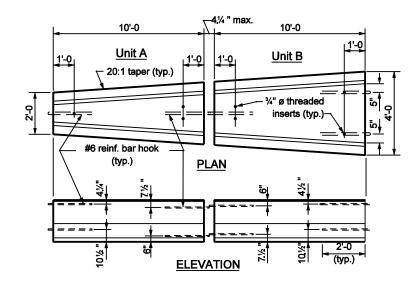
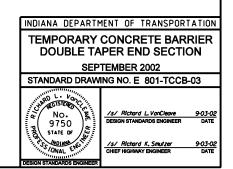


### **DOUBLE TAPER END SECTION**



### NOTES:

- 1. For connection details see Standard Drawing E 801-TCCB-02.
- 2. For details of barrier anchorage see Standard Drawing E 801-TCCB-04.
- Extreme ends of the double taper end assembly require a 1½ " ø bolt x 2'-3½ " (4" min. thread, hex head and hex nut) for connecting to adjacent temporary concrete barriers.
- For details of connection between Units A and B, see Standard Drawing E 801-TCCB-02.



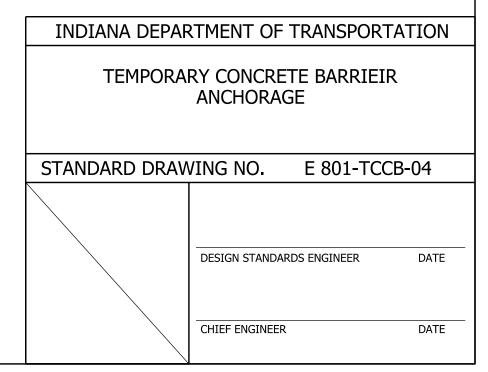
### **DOUBLE TAPER END SECTION ASSEMBLY**

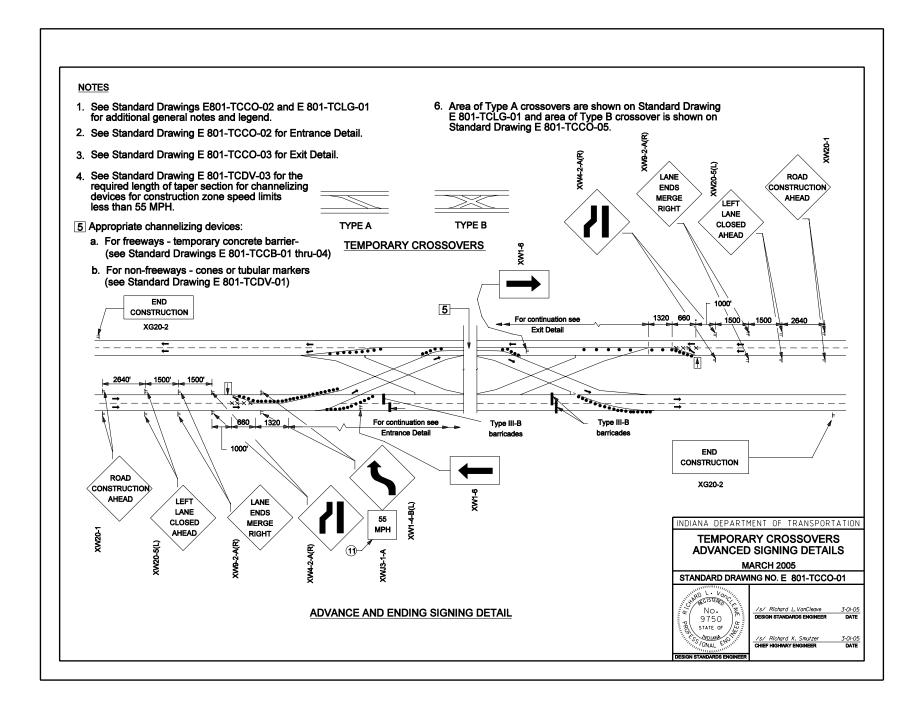
(Showing location of inserts and bar hooks)

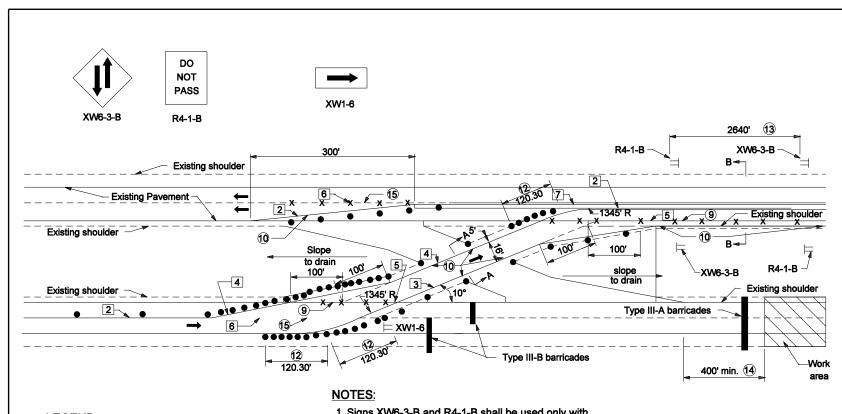
The version of the drawing dated September 2002 has been deleted.

For contracts let on or after May 1, 2015 anchored temporary concrete barrier shall meet the appropriate Test Level 2 or 3 NCHRP 350 or MASH crash test standards and have an FHWA Eligibility Letter for Roadside Saftey Hardware.

This revision affects pay items for Temporary Traffic Barrier Type 1 Anchored, Type 2 Anchored, and Type 3 Anchored.





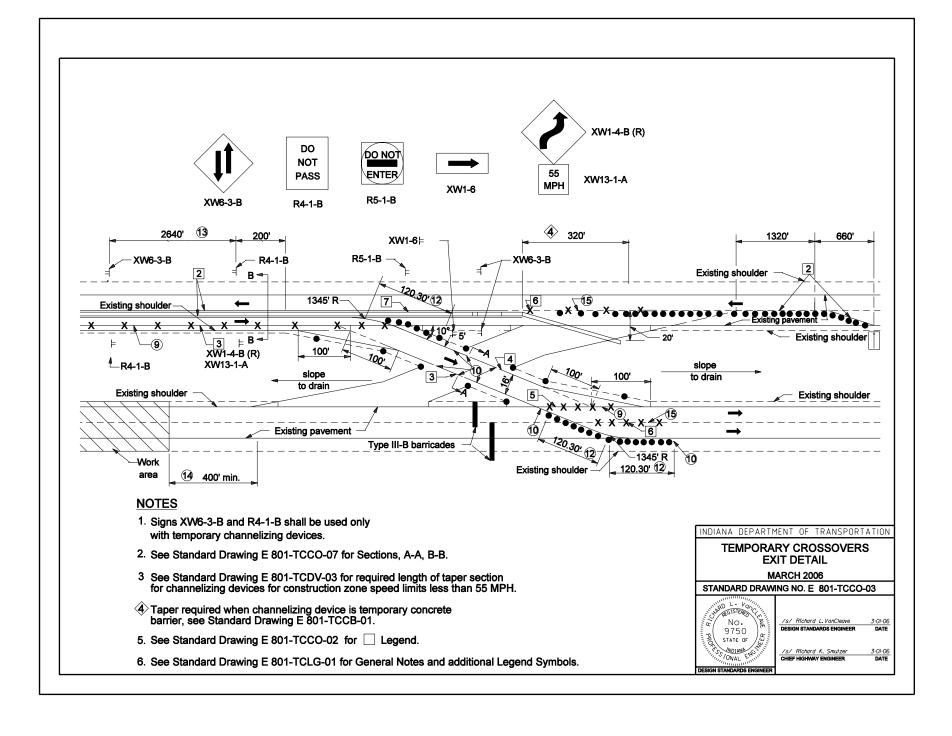


### **LEGEND**

- 1 Temporary Pavement Marking, White, 4"
- Temporary Pavement Marking, Yellow, 4"
- Temporary Pavement Marking, White, 8"
- Temporary Pavement Marking, Yellow, 8"
- 5 Line, Soild Yellow, 4", Remove
- 6 Line, Broken White, 4" Remove
- Temporary Concrete Barrier Freeways Channelizing Devices - Non-Freeway Multi-lane Divided Roadways.

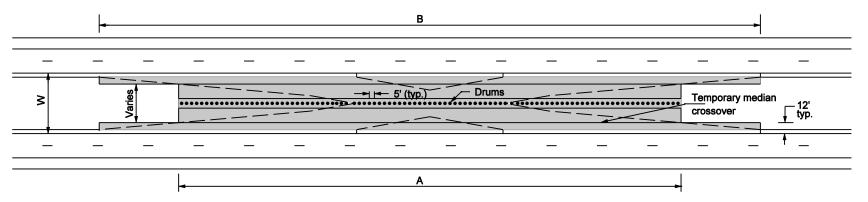
- Signs XW6-3-B and R4-1-B shall be used only with temporary channelizing devices.
- 2. See Standard Drawing E 801-TCCO-07 for Sections, A-A , B-B.
- 3 See Standard Drawings E 801-TCDV-04 thru E 801-TCDV-07 for barricade and construction sign mounting information.
- 4 For channelization devices see Standard Drawing E 801-TCDV-01.
- 5 See Standard Drawing E 801-TCDV-03 for required length of taper section for channelizing devices when construction zone speed limits are less than 55 MPH.
- 6 See Standard Drawing E 801-TCLG-01 for General Notes and additional Legend Symbols



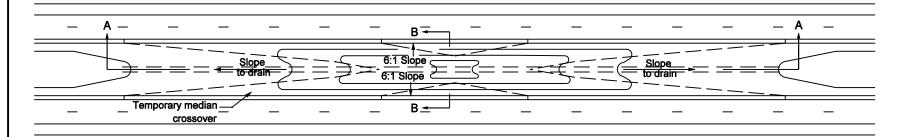


### **NOTES**

- 1. See Standard Drawing E 801-TCCO-06 for Sections A-A and B-B.
- 2. Pave to drain.



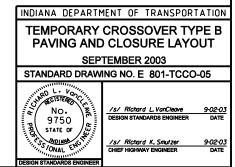
### PAVING LIMITS AND DRUM CLOSURE

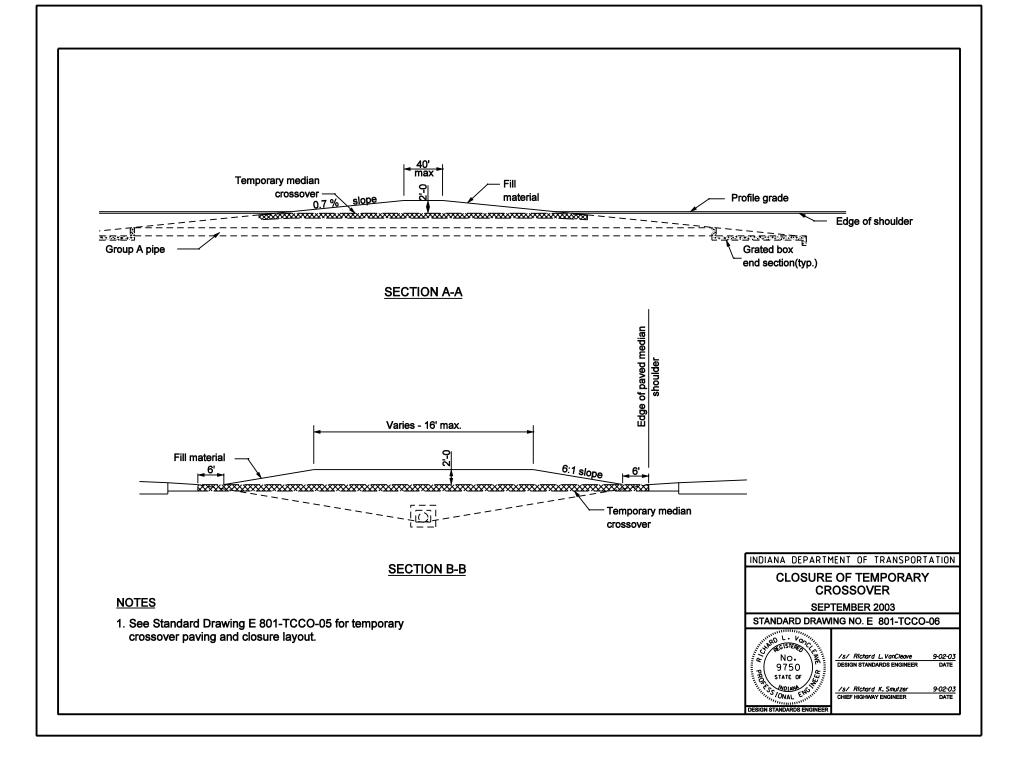


### TYPE B CROSS OVER

Median Width W	Dimension A	Dimension B	Area of Paving strips
Feet	Feet	Feet	SQ. Yards
60	564	833	4310
50	505	774	3380
40	449	719	2605
36	427	696	2326
30	390	659	1930
26	371	640	1750

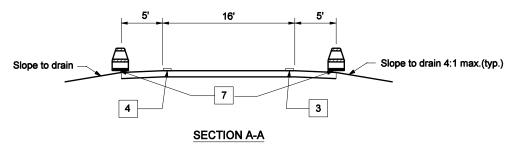
### EARTH COVER CLOSURE

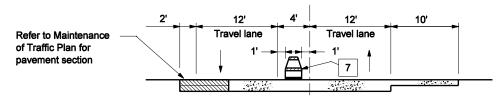




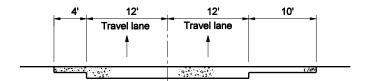
### **GENERAL NOTES:**

1. See Standard Drawing E 801-TCCO-02 for Legend



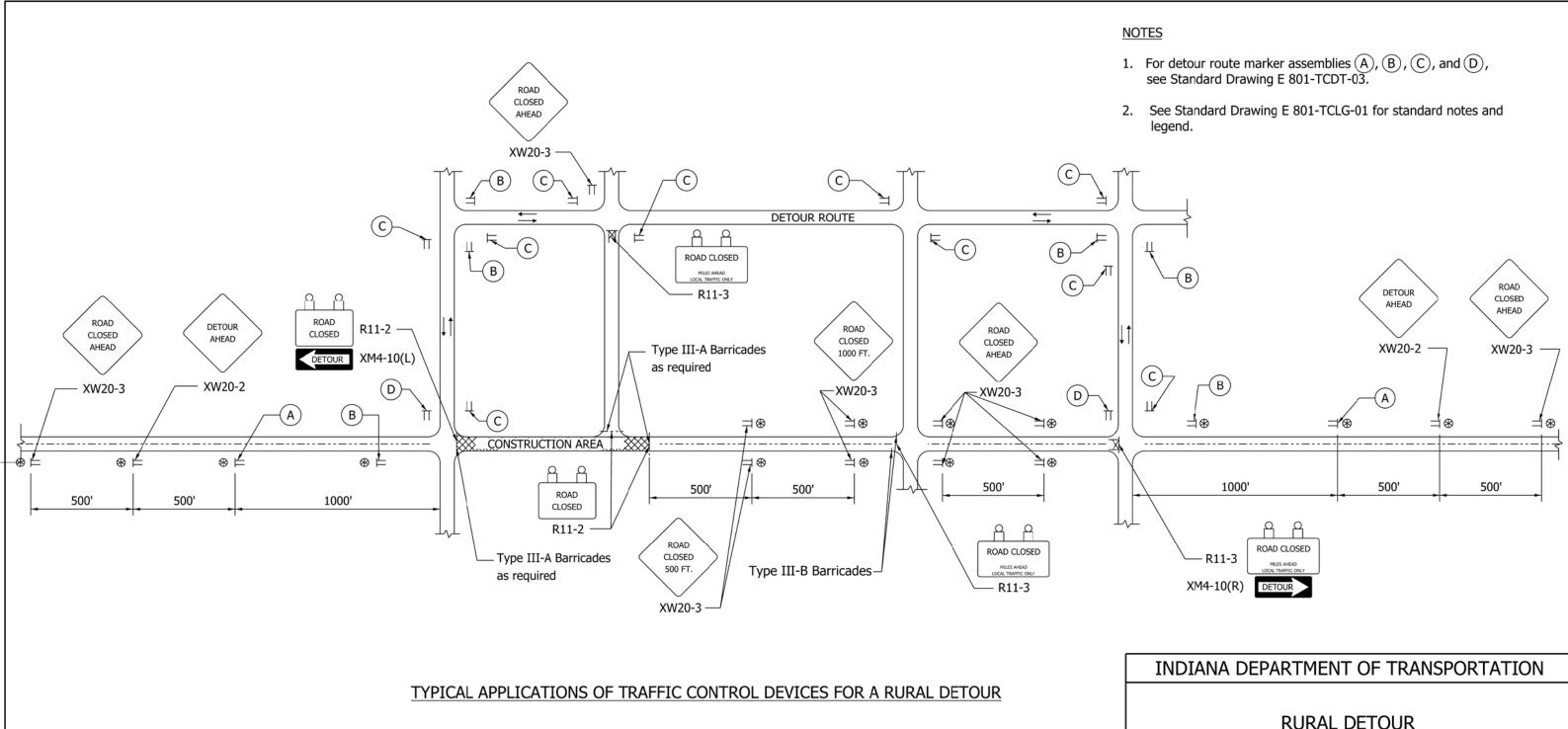


TRAFFIC MAINTENANCE SECTION SECTION B-B



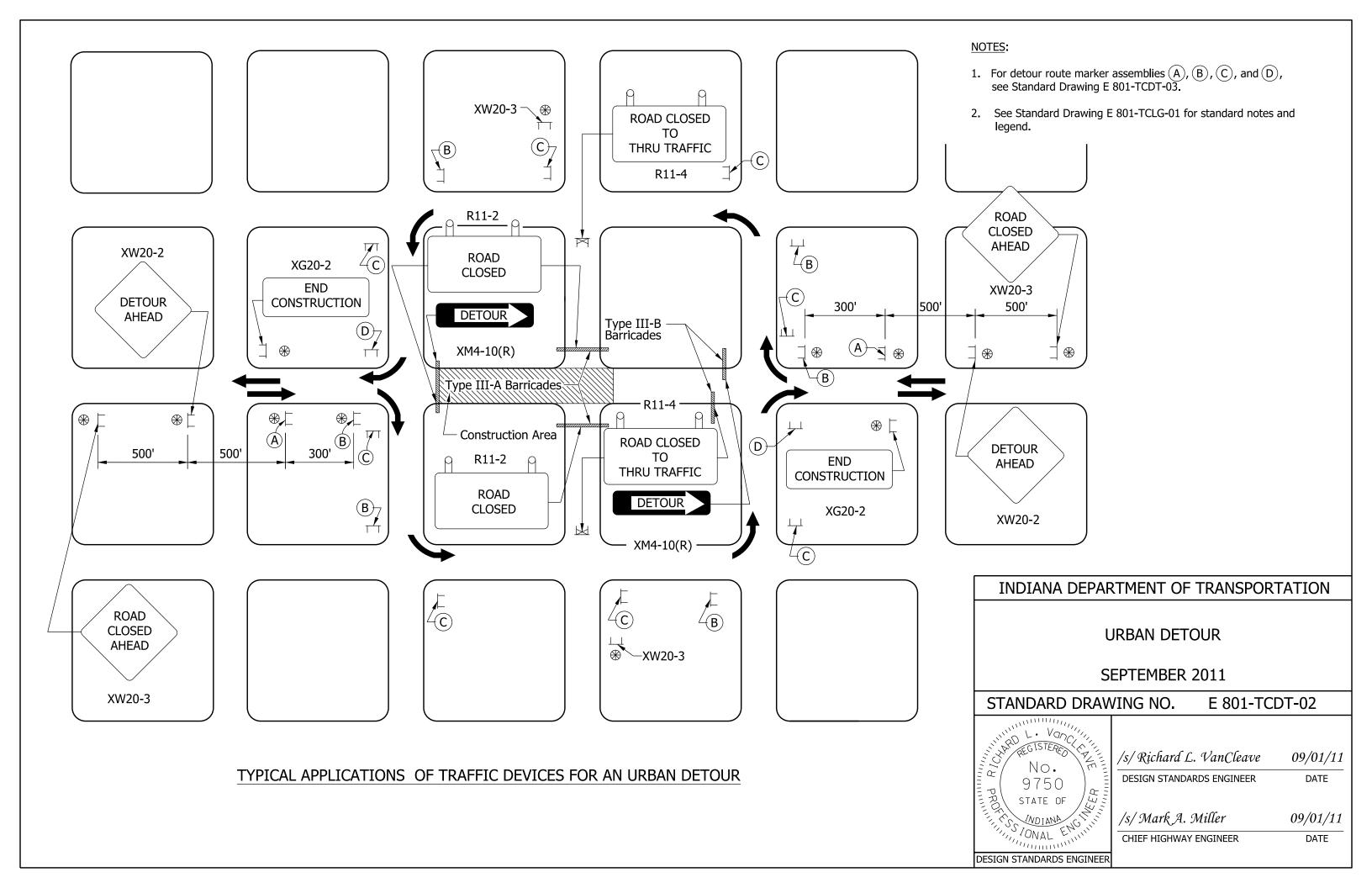
PRE CONSTRUCTION SECTION





### **RURAL DETOUR** SEPTEMBER 2011 STANDARD DRAWING NO. E 801-TCDT-01 NO. 09/01/11 /s/Richard L. VanCleave DESIGN STANDARDS ENGINEER DATE 9750 STATE OF C'S MOIANA COLOR 09/01/11 /s/ Mark A. Miller CHIEF HIGHWAY ENGINEER DATE

DESIGN STANDARDS ENGINEER





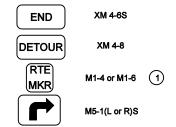
**ADVANCE TURN DETOUR ROUTE MARKER ASSEMBLY** 



DIRECTIONAL DETOUR ROUTE MARKER ASSEMBLY



CONFIRMING DETOUR ROUTE MARKER ASSEMBLY



**END DETOUR ROUTE** MARKER ASSEMBLY

### **GENERAL NOTES**

- 1) For an un-numbered route, a street name sign or county road name or number sign shall be used in lieu of the route marker in detour route marker assembly.
- A Advance turn detour route marker assemblies shall be located as shown, or after the last cross street prior to the beginning of the detour, as directed.
- (B) Directional detour route marker assemblies shall be located 100 ft to 200 ft in advance of all required turns within the detour limits.
- (C) Confirming detour route marker assemblies shall be located 200 ft past all major intersections, as directed, and shall be spaced a maximum of 3 mi on a rural detour or 0.5 mi on an urban detour on each leg of such detours. Confirming detour route marker assemblies shall be placed after a required turn when directed.
- (D) End detour route marker assemblies shall be located at the point at which traffic is returned to the original route. The advance turn marker (M5-1) shall be included in the assembly when traffic is required to turn to access the original route.

INDIANA DEPARTMENT OF TRANSPORTATION

### **DETOUR ROUTE** MARKER ASSEMBLIES

**MARCH 2003** 

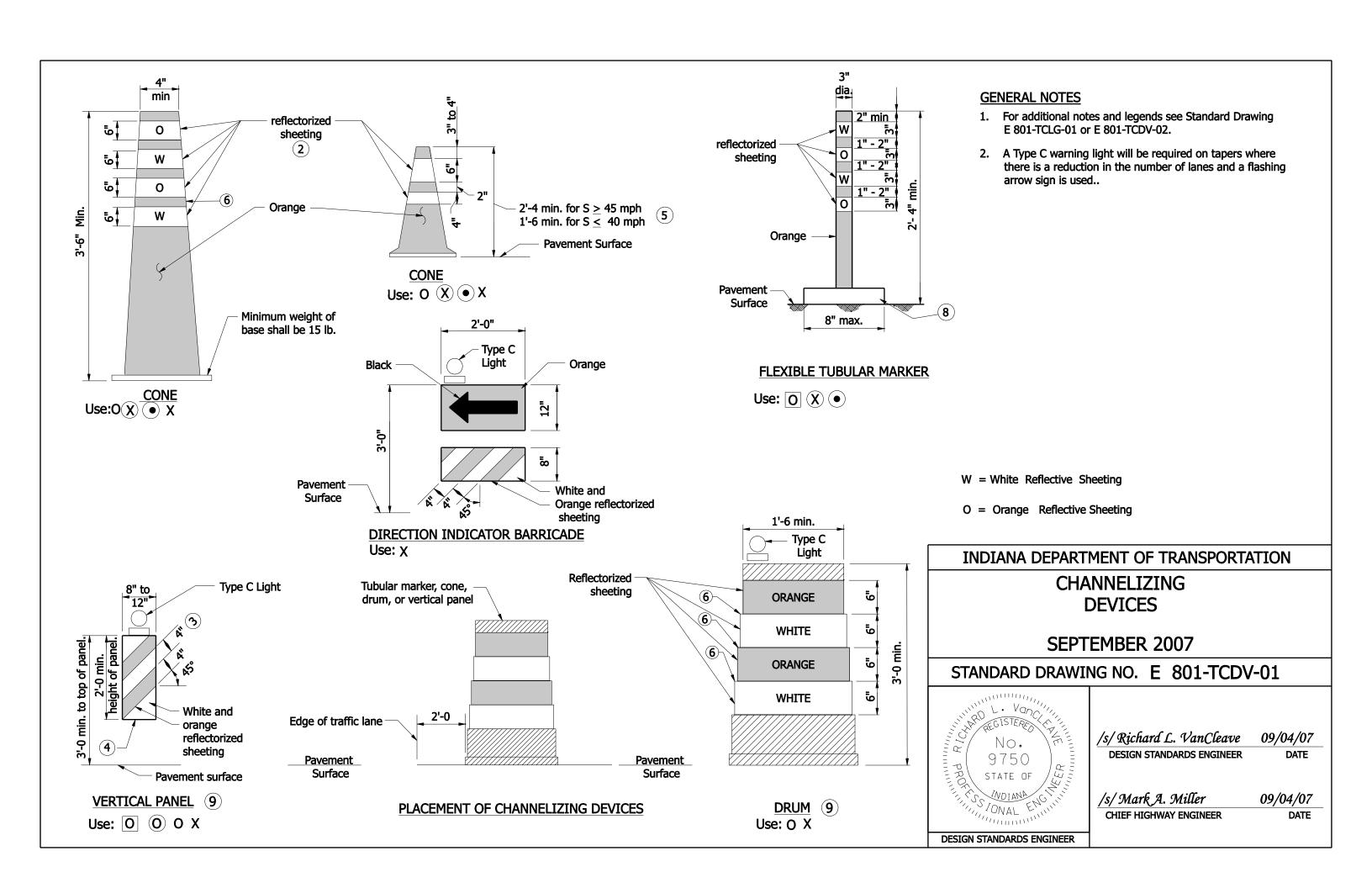
STANDARD DRAWING NO. E 801-TCDT-03



/s/ Richard L. VanCleave 3-03-03 DESIGN STANDARDS ENGINEER DATE 3-<u>03-03</u> /s/ Richard K.Smutzer

DATE

CHIEF HIGHWAY ENGINEER



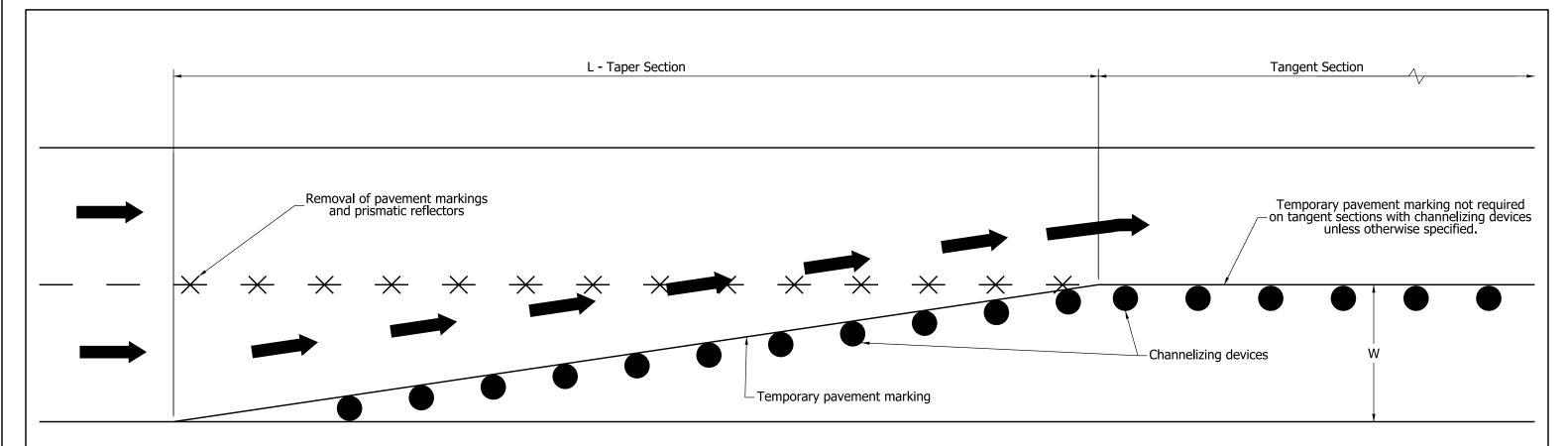
### **GENERAL NOTES**

- 1. Unless otherwise specified, channelizing devices shall be spaced as shown on Standard Drawing E 801-TCLG-01.
- (2) Reflectorized bands may be omitted from cones for lane closures during daylight hours.
- 3 For vertical panels greater than 3 ft in height, the width of the stripes shall be 6 in.
- 4 Vertical panels used on an expressway or a freeway shall have a minimum reflective panel area of 270 in<sup>2</sup>. Other roadways with a posted speed limit of 50 mph or greater shall also have a minimum reflective panel area of 270 in<sup>2</sup>.
- (5) Cones shall have a minimum height of 2'-4" when used at night.
- 6 The maximum distance between the edges of adjacent reflective sheeting strips shall be 2 in.
- 7. Panel and direction indicator barricades and supports shall meet NCHRP 350 crash evaluation criteria.
- (8) Minimum flexible tubular marker base area shall be 0.3 ft.<sup>2</sup>
- (9) It is not necessary to delineate a drop-off of 3 in. or less adjacent to active travel lanes. Where channellizing devices are used to delineate drop-offs of 3 in. or less adjacent to active travel lanes, at least 33 in. of the device shall be above the adjoining pavement surface. Where channelizing devices are used to delineate a drop-off greater than 3 in. adjacent to active travel lanes, at least 27 in. of the device shall be above the adjoining pavement surface. In no case shall more than 9 in. of the device be below the adjoining pavement surface.
- 10. The proper orientation in respect to approaching vehicular traffic shall be maintained on vertical panels. Drums are the preferred channelizing device in a tight radius curve.

### **LEGEND**

- O Device may be used in tangent set-ups.
- X Device may be used in taper or transition set-ups.
- X Devices may be used in two-way traffic set-ups to divide opposing lanes of traffic.
- Device may be used to divide two or more lanes of traffic in the same direction.
- O Device may be used to replace barricades and drums where space is limited.
- O Device may be used to delineate edge of pavement drop-off where space is limited.

# CHANNELIZING DEVICES SEPTEMBER 2009 STANDARD DRAWING NO. E 801-TCDV-02 /s/Richard L. VanCleave 09/01/09 DESIGN STANDARDS ENGINEER DATE /s/Mark A. Miller 09/01/09 CHIEF HIGHWAY ENGINEER DATE



S	L			
MPH	W = 9	W = 10	W = 11	W = 12
20	60	70	70	80
25	90	100	120	130
30	140	150	170	180
35 & 40	180 & 240	200 & 270	220 & 300	250 & 320
45	400	450	500	540
50	450	500	550	600
55	500	550	610	660
65	590	650	720	780

The values of L for speeds of 45 mph or greater are based on the equation  $L = W \times S$ . The values for speeds of less than 40 mph or lower are based on the equation  $L = W \times S^2/60$ . For both equations, L and W are in feet and S is mph. These equations are taken from the MUTCD. The taper lengths used in the field, may be either the values provided in the table or calculated values from the equations. For offset widths other than those used in the table, the taper lengths shall be calculated based on the equations.

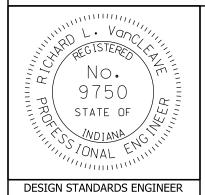
### **LEGEND**

- L Minimum length of taper in feet.
- S Posted speed limit prior to the construction zone in mph.
- W Width of offset in feet.

### INDIANA DEPARTMENT OF TRANSPORTATION

# MERGING OR SHIFTING TAPER SEPTEMBER 2009

STANDARD DRAWING NO. E 801-TCDV-03

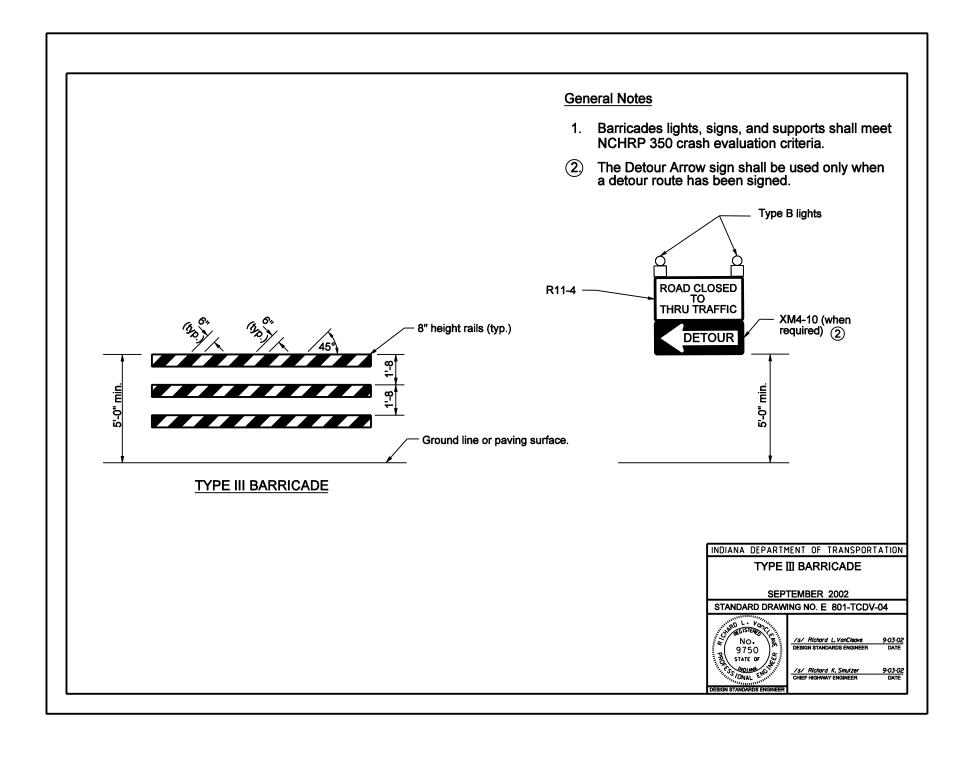


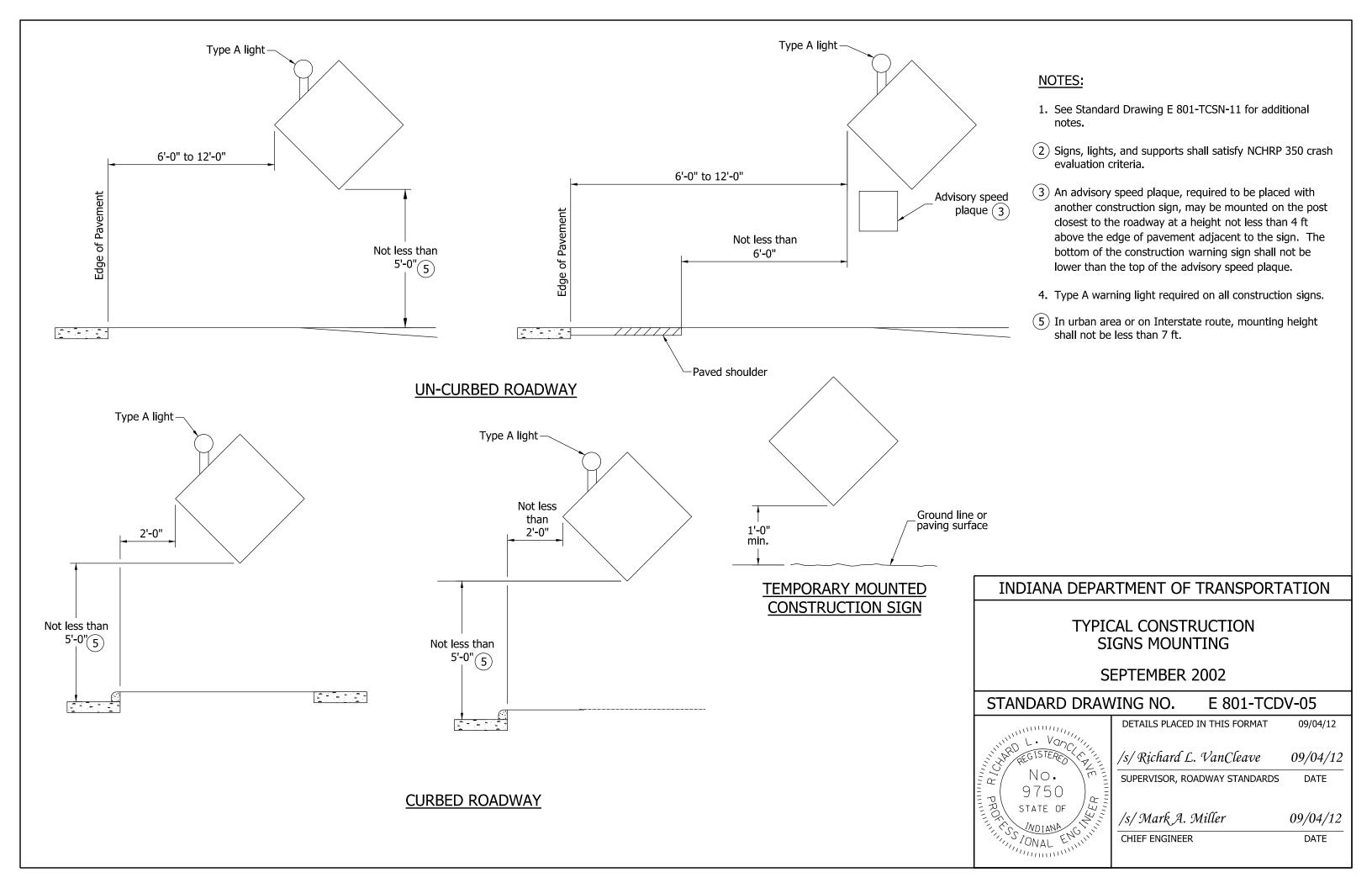
 $\frac{/s/\textit{Richard L. VanCleave}}{\textit{DESIGN STANDARDS ENGINEER}} \frac{09/01/09}{\textit{DATE}}$ 

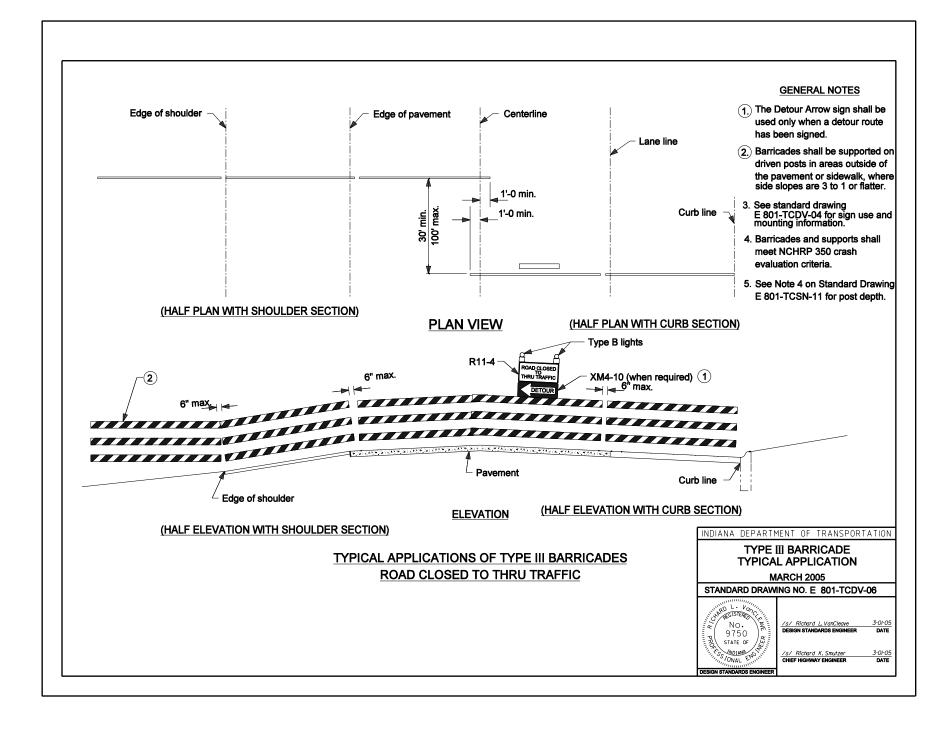
/s/ Mark A. Miller
CHIEF HIGHWAY ENGINEER

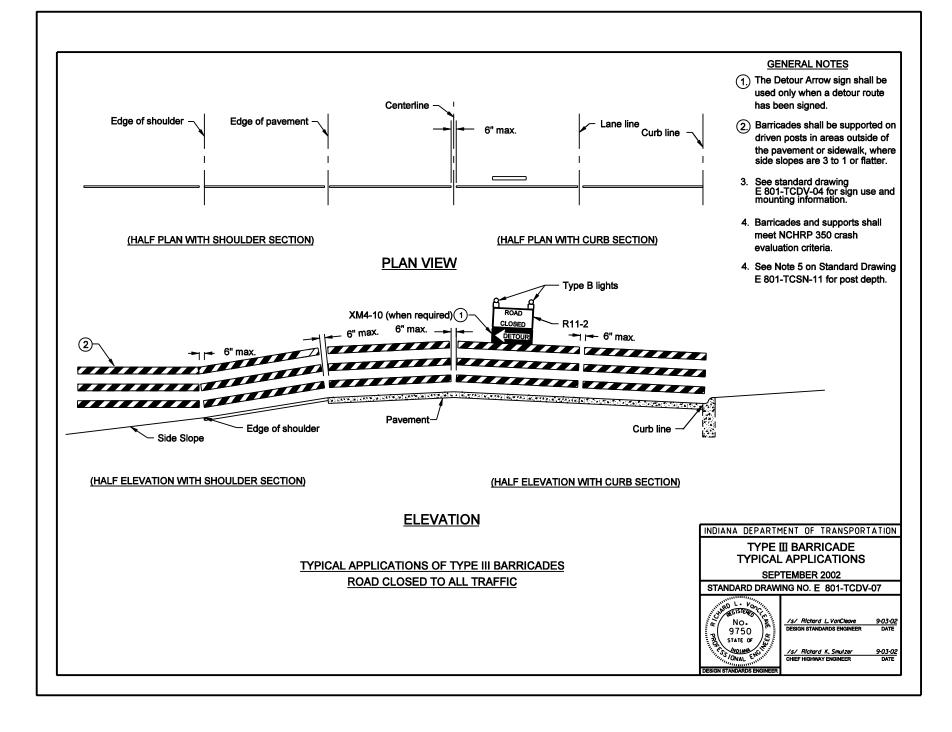
HIGHWAY ENGINEER DATE

09/01/09



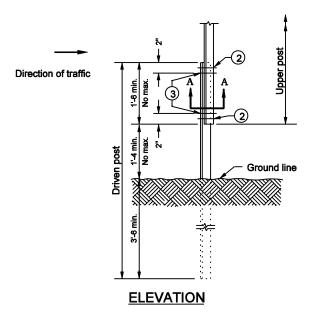






# Upper post Spacer required for all bolts. Direction of traffic Spacer thickness 1

### **SECTION "A-A"**

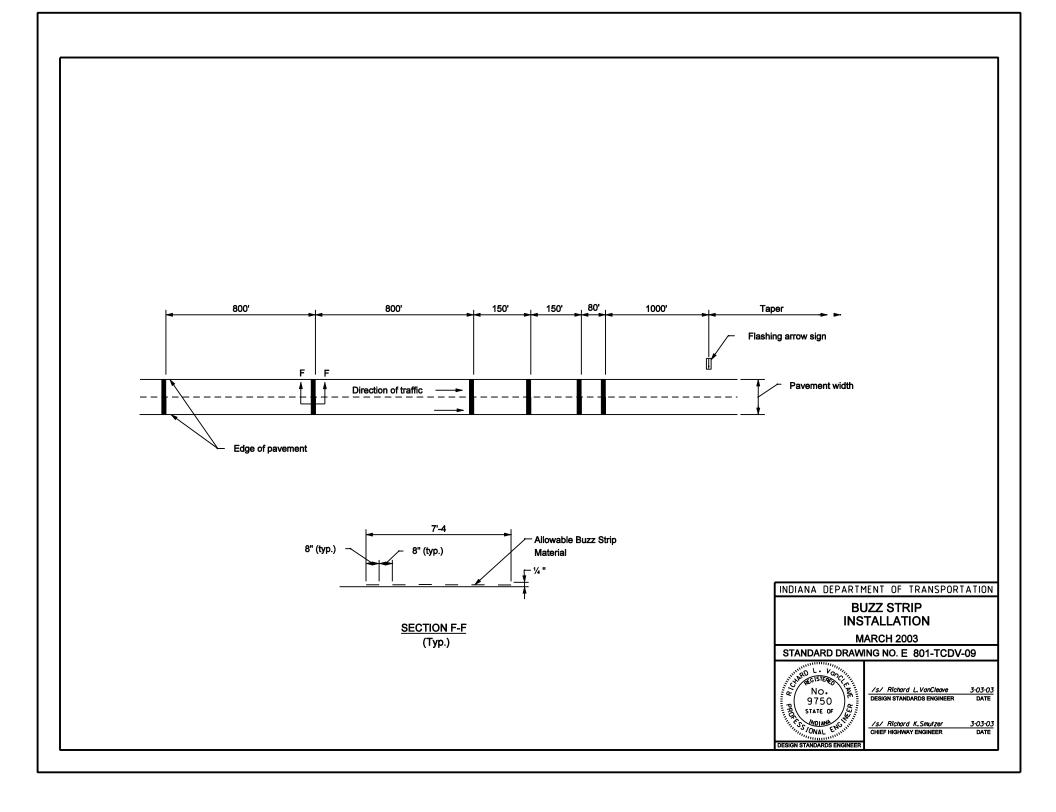


**U CHANNEL STEEL POST SPLICE** 

### **GENERAL NOTES**

- 1 The spacer thickness shall be 1/16 in.. less than the gap between the posts when positioned in the unbolted configuration.
- The exterior bolt, spacer, washer, and nut shall be installed in a prepunched hole within the first 2 in. of the end of the lapped post section.
- 3 The interior bolt, spacer, washer, and nut shall be installed in a prepunched hole within the first 2 in. of the exterior bolts. The maximum spacing between the interior bolts shall be 1'-6. If the length of the post lap is increased such that this 1'-6 maximum is exceeded, then additional interior bolts shall be installed such that the maximum space between adjacent interior bolts does not exceed the 1'-6 limit.
- The driven post shall always be mounted in front of the upper post with respect to adjacent oncoming traffic, regardless of the direction the sign is facing,
- 5. The bolts shown shall be \%" x 2".





# XG20-5-B-Amber strobe WORKSITE light XW3-5-B-**SPEED** LIMIT S4-4-**WHEN FLASHING** (2) ۵.



## XG20-5-B-Amber strobe WORKSITE light SPEED R2-1-B-LIMIT S4-4-WHEN **FLASHING** (2) $\bigcirc$

WORKSITE SPEED LIMIT SIGN ASSEMBLY

### NOTES:

- 1. If not trailer mounted, signs and supports shall satisfy NCHRP 350 crash evaluation criteria.
- (2) See Standard Drawing 801-TCDV-05 for lateral and vertical placement.
- 3. Advance warning sign speed limit shall match that on worksite speed limit sign.
- 4. The worksite speed limit shall be at least 10 mph below the posted speed limit for the roadway under construction.
- 5. Sign series shown is for freeway or expressway application.

### INDIANA DEPARTMENT OF TRANSPORTATION

WORKSITE SPEED LIMIT SIGN ASSEMBLY FOR INTERMITTENT USE (When Workers Present) SEPTEMBER 2012

STANDARD DRAWING NO. E 801-TCDV-10

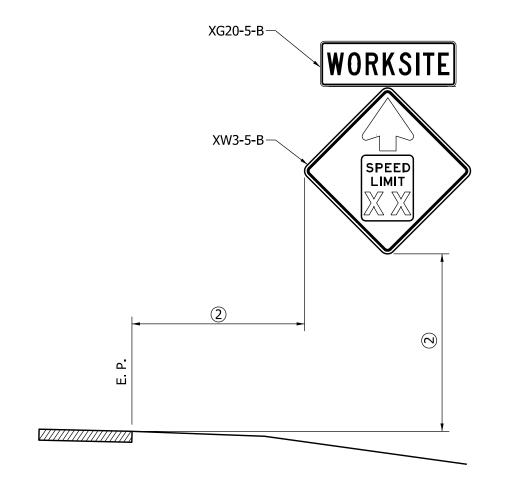


/s/Richard L. VanCleave

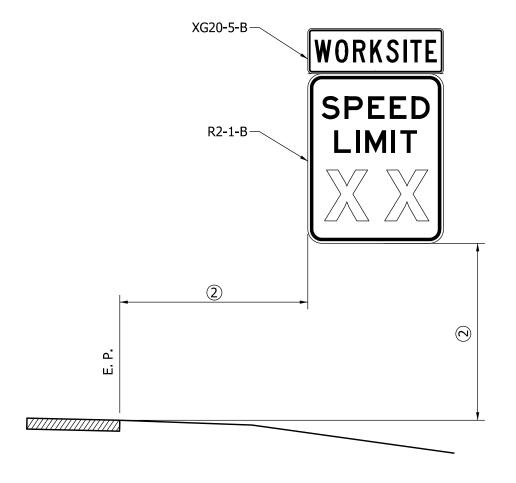
09/04/12 SUPERVISOR, ROADWAY STANDARDS DATE

/s/ Mark A. Miller 09/04/12

CHIEF ENGINEER DATE



REDUCED SPEED ADVANCE WARNING SIGN ASSEMBLY



**WORKSITE SPEED LIMIT** SIGN ASSEMBLY

### NOTES:

- 1. If not trailer mounted, signs and supports shall satisfy NCHRP 350 crash evaluation criteria.
- (2) See Standard Drawing 801-TCDV-05 for lateral and vertical placement.
- 3. Advance warning sign speed limit shall match that on worksite speed
- 4. The worksite speed limit shall be at least 10 mph below the posted speed limit for the roadway under construction.
- 5. Sign series shown is for freeway or expressway application.

### INDIANA DEPARTMENT OF TRANSPORTATION

WORKSITE SPEED LIMIT SIGN ASSEMBLY (For Continuous Use) SEPTEMBER 2012

STANDARD DRAWING NO. E 801-TCDV-11



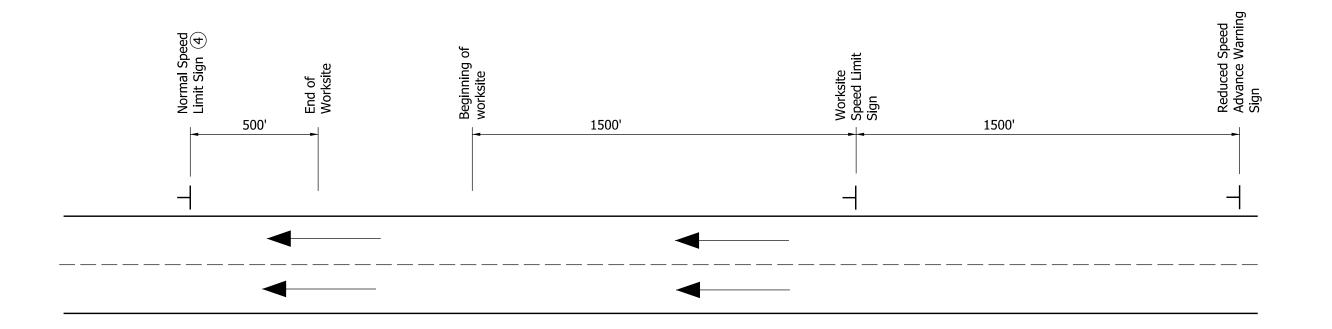
/s/ Richard L. VanCleave

09/04/12 DATE

SUPERVISOR, ROADWAY STANDARDS

/s/ Mark A. Miller 09/04/12

CHIEF ENGINEER DATE



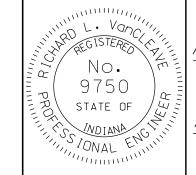
### NOTES:

- 1. Worksite speed limit sign assemblies shall be placed on both sides of the roadway only where all travel lanes approaching the construction site are open to traffic traveling in the same direction.
- 2. Worksite speed limit sign assemblies shall be placed 500 ft beyond each crossroad or the last entrance ramp for each interchange, at 2-mile intervals throughout the worksite, or adjacent to the existing normal speed limit signs.
- 3. See Standard Drawings E 801-TCDV-10 and -11 for additional notes on assembly requirements.
- 4 For a rural Interstate route application, a truck speed limit sign shall be used and placed immediately to the right of the normal speed limit sign.

### INDIANA DEPARTMENT OF TRANSPORTATION

WORKSITE SPEED LIMIT SIGN ASSEMBLY LONGITUDINAL PLACEMENT SEPTEMBER 2012

STANDARD DRAWING NO. E 801-TCDV-12



/s/Richard L. VanCleave

ive 09/04/12

SUPERVISOR, ROADWAY STANDARDS

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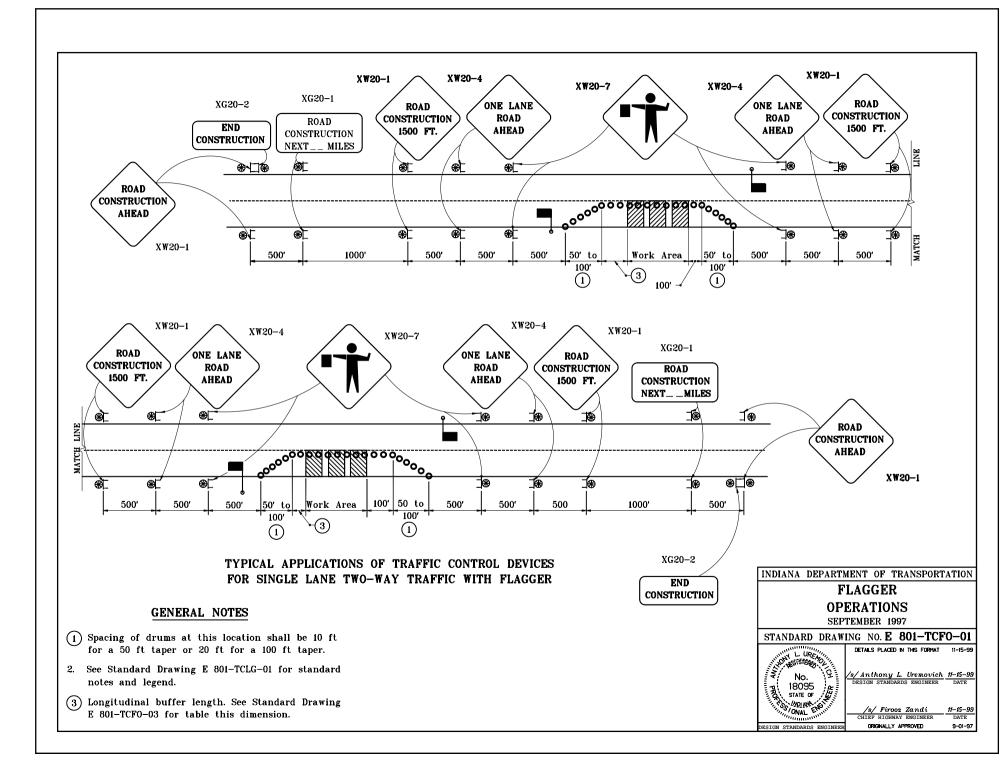
/s/ Mark A. Miller

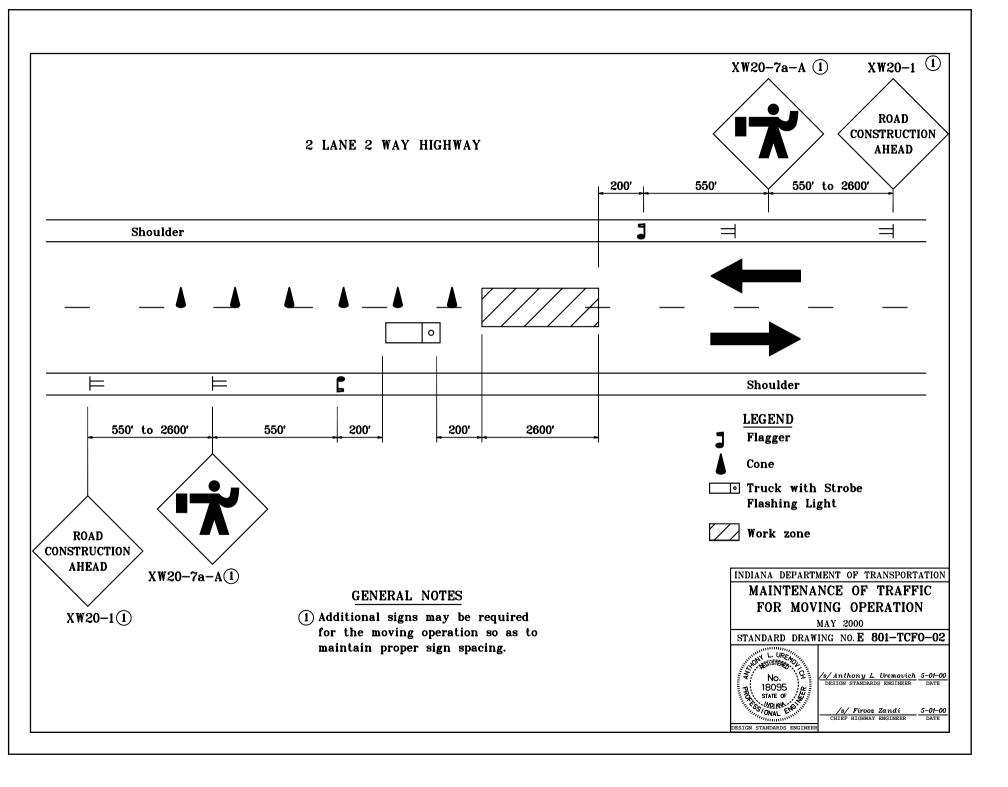
CHIEF ENGINEER

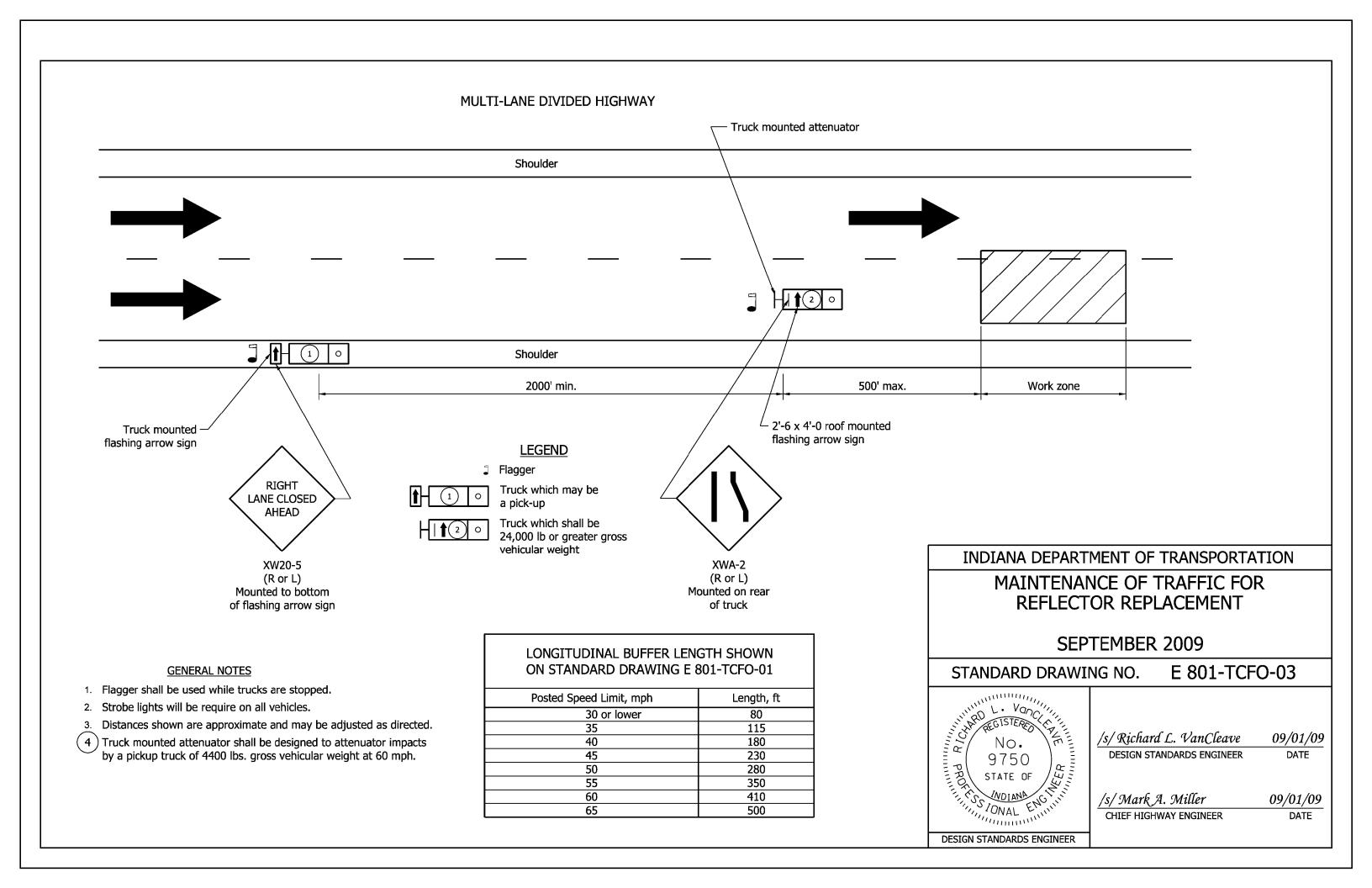
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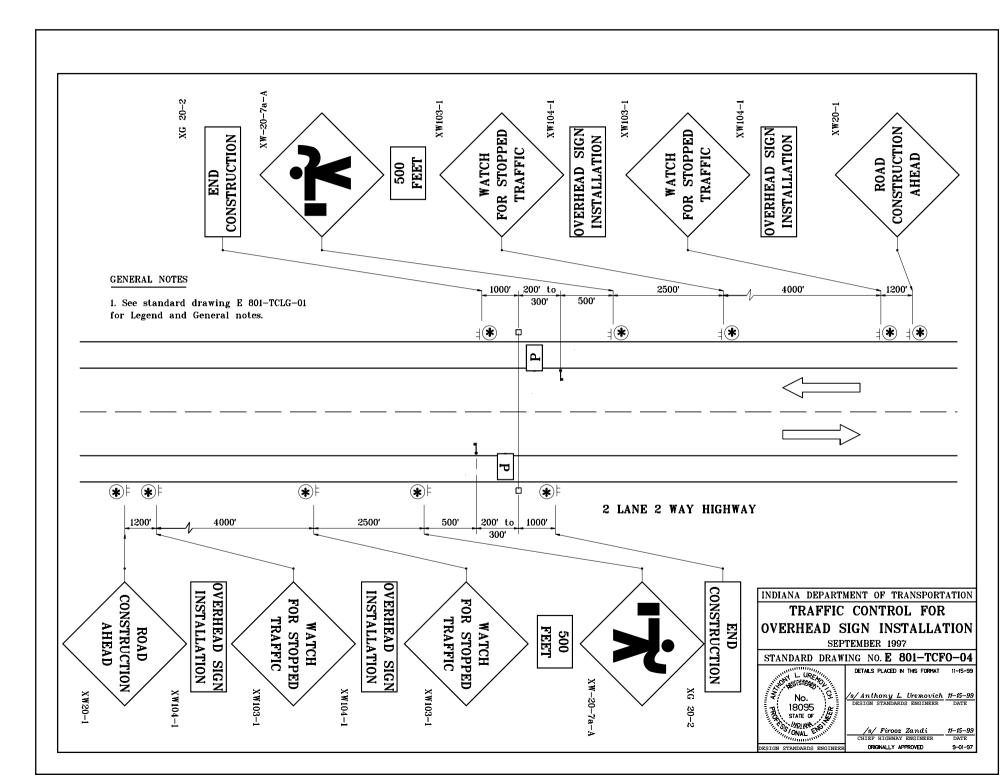
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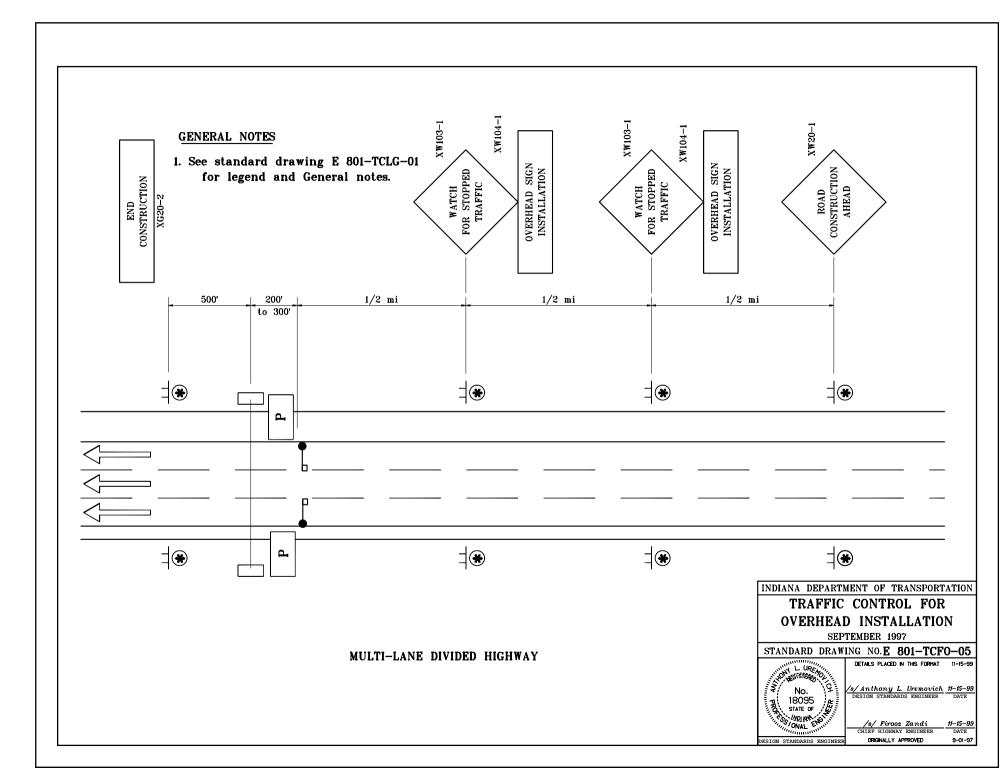
09/04/12

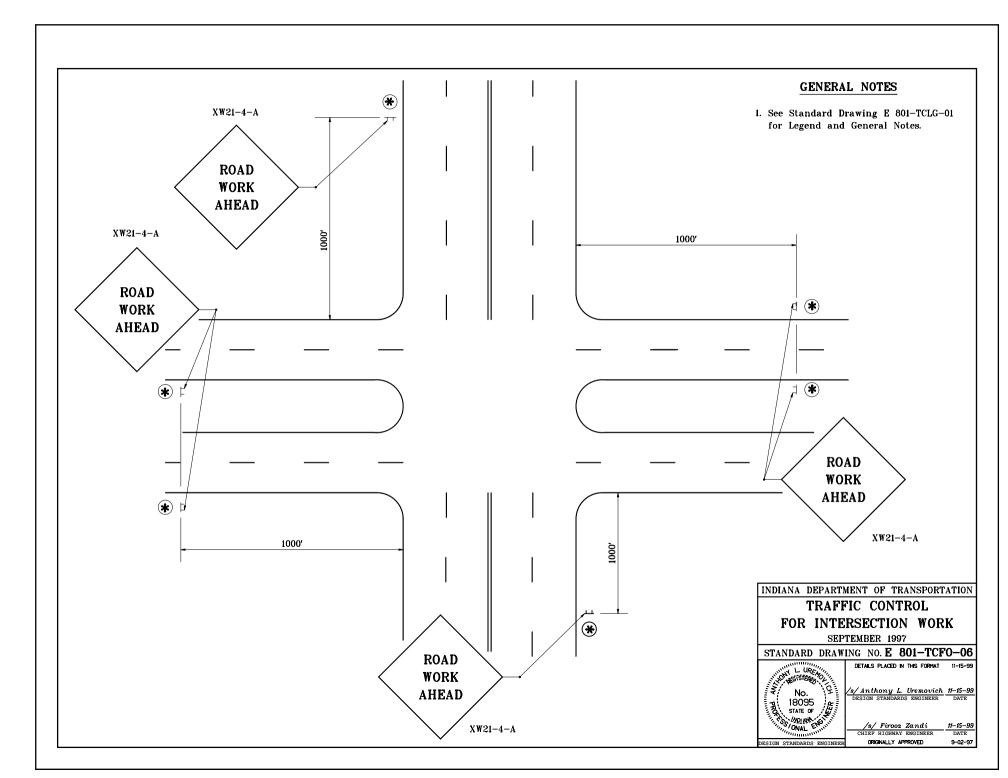


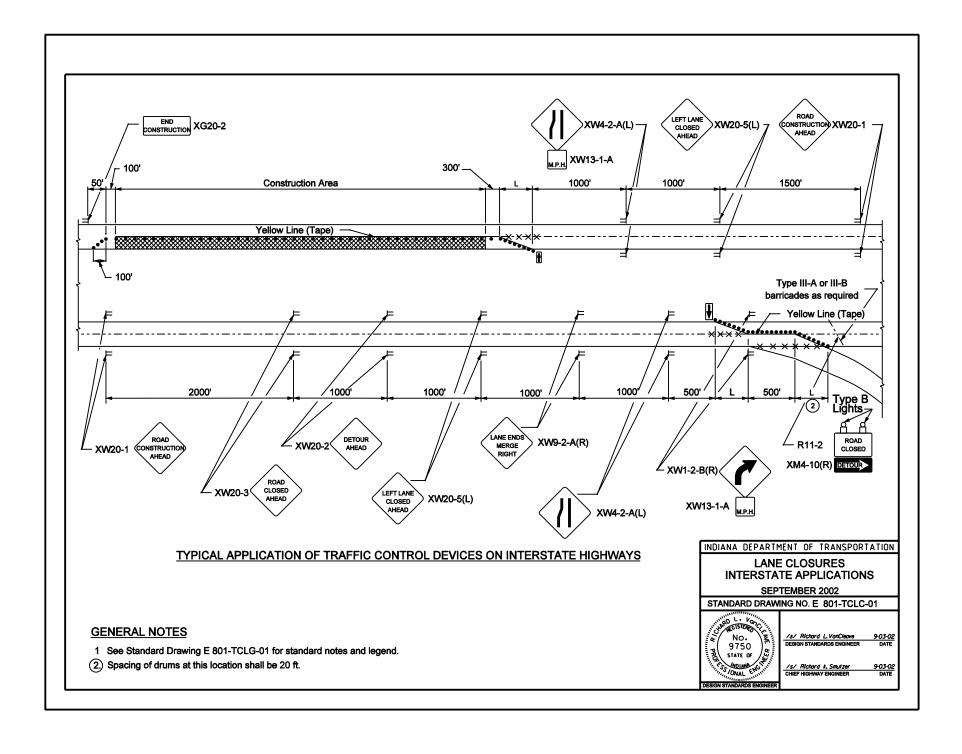


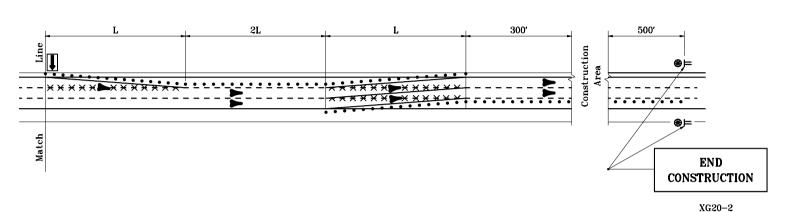




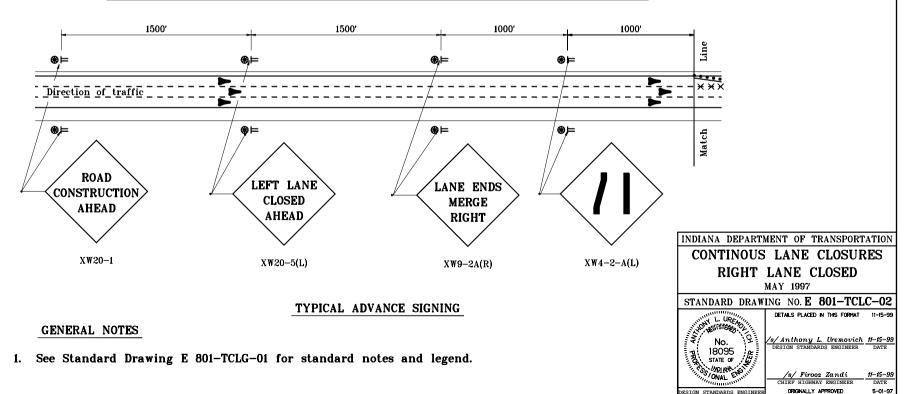




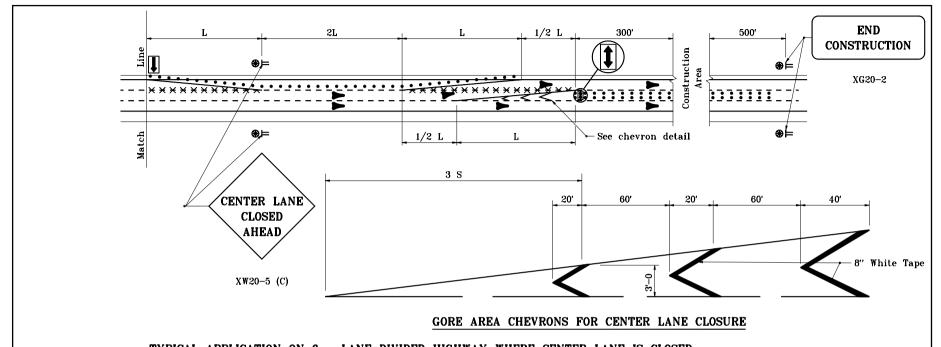




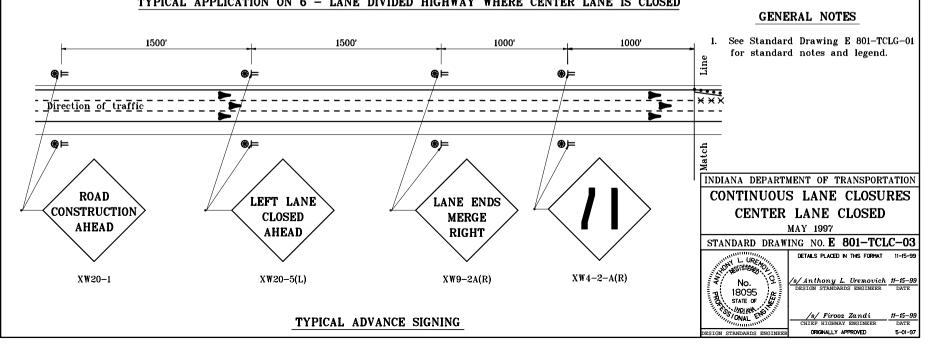
### TYPICAL APPLICATION ON 6 - LANE DIVIDED HIGHWAY WHERE RIGHT LANE IS CLOSED

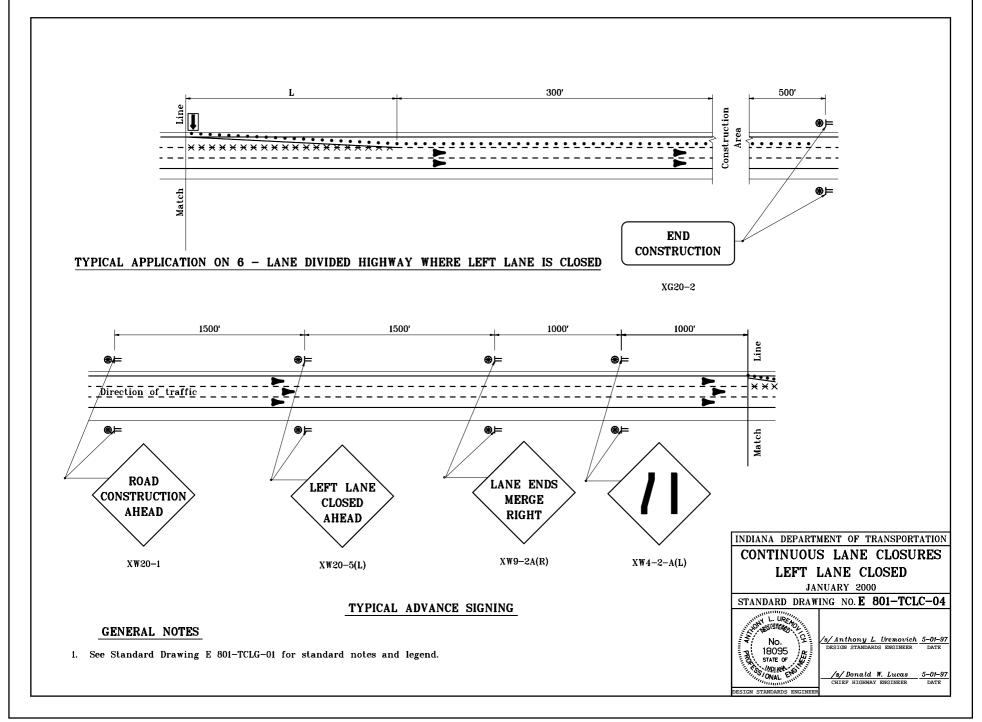


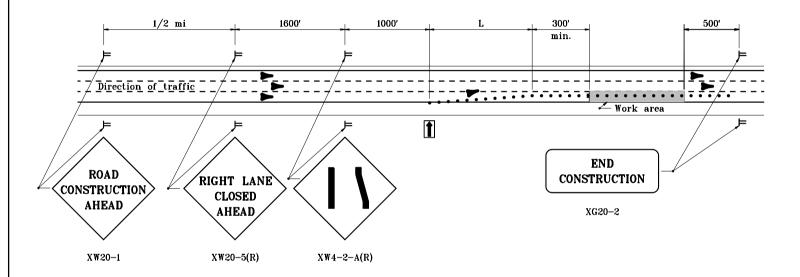
ESIGN STANDARDS ENGINEER



### TYPICAL APPLICATION ON 6 - LANE DIVIDED HIGHWAY WHERE CENTER LANE IS CLOSED







### TYPICAL APPLICATION ON 6 - LANE DIVIDED HIGHWAY WHERE RIGHT LANE IS CLOSED

### GENERAL NOTES

- 1. All lanes are to be open after daylight working hours.
- 2. See Standard Drawiog E 801-TCLG-01 for standard notes and legend.

### INDIANA DEPARTMENT OF TRANSPORTATION

### DAYLIGHT LANE CLOSURES RIGHT LANE CLOSED

MAY 1997



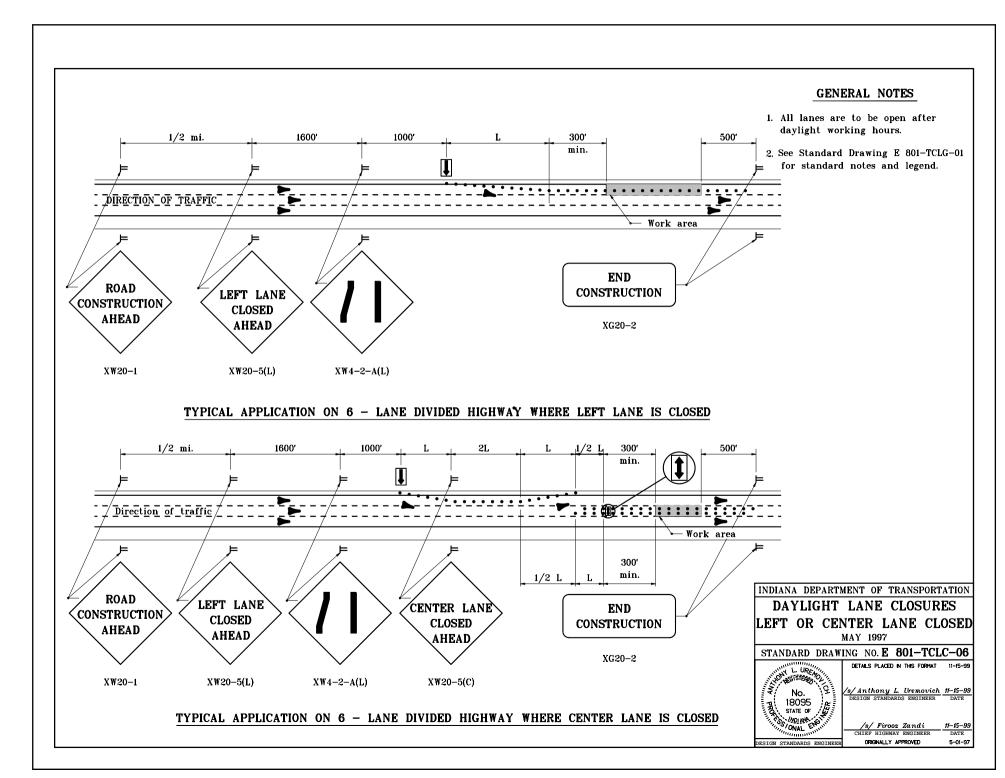
18095 STATE OF WOI WALL

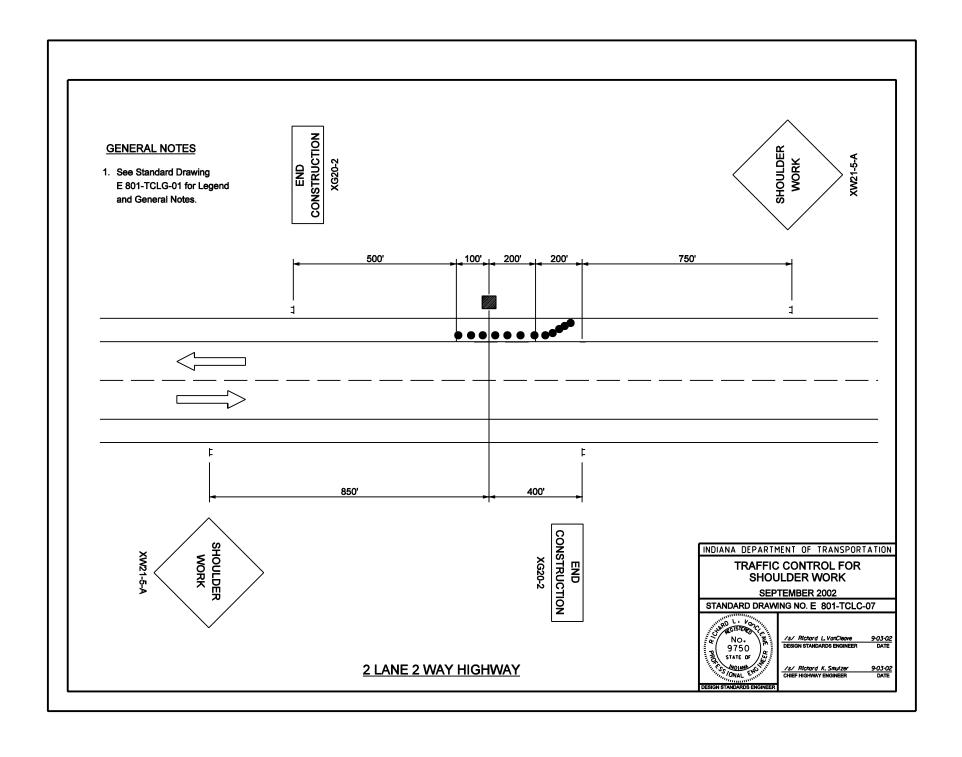
DESIGN STANDARDS ENGINEER

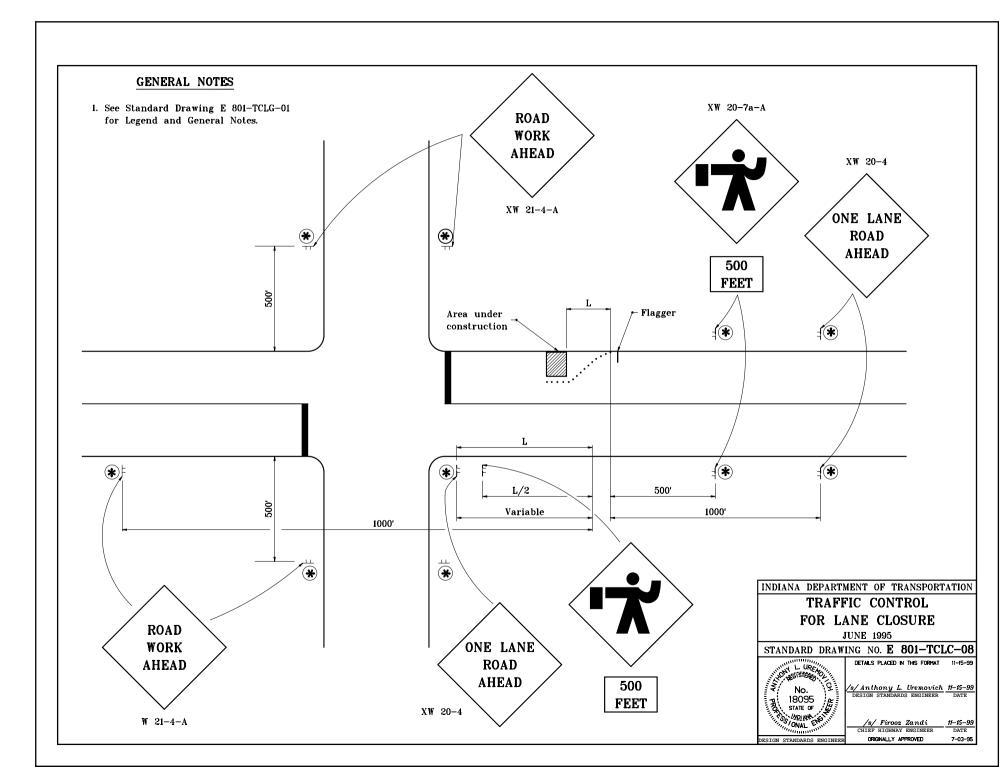
DETAILS PLACED IN THIS FORMAT 11-15-99 s/Anthony L. Uremovich 11-15-99

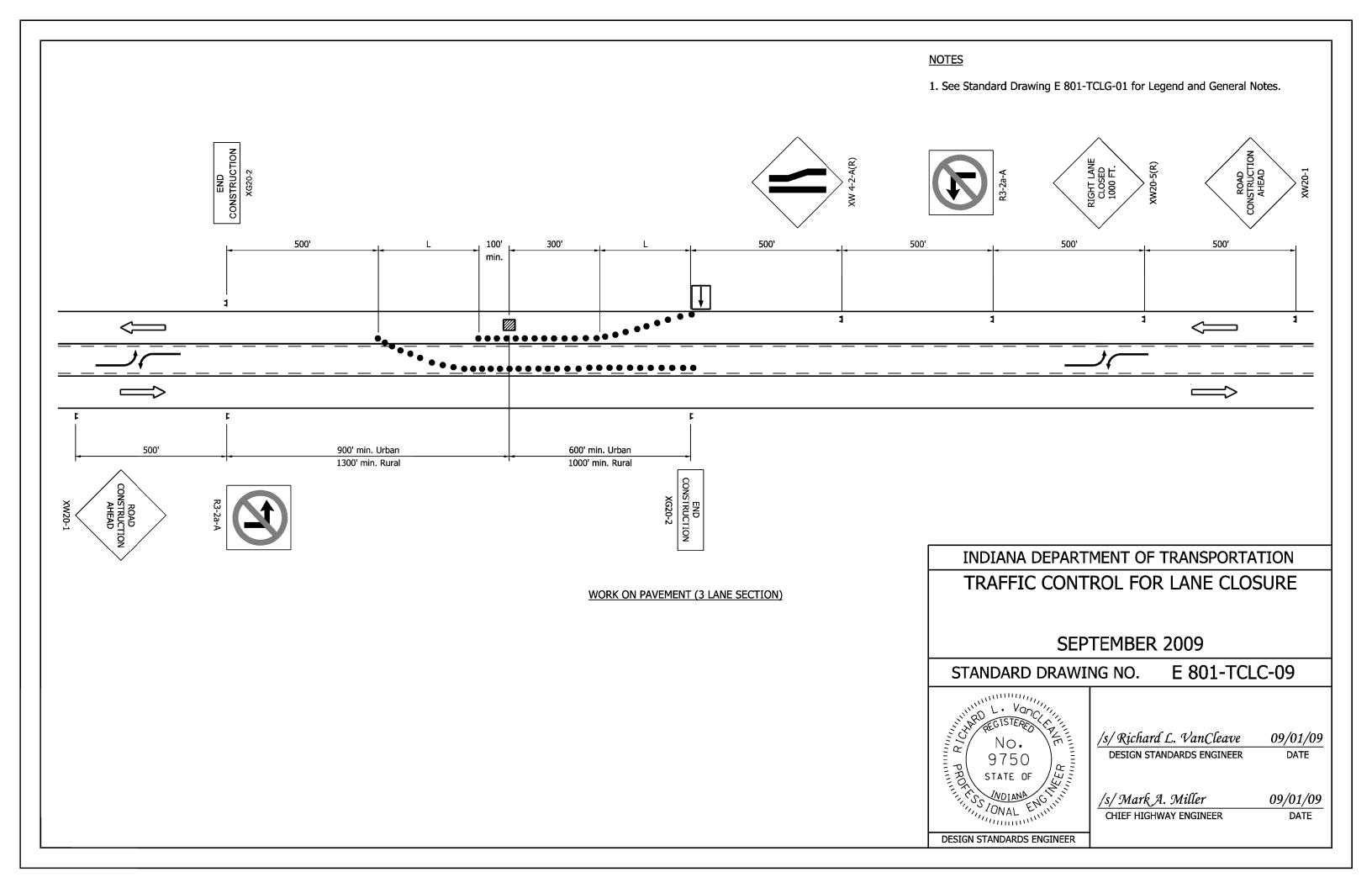
/s/ Firooz Zandi 5-01-97

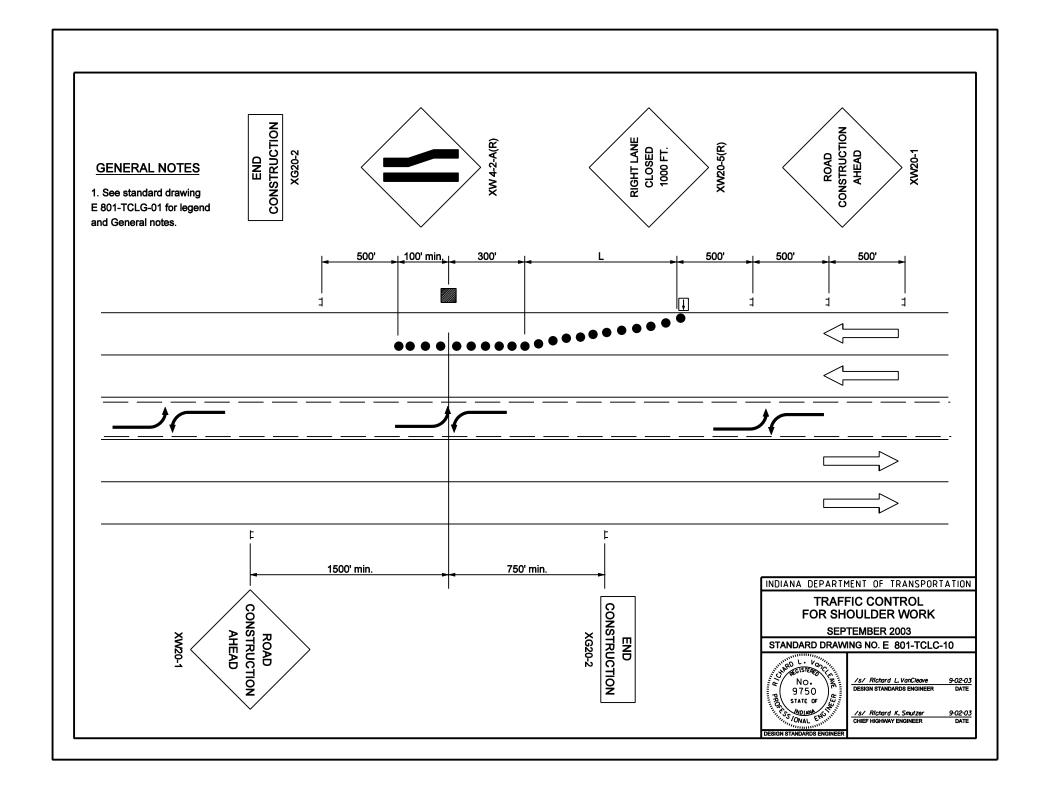
ORIGINALLY APPROVED

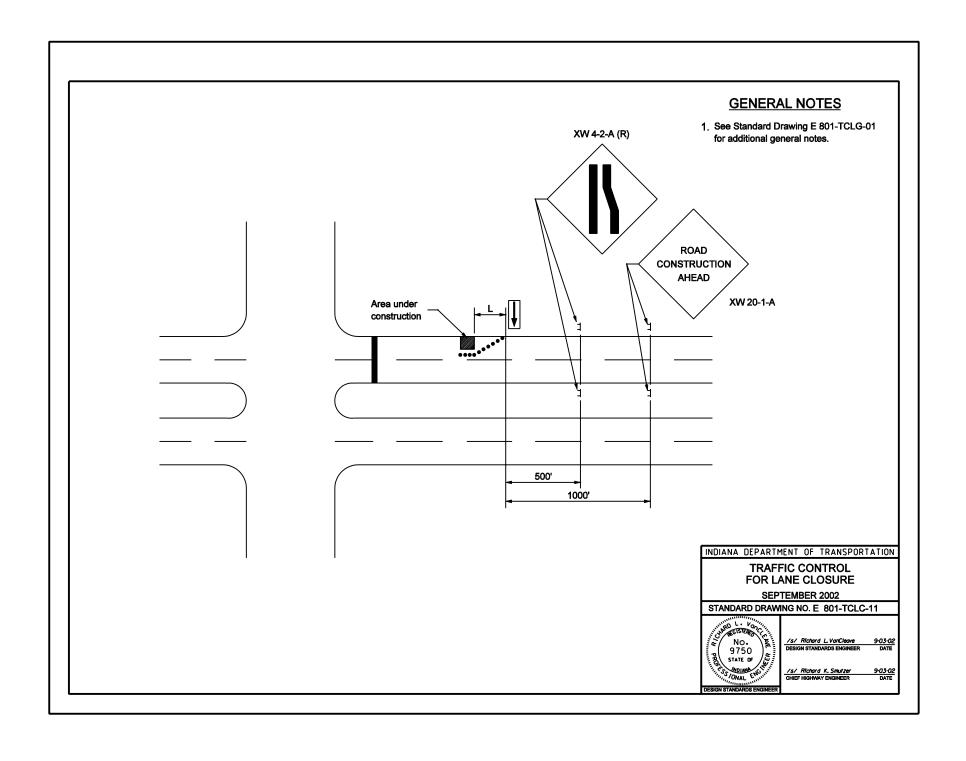


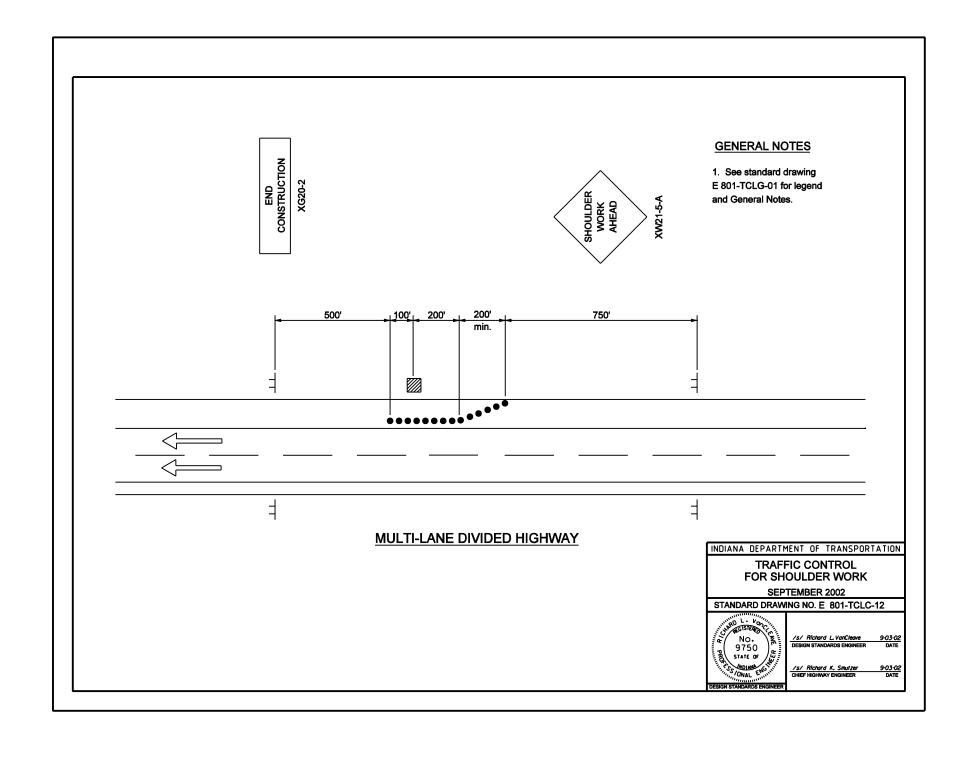


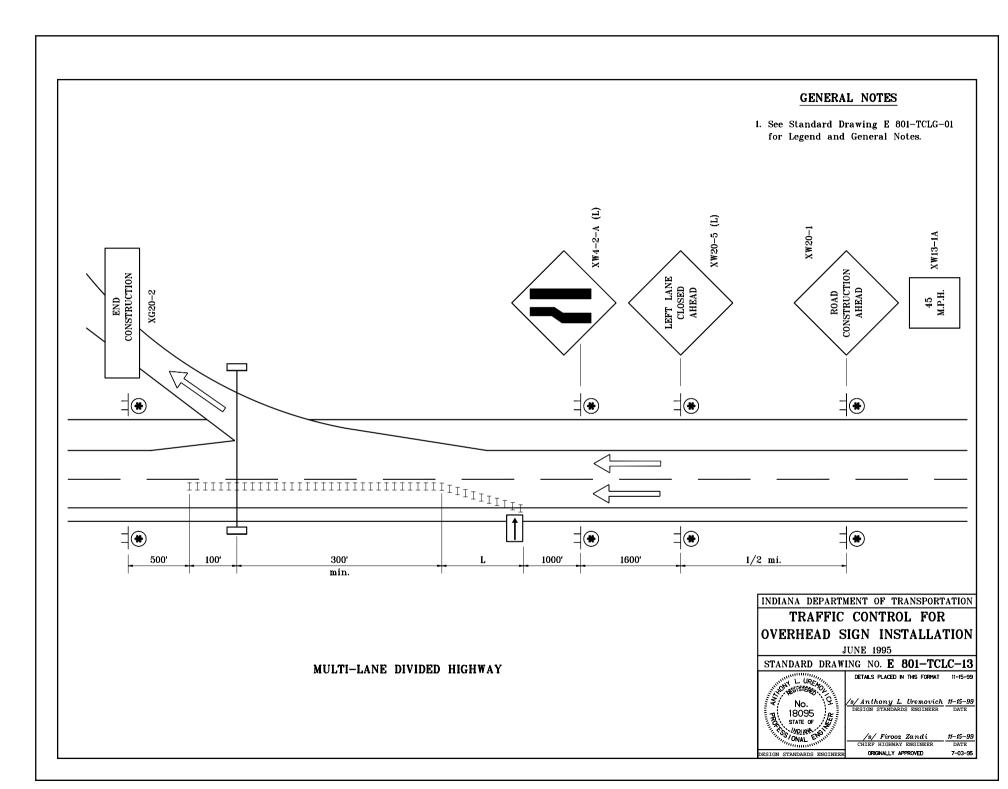


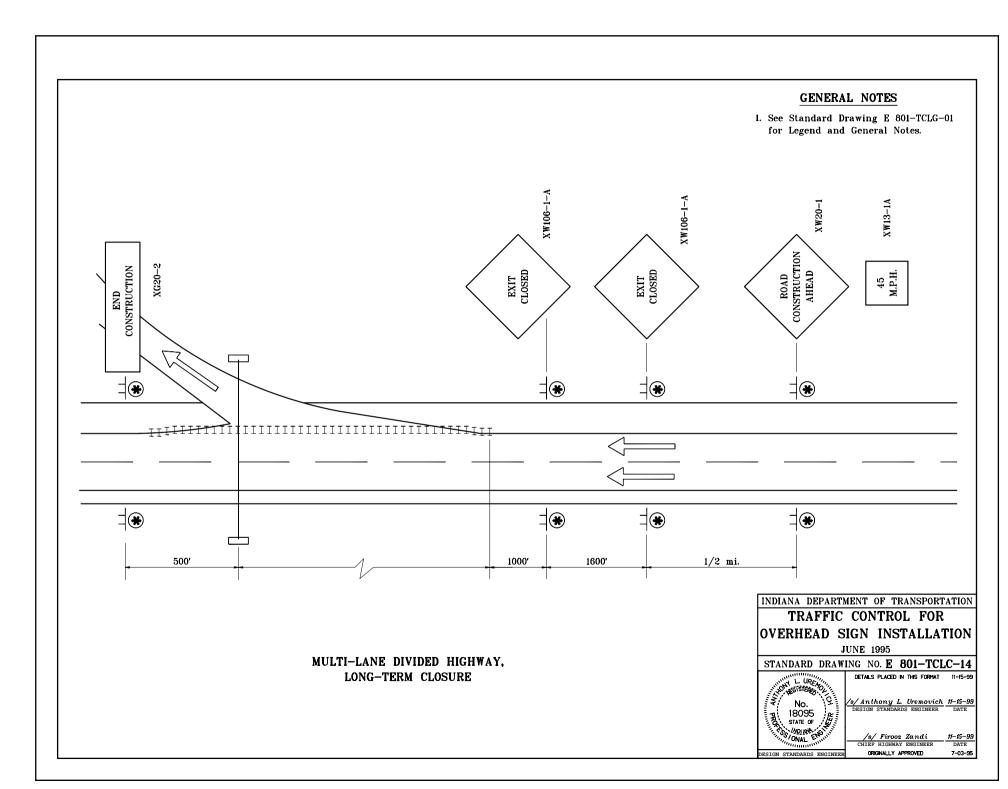


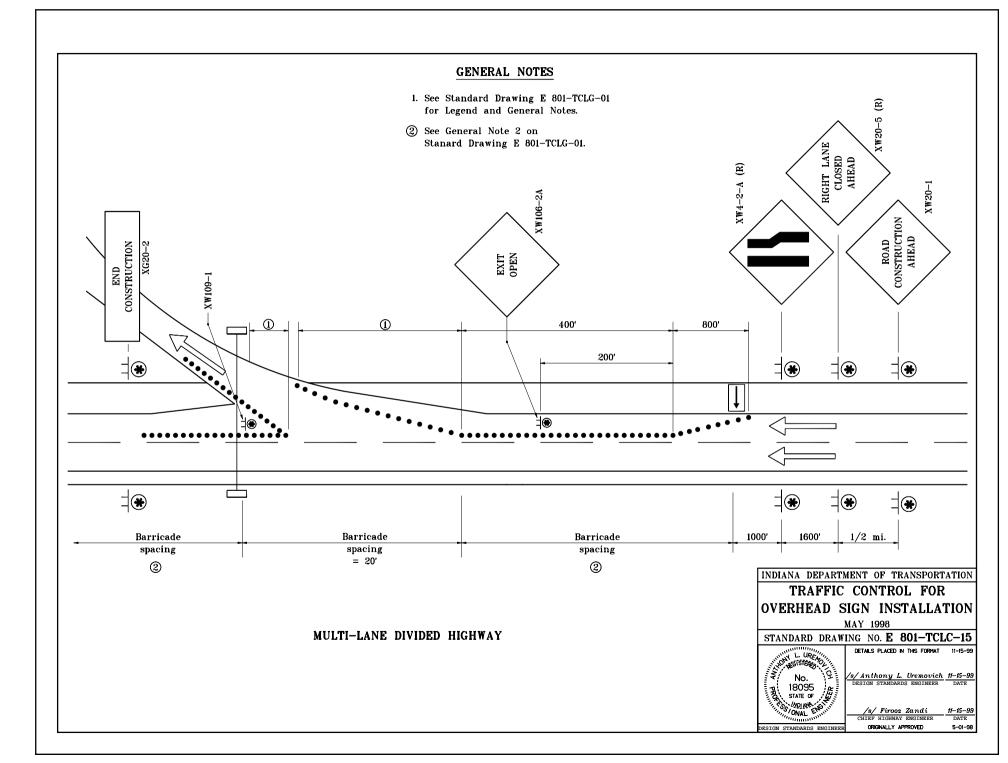


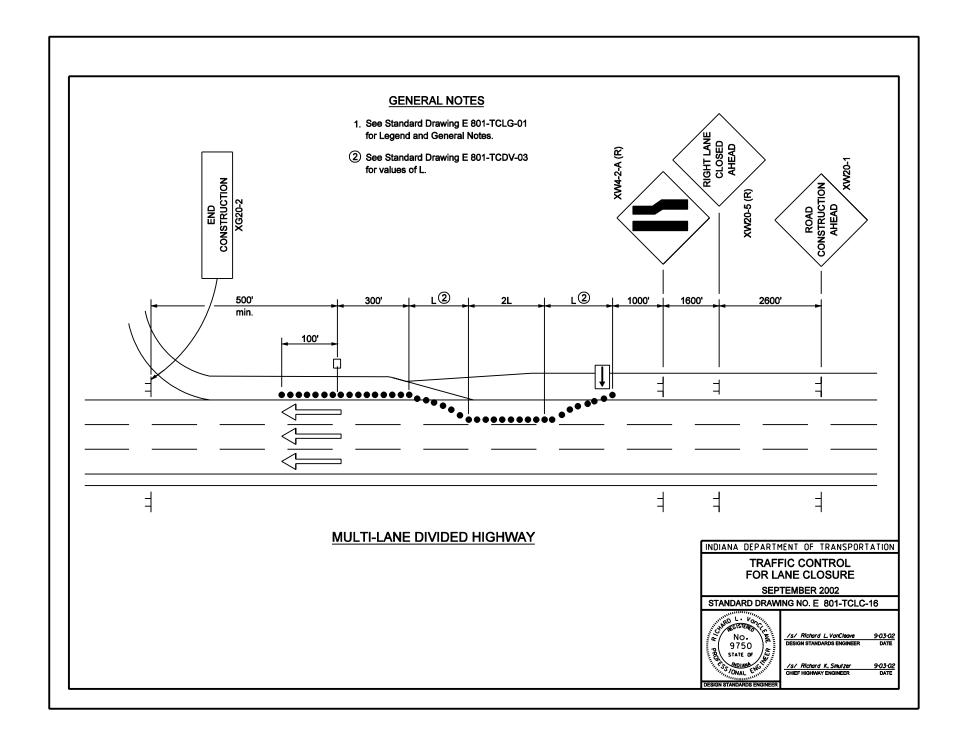


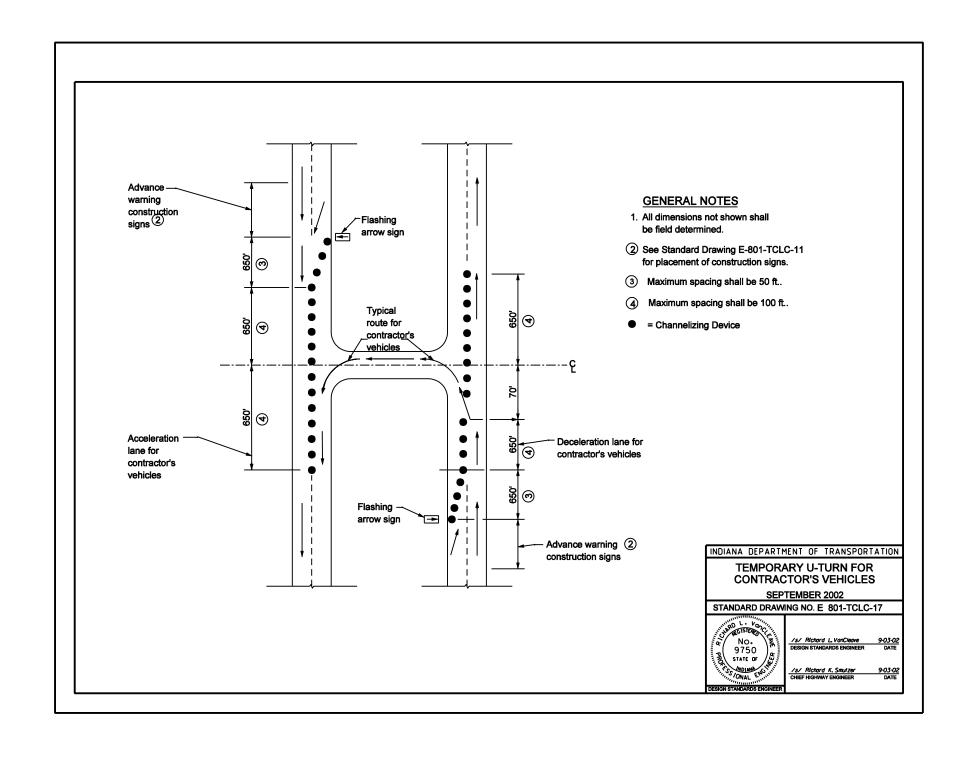












#### **GENERAL NOTES**

- ① Distances shown are typical except minimum distances may be varied based on field conditions.
- 2. The spacing of channelizing devices on tangents shall be as follows:
  - a. Where the posted speed limit is 50 m.p.h. or greater, the spacing shall be 100 ft.
  - b. Where the posted speed limit is less than or equal to 45 m.p.h., the spacing shall be 50 ft.
- 3. The spacing of channelizing devices on tapers shall be numerically equal in feet to the posted speed limit in mph.
- The flashing arrow sign shall not be placed on a sidewalk. The flashing arrow sign shall be placed at a distance of L/3 from the beginning of the taper.
- For temporary lane closures during daylight hours, cones or tubular markers may be used in lieu of drums.
- Temporary pavement markings will not be required for temporary daylight lane closures.
- 7. Minimum pavement section for 1000 trucks per day or less shall consist of 165 #/syd of HMA Surface, on 330 #/syd of HMA Intermediate, on 935 #/syd of HMA Base, on 8 in subgrade treatment. if the truck count for the crossover is greater than 1000 trucks per day, the required pavement section will be provided elsewhere in the plans.

- 8. Temporary highway illumination, when specified, shall be as detailed elsewhere in the plans.
- Once the crossovers have been removed, this line shall be restriped yellow, if the pavement is to again be used for one-way traffic.
- (10) For Temporary Crossover Type B, this line shall be removed when the traffic pattern is switched.
- 1 The advisory speed plate will not be required when the existing posted speed limit is less than 55 mph.
- (12) Spacing of channelizing devices at this location shall be 20 ft.
- (13) The "Two-Way Traffic" (XW6-3B) and "Do Not Pass" (R4-1-B) signs shall alternate every 2640 ft throughout the two-lane two-way operation.

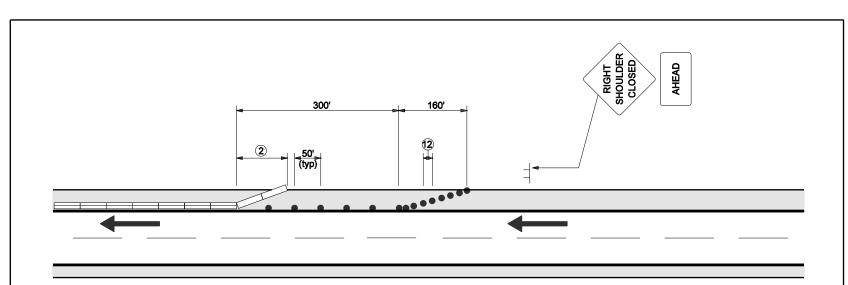
- 14 For a bridge contract, this distance may be adjusted by the Engineer as required. However, it shall be as close to the minimum as possible.
- 15 Once the crossovers have been removed, this line shall be restriped broken white, if the pavement is to again be used for one way traffic.

#### LEGEND

•	Flagger		Temporary Pavement Marking
	Work area	<del>-× ×</del>	Removal of pavement markings and prismatic reflectors
<b>—</b>	Flashing arrow sign	Ħ	Typical Sign Standard (Road Closure
	Channelizing device		Sign Assembly)
р	Police car (optional)		Type III-A or Type III-B Barricades as required
	```		•
11	Construction sign and	4	Double Headed Flashing Arrow Sign
	supports	<b></b>	Direction of Traffic
W =	Width of offset		

SURFACE AREA OF ONE TYPE A TEMPORARY CROSSOVER SYS										
MEDIAN WIDTH, ft	TYPE A									
60	1208									
50	1041									
40	880									
36	814									
30	713									
26	648									

INDIANA DEPARTN	1ENT OF TRANSPORT	ATION								
TRAFFIC CONTROL LEGEND AND GENERAL NOTES MARCH 2006										
STANDARD DRAWING NO. E 801-TCLG-01										
NO. 9750 STATE OF PAGE	/s/ Richard L. VanCleave DESIGN STANDARDS ENGINEER	3-0/-06 DATE								
STATE OF WILLIAM STATE OF WILLIAM STANDARDS ENGINEER	/s/ Richard K. Smutzer CHIEF HIGHWAY ENGINEER	3-01-06 DATE								



#### **NOTES**

- All other applicable traffic control devices shall be utilized where appropriate in addition to those devices shown hereon.
- ② Flared temporary barrier or approved end treatment-flare rate 12:1 desirable.
- 3. For general notes see Standard Drawing E-801-TCLG-01.
- Individual channelizing devices may be temporarily relocated or removed, as necessary, to allow access to the construction site by construction vehicles or access to residences or businesses.
   Tangent area openings shall not exceed 100 feet. Flare area openings shall not exceed 60 feet.

#### LEGEND

Temporary Traffic Barrier

● − Drums

☐ — Sign

→ Direction of traffic

INDIANA DEPARTMENT OF TRANSPORTATION

# TRAFFIC CONTROL SHOULDER CLOSURE

MARCH 2006

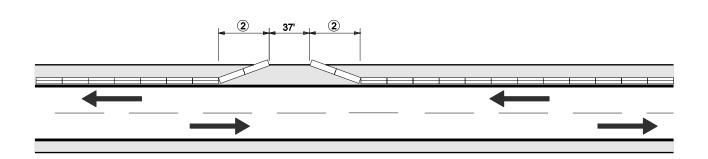
STANDARD DRAWING NO. E 801-TCSC-01



 /s/ Richard L. VanCleave
 3-01-06

 DESIGN STANDARDS ENGINEER
 DATE

/s/ Richard K. Smutzer 3-01-06
CHIEF HIGHWAY ENGINEER DATE



#### **NOTES**

- All other applicable traffic control devices shall be utilized where appropriate in addition to those devices shown hereon.
- (2) Flared temporary barrier or approved end treatment-flare rate 12:1 desirable.
- 3. For general notes see Standard Drawing E-801-TCLG-01.

#### **LEGEND**

Temporary Traffic Barrier

← Direction of traffic

#### TWO-WAY-UNDIVIDED

INDIANA DEPARTMENT OF TRANSPORTATION

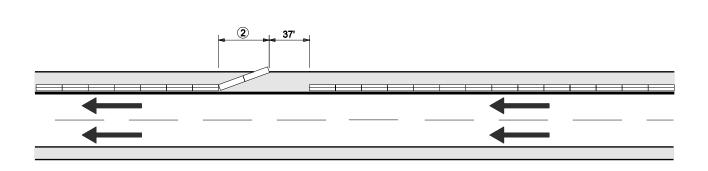
TRAFFIC CONTROL SHOULDER CLOSURE LOCAL ACCESS MARCH 2006

STANDARD DRAWING NO. E 801-TCSC-02



/s/ Richard L. VanCleave 3-0I-06
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-01-06
CHIEF HIGHWAY ENGINEER DATE



#### **NOTES**

- All other applicable traffic control devices shall be utilized where appropriate in addition to those devices shown hereon.
- (2) Flared temporary barrier or approved end treatment-flare rate 12:1 desirable.
- 3. For general notes see Standard Drawing E-801-TCLG-01.

#### **LEGEND**



← Direction of traffic

#### MULTI-LANE-DIVIDED

INDIANA DEPARTMENT OF TRANSPORTATION

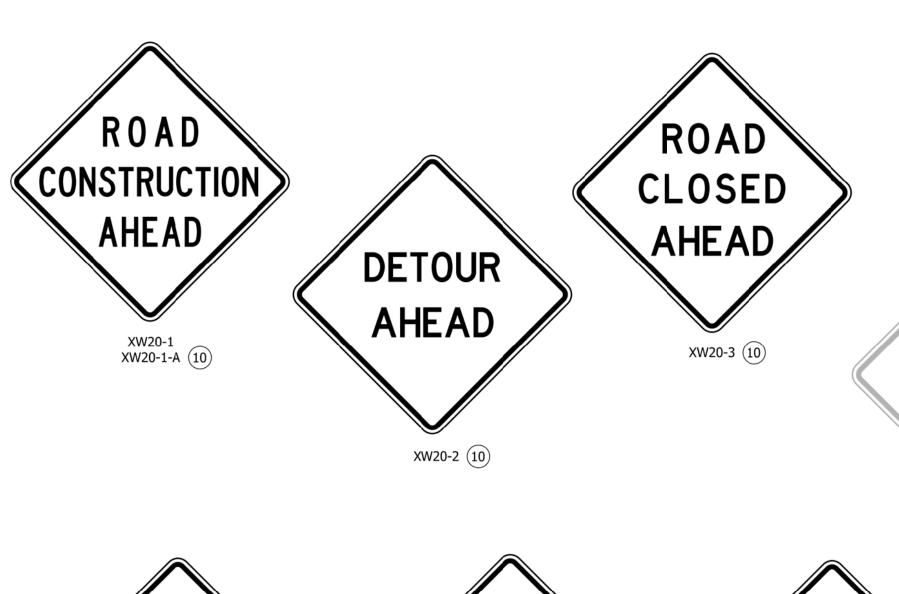
TRAFFIC CONTROL SHOULDER CLOSURE LOCAL ACCESS MARCH 2006

STANDARD DRAWING NO. E 801-TCSC-03



/s/ Richard L. VanCleave 3-0I-06
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-01-06
CHIEF HIGHWAY ENGINEER DATE





- 1. Sign XW21-3-A shall be placed as directed where road machinery is operating on or across pavement open to traffic.
- 2. See Standard Drawing E 801-TCSN-11 for additional general notes.
- 3 A 28 in. x 10 in. metal plate, covered with federal orange reflective material with black numerals designating predetermined distance, may be attached over the word "AHEAD" to more specifically locate the subject hazard.

1500 FT W16-2 (3)





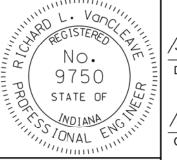


# INDIANA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SIGNS

SEPTEMBER 2010

STANDARD DRAWING NO. E 801-TCSN-01



/s/ Richard L. VanCleave

DESIGN STANDARDS ENGINEER

/s/ Mark A. Miller

CHIEF HIGHWAY ENGINEER DATE

09/01/10

DATE

09/01/10

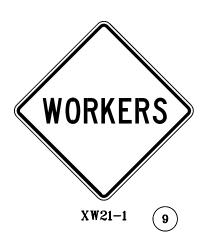


1. See Standard Drawing E 801-TCSN-11 for additional general notes.













INDIANA DEPARTMENT OF TRANSPORTATION TRAFFIC CONTROL **SIGNS** 

SEPTEMBER 1997

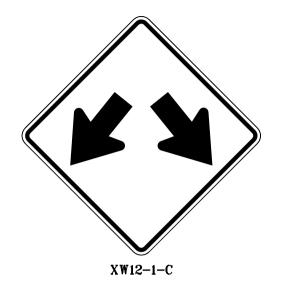
STANDARD DRAWING NO. E 801-TCSN-02

DETAILS PLACED IN THIS FORMAT

/s/Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99 9-02-97

# XW6-3-B



#### GENERAL NOTES

1. See Standard Drawing E 801-TCSN-11 for additional general notes.



XM4-9 (R or L) XM4-9-B (R or L)



XM4-10 (R or L)

#### INDIANA DEPARTMENT OF TRANSPORTATION TRAFFIC CONTROL

**SIGNS** 

JUNE 1995

STANDARD DRAWING NO. E 801-TCSN-03

DESIGN STANDARDS ENGINEER

s/Anthony L. Uremovich 11-15-99

DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Firooz Zandi



R2-1 R2-1-B (1)



R3-2a R3-2c (1)



R11-2



R12-1 R12-1-A ①

## NOTES:

- 1. Signs R11-2, R11-3, R11-4, R5-1-A and R5-1-B shall be prismatic reflective sheeting background.
- 2. See Standard Drawing E 801-TCSN-11 for additional general notes.



R6-1 (R or L)



R6-2-A (R or L)

ROAD CLOSED 10 MILES AHEAD LOCAL TRAFFIC ONLY

R11-3



R5-1-A R5-1-B (1)



R4-1-B ①

**ROAD CLOSED** THRU TRAFFIC

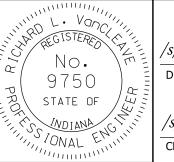
R11-4

## INDIANA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL **SIGNS** 

SEPTEMBER 2010

STANDARD DRAWING NO. E 801-TCSN-04



/s/Richard L. VanCleave

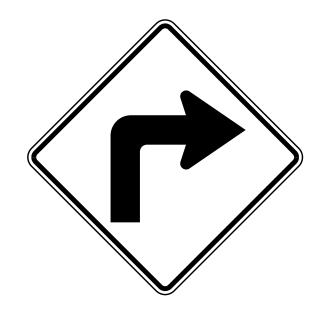
09/01/10 DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller

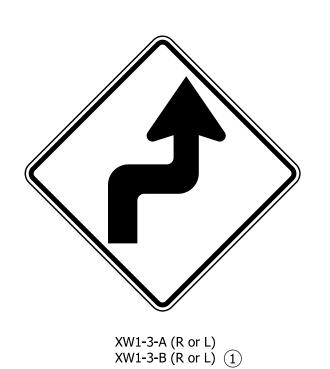
09/01/10

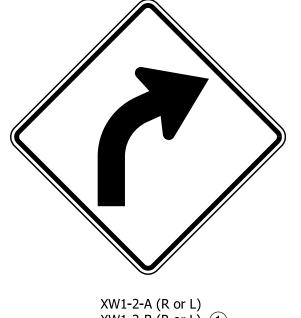
CHIEF HIGHWAY ENGINEER DATE DESIGN STANDARDS ENGINEER

XW1-4-A (R or L) XW1-4-B (R or L) ①



XW1-1-A (R or L) XW1-1-B (R or L) ①





XW4-2 (R or L) XW4-2-A (R or L) 1 XW1-2-A (R or L) XW1-2-B (R or L) 1

# NOTE:

① See Standard Drawing E 801-TCSN-11 for additional general notes.

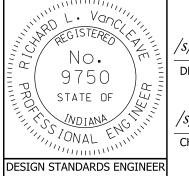
LANE ENDS									
	XW4-2	XW4-2-A							
Α	28	37							
В	4	5 5/16							
С	4	5 1/16							
D	1	1 3/8							
Е	14	16 5/8							
F	4	5 5/16							
G	10	13 5/16							
Н	10	13 5/16							

# INDIANA DEPARTMENT OF TRANSPORTATION

# TRAFFIC CONTROL SIGNS

SEPTEMBER 2010

STANDARD DRAWING NO. E 801-TCSN-05



/s/ Richard L. VanCleave 09/01/10 DESIGN STANDARDS ENGINEER

/s/ Mark A. Miller 09/01/10 DATE

DATE

CHIEF HIGHWAY ENGINEER







XW6-2a-A

XW6-2a-B (1)

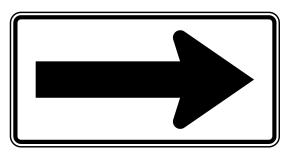


# NOTE:

(1) See Standard Drawing E 801-TCSN-11 for additional general notes.



XW13-1-A (To be used below a warning sign only.)



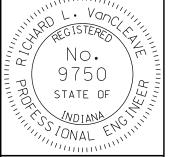
XW1-6 XW1-6-A 1

# INDIANA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SIGNS

SEPTEMBER 2011

STANDARD DRAWING NO. E 801-TCSN-06



/s/ Richard L. VanCleave

DESIGN STANDARDS ENGINEER

09/01/11 DATE

/s/ Mark A. Miller

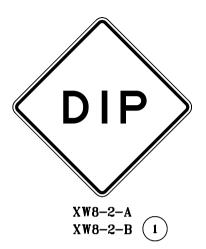
09/01/11

DATE

DESIGN STANDARDS ENGINEER

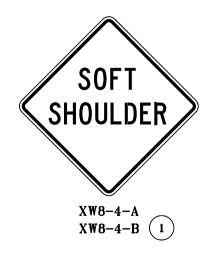
CHIEF HIGHWAY ENGINEER

XW8-3-A









#### GENERAL NOTES

1. See Standard Drawing E 801-TCSN-11 for additional general notes.



XW9-2-A (R or L)

INDIANA DEPARTMENT OF TRANSPORTATION TRAFFIC CONTROL **SIGNS** 

JUNE 1995

STANDARD DRAWING NO. E 801-TCSN-07 DETAILS PLACED IN THIS FORMAT



DESIGN STANDARDS ENGINEER

/s/Anthony L. Uremovich 11-15-99

/s/ Firooz Zandi









#### GENERAL NOTES

1. See Standard Drawing E 801-TCSN-11 for additional general notes.



#### INDIANA DEPARTMENT OF TRANSPORTATION TRAFFIC CONTROL

**SIGNS** 

JUNE 1995

STANDARD DRAWING NO.E 801-TCSN-08

s/Anthony L. Uremovich 11-15-99

DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Firooz Zandi





#### NOTE:

(1) See Standrad Drawing E 801-TCSN-11 for additional general notes.

# OVERHEAD SIGN INSTALLATION

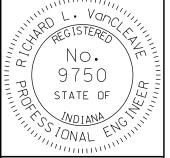
XW104-1 To be used below an XW103-1 Sign only.

# INDIANA DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL SIGNS

SEPTEMBER 2010

STANDARD DRAWING NO. E 801-TCSN-09



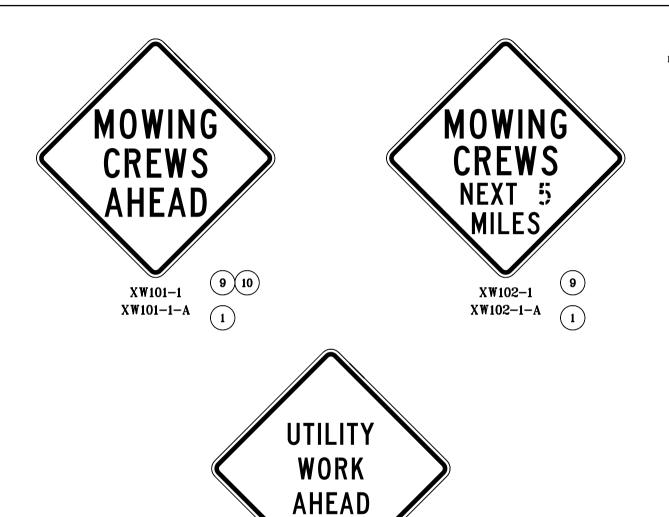
/s/ Richard L. VanCleave

DESIGN STANDARDS ENGINEER

GN STANDARDS ENGINEER DATE

09/01/10

/s/ Mark A. Miller 09/01/10
CHIEF HIGHWAY ENGINEER DATE



[10]

XW108-1

XW108-1-A

#### GENERAL NOTES

1. See Standard Drawing E 801-TCSN-11 for additional general notes.

#### INDIANA DEPARTMENT OF TRANSPORTATION TRAFFIC CONTROL

**SIGNS** JUNE 1995

#### STANDARD DRAWING NO. E 801-TCSN-10



DETAILS PLACED IN THIS FORMAT 11-15-99

/s/Anthony L. Uremovich 11-15-99

/s/ Firooz Zandi

DESIGN STANDARDS ENGINEER

### **GENERAL NOTES:**

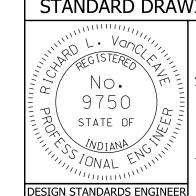
- (1) This sign shall be used on expressways, freeways, and other roadways with design speeds of 50 mph. or more.
- 2. The minimum vertical and horizontal clearances for construction signs shall be as on Standard Drawing E 801-TCDV-05.
- 3. The minimum horizontal clearance for construction signs on curbed roadway sections shall be 2'-0" from the face of the curb to the near edge of the sign.
- 4. The minimum depth for wood or steel posts shall be 4 ft.
- 5. See Standard Drawing E 801-TCDV-08 for U-Channel Steel Post Splice Detail.
- (9) This sign shall be removed, covered, or turned to face away from the roadway during non-working hours.
- (10) This sign may be ordered to read "500 FT", "1000 FT", or "1500 FT" in place of the word "Ahead". Such signs may be used in place of, or in conjunction with, the indicated sign.

# INDIANA DEPARTMENT OF TRANSPORTATION

# **CONSTRUCTION SIGNS GENERAL NOTES**

SEPTEMBER 2010

STANDARD DRAWING NO. E 801-TCSN-11



/s/Richard L. VanCleave

DESIGN STANDARDS ENGINEER

/s/ Mark A. Miller 09/01/10

09/01/10

DATE

CHIEF HIGHWAY ENGINEER

DATE

SIGN NUMBER	SIGN MESSAGE	POST DI	ESIGN	SIGN SIZE	SIGN COLOR		BORDER	MARGIN	LETTER HEIGHT	LETTER HEIGHT	LETTER HEIGHT	WORD OR	PCT.	ARROW SIZE		CORNER	NUMBER OF POSTS
		4 x 4 WOOD	STEEL		BACKGROUND	COPY	WIDTH	WIDTH	SERIES-LINE 1	SERIES-LINE 2	SERIES-LINE 3	LINE 1	1	HEAD	SHAFT	RADIUS	ONE TWO
XG20-1	"Road Construction Next Miles"	*	В	60 x 36	Orange	Black	3/4	1/2	6 - Series C	6 - Series C	6 - Series C					2 1/4	Х
XG20-2	"End Construction"	*	В	60 x 24	Orange	Black	1/2	3/8	6 - Series C	6 - Series C						1 1/2	Х
XG20-2a	"End Road Work"	*	В	48 x 18	Orange	Black	1/2	3/8	6 - Series C	6 - Series C						1 1/2	Х
XG20-4	"Pilot Car Follow Me"			36 x 18	Orange	Black	1/2	3/8	5 - Series C	5 - Series C						1 1/2	
XG20-5	(Route number or) "Lane Closed" (date)	*	В	48 x 36	Orange	Black	3/4	1/2	6 - Series C	6 - Series C	6 - Series C					2 1/4	X
XG20-5-B	"Worksite" plate			48 x 16	Orange	Black	1/2	3/8	8 - Series C							1 1/2	
XW20-6	"Lane Restrictions On Or After *** ** 2007	*	В	60 x 30	Orange	Black	3/4	1/2	5 - Series C	5 - Series C	4 - Series C					1 7/8	X
XW20-6a	"Lane Restrictions On Or After *** ** 2007	*	В	72 x 36	Orange	Black	7/8	5/8	6 - Series C	6 - Series C	5 - Series C					2 1/4	X
XM4-9 (R or L)	"Detour" (above black arrow)	*	А	30 x 24	Orange	Black	1/2	3/8	5 - Series D			"Detour"		7 x 8	11 x 3 1/2	1 1/2	X
XM4-9-B (R or L)	"Detour" (above black arrow)	*	В	60 x 48	Orange	Black	1 1/4	3/8	10 - Series D			"Detour"		14 3/4 x 16	21 3/4 x 7	3	X
XM4-10 (R or L)	"Detour" (inside orange arrow)	*	В	48 x 18	Black & Orange	Black		3/8	6 - Series D					12 x 13 3/8	29 3/4 x 8	1 1/2	X
XW1-1-A (R or L)	(Turn symbol)	*	А	36 x 36	Orange	Black	3/4	1/2						10 5/8 x 12	5 1/4	2 1/4	X
XW1-1-B (R or L)	(Turn symbol)	*	В	48 x 48	Orange	Black	1 1/4	3/4						14 1/8 x 16	7	3	X
XW1-2-A (R or L)	(Curve symbol)	*	Α	36 x 36	Orange	Black	3/4	1/2						10 5/8 x 12	5 1/4	2 1/4	X
XW1-2-B (R or L)	(Curve symbol)	*	В	48 x 48	Orange	Black	1 1/4	3/4						14 1/8 x 16	7	3	Х
XW1-3-A (R or L)	(Reverse turn symbol)	*	Α	36 x 36	Orange	Black	3/4	1/2						10 5/8 x 12	5 1/4	2 1/4	Х
XW1-3-B (R or L)	(Reverse turn symbol)	*	В	48 x 48	Orange	Black	1 1/4	3/4						14 1/8 x 16	7	3	X
XW1-4-A (R or L)	(Reverse curve symbol)	*	А	36 x 36	Orange	Black	3/4	1/2						10 5/8 x 12	5 1/4	2 1/4	X
XW1-4-B (R or L)	(Reverse curve symbol)	*	В	48 x 48	Orange	Black	1 1/4	3/4						14 1/8 x 16	7	3	X
XW1-6	(Single headed arrow)	*	В	48 x 24	Orange	Black	3/4	3/4						13 1/8 x 15	26 x 6 1/2	1 1/2	X
XW1-6-A	(Single headed arrow)	*	В	60 x 30	Orange	Black	3/4	1/2						16 3/8 x 18	32 1/2 x 8	2 1/4	X
XW4-2 (R or L)	(Lane ends merge symbol)	*	А	36 x 36	Orange	Black	3/4	1/2	See Stand	dard Sheet 3A Detours						2 1/4	X
XW4-2-A (R or L)	(Lane ends merge symbol)	*	В	48 x 48	Orange	Black	1 1/4	3/4	See Stand	dard Sheet 3A Detours						1 1/2	X
XW6-2a-A	(Divided highway ends symbol)	*	А	36 x 36	Orange	Black	3/4	1/2	5 - Series D	5 - Series D	5 - Series D					2 1/4	Х
XW6-2a-B	(Divided highway ends symbol)	*	В	48 x 48	Orange	Black	1 1/4	3/4	7 - Series D	7 - Series D	7 - Series D					3	X
XW3-5-A	Arrow - "Speed Limit"	*	А	36 x 36	Orange	Black	7/8	5/8	3 - Series E	3 - Series E	12 - C					2 1/4	X
XW3-5-B	Arrow - "Speed Limit"	*	В	48 x 48	Orange	Black	1 1/4	3/4	4 - Series E	4 - Series E	15 C					3	X
XW3-5a-A	" MPH - Speed Zone Ahead"	*	А	36 x 36	Orange	Black	7/8	5/8	5 - Series C	5 - Series C	5 - Series C					2 1/2	Х
XW3-5a-B	" MPH - Speed Zone Ahead"	*	В	48 x 48	Orange	Black	1 1/4	3/4	7 - Series C	7 - Series C	7 - Series C					3	Х

\*Wood post permitted.

# NOTES:

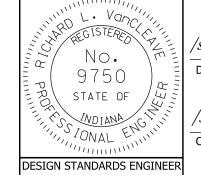
- $\begin{tabular}{ll} \hline $\tt 1$ Spacing between letters of this word or line shall be reduced by this percentage as shown in the FHWA document, Standard Highway Signs. \\ \hline \end{tabular}$ 
  - 2. See Standard Drawing E 801-TCSN-11 for additional general notes.
  - 3. All dimensions are in inches.

# INDIANA DEPARTMENT OF TRANSPORTATION

SIGN DESIGN DETAILS (Sheet 1 of 2)

SEPTEMBER 2011

STANDARD DRAWING NO. E 801-TCSN-12



/s/Richard L. VanCleave 09/01/11 DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/01/11

CHIEF HIGHWAY ENGINEER

SIGN NUMBER	SIGN MESSAGE	POST DE	SIGN	SIGN SIZE	SIGN COLOR		BORDER	MARGIN	LETTER HEIGHT	LETTER HEIGHT	LETTER HEIGHT	WORD OR	PCT.	ARROW	SIZE	CORNER	NUMBER OF POSTS
		4 x 4 WOOD	STEEL	SIGN SIZE	BACKGROUND	СОРУ	COPY WIDTH	WIDTH	SERIES-LINE 1	SERIES-LINE 2	SERIES-LINE 3	LINE 1	1	HEAD	SHAFT	RADIUS	ONE TWO
XW6-3-B	(Two way traffic symbol)	*	В	48 x 48	Orange	Black	1 1/4	3/4						11 5/8 x 13 3/4	23 1/2 x 6	3	Х
XW8-1-A	"Bump"	*	А	36 x 36	Orange	Black	3/4	1/2	10 - Series D							2 1/4	Х
XW8-1-B	"Bump"	*	В	48 x 48	Orange	Black	1 1/4	3/4	12 - Series D							3	X
XW8-2-A	"Dip"	*	Α	36 x 36	Orange	Black	3/4	1/2	10 - Series E							2 1/4	X
XW8-2-B	"Dip"	*	В	48 x 48	Orange	Black	1 1/4	3/4	12 - Series E							3	Х
XW8-3-A	"Pavement Ends"	*	Α	36 x 36	Orange	Black	3/4	1/2	6 - Series C	6 - Series C						2 1/4	X
XW8-4-A	"Soft Shoulder"	*	А	36 x 36	Orange	Black	3/4	1/2	6 - Series C	6 - Series C						2 1/4	X
XW8-4-B	"Soft Shoulder"	*	В	48 x 48	Orange	Black	1 1/4	3/4	8 - Series C	8 - Series C						3	X
XW8-6-A	"Truck Crossing"	*	Α	36 x 36	Orange	Black	3/4	1/2	6 - Series C	6 - Series C						2 1/4	X
XW8-6-B	"Truck Crossing"	*	В	48 x 48	Orange	Black	1 1/4	3/4	8 - Series C	8 - Series C						3	X
XW9-1-A (R or L)	" Lane Ends"	*	Α	36 x 36	Orange	Black	3/4	1/2	6 - Series D	6 - Series D	6 - Series D					2 1/4	X
XW9-1-B (R or L)	"Lane Ends"	*	В	48 x 48	Orange	Black	1 1/4	3/4	8 - Series D	8 - Series D	8 - Series D					3	X
XW9-2-A (R or L)	"Lane Ends Merge"	*	В	48 x 48	Orange	Black	1 1/4	3/4	6 - Series C	8 - Series D	8 - Series D					2 1/4	X
XW12-1-C	(Double headed arrow)	*	В	48 x 48	Orange	Black	1 1/4	3/4						12 1/2 x 15	12 x 5 1/4	3	X
XW13-1-A	" MPH" (Advisory speed plate)	*	А	24 x 24	Orange	Black	1/2	3/8	10 - Series E	4 - Series E						1 1/2	
XW20-1	"Road Construction Ahead"	*	В	48 x 48	Orange	Black	1 1/4	3/4	7 - Series C	7 - Series C	7 - Series C	"Construction"	25			3	X
XW20-1-A	"Road Construction Ahead"	*	В	60 x 60	Orange	Black	1 1/2	1	8 - Series C	8 - Series C	8 - Series C	"Construction"	25			95	Х
XW20-1a	"Road Repairs Next Miles"	*	В	48 x 48	Orange	Black	1 1/4	3/4	8 - Series C	8 - Series C	6 - Series C					3	Х
XW20-2	"Detour Ahead"	*	В	48 x 48	Orange	Black	1 1/4	3/4	8 - Series D	8 - Series D		"Detour"	25			3	X
XW20-3	"Road Closed Ahead"	*	В	48 x 48	Orange	Black	1 1/4	3/4	7 - Series D	7 - Series D	7 - Series D					3	X
XW20-4	"One Lane Road Ahead"	*	В	48 x 48	Orange	Black	1 1/4	3/4	7 - Series C	7 - Series C	7 - Series C					3	X
XW20-5 (R, C, or L)	" Lane Closed Ahead"	*	В	48 x 48	Orange	Black	1 1/4	3/4	6 - Series C	6 - Series C	6 - Series C		2			3	X
XW20-7a-A	(Flagger symbol)	*	В	48 x 48	Orange	Black	1 1/4	3/4								1 1/2	Х
XW21-1a	(Workers symbol)	*	А	36 x 36	Orange	Black	3/4	1/2	6 - Series D							2 1/4	X
XW21-2	"Fresh Oil"	*	Α	30 x 30	Orange	Black	3/4	3/8	6 - Series D	6 - Series D		"Fresh"	2/4			1 7/8	X
XW21-2-A	"Fresh Oil"	*	А	36 x 36	Orange	Black	3/4	1/2	7 - Series D	7 - Series D		"Fresh"	3/4			2 1/4	X
XW21-3-A	"Road Machinery Ahead"	*	В	48 x 48	Orange	Black	1 1/4	3/4	7 - Series D	7 - Series D	7 - Series D	"Machinery"	25			3	X
XW21-4-A	"Road Work Ahead"	*	В	48 x 48	Orange	Black	1 1/4	3/4	7 - Series D	7 - Series D	7 - Series D					3	X
XW21-5-A	"Shoulder Work"	*	Α	36 x 36	Orange	Black	3/4	1/2	6 - Series C	6 - Series C		"Shoulder"	1			2 1/4	Х
XW21-6-A	"Survey Crew"	*	Α	36 x 36	Orange	Black	3/4	1/2	6 - Series C	6 - Series C						2 1/4	Х

\*Wood post permitted.

# NOTES:

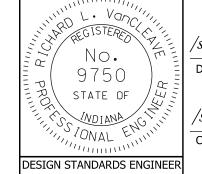
- ① Spacing between letters of this word or line shall be reduced by this percentage as shown in the FHWA document, Standard Highway Signs.
  - 2. See Standard Drawing E 801-TCSN-11 for additional general notes.
  - 3. All dimensions are in inches.

# INDIANA DEPARTMENT OF TRANSPORTATION

SIGN DESIGN DETAILS (sheet 2 of 2)

SEPTEMBER 2011

STANDARD DRAWING NO. E 801-TCSN-12A



/s/ Richard L. VanCleave

09/01/11 DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/01/11

CHIEF HIGHWAY ENGINEER DATE

SIGN NUMBER	SIGN MESSAGE	POST DESIGN			SIGN COLOR		BODDED	, , , , , , , , , , , , , , , , , , ,	LETTER HEIGHT	LETTER LIETCHT	LETTER LIETCHT	LETTER LIETCUT	   ARRO\	N SIZE	CORNER		: POSTS
SIGN NUMBER	SIGN MESSAGE	4 x 4 WOOD	STEEL	SIGN SIZE	BACKGROUND	COPY		WIDTH	SERIES-LINE 1	SERIES-LINE 2	SERIES-LINE 3		HEAD		RADIUS		
XW101-1	"Mowing Crews Ahead"	*	Α	36 x 36		Black	3/4	1/2	6 - Series C	6 - Series C	6 - Series C				2 1/4		X
XW101-1-A	"Mowing Crews Ahead"	*	В	48 x 48	Orange	Black	1 1/4	3/4	8 - Series C	8 - Series C	8 - Series C				3		Х
XW102-1	"Mowing Crews Next Miles"	*	Α	36 x 36	Orange	Black	3/4	1/2	6 - Series C	6 - Series C	4 - Series C	4 - Series C			2 1/4		Х
XW102-1-A	"Mowing Crews Next Miles"	*	В	48 x 48		Black	1 1/4	3/4	8 - Series C	8 - Series C	6 - Series C	6 - Series C			3		Х
XW103-1	"Watch For Stopped Traffic"	*	В	48 x 48		Black	1 1/4	3/4	7 - Series C	7 - Series C	7 - Series C				3		Х
XW104-1	"Overhead Sign Installation"	*	В	60 x 24		Black	1/2	3/8	6 - Series C	6 - Series C					1 1/2		Х
XW105-1-A	"Right Lane Exit Open"	*	В	48 x 48		Black	1 1/4	3/4	6 - Series C	6 - Series C					3		Х
XW106-1-A	"Exit Closed"	*	В	48 x 48		Black	1 1/4	3/4	7 - Series C	7 - Series C					3		Х
XW106-2-A	"Exit Open"	*	В	48 x 48		Black	1 1/4	3/4	7 - Series C	7 - Series C					3		Х
XW108-1	"Utility Work Ahead"	*	Α	36 x 36	Orange	Black	3/4	1/2	6 - Series D	6 - Series D	6 - Series D				2 1/4		Х
XW108-1-A	"Utility Work Ahead"	*	В	48 x 48	Orange	Black	1 1/4	3/4	6 - Series C	6 - Series C	6 - Series C				3		Х
XW109-1	"Exit" (above black arrow)	*	В	48 x 48		Black	1 1/4	3/4	12 - Series D						3		Х
R2-1	"Speed limit"	*	Α	24 x 30	White	Black	1/2	3/8	4 - Series E	4 - Series E	10 - Series E				1 1/2	Х	
R2-1-B	"Speed limit"	*	В	48 x 60	White	Black	1 1/4	3/4	8 - Series E	8 - Series E	16 - Series E				3		Х
R3-2-A (R or L)	(No turn symbol)	*	Α	30 x 30	White	Black	3/4	3/8							2	Х	
	(No turn symbol)	*	В	48 x 48	White	Black	1 1/4	3/4							3		Х
R4-1	"Do Not Pass"	*	Α	24 x 30	White	Black	1/2	3/8	6 - Series D	6 - Series D	5 - Series D				1 7/8	Х	
R4-1-B	"Do Not Pass"	*	В	48 x 60	White	Black	1 1/4	3/4	10 - Series D	10 - Series D	10 - Series D				3		Х
R5-1-A	"Do Not Enter" (inside symbol)	*	Α	36 x 36	Red	White		17 1/2	5 - Series D	6 x 30 Bar	5 - Series D				2 1/4		Х
R5-1-B	"Do Not Enter" (inside symbol)	*	В	48 x 48	Red	White	Radius	23 1/2	6 - Series D	8 x 40 Bar	6 - Series D				3		Х
R6-1 (R or L)	"One Way" (inside white arrow)	*	Α	36 x 36	Black & White	Black		3/8	4 - Series D				7 1/2 x 8 1/2	22 1/4 x 5 1/4	1 1/2		Х
R6-2-À (R or L)	"One Way" (above black arrow)	*	Α	24 x 30	White	Black	1/2	3/8	6 - Series D	6 - Series D			5 1/4 x 6	8 x 2 1/4	1 1/2	Х	
R11-2	"Road Closed"	*	В	48 x 30	White	Black	3/4	3/8	8 - Series D	8 - Series D				,	1 7/8		Х
R11-3	"Road Closed Miles Ahead "Local Traffic Only"	*	В	60 x 30	White	Black	3/4	3/8	6 - Series C	5 - Series C	4 - Series C				1 7/8		Х
R11-4	"Road Closed To Thru Traffic"	*	В	60 x 30	White	Black	3/4	3/8	6 - Series C	5 - Series C	6 - Series C				1 7/8		Х
R12-1	"Weight LimitTons"	*	Α	24 x 30	White	Black	1/2	3/8	4 - Series D	4 - Series D	5 - Series E	5 - Series D			1 1/2	Х	
R12-1-A	"Weight LimitTons"		В	36 x 48	White	Black	3/4	1/2	6 - Series D	6 - Series D	8 - Series E	10 - Series D			2 1/4		Х
S 4-4	"When Flashing" plaque	*		48 x 20	White	Black	1/2	3/8	5 - Series D	5 - Series D					1 1/2		
R2-Y12	"End Work Site Speed Limit"	*	Α	24 x 36	White	Black	1/2	3/8	4 - Series D	4 - Series D	4 - Series D	4 - Series D			1 1/2	Х	
R2-Y12-B	"End Work Site Speed Limit"	*	В	36 x 54	White	Black	1 1/4	3/4	6 - Series D	6 - Series D	6 - Series D	6 - Series D			3		Х

<sup>\*</sup> Wood post permitted.

# NOTES:

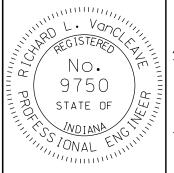
- 1. See Standard Drawing E 801-TCSN-11 for General Notes.
- 2. All dimensions are in inches.

# INDIANA DEPARTMENT OF TRANSPORTATION

# SIGN DESIGN DETAILS

SEPTEMBER 2012

STANDARD DRAWING NO. E 801-TCSN-13



/s/ Richard L. VanCleave

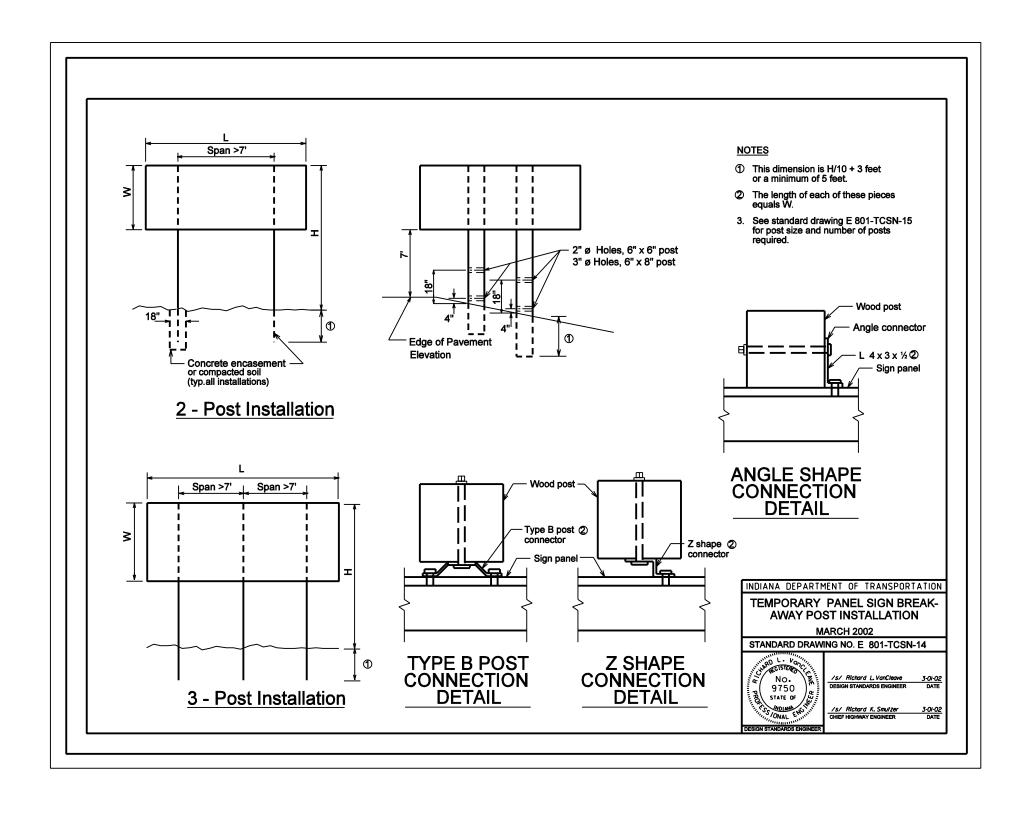
SUPERVISOR, ROADWAY STANDARDS

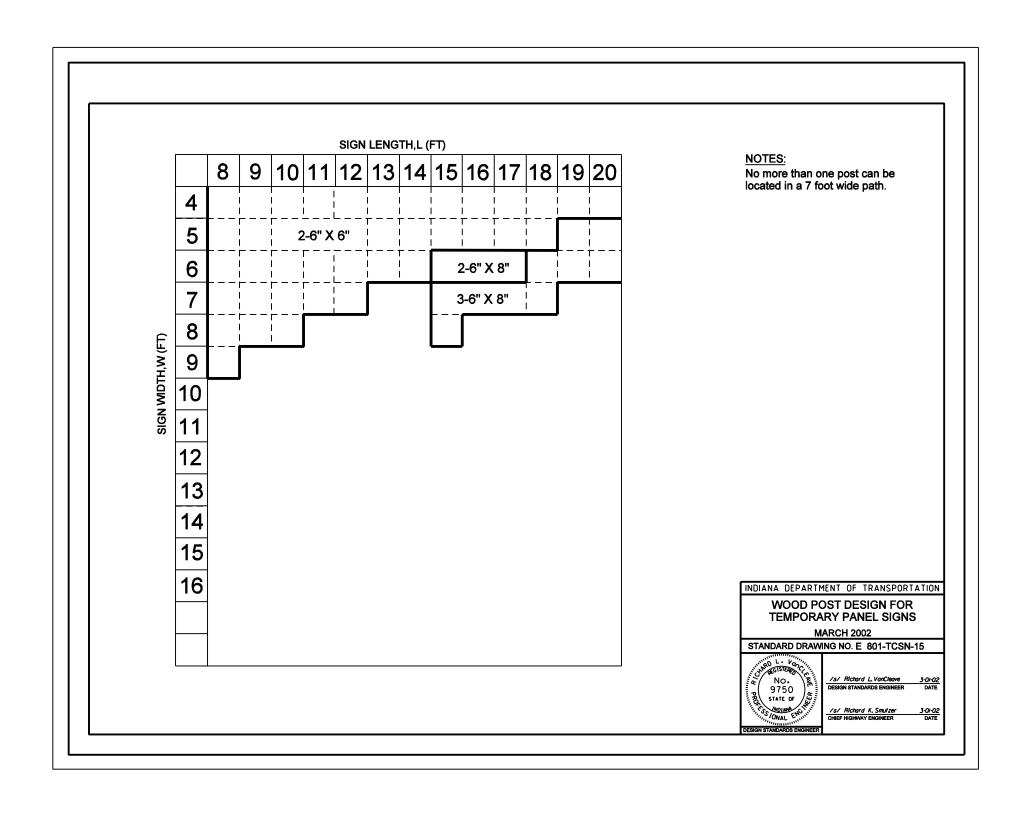
/s/ Mark A. Miller 09/04/12

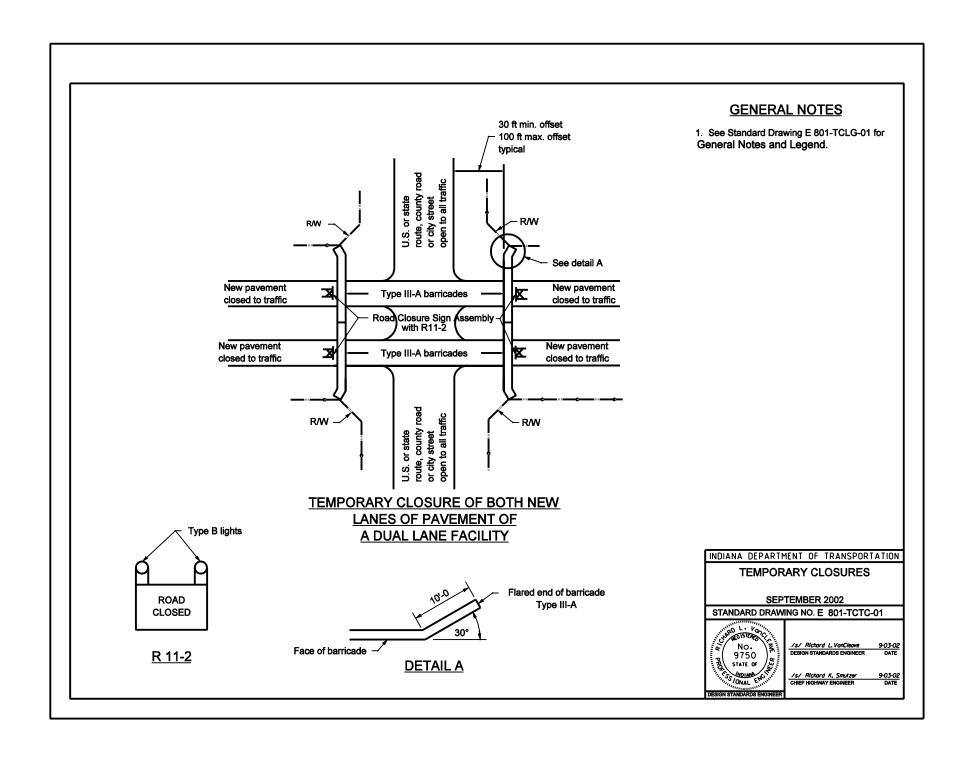
09/04/12

DATE

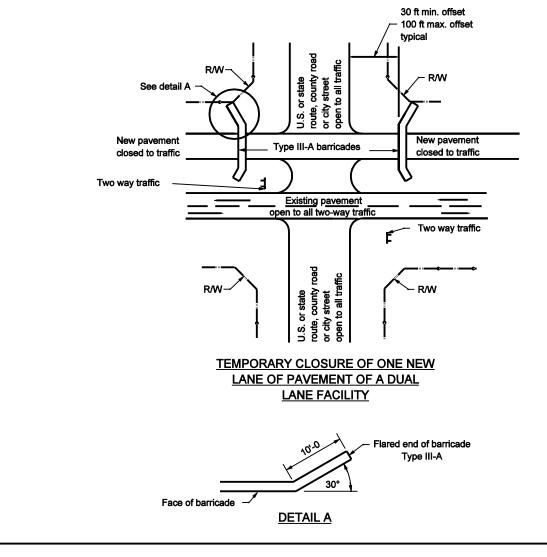
CHIEF ENGINEER



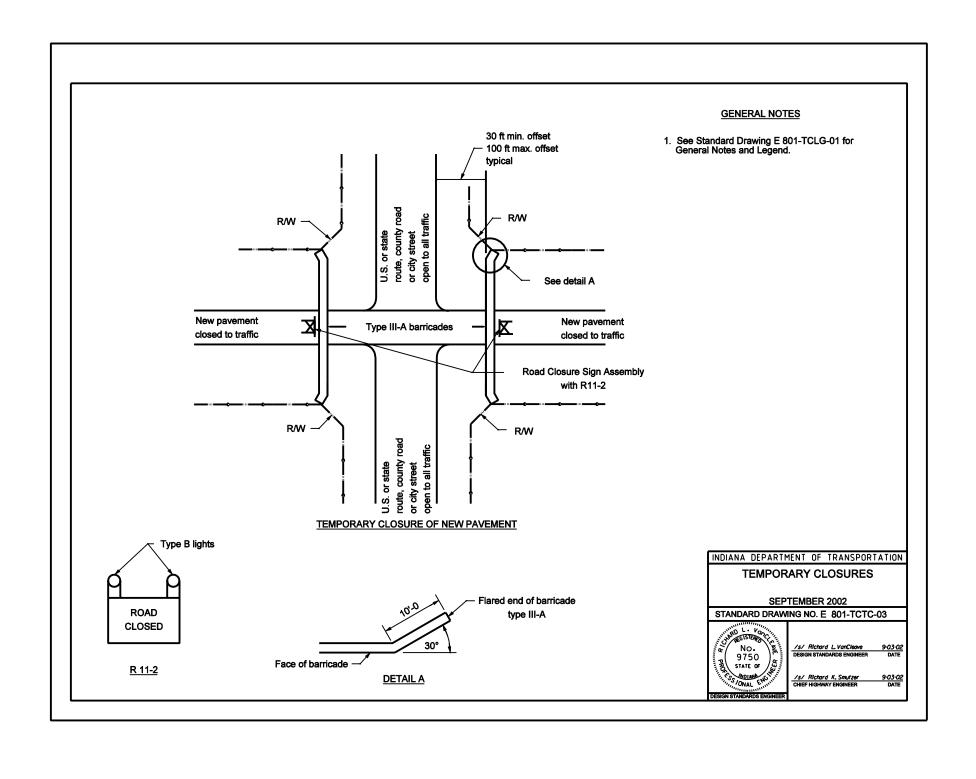


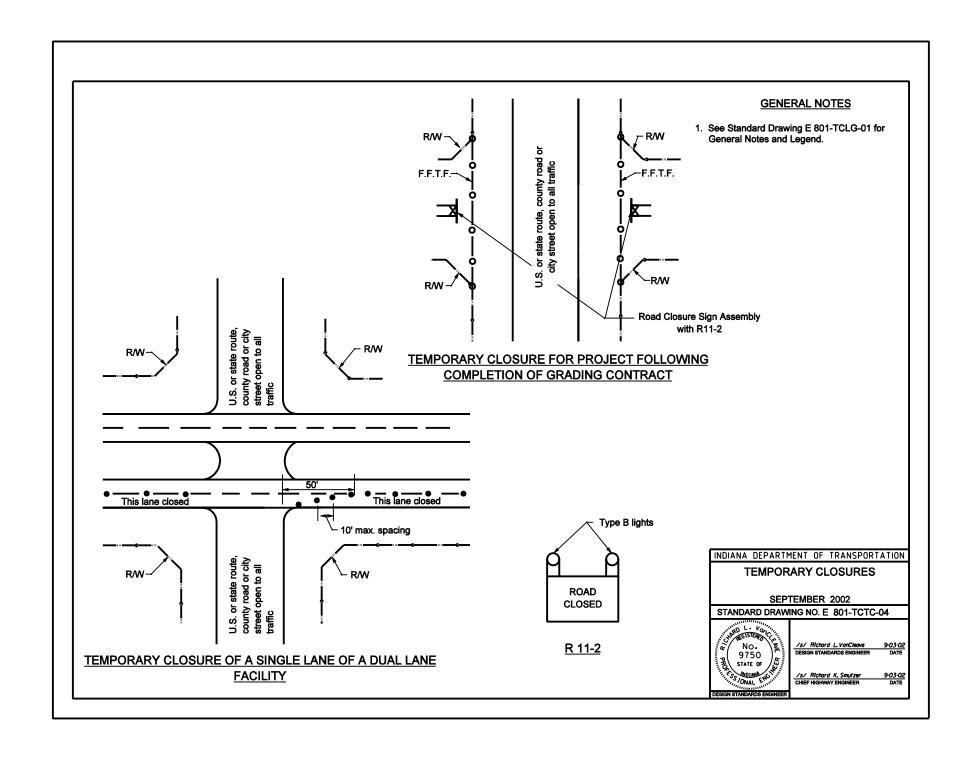


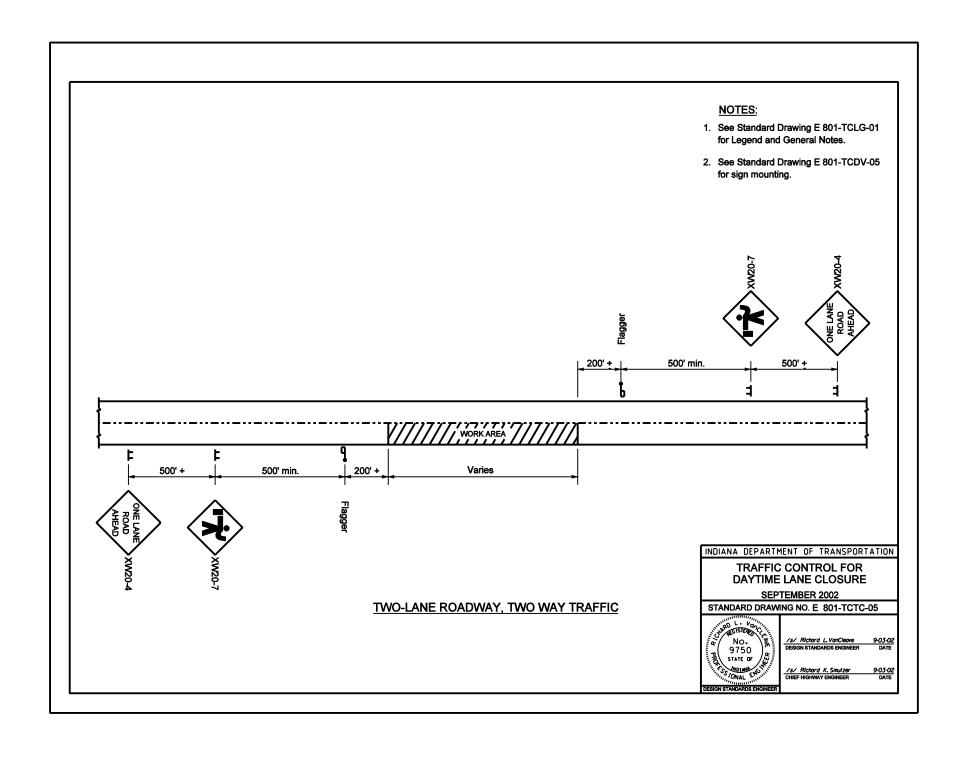
# GENERAL NOTES 1. See Standard Drawing E 801-TCLG-01 for General Notes and Legend.

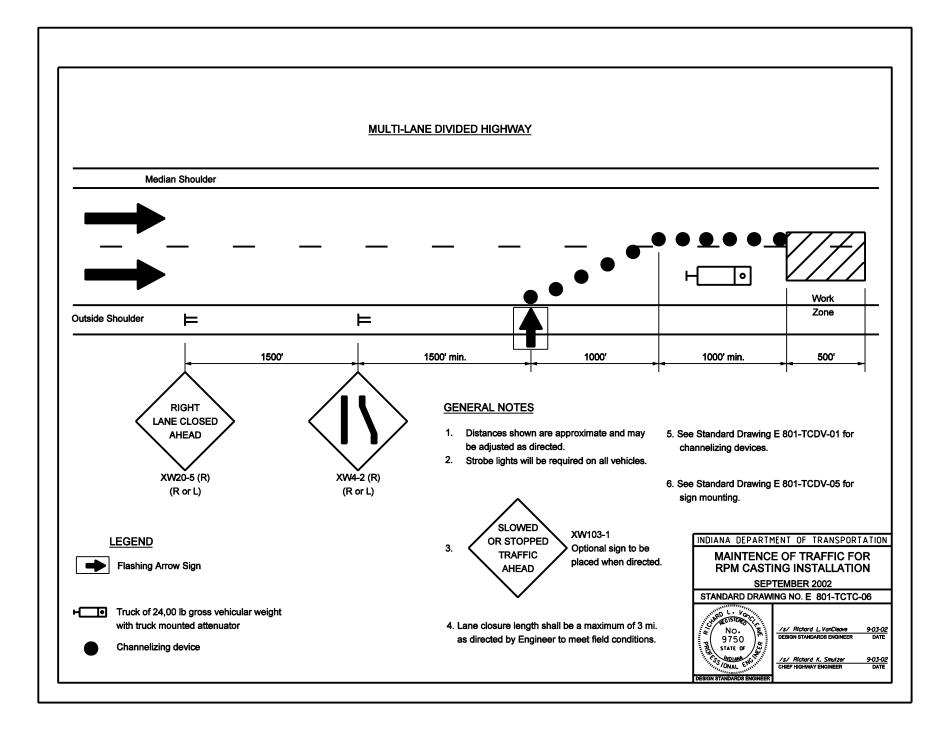


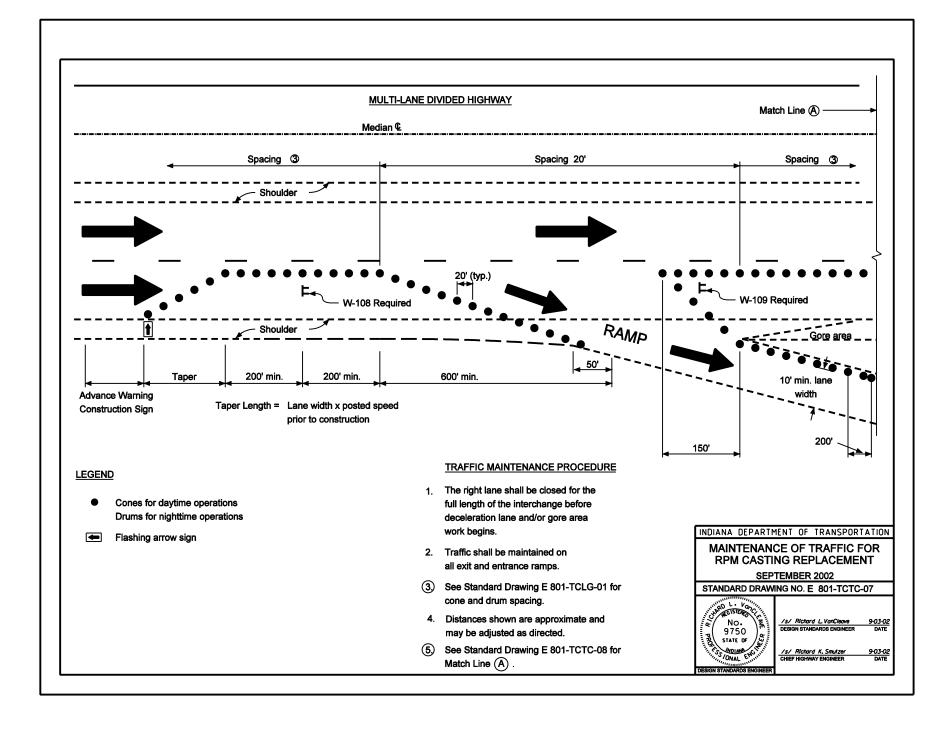


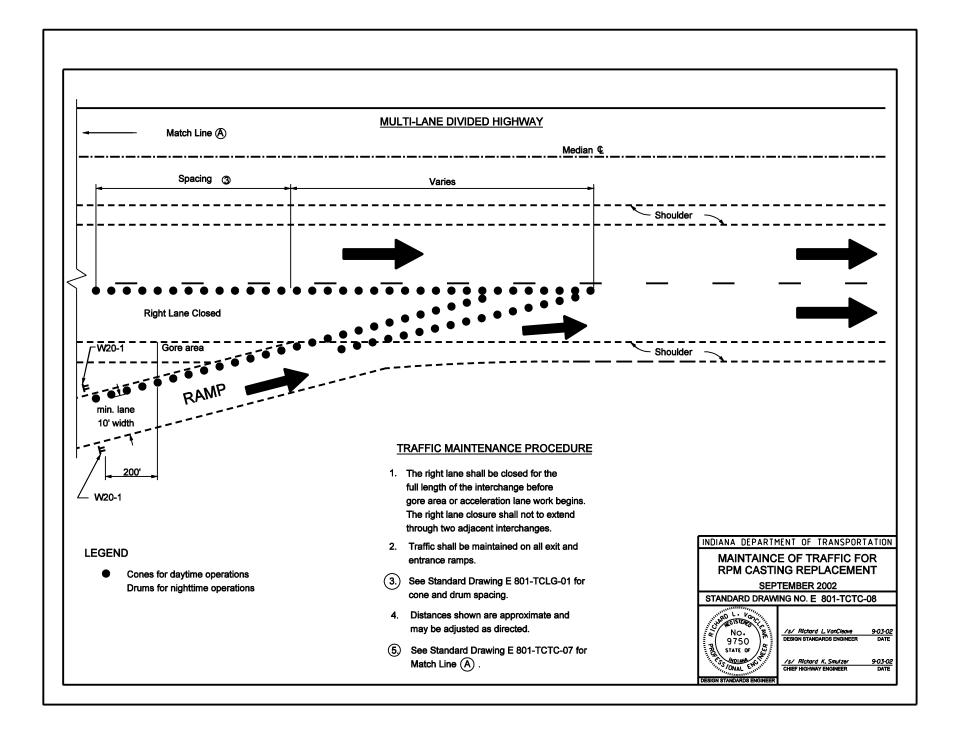


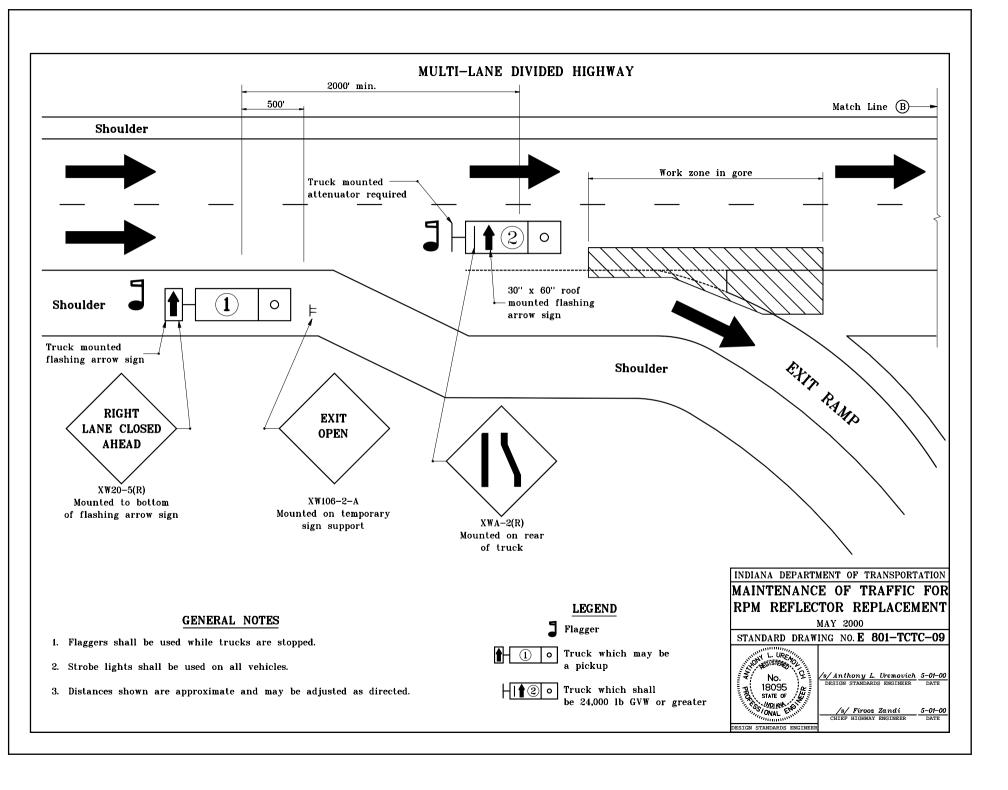


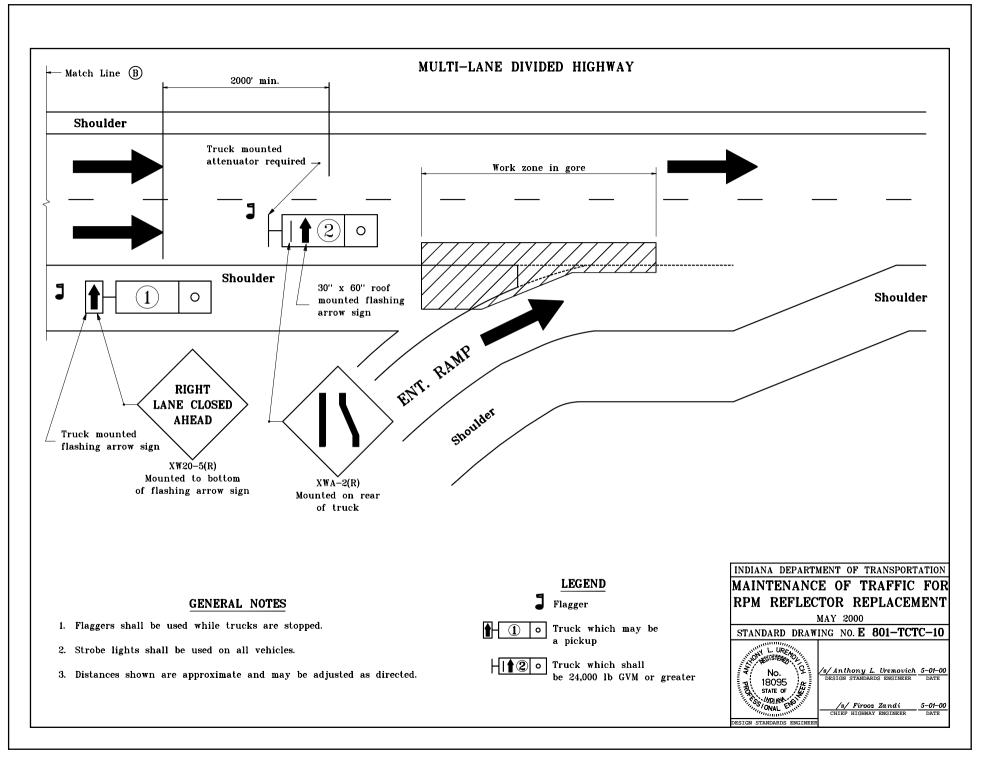






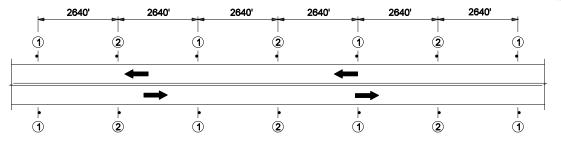






#### **GENERAL NOTES:**

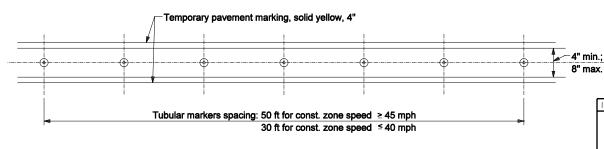
- 1. Signing pattern typical both sides of roadway, for each direction of travel.
- See Standard Drawing E 801-TCDV-01 for tubular marker details.



#### **LEGEND**

- 1 R4-1-B "Do Not Pass"
- 2 XW6-3 two-way traffic symbol
- Tubular markers

#### **CONSTRUCTION SIGNS LOCATION DETAIL**



TUBULAR MARKERS ALONG CENTERLINE OF PAVEMENT LAYOUT

TWO LANE, TWO WAY OPPOSING TRAFFIC

INDIANA DEPARTMENT OF TRANSPORTATION

#### TUBULAR MARKER DELINEATION

MARCH 2006

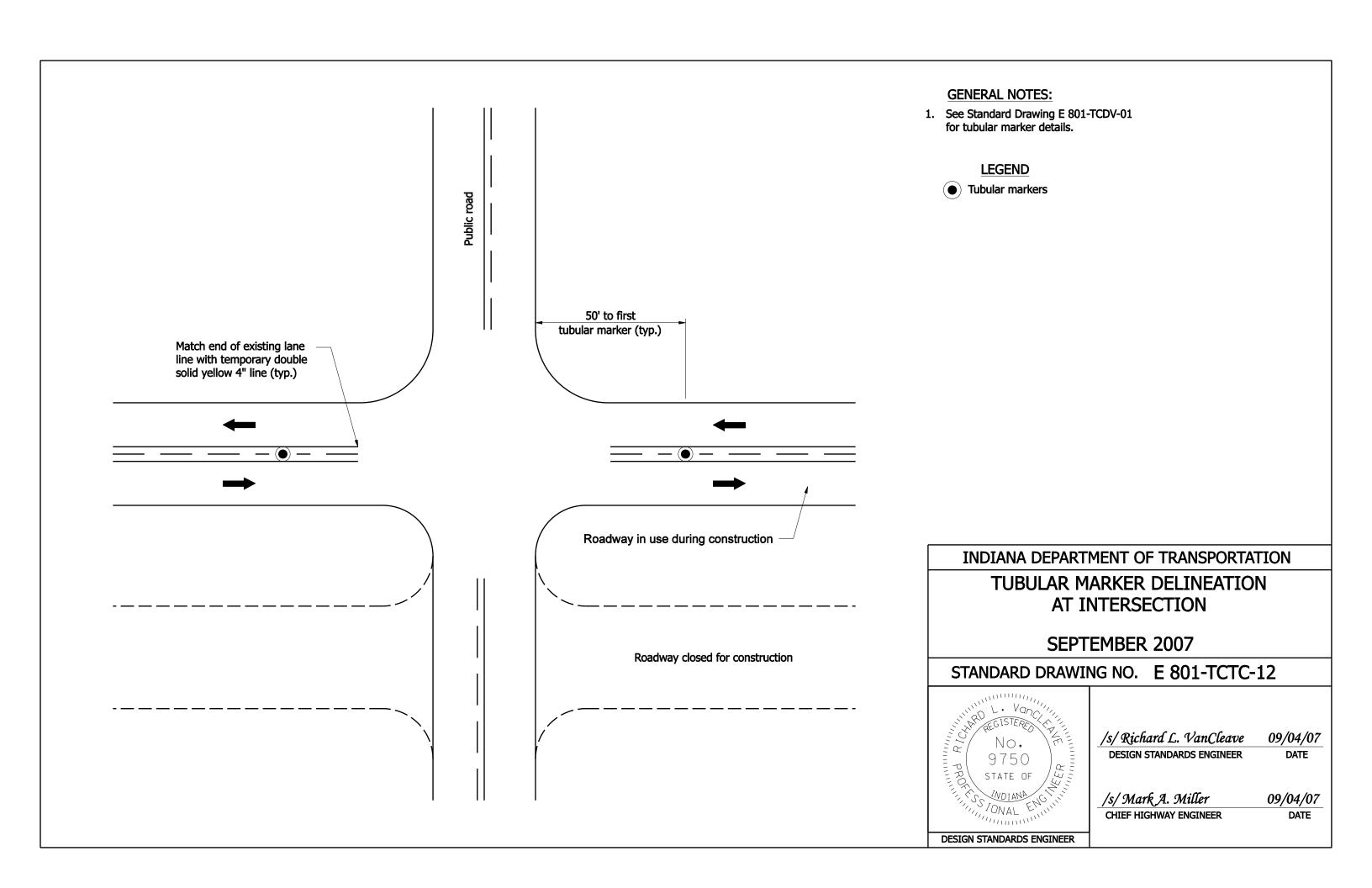
STANDARD DRAWING NO. E 801-TCTC-11

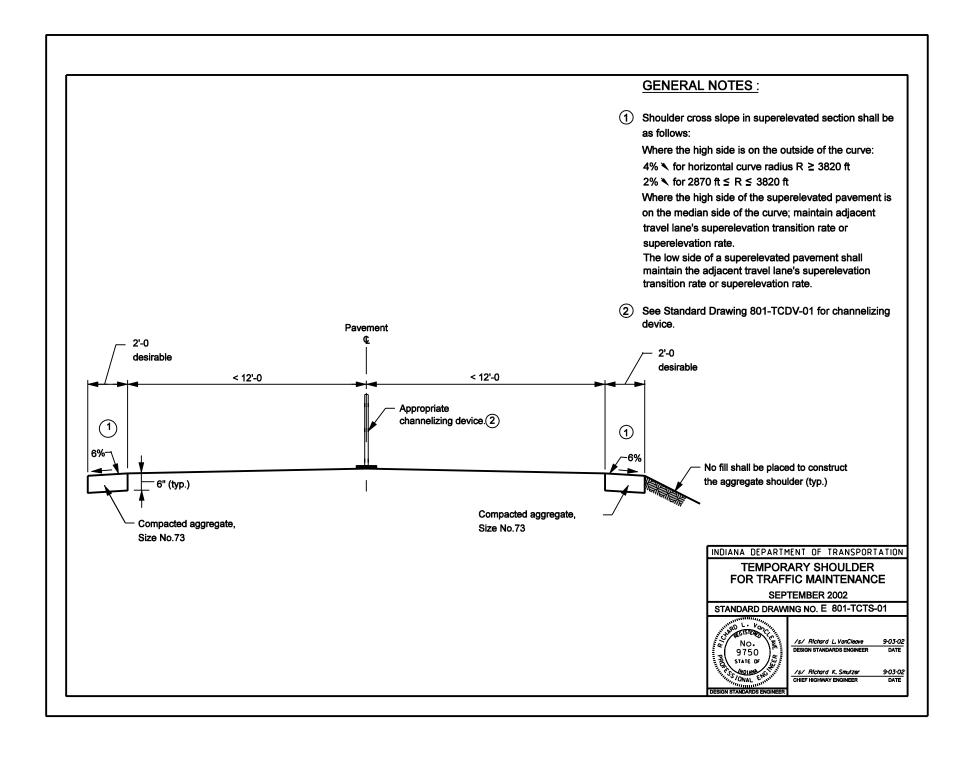


/s/ Richard L. VanCleave 3-0I-06
DESIGN STANDARDS ENGINEER DATE

ESIGN STANDARDS ENGINEER

/s/ Richard K. Smutzer 3-0/-C CHIEF HIGHWAY ENGINEER DAT





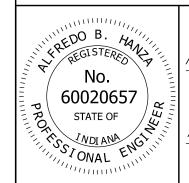
INDEX			
SHEET NO.	SUBJECT		
1	Index		
2	Plan & Elevation		
3	Truss Sections, Member Size Table		
4	Table of Dimensions, Spans 34' thru 81'		
5	Table of Dimensions, Spans 82' thru 130' & Camber		
6	Chord Connections and Weld Details		
7	Flange & Chord End Plate Details		
8	End Support Upper Chord Connection Details		
9	End Support Lower Chord Connection Details		
10	End Support Base Plate and I.D. Tag Details		
11	End Support Handhole, Top Cap, and J-Hook Details		
12	Anchor Plates, Anchor Bolts, and Metal Skirt Details		
13	Ladder Details		
14	Ladder Details		
15	Security Gate Details		
16	Walkway Grating Details		
17	Walkway Grating Details		
18	Walkway Grating Details		
19	Wiring Layout Details		
20	Spread Foundation at 33" Concrete Barrier Wall		
21	Spread Foundation at 45" Concrete Barrier Wall		
22	Spread Foundation at Median or Shoulder, 36" Height		
23	Spread Foundations Quantities		

#### INDIANA DEPARTMENT OF TRANSPORTATION

# DYNAMIC MESSAGE SIGN STRUCTURE DRAWING INDEX

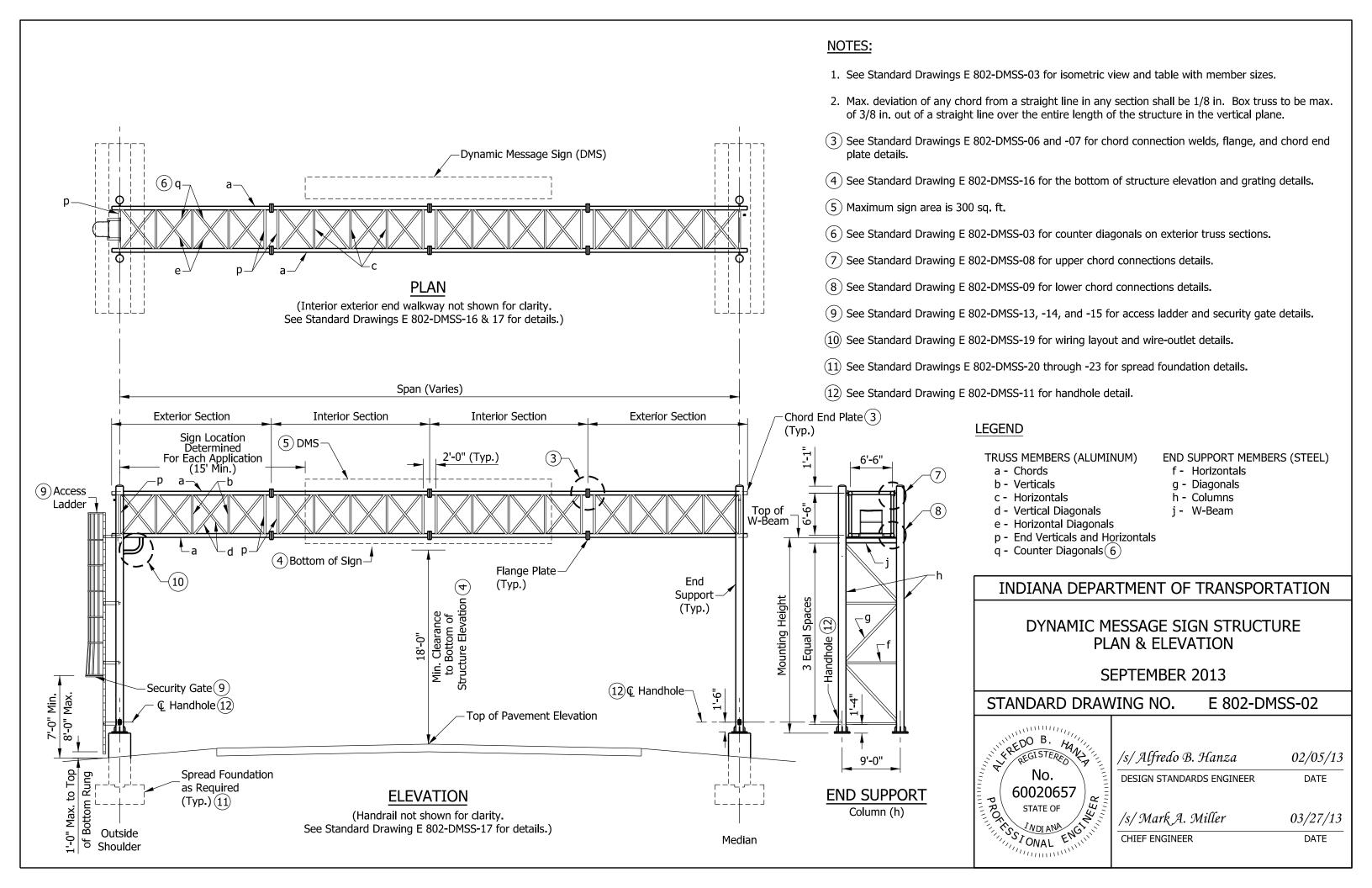
SEPTEMBER 2013

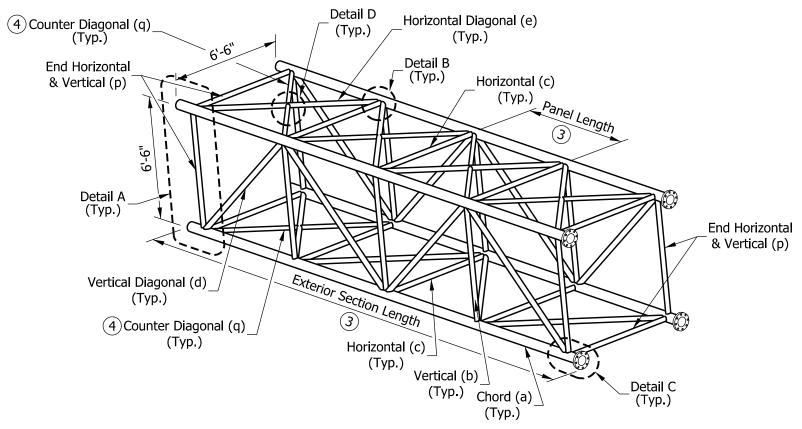
STANDARD DRAWING NO. E 802-DMSS-01



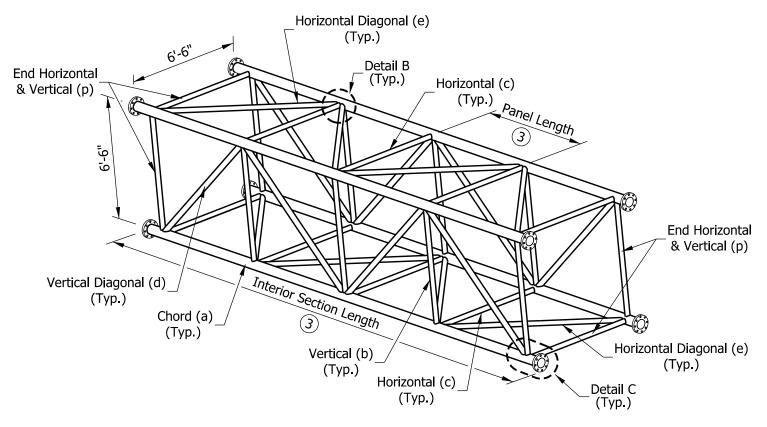
s/ Alfredo B. Hanza	02/05/1.
ESIGN STANDARDS ENGINEER	DATE

/s/ Mark A. Miller 03/27/13





#### TYPICAL EXTERIOR TRUSS SECTION



TYPICAL INTERIOR TRUSS SECTION

#### NOTES:

- 1. See Standard Drawing E 802-DMSS-06 for Details A through D.
- 2. Truss members to be aluminum. End support members to be steel. Steel pipe diameters shown in table are nominal pipe sizes.
- (3) Number of panels and sections varies. See Standard Drawing E 802-DMSS-04 and -05 for recommended dimensions.
- (4) Counter Diagonal (q) shall be provided in exterior sections at the top of each panel and at the bottom of end panel only as shown. It is not required in interior sections.
- 5. See Standard Drawing E 802-DMSS-02 for end support members.

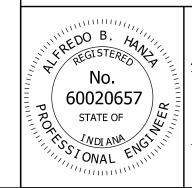
MAX. SPAN = 130 ft. MAX. SIGN AREA = 300 sq. ft. MAX. MOUNTING HEIGHT = 24'-6"				
ALUMINUM TR	USS MEN	/IBERS		
MEMBER	MARK	O.D. (IN.) x WALL THK. (IN.)		
CHORD	a	7 x 0.375		
VERTICAL	b	3 x 0.250		
HORIZONTAL	С	4 x 0.250		
VERTICAL DIAGONAL	d	3.5 x 0.500		
HORIZONTAL DIAGONAL	е	4 x 0.500		
END VERTICAL and HORIZONTAL	р	4 x 0.375		
COUNTER DIAGONAL (SEE NOTE 4)	q	2.5 x 0.500		
STEEL END-SUPPORT MEMBERS				
COLUMN	h	14 x 0.375		
HORIZONTAL	f	3.5 x 0.216		
DIAGONAL	g	4.5 x 0.438		
W-BEAM	j	W10 x 68		

#### INDIANA DEPARTMENT OF TRANSPORTATION

DYNAMIC MESSAGE SIGN STRUCTURE TRUSS SECTIONS, MEMBER SIZE TABLE

SEPTEMBER 2013

STANDARD DRAWING NO. E 802-DMSS-03



	/s/ Alfredo B. Hanza	02/05/13
	DESIGN STANDARDS ENGINEER	DATE
11	/s/ Mark A. Miller	03/27/13
	CHIEF ENGINEER	DATE

LENGTH, (FT)   SECTIONS   PER SECTION   END DIMEN,   LENGTH   LENGTH   LENGTH   SECTIONS   PER SECTION   LENGTH   LENGTH	DIMENSIONS FOR DINAMIC MESSAGE SIGN STRUCTURES (S4 TIRO 61)									
LENGTH, (FT)   SECTION   PER SECTION   END DIMEN.   LENGTH   LENGTH   SECTIONS   PER SECTION   LENGTH   LENGTH	SPAN	EXTERIOR SECTIONS						INTERIOR SE	ECTIONS	
34				1						SECTION LENGTH
35		1	6	6"	5'-6"	35'-6"	0			
36		1								
37		2								
38										
39										
41		2	3	6"	6'-0"	20'-3"	0			
42	40	2	3	6"	6'-2"	20'-9"	0			
43         2         4         6"         5'-0"         22'-3"         0           44         2         4         6"         5'-11/2"         22'-9"         0           45         2         4         6"         5'-3"         23'-3"         0           46         2         4         6"         5'-41/2"         23'-9"         0           47         2         4         6"         5'-6"         24'-3"         0           48         2         4         6"         5'-71/2"         24'-9"         0           49         2         4         6"         5'-10 1/2"         25'-9"         0           50         2         4         6"         5'-10 1/2"         25'-9"         0           51         2         4         6"         6'-0"         26'-3"         0           51         2         4         6"         6'-11/2"         25'-9"         0           52         2         4         6"         6'-11/2"         25'-9"         0           53         2         4         6"         6'-11/2"         27'-3"         0           54         2	41	2	3	6"	6'-4"	21'-3"	0			
44         2         4         6"         S'-1 1/2"         22'-9"         0           45         2         4         6"         5'-3"         0         0           46         2         4         6"         5'-6"         24'-3"         0           47         2         4         6"         5'-6"         24'-3"         0           48         2         4         6"         5'-71/2"         24'-9"         0           49         2         4         6"         5'-9"         25'-3"         0           50         2         4         6"         5'-10 1/2"         25'-9"         0           51         2         4         6"         6'-0"         26'-3"         0           52         2         4         6"         6'-11/2"         26'-9"         0           53         2         4         6"         6'-3"         27'-3"         0           54         2         4         6"         6'-4"         22'-9"         0           55         2         4         6"         6'-6"         28'-3"         0           55         2         5 <td< td=""><td>42</td><td>2</td><td>3</td><td></td><td></td><td></td><td>0</td><td></td><td></td><td></td></td<>	42	2	3				0			
45		2	4				0			
46       2       4       6"       5'-4 1/2"       23'-9"       0         47       2       4       6"       5'-6"       24'-3"       0         48       2       4       6"       5'-7 1/2"       24'-9"       0         49       2       4       6"       5'-9"       25'-3"       0         50       2       4       6"       5'-10 1/2"       25'-9"       0         51       2       4       6"       6'-0"       26'-3"       0         51       2       4       6"       6'-11/2"       25'-9"       0         52       2       4       6"       6'-11/2"       26'-9"       0         53       2       4       6"       6'-11/2"       27'-3"       0         54       2       4       6"       6'-41/2"       27'-9"       0         55       2       4       6"       6'-6"       28'-3"       0         55       2       4       6"       6'-6"       28'-3"       0         55       2       4       6"       6'-6"       28'-3"       0         55       5       51/4"       <			4							
47         2         4         6"         5"-6"         24"-3"         0           48         2         4         6"         5"-71/2"         24"-9"         0           49         2         4         6"         5"-9"         25"-3"         0           50         2         4         6"         5"-10 1/2"         25"-9"         0           51         2         4         6"         6"-0"         26"-3"         0           52         2         4         6"         6"-11/2"         26"-9"         0           53         2         4         6"         6"-3"         27"-3"         0           54         2         4         6"         6"-41/2"         27"-9"         0           55         2         4         6"         6"-6"         28"-3"         0           55         2         4         6"         6"-6"         28"-3"         0           55         2         4         6"         5"-41/2"         27"-9"         0           55         2         4         6"         5"-41/2"         27"-9"         0           55         5 1/4"         5"-			4				0			
48         2         4         6"         5'-71/2"         24'-9"         0           49         2         4         6"         5'-9"         25'-3"         0           50         2         4         6"         5'-10 1/2"         25'-9"         0           51         2         4         6"         6'-0"         26'-3"         0           52         2         4         6"         6'-11/2"         26'-9"         0           53         2         4         6"         6'-41/2"         27'-9"         0           54         2         4         6"         6'-41/2"         27'-9"         0           55         2         4         6"         6'-41/2"         27'-9"         0           55         2         4         6"         6'-6"         28'-3"         0           55         2         4         6"         6'-41/2"         27'-9"         0           55         2         4         6"         6'-41/2"         29'-9"         0           57         2         5         5 1/4"         5'-3 3/4"         28'-9"         0           58         2										
49         2         4         6"         5'-9"         25'-3"         0           50         2         4         6"         5'-10 1/2"         25'-9"         0           51         2         4         6"         6'-0"         26'-3"         0           52         2         4         6"         6'-1 1/2"         26'-9"         0           53         2         4         6"         6'-3"         27'-3"         0           54         2         4         6"         6'-41/2"         27'-9"         0           55         2         4         6"         6'-41/2"         27'-9"         0           55         2         4         6"         6'-41/2"         27'-9"         0           55         2         4         6"         6'-6"         28'-3"         0           55         2         4         6"         6'-6"         28'-3"         0           55         5         5 1/4"         5'-3 3/4"         28'-9"         0           57         2         5         6 1/4"         5'-4 3/4"         29'-3"         0           58         2         5			4							
50         2         4         6"         5'-10 1/2"         25'-9"         0           51         2         4         6"         6'-0"         26'-3"         0           52         2         4         6"         6'-1/2"         26'-9"         0           53         2         4         6"         6'-3"         27'-3"         0           54         2         4         6"         6'-4 1/2"         27'-9"         0           55         2         4         6"         6'-6"         28'-3"         0           55         2         4         6"         6'-6"         28'-3"         0           56         2         5         5 1/4"         5'-3 3/4"         29'-3"         0           57         2         5         6 1/4"         5'-4 3/4"         29'-3"         0           58         2         5         6"         5'-6"         29'-9"         0           59         2         5         5 3/4"         5'-7 1/4"         30'-3"         0           60         2         5         5 1/2"         5'-9 1/2"         31'-3"         0           61         2 <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>			-							
51         2         4         6"         6-0"         26-3"         0           52         2         4         6"         6-1 1/2"         26-9"         0           53         2         4         6"         6-3"         27-3"         0           54         2         4         6"         6-4 1/2"         27-9"         0           55         2         4         6"         6-6"         28-3"         0           56         2         5         5 1/4"         5'-3 3/4"         28-9"         0           57         2         5         6 1/4"         5'-4 3/4"         29-3"         0           58         2         5         6"         5'-6"         29-9"         0           58         2         5         5 3/4"         5'-1/4"         30'-3"         0           59         2         5         5 3/4"         5'-7 1/4"         30'-3"         0           60         2         5         5 1/2"         5'-8 1/2"         30'-9"         0           61         2         5         6 1/2"         5'-9 1/2"         31'-3"         0           62         2										
52         2         4         6"         6'-1 1/2"         26'-9"         0           53         2         4         6"         6'-3"         27'-3"         0           54         2         4         6"         6'-4 1/2"         27'-9"         0           55         2         4         6"         6'-6"         28'-3"         0           56         2         5         5 1/4"         5'-3 3/4"         28'-9"         0           56         2         5         6 1/4"         5'-4 3/4"         29'-3"         0           57         2         5         6 1/4"         5'-4 3/4"         29'-3"         0           58         2         5         6'"         5'-6"         29'-9"         0           59         2         5         5 3/4"         5'-7 1/4"         30'-3"         0           60         2         5         5 1/2"         5'-8 1/2"         30'-9"         0           61         2         5         6 1/2"         5'-9 1/2"         31'-3"         0           62         2         5         6 1/4"         5'-10 3/4"         31'-9"         0           6			-							
53         2         4         6"         6'-3"         27'-3"         0           54         2         4         6"         6'-4 1/2"         27'-9"         0           55         2         4         6"         6'-6"         28'-3"         0           56         2         5         5 1/4"         5'-3 3/4"         28'-9"         0           57         2         5         6 1/4"         5'-4 3/4"         29'-3"         0           58         2         5         6 1/4"         5'-4 3/4"         29'-9"         0           58         2         5         6''         5'-6"         29'-9"         0           59         2         5         5 3/4"         5'-7 1/4"         30'-3"         0           60         2         5         5 1/2"         5'-8 1/2"         30'-9"         0           61         2         5         6 1/4"         5'-10 3/4"         31'-3"         0           62         2         5         6 1/4"         5'-10 3/4"         31'-9"         0           63         2         5         6"         6'-0"         32'-3"         0           64 </td <td></td> <td></td> <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>			•							
54         2         4         6"         6'-4 1/2"         27'-9"         0           55         2         4         6"         6'-6"         28'-3"         0           56         2         5         5 1/4"         5'-3 3/4"         28'-9"         0           57         2         5         6 1/4"         5'-4 3/4"         29'-9"         0           58         2         5         6"         5'-6"         29'-9"         0           59         2         5         5 3/4"         5'-7 1/4"         30'-3"         0           60         2         5         5 1/2"         5'-8 1/2"         30'-9"         0           61         2         5         6 1/2"         5'-9 1/2"         31'-3"         0           62         2         5         6 1/2"         5'-9 1/2"         31'-3"         0           63         2         5         6 1/4"         5'-10 3/4"         31'-9"         0           64         2         5         6"         6'-0"         32'-3"         0           65         2         5         5 3/4"         6'-1 1/4"         32'-9"         0 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>										
55         2         4         6"         6'-6"         28'-3"         0           56         2         5         51/4"         5'-3 3/4"         28'-9"         0           57         2         5         6 1/4"         5'-4 3/4"         29'-3"         0           58         2         5         6'         5'-6"         29'-9"         0           58         2         5         6"         5'-6"         29'-9"         0           59         2         5         5 3/4"         5'-7 1/4"         30'-3"         0           60         2         5         5 1/2"         5'-8 1/2"         30'-9"         0           61         2         5         6 1/2"         5'-9 1/2"         31'-3"         0           62         2         5         6 1/4"         5'-10 3/4"         31'-9"         0           63         2         5         6"         6'-0"         32'-3"         0           64         2         5         5 3/4"         6'-1 1/4"         32'-9"         0           65         2         5         5 1/2"         6'-2 1/2"         33'-3"         0           66<										
56         2         5         5 1/4"         5'-3 3/4"         28'-9"         0           57         2         5         6 1/4"         5'-4 3/4"         29'-3"         0           58         2         5         6"         5'-6"         29'-9"         0           59         2         5         5 3/4"         5'-7 1/4"         30'-3"         0           60         2         5         5 1/2"         5'-8 1/2"         30'-9"         0           61         2         5         6 1/2"         5'-9 1/2"         31'-3"         0           62         2         5         6 1/4"         5'-10 3/4"         31'-9"         0           63         2         5         6'-0"         32'-3"         0           64         2         5         5 3/4"         6'-1 1/4"         32'-9"         0           65         2         5         5 1/2"         6'-2 1/2"         33'-3"         0           66         2         5         5 1/4"         6'-3 3/4"         33'-9"         0           66         2         5         5 1/4"         6'-5"         34'-3"         0           68			-							
57         2         5         6 1/4"         5'-4 3/4"         29'-3"         0           58         2         5         6"         5'-6"         29'-9"         0           59         2         5         5 3/4"         5'-7 1/4"         30'-3"         0           60         2         5         5 1/2"         5'-8 1/2"         30'-9"         0           61         2         5         6 1/2"         5'-9 1/2"         31'-3"         0           62         2         5         6 1/4"         5'-10 3/4"         31'-9"         0           63         2         5         6'-0"         32'-3"         0           64         2         5         5 3/4"         6'-1 1/4"         32'-9"         0           65         2         5         5 1/2"         6'-2 1/2"         33'-3"         0           66         2         5         5 1/4"         6'-3 3/4"         33'-9"         0           67         2         5         5 1/4"         6'-5"         34'-3"         0           68         2         5         6"         6'-6"         34'-9"         0	55									
58         2         5         6"         5'-6"         29'-9"         0           59         2         5         53/4"         5'-71/4"         30'-3"         0           60         2         5         51/2"         5'-81/2"         30'-9"         0           61         2         5         61/2"         5'-91/2"         31'-3"         0           62         2         5         61/4"         5'-103/4"         31'-9"         0           63         2         5         6"         6'-0"         32'-3"         0           64         2         5         53/4"         6'-11/4"         32'-9"         0           65         2         5         51/2"         6'-21/2"         33'-3"         0           66         2         5         51/4"         6'-33/4"         33'-9"         0           67         2         5         5"         6'-5"         34'-3"         0           68         2         5         6"         6'-6"         34'-9"         0	56									
59         2         5         5 3/4"         5'-7 1/4"         30'-3"         0           60         2         5         5 1/2"         5'-8 1/2"         30'-9"         0           61         2         5         6 1/2"         5'-9 1/2"         31'-3"         0           62         2         5         6 1/4"         5'-10 3/4"         31'-9"         0           63         2         5         6"         6'-0"         32'-3"         0           64         2         5         5 3/4"         6'-1 1/4"         32'-9"         0           65         2         5         5 1/2"         6'-2 1/2"         33'-3"         0           66         2         5         5 1/4"         6'-3 3/4"         33'-9"         0           67         2         5         5"         6'-5"         34'-3"         0           68         2         5         6"         6'-6"         34'-9"         0										
60     2     5     5 1/2"     5'-8 1/2"     30'-9"     0       61     2     5     6 1/2"     5'-9 1/2"     31'-3"     0       62     2     5     6 1/4"     5'-10 3/4"     31'-9"     0       63     2     5     6"     6'-0"     32'-3"     0       64     2     5     5 3/4"     6'-1 1/4"     32'-9"     0       65     2     5     5 1/2"     6'-2 1/2"     33'-3"     0       66     2     5     5 1/4"     6'-3 3/4"     33'-9"     0       67     2     5     5"     6'-5"     34'-3"     0       68     2     5     6"     6'-6"     34'-9"     0										
61     2     5     6 1/2"     5'-9 1/2"     31'-3"     0       62     2     5     6 1/4"     5'-10 3/4"     31'-9"     0       63     2     5     6"     6'-0"     32'-3"     0       64     2     5     5 3/4"     6'-1 1/4"     32'-9"     0       65     2     5     5 1/2"     6'-2 1/2"     33'-3"     0       66     2     5     5 1/4"     6'-3 3/4"     33'-9"     0       67     2     5     5"     6'-5"     34'-3"     0       68     2     5     6"     6'-6"     34'-9"     0										
62     2     5     6 1/4"     5'-10 3/4"     31'-9"     0       63     2     5     6"     6'-0"     32'-3"     0       64     2     5     5 3/4"     6'-1 1/4"     32'-9"     0       65     2     5     5 1/2"     6'-2 1/2"     33'-3"     0       66     2     5     5 1/4"     6'-3 3/4"     33'-9"     0       67     2     5     5"     6'-5"     34'-3"     0       68     2     5     6"     6'-6"     34'-9"     0										
63     2     5     6"     6'-0"     32'-3"     0       64     2     5     53/4"     6'-1 1/4"     32'-9"     0       65     2     5     5 1/2"     6'-2 1/2"     33'-3"     0       66     2     5     5 1/4"     6'-3 3/4"     33'-9"     0       67     2     5     5"     6'-5"     34'-3"     0       68     2     5     6"     6'-6"     34'-9"     0										
64     2     5     5 3/4"     6'-1 1/4"     32'-9"     0       65     2     5     5 1/2"     6'-2 1/2"     33'-3"     0       66     2     5     5 1/4"     6'-3 3/4"     33'-9"     0       67     2     5     5"     6'-5"     34'-3"     0       68     2     5     6"     6'-6"     34'-9"     0				6"						
65     2     5     5 1/2"     6'-2 1/2"     33'-3"     0       66     2     5     5 1/4"     6'-3 3/4"     33'-9"     0       67     2     5     5"     6'-5"     34'-3"     0       68     2     5     6"     6'-6"     34'-9"     0				-						
66     2     5     5 1/4"     6'-3 3/4"     33'-9"     0       67     2     5     5"     6'-5"     34'-3"     0       68     2     5     6"     6'-6"     34'-9"     0										
67     2     5     5"     6'-5"     34'-3"     0       68     2     5     6"     6'-6"     34'-9"     0										
68 2 5 6" 6'-6" 34'-9" 0			5	5"						
69 2 4 6" 5'-4" 23'-7" 1 4 5'-4" 23'-6	69			6"	5'-4"	23'-7"		4	5'-4"	23'-4"
										23'-8"
71 2 4 6" 5'-6" 24'-3" 1 4 5'-6" 24'-	71						1			24'-0"
72 2 4 6" 5'-7" 24'-7" 1 4 5'-7" 24'-4	72			6"	5'-7"					24'-4"
73 2 4 6" 5'-8" 24'-11" 1 4 5'-8" 24'-6				6"		24'-11"				24'-8"
74 2 4 6" 5"-9" 25'-3" 1 4 5"-9" 25'-6"	74			6"			1			25'-0"
75 2 4 6" 5'-10" 25'-7" 1 4 5'-10" 25'-4		2	4				1	4		25'-4"
			4				1	4		25'-8"
			4							26'-0"
								4		26'-4"
			4				_	4		26'-8"
										27'-0"
81 2 4 6" 6'-4" 27'-7" 1 4 6'-4" 27'-4	81	2	4	6"	6'-4"	27'-7"	1 1	4	6'-4"	27'-4"

DIMENSIONS FOR DYNAMIC MESSAGE SIGN STRUCTURES (34' THRU 81')

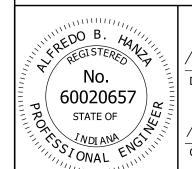
#### NOTES:

- 1. The table of dimensions for a dynamic message sign structure is divided and put on two Standard Drawings E 802-DMSS-04 and -05. the table shows dimensions with all sections requirements accounted for.
- 2. All panels on a truss shall be the same length. The minimum panel length for all trusses is 5'-0" and the maximum is 6'-6".
- 3. A single interior section in a truss shall have an even number of panels to maintain the pattern of the vertical diagonals.
- 4. Use minimum number of sections for each truss, keeping the maximum section length at 35'-6".
- 5. See Standard Drawing E 802-DMSS-05 for required camber.

#### INDIANA DEPARTMENT OF TRANSPORTATION

DYNAMIC MESSAGE SIGN STRUCTURE
TABLE OF DIMENSIONS
SPANS 34' THRU 81'
SEPTEMBER 2013

STANDARD DRAWING NO. E 802-DMSS-04

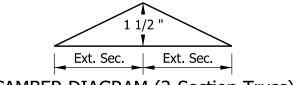


 $\frac{/s/Alfredo\ B.\ Hanza}{\text{DESIGN STANDARDS ENGINEER}} \frac{02/05/13}{\text{DATE}}$ 

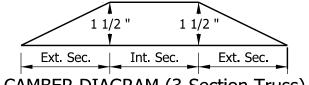
/s/ Mark A. Miller 03/27/13

DIMENSIONS FOR DYNAMIC MESSAGE SIGN STRUCTURES (82' THRU 130')									
SPAN	EXTERIOR SECTIONS					INTERIOR SE	CTIONS		
SPAN-TRUSS LENGTH, (FT)	NO. OF EXT. SECTIONS	NO. OF PANELS PER SECTION	VARIABLE END DIMEN.	PANEL LENGTH	SECTION LENGTH	NO. OF INT. SECTIONS	NO. OF PANELS PER SECTION	PANEL LENGTH	SECTION LENGTH
82	2	4	6"	6'-5"	27'-11"	1	4	6'-5"	27'-8"
83	2	4	6"	6'-6"	28'-3"	1 1	4	6'-6"	28'-0"
84	2	5	5 3/4"	5'-7 3/4"	30'-5 1/2"	1	4	5'-7 3/4"	24'-7"
85	2	5	6 1/2"	5'-8 1/2"	30'-10"	1	4	5'-8 1/2"	24'-10"
86	2	5	5 1/2"	5'-9 1/2"	31'-2"	1	4	5'-9 1/2"	25'-2"
87	2	5	6 1/4"	5'-10 1/4"	31'-6 1/2"	1	4	5'-10 1/4"	25'-5"
88	2	5	7"	5'-11"	31'-11"	1	4	5'-11"	25'-8"
89	2	5	6"	6'-0"	32'-3"	1 1	4	6'-0"	26'-0"
90	2	5	5"	6'-1" 6'-1 3/4"	32'-7"	1	4	6'-1"	26'-4"
91 92	2 2	<u> </u>	5 3/4" 6 1/2"	6'-2 1/2"	32'-11 1/2" 33'-4"	1 1	4	6'-1 3/4" 6'-2 1/2"	26'-7" 26'-10"
93	2	<u>5</u> 5	5 1/2"	6'-3 1/2"	33'-8"	1 1	4	6'-3 1/2"	20-10 27'-2"
94	2	<u>5</u>	6 1/4"	6'-4 1/4"	34'-0 1/2"	1 1	4	6'-4 1/4"	27'-5"
95	2	<u>5</u>	5 1/4"	6'-5 1/4"	34'-4 1/2"	1 1	4	6'-5 1/4"	27'-9"
96	2	5	6"	6'-6"	34'-9"	1	4	6'-6"	28'-0"
97	2	4	6"	5'-7 1/2"	24'-9"	2	4	5'-7 1/2"	24'-6"
98	2	4	6"	5'-8 1/4"	25'-0"	2	4	5'-8 1/4"	24'-9"
99	2	4	6"	5'-9"	25'-3"	2	4	5'-9"	25'-0"
100	2	4	6"	5'-9 3/4"	25'-6"	2	4	5'-9 3/4"	25'-3"
101	2	4	6"	5'-10 1/2"	25'-9"	2	4	5'-10 1/2"	25'-6"
102	2	4	6"	5'-11 1/4"	26'-0"	2	4	5'-11 1/4"	25'-9"
103	2	4	6"	6'-0"	26'-3"	2	4	6'-0"	26'-0"
104	2	4	6"	6'-0 3/4" 6'-1 1/2"	26'-6"	2	4	6'-0 3/4" 6'-1 1/2"	26'-3"
105 106	2 2	<u>4</u> 4	6" 6"	6'-2 1/4"	26'-9" 27'-0"	2	4	6'-2 1/4"	26'-6" 26'-9"
106	2	<del>4</del> 4	6"	6'-3"	27-0 27'-3"	2 2	4	6'-3"	26 <i>-</i> 9 27'-0"
107	2	4	6"	6'-3 3/4"	27'-6"	2	4	6'-3 3/4"	27'-3"
109	2	4	6"	6'-4 1/2"	27'-9"	2	4	6'-4 1/2"	27'-6"
110	2	 4	6"	6'-5 1/4"	28'-0"	2	4	6'-5 1/4"	27'-9"
111	2	4	6"	6'-6"	28'-3"	2	4	6'-6"	28'-0"
112	2	5	6"	5'-3"	28'-6"	2	5	5'-3"	28'-3"
113	2	5	7"	5'-3 1/2"	28'-9 1/2"	2	5	5'-3 1/2"	28'-5 1/2"
114	2	5	5 1/2"	5'-4 1/4"	28'-11 3/4"	2	5	5'-4 1/4"	28'-9 1/4"
115	2	5	6 1/2"	5'-4 3/4"	29'-3 1/4"	2	5	5'-4 3/4"	28'-11 3/4"
116	2	5	5"	5'-5 1/2"	29'-5 1/2"	2	5	5'-5 1/2"	29'-3 1/2"
117	2	5	6"	5'-6" 5'-6 1/2"	29'-9"	2	5	5'-6" 5'-6 1/2"	29'-6" 29'-8 1/2"
118 119	2 2	<u> </u>	5" 5 1/2"	5-6 1/2"	29'-10 1/2" 30'-2 3/4"	2	5 5	5'-7 1/4"	30'-0 1/4"
120	2	<u> </u>	6 1/2"	5'-7 3/4"	30'-6 1/4"	2 2	5	5'-7 3/4"	30'-2 3/4"
120	2	<u>5</u>	5"	5'-8 1/2"	30'-8 1/2"	2	5	5'-8 1/2"	30'-6 1/2"
122	2	<u>5</u>	6"	5'-9"	31'-0"	2	5	5'-9"	30'-9"
123	2	5	7"	5'-9 1/2"	31'-3 1/2"	2	5	5'-9 1/2"	30'-11 1/2"
124	2	<u>5</u>	5 1/2"	5'-10 1/4"	31'-5 3/4"	2	5	5'-10 1/4"	31'-3 1/4"
125	2	5	6 1/2"	5'-10 3/4"	31'-9 1/4"	2	5	5'-10 3/4"	31'-5 3/4"
126	2	5	5"	5'-11 1/2"	31' -11 1/2"	2	5	5'-11 1/2"	31'-9 1/2"
127	2	5	6"	6'-0"	32'-3"	2	5	6'-0"	32'-0"
128	2	5	7"	6'-0 1/2"	32'-6 1/2"	2	5	6'-0 1/2"	32'-2 1/2"
129	2	5	5 1/2"	6'-1 1/4"	32'-8 3/4"	2	5	6'-1 1/4"	32'-6 1/4"
130	2	5	6 1/2"	6'-1 3/4"	33'-0 1/4"	2	5	6'-1 3/4"	32'-8 3/4"

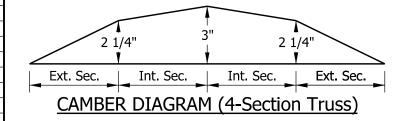
- 1. Camber diagrams to build truss structures with 2 to 4 sections are shown. Cambers shown are for fabrication only and are measured with trusses fully supported at no-load conditions. Allowable camber tolerance for truss is 25% of specific camber value.
- 2. See Standard Drawing E 805-DMSS-04 for additional notes.



#### **CAMBER DIAGRAM (2-Section Truss)**



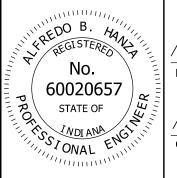
#### **CAMBER DIAGRAM (3-Section Truss)**



#### INDIANA DEPARTMENT OF TRANSPORTATION

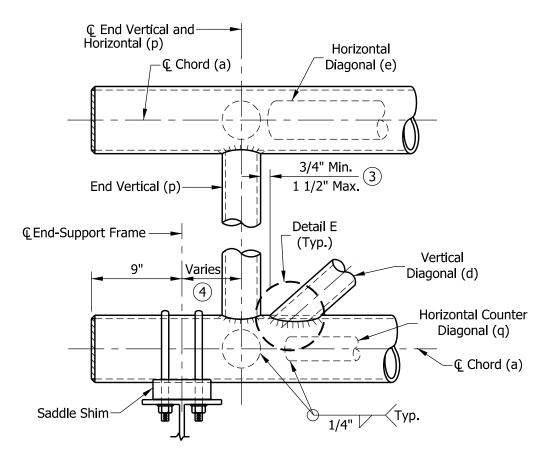
DYNAMIC MESSAGE SIGN STRUCTURE
TABLE OF DIMENSIONS
SPANS 82' THRU 130' & CAMBER
SEPTEMBER 2013

STANDARD DRAWING NO. E 802-DMSS-05

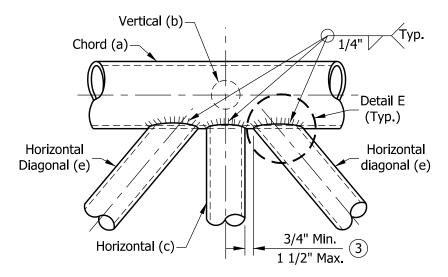


/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE

/s/ Mark A. Miller 03/27/13

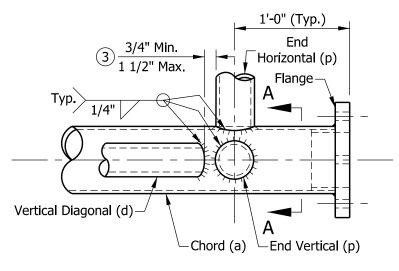


DETAIL A
EXTERIOR SECTION AT END-SUPPORT

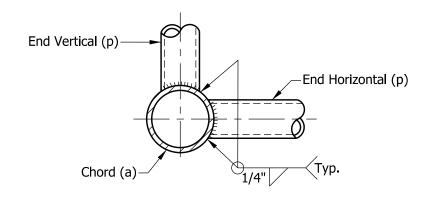


<u>DETAIL B</u>

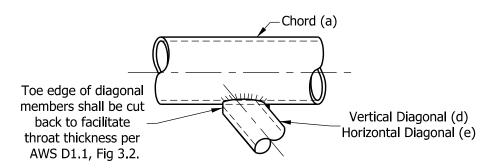
TYPICAL PANEL CONNECTION
PLAN VIEW



DETAIL C
CHORD AT FLANGE CONNECTION
PLAN VIEW

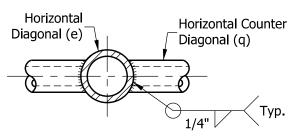


SECTION A-A
TYPICAL JOINT DETAILS



DETAIL E

- 1. All bracing members shall be machined to provide a snug fit to the chord along the entire edge of bracing members before welding.
- 2. See Standard Drawing E 802-DMSS-03 for member locations and sizes.
- 3 Vertical and horizontal diagonals shall be detailed for minimum offset from the panel point based on the following: offset shall be such as to provide a 3/4" minimum to 1 1/2" maximum clearance between any diagonal and any horizontal or vertical member; and provide clearance for U-bolt connection for signs.
- For variable end dimension, Standard Drawings E 802-DMSS-04 and



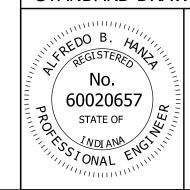
DETAIL D

#### INDIANA DEPARTMENT OF TRANSPORTATION

# DYNAMIC MESSAGE SIGN STRUCTURE CHORD CONNECTIONS AND WELD DETAILS

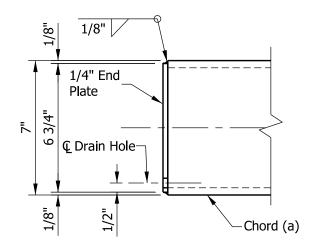
SEPTEMBER 2013

STANDARD DRAWING NO. E 802-DMSS-06



١		
	/s/ Alfredo B. Hanza	02/05/1.
	DESIGN STANDARDS ENGINEER	DATE
111.	/s/ Mark A. Miller	03/27/13
١	CHIEF ENGINEER	DATE

# B 6 3 | 4" 1/2" Ø Drain Hole



END VIEW

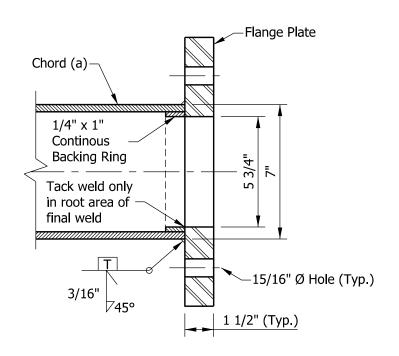
CHORD END PLATE DETAILS

SECTION B-B

**FLANGE PLATE DETAILS** 

# Mating surfaces to be flat within ±1/64" Drill 8-15/16" equally spaced holes for 7/8" Ø bolts

**END VIEW** 



SECTION C-C

#### NOTE:

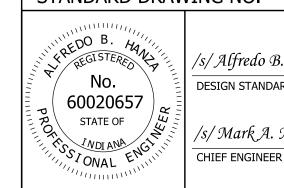
1. See Standard Drawing E 802-DMSS-02 for chord flange locations.

#### INDIANA DEPARTMENT OF TRANSPORTATION

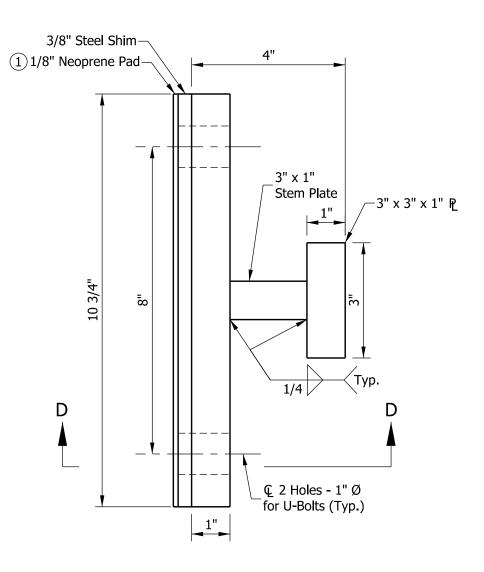
# DYNAMIC MESSAGE SIGN STRUCTURE FLANGE & CHORD END PLATE DETAILS

SEPTEMBER 2013

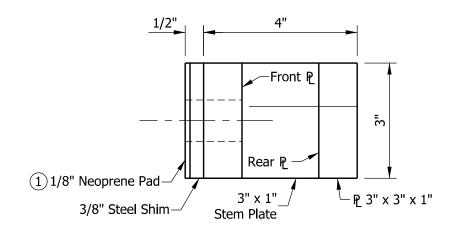
STANDARD DRAWING NO. E 802-DMSS-07



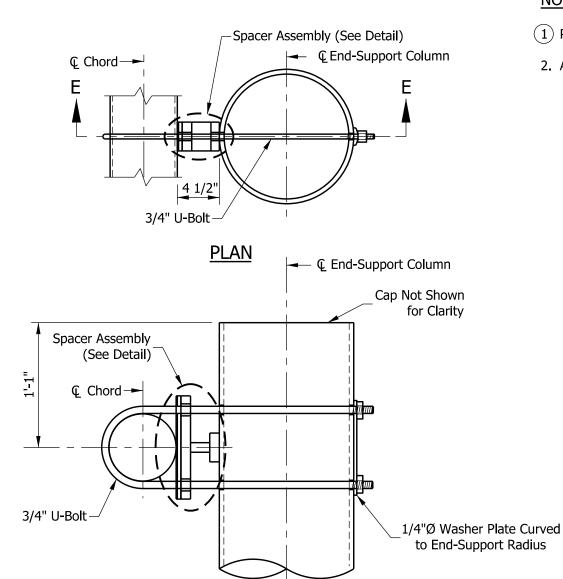
	/s/ Alfredo B. Hanza	02/05/13
1111111	DESIGN STANDARDS ENGINEER	DATE
111	/s/ Mark A. Miller	03/27/13



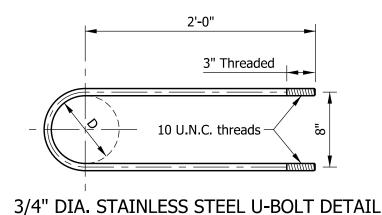
ELEVATION
END-SUPPORT SPACER ASSEMBLY DETAIL



SECTION D-D



# SECTION E-E UPPER CHORD CONNECTION DETAILS



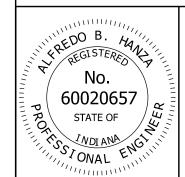
#### NOTES:

- 1 Provide isolation from steel-dissimilar metal as required.
- 2. All spacer assembly material to be steel.

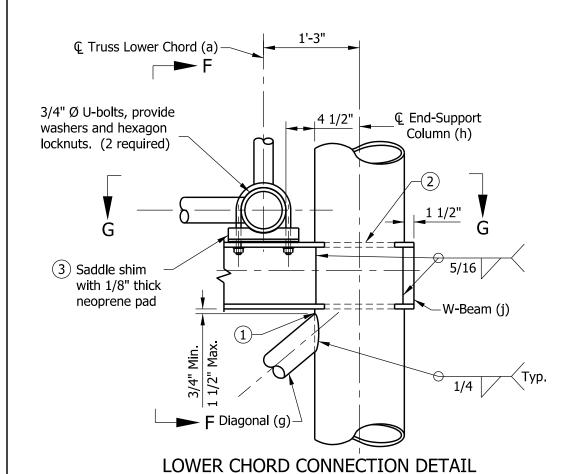
#### INDIANA DEPARTMENT OF TRANSPORTATION

DYNAMIC MESSAGE SIGN STRUCTURE END SUPPORT UPPER CHORD CONNECTION DETAILS SEPTEMBER 2013

STANDARD DRAWING NO. E 802-DMSS-08



	/s/ Alfredo B. Hanza	02/05/13
111111	DESIGN STANDARDS ENGINEER	DATE
111111	/s/ Mark A. Miller	03/27/13
	CHIFF ENGINEER	DATE



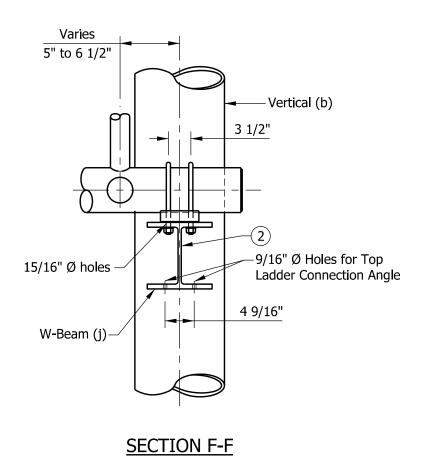
End-Support Column (h)-

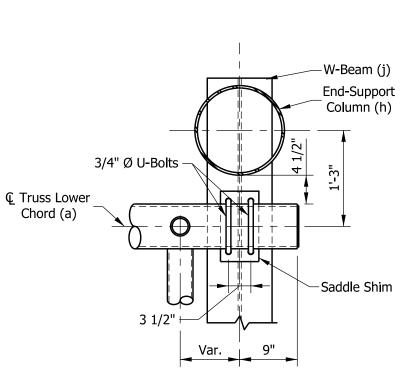
Diagonal (g)

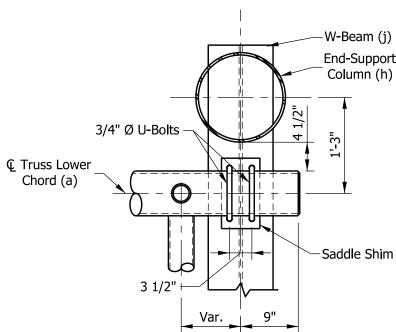
1 1/2" Max.

Diagonal (g)

Horizontal (f)-







**ELEVATION (END SUPPORT)** TYPICAL BRACING MEMBERS CONNECTION

1/4 /

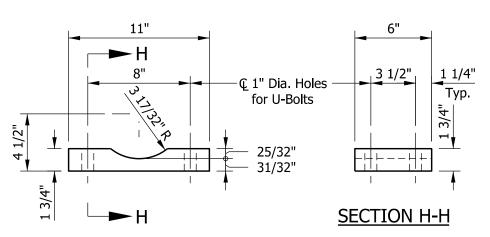
**©** End-Support

Column (h)

**SECTION G-G** 

#### NOTES:

- $\widehat{\ \ }$  Toe edge of diagonal member shall be cut back to facilitate throat thickness. See Standard Drawing E 802-DMSS-06 for toe-edge Detail
- (2) Cut holes in end support columns for W-beams to pass through. Holes to have 1/8" maximum clearance to W-beam. Holes in opposite sides of column to be checked for proper alignment prior to cutting.
- (3) Provide neoprene pads at all chord-to-W-beam bearing surfaces.
- 4. See Standard Drawing E 802-DMSS-03 for end-support member sizes.

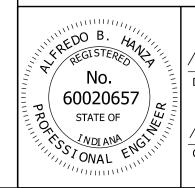


SADDLE SHIM DETAIL

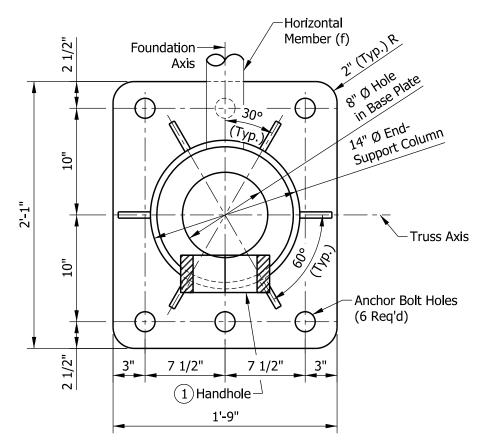
#### INDIANA DEPARTMENT OF TRANSPORTATION

DYNAMIC MESSAGE SIGN STRUCTURE **END-SUPPORT** LOWER CHORD CONNECTION DETAILS SEPTEMBER 2013

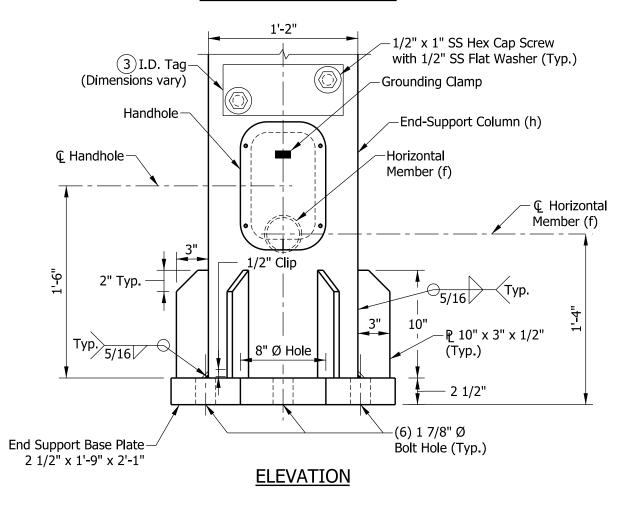
#### STANDARD DRAWING NO. E 802-DMSS-09



/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE



#### TYPE B-14 BASE PLATE



#### NOTES:

- 1) See Standard Drawing E 802-DMSS-11 for handhole details.
- 2. See Standard Drawing E 802-DMSS-12 for anchor bolts and skirt details.
- (3) I.D. tag is a 1/8" stainless steel plate with the following information stamped in 1/2" black letters:

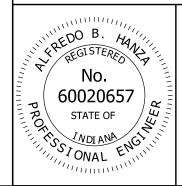
Manufacturer	, Drawing/Order #
Contract #	, Structure Type
Fabrication Date	, Structure Length
End Support Mou	ınting Height

4. Each end support requires one I.D. tag.

#### INDIANA DEPARTMENT OF TRANSPORTATION

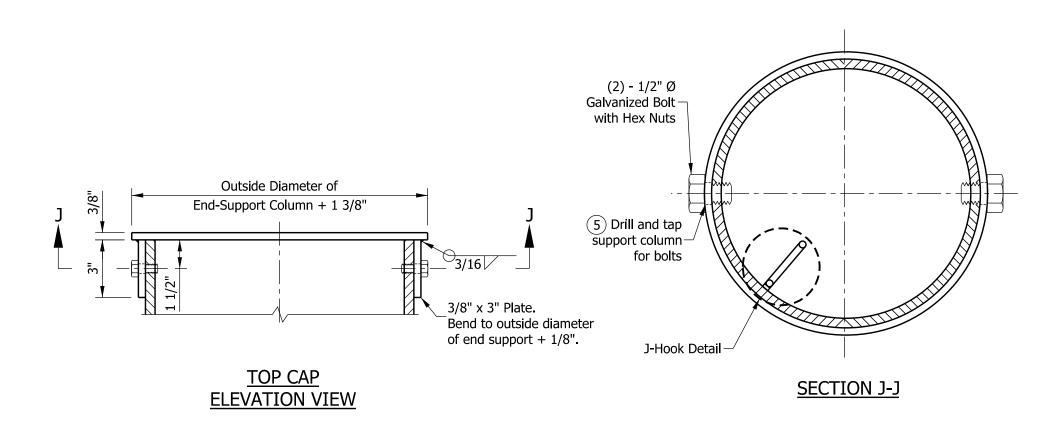
DYNAMIC MESSAGE SIGN STRUCTURE END SUPPORT BASE PLATE AND I.D. TAG DETAILS SEPTEMBER 2013

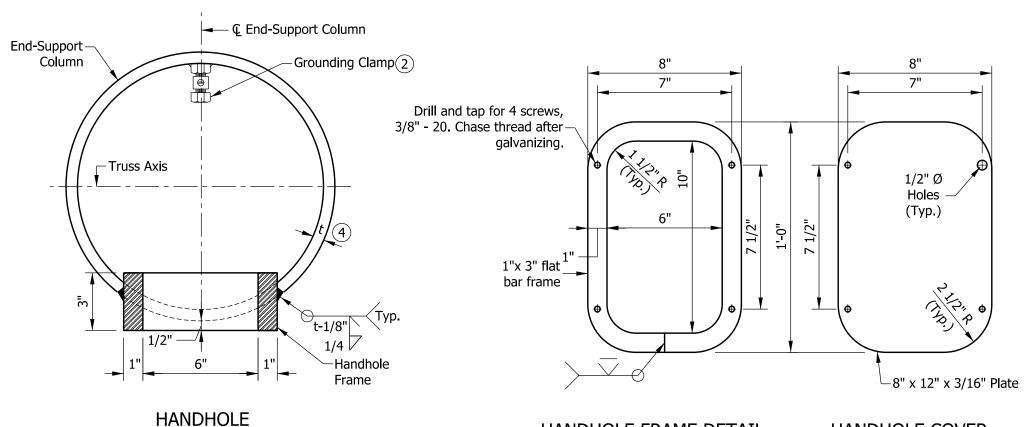
#### STANDARD DRAWING NO. E 802-DMSS-10



/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE

/s/ Mark A. Miller 03/27/13





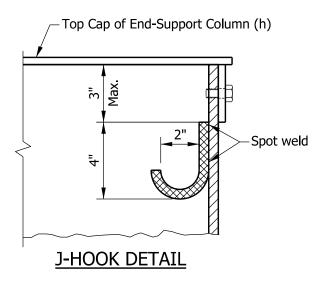
**SECTION ACROSS COLUMN** 

HANDHOLE FRAME DETAIL

HANDHOLE COVER

#### NOTES:

- 1. In lieu of fabricated handhole frame as shown, frame may be cut from 3" plate (rolling direction vertical).
- 2 See Standard Drawing E 802-SNWR-03 for grounding post details. Grounding post to be placed on far side of support directly opposite center of handhole.
- 3. See Standard Drawing E 802-DMSS-10 for handhole locations.
- (4) See Standard Drawing E 802-DMSS-03 for thicknesses of end-support column.
- (5) Bolts shall be located to miss J-hook.
- 6. One handhole required on each end support.

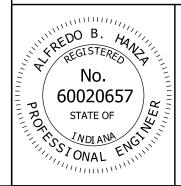


#### INDIANA DEPARTMENT OF TRANSPORTATION

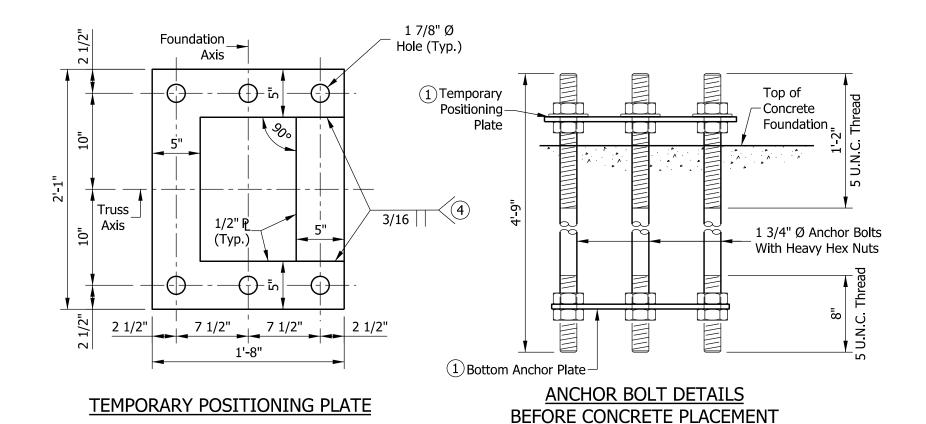
DYNAMIC MESSAGE SIGN STRUCTURE END SUPPORT HANDHOLE, TOP CAP, AND J-HOOK DETAILS SEPTEMBER 2013

#### STANDARD DRAWING NO. E 802-DMSS-11

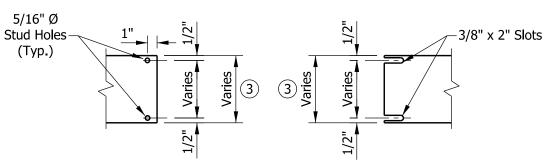
CHIEF ENGINEER



/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13

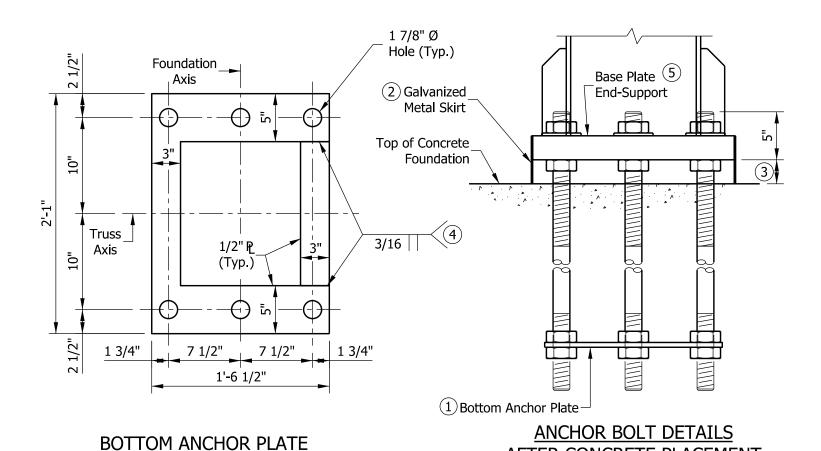


- (1) Use temporary positioning plate and bottom anchor plate for all foundations. Temporary positioning plate should be removed after placing concrete.
- (2) Secure galvanized metal skirt to base plate after erection as shown in
- (3) Minimum base plate gap is 2 1/2" and can be increased up to 5 1/2". Metal skirt width shall be at least 1 1/2" more than the actual gap.
- (4) Contractor has the option to use four separate bars. Weld to maintain angles and shapes as shown.
- (5) For base plate of end-support, see Standard Drawing E 802-DMSS-10.



**DETAIL G** 

**DETAIL H** 



AFTER CONCRETE PLACEMENT

-Detail G METAL SKIRT DETAIL

1'-9"

10 ga. Galvanized Plate-

THO P

5/16" Ø

(Typ.)

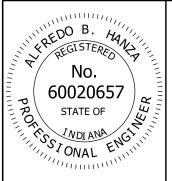
Detail H

Stud Holes

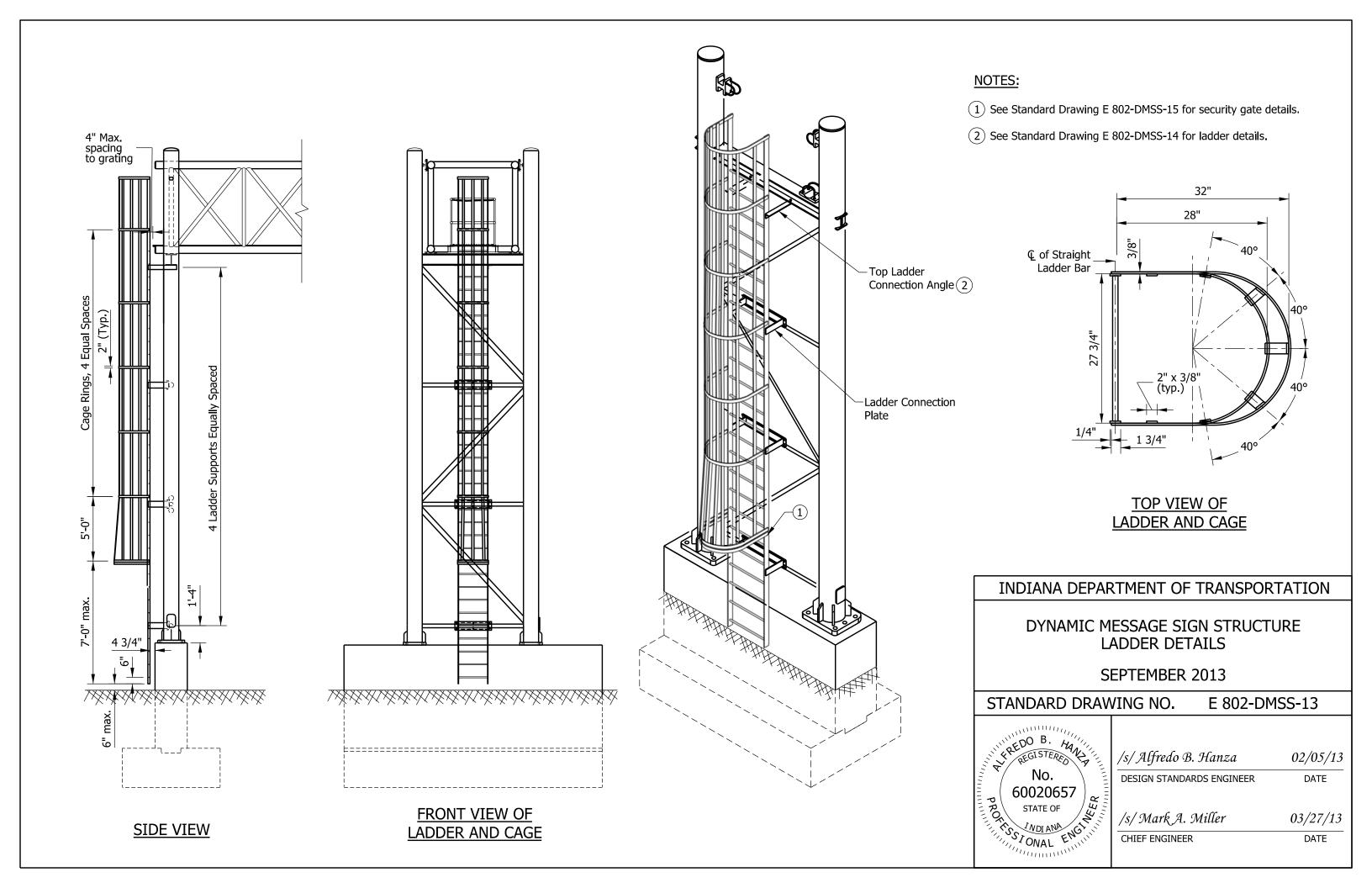
#### INDIANA DEPARTMENT OF TRANSPORTATION

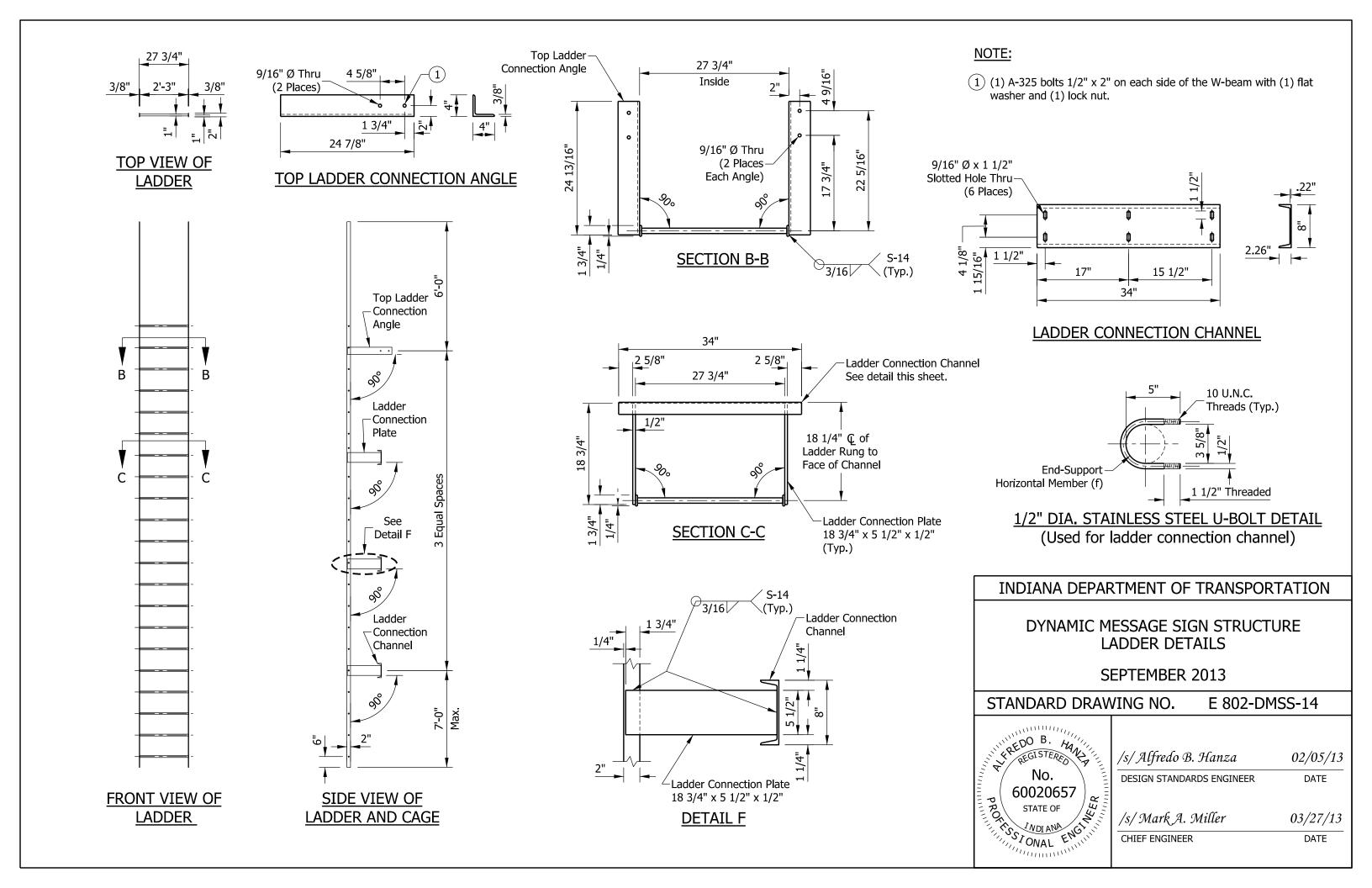
DYNAMIC MESSAGE SIGN STRUCTURE ANCHOR PLATES, ANCHOR BOLTS, AND METAL SKIRT DETAILS SEPTEMBER 2013

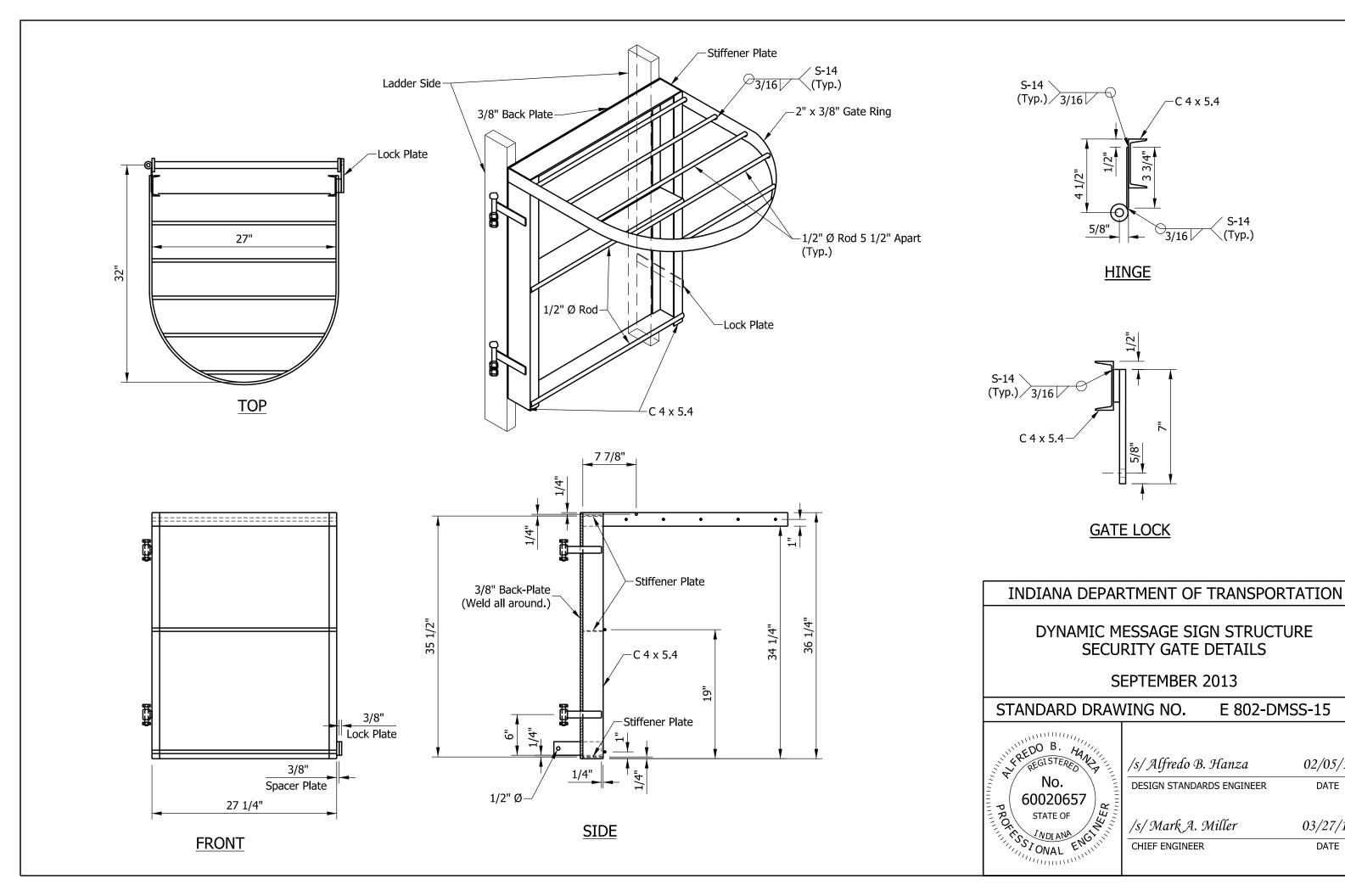
STANDARD DRAWING NO. E 802-DMSS-12



/s/ Alfredo B. Hanza 02/05/13 DESIGN STANDARDS ENGINEER DATE /s/ Mark A. Miller 03/27/13 CHIEF ENGINEER DATE







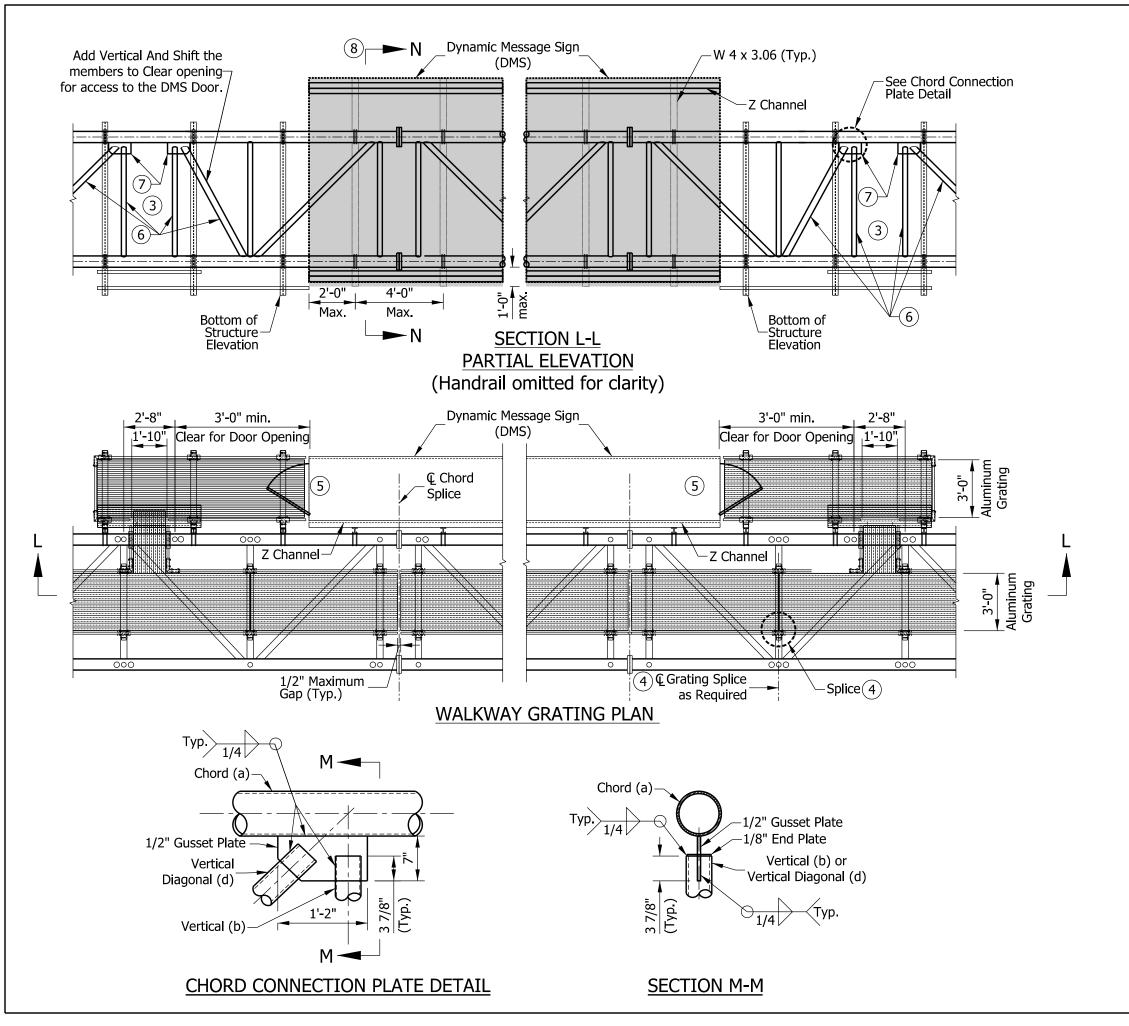
S-14 (Typ.)

E 802-DMSS-15

02/05/13

DATE

03/27/13



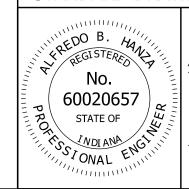
- 1. Interior walkway gratings are extruded I-bars 2" x 1/4" at 1 3/16" center-to-center. Crossbar shall have a maximum gap of 4". Moment of inertia  $I_x = 1.382 \text{ in}^4$ . A different grating of equal strength may be used upon approval.
- 2. Interior walkway grating shall run the full length center to center of end support truss members plus 9" at each end.
- (3) The contractor shall coordinate with the fabricator to determine which truss panel is to be modified to allow opening for access to the DMS door.
- (4) Interior walkway gratings can be spliced on center of any horizontal truss members as needed. See Standard Drawing E 802-DMSS-18 for typical grating splice detail.
- (5) The contractor shall coordinate with sign manufacturer so floor inside DMS is one comfortable step to the exterior grating.
- 6 Truss vertical and diagonal members on each side of the DMS access door shall be aluminum with 4.0" diameter and a minimum wall thickness of 0.500".
- 7 Install gusset plates at vertical and diagonal intersection on each side of the opening for access to DMS door.
- (8) See Standard Drawing E 802-DMSS-17 for Section N-N.

#### INDIANA DEPARTMENT OF TRANSPORTATION

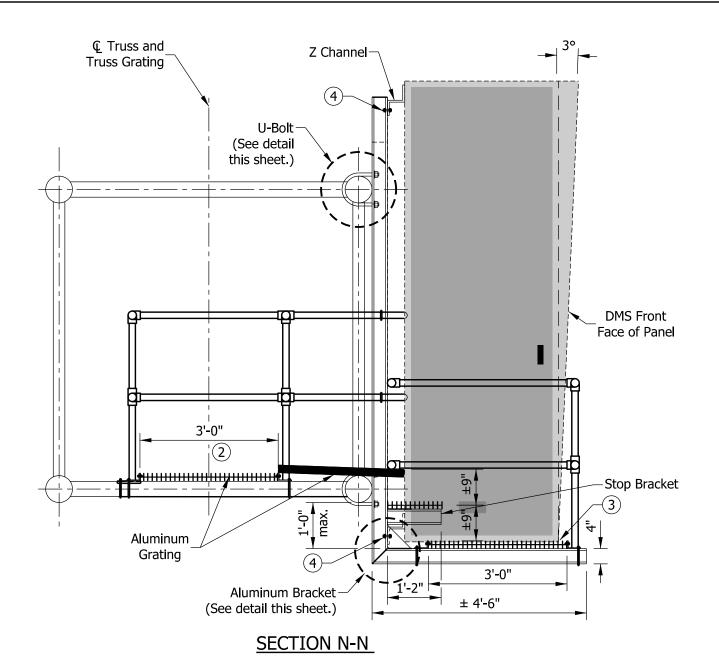
### DYNAMIC MESSAGE SIGN STRUCTURE WALKWAY GRATING DETAILS

SEPTEMBER 2013

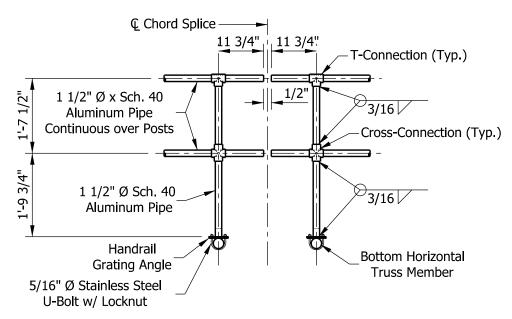
STANDARD DRAWING NO. E 802-DMSS-16



	/s/ Alfredo B. Hanza	02/05/1
	DESIGN STANDARDS ENGINEER	DATE
	/s/ Mark A. Miller	03/27/1.
١	CHIEF ENGINEER	DATE

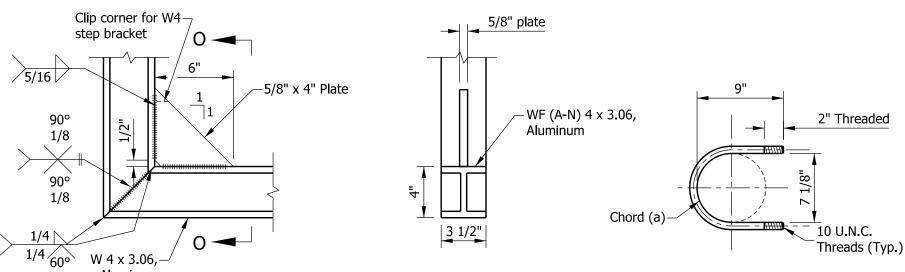


- 1. The front face of the DMS shall be tilted at 3° toward approaching traffic. If the DMS is not built with the front face tilted appropriately, a block shall be placed on the top of the back face to obtain the 3° tilt.
- (2) The walkway grating width is nominal and may vary  $\pm 1/2$ " based on available standard widths.
- (3) The bottom of the DMS door shall open without obstruction from the
- (1) A-325 bolt 1/2" x 2" on each side of the WF (A-N) 4 x 3.06 aluminum bracket web with (1) flat washer and (1) lock nut.
- 5. (2) flat washers, (2) lock washers, and (2) lock nuts per U-bolt; 4 required per bracket.



#### TYPICAL HANDRAIL DETAIL

1/2" DIA. STAINLESS STEEL U-BOLT DETAIL



ALUMINUM BRACKET DETAIL

Aluminum

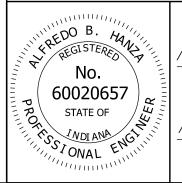
**SECTION O-O** 

#### INDIANA DEPARTMENT OF TRANSPORTATION

#### DYNAMIC MESSAGE SIGN STRUCTURE WALKWAY GRATING DETAILS

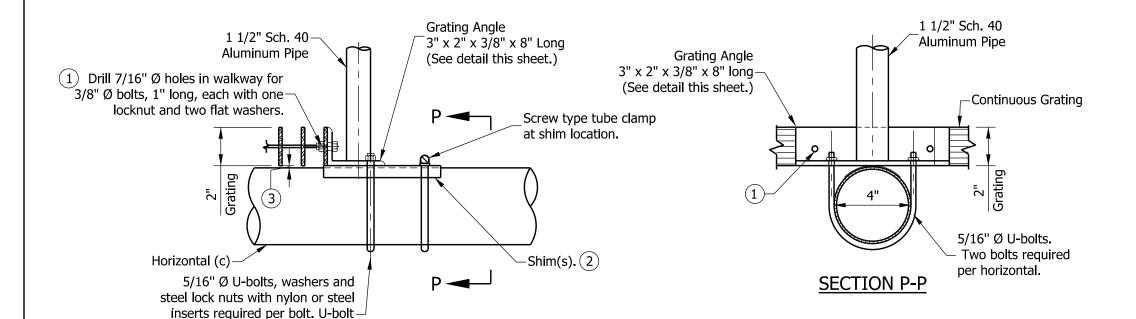
SEPTEMBER 2013

#### STANDARD DRAWING NO. E 802-DMSS-17

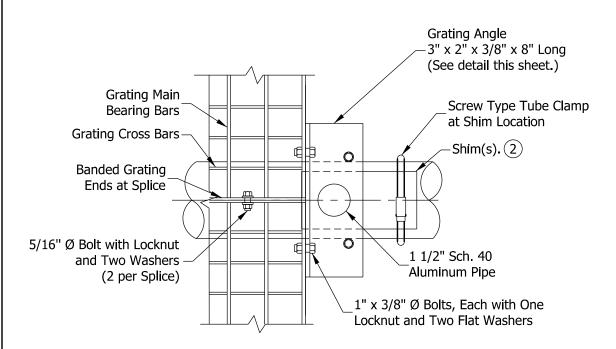


/s/ Alfredo B. Hanza 02/05/13 DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13 CHIEF ENGINEER DATE

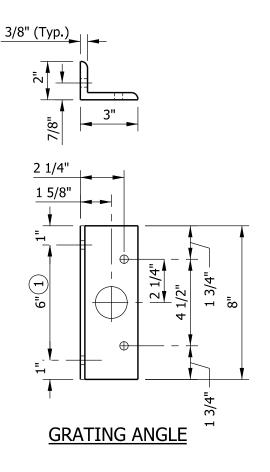


#### **GRATING SUPPORT DETAIL**



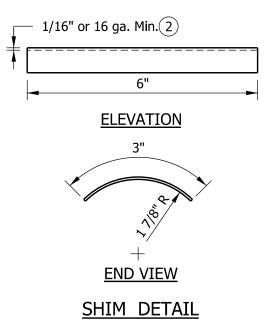
and base plate connections required at horizontals only.

**GRATING SPLICE DETAIL** 



#### NOTES:

- 1 Drilling of holes in grating may be done in shop or field, based on Contractor's preference and subject to accurate alignment.
- 2 Shims may be placed as shown if needed to compensate for alignment variations between horizontal and diagonal pipes beyond adjustment provided by angles. Thicker shims may be used subject to shims performing properly.
- (3) Tube-to-grating gap may vary from 0" to 1/2" max. to align walkway and to allow for camber.



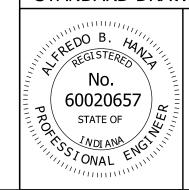
#### INDIANA DEPARTMENT OF TRANSPORTATION

# DYNAMIC MESSAGE SIGN STRUCTURE WALKWAY GRATING DETAILS

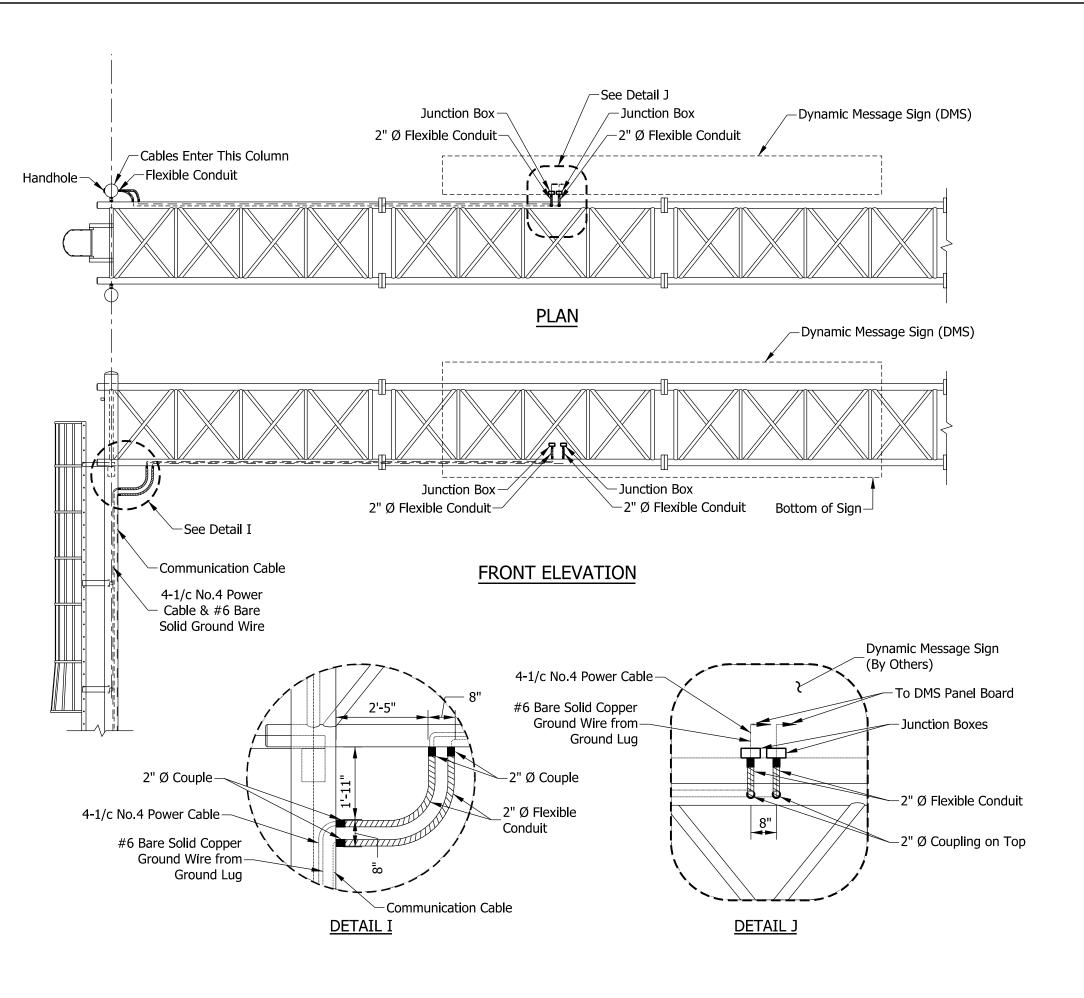
SEPTEMBER 2013

STANDARD DRAWING NO. E 802-DMSS-18

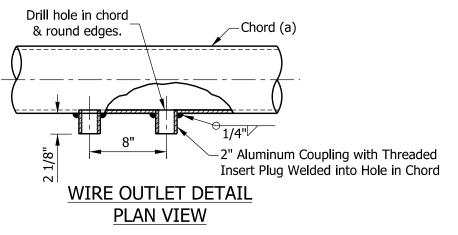
CHIEF ENGINEER



	/s/ Alfredo B. Hanza	02/05/13
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	DESIGN STANDARDS ENGINEER	DATE
11.	/s/ Mark A. Miller	03/27/13



- 1. Cables shall be laid out as shown or as otherwise directed.
- 2. It is the Contractor's responsibility to coordinate locations of cable access with manufacturers.
- 3. Wire outlets shall be composed of aluminum on the chord and steel on the end support and shall have threaded-insert plug.

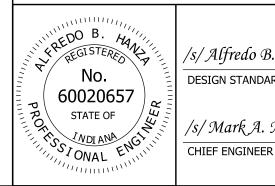


#### INDIANA DEPARTMENT OF TRANSPORTATION

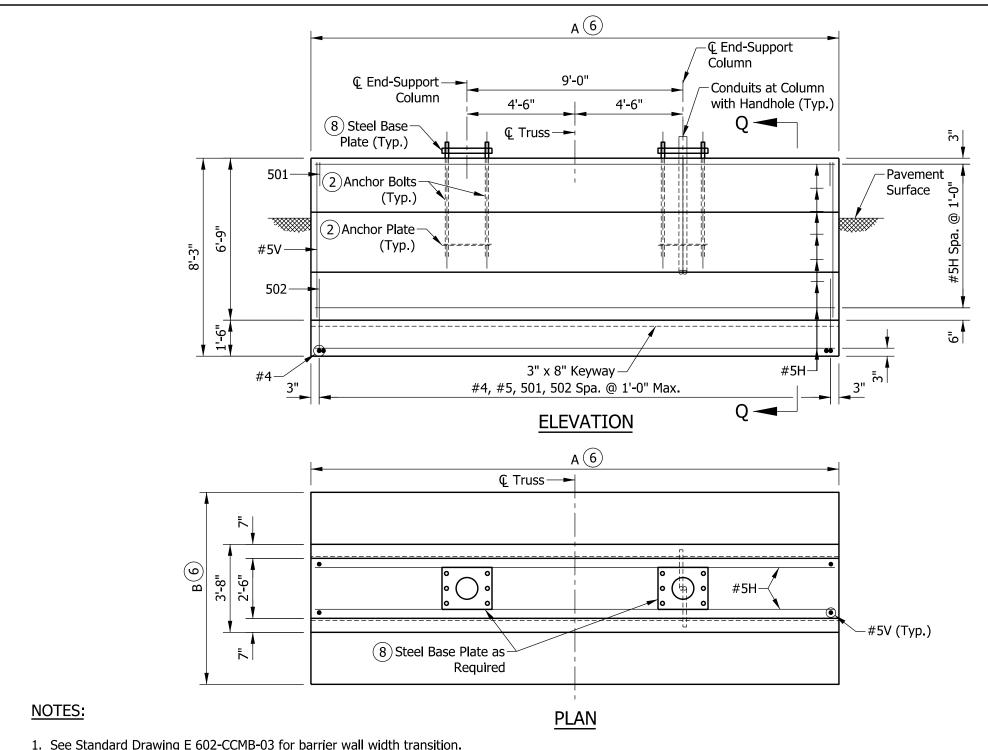
# DYNAMIC MESSAGE SIGN STRUCTURE WIRING LAYOUT DETAILS

SEPTEMBER 2013

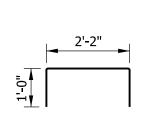
STANDARD DRAWING NO. E 802-DMSS-19



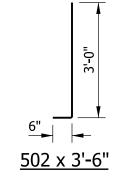
/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13

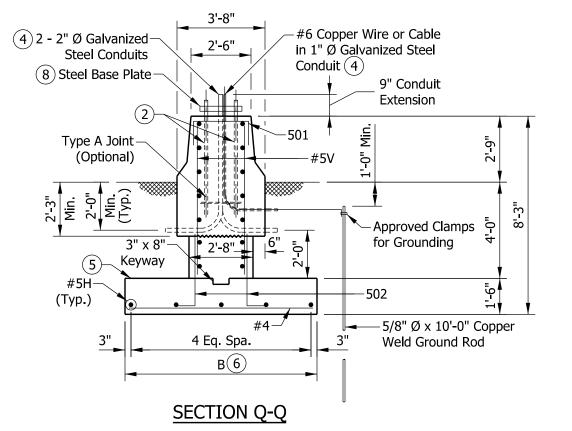


- 1. See Standard Drawing E 602-CCMB-03 for barrier wall width transition.
- (2) See Standard Drawing E 802-DMSS-12 for anchor bolt and anchor plate details.
- 3. Surface seal top and sides of barrier railing to the pavement surface.
- (4) Thread and cap both ends of steel conduit.
- (5) Top of foundation shall be level.
- (6) For variable dimensions, reinforcing schedule, and estimated quantities, see Standard Drawing E 802-DMSS-23.
- 7. Top of the footing shall be a minimum of 4'-0" below the pavement or ground surface.
- (8) See Standard Drawing E 802-DMSS-10 for base plate details.



501 x 4'-2"





#### LEGEND:

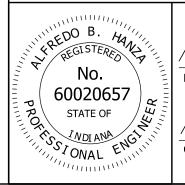
H = Horizontal

Vertical

#### INDIANA DEPARTMENT OF TRANSPORTATION

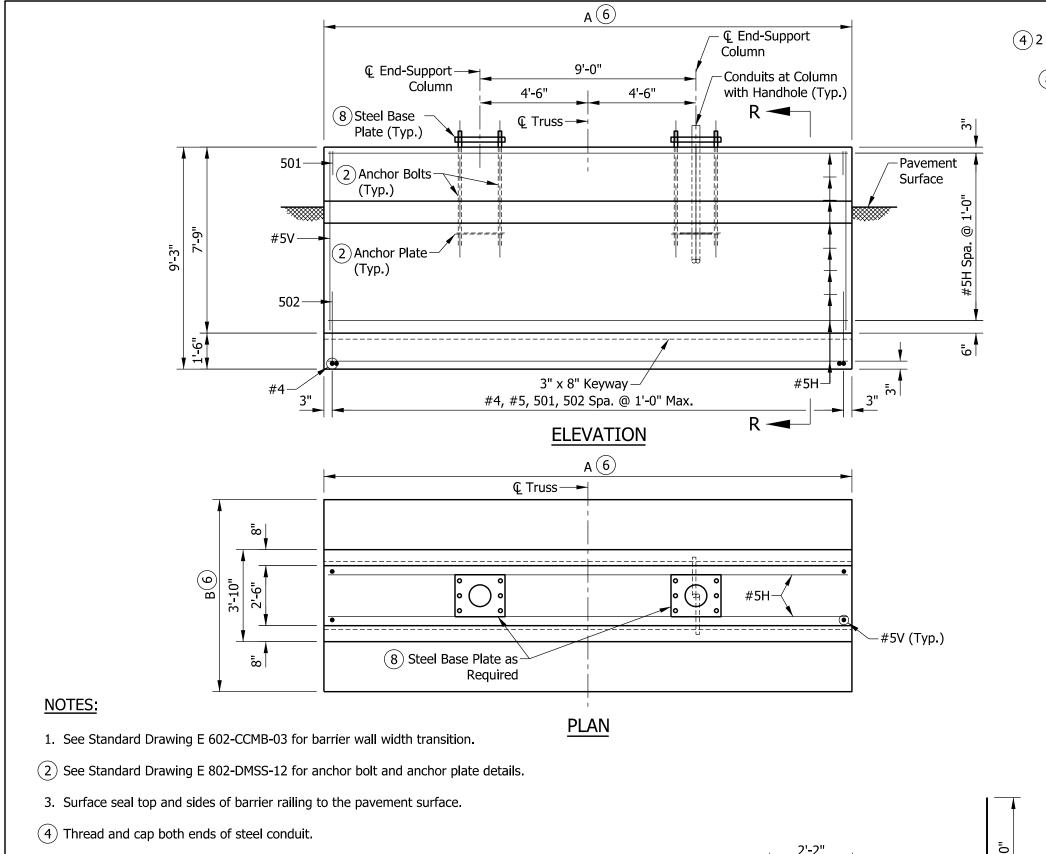
DYNAMIC MESSAGE SIGN STRUCTURE SPREAD FOUNDATION AT 33" CONCRETE BARRIER WALL SEPTEMBER 2013

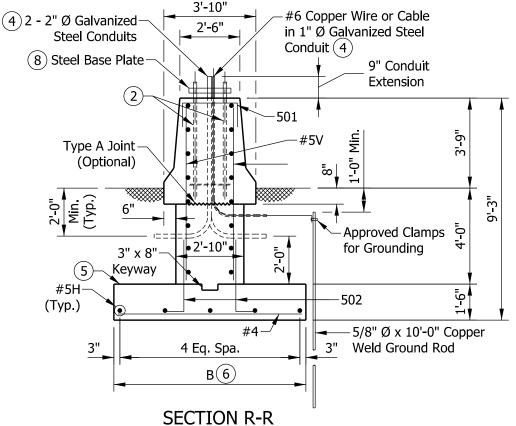
STANDARD DRAWING NO. E 802-DMSS-20



/s/ Alfredo B. Hanza 02/05/13 DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13





#### LEGEND:

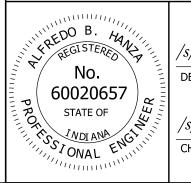
H = Horizontal

Vertical

#### INDIANA DEPARTMENT OF TRANSPORTATION

DYNAMIC MESSAGE SIGN STRUCTURE SPREAD FOUNDATION AT 45" CONCRETE BARRIER WALL SEPTEMBER 2013

STANDARD DRAWING NO. E 802-DMSS-21



/s/ Alfredo B. Hanza 02/05/13 DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13 DATE

CHIEF ENGINEER

2'-2"

502 x 3'-6"

501 x 4'-2"

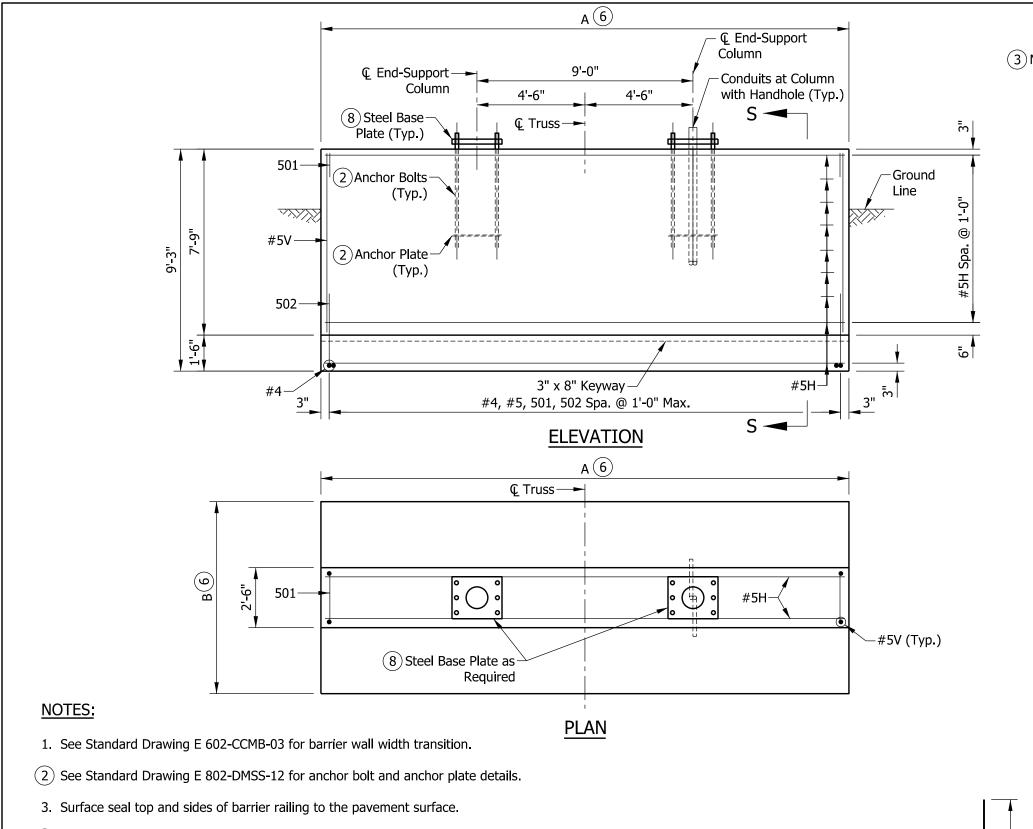
7. Top of the footing shall be a minimum of 4'-0" below the pavement or ground surface.

(8) See Standard Drawing E 802-DMSS-10 for base plate details.

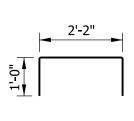
(6) For variable dimensions, reinforcing schedule, and estimated quantities, see Standard Drawing

(5) Top of foundation shall be level.

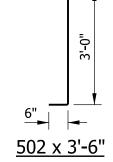
E 802-DMSS-23.

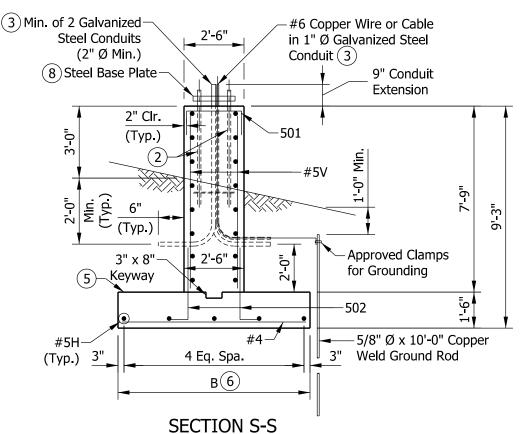


- (4) Thread and cap both ends of steel conduit.
- (5) Top of foundation shall be level.
- (6) For variable dimensions, reinforcing schedule, and estimated quantities, see Standard Drawing E 802-DMSS-23.
- 7. Top of the footing shall be a minimum of 4'-0" below the pavement or ground surface.
- (8) See Standard Drawing E 802-DMSS-10 for base plate details.



501 x 4'-2"





#### LEGEND:

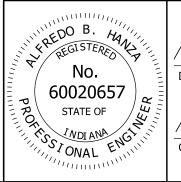
H = Horizontal

Vertical

#### INDIANA DEPARTMENT OF TRANSPORTATION

DYNAMIC MESSAGE SIGN STRUCTURE SPREAD FOUNDATION AT MEDIAN OR SHOULDER, 36" HEIGHT SEPTEMBER 2013

STANDARD DRAWING NO. E 802-DMSS-22



/s/ Alfredo B. Hanza 02/05/13 DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13 CHIEF ENGINEER DATE

TABLE 1: SP	READ FOUNDATIONS	FOR DYNAM	1IC MESSAGE	OVERHEAD SIGN STRUCTURE
MAX. SIGN AREA (SFT)	ALLOWABLE GROSS SOIL	FOOTING [	DIMENSION	
	BEARING PRESSURE (PSF)	LENGTH, A (FT)	WIDTH, B (FT)	TYPE OF BARRIER
	1500 - 2499	26'	7'	33", 45" or 36" Median/Shoulder
300	2500 - 3499	- 3499 22'		33", 45" or 36" Median/Shoulder
	> 3499	20'	5'	33", 45" or 36" Median/Shoulder

	TABLE 2: SPREAD FOUNDATIONS DIMENSIONS AND BILL OF MATERIALS																
FOOTING DI	MENSION			#4	7	#5H	#5V		501		502		502		TOTAL EPOXY COATED	CONCRETE	SURFACE SEAL
A (FT)	B (FT)	TYPE OF BARRIER	NO. BARS	LENGTH	NO. BARS	LENGTH	NO. BARS	LENGTH	NO. BARS	LENGTH	NO. BARS	LENGTH	REINFORCING BARS (LBS)	CLASS A (CYS)	(SYS)		
		33" Concrete Barrier	27	6'-8"	19	25'-8"	54	6'-6"	27	4'-2"	54	3'-6"	1309	27.9	23.9		
26'	7'	45" Concrete Barrier	27	6'-8"	21	25'-8"	54	7'-6"	27	4'-2"	54	3'-6"	1418	30.9	29.7		
		36" Median or Shoulder Barrier	27	6'-8"	21	25'-8"	54	7'-6"	27	4'-2"	54	3'-6"	1418	28.8	24.6		
		33" Concrete Barrier	23	4'-8"	19	21'-8"	46	6'-6"	23	4'-2"	46	3'-6"	1081	21.2	20.2		
22'	5'	45" Concrete Barrier	23	4'-8"	21	21'-8"	46	7'-6"	23	4'-2"	46	3'-6"	1175	23.7	25.1		
			36" Median or Shoulder Barrier	23	4'-8"	21	21'-8"	46	7'-6"	23	4'-2"	46	3'-6"	1175	21.9	20.8	
		33" Concrete Barrier	21	4'-8"	19	19'-8"	42	6'-6"	21	4'-2"	42	3'-6"	984	19.3	18.4		
20'	5'	45" Concrete Barrier	21	4'-8"	21	19'-8"	42	7'-6"	21	4'-2"	42	3'-6"	1069	21.6	22.9		
		36" Median or Shoulder Barrier	21	4'-8"	21	19'-8"	42	7'-6"	21	4'-2"	42	3'-6"	1069	19.9	18.9		

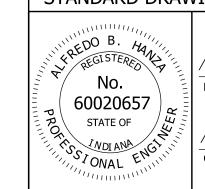
- 1. Geotechnical recommendations for Allowable Gross Soil Bearing Pressure shall be obtained to determine footing size and reinforcement shown in Tables 1 and 2.
- If Allowable Gross Soil Bearing Pressure is less than 1500 psf, a drilled shaft or other special foundation shall be used.
- 3. See Standard Drawings E 802-DMSS-20 through -22 for locations of dimensions and reinforcing bars.

#### INDIANA DEPARTMENT OF TRANSPORTATION

#### DYNAMIC MESSAGE SIGN STRUCTURE SPREAD FOUNDATIONS QUANTITIES

SEPTEMBER 2013

STANDARD DRAWING NO. E 802-DMSS-23



/s/ Alfredo B. Hanza 02/05/13 DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13 CHIEF ENGINEER

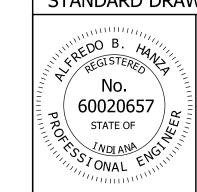
INDEX								
SHEET NO.	SUBJECT							
1	Index							
2	Plan & Elevation							
3	Truss Sections, Table with Member Sizes							
4	Table of Dimensions, Spans 34' thru 81'							
5	Table of Dimensions, Spans 82' thru 130' and Camber							
6	Chord Connections and Weld Details							
7	Flange, Chord End Plate, and Wire Outlet Details							
8	Upper Chord Connection Details							
9	Lower Chord Connection Details							
10	End Support Lower Chord Connections, Alternate HSS Beam Details							
11	End Support Base Plate and I.D. Tag Details							
12	End Support Top Cap, Handhole, and J-Hook Details							
13	End Support Anchor Bolt and Metal Skirt Details							
14	Interior Walkway Grating Details							
15	Interior Walkway Grating Details							
16	Lighting Walkway							
17	Lighting Walkway							
18	Lighting Walkway Profile							
19	Lighting Walkway and Handrail Assembly							
20	Lighting Walkway, Handrail Hinge, and Grating Details							
21	Lighting Walkway Fixture Mount Details							
22	Spread Foundation at 33" Concrete Barrier Wall							
23	Spread Foundation at 45" Concrete Barrier Wall							
24	Spread Foundation for Median or Shoulder, 36" Height							
25	Spread Foundations Quantities							
26	Alternate Drilled Shaft Foundation at 33" Concrete Barrier Wall							
27	Alternate Drilled Shaft Foundation at 45" Concrete Barrier Wall							
28	Alternate Drilled Shaft Foundation for Median or Shoulder, 36" Height							
29	Alternate Drilled Shaft Foundations Quantities							

#### INDIANA DEPARTMENT OF TRANSPORTATION

# SIGN BOX TRUSS STRUCTURE DRAWING INDEX

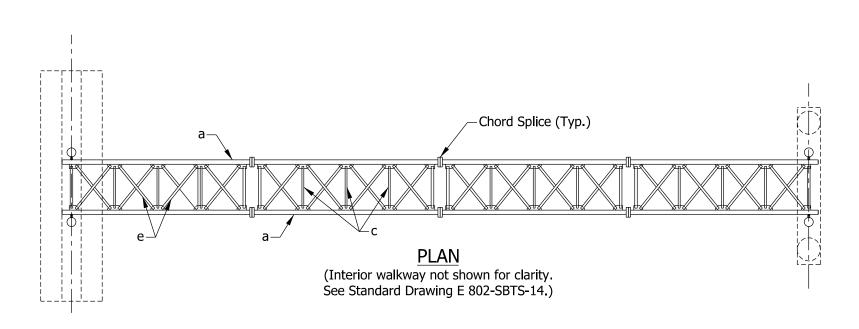
SEPTEMBER 2013

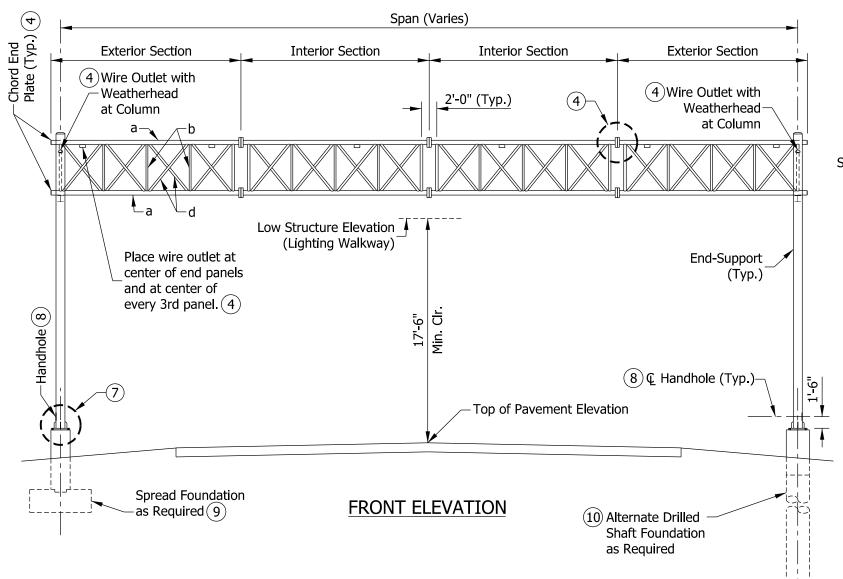
STANDARD DRAWING NO. E 802-SBTS-01



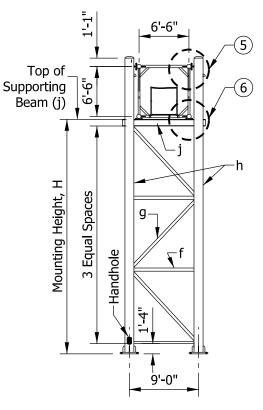
 $\frac{/s/$  Alfredo B. Hanza 02/05/13 DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13





- 1. See Standard Drawing E 802-SBTS-03 for member sizes.
- 2. Maximum deviation of any chord from a straight line in any section shall be 1/8" for box truss to be a maximum of 3/8" out of a straight line over the entire length of the structure in the vertical plane.
- 3. All truss members are aluminum. End-support members are steel. Walkways, bearing elements, and wire outlet are aluminum.
- (4) See Standard Drawing E 802-SBTS-07 for connection flange, chord end plate, and wire outlet details.
- (5)See Standard Drawing E 802-SBTS-08 for upper chord connection details and E 802-SBTS-12 for top cap, handhole, and J-hook details.
- (6) See Standard Drawing E 802-SBTS-09 for lower chord connection details. See Standard Drawing E 802-SBTS-10 for alternate HSS beam and saddle shim detail.
- (7) See Standard Drawing E 802-SBTS-11 for base plate detail and E 802-SBTS-13 for anchor bolts and skirt details.
- (8) See Standard Drawing E 802-SBTS-12 for handhole detail.
- (9) See Standard Drawings E 802-SBTS-22 through -25 for spread foundations.
- (10) See Standard Drawings E 802-SBTS-26 through -29 for alternate drilled shaft foundations.



**END-SUPPORT** 

#### **LEGEND**

TRUSS MEMBERS

a - Chords

b - Verticals

c - Horizontals

d - Vertical Diagonals

e - Horizontal Diagonals

**END-SUPPORT MEMBERS** 

h - Columns

f - Horizontals

g - Diagonals

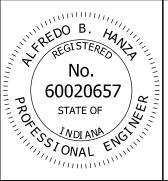
j - Supporting Beam

#### INDIANA DEPARTMENT OF TRANSPORTATION

#### SIGN BOX TRUSS STRUCTURE **PLAN & ELEVATION**

SEPTEMBER 2013

STANDARD DRAWING NO. E 802-SBTS-02

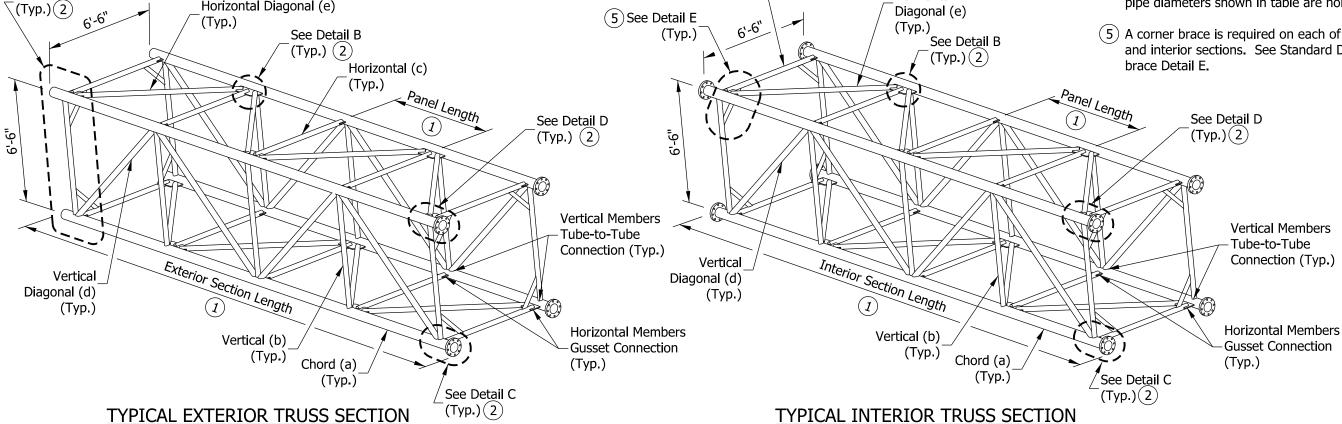


/s/ Alfredo B. Hanza 02/05/13 DATE

DESIGN STANDARDS ENGINEER

/s/ Mark A. Miller 03/27/13

- 1 Number of panels and sections varies. See table on Standard Drawing E 802-SBTS-04 and -05 for recommended dimensions.
- (2) See Standard Drawing E 802-SBTS-06 for welded connections and Details A through F.
- 3. See Standard Drawing E 802-SBTS-02 for Legend.
- 4. Truss members to be aluminum. End-support members to be steel. Steel pipe diameters shown in table are nominal pipe size.
- (5) A corner brace is required on each of the eight external corners of exterior and interior sections. See Standard Drawing E 802-SBTS-06 for corner brace Detail E.



Horizontal (c)

Horizontal

(Typ.)

			MAX.		TRUSS MEMBERS, ALUMINUM									END-SUPPORT MEMBERS, STEEL																																																
TRUSS TYPE	MAX. SIGN AREA	MAX. SPAN	MOUNTING HEIGHT	CHO	ORD	VERT	ΓICAL	HORIZ	ONTAL		TICAL SONAL	HORIZ DIAG	ONTAL ONAL	HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		HORIZONTAL		DIAG	ONAL	COL	UMN	SUPPORTING BEAM
	, <u></u>		Н	ä	а		b	(	С	(	b	(	e	f		f		f		f		f		f		f		f		Ţ.	g	ł	ì	j																												
			П	DIA.	THK	DIA.	THK	DIA.	THK	DIA.	THK	DIA.	THK	DIA.	THK	DIA.	THK	DIA.	THK																																											
	SQ. FT.	FT.	FT.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.																																											
Α	500	130	28'-6"	6.00	0.250	2.50	0.250	4.00	0.188	3.00	0.375	4.00	0.375	5.00	0.375	5.00	0.375	14.00	0.500																																											
В	700	100	28'-6"	6.50	0.375	3.00	0.375	4.00	0.188	3.00	0.500	4.00	0.375	5.00	0.375	7.00	0.375	14.00	0.500	W 8 x 58 or																																										
С	700	130	28'-6"	7.00	0.375	3.00	0.375	4.00	0.188	3.00	0.500	4.00	0.500	5.00	0.375	8.00	0.500	14.00	0.593	HSS 8" x 8" x 1/2"																																										
D		100	28'-6"	7.00	0.375	3.00	0.375	4.00	0.188	3.00	0.500	4.00	0.500	5.00	0.375	8.00	0.500	18.00	0.500																																											
Е	900	130	28'-6"	7.00	0.500	3.00	0.375	4.00	0.250	3.00	0.500	4.00	0.500	5.00	0.375	8.00	0.593	18.00	0.562	W 10 x 68 or HSS 10" x 10" x 1/2"																																										

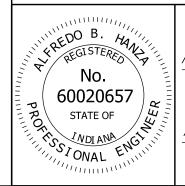
See Detail A

Horizontal Diagonal (e)

#### INDIANA DEPARTMENT OF TRANSPORTATION

SIGN BOX TRUSS STRUCTURE TRUSS SECTIONS IN ISOMETRIC VIEWS, TABLE WITH MEMBER SIZES SEPTEMBER 2013

STANDARD DRAWING NO. E 802-SBTS-03



/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE

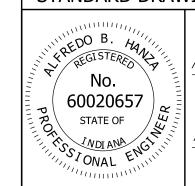
DIMENSIONS FOR SIGN BOX TRUSSES (34' THRU 81')												
SPAN		EXTERIO	R SECTIONS	INTERIOR SECTIONS								
SPAN-TRUSS	NO. OF EXT.	NO. OF PANELS	VARIABLE	PANEL	SECTION	NO. OF INT.	NO. OF PANELS	PANEL	SECTION			
LENGTH, (FT)	SECTIONS	PER SECTION	END DIMEN.	LENGTH	LENGTH	SECTIONS	PER SECTION	LENGTH	LENGTH			
34	1	6	6"	5'-6"	35'-6"	0						
35	1	6	6"	5'-8"	36'-6"	0						
36	2	3	6"	5'-6"	18'-9"	0						
37	2	3	6"	5'-8"	19'-3"	0						
38	2	3	6"	5'-10"	19'-9"	0						
39	2	3	6"	6'-0"	20'-3"	0						
40	2	3	6"	6'-2"	20'-9"	0						
41	2	3	6"	6'-4"	21'-3"	0						
42	2	3	6"	6'-6"	21'-9"	0						
43	2	4	6"	5'-0"	22'-3"	0						
44	2	4	6"	5'-1 1/2"	22'-9"	0						
45	2	4	6"	5'-3"	23'-3"	0						
46	2	4	6"	5'-4 1/2"	23'-9"	0						
47	2	4	6"	5'-6"	24'-3"	0						
48	2	4	6"	5'-7 1/2"	24'-9"	0						
49	2	4	6"	5'-9"	25'-3"	0						
50	2	4	6"	5'-10 1/2"	25'-9"	0						
51	2	4	6"	6'-0"	26'-3"	0						
52	2	4	6"	6'-1 1/2"	26'-9"	0						
53	2	4	6"	6'-3"	27'-3"	0						
54	2	4	6"	6'-4 1/2"	27'-9"	0						
55	2	4	6"	6'-6"	28'-3"	0						
56	2	5	5 1/4"	5'-3 3/4"	28'-9"	0						
57	2	5	6 1/4"	5'-4 3/4"	29'-3"	0						
58	2	5	6"	5'-6"	29'-9"	0						
59	2	5	5 3/4"	5'-7 1/4"	30'-3"	0						
60	2	5	5 1/2"	5'- 8 1/2"	30'-9"	0						
61	2	5	6 1/2"	5'-9 1/2"	31'-3"	0						
62	2	5	6 1/4"	5'-10 3/4"	31'-9"	0						
63	2	5	6"	6'-0"	32'-3"	0						
64	2	5	5 3/4"	6'-1 1/4"	32'-9"	0						
65	2	5	5 1/2"	6'-2 1/2"	33'-3"	0						
66	2	5	5 1/4"	6'-3 3/4"	33'-9"	0						
67	2	5	6 1/4"	6'-4 3/4"	34'-3"	0						
68	2	5	6"	6'-6"	34'-9"	0						
69	2	4	6"	5'-4"	23'-7"	1	4	5'-4"	23'-4"			
70	2	4	6"	5'-5"	23'-11"	1	4	5'-5"	23'-8"			
71	2	4	6"	5'-6"	24'-3"	1	4	5'-6"	24'-0"			
72	2	4	6"	5'-7"	24'-7"	1	4	5'-7"	24'-4"			
73	2	4	6"	5'-8"	24'-11"	1	4	5'-8"	24'-8"			
74	2	4	6"	5"-9"	25'-3"	1	4	5"-9"	25'-0"			
75	2	4	6"	5'-10"	25'-7"	1	4	5'-10"	25'-4"			
76	2	4	6"	5'-11"	25'-11"	1	4	5'-11"	25'-8"			
77	2	4	6"	6'-0"	26'-3"	1	4	6'-0"	26'-0"			
78	2	4	6"	6'-1 "	26'-7"	1	4	6'-1 "	26'-4"			
79	2	4	6"	6'-2"	26'-11"	1	4	6'-2"	26'-8"			
80	2	4	6"	6'-3"	27'-3"	1	4	6'-3"	27'-0"			
81	2	4	6"	6'-4"	27'-7"	1	4	6'-4"	27'-4"			

- 1. All panels on a truss shall be the same length. The minimum panel length is 5'-0" and the maximum is 6'-6".
- 2. A single interior section in a truss shall have an even number of panels to maintain the pattern of the vertical diagonals.
- 3. Use minimum number of sections for each box truss structure, while maintaining the maximum section length at 36'-6".
- 4. See Standard Drawing E 802-SBTS-05 for required camber.

#### INDIANA DEPARTMENT OF TRANSPORTATION

SIGN BOX TRUSS STRUCTURE TABLE OF DIMENSIONS SPANS 34' THRU 81' SEPTEMBER 2013

STANDARD DRAWING NO. E 802-SBTS-04

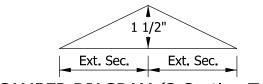


/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE

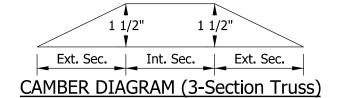
/s/ Mark A. Miller 03/27/13

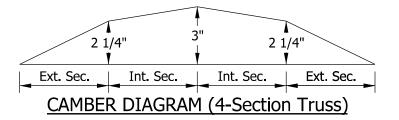
DIMENSIONS FOR SIGN BOX TRUSSES (82' THRU 130')									
SPAN	EXTERIOR SECTIONS				INTERIOR SECTIONS				
SPAN-TRUSS	NO. OF EXT.	NO. OF PANELS	VARIABLE	PANEL	SECTION	NO. OF INT.	NO. OF PANELS	PANEL	SECTION
LENGTH, (FT)	SECTIONS	PER SECTION	END DIMEN.	LENGTH	LENGTH	SECTIONS	PER SECTION	LENGTH	LENGTH
82	2	4	6"	6'-5"	27'-11"	1	4	6'-5"	27'-8"
83	2	4	6"	6'-6"	28'-3"	1	4	6'-6"	28'-0"
84	2	5	5 3/4"	5'-7 3/4"	30'-5 1/2"	1	4	5'-7 3/4"	24'-7"
85	2	5	6 1/2"	5'-8 1/2"	30'-10"	1	4	5'-8 1/2"	24'-10"
86	2	5	5 1/2"	5'-9 1/2"	31'-2"	1	4	5'-9 1/2"	25'-2"
87	2	5	6 1/4"	5'-10 1/4"	31'-6 1/2"	1	4	5'-10 1/4"	25'-5"
88	2	5	7"	5'-11"	31'-11"	1	4	5'-11"	25'-8"
89	2	5	6"	6'-0"	32'-3"	1	4	6'-0"	26'-0"
90	2	5	6 3/4"	6'-0 3/4"	32'-7 1/2"	1	4	6'-0 3/4"	26'-3"
91	2	5	5 3/4"	6'-1 3/4"	32'-11 1/2"	1	4	6'-1 3/4"	26'-7"
92	2	5	6 1/2"	6'-2 1/2"	33'-4"	1	4	6'-2 1/2"	26'-10"
93	2	5	5 1/2"	6'-3 1/2"	33'-8"	1	4	6'-3 1/2"	27'-2"
94	2	5	6 1/4"	6'-4 1/4"	34'-1/2"	1	4	6'-4 1/4"	27'-5"
95	2	5	5 1/4"	6'-5 1/4"	34'-4 1/2"	1	4	6'-5 1/4"	27'-9"
96	2	5	6"	6'-6"	34'-9"	1	4	6'-6"	28'-0"
97	2	4	6"	5'-7 1/2"	24'-9"	2	4	5'-7 1/2"	24'-6"
98	2	4	6"	5'-8 1/4"	25'-0"	2	4	5'-8 1/4"	24'-9"
99	2	4	6"	5'-9"	25'-3"	2	4	5'-9"	25'-0"
100	2	4	6"	5'-9 3/4"	25'-6"	2	4	5'-9 3/4"	25'-3"
101	2	4	6"	5'-10 1/2"	25'-9"	2	4	5'-10 1/2"	25'-6"
102	2	4	6"	5'-11 1/4"	26'-0"	2	4	5'-11 1/4"	25'-9"
103	2	4	6"	6'-0"	26'-3"	2	4	6'-0"	26'-0"
104	2	4	6"	6'-0 3/4"	26'-6"	2	4	6'-0 3/4"	26'-3"
105	2	4	6"	6'-1 1/2"	26'-9"	2	4	6'-1 1/2"	26'-6"
106	2	4	6"	6'-2 1/4"	27'-0"	2	4	6'-2 1/4"	26'-9"
107	2	4	6"	6'-3"	27'-3"	2	4	6'-3"	27'-0"
108	2	4	6"	6'-3 3/4"	27'-6"	2	4	6'-3 3/4"	27'-3"
109	2	4	6"	6'-4 1/2"	27'-9"	2	4	6'-4 1/2"	27'-6"
110	2	4	6"	6'-5 1/4"	28'-0"	2	4	6'-5 1/4"	27'-9"
111	2	4	6"	6'-6"	28'-3"	2	4	6'-6"	28'-0"
112	2	5	6"	5'-3"	28'-6"	2	5	5'-3"	28'-3"
113	2	5	7"	5'-3 1/2"	28'-9 1/2"	2	5	5'-3 1/2"	28'-5 1/2"
114	2	5	5 1/2"	5'-4 1/4"	28'-11 3/4"	2	5	5'-4 1/4"	28'-9 1/4"
115	2	5	6 1/2"	5'-4 3/4"	29'-3 1/4"	2	5	5'-4 3/4"	28'-11 3/4"
116	2	5	7 1/2"	5'-5 1/4"	29'-6 3/4"	2	5	5'-5 1/4"	29'-2 1/4"
117	2	5	6"	5'-6"	29'-9"	2	5	5'-6"	29'-6"
118	2	5	7"	5'-6 1/2"	30'-0 1/2"	2	5	5'-6 1/2"	29'-8 1/2"
119	2	5	5 1/2"	5'-7 1/4"	30'-2 3/4"	2	5	5'-7 1/4"	30'-1/4"
120	2	5	6 1/2"	5'-7 3/4"	30'-6 1/4"	2	5	5'-7 3/4"	30'-2 3/4"
121	2	5 5	7 1/2" 6"	5'-8 1/4" 5'-9"	30'-9 3/4" 31'-0"	2 2	5	5'-8 1/4" 5'-9"	30'-5 1/4" 30'-9"
122			7"				5		
123	2	5 5		5'-9 1/2"	31'-3 1/2"	2	5	5'-9 1/2"	30'-11 1/2"
124	2		5 1/2"	5'-10 1/4"	31'-5 3/4"	2	5	5'-10 1/4"	31'-3 1/4"
125	2	5	6 1/2"	5'-10 3/4"	31'-9 1/4"	2	5	5'-10 3/4"	31'-5 3/4"
126	2	5 5	7 1/2" 6"	5'-11 1/4"	32' -0 3/4"	2	5 5	5'-11 1/4"	31'-8 1/4"
127	2		7"	6'-0"	32'-3"	2		6'-0"	32'-0"
128	2	5		6'-0 1/2"	32'-6 1/2"	2	5	6'-0 1/2"	32'-2 1/2"
129	2	5 5	5 1/2"	6'-1 1/4"	32'-8 3/4"	2	5	6'-1 1/4"	32'-6 1/4"
130	2	) 5	6 1/2"	6'-1 3/4"	33'-1/4"	2	5	6'-1 3/4"	32'-8 3/4"

- 1. Camber diagrams for truss structures with 2 to 4 sections are shown. Cambers shown are for fabrication only and are measured with trusses fully supported at no-load conditions. Allowable camber tolerance for truss is 25% of specific camber value.
- 2. See Standard Drawing E 802-SBTS-04 for additional notes.



# CAMBER DIAGRAM (2-Section Truss)



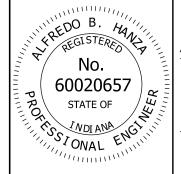


## INDIANA DEPARTMENT OF TRANSPORTATION

SIGN BOX TRUSS STRUCTURE
TABLE OF DIMENSIONS
SPANS 82' THRU 130' AND CAMBER
SEPTEMBER 2013

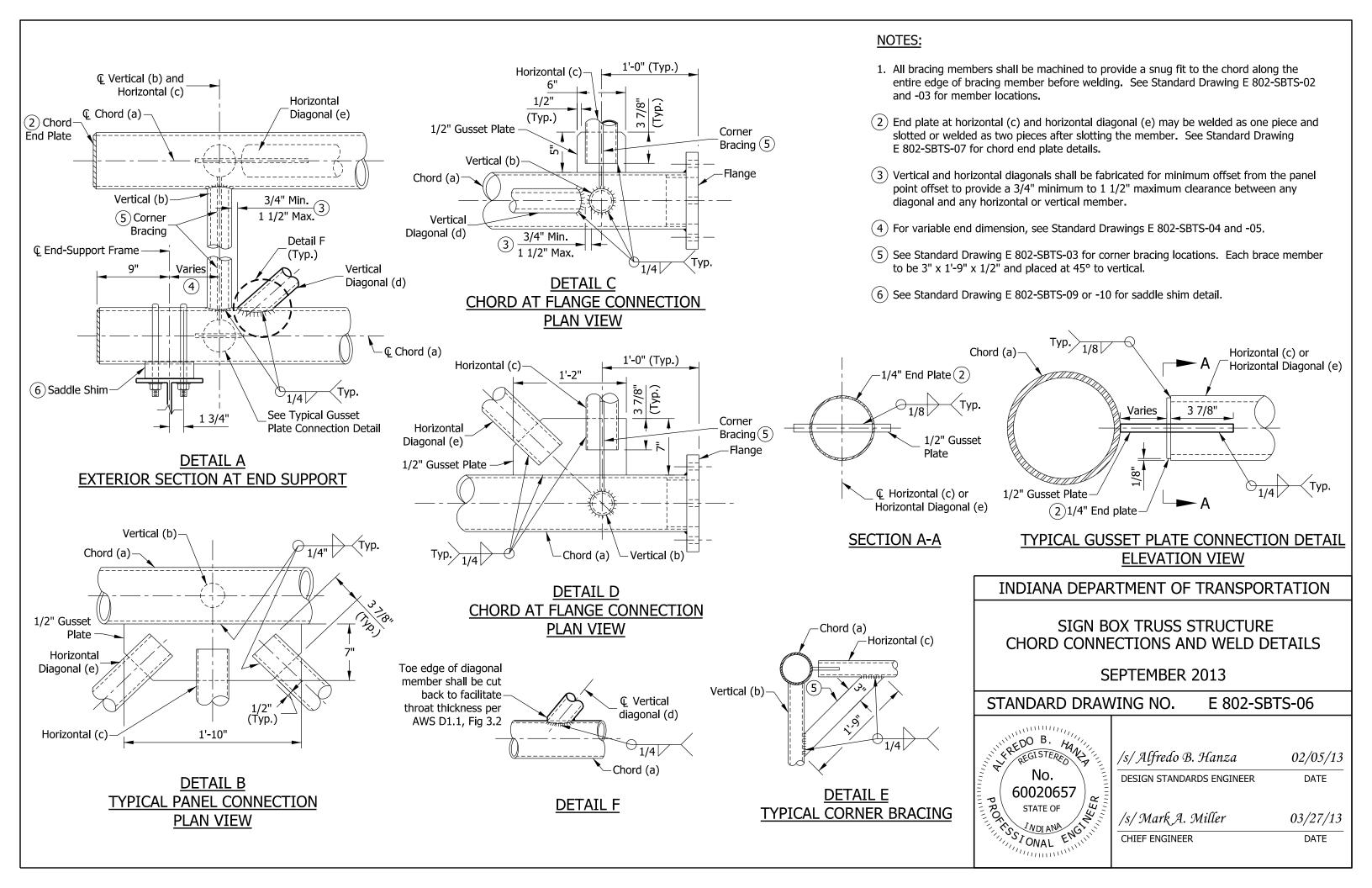
STANDARD DRAWING NO. E 802-SBTS-05

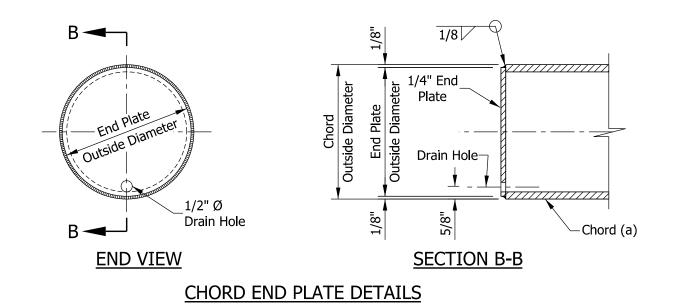
CHIEF ENGINEER

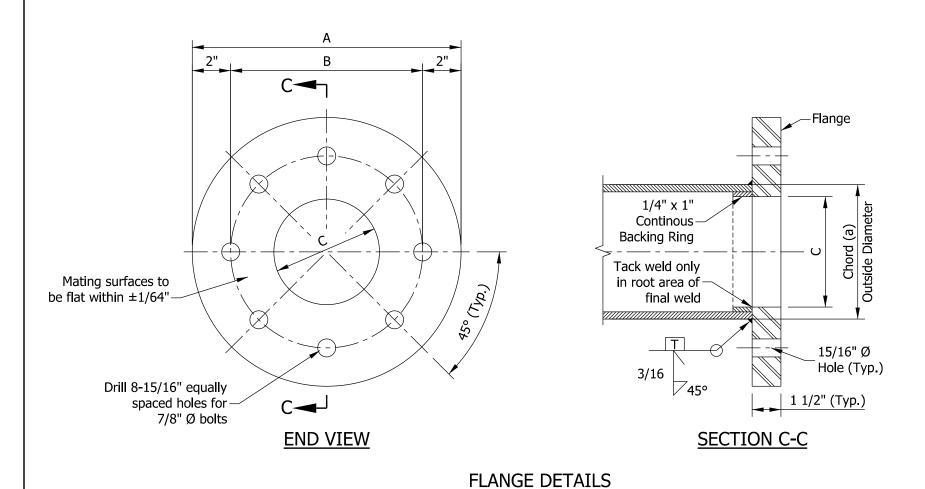


/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13

DATE







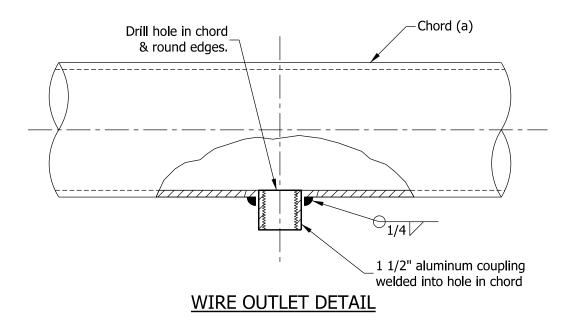
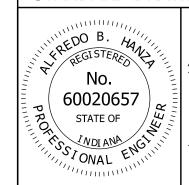
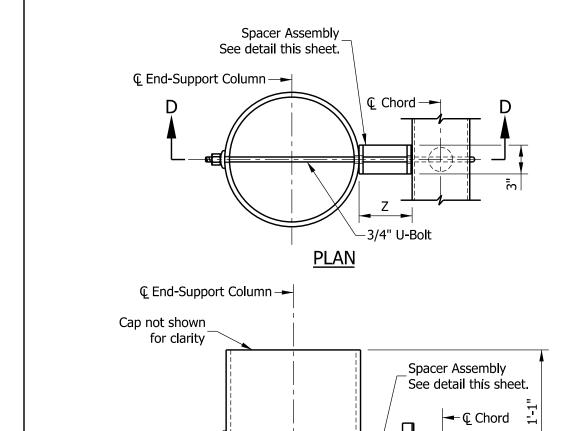


TABLE OF FLANGE DIMENSIONS				
TRUSS CHORD	BOLT	DIMENSION		
O.D. x THK.	SIZE	А	В	С
6" x 1/4"	7/8"	13"	9"	5"
6 1/2" x 3/8"	7/8"	14"	10"	5 1/4"
7" x 3/8"	7/8"	14"	10"	5 3/4"
7" x 1/2"	7/8"	14"	10"	5 1/2"

SIGN BOX TRUSS STRUCTURE FLANGE, CHORD END PLATE, AND WIRE OUTLET DETAILS SEPTEMBER 2013



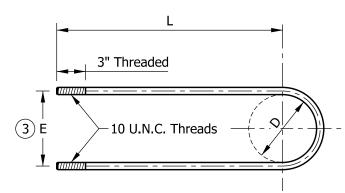
	/s/ Alfredo B. Hanza	03/26/13
11111	DESIGN STANDARDS ENGINEER	DATE
1111	/s/ Mark A. Miller	03/27/13
	CHIEF ENGINEER	DATE



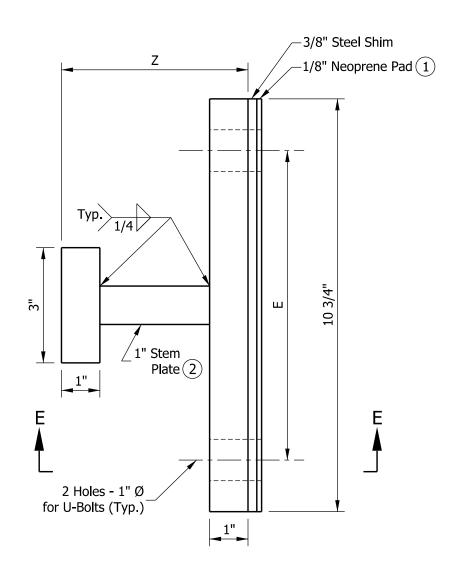
1/4" Plate Washer Bent to End-Support Radius



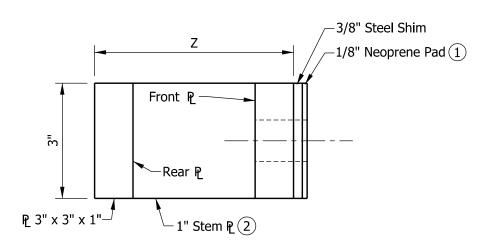
-3/4" U-Bolt



3/4" DIA. STAINLESS STEEL U-BOLT DETAIL



ELEVATION
END SUPPORT SPACER ASSEMBLY DETAIL



**SECTION E-E** 

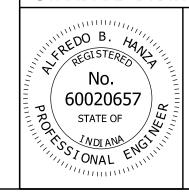
## NOTES:

- 1 Provide isolation from steel-dissimilar metal as required.
- 2 For trusses type D or E, the 1" stem plate is not required. Fillet weld front and rear plates together.
- (3) Dimension E is equal to the diameter of chord (a) plus 1".

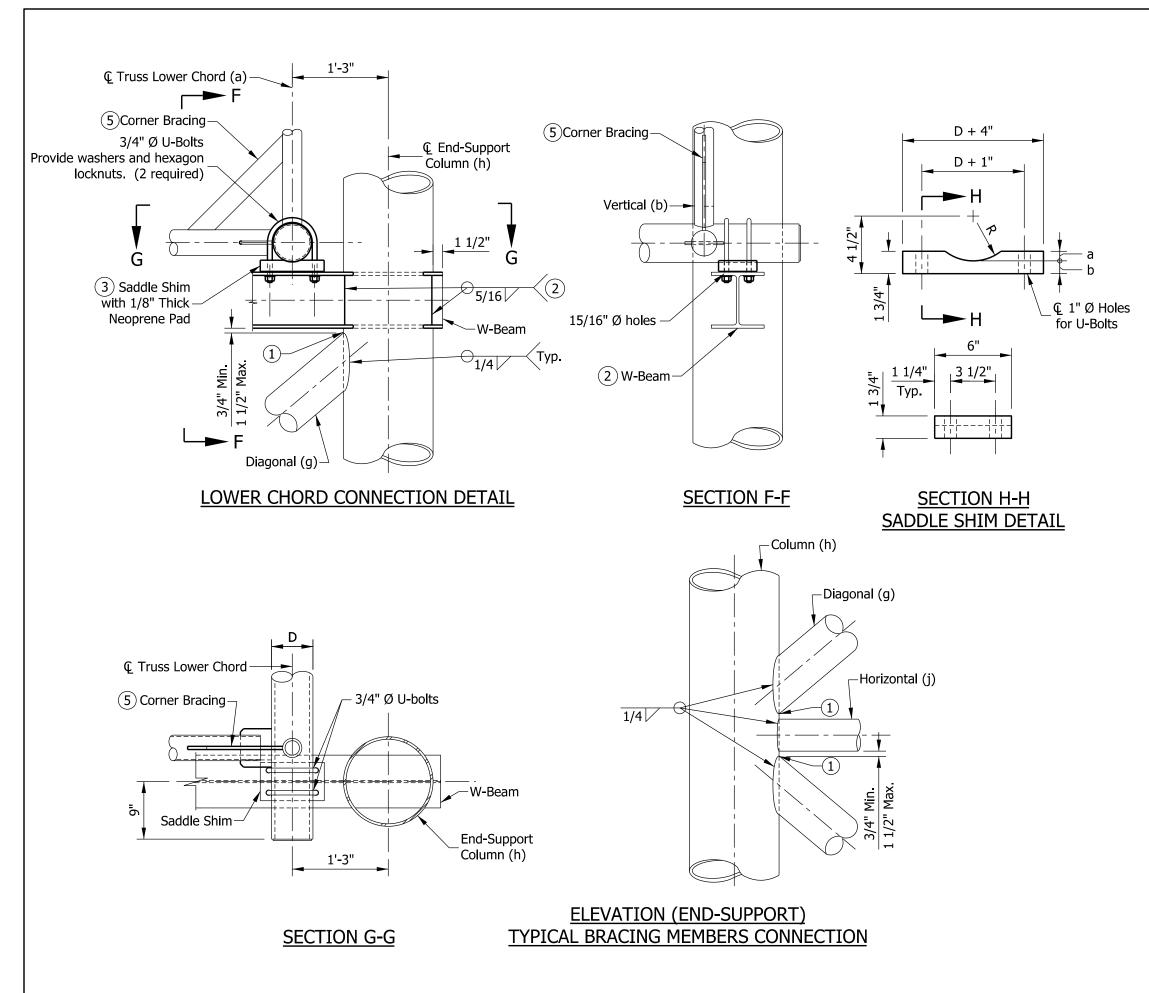
SPACER ASSEMBLY DIMENSIONS						
TRUSS TYPE	END-SUPPORT COLUMN SIZE (h)	CHORD (a)	Ø OF U-BOLT BEND	E	Z	L
	O.D. IN.	O.D. IN.	(D) IN.	IN.	IN.	IN.
Α	14	6	6 1/16	7	4 1/2	24
В	14	6 1/2	6 9/16	7 1/2	4 1/4	24
С	14	7	7 1/16	8	4	24
D	18	7	7 1/16	8	2	26
Е	18	7	7 1/16	8	2	26

## INDIANA DEPARTMENT OF TRANSPORTATION

SIGN BOX TRUSS STRUCTURE END-SUPPORT UPPER CHORD CONNECTION DETAILS SEPTEMBER 2013



	/s/ Alfredo B. Hanza	02/05/13
1111111	DESIGN STANDARDS ENGINEER	DATE
1111	/s/ Mark A. Miller	03/27/13
	CHIEF ENGINEER	DATE



- 1 Toe edge of diagonal member shall be cut back to facilitate throat thickness. See Standard Drawing E 802-SBTS-06 Detail F for toe-edge detail.
- 2 Cut holes in end support columns for W-beams to pass through. Holes to have 1/8" maximum clearance to W-beam. Holes in opposite sides of column to be checked for proper alignment prior to cutting.
- (3) Provide neoprene pads at all chord-to-W-beam bearing surfaces.
- 4. See Standard Drawing E 802-SBTS-03 for end-support member sizes.
- (5) A corner brace is required on each of the eight external corners of exterior and interior sections. Each brace shall be 1'-9" x 3" x 1/2". See Standard Drawing E 802-SBTS-06 for angle bracing Detail E.
- 6. See Standard Drawing E 802-SBTS-10 for HSS square-beam as an alternate to truss supporting W-beam.

D	a	b
6"	9/32"	1 15/32"
6 1/2"	17/32"	1 7/32"
7"	25/32"	31/32"

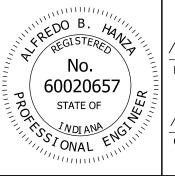
R = D/2 + 1/32"

 $R + b = 4 \frac{1}{2}$ "

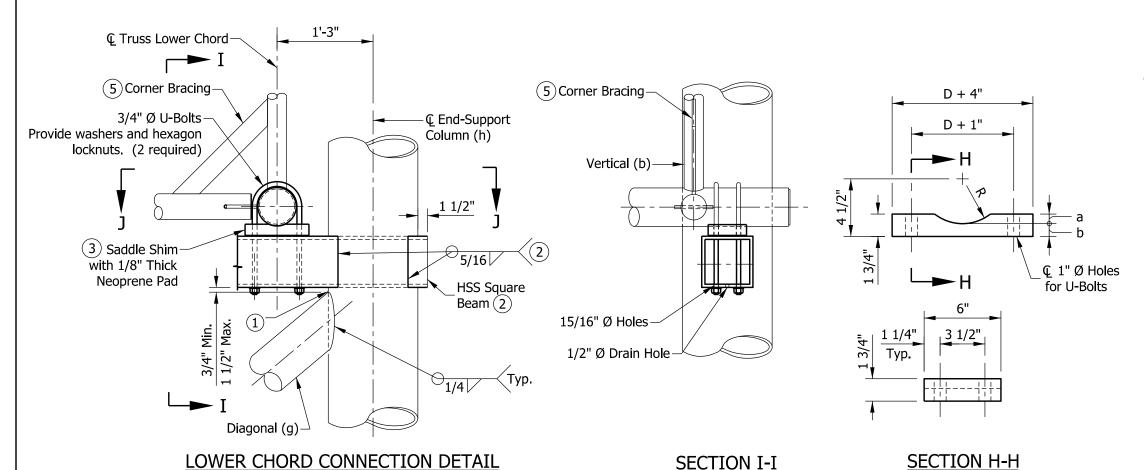
D = Outside Diameter of Chord(a).

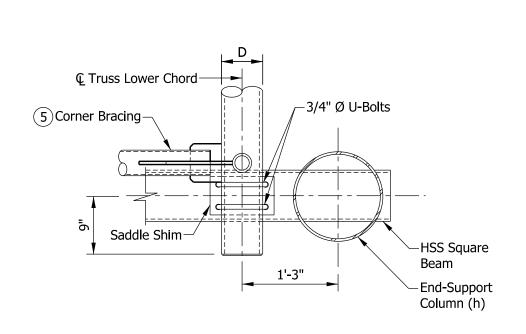
## INDIANA DEPARTMENT OF TRANSPORTATION

SIGN BOX TRUSS STRUCTURE END-SUPPORT LOWER CHORD CONNECTION DETAILS SEPTEMBER 2013

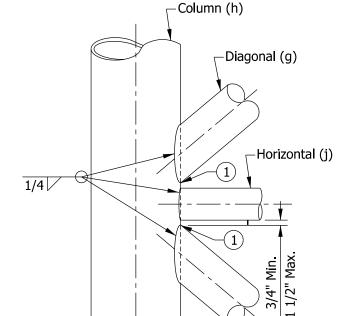


/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE





SECTION J-J



SADDLE SHIM DETAIL

ELEVATION (END-SUPPORT)
TYPICAL BRACING MEMBERS CONNECTION

### NOTES:

- 1 Toe edge of diagonal member shall be cut back to facilitate throat thickness. See Standard Drawing E 802-SBTS-06 Detail F for toe-edge detail.
- 2 Cut holes in end support columns for square beams to pass through. Holes to have 1/8" maximum clearance to square beam. Holes in opposite sides of column to be checked for proper alignment prior to cutting.
- (3) Provide neoprene pads at all chord-to-square-beam bearing surfaces.
- 4. See Standard Drawing E 802-SBTS-03 for end support member sizes.
- (5) A corner brace is required on each of the eight external corners of exterior and interior sections. Each brace shall be 1'-9" x 3" x 1/2". See Standard Drawing E 802-SBTS-06 for angle bracing Detail E.

D	a	b
6"	9/32"	1 15/32"
6 1/2"	17/32"	1 7/32"
7"	25/32"	31/32"

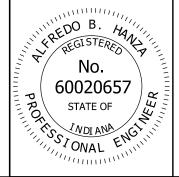
R = D/2 + 1/32"

 $R + b = 4 \frac{1}{2}$ "

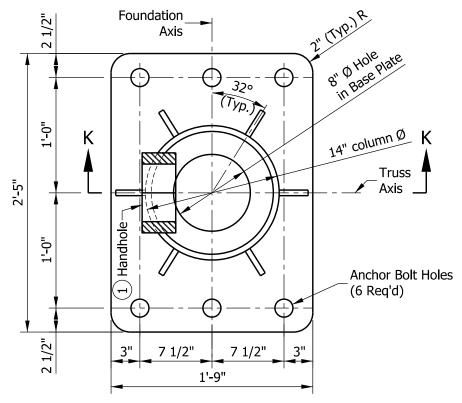
D = Outside Diameter of Chord(a).

# INDIANA DEPARTMENT OF TRANSPORTATION

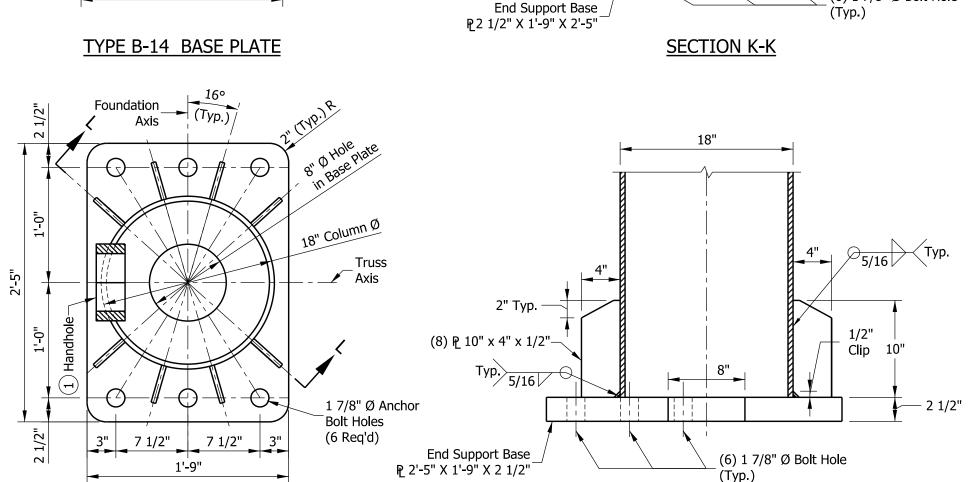
SIGN BOX TRUSS STRUCTURE END SUPPORT LOWER CHORD CONNECTION DETAILS, ALTERNATE HSS BEAM SEPTEMBER 2013



	/s/ Alfredo B. Hanza	02/05/13
	DESIGN STANDARDS ENGINEER	DATE
	/s/ Mark A. Miller	03/27/13
١	CHIEF ENGINEER	DATE



TYPE B-18 BASE PLATE



(Typ.)

(1) **©** Handhole

Typ. 5/16

1'-6"

14"

SECTION L-L

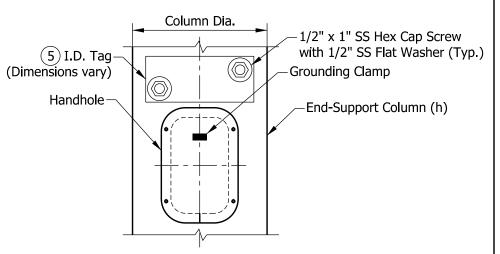
- 2 1/2"

(6) 1 7/8" Ø Bolt Hole

## NOTES:

- 1) See Standard Drawing E 802-SBTS-12 for handhole details.
- 2. Use Type B-14 base plate for end-support column having diameter of 14". Use Type B-18 base plate for end-support column having diameter of 18".
- 3. See Standard Drawing E 802-SBTS-13 for anchor bolt and metal skirt details.
- 4. Each end support shall have one handhole at the column base (h). Handhole shall be placed on the column nearest to the sign.
- (5) I.D. tag is required on each end-support column. 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 \_\_\_\_\_, Structure Length \_\_\_\_\_ End Support Mounting Height \_\_\_\_\_



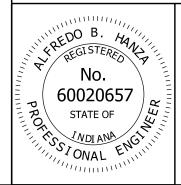
# ELEVATION VIEW FROM HANDHOLE SIDE

## INDIANA DEPARTMENT OF TRANSPORTATION

SIGN BOX TRUSS STRUCTURE END SUPPORT BASE PLATE AND I.D. TAG DETAILS SEPTEMBER 2013

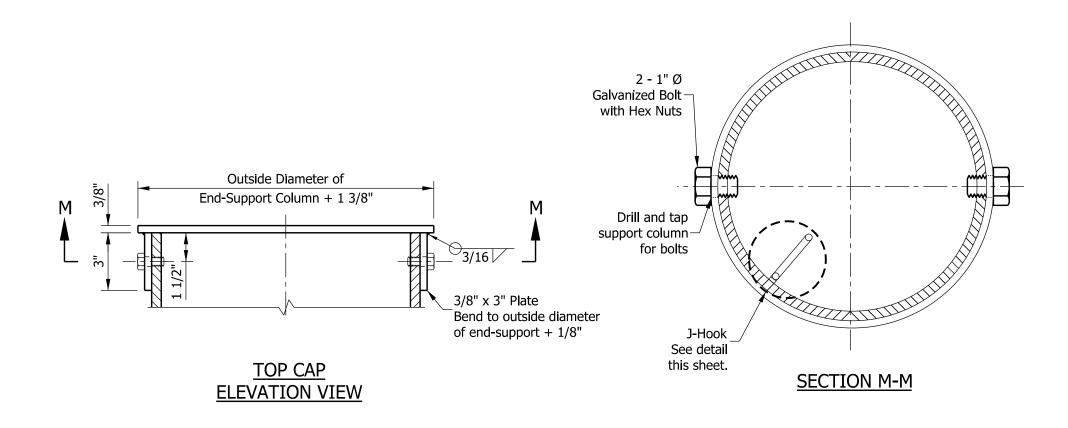
STANDARD DRAWING NO. E 802-SBTS-11

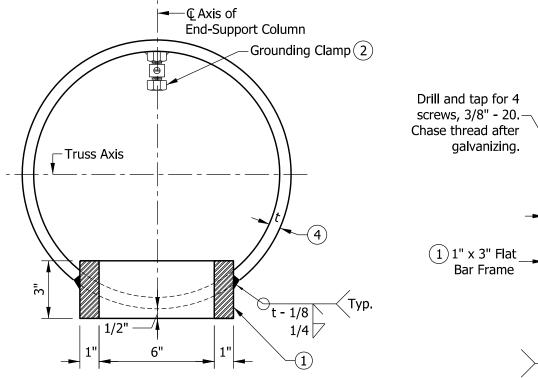
CHIEF ENGINEER



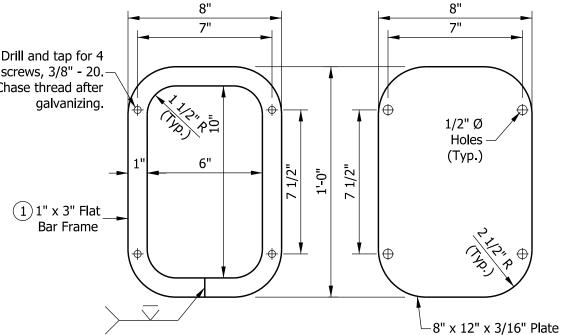
/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13

DATE





<u>HANDHOLE</u> SECTION ACROSS COLUMN

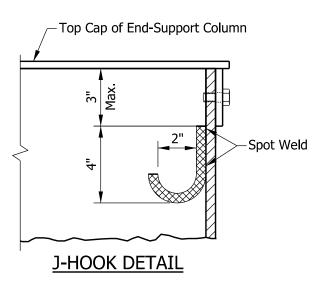


HANDHOLE FRAME DETAIL

HANDHOLE COVER

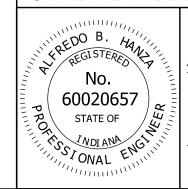
## NOTES:

- 1 In lieu of fabricated handhole frame as shown, frame may be cut from 3" plate (rolling direction vertical).
- 2 See Standard Drawing E 802-SNWR-03 for grounding post details. Grounding post to be placed on far side of support directly opposite center of handhole.
- 3. See Standard Drawing E 802-SBTS-02 and 10 for handhole locations.
- 4 See Standard Drawing E 802-SBTS-03 for thicknesses of end-support columns (h).

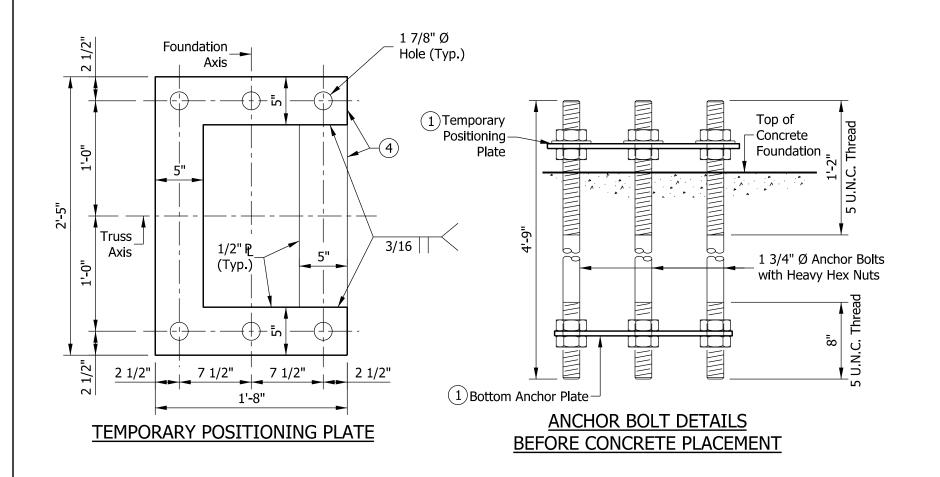


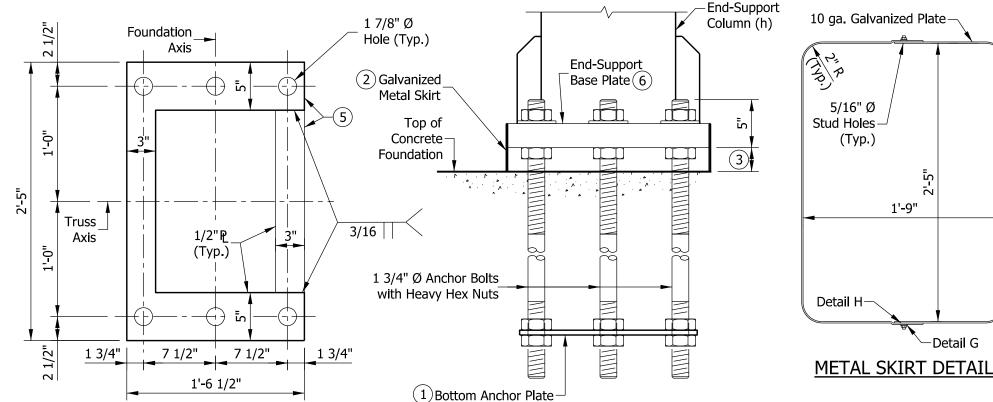
## INDIANA DEPARTMENT OF TRANSPORTATION

SIGN BOX TRUSS STRUCTURE END-SUPPORT TOP-CAP, HANDHOLE, AND J-HOOK DETAILS SEPTEMBER 2013



/s/ Alfredo B. Hanza	02/05/1
 DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/1.
CHIEF ENGINEER	DATE



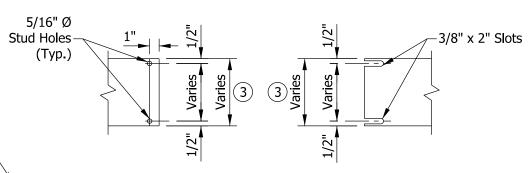


**BOTTOM ANCHOR PLATE** 

ANCHOR BOLT DETAILS
AFTER CONCRETE PLACEMENT

#### NOTES:

- 1 Use temporary positioning plate and bottom anchor plate for all foundations. Temporary positioning plate should be removed after placing concrete.
- 2 Secure galvanized metal skirt to base plate after erection as shown in skirt detail.
- (3) Minimum base plate gap is 2 1/2" and can be increased up to 5 1/2". Metal skirt width shall be at least 1 1/2" more than the actual gap.
- (4) May use four separate 5" plates welded together to maintain angles and shape as shown.
- (5) May use two separate 3" and two separate 5" plates welded together to maintain angles and shape as shown.
- 6 See Standard Drawing E 802-SBTS-11 for end-support base plate details.



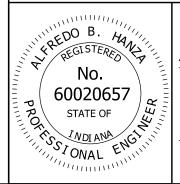
**DETAIL G** 

DETAIL H

## INDIANA DEPARTMENT OF TRANSPORTATION

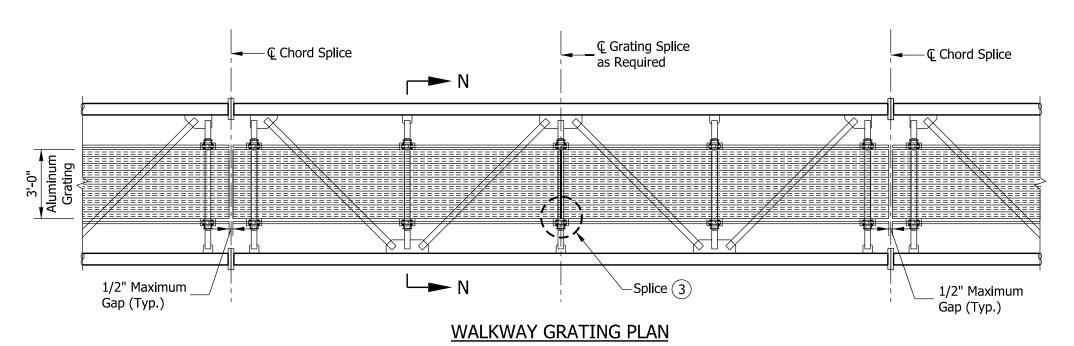
SIGN BOX TRUSS STRUCTURE END-SUPPORT ANCHOR BOLT AND METAL SKIRT DETAILS SEPTEMBER 2013

STANDARD DRAWING NO. E 802-SBTS-13



/s/ Alfredo B. Hanza	03/26/13
DESIGN STANDARDS ENGINEER	DATE
10/Mark A Millor	02/27/12

/s/ Mark A. Miller 03/27/13
CHIEF ENGINEER DATE



#### - © Truss and Truss Grating Chord Splice 11 3/4" , |<sub>|</sub> 11 3/4" T Connection 5/16" Eye-Bolt 1 1/2" Ø x Sch. 40 w/Two Nuts-Spring 3/16 1/2" Aluminum Pipe & Washers Snap Continuous over Posts **Cross Connection ©** Truss and Sign 1'-9 3/4" 1 1/2" Ø Sch. 40 3/16 <sup>∠</sup>3/16" Chain Aluminum Pipe 3'- 1/8" (2) -Sign Panel Hand Rail ...... Grating Angle **Bottom Horizontal** Truss Member 5/16" Ø Stainless Steel Aluminum U-Bolt w/ Locknut Grating TYPICAL HANDRAIL DETAIL **SECTION N-N**

## NOTES:

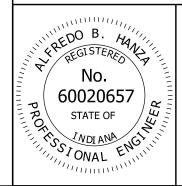
- 1. Interior walkway gratings shall be extruded I-bars 2" x 1/4" x 1 3/16" center-to-center. Cross bars shall have a maximum gap of 4". Moment of Inertia,  $I_x = 1.382 \text{ in}^4$ . A different grating of equal strength may be used upon approval.
- (2) Walkway grating width is nominal and may vary  $\pm 1/2$ " based on available standard widths.
- 3 Interior walkway gratings can be spliced on center of any horizontal truss member as needed. See Standard Drawing E 802-SBTS-15 for typical interior walkway grating splice detail.
- 4. Interior walkway grating shall run the full length, center-to-center, of end-support truss members plus 9" at each end.

## INDIANA DEPARTMENT OF TRANSPORTATION

# SIGN BOX TRUSS STRUCTURE INTERIOR WALKWAY GRATING DETAILS

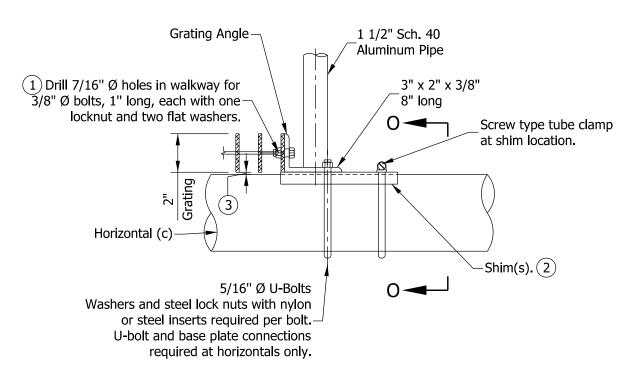
SEPTEMBER 2013

STANDARD DRAWING NO. E 802-SBTS-14

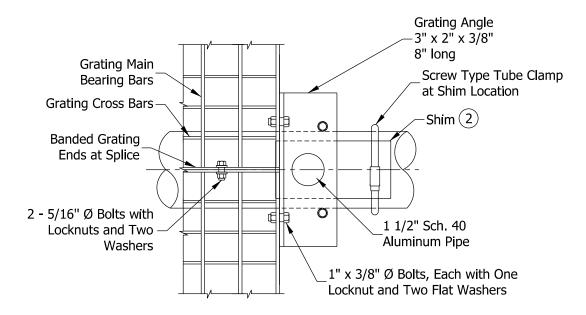


/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE

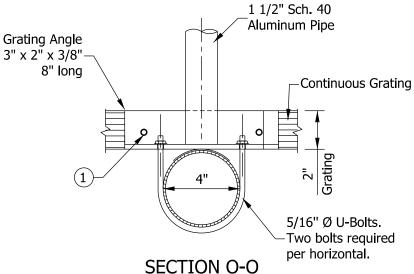
/s/ Mark A. Miller 03/27/13

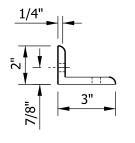


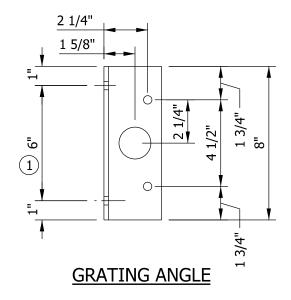
# **GRATNG SUPPORT DETAIL**



**GRATING SPLICE DETAIL** 

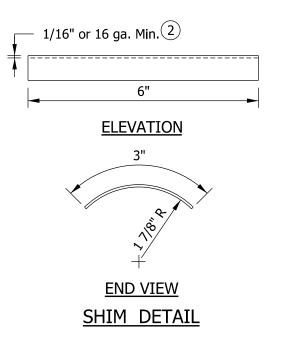






### NOTES:

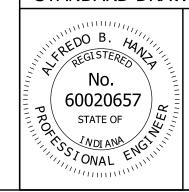
- 1 Drilling of holes in grating may be done in shop or field, based on Contractor's preference and subject to accurate alignment.
- 2 Shims may be placed as shown, if needed to compensate for alignment variations between horizontal and diagonal pipes beyond adjustment provided by angles. Thicker shims may be used subject to shims performing properly.
- (3) Tube-to-grating gap may vary from 0 to 1/2" max. to align walkway, allow for camber.



# INDIANA DEPARTMENT OF TRANSPORTATION

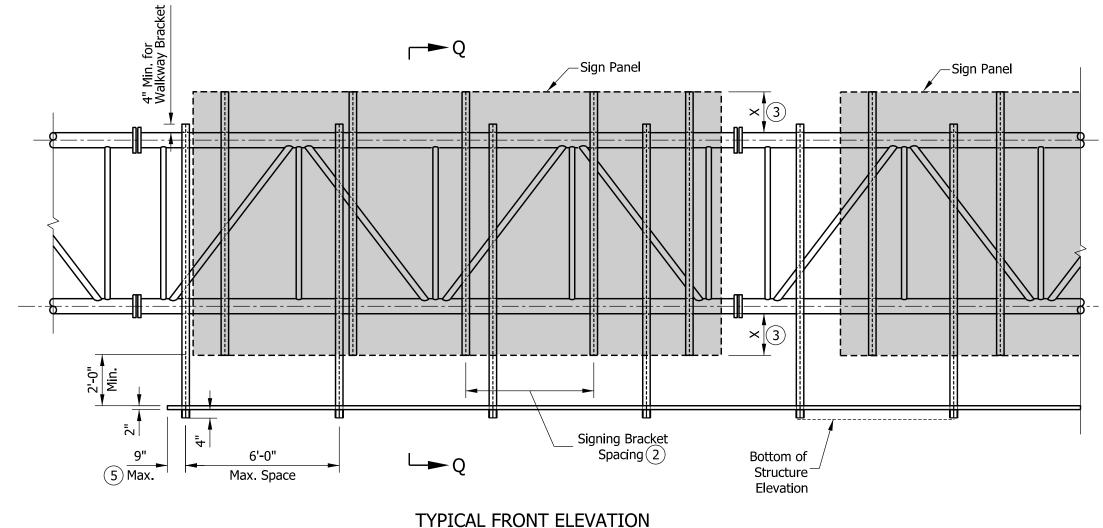
# SIGN BOX TRUSS STRUCTURE INTERIOR WALKWAY GRATING DETAILS

SEPTEMBER 2013



	/s/ Alfredo B. Hanza	02/05/13
	DESIGN STANDARDS ENGINEER	DATE
1111	/s/ Mark A. Miller	03/27/13
	CHIFF ENGINEER	DATE

- 1. For location and data for sign panels, see plan details cross section.
- 2 Signs > 7' in height, bracket spacing 5' max. Signs  $\leq$  7' in height, bracket spacing 7' max.
- (3) Dimension X depends on the height of the sign. Sign is to be centered vertically on truss.
- 4. See Standard Drawing E 802-SBTS-17 for Plan, and E 802-SBTS-18 for Section Q-Q.
- (5) Sign shall be installed on truss with independent brackets WF (A-N) 4 x 3.06. Lighting walkway may be extended to comply with the 9" maximum unsupported grating.



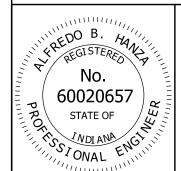
(Lights & handrail omitted for clarity)

## INDIANA DEPARTMENT OF TRANSPORTATION

# SIGN BOX TRUSS STRUCTURE LIGHTING WALKWAY

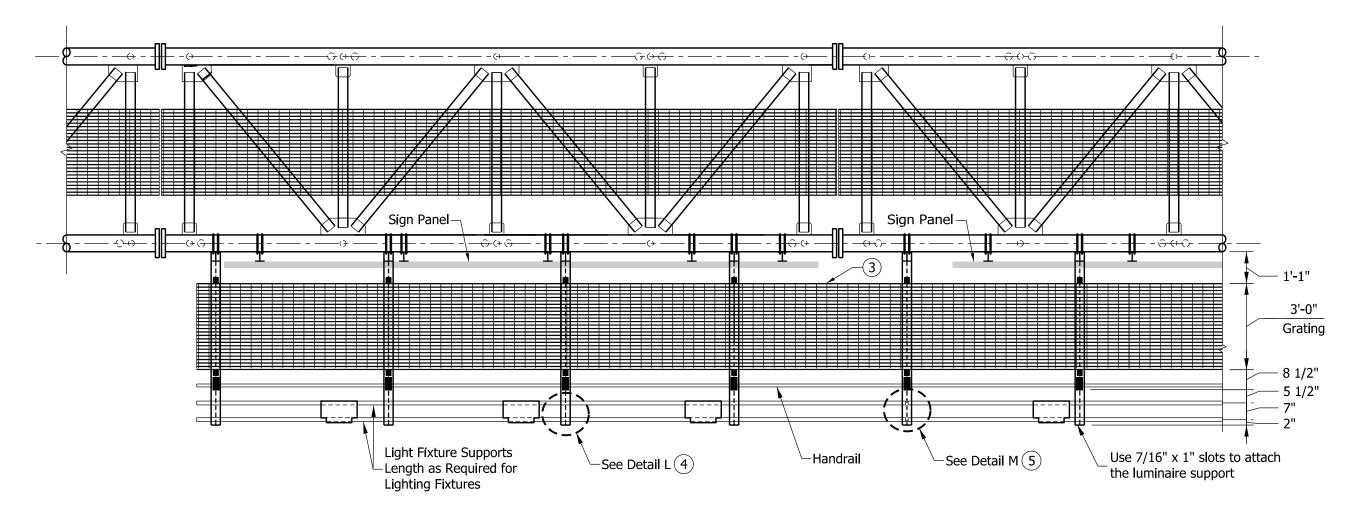
SEPTEMBER 2013

STANDARD DRAWING NO. E 802-SBTS-16



/s/ Alfredo B. Hanza 02/05/13
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13

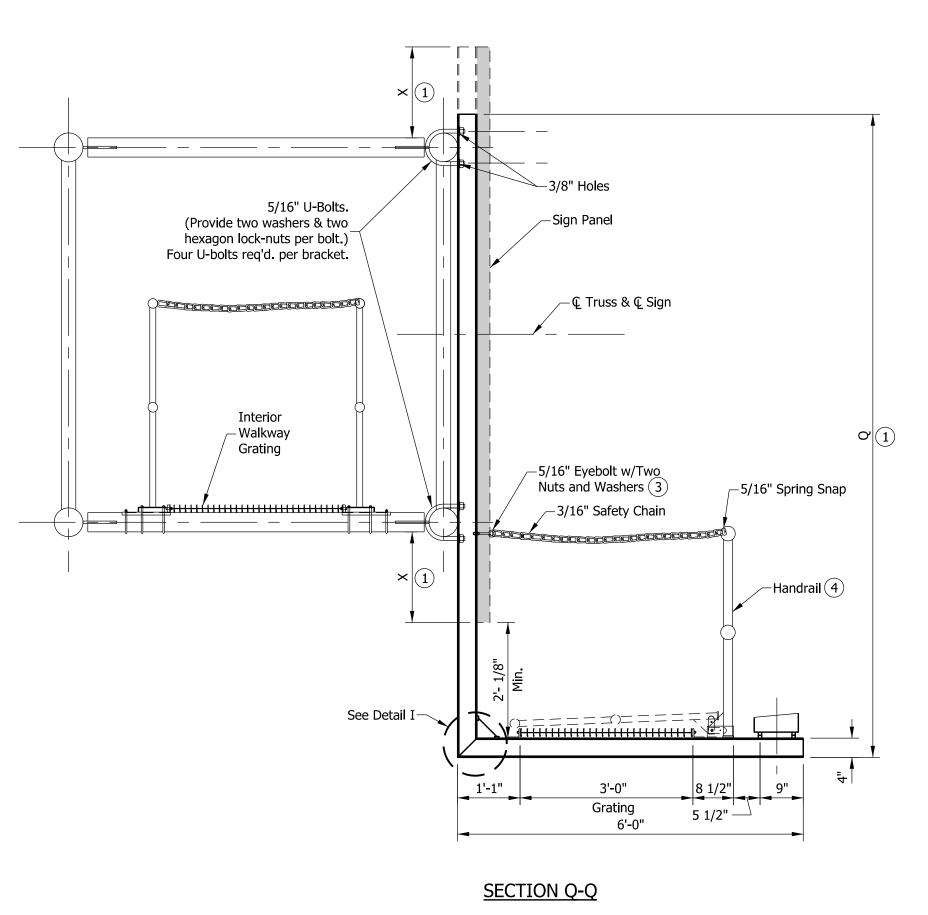


**PLAN** 

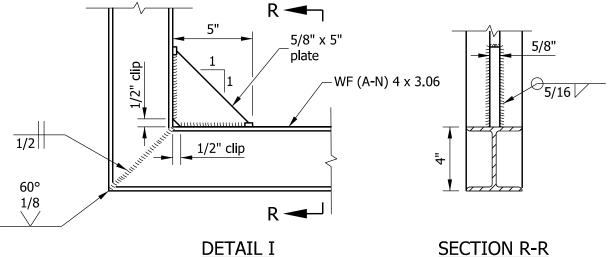
## NOTES:

- 1. Handrail and grating shall span a minimum of 3 brackets.
- 2. Grating splice located on center of L-bracket only. See Standard Drawing E 802-SBTS-21, Detail M.
- (3) Lighting walkway gratings are extruded I-bars 2" x 1/4" spaced at 1 3/16" center-to-center. Cross bars shall have a maximum gap of 4". Moment of Inertia,  $I_x = 1.382 \text{ in}^4$ . A different grating of equal strength may be used upon approval.
- (4) See Standard Drawing E 802-SBTS-21, Detail L.
- 5 See Standard Drawing E 802-SBTS-21, Detail M.

## INDIANA DEPARTMENT OF TRANSPORTATION SIGN BOX TRUSS STRUCTURE LIGHTING WALKWAY SEPTEMBER 2013 STANDARD DRAWING NO. E 802-SBTS-17 HREGISTEREO PAR /s/ Alfredo B. Hanza 02/05/13 No. DESIGN STANDARDS ENGINEER DATE 60020657 STATE OF STATE OF ONAL ENGINEERS /s/ Mark A. Miller 03/27/13 CHIEF ENGINEER DATE



- 1. Dimensions X and Q to be determined by Contractor to fit signs.
- 2. Sign panel shall be placed symmetrically about centerline of truss.
- 3 Eyebolt shall be attached to web of bracket at approximate elevation of upper handrail pipe.
- (4) See Standard Drawing E 802-SBTS-19 for handrail details.

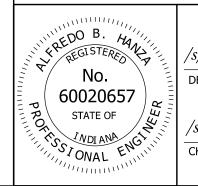


## INDIANA DEPARTMENT OF TRANSPORTATION

# SIGN BOX TRUSS STRUCTURE LIGHTING WALKWAY PROFILE

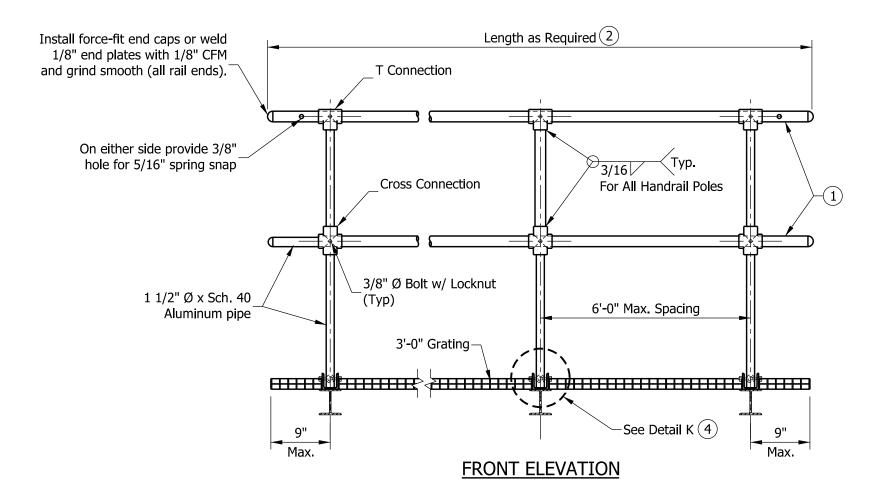
SEPTEMBER 2013

STANDARD DRAWING NO. E 802-SBTS-18



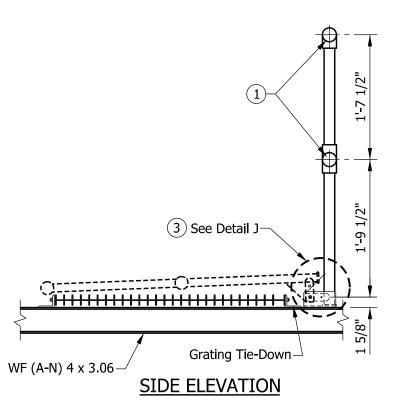
/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE

/s/ Mark A. Miller 03/27/13



- 1 Horizontal rail member shall be continuous through fitting.

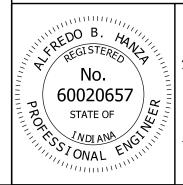
  Manufacturer shall provide 7/16" holes for fitting 3/8" bolt. Field drill 7/16" hole in horizontal rail member. Attach handrail with 3/8" bolt, washer, and locknut.
- (2) Rail and grating shall span a minimum of three brackets.
- (3) See Standard Drawing E 802-SBTS-20 for Detail J.
- (4) See Standard Drawing E 802-SBTS-20 for Detail K.



## INDIANA DEPARTMENT OF TRANSPORTATION

SIGN BOX TRUSS STRUCTURE LIGHTING WALKWAY AND HANDRAIL ASSEMBLY SEPTEMBER 2013

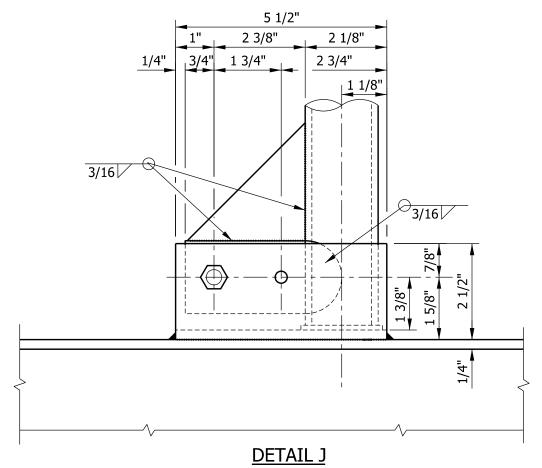
STANDARD DRAWING NO. E 802-SBTS-19



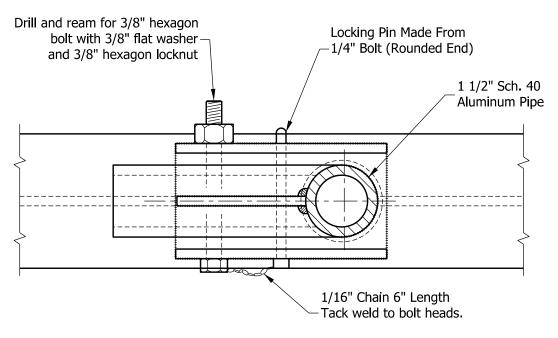
/s/Alfredo B. Hanza 02/05/13

DESIGN STANDARDS ENGINEER DATE

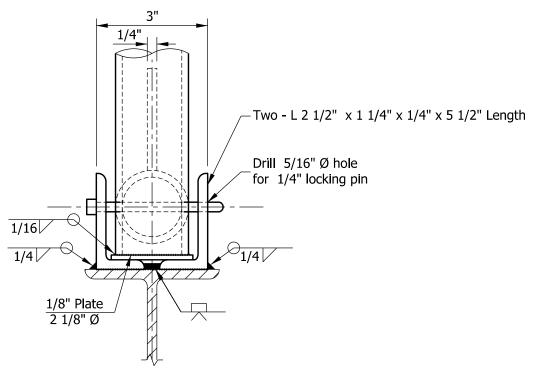
/s/ Mark A. Miller 03/27/13



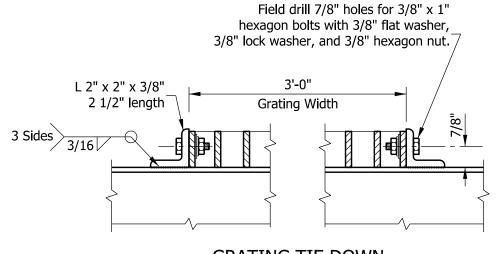




<u>PLAN</u> <u>DETAILS OF HANDRAIL HINGE</u>



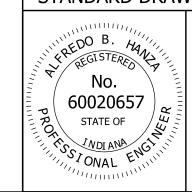
<u>DETAIL K</u> <u>FRONT ELEVATION</u>



GRATING TIE DOWN (Two req'd per walkway bracket)

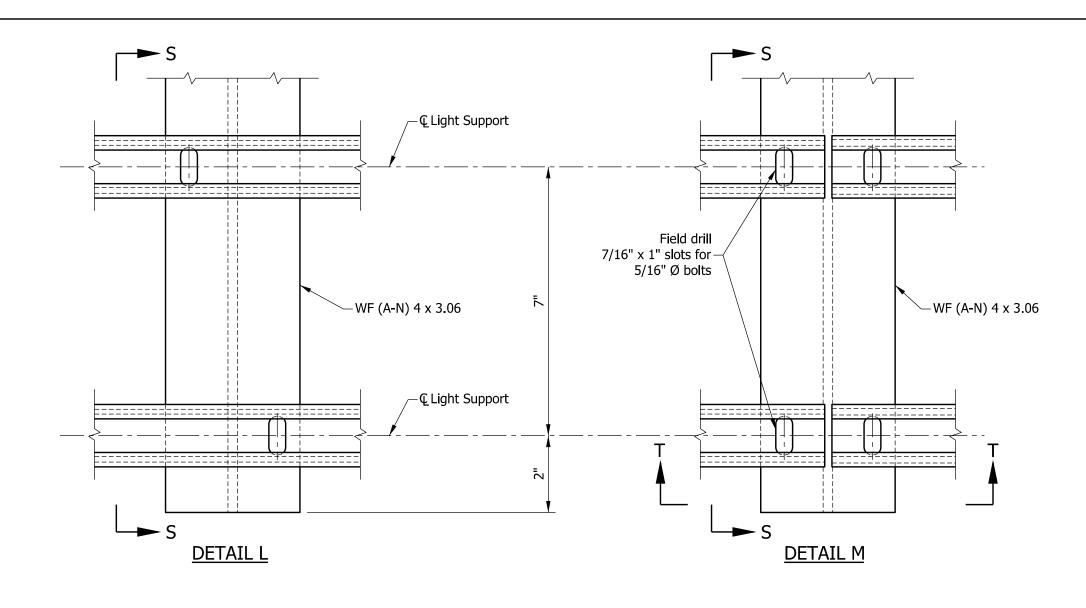
SIGN BOX TRUSS STRUCTURE LIGHTING WALKWAY, HANDRAIL HINGE, AND GRATING DETAILS SEPTEMBER 2013

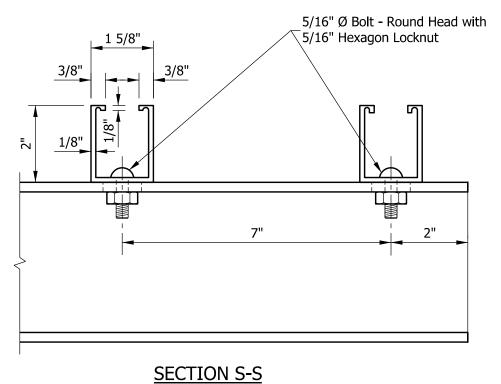
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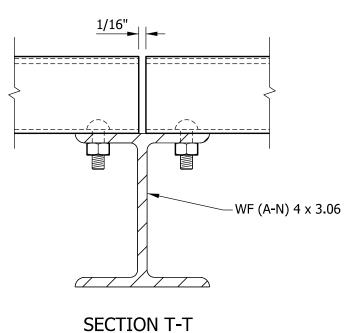


	/s/ Alfredo B. Hanza	03/26/13
11111111	DESIGN STANDARDS ENGINEER	DATE
1111		

/s/ Mark A. Miller 03/27/13
CHIEF ENGINEER DATE

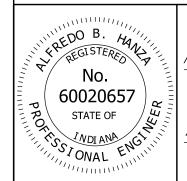






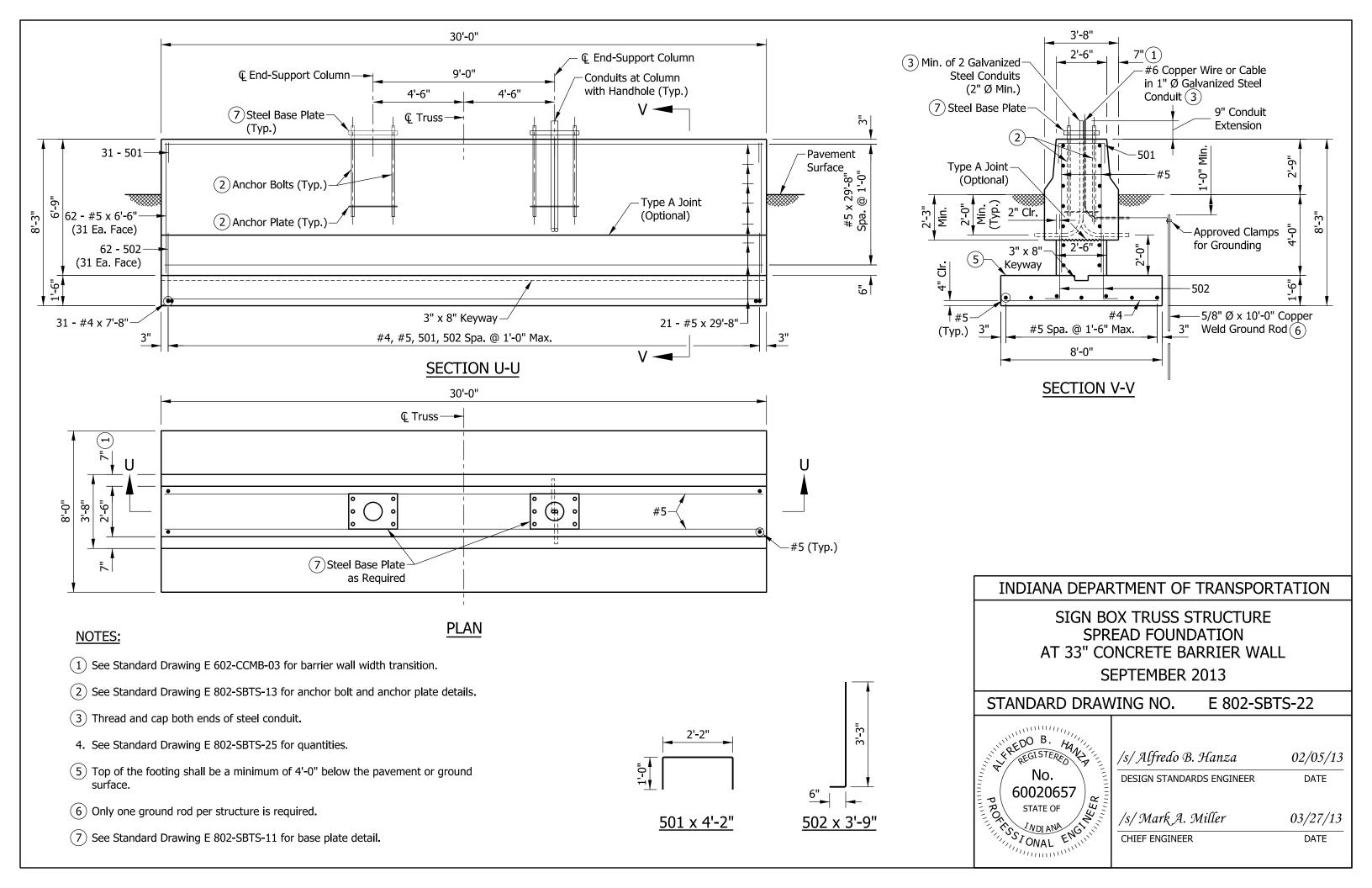
SIGN BOX TRUSS STRUCTURE LIGHTING WALKWAY FIXTURE MOUNT DETAILS SEPTEMBER 2013

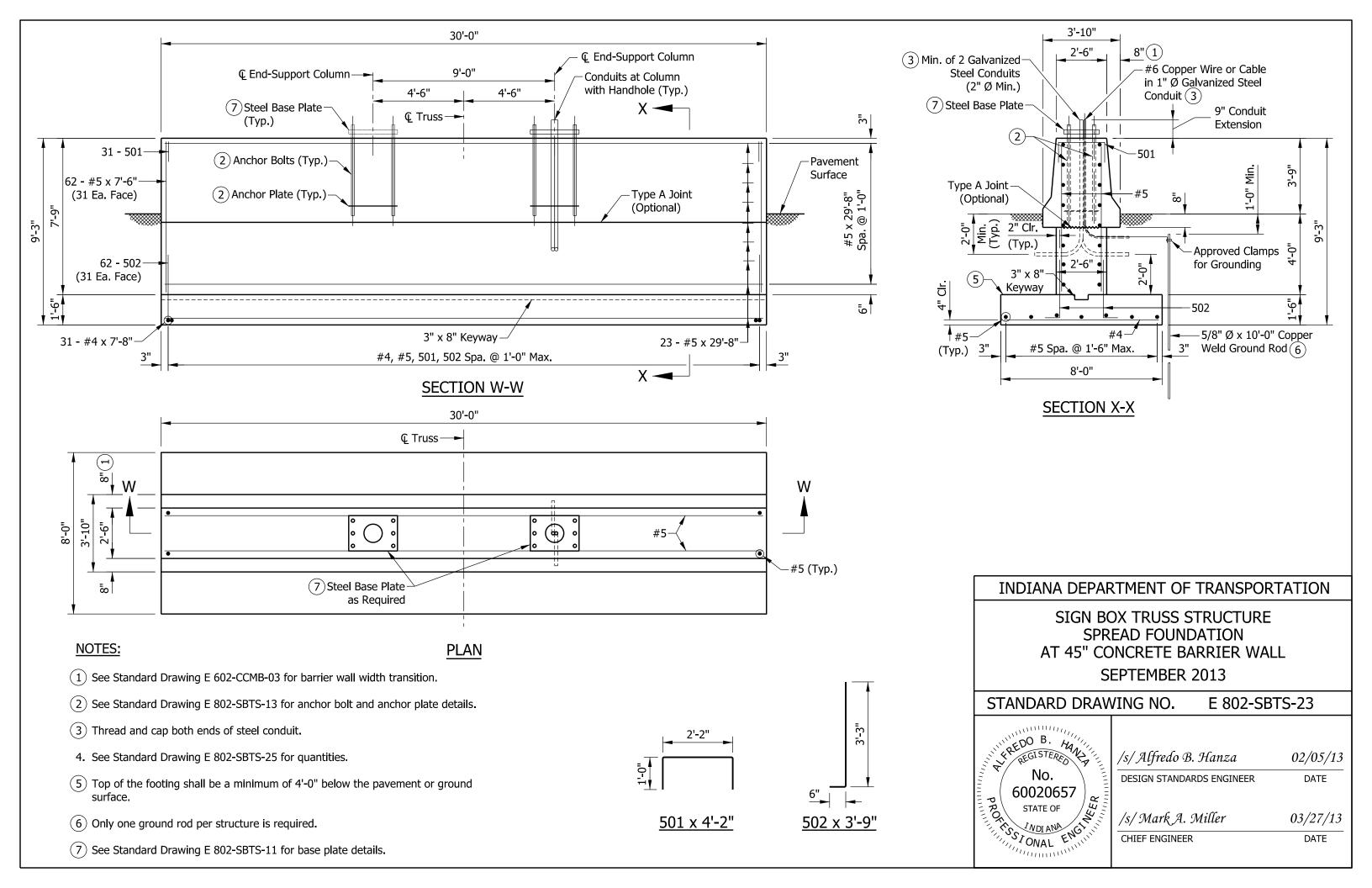
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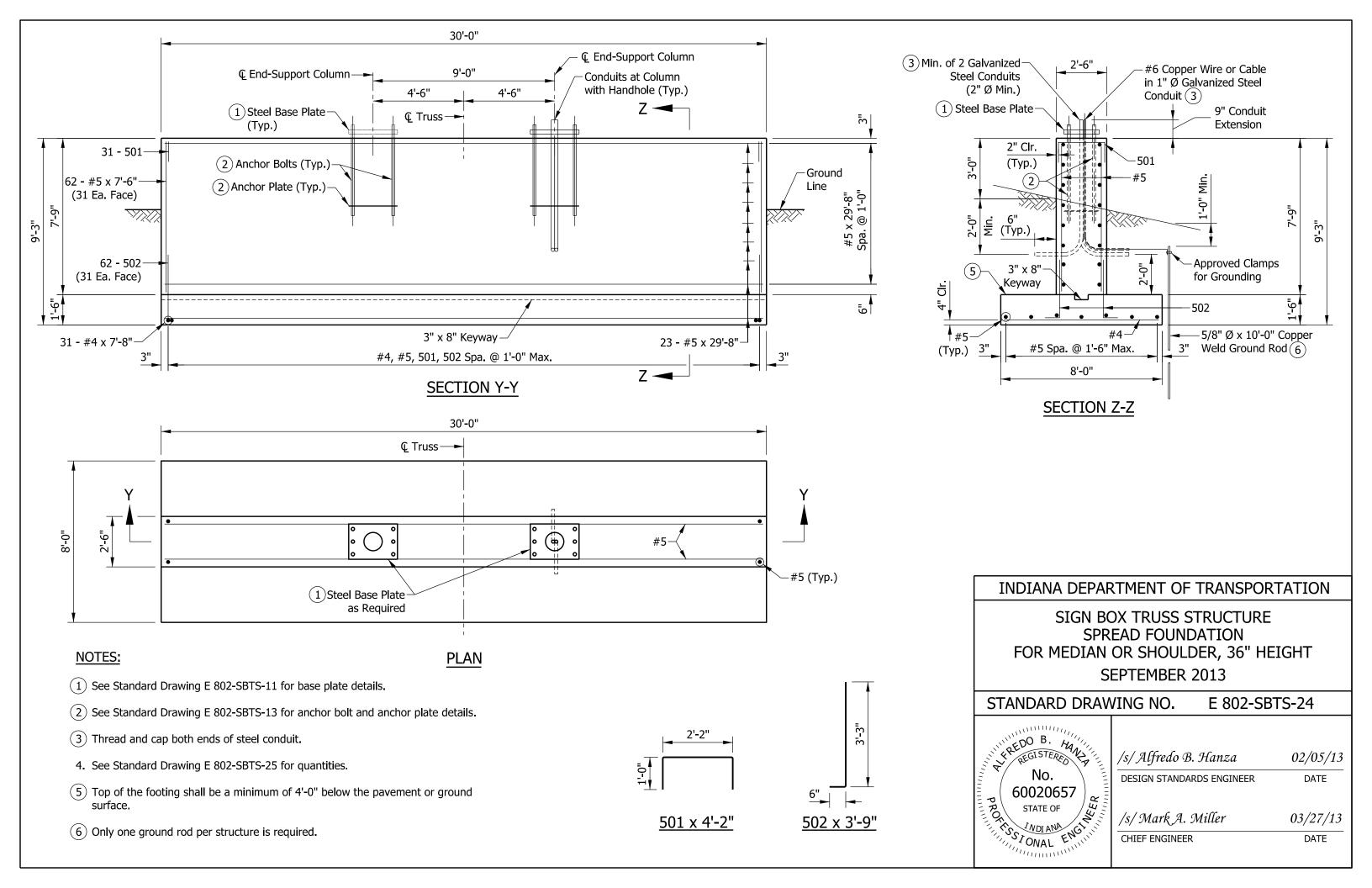


/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE

/s/ Mark A. Miller 03/27/13 CHIEF ENGINEER







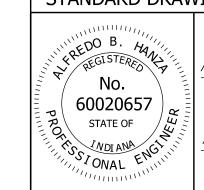
SPREAD FOUNDATION AT 33" CONCRETE BARRIER WALL			
EPOXY-0	COATED RE	INFORCING	G BARS
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
501	31	4'-2"	
502	62	3'-9"	
#5	62	6'-6"	
#5	21	29'-8"	
Total #5	1447 LBS		
#4	31	7'-8"	
Total #4	159 LBS		
Total Epoxy-Co Reinforcing Bar	1606 LBS		
CONCRETE, CLASS A			
Total Concrete, Class A 35.8 CYS			
MISCELLANEOUS			
Surface Seal 27.6 SYS			

SPREAD FOUNDATION AT 45" CONCRETE BARRIER WALL				
EPOXY-0	COATED RE	INFORCING	G BARS	
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT	
501	31	4'-2"		
502	62	3'-9"		
#5	62	7'-6"		
#5	23	29'-8"		
Total #5			1574 LBS	
#4	31	7'-8"		
Total #4			159 LBS	
Total Epoxy-Co Reinforcing Bar	1733 LBS			
CONCRETE, CLASS A				
Total Concrete, Class A 37.6 CYS				
MISCELLANEOUS				
Surface Seal	Surface Seal 34.3 SYS			

SPREAD FOUNDATION FOR MEDIAN OR SHOULDER, 36" HEIGHT			
EPOXY-0	COATED RE	INFORCING	G BARS
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
501	31	4'-2"	
502	62	3'-9"	
#5	62	7'-6"	
#5	23	29'-8"	
Total #5			1574 LBS
#4	31	7'-8"	
Total #4			159 LBS
Total Epoxy-Coated Reinforcing Bars			1733 LBS
CONCRETE, CLASS A			
Total Concrete, Class A			34.9 CYS
MISCELLANEOUS			
Surface Seal 28.3 SYS			

SIGN BOX TRUSS STRUCTURE
SPREAD FOUNDATIONS
QUANTITIES
SEPTEMBER 2013

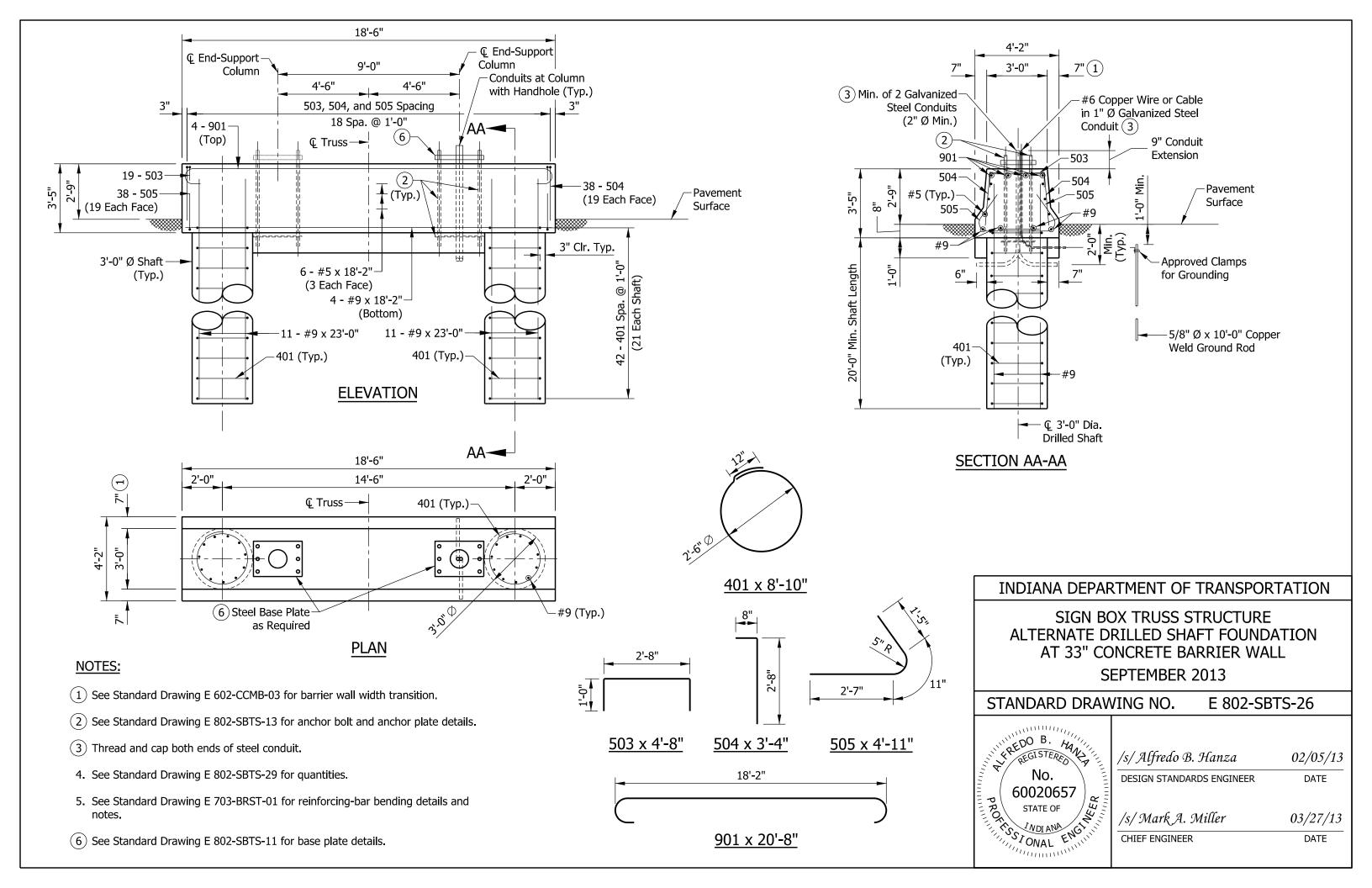
STANDARD DRAWING NO. E 802-SBTS-25

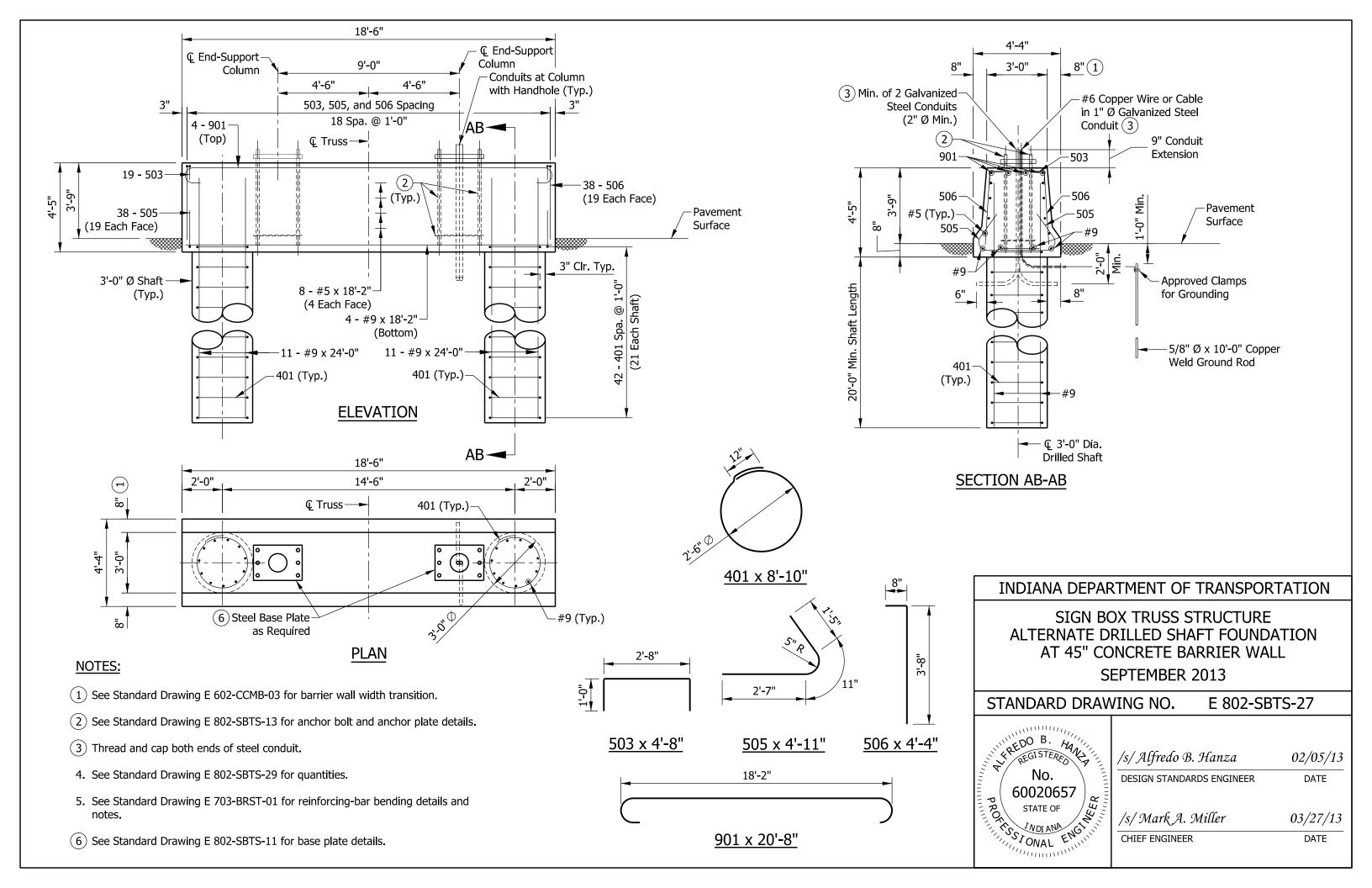


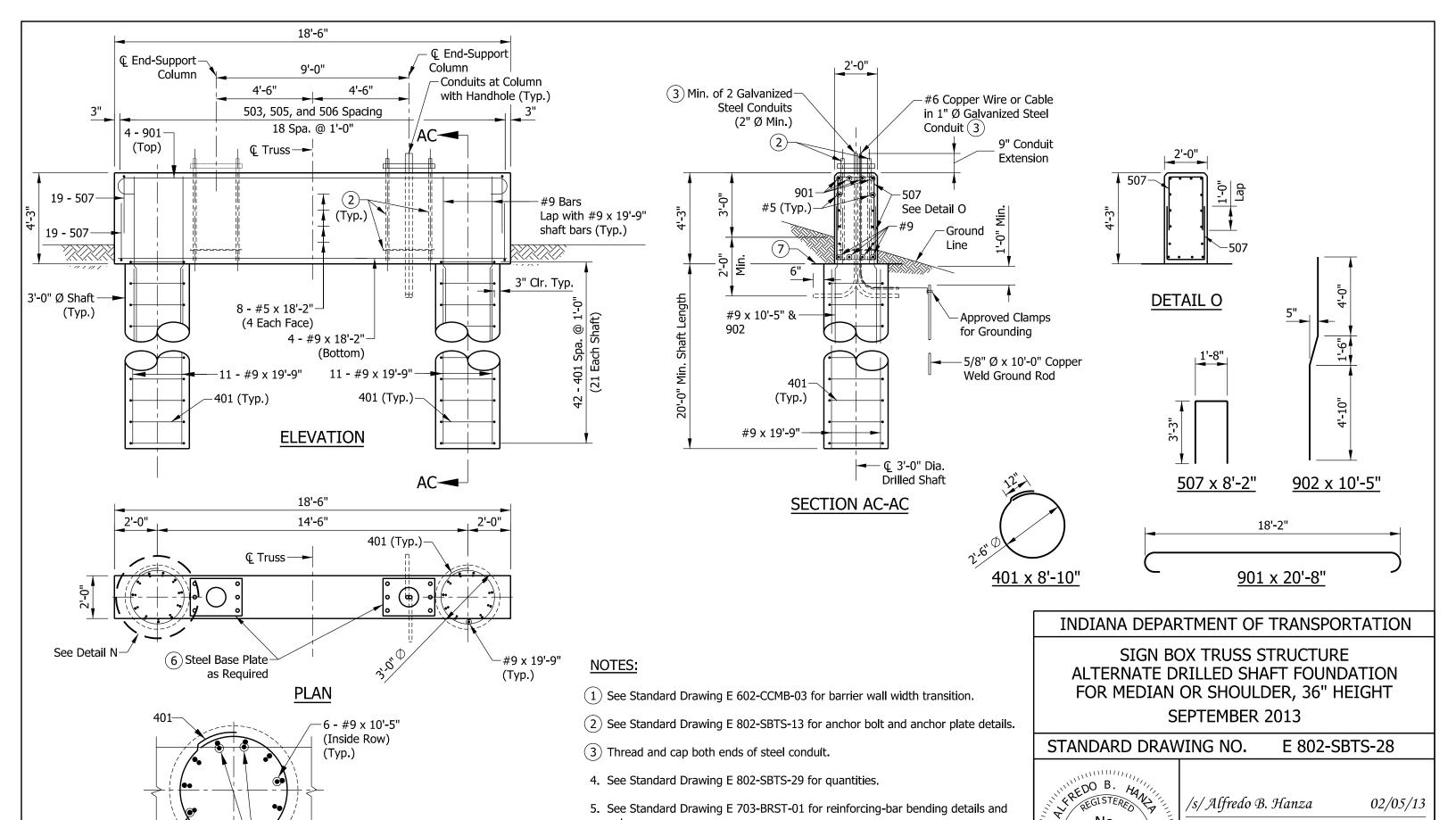
/s/ Alfredo B. Hanza 02/05/13

DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13







(6) See Standard Drawing E 802-SBTS-11 for base plate details.

notes.

(7) Top of foundation shall be level.

11 - #9 x 19'-9"

(Outside Row)

(Typ.)

5 - 902

**DETAIL N** 

(Inside Row)

No.

60020657

STATE OF STA

STONAL ET

DESIGN STANDARDS ENGINEER

/s/ Mark A. Miller

CHIEF ENGINEER

DATE

03/27/13

DATE

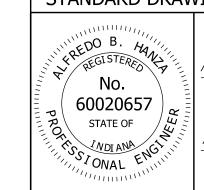
ALTERNATE DRILLED SHAFT FOUNDATION AT 33" CONCRETE BARRIER WALL			
EPOXY-0	COATED RE	INFORCING	G BARS
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
901	4	20'-8"	
#9	4	18'-2"	
#9	22	23'-0"	
Total #9			2249 LBS
503	19	4'-8"	
504	38	3'-4"	
505	38	4'-11"	
#5	6	18'-2"	
Total #5	533 LBS		
401	42	8'-10"	
Total #4	248 LBS		
Total Epoxy-Co Reinforcing Bar	3030 LBS		
CONCRETE, CLASS A			
Total Concrete, Class A 20.0 CYS			
MISCELLANEOUS			
Surface Seal 17.6 SYS			

ALTERNATE DRILLED SHAFT FOUNDATION AT 45" CONCRETE BARRIER WALL				
EPOXY-0	COATED RE	INFORCING	G BARS	
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT	
901	4	20'-8"		
#9	4	18'-2"		
#9	22	24'-0"		
Total #9			2323 LBS	
503	19	4'-8"		
505	38	4'-11"		
506	38	4'-4"		
#5	8	18'-2"		
Total #5	611 LBS			
401	42	8'-10"		
Total #4 248 LBS				
Total Epoxy-Co Reinforcing Bar	3182 LBS			
CONCRETE, CLASS A				
Total Concrete, Class A 20.8 CYS				
MISCELLANEOUS				
Surface Seal 21.7 SYS				

ALTERNATE DRILLED SHAFT FOUNDATION FOR MEDIAN OR SHOULDER, 36" HEIGHT			
EPOXY-COATED REINFORCING BARS			
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
901	4	20'-8"	
902	10	10'-5"	
#9	4	18'-2"	
#9	12	10'-5"	
#9	22	19'-9"	
Total #9			2785 LBS
507	38	8'-2"	
#5	8	18'-2"	
Total #5			475 LBS
401	42	8'-10"	
Total #4			248 LBS
Total Epoxy-Coated Reinforcing Bars			3508 LBS
CONCRETE, CLASS A			
Total Concrete, Class A 16.3 CYS			16.3 CYS
MISCELLANEOUS			
Surface Seal 21.6 SYS			21.6 SYS

SIGN BOX TRUSS STRUCTURE
ALTERNATE DRILLED SHAFT FOUNDATIONS
QUANTITIES
SEPTEMBER 2013

STANDARD DRAWING NO. E 802-SBTS-29



/s/ Alfredo B. Hanza 02/05/13

DESIGN STANDARDS ENGINEER DATE

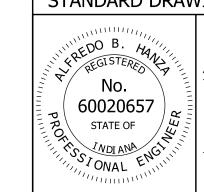
/s/ Mark A. Miller 03/27/13

INDEX					
SHEET NO.	SUBJECT				
1	Index				
2	Double Arm Plan and Elevation				
3	Double Arm Panel Dimensions and Member Sizes				
4	Double Arm Connections, Weld Details, Chord End Plate Details, and Camber				
5	Double Arm Connection to Column Details				
6	Double Arm Column Top Cap and Cable J-Hook				
7	Quadri-Chord Plan and Elevation				
8	Quadri-Chord Panel Dimensions and Member Sizes				
9	Quadri-Chord Connections, Weld Details, Chord End Plate Details, and Camber				
10	Quadri-Chord Lower Arm Connection to Column and Wire Outlet Detail				
11	Quadri-Chord Upper Arm Connection to Column				
12	Double Arm and Quadri-Chord Base Plate, Anchor Bolt, and Metal Skirt Details				
13	Double Arm and Quadri-Chord Column Handhole and I.D. Tag Details				
14	Structure Type A or B Foundation at 33" Concrete Barrier				
15	Structure Type C, D, E, or F Foundation at 33" Concrete Barrier				
16	Structure Type G, H, or I Foundation at 33" Concrete Barrier				
17	Structure Type A or B Foundation at 45" Concrete Barrier				
18	Structure Type C, D, E, or F Foundation at 45" Concrete Barrier				
19	Structure Type G, H, or I Foundation at 45" Concrete Barrier				
20	Structure Type A or B Foundation, 36" Height				
21	Structure Type C, D, E, or F Foundation, 36" Height				
22	Structure Type G, H, or I Foundation, 36" Height				

# SIGN CANTILEVER STRUCTURE DRAWING INDEX

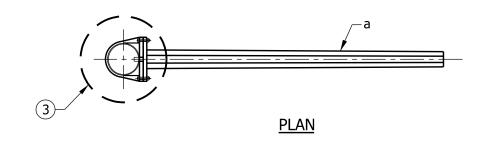
SEPTEMBER 2013

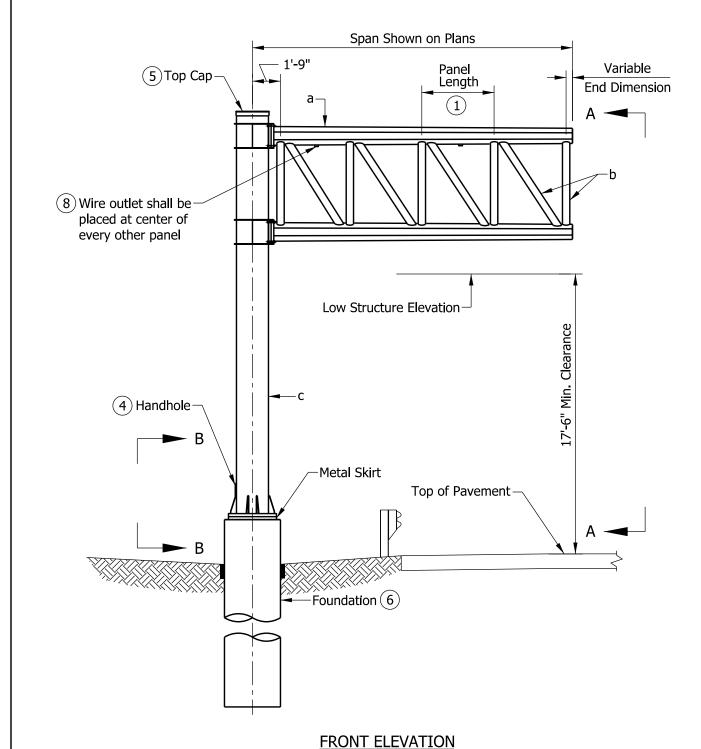
STANDARD DRAWING NO. E 802-SCLS-01

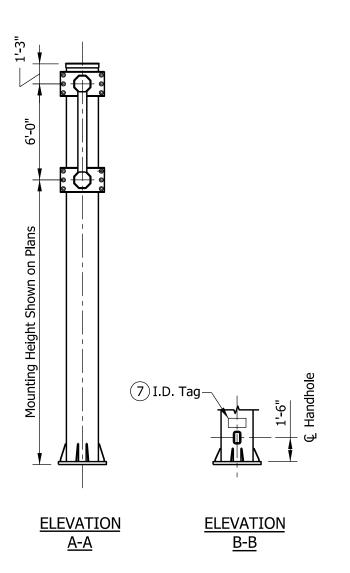


/s/ Alfredo B. Hanza	03/25/13
DESIGN STANDARDS ENGINEER	DATE

/s/ Mark A. Miller 03/27/13







- 1 See Standard Drawing E 802-SCLS-03 for panel dimensions and member sizes.
- 2. Maximum deviation of a chord from a straight line shall be 1/8".
- 3 See Standard Drawing E 802-SCLS-05 for connection to column details.
- (4) See Standard Drawing E 802-SCLS-13 for handhole detail.
- (5) See Standard Drawing E 802-SCLS-06 for top cap and cable J-hook detail.
- 6 See Standard Drawings E 802-SCLS-14, -17, and -20 for foundation details.
- (7) See Standard Drawing E 802-SCLS-13 for I.D. tag detail.
- (8) See Standard Drawing E 802-SCLS-10 for wire outlet detail.

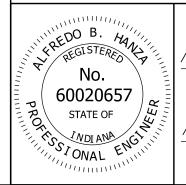
#### LEGEND:

- a Chord
- b Vertical and Vertical Diagonal
- c Column

# INDIANA DEPARTMENT OF TRANSPORTATION

SIGN CANTILEVER STRUCTURE DOUBLE ARM PLAN AND ELEVATION SEPTEMBER 2013

STANDARD DRAWING NO. E 802-SCLS-02



/s/Alfredo B. Hanza 02/05/13

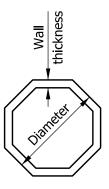
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13

DOUBLE ARM PANEL DIMENSIONS							
SPAN	NO. OF PANELS PANEL LENGTH VARIABLE END DIMENSION						
10'	2	4'-0"	0'-3"				
11'	3	3'-0"	0'-3"				
12'	3	3'-3"	0'-6"				
13'	3	3'-6"	0'-9"				
14'	3	4'-0"	0'-3"				
15'	3	4'-3"	0'-6"				
16'	4	3'-6"	0'-3"				
17'	4	3'-9"	0'-3"				
18'	4	4'-0"	0'-3"				
19'	4	4'-3"	0'-3"				
20'	4	4'-6"	0'-3"				

	DOUBLE ARM MEMBER SIZES								
I SIR.			MAX MOUNTING			VERTICAL/VERTICAL DIAGONAL b		COLUMN c	
TYPE	SPAN (FT.)	SIGN AREA (FT.)	HEIGHT (FT.)	DIAMETER (IN.)	WALL THICK. (IN.)	DIAMETER (IN.)	WALL THICK. (IN.)	DIAMETER (IN.)	WALL THICK. (IN.)
А	10	180	24	7 5/8	0.500	4 1/2	0.337	18	0.750
В	15	280	24	10 3/4	0.593	5 9/16	0.500	20	0.812
С	20	380	24	14	0.593	6 5/8	0.719	24	0.968

- 1. All panels on the double arm shall be the same length. The minimum panel length is 3'-0" and the maximum is 4'-6".
- 2. See Standard Drawing E 802-SCLS-04 for connections, weld details, and required camber.
- 3. For base plate and anchor bolt details see Standard Drawing E 802-SCLS-12.
- 4. See Standard Drawings E 802-SCLS-14, -17, and -20 for foundation details.
- 5. All member diameters shown are outside diameters.
- (6) Double arm chord shape shall be octagonal tubular with 0.14 in./ft. taper, maximum diameter shown in table.

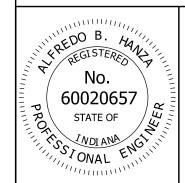


### OCTAGON TUBULAR SHAPE

## INDIANA DEPARTMENT OF TRANSPORTATION

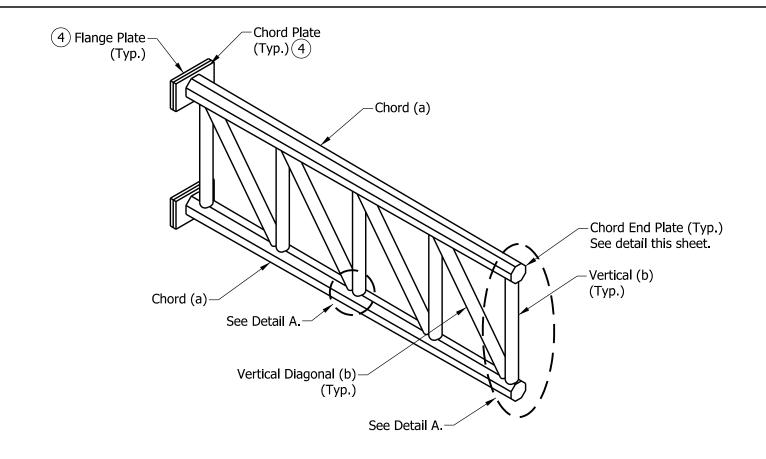
SIGN CANTILEVER STRUCTURE
DOUBLE ARM
PANEL DIMENSIONS AND MEMBER SIZES
SEPTEMBER 2013

STANDARD DRAWING NO. E 802-SCLS-03

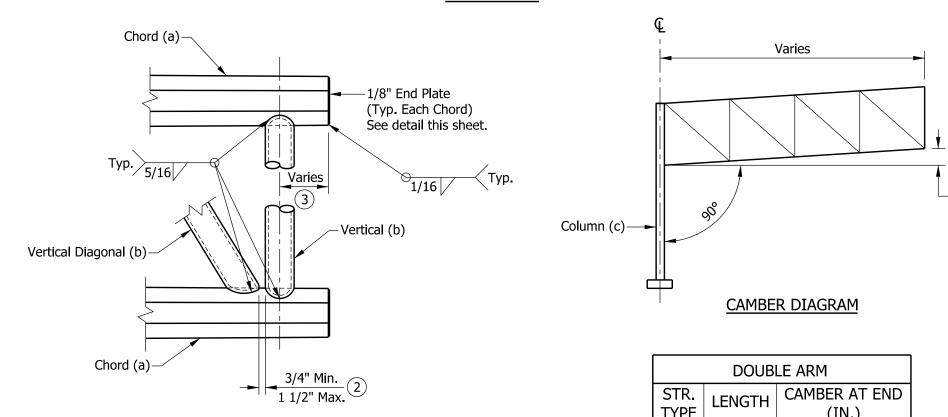


/s/ Alfredo B. Hanza 02/05/13
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13



#### **DOUBLE ARM**



**DETAIL A** 

**TYPE** 

В

С

10'-0"

15'-0"

20-0"

(IN.)

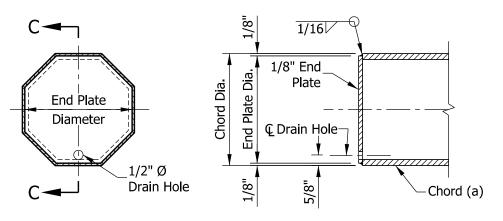
0.375

0.750

1.000

# NOTES:

- 1. See Standard Drawing E 802-SCLS-03 for panel dimensions and member sizes.
- (2) Vertical diagonals shall be placed for minimum offset from the panel point such that the offset shall provide a 3/4" minimum to 1 1/2" maximum clearance between each diagonal and vertical member, and to provide clearance for U-bolt connections to signs.
- (3) For variable end dimension, see table of panel dimensions on Standard Drawing E 802-SCLS-03.
- (4) See Standard Drawing E 802-SCLS-05 for flange plate and chord plate



**END VIEW** 

Camber at End

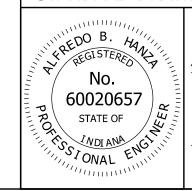
(See table)

**SECTION C-C** 

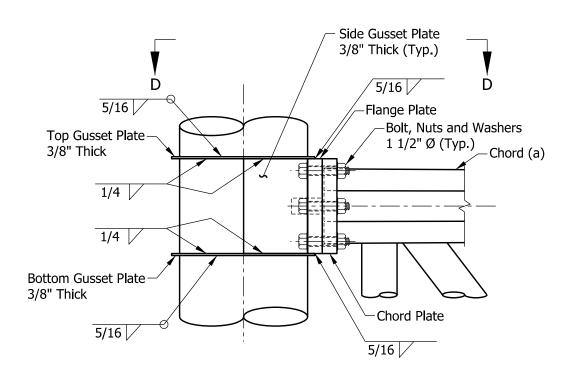
CHORD END PLATE DETAILS

# INDIANA DEPARTMENT OF TRANSPORTATION

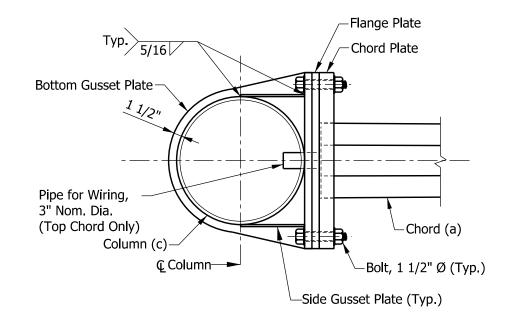
SIGN CANTILEVER STRUCTURE DOUBLE ARM CONNECTIONS, WELD DETAILS, CHORD END PLATE DETAILS, AND CAMBER SEPTEMBER 2013



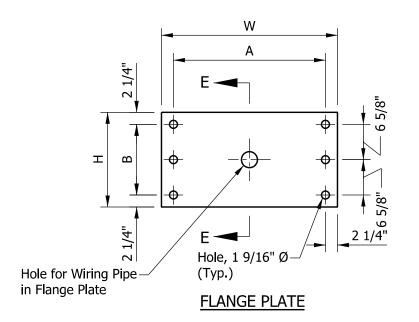
	/s/ Alfredo B. Hanza	02/05/13
	DESIGN STANDARDS ENGINEER	DATE
1111	/s/ Mark A. Miller	03/27/13
	CHIEF ENGINEER	DATE

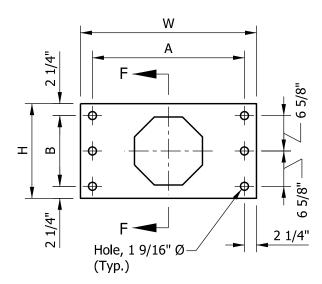


# DOUBLE ARM TRUSS CONNECTION ELEVATION

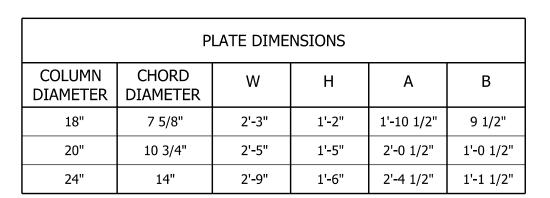


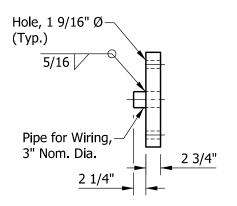
**SECTION D-D** 



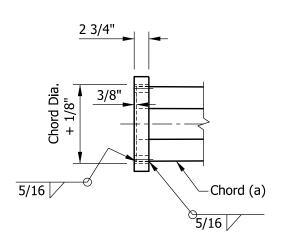


**CHORD PLATE** 





# SECTION E-E

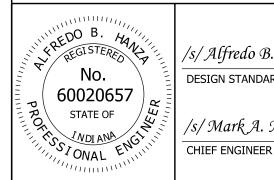


## SECTION F-F

## INDIANA DEPARTMENT OF TRANSPORTATION

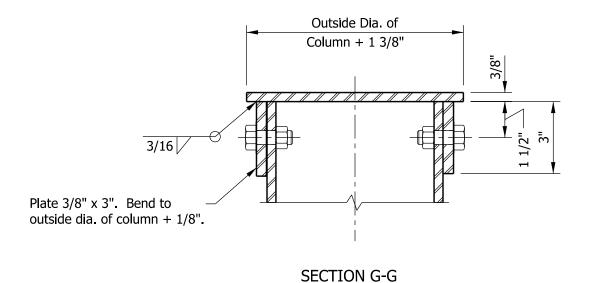
SIGN CANTILEVER STRUCTURE
DOUBLE ARM
CONNECTION TO COLUMN DETAILS
SEPTEMBER 2013

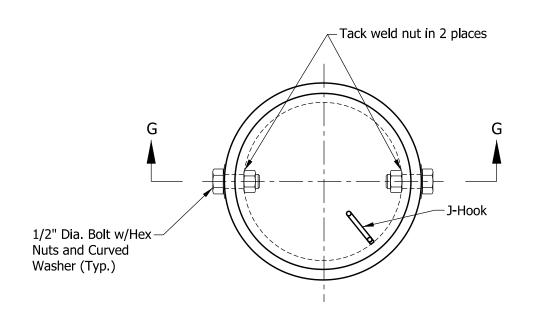
STANDARD DRAWING NO. E 802-SCLS-05



/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13

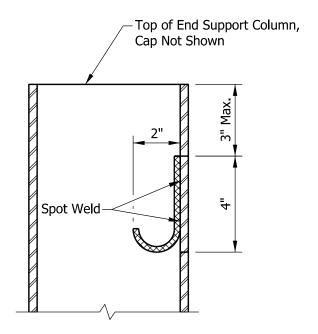
DATE





PLAN
TOP CAP - STEEL COLUMN

- 1. J-hook shall consist of 3/8" dia. bars constructed as shown, and spot-welded to inside of the columns.
- 2. Cap bolts used to attach top cap of columns shall be located to miss J-hook.

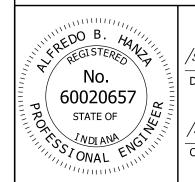


CABLE J-HOOK

## INDIANA DEPARTMENT OF TRANSPORTATION

SIGN CANTILEVER STRUCTURE DOUBLE ARM COLUMN TOP CAP AND CABLE J-HOOK SEPTEMBER 2013

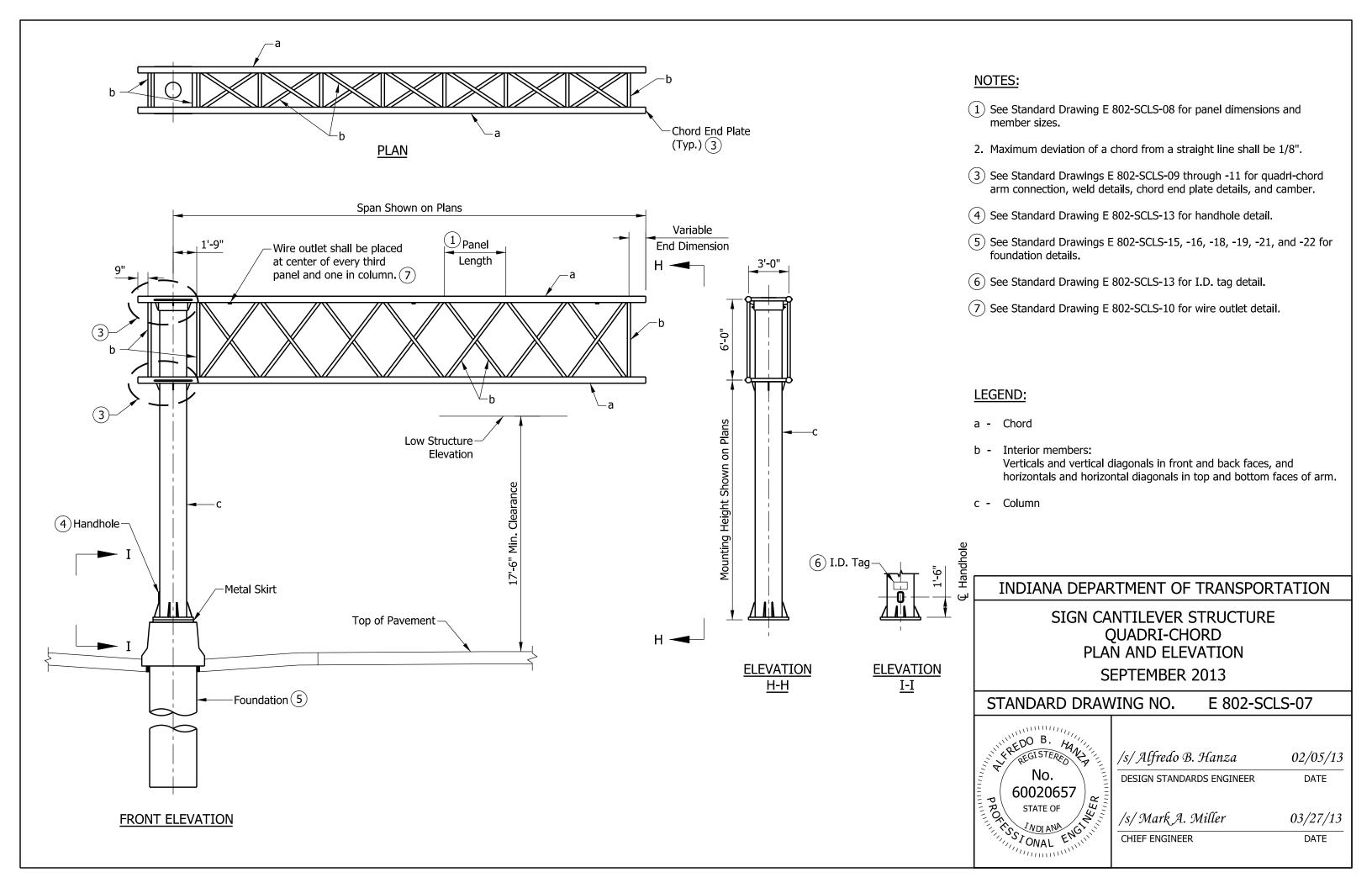
STANDARD DRAWING NO. E 802-SCLS-06



/s/Alfredo B. Hanza 02/05/13

DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13



PANEL DIMENSIONS							
SPAN	NO. OF PANELS	PANEL LENGTH	VARIABLE END DIMENSION				
21'	5	3'-9"	0'-6"				
22'	5	3'-9"	1'-6"				
23'	5	4'-0"	1'-3"				
24'	5	4'-3"	1'-0"				
25'	5	4'-6"	0'-9"				
26'	6	3'-9"	1'-9"				
27'	6	4'-0"	1'-3"				
28'	6	4'-3"	0'-9"				
29'	6	4'-3"	1'-9"				
30'	6	4'-6"	1'-3"				
31'	7	4'-0"	1'-3"				
32'	7	4'-3"	0'-6"				
33'	7	4'-3"	1'-6"				
34'	7	4'-6"	0'-9"				
35'	7	4'-6"	1'-9"				

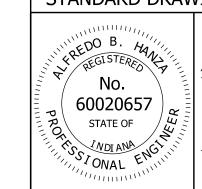
	QUADRI-CHORD MEMBER SIZES								
STR.	MAX	MAX	MAX MOUNTING	⑤ CHORD a		VERT./HORIZ./DIAG. b		COLUMN c	
TYPE	SPAN (FT.)	SIGN AREA (FT.)	HEIGHT (FT.)	DIAMETER (IN.)	WALL THICK. (IN.)	DIAMETER (IN.)	WALL THICK. (IN.)	DIAMETER (IN.)	WALL THICK. (IN.)
D	25	300	24	5 9/16	0.258	2 7/8	0.203	24	0.562
E	30	300	24	5 9/16	0.258	2 7/8	0.203	24	0.562
F	35	300	24	5 9/16	0.375	2 7/8	0.276	24	0.688
G	25	400	24	5 9/16	0.375	2 7/8	0.276	24	0.968
Н	30	400	24	5 9/16	0.375	2 7/8	0.276	24	0.968
I	35	400	24	5 9/16	0.375	2 7/8	0.276	24	0.968

- 1. All panels in a structure shall be the same length. The minimum panel length is 3'-9" and the maximum is 4'-6".
- 2. See Standard Drawing E 802-SCLS-09 for connections, weld details, and required camber.
- 3. For base plate, anchor bolt, and metal skirt details see Standard Drawing E 802-SCLS-12.
- 4. All member diameters shown are outside diameters.
- 5 Quadri-chord arm chord shape shall be circular with constant diameter.

## INDIANA DEPARTMENT OF TRANSPORTATION

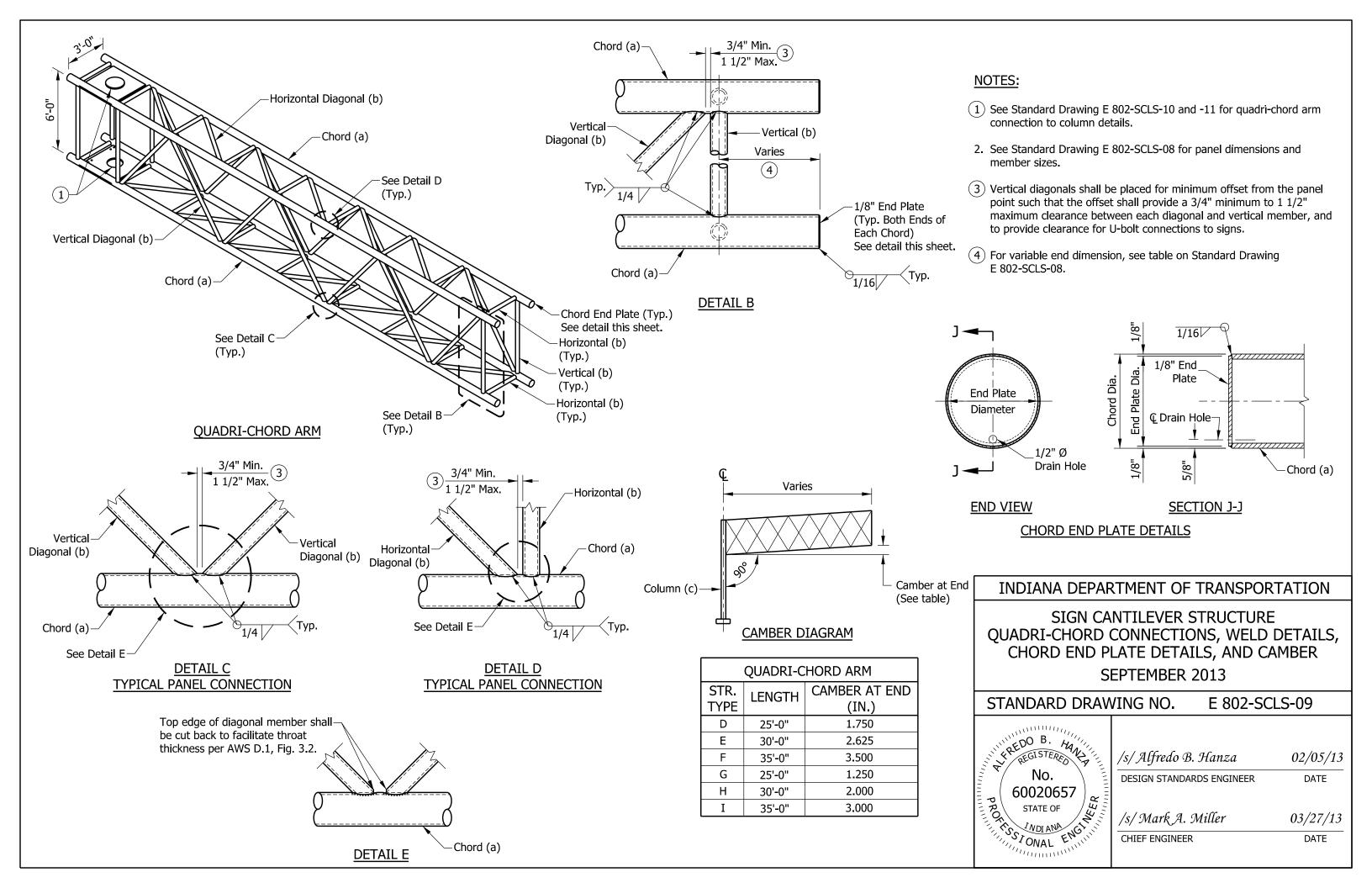
SIGN CANTILEVER STRUCTURE
QUADRI-CHORD
PANEL DIMENSIONS AND MEMBER SIZES
SEPTEMBER 2013

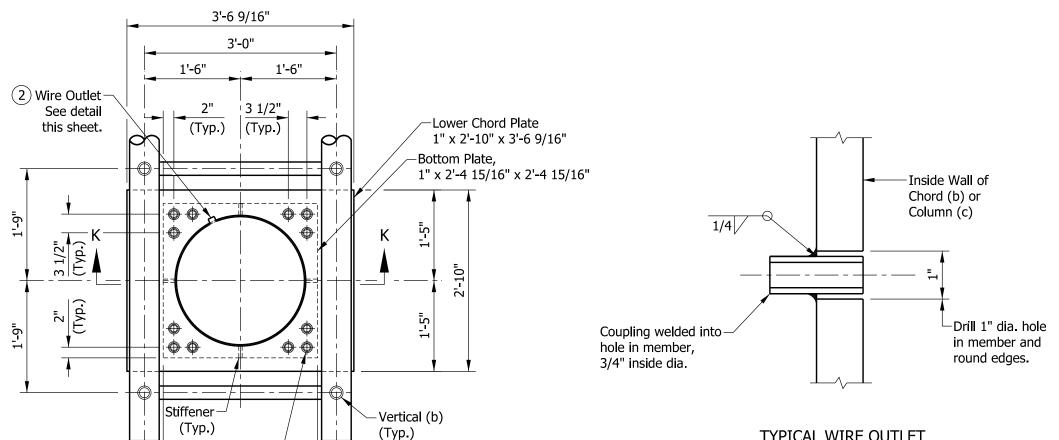
STANDARD DRAWING NO. E 802-SCLS-08



 $\frac{/s/Alfredo\ B.\ Hanza}{\text{DESIGN STANDARDS ENGINEER}} \frac{02/05/13}{\text{DATE}}$ 

/s/ Mark A. Miller 03/27/13





-Lower Chord (a)

Bolts with Nuts-

and Washers, 1" Dia. (Typ.)

2'-4 15/16"

**SECTION K-K** 

Lower Chord (a)

(2) Wire Outlet-

1/2"

Lower Chord (a)—

See detail this sheet.

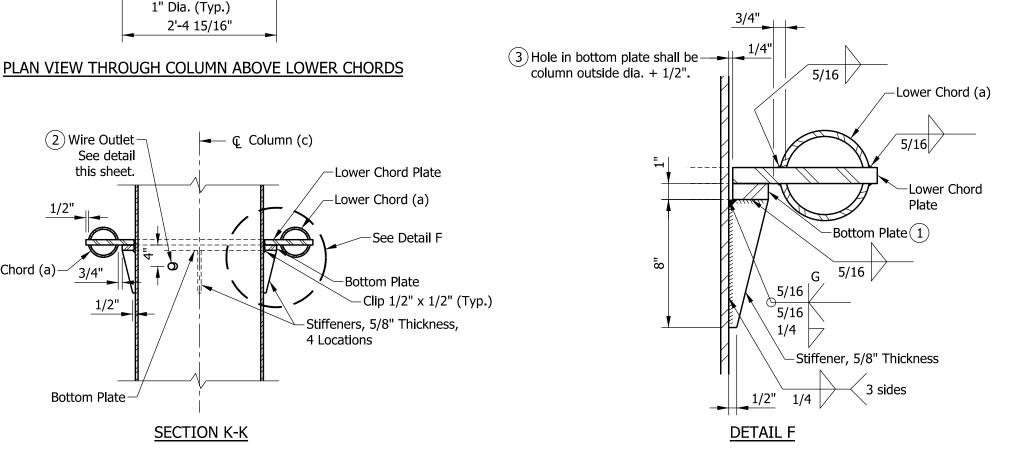
1/2"

Bottom Plate-

#### NOTES:

- (1) Grind top of bottom plate if required to fully seat lower chord plate. Repair damaged galvanizing before assembly.
- (2) Orient pipe toward sign. Hole diameter in column shall equal outside pipe diameter + 1/8".
- (3) After tightening lower connection bolts, fill gap with non-hardening silicone caulk suitable for exterior exposure.

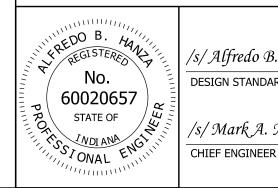
## TYPICAL WIRE OUTLET



## INDIANA DEPARTMENT OF TRANSPORTATION

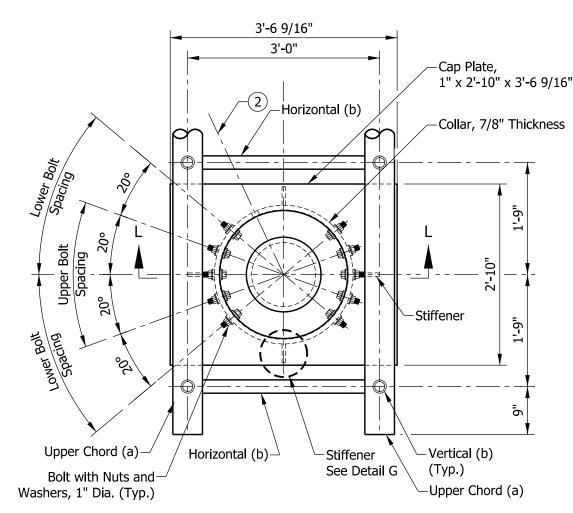
SIGN CANTILEVER STRUCTURE QUADRI-CHORD LOWER ARM CONNECTION TO COLUMN AND WIRE OUTLET DETAIL SEPTEMBER 2013

STANDARD DRAWING NO. E 802-SCLS-10



	/s/ Alfredo B. Hanza	03/25/13
11111111	DESIGN STANDARDS ENGINEER	DATE
11.	/s/ Mark A. Miller	03/27/13

DATE



## PLAN VIEW - TOP OF COLUMN ABOVE UPPER CHORDS

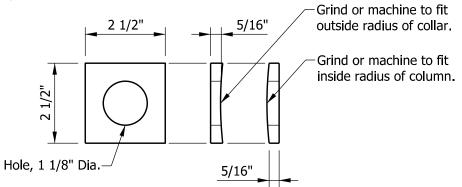
collar plate shall equal bolt dia. plus 1/16".

#### -Cap Plate, 1" x 2'-10" x 3'-6 9/16" 1/8"(1) Top of Column 1/2" <u>5</u> O.D. of Column 3/8 -6 3/4 I.D. of Collar(1)3/8 Stiffener, 1/2" Bottom Edge of Collar Plate 5/8" x 3 1/2" x 8 1/2" 1/2" Chamfer on inside of 7/8" collar to facilitate field assembly, 3/16" - 45°.

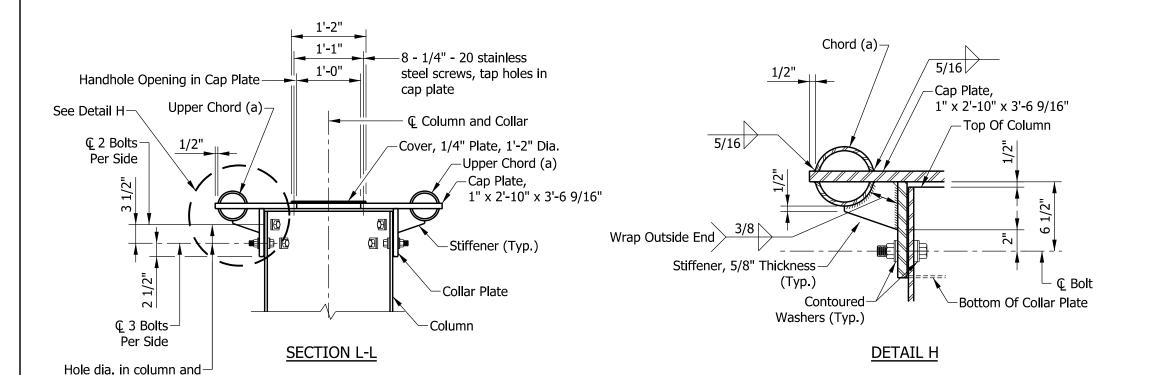
**DETAIL G** 

### NOTES:

- 1 After galvanizing, collar inside diameter shall equal outside diameter of galvanized column plus  $1/8" \pm 1/16"$ . Maximum gap between column and collar shall be 1/8" before tightening bolts.
- (2) Optional full penetration weld in collar may be made at two locations, 180° apart. X-ray or ultrasonic test (UT) 100%.
- 3. See Standard Drawing E 802-SCLS-08 for dimensions and member sizes

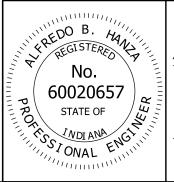


## CONTOURED WASHER

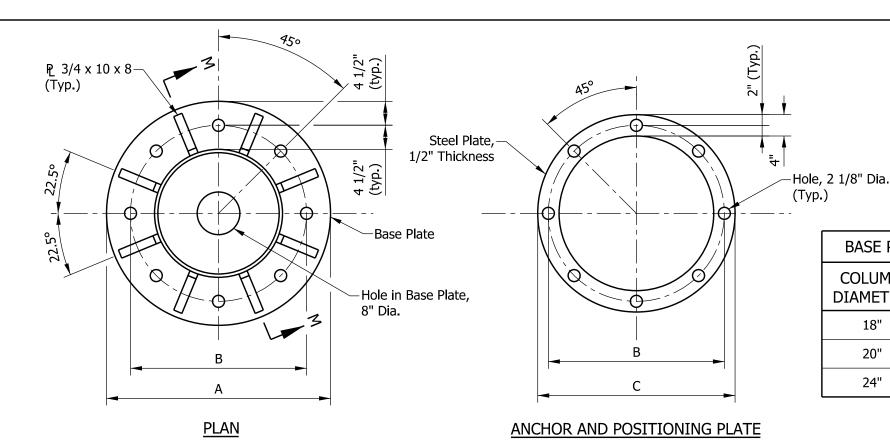


## INDIANA DEPARTMENT OF TRANSPORTATION

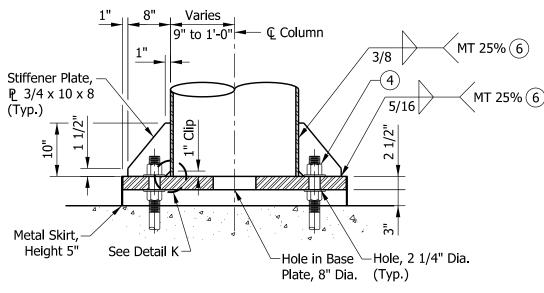
SIGN CANTILEVER STRUCTURE
QUADRI-CHORD UPPER ARM CONNECTION
TO COLUMN
SEPTEMBER 2013

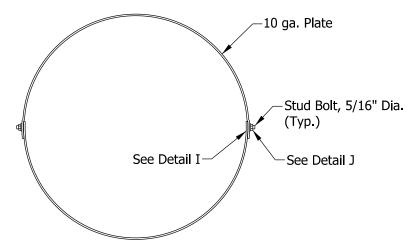


/s/ Alfredo B. Hanza	03/26/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE



- (1) Minimum length which shall be galvanized. Entire bolt may be galvanized at contractor's option.
- (2) Provide uncoated nut at bottom of anchor plate. Deform thread or use chemical thread lock to secure.
- (3) Use continuous backer ring, 5/16" x 2" minimum. Tack weld only in root area of final weld.
- (4) Anchor bolt nuts shall be tightened against the base plate by turning the nut a minimum of 1/6 turn from snug tight condition.
- (5) See Standard Drawings E 802-SCLS-03 and -08 for column wall
- (6) UT Ultrasonic Testing, 25% of entire column to base plate weld. MT - Magnetic Particle Testing, 25% or 1 side of 4 stiffeners.





**BASE PLATE DIMENSIONS** 

3'-0"

3'-2"

3'-6"

В

2'-3"

2'-5"

2'-9"

C

2'-7"

2'-9"

3'-1"

Stud Holes,

5/16" Dia.

(Typ.)

**COLUMN** 

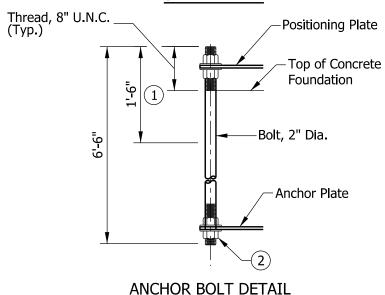
**DIAMETER** 

18"

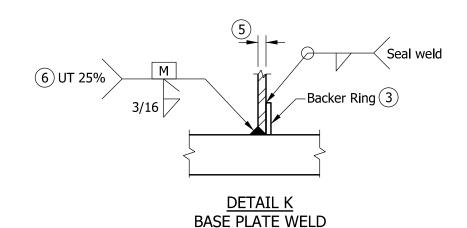
20"

24"

# SKIRT DETAIL



#### **SECTION M-M**

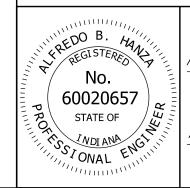


# INDIANA DEPARTMENT OF TRANSPORTATION

5

SIGN CANTILEVER STRUCTURE DOUBLE ARM AND QUADRI-CHORD BASE PLATE, ANCHOR BOLT, AND METAL SKIRT DETAILS SEPTEMBER 2014

#### STANDARD DRAWING NO. E 802-SCLS-12



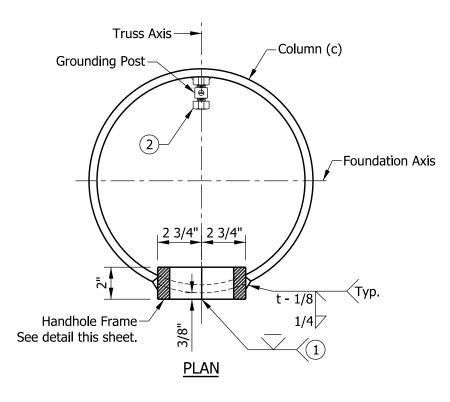
- 0-

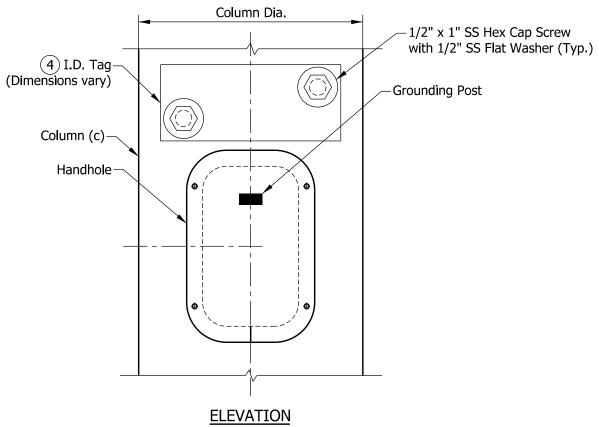
**DETAIL I** 

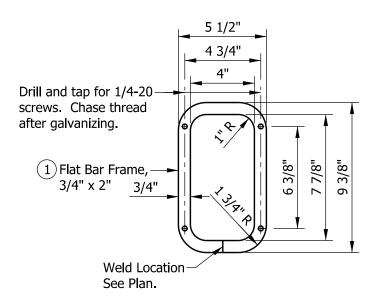
_	/s/ Alfredo B. Hanza	12/02/13
///////////////////////////////////////	DESIGN STANDARDS ENGINEER	DATE
	/s/ Mark A. Miller	12/05/13
	CHIEF ENGINEER	DATE

DETAIL J

-3/8" x 2" Slots



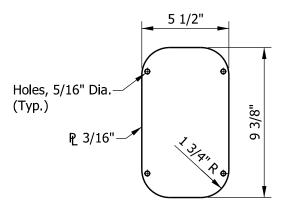




HANDHOLE FRAME

- (1) In lieu of fabricated handhole frame as shown, frame may be cut from 2" plate with rolling direction vertical.
- (2) See Standard Drawing E 802-SNWR-03 for grounding post details. Grounding post shall be placed on far side of support directly opposite center of handhole.
- 3. See Standard Drawings E 802-SCLS-02 and -07 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 \_\_\_\_\_, Arm Length \_\_\_\_\_ Pole Mounting Height \_

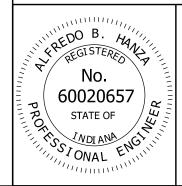


#### HANDHOLE COVER

# INDIANA DEPARTMENT OF TRANSPORTATION

SIGN CANTILEVER STRUCTURE DOUBLE ARM AND QUADRI-CHORD COLUMN HANDHOLE AND I.D. TAG DETAILS SEPTEMBER 2013

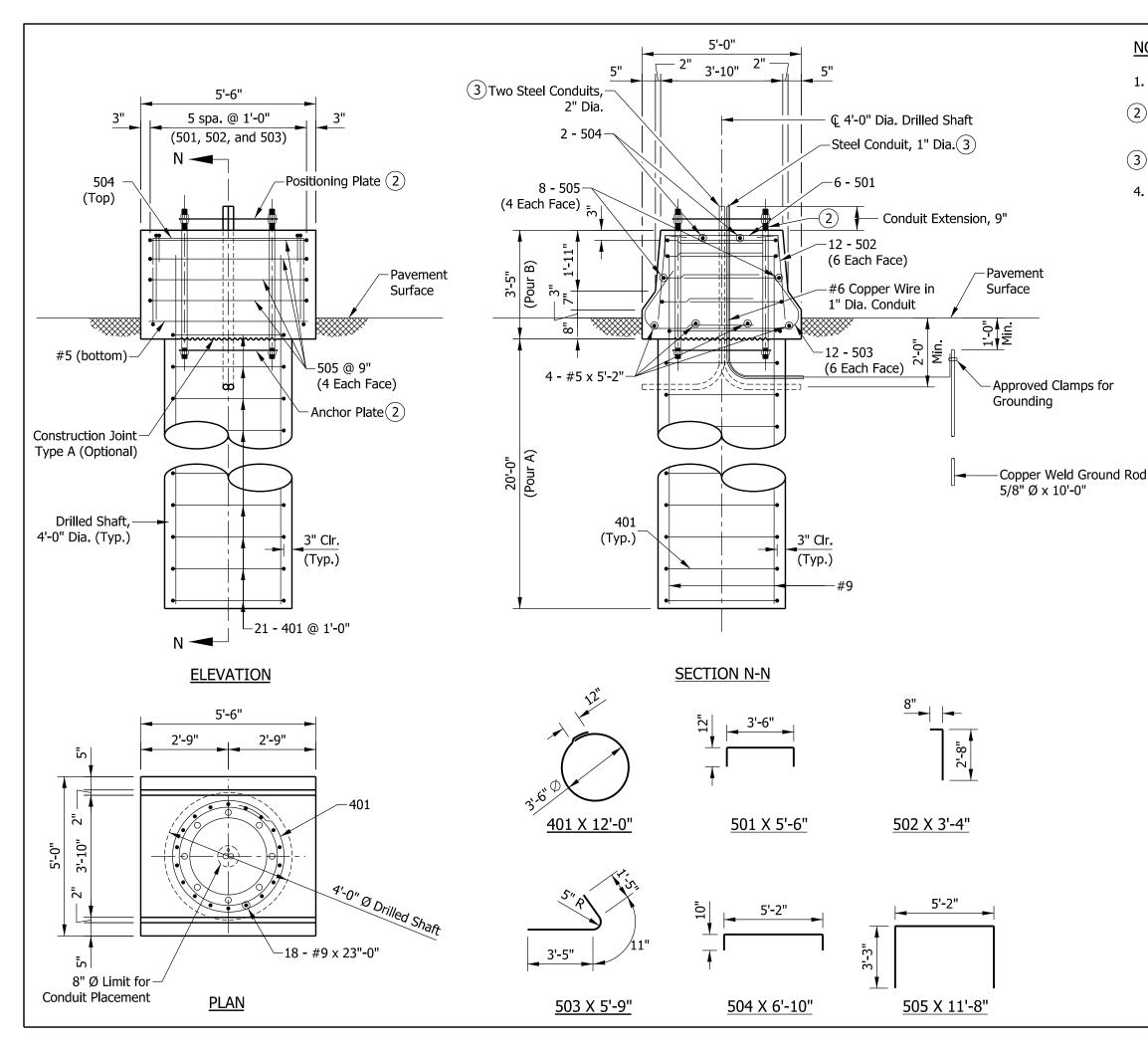
STANDARD DRAWING NO. E 802-SCLS-13



/s/ Alfredo B. Hanza 02/05/13 DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13 CHIEF ENGINEER

DATE



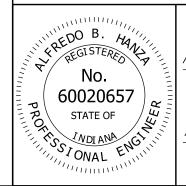
- 1. See Standard Drawing E 602-CCMB-03 for barrier wall width transition.
- 2 See Standard Drawing E 802-SCLS-12 for anchor and positioning plate and anchor bolt details.
- (3) Thread and cap both ends of steel conduit.
- 4. Surface seal top and sides of barrier railing to the pavement surface.

BILL OF MATERIALS				
EPOXY-CO	ATED RE	INFORCI	NG BARS	
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT	
#9	18	23'-0"		
Total #9			1408 LBS	
501	6	5'-6"	_	
502	12	3'-4"		
503	12	5'-9"		
504	2	6'-10"		
505	8	11'-8"		
#5	4	5'-2"		
Total #5			281 LBS	
401	21	12'-0"		
Total #4	168 LBS			
Total Epoxy-C Reinforcing B	1857 LBS			
CONCRETE, CLASS A				
Pour A	9.3 CYS			
Pour B			3.0 CYS	
Total Concrete, Class A 12.3 CYS				
MISCELLANEOUS				
Surface Seal 5.9 SYS				

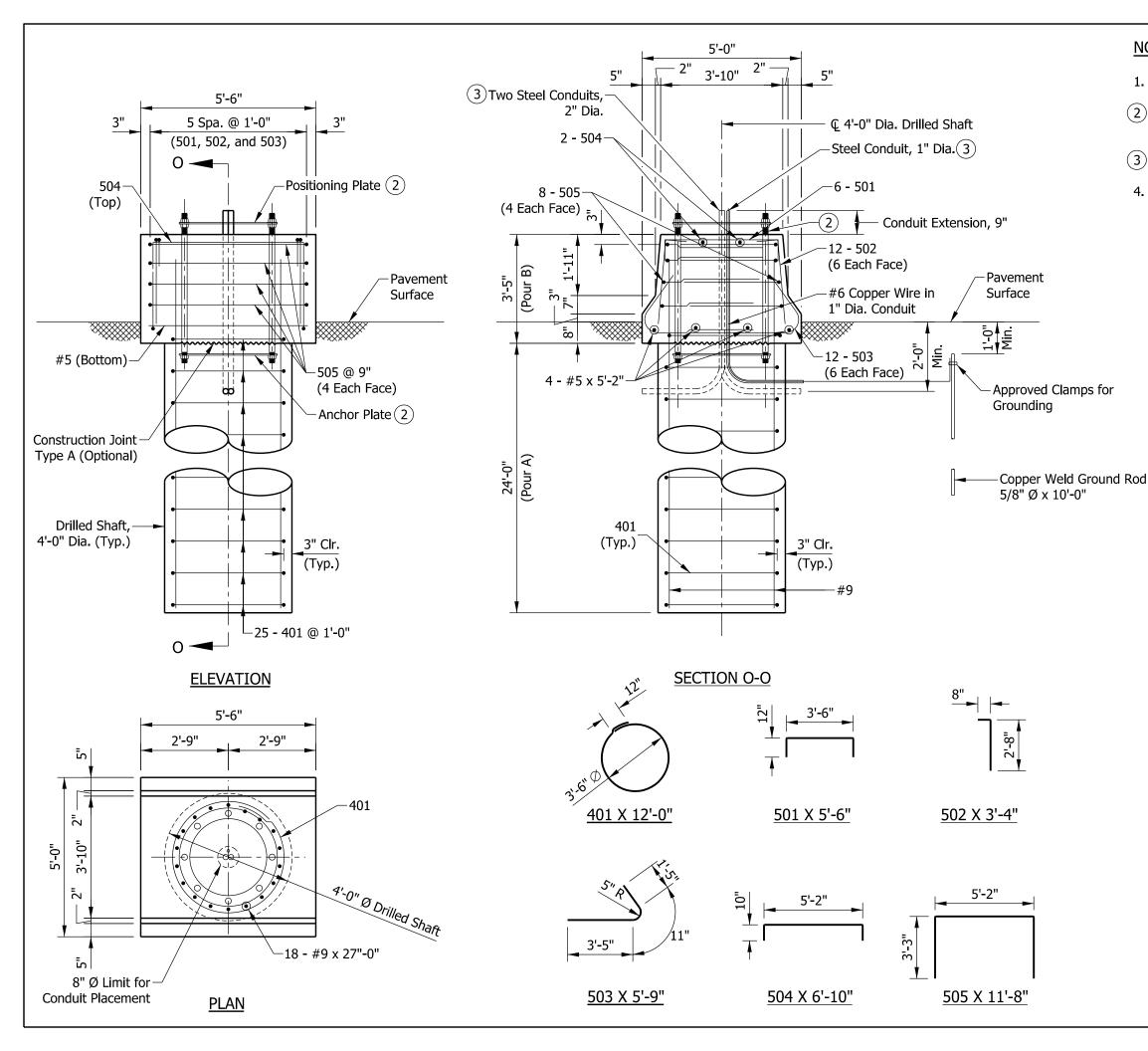
# INDIANA DEPARTMENT OF TRANSPORTATION

# SIGN CANTILEVER STRUCTURE TYPE A OR B FOUNDATION AT 33" CONCRETE BARRIER

SEPTEMBER 2013



   /s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE



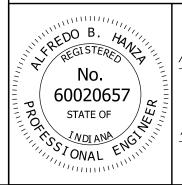
- 1. See Standard Drawing E 602-CCMB-03 for barrier wall width transition.
- 2 See Standard Drawing E 802-SCLS-12 for anchor and positioning plate and anchor bolt details.
- (3) Thread and cap both ends of steel conduit.
- 4. Surface seal top and sides of barrier railing to the pavement surface.

BILL OF MATERIALS				
EPOXY-CO	ATED RE	INFORCI	NG BARS	
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT	
#9	18	27'-0"		
Total #9			1652 LBS	
501	6	5'-6"		
502	12	3'-4"		
503	12	5'-9"		
504	2	6'-10"		
505	8	11'-8"		
#5	4	5'-2"		
Total #5	281 LBS			
401	25	12'-0"		
Total #4	200 LBS			
Total Epoxy-C Reinforcing Ba	2133 LBS			
CONCRETE, CLASS A				
Pour A			11.2 CYS	
Pour B		_	3.0 CYS	
Total Concrete, Class A 14.2 CYS				
MISCELLANEOUS				
Surface Seal 5.9 SYS				

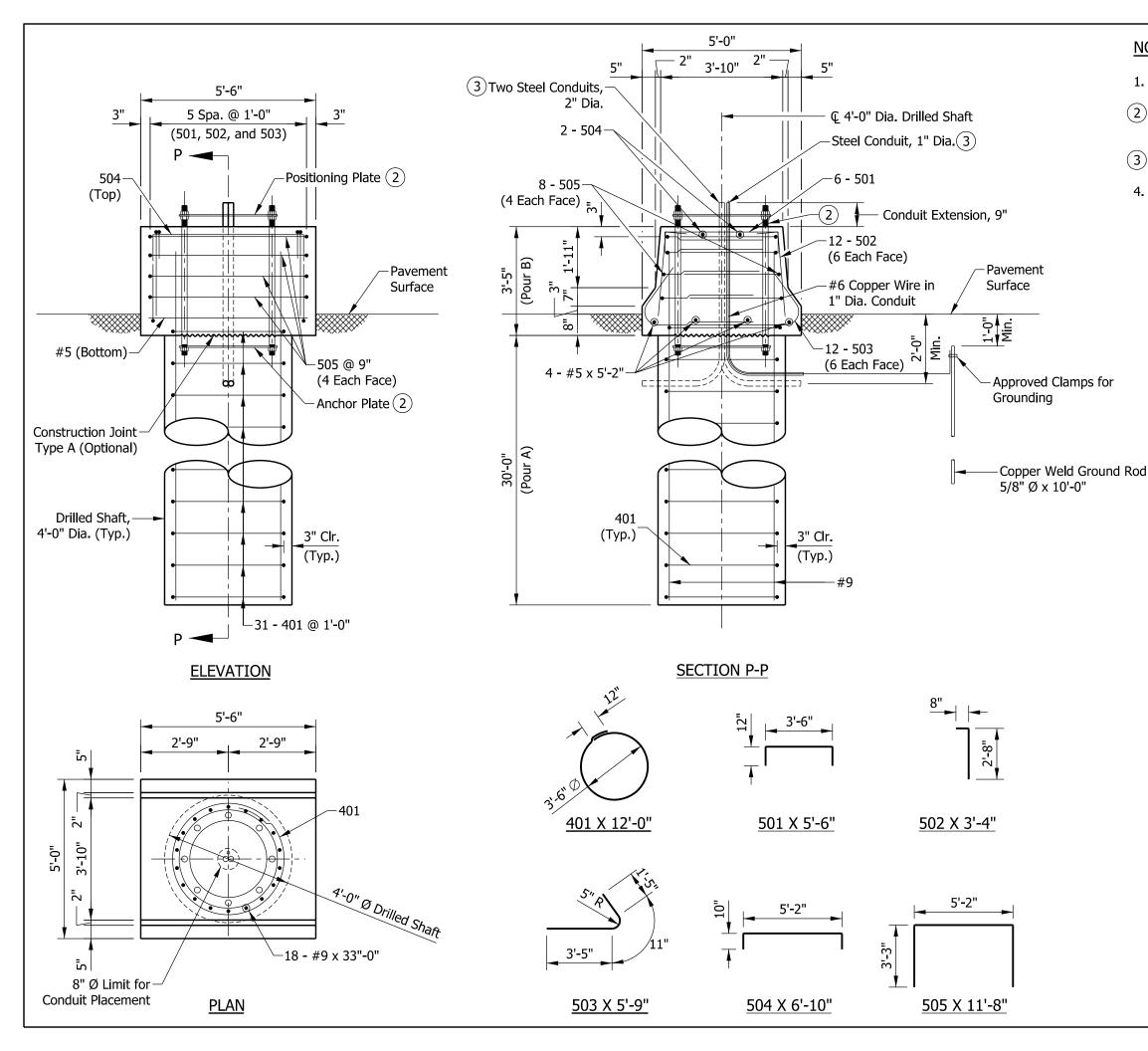
# INDIANA DEPARTMENT OF TRANSPORTATION

# SIGN CANTILEVER STRUCTURE TYPE C, D, E, OR F FOUNDATION AT 33" CONCRETE BARRIER

# SEPTEMBER 2013



/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE



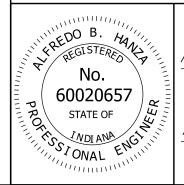
- 1. See Standard Drawing E 602-CCMB-03 for barrier wall width transition.
- 2 See Standard Drawing E 802-SCLS-12 for anchor and positioning plate and anchor bolt details.
- (3) Thread and cap both ends of steel conduit.
- 4. Surface seal top and sides of barrier railing to the pavement surface.

BILL OF MATERIALS				
EPOXY-COATED REINFORCING BARS				
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT	
#9	18	33'-0"		
Total #9			2020 LBS	
501	6	5'-6"		
502	12	3'-4"		
503	12	5'-9"		
504	2	6'-10"		
505	8	11'-8"		
#5	4	5'-2"		
Total #5			281 LBS	
401	31	12'-0"		
Total #4	248 LBS			
Total Epoxy-Coated Reinforcing Bars 2549 LBS				
CC	NCRETE	, CLASS A	4	
Pour A			14.0 CYS	
Pour B			3.0 CYS	
Total Concrete, Class A 17.0 CYS				
MISCELLANEOUS				
Surface Seal 5.9 SYS				

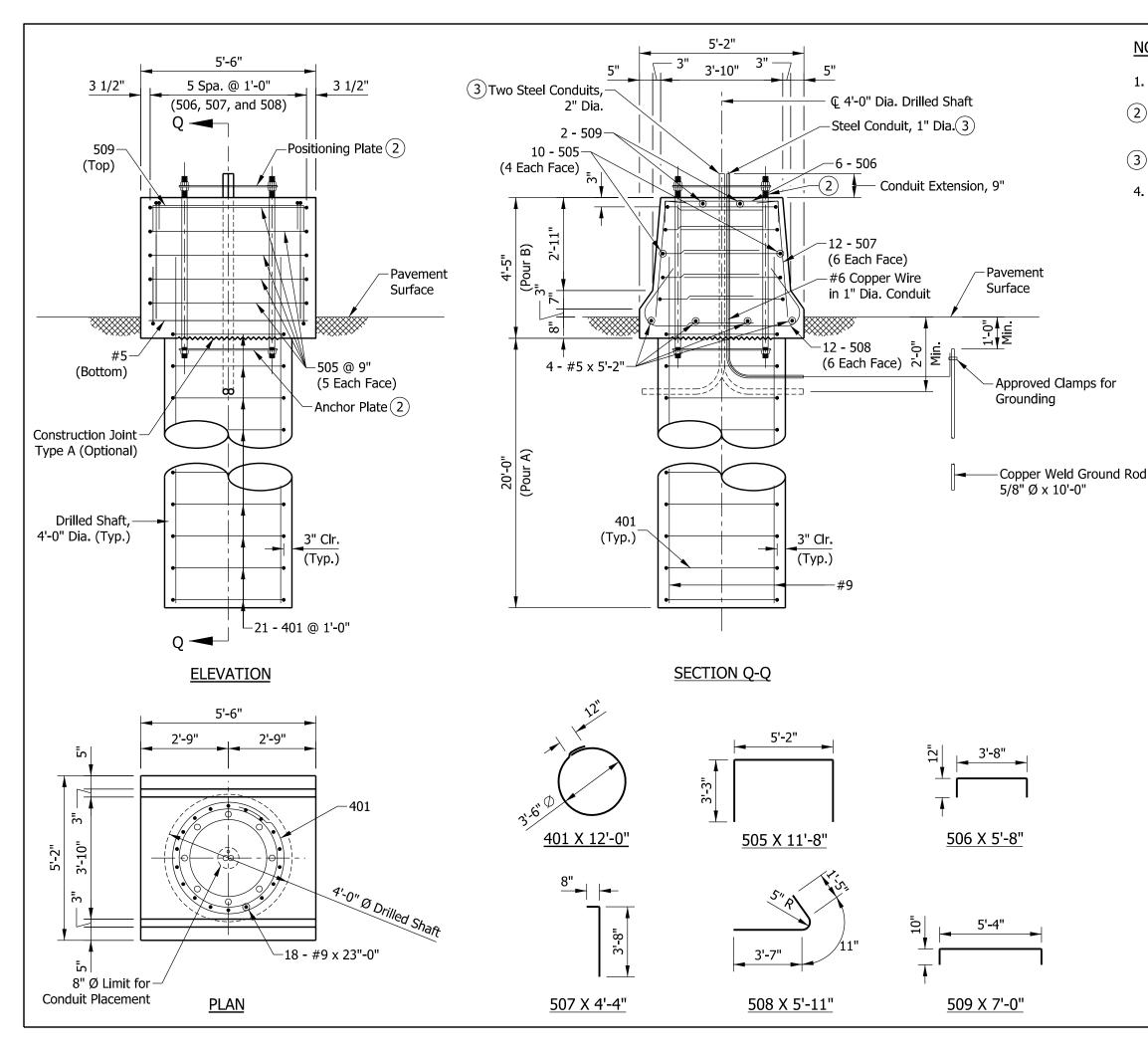
# INDIANA DEPARTMENT OF TRANSPORTATION

# SIGN CANTILEVER STRUCTURE TYPE G, H, OR I FOUNDATION AT 33" CONCRETE BARRIER

# SEPTEMBER 2013



/s/ Alfredo B. Hanza	03/26/13
DESIGN STANDARDS ENGINEER	DATE
/s/Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE



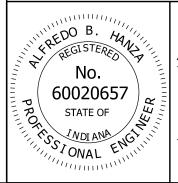
- 1. See Standard Drawing E 602-CCMB-03 for barrier wall width transition.
- 2 See Standard Drawing E 802-SCLS-12 for anchor and positioning plate and anchor bolt details.
- (3) Thread and cap both ends of steel conduit.
- 4. Surface seal top and sides of barrier railing to the pavement surface.

BILL OF MATERIALS				
EPOXY-CO	ATED RE	INFORCI	NG BARS	
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT	
#9	18	23'-0"		
Total #9			1408 LBS	
505	10	11'-8"		
506	6	5'-8"		
507	12	4'-4"		
508	12	5'-11"		
509	2	7'-0"		
#5	4	5'-2"		
Total #5	322 LBS			
401	21	12'-0"		
Total #4	168 LBS			
Total Epoxy-C Reinforcing B	1898 LBS			
CONCRETE, CLASS A				
Pour A	9.3 CYS			
Pour B	4.0 CYS			
Total Concrete, Class A 13.3 CYS				
MISCELLANEOUS				
Surface Seal 7.1 SYS				

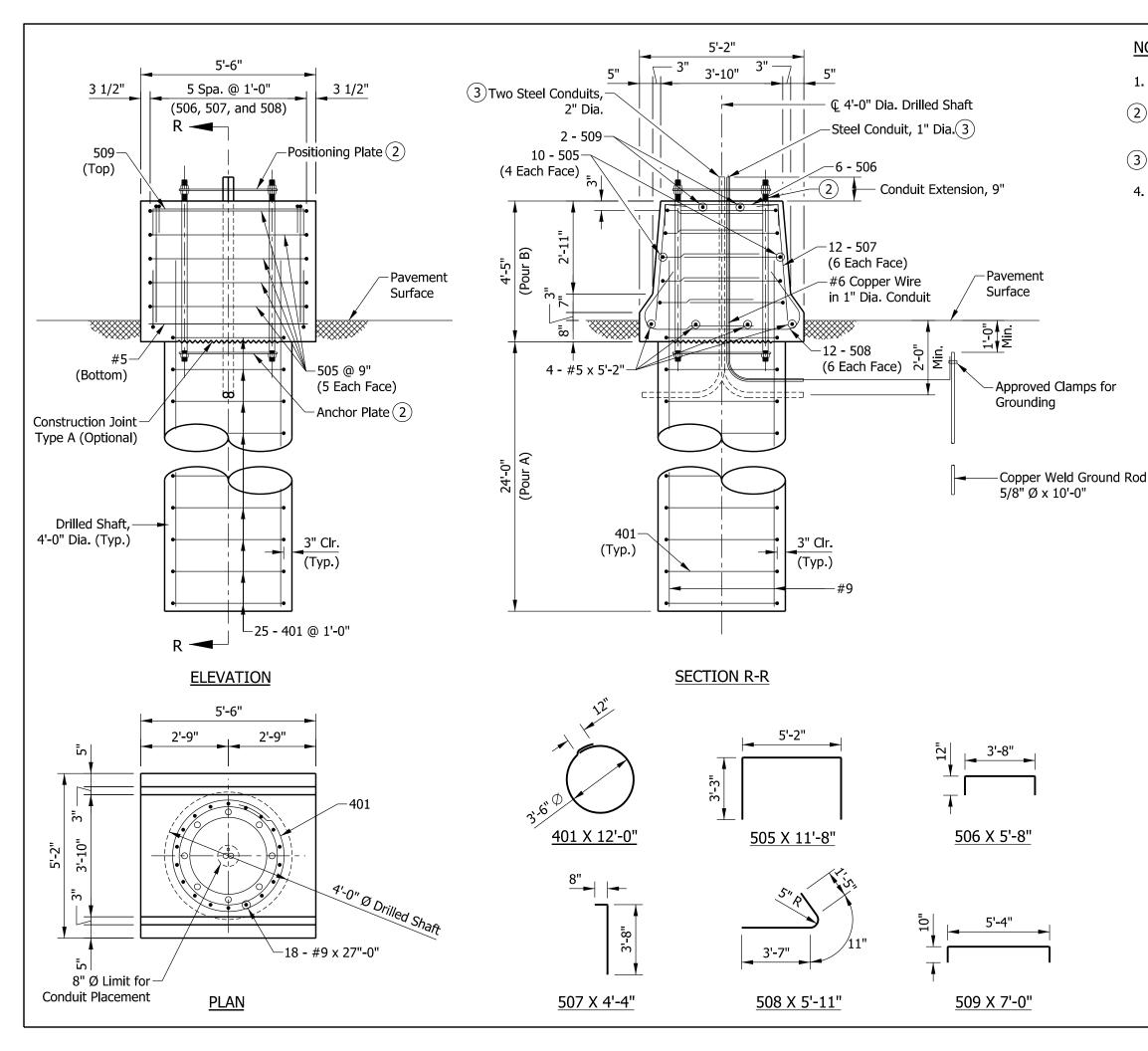
### INDIANA DEPARTMENT OF TRANSPORTATION

# SIGN CANTILEVER STRUCTURE TYPE A OR B FOUNDATION AT 45" CONCRETE BARRIER

### SEPTEMBER 2013



   /s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE



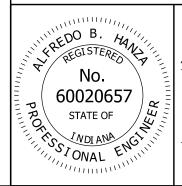
- 1. See Standard Drawing E 602-CCMB-03 for barrier wall width transition.
- 2 See Standard Drawing E 802-SCLS-12 for anchor and positioning plate and anchor bolt details.
- (3) Thread and cap both ends of steel conduit.
- 4. Surface seal top and sides of barrier railing to the pavement surface.

BILL OF MATERIALS				
EPOXY-CO	ATED RE	INFORCI	NG BARS	
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT	
#9	18	27'-0"		
Total #9			1652 LBS	
505	10	11'-8"		
506	6	5'-8"		
507	12	4'-4"		
508	12	5'-11"		
509	2	7'-0"		
#5	4	5'-2"		
Total #5	322 LBS			
401	25	12'-0"		
Total #4	200 LBS			
Total Epoxy-C Reinforcing B	1848 LBS			
CC	ONCRETE	, CLASS A	4	
Pour A			11.2 CYS	
Pour B	4.0 CYS			
Total Concrete, Class A 15.2 CYS				
MISCELLANEOUS				
Surface Seal 7.1 SYS				

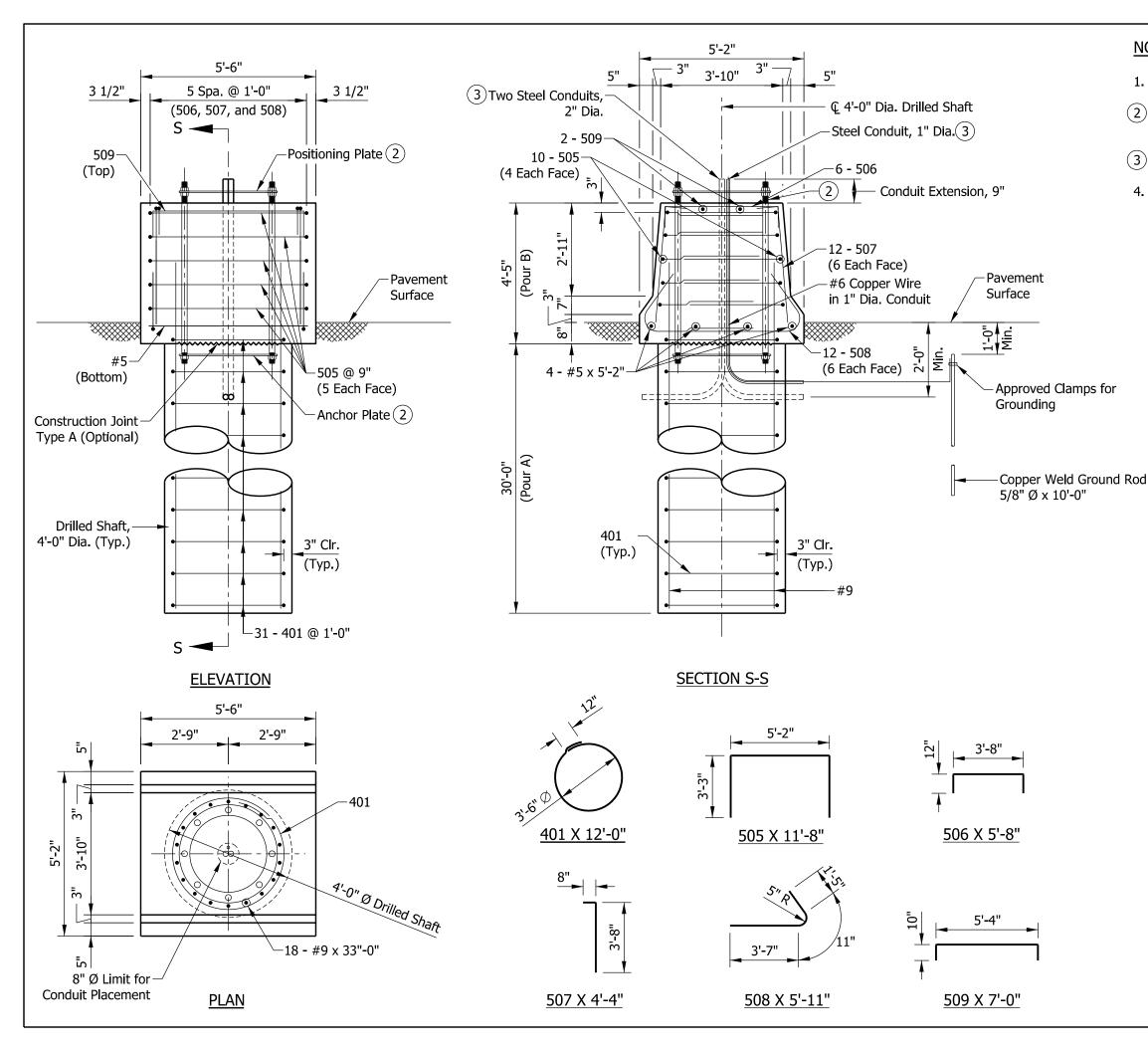
# INDIANA DEPARTMENT OF TRANSPORTATION

# SIGN CANTILEVER STRUCTURE TYPE C, D, E, OR F FOUNDATION AT 45" CONCRETE BARRIER

### SEPTEMBER 2013



/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE



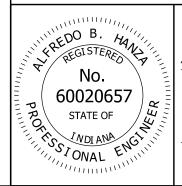
- 1. See Standard Drawing E 602-CCMB-03 for barrier wall width transition.
- 2 See Standard Drawing E 802-SCLS-12 for anchor and positioning plate and anchor bolt details.
- (3) Thread and cap both ends of steel conduit.
- 4. Surface seal top and sides of barrier railing to the pavement surface.

BILL OF MATERIALS				
EPOXY-CO	ATED RE	INFORCI	NG BARS	
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT	
#9	18	33'-0"		
Total #9			2020 LBS	
505	10	11'-8"		
506	6	5'-8"		
507	12	4'-4"		
508	12	5'-11"		
509	2	7'-0"		
#5	4	5'-2"		
Total #5			322 LBS	
401	31	12'-0"		
Total #4	248 LBS			
Total Epoxy-Coated 2698 LBS Reinforcing Bars				
CC	ONCRETE	, CLASS A	4	
Pour A			13.9 CYS	
Pour B	_	4.0 CYS		
Total Concrete, Class A 17.9 CYS				
MISCELLANEOUS				
Surface Seal 7.1 SYS				

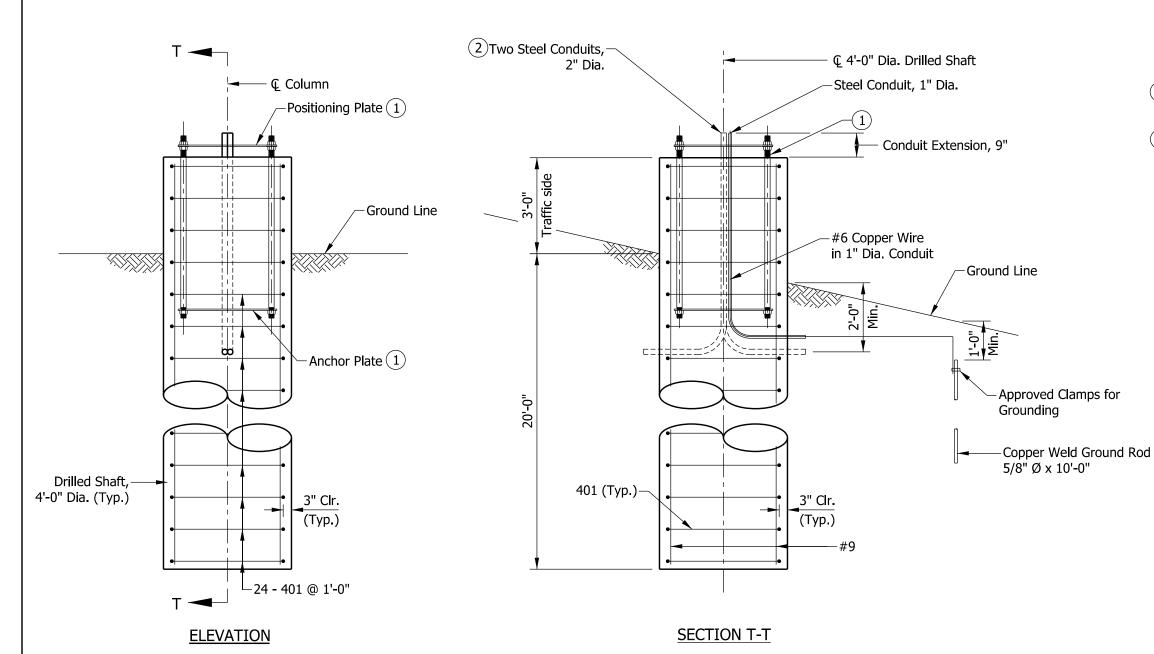
# INDIANA DEPARTMENT OF TRANSPORTATION

# SIGN CANTILEVER STRUCTURE TYPE G, H, OR I FOUNDATION AT 45" CONCRETE BARRIER

# SEPTEMBER 2013



/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
	02/27/42
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE



401 X 12'-0"

401

-18 - #9 x 22'-9"

**PLAN** 

8" Ø Limit for-

Conduit Placement

4'-0" Ø Drilled Shaft

#### NOTES:

- 1 See Standard Drawing E 802-SCLS-12 for anchor and positioning plate and anchor bolt details.
- (2) Thread and cap both ends of steel conduit.
- 3. Surface seal top and sides of foundation to the ground surface.

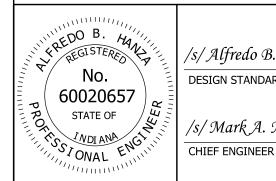
BILL OF MATERIALS			
EPOXY-CO	ATED RE	INFORCI	NG BARS
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
#9	18	22'-9"	
Total #9			1392 LBS
401	24	12'-0"	
Total #4			192 LBS
Total Epoxy-Coated Reinforcing Bars			1584 LBS
MISCELLANEOUS			
Concrete, Class A 10.7 CYS			10.7 CYS
Surface Seal			4.3 SYS

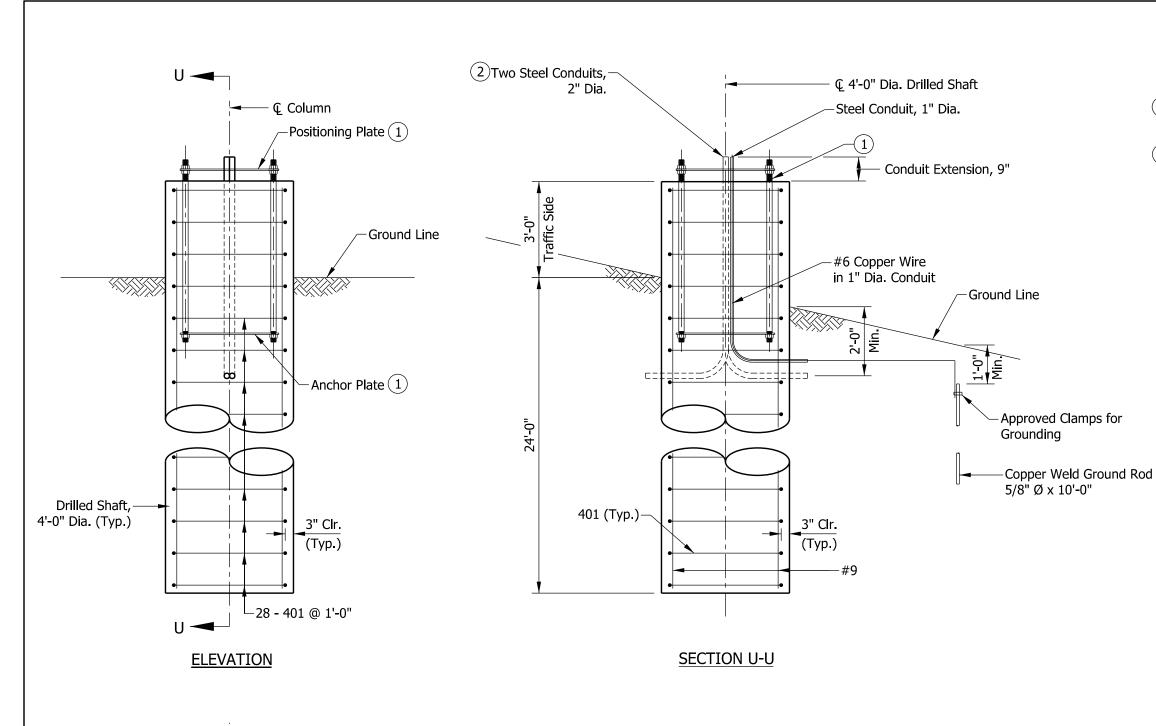
# INDIANA DEPARTMENT OF TRANSPORTATION

# SIGN CANTILEVER STRUCTURE TYPE A OR B FOUNDATION, 36" HEIGHT

SEPTEMBER 2013

STANDARD DRAWING NO. E 802-SCLS-20





- (1) See Standard Drawing E 802-SCLS-12 for anchor and positioning plate and anchor bolt details.
- (2) Thread and cap both ends of steel conduit.
- 3. Surface seal top and sides of foundation to the ground surface.

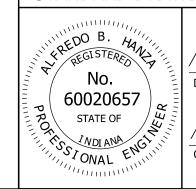
BILL OF MATERIALS			
EPOXY-CO	ATED RE	INFORCI	NG BARS
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
#9	18	26'-9"	
Total #9			1637 LBS
401	28	12'-0"	
Total #4 224 LBS			
Total Epoxy-C Reinforcing B	1861 LBS		
MISCELLANEOUS			
Concrete, Class A 12.6 CYS			
Surface Seal 4.3 SYS			

# INDIANA DEPARTMENT OF TRANSPORTATION

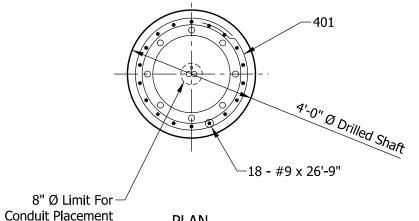
SIGN CANTILEVER STRUCTURE TYPE C, D, E, OR F FOUNDATION, 36" HEIGHT

SEPTEMBER 2013

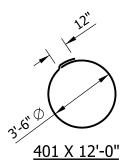
STANDARD DRAWING NO. E 802-SCLS-21

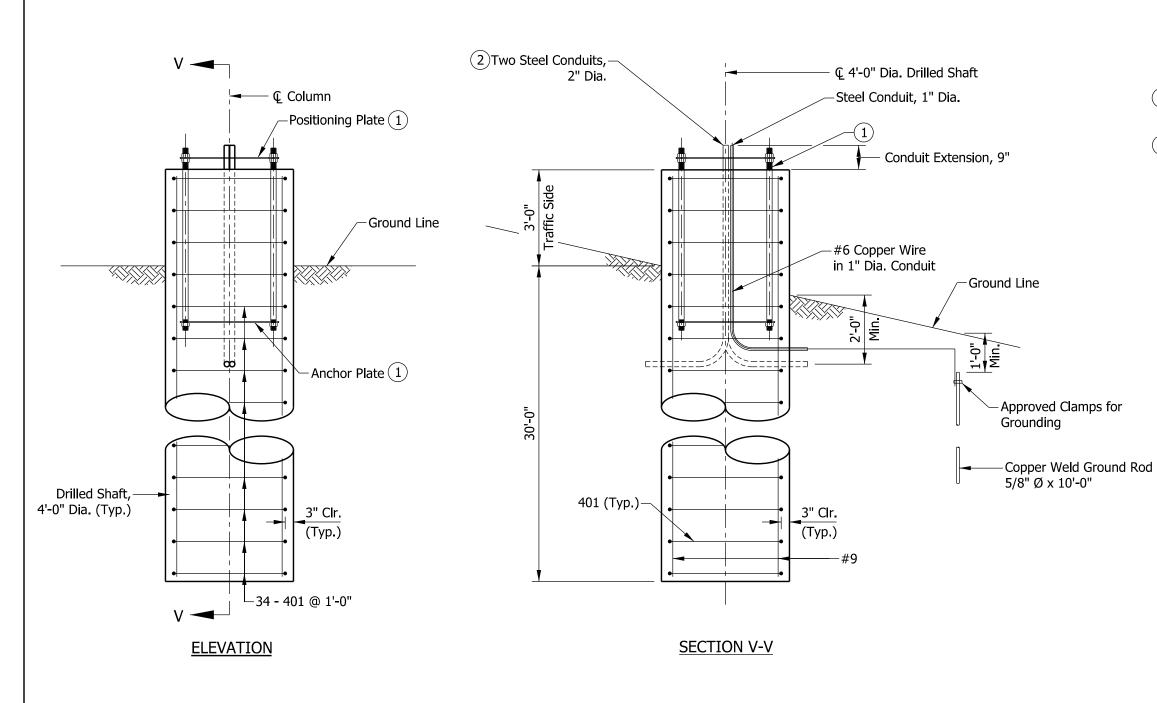


	/s/ Alfredo B. Hanza	02/05/13
1111111	DESIGN STANDARDS ENGINEER	DATE
1111	/s/ Mark A. Miller	03/27/13
	CHIEF ENGINEER	DATE



**PLAN** 





-18 - #9 x 32'-9"

PLAN

8" Ø Limit for-

Conduit Placement

### NOTES:

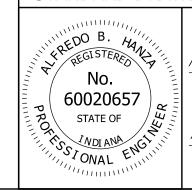
- 1 See Standard Drawing E 802-SCLS-12 for anchor and positioning plate and anchor bolt details.
- 2 Thread and cap both ends of steel conduit.
- 3. Surface seal top and sides of foundation to the ground surface.

BILL OF MATERIALS			
EPOXY-CO	ATED RE	INFORCI	NG BARS
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
#9	18	32'-9"	
Total #9			2004 LBS
401	34	12'-0"	
Total #4	273 LBS		
Total Epoxy-Coated Reinforcing Bars			2277 LBS
MISCELLANEOUS			
Concrete, Class A 15.4 CYS			
Surface Seal 4.3 SYS			

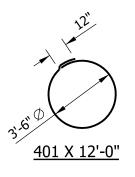
# INDIANA DEPARTMENT OF TRANSPORTATION

SIGN CANTILEVER STRUCTURE TYPE G, H, OR I FOUNDATION, 36" HEIGHT

SEPTEMBER 2013



( ) = 55	/ //
/s/ Alfredo B. Hanza	02/05/1.
 DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE



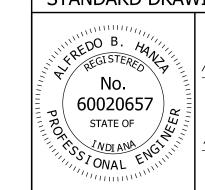
	INDEX		
SHEET NO.	SUBJECT		
1	Drawing Index		
2	Plan, Elevation, Member Sizes, and Camber		
3	Quadri-Chord and Flange Details		
4	Upper Chords Connection Details		
5	Lower Chords Connection and Wire Outlet Details		
6	Base Plate, Anchor Bolt, and Metal Skirt Details		
7	Handhole and I.D. Tag Details		
8	Foundation at 33" Concrete Barrier		
9	Foundation at 45" Concrete Barrier		

# INDIANA DEPARTMENT OF TRANSPORTATION

# SIGN CANTILEVER STRUCTURE BUTTERFLY DRAWING INDEX

SEPTEMBER 2014

STANDARD DRAWING NO. E 802-SCSB-01

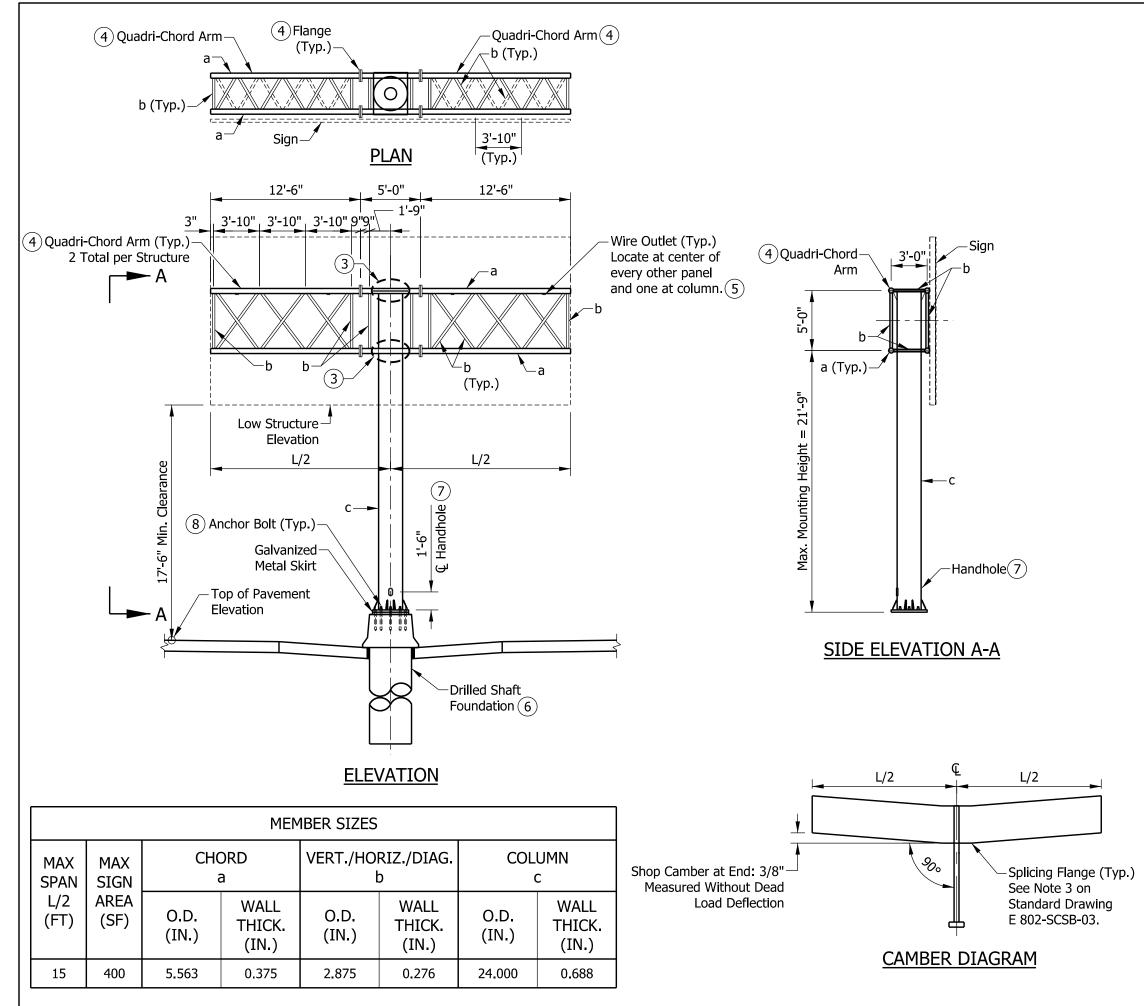


/s/ Alfredo B. Hanza 09/20/13

DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/26/13

CHIEF ENGINEER DATE



- 1. Maximum deviation of any chord from a straight line shall be 1/8".
- 2. All butterfly structure members are steel.
- (3) See Standard Drawings E 802-SCSB-04 and -05 for upper and lower chord connection details.
- (4) See Standard Drawing E 802-SCSB-03 for quadri-chord and flange details.
- (5) See Standard Drawing E 802-SCSB-05 for wire outlet detail.
- (6) See Standard Drawings E 802-SCSB-08 and -09 for foundation details.
- (7) See Standard Drawing E 802-SCSB-07 for handhole and I.D. tag details.
- (8) See Standard Drawing E 802-SCSB-06 for base plate, anchor bolt, and metal skirt details.

### **LEGEND:**

- a Chord Member
- b Interior Member
   Verticals and Vertical Diagonals in Front and Back Faces, and
   Horizontals and Horizontal Diagonals in Top and Bottom Faces
   of Quadri-Chord Arm
- c Column

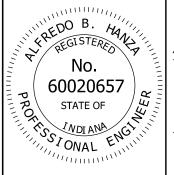
### INDIANA DEPARTMENT OF TRANSPORTATION

SIGN CANTILEVER STRUCTURE BUTTERFLY PLAN, ELEVATION, MEMBER SIZE, AND CAMBER

SEPTEMBER 2014

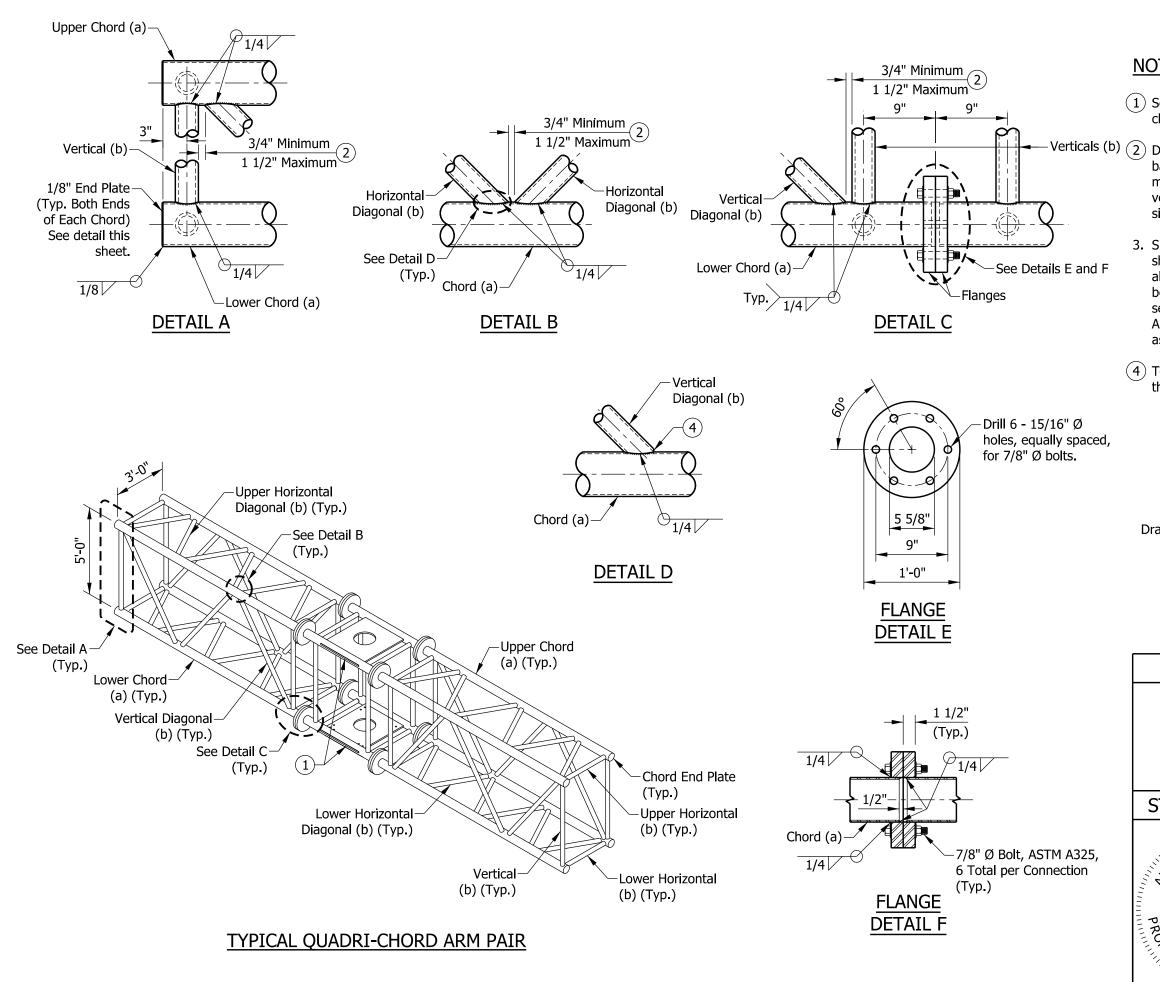
STANDARD DRAWING NO. E 802-SCSB-02

CHIEF ENGINEER

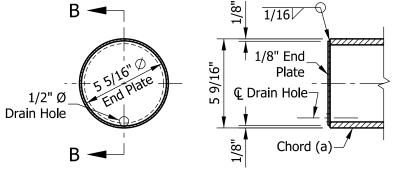


	/s/ Alfredo B. Hanza	09/20/13
11111111	DESIGN STANDARDS ENGINEER	DATE
	/s/ Mark A. Miller	09/26/13

DATE



- See Standard Drawings E 802-SCSB-04 and -05 for upper and lower chords connection details.
- -Verticals (b) 2 Diagonals shall be detailed for minimum offset from the panel point based on the following: Offset shall be such as to provide a 3/4" minimum to 1 1/2" maximum clearance between any diagonal and any vertical member, and to provide clearance for U-bolt connections of signs.
  - 3. Splicing flanges shall be attached to each arm unit with the arm shop-assembled to camber shown. Arm units shall be in proper alignment and flange surfaces shall be shop-bolted into full contact before welding. Sufficient external welds or tacks shall be made to secure flanges until remaining welds are made after disassembly. Adjacent flanges shall be "match marked" to insure proper field assembly.
  - 4 Toe edge of diagonal member shall be cut back to facilitate throat thickness per AWS D1.1, Figure 3.2.

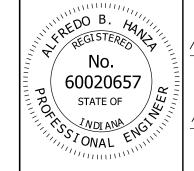


END VIEW SECTION B-B
CHORD END PLATE DETAIL

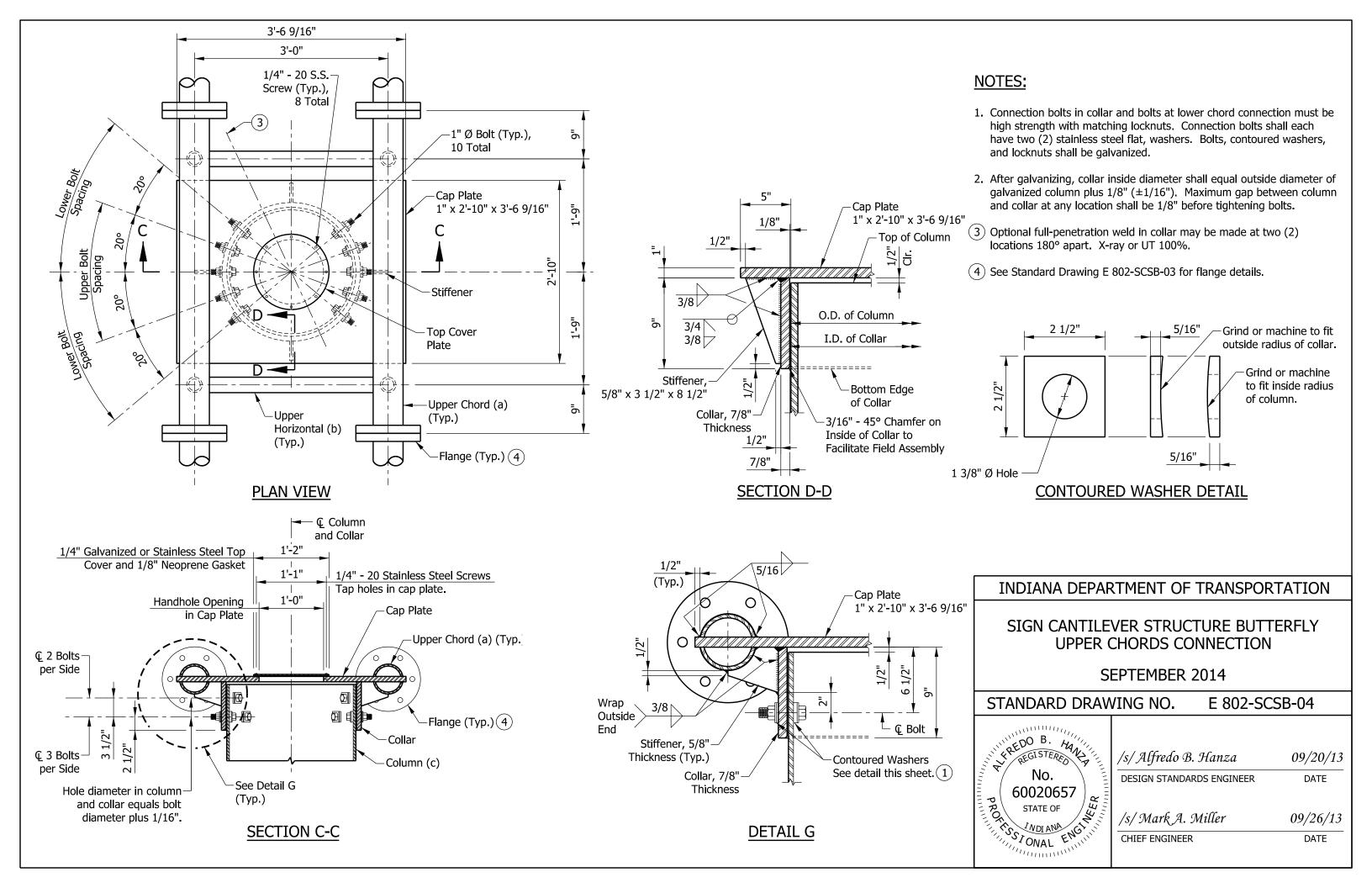
# INDIANA DEPARTMENT OF TRANSPORTATION

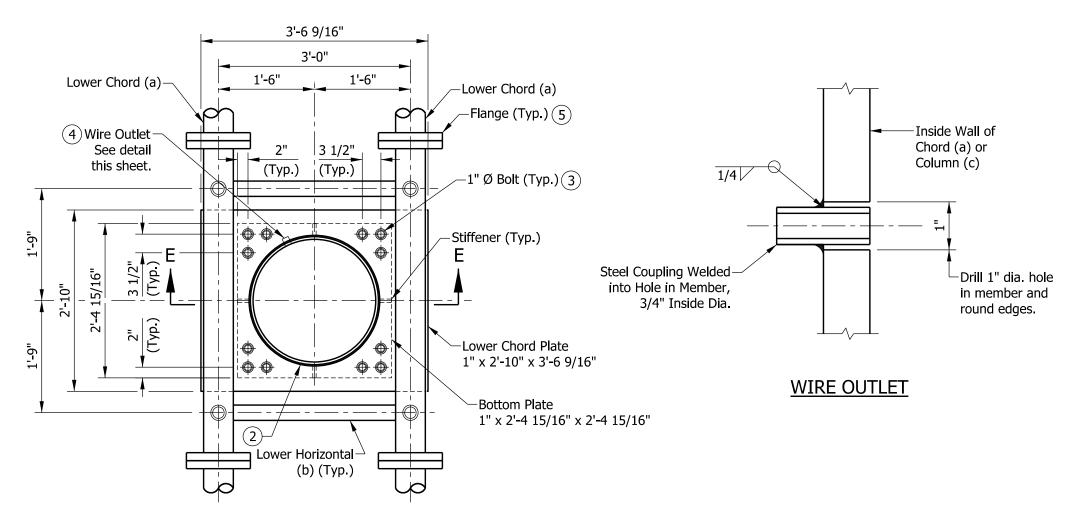
SIGN CANTILEVER STRUCTURE BUTTERFLY QUADRI-CHORD AND FLANGE DETAILS

SEPTEMBER 2014

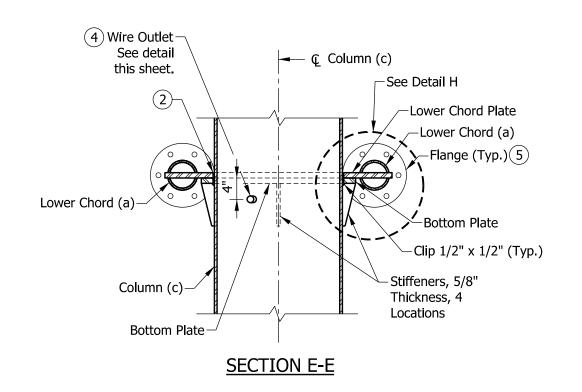


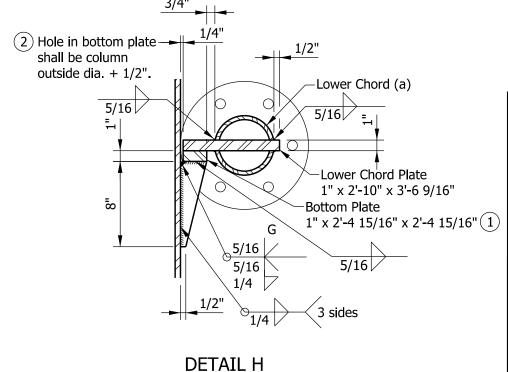
/s/ Alfredo B. Hanza	09/20/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	09/26/13
CHIEF ENGINEER	DATE
	DESIGN STANDARDS ENGINEER  /s/ Mark A. Miller





# PLAN SECTION THROUGH COLUMN ABOVE LOWER CHORDS





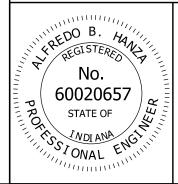
# NOTES:

- (1) Grind top plate if required to fully seat lower chord plate. Repair damaged galvanizing before assembly.
- (2) After tightening lower connection bolts, fill gap with non-hardening silicone caulk suitable for exterior exposure.
- (3) Connection bolts in collar and bolts at lower chord connection must be high strength with matching locknuts. Connection bolts shall each have two (2) stainless steel flat washers. Bolts, contoured washers, and locknuts shall be galvanized.
- (4) Orient pipe toward sign. Hole diameter in column shall equal outside pipe diameter + 1/8".
- (5) See Standard Drawing E 802-SCSB-03 for flange details.

# INDIANA DEPARTMENT OF TRANSPORTATION

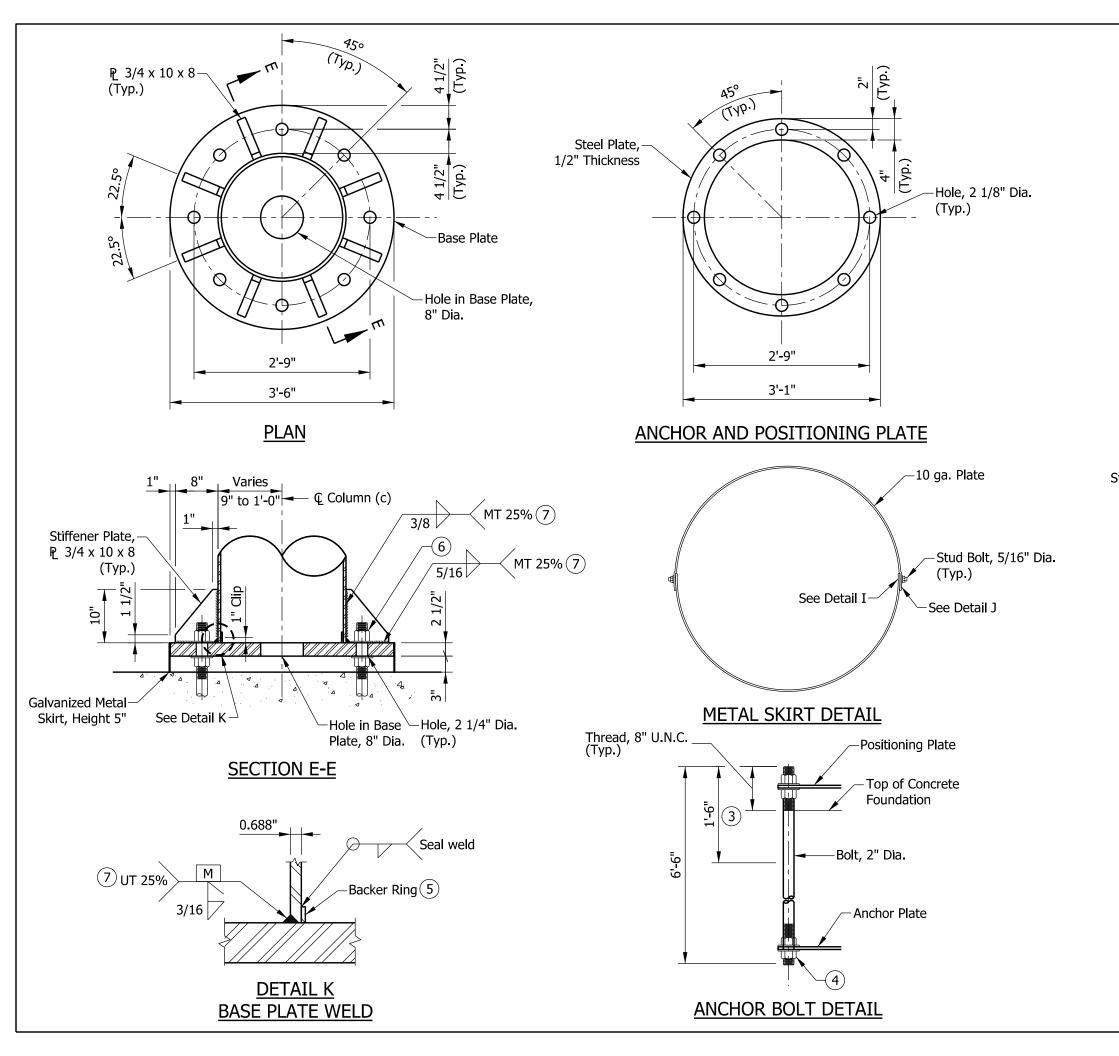
SIGN CANTILEVER STRUCTURE BUTTERFLY LOWER CHORDS CONNECTION AND WIRE OUTLET DETAIL SEPTEMBER 2014

STANDARD DRAWING NO. E 802-SCSB-05

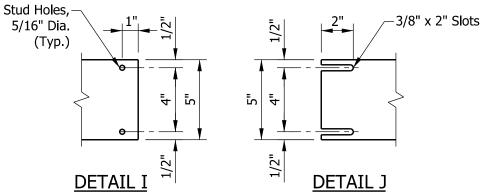


/s/ Alfredo B. Hanza	09/25/13
DESIGN STANDARDS ENGINEER	DATE

/s/ Mark A. Miller 09/26/13 CHIEF ENGINEER DATE

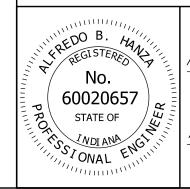


- 1. Utilize temporary positioning plate and leveling nuts or other engineer-approved methods to maintain anchor bolt alignment during concrete placement. Positioning plate and associated nuts shall be removed upon completion of the foundation.
- 2. Protect threads during concreting with tape, sleeves, or other means.
- (3) 1'-6" is the minimum length which shall be galvanized. Entire bolt may be galvanized at contractor's option.
- (4) Provide uncoated nut at bottom of anchor plate. Deform thread or use chemical thread lock to secure.
- (5) Use continuous backer ring, 1/4" x 1" minimum. Tack weld only in root area of final weld.
- 6 Anchor bolt nuts shall be tightened against the base plate by turning the nut a minimum of 1/6 turn from snug tight condition.
- 7 UT Ultrasonic Testing, 25% of entire column to base plate weld. MT - Magnetic Particle Testing, 25% or 1 side of 4 stiffeners.

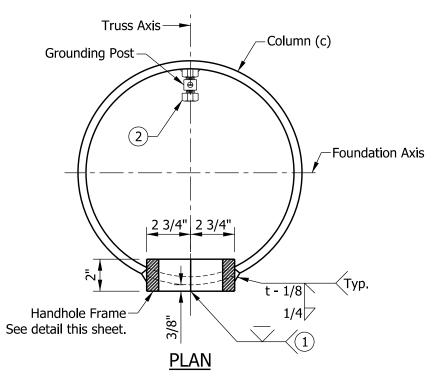


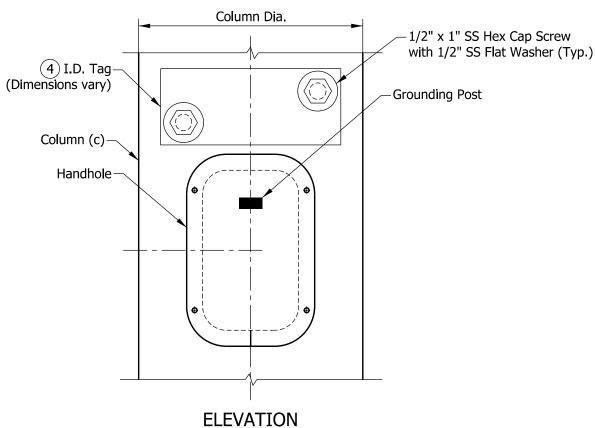
# INDIANA DEPARTMENT OF TRANSPORTATION

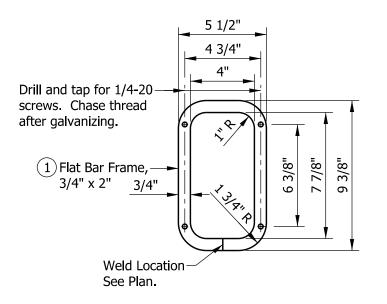
SIGN CANTILEVER STRUCTURE BUTTERFLY
BASE PLATE, ANCHOR BOLT, AND
METAL SKIRT DETAILS
SEPTEMBER 2014



	/s/ Alfredo B. Hanza	09/20/13
1111111	DESIGN STANDARDS ENGINEER	DATE
1111,	/s/ Mark A. Miller	09/26/13
	CHIEF ENGINEER	DATE





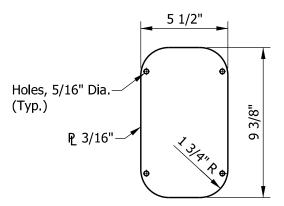


# **HANDHOLE FRAME**

# NOTES:

- 1 In lieu of fabricated handhole frame as shown, frame may be cut from 2" plate with rolling direction vertical.
- 2 See Standard Drawing E 802-SNWR-03 for grounding post details. Grounding post shall be placed on far side of support directly opposite center of handhole.
- 3. See Standard Drawing E 802-SCSB-02 for handhole location.
- 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 \_\_\_\_\_, Arm Length \_\_\_\_ Pole Mounting Height \_\_\_\_



# HANDHOLE COVER

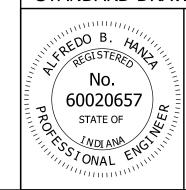
# INDIANA DEPARTMENT OF TRANSPORTATION

SIGN CANTILEVER STRUCTURE BUTTERFLY HANDHOLE AND I.D. TAG DETAILS

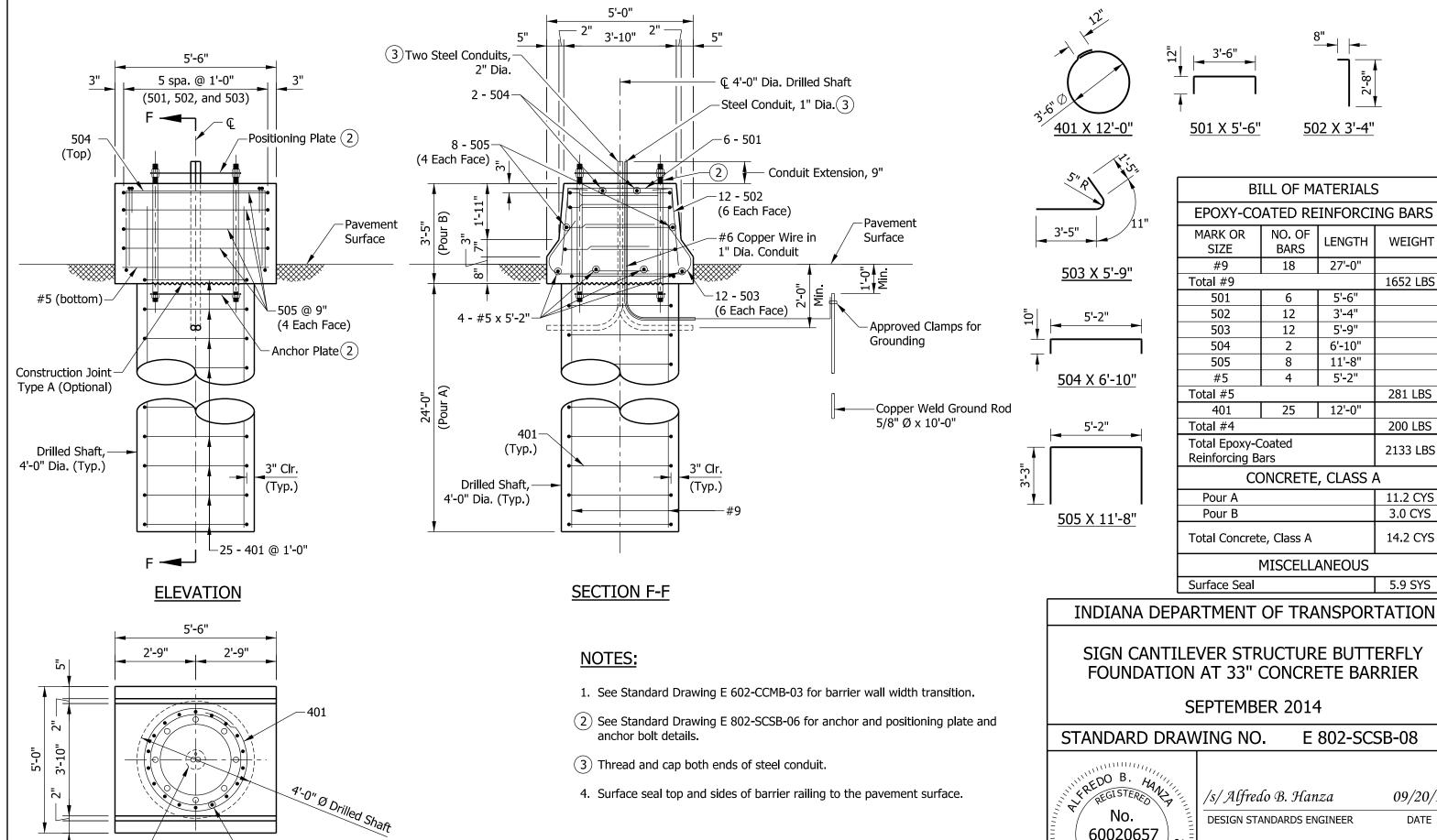
SEPTEMBER 2014

STANDARD DRAWING NO. E 802-SCSB-07

CHIEF ENGINEER



/s/ Alfredo B. Hanza	09/20/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	09/26/13



-18 - #9 x 27'-0"

**PLAN** 

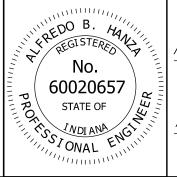
<u>"</u>

8" Ø Limit for Conduit Placement

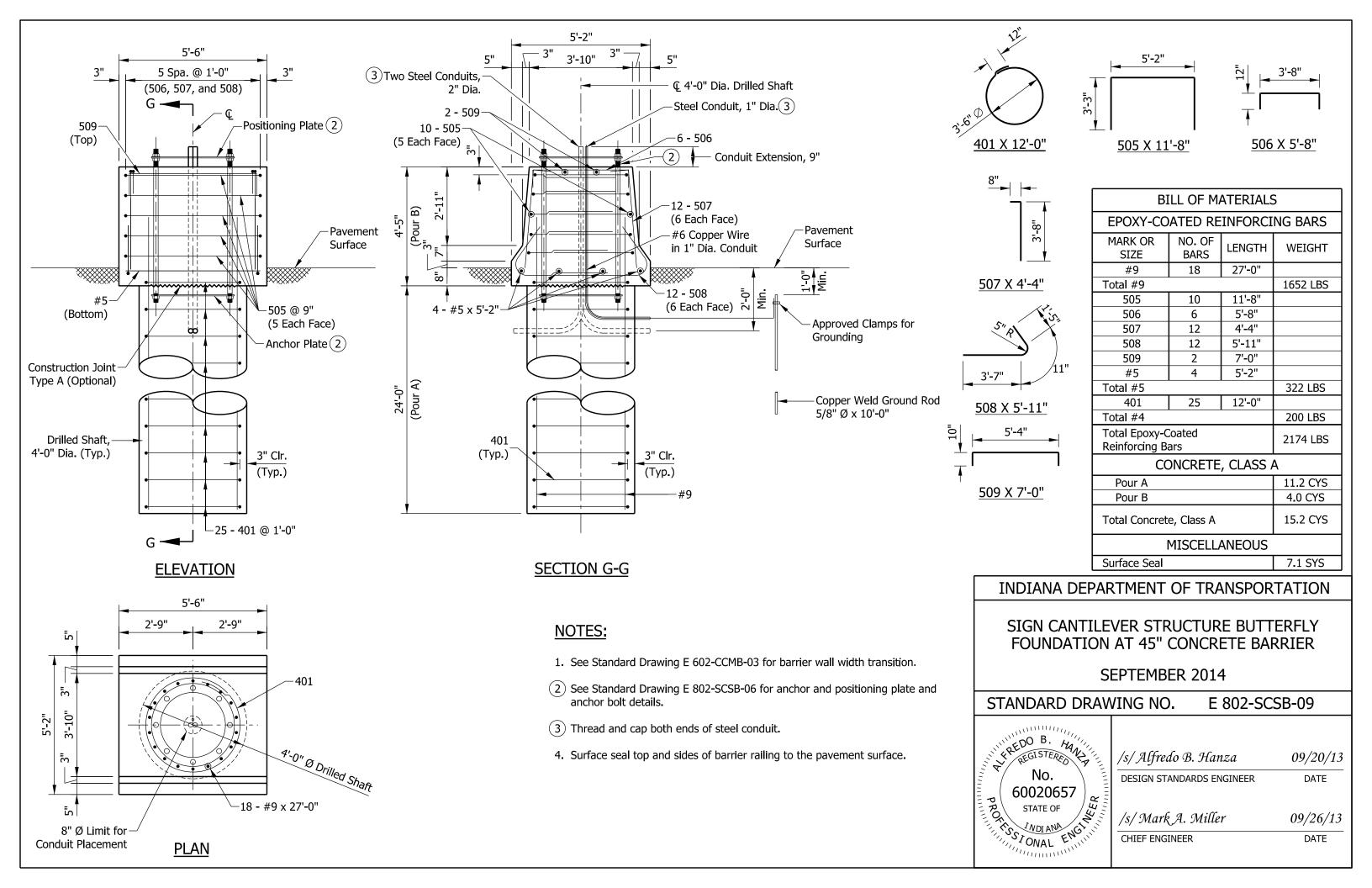
BILL OF MATERIALS								
EPOXY-COATED REINFORCING BARS								
MARK OR SIZE	NO. OF BARS	WEIGHT						
#9	18	27'-0"						
Total #9			1652 LBS					
501	6	5'-6"						
502	12	3'-4"						
503	12	5'-9"						
504	2	6'-10"						
505	8							
#5	#5 4 5'-2"							
Total #5	Total #5							
401	25							
Total #4		200 LBS						
	Total Epoxy-Coated Reinforcing Bars							
CC	NCRETE	, CLASS /	4					
Pour A			11.2 CYS					
Pour B			3.0 CYS					
Total Concret	14.2 CYS							
	MISCELL	ANEOUS						
Surface Seal			5.9 SYS					

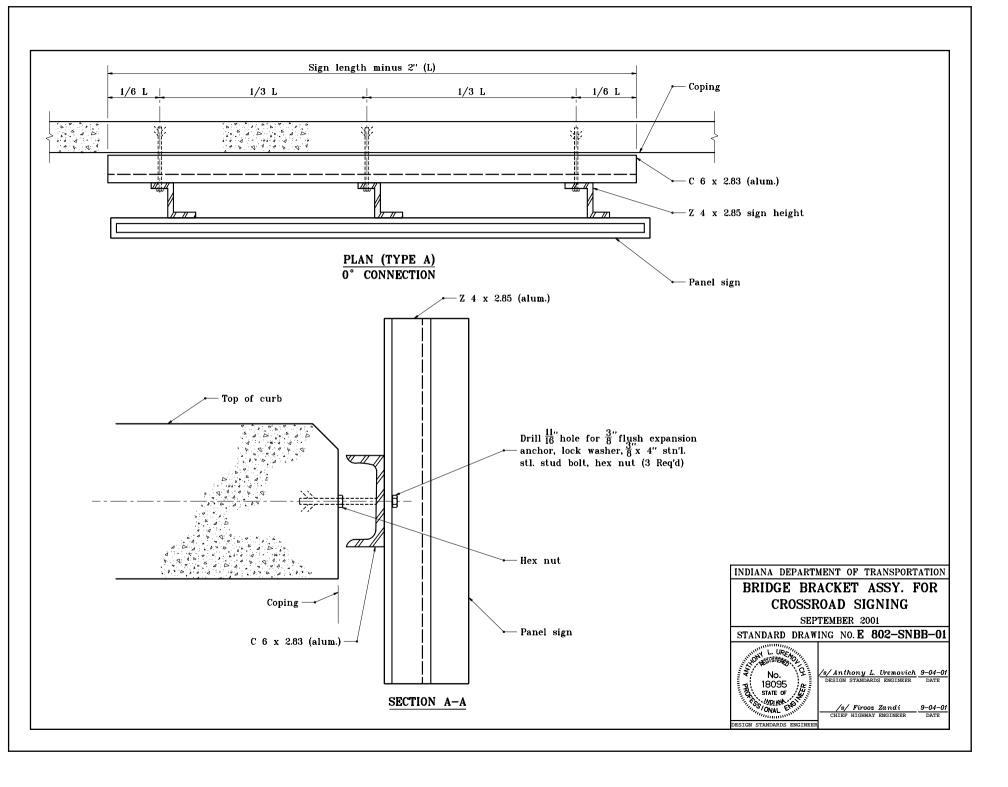
# SIGN CANTILEVER STRUCTURE BUTTERFLY FOUNDATION AT 33" CONCRETE BARRIER

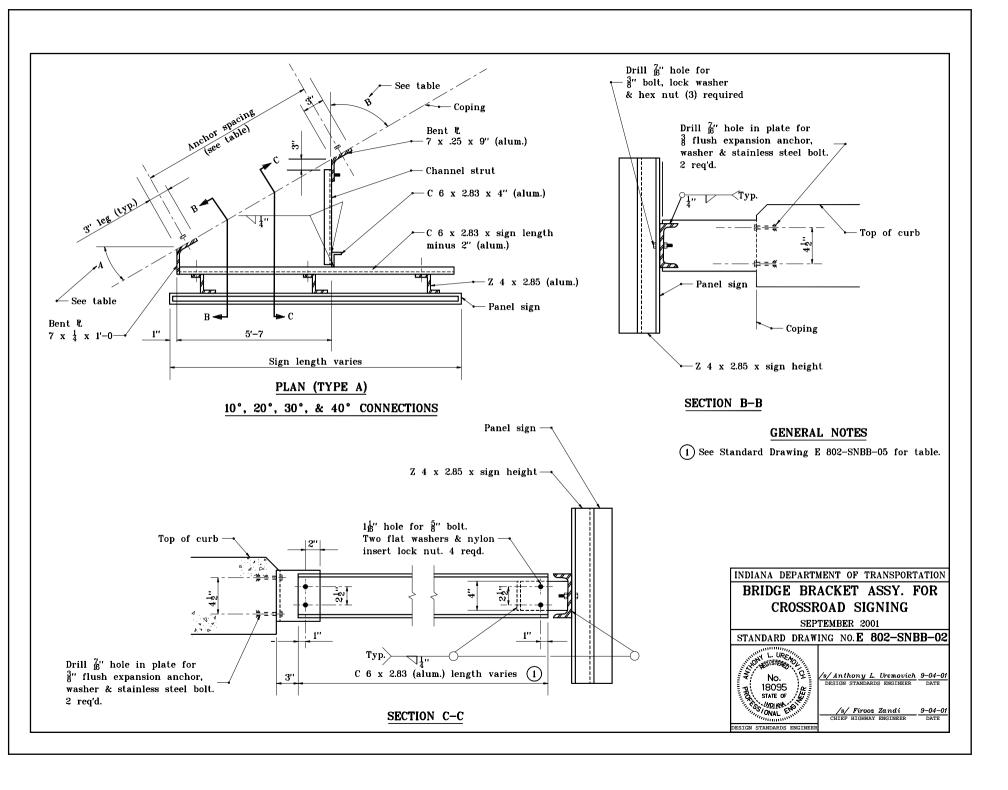
E 802-SCSB-08

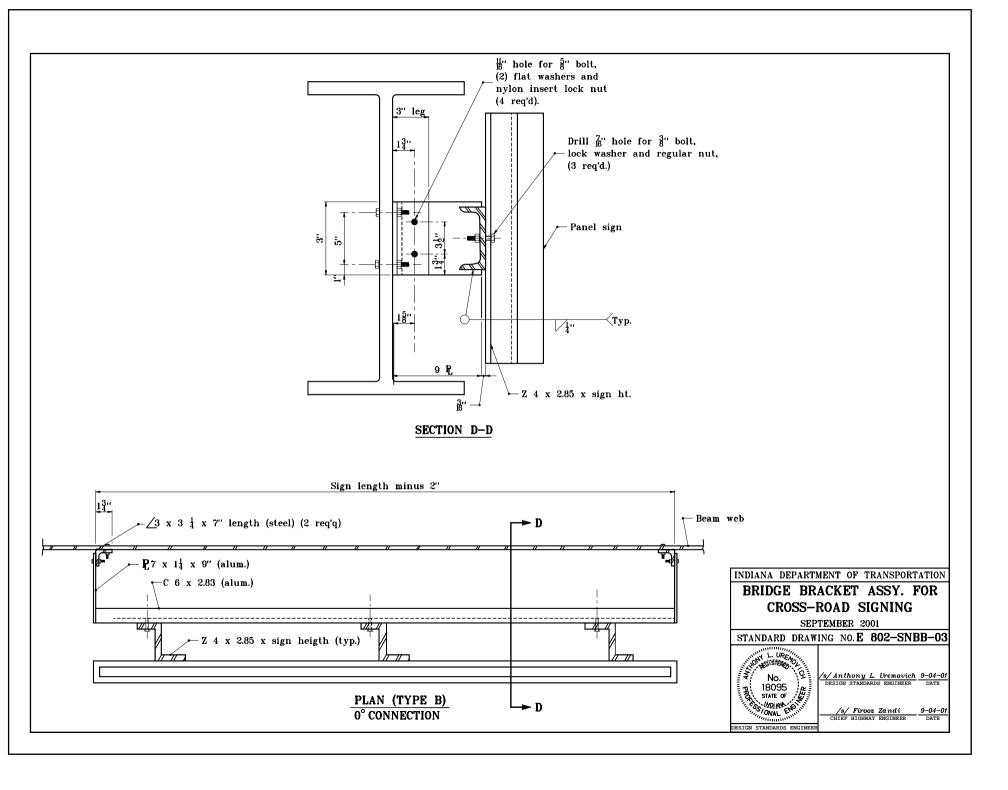


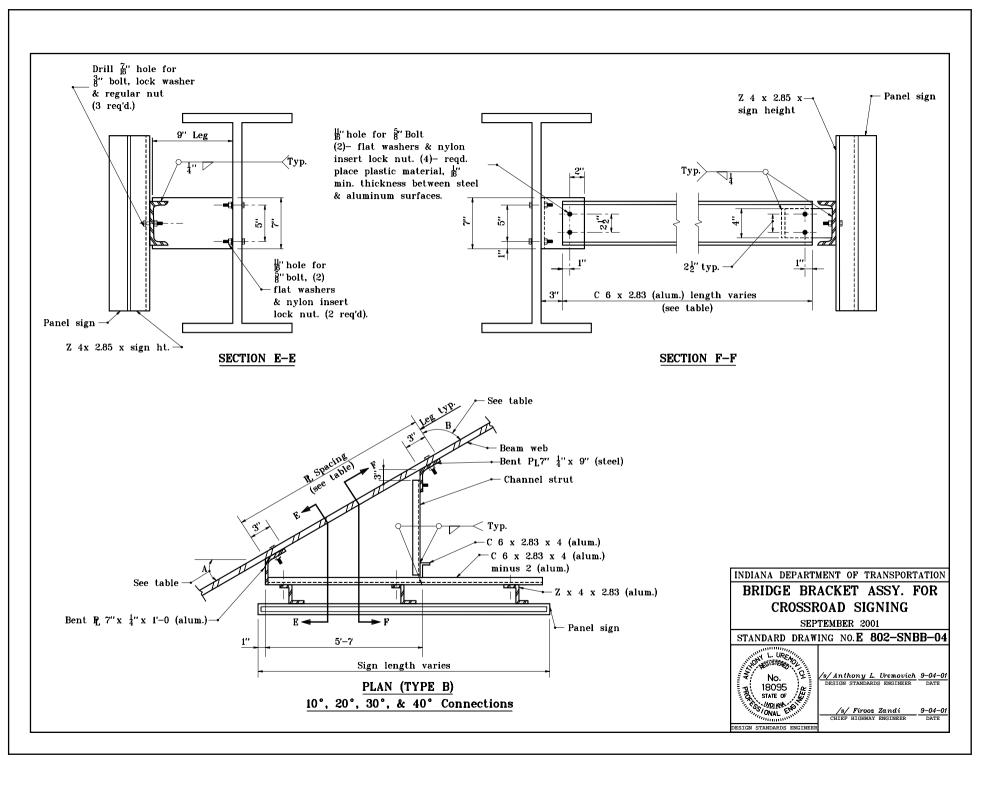
/s/ Alfredo B. Hanza	09/20/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	09/26/13
CHIEF ENGINEER	DATE











	TYPE A & B BRIDGE CONNECTION TABLE										
SKEW	CONNECTION (ANGLE A)	ANGLE B	CHANNEL STRUT LENGTH								
0°- 10°	0°										
10°- 20°	10°	80°	C 6 x 2.83 x 1'-4 <sup>3</sup> / <sub>4</sub> "	5'-6	5'-11						
20°- 30°	20°	70°	C 6 x 2.83 x 2'-5¼"	5'-112''	6'-2 <mark>1</mark> ''						
30°- 40°	30°	60°	C 6 x 2.83 x 3'-72"	6'-5½''	6'-8½''						
40°- 50°	40°	50°	C 6 x 2.83 x 5'-1 <sup>1</sup> / <sub>4</sub> "	7'-3¾''	7'-6½''						

#### GENERAL NOTES

- 1. Bottom edge of sign shall be horizontal when erected and shall be a minimum of 1'-6 above the bridge beam flange at all
- 2. All 3" bolts used with 3" expansion anchors shall be 1 in. long ( $\pm 0$  ") and shall engage expansion anchors of 1 1/2 times the bolt dia. or 9 threads minimum except for Type A 0° connections to bridge fascia. The contractor may use either type A or B.

INDIANA DEPARTMENT OF TRANSPORTATION

#### BRIDGE BRACKET ASSY. FOR CROSSROAD SIGNING

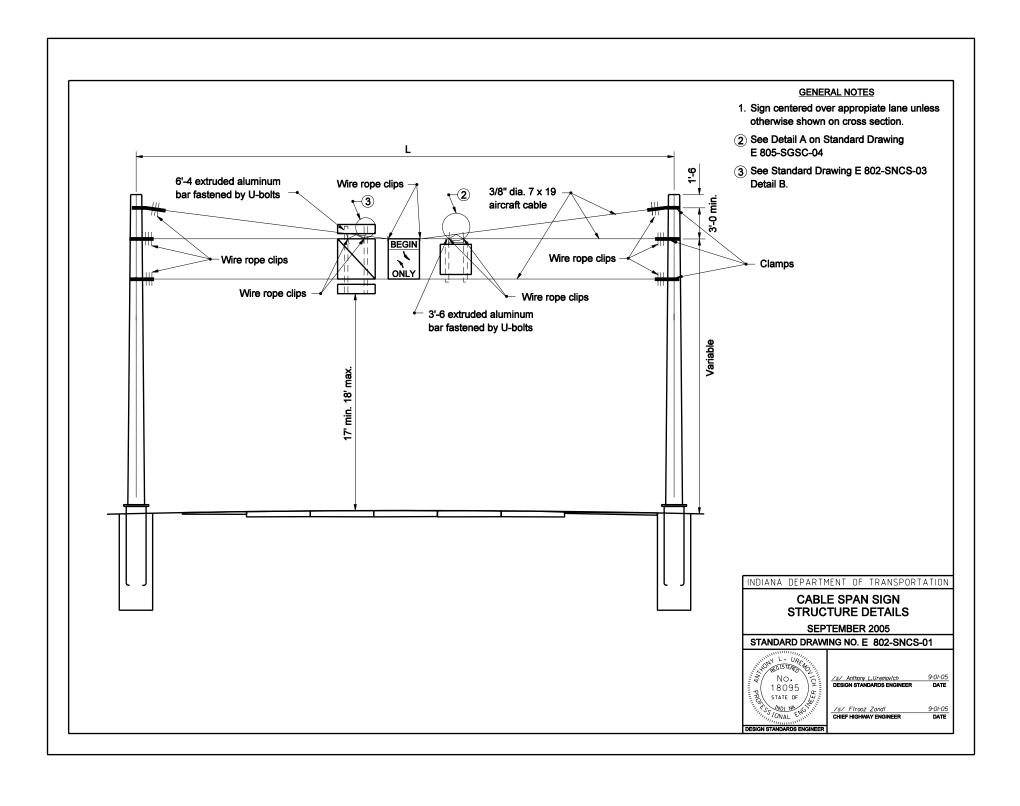
SEPTEMBER 2001

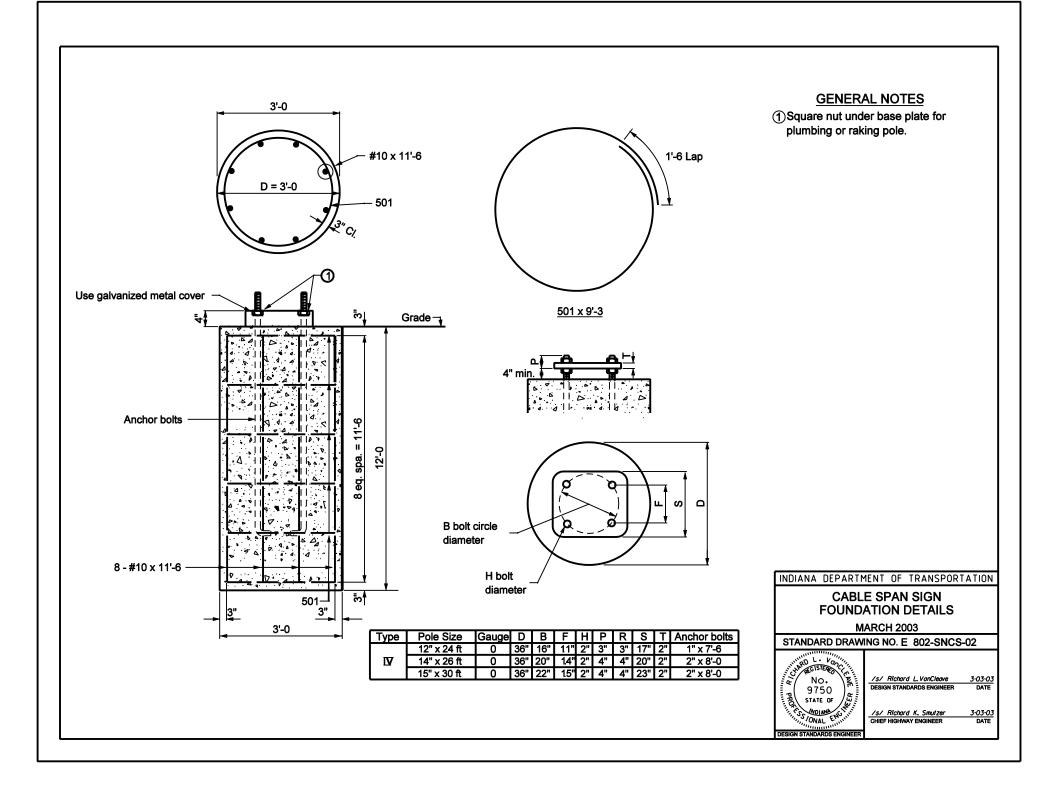
STANDARD DRAWING NO.E 802-SNBB-05

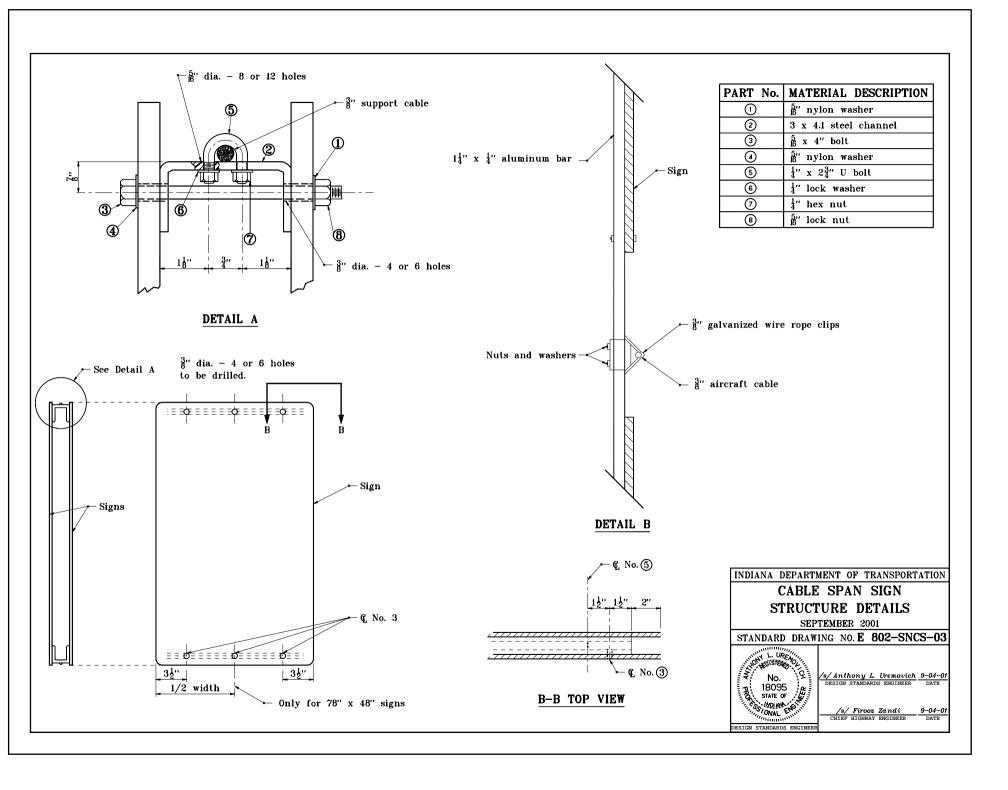


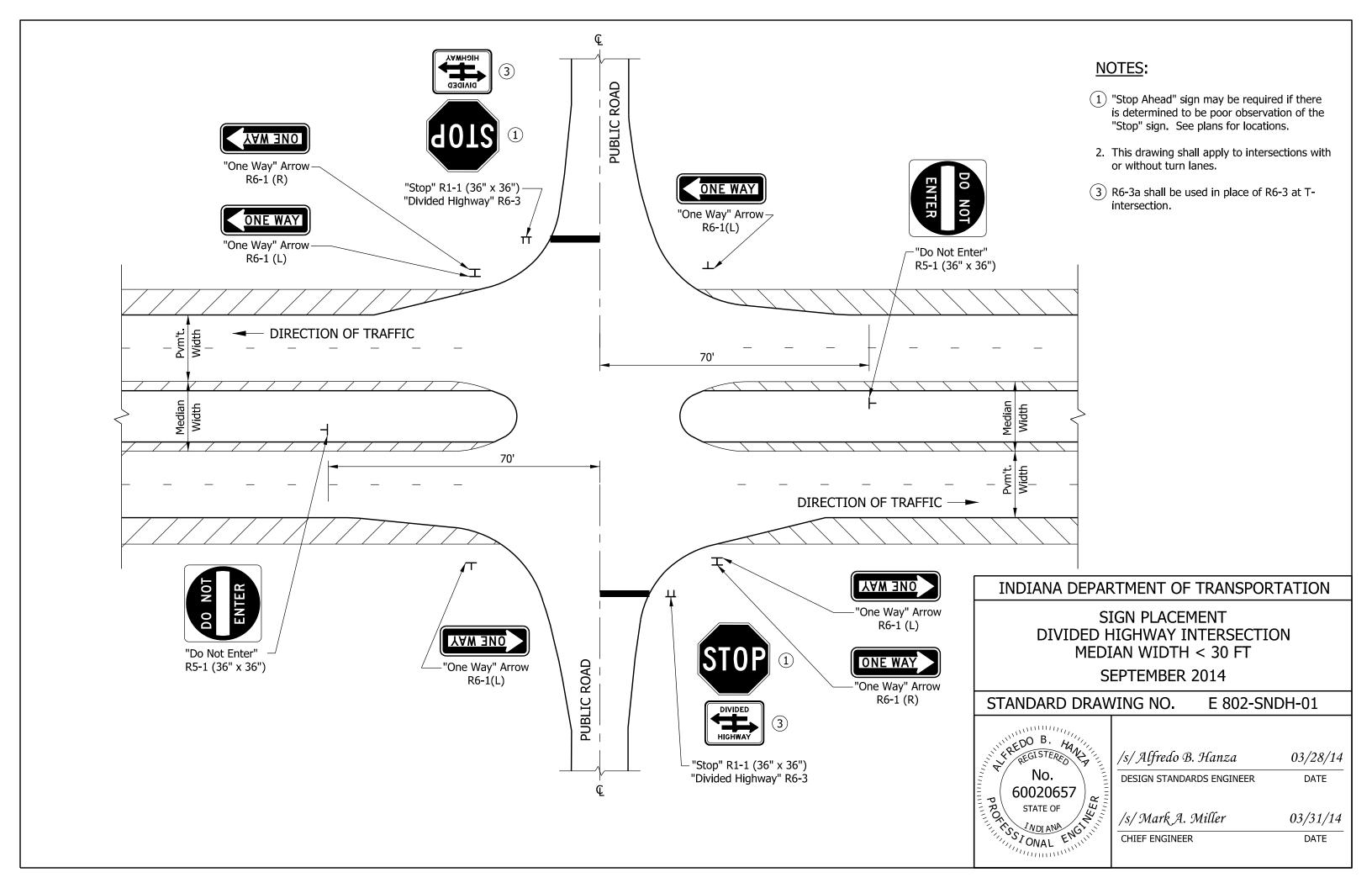
/s/ Anthony L. Uremovich 9-04-01
DESIGN STANDARDS ENGINEER DATE

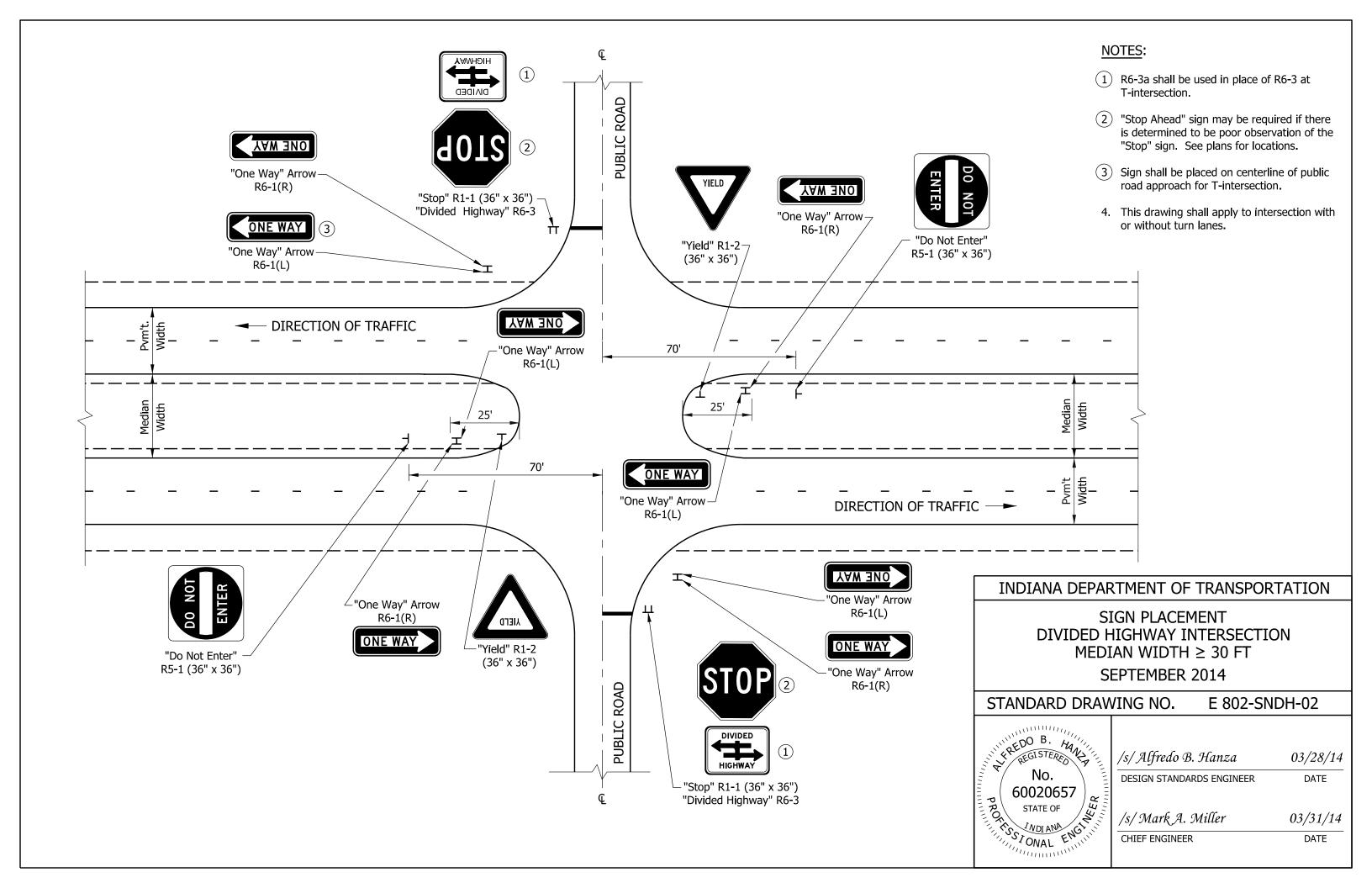
/s/ Firooz Zandi 9-04-01

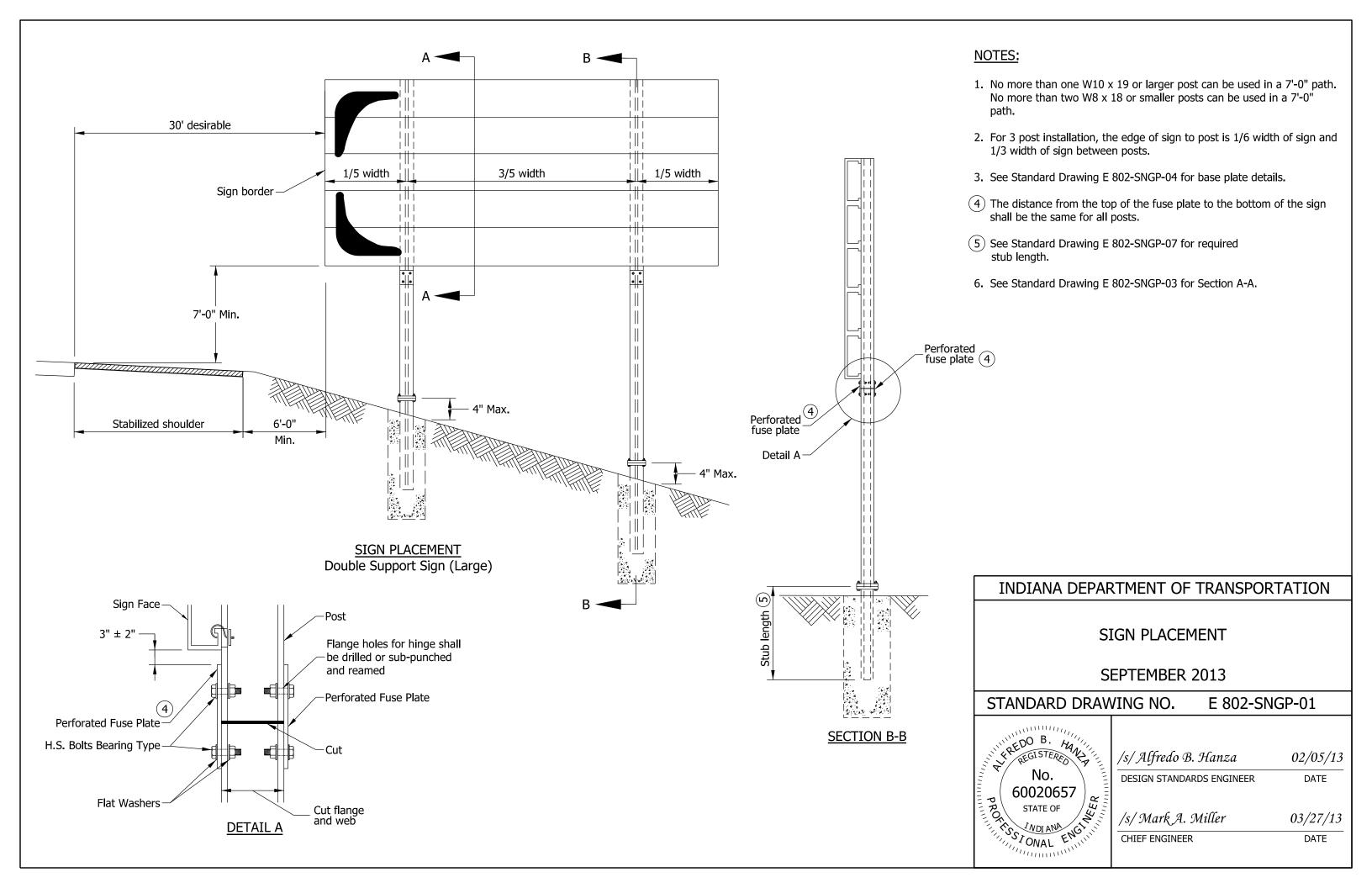


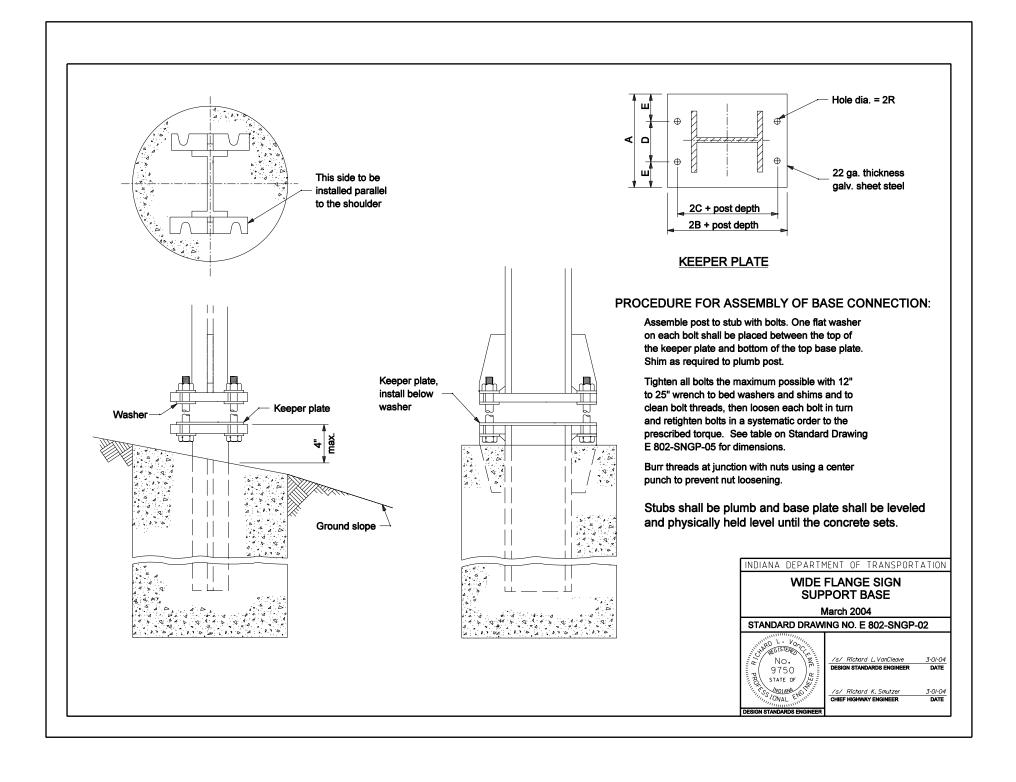


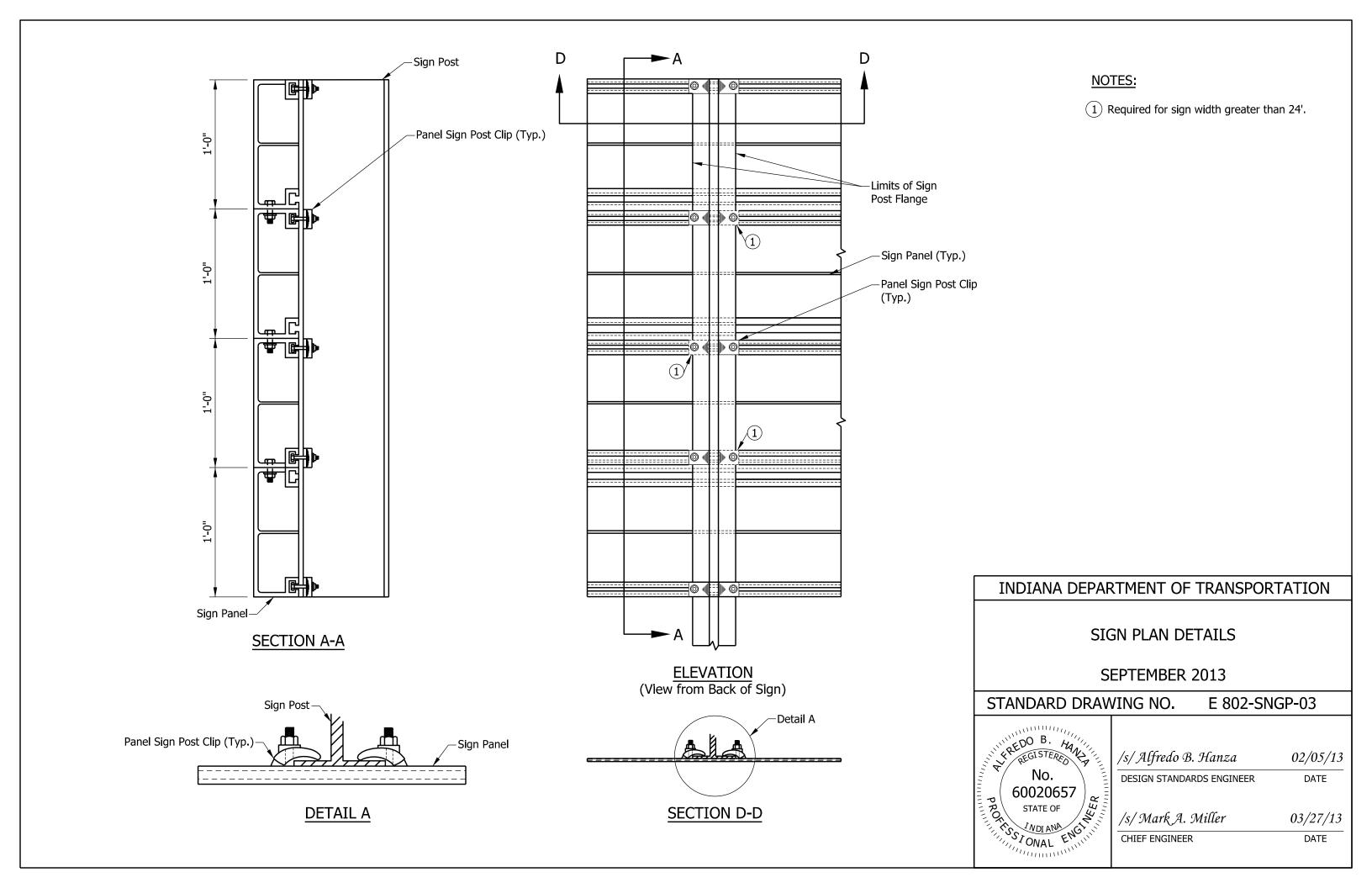


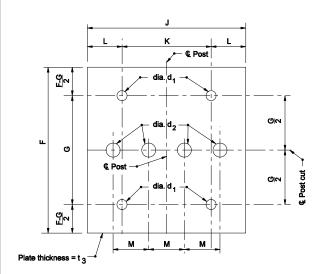


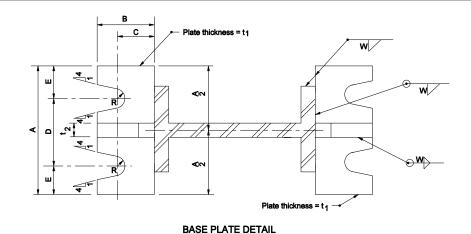




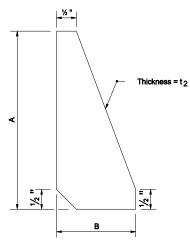






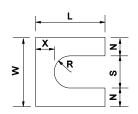


#### PERFORATED FUSE PLATE DETAIL (3.)



STIFFENER PLATE DETAIL

SHIM DETAIL										
BOLT L W N R S										
½" to ¾"	13/4"	13/4"	15/32"	13/32"	<sup>13</sup> / <sub>16</sub> "	15/32'				
1"	2"	2"	3/8"	5/8"	11/4"	15/32'				



Furnish 2-0.012  $\pm$  thick and 2-0.03  $\pm$  thick shims per post.

SHIM DETAIL

#### Notes:

- See table on Standard Drawing E 802-SNGP-05 for diminsions and weight of stiffener plate and base plate.
- See table on Standard Drawing E 802-SNGP-06 for dimensions and weight of preforated fuse plate.
- 3) Use H.S. bolts with hex head, & hex nut, one flat washer under each bolt head and beveled or flat washer (where required) under nut.
- 4. Dimensional tolerances excluding the thickness for shims is  $\pm$  1/32".



\_\_\_\_

	BASE PLATE & STIFFENER PLATE DATA TABLE													
Post Size	Bolt Size	Torque in lb	Wt. of 4 Plates (One Post) ,lb	Wt. of 4 Stiffeners (One Post) ,lb	Α	В	C	D	E	R	d4	t <sub>1</sub>	t2	W
W6 x 9	½" ø x 2¼ "	140	5.10	3.33	4½"	2"	1.3%"	2½"	1"	9/23"	1.3%"	1/2"	1/2"	3/16"
W8 x 10	%" ø x 2½ "	300	6.38	4.07	5"	21/4"	1.1/2"	21%"	11/46"	11/32"	1.1/2"	"	"	"
W8 x 13	¾" ø x 3"	500	12.6	7.97	6"	2½"	"	3.1/8"	17/4e"	13/32"	1.¾"	3/4"	3/4"	1/4"
W8 x 15	n n	II .	"	"	"	"	"	"	"	"	"	"	"	"
W8 x 18	"	II .	ıı .	"	"	"	"	"	"	"	"		"	5/16"
W10 x 19	1" ø x 3.¼"	700	14.04	8.66	11	2¾"	1.1/2"	35%"	13/46"	17/32"	21/4"	3/4"	3/4"	5/16"

INDIANA DEPARTMENT OF TRANSPORTATION

SIGN DATA TABLES

SEPTEMBER 2002

STANDARD DRAWING NO. E 802-SNGP-05



/s/ Richard L. VanCleave 9-03DESIGN STANDARDS ENGINEER DAT

/s/ Richard K. Smutzer 9-03-02
CHIEF HIGHWAY ENGINEER DATE

	PERFORATED FUSE PLATE DATA TABLE											
Post Size	BOLT SIZE	Wt. of Plate* (One Post), lb	F	G	J	К	L	М	d <sub>1</sub>	d <sub>2</sub>	t <sub>3</sub>	Bolt Tension, lbs
W6 x 9	½" x 1½"	1.01	41/4 "	2"	4"	21/4"	7⁄8"	1"	9/16"	3/4 "	1⁄4 "	12000
W8 x 10	½" x 1½"	1.01	41/4 "	2"	4"	21/4 "	7⁄8"	1"	9/16"	3⁄4 "	1⁄4 "	12000
W8 x 13	½ " x 1½ "	1.01	41/4 "	2"	4"	21/4 "	7⁄8"	1"	9/16"	3⁄4 "	1⁄4 "	12000
W8 x 15	<sup>5</sup> / <sub>8</sub> " x 2 <sup>1</sup> / <sub>4</sub> "	1.72	5"	2½"	4"	2 <sup>1</sup> ⁄ <sub>4</sub> "	7⁄8"	1"	<sup>11</sup> ⁄ <sub>16</sub> "	3⁄4 "	3⁄8 "	19000
W8 x 18	5/8 " x 2 <sup>1</sup> / <sub>4</sub> "	2.27	5"	21/2 "	5 <sup>1</sup> ⁄ <sub>4</sub> "	23/4 "	11/4"	11/4"	<sup>11</sup> ⁄ <sub>16</sub> "	11/16 "	3⁄8 "	19000
W10 x 19	<sup>5</sup> / <sub>8</sub> " x 2 <sup>1</sup> / <sub>4</sub> "	1.72	5"	2½"	4"	2 <sup>1</sup> ⁄ <sub>4</sub> "	7⁄8"	1"	<sup>11</sup> ⁄ <sub>16</sub> "	3⁄4 "	3⁄8 "	19000

<sup>\*</sup> Gross weight with holes deducted from weight. Incidental weights of bolts and washers are not included in plan quantities.

1. See Standard Drawing E 802-SNGP-01 through 07 for details and notes for posts, bolts, washers, etc.

# INDIANA DEPARTMENT OF TRANSPORTATION SIGN DATA TABLES

SEPTEMBER 2008

STANDARD DRAWING NO. E 802- SNGP-06



/s/ Richard L. VanCleave
DESIGN STANDARDS ENGINEER

09/02/08 DATE

/s/ Mark A. Miller
CHIEF HIGHWAY ENGINEER

09/02/08 DATE

DESIGN STANDARDS ENGINEER

FOUNDATION DATA				
Туре	Post Size	Stub Length	Dia.	Depth
ΔΠ	W6 x 9	2'-0	20"	5'
VIII	W8 x 10	2'-0	20"	5'
IX	W8 x 13	2'-0	20"	5'
X	W8 x 15	2'-6	24"	6'
ΧI	W8 x 18	2'-6	24"	6'
XII	W10 x 19	2'-6	24"	7'

INDIANA DEPARTMENT OF TRANSPORTATION

# WIDE FLANGE SIGN POST SUPPORT FOUNDATION DATA

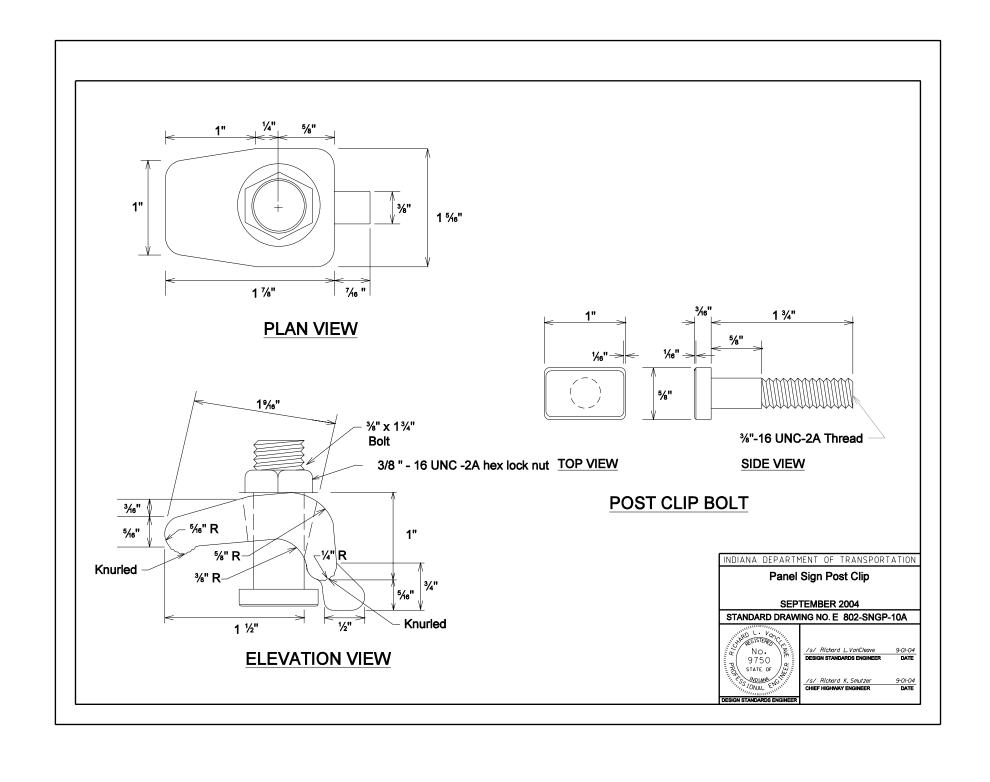
MARCH 2004

STANDARD DRAWING NO. E 802-SNGP-07

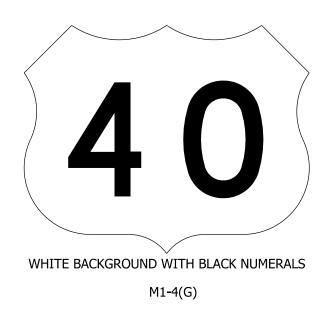


/s/ Richard L. VanCleave	3-01-04
DESIGN STANDARDS ENGINEER	DATE

/s/ Richard K. Smutzer 3-0I-04
CHIEF HIGHWAY ENGINEER DATE







(G) INDICATES SHIELD TO BE USED ON ALL GUIDE SIGNS AND DOES NOT REQUIRE BLACK BORDER

#### FOR GUIDE SIGN USE

# FOR INDEPENDENT USE ONLY

M1-4(I)

		M1-	4(I)		
12" NUI	MERALS	18" NUI	MERALS	24" NUI	MERALS
2 DIGITS	3 DIGITS	2 DIGITS	3 DIGITS	2 DIGITS	3 DIGITS
24" x 24"	30" x 24"	36" x 36"	45" x 36"	48" x 48"	60" x 48"

		M1-	4(G)		
12" NUI	MERALS	18" NUI	MERALS	24" NUI	MERALS
2 DIGITS	3 DIGITS	2 DIGITS	3 DIGITS	2 DIGITS	3 DIGITS
24" x 24"	30" x 24"	36" x 36"	45" x 36"	48" x 48"	60" x 48"

JCT

M2-1(S) M2-1(I) TO

M4-5(I) M4-5(S)

# (I) INDICATES WHITE LEGEND ON BLUE BACKGROUND (INTERSTATE) (S) INDICATES BLACK LEGEND ON SILVER BACKGROUND (STATE)

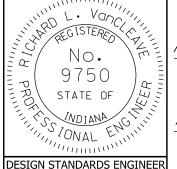
STATE	M2-1(S)	M2-1-(S)	M4-5(S)	M4-5-(S)
INTERSTATE	M2-1(I)	M2-1-(I)	M4-5(I)	M4-5-(I)
SHIELD SIZES	24" x 24" 30" x 24"	36" x 36" 45" x 36"	24" x 24" 30" x 24"	36" x 36" 45" x 36"
CORRESPONDING SIGN SIZE	21" x 15"	21" x 15"	24" x 21"	30" x 15"

# INDIANA DEPARTMENT OF TRANSPORTATION

## **ROUTE MARKER DETAILS**

SEPTEMBER 2010

STANDARD DRAWING NO. E 802-SNGS-01



 $\frac{/s/Richard\ L.\ VanCleave}{DESIGN\ STANDARDS\ ENGINEER} \frac{09/01/10}{DATE}$ 

/s/ Mark A. Miller 09/01/10
CHIEF HIGHWAY ENGINEER DATE

11111111111



WHITE BACKGROUND WITH BLACK LETTERS, NUMERALS AND BORDER

M1-5

## STATE ROUTE MARKER

		M1	5		
12" NUI	MERALS	18" NUI	MERALS	24" NUI	MERALS
2 DIGITS	3 DIGITS	2 DIGITS	3 DIGITS	2 DIGITS	3 DIGITS
24" x 24"	30' x 24"	36" x 36"	45" x 36"	48" x 48"	60" x 48"



WHITE LETTERS, NUMERALS, AND BORDER

M1-1

## INTERSTATE SHIELD

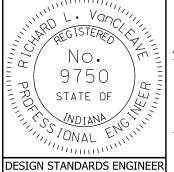
		M1	-1		
12" NUI	MERALS	18" NUI	MERALS	24" NUI	MERALS
2 DIGITS	3 DIGITS	2 DIGITS	3 DIGITS	2 DIGITS	3 DIGITS
24" x 24"	30' x 24"	36" x 36"	45" x 36"	48" x 48"	60" x 48"

# INDIANA DEPARTMENT OF TRANSPORTATION

**ROUTE MARKER DETAILS** 

SEPTEMBER 2010

STANDARD DRAWING NO. E 802-SNGS-02



/s/ Richard L. VanCleave

DESIGN STANDARDS ENGINEER

DESIGN STANDARDS ENGINEER

/s/Mark A. Miller 09/01/10

09/01/10

DATE

CHIEF HIGHWAY ENGINEER DATE



M5-1 (R or L) (I or S)



M5-2 (R or L) (I or S)



M6-1 (R or L) (I or S)



M6-5 (R or L) (I or S)



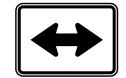
M6-7 (R or L) (I or S)



M6-2 (R or L) (I or S)



M6-3 (I or S)



M6-4 (I or S)



M6-6 (R or L) (I or S)

\* Note: Make 1st letter 10% taller

STATE	M5-1(S) M6-1(S) M6-3(S) M6-5(S) M6-7(S) M5-2(S) M6-2(S) M6-4(S) M6-6(S)	
INTERSTATE		M6-3(I) M6-5(I) M6-7(I) M6-4(I) M6-6(I)
SHIELD SIZES	24" x 24" 30" x 24"	36" x 36" 45" x 36"
CORRESPONDING SIGN SIZE	21" x 15"	21" x 15"



M3-1 \* (S or I)



M3-2 \* (S or I)



M3-3 \* (S or I)



M3-4 \* (S or I)

STATE	M3-1(S) M3-2(S) M3-3(S) M3-4(S)			
INTERSTATE		M3-1(I) M3-3(I)	• •	
SHIELD SIZES	24" x 24"	30" x 24"	36" x 36"	45" x 36"
CORRESPONDING SIGN SIZE	24" x 12"	30" x 15"	30" x 15"	30" x 15"

# INDIANA DEPARTMENT OF TRANSPORTATION

# **ROUTE MARKER DETAILS**

SEPTEMBER 2010

STANDARD DRAWING NO. E 802-SNGS-03



/s/ Richard L. VanCleave

DESIGN STANDARDS ENGINEER

/s/ Mark A. Miller 09/01/10
CHIEF HIGHWAY ENGINEER DATE

09/01/10

DATE

CHIEF HIGHWAY ENGINEER

#### **GENERAL NOTES**

- 1. All series M(S) "JCT", cardinal directions, "TO", and arrows shall be white background with black legend and border.
- 2. All series M(I) "JCT", cardinal directions, "TO", and arrows shall be blue background with white legend and border.
- 3. Numerals sometimes cannot be accommodated within the space available. For this situation, the standard series D numeral may be reduced to series C. As a second choice, use the next smaller height commonly available.
- 4. For independent use of sheet signs, a nylon and metal washer shall be placed between each bolt head and the face of the metal sign. See Sign Bolt Detail on Std. Dwg. No. E 802-SNGS-07.
- 5. Visually space numbers about vertical centerline of shield.
- 6. Wherever white is specified herein as a color, it is understood to include silver-colored reflecting coatings or elements that reflect white light.
- 7. Fabrication details for the signs shown shall be found in the Standard Highway Signs booklet. Shop drawings will be supplied on all other signs not found in such booklet
- 8. For hole punch pattern see shop drawings.

INDIANA DEPARTMENT OF TRANSPORTATION

ROUTE MARKER DETAILS

JANUARY 2000

STANDARD DRAWING NO. E 802-SNGS-04



/s/Anthony L. Uremovich 3-01-95

/s/ Donald W. Lucas 3-01-95

CHIEF HIGHWAY ENGINEER

SIGN	REMARKS	BACKGROUND	COPY & BORDER
IGD, GD	Directional	S-3-H	В
IGDO, GD	Directional	S-3-H	В
IGI	Information	S-3-H	В
IGS	Services	S-4-H	В
IGS	Services	S-6-H	S-2-H
IGDO, GDO Special - Panel	Warning Panel	S-1-H	А
R1-1	Stop	S-5-H	S-2-H
R1-2	Yield	S-2-H	S-5 <b>-</b> H
R1-3, R1-4	4-Way, A <b>ll</b> -Way	S-5-H	S-2-H
R2-3	Night Speed	0-1-H	S-2-H
R3-1, R3-2, R3-4	No Right, Left, or U Turns	S-2-H	S-5-H, 0-1-H
R5-1	Do Not Enter	S-5-H	S-2-H
R5-1a	Wrong Way	S-5-H	S-2-H
R5-2, R5-6	No Trucks, Bicycles	S-2-H	S-5-H, 0-1-H
R7-1, R7-4, R7-107, R7-201	No Parking (Urban)	S-2-H	S-5-H
R7-2a, R7-107a	No Parking (Urban)	S-2-H	S-5-H, 0-1-H
R7-5, R7-5a, R7-108	Restricted Parking	S-2-H	S-7-H
R7-8	Reserved Parking	S-2-H	S-7-H, S-6-H
R8-1, R8-1a, R8-2, R8-3, R8-3b, R8-3c, R8-8	No Parking (Rural)	S-2-H	S-5-H
R8-3a	No Parking (Rural)	S-2-H	S-5-H, 0-1-H
R9-3a, R9-4a	Pedestrian Signs	S-2-H	S-5-H, 0-1-H
All other regulatory signs		S-2-H	0-1-H
W3-1a, W3-2a	Stop & Yield Ahead	S-1-H	S-2-H, S-5-H, O-1-H
W3-3	Signal Ahead	S-1-H	S-5-H S-7-H, O-1-H
All other warning signs	Except Construction Signs, School Warning Signs, and Signs labeled as "FY"	S-1-H	O-1-H
Warning Signs labeled as "FY"		S-10-H	O-1-H
All School Warning Signs		S-11-H	O-1-H
M1-1	Interstate Shields	S-8-H	S-2-H
M1-2, M1-3	Business Shields	S-7-H	S-2-H
M1-4	U.S. Shields	S-2-H	O-1-H
M1-5	County Shields	S-4-H	S-1 <b>-</b> H
M1-6	State Shields	S-2-H	O-1-H
M1-7	National Forest		S-2-H

# KEY

CODE	DESCRIPTION
0-1-H	Paint (Black) for use with prismatic reflective sheeting
S-1-H	Reflective sheeting (Yellow) prismatic
S-2-H	Reflective sheeting (Silver) prismatic
S-3-H	Reflective sheeting (Green) prismatic
S-4-H	Reflective sheeting (Blue) prismatic
S-5-H	Reflective sheeting (Silver with reverse screen transparent Red) prismatic
S-6-H	Reflective sheeting (Silver with reverse screen transparent Blue) prismatic
S-7-H	Reflective sheeting (Silver with reverse screen transparent Green) prismatic
S-8-H	Reflective sheeting (Silver with reverse screen transparent Red and Blue) prismatic
S-9-H	Reflective sheeting (Orange) prismatic
S-10-H	Reflective sheeting (Fluorescent Yellow), prismatic
S-11-H	Reflective sheeting (Fluorescent Yellow-Green), prismatic
А	Cut - Out letters which are painted black or as per specifications
В	Copy as per specifications
Δ	Brown background with prismatic reflective sheeting

## SIGN IDENTIFICATION CODES

IGDO Interstate guide directional overhead

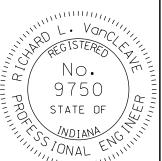
IGD	Interstate guide directional
IGS	Interstate guide service and rest area
IGI	Interstate guide information
GDO	Guide directional overhead
GD	Guide directional
R	Regulatory sign
W	Warning, construction, & maint. signs
M	Route markers and aux. markers
	for assemblies
D	Destination sign
I	Information

# INDIANA DEPARTMENT OF TRANSPORTATION

# SIGN REFLECTORIZATION SCHEDULE

SEPTEMBER 2012

STANDARD DRAWING NO. E 802-SNGS-05



/s/ Richard L. VanCleave

Cleave 09/04/12

SUPERVISOR, ROADWAY STANDARDS

/s/ Mark A. Miller 09/04/12

CHIEF ENGINEER

DATE

DATE

SIGN	REMARKS	BACKGROUND	COPY & BORDER
M2-1 (I), M3-1 (I), M3-2 (I), M3-3 (I), M3-4 (I)	Auxiliary markers	S-6-H	S-2-H
M4-5 (I), M4-7 (I), M5-1 (I), M5-2 (I)	Auxiliary markers	S-6-H	S-2-H
M6-1 Through M6-7	Auxiliary markers	S-6-H	S-2-H
M4-5, M4-6, M4-6a	Auxiliary markers	S-7-H	S-2-H
M4-8, M4-9	Detour marker	S-9-H	O-1-H
all other marker Auxiliaries		S-2-H	O-1-H
D4.4	D. I.:	6.2.11	6.7.11
D4-1	Parking	S-2-H	S-7-H
D5-5, D5-5a, D9-2, D9-6	Rest area & service	S-6-H	S-2-H
D7-2	Recreation area	Δ	S-2-H
All other destination signs		S-3-H	S-2-H
I-17, I-18, I-19		S-6-H	S-2-H
I-20, I-21		S-2-H	O-1-H
All other I-Signs		S-7-H	S-2-H
All construction signs		S-9-H	O-1-H
All maintenance signs		S-9-H	O-1-H

Wherever white is specified herein as a color, it is understood to include silver-colored reflecting coatings or elements that reflect white light.

## KEY

CODE	DESCRIPTION
0-1-H	Paint (Black) for use with prismatic reflective sheeting
S-1-H	Reflective sheeting (Yellow) prismatic
S-2-H	Reflective sheeting (Silver) prismatic
S-3-H	Reflective sheeting (Green) prismatic
S-4-H	Reflective sheeting (Blue) prismatic
S-5-H	Reflective sheeting (Silver with reverse screen transparent Red) prismatic
S-6-H	Reflective sheeting (Silver with reverse screen transparent Blue) prismatic
S-7-H	Reflective sheeting (Silver with reverse screen transparent Green) prismatic
S-8-H	Reflective sheeting (Silver with reverse screen transparent Red and Blue) prismatic
S-9-H	Reflective sheeting (Orange) prismatic
А	Cut - Out letters which are painted black or as per specifications
В	Copy as per specifications
	Brown background with prismatic reflective sheeting

## SIGN IDENTIFICATION CODES

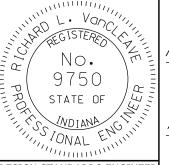
IGDO	Interstate guide directional overhead
IGD	Interstate guide directional
IGS	Interstate guide service and rest area
IGI	Interstate guide information
GDO	Guide directional overhead
GD	Guide directional
R	Regulatory sign
W	Warning, construction, & maint. signs
М	Route markers and aux. markers
	for assemblies
D	Destination sign
I	Information

# INDIANA DEPARTMENT OF TRANSPORTATION

# SIGN REFLECTORIZATION SCHEDULE

SEPTEMBER 2010

STANDARD DRAWING NO. E 802-SNGS-06



/s/Richard L. VanCleave

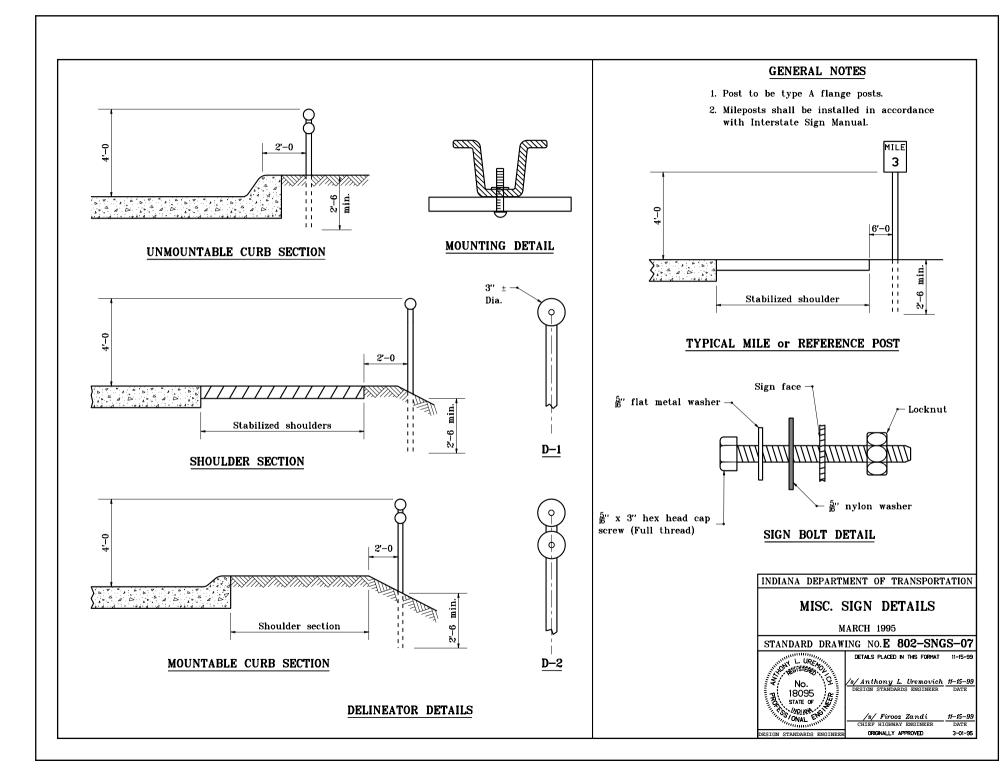
DESIGN STANDARDS ENGINEER

/s/Mark A. Miller 09/01/10

09/01/10

DATE

CHIEF HIGHWAY ENGINEER



#### **GENERAL NOTES**

- Nut shall be tightened sufficiently so that the sign is held firmly against the post. However, there shall be no deformation of aluminum sheeting or twisting or damage to the reflective sheeting.
- Signs shall be fastened to the posts with bolts, metal and nylon washers and locknut.
- A nylon washer and a metal washer shall be placed between each bolt head and the face of the sign.
- 4. Flanged channel posts are as specified and as shown on the plans.
- The sheet signs shall be punched or drilled for mounting such that the vertical hole spacing is in equal increments of millimeters.
- 6. See Std. Dwg. No. E 802-SNPL-02 for mounting height and lateral locations of signs.
- 7. Splicing of flanged channel post will not be permitted.
- 8. Bolt can either be stainless steel or galvanized steel bolt.

#### INDIANA DEPARTMENT OF TRANSPORTATION

#### MISC. SIGN DETAILS GENERAL NOTES

MAY 1999

STANDARD DRAWING NO.E 802-SNGS-08

No. 18095 STATE OF ST

DETAILS PLACED IN THIS FORMAT 11-15-99

/s/Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi

ORIGINALLY APPROVED

MOUNTING	ŧ	5 ft		6 ft		'ft	8	ft	
WIDTH HEIGHT X HEIGHT ("W x H")	U CHANNEL	SQUARE POST	U CHANNEL	SQUARE POST	U CHANNEL	SQUARE POST	U CHANNEL	SQUARE POST	
12 x 12, 12 x 8, 12 x 9 12 x 12, 12 x 18, 12 x 30 12 x 36	1-A 1-A		1-A 1-A		1-A 1-A		1-A 1-A		
18 x 6, 18 x 12, 18 x 18	1-A		1-A		1-A		1-A		
18 x 24	1-A		1-A		1-A		1-A		
18 x 30	1-A		1-A		1-A		1-A		
18 x 48	1-A		1-A		1-A		1-A		
24 x 12, 24 x 18, 24 x 24	1-A		1-A		1-A		1-A		
24 x 30	1-A		1-A		1-A		1-A		
24 x 36	1-A		1-A		1-A		1-A		
30 x 18	1-A		1-A		1-A		1-A		
30 x 24	1-A		1-A		1-A		1-A		
30 x 30	1-A		1-A		1-A		1-A		
30 x 36	1-A		1-A		1-A		1-A		
30 x 42	1-B		1-B		1-B		1-B		
30 x 48	1-B	_	1-B	-	1-B	<u> </u>	1-B	_	
36 x 12	2-A	1-Type 1							
36 x 18	2-A	+	2-A	+	2-A	<del>, i</del>	2-A		
36 x 24	2-A		2-A		2-A		2-A		
36 x 36	2-A		2-A		2-A		2-A		
36 x 48	2-A		2-A		2-A		2-A		
42 x 18	2-A		2-A		2-A		2-B		
42 x 24	2-A		2-A		2-A		2-A		
42 x 30	2-A		2-A		2-A		2-A		
42 x 36	2-A		2-A		2-A		2-A		
48 x 16	2-A		2-A		2-A		2-A		
48 x 18	2-A		2-A		2-A		2-A		
48 x 24	2-A		2-A		2-A		2-A		
48 x 30	2-A		2-A		2-A		2-A		
48 x 36	2-A		2-A		2-A		2-A		
48 x 48	2-A		2-B		2-B		2-B		
48 x 60	2-B		2-B		2-B		2-B		
60 x 24	2-A		2-A		2-A		2-A		
60 x 30	2-A	2	2-A	2	2-A	2	2-A	2	
60 x 36	2-A	2-Type 2	2-A	2-Type 2	2-B	2-Type 2	2-B	2-Type 2	
60 x 48	2-B	24	2-B	.4	2-B	4	2-B	.4	
72 x 24	2-A		2-A		2-A		2-A		
72 x 36	2-B		2-B		2-B		2-B		
90 x 36 120 x 36	2-B	2-Type 3							

#### **GENERAL NOTES**

- See Standard Sheet E 802-SNGS-10 for square steel sign post installation details.
- 2. The type 1 post shall be 21/4 in. x 21/4in. x 12 ga. wall thickness.
- 3. The type 2 post shall be 2 in. x 2 in. x 12 ga. wall thickness.
- 4. The type 3 post shall be  $2\frac{1}{2}$  in.  $x 2\frac{1}{2}$  in. x 12 ga. wall thickness.

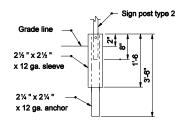
STEEL SIGN POSTS

SEPTEMBER 2006

STANDARD DRAWING NO. E 802-SNGS-09

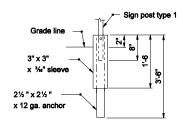
/s/ Richard L. VanCleave 9-01-06
DESIGN STANDARDS ENGINEER DATE
/s/ Richard K. Smulzer 9-01-06
CHIEF HIGHWAY ENGINEER DATE

#### **SQUARE POST** 12 ga. Thickness



#### REINFORCED ANCHOR BASE

#### **SQUARE POST** 12 ga. Thickness



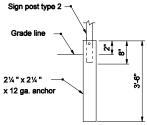
#### REINFORCED ANCHOR BASE

#### **GENERAL NOTES:**

1. See Standard Drawing E-802-SNGS-09 for sign size and E802-SNPL-02 for mounting height table.

#### **SQUARE POST**

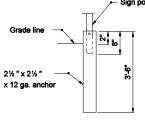
12 ga. Thickness



#### **UNREINFORCED ANCHOR BASE**

#### **SQUARE POST**

12 ga. Thickness Sign post type 1



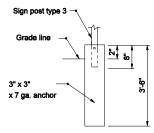
#### **UNREINFORCED ANCHOR BASE**

#### NO. OF POSTS WALL **EMBEDMENT** POST TYPE PERMITTED IN **THICKNESS** LENGTH 7 ft PATH **U-CHANNEL** A,B 1 OR 2 3'-6"

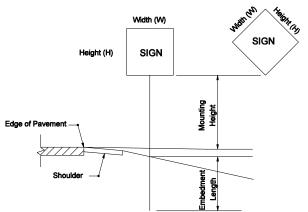
12 ga. 1 2 12 ga. 1 OR 2 ANCHOR SQUARE BASE 3 12 ga. 1

#### **SQUARE POST**

12 ga. Thickness



#### **UNREINFORCED ANCHOR BASE**

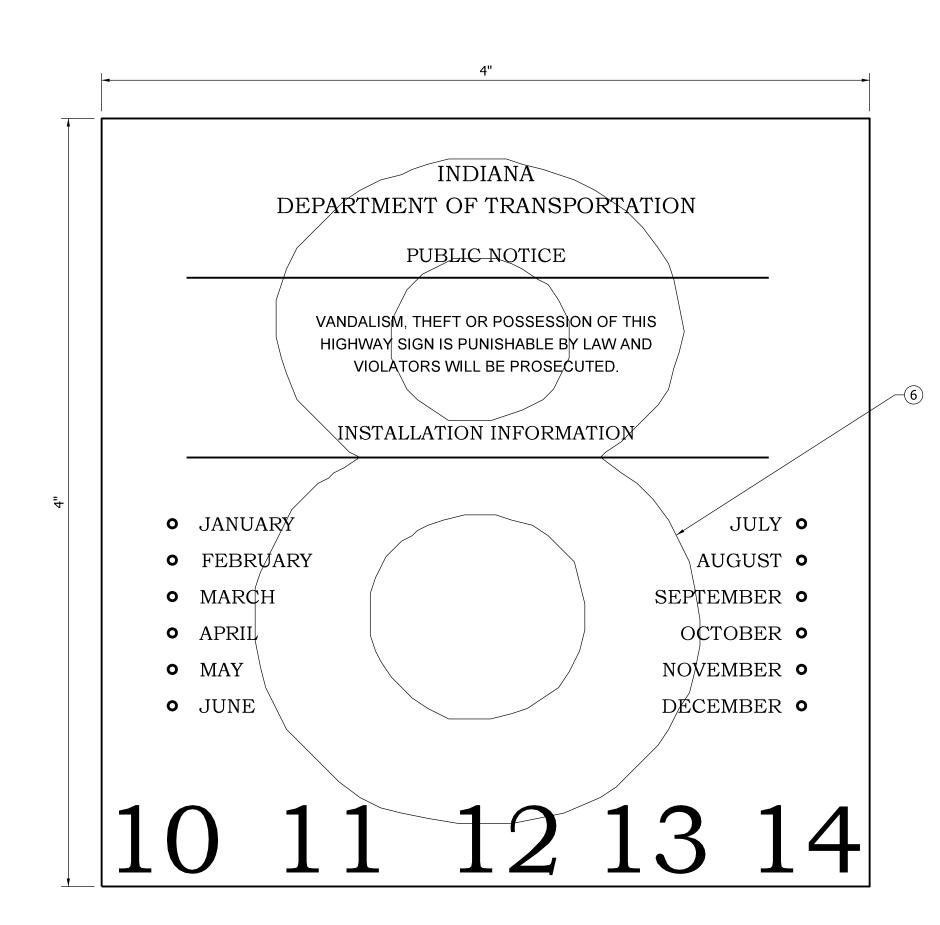


# INDIANA DEPARTMENT OF TRANSPORTATION STEEL SIGN POSTS SEPTEMBER 2006

STANDARD DRAWING NO. E 802-SNGS-10

NO. 9750 STATE OF DESIGN STANDARDS ENGINE
WAL CONAL CONT.

/s/ Richard L. VanCleave	9-01-06
DESIGN STANDARDS ENGINEER	DATE
/s/ Richard K.Smutzer	9-01-06



- 1. Height of lettering shall be 1/8" to 1/4". The height of the dates along the bottom shall be 1/2".
- 2. Copy shall be black on reflectorized white background
- 3. The number of dates along the bottom need not be five, and the first date need not be 07. However, the installation date shall be shown.
- 4. The month and year of installation shall be punched by a 1/4" minimum diameter hole.
- 5. The overlay number to be of colored transparent sheeting to indicate the last digit of the year of installation.
- 6 The decade of installation shall be indicated by color of transparent sheeting:

2010 - 2019 Red

2020 - 2029 Brown

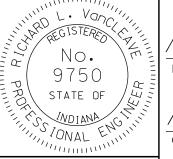
2030 - 2039 Orange

# INDIANA DEPARTMENT OF TRANSPORTATION

# SIGN IDENTIFICATION MARKING

SEPTEMBER 2010

STANDARD DRAWING NO. E 802-SNGS-11



/s/Richard L. VanCleave

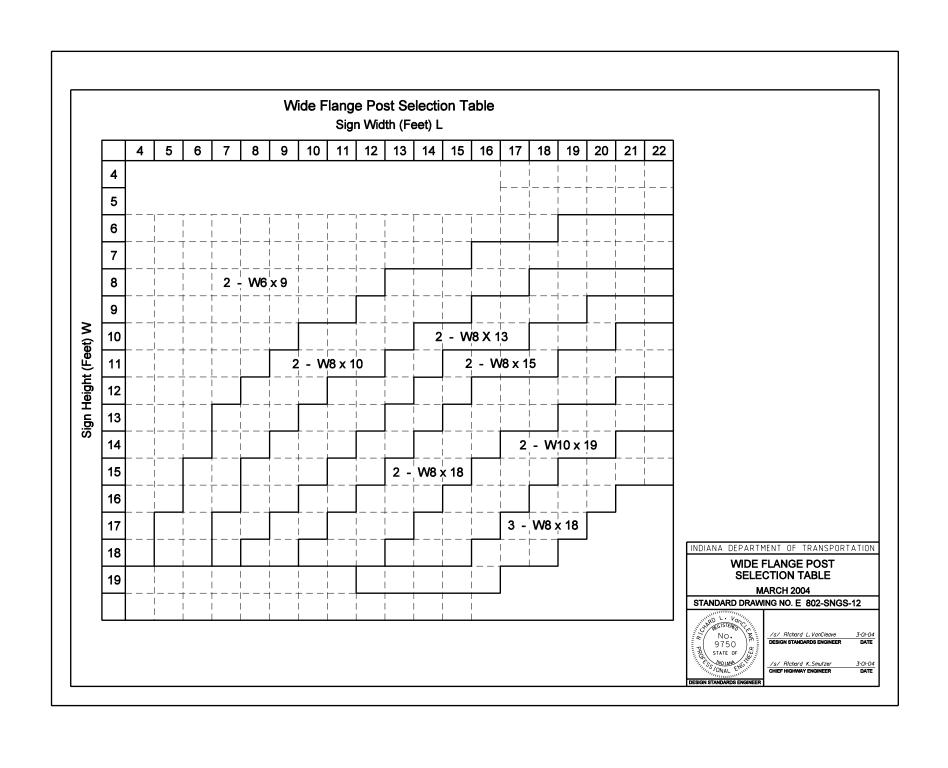
DESIGN STANDARDS ENGINEER DATE

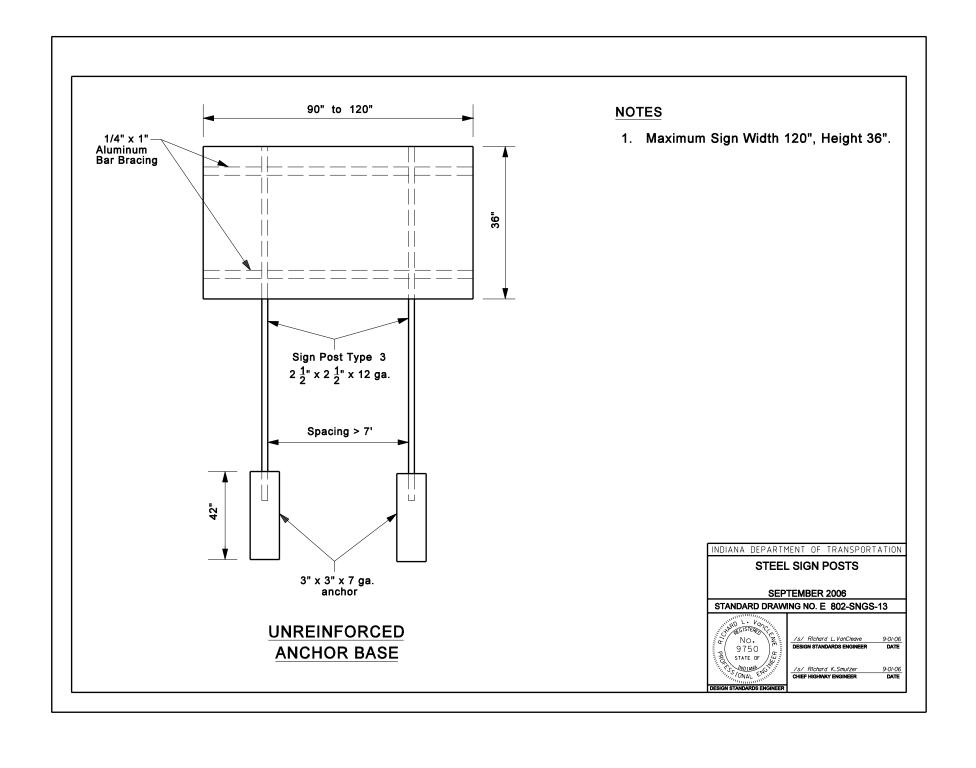
09/01/10

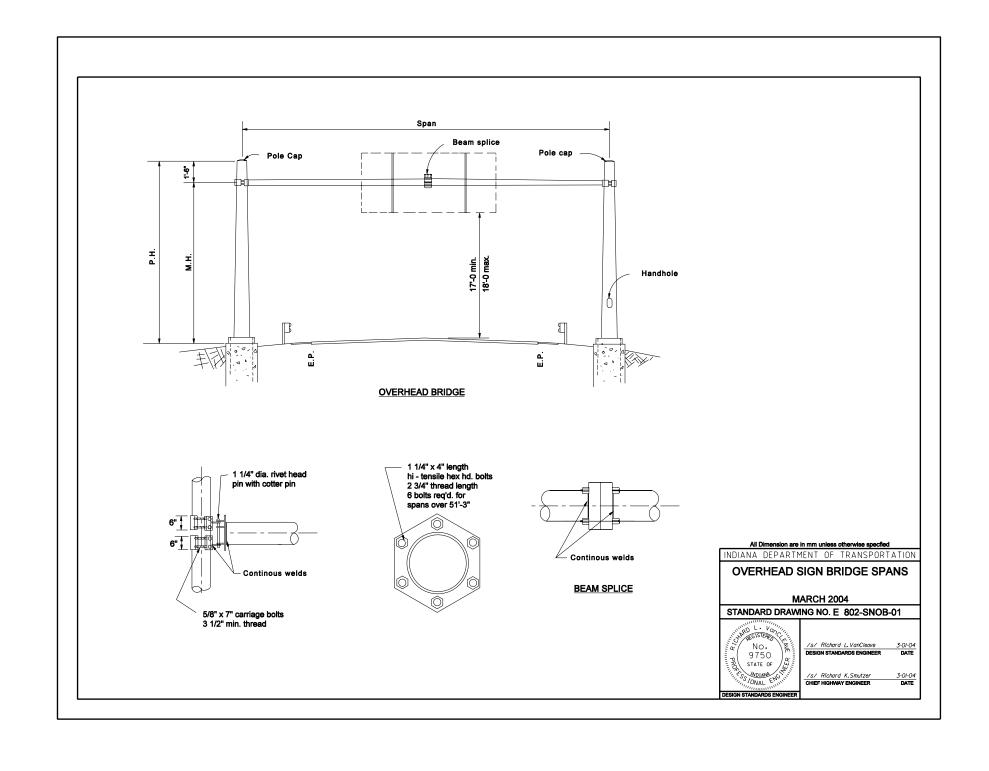
09/01/10

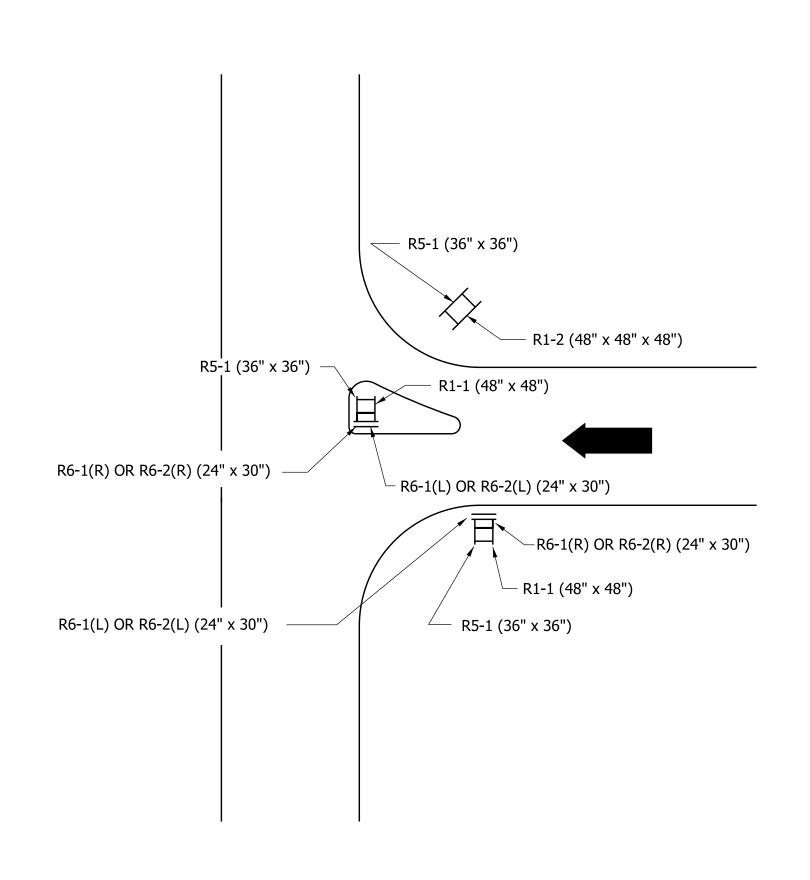
/s/ Mark A. Miller

CHIEF HIGHWAY ENGINEER DATE







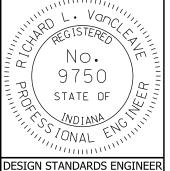


# INDIANA DEPARTMENT OF TRANSPORTATION

SIGN DETAILS TYPICAL LOCATION

SEPTEMBER 2010

STANDARD DRAWING NO. E 802-SNPL-01



/s/ Richard L. VanCleave

09/01/10 DATE

DESIGN STANDARDS ENGINEER

/s/ Mark A. Miller 09/01/10

CHIEF HIGHWAY ENGINEER

DATE

TYPE OF ROADWAY CLEARANCE	INTERSTATE AND DIVIDED HIGHWAY WITH SHOULDER, RURAL & URBAN	DIVIDED HIGHWAY WITH CURB, RURAL & URBAN	NON-DIVIDED HIGHWAY, RURAL OR CITY STREET	NON-DIVIDED HIGHWAY, URBAN
VERTICAL: EDGE OF TRAVELED WAY PAVEMENT TO BOTTOM OF SIGN OR SIGNS	7 ft TO 7.5 ft ①	7 ft TO 7.5 ft ②	5 ft TO 5.5 ft 4 2	7 ft TO 7.5 ft ②
HORIZONTAL: EDGE OF TRAVELED WAY PAVEMENT TO EDGE OF SIGN OR SIGNS	12 ft min. or 6 ft min. from the shoulder, whichever is greater	6 ft min.	12 ft min. or 6 ft min. from the shoulder, whichever is greater	12 ft min. or 6 ft min. from the shoulder, whichever is greater 3.

- If a secondary sign is mounted below another sign, the secondary sign shall be installed at least 5 ft. above the level of the pavement edge.
- 2. The height to the bottom of a secondary sign mounted below another sign may be 1 ft. less than the height specified above.
- ③ In urban areas where lateral offsets are limited, a minimum lateral offset of 2 ft. may be used. A minimum offset of 1 ft. from the face of the curb may be used in urban areas where sidewalk width is limited or where existing poles are close to the curb.
- (4) Where parking or pedestrian movements occur on an expected recurring basis, the clearance to the bottom of the sign shall be at least 7 ft.

#### INDIANA DEPARTMENT OF TRANSPORTATION

# HORIZONTAL AND VERTICAL SHEET SIGN CLEARENCE

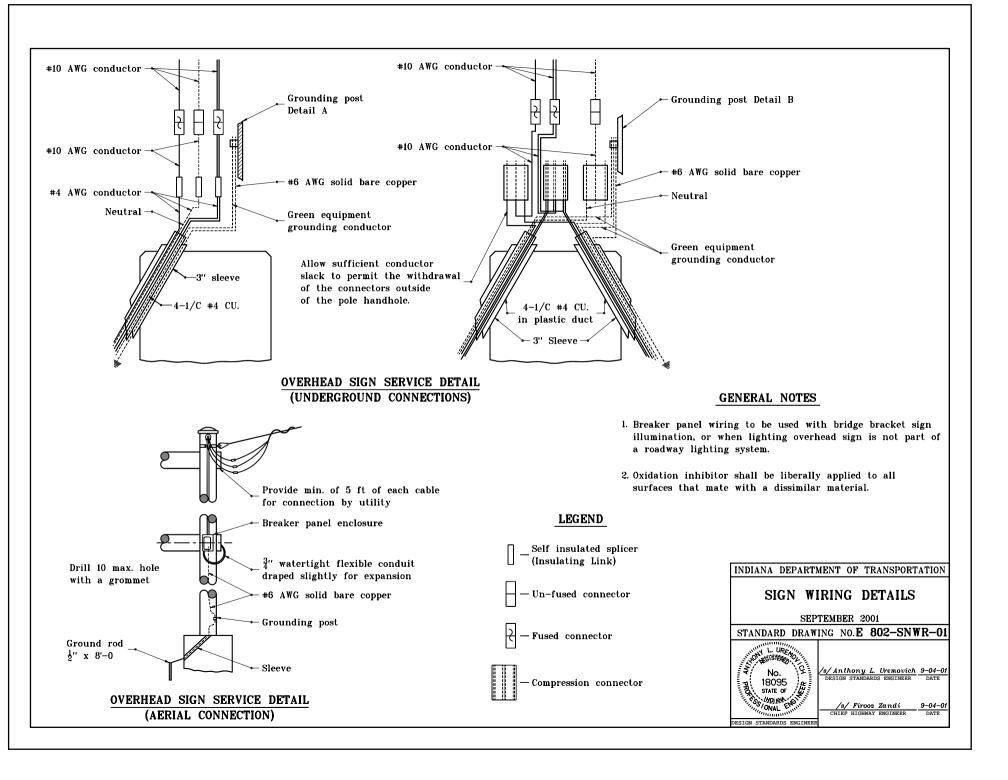
SEPTEMBER 2003

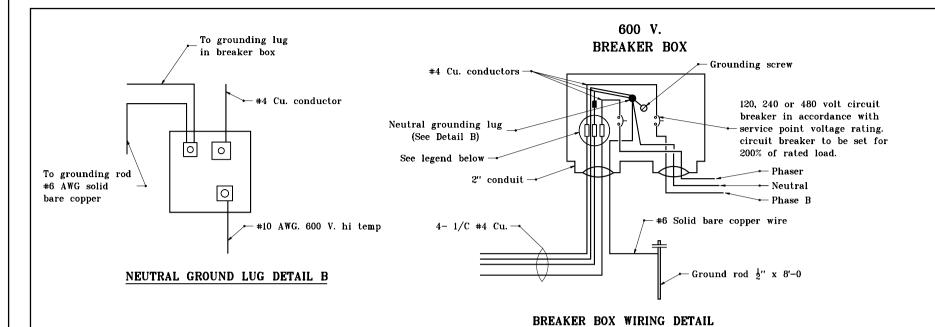
STANDARD DRAWING NO. E 802-SNPL-02

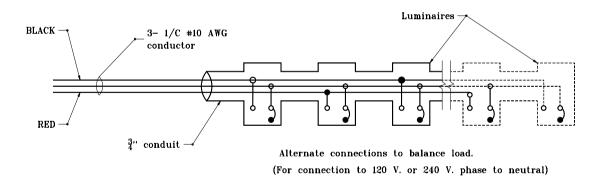


/s/ Richard L. VanCleave 9-02-03
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K.Smutzer 9-02-03
CHIEF HIGHWAY ENGINEER DATE







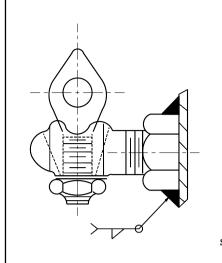
#### LUMINAIRE WIRING DETAIL

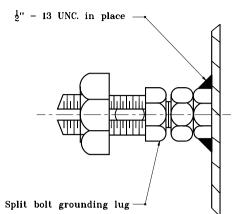
#### GENERAL NOTES

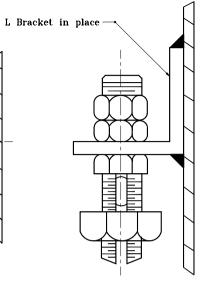
- Breaker panel wiring to be used with bridge bracket sign illumination, or when lighting overhead sign is not a roadway lighting system.
- 2. Oxidation inhibitor shall be liberally applied to all surfaces that mate with a dissimilar material.





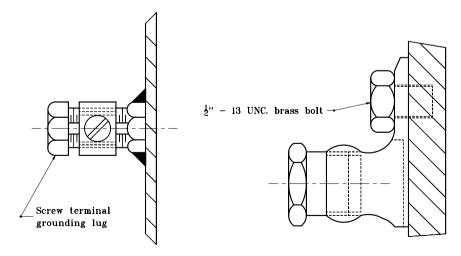






#### GENERAL NOTES

1. Oxidation inhibitor shall be liberally applied to all surfaces that mate with a dissimilar material.



ALTERNATIVE GROUNDING POSTS DETAIL A

SIGN WIRING DETAILS

SEPTEMBER 2001

STANDARD DRAWING NO.E 802-SNWR-03

NO. | SANTHONY L. Uremovich | 9-04-01 |

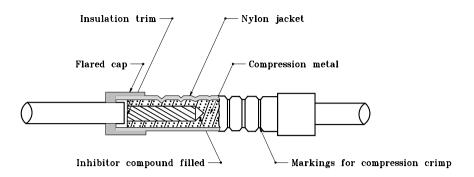
STANDARD STANDARDS ENGINEER | DATE |

SANTHONY L. Uremovich | 9-04-01 |

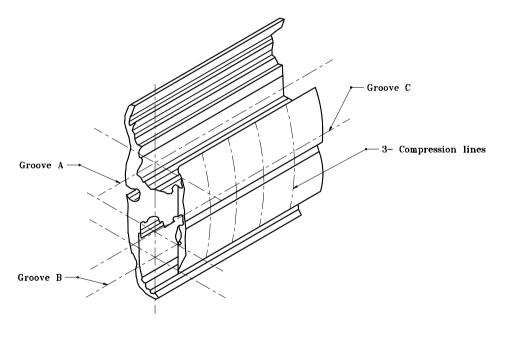
SANTHONY L. UREMOVICH | DATE |

SANTHONY L. UREMOVICH | DAT

INDIANA DEPARTMENT OF TRANSPORTATION



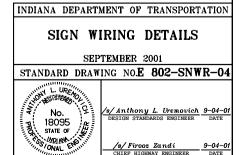
#### INSULATING LINK DETAIL



MULTIPLE COMPRESSION FITTING DETAIL

#### GENERAL NOTES

- Oxidation inhibitor shall be liberally applied to all surfaces that mate with a dissimilar material.
- 2. Grooves A & B to receive 1 #4 Cu. conductor.
- 3. Groove C to receive 1 #10 conductor.
- 4. Use of inhibiting compound is mandatory for all connections.
- Multiple compression fitting shall be covered with snap-on fiber or plastic covers. Taping shall not be permitted.



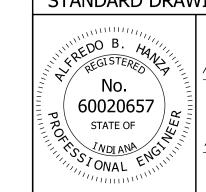
INDEX							
SHEET NO.	SUBJECT						
1	Index						
2	Plan & Elevation						
3	Isometric Views						
4	Panel Dimensions, Spans 36' thru 83'						
5	Panel Dimensions, Spans 84' thru 130'						
6	Member Sizes and Camber						
7	Connection Details						
8	Connection and Welding Details						
9	Chord Flange Details						
10	Top Cap and Chord End Plate Details						
11	Sign Attachment Details						
12	Base Plate, Anchor Bolt, and I.D. Tag Details						
13	Handhole Details						
14	Drilled Shaft Foundation						
15	Spread Foundation						

# INDIANA DEPARTMENT OF TRANSPORTATION

# TRI-CHORD SIGN STRUCTURE DRAWING INDEX

SEPTEMBER 2013

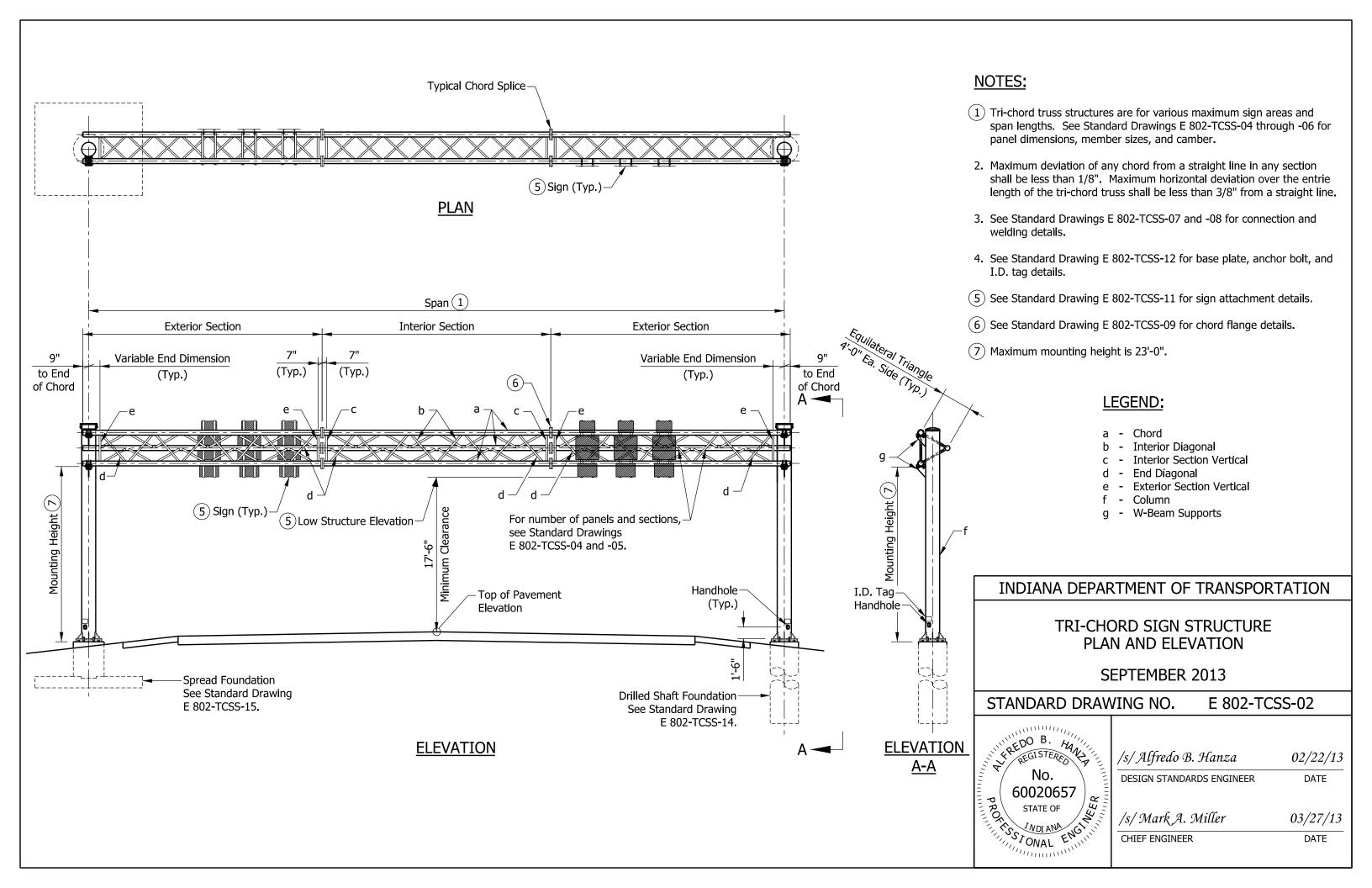
STANDARD DRAWING NO. E 802-TCSS-01

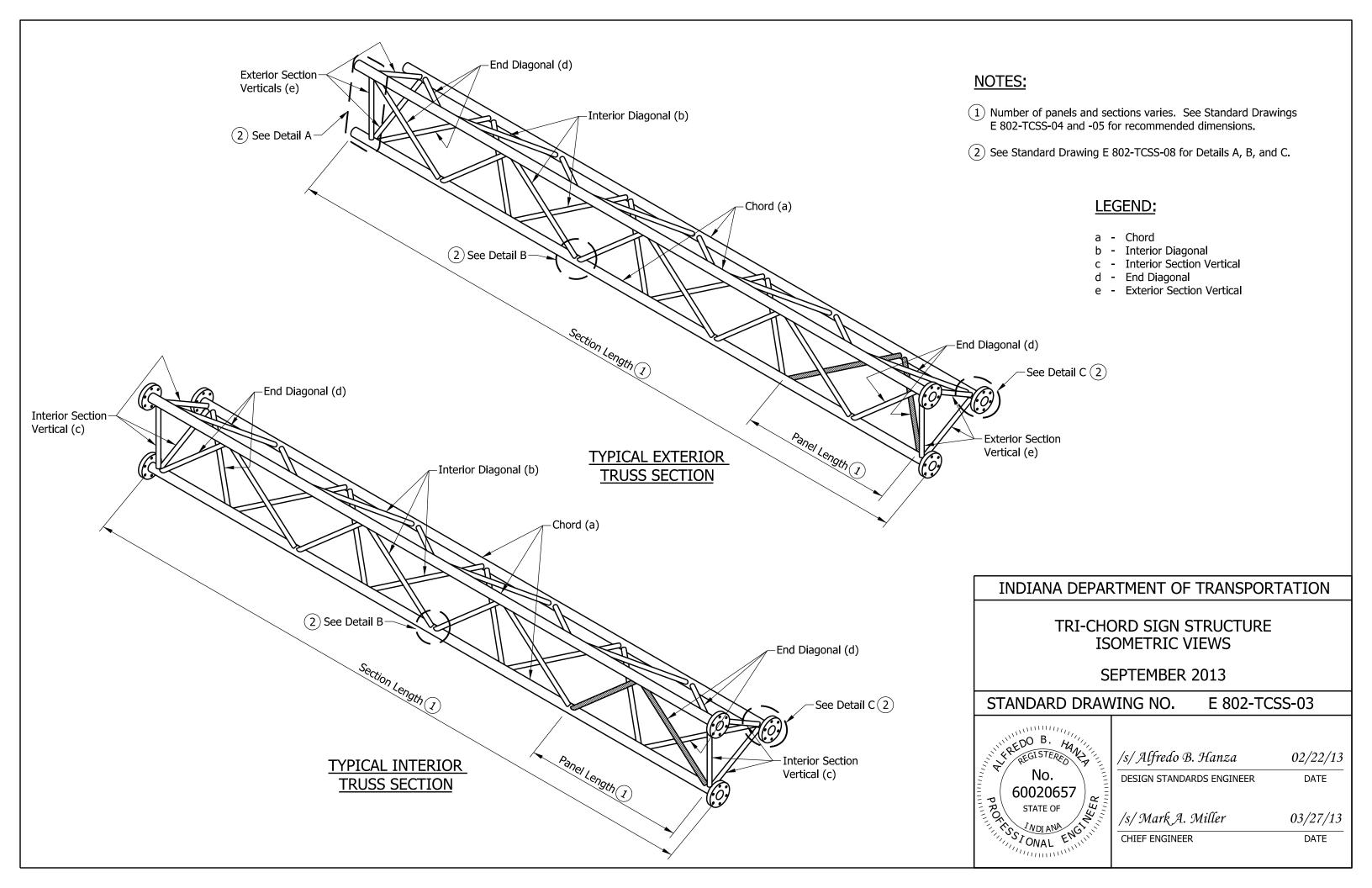


/s/ Alfredo B. Hanza 02/22/13
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13

CHIEF ENGINEER DATE





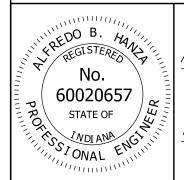
		RECOMM	iended Panel	DIMENSION	S FOR TRI-CH	HORD (36	' THROUGH 83'	)			
SPAN			EXTERIOR SECT	IONS		INTERIOR SECTIONS					
SPAN-TRUSS LENGTH (FT)	NO. OF EXT. SEC.	NO. OF EXT. PANELS PER SEC.	VARIABLE END DIMENSION	PANEL LENGTH	SECTION LENGTH	NO. OF INT. SEC.	NO. OF INT. PANELS PER SEC.	PANEL LENGTH	SECTION LENGTH		
36	2	5	1'-2"	3'-3"	18'-9"						
37	2	5	1'-3"	3'-4"	19'-3"						
38	2	5	1'-4"	3'-5"	19'-9"						
39	2	5	1'-5"	3'-6"	20'-3"						
40	2	5	1'-6"	3'-7"	20'-9"						
41	2	5	1'-7"	3'-8"	21'-3"						
42	2	6	1'-5"	3'-2"	21'-9"						
43	2	6	1'-5"	3'-3"	22'-3"						
44	2	6	1'-5"	3'-4"	22'-9"						
45	2	6	1'-5"	3'-5"	23'-3"	1					
46	2	7	1'-5"	3'-0"	23'-9"	1					
47	2	7	1'-4"	3'-1"	24'-3"						
48	2	7	1'-6 1/2"	3'-1 1/2"	24'-9"						
49	2	7	1'-5 1/2"	3'-2 1/2"	25'-3"						
50	2	7	1'-4 1/2"	3'-3 1/2"	25'-9"						
51	2	7	1'-7"	3'-4"	26'-3"						
52	2	7	1'-6"	3'-5"	26'-9"						
53	2	7	1'-5"	3'-6"	27'-3"						
54	2	7	1'-4"	3'-7"	27'-9"						
55	2	7	1'-6 1/2"	3'-7 1/2"	28'-3"						
56	2	7	1'-5 1/2"	3'-8 1/2"	28'-9"						
57	2	7	1'-4 1/2"	3'-9 1/2"	29'-3"						
58	2	7	1'-7"	3'-10"	29'-9"	†					
59	2	6	1'-4"	3'-0"	20'-8"	1	6	3'-0"	19'-2"		
60	2	6	1'-5 1/2"	3'-1/2"	21'-1/2"	1	6	3'-1/2"	19'-5"		
61	2	6	1'-7"	3'-1"	21'-5"	1	6	3'-1"	19'-8"		
62	2	6	1'-8 1/2"	3'-1 1/2"	21'-9 1/2"	1	6	3'-1 1/2"	19'-11"		
63	2	6	1'-10"	3'-2"	22'-2"	1	6	3'-2"	20'-2"		
64	2	6	1'-7"	3'-3"	22'-5"	1	6	3'-3"	20'-8"		
65	2	6	1'-8 1/2"	3'-3 1/2"	22'-9 1/2"	1	6	3'-3 1/2"	20'-11"		
66	2	6	1'-10"	3'-4"	23'-2"	1	6	3'-4"	21'-2"		
67	2	6	1'-7"	3'-5"	23'-5"	1	6	3'-5"	21'-8"		
68	2	6	1'-8 1/2"	3'-5 1/2"	23'-9 1/2"	1	6	3'-5 1/2"	21'-11"		
69	2	6	1'-10"	3'-6"	24'-2"	1	6	3'-6"	22'-2"		
70	2	6	1'-9"	3'-2 1/2"	22'-4"	1	8	3'-2 1/2"	26'-10"		
71	2	6	1'-5"	3'-3 1/2"	22'-6"	1	8	3'-3 1/2"	27'-6"		
72	2	6	1'-6"	3'-4"	22'-10"	1	8	3'-4"	27'-10"		
72	2	6	1'-7"	3'-4 1/2"	23'-2"	1	8	3'-4 1/2"	28'-2"		
74	2	6	1'-8"	3'-5"	23'-6"	1	8	3'-5"	28'-6"		
75	2	6	1'-4"	3'-6"	23'-8"	1	8	3'-6"	29'-2"		
75 76	2	6	1'-5"	3'-6 1/2"	24'-0"	1	8	3'-6 1/2"	29'-6"		
77	2	6	1'-6"	3'-7"	24'-4"	1	8	3'-7"	29'-10"		
78	2	6	1'-7"	3'-7 1/2"	24'-8"	1	8	3'-7 1/2"	30'-2"		
79	2	6	1'-8"	3'-8"	25'-0"	1	8	3'-8"	30'-6"		
80	2	6	1'-4"	3'-9"	25'-2"	1 1	8	3'-9"	31'-2"		
81	2	6	1'-5"	3'-9 1/2"	25'-6"	1	8	3'-9 1/2"	31'-6"		
82	2	6	1'-6"	3'-10"	25'-10"	1	8	3'-10"	31'-10"		
83	2	6	1'-7"	3'-10 1/2"	26'-2"	1 1	8	3'-10 1/2"	31-10 32'-2"		
ია	۷	U	1 -/	2-10 1/2	ZU <b>-</b> Z	1 1	0	2-10 1/2	34 <del>-</del> 4		

- 1. All panels on a truss shall be the same length. The minimum panel length is 3'-0" and the maximum is 4'-0".
- 2. A single interior unit shall have an even number of panels to maintain the pattern of the diagonals.
- 3. Use minimum number of sections for each truss. Keep the maximum section length at 35'-0".
- 4. See Standard Drawing E 802-TCSS-05 for required camber.

# INDIANA DEPARTMENT OF TRANSPORTATION

TRI-CHORD SIGN STRUCTURE
PANEL DIMENSIONS
SPANS 36' THRU 83'
SEPTEMBER 2013

STANDARD DRAWING NO. E 802-TCSS-04



/s/ Alfredo B. Hanza	02/22/13
DESIGN STANDARDS ENGINEER	DATE

/s/ Mark A. Miller 03/27/13

CHIEF ENGINEER DATE

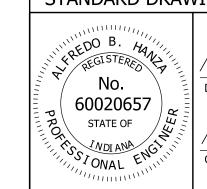
RECOMMENDED PANEL DIMENSIONS FOR TRI-CHORD (84' THROUGH 130')												
SPAN			EXTERIOR SECT	IONS	INTERIOR SECTIONS							
SPAN-TRUSS LENGTH (FT)	NO. OF EXT. SEC.	NO. OF EXT. PANELS PER SEC.	VARIABLE END DIMENSION	PANEL LENGTH	SECTION LENGTH	NO. OF INT. SEC.	NO. OF INT. PANELS PER SEC.	PANEL LENGTH	SECTION LENGTH			
84	2	6	1'-8"	3'-11"	26'-6"	1	8	3'-11"	32'-6"			
85	2	6	1'-9"	3'-11 1/2"	26'-10"	1	8	3'-11 1/2"	32'-10"			
86	2	6	1'-10"	4'-0"	27'-2"	1	8	4'-0"	33'-2"			
87	2	7	1'-6 1/2"	3'-8 1/2"	28'-10"	1	8	3'-8 1/2"	33'-10"			
88	2	7	1'-7"	3'-9"	29'-2"	1	8	3'-9"	31'-2"			
89	2	7	1'-7 1/2"	3'-9 1/2"	29'-6"	1	8	3'-9 1/2"	31'-6"			
90	2	7	1'-8"	3'-10"	29'-10"	1	8	3'-10"	31'-10"			
91	2	7	1'-8 1/2"	3'-10 1/2"	30'-2"	1	8	3'-10 1/2"	32'-2"			
92	2	8	1'-8"	3'-8"	32'-4"	1	8	3'-5 1/2"	28'-10"			
93	2	8	1'-8"	3'-8 1/2"	32'-8"	1	8	3'-6"	29'-2"			
94	2	8	1'-8"	3'-9"	33'-0"	1	8	3'-6 1/2"	29'-6"			
95	2	8	1'-8"	3'-9 1/2"	33'-4"	1	8	3'-7"	29'-10"			
96	2	8	1'-8"	3'-10"	33'-8"	1	8	3'-7 1/2"	30'-2"			
97	2	8	1'-8"	3'-10 1/2"	34'-0"	1	8	3'-8"	30'-6"			
98	2	8	1'-8"	3'-11"	34'-4"	1	8	3'-8 1/2"	30'-10"			
99	2	8	1'-8"	3'-11 1/2"	34'-8"	1	8	3'-9"	31'-2"			
100	2	8	1'-8"	4'-0"	35'-0"	1	8	3'-9 1/2"	31'-6"			
101	2	8	1'-10 1/2"	3'-1 1/2"	28'-2 1/2"	1	7	3'-1 1/2"	23'-1/2"			
102	2	8	1'-9"	3'-2"	28'-5"	1	7	3'-2"	23'-4"			
103	2	8	1'-7 1/2"	3'-2 1/2"	28'-7 1/2"	1	7	3'-2 1/2"	23'-7 1/2"			
104	2	8	1'-6"	3'-3"	28'-10"	1	7	3'-3"	23'-11"			
105	2	8	1'-4 1/2"	3'-3 1/2"	29'-0 1/2"	1	7	3'-3 1/2"	24'-2 1/2"			
106	2	8	1'-10 1/2"	3'-3 1/2"	29'-6 1/2"	1	7	3'-3 1/2"	24'-2 1/2"			
107	2	8	1'-9"	3'-3 1/2"	29'-9"	1	7	3'-4"	24'-6"			
108	2	8	1'-7 1/2"	3'-4 1/2"	29'-11 1/2"	1	7	3'-4 1/2"	24'-9 1/2"			
109	2	8	1'-6"	3'-5"	30'-2"	1	7	3'-5"	25'-1"			
110	2	8	1'-8 1/4"	3'-5 1/4"	30'-6 1/4"	1	7	3'-5 1/4"	25'-2 3/4"			
111	2	8	1'-10 1/2"	3'-5 1/2"	30'-5 1/4"	1	7	3'-5 1/2"	25'-4 1/2"			
112	2	8	1'-9"	3'-6"	31'-1"	1	7	3'-6"	25'-8"			
113	2	8	1'-7 1/2"	3'-6 1/2"	31'-3 1/2"	1	7	3'-6 1/2"	25'-11 1/2"			
114	2	8	1'-6"	3'-7"	31'-6"	1	7	3'-7"	26'-3"			
115	2	8	1'-8 1/4"	3'-7 1/4"	31'-10 1/4"	1	7	3'-7 1/4"	26'-4 3/4"			
116	2	8	1'-10 1/2"	3'-7 1/2"	32'-2 1/2"	1	7	3'-7 1/2"	26'-6 1/2"			
117	2	8	1'-9"	3'-8"	32'-5"	1	7	3'-8"	26'-10"			
118	2	8	1'-7 1/2"	3'-8 1/2"	32'-7 1/2"	1	7	3'-8 1/2"	27'-1 1/2"			
119	2	8	1'-6"	3'-9"	32'-10"	1	7	3'-9"	27'-5"			
120	2	8	1'-8 1/4"	3'-9 1/4"	33'-2 1/4"	1	7	3'-9 1/4"	27'-6 3/4"			
121	2	8	1'-10 1/2"	3'-9 1/2"	33'-6 1/2"	1	7	3'-9 1/2"	27'-8 1/2"			
122	2	8	1'-9"	3'-10"	33'-9"	1	7	3'-10"	28'-0"			
123	2	8	1'-9"	3'-5 1/2"	30'-9"	1	8	3'-9 1/2"	31'-6"			
124	2	8	1'-11"	3'-5 1/2"	30'-11"	1	8	3'-10"	31'-10"			
125	2	8	1'-9"	3'-6"	31'-1"	1	8	3'-10 1/2"	32'-2"			
126	2	8	1'-7"	3'-6 1/2"	31'-3"	1	8	3'-11"	32'-6"			
127	2	8	1'-9"	3'-7"	31'-9"	1	8	3'-11"	32'-6"			
128	2	8	1'-11"	3'-7 1/2"	32'-3"	1	8	3'-11"	32'-6"			
129	2	8	1'-9"	3'-8"	32'-5"	1	8	3'-11 1/2"	32'-10"			
130	2	8	1'-7"	3'-8 1/2"	32'-7"	1	8	4'-0"	33'-2"			

- 1. All panels on a truss shall be the same length. The minimum panel length is 3'-0" and the maximum is 4'-0".
- 2. A single interior unit shall have an even number of panels to maintain the pattern of the diagonals.
- 3. Use minimum number of sections for each truss. Keep the maximum section length at 35'-0".
- 4. See Standard Drawing E 802-TCSS-05 for required camber.

# INDIANA DEPARTMENT OF TRANSPORTATION

TRI-CHORD SIGN STRUCTURE
PANEL DIMENSIONS
SPANS 84' THRU 130'
SEPTEMBER 2013

STANDARD DRAWING NO. E 802-TCSS-05



 $\frac{/s/Alfredo\ B.\ Hanza}{\text{DESIGN STANDARDS ENGINEER}} \frac{02/22/13}{\text{DATE}}$ 

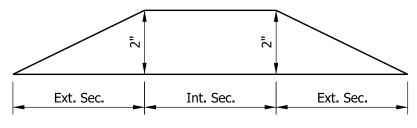
/s/ Mark A. Miller 03/27/13

CHIEF ENGINEER DATE

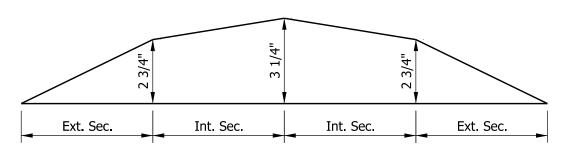
	TRI-CHORD SIGN STRUCTURE MEMBER SIZES																		
					TRUSS MEMBERS									END SUPPORT MEMBERS					
TRUSS TYPE	MAX SIGN AREA (SQ FT)	MAX MOUNTING HEIGHT,	MOUNTING	MOUNTING	MOUNTING	MAX SPAN (FT)	CHORD a		l .	INT. DIAGONALS		INT. SECTION VERT. c		END DIAGONALS d		ECTION RT.	COLUMN f		W-BEAM
	(34.1)	Н		DIAM. (IN.)	THICK (IN.)	DIAM. (IN.)	THICK (IN.)	DIAM. (IN.)	THICK (IN.)	DIAM. (IN.)	THICK (IN.)	DIAM. (IN.)	THICK (IN.)	DIAM. (IN.)	THICK (IN.)	g			
А			80	5.563	0.375	1.900	0.145	1.900	0.200	2.875	0.276	1.900	0.145	18.000	0.562	W 12 x 35			
В	120	23'-0"	100	5.563	0.375	2.375	0.218	1.900	0.200	2.875	0.375	2.375	0.218	18.000	0.562	W 12 x 35			
С			130	5.563	0.500	2.375	0.218	1.900	0.200	2.875	0.375	2.375	0.218	20.000	0.500	W 12 x 58			
D			80	5.563	0.625	2.375	0.343	1.900	0.200	2.875	0.552	2.375	0.343	18.000	0.750	W 12 x 35			
Е	240	23'-0"	100	5.563	0.625	2.375	0.343	1.900	0.200	2.875	0.552	2.375	0.343	20.000	0.812	W 12 x 35			
F			130	6.625	0.562	2.375	0.343	1.900	0.200	3.500	0.437	2.375	0.343	22.000	0.875	W 12 x 58			

# Ext. Sec. Ext. Sec.

# CAMBER DIAGRAM (2-Section Truss)



**CAMBER DIAGRAM (3-Section Truss)** 



CAMBER DIAGRAM (4-Section Truss)

# LEGEND:

a - Chord

b - Interior Diagonal

c - Interior Section Vertical

d - End Diagonal

e - Exterior Section Vertical

f - Column

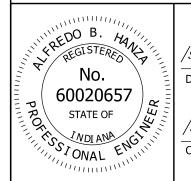
g - W-Beam Support

# INDIANA DEPARTMENT OF TRANSPORTATION

# TRI-CHORD SIGN STRUCTURE MEMBER SIZES AND CAMBER

SEPTEMBER 2013

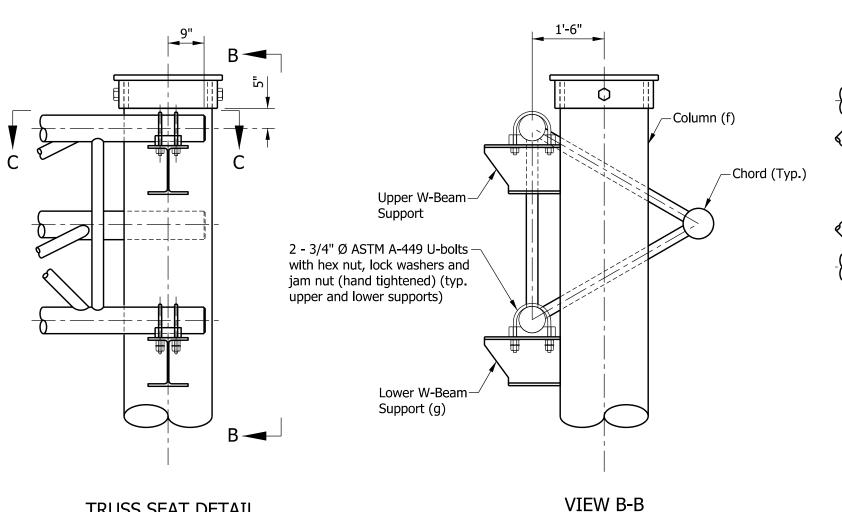
STANDARD DRAWING NO. E 802-TCSS-06

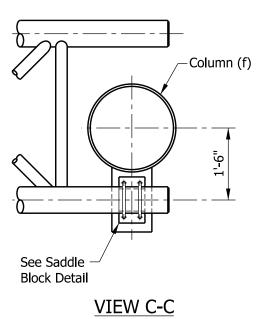


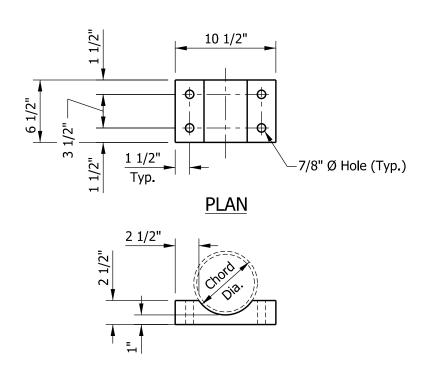
/s/Alfredo B. Hanza 02/22/13DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13

CHIEF ENGINEER

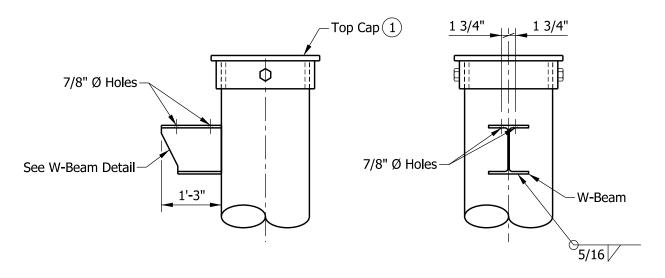




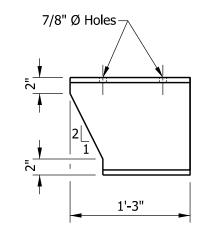


## SADDLE BLOCK DETAIL

# TRUSS SEAT DETAIL



# TRUSS SEAT DETAIL



# W-BEAM DETAIL

NOTE: Upper and lower W-beam details are the same.

# NOTE:

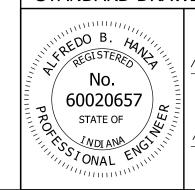
1 See Standard Drawing E 802-TCSS-10 for top cap detail.

# INDIANA DEPARTMENT OF TRANSPORTATION

# TRI-CHORD SIGN STRUCTURE **CONNECTION DETAILS**

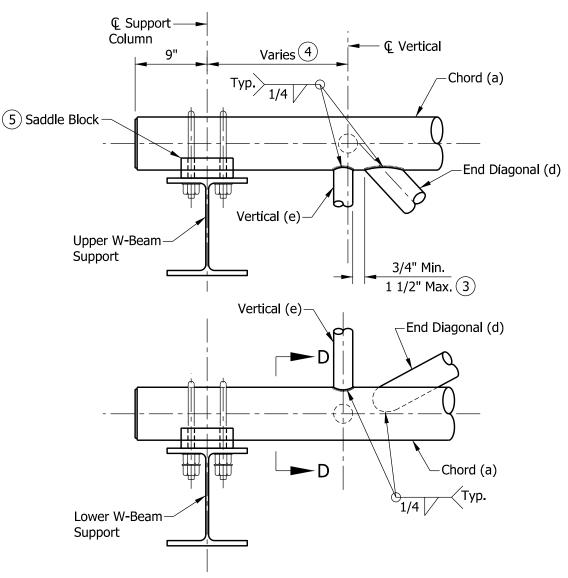
SEPTEMBER 2013

STANDARD DRAWING NO. E 802-TCSS-07

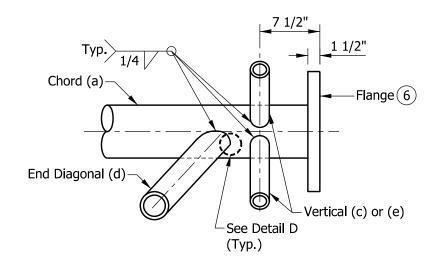


/s/ Alfredo B. Hanza	02/22/13
DESIGN STANDARDS ENGINEER	DATE

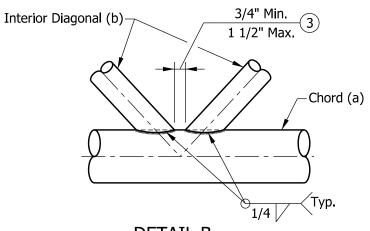
/s/ Mark A. Miller 03/27/13 CHIEF ENGINEER DATE



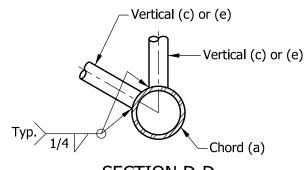
<u>DETAIL A</u>
<u>SUPPORT END DETAIL FOR EXTERIOR SECTION</u>



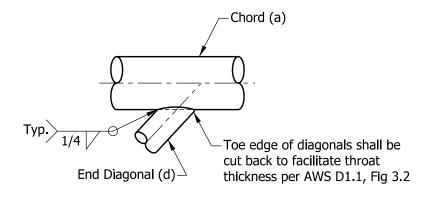
DETAIL C
TYPICAL PANEL CONNECTION



<u>DETAIL B</u>
TYPICAL PANEL CONNECTION



SECTION D-D
TYPICAL JOINT DETAILS



**DETAIL D** 

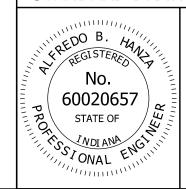
- 1. All bracing members shall be machined to provide a snug fit to the chord members along the entire edge of bracing members before welding.
- 2. See Standard Drawing E 802-TCSS-03 for member location and see Standard Drawing E 802-TCSS-06 for member sizes.
- (3) Vertical and horizontal diagonals shall be detailed for minimum offset from the panel point based on the following: offset shall provide a 3/4" minimum to 1 1/2" maximum clearance between any diagonal and any horizontal or vertical member, and to provide clearance for U-bolt connections of signs.
- 4 Variable end dimension. See Standard Drawings E 802-TCSS-04 and -05 for table of recommended dimensions.
- (5) See Standard Drawing E 802-TCSS-07 for saddle block details.
- (6) See Standard Drawing E 802-TCSS-09 for chord flange details.

## INDIANA DEPARTMENT OF TRANSPORTATION

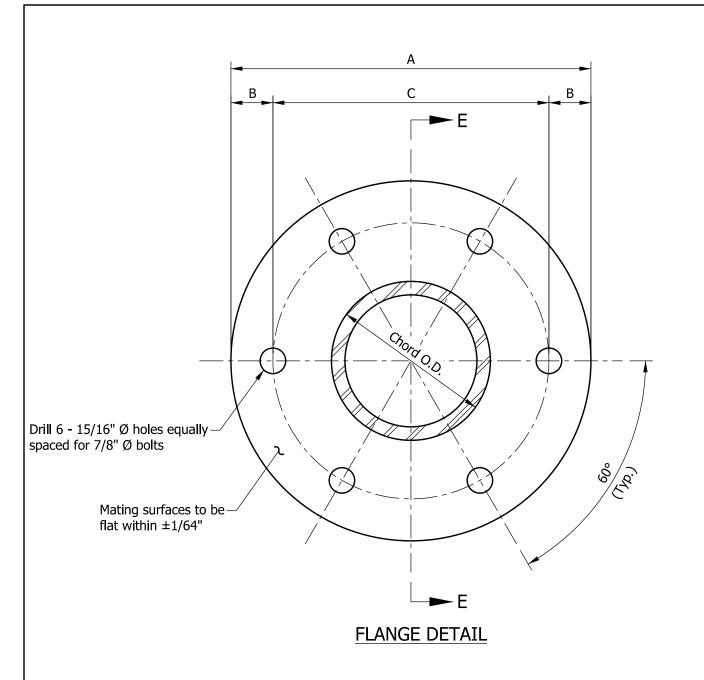
# TRI-CHORD SIGN STRUCTURE CONNECTION AND WELDING DETAILS

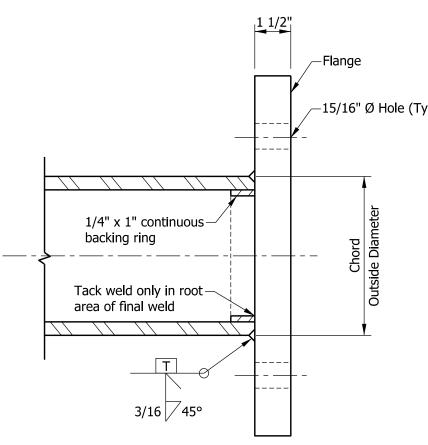
SEPTEMBER 2013

STANDARD DRAWING NO. E 802-TCSS-08



/s/ Alfredo B. Hanza	03/26/13
 DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE





- 1. Mating surfaces to be flat within  $\pm 1/64$ ". Flange shall be given additional finish if necessary to ensure contact between plates.
- 2. Use Type I ASTM A325 bolts with matching lock nuts. Lock nuts shall have steel inserts.
- -15/16" Ø Hole (Typ.) 3. Bolts and lock nuts shall be hot dip galvanized in accordance with AASHTO M 232.
  - 4. Install high strength bolts in accordance with 711.65.

# **SECTION E-E**

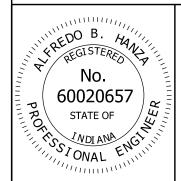
DIMENSION TABLE				
TRUSS CHORD O.D.	BOLT SIZE	Α	В	С
6.625"	7/8"	14"	2"	10"
5.625"	7/8"	13"	2"	9"

# INDIANA DEPARTMENT OF TRANSPORTATION

# TRI-CHORD SIGN STRUCTURE **CHORD FLANGE DETAILS**

SEPTEMBER 2013

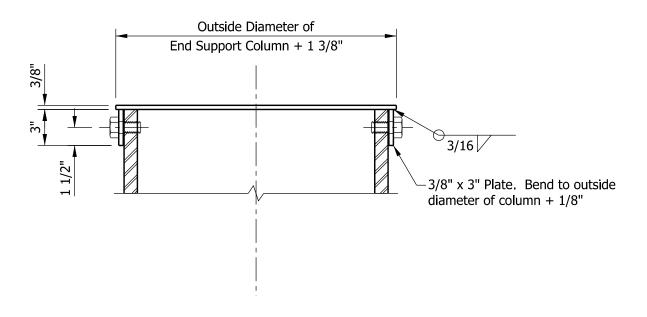
STANDARD DRAWING NO. E 802-TCSS-09

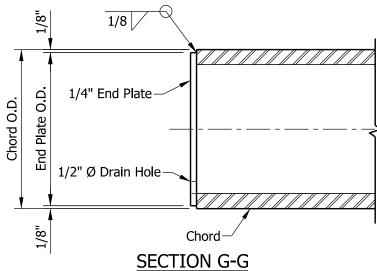


/s/ Alfredo B. Hanza 03/26/13 DESIGN STANDARDS ENGINEER DATE

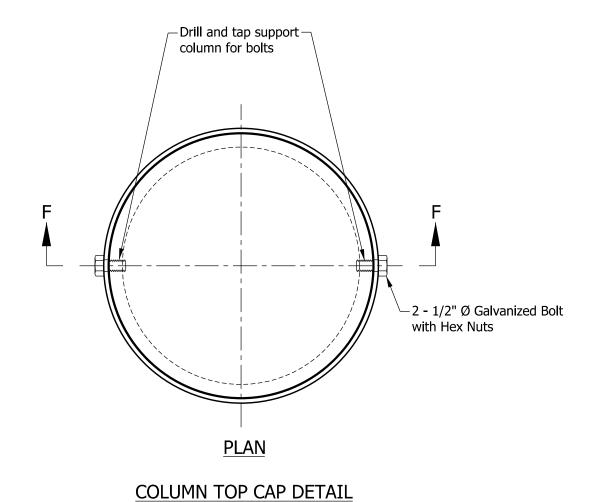
/s/ Mark A. Miller 03/27/13 CHIEF ENGINEER

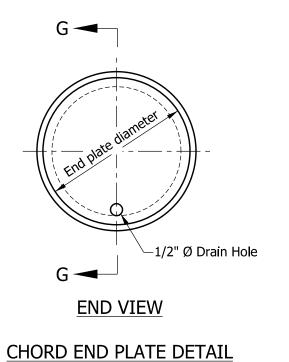
DATE





SECTION F-F



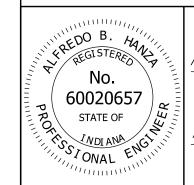


# INDIANA DEPARTMENT OF TRANSPORTATION

# TRI-CHORD SIGN STRUCTURE TOP CAP AND CHORD END PLATE DETAILS

SEPTEMBER 2013

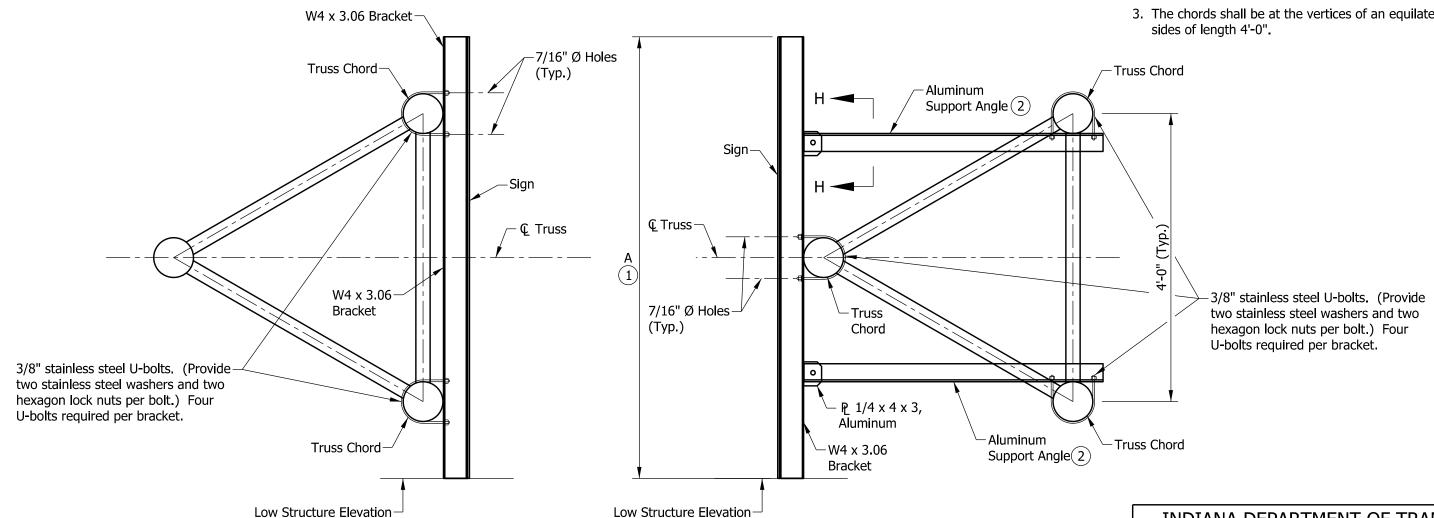
STANDARD DRAWING NO. E 802-TCSS-10



/s/ Alfredo B. Hanza	02/22/13
DESIGN STANDARDS ENGINEER	DATE

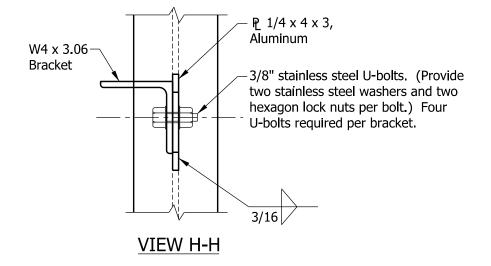
/s/ Mark A. Miller 03/27/13 CHIEF ENGINEER

- (1) Dimension A to be determined by Contractor to fit required signs.
- (2) A minimum of two truss chord attachment points to be used for each
- 3. The chords shall be at the vertices of an equilateral triangle having sides of length 4'-0".



# FRONT SIGN MOUNTING DETAIL

# REAR SIGN MOUNTING DETAIL

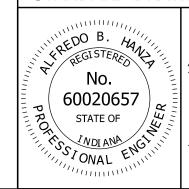


## INDIANA DEPARTMENT OF TRANSPORTATION

# TRI-CHORD SIGN STRUCTURE SIGN ATTACHMENT DETAILS

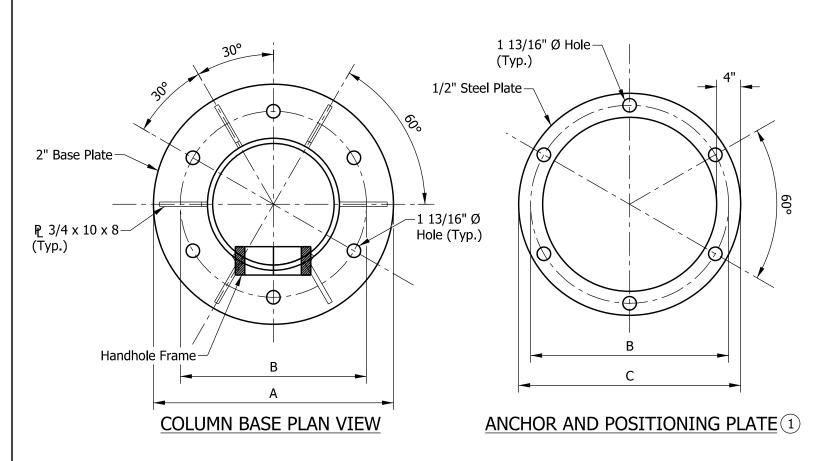
SEPTEMBER 2013

STANDARD DRAWING NO. E 802-TCSS-11

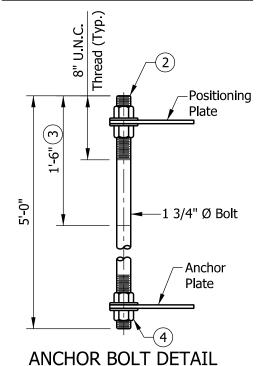


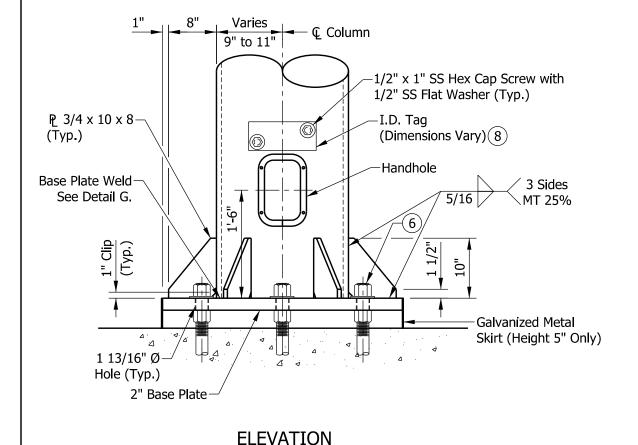
/s/ Alfredo B. Hanza	02/22/13
DESIGN STANDARDS ENGINEER	DATE

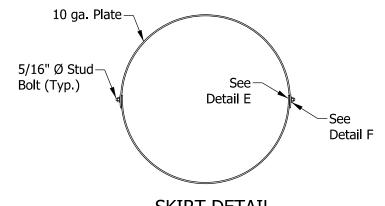
/s/ Mark A. Miller 03/27/13 CHIEF ENGINEER DATE



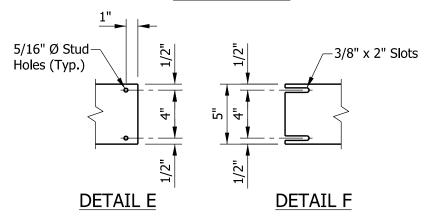
BA	BASE PLATE DIMENSIONS			
	LUMN METER	А	В	С
	18"	3'-0"	2'-3"	2'-7"
2	20"	3'-2"	2'-5"	2'-9"
	22"	3'-4"	2'-7"	2'-11"



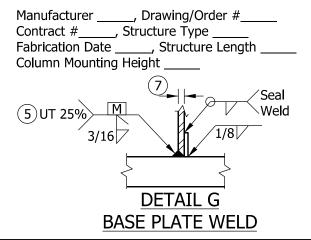




SKIRT DETAIL



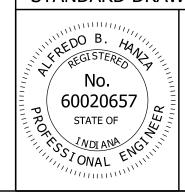
- 1) Utilize temporary positioning plate and leveling nuts or other Engineerapproved methods to maintain anchor bolt alignment during concrete placement. Positioning plate and associated nuts shall be removed upon completion of the foundation.
- (2) Protect threads during concreting with tape, sleeves, or other means.
- (3) 1'-6" is minimum to be galvanized. Entire bolt may be galvanized at Contractor's option.
- (4) Provide uncoated nut at bottom of anchor plate. Deform thread or use chemical thread lock to secure.
- (5) Use 1/4" x 1" minimum continuous backer ring. Tack weld only in root area of final weld. See Detail G this page for base plate weld detail.
- (6) Anchor bolt nuts shall be tightened against the base plate by turning the nut 1/6 turn (minimum) from snug tight condition.
- (7) See Standard Drawing E 802-TCSS-06 for column wall thickness.
- (8) I.D. tag is a 1/8" stainless steel plate with the following information stamped in 1/2" black letters:



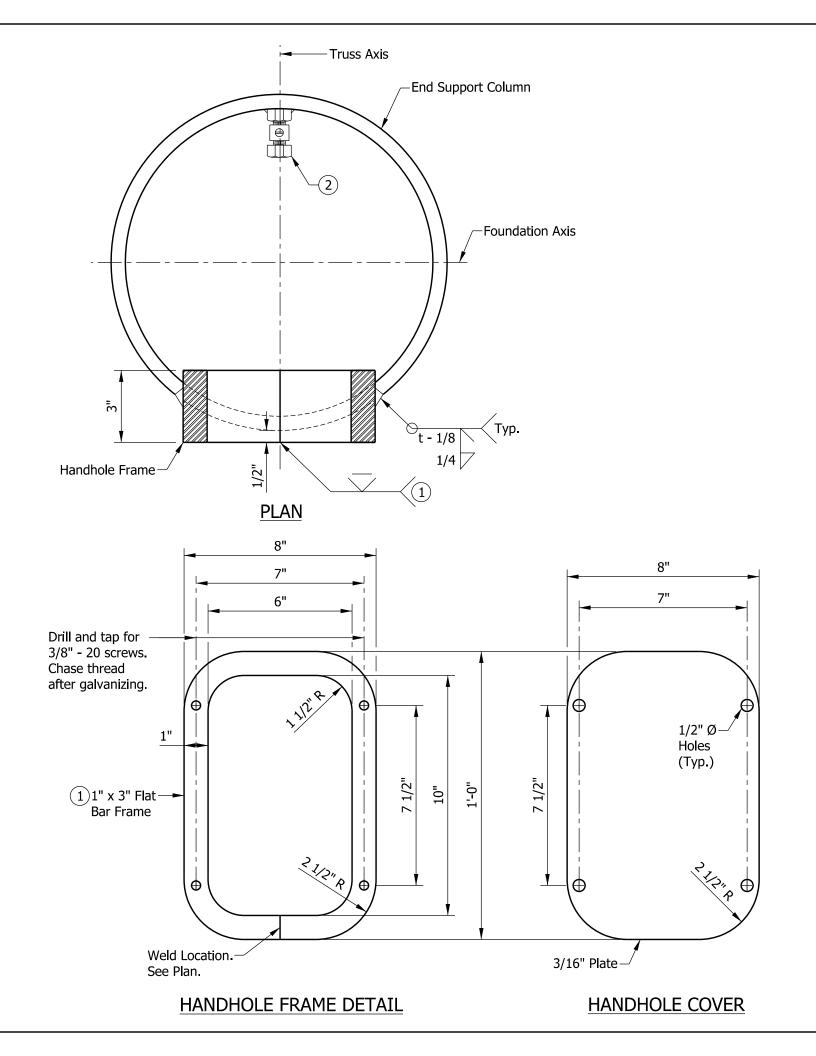
## INDIANA DEPARTMENT OF TRANSPORTATION

TRI-CHORD SIGN STRUCTURE BASE PLATE, ANCHOR BOLT, AND I.D. TAG DETAILS SEPTEMBER 2013

STANDARD DRAWING NO. E 802-TCSS-12



/s/ Alfredo B. Hanza	03/26/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE



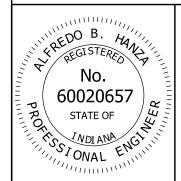
- 1 In lieu of fabricated handhole frame as shown, frame may be cut from 3" plate (rolling direction vertical).
- 2 Grounding clamp to be placed on far side of support directly opposite center of handhole.
- 3. See Standard Drawing E 802-TCSS-12 for handhole locations.

# INDIANA DEPARTMENT OF TRANSPORTATION

# TRI-CHORD SIGN STRUCTURE HANDHOLE DETAILS

SEPTEMBER 2013

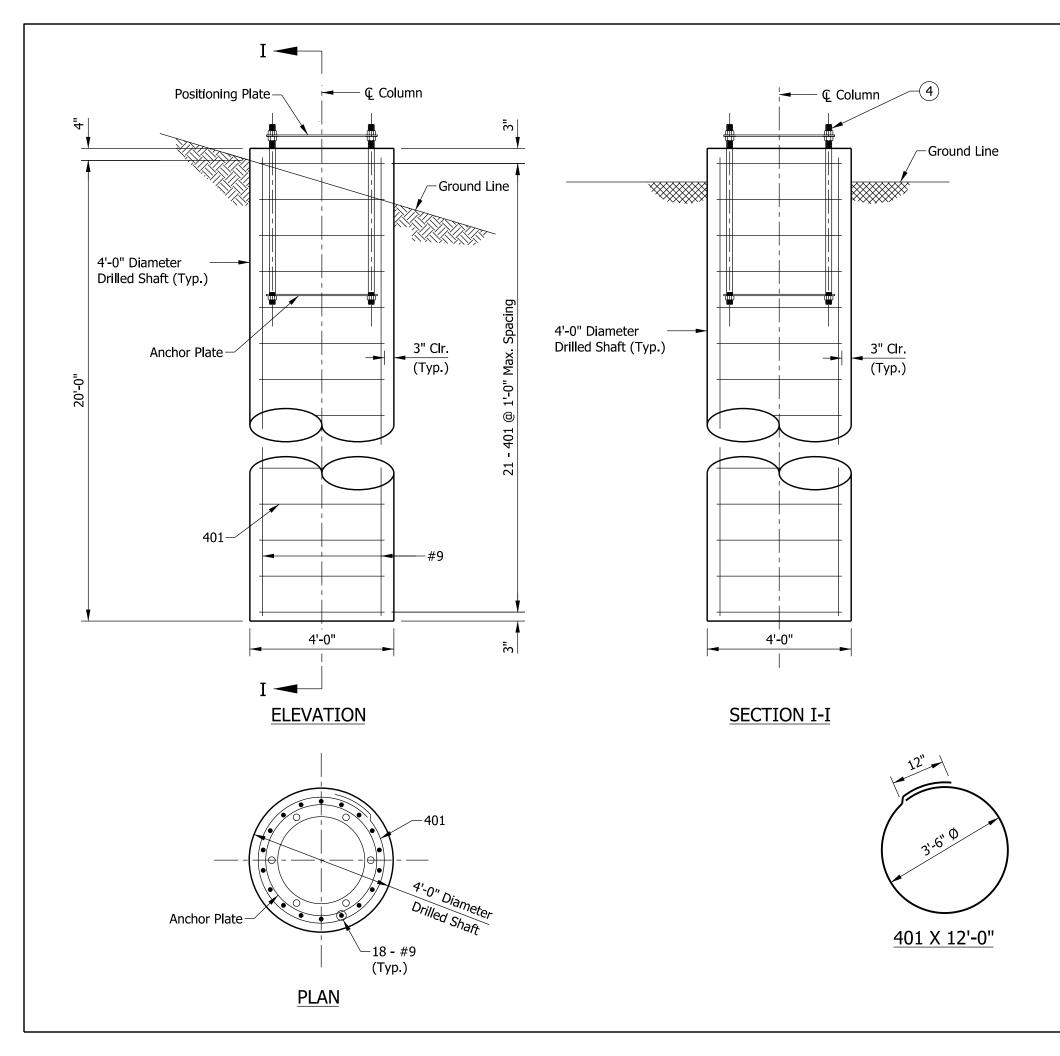
STANDARD DRAWING NO. E 802-TCSS-13



/s/ Mark A. Miller 03/27/13

CHIEF ENGINEER

DATE



- 1. This standard foundation design is applicable for all tri-chord sign structures.
- 2. The design is based on clay soil with minimum unconfined shear strength of 750 psf or sandy soil with minimum friction angle of 30°.
- 3. All reinforcing bars to be epoxy coated.
- (4) See Standard Drawing E 802-TCSS-12 for anchor bolts.

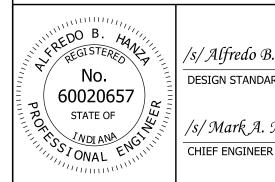
BILL OF MATERIALS			
EPOXY-COATED REINFORCING BARS			
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT
901	18	20'-0"	
Total #9	1224 LBS		
#4	21	12'-0"	
Total #4	168 LBS		
Total Epoxy-C Reinforcing Ba	1392 LBS		
MISCELLANEOUS			
Concrete, Class A			9.5 CYS
Surface Seal			0.5 SYS

# INDIANA DEPARTMENT OF TRANSPORTATION

# TRI-CHORD SIGN STRUCTURE DRILLED SHAFT FOUNDATION

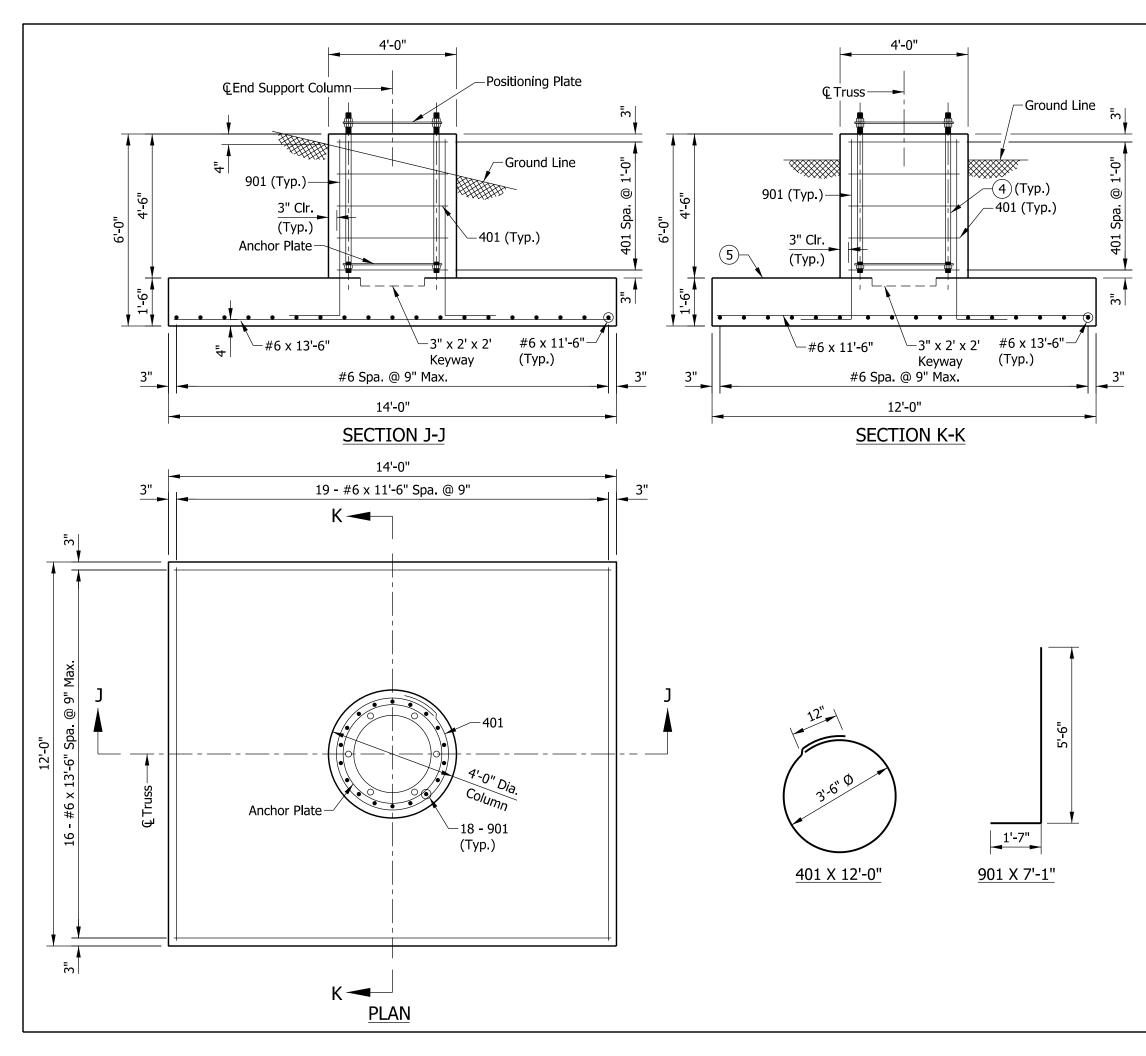
SEPTEMBER 2013

STANDARD DRAWING NO. E 802-TCSS-14



/s/ Alfredo B. Hanza	02/22/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13

DATE



- 1. This standard foundation design is applicable for all tri-chord sign structures.
- 2. The design is based on allowable gross soil bearing pressure of 1500 psf.
- 3. All reinforcing bars to be epoxy coated.
- (4) See Standard Drawing E 802-TCSS-12 for anchor bolts.
- 5 Top of the footing shall be a minimum of 4'-0" below the pavement or ground line.

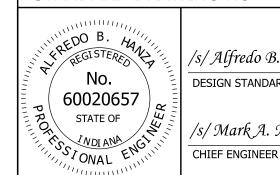
BILL OF MATERIALS				
EPOXY-CO	ATED RE	INFORCI	NG BARS	
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT	
901	18	7'-1"		
Total #9			434 LBS	
#6	19	11'-6"		
#6	16	13'-6"		
Total #6			652 LBS	
401 5 12'-0"				
Total #4			40 LBS	
Total Epoxy-C Reinforcing Ba	1126 LBS			
MISCELLANEOUS				
Concrete, Class A			11.4 CYS	
Surface Seal			0.5 SYS	

## INDIANA DEPARTMENT OF TRANSPORTATION

# TRI-CHORD SIGN STRUCTURE SPREAD FOUNDATION

SEPTEMBER 2013

STANDARD DRAWING NO. E 802-TCSS-15



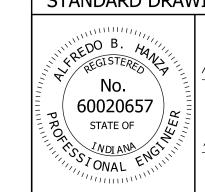
/s/ Alfredo B. Hanza	02/22/1.
 DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13

	INDEX			
SHEET NO.	HEET NO. SUBJECT			
1	Index			
2	Pole Dimensions and Details			
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'			

# SIGNAL DUAL ARM CANTILEVERS DRAWING INDEX

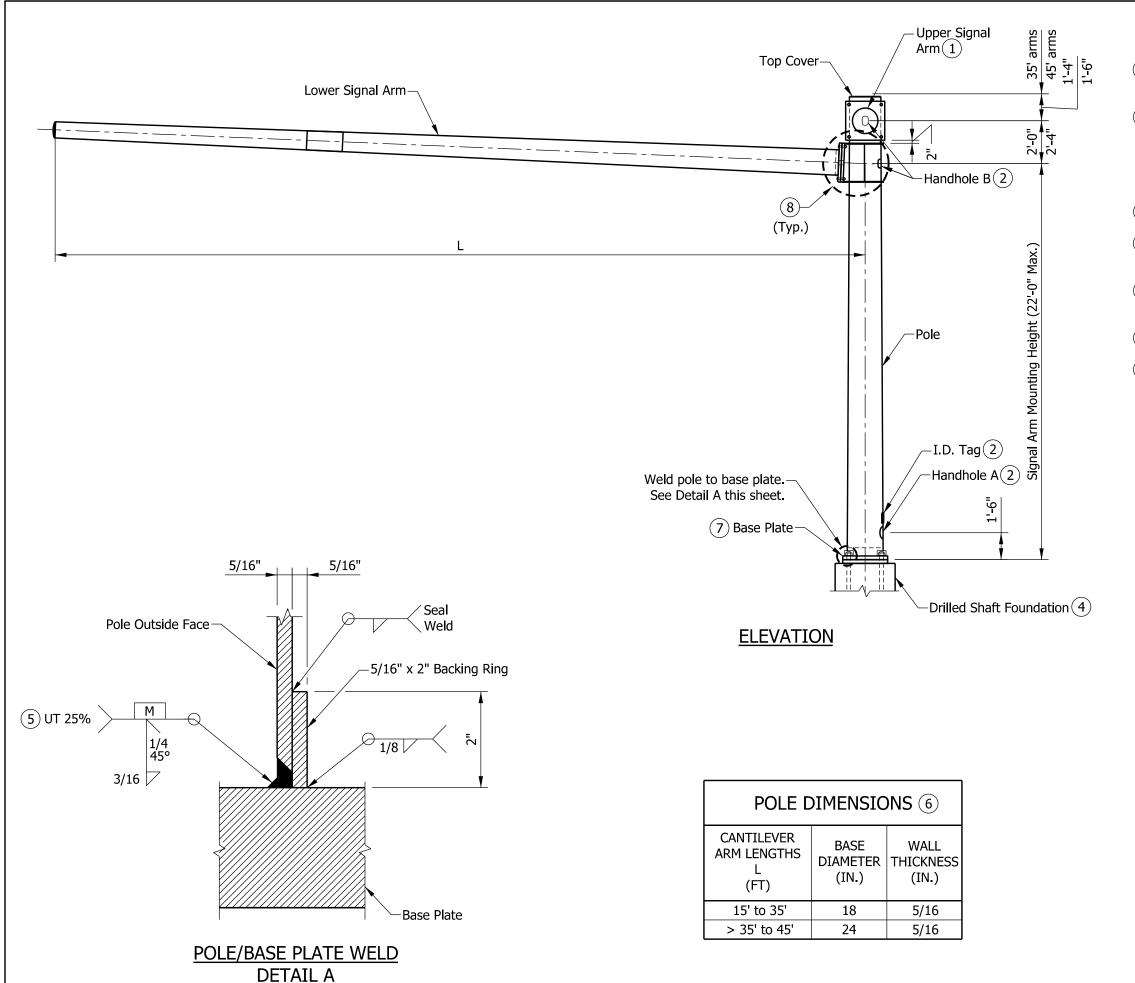
SEPTEMBER 2013

STANDARD DRAWING NO. E 805-SDAC-01

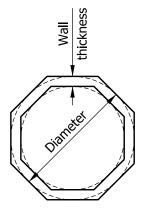


 $\frac{/s/Alfredo\ B.\ Hanza}{\text{DESIGN STANDARDS ENGINEER}} \frac{02/05/13}{\text{DATE}}$ 

/s/ Mark A. Miller 03/27/13



- 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 Standard Drawing E 805-SDAC-06 for handhole and I.D. tag details.
- 3. See Standard Drawings E 805-SGGR-01 through -03 for grounding details.
- (4) See Standard Drawings E 805-SDAC-08 and -09 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 Standard Drawing E 805-SDAC-04 for base plate details.
- (8) See Standard Drawing E 805-SDAC-05 for arm connection details.



OCTAGON AND CIRCULAR
TUBULAR SHAPE 6

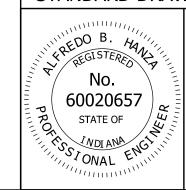
### INDIANA DEPARTMENT OF TRANSPORTATION

# SIGNAL DUAL ARM CANTILEVERS POLE DIMENSIONS AND DETAILS

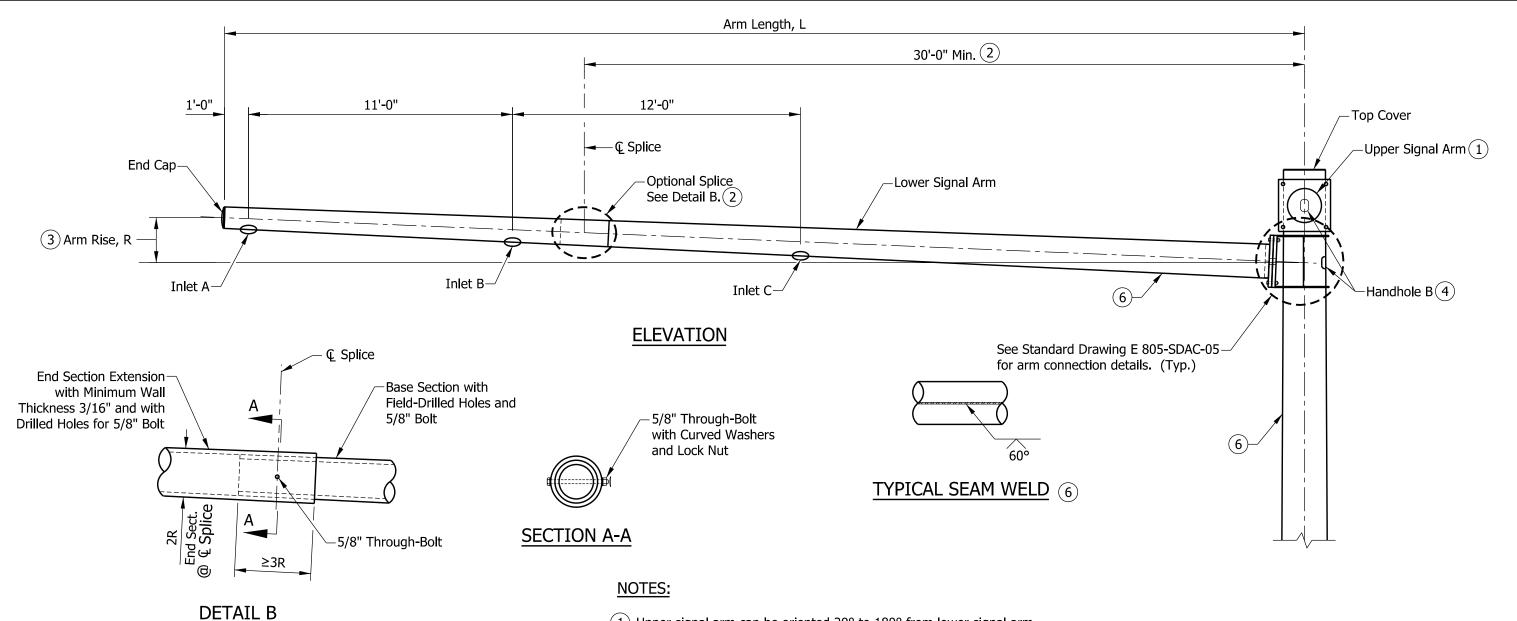
SEPTEMBER 2013

STANDARD DRAWING NO. E 805-SDAC-02

CHIEF ENGINEER



	/s/ Alfredo B. Hanza	02/05/13
11111111	DESIGN STANDARDS ENGINEER	DATE
11,	/s/ Mark A. Miller	03/27/13



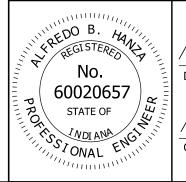
SIGNAL DUAL ARM CANTILEVER DATA				
ARM LENGTH L (FT.)	ARM DIAMETER AT POLE (IN.)	ARM WALL THICKNESS (IN.)	ARM RISE R (IN.)(3)	CABLE INLETS
15	14	5/16	7 1/2	A, B
20	14	5/16	10	A, B
25	14	5/16	12 1/2	A, B
30	14	5/16	15	A, B
35	14	5/16	17 1/2	A, B, C
40	17	5/16	20	A, B, C
45	17	5/16	22 1/2	A, B, C

- 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 of the end section).
- (3) Arm rise is measured in the undeflected position without vertical loads on the arm.
- (4) See Standard Drawing E 805-SDAC-06 for handhole B details.
- 5. See Standard Drawing E 805-SDAC-07 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.).

# SIGNAL DUAL ARM CANTILEVERS ARM DIMENSIONS AND DETAILS

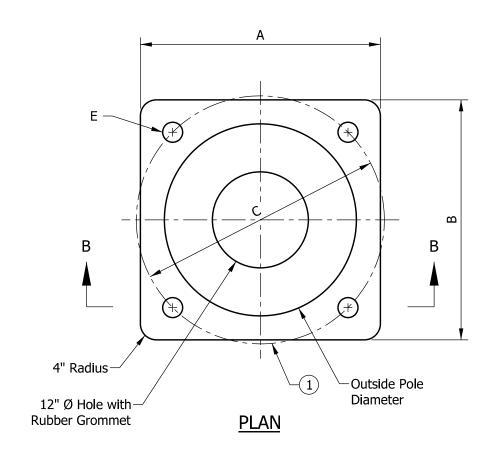
SEPTEMBER 2013

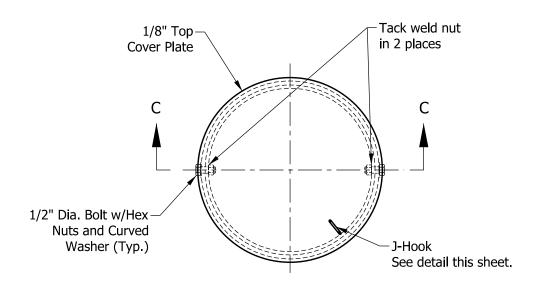
STANDARD DRAWING NO. E 805-SDAC-03



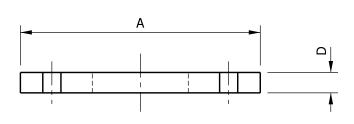
/s/Alfredo B. Hanza 02/05/13
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13

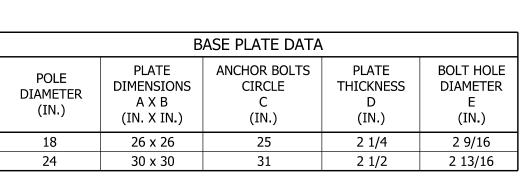


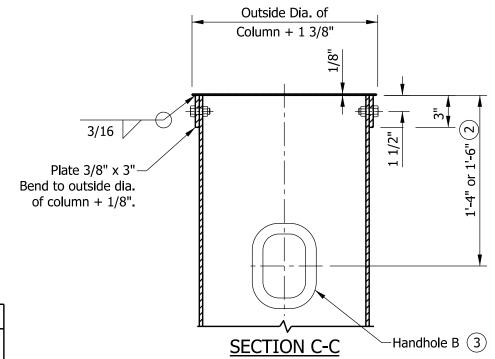


PLAN
TOP COVER - STEEL COLUMN

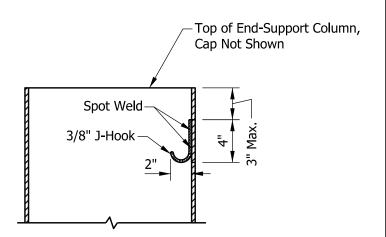


SECTION B-B BASE PLATE





- 1 Anchor bolt circle shall allow clearance for the anchor bolt washers. Cutting or trimming of the washers will not be allowed.
- (2) See Standard Drawing E 805-SDAC-02 for handhole locations.
- (3) See Standard Drawing E 805-SDAC-06 for handhole details.



**CABLE J-HOOK** 

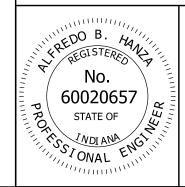
### INDIANA DEPARTMENT OF TRANSPORTATION

## SIGNAL DUAL ARM CANTILEVERS BASE PLATE AND POLE TOP COVER DETAILS

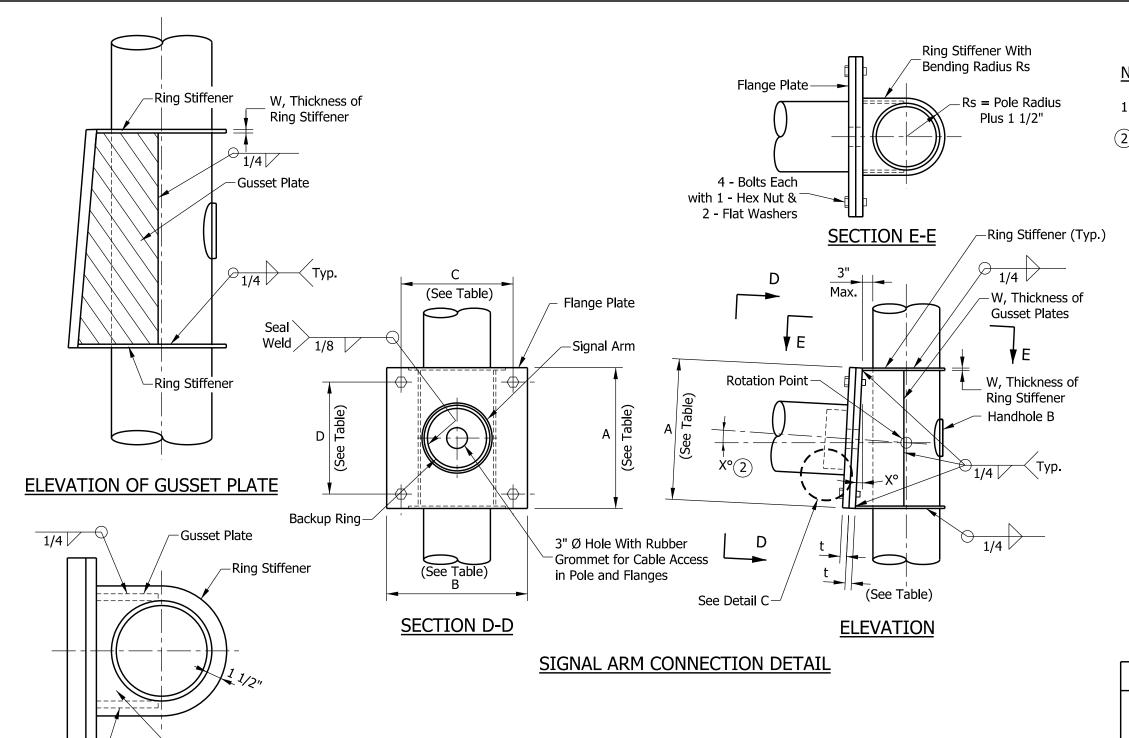
SEPTEMBER 2013

STANDARD DRAWING NO. E 805-SDAC-04

CHIEF ENGINEER



/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13



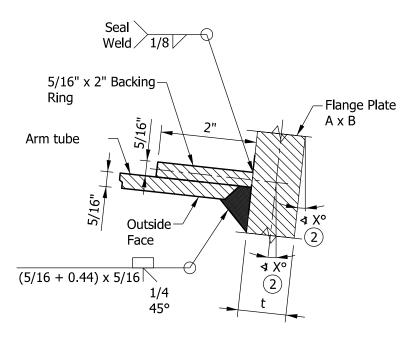
## TOP OF GUSSET PLATE

Ring Stiffener

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

### NOTES:

- 1. See Standard Drawing E 805-SDAC-06 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 Standard Drawing E 805-SDAC-03.



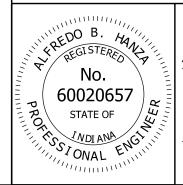
# <u>DETAIL C</u> <u>ARM WELD</u>

### INDIANA DEPARTMENT OF TRANSPORTATION

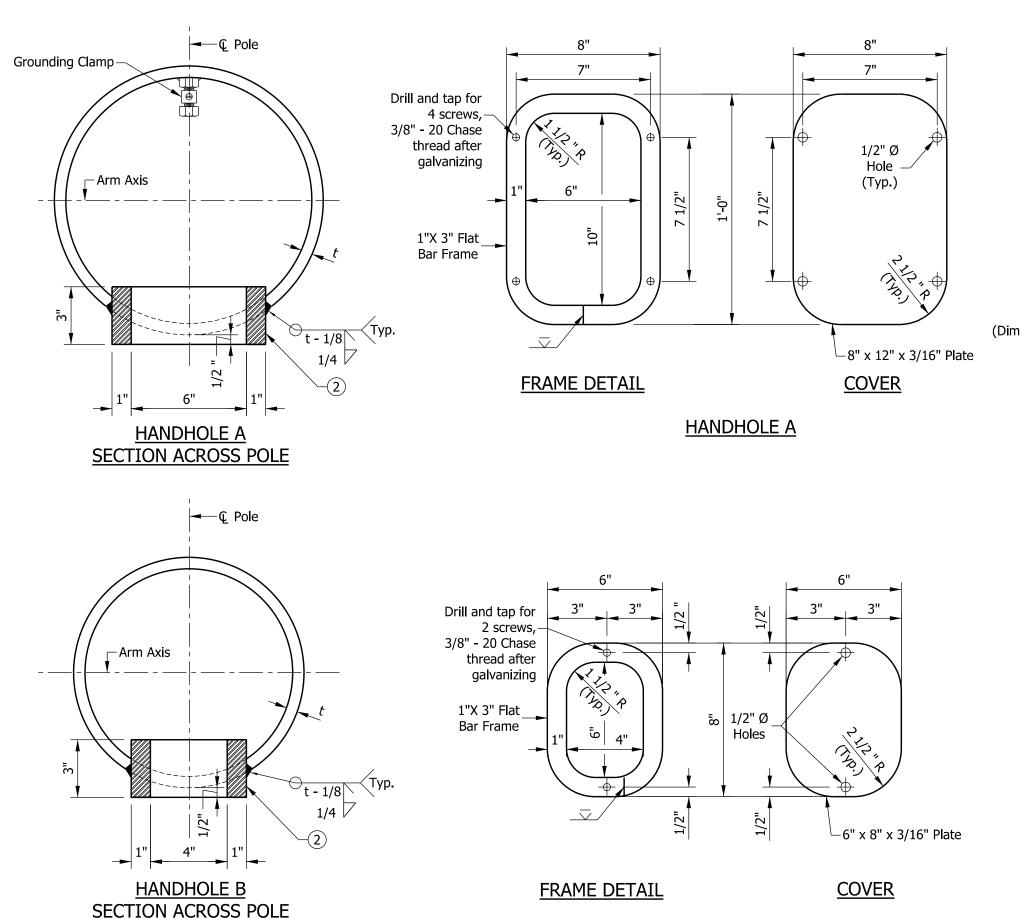
# SIGNAL DUAL ARM CANTILEVERS ARM CONNECTION DETAILS

SEPTEMBER 2013

STANDARD DRAWING NO. E 805-SDAC-05



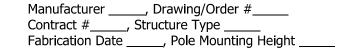
/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE

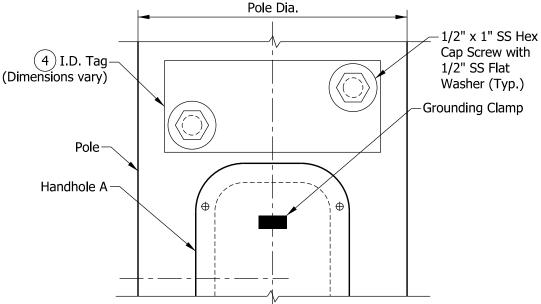


HANDHOLE B

### 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 Standard Drawing E 805-SDAC-02 for handhole locations.
- 4 I.D. tag is a 1/8" stainless steel plate with the following information stamped in 1/2" black letters:





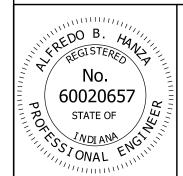
# PARTIAL ELEVATION AT HANDHOLE A

### INDIANA DEPARTMENT OF TRANSPORTATION

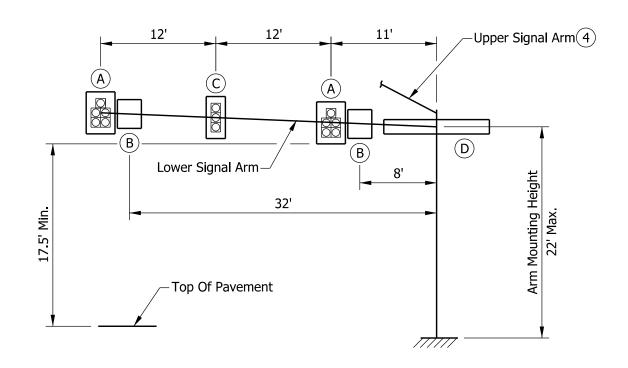
SIGNAL DUAL ARM CANTILEVERS HANDHOLE AND I.D. TAG DETAILS

SEPTEMBER 2013

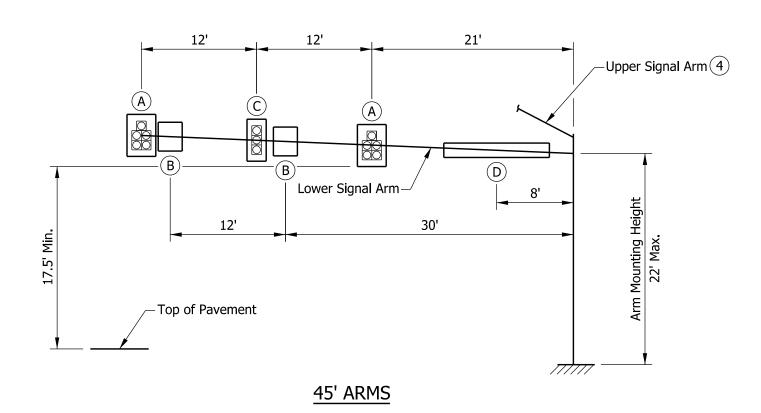
STANDARD DRAWING NO. E 805-SDAC-06



	/s/ Alfredo B. Hanza	02/05/13
111111	DESIGN STANDARDS ENGINEER	DATE
11111	/s/ Mark A. Miller	03/27/13
	CHIEF ENGINEER	DATE



### **35' 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 Standard Drawing E 805-SDAC-08.
- 3. Foundation Type F is designed for arm length of greater than 35' to 45'. See Standard Drawing E 805-SDAC-09.
- (4) Both arms can be loaded as shown in loading diagrams.

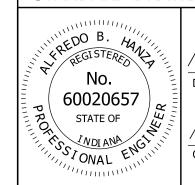
	SIGNAL AND SIGN LOADING INFORMATION TABLE			
DEVICE	DESCRIPTION	DEVICE AREA (SQ FT)	WEIGHT (LBS)	
A	12" - 5 section signal head with backplates	14.5	69	
B	36" x 30" regulatory sign	7.5	19	
C	12" - 3 section signal head with backplates	10.1	55	
D	18" x 11'-0" street name sign	16.5	41	

## INDIANA DEPARTMENT OF TRANSPORTATION

# SIGNAL DUAL ARM CANTILEVERS LOADING DIAGRAMS

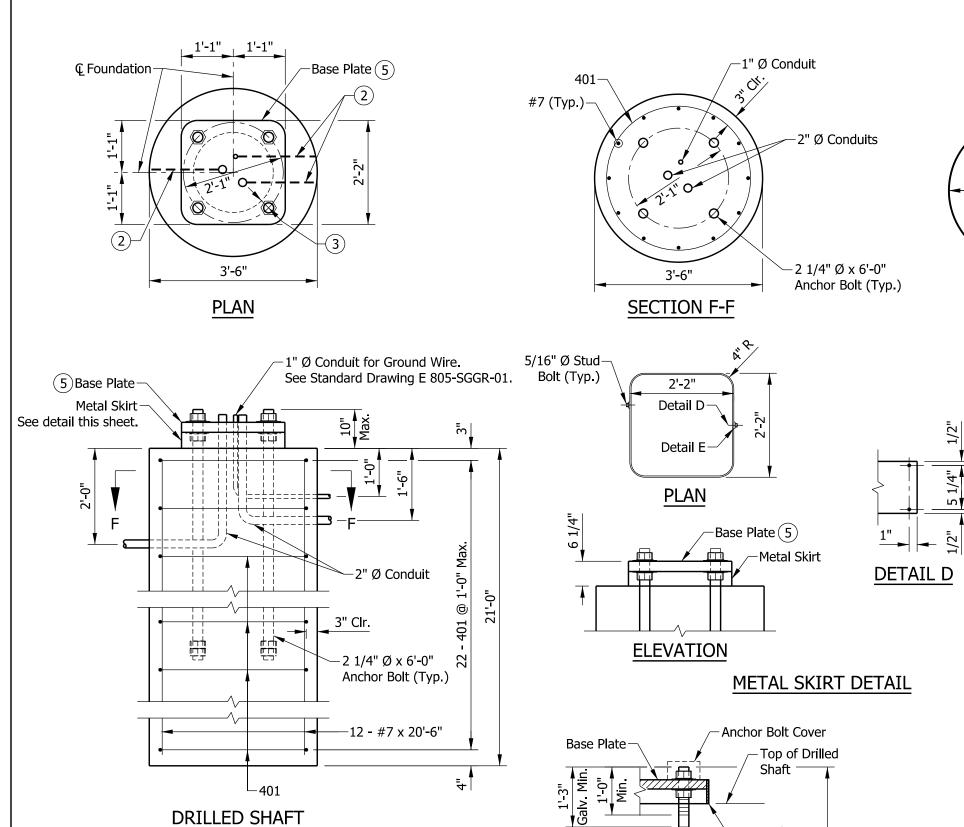
SEPTEMBER 2013

STANDARD DRAWING NO. E 805-SDAC-07



/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE

/s/ Mark A. Miller 03/27/13



**ELEVATION** 

### NOTES:

1'-6"

**DETAIL E** 

1'-6" R

401 X 11'-0"

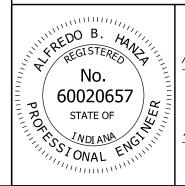
- 1. The Type E foundations are to be used for 35' dual arm structures and cohesive soil with minimum  $Q_u = 750$  lb/ft or sand with minimum friction angle 30°.
- 2 A tooled line or other permanent marking shall be provided on the top of the foundation to indicate the direction of the conduits' exit 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 Standard Drawing E 805-SDAC-04 for base plate details.

BILL OF MATERIALS				
RE	INFORC:	ING BARS	5	
MARK OR SIZE	NO. OF BARS	LENGTH	WEIGHT	
#7	12	20'-6"		
Total #7	503 LBS			
401				
Total #4	162 LBS			
Total Reinford	665 LBS			
CONCRETE				
Concrete, Class A 7.5 CYS				

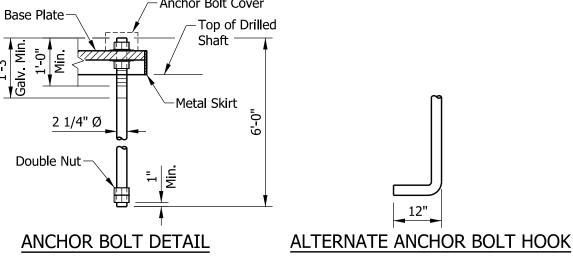
## INDIANA DEPARTMENT OF TRANSPORTATION

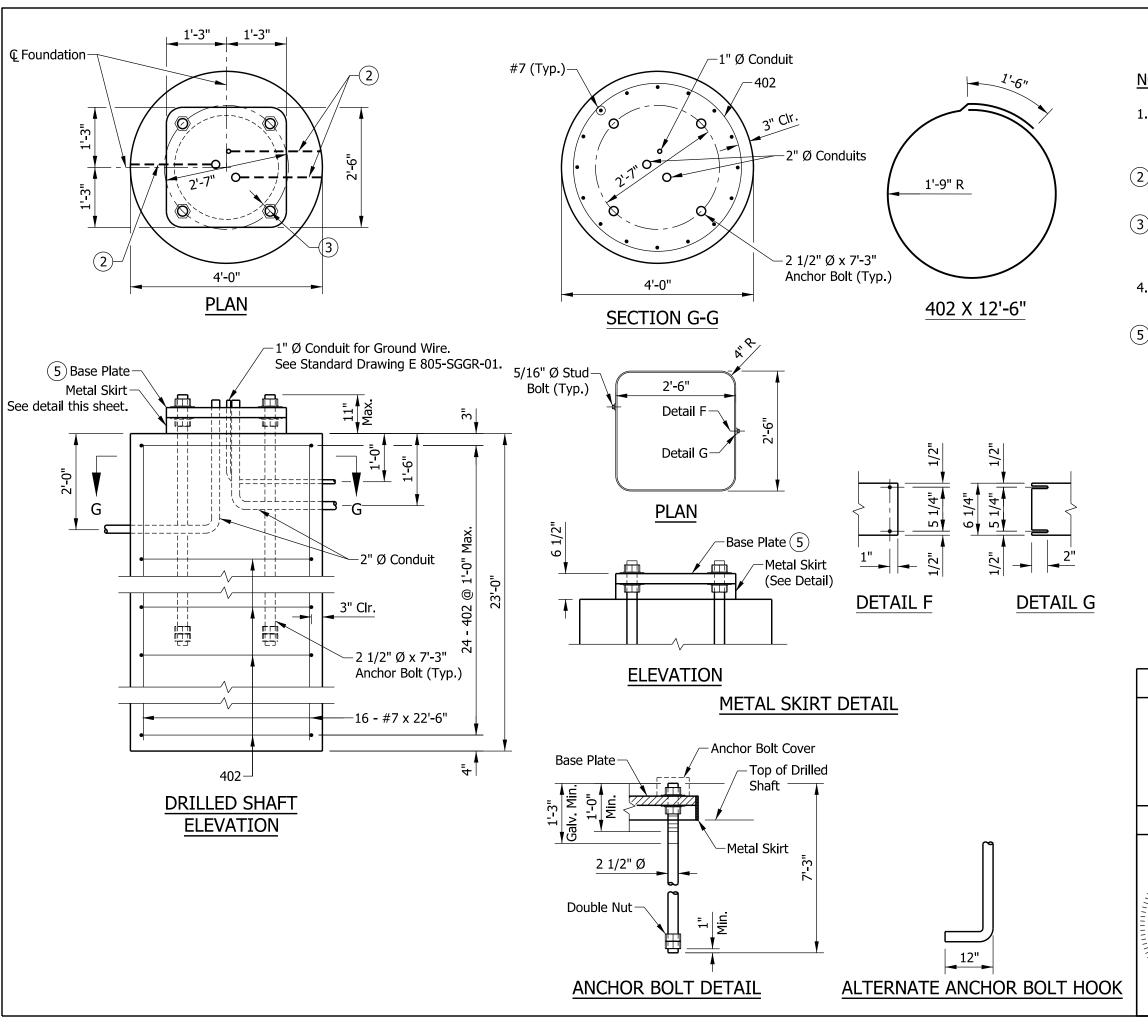
SIGNAL DUAL ARM CANTILEVERS FOUNDATION, DRILLED SHAFT TYPE E FOR DUAL ARMS 35' OR LESS SEPTEMBER 2013

STANDARD DRAWING NO. E 805-SDAC-08



	/s/ Alfredo B. Hanza	02/05/13
1111111	DESIGN STANDARDS ENGINEER	DATE
1111	/s/ Mark A. Miller	03/27/13
	CHIEF ENGINEER	DATE





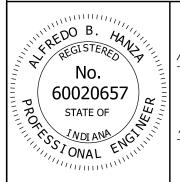
- 1. The Type E foundations are to be used for 35' dual arm structures and cohesive soil with minimum  $Q_u = 750$  lb/ft or sand with minimum friction angle 30°.
- (2) A tooled line or other permanent marking shall be provided on the top of the foundation to indicate the direction of the conduits' exit 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 Standard Drawing E 805-SDAC-04 for base plate details.

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

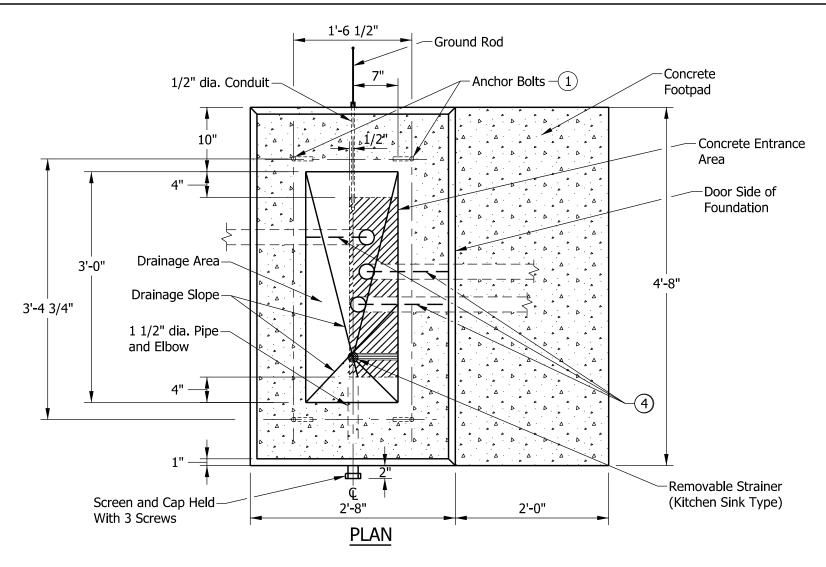
### INDIANA DEPARTMENT OF TRANSPORTATION

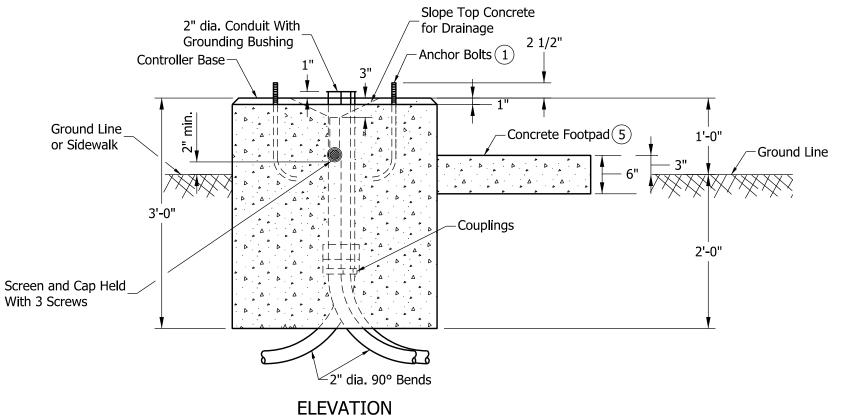
SIGNAL DUAL ARM CANTILEVERS FOUNDATION, DRILLED SHAFT TYPE F FOR DUAL ARMS GREATER THAN 35' TO 45' SEPTEMBER 2013

### STANDARD DRAWING NO. E 805-SDAC-09



   /s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE





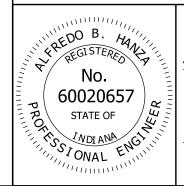
- (1) See Standard Drawing E 805-SGPB-01 for anchor bolt details.
- 2. Install minimum 3 2" dia. conduits for each foundation.
- 3. Conduits not used shall be capped below grade. More inlets shall be installed as required on plans.
- Make a permanent line on top of the concrete foundation indicating the direction of the 2" conduits' exit.
- Concrete footpad shall be constructed of the same class concrete as the foundation.

## INDIANA DEPARTMENT OF TRANSPORTATION

# SIGNAL CONTROLLER CABINET FOUNDATION TYPE P-1

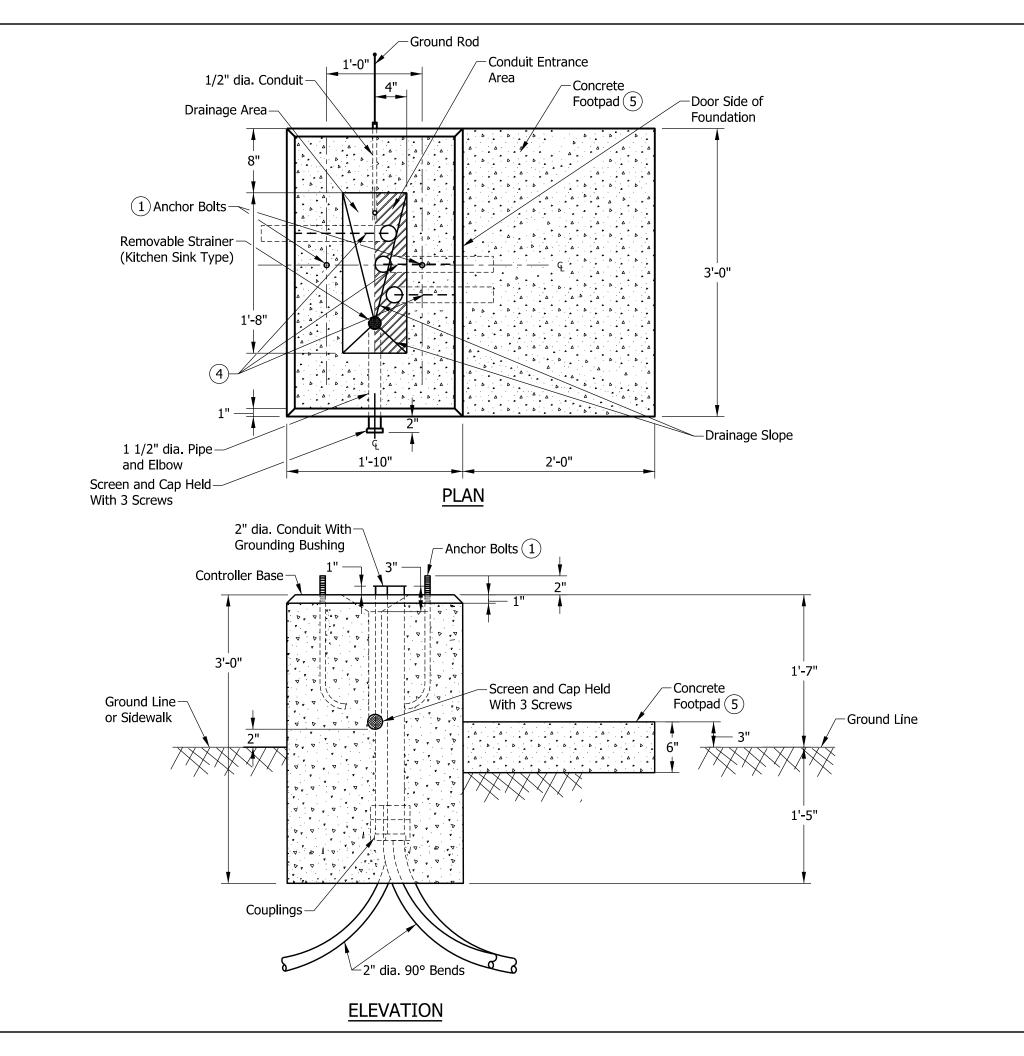
SEPTEMBER 2013

STANDARD DRAWING NO. E 805-SGCF-01



/s/ Alfredo B. Hanza	02/22/13
DESIGN STANDARDS ENGINEER	DATE

/s/ Mark A. Miller 03/27/13



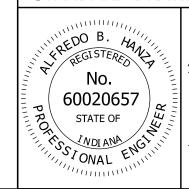
- See Standard Drawing E 805-SGPB-01 for anchor bolt details.
- 2. Install minimum 3 - 2" dia. conduits for each foundation.
- Conduits not used shall be capped below grade. More inlets shall be installed as required on plans.
- (4) Make a permanent line on top of the concrete foundation indicating the direction of the 2" conduits' exit.
- Concrete footpad shall be constructed of the same class concrete as the foundation.

## INDIANA DEPARTMENT OF TRANSPORTATION

## SIGNAL CONTROLLER CABINET FOUNDATION TYPE M

SEPTEMBER 2013

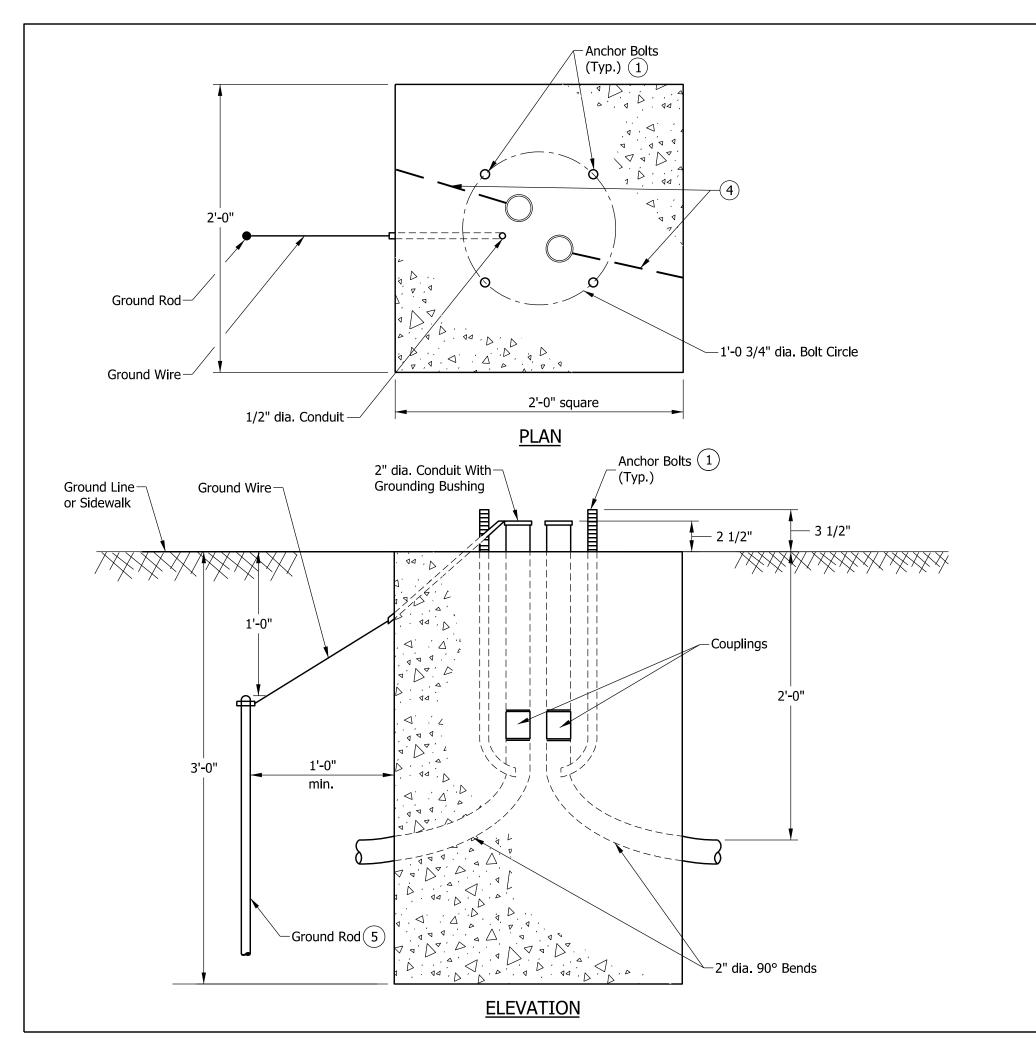
STANDARD DRAWING NO. E 805-SGCF-02



/s/ Alfredo B. Hanza	02/22/13
DESIGN STANDARDS ENGINEER	DATE

/s/ Mark A. Miller 03/27/13 DATE

CHIEF ENGINEER



## **GENERAL NOTES:**

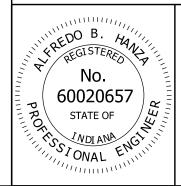
- (1) See Standard Drawing E 805-SGPB-01 for anchor bolt details.
- 2. A minimum of two 2-in. dia. conduit inlets shall be installed for each foundation.
- 3. Conduit inlets not used shall be capped below grade. More inlets shall be installed as required on plans.
- (4) Make a permanent line on top of the concrete foundation indicating the direction of the 2-in. conduits' exit.
- (5) The ground rod has length 8 ft.

## INDIANA DEPARTMENT OF TRANSPORTATION

# SIGNAL PEDESTAL FOUNDATION TYPE A

SEPTEMBER 2013

STANDARD DRAWING NO. E 805-SGCF-03

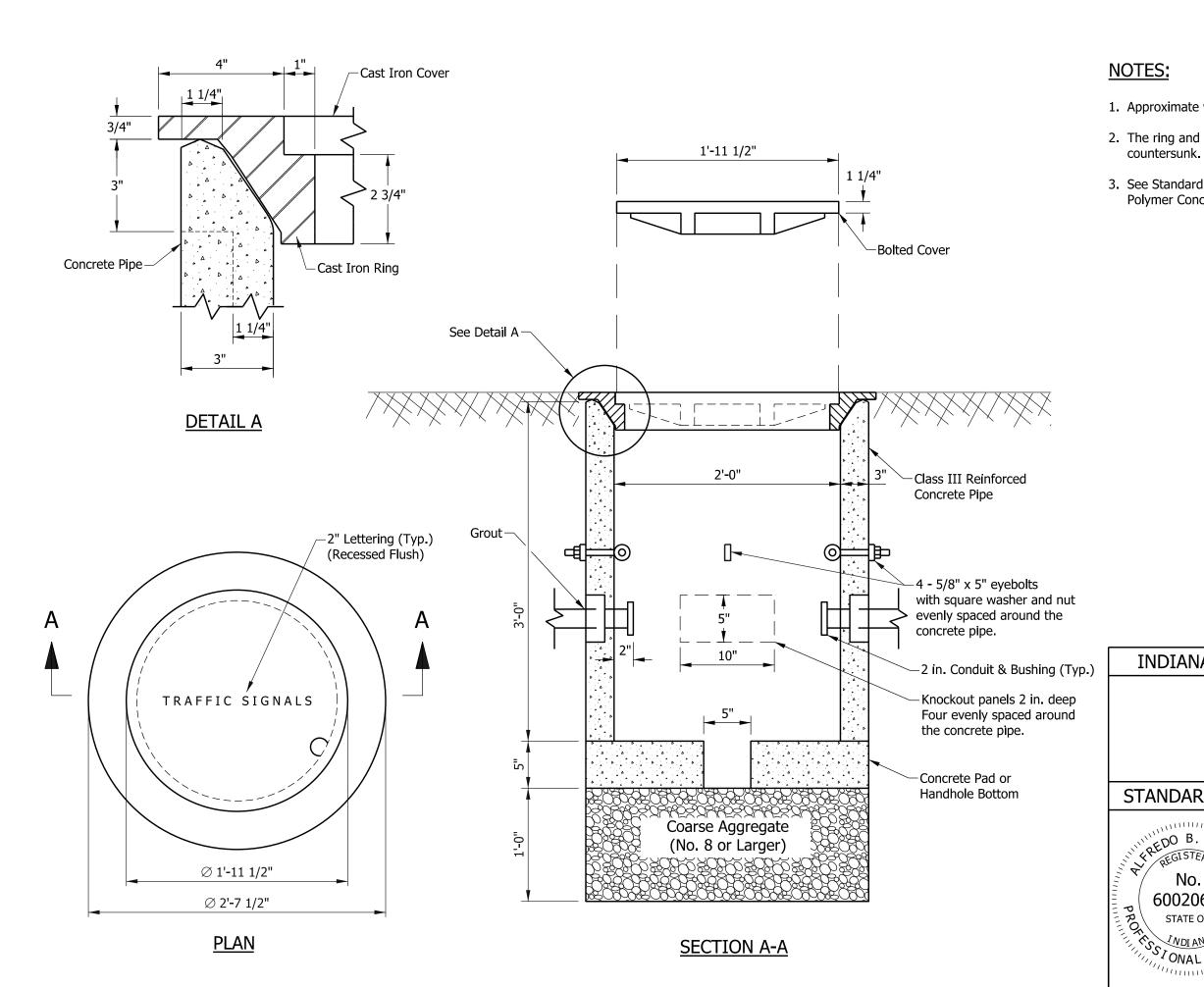


/s/Alfredo B. Hanza 02/27/13

DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13

CHIEF ENGINEER

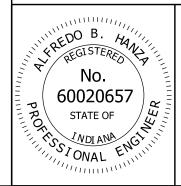


- 1. Approximate weight for cast iron ring and cover shall be 320 lb.
- 2. The ring and cover shall be secure. Attachment hardware shall be
- 3. See Standard Drawing E 805-SGCF-06 for Signal Handhole, Type II, Polymer Concrete and cover.

SIGNAL HANDHOLE, TYPE I CONCRETE

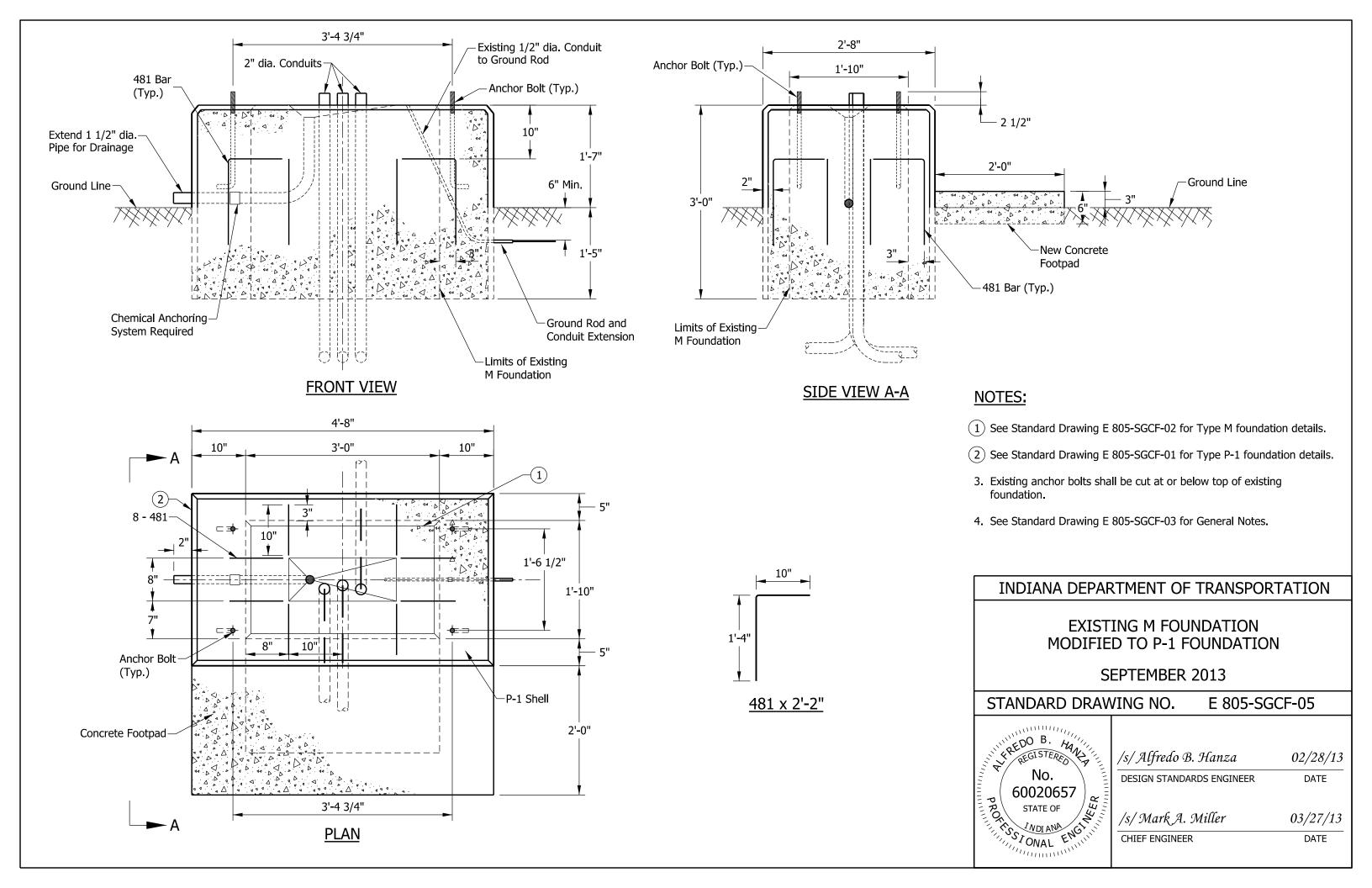
SEPTEMBER 2013

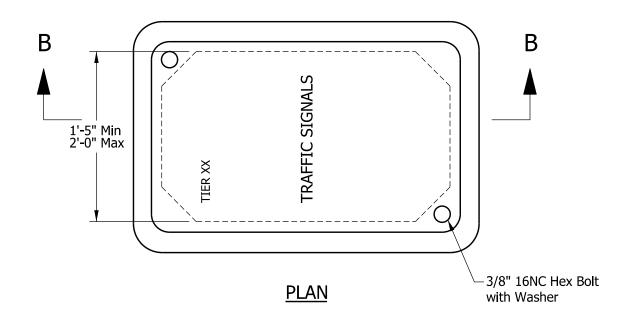
STANDARD DRAWING NO. E 805-SGCF-04

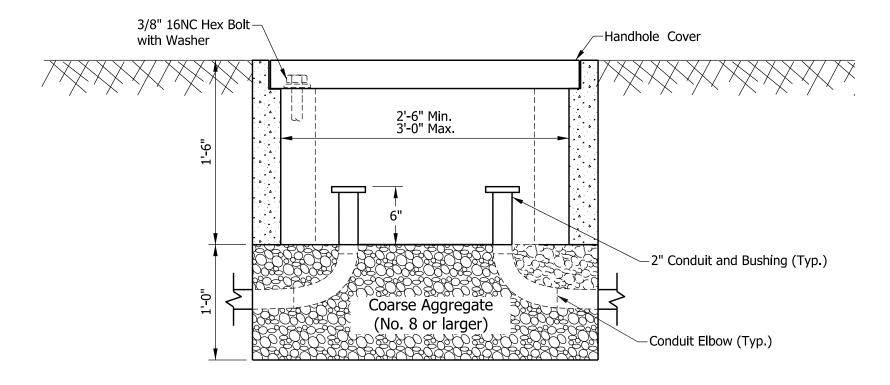


/s/ Alfredo B. Hanza 02/22/13 DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13







SECTION B-B

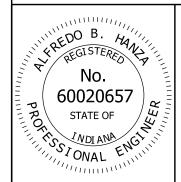
1. See Standard Drawing E 805-SGCF-04 for Signal Handhole, Type I, Concrete and cover.

## INDIANA DEPARTMENT OF TRANSPORTATION

# SIGNAL HANDHOLE, TYPE II POLYMER CONCRETE

SEPTEMBER 2013

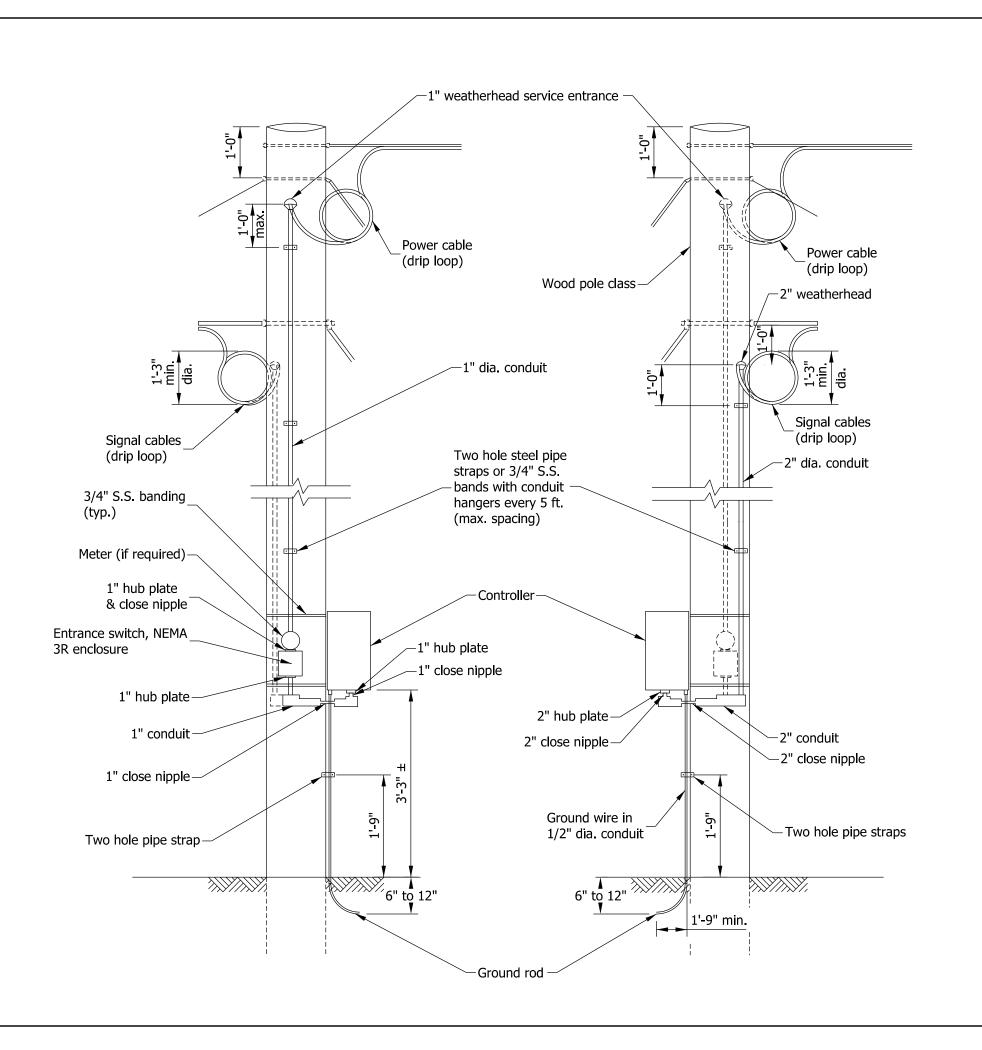
STANDARD DRAWING NO. E 805-SGCF-06



/s/Alfredo B. Hanza 02/22/13

DESIGN STANDARDS ENGINEER DATE

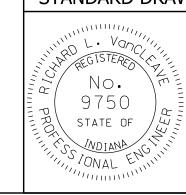
/s/ Mark A. Miller 03/27/13



# SIGNAL SERVICE & CONTROLLER MOUNTED ON WOOD POLE

SEPTEMBER 2012

STANDARD DRAWING NO. E 805-SGCO-01



/s/Richard L. VanCleave

09/04/12

SUPERVISOR, ROADWAY STANDARDS

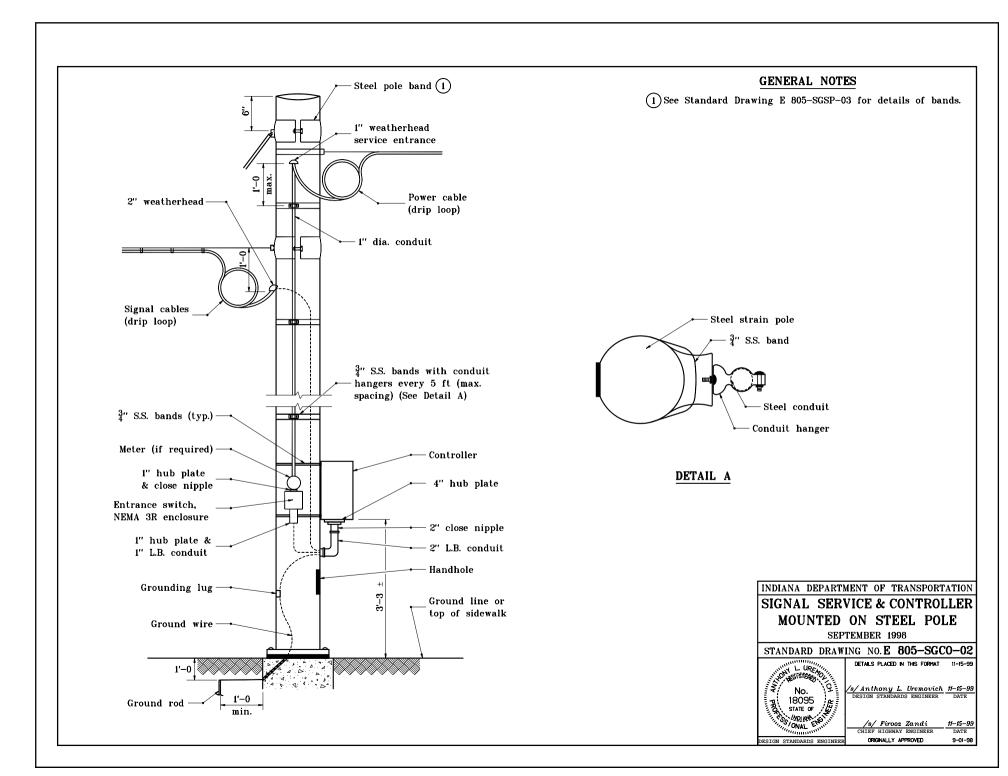
09/04/12

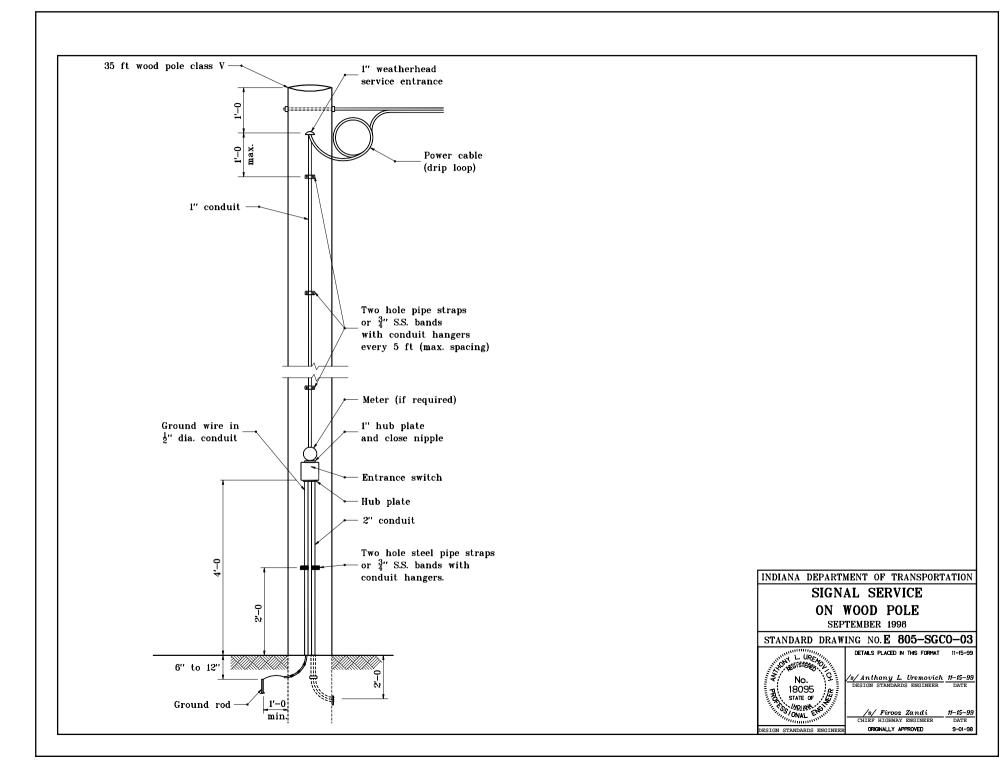
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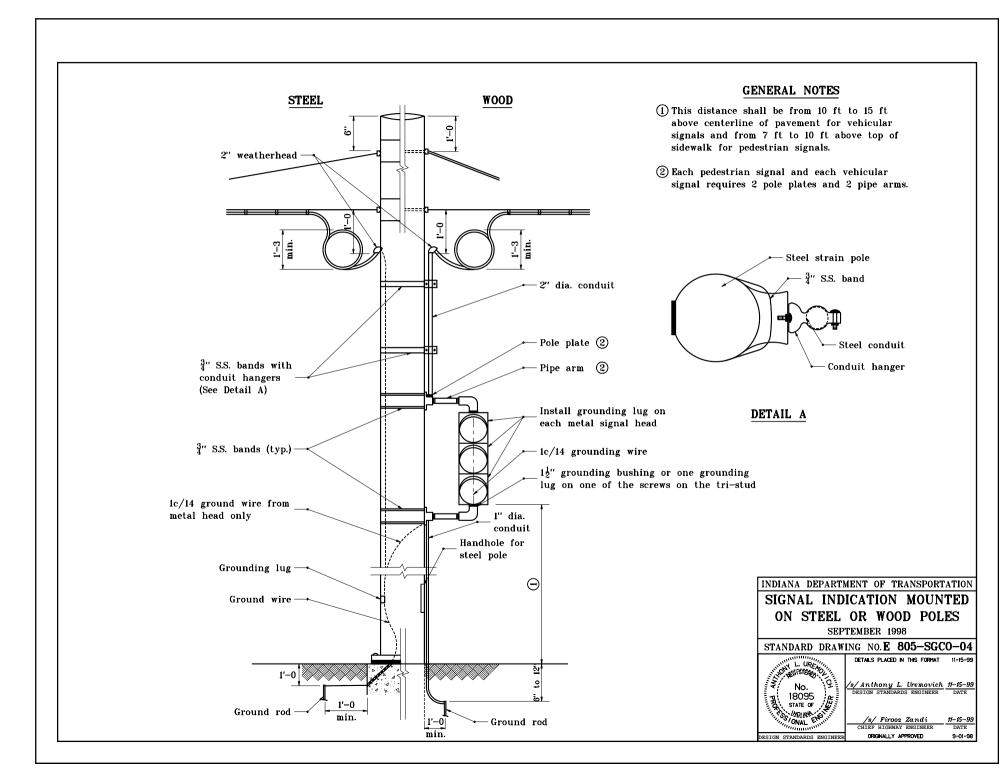
/s/ Mark A. Miller

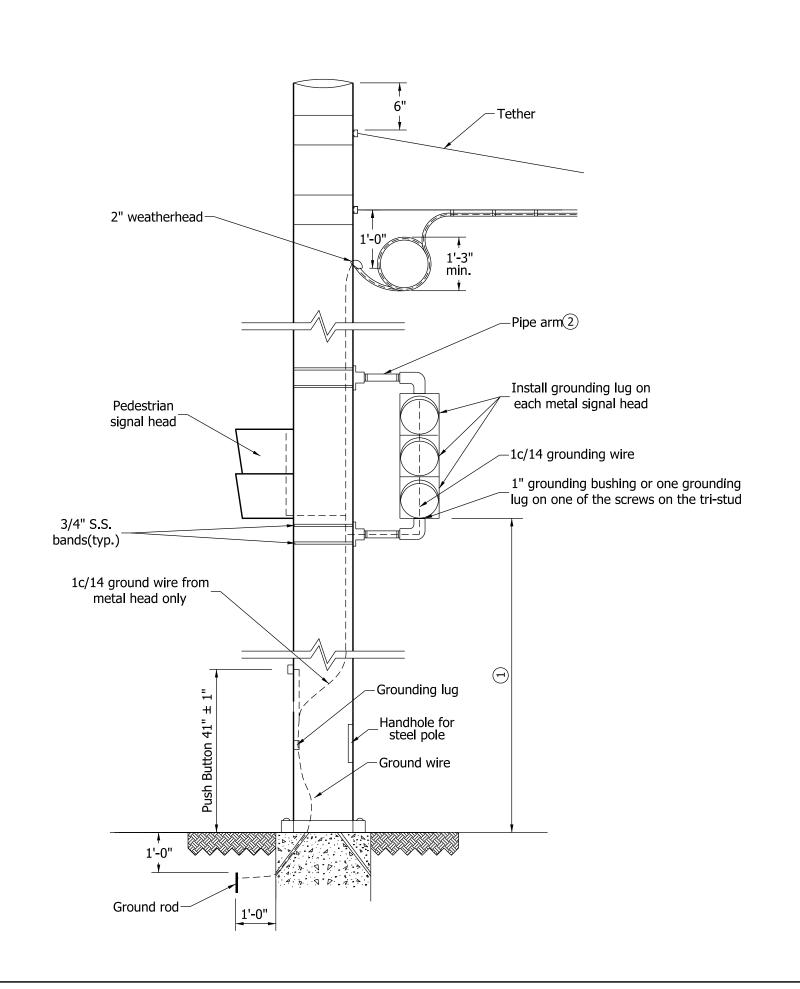
DATE

CHIEF ENGINEER









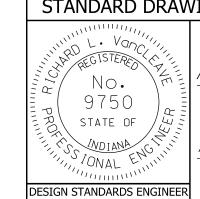
- 1) This distance shall be from 10'-0" to 15'-0"above centerline of pavement for vehicular signals and from 7'-0" to 10'-0" above top of sidewalk for pedestrian signals.
- (2) Each pedestrian signal and each vehicular signal requires 2 pole plates and 2 pipe arms.

## INDIANA DEPARTMENT OF TRANSPORTATION

## SIGNAL INDICATION MOUNTED ON STEEL POLE

SEPTEMBER 2010

STANDARD DRAWING NO. E 805-SGCO-04A



/s/ Richarh L. Vancleave

09/01/10

DESIGN STANDARDS ENGINEER

09/01/10

DATE

/s/ Mark A. Miller

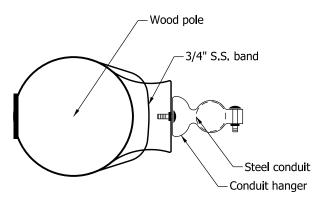
CHIEF HIGHWAY ENGINEER

DESIGN STANDARDS ENGINEER

# Tether Downguy 2" weatherhead-1'-3" min. -2" dia. conduit 1c/14 grounding wire Pole plate (2) Pipe arm (2) 3/4" S.S. bands with conduit hangers (See Detail A) Pedestrian signal head Install grounding lug on each metal signal head 1c/14 grounding wire 1" grounding bushing or one grounding lug on one of the screws on the tri-stud 3/4" S.S. bands (typ.) 1" dia. conduit Push Button 41" ± $\overline{\Box}$ -1c/14 grounding wire Ground rod

### NOTES:

- This distance shall be from 10'-0" to 15'-0"above centerline of pavement for vehicular signals and from 7'-0" to 10'-0" above top of sidewalk for pedestrian signals.
- 2 Each pedestrian signal and each vehicular signal requires 2 pole plates and 2 pipe arms.



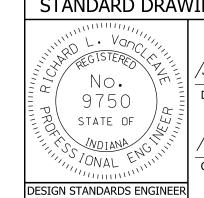
## **DETAIL A**

## INDIANA DEPARTMENT OF TRANSPORTATION

## SIGNAL INDICATION MOUNTED ON WOOD POLES

SEPTEMBER 2010

STANDARD DRAWING NO. E 805-SGCO-04B



/s/ Richarh L. Vancleave

DESIGN STANDARDS ENGINEER

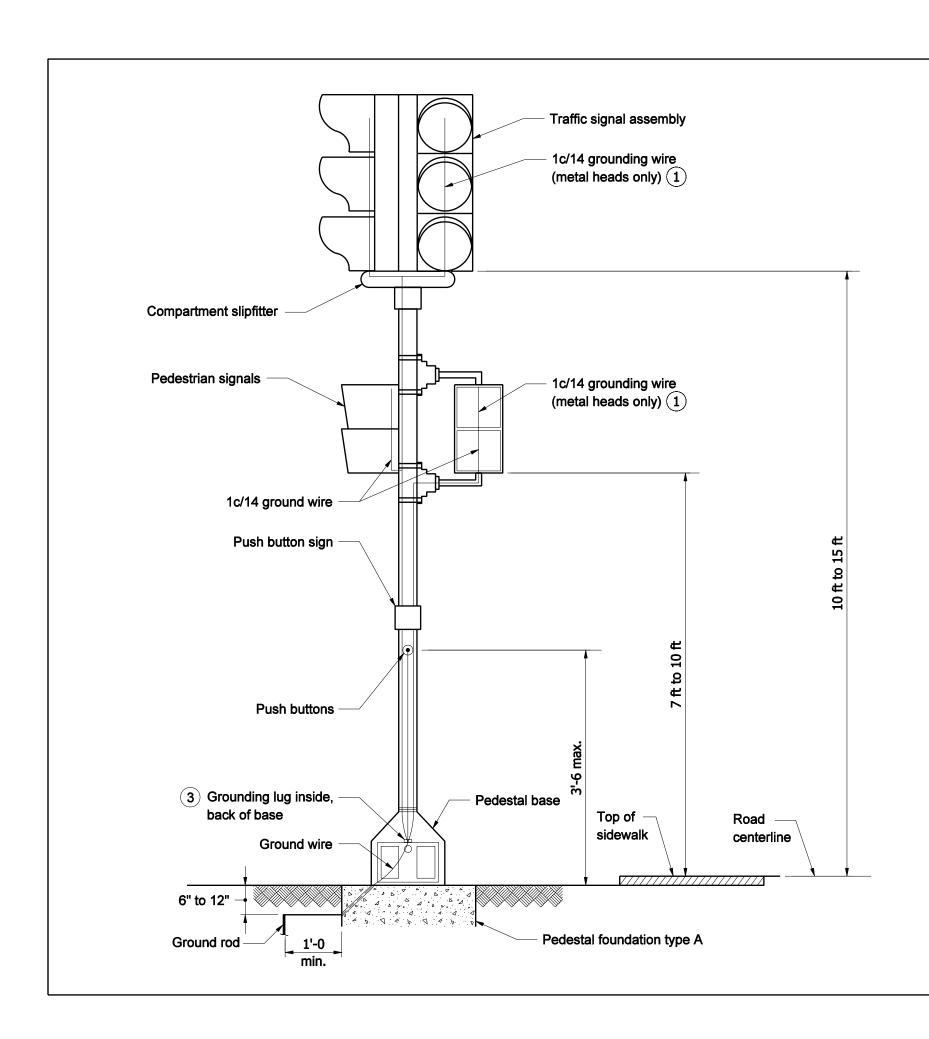
/s/ Mark A. Miller 09/01/10

09/01/10

DATE

CHIEF HIGHWAY ENGINEER

DESIGN STANDARDS ENGINEER



#### **GENERAL NOTES**

- 1) On metal signal heads grounding wire shall connect each signal head and the bottom groundingbushing of the assembly to the grounding lug.
- 2. Single conductor (hookup) shall be used from slipfitterterminal block to signal indications.
- (3) See Standard Drawing E 805-SGGR-03 for grounding lug details.

## INDIANA DEPARTMENT OF TRANSPORTATION

# PEDESTAL MOUNTED SIGNAL INDICATIONS

SEPTEMBER 2007

STANDARD DRAWING NO. E 805-SGCO-05

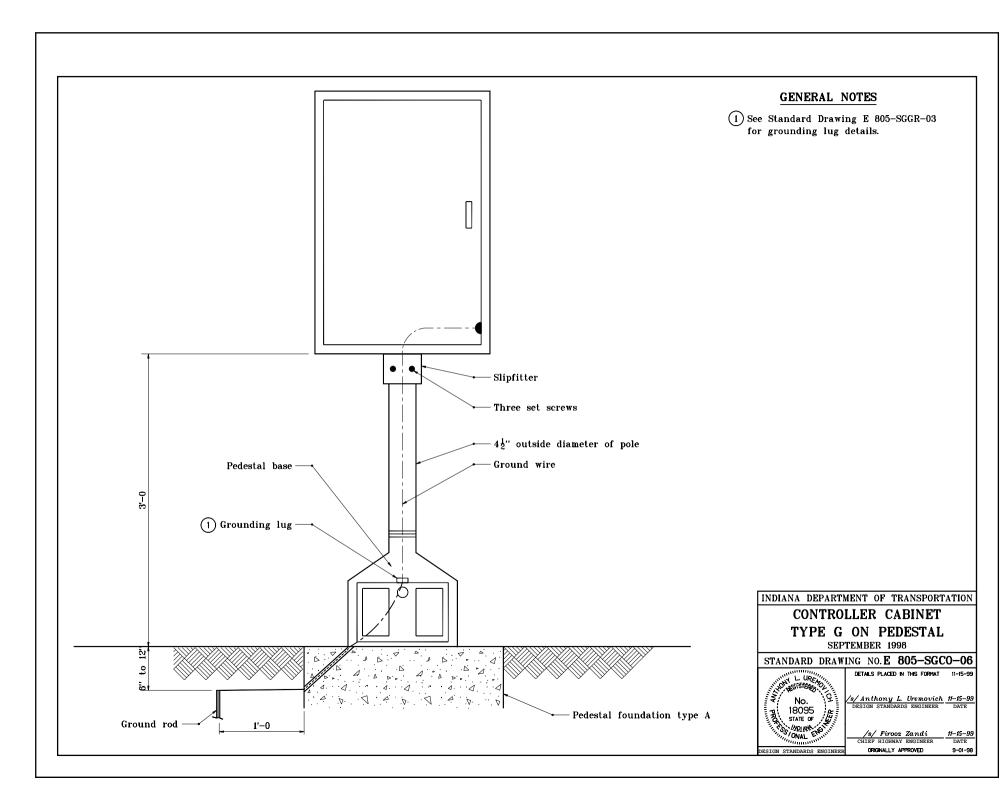


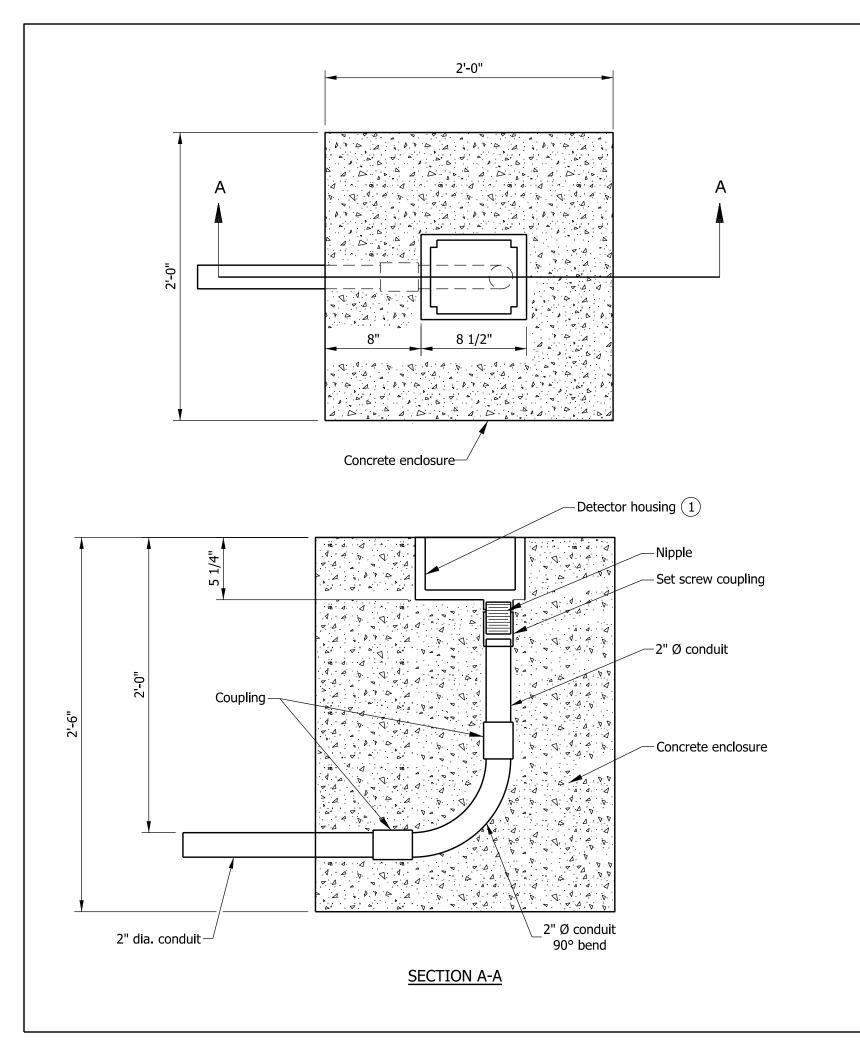
/s/Richard L. VanCleave DESIGN STANDARDS ENGINEER

09/04/07 DATE

/s/ Mark A. Miller CHIEF HIGHWAY ENGINEER 09/04/07 DATE

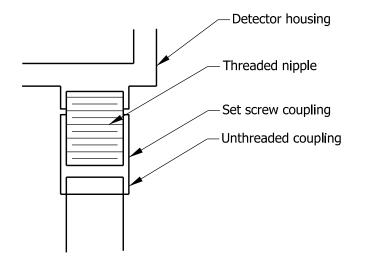
DESIGN STANDARDS ENGINEER





## **NOTE**

1 See Standard Drawing E 805-SGDH-02 for detector housing detail.



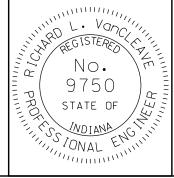
DETECTOR HOUSING COUPLING DETAIL

## INDIANA DEPARTMENT OF TRANSPORTATION

INSTALLATION DETAIL DETECTOR HOUSING

SEPTEMBER 2012

STANDARD DRAWING NO. E 805-SGDH-01

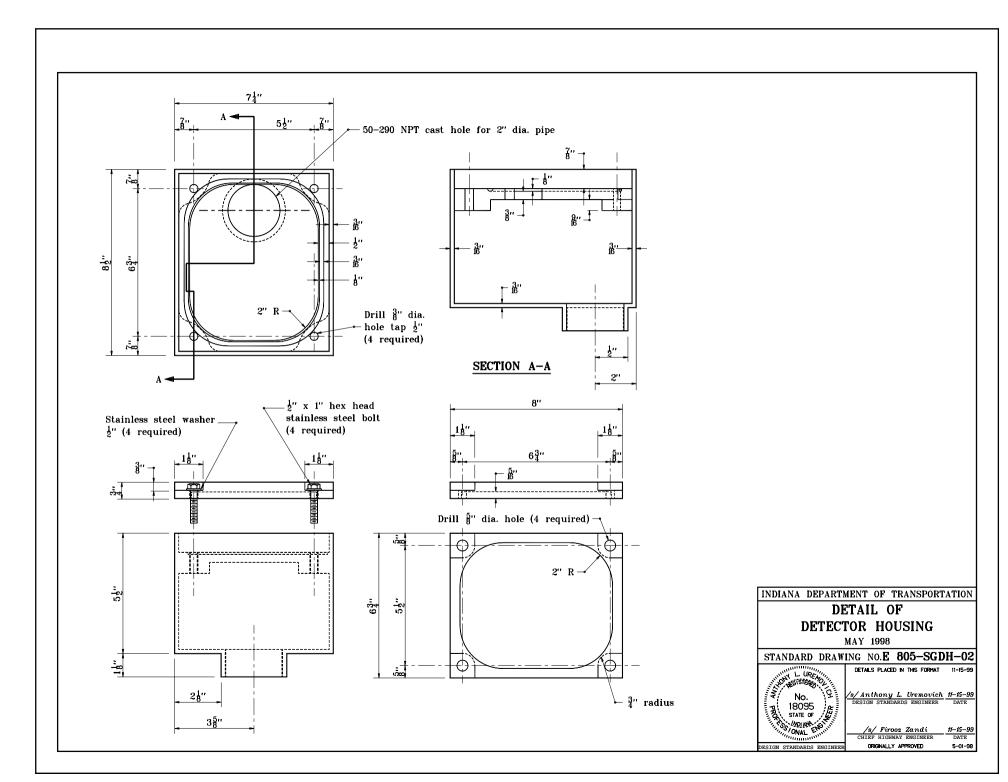


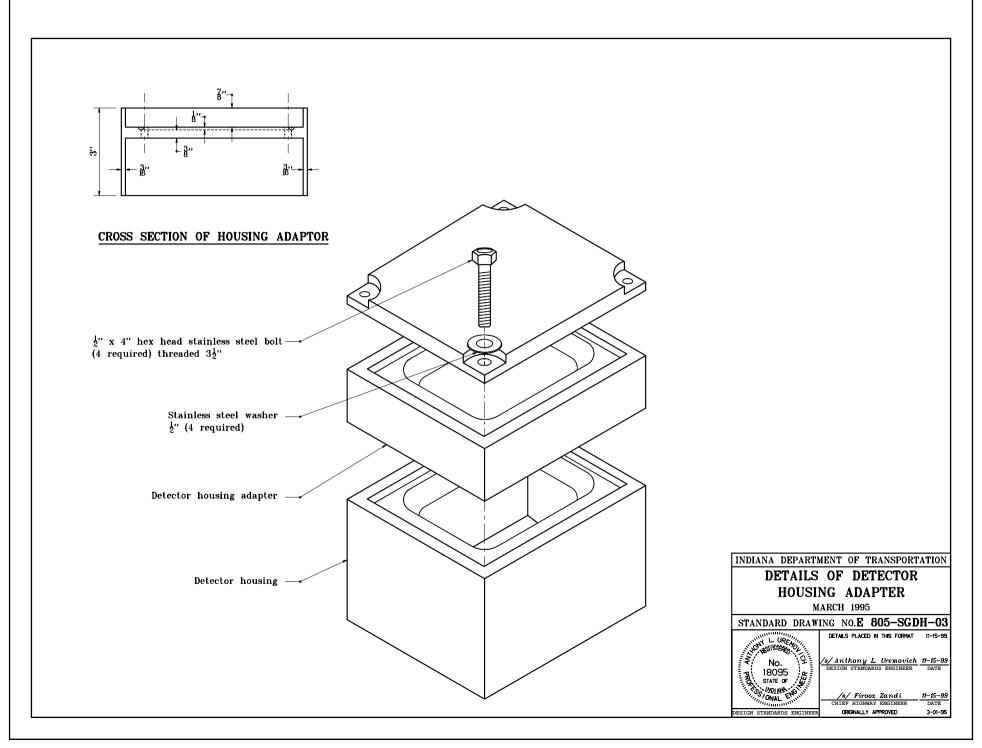
/s/Richard L. VanCleave

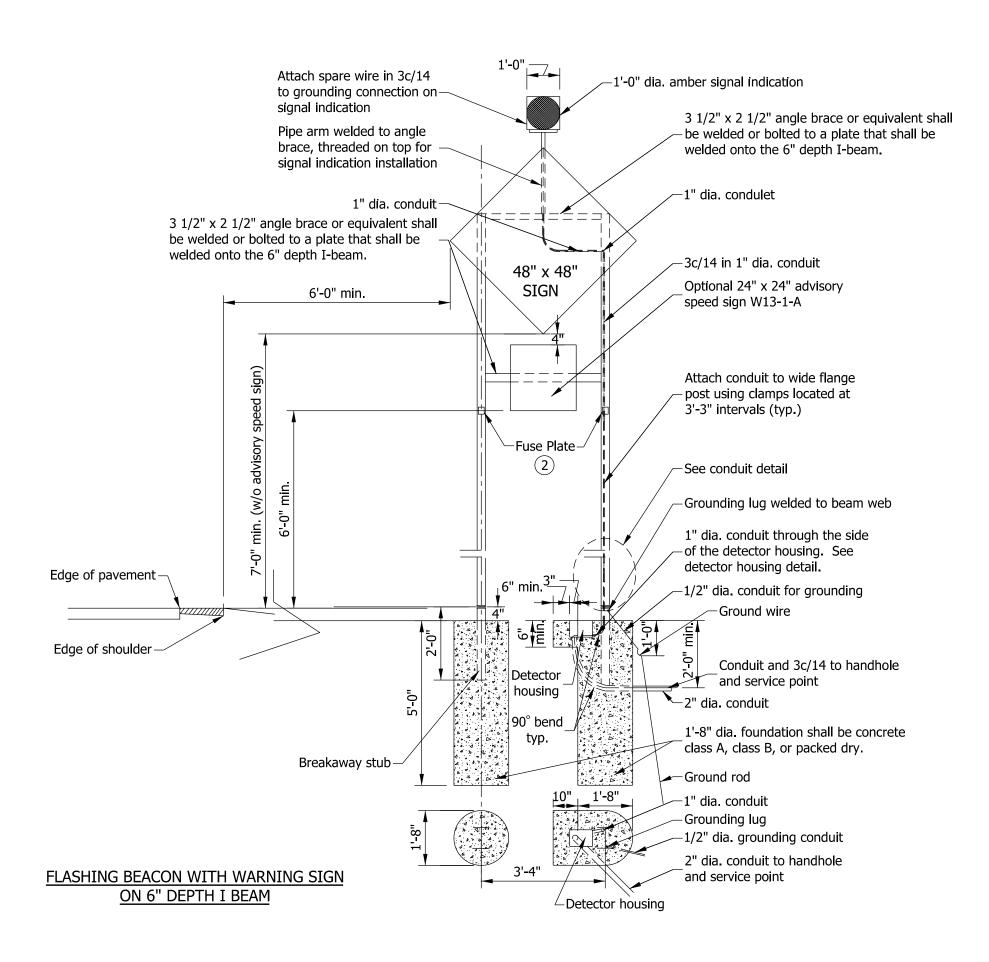
SUPERVISOR, ROADWAY STANDARDS DATE

/s/ Mark A. Miller 09/04/12

09/04/12







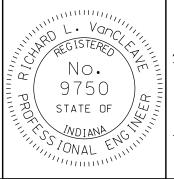
- 1. See Standard Drawing E 802-SNGP-01 through 10 for breakaway details and dimensions. Use post size W 6 x 9.
- The fuse plate shall be 6 in. below the lowest fastener of the sign.
- 3. See Standard Drawing E 805-SGFB-01A for conduit and detector housing details.

## INDIANA DEPARTMENT OF TRANSPORTATION

## FLASHING BEACON WITH WARNING SIGN

SEPTEMBER 2012

STANDARD DRAWING NO. E 805-SGFB-01



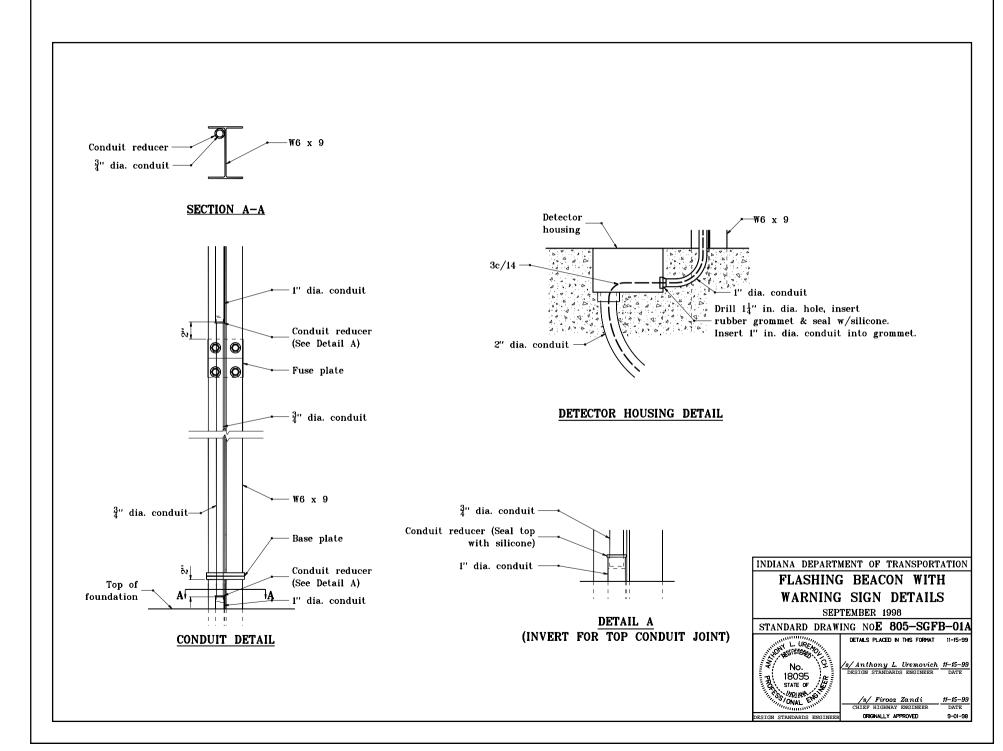
/s/ Richard L. VanCleave

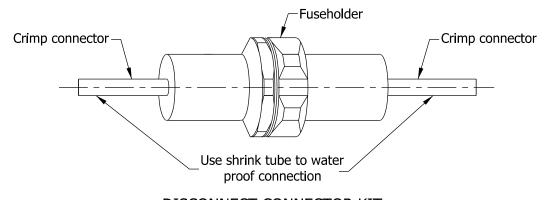
SUPERVISOR, ROADWAY STANDARDS DATE

/s/ Mark A. Miller

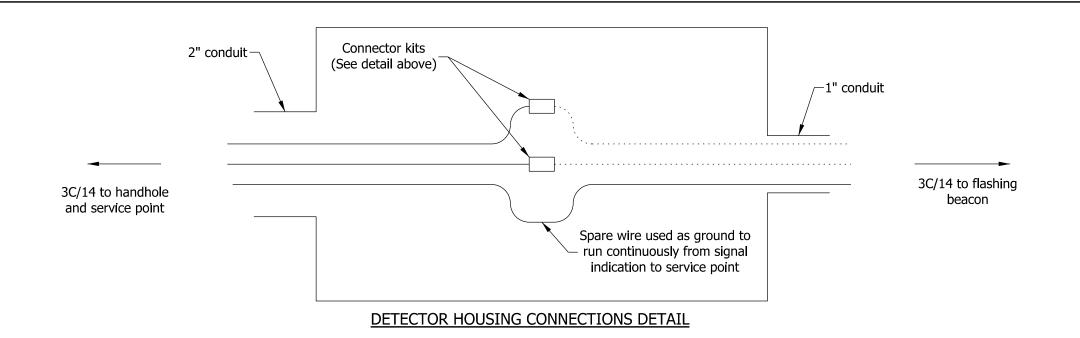
1iller 09/04/12

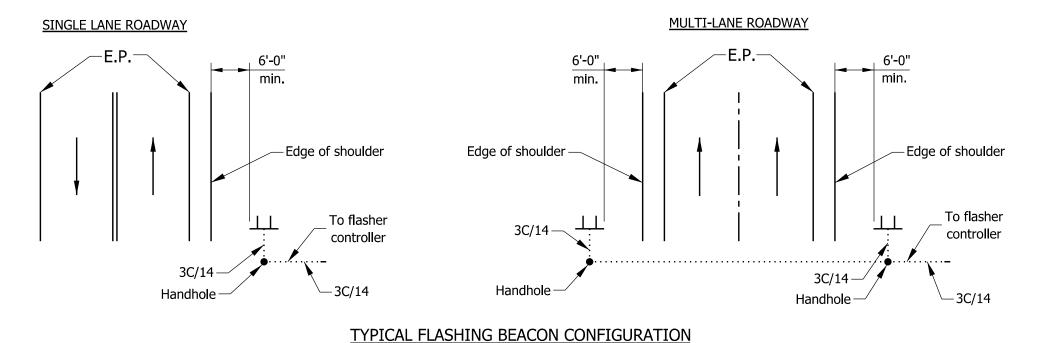
09/04/12





# DISCONNECT CONNECTOR KIT TO BE USED IN DETECTOR HOUSING



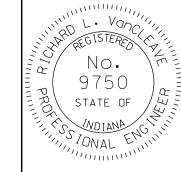


## INDIANA DEPARTMENT OF TRANSPORTATION

FLASHING BEACON WITH WARNING SIGN DETAILS

SEPTEMBER 2012

STANDARD DRAWING NO. E 805-SGFB-02



/s/Richard L. VanCleave

9/04/12

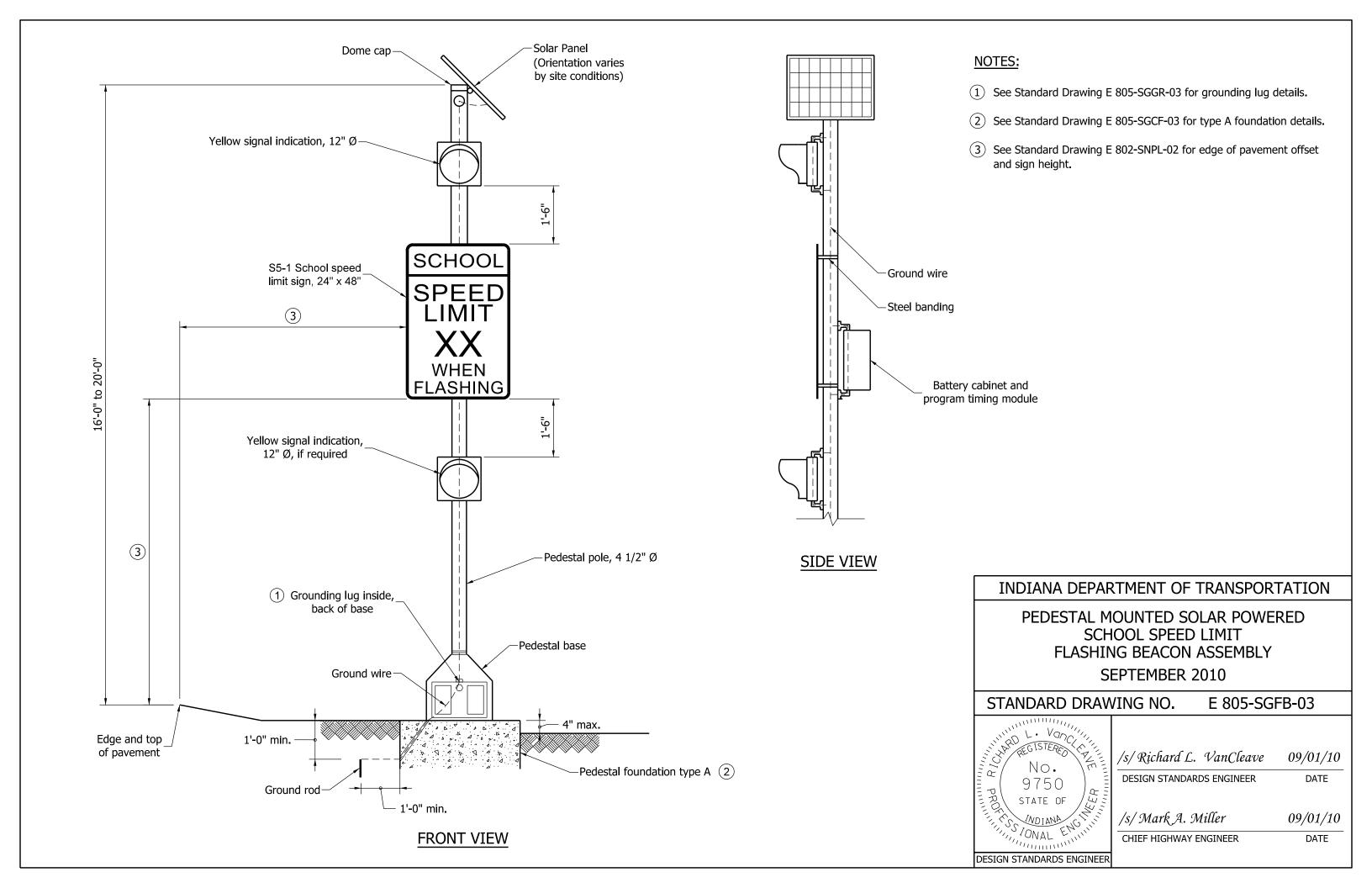
SUPERVISOR, ROADWAY STANDARDS

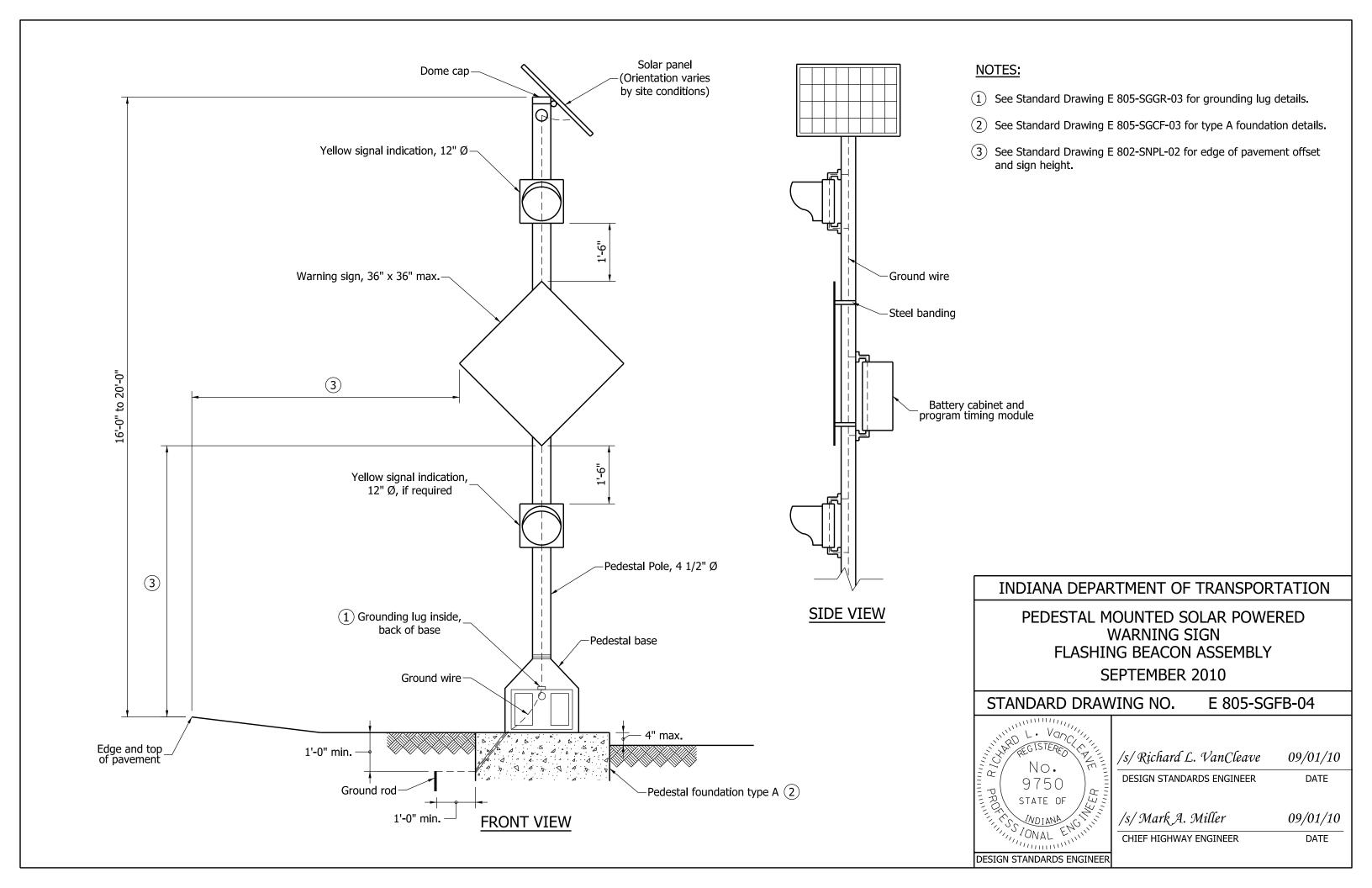
/s/ Mark A. Miller

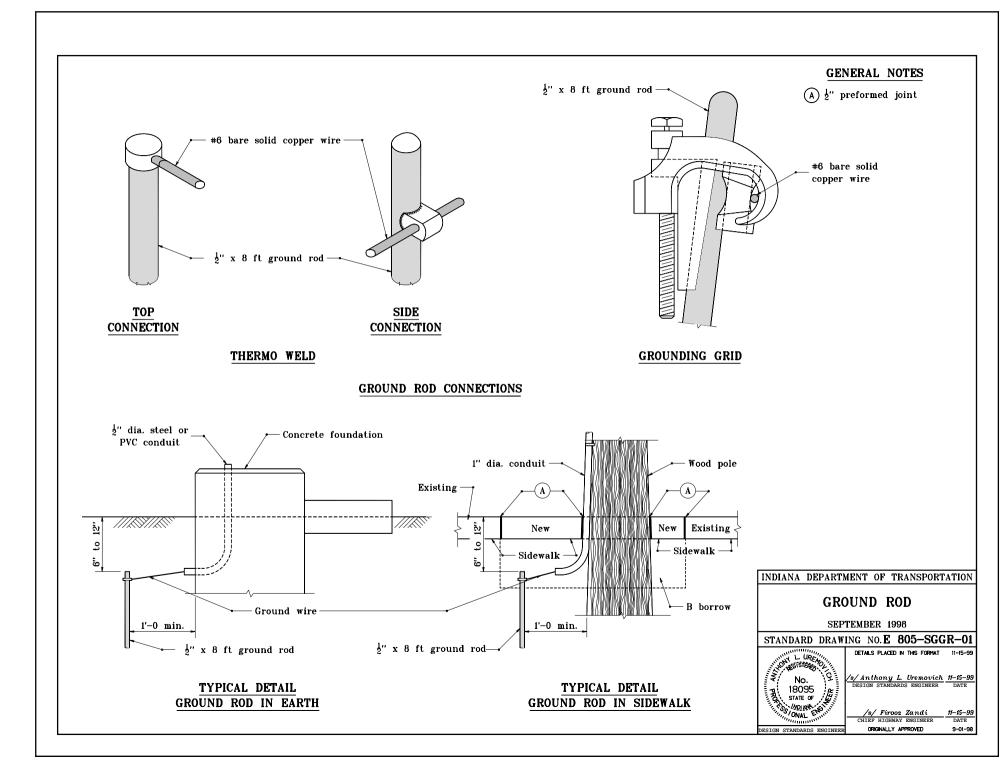
09/04/12

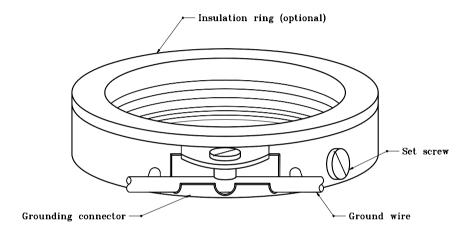
DATE

CHIEF ENGINEER









#### THREADED GROUNDING BUSHING

SEPTEMBER 1998

#### STANDARD DRAWING NO.E 805-SGGR-02

No. 18095 STATE OF ONAL DETAILS PLACED IN THIS FORMAT 11-15-99

/s/Anthony L. Uremovich 11-15-99

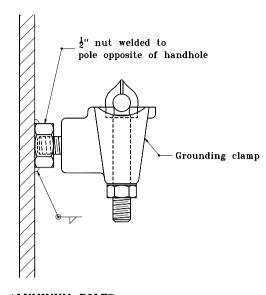
DESIGN STANDARDS ENGINEER DATE

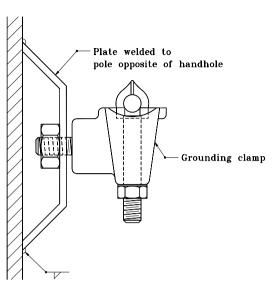
/s/ Firooz Zandi #-

ORIGINALLY APPROVED

DESIGN STANDARDS ENGINEER ORIGINAL

APPROVED 9-01-9

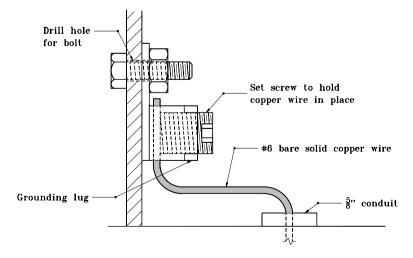


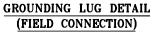


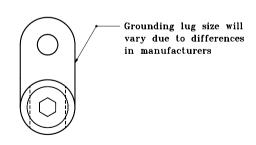
#### ALUMINUM POLES

STEEL POLES

#### GROUNDING POST DETAIL







INDIANA DEPARTMENT OF TRANSPORTATION

#### GROUNDING DETAILS

MARCH 1995

STANDARD DRAWING NO.E 805-SGGR-03

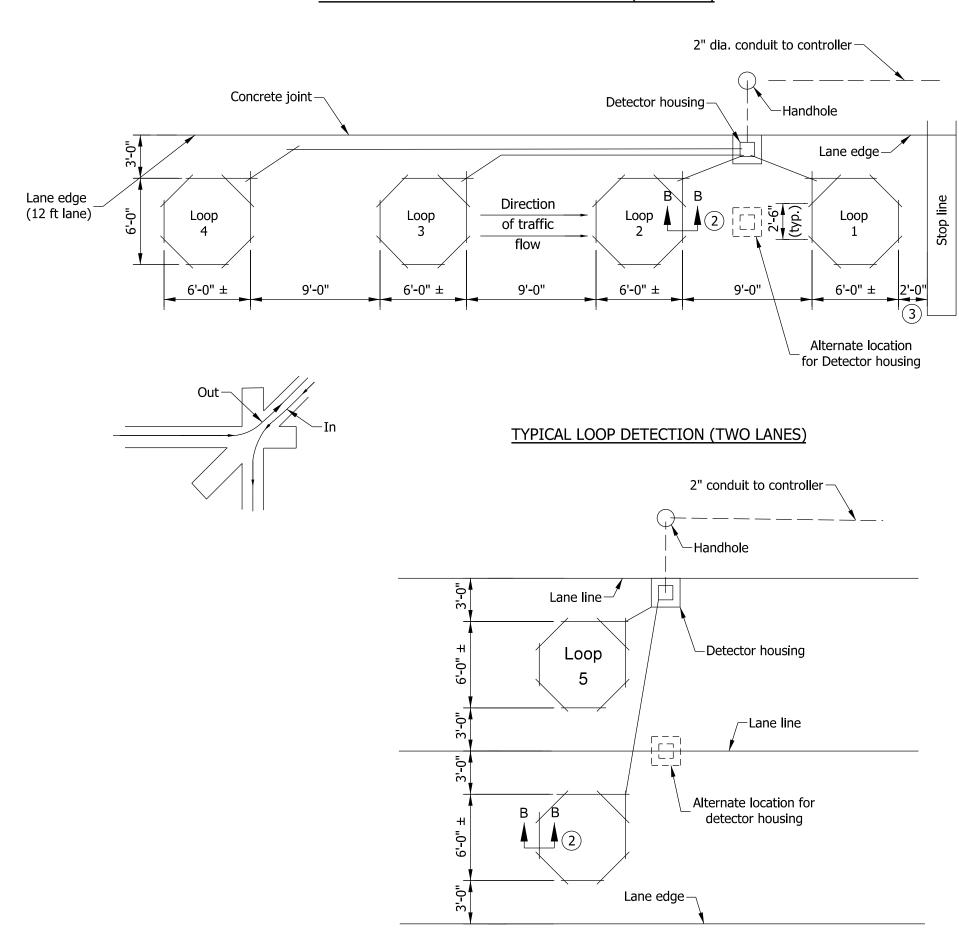
DETAILS PLACED IN THIS FORMAT 11-15-99

s/Anthony L. Uremovich 11-15-99

/s/ Firooz Zandi

ORIGINALLY APPROVED DESIGN STANDARDS ENGINEER

#### TYPICAL LOOP DETECTION SAW-CUT PLAN (ONE LANE)



#### **NOTES**

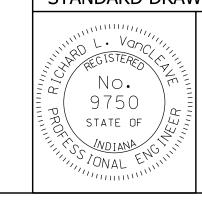
- 1. Loop saw-cuts as shown on plan sheets are to be considered as schematic only. In the event of discrepancies, this detail shall govern.
- ② See Standard Drawing E 805-SGLI-02 for Section B-B.
- 3 This distance is typical depending on the intersection geometrics; a loop can be sawed in front of the stop line.

## INDIANA DEPARTMENT OF TRANSPORTATION

# TRAFFIC SIGNAL LOOP INSTALLATION

SEPTEMBER 2012

STANDARD DRAWING NO. E 805-SGLI-01



/s/Richard L. VanCleave

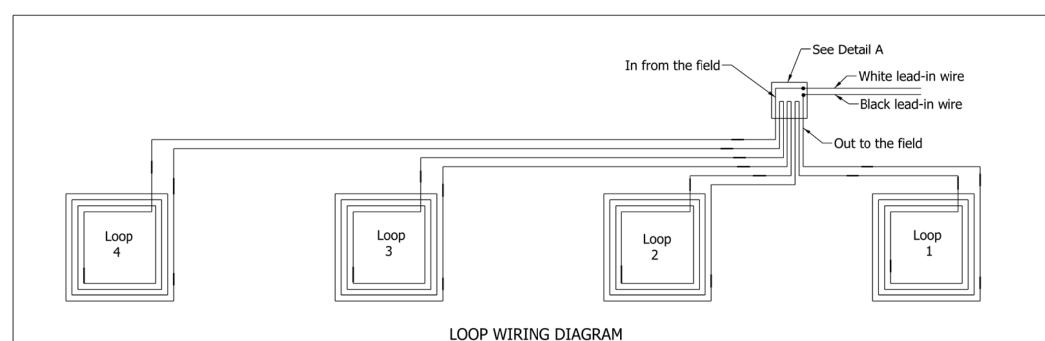
*VanCleave* 09/04/12

SUPERVISOR, ROADWAY STANDARDS

/s/ Mark A. Miller 09/04/12

CHIEF ENGINEER

DATE



Saw cut 3/8" Min.

-Roadway surface

Backer rod

2 to 4 inch

pieces spaced every 12 inches over loop wire

# 7/16" Max. -1C/14 loop wire 1/8" Min. 3/16" Max. White lead-in wire -Black lead-in wire Loop sealant-2C/16 shielded loop lead-in cable -IN-3 -OUT-3 OUT-1 **OUT-4** IN-2 IN-1 See splice detail (waterproofing) 1C/14 wire in 1/4" O.D. PVC 1 LOOP SAW-CUT DETAIL **DETAIL A SECTION B-B DETECTOR HOUSING WIRING**

# NOTES:

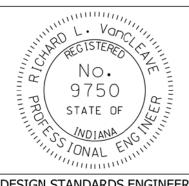
- 1 Duct loop wires to be twisted around each other a minimum of 5 turns/ft then coiled and tied with self-locking strips.
- 2 Loop wires to be tagged in or out as indicated.
- (3) See splice detail (waterproofing) on Standard Drawing E 805-SGLI-04.
- 4. The loop wire is continuously wound in the loop saw slot for the required number of turns.

# INDIANA DEPARTMENT OF TRANSPORTATION

# TRAFFIC SIGNAL LOOP INSTALLATION

SEPTEMBER 2010

# STANDARD DRAWING NO. E 805-SGLI-02



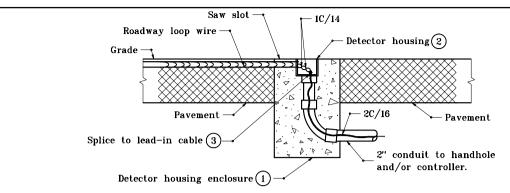
/s/Richarh L. Vancleave 09/01/10 DESIGN STANDARDS ENGINEER DATE

09/01/10

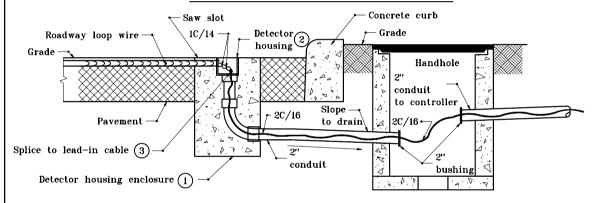
DATE

/s/ Mark A. Miller CHEIF HIGHWAY ENGINEER

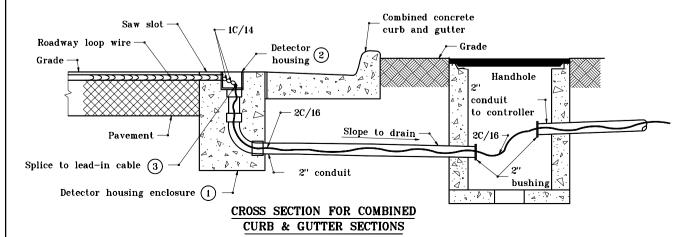
DESIGN STANDARDS ENGINEER



### CROSS SECTION FOR NON-CURBED SECTIONS



### CROSS SECTION FOR CONCRETE CURB SECTIONS



### GENERAL NOTES

- (1) For detail, see Standard Drawing No. E 805-SGDH-01
- (2) For detail, see Standard Drawing No. E 805-SGDH-02
- For detail, see Standard Drawing No. E 805-SGLI-04.

INDIANA DEPARTMENT OF TRANSPORTATION TRAFFIC SIGNAL LOOP DETEC-

TOR HOUSING INSTALLATION

**MARCH 1995** 

STANDARD DRAWING NO. E 805-SGLI-03



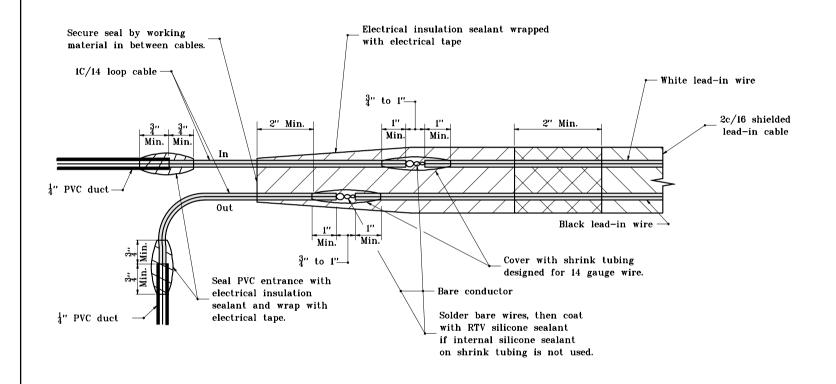
DETAILS PLACED IN THIS FORMAT

Anthony L. Uremovich 11-15-99

/s/ Firooz Zandi 11-15-99

ORIGINALLY APPROVED

3-01-95



### SPLICE DETAIL

# INDIANA DEPARTMENT OF TRANSPORTATION

# TRAFFIC SIGNAL LOOP SPLICE

MARCH 1995

### STANDARD DRAWING NO. E 805-SGLI-04



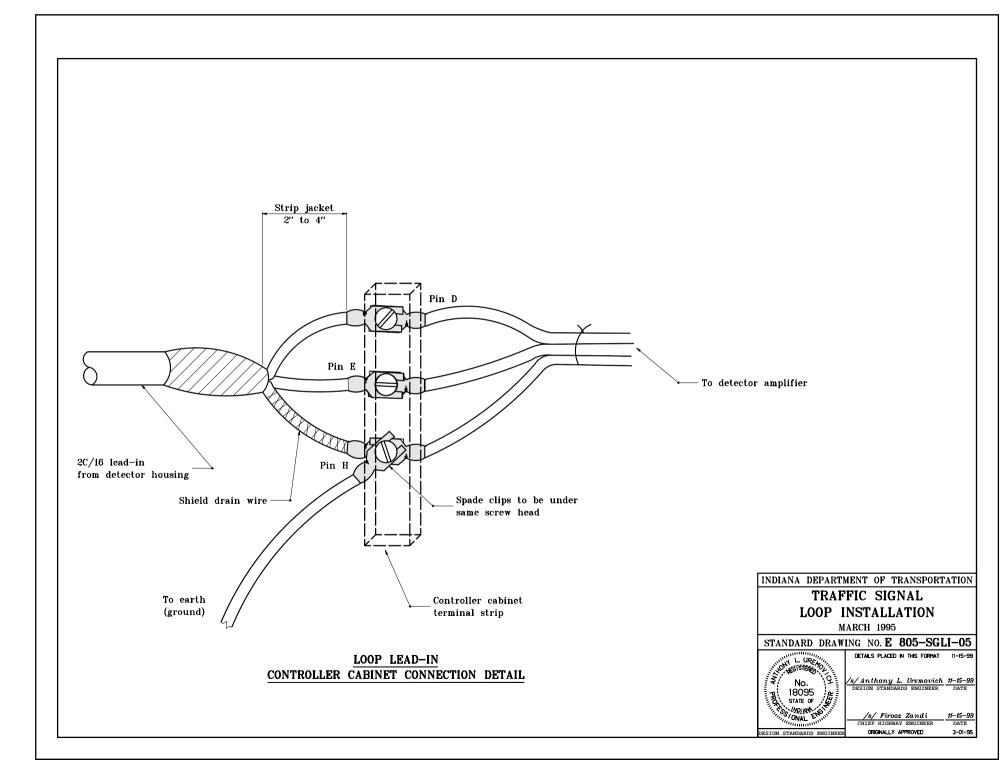
DETAILS PLACED IN THIS FORMAT 11-15-99

/s/Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

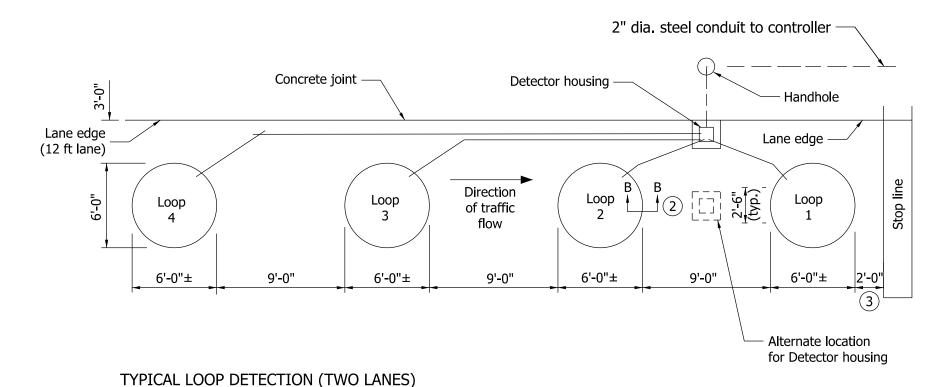
/s/ Firooz Zandi #1-15-

DESIGN STANDARDS ENGINEER

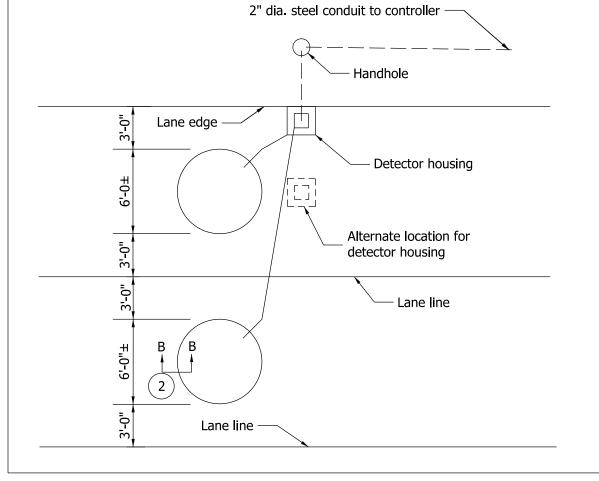
ORIGINALLY APPROVED

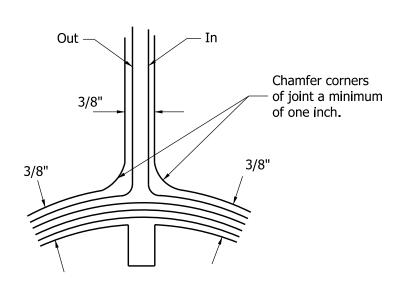


# TYPICAL LOOP DETECTION SAW-CUT PLAN (ONE LANE)



# <u>DETAIL A</u> DETECTOR HOUSING WIRING





The loop wire is continuously wound in the loop saw slot for the required numbers of turns (4 turns shown)

# NOTES:

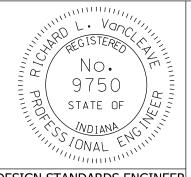
- 1. Loop saw-cuts as shown on the plans are to be considered as schematic only. In the event of discrepancies, this detail shall govern.
- (2) See Standard Drawing E 805-SGLI-02 for Section B-B.
- (3) This distance is typical depending on the intersection geometrics; a loop can be sawed in front of the stop line.
- 4. The loop(s) shall be centered transversely in the travel lane.
- 5. The saw slot for the line from the detector housing to the circular loop shall be approximately perpendicular to the tangent of the loop at the point of intersection.

# INDIANA DEPARTMENT OF TRANSPORTATION

# TRAFFIC SIGNAL LOOP INSTALLATION

SEPTEMBER 2011

# STANDARD DRAWING NO. E 805-SGLI-06



/s/ Richarh L. Vancleave
DESIGN STANDARDS ENGINEER

/s/ Mark A. Miller

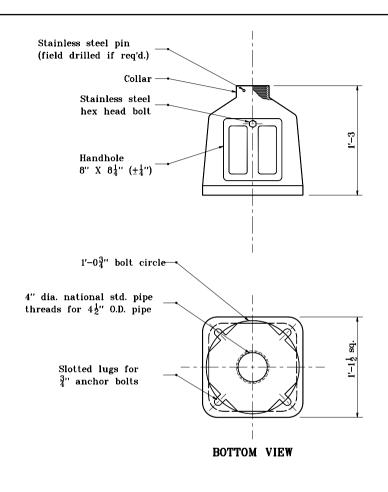
CHEIF HIGHWAY ENGINEER

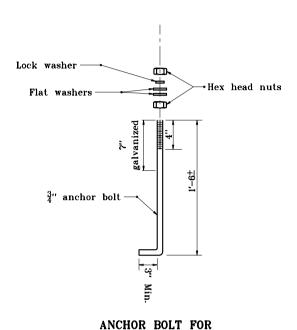
DESIGN STANDARDS ENGINEER

09/01/11 DATE

09/01/11

DATE





A, M, AND P-1 FOUNDATIONS

# INDIANA DEPARTMENT OF TRANSPORTATION

# ANCHOR BOLTS AND PEDESTAL BASE

SEPTEMBER 1998

STANDARD DRAWING NO. E 805-SGPB-01

No. 18095

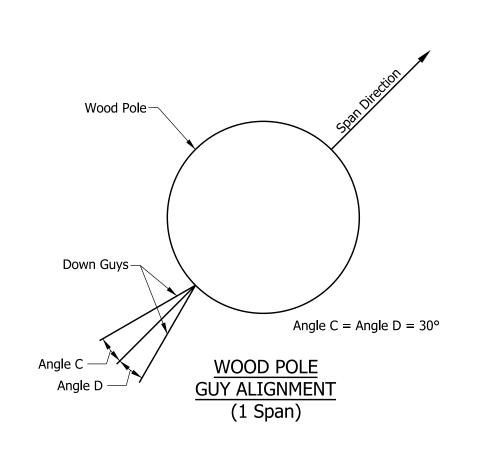
's/Anthony L. Uremovich #1-15-99
DESIGN STANDARDS ENGINEER DATE

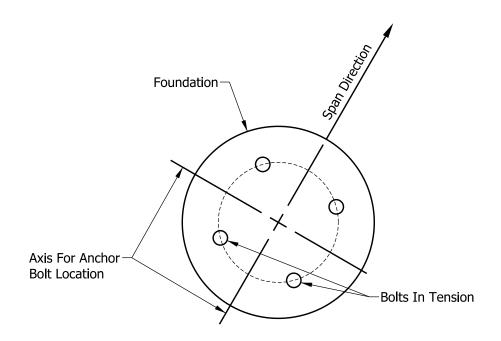
/s/ Firooz Zandi 1

DETAILS PLACED IN THIS FORMAT

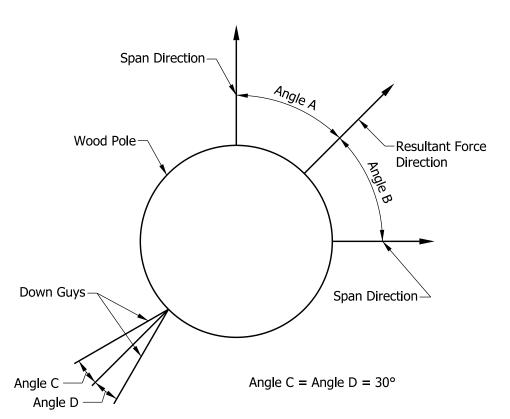
ORIGINALLY APPROVED

DESIGN STANDARDS ENGINEER ORG





# STEEL STRAIN POLE ANCHOR BOLT ORIENTATION (1 Span)



Span Direction

Angle A

Resultant Force Direction

Axis For Anchor Bolt Location

Span Direction

Span Direction

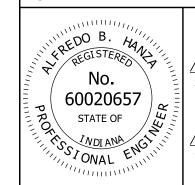
STEEL STAIN POLE ANCHOR BOLT ORIENTATION (2 Spans)

# INDIANA DEPARTMENT OF TRANSPORTATION

# **POLE ALIGNMENT**

# SEPTEMBER 2013

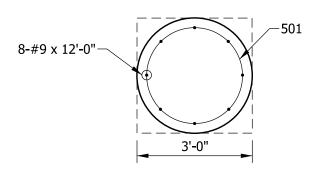
STANDARD DRAWING NO.	E 805-SGSC-01
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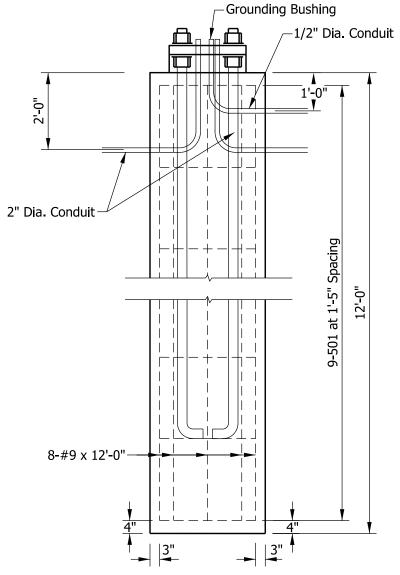


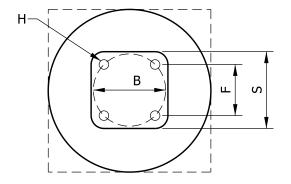
DETAILS PLACED IN THIS FORMAT	09/01/15
/s/ Alfredo B. Hanza	02/27/13
SUPERVISOR, TRAFFIC DESIGN	DATE

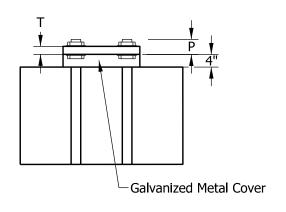
/s/ Mark A. Miller 03/27/13
CHIEF ENGINEER DATE

# WOOD POLE GUY ALIGNMENT (2 Spans)

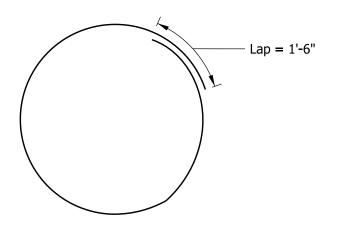








BASE PLATE AND ANCHOR BOLT DATA								
Anchor Bolts	В	F	Н	Р	S	Т	Pole Size	Foundation
2 1/4" x 8'-0"	1'-10"	1'-3 1/2"	2 3/4"	4 3/4"	1'-11"	2 1/2"	1'-3" x 30' 1'-5" x 36'	3'-0" x 12'



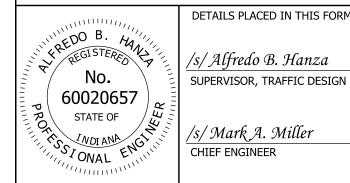
501 x 9'-4"

# INDIANA DEPARTMENT OF TRANSPORTATION

# STEEL SIGNAL STRAIN POLE FOUNDATION DETAILS

SEPTEMBER 2013

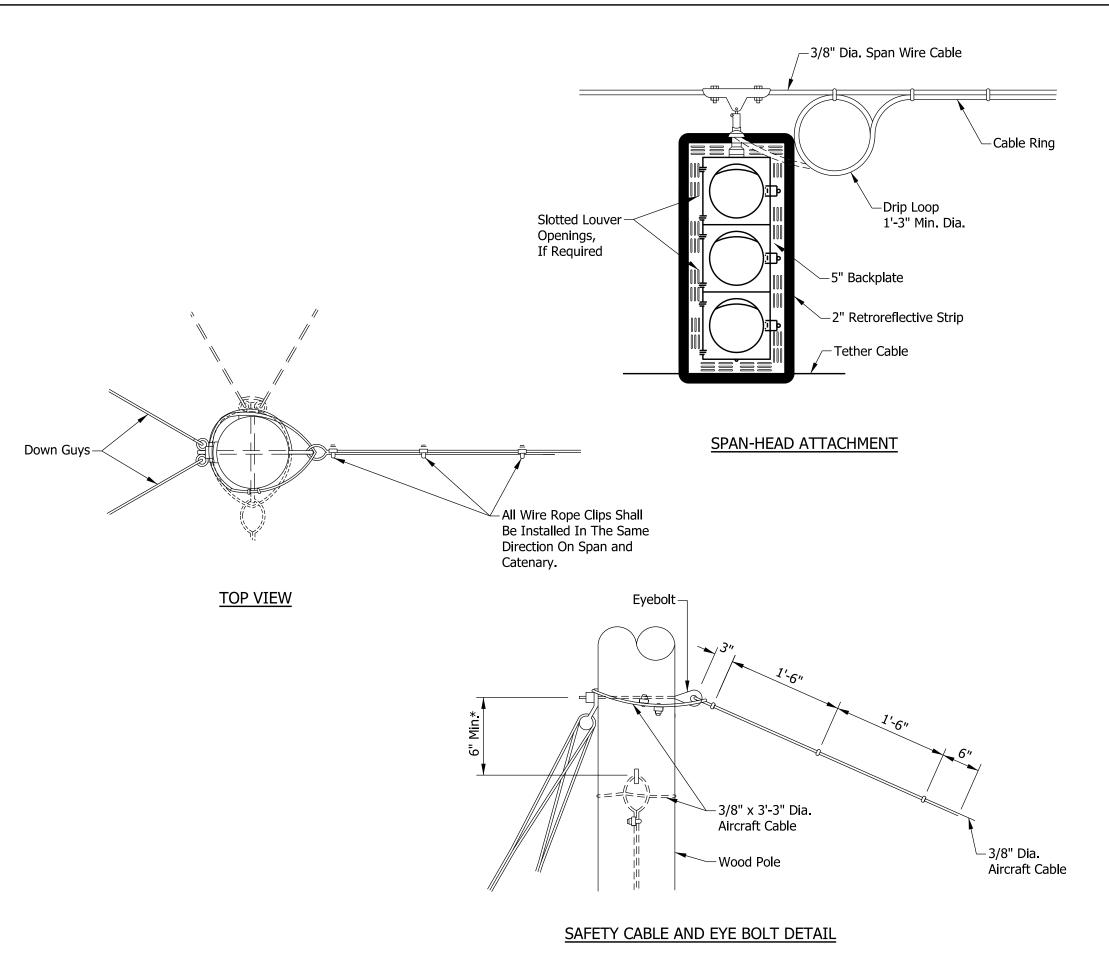
STANDARD DRAWING NO. E 805-SGSC-02



DETAILS PLACED IN THIS FORMAT	09/01/15
/s/ Alfredo B. Hanza	02/27/1

s/Mark A. Miller	03/27/13
HIFE ENGINEER	DATE

DATE



\* If more than one catenary is attached to pole.

# NOTES:

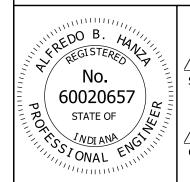
- 1. Installation is the same for steel strain poles except pole bands will be used.
- 2. Aircraft cable shall use a heavy closed wire rope thimble at contact with pole bands.

# INDIANA DEPARTMENT OF TRANSPORTATION

# CABLE SPAN ATTACHMENT

SEPTEMBER 2013

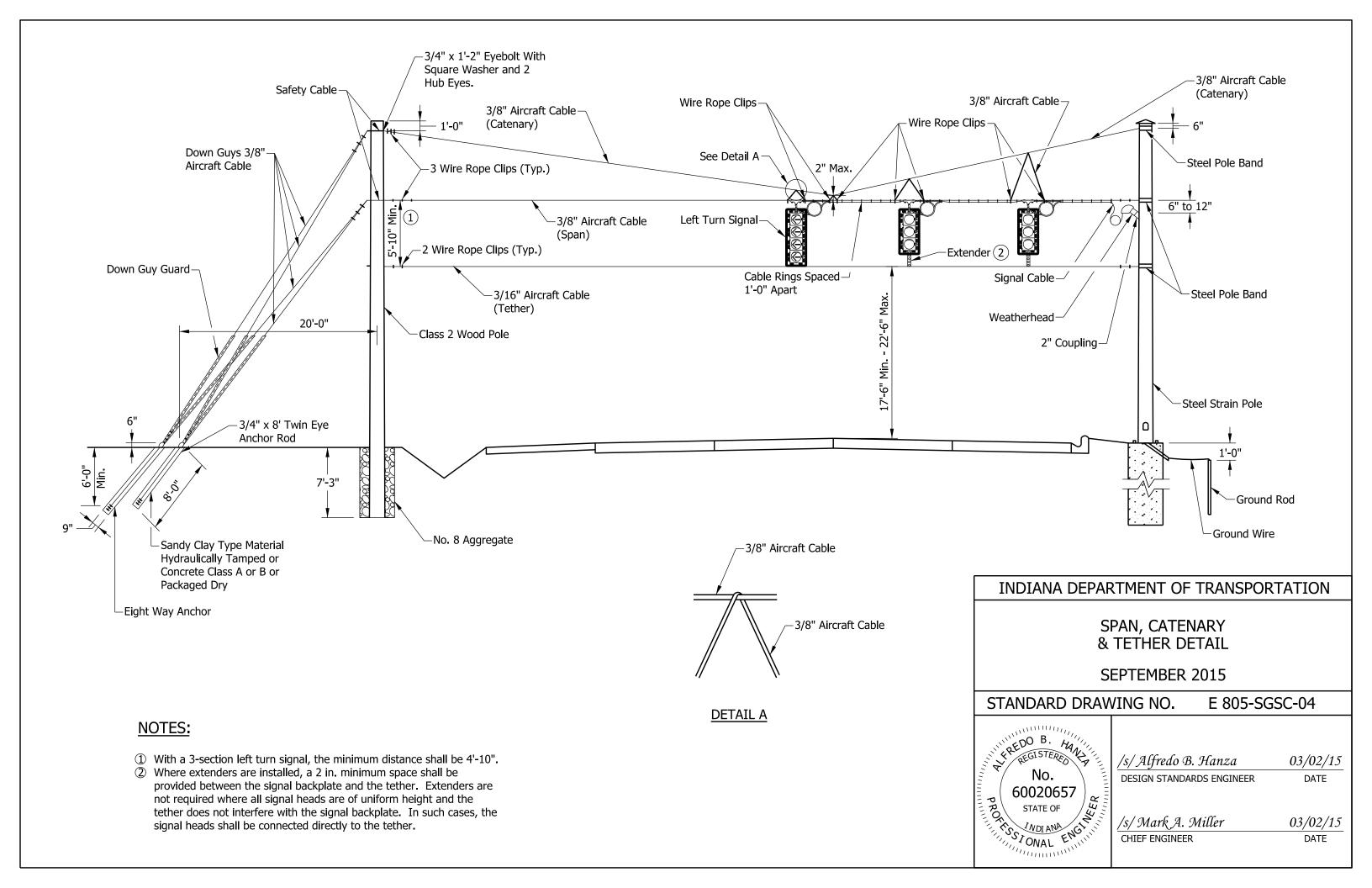
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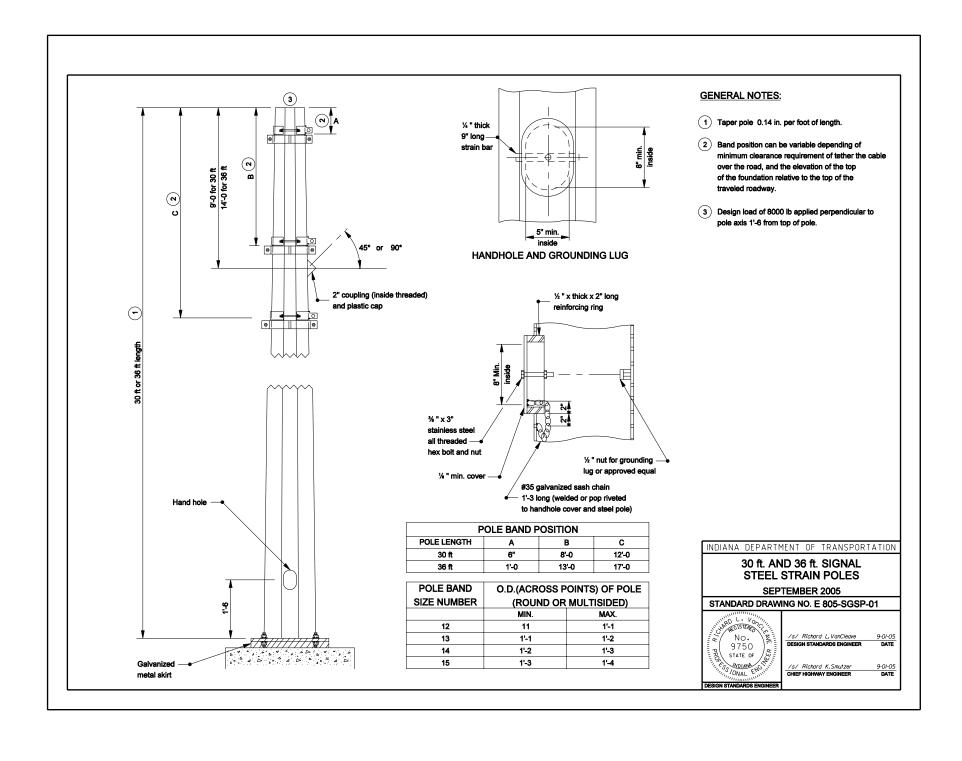


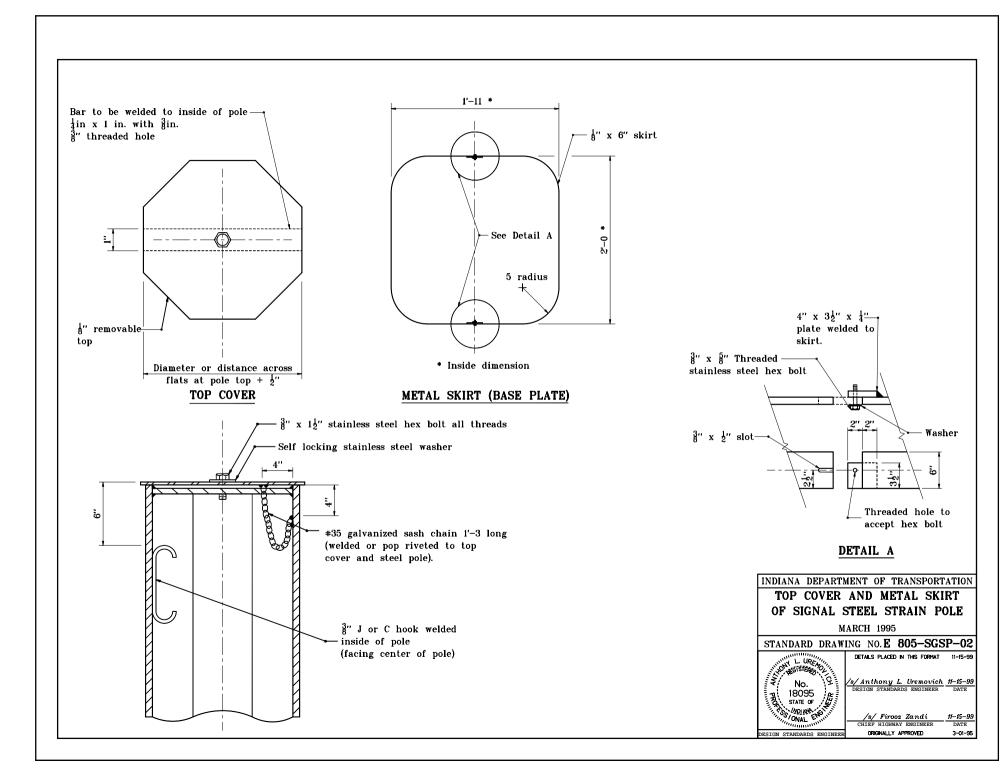
DETAILS PLACED IN THIS FORMAT 09/01/15

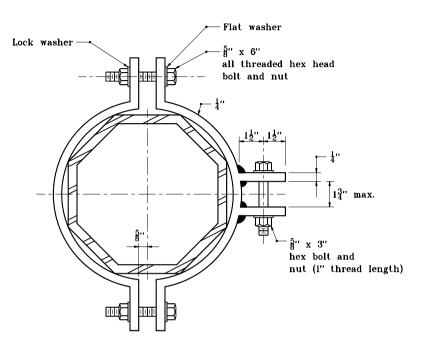
/s/ Alfredo B. Hanza 02/27/13 SUPERVISOR, TRAFFIC DESIGN DATE

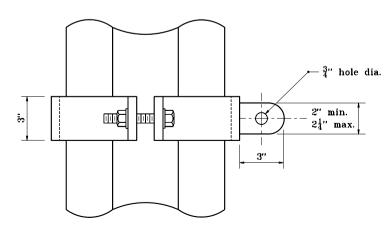
/s/ Mark A. Miller 03/27/13











REQUIRES TWO POLE BANDS AT EACH POSITION ON POLE (SIX BANDS PER POLE)

## INDIANA DEPARTMENT OF TRANSPORTATION

# POLE BAND FOR SIGNAL STEEL STRAIN POLE

SEPTEMBER 1998

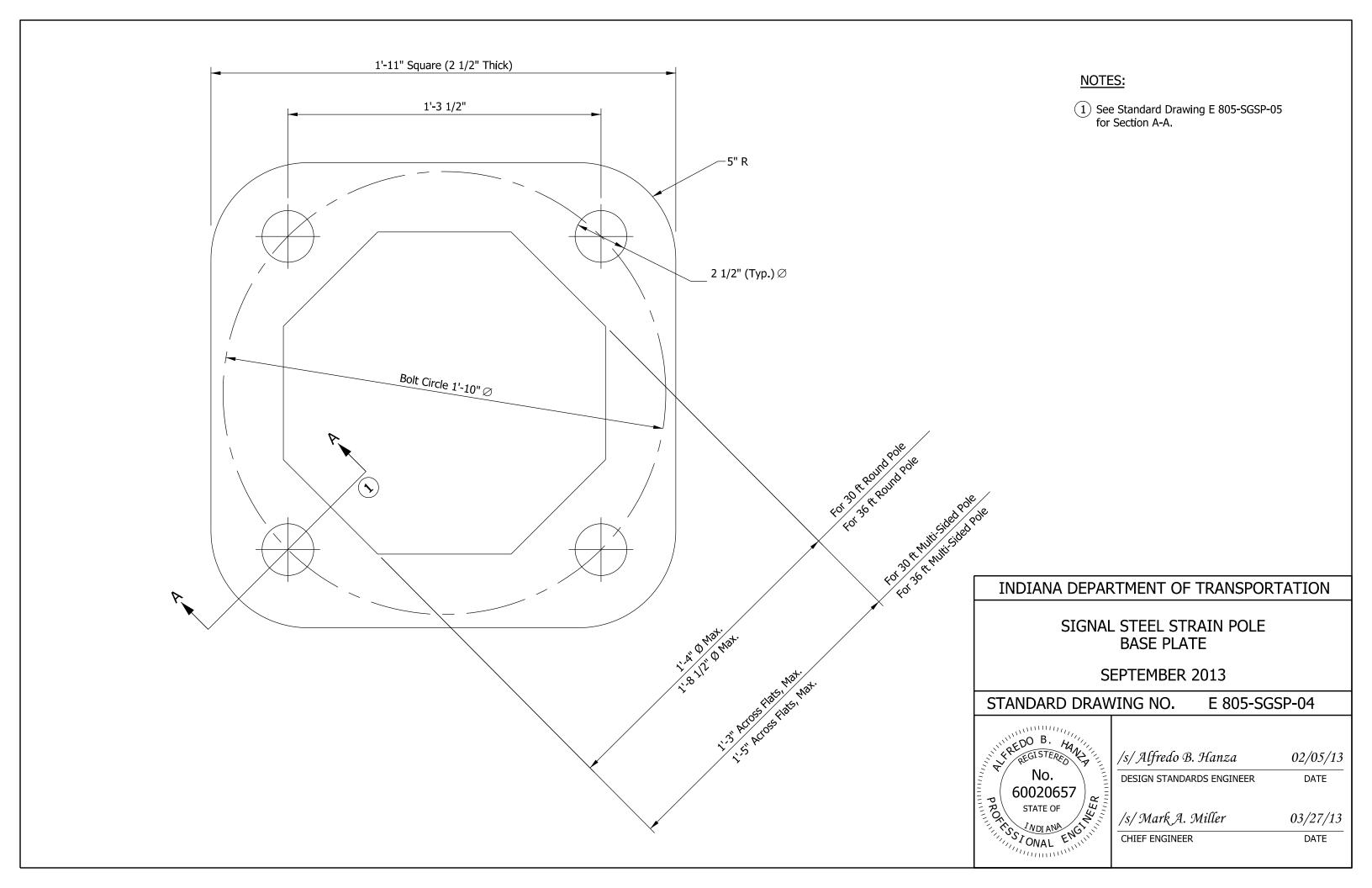
STANDARD DRAWING NO.E 805-SGSP-03

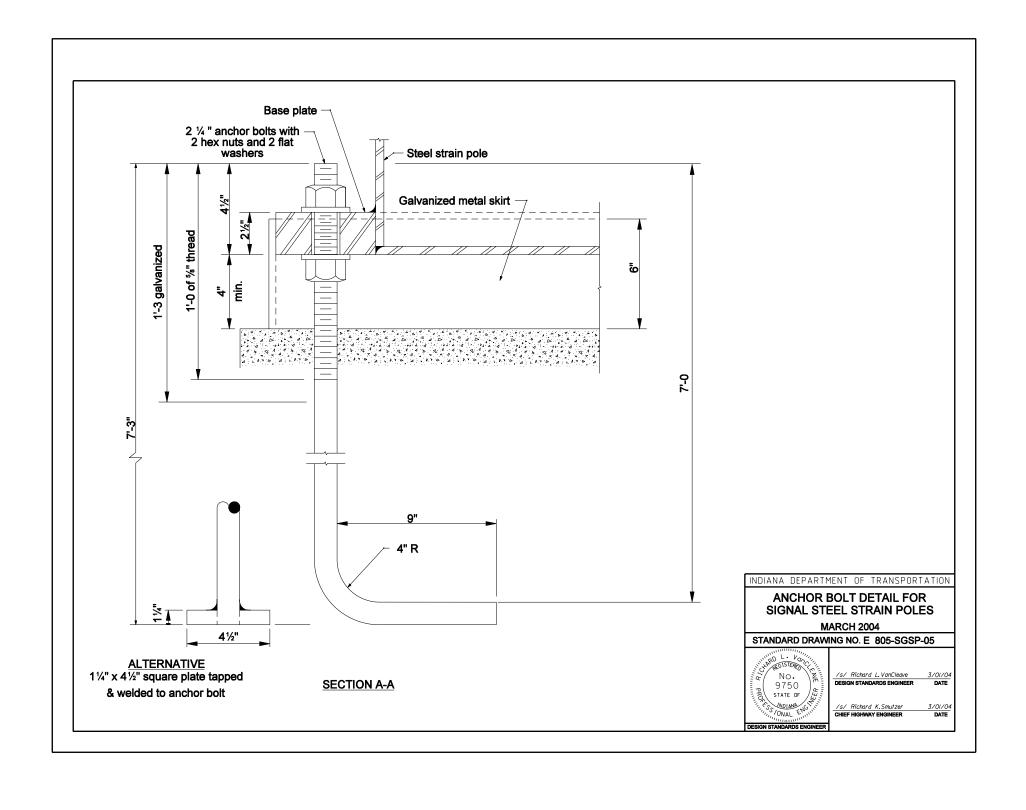


/s/Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/S/ Firooz Zandi
CHIEF HIGHWAY ENGINEER
TANDARDS ENGINEER
ORGONALLY APPROVED

DESIGN STANDARDS ENGINEER





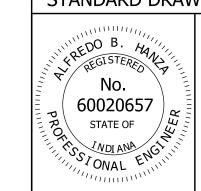
	INDEX				
SHEET NO.	SUBJECT				
1	Drawing Index				
2	Single Signal Arm Pole Elevation, Dimensions, and Base Plate Weld Detail				
3	Signal Arm Dimensions & Details				
4	Signal Arm Pole Base Plate, Bottom Splice Plates, and Pole Top Cover Details				
5	Signal Arm Connection Details				
6	Handhole Details				
7	Placement of Signals and Signs, Loading for Arm of 35' or Less				
8	Placement of Signals and Signs, Loading for Arm of Greater Than 35' to 60'				
9	Combination Pole Elevation, Dimensions, and Base Plate Weld Detail				
10	Combination Arm Dimensions & Details				
11	Combination Arm Connection Details				
12	Combination Pole Splice Details for Arms 35' or Less				
13	Combination Pole Splice Details for Arm of Greater Than 35' to 60'				
14	Combination Arm Loading for Arm of 35' or Less				
15	Combination Arm Loading for Arm of Greater Than 35' to 60'				
16	Drilled Shaft Foundation Type A for Arm of 35' or Less				
17	Drilled Shaft Foundation Type B for Arm of Greater Than 35' to 60'				
18	Spread Footing Foundation Type C for Arm of 35' or Less				
19	Spread Footing Foundation Type D for Arm of Greater Than 35' to 60'				

# INDIANA DEPARTMENT OF TRANSPORTATION

# TRAFFIC SIGNAL CANTILEVER STRUCTURE DRAWING INDEX

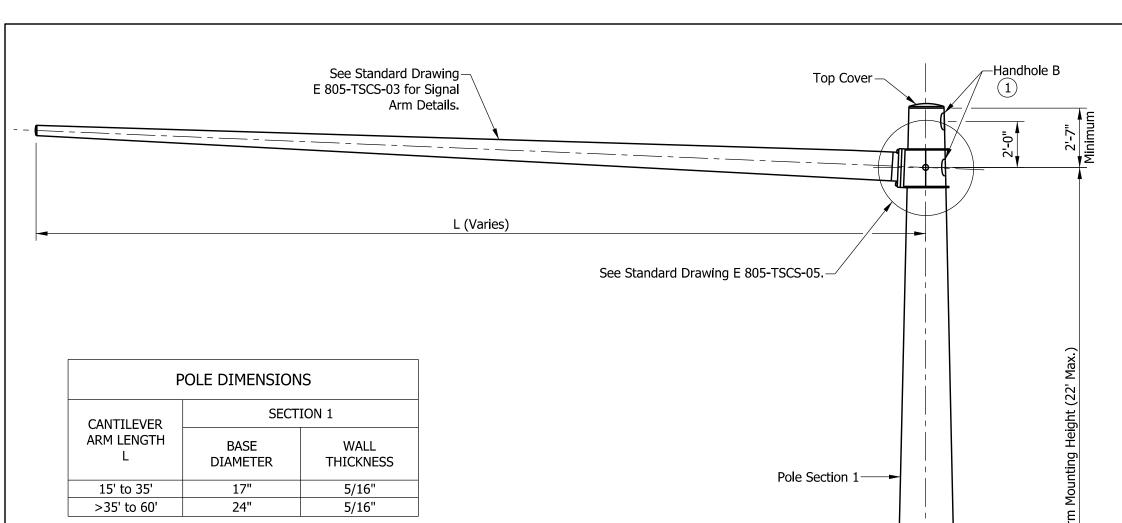
SEPTEMBER 2013

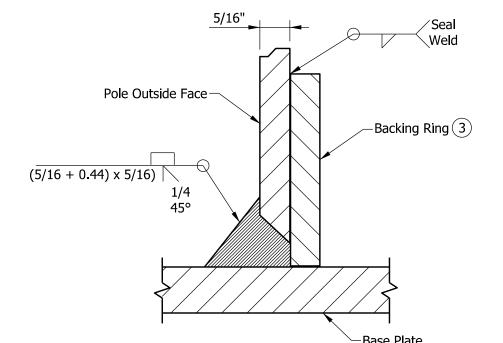
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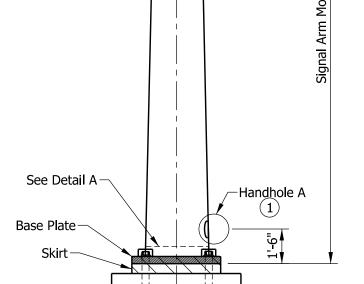
 $\frac{/s/Alfredo\ B.\ Hanza}{\text{DESIGN STANDARDS ENGINEER}} \frac{02/05/13}{\text{DATE}}$ 

/s/ Mark A. Miller 03/27/13









POLE ELEVATION

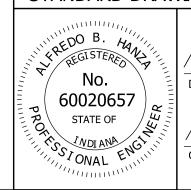
# NOTES:

- 1 See Standard Drawing E 805-TSCS-06 for handhole details.
- 2. See Standard Drawing E 805-SGGR-01 to -03 for grounding details.
- 3) Use continuous backing ring, 5/16" x 2" minimum. Tack weld only in root area of final weld.

# INDIANA DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL CANTILEVER STRUCTURE SINGLE SIGNAL ARM POLE ELEVATION, DIMENSIONS, AND BASE PLATE WELD DETAIL SEPTEMBER 2014

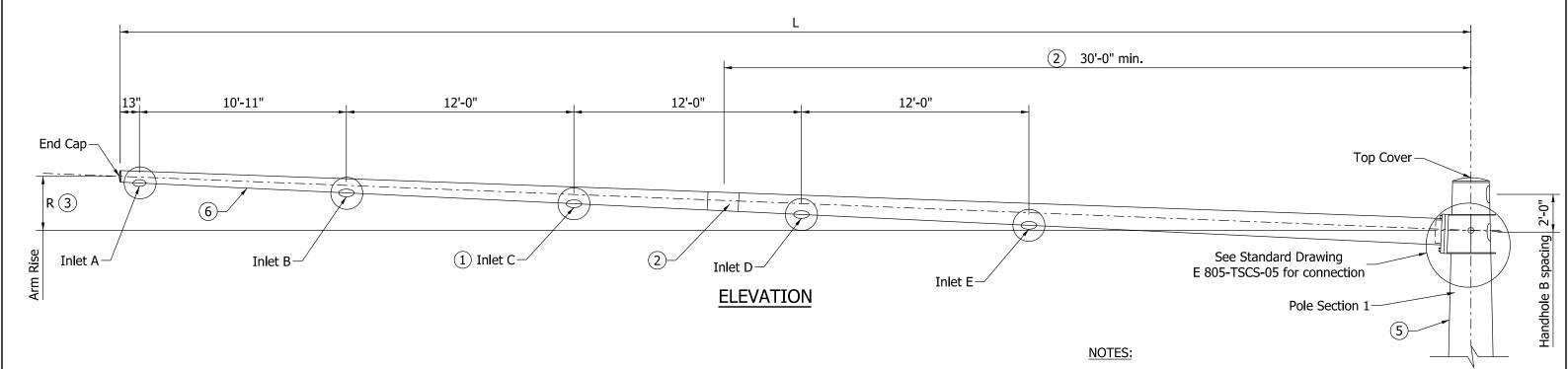
STANDARD DRAWING NO. E 805-TSCS-02



/s/ Alfredo B. Hanza 12/02/13
DESIGN STANDARDS ENGINEER DATE

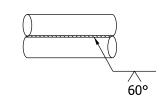
/s/ Mark A. Miller 12/05/13

CHIEF ENGINEER



Base section with wall thickness 5/16" and field drilled hole for 5/8" bolt with curved washer and lock nut

**2 OPTIONAL ARM SPLICE DETAIL** 



**5 TYPICAL SEAM WELD** 

ARM DIMENSIONS TABLE					
L (ft.)	ARM DIAMETER AT POLE	ARM WALL THICKNESS (in.)	R (in.)	CABLE INLETS	
15	8"	5/16"	7 1/2"	A, B	
20	10"	5/16"	10"	A, B	
25	11"	5/16"	1'-0 1/2"	A, B	
30	13"	5/16"	1'-3"	A, B	
35	14"	5/16"	1'-5 1/2"	А, В, С	
40	15"	5/16"	1'-8"	А, В, С	
45	17"	5/16"	1'-10 1/2"	А, В, С	
50	19"	5/16"	2'-1"	A, B, C, D	
55	20"	5/16"	2'-3 1/2"	A, B, C, D	
60	21"	5/16"	2'-6"	A, B, C, D, E	

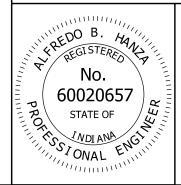
- 1 Number of cable inlets depends on arm L (See Arm Dimensions Table). The inlet diameter shall be 1 3/4" with rubber grommet (Typ.)
- 2 Optional splice can be used for arm length of greater than 40'. Field assembly shall achieve a snug tight joint, with minimum overlap not less than 1.5 times the inside dimension of the end section.
- 3 Arm rise R is measured in the undeflected position without vertical loads on the arm.
- 4. See Standard Drawings E 805-TSCS-07 and -08 for placement of signal and signs for each arm length.
- (5) If seam welds are used, the weld location for the arms shall be along the bottom, and on the side of pole as shown.

# INDIANA DEPARTMENT OF TRANSPORTATION

# TRAFFIC SIGNAL CANTILEVER STRUCTURE SIGNAL ARM DIMENSIONS & DETAILS

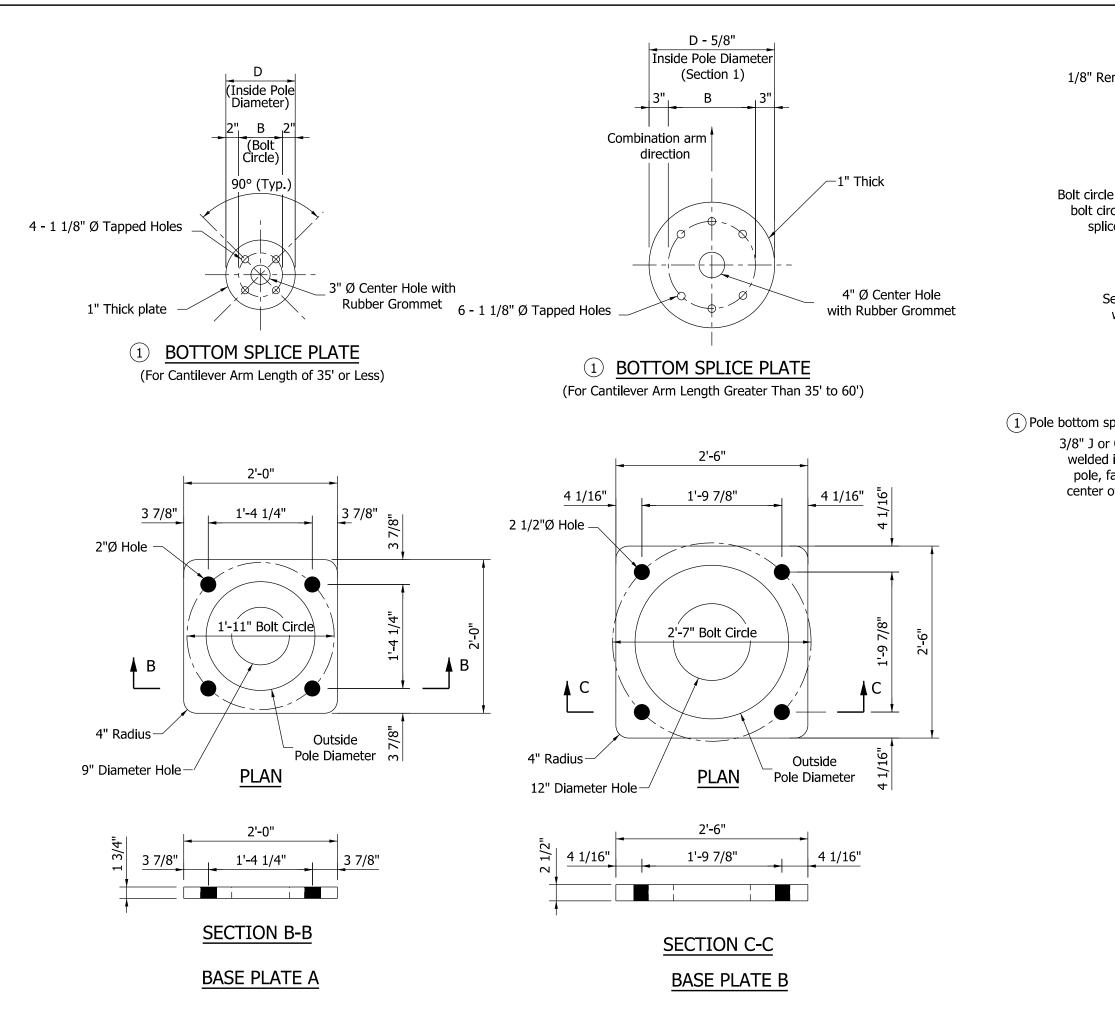
SEPTEMBER 2013

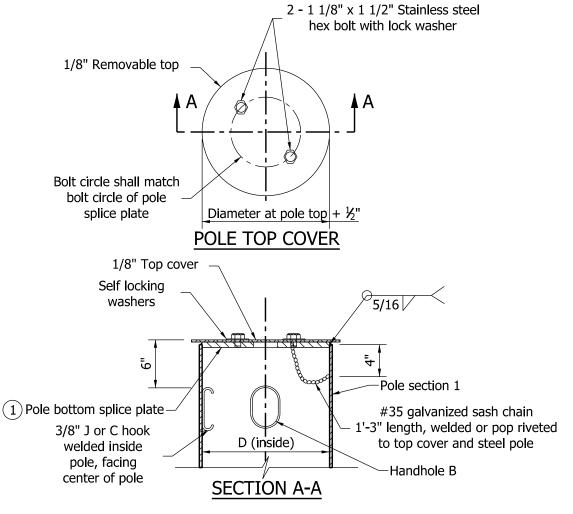
STANDARD DRAWING NO. E 805-TSCS-03



/s/Alfredo B. Hanza 02/05/13
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13

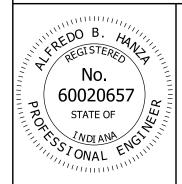




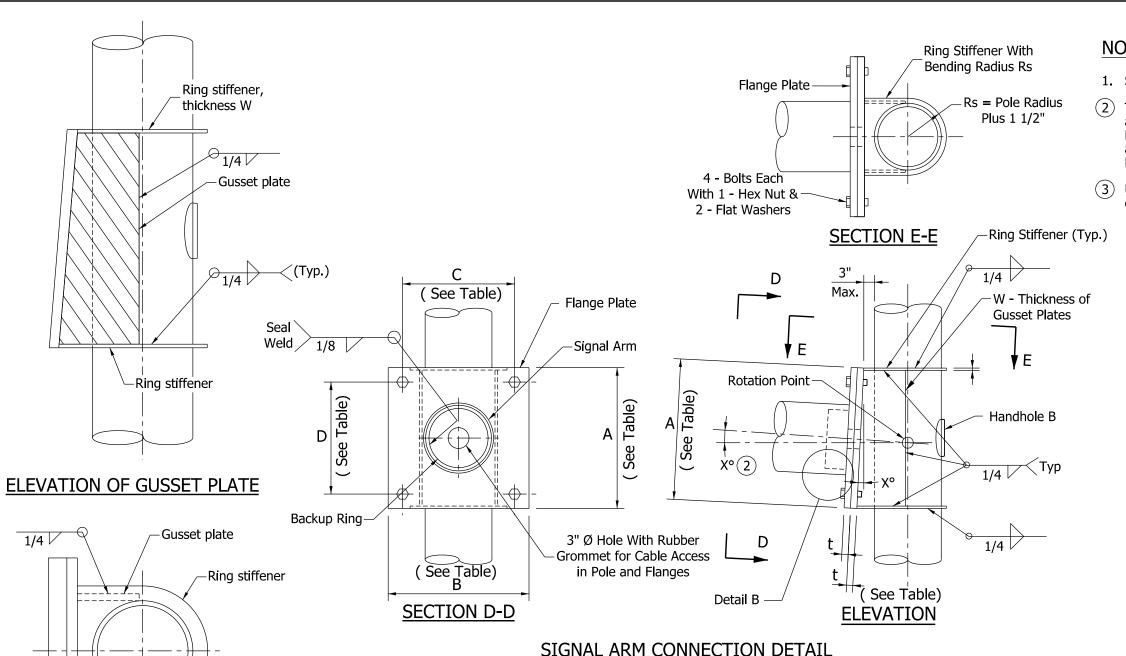
- See Standard Drawings E 805-TSCS-12 and -13 for bottom splice details.
- 2. Bolt circle shall allow clearance for the plate washer. Cutting or trimming the washer will not be allowed.

# INDIANA DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL CANTILEVER STRUCTURE SIGNAL ARM POLE BASE PLATE, BOTTOM SPLICE PLATES, AND POLE TOP COVER DETAILS SEPTEMBER 2013



١		
	/s/ Alfredo B. Hanza	03/26/13
	DESIGN STANDARDS ENGINEER	DATE
	/ / a / C a a / CC	0.0 (0.0 (1.0
	/s/ Mark A. Miller	03/27/13
١	CHIEF ENGINEER	DATE



Ring Stiffener

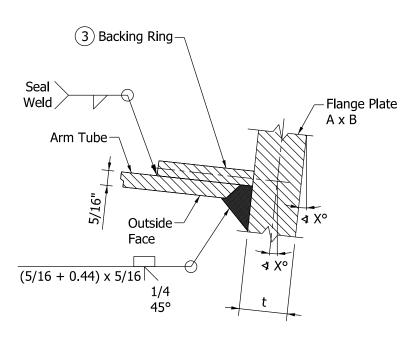
TOP OF GUSSET PLATE

# SIGNAL ARM CONNECTION DETAIL

PLATES AND BOLTS FOR SIGNAL SINGLE ARM CANTILEVER						
ARM LENGTH	FLANGE PLATE A x B	BOLT PATTERN C x D	RING STIFFNER GUSSET PLATE W	FLANGE PLATE THICKNESS t	BOLT	
15' to 35'	22" x 22"	17 1/2" x 17 1/2"	3/8"	1 1/2"	1 1/8" - 7 UNC x 4 1/4" Long	
>35' to 60'	33" x 33"	27 1/2" x 27 1/2"	1/2"	1 3/4"	1 1/2" - 6 UNC x 6 1/4" Long	

# **NOTES:**

- 1. See Standard Drawing E 805-TSCS-06 for Handhole B details.
- 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 Arm Dimension Table on Standard Drawing E 805-TSCS-03.
- Use continuous backing ring, 5/16" x 2" minimum. Tack weld only in root area of final weld.



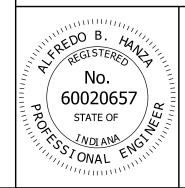
**DETAIL B - ARM WELD** 

# INDIANA DEPARTMENT OF TRANSPORTATION

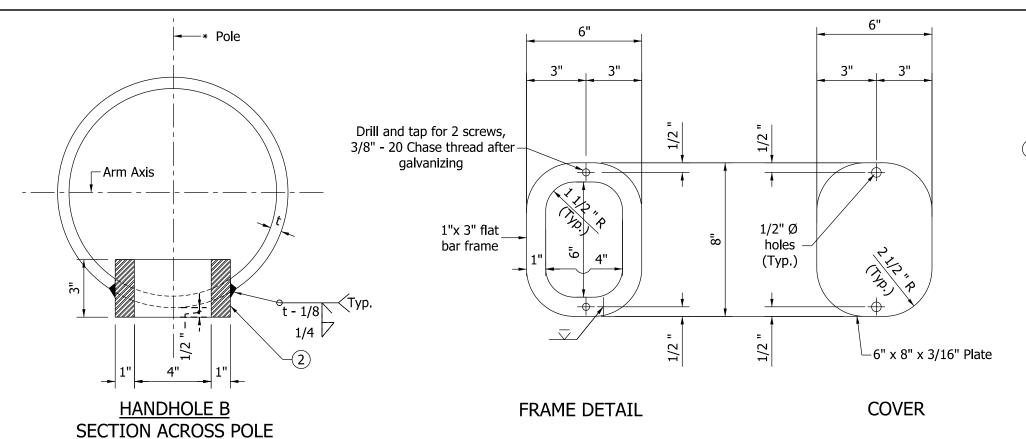
TRAFFIC SIGNAL CANTILEVER STRUCTURE SIGNAL ARM CONNECTION DETAILS

SEPTEMBER 2014

E 805-TSCS-05 STANDARD DRAWING NO.

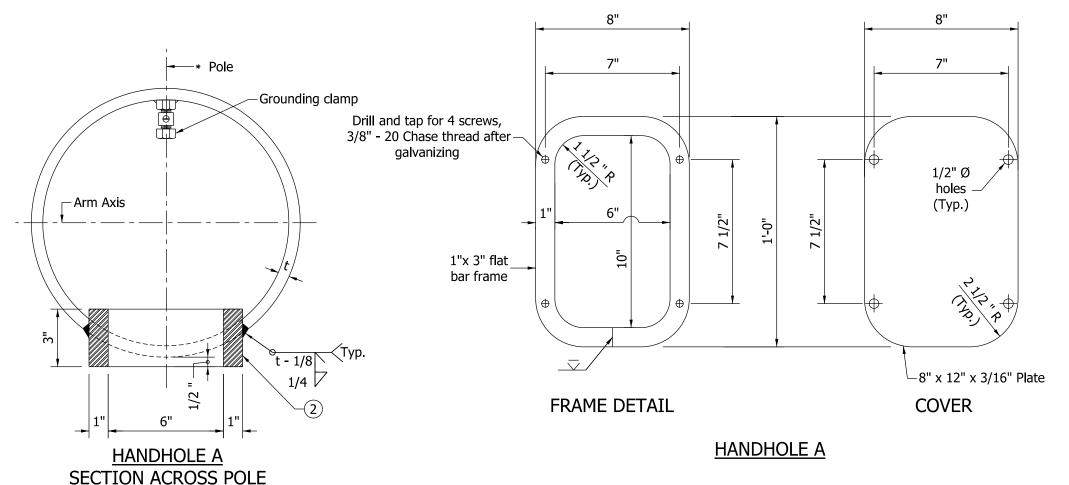


	/s/ Alfredo B. Hanza	12/02/13
, , , , , , , , , , , , ,	DESIGN STANDARDS ENGINEER	DATE
	/s/ Mark A. Miller	12/05/13
	CHIEF ENGINEER	DATE



- 1 Handhole A shall be used at the base of the pole. Handhole B shall be used at all other locations.
- 2 In lieu of fabricated handhole frame as shown, frame may be cut from 3" plate with rolling direction vertical.
- 3 See Standard Drawings E 805-TSCS-02 and -09 for handhole locations.

# HANDHOLE B

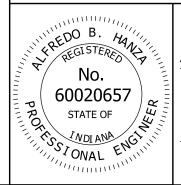


# INDIANA DEPARTMENT OF TRANSPORTATION

# TRAFFIC SIGNAL CANTILEVER STRUCTURE HANDHOLE DETAILS

SEPTEMBER 2013

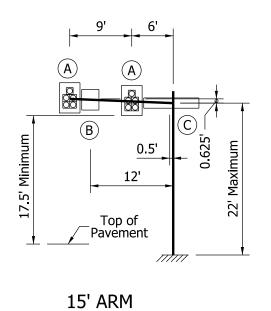
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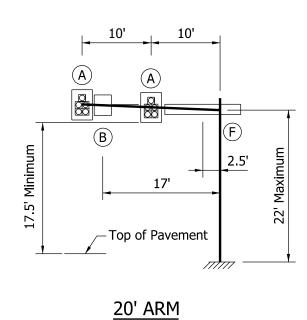


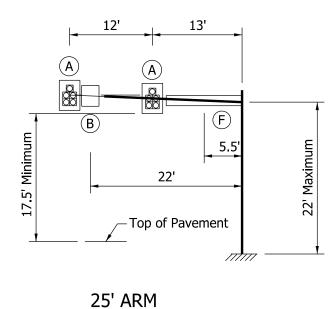
/s/Alfredo B. Hanza 02/05/13

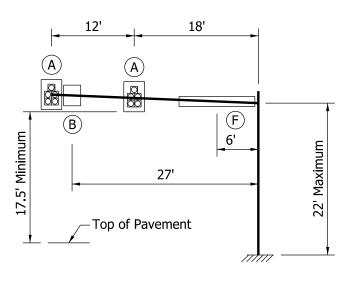
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/27/13





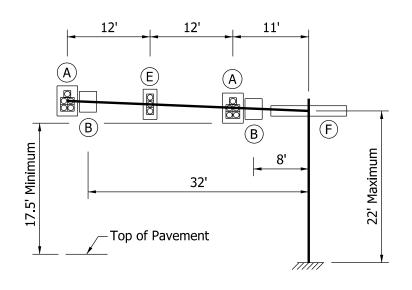




# 30' ARM

# NOTE:

1. The structure arms and pole are designed for the above loading conditions. Foundation types A and C are designed for arms having length of 35 ft or less. See Standard Drawings E 805-TSCS-16 and -18 for foundation types A and C.

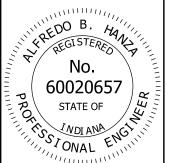


LEGEND				
Device	Description			
A	12" - 5 Section Signal Head With Backplates			
B	36" x 30" Regulatory Sign			
C	18" x 96" Street Name Sign			
E	12" - 3 Section Signal Head With Backplates			
F	18" x 132" Street Name Sign			

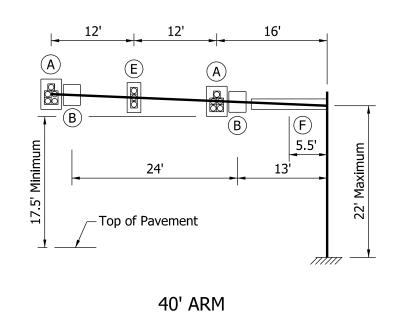
35' ARM

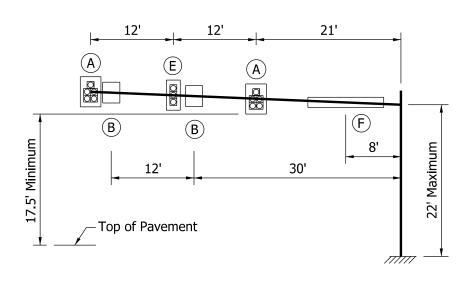
# INDIANA DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL CANTILEVER STRUCTURE PLACEMENT OF SIGNALS AND SIGNS LOADING FOR ARM OF 35' OR LESS SEPTEMBER 2013

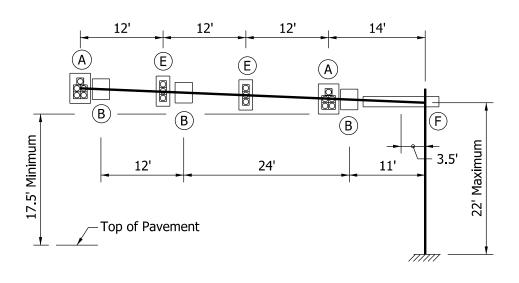


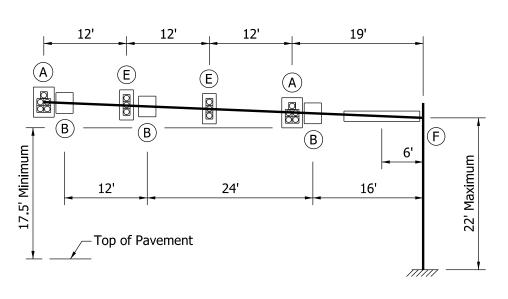
	/s/ Alfredo B. Hanza	02/05/1.
	DESIGN STANDARDS ENGINEER	DATE
111.	/s/ Mark A. Miller	03/27/13
	CHIEF ENGINEER	DATE

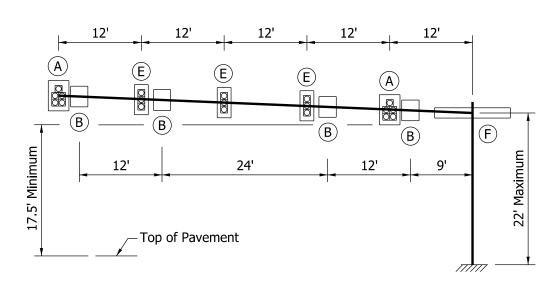




45' ARM







55' ARM 60' ARM

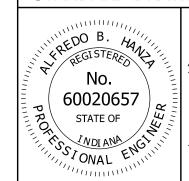
# NOTES:

- 1. See Standard Drawing E 805-TSCS-07 for Legend.
- 2. The structure arms and pole are designed for the above loading conditions. Foundation types B and D are designed for arms having length of greater than 35 ft to 60 ft. See Standard Drawings E 805-TSCS-17 and -19 for foundation types B and D.

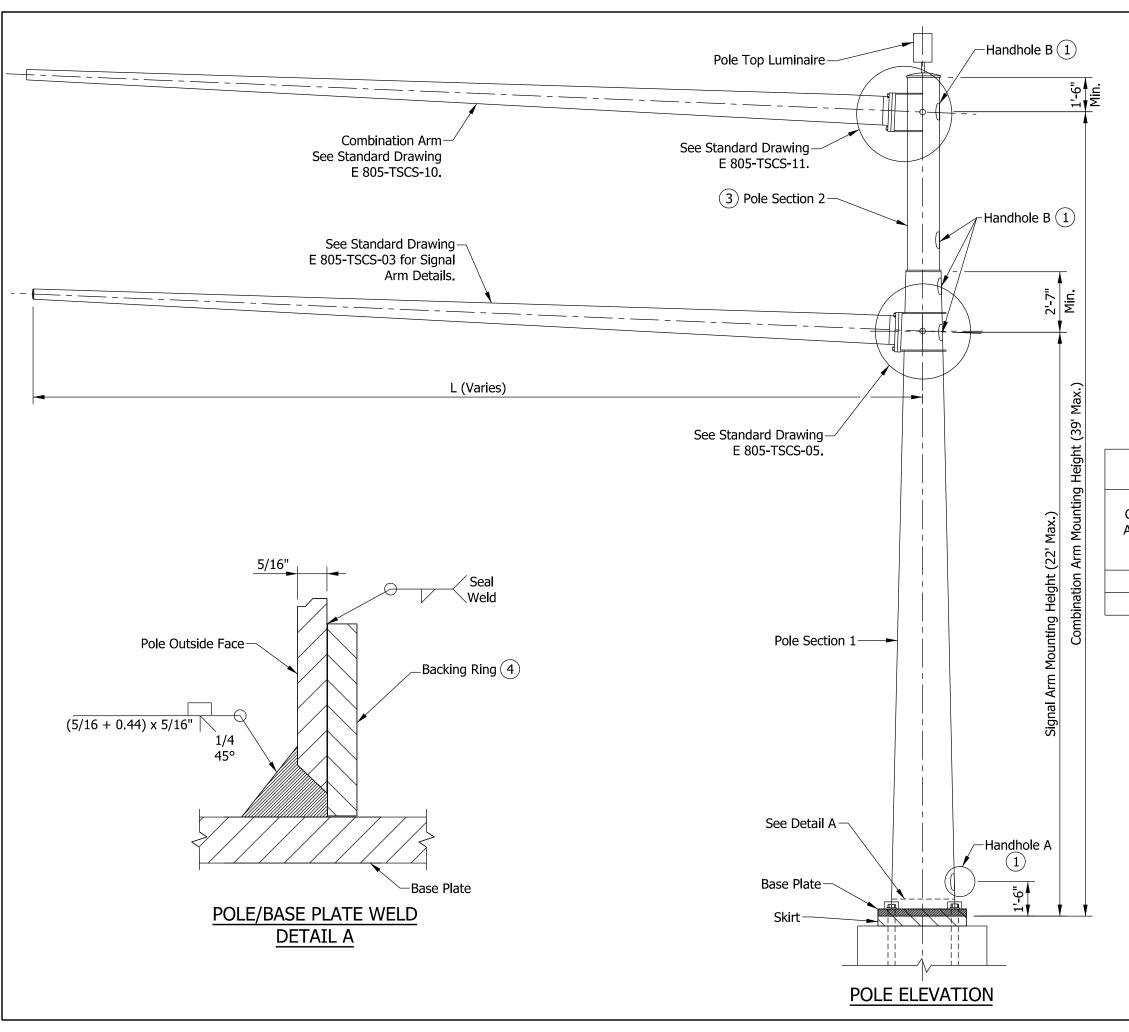
50' ARM

# INDIANA DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL CANTILEVER STRUCTURE
PLACEMENT OF SIGNALS AND SIGNS
LOADING FOR ARM OF GREATER THAN 35' TO 60'
SEPTEMBER 2013



	/s/ Alfredo B. Hanza	02/05/13
	DESIGN STANDARDS ENGINEER	DATE
	/s/ Mark A. Miller	03/27/13
1	CHIEF ENGINEER	DATE



- 1 See Standard Drawing E 805-TSCS-06 for handhole details.
- 2. See Standard Drawing E 805-SGGR-01 to -03 for grounding details.
- (3) Base diameter of Pole Section 2 shall be equal to top diameter of Pole Section 1.
- 4 Use continuous backing ring, 5/16" x 2" minimum. Tack weld only in root area of final weld.

# VERTICAL CLEARANCE CRITERIA:

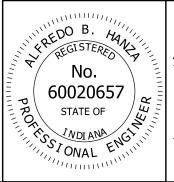
Maintain 40'-0" minimum clearance from top of pavement to the camera lens.

POLE DIMENSIONS				
CANTILEVER	POLE SECTION 1		POLE SECTION 2	
ARM LENGTH L	BASE DIAMETER	WALL THICKNESS	BASE DIAMETER	WALL THICKNESS
15' to 35'	17"	5/16"	See Note 3	1/8"
>35' to 60'	24"	5/16"	See Note 3	1/8"

# INDIANA DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL CANTILEVER STRUCTURE COMBINATION POLE ELEVATION, DIMENSIONS, AND BASE PLATE WELD DETAIL SEPTEMBER 2014

STANDARD DRAWING NO. E 805-TSCS-09

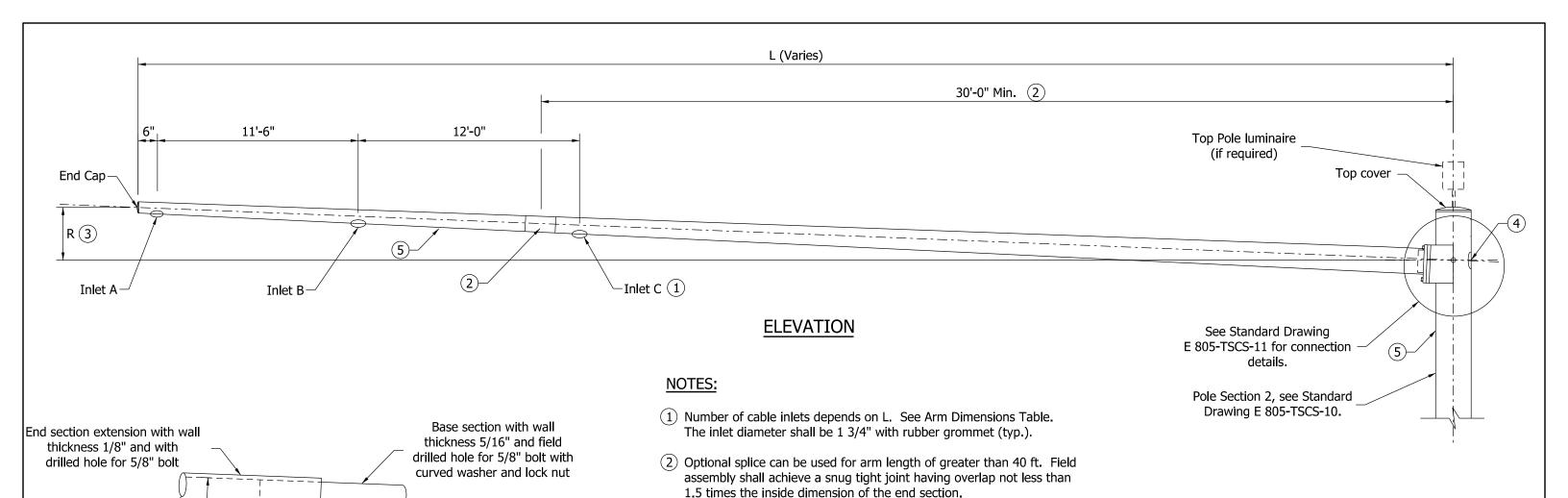


/s/ Alfredo B. Hanza 12/02/13

DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 12/05/13

CHIEF ENGINEER DATE



(3) Arm rise R is measured in the undeflected position without vertical

(5) If seam welds are used, the weld location for the arms shall be along

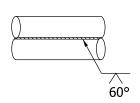
(4) See Standard Drawing E 805-TSCS-06 for handhole details.

the bottom, and on the side of the pole as shown.

**② OPTIONAL ARM SPLICE DETAIL** 

≥3R

2R End sect.



5/8" thru bolt

**5** TYPICAL SEAM WELD

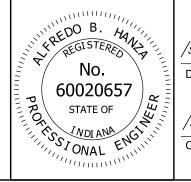
ARM DIMENSIONS TABLE				
L	L ARM DIAMETER AT POLE THICKNESS 3		CABLE INLETS	
15'	5 1/2"	1/8"	7 1/2"	А
20'	5 1/2"	1/8"	10"	Α
25'	7"	1/8"	1'-0 1/2"	А
30'	8"	1/8"	1'-3"	A, B
35'	8"	1/8"	1'-5 1/2"	A, B
40'	9"	1/8"	1'-8"	A, B, C
45'	10"	1/8"	1'-10 1/2"	A, B, C
50'	11"	1/8"	2'-1"	A, B, C
55'	11" 1/8"		2'-3 1/2"	A, B, C
60'	12"	1/8"	2'-6"	A, B, C

loads on the arm.

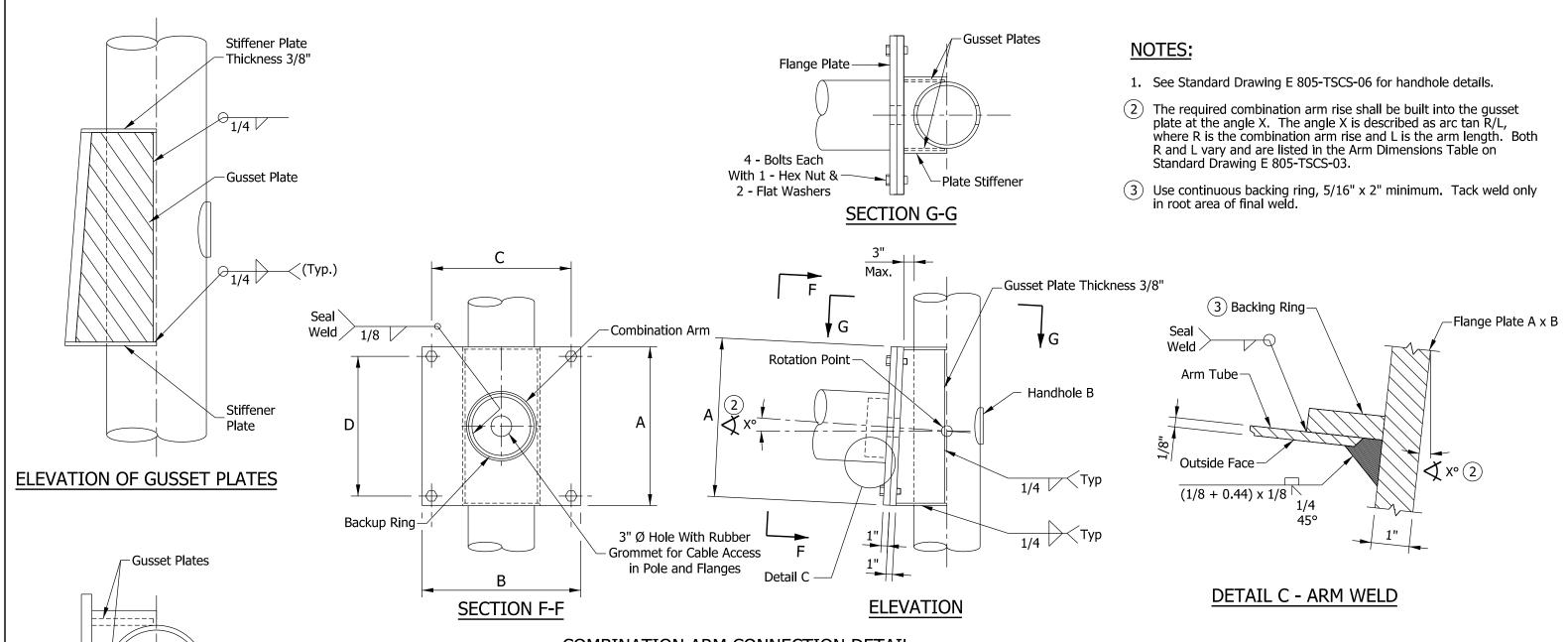
# INDIANA DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL CANTILEVER STRUCTURE COMBINATION ARM DIMENSIONS & DETAILS

SEPTEMBER 2013



/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE



# COMBINATION ARM CONNECTION DETAIL

PLATES AND BOLTS FOR COMBINATION ARM CANTILEVER				
ARM LENGTH	FLANGE PLATE A x B	BOLT PATTERN C x D	FLANGE PLATE THICKNESS	BOLT
15' to 35'	20" x 20"	17" x 17"	1"	7/8" - 9 UNC x 3.5" Long
>35' to 60'	25" x 25"	22" x 22"	1"	7/8" - 9 UNC x 3.5" Long

Stiffener Plate

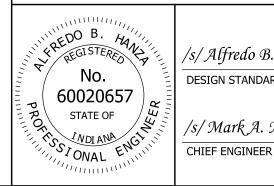
TOP OF GUSSET PLATES

# INDIANA DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL CANTILEVER STRUCTURE COMBINATION ARM CONNECTION DETAILS

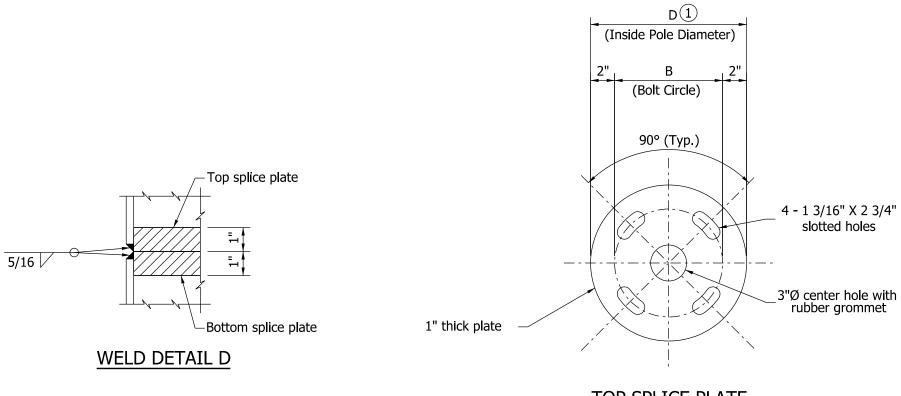
SEPTEMBER 2014

STANDARD DRAWING NO. E 805-TSCS-11

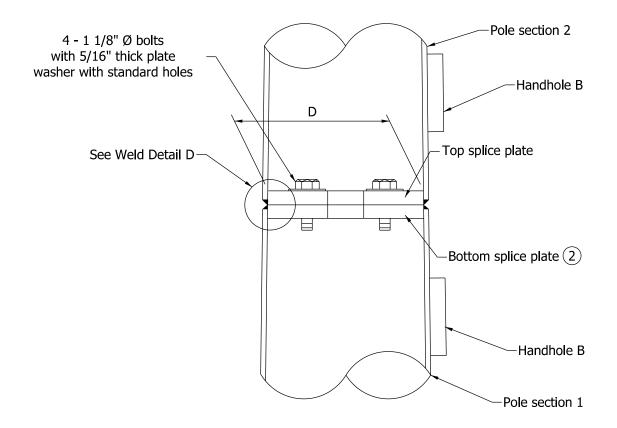


/s/ Alfredo B. Hanza	12/02/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	12/05/13

DATE



# TOP SPLICE PLATE



**ELEVATION** 

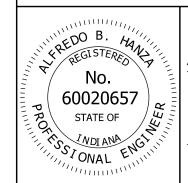
# NOTES:

- 1) See Standard Drawing E 805-TSCS-09 for pole dimensions.
- 2 See Standard Drawings E 805-TSCS-04 and -13 for bottom splice plate details.
- 3. Diameter at the bottom of Pole Section 2 shall match the diameter at the top of Pole Section 1.

# INDIANA DEPARTMENT OF TRANSPORTATION

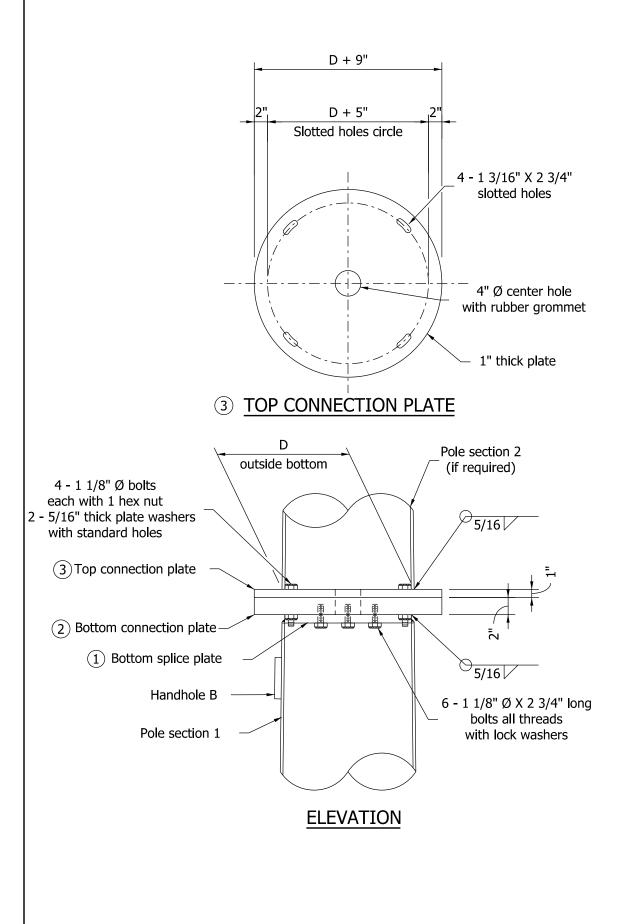
TRAFFIC SIGNAL CANTILEVER STRUCTURE COMBINATION POLE SPLICE DETAILS FOR ARMS 35' OR LESS SEPTEMBER 2013

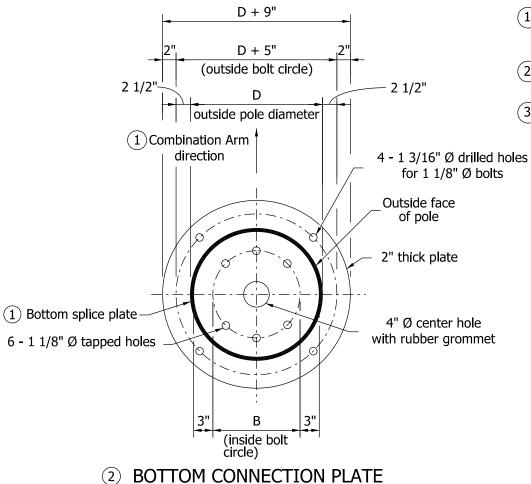
STANDARD DRAWING NO. E 805-TSCS-12



/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE

/s/ Mark A. Miller 03/27/13



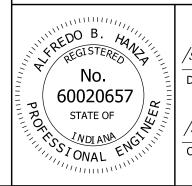


- Orient bottom splice and bottom connection plates with combination arm as shown on the bottom splice plate detail on Standard Drawings E 805-TSCS-04 and -12.
- 2 All plate dimensions shall be based upon the outside diameter D at the top of pole section 1.
- Diameter at bottom of pole section 2 shall match the diameter at the top of pole section 1.

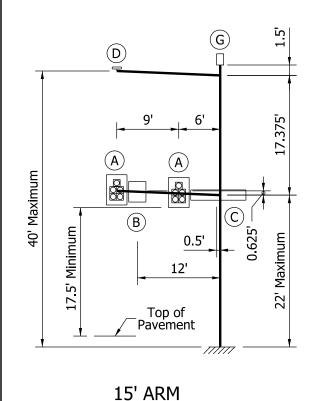
# INDIANA DEPARTMENT OF TRANSPORTATION

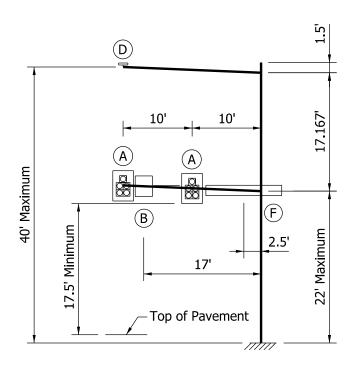
TRAFFIC SIGNAL CANTILEVER STRUCTURE COMBINATION POLE SPLICE DETAILS FOR ARM OF GREATER THAN 35' TO 60' SEPTEMBER 2013

STANDARD DRAWING NO. E 805-TSCS-13

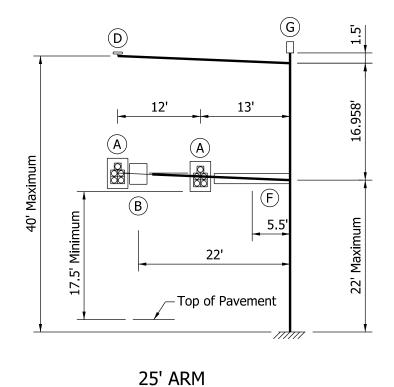


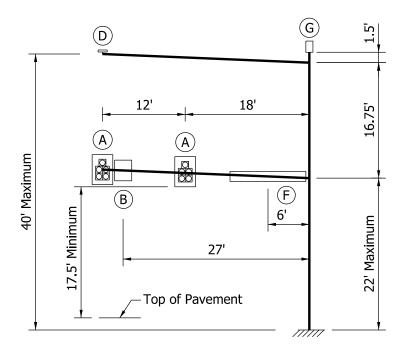
/s/ Mark A. Miller 03/27/13





20' ARM





<u>30' ARM</u>

# Top of Pavement Ao' Maximum 17.5' Minimum B 8, 35, Ao Basimum 16.542. 11.5' Alinimum 16.542.

35' ARM

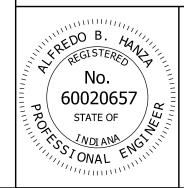
LEGEND			
DEVICE DESCRIPTION			
(A) 12" - 5 Section Signal Head With Backplates			
B 36" x 30" Regulatory Sign			
C 18" x 96" Street Name Sign			
D 1 - Mounted Camera			
E 12" - 3 Section Signal Head With Backplates			
F 18" x 132" Street Name Sign			
G Top Pole Luminaire			

# NOTE:

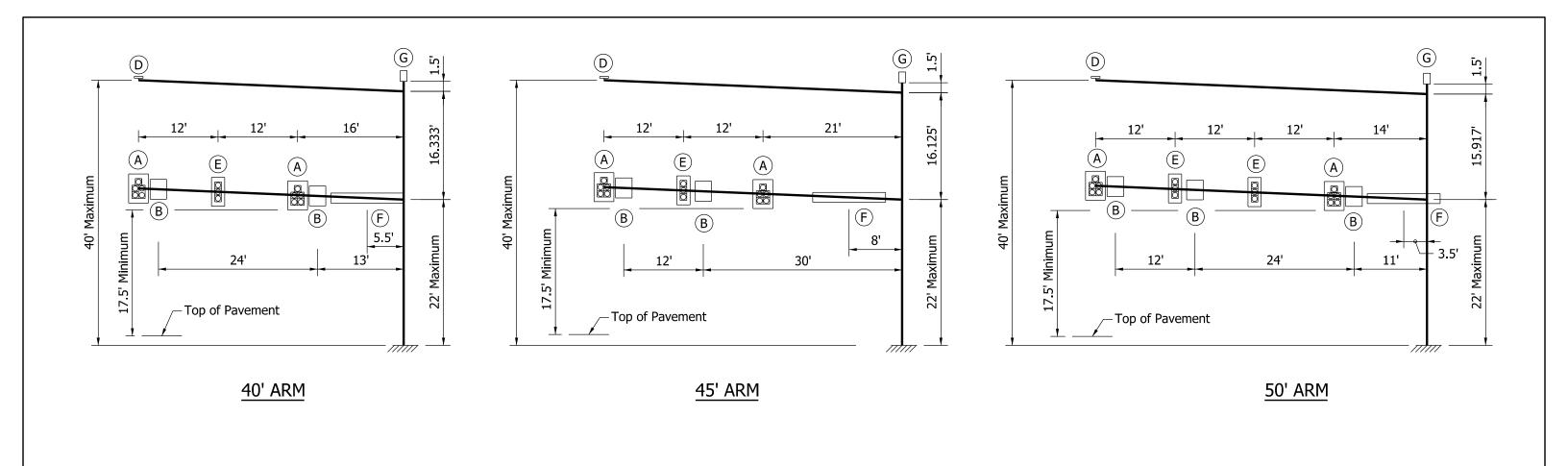
1. The structure arms and pole are designed for the above loading conditions. Foundation types A and C are designed for arms having length of 35 ft or less. See Standard Drawings E 805-TSCS-16 and -18 for foundation types A and C.

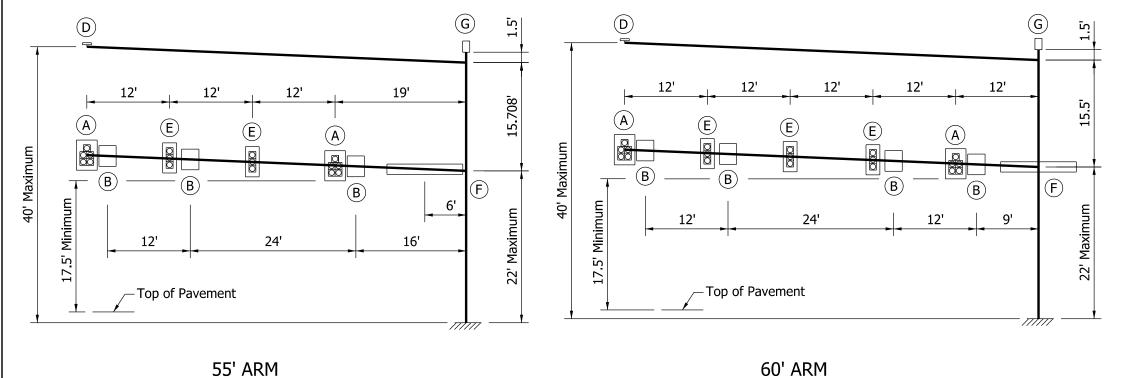
# INDIANA DEPARTMENT OF TRANSPORTATION

TRAFFIC SIGNAL CANTILEVER STRUCTURE COMBINATION ARM LOADING FOR ARM OF 35' OR LESS SEPTEMBER 2013



/s/ Alfredo B. Hanza	02/05/13
 DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE

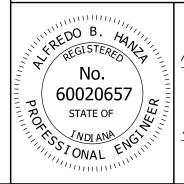




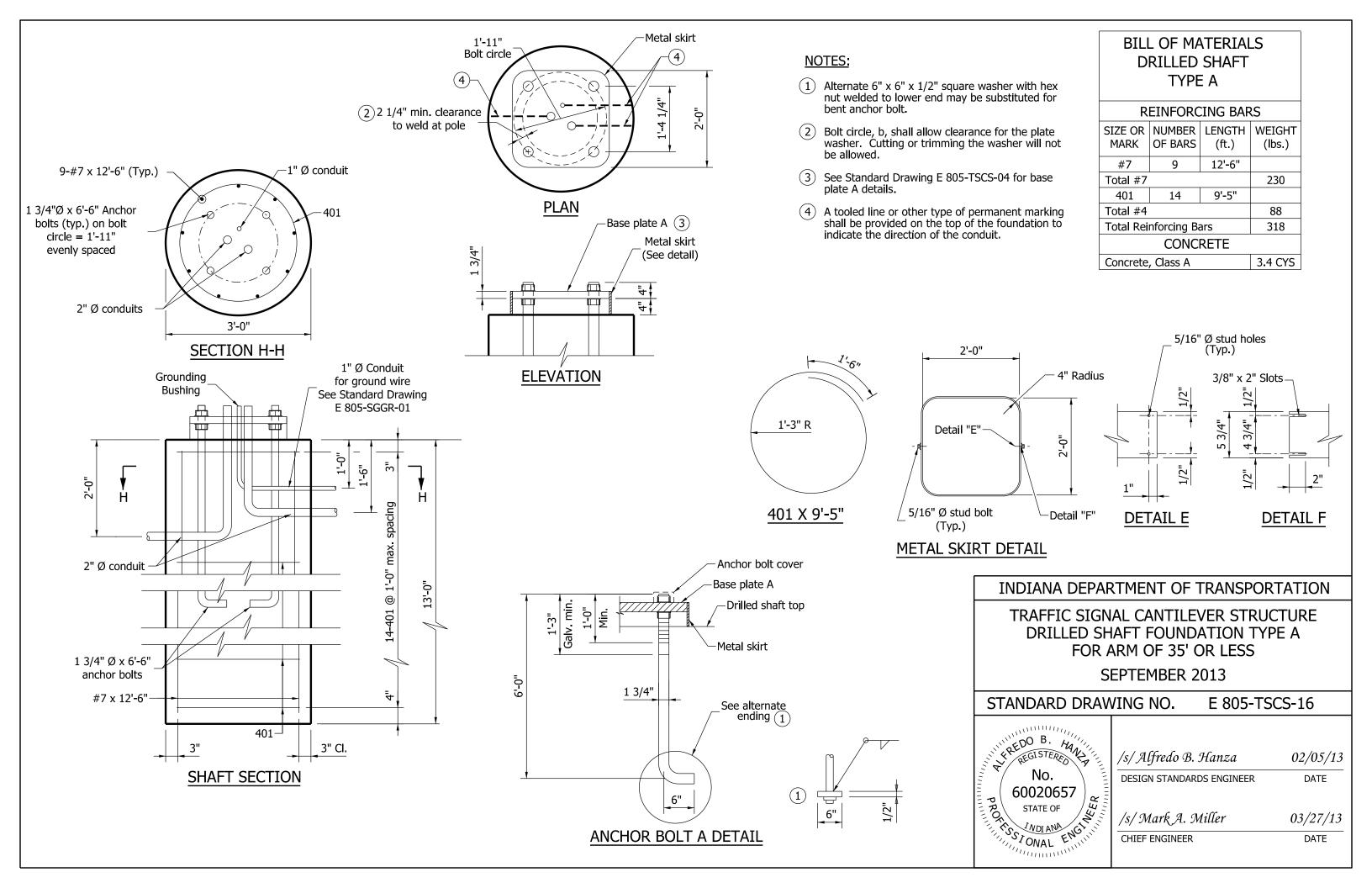
- 1. See Standard Drawing E 805-TSCS-14 for Legend.
- 2. The structure arms and pole are designed for the above loading conditions. Foundation types B and D are designed for arms having length of greater than 35 ft to 60 ft. See Standard Drawings E 805-TSCS-17 and -19 for foundation types B and D.

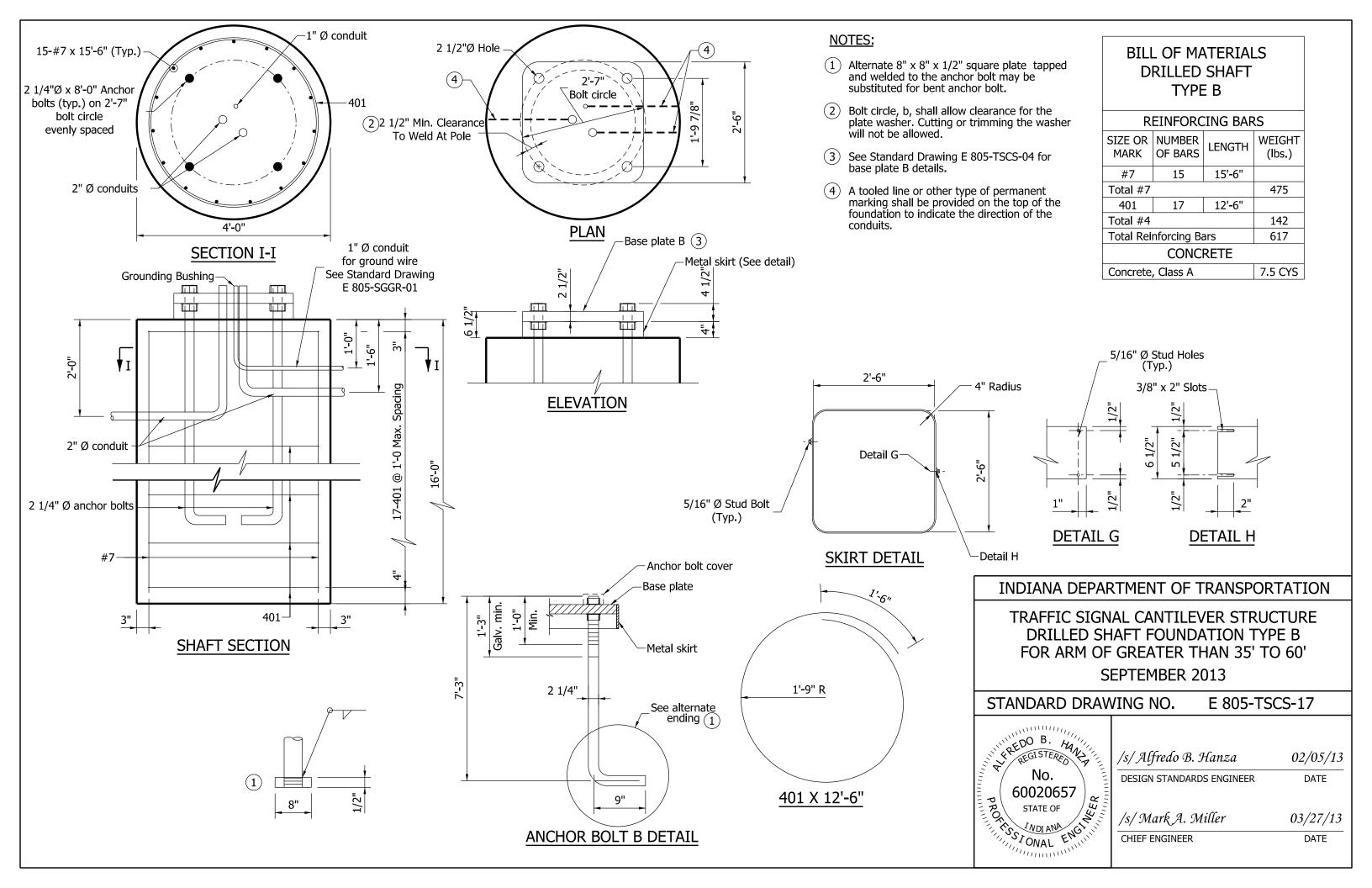
# INDIANA DEPARTMENT OF TRANSPORTATION

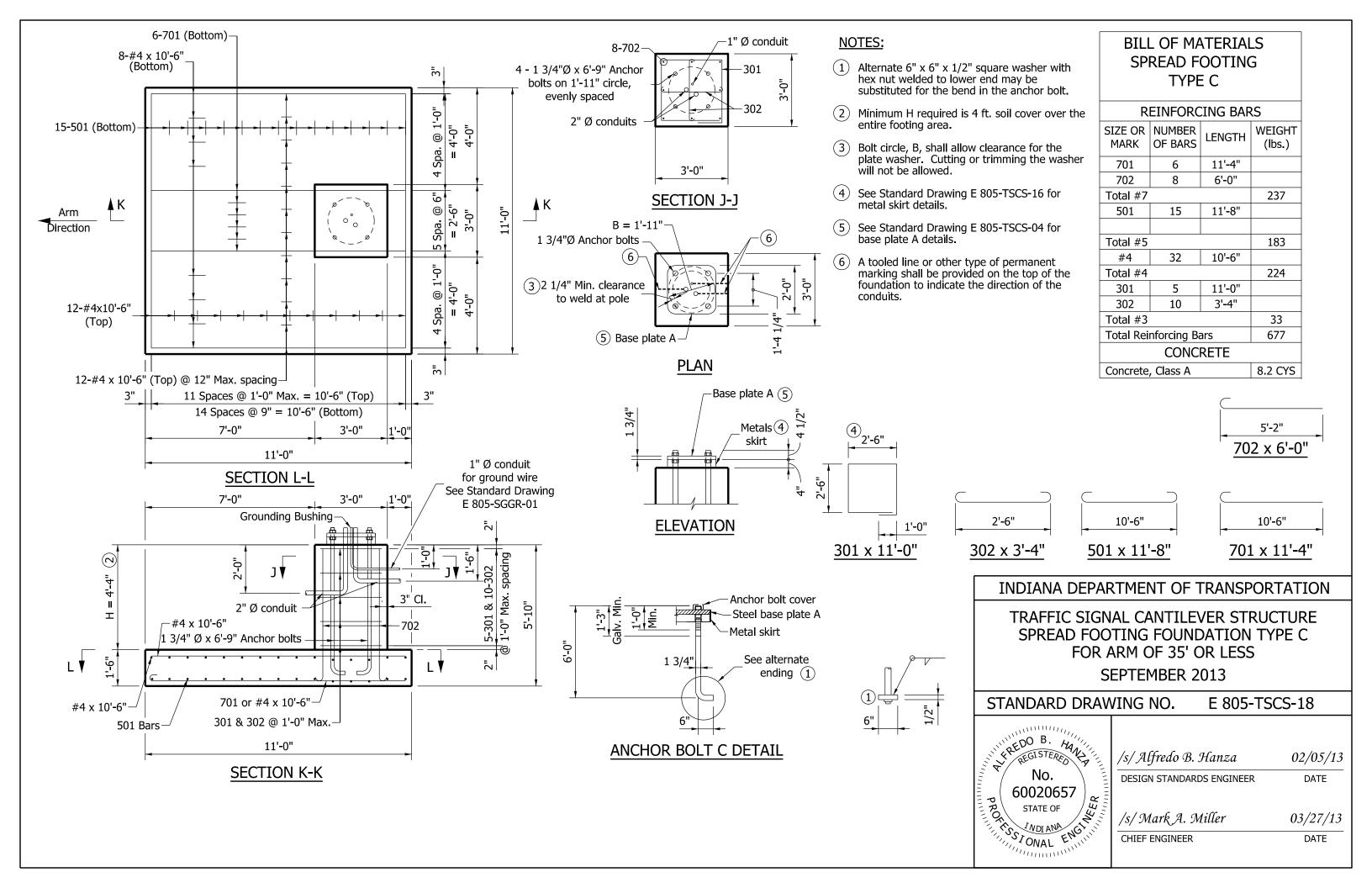
TRAFFIC SIGNAL CANTILEVER STRUCTURE COMBINATION ARM LOADING FOR ARM OF GREATER THAN 35' TO 60' SEPTEMBER 2013

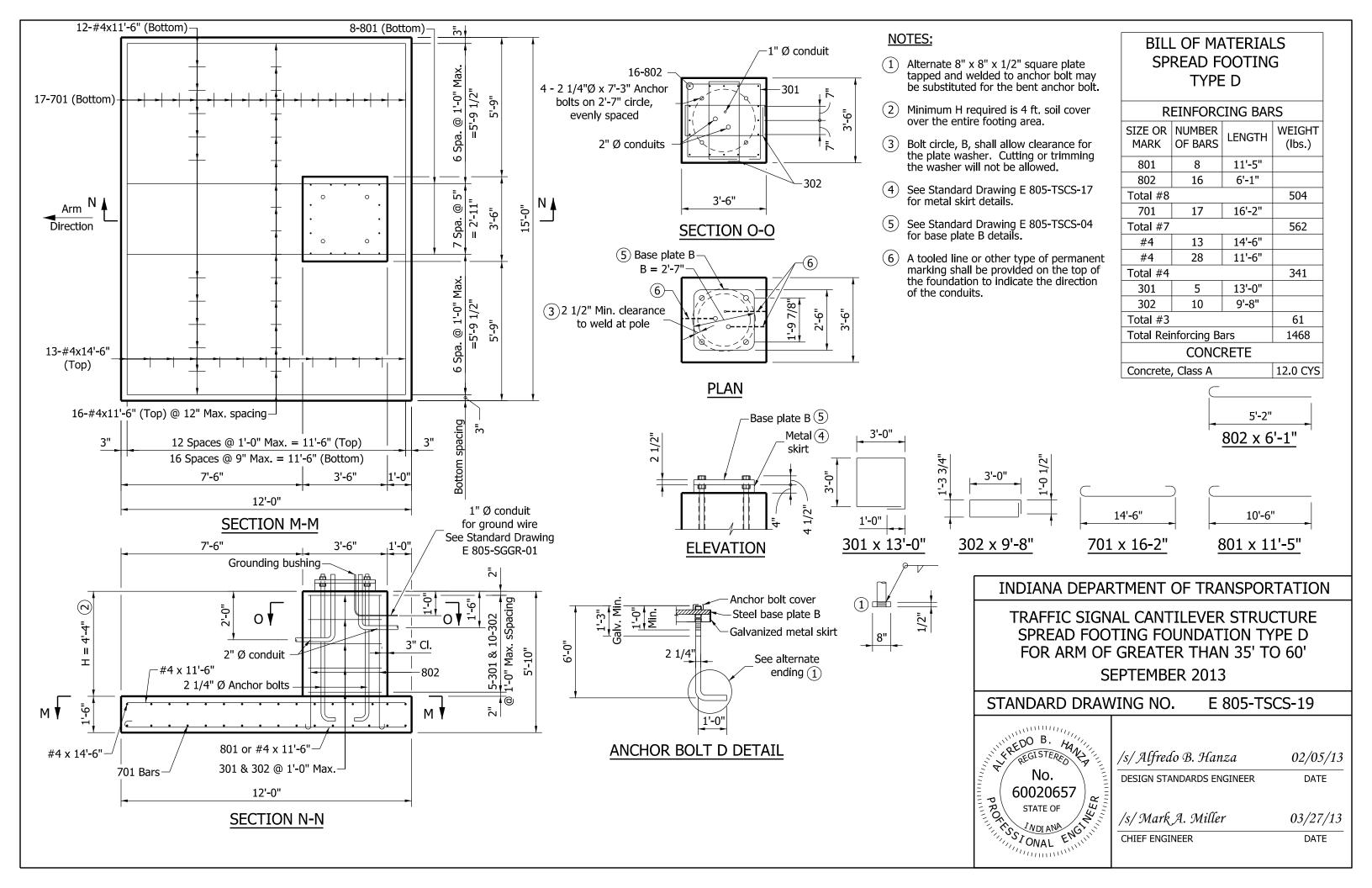


/s/ Alfredo B. Hanza	02/05/13
DESIGN STANDARDS ENGINEER	DATE
/s/ Mark A. Miller	03/27/13
CHIEF ENGINEER	DATE



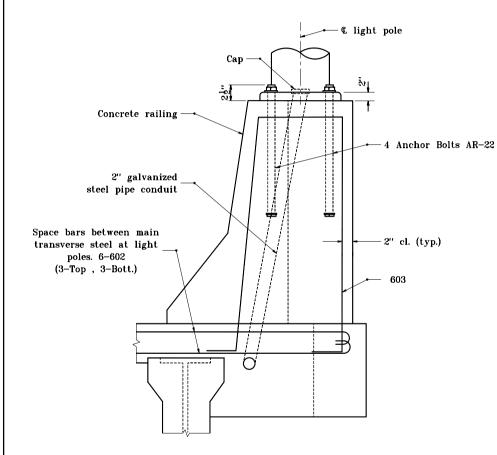




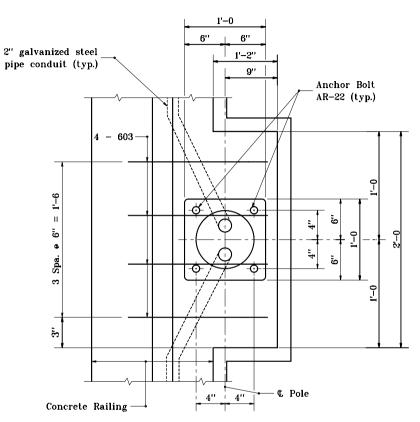




1. See Standard Drawing E 807-BLIT-03 for bending diagrams.



SECTION



The bolt circle diameter is approximately  $11\frac{1}{2}$ ".

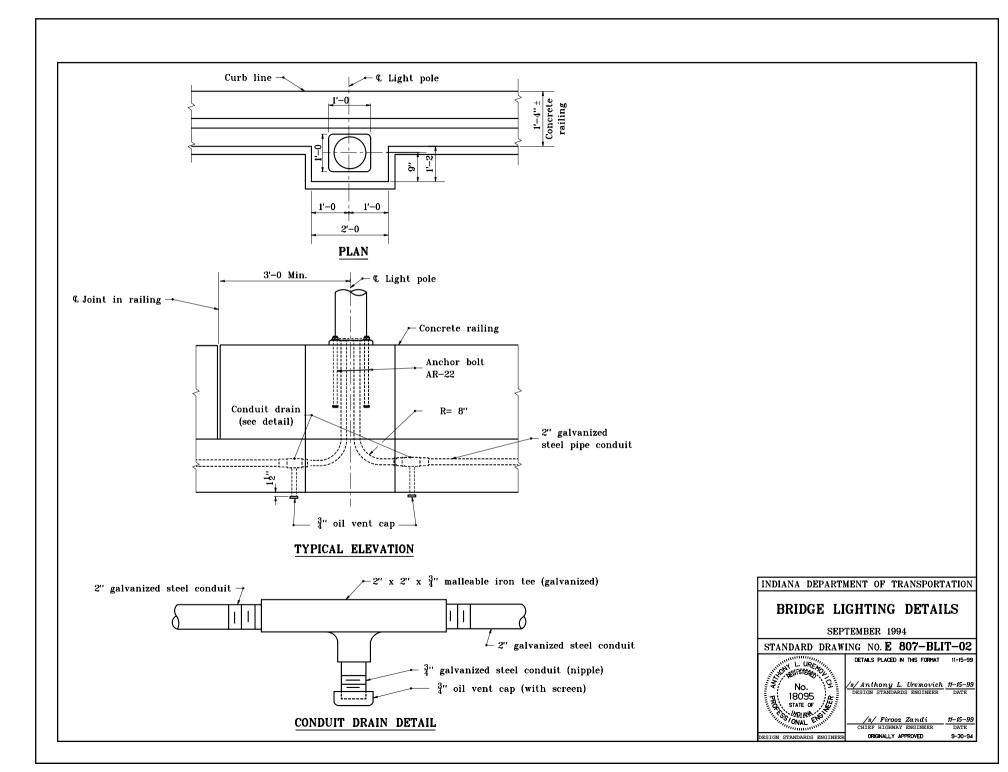
DESIGN STANDARDS ENGINEER

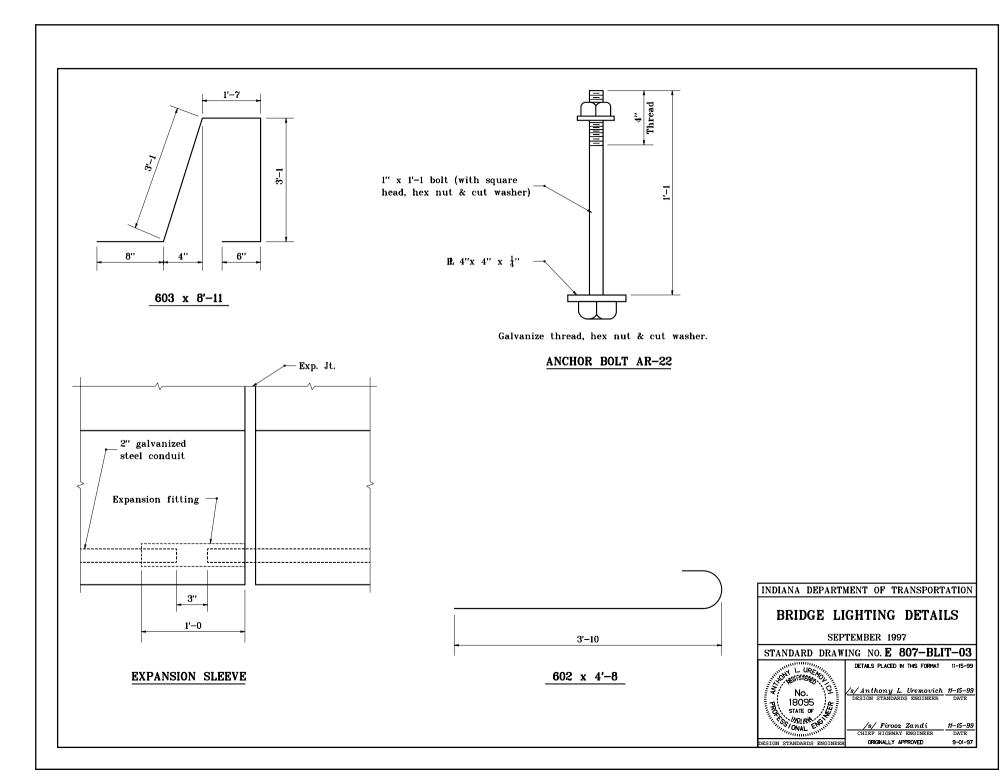
### **PLAN**



ORIGINALLY APPROVED

9-01-97





# GENERAL NOTES

- 1. See General Plan for location of light posts.
- 2. See Bill of Materials for reinforcing steel.
- 3. Ream and cap all ends.
- 4. Carry conduit 2'-0 beyond shoulder line.
- 5. Bars 602 and 603 shall be epoxy coated.
- 6. Mast arm shall be truss type.
- 7. Vertical contraction joints in the railing shall be located a minimum of 3'-0 from the centerline of the light pole.

INDIANA DEPARTMENT OF TRANSPORTATION

# BRIDGE LIGHTING DETAILS

SEPTEMBER 1997

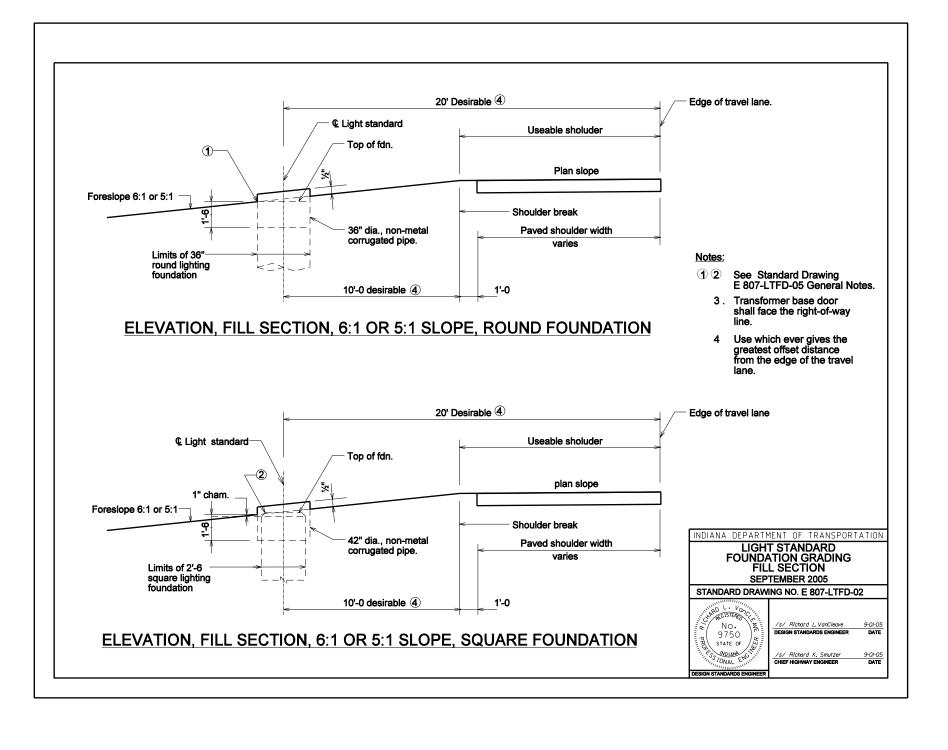
STANDARD DRAWING NO. E 807-BLIT-04

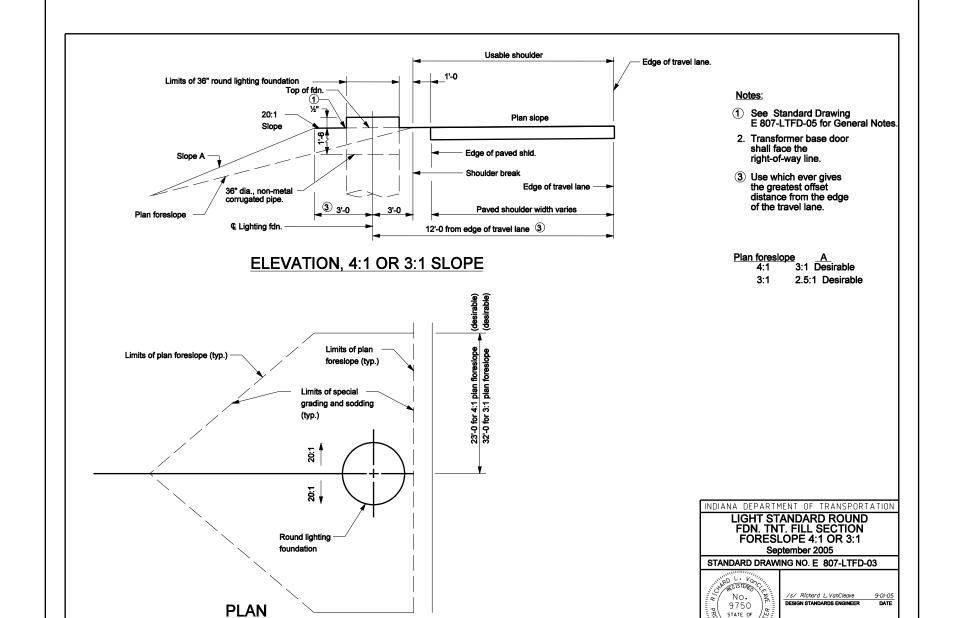
DESIGN STANDARDS ENGINEER

/s/Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

DETAILS PLACED IN THIS FORMAT 11-15-99

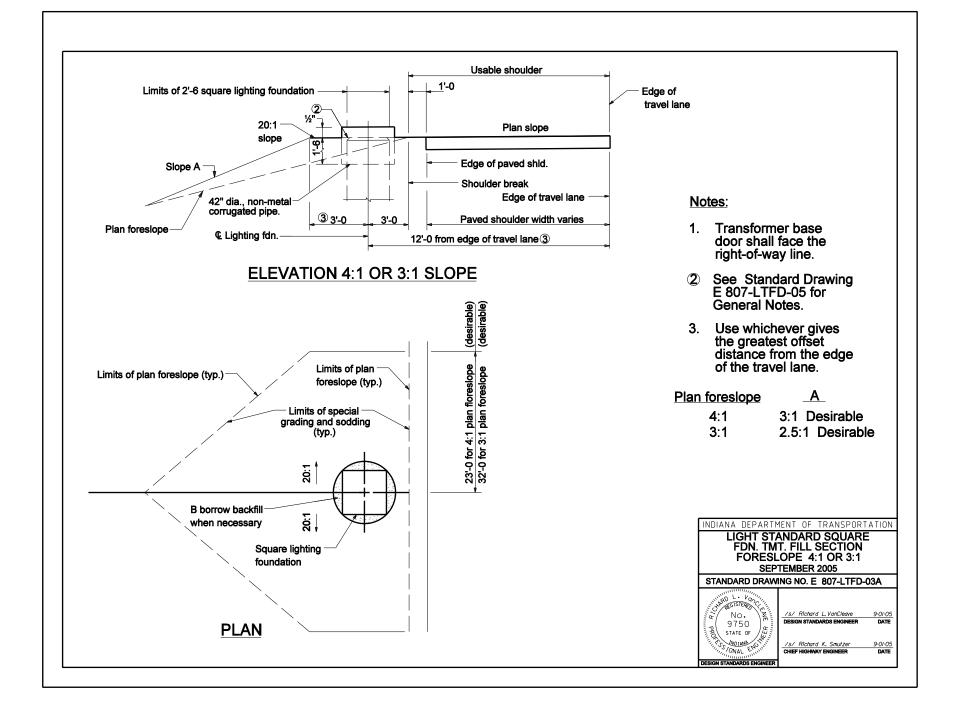
/s/ Firooz Zandi

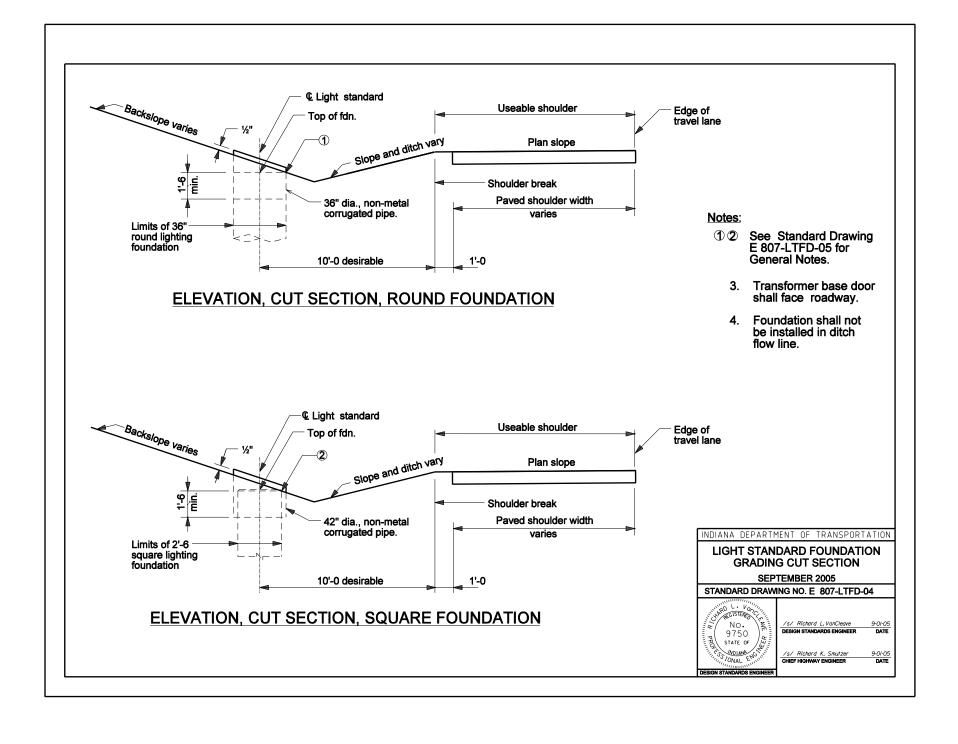


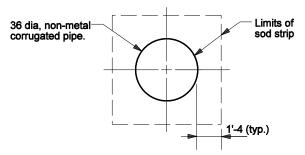


STATE OF

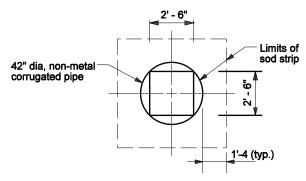
/s/ Richard K. Smutzer CHIEF HIGHWAY ENGINEER 9-01-05 DATE



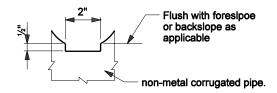




# PLAN, ROUND FOUNDATION



# PLAN, SQUARE FOUNDATION

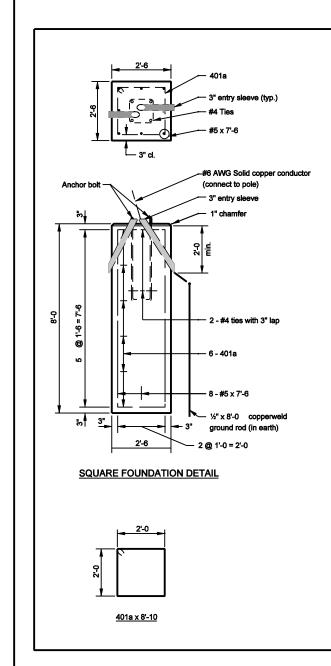


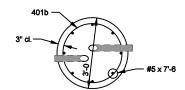
# **DRAINAGE NOTCH**

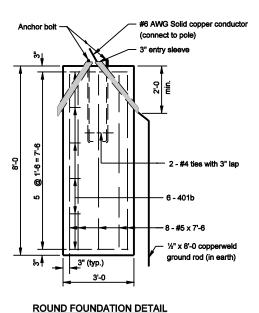
# Notes:

1. Drainage notch shall follow the slope of the ground.









# **GENERAL NOTES**

- Top of lighting foundation shall be flush with foreslope at this point.
- Base of chamfer at top of lighting foundation shall be flush with foreslope at this point.
- 3. See Standard Drawing E 801-LTFD-04A for plan views of pipe placement and sodding.
- Low exposd end of pipe shall have drainage notch as shown on Standard Drawing E 807-LTFD-04A.
- 5. Arrows shall be engraved on top of foundation to indicate direction of cable duct run.

### INDIANA DEPARTMENT OF TRANSPORTATION

### LIGHT FOUNDATION

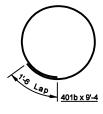
SEPTEMBER 2002

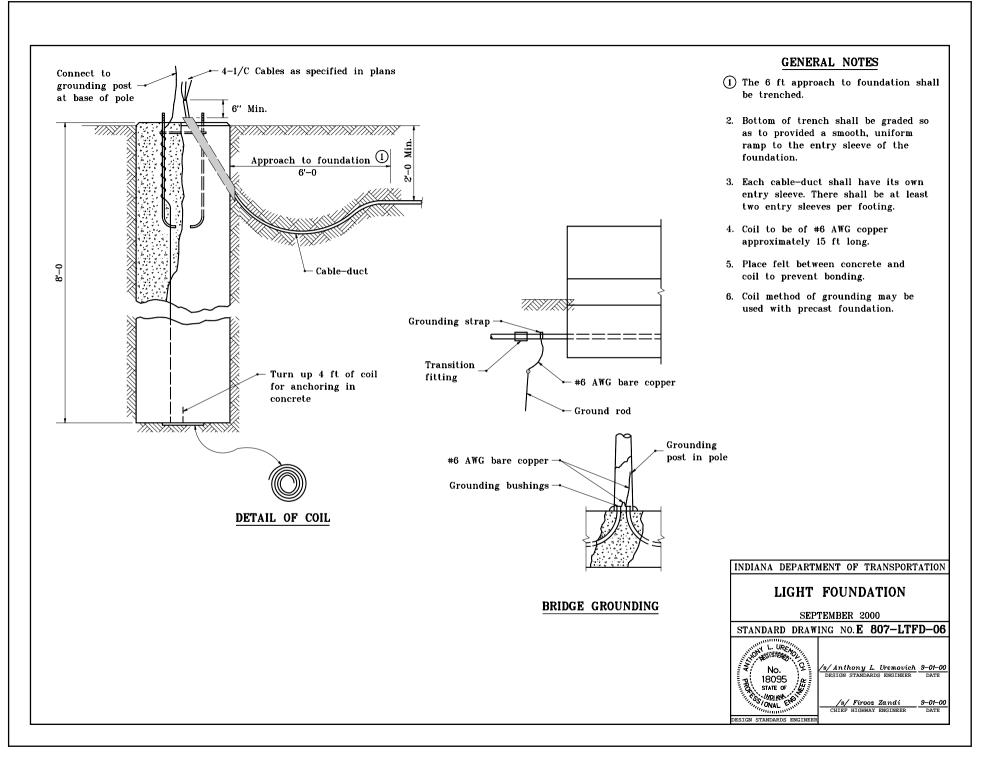
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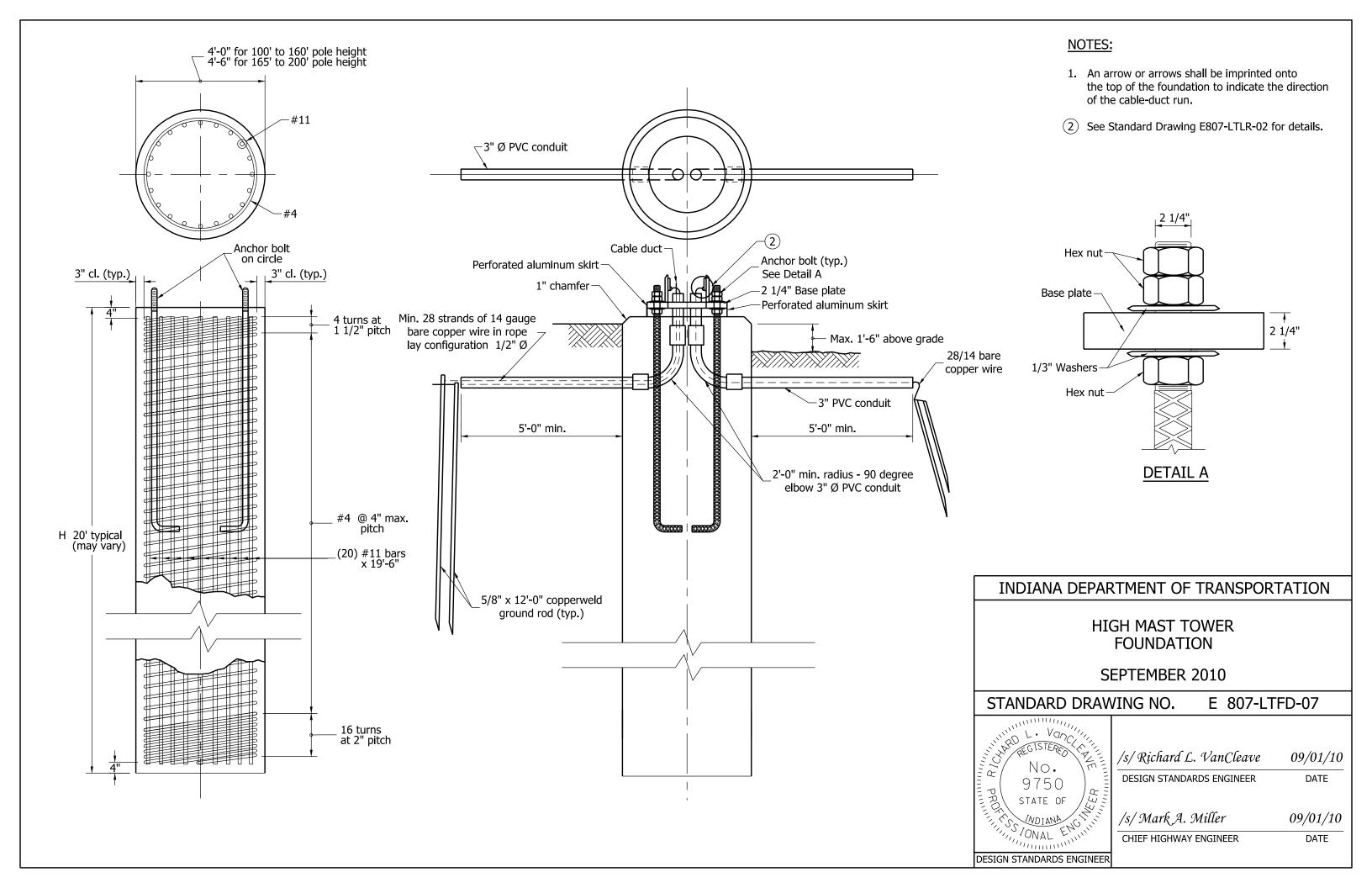


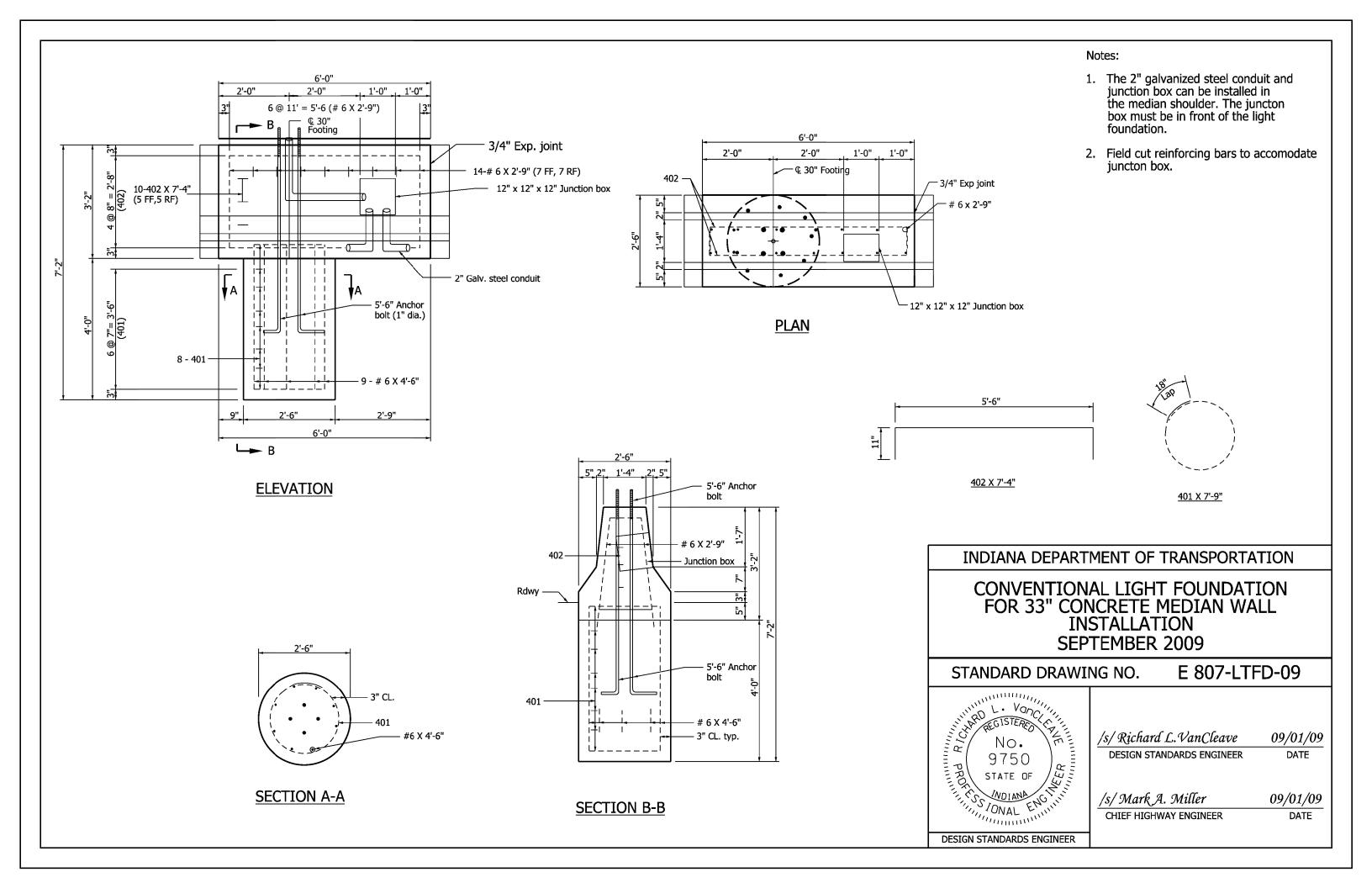
/s/ Richard L. VanCleave 9-03-02
DESIGN STANDARDS ENGINEER DATE

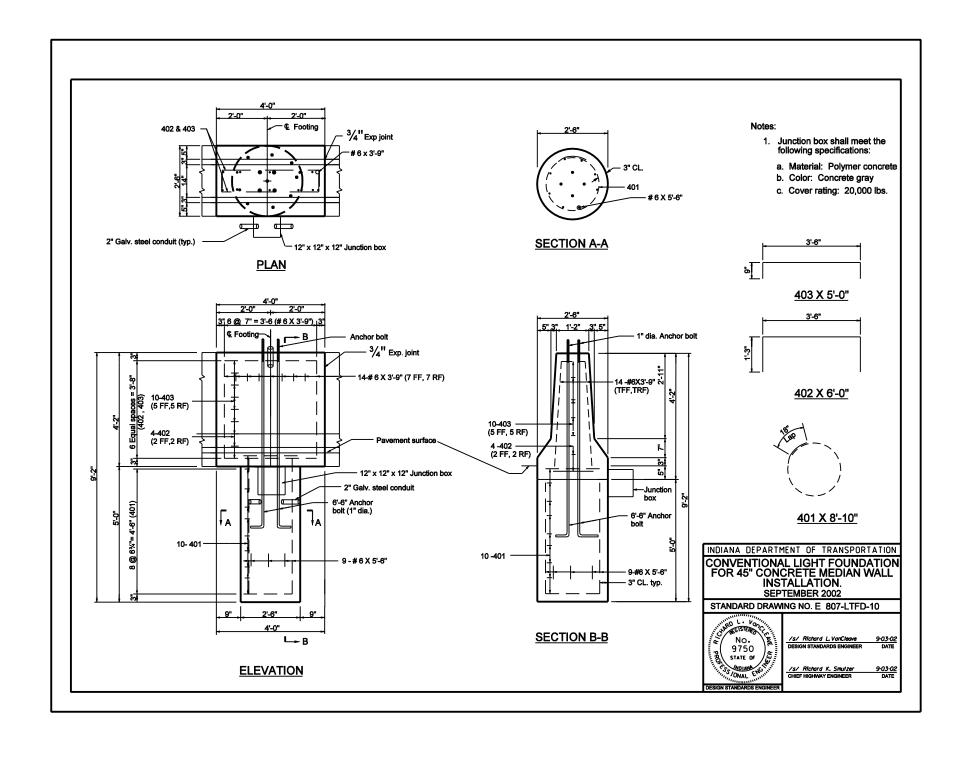
/S/ Richard K. Smutzer 9-03-02
CHIEF HIGHWAY ENGINEER DATE





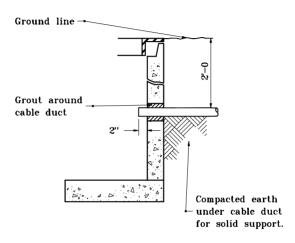




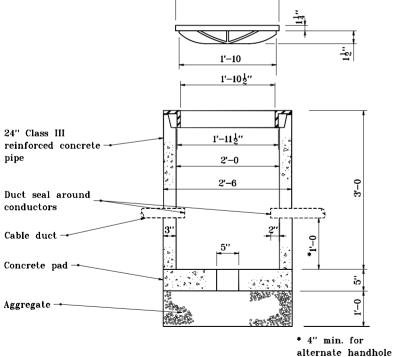




- 1. Alternate handhole minimum size shall be 1'-7 x 2'-6 x 1'-10 depth with 2 in. lid thickness.
- 2. Approximate weight for cast iron ring and cover shall be 320 lb.



# CABLE DUCT ENTERING HANDHOLE



STREET & ALLEY TYPE HANDHOLE

2'-73"

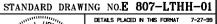
LIGHTING

1'-113"

INDIANA DEPARTMENT OF TRANSPORTATION

# LIGHT HANDHOLE DETAILS

MARCH 1995





/s/Anthony L. Uremovich 7-27-99
DESIGN STANDARDS ENGINEER DATE

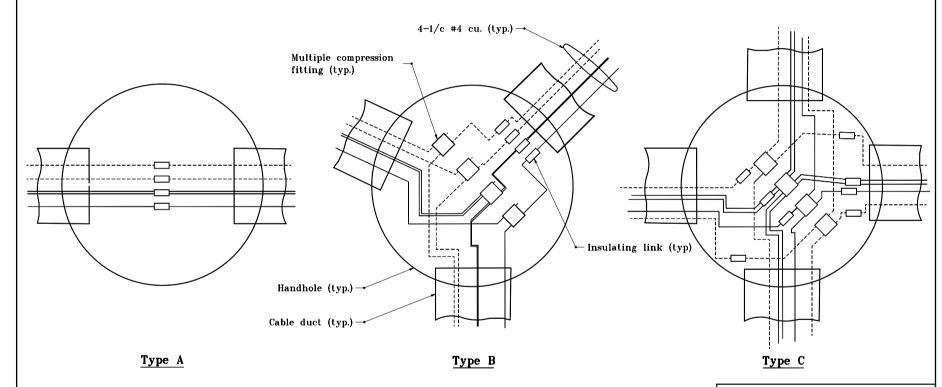
/s/ Firooz Zandi 7-27-99
CHIEF HIGHWAY ENGINEER DATE
ORGGANLLY APPROVED 3-01-95

DECTON CTANDADO PROTREDE

N STANDARDS ENGINEER



 For multiple compression fitting and insulating link details, see Standard Drawing No. E 803-SNWR-04.



# HANDHOLE CONNECTION DIAGRAM

INDIANA DEPARTMENT OF TRANSPORTATION

# LIGHT HANDHOLE CONNECTIONS

MARCH 1995

# STANDARD DRAWING NO.E 807-LTHH-02

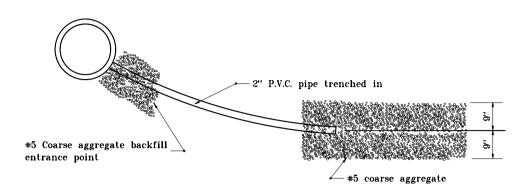
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DETAILS PLACED IN THIS FORMAT 11-15-99

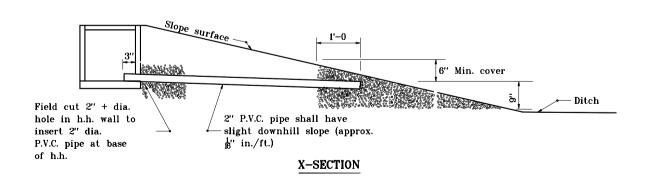
/s/Anthony L. Uremovich 11-15-99

3-01-95

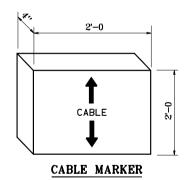
/s/ Firooz Zandi #1-15



# PLAN VIEW



# HANDHOLE DRAIN DETAIL



INDIANA DEPARTMENT OF TRANSPORTATION

# LIGHT HANDHOLE DRAIN & CABLE MARKER

MARCH 1995

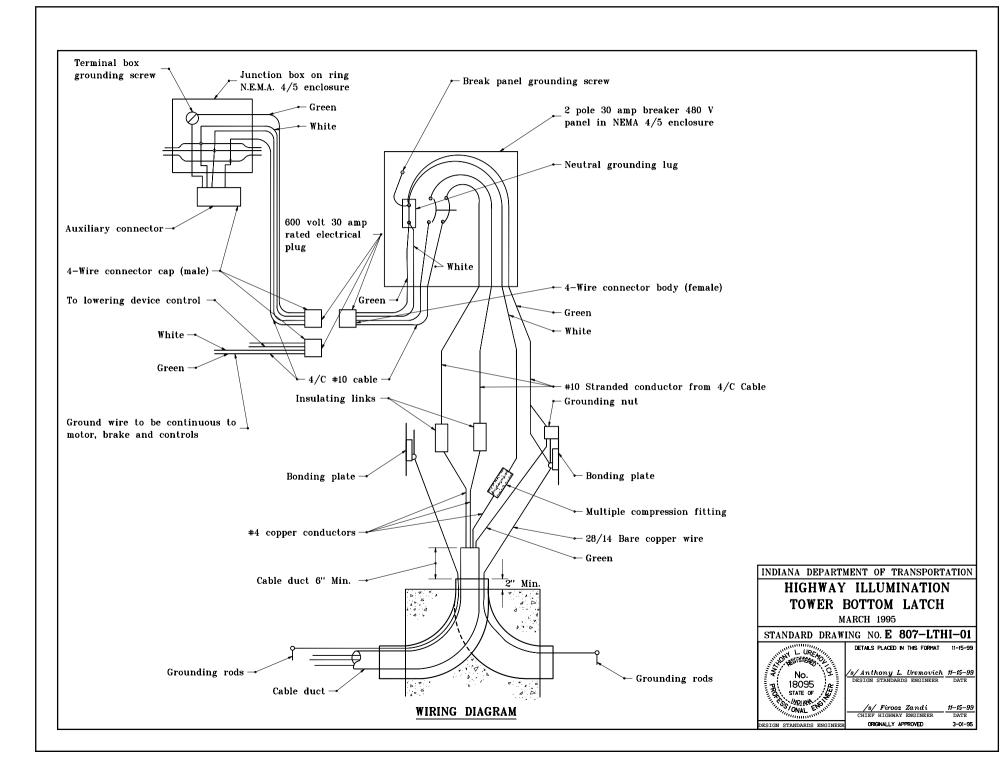
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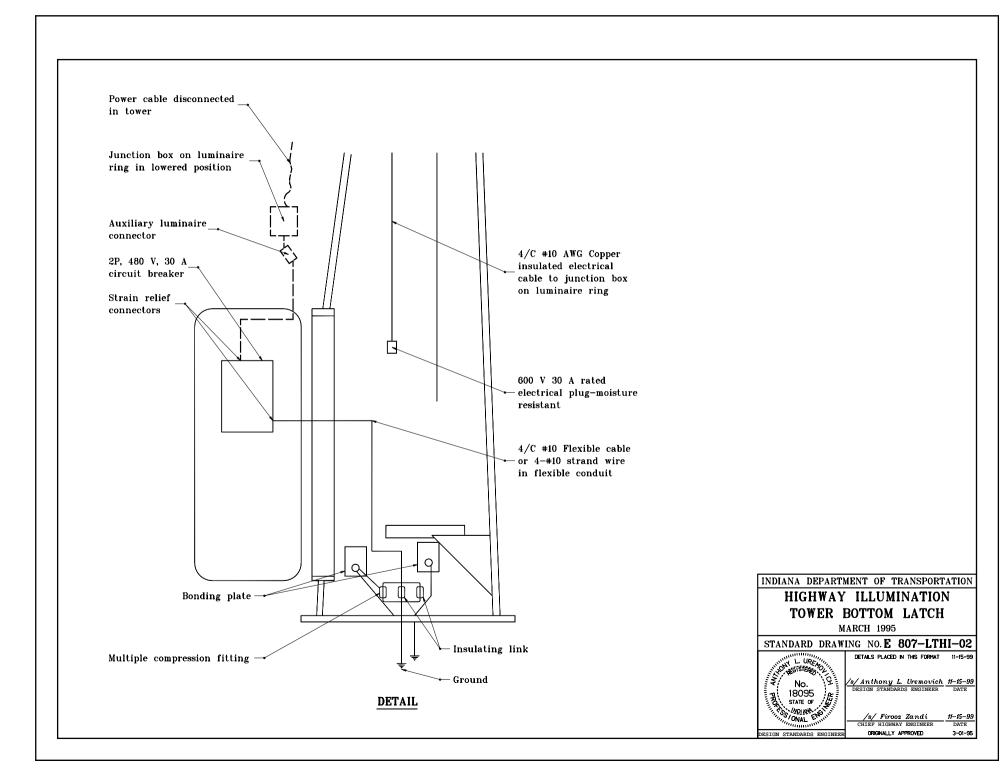


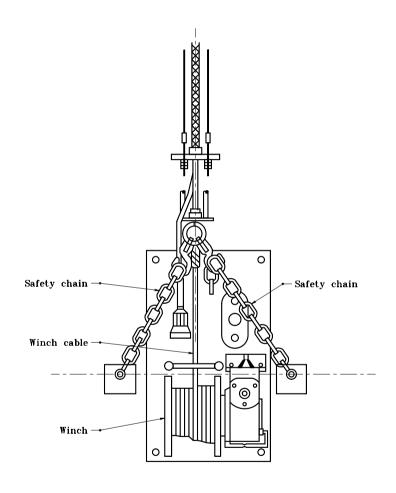
DESIGN STANDARDS ENGINEER

DETAILS PLACED IN THIS FORMAT 11-15-99 /s/Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi







BOTTOM LATCH

INDIANA DEPARTMENT OF TRANSPORTATION

# HIGHWAY ILLUMINATION TOWER DETAILS - BOTTOM LATCH

JANUARY 1999

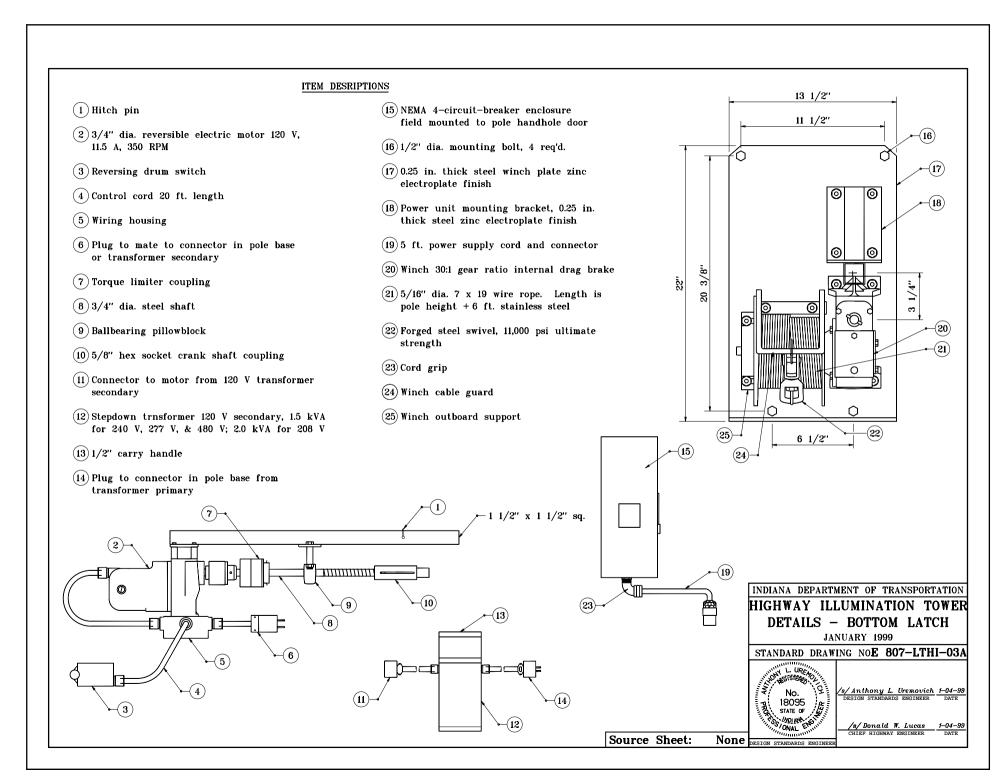
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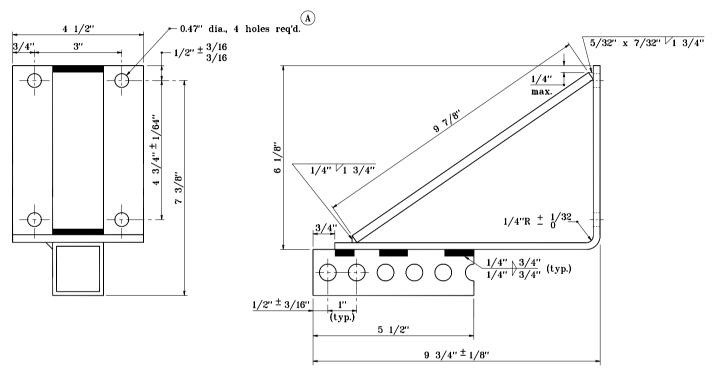


/s/Anthony L. Uremovich 1-04-99
DESIGN STANDARDS ENGINEER DATE

/s/Donald W. Lucas

Source Sheet:





(A) Tolerances:  $0 \pm 1/32$ ", angles  $\pm 1/2$ " unless noted

INDIANA DEPARTMENT OF TRANSPORTATION

# HIGHWAY ILLUMINATION TOWER DETAILS - BOTTOM LATCH

JANUARY 1999

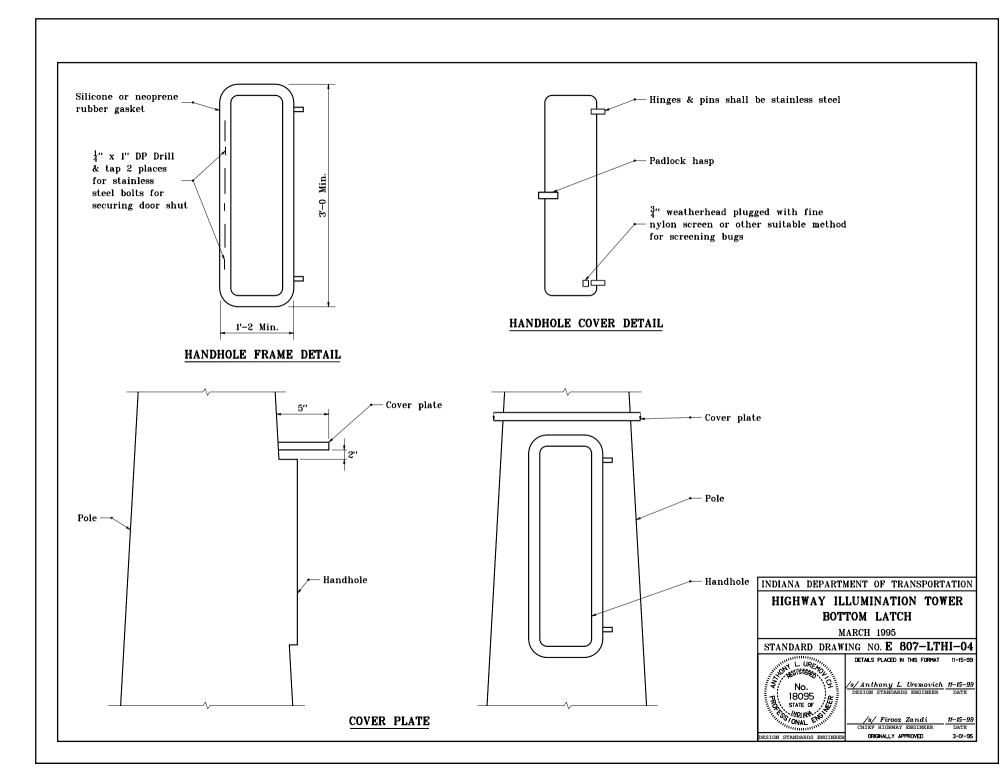
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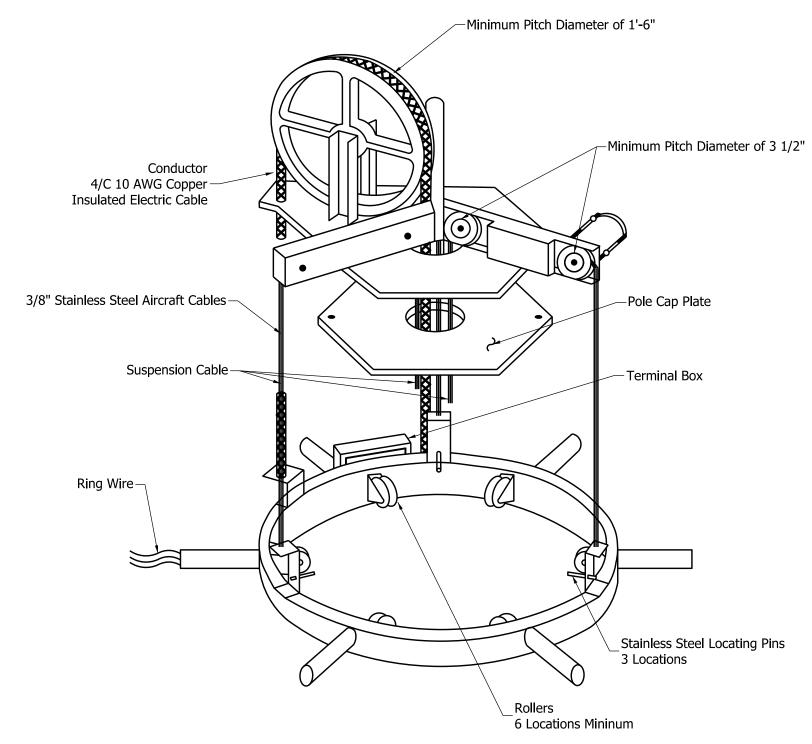


/s/Anthony L. Uremovich 1-04-99
DESIGN STANDARDS ENGINEER DATE

/s/ Donald W. Lucas 1-04-99

Source Sheet:





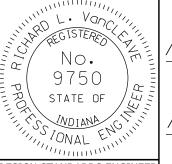
# RING ASSEMBLY

# INDIANA DEPARTMENT OF TRANSPORTATION

# HIGHWAY ILLUMINATION TOWER DETAILS BOTTOM LATCH

SEPTEMBER 2010

STANDARD DRAWING NO. E 807-LTHI-05



/s/ Richard L. Vancleave

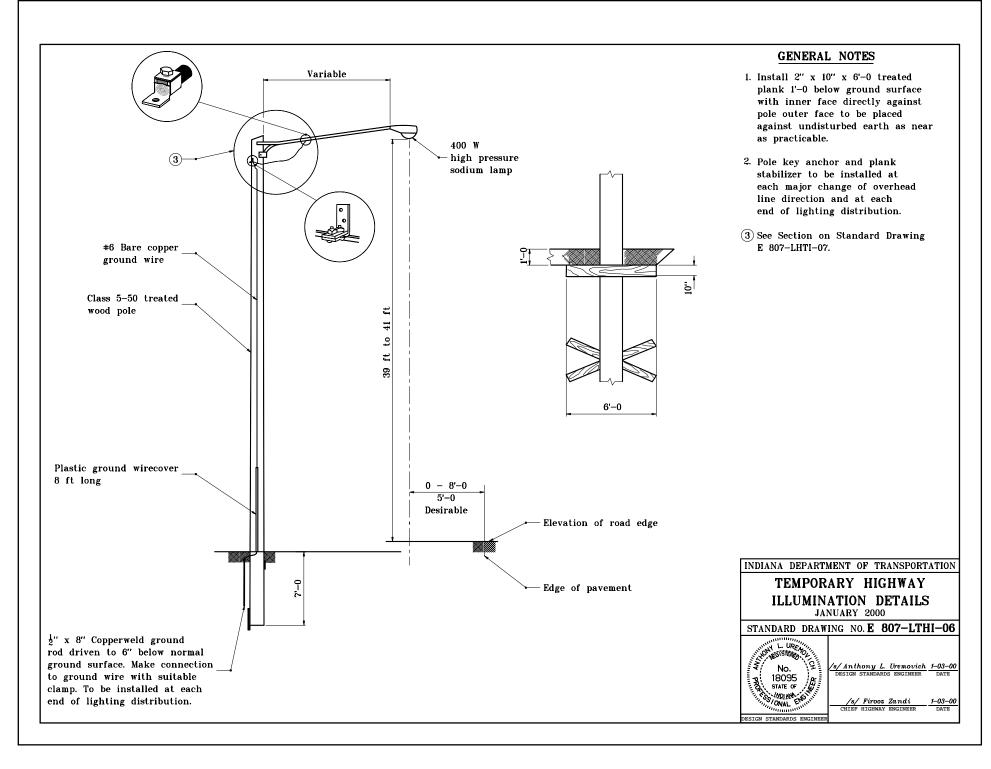
DESIGN STANDARDS ENGINEER

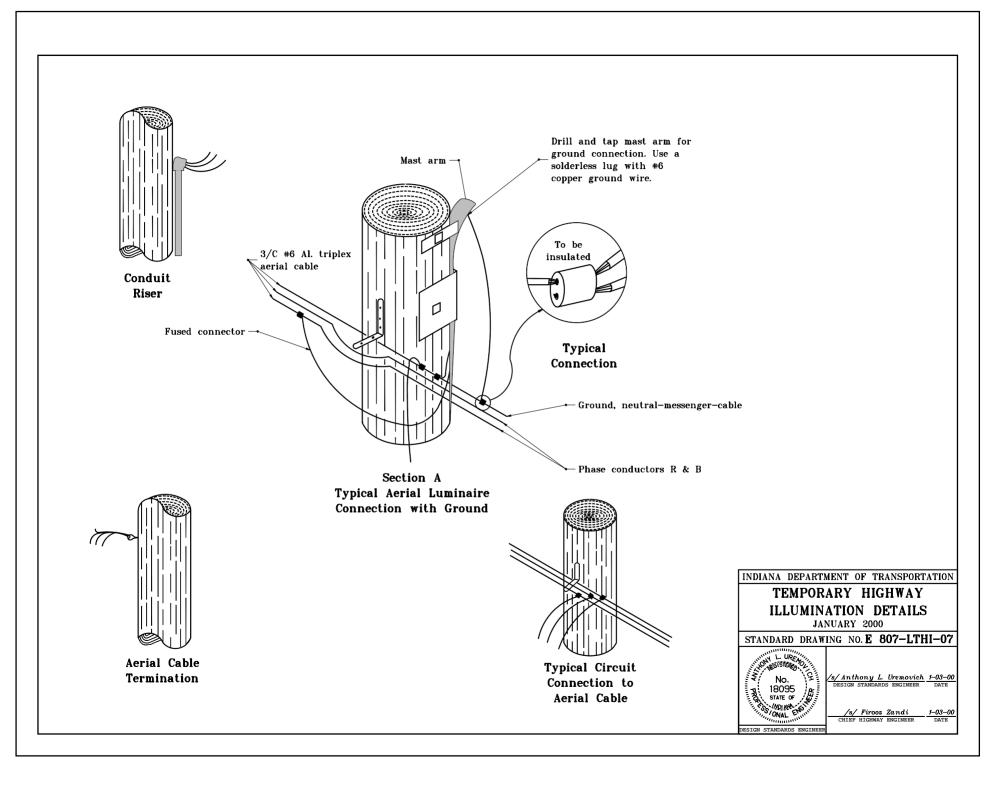
/s/ Mark A. Miller

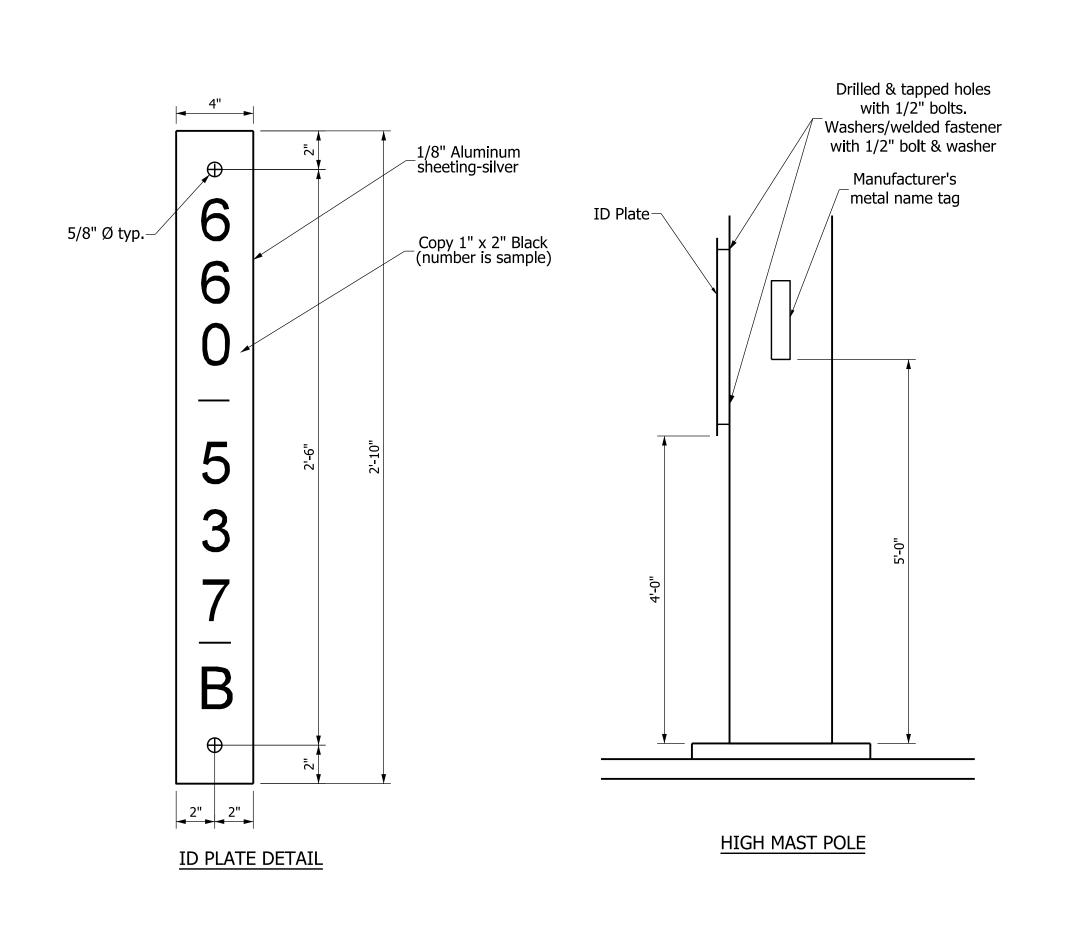
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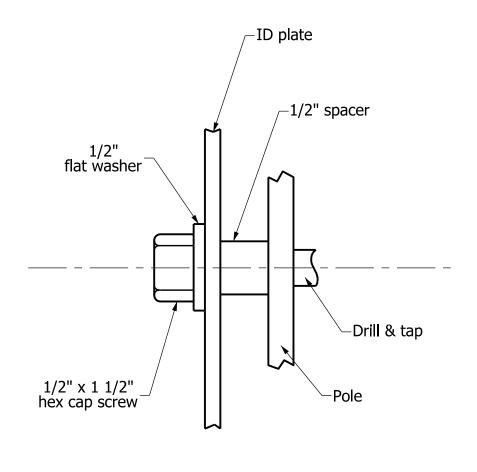
DESIGN STANDARDS ENGINEER

CHIEF HIGHWAY ENGINEER DATE









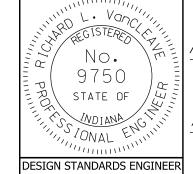
# MOUNTING DETAIL

# INDIANA DEPARTMENT OF TRANSPORTATION

HIGH MAST POLE **ID PLATES** 

SEPTEMBER 2010

STANDARD DRAWING NO. E 807-LTHM-01



/s/ Richard L. VanCleave

09/01/10

DESIGN STANDARDS ENGINEER

09/01/10

DATE

/s/ Mark A. Miller CHIEF HIGHWAY ENGINEER

DATE

DESIGN STANDARDS ENGINEER

# L 1 x 1 x 1/8\_ aluminum 3/8" Ø hole-PERFORATED ALUMINUM SKIRT

# NOTES:

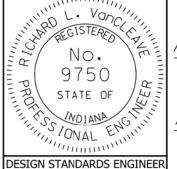
- 1. Holes shall be 3/8" dia., 1/2" outer circle, staggered.
- 2. The base plate of the high mast pole and exposed anchor bolts shall be enclosed by the aluminum skirt.

# INDIANA DEPARTMENT OF TRANSPORTATION

# HIGH MAST POLE PERFORATED ALUMINUM SKIRT

SEPTEMBER 2010

STANDARD DRAWING NO. E 807-LTHM-02



/s/ Richard L. Vancleave

DESIGN STANDARDS ENGINEER

/s/ Mark A. Miller

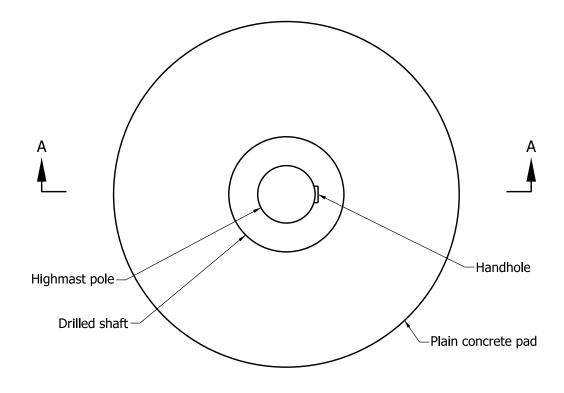
Ter 09/01/10

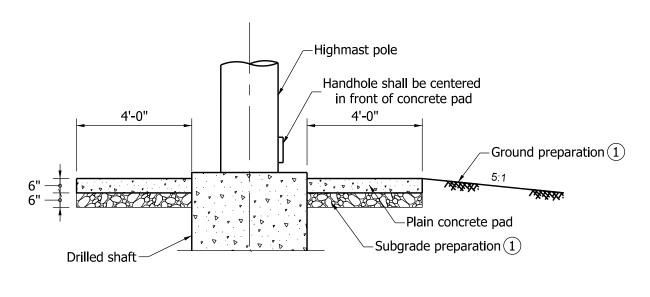
CHIEF HIGHWAY ENGINEER

DATE

# NOTES:

- 1 See Standard Drawing E 807-LTHM-04 for Subgrade and ground preparation requirements.
- 2. The slope grading around the concrete pad shall be as shown unless otherwise directed.





# SECTION A-A

# INDIANA DEPARTMENT OF TRANSPORTATION LIGHTING HIGH MAST POLE CONCRETE PAD SEPTEMBER 2010 STANDARD DRAWING NO. E 807-LTHM-03

NO.

9750

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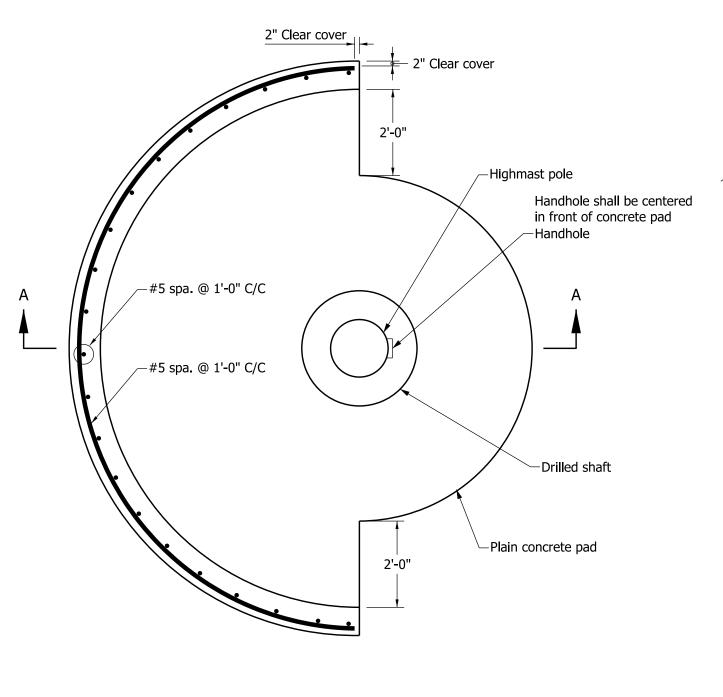
DESIGN STANDARDS ENGINEER

/s/ Richard L. Vancleave 09/01/10

DESIGN STANDARDS ENGINEER DATE

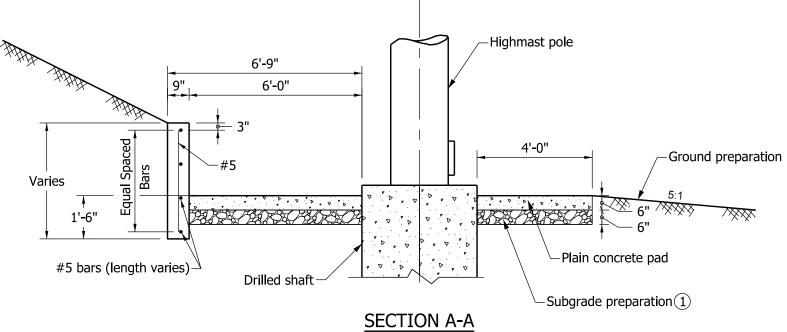
/s/ Mark A. Miller 09/01/10
CHIEF HIGHWAY ENGINEER DATE

1///////////



# NOTES:

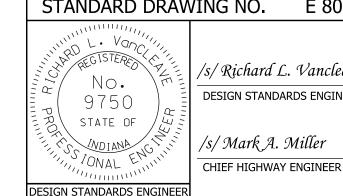
- 1 After excavation, the ground shall be compacted by means of a portable vibratory roller. Soft soil which does not compact shall be removed. All excavated material shall be replaced with compacted aggregate No. 53.
- 2. See Standard Drawing E 807-LTHM-03 for concrete pad where no retaining wall is required.
- 3. See Standard Drawing E 703-BRST-01 for bar bending details.
- 4. All reinforcing bars shall be epoxy coated.



# INDIANA DEPARTMENT OF TRANSPORTATION

LIGHTING HIGH MAST POLE **CONCRETE PAD** WITH RETAINING WALL SEPTEMBER 2010

### STANDARD DRAWING NO. E 807-LTHM-04



/s/ Richard L. Vancleave

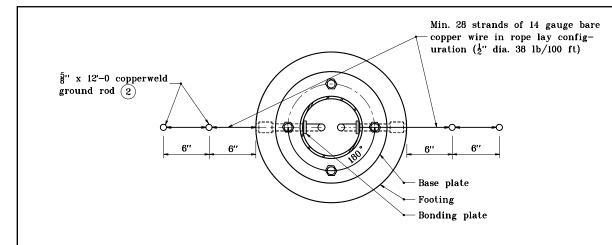
09/01/10 DATE

DESIGN STANDARDS ENGINEER

09/01/10

/s/ Mark A. Miller

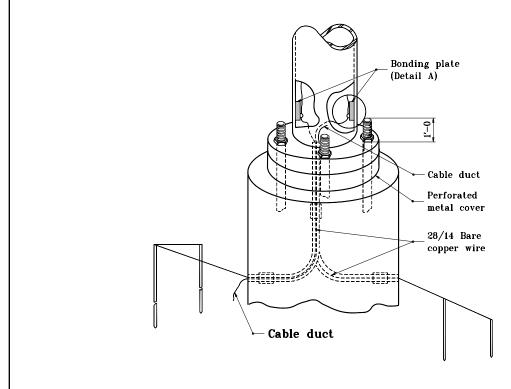
DATE



# **GENERAL NOTES**

- 1. Shop drawings shall be submitted on lightning rod and connection details. Drawings are for informational purposes only. Only one lightning rod is required per structure.
- (2) Grounding rod must be located a min. of 6 ft from base at a min. of 2 ft below grade.

For bonding plate detail, see Standard Drawing No. E 807-LTLR-02.



# INDIANA DEPARTMENT OF TRANSPORTATION LIGHTNING ROD

TYPICAL DETAILS MARCH 1995

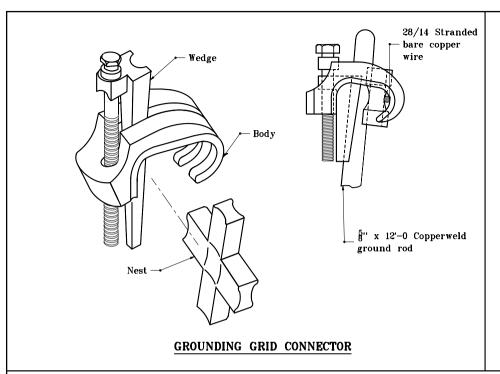
STANDARD DRAWING NO. E 807-LTLR-01

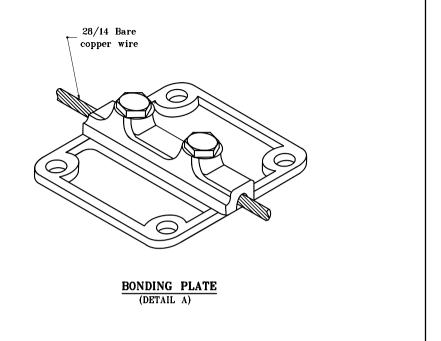


DETAILS PLACED IN THIS FORMAT s/Anthony L. Uremovich 7-27-99

7-27-99

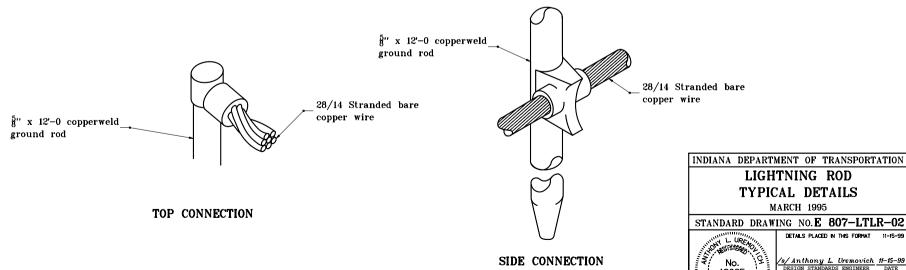
/s/ Firooz Zandi ORIGIANLLY APPROVED



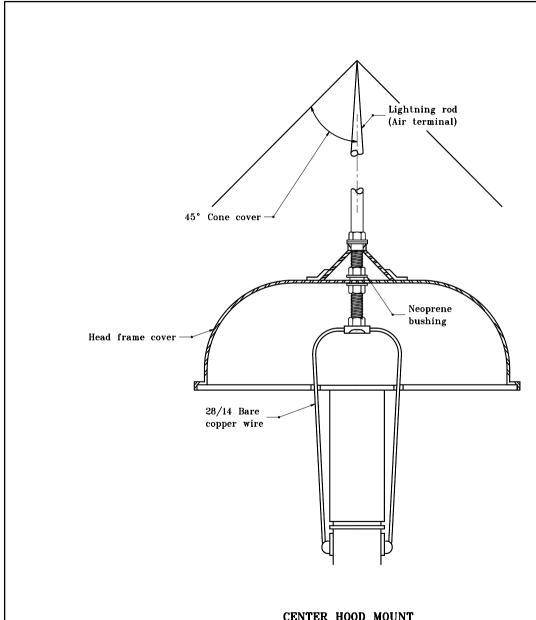


/s/ Firooz Zandi HEF HIGHWAY ENGINEE ORIGNALLY APPROVED

DESIGN STANDARDS ENGINEER



THERMOWELD PROCESS



CENTER HOOD MOUNT

# INDIANA DEPARTMENT OF TRANSPORTATION

# LIGHTNING ROD TYPICAL DETAILS

MARCH 1995

# STANDARD DRAWING NO.E 807-LTLR-03

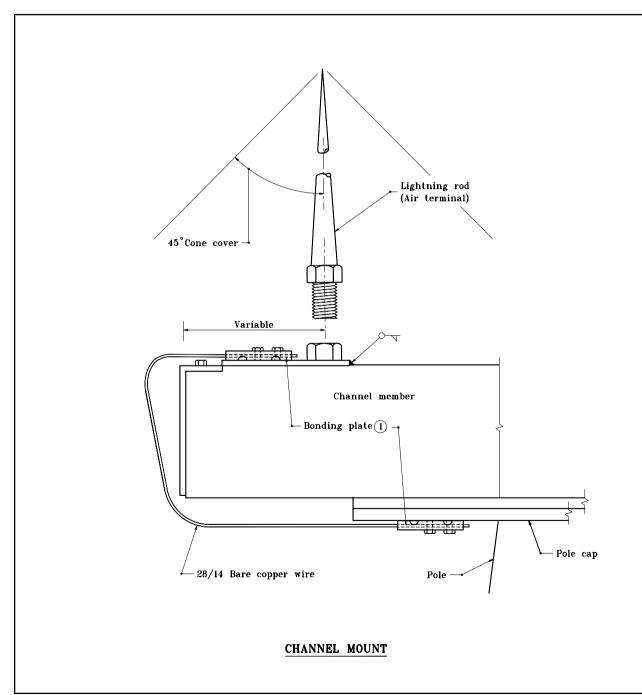


DETAILS PLACED IN THIS FORMAT 11-15-99

/s/Anthony L. Uremovich #1-45-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi CHIEF HIGHWAY ENGINEER

DESIGN STANDARDS ENGINEER



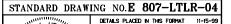
### NOTES

(1) See Standard Drawing E 807-LTLR-02 for Detail A.

# INDIANA DEPARTMENT OF TRANSPORTATION

# LIGHTNING ROD TYPICAL DETAILS

MARCH 1995





s/Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi CHIEF HIGHWAY ENGINEER ORIGINALLY APPROVED

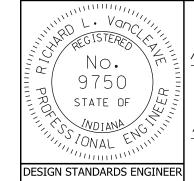
DESIGN STANDARDS ENGINEER

					POLE	DATA SCH	EDULE					
				POLE S	SHAFT DATA		BASE PLATE			ANCHOR BOLT		
POLE HEIGHT (E.M.H.)	No. of Sec.	Sec.		n Diameter nches Top	Min. Wall Thickness in inches	Section Length in Feet	Size in inches	Bolt Circle (in.)	Thick- ness (in.)	No. Req'd.	Diameter (in.)	Length (in.)
100'	2	Α	24.50	17.16	0.250	52.42	37.50	31.50	2.25	6	2.25	90
		В	18.00	10.88	0.1875	50.89						
105'	3	Α	21.50	18.14	0.3125	23.98	37.50	31.50	2.25	6	2.25	90
		В	19.00	13.23	0.1875	41.21						
		С	14.00	7.55	0.1875	46.07						
	3	Α	22.50	19.13	0.3125	24.10	37.50	31.50	2.25	6	2.25	90
110'		В	20.00	13.72	0.1875	44.84						
		С	14.50	7.85	0.1875	47.50						
115'	3	Α	23.50	20.11	0.3125	24.23	37.50	31.50	2.25	6	2.25	90
		В	21.00	14.21	0.1875	48.48						
		С	15.00	8.15	0.1875	48.93						
120'	3	Α	26.00	22.07	0.3125	28.05	37.50	31.50	2.25	6	2.25	90
		В	23.00	16.18	0.1875	48.73						
		С	17.00	9.95	0.1875	50.36						
125'	3	Α	25.00	21.09	0.3750	27.92	37.50	31.50	2.25	6	2.25	90
		В	22.00	14.70	0.1875	52.11						
		С	15.50	8.25	0.1875	51.79						
	3	Α	25.00	20.11	0.3750	34.94	37.50	31.50	2.25	6	2.25	90
130'		В	21.00	14.21	0.1875	48.48						
		С	15.00	7.55	0.1875	53.21						
135'	3	Α	26.00	20.11	0.3750	42.09	37.50	31.50	2.25	6	2.25	90
		В	21.00	14.21	0.1875	48.48						
		С	15.00	7.85	0.1875	51.07						
140'	3	Α	26.80	20.60	0.3750	44.29	37.50	31.50	2.25	6	2.25	90
		В	21.50	14.21	0.1875	52.05						
		С	15.00	7.95	0.1875	50.36						
145'	3	Α	27.00	20.60	0.4375	45.72	39.50	33.50	2.25	8	2.25	90
		В	21.50	14.21	0.1875	52.05						
		С	15.00	7.45	0.1875	53.93						
150'	3	Α	28.00	20.60	0.4375	52.86	39.50	33.50	2.25	8	2.25	90
		В	21.50	14.21	0.1875	52.05						
		С	15.00	7.75	0.1875	51.79						
155'	4	Α	28.50	24.04	0.4375	31.87	39.50	33.50	2.25	8	2.25	90
		В	25.00	19.13	0.1875	41.96						
		С	20.00	14.21	0.1875	41.34						
		D	15.00	7.93	0.1875	50.54						

# INDIANA DEPARTMENT OF TRANSPORTATION

LIGHTING HIGH MAST POLE POLE DATA SCHEDULE (1 of 2) POLE HEIGHTS 100' - 155' SEPTEMBER 2010

STANDARD DRAWING NO. E 807-LTPD-01



/s/Richard L. Vancleave

DESIGN STANDARDS ENGINEER

/s/ Mark A. Miller 09/01/10

CHIEF HIGHWAY ENGINEER

DATE

09/01/10

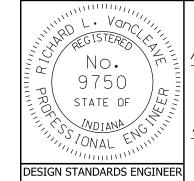
DATE

					POLE	DATA SCHE	DULE					
			P	OLE SHAFT D	BASE PLATE			ANCHOR BOLT				
POLE HEIGHT (E.M.H.)	No. of Sec.	Sec.		n Diameter nches Top	Min. Wall Thickness in inches	Section Length in Feet	Size in inches	Bolt Circle (in.)	Thick- ness (in.)	No. Req'd.	Diameter (in.)	Length (in.)
160'	4	A B C	28.80 26.00 20.50 14.50	25.02 19.62 13.72 7.53	0.4375 0.1875 0.1875 0.1875	27.00 45.59 48.42 49.82	39.50	33.50	2.25	8	2.25	90
165'	4	A B C D	29.50 26.50 20.50 14.50	25.51 19.62 13.72 7.53	0.5000 0.1875 0.1875 0.1875	28.49 49.17 48.42 49.82	46	40.00	2.25	8	2.25	90
170'	4	A B C D	30.50 26.00 21.00 15.00	25.02 20.11 14.21 7.83	0.5000 0.1875 0.1875 0.1875	39.14 42.09 48.48 51.25	46	40.00	2.25	8	2.25	90
175'	4	A B C D	31.00 26.00 20.50 14.50	25.02 19.62 13.72 7.63	0.5000 0.1875 0.1875 0.1875	42.71 45.59 48.42 49.11	46	40.00	2.25	8	2.25	90
180'	4	A B C D	32.00 26.00 20.00 14.00	25.02 19.13 13.23 7.93	0.5000 0.1875 0.1875 0.1875	49.85 49.10 48.35 43.39	46	40.00	2.25	8	2.25	90
185'	4	A B C D	32.50 27.00 21.00 15.00	26.00 20.11 14.21 7.73	0.5000 0.1875 0.1875 0.1875	46.41 49.23 48.48 51.96	46	40.00	2.25	8	2.25	90
190'	5	A B C D	33.00 30.00 25.00 20.00 15.00	28.95 24.04 19.13 14.21 7.90	0.6250 0.1875 0.1875 0.1875 0.1875	28.92 42.59 41.96 41.34 50.71	48	42.00	2.25	12	2.25	90
195'	5	A B C D	33.50 30.00 25.00 20.00 15.00	28.95 24.04 19.13 14.21 7.70	0.6250 0.1875 0.1875 0.1875 0.1875	32.50 42.59 41.96 41.34 52.14	48	42.00	2.25	12	2.25	90
200'	5	A B C D	34.00 30.00 24.50 19.50 14.50	28.89 23.55 18.63 13.72 7.56	0.6250 0.2188 0.1875 0.1875 0.1875	36.51 46.09 41.90 41.27 49.55	48	42.00	2.25	12	2.25	90

# INDIANA DEPARTMENT OF TRANSPORTATION

LIGHTING HIGH MAST POLE POLE DATA SCHEDULE (2 of 2) POLE HEIGHTS 160' - 200' SEPTEMBER 2010

STANDARD DRAWING NO. E 807-LTPD-02

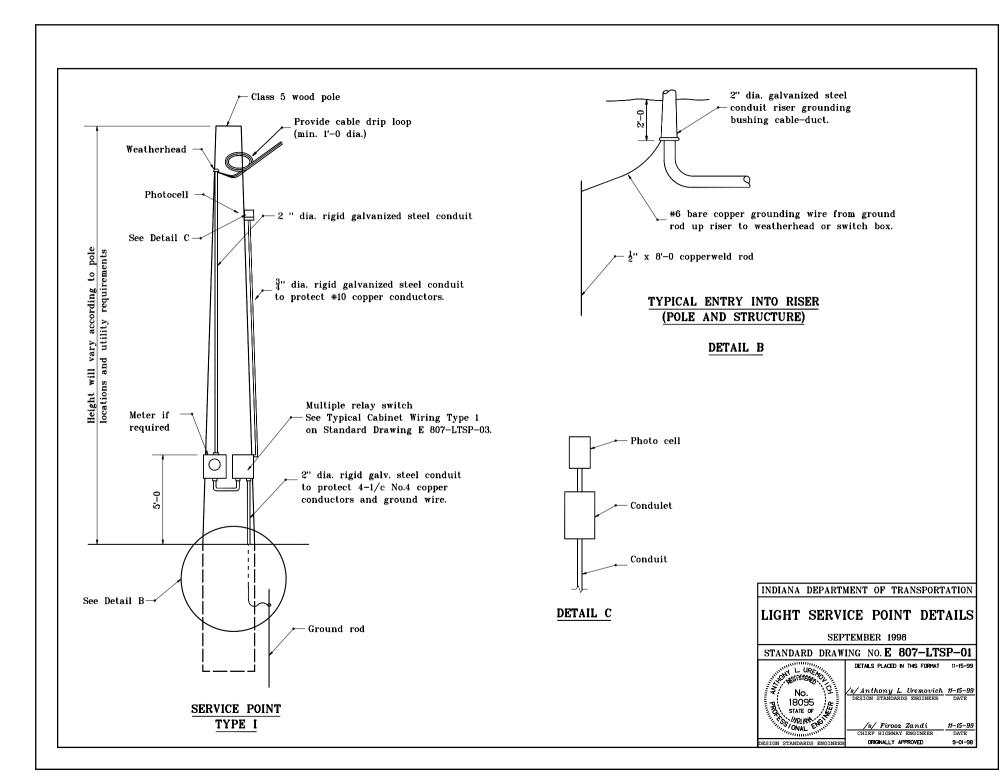


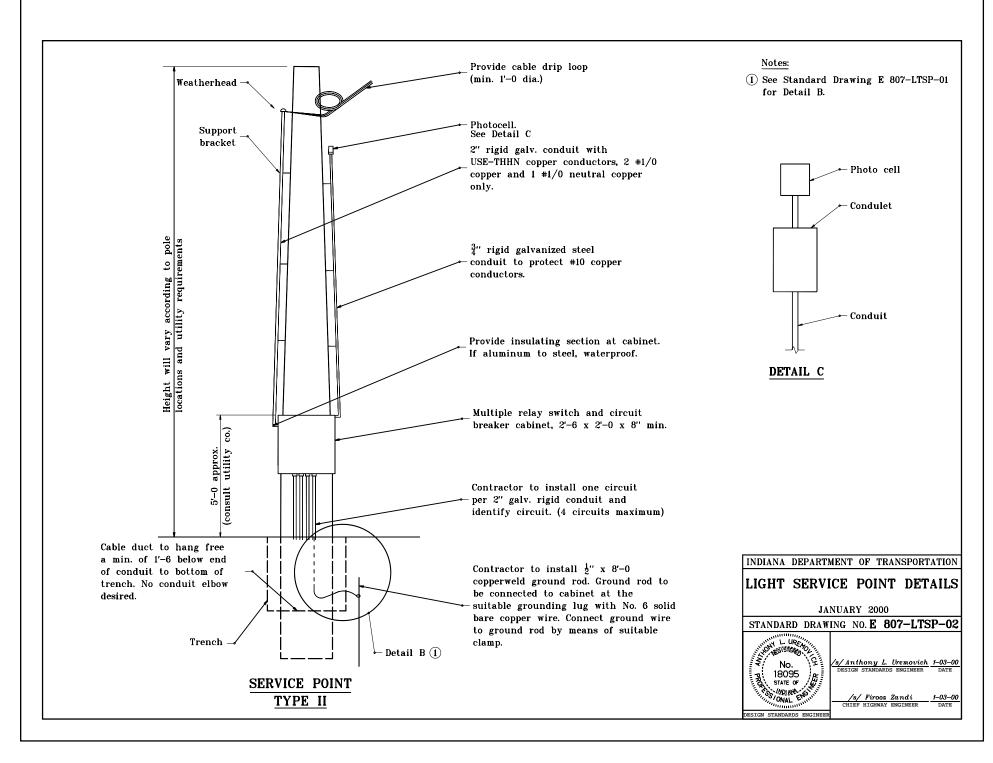
/s/Richard L. Vancleave 09/01/10 DESIGN STANDARDS ENGINEER

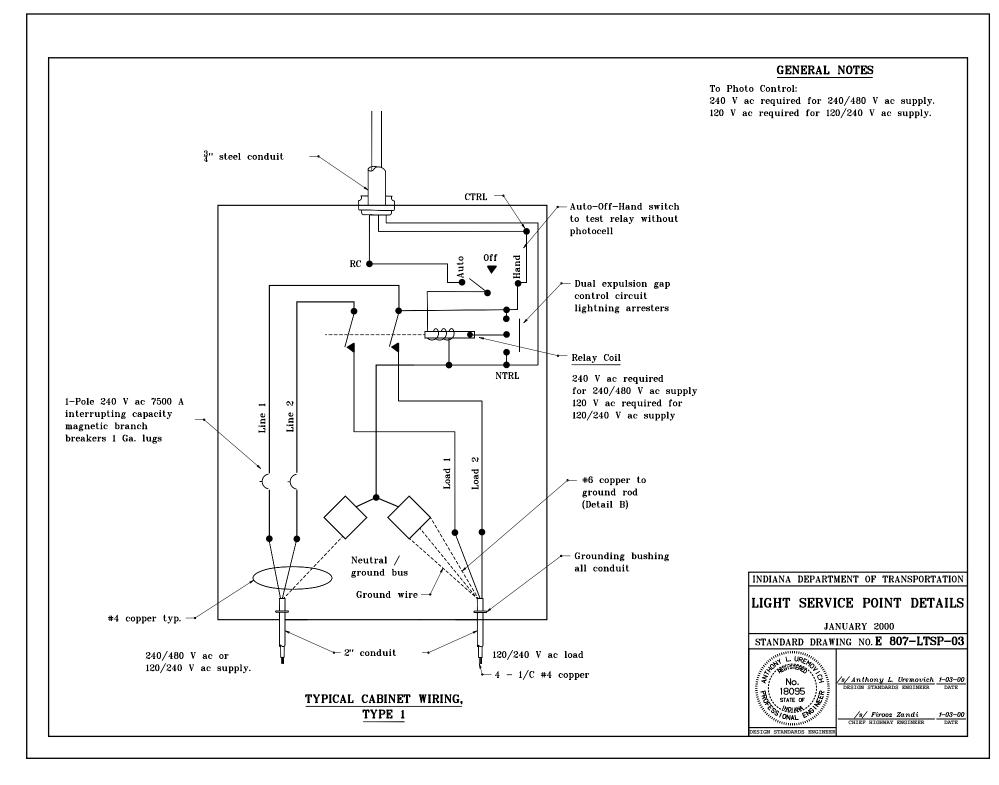
/s/ Mark A. Miller 09/01/10

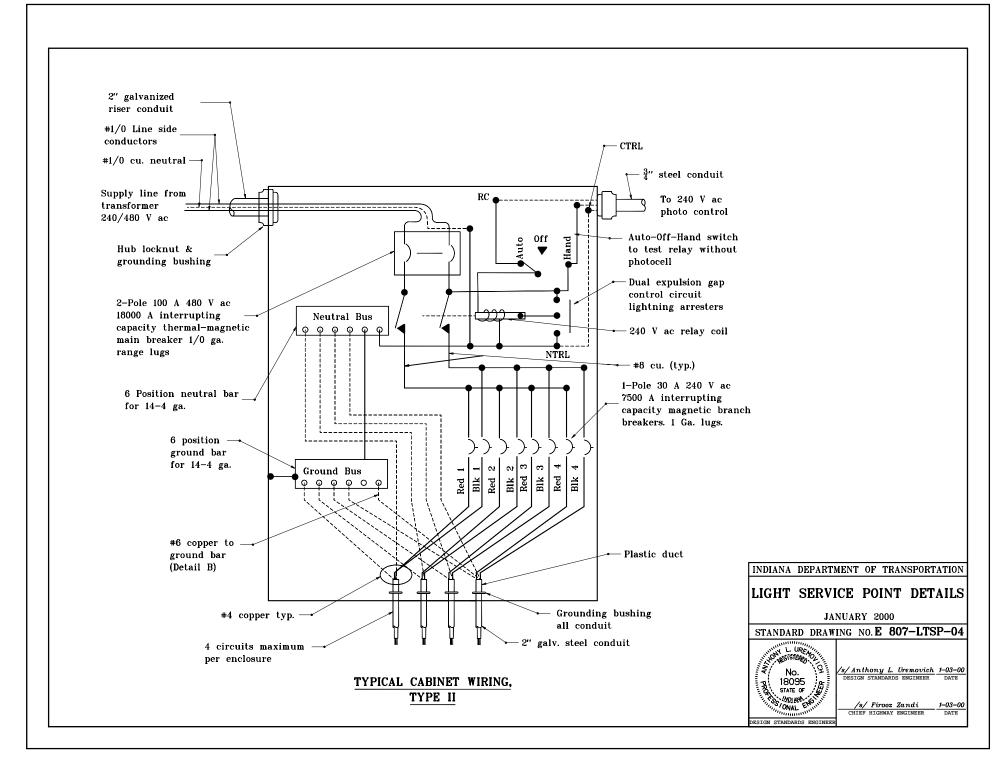
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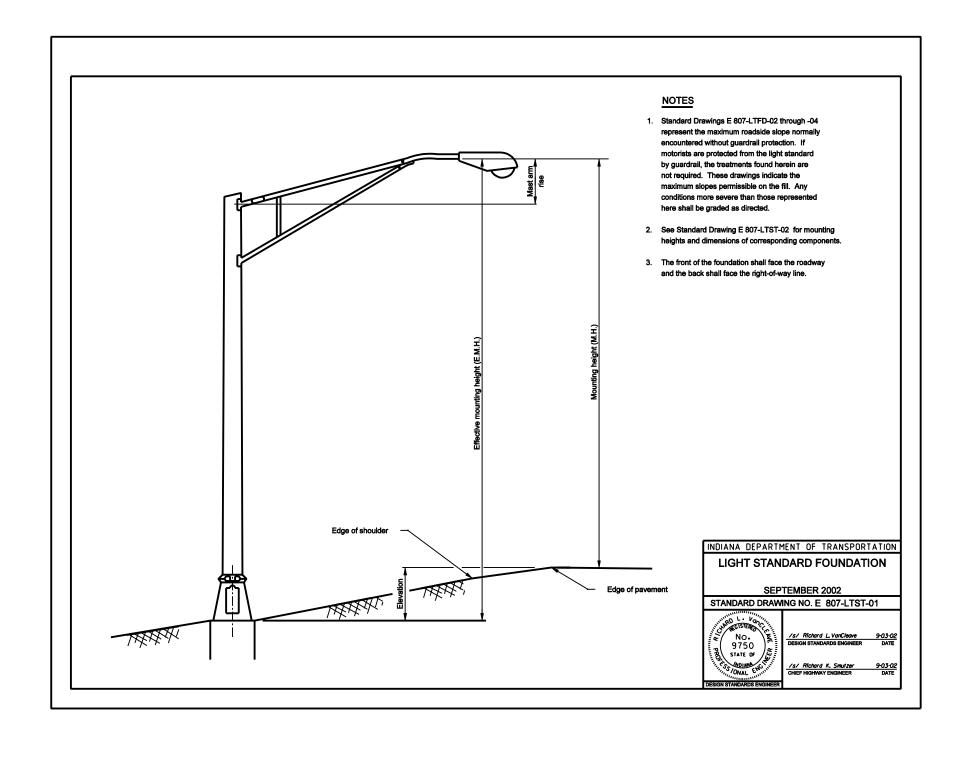
CHIEF HIGHWAY ENGINEER











FOR ROADWAY INSTALLATION (TRANSFORMER BASE)						
E.M.H. (FT.)	ARM LENGTH (FT.)		BASE PLATE			
		BASE DIAMETER (IN.)	TOP DIAMETER (IN.)	THICKNESS (IN.)	BOLT CIRCLE (IN.)	
25	5	8	4.5	0.188	11 1/2"	
25	10	8	6	0.188	11 1/2"	
25	15	8	6	0.188	11 1/2"	
25	20	10	6	0.188	14 1/2"	
25	25	10	6	0.250	14 1/2"	
30	5	8	4.5	0.188	11 1/2"	
30	10	8	6	0.188	11 1/2"	
30	15	8	6	0.188	11 1/2"	
30	20	10	6	0.188	14 1/2"	
30	25	10	6	0.250	14 1/2"	
35	5	8	4.5	0.188	11 1/2"	
35	10	8	6	0.188	11 1/2"	
35	15	8	6	0.188	11 1/2"	
35	20	10	6	0.188	14 1/2"	
35	25	10	6	0.250	14 1/2"	
40	5	8	6	0.188	11 1/2"	
40	10	8	6	0.188	11 1/2"	
40	15	8	6	0.219	11 1/2"	
40	20	10	6	0.219	14 1/2"	
40	25	10	6	0.312	14 1/2"	
45	5	8	6	0.219	11 1/2"	
45	10	8	6	0.219	11 1/2"	
45	15	8	6	0.219	11 1/2"	
45	20	10	6	0.250	14 1/2"	
45	25	10	6	0.312	14 1/2"	

### **NOTES**

- 1. Each anchor bolt for roadway installation shall have a diameter of 1", a total length of 4'-4" and a hook length of 4". Each washer shall be galvanized flat washer 1 1/16" I.D., 2 3/4" O.D., 1/2" thick.
- 2. Each anchor bolt for a bridge deck installation shall have a diameter of 1", a total length of 3'-8", and a hook length of 4".

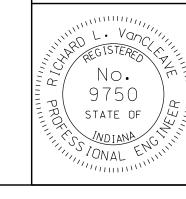
FOR BRIDGE DECK INSTALLATION (ANCHOR BASE)						
E.M.H. (FT.)	ARM LENGTH (FT.)	SHAFT			BASE PLATE	
		BASE DIAMETER (IN.)	TOP DIAMETER (IN.)	THICKNESS (IN.)	BOLT CIRCLE (IN.)	
25	5	8	4.5	0.188	11 1/2"	
25	5	8	6	0.188	11 1/2"	
30	5	8	4.5	0.188	11 1/2"	
30	5	8	6	0.188	11 1/2"	
35	5	8	4.5	0.188	11 1/2"	
35	5	8	6	0.188	11 1/2"	
40	5	8	6	0.188	11 1/2"	
40	5	8	6	0.219	11 1/2"	
45	5	8	6	0.219	11 1/2"	
45	5	8	6	0.250	11 1/2"	

### INDIANA DEPARTMENT OF TRANSPORTATION

# ALUMINUM LIGHT POLE WITH TRANSFORMER BASE

SEPTEMBER 2012

STANDARD DRAWING NO. E 807-LTST-02



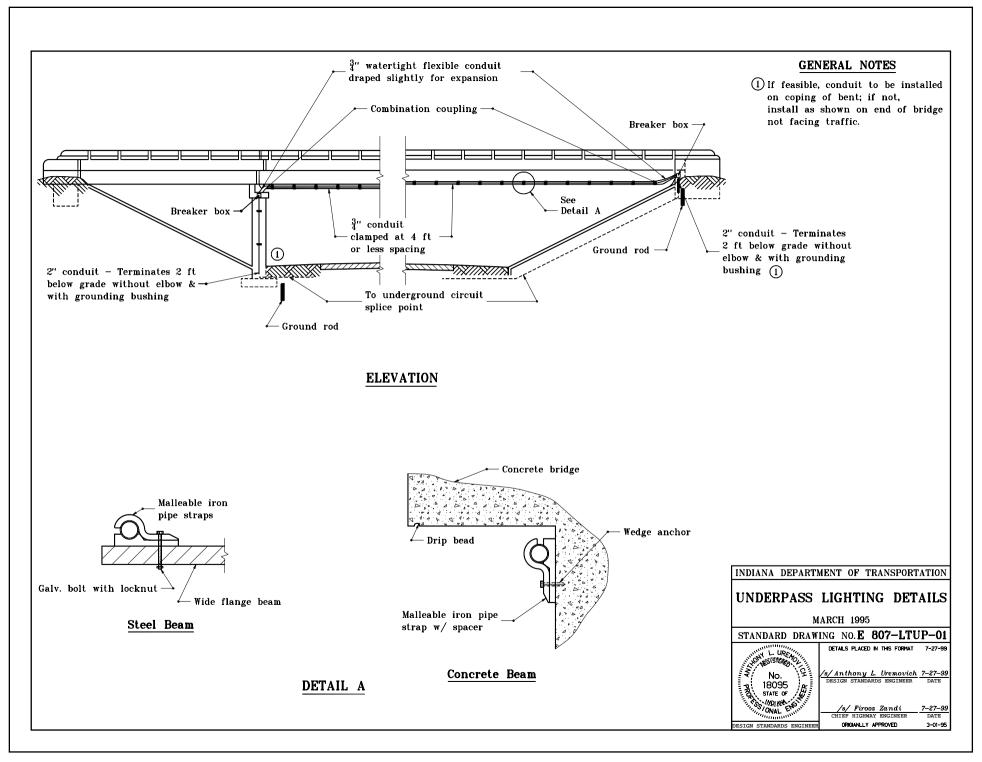
/s/ Richard L. VanCleave

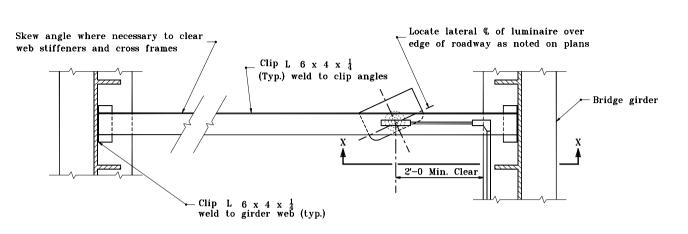
SUPERVISOR, ROADWAY STANDARDS DATE

/s/ Mark A. Miller 09/04/12

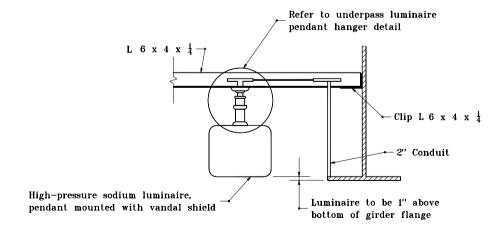
09/04/12

CHIEF ENGINEER DATE

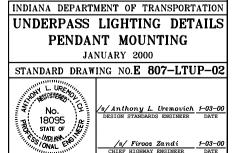


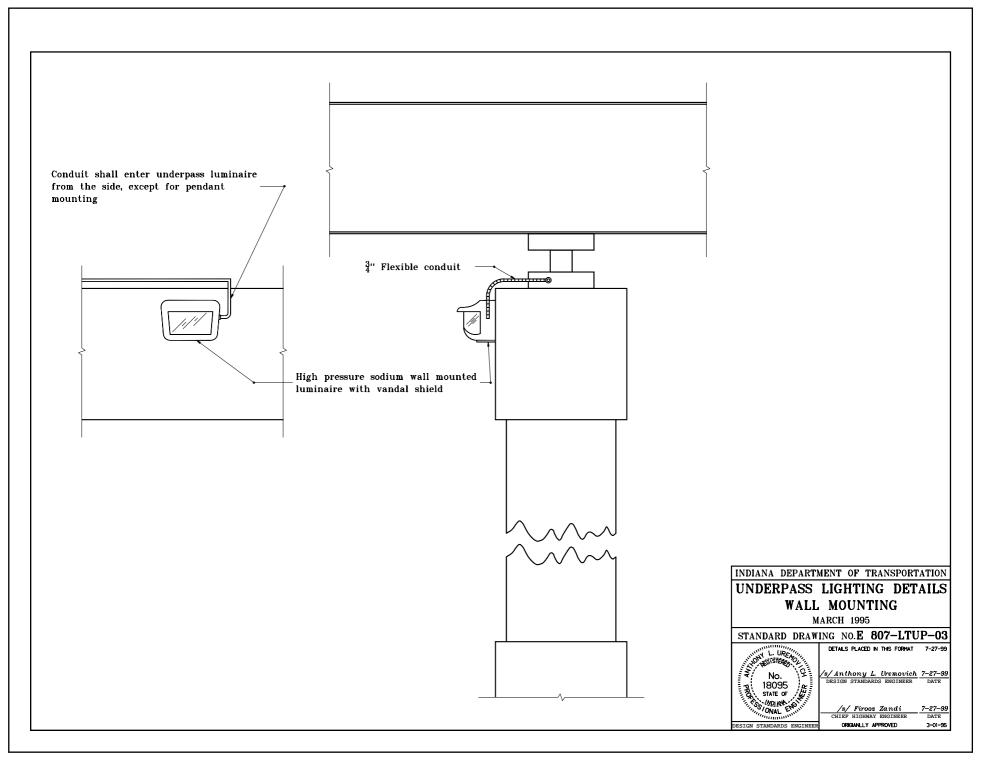


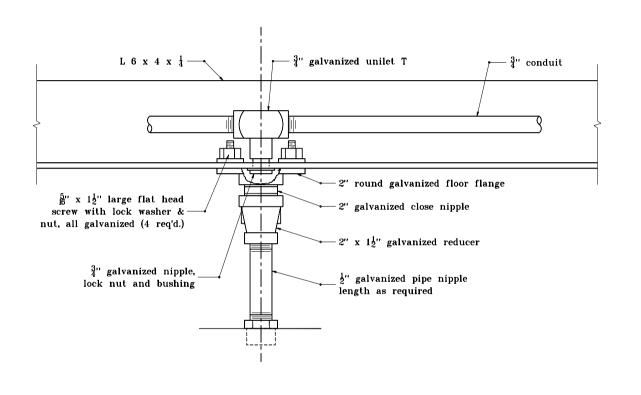
### PLAN VIEW



### SECTION X-X







INDIANA DEPARTMENT OF TRANSPORTATION

### UNDERPASS LIGHTING DETAILS PENDANT HANGER DETAIL

JANUARY 2000

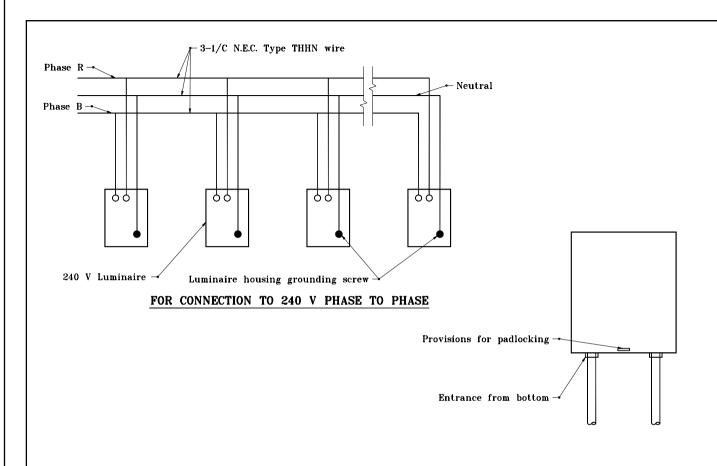
STANDARD DRAWING NO.E 807-LTUP-04

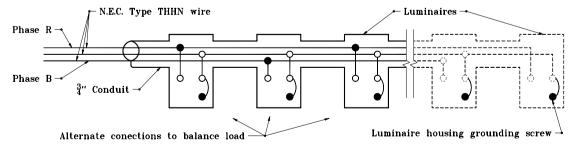


/s/Anthony L. Uremovich 1-03-00 DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 1-0

ESIGN STANDARDS ENGINEER





FOR CONNECTION TO 120 V OR 240 V PHASE TO NEUTRAL

### INDIANA DEPARTMENT OF TRANSPORTATION UNDERPASS LIGHTING DETAILS LUMINAIRE WIRING DETAIL

JANUARY 2000

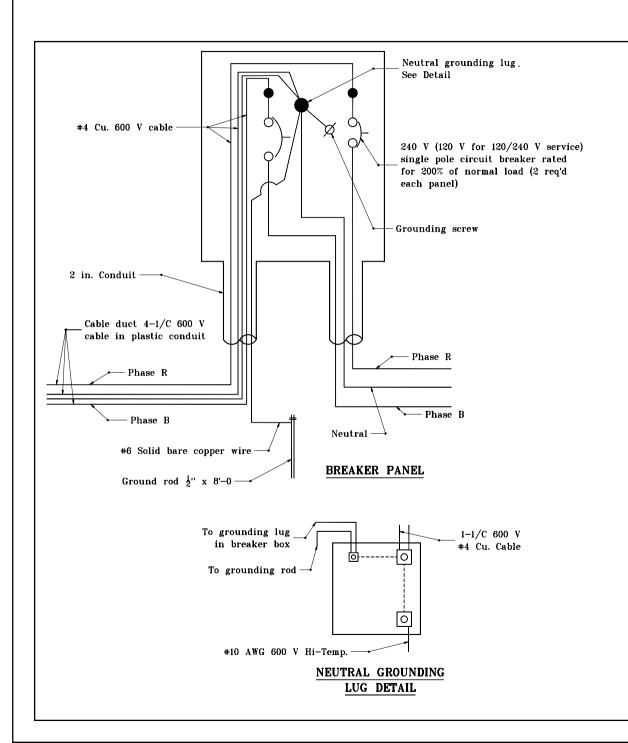
STANDARD DRAWING NO.E 807-LTUP-05



/s/ Anthony L. Uremovich 1-03-00
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi

1-03-00



### **GENERAL NOTES**

- 1. For all luminaire wiring from breaker panel, the last luminaire shall be #10 AWG stranded copper, 600 V.
- 2. Where sign illumination and underpass illumination are to be installed on the same structure, both sign and underpass luminaires may be connected to the same circuit.

INDIANA DEPARTMENT OF TRANSPORTATION UNDERPASS LIGHTING DETAILS CIRCUIT BREAKER WIRING DETAIL MARCH 1995

STANDARD DRAWING NO.E 807-LTUP-06

18095 STATE OF -AMA LOW! DESIGN STANDARDS ENGINEER

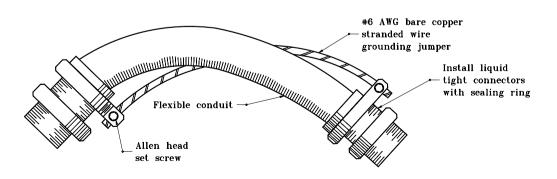
s/Anthony L. Uremovich 11-15-99

DETAILS PLACED IN THIS FORMAT 11-15-99

/s/ Firooz Zandi

### Bolt or lag bolt Conduit -Expansion fitting Malleable iron pipe straps and spacers Malleable iron clamp with steel U-bolt Concrete anchor to be installed only when needed Tinned copper braided bonding jumper

### TYPICAL 3 IN. AND 2 IN. DIAMETER EXPANSION FITTING WITH GROUNDING JUMPER



TYPICAL 3 IN. AND 2 IN. DIAMETER FLEXIBLE CONDUIT WITH GROUNDING JUMPER

### GENERAL NOTES

- 1. Malleable iron pipe straps to be installed immediately before and after the installed expansion fitting, to support expansion fitting and conduit.
- 2. Spacers shall be provided underneath the pipe strap to allow proper clearance between the bridge structure and the fitting.
- 3. Grounding jumper shall not be wrapped around flexible conduit, but slightly draped on one side.

INDIANA DEPARTMENT OF TRANSPORTATION

### UNDERPASS LIGHTING DETAILS

MARCH 1995

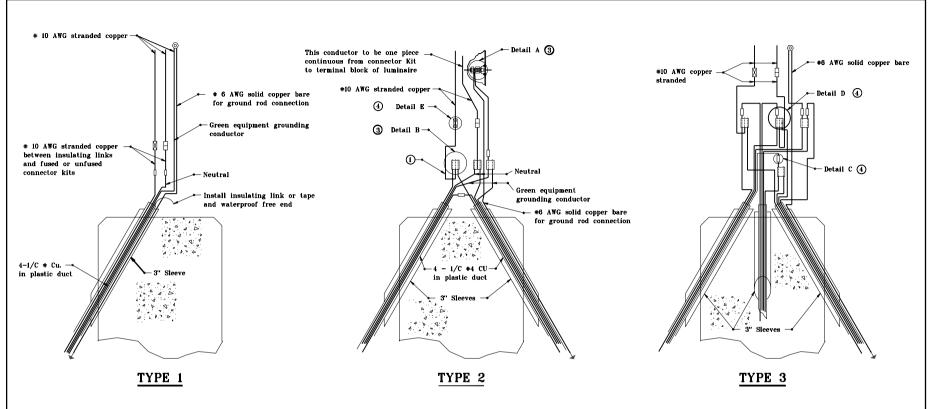
STANDARD DRAWING NO.E 807-LTUP-07 DETAILS PLACED IN THIS FORMAT 11-15-99

18095

s/Anthony L. Uremovich #1-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi

DESIGN STANDARDS ENGINEER



### CONNECTION TYPES

### NOTES

- (1) Allow sufficient conductor slack to permit the withdrawal of outside of pole handhole.
- 2. Use of inhibiting compound is mandatory for all connections.
- (3) See Standard Drawing E 807-LTWR-02 for details.
- (4) See Standard Drawing E 807-LTWR-03 for details.

### LEGEND

- Grounding post

Self insulated splicer (insulating link)

- Unfused connector

— Fused connector

Compression connector

INDIANA DEPARTMENT OF TRANSPORTATION

LIGHTING WIRING DETAILS

JANUARY 1996

STANDARD DRAWING NO.E 807-LTWR-01

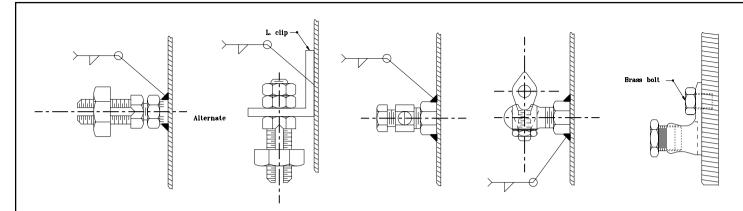
18095 STATE OF ONAL EN

DESIGN STANDARDS ENGINEER

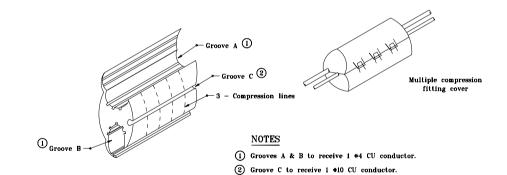
DETAILS PLACED IN THIS FORMAT 11-15-99 /s/Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi 11-15-99

1-02-96



### DETAIL A ALTERNATIVE GROUNDING POSTS



### DETAIL B MULTIPLE COMPRESSION FITTING

### **LEGEND**

Grounding post

Self insulated splicer (insulating link)

Unfused connector

Fused connector

— Compression connector

INDIANA DEPARTMENT OF TRANSPORTATION

LIGHTING WIRING DETAILS

JANUARY 1996

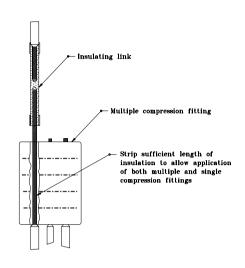
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DETAILS PLACED IN THIS FORMAT 11-15-99

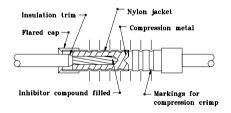
S/Anthony L. Uremovich 11-15-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi

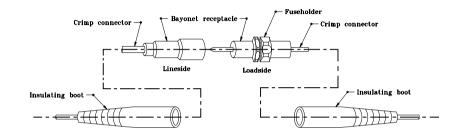
ORIGINALLY APPROVED DESIGN STANDARDS ENGINEER



DETAIL D



DETAIL C INSULATING LINK



### DETAIL E BAYONET DISCONNECT CONNECTOR KIT

### **LEGEND**

- Grounding post

— Self insulated splicer (insulating link)

- Unfused connector

Fused connector

Compression connector

INDIANA DEPARTMENT OF TRANSPORTATION

### LIGHTING WIRING DETAILS

JANUARY 1996

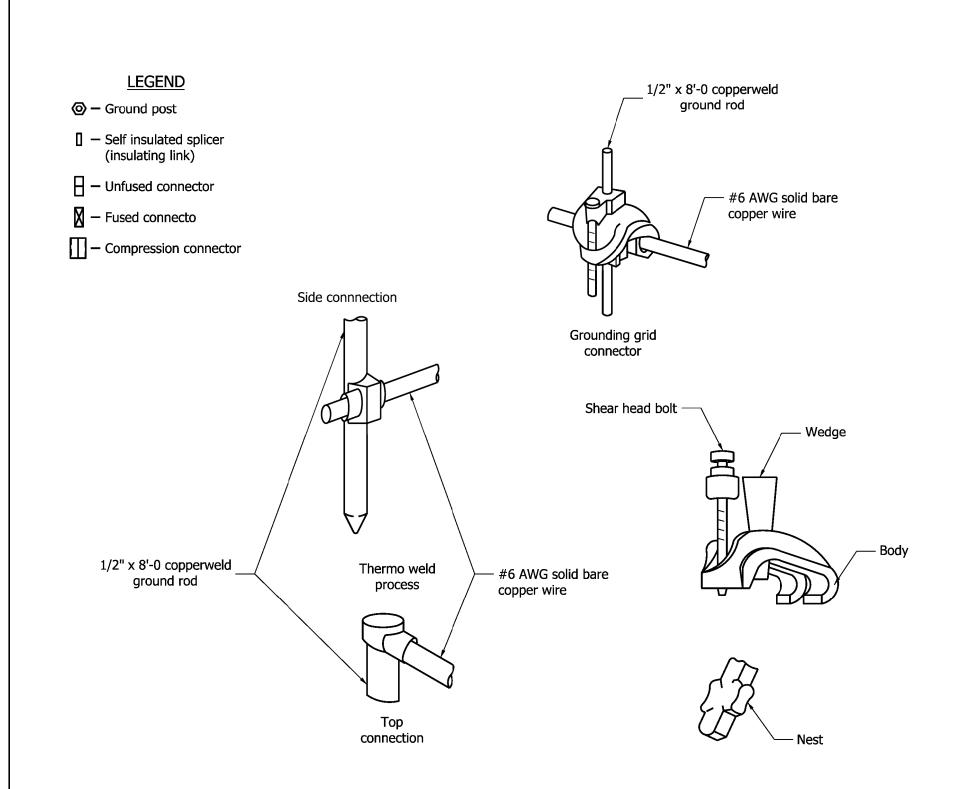
STANDARD DRAWING NO.E 807-LTWR-03

18095 STATE OF ONAL EN DETAILS PLACED IN THIS FORMAT 11-15-99

/s/Anthony L. Uremovich #1-45-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi CHIEF HIGHWAY ENGINEER 11-15-99 1-02-96

DESIGN STANDARDS ENGINEER

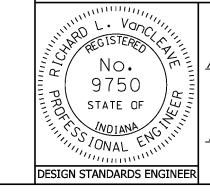


DETAIL F TYPICAL GROUND ROD CONNECTION

### INDIANA DEPARTMENT OF TRANSPORTATION LIGHTING WIRING DETAILS

SEPTEMBER 2009

STANDARD DRAWING NO. E 807-LTWR-04



/s/Richard L. VanCleave 09/01/09 DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller

09/01/09 CHIEF HIGHWAY ENGINEER DATE

INDEX				
SHEET NO.	SUBJECT			
1	Index			
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3	Dotted Lines for Freeway Deceleration Lanes			
4	Freeway Short Auxiliary Lanes and Lane Drops			
5	Route Split with Dedicated Lanes			
6	Lane Drops at Intersections			

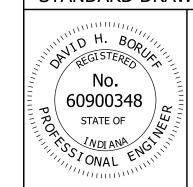
### INDIANA DEPARTMENT OF TRANSPORTATION

### DOTTED LINE MARKING DRAWING INDEX AND GENERAL NOTES

SEPTEMBER 2015

STANDARD DRAWING NO. E 808-

E 808-DLIM-01



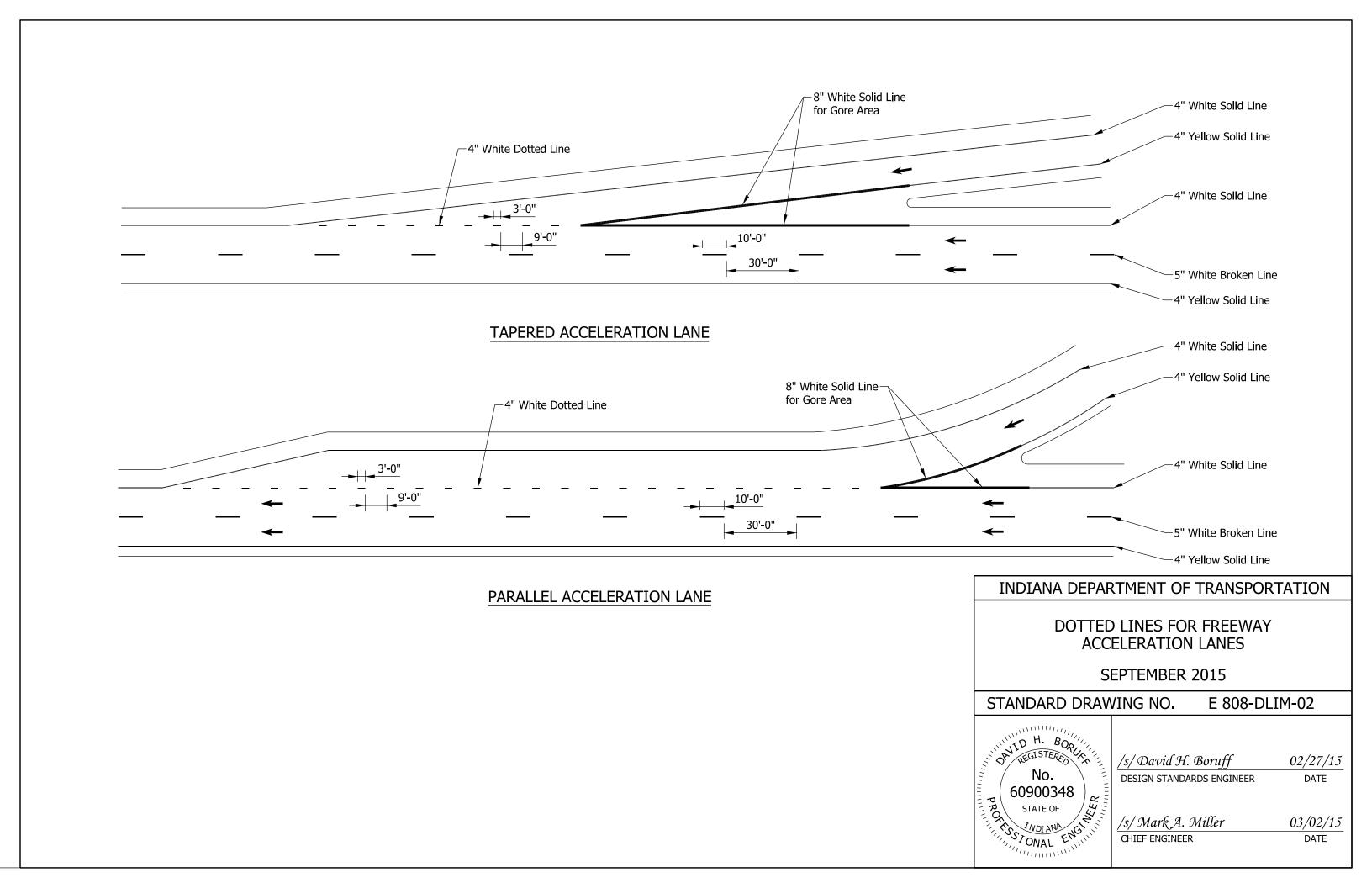
/s/ David H. Boruff
DESIGN STANDARDS ENGINEER

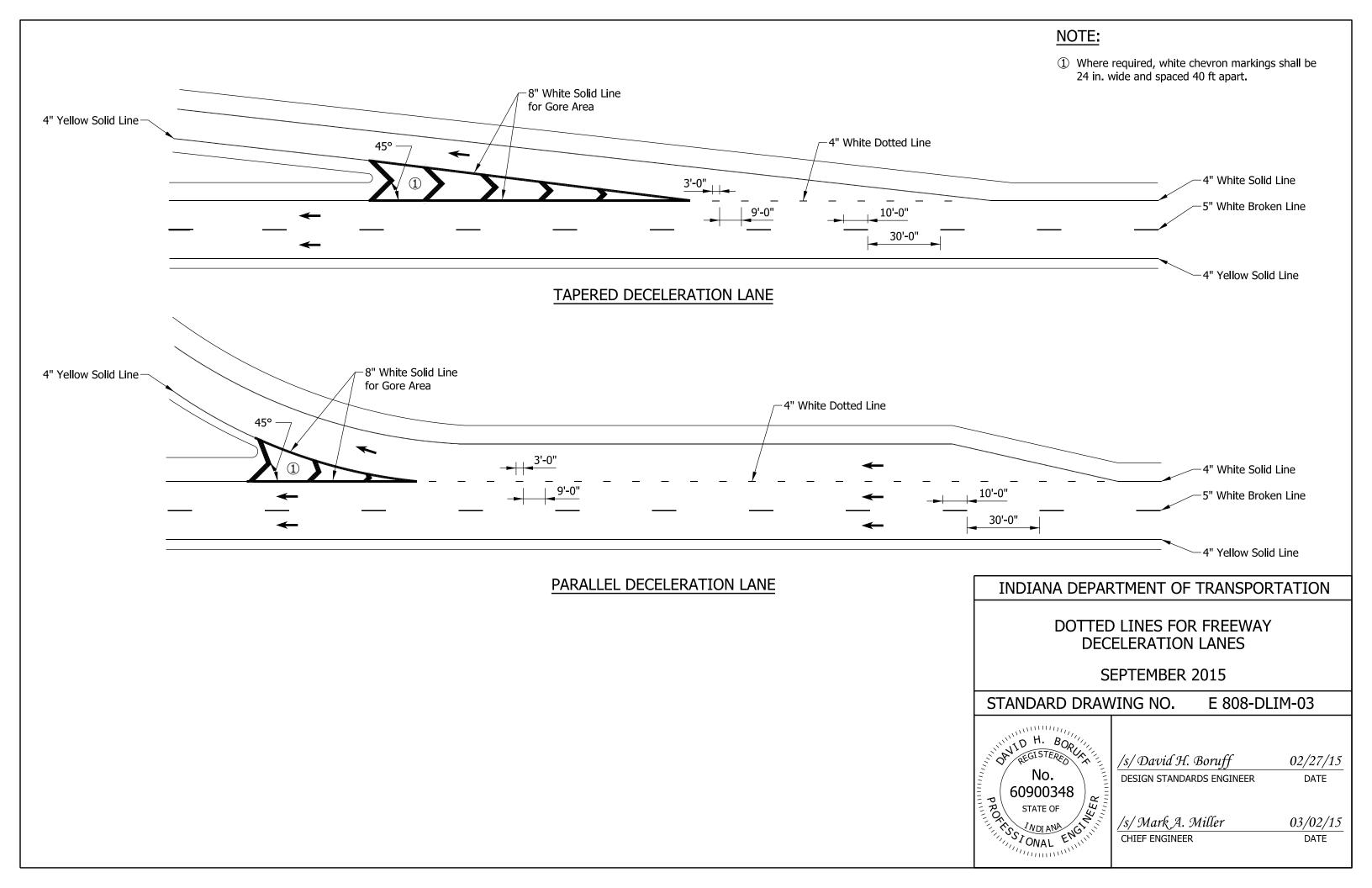
02/27/15 DATE

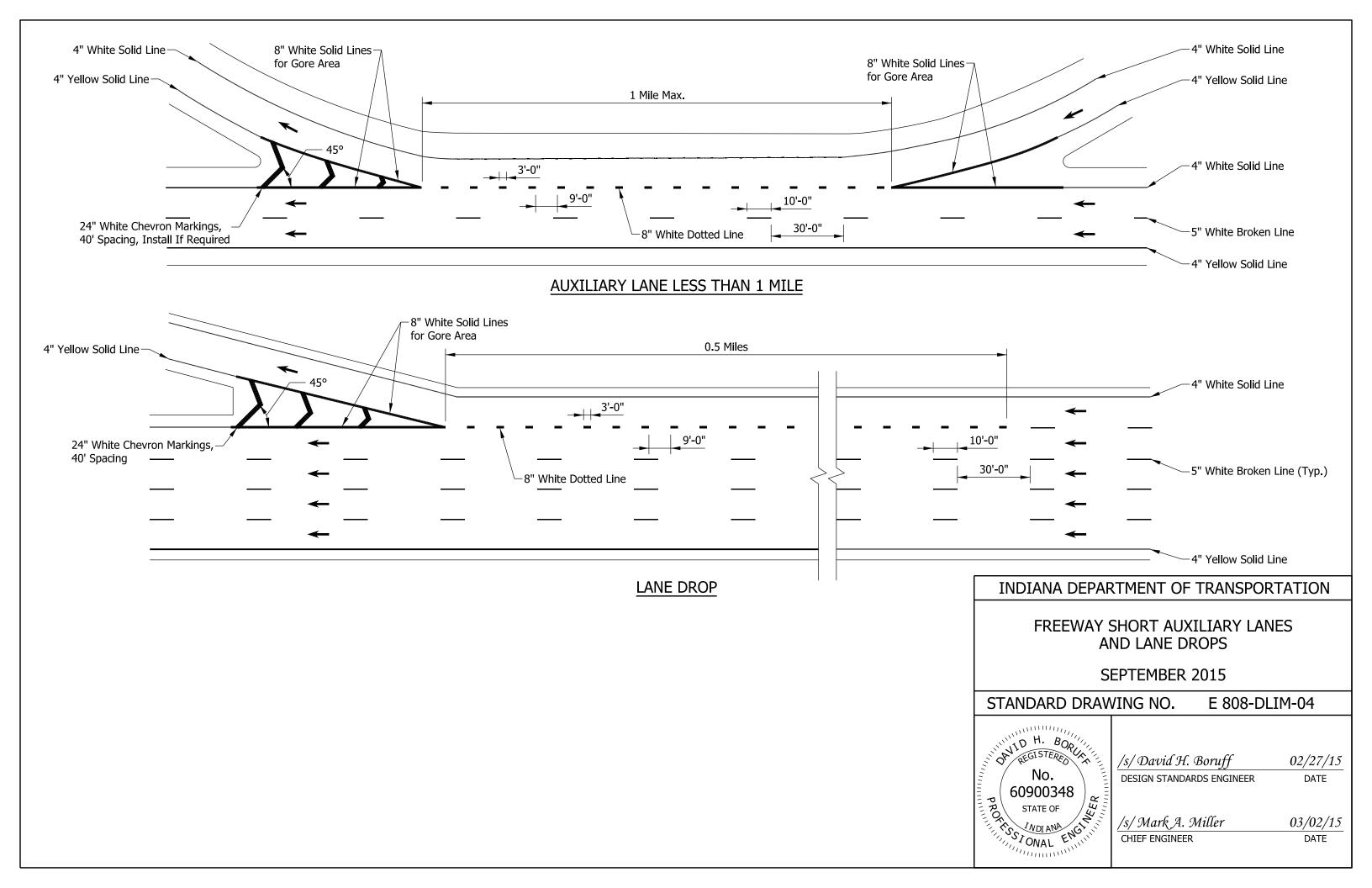
/s/ Mark A. Miller

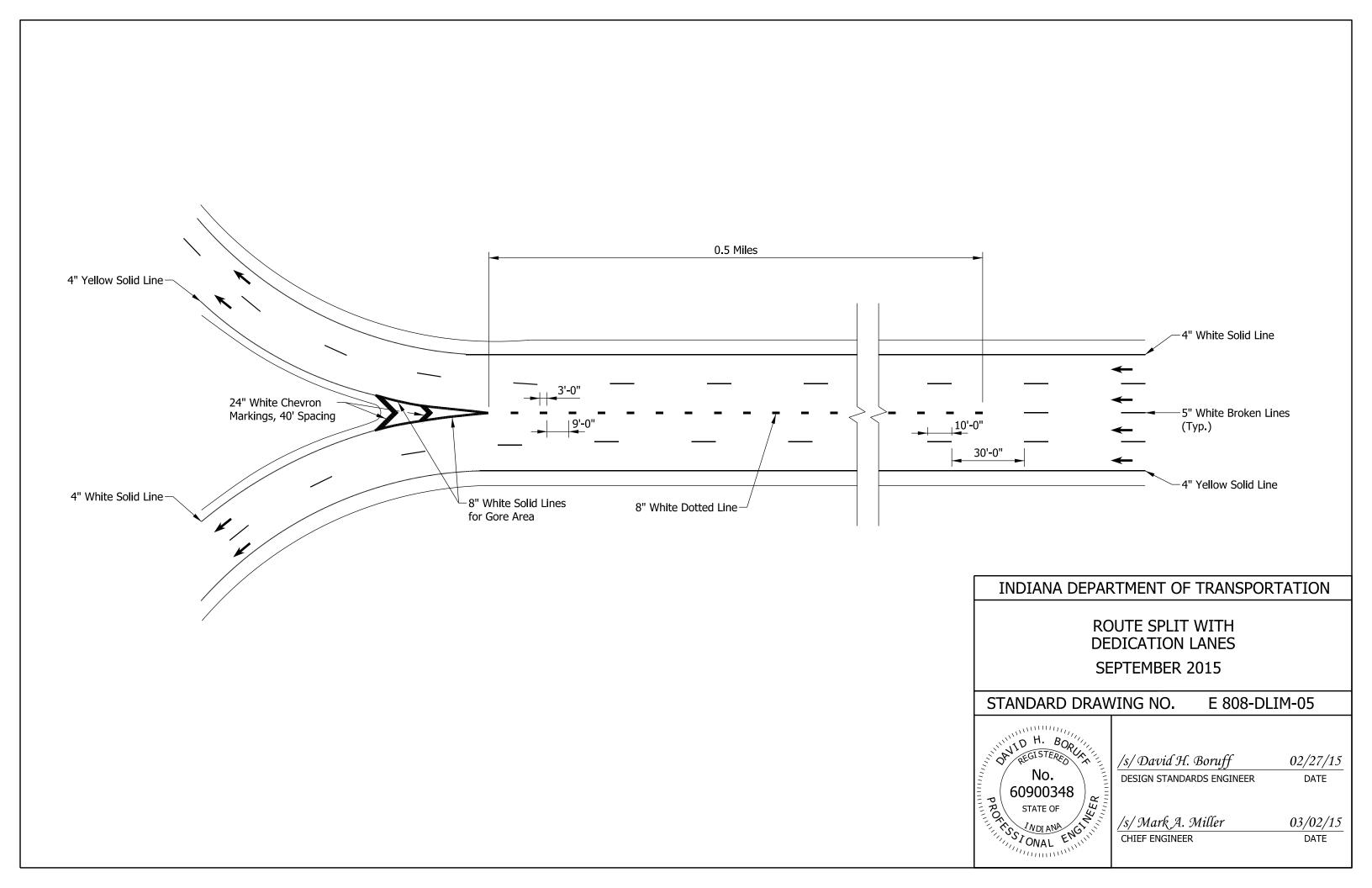
03/02/15

CHIEF ENGINEER



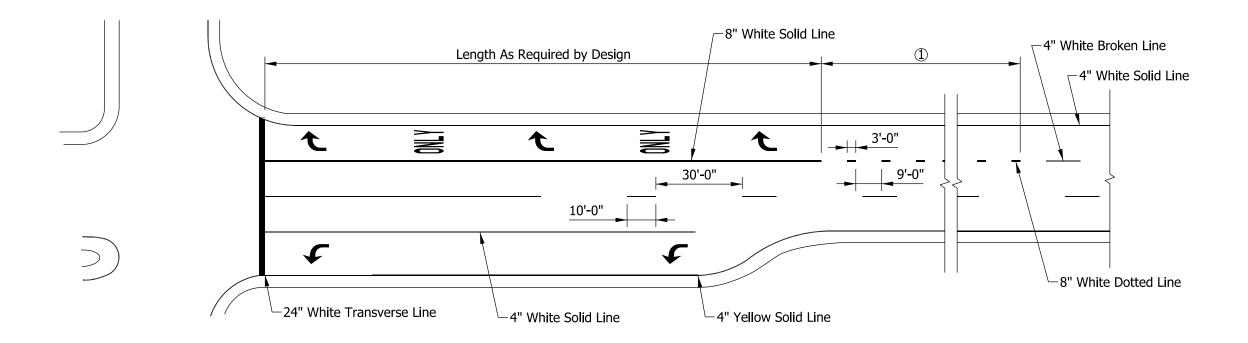




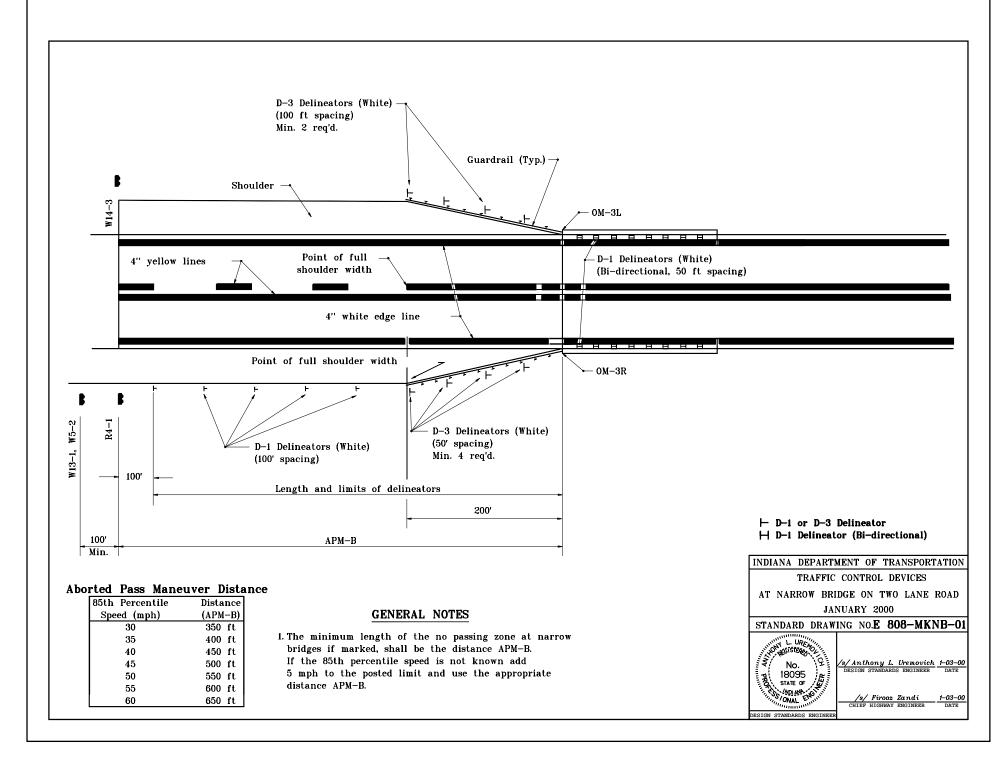


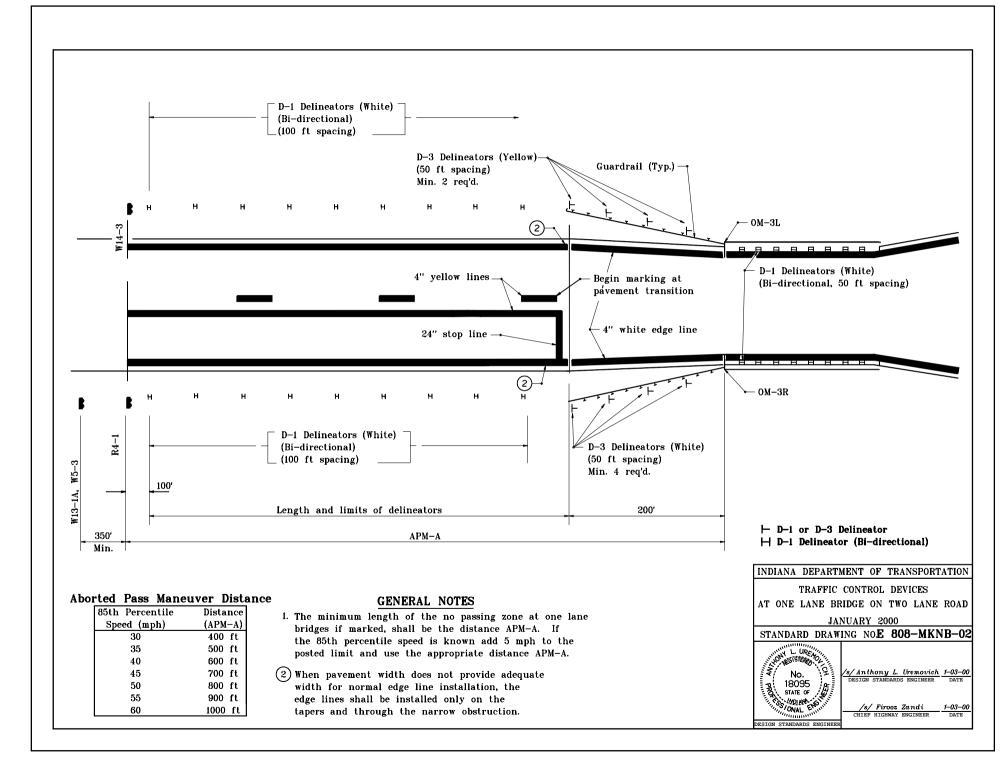
### NOTE:

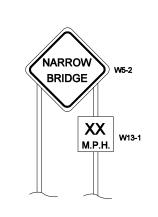
1 The dotted line shall be extended to the lesser of 300 ft or the nearest intersection.



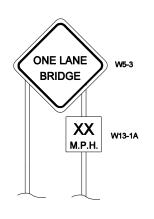
### INDIANA DEPARTMENT OF TRANSPORTATION LANE DROPS AT **INTERSECTIONS** SEPTEMBER 2015 STANDARD DRAWING NO. E 808-DLIM-06 No. 02/27/15 /s/ David H. Boruff DESIGN STANDARDS ENGINEER DATE 60900348 STATE OF STATE OF ONAL ENGINEERS /s/ Mark A. Miller 03/02/15 CHIEF ENGINEER DATE





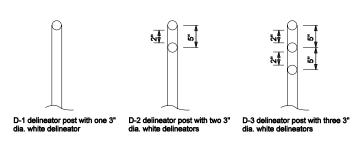


### SIGNAGE REQUIRED AT NARROW BRIDGE ON TWO LANE ROADWAY



SIGNAGE REQUIRED AT ONE LANE BRIDGE

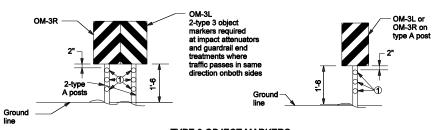
ON TWO LANE ROADWAY



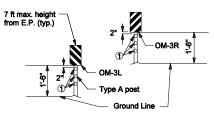
### **DELINEATORS WITH POSTS**

### NOTES

- 1 Delineators:
  - OM-3L: 3 amber buttons on 5" centers OM-3R: 3 white buttons on 5" centers
- Diagonal stripes similar in design to the Type 3 object marker, that have been applied by the manufacturer of approved impact attenuators or guardrail end treatments will be permitted in lieu of the object markers shown hereon.

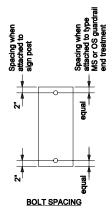


**TYPE 3 OBJECT MARKERS** PLACEMENT AT GUARDRAIL END TREATMENTS **AND IMPACT ATTENUATORS (2)** 



Type 3 object marker (R or L) shall be installed in line with the inner edge of the obstruction.

TYPE 3 OBJECT MARKER PLACEMENT AT ONE-LANE OR NARROW **BRIDGE ON TWO LANE ROADWAY** 



INDIANA DEPARTMENT OF TRANSPORTATION

### PLACEMENT OF TRAFFIC **CONTROL DEVICES**

MARCH 2005

### STANDARD DRAWING NO. E 808-MKNB-03



/s/ Richard L. VanCleave DESIGN STANDARDS ENGINEER

/s/ Richard K.Smutzer

DESIGN STANDARDS ENGINEER

### GENERAL NOTES

- 1. No-passing zone signs are required if ADT is greater than 750 or posted speed limit is 50 mph or greater.
- 2. Signs of larger sizes than implied by sign designations may be used if desired.
- 3. A bridge or culvert, with a clear roadway of 18 ft to 22 ft inclusive, with a clear roadway of less than that of the approach pavement, or where the handrail or curb is less than 2 ft from the edge of pavement will be considered a narrow bridge. The W5-2 sign shall be installed for this condition.
- 4. A bridge or culvert with less than 18 ft between opposite vertical surfaces will be considered a one lane bridge. The W5-3 sign shall be installed for this condition.
- 5. D-3 delineators will be required if ADT is greater than 500 at a narrow bridge. D-3 delineatiors will be required if ADT is greater than 250 at a one lane bridge.
- 6. The minimum length of the no-passing zone at a narrow bridge shall be the distance APM B. If the 85th percentile speed is not known, add 5 mph to the posted speed limit and use the appropriate distance APM B.
- 7. The minimum length of the no-passing zone at a one lane bridge shall be the distance APM A. If the 85th percentile speed is not known, add 5 mph to the posted speed limit and use the appropriate distance APM A.
- 8. Where guardrail is installed, delineators shall be installed at the back side of the guardrail. Where the guardrail run ends and additional delineators are required, they shall be installed a minimum of 2 ft from the edge of the shoulder.
- 9. Type 3 object markers may not be required at all four corners of a culvert. Two type 3 object markers shall be installed back-to-back on a single post at the incoming side of the culvert. If delineators may be placed such that there is a 25 ft diagonal distance between the delineators on the opposite side of the roadway, D-3 delineator spacing may be increased to 100 ft.

INDIANA DEPARTMENT OF TRANSPORTATION

### PLACEMENT OF TRAFFIC CONTROL DEVICES

JANUARY 2000

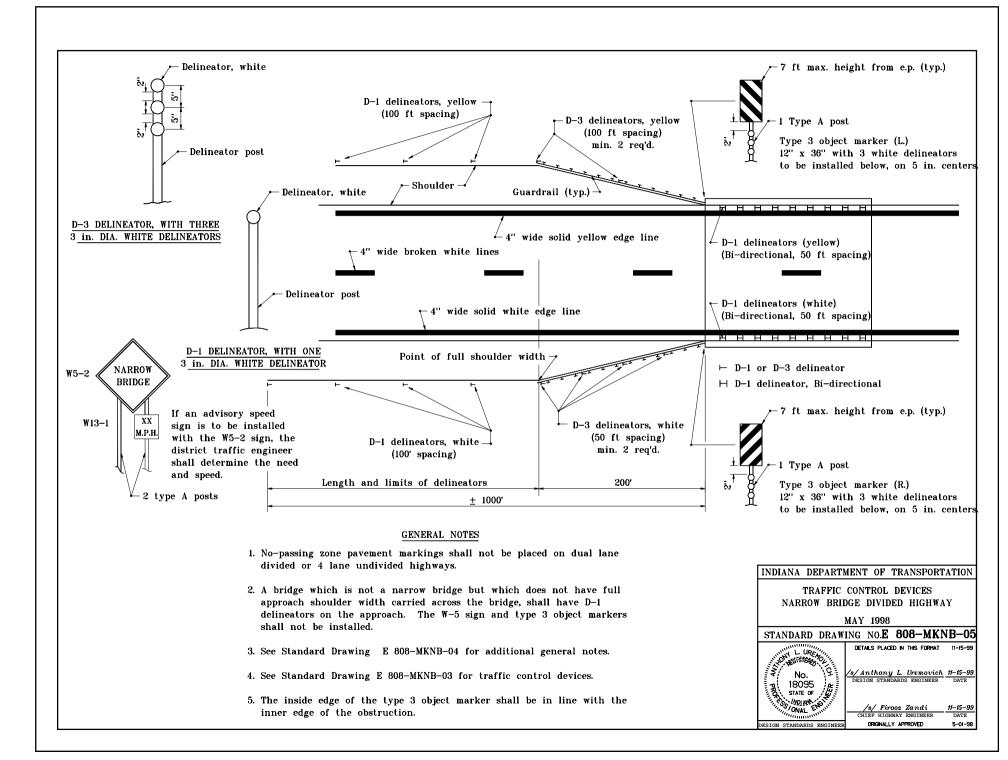
STANDARD DRAWING NOE 808-MKNB-04

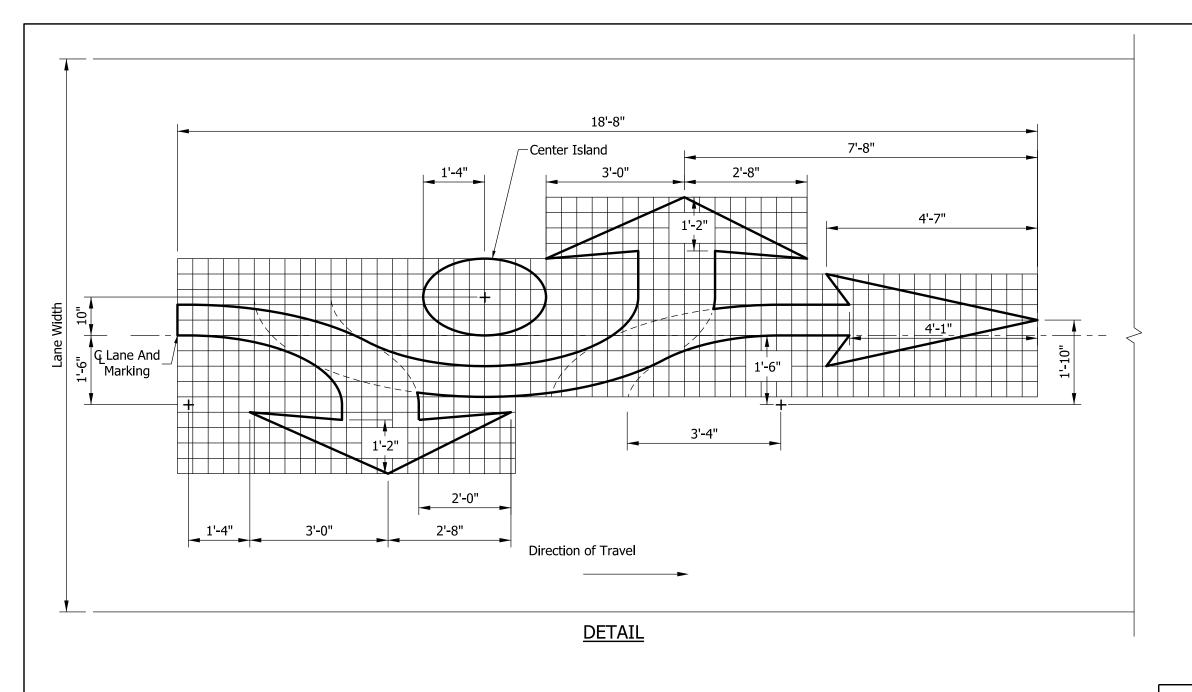


/s/Anthony L. Uremovich 1-03-00
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi
CHIEF HIGHWAY ENGINEER

SIGN STANDARDS ENGINEER

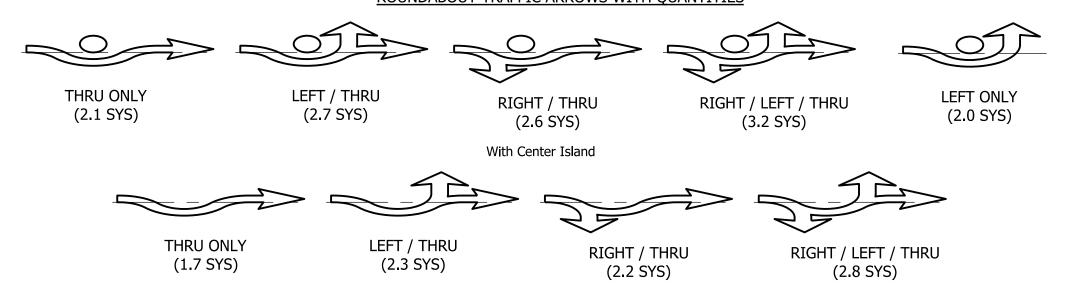




### NOTES:

- 1. Each roundabout traffic arrow pavement marking shall be centered in the travel lane.
- 2. The grid lines are 4 in. apart.

### ROUNDABOUT TRAFFIC ARROWS WITH QUANTITIES



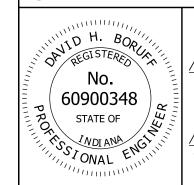
Without Center Island

### INDIANA DEPARTMENT OF TRANSPORTATION

### **PAVEMENT MARKINGS ROUNDABOUT TRAFFIC ARROWS**

SEPTEMBER 2015

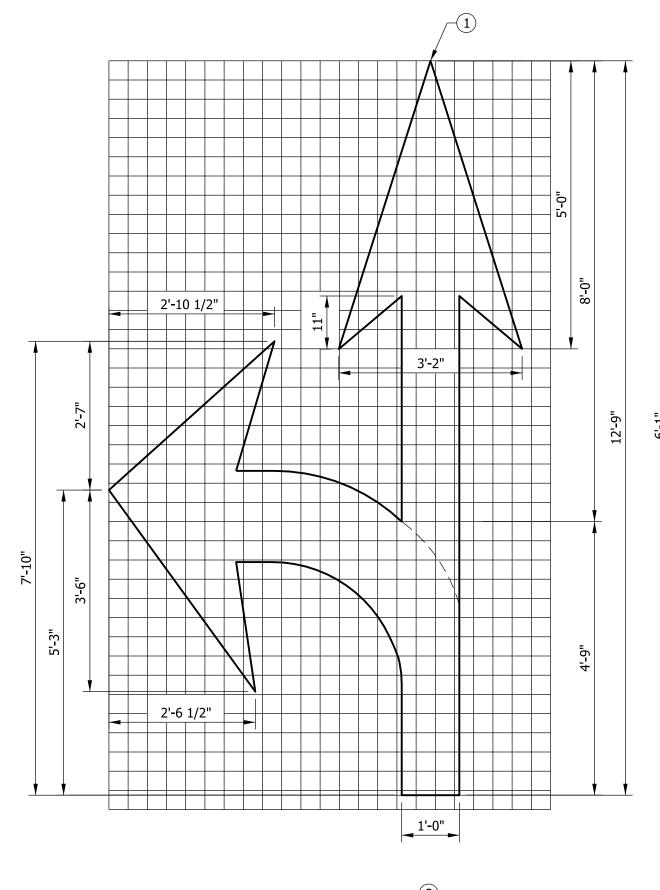
STANDARD DRAWING NO. E 808-MKPM-01

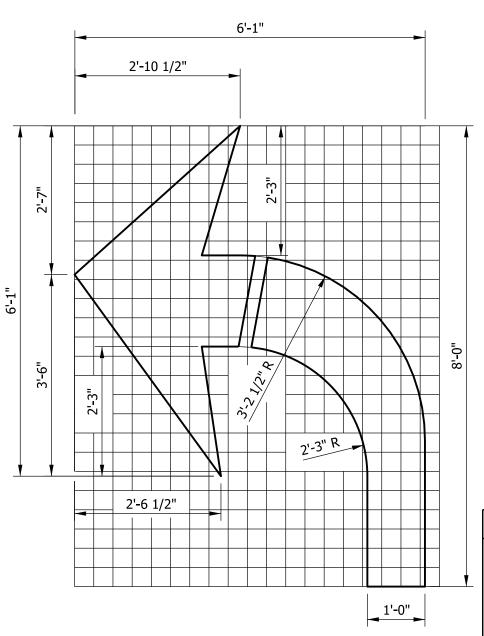


/s/ David H. Boruff DESIGN STANDARDS ENGINEER 03/04/15 DATE

/s/ Mark A. Miller 03/06/15

CHIEF ENGINEER DATE





LEFT/THRU ARROW

LEFT ONLY ARROW

### NOTES:

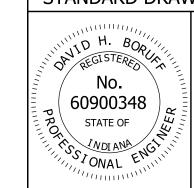
- 1 The tip of the lane indication arrow closest to the stop line shall be 20 ft in advance of the nearest edge of the stop line.
- 2. The grid lines are 4 in. apart.
- ③ Reverse the dimensions of the left arrow for a right/thru or right only arrow.

### INDIANA DEPARTMENT OF TRANSPORTATION

### TRANSVERSE MARKINGS TURN ARROWS

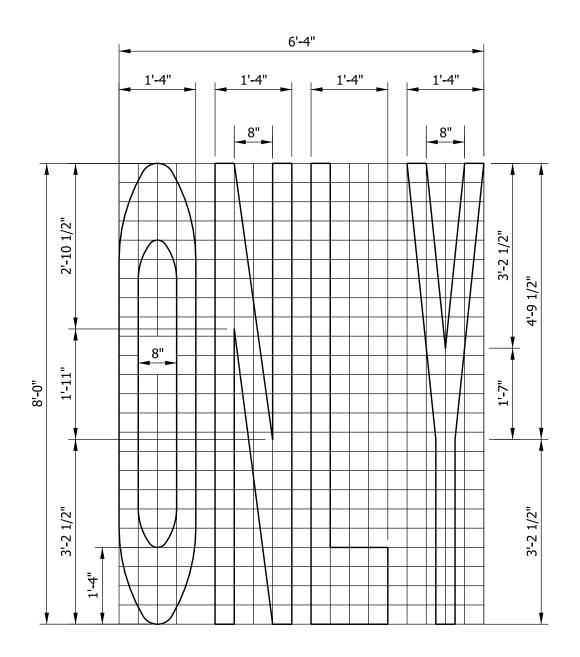
SEPTEMBER 2015

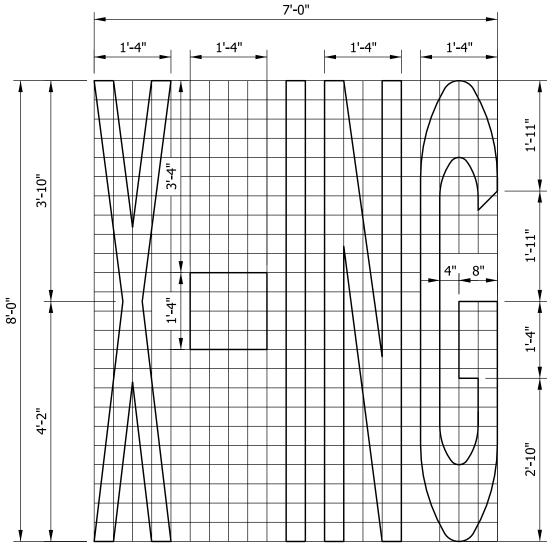
STANDARD DRAWING NO. E 808-MKPM-02



/s/ David H. Boruff 03/04/15
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/06/15
CHIEF ENGINEER DATE





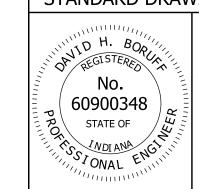
### NOTES:

- The top part of the word ONLY shall be placed prior to the lane indication arrow, 32 ft for posted speeds ≤ 45 mph but not more than 80 ft for posted speeds > 45 mph.
- 2 Each letter is 1'-4" wide. Vertical line segments within each letter are 4" wide. Spaces between vertical line segments are 4".
- 3. The grid lines are 4 in. apart.

### INDIANA DEPARTMENT OF TRANSPORTATION

TRANSVERSE MARKINGS
WORD MESSAGES
"ONLY" AND "X-ING"
SEPTEMBER 2015

STANDARD DRAWING NO. E 808-MKPM-03



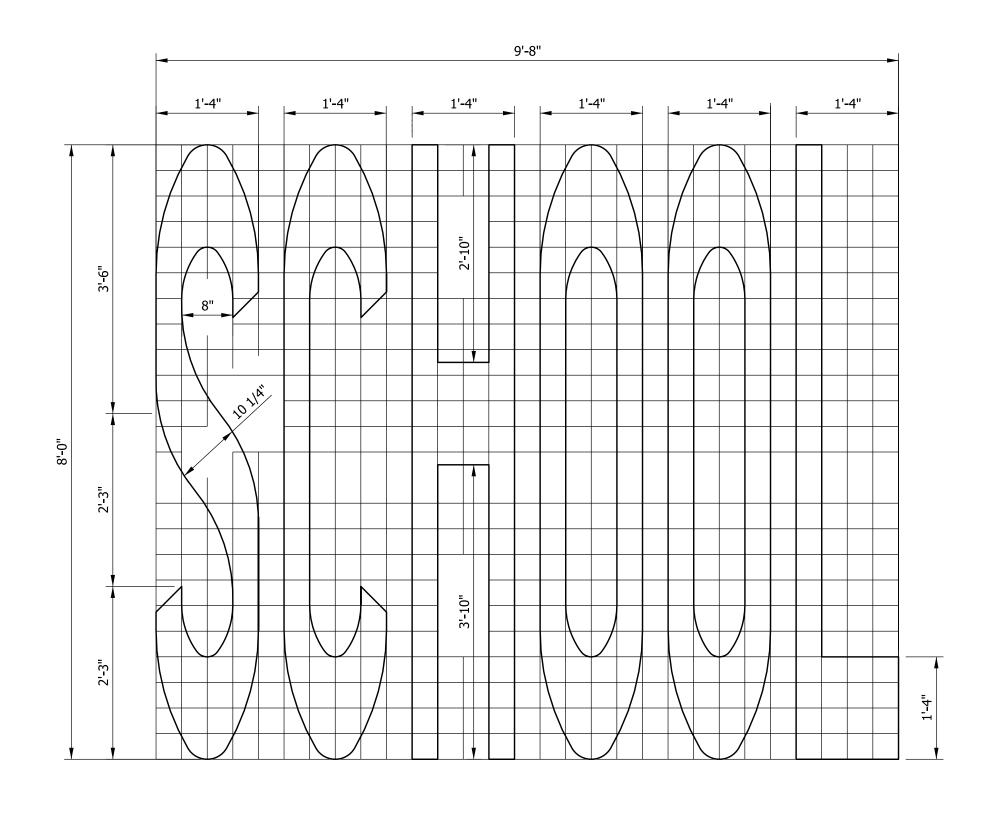
/s/ David H. Boruff

03/04/15 DATE

DESIGN STANDARDS ENGINEER

/s/ Mark A. Miller 03/06/15

CHIEF ENGINEER DATE



### NOTES:

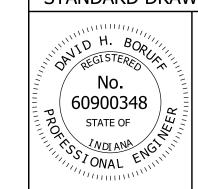
- 1. Each letter is 1'-4" wide. Vertical line segments within each letter are 4" wide. Spaces between vertical lines are 4".
- 2. Grid lines are 4 in. apart.

### INDIANA DEPARTMENT OF TRANSPORTATION

TRANSVERSE MARKINGS
WORD MESSAGE
"SCHOOL"

SEPTEMBER 2015

STANDARD DRAWING NO. E 808-MKPM-04



/s/ David H. Boruff

03/04/15 DATE

DESIGN STANDARDS ENGINEER

03/06/15

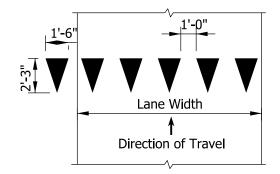
/s/ Mark A. Miller
CHIEF ENGINEER

# Yield Line (Typ.)

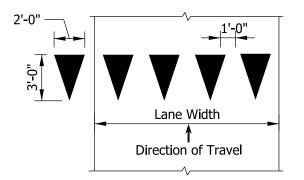
YIELD LINE PLACEMENT

### NOTES:

① Yield line width and placement shall be as shown on the plans.



### **27 INCH WIDE YIELD LINES**



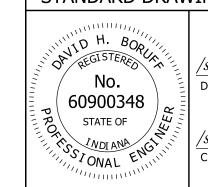
### 36 INCH WIDE YIELD LINES

### INDIANA DEPARTMENT OF TRANSPORTATION

TRANSVERSE MARKINGS YIELD LINES

SEPTEMBER 2015

STANDARD DRAWING NO. E 808-MKPM-05



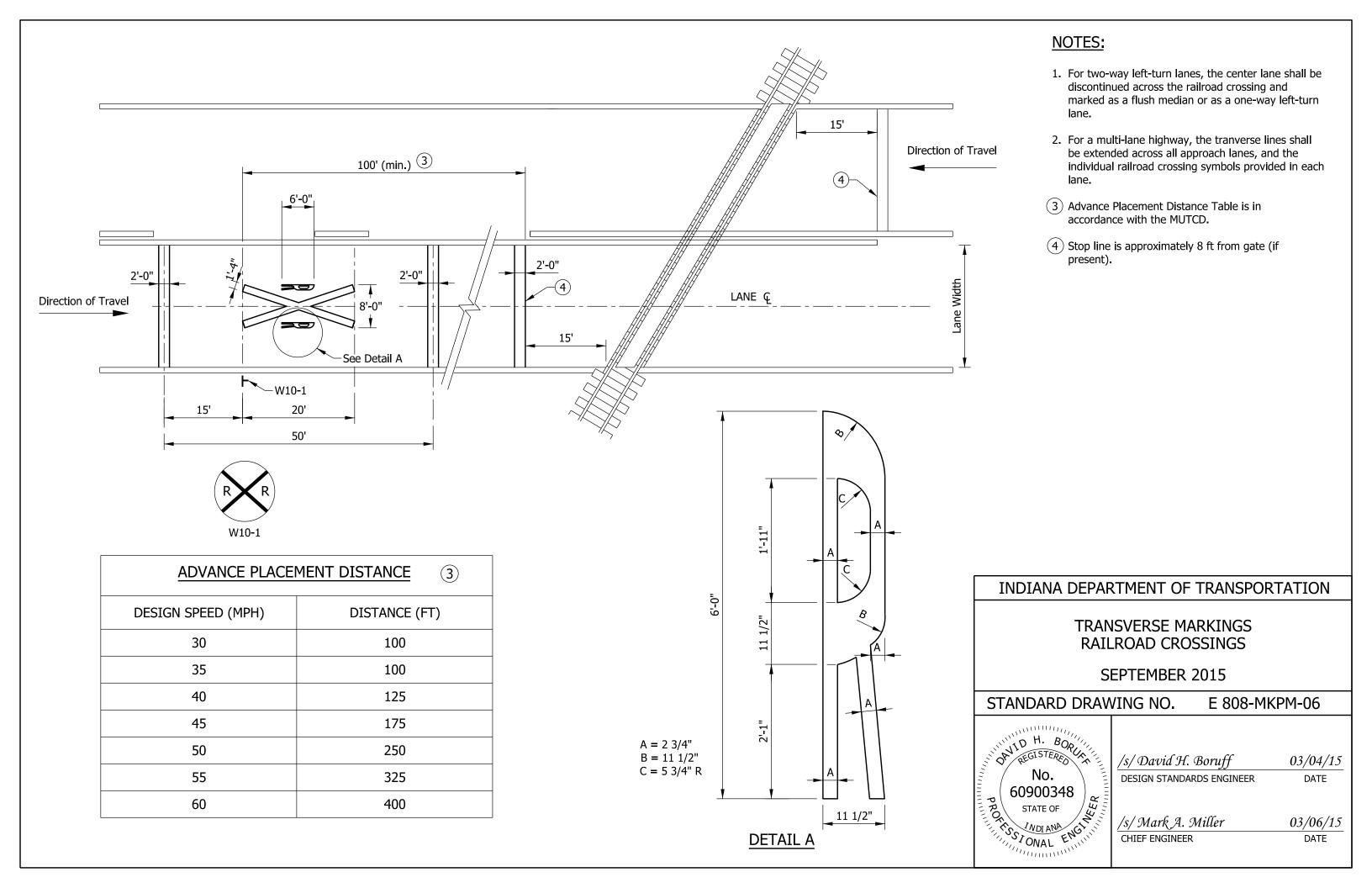
/s/ David H. Boruff

03/04/15 DATE

DESIGN STANDARDS ENGINEER

03/06/15

/s/ Mark A. Miller CHIEF ENGINEER



INDEX				
SHEET NO.	SUBJECT			
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2	Raised Pavement Markers at Freeway Exit Ramp Gore Area			
3	Raised Pavement Markers at Freeway Entrance Ramps			
4	Raised Pavement Markers at Freeway Exit Ramps			
5	Raised Pavement Markers at Cloverleaf Freeway Exit Ramps			
6	Raised Pavement Markers at Cloverleaf Entrance Ramps			
7	Raised Pavement Markers for Tapered Freeway Entrance Lanes			
8	Raised Pavement Markers at Parallel Freeway Entrance Lanes			
9	Placement of Snowplowable Raised Pavement Markers on Non-Freeways			

### **GENERAL NOTES:**

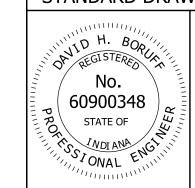
1. Raised pavement markers shall be selected from the Department's list of approved Snowplowable Raised Pavement Markers.

### INDIANA DEPARTMENT OF TRANSPORTATION

## RAISED PAVEMENT MARKERS DRAWING INDEX AND GENERAL NOTES

SEPTEMBER 2015

STANDARD DRAWING NO. E 808-MKRM-01



/s/ David H. Boruff
DESIGN STANDARDS ENGINEER

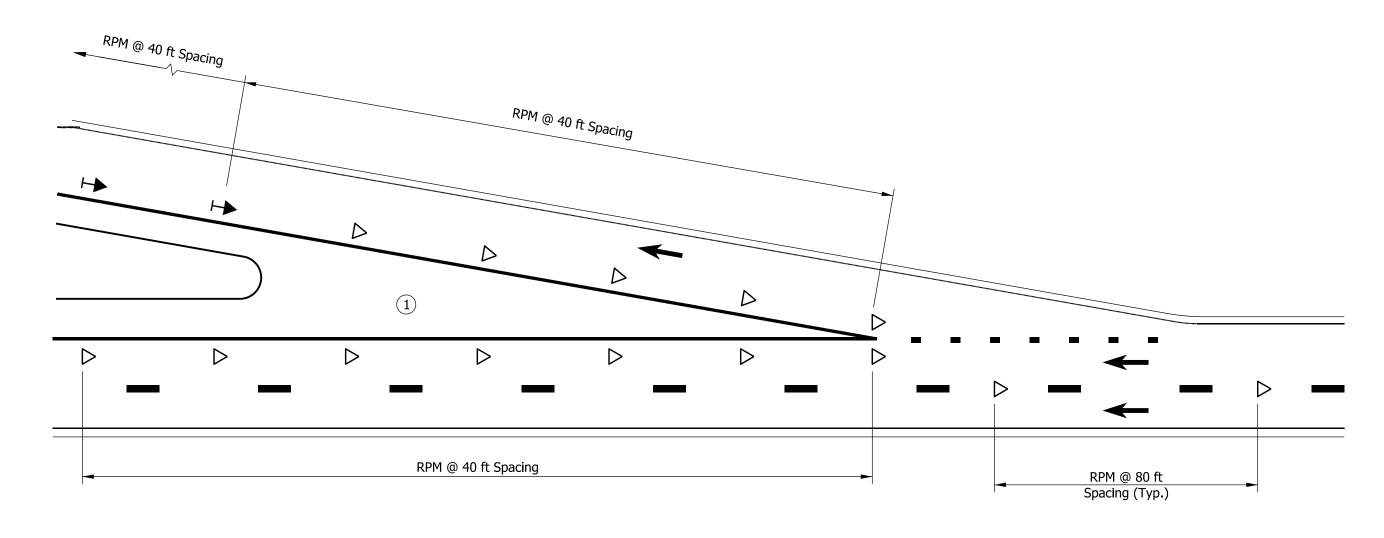
02/27/15 DATE

/s/ Mark A. Miller 03/02/15

CHIEF ENGINEER

### NOTES:

1) See Standard Drawing 808-DLIM-03 for chevron marking details.



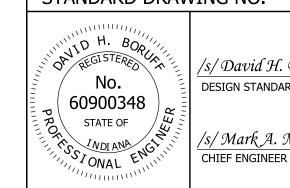
### TYPICAL EXIT RAMP SHOWING LOCATIONS OF RAISED PAVEMENT MARKERS (GORE AREA)

### INDIANA DEPARTMENT OF TRANSPORTATION

RAISED PAVEMENT MARKERS AT FREEWAY EXIT RAMP GORE AREA

SEPTEMBER 2015

STANDARD DRAWING NO. E 808-MKRM-02



/s/ David H. Boruff DESIGN STANDARDS ENGINEER

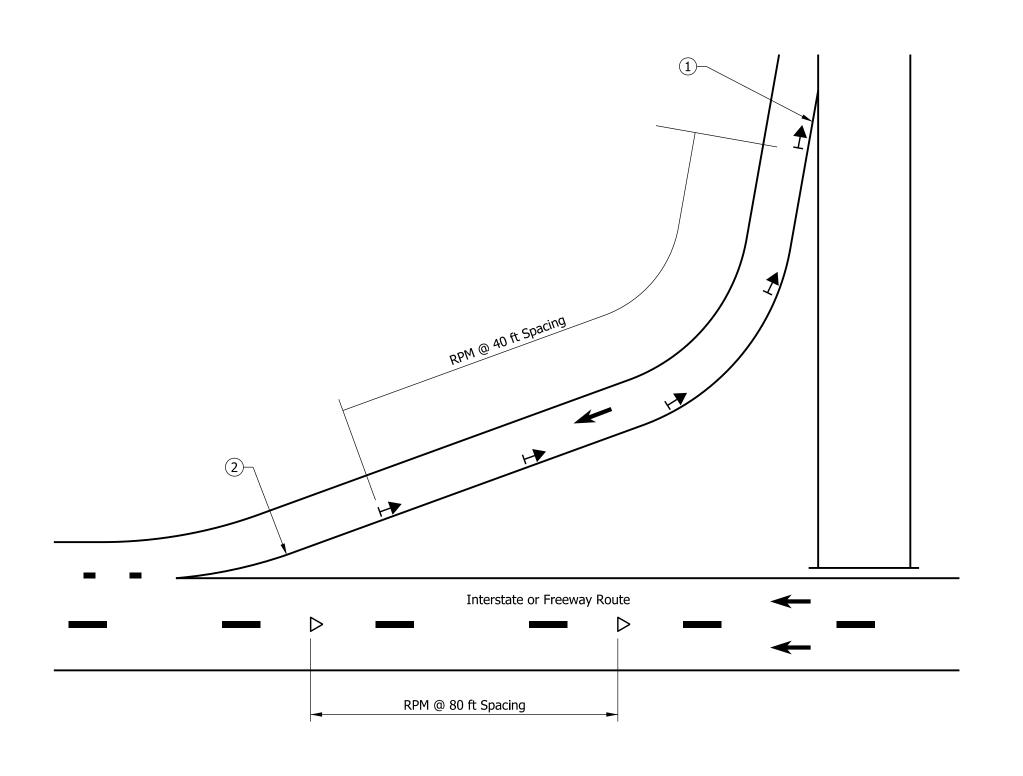
02/27/15 DATE

/s/ Mark A. Miller

03/02/15 DATE

**LEGEND** 

One-way White R.P.M. Two-way Yellow/Red R.P.M. Broken Line Dotted Line



### TYPICAL ENTRANCE RAMP SHOWING LOCATIONS OF RAISED PAVEMENT MARKERS

### NOTES:

- (1) See Standard Drawing E 808-MKRM-02 for location of raised pavement markers at typical exit ramp gore area.
- 2 See Standard Drawing E 808-MKRM-08 for location of raised pavement markers at typical entrance ramp gore area.

### **LEGEND**

One-way White R.P.M.

← Two-way Yellow/Red R.P.M. Broken Line

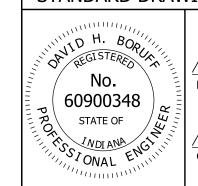
Dotted Line

### INDIANA DEPARTMENT OF TRANSPORTATION

### RAISED PAVEMENT MARKERS AT FREEWAY ENTRANCE RAMPS

SEPTEMBER 2015

STANDARD DRAWING NO. E 808-MKRM-03



/s/ David H. Boruff

02/27/15

DESIGN STANDARDS ENGINEER

/s/ Mark A. Miller 03/02/15

CHIEF ENGINEER

DATE

# RPM @ 40 ft Spacing-−P.T. HD One Yellow/Red-RPM Past P.T. -RPM @ 40 ft Spacing P.T. \_P.C. RPM @ 80 ft Spacing Interstate or Freeway Route

# TYPICAL EXIT RAMP SHOWING LOCATIONS OF RAISED PAVEMENT MARKERS (DIAMOND OR PARTIAL CLOVERLEAF INTERCHANGE)

### NOTES:

1 See Standard Drawing E 808-MKRM-02 for location of raised pavement markers at typical exit ramp gore area.

### **LEGEND**

One-way White R.P.M.

☐ Two-way White/Red R.P.M. Two-way Yellow/Red R.P.M.

Broken Line

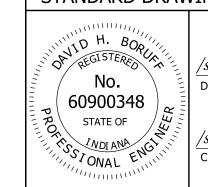
Dotted Line

### INDIANA DEPARTMENT OF TRANSPORTATION

RAISED PAVEMENT MARKERS AT FREEWAY EXIT RAMPS

SEPTEMBER 2015

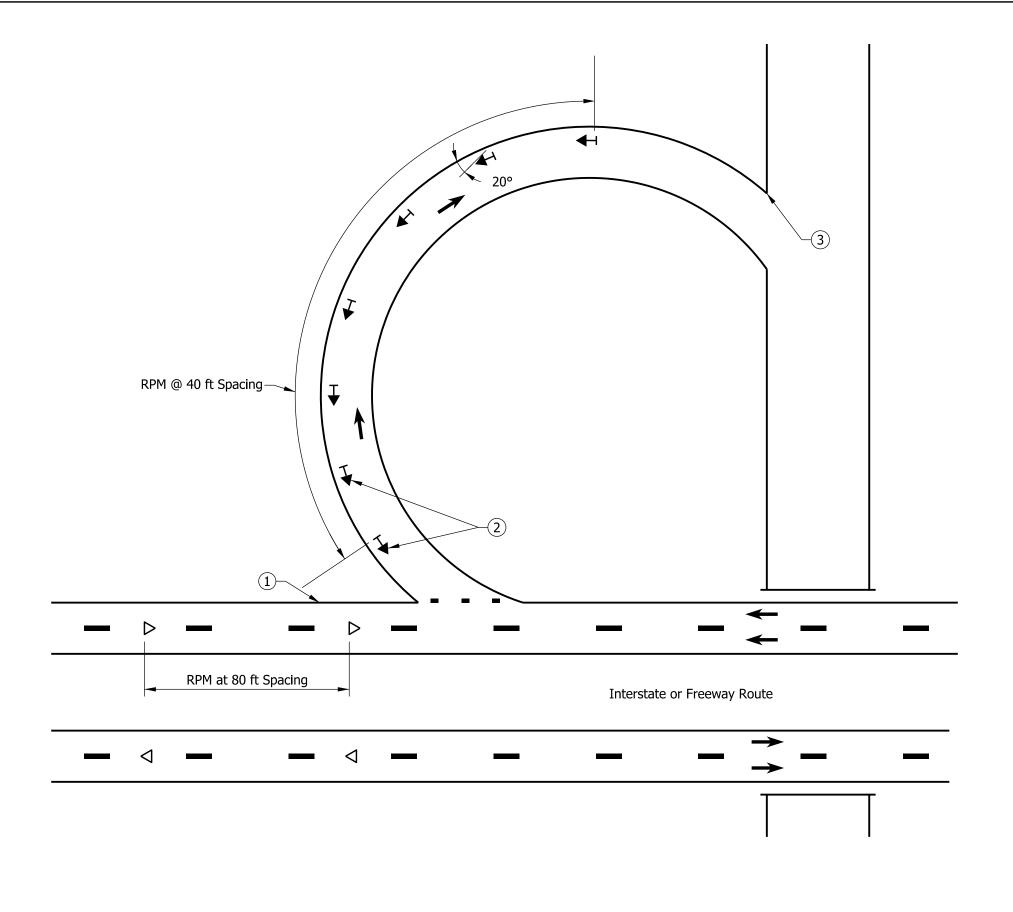
STANDARD DRAWING NO. E 808-MKRM-04



/s/ David H. Boruff 02/27/15
DESIGN STANDARDS ENGINEER DATE

/s/Mark A. Miller 03/02/15

CHIEF ENGINEER DATE



TYPICAL EXIT RAMP SHOWING LOCATIONS OF RAISED PAVEMENT MARKERS (CLOVERLEAF INTERCHANGE)

## NOTES:

- 1 See Standard Drawing E 808-MKRM-02 for location of raised pavement markers at typical exit ramp gore area.
- 2 See Standard Drawing E 808-MKRM-03 for location of raised pavement markers at typical loop ramp.
- (3) See Standard Drawing E 808-MKRM-07 for location of raised pavement markers at typical tapered entrance ramp gore area and Standard Drawing E 808-MKRM-08 for location of raised pavement markers at typical parallel entrance ramp gore area.

## **LEGEND**

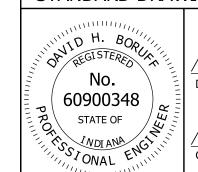
- One-way White R.P.M.
- Two-way Yellow/Red R.P.M.
- Broken Line
- Dotted Line

#### INDIANA DEPARTMENT OF TRANSPORTATION

## RAISED PAVEMENT MARKERS AT CLOVER LEAF FREEWAY EXIT RAMPS

SEPTEMBER 2015

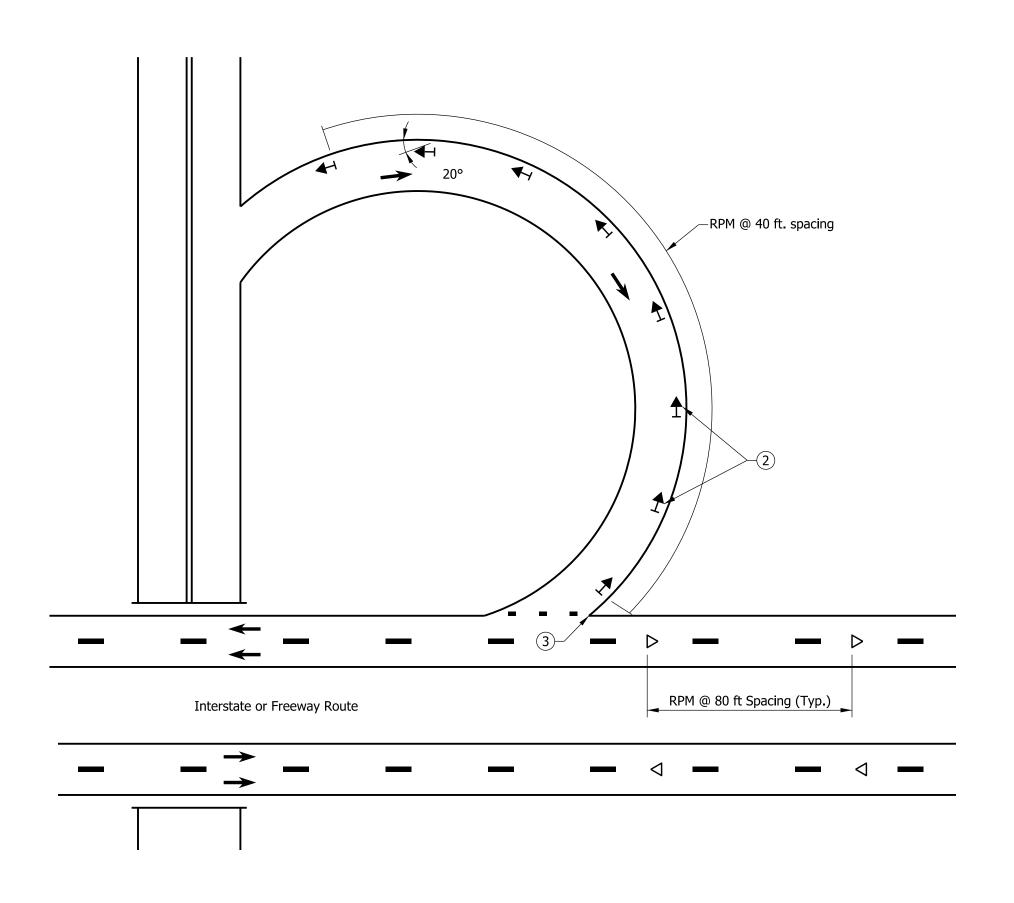
STANDARD DRAWING NO. E 808-MKRM-05



/s/ David H. Boruff 02/27/15 DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller

03/02/15 CHIEF ENGINEER DATE



TYPICAL EXIT RAMP SHOWING LOCATIONS OF RAISED PAVEMENT MARKERS (CLOVERLEAF INTERCHANGE)

## NOTES:

- 1 See Standard Drawing E-808-MKRM-02 for location of raised pavement markers at typical exit ramp gore area.
- 2 See Standard Drawing E-808-MKRM-03 for location of raised pavement markers at typical loop ramp.
- 3 See Standard Drawing E-808-MKRM-07 for location of raised pavement markers at typical tapered entrance ramp and Standard Drawing E-808-MKRM-08 for location of raised pavement markers at typical parallel entrance ramp gore area.

## **LEGEND**

✓ One-way White R.P.M.

Two-way Yellow/Red R.P.M.

Broken Line

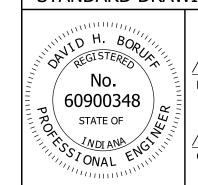
Dotted Line

#### INDIANA DEPARTMENT OF TRANSPORTATION

#### RAISED PAVEMENT MARKERS AT CLOVERLEAF ENTRANCE RAMPS

SEPTEMBER 2015

STANDARD DRAWING NO. E 808-MKRM-06



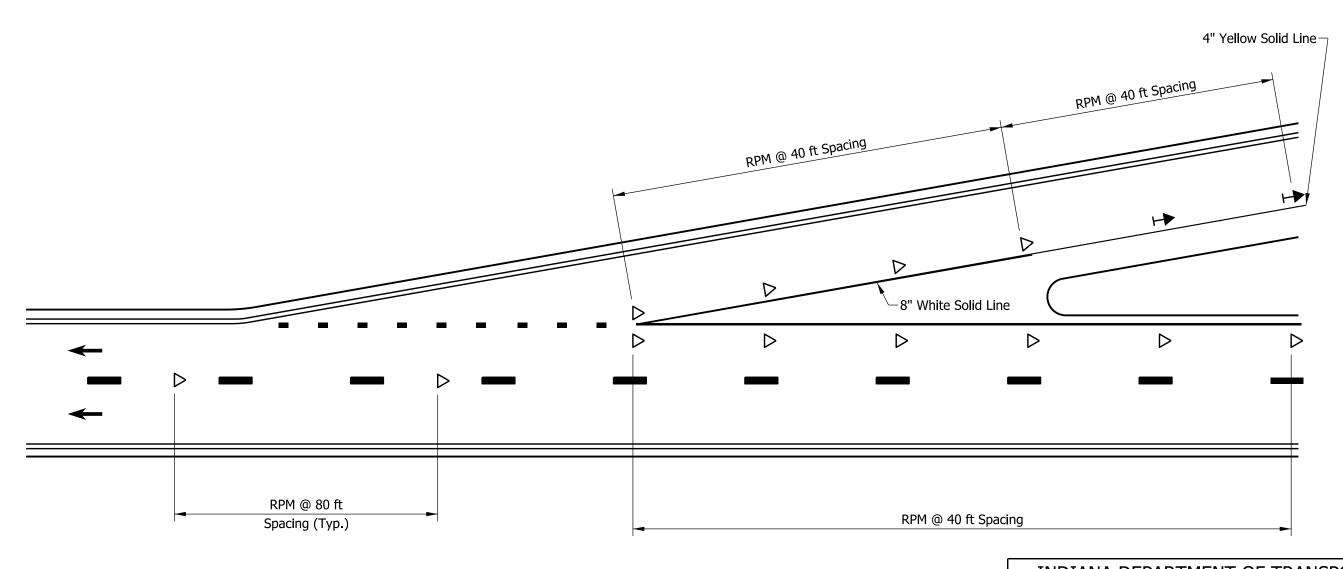
/s/ David H. Boruff

02/27/15 ER DATE

DESIGN STANDARDS ENGINEER

/s/ Mark A. Miller 03/02/15

CHIEF ENGINEER DATE



## TYPICAL ENTRANCE RAMP SHOWING LOCATIONS OF RAISED PAVEMENT MARKERS (GORE AREA)

## **LEGEND**

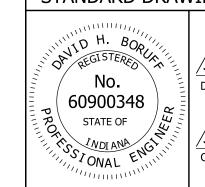
- One-way White R.P.M.
- ← Two-way Yellow/Red R.P.M.
- Broken Line
- Dotted Line

## INDIANA DEPARTMENT OF TRANSPORTATION

## RAISED PAVEMENT MARKERS FOR TAPERED FREEWAY ENTRANCE LANES

SEPTEMBER 2015

STANDARD DRAWING NO. E 808-MKRM-07



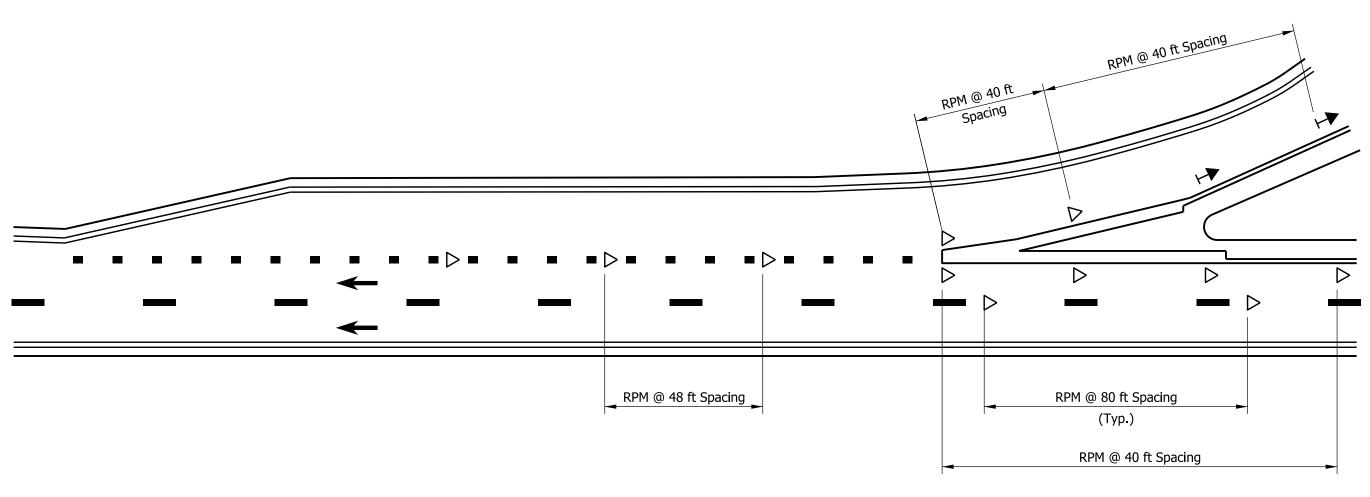
/s/ David H. Boruff

02/27/15 DATE

DESIGN STANDARDS ENGINEER

/s/ Mark A. Miller 03/02/15 DATE

CHIEF ENGINEER



## TYPICAL ENTRANCE RAMP SHOWING LOCATIONS OF RAISED PAVEMENT MARKERS (GORE AREA)

## **LEGEND**

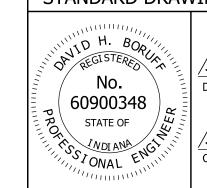
One-way White R.P.M. Two-way Yellow/Red R.P.M. Broken Line Dotted Line

## INDIANA DEPARTMENT OF TRANSPORTATION

## RAISED PAVEMENT MARKERS AT PARALLEL FREEWAY ENTRANCE LANES

SEPTEMBER 2015

STANDARD DRAWING NO. E 808-MKRM-08



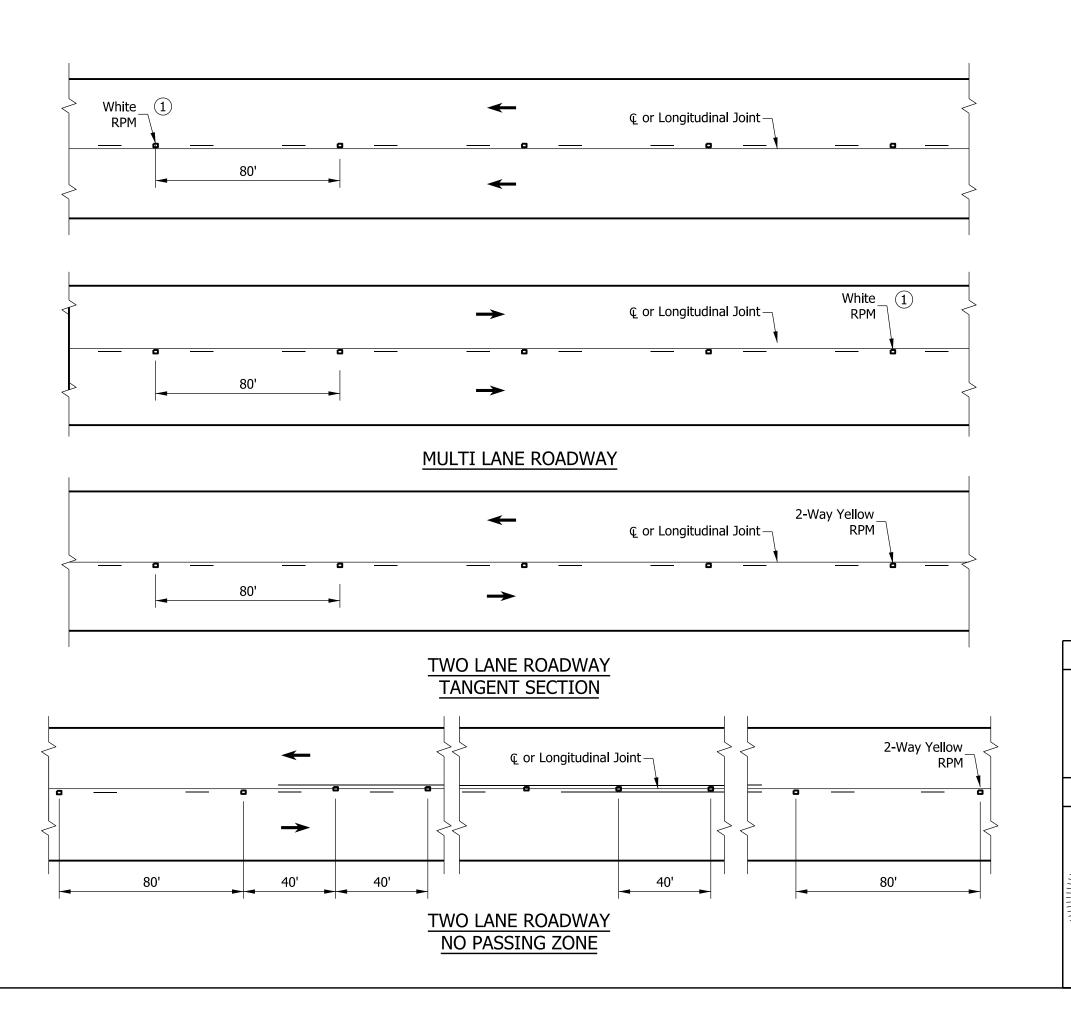
/s/ David H. Boruff

02/27/15 DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 03/02/15

CHIEF ENGINEER

DATE



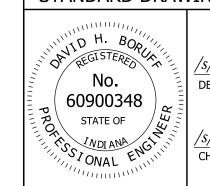
## NOTES:

1 Use 2-way White/Red RPM within 200 ft of all public road intersections.

## INDIANA DEPARTMENT OF TRANSPORTATION

PLACEMENT OF SNOWPLOWABLE RAISED PAVEMENT MARKERS ON NON-FREEWAYS SEPTEMBER 2015

STANDARD DRAWING NO. E 808-MKRM-09



/s/ David H. Boruff

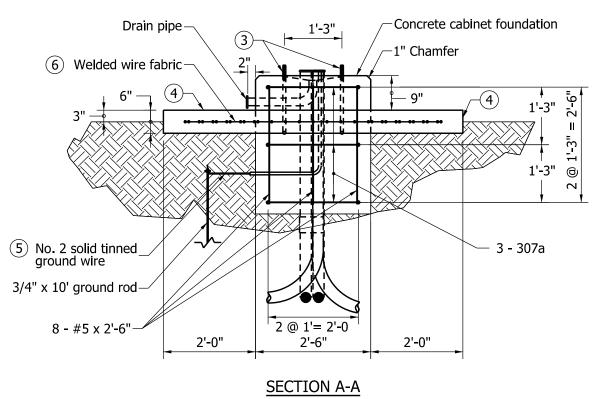
02/27/15 DATE

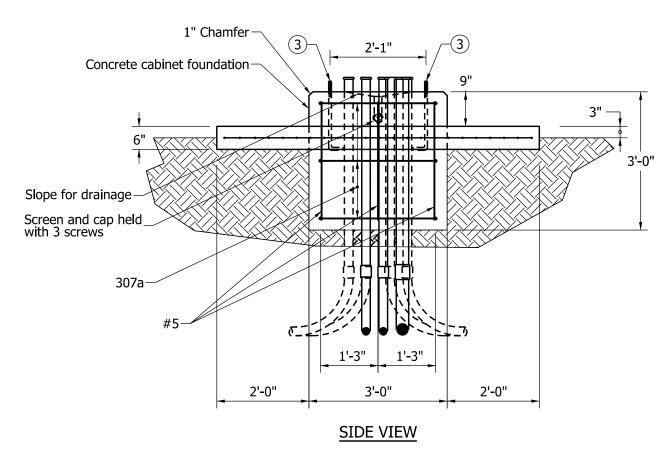
DESIGN STANDARDS ENGINEER

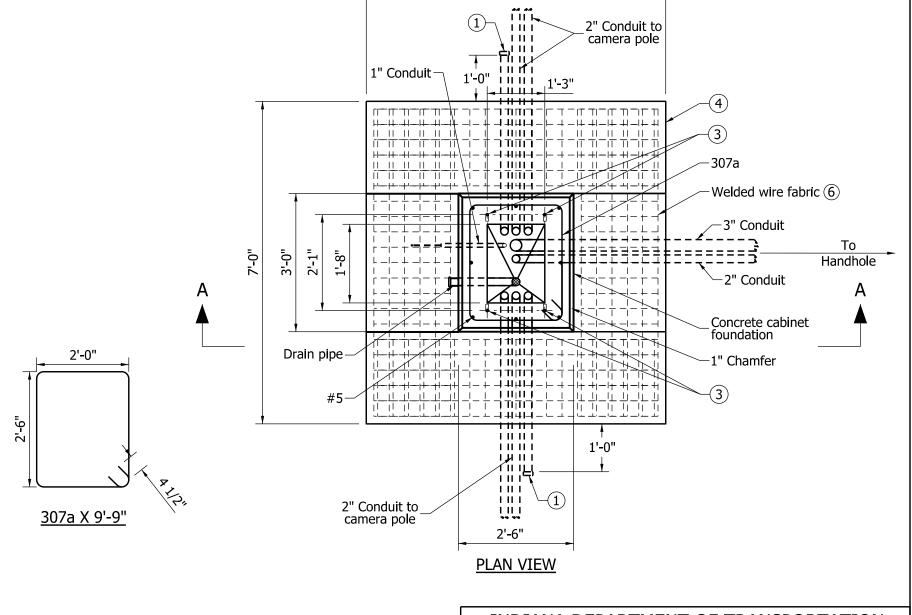
/s/ Mark A. Miller 03/02/15

CHIEF ENGINEER

DATE







6'-6"

#### NOTES:

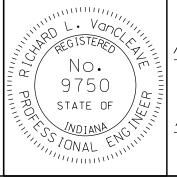
- 1) 2" conduit capped off for future use.
- 2. Direction and actual location of conduit may vary due to service point and camera pole placement.
- (3) 3/4" x 18" anchor bolt as shown on Standard Drawing E 805 SGPB-01.
- (4) Concrete footpad shall be sloped to drain outward.
- (5) Bind ground rod to foundation using No. 2 solid tinned ground wire.
- (6) Welded wire fabric shall be 6 x 6 W6 x W6.

#### INDIANA DEPARTMENT OF TRANSPORTATION

# ITS CONTROLLER CABINET FOUNDATION VIRTUAL WEIGH-IN-MOTION (VWIM)

SEPTEMBER 2012

STANDARD DRAWING NO. E 809-ICCF-01

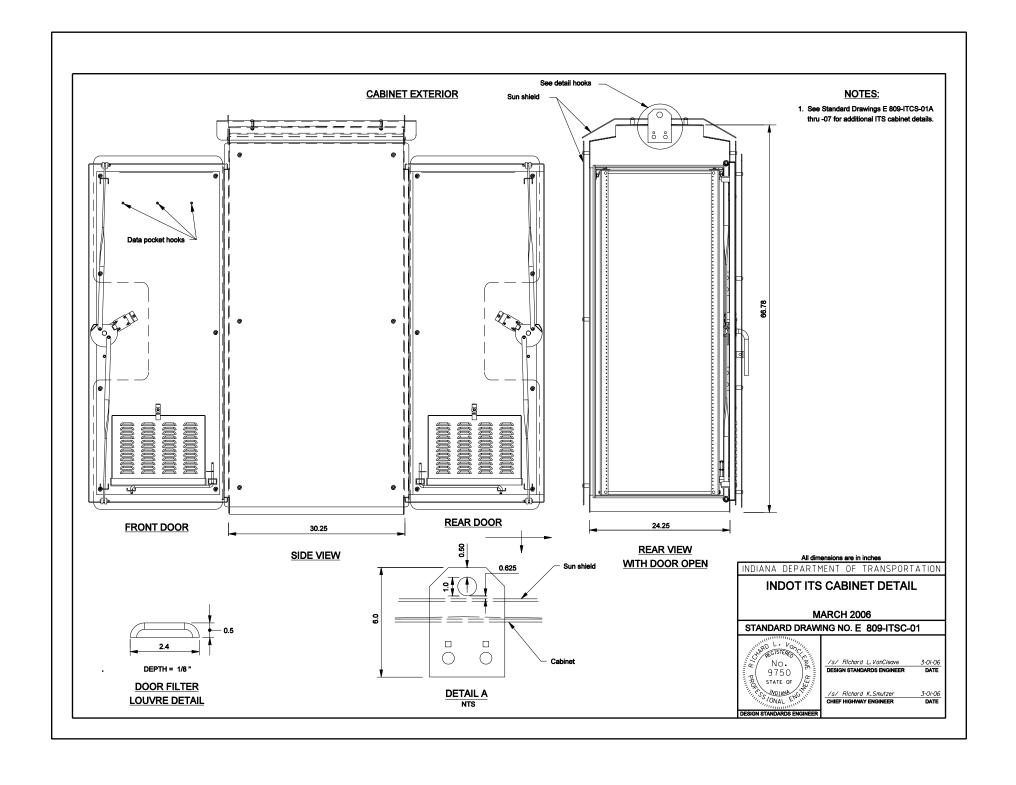


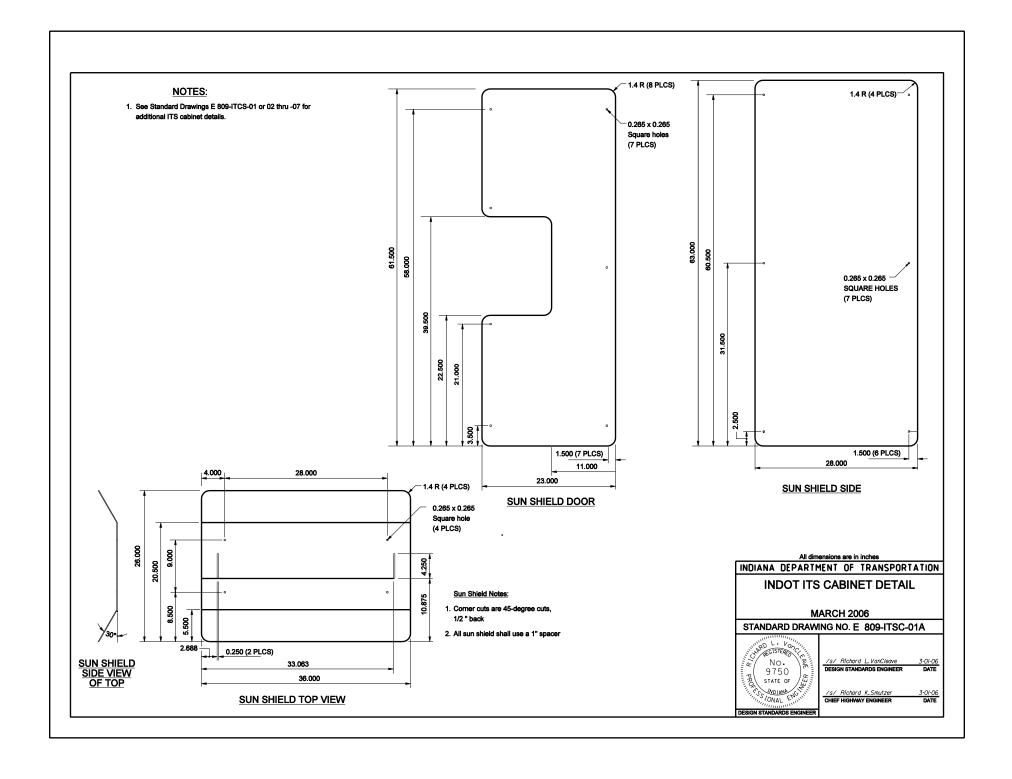
/s/ Richard L. Van Cleave 09/04/12
SUPERVISOR, ROADWAY STANDARDS DATE

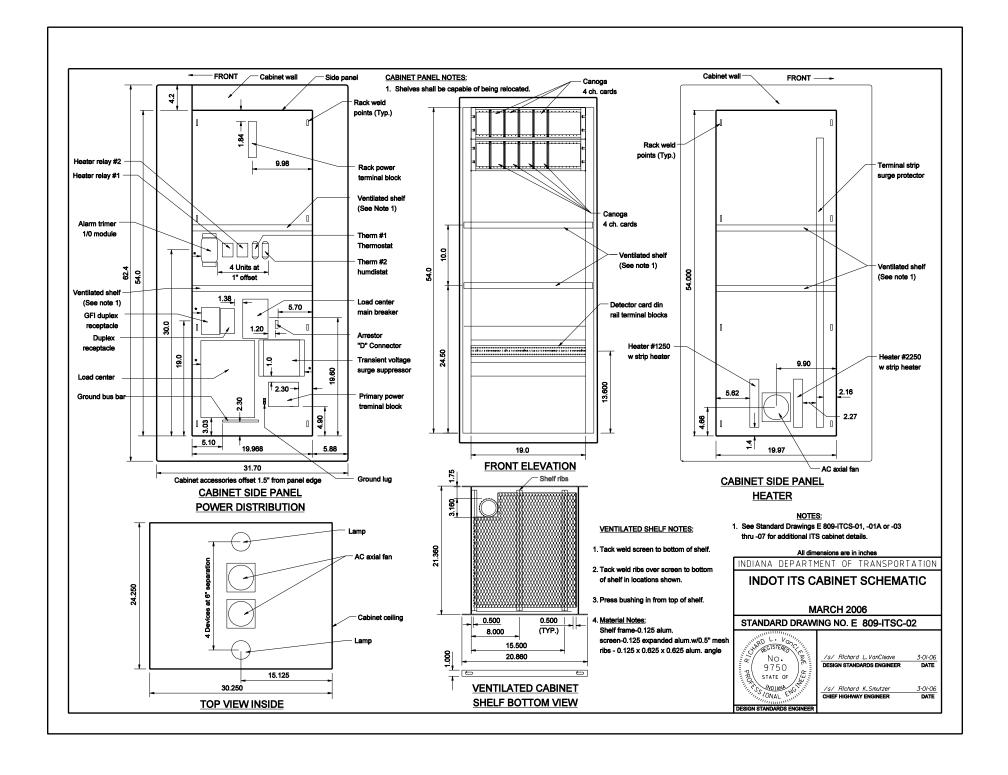
/s/ Mark A. Miller 09/04/12

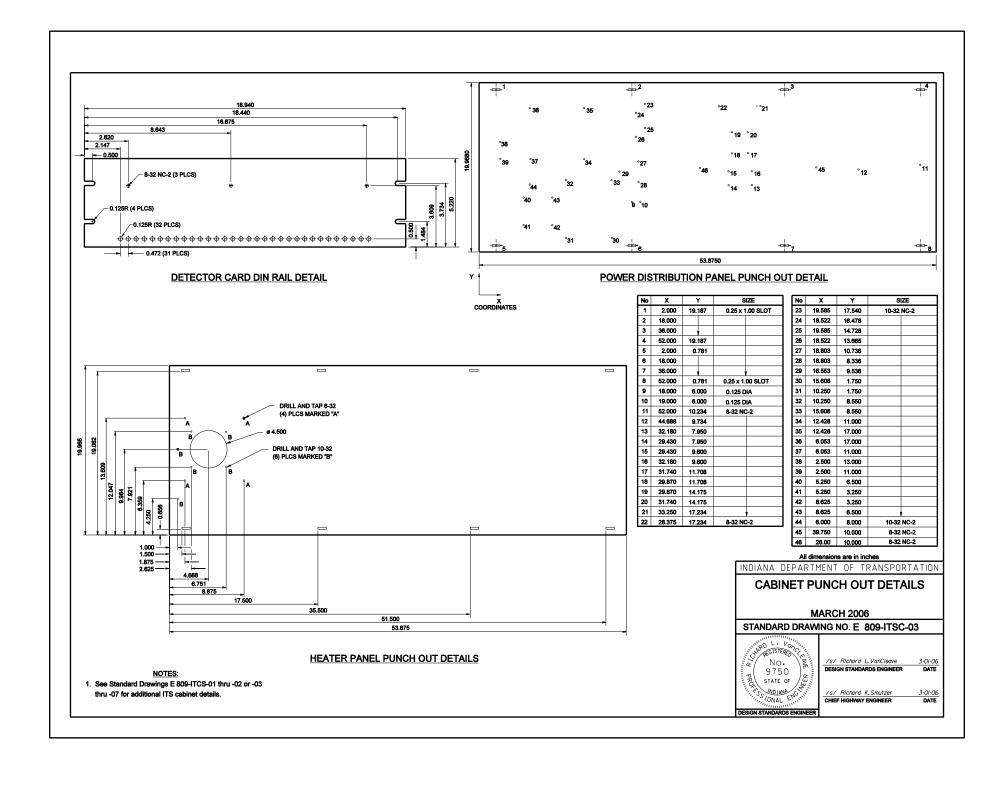
CHIEF ENGINEER

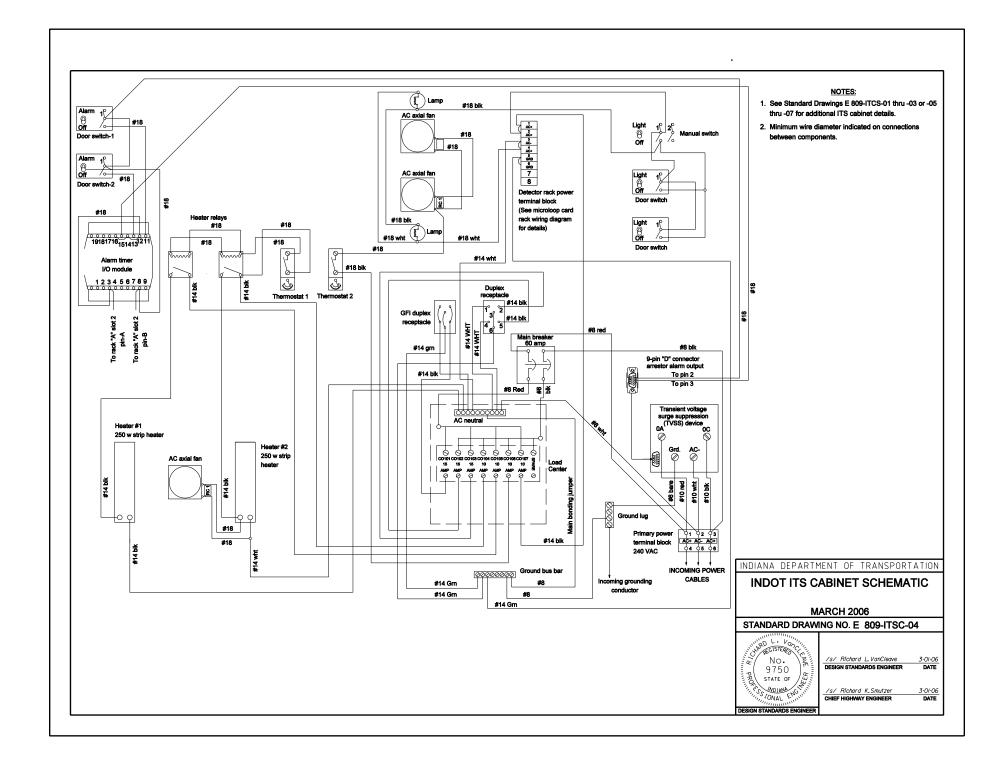
DATE

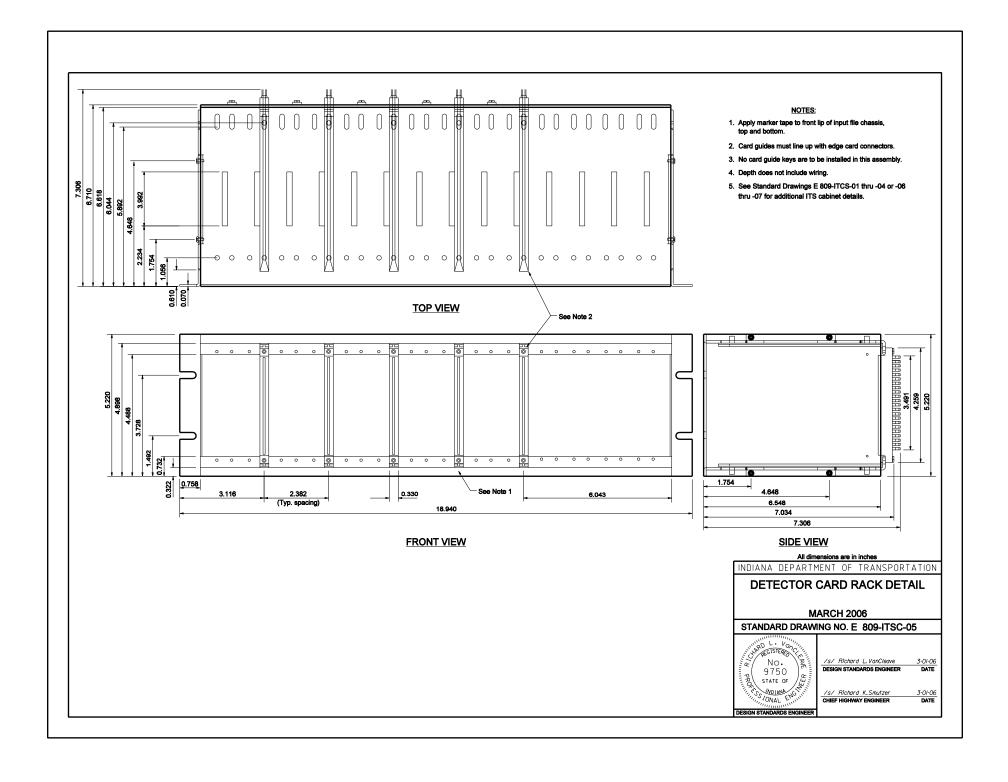


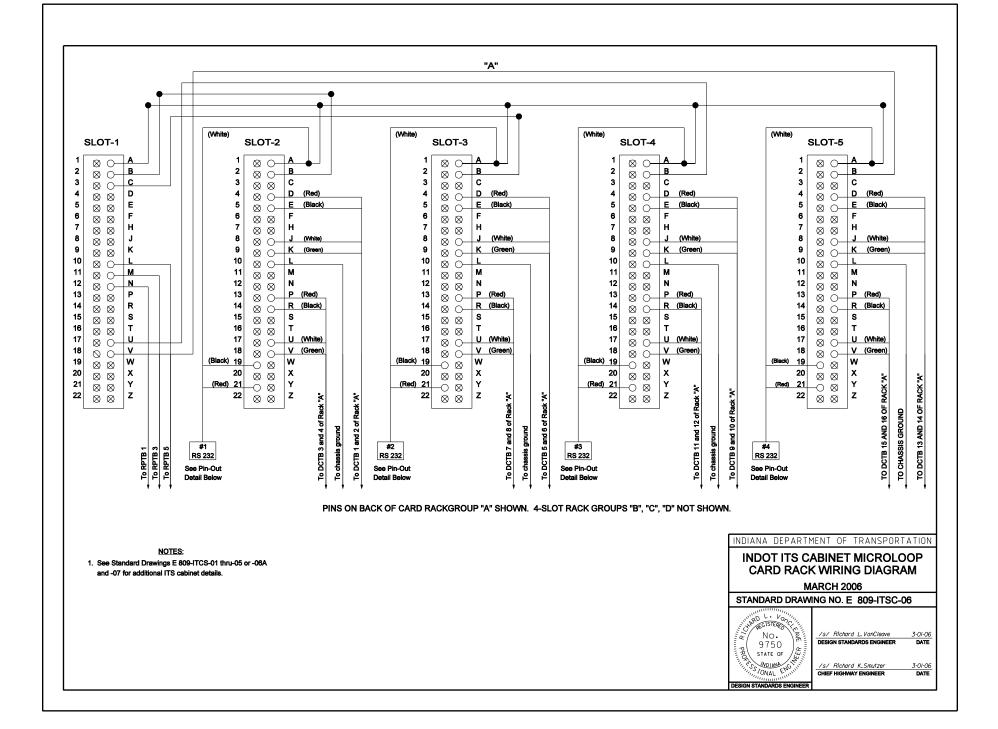


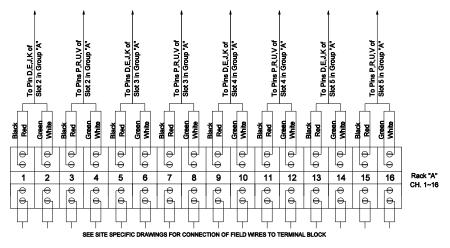




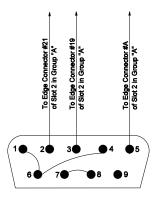




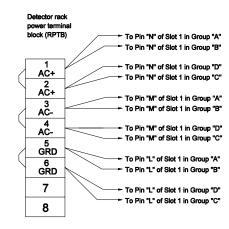




DETECTOR CARD DIN RAIL
TERMINAL BLOCKS (DCTB)
(16-BLOCK DIN RAIL GROUPS "B", "C", "D" NOT SHOWN)



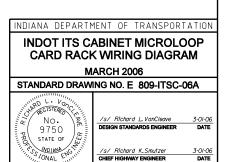
#1 RS232 PIN-OUT DETAIL



#### NOTES:

- Cables from rack to field terminal block shall be two pair twisted with a sheild on each pair.
- 2. Field terminal blocks shall be Entrelec #0115-271.22
- Cables from rack to field terminal blocks shall be 10' in length with extra coiled P on end of rack.
- Slot 1 for rack power module. Slots 2 through 5 are for canoga channel cards.
- See Standard Drawings E 809-ITSC-01 thur -06 or -07 for additional ITS cabinet details.

DESIGN STANDARDS ENGINEE







GFI EQUIPMENT #1
RECEPTACLE RECEPTACLE #2

Above tags are one each for a total of 4 tags. RACK A, RACK B, RACK C, and RACK D

MAIN BREAKER

G F I	RECEP #1			HEATER #2			
-------------	-------------	--	--	--------------	--	--	--

SURGE SUPPRESSOR HEATER HEATER #2 #1

HEATER 1 and HEATER 2 are 1 tag Each.

HEATER RELAY #2		HEATING THERMO STAT	
-----------------------	--	---------------------------	--

RACK A	RACK B	RACK C	RACK D
IMONA	TOTOLD	IVIORO	IVIOND

NOTES:

See Standard Drawings E 809-ITCS-01 thru -06A for additional ITS cabinet details.

ENGRAVED TAG DETAIL

MARCH 2006

STANDARD DRAWING NO. E 809-ITSC-07

STANDARD DRAWING NO. E 809-ITSC-07

STANDARD DRAWING NO. E 809-ITSC-07

DESIGN STANDARDS ENGINEER DATE

STATE OF STATE OF STANDARDS ENGINEER DATE

/s/ Richard K.Smutzer

CHIEF HIGHWAY ENGINEER

3-01-06

STONAL ENG

ALARM I/O MODULE