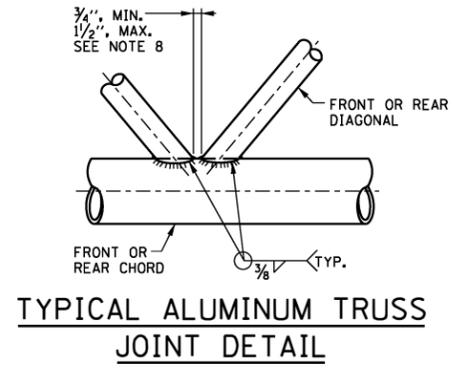
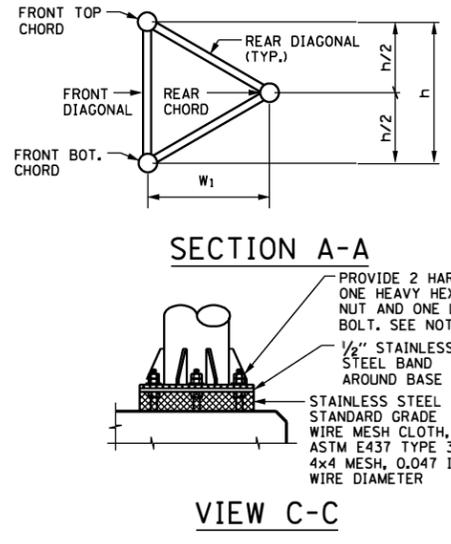
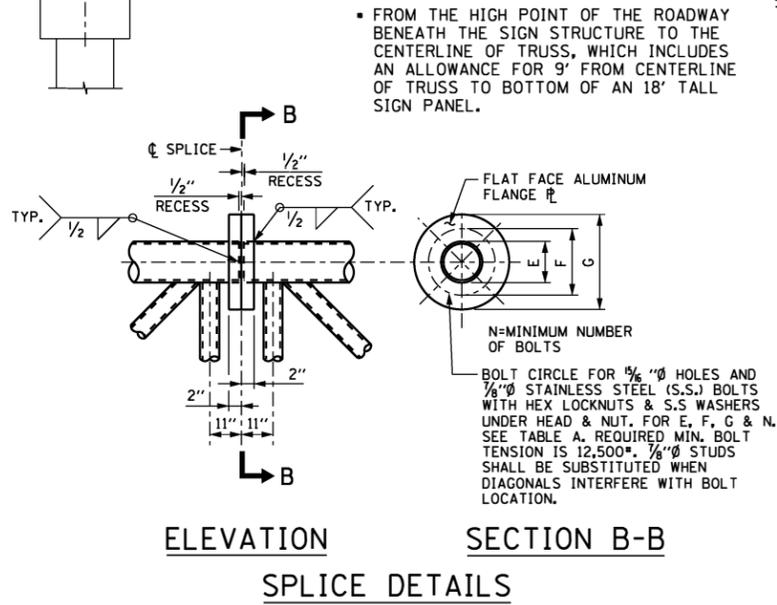
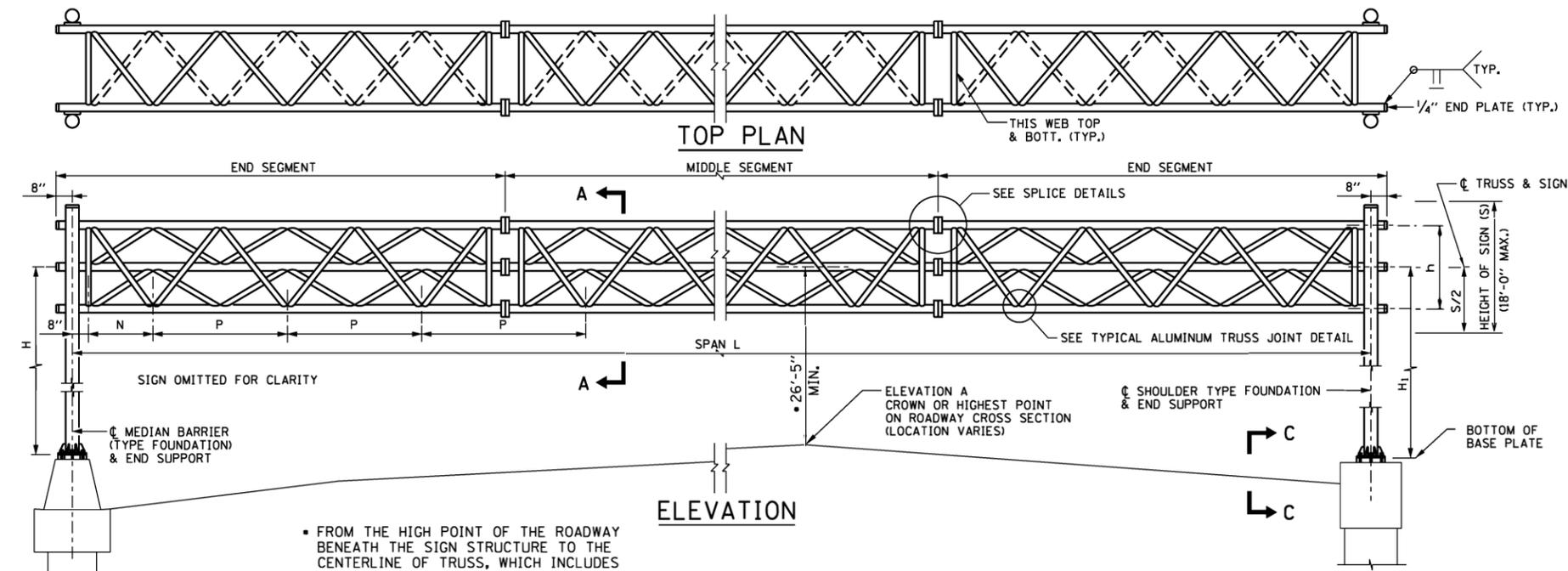


**Illinois Tollway Standard Drawings Revisions**

<b>Section F Sign Structure</b>		<b>Effective: 03-01-2019</b>
<b>Drawing</b>	<b>Modification Summary</b>	
<b>F1</b>	<b>OVERHEAD SIGN STRUCTURE SPAN TYPE STRUCTURE DETAILS</b>	
Sheet 1	Update barrier shape to constant slope.	
Sheet 3	Revised anchor bolt length for taller barrier. Update X values "Design Table for Drilled Shafts in Cohesive Soils" and added Qu > 1.25 Ton/Sq. Ft. to the drilled shaft design table.	
Sheet 4	Update barrier shape, details and quantities for constant slope. Update X values "Design Table for Drilled Shafts in Cohesive Soils" and added Qu > 1.25 Ton/Sq. Ft. to the drilled shaft design table. Revised callout and quantities for grade beam to be class SI concrete.	
Sheet 5	Revised shape of t1(E) bar in Bar List table and updated barrier shape, details and quantities for constant slope. Update X values "Design Table for Drilled Shafts in Cohesive Soils" and added Qu > 1.25 Ton/Sq. Ft. to the drilled shaft design table. Revised callout and quantities for grade beam to be class SI concrete.	
<b>F4</b>	<b>OVERHEAD SIGN STRUCTURE CANTILEVER TYPE STRUCTURE DETAILS</b>	
Sheet 7	Update barrier shape to constant slope	
<b>F8</b>	<b>OVERHEAD SIGN STRUCTURE SIGN AND LUMINAIRE SUPPORTS</b>	
Sheet 1	Revised Note 2 reference to designer	
<b>F9</b>	<b>BREAKAWAY SIGN SUPPORT DETAILS</b>	
Sheet 1	Clarified the design stress for soil pressure and separated into a new category 'Foundation'	
<b>F11</b>	<b>MILEPOST MARKER</b>	
Sheet 2	Removed 'WALL' from Barrier Wall Mount Detail title	
<del><b>F12</b></del>	<del><b>MOUNTING DETAILS FOR RETROFITTING NEW EXIT SIGN PANELS</b></del>	
Sheet 1	This sheet has been removed from to Standard to the 720 OHS Base Sheets	
<b>F13</b>	<b>OVERHEAD SIGN STRUCTURE MONOTUBE TYPE (STEEL) MAINLINE STRUCTURE DETAILS</b>	
Sheet 1	Update barrier shape to constant slope. Revised dimension note for minimum clearance.	
Sheet 2	Update barrier shape to constant slope. Revised dimension note for minimum clearance.	
Sheet 3	Update barrier shape to constant slope.	
Sheet 6	Update barrier shape and reinforcing details for constant slope.	
Sheet 7	Update barrier shape and reinforcing details for constant slope.	
Sheet 8	Update barrier shape and reinforcing details for constant slope.	
<b>F14</b>	<b>OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE STRUCTURE DETAILS</b>	
Sheet 5	Revised Note 2 for protective coat to include the perimeter of the column	
Sheet 6	Update barrier shape to constant slope.	
<b>F15</b>	<b>OVERHEAD SIGN STRUCTURE MONOTUBE TYPE (STEEL) STRUCTURE DETAILS FOR AET RAMP</b>	
Sheet 1	Update barrier shape to constant slope. Updated Elevation and table to indicate "I-Pass or Pay Online Sign"	
Sheet 2	Update barrier shape to constant slope. Revised elevation to show square bar continuous. Updated dimension note for minimum clearance.	
Sheet 3	Update barrier shape to constant slope. Updated dimension note for minimum clearance.	
Sheet 5	Section H-H dimensions are updated.	
Sheet 6	Update barrier shape and reinforcing details for constant slope.	
Sheet 7	Update barrier shape and reinforcing details for constant slope.	
<b>F16</b>	<b>OVERHEAD SIGN STRUCTURE MONOTUBE TYPE (STEEL) STRUCTURE DETAILS FOR CASH-IPO RAMP</b>	
Sheet 1	Update barrier shape to constant slope.	
Sheet 2	Update barrier shape to constant slope. Updated dimension note for minimum clearance.	
Sheet 5	Update barrier shape and reinforcing details for constant slope.	
Sheet 6	Update barrier shape and reinforcing details for constant slope.	
<b>F17</b>	<b>OVERHEAD SIGN STRUCTURE SPAN STYPE (STEEL) STRUCTURE DETAILS</b>	
Sheet 8	Update barrier shape to constant slope and revised transition length from 10'-0" to 21'-3".	
Sheet 9	Update barrier shape to constant slope and revised transition length from 10'-0" to 21'-3".	

 New Sheet

 Retired Standard



**GENERAL NOTES:**

1. WORK THIS SHEET WITH OVERHEAD SIGN STRUCTURES SPAN TYPE SUMMARY AND TOTAL BILL OF MATERIAL.
2. AFTER ADJUSTMENTS TO LEVEL TRUSS AND ENSURE ADEQUATE VERTICAL CLEARANCE, ALL TOP AND LEVELING NUTS SHALL BE TIGHTENED AGAINST THE BASE PLATE WITH A MINIMUM TORQUE OF 200 LB.-FT. STAINLESS STEEL MESH SHALL THEN BE PLACED AROUND THE PERIMETER OF THE BASE PLATE. SECURE TO BASE PLATE WITH STAINLESS STEEL BANDING.
3. SIGN SUPPORT STRUCTURES MAY BE SUBJECT TO DAMAGING VIBRATIONS AND OSCILLATIONS WHEN SIGN PANELS ARE NOT IN PLACE DURING ERECTION OR MAINTENANCE OF THE STRUCTURE. TO AVOID THESE, ATTACH TEMPORARY BLANK SIGN PANELS OR OTHER BRACING TO THE STRUCTURE UNTIL PERMANENT SIGNS ARE INSTALLED.
4. TRUSS SEGMENTS SHALL BE SHIPPED INDIVIDUALLY WITH ADEQUATE PROVISION TO PREVENT DETRIMENTAL MOTION DURING TRANSPORT. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE CONFIGURATION AND PROTECTION OF THE TRUSSES.
5. ONLY SIGN PANELS ARE PERMITTED TO BE MOUNTED ON THIS TRUSS.

**DESIGN SPECIFICATIONS:**

1. 2013 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, 6TH EDITION.

**CONSTRUCTION SPECIFICATIONS:**

1. ALL MATERIALS, EXCEPT AS SHOWN, FABRICATION, ERECTION AND CONSTRUCTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH SECTION 733 OF THE LATEST ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS.

**LOADING:**

1. BOTH END SUPPORTS ARE DESIGNED FOR 60% OF THE TOTAL LOAD.
2. WIND LOADING SHALL BE A MINIMUM OF 35 PSF ON SIGN PANELS AND 10 PSF ON GROSS AREAS DEFINED BY THE PERIMETER OF TRUSS MEMBERS NOT COVERED BY SIGN PANEL AREAS.
3. THE AASHTO GROUP II AND III ALLOWABLE STRESS SHALL BE 133% (ALLOWABLE STRESS DESIGN).

**FABRICATION NOTES:**

1. NO SPLICES SHALL BE LOCATED WITHIN 0.1xL OF THE CENTERLINE OF THE SPAN.
2. MATERIALS: ALUMINUM SHALL CONFORM TO ASTM B221, ALLOY 6061 TEMPER T6. ALL STRUCTURAL STEEL PIPE SHALL BE ASTM A53 GRADE B OR A106 GRADE B. ALL STRUCTURAL STEEL PLATES AND SHAPES SHALL CONFORM TO AASHTO M270 GR. 36 OR GR. 50. STAINLESS STEEL FOR SHIMS, SLEEVES AND HANDHOLE COVERS SHALL BE ASTM A240, TYPE 302 OR 304, OR ANOTHER ALLOY SUITABLE FOR EXTERIOR EXPOSURE AND ACCEPTABLE TO THE ENGINEER. THE STEEL PIPE AND STIFFENING RIBS AT THE BASE PLATE FOR THE COLUMN SHALL HAVE A MINIMUM LONGITUDINAL CHARTY V-NOTCH (CVN) ENERGY OF 15 LB.-FT. AT 40° F. (ZONE 2) BEFORE GALVANIZING.
3. WELDING: ALL WELDS TO BE CONTINUOUS UNLESS OTHERWISE SHOWN. ALL WELDING TO BE DONE IN ACCORDANCE WITH CURRENT AWS D1.1 AND D1.2 STRUCTURAL WELDING CODES (STEEL AND ALUMINUM) AND THE IDOT STANDARD SPECIFICATIONS. ALUMINUM WELD FILLER SHALL BE ALLOY 5556.
4. FASTENERS FOR ALUMINUM TRUSSES: HIGH STRENGTH BOLTS SHALL SATISFY THE REQUIREMENTS OF AASHTO M164 (ASTM A325), OR APPROVED ALTERNATE, AND SHALL HAVE MATCHING LOCK NUTS. THREADED STUDS FOR SPLICES (IF MEMBERS INTERFERE) SHALL SATISFY THE REQUIREMENTS OF ASTM A449, ASTM A193, GRADE B7, OR APPROVED ALTERNATE, AND SHALL HAVE MATCHING LOCK NUTS. BOLTS AND LOCK NUTS NOT REQUIRED TO BE HIGH STRENGTH SHALL SATISFY THE REQUIREMENTS OF ASTM A307. ALL BOLTS AND LOCK NUTS SHALL BE HOT DIP GALVANIZED PER AASHTO M232, EXCEPT STAINLESS STEEL FASTENERS, NUTS AND WASHERS. THE LOCK NUTS SHALL HAVE NYLON OR STEEL INSERTS. A STAINLESS STEEL FLAT WASHER CONFORMING TO ASTM A240 TYPE 302 OR 304, IS REQUIRED UNDER BOTH HEAD AND NUT OR UNDER BOTH NUTS WHERE THREADED STUDS ARE USED. HIGH STRENGTH BOLT INSTALLATION SHALL CONFORM TO ARTICLE 505.04 (f)(2)d OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. ROTATIONAL CAPACITY ("ROCAP") TESTING OF BOLTS WILL NOT BE REQUIRED.
5. U-BOLTS: U-BOLTS SHALL BE PRODUCED FROM ASTM A276 TYPE 304, 304L, 316 OR 316L, CONDITION A, COLD FINISHED STAINLESS STEEL, OR AN EQUIVALENT MATERIAL ACCEPTABLE TO THE ENGINEER. ALL NUTS FOR U-BOLTS SHALL BE LOCK NUTS EQUIVALENT TO ASTM A307 WITH NYLON OR STEEL INSERTS AND HOT DIP GALVANIZED PER AASHTO M232. A STAINLESS STEEL FLAT WASHER CONFORMING TO ASTM A240, TYPE 302 OR 304, IS REQUIRED UNDER EACH U-BOLT LOCK NUT.
6. GALVANIZING: ALL STEEL GRATING, PLATES, SHAPES AND PIPE SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111. PAINTING IS NOT PERMITTED.
7. SEE TABLE "SIGN STRUCTURE MEMBER SCHEDULE" FOR "W" AND "W<sub>1</sub>".
8. DIAGONALS SHALL BE DETAILED TO MINIMIZE OFFSET FOR THEORETICAL PANEL POINT AND PROVIDE 3/4" TO 1 1/2" INCH CLEARANCE BETWEEN DIAGONALS AND PROVIDE CLEARANCE FOR U-BOLT CONNECTIONS OF SIGNS OR WALKWAY BRACKETS.
9. FOR ANY DESIGN SPAN LENGTH THAT FALL BETWEEN TWO CONSECUTIVE SPANS, PROVIDED IN COLUMN 2 OF TABLE "SIGN STRUCTURE MEMBER SCHEDULE", THE LARGER DESIGN SPAN LENGTH SHALL BE USED (I.E. FOR A 92' SPAN LENGTH FALLING BETWEEN 90' AND 95' DESIGN SPAN LENGTHS IN TABLE, THE 95' DESIGN SPAN LENGTH TRUSS AND POST DETAILS SHALL BE USED).

CAMBER	
SPAN IN FEET	CAMBER IN INCHES
80 THRU 95	1 1/2"
96 THRU 110	1 3/8"
111 THRU 120	1 1/8"
121 THRU 130	1 1/8"
131 THRU 140	2"
141 THRU 150	2 1/8"

PROVIDE THE ABOVE CAMBER AT MIDDLE OF SPAN OF STRUCTURES

TABLE A			
CHORD O.D.	E	F	N
5/2"Ø	10"	13"	8
6 3/8"Ø & 7"Ø	11 1/2"	14 1/2"	10
7 1/2"Ø	12 1/2"	15 1/2"	12
9"Ø	13 1/2"	16 1/2"	14
10"Ø	15 1/2"	18 1/2"	16
11"Ø	17 1/2"	20 1/2"	18

SIGN STRUCTURE MEMBER SCHEDULE														
TRUSS NO.	DIMENSIONS					ALUMINUM TRUSS *				STEEL END SUPPORT				
	TRUSS SPAN L	P	N	h	W <sub>1</sub>	MAXIMUM ALLOWABLE SIGN PANEL AREA	DL (TRUSS) DEFLECTION	MIDDLE SEGMENT OR END SEGMENT						
								CHORD (O.D.)		DIAGONAL (O.D.)		W	PIPE COLUMN (NOMINAL DIAMETER)	
								FRONT	REAR	FRONT	REAR		10" X.X.S. (104.13"/FT.)	12" X.X.S. (125.49"/FT.)
T-80	80'-0"	9'-0"	3'-4"	4'-6"	3'-10 3/4"	900 S.F.	1"	5 1/2"Ø x 1/2"	5 1/2"Ø x 1/2"	2 1/2"Ø x 1/4"	2 1/2"Ø x 1/4"	5'-9"	32'-0" (MAX)	38'-0" (MAX)
T-85	85'-0"	9'-6"	3'-10"	4'-9"	4'-1 3/8"	955 S.F.	1 1/16"	6 3/8"Ø x 1/2"	6 3/8"Ø x 1/2"	3"Ø x 1/4"	3"Ø x 1/4"	6'-7"	31'-0" (MAX)	38'-0" (MAX)
T-90	90'-0"	10'-0"	4'-4"	5'-0"	4'-4"	1010 S.F.	1 1/8"	6 3/8"Ø x 1/2"	6 3/8"Ø x 1/2"	3"Ø x 1/4"	3"Ø x 1/4"	6'-7"	31'-0" (MAX)	38'-0" (MAX)
T-95	95'-0"	10'-6"	4'-10"	5'-3"	4'-6 5/8"	1065 S.F.	1 3/16"	6 3/8"Ø x 1/2"	6 3/8"Ø x 1/2"	3"Ø x 1/4"	3"Ø x 1/4"	6'-7"	31'-0" (MAX)	38'-0" (MAX)
T-100	100'-0"	11'-4"	4'-0"	5'-8"	4'-10 7/8"	1125 S.F.	1 1/4"	7"Ø x 1/2"	7"Ø x 1/2"	3 1/2"Ø x 1/4"	3 1/2"Ø x 1/4"	7'-5"	31'-0" (MAX)	38'-0" (MAX)
T-105	105'-0"	12'-0"	3'-10"	6'-0"	5'-2 3/8"	1180 S.F.	1 3/16"	7"Ø x 1/2"	7"Ø x 1/2"	3 1/2"Ø x 1/4"	3 1/2"Ø x 1/4"	7'-5"	31'-0" (MAX)	38'-0" (MAX)
T-110	110'-0"	12'-6"	4'-4"	6'-3"	5'-5"	1200 S.F.	1 3/8"	7"Ø x 1/2"	7"Ø x 1/2"	3 1/2"Ø x 1/4"	3 1/2"Ø x 1/4"	7'-5"	31'-0" (MAX)	38'-0" (MAX)
T-115	115'-0"	13'-0"	4'-10"	6'-6"	5'-7 3/8"	1200 S.F.	1 1/2"	7 1/2"Ø x 1/2"	7 1/2"Ø x 1/2"	3 1/2"Ø x 1/4"	3 1/2"Ø x 1/4"	10'-2"	34'-0" (MAX)	40'-0" (MAX)
T-120	120'-0"	13'-8"	4'-8"	6'-10"	5'-11"	1200 S.F.	1 3/8"	7 1/2"Ø x 1/2"	7 1/2"Ø x 1/2"	3 1/2"Ø x 1/4"	3 1/2"Ø x 1/4"	10'-2"	34'-0" (MAX)	40'-0" (MAX)
T-130	130'-0"	15'-0"	4'-4"	7'-6"	6'-5 3/8"	1200 S.F.	1 3/8"	9"Ø x 1/2"	9"Ø x 1/2"	4"Ø x 1/4"	4"Ø x 1/4"	10'-2"	NOT APPLICABLE	40'-0" (MAX)
T-140	140'-0"	16'-3"	4'-4"	8'-2"	7'-0 3/8"	1200 S.F.	1 1/16"	10"Ø x 1/2"	10"Ø x 1/2"	4"Ø x 1/4"	4"Ø x 1/4"	10'-2"	NOT APPLICABLE	40'-0" (MAX)
T-150	150'-0"	17'-6"	4'-4"	8'-10"	7'-7 3/4"	1200 S.F.	1 3/16"	11"Ø x 1/2"	11"Ø x 1/2"	4 1/2"Ø x 1/4"	4 1/2"Ø x 1/4"	10'-2"	NOT APPLICABLE	40'-0" (MAX)

\* SUBSTITUTION OF LARGER TRUSS SIZE IS ACCEPTABLE.

**NOTES:**

1. XXS DENOTES DOUBLE EXTRA STRONG PIPE.
2. A PAIR OF MAIN PIPE COLUMN SIZES FOR EACH SUPPORT SHALL BE SELECTED INDEPENDENTLY BASED ON SPECIFIC NEEDS.

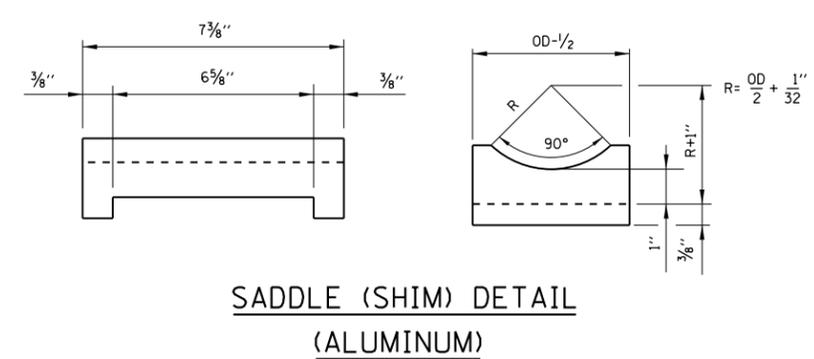
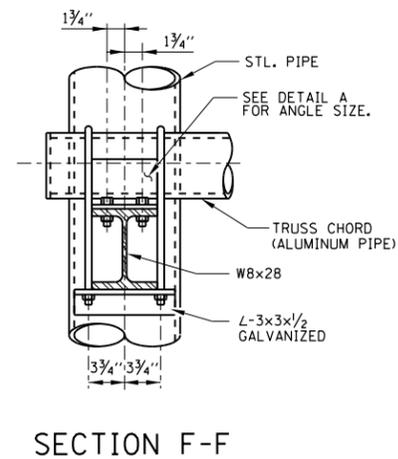
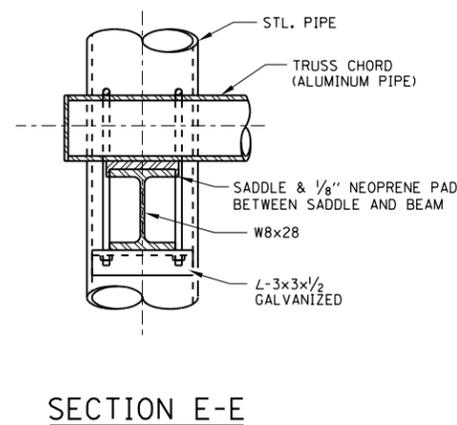
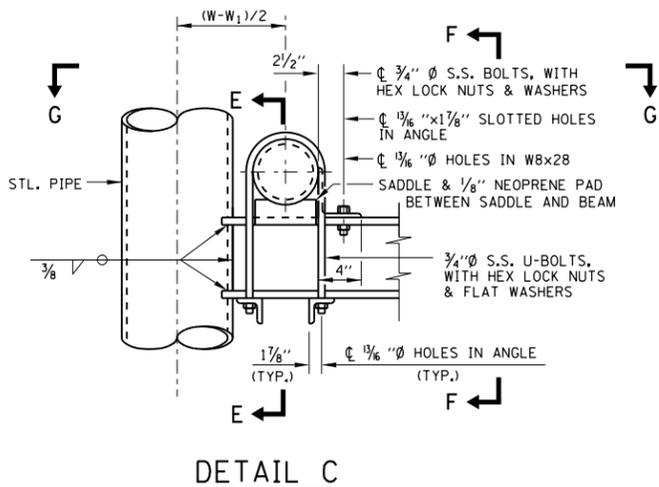
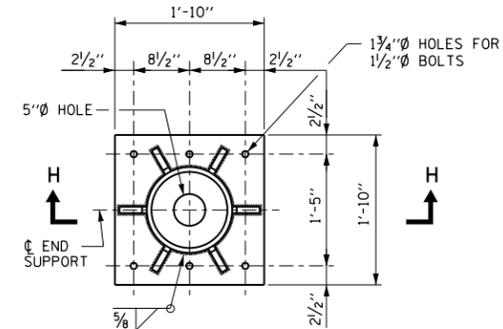
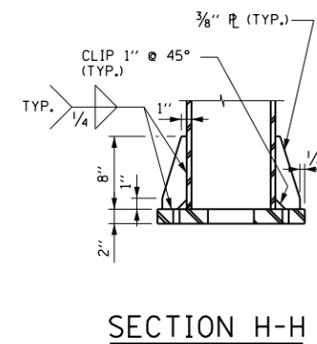
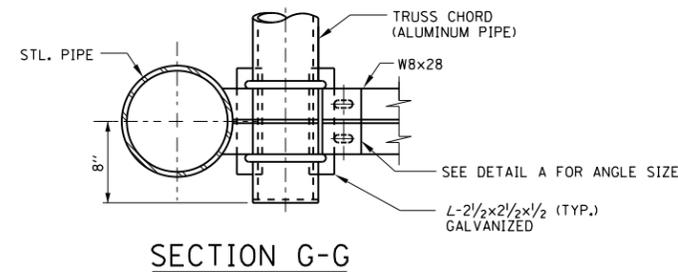
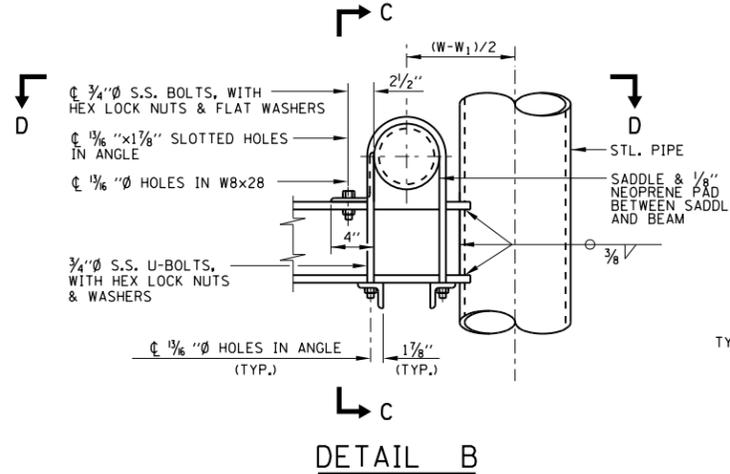
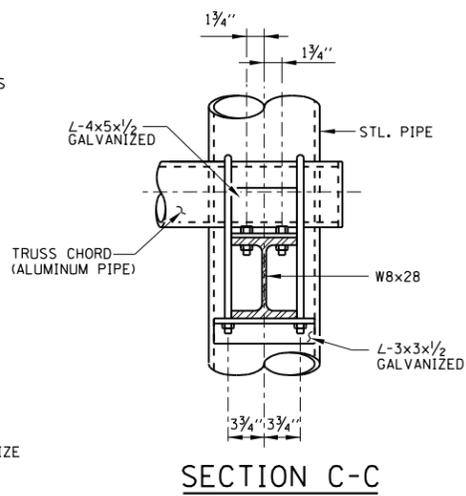
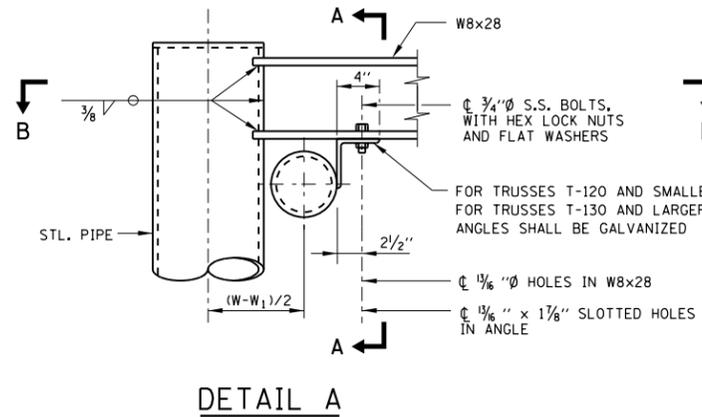
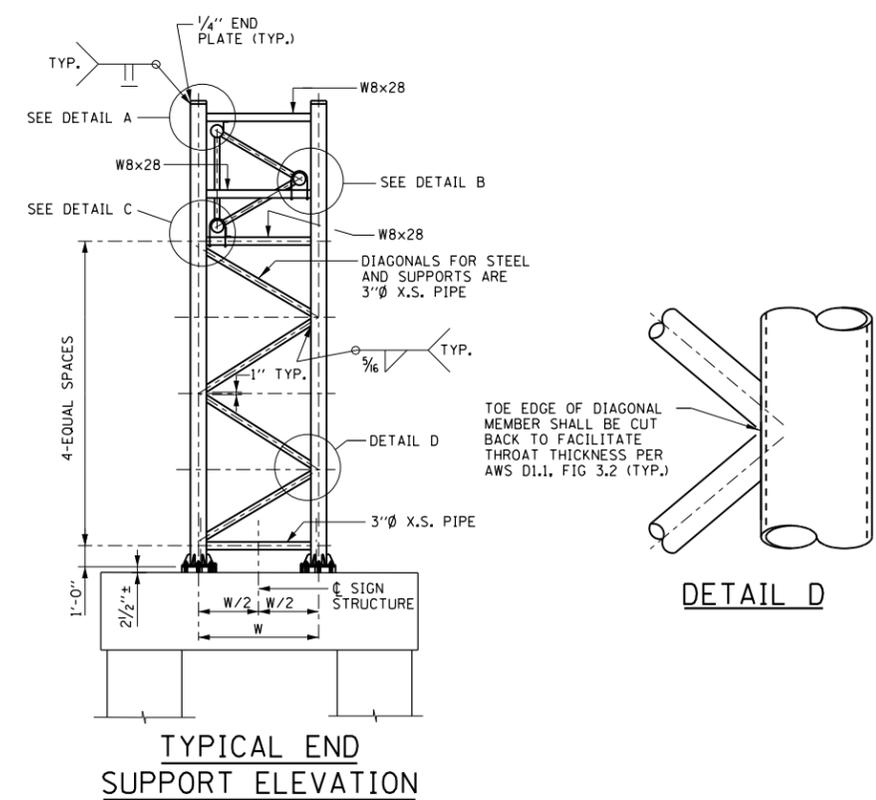
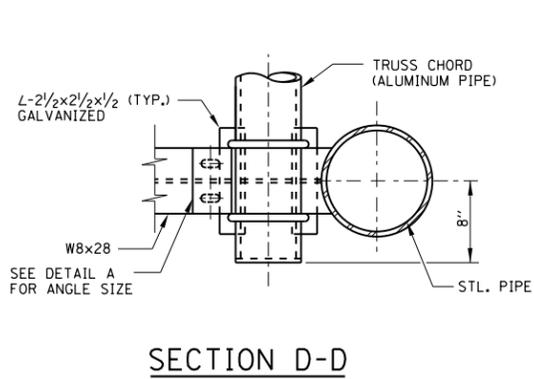
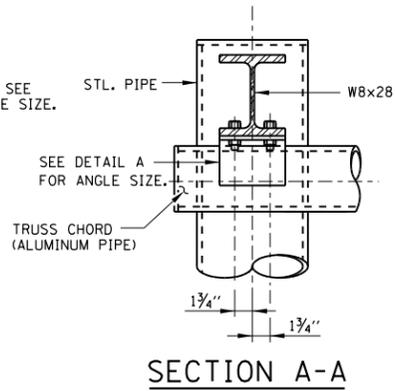
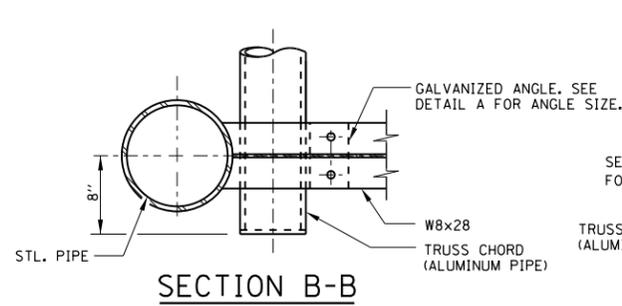
APPROVED: *Paul Kovacs* DATE 2-07-2012  
CHIEF ENGINEERING OFFICER

DATE	REVISIONS
7-01-2014	REVISED FOUNDATION CONCRETE.
3-11-2015	REVISED NOTES.
3-31-2016	REVISED FOUNDATION NOTE AND REVISED BASE PLATE DIMENSIONS.
3-31-2017	COLUMN MEMBER ADJUSTMENTS AND FOUNDATION REINFORCEMENT.
3-01-2018	REVISED VER. CLEARANCE, AND ADDED NOTE
3-01-2019	UPDATE BARRIER SHAPE, CHANGED GRADE BEAM TO CLASS SI CONCRETE, REVISED +1(E) BAR IN BAR LIST
	ADDED NOTE 9 FOR DESIGN SPAN LENGTH
2-13-2020	ADDED WASHER & NUTS CALLOUT-VIEW C-C.

SHEET 1 OF 5

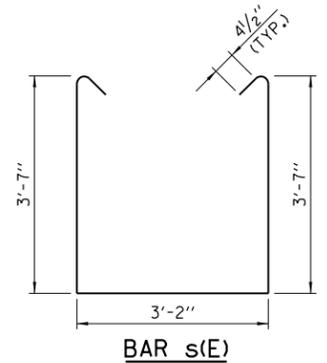
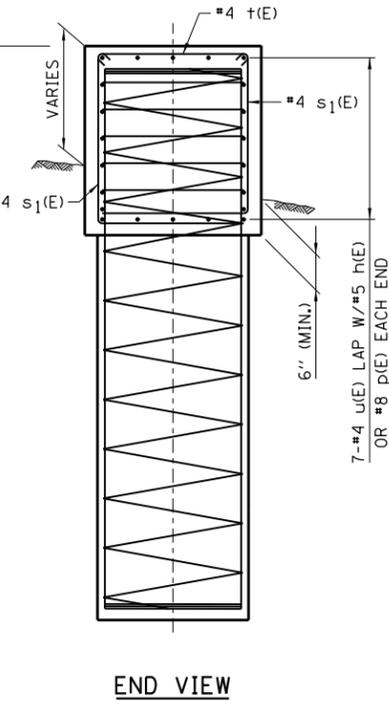
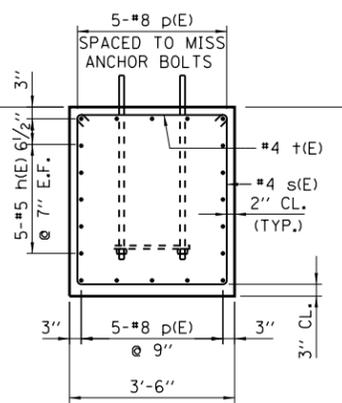
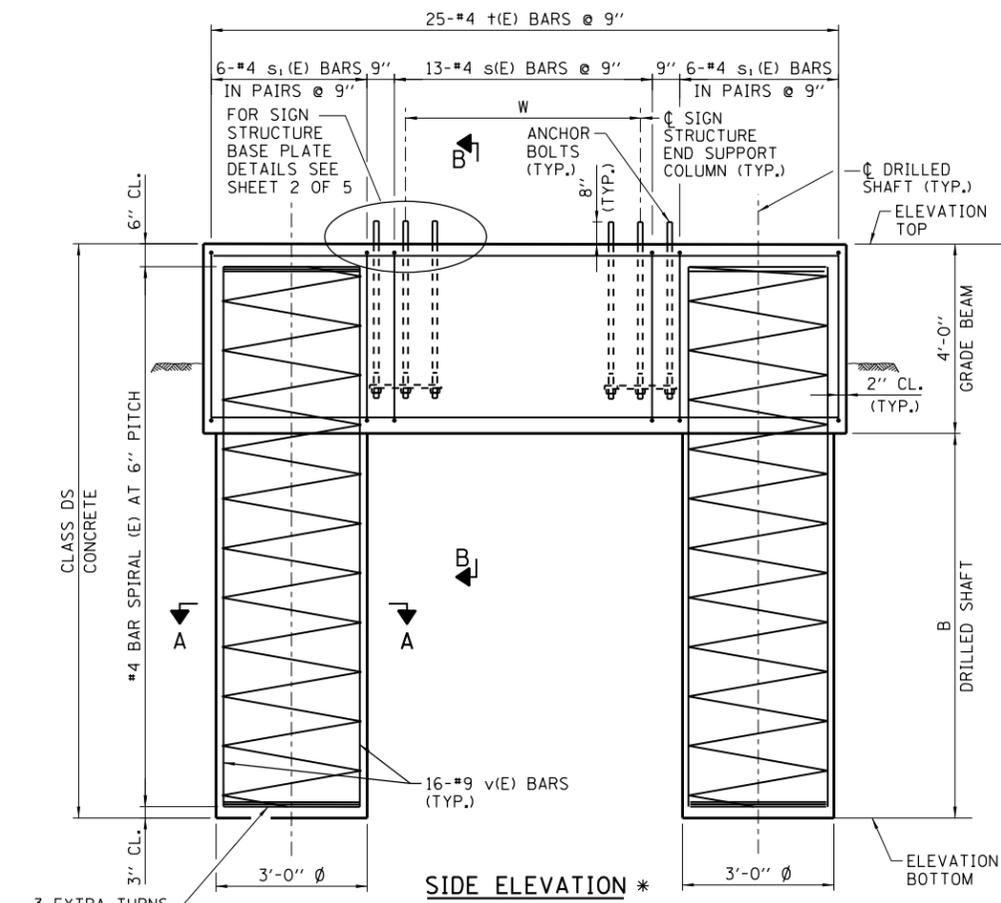
**OVERHEAD SIGN STRUCTURE  
SPAN TYPE  
STRUCTURE DETAILS**

STANDARD F1-10



Paul Kovacs  
APPROVED... DATE 2-7-2012...  
CHIEF ENGINEERING OFFICER

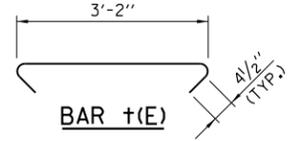
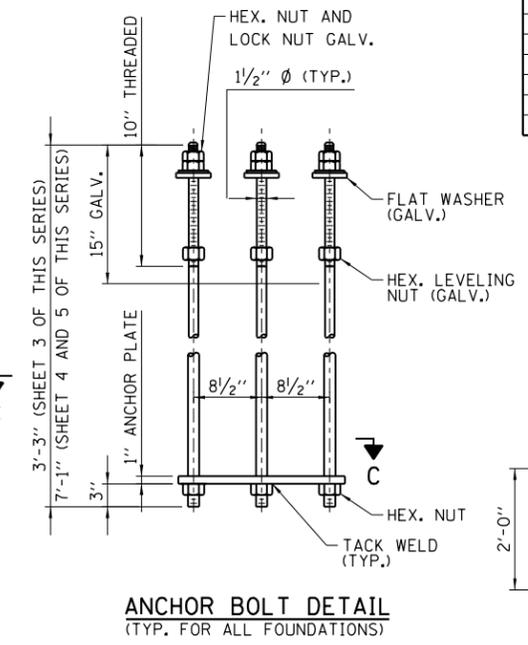
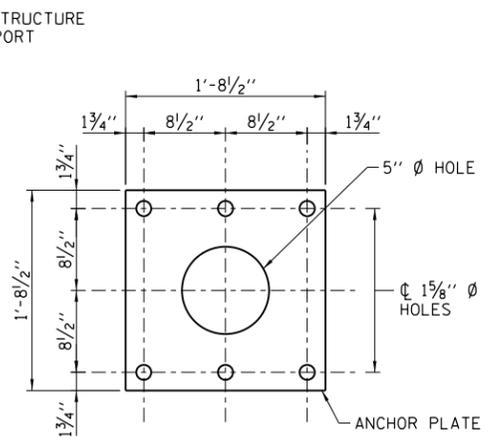
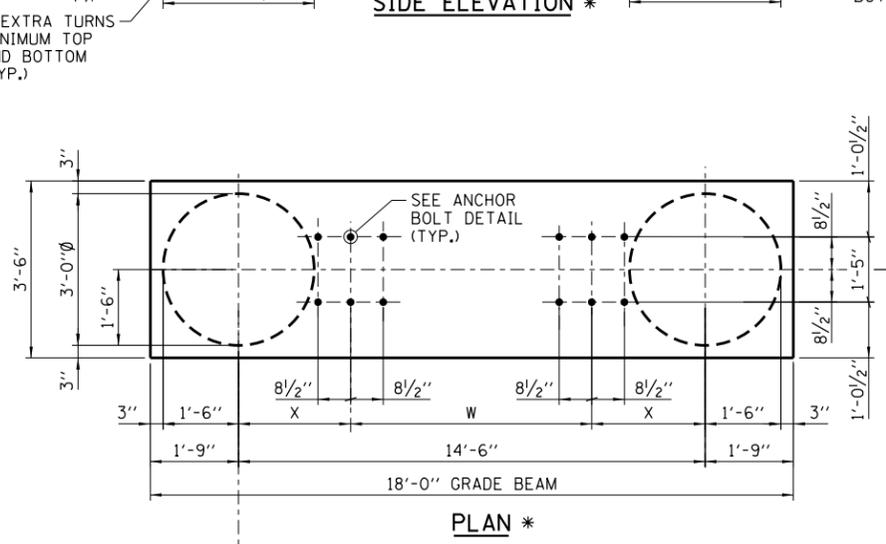




**NOTES:**

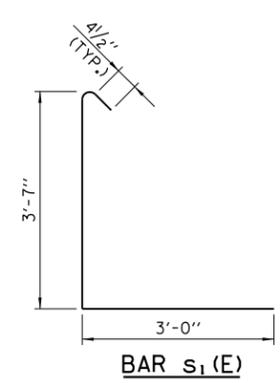
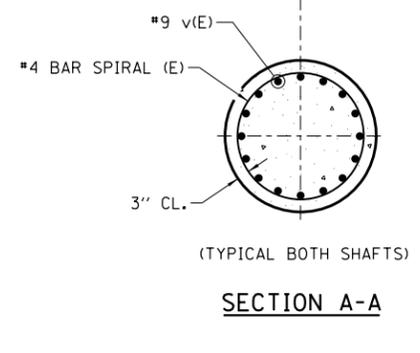
1. THE FOUNDATION DETAILS SHOWN ARE BASED ON THE PRESENCE OF MOSTLY COMMON COHESIVE SOIL CONDITIONS (SILTY OR SANDY CLAY), WITH AN AVERAGE UNCONFINED COMPRESSIVE STRENGTH (OU) > 1.25 TON/SQ. FT. WHICH SHALL BE DETERMINED BY PREVIOUS SOIL INVESTIGATIONS AT THE JOBSITE. WHEN OTHER CONDITIONS ARE INDICATED, THE FOUNDATION DIMENSIONS SHOWN SHALL BE INCLUDED IN THE PLANS AND THE FOUNDATION DIMENSIONS SHOWN SHALL BE THE RESULT OF SITE SPECIFIC DESIGNS. IF CONDITIONS ENCOUNTERED IN THE FIELD ARE DIFFERENT THAN THOSE INDICATED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE IF THE FOUNDATION DIMENSIONS NEED TO BE MODIFIED.
2. ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M314 OR ASTM F1554 GRADE 55, WITH A MINIMUM TENSILE STRENGTH OF 75,000 PSI. ALL OTHER MATERIAL, FABRICATION, AND CONSTRUCTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH SECTION 734 OF THE ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS.
3. CONCRETE SHALL BE PLACED MONOLITHICALLY, WITHOUT CONSTRUCTION JOINTS UNLESS NOTED OTHERWISE.
4. BACKFILL SHALL BE PLACED PER SECTION 502 OF THE IDOT STANDARD SPECIFICATION AND PRIOR TO ERECTION OF SUPPORT COLUMN.
5. A NORMAL SURFACE FINISH FOLLOWED BY A CONCRETE SEALER APPLICATION WILL BE REQUIRED ON CONCRETE SURFACES ABOVE THE LOWEST ELEVATION 6" BELOW FINISHED GROUND LINE.
6. ALL REBAR DESIGNATED (E) SHALL BE EPOXY COATED. REBAR SHALL BE POSITIONED SO THAT THERE WILL BE NO INTERFERENCE BETWEEN VERTICAL REINFORCEMENT AND ANCHOR BOLTS.
7. SITE GROUNDING ELECTRODE SYSTEM TO BE PROVIDED AS INDICATED ON THE PLANS.
8. NO SONOTUBES OR DECOMPOSABLE FORMS SHALL BE USED 6" BELOW THE FINISHED GROUND LINE. PERMANENT METAL FORMS OR OTHER SHIELDING SHALL NOT BE LEFT IN PLACE BELOW THE ELEVATION WITHOUT THE ENGINEER'S WRITTEN PERMISSION. EXCAVATIONS SHALL BE DEWATERED BEFORE CONCRETE PLACEMENT IF DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST.
9. IF NECESSARY TO INCREASE STEEL END SUPPORT HEIGHT ABOVE THE LIMITATIONS SHOWN IN SIGN STRUCTURE MEMBER SCHEDULE ON SHEET 1 OF THIS SERIES, GRADE BEAM DEPTH SHALL BE INCREASED UP TO 6'-0" WITHOUT CHANGES TO THE DRILLED SHAFT DESIGN. GRADE BEAM REINFORCEMENT, CONCRETE VOLUME AND LENGTH OF ANCHOR BOLTS SHALL BE REVISED ACCORDINGLY.

TRUSS No.	W	X	B	CLASS DS CONC. CY	REINF. BARS POUND
T-80	5'-9"	4'-4 1/2"	40'-0"	30.3	6650
T-85	6'-7"	3'-11 1/2"	50'-0"	35.5	7940
T-90	6'-7"	3'-11 1/2"	50'-0"	35.5	7940
T-95	6'-7"	3'-11 1/2"	50'-0"	35.5	7940
T-100	7'-5"	3'-6 1/2"	50'-0"	35.5	7940
T-105	7'-5"	3'-6 1/2"	50'-0"	35.5	7940
T-110	7'-5"	3'-6 1/2"	50'-0"	35.5	7940
T-115	10'-2"	2'-2"	50'-0"	35.5	7940
T-120	10'-2"	2'-2"	50'-0"	35.5	7940
T-130	10'-2"	2'-2"	55'-0"	38.1	8590
T-140	10'-2"	2'-2"	55'-0"	38.1	8590
T-150	10'-2"	2'-2"	55'-0"	38.1	8590



BAR	NUMBER	SIZE	LENGTH	SHAPE
h (E)	10	#5	17'-8"	—
p (E)	10	#8	17'-8"	—
s (E)	13	#4	11'-1"	U
s1 (E)	24	#4	6'-11 1/2"	U
+ (E)	25	#4	3'-11"	—
u (E)	14	#4	7'-0"	U
v (E)	32	#9	B ADD 3'-3"	—

\* #4 BAR SPIRAL (E) - SEE SIDE ELEVATION

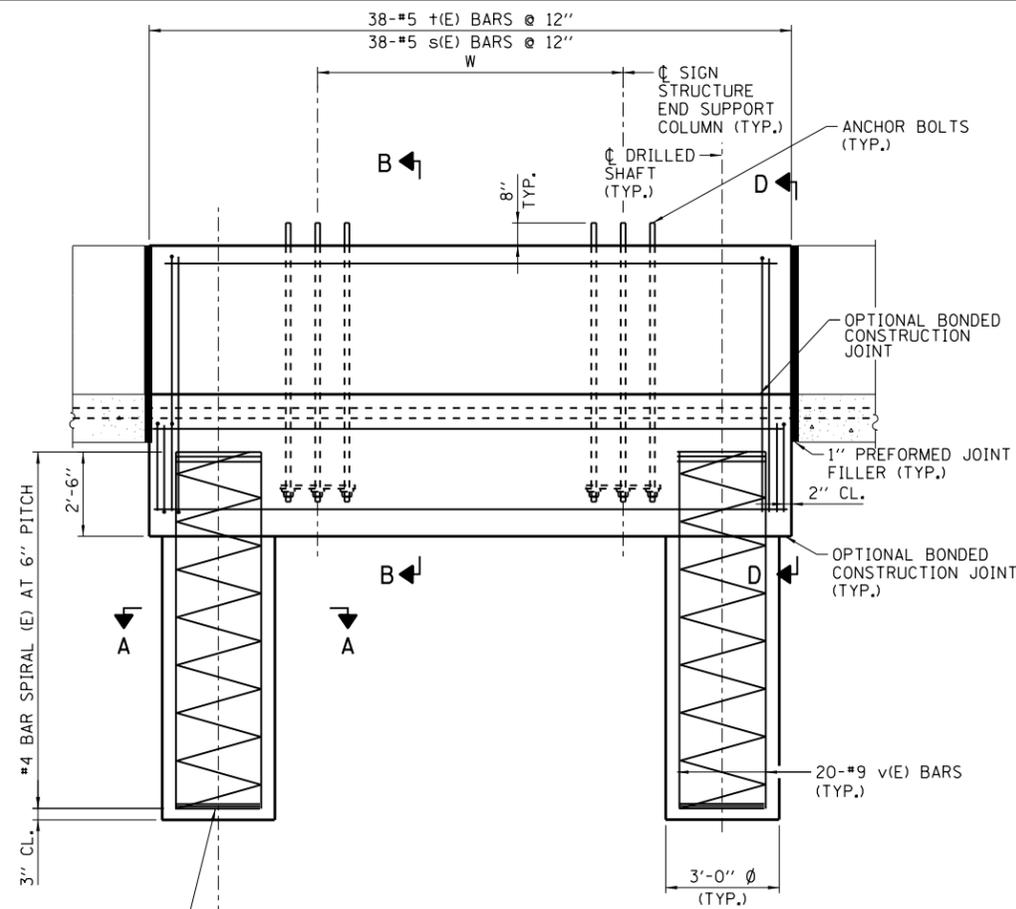


Paul Kovacs  
 APPROVED... DATE 2-7-2012...  
 CHIEF ENGINEERING OFFICER

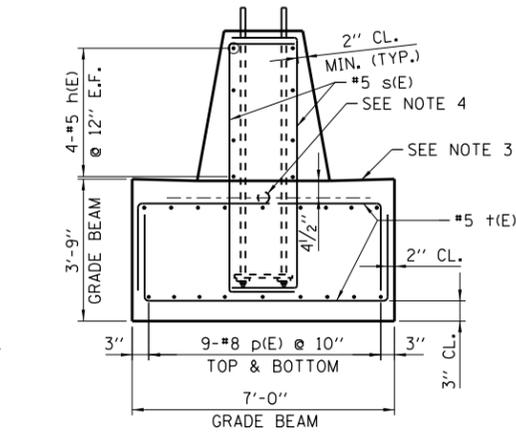
SHEET 3 OF 5

OVERHEAD SIGN STRUCTURE  
 SPAN TYPE  
 STRUCTURE DETAILS

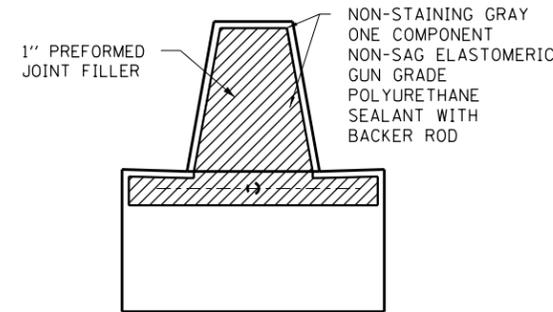
STANDARD F1-10



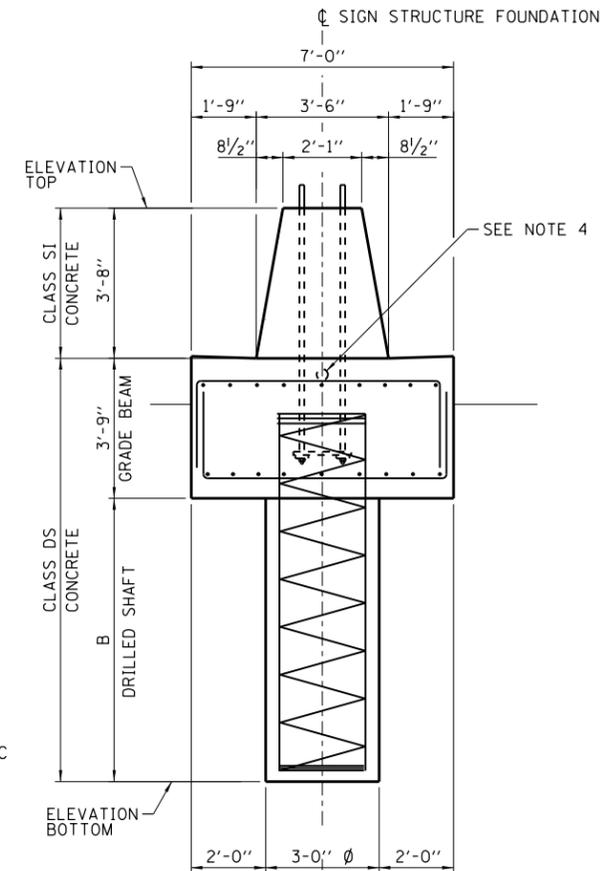
**SIDE ELEVATION \***



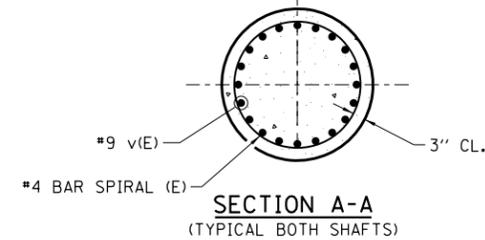
**SECTION B-B**



**SECTION D-D**



**END VIEW**

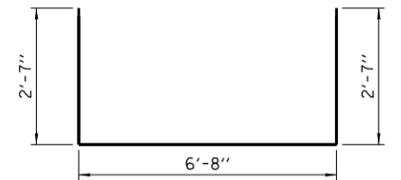


**SECTION A-A  
(TYPICAL BOTH SHAFTS)**

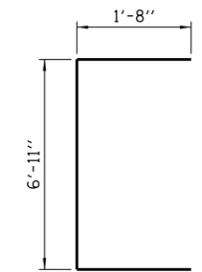
**BAR LIST - EACH FOUNDATION**

BAR	NUMBER	SIZE	LENGTH	SHAPE
h(E)	8	#5	17'-8"	—
p(E)	18	#8	17'-8"	—
s(E)	38	#5	10'-3"	C
t(E)	38	#5	11'-10"	—
v(E)	40	#9	B ADD 2'-3"	—

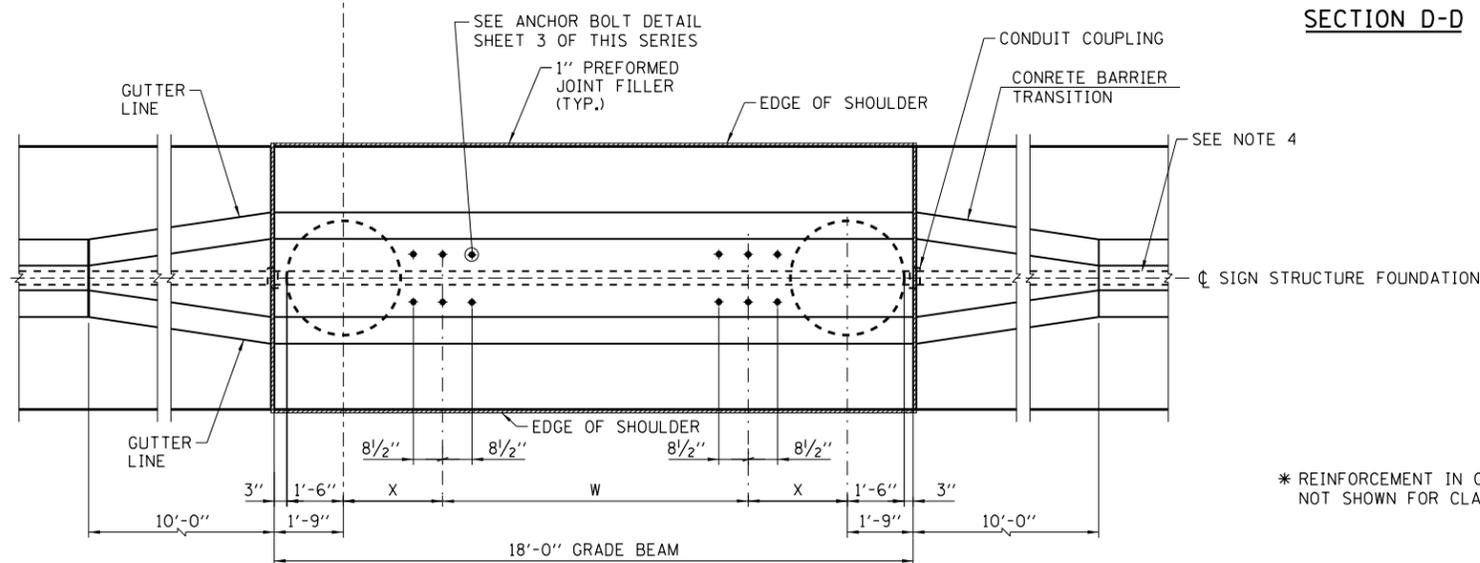
#4 BAR SPIRAL (E) - SEE SIDE ELEVATION



**BAR t(E)**



**BAR s(E)**



**PLAN \***

(REINFORCEMENT NOT SHOWN FOR CLARITY)

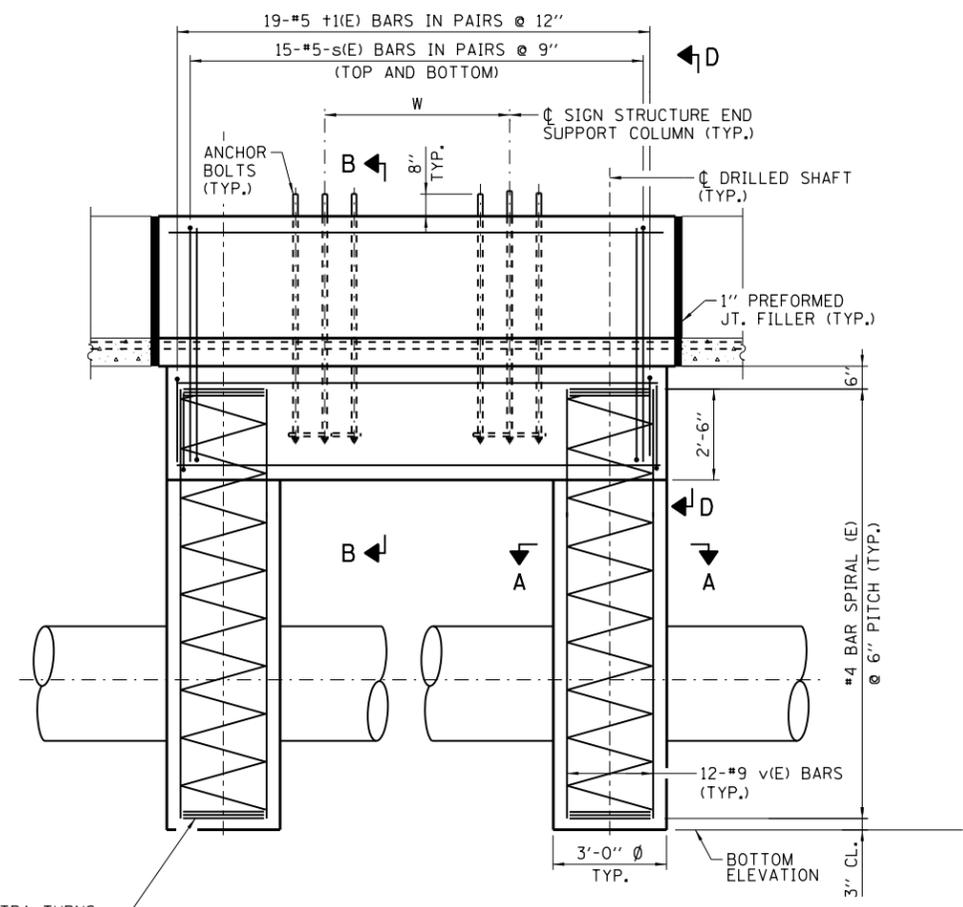
\* REINFORCEMENT IN GRADE BEAM NOT SHOWN FOR CLARITY

TRUSS No.	DESIGN TABLE FOR DRILLED SHAFTS IN COHESIVE SOILS ( $QU > 1.25$ TON/SQ. FT.)			CLASS DS CONC. CU. YD.	CLASS S1 CONC. CU. YD.	REINF. BARS POUND	PROTECTIVE COAT SQ. YD.
	W	X	B				
T-80	5'-9"	4'-4 1/2"	50'-0"	43.7	6.8	10110	26.1
T-85	6'-7"	3'-11 1/2"	55'-0"	46.3	6.8	10890	26.1
T-90	6'-7"	3'-11 1/2"	55'-0"	46.3	6.8	10890	26.1
T-95	6'-7"	3'-11 1/2"	55'-0"	46.3	6.8	10890	26.1
T-100	7'-5"	3'-6 1/2"	55'-0"	46.3	6.8	10890	26.1
T-105	7'-5"	3'-6 1/2"	55'-0"	46.3	6.8	10890	26.1
T-110	7'-5"	3'-6 1/2"	55'-0"	46.3	6.8	10890	26.1
T-115	10'-2"	2'-2"	55'-0"	46.3	6.8	10890	26.1
T-120	10'-2"	2'-2"	55'-0"	46.3	6.8	10890	26.1
T-130	10'-2"	2'-2"	55'-0"	46.3	6.8	10890	26.1
T-140	10'-2"	2'-2"	55'-0"	46.3	6.8	10890	26.1
T-150	10'-2"	2'-2"	55'-0"	46.3	6.8	10890	26.1

**NOTES:**

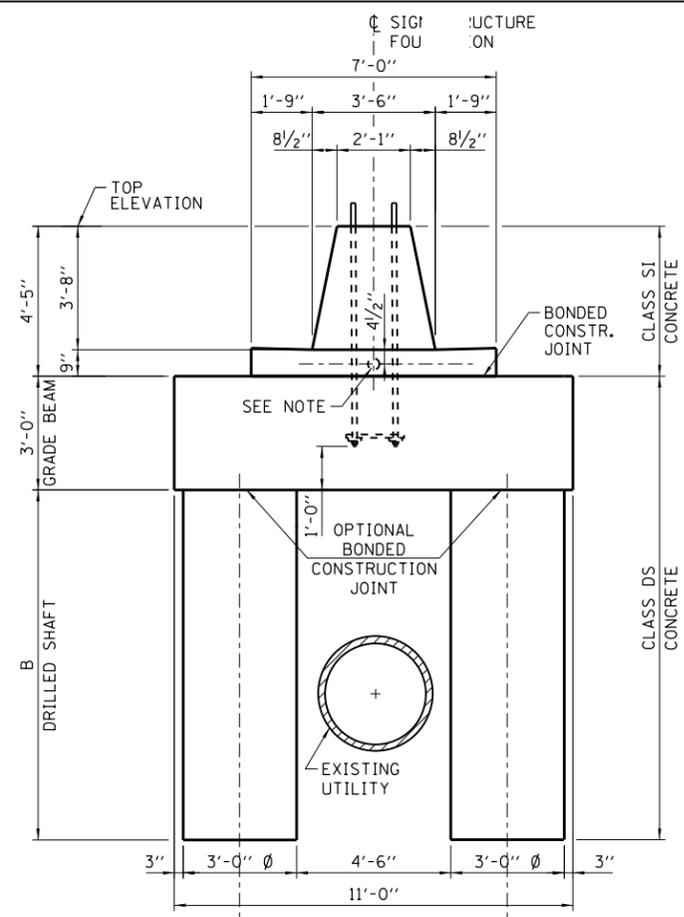
- SEE SHEET 3 OF THIS SERIES FOR GENERAL NOTES AND DESIGN CRITERIA.
- FOR SIGN STRUCTURE BASE PLATE DETAIL, SEE SHEET 2 OF THIS SERIES.
- REFERENCE ILLINOIS TOLLWAY STANDARD DRAWING C5 FOR GUTTER SLOPE.
- COORDINATE CONDUIT SIZE, LOCATION AND QUANTITY WITH ELECTRICAL PLANS, CONDUITS SHALL BE PLACED TO MISS REINFORCEMENT BARS, DO NOT CUT REINFORCEMENT BARS.
- PROTECTIVE COAT SHALL BE APPLIED TO THE TRAFFIC AND TOP FACES OF THE BARRIER AND TOP FACE OF GUTTER.





**SIDE ELEVATION \***

\* REINFORCEMENT IN GRADE BEAM NOT SHOWN FOR CLARITY



**END VIEW**

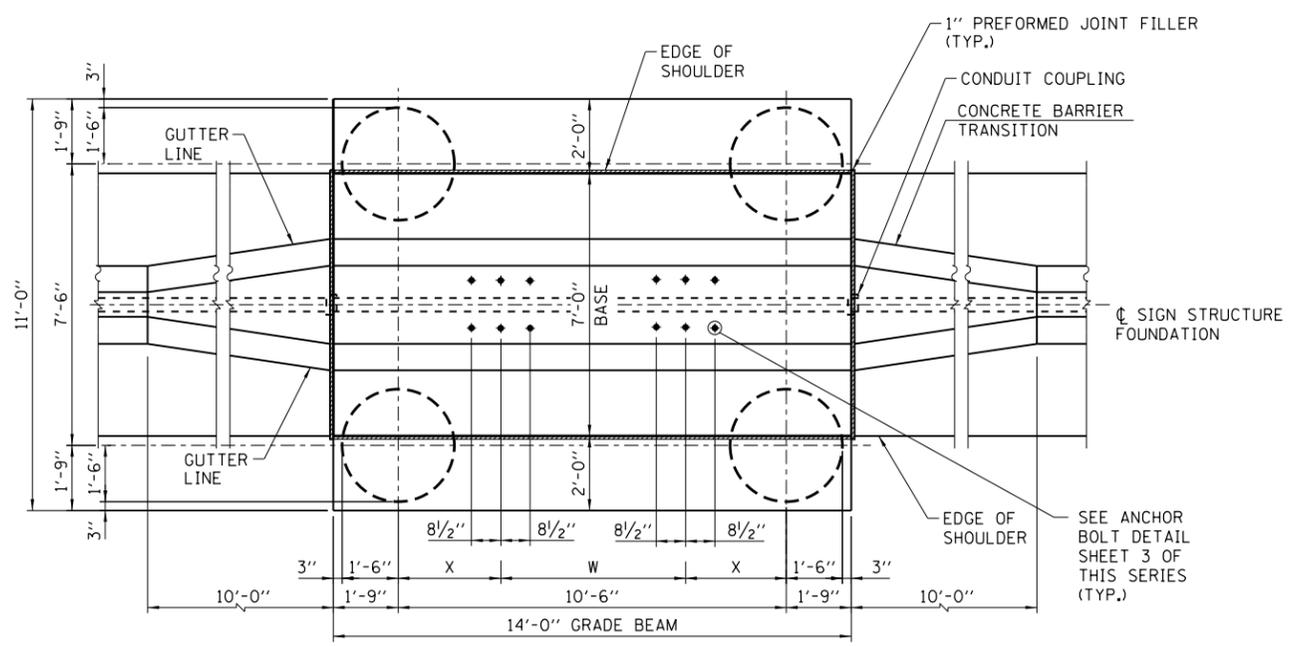
DESIGN TABLE FOR DRILLED SHAFTS IN COHESIVE SOILS (QU > 1.25 TON/SQ. FT.)

TRUSS No.	W	X	B	CLASS DS CONC. CU. YD.	CLASS SI CONC. CU. YD.	REINF. BARS POUND	PROTECTIVE COAT SQ. YD.
T-80	5'-9"	2'-4 1/2"	25'-0"	43.3	8.0	9950	20.3
T-85	6'-7"	1'-11 1/2"	25'-0"	43.3	8.0	9950	20.3
T-90	6'-7"	1'-11 1/2"	25'-0"	43.3	8.0	9950	20.3
T-95	6'-7"	1'-11 1/2"	25'-0"	43.3	8.0	9950	20.3
T-100	7'-5"	1'-6 1/2"	25'-0"	43.3	8.0	9950	20.3
T-105	7'-5"	1'-6 1/2"	30'-0"	48.5	8.0	10980	20.3
T-110	7'-5"	1'-6 1/2"	30'-0"	48.5	8.0	10980	20.3
T-115	10'-2"	0'-2"	30'-0"	48.5	8.0	10980	20.3
T-120	10'-2"	0'-2"	30'-0"	48.5	8.0	10980	20.3
T-130	10'-2"	0'-2"	30'-0"	48.5	8.0	10980	20.3
T-140	10'-2"	0'-2"	30'-0"	48.5	8.0	10980	20.3
T-150	10'-2"	0'-2"	30'-0"	48.5	8.0	10980	20.3

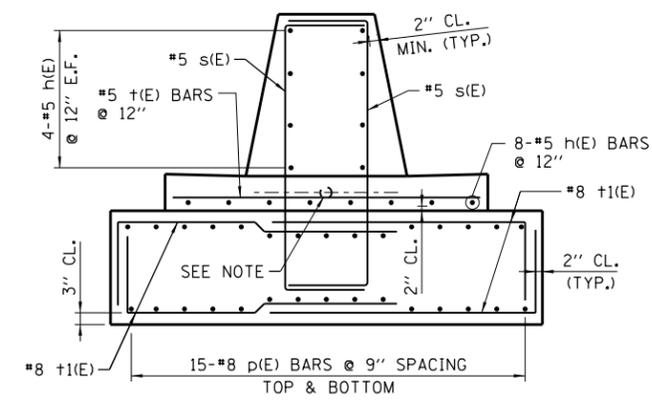
**BAR LIST - EACH FOUNDATION**

BAR	NUMBER	SIZE	LENGTH	SHAPE
h(E)	16	#5	13'-8"	—
p(E)	30	#8	13'-8"	—
s(E)	38	#5	10'-3"	C
+ (E)	15	#5	6'-8"	—
+1(E)	60	#8	12'-7"	—
v(E)	48	#9	B. ADD 2'-3"	—

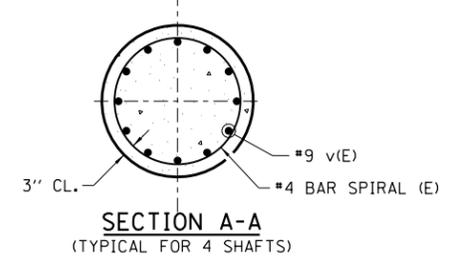
#4 BAR SPIRAL (E) - SEE SIDE ELEVATION



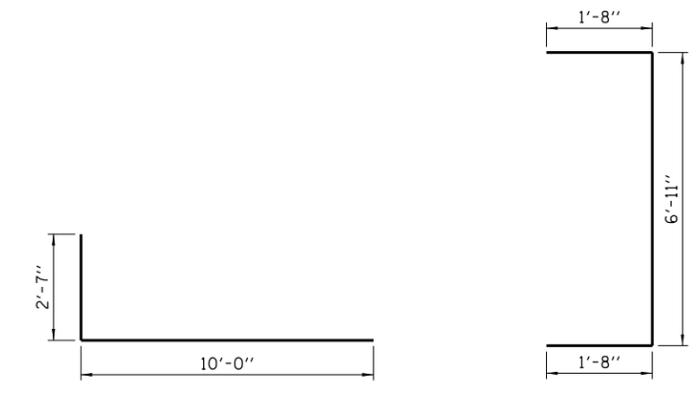
**PLAN \***



**SECTION B-B**

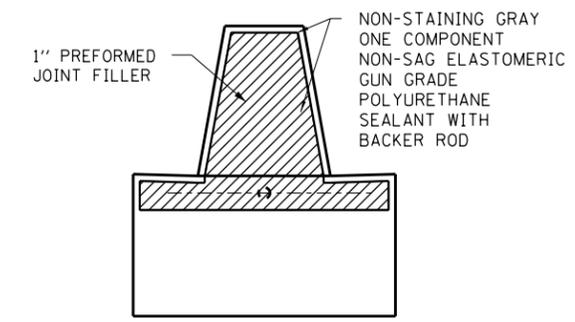


**SECTION A-A (TYPICAL FOR 4 SHAFTS)**



**BAR +1(E)**

**BAR -s(E)**



**SECTION D-D**

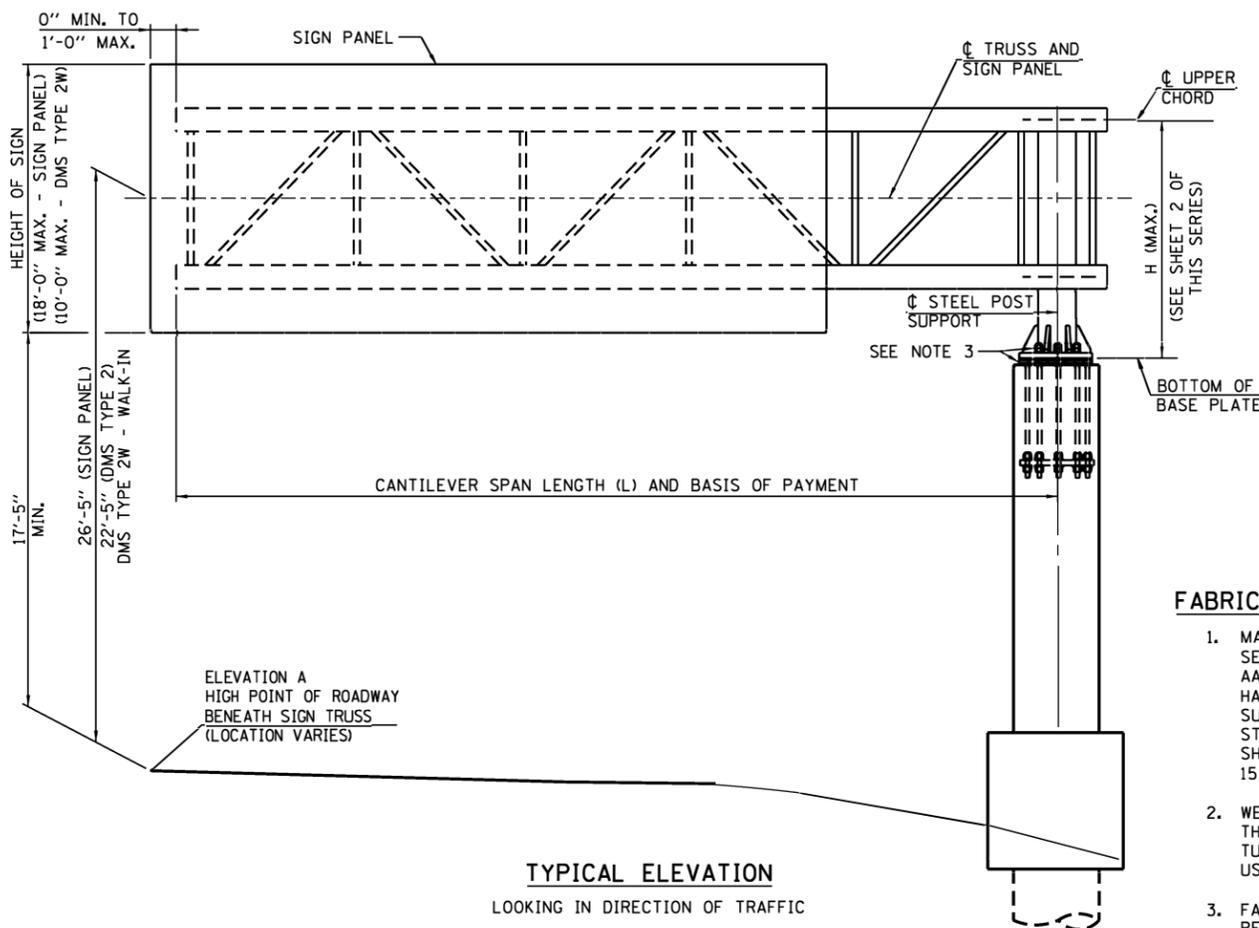
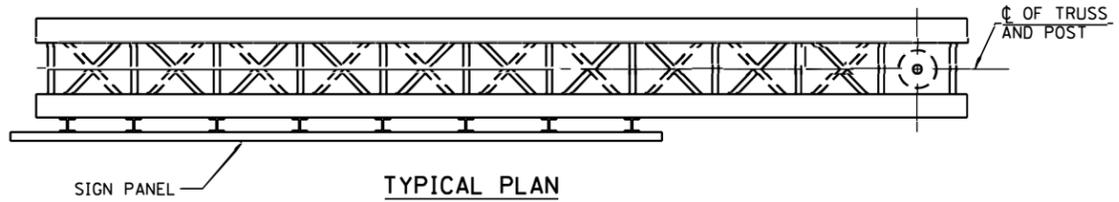
APPROVED: *Paul Kovacs* DATE 2-7-2012  
CHIEF ENGINEERING OFFICER

**NOTE:**  
1. SEE NOTES ON SHEET 4 OF THIS SERIES.

SHEET 5 OF 5

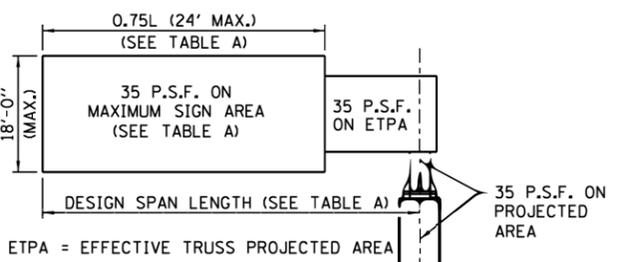
**OVERHEAD SIGN STRUCTURE  
SPAN TYPE  
STRUCTURE DETAILS**

**STANDARD F1-10**



**TABLE A: MAXIMUM LIMITS FOR SIGNS**

TRUSS TYPE	DESIGN SPAN LENGTH (FT.)	MAXIMUM SIGN AREA (SQ. FT.)	MAXIMUM SIGN LENGTH (FT.)
20-D	20	270	15
25-D	25	338	18.75
30-D	30	405	22.5
35-D	35	432	24
40-D	40	432	24
45-D	45	432	24
50-D	50	432	24



**DESIGN WIND LOADING DIAGRAM**

**FABRICATION NOTES:**

- MATERIALS:** FOR MATERIAL SPECIFICATIONS FOR CANTILEVER SIGN STRUCTURES, SEE TABLE B. ALL STRUCTURAL STEEL PLATES AND SHAPES SHALL CONFORM TO AASHTO M270 GR. 50, STAINLESS STEEL FOR SHIMS, SLEEVES AND HANDHOLE COVERS SHALL BE ASTM A240, TYPE 302 OR 304 OR ANOTHER ALLOY SUITABLE FOR EXTERIOR EXPOSURE AND ACCEPTABLE TO THE ENGINEER. THE STEEL PIPE AND STIFFENING RIBS AT THE BASE PLATE FOR THE STEEL POST SHALL HAVE A MINIMUM LONGITUDINAL CHARNY V-NOTCH (CVN) ENERGY OF 15 LB.-FT. AT 40° F (ZONE 2) BEFORE GALVANIZING.
- WELDING:** ALL MATERIALS, WELDING PROCEDURES AND INSPECTION USED FOR THE CANTILEVER OVERHEAD SIGN STRUCTURE SHALL CONFORM TO AWS D1.1-10 FOR TUBULAR, CYCLICALLY LOADED STRUCTURES. ADDITIONALLY, ALL WELDED MATERIALS USED SHALL BE PREQUALIFIED FOR USE WITH WPS AS PER AWS D1.1-10, TABLE 3.1.
- FASTENERS FOR STEEL TRUSSES:** HIGH STRENGTH BOLTS SHALL SATISFY THE REQUIREMENTS OF AASHTO M164 (ASTM A325), OR APPROVED ALTERNATE, AND SHALL HAVE MATCHING LOCKNUTS. THREADED STUDS FOR SPLICES (IF MEMBERS INTERFERE) SHALL SATISFY THE REQUIREMENTS OF ASTM A449. ASTM A193 GRADE B7, OR APPROVED ALTERNATE, AND SHALL HAVE MATCHING LOCKNUTS. BOLTS AND LOCKNUTS NOT REQUIRED TO BE HIGH STRENGTH SHALL SATISFY THE REQUIREMENTS OF ASTM A307. ALL BOLTS AND LOCKNUTS SHALL BE HOT DIP GALVANIZED PER AASHTO M232, EXCEPT STAINLESS STEEL FASTENERS, NUTS AND WASHERS. THE LOCKNUTS SHALL HAVE NYLON OR STEEL INSERTS. A STAINLESS STEEL FLAT WASHER CONFORMING TO ASTM A240 TYPE 302 OR 304, IS REQUIRED UNDER BOTH HEAD AND NUT OR UNDER BOTH NUTS WHERE THREADED STUDS ARE USED. HIGH STRENGTH BOLT INSTALLATION SHALL CONFORM TO ARTICLE 505.04(F)(2)d OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. ROTATIONAL CAPACITY ("ROCAP") TESTING OF BOLTS WILL NOT BE REQUIRED.
- U-BOLTS:** U-BOLTS SHALL BE PRODUCED FROM ASTM A276 TYPE 304, 304L, 316 OR 316L, CONDITION A, COLD FINISHED STAINLESS STEEL, OR AN EQUIVALENT MATERIAL ACCEPTABLE TO THE ENGINEER. ALL NUTS FOR U-BOLTS SHALL BE LOCKNUTS EQUIVALENT TO ASTM A307 WITH NYLON OR STEEL INSERTS AND HOT DIP GALVANIZED PER AASHTO M232. A STAINLESS STEEL FLAT WASHER CONFORMING TO ASTM A240, TYPE 302 OR 304, IS REQUIRED UNDER EACH U-BOLT LOCKNUT.
- GALVANIZING:** ALL PLATES, SHAPES AND PIPE SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111. PAINTING IS NOT PERMITTED. ALL FASTENERS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111 OR M232 AS APPROPRIATE FOR THE PRODUCT (EXCEPT STAINLESS STEEL FASTENERS).

**GENERAL NOTES:**

- WORK THIS SHEET WITH OVERHEAD SIGN STRUCTURE CANTILEVER TYPE SUMMARY AND TOTAL BILL OF MATERIAL SHEET.
- AFTER ADJUSTMENTS TO LEVEL TRUSS AND ENSURE ADEQUATE VERTICAL CLEARANCE, ALL TOP AND LEVELING NUTS SHALL BE TIGHTENED AGAINST THE BASE PLATE WITH A MINIMUM TORQUE OF 200 LB.-FT. STAINLESS STEEL MESH SHALL THEN BE PLACED AROUND THE PERIMETER OF THE BASE PLATE. SECURE TO BASE PLATE WITH STAINLESS STEEL BANDING.
- SIGN SUPPORT STRUCTURES MAY BE SUBJECT TO DAMAGING VIBRATIONS AND OSCILLATIONS WHEN SIGN PANELS ARE NOT IN PLACE DURING ERECTION OR MAINTENANCE OF THE STRUCTURE. TO AVOID THESE, ATTACH TEMPORARY BLANK SIGN PANELS OR OTHER BRACING TO THE STRUCTURE UNTIL PERMANENT SIGNS ARE INSTALLED.
- TRUSSES SHALL BE SHIPPED INDIVIDUALLY WITH ADEQUATE PROVISION TO PREVENT DETRIMENTAL MOTION DURING TRANSPORT. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE CONFIGURATION AND PROTECTION OF THE TRUSSES.
- ALL WELDS SHALL BE CONTINUOUS UNLESS OTHERWISE SHOWN. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH CURRENT AWS D1.1 STRUCTURE WELDING CODE AND THE STANDARD SPECIFICATIONS.
- ALL STEEL PLATES, SHAPES AND PIPE SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111.
- PROVIDE RUBBED SURFACE FINISH FOLLOWED BY CONCRETE SEALER APPLICATION ON ENTIRE SURFACE OF CONCRETE COLUMN AND NORMAL SURFACE FINISH ON GRADE BEAM, EXCEPT BOTTOM SURFACE.
- REINFORCEMENT BARS DESIGNATED (E) SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- DMS TYPE 2W - WALK-IN IS PERMITTED TO BE INSTALLED ON CANTILEVER TRUSS. DO NOT INSTALL SIGN PANEL IN CONJUNCTION WITH DMS TYPE 2W - WALK-IN. SEE SHEET 9 OF THIS SERIES FOR PERMISSIBLE SIGN SIZE AND WEIGHT.

**CONSTRUCTION SPECIFICATIONS:**

- ALL MATERIALS, EXCEPT AS SHOWN, FABRICATION, ERECTION AND CONSTRUCTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH SECTION 733 OF THE LATEST ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS.

**LOADING:**

- ALL CANTILEVER TRUSSES ARE DESIGNED FOR AN 18'-0" DEEP SIGN PANEL OVER 75% OF THE ARM LENGTH, WITH A MAXIMUM PANEL WIDTH OF 24'-0".
- ALL CANTILEVER TRUSSES ARE DESIGNED FOR 35 PSF WIND PRESSURE ON TRUSS MEMBERS AND SIGN PANEL.
- THE AASHTO GROUP II AND III ALLOWABLE STRESS SHALL BE 133% (ALLOWABLE STRESS DESIGN).

**DESIGN SPECIFICATIONS:**

THESE STRUCTURES ARE DESIGNED TO SATISFY THE 2013 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, SIXTH EDITION.

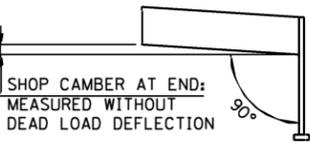
CONCRETE COLUMN, GRADE BEAM AND DRILLED SHAFT ARE DESIGNED IN ACCORDANCE WITH THE 2012 EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS (INCLUDING THE 2013 INTERIM REVISIONS).

**DESIGN UNIT STRESSES FOR REINFORCED CONCRETE:**

CLASS SI CONCRETE	f'c = 3,500 P.S.I.
CLASS DS CONCRETE	f'c = 4,000 P.S.I.
REINFORCING STEEL	fy = 60,000 P.S.I.

**SHOP CAMBER TABLE**

CANTILEVER LENGTH (L)	SHOP CAMBER AT END
20'	1 1/2"
25'	1 1/2"
30'	2"
35'	2 1/2"
40'	2 1/2"
45'	3"
50'	3 1/2"



**CAMBER DIAGRAM**  
(FOR FABRICATION ONLY)

**TABLE B: MATERIAL SPECIFICATIONS FOR STRUCTURAL STEEL AND FASTENERS**

ELEMENT OF STRUCTURE	SPECIFICATION	MINIMUM YIELD STRENGTH (K.S.I.)	MINIMUM ULTIMATE STRENGTH (K.S.I.)
STRUCTURAL STEEL TUBE	ASTM A500 GRADE B	46	58
STRUCTURAL STEEL POST AND PIPE	API 5L GRADE B OR X42 OR X52	35	52
	ASTM A106 GRADE B	35	60
	ASTM A53, TYPE E OR S, GRADE B	35	60
STEEL BAR AND STEEL PLATES	ASTM A572 GRADE 50	50	65
STAINLESS STEEL BOLTS	ASTM A193, CLASS 1, GRADE B8	30	75
STRUCTURAL STEEL BOLTS	ASTM 325 TYPE 1	--	105
STAINLESS STEEL LOCKNUTS	ASTM A194 GRADE 8F ASTM A194 GRADE 2H	--	--
NUTS	ASTM A563 GRADE DH	--	--
STEEL WASHERS	ASTM F436	--	--
STAINLESS STEEL WASHERS	ASTM A240, TYPE 302	--	--
STEEL ANCHOR BOLTS	AASHTO M314 OR ASTM F1554	55	75

APPROVED..... DATE 3-31-2014  
*Paul Kovacs*  
 CHIEF ENGINEERING OFFICER

DATE	REVISIONS
12-12-2013	REVISED TABLES AND NOTES
2-07-2014	REVISED STEEL POST TO CONCRETE
3-31-2014	ADDED DMS TYPE II
7-01-2014	ADDED DIMENSIONS AND REVISED NOTES
3-11-2015	ADDED DIMENSIONS AND REVISED NOTES
3-31-2016	REVISED FOUNDATION NOTE
3-31-2017	ADDED WALKWAY GRATING DETAILS
3-01-2018	ADDED VERTICAL CLEARANCE
3-01-2019	UPDATED BARRIER SHAPE
2-13-2020	UPDATED TABLE C. ANCHOR BOLT DETAIL



OVERHEAD SIGN STRUCTURE CANTILEVER TYPE STRUCTURE DETAILS

STANDARD F4-11

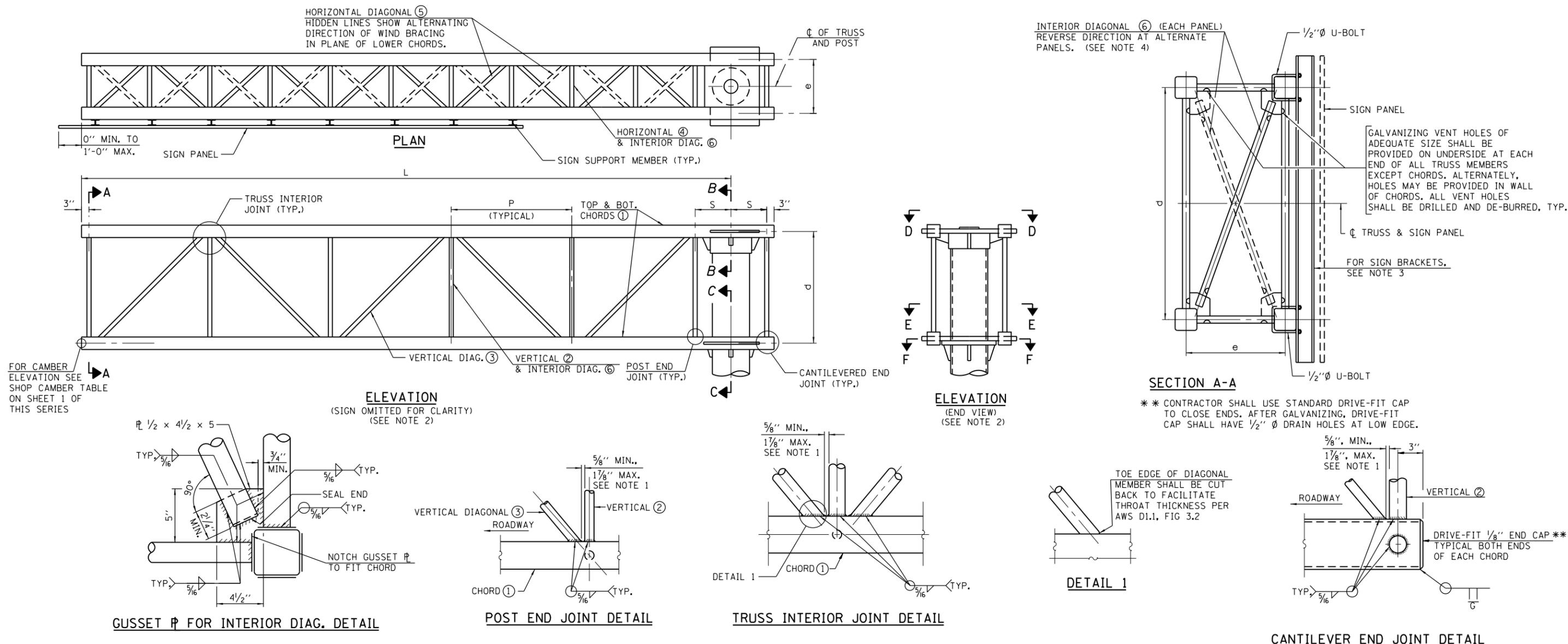


TABLE C: TRUSS AND POST DETAILS FOR 18'-0" (MAX.) SIGN HEIGHT

DESIGN SPAN LENGTH (L)	TRUSS TYPE	TRUSS SIZE		ACTUAL SPAN LENGTH	MAXIMUM SIGN LENGTH	STEEL SUPPORT POST (COLUMN)				TRUSS MEMBERS AND DETAILS													
		e	d			DIAMETER	WEIGHT	* WALL THICKNESS	H (MAX.)	TOP & BOTTOM CHORD (1)	VERTICAL (2)		VERTICAL DIAG. (3)		HORIZONTAL (4)		HORIZONTAL DIAG. (5)		INTERIOR DIAG. (6)		PANELS		
											PIPE	WALL	PIPE	WALL	PIPE	WALL	PIPE	WALL	PIPE	WALL	NO.	P	S
20'	20-D	2'-6"	5'-6"	20'-1"	15'-0"	18"	138.30 (#/FT)	3/4"	12'-0"	HSS 5x5x1/4	2 1/2" Ø X.S	0.276"	3" Ø X.X.S	0.600"	1 1/2" Ø X.S	0.200"	2 1/2" Ø X.S	0.276"	1 1/2" Ø X.S	0.200"	4	4'-7"	1'-6"
25'	25-D	3'-6"	5'-6"	24'-11"	18'-9"	18"	181.73 (#/FT)	1"	12'-0"	HSS 5x5x1/4	2 1/2" Ø X.S	0.276"	3" Ø X.X.S	0.600"	2" Ø X.S	0.218"	2 1/2" Ø X.S	0.276"	2" Ø X.S	0.218"	5	4'-7"	1'-9"
30'	30-D	3'-6"	7'-0"	30'-2"	22'-6"	18"	181.73 (#/FT)	1"	12'-0"	HSS 6x6x1/4	3" Ø X.S	0.300"	4" Ø X.X.S	0.674"	2" Ø X.S	0.218"	2 1/2" Ø X.S	0.276"	2" Ø X.S	0.218"	5	5'-7"	2'-0"
35'	35-D	4'-0"	7'-0"	35'-0"	24'-0"	24"	186.41 (#/FT)	3/4"	12'-0"	HSS 6x6x1/4	3" Ø X.S	0.300"	4" Ø X.X.S	0.674"	2" Ø X.S	0.218"	2 1/2" Ø X.S	0.276"	2" Ø X.S	0.218"	5	6'-6"	2'-3"
40'	40-D	4'-0"	7'-0"	40'-0"	24'-0"	24"	186.41 (#/FT)	3/4"	12'-0"	HSS 6x6x1/4	3" Ø X.S	0.300"	4" Ø X.X.S	0.674"	2" Ø X.S	0.218"	2 1/2" Ø X.S	0.276"	2" Ø X.S	0.218"	6	6'-3"	2'-3"
45'	45-D	4'-6"	7'-0"	45'-0 1/2"	24'-0"	24"	245.87 (#/FT)	1"	12'-0"	HSS 6x6x1/4	3" Ø X.S	0.300"	4" Ø X.X.S	0.674"	2" Ø X.S	0.218"	2 1/2" Ø X.S	0.276"	2" Ø X.S	0.218"	7	6'-0 1/2"	2'-6"
50'	50-D	4'-6"	7'-0"	50'-1"	24'-0"	24"	245.87 (#/FT)	1"	12'-0"	HSS 6x6x1/4	3" Ø X.S	0.300"	4" Ø X.X.S	0.674"	2" Ø X.S	0.218"	2 1/2" Ø X.S	0.276"	2" Ø X.S	0.218"	8	5'-11"	2'-6"

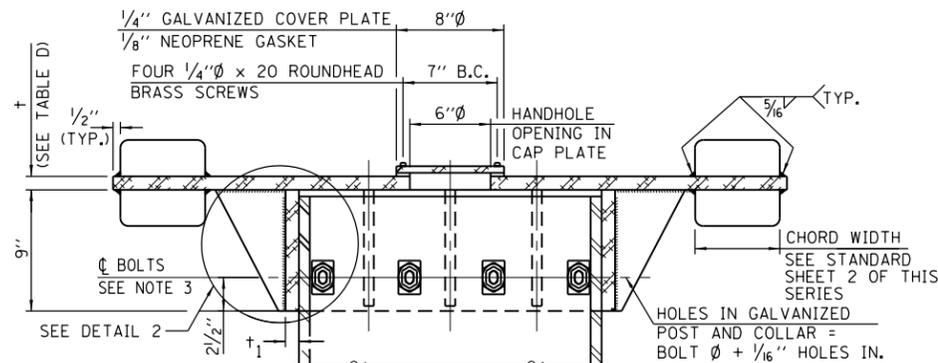
\* NOMINAL WALL THICKNESS SHOWN. THICKER WALL IS PERMITTED UPON ENGINEER'S APPROVAL.

NOTES:

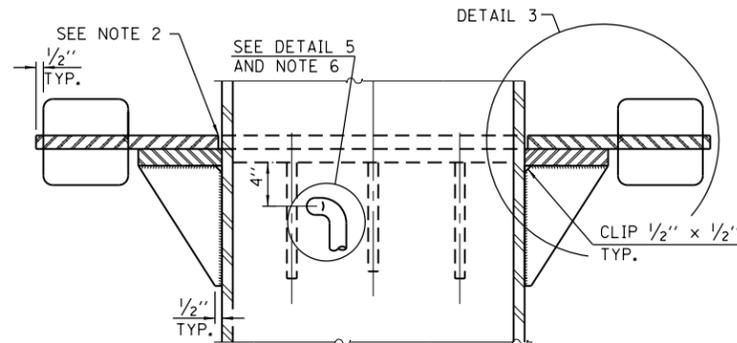
1. TRUSS MEMBERS SHALL BE SPACED A MINIMUM OF 3 TIMES THE WALL THICKNESS OF THE LARGEST CONNECTING MEMBERS TO ENSURE PROPER WELD SPACING.
2. FOR SECTIONS B-B, C-C, D-D, E-E AND F-F SEE SHEET 3 OF THIS SERIES.
3. FOR SIGN SUPPORT DETAILS, SEE ILLINOIS TOLLWAY STANDARD DRAWING F8, FOR DMS TYPE 2W - WALK-IN SIGN SUPPORT DETAILS, SEE SHEET 9 OF THIS SERIES.
4. DIRECTION OF INTERIOR DIAGONALS SHOWN IN SECTION A-A CORRECTLY DEPICTS TRUSSES HAVING AN ODD NUMBER OF PANELS. TRUSSES WITH AN EVEN NUMBER OF PANELS WILL HAVE DIAGONALS IN A REVERSED DIRECTION THAN AS SHOWN.
5. FOR ANY DESIGN SPAN LENGTH THAT FALLS BETWEEN TWO CONSECUTIVE SPANS, PROVIDED IN COLUMN 1 OF TABLE C, THE LARGER DESIGN SPAN LENGTH SHALL BE USED (I.E. FOR A 32' SPAN LENGTH FALLING BETWEEN 30' AND 35' DESIGN SPAN LENGTHS IN TABLE C, THE 35' DESIGN SPAN LENGTH TRUSS AND POST DETAILS SHALL BE USED).

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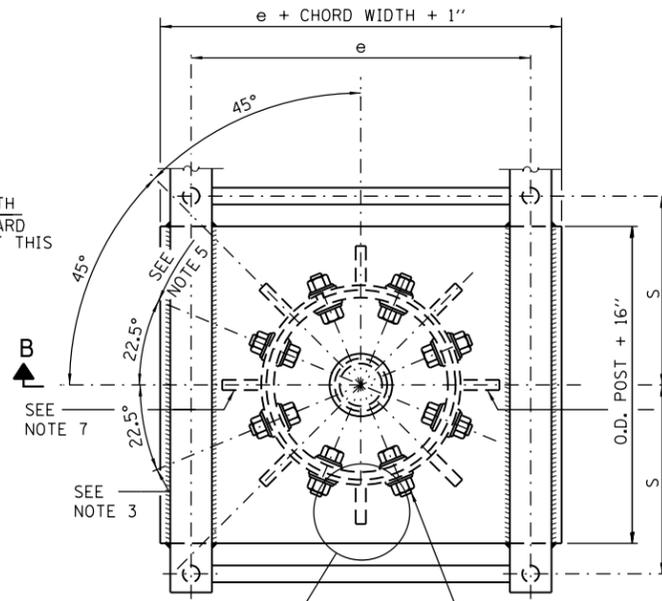
OVERHEAD SIGN STRUCTURE  
 CANTILEVER TYPE  
 STRUCTURE DETAILS  
 STANDARD F4-11



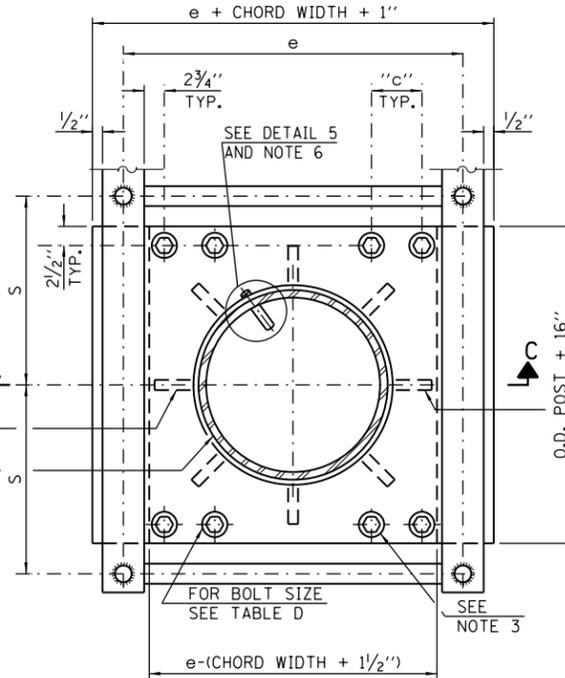
SECTION B-B



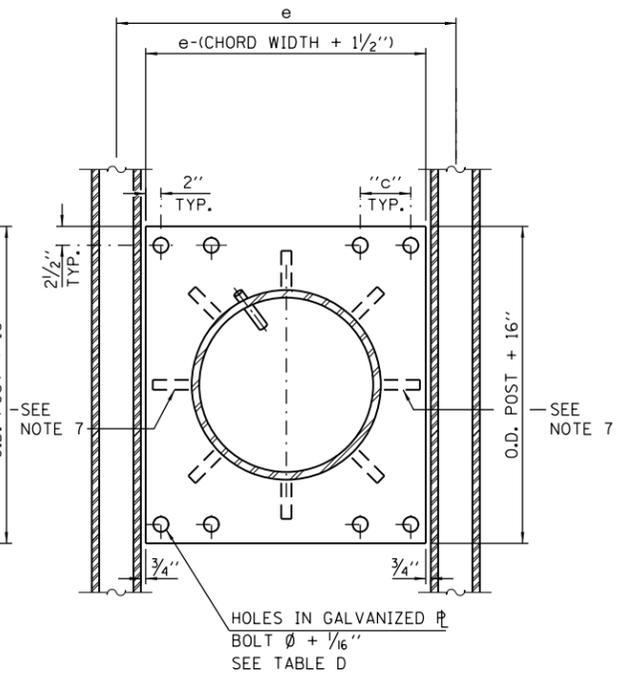
SECTION C-C



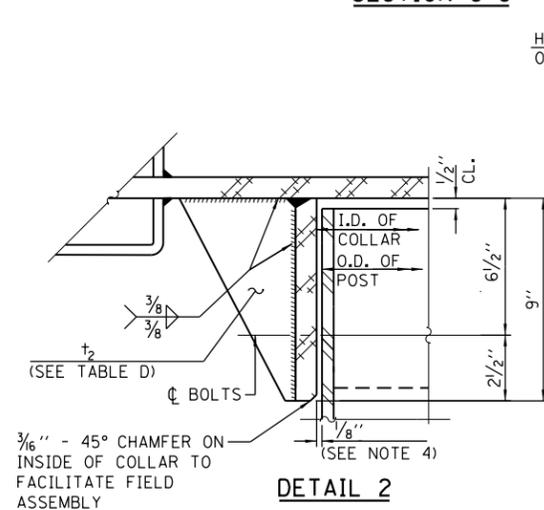
VIEW D-D  
(CAP PLATE)



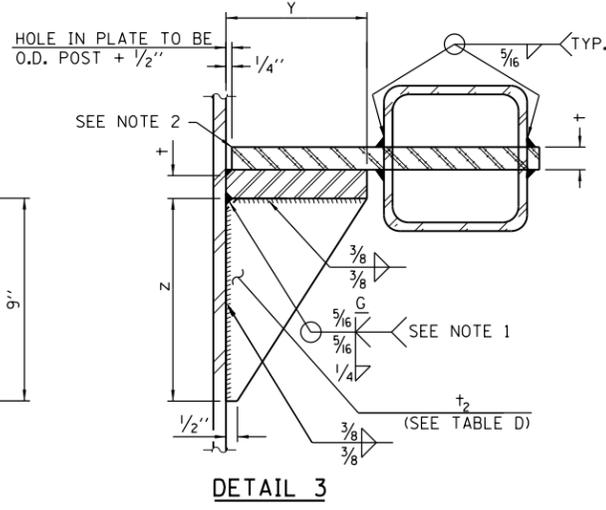
SECTION E-E  
(JUNCTURE PLATE)



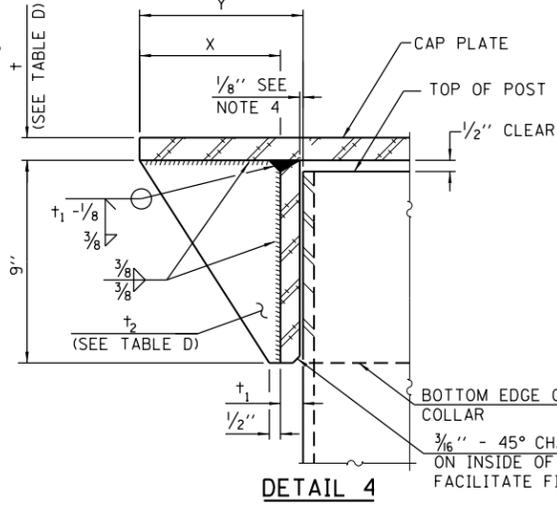
SECTION F-F  
(SETTING PLATE)



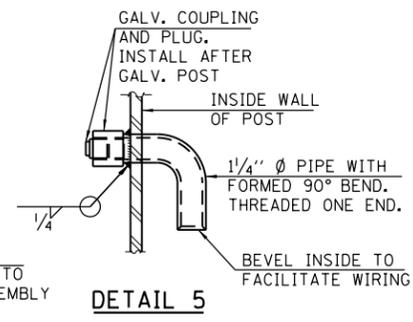
DETAIL 2



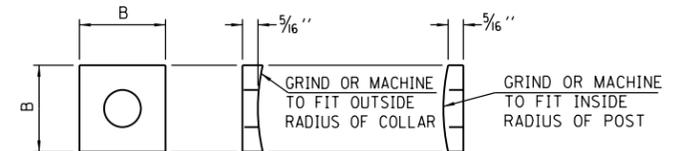
DETAIL 3



DETAIL 4



DETAIL 5



BOLT SIZE	CONTOURED WASHERS	
	HOLE DIA.	B
1 1/8" Ø	1 1/4" Ø	2 1/4"
1 1/4" Ø	1 3/8" Ø	2 1/4"
1 1/2" Ø	1 5/8" Ø	2 1/4"

(ASTM A240, TYPE 304)

**NOTES:**

- GRIND TOP IF REQUIRED TO FULLY SEAT PLATE. REPAIR DAMAGED GALVANIZING BEFORE ASSEMBLY.
- AFTER TIGHTENING LOWER CONNECTION BOLTS, FILL GAP WITH NON-HARDENING SILICONE CAULK SUITABLE FOR EXTERIOR EXPOSURE AND ACCEPTABLE TO THE ENGINEER.
- CONNECTION BOLTS IN COLLAR AND BOLTS AT LOWER CHORD CONNECTION SHALL BE HIGH STRENGTH WITH MATCHING LOCKNUTS. LOWER CONNECTION BOLTS SHALL HAVE 2 FLAT WASHERS EACH.
- AFTER GALVANIZING, COLLAR I.D. SHALL EQUAL O.D. OF GALVANIZED POST PLUS 1/8" (±1/16") MAXIMUM GAP BETWEEN POST AND COLLAR AT ANY LOCATION SHALL BE 1/8" BEFORE TIGHTENING BOLTS.
- OPTIONAL FULL PENETRATION WELD IN COLLAR. (TWO LOCATIONS MAXIMUM (180° APART) X-RAY OR UT 100%) ALL BOLTS SHOWN ARE HIGH STRENGTH.
- ORIENT PIPE TOWARD SIGN PANEL SIDE. HOLE IN POST = O.D. PIPE + 1/8".
- OMIT INDICATED STIFFENER IN TRUSS TYPE 20-D.

TABLE D: BOLT SCHEDULE

SPAN LENGTH	POST OUTSIDE DIAMETER	JUNCTURE & COLLAR CONNECTION BOLT DIAMETER	LOWER JUNCTURE BOLT SPACING DIMENSION "c"	PLATE THICKNESS		STIFFENER THICKNESS (t <sub>2</sub> )	NO. OF STIFFENERS	STIFFENERS		
				(t)	(t <sub>1</sub> )			x	y	z
< = 20'	18"	1 1/8"	3 1/8"	1"	3/4"	1/2"	6	5"	6"	8"
21'-30'	18"	1 1/2"	3 3/4"	1 1/8"	7/8"	3/4"	8	5"	6"	8"
31'-40'	24"	1 1/2"	4 1/2"	1 1/4"	1"	3/4"	8	7"	8"	10 1/2"
41'-50'	24"	1 1/2"	4 1/2"	1 1/4"	1"	3/4"	8	7"	8"	10 1/2"

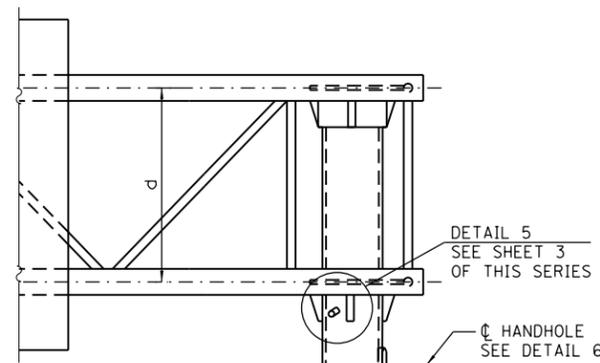
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B.C. = BOLT CIRCLE

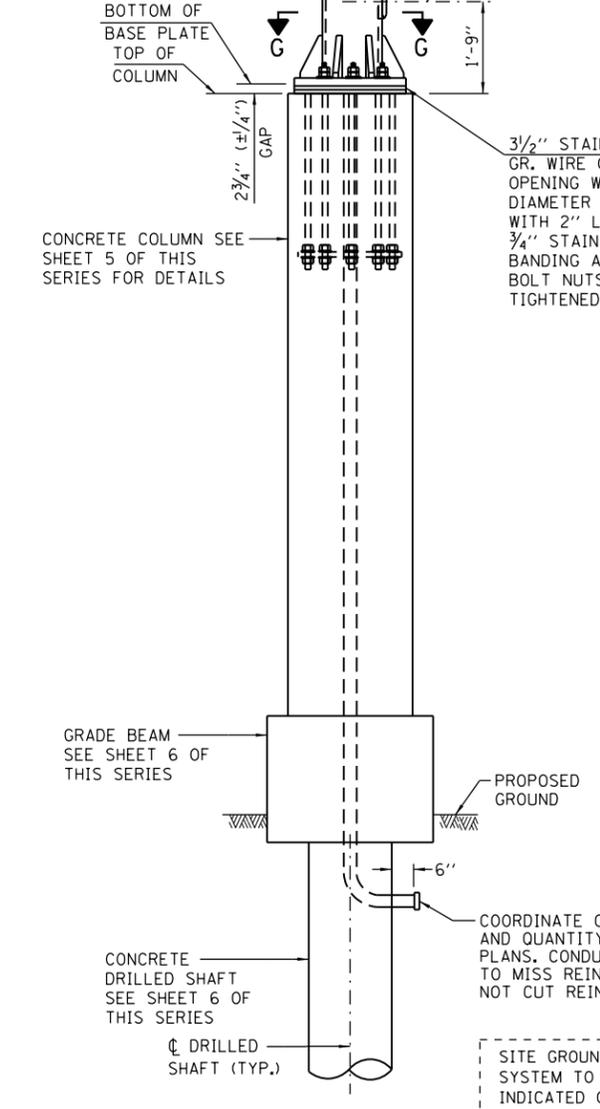
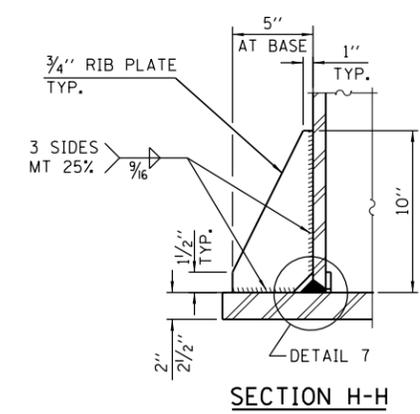
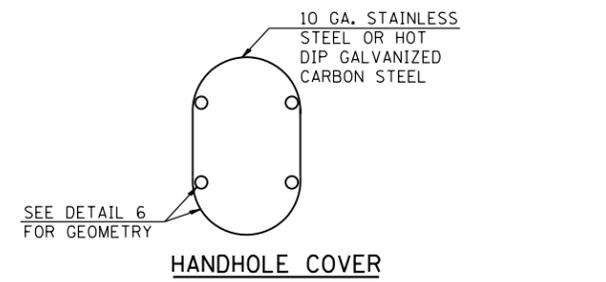
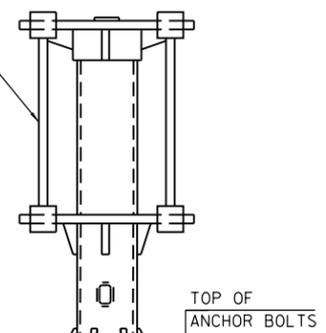


OVERHEAD SIGN STRUCTURE  
CANTILEVER TYPE  
STRUCTURE DETAILS

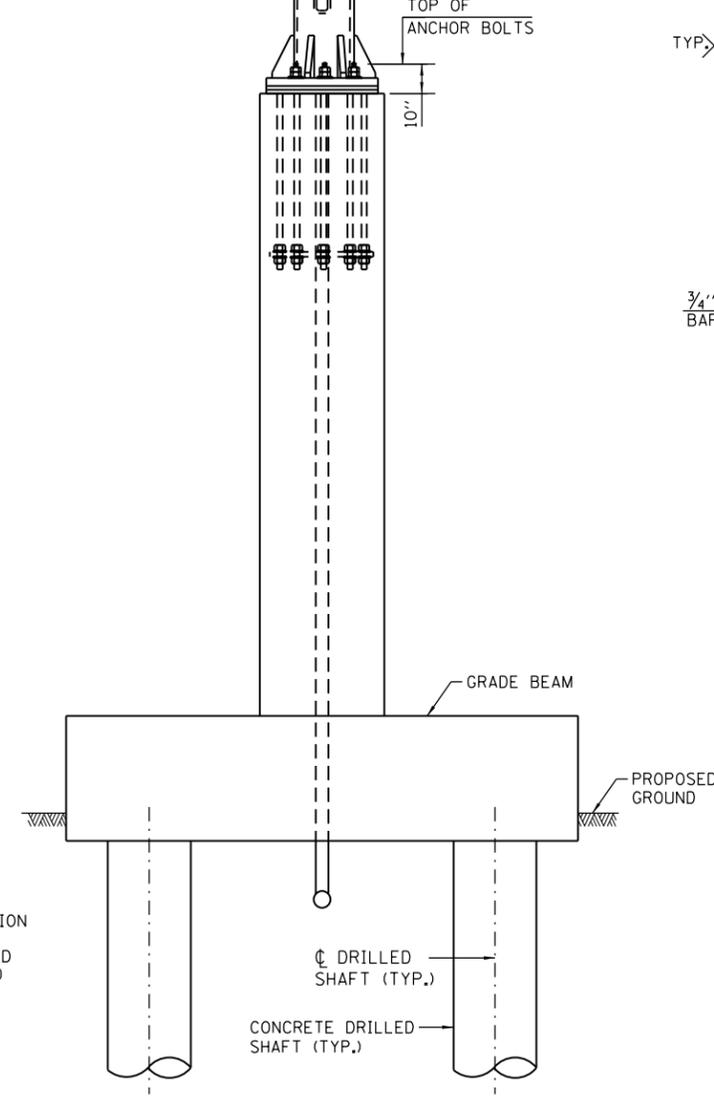
STANDARD F4-11



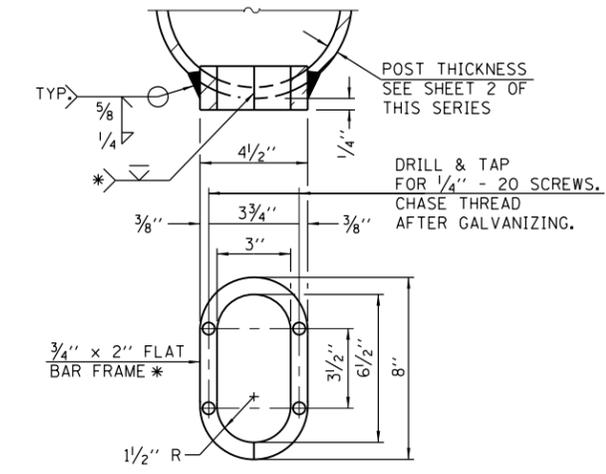
ALL METALLIC MEMBERS ATTACHED TO THE CANTILEVER STEEL POST STRUCTURE SHALL BE BONDED TOGETHER BY MEANS OF A COPPER BONDING JUMPER TO CREATE A CONTINUOUS LOW IMPEDANCE PATH TO THE SITE GROUNDING ELECTRODE SYSTEM.



FRONT ELEVATION



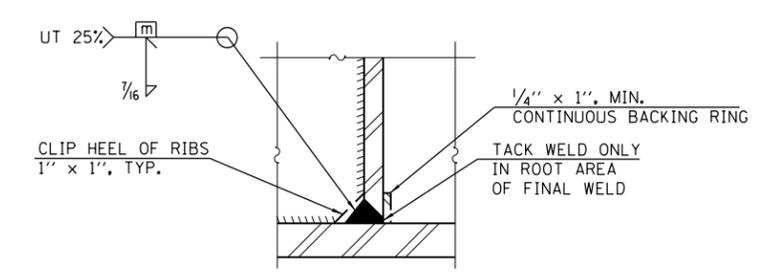
SIDE ELEVATION



PROVIDE 8" x 4 1/2" COVER. OUTSIDE CORNERS = 2 1/4" RADIUS. PROVIDE 4-5/16" Ø HOLES IN COVER FOR 1/4" - 20 ROUND HEAD HOT DIP GALVANIZED OR STAINLESS STEEL MACHINE SCREWS. (SEE COVER DETAILS.)

DETAIL 6

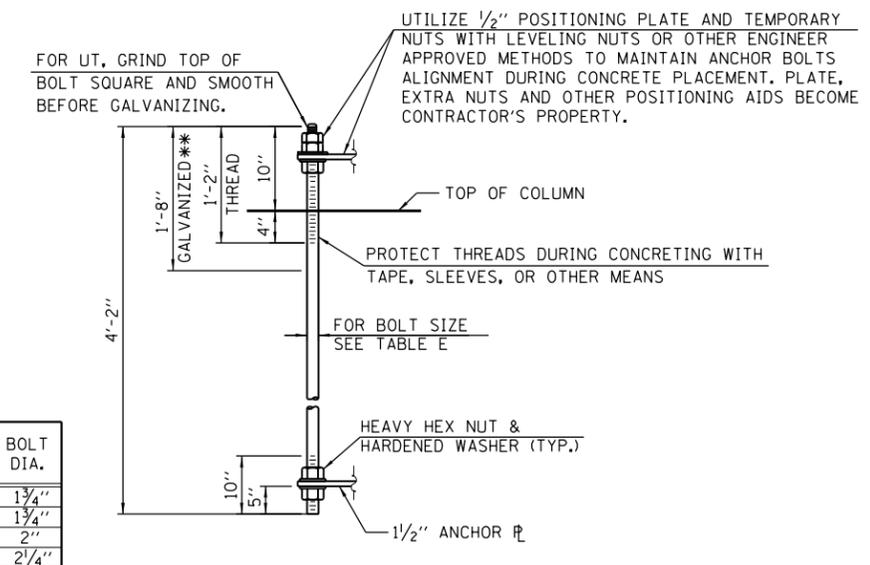
- \* BENT BARS MAY BE BUTT WELDED TOP AND BOTTOM OR BOTTOM ONLY. IN LIEU OF FABRICATED HANDHOLE FRAME AS SHOWN, MAY CUT FROM 2" PLATE (ROLLING DIRECTION VERTICAL). ALL CUT FACES TO BE GROUND TO ANSI ROUGHNESS OF 500 µIN OR LESS.
- \* \* 18" IS MINIMUM TO BE GALVANIZED. ENTIRE BOLT MAY BE GALVANIZED AT CONTRACTOR'S OPTION.



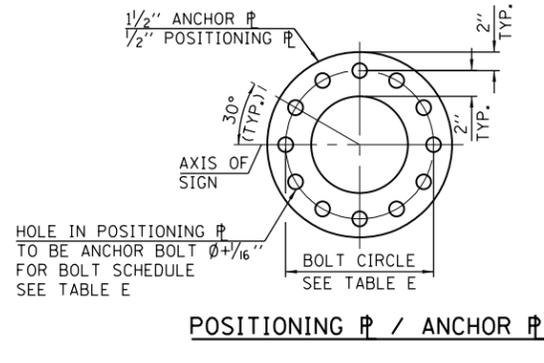
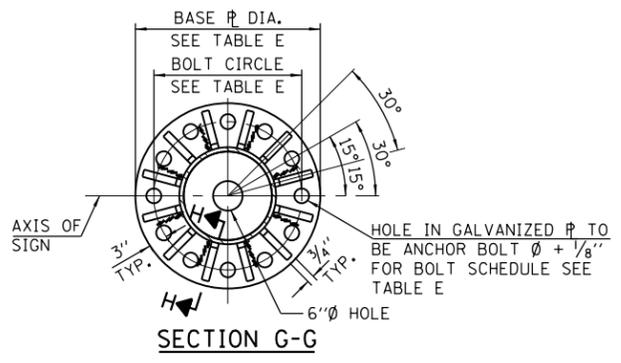
DETAIL 7 (TYPICAL RIB)

TABLE E: BASE PLATE DETAIL

SPAN LENGTH (L)	POST OUTSIDE DIAMETER	BASE PLATE		BOLT CIRCLE	BOLT DIA.
		DIAMETER	THICKNESS		
< 20'	18"	30"	2"	24"	1 3/4"
21'-30'	18"	30"	2"	24"	1 3/4"
31'-40'	24"	36"	2 1/2"	30"	2"
41'-50'	24"	36"	2 1/2"	30"	2 1/4"



ANCHOR BOLT DETAIL

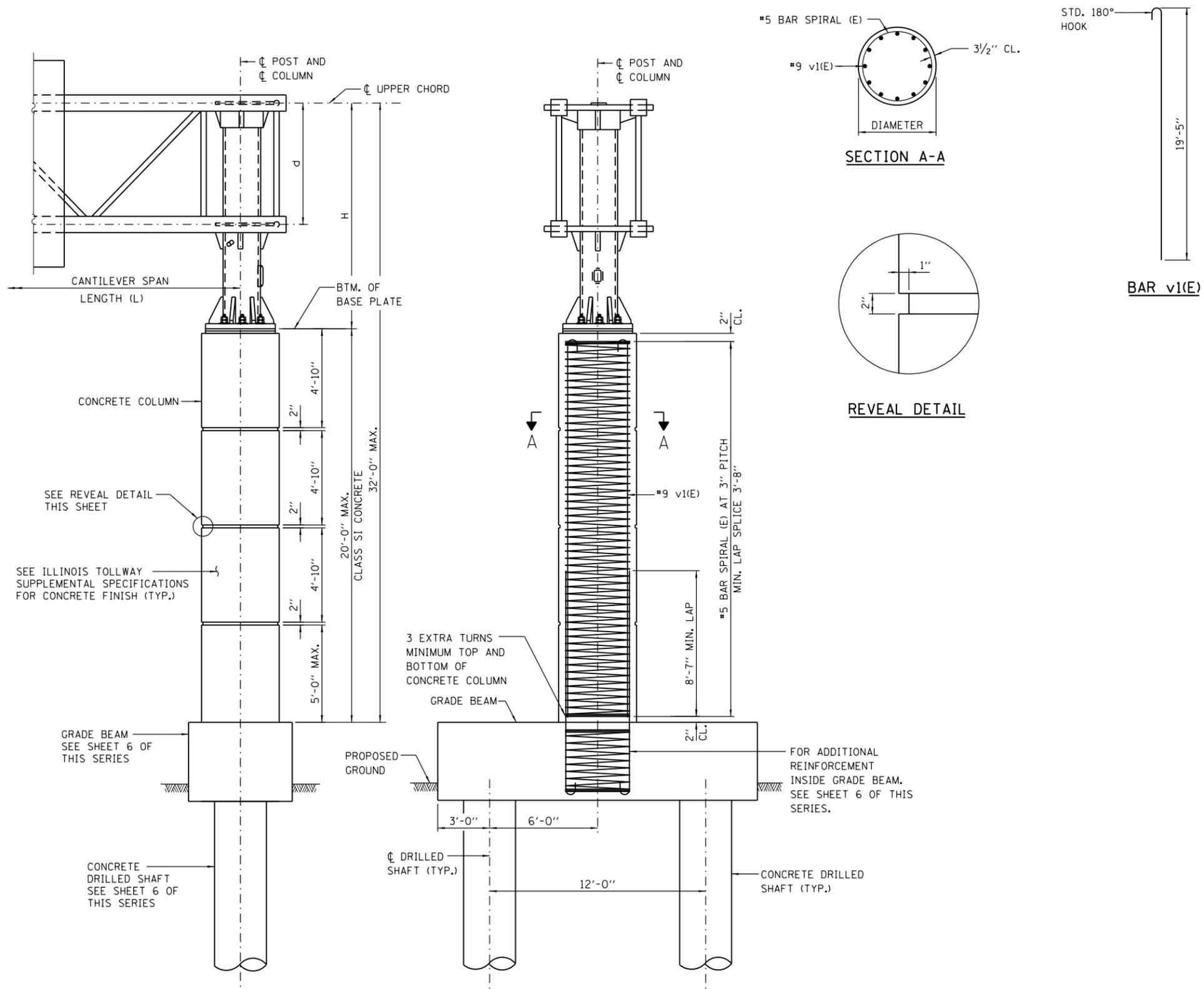


NOTE:

ANCHOR BOLTS SHALL CONFORM TO AASHTO M314 OR ASTM F1554 AND MEET CHARPY V-NOTCH (CVN) ENERGY OF 15 LB.-FT. AT 10° F. BEFORE GALVANIZING. GALVANIZE THE UPPER 18" (MINIMUM \*\*) AND ASSOCIATED M291, GRADE A, C OR DH HEAVY HEX NUTS, HEAVY HEX LOCK NUTS AND HARDENED WASHERS PER AASHTO M293. NO WELDING SHALL BE PERMITTED ON BOLTS. PROVIDE AN UNFINISHED NUT AT BOTTOM, A HEXAGON LOCKNUT, HEXAGON NUT AND WASHER ABOVE BASE PLATE AND A LEVELING NUT AND WASHER BELOW BASE PLATE. NUTS SHALL EACH BE TIGHTENED WITH 200 LB.-FT. MINIMUM TORQUE AGAINST BASE PLATE. BEFORE OR AFTER THREADING, BUT BEFORE GALVANIZING, EACH ANCHOR BOLT SHALL BE ULTRASONICALLY TESTED (UT) BY A LEVEL II OR III INSPECTOR, QUALIFIED IN ACCORDANCE WITH ANSI GUIDELINES, USING A STRAIGHT BEAM, 1/2" Ø 3.5 MHZ. TRANSDUCER, TO ENSURE NO REJECTABLE FLAWS EXIST IN THE UPPER 18" (TENSION CRITERIA).

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**TABLE F: CONCRETE COLUMN DESIGN TABLE**

SPAN LENGTH (L)	STEEL POST DIAMETER	CONCRETE COLUMN			
		DIAMETER	VERTICAL BAR v1(E)	CLASS SI CONC. CU. YD.*	REINF. BARS POUND *
< = 20'	18"	3'-6"	16-#9	7.1	1,910
21'-30'	18"	3'-6"	16-#9	7.1	1,910
31'-40'	24"	4'-0"	20-#9	9.2	2,330
41'-50'	24"	4'-0"	20-#9	9.2	2,330

\* CONCRETE VOLUME AND REBAR WEIGHT ARE DETERMINED FOR 20'-0" CONCRETE COLUMN HEIGHT. ADJUST CONCRETE VOLUME AND REBAR WEIGHT ACCORDINGLY IF CONCRETE COLUMN HEIGHT IS LESS THAN 20'-0".

**FRONT ELEVATION**

**SIDE ELEVATION**

**SECTION A-A**

**REVEAL DETAIL**

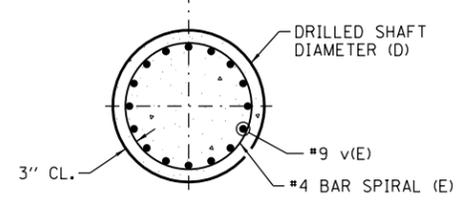
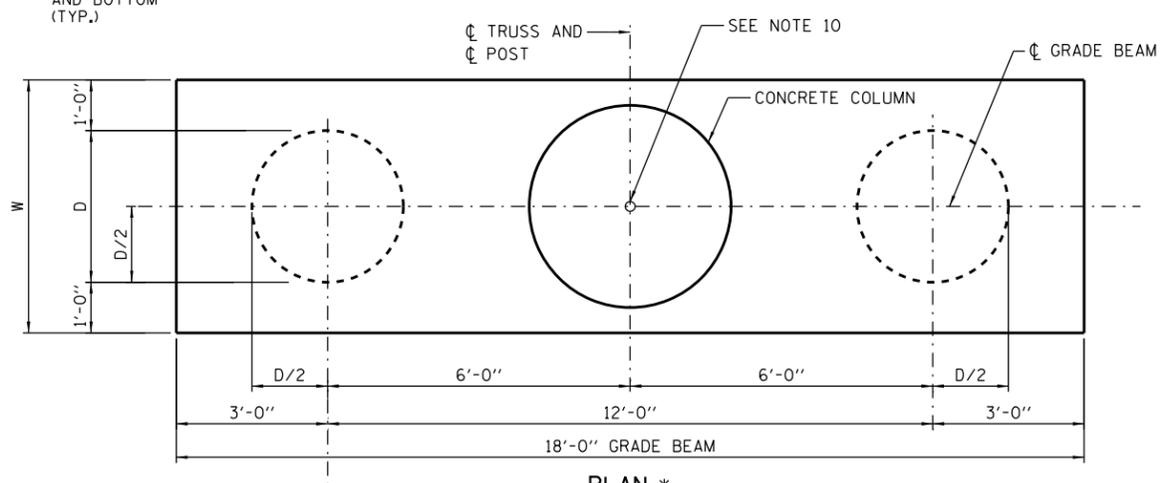
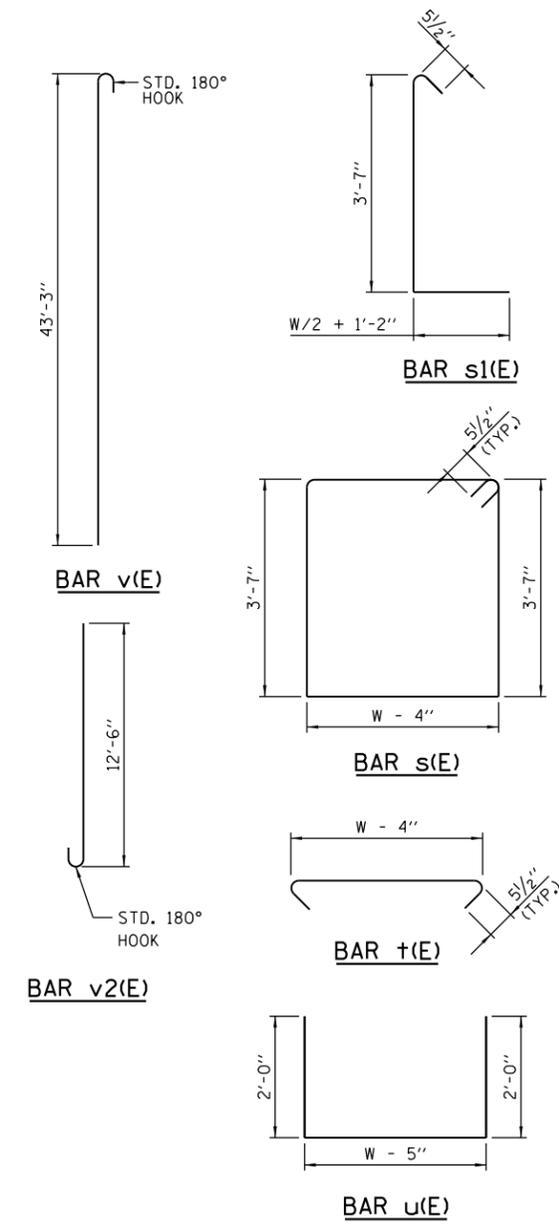
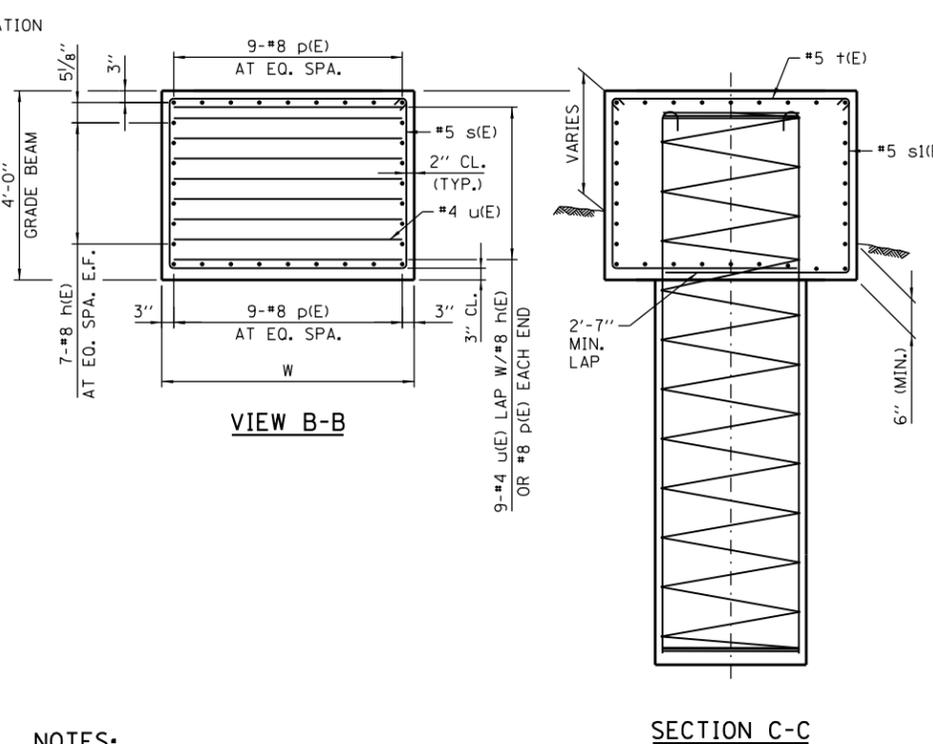
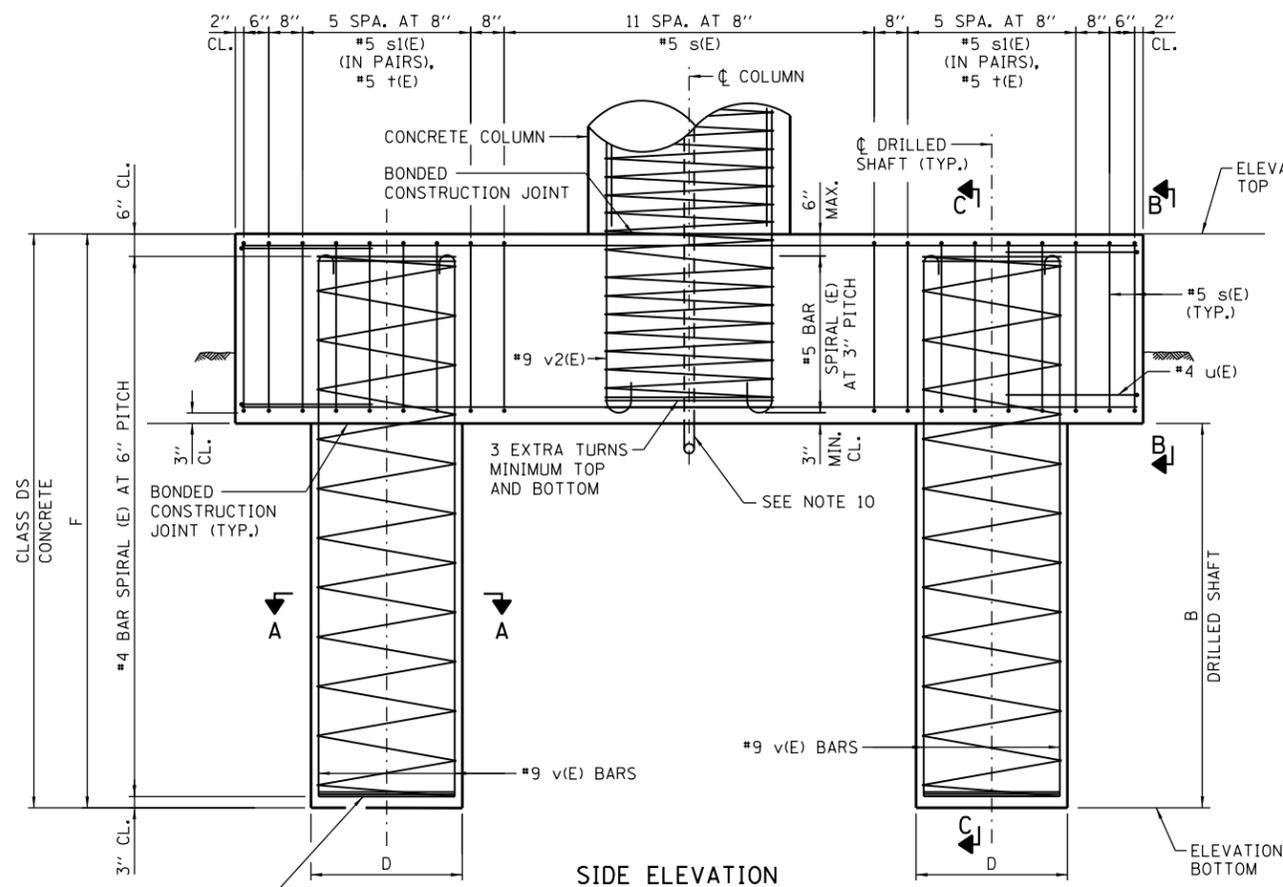


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**BAR LIST - EACH FOUNDATION**

(2 SHAFT AND 1 GRADE BEAM)

BAR	NUMBER	SIZE	LENGTH		SHAPE
			D = 3'-0"	D = 4'-0"	
h(E)	14	#8	17'-8"	17'-8"	
p(E)	18	#8	17'-8"	17'-8"	
s(E)	16	#5	17'-5"	19'-5"	⊏
s1(E)	24	#5	7'-8 1/2"	8'-2 1/2"	⊏
t(E)	12	#5	5'-7"	6'-7"	⊏
u(E)	18	#4	8'-7"	9'-7"	⊏
v(E)	SEE TABLE G	#9	44'-6"	44'-6"	⊏
v2(E)	SEE TABLE G	#9	13'-9"	13'-9"	⊏
*4 BAR SPIRAL (E) - SEE SIDE ELEVATION					
*5 BAR SPIRAL (E) - SEE SIDE ELEVATION					



**NOTES:**

- THE FOUNDATION DETAILS SHOWN ARE BASED ON THE PRESENCE OF MOSTLY COHESIVE SOIL CONDITIONS (SILTY OR SANDY CLAY), WITH AN AVERAGE UNCONFINED COMPRESSIVE STRENGTH (QU) > 1.25 TON/SQ. FT. WHICH SHALL BE DETERMINED BY PREVIOUS SOIL INVESTIGATIONS AT THE JOBSITE. WHEN OTHER CONDITIONS ARE INDICATED, THE BORING DATA SHALL BE INCLUDED IN THE PLANS AND THE FOUNDATION DIMENSIONS SHOWN SHALL BE THE RESULT OF SITE SPECIFIC DESIGNS. IF CONDITIONS ENCOUNTERED IN THE FIELD ARE DIFFERENT THAN THOSE INDICATED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE IF THE FOUNDATION DIMENSIONS NEED TO BE MODIFIED.
- ALL MATERIAL, FABRICATION, AND CONSTRUCTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH SECTION 734 OF THE ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS.
- CONCRETE SHALL BE PLACED MONOLITHICALLY, WITHOUT CONSTRUCTION JOINTS UNLESS NOTED OTHERWISE.
- BACKFILL SHALL BE PLACED PER SECTION 502 OF THE STANDARD SPECIFICATION AND PRIOR TO ERECTION OF CONCRETE COLUMN.
- PROVIDE RUBBED SURFACE FINISH FOLLOWED BY CONCRETE SEALER APPLICATION ON ENTIRE SURFACE OF CONCRETE COLUMN AND NORMAL SURFACE FINISH ON GRADE BEAM, EXCEPT BOTTOM SURFACE. COST IS INCLUDED IN THE COST OF "FOUNDATION FOR OVERHEAD SIGN STRUCTURE, CANTILEVER TYPE".
- ALL REBAR DESIGNATED (E) SHALL BE EPOXY COATED. REBAR SHALL BE POSITIONED SO THAT THERE WILL BE NO INTERFERENCE BETWEEN VERTICAL REINFORCEMENT AND STIRRUPS.
- NO SONOTUBES OR DECOMPOSABLE FORMS SHALL BE USED 6" BELOW THE FINISHED GROUND LINE. PERMANENT METAL FORMS OR OTHER SHIELDING SHALL NOT BE LEFT IN PLACE BELOW THE ELEVATION WITHOUT THE ENGINEER'S WRITTEN PERMISSION. EXCAVATIONS SHALL BE DEWATERED BEFORE CONCRETE PLACEMENT IF DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST.
- FOR SIZE AND NUMBER OF PVC COATED STEEL CONDUITS, SEE ELECTRICAL CONSTRUCTION DRAWINGS.
- TYPICAL SIGN STRUCTURE FOUNDATION IS SHOWN ON THIS SHEET. SEE SHEET 7 OF THIS SERIES FOR FOUNDATION LOCATED IN ROADWAY MEDIAN.
- COORDINATE CONDUIT SIZE, LOCATION AND QUANTITY WITH ELECTRICAL PLANS. CONDUITS SHALL BE PLACED TO MISS REINFORCEMENT BARS. DO NOT CUT REINFORCEMENT BARS.

**NOTE:**  
 \* REINFORCEMENT IN GRADE BEAM NOT SHOWN FOR CLARITY.  
 \*\* FOR GRADE BEAM ONLY.

BAR SPIRAL LAP SPLICE	
BAR	MIN. LAP
#4	2'-11"
#5	3'-8"

**TABLE G: DESIGN TABLE FOR DRILLED SHAFTS IN COHESIVE SOILS**

SPAN LENGTH (L)	W	D	B	F	VERTICAL BAR			CLASS DS CONC. CU. YD.**	CLASS DS CONC. CU. YD.	REINF. BARS POUND
					v(E) SHAFT 1	v(E) SHAFT 2	v2(E)			
< = 20'	5'-0"	3'-0"	40'	44'	12-#9	12-#9	16-#9	13.4	21	7,700
21'-30'	5'-0"	3'-0"	40'	44'	12-#9	12-#9	16-#9	13.4	21	7,700
31'-40'	6'-0"	4'-0"	40'	44'	20-#9	20-#9	20-#9	16	37.3	10,800
41'-50'	6'-0"	4'-0"	40'	44'	20-#9	20-#9	20-#9	16	37.3	10,800



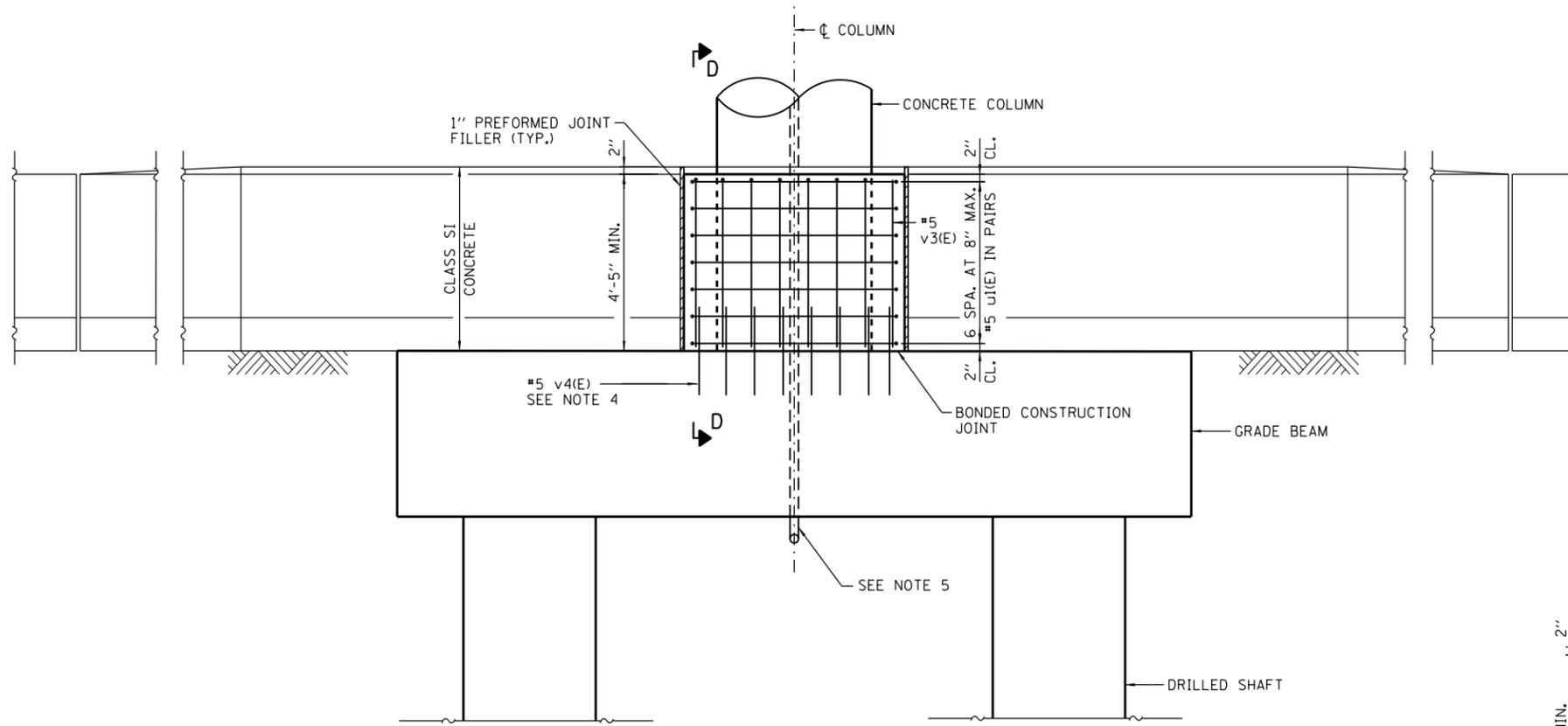
OVERHEAD SIGN STRUCTURE  
 CANTILEVER TYPE  
 STRUCTURE DETAILS

STANDARD F4-11

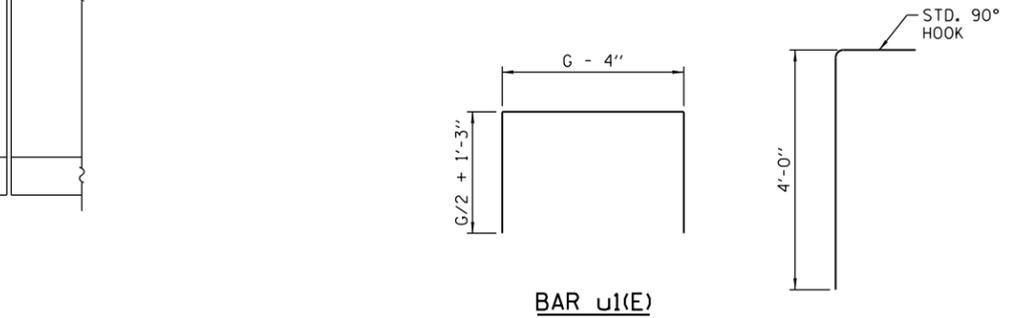
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**BAR LIST - CRASHWALL**

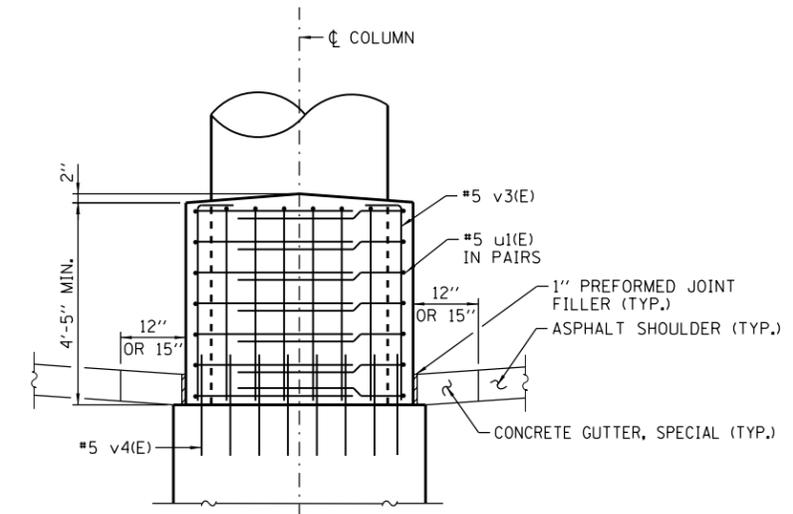
BAR	SIZE	G = 4'-6"		G = 5'-0"		SHAPE
		NUMBER	LENGTH	NUMBER	LENGTH	
u1(E)	#5	14	11'-2"	14	12'-2"	
v3(E)	#5	24	4'-10"	28	4'-10"	
v4(E)	#5	24	2'-0"	28	2'-0"	



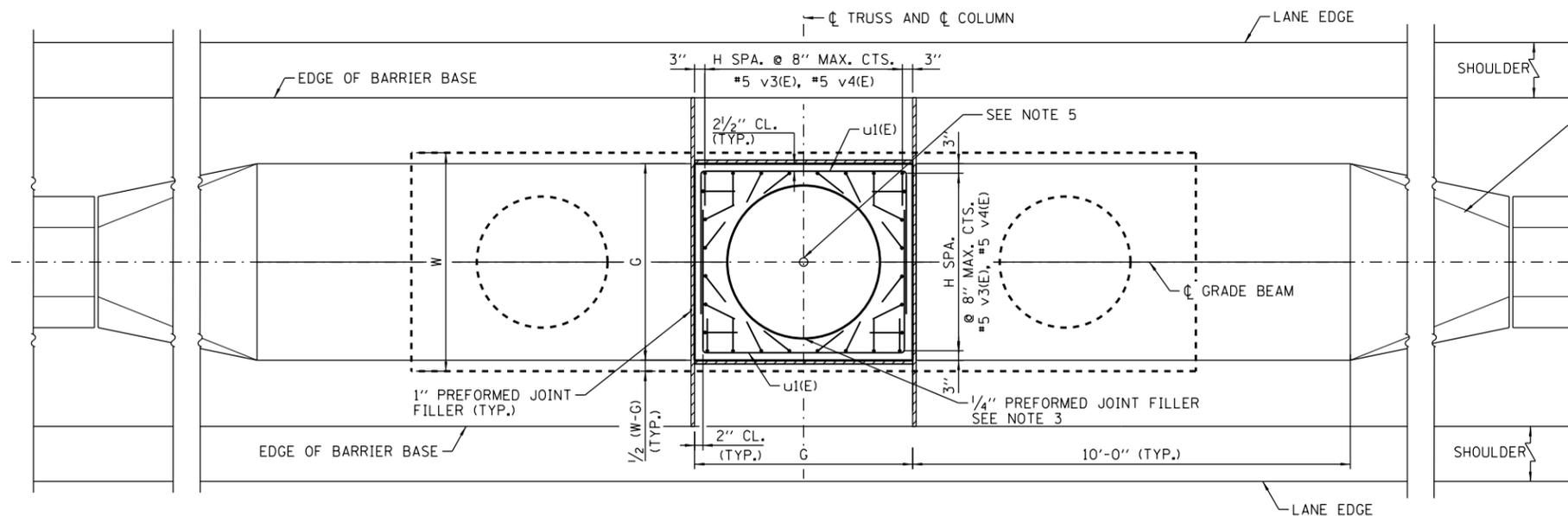
**SIDE ELEVATION**



**BAR v3(E)**



**SECTION D-D**



**PLAN**

**NOTES:**

- SEE SHEET 6 OF THIS SERIES FOR ADDITIONAL NOTES.
- GRADE BEAM AND DRILLED SHAFT DIMENSIONS, DETAILS, QUANTITIES AND BAR LIST ARE SHOWN ON SHEET 6 OF THIS SERIES.
- SEAL EXPOSED SURFACE OF 1/4" PREFORMED JOINT FILLER WITH BACKER ROD AND SILICONE SEALER (1" DEEP AND HOLD 1/8" BELOW SURFACE OF CONCRETE).
- #5 DRILLED ANCHOR BARS WILL BE EPOXY GROUTED AASHTO M31, GRADE 60 REBAR. PROVIDE 12" MINIMUM EMBEDMENT. INSTALL ANCHORS ACCORDING TO STANDARD SPECIFICATIONS SECTION 584. LOCATE GRADE BEAM REBAR PRIOR TO DRILLING. DO NOT DAMAGE GRADE BEAM REBAR DURING INSTALLATION.
- COORDINATE CONDUIT SIZE, LOCATION AND QUANTITY WITH ELECTRICAL PLANS. CONDUITS SHALL BE PLACED TO MISS REINFORCEMENT BARS. DO NOT CUT REINFORCEMENT BARS.
- PROTECTIVE COAT SHALL BE APPLIED TO TRAFFIC AND TOP FACES OF CRASHWALL.

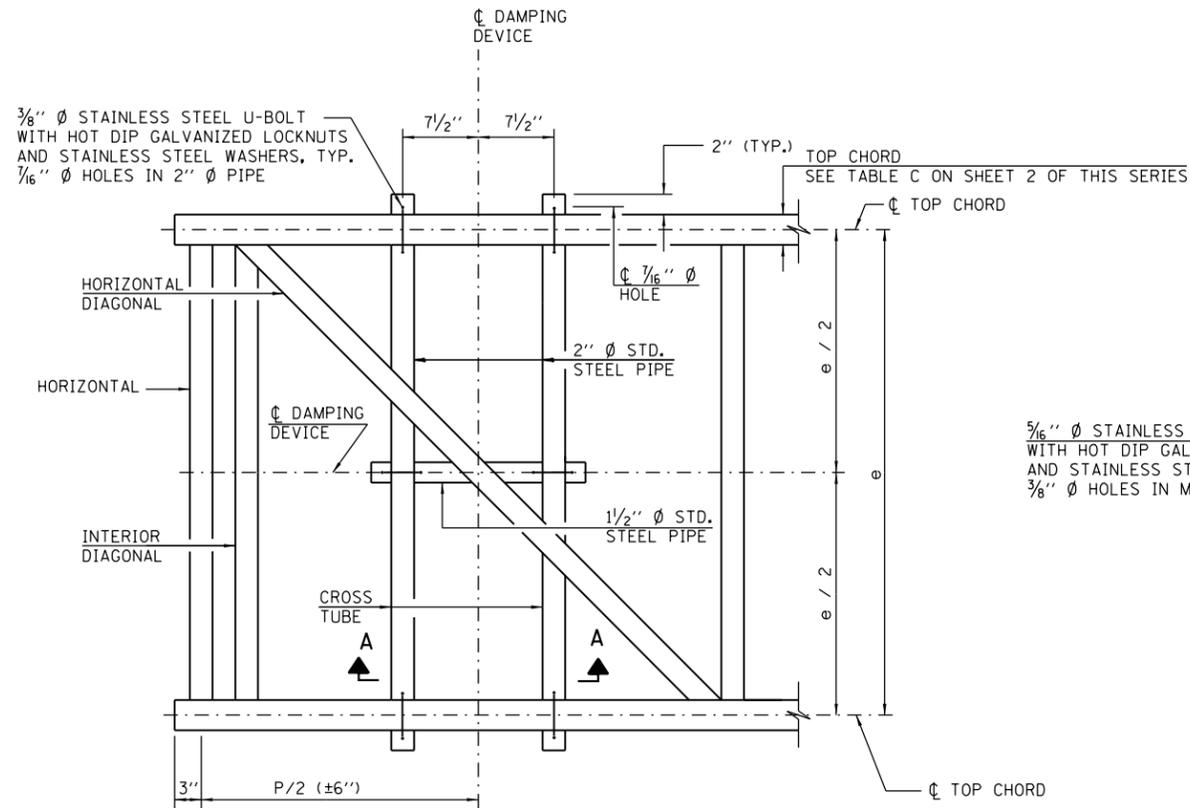
**TABLE H: DESIGN TABLE FOR CRASHWALL**

SPAN LENGTH (L)	W	G	H	CLASS S1 CONCRETE CU. YD.	REINF. BARS POUND	PROTECTIVE COAT SQ. YD.
< = 20'	5'-0"	4'-6"	6	1.7	340	6.0
21'-30'	5'-0"	4'-6"	6	1.7	340	6.0
31'-40'	6'-0"	5'-0"	7	2.0	380	7.0
41'-50'	6'-0"	5'-0"	7	2.0	380	7.0

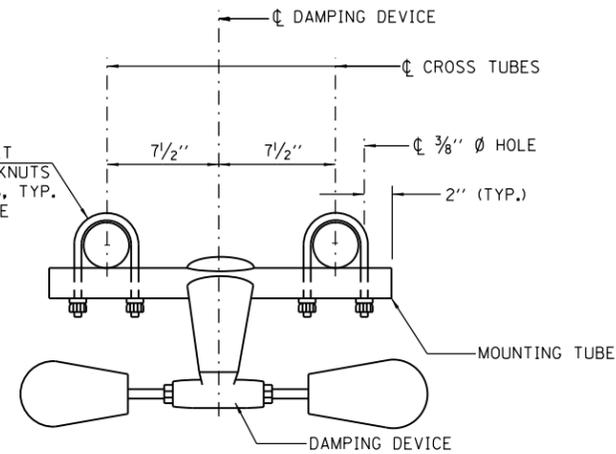


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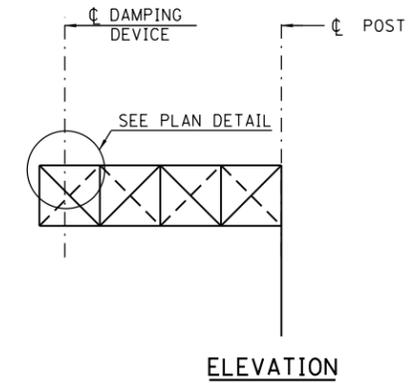
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CHIEF ENGINEERING OFFICER



PLAN DETAIL

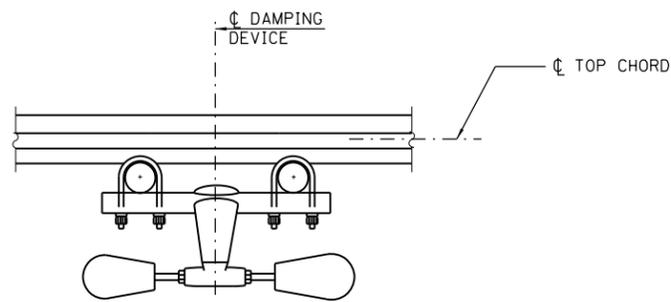


TRUSS DAMPING DEVICE CONNECTION DETAIL

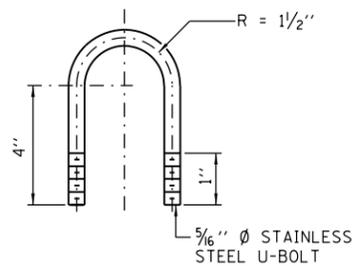


ELEVATION

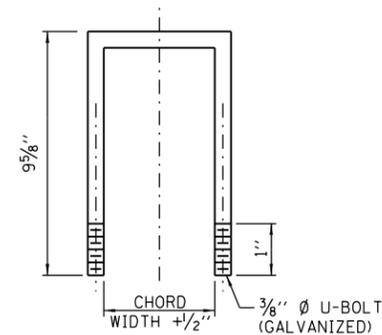
**NOTE:**  
 DAMPER: ONE DAMPER PER TRUSS. (31 LBS. STOCKBRIDGE-TYPE 29" MINIMUM BETWEEN ENDS OF WEIGHTS.)



SECTION A-A



DAMPING DEVICE MOUNTING TUBE U-BOLT DETAIL (TYPICAL)



TOP CHORD TO CROSS TUBE U-BOLT DETAIL (TYPICAL)

APPROVED.....  
 DATE 3-31-2014  
 CHIEF ENGINEERING OFFICER

Paul Kovacs



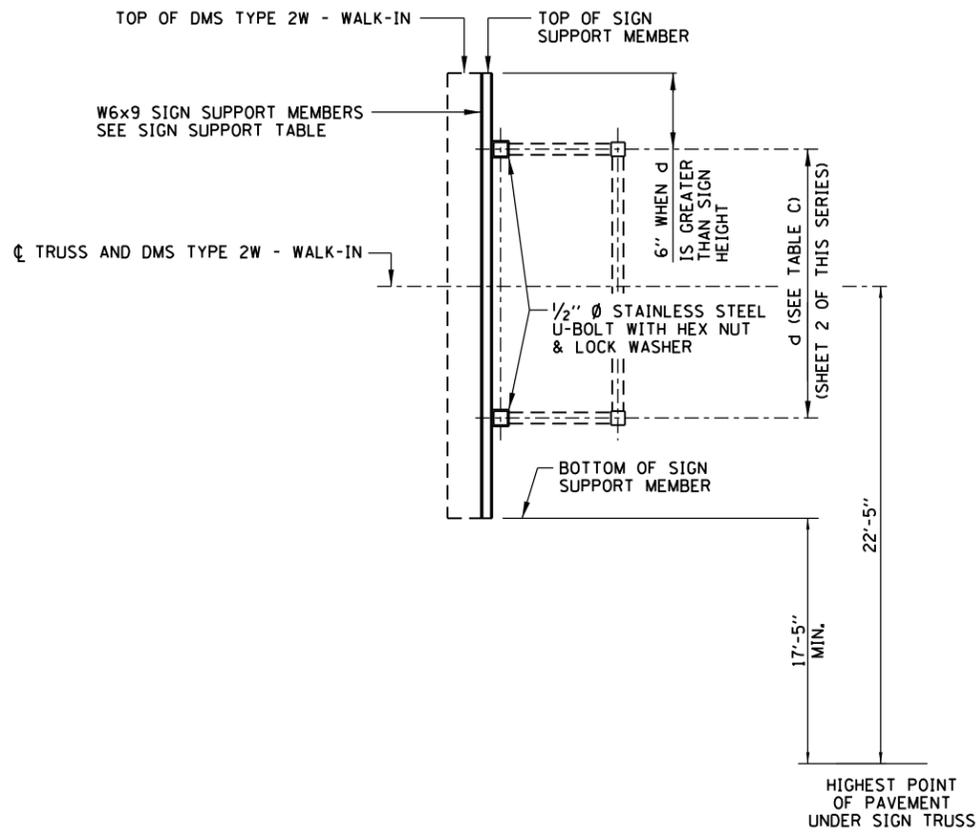
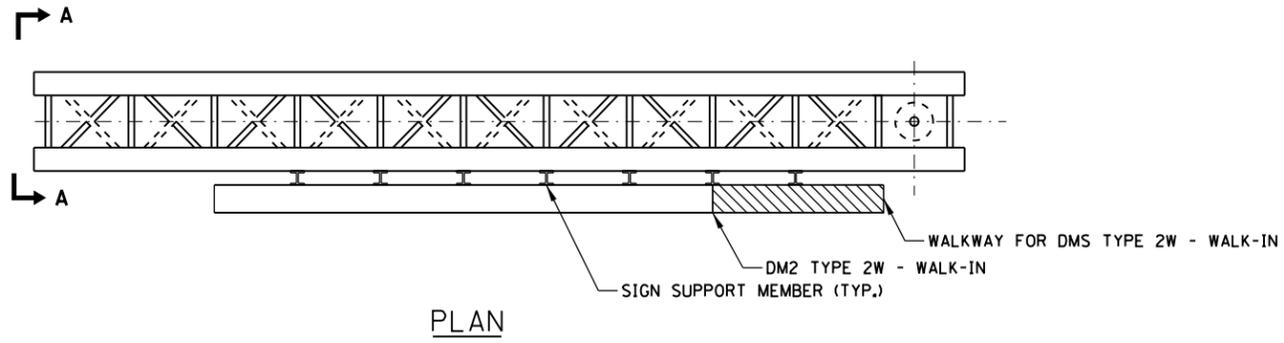
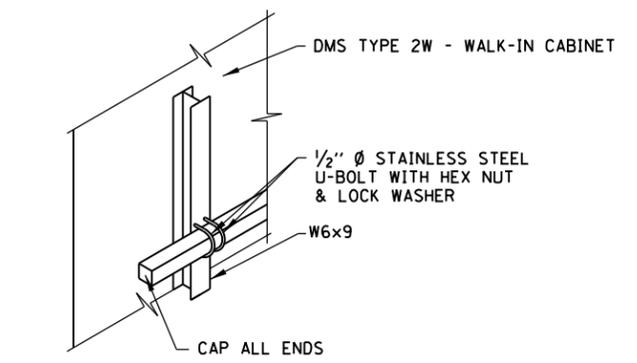


TABLE I: SIGN SUPPORT TABLE

SIGN WIDTH		NUMBER OF SIGN SUPPORTS REQUIRED
GREATER THAN	LESS THAN OR EQUAL TO	
8'-0"	14'-0"	2
14'-0"	20'-0"	3
20'-0"	26'-0"	4
26'-0"	32'-0"	5
		6

TABLE J: DMS TYPE 2W - WALK-IN TABLE

MAXIMUM TRUSS LENGTH	SIGN WIDTH			MAXIMUM WEIGHT
	HEIGHT	WIDTH	DEPTH	
40 FEET	8'-0"	26'-6"	3'-4 1/2"	4200 LBS.



NOTES:

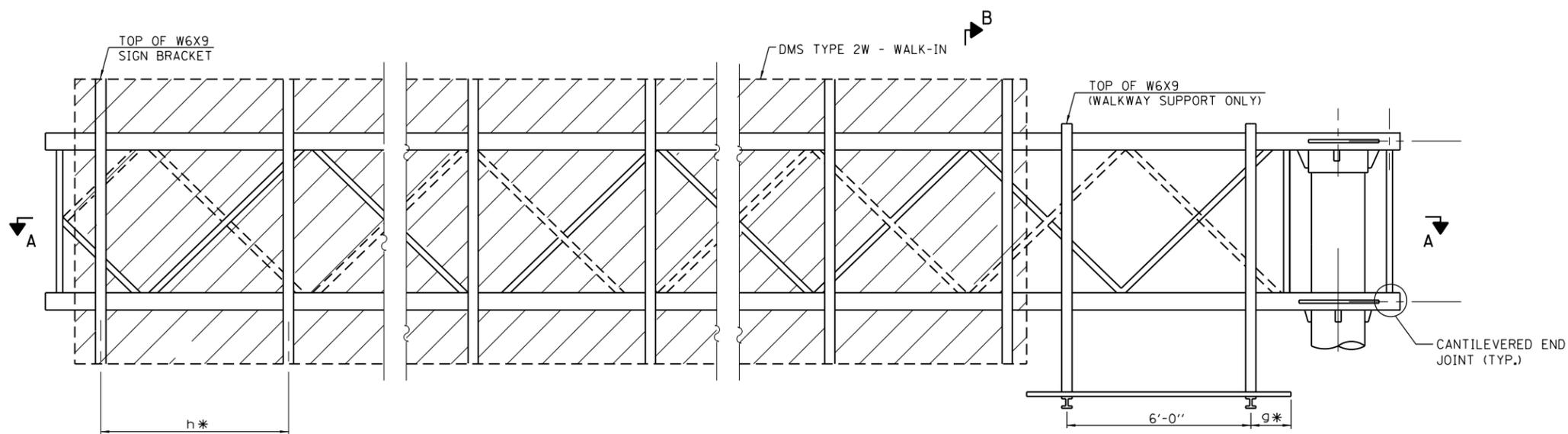
1. DMS TYPE 2W - WALK-IN SHALL BE ATTACHED TO TRUSS AS CLOSE TO PANEL JOINTS AS POSSIBLE.
2. VERIFY SIGN SUPPORT MEMBER LENGTH PRIOR TO FABRICATION.
3. DMS TYPE 2W - WALK-IN MANUFACTURER SHALL DESIGN, PROVIDE AND INSTALL HORIZONTAL MOUNTING MEMBERS. VERTICAL SPACING OF HORIZONTAL MEMBERS SHALL BE DESIGNED BY DMS TYPE 2W - WALK-IN MANUFACTURER. VERIFY VERTICAL SPACING WITH HOLES FOR STAINLESS STEEL U-BOLT.

APPROVED.....  
*Paul Kovacs*  
 CHIEF ENGINEERING OFFICER  
 DATE 3-31-2014

SHEET 9 OF 12

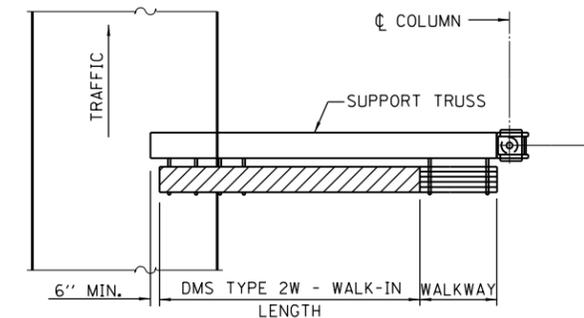
OVERHEAD SIGN STRUCTURE  
 CANTILEVER TYPE  
 STRUCTURE DETAILS

STANDARD F4-11



\* BRACKET AND GRATING DIMENSIONS ARE NOMINAL AND WILL VARY BASED ON ACTUAL DMS TYPE 2W - WALK-IN DIMENSIONS PLUS MANUFACTURER'S MOUNTING DEVICES.

**TYPICAL FRONT ELEVATION**  
WITH HANDRAIL OMITTED FOR CLARITY.  
FOR SECTION B-B, SEE SHEET 11 OF THIS SERIES.



**PLAN**  
**WALKWAY AND HANDRAIL SKETCH**  
(ROAD PLAN BENEATH TRUSS VARIES)  
WALKWAY MAY BE LOCATED AT RIGHT OR LEFT END OF TRUSS.

**NOTES:**

SPACE WALKWAY BRACKETS AND SIGN BRACKETS W6X9 FOR EFFICIENCY AND WITHIN LIMITS SHOWN:

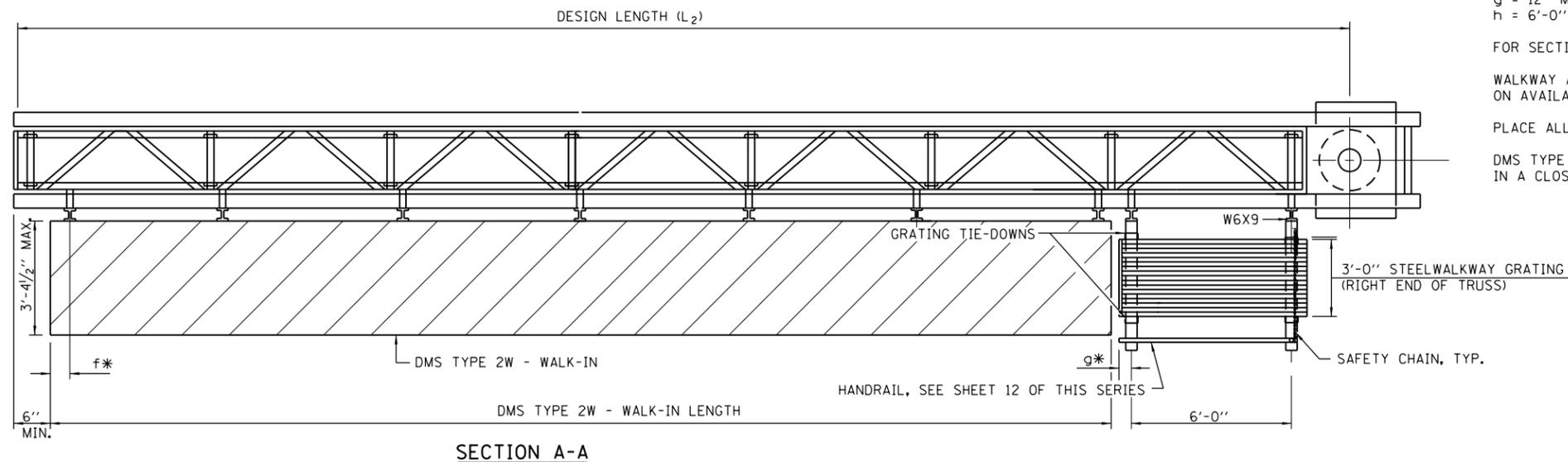
f = 12" MAXIMUM, 4" MINIMUM (END OF SIGN TO  $\phi$  OF NEAREST BRACKET)  
g = 12" MAXIMUM, 4" MINIMUM (END OF WALKWAY GRATING TO  $\phi$  OF NEAREST SUPPORT BRACKET)  
h = 6'-0" MAXIMUM ( $\phi$  TO  $\phi$  SIGN AND/OR WALKWAY SUPPORT BRACKETS, W6X9)

FOR SECTION B-B, SEE SHEET 11 OF THIS SERIES.

WALKWAY AND TRUSS GRATING WIDTH DIMENSIONS ARE NOMINAL AND MAY VARY  $\pm 1/2$ " BASED ON AVAILABLE STANDARD WIDTH.

PLACE ALL SIGN AND WALKWAY BRACKETS AS CLOSE TO PANEL POINTS AS PRACTICAL.

DMS TYPE 2W - WALK-IN SHALL HAVE THE DOOR AT THE END, OPPOSITE THE WALKWAY SECURED IN A CLOSED POSITION.

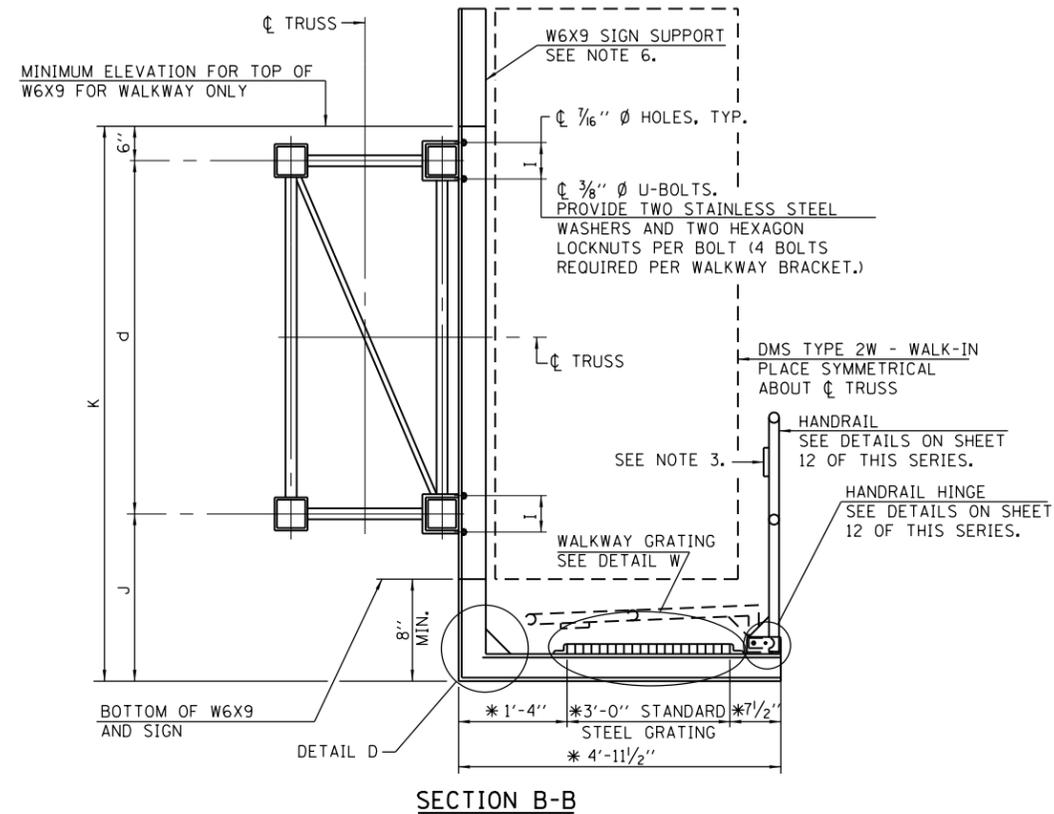


PLACE ALL SIGN AND WALKWAY BRACKETS AS CLOSE TO PANEL POINTS AS PRACTICAL.

**BRACKET TABLE**

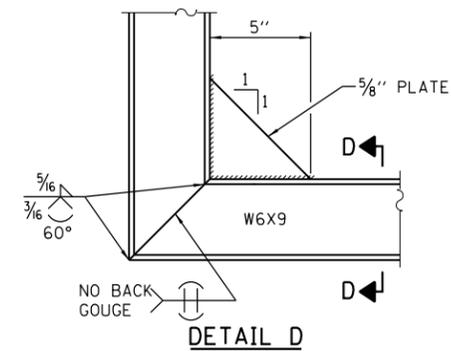
W6X9		
SIGN WIDTH		NUMBER OF BRACKETS REQUIRED
GREATER THAN	LESS THAN OR EQUAL TO	
	8'-0"	2
8'-0"	14'-0"	3
14'-0"	20'-0"	4
20'-0"	26'-0"	5
26'-0"	32'-0"	6



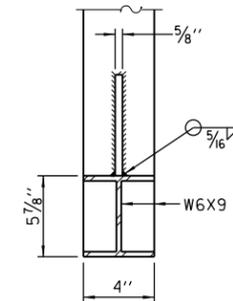


SECTION B-B

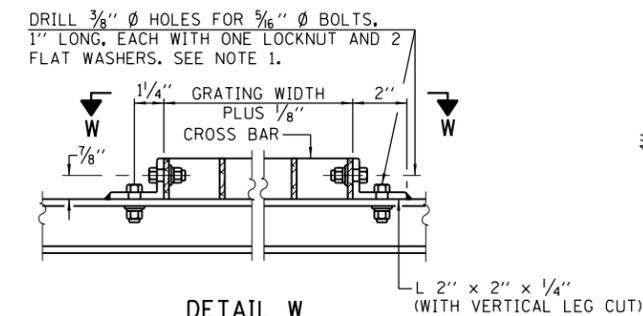
\*BRACKET AND GRATING DIMENSIONS ARE NOMINAL AND WILL VARY BASED ON ACTUAL DMS TYPE 2W - WALK-IN DIMENSIONS PLUS MANUFACTURERS MOUNTING DEVICE.



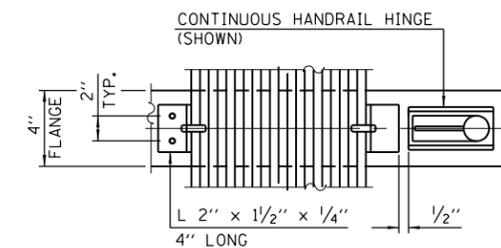
DETAIL D



SECTION D-D



DETAIL W  
(WALKWAY GRATING)



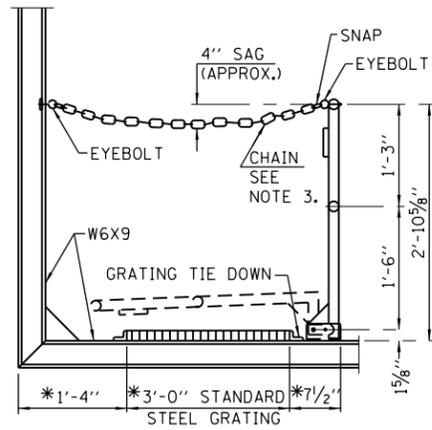
(CONTINUOUS WALKWAY GRATING)

SECTION W-W

**NOTES:**

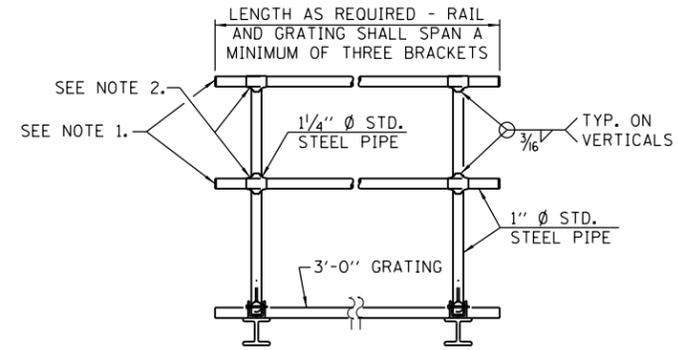
1. DRILLING HOLES IN GRATING MAY BE DONE IN SHOP OR FIELD, BASED ON CONTRACTOR'S PREFERENCE AND SUBJECT TO ACCURATE ALIGNMENT.
2. IF HANDRAIL JOINT PRESENT, WELD ANGLE TO W6X9 AND 1/4" EXTENSION BARS. SEE SHEET 12 OF THIS SERIES.
3. # 1/8" x 1/2" x 2" WELDED TO HANDRAIL POSTS TO PROTECT LOCATIONS THAT CONTACT GRATING.
4. DMS TYPE 2W - WALK-IN MANUFACTURER SHALL DESIGN AND SUPPLY HARDWARE FOR CONNECTION TO W6X9. BOLTS SHALL BE STAINLESS STEEL OR HOT DIP GALVANIZED HIGH STRENGTH PER IDOT SPECIFICATIONS.





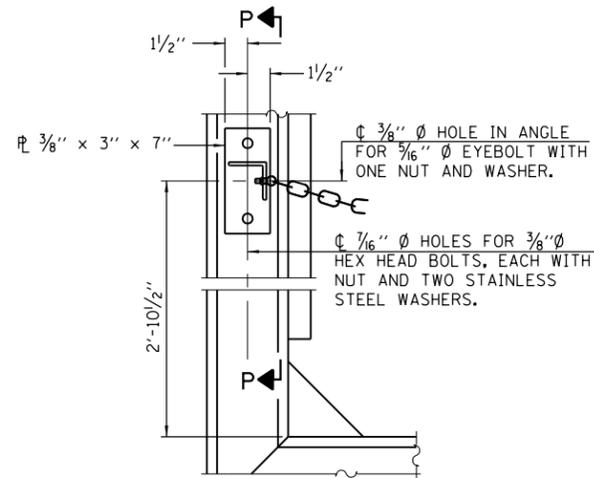
**SIDE ELEVATION**  
(SHOWING SAFETY CHAIN W/O SIGN)

\* BRACKET AND GRATING DIMENSIONS ARE NOMINAL AND WILL VARY BASED ON ACTUAL DMS TYPE 2W - WALK-IN DIMENSIONS PLUS MANUFACTURERS MOUNTING DEVICE.



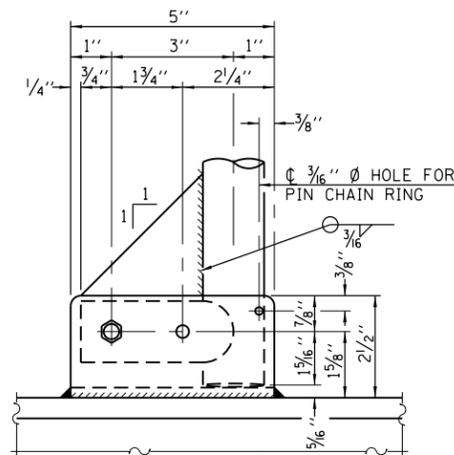
**FRONT ELEVATION**

**HANDRAIL DETAILS**

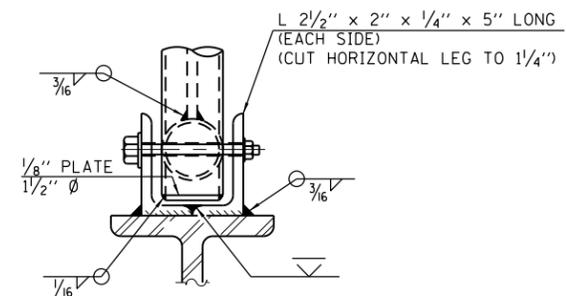


**ALTERNATE SAFETY CHAIN ATTACHMENT**

ITEMS NOT SHOWN SAME AS "SIDE ELEVATION" OF "HANDRAIL DETAILS"

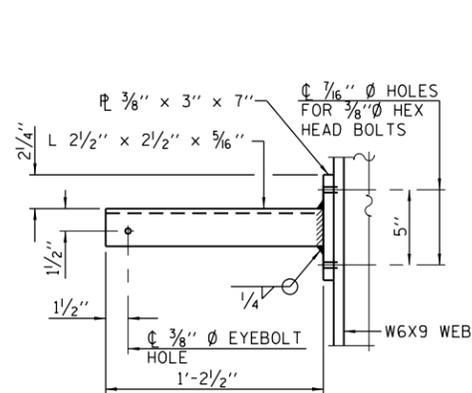


**SIDE ELEVATION**

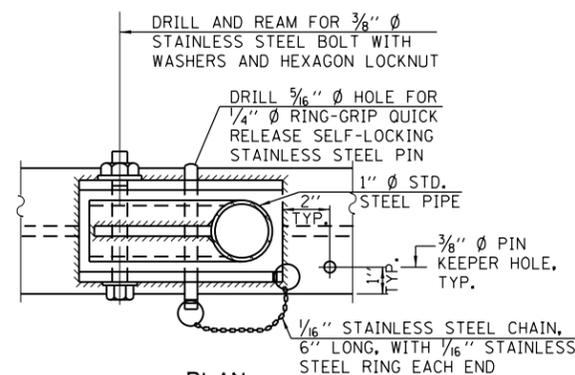


**FRONT ELEVATION**

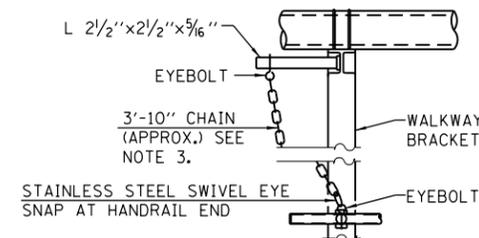
DETAILS NOT SHOWN SAME AS "ELEVATION" AT RIGHT.



**SECTION P-P**

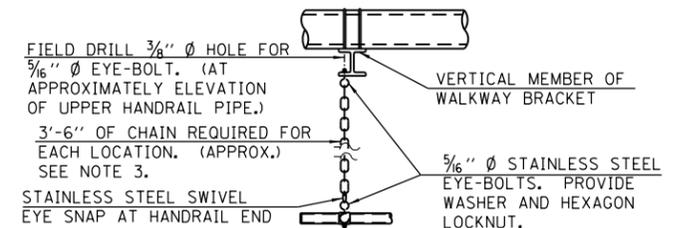


**PLAN DETAIL E HANDRAIL HINGE**



**ALTERNATE SAFETY CHAIN ATTACHMENT**

DETAILS NOT SHOWN SIMILAR TO "SAFETY CHAIN" DETAILS (WALKWAY OMITTED FOR CLARITY)



**SAFETY CHAIN**

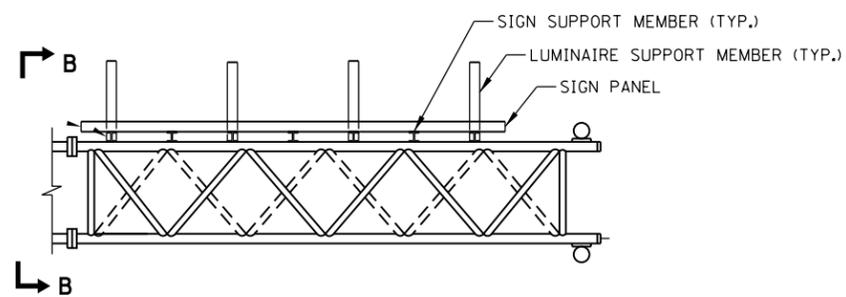
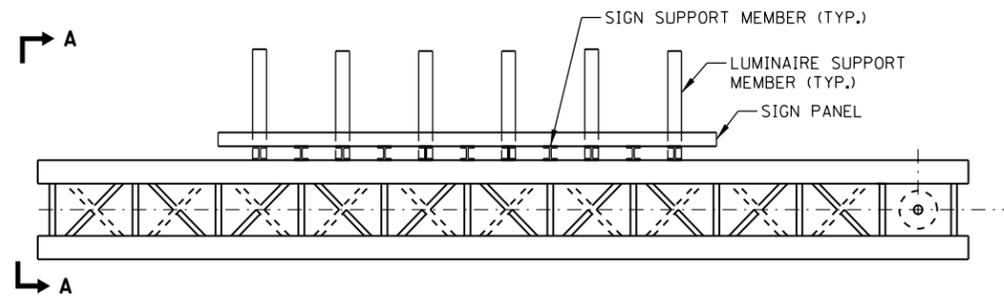
ONE REQUIRED FOR EACH END OF WALKWAY.

**NOTES:**

1. INSTALL STANDARD FORCE-FIT END CAPS OR WELD 1/8" END PLATES WITH 1/8" C.F.W. AND GRIND SMOOTH. (ALL RAIL ENDS)
2. HORIZONTAL HANDRAIL MEMBER SHALL BE CONTINUOUS THRU 1 1/4" Ø PIPE. PROVIDE 3/16" Ø HOLE IN 1 1/4" Ø PIPE FOR 3/8" Ø BOLT. FIELD DRILL 1/16" Ø HOLE IN HORIZONTAL RAIL MEMBER. PROVIDE LOCKNUT AND TWO STAINLESS STEEL WASHERS FOR BOLT. (USE 3/16" EYEBOLTS IN 1/16" Ø HOLES ON TOP RAIL AT ENDS ONLY.)
3. 3/16" TYPE 304L STAINLESS STEEL CHAIN, APPROXIMATELY 12 LINKS PER FOOT.



Paul Kovacs



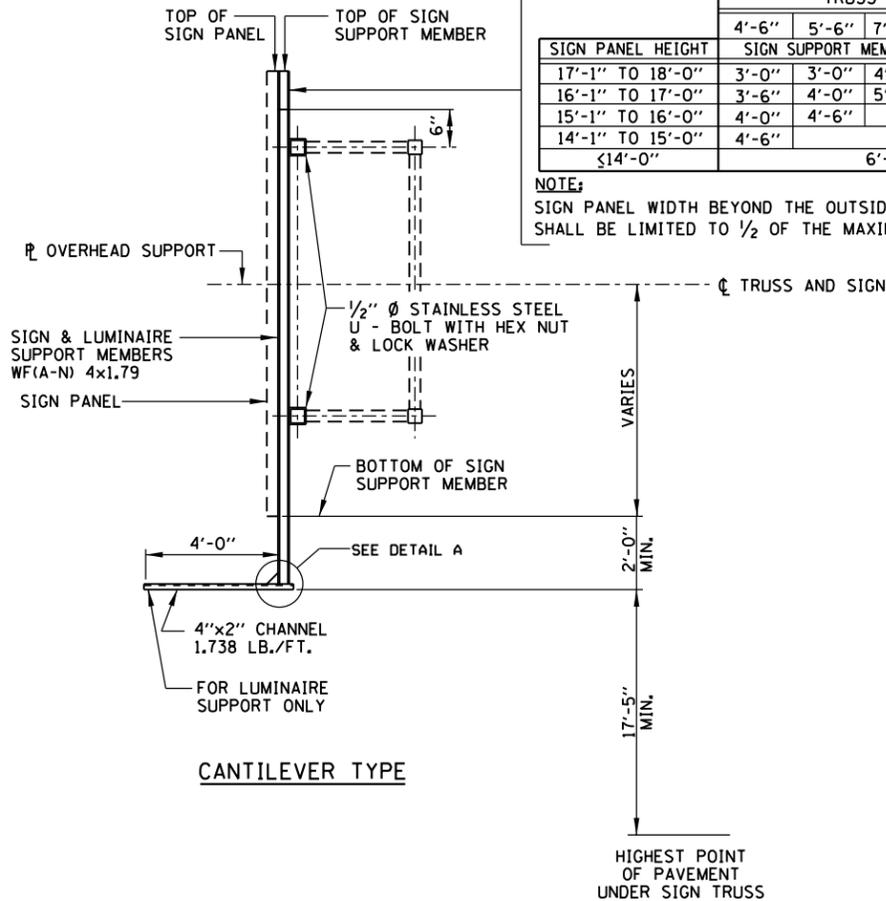
PLAN

PLAN

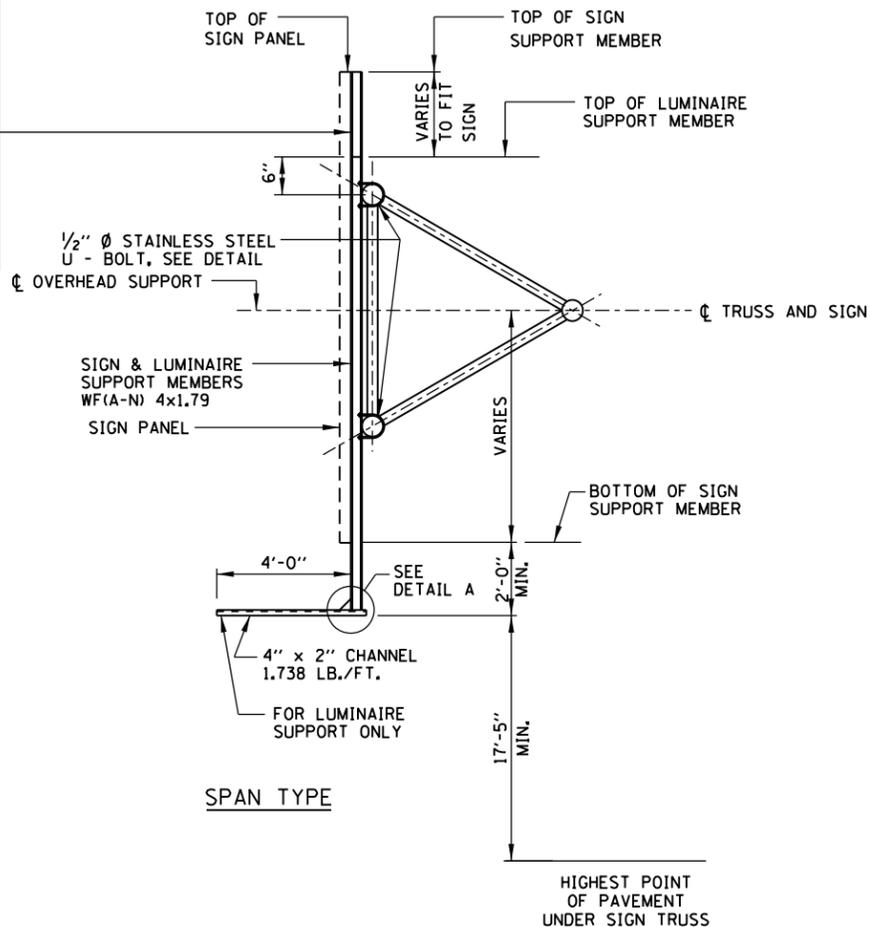
SIGN SUPPORT MEMBERS-WF(A-N) 4x1.79

SIGN PANEL HEIGHT	TRUSS DEPTH				
	4'-6"	5'-6"	7'-0"	8'-2"	8'-10"
17'-1" TO 18'-0"	3'-0"	3'-0"	4'-6"	5'-6"	6'-0"
16'-1" TO 17'-0"	3'-6"	4'-0"	5'-0"	6'-0"	
15'-1" TO 16'-0"	4'-0"	4'-6"		6'-0"	
14'-1" TO 15'-0"	4'-6"			6'-0"	
≤14'-0"				6'-0"	

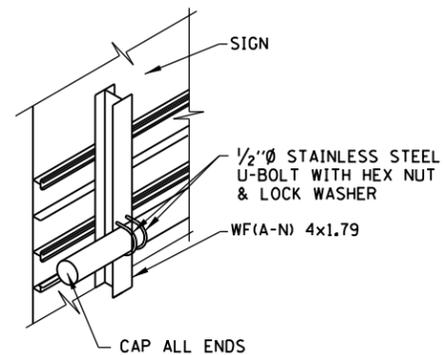
NOTE:  
SIGN PANEL WIDTH BEYOND THE OUTSIDE VERTICAL MEMBER SHALL BE LIMITED TO 1/2 OF THE MAXIMUM SPACING



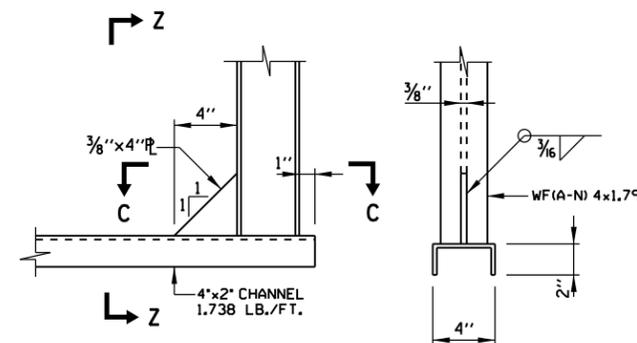
SECTION A-A



SECTION B-B

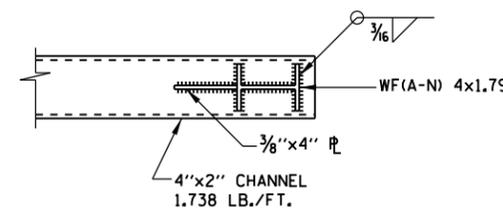


STAINLESS STEEL U-BOLT DETAIL



DETAIL A

SECTION Z-Z



SECTION C-C

NOTES:  
ALL MATERIAL IS ALUMINUM (UNLESS OTHERWISE NOTED).

NOTES:

- SIGN PANEL SHALL BE ATTACHED TO TRUSS AS CLOSE TO PANEL JOINTS AS POSSIBLE.
- LUMINAIRE SUPPORT MEMBERS TO BE INSTALLED ONLY WHEN SIGN STRUCTURE IS TO BE ILLUMINATED.

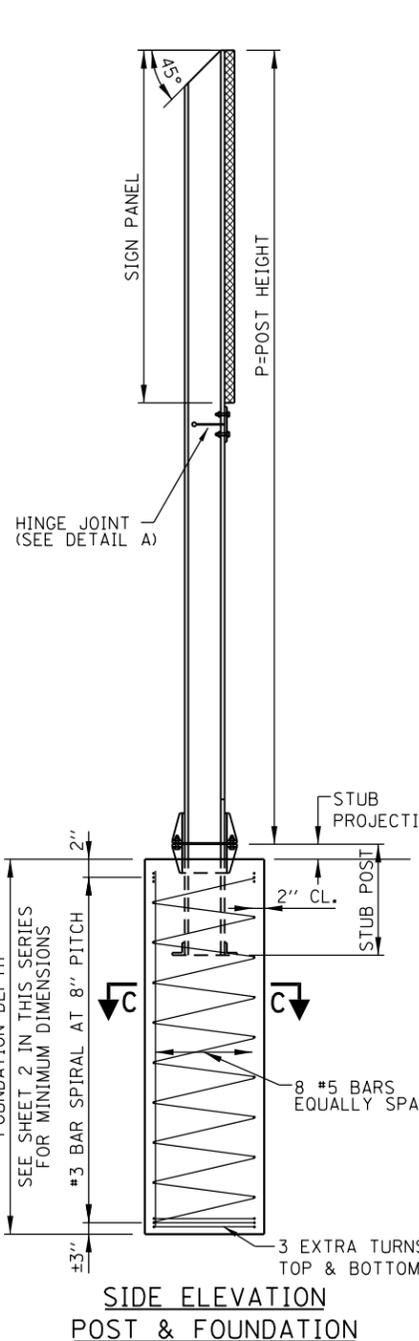
APPROVED, *Paul Kovacs* DATE 2-7-2012..  
CHIEF ENGINEERING OFFICER

DATE	REVISIONS
1-1-2009	ADDED PLAN VIEWS FOR SIGN STRUCTURES
2-7-2012	REVISED OVERHEAD SIGN STRUCTURE CANTILEVER DIAGONALS
2-1-2013	REMOVED VERTICAL CLEARANCE.
3-31-2014	REVISED SIGN SUPPORT MEMBERS
3-11-2015	REVISED VERTICAL CL. AND SIGN SUPPORT
3-01-2018	ADDED VERTICAL CLEARANCE
3-01-2019	REVISED NOTE 2

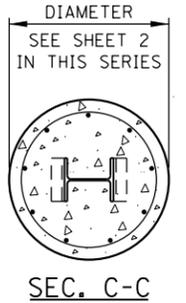


OVERHEAD SIGN STRUCTURE  
SIGN AND LUMINAIRE  
SUPPORTS

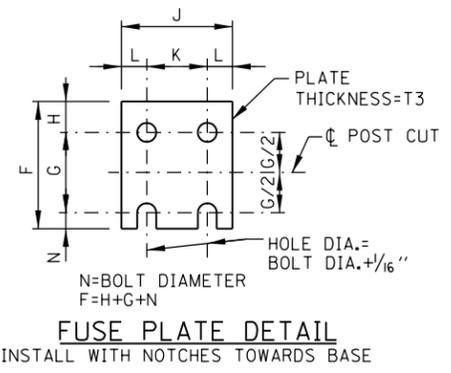
STANDARD F8-07



**SIDE ELEVATION POST & FOUNDATION**



**SEC. C-C**



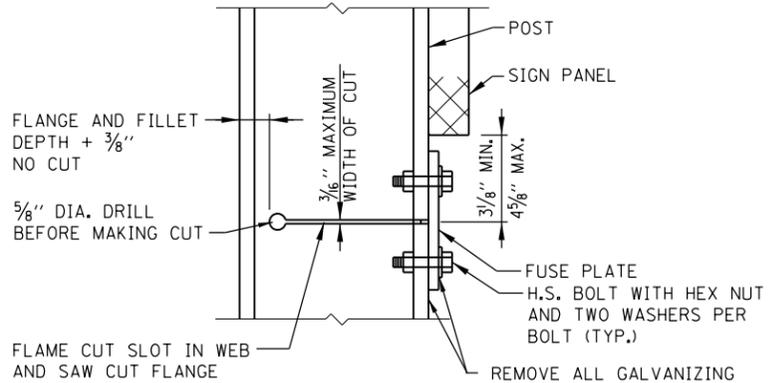
**FUSE PLATE DETAIL**

INSTALL WITH NOTCHES TOWARDS BASE

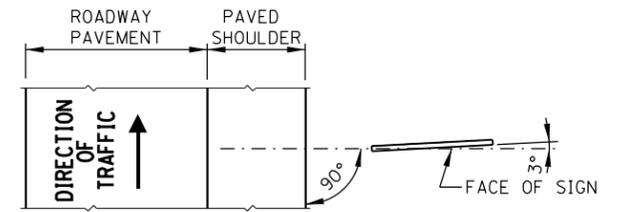
**FABRICATORS NOTES**

THE SLOT AND THE 5/8" DIA. HOLE IN THE WEB AND THE FUSE PLATE BOLT HOLES IN THE FLANGE SHALL BE MADE BEFORE GALVANIZING. POST FLANGE SHALL BE SAW CUT AFTER GALVANIZING AND BARE METAL SURFACES SHALL BE COATED WITH AN APPROVED ZINC SOLDER OR ZINC-RICH PAINT. THESE SURFACES SHALL NOT BE COATED UNTIL THE FUSE PLATE IS INSTALLED AND BOLTS FULLY TIGHTENED.

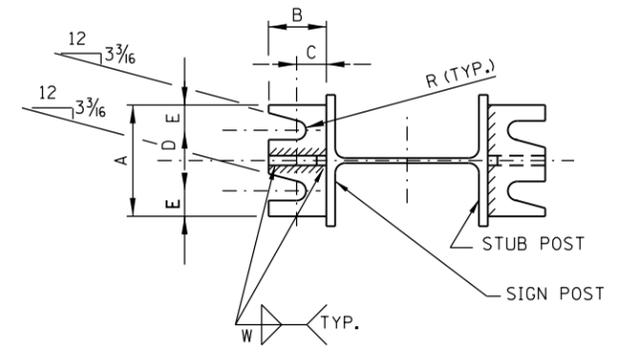
G & H DIM. TABLE		
BOLT DIA.	G	H
1/2"	2"	1 1/8"
5/8"	2 1/4"	1 1/4"
3/4"	2 1/2"	1 3/8"
7/8"	2 3/4"	1 1/2"
1"	3"	1 5/8"
1 1/8"	3 1/4"	1 3/4"
1 1/4"	3 1/2"	1 7/8"



**HINGE JOINT DETAIL A**



**LOCATION SKETCH**



**SEC. A-A**

**GENERAL NOTES**

**DESIGN:** THE LATEST EDITION OF THE "AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRE AND TRAFFIC SIGNALS".

**CONSTRUCTION:** STANDARD SPECIFICATIONS AND THE SPECIAL PROVISIONS.

**LOADING:** FOR 80 MPH WIND VELOCITY PLUS 30% GUST FACTOR NORMAL TO SIGN.

**DESIGN STRESSES:**  
 STRUCTURAL STEEL - PER AASHTO 20,000 P.S.I.  
 REINFORCING STEEL - 24,000 P.S.I.  
 CLASS SI CONCRETE - 1,400 P.S.I.

**FOUNDATION:** MINIMUM UNCONFINED COMPRESSIVE STRENGTH,  $Q_u$  FOR ALL LAYERS FOR COHESIVE SOILS (CLAYS) SHALL BE 1.25 TON/SQ.FT.

**WELDING:** ALL WELDING TO BE CONTINUOUS UNLESS OTHERWISE SHOWN. ALL WELDING TO BE DONE IN ACCORDANCE WITH CURRENT AWS SPECIFICATIONS, AND STANDARD SPECIFICATIONS.

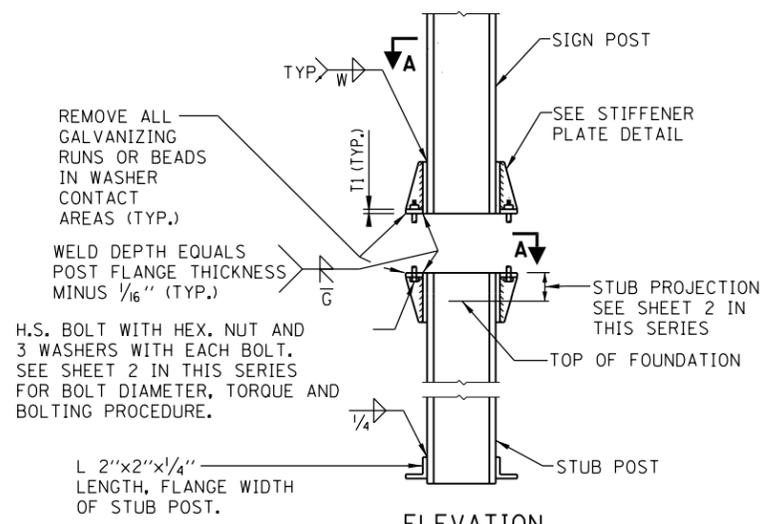
**MATERIALS:** ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 AND LRFD SPECIFICATIONS.

ALL HIGH STRENGTH STEEL BOLTS, NUTS AND WASHERS SHALL CONFORM TO STANDARD SPECIFICATIONS.

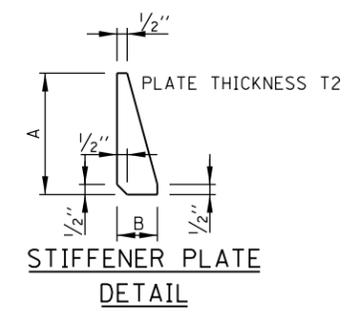
HIGH STRENGTH STEEL BOLTS, NUTS AND HARDENED WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M232.

HIGH STRENGTH BOLTS IN BASE PLATES SHALL BE TIGHTENED TO THE TORQUE SHOWN ON SHEET 2 IN THIS SERIES.

AFTER FABRICATION, THE POST, FUSE PLATE, BASE PLATE AND UPPER 6" OF STUB POST SHALL BE HOT-DIP GALVANIZED ACCORDING TO ASTM M111, EXCEPT AS NOTED UNDER FABRICATOR NOTES.

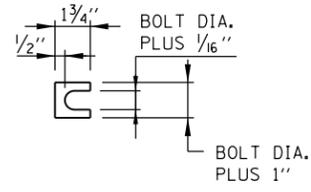


**ELEVATION SIGN POST & STUB POST**



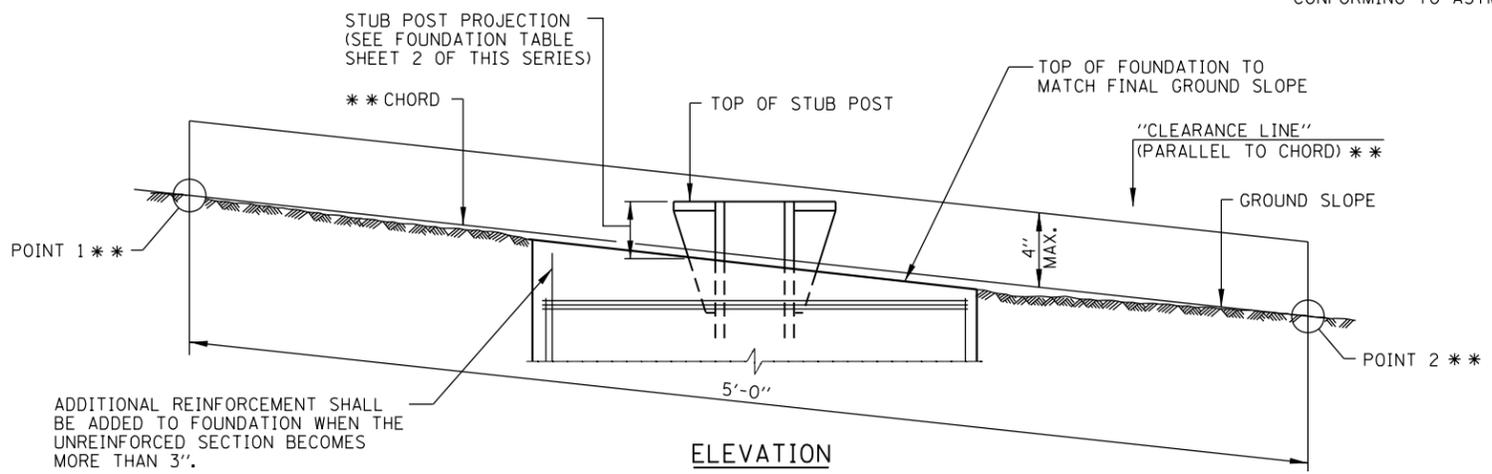
**STIFFENER PLATE DETAIL**

SEE SHEET 2 IN THIS SERIES FOR DIMENSIONS



**SHIM DETAIL**

FURNISH 2-.012" THICK AND 2-.032" THICK SHIMS PER POST. SHIMS SHALL BE FABRICATED FROM BRASS SHIM STOCK CONFORMING TO ASTM B36.



**ELEVATION GROUND LINE & STUB POST**

\*\* FOR ALL "POINT 1" AND "POINT 2" LOCATIONS, "CLEARANCE LINE" MUST BE AT OR ABOVE TOP OF STUB POST.

ADDITIONAL REINFORCEMENT SHALL BE ADDED TO FOUNDATION WHEN THE UNREINFORCED SECTION BECOMES MORE THAN 3'.

APPROVED: *Paul Kovacs* CHIEF ENGINEER DATE 1-1-2010...

DATE	REVISIONS
2-7-2012	ADDED STUB POST CLEARANCE DIMENSIONS, REVISED SIGN INSTALLATION CLEARANCE DIMENSIONS
11-1-2012	REVISED NOTES, MODIFIED SLOPE REQUIREMENTS FOR BREAKAWAY SUPPORTS
3-01-2019	CLARIFIED DESIGN STRESS FOR SOIL PRESSURE

**Illinois Tollway**

**BREAKAWAY SIGN SUPPORT DETAILS**

**STANDARD F9-05**

POST	FOUNDATION TABLE											BASE CONNECTION DATA TABLE												
	FOUNDATION			REINFORCEMENT					STUB POST			BOLT SIZE AND TORQUE	A	B	C	D	E	T1	T2	W	R			
	DIA.	MIN. DEPTH	CY.* CONC.	VERTICAL BARS NO.	VERTICAL BARS SIZE	VERTICAL BARS LGTH.	BAR SPIRALS SIZE	BAR SPIRALS O.D.	BAR SPIRALS LGTH.	LBS.**	STUB LGTH.											STUB PROJECTION	LBS.***	
W6x9	2'-0"	6'-0"	.70	8	#5	5'-9"	#3	20 1/2"	79'	78	2'-3"	3"	44	5/8" Ø x 3 1/4" LG. TORQUE = 450" #	6"	2 1/4"	1 1/4"	3 1/2"	1 1/4"	3/4"	1/2"	1/4"	11/32"	
W6x15	2'-0"	6'-0"	.70	8	#5	5'-9"	#3	20 1/2"	79'	78	2'-6"	3"	71											
W8x18	2'-0"	6'-0"	.70	8	#5	5'-9"	#3	20 1/2"	79'	78	2'-6"	3"	85	3/4" Ø x 3 3/4" LG. TORQUE = 750" #	6"	2 1/2"	1 3/8"	3 1/4"	1 3/8"	1"	1/2"	5/16"	11/32"	
W10x22	2'-6"	6'-6"	1.18	8	#5	6'-3"	#3	26 1/2"	105'	92	3'-0"	2 1/2"	110											
W10x26	2'-6"	7'-0"	1.27	8	#5	6'-9"	#3	26 1/2"	112'	98	3'-0"	2 1/2"	137											
W12x26	2'-6"	7'-9"	1.41	8	#5	7'-6"	#3	26 1/2"	119'	107	3'-0"	2 1/2"	140	7/8" Ø x 4" LG. TORQUE = 950" #	7"	2 3/4"	1 1/2"	4"	1 1/2"	1"	3/4"	3/8"	15/32"	
W14x30	3'-0"	7'-3"	1.90	8	#5	7'-0"	#3	32 1/2"	145'	113	3'-0"	2 1/2"	150											
W14x38	3'-0"	8'-0"	2.09	8	#5	7'-9"	#3	32 1/2"	153'	122	3'-6"	2 1/2"	208	1" Ø x 4 1/2" LG. TORQUE = 1100" #	7 1/2"	3"	1 3/4"	4"	1 3/4"	1 1/4"	3/4"	3/8"	11/32"	
W16x45	3'-0"	8'-6"	2.23	8	#5	8'-3"	#3	32 1/2"	162'	130	3'-6"	2 1/2"	233											

**PROCEDURE FOR ASSEMBLY OF BASE CONNECTION:**

1. ASSEMBLE POST TO STUB WITH H.S. BOLTS AND ONE OF THE THREE FLAT WASHERS ON EACH BOLT BETWEEN PLATES AS SHOWN.
2. SHIMS MAY BE USED BETWEEN PLATES TO LEVEL POST.
3. TIGHTEN BOLTS IN BASE PLATE IN A SYSTEMATIC ORDER TO THE REQUIRED TORQUE.
4. LOOSEN EACH BOLT AND RETIGHTEN TO THE REQUIRED TORQUE IN SAME ORDER AS INITIAL TIGHTENING.
5. BURR OR CENTER PUNCH THREADS AT JUNCTURE OF BOLT AND NUT TO PREVENT NUT FROM LOOSENING.

- \* QUANTITY OF CLASS SI CONCRETE CONSISTS OF ALL CONCRETE NECESSARY FOR ONE FOUNDATION. (CUBIC YARDS)
- \*\* THIS INCLUDES REINFORCEMENT BARS AND SPIRAL HOOPING REQUIRED FOR ONE FOUNDATION.
- \*\*\* INCLUDES WEIGHT OF STUB POST WITH ANGLES, GUSSETS, BASE PLATES, BOLTS, NUTS, WASHERS, PLUS BASE PLATES AND GUSSETS ON MAIN POST, PLUS FUSE PLATE (IF ANY) WITH BOLTS, NUTS AND WASHERS. (ONE POST)

**EQUIVALENT TORQUE VALUES**

- 450" # = 37.5' #
- 750" # = 62.5' #
- 950" # = 79.2' #
- 1100" # = 91.7' #

POST	FUSE PLATE DATA TABLE				FUSE PLATE BOLT SIZE TABLE											
	J	K	L	T3	SIGN DEPTH											
					4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	
W6x9	4"	2 1/4"	7/8"	1/4"	1/2"Øx1 1/2"	1/2"Øx1 1/2"	1/2"Øx1 1/2"	5/8"Øx1 3/4"	5/8"Øx1 3/4"	5/8"Øx1 3/4"	---	---	---	---	---	
W6x15	6"	3 1/2"	1 1/4"	3/8"	1/2"Øx1 3/4"	1/2"Øx1 3/4"	5/8"Øx2"	5/8"Øx2"	3/4"Øx2"	3/4"Øx2"	3/4"Øx2"	3/4"Øx2"	7/8"Øx2"	7/8"Øx2"	---	
W8x18	5 1/4"	2 3/4"	1 1/4"	3/8"	1/2"Øx1 3/4"	1/2"Øx1 3/4"	1/2"Øx1 3/4"	5/8"Øx2"	5/8"Øx2"	3/4"Øx2"	3/4"Øx2"	3/4"Øx2"	7/8"Øx2 1/4"	7/8"Øx2 1/4"	7/8"Øx2 1/4"	7/8"Øx2 1/4"
W10x22	5 3/4"	2 3/4"	1 1/2"	1/2"	1/2"Øx2"	1/2"Øx2"	1/2"Øx2"	5/8"Øx2"	5/8"Øx2"	3/4"Øx2 1/4"	3/4"Øx2 1/4"	3/4"Øx2 1/4"	7/8"Øx2 1/4"	7/8"Øx2 1/4"	7/8"Øx2 1/2"	1"Øx2 1/2"
W10x26	5 3/4"	2 3/4"	1 1/2"	5/8"	1/2"Øx2"	1/2"Øx2"	1/2"Øx2"	5/8"Øx2 1/4"	5/8"Øx2 1/4"	3/4"Øx2 1/2"	3/4"Øx2 1/2"	3/4"Øx2 1/2"	7/8"Øx2 1/2"	7/8"Øx2 1/2"	1"Øx2 3/4"	1"Øx2 3/4"
W12x26	6 1/2"	3 1/2"	1 1/2"	5/8"	---	---	---	---	---	5/8"Øx 2 1/4"	---	---	7/8"Øx2 1/2"	7/8"Øx2 1/2"	1"Øx2 1/2"	1"Øx2 1/2"
W14x30	6 3/4"	3 1/2"	1 5/8"	1/2"	1/2"Øx2"	1/2"Øx2"	1/2"Øx2"	1/2"Øx2"	1/2"Øx2"	5/8"Øx2"	5/8"Øx2 1/4"	3/4"Øx2 1/4"	3/4"Øx2 1/4"	7/8"Øx2 1/4"	7/8"Øx2 1/2"	1"Øx2 1/2"
W14x38	6 3/4"	3 1/2"	1 5/8"	1/2"	---	1/2"Øx2"	1/2"Øx2"	1/2"Øx2"	1/2"Øx2"	5/8"Øx2 1/4"	5/8"Øx2 1/4"	3/4"Øx2 1/2"	3/4"Øx2 1/2"	7/8"Øx2 1/2"	7/8"Øx2 1/2"	1"Øx2 1/2"
W16x45	7"	3 1/2"	1 3/4"	1/2"	---	---	---	1/2"Øx2"	1/2"Øx2"	5/8"Øx2 1/4"	5/8"Øx2 1/4"	5/8"Øx2 1/4"	3/4"Øx2 1/2"	3/4"Øx2 1/2"	7/8"Øx2 1/2"	7/8"Øx2 1/2"

POST	FUSE PLATE DATA TABLE				FUSE PLATE BOLT SIZE TABLE											
	J	K	L	T3	SIGN DEPTH											
					15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	---	
W6x9	4"	2 1/4"	7/8"	1/4"	---	---	---	---	---	---	---	---	---	---	---	---
W6x15	6"	3 1/2"	1 1/4"	3/8"	---	---	---	---	---	---	---	---	---	---	---	---
W8x18	5 1/4"	2 3/4"	1 1/4"	3/8"	7/8"Øx2 1/4"	7/8"Øx2 1/4"	---	---	---	---	---	---	---	---	---	---
W10x22	5 3/4"	2 3/4"	1 1/2"	1/2"	1"Øx2 3/4"	1"Øx2 3/4"	1"Øx2 3/4"	1"Øx2 3/4"	1"Øx2 3/4"	1"Øx2 3/4"	---	---	---	---	---	---
W10x26	5 3/4"	2 3/4"	1 1/2"	5/8"	1"Øx2 3/4"	1 1/8"Øx3"	1 1/8"Øx3"	1 1/4"Øx3"	---							
W12x26	6 1/2"	3 1/2"	1 1/2"	5/8"	1"Øx2 3/4"	1"Øx2 3/4"	1 1/8"Øx3"	1 1/4"Øx3"	---							
W14x30	6 3/4"	3 1/2"	1 5/8"	1/2"	1"Øx2 3/4"	1"Øx2 3/4"	1 1/4"Øx3"	---								
W14x38	6 3/4"	3 1/2"	1 5/8"	1/2"	1"Øx2 1/2"	1"Øx2 3/4"	1 1/4"Øx3"	---								
W16x45	7"	3 1/2"	1 3/4"	1/2"	7/8"Øx2 1/2"	1"Øx2 3/4"	1"Øx2 3/4"	1 1/8"Øx3"	1 1/4"Øx3"	---						

**PROCEDURE FOR FUSE PLATE BOLT TIGHTENING:**

ALL FRICTION FUSE BOLTS SHALL BE TIGHTENED IN THE SHOP AS APPROVED BY THE ENGINEER ACCORDING TO ONE OF THE FOLLOWING METHODS:

1. TURN-OF-NUT TIGHTENING,
2. TIGHTENING BY USE OF A DIRECT TENSION INDICATOR.

THE ABOVE METHODS OF INSTALLATION AND TIGHTENING SHALL CONFORM TO THE LATEST ISSUE OF THE SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A-325 OR A-490 BOLTS, FOR SLIP-CRITICAL CONNECTIONS AS ISSUED BY THE RESEARCH COUNCIL ON RIVETED AND BOLTED STRUCTURAL JOINTS OF THE ENGINEERING FOUNDATION.

TIGHTENING SHALL BE TO SUCH A DEGREE AS TO OBTAIN THE FOLLOWING MINIMUM RESIDUAL TENSION IN EACH BOLT.

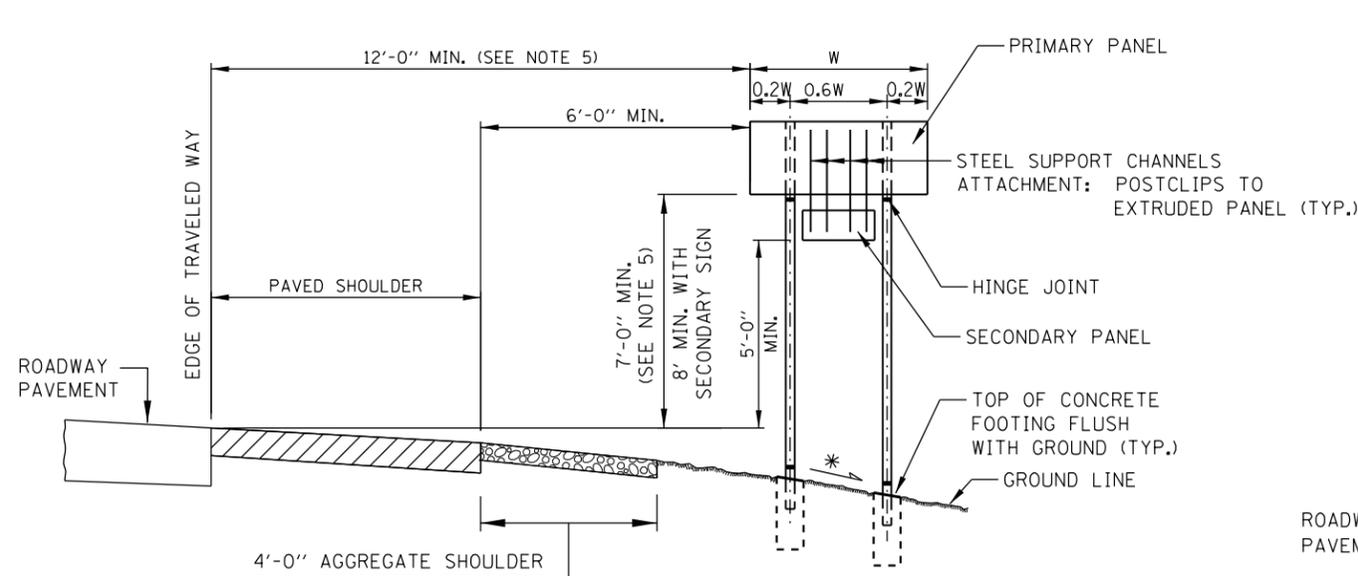
BOLT DIA.	MIN. RESIDUAL BOLT TENSION	BOLT DIA.	MIN. RESIDUAL BOLT TENSION	BOLT DIA.	MIN. RESIDUAL BOLT TENSION
1/2"	12,050	7/8"	39,250	1 1/4"	71,700
5/8"	19,200	1"	51,500		
3/4"	28,400	1 1/8"	56,450		



BREAKAWAY SIGN SUPPORT DETAILS

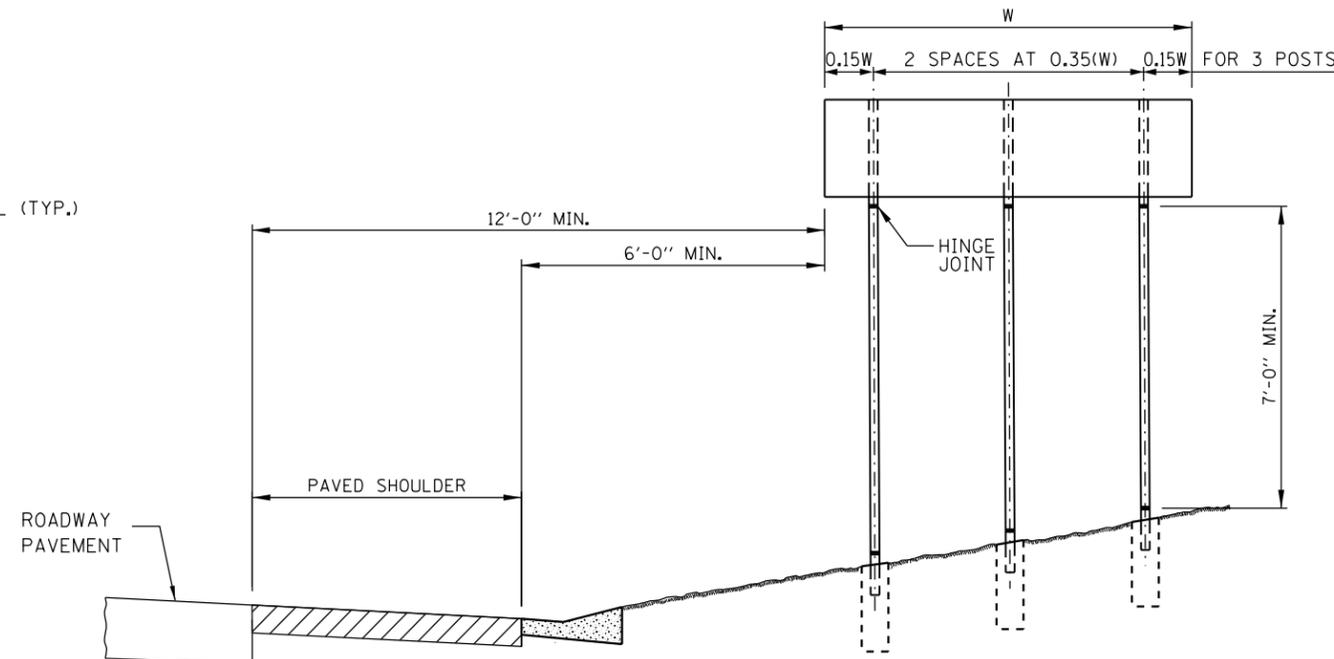
STANDARD F9-05

APPROVED: *Paul Kovacs*  
 CHIEF ENGINEER DATE 1-1-2010...

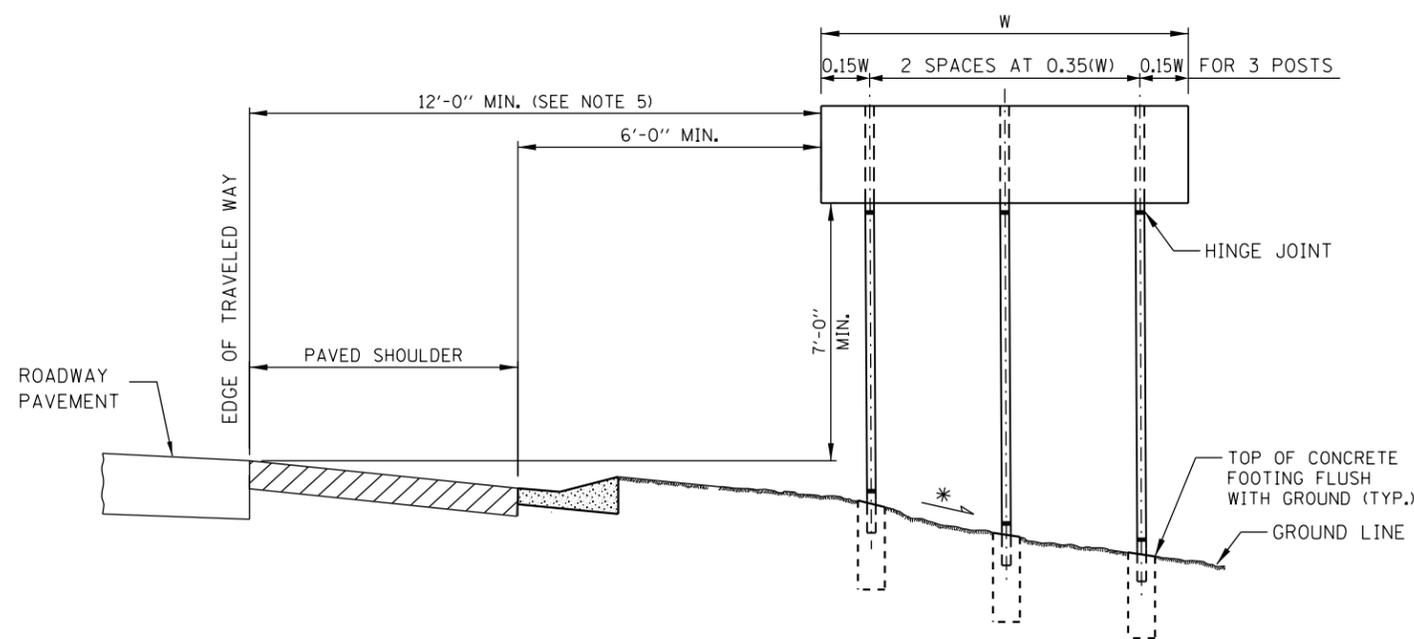


CONDITION 1 - SIGN INSTALLATION

(\* ) FORESLOPE 1:6 (V:H) OR FLATTER



CONDITION 3 - SIGN INSTALLATION



CONDITION 2 - SIGN INSTALLATION

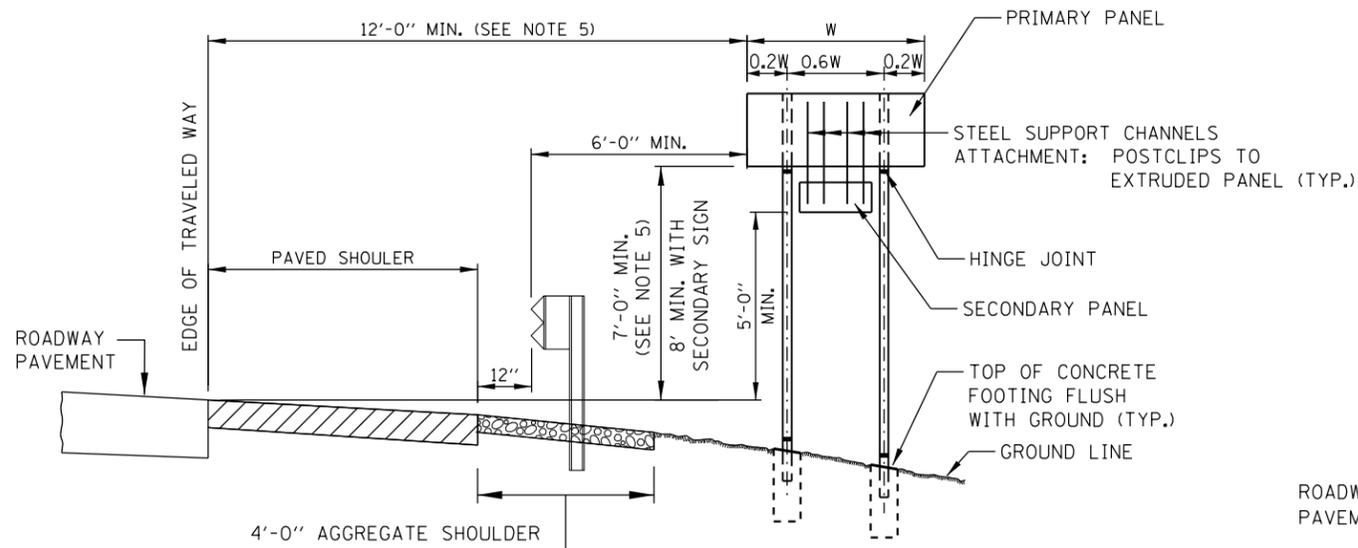
(\* ) FORESLOPE 1:6 (V:H) OR FLATTER

NOTES:

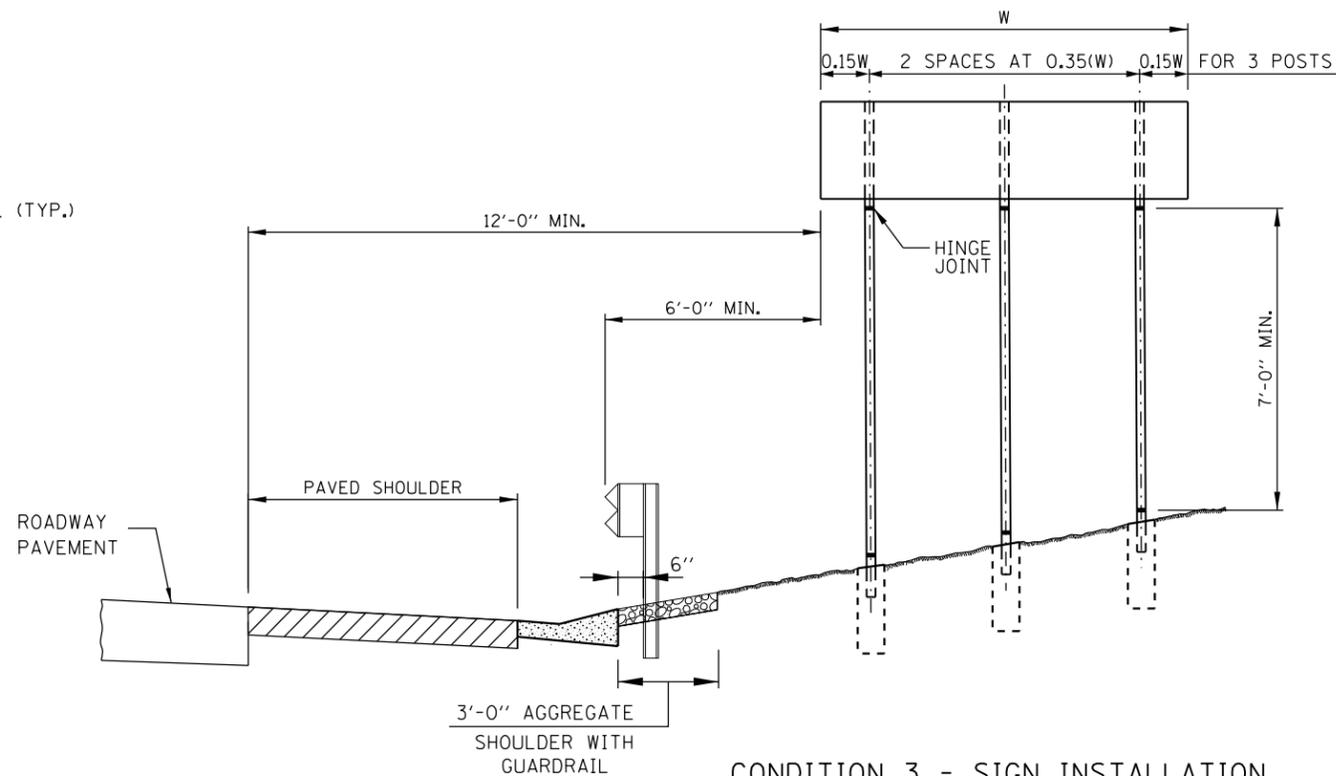
1. SEE SIGN INSTALLATION SCHEDULE IN CONTRACT PLANS FOR DIMENSIONS.
2. THE DIMENSIONS OF ALL POSTS FOR GROUND MOUNTED SIGNS ARE BASED ON DESIGN CROSS SECTIONS. THE CONTRACTOR SHALL VERIFY REQUIRED POST LENGTHS IN THE FIELD, PRIOR TO SUBMITTING SHOP DRAWINGS AND POST FABRICATION TO MAINTAIN THE CLEARANCES SHOWN.
3. SIGN FOUNDATION ELEVATIONS TO BE BASED ON FINISHED SLOPES.
4. ANY ADDITIONAL SIGN TO BE ADDED LATER MUST BE SUPPORTED BY THE EXISTING SIGN PANEL AND NOT THE SIGN POST. MINIMUM CLEARANCES SHALL BE MAINTAINED.
5. SIGNS THAT ARE PLACED WELL OUTSIDE THE CLEAR ZONE MAY BE INSTALLED WITH A MINIMUM HEIGHT OF 5 FEET, MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE HORIZONTAL ELEVATION OF THE NEAR EDGE OF TRAVELED ROADWAY.
6. MINIMUM HEIGHT OF LOWEST POST SHALL BE 7'-0" MEASURED BETWEEN STUB PROJECTION AND HINGE JOINT.
7. FOR TWO POSTS SPACED LESS THAN 7 FEET APART, EACH POST SHALL HAVE A MASS LESS THAN 18 lb/ft.
8. WHEN THE TOTAL COMBINED WEIGHT OF THE TWO POSTS LOCATED WITHIN 7 FEET OF EACH OTHER EXCEEDS 600 lbs., THE SIGN SHALL BE PLACED WELL OUTSIDE THE CLEAR ZONE OR BE SHIELDED FROM VEHICULAR IMPACT.

UNSHIELDED SLOPE

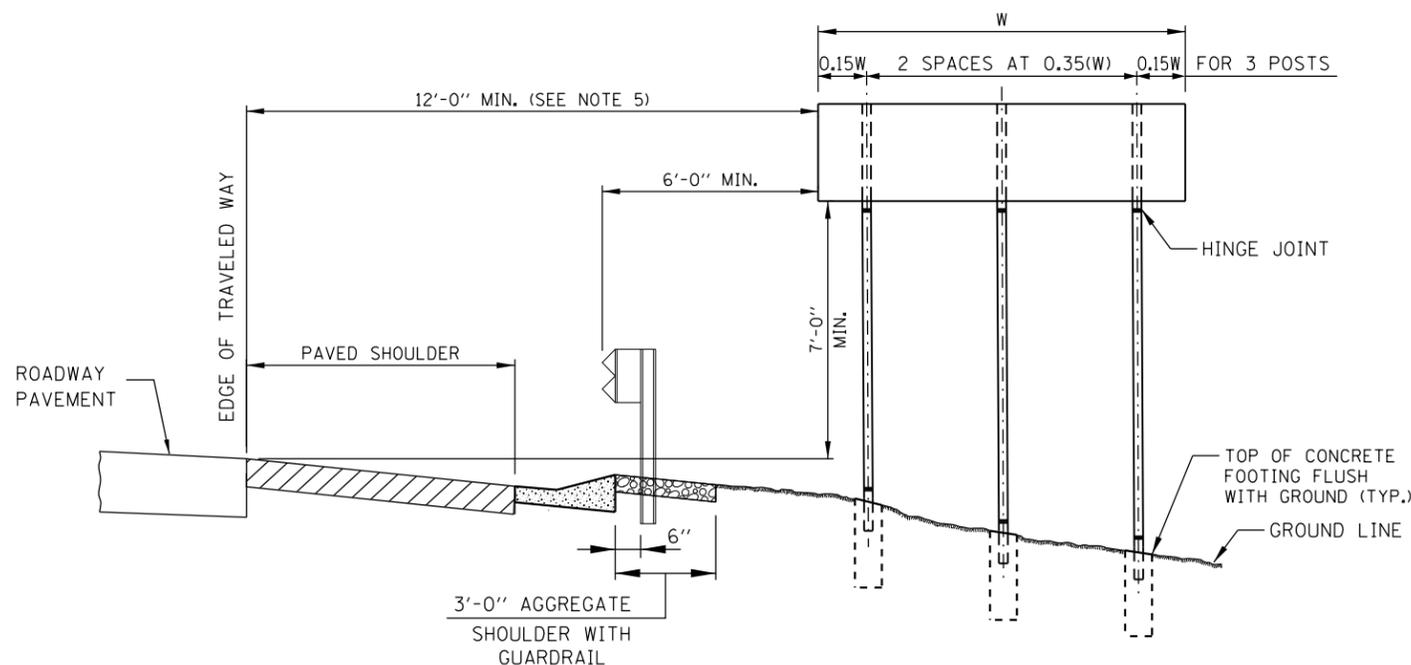




CONDITION 1 - SIGN INSTALLATION



CONDITION 3 - SIGN INSTALLATION



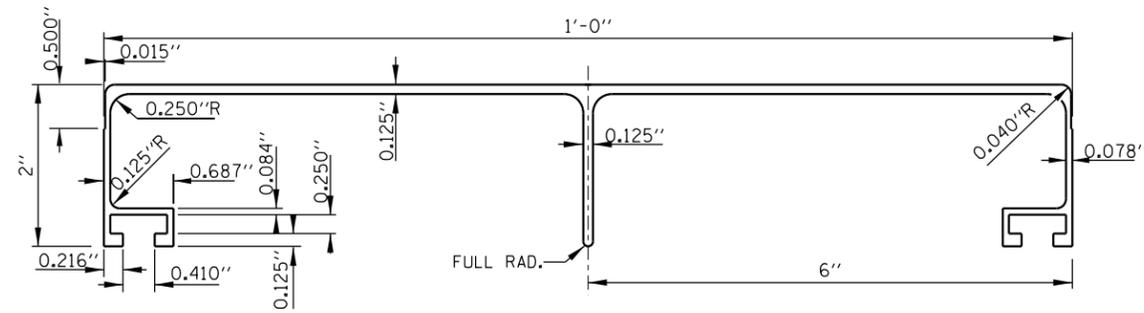
CONDITION 2 - SIGN INSTALLATION

SHIELDED SLOPE

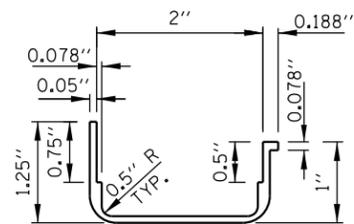
NOTES:

1. SEE SIGN INSTALLATION SCHEDULE IN CONTRACT PLANS FOR DIMENSIONS.
2. THE DIMENSIONS OF ALL POSTS FOR GROUND MOUNTED SIGNS ARE BASED ON DESIGN CROSS SECTIONS. THE CONTRACTOR SHALL VERIFY REQUIRED POST LENGTHS IN THE FIELD, PRIOR TO SUBMITTING SHOP DRAWINGS AND POST FABRICATION TO MAINTAIN THE CLEARANCES SHOWN.
3. SIGN FOUNDATION ELEVATIONS TO BE BASED ON FINISHED SLOPES.
4. ANY ADDITIONAL SIGN TO BE ADDED LATER MUST BE SUPPORTED BY THE EXISTING SIGN PANEL AND NOT THE SIGN POST. MINIMUM CLEARANCES SHALL BE MAINTAINED.
5. SIGNS THAT ARE PLACED WELL OUTSIDE THE CLEAR ZONE MAY BE INSTALLED WITH A MINIMUM HEIGHT OF 5 FEET, MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE HORIZONTAL ELEVATION OF THE NEAR EDGE OF TRAVELED ROADWAY.
6. MINIMUM HEIGHT OF LOWEST POST SHALL BE 7'-0" MEASURED BETWEEN STUB PROJECTION AND HINGE JOINT.
7. FOR TWO POSTS SPACED LESS THAN 7 FEET APART, EACH POST SHALL HAVE A MASS LESS THAN 18 lb/ft.
8. WHEN THE TOTAL COMBINED WEIGHT OF THE TWO POSTS LOCATED WITHIN 7 FEET OF EACH OTHER EXCEEDS 600 lbs., THE SIGN SHALL BE PLACED WELL OUTSIDE THE CLEAR ZONE OR BE SHIELDED FROM VEHICULAR IMPACT.

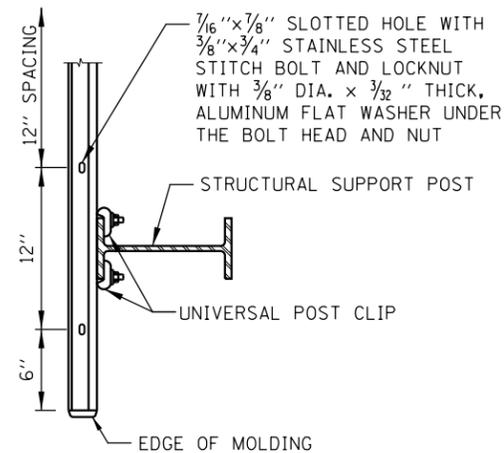




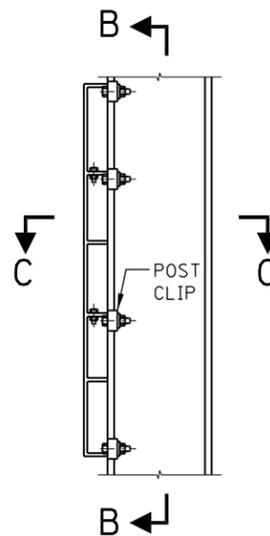
12" PANEL  
TYPE B SIGN PANEL EXTRUSIONS



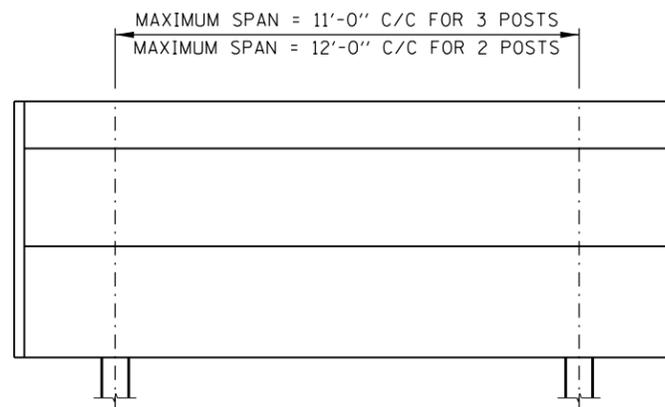
EDGE MOLDING SECTION  
FOR SIGN PANEL



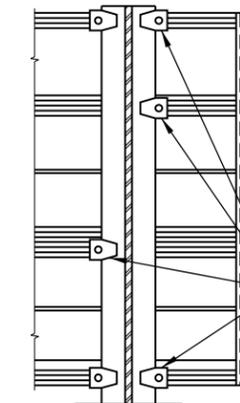
SECTION C-C



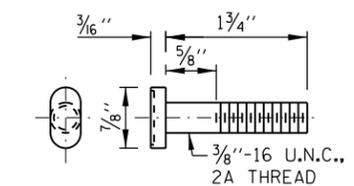
SECTION A-A



FACE OF SIGN PANEL

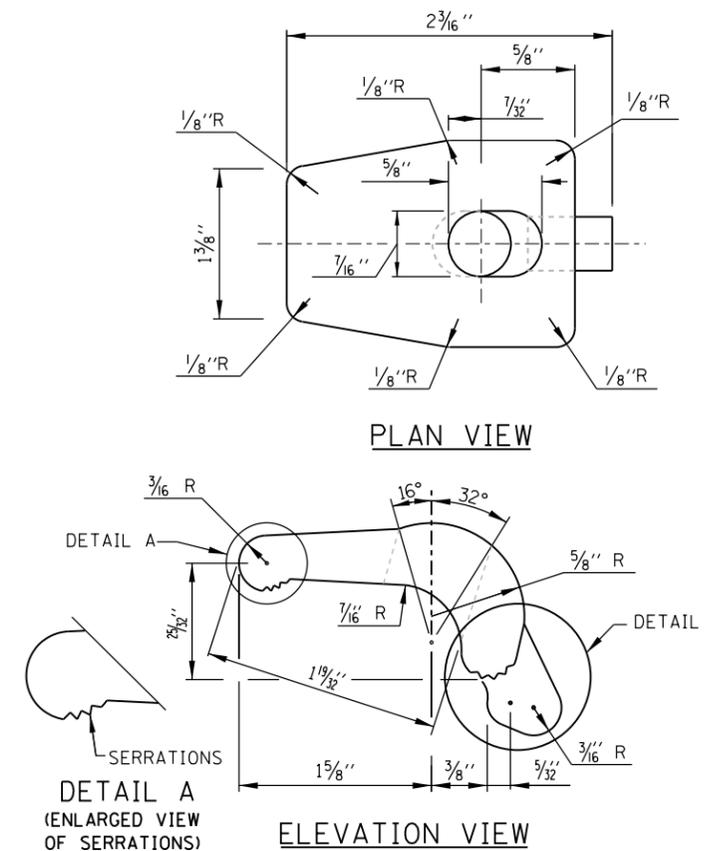


SECTION B-B



POST CLIP BOLT  
STAINLESS STEEL

PROVIDE TWO (2) POST CLIPS AT TOP AND BOTTOM. ALTERNATE INTERIOR POST CLIPS ON SIGNS UNDER 24 FEET LONG AND OVER HEAD MOUNTED SIGNS. DO NOT ALTERNATE INTERIOR CLIPS ON OTHER SIGNS. A 3/8" DIA. x 3/32" THICK, ALUMINUM FLAT WASHER SHALL BE USED UNDER EACH NUT TO PREVENT GOUGING OF THE CLIP.



ALUMINUM CLIP DETAIL

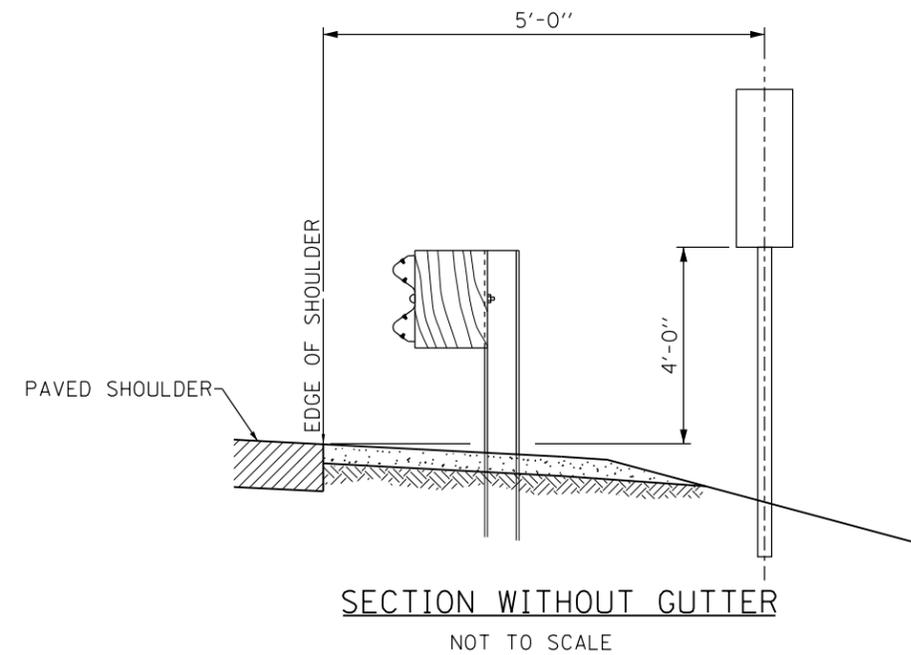
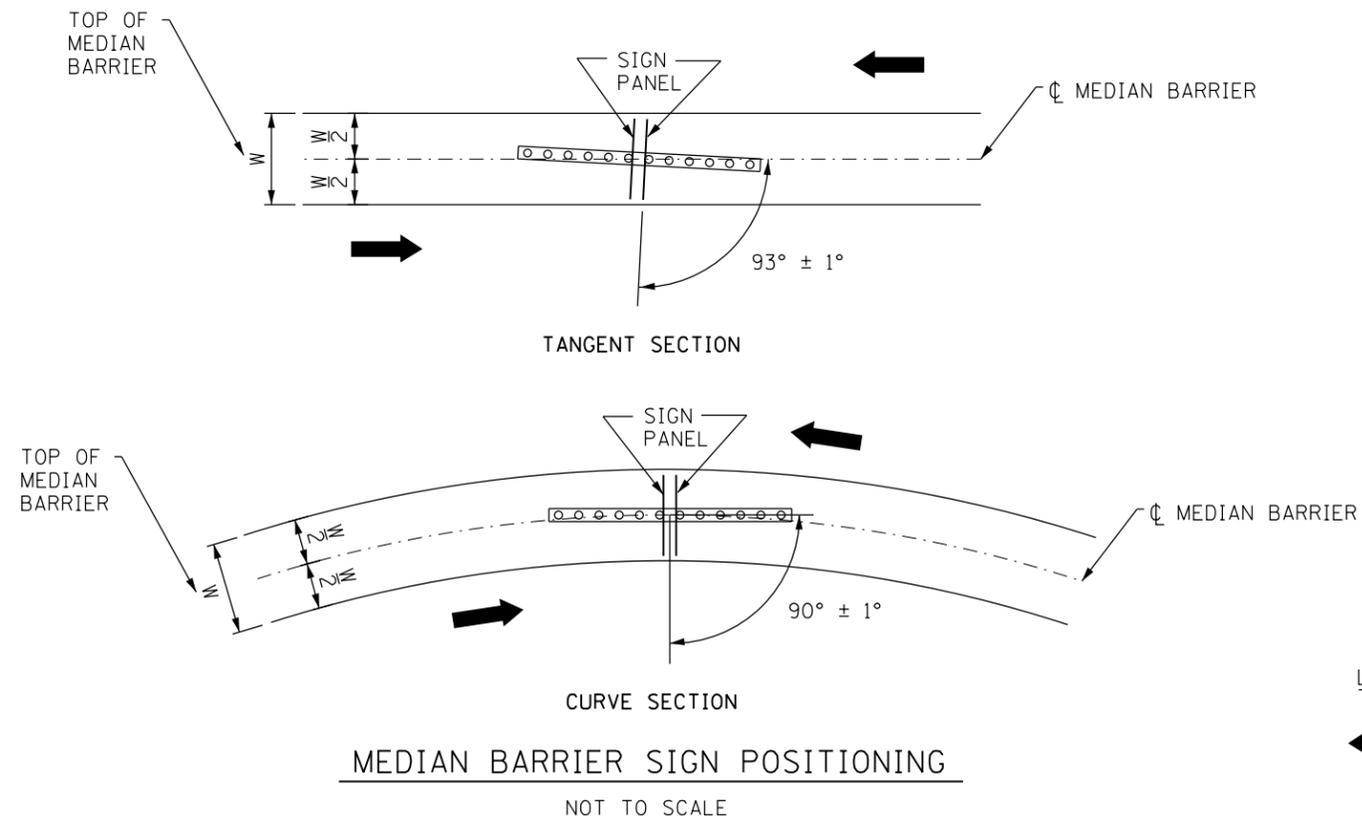
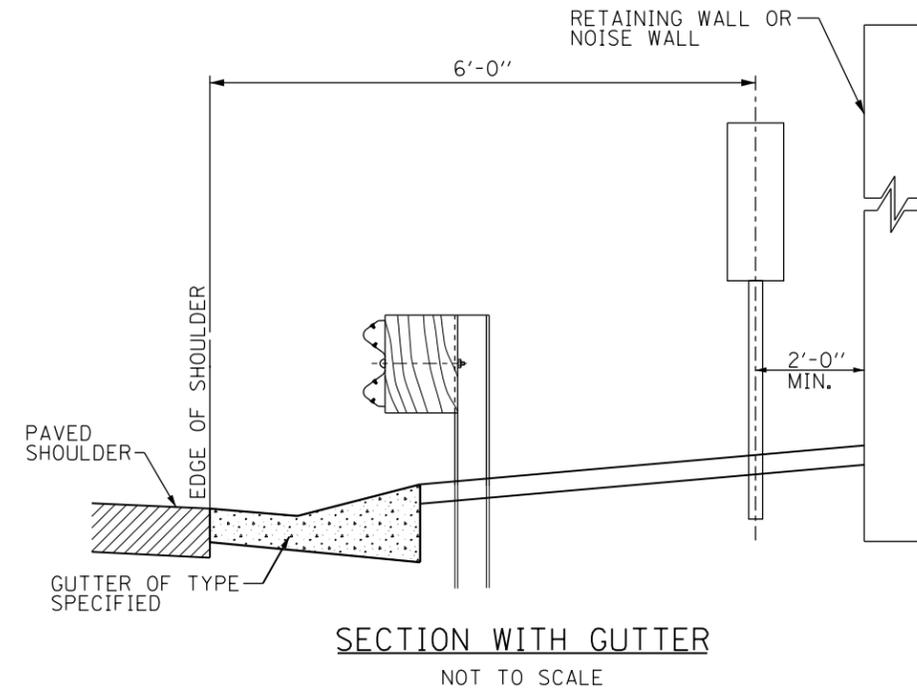
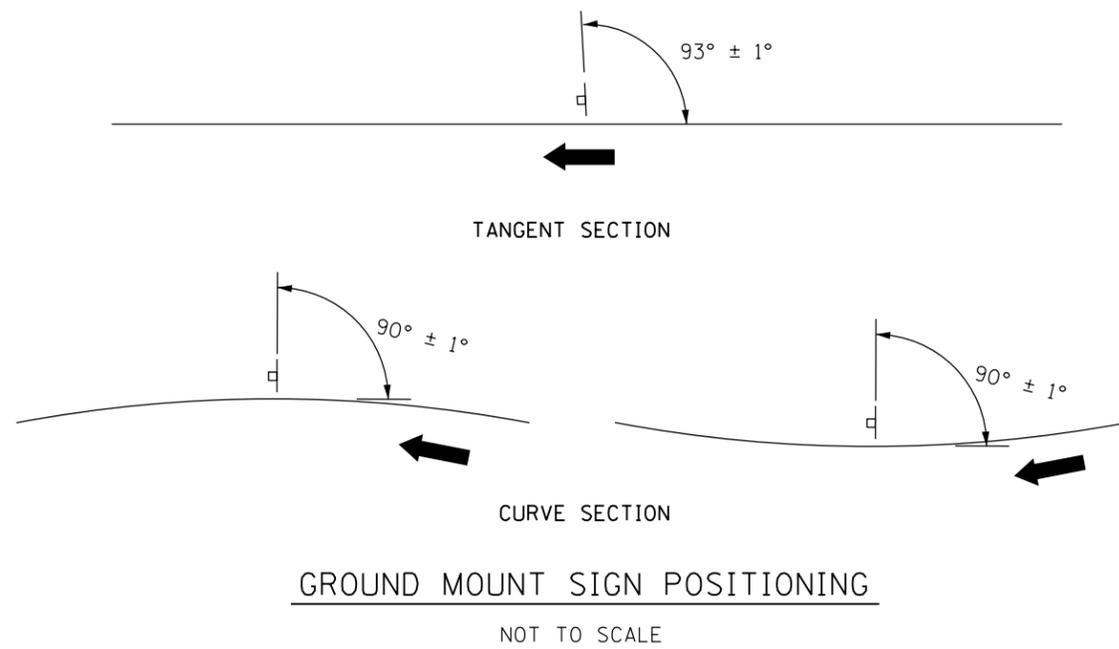
APPROVED, *Paul Kovacs* CHIEF ENGINEER DATE 2-7-2012...

DATE	REVISIONS
1-1-2009	MODIFIED TYPE B SIGN PANEL DIM.
	MODIFIED POST CLIP DETAIL
2-7-2012	REMOVED DETAIL FOR MOUNTING 2 PANEL SIGN
3-11-2015	ADDED WASHERS TO CONNECTION DETAILS



MISCELLANEOUS DETAILS  
AND ALUMINUM SIGN PANELS

STANDARD F10-03



LEGEND:  
 DIRECTION OF TRAFFIC

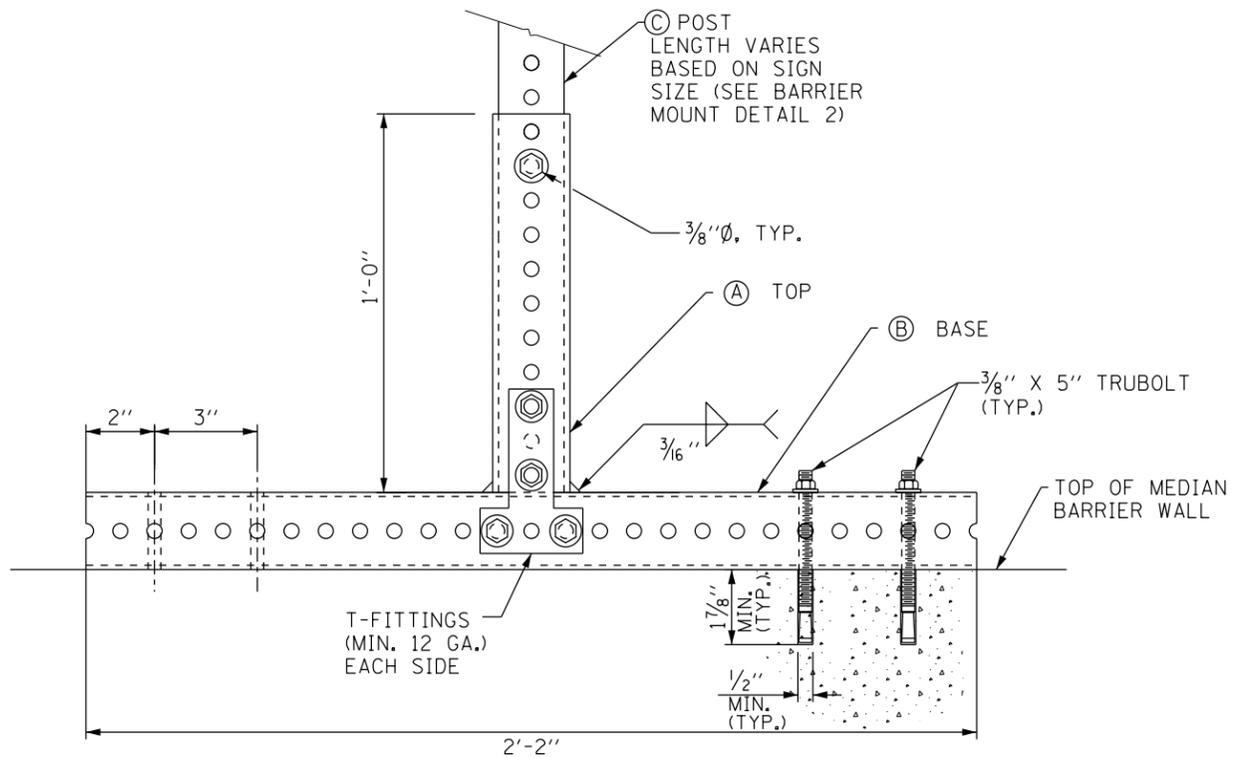


MILEPOST MARKER

STANDARD F11-06

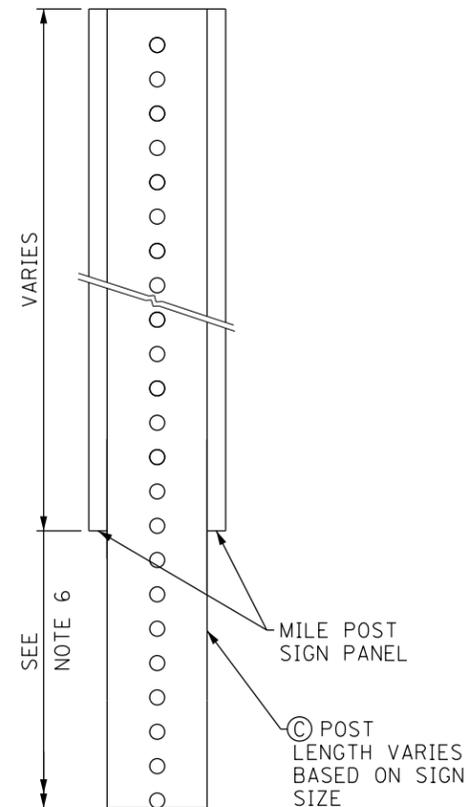
DATE	REVISIONS
5-8-2009	POSITIONING DETAILS
8-1-2009	REVISED BARRIER WALL MOUNT
3-1-2013	REMOVED MILE POST SIGNS
3-31-2016	REVISED BOLT NOTE
3-01-2019	REMOVED "LIGHT POLE/SIGN STRUCTURE MOUNT DETAIL"
12-31-2019	REVISED BARRIER MOUNT DETAIL AND GENERAL NOTES

APPROVED: DATE 4-6-2009  
CHIEF ENGINEER



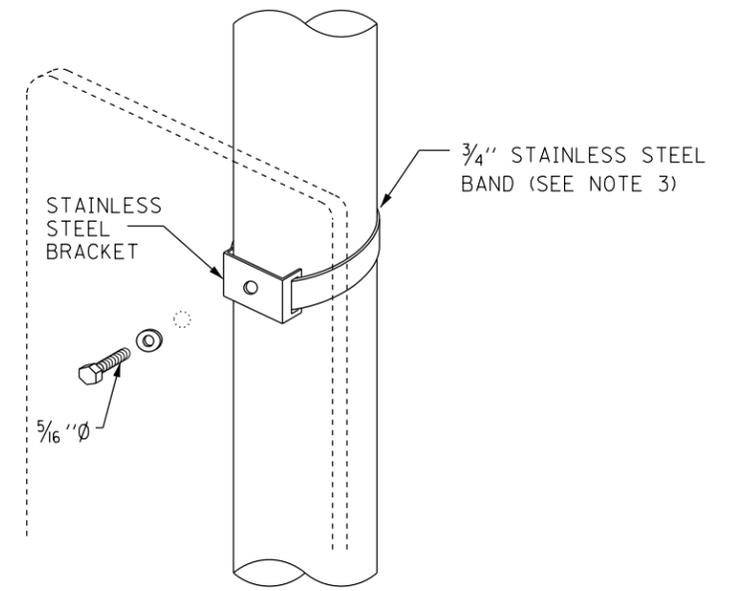
**BARRIER MOUNT DETAIL**

NOT TO SCALE



**BARRIER MOUNT DETAIL 2**

NOT TO SCALE

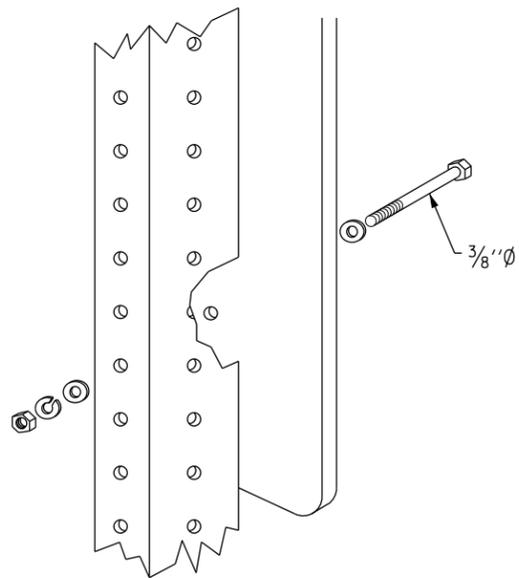


**LIGHT POLE/SIGN STRUCTURE MOUNT DETAIL**

NOT TO SCALE

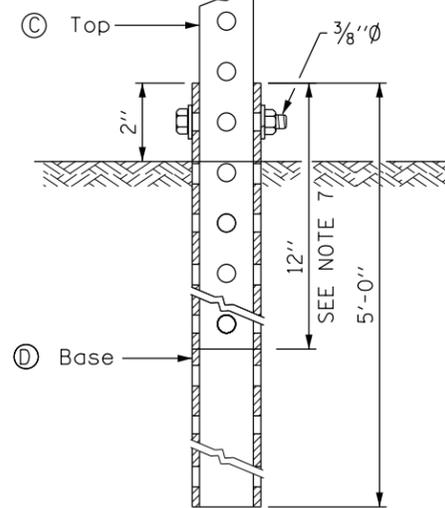
**GENERAL NOTES:**

1. ALL ANCHOR BOLTS FOR MEDIAN BARRIER MOUNT DETAIL SHALL BE 3/8" DIA. RED HEAD "TRUBOLT" OR APPROVED EQUAL.
2. ALL DIMENSIONS ARE IN INCHES UNLESS SHOWN OTHERWISE.
3. FOLLOWING ARE THE STEPS FOR FASTENING THE MILEPOST MARKER SIGN PANEL. ALL MOUNTING DETAILS SHOWN ON THIS SHEET APPLY:
  - a. CENTER ALL FASTENERS ON THE SIGN PANEL.
  - b. START AND FINISH THE FASTENER SPACING USING A MINIMUM OF 3" TO A MAXIMUM OF 6" FROM THE TOP AND BOTTOM EDGE OF THE SIGN PANEL.
  - c. THE DISTANCE BETWEEN SUCCESSIVE FASTENERS SHALL NOT EXCEED 2'-0".
4. CENTER THE 5/16" DIA. BOLT IN THE MIDDLE OF THE SIGN.
5. USE THE SAME ATTACHMENT FOR BACK TO BACK MILEPOST MARKER SIGN.
6. DISTANCE FROM THE EDGE OF SHOULDER TO THE BOTTOM OF THE MILEPOST MARKER SIGN SHALL BE A MINIMUM OF 4'-0" REGARDLESS OF BARRIER TYPE.
7. THE TOP SECTION SHALL BE TELESKOPEDED INTO THE BASE SECTION 12 INCHES AND FASTENED TOGETHER.
8. FOR ATTACHMENT TO BRIDGE PARAPET USE BARRIER WALL MOUNT DETAIL. ONLY ONE PANEL REQUIRED WHEN ATTACHED TO PARAPET ALONG OUTSIDE SHOULDER.
9. BASE AND POST ASSEMBLY SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASTHO M111 OR AS SPECIFIED IN THE SPECIAL PROVISION.



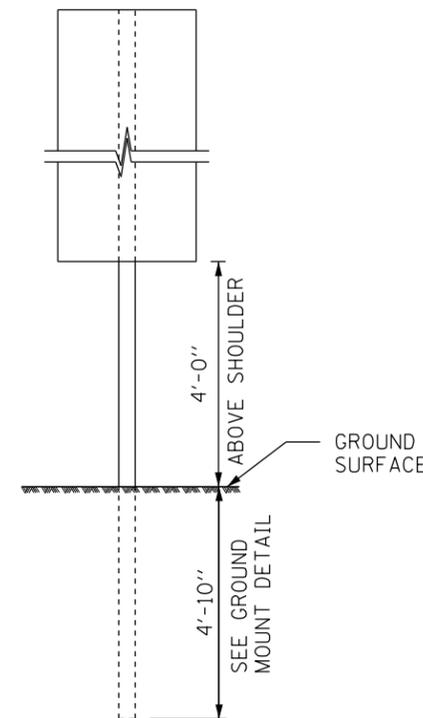
**TELESKOPEDED STEEL POSTS**

NOT TO SCALE



**GROUND MOUNT DETAIL**

NOT TO SCALE

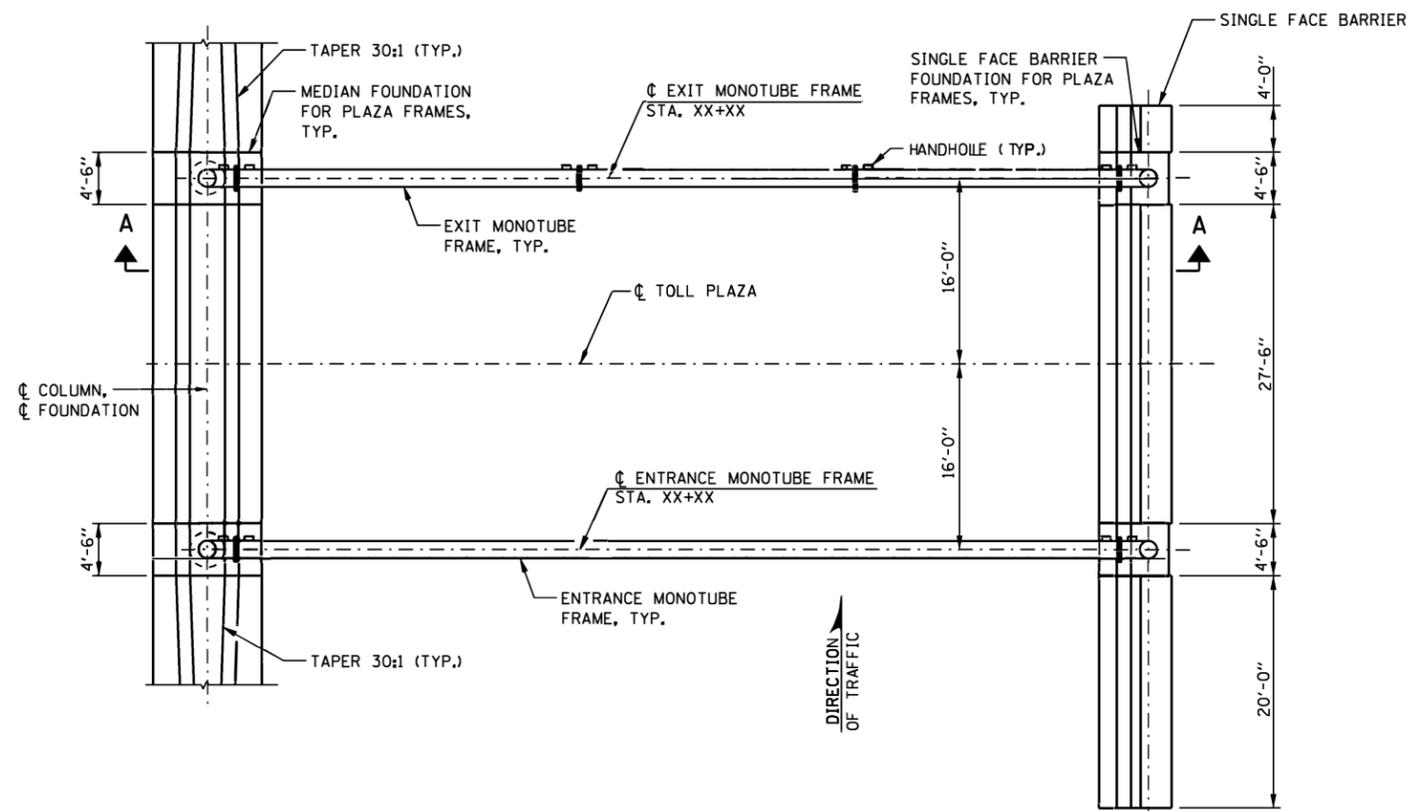


**ONE POST INSTALLATION**

NOT TO SCALE

(A)	2 1/4" x 2 1/4" x 1'-0" (12 GA.)
(B)	2 1/4" x 2 1/4" x 2'-2" (12 GA.)
(C)	2" x 2" x VARIES (12 GA.)
(D)	2 1/4" x 2 1/4" x 5'-0" (12 GA.)

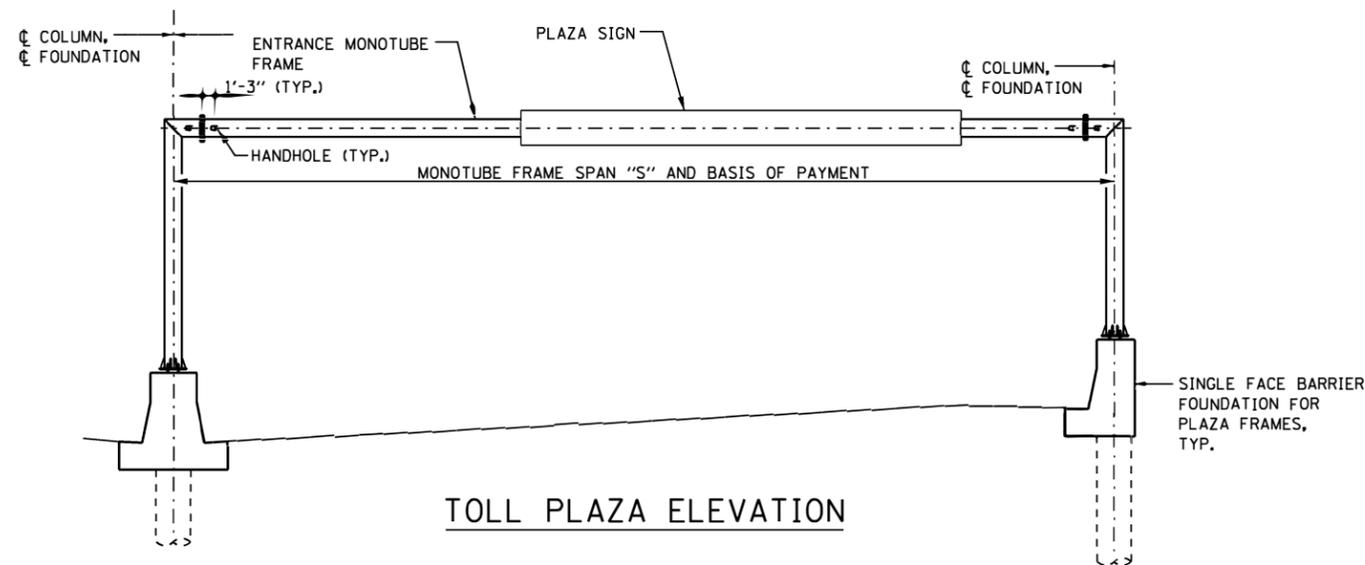




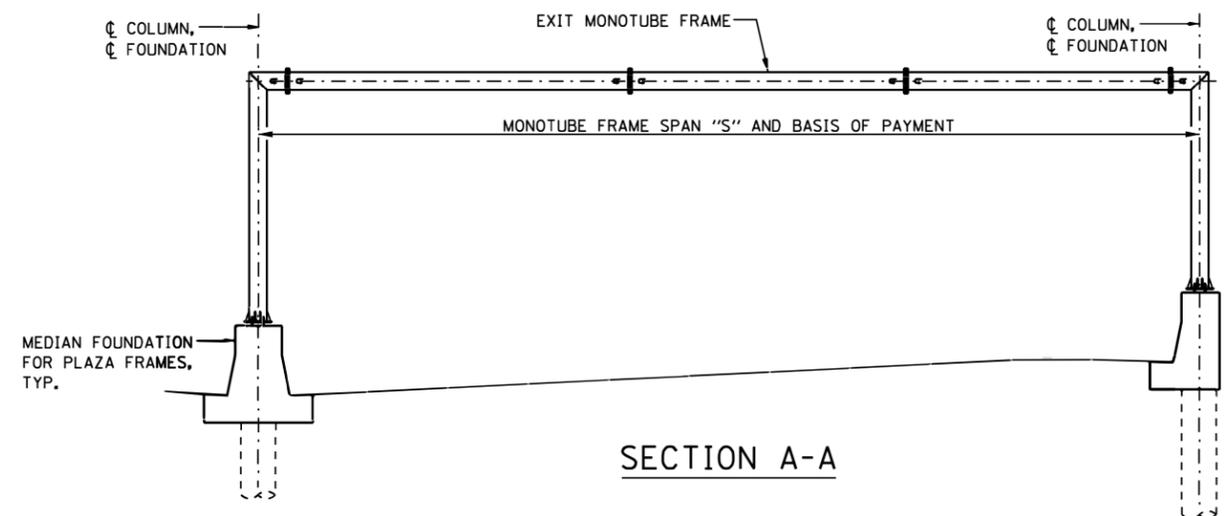
TOLL PLAZA PLAN

**NOTES:**

1. SEE PLANS FOR SIGN SIZE AND LOCATION.
2. MAXIMUM PLAZA SIGN AREA IS 108 SQ. FT.  
MAXIMUM PLAZA SIGN LENGTH IS 36 FT.



TOLL PLAZA ELEVATION



SECTION A-A

DATE	REVISIONS
7-01-2014	ADDED GROUNDING DETAILS.
3-11-2015	ADDED MEDIAN AND NOTES.
3-31-2016	REVISED FOUNDATION NOTE.
3-01-2018	REVISED SIGN STRUCTURE
3-01-2019	UPDATED CONSTANT SLOPE BARRIER, REINFORCING DETAILS AND QUANTITIES
5-24-2019	UPDATED SHOULDER BARRIER DETAILS AND QUANTITIES FOR 3'-8"
2-13-2020	ADDED HANDHOLES, INSTALLATION & INSPECTION NOTES OF ANCHOR BOLT & SPLICES

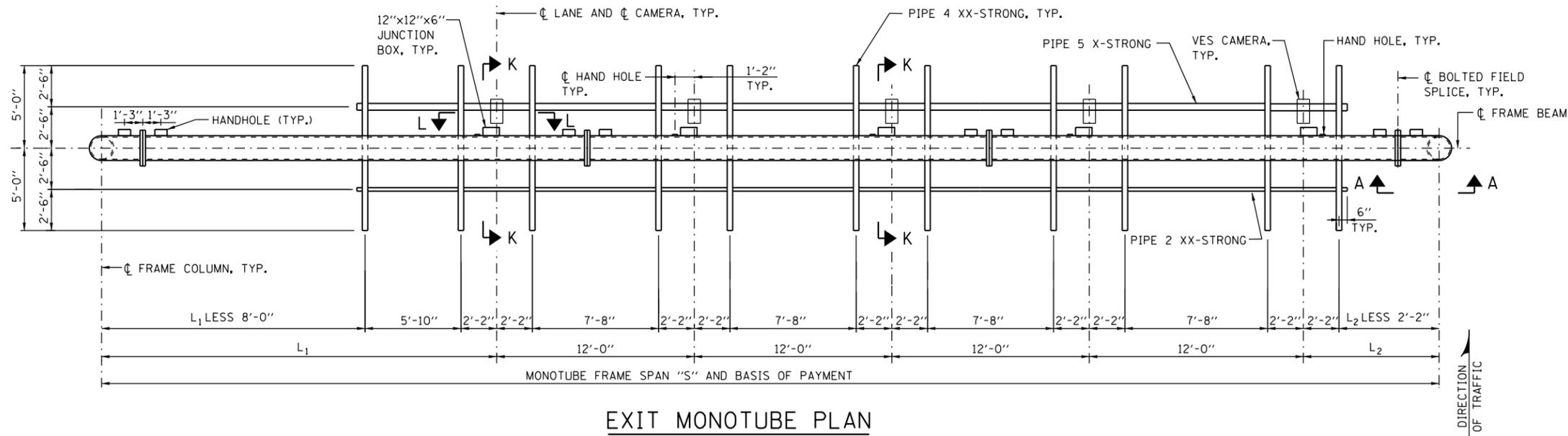


OVERHEAD SIGN STRUCTURE  
MONOTUBE TYPE (STEEL)  
MAINLINE STRUCTURE DETAILS

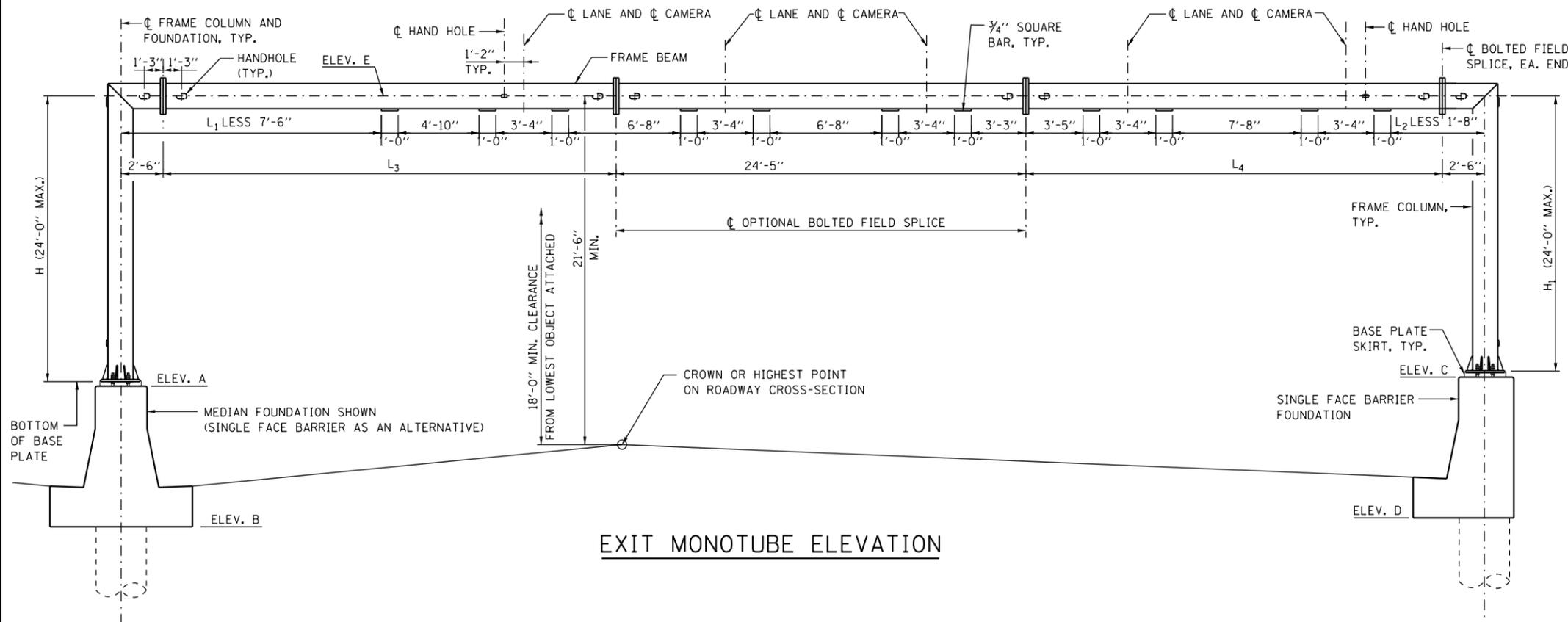
STANDARD F13-06

APPROVED.....  
  
 CHIEF ENGINEERING OFFICER DATE 3-31-2014





**EXIT MONOTUBE PLAN**



**EXIT MONOTUBE ELEVATION**

**NOTES:**

1. SEE SHEET 2 OF THIS SERIES FOR MONOTUBE FRAME TABLE, VIEW L-L, BASE PLATE DETAIL, AND ADDITIONAL NOTES.
2. WORK THIS SHEET WITH, OVERHEAD SIGN STRUCTURES EXIT MONOTUBE TYPE (STEEL) SUMMARY AND TOTAL BILL OF MATERIAL SHEET.



**GENERAL NOTES:**

1. SEE THE ILLINOIS TOLLWAY STRUCTURE DESIGN MANUAL FOR MINIMUM VERTICAL CLEARANCE.
2. AFTER ADJUSTMENTS TO LEVEL FRAME BEAM AND ENSURE ADEQUATE VERTICAL CLEARANCE, TIGHTEN ALL TOP AND LEVELING NUTS AGAINST THE BASE PLATE WITH A MINIMUM TORQUE OF 200 LB.-FT. THEN PLACE STAINLESS STEEL MESH AROUND THE PERIMETER OF THE BASE PLATE. SECURE TO BASE PLATE WITH STAINLESS STEEL BANDING.
3. REINFORCEMENT BARS DESIGNATED "E" SHALL BE EPOXY COATED.

**STRUCTURAL STEEL:**

1. MATERIAL FOR THE MONOTUBE FRAME SHALL CONFORM TO THE REQUIREMENT OF ASTM A500 GRADE B. OTHER STRUCTURAL STEEL SHAPES AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36, UNLESS NOTED OTHERWISE.
2. PIPES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A53 GRADE B.
3. ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F1554 (AASHTO M314) GRADE 55, WITH A MINIMUM TENSILE STRENGTH OF 75,000 PSI. INSTALLATION AND INSPECTION OF ANCHOR BOLTS SHALL COMPLY WITH ILLINOIS TOLLWAY SPECIAL PROVISION "INTELLIGENT TRANSPORTATION SYSTEMS GANTRY FRAME "STEEL". ANCHORS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 (AASHTO M232). SEE SHEET 6 OF THIS SERIES FOR GALVANIZED LENGTH.
4. U-BOLTS SHALL BE STAINLESS STEEL AND SHALL CONFORM TO ASTM 193, CLASS I, GRADE B8 (AISI TYPE 304). WASHERS FOR U-BOLTS SHALL CONFORM TO ASTM A240, TYPE 302. NUTS FOR U-BOLTS SHALL CONFORM TO ASTM A194 (AASHTO M292), GRADE 8F (AISI TYPE 303).
5. BOLTS (EXCLUDING ANCHOR BOLTS AND U-BOLTS) SHALL BE HIGH STRENGTH AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM A325 (AASHTO M164). THEY SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 (AASHTO M232).
6. NUTS SHALL CONFORM TO ASTM A563 GRADE DH AND GALVANIZED ACCORDING TO ASTM A153 (AASHTO M232).
7. HARDENED STEEL WASHERS SHALL CONFORM TO ASTM F436 AND GALVANIZED ACCORDING TO ASTM A153 (AASHTO M232).
8. TUBES FOR MONOTUBE FRAME, PIPES, STRUCTURAL STEEL SHAPES AND PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 AFTER FABRICATION.
8. THE MONOTUBE FRAME BEAM, COLUMNS, BASE PLATE MATERIAL, AND SPLICES ARE CONSIDERED TENSION MEMBERS AND SHALL CONFORM TO THE IMPACT TESTING REQUIREMENT, ZONE 2.
10. WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS USING E70-XX ELECTRODES, AND SHALL CONFORM TO AWS D1.1-08 "STRUCTURAL WELDING CODE - STEEL". ALL WELDS ON ARCHITECTURAL EXPOSED STEEL (AES) MEMBERS ARE TO BE GROUND SMOOTH AND FILLED.

**DESIGN LOADING:**

WIND LOAD CRITERIA  
 BASIC WIND SPEED = 90 MPH  
 G = 1.14  
 I<sub>r</sub> = 1.00 (50 YR. RECURRENCE INTERVAL)

**EQUIPMENT LOADS:**

CAMERA ASSEMBLY 8 LB.  
 ANTENNA 20 LB.

**DESIGN STRESSES FOR REINFORCED CONCRETE:**

f'<sub>c</sub> = COMPRESSIVE STRENGTH OF CONCRETE AT 14 DAYS (CLASS S1) = 3,500 P.S.I.  
 f'<sub>c</sub> = COMPRESSIVE STRENGTH OF CONCRETE AT 14 DAYS (CLASS DS) = 4,000 P.S.I.  
 f<sub>y</sub> = YIELD STRENGTH OF REINFORCEMENT BARS (GRADE 60) = 60,000 P.S.I.

**FOUNDATION:**

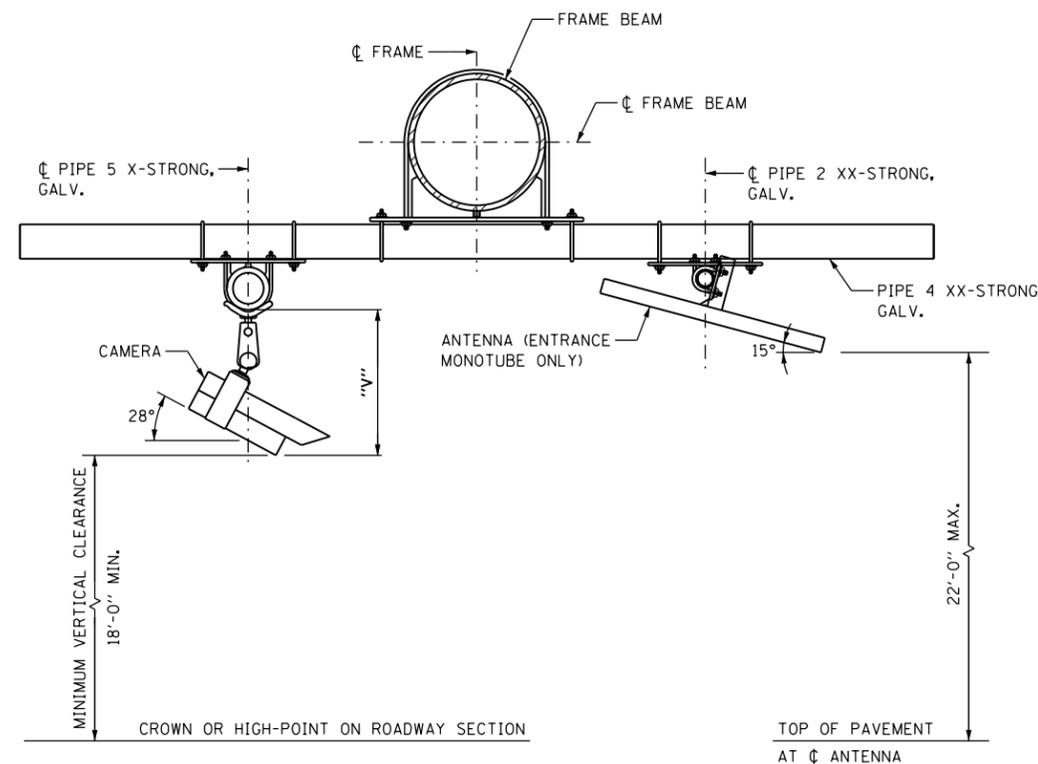
MINIMUM UNCONFINED COMPRESSIVE STRENGTH, Q<sub>u</sub> FOR ALL LAYERS OF COHESIVE SOILS (CLAYS) SHALL BE 1.25 TON/SQ.FT. AT PLAZA FRAMES.

**DESIGN SPECIFICATIONS:**

1. ILLINOIS TOLLWAY STRUCTURE DESIGN MANUAL, LATEST EDITION.
2. AASHTO STANDARD SPECIFICATION FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 6TH EDITION.
3. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6TH EDITION DATED FEBRUARY 2012.
4. ILLINOIS DEPARTMENT OF TRANSPORTATION BRIDGE MANUAL, JANUARY 2012

**CONSTRUCTION SPECIFICATIONS:**

1. ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS TO THE ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.
2. ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.



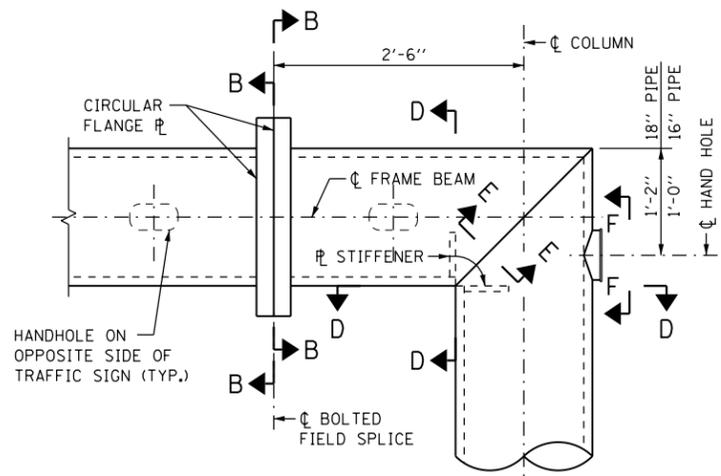
**NOTE:**

VERIFY DIMENSION "V" WITH CAMERA MANUFACTURER.

APPROVED: *Paul Kovacs* DATE 3-31-2014  
 CHIEF ENGINEERING OFFICER

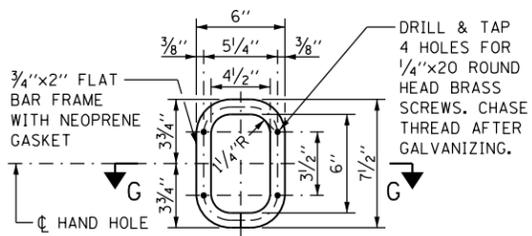
**SECTION P-P**





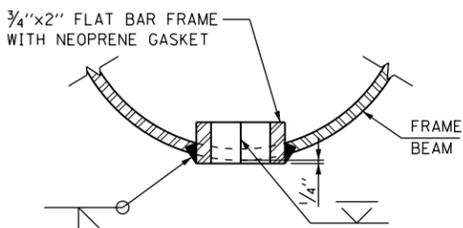
SECTION A-A

(SEE SHEET 1 OF THIS SERIES FOR LOCATION)



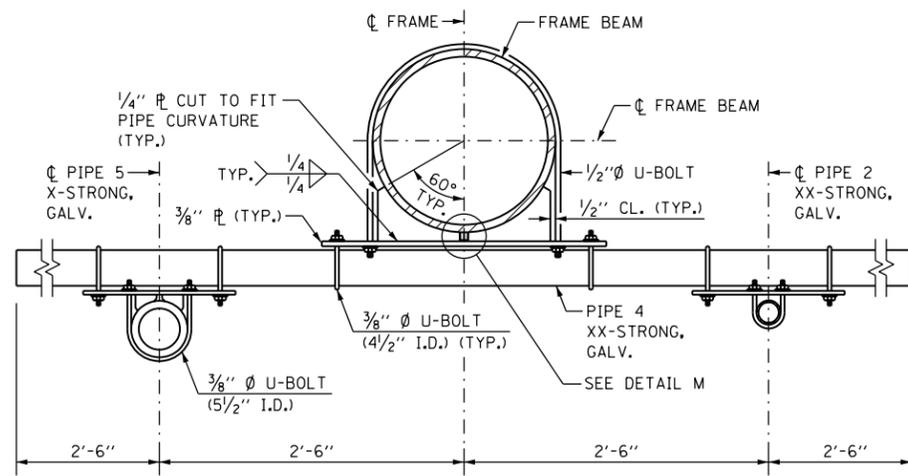
SECTION F-F

PROVIDE 6" x 7 1/2" #10 GA. COVER. ROUND CORNERS TO 2" RADIUS. PROVIDE FOUR 3/8" Ø HOLES.

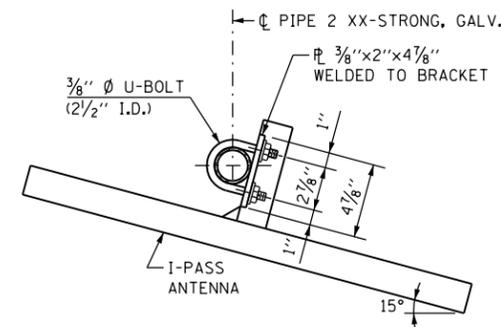


SECTION G-G

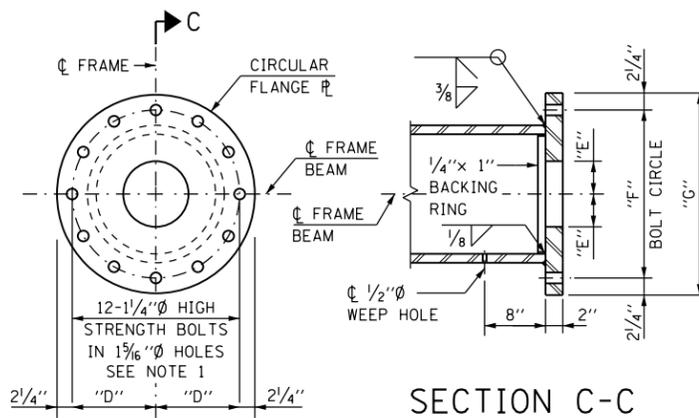
FRAME BEAM	"D"	"E"	"F"	"G"
HSS 16x0.500	10"	6"	1'-8"	2'-0 1/2"
HSS 18x0.500	11"	6"	1'-10"	2'-2 1/2"



SECTION K-K



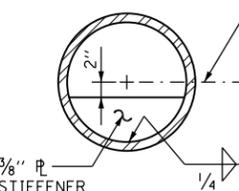
ANTENNA HANGER



SECTION C-C

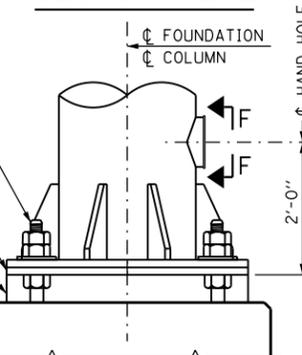
NOTE 1: INSTALLATION AND INSPECTION OF SPLICE BOLTS SHALL COMPLY WITH ILLINOIS TOLLWAY SPECIAL PROVISION "INTELLIGENT TRANSPORTATION SYSTEMS GANTRY FRAME (STEEL)".

SECTION B-B

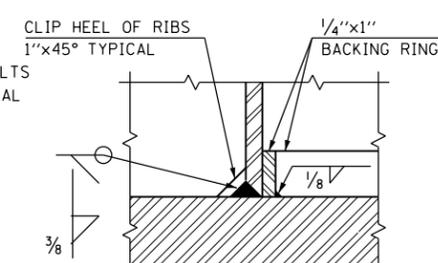


SECTION D-D

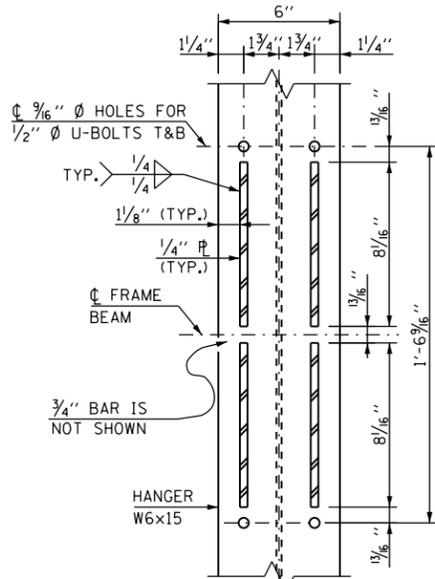
SECTION E-E



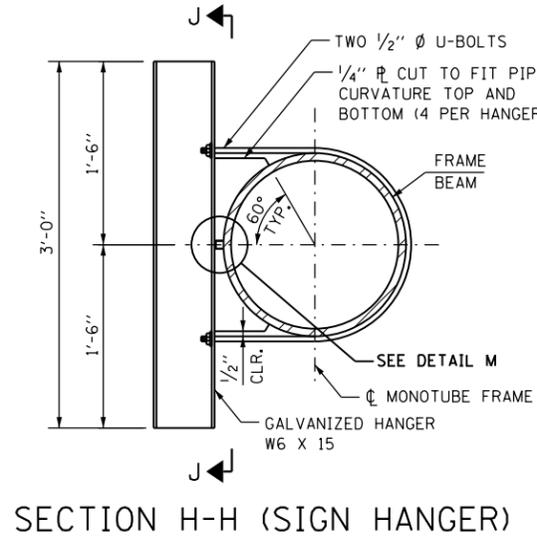
COLUMN BASE



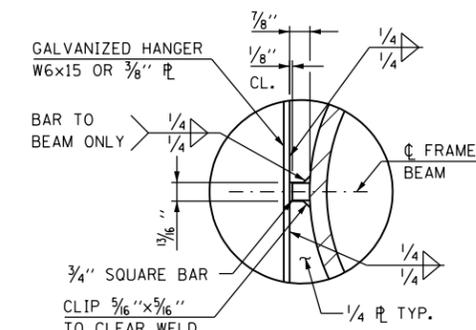
DETAIL T



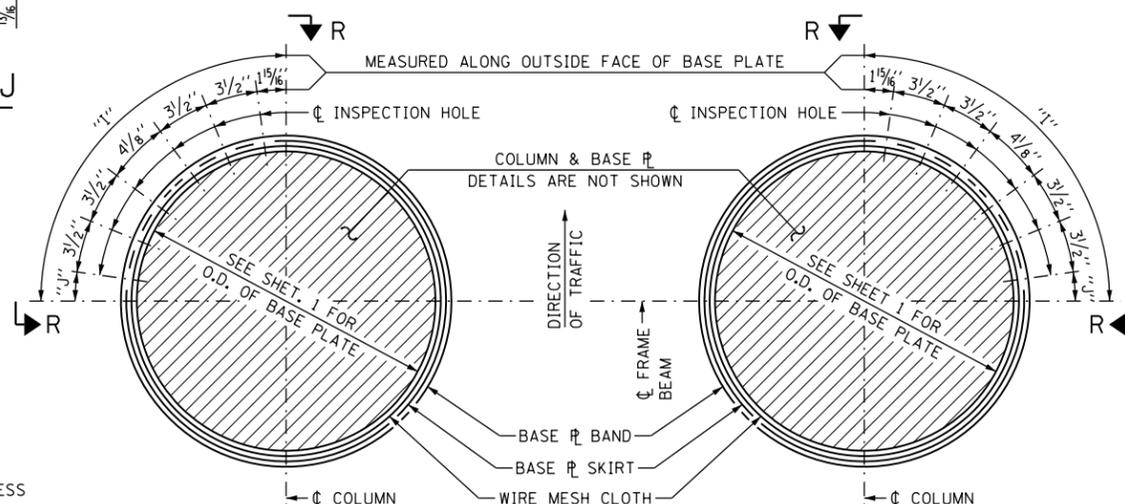
SECTION J-J



SECTION H-H (SIGN HANGER)



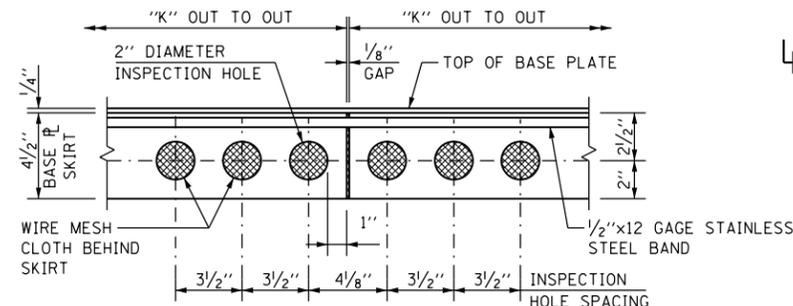
DETAIL M



LEFT BASE PLATE

RIGHT BASE PLATE

COLUMN BASE PLATE PLAN



VIEW R-R (BASE PLATE SKIRT)

FRAME COLUMN	"I"	"J"	"K"
HSS 16x0.500	1'-8 7/16"	3/8"	6'-9 9/16"
HSS 18x0.500	1'-10"	1 1/8"	7'-3 7/8"

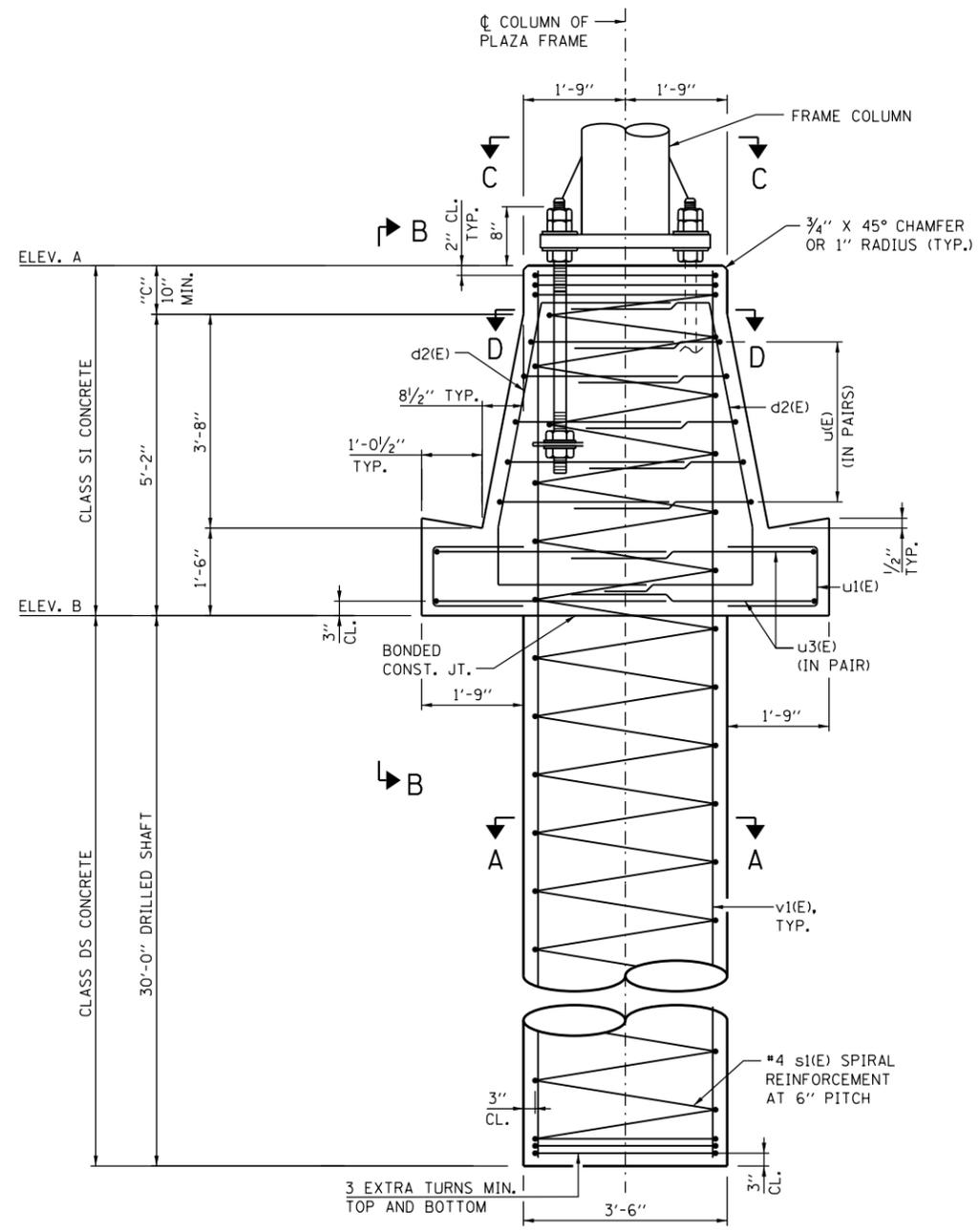
**Illinois Tollway**

OVERHEAD SIGN STRUCTURE  
MONOTUBE TYPE (STEEL)  
MAINLINE STRUCTURE DETAILS

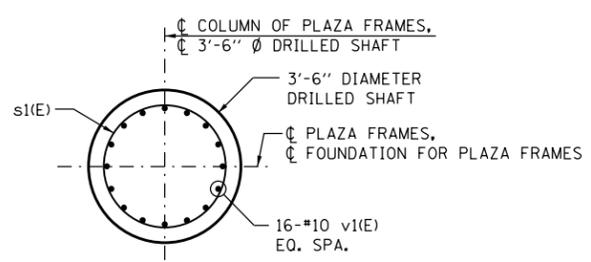
STANDARD F13-06

Paul Kovacs  
APPROVED... CHIEF ENGINEERING OFFICER  
DATE 3-31-2014

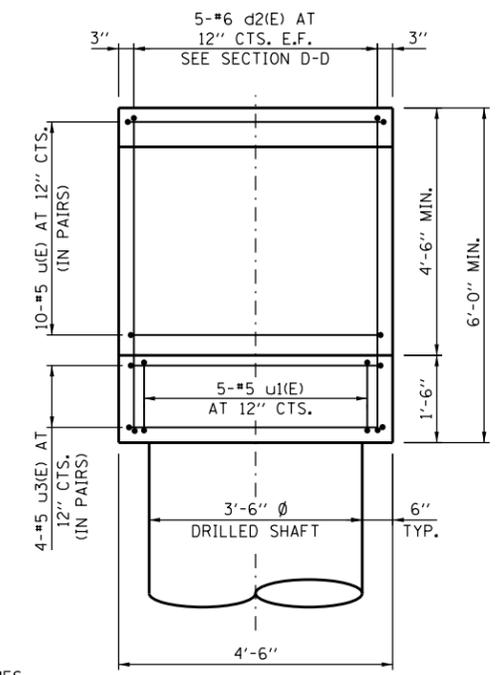




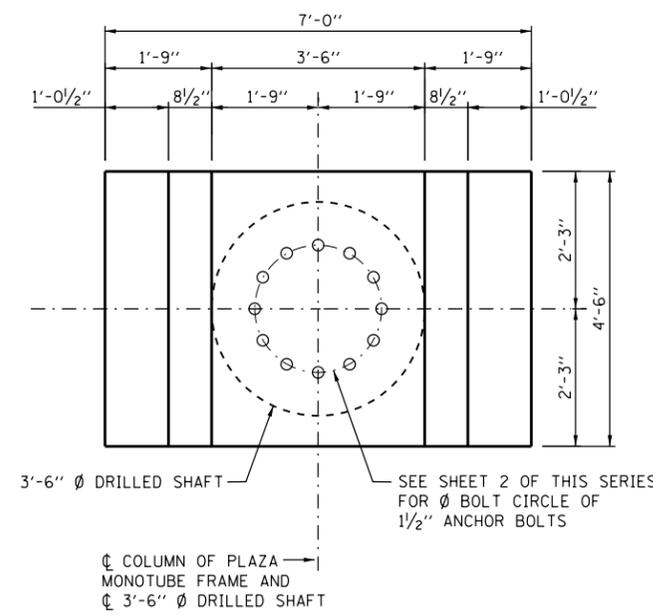
MEDIAN FOUNDATION FOR PLAZA FRAMES



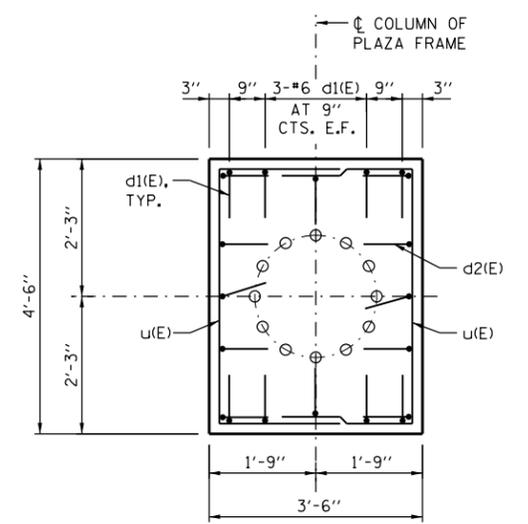
SECTION A-A



VIEW B-B



VIEW C-C



SECTION D-D

- NOTES:**
1. ANCHOR BOLT ASSEMBLY DETAIL, ANCHOR PLATE DETAIL AND BAR BENDING DIAGRAMS AND QUANTITIES ARE SHOWN ON SHEET 6 OF THIS SERIES.
  2. SEE SHEET 6 OF THIS SERIES FOR ADDITIONAL NOTES.
  3. SITE GROUNDING ELECTRODE SYSTEM TO BE PROVIDED AS INDICATED ON THE PLANS.

**LEGEND:**  
 E.F. - EACH FACE  
 CTS. - CENTERS

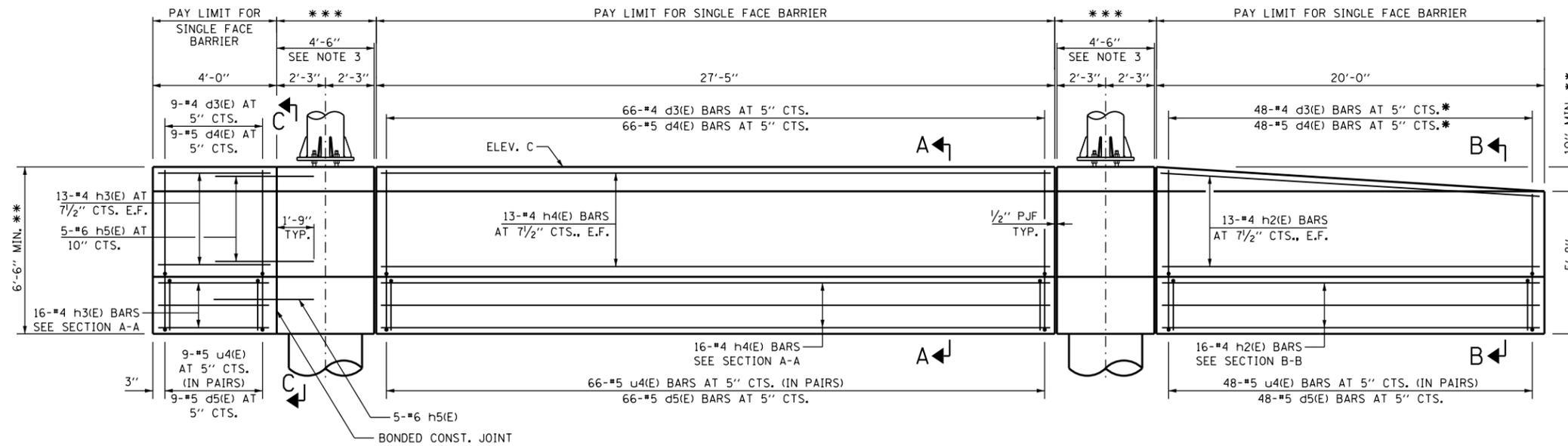
Paul Kovacs  
 APPROVED... DATE 3-31-2014  
 CHIEF ENGINEERING OFFICER

SHEET 7 OF 8



OVERHEAD SIGN STRUCTURE  
 MONOTUBE TYPE (STEEL)  
 MAINLINE STRUCTURE DETAILS

STANDARD F13-06



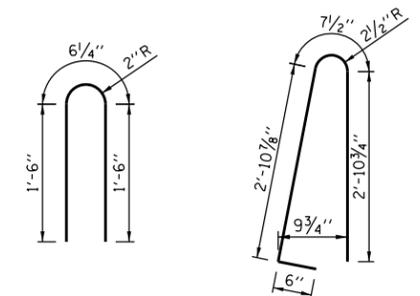
**SINGLE FACE BARRIER ELEVATION**

INSIDE FACE BARRIER IS SHOWN

- \* CUT IN FIELD AS REQUIRED TO FIT TAPER
- \*\* BASED ON DIMENSION "C" = 10'
- \*\*\* PAY LIMIT FOR FOUNDATION FOR OVERHEAD SIGN STRUCTURE

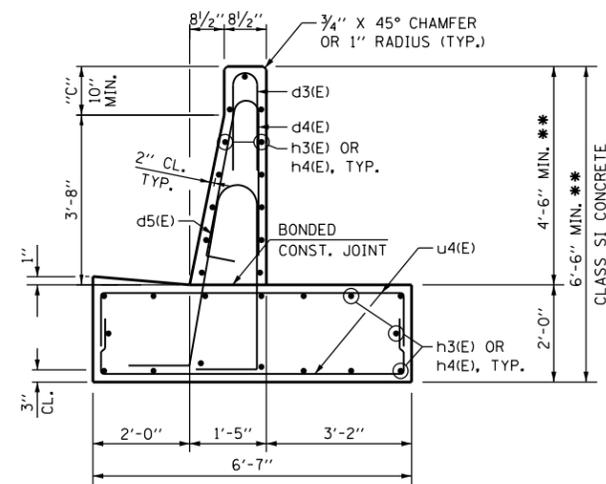
**BAR LIST - ONE BARRIER**

BAR	NO.	SIZE	LENGTH	SHAPE
d3(E)	123	#4	3'-7"	U
d4(E)	123	#5	7'-0"	U
d5(E)	123	#5	9'-10"	U
h2(E)	29	#4	19'-7"	I
h3(E)	29	#4	2'-8"	I
h4(E)	29	#4	27'-1"	I
h5(E)	10	#6	3'-9"	I
u4(E)	246	#5	9'-3"	L

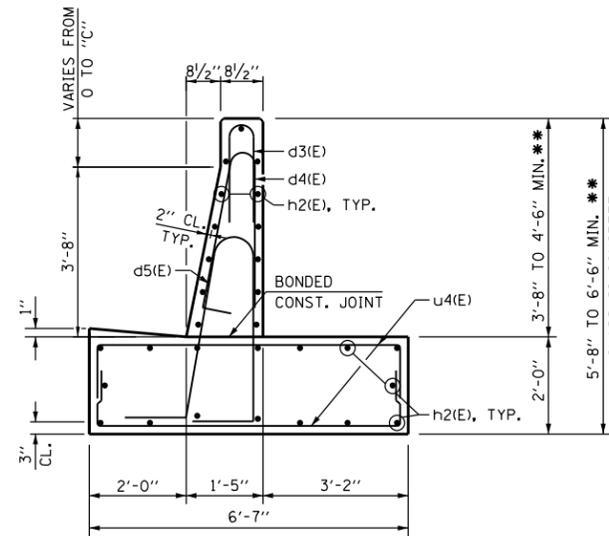


BAR d3(E)

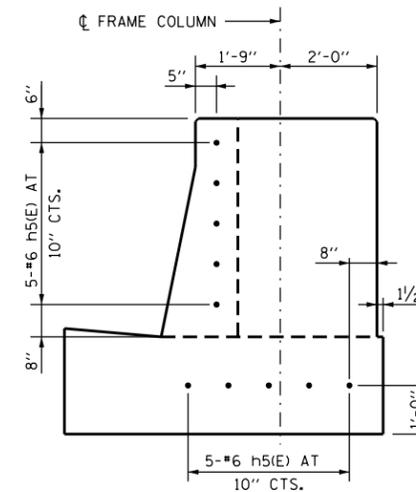
BAR d4(E)



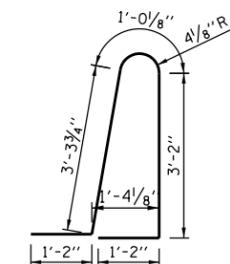
SECTION A-A



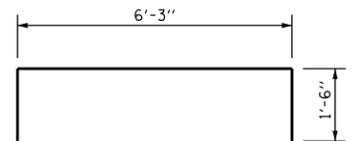
SECTION B-B



SECTION C-C



BAR d5(E)



BAR u4(E)

**ESTIMATED QUANTITY**

(FOR ONE SINGLE FACE BARRIER)

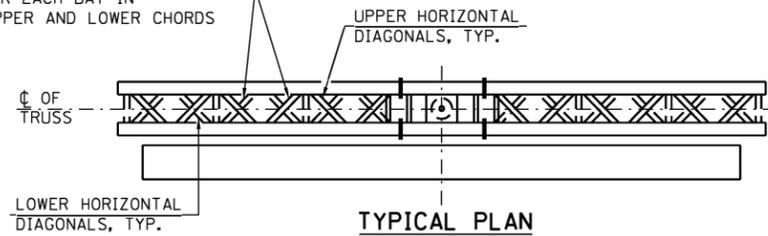
ITEM	UNIT	TOTAL
CONCRETE STRUCTURES	CU. YD.	33.6
REINFORCEMENT BARS, EPOXY COATED	POUND	5,840
PROTECTIVE COAT	SQ. YD.	40.7

**NOTES:**

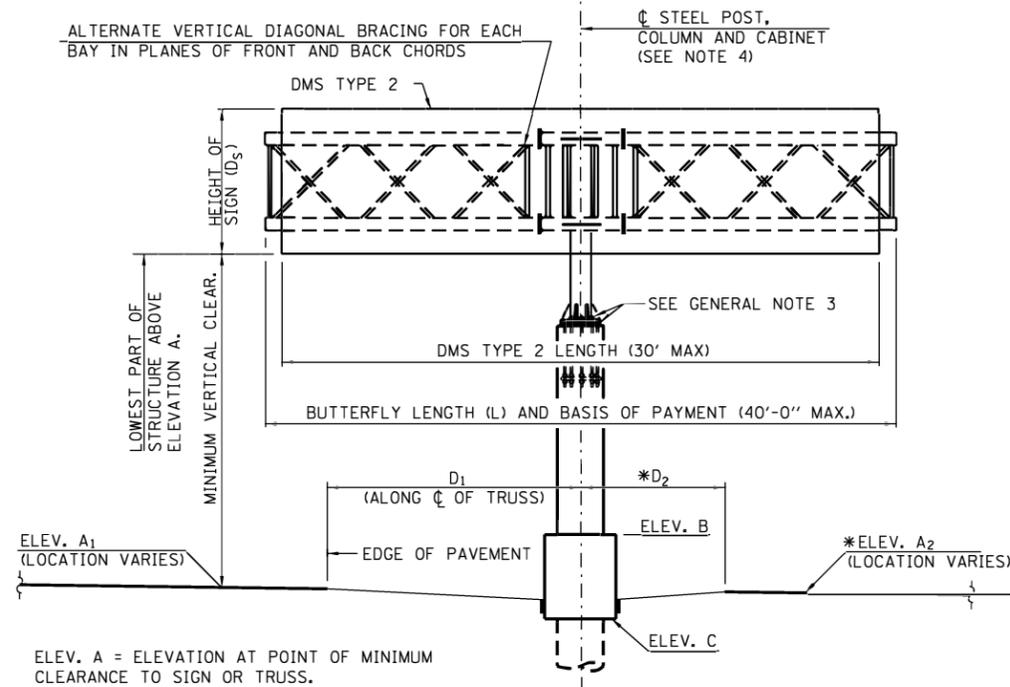
1. PROTECTIVE COAT SHALL BE APPLIED TO THE TRAFFIC AND TOP FACES OF THE BARRIER, TOP FACE OF THE GUTTER AND TO THE ENTRANCE SIDE FACE (AT THE BEGINNING OF THE PLAZA PAVEMENT) FOR THE FULL HEIGHT OF THE BARRIER.
2. FOR LOCATION OF ELECTRICAL JUNCTION BOXES ON THE WALL, SEE ELECTRICAL DETAIL SHEETS.
3. FOR SINGLE FACE BARRIER FOUNDATION DETAILS FOR PLAZA FRAMES SEE SHEET 6 OF THIS SERIES.
4. QUANTITIES FOR SINGLE FACE BARRIER ARE DETERMINED USING "C" = 10". IF DIMENSION "C" IS GREATER THAN 10", ADJUST QUANTITIES ACCORDINGLY.



ALTERNATE DIRECTION OF HORIZONTAL DIAGONALS FOR EACH BAY IN PLANES OF UPPER AND LOWER CHORDS



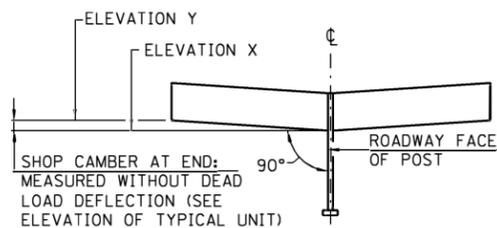
ALTERNATE VERTICAL DIAGONAL BRACING FOR EACH BAY IN PLANES OF FRONT AND BACK CHORDS



\* ELEVATION A<sub>2</sub> AND DIMENSION D<sub>2</sub> NOT USED WHEN BUTTERFLY STRUCTURE IS MOUNTED ON RIGHT SIDE OF THE SHOULDER.

**SHOP CAMBER TABLE**

UNIT LENGTH L <sub>1</sub> OR L <sub>2</sub>	SHOP CAMBER AT END
15'	1/4"
20'	1/2"
25'	3/4"

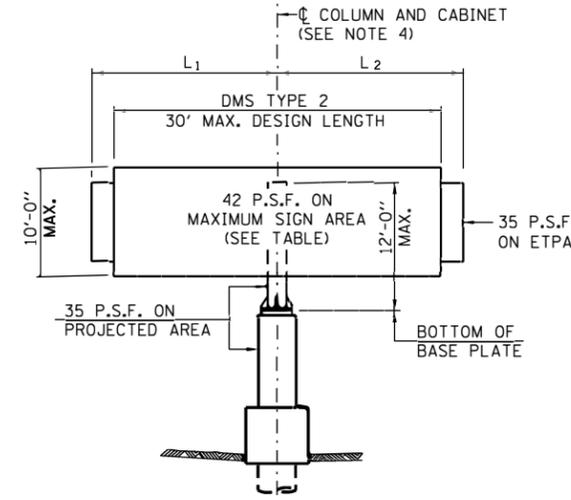


**CAMBER DIAGRAM**  
(FOR FABRICATION ONLY)

APPROVED: *Paul Kovacs* DATE 3-31-2014.  
CHIEF ENGINEERING OFFICER

**DMS TYPE 2 TABLE**

TRUSS MOUNTING	MAXIMUM TOTAL AREA	MAXIMUM ALLOWABLE WEIGHT
ONE FACE	300 SQ. FT.	5000 LB. - CENTERED ON STRUCTURE
TWO FACE	300 SQ. FT.	6000 LB. - CENTERED ON STRUCTURE



**DESIGN WIND LOADING DIAGRAM**  
ETPA = EFFECTIVE TRUSS PROJECTED AREA

**FABRICATION NOTES:**

- MATERIALS:** ALL STRUCTURAL STEEL PIPE SHALL BE ASTM A53 GRADE B OR ASTM A106 GRADE B OR API 5L GRADE X42 OR API 5L GRADE X52. ALL STRUCTURAL STEEL TUBE SHALL CONFORM TO ASTM A500 GRADE B. ALL STRUCTURAL STEEL PLATES AND SHAPE SHALL CONFORM TO AASHTO M270 GRADE 50 (M183 OR M223 GRADE 50). STAINLESS STEEL FOR SHIMS, SLEEVES AND HANDHOLE COVERS SHALL BE ASTM A240, TYPE 302 OR 304, OR ANOTHER ALLOY SUITABLE FOR EXTERIOR EXPOSURE AND ACCEPTABLE TO THE ENGINEER. THE STEEL PIPE AND STIFFENING RIBS AT THE BASE PLATE FOR THE COLUMN SHALL HAVE A MINIMUM LONGITUDINAL CHARPY V-NOTCH (CVN) ENERGY OF 15 LB.-FT. AT 40° F (ZONE 2) BEFORE GALVANIZING.
- WELDING:** ALL WELDS TO BE CONTINUOUS UNLESS OTHERWISE SHOWN. ALL WELDING TO BE DONE IN ACCORDANCE WITH CURRENT AWS D1.1 STRUCTURAL WELDING CODE AND THE STANDARD SPECIFICATIONS.
- FASTENERS:** HIGH STRENGTH BOLTS SHALL SATISFY THE REQUIREMENTS OF AASHTO M164 (ASTM A325), OR APPROVED ALTERNATE, AND SHALL HAVE MATCHING LOCKNUTS. THREADED STUDS FOR SPLICES (IF MEMBERS INTERFERE) SHALL SATISFY THE REQUIREMENTS OF ASTM A449, ASTM A193, GRADE B7, OR APPROVED ALTERNATE, AND SHALL HAVE MATCHING LOCKNUTS. BOLTS AND LOCKNUTS NOT REQUIRED TO BE HIGH STRENGTH SHALL SATISFY THE REQUIREMENTS OF ASTM A307. ALL BOLTS AND LOCKNUTS SHALL BE HOT DIP GALVANIZED PER AASHTO M232, EXCEPT STAINLESS STEEL FASTENERS, NUTS AND WASHERS. THE LOCKNUTS SHALL HAVE NYLON OR STEEL INSERTS. A STAINLESS STEEL FLAT WASHER CONFORMING TO ASTM A240 TYPE 302 OR 304, IS REQUIRED UNDER BOTH HEAD AND NUT OR UNDER BOTH NUTS WHERE THREADED STUDS ARE USED. HIGH STRENGTH BOLT INSTALLATION SHALL CONFORM TO ARTICLE 505.04(f)(2)d OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. ROTATIONAL CAPACITY ("ROCAP") TESTING OF BOLTS WILL NOT BE REQUIRED.
- U-BOLTS & EYEBOLTS:** U-BOLTS AND EYEBOLTS SHALL BE PRODUCED FROM ASTM A276 TYPE 304, 304L, 316 OR 316L, CONDITION A, COLD FINISHED STAINLESS STEEL, OR AN EQUIVALENT MATERIAL ACCEPTABLE TO THE ENGINEER. ALL NUTS FOR U-BOLTS AND EYEBOLTS SHALL BE LOCK NUTS EQUIVALENT TO ASTM A307 WITH NYLON OR STEEL INSERTS AND HOT DIP GALVANIZED PER AASHTO M232. A STAINLESS STEEL FLAT WASHER CONFORMING TO ASTM A240, TYPE 302 OR 304, IS REQUIRED UNDER EACH U-BOLT AND EYEBOLT LOCKNUT.
- GALVANIZING:** ALL STEEL PLATES, SHAPES AND PIPE SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111. PAINTING IS NOT PERMITTED.
- ANCHOR BOLTS:** SHALL CONFORM TO AASHTO M314 OR ASTM F1554 GRADE 55.

**GENERAL NOTES:**

- WORK THIS SHEET WITH OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE (STEEL) SUMMARY AND TOTAL BILL OF MATERIAL SHEET.
- AFTER ADJUSTMENTS TO LEVEL TRUSS AND ENSURE ADEQUATE VERTICAL CLEARANCE, ALL TOP AND BOTTOM LEVELING NUTS SHALL BE TIGHTENED AGAINST THE BASE PLATE WITH A MINIMUM TORQUE OF 200 LB.-FT. STAINLESS STEEL MESH SHALL THEN BE PLACED AROUND THE PERIMETER OF THE BASE PLATE. SECURE TO BASE PLATE WITH STAINLESS STEEL BANDING.
- CENTERLINE DMS TYPE 2 SHALL BE LOCATED AT CENTERLINE OF COLUMN.
- SIGN SUPPORT STRUCTURES MAY BE SUBJECT TO DAMAGING VIBRATIONS AND OSCILLATIONS WHEN DMS ARE NOT IN PLACE DURING ERECTION OR MAINTENANCE OF THE STRUCTURE. TO AVOID THESE VIBRATIONS AND OSCILLATIONS, CONSIDERATION SHOULD BE GIVEN TO ATTACHING TEMPORARY BLANK SIGN PANELS TO THE STRUCTURE.
- TRUSSES SHALL BE SHIPPED INDIVIDUALLY WITH ADEQUATE PROVISION TO PREVENT DETRIMENTAL MOTION DURING TRANSPORT. THIS MAY REQUIRE ROPES BETWEEN HORIZONTALS AND DIAGONALS OR ENERGY DISSIPATING (ELASTIC) TIES TO THE VEHICLE. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE CONFIGURATION AND PROTECTION OF THE TRUSSES.
- PROVIDE RUBBED SURFACE FINISH FOLLOWED BY CONCRETE SEALER APPLICATION ON ENTIRE SURFACE OF CONCRETE COLUMN AND ALL SURFACES OF CRASHWALL, EXCEPT BOTTOM SURFACE.
- REINFORCEMENT BARS: REINFORCEMENT BARS DESIGNATED (E) SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- PARAMETERS SHOWN ARE BASIS FOR THIS STANDARD. INSTALLATION NOT WITHIN DIMENSIONAL LIMITS SHOWN REQUIRE SPECIAL ANALYSIS FOR ALL COMPONENTS.
- IT IS PERMISSIBLE TO MOUNT TWO DMS TYPE 2 ON THE BUTTERFLY TRUSS, ONE ON EACH FACE OF THE TRUSS. THE TOTAL COMBINED DEPTH OF DMS TYPE 2 SHALL NOT EXCEED 4'-4" AND THE TOTAL COMBINED WEIGHT SHALL NOT EXCEED 6000 LB. CENTER THE DMS TYPE 2 ON  $\phi$  STEEL POST. DO NOT INSTALL SIGN PANEL IN CONJUNCTION WITH DMS TYPE 2 SIGN CABINETS ON ONE FACE OF THE TRUSS. A SIGN PANEL ON ONE FACE AND DMS TYPE 2 ON THE OTHER IS PERMITTED.

**CONSTRUCTION SPECIFICATIONS:**

- ALL MATERIALS, EXCEPT AS SHOWN, FABRICATION, ERECTION AND CONSTRUCTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH SECTION 733 AND 734 OF THE LATEST ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS.

**LOADING:**

- 90 M.P.H. WIND VELOCITY. WIND LOADING: 42 P.S.F. NORMAL TO DMS TYPE 2 CABINET AREA AND 35 P.S.F. NORMAL TO TRUSS ELEMENTS NOT BEHIND SIGN LOADING DIAGRAM.
- THE AASHTO GROUP II AND III ALLOWABLE STRESS SHALL BE 133% (ALLOWABLE STRESS DESIGN).

**DESIGN SPECIFICATIONS:**

THESE STRUCTURES ARE DESIGNED TO SATISFY THE 2013 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, SIXTH EDITION.

CONCRETE COLUMN, CRASHWALL AND DRILLED SHAFT ARE DESIGNED IN ACCORDANCE WITH THE 2012 EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS (INCLUDING THE 2013 INTERIM REVISIONS).

**DESIGN UNIT STRESSES FOR REINFORCED CONCRETE:**

CLASS SI CONCRETE:  $f'_c = 3,500$  P.S.I.  
CLASS DS CONCRETE:  $f'_c = 4,000$  P.S.I.  
REINFORCING STEEL:  $f_y = 60,000$  P.S.I.

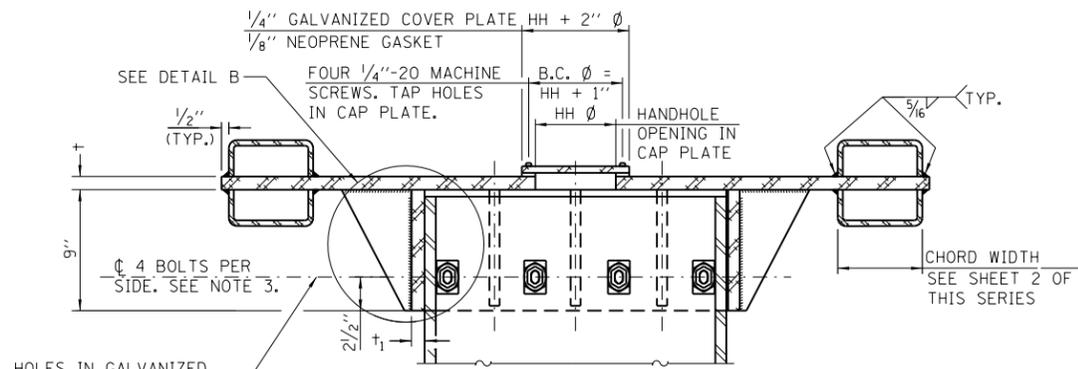
DATE	REVISIONS
7-01-2014	REVISED NOTES
3-11-2015	REVISED NOTES
3-31-2016	ADDED FOUNDATION NOTE AND REMOVED WALKWAY GRATING
3-01-2018	REVISED SIGN STRUCTURE
3-01-2019	REVISED NOTE TO APPLY PROTECTIVE COAT TO THE PERIMETER OF THE COLUMN
2-13-2020	UPDATED CRASH WALL HEIGHT. ADDED HEAVY HEX NUT TO ANCHORS



OVERHEAD SIGN STRUCTURE  
BUTTERFLY TYPE  
STRUCTURE DETAILS

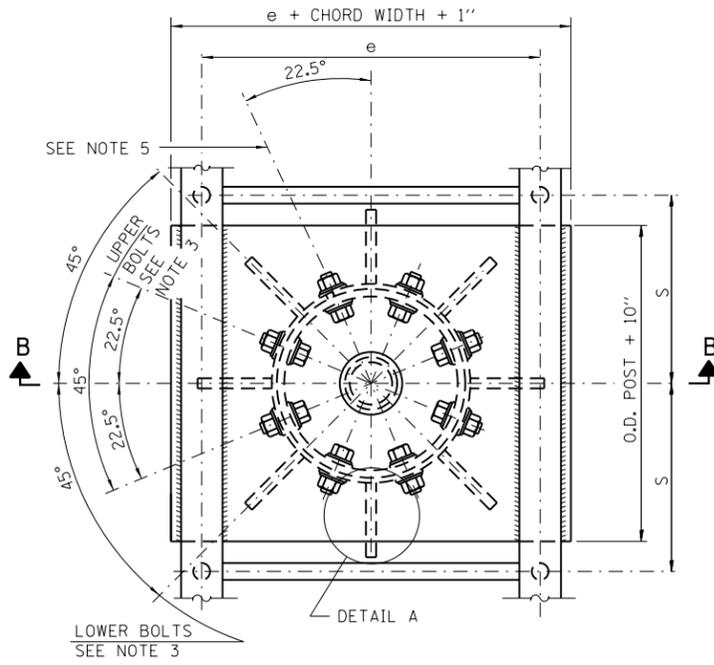
STANDARD F14-05



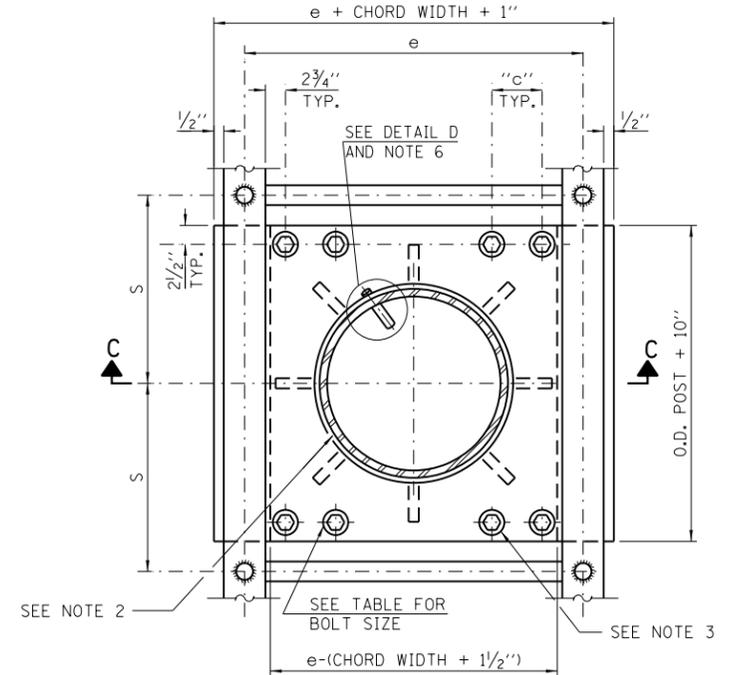


**SECTION B-B**

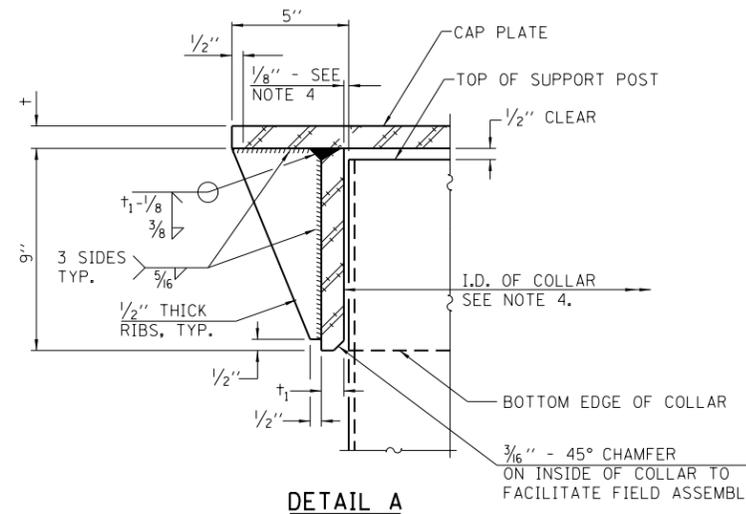
BOLTS SHALL BE HIGH STRENGTH WASHERS (INCLUDING CONTOURED WASHERS), AND LOCKNUTS SHALL BE STAINLESS STEEL.



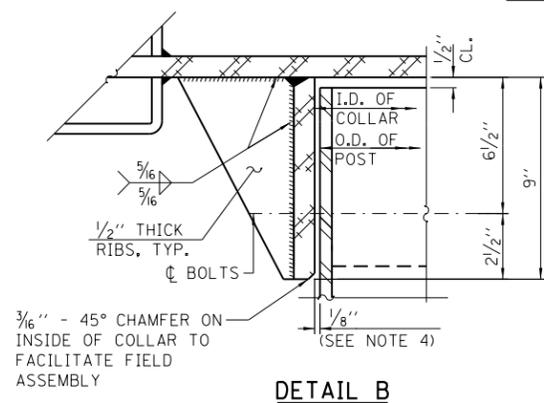
**PLAN VIEW - TOP OF COLUMN**



**SECTION THRU POST ABOVE LOWER CHORDS**

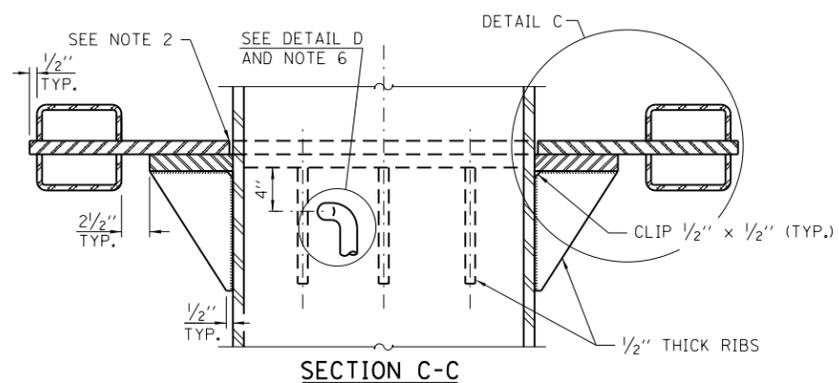


**DETAIL A**

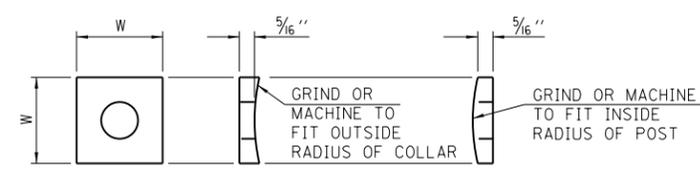


**DETAIL B**

(FOR DETAILS NOT SHOWN, SEE DETAIL C)



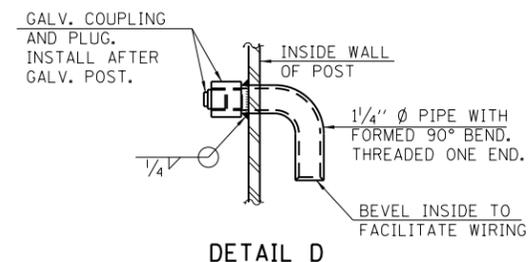
**SECTION C-C**



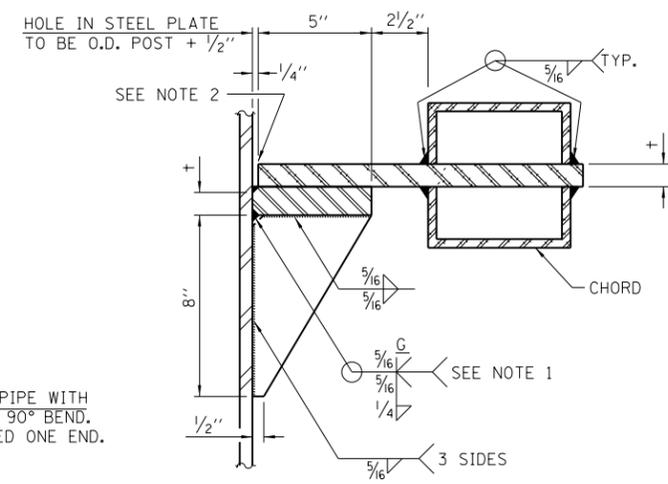
**CONTOURED WASHERS**

BOLT SIZE	CONTOURED WASHERS	
	HOLE DIA.	W
3/8"	1"	2 1/2"
1"	1 1/8"	3"
1 1/4"	1 3/8"	3 1/4"

(ASTM A240, TYPE 304)



**DETAIL D**



**DETAIL C**

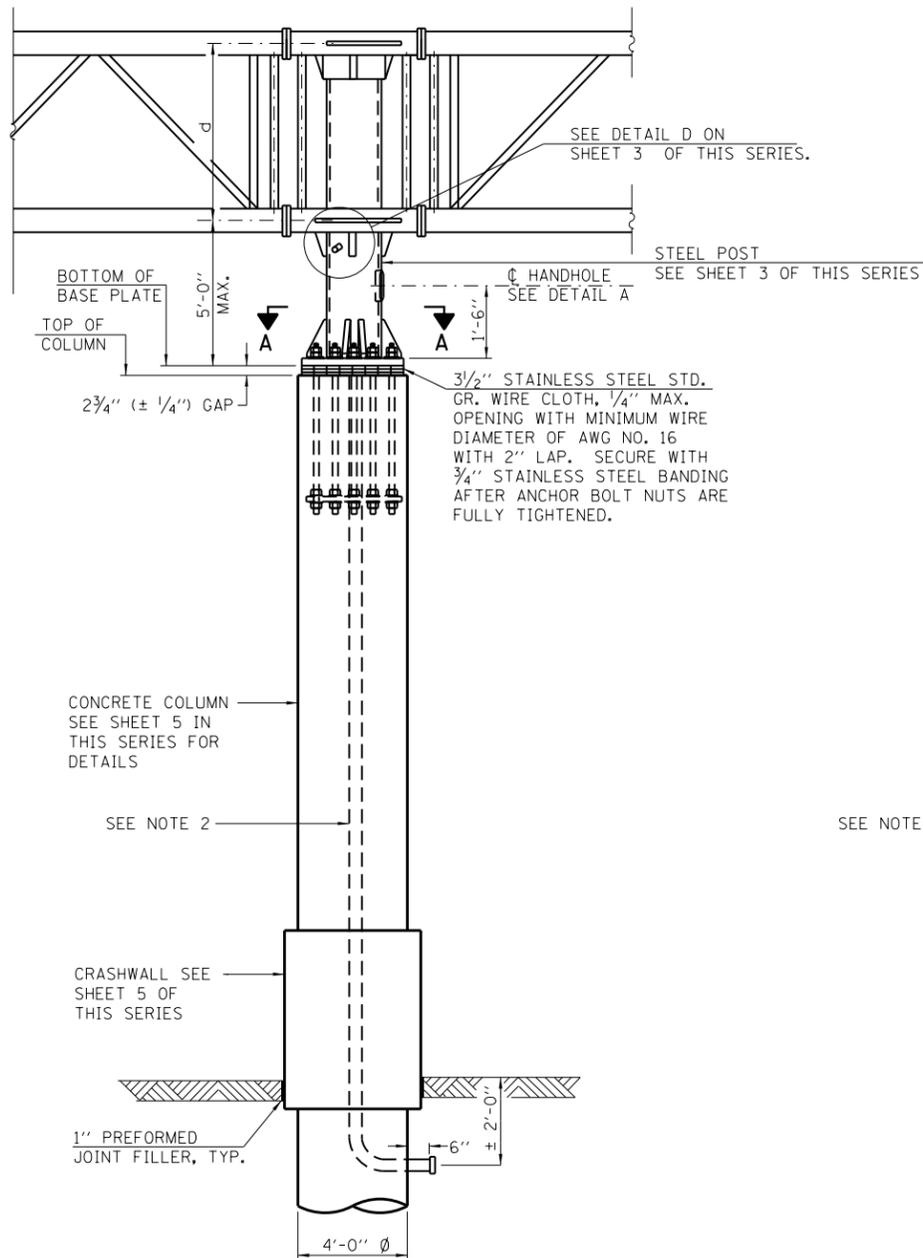
**NOTES:**

- GRIND TOP IF REQUIRED TO FULLY SEAT PLATE. REPAIR DAMAGED GALVANIZING BEFORE ASSEMBLY.
- AFTER TIGHTENING LOWER CONNECTION BOLTS, FILL GAP WITH NON-HARDENING, SILICONE CAULK SUITABLE FOR EXTERIOR EXPOSURE AND ACCEPTABLE TO THE ENGINEER.
- CONNECTION BOLTS IN COLLAR AND BOLTS AT LOWER CHORD CONNECTION SHALL BE HIGH STRENGTH WITH MATCHING LOCKNUTS. CONNECTION BOLTS SHALL HAVE TWO STAINLESS STEEL FLAT WASHERS EACH.
- COLLAR I.D. SHALL BE MANUFACTURED TO CORRESPOND TO O.D. OF ACTUAL GALVANIZED POST PLUS 1/8" (± 1/16"). MAXIMUM GAP BETWEEN POST AND COLLAR AT ANY LOCATION EQUALS 1/8" BEFORE TIGHTENING BOLTS.
- OPTIONAL FULL PENETRATION WELD IN COLLAR. (TWO LOCATIONS MAXIMUM (180° APART) X-RAY OR UT 100%)
- ORIENT PIPE TOWARD WALKWAY SIDE. HOLE IN POST = O.D. PIPE + 1/8".

**CONNECTION TABLE**

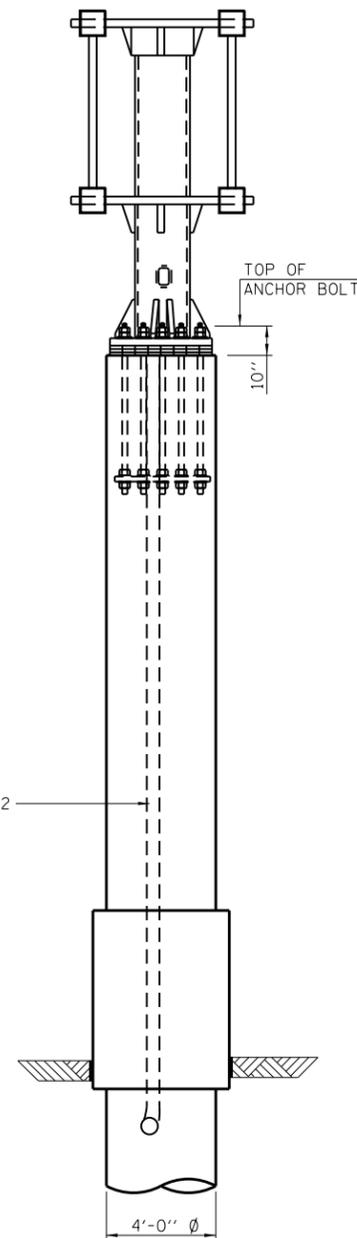
POST OUTSIDE DIAMETER	UPPER & LOWER CONNECTION BOLT DIAMETER (SEE NOTE 3)	LOWER JUNCTURE BOLT SPACING DIMENSION "C" (SEE NOTE 3)	OPENING IN CAP PLATE "HH"	PLATE THICKNESS (t)	COLLAR THICKNESS (t1)
24"	1 1/4"	3 1/2"	6"	1"	7/8"



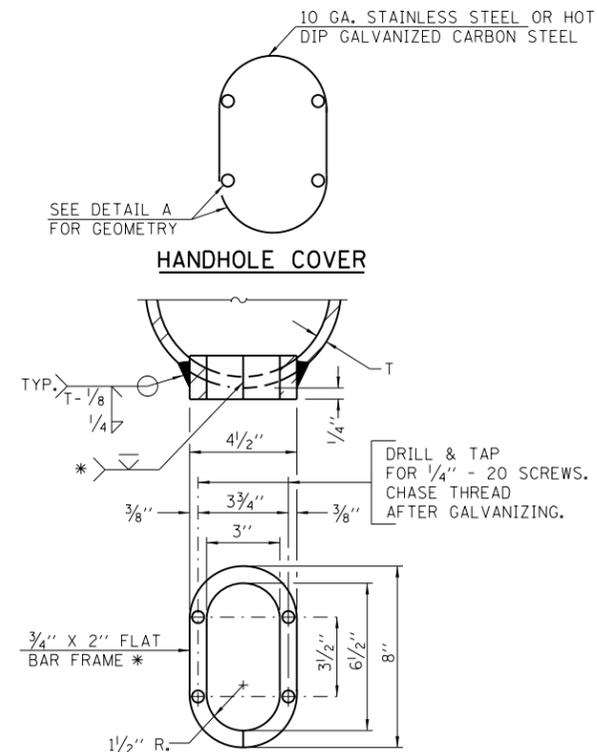


**FRONT ELEVATION**

SEE SHEET 5 OF THIS SERIES FOR FOUNDATION DETAILS.  
(DMS TYPE 2 SIGN CABINET NOT SHOWN FOR CLARITY)



**SIDE ELEVATION**

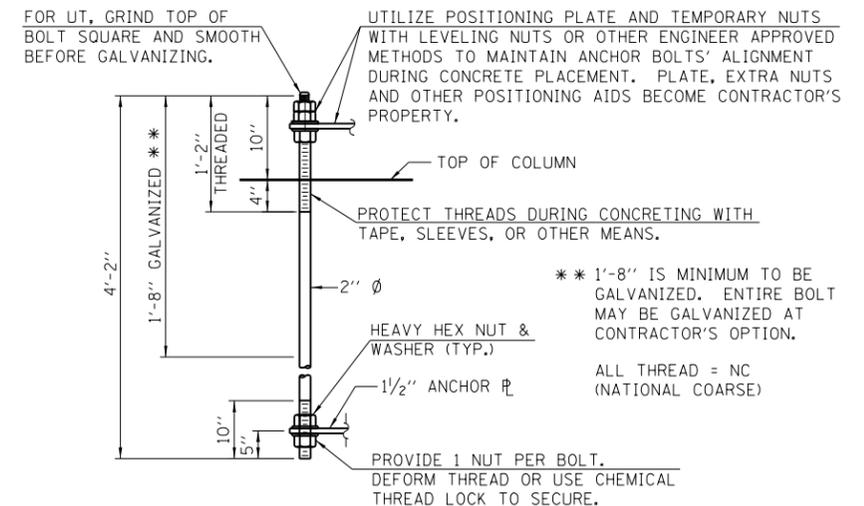


**DETAIL A**

PROVIDE 8" X 4 1/2" COVER. OUTSIDE CORNERS = 2 1/4" RADIUS. PROVIDE 4-5/16" Ø HOLES IN FOR 1/4" - 20 ROUND HEAD HOT DIP GALVANIZED OR STAINLESS STEEL MACHINE SCREWS. (SEE COVER DETAILS.)

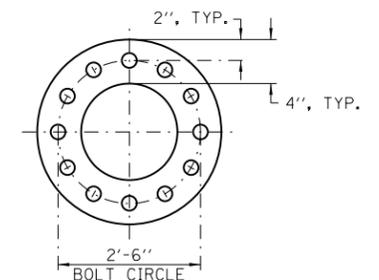
**NOTE:**

1. SITE GROUNDING ELECTRODE SYSTEM TO BE PROVIDED AS INDICATED ON PLANS.
2. SEE PLAN SHEETS FOR TYPE, SIZE AND NUMBER OF CONDUITS.

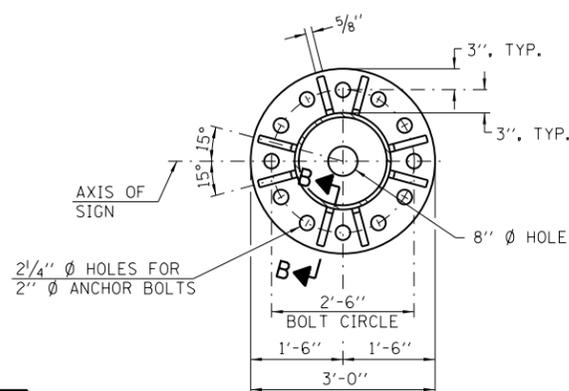


**ANCHOR BOLT DETAIL**

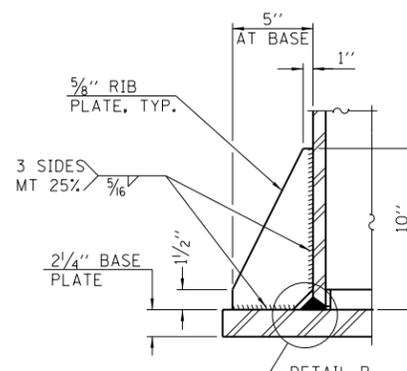
ANCHOR BOLTS SHALL CONFORM TO AASHTO M314 OR ASTM F1554 GRADE 55. GALVANIZE THE UPPER 1'-8" (MINIMUM (\*\*)) AND ASSOCIATED AASHTO M291, GRADE A, C OR DH HEAVY HEX NUTS AND HARDENED WASHERS PER AASHTO M232. NO WELDING SHALL BE PERMITTED ON BOLTS. PROVIDE A NUT AT BOTTOM, A HEXAGON LOCKNUT AND WASHER ABOVE BASE PLATE AND A LEVELING NUT AND WASHER BELOW BASE PLATE. NUTS SHALL EACH BE TIGHTENED WITH 200 LB.-FT. MINIMUM TORQUE AGAINST BASE PLATE. BEFORE OR AFTER THREADING, BUT BEFORE GALVANIZING, EACH ANCHOR BOLT SHALL BE ULTRASONICALLY TESTED (UT) BY A LEVEL II OR III INSPECTOR, QUALIFIED IN ACCORD WITH ANSI GUIDELINES, TO ENSURE NO REJECTABLE FLAWS EXIST IN THE UPPER 18" (TENSION CRITERIA).



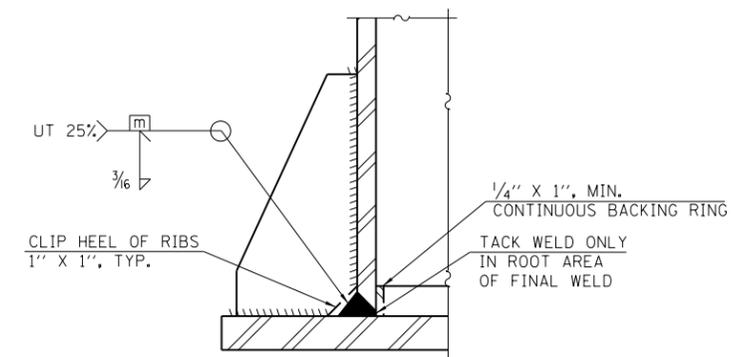
**POSITIONING PLATE/ANCHOR BOLT**



**SECTION A-A**



**SECTION B-B**



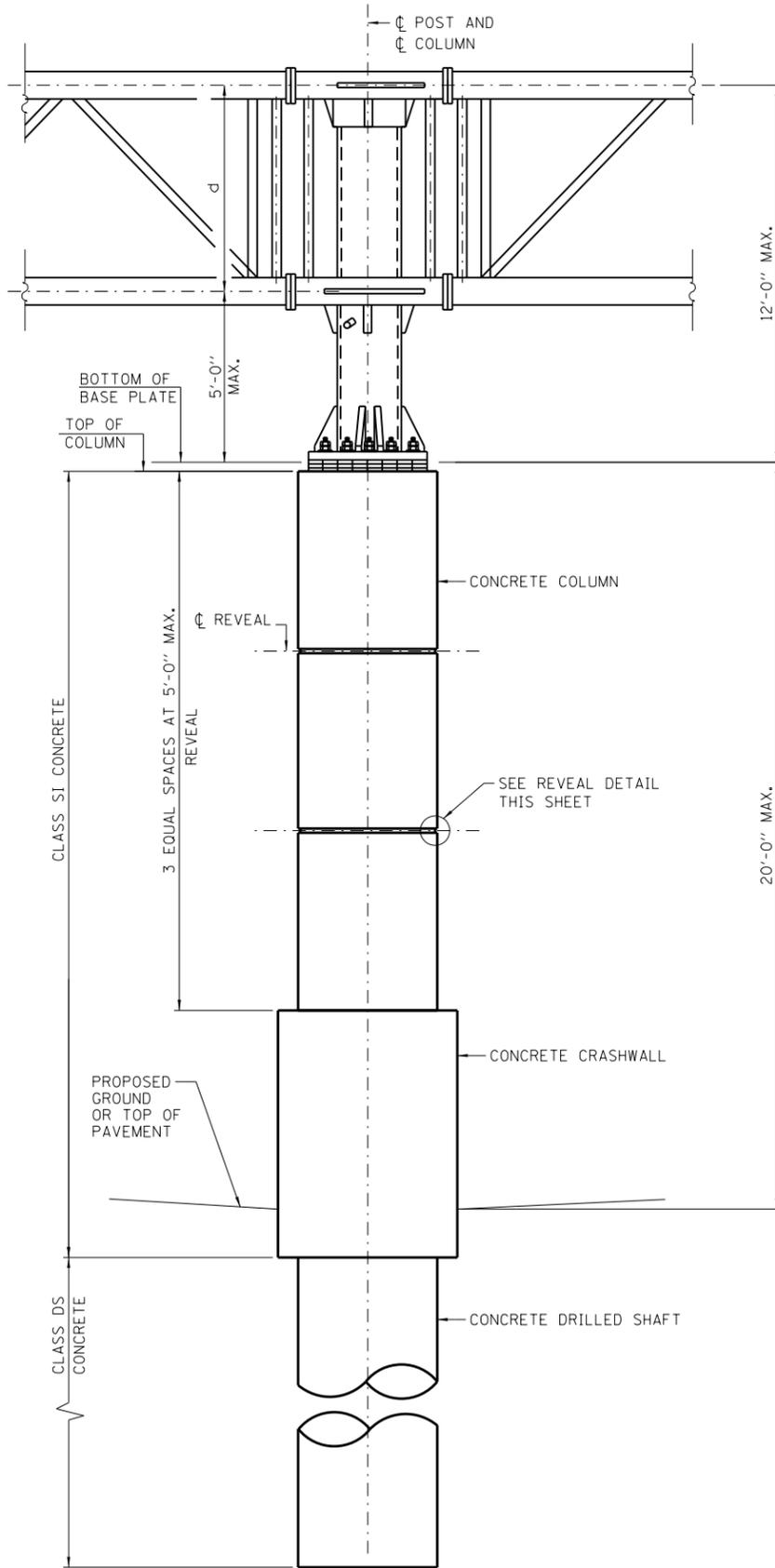
**DETAIL B  
(TYPICAL RIB)**

APPROVED... DATE 3-31-2014.  
CHIEF ENGINEERING OFFICER

SHEET 4 OF 8

**OVERHEAD SIGN STRUCTURE  
BUTTERFLY TYPE  
STRUCTURE DETAILS**

STANDARD F14-05



**FRONT ELEVATION**  
DMS TYPE 2 NOT SHOWN FOR CLARITY

**BILL OF MATERIAL-EACH FOUNDATION**

CLASS S1 CONC. CY	CLASS DS CONC. CY	REBAR POUNDS	PROTECTIVE COAT SQ. YD.
12.9	11.7	4,790	6.0

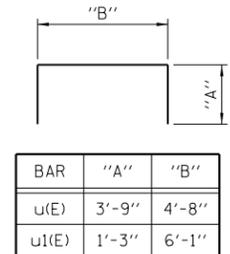
**BAR LIST-EACH FOUNDATION**  
(COLUMN, CRASHWALL AND DRILLED SHAFT)

BAR	NUMBER	SIZE	LENGTH	SHAPE
v(E)	20	#9	38'-3"	
v1(E)	20	#9	15'-8"	
s(E)	1	#4	31'-1"	
s1(E)	1	#4	14'-5"	
u(E)	12	#5	12'-2"	U
u1(E)	18	#5	8'-7"	U

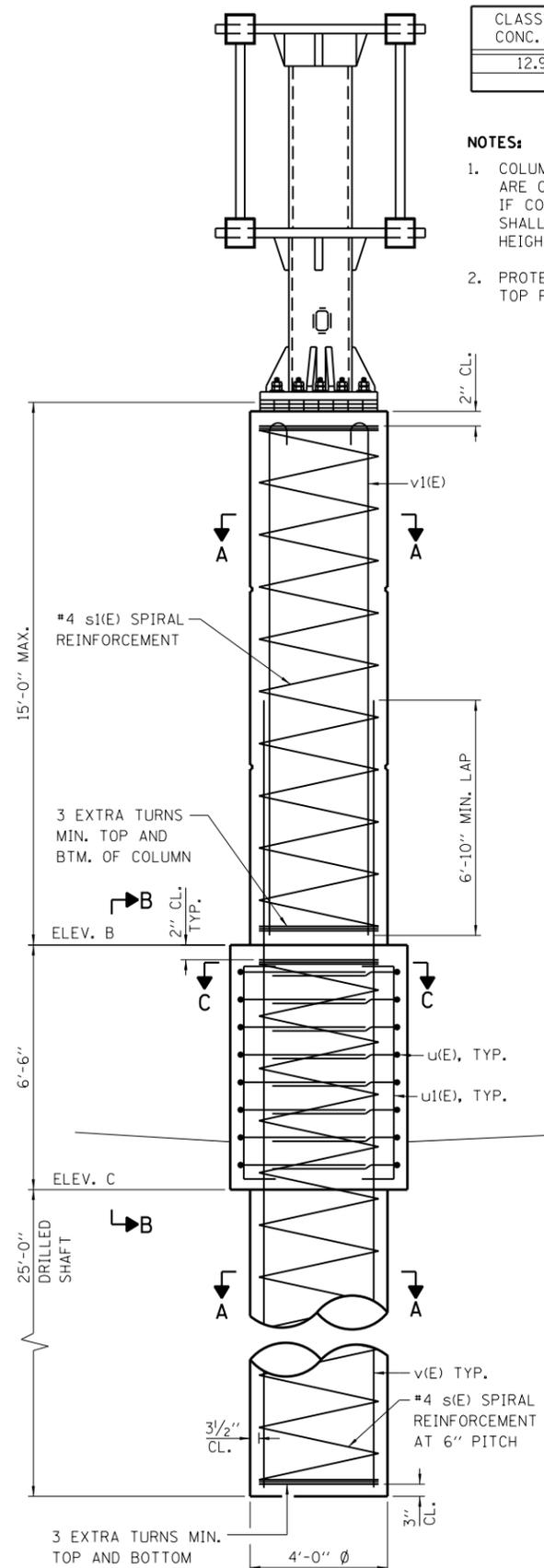
**NOTES:**

- COLUMN CONCRETE VOLUME AND BAR s1(E) LENGTH ARE COMPUTED BASED ON 15'-0" COLUMN HEIGHT. IF COLUMN HEIGHT IS NOT EQUAL 15'-0", QUANTITIES SHALL BE CALCULATED BASED ON ACTUAL COLUMN HEIGHT.
- PROTECTIVE COAT SHALL BE APPLIED TO TRAFFIC AND TOP FACES OF CRASHWALL AND PERIMETER OF THE COLUMN.

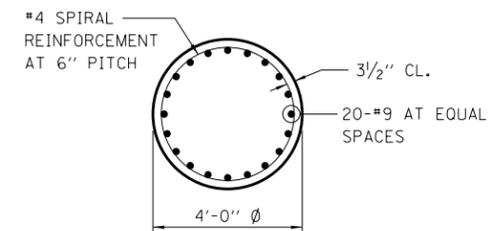
\* THE LENGTH OF SPIRAL SHOWN IS THE HEIGHT OF SPIRAL



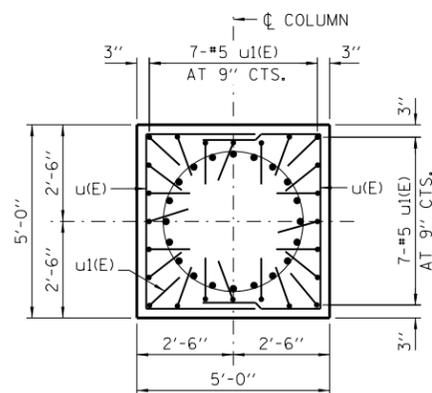
**BAR u(E), u1(E)**



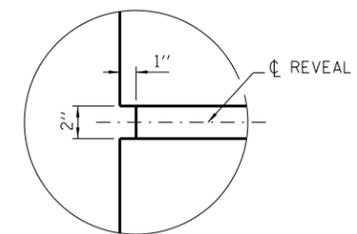
**SIDE ELEVATION**



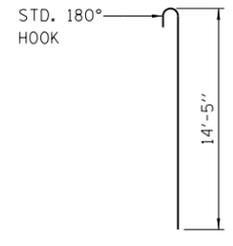
**SECTION A-A**



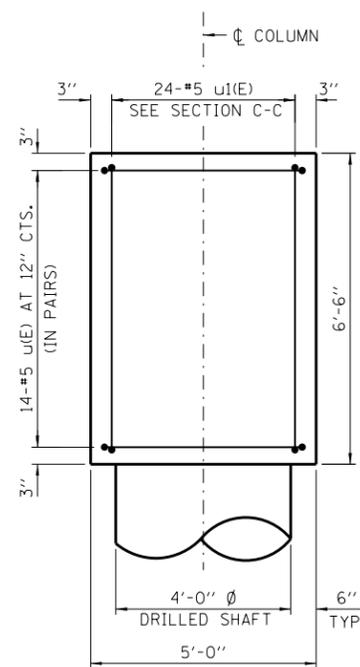
**SECTION C-C**



**REVEAL DETAIL**



**BAR v1(E)**

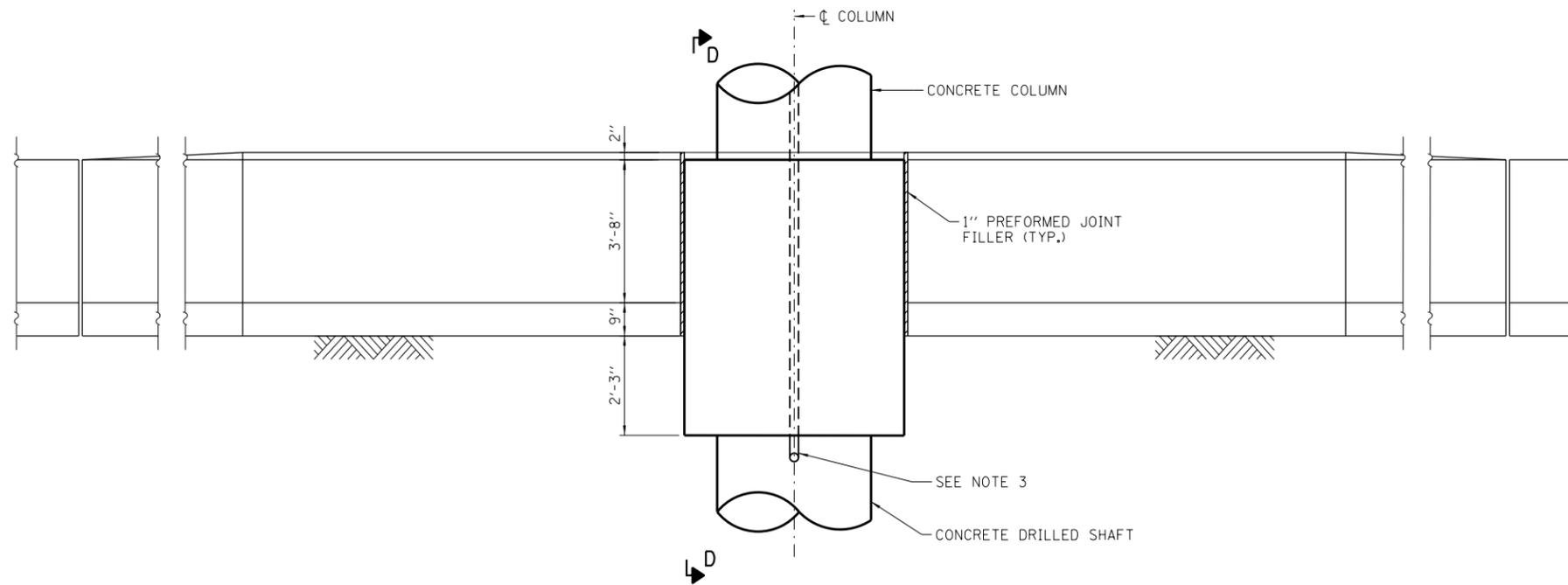


**SECTION B-B**

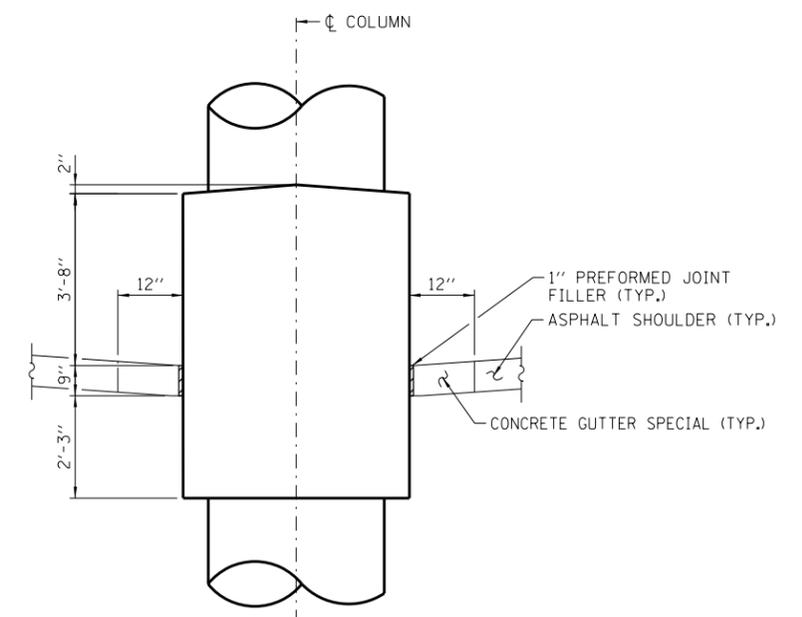
**FOUNDATIONS:**

THE FOUNDATION DETAILS SHOWN ARE BASED ON THE PRESENCE OF MOSTLY COMMON COHESIVE SOIL CONDITIONS (SILTY OR SANDY CLAY), WITH AN AVERAGE UNCONFINED COMPRESSIVE STRENGTH (QU) > 1.25 TON/SQ. FT. WHICH SHALL BE DETERMINED BY PREVIOUS SOIL INVESTIGATIONS AT THE JOBSITE. WHEN OTHER CONDITIONS ARE INDICATED, THE BORING DATA SHALL BE INCLUDED IN THE PLANS AND THE FOUNDATION DIMENSIONS SHOWN SHALL BE THE RESULT OF SITE SPECIFIC DESIGNS. IF CONDITIONS ENCOUNTERED IN THE FIELD ARE DIFFERENT THAN THOSE INDICATED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE IF THE FOUNDATION DIMENSIONS NEED TO BE MODIFIED.

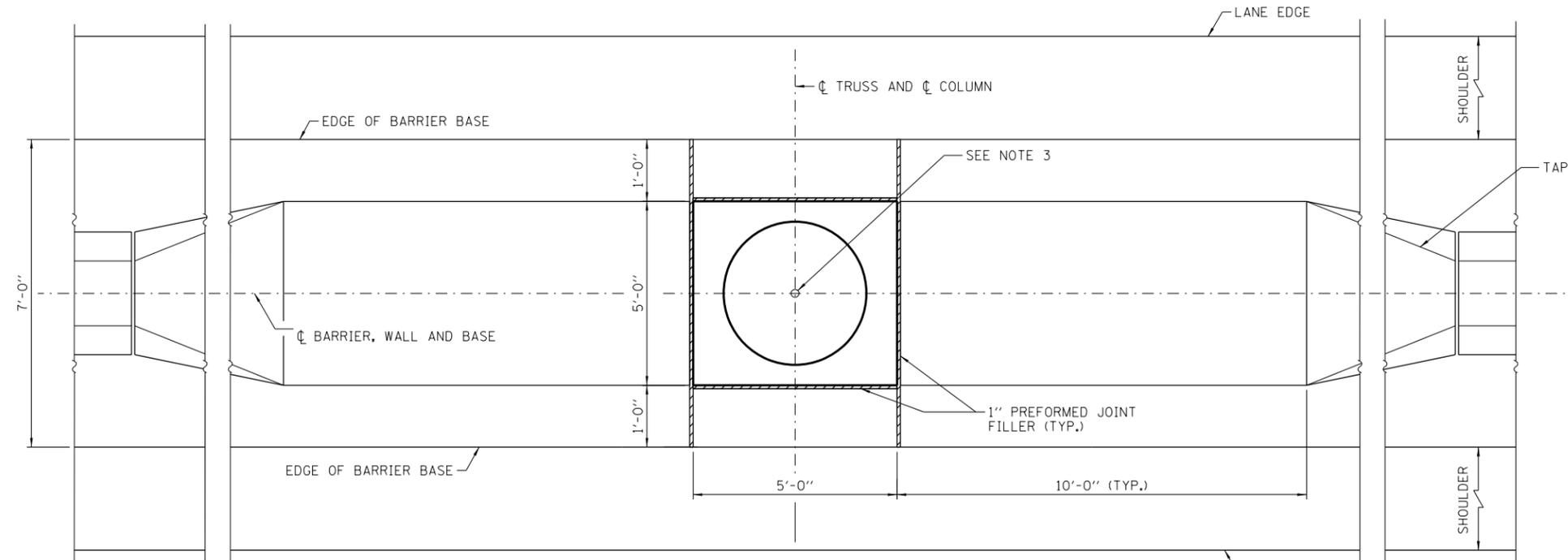




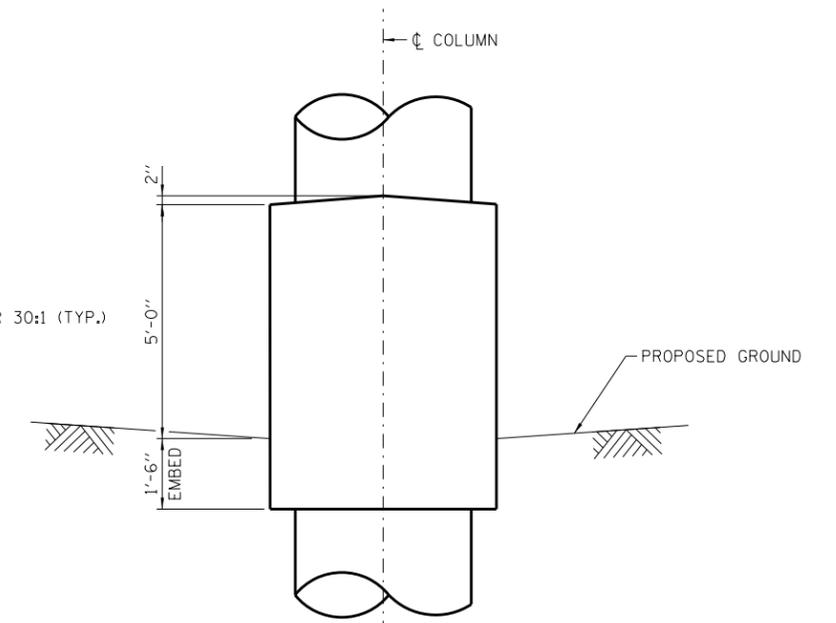
**SIDE ELEVATION**



**SECTION D-D**  
FOUNDATION LOCATED IN PAVED ROADWAY MEDIAN



**PLAN**



**SECTION D-D**  
FOUNDATION LOCATED IN UNPAVED ROADWAY MEDIAN

**NOTES:**

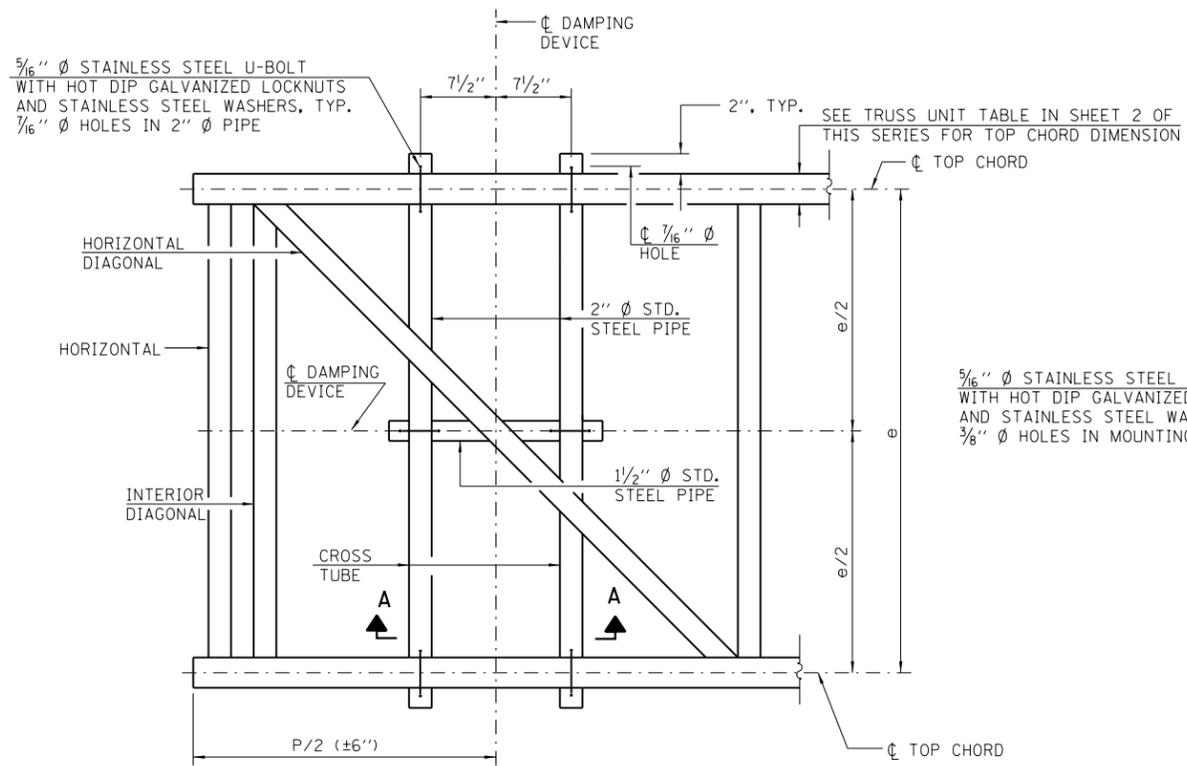
1. SIDE ELEVATION AND PLAN VIEW ARE SHOWN FOR FOUNDATION LOCATED IN PAVED MEDIAN.
2. SEE SHEET 5 OF THIS SERIES FOR REINFORCEMENT DETAILS.
3. COORDINATE CONDUIT SIZE, LOCATION AND QUANTITY WITH ELECTRICAL PLANS. CONDUITS SHALL BE PLACED TO MISS REINFORCEMENT BARS. DO NOT CUT REINFORCEMENT BARS.



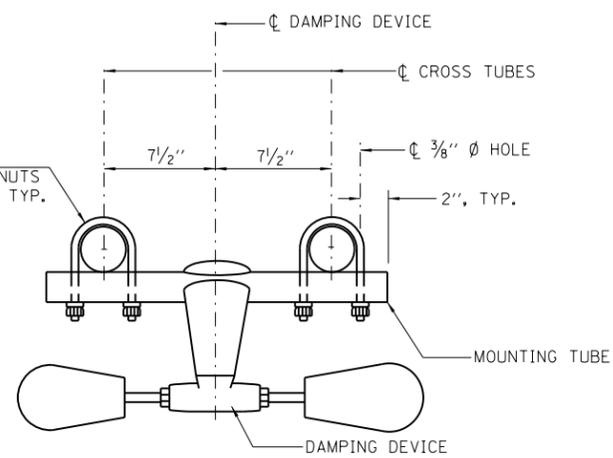
OVERHEAD SIGN STRUCTURE  
BUTTERFLY TYPE  
STRUCTURE DETAILS

STANDARD F14-05

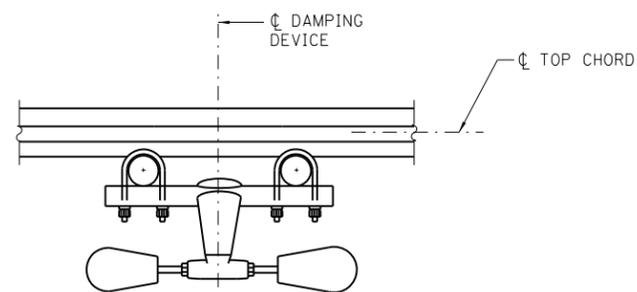
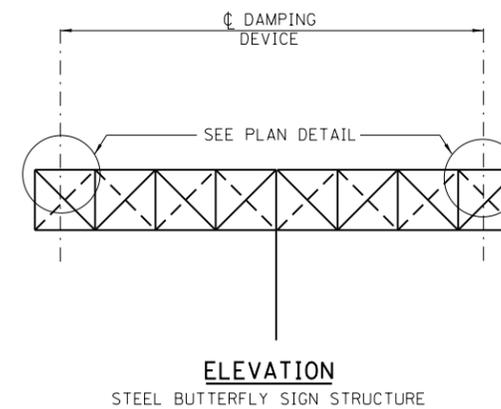
*Paul Kovacs*  
APPROVED . . . . . DATE 3-31-2014  
CHIEF ENGINEERING OFFICER



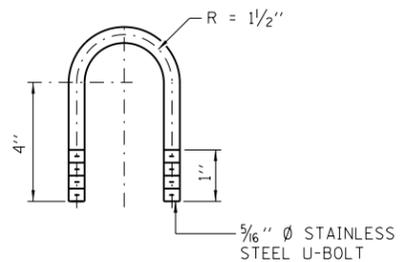
**PLAN DETAIL**



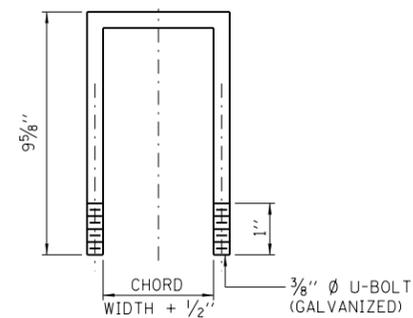
**TRUSS DAMPING DEVICE CONNECTION DETAIL**



**SECTION A-A**



**DAMPING DEVICE MOUNTING TUBE U-BOLT DETAIL (TYPICAL)**



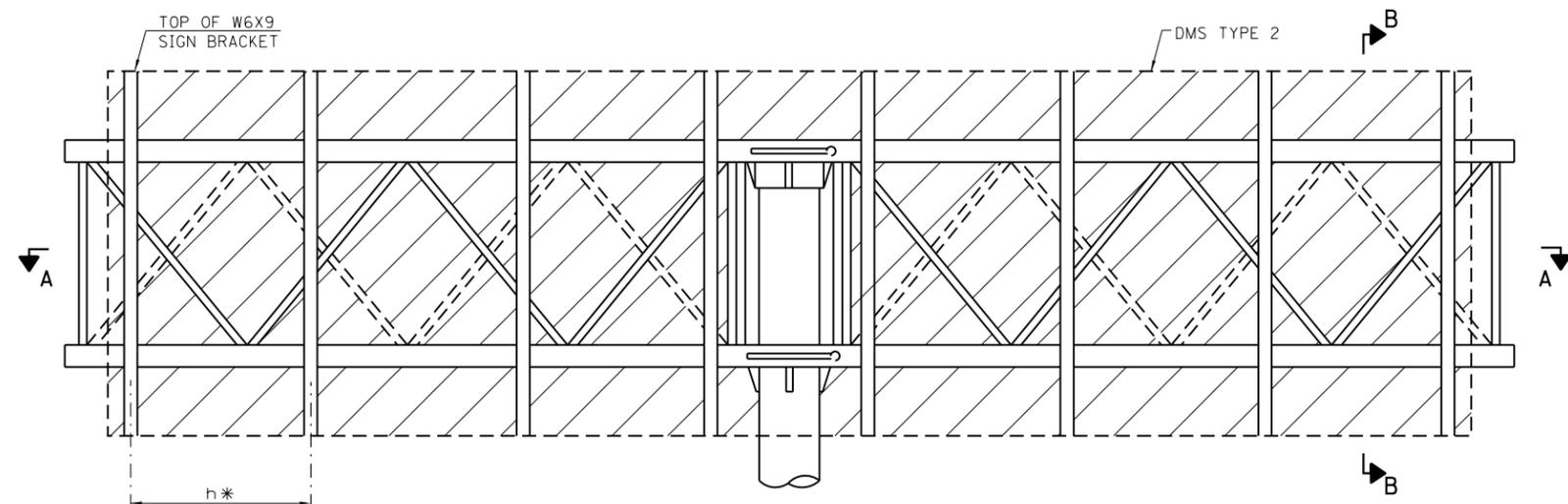
**TOP CHORD TO CROSS TUBE U-BOLT DETAIL (TYPICAL)**

**NOTE:**

DAMPER: ONE DAMPER PER TRUSS. (31 LBS. STOCKBRIDGE-TYPE 29" MINIMUM BETWEEN ENDS OF WEIGHTS).

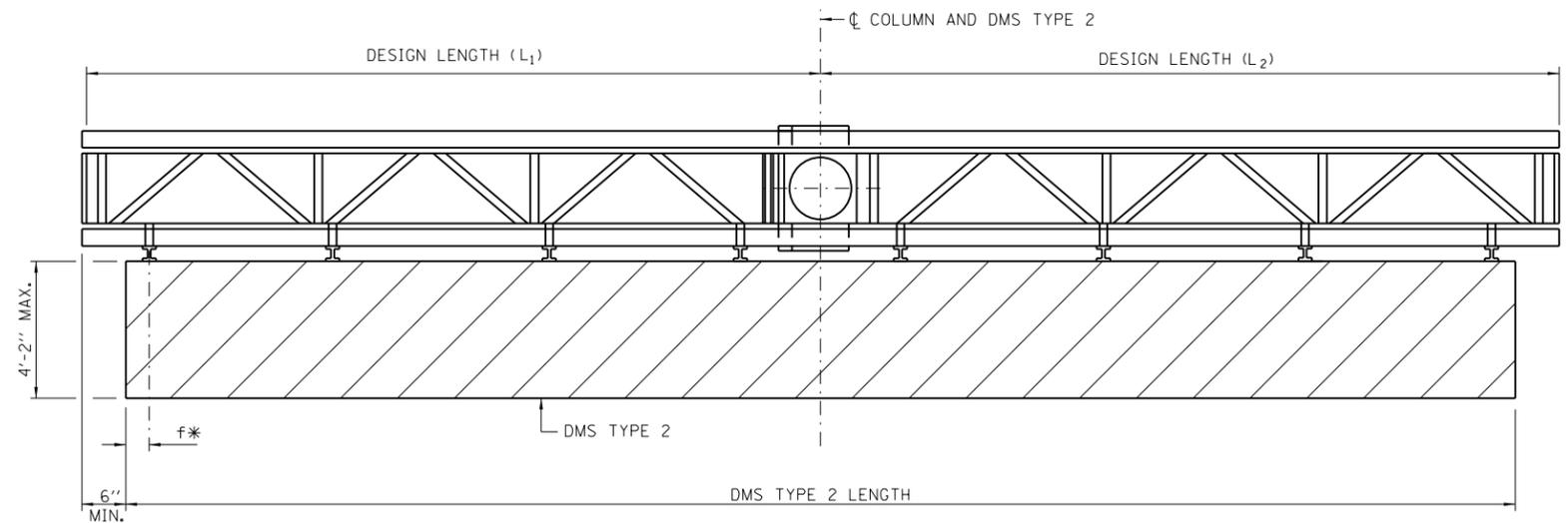
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*Paul Kovacs*  
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OVERHEAD SIGN STRUCTURE  
 BUTTERFLY TYPE  
 STRUCTURE DETAILS  
 STANDARD F14-05



\* BRACKET DIMENSIONS ARE NOMINAL AND WILL VARY BASED ON ACTUAL DMS TYPE 2 DIMENSIONS PLUS MANUFACTURER'S MOUNTING DEVICES.

TYPICAL FRONT ELEVATION

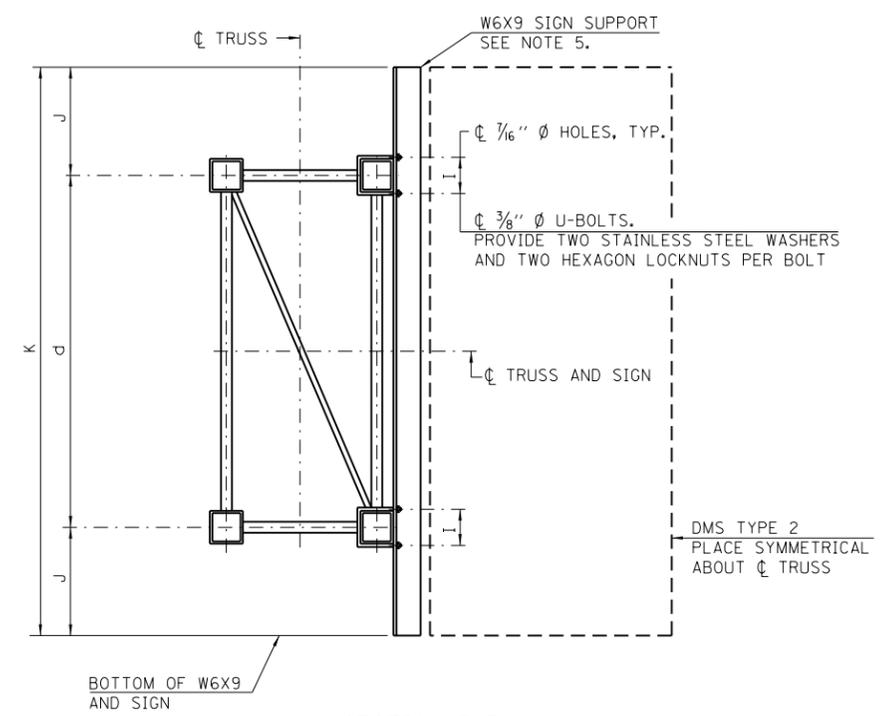


SECTION A-A

PLACE ALL SIGN BRACKETS AS CLOSE TO PANEL POINTS AS PRACTICAL.  
(ROAD PLAN BENEATH TRUSS VARIES)  
BUTTERFLY MAY BE LOCATED IN SHOULDER AREA.

NOTES:

1. SPACE SIGN BRACKETS W6X9 FOR EFFICIENCY AND WITHIN LIMITS SHOWN:
2.  $f = 12''$  MAXIMUM,  $4''$  MINIMUM (END OF SIGN TO  $\phi$  OF NEAREST BRACKET)  
 $h = 6'-0''$  MAXIMUM ( $\phi$  TO  $\phi$  SIGN SUPPORT BRACKETS, W6X9)
3. MAXIMUM DMS TYPE 2 WEIGHT = 5000 LBS.
4.  $4'-2''$  MAXIMUM DEPTH INCLUDES DEPTH OF DMS TYPE 2 PLUS CONNECTION TO W6X9.
5. DMS TYPE 2 MANUFACTURER SHALL DESIGN AND SUPPLY HARDWARE FOR CONNECTION TO W6X9. BOLTS SHALL BE STAINLESS STEEL OR HOT DIP GALVANIZED HIGH STRENGTH PER THE STANDARD SPECIFICATION.



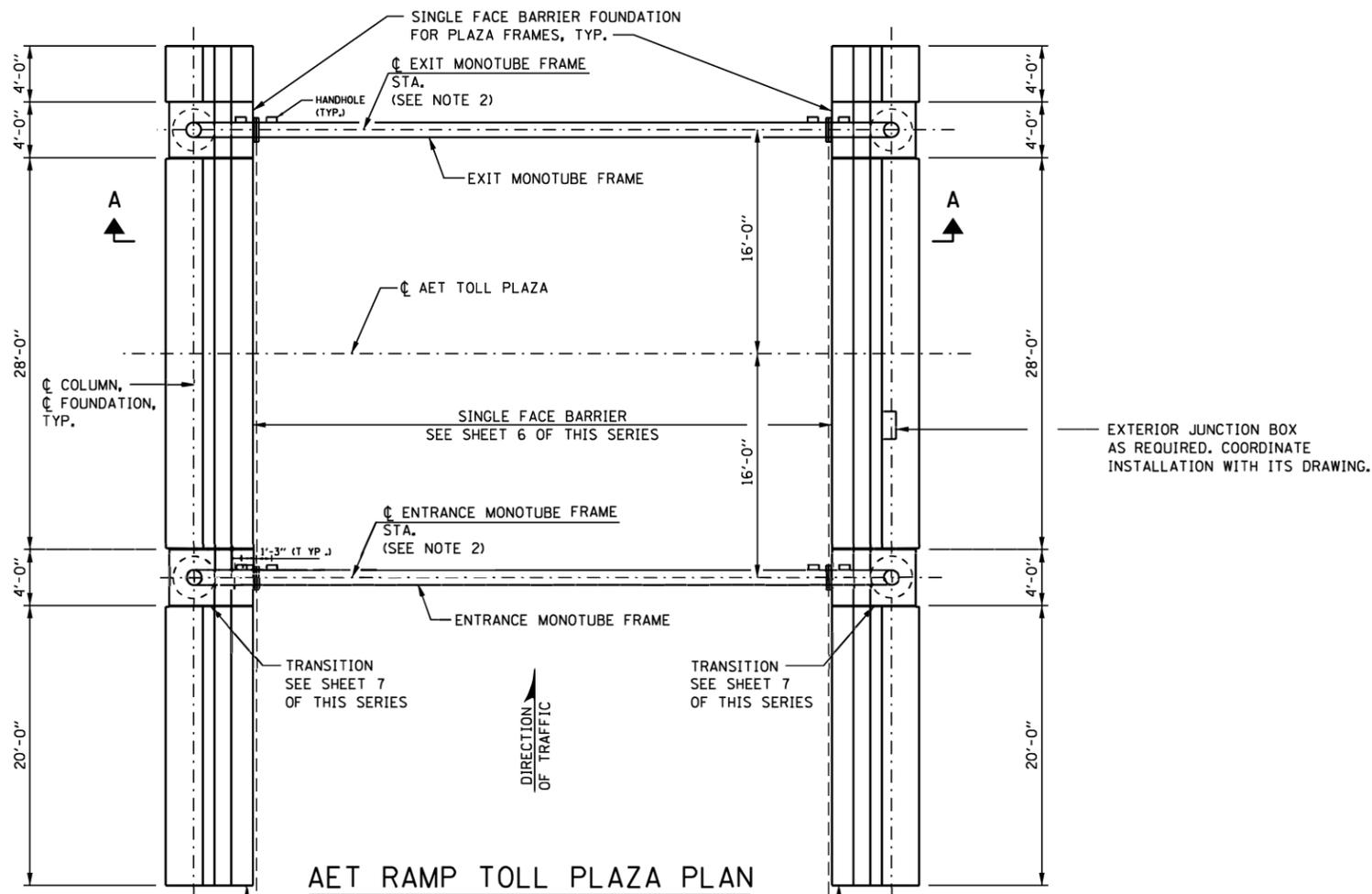
SECTION B-B

BRACKET TABLE

W6X9		
SIGN WIDTH		NUMBER OF BRACKETS REQUIRED
GREATER THAN	LESS THAN OR EQUAL TO	
	8'-0"	2
8'-0"	14'-0"	3
14'-0"	20'-0"	4
20'-0"	26'-0"	5
26'-0"	32'-0"	6



APPROVED: *Paul Kovacs* DATE 3-31-2014.  
CHIEF ENGINEERING OFFICER



SIGN TABLE

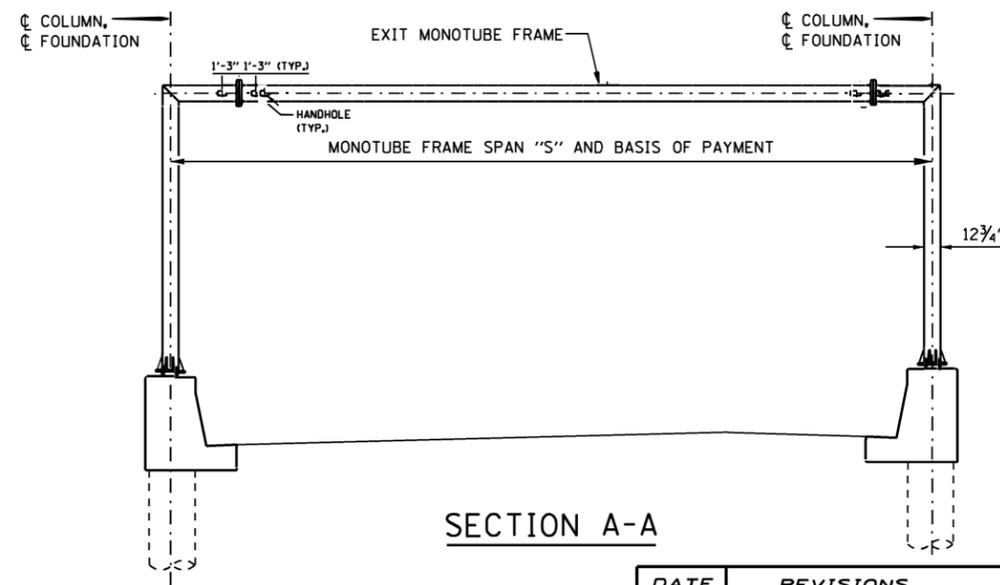
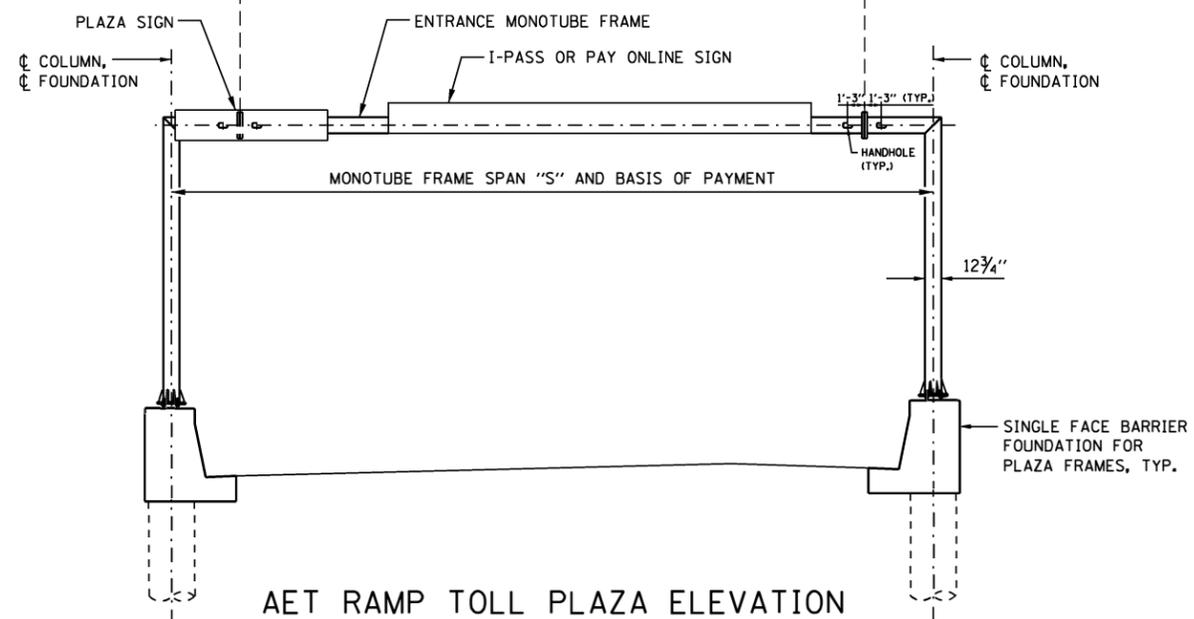
SIGN	MAXIMUM AREA	MAXIMUM LENGTH
PLAZA SIGN	24 S.F.	8'-0"
I-PASS OR PAY ONLINE SIGN	60 S.F.	20'-0"

NOTE:

1. SEE CONTRACT PLANS FOR SIGN SIZE AND LOCATION.
2. PROVIDE ENTRANCE AND EXIT MONOTUBE FRAME STATIONS IN CONTRACT PLANS.

PROVIDE ATTENUATOR, BARRIER WALL OR GUARDRAIL TERMINAL AS SHOWN ON PLANS

PROVIDE ATTENUATOR, BARRIER WALL OR GUARDRAIL TERMINAL AS SHOWN ON PLANS



SECTION A-A

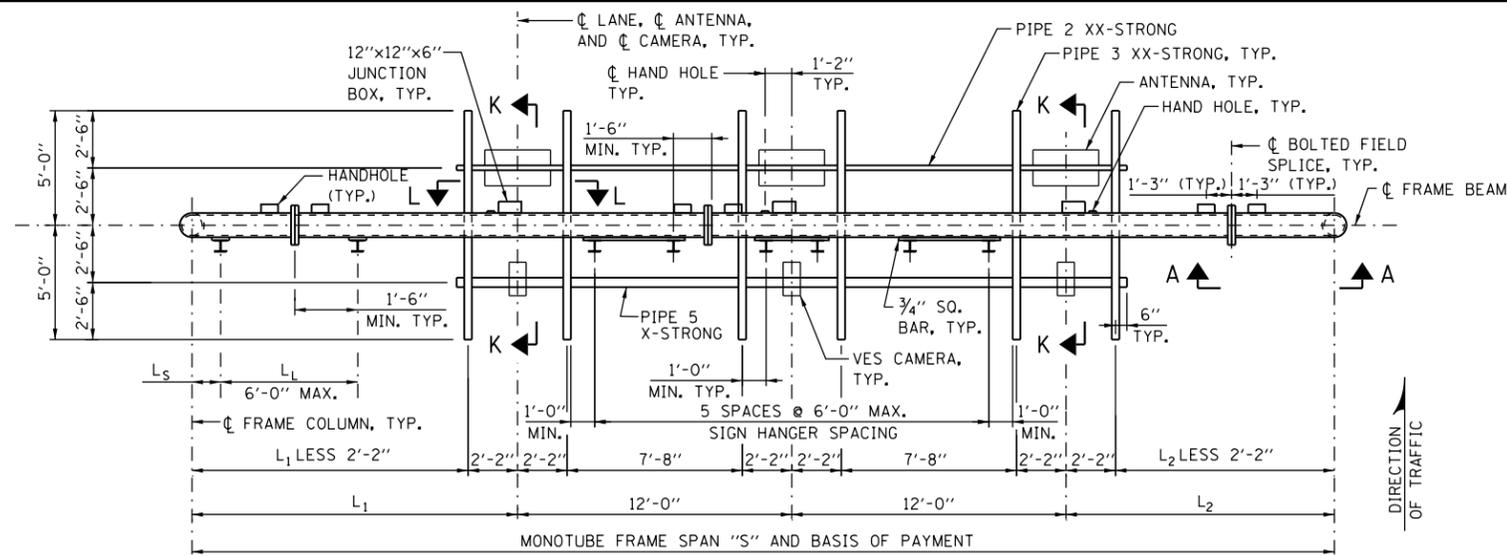
APPROVED *Paul Kovacs* CHIEF ENGINEER DATE 10-14-2014

DATE	REVISIONS
3-31-2016	REVISED FOUNDATION NOTE
3-31-2017	REVISED I-PASS ONLY SIGN
3-01-2019	UPDATED CONSTANT SLOPE BARRIER, REINFORCING DETAILS AND QUANTITIES
5-24-2019	UPDATED SHOULDER BARRIER DETAILS AND QUANTITIES FOR 3'-8"
2-13-2020	ADDED HANDHOLE, INSTALLATION & INSPECTION OF SPLICE & ANCHORS

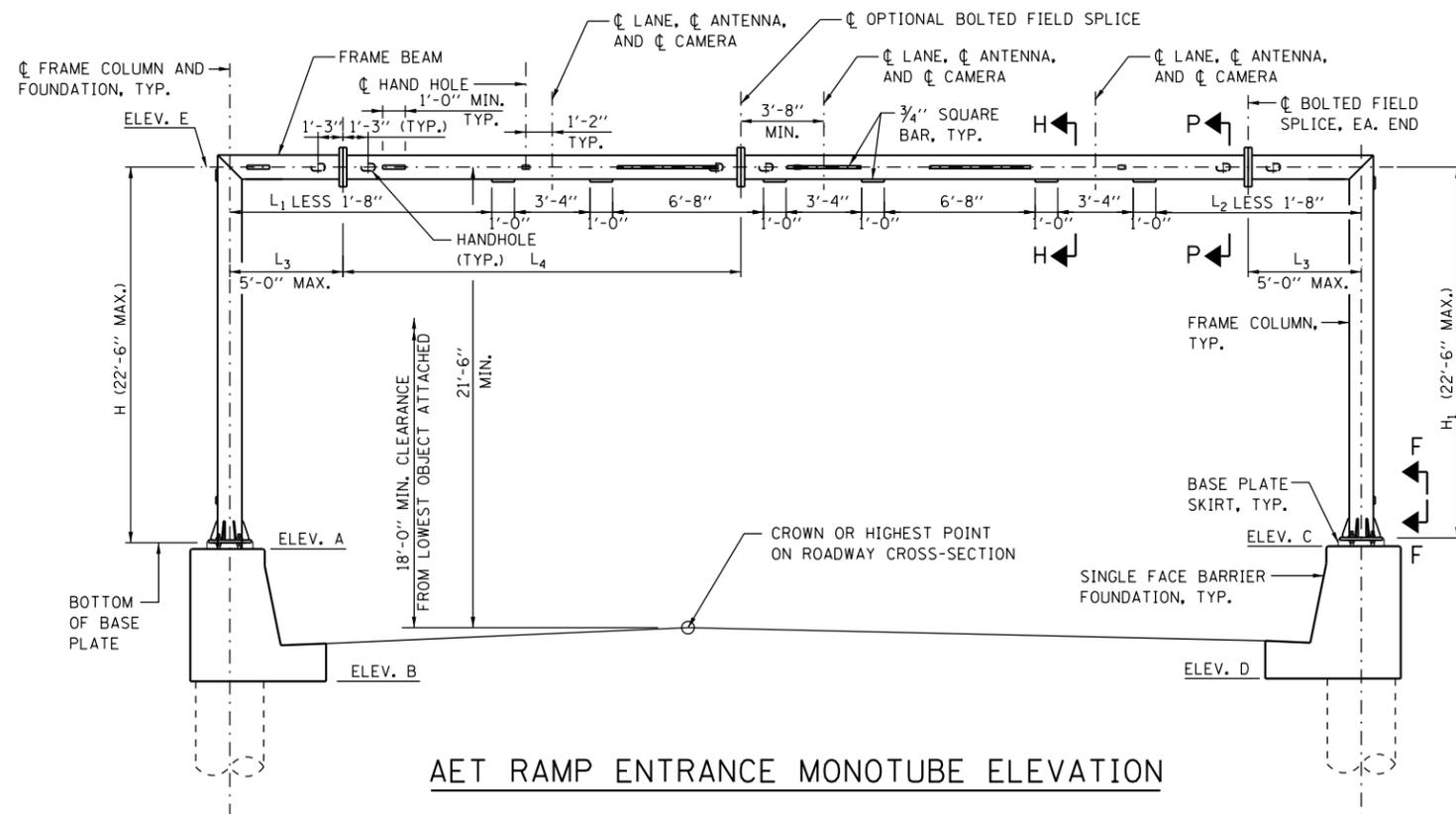


OVERHEAD SIGN STRUCTURE MONOTUBE TYPE (STEEL) STRUCTURE DETAILS FOR AET RAMP

STANDARD F15-05



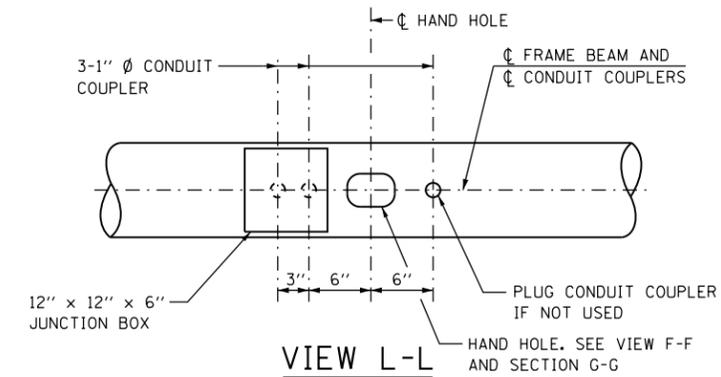
**AET RAMP ENTRANCE MONOTUBE PLAN**



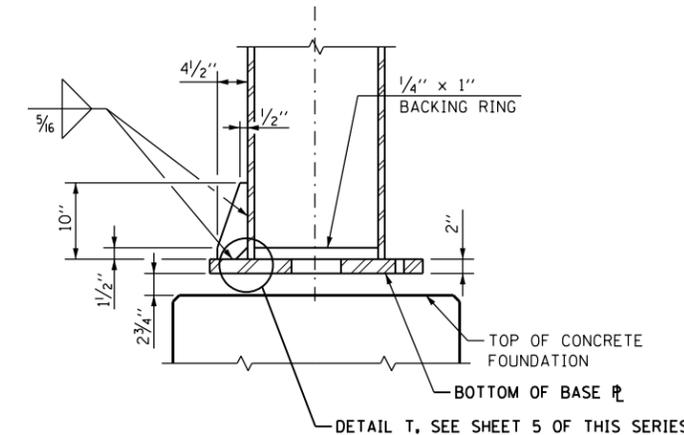
**AET RAMP ENTRANCE MONOTUBE ELEVATION**

**NOTES:**

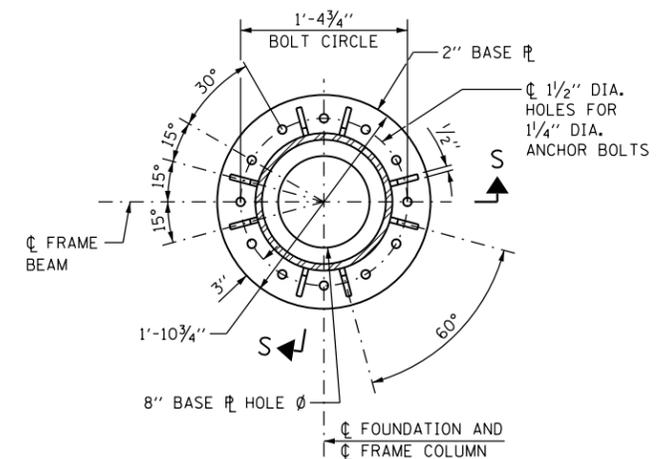
1. FOUNDATIONS FOR MONOTUBE FRAMES ARE SHOWN ON SHEET 6 OF THIS SERIES.
2. SEE SHEET 5 OF THIS SERIES FOR SECTIONS A-A, G-G, H-H, K-K, VIEW F-F AND BASE PLATE SKIRT.
3. SEE SHEET 4 OF THIS SERIES FOR SECTION P-P.
4. PROVIDE CAMBER AT MIDSPAN OF STRUCTURE.
5. LOCATE OPTIONAL BOLTED FIELD SPLICE NEAR MIDSPAN.
6. WORK THIS SHEET WITH, OVERHEAD SIGN STRUCTURE ENTRANCE MONOTUBE TYPE (STEEL) AET RAMP SUMMARY AND TOTAL BILL OF MATERIAL SHEET.



**VIEW L-L**



**SECTION S-S**



**BASE PLATE PLAN  
ENTRANCE AND EXIT MONOTUBE**

**ENTRANCE MONOTUBE FRAME TABLE**

SPAN "S"	FRAME COLUMN	FRAME BEAM	CAMBER
50' MAX.	HSS 12.75x0.500	HSS 12.75x0.500	1 3/4"

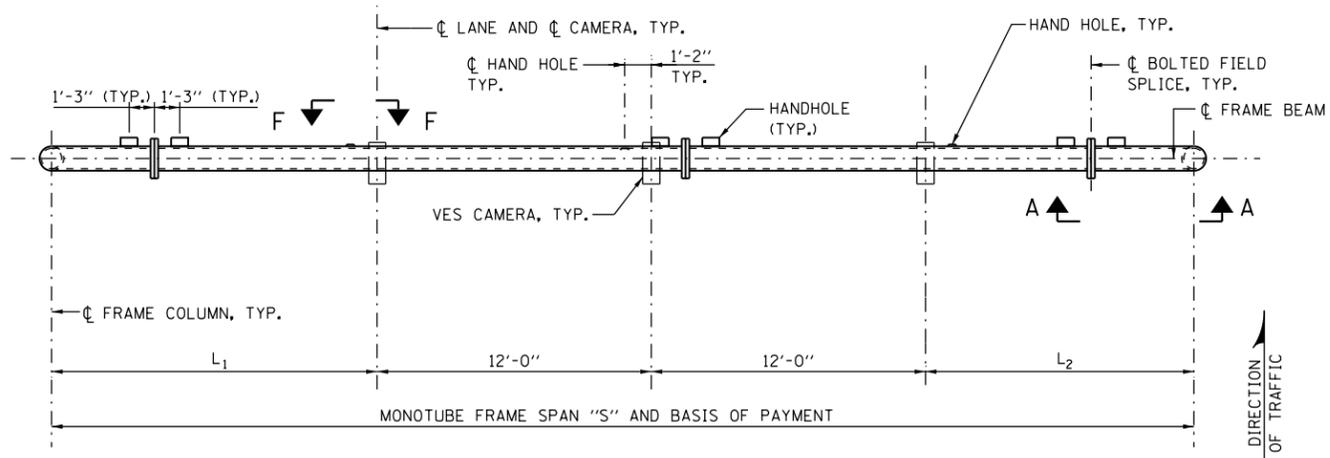
SEE ILLINOIS TOLLWAY STANDARD DRAWING F13 FOR SPANS GREATER THAN 50'.



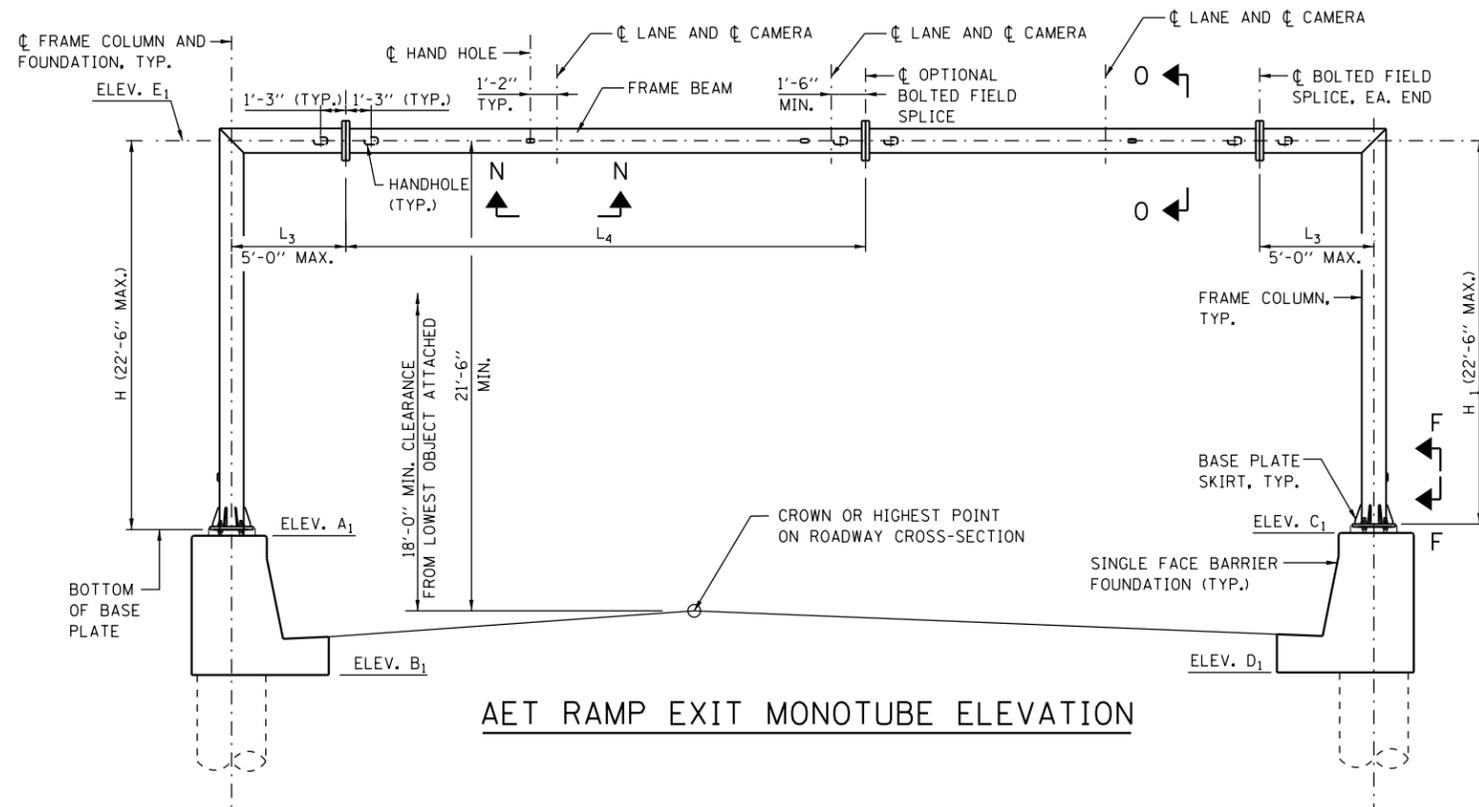
OVERHEAD SIGN STRUCTURE  
MONOTUBE TYPE (STEEL)  
STRUCTURE DETAILS  
FOR AET RAMP

STANDARD F15-05

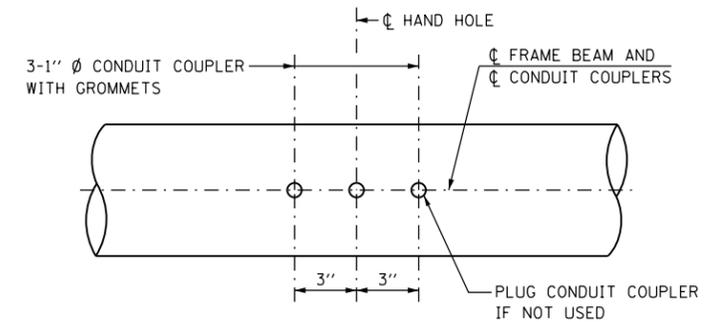
APPROVED: *Paul Kovacs* CHIEF ENGINEER DATE 10-14-2014



**AET RAMP EXIT MONOTUBE PLAN**



**AET RAMP EXIT MONOTUBE ELEVATION**



**VIEW N-N (CONDUIT COUPLER DETAIL)**

**EXIT MONOTUBE FRAME TABLE**

SPAN "S"	FRAME COLUMN	FRAME BEAM	CAMBER
50' MAX.	HSS 12.75x0.500	HSS 12.75x0.500	1 3/4"

SEE STANDARD F13 FOR SPANS GREATER THAN 50'.

**NOTES:**

1. SEE SHEET 2 OF THIS SERIES FOR SECTION S-S, BASE PLAN AND ADDITIONAL NOTES.
2. SEE SHEET 4 OF THIS SERIES FOR SECTION O-O.
3. SEE SHEET 5 OF THIS SERIES FOR SECTIONS A-A AND G-G, AND BASE PLATE SKIRT.
4. WORK THIS SHEET WITH, OVERHEAD SIGN STRUCTURE EXIT MONOTUBE TYPE (STEEL) AET RAMP SUMMARY AND TOTAL BILL OF MATERIAL SHEET.

APPROVED.....  
*Paul Kovacs*  
 CHIEF ENGINEER DATE 10-14-2014



**GENERAL NOTES:**

1. AFTER ADJUSTMENTS TO LEVEL FRAME BEAM AND ENSURE ADEQUATE VERTICAL CLEARANCE, TIGHTEN ALL TOP AND LEVELING NUTS AGAINST THE BASE PLATE WITH A MINIMUM TORQUE OF 200 LB.-FT. THEN PLACE STAINLESS STEEL MESH AROUND THE PERIMETER OF THE BASE PLATE. SECURE TO BASE PLATE WITH STAINLESS STEEL BANDING.
2. REINFORCEMENT BARS DESIGNATED "(E)" SHALL BE EPOXY COATED.

**STRUCTURAL STEEL:**

1. MATERIAL FOR THE MONOTUBE FRAME SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500 GRADE B. BASE PLATE AND STIFFENER PLATE SHALL CONFORM TO ASTM A709 GRADE 50. OTHER STRUCTURAL STEEL SHAPES AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36, UNLESS NOTED OTHERWISE.
2. PIPES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A53 GRADE B.
3. ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F1554 (AASHTO M314) GRADE 55, WITH A MINIMUM TENSILE STRENGTH OF 75,000 PSI. INSTALLATION AND INSPECTION OF ANCHOR BOLTS SHALL COMPLY WITH ILLINOIS TOLLWAY SPECIAL PROVISION "INTELLIGENT TRANSPORTATION SYSTEMS GANTRY FRAME "STEEL". ANCHORS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 (AASHTO M232). SEE SHEET 6 OF THIS SERIES FOR GALVANIZED LENGTH.
4. U-BOLTS SHALL BE STAINLESS STEEL. PROVIDE STAINLESS STEEL WASHERS AND NUTS FOR U-BOLTS.
5. BOLTS (EXCLUDING ANCHOR BOLTS AND U-BOLTS) SHALL BE HIGH STRENGTH STEEL BOLTS.
6. TUBES FOR MONOTUBE FRAME, PIPES, STRUCTURAL STEEL SHAPES AND PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 AFTER FABRICATION.
7. THE MONOTUBE FRAME BEAM, COLUMNS, BASE PLATE MATERIAL, AND SPLICES ARE CONSIDERED TENSION MEMBERS AND SHALL CONFORM TO THE IMPACT TESTING REQUIREMENT, ZONE 2.

**DESIGN LOADING:**

WIND LOAD CRITERIA

SIGN PANEL	35 P.S.F.
COLUMN/BEAM	35 P.S.F.

**EQUIPMENT LOADS:**

CAMERA ASSEMBLY	8 LB.
ANTENNA	20 LB.

**DESIGN STRESSES FOR REINFORCED CONCRETE:**

f'c = COMPRESSIVE STRENGTH OF CONCRETE (CLASS SI)	= 3,500 P.S.I.
f'c = COMPRESSIVE STRENGTH OF CONCRETE (CLASS DS)	= 4,000 P.S.I.
fy = YIELD STRENGTH OF REINFORCEMENT BARS (GRADE 60)	= 60,000 P.S.I.

**FOUNDATION:**

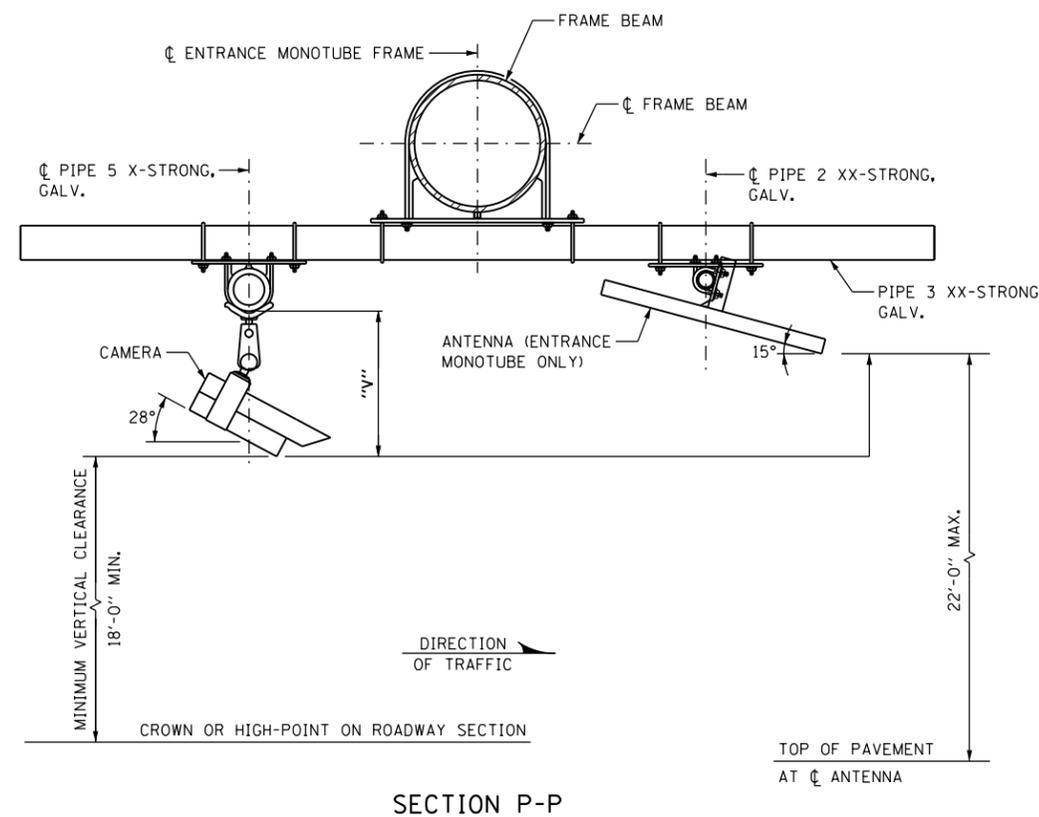
MINIMUM UNCONFINED COMPRESSIVE STRENGTH, Qu FOR ALL LAYERS OF COHESIVE SOILS (CLAYS) SHALL BE 1.25 TON/SQ.FT. AT MONOTUBE FRAMES.

**DESIGN SPECIFICATIONS:**

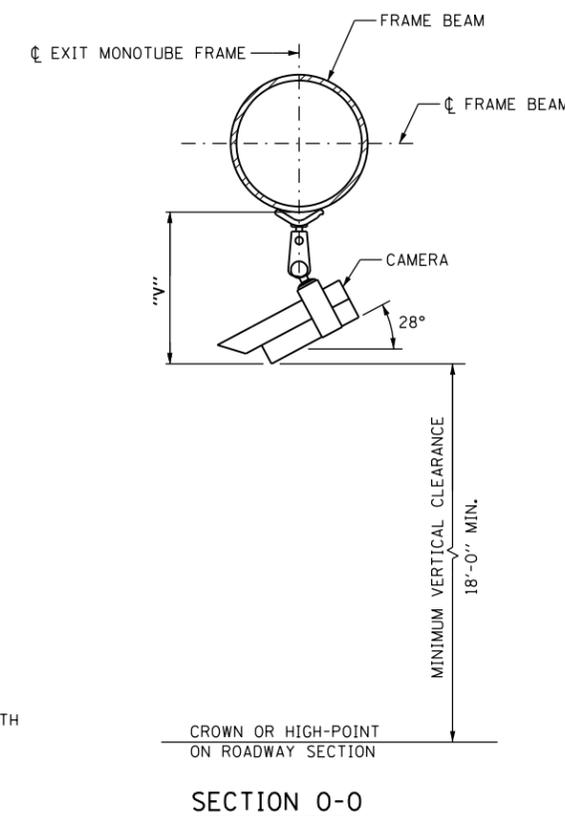
1. ILLINOIS TOLLWAY STRUCTURE DESIGN MANUAL, LATEST EDITION.
2. AASHTO STANDARD SPECIFICATION FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 6TH EDITION.
3. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6TH EDITION DATED FEBRUARY 2012.
4. ILLINOIS DEPARTMENT OF TRANSPORTATION BRIDGE MANUAL, JANUARY 2012

**CONSTRUCTION SPECIFICATIONS:**

1. ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS TO THE ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.
2. ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.



**SECTION P-P**



**SECTION 0-0**

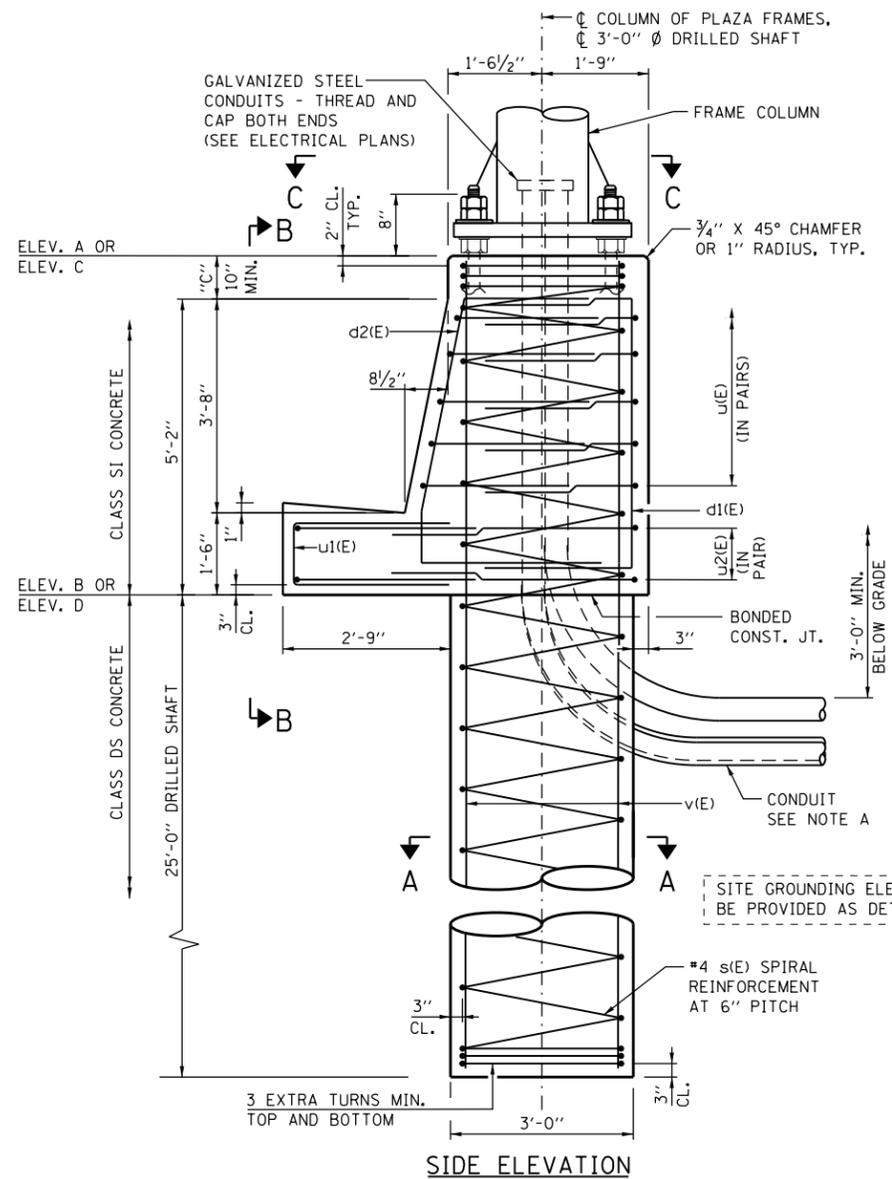
**NOTE:**  
VERIFY DIMENSION "V" WITH CAMERA MANUFACTURER.

APPROVED.....  
  
 CHIEF ENGINEER  
 DATE 10-14-2014

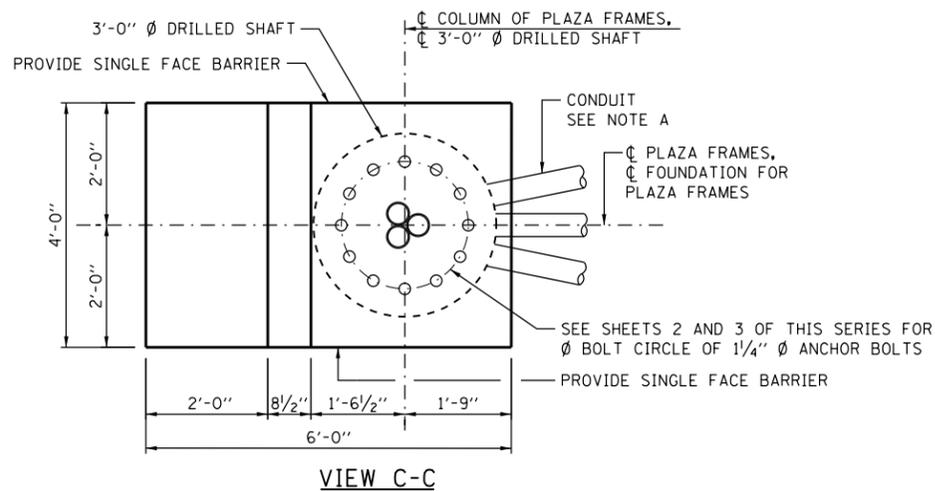


OVERHEAD SIGN STRUCTURE  
 MONOTUBE TYPE (STEEL)  
 STRUCTURE DETAILS  
 FOR AET RAMP  
 STANDARD F15-05



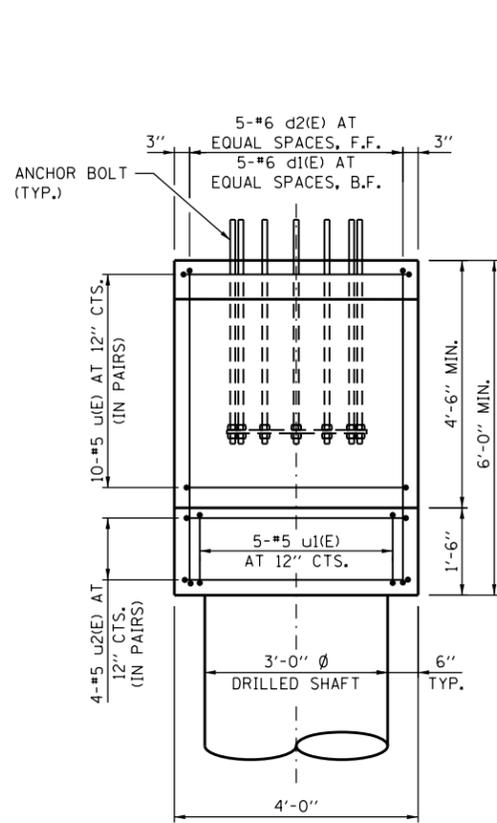


SIDE ELEVATION

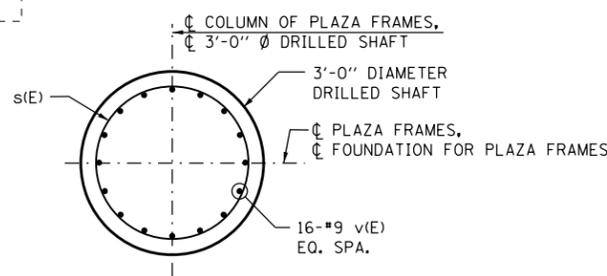


VIEW C-C

**SINGLE FACE BARRIER FOUNDATION FOR PLAZA FRAMES**



VIEW B-B



SECTION A-A

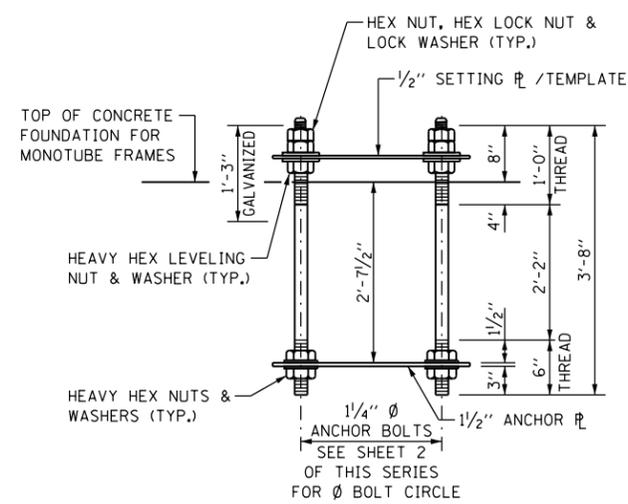
- NOTE A:**
- COORDINATE CONDUIT SIZE, LOCATION AND QUANTITY WITH ELECTRICAL PLANS. PROVIDE CONDUIT COUPLERS AS REQUIRED.
  - CONDUITS SHALL BE PLACED TO MISS REINFORCEMENT. CUTTING OF REINFORCEMENT SHALL NOT BE ALLOWED.
- NOTE B:**
- PROTECTIVE COAT SHALL BE APPLIED TO THE TRAFFIC AND TOP FACES OF THE BARRIER AND TOP OF GUTTER

**FOUNDATION NOTE:**

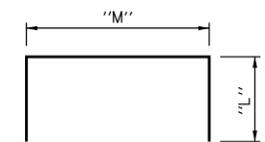
THE FOUNDATION DETAILS SHOWN ARE BASED ON THE PRESENCE OF MOSTLY COMMON COHESIVE SOIL CONDITIONS (SILTY OR SANDY CLAY), WITH AN AVERAGE UNCONFINED COMPRESSIVE STRENGTH (QU) > 1.25 TON/SQ. FT. WHICH MUST BE DETERMINED BY PREVIOUS SOIL INVESTIGATIONS AT THE JOBSITE. WHEN OTHER CONDITIONS ARE INDICATED, THE BORING DATA SHALL BE INCLUDED IN THE PLANS AND THE FOUNDATION DIMENSIONS SHOWN SHALL BE THE RESULT OF SITE SPECIFIC DESIGNS. IF CONDITIONS ENCOUNTERED IN THE FIELD ARE DIFFERENT THAN THOSE INDICATED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE IF THE FOUNDATION DIMENSIONS NEED TO BE MODIFIED.

**LEGEND:**

F.F. - FRONT FACE  
 B.F. - BACK FACE  
 CTS. - CENTERS

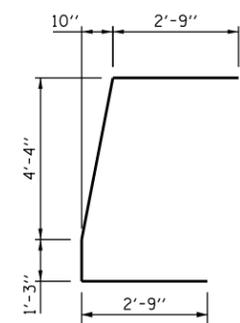


ANCHOR BOLT ASSEMBLY



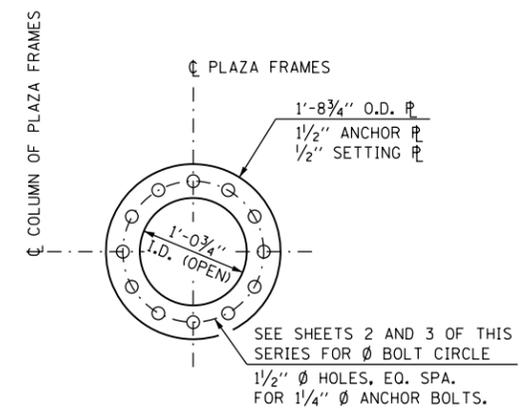
BAR	"L"	"M"
d1(E)	2'-9"	5'-7"
u1(E)	2'-9"	3'-8"
u1(E)	3'-3"	1'-1"
u2(E)	3'-10"	3'-8"

BARS d1(E), u1(E), u2(E)



BAR d2(E)

FRAME COLUMN	ANCHOR BOLT
HSS 12.75x0.500	12



ANCHOR BOLT / SETTING PLATE

**BAR LIST-ONE FOUNDATION**

BAR	NO.	SIZE	LENGTH	SHAPE
d1(E)	5	#6	11'-1"	U
d2(E)	5	#6	11'-2"	U
s(E)	1	#4	30'-7"	WWW
v(E)	16	#9	30'-7"	—
u1(E)	10	#5	9'-2"	U
u1(E)	5	#5	7'-7"	U
u2(E)	4	#5	11'-4"	U

- \* THE LENGTH OF SPIRAL SHOWN IS THE HEIGHT OF SPIRAL, COMPUTED USING "C" = 10". ADJUST LENGTH ACCORDINGLY IF "C" IS GREATER THAN 10".
- \*\* BAR LENGTH IS COMPUTED USING "C" = 10". ADJUST BAR LENGTH ACCORDINGLY IF "C" IS GREATER THAN 10".

**ESTIMATED QUANTITY**

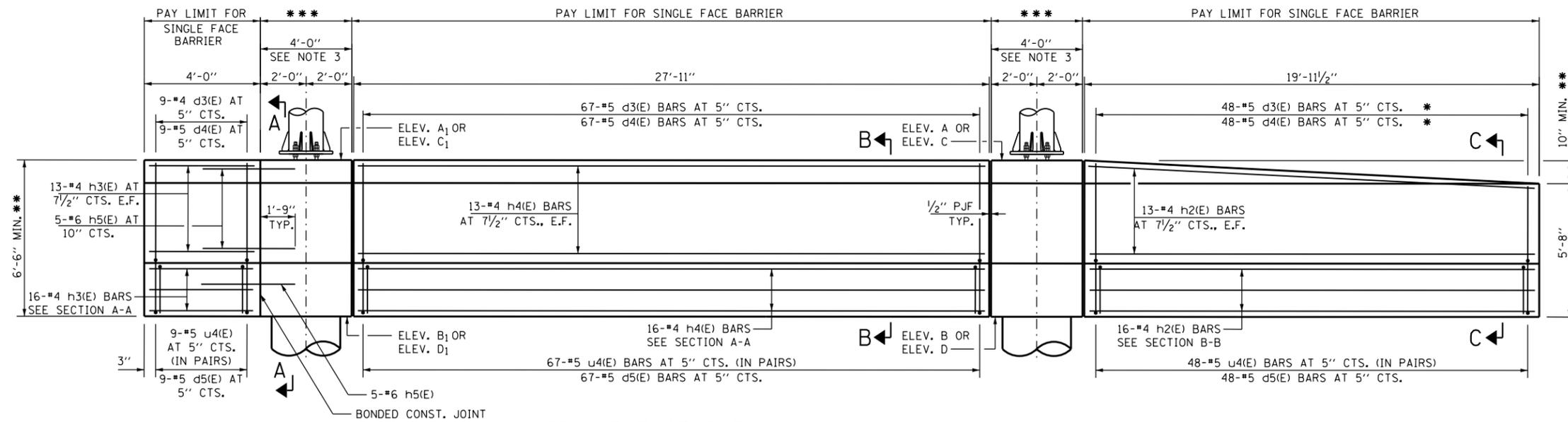
ITEM	UNIT	SINGLE FACE BARRIER FDN.
CLASS SI CONCRETE	CU. YD.	3.8
CLASS DS CONCRETE	CU. YD.	6.6
REINFORCEMENT BARS, EPOXY COAT	POUND	2,360
PROTECTIVE COAT	SQ. YD.	4.4

**NOTE:**

QUANTITIES FOR SINGLE FACE BARRIER FOUNDATION ARE DETERMINED USING "C" = 10". IF DIMENSION "C" IS GREATER THAN 10", ADJUST QUANTITIES ACCORDINGLY.

APPROVED: *Paul Kovacs* CHIEF ENGINEER DATE 10-14-2014.

OVERHEAD SIGN STRUCTURE  
 MONOTUBE TYPE (STEEL)  
 STRUCTURE DETAILS  
 FOR AET RAMP  
 STANDARD F15-05



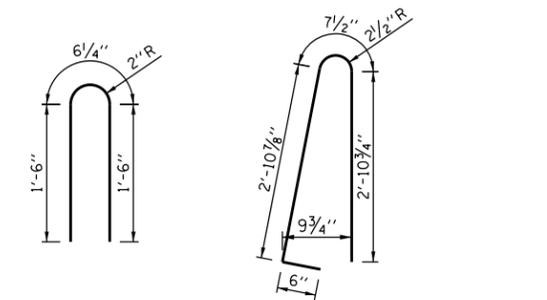
**SINGLE FACE BARRIER AND BARRIER BASE ELEVATION**

INSIDE FACE OF RIGHT BARRIER IS SHOWN  
(MIRROR ELEVATION OF LEFT BARRIER)

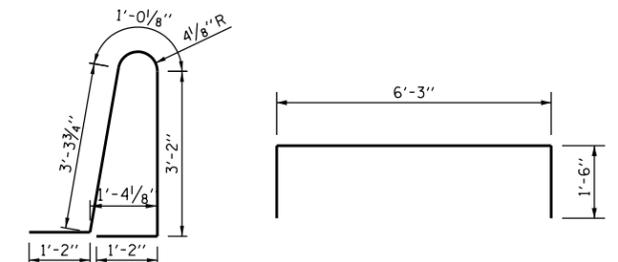
- \* CUT IN FIELD AS REQUIRED TO FIT TAPER
- \*\* BASED ON DIMENSION "C" = 10'
- \*\*\* PAY LIMIT FOR FOUNDATION FOR OVERHEAD SIGN STRUCTURE

**BAR LIST - FOR ONE BARRIER**

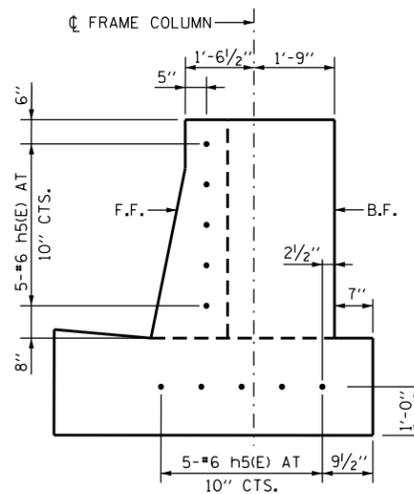
BAR	NO.	SIZE	LENGTH	SHAPE
d3(E)	124	#4	3'-7"	U
d4(E)	124	#5	7'-0"	U
d5(E)	124	#5	9'-10"	U
h2(E)	29	#4	19'-7"	I
h3(E)	29	#4	3'-8"	I
h4(E)	29	#4	27'-7"	I
h5(E)	10	#6	3'-9"	I
u4(E)	248	#5	9'-3"	L



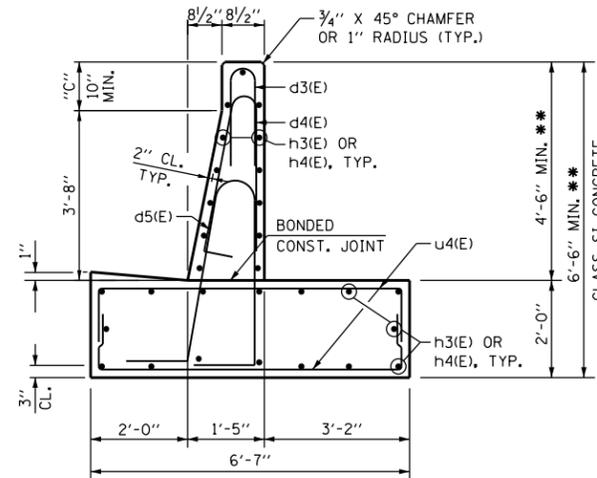
BAR d3(E)      BAR d4(E)



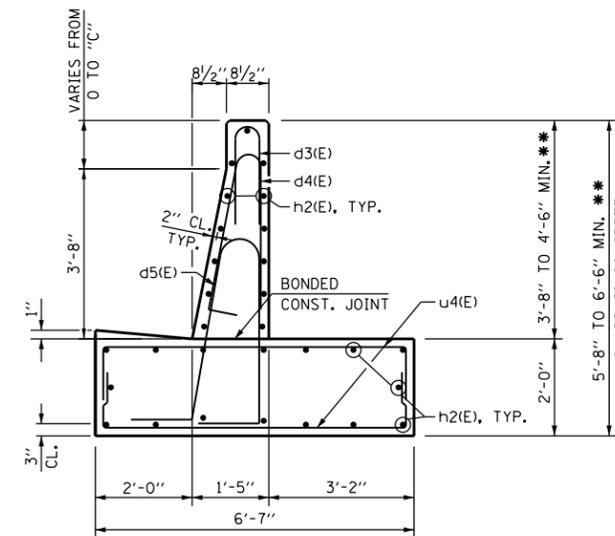
BAR d5(E)      BAR u4(E)



SECTION A-A



SECTION B-B



SECTION C-C

**ESTIMATED QUANTITY**

(FOR ONE SINGLE FACE BARRIER)

ITEM	UNIT	TOTAL
CONCRETE STRUCTURES	CU. YD.	33.9
REINFORCEMENT BARS, EPOXY COATED	POUND	5,910
PROTECTIVE COAT	SQ. YD.	41.1

**NOTES:**

1. PROTECTIVE COAT SHALL BE APPLIED TO THE TRAFFIC AND TOP FACES OF THE BARRIER, GUTTER AND TO THE ENTRANCE SIDE FACE (AT THE BEGINNING OF THE RAMP PLAZA PAVEMENT) FOR THE FULL HEIGHT OF THE BARRIER.
2. ELECTRICAL JUNCTION BOXES SHALL BE EXTERIOR MOUNTED ON THE BACK FACE OF BARRIER.
3. FOR SINGLE FACE BARRIER FOUNDATION DETAILS FOR MONOTUBE FRAMES, SEE SHEET 6 OF THIS SERIES.
4. QUANTITIES FOR SINGLE FACE BARRIER ARE DETERMINED USING "C" = 10'. IF DIMENSION "C" IS GREATER THAN 10', ADJUST QUANTITIES ACCORDINGLY.
5. SEE OVERHEAD SIGN STRUCTURE ENTRANCE MONOTUBE TYPE (STEEL) AET RAMP SUMMARY AND TOTAL BILL OF MATERIAL IN CONTACT PLANS FOR COMPLETE BILL OF MATERIAL.



OVERHEAD SIGN STRUCTURE  
MONOTUBE TYPE (STEEL)  
STRUCTURE DETAILS  
FOR AET RAMP

STANDARD F15-05

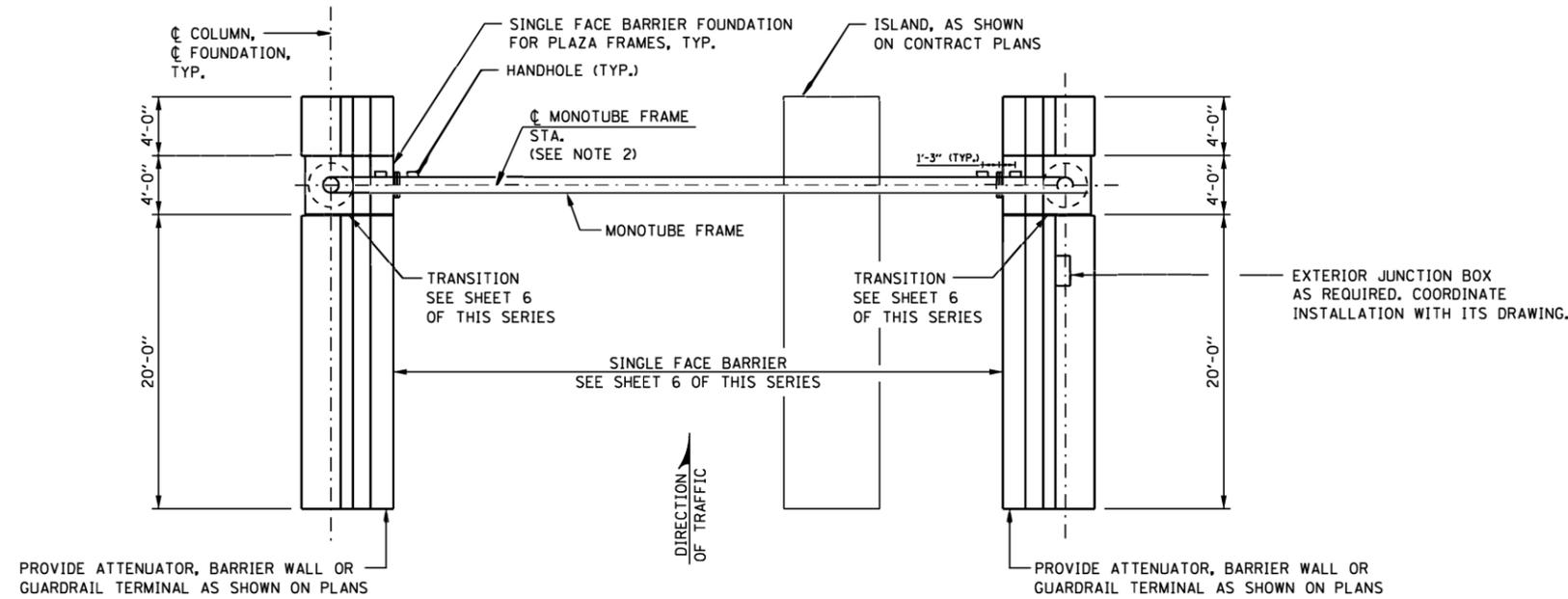
APPROVED: *Paul Kovacs* DATE 10-14-2014  
CHIEF ENGINEER

### SIGN TABLE

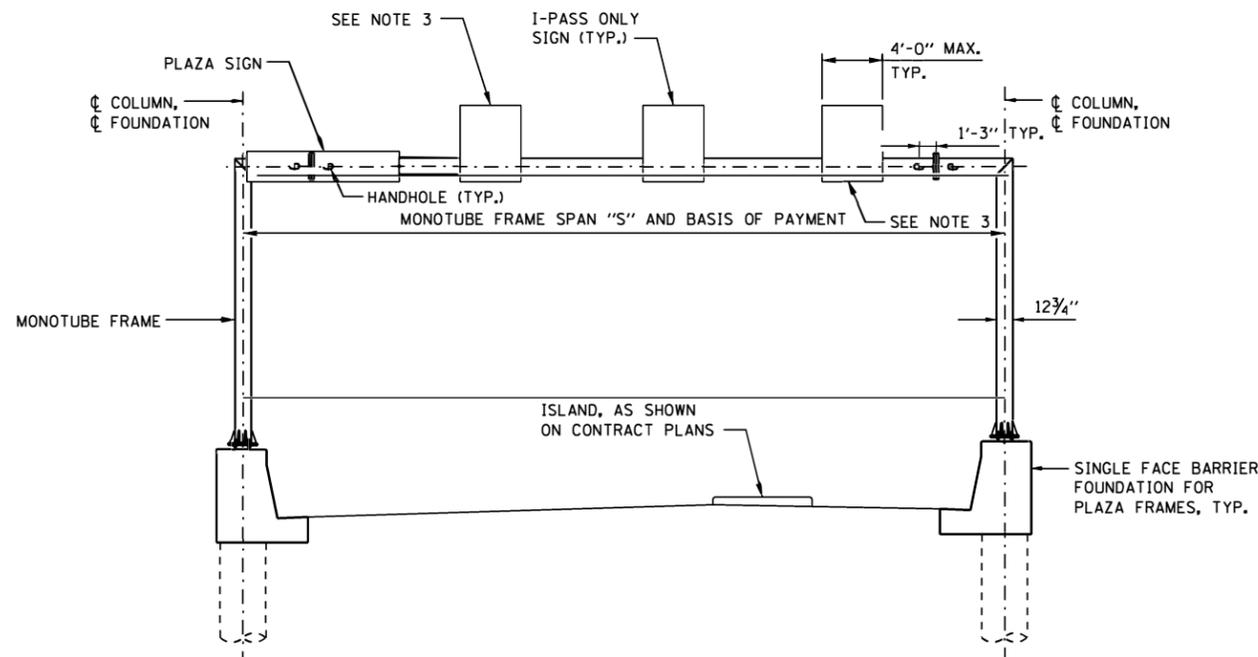
SIGN	MAXIMUM AREA	MAXIMUM LENGTH
PLAZA SIGN	24 S.F.	8'-0"
I-PASS ONLY SIGN	20 S.F.	4'-0"
CASH ONLY SIGN	20 S.F.	4'-0"

### NOTE:

1. SEE CONTRACT PLANS FOR SIGN SIZE AND LOCATION.
2. PROVIDE MONOTUBE FRAME STATION IN CONTRACT PLANS.
3. CASH ONLY SIGN OR I-PASS ONLY SIGN. SEE CONTRACT PLANS FOR SIGN PLACEMENT.



CASH-IPO RAMP TOLL PLAZA PLAN



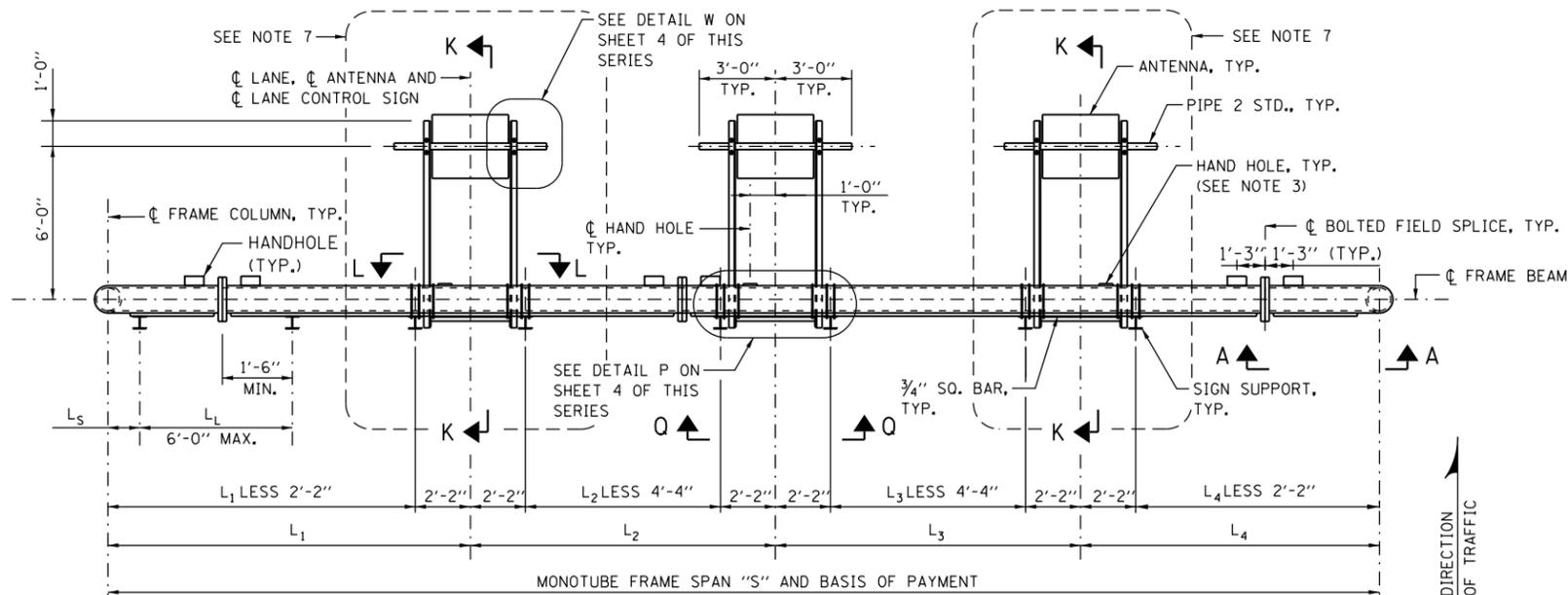
CASH-IPO RAMP TOLL PLAZA ELEVATION

DATE	REVISIONS
3-31-2016	REVISED FOUNDATION NOTE.
3-01-2019	UPDATED CONSTANT SLOPE BARRIER, REINFORCING DETAILS AND QUANTITIES
5-24-2019	UPDATED SHOULDER BARRIER DETAILS AND QUANTITIES FOR 3'-8"
2-13-2020	ADDED HANDHOLES, INSTALLATION & INSPECTION OF SPLICE & ANCHORS
	UPDATED BARRIER DETAILS

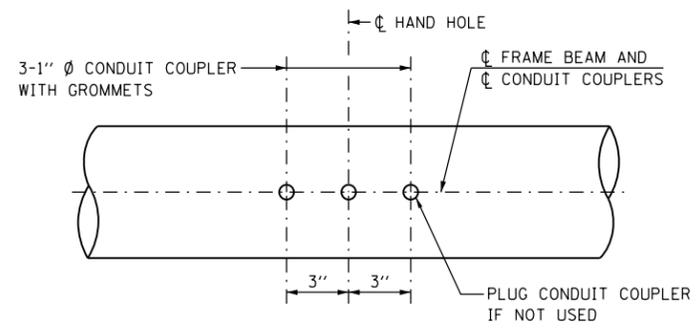


OVERHEAD SIGN STRUCTURE MONOTUBE TYPE (STEEL) STRUCTURE DETAILS FOR CASH-IPO RAMP  
STANDARD F16-04

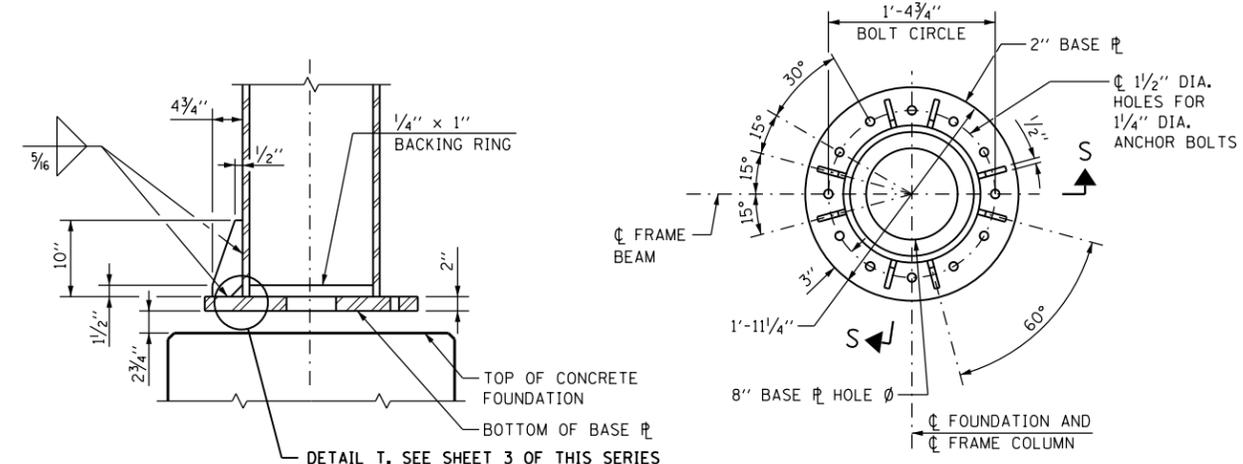
APPROVED: *Paul Kovacs* CHIEF ENGINEER DATE 10-14-2014



CASH-IPO RAMP MONOTUBE PLAN

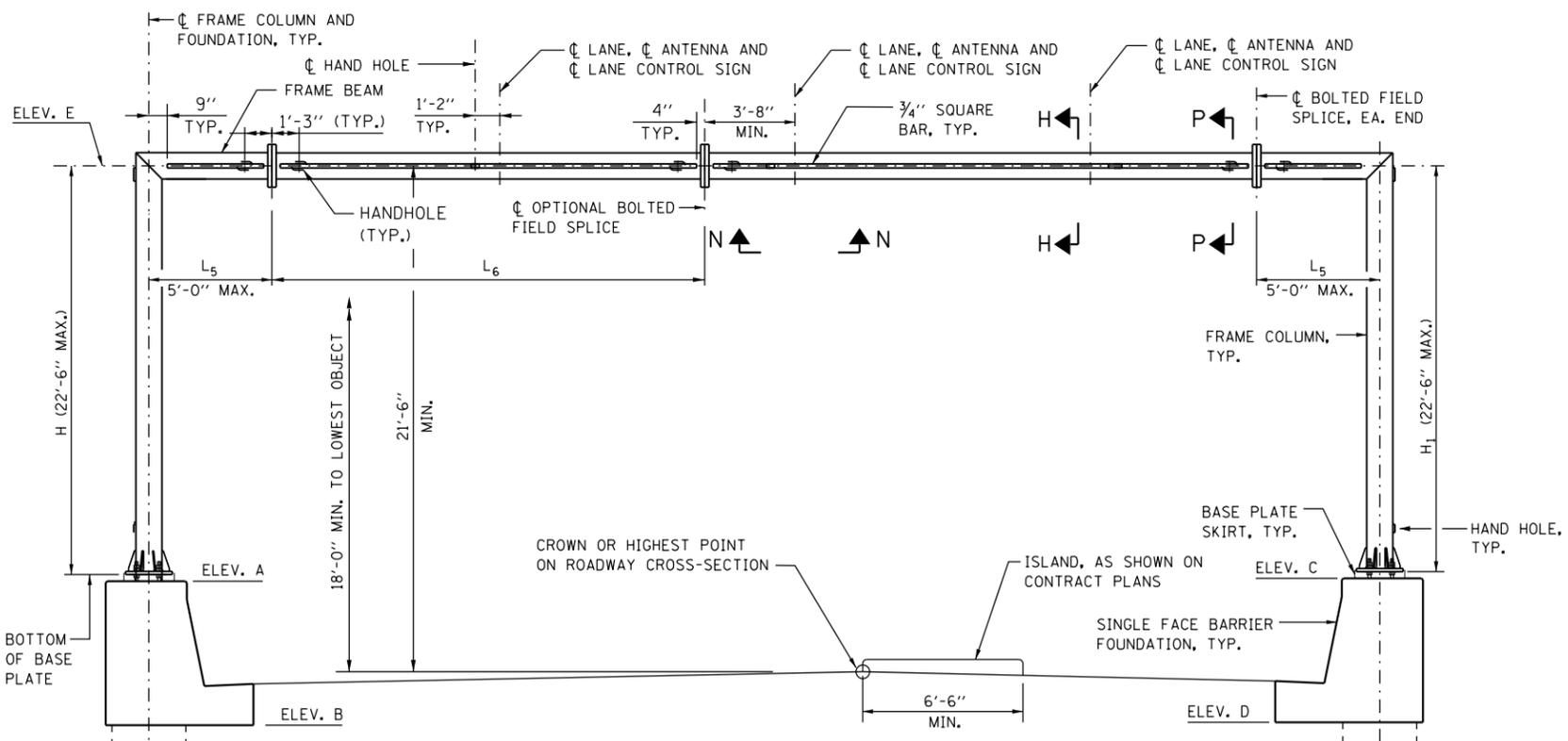


VIEW N-N (CONDUIT COUPLER DETAIL)



SECTION S-S

BASE PLATE PLAN MONOTUBE FRAME



CASH-IPO RAMP MONOTUBE ELEVATION

MONOTUBE FRAME TABLE

SPAN "S"	FRAME COLUMN	FRAME BEAM	CAMBER
60' MAX.	HSS 12.75x0.500	HSS 12.75x0.500	2 1/2"

SEE STANDARD F13 FOR SPANS GREATER THAN 60'

NOTES:

1. WORK THIS SHEET WITH OVERHEAD SIGN STRUCTURE MONOTUBE TYPE (STEEL) CASH-IPO RAMP, SUMMARY AND TOTAL BILL OF MATERIAL SHEET.
2. FOUNDATION FOR MONOTUBE FRAME IS SHOWN ON SHEET 5 OF THIS SERIES.
3. SEE SHEET 4 OF THIS SERIES FOR SECTIONS G-G, H-H AND K-K, VIEWS A-A AND O-O, AND HAND HOLE DETAILS.
4. SEE SHEET 3 OF THIS SERIES FOR SECTION P-P AND BASE PLATE SKIRT.
5. PROVIDE CAMBER AT MIDSPAN OF STRUCTURE.
6. LOCATE OPTIONAL BOLTED FIELD SPLICE NEAR MIDSPAN.
7. OMIT ANTENNA AND ANTENNA MOUNTING ASSEMBLY ABOVE CASH ONLY LANE.



OVERHEAD SIGN STRUCTURE MONOTUBE TYPE (STEEL) STRUCTURE DETAILS FOR CASH-IPO RAMP STANDARD F16-04

Paul Kovacs  
APPROVED... CHIEF ENGINEER... DATE 10-14-2014

**GENERAL NOTES:**

1. AFTER ADJUSTMENTS TO LEVEL FRAME BEAM AND ENSURE ADEQUATE VERTICAL CLEARANCE, TIGHTEN ALL TOP AND LEVELING NUTS AGAINST THE BASE PLATE WITH A MINIMUM TORQUE OF 200 LB.-FT. THEN PLACE STAINLESS STEEL MESH AROUND THE PERIMETER OF THE BASE PLATE. SECURE TO BASE PLATE WITH STAINLESS STEEL BANDING.
2. REINFORCEMENT BARS DESIGNATED "E" SHALL BE EPOXY COATED.
3. FINAL LOCATION OF I-PASS ANTENNAE SHALL BE AS DIRECTED BY THE ILLINOIS TOLLWAY.

**STRUCTURAL STEEL:**

1. MATERIAL FOR THE MONOTUBE FRAME AND RECTANGULAR HSS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500 GRADE B. BASE PLATE AND STIFFENER PLATE SHALL CONFORM TO ASTM A709 GRADE 50. OTHER STRUCTURAL STEEL SHAPES AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36, UNLESS NOTED OTHERWISE.
2. PIPES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A53 GRADE B.
3. ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F1554 (AASHTO M314) GRADE 55, WITH A MINIMUM TENSILE STRENGTH OF 75,000 PSI. INSTALLATION AND INSPECTION OF ANCHOR BOLTS SHALL COMPLY WITH ILLINOIS TOLLWAY SPECIAL PROVISION "INTELLIGENT TRANSPORTATION SYSTEMS GANTRY FRAME "STEEL". ANCHORS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 (AASHTO M232). SEE SHEET 6 OF THIS SERIES FOR GALVANIZED LENGTH.
4. U-BOLTS SHALL BE STAINLESS STEEL. PROVIDE STAINLESS STEEL WASHERS AND NUTS FOR U-BOLTS.
5. BOLTS (EXCLUDING ANCHOR BOLTS AND U-BOLTS) SHALL BE HIGH STRENGTH STEEL BOLTS.
6. TUBES FOR MONOTUBE FRAME, PIPES, STRUCTURAL STEEL SHAPES AND PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 AFTER FABRICATION.
7. THE MONOTUBE FRAME BEAM, COLUMNS, BASE PLATE MATERIAL, AND SPLICES ARE CONSIDERED TENSION MEMBERS AND SHALL CONFORM TO THE IMPACT TESTING REQUIREMENT, ZONE 2.

**DESIGN LOADING:**

WIND LOAD CRITERIA	
SIGN PANEL	35 P.S.F.
COLUMN/BEAM	35 P.S.F.

**EQUIPMENT LOADS:**

LED LANE CONTROL SIGN	50 LB.
ANTENNA	28 LB.

**DESIGN STRESSES FOR REINFORCED CONCRETE:**

$f'_c$ = COMPRESSIVE STRENGTH OF CONCRETE (CLASS S1)	= 3,500 P.S.I.
$f'_c$ = COMPRESSIVE STRENGTH OF CONCRETE (CLASS DS)	= 4,000 P.S.I.
$f_y$ = YIELD STRENGTH OF REINFORCEMENT BARS (GRADE 60)	= 60,000 P.S.I.

**FOUNDATION:**

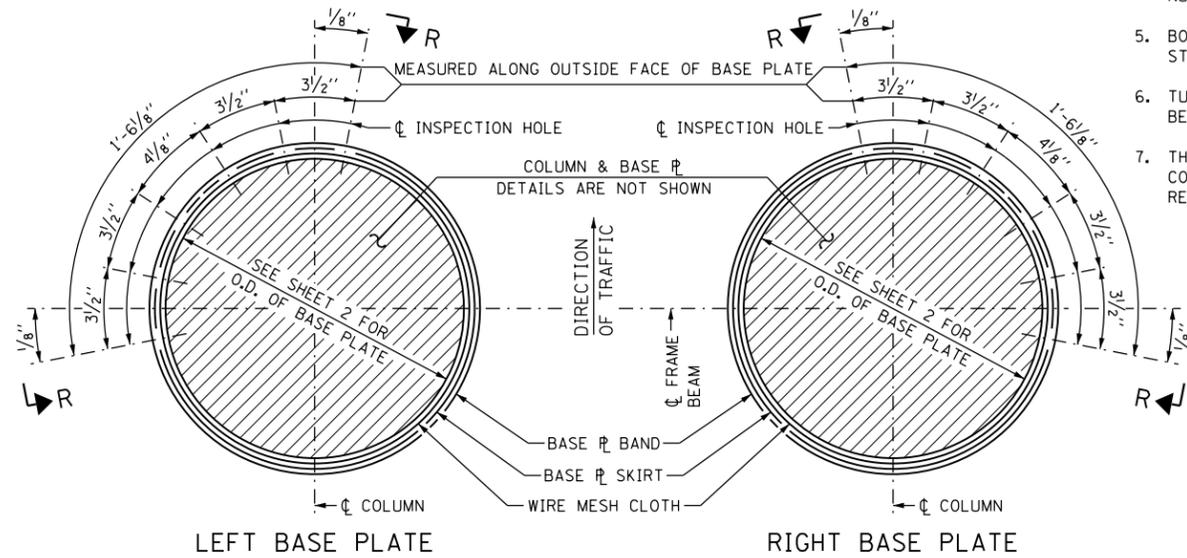
MINIMUM UNCONFINED COMPRESSIVE STRENGTH,  $Q_u$  FOR ALL LAYERS OF COHESIVE SOILS (CLAYS) SHALL BE 1.25 TON/SQ.F.T. AT RAMP FRAMES.

**DESIGN SPECIFICATIONS:**

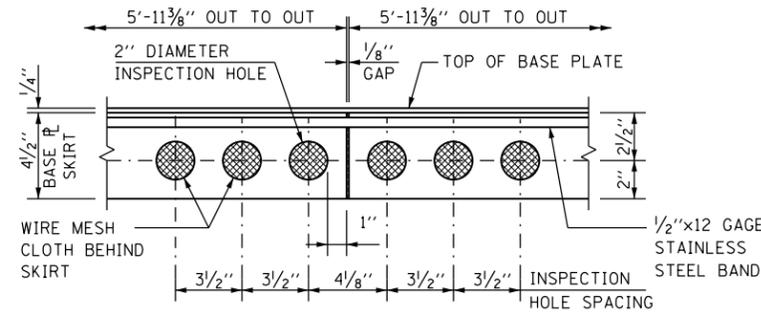
1. ILLINOIS TOLLWAY STRUCTURE DESIGN MANUAL, LATEST EDITION.
2. AASHTO STANDARD SPECIFICATION FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 6TH EDITION.
3. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6TH EDITION DATED FEBRUARY 2012.
4. ILLINOIS DEPARTMENT OF TRANSPORTATION BRIDGE MANUAL, JANUARY 2012

**CONSTRUCTION SPECIFICATIONS:**

1. ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS TO THE ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.
2. ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.



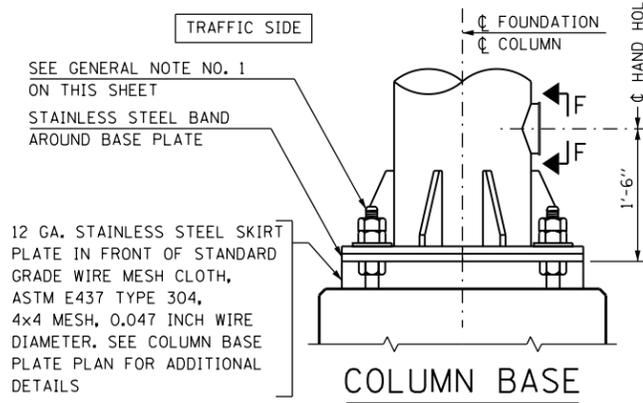
LEFT BASE PLATE  
RIGHT BASE PLATE  
COLUMN BASE PLATE PLAN



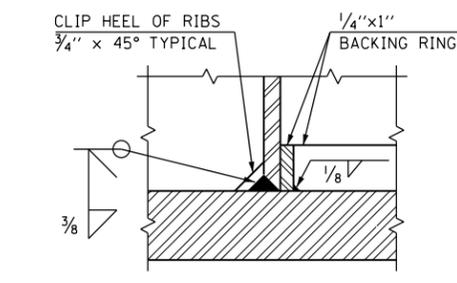
VIEW R-R (BASE PLATE SKIRT)

**NOTE:**

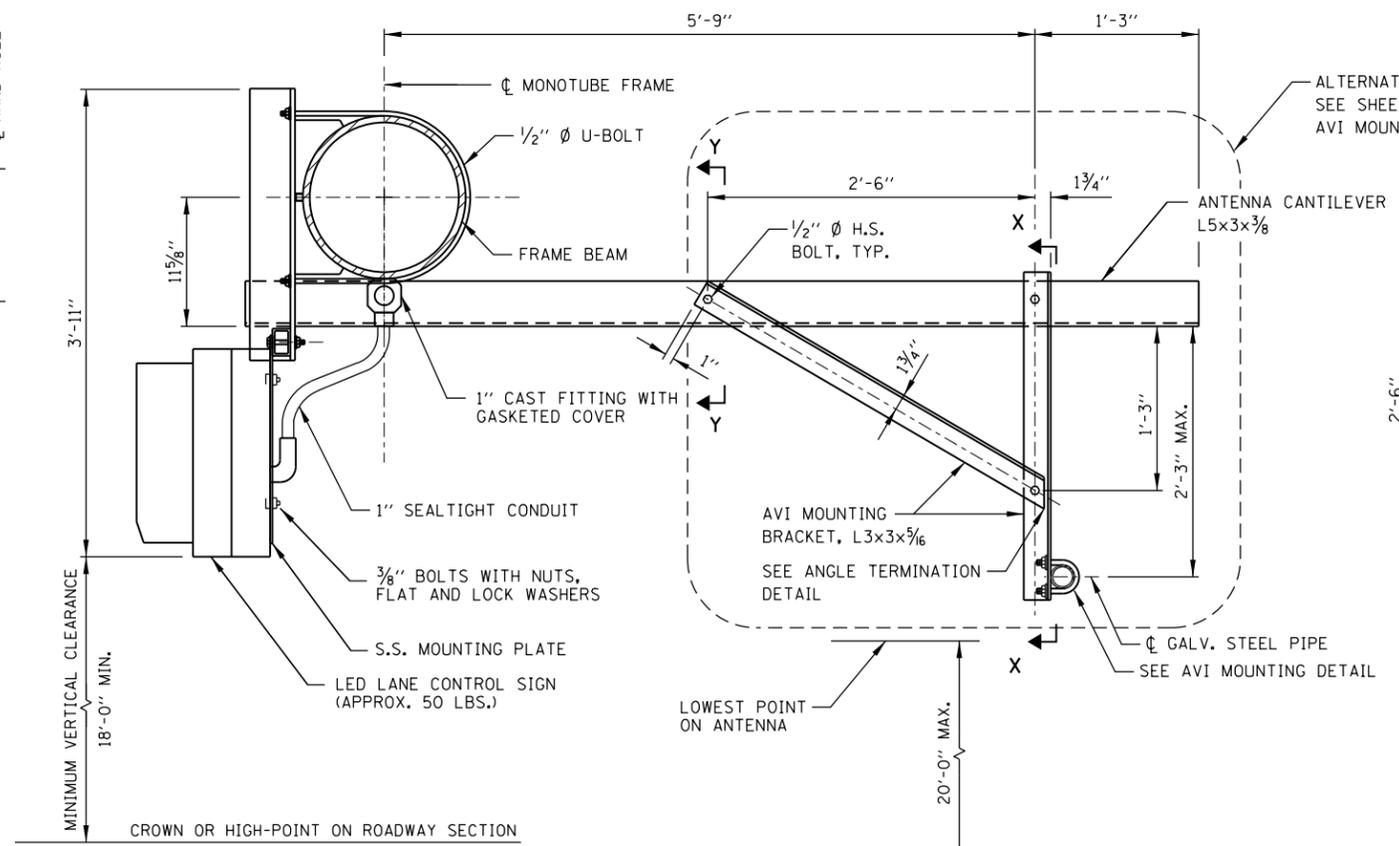
SEE SHEET 4 OF THIS SERIES FOR VIEW F-F.



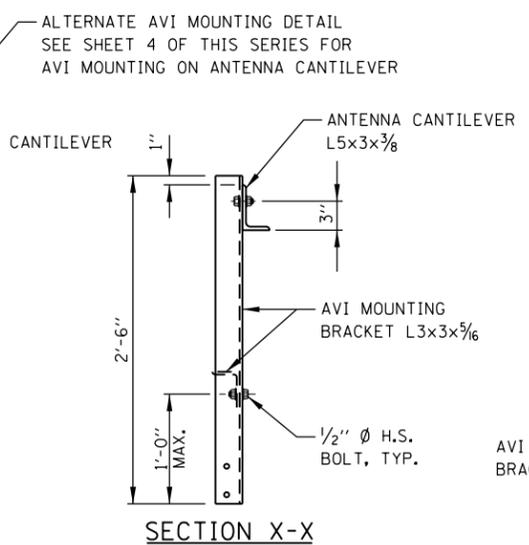
COLUMN BASE



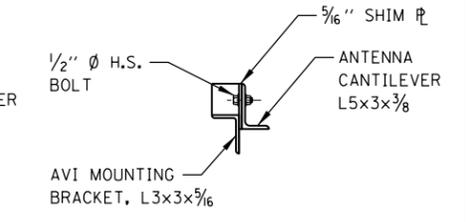
DETAIL T



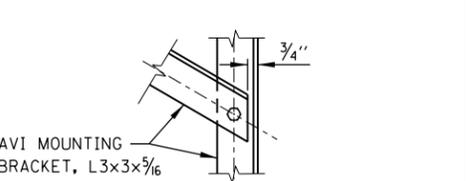
SECTION P-P  
(LED LANE CONTROL SIGNAL MOUNTING DETAIL)



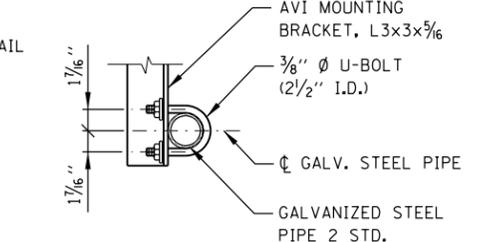
SECTION X-X



SECTION Y-Y

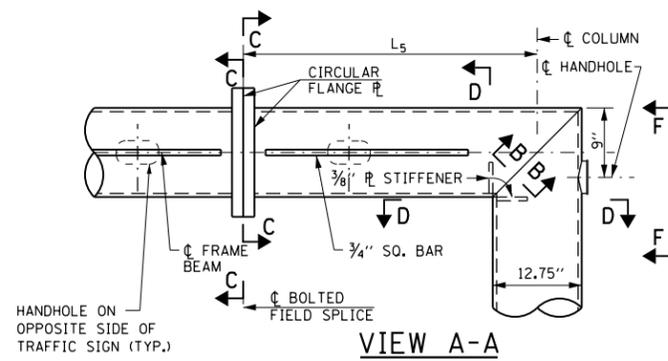


ANGLE TERMINATION

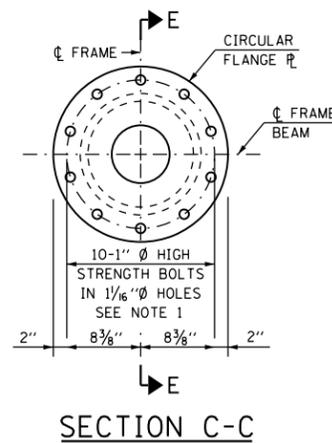


AVI MOUNTING DETAIL

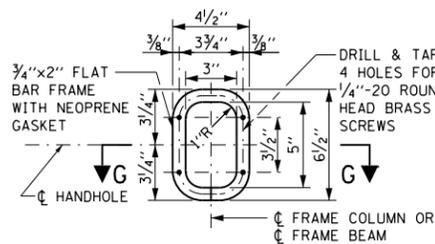
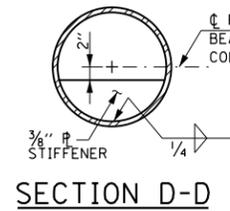
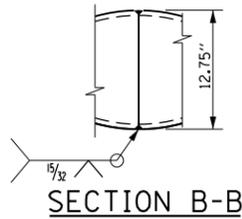
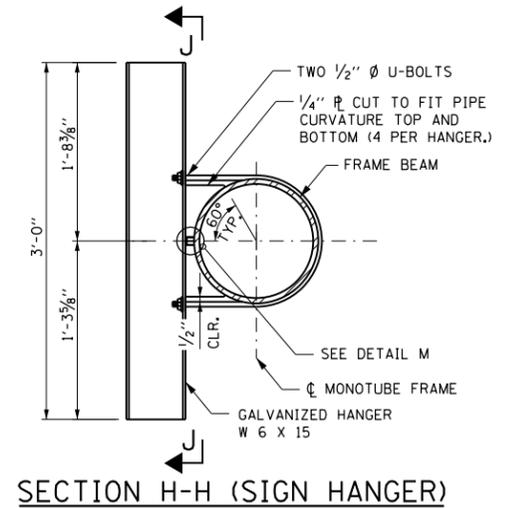
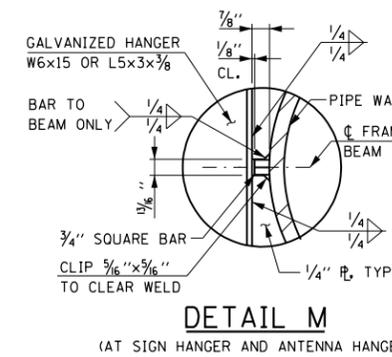
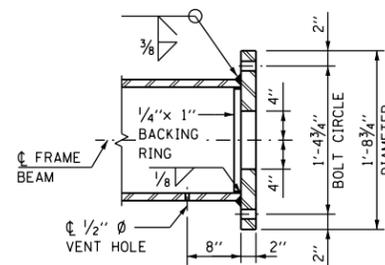




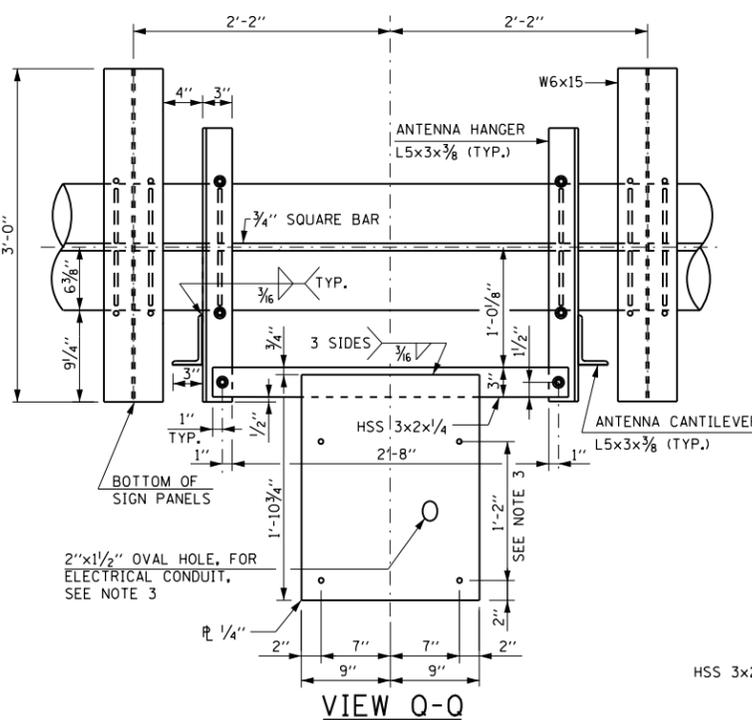
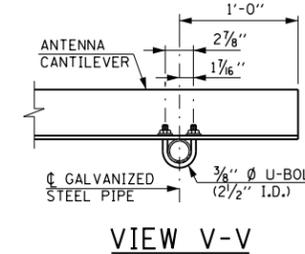
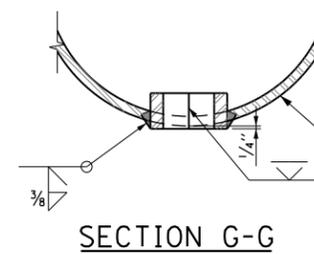
HANDHOLE ON OPPOSITE SIDE OF TRAFFIC SIGN (TYP.)



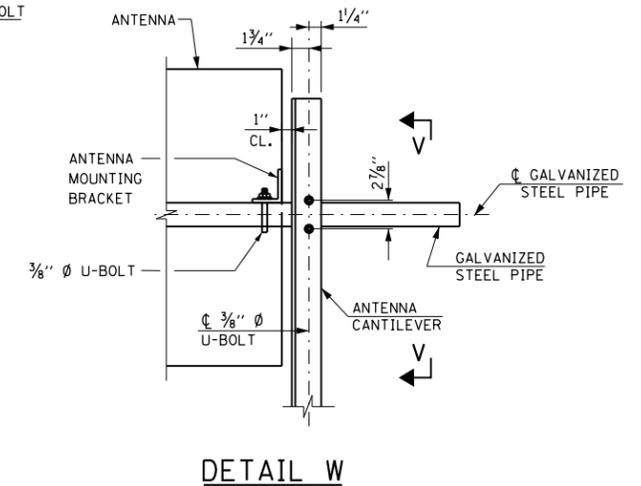
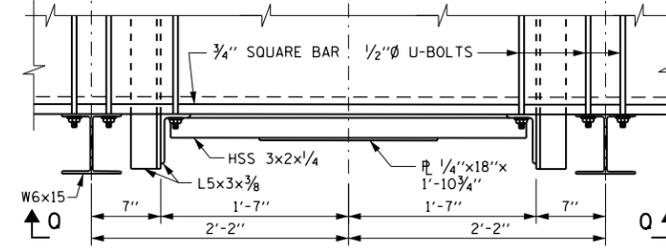
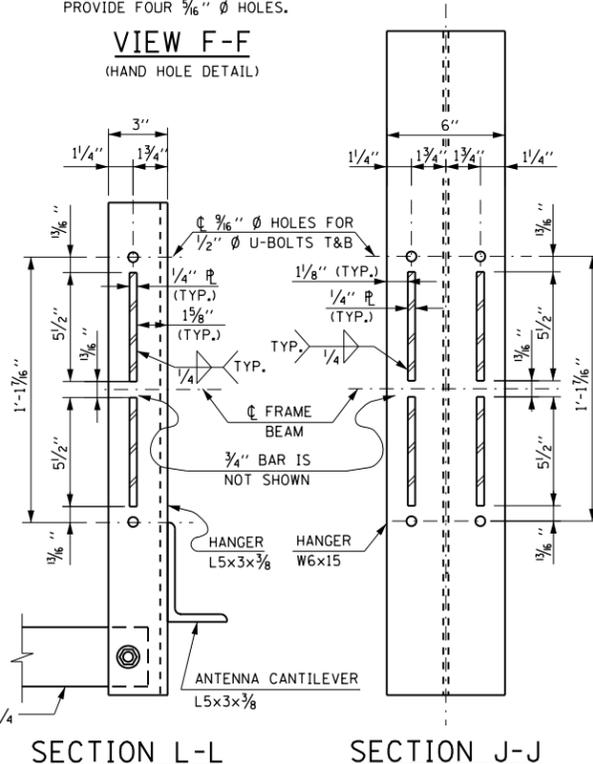
NOTE 1: INSTALLATION AND INSPECTION OF SPLICE BOLTS SHALL COMPLY WITH ILLINOIS TOLLWAY SPECIAL PROVISION "INTELLIGENT TRANSPORTATION SYSTEMS GANTRY FRAME (STEEL)".



PROVIDE 6 1/2 inch x 4 1/2 inch #10 GA. COVER. ROUND CORNERS TO 1 3/4 INCH RADIUS. PROVIDE FOUR 3/16 INCH DIAMETER HOLES.

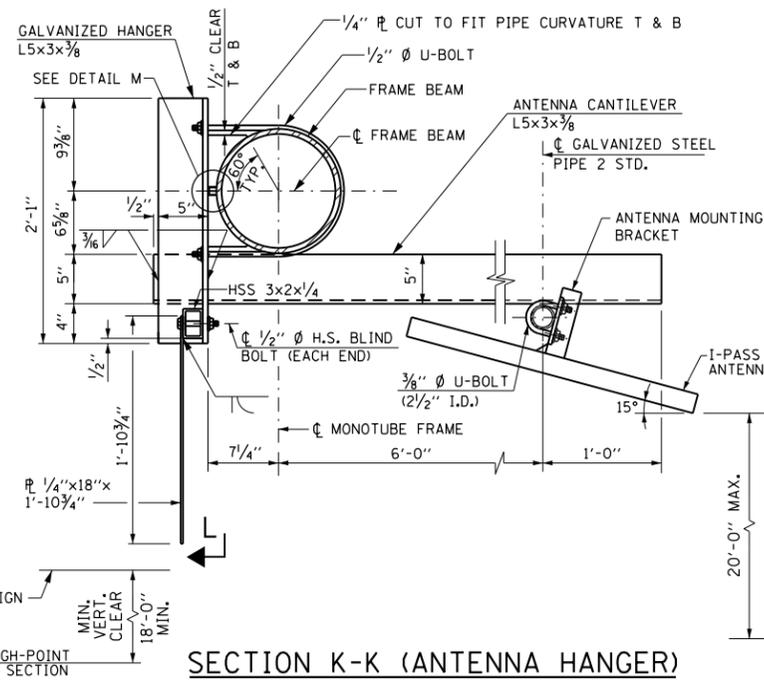


2" x 1 1/2" OVAL HOLE, FOR ELECTRICAL CONDUIT, SEE NOTE 3



**NOTES:**

- SIGN AND SIGN HANGER ARE OMITTED FROM VIEW A-A FOR CLARITY.
- FOR DETAILS OF ATTACHMENT BETWEEN HANGER AND SIGN PANELS, SEE ILLINOIS TOLLWAY STANDARD DRAWING F10.
- CONTRACTOR SHALL VERIFY LOCATION AND SIZE OF HOLES WITH LANE CONTROL SIGNAL PRIOR TO FABRICATION OF 1/4 INCH PLATE.
- T&B DENOTE TOP AND BOTTOM.
- PROVIDE ANTENNA MOUNTING BRACKET ACCORDING TO ANTENNA MANUFACTURER'S RECOMMENDATION.
- SEE SHEET 2 OF THIS SERIES FOR HANDHOLE LOCATIONS.



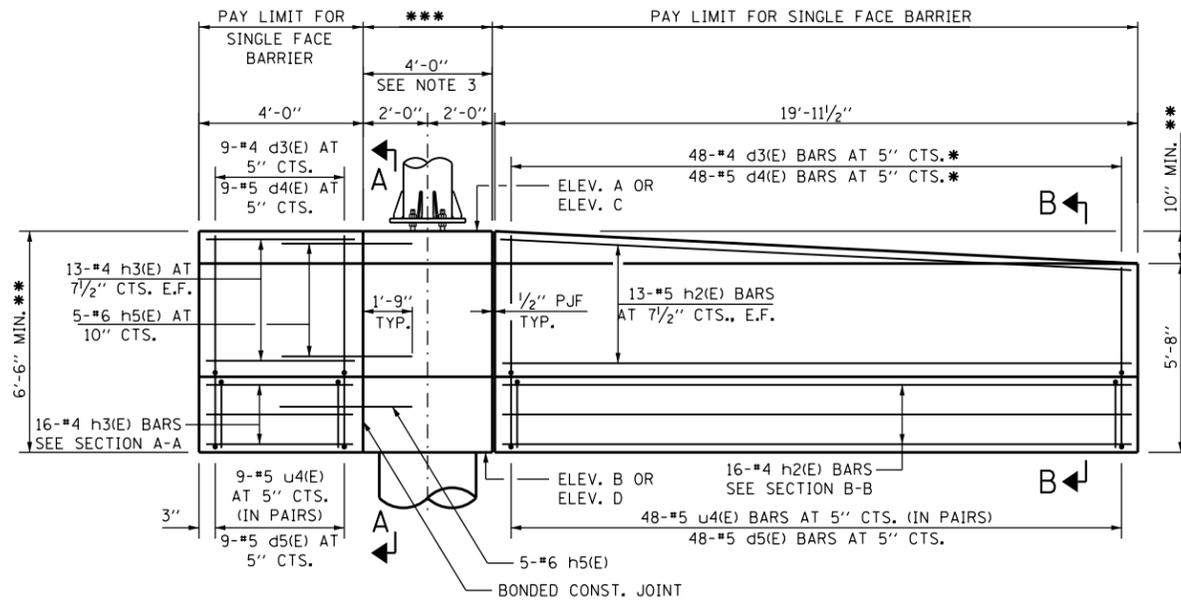
MIN. VERT. CLEAR 18'-0" MIN.  
CROWN OR HIGH-POINT ON ROADWAY SECTION

TOP OF PAVEMENT AT ANTENNA

Paul Kovacs  
APPROVED, CHIEF ENGINEER  
DATE 10-14-2014







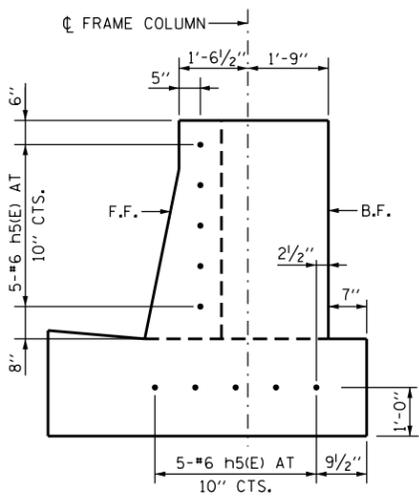
**SINGLE FACE BARRIER ELEVATION**

INSIDE FACE OF RIGHT BARRIER IS SHOWN  
(MIRROR ELEVATION OF LEFT BARRIER)

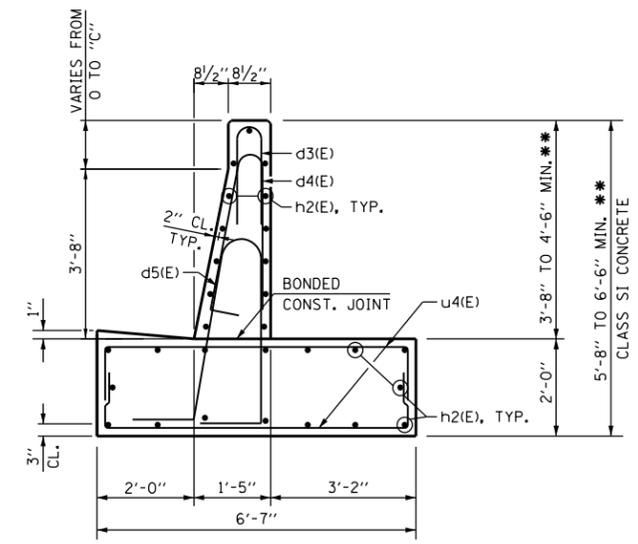
- \* CUT IN FIELD AS REQUIRED TO FIT TAPER
- \*\* BASED ON DIMENSION "C" = 10"
- \*\*\* PAY LIMIT FOR FOUNDATION FOR OVERHEAD SIGN STRUCTURE

**BAR LIST - ONE BARRIER**

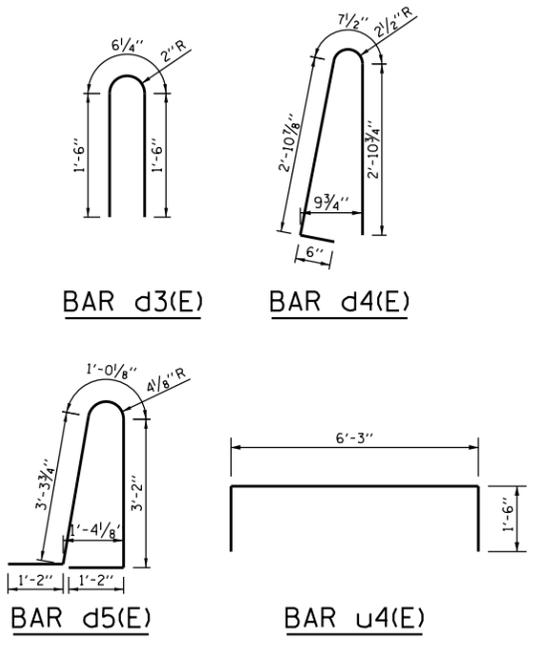
BAR	NO.	SIZE	LENGTH	SHAPE
d3(E)	57	#4	3'-7"	U
d4(E)	57	#5	7'-0"	U
d5(E)	57	#5	9'-10"	U
h2(E)	29	#4	19'-7"	I
h3(E)	29	#4	3'-8"	I
h5(E)	10	#6	3'-9"	I
u4(E)	114	#5	9'-3"	U



**SECTION A-A**



**SECTION B-B**



**ESTIMATED QUANTITY**

(FOR ONE SINGLE FACE BARRIER)

ITEM	UNIT	TOTAL
CONCRETE STRUCTURES	CU. YD.	15.6
REINFORCEMENT BARS, EPOXY COATED	POUND	2,750
PROTECTIVE COAT	SQ. YD.	18.5

**NOTES:**

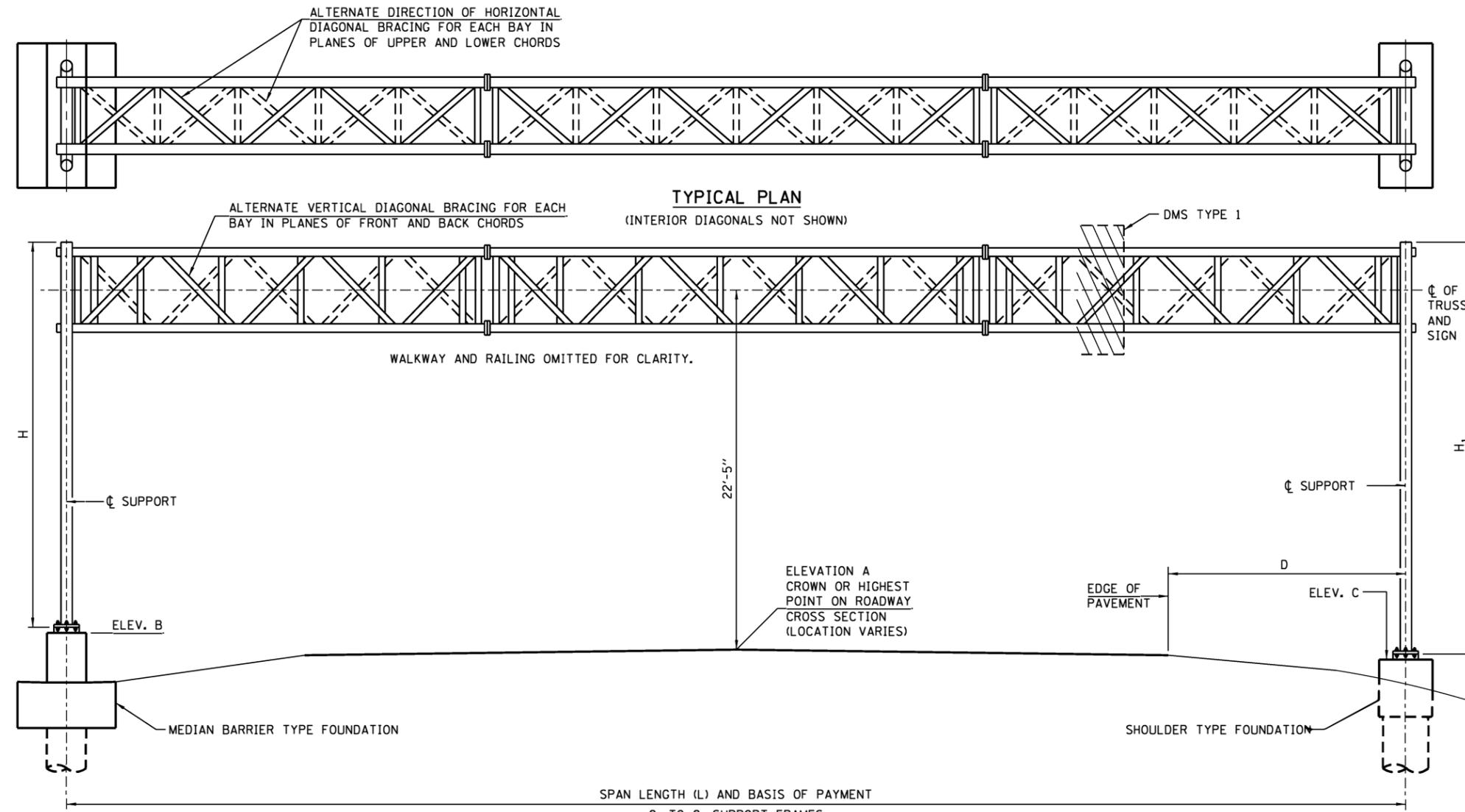
1. PROTECTIVE COAT SHALL BE APPLIED TO THE TRAFFIC AND TOP FACES OF THE BARRIER, GUTTER AND TO THE ENTRANCE SIDE FACE (AT THE BEGINNING OF THE RAMP PLAZA PAVEMENT) FOR THE FULL HEIGHT OF THE BARRIER.
2. ELECTRICAL JUNCTION BOXES SHALL BE EXTERIOR MOUNTED ON THE BACK FACE OF BARRIER.
3. FOR SINGLE FACE BARRIER FOUNDATION DETAILS FOR MONOTUBE FRAMES, SEE SHEET 5 OF THIS SERIES.
4. QUANTITIES FOR SINGLE FACE BARRIER ARE DETERMINED USING "C" = 10". IF DIMENSION "C" IS GREATER THAN 10", ADJUST QUANTITIES ACCORDINGLY.
5. WORK THIS SHEET WITH, OVERHEAD SIGN STRUCTURE MONOTUBE TYPE (STEEL) CASH-IPO RAMP SUMMARY AND TOTAL BILL OF MATERIAL SHEET.



OVERHEAD SIGN STRUCTURE  
MONOTUBE TYPE (STEEL)  
STRUCTURE DETAILS  
FOR CASH-IPO RAMP

STANDARD F16-04

APPROVED.....  
DATE 10-14-2014  
CHIEF ENGINEER



**GENERAL NOTES:**

1. WORK THIS SHEET WITH, OVERHEAD SIGN STRUCTURE SPAN TYPE (STEEL) SUMMARY AND BILL OF MATERIAL SHEET.
2. AFTER ADJUSTMENTS TO LEVEL TRUSS AND ENSURE ADEQUATE VERTICAL CLEARANCE, ALL TOP AND LEVELING NUTS SHALL BE TIGHTENED AGAINST THE BASE PLATE WITH A MINIMUM TORQUE OF 200 LB.-FT. STAINLESS STEEL MESH SHALL THEN BE PLACED AROUND THE PERIMETER OF THE BASE PLATE. SECURE TO BASE PLATE WITH STAINLESS STEEL BANDING.
3. SIGN SUPPORT STRUCTURES MAY BE SUBJECT TO DAMAGING VIBRATIONS AND OSCILLATIONS WHEN DMS IS NOT IN PLACE DURING ERECTION OR MAINTENANCE OF THE STRUCTURE. TO AVOID THESE, ATTACH TEMPORARY BLANK SIGN PANELS OR OTHER BRACING TO THE STRUCTURE UNTIL DMS IS INSTALLED.
4. TRUSS UNITS SHALL BE SHIPPED INDIVIDUALLY WITH ADEQUATE PROVISION TO PREVENT DETRIMENTAL MOTION DURING TRANSPORT. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE CONFIGURATION AND PROTECTION OF THE TRUSS UNITS.
5. ALL WELDS SHALL BE CONTINUOUS UNLESS OTHERWISE SHOWN. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH CURRENT AWS D1.1 STRUCTURE WELDING CODE AND THE STANDARD SPECIFICATIONS.
6. INSTALLATIONS NOT WITHIN DIMENSIONAL LIMITS SHOWN REQUIRE SPECIAL ANALYSIS FOR ALL COMPONENTS.
7. ONE DMS TYPE 1 IS PERMITTED TO BE MOUNTED ON A SPAN TRUSS. DO NOT MOUNT SIGN PANELS ON THIS TRUSS.

**FABRICATION NOTES:**

1. MATERIALS: SEE MATERIAL SPECIFICATIONS TABLE FOR MATERIAL SPECIFICATIONS FOR OVERHEAD SIGN STRUCTURE SPAN TYPE (STEEL). STAINLESS STEEL FOR SHIMS, SLEEVES AND HANDHOLE COVERS SHALL BE ASTM A240, TYPE 302 OR 304 OR ANOTHER ALLOY SUITABLE FOR EXTERIOR EXPOSURE AND ACCEPTABLE TO THE ENGINEER. THE STEEL PIPE AND STIFFENING RIBS AT THE BASE PLATE FOR THE STEEL POST SHALL HAVE A MINIMUM LONGITUDINAL CHARPY V-NOTCH (CVN) ENERGY OF 15 LB.-FT. AT 40°F (ZONE 2) BEFORE GALVANIZING.
2. WELDING: ALL MATERIALS, WELDING PROCEDURES AND INSPECTION USED FOR THE SPAN TYPE OVERHEAD SIGN STRUCTURE SHALL CONFORM TO AWS D1.1-10 FOR TUBULAR, CYCLICALLY LOADED STRUCTURES. ADDITIONALLY, ALL WELDED MATERIALS USED SHALL BE PREQUALIFIED FOR USE WITH WPS PER AWS D1.1-10, TABLE 3.1.
3. FASTENERS FOR STEEL TRUSSES: HIGH STRENGTH BOLTS SHALL SATISFY THE REQUIREMENTS OF AASHTO M164 (ASTM A325), OR APPROVED ALTERNATE, AND SHALL HAVE MATCHING LOCKNUTS. THREADED STUDS FOR SPLICES (IF MEMBERS INTERFERE) SHALL SATISFY THE REQUIREMENTS OF ASTM A449, ASTM A193 GRADE B7, OR APPROVED ALTERNATE, AND SHALL HAVE MATCHING LOCKNUTS. BOLTS AND LOCKNUTS NOT REQUIRED TO BE HIGH STRENGTH SHALL SATISFY THE REQUIREMENTS OF ASTM A307. ALL BOLTS AND LOCKNUTS SHALL BE HOT DIP GALVANIZED PER AASHTO M232, EXCEPT STAINLESS STEEL FASTENERS, NUTS AND WASHERS. THE LOCKNUTS SHALL HAVE NYLON OR STEEL INSERTS. A STAINLESS STEEL FLAT WASHER CONFORMING TO ASTM A240 TYPE 302 OR 304, IS REQUIRED UNDER BOTH HEAD AND NUT OR UNDER BOTH NUTS WHERE THREADED STUDS ARE USED. HIGH STRENGTH BOLT INSTALLATION SHALL CONFORM TO ARTICLE 505.04(f)(2)d OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. ROTATIONAL CAPACITY ("ROCAP") TESTING OF BOLTS WILL NOT BE REQUIRED.
4. U-BOLTS: U-BOLTS SHALL BE PRODUCED FROM ASTM A193 GRADE B8 OR B8M, OR AN EQUIVALENT MATERIAL ACCEPTABLE TO THE ENGINEER. ALL NUTS FOR U-BOLTS SHALL BE LOCKNUTS EQUIVALENT TO ASTM A307 WITH NYLON OR STEEL INSERTS AND HOT DIP GALVANIZED PER AASHTO M232. A STAINLESS STEEL FLAT WASHER CONFORMING TO ASTM A240, TYPE 302 OR 304, IS REQUIRED UNDER EACH U-BOLT LOCKNUT.
5. STEEL GRATING: STEEL BARS FOR GRATING ELEMENTS SHALL CONFORM TO ASTM A36 OR AN EQUIVALENT MATERIAL ACCEPTABLE TO THE ENGINEER.
6. GALVANIZING: ALL PLATES, SHAPES AND PIPE SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111. PAINTING IS NOT PERMITTED. ALL FASTENERS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111 OR M232 AS APPROPRIATE FOR THE PRODUCT (EXCEPT STAINLESS STEEL FASTENERS).

**CONSTRUCTION SPECIFICATIONS:**

1. ALL MATERIALS, EXCEPT AS SHOWN, FABRICATION, ERECTION AND CONSTRUCTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE LATEST STANDARD SPECIFICATIONS.

**LOADING:**

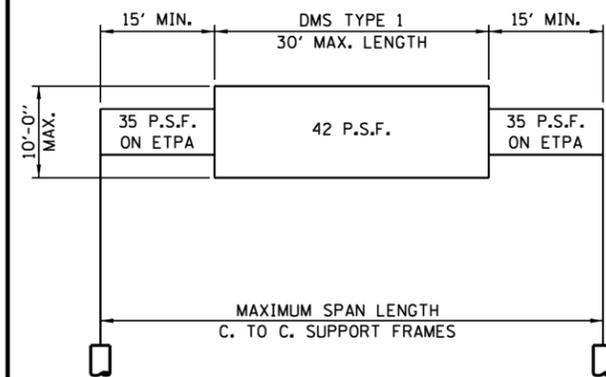
1. SPAN TYPE (STEEL) TRUSS ARE DESIGNED FOR A 10'-0" DEEP DMS, WITH A MAXIMUM LENGTH OF 30'-0" AND A MAXIMUM THICKNESS OF 4'-2".
2. SPAN TYPE (STEEL) TRUSS ARE DESIGNED FOR 40 PSF WIND PRESSURE ON TRUSS MEMBERS AND 56 PSF ON DMS.
3. WALKWAY LOADING SHALL INCLUDE DEAD LOAD PLUS 500 LBS. CONCENTRATED LIVE LOAD.

**DESIGN SPECIFICATIONS:**

THESE STRUCTURES ARE DESIGNED TO SATISFY THE 2015 AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, FIRST EDITION WITH INTERIMS.

**TYPICAL ELEVATION**  
(LOOKING AT FACE OF SIGN)

ELEV. A = ELEVATION AT POINT OF MINIMUM CLEARANCE TO DMS, WALKWAY SUPPORT OR TRUSS.



**DESIGN WIND LOADING DIAGRAM**

ETPA = EFFECTIVE TRUSS PROJECTED AREA.  
MAXIMUM DMS WEIGHT = 5000 LBS.

**MATERIAL SPECIFICATIONS TABLE FOR STRUCTURAL STEEL AND FASTENERS**

ELEMENT OF STRUCTURE	SPECIFICATION	MINIMUM YIELD STRENGTH (K.S.I.)	MINIMUM ULTIMATE STRENGTH (K.S.I.)
HOLLOW STRUCTURAL SECTIONS (HSS)	ASTM A500 GRADE B	42	58
STRUCTURAL STEEL PIPE	ASTM A53, TYPE E OR S, GRADE B	35	60
STRUCTURAL STEEL BAR, PLATES AND SHAPES	ASTM A572 GRADE 50	50	65
STAINLESS STEEL BOLTS	ASTM A193 GRADE B8 OR B8M	30	75
STRUCTURAL STEEL BOLTS	ASTM 325, TYPE 1	--	105
STAINLESS STEEL LOCKNUTS	ASTM A194 GRADE 8F ASTM A194 GRADE 2H	--	--
NUTS	ASTM A563 GRADE DH	--	--
STEEL WASHERS	ASTM F436	--	--
STAINLESS STEEL WASHERS	ASTM A240, TYPE 302	--	--
STEEL ANCHOR BOLTS	AASHTO M314 OR ASTM F1554	105	125

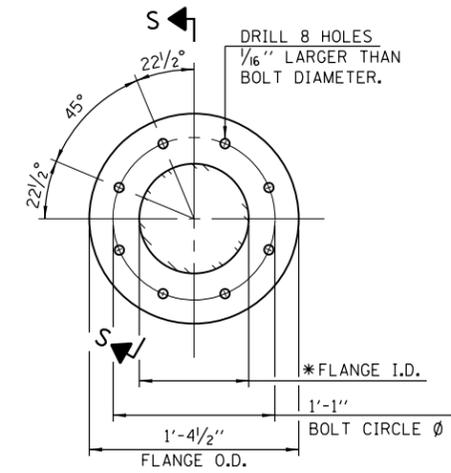
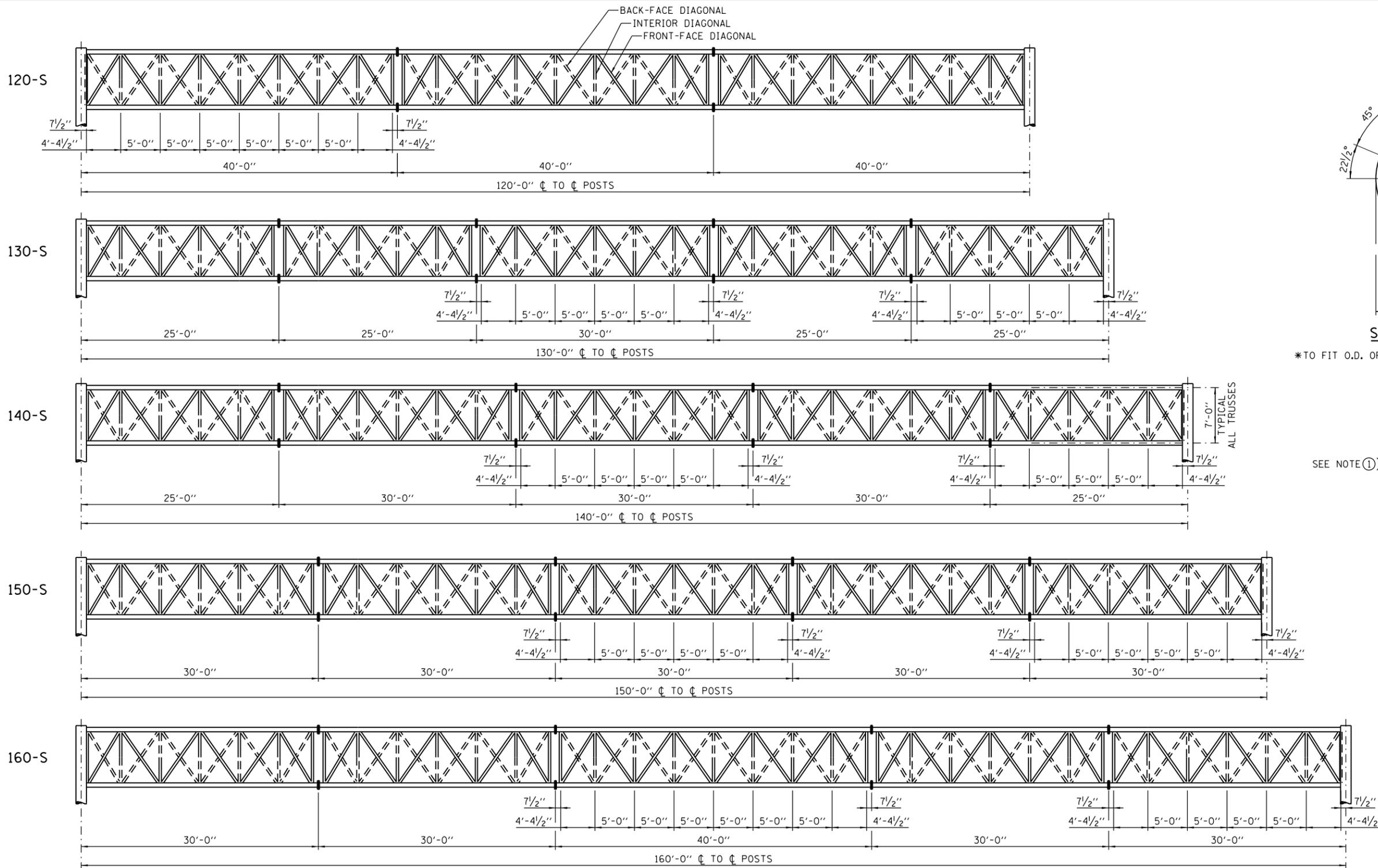


OVERHEAD SIGN STRUCTURE  
SPAN TYPE (STEEL)  
STRUCTURE DETAILS

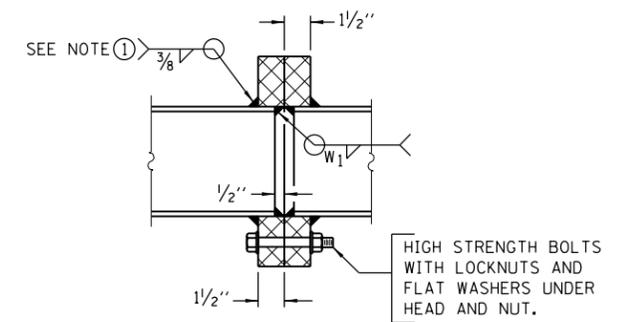
STANDARD F17-05

DATE	REVISIONS
3-31-2016	REVISED FOUNDATION NOTE.
3-31-2017	FOUNDATION REINFORCEMENT UPDATE
3-01-2018	REVISED SIGN STRUCTURE
3-01-2019	UPDATE BARRIER SHAPE, HEIGHT AND TRANSITION LENGTH
2-13-2020	UPDATE CRASHWALL HEIGHT ADDED HEAVY HEX NUT TO ANCHORS

APPROVED: *Paul Kovacs* DATE 5-20-2014.  
CHIEF ENGINEERING OFFICER



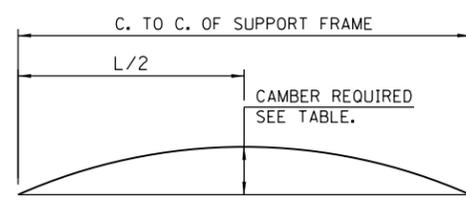
\*TO FIT O.D. OF CHORD WITH MAXIMUM GAP OF 1/16".



**NOTE:**  
 ① SPlicing FLANGES SHALL BE ATTACHED TO EACH TRUSS UNIT WITH THE TRUSS SHOP ASSEMBLED TO CAMBER SHOWN. TRUSS 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.

**PART ELEVATION VIEWS**

SPAN LENGTH (L)	CAMBER
120'	2 3/4"
130'	3 1/4"
140'	4"
150'	4 1/4"
160'	5"



**NOTE:**  
 1. FABRICATE TRUSS WITH CHORDS CURVED SMOOTHLY TO PROVIDE CAMBER.  
 2. DO NOT CAMBER BY SHIMMING AT TRUSS FIELD SPLICES OR CUTTING AND REWELDING CHORD.

**TRUSS MEMBER SCHEDULE**

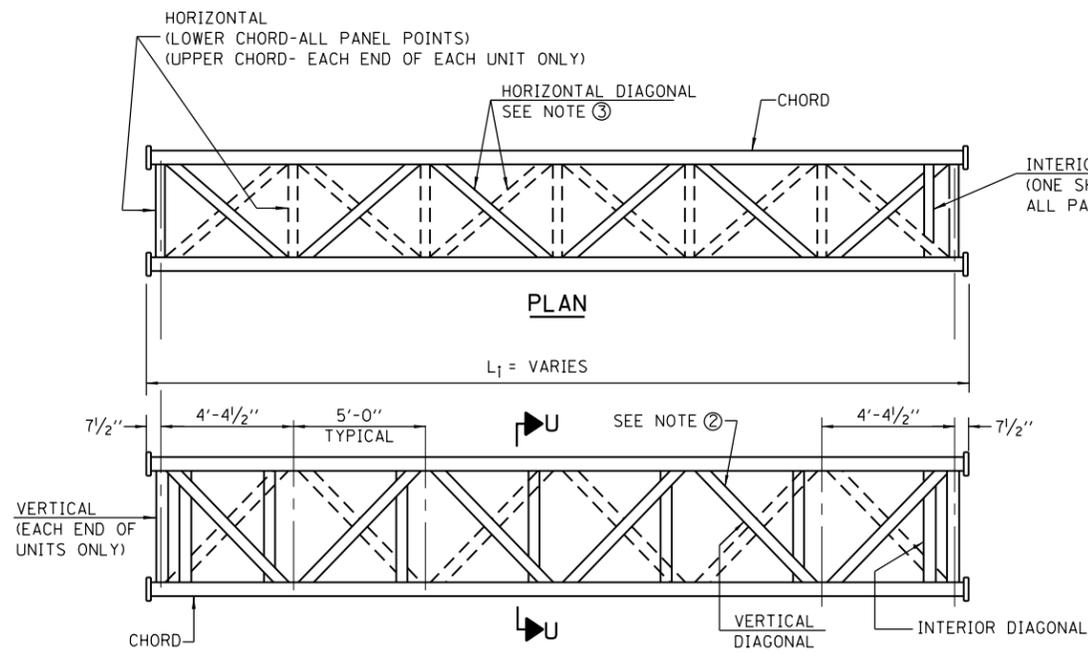
DESIGN TRUSS TYPE	SPAN	CHORDS	VERTICAL DIAGONALS, VERTICALS AND INTERIOR DIAGONALS	HORIZONTAL DIAGONALS	HORIZONTALS	SPlicing FLANGE		
						H.S. BOLTS		WELD SIZE
						NO./SPLICE	DIA.	
120-S	120'	HSS 8.625x0.322	PIPE 3 1/2 X-STRONG	PIPE 3 XX-STRONG	PIPE 3 X-STRONG	8	1"	1/4"
130-S	130'	HSS 8.625x0.375	PIPE 3 1/2 X-STRONG	PIPE 3 XX-STRONG	PIPE 3 X-STRONG	8	1"	5/16"
140-S	140'	HSS 8.625x0.375	PIPE 3 1/2 X-STRONG	PIPE 3 XX-STRONG	PIPE 3 X-STRONG	8	1"	3/16"
150-S	150'	HSS 8.625x0.500	PIPE 3 1/2 X-STRONG	PIPE 3 XX-STRONG	PIPE 3 X-STRONG	8	1"	7/16"
160-S	160'	HSS 8.625x0.500	PIPE 3 1/2 X-STRONG	PIPE 3 XX-STRONG	PIPE 3 X-STRONG	8	1 1/4"	7/16"



OVERHEAD SIGN STRUCTURE  
 SPAN TYPE (STEEL)  
 STRUCTURE DETAILS

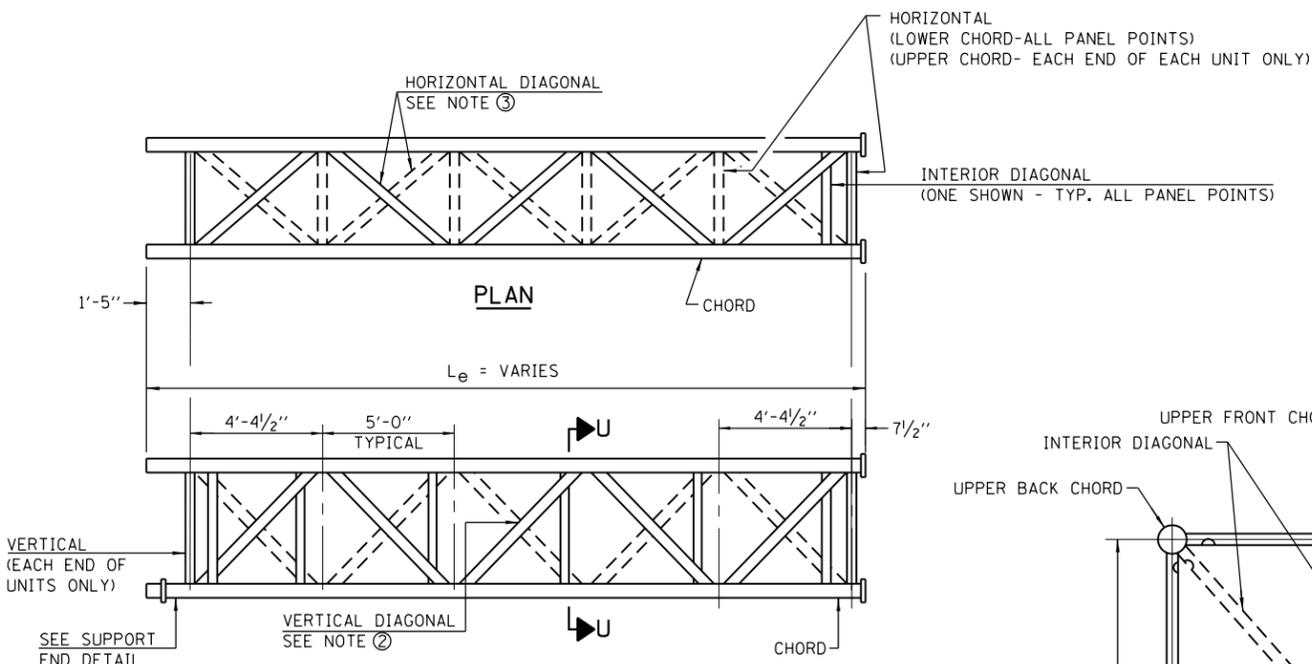
STANDARD F17-05

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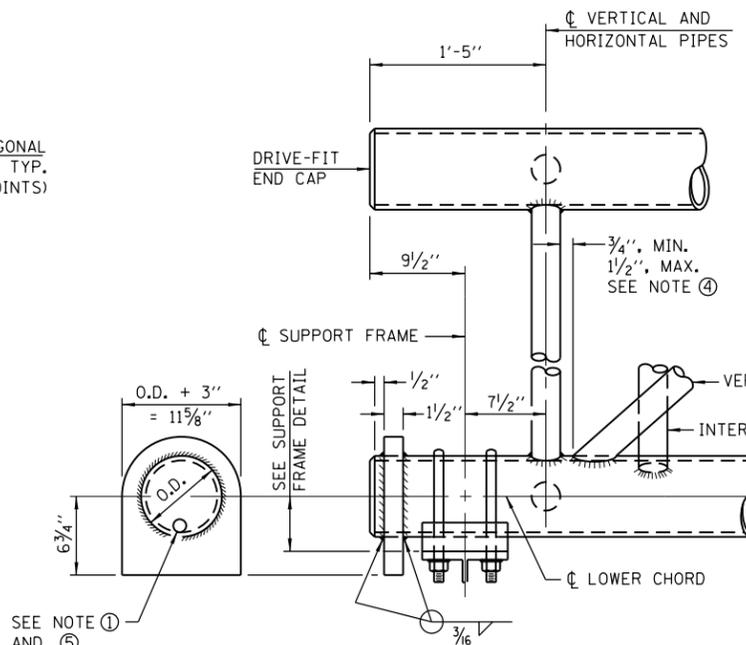
**ELEVATION  
TYPICAL INTERIOR UNIT**

EVEN OR ODD NUMBER OF PANELS/EXTERIOR UNITS ALLOWED.

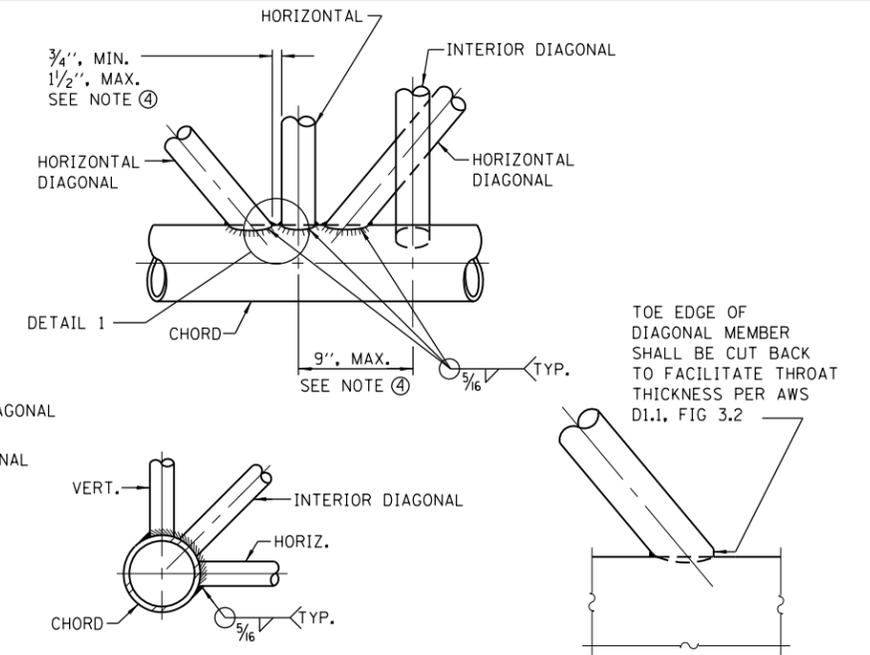


**ELEVATION  
TYPICAL EXTERIOR UNIT**

EVEN OR ODD NUMBER OF PANELS/EXTERIOR UNITS ALLOWED.

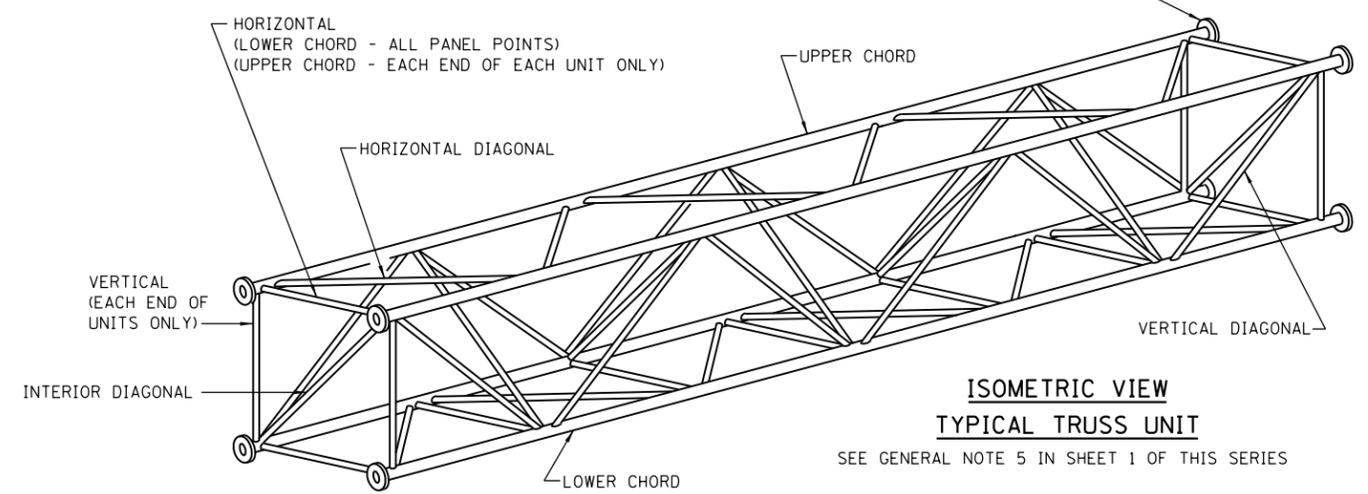


**SUPPORT END DETAIL FOR EXTERIOR UNIT**



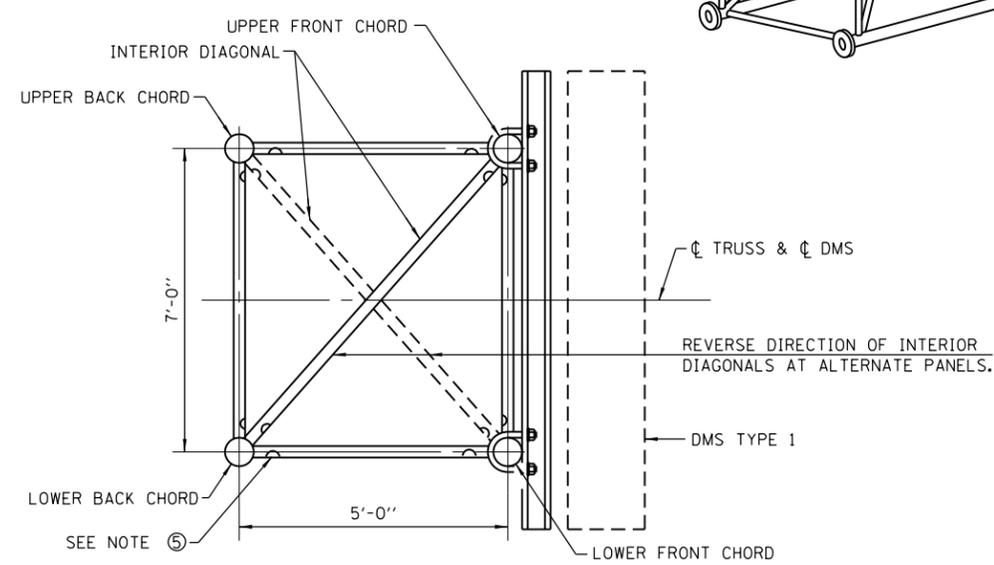
**TYPICAL JOINT DETAILS**

**DETAIL 1**



**ISOMETRIC VIEW  
TYPICAL TRUSS UNIT**

SEE GENERAL NOTE 5 IN SHEET 1 OF THIS SERIES



**SECTION U-U**

(VERTICAL AND HORIZONTAL DIAGONALS NOT SHOWN)

**NOTES**

- ① CONTRACTOR SHALL USE STANDARD DRIVE-FIT CAP TO CLOSE END. 1/2" Ø DRAIN HOLE IN DRIVE-FIT CAP INSTALLED AFTER GALVANIZING. (TYP. AT NON-SPLICE ENDS OF CHORDS)
- ② VERTICAL DIAGONALS IN FRONT AND BACK FACE SHALL ALTERNATE INCLINATION.
- ③ HIDDEN LINES SHOW WIND BRACING ALTERNATES DIRECTION BETWEEN PLANES OF TOP AND BOTTOM CHORDS.
- ④ ALL DIAGONALS SHALL BE OFFSET FROM THE PANEL POINT BASED ON THE FOLLOWING: OFFSET SHALL PROVIDE A 3/4" MINIMUM TO 1 1/2" MAXIMUM CLEARANCE BETWEEN DIAGONAL AND ANY OTHER DIAGONAL, HORIZONTAL OR VERTICAL MEMBER, AND TO PROVIDE CLEARANCE FOR U-BOLT CONNECTIONS OF DMS TYPE 1 OR WALKWAY BRACKETS.
- ⑤ GALVANIZING VENT HOLES OF ADEQUATE SIZE SHALL BE PROVIDED ON UNDERSIDE AT EACH END OF TRUSS MEMBERS EXCEPT CHORDS. ALTERNATELY, HOLES MAY BE PROVIDED IN WALL OF CHORDS. ALL VENT HOLES SHALL BE DRILLED AND DE-BURRED, TYP.

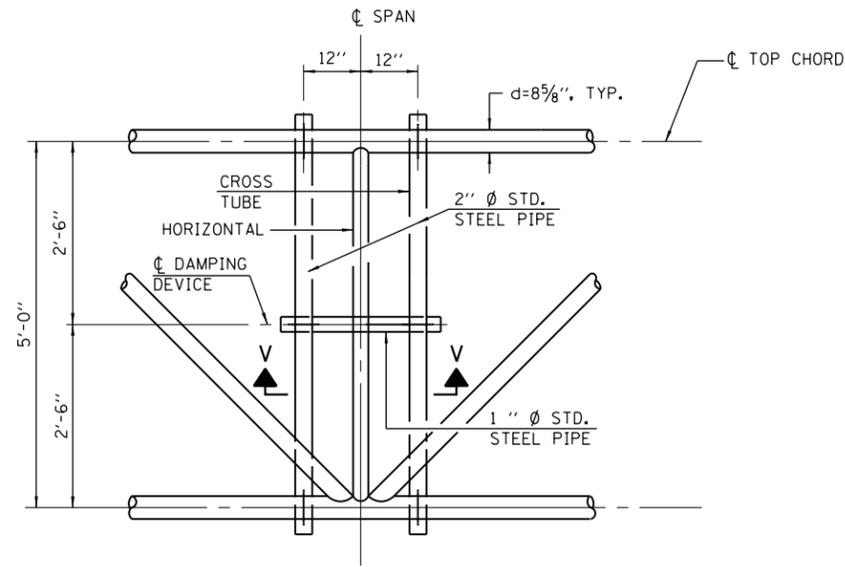


OVERHEAD SIGN STRUCTURE  
SPAN TYPE (STEEL)  
STRUCTURE DETAILS

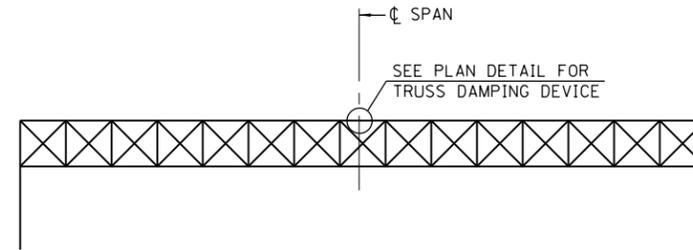
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DATE 5-20-2014.  
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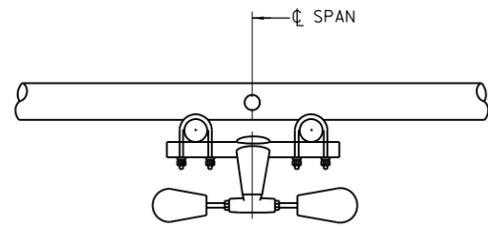
**PLAN DETAIL**  
CL SPAN AT PANEL POINTS



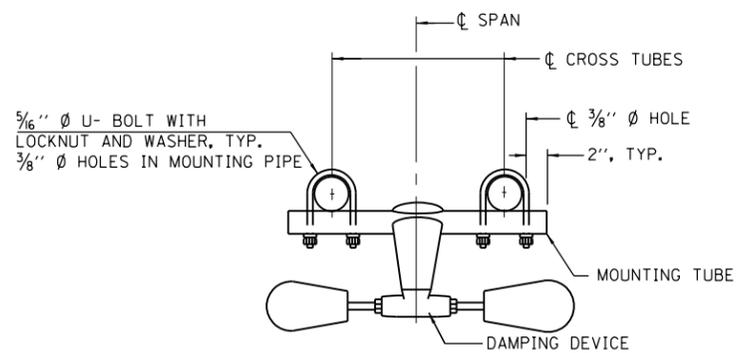
**ELEVATION**  
STEEL OVERHEAD  
SIGN TRUSS

**DAMPER NOTE:**

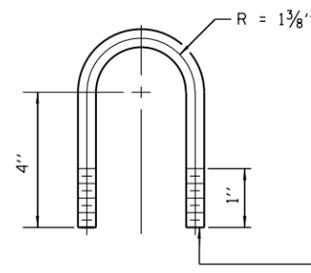
ONE DAMPER PER TRUSS. (31 LBS. STOCKBRIDGE-TYPE - 29" MINIMUM BETWEEN ENDS OF WEIGHTS).



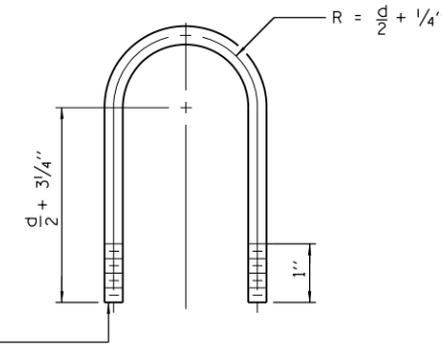
**SECTION V-V**



**TRUSS DAMPING  
DEVICE CONNECTION DETAIL**  
(TYPICAL)



**DAMPING DEVICE MOUNTING  
TUBE U-BOLT DETAIL**  
(TYPICAL)

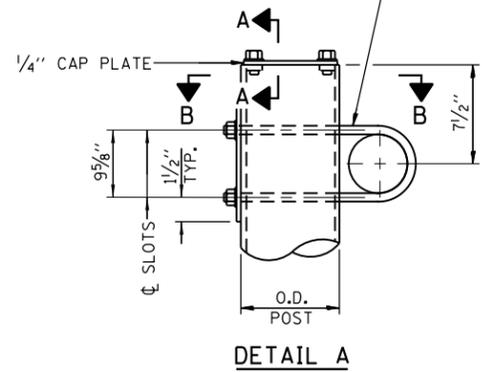


**TOP CHORD TO CROSS TUBE  
U-BOLT DETAIL**  
(TYPICAL)

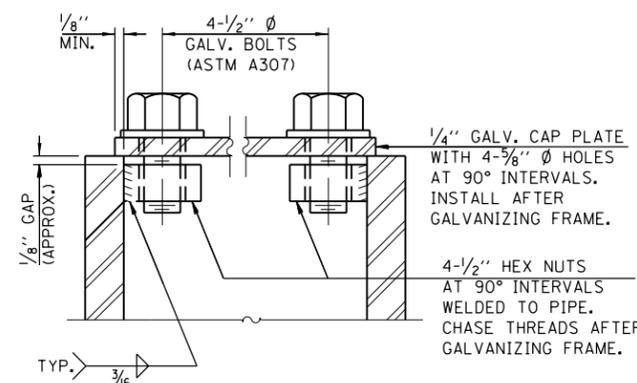
*Paul Kovacs*  
APPROVED..... CHIEF ENGINEERING OFFICER DATE 5-20-2014.



3/4" Ø U-BOLT.  
 PROVIDE TWO WASHERS AND TWO  
 HEXAGON LOCKNUTS. (4)  
 1/8" X 2" SLOTS ON Ø POST.  
 (4 SLOTS REQUIRED PER PIPE)

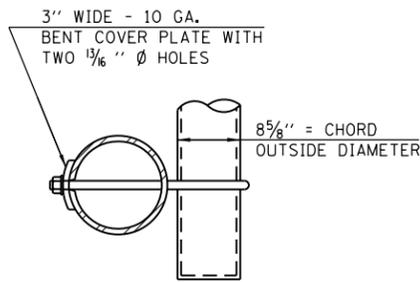


DETAIL A



SECTION A-A

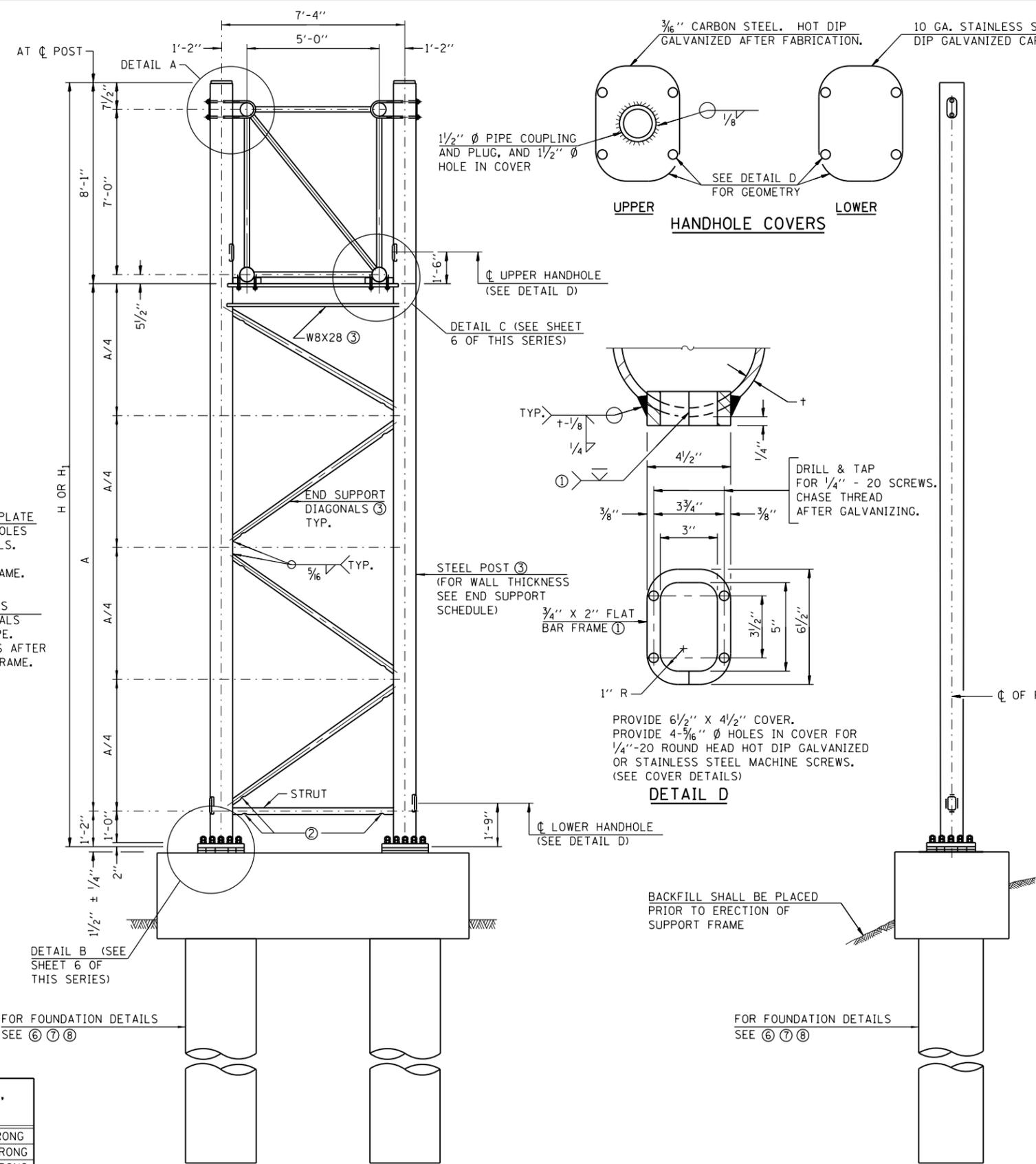
AS AN ALTERNATE TO BOLTS, MAY USE GALVANIZED  
 DRIVE-FIT CAPS INSTALLED AFTER GALVANIZING FRAME.



SECTION B-B

END SUPPORT SCHEDULE

DESIGN TRUSS TYPE	H OR H <sub>1</sub>	+	POSTS	DIAGONALS, STRUT
120-S	34' MAX.	1/2"	HSS 12.75x0.500	PIPE 5 X-STRONG
130-S	34' MAX.	1/2"	HSS 14x0.500	PIPE 5 XX-STRONG
140-S	34' MAX.	1/2"	HSS 14x0.500	PIPE 5 XX-STRONG
150-S	36' MAX.	1/2"	HSS 16x0.500	PIPE 5 XX-STRONG
160-S	36' MAX.	1/2"	HSS 16x0.500	PIPE 5 XX-STRONG



SIDE ELEVATION

END ELEVATION

END SUPPORT DETAILS

NOTES:

- ① IN LIEU OF FABRICATED HANDHOLE FRAME AS SHOWN, MAY CUT FROM 2" PLATE (ROLLING DIRECTION VERTICAL). ALL CUT FACES TO BE GROUND TO ANSI ROUGHNESS OF 500 µIN OR LESS.
- ② GALVANIZING VENT HOLES OF ADEQUATE SIZE SHALL BE PROVIDED ON UNDERSIDE AT EACH END OF BRACING PIPES. ALTERNATELY, HOLES MAY BE PROVIDED IN WALL OF PIPE COLUMN. ALL VENT HOLES SHALL BE DRILLED AND DE-BURRED, TYP.
- ③ STEEL PIPE, PLATE, CARBON STEEL HANDHOLE COVERS AND ROLLED SECTIONS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. PAINTING IS NOT PERMITTED. SEE SHEET 1 OF THIS SERIES.
- ④ SEE GENERAL NOTES FOR FASTENERS.
- ⑤ NONSTANDARD APPLICATIONS SHALL HAVE DIMENSIONS VERIFIED OR AMENDED AS APPROPRIATE.
- ⑥ SEE SHEET 7 OF THIS SERIES FOR SHOULDER TYPE FOUNDATION DETAILS.
- ⑦ SEE SHEET 8 OF THIS SERIES FOR MEDIAN BARRIER TYPE FOUNDATION DETAILS.
- ⑧ SEE SHEET 9 OF THIS SERIES FOR MEDIAN BARRIER TYPE FOUNDATION DETAILS WHEN EXISTING UTILITY IS PRESENT.

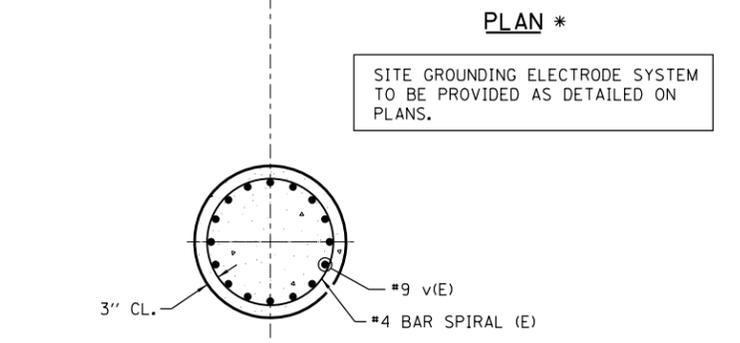
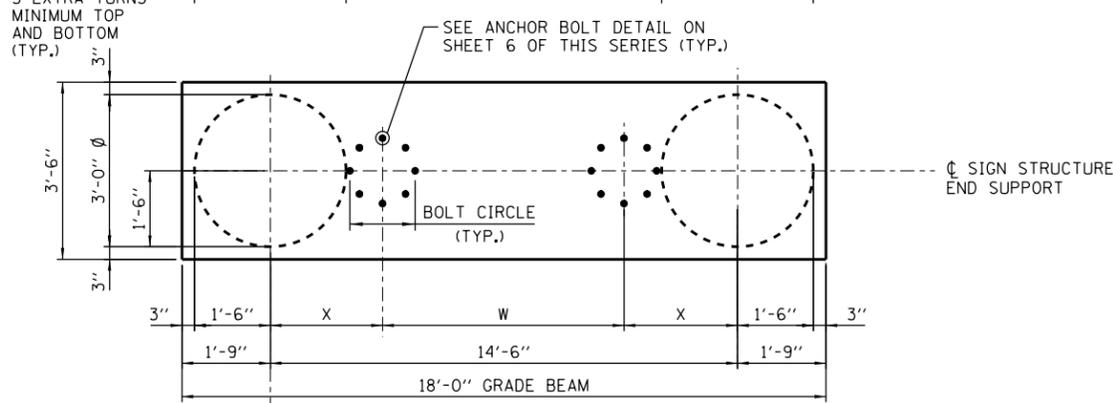
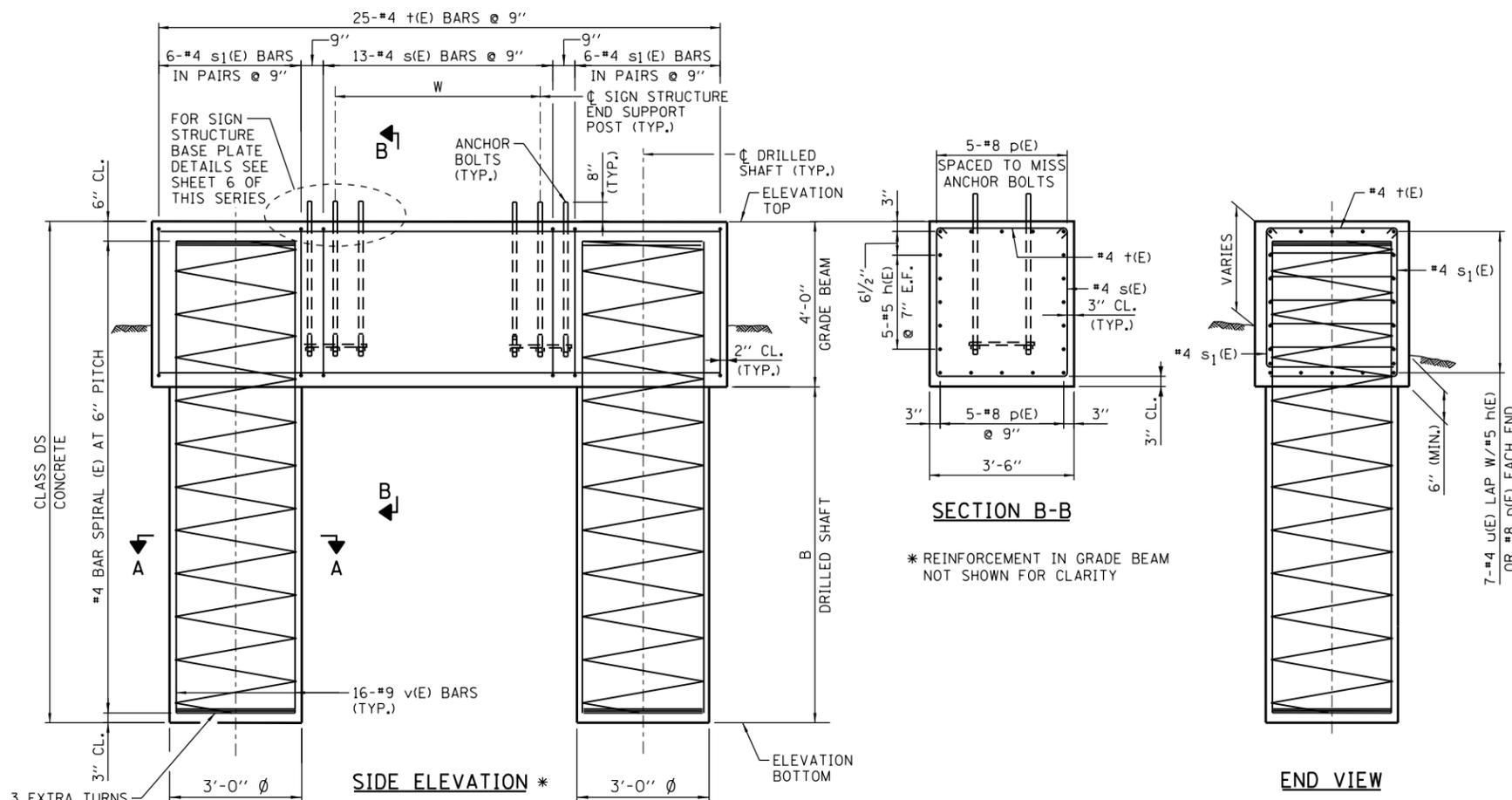
Paul Kovacs  
 APPROVED..... DATE 5-20-2014.  
 CHIEF ENGINEERING OFFICER

SHEET 5 OF 12

OVERHEAD SIGN STRUCTURE  
 SPAN TYPE (STEEL)  
 STRUCTURE DETAILS

STANDARD F17-05





APPROVED: *Paul Kovacs* DATE 5-20-2014  
CHIEF ENGINEERING OFFICER

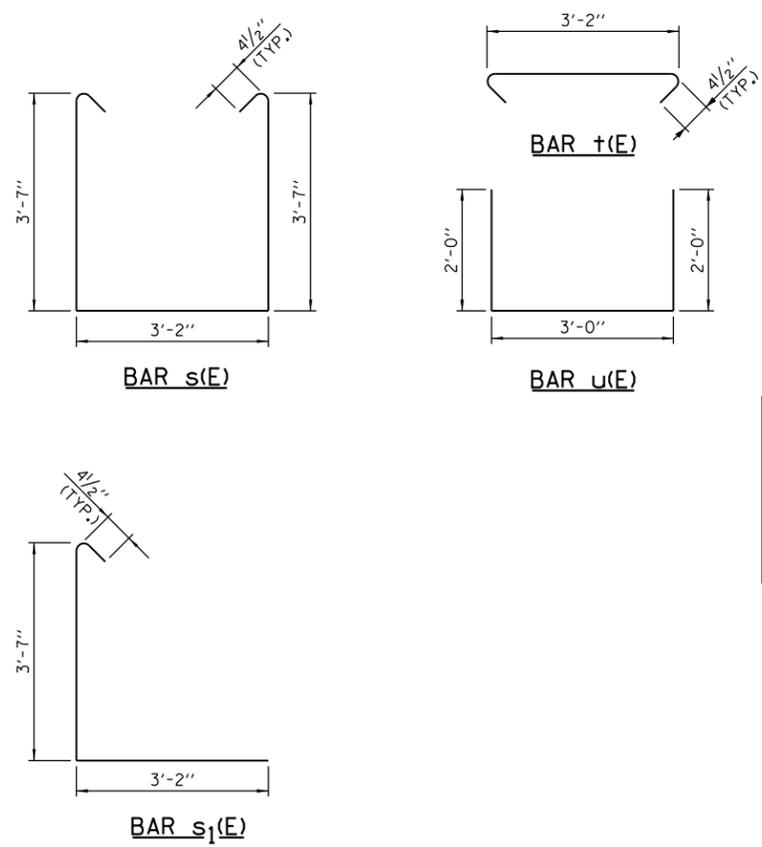
**NOTES:**

1. THE FOUNDATION DETAILS SHOWN ARE BASED ON THE PRESENCE OF MOSTLY COHESIVE SOIL CONDITIONS (SILTY OR SANDY CLAY), WITH AN AVERAGE UNCONFINED COMPRESSIVE STRENGTH (QU) > 1.25 TON/SQ. FT. WHICH SHALL BE DETERMINED BY PREVIOUS SOIL INVESTIGATIONS AT THE JOBSITE. WHEN OTHER CONDITIONS ARE INDICATED, THE BORING DATA SHALL BE INCLUDED IN THE PLANS AND THE FOUNDATION DIMENSIONS SHOWN SHALL BE THE RESULT OF SITE SPECIFIC DESIGNS. IF CONDITIONS ENCOUNTERED IN THE FIELD ARE DIFFERENT THAN THOSE INDICATED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE IF THE FOUNDATION DIMENSIONS NEED TO BE MODIFIED.
2. ALL MATERIAL, FABRICATION, AND CONSTRUCTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH SECTION 734 OF THE ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS.
3. CONCRETE SHALL BE PLACED MONOLITHICALLY, WITHOUT CONSTRUCTION JOINTS UNLESS NOTED OTHERWISE.
4. BACKFILL SHALL BE PLACED PER SECTION 502 OF THE IDOT STANDARD SPECIFICATION AND PRIOR TO ERECTION OF END SUPPORT POST.
5. PROVIDE NORMAL SURFACE FINISH, FOLLOWED BY CONCRETE SEALER APPLICATION ON ALL CONCRETE SURFACES EXCEPT BOTTOM OF GRADE BEAM AND DRILLED SHAFTS.
6. ALL REBAR DESIGNATED (E) SHALL BE EPOXY COATED. REBAR SHALL BE POSITIONED SO THAT THERE WILL BE NO INTERFERENCE BETWEEN VERTICAL REINFORCEMENT AND ANCHOR BOLTS.
7. NO SONOTUBES OR DECOMPOSABLE FORMS SHALL BE USED 6" BELOW THE FINISHED GROUND LINE. PERMANENT METAL FORMS OR OTHER SHIELDING SHALL NOT BE LEFT IN PLACE BELOW THE ELEVATION WITHOUT THE ENGINEER'S WRITTEN PERMISSION. EXCAVATIONS SHALL BE DEWATERED BEFORE CONCRETE PLACEMENT IF DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST.
8. IF NECESSARY TO INCREASE STEEL END SUPPORT HEIGHT ABOVE THE LIMITATIONS SHOWN IN SIGN STRUCTURE MEMBER SCHEDULE ON SHEET 5 OF THIS SERIES, GRADE BEAM DEPTH ON THIS SHEET SHALL BE INCREASED UP TO 6'-0" WITHOUT CHANGES TO THE DRILLED SHAFT DESIGN. GRADE BEAM REINFORCEMENT, CONCRETE VOLUME AND LENGTH OF ANCHOR BOLTS SHALL BE REVISED ACCORDINGLY.

**BAR LIST - EACH FOUNDATION**  
(2 SHAFT AND 1 GRADE BEAM)

BAR	NUMBER	SIZE	LENGTH	SHAPE
h(E)	10	#5	17'-8"	—
p(E)	10	#8	17'-8"	—
s(E)	13	#4	11'-1"	┌┐
s <sub>1</sub> (E)	24	#4	6'-11 1/2"	┌┐
t(E)	25	#4	3'-11"	┌┐
u(E)	14	#4	7'-0"	┌┐
v(E)	32	#9	B ADD 3'-3"	—

#4 BAR SPIRAL (E) - SEE SIDE ELEVATION

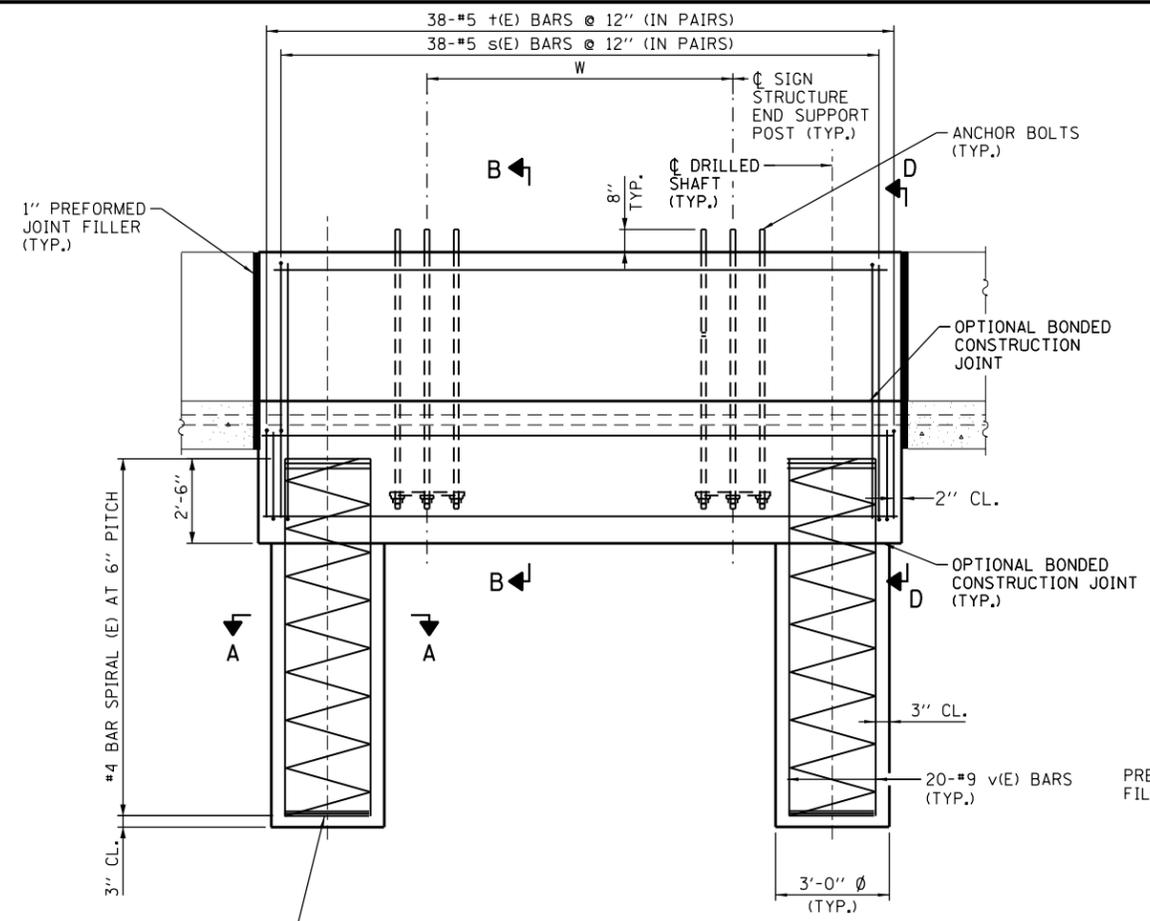


**SHOULDER FOUNDATION SCHEDULE**

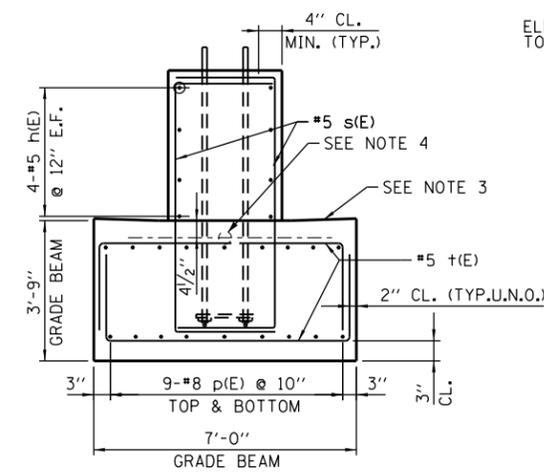
DESIGN TRUSS TYPE	W	X	B	CLASS DS CONCRETE (CU YD)	REINFORCEMENT BARS (POUNDS)
120-S	7'-4"	3'-7"	50'-0"	35.5	7960
130-S	7'-4"	3'-7"	55'-0"	38.1	8600
140-S	7'-4"	3'-7"	55'-0"	38.1	8600
150-S	7'-4"	3'-7"	55'-0"	38.1	8600
160-S	7'-4"	3'-7"	55'-0"	38.1	8600



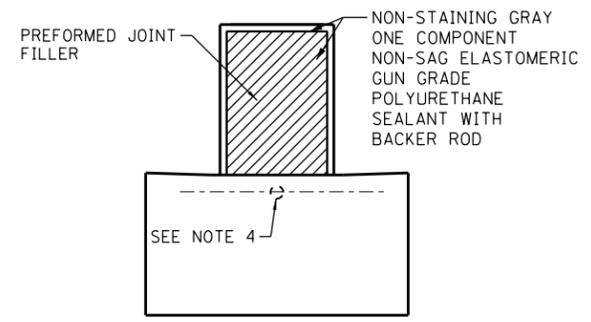
OVERHEAD SIGN STRUCTURE  
SPAN TYPE (STEEL)  
STRUCTURE DETAILS  
STANDARD F17-05



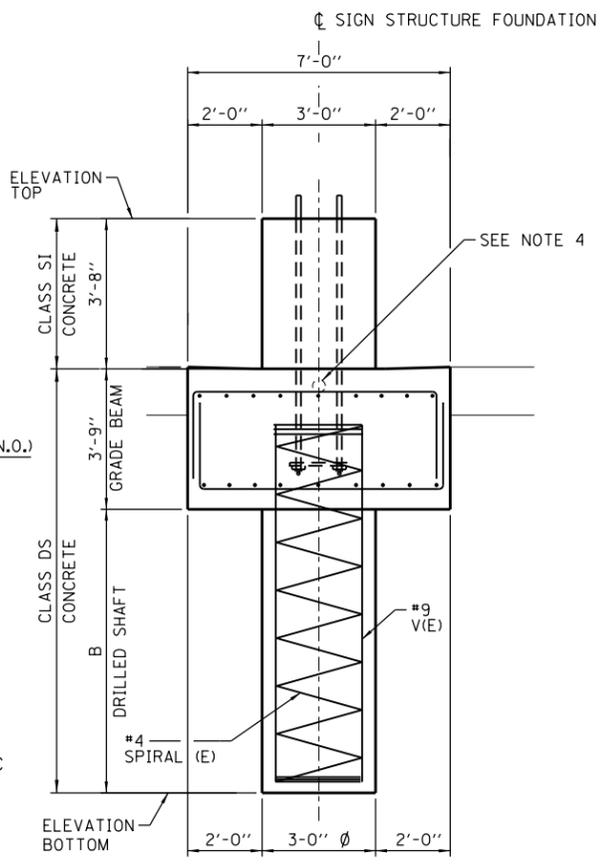
**SIDE ELEVATION \***



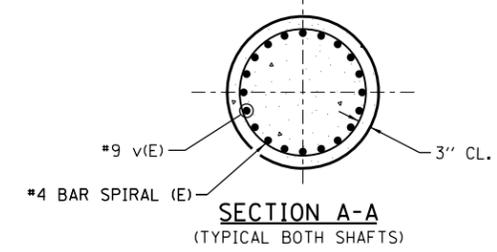
**SECTION B-B**



**SECTION D-D**



**END VIEW**

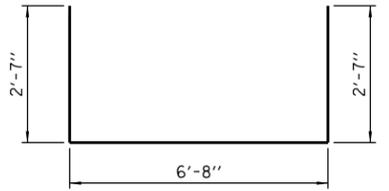


**SECTION A-A (TYPICAL BOTH SHAFTS)**

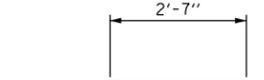
**BAR LIST - EACH FOUNDATION**

BAR	NUMBER	SIZE	LENGTH	SHAPE
h(E)	8	#5	17'-8"	—
p(E)	18	#8	17'-8"	—
s(E)	38	#5	11'-3"	⌊
t(E)	38	#5	11'-10"	⌊
v(E)	40	#9	B ADD 2'-3"	⌊

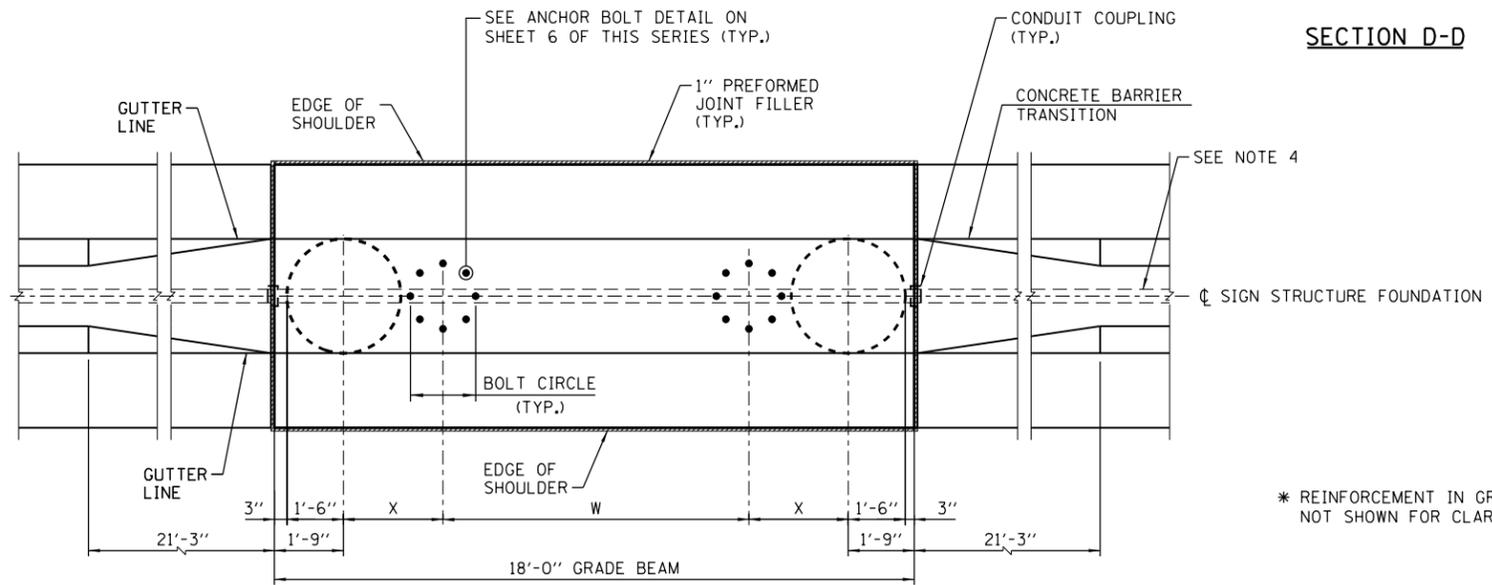
#4 BAR SPIRAL (E) - SEE SIDE ELEVATION



**BAR t(E)**



**BAR s(E)**



**PLAN \***

**MEDIAN BARRIER FOUNDATION SCHEDULE**

DESIGN TRUSS TYPE	W	X	B	CLASS SI CONCRETE (CU YD)	CLASS DS CONCRETE (CU YD)	REINFORCEMENT BARS (POUNDS)	PROTECTIVE COAT (SQ YD)
120-S	7'-4"	3'-7"	55'-0"	7.4	46.3	10970	28.0
130-S	7'-4"	3'-7"	55'-0"	7.4	46.3	10970	28.0
140-S	7'-4"	3'-7"	60'-0"	7.4	48.9	12850	28.0
150-S	7'-4"	3'-7"	65'-0"	7.4	51.5	13630	28.0
160-S	7'-4"	3'-7"	65'-0"	7.4	51.5	13630	28.0

\* REINFORCEMENT IN GRADE BEAM NOT SHOWN FOR CLARITY

**NOTES:**

- SEE SHEET 7 OF THIS SERIES FOR FOUNDATION NOTES AND DESIGN CRITERIA.
- FOR SIGN STRUCTURE BASE PLATE DETAIL, SEE SHEET 6 OF THIS SERIES.
- REFERENCE ILLINOIS TOLLWAY STANDARD DRAWING C5 FOR GUTTER SLOPE.
- COORDINATE CONDUIT SIZE, LOCATION AND QUANTITY WITH ELECTRICAL PLANS. CONDUITS SHALL BE PLACED TO MISS REINFORCEMENT BARS. DO NOT CUT REINFORCEMENT BARS.
- PROTECTIVE COAT SHALL BE APPLIED TO THE TRAFFIC AND TOP FACES OF BARRIER AND TOP FACE OF GUTTER.

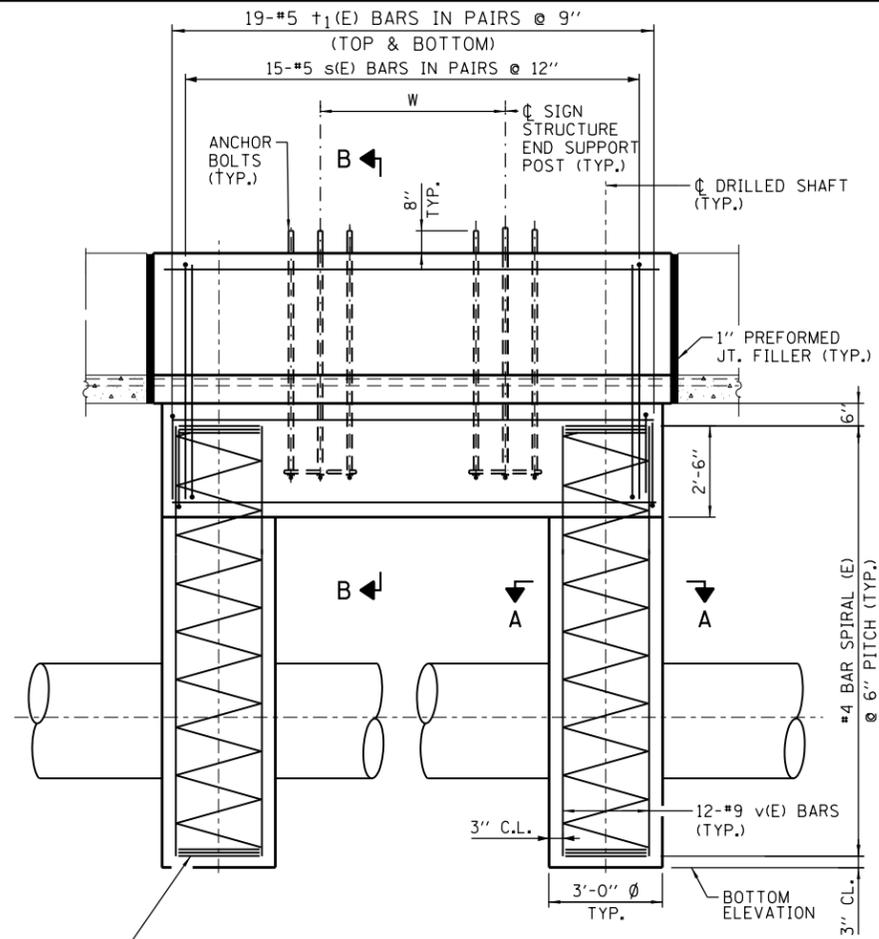


OVERHEAD SIGN STRUCTURE SPAN TYPE (STEEL) STRUCTURE DETAILS

STANDARD F17-05

APPROVED... DATE 5-20-2014. CHIEF ENGINEERING OFFICER

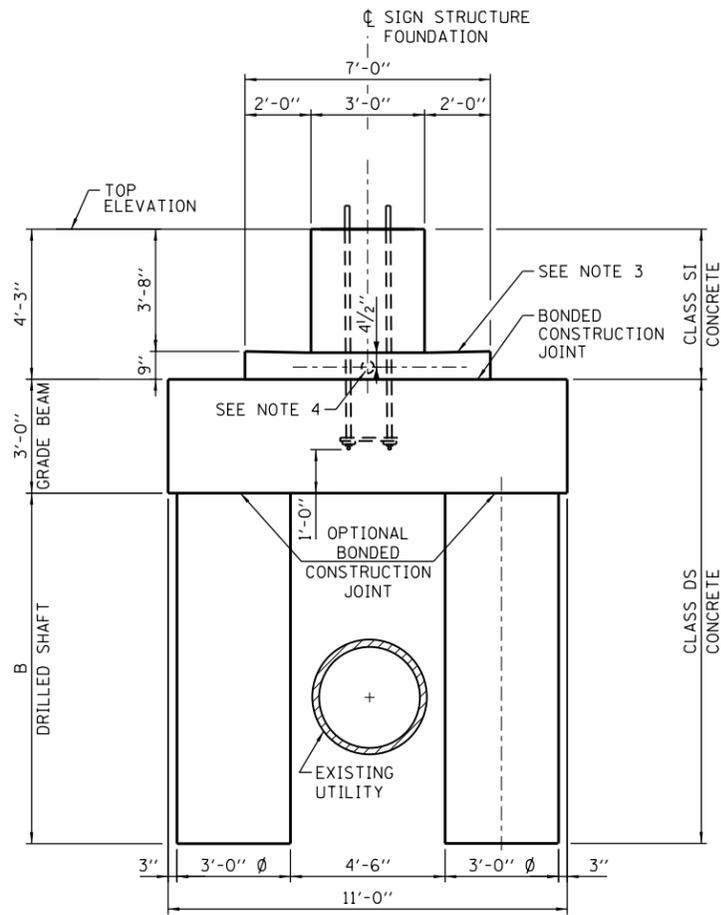
SITE GROUNDING ELECTRODE SYSTEM TO BE PROVIDED AS DETAILED ON PLANS.



3 EXTRA TURNS  
MINIMUM TOP  
AND BOTTOM  
(TYP.)

**SIDE ELEVATION \***

\* REINFORCEMENT IN GRADE BEAM  
NOT SHOWN FOR CLARITY



**END VIEW**

**BAR LIST - EACH FOUNDATION**

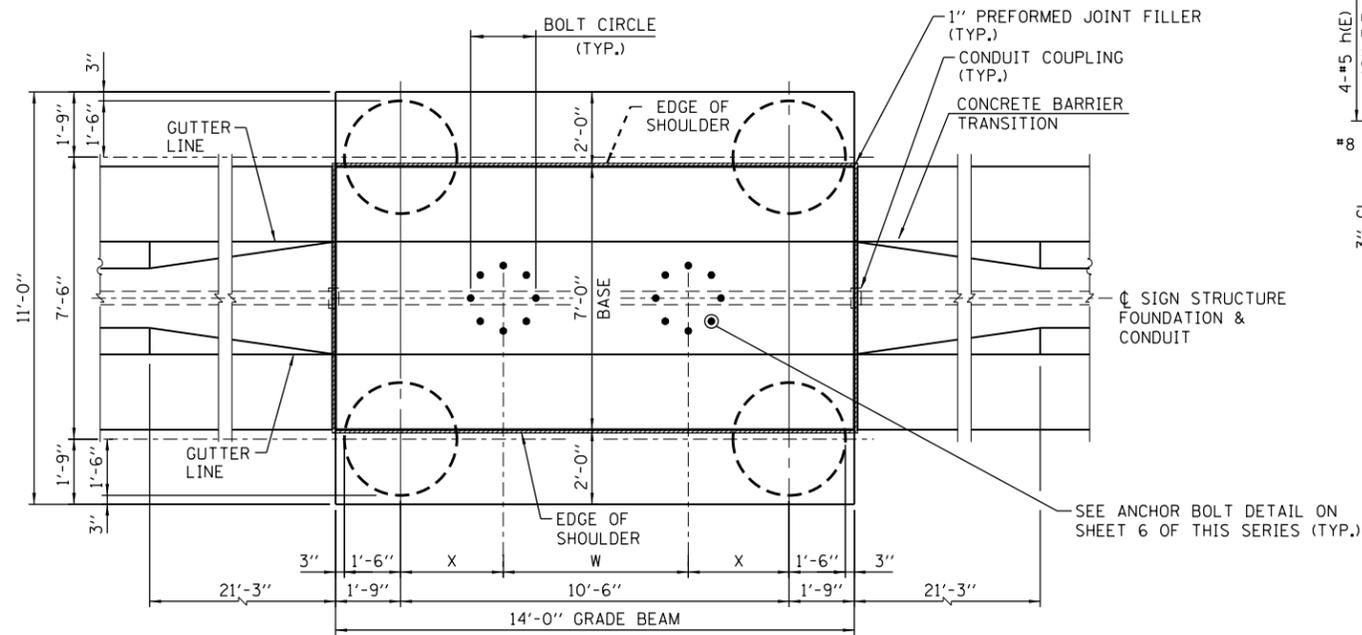
BAR NUMBER	SIZE	LENGTH	SHAPE
h(E) 16	#5	13'-8"	—
p(E) 30	#8	13'-8"	—
s(E) 30	#5	11'-3"	C
+1(E) 15	#5	6'-8"	—
+1(E) 76	#8	12'-7"	—
v(E) 48	#9	B ADD 2'-3"	—

#4 BAR SPIRAL (E) - SEE SIDE ELEVATION

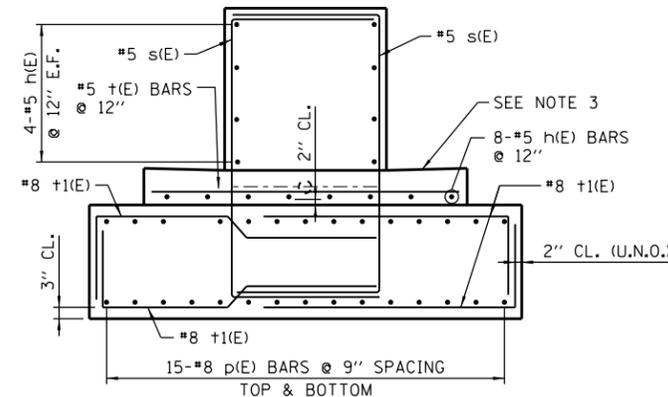
**MEDIAN BARRIER FOUNDATION SCHEDULE**

DESIGN TRUSS TYPE	W	X	B	CLASS SI CONCRETE (CU YD)	CLASS DS CONCRETE (CU YD)	REINFORCEMENT BARS (POUNDS)	PROTECTIVE COAT (SQ YD)
120-S	7'-4"	1'-7"	40'-0"	8.5	59.0	13120	22.0
130-S	7'-4"	1'-7"	40'-0"	8.5	59.0	13120	22.0
140-S	7'-4"	1'-7"	45'-0"	8.5	64.2	14150	22.0
150-S	7'-4"	1'-7"	50'-0"	8.5	69.5	15170	22.0
160-S	7'-4"	1'-7"	50'-0"	8.5	69.5	15170	22.0

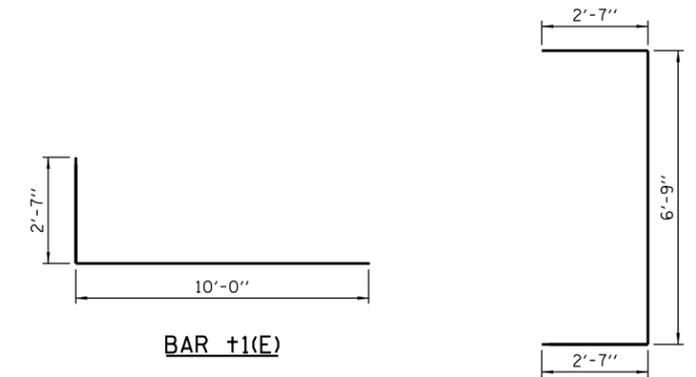
SITE GROUNDING ELECTRODE SYSTEM  
TO BE PROVIDED AS DETAILED ON  
PLANS.



**PLAN \***

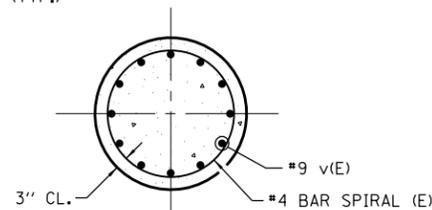


**SECTION B-B**



**BAR +1(E)**

**BAR s(E)**

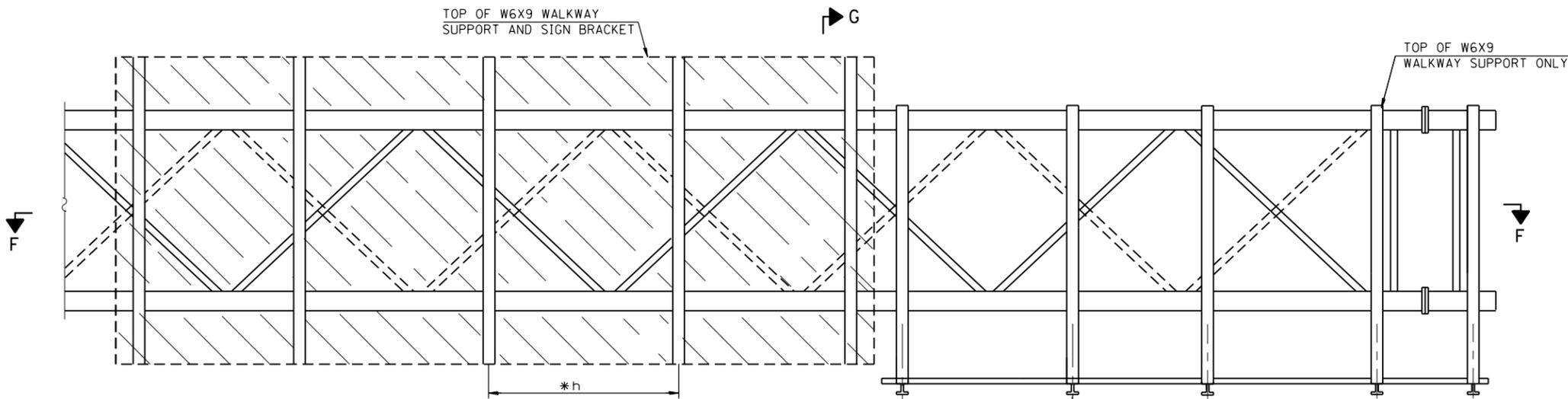


**SECTION A-A**  
(TYPICAL FOR 4 SHAFTS)

**NOTES:**

- SEE SHEET 7 FOR FOUNDATION NOTES AND DESIGN CRITERIA.
- FOR SIGN STRUCTURE BASE PLATE DETAIL, SEE SHEET 6 OF THIS SERIES.
- REFERENCE ILLINOIS TOLLWAY STANDARD DRAWING C5 FOR GUTTER SLOPE.
- COORDINATE CONDUIT SIZE, LOCATION AND QUANTITY WITH ELECTRICAL PLANS. CONDUITS SHALL BE PLACED TO MISS REINFORCEMENT BARS. DO NOT CUT REINFORCEMENT BARS.
- PROTECTIVE COAT SHALL BE APPLIED TO THE TRAFFIC AND TOP FACES OF BARRIER AND TOP FACE OF GUTTER.

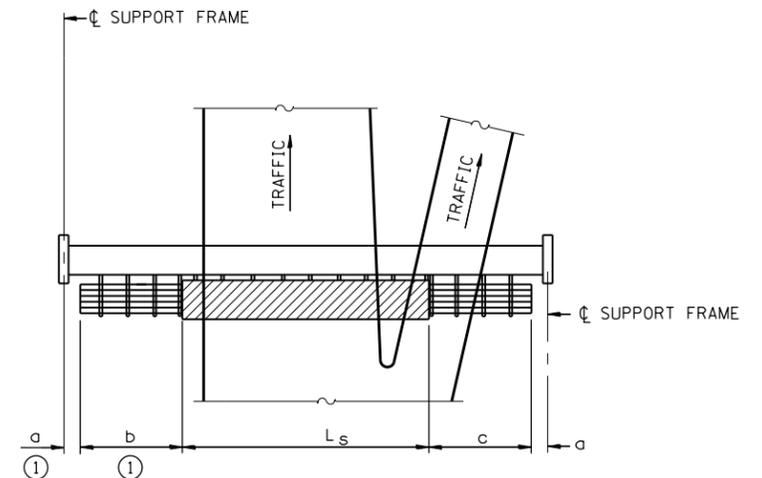




WALKWAY AND TRUSS GRATING WIDTH DIMENSIONS ARE NOMINAL AND MAY VARY ±1/2" BASED ON AVAILABLE STANDARD WIDTHS.

**TYPICAL FRONT ELEVATION**  
WITH HANDRAIL OMITTED FOR CLARITY.

BRACKET AND GRATING DIMENSIONS ARE NOMINAL AND WILL VARY BASED ON ACTUAL DMS DIMENSIONS PLUS MANUFACTURER'S MOUNTING DEVICES.



**PLAN**  
**WALKWAY AND HANDRAIL SKETCH**  
(ROAD PLAN BENEATH TRUSS VARIES)

**BRACKET TABLE**

SIGN WIDTH		NUMBER BRACKETS REQUIRED
GREATER THAN	LESS THAN OR EQUAL TO	
	8'-0"	2
8'-0"	14'-0"	3
14'-0"	20'-0"	4
20'-0"	26'-0"	5
26'-0"	32'-0"	6

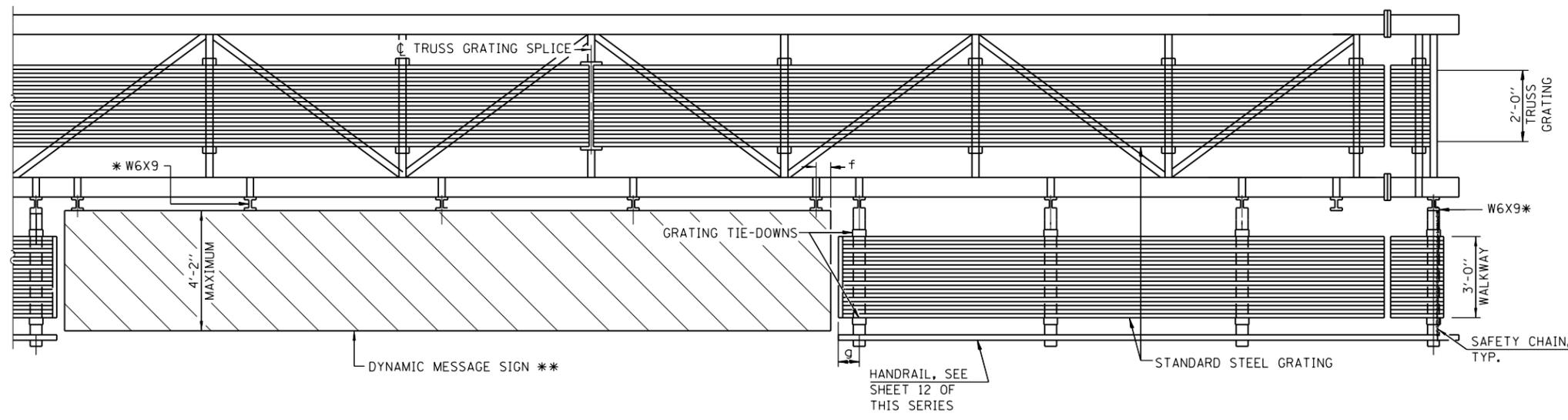
**NOTES:**

- \* SPACE W6X9 WALKWAY BRACKETS AND SIGN BRACKETS FOR EFFICIENCY AND WITHIN LIMITS SHOWN:  
 f = 12" MAXIMUM, 4" MINIMUM (END OF SIGN TO C OF NEAREST BRACKET)  
 g = 12" MAXIMUM, 4" MINIMUM (END OF WALKWAY GRATING TO C OF NEAREST SUPPORT BRACKET)  
 h = 6'-0" MAXIMUM (C TO C SIGN AND/OR WALKWAY SUPPORT BRACKETS, W6X9)
- \*\* MAXIMUM DMS WEIGHT = 5000 LBS. 4'-2" MAXIMUM THICKNESS INCLUDES THICKNESS OF DMS TYPE 1 PLUS CONNECTION TO W6X9.

FOR SECTION G-G AND GRATING SPLICE DETAILS, SEE SHEET 11 OF THIS SERIES. FOR HANDRAIL SPLICE DETAILS, SEE SHEET 12 OF THIS SERIES.

TRUSS GRATING TO FACILITATE INSPECTION SHALL RUN FULL LENGTH (CENTER TO CENTER OF SUPPORT FRAMES) ±12" ON OVERHEAD TRUSSES.

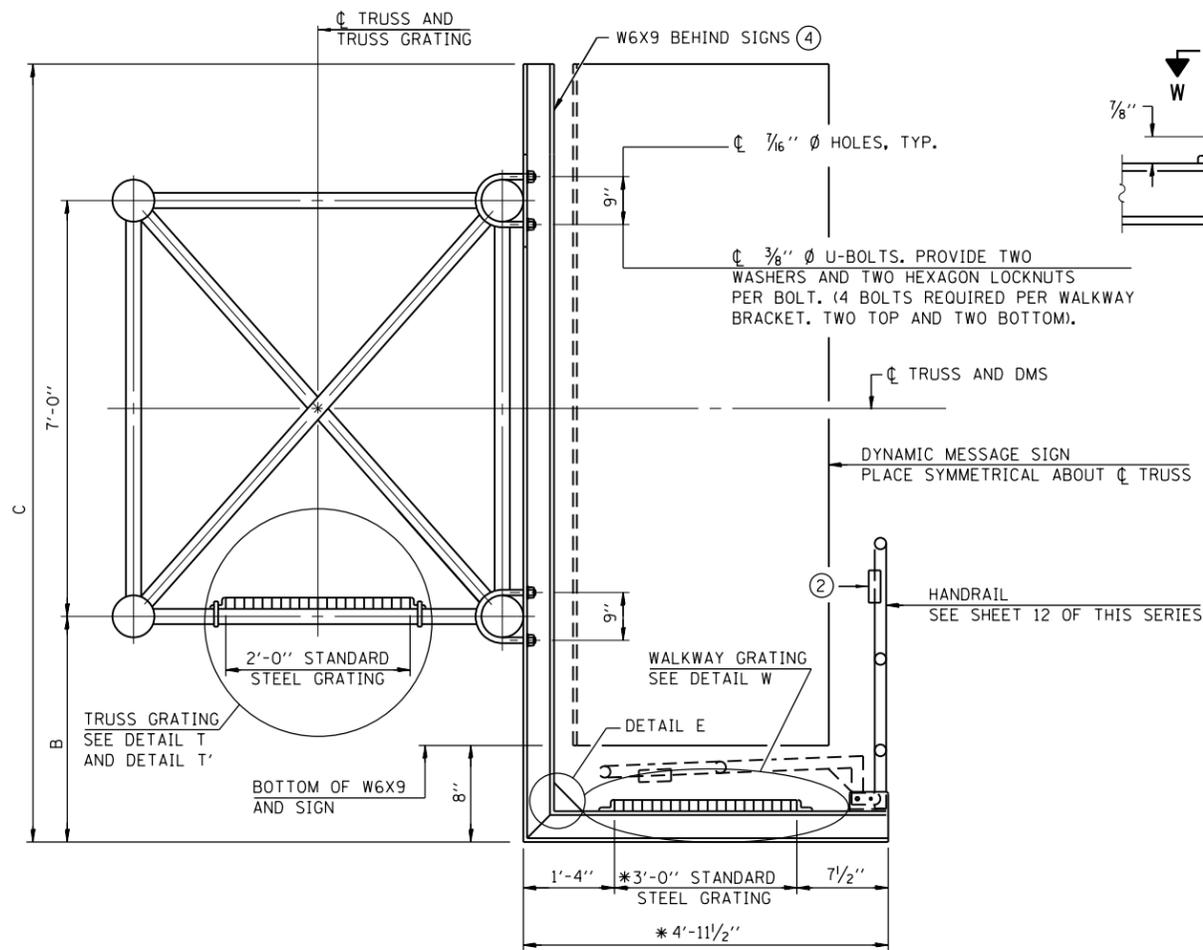
- ① IF WALKWAY IS REQUIRED LEFT OF THE DMS, a = 1'-6" AND b = WALKWAY LENGTHS. IF WALKWAY IS NOT REQUIRED LEFT OF THE DMS, b = 0 AND "a" IS DIMENSION FROM LEFT SUPPORT FRAME TO LEFT END OF DMS.



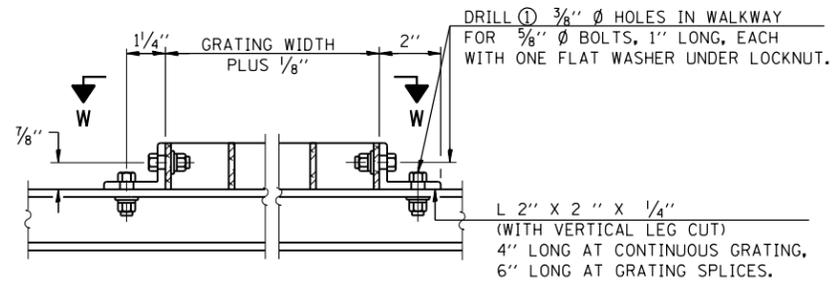
**SECTION F-F**

HANDRAIL AND WALKWAY SHALL SPAN A MINIMUM OF THREE BRACKETS BETWEEN SPLICES AND/OR GAP JOINTS. PLACE ALL SIGN AND WALKWAY BRACKETS AS CLOSE TO PANEL POINTS AS PRACTICAL. GRATING AND HANDRAIL SPLICES PLACED AS NEEDED.

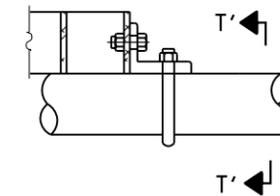




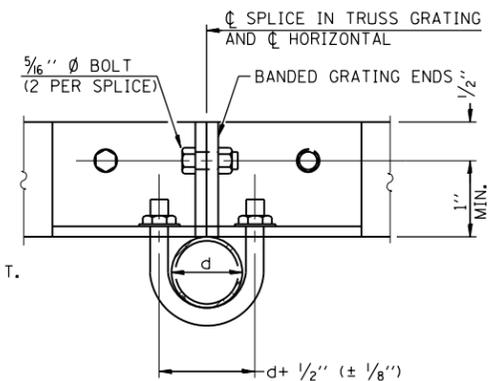
**SECTION G-G**



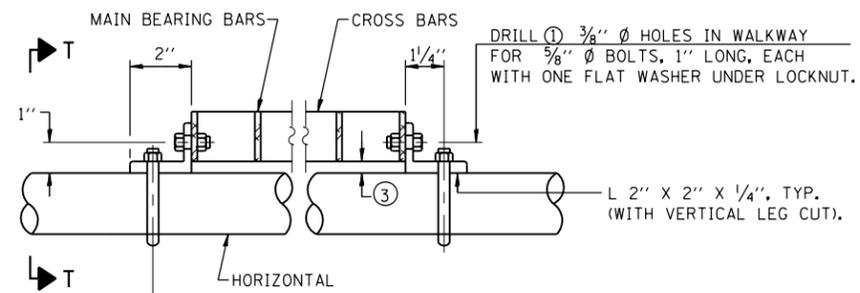
**DETAIL W**  
(WALKWAY GRATING)



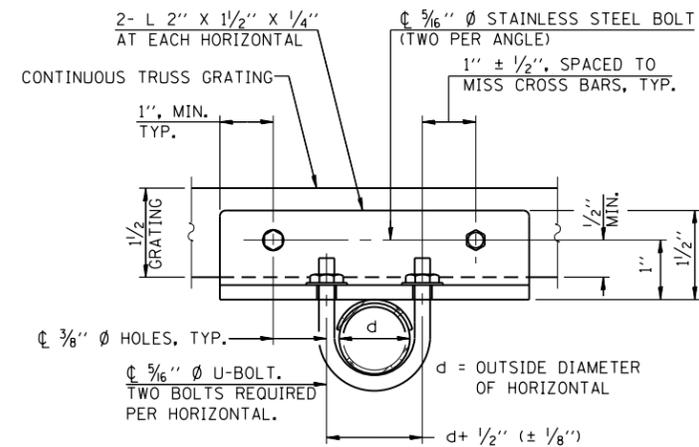
**DETAIL T'**  
(TRUSS GRATING SPLICE)  
DETAILS NOT SHOWN SAME AS DETAIL T.  
ALTERNATE MATERIALS MAY BE USED  
SUBJECT TO THE ENGINEER'S REVIEW  
AND APPROVAL.



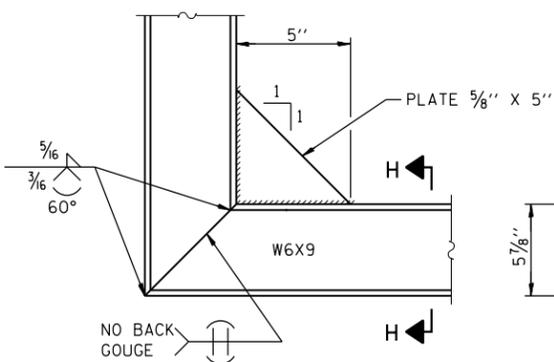
**SECTION T'-T'**



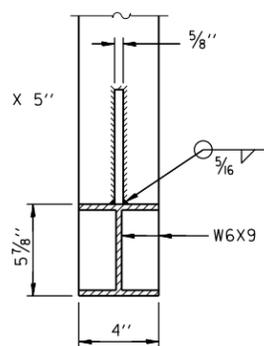
**DETAIL T**  
(CONTINUOUS TRUSS GRATING)



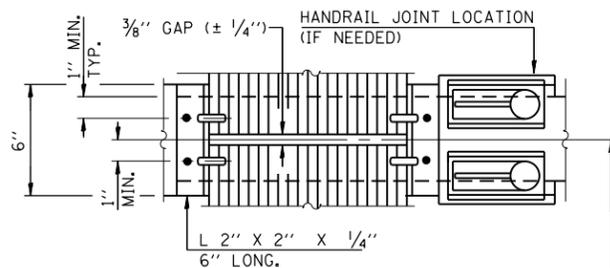
**SECTION T-T**



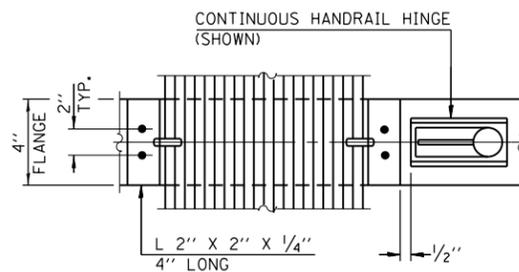
**DETAIL E**



**SECTION H-H**



**SECTION W-W**  
(CONTINUOUS WALKWAY GRATING)



**SECTION W-W**  
(CONTINUOUS WALKWAY GRATING)

**NOTES:**

- ① DRILLING HOLES IN GRATING MAY BE DONE IN SHOP OR FIELD, BASED ON CONTRACTOR'S PREFERENCE AND SUBJECT TO ACCURATE ALIGNMENT.
- ② PL 1/8" X 1/2" X 2" WELDED TO HANDRAIL POSTS TO PROTECT LOCATIONS THAT CONTACT GRATING.
- ③ TUBE TO GRATING GAP MAY VARY FROM 0 TO 1/2", MAX. TO ALIGN WALKWAY, ALLOW FOR CAMBER, ETC.
- ④ DMS MANUFACTURER SHALL DESIGN AND SUPPLY HARDWARE FOR CONNECTION OF DMS TO W6x9. BOLTS SHALL BE STAINLESS STEEL OR HOT DIP GALVANIZED HIGH STRENGTH PER ILLINOIS TOLLWAY SPECIFICATIONS.

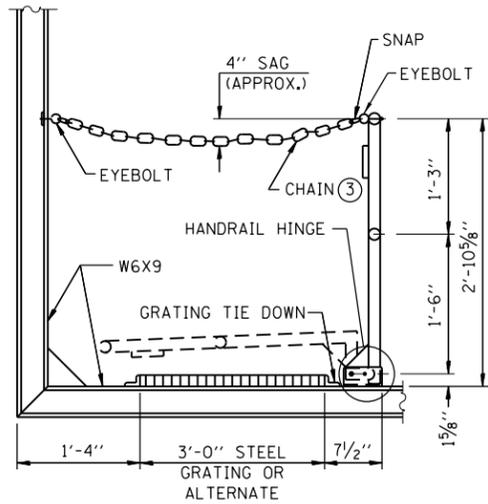
\* BRACKET AND GRATING DIMENSIONS ARE NOMINAL AND WILL VARY BASED ON ACTUAL DMS DIMENSIONS PLUS MANUFACTURER'S MOUNTING DEVICES.

**BARS SIZES FOR STANDARD STEEL GRATING**

TRUSS GRATING: MAIN BEARING BARS 3/16" X 1/2" ON 1 1/4" CENTERS.  
CROSS BARS 3/16" X 1/2" ON 4" CENTERS.  
WALKWAY GRATING: MAIN BEARING BARS 3/16" X 1/2" ON 1 1/4" CENTERS.  
CROSS BARS 3/16" X 1/2" ON 4" CENTERS.

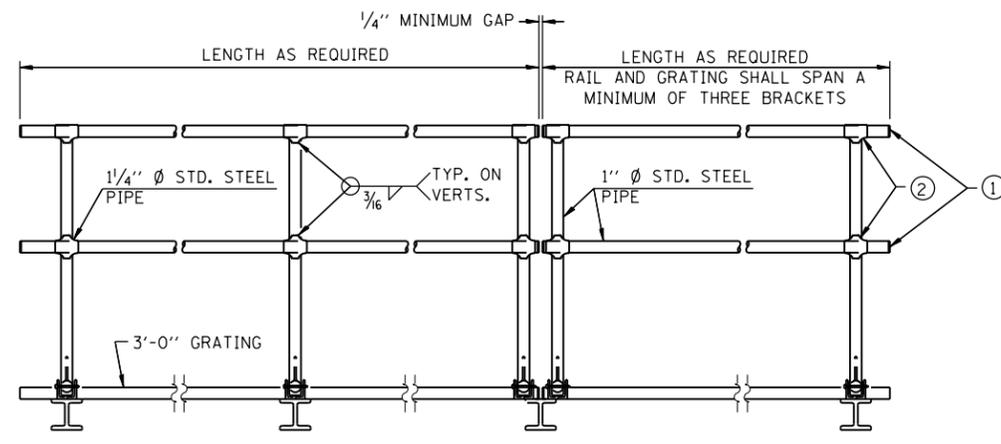
*Paul Kovacs*  
APPROVED..... DATE 5-20-2014.  
CHIEF ENGINEERING OFFICER



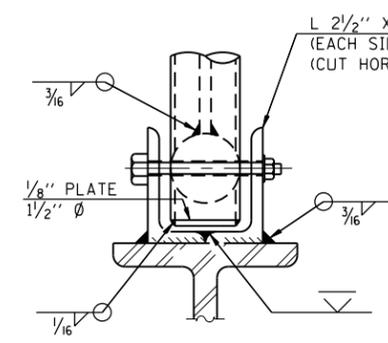


**SIDE ELEVATION**  
(SHOWING SAFETY CHAIN W/O SIGN)

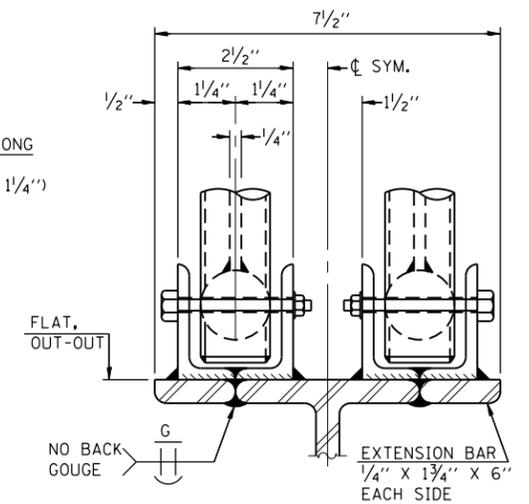
**HANDRAIL DETAILS**



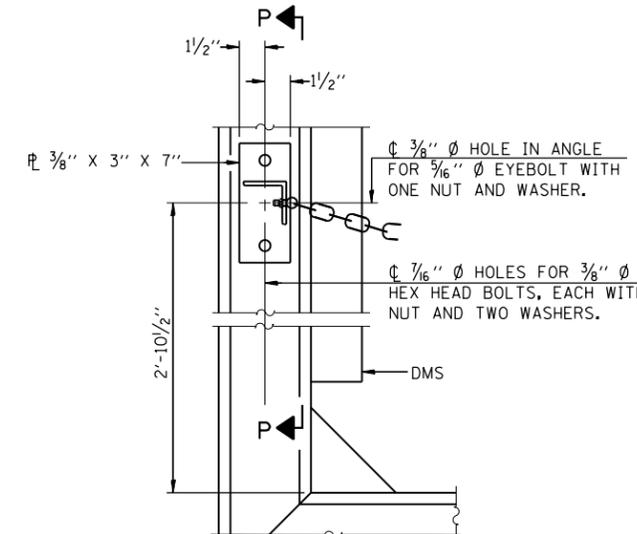
**FRONT ELEVATION**



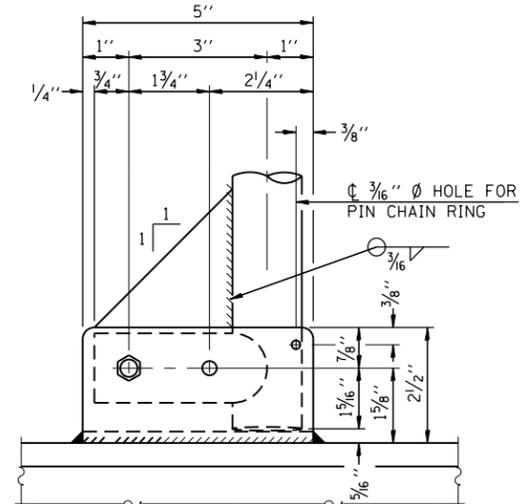
**FRONT ELEVATION**  
SEE "ELEVATION" AT RIGHT FOR DIMENSIONS.



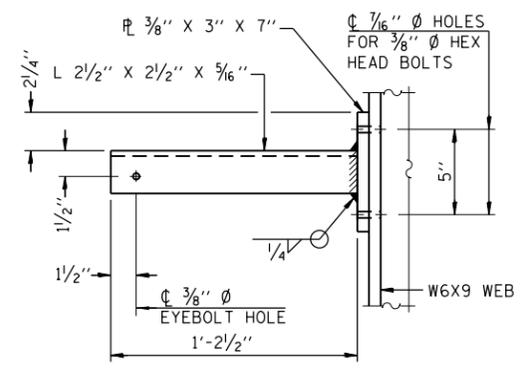
**ELEVATION AT HANDRAIL JOINT**



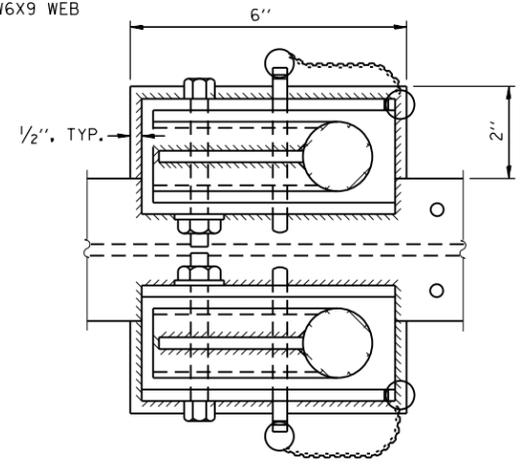
**ALTERNATE SAFETY CHAIN ATTACHMENT**  
(WITH SIGN PRESENT)  
ITEMS NOT SHOWN SAME AS "SIDE ELEVATION" OF "HANDRAIL DETAILS"



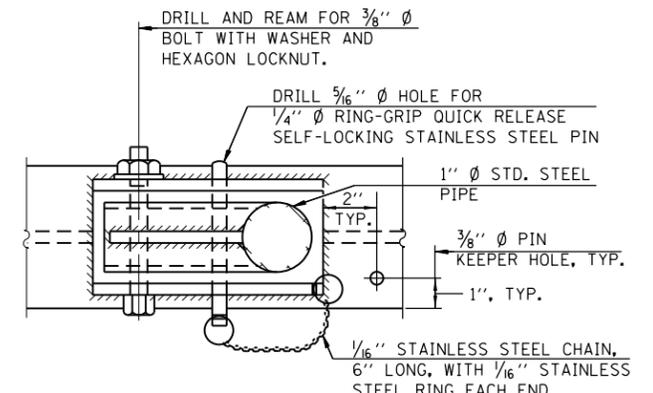
**SIDE ELEVATION**



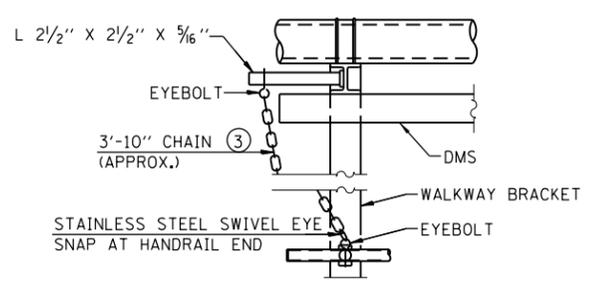
**SECTION P-P**



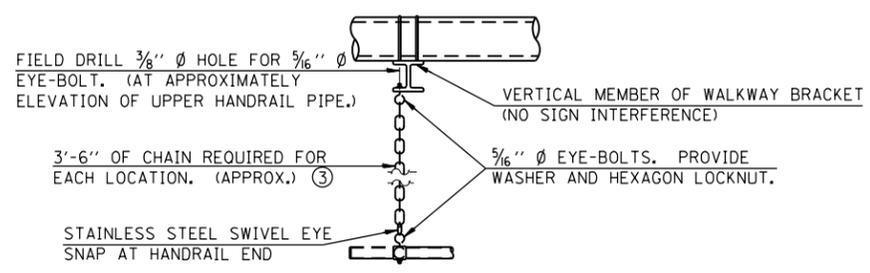
**PLAN AT HANDRAIL JOINT**  
DETAILS NOT SHOWN SAME AS "PLAN"



**PLAN AT HANDRAIL HINGE**



**ALTERNATE SAFETY CHAIN ATTACHMENT**  
DETAILS NOT SHOWN SIMILAR TO "SAFETY CHAIN" DETAILS  
(WALKWAY OMITTED FOR CLARITY)

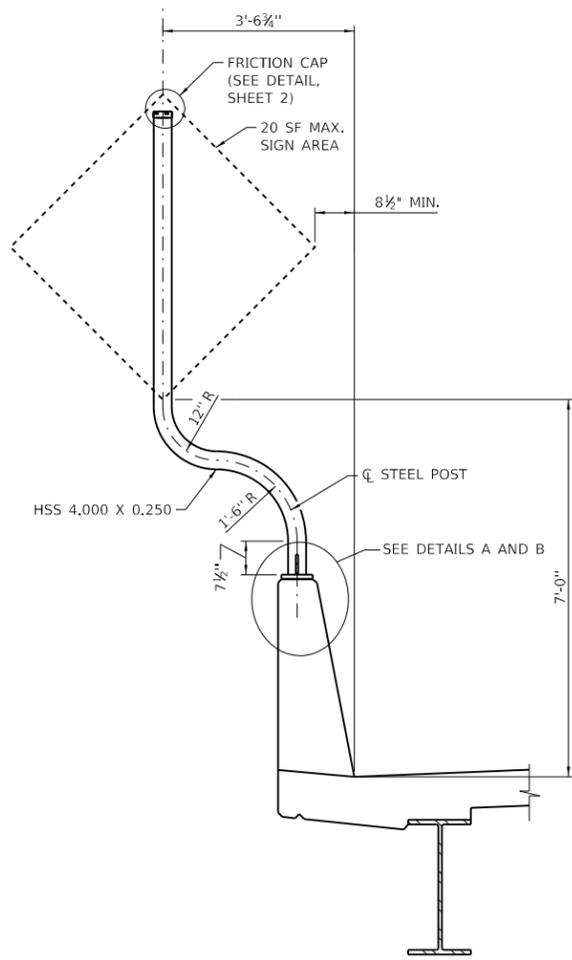


**SAFETY CHAIN**  
ONE REQUIRED FOR EACH END OF EACH WALKWAY.

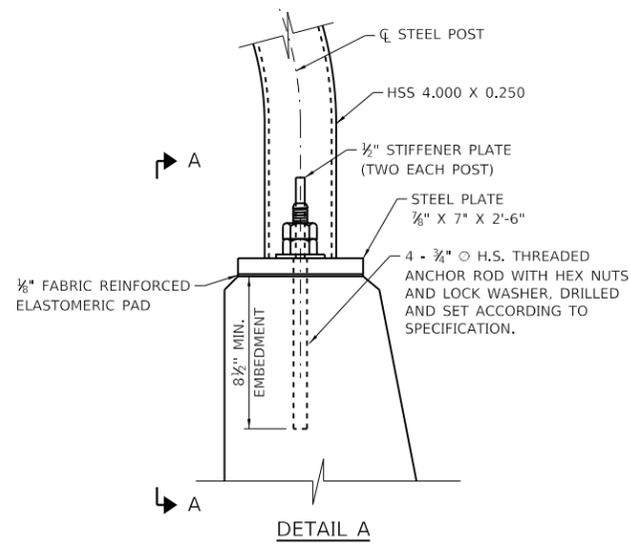
**NOTES:**

- INSTALL STANDARD FORCE-FIT END CAPS OR WELD 1/8" END PLATES WITH 1/8" C.F.W. AND GRIND SMOOTH. (ALL RAIL ENDS)
- HORIZONTAL HANDRAIL MEMBER SHALL BE CONTINUOUS THRU 1/4" DIAMETER PIPE. PROVIDE 7/16" DIAMETER HOLE IN 1/4" DIAMETER PIPE FOR 3/8" DIAMETER BOLT. FIELD DRILL 7/16" DIAMETER HOLE IN HORIZONTAL RAIL MEMBER. PROVIDE WASHER AND LOCKNUT FOR BOLT. (USE 3/16" EYEBOLTS IN 7/16" DIAMETER HOLES ON TOP RAIL AT ENDS ONLY.)
- 3/16" TYPE 304L STAINLESS STEEL CHAIN, APPROXIMATELY 12 LINKS PER FOOT.

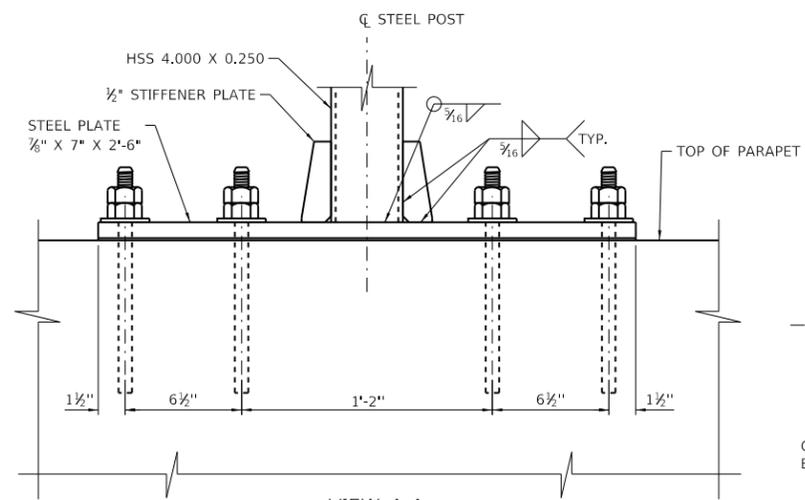




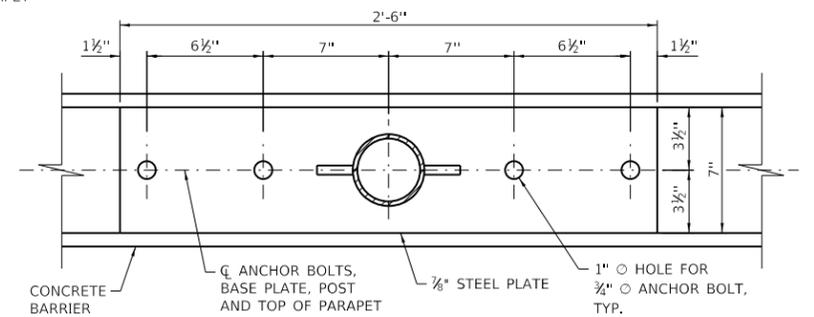
**PARAPET MOUNTED SIGN**  
MAXIMUM SIGN AREA 20 SF



**DETAIL A**

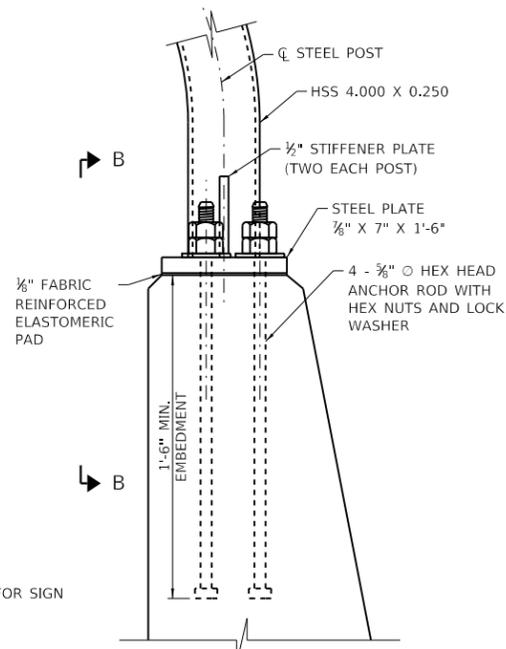


**VIEW A-A**

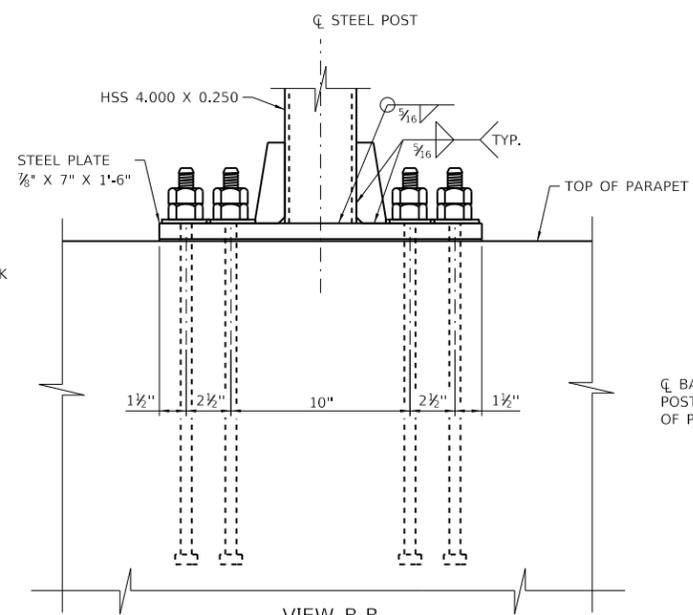


**BASE PLATE DETAIL**  
(FOR POST INSTALLED CONDITION)

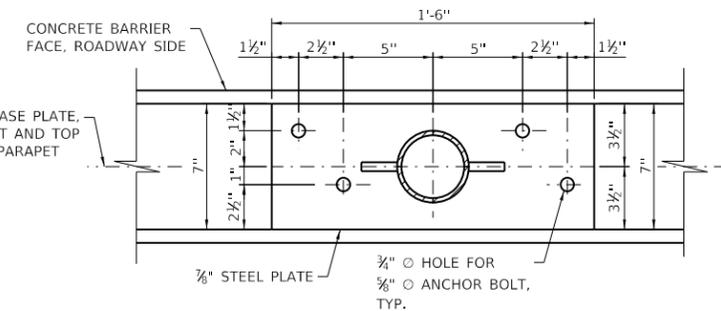
**POST INSTALLED DETAIL**  
(MAXIMUM SIGN AREA 20 SF)



**DETAIL B**



**VIEW B-B**

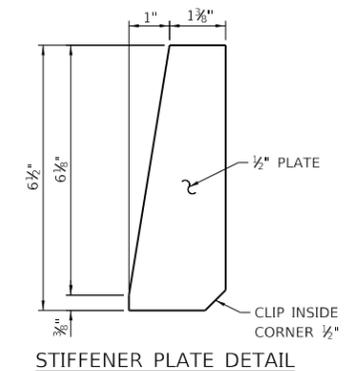


**BASE PLATE DETAIL**  
(CAST-IN-PLACE INSTALLATION)

**CAST-IN-PLACE DETAIL**  
(MAXIMUM SIGN AREA 20 SF)

**MATERIAL SPECIFICATIONS FOR  
STRUCTURAL STEEL AND FASTENERS**

ELEMENTS OF STRUCTURE	MINIMUM YIELD STRENGTH (K.S.I.)	MINIMUM ULTIMATE STRENGTH (K.S.I.)
STRUCTURAL STEEL TUBE	42	58
STEEL ANCHOR BOLTS	36	58

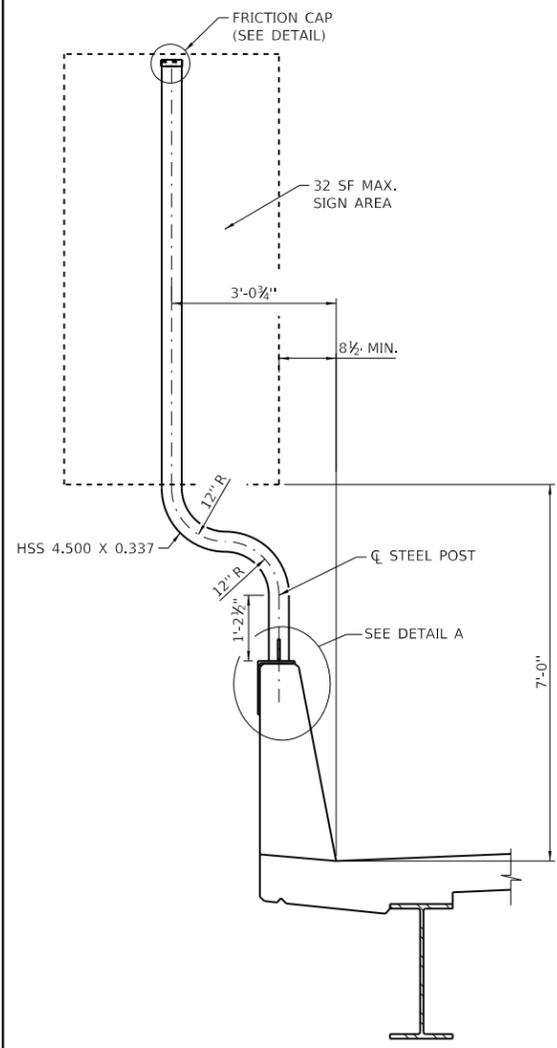


**STIFFENER PLATE DETAIL**

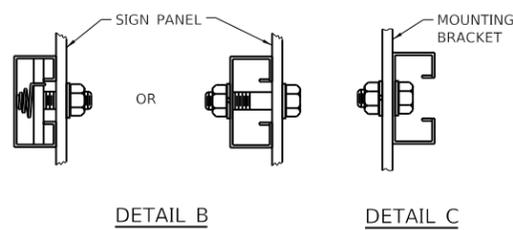
**NOTES:**

- FOR MATERIAL, FABRICATION, ERECTION, AND OTHER REQUIREMENTS, REFER TO ILLINOIS TOLLWAY "STRUCTURAL SUPPORT FOR SIGN PANELS" SPECIAL PROVISION.
- THESE DETAILS ARE NOT INTENDED FOR PORTABLE AND/OR PRECAST BARRIER.
- DESIGN CONFORMS TO THE 2015 EDITION OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS WITH 2017 INTERIM SPECIFICATIONS THERETO. DESIGN WIND SPEEDS OF 3-S GUST WITH SPEED OF 120 MPH PLUS 14% GUST FACTOR, AND A WIND IMPORTANCE FACTOR OF 1.0 (50 YEAR MEAN RECURRENCE INTERVAL) FOR THE SUPPORTING STRUCTURES.
- THE PARAPET WALL SHALL BE DESIGNED TO SAFELY SUPPORT THE PROPOSED SIGN PANELS IN ACCORDANCE WITH NOTE 3.
- WELDED PLATES MAY BE USED IN LIEU OF THE BENT PLATE OF MOUNTING PLATE SHOWN. ALL STEEL ELEMENTS SHALL BE GALVANIZED AFTER FABRICATION.
- EXISTING REINFORCING BARS IN THE CONCRETE STRUCTURES MAY CONFLICT WITH SPECIFIC ANCHOR LOCATIONS. THE CONTRACTOR SHALL LOCATE THE POSITION OF THE REINFORCING BARS AT THE LOCATIONS OF THE CONCRETE ANCHORS. DRILLED HOLES FOR ANCHOR RODS SHALL BE CAREFULLY PLACED TO AVOID INTERFERENCE WITH EXISTING REINFORCEMENT.
- NO ANCHOR BOLT SHALL BE PLACED CLOSER THAN 12" FROM PARAPET WALL EXPANSION JOINT.
- TWO STIFFENER PLATES (ONE ON EACH SIDE OF POST) SHALL BE WELDED AS SHOWN ON PLANS IN DIRECTION PERPENDICULAR TO SIGN.
- INSTALLATION SHALL BE DONE IN ACCORDANCE WITH ILLINOIS TOLLWAY SPECIAL PROVISION "SIGN INSTALLATION".
- THIS STANDARD SHALL BE UTILIZED TO MOUNT SIGN SUPPORT ON SINGLE FACE PARAPETS CONSTRUCTED ON BRIDGES, WALLS AND MOMENT SLABS.

APPROVED: *Paul Kovacs* DATE 12-31-2019  
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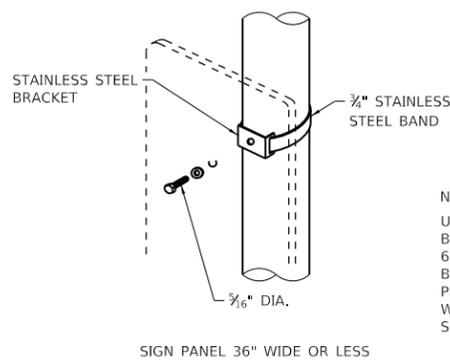


**PARAPET MOUNTED SIGN**  
MAXIMUM SIGN AREA 32 SF



**DETAIL B**

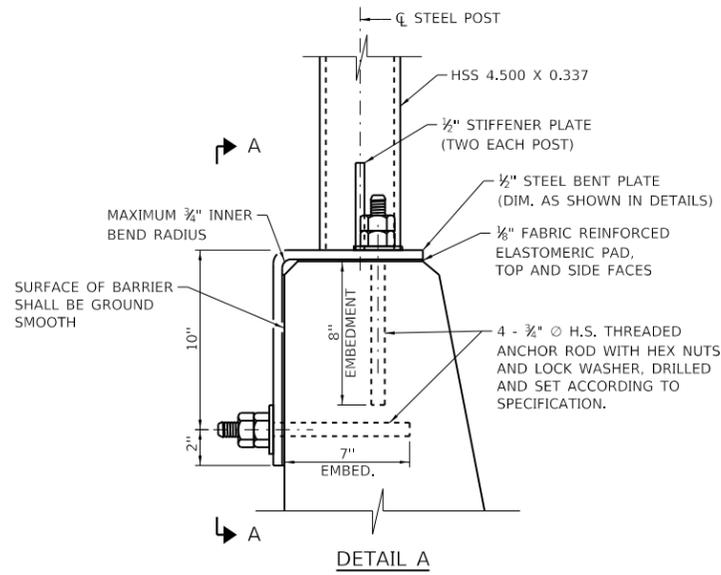
**DETAIL C**



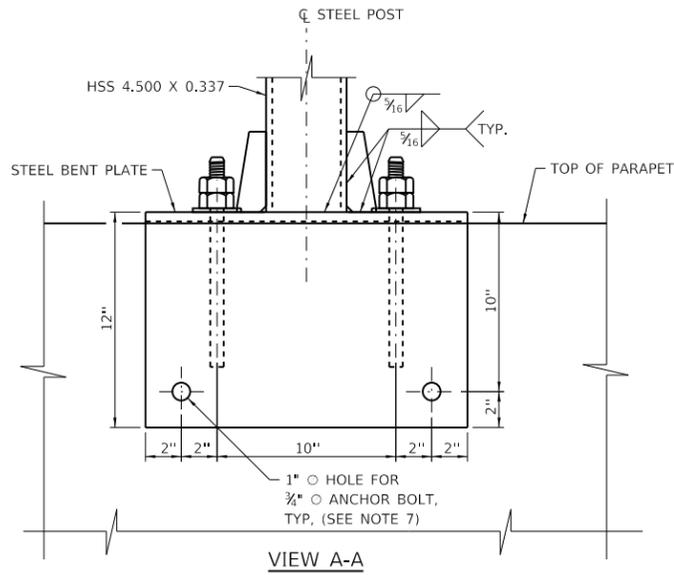
SIGN PANEL 36" WIDE OR LESS

NOTE:  
USE A MINIMUM OF 2 BRACKETS (LOCATED 6" FROM TOP AND BOTTOM OF SIGN) PER INSTALLATION WITH MAXIMUM SPACING OF 3'-0".

**MOUNTING BRACKET DETAILS**

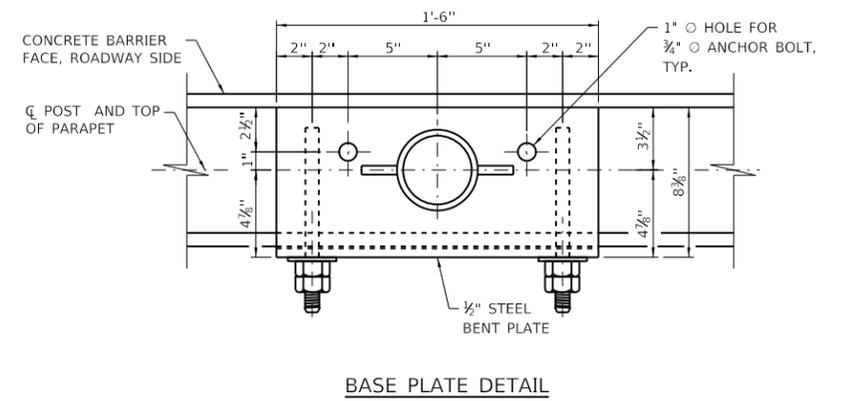


**DETAIL A**

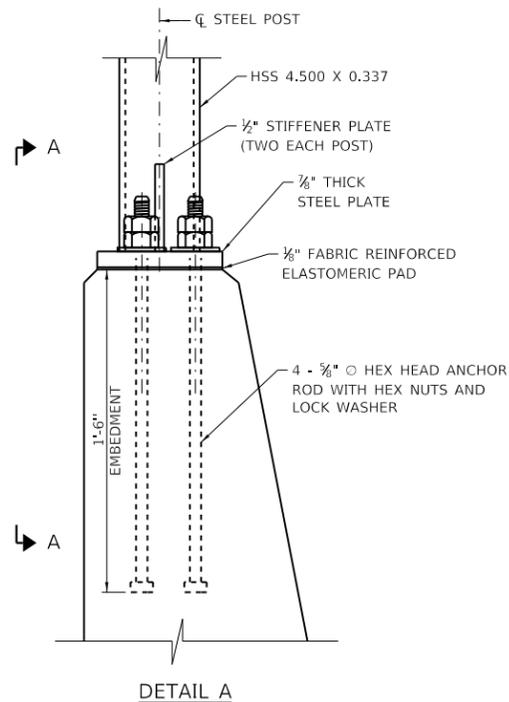


**VIEW A-A**

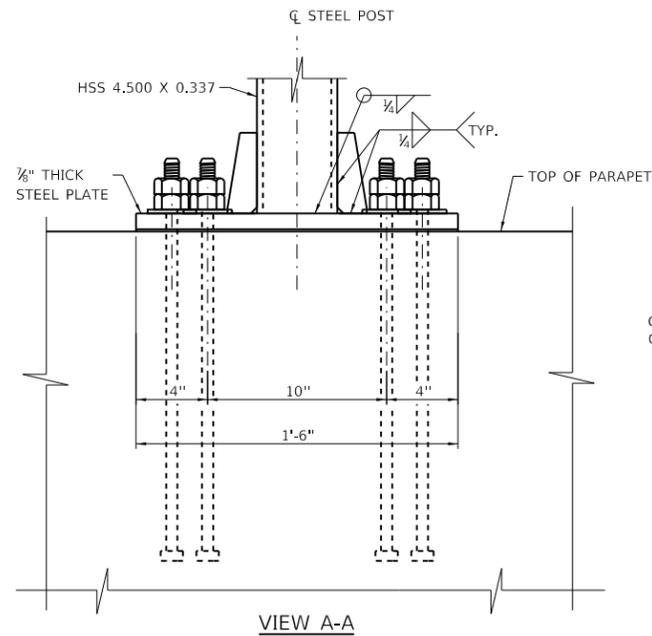
**POST INSTALLED DETAIL**  
(MAXIMUM SIGN AREA 32 SF)



**BASE PLATE DETAIL**

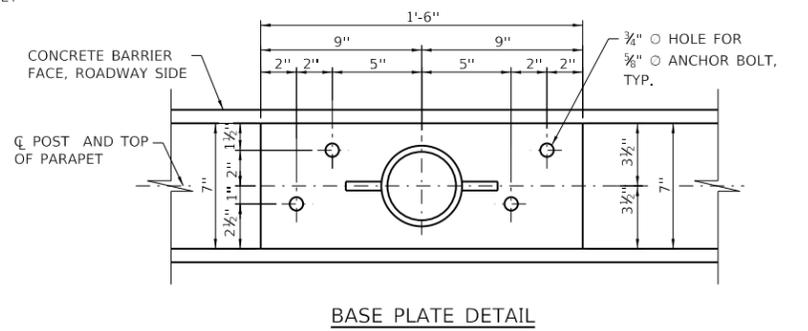


**DETAIL A**

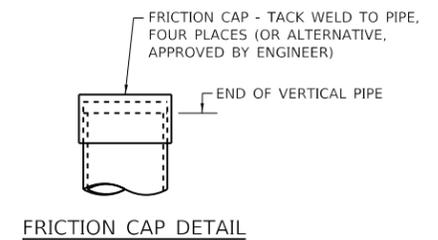


**VIEW A-A**

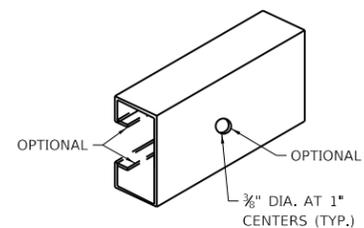
**CAST-IN-PLACE DETAIL**  
(MAXIMUM SIGN AREA 32 SF)



**BASE PLATE DETAIL**



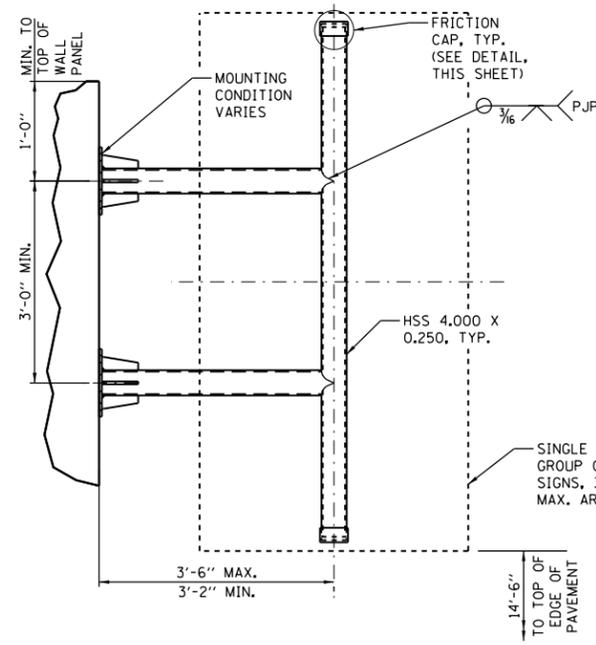
**FRICTION CAP DETAIL**



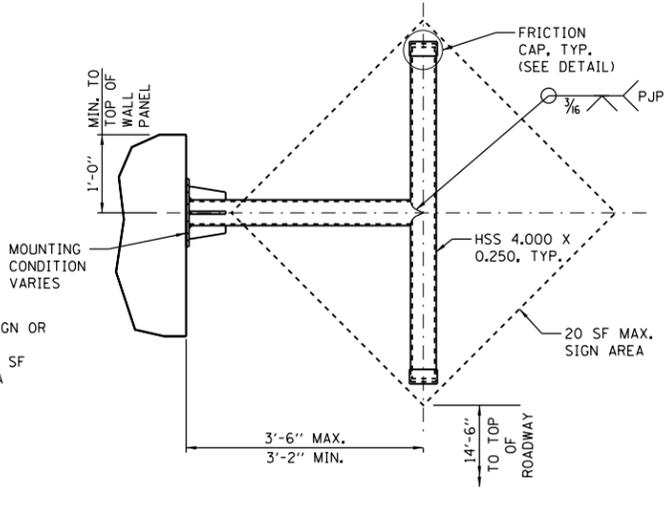
**SUPPORTING CHANNEL DETAILS**

SUPPORTING CHANNEL SECTION MODULUS (MINIMUM)	Axis A	Axis B
STEEL	0.050 in <sup>3</sup>	0.105 in <sup>3</sup>
ALUMINUM	0.150 in <sup>3</sup>	0.315 in <sup>3</sup>

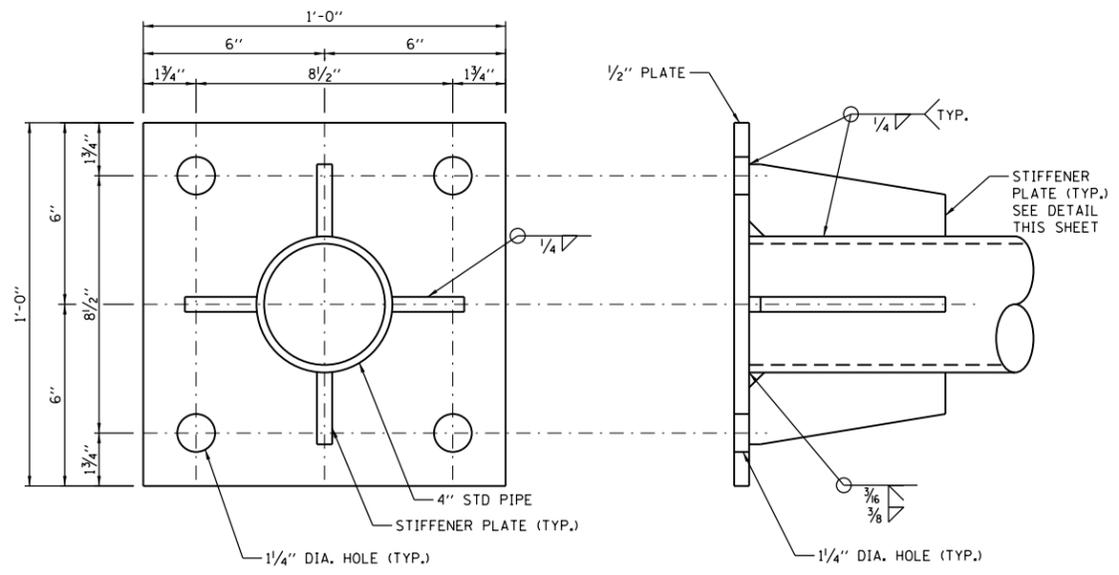
APPROVED *Paul Kovacs* DATE 12-31-2019  
CHIEF ENGINEERING OFFICER



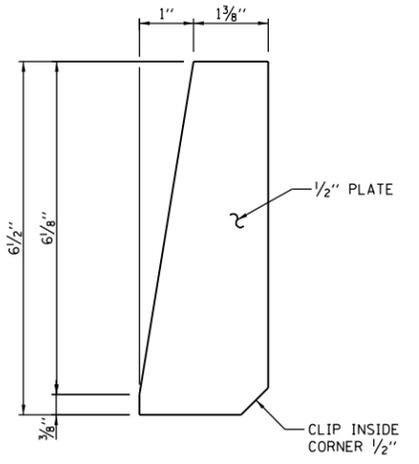
**SIGN PANEL MOUNT**  
(MAXIMUM SIGN AREA 32 SF)



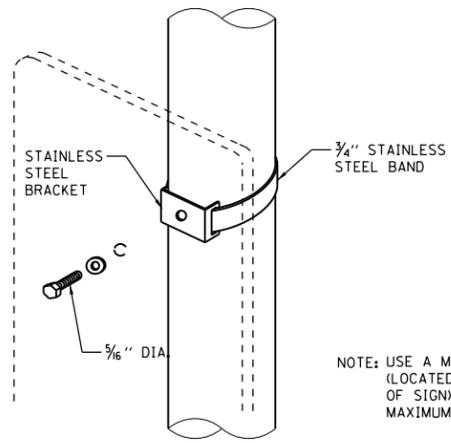
**SIGN PANEL MOUNT**  
(MAXIMUM SIGN AREA 20 SF)



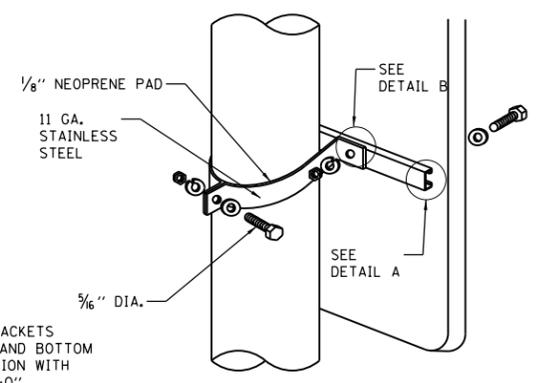
**BASE PLATE DETAILS**



**STIFFENER PLATE DETAIL**



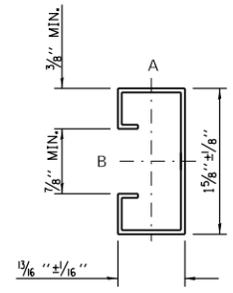
**MOUNTING BRACKET DETAIL**



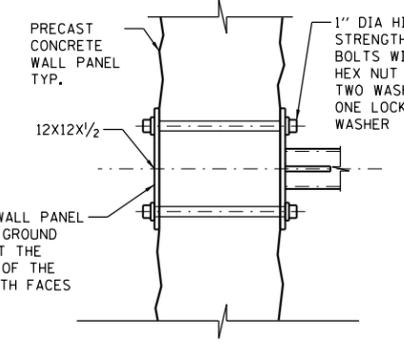
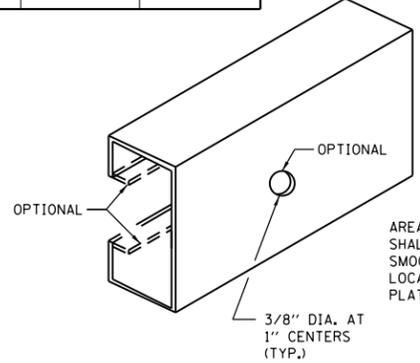
**MOUNTING BRACKET DETAIL**

NOTE: USE A MINIMUM OF 2 BRACKETS (LOCATED 6" FROM TOP AND BOTTOM OF SIGN) PER INSTALLATION WITH MAXIMUM SPACING OF 3'-0".

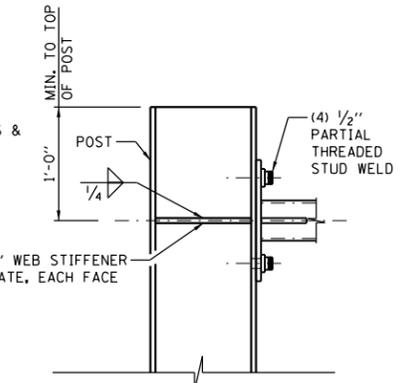
SUPPORTING CHANNEL SECTION MODULUS (MINIMUM)	Axis A	Axis B
STEEL	0.050 in <sup>3</sup>	0.105 in <sup>3</sup>
ALUMINUM	0.150 in <sup>3</sup>	0.315 in <sup>3</sup>



**SUPPORTING CHANNEL DETAILS**



**CONNECTION TO PANEL**

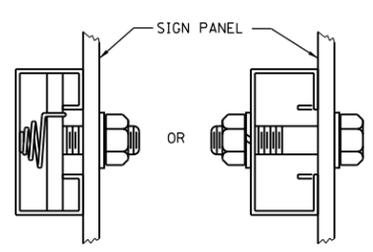


**CONNECTION TO POST**

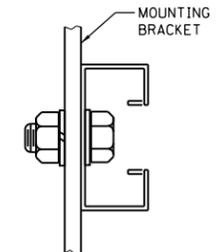
(APPLIES WHERE CONNECTION TO WALL PANEL IS NOT FEASIBLE DUE TO 14'-6" CLEARANCE REQUIREMENT)

**NOTES:**

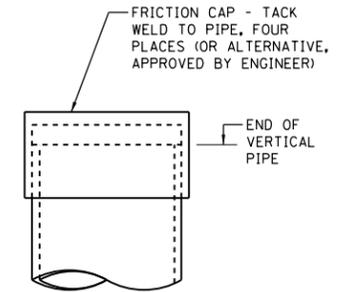
- FOR MATERIAL, FABRICATION, ERECTION, AND OTHER REQUIREMENTS, REFER TO ILLINOIS TOLLWAY "STRUCTURAL SUPPORT FOR SIGN PANELS" SPECIAL PROVISION.
- DESIGN CONFORMS TO THE 2015 EDITION OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS WITH 2017 INTERIM SPECIFICATIONS THERETO. DESIGN WIND SPEEDS OF 3-5 GUST WITH SPEED OF 120 MPH PLUS 14% GUST FACTOR, AND A WIND IMPORTANCE FACTOR OF 1.0 (50 YEAR MEAN RECURRENCE INTERVAL) FOR THE SUPPORTING STRUCTURES.
- ALL FABRICATION SHALL BE COMPLETE AND READY FOR ASSEMBLY BEFORE GALVANIZING. NO PUNCHING, DRILLING, CUTTING, NOR WELDING SHALL BE PERMITTED AFTER GALVANIZING.
- THE WALL PANELS AND/OR POSTS SHALL BE DESIGNED TO SAFELY SUPPORT THE PROPOSED SIGN PANELS IN ACCORDANCE WITH NOTE 2.
- FOR SIGN CONNECTION TO MOUNTING BRACKET, SHOP DRILL HOLES ON SIGN IN ACCORDANCE WITH THE CURRENT STANDARD HIGHWAY SIGN DESIGNS FOR ILLINOIS. ADDITIONAL HOLES(N) NEEDED TO MEET A STIPULATED TYPE MOUNTING MAY BE FIELD DRILLED.
- ALL THREADED RODS SHALL CONFIRM TO ASTM F1554 GRADE 105, EACH WITH ONE PLATE WASHER AND LOCKNUT AND BE HOT DIP GALVANIZED PER ASTM A153 (AASHTO M232). THEY SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 1211 OF ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS TO THE IDOT STANDARD SPECIFICATIONS.
- A NYLON WASHER SHALL BE PLACED BETWEEN THE SIGN FACE AND ANY OTHER WASHER REQUIRED ON SIGNS CONSTRUCTED OF ASTM TYPE III OR IV SHEETING.
- CONTRACTOR SHALL VERIFY APPLICABLE FIELD DIMENSIONS BEFORE FABRICATION. HOLES DRILLED THROUGH NOISE ABATEMENT WALL SHALL BE DRILLED WITH ROTARY (CORING OR MASONRY DRILL) TYPE EQUIPMENT. PERCUSSION (STAR) DRILLING SHALL NOT BE ALLOWED.
- CENTER LINE OF BOLTS INTO NOISE ABATEMENT WALL SHALL BE AT LEAST 12" TO CENTER LINE OF OPEN JOINT IN WALL.



**DETAIL A**



**DETAIL B**



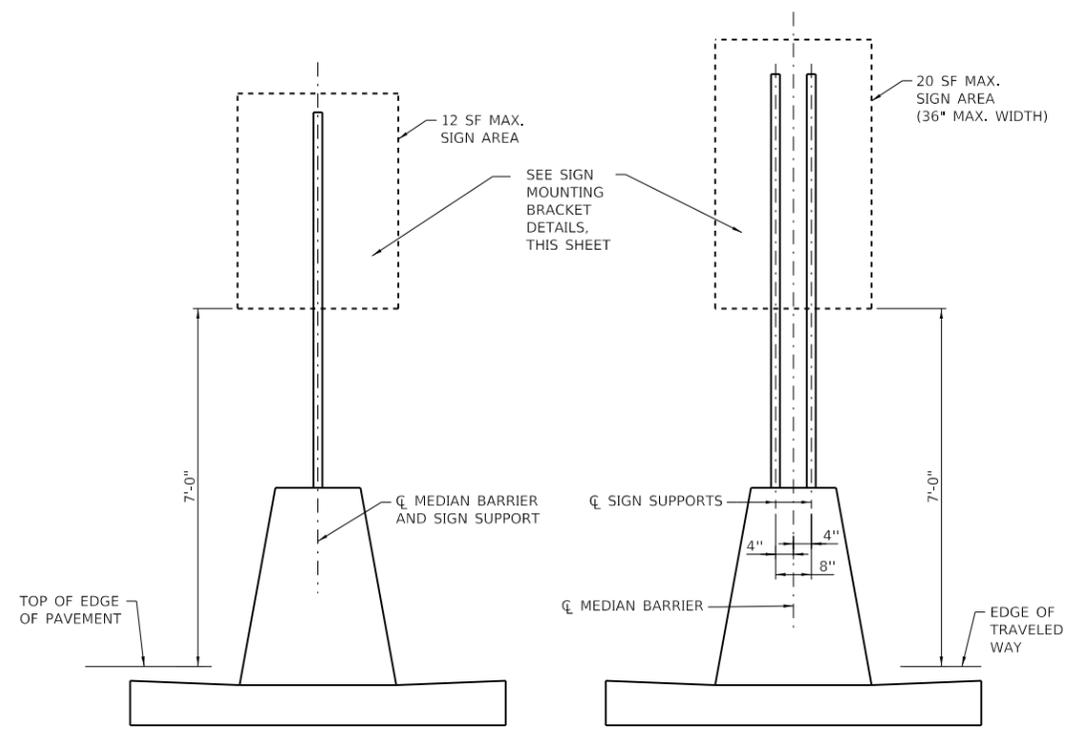
**FRICTION CAP DETAIL**

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SHEET 1 OF 1

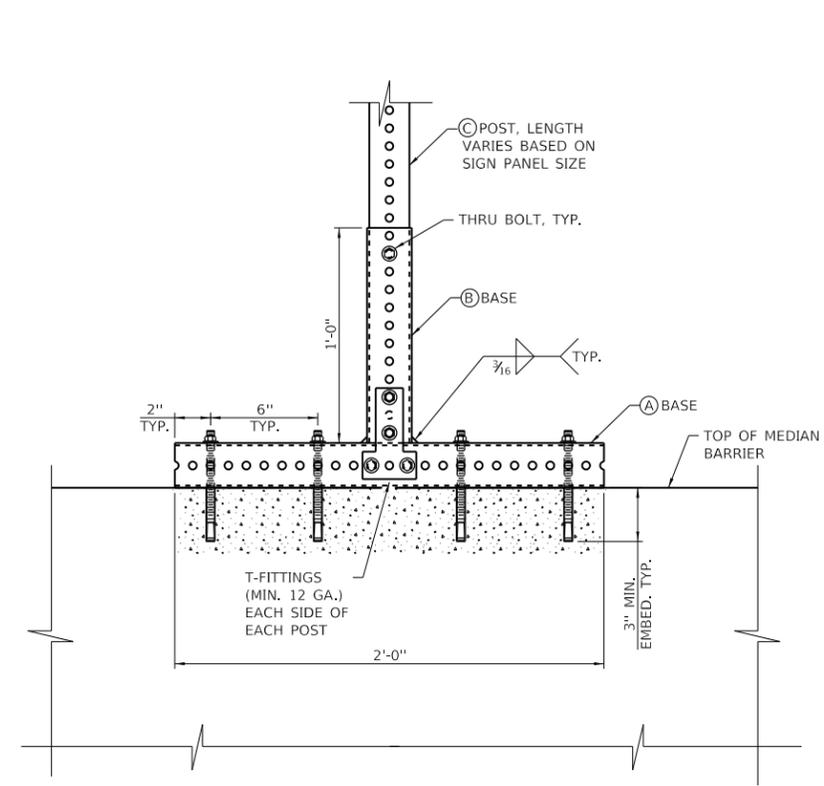
**NOISE ABATEMENT WALL MOUNTED SIGN SUPPORT**

STANDARD F19-01



ONE POST INSTALLATION

TWO POSTS INSTALLATION



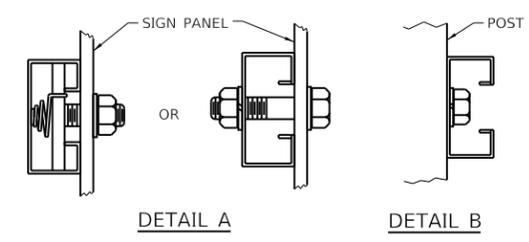
SIDE ELEVATION - BARRIER MOUNT DETAIL  
(LOOKING PERP. TO TRAFFIC)

NOTES:

1. ALL ANCHOR BOLTS FOR MEDIAN BARRIER MOUNTED SIGN SUPPORT ASSEMBLY SHALL BE 3/8" DIA. EXPANSION ANCHORS.
2. THE TOP SECTION SHALL BE TELESOPED INTO THE BASE SECTION 12 INCHES AND FASTENED TOGETHER.
3. DESIGN CONFORMS TO THE 2015 EDITION OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS WITH 2017 INTERIM SPECIFICATIONS THERETO. DESIGN WIND SPEEDS OF 3-s GUST WITH SPEED OF 120 MPH PLUS 14% GUST FACTOR, AND A WIND IMPORTANCE FACTOR OF 1.0 (50 YEAR MEAN RECURRENCE INTERVAL) FOR THE SUPPORTING STRUCTURES.
4. NO ANCHOR BOLT SHALL BE PLACED CLOSER THAN 12" FROM CENTER LINE OF MEDIAN BARRIER JOINT.
5. SIGN FABRICATION AND INSTALLATION SHALL BE DONE IN ACCORDANCE WITH ILLINOIS TOLLWAY SPECIAL PROVISION "SIGN INSTALLATION".
6. BASE AND POST ASSEMBLY SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111 OR AS SPECIFIED IN THE SPECIAL PROVISION "TELESCOPING STEEL SIGN SUPPORT, BARRIER ASSEMBLY".
7. ALL MATERIALS FOR THE SIGN SUPPORT ASSEMBLY SHALL BE INCLUDED IN THE COST OF "TELESCOPING STEEL SIGN SUPPORT, BARRIER ASSEMBLY".

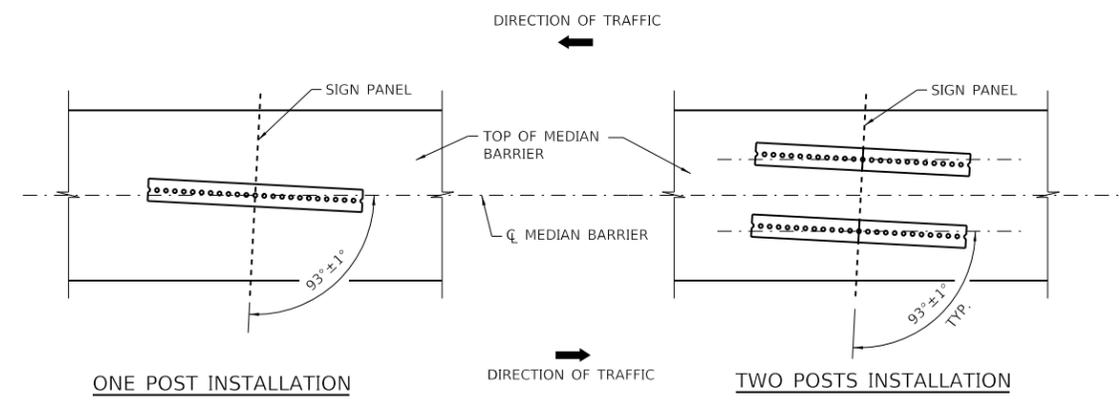
MEMBER DETAILS

(A)	2 1/2" x 2 1/2" x 1'-0" (12 GA.)
(B)	2 1/2" x 2 1/2" x 1'-0" (12 GA.)
(C)	2 1/4" x 2 1/4" x VARIES (12 GA.)



DETAIL A

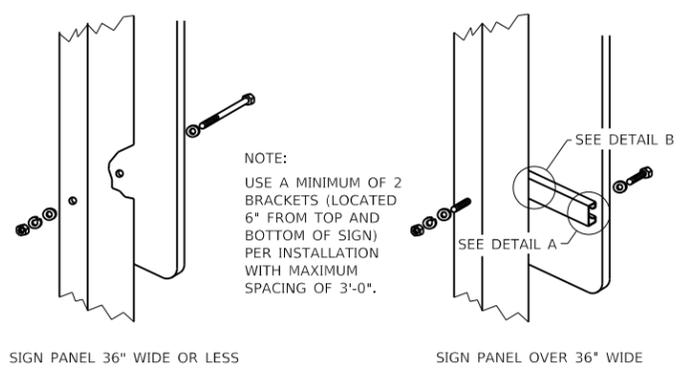
DETAIL B



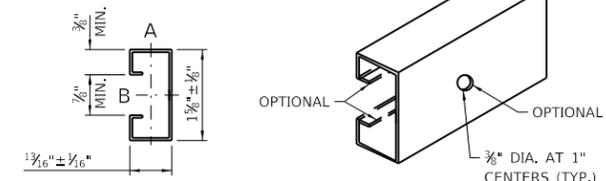
ONE POST INSTALLATION

TWO POSTS INSTALLATION

PLAN VIEW



MOUNTING BRACKET DETAILS



SUPPORTING CHANNEL DETAILS

SUPPORTING CHANNEL SECTION MODULUS (MINIMUM)	Axis A	Axis B
STEEL	0.050 in. <sup>3</sup>	0.105 in. <sup>3</sup>
ALUMINUM	0.150 in. <sup>3</sup>	0.315 in. <sup>3</sup>

APPROVED: *Paul Kovacs* DATE 12-31-2019  
CHIEF ENGINEERING OFFICER