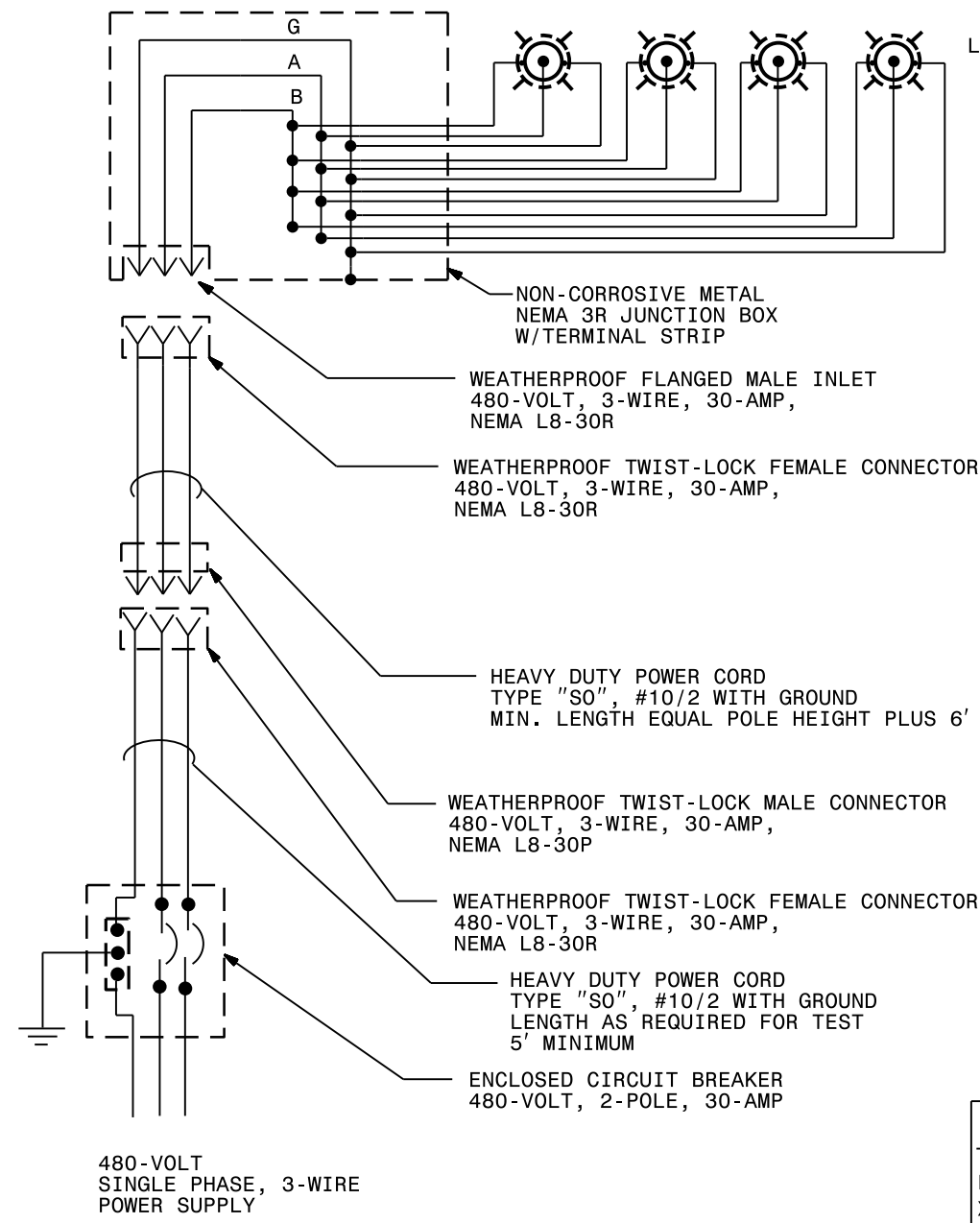
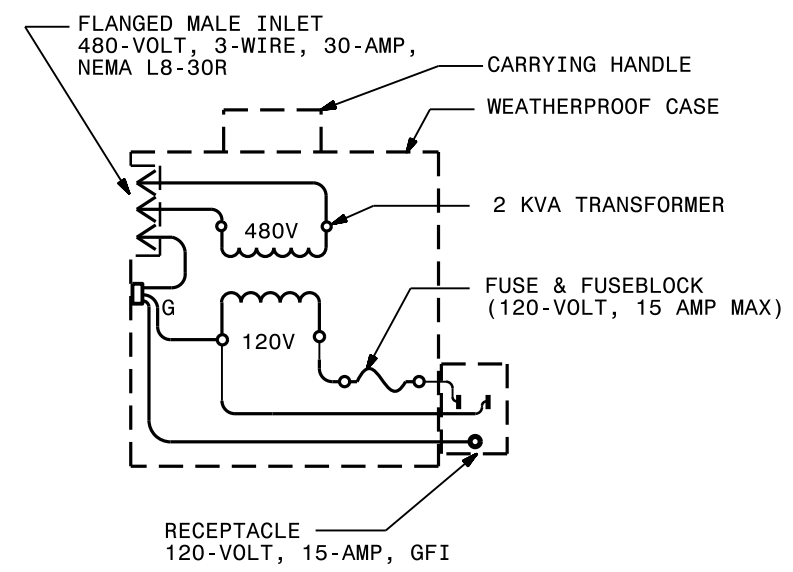


1-12

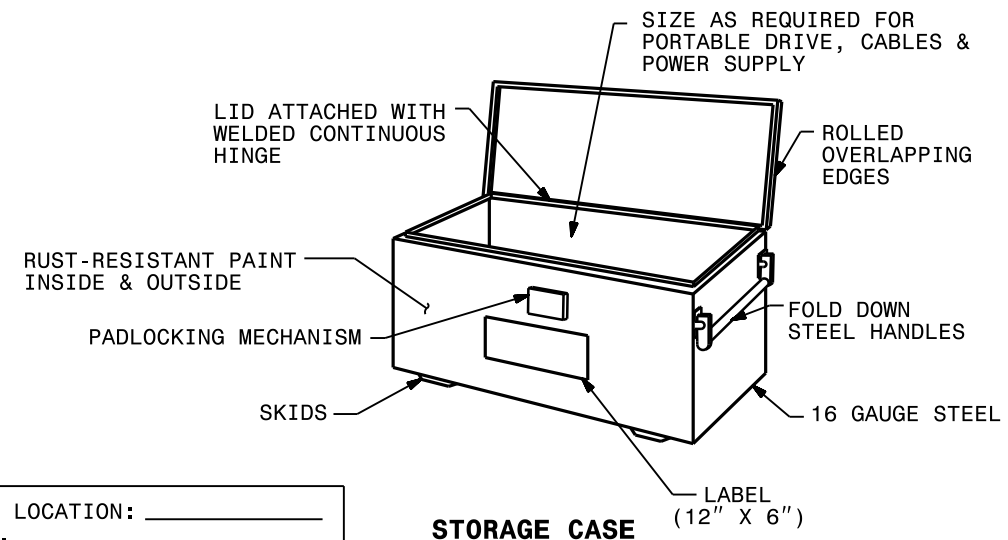
ENGLISH STANDARD DRAWING FOR
HIGH MOUNT STANDARD
WIRING DIAGRAM



HIGH MOUNT WIRING DIAGRAM



PORTABLE DRIVE POWER SUPPLY



STORAGE CASE

PROJECT LOCATION: _____

TIP NO.: _____

LET DATE: _____

XFORMER PRIMARY VOLTAGE: _____

LOWERING DEVICE MFG.: _____

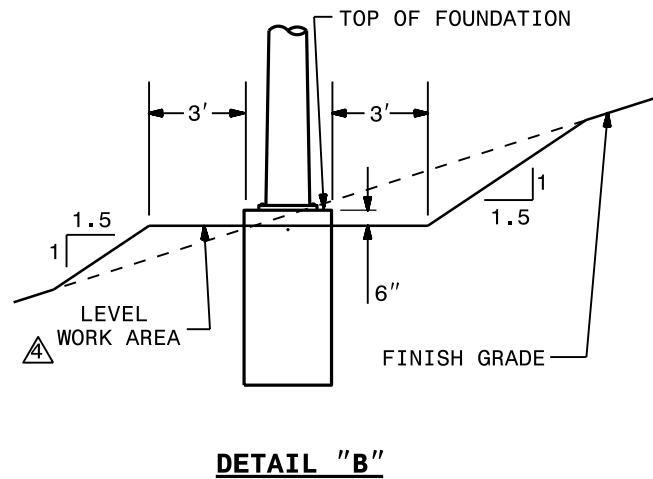
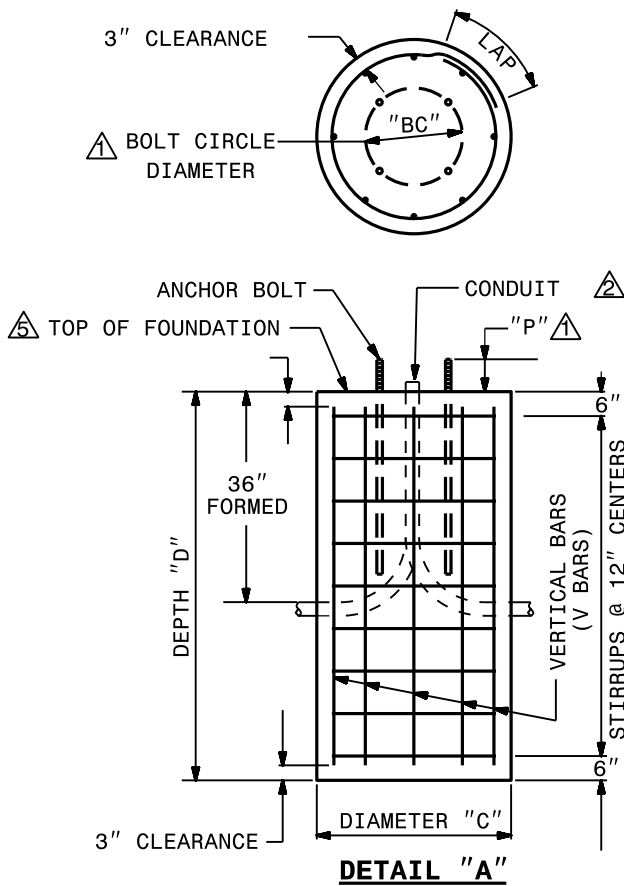
STORAGE CASE LABEL

1-12

ENGLISH STANDARD DRAWING FOR
HIGH MOUNT STANDARD
WIRING DIAGRAM

TABLE OF FOUNDATION DIMENSIONS AND QUANTITIES △																		
HEIGHT OF HIGH MOUNT FT	DIAMETER "C" FT	STIRRUPS		WIND VELOCITY MPH														
				90					110					130				
				DEPTH "D" FT	V BARS		REINF.* STEEL LBS	CONCRETE CY	DEPTH "D" FT	V BARS		REINF.* STEEL LBS	CONCRETE CY	DEPTH "D" FT	V BARS		REINF.* STEEL LBS	CONCRETE CY
SIZE	LAP-FT	QTY	SIZE		QTY	SIZE				QTY	SIZE							
60	3.5	#3	1.0	11	8	#8	280	3.9	12	8	#8	306	4.3	13	8	#8	331	4.6
80	3.5	#3	1.0	12	8	#8	306	4.3	13	8	#8	331	4.6	15	8	#8	382	5.3
100	4.0	#3	1.0	13	8	#9	413	6.1	15	8	#9	477	7.0	16	8	#9	509	7.4
120	4.5	#3	1.0	15	8	#10	557	8.2	16	8	#10	636	9.4	18	8	#10	716	10.6

* INCLUDES STIRRUPS AND VERTICAL BARS (V BARS)



NOTES

△ ANCHOR BOLTS

CONFORM NUMBER, SIZE, AND LENGTH OF ANCHOR BOLTS, BOLT CIRCLE DIAMETER "BC", AND ANCHOR BOLT PROJECTION "P" TO APPROVED HIGH MOUNT STANDARD DRAWINGS.

△ CONDUITS

MATCH ORIENTATION, QUANTITY, TYPE, AND SIZE OF CONDUITS TO THE LAYOUT SHEETS. STUB AND CAP ONE SPARE CONDUIT AT EACH FOUNDATION. PROJECT CONDUIT A MAXIMUM OF 2" ABOVE TOP OF FOUNDATION. PLACE CONDUIT 30" BENEATH FINISH GRADE. INCLUDE 3/4" CONDUIT FOR GROUNDING ELECTRODE CONDUCTOR TO GROUND ROD AT HIGH MAST FOUNDATION.

△ DIMENSIONS & QUANTITIES

DIMENSIONS AND QUANTITIES OF CONCRETE AND REINFORCING STEEL ARE GIVEN FOR THE PURPOSE OF OBTAINING BID PRICES ONLY. SEE STANDARD SPECIFICATIONS SECTION 1402, FOR OTHER STRUCTURAL REQUIREMENTS.

△ WORK AREA

PROVIDE A LEVEL WORK AREA AROUND EACH FOUNDATION. CUT/FILL SLOPES MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

△ ELEVATION

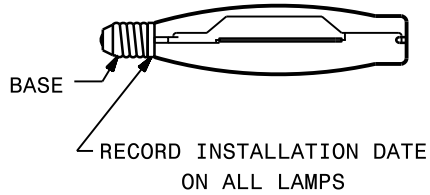
SET TOP OF FOUNDATION AT 6" ABOVE LEVEL WORK AREA. SEE DETAIL "B".

△ GUARDRAIL

WHERE GUARDRAIL IS REQUIRED TO BE INSTALLED AS PART OF LIGHTING WORK, SET GUARDRAIL NO MORE THAN 8' FROM CENTER OF HIGH MAST FOUNDATION.

1-12

ENGLISH STANDARD DRAWING FOR
HIGH MOUNT LUMINAIRES
 AND LAMPS

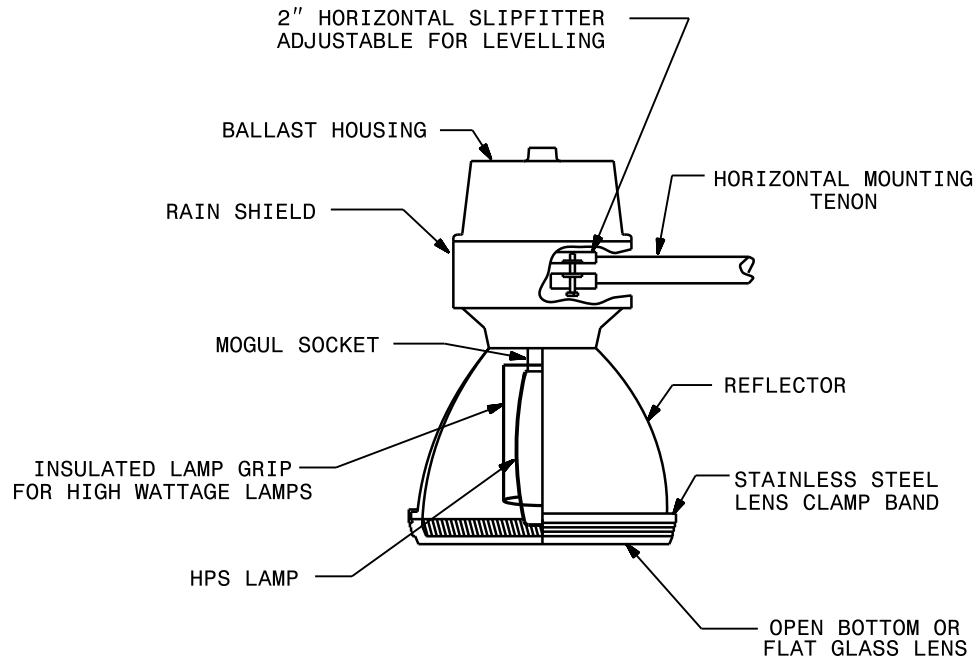


LAMP ⚠

LAMP				
TYPE \ SPEC	BASE	RATED LIFE (HRS.)	INITIAL LUMENS	POSITION
1000W HPS	MOGUL	24,000	140,000	UNIVERSAL
750W HPS	MOGUL	24,000	110,000	UNIVERSAL
400W HPS	MOGUL	24,000	50,000	UNIVERSAL

⚠ NOTES

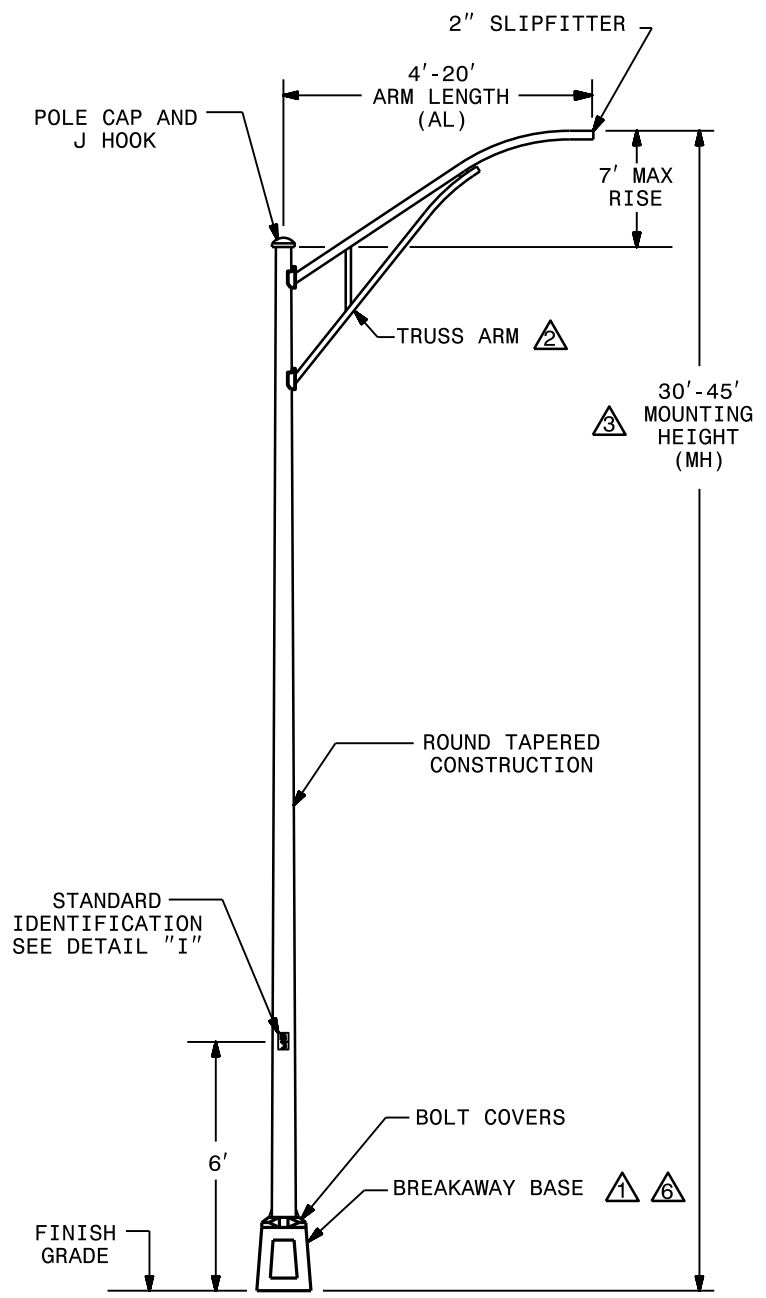
- ⚠ SEE STANDARD SPECIFICATIONS SECTION 1400-2G FOR LAMPS.
- ⚠ SEE PLANS FOR WATTAGE AND IES DISTRIBUTION



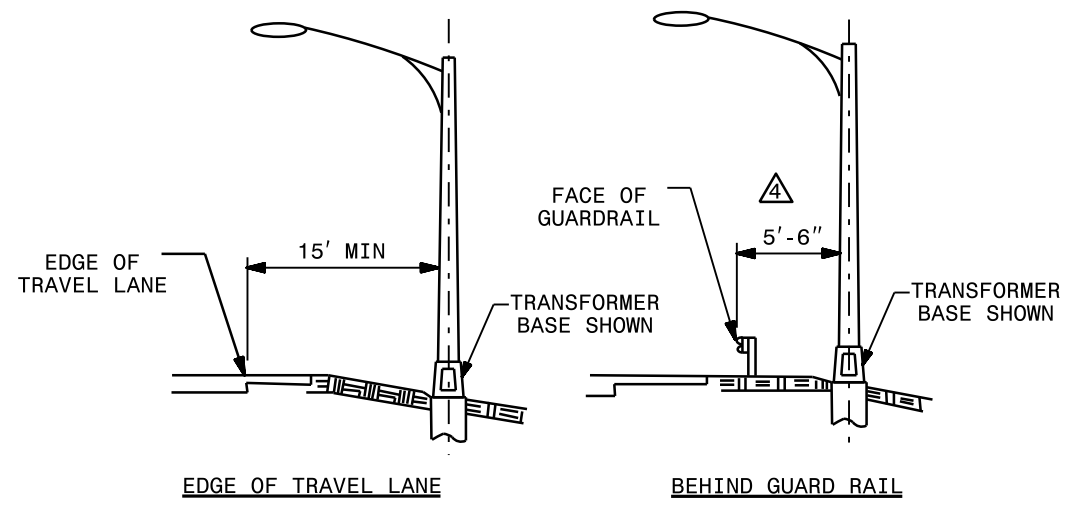
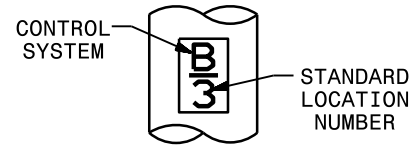
HIGH MOUNT LUMINAIRE ⚠
 HPS

1-12

ENGLISH STANDARD DRAWING FOR
HIGH MOUNT LUMINAIRES
 AND LAMPS

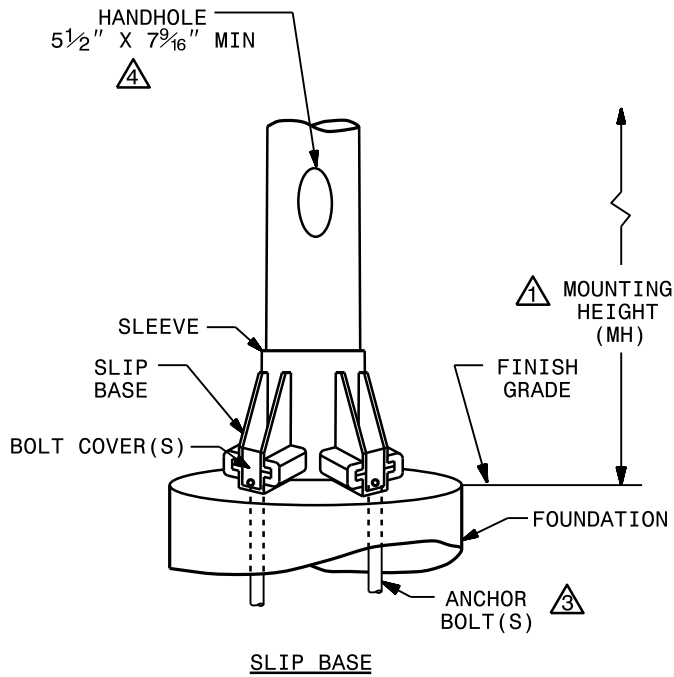


SINGLE-ARM LIGHT STANDARD
TYPE MTLT\MTLS (MH) SA (AL) 5

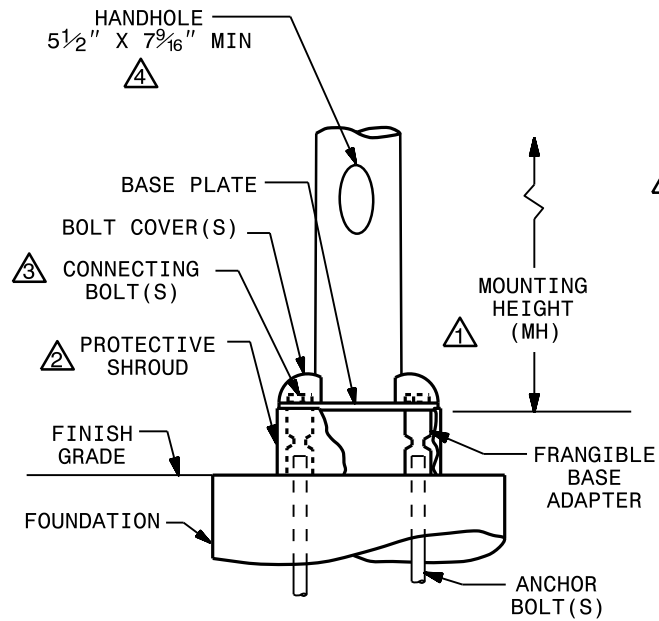


NOTES

- 1 TRANSFORMER BASE SHOWN. OTHER BASES MEETING AASHTO BREAKAWAY REQUIREMENTS MAY BE PROVIDED IF APPROVED BY THE ENGINEER. SEE "BASE DETAILS" ON SHEET 2 OF 3.
- 2 SINGLE-MEMBER ARMS MAY BE PROVIDED IN LIEU OF TRUSS ARMS, WHEN SPECIFIED ARM LENGTH IS 8' OR LESS AND MOUNTING HEIGHT IS 35' OR LESS.
- 3 MOUNTING HEIGHT INCLUDES BREAKAWAY BASE FOR LIGHT STANDARDS WITH TRANSFORMER BASES. SEE "BASE DETAILS" ON SHEET 2 OF 3.
- 4 STANDARD PLACEMENT MAY BE REDUCED TO 3'-6" BEHIND FACE OF GUARDRAIL WHEN POSTS ARE SPACED 3'-1 1/2", OR WHERE SPEED LIMIT IS LESS THAN 55 MPH.
- 5 INSERT MOUNTING HEIGHT (MH) AND ARM LENGTH (AL) FROM PAY ITEM DESCRIPTION TO DETERMINE PROPOSED SINGLE-ARM LIGHT STANDARDS.
- 6 LIGHT STANDARDS MOUNTED ON BRIDGE OUTRIGGERS OR BEHIND RETAINING/BARRIER WALLS DO NOT REQUIRE BREAKAWAY BASES.

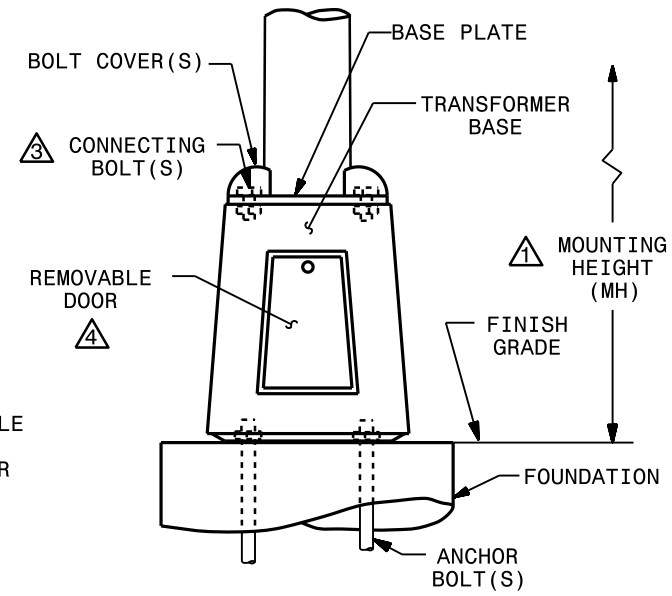


SLIP BASE



FRANGIBLE BASE INSERT ADAPTER

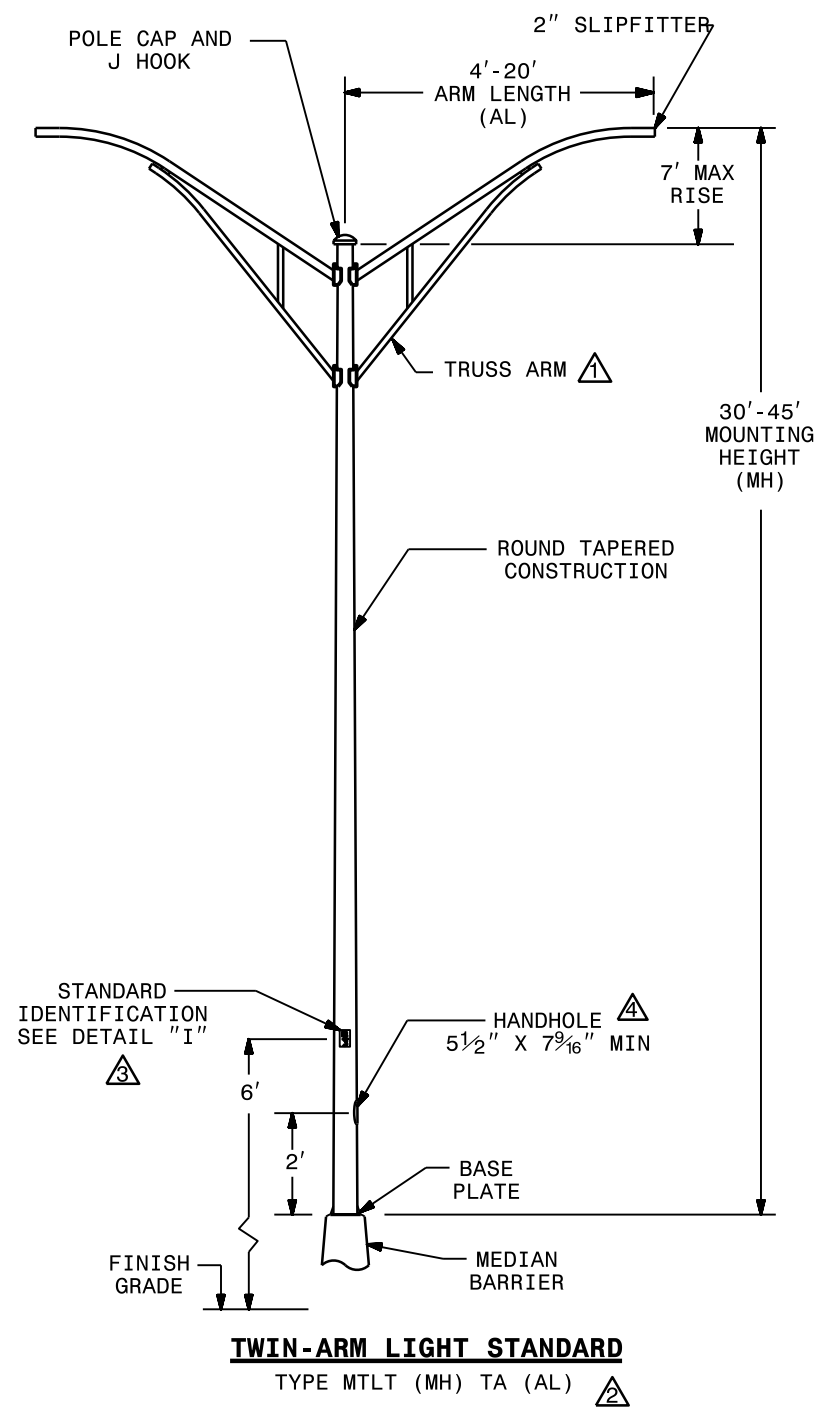
BASE DETAILS



TRANSFORMER BASE

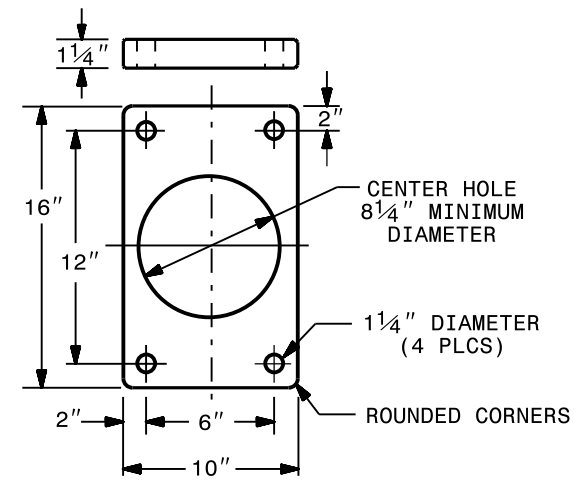
NOTES

- MOUNTING HEIGHT INCLUDES BREAKAWAY BASE FOR LIGHT STANDARDS WITH TRANSFORMER BASES.
- FIT PROTECTIVE SHROUD SNUGLY AROUND BASE PLATE TO PROTECT CONDUIT AND WIRING AT BASE OF STANDARD.
- PROVIDE WASHERS AND SHIMS REQUIRED BY BASE MANUFACTURER.
- PROVIDE ACCESSIBLE GROUNDING LUG INSIDE.
- LABEL ALL BASES TO SHOW COMPLIANCE WITH AASHTO BREAKAWAY REQUIREMENTS.

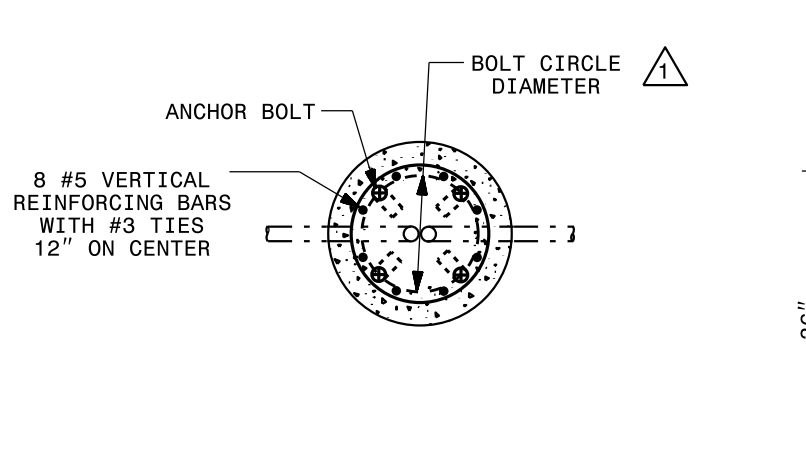


NOTES

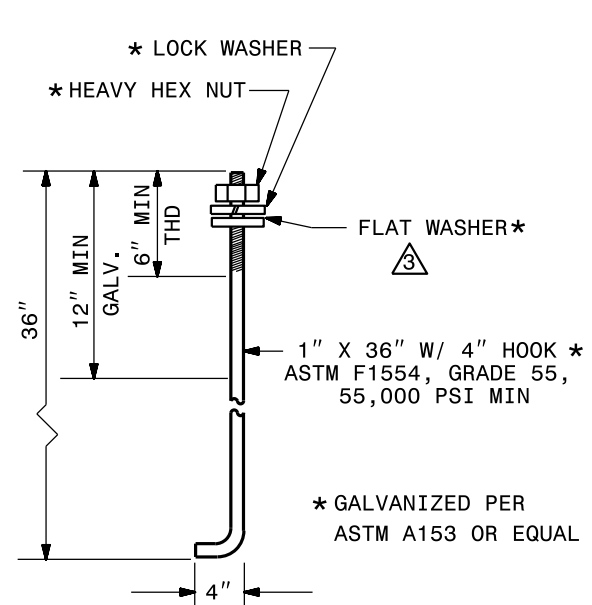
- △ SINGLE-MEMBER ARMS MAY BE PROVIDED IN LIEU OF TRUSS ARMS, WHEN SPECIFIED ARM LENGTH IS 8' OR LESS AND MOUNTING HEIGHT IS 35' OR LESS.
- △ INSERT MOUNTING HEIGHT (MH) AND ARM LENGTH (AL) FROM PAY ITEM DESCRIPTION TO DETERMINE PROPOSED TWIN-ARM LIGHT STANDARDS.
- △ SEE SHEET 1 OF 3 FOR DETAIL "I".
- △ PROVIDE ACCESSIBLE GROUNDING LUG INSIDE.
- △ SQUARE BASE PLATE REQUIRED FOR TWIN-ARM STANDARDS INSTALLED ON TYPE R1 OR R2 FOUNDATION WITH BREAKAWAY BASE. SEE PLANS FOR LOCATIONS.



BASE PLATE DETAIL
ALL DIMENSIONS ARE EXACT

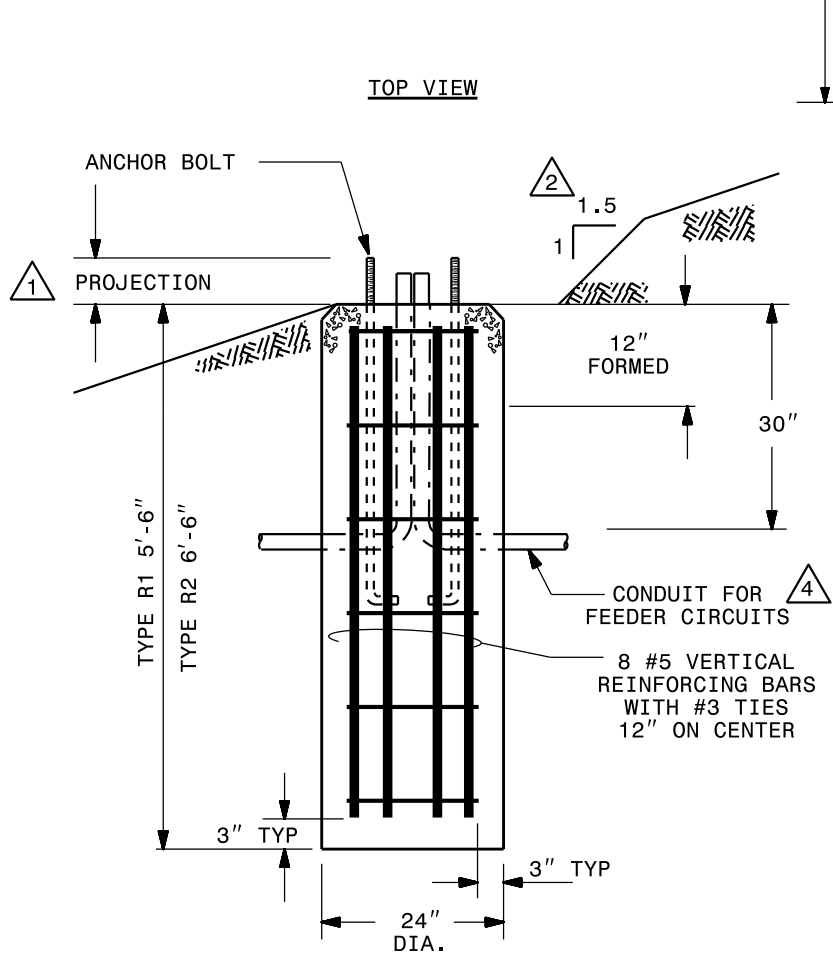


TOP VIEW

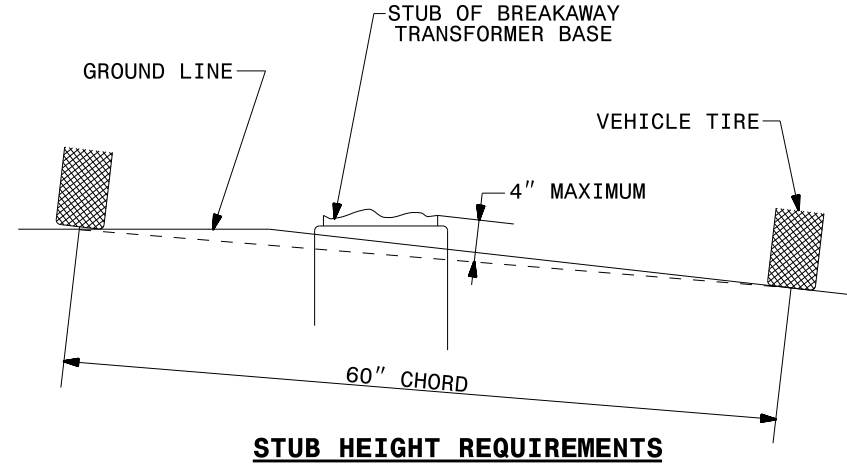


ANCHOR BOLT DETAIL

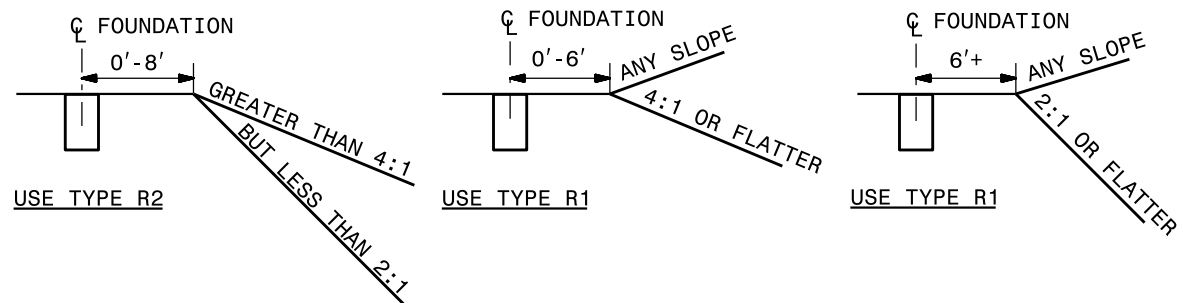
- NOTES**
- 1 ANCHOR BOLT CIRCLE DIAMETER AND PROJECTION OF ANCHOR BOLTS AS SPECIFIED BY APPROVED BASE MANUFACTURER, AND AS SHOWN BELOW IN STUB HEIGHT REQUIREMENTS.
 - 2 ADJUST SURROUNDING GRADE AS REQUIRED FOR ANCHOR BOLT PROJECTION TO MEET 4" CLEARANCE REQUIREMENT OVER 60" CHORD.
 - 3 PROVIDE WASHERS AND SHIMS REQUIRED BY APPROVED BASE MANUFACTURER.
 - 4 SEE LIGHTING LAYOUT PLANS FOR SIZE AND ORIENTATION OF CONDUIT FOR FEEDER CIRCUITS.



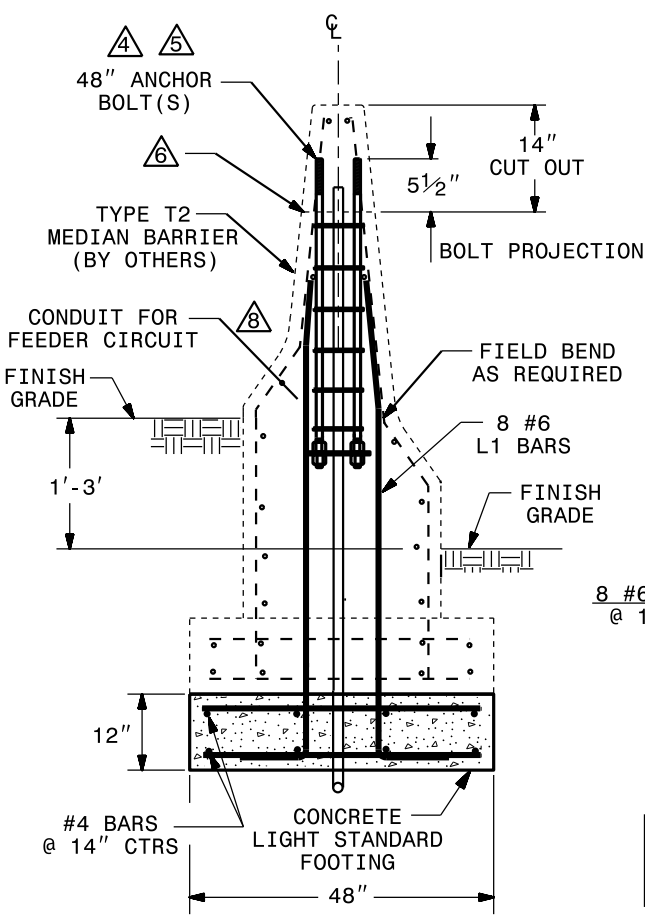
STANDARD FOUNDATION
TYPE R1 & TYPE R2



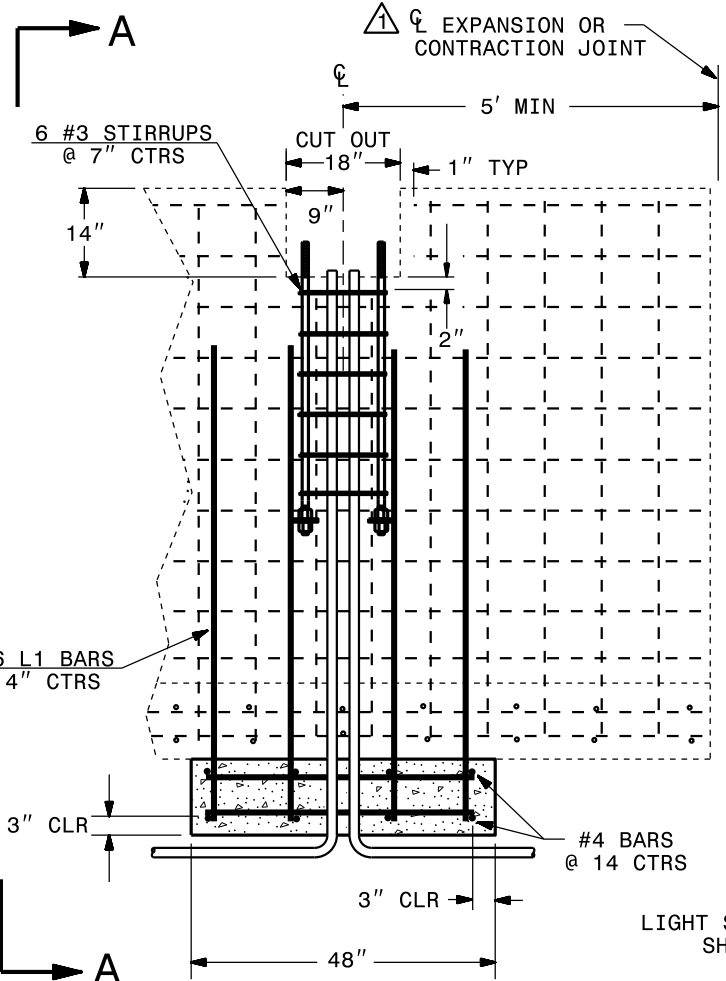
STUB HEIGHT REQUIREMENTS



SLOPE CONDITIONS

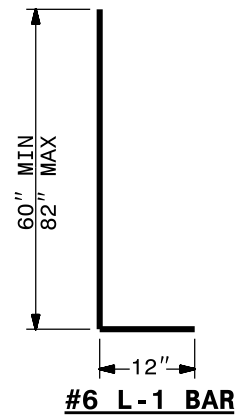


SECTION A-A

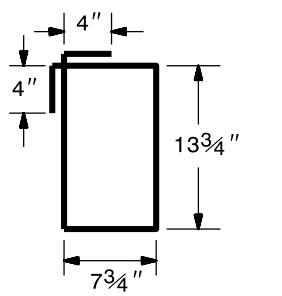


ELEVATION VIEW

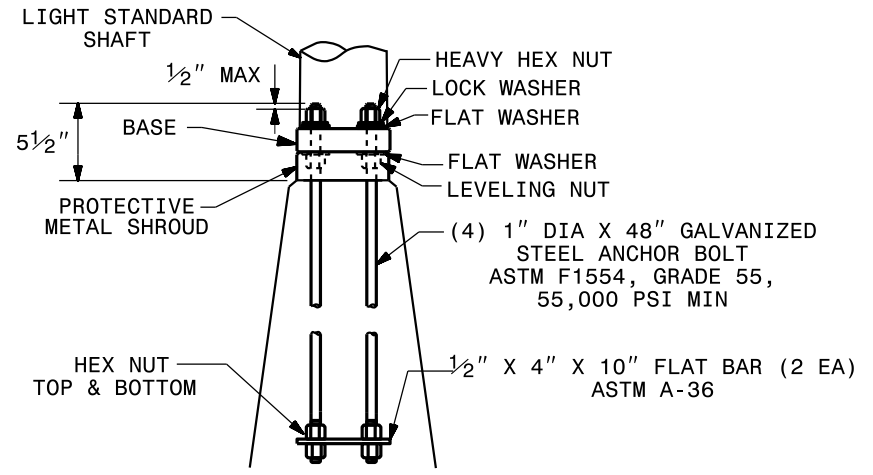
- NOTES**
- 1 LOCATE EXPANSION OR CONTRACTION JOINT 5' MINIMUM FROM CENTER LINE OF LIGHT STANDARD FOUNDATION.
 - 2 ALL SPECIFIED STEEL AND CONCRETE ON THIS SHEET IS IN ADDITION TO THAT REQUIRED FOR THE MEDIAN BARRIER.
 - 3 DIMENSIONS FOR #3 STIRRUPS ARE APPROXIMATE. FIT STIRRUPS TIGHTLY AROUND ANCHOR BOLTS.
 - 4 PROTECT ANCHOR BOLTS AND CONDUIT DURING PLACEMENT OF CONCRETE.
 - 5 FURNISH ALL ANCHOR BOLTS WITH HEAVY HEX NUTS, LEVELING NUTS, FLAT WASHERS, LOCK WASHERS AND FLAT CONNECTING BAR.
 - 6 PROVIDE 1/2" RADIUS ON ALL EXPOSED EDGES SIMILAR TO TOP OF BARRIER.
 - 7 USE TYPE M2 STANDARD FOUNDATION WITH TYPE T2 MEDIAN BARRIER.
 - 8 SEE LIGHTING LAYOUT PLANS FOR SIZE AND ORIENTATION OF CONDUIT FOR FEEDER CIRCUITS.



#6 L-1 BAR

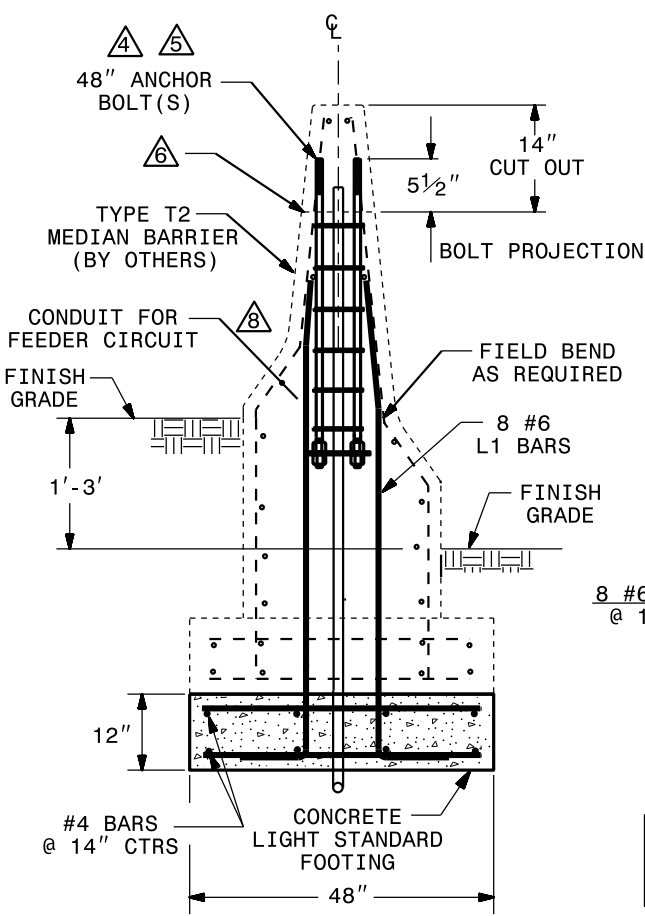


#3 STIRRUP

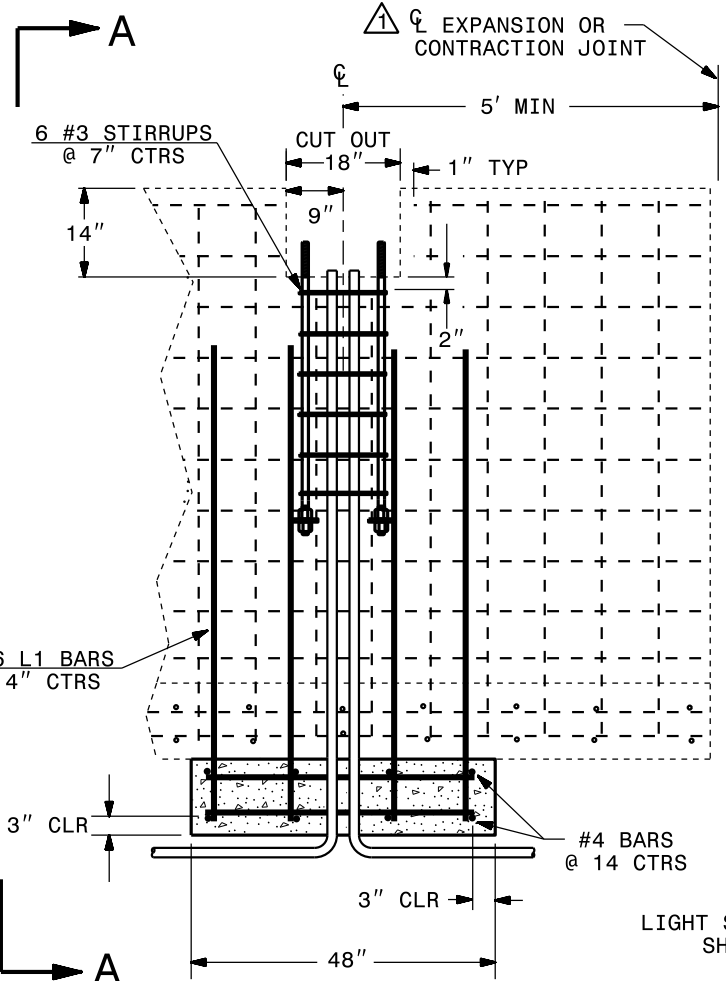


ANCHOR BOLT DETAIL

BARRIER CUT OUT NOT SHOWN

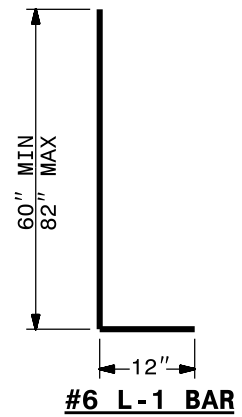


SECTION A-A

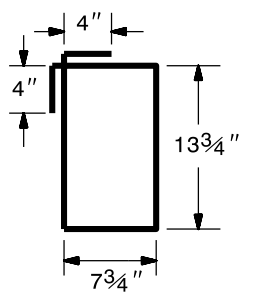


ELEVATION VIEW

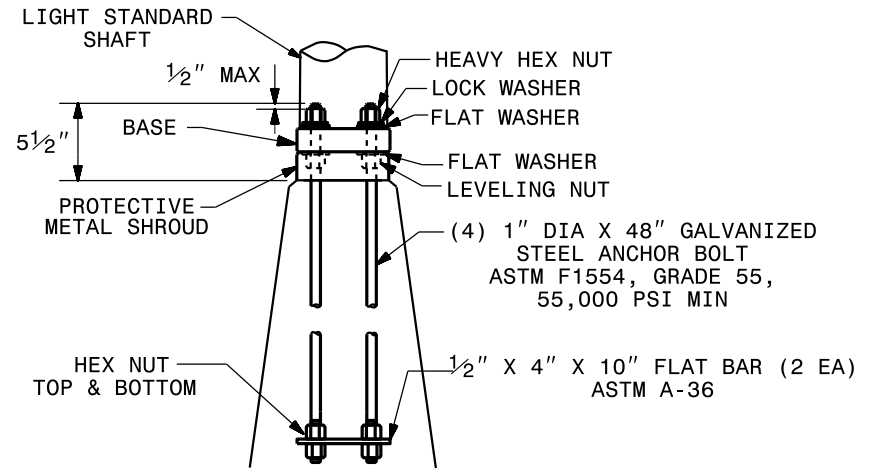
- NOTES**
- 1 LOCATE EXPANSION OR CONTRACTION JOINT 5' MINIMUM FROM CENTER LINE OF LIGHT STANDARD FOUNDATION.
 - 2 ALL SPECIFIED STEEL AND CONCRETE ON THIS SHEET IS IN ADDITION TO THAT REQUIRED FOR THE MEDIAN BARRIER.
 - 3 DIMENSIONS FOR #3 STIRRUPS ARE APPROXIMATE. FIT STIRRUPS TIGHTLY AROUND ANCHOR BOLTS.
 - 4 PROTECT ANCHOR BOLTS AND CONDUIT DURING PLACEMENT OF CONCRETE.
 - 5 FURNISH ALL ANCHOR BOLTS WITH HEAVY HEX NUTS, LEVELING NUTS, FLAT WASHERS, LOCK WASHERS AND FLAT CONNECTING BAR.
 - 6 PROVIDE 1/2" RADIUS ON ALL EXPOSED EDGES SIMILAR TO TOP OF BARRIER.
 - 7 USE TYPE M2 STANDARD FOUNDATION WITH TYPE T2 MEDIAN BARRIER.
 - 8 SEE LIGHTING LAYOUT PLANS FOR SIZE AND ORIENTATION OF CONDUIT FOR FEEDER CIRCUITS.



#6 L-1 BAR



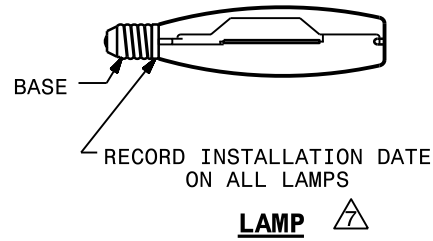
#3 STIRRUP



ANCHOR BOLT DETAIL

BARRIER CUT OUT NOT SHOWN

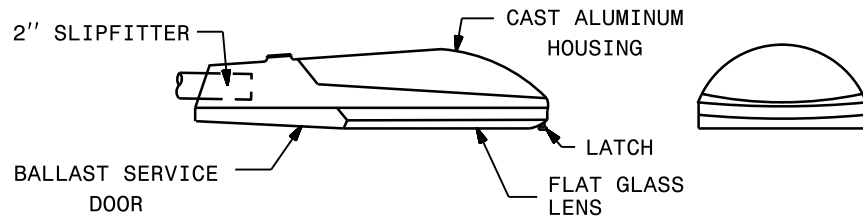
TYPE M2 FOUNDATION



LAMPS					
SPEC TYPE	BULB	BASE	RATED LIFE (HRS.)	INITIAL LUMENS	POSITION
400W HPS	ED18	MOGUL	24,000	50,000	UNIVERSAL
250W HPS	ED18	MOGUL	24,000	28,000	UNIVERSAL

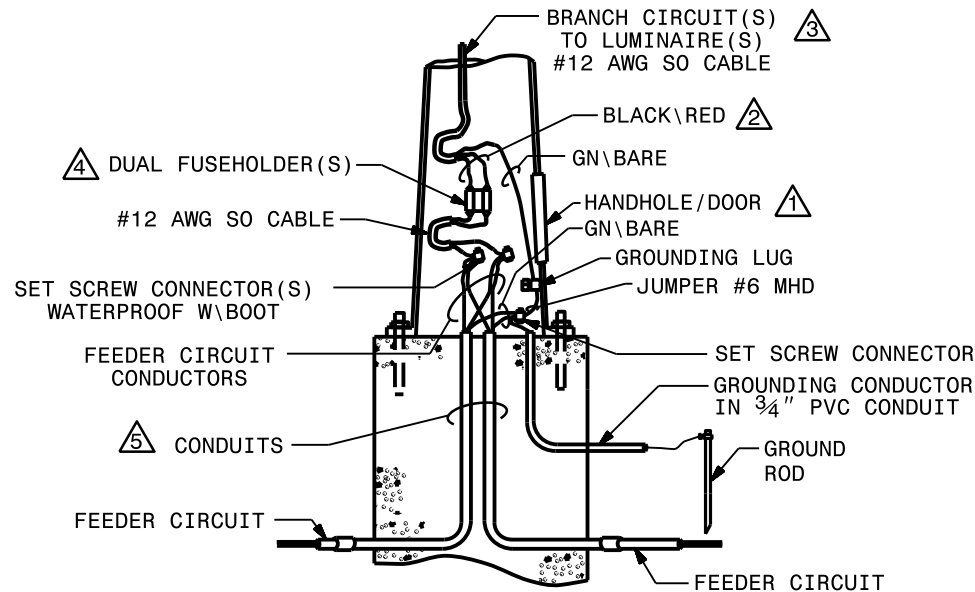
NOTES

- 1 PROVIDE ACCESS TO FUSEHOLDERS FROM HANDHOLE OR TRANSFORMER BASE.
- 2 SEE STANDARD SPECIFICATIONS SECTION 1400-4F FOR WIRING METHODS AND COLOR CODE OF CONDUCTORS.
- 3 PROVIDE SEPARATE BRANCH CIRCUIT AND FUSEHOLDER FOR EACH LUMINAIRE AT TWIN-ARM LIGHT STANDARDS.
- 4 BREAKAWAY FUSEHOLDERS REQUIRED AT ALL BREAKAWAY LIGHT STANDARDS.
- 5 SEE LIGHTING LAYOUT PLANS FOR NUMBER AND SIZE OF FEEDER CIRCUITS REQUIRED AT EACH LIGHT STANDARD.
- 6 SEE STANDARD SPECIFICATIONS SECTION 1400-2E FOR FUSEHOLDERS.
- 7 SEE STANDARD SPECIFICATIONS SECTION 1400-2G FOR LAMPS.
- 8 INSERT STYLE AND SIZE FROM PAY ITEM DESCRIPTION TO DETERMINE PROPOSED LUMINAIRES.



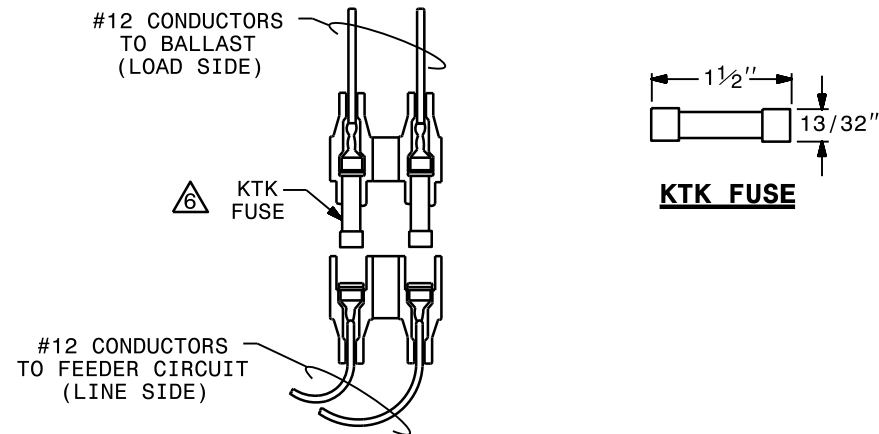
LIGHT STANDARD LUMINAIRE

TYPE (STYLE) (SIZE)

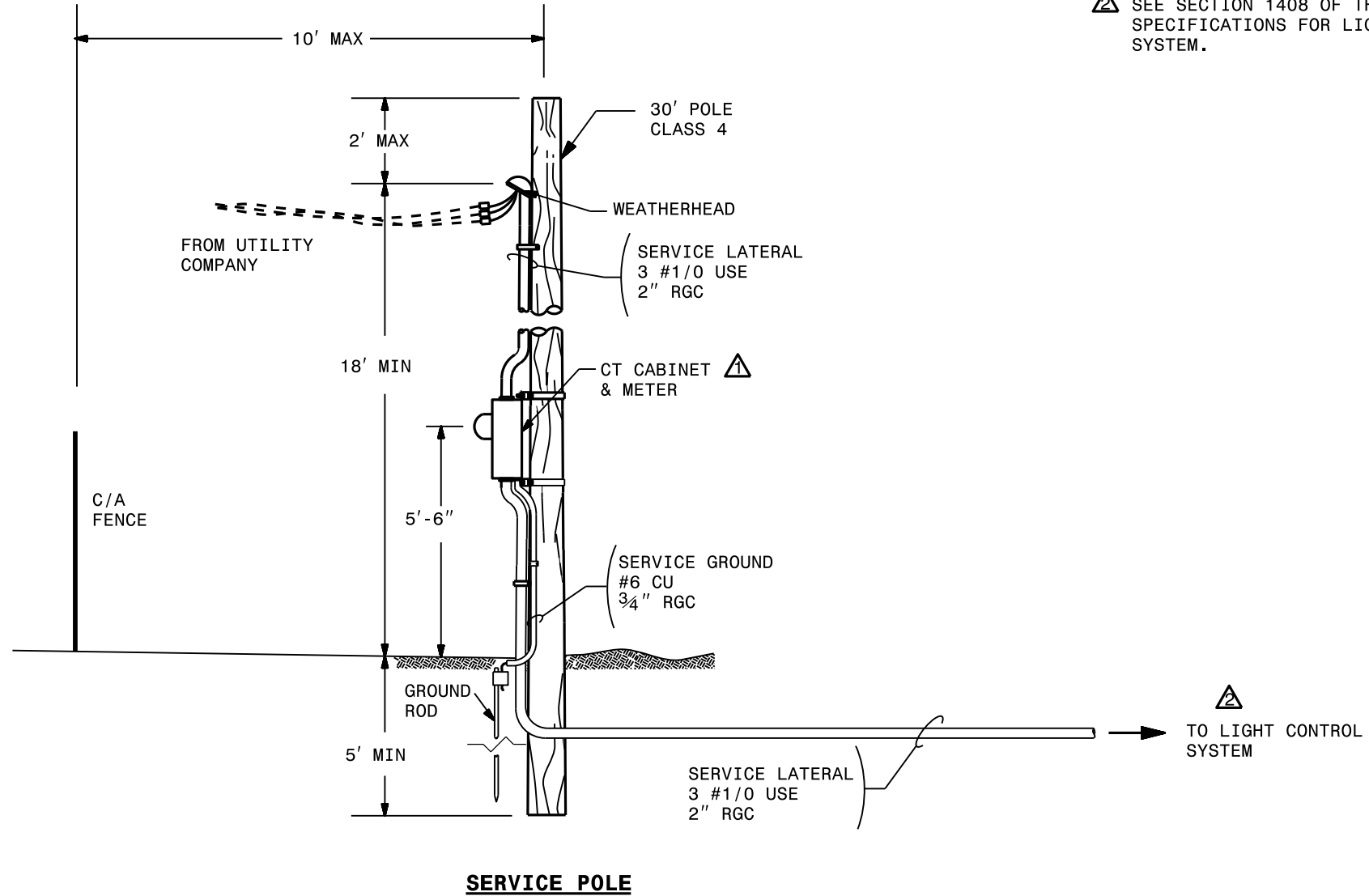


WIRING DIAGRAM

@ BASE OF LIGHT STANDARD



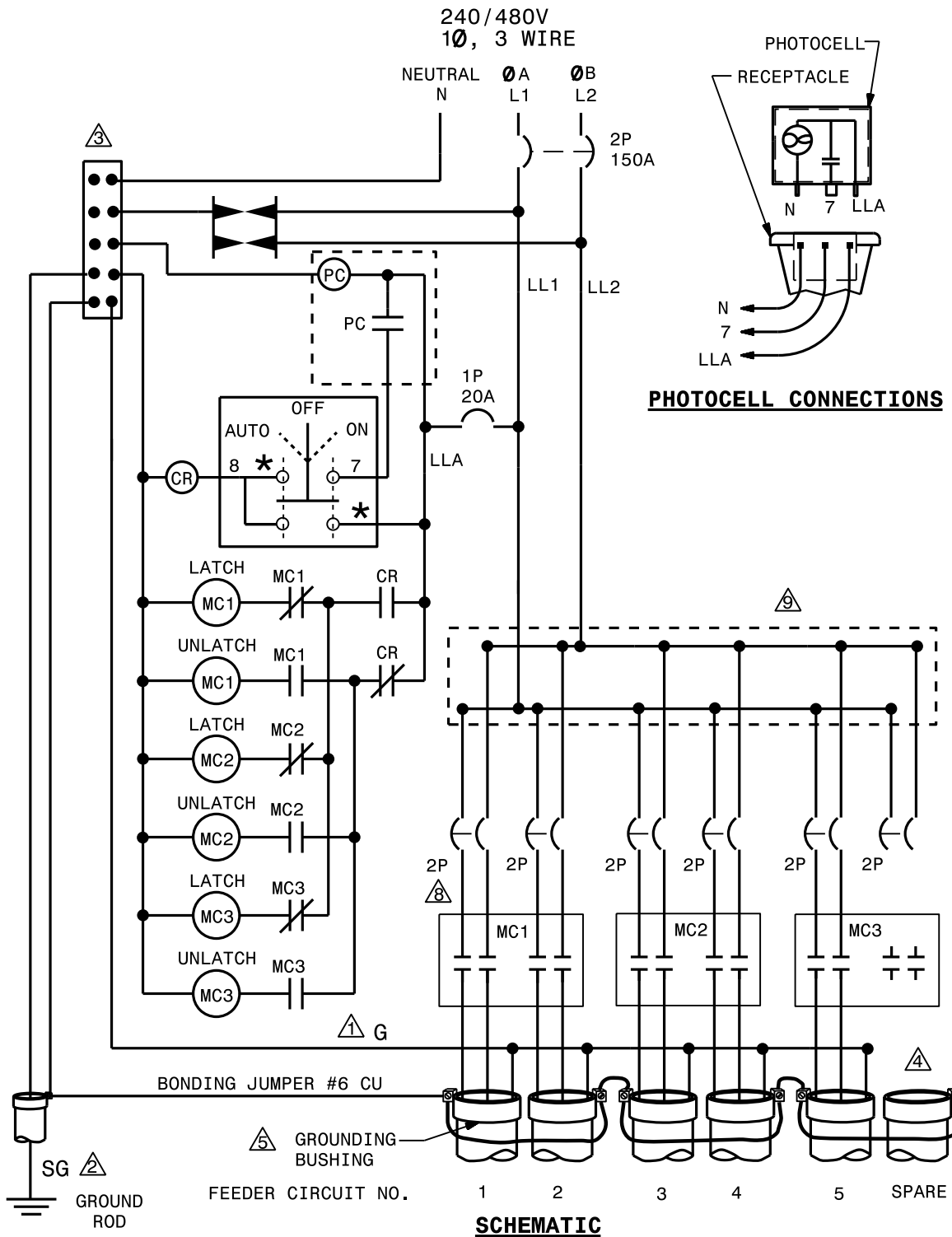
FUSEHOLDER



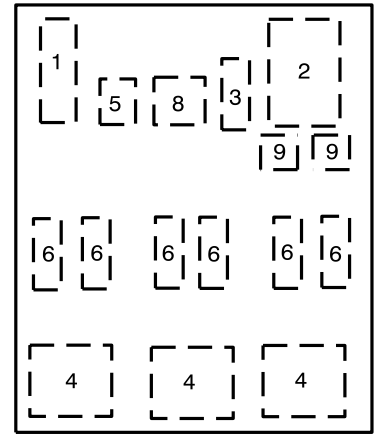
△ NOTES

△ CURRENT TRANSFORMER (CT) CABINET AND METER MAY BE MOUNTED ON BACK OF LIGHT CONTROL SYSTEM ENCLOSURE.

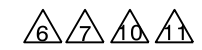
△ SEE SECTION 1408 OF THE STANDARD SPECIFICATIONS FOR LIGHT CONTROL SYSTEM.



PHOTOCELL CONNECTIONS



INTERIOR PANEL
COMPONENT LAYOUT



COMPONENT LIST			
#	QTY	DESCRIPTION	SPECIFICATIONS
1	1	NEUTRAL BAR	
2	1	SERVICE CIRCUIT BREAKER	2P, 480V, 150A
3	1	CONTROL CIRCUIT BREAKER	1P, 240V, 15A
4	3	MECHANICALLY HELD CONTACTORS	4P, 480V, 60A W/240V COIL
5	1	CONTROL RELAY W/NC & NO CONTACT	240V, 10A, W/240V COIL
6	6	FEEDER CIRCUIT BREAKERS	2P, 480V, 50A MAX
7	1	LIGHTNING ARRESTOR	
8	1	SELECTOR SWITCH (ON-OFF-AUTO)	240V, 10A
9	2	POWER DISTRIBUTION LUGS OR BLOCKS	
		MOUNTING BRACKETS OR SCREW STUDS	

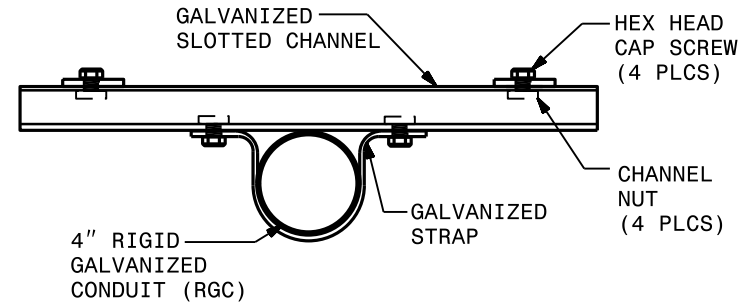
- NOTES**
- 1 EQUIPMENT GROUNDS (G) SHALL BE SIZED ACCORDING TO CIRCUIT DESCRIPTION. SEE PLANS.
 - 2 SYSTEM GROUND (SG) SHALL BE CONTINUOUS FROM THE NEUTRAL BAR TO THE GROUNDING ELECTRODE (GROUND ROD).
 - 3 THE NEUTRAL BAR SHALL BE BONDED TO THE PANEL.
 - 4 FEEDER CIRCUITS NOT SHOWN ON THE PLANS SHALL NOT BE INSTALLED, BUT CONDUIT SHALL BE INSTALLED AND CAPPED.
 - 5 INSTALL A GROUNDING BUSHING ON EACH METAL CONDUIT. CONNECT BONDING JUMPER AS REQUIRED BY NEC.
 - 6 SEE SHEET 3 OF 3 FOR ENCLOSURE.
 - 7 THE CONTROL SYSTEM MUST BE LABELED "SUITABLE FOR USE AS SERVICE EQUIPMENT." REFER TO STANDARD SPECIFICATION 1408-2 FOR OTHER REQUIREMENTS.
 - 8 SEE PLANS FOR BREAKER SIZES.
 - 9 PROVIDE MULTI-TAP LOAD LUGS OR POWER DISTRIBUTION BLOCKS.
 - 10 PROVIDE MANUFACTURER SUPPLIED MOUNTING BRACKETS OR SCREW STUDS PERMANENTLY ATTACHED TO THE BACK PANEL, FOR MOUNTING COMPONENTS.
 - 11 INSTALL LIGHTNING ARRESTOR ON OUTSIDE OF CABINET ASSEMBLY.

SCHEMATIC

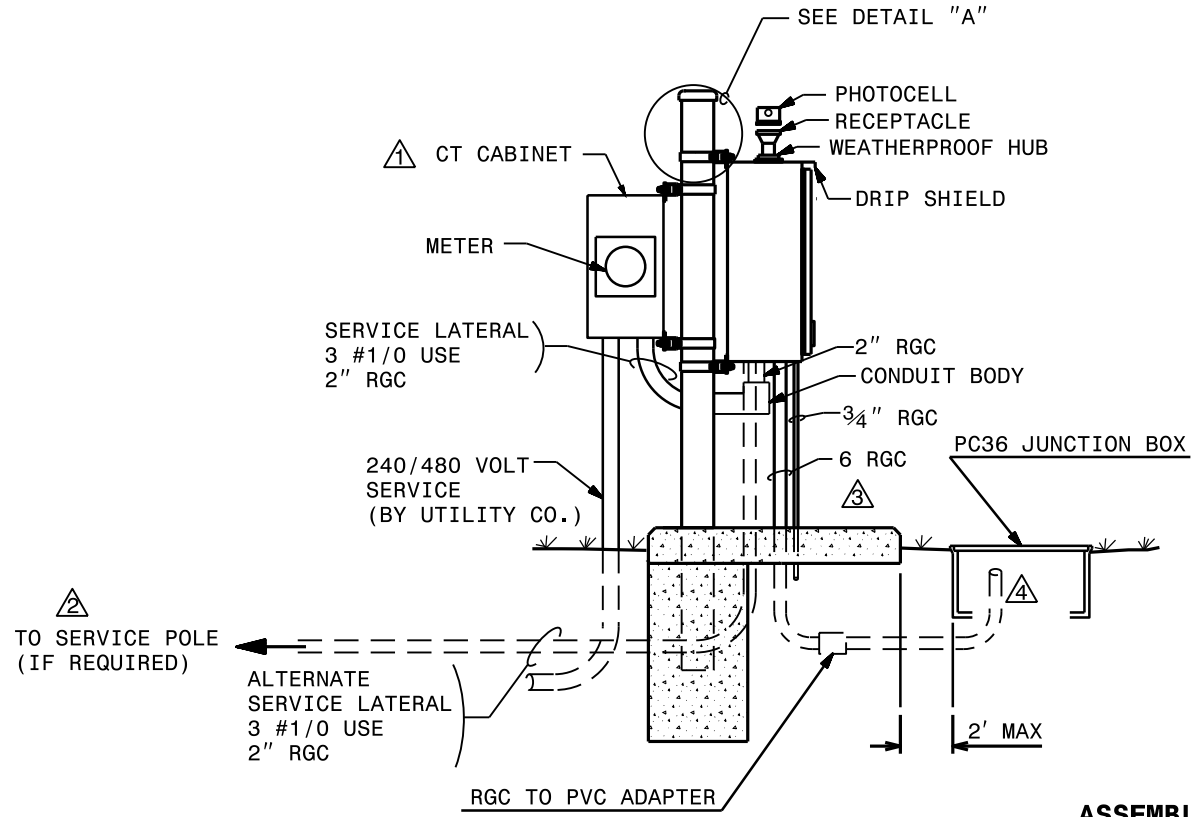
△ NOTES

- △ CURRENT TRANSFORMER (CT) CABINET AND METER MAY BE MOUNTED ON SERVICE POLE OR BACK OF CONTROL ENCLOSURE.
- △ SEE SECTION 1407 OF THE STANDARD SPECIFICATIONS FOR SERVICE POLE AND SERVICE LATERAL.
- △ SEE PLANS FOR SIZE OF CONDUITS AND/OR ELECTRICAL DUCT.
- △ STUB FEEDER CIRCUIT CONDUITS INTO JUNCTION BOX. CAP UNUSED CONDUITS. FEEDER CIRCUITS MUST BE MINIMUM 30" BELOW GRADE

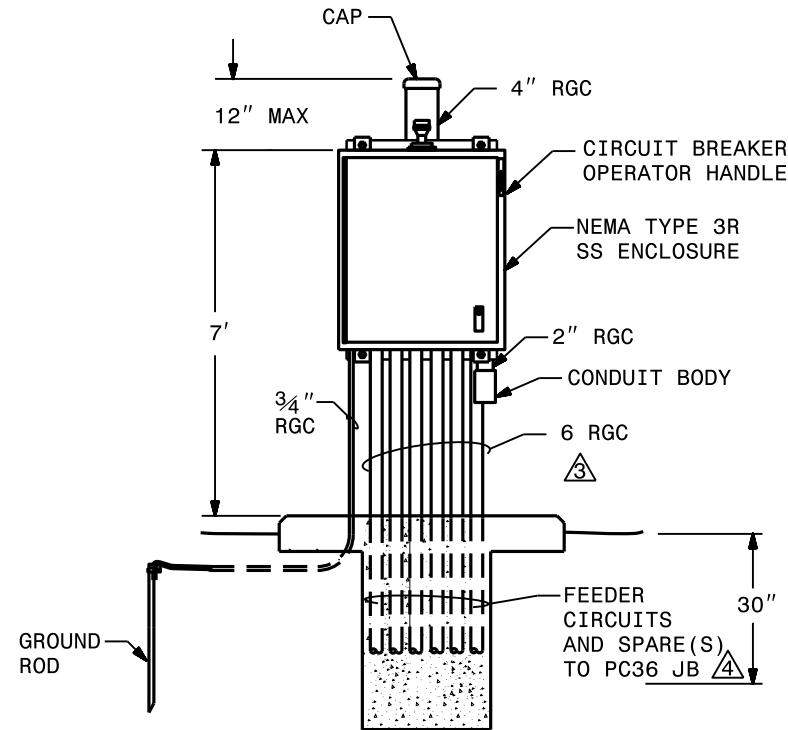
- △ SEE SECTION 1411 OF THE STANDARD SPECIFICATIONS FOR JUNCTION BOX INSTALLATION.
- △ ALL ABOVE GROUND CIRCUITRY TO BE INSTALLED IN RIGID GALVANIZED CONDUIT. UNDERGROUND FEEDER CIRCUITS TO BE INSTALLED IN SCH 40 PVC CONDUIT.
- △ LIGHTNING ARRESTOR INSTALLED OUTSIDE OF CABINET. NOT SHOWN FOR CLARITY.

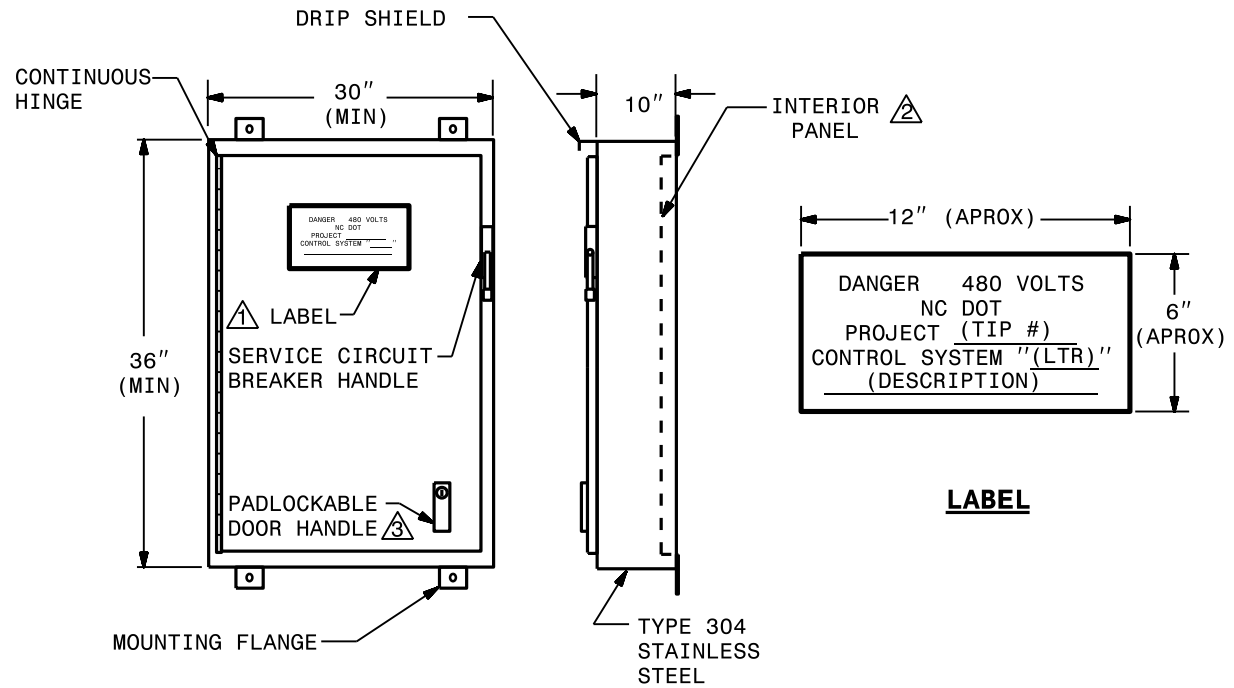
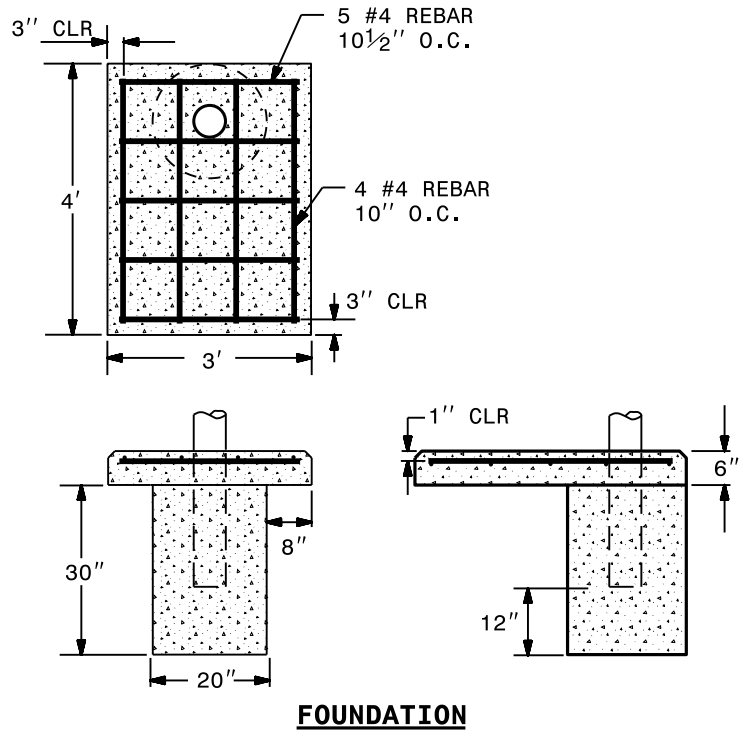


DETAIL "A"
MOUNTING HARDWARE



ASSEMBLY





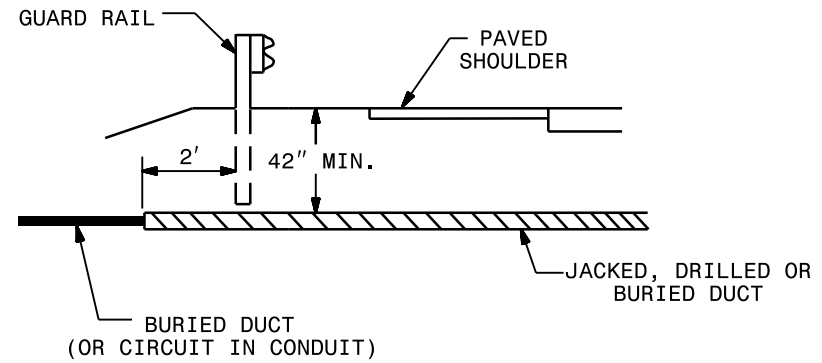
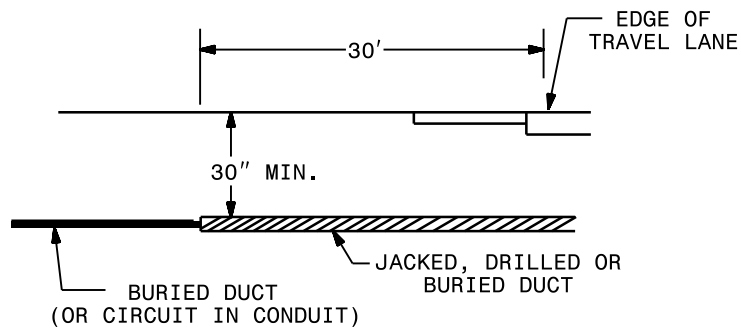
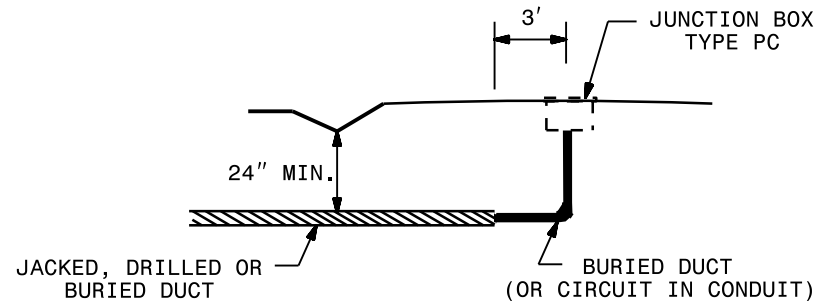
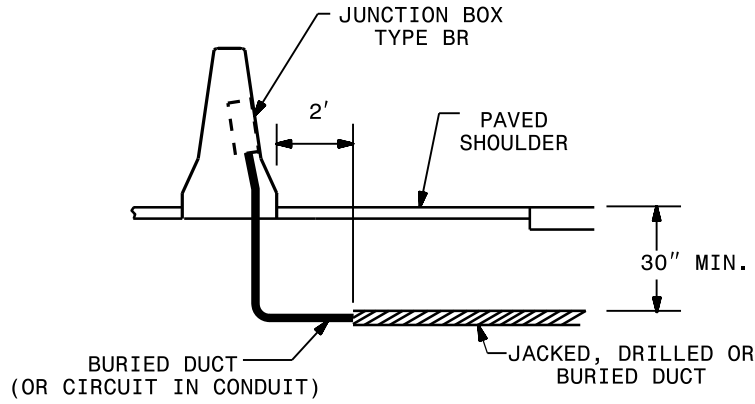
NEMA TYPE 3R STAINLESS STEEL ENCLOSURE

△ NOTES

- △ PERMANENTLY ATTACH A LABEL TO THE ENCLOSURE DOOR SHOWING THE WORK ORDER NUMBER, CONTROL SYSTEM LETTER DESIGNATION AND LOCATION DESCRIPTION SHOWN IN THE LOAD SCHEDULE AT EACH CONTROL SYSTEM IN THE PLANS.
- △ SEE SHEET 1 OF 3 FOR INTERIOR PANEL AND COMPONENT LAYOUT.
- △ PROVIDE DOOR CLOSING MECHANISM INTERLOCKED WITH SERVICE CIRCUIT BREAKER HANDLE. SEE STANDARD SPECIFICATIONS FOR DETAILS.

1-12

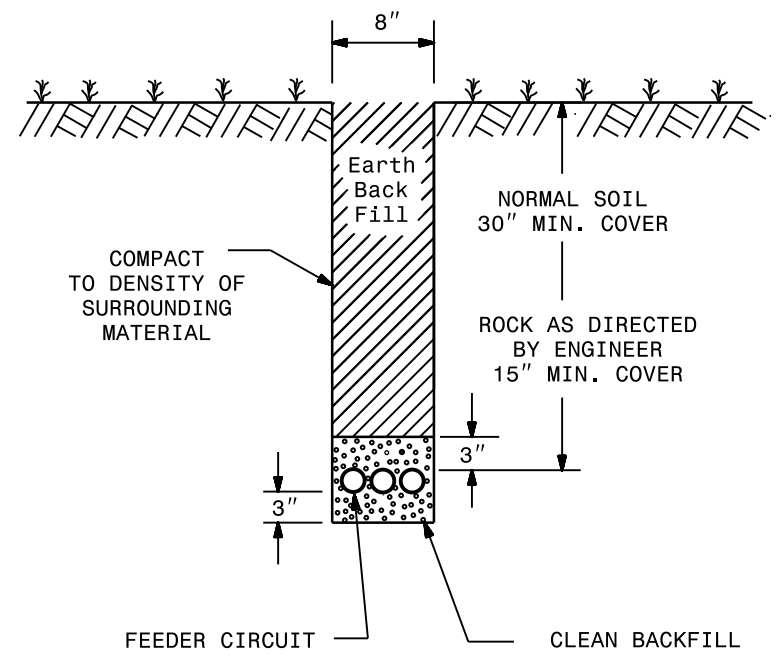
ENGLISH STANDARD DRAWING FOR
ELECTRICAL DUCT



ELECTRICAL DUCT INSTALLATION

1-12

ENGLISH STANDARD DRAWING FOR
ELECTRICAL DUCT



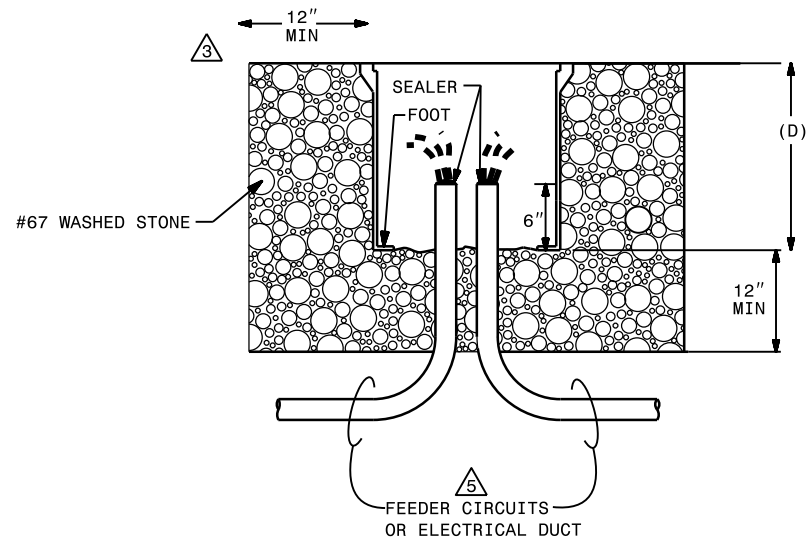
FEEDER CIRCUIT INSTALLATION

1-12

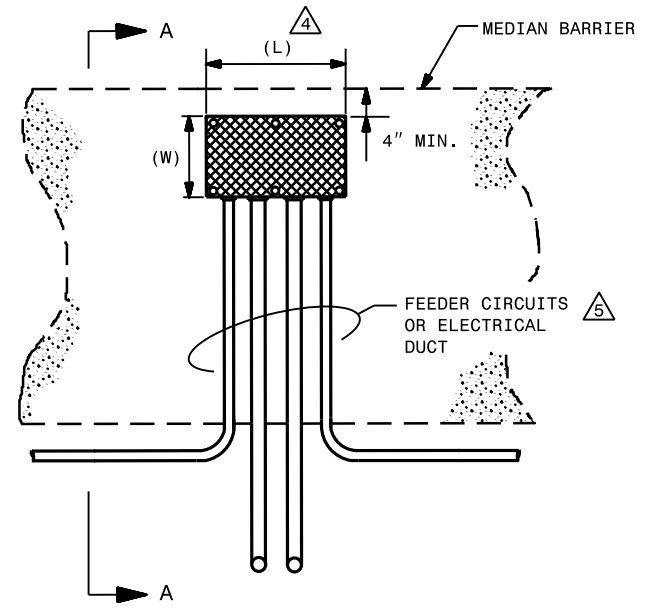
ENGLISH STANDARD DRAWING FOR
ELECTRICAL JUNCTION BOXES

1-12

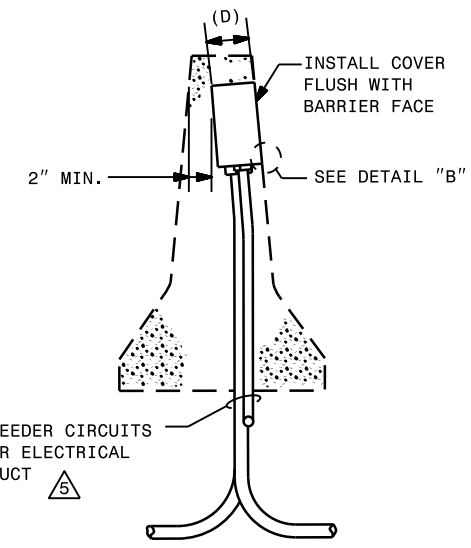
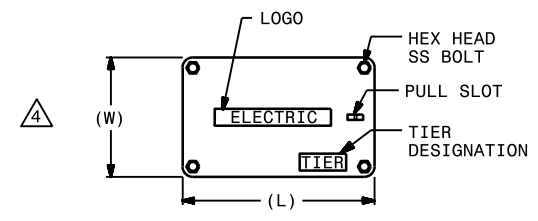
ENGLISH STANDARD DRAWING FOR
ELECTRICAL JUNCTION BOXES



ELECTRICAL JUNCTION BOX TYPE PC (SIZE)

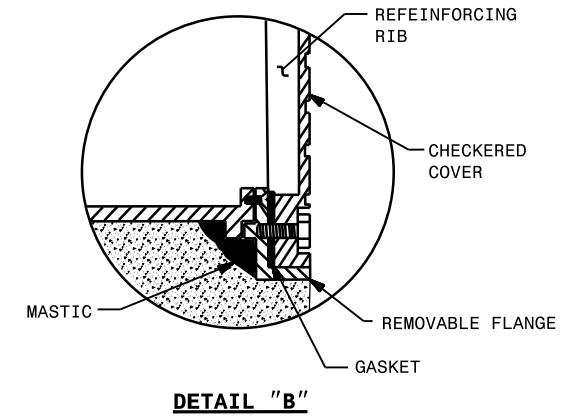


ELECTRICAL JUNCTION BOX TYPE BR (SIZE)

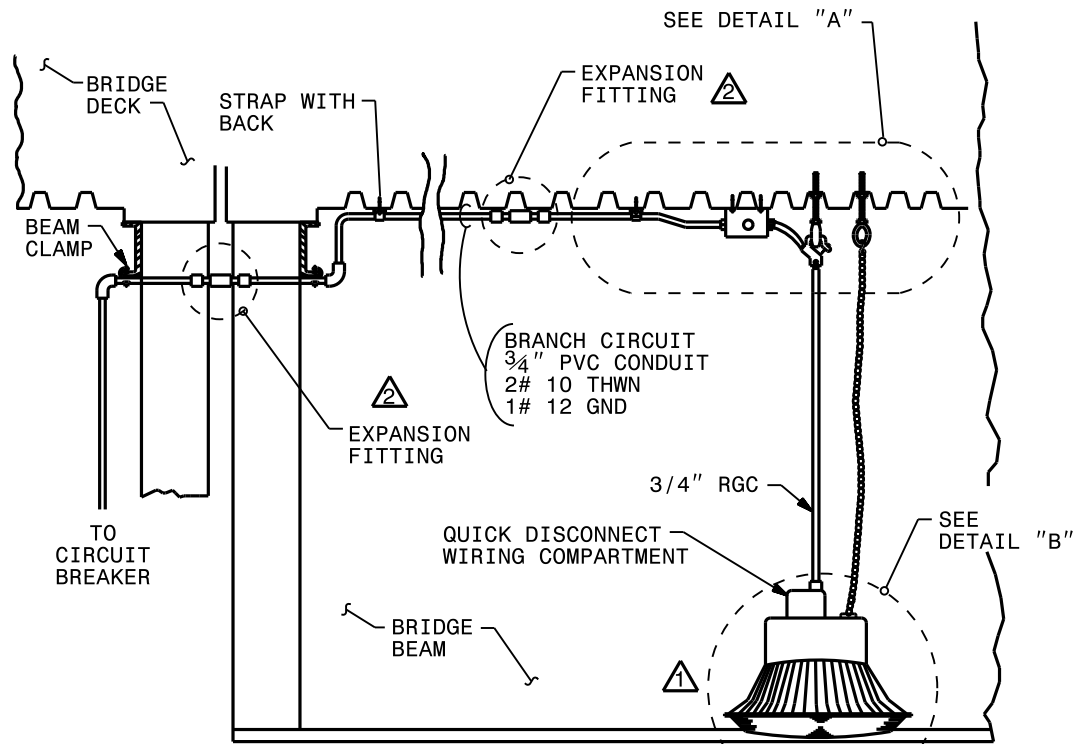


SECTION A-A

- NOTES**
- 1 SEE STANDARD SPECIFICATIONS SECTION 1400-2H FOR SEALER AND MASTIC.
 - 2 INSERT PAY ITEM DESCRIPTION FOR (SIZE) TO DETERMINE PROPOSED JUNCTION BOX.
 - 3 SET TOP OF BOX FLUSH WITH CONCRETE IF REQUIRED TO BE PLACED IN SIDEWALKS OR OTHER CONCRETE STRUCTURES.
 - 4 SIZE IS SPECIFIED AS NOMINAL INSIDE DIMENSIONS FOR WIDTH (W), LENGTH (L) AND DEPTH (D). SEE PLANS FOR PROPOSED DIMENSIONS.
 - 5 SEE LAYOUT SHEETS FOR NUMBER AND SIZE OF FEEDER CIRCUITS AND ELECTRICAL DUCT.



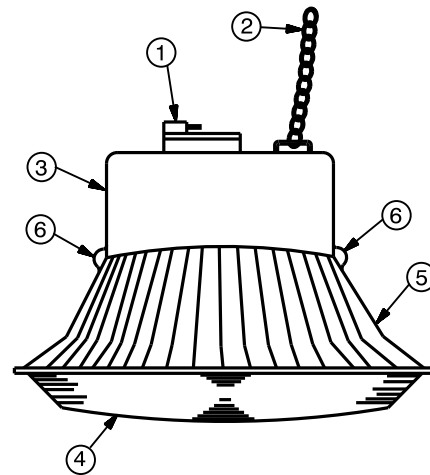
DETAIL "B"



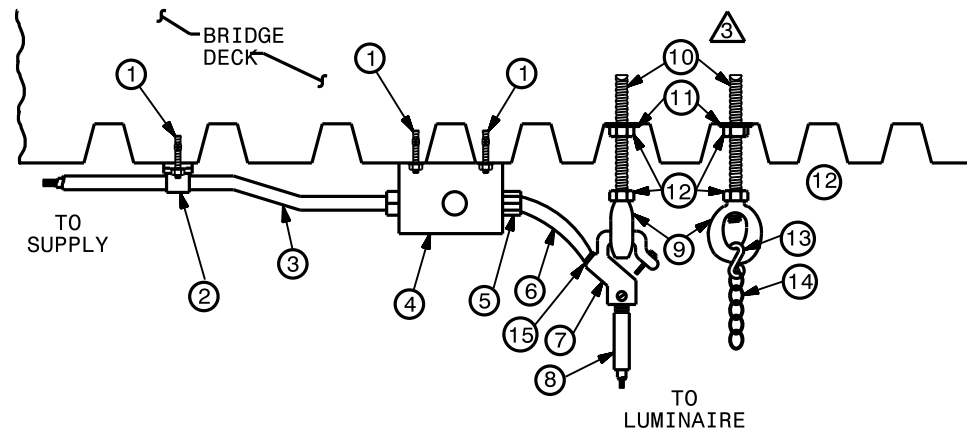
TYPE PM LUMINAIRE AND CIRCUITRY

○ COMPONENTS

- ① ELECTRICAL DISCONNECT MOUNTING RECEPTACLE
- ② SAFETY CHAIN
- ③ ALUMINUM BALLAST HOUSING
- ④ ACRYLIC PRISMATIC REFRACTOR
- ⑤ ALUMINUM REFLECTOR
- ⑥ SS SPRING LATCHES
- ⑦ QUICK DISCONNECT WIRING COMPARTMENT
- ⑧ 3/4" THREADED CONDUIT CONNECTION



DETAIL "B"



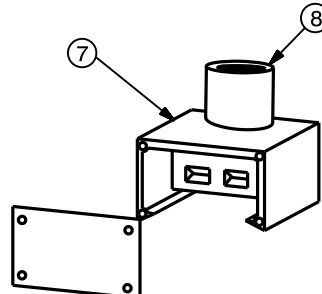
DETAIL "A"

○ COMPONENTS

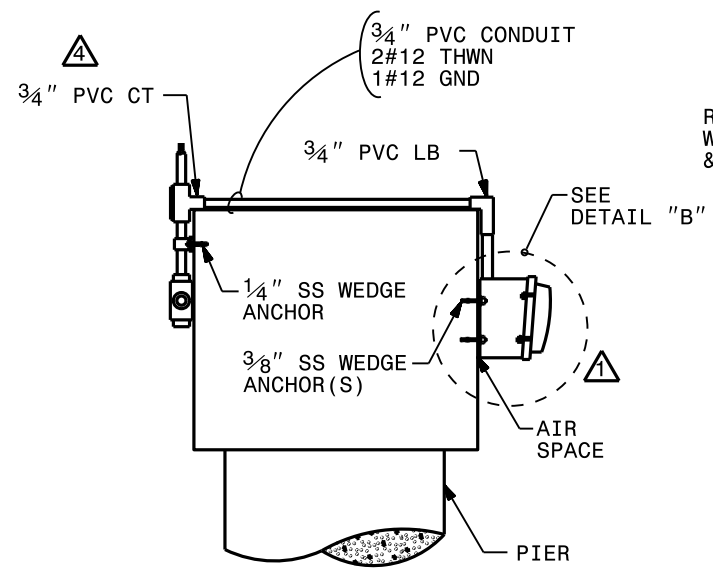
- ① 1/4" SS WEDGE ANCHOR
- ② STRAP WITH BACK
- ③ 3/4" PVC CONDUIT
- ④ ROUND PVC BOX W/4-3/4" HUBS AND GASKETED COVER
- ⑤ CORD GRIP
- ⑥ 3 COND. "SO" CORD (12 AWG 600 VAC)
- ⑦ HOOK, FEMALE
- ⑧ 3/4" RGS CONDUIT
- ⑨ 3/8" GALV. EYE NUT
- ⑩ 3/8" SS THREADED ROD AND DROP IN OR EXPANSION ANCHOR
- ⑪ 3/8" SS FLAT WASHER
- ⑫ 3/8" SS HEX NUT
- ⑬ CHAIN "S" LINK
- ⑭ SAFETY CHAIN
- ⑮ SEALER

△ NOTES

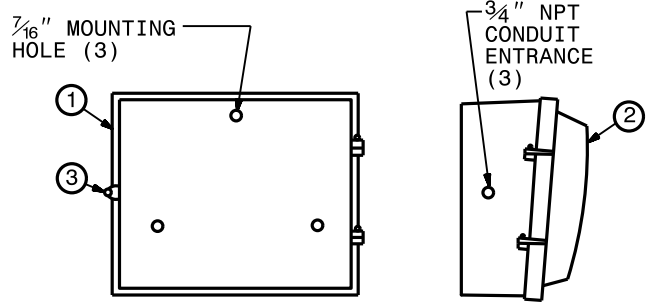
- ① MOUNT TYPE PM LUMINAIRE FLUSH WITH BOTTOM OF BEAMS.
- ② PROVIDE EXPANSION FITTINGS AT EACH BRIDGE EXPANSION JOINT. PROVIDE AT LEAST 1 EXPANSION JOINT IN SECTIONS OF CONDUIT GREATER THAN 20' BETWEEN JUNCTION BOXES OR LIGHT FIXTURES, AND 1 EXPANSION JOINT EVERY 80' FOR LONGER RUNS.
- ③ REFER TO STANDARD SPECIFICATION 1074-2 FOR EXPANSION ANCHOR UNITS.



1-12

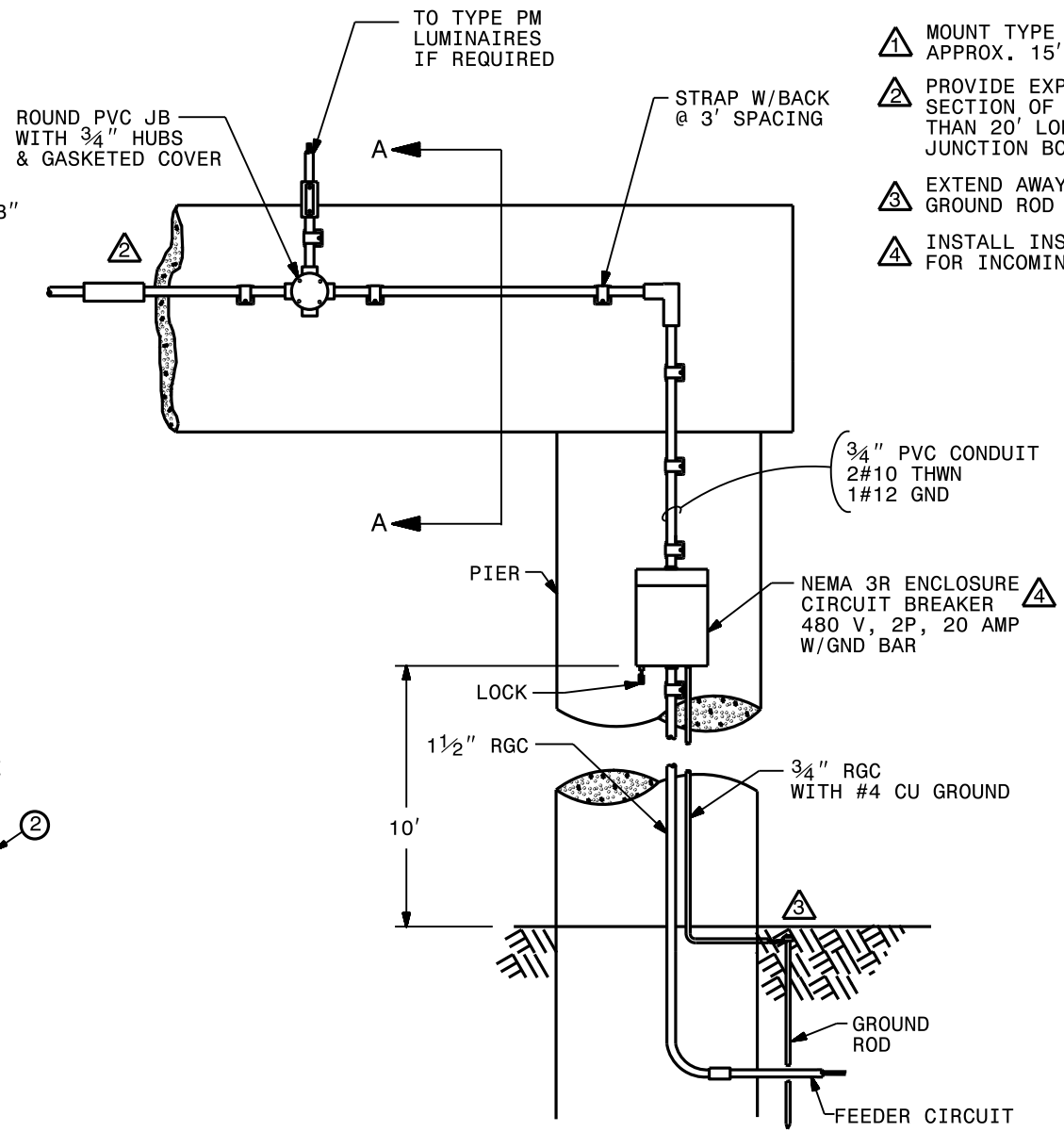


SECTION A-A



DETAIL "B"

- **COMPONENTS**
- ① DIE CAST ALUMINUM HOUSING, DOOR & HINGE
 - ② PRISMATIC REFRACTOR
 - ③ SINGLE SCREW LATCH



TYPE WM LUMINAIRE AND CIRCUITRY

- NOTES**
- ⚠ MOUNT TYPE WM LUMINAIRE APPROX. 15' ABOVE ROADWAY.
 - ⚠ PROVIDE EXPANSION FITTINGS IN EACH SECTION OF CONDUIT THAT IS GREATER THAN 20' LONG BETWEEN TERMINALS AT JUNCTION BOXES ON PIER CAP.
 - ⚠ EXTEND AWAY FROM PIER SO THAT GROUND ROD WILL MISS FOOTING.
 - ⚠ INSTALL INSULATED GROUNDING BUSHING FOR INCOMING FEEDER CIRCUIT IN RGC.

1-12