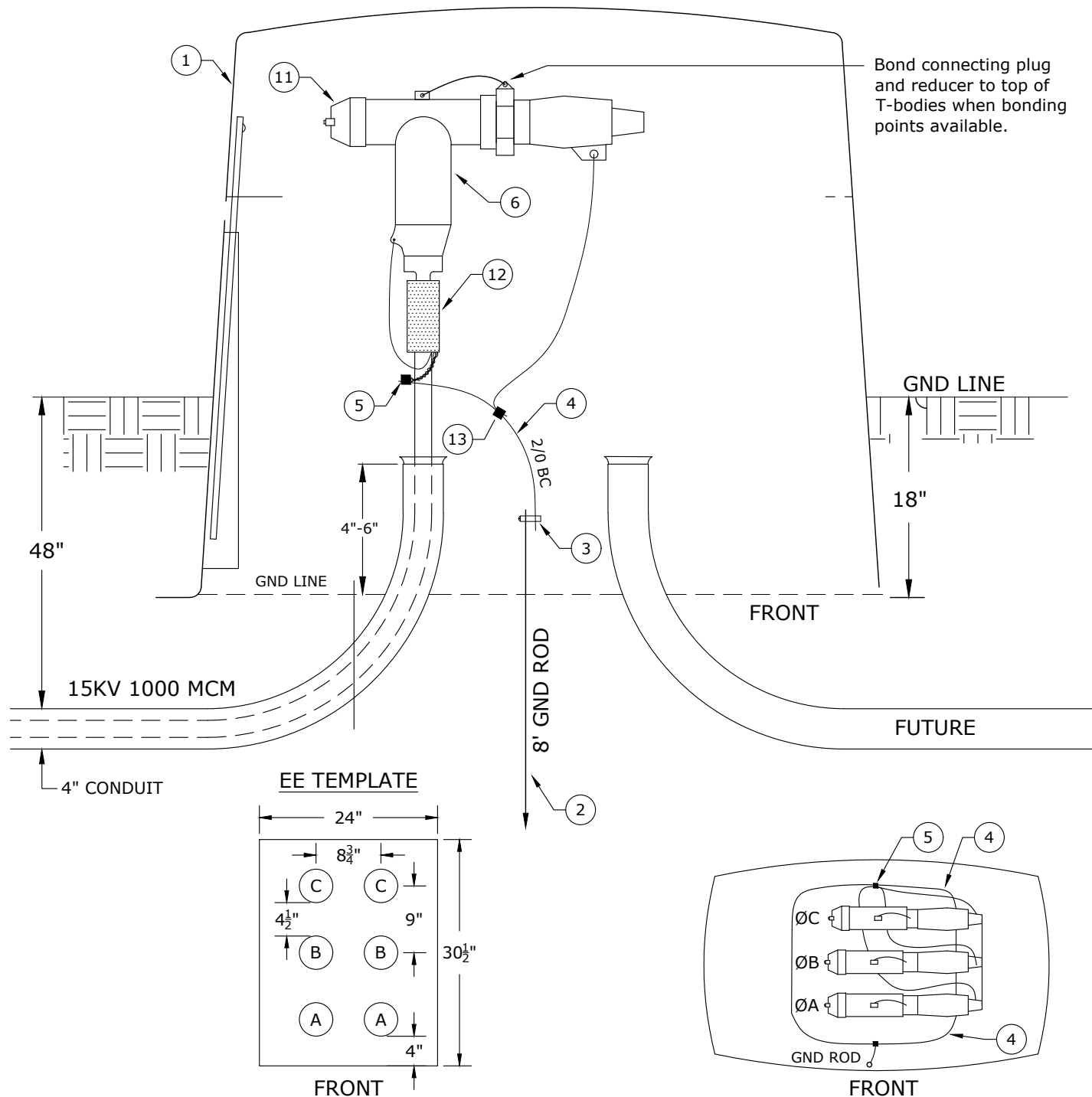
## **1000 MCM CABLE**

12/23/2022

~	UEE1	Elbow Enclosure - Deadend
~	UEE2	Elbow Enclosure - Feed-Through
C	UPR1	1000 MCM Cable Riser
C	UPR2	1000 MCM Power Cable Riser Grounding Detail
C	UPR4	1000 MCM Cable Riser with 3Ø Switch
C	UPR5	1000 MCM Cable Riser with 600 Amp Disconnects
C	UPR6	Parallel 1000 MCM Cable Riser with 3Ø Switch
~	USG1	Padmount Switchgear - 600A Elbow - 1000MCM Cable
~	USG2	Padmount Switchgear Chart
~	USG3	Deadfront Switchgear – 612 Vault Detail
~	USG5	Deadfront Switchgear on 774 Vault For Maintenance Only or When Std USG3 Vault Will Not Fit
~	USG8	Below Grade Switchgear – Use w/ Std USG9
~	USG9	Below Grade Switchgear – Vault Detail – Use w/ Std USG8
~	USP	1000MCM Splice Pit Flush-Mount

**N** New Standard  
**R** Redrawn Standard  
**C** Changed Standard  
**~** No Change





#### Notes:

1. Use EE template when framing conduits and backfilling.
2. Leave enough cable slack to position the elbow near the top of the enclosure lid. This provides room for future operations.
3. Elbows assemble 8-3/4" apart (center to center). Align conduits to avoid cable bending.

Rev. 4 - Corrected material list, torque requirements, and template dimensions.



## CONSTRUCTION STANDARDS

### ELBOW ENCLOSURE DEADEND

PAGE:  
1 of 2

UEE1

CAD FILE:  
UEE1

#### REVISIONS

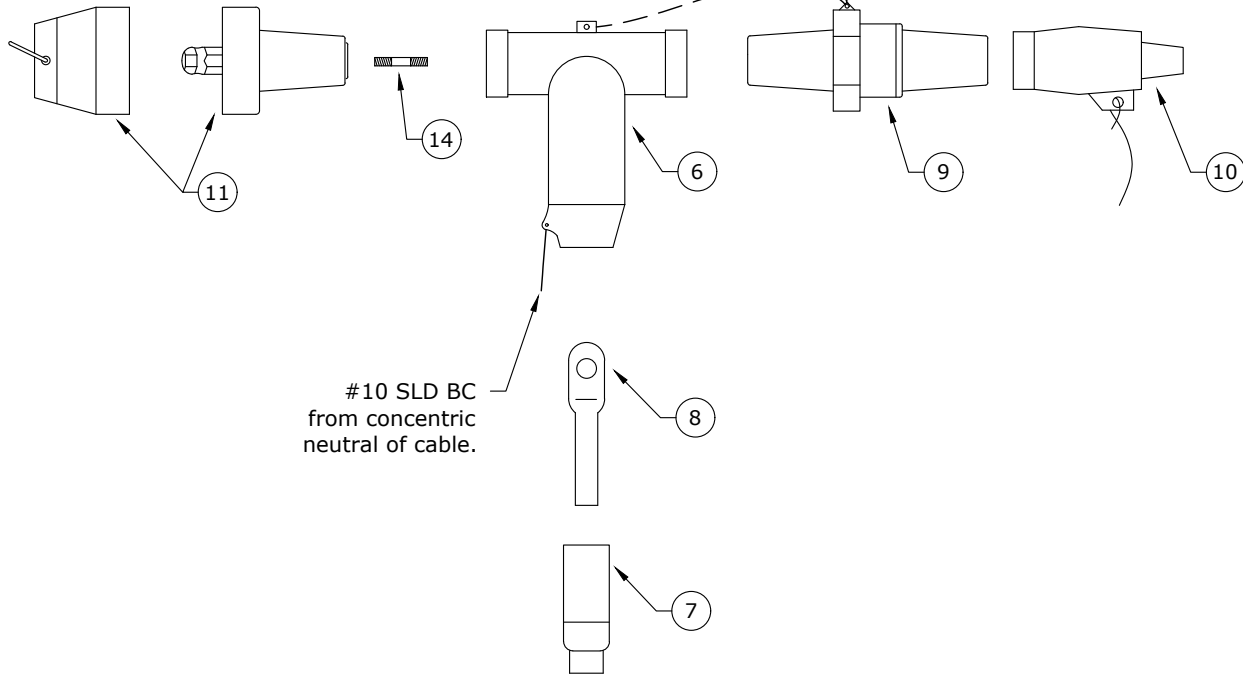
DATE	ENGR	OPS
1 9/23/04	LB	AH
2 10/7/05	LB	AH
3 12/14/09	KJP	
4 8/8/22	CRM	GM

APP:  
DATE: 6/90

SECTION  
1600

For insulating plug:  
Use torque wrench & tighten  
according to manufacturers  
specifications.

For connector plug, tap plug or tap  
well:  
Use torque wrench and  
tighten according to  
manufacturers specifications.



DEADEND

Rev. 4 - Corrected material list, torque requirements, and template dimensions.

ITEM NO.	DESCRIPTION	UEE1*	
		QTY.	S/N
1	Enclosure, Elbow (EE), Fiberglass, 72"w x 49"h x 44"d	1	2213
2	Rod, Ground, 5/8" x 8'	1	1124
3	Clamp, Ground Rod, 5/8" Bronze, Large	1	282
4	Conductor, OH, Cu, 2/0, 7-Str, Bare, Soft-Drawn, 1C	30 Ft.	379 *
5	Connector, Crimpet, Cu, Run & Tap 3/0 to 4/0 Str	3	460
6	Elbow, 600 Amp, T-body	3	1825
7	Adapter, Cable, 1000 MCM	3	1
8	Contact, Compression, Al, 1000 MCM, Non-Threaded Hole	3	941
9	Plug, Loadbreak, Reducing Tap, 600A-200A	3	1769
10	Cap, Protective Insulated, 200A	3	265
11	Plug, Basic Insulating	3	1824
12	Elbow, Sealing Kit, 1000MCM, 175 & 220 mil	3	2376
13	Connector, Crimpet, Cu, Run & Tap 1/0 to 2/0 Str	1	457
14	Stud, Al, 600A T-body To Reducer Plug	3	2704 *



## CONSTRUCTION STANDARDS

### ELBOW ENCLOSURE DEADEND

PAGE:  
2 of 2

UEE1

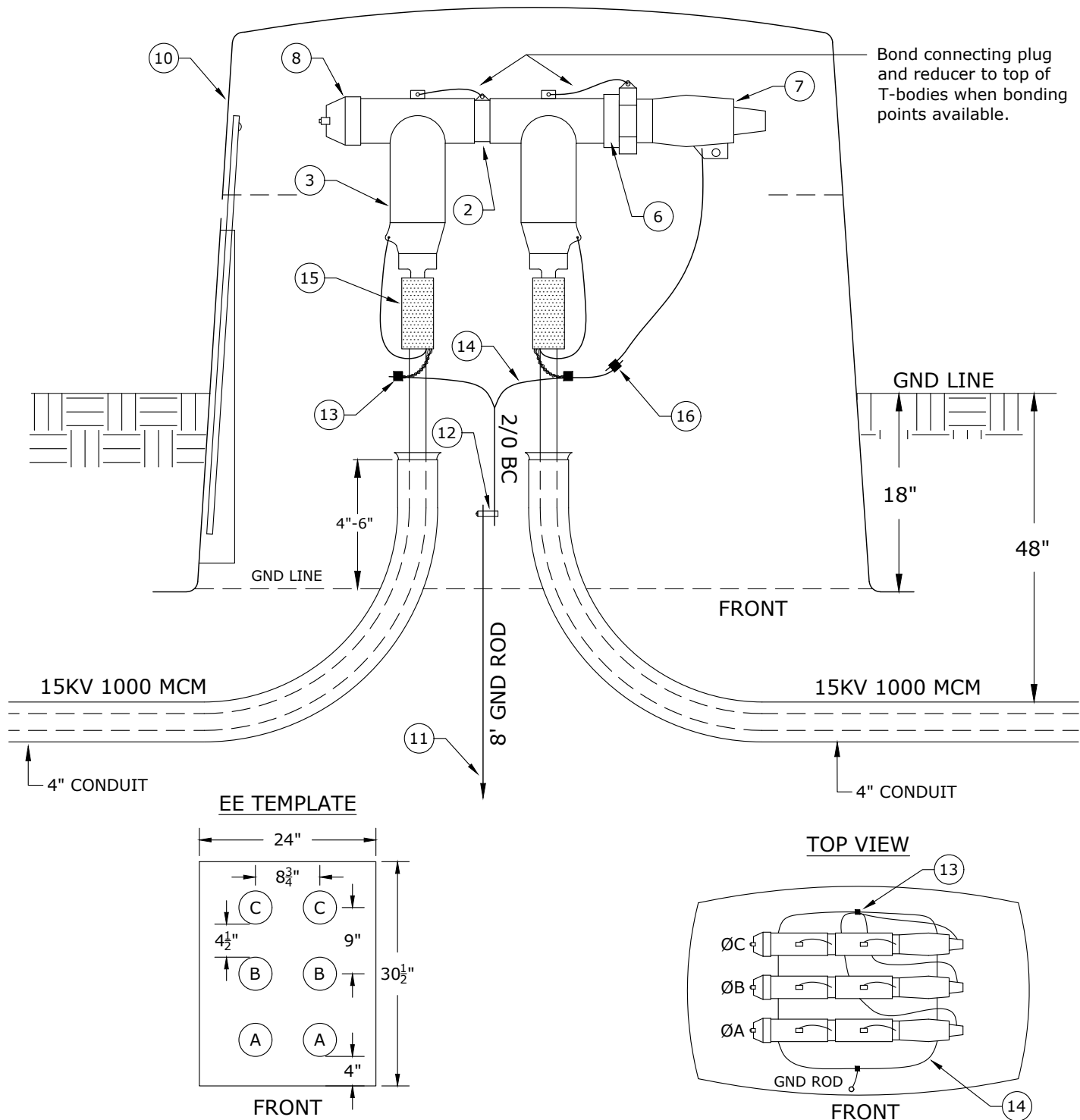
CAD FILE:  
UEE1

#### REVISIONS

Δ	DATE	ENGR	OPS
1	9/23/04	LB	AH
2	10/7/05	LB	AH
3	12/14/09	KJP	
4	8/8/22	CRM	GM

APP:  
DATE: 6/90

SECTION  
1600



#### Notes:

1. Use EE template when framing conduits and backfilling.
2. Leave enough cable slack to position the elbow near the top of the enclosure lid. This provides room for future operations.
3. Elbows assemble 8-3/4" apart (center to center). Align conduits to avoid cable bending.

Rev. 3 - Corrected material list, torque requirements, and template dimensions.



## CONSTRUCTION STANDARDS

### ELBOW ENCLOSURE FEED-THROUGH

PAGE:  
1 of 2

UEE2

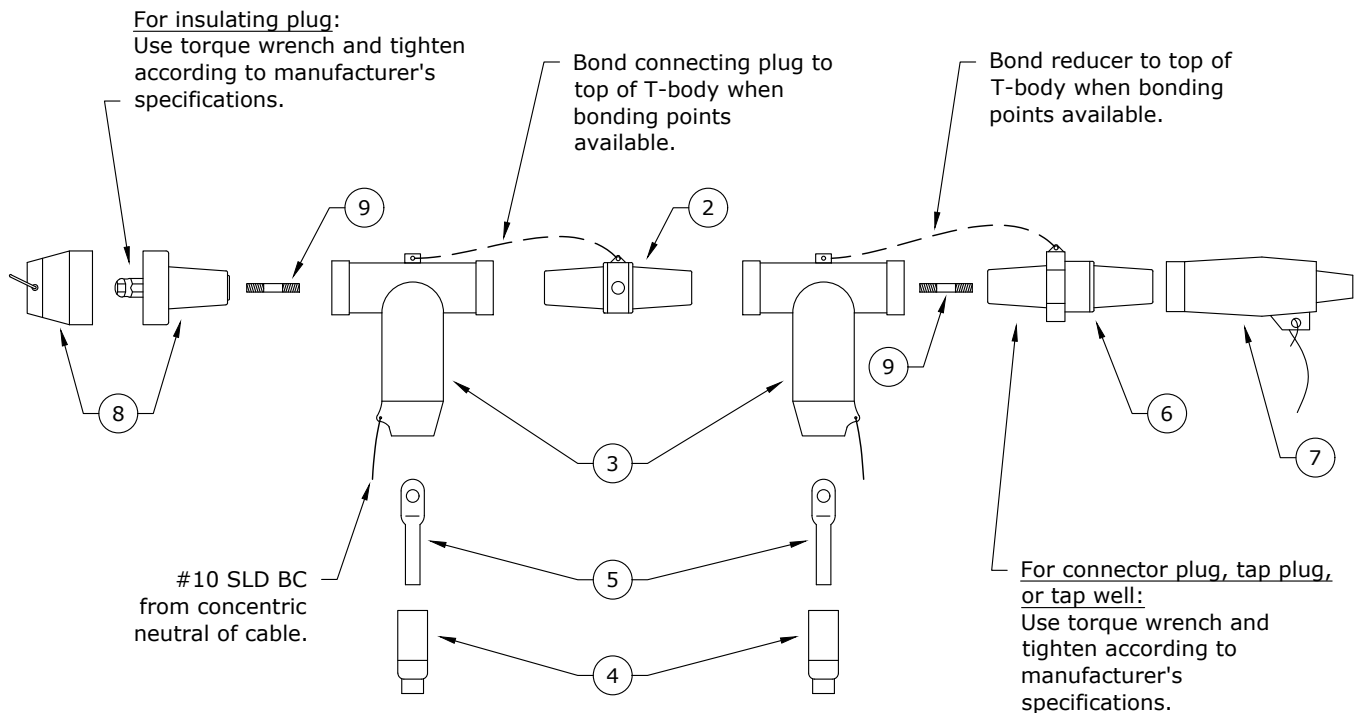
CAD FILE:  
UEE2

#### REVISIONS

REV	DATE	ENGR	OPS
1	10/7/05	LB	AH
2	8/25/09	CM	AH
3	8/8/22	CRM	GM

APP: LB/AH  
DATE: 9/23/04

SECTION  
1600



Rev. 3 - Corrected material list, torque requirements, and template dimensions.

ITEM NO.	DESCRIPTION	UEE2	
		QTY.	S/N
1	Elbow, 600A, NLB, Test Point, Kit for UEE2	3	2693
	<i>Each Kit Consists Of: (Items #2 Thru #9)</i>		
2	Plug, Connecting, 600A	1	1723
3	Elbow, 600A, T-body	2	1825
4	Adapter, Cable, 1000MCM	2	1
5	Contact, Compression, Al, 1000 MCM, Non-threaded Hole	2	941
6	Plug, Loadbreak, Reducing Tap, 600A-200A	1	1769
7	Cap, Protective Insulated, 200A	1	265
8	Plug, Basic Insulating	1	1824
9	Stud, Al, 600A T-body To Reducer Plug	2	2704 *
10	Enclosure, Elbow (EE), Fiberglass, 72"w x 49"h x 44"d	1	2213
11	Rod, Ground, 5/8" x 8'	1	1124
12	Clamp, Ground Rod, 5/8" Bronze, Large	1	282
13	Connector, Crimpet, Cu, Run & Tap 3/0 to 4/0	6	460
14	Conductor, OH, Cu, 2/0, 7-Str, Bare, Soft-Drawn, 1C	30 ft	379
15	Elbow, Sealing Kit, 1000MCM, 175 & 220 mil	6	2376
16	Connector, Crimpet, Cu, Run & Tap 1/0 to 2/0 Str	1	457



## CONSTRUCTION STANDARDS

### ELBOW ENCLOSURE FEED-THROUGH

PAGE:  
2 of 2

UEE2

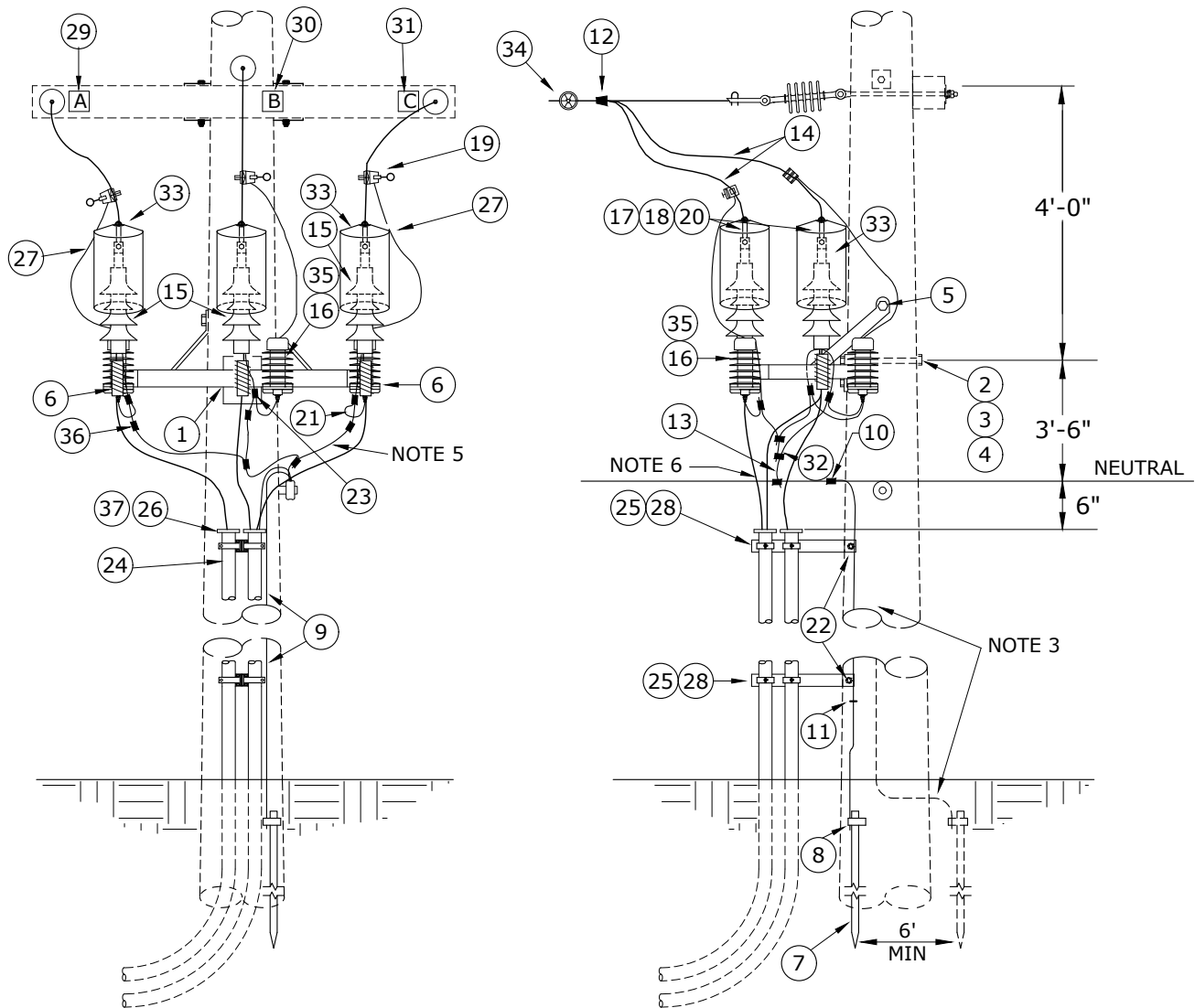
CAD FILE:  
UEE2

#### REVISIONS

Δ	DATE	ENGR	OPS
1	10/7/05	LB	AH
2	8/25/09	CM	AH
3	8/8/22	CRM	GM

APP: LB/AH  
DATE: 9/23/04

SECTION  
1600



**Notes:**

1. UPR4 is the preferred standard. This standard is to be used for short dips such as airport dips or if other switches are nearby for isolation. See UPR4 for the recommended construction.
2. See UPR2 for grounding details.
3. All ground wire is #4 Cu equivalent covered copper-clad steel.
4. Static wire ground when required. **DO NOT** connect to neutral. See N2 for details. Engineer must call for static wire ground separately.
5. Avoid sharp turns in the arrester grounds and primary leads.
6. 2/0 CU from terminators to overhead neutral for all 1000MCM construction.

Rev 3 - Removed extra 2/0 Cu neutral for substation get-a-aways, changed to copper-clad steel grounds & added support grips and 4/0-2/0 crimpets.



## CONSTRUCTION STANDARDS

1000 MCM CABLE RISER

### REVISIONS

R	DATE	ENGR	OPS
0	2/23/00	HWH	MA
1	12/29/04	LB	AH
2	1/13/10	CM	AH
3	12/9/22	CRM	GM

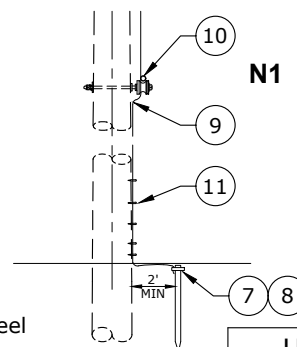
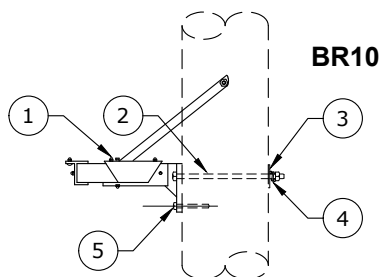
PAGE:  
1 of 2

**UPR1**

CAD FILE:  
UPR1

APP:  
DATE: 6/90

SECTION  
**1600**



Rev 3 - Removed extra 2/0 Cu neutral for substation get-a-ways, changed to copper-clad steel grounds & added support grips and 4/0-2/0 crimpets.

ITEM NO.	DESCRIPTION	UPR1	
		BR10	
ITEM NO.	DESCRIPTION	QTY.	S/N
		QTY.	S/N
1	Bracket, Terminator, Mount, 48", 1000MCM	1	2842 *
2	Bolt, Machine, 5/8" x 14", Galv, 12,400 lb Ultimate Tensile	1	156
3	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole, Galv	1	1392
4	Washer, Lock, Spring, Double Coil, Galv, 5/8"	1	2217
5	Screw, Lag, 1/2" x 4 1/2", Twist Drive, Drive Point	3	1132
6	Support, Cable, 1000MCM	3	2229
ITEM NO.	DESCRIPTION	N1	
		QTY.	S/N
7	Rod, Ground, 5/8" x 8'	1	1124
8	Clamp, Ground Rod, 5/8", Small, Bronze	1	281
9	Conductor, Copper-Clad Steel, #4 Cu Equivalent, 40% Annealed, Black Jacket with Green Stripe	40*	1512 *
10	Connector, H-Tap, Al/Cu, Run #2-2/0 Str - Tap #6-#1 Str	1	413
11	Staple, Ground Wire, Barbed, Galvanized, 1 1/2"	24	2707
ITEM NO.	DESCRIPTION	ADDITIONAL MATERIAL	
		QTY.	S/N
12	Connector, Tap, Wedge, Run and Tap 336 ACSR to 397 AAC	3	2501
13	Conductor, OH, 600v, Cu, 2/0, 19-Str, XLPE, 80 mil, Soft-Drawn, 1C, RHW-2	30	381
14	Conductor, OH, AAC, 397.5, 19-Str, Bare, 1C, Canna	30	367
15	Terminator, 15kV, Cold-Shrink JCN, 1000MCM	3	2225
16	Arrester, Surge, 9 kV, MOV, Riser Pole	3	58
17	Connector, Compression, Lug, 2-hole, 336 ACSR & 397 AAC	3	438
18	Connector, Compression, Lug, Al/Cu, Tin-Plated, 1000MCM to NEMA 2-Hole	3	1501
19	Clamp, Hot Line, GP1530, Line #6 Sol - 400MCM, Tap #6 Sol - 4/0 Str Cu Only	3	284
20	Bolt, 1/2" x 2", w/ Flat and Belleville Washers, Assembly	6	1389
21	Conductor, OH, Cu, #4 Solid, Bare, Soft-Drawn, 1C	10	376
22	Screw, Lag, 1/2" x 4 1/2", Twist Drive, Drive Point	6	1132
23	Connector, Crimpet, Cu, Run 3/0 - 4/0 Str, Tap #6 Sol - #2 Str	3	458 *
24	Conduit, 4" x 10', Sch 80	90	2203
25	Clamp, Standoff Bracket, 4"	9	297
26	End Bell, 4", Sch 40, Long	3	2204
27	Conductor, OH, 600v, Cu, #2, 7-Str, XLPE, 60 mil, Soft-Drawn, 1C, RHW-2	15	393
28	Bracket, Standoff, 15" w/ Stop and Brace	3	227
29	Tag, Phase A	1	1280
30	Tag, Phase B	1	1281
31	Tag, Phase C	1	1282
32	Connector, Crimpet, Cu, Run and Tap 1/0 - 2/0 Str	2 *	457
33	Guard, Wildlife, Large, OH/UG Terminators	3	1676
34	Indicator, Fault, 400A, OH, Beacon w/ Signal Flag, Electric Field Reset	3	2558
35	Guard, Wildlife, Polymer Arrester	3	2583
36	Connector, Crimpet, Cu, Run 3/0 Str - 250 Str, Tap #6 Sol - 2/0 Str	3	459 *
37	Grip, Support, 4" Conduit, 1000MCM (1.625" to 2.5")	3	2521 *



## CONSTRUCTION STANDARDS

1000 MCM CABLE RISER

PAGE:  
2 of 2

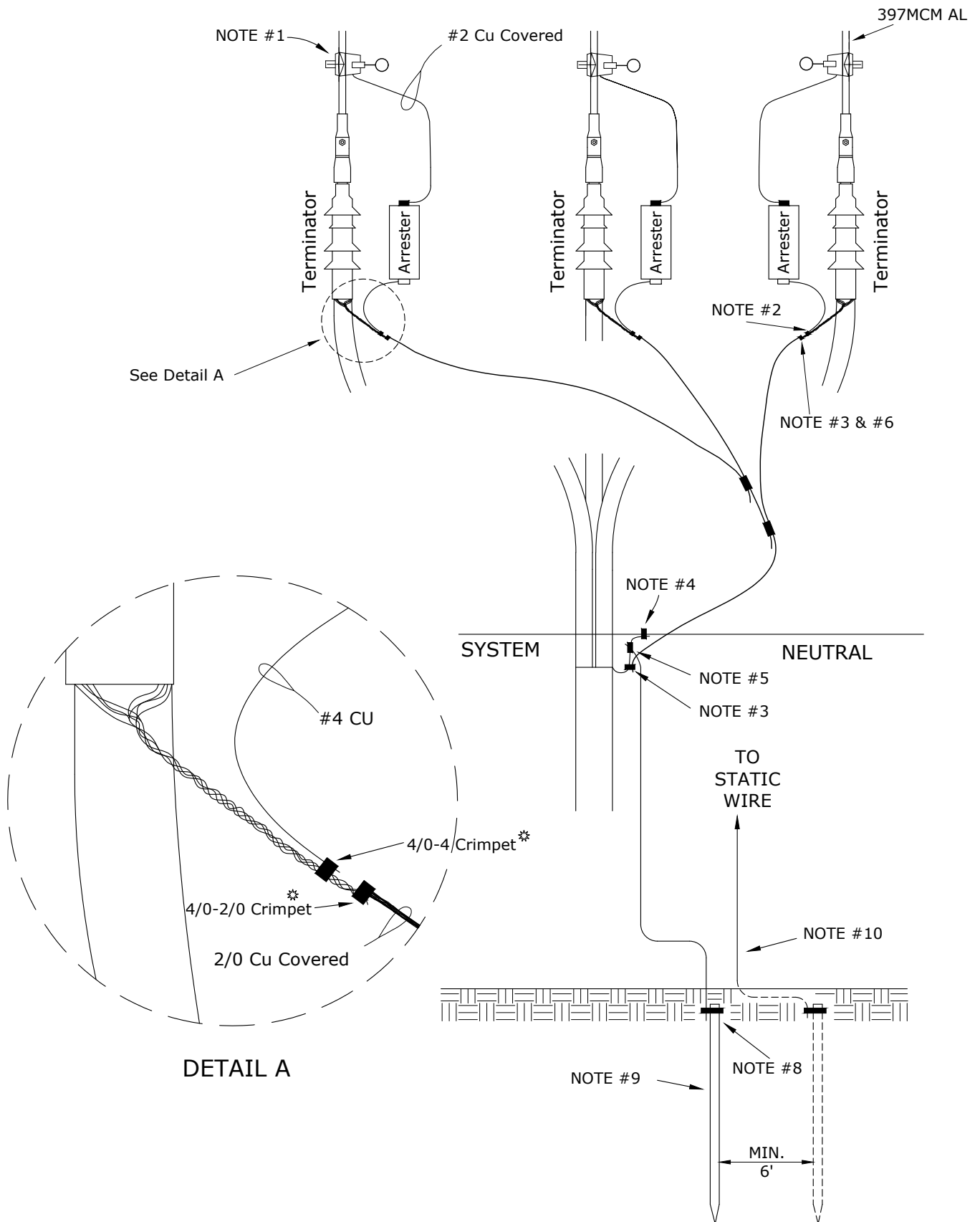
UPR1

CAD FILE:  
UPR1

REVISIONS			
Δ	DATE	ENGR	OPS
0	2/23/00	HWH	MA
1	12/29/04	LB	AH
2	1/13/10	CM	AH
3	12/9/22	CRM	GM

APP:  
DATE: 6/90

SECTION  
1600



Rev 2 - Updated notes for 2023 NESC and changed to 4/0-2/0 crimpet.



## CONSTRUCTION STANDARDS

1000 MCM CABLE RISER  
GROUNDING DETAIL

PAGE:  
1 of 2

UPR2


CAD FILE:  
UPR2

REVISIONS			
R	DATE	ENGR	OPS
0	2/23/00	HWH	MA
1	12/29/04	LB	AH
2	12/9/22	CRM	GM
APP:			SECTION
DATE: 6/90			1600

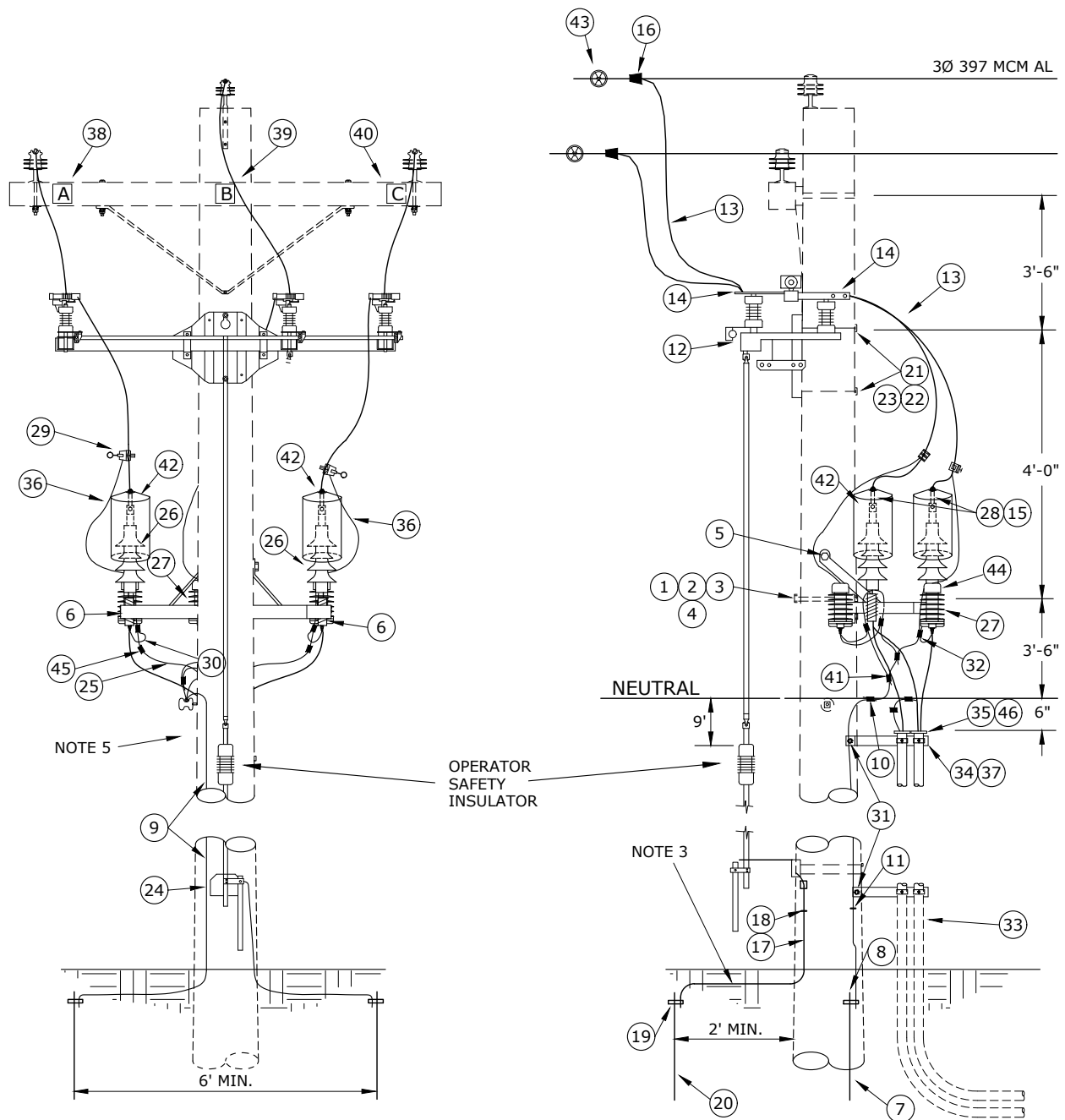
## NOTES:

1. Make connections as close to terminator as possible but DO NOT make a sharp bend. Use hot line clamp for easy removal.
2. Connect surge arrester lead to concentric neutral.
3. Connect concentric neutral wires (twist together) to 2/0 stranded copper with 4/0-2/0\* crimpet. Connect separate 2/0 runs, as per drawing, from each concentric neutral to the system neutral. Use 2/0 covered conductor and train this conductor back down along the 1000MCM cable for appearance.
4. Connect 2/0 copper riser neutral to system neutral only. This riser neutral is only used for substation get-a-ways. The 2/0 Cu riser neutral is only needed on old installations where the 1000MCM had less than 1/3 neutral per phase. Any get-a-way with a full neutral does not need the additional 2/0 Cu.\*
5. Use separate ground lead for system neutral grounding connection. Any other equipment grounds may be connected to this ground lead also per NESC 092B3.
6. Do not connect arrester grounds separately to system neutral. Connect to concentric neutral as near to the terminator as possible per NESC 097B.
7. Do not ground equipment mounting bracket per NESC 123A.
8. Top of ground rod must be buried per NESC 094C2a3.\*
9. If more than one ground rod is required they must be separated by at least 6 feet per NESC 094C2a2.\*
10. Static wire ground when required. DO NOT connect to neutral. See TN1 to TN4 for static wire details.

Rev 2 - Updated notes for 2023 NESC and changed to 4/0-2/0 crimpet.

	<b>CONSTRUCTION STANDARDS</b> 1000 MCM CABLE RISER GROUNDING DETAIL	REVISIONS				
PAGE: 2 of 2		UPR2		CAD FILE: UPR2	APP: DATE: 6/90	
				SECTION 1600		





#### Notes:

1. This is the recommended 1000 MCM riser standard. See UPR1 or UPR5 when it is not possible to install a switch.
2. See UPR2 for grounding details.
3. All ground wire is #4 Cu equivalent covered copper-clad steel.
4. Avoid sharp turns in lightning arrester grounds and primary leads.
5. The pole must be 45' Class 2 or taller.
6. Static wire ground when required. DO NOT connect to neutral. See N2 for details. Engineer must call for static wire ground separately.

Rev 1 - Corrected material issue, changed to copper-clad steel, and added support grips and Note #6.



## CONSTRUCTION STANDARDS

1000MCM CABLE RISER  
WITH 3Ø SWITCH

PAGE:  
1 of 3

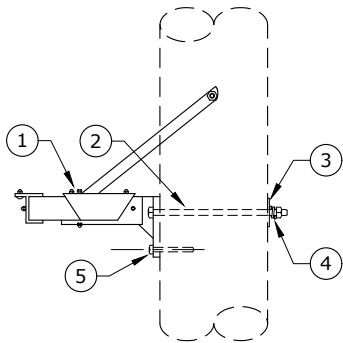
UPR4

CAD FILE:  
UPR4

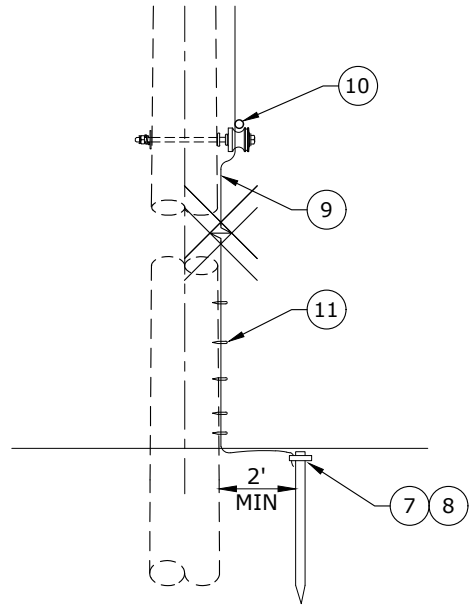
#### REVISIONS

Δ/R	DATE	ENGR	OPS
1	12/9/22	CRM	GM

APP:	CM/AH	SECTION
DATE:	1/13/10	1600



**BR10**



**N1**



## CONSTRUCTION STANDARDS

1000MCM CABLE RISER  
WITH 3Ø SWITCH



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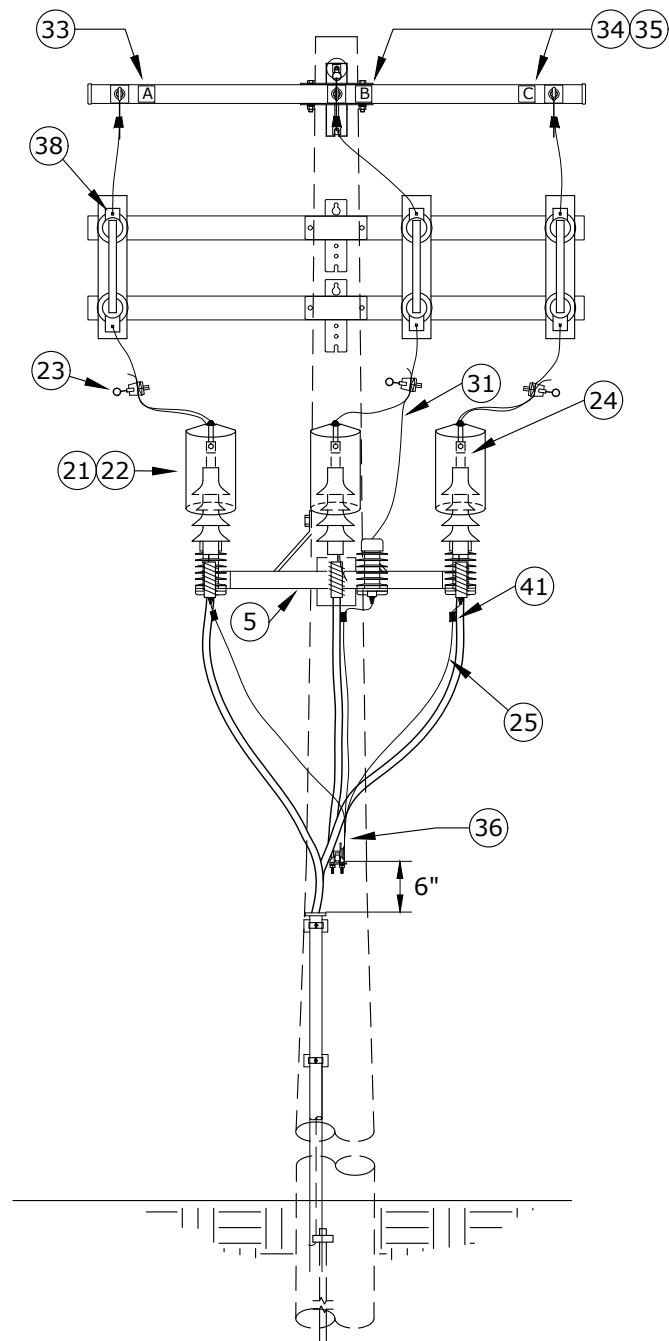
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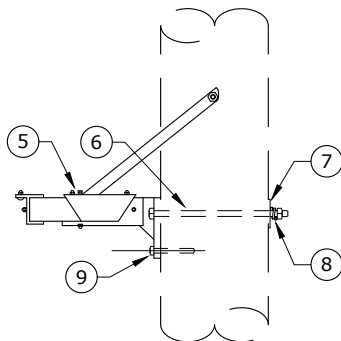
CAD FILE:  
UPR4

### REVISIONS

△ R	DATE	ENGR	OPS
1	12/9/22	CRM	GM
APP:	CM/AH	SECTION <b>1600</b>	
DATE:	1/13/10		

Rev 1 - Corrected material issue, changed to copper-clad steel, and added support grips and Note #6.			UPR4		
ITEM NO.	DESCRIPTION	BR10			
		QTY.	S/N		
1	Bracket, Terminator, Mount, 48", 1000MCM	1	2842 *		
2	Bolt, Machine, 5/8" x 14", Galv, 12,400 lb Ultimate Tensile	1	156		
3	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole, Galv	1	1392		
4	Washer, Lock, Spring, Double Coil, Galv 5/8"	1	2217		
5	Screw, Lag, 1/2" x 4 1/2", Twist Drive, Drive Point	3	1132		
6	Support, Cable, 1000MCM	3	2229		
ITEM NO.	DESCRIPTION	N1			
		QTY.	S/N		
7	Rod, Ground, 5/8" x 8'	1	1124		
8	Clamp, Ground Rod, 5/8", Small, Bronze	1	281		
9	Conductor, Copper-Clad Steel, #4 Cu Equivalent, 40% Annealed, Black Jacket with Green Stripe	40*	1512 *		
10	Connector, H-Tap, Al/Cu, Run #2 - 2/0 Str, Tap #6 - #1 Str	1	413		
11	Staple, Ground Wire, Barbed, Galvanized, 1 1/2"	24	2707 *		
ITEM NO.	DESCRIPTION	ADDITIONAL MATERIAL			
		QTY.	S/N		
12	Switch, Loadbreak, Horizontal, 600A, 15kV	1	2432		
13	Conductor, OH, AAC, 397.5, 19-Str, Bare, 1C, Canna	60	367		
14	Connector, Compression, Lug, 2-Hole, 336 ACSR and 397 AAC	6	438		
15	Bolt, 1/2" x 2", w/ Flat and Belleville Washers, Assembly	6 *	1389		
16	Connector, Tap, Wedge, Run and Tap 336 ACSR - 397 AAC	3	2501		
17	Conductor, Copper-Clad Steel, #4 Cu Equivalent, 40% Annealed, Black Jacket with Green Stripe	20	1512 *		
18	Staple, Ground Wire, Barbed, Galvanized, 1 1/2"	5	2707 *		
19	Clamp, Ground Rod, 5/8", Small, Bronze	1	281		
20	Rod, Ground, 5/8" x 8'	1	1124		
21	Machine Bolt, 3/4" x 16" Galv., 18,350 lbs. Ultimate Tensile	2	175		
22	Washer, Curved, Cast, 4" x 4" with 13/16" Hole	2	1910		
23	Washer, Lock Spring, Double Coil, Galv. 3/4"	2	2218		
24	Lock, Padlock, 2" Hardened Stainless Steel Shackle	1	2564		
25	Conductor, OH, 600v, Cu, 2/0, 19-Str, XLPE, 80 mil, Soft-Drawn, 1C, RHW-2	60	381		
26	Terminator, 15kV, Cold-Shrink JCN, 1000 MCM	3	2225		
27	Arrester, Surge, 9kV, MOV, Riser Pole	3	58		
28	Connector, Compression, Lug, Al/Cu, Tin-Plated, 1000MCM to NEMA 2-Hole	3	1501		
29	Clamp, Hot Line, GP 1530, Line #6 Sol - 400MCM, Tap #6 Sol - 4/0 Str Cu Only	3	284		
30	Conductor, OH, Cu, #4 Solid, Bare, Soft-Drawn, 1C	10	376		
31	Screw, Lag, 1/2" x 4 1/2", Twist Drive, Drive Point	9	1132		
32	Connector, Crimpet, Cu, Run 3/0 - 4/0 Str, Tap #6 Sol - #2 Str	3 *	458 *		
33	Conduit, 4" x 10', Sch 80	90*	2203		
34	Clamp, Standoff Bracket, 4"	9	297		
35	End Bell, 4" Sch 40, Long	3	2204		
36	Conductor, OH, 600v, Cu, #2, 7-Str, XLPE, 60 mil, Soft-Drawn, 1C, RHW-2	15	393		
37	Bracket, Standoff, 15" with Stop and Brace	3	227		
38	Tag, Phase A	1	1280		
39	Tag, Phase B	1	1281		
40	Tag, Phase C	1	1282		
41	Connector, Crimpet, Cu, Run and Tap 1/0 - 2/0 Str	2 *	457		
42	Guard, Wildlife, Large, OH/UG Terminators	3	1676 *		
43	Indicator, Fault, 400A, OH, Beacon with Signal Flag, Electric Field Reset	3	2558		
44	Guard, Wildlife, Polymer Arrester	3	2583*		
45	Connector, Crimpet, Cu, Run 3/0 Str - 250 Str, Tap #6 Sol - 2/0 Str	3	459 *		
46	Grip, Support, 4" Conduit, 1000MCM (1.625" to 2.5")	3	2521*		
<div><div><div>Clark Public Utilities</div><div></div></div></div>		CONSTRUCTION STANDARDS			
		1000MCM CABLE RISER WITH 3Ø SWITCH			
		REVISIONS			
			DATE	ENGR	OPS
		1	12/9/22	CRM	GM
PAGE: 3 of 3		UPR4	CAD FILE: UPR4		
APP: CM/AH		SECTION			
DATE: 1/13/10		1600			



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Clark  
Public  
Utilities

SECTION  
1600

Rev 1 - Removed extra 2/0 Cu neutral for substation get-a-ways, added 4/0-2/0 crimpets and support grips, and changed ground to Cu-clad steel grounds.

ITEM NO	DESCRIPTION	UPR5	
		CR23B (2)	
		QTY	S/N
1	Crossarm, Distribution, Fiberglass, 10' Long x 3-5/8" Wide x 4-5/8" Tall	2	3031 *
2	Bolt, Machine, 5/8" x 14", Galv., 12,400 lb Ultimate Tensile	4	156 *
3	Washer, Lock, Spring, Double Coil, Galv, 5/8"	4	2217 *
4	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole	4	1392 *
ITEM NO	DESCRIPTION	BR10	
		QTY	S/N
		QTY	S/N
5	Bracket, Terminator, Mount, 48", 1000MCM	1	2842 *
6	Bolt, Machine, 5/8" x 14", Galv, 12,400 lb Ultimate Tensile	1	156
7	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole, Galv	1	1392
8	Washer, Lock, Spring, Double Coil, Galv, 5/8"	1	2217
9	Screw, Lag, 1/2" x 4 1/2", Twist Drive, Drive Point	3	1132
10	Support, Cable, 1000MCM	3	2229
ITEM NO	DESCRIPTION	N1	
		QTY	S/N
		QTY	S/N
11	Rod, Ground, 5/8" x 8'	1	1124
12	Clamp, Ground Rod, 5/8", Small, Bronze	1	281
13	Conductor, Copper-Clad Steel, #4 Cu Equivalent, 40% Annealed, Black Jacket with Green Stripe	40*	1512 *
14	Connector, H-Tap, Al/Cu, Run #2 - 2/0 Str, Tap #6 - #1 Str	1	413
15	Staple, Ground Wire, Barbed, Galvanized, 1 1/2"	24*	2707 *
ITEM NO	DESCRIPTION	ADDITIONAL MATERIAL	
		QTY	S/N
		QTY	S/N
16	Connector, Tap, Wedge, Run and Tap 336 ACSR and 397 AAC	3	2501
17	Conductor, OH, 600v, Cu, 2/0, 19-Str, XLPE, 80 mil, Soft-Drawn, 1C, RHW-2	30	381
18	Conductor, OH, AAC, 397.5, 19-Str, Bare, 1C, Canna	30	367
19	Terminator, 15kV, Cold-Shrink JCN, 1000MCM	3	2225
20	Arrester, Surge, 9 kV, MOV, Riser Pole	3	58
21	Connector, Compression, Lug, 2-Hole, 336 ACSR and 397 AAC	3	438
22	Connector, Compression, Lug, Al/Cu, Tin-Plated, 1000MCM to NEMA 2-Hole	3	1501
23	Clamp, Hot Line, GP1530, Line #6 Sol - 400MCM, Tap #6 Sol - 4/0 Str, Cu Only	3	284
24	Bolt, 1/2" x 2", w/ Flat and Belleville Washers, Assembly	6	1389
25	Conductor, OH, Cu, #4 Solid, Bare, Soft-Drawn, 1C	10	376
26	Screw, Lag, 1/2" x 4 1/2", Twist Drive, Drive Point	9	1132
27	Connector, Crimpet, Cu, Run 3/0 - 4/0 Str, Tap #6 Sol - #2 Str	3	458 *
28	Conduit, 4" x 10', Sch 80	90*	2203
29	Clamp, Standoff Bracket, 4"	9	297
30	End Bell, 4", Sch 40, Long	3	2204
31	Conductor, OH, 600v, Cu, #2, 7-Str, XLPE, 60 mil, Soft-Drawn, 1C, RHW-2	15	393
32	Bracket, Standoff, 15" with Stop and Brace	3	227
33	Tag, Phase A	1	1280
34	Tag, Phase B	1	1281
35	Tag, Phase C	1	1282
36	Connector, Crimpet, Cu, Run and Tap 1/0 - 2/0 Str	2 *	457
37	Guard, Wildlife, Large, OH/UG Terminators	3	1676
38	Disconnect, 600 Amp, Single Blade	3	2531
39	Indicator, Fault, 400A, OH, Beacon with Signal Flag, Electric Field Reset	3	2558
40	Guard, Wildlife, Polymer Arrester	3	2583
41	Connector, Crimpet, Cu, Run 3/0 Str - 250 Str, Tap #6 Sol - 2/0 Str	3	459 *
42	Grip, Support, 4" Conduit, 1000MCM (1.625" to 2.5")	3	2521*



## CONSTRUCTION STANDARDS

1000MCM CABLE RISER  
WITH 600 AMP DISCONNECTS

PAGE:  
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UPR5

CAD FILE:  
UPR5

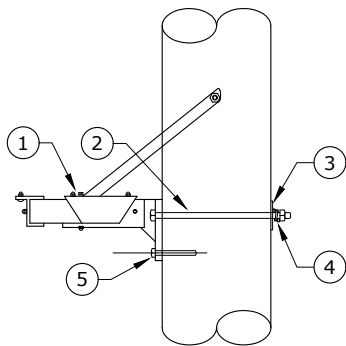
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R	DATE	ENGR	OPS
1	12/9/22	CRM	GM

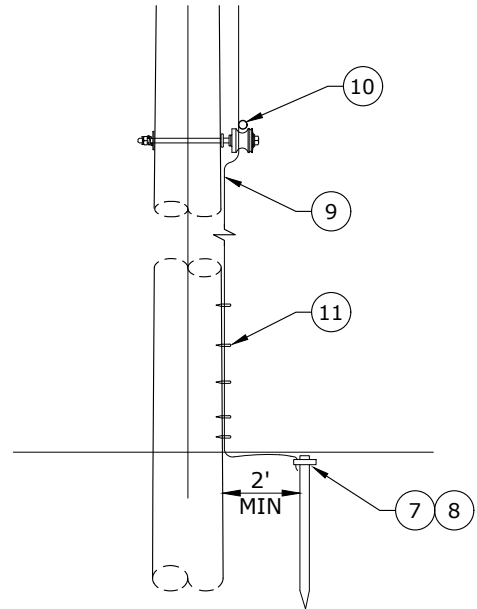
APP: CM/AH  
DATE: 1/13/10

SECTION  
1600





**BR10**



**N1**

Rev 1 - Added 4/0-2/0 crimpets and support grips.

ITEM NO.	DESCRIPTION	UPR6 BR10	
		QTY.	S/N
1	Bracket, Terminator Mount, 48", 1000 MCM Cable	1	2842
2	Bolt, Machine, 5/8" x 14", Galv., 12,400 lbs Ultimate Tensile	1	156
3	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole, Galv	1	1392
4	Washer, Lock, Spring, Double Coil Galv., 5/8"	1	2217
5	Screw, Lag, 1/2" x 4 1/2", Twist Drive, Drive Point	3	1132
6	Support, Cable, 1000 MCM	3	2229
ITEM NO.	DESCRIPTION	N1	
		QTY.	S/N
7	Rod, Ground, 5/8" x 8'	1	1124
8	Clamp, Ground Rod, 5/8", Small, Bronze	1	281
9	Conductor, Copper-Clad Steel, #4 Cu Equivalent, 40% Annealed, Black Jacket with Green Stripe	40	1512
10	Connector, H-Tap, Al/Cu, Run #2 - 2/0 Str, Tap #6 - #1 Str	1	413
11	Staple, Ground, Barbed, Galvanized, 1 1/2"	24	2707



## CONSTRUCTION STANDARDS

PARALLEL 1000MCM CABLE RISER  
WITH 3Ø SWITCH

PAGE:  
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**UPR6**

CAD FILE:  
UPR6

REVISIONS			
DATE	ENGR	OPS	
12/9/22	CRM	GM	
APP:	CM/DK	SECTION	
DATE:	11/2/18	1600	



ITEM NO.	DESCRIPTION	UPR6	
		ADDITIONAL MATERIAL	
		QTY.	S/N
12	Switch, Loadbreak, Horizontal, 900A, 15kV	1	2432
13	Conductor, OH, AAC, 397.5, 19-Str, Bare, 1C, Canna	60	367
14	Connector, Compression, Lug, 2-Hole, 336 ACSR and 397 AAC	9	438
15	Bolt, 1/2" x 2", w/ Flat & Belleville Washers , Assembly	12	1389
16	Connector, Tap, Wedge, Run and Tap 336 ACSR - 397 AAC	3	2501
17	Conductor, Copper-Clad Steel, #4 Cu Equivalent, 40% Annealed, Black Jacket with Green Stripe	20	1512
18	Staple, Ground, Barbed, Galv, 1 1/2"	5	2707
19	Clamp, Ground Rod, 5/8", Small, Bronze	1	281
20	Rod, Ground, 5/8" x 8'	1	1124
21	Bolt, Machine, 3/4" x 16", Galv, 18,300 lb Ultimate Tensile	2	175
22	Washer, Curved, Cast, 4" x 4" w/ 13/16" Hole	2	1910
23	Washer, Lock, Spring, Double Coil Galv, 3/4"	2	2218
24	Lock, Padlock, 2" Hardened Stainless Steel Shackle	1	2564
25	Conductor, OH, 600v, Cu, 2/0, 19-Str, XLPE, 80 mil, Soft-Drawn, 1C, RHW-2	60	381
26	Terminator, 15 kV, Cold-Shrink JCN, 1000 MCM	6	2225
27	Arrester, Surge, 9 kV, MOV, Riser Pole	3	58
28	Connector, Compression, Lug, Al/Cu, Tin-Plated, 1000 MCM to NEMA 2-Hole	6	1501
29	Clamp, Hot Line, GP 1530, Line #6 Sol - 400MCM, Tap #6 Sol - 4/0 Str, Cu Only	3	284
30	Conductor, OH, Cu, #4 Solid, Bare, Soft-Drawn, 1C	10	376
31	Screw. Lag, 1/2" x 4 1/2", Twist Drive, Drive Point	6	1132
32	Connector, Crimpet, Cu, Run 3/0 - 4/0 Str, Tap #6 Sol - #2 Str	6	458 *
33	Conduit, 4" x 10', Sch 80	180	2203
34	Clamp, Standoff Bracket, 4"	18	297
35	End Bell, 4" Sch 40, Long	6	2204
36	Conductor, OH, 600v, Cu, #2, 7-Str, XLPE, 60 mil, Soft-Drawn, 1C, RHW-2	15	393
37	Bracket, Standoff, Riser, 24" with Stop and Brace	3	228
38	Tag, Phase A	1	1280
39	Tag, Phase B	1	1281
40	Tag, Phase C	1	1282
41	Connector, Crimpet, Cu, Run and Tap 1/0 - 2/0 Str	6 *	457
42	Guard, Wildlife, Large OH/UG Terminators	3	1676
43	Indicator, Fault, 400A, OH, Beacon with Signal Flag, Electric Field Reset	3	2558
44	Bolt, 1/2" x 2-1/2", w/ Flat & Belleville Washers, Assembly	6	2584
45	Support, Cable, 1000 MCM	3	2229
46	Guard, Wildlife, Polymer Arrester	3	2583
47	Connector, Crimpet, Cu, Run 3/0 Str - 250 Str, Tap #6 Sol - 2/0 Str	6	459 *
48	Grip, Support, 4" Conduit, 1000MCM (1.625" to 2.5")	6	2521 *



# CONSTRUCTION STANDARDS

## PARALLEL 1000MCM CABLE RISER WITH 3Ø SWITCH

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UPR6

CAD FILE:  
UPR6

### REVISIONS

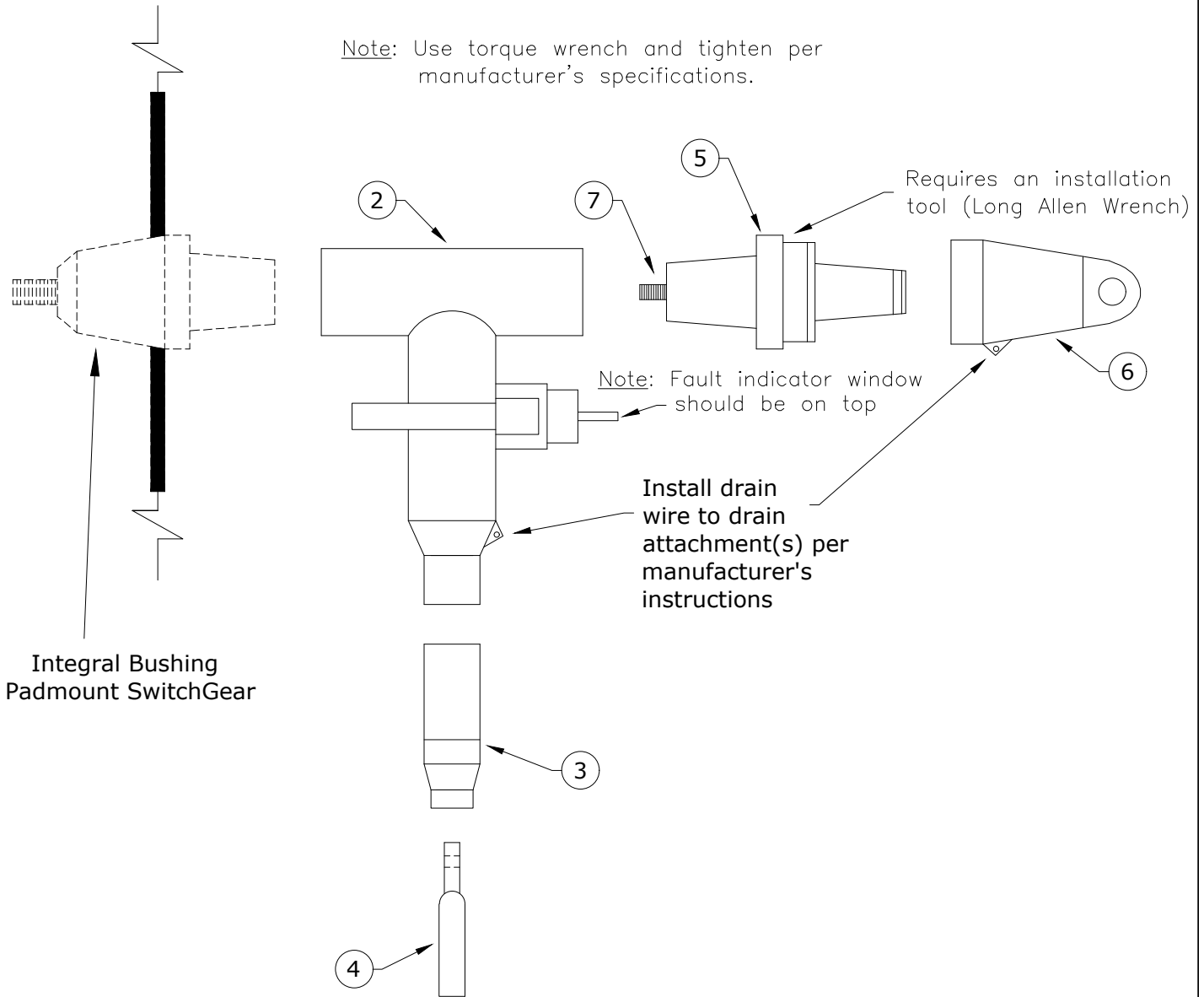
Δ	DATE	ENGR	OPS
1	12/9/22	CRM	GM

APP: CM/DK  
DATE: 11/2/18

SECTION  
1600

# ASSEMBLY DIAGRAM

## ONE ASSEMBLY PER 600A PHASE



Rev 3: Added torque requirements and material corrections.

ITEM NO.	DESCRIPTION	USG1	
		QTY.	S/N
1	600A Elbow Kit For Switchgear	1	2692
	<i>Each Kit Consists Of #2 to #7:</i>		
2	Housing, Elbow, 600A	1	1825
3	Adapter, Cable, 1000 MCM	1	1
4	Contact, Compression, 1000 MCM, Al, Non-Threaded Hole	1	941
5	Plug, Loadbreak Reducing Tap, 600A-200A	1	1769
6	Cap, Protective Insulated, 200A, 15kV	1	265
7	Stud, Al, 600A, T-Body to Reducer Plug	1	2704
8	600A Elbow Sealing Kit	1	2376



### CONSTRUCTION STANDARDS

PADMOUNT SWITCHGEAR  
600 AMP ELBOW - 1000MCM CABLE

PAGE:  
1 of 1

USG1

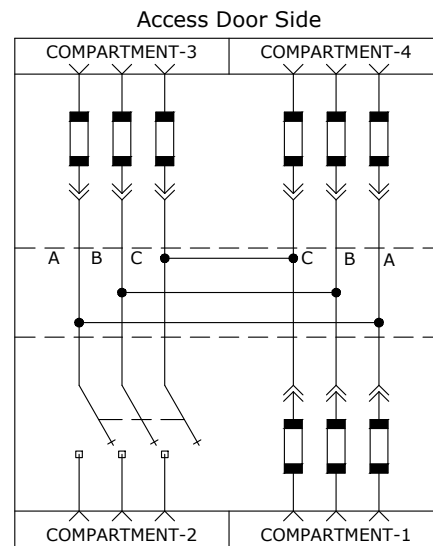
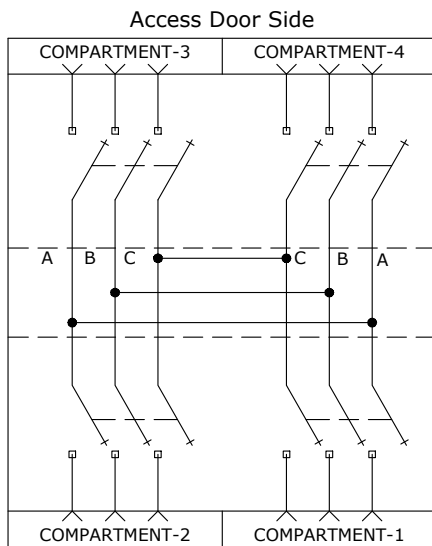
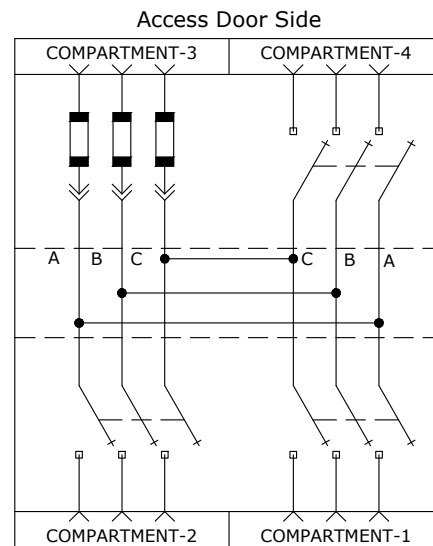
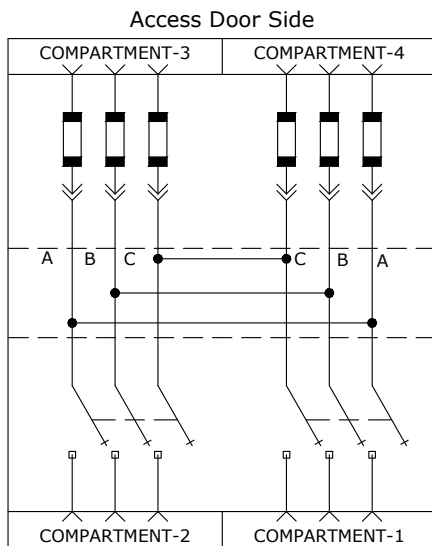
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#### REVISIONS

DATE	ENGR	OPS
2/23/00	HWH	MA
1/11/04	LB	AH
4/29/09	CM	AH
12/5/19	CM	GM

APP: GGW/RWG  
DATE: 6/90

SECTION  
1600



PADMOUNT DEADFRONT	PADMOUNT LIVEFRONT (Maintenance only)	600 AMP 3ø SWITCH	200 AMP 3ø POSITIONS
PME9	PMH9	2	2
PME10	PMH10	4	0
PME11	PMH11	3	1
PME12	PMH12	1	3

FUSE SIZE (SMU)	S/N
65E	2770
100E	2771
125E	2772

Contact Systems Engineering for proper fuse coordination.

**Notes:**

1. Material issue has the maximum number of fault indicators that may be used. Engineer to determine the actual number needed.
2. All new PMEs are ordered with the required number of 100E fuses for the configuration plus 3 spare 100E fuses.
3. If 65E or 125E fuses are required, the Engineer will have to call for the number needed plus 3 spares.

Rev. 4 - Changed to PME and PMH nomenclature, SMU fuses, removed separate fuse holders, added tie-downs, changed to 612 vault, and updated materials.



## CONSTRUCTION STANDARDS

### PADMOUNT SWITCHGEAR CHART

USE WITH STANDARD USG3

PAGE:  
1 of 2

# USG2

CAD FILE:  
USG2

REVISIONS			
Δ	DATE	ENGR	OPS
1	1/11/04	LB	AH
2	10/7/05	LB	AH
3	4/29/09	CM	AH
4	12/5/19	CM	GM
APP: HWH/MA SECTION DATE: 2/22/00 1600			

Rev. 4 - Changed to PME and PMH nomenclature, SMU fuses, removed separate fuse holders, added tie-downs, changed to 612 vault, and updated materials.

### DEADFRONT (CPU Standard)

ITEM NO.	DESCRIPTION	S/N	PME9	PME10	PME11	PME12
			QTY	QTY	QTY	QTY
1	Switch, Padmount, PME9, 2-600A Switches & 2-200A Fused Taps	2458	1	-	-	-
	PME10, 4-600A Switches	2452	-	1	-	-
	PME11, 3-600A Switches & 1-200A Fused Taps	2459	-	-	1	-
	PME12, 1-600A Switches & 3-200A Fused Taps	CONTACT STANDARDS ENGINEERING - NOT STOCKED				
2	600A Elbow Kit For Switchgear (USG1 Kit)	2692	6	12	9	3
	<i>Each Kit Consists Of #3 to #8:</i>					
3	Housing, Elbow, 600A	1825	6	12	9	3
4	Adapter, Cable, 1000 MCM	1	6	12	9	3
5	Contact, Compression, 1000 MCM, Al, Non-Threaded Hole	941	6	12	9	3
6	Plug, Loadbreak Reducing Tap, 600A-200A	1769	6	12	9	3
7	Cap, Protective Insulated, 200A, 15kV	265	6	12	9	3
8	Stud, Al, 600A, T-Body to Reducer Plug	2704	6	12	9	3
9	Elbow, Sealing Kit, 1000MCM 175 & 220 mil	2376	6	12	9	3
10	Conductor, Cu, 2/0, 1C, 7-Str, Bare, Soft Drawn	379	40	50	45	35
11	Connector, Crimpet, Cu, Run 4/0 Str, Tap 1/0 - 2/0 Str	459	6	12	9	3
12	Connector, Crimpet, Cu, Run 1/0 - 2/0 Str, Tap 1/0 - 2/0 Str	457	2	4	3	1
13	Indicator, Fault, UG, 800A, Test-Point, Voltage-Reset, 3-phase	2695	1	3	2	-
14	Elbow, 200A, LB, 1/0, 175 & 220 mil, Test Point, 15 kV, Jacket Seal	1312	6	-	3	9
15	Cap, Protective, Insulated, 200A 15 kV	265	6	-	3	9
16	Bushing, Standoff, Insulated, 200A	252	6	-	3	9
17	Connector, Crimpet, Cu, Run & Tap #2 Sol/Str (2C2)	455	6	-	3	9
18	Connector, Crimpet, Cu, Run 1/0 - 2/0 Str, Tap #8 Sol - #2 Str	456	2	-	1	3
19	Strut, Slotted, 10', 1-5/8" x 1-5/8", 12 Ga Galv	2958	1	2	2	1
20	Anchor, Sleeve, 1/2" x 3", Stainless Steel, 3/8" Thread	2959	4	8	8	4
21	Washer, Flat, 3/8", (304) Stainless Steel	1398	4	8	8	4
22	Bracket, Wall Mount, Strut, 2-Hole, Galv	2960	2	4	4	2
23	Clamp, Cable, Strut, 1000 MCM, Mount	2961	6	12	9	3
24	Bolt, Machine, 1/2" x 1", (304) Stainless Steel	130	14	16	16	14
25	Nut, Spring-Loaded, Galv, 1/2" (Unistrut)	920	14	16	16	14

### LIVEFRONT (Non-standard)

ITEM NO.	DESCRIPTION	S/N	PMH9	PMH10	PMH11	PMH12
			QTY	QTY	QTY	QTY
1	Bolt, Machine, 1/2" x 2", SS	132	24	24	24	24
2	Clamp, Ground Rod	282	2	2	2	2
3	Conductor, 2/0 BC, 7 STR	379	50	50	50	50
4	Connector, Comp Lug YCA26-2NCU 2/0	431	6	-	3	9
5	Connector, Crimpet, 2/0 - 2/0	457	4	4	4	4
6	Rod, Ground, 5/8" x 8'	1124	2	2	2	2
7	2" x 1/2" Bolt Assembly	1389	24	24	24	24
8	Connector, Comp Lug, YA44-A3AL/CU 1000 MCM	1501	6	12	9	3
9	Vault, Concrete, 600 AMP SW, Mod. U-J-6	1541	1	1	1	1
10	Terminator, Outdoor, Molded Rubber 1/0	2214	6		3	9
11	Terminator, Outdoor, Butyl, 600 AMP, 1000 MCM	2225	6	12	9	3
12	Switch, Padmt, Linefront, PMH9		(#1265)	(#1264)	(#1468)	(#1471)
13	Holder, Fuse, Padmount, Livefront	745	6	-	3	9
14	Fault Indicator, 800A, Current-Reset, Beacon	2463	1	3	2	-
15	Caulk, Switchgear	2604	1	1	1	1



## CONSTRUCTION STANDARDS

### PADMOUNT SWITCHGEAR CHART

USE WITH STANDARD USG3

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# USG2

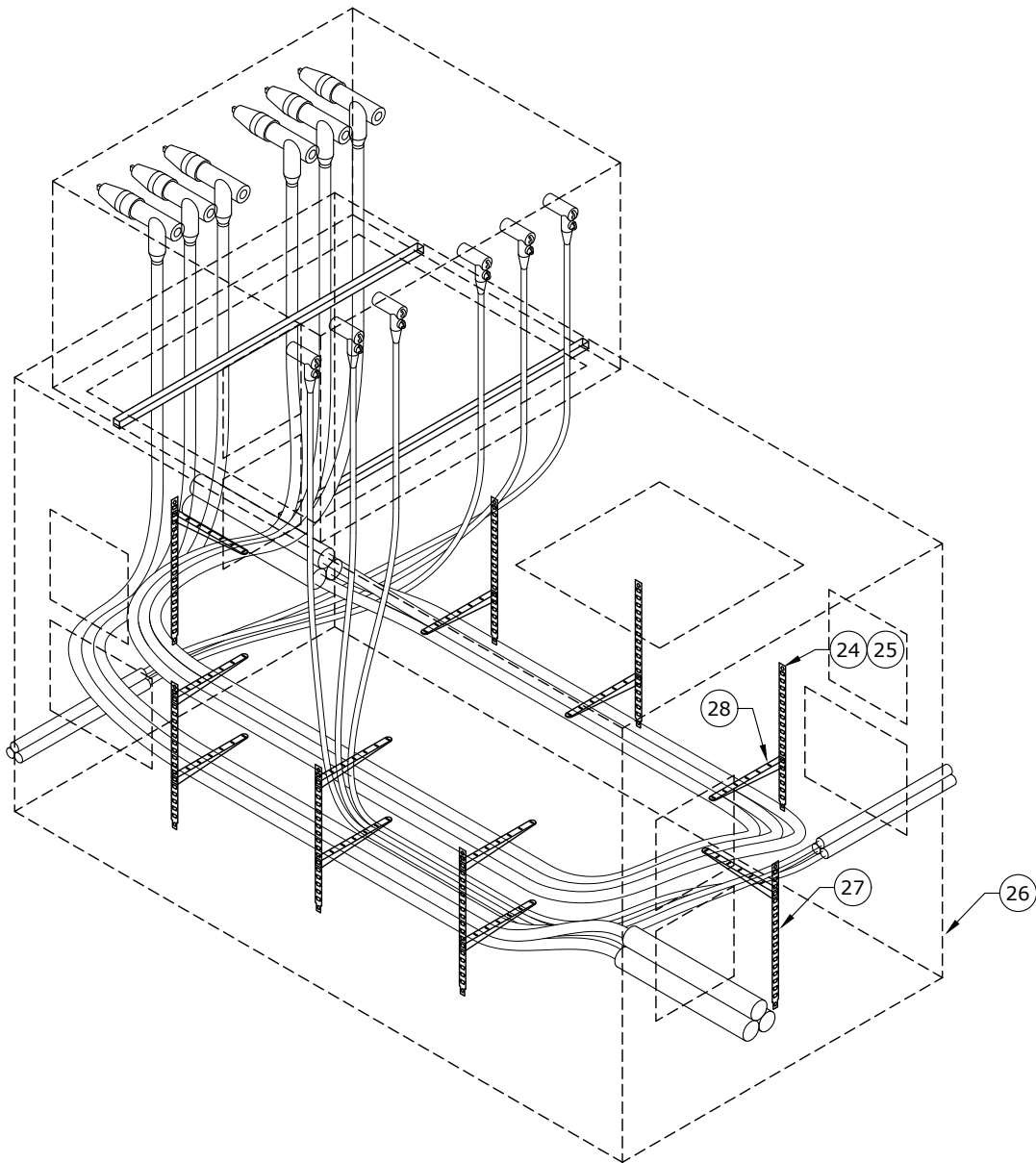
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#### REVISIONS

R	DATE	ENGR	OPS
1	1/11/04	LB	AH
2	10/7/05	LB	AH
3	4/29/09	CM	AH
4	12/5/19	CM	GM

APP: HWH/MA  
DATE: 2/22/00

SECTION  
1600



**Notes:**

1. Cable clamps required on 600A ways and not required on 200A ways. Install strut and cable clamps after setting switchgear to precisely land elbows on bushings.
2. Seal vacant conduits with reusable expanding duct plugs.  
     2" - S/N 2955  
     4" - S/N 2943  
     Seal conduits with cable using inflatable seals.  
     2" - S/N 2952  
     4" - S/N 2943
3. For PME9 and PME12, face switchgear side with two fuse bays toward access door.
4. Engineer to call for temporary lid (S/N 2495) when switch and vault installed separately.

Rev. 4 - Fixed stock number in Note 4 for temporary lid.



## CONSTRUCTION STANDARDS

DEADFRONT SWITCHGEAR  
612 VAULT DETAIL  
USE WITH STANDARD USG2

PAGE:  
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**USG3**

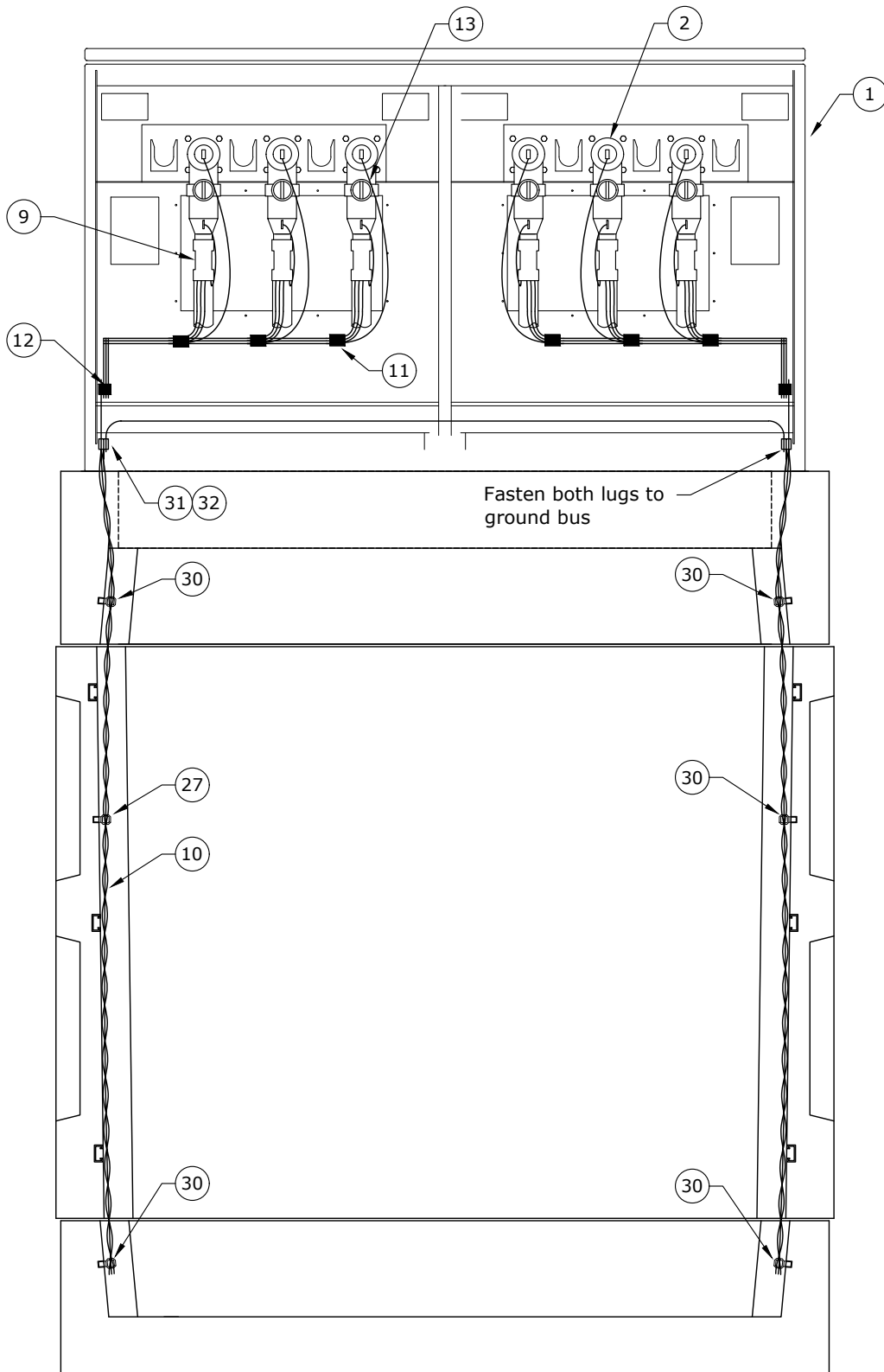
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### REVISIONS

△ R	DATE	ENGR	OPS
1	1/11/04	LB	AH
2	10/7/05	LB	AH
3	12/5/19	CM	GM
4	9/16/21	JDK	

APP: HWH/MA  
DATE: 2/22/00

SECTION  
**1600**



**600A Elbow Detail**

Rev. 4 - Fixed stock number in Note 4 for temporary lid.



## CONSTRUCTION STANDARDS

DEADFRONT SWITCHGEAR  
612 VAULT DETAIL  
USE WITH STANDARD USG2

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**USG3**

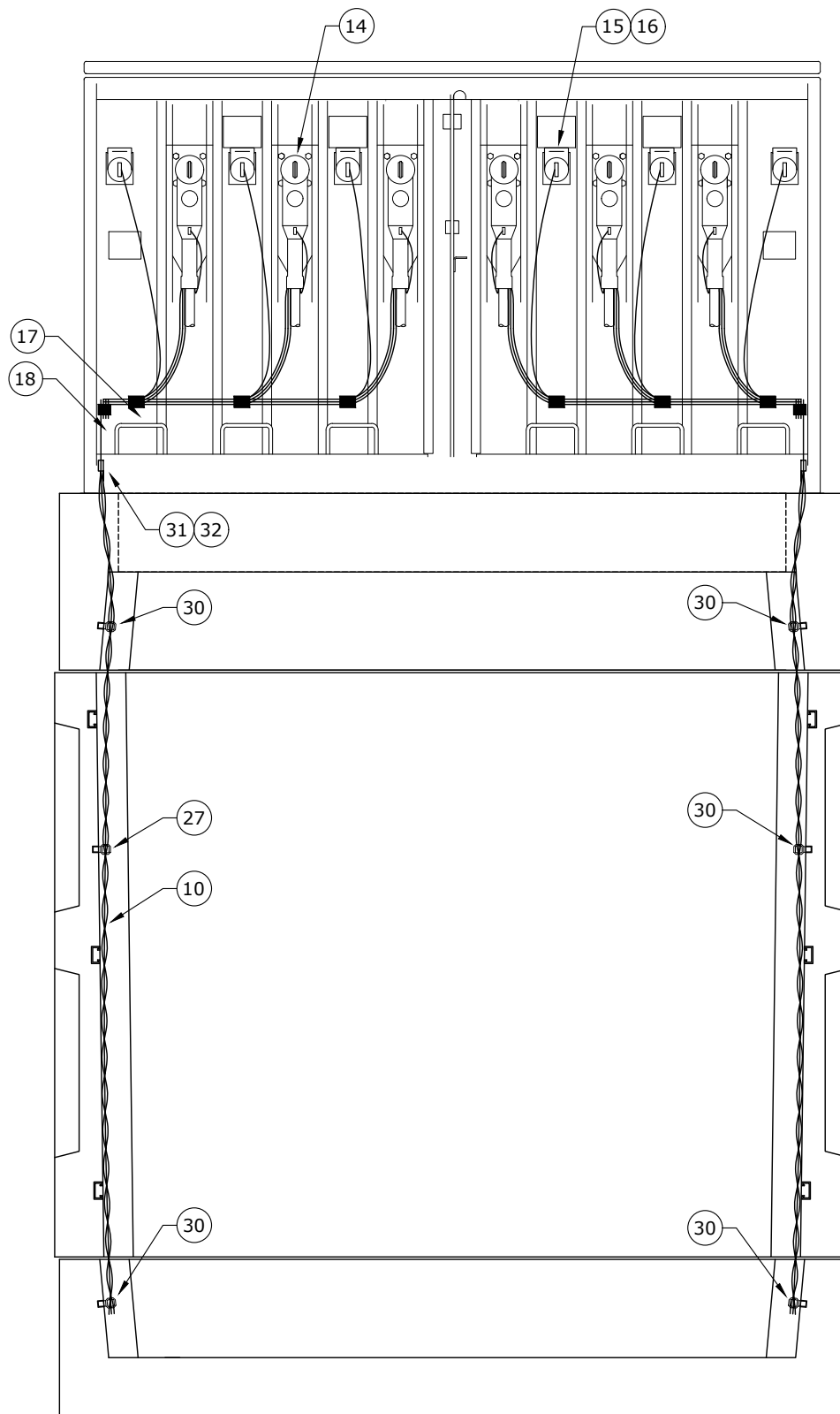
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### REVISIONS

△ R	DATE	ENGR	OPS
1	1/11/04	LB	AH
2	10/7/05	LB	AH
3	12/5/19	CM	GM
4	9/16/21	JDK	

APP: HWH/MA  
DATE: 2/22/00

SECTION  
**1600**



200A Elbow Detail

Rev. 4 - Fixed stock number in Note 4 for temporary lid.



## CONSTRUCTION STANDARDS

DEADFRONT SWITCHGEAR  
612 VAULT DETAIL  
USE WITH STANDARD USG2

PAGE:  
3 of 6

**USG3**

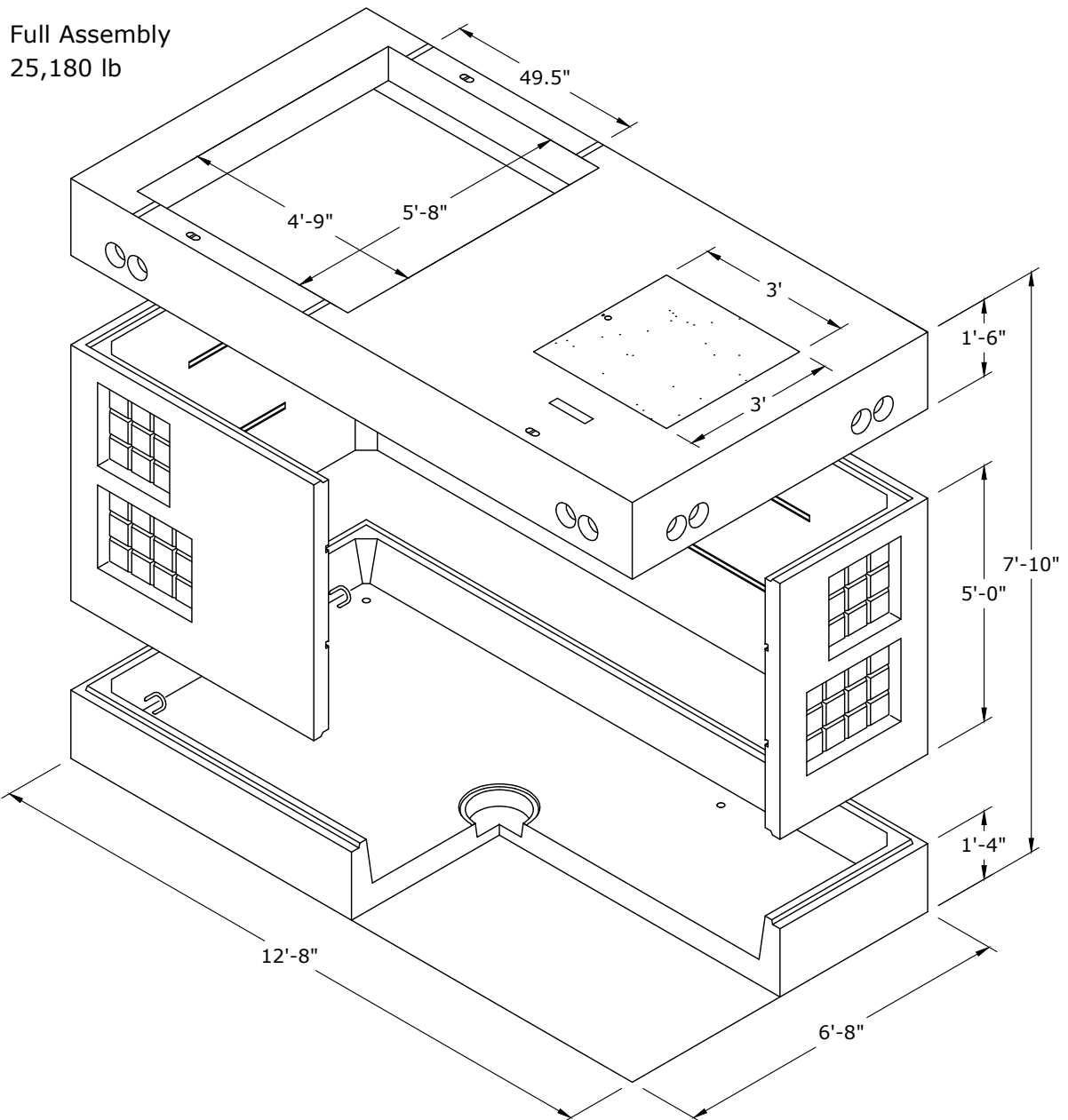
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### REVISIONS

△ R	DATE	ENGR	OPS
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2	10/7/05	LB	AH
3	12/5/19	CM	GM
4	9/16/21	JDK	

APP: HWH/MA  
DATE: 2/22/00

SECTION  
**1600**



Rev. 4 - Fixed stock number in Note 4 for temporary lid.



## CONSTRUCTION STANDARDS

DEADFRONT SWITCHGEAR  
612 VAULT DETAIL  
USE WITH STANDARD USG2

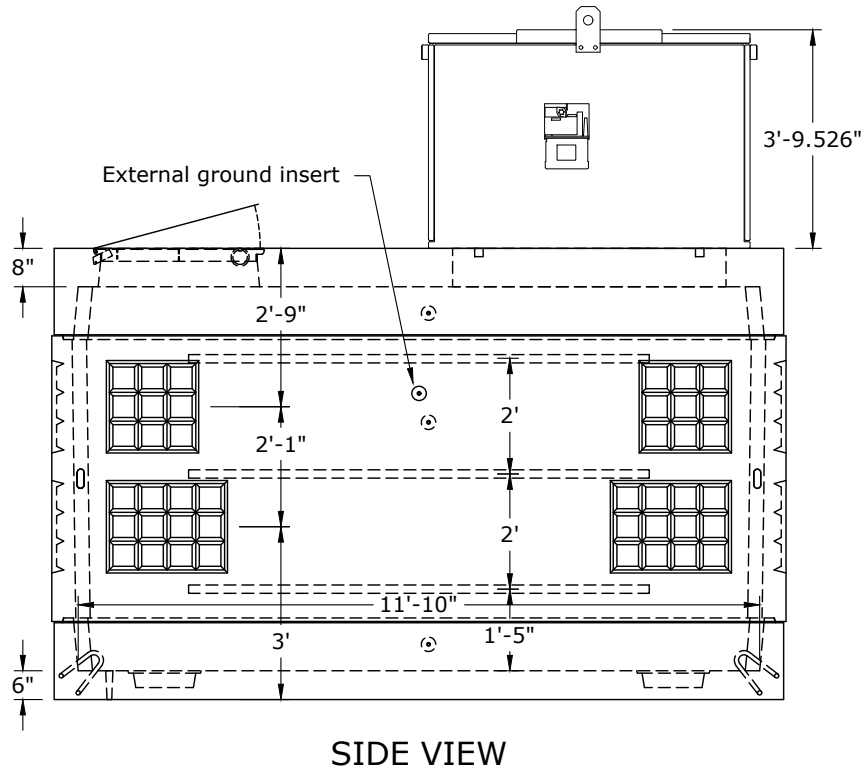
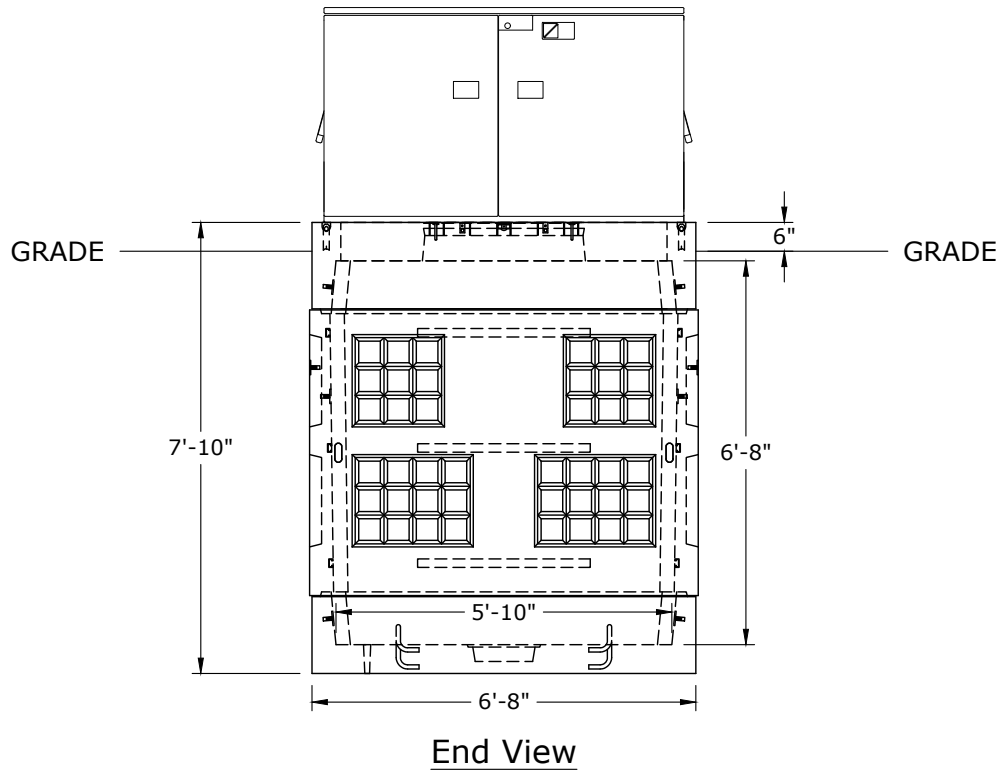
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4 of 6

**USG3**

CAD FILE:  
USG3

REVISIONS			
△ R	DATE	ENGR	OPS
1	1/11/04	LB	AH
2	10/7/05	LB	AH
3	12/5/19	CM	GM
4	9/16/21	JDK	
APP: HWH/MA		SECTION	
DATE: 2/22/00		<b>1600</b>	





Rev. 4 - Fixed stock number in Note 4 for temporary lid.



## CONSTRUCTION STANDARDS

DEADFRONT SWITCHGEAR  
612 VAULT DETAIL  
USE WITH STANDARD USG2

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USG3

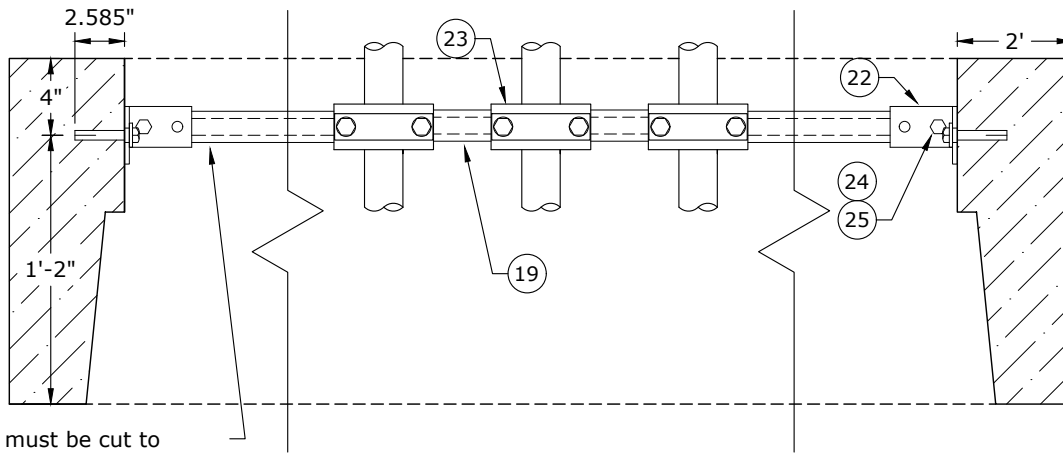
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### REVISIONS

△ R	DATE	ENGR	OPS
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2	10/7/05	LB	AH
3	12/5/19	CM	GM
4	9/16/21	JDK	

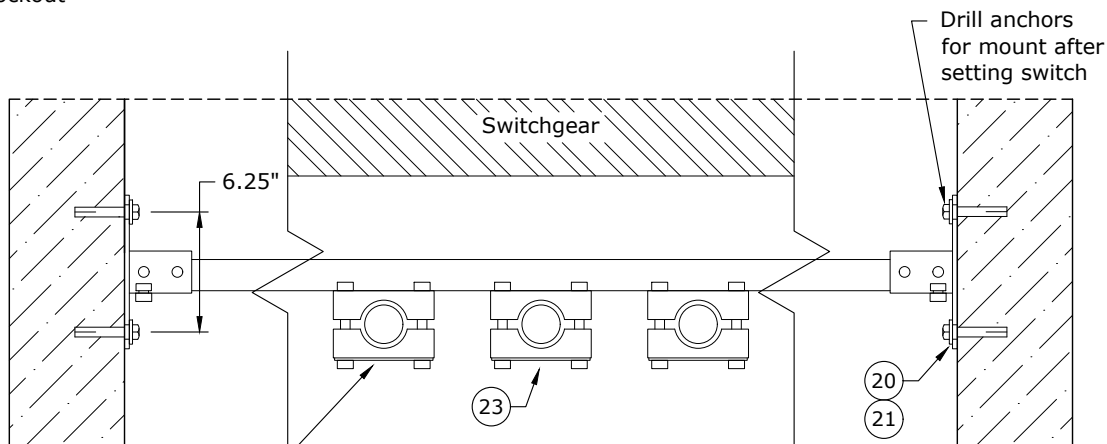
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DATE: 2/22/00

SECTION  
1600



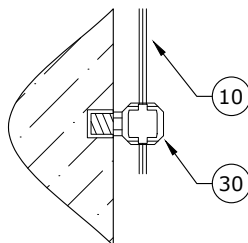
Strut must be cut to 5'-8-1/2" to fit across the lid blockout

**Cable Support Side View**

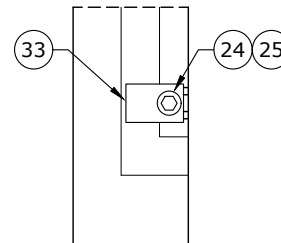


Mount cable clamps on door side of strut

**Cable Support Top View**



**UFER Ground Connection**



**Switchgear to Vault Anchoring Detail**

Rev. 4 - Fixed stock number in Note 4 for temporary lid.

ITEM NO.	DESCRIPTION	USG3	
		QTY	S/N
26	Vault, w/ Lid, 612-3LA, Ufer Ground, for PME Switchgear	1	2957
27	Rack, Cable, 30"	8	2861
28	Hook, Cable Rack, 18"	16	2863
29	Tie Wrap, Plastic, Releasable, 1/2" W x 19" L	36	2956
30	Lug, Grounding, #8 Sol - 2/0 Str, 4-Way	6	842
31	Connector, Compression Lug, Cu, 2/0 Str	4	431
32	Bolt, Washer, SS, 1/2" x 2" Assembly, w/ Si Br Nut	4	1389
33	Washer, 2" x 3" x 3/16" with 9/16" Slotted Hole	4	1415



## CONSTRUCTION STANDARDS

DEADFRONT SWITCHGEAR  
612 VAULT DETAIL  
USE WITH STANDARD USG2

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**USG3**

CAD FILE:  
USG3

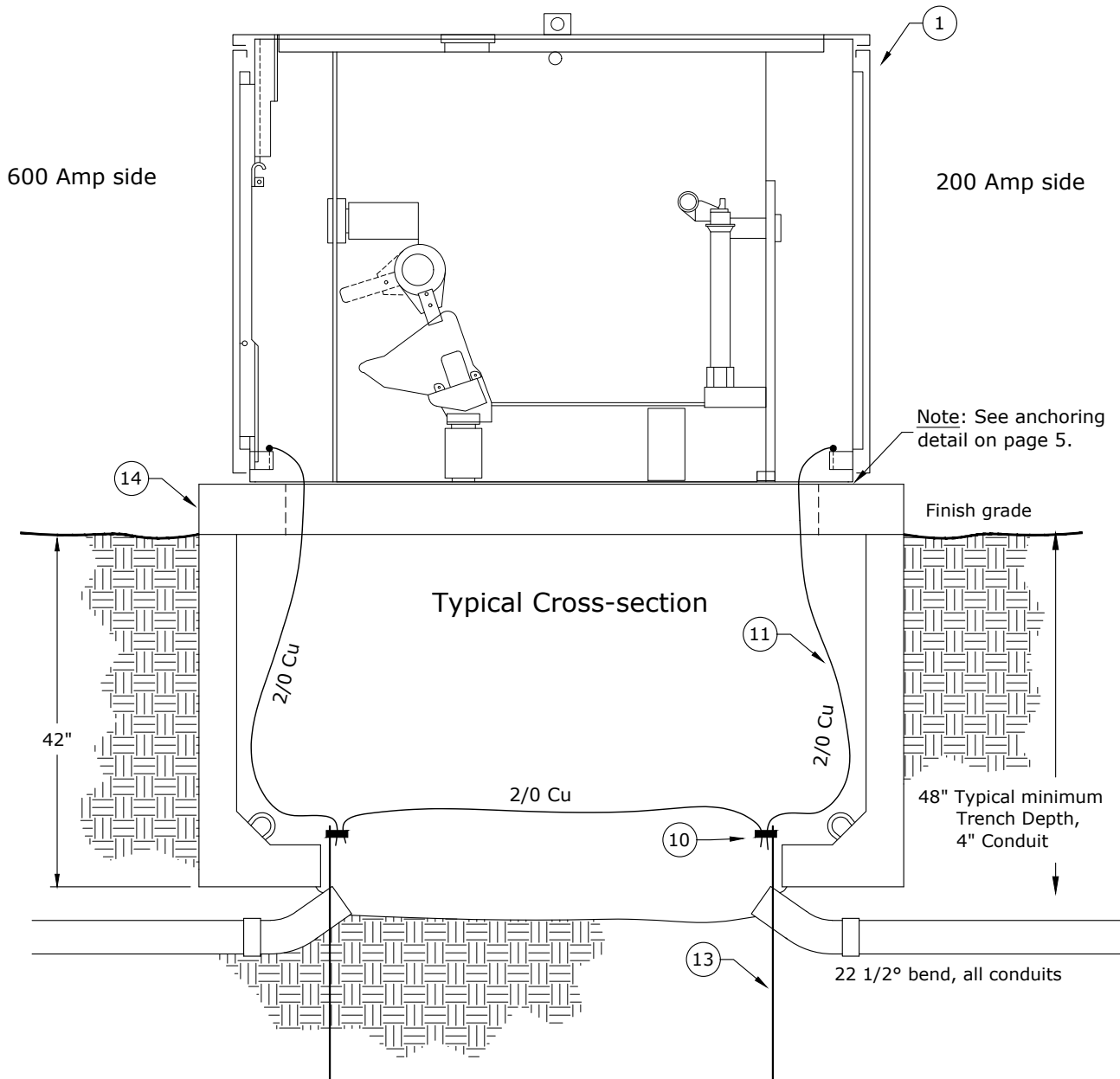
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2	10/7/05	LB	AH
3	12/5/19	CM	GM
4	9/16/21	JDK	

APP: HWH/MA  
DATE: 2/22/00

SECTION  
**1600**

FOR MAINTENANCE ONLY OR  
WHEN STD USG3 VAULT WILL NOT FIT



- Notes:**
1. Std USG3 is the preferred vault standard for PME switchgear.
  2. Install 2 ground rods and 2/0 Cu bus loop around vault & bond to switchgear case in opposite corners.
  3. Remote indicator for fault indicator is to be installed in the upper hinged-side of door of compartment with indicator.

Rev. 2 - Combined USG 5, 6, & 7, changed to maintenance or where 612 vault does not fit & added material issue.



## CONSTRUCTION STANDARDS

DEADFRONT SWITCHGEAR ON 774 VAULT  
FOR MAINTENANCE ONLY  
OR WHEN STD USG3 VAULT WILL NOT FIT

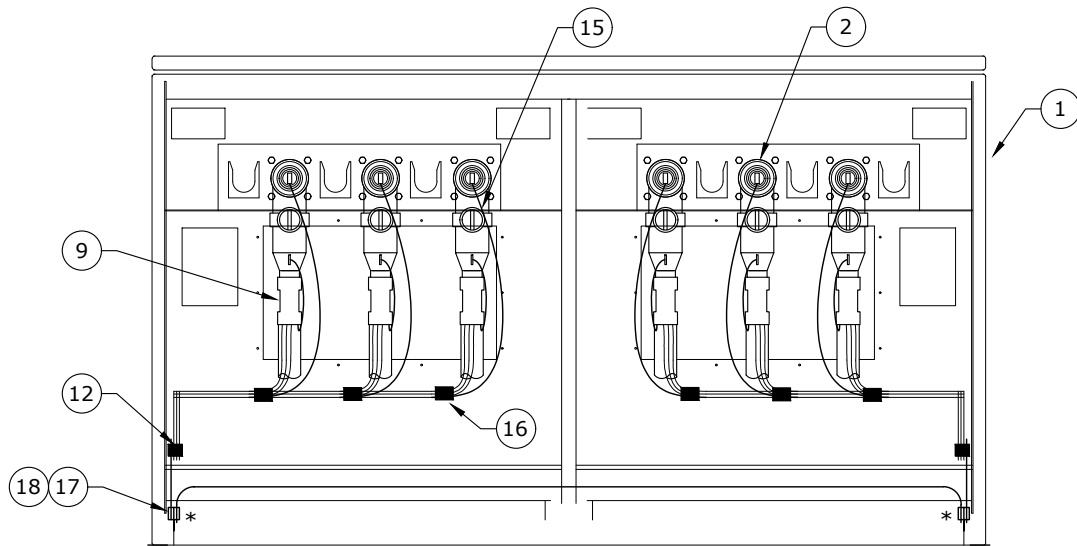
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USG5

CAD FILE:  
USG5

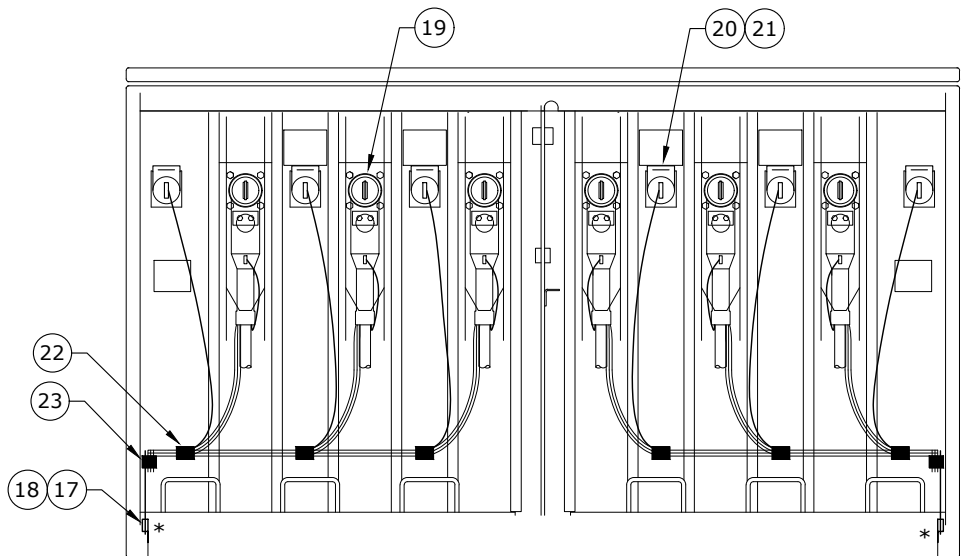
### REVISIONS

R	DATE	ENGR	OPS
1	1/11/04	LB	AH
2	8/8/22	CRM	GM
APP: HWH/MA		SECTION	
DATE: 11/94		1600	



**600A Elbow Detail**

\*Note: Bond concentric neutrals from cable to 2/0 Cu ground. Leave enough slack to move elbows.



**200A Elbow Detail**

Rev. 2 - Combined USG 5, 6, & 7, changed to maintenance or where 612 vault does not fit, and added material issue.



## CONSTRUCTION STANDARDS

DEADFRONT SWITCHGEAR ON 774 VAULT  
FOR MAINTENANCE ONLY  
OR WHEN STD USG3 VAULT WILL NOT FIT

PAGE:  
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**USG5**

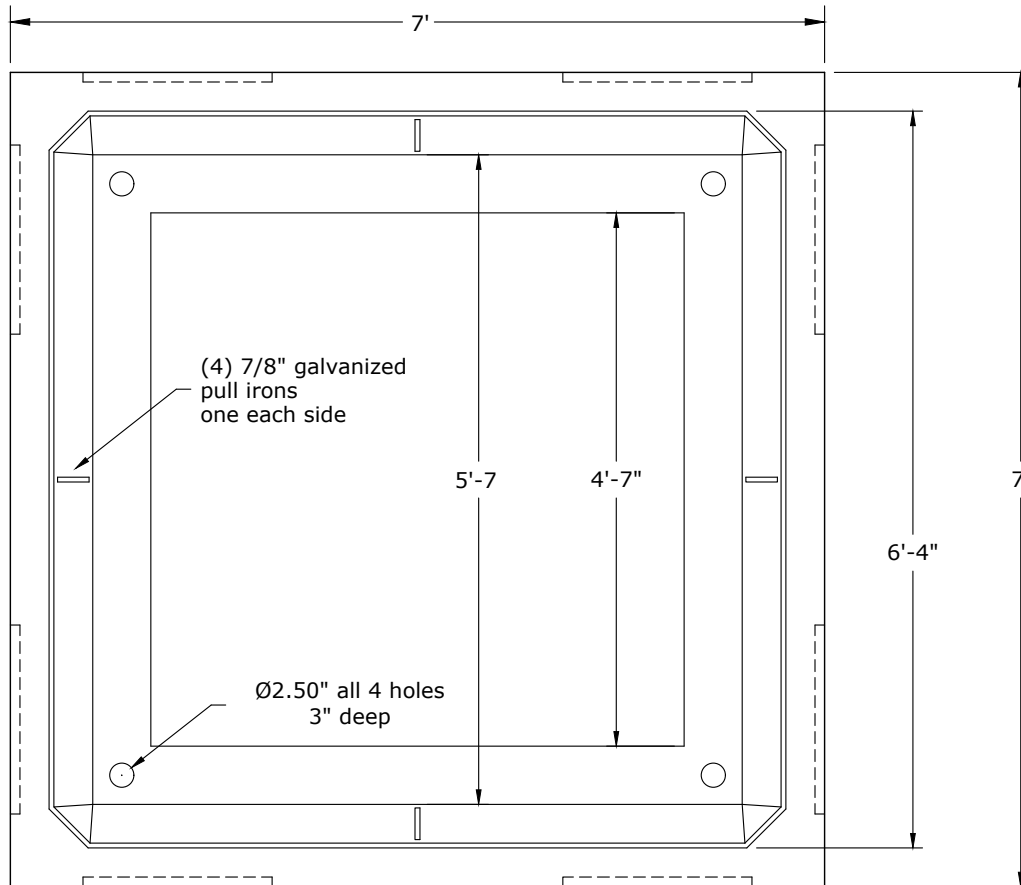
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USG5

### REVISIONS

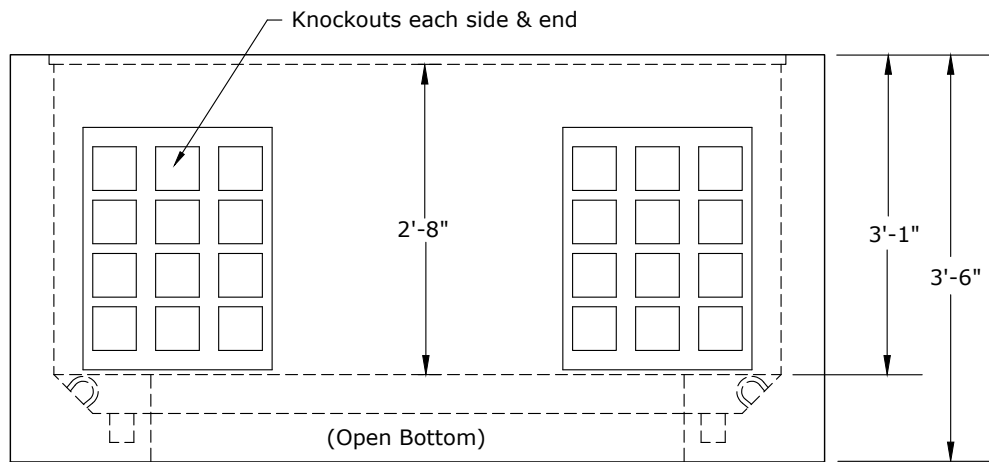
Δ	DATE	ENGR	OPS
1	1/11/04	LB	AH
2	8/8/22	CRM	GM

APP: HWH/MA  
DATE: 11/94

SECTION  
**1600**



Top View (Vault Base)



Front View (Vault Base)

Base Weight - 6,040 lb

Rev. 2 - Combined USG 5, 6, & 7, changed to maintenance or where 612 vault does not fit, and added material issue.



## CONSTRUCTION STANDARDS

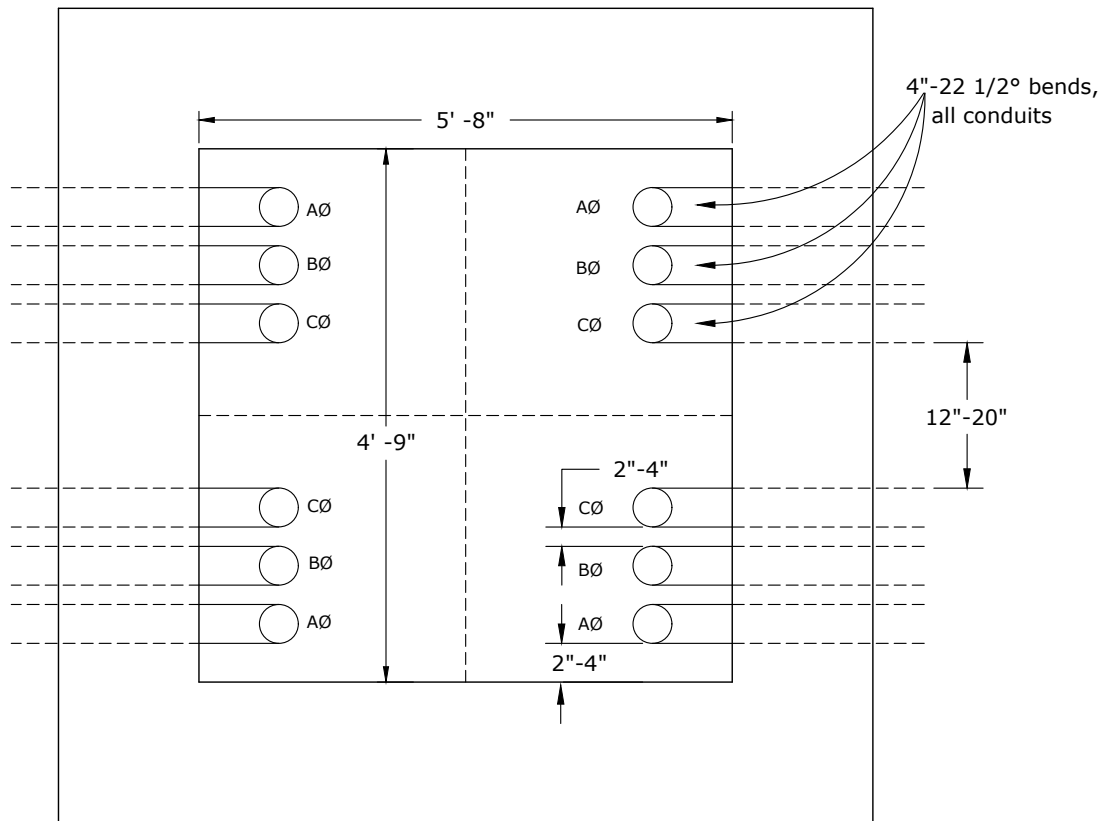
DEADFRONT SWITCHGEAR ON 774 VAULT  
FOR MAINTENANCE ONLY  
OR WHEN STD USG3 VAULT WILL NOT FIT

PAGE:  
3 of 6

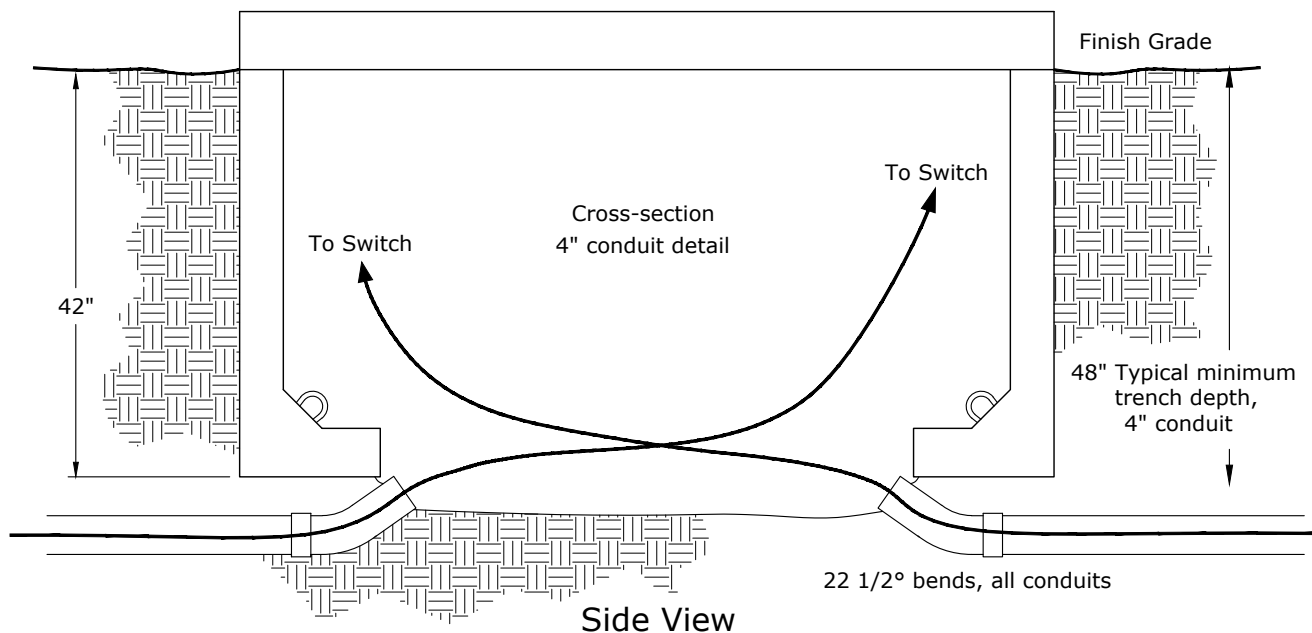
USG5

CAD FILE:  
USG5

REVISIONS			
△ R	DATE	ENGR	OPS
1	1/11/04	LB	AH
2	8/8/22	CRM	GM
APP: HWH		SECTION	
DATE: 11/94		1600	



Top View



Side View

Rev. 2 - Combined USG 5, 6, & 7, changed to maintenance or where 612 vault does not fit, and added material issue.



## CONSTRUCTION STANDARDS

DEADFRONT SWITCHGEAR ON 774 VAULT  
FOR MAINTENANCE ONLY  
OR WHEN STD USG3 VAULT WILL NOT FIT

PAGE:  
4 of 6

USG5

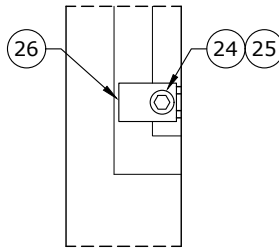
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### REVISIONS

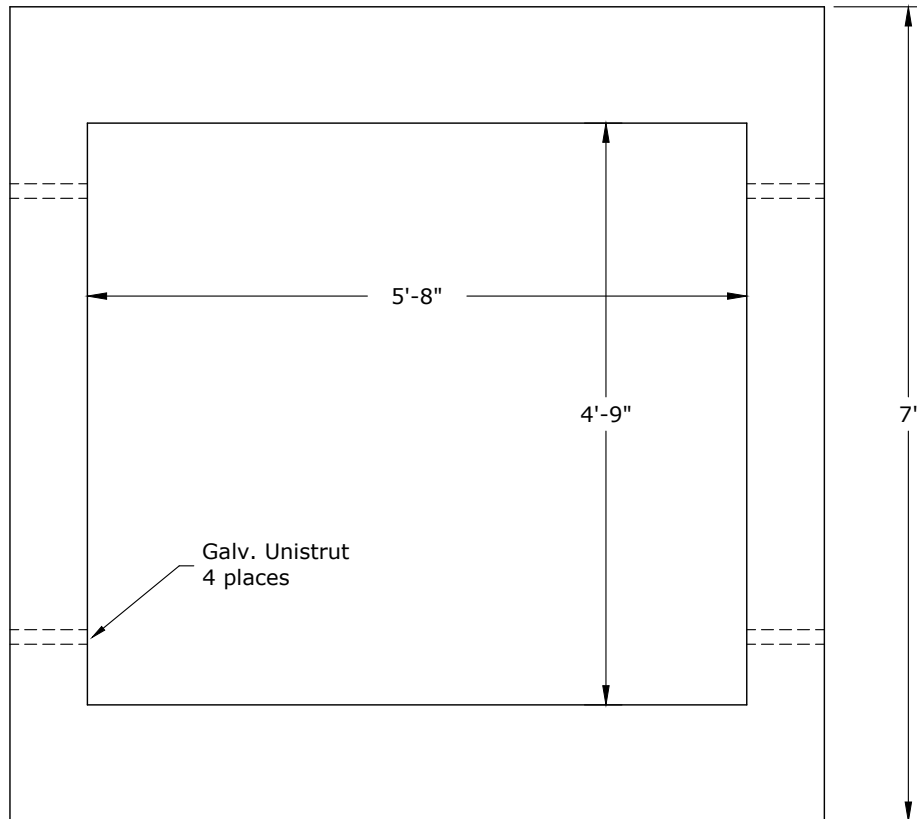
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1/11/04	LB	AH
8/8/22	CRM	GM

APP: HWH/MA  
DATE: 11/94

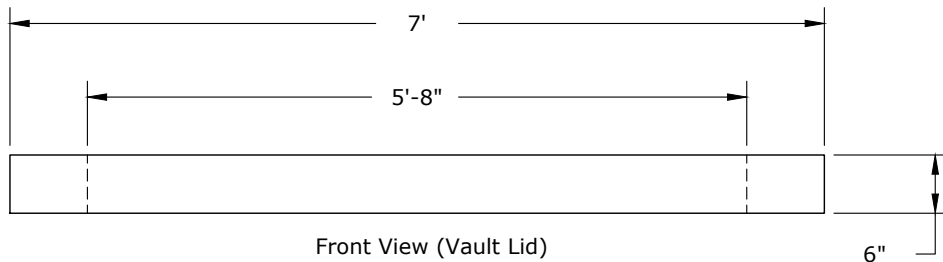
SECTION  
1600



**Switchgear to  
Vault Anchoring Detail**



Top View (Vault Lid)



Front View (Vault Lid)

Lid Weight - 2,740 lb

Rev. 2 - Combined USG 5, 6, & 7, changed to maintenance or where 612 vault does not fit, and added material issue.



## CONSTRUCTION STANDARDS

DEADFRONT SWITCHGEAR ON 774 VAULT  
FOR MAINTENANCE ONLY  
OR WHEN STD USG3 VAULT WILL NOT FIT

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**USG5**

CAD FILE:  
USG5

### REVISIONS

△	DATE	ENGR	OPS
1	1/11/04	LB	AH
2	8/8/22	CRM	GM

APP: HWH  
DATE: 11/94

SECTION  
**1600**

ITEM NO.	DESCRIPTION	S/N	7PME9	7PME10	7PME11	7PME12
			QTY	QTY	QTY	QTY
1	Switch, Padmt, PME 9, 2-600 A Switches & 2-200 A Fused Bays	2458	1	-	-	-
	PME 10, 4-600 A Switches	2452	-	1	-	-
	PME 11, 3-600 A Switches & 1-200 A Fused Bay	2459	-	-	1	-
	PME 12, 1-600 A Switch & 3-200 A Fused Bays	Contact Standards Engineer - Not Stocked				
2	Elbow, 600A, NLB, Test Point, Kit For USG1	2692	6	12	9	3
	Each Kit Consists Of #3 to #8:					
3	Elbow, 600 A, T-body	1825	6	12	9	3
4	Adapter, Cable, 1000 MCM	1	6	12	9	3
5	Contact, Compression, Al, 1000 MCM, Non-Threaded Hole	941	6	12	9	3
6	Plug, Loadbreak, Reducing Tap, 600A-200A	1769	6	12	9	3
7	Cap, Protective, Insulated, 200A, 15 kV	265	6	12	9	3
8	Stud, Al, 600A, T-body to Reducer Plug	2704	6	12	9	3
9	Elbow, Sealing Kit, 1000MCM, 175mil & 220mil	2376	6	12	9	3
10	Clamp, Ground Rod, 5/8" Bronze, Large	282	2	2	2	2
11	Conductor, OH, Cu, 2/0, 7-Str, Bare, Soft Drawn, 1C	379	50	50	50	50
12	Connector, Crimpet, Cu, Run & Tap 1/0 - 2/0 Str	457	2	4	3	1
13	Rod, Ground, 5/8" x 8'	1124	2	2	2	2
14	Vault, Concrete, with Lid, 774, PME Switchgear	1541	1	1	1	1
15	Indicator, Fault, UG, 800A, Test-Point, Voltage-Reset, 3 phase	2695	1	3	2	-
16	Connector, Crimpet, Cu, Run 3/0 - 250 Str, Tap #6 Sol - 2/0 Str	459	6	12	9	3
17	Connector, Compression Lug, Cu, 2/0 Str	431	4	4	4	4
18	Bolt, Hexhead, SS, 1/2" x 2" Assembly, w/ Belleville & Flat Washers	1389	4	4	4	4
19	Elbow, 200A, LB, 1/0, 175 & 220 mil, Test Point, 15 kV, Jacket Seal	1312	6	-	3	9
20	Cap, Protective, Insulated, 200A 15 kV	265	6	-	3	9
21	Bushing, Standoff, Insulated, 200A	252	6	-	3	9
22	Connector, Crimpet, Cu, Run & Tap #2 Sol/Str (2C2)	455	6	-	3	9
23	Connector, Crimpet, Cu, Run 1/0 - 2/0 Str, Tap #8 Sol - #2 Str	456	2	-	1	3
24	Bolt, Machine, 1/2" x 1", (304) Stainless Steel	130	4	4	4	4
25	Nut, Spring-Loaded, Galv, 1/2" (Unistrut)	920	4	4	4	4
26	Washer, 2" x 3" x 13/16" w/ 9/16" Slotted Hole	1415	4	4	4	4


Additional Material If Needed

Description	S/N
Lid Only for Vault, Concrete, 774, PME Switchgear	1541B
Cover, Vault, 71" x 77", Fiberglass (Temp Only)	2495

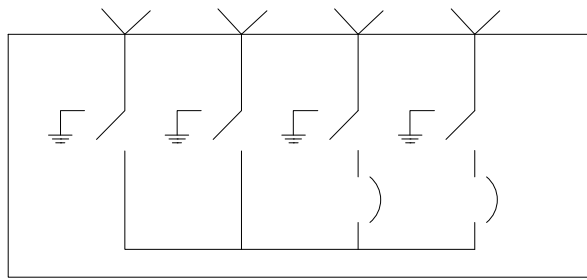
- Notes:** 1. Material issue has the maximum number of fault indicators that may be used. Engineer to determine the actual number needed.  
2. All new PMEs are ordered with the required number of 100E fuses for the configuration plus 3 spare fuses.  
3. If 65E or 125E fuses are required, the Engineer will have to call for the number needed plus 3 spares.  
4. Contact Systems Engineering for proper fuse coordination.

FUSE SIZE	S/N
65 E	661
100 E	662
125 E	663

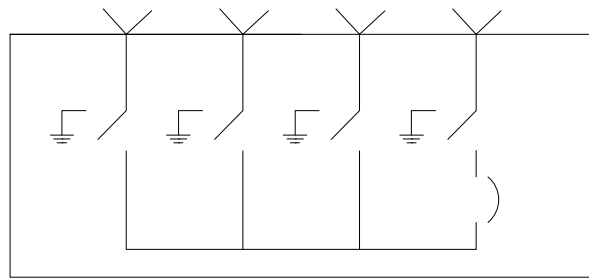
Rev. 2 - Combined USG 5, 6, & 7, changed to maintenance or where 612 vault does not fit, and added material issue.

	<p align="center"><b>CONSTRUCTION STANDARDS</b></p> <p align="center">DEADFRONT SWITCHGEAR ON 774 VAULT FOR MAINTENANCE ONLY OR WHEN STD USG3 VAULT WILL NOT FIT</p> <p align="center"><b>USG5</b></p>		<p align="center"><b>REVISIONS</b></p> <table border="1"> <tr> <th>DATE</th> <th>ENGR</th> <th>OPS</th> </tr> <tr> <td>1/11/04</td> <td>LB</td> <td>AH</td> </tr> <tr> <td>8/8/22</td> <td>CRM</td> <td>GM</td> </tr> </table>				DATE	ENGR	OPS	1/11/04	LB	AH	8/8/22	CRM	GM
			DATE	ENGR	OPS										
1/11/04	LB	AH													
8/8/22	CRM	GM													
PAGE: 6 of 6	CAD FILE: USG5	APP: HWH/MA DATE: 11/94 SECTION <b>1600</b>													

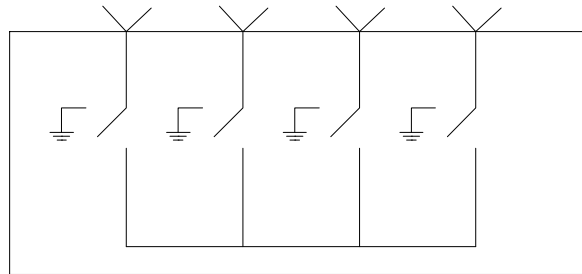




S/N 2910 - Model 422



S/N 2911 - Model 431



S/N 2924 - Model 440

BELOW GRADE SWITCH MODEL	S/N	600 AMP 3Ø SWITCH	200 AMP 3Ø FUSED POSITIONS
422	2910	2	2
431	2911	3	1
440	2924	4	0

ITEM NO.	DESCRIPTION	S/N	BG422	BG431	BG440
			QTY	QTY	QTY
1	Switchgear, Below Grade, 422, 15kV, 12.5kA Isc	2910	1	-	-
	Switchgear, Below Grade, 431, 15kV, 12.5kA Isc	2911	-	1	-
	Switchgear, Below Grade, 440, 15kV, 12.5kA Isc	2924	-	-	1
2	Elbow, 600A, NLB, Test Point, Kit For USG1 Each Kit Consists Of Items #3 to #8:	2692	6	9	12
3	Elbow, 600A, T-body	1825	6	9	12
4	Adapter, Cable, 1000 MCM	1	6	9	12
5	Contact, Compression, Al, 1000 MCM, Non-Threaded Hole	941	6	9	12
6	Plug, Loadbreak, Reducing Tap, 600A-200A	1769	6	9	12
7	Cap, Protective, Insulated, 200A, 15 kV	265	12	12	12
8	Stud, Al, 600A, T-body to Reducer Plug	2704	6	9	12
9	Elbow, Sealing Kit, 1000MCM, 175 & 220 mil	2376	6	9	12
10	Connector, Crimpet, Cu, Run & Tap 3/0 to 4/0 Str	460	6	9	12
11	Elbow, 200A, LB, 1/0, 175 & 220 mil, Test Point, 15 kV, Jacket Seal	1312	6	3	-
12	Bushing, Feed-Thru, 200A, 15 kV	237	6	3	-
13	Connector, Crimpet, Cu, Run & Tap #2 Sol/Str (2C2)	455	6	3	-
14	Indicator, Fault, 400A, Test Point, Voltage Reset, 1Ø	2694	2	1	-
15	Indicator, Fault, 800A, Test Point, Voltage Reset, 3Ø	2695	1	2	3



## CONSTRUCTION STANDARDS

BELOW GRADE SWITCHGEAR

USE WITH STANDARD USG9

PAGE:  
1 of 1

**USG8**

CAD FILE:  
USG8

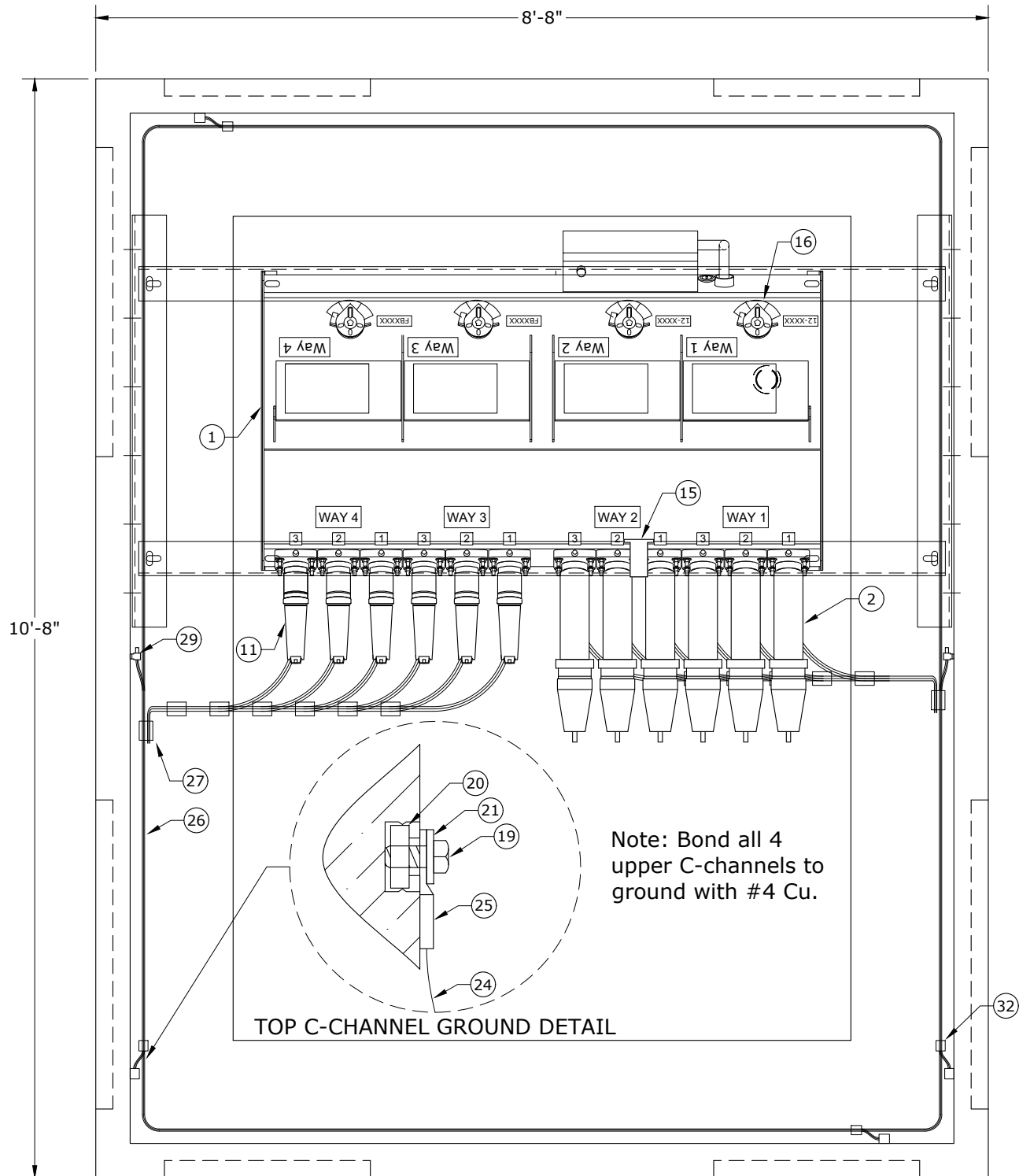
### REVISIONS

DATE	ENGR	OPS

APP: CRM/GM  
DATE: 8/8/22

SECTION  
**1600**

**Note:** Switch numbers and FB number labels are made by the warehouse. Labels are black on yellow and are 4" wide by 2" high. Systems Engineering assigns the numbers.



Grounding Detail Top View



**CONSTRUCTION STANDARDS**

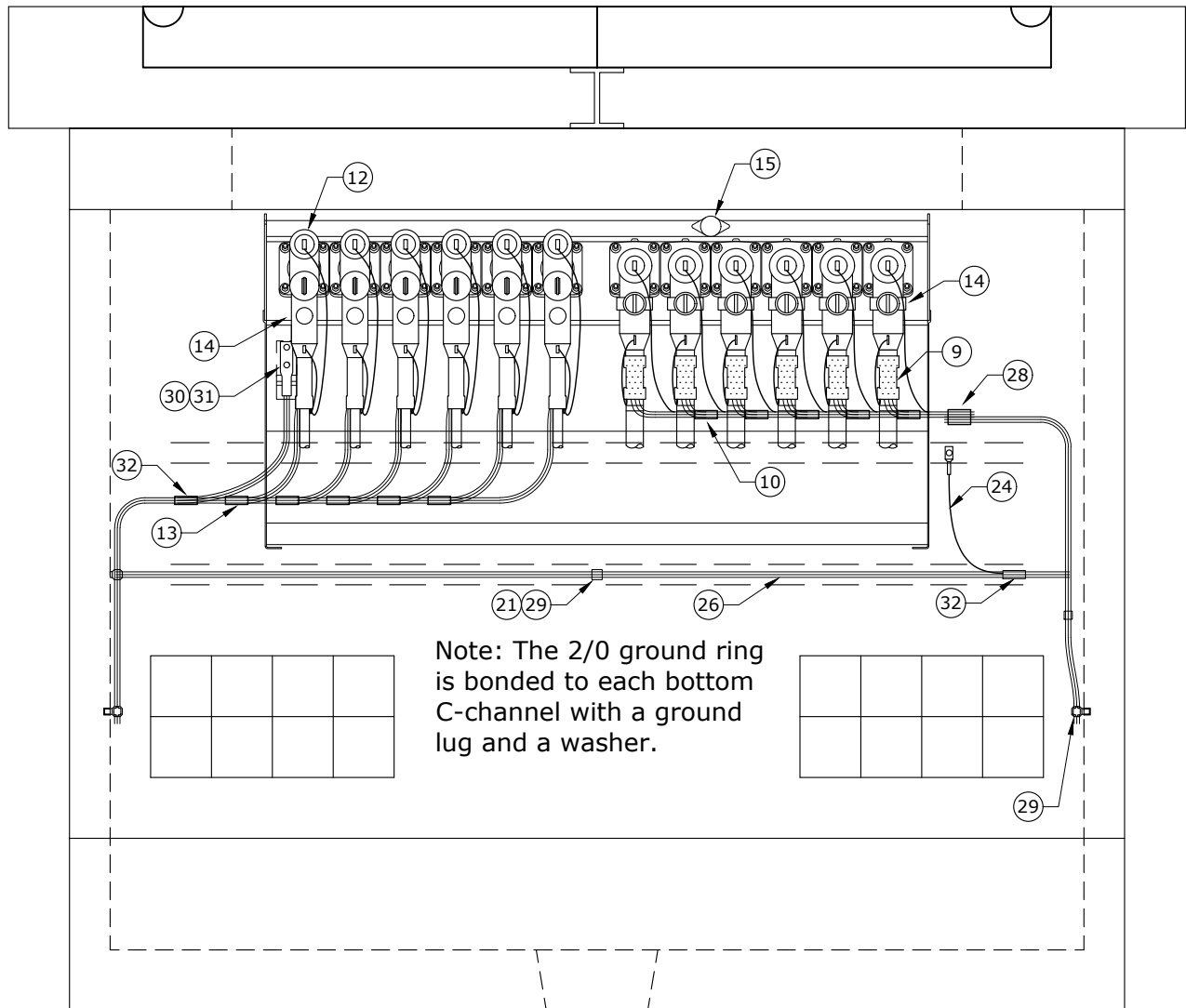
BELOW GRADE SWITCHGEAR  
VAULT DETAIL  
USE WITH STANDARD USG8

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1 of 7

**USG9**

CAD FILE:  
USG9

REVISIONS			
Δ	DATE	ENGR	OPS
APP: CRM/GM		SECTION	
DATE: 8/8/22		1600	



Grounding Detail Back View

**Note:** This drawing is for model 422. For all models, keep 200A elbow concentrics separate from 600A elbow concentrics.



## CONSTRUCTION STANDARDS

BELOW GRADE SWITCHGEAR  
VAULT DETAIL  
USE WITH STANDARD USG8

PAGE:  
2 of 7

**USG9**

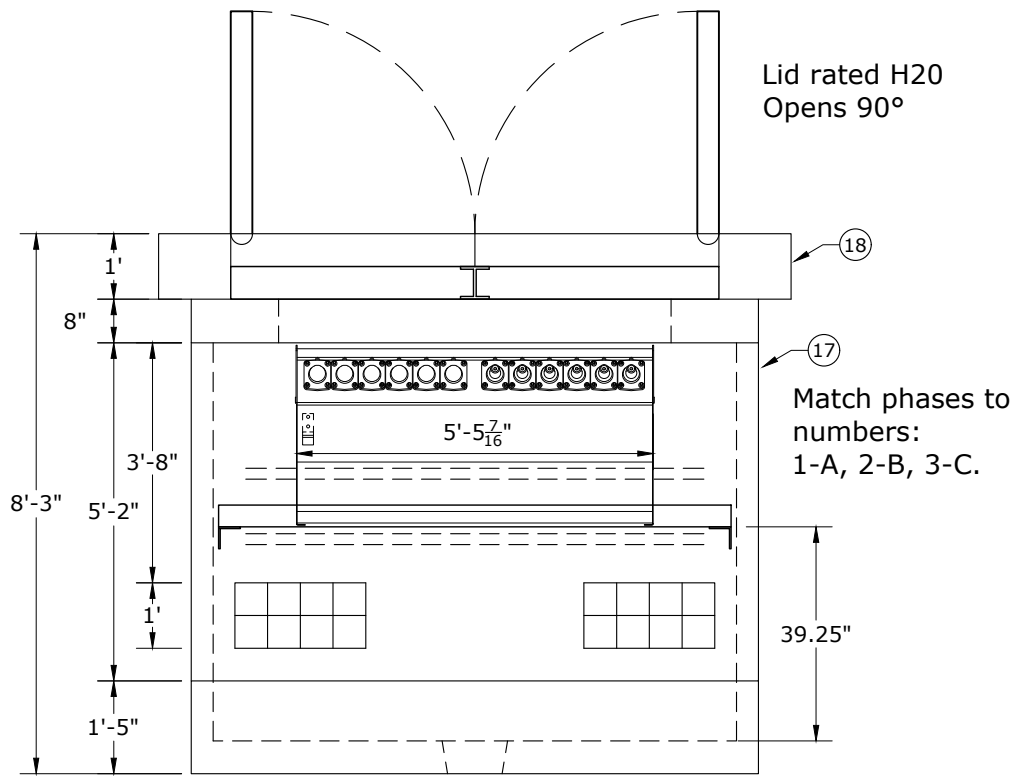
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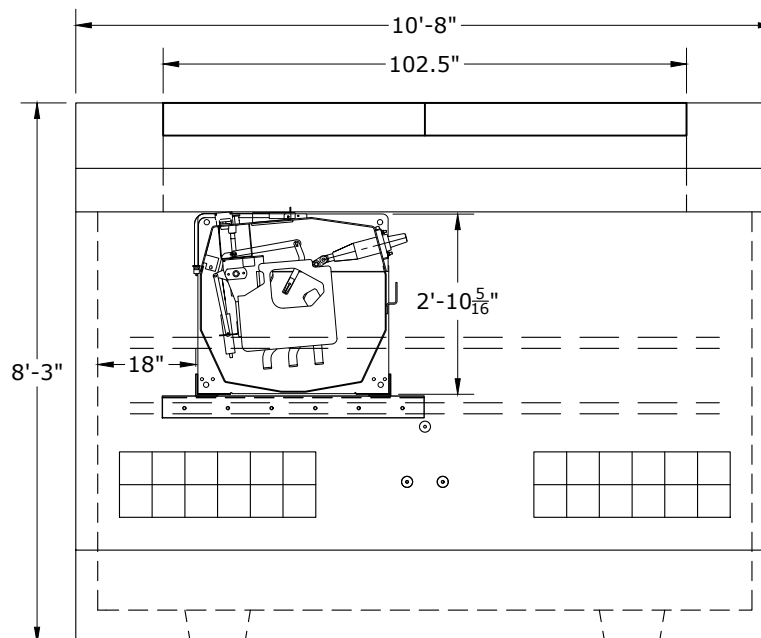
△	DATE	ENGR	OPS

APP: CRM/GM  
DATE: 8/8/22

SECTION  
**1600**



Back View



Side View

Notes:

1. Use the bottom outermost conduits first so that remaining vacant conduits are accessible for future cable pulling and orderly cable training. Seal vacant conduits with reusable expanding duct plugs (S/N 2943). Seal conduits with cable using inflatable seals (S/N 2944).
2. Install feed-thru bushings in each 200 A bushing well.



**CONSTRUCTION STANDARDS**

BELOW GRADE  
VAULT DETAIL  
USE WITH STANDARD USG8

PAGE:  
3 of 7

**USG9**

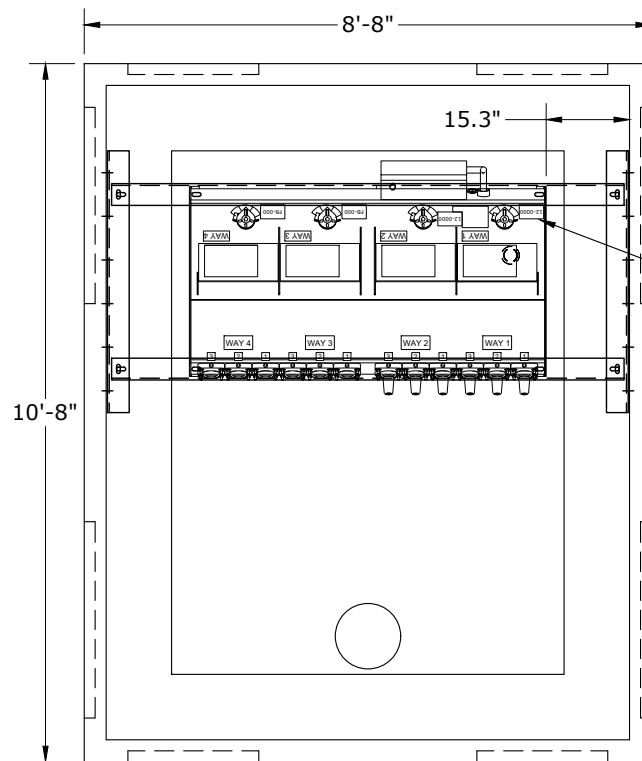
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**REVISIONS**

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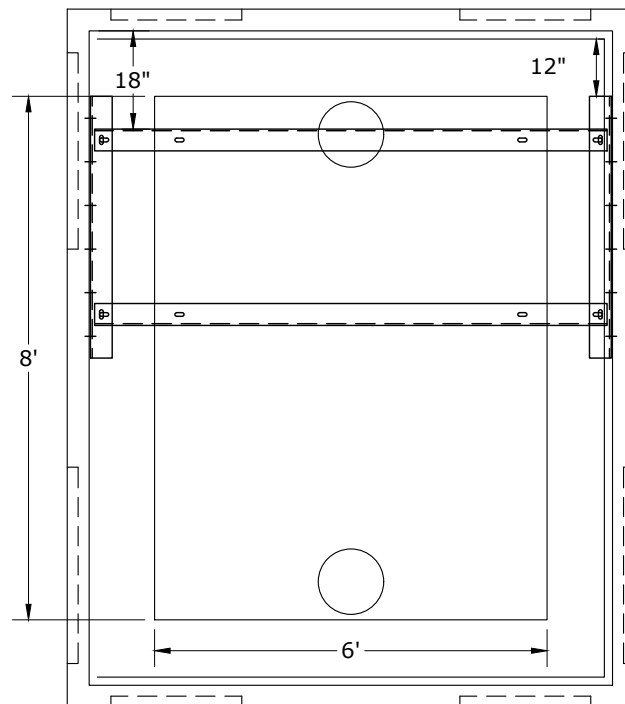
APP: CRM/GM  
DATE: 8/8/22

SECTION  
**1600**



See Systems Engineering for switch and fuse bay numbers.

Vault Base With Switch



Vault Base Top View



## CONSTRUCTION STANDARDS

BELOW GRADE SWITCHGEAR  
VAULT DETAIL  
USE WITH STANDARD USG8

PAGE:  
4 of 7

**USG9**

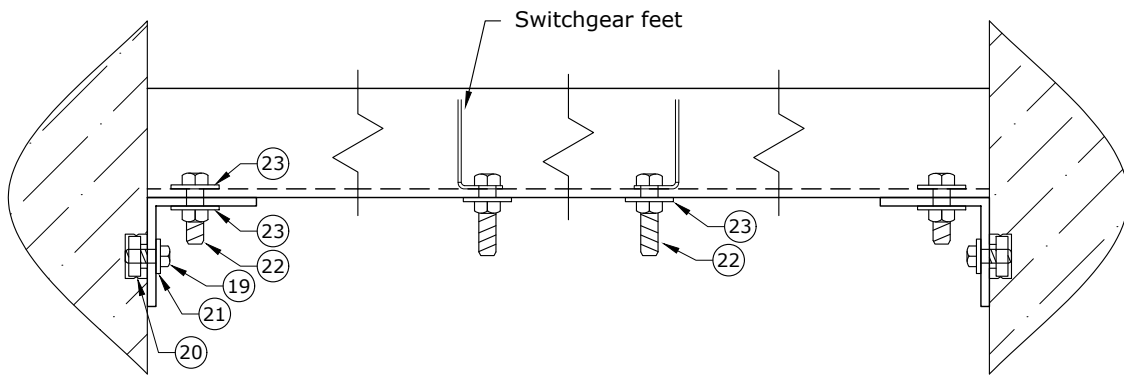
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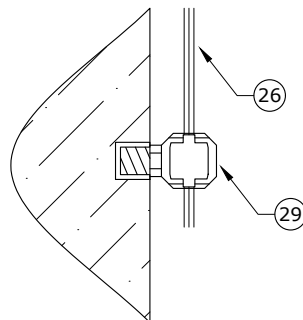
△	DATE	ENGR	OPS

APP: CRM/GM  
DATE: 8/8/22

SECTION  
**1600**

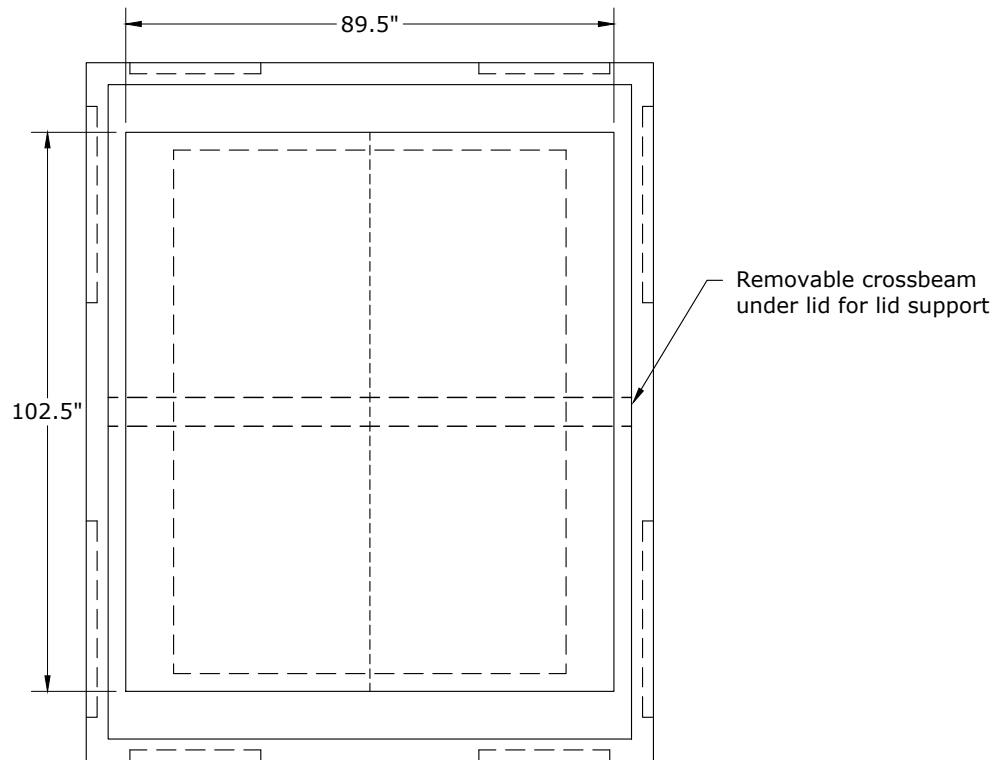


Switchgear Support Assembly



Ufer Ground Connection Detail





Top View With Lid

Note: See USG8 for items #1-16.

ITEM NO.	DESCRIPTION	USG9	
		QTY	S/N
17	Vault, 810. w/o Lid, Below Grade Switch	1	2793
18	Lid, (2) 3' x 8' Doors, 810 Vault, Below Grade Switch	1	2794
19	Bolt, Machine, 1/2" x 1-1/2" SS	12	131
20	Nut, Spring-Loaded Galv. 1/2"	16	920
21	Washer, Flat, 1/2", SS	20	2610
22	Bolt, Machine 5/8" x 2" Galv., 12,400 lbs Ultimate Tensile	8	149
23	Washer, Flat Round, Galv., 5/8"	16	1395
24	Conductor, OH, BSDC, #4, 1C 7 Str	35	377
25	Connector, Compression Lug, #4 Cu	8	2548
26	Conductor, OH, BSDC, 2/0, 1C 7 Str	60	379
27	Connector, Crimpet, Cu, 2/0 to 2/0	6	457
28	Connector, Crimpet, Cu, 2/0 to 4/0	1	459
29	Lug, Grounding, #8 SLD - 2/0 Str 4 Way	6	842
30	Connector, Compression Lug, Cu 2/0 Str	1	431
31	Bolt, Washer, SS, 1/2" x 2" Assembly, w/ Si Br Nut	2	1389
32	Connector, Crimpet, Cu, 1/0-2/0 to #6-#2	6	456



## CONSTRUCTION STANDARDS

BELOW GRADE SWITCHGEAR  
VAULT DETAIL  
USE WITH STANDARD USG8

PAGE:  
7 of 7

**USG9**

CAD FILE:  
USG9

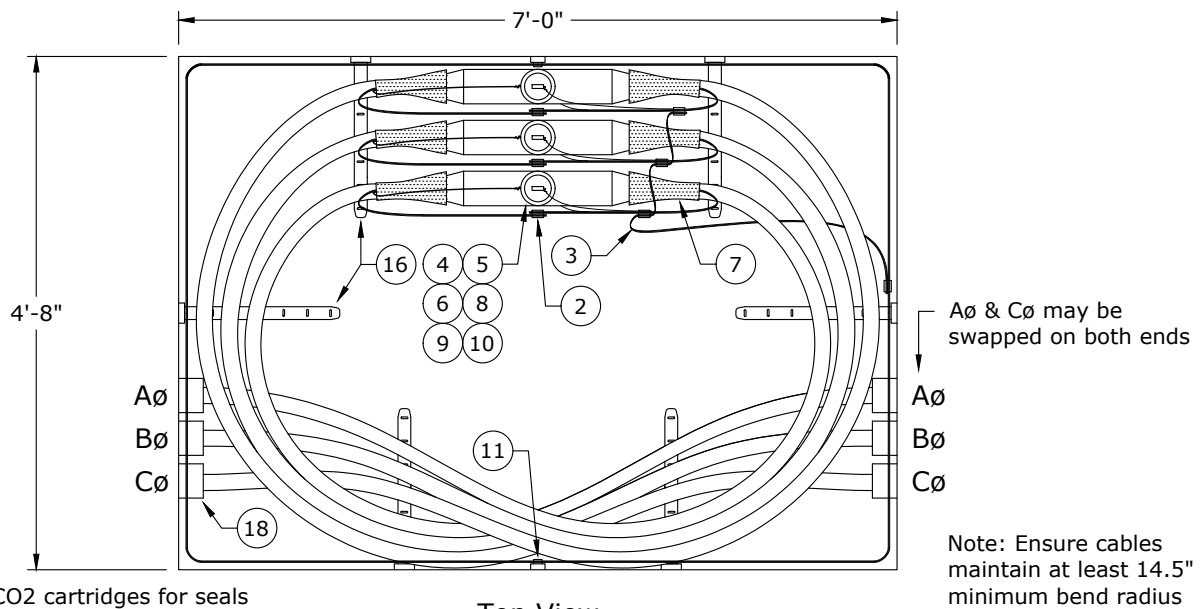
### REVISIONS

△	DATE	ENGR	OPS

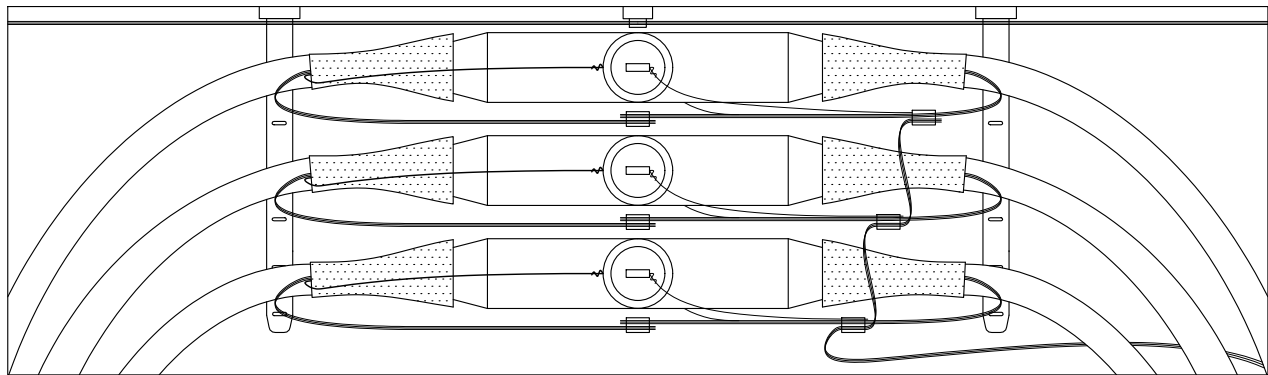
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DATE: 8/8/22

SECTION  
**1600**

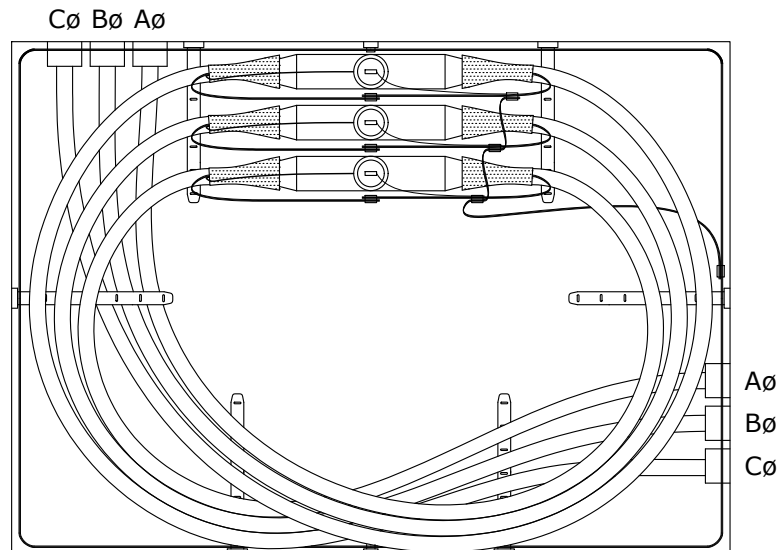




Top View



Grounding Detail



Alternate Configuration




## CONSTRUCTION STANDARDS

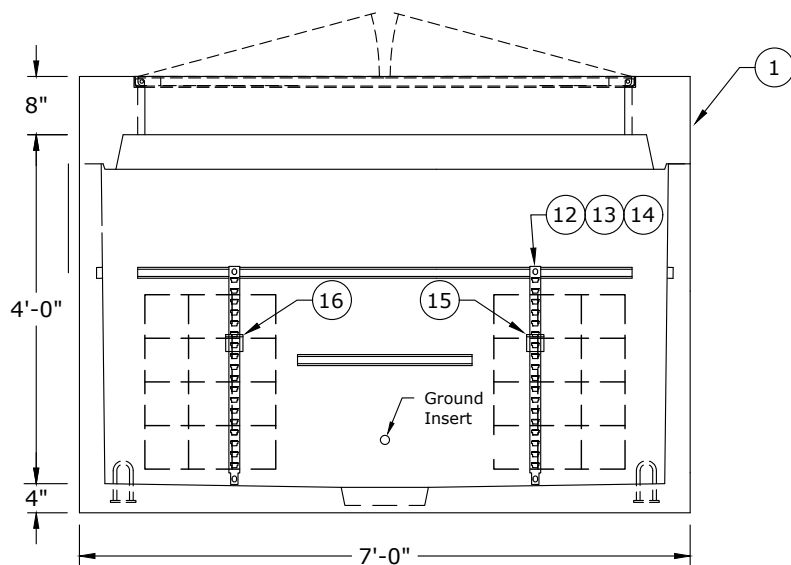
1000MCM SPLICE PIT  
FLUSH-MOUNT

PAGE:  
1 of 2

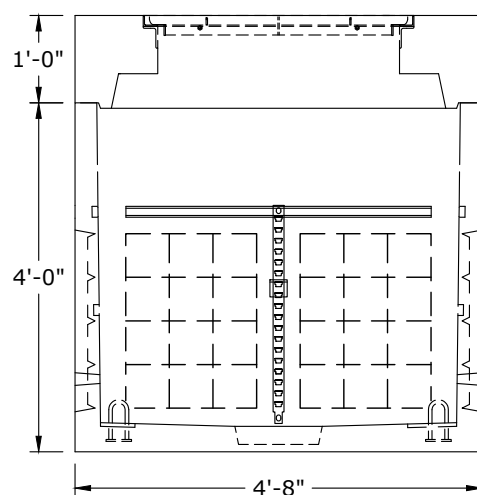
USP

CAD FILE:  
USP

REVISIONS			
	DATE	ENGR	OPS
APP:	CRM/GM	SECTION	
DATE:	8/8/22	1600	



Front View (Inside)



Side View (Inside)

ITEM NO.	DESCRIPTION	USP	
		QTY.	S/N
1	Vault, 575LA, Flush-Mount J-Box or EE, Ufer Ground, Non-Slip Lid	1	2722
2	Connector, Crimpet, Cu, Run & Tap 1/0 - 2/0 Str	7	457
3	Conductor, OH, Cu, 2/0, 7-str, Bare, Soft-Drawn, 1C	30	379
4	Extender, 1000MCM Cable	3	2766
5	Plug, Basic Insulating	3	1824
6	Contact, Compression, Al, 1000MCM, Non-Threaded Hole	6	941
7	Elbow, Sealing Kit, 1000MCM 175 & 220 Mil	6	2376
8	Adapter, Cable, 1000MCM	6	1
9	Plug, Loadbreak, Reducing Tap, 600A-200A	3	1769
10	Cap, Protective, Insulated, 200A	3	265
11	Lug, Grounding, #8 Sol - 2/0 Str, 4-Way	2	842
12	Bolt, Machine, 1/2" x 1-1/2" SS	6	131
13	Nut, Spring-Loaded, Galv, 1/2" (Uni-strut)	6	920
14	Washer, Flat, 1/2", 18-8, Stainless Steel	6	2610
15	Bracket, Mounting, Vault, 30"	6	2861
16	Arm, Vault, Cable, 18"	6	2863
17	Tie Wrap, Plastic, Releasable, 1/2" W x 19" L	21	2956
18	Seal, 4" Conduit, Inflatable (Up to 2 Cables)	6	2944



## CONSTRUCTION STANDARDS

1000MCM SPLICE PIT  
FLUSH-MOUNT

PAGE:  
2 of 2

USP

CAD FILE:  
USP

### REVISIONS

DATE	ENGR	OPS

APP: CRM/GM  
DATE: 8/8/22

SECTION  
1600

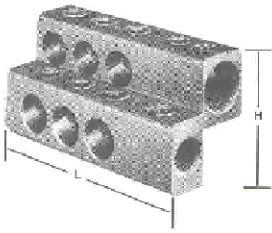
# 1700

## UNDERGROUND SECONDARY

3/14/2023

- ~ UB30-UB60 Basic Units - Underground Secondary
- ~ UE18,UE38 Secondary J-Box 17" x 30" x 18" Deep (Light Duty)  
Secondary J-Box 24" x 36" x 18"
- ~ UED6 Secondary Pedestal Assembly
- ~ US-1 UG Secondary Splice
- ~ US6 Padmount Transformer Assembly 1Ø Secondary
- ~ US35-US38 Secondary Connectors 3Ø Padmount Transformer

- N** New Standard
- R** Redrawn Standard
- C** Changed Standard
- ~** No Change



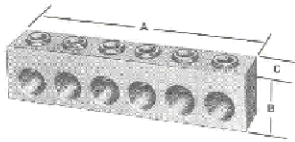
### Single Phase Padmount Transformer Terminal

UB30's	Material Descriptions	TDM #	Const. Spec.
Connector PTL 4-250 UG Al/Cu 6 to 4/0		1439	UB30
Connector PTL 4-350 UG Al/Cu 6 to 350		539	UB31
Connector PTL 6-250 UG Al/Cu 6 to 4/0		540	UB32
Connector PTL 6-350 UG Al/Cu 6 to 350		541	UB33
Connector PTL 6-500 UG Al/Cu 2 to 500		542	UB34



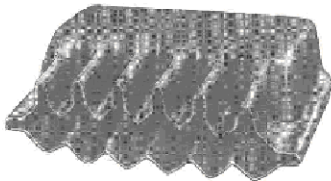
### Three Phase Padmount Transformer Terminal

See US35 through US40 for Three Phase Padmount Transformer Terminals



### Pedestal and Junction Box Connector

UB50's	Material Descriptions	TDM #	Const. Spec.
Connector PTL 4-250 UG Al/Cu 6 to 4/0		527	UB50
Connector PTL 4-350 UG Al/Cu 6 to 350		528	UB51
Connector PTL 4-500 UG Al/Cu 2 to 500		529	UB52
Connector PTL 6-250 UG Al/Cu 6 to 4/0		530	UB53
Connector PTL 6-350 UG Al/Cu 6 to 350		531	UB54
Connector PTL 6-500 UG Al/Cu 2 to 500		532	UB55
Connector PTL 6-750 UG Al/Cu 350 to 750		533	UB56
Connector PTL 8-500 UG Al/Cu 2 to 500		534	UB57
Connector PTL 8-750 UG Al/Cu 2 to 750		535	UB58



### PTL, PET, PED Cover

UB60's	Material Descriptions	TDM #	Const. Spec.
Cover, Connector 4-350 UG		573	UB60
Cover, Connector 6-500 UG		574	UB61
Cover, Connector 8-500 UG		575	UB62
Cover, Connector 8-750 UG		576	UB63



## CONSTRUCTION STANDARDS

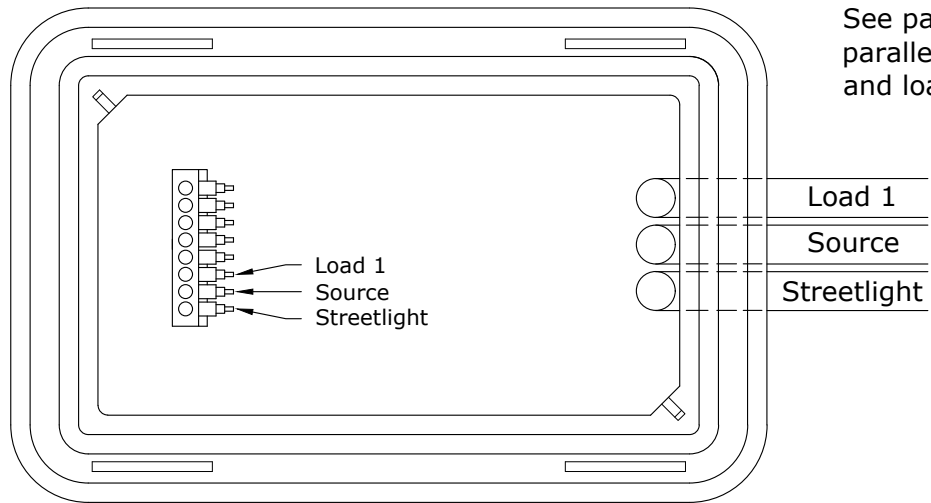
### BASIC UNITS UNDERGROUND SECONDARY

PAGE:  
1 of 1

UB30, UB40, UB50, UB60

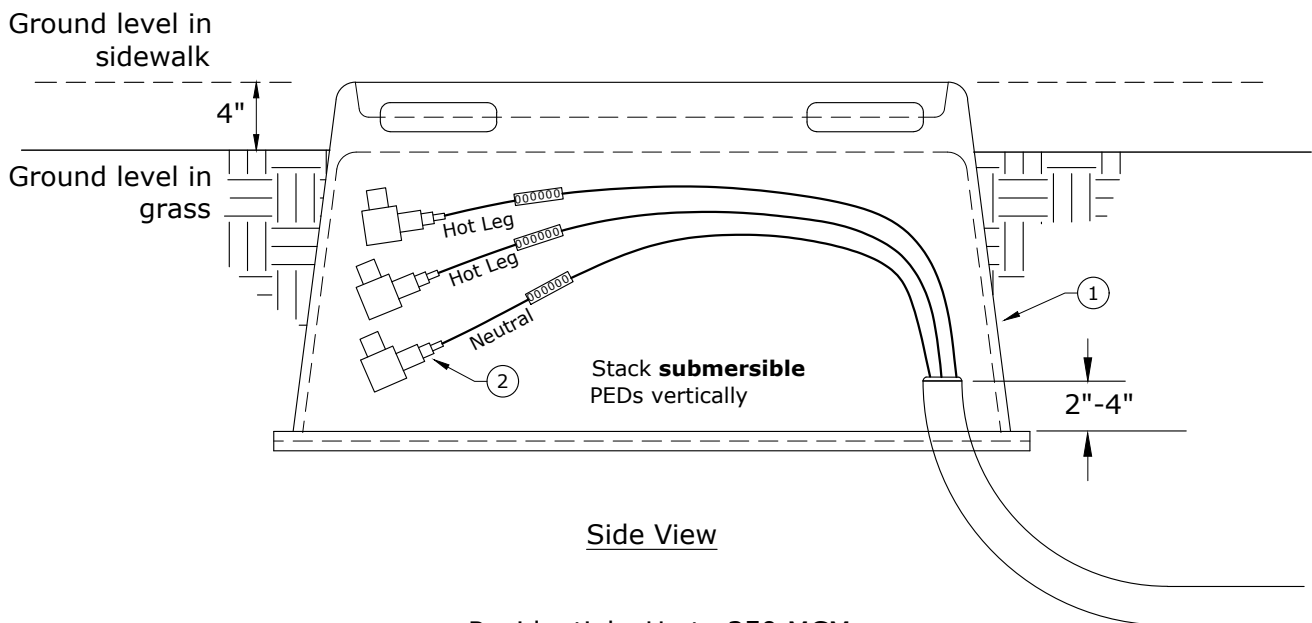
CAD FILE:  
UB30

REVISIONS			
DATE	ENGR	OPS	
8/16/02			
REDRAWN IN CAD			
APP: ELM	SECTION		
DATE: 1/22/80	1700		



See page 2 for parallel sources and loads.

Top View



Side View

Residential - Up to 350 MCM  
Commercial - Up to 500 MCM

Notes:

1. Do not install S/N 2556 in streets, alleys, or highways.
2. Cut all cables long enough to allow makeup to be done above the box top with cables in an approximately vertical position.
3. Bend cables down after makeup so that lid can be installed.
4. Use silicone grease on all allen wrench plugs and cable boots (both ends).
5. If additional depth is needed, place one box upside down, bolt the 2 boxes together and salvage one lid. (S/N 2556 only).

Rev. 7 - Added drawing for parallel source and loads.



## CONSTRUCTION STANDARDS

SECONDARY JUNCTION BOX  
17" x 30" x 18" DEEP (LIGHT DUTY)  
24" x 36" x 18" DEEP (HEAVY DUTY)

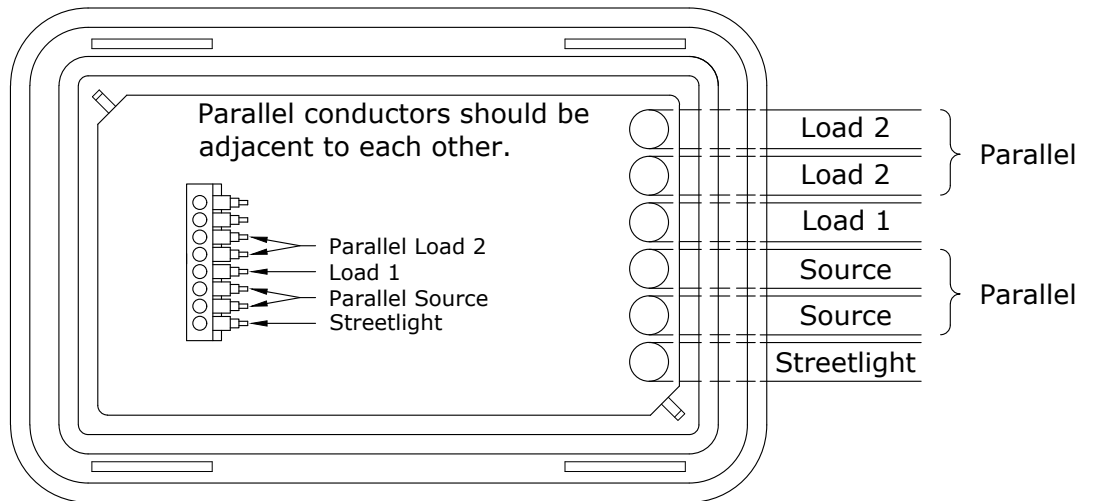
PAGE:  
1 of 2

**UE18,UE38**

CAD FILE:  
UE18

REVISIONS			
DATE	ENGR	OPS	
4 10/29/18	KJP		
5 6/24/19	JDK		
6 12/2/19	KJP		
7 12/9/22	CRM	GM	
APP: GGW/RWG		SECTION	
DATE: 4/92		1700	

Zip tie ONE tag  
around each set of  
parallel cables.



Top View  
**Parallel Source and Loads**


Occasional Traffic Areas (S/N 2556):

- Rated 10,000 pounds
- This box is NOT for use in streets, alley or highways. Do NOT use in driveways if location is part of the normal traveled way

Heavier Traffic Areas (S/N 2608):

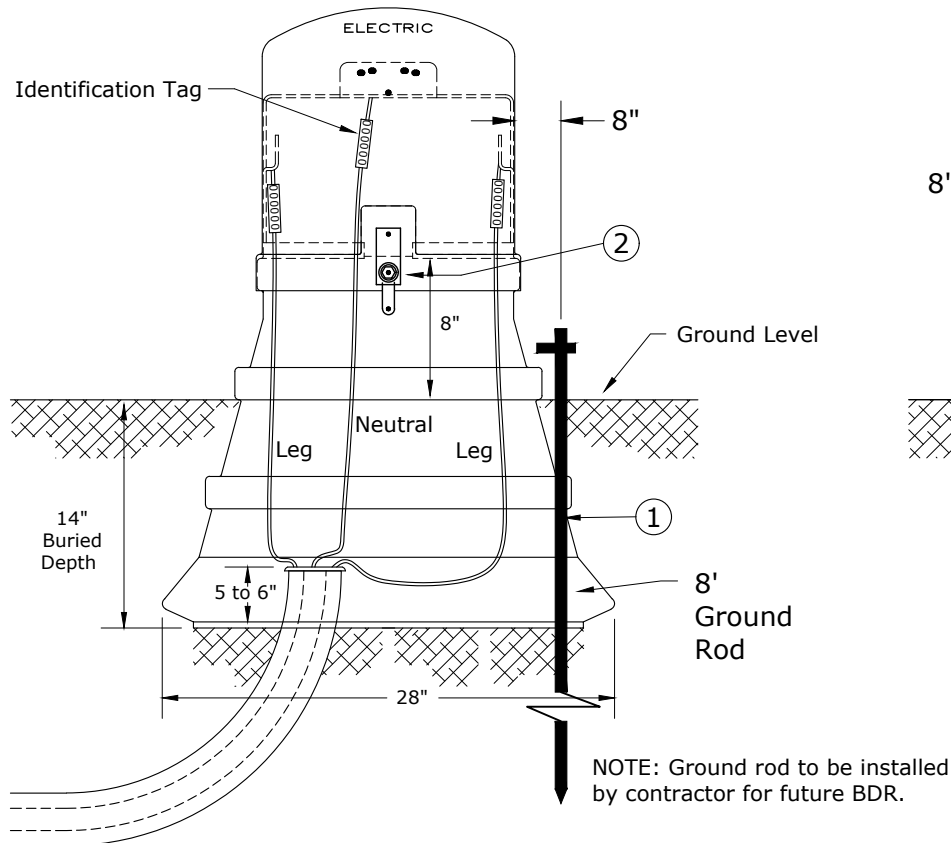
- Rated 20,000 pounds
- This box is 24" x 36" x 18"
- May be used in alleys or driveways-only rated 20k
- Do NOT use in streets or highways

Rev. 7 - Added drawing for parallel source and loads.

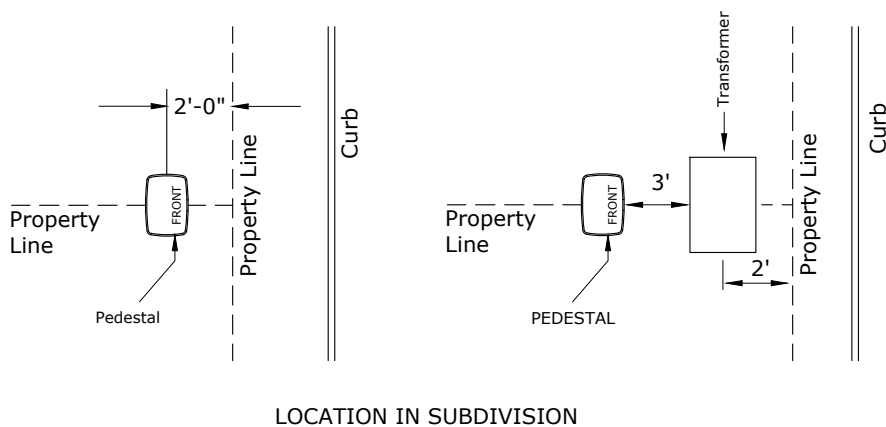
ITEM NO	DESCRIPTION	UE18			
		QTY	S/N		
1	Box, Junction, Secondary, Composite, Light Duty (10k lb) with Cover, 17" x 30" x 18" with Pentabolts	1	2556		
2	Connector, Submersible, Sec., 8 Position, #12 to 500 MCM Al/Cu	3	2264		
ITEM NO	DESCRIPTION	UE18H			
		QTY	S/N		
1	Box, Junction, Secondary, Composite, Heavy Duty (20k lb) with Cover, 24" x 36" x 18" with Pentabolts	1	2608		
2	Connector, Submersible, Sec., 8 Position, #12 to 500 MCM Al/Cu	3	2264		
ITEM NO	DESCRIPTION	UE38			
		QTY	S/N		
1	Box, Junction, Secondary, Composite, Light Duty (10k lb) with Cover, 17" x 30" x 18" with Pentabolts	1	2556		
2	Connector, Submersible, Sec., 8 Position, #12 to 500 MCM Al/Cu	4	2264		
ITEM NO	DESCRIPTION	UE38H			
		QTY	S/N		
1	Box, Junction, Secondary, Composite, Heavy Duty (20k lb) with Cover, 24" x 36" x 18" with Pentabolts	1	2608		
2	Connector, Submersible, Sec., 8 Position, #12 to 500 MCM Al/Cu	4	2264		
<div><div><div>Clark Public Utilities</div><div></div></div><div><div>CONSTRUCTION STANDARDS</div><div>SECONDARY JUNCTION BOX 17" x 30" x 18" DEEP (LIGHT DUTY) 24" x 36" x 18" DEEP (HEAVY DUTY)</div></div></div>		REVISIONS			
		<div><div><div>R</div><div></div></div></div>	DATE	ENGR	OPS
		4	10/29/18	KJP	
		5	6/24/19	JDK	
		6	12/2/19	KJP	
		7	12/9/22	CRM	GM
PAGE: 2 of 2		CAD FILE: UE18			
UE18,UE38		APP: GGW/RWG DATE: 4/92			
		SECTION 1700			

# FRONT VIEW

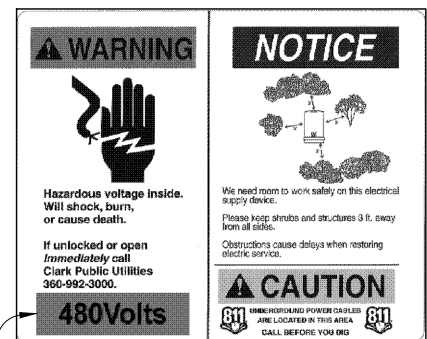
# SIDE VIEW



- Notes: 1.) Leave slack in wire to allow for settling.  
2.) Recommended torque for connectors: 23-38 ft-lb



## FOR 480V SERVICE



Add S/N 794 "480 VOLTS" Label to "WARNING" label when pedestal is used for 480 V service.

Rev. 3 - Added drawing for parallel source and load.



## CONSTRUCTION STANDARDS SECONDARY PEDESTAL ASSEMBLY

PAGE:  
1 of 3

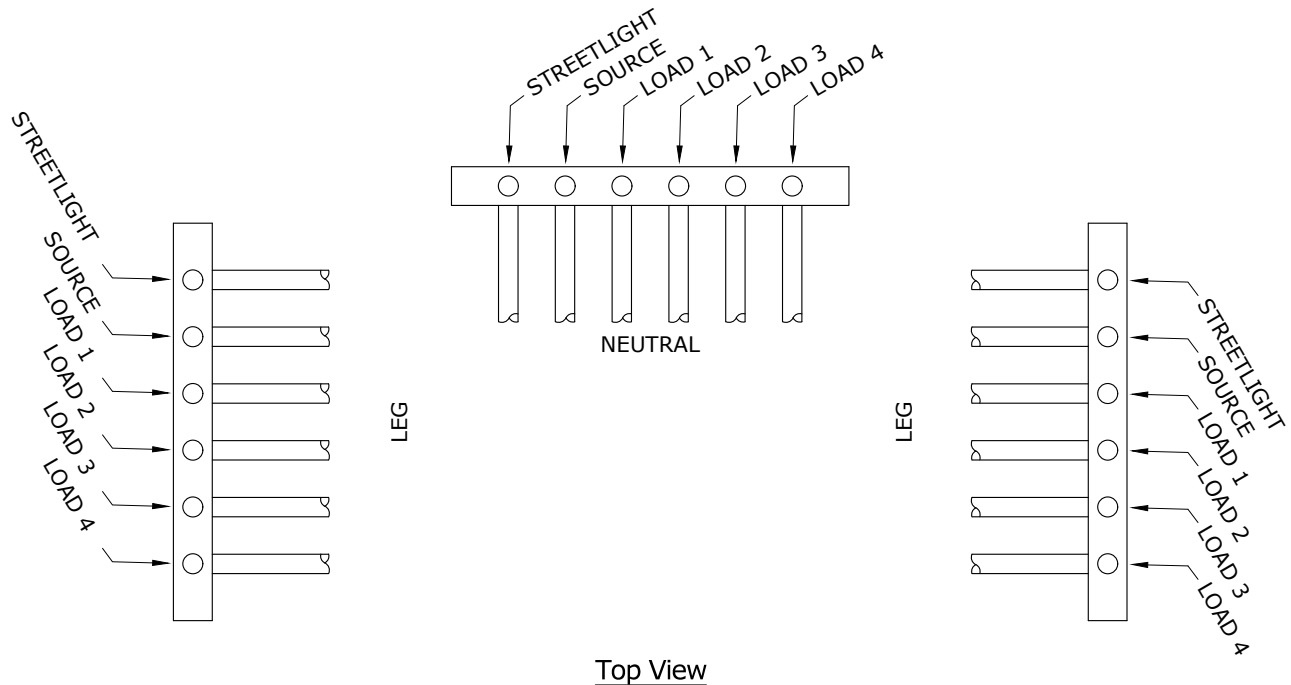
UED6

CAD FILE:  
UED6

REVISIONS			
Δ	DATE	ENGR	OPS
	2/23/00	HWH	MA
1	4/26/04	LB	AH
2	3/12/20	KJP	
3	12/9/22	CRM	GM
APP: HWH/ELM SECTION 1700			
DATE: 1980			

**DO NOT Cut Zip Ties off Plastic PED Covers**  
**Zip Ties MUST Be Reinstalled**

**Back of Pedestal**



**Top View**


**Recommended torque: 23-38 ft-lb**  
**Do NOT Use Impact Driver/Wrench**

- Notes: 1.) Maximum cable size is 350 MCM.  
 2.) Minimum cable size is #10.  
 3.) Maximum of 6 triplex cables.

Rev. 3 - Added drawing for parallel source and load.

ITEM NO	DESCRIPTION	UED6	
		QTY	S/N
1	Pedestal, Secondary, Above Ground, W/ Connectors and Covers *	1	2562
2	Lock, Equipment *	1	837

		<b>CONSTRUCTION STANDARDS</b> SECONDARY PEDESTAL ASSEMBLY		REVISIONS			
				Δ	DATE	ENGR	OPS
				0	2/23/00	HWH	MA
				1	4/26/04	LB	AH
				2	3/12/20	KJP	
				3	12/9/22	CRM	GM

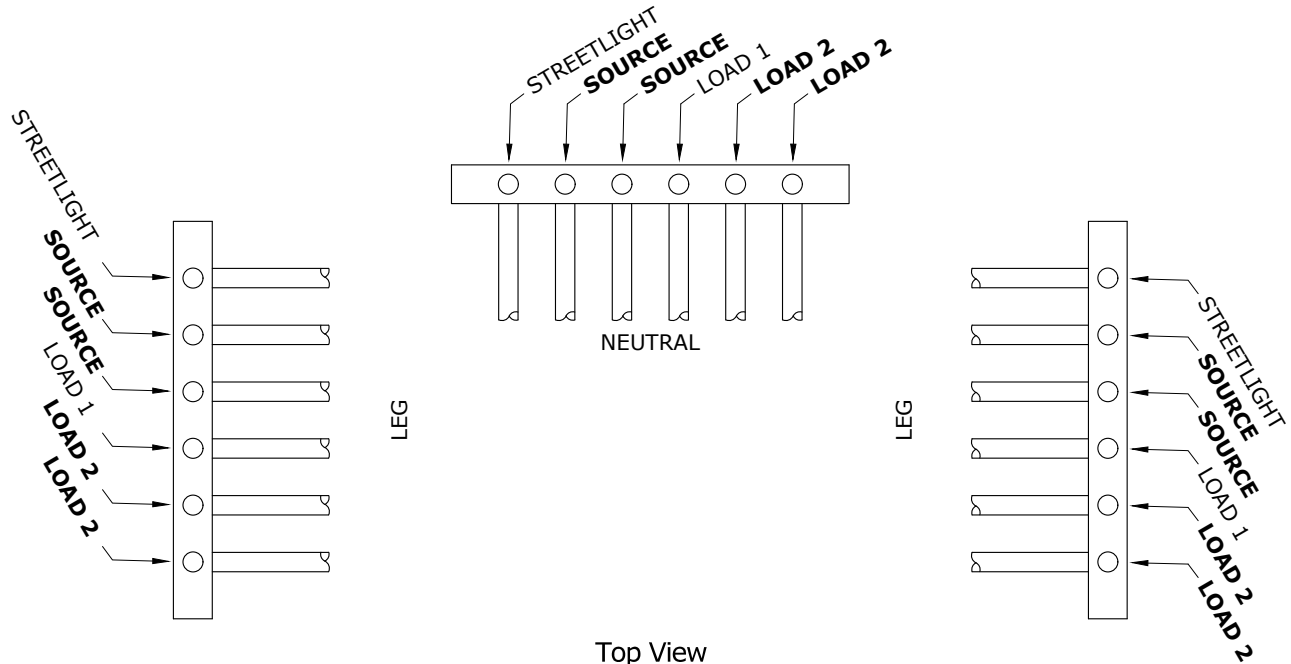
PAGE: 2 of 3	UED6		CAD FILE: UED6	APP: HWH/ELM DATE: 1980	SECTION 1700
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**DO NOT Cut Zip Ties off Plastic PED Covers**  
**Zip Ties MUST Be Reinstalled**

Zip tie ONE tag around each set of parallel cables

Back of Pedestal



Top View

**Parallel Source and Loads**

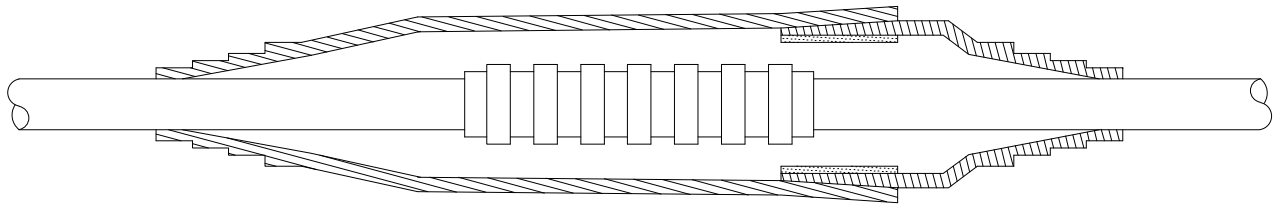
**Recommended torque: 23-38 ft-lb**  
**Do NOT Use Impact Driver/Wrench**

- Notes: 1.) Maximum cable size is 350 MCM.  
 2.) Minimum cable size is #10.  
 3.) Maximum of 6 triplex cables.

Rev. 3 - Added drawing for parallel source and load.

ITEM NO	DESCRIPTION	UED6	
		QTY	S/N
1	Pedestal, Secondary, Above Ground, W/ Connectors and Covers *	1	2562
2	Lock, Equipment *	1	837

<div><div>Clark Public Utilities</div><div></div></div>	<div>CONSTRUCTION STANDARDS</div> <div>SECONDARY PEDESTAL ASSEMBLY</div> <div>PARALLEL SOURCE AND LOADS</div>		REVISIONS						
			<div><div><div>R</div><div></div></div></div>	DATE	ENGR	OPS			
			0	2/23/00	HWH	MA			
			1	4/26/04	LB	AH			
			2	3/12/20	KJP				
	3	12/9/22	CRM	GM					
PAGE: 3 of 3		UED6		CAD FILE: UED6		APP: HWH/ELM		SECTION	
						DATE: 1980		1700	



APPLY SILICONE GREASE TO CABLES FOR EASE OF ASSEMBLY.

NOTES:

1. THIS SPLICE IS FOR ANY 600 VOLT OR LESS APPLICATION.
2. THIS SPLICE CAN BE DIRECTLY BURIED OR USED IN A HAND HOLE OR VAULT.
3. OTHER SIZES ARE AVAILABLE FOR SPECIAL APPLICATIONS.

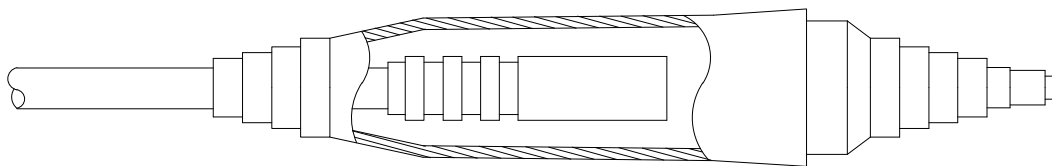
MATERIAL LIST

US-1

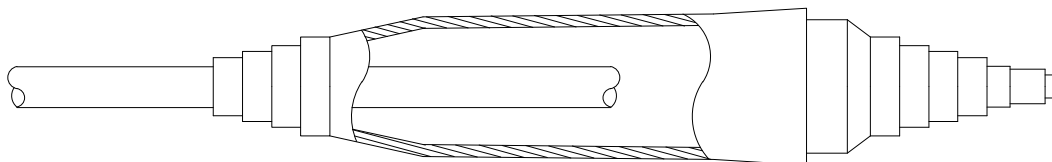
ITEM	QTY.	DESCRIPTION	SIN
1	1	SPLICE KIT, 600V, U.G.	1215
2	1	CONNECTOR, SLEEVE	#

WIRE SIZE	#SIN
2/0 AL	1166
4/0 AL	1167
350 AL	1169
2/0-4/0 AL	1454
4/0-350 AL	1455

OTHER USES



HALF-READY SPLICE



CABLE CAP



CONSTRUCTION STANDARDS  
UNDERGROUND SECONDARY  
SPLICE

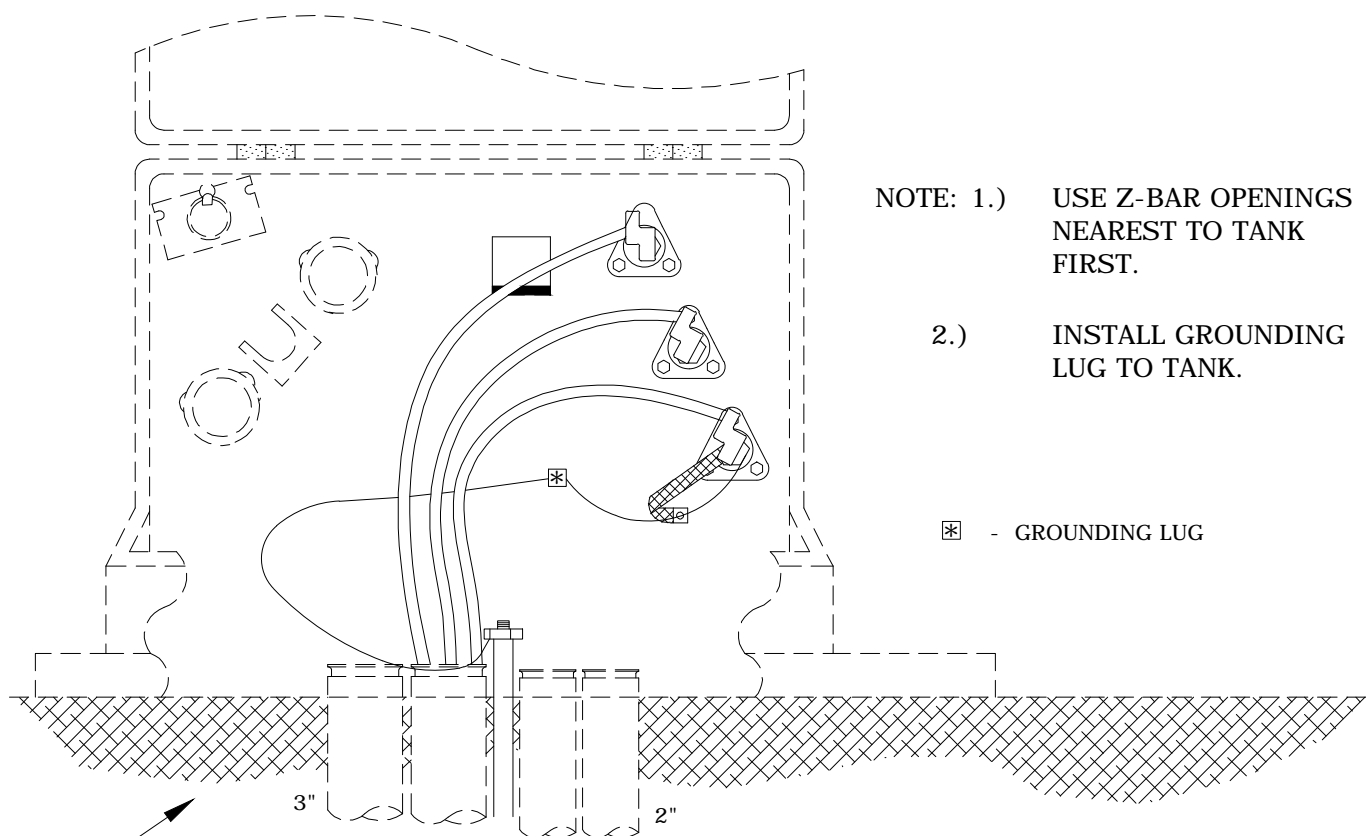
PAGE:  
1 of 1

US-1

CAD FILE:  
US-1

REVISIONS

REVISION	DATE	ENGR	OPS
0	2/23/00	HWH	MA
0			
APP:	JEH	SECTION	
DATE:	2/22/00	1700	



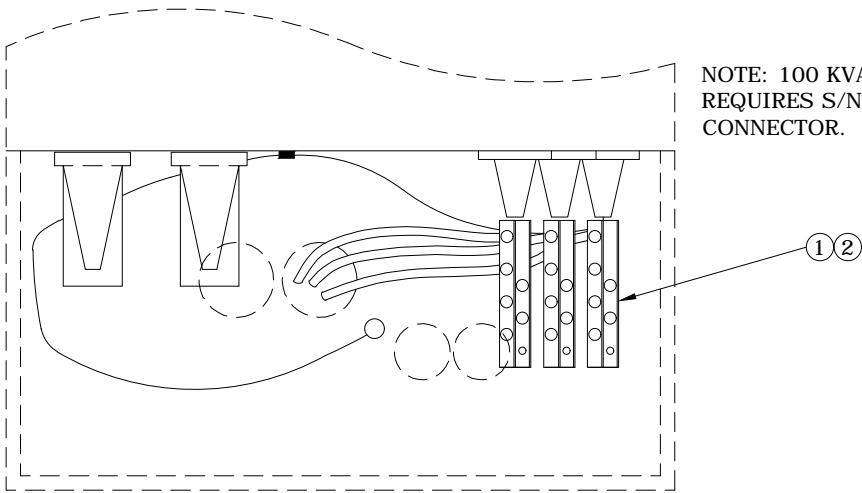
NOTE: 1.) USE Z-BAR OPENINGS NEAREST TO TANK FIRST.

2.) INSTALL GROUNDING LUG TO TANK.

\* - GROUNDING LUG

SECONDARY CONDUITS  
AS NEEDED  
(MAXIMUM 6)

FRONT VIEW OF TRANSFORMER



NOTE: 100 KVA TRANSFORMER  
REQUIRES S/N #2318 FOR Z-BAR  
CONNECTOR. \*

TOP VIEW OF PAD WINDOW  
(SHOWING CONDUIT AND CONDUCTOR LOCATION)

REV 1 - ADDED GROUNDING LUG; CHANGED Z-BAR POSITION  
REV 2 - UPDATED FOR ALL-CONDUIT SYSTEM AND ADDED "NOTE"  
FOR 100KVA Z-BAR CONNECTORS.

ITEM NO.	DESCRIPTION	REVISIONS	
		QTY.	S/N
1	Connector, Z-Bar #2-500KCM + St. Lt.	3	2265
2	Cover, Connector, U.G.	3	2266



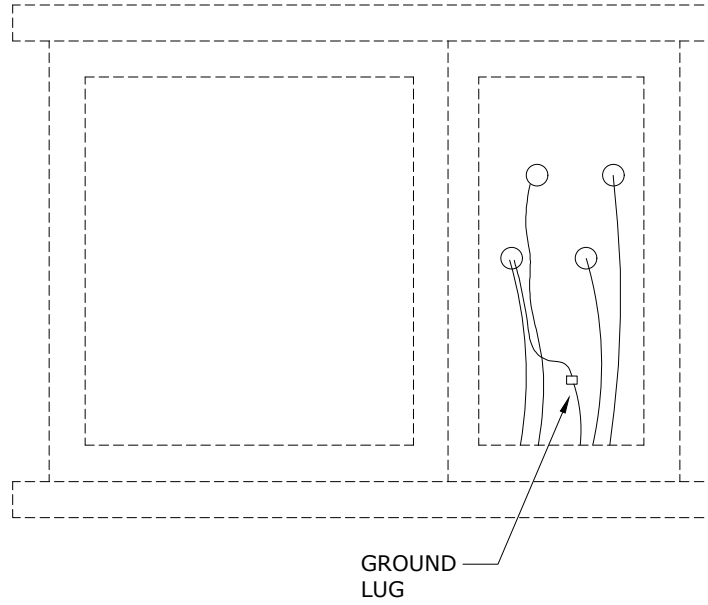
# CONSTRUCTION STANDARDS PADMOUNT TRANSFORMER ASSEMBLY SINGLE PHASE SECONDARY

PAGE:  
1 of 1

US6

CAD FILE:  
US6

REVISIONS			
REV	DATE	ENGR	OPS
1	2/23/00	HWH	MA
2	12/29/04	LB	AH
1 ADDED GROUNDING LUG			
APP: JEH		SECTION	
DATE: 2/22/00		1700	



US35  
US36

**Notes:**

1. This specification covers 3Ø padmounted transformers 75 through 1500 kVA, 120/208 V and 277/480 V.
2. Conductor size range is 1/0 through 750 kcmil.
3. See Std UT30-UT32 - Underground Transformers - Section 1400 for mounting arrangement.

Rev. 2 - Removed US37 & 38 due to secondary bushing leaks and clearance problems in secondary compartment of transformer.

ITEM NO.	DESCRIPTION	US35	
		QTY.	S/N
1	Connector, PET, 6-750 Al/Cu 1/0 to 750	4	2129
2	1/2" Belleville Assembly, SS 2" Bolt and Washers W/ Bronze Nut	4	1389
3	Cover, Connector, 6-750	4	2176
ITEM NO.	DESCRIPTION	US36	
		QTY.	S/N
1	Connector, PET, 6-750 Al/Cu 1/0 to 750	4	2129
2	1/2" Belleville Assembly, SS 2 1/2" Bolt and Washers W/ Bronze Nut	4	2584
3	Cover, Connector, 6-750	4	2176



**CONSTRUCTION STANDARDS**  
SECONDARY CONNECTORS  
THREE PHASE PADMOUNT TRANSFORMERS

PAGE:  
1 of 1

**US35-US38**

CAD FILE:  
US35

REVISIONS			
△	DATE	ENGR	OPS
1	11/12/10	KJP	
2	9/21/21	JDK	
△			
APP:	HWH/MA	SECTION	
DATE:	2/23/00	<b>1700</b>	