INDEX	
SHEET NO.	SUBJECT
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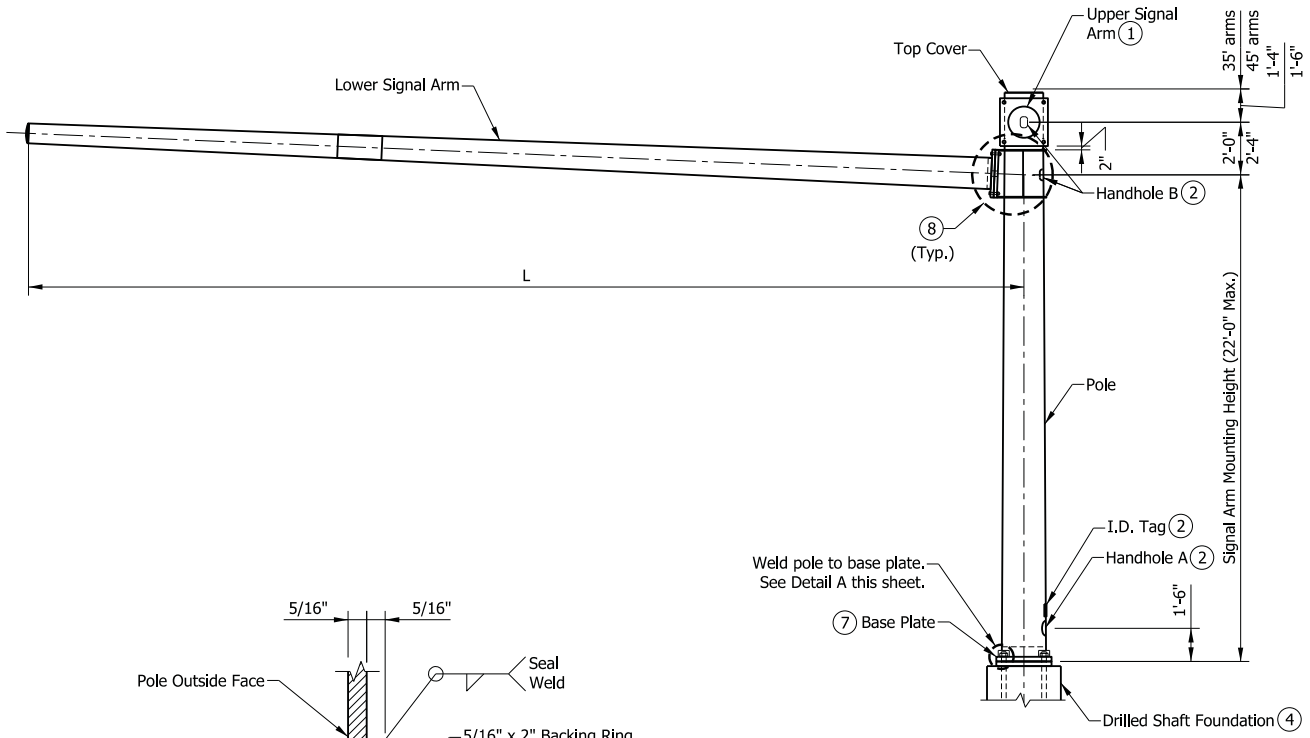
3	Arm Dimensions and Details
4	Base Plate and Pole Top Cover Details
5	Arm Connection Details
6	Handhole and I.D. Tag Details
7	Loading Diagrams
8	Foundation, Drilled Shaft Type E, for Dual Arms 35' or Less
9	Foundation, Drilled Shaft Type F, for Dual Arms Greater Than 35' to 45'

E 805-T-187d 1 of 9

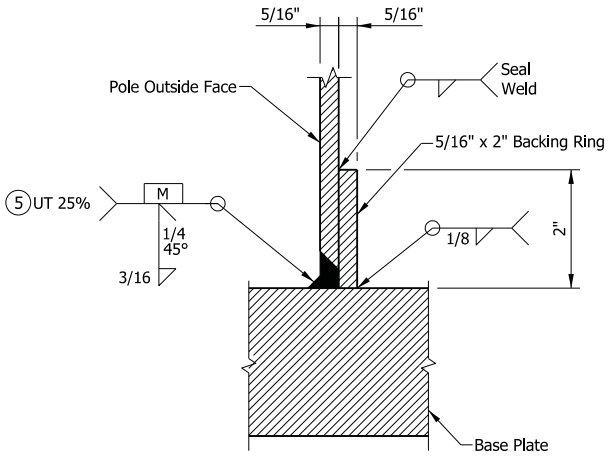
INDIANA DEPARTMENT OF TRANSPORTATION

SIGNAL DUAL ARM CANTILEVERS
DRAWING INDEX

03-01-13



ELEVATION

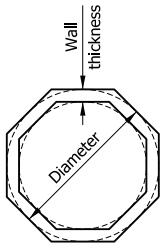


POLE/BASE PLATE WELD
DETAIL A

POLE DIMENSIONS (6)		
CANTILEVER ARM LENGTHS L (FT)	BASE DIAMETER (IN.)	WALL THICKNESS (IN.)
15' to 35'	18	5/16
> 35' to 45'	24	5/16

NOTES:

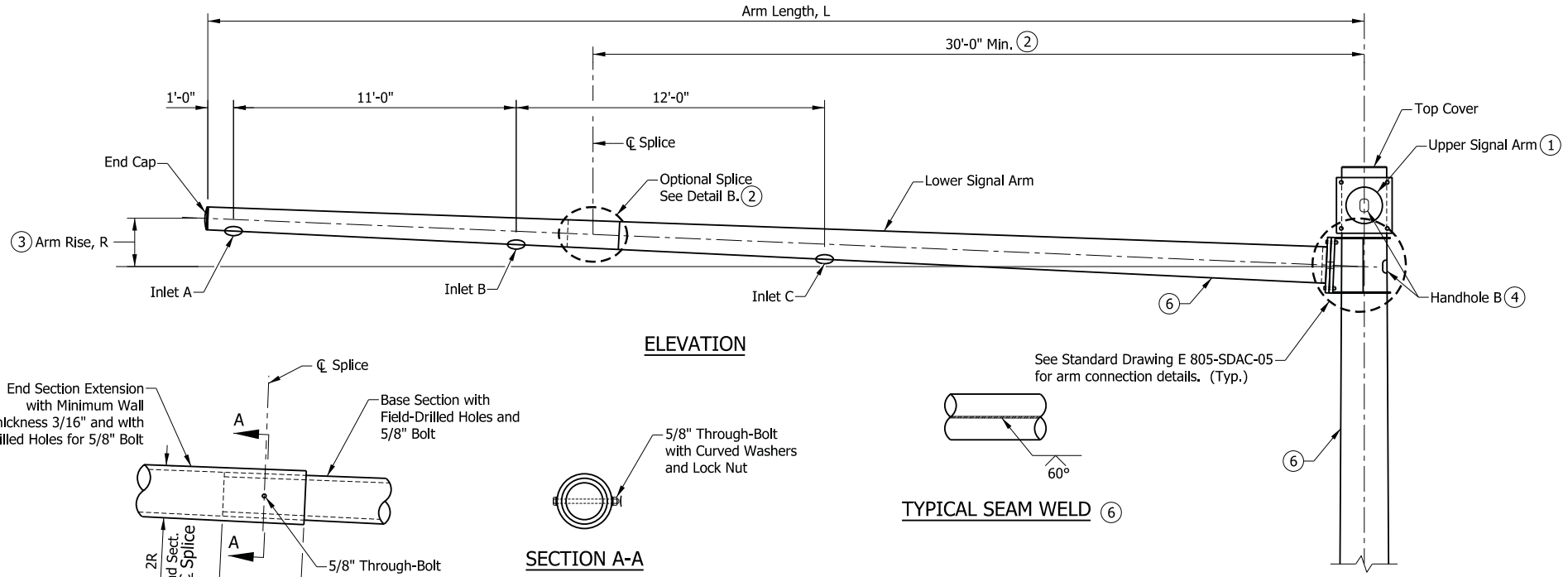
1. This structure is a dual arm cantilever design for traffic signals. Cantilever arms can be positioned at 20° to 180° to each other.
2. See Sheet 6 for handhole and I.D. tag details.
3. See Standard Drawings E 805-SGGR-01 through -03 for grounding details.
4. See Sheets 8 and 9 for foundation details.
5. A minimum of 25% of the pole to base plate welds shall be ultransonically tested (UT).
6. Pole and arms may be octagonal or circular shaped and shall have a 0.14 in./ft taper. All member diameters shown are outside diameter.
7. See Sheet 4 for base plate details.
8. See Sheet 5 for arm connection details.



OCTAGON AND CIRCULAR
TUBULAR SHAPE (6)

INDIANA DEPARTMENT OF TRANSPORTATION

SIGNAL DUAL ARM CANTILEVERS
POLE DIMENSIONS AND DETAILS



ELEVATION

DETAIL B

SECTION A-A

TYPICAL SEAM WELD (6)

SIGNAL DUAL ARM CANTILEVER DATA				
ARM LENGTH L (FT.)	ARM DIAMETER AT POLE (IN.)	ARM WALL THICKNESS (IN.)	ARM RISE R (IN.) (3)	CABLE INLETS
15	14	5/16	7 1/2	A, B
20	14	5/16	10	A, B
25	14	5/16	12 1/2	A, B
30	14	5/16	15	A, B
35	14	5/16	17 1/2	A, B, C
40	17	5/16	20	A, B, C
45	17	5/16	22 1/2	A, B, C

NOTES:

(1) Upper signal arm can be oriented 20° to 180° from lower signal arm. The dimensions and details shall be as shown on this drawing.

(2) Optional splices can be used for greater than 40' mast arms. The splice shall be located a minimum of 30' from the pole. The end extension section of the arm shall have a wall thickness of 3/16" or greater. Field assembly to achieve a snug tight joint (min. overlap not less than 3 times the inside radius ofthe end section).

(3) Arm rise is measured in the undeflected position without vertical loads on the arm.

(4) See Sheet 6 for handhole B details.

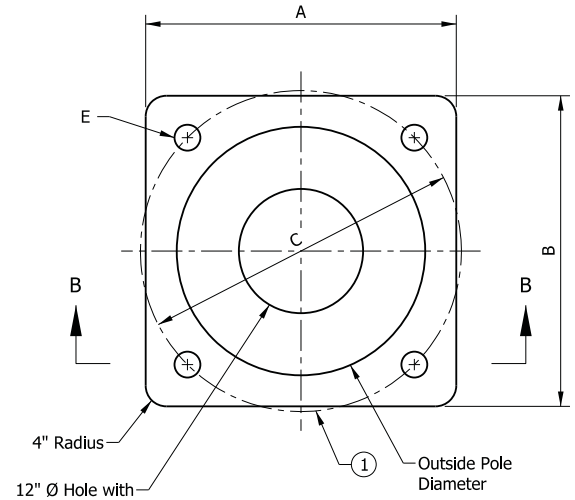
5. See Sheet 7 for loading diagrams.

(6) If seam welds are used, the weld location shall be along the bottom for the arms, and on the side of pole as shown. All pole and arm seam welds shall be 100% ultrasonically tested.

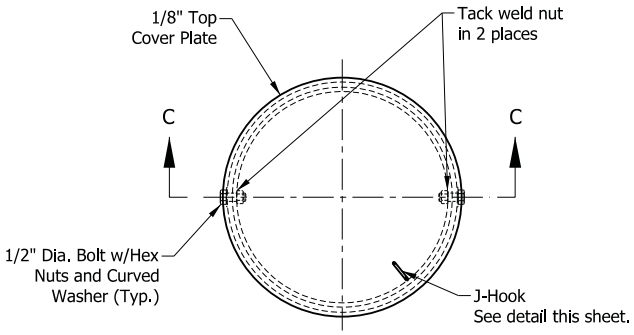
7. Number of cable inlets depends on arm L (see table on this sheet). The inlet diameter shall be 1 3/4" with rubber grommet (typ.).

INDIANA DEPARTMENT OF TRANSPORTATION

SIGNAL DUAL ARM CANTILEVERS ARM DIMENSIONS AND DETAILS



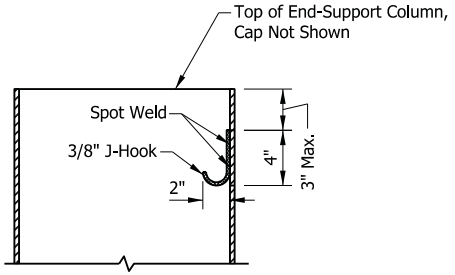
PLAN



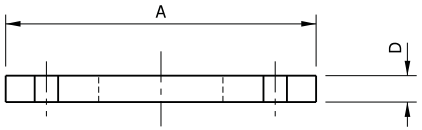
PLAN
TOP COVER - STEEL COLUMN

NOTES:

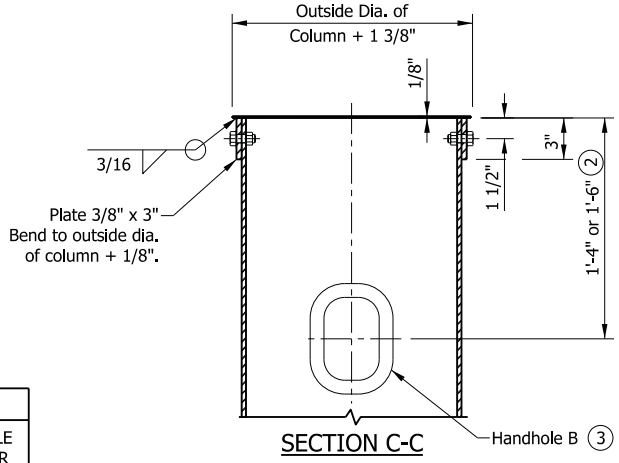
1. Anchor bolt circle shall allow clearance for the anchor bolt washers. Cutting or trimming of the washers will not be allowed.
2. See Sheet 2 for handhole locations.
3. See Sheet 6 for handhole details.



CABLE J-HOOK



SECTION B-B
BASE PLATE

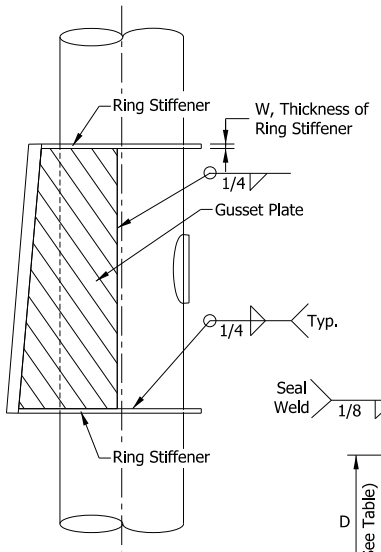


SECTION C-C

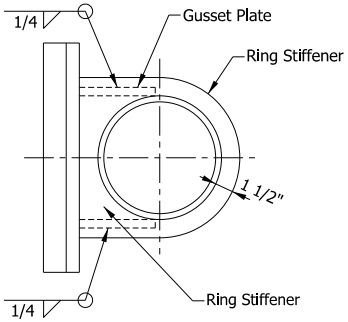
BASE PLATE DATA				
POLE DIAMETER (IN.)	PLATE DIMENSIONS A X B (IN. X IN.)	ANCHOR BOLTS CIRCLE C (IN.)	PLATE THICKNESS D (IN.)	BOLT HOLE DIAMETER E (IN.)
18	26 x 26	25	2 1/4	2 9/16
24	30 x 30	31	2 1/2	2 13/16

INDIANA DEPARTMENT OF TRANSPORTATION

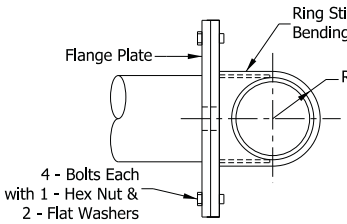
SIGNAL DUAL ARM CANTILEVERS
BASE PLATE AND POLE TOP COVER DETAILS



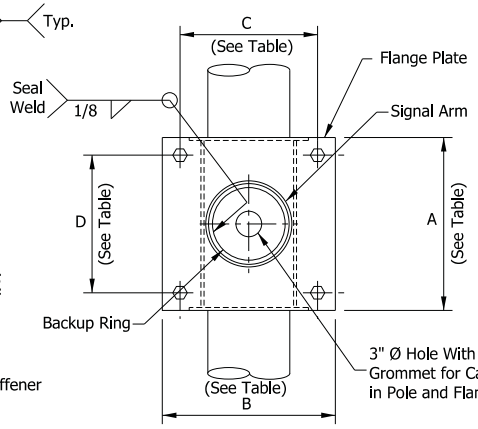
ELEVATION OF GUSSET PLATE



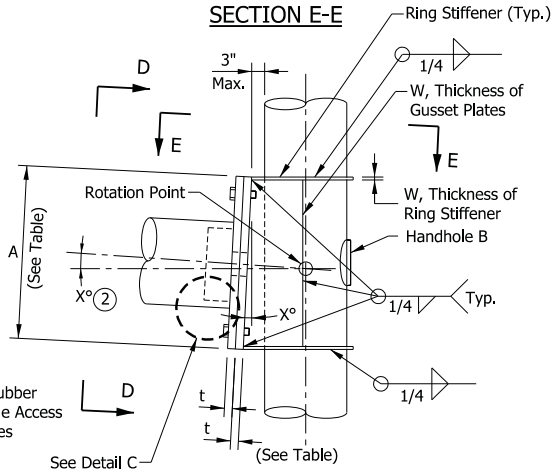
TOP OF GUSSET PLATE



SECTION E-E

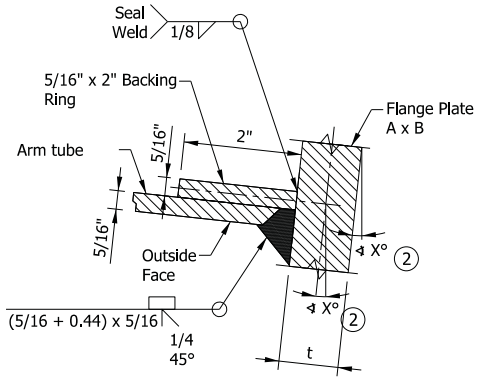


SECTION D-D



ELEVATION

SIGNAL ARM CONNECTION DETAIL



DETAIL C
ARM WELD

NOTES:

1. See Sheet 6 for Handhole B details.

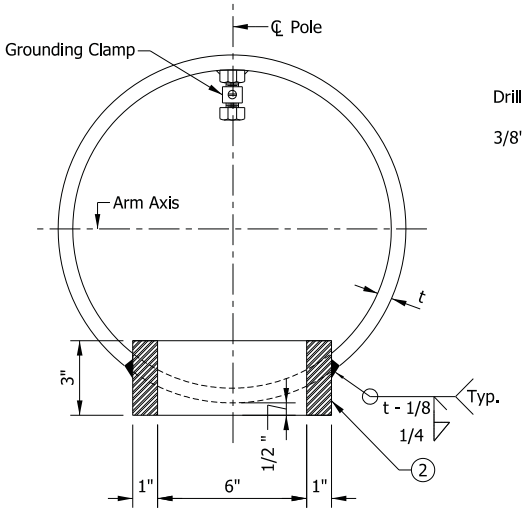
(2) The required signal arm rise shall be built into the gusset plate at the angle X. The angle X is described as arc tan R/L, where R is the arm rise and L is the arm length. Both R and L vary and are listed in the Signal Dual Arm Cantilever Data table on Sheet 3.

TABLE OF PLATES AND BOLTS FOR SIGNAL DUAL ARM CANTILEVER

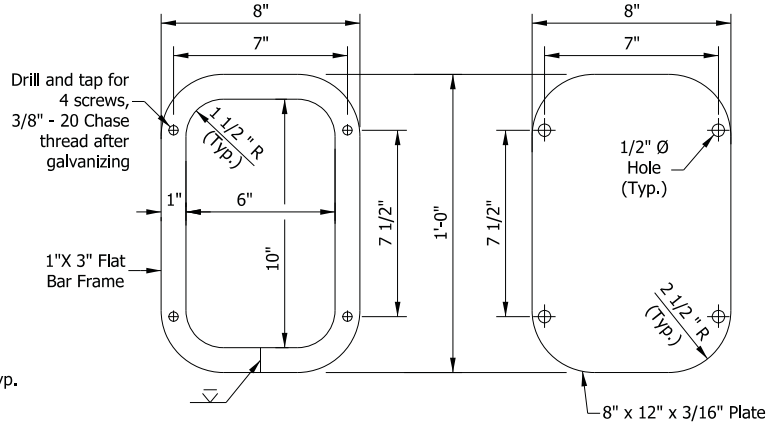
ARM LENGTH (FT)	FLANGE PLATE A X B (IN.)	BOLT PATTERN C X D (IN. X IN.)	RING STIFFENER & GUSSET PLATE THICKNESS W (IN.)	FLANGE PLATE THICKNESS t (IN.)	BOLT DIAMETER (IN.)	BOLT LENGTH (IN.)
15 to 35	22 x 22	17 1/2 x 17 1/2	3/8	1 1/2	1 1/4	5
> 35 to 45	26 x 26	21 1/2 x 21 1/2	1/2	2	1 1/2	6

INDIANA DEPARTMENT OF TRANSPORTATION

SIGNAL DUAL ARM CANTILEVERS
ARM CONNECTION DETAILS



HANDHOLE A
SECTION ACROSS POLE



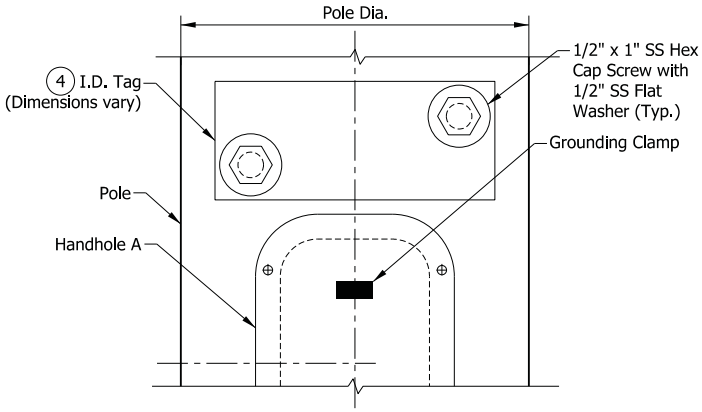
FRAME DETAIL COVER

HANDHOLE A

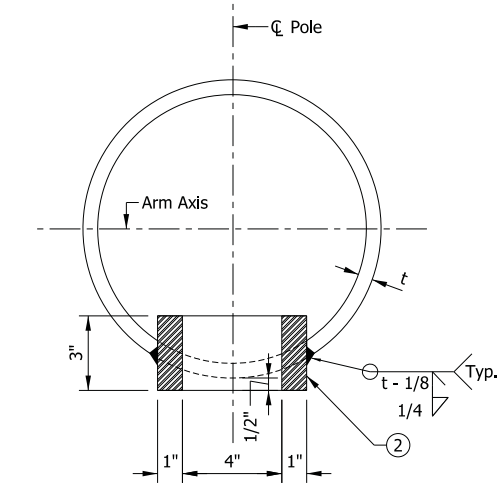
NOTES:

1. Handhole A to be used at the base of the pole. Handhole B to be used at all other locations.
2. In lieu of fabricated handhole frame as shown, frame may be cut from 3" plate (rolling direction vertical).
3. See Sheet 2 for handhole locations.
4. I.D. tag is a 1/8" stainless steel plate with the following information stamped in 1/2" black letters:

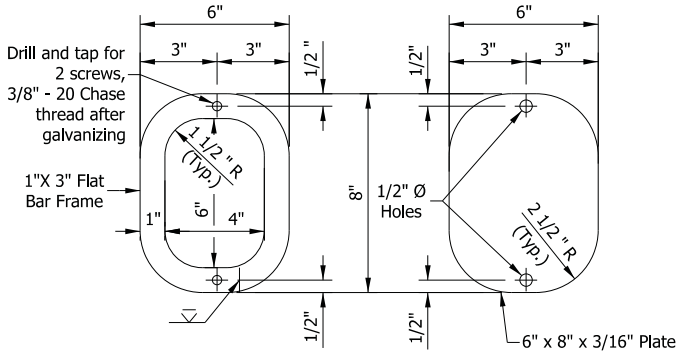
   Manufacturer _____, Drawing/Order #_____
   Contract #_____, Structure Type _____
   Fabrication Date _____, Pole Mounting Height _____



PARTIAL ELEVATION
AT HANDHOLE A



HANDHOLE B
SECTION ACROSS POLE

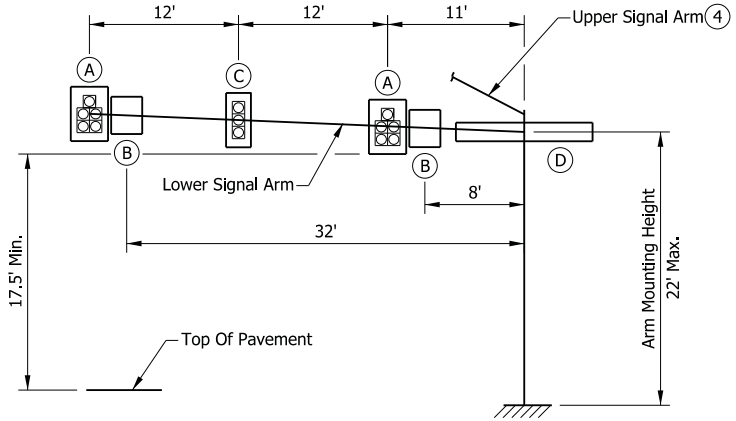


FRAME DETAIL COVER

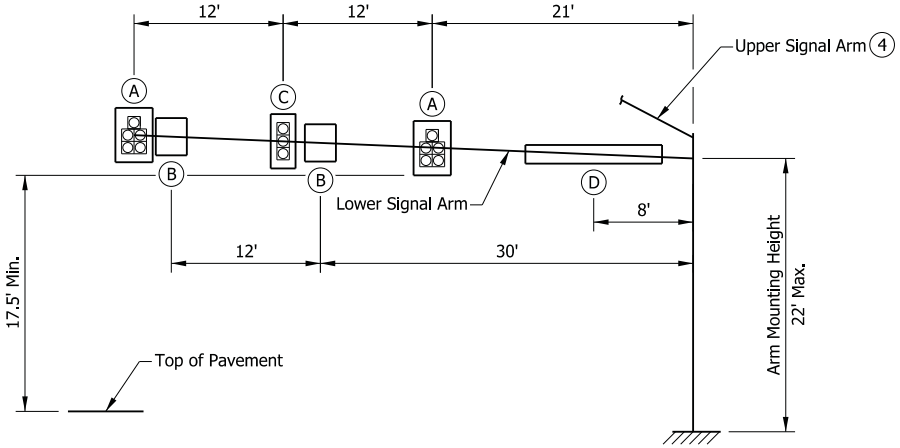
HANDHOLE B

INDIANA DEPARTMENT OF TRANSPORTATION

SIGNAL DUAL ARM CANTILEVERS
HANDHOLE AND I.D. TAG DETAILS



35' ARMS



45' ARMS

NOTES:

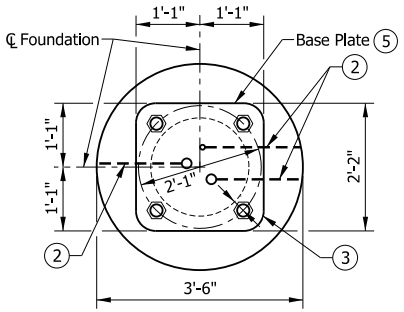
1. The arms and pole are designed for the loading conditions shown. For arm lengths shorter than 35', the loading shall not exceed the loading shown for the 35' arm length.
2. Foundation Type E is designed for arm length of 35' or less. See Sheet 8.
3. Foundation Type F is designed for arm length of greater than 35' to 45'. See Sheet 9.

(4) Both arms can be loaded as shown in loading diagrams.

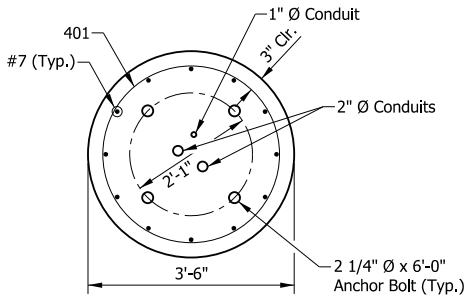
SIGNAL AND SIGN LOADING INFORMATION TABLE			
DEVICE	DESCRIPTION	DEVICE AREA (SQ FT)	WEIGHT (LBS)
(A)	12" - 5 section signal head with backplates	14.5	69
(B)	36" x 30" regulatory sign	7.5	19
(C)	12" - 3 section signal head with backplates	10.1	55
(D)	18" x 11'-0" street name sign	16.5	41

INDIANA DEPARTMENT OF TRANSPORTATION

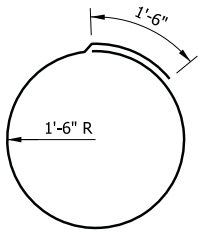
SIGNAL DUAL ARM CANTILEVERS LOADING DIAGRAMS



PLAN



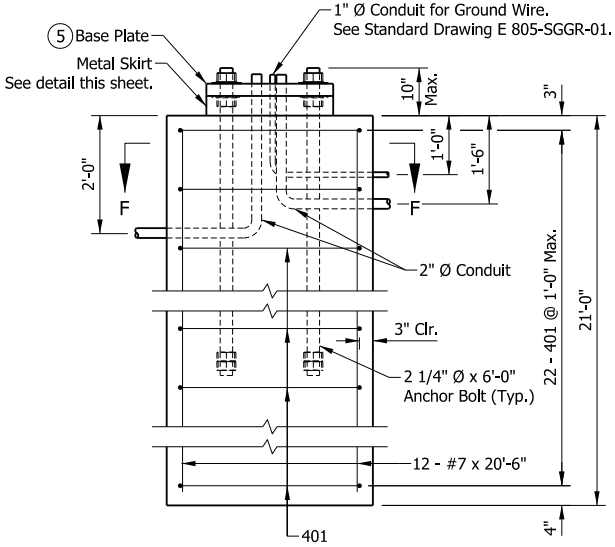
SECTION F-F



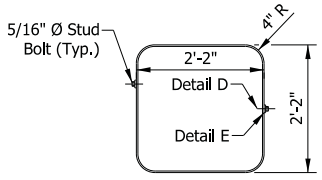
401 X 11'-0"

NOTES:

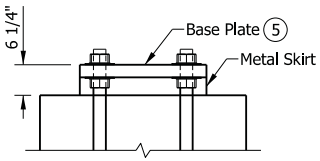
1. The Type E foundations are to be used for 35' dual arm structures and cohesive soil with minimum Q_u = 750 lb/ft or sand with minimum friction angle 30°.
2. A tooled line or other permanent marking shall be provided on the top of the foundation to indicate the direction of the conduits' exit ends.
3. 2 1/2" minimum clearance to weld at pole. Anchor bolt circle shall allow clearance for the anchor bolt washers. Cutting or trimming of the washers will not be allowed.
4. The foundation shall be poured monolithically and shall have no construction joint.
5. See Sheet 4 for base plate details.



DRILLED SHAFT ELEVATION

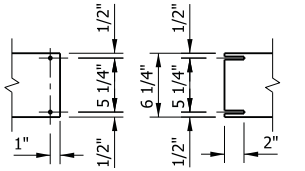


PLAN



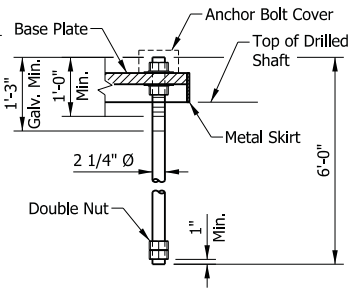
ELEVATION

METAL SKIRT DETAIL



DETAIL D DETAIL E

BILL OF MATERIALS			
REINFORCING BARS			
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
#7	12	20'-6"	
Total #7			503 LBS
401	22	11'-0"	
Total #4			162 LBS
Total Reinforcing Bars			665 LBS
CONCRETE			
Concrete, Class A			7.5 CYS

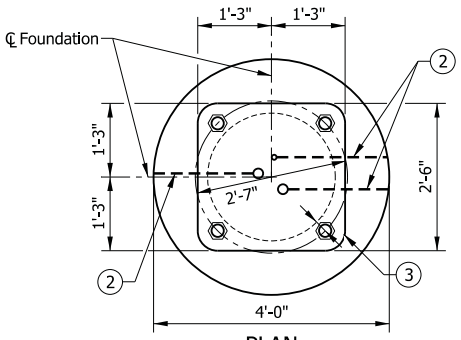


ANCHOR BOLT DETAIL

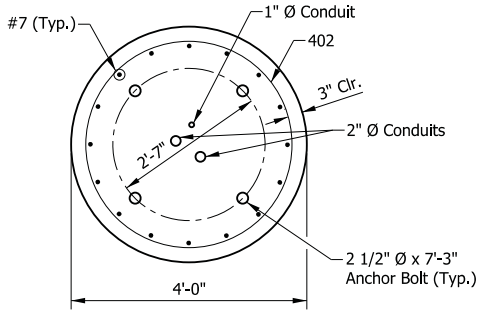
ALTERNATE ANCHOR BOLT HOOK

INDIANA DEPARTMENT OF TRANSPORTATION

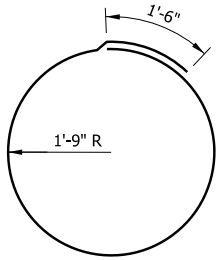
SIGNAL DUAL ARM CANTILEVERS FOUNDATION, DRILLED SHAFT TYPE E FOR DUAL ARMS 35' OR LESS



PLAN



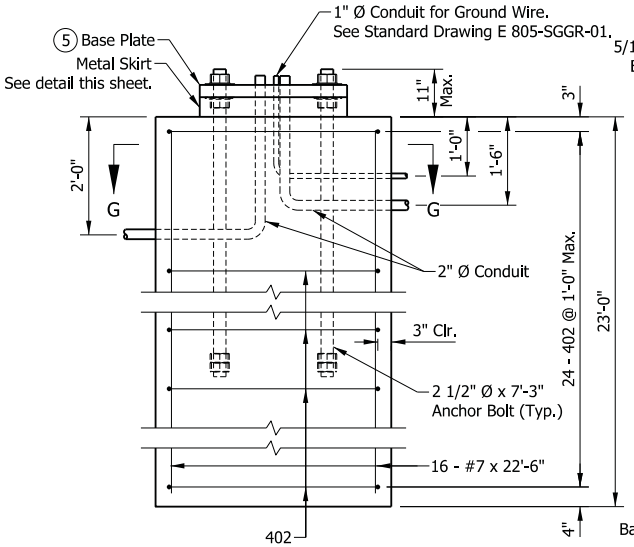
SECTION G-G



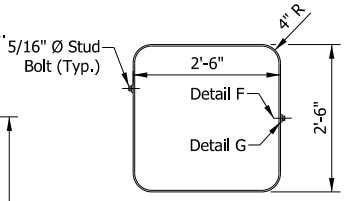
402 X 12'-6"

NOTES:

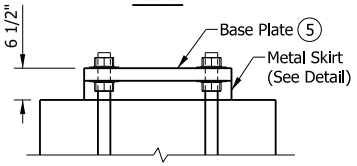
1. The Type E foundations are to be used for 35' dual arm structures and cohesive soil with minimum Q_u = 750 lb/ft or sand with minimum friction angle 30°.
2. A tooled line or other permanent marking shall be provided on the top of the foundation to indicate the direction of the conduits' exit ends.
3. 2 1/2" minimum clearance to weld at pole. Anchor bolt circle shall allow clearance for the anchor bolt washers. Cutting or trimming of the washers will not be allowed.
4. The foundation shall be poured monolithically and shall have no construction joint.
5. See Sheet 4 for base plate details.



DRILLED SHAFT ELEVATION

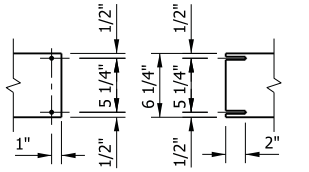


PLAN



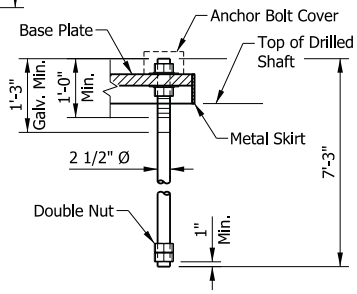
ELEVATION

METAL SKIRT DETAIL



DETAIL F DETAIL G

BILL OF MATERIALS			
REINFORCING BARS			
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
#7	16	22'-6"	
Total #7			736 LBS
402	24	12'-6"	
Total #4			201 LBS
Total Reinforcing Bars			937 LBS
CONCRETE			
Concrete, Class A			10.7 CYS



ANCHOR BOLT DETAIL

ALTERNATE ANCHOR BOLT HOOK

INDIANA DEPARTMENT OF TRANSPORTATION

SIGNAL DUAL ARM CANTILEVERS FOUNDATION, DRILLED SHAFT TYPE F FOR DUAL ARMS GREATER THAN 35' TO 45'