

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 1 of 51
Contract Number 44949

PLANS FOR PROPOSED FEDERAL AID HIGHWAY

VARIOUS ROUTES
OVD SIN STR REP & REPL 2007-16
VARIOUS COUNTIES
C-60-023-07

INDEX OF SHEETS

<u>NO.</u>	<u>DESCRIPTION</u>
1	COVER SHEET
2-3	SUMMARY OF QUANTITIES
4-5	SCHEDULE OF QUANTITIES
6-39	SCHEDULE OF LOCATIONS FOR DISTRICT 5
40-50	SCHEDULE OF LOCATIONS FOR DISTRICT 7
51	HANDRAIL HINGE REPAIR DETAIL

STANDARDS

630001-07
630301-04
702001-06
701006-02
701101-01
701106-01
701201-02
701301-02
701401-03
701406-04
701411-03
720021-01
701400-02

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED 2/16 2007
PASSED

Joe Hill
ENGINEER OF OPERATIONS

March 23, 2007
Eric E. Hamel
Interim ENGINEER OF DESIGN AND ENVIRONMENT

APPROVED March 23, 2007
Milton R. Sees P.E.
DIRECTOR DIVISION OF HIGHWAYS

JOINT UTILITY LOCATING INFORMATION FOR
EXCAVATIONS PHONE: 800-892-0123

CONTRACT NO. 44949

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 2 of 51
Contract Number 44949

Summary of Quantities

CODE NUMBER	PAY ITEM	UNIT	Y002 - 1C 100% STATE TOTAL QUANTITY	RURAL
T9990700	REPLACE OVERHEAD SIGN WALKWAY	FOOT	58.00	58.00
	AND			
T9990710	REMOVE REINSTALL WALKWAY	FOOT	320.75	320.75
T9992530	REPLACE AND TIGHTEN SIGN MOUNTING CLIPS PER EACH SIGN	EACH	10.00	10.00
T9992700	REM & REIN: SIGN PANEL	SQ FT	1,982.50	1,982.50
	AND			
T9997700	FURNISH INSTALL SAFETY CHAIN	EACH	14.00	14.00
T9998815	REPAIR HANDRAIL LOCKING PIN CONNECTION	EACH	47.00	47.00
X0324397	RELOCATE ELECTRIC SERVICE	EACH	4.00	4.00
	AND			
T9998995	DISCONNECT RECONNECT ELECTRIC SERVICE	EACH	4.00	4.00
Z003 0150	IMPACT ATTENUATORS (NON-REDIRECTIVE), TEST LEVEL 3	EACH	1.00	1.00
Z0030350	IMPACT ATTENUATORS, RELOCATE (NON-REDIRECTIVE), TEST LEVEL 3	EACH	4.00	4.00
* 63000000	STEEL PLATE BEAM GUARD RAIL, TYPE A	FOOT	100.00	100.00
* 63000005	STEEL PLATE BEAM GUARD RAIL, TYPE B	FOOT	100.00	100.00
* 63100167	TRAFFIC BARRIER TERMINAL TYPE 1, SPECIAL (TANGENT)	EACH	1.00	1.00
63200310	GUARDRAIL REMOVAL	FOOT	100.00	100.00
* 63300730	STEEL PLATE BEAM GUARD RAIL, STEEL POSTS	EACH	8.00	8.00
* 63400105	GUARD POSTS	EACH	40.00	40.00
63400205	GUARD POSTS REMOVAL	EACH	25.00	25.00
67100100	MOBILIZATION	L SUM	1.00	1.00
	AND			
70101700	TRAFFIC CONTROL PROTECTION	L SUM	1.00	1.00

* SPECIALTY ITEMS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 4 of 51
Contract Number 44949

Schedule of Quantities

PAY ITEM	UNIT	Y002 - 1C 100% STATE TOTAL QUANTITY	DISTRICT 5	DISTRICT 7
REPLACE OVERHEAD SIGN WALKWAY	FOOT	58.00	58.00	0.00
REMOVE & REINSTALL WALKWAY	FOOT	320.75	177.50	143.25
REPLACE/TIGHTEN CLIP PER SIGN	EACH	10.00	5.00	5.00
REMOVE & REINSTALL SIGN PANEL	SQ FT	1,982.50	996.00	986.50
FURNISH & INSTALL SAFETY CHAIN	EACH	14.00	8.00	6.00
REPAIR HANDRAIL LOCKING PIN CONNECTION	EACH	47.00	24.00	23.00
DISCONNECT / RECONNECT ELECTRIC SERVICE	EACH	4.00	2.00	2.00
RELOCATE ELECTRIC SERVICE	EACH	4.00	2.00	2.00
IMPACT ATTENUATORS, (NON-DIRECTIVE) TEST LEVEL 3	EACH	1.00	1.00	0.00
IMPACT ATTENUATORS, RELOCATE (NON-DIRECTIVE) TEST LEVEL 3	EACH	4.00	4.00	0.00
STEEL PLATE BEAM GUARDRAIL, TYPE A	FOOT	100.00	100.00	0.00
STEEL PLATE BEAM GUARDRAIL, TYPE B	FOOT	100.00	100.00	0.00
TRAFFIC BARRIER TERMINAL, TYPE 1 SPECIAL (TANGENT)	EACH	1.00	1.00	0.00
GUARDRAIL REMOVAL	FOOT	100.00	100.00	0.00
STEEL PLAT BEAM GUARDRAIL STEEL POST	EACH	8.00	8.00	0.00
GUARD POST	EACH	40.00	40.00	0.00
GUARD POST REMOVAL	EACH	25.00	25.00	0.00

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 6 of 51
Contract Number 44949

District 5
Overhead Sign Structure Replacement

Location No.:		State I.D. No.:		5S010I057R236.24	
County:	Champaign	Route:	I - 57	M.P.:	236.24
Description of Work		Unit	Quantity		
REMOVE OVERHEAD SIGN STRUCTURE-SPAN		EACH	1.00		
OVERHEAD SIGN STRUCTURE-SPAN, TYPE I A		FOOT	90.00		
DRILLED SHAFT CONCRETE FOUNDATION		CU YD	25.40		
REMOVE CONCRETE FOUNDATION-OVERHEAD		EACH	2.00		
STRUCTURAL STEEL SUPPORT OVERHEAD SIGN STRUCTURE		EACH	2.00		
REMOVE & REINSTALL SIGN PANEL		SQ FT	214.00		
REMOVE & REINSTALL WALKWAY		SQ FT	31.00		
FURNISH & INSTALL SAFETY CHAIN		EACH	2.00		
REPAIR HANDRAIL LOCKING PIN CONNECTION		EACH	8.00		
IMPACT ATTENUATORS, RELOCATE (NON-DIRECTIVE) TL3		EACH	2.00		
GUARD POSTS		EACH	20.00		
GUARD POSTS REMOVAL		EACH	10.00		
This overhead sign structure is being completely replaced.					

Location No.:		State I.D. No.:		5S010I057L238.44	
County:	Champaign	Route:	I - 57	M.P.:	238.44
Description of Work		Unit	Quantity		
REMOVE OVERHEAD SIGN STRUCTURE-SPAN		EACH	1.00		
OVERHEAD SIGN STRUCTURE SPAN, TYPE I A		FOOT	88.00		
DRILLED SHAFT CONCRETE FOUNDATION		CU YD	23.40		
REMOVE CONCRETE FOUNDATION OVERHEAD		EACH	2.00		
REMOVE & REINSTALL SIGN PANEL		SQ FT	375.00		
FURNISH & INSTALL SAFETY CHAIN		EACH	2.00		
STRUCTURAL STEEL SUPPORT OVERHEAD SIGN STRUCTURE		EACH	2.00		
REPLACE OVERHEAD SIGN WALKWAY		FOOT	35.00		
IMPACT ATTENUATORS, RELOCATE (NON-DIRECTIVE) TL3		EACH	2.00		
GUARD POSTS		EACH	20.00		
GUARD POSTS REMOVAL		EACH	15.00		
REPLACE / TIGHTEN CLIP PER SIGN		EACH	3.00		
This overhead sign structure is being completely replaced.					

Location No.:		State I.D. No.:		5C010U045R012.76	
County:	Champaign	Route:	U.S. - 45	M.P.:	12.76
Description of Work		Unit	Quantity		
REMOVE OVERHEAD SIGN STRUCTURE-SPAN		EACH	1.00		
OVERHEAD SIGN STRUCTURE-CANTILEVER TYPE III A		FOOT	40.00		
REMOVE & REINSTALL SIGN PANEL		SQ FT	128.00		
REMOVE & REINSTALL WALKWAY		FOOT	53.50		
REPLACE / TIGHTEN CLIP PER SIGN		EACH	2.00		
REPAIR HANDRAIL LOCKING PIN CONNECTION		EACH	8.00		
IMPACT ATTENUATORS, (NON-DIRECTIVE) TL3		EACH	1.00		
REMOVE CONCRETE FOUNDATION OVERHEAD		EACH	2.00		
DRILLED SHAFT CONCRETE FOUNDATION		CU YD	12.50		
This overhead sign structure is being replaced with an overhead sign structure cantilever, Type III.					

Location No.:		State I.D. No.:		5S010I074R179.10	
County:	Champaign	Route:	I - 74	M.P.:	179.10
Description of Work		Unit	Quantity		
REMOVE OVERHEAD SIGN STRUCTURE-SPAN		EACH	1.00		
OVERHEAD SIGN STRUCTURE-SPAN TYPE I A		FOOT	84.00		
DRILLED SHAFT CONCRETE FOUNDATION		CU YD	20.40		
REMOVE CONCRETE FOUNDATION-OVERHEAD		EACH	2.00		
STRUCTURAL STEEL SUPPORT OVERHEAD SIGN STRUCTURE		EACH	2.00		
REMOVE & REINSTALL SIGN PANEL		SQ FT	253.00		
REMOVE & REINSTALL WALKWAY		FOOT	50.00		
RELOCATE ELECTRIC SERVICE		EACH	1.00		
DISCONNECT/RECONNECT ELECTRIC SERVICE		EACH	1.00		
REPLACE OVERHEAD SIGN WALKWAY		FOOT	17.00		
GUARDRAIL REMOVAL		FOOT	50.00		
GUARDRAIL MARKERS, TYPE A		EACH	1.00		
STEEL PLATE BEAM GAURDRAIL, TYPE B		FOOT	50.00		
FURNISH & INSTALL SAFETY CHAIN		EACH	2.00		
REPAIR HANDRAIL LOCKING PIN CONNECTION		EACH	8.00		

Location No.:		State I.D. No.:		5S092I074R213.40	
County:	Vermilion	Route:	I-74	M.P.:	213.4
Description of Work		Unit	Quantity		
REMOVE OVERHEAD SIGN STRUCTURE-SPAN		EACH	1.00		
OVERHEAD SIGN STRUCTURE-SPAN, TYPE II A		FOOT	64.00		
STRUCTURAL STEEL SUPPORT OVERHEAD SIGN STRUCTURE		EACH	2.00		
REMOVE & REINSTALL SIGN PANEL		SQ FT	26.00		
REMOVE & REINSTALL WALKWAY		FOOT	43.00		
DRILLED SHAFT CONCRETE FOUNDATION		CU YD	14.50		
REMOVE CONCRETE FOUNDATION OVERHEAD		EACH	2.00		
FURNISH & INSTALL SAFETY CHAIN		EACH	2.00		
DISCONNECT/RECONNECT ELECTRIC SERVICE		EACH	1.00		
RELOCATE ELECTRIC SERVICE		EACH	1.00		
GUARDRAIL REMOVAL		FOOT	50.00		
GUARDRAIL MARKERS, TYPE A		EACH	3.00		
STEEL PLATE BEAM GUARDRAIL, TYPE A		FOOT	100.00		
STEEL PLATE BEAM GUARDRAIL, TYPE B		FOOT	50.00		
TBT TYPE 1, SPECIAL (TANGENT)		EACH	1.00		
TERMINAL MARKER-DIRECT APPLIED		EACH	1.00		
STEEL PLATE BEAM GUARDRAIL STEEL POST		EACH	8.00		
SIGN PANEL - TYPE 3		SQ FT	314.25		
REMOVE SIGN PANEL - TYPE 3		SQ FT	265.00		
REPLACE OVERHEAD SIGN WALKWAY		FOOT	6.00		
This overhead sign structure is being completely replaced.					

GENERAL NOTES

DESIGN: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. ("AASHTO Specifications")

CONSTRUCTION: Current (at time of letting) Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, Supplemental Specifications and Special Provisions. ("Standard Specifications")

LOADING: 90 M.P.H. WIND VELOCITY

WALKWAY LOADING: Dead load plus 500 lbs. concentrated live load.

DESIGN STRESSES:
Field Units
f_c = 3,500 p.s.i.
f_y = 60,000 p.s.i. (reinforcement)

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 Standard Specifications.

MATERIALS: Aluminum Alloys as shown throughout plans. All Structural Steel Pipe shall be ASTM A53 Grade B with a minimum yield of 35,000 p.s.i., or A500 Grade B or C with a minimum yield of 46,000 p.s.i. If A500 pipe is substituted for A53, then the outside diameter shall be as detailed and wall thickness greater than or equal to A53.

All Structural Steel Plates and Shapes shall conform to AASHTO M270 Gr. 36, Gr. 50 or Gr. 50W*. 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.

FASTENERS FOR ALUMINUM TRUSSES: All bolts noted as "high strength" must satisfy the requirements of AASHTO M164 (ASTM A325), or approved alternate, and must have matching lock nuts. Threaded studs for splices (if Members interfere) must satisfy the requirements of ASTM A449, ASTM A193, Grade B7, or approved alternate, and must have matching lock nuts. Bolts and lock nuts not required to be high strength must satisfy the requirements of ASTM A307. All bolts and lock nuts must be hot dip galvanized per AASHTO M232. The lock nuts must 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 AND EYEBOLTS: U-Bolts and Eyebolts must 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 must 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 lock nut.

GALVANIZING: All Steel Grating, Plates, Shapes and Pipe shall be Hot Dip Galvanized after fabrication in accordance with AASHTO M111. Painting is not permitted.

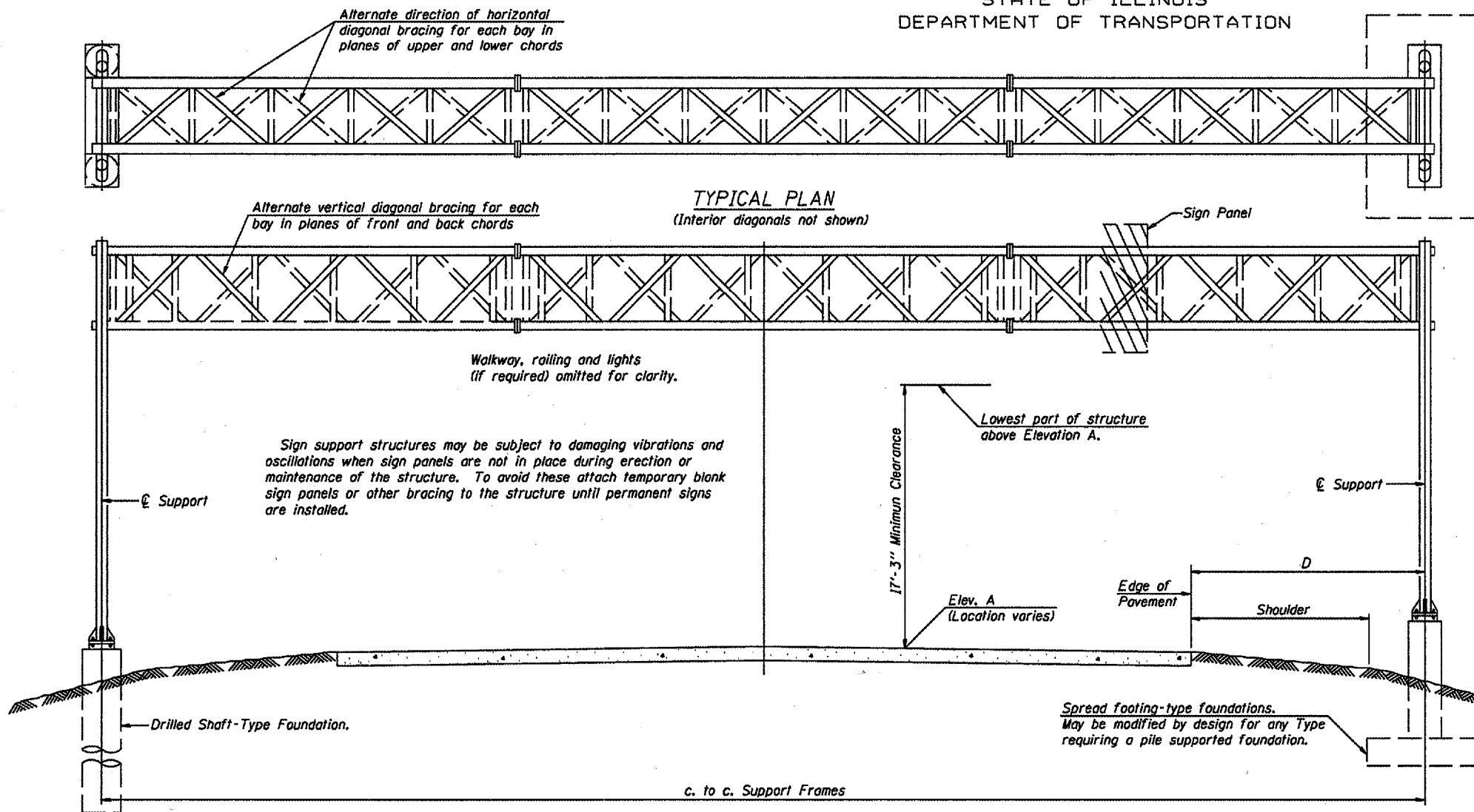
ANCHOR RODS: Shall conform to AASHTO M314 Gr. 36 or 55 with a minimum Charpy V-Notch (CVN) energy of 15 lb.-ft. at 40° F.

CONCRETE SURFACES: All concrete surfaces above an elevation 6" below the lowest final ground line at each foundation shall be cleaned and coated with Bridge Seat Sealer in accordance with the Standard Specifications.

REINFORCEMENT BARS: Reinforcement Bars designated (E) shall be epoxy coated in accordance with the Standard Specifications.

FOUNDATIONS: The contract unit price for Concrete Foundations and Drilled Shaft Concrete Foundations shall include reinforcement bars complete in place.

* If M270 Gr. 50W (M222) steel is proposed, chemistry for plate to be used shall first be approved by the Engineer as suitable for galvanizing and welding.

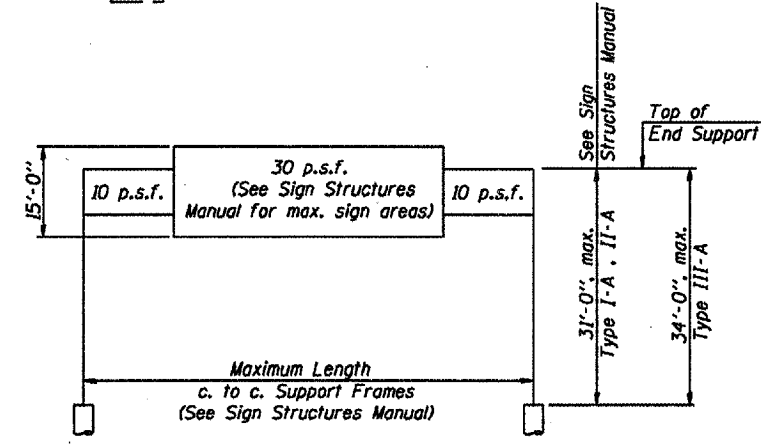


TYPICAL ELEVATION
(Looking at Face of Signs)**

Elev. A = Elevation at point of minimum clearance to sign, walkway support or truss.

Structure Number	Station	Design Truss Type	c. to c. Supports	Elev. A	Dim. D	Height of Tallest Sign	Total Sign Area
5S0101057R236.24	529 + 00	I - A	90' - 0"	754.26	32' - 0"	14' - 0"	214.00
5S0101057L238.44	665 + 00	I - A	88' - 0"	762.40	32' - 0"	13' - 0"	375.00
5S0101074R179.10	165 + 00	I - A	84' - 0"	781.80	20' - 0"	11' - 6"	253.00
5S0921074R213.40	1882 + 50	I - A	64' - 0"	662.41	13' - 0"	13' - 6"	340.25

**Looking upstation for structures with signs both sides.



DESIGN WIND LOADING DIAGRAM

Parameters shown are basis for I.D.O.T. Standards and Sign Manual Tables. Installations not within dimensional limits shown require special analysis for all components.

TOTAL BILL OF MATERIAL

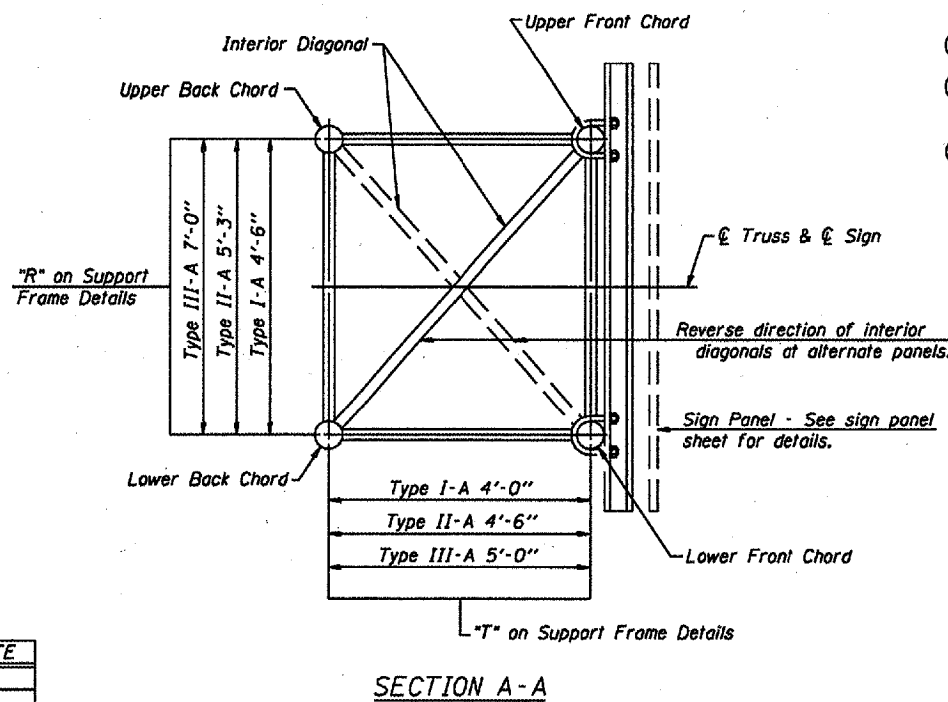
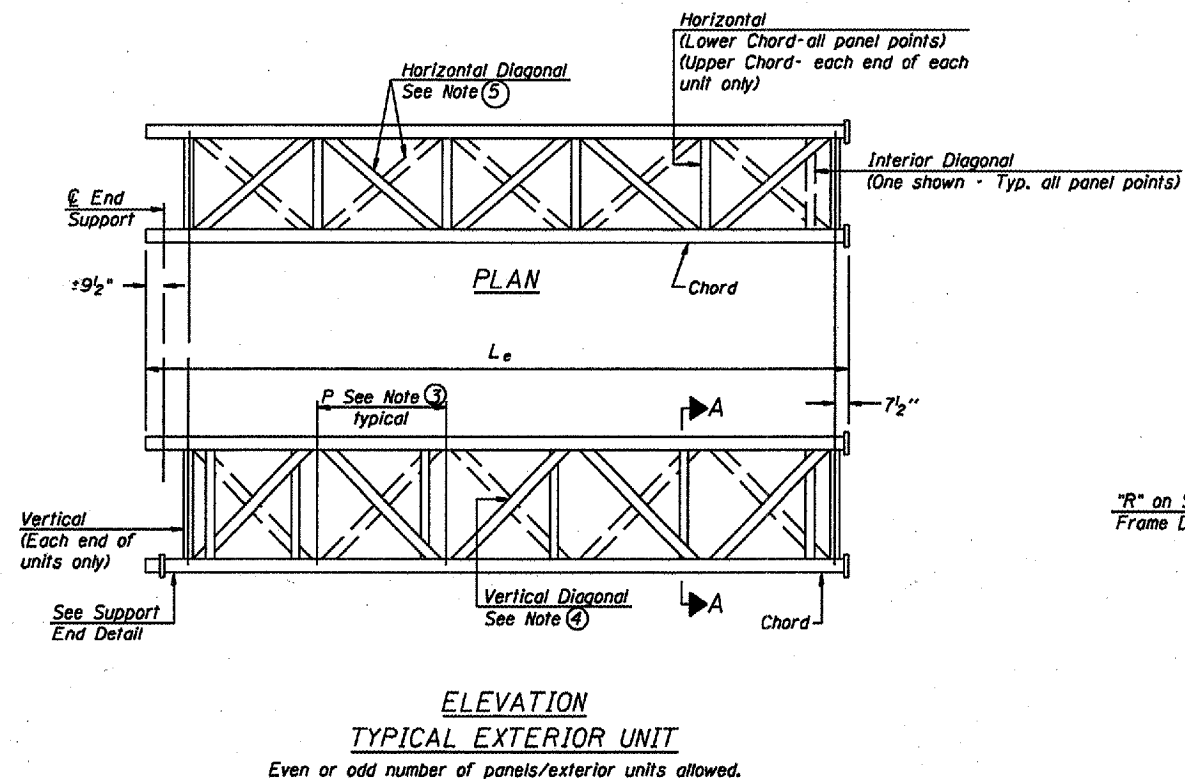
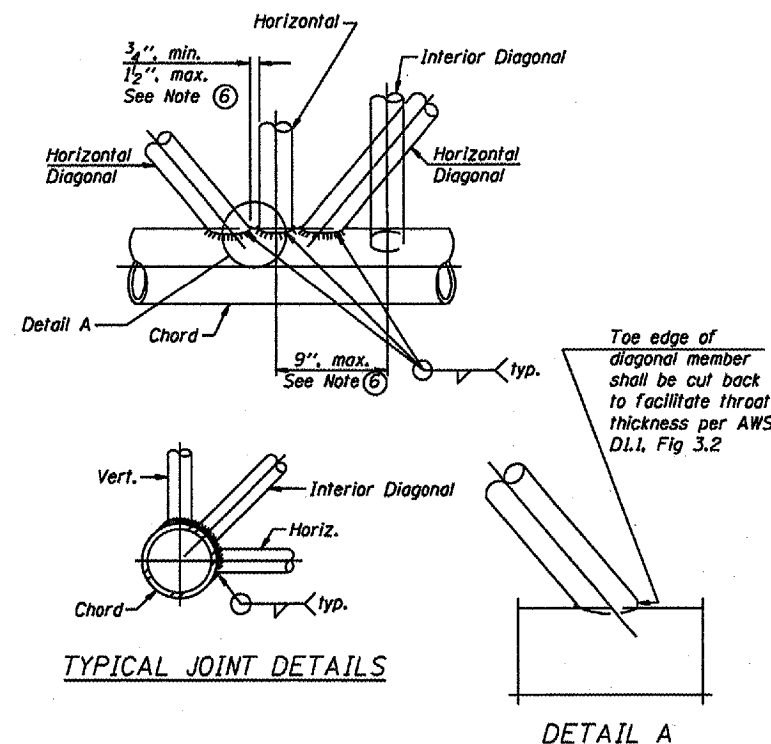
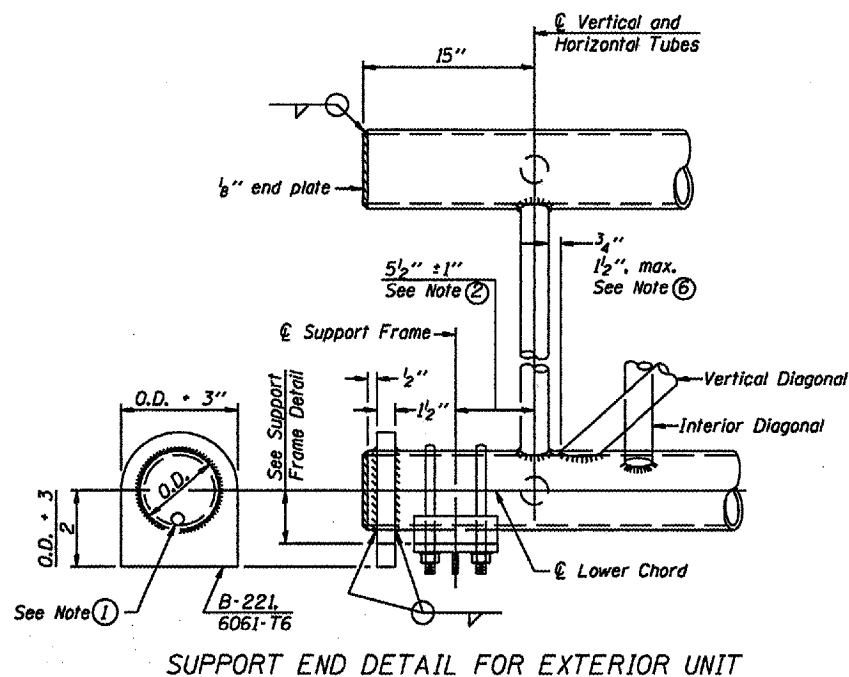
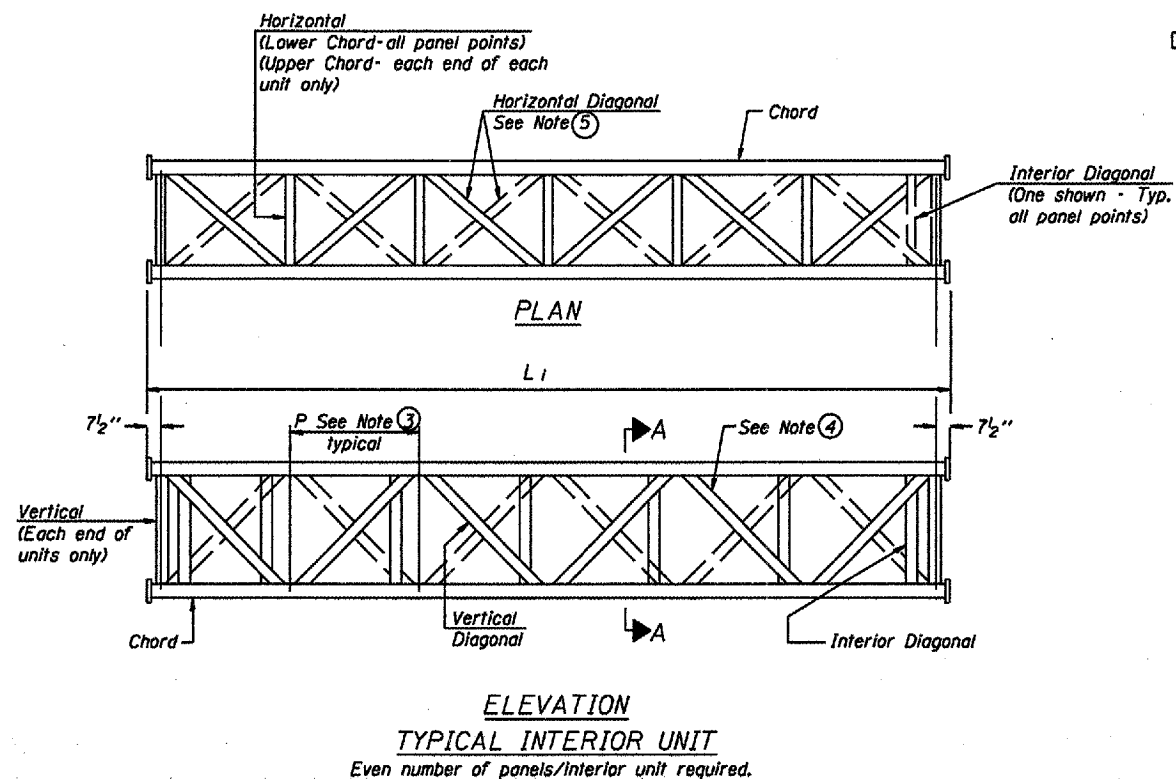
ITEM	UNIT	TOTAL
OVERHEAD SIGN STRUCTURE SPAN TYPE I-A	Foot	
OVERHEAD SIGN STRUCTURE SPAN TYPE II-A	Foot	
OVERHEAD SIGN STRUCTURE SPAN TYPE III-A	Foot	
OVERHEAD SIGN STRUCTURE WALKWAY TYPE A	Foot	
CONCRETE FOUNDATIONS	Cu. Yds.	
DRILLED SHAFT CONCRETE FOUNDATIONS	Cu. Yds.	

NUMBER	REVISION	DATE

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES

**OVERHEAD SIGN STRUCTURES
GENERAL PLAN & ELEVATION
ALUMINUM TRUSS & STEEL SUPPORTS**

District 5
Overhead Sign
Structure Replacement



- NOTES**
- Contractor may alternatively use standard aluminum drive-fit cap to close end. $\frac{1}{2}$ " ϕ drain hole in end plate/drive-fit cap. (Typ. at ends of all chords)
 - $5\frac{1}{2}$ " end dimension may vary by ± 1 " to provide uniform panel spacing (P).
 - Panel spacing (P) shall be uniform for entire truss and between 4'-0" and 5'-0" for Type I-A or 4'-0" and 5'-6" for Types II-A and III-A.
 - Vertical Diagonals in front and back face shall alternate.
 - Hidden lines show wind bracing alternates direction between planes of top and bottom chords.
 - All diagonals shall be detailed for minimum offset from the panel point based on the following: Offset shall be such as to provide a $\frac{3}{4}$ " minimum to $\frac{1}{2}$ " maximum clearance between any diagonal and any horizontal or vertical member, and to provide clearance for U-bolt connections of signs or walkway brackets.

OVERHEAD SIGN STRUCTURES
ALUMINUM TRUSS DETAILS
FOR TRUSS TYPES I-A, II-A AND III-A

District 5
Overhead Sign
Structure Replacement

DESIGNED	
CHECKED	
DRAWN	
CHECKED	

20	
EXAMINED	ENGINEER OF BRIDGE DESIGN
PASSED	ENGINEER OF BRIDGES AND STRUCTURES

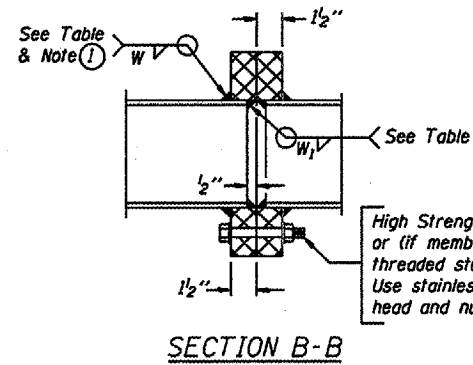
NUMBER	REVISION	DATE

OS-A-2

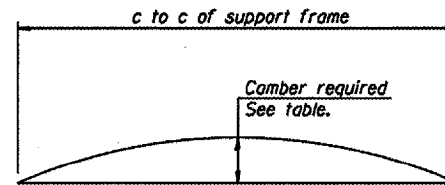
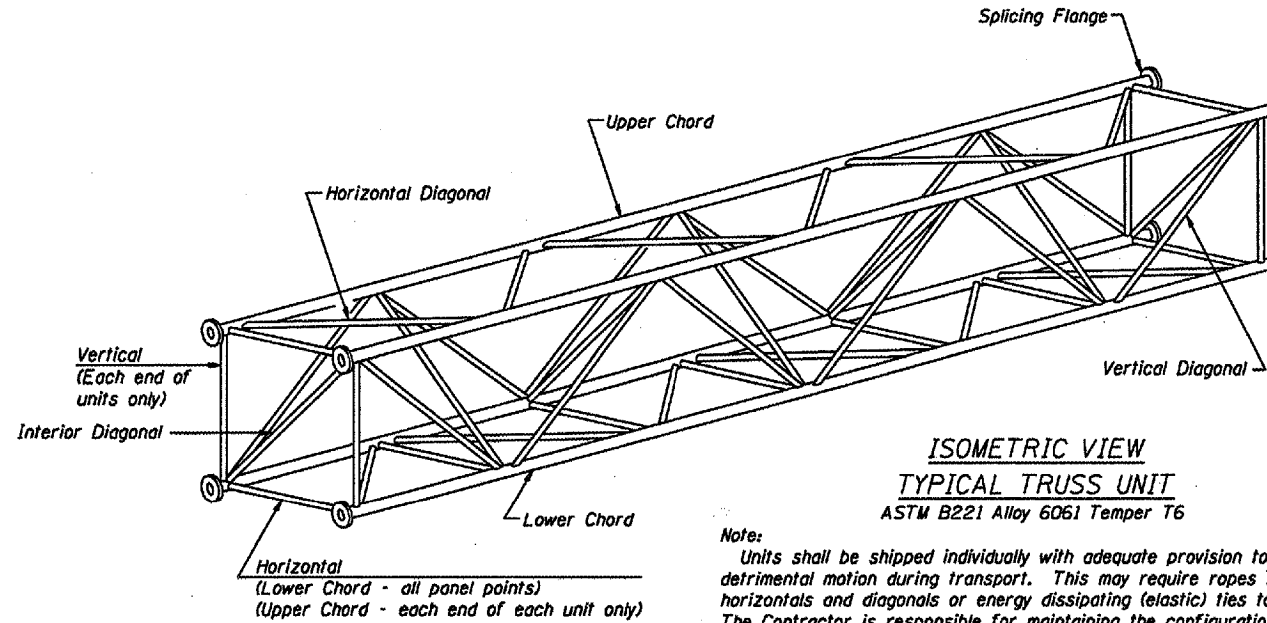
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TRUSS UNIT TABLE

Structure Number	Station	Design Truss Type	Exterior Units (2)			Interior Unit				Upper & Lower Chord		Verticals; Horizontals; Vertical, Horizontal, and Interior Diagonals		Camber at Midspan	Splicing Flange					
			No. Panels per Unit	Unit Lgth.(L _e)	Panel Lgth.(P)	No. Req'd.	No. Panels per Unit	Unit Lgth.(L _i)	Panel Lgth.(P)	O.D.	Wall	O.D.	Wall		Bolts		Weld Sizes		A	B
															No./Splice	Dia.	W	W _i		
550101057R236.24	529 + 00	I - A	6	30'-9"	4'-9 3/4"	1	6	30'-1 1/2"	4'-9 3/4"	5 1/2"	5/16"	2 1/2"	5/16"	2 3/4"	6	7/8"	3/8"	1/4"	9 1/4"	12 1/4"
550101057L238.44	665 + 00	I - A	6	30'-1 1/2"	4'-8 1/2"	1	6	29'-6"	4'-8 1/2"	5 1/2"	5/16"	2 1/2"	5/16"	2 3/4"	6	7/8"	3/8"	1/4"	9 1/4"	12 1/4"
550101074R179.10	165 + 00	I - A	6	28'-9"	4'-5 3/4"	1	6	28'-1 1/2"	4'-5 3/4"	5 1/2"	5/16"	2 1/2"	5/16"	2 1/2"	6	7/8"	3/8"	1/4"	9 1/4"	12 1/4"
550921074R213.40	1882 + 50	I - A	7	32'-9 1/2"	4'-5"					5"	5/16"	2 1/2"	5/16"	1 1/2"	6	7/8"	5/16"	1/4"	8 3/4"	11 3/4"

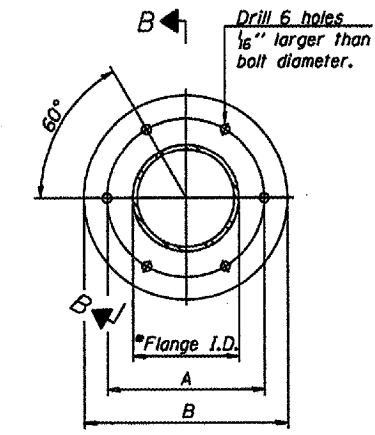
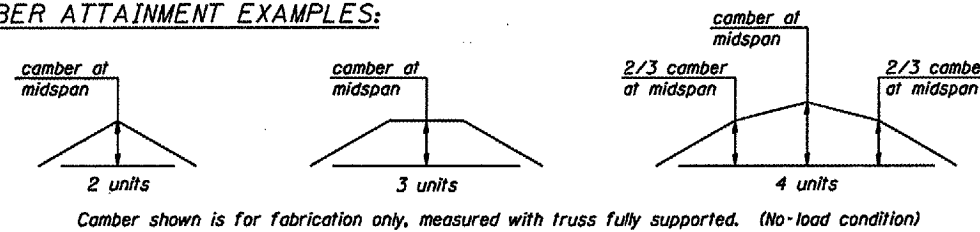


① Splicing Flanges shall be attached to each truss unit with the truss shop assembled to camber shown. Truss units shall be in proper alignment and flange surfaces shall be shop bolted into full contact before welding. Sufficient external welds or tacks shall be made to secure flanges until remaining welds are made after disassembly. Adjacent flanges shall be "match marked" to insure proper field assembly.

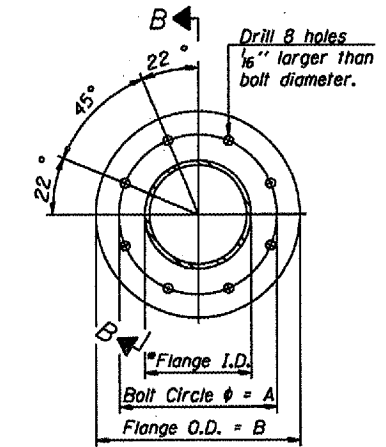


CAMBER DIAGRAM
Camber curve shown is theoretical. Actual camber attained by slope changes at splices between units.

CAMBER ATTAINMENT EXAMPLES:



TRUSS TYPES I-A, II-A, & III-A



TRUSS TYPES II-A & III-A

SPLICING FLANGES

ASTM B221, Alloy 6061-T6
or ASTM B209, Alloy 6061-T651
*To fit O.D. of Chord with maximum gap of 1/16"

NUMBER	REVISION	DATE

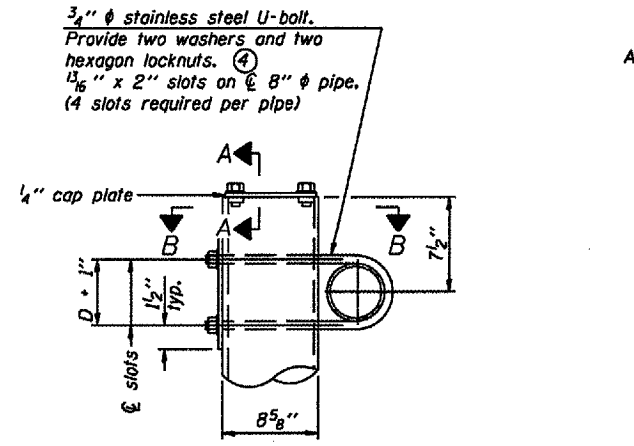
DESIGNED	20
CHECKED	EXAMINED
DRAWN	PASSED
CHECKED	ENGINEER OF BRIDGES AND STRUCTURES

OS4-A-2

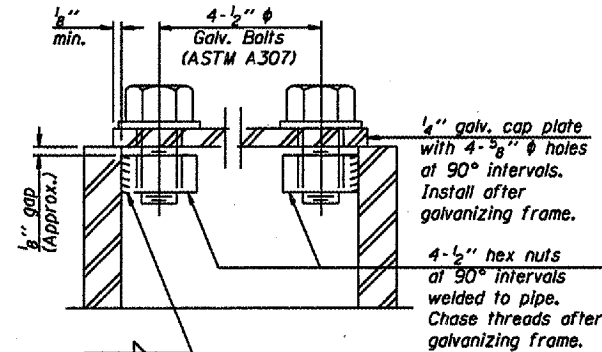
7/01/2006

OVERHEAD SIGN STRUCTURES
ALUMINUM TRUSS DETAILS
FOR TRUSS TYPES I-A, II-A AND III-A

District 5
Overhead Sign
Structure Replacement

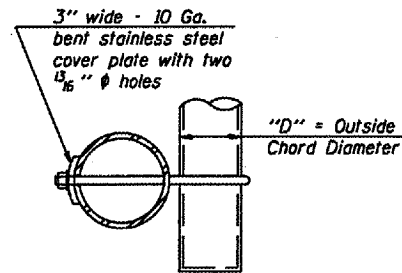


DETAIL A

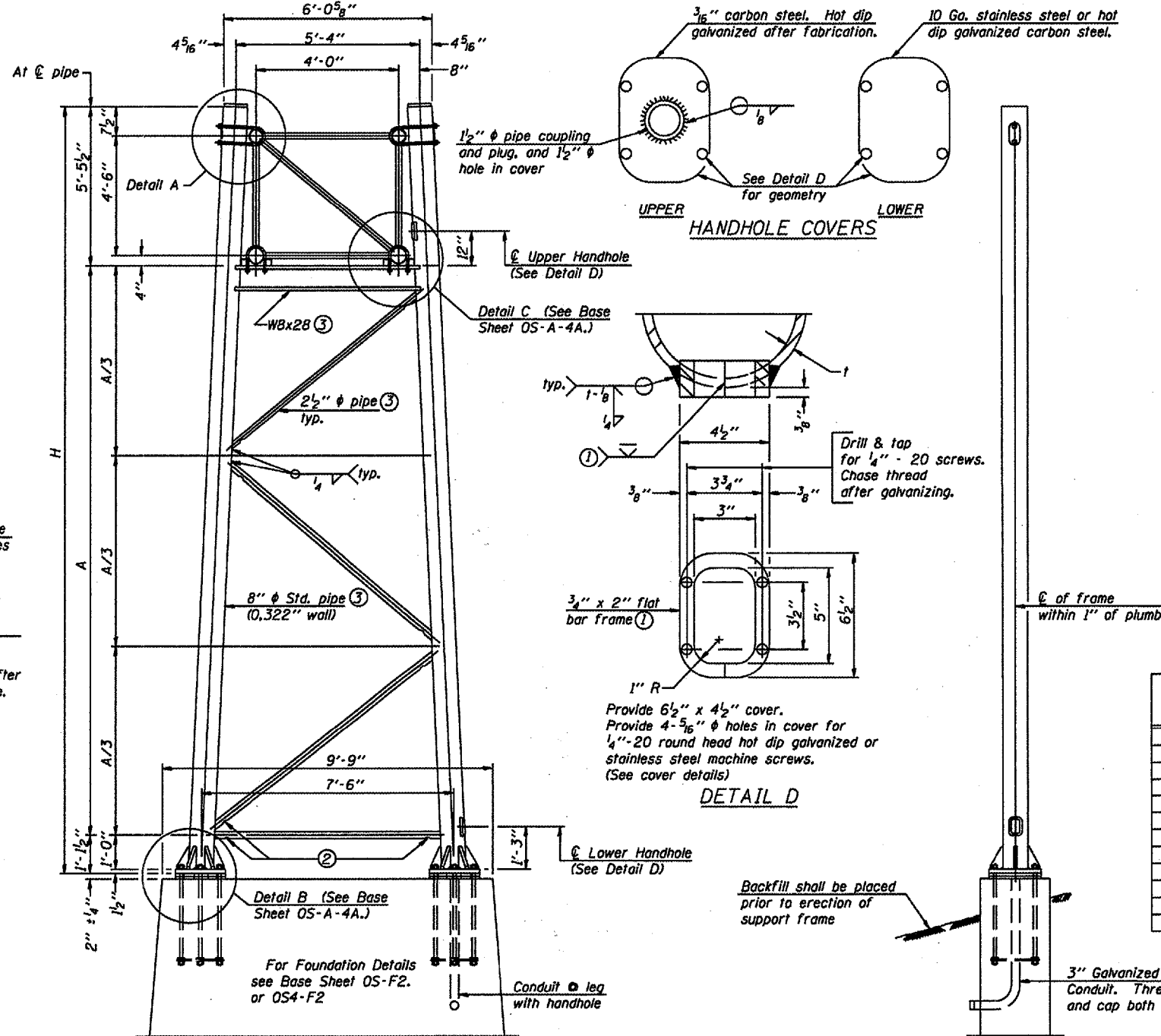


SECTION A-A

As an alternate to bolts, may use galvanized drive-fit caps installed after galvanizing frame.



SECTION B-B



SIDE ELEVATION

END ELEVATION

8" ϕ PIPE TRUSS SUPPORT FRAME

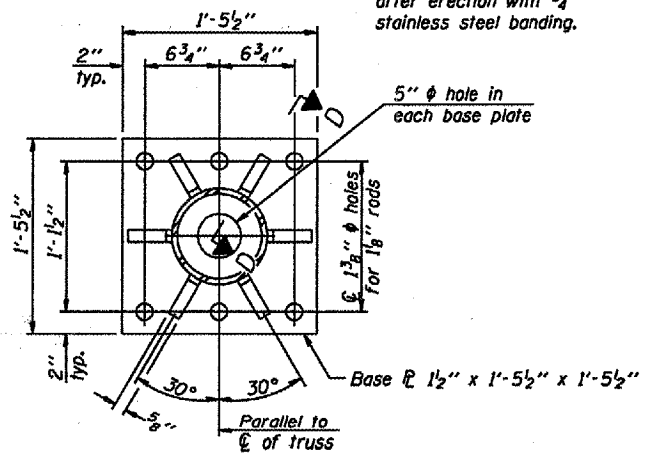
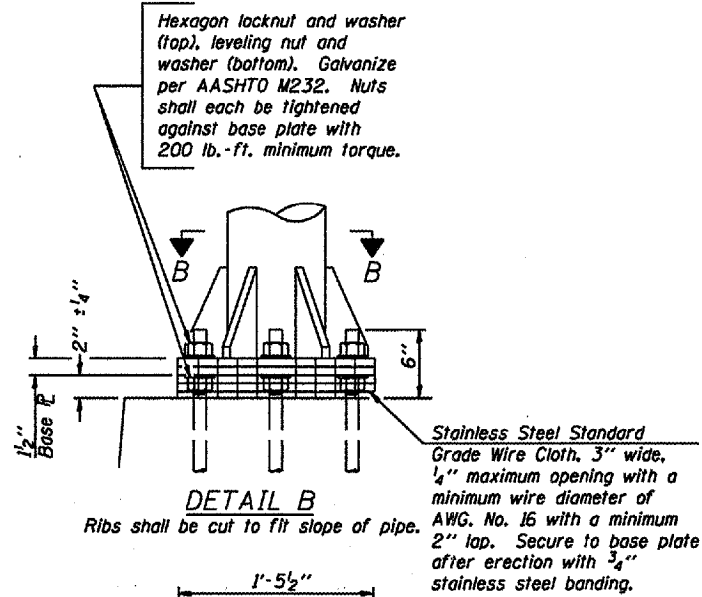
Support Design Loads: See Base Sheet OS-A-1 for design and loading criteria.
Load combinations checked include deadload plus:
a) 100% wind normal to sign, 20% parallel to sign
b) 60% wind normal to sign, 30% parallel to sign

- 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 μ in 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 Base Sheet OS-A-1.
- ④ See General Notes for fasteners.
- ⑤ Dimensions shown are based on selection criteria in the Sign Structures Manual. Nonstandard applications must have dimensions verified or amended as appropriate.
- ⑥ "H" based on 15'-0" or actual sign height, whichever is greater.

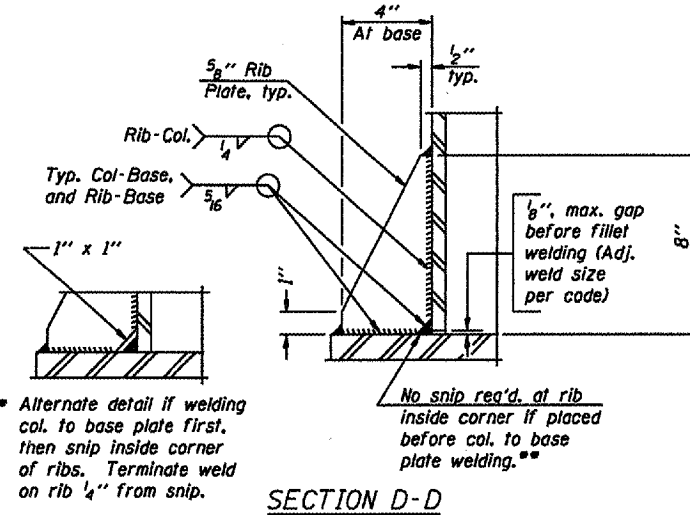
Structure Number	Station	Support		H ⑥	A
		Left	Right		
5S0921074R213.40	1882 + 50	X	X	26'-6"	19' - 11"

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES

NUMBER	REVISION	DATE

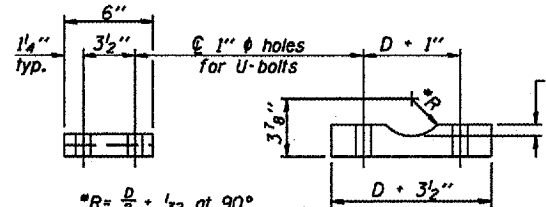


SECTION B-B



SECTION D-D

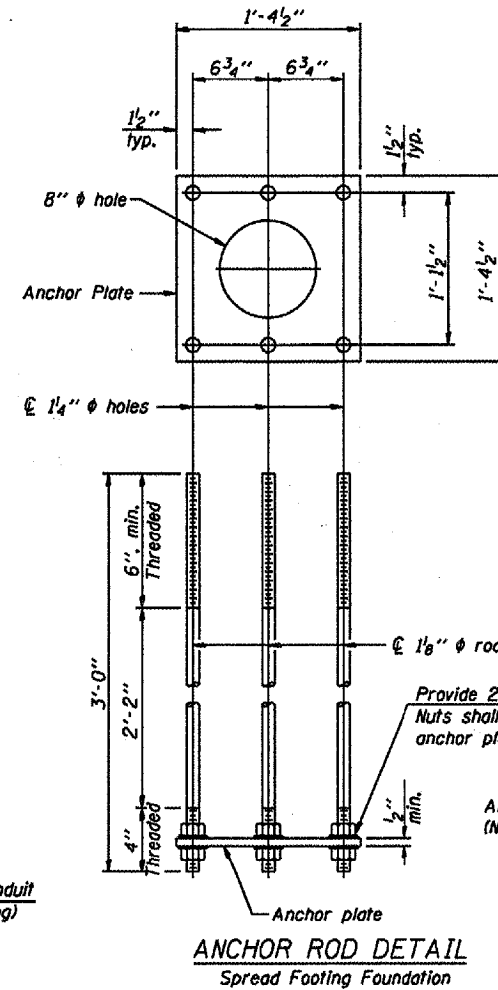
•• Alternate detail if welding col. to base plate first, then snip inside corner of ribs. Terminate weld on rib 1/4" from snip.



SADDLE SHIM DETAIL

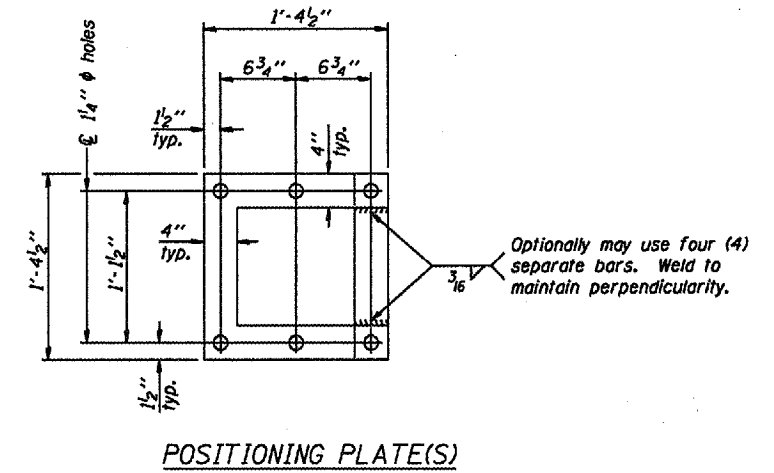
ASTM B26 Alloy 356-F
or
ASTM B209 Alloy 6061-T651
(4 required per sign truss)

Truss Chord Nominal Dia.	ϕ
5"	3/4"
5 1/2"	13/16"
6"	7/8"
6 1/2"	15/16"



Provide 2 uncoated nuts per rod. Nuts shall be "snug tight" against anchor plate.

All Thread = NC (National Coarse)



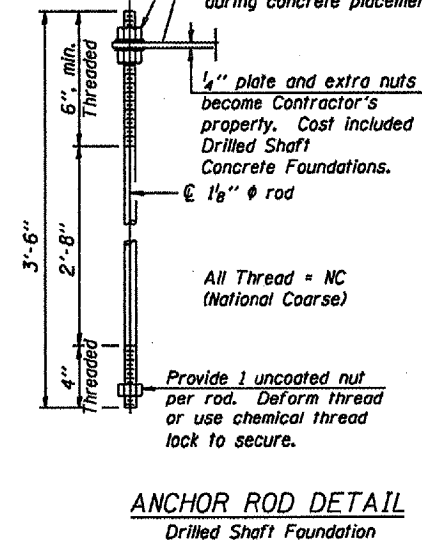
POSITIONING PLATE(S)

At each location, provide 1/4" thick positioning plate(s) and six (6) additional nuts to be used with leveling nuts to maintain anchor bolts position during concrete placement.

1/4" plate and extra nuts become Contractor's property. Cost included in Drilled Shaft Concrete Foundations.

All Thread = NC (National Coarse)

Provide 1 uncoated nut per rod. Deform thread or use chemical thread lock to secure.



Anchor rods shall conform to AASHTO M314 Grade 36 or 55 and meet Charpy V-Notch (CVN) energy of 15 lb.-ft. at 40° F. Galvanize upper 12" per AASHTO M232. No welding shall be permitted on rods.

TYPE I-A TRUSS
8" PIPE SUPPORT FRAME DETAILS

OVERHEAD SIGN STRUCTURES
SUPPORT FRAME DETAILS ALUMINUM TRUSS

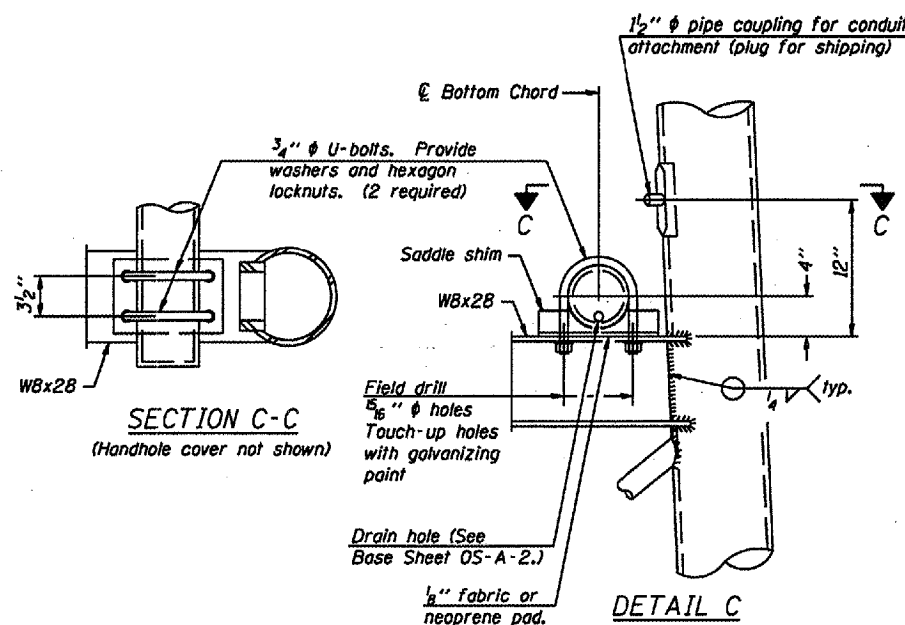
District 5
Overhead Sign
Structure Replacement

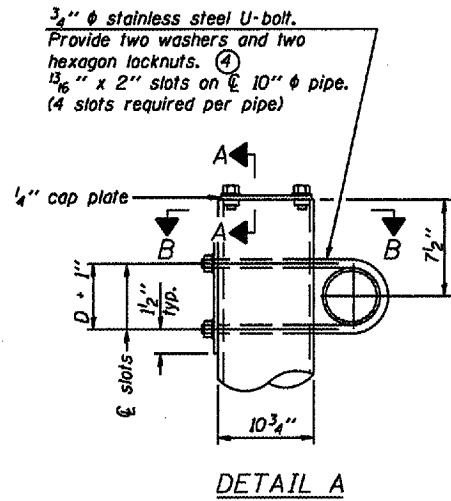
NUMBER	REVISION	DATE

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES

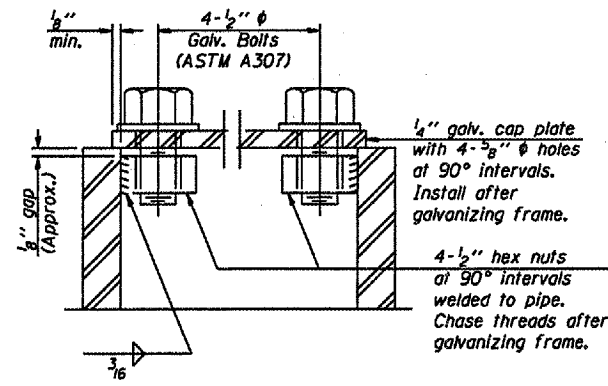
OS-A-4A

7/01/2006



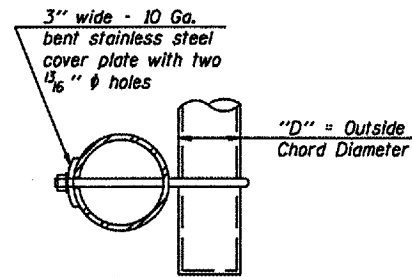


DETAIL A

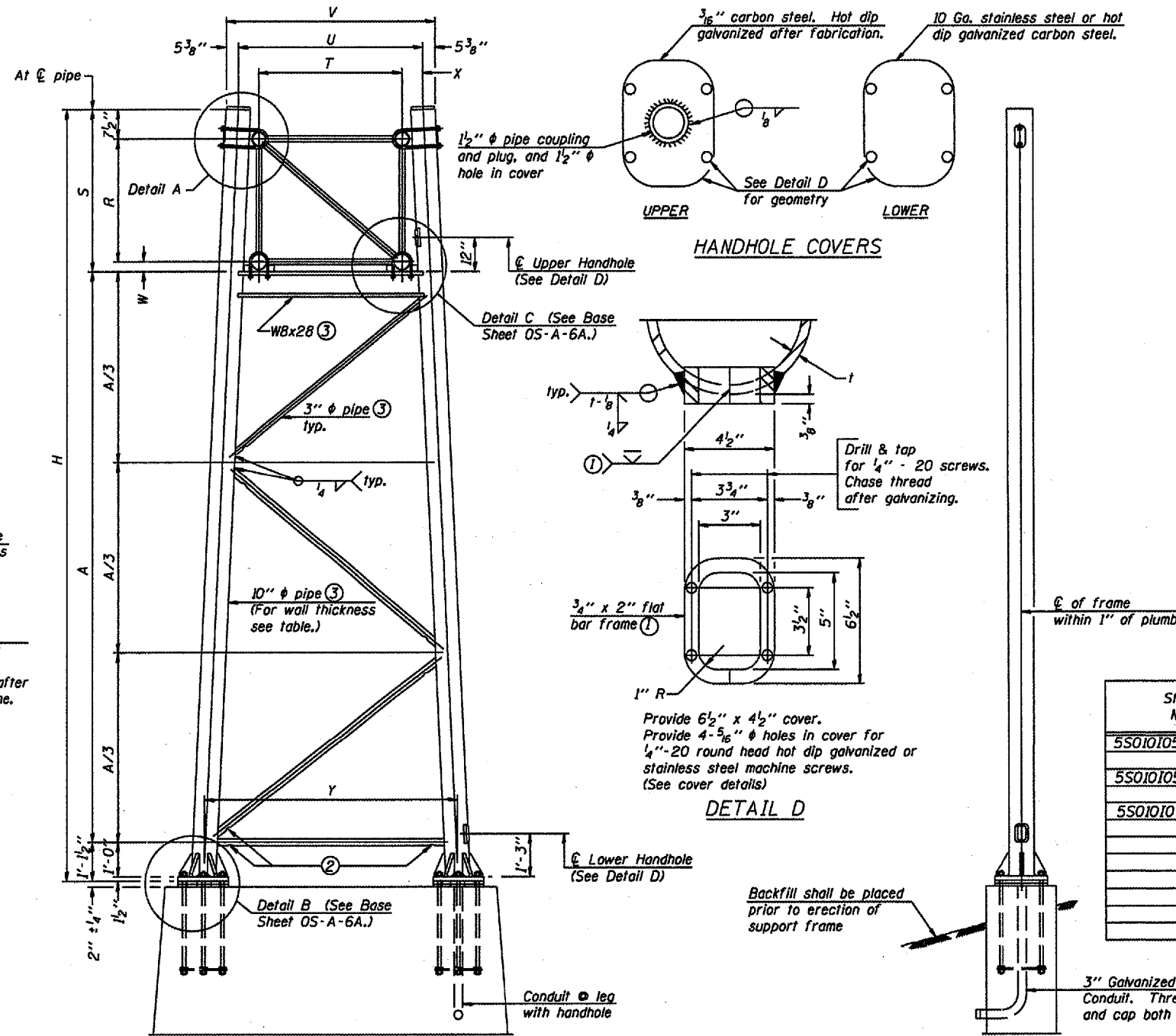


SECTION A-A

As an alternate to bolts, may use galvanized drive-fit caps installed after galvanizing frame.



SECTION B-B



For Foundation Details, see base sheet OS-F3 (Spread Footing) or OS4-F3 (Drilled Shaft).

SIDE ELEVATION

END ELEVATION

10" ϕ PIPE TRUSS SUPPORT FRAME

Truss Type	Dimensions							
	R	S	T	U	V	W	X	Y
I-A	4'-6"	5'-5 1/2"	4'-0"	5'-6"	6'-4 3/4"	4"	9"	8'-3"
II-A ⑥	5'-3"	6'-3 1/4"	4'-6"	6'-1"	6'-11 3/4"	4 3/4"	9 1/2"	8'-3"

Support Design Loads: See Base Sheet OS-A-1 for design and loading criteria.

Load combinations checked include deadload plus:
a) 100% wind normal to sign, 20% parallel to sign
b) 60% wind normal to sign, 30% parallel to sign

- 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 μ in or less.
- 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.
- Steel pipe, plate, carbon steel handhole covers and rolled sections shall be hot dip galvanized after fabrication. Painting is not permitted. See Base Sheet OS-A-1.
- See General Notes for fasteners.
- Dimensions shown are based on selection criteria in the Sign Structures Manual. Nonstandard applications must have dimensions verified or amended as appropriate.
- "H" based on 15'-0" or actual sign height, whichever is greater.

Structure Number	Station	Support		Truss Type	Pipe Wall Thickness	H ⑥	A
		Left	Right				
550101057R236.24	529 + 00	X	X	I - A	0.279	28'-5 1/2"	21'-10 1/2"
550101057L238.44	665 + 00	X	X	I - A	0.279	29'-4"	22'-9"
550101074R179.10	165 + 00	X	X	I - A	0.279	29'-10"	23'-3"

DESIGNED -		20
CHECKED -	EXAMINED	
DRAWN -	PASSED	ENGINEER OF BRIDGE DESIGN
CHECKED -		ENGINEER OF BRIDGES AND STRUCTURES

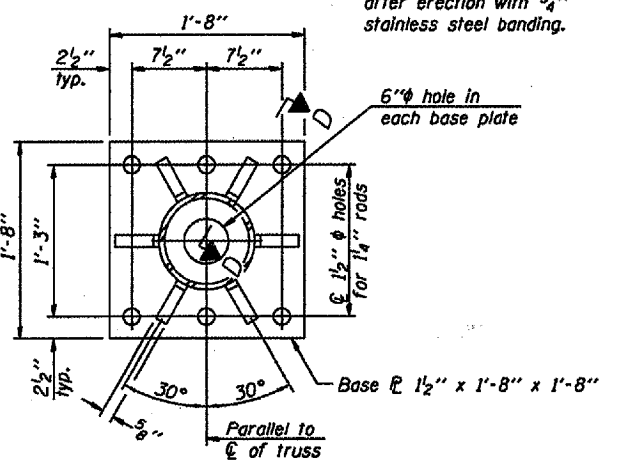
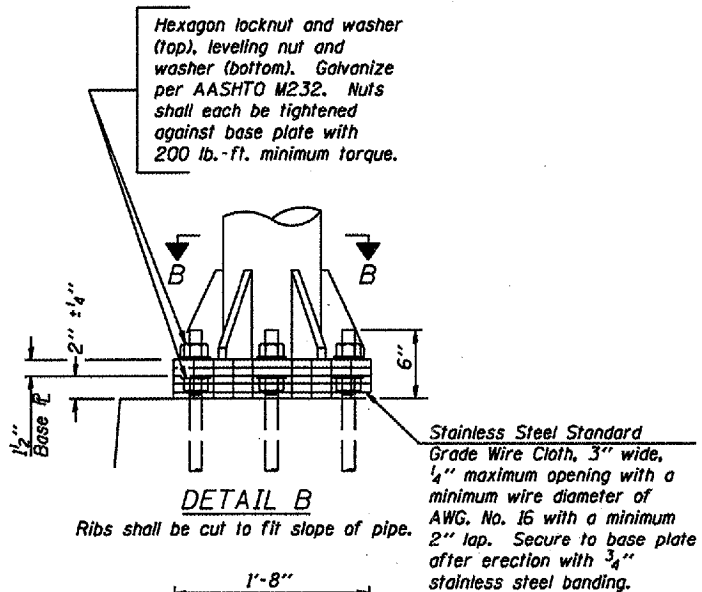
OS-A-6

7/01/2006

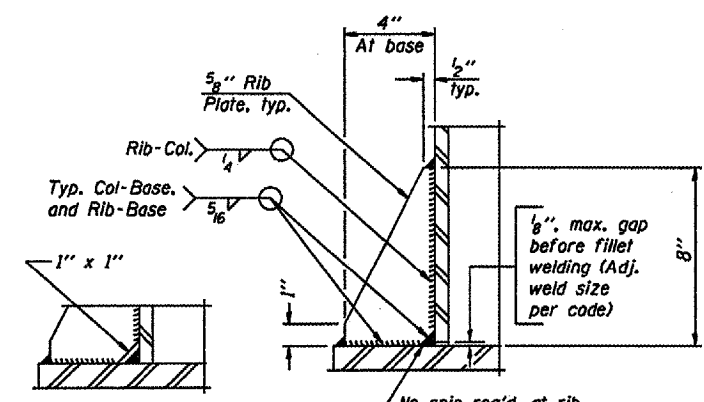
NUMBER	REVISION	DATE

OVERHEAD SIGN STRUCTURES
SUPPORT FRAME FOR ALUMINUM TRUSS

District 5
Overhead Sign
Structure Replacement

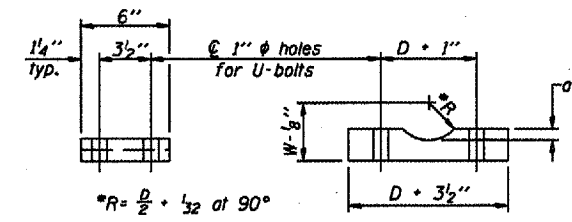


SECTION B-B



SECTION D-D

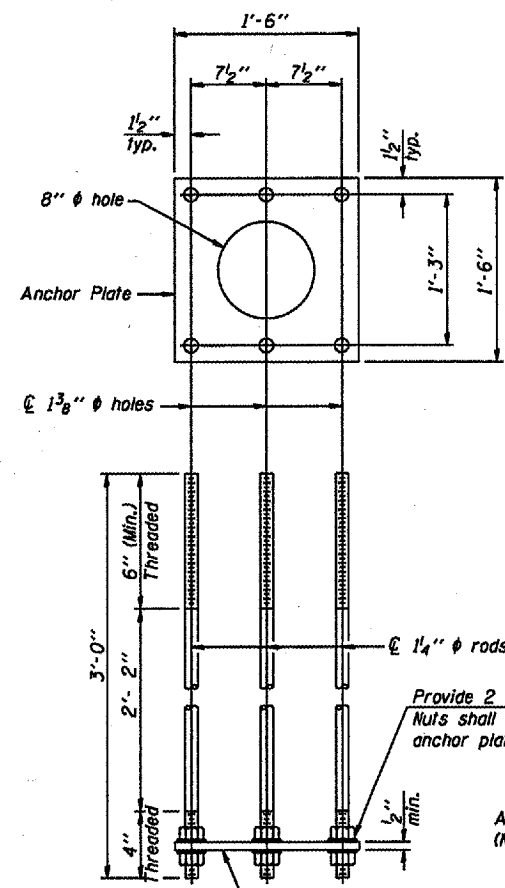
** Alternate detail if welding col. to base plate first, then snip inside corner of ribs. Terminate weld on rib 1/4" from snip.



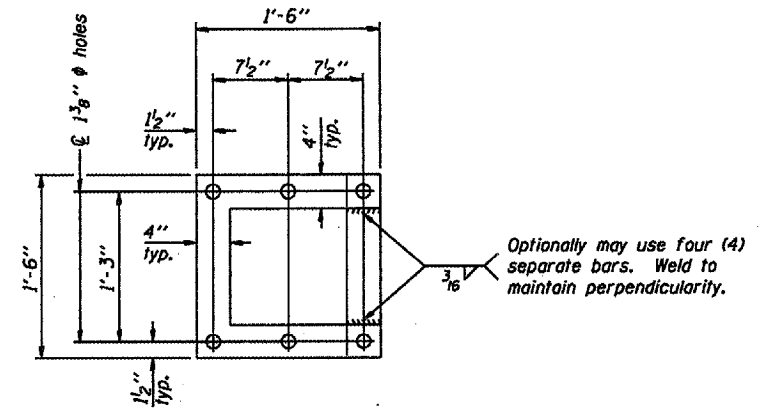
SADDLE SHIM DETAIL

ASTM B26 Alloy 356-F
or
ASTM B209 Alloy 6061-T651
(4 required per sign truss)

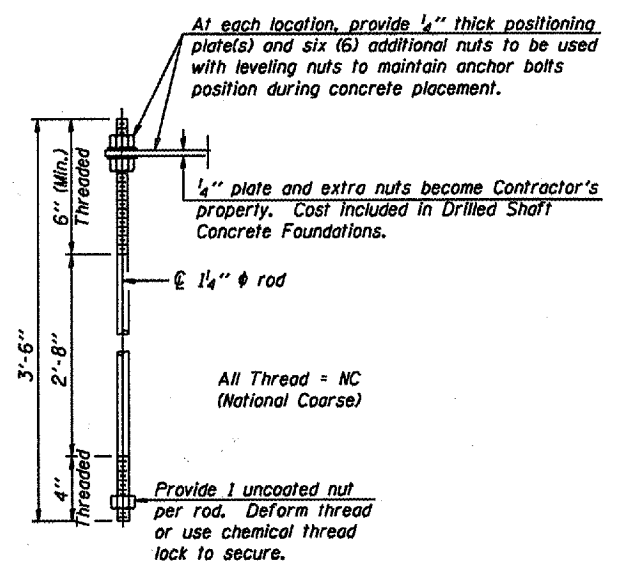
Truss Chord Nominal Dia.	α
5"	3/4"
5 1/2"	13/16"
6"	7/8"
6 1/2"	5/8"
7"	1"



ANCHOR ROD DETAIL
Spread Footing Foundation



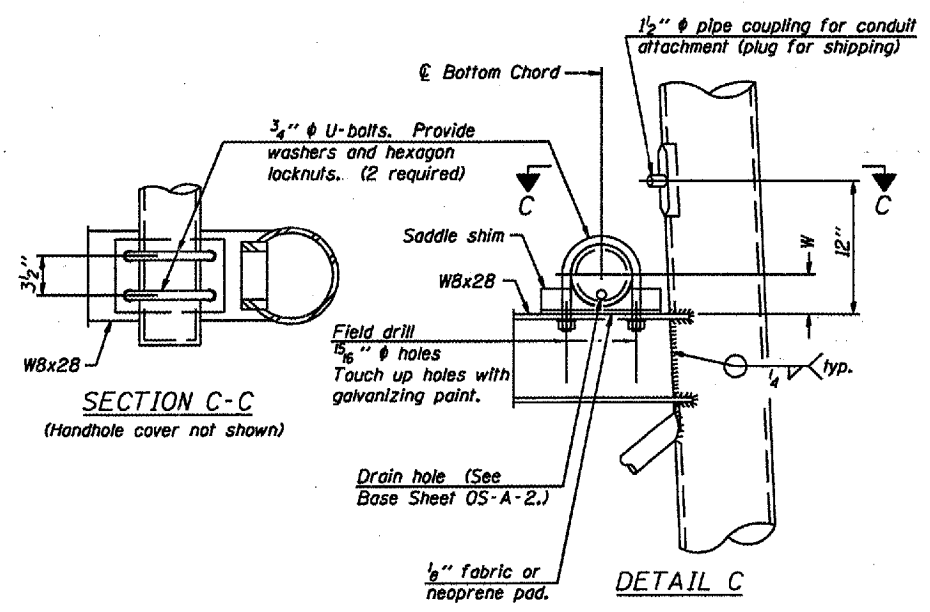
POSITIONING PLATE(S)



ANCHOR ROD DETAIL
Drilled Shaft Foundation

Anchor rods shall conform to AASHTO M314 Grade 36 or 50 and meet Charpy V-Notch (CVN) energy of 15 lb.-ft. at 40° F. Galvanize upper 12" per AASHTO M232. No welding shall be permitted on rods.

10" ϕ PIPE SUPPORT FRAME DETAILS



SECTION C-C
(Handhole cover not shown)

DETAIL C

NUMBER	REVISION	DATE

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES

OVERHEAD SIGN STRUCTURES
SUPPORT FRAME DETAILS ALUMINUM TRUSS

District 5
Overhead Sign
Structure Replacement

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

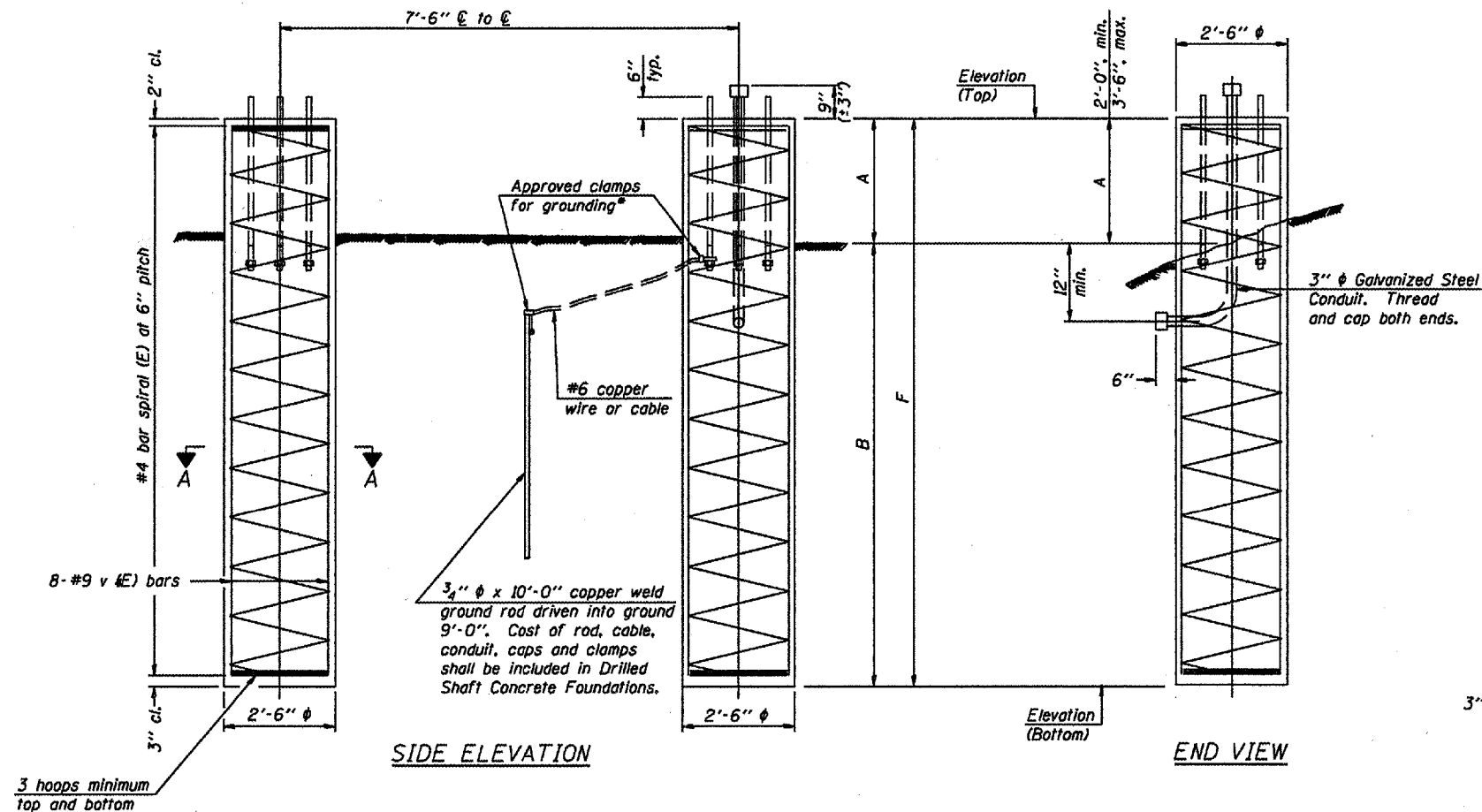
Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 14 of 51
Contract Number 44949

For anchor rod size and placement, see Support Frame Detail Sheet.

* Anchor rod shall be ground or filed to bright metal at clamp and cable connection location.

BAR LIST - EACH FOUNDATION

Bar	Number	Size	Length	Shape
v4(E)	16	#9	F less 5"	—
#4 bar spiral (E) - see Side Elevation				



NOTES:

The foundation dimensions shown are based on the presence of mostly cohesive soils with an average Unconfined Compressive Strength (Q_u) of at least 1.25 tsf, which must be determined by previous soil investigations at the jobsite. When other conditions are indicated, the boring data will be included in the plans and the foundation dimensions shown will be the result of site specific designs.

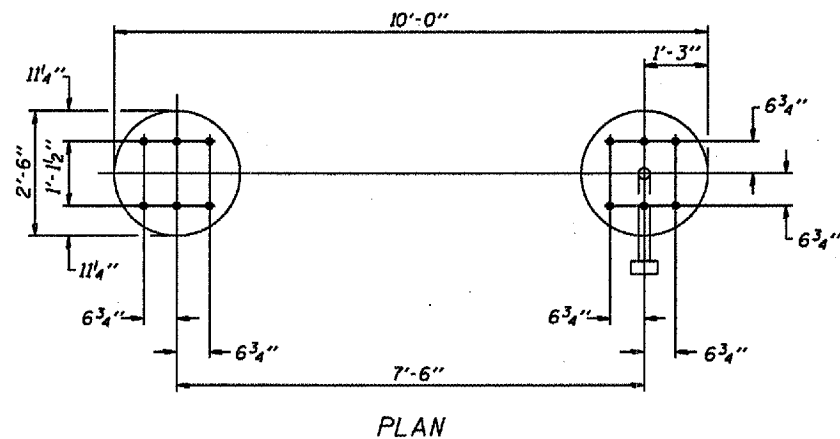
If the conditions encountered are different than those indicated, the Contractor shall notify the Engineer to determine if the foundation dimensions need to be modified. If dimensions "B" or "F" are revised by more than 12" by the Contractor, "as-built" plans shall be prepared and submitted to the District Bureau of Operations for future reference.

No sonotubes or decomposable forms shall be used below the lower conduit entrance. Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.

Concrete shall be placed monolithically, without construction joints.

Backfill shall be placed per Article 502 of Standard Specification and prior to erection of support column.

A normal surface finish followed by a Bridge Seat Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in Drilled Shaft Concrete Foundation.



Structure Number	Station	Left Foundation					Right Foundation					Class SI Concrete (Cu. Yds.)
		Elevation Top	Elevation Bottom	A	B	F	Elevation Top	Elevation Bottom	A	B	F	
5S0921074R213.40	1882 + 50	664.65		3' - 0"	17' - 0"	20' - 0"	664.65		3' - 0"	17' - 0"	20' - 0"	14.50

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	

EXAMINED _____ ENGINEER OF BRIDGE DESIGN
PASSED _____ ENGINEER OF BRIDGES AND STRUCTURES

NUMBER	REVISION	DATE

DETAILS FOR 8" ϕ SUPPORT FRAME
TYPE I-A TRUSS

OVERHEAD SIGN STRUCTURES
DRILLED SHAFT DETAILS

District 5
Overhead Sign
Structure Replacement

Revised 2/26/07

For anchor rod size and placement, see Support Frame Detail Sheet.

* Anchor rod shall be ground or filed to bright metal at clamp and cable connection location.

BAR LIST - EACH FOUNDATION

Bar	Number	Size	Length	Shape
v4(E)	24	#9	F less 5"	—
#4 bar spiral (E) - see Side Elevation				

NOTES:

The foundation dimensions shown are based on the presence of mostly cohesive soils with an average Unconfined Compressive Strength (Q_u) of at least 1.25 tsf, which must be determined by previous soil investigations at the jobsite. When other conditions are indicated, the boring data will be included in the plans and the foundation dimensions shown will be the result of site specific designs.

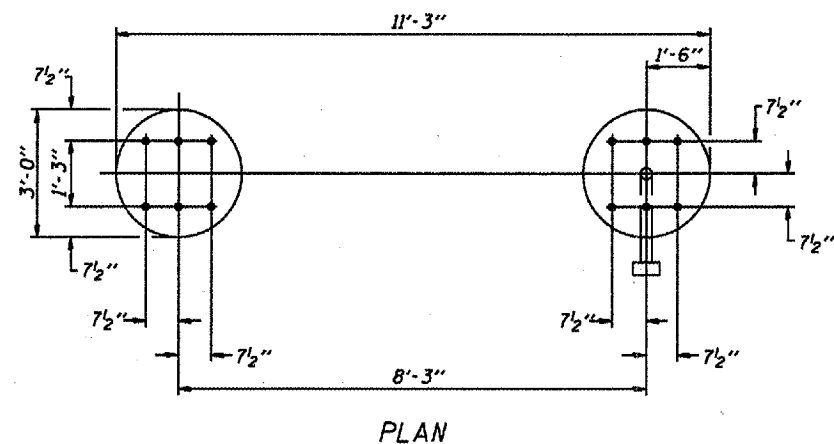
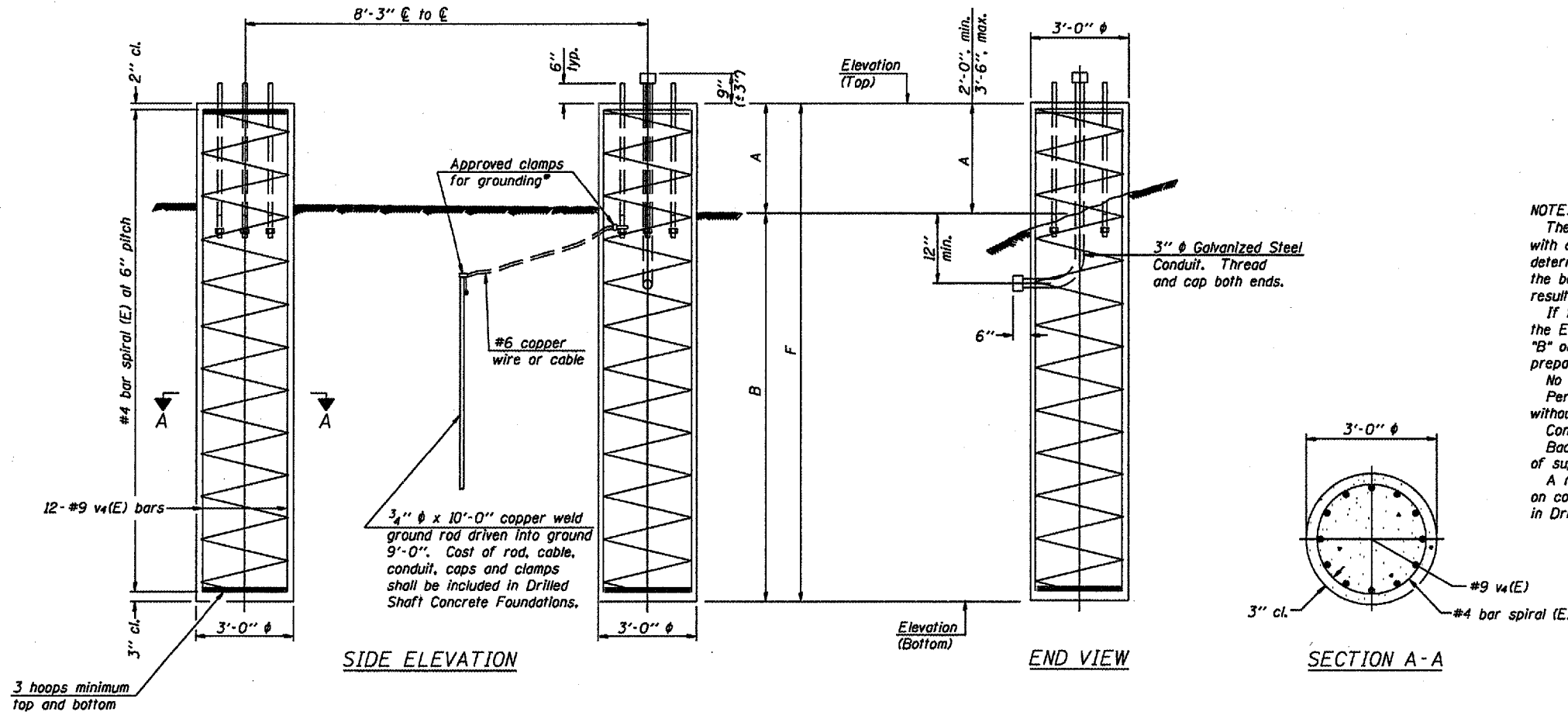
If the conditions encountered are different than those indicated, the Contractor shall notify the Engineer to determine if the foundation dimensions need to be modified. If dimensions "B" or "F" are revised by more than 12" by the Contractor, "as-built" plans shall be prepared and submitted to the District Bureau of Operations for future reference.

No sonotubes or decomposable forms shall be used below the lower conduit entrance. Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.

Concrete shall be placed monolithically, without construction joints.

Backfill shall be placed per Article 502 of Standard Specification and prior to erection of support column.

A normal surface finish followed by a Bridge Seat Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in Drilled Shaft Concrete Foundation.



Structure Number	Station	Left Foundation			Right Foundation			Class SI Concrete (Cu. Yds.)			
		Elevation Top	Elevation Bottom	F	Elevation Top	Elevation Bottom	F				
550101057R236.24	529 + 00						754.51	3' - 0"	18' - 6"	21' - 6"	11.30
550101057L238.44	665 + 00						762.40	3' - 0"	16' - 6"	19' - 6"	10.20
550101074R179.10	165 + 00	780.68		3' - 0"	16' - 6"	19' - 6"	780.68	3' - 0"	16' - 6"	19' - 6"	20.40

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES

NUMBER	REVISION	DATE

DETAILS FOR 10" Ø SUPPORT FRAME
TYPE I-A or II-A TRUSS

OVERHEAD SIGN STRUCTURES
DRILLED SHAFT DETAILS

District 5
Overhead Sign
Structure Replacement

Revised 2/26/07

NOTES:

The foundation dimensions shown are based on the presence of mostly cohesive soils with an average Unconfined Compressive Strength (Cu) of at least 1.25 tsf, which must be determined by previous soil investigations at the jobsite. When other conditions are indicated, the boring data will be included in the plans and the foundation dimensions shown will be the result of site specific designs.

If the conditions encountered are different than those indicated, the Contractor shall notify the Engineer to determine if the foundation dimensions need to be modified. If dimensions "B" or "F" are revised by more than 12" by the Contractor, "as-built" plans shall be prepared and submitted to the District Bureau of Operations for future reference.

No sonotubes or decomposable forms shall be used below the lower conduit entrance. Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.

Concrete shall be placed monolithically, without construction joints.

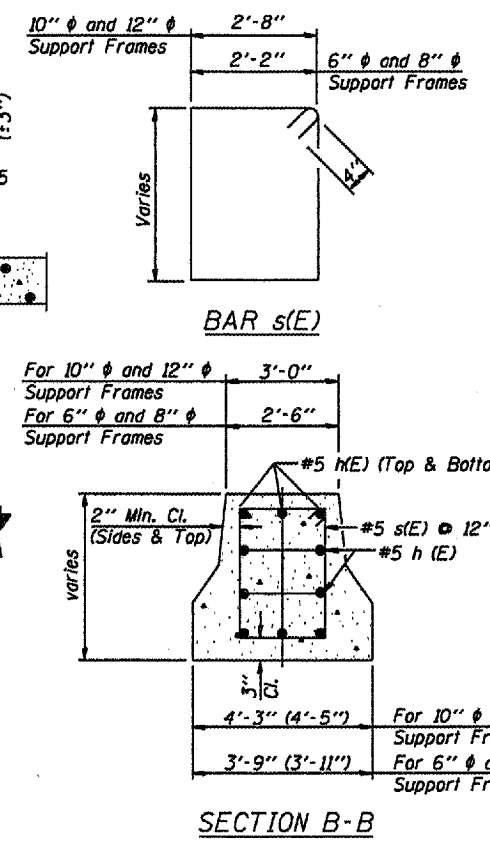
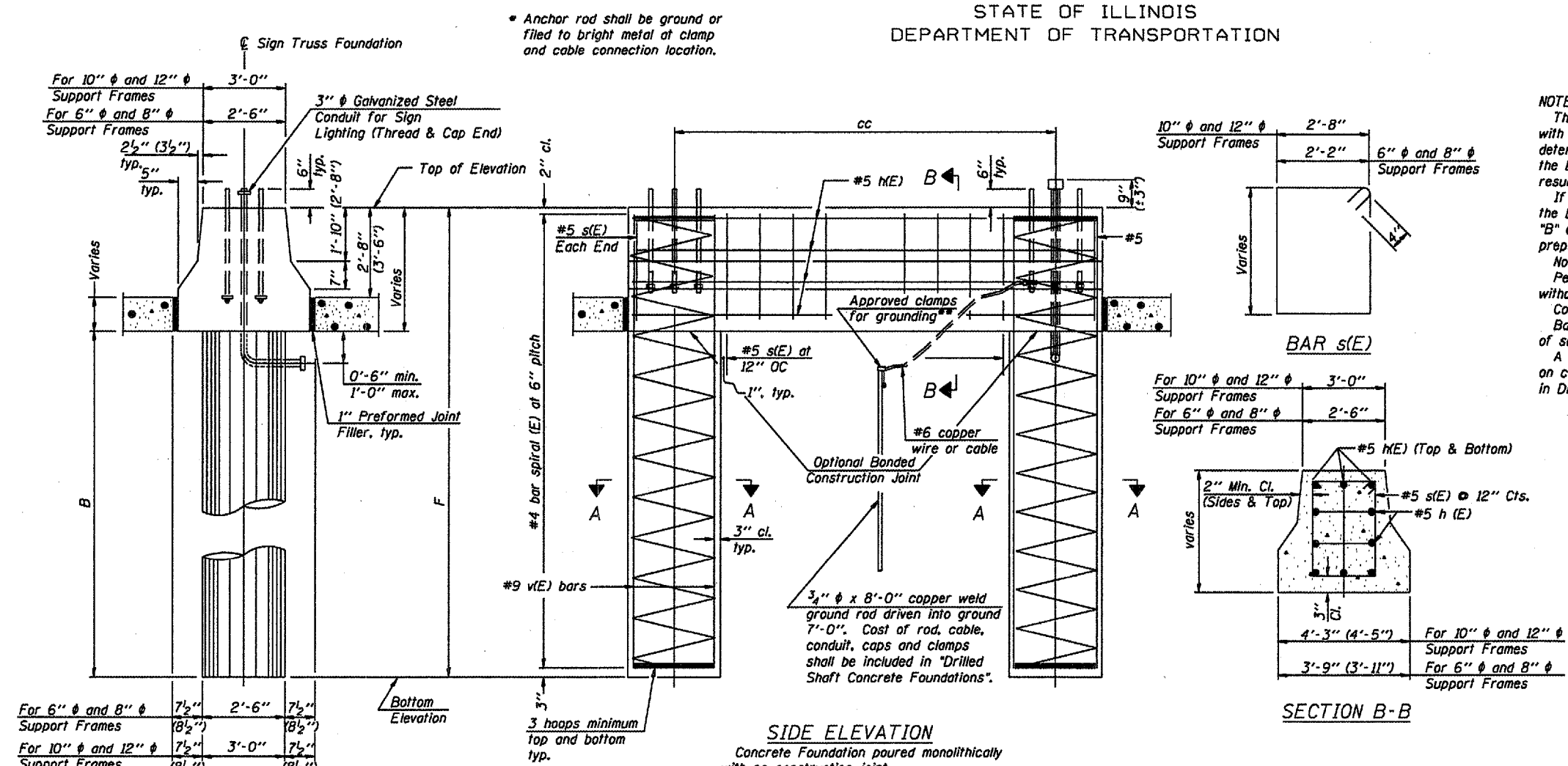
Backfill shall be placed per Article 502 of Standard Specification and prior to erection of support column.

A normal surface finish followed by a Bridge Seat Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in Drilled Shaft Concrete Foundation.

BAR LIST - EACH FOUNDATION

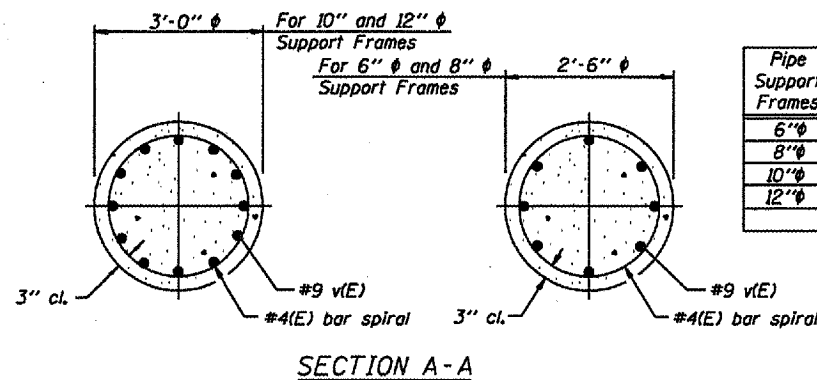
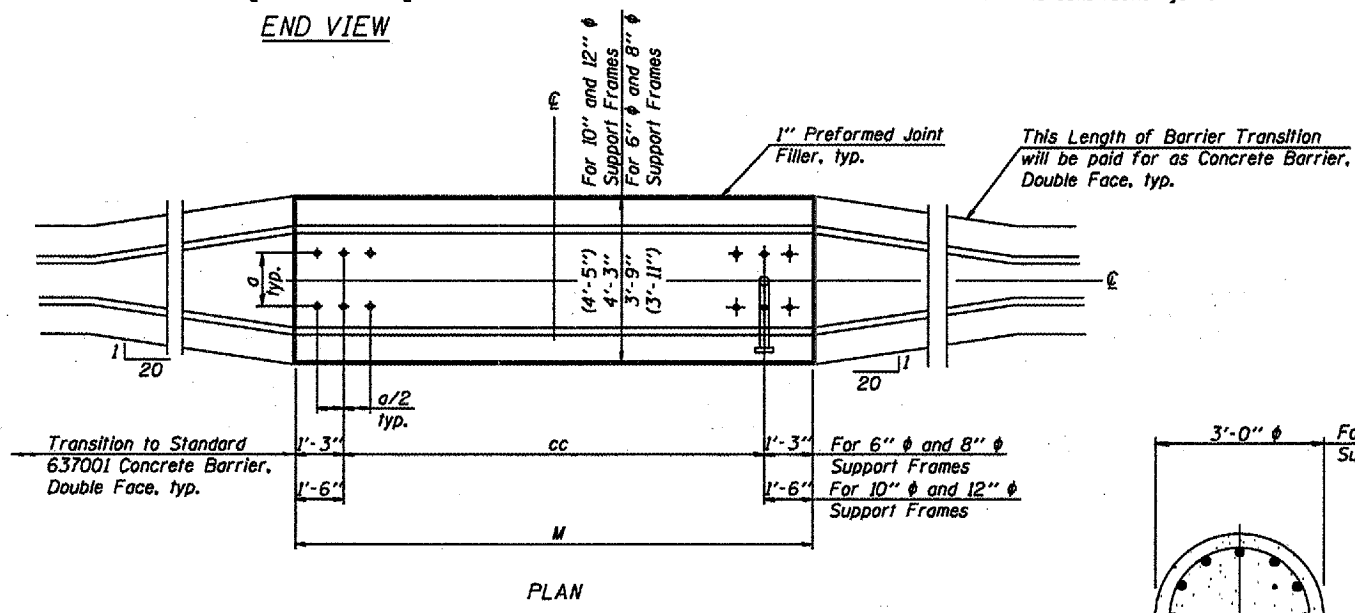
Bar	Number	Size	Length	Shape
ME	10	#5	M less 4"	—
s(E)	Varies	#5	Varies	□
v(E)	16	#9	F less 0'-5"	—
v(E)	24	#9	F less 0'-5"	—
#4(E) bar spiral - see Side Elevation				

All dimensions in parenthesis are for 42" high barrier.



SIDE ELEVATION
Concrete Foundation poured monolithically with no construction joint.

Structure Number	Station	Left Foundation		Right Foundation		Class S1 Concrete (Cu. Yds.)	
		Elevation Top	Elevation Bottom	B	F		Elevation Top
550101057R236.24	529 + 00	754.51		18'-6"	21'-6"	14.10	
550101057L238.44	665 + 00	762.40		16'-6"	19'-6"	13.00	



Pipe Support Frames	cc	M	a	a/2
6"φ	7'-0"	9'-6"	0'-11"	5 1/2"
8"φ	7'-6"	10'-0"	1'-1 1/2"	6 3/4"
10"φ	8'-3"	11'-3"	1'-3"	7 1/2"
12"φ	9'-0"	12'-0"	1'-6"	9"

SECTION A-A

DESIGNED -
CHECKED -
DRAWN -
CHECKED -

20

EXAMINED -
PASSED -

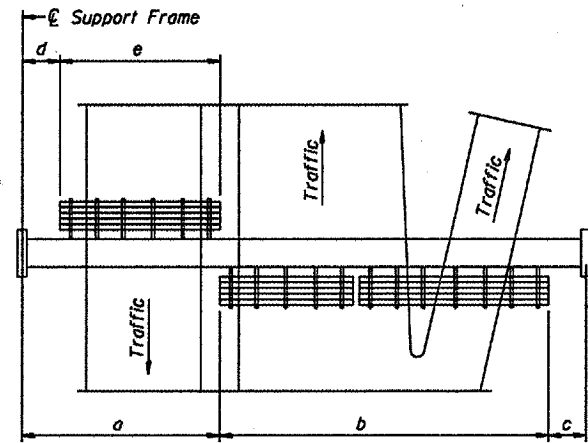
ENGINEER OF BRIDGE DESIGN
ENGINEER OF BRIDGES AND STRUCTURES

OS4-MED 7/01/2006

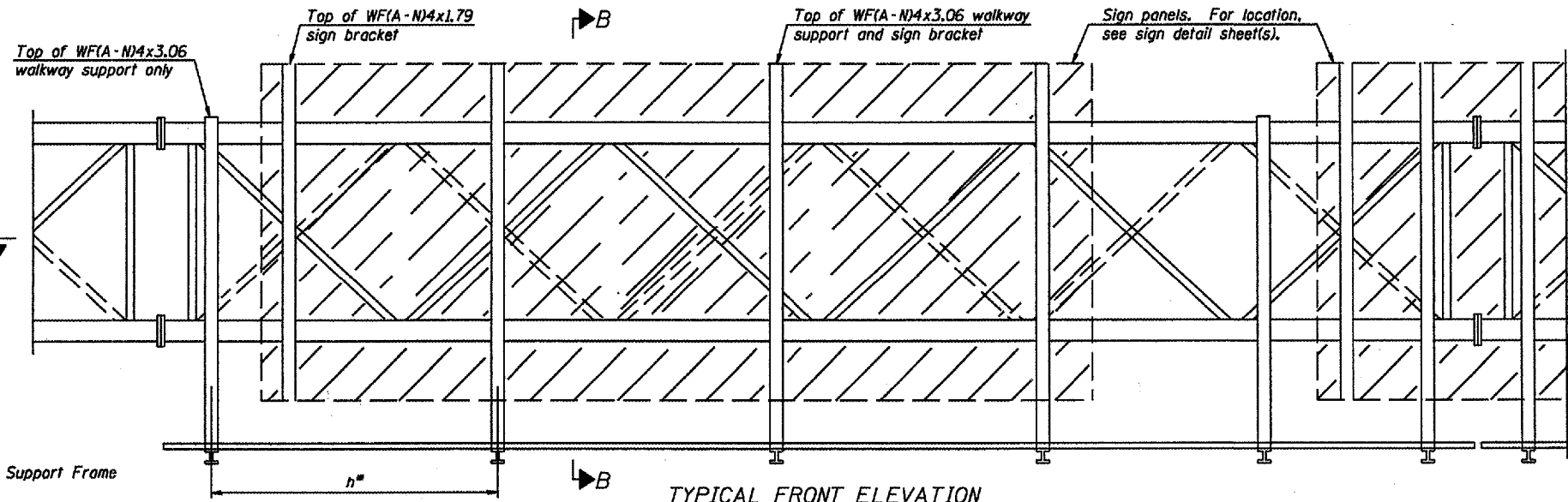
OVERHEAD SIGN STRUCTURES
MEDIAN SUPPORT FOUNDATION DETAILS

District 5
Overhead Sign
Structure Replacement

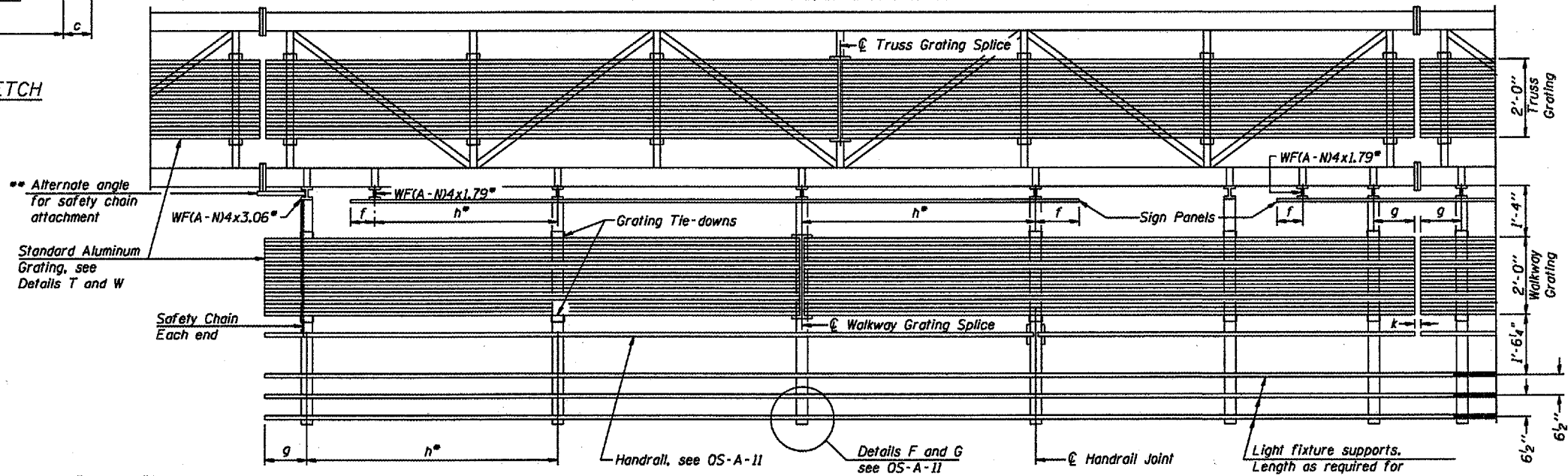
Revised 2/26/07



PLAN
WALKWAY AND HANDRAIL SKETCH
(Road plan beneath truss varies)



TYPICAL FRONT ELEVATION
With lights and handrail omitted for clarity.
For Section B-B, see Base Sheet OS-A-10.



Walkway and Truss Grating width dimensions are nominal and may vary ±½" based on available standard widths.

BRACKET TABLE

Sign Width		Number Brackets Required
Greater Than	Less Than or Equal To	
	8'-0"	2
	14'-0"	3
	20'-0"	4
	26'-0"	5
	32'-0"	6

WFA-N4x1.79 or WFA-N4x3.06
ASTM B308, Alloy 6061-T6

** Alternate angle for safety chain attachment

Standard Aluminum Grating, see Details T and W

Notes:

• Space walkway brackets WFA-N4x3.06 and sign brackets WFA-N4x1.79 for efficiency and within limits shown:

f = 12" maximum, 4" minimum (End of sign to center of nearest bracket)

g = 12" maximum, 4" minimum (End of walkway grating to center of nearest support bracket)

h = 6'-0" maximum (center to center of sign and/or walkway support brackets, WFA-N4x1.79 or WFA-N4x3.06)

k = 2" maximum gap between adjacent walkway grating sections and handrail ends

** If walkway bracket at safety chain location is behind sign, add angle to bracket, see Alternate Safety Chain Attachment on Base Sheet OS-A-11.

For Details T and W, Section B-B and Grating Splice Details see Base Sheet OS-A-10.

For Handrail Details see Base Sheet OS-A-11.

SECTION A-A
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. Handrail joints, grating, and light support splices placed as needed.

Truss grating to facilitate inspection shall run full length (center to center of support frames) ±12" on overhead trusses. Cost of truss grating is included in "Overhead Sign Structure".

DESIGNED -	
CHECKED -	
DRAWN -	
CHECKED -	

EXAMINED	20
PASSED	

NUMBER	REVISION	DATE

OS-A-9 7/01/2006

Structure Number	Station	a	b	c	d	e	Walkway Grating and Handrail Lengths
550101057R236.24	529 + 00						91' - 8" *
550101057L238.44	665 + 00		35'-0"				89' - 9" *
550101074R179.10	165 + 00						85' - 8" *
550921074R213.40	1882 + 50		6'-0"				65' - 7" *

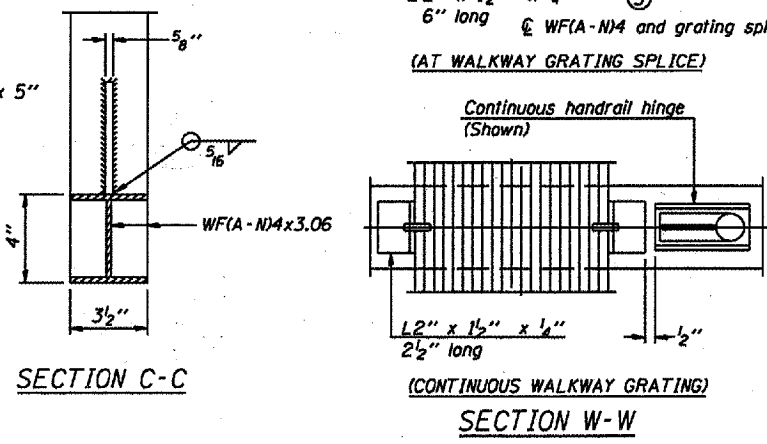
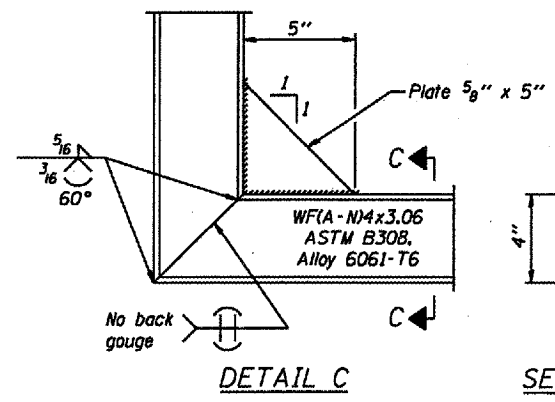
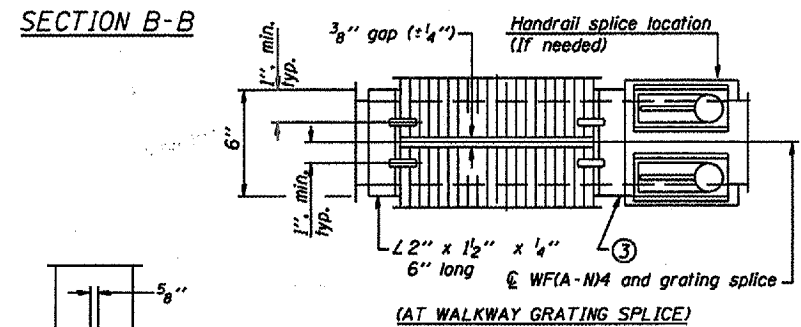
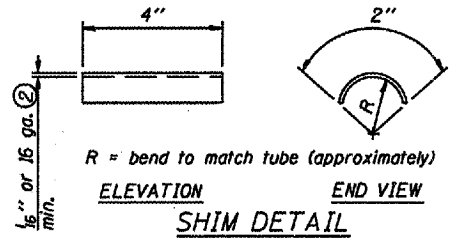
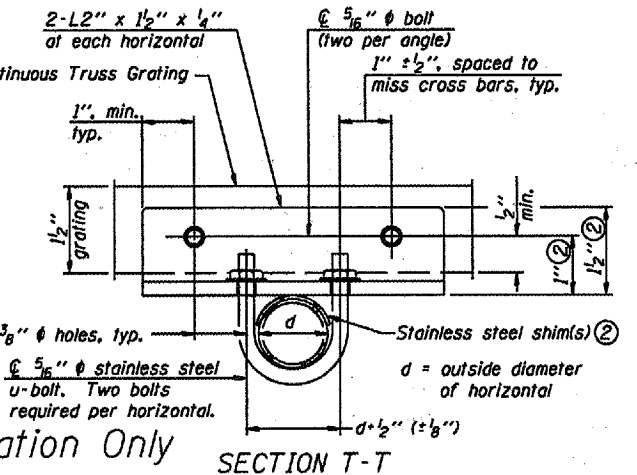
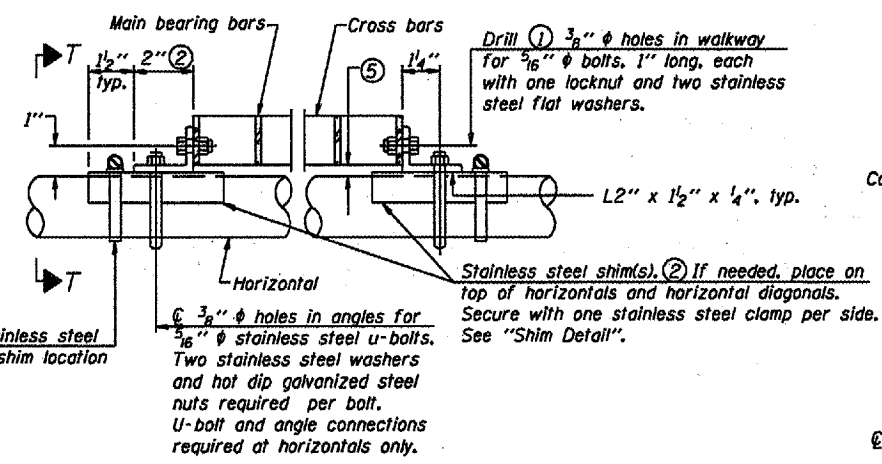
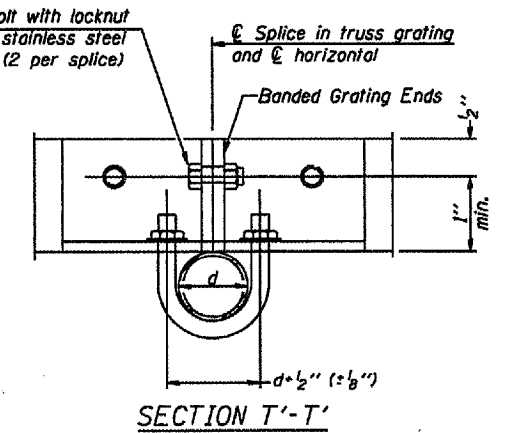
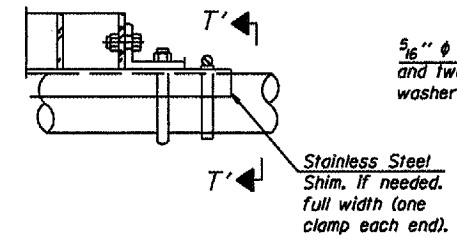
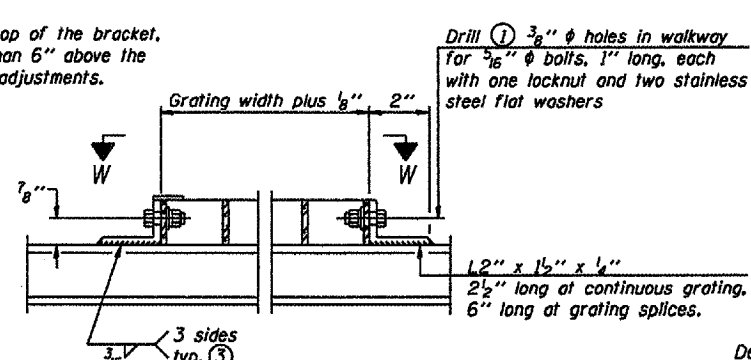
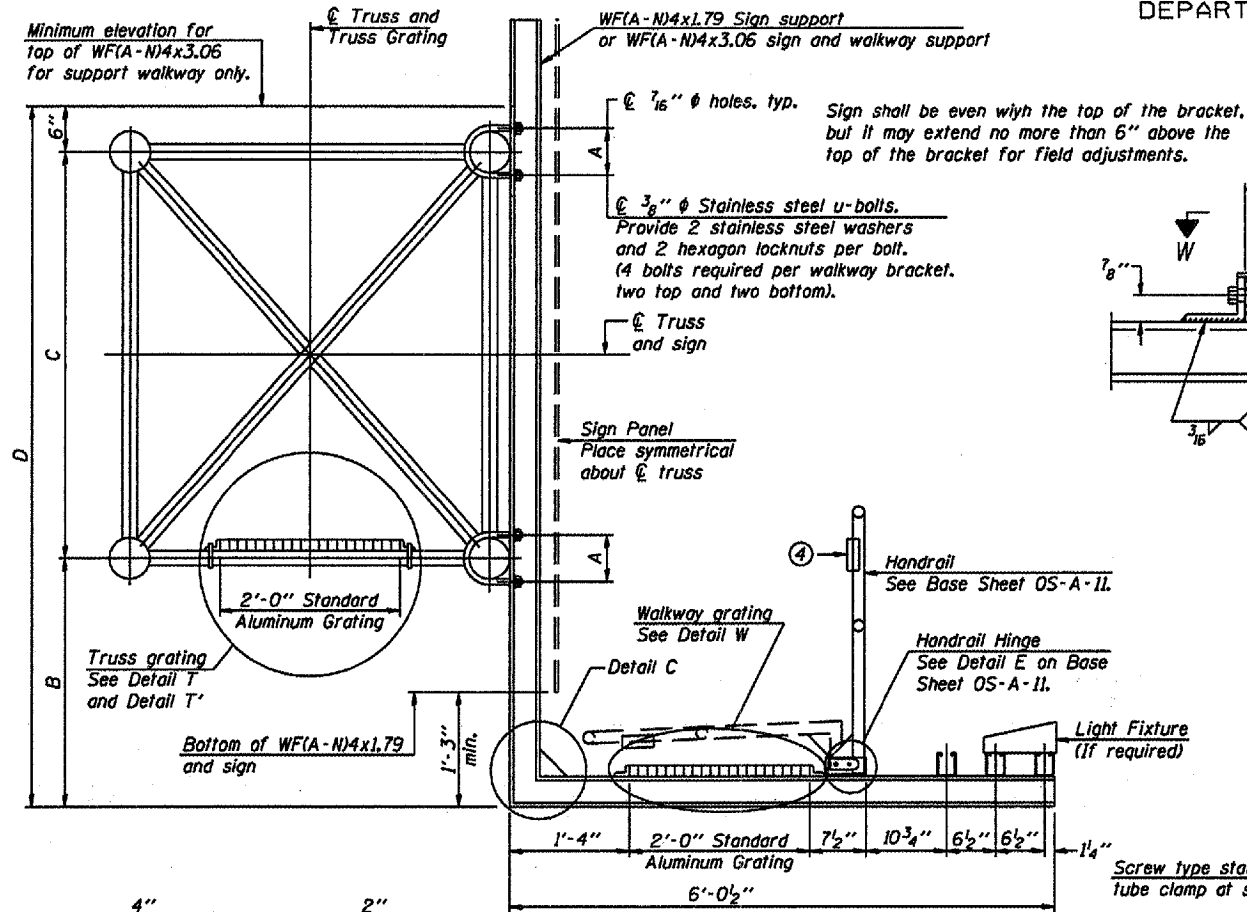
* The length shown is for truss grating.
Structure No. 550101057L238.44 includes new walkway and walkway support brackets.
Structure No. 550921074R213.40 add 6 foot of additional walkway and two support brackets.

**OVERHEAD SIGN STRUCTURES
ALUMINUM WALKWAY DETAILS**

District 5
Overhead Sign
Structure Replacement

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 18 of 51
Contract Number 44949



SPECIFICATIONS FOR STANDARD ALUMINUM GRATING

Main Bearing Bars shall be 3/16" x 1 1/2" on 1 3/16" centers and conform to ASTM B221 Alloy 6061-T6.
Cross bars shall be 3/16" x 1 1/2" on 4" centers and conform to ASTM B221 Alloy 6063-T5 or 6061-T6.

OR

Aluminum Grating with modified "I" sections for main bearing bars shall meet the following requirements:
Main bars shall conform to ASTM B221 Alloy 6061-T6 and have a minimum section modulus equal to 0.0705 in.³ per bar, a depth of 1 1/2", spaced on 1 3/16" centers.
Cross bars shall conform to ASTM B221 Alloy 6063-T5 or T-42 and spaced on 4" centers.

- Drilling holes in grating may be done in shop or field, based on Contractor's preference and subject to accurate alignment.
- Stainless steel shims shall be placed as shown in Detail T if needed to compensate for alignment variations between horizontal and diagonal pipes beyond adjustment provided by angles. Thicker shims may be used subject to shims performing properly.
- If Handrail Joint present, weld angle to WF(A-N)4 and 1/4" extension bars. (See Base Sheet OS-A-11.)
- 1/8" x 1/2" x 2" welded to handrail posts to protect locations that contact grating.
- Tube to grating gap may vary from 0 to 1/2", max. to align walkway, allow for camber, etc.

Structure Number	Station	A	B	C	D
550101057L238.44	665 + 00	6"	5'-6"	4'-6"	10'-6"
550921074R213.40	1882 + 50	5 3/16"	4'-0"	5'-0"	11'-0"

The two additional walkway support brackets for Structure No. 550921074R213.40 shall match the dimensions of the existing brackets.

OVERHEAD SIGN STRUCTURES
ALUMINUM WALKWAY DETAILS

District 5
Overhead Sign
Structure Replacement

DESIGNED - _____

CHECKED - _____

DRAWN - _____

CHECKED - _____

OS-A-10 7/01/2006

20

EXAMINED _____

PASSED _____

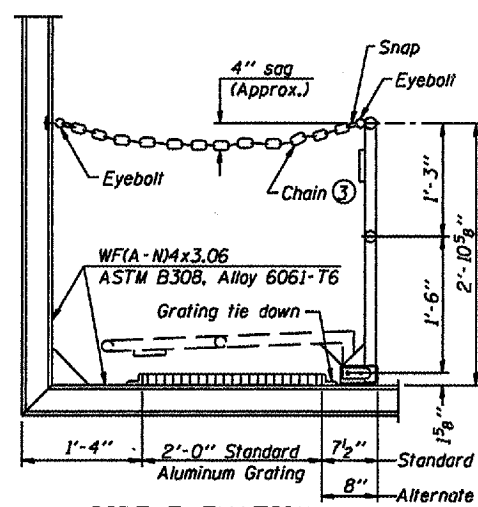
ENGINEER OF BRIDGE DESIGN

ENGINEER OF BRIDGES AND STRUCTURES

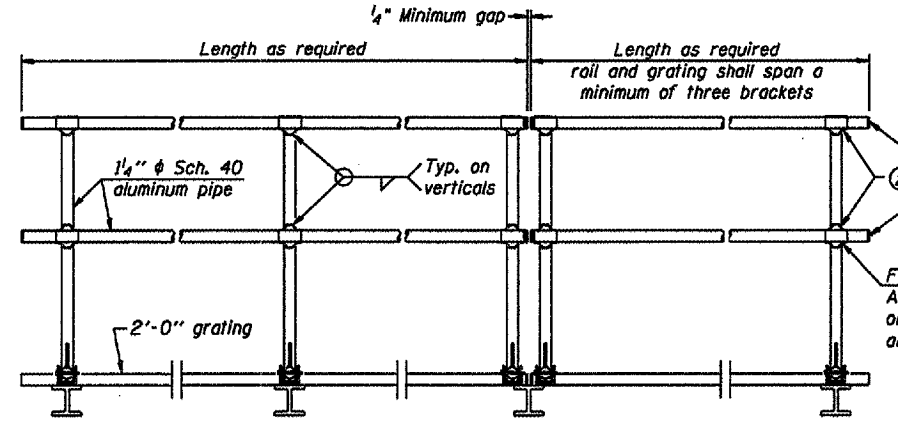
NUMBER	REVISION	DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 19 of 51
Contract Number 44949



SIDE ELEVATION
(Showing safety chain w/o sign)

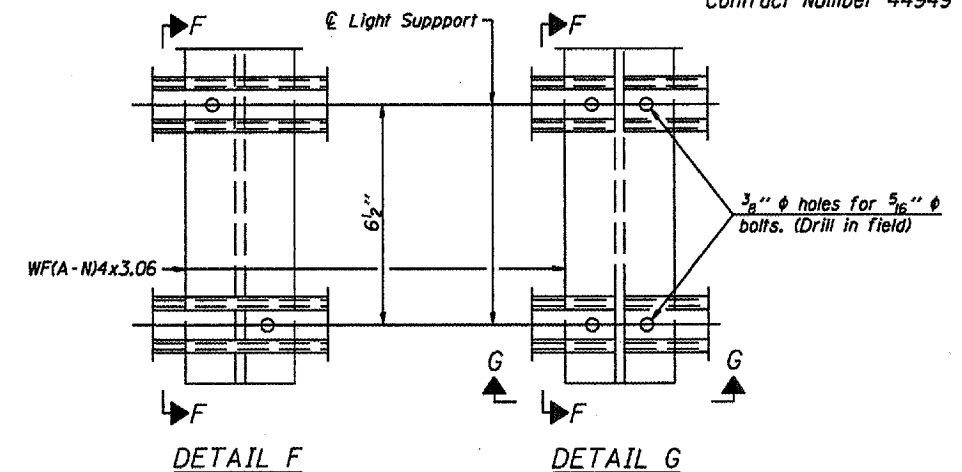


FRONT ELEVATION

HANDRAIL DETAILS

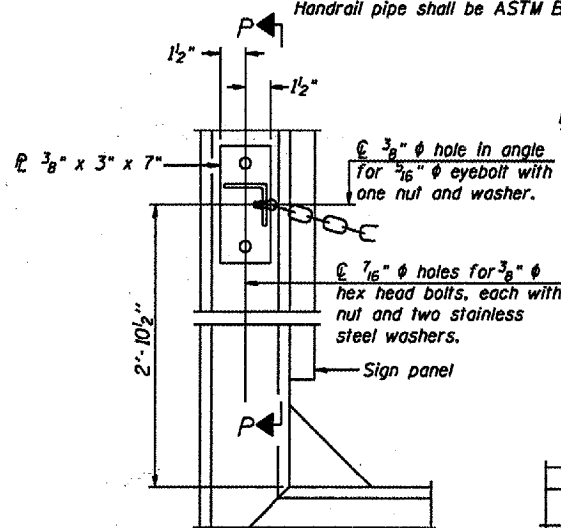
Handrail pipe shall be ASTM B241 or B429, Alloy 6063-T6 or Alloy 6061-T6.

- 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 fitting. Provide 1/16" hole in fitting for 3/8" bolt. Field drill 1/16" hole in horizontal rail member. Provide locknut and two stainless steel washers for bolt. (Use 5/16" eyebolts in 1/16" holes on top rail at ends only.)



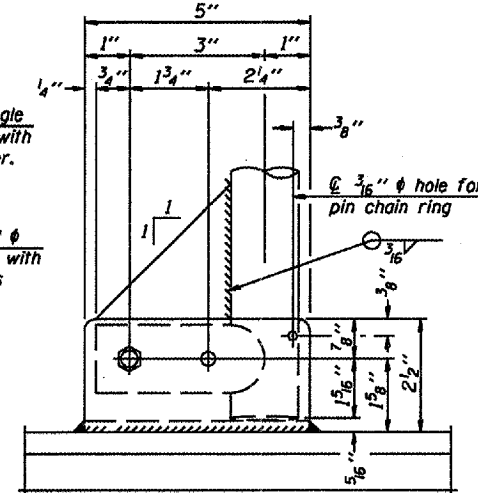
DETAIL F

DETAIL G

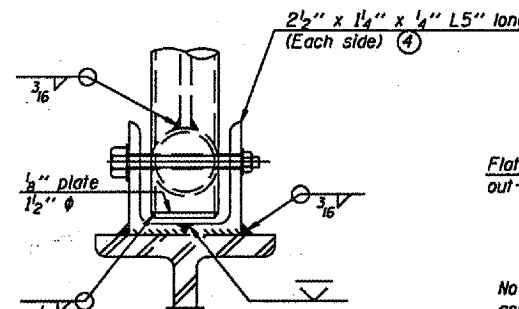


ALTERNATE SAFETY CHAIN ATTACHMENT
(With Sign Present)

Items not shown same as "Side Elevation" of "Handrail Details"

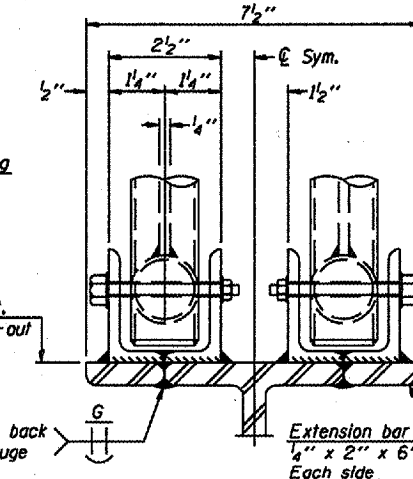


SIDE ELEVATION

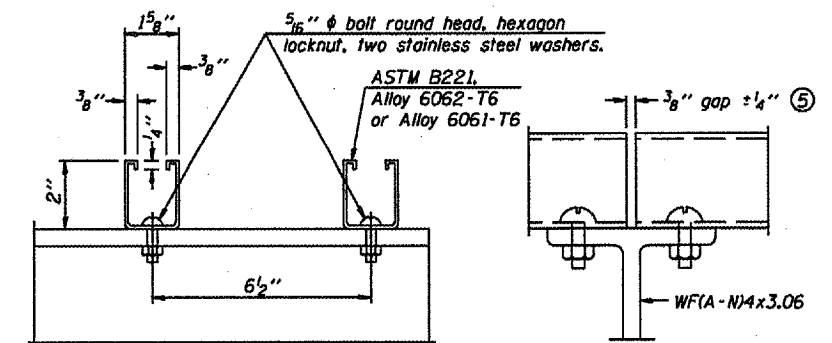


FRONT ELEVATION

See "Elevation" at right for dimensions.



ELEVATION AT HANDRAIL JOINT ④

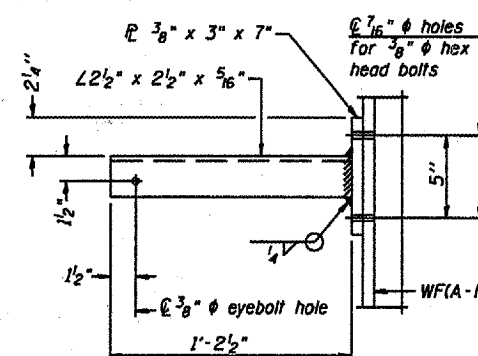


SECTION F-F

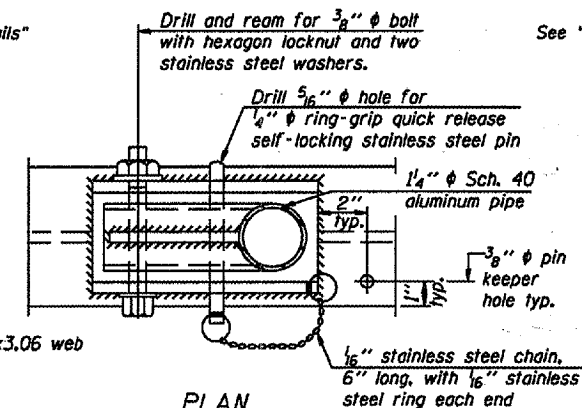
SECTION G-G

LIGHTING FIXTURE MOUNTS (IF REQUIRED)

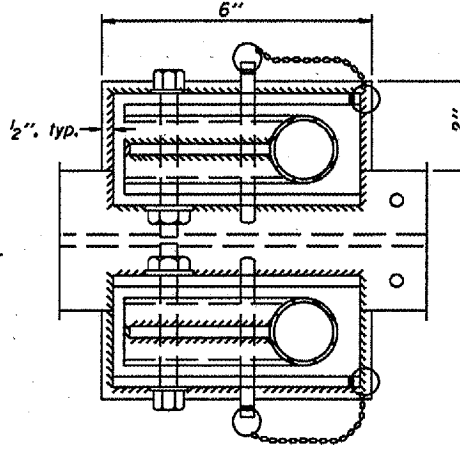
- ⑤ Field cut ends of light support channels shall be free of burrs or hazardous projections and coated with zinc-rich primer or equivalent.



SECTION P-P

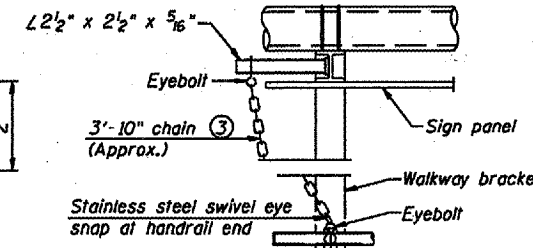


DETAIL E HANDRAIL HINGE



PLAN AT HANDRAIL JOINT

Details not shown same as "PLAN"

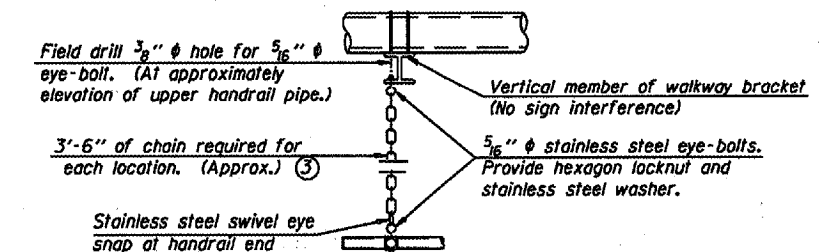


ALTERNATE SAFETY CHAIN ATTACHMENT

Details not shown similar to "Safety Chain" Details (Walkway omitted for clarity)

- ③ 3/16" Type 304L stainless steel chain, approximately 12 links per foot.

- ④ Extrusions may be used in lieu of the details shown, with approval of the Engineer.



SAFETY CHAIN

One required for each end of each walkway.

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	

NUMBER	REVISION	DATE

OS-A-11

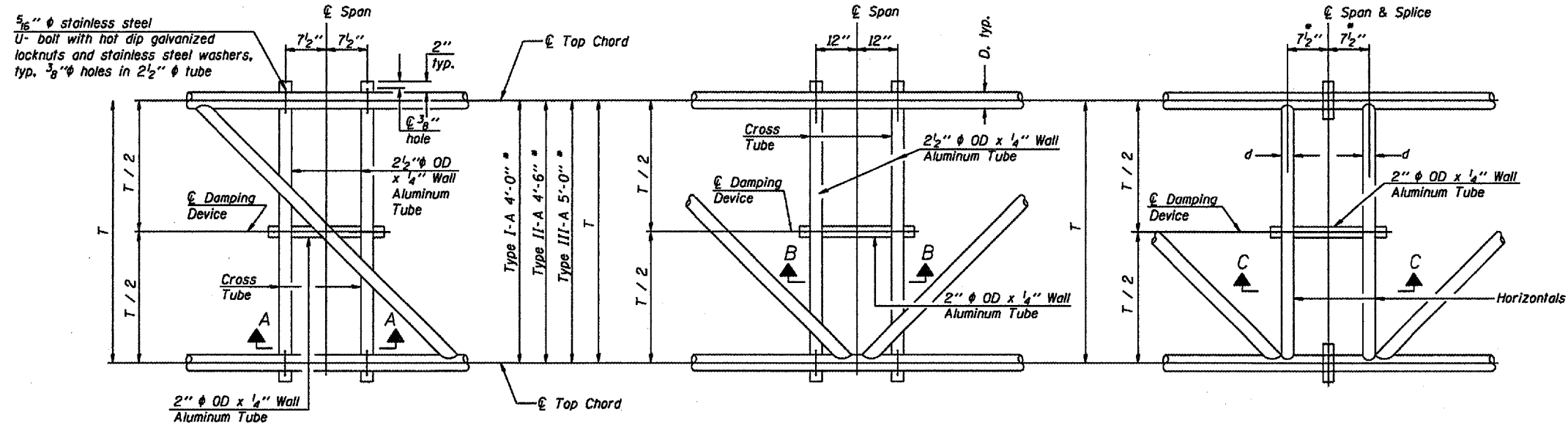
7/01/2006

**OVERHEAD SIGN STRUCTURES
ALUMINUM HANDRAIL DETAILS**

District 5
Overhead Sign
Structure Replacement

This Sheet For Information Only

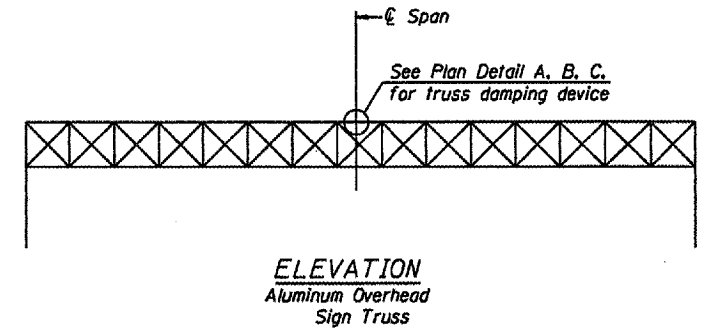
* Center of horizontal to center of splice dimension may vary. Verify before drilling holes in mounting tube.



PLAN DETAIL "A"
Span between Panel Points

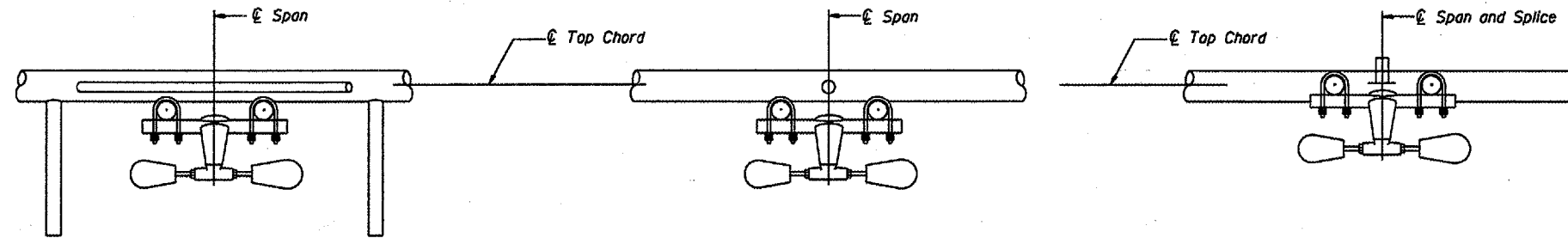
PLAN DETAIL "B"
Span at Panel Point

PLAN DETAIL "C"
Span at Chord Splice



NOTES
Damper: One damper per truss.
(31 lbs. Stockbridge-Type Aluminum)
Cost included in Overhead Sign Structure...

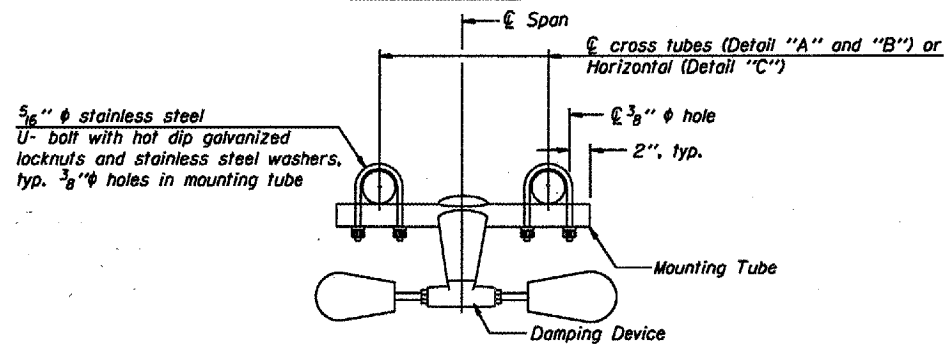
Materials: Aluminum tubes shall be ASTM B221 alloy 6061 temper T6. Cost included in Overhead Sign Structure...



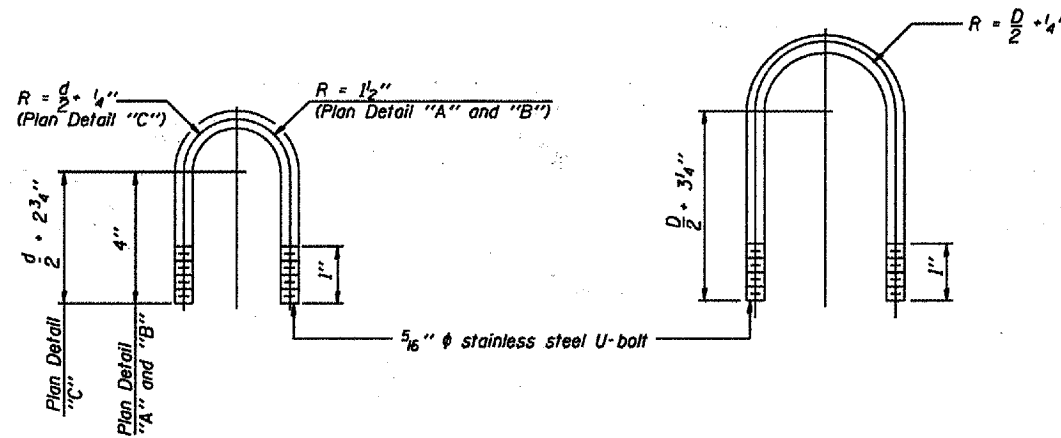
SECTION A-A

SECTION B-B

SECTION C-C



TRUSS DAMPING
DEVICE CONNECTION DETAIL
(Typical)



DAMPING DEVICE MOUNTING
TUBE U-BOLT DETAIL
(Typical)

TOP CHORD TO CROSS TUBE
U-BOLT DETAIL
(Typical - Detail "A" and "B")

OVERHEAD SIGN STRUCTURE
DAMPING DEVICE

District 5
Overhead Sign
Structure Replacement

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 21 of 51
Contract Number 44949

GENERAL NOTES

DESIGN: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. ("AASHTO Specifications")

CONSTRUCTION: Current (at time of letting) Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, Supplemental Specifications and Special Provisions. ("Standard Specifications")

LOADING: 90 M.P.H. WIND VELOCITY

WALKWAY LOADING: Dead load plus 500 lbs. concentrated live load.

DESIGN STRESSES:

Field Units
 $f_c = 3,500$ p.s.i.
 $f_y = 60,000$ p.s.i. (reinforcement)

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 Standard Specifications.

MATERIALS: Aluminum Alloys as shown throughout plans. All Structural Steel Pipe shall be ASTM A53 Grade B with a minimum yield of 35,000 p.s.i., or A500 Grade B or C with a minimum yield of 46,000 p.s.i. If A500 pipe is substituted for A53, then the outside diameter shall be as detailed and wall thickness greater than or equal to A53.

All Structural Steel Plates and Shapes shall conform to AASHTO M270 Gr. 36, Gr. 50 or Gr. 50W. 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.

FASTENERS FOR ALUMINUM TRUSSES: All bolts noted as "high strength" must satisfy the requirements of AASHTO M164 (ASTM A325), or approved alternate, and must have matching lock nuts. Threaded studs for splices (if Members interfere) must satisfy the requirements of ASTM A449, ASTM A193, Grade B7, or approved alternate, and must have matching lock nuts. Bolts and lock nuts not required to be high strength must satisfy the requirements of ASTM A307. All bolts and lock nuts must be hot dip galvanized per AASHTO M232. The lock nuts must 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 AND EYEBOLTS: U-Bolts and Eyebolts must 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 must 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 lock nut.

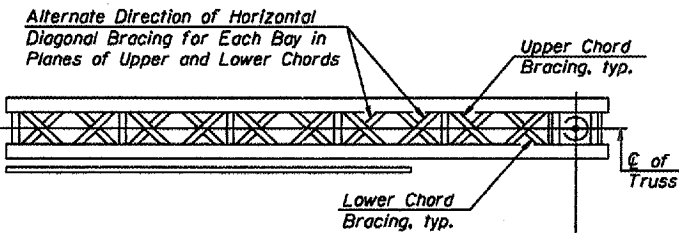
GALVANIZING: All Steel Grating, Plates, Shapes and Pipe shall be Hot Dip Galvanized after fabrication in accordance with AASHTO M111. Painting is not permitted.

ANCHOR RODS: Shall conform to AASHTO M314 Gr. 55 with a minimum Charpy V-Notch (CVN) energy of 15 lb.-ft. at 10° F.

CONCRETE SURFACES: All concrete surfaces above an elevation 6" below the lowest final ground line at each foundation shall be cleaned and coated with Bridge Seat Sealer in accordance with the Standard Specifications.

REINFORCEMENT BARS: Reinforcement Bars designated (E) shall be epoxy coated in accordance with the Standard Specifications.

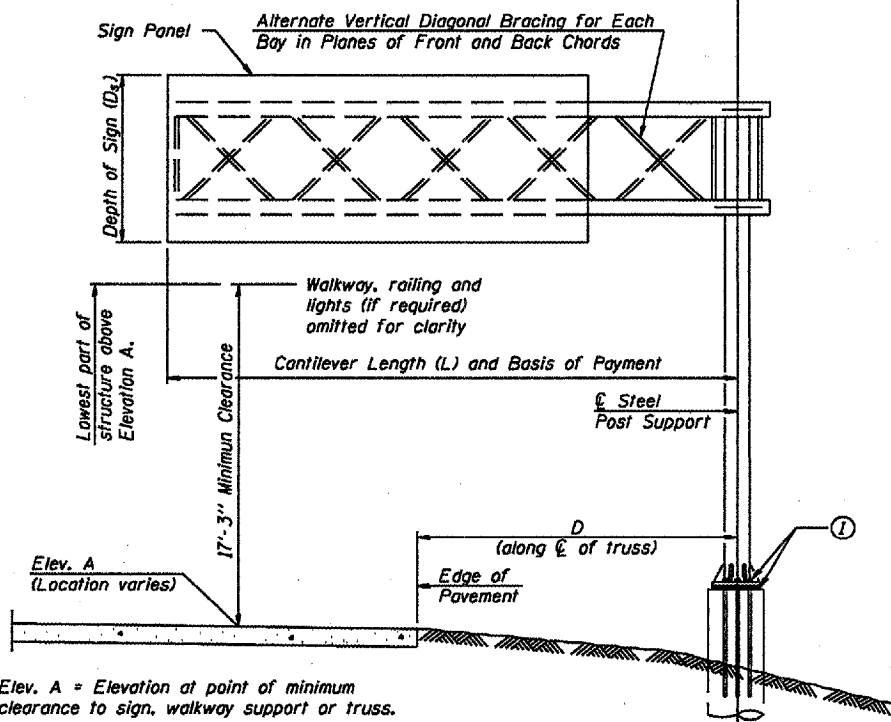
FOUNDATIONS: The contract unit price for Drilled Shaft Concrete Foundations shall include reinforcement bars complete in place.



TYPICAL PLAN
(Walkway not shown)

Structure Number	Station	Design Truss Type	Cantilever Length (L)	Elev. A	Dim. D	D _s	Total Sign Area
5C010U045R012.76	30 + 00	III-C-A	40' - 0"	781.80	20' - 0"	7' - 0"	128.0

Truss Type	Maximum Sign Area	Maximum Length
I-C-A	170 Sq. Ft.	25 Ft.
II-C-A	340 Sq. Ft.	30 Ft.
III-C-A	400 Sq. Ft.	40 Ft.



TYPICAL ELEVATION
Looking in Direction of Traffic

DESIGN WIND LOADING DIAGRAM

Parameters shown are basis for I.D.O.T. Standards
Installations not within dimensional limits shown
require special analysis for all components.

① After adjustments to level truss and insure 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.

Note:

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.

• If M270 Gr. 50W (M222) steel is proposed, chemistry for plate to be used shall first be approved by the Engineer as suitable for galvanizing and welding.

TOTAL BILL OF MATERIAL

ITEM	UNIT	TOTAL
OVERHEAD SIGN STRUCTURE CANTILEVER TYPE I-C-A	Foot	
OVERHEAD SIGN STRUCTURE CANTILEVER TYPE II-C-A	Foot	
OVERHEAD SIGN STRUCTURE CANTILEVER TYPE III-C-A	Foot	
OVERHEAD SIGN STRUCTURE WALKWAY, TYPE A	Foot	
DRILLED SHAFT CONCRETE FOUNDATIONS	Cu. Yds.	

CANTILEVER SIGN STRUCTURES
GENERAL PLAN & ELEVATION
ALUMINUM TRUSS & STEEL POST

District 5
Overhead Sign
Structure Replacement

Revised 2/26/07

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES

	ENGINEER OF BRIDGE DESIGN
	ENGINEER OF BRIDGES AND STRUCTURES

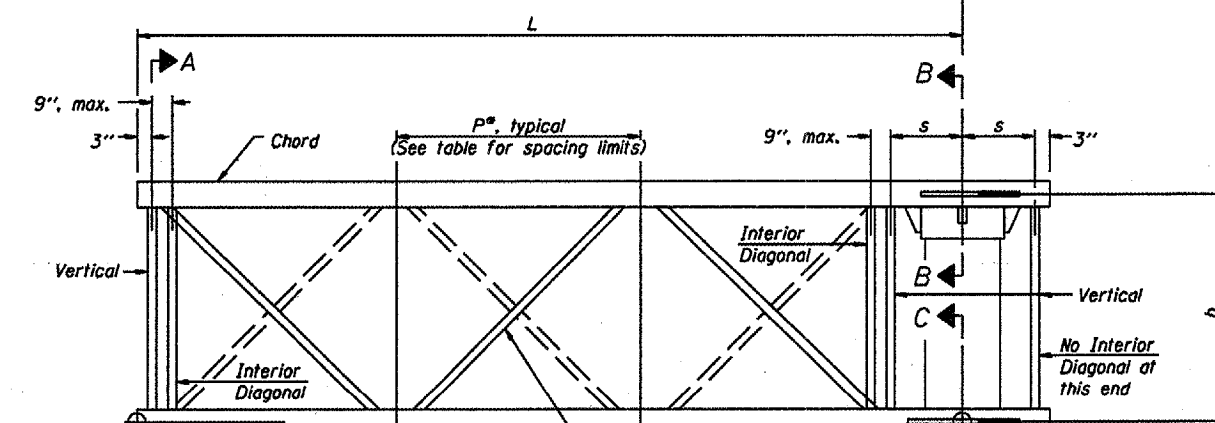
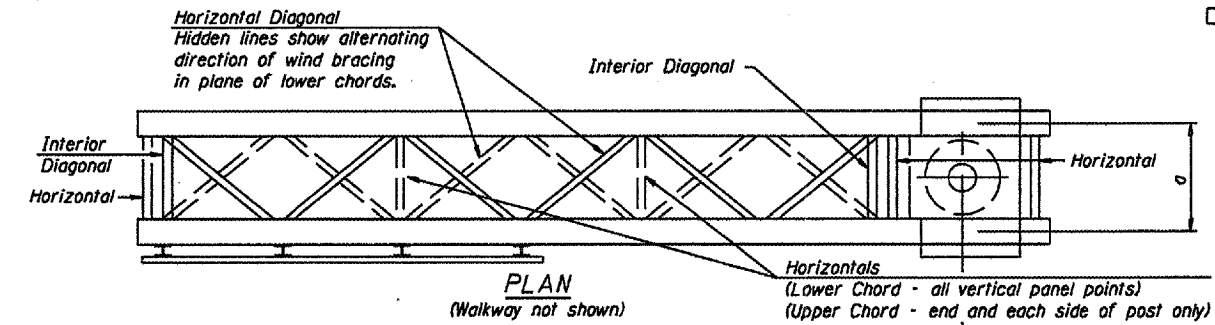
NUMBER	REVISION	DATE

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11/01/2006

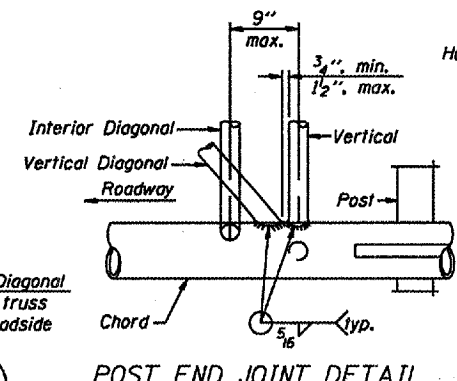
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 22 of 51
Contract Number 44949



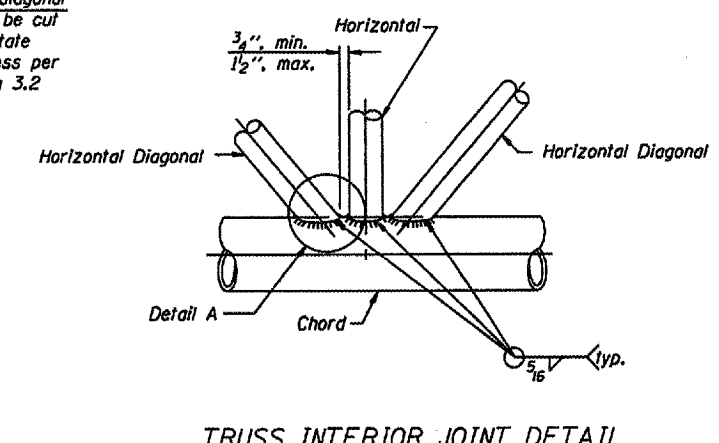
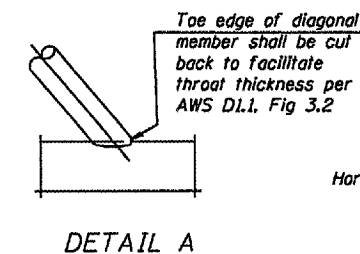
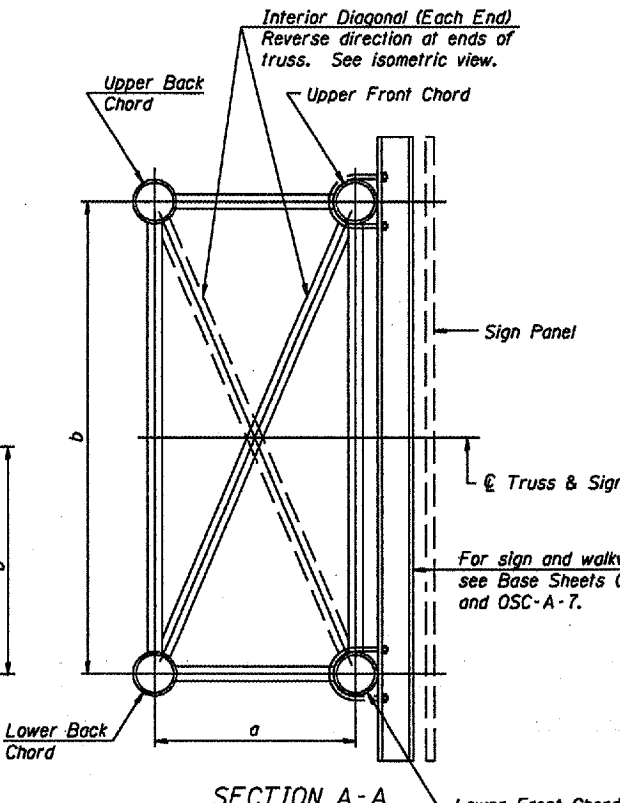
For Section B-B and Section C-C, see Base Sheet OSC-A-3.

Note:
There are twice as many horizontal diagonals as there are vertical diagonals.

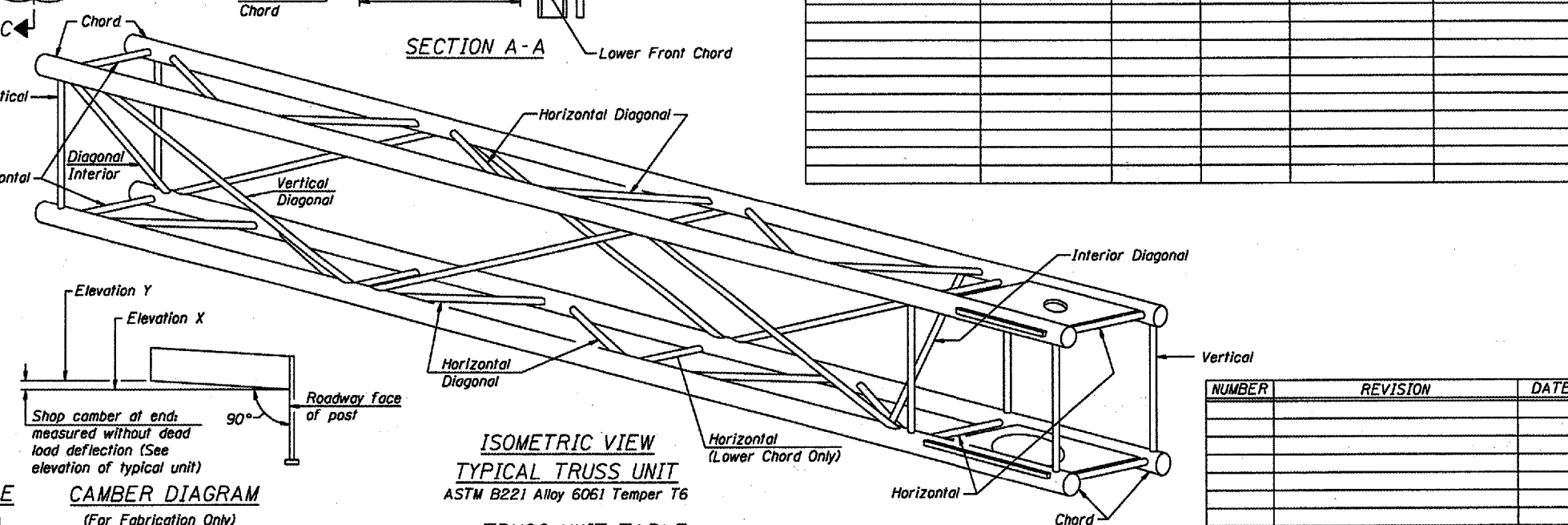
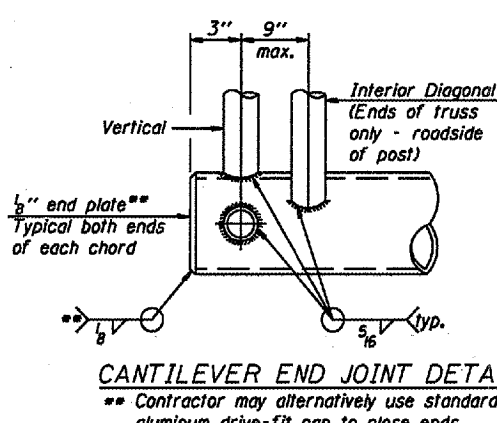


SHOP CAMBER TABLE

Unit Length (L)	Shop Camber at End
15'	1 1/2"
16'-17'	1 3/4"
18'-20'	2"
21'-22'	2 1/4"
23'-25'	2 1/2"
26'-27'	2 3/4"
28'-30'	3"
31'-32'	3 1/4"
33'-35'	3 1/2"
36'-37'	4"
38'-40'	4 1/2"



Structure Number	Station	Truss Type	Design Length (L)	Number of Panels Per Unit	Panel Length (P)**
5C010U045R012.76	30 + 00	III-C-A	40' - 0"	8	4' - 9"



CAMBER DIAGRAM
(For Fabrication Only)

Truss Type	Dimension "a"	Dimension "b"	Dimension "c"	Limits for Panel Spacing (P)**	Up. & Low. Chord		Verticals; Horizontals; Vertical, Horizontal, and Interior Diagonals	
					O.D.	Wall	O.D.	Wall
I-C-A	24"	54"	16"	36" min. to 48" max.	5"	5/16"	2 1/2"	5/16"
II-C-A	36"	66"	21"	42" min. to 54" max.	6 1/2"	5/16"	3 1/4"	5/16"
III-C-A (35' Max.)	36"	84"	21"	48" min. to 66" max.	7"	3/8"	3 1/2"	3/8"
III-C-A (>35' to 40')	36"	84"	21"	48" min. to 66" max.	8"	3/8"	3 1/2"	3/8"

** P = $\frac{L - S - 3"}{\# \text{ Panels}}$

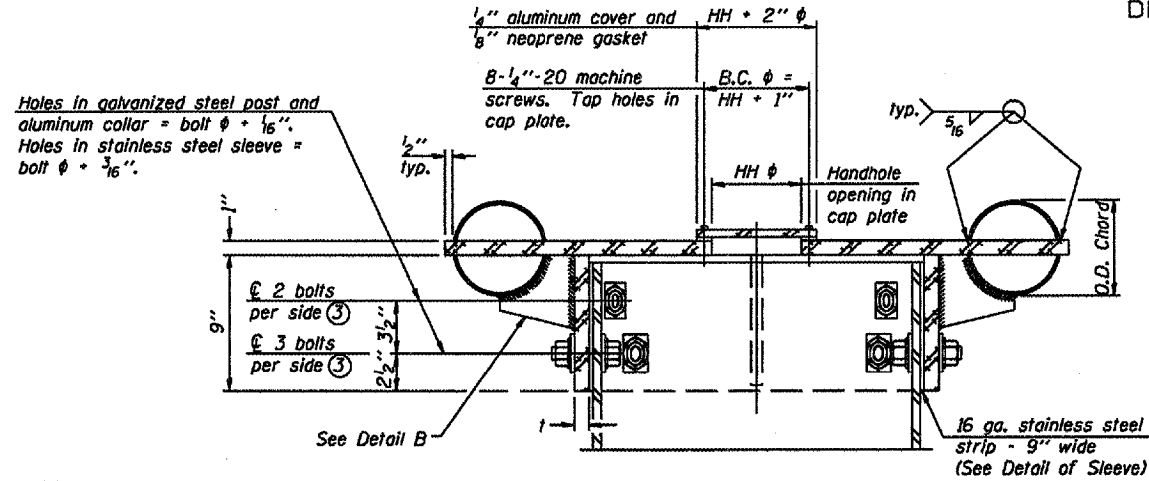
NUMBER	REVISION	DATE

CANTILEVER SIGN STRUCTURES
TRUSS DETAILS
ALUMINUM TRUSS & STEEL POST

District 5
Overhead Sign
Structure Replacement

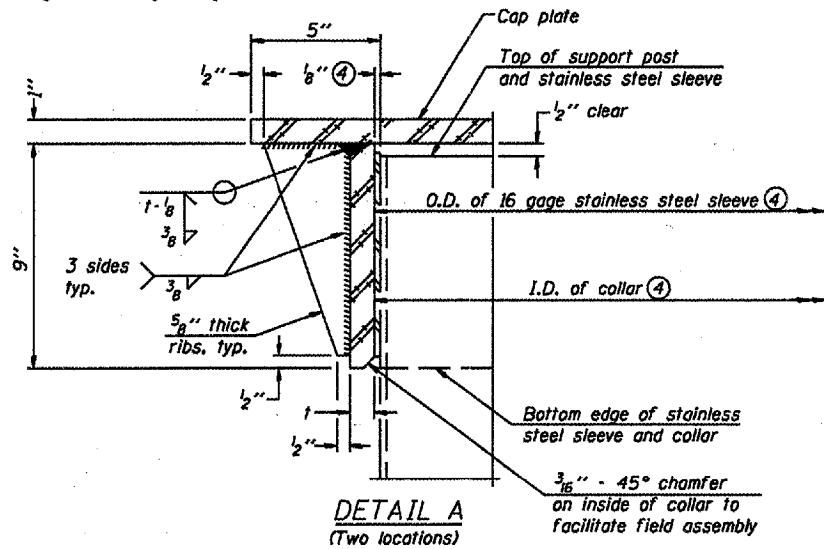
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CHECKED	_____	EXAMINED
DRAWN	_____	PASSED
CHECKED	_____	ENGINEER OF BRIDGES AND STRUCTURES

OSC-A-2 7/01/2006

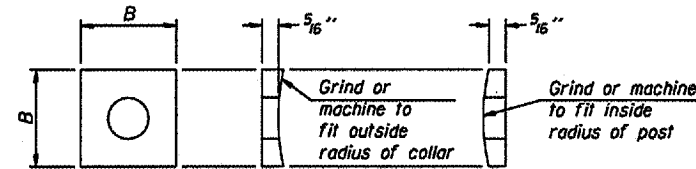


④ Collar I.D. shall be manufactured to correspond to O.D. of actual galvanized post and stainless steel sleeve plus 1/8" (± 1/16"). Maximum gap between post and collar at any location equals 1/8" before tightening bolts.

SECTION B-B
Bolts, washers (including contoured washers), and locknuts shall be stainless steel.



DETAIL A
(Two locations)



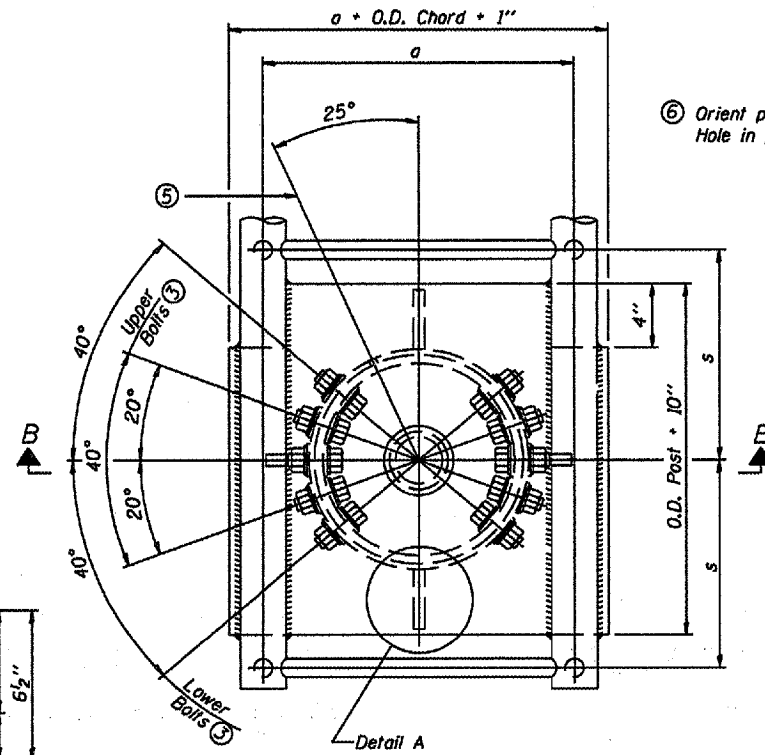
CONTOURED WASHERS

Bolt Size	Contoured Washers	
	Hole Dia.	B
7/8"	1"	2 1/2"
1"	1 1/8"	3"
1 1/4"	1 3/8"	3 1/4"

DETAIL OF STAINLESS STEEL SLEEVE

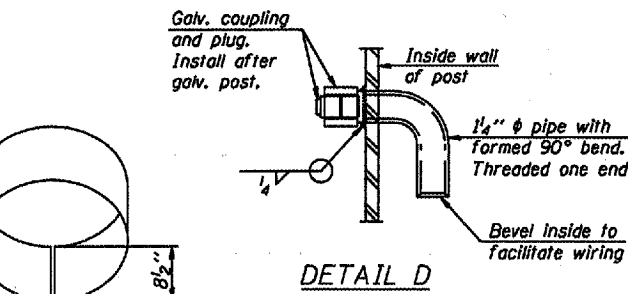
Weld to post after galvanizing. (Prepare post surface to insure tight, uniform fit and allow welding.) Welds to be 1/2" long at 6" cts. along top edge and at 1/4" opening.

NUMBER	REVISION	DATE

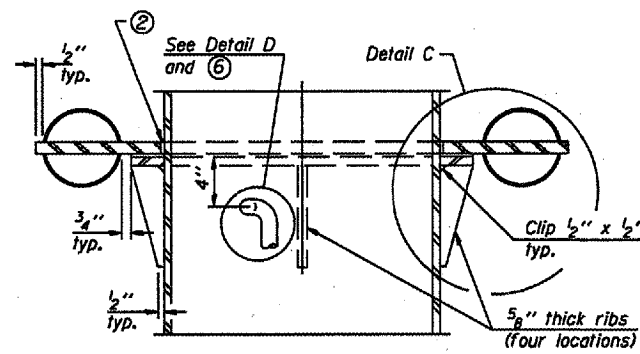


PLAN VIEW - TOP OF COLUMN

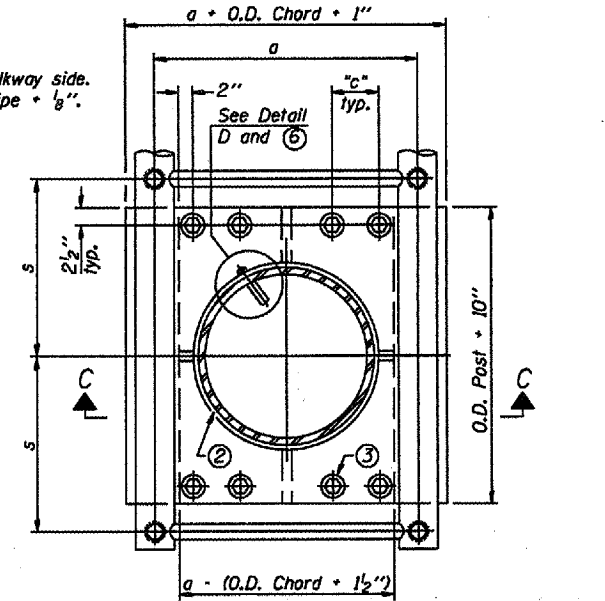
⑤ Optional full penetration weld in collar. (Two locations maximum....(180° apart)....X-ray or UT 100%)



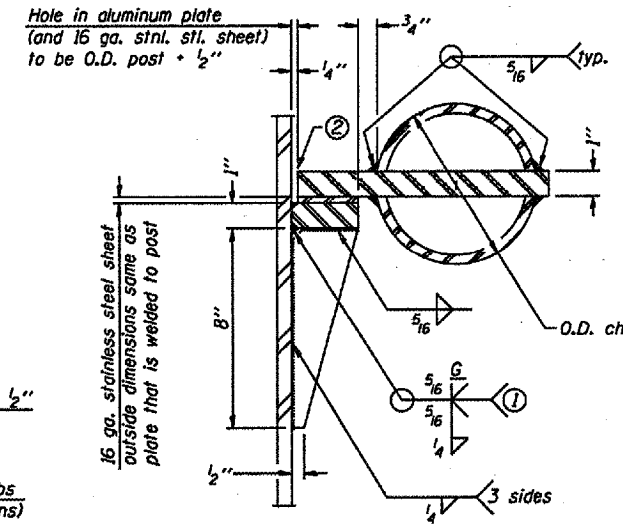
DETAIL D



SECTION C-C



SECTION THRU POST ABOVE LOWER CHORDS



DETAIL C

- ① Grind top if required to fully seat aluminum plate and stainless steel sheet.
- ② After tightening lower connection bolts, fill gap with non-hardening, silicone caulk suitable for exterior exposure and acceptable to the Engineer. Cost is included in Overhead Sign Structure Cantilever.

Truss Type	Post Size	Upper & Lower Connection Bolt Diameter ③	Lower Juncture Bolt Spacing Dimension "c" ③	Opening in Cap Plate "HH"	Collar Thickness (t)	Side Ribs	
						x	y
I-C-A	16" phi (83#1)	7/8"	3 1/4"	8"	5/8"	1 3/4"	2 1/4"
II-C-A	24" phi (125#1)	1"	3 1/2"	12"	7/8"	2"	1 1/4"
III-C-A (35' max.)	24" phi (125#1)	1 1/4"	3 1/2"	12"	7/8"	2"	1"
III-C-A (>35' to 40')	24" phi (171#1)	1 1/4"	3 1/2"	12"	7/8"	2"	1"

③ Upper and lower connection bolts in collar and bolts at lower chord connection shall be high strength with matching locknuts. Connection bolts shall have 2 stainless steel flat washers each.

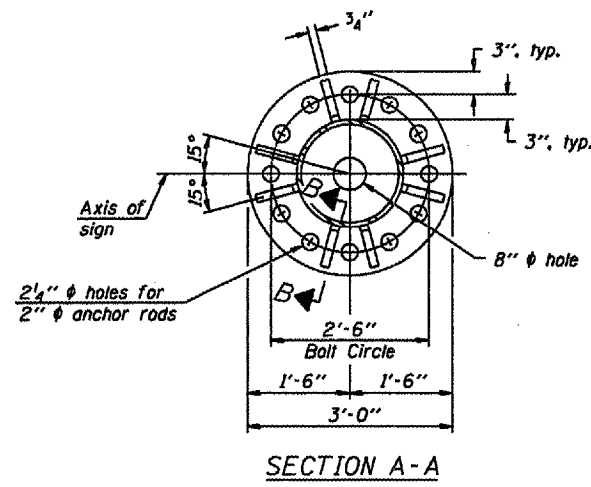
CANTILEVER SIGN STRUCTURES
JUNCTURE DETAILS
ALUMINUM TRUSS & STEEL POST

District 5
Overhead Sign
Structure Replacement

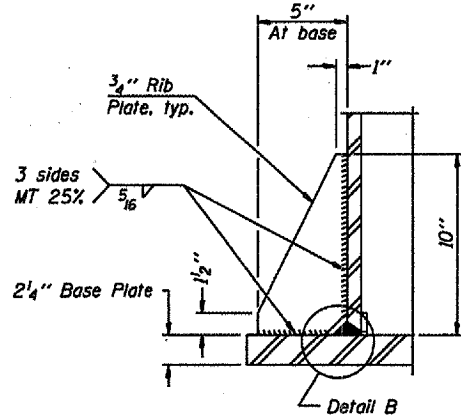
DESIGNED	20
CHECKED	EXAMINED
DRAWN	PASSED
CHECKED	ENGINEER OF BRIDGES AND STRUCTURES

OSC-A-3

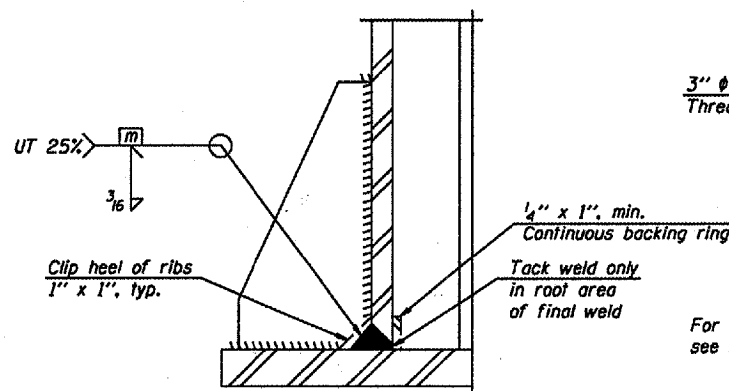
7/01/2006



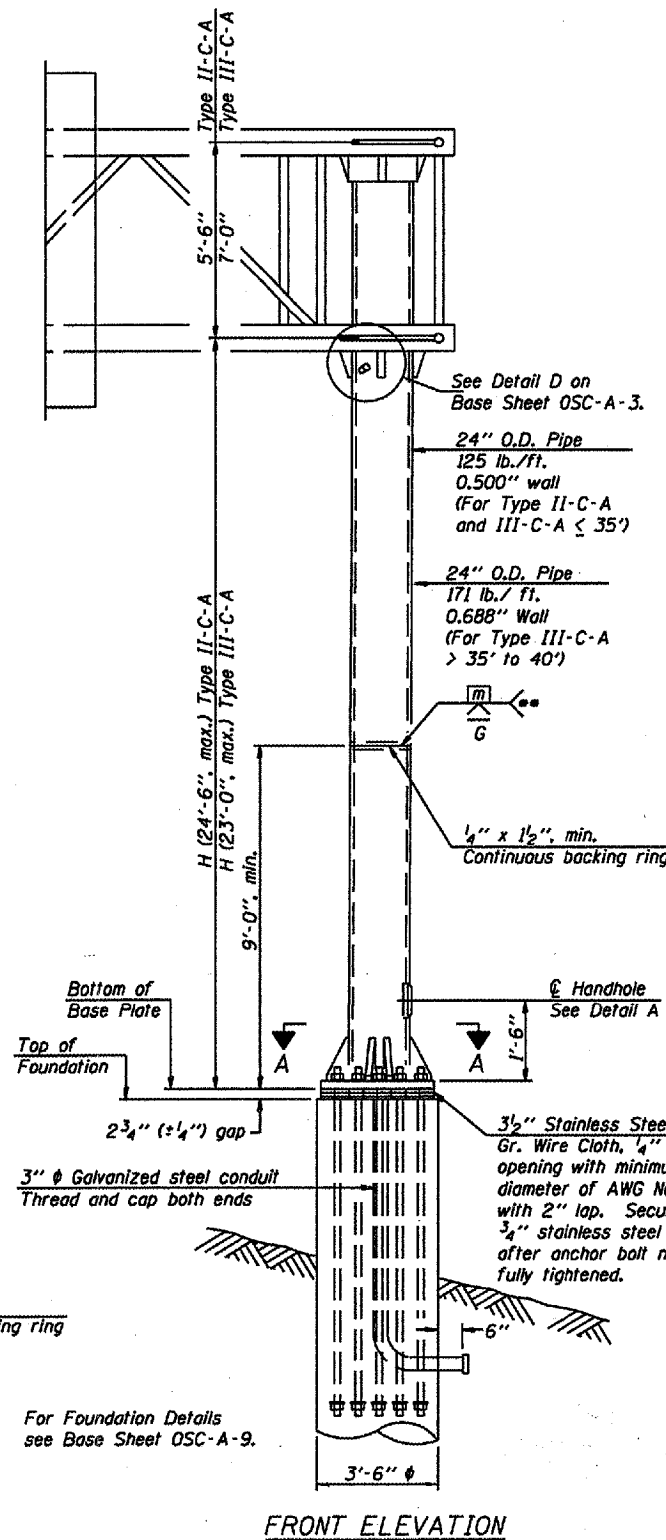
SECTION A-A



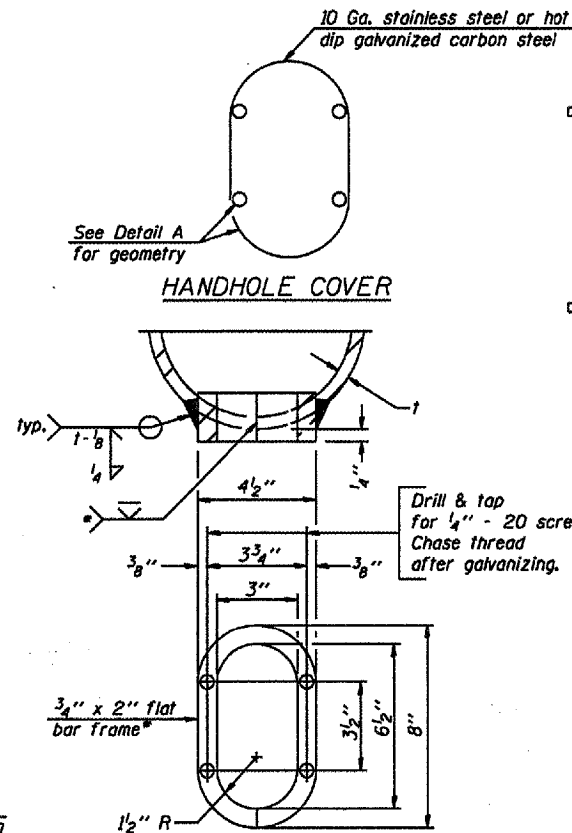
SECTION B-B



DETAIL B
(Typical rib)

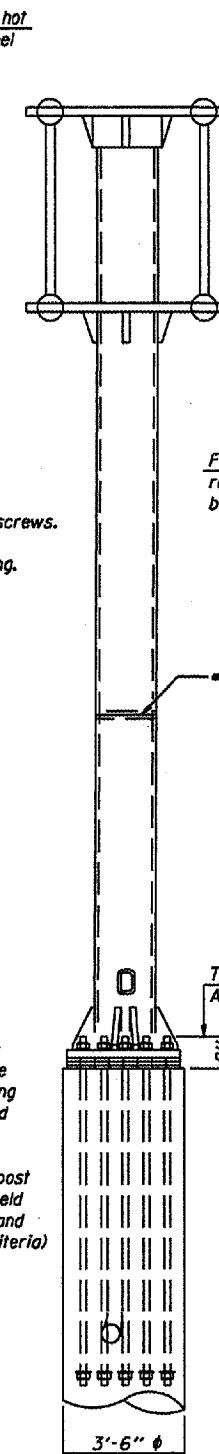


FRONT ELEVATION

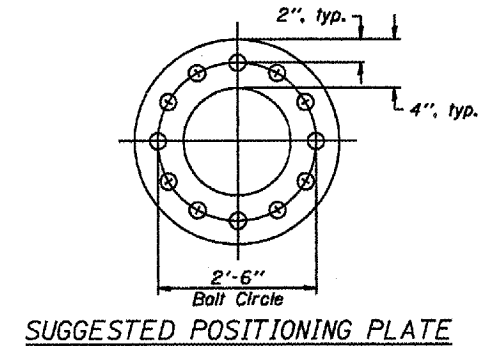


DETAIL A

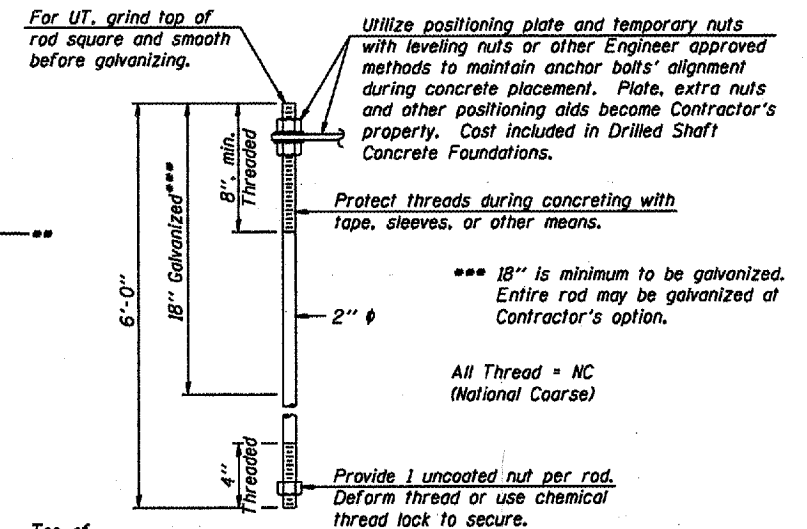
- * Bent bars may be butt welded top and bottom or bottom only. In lieu of fabricated handhole frame as shown, may cut from 2" plate (rolling direction vertical). All cut faces to be ground to ANSI Roughness of 500 μ in or less.
- ** Butt welded joint in post is only allowed for post heights (H) over 20 ft. in length. If used, weld procedure must be preapproved by Engineer and joint shall receive 100% RT or UT (tension criteria) at Contractor's expense.



SIDE ELEVATION



SUGGESTED POSITIONING PLATE



ANCHOR ROD DETAIL

Anchor rods shall conform to AASHTO M314 Grade 55 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 and hardened washers per AASHTO M232. No welding shall be permitted on rods. Provide an unfinished 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 rod shall be ultrasonically tested (UT) by a Level II or III inspector, qualified in accord with ANSI guidelines, using a straight beam, 1/2" ϕ 3.5 mhz. transducer, to insure no rejectable flaws exist in the upper 18" (tension criteria). Cost of testing included in Drilled Shaft Concrete Foundations.

CANTILEVER SIGN STRUCTURES
TYPE II-C-A & III-C-A TRUSS SUPPORT POST
ALUMINUM TRUSS & STEEL POST

District 5
Overhead Sign
Structure Replacement

DESIGNED	20
CHECKED	EXAMINED
DRAWN	PASSED
CHECKED	ENGINEER OF BRIDGES AND STRUCTURES

OSC-A-5

7/01/2006

NUMBER	REVISION	DATE

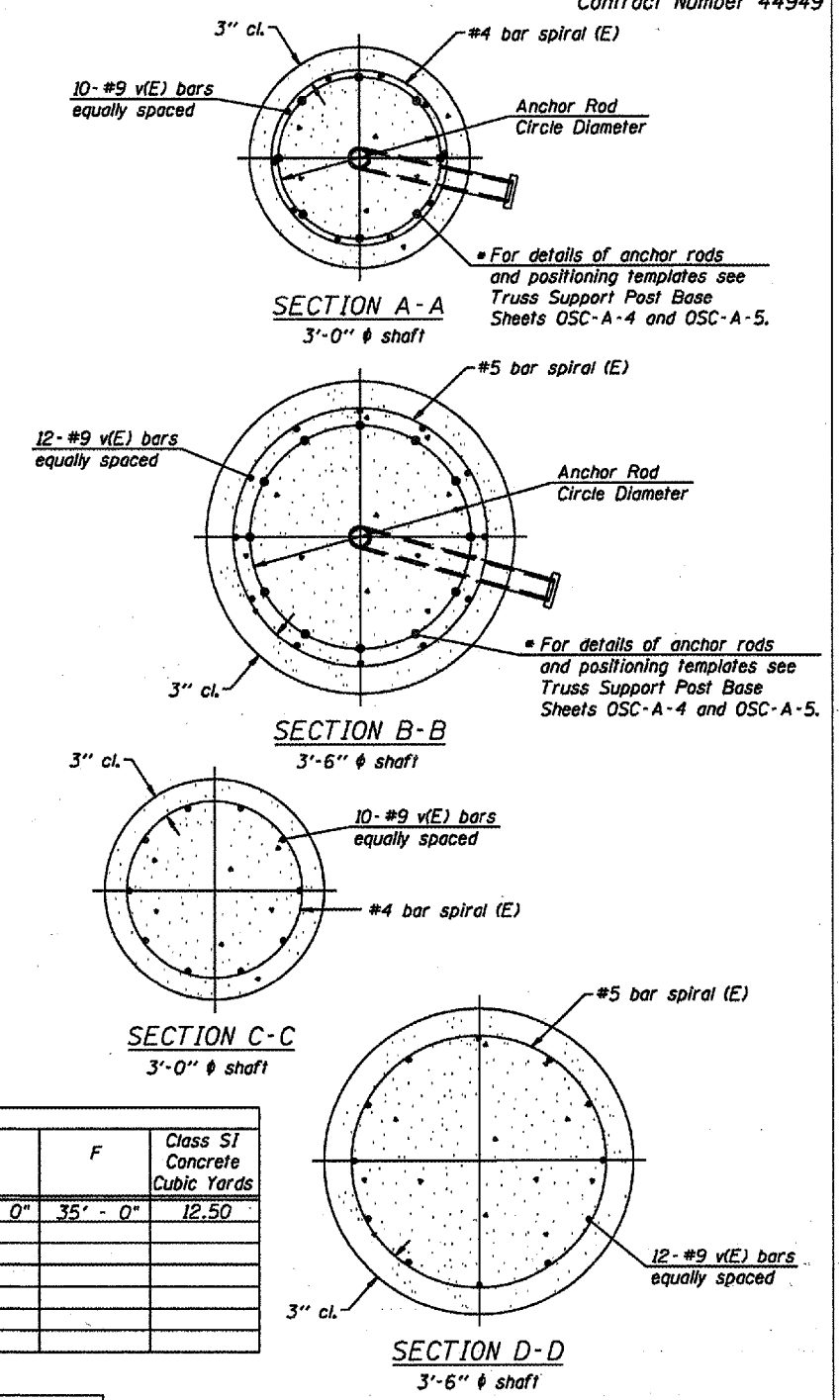
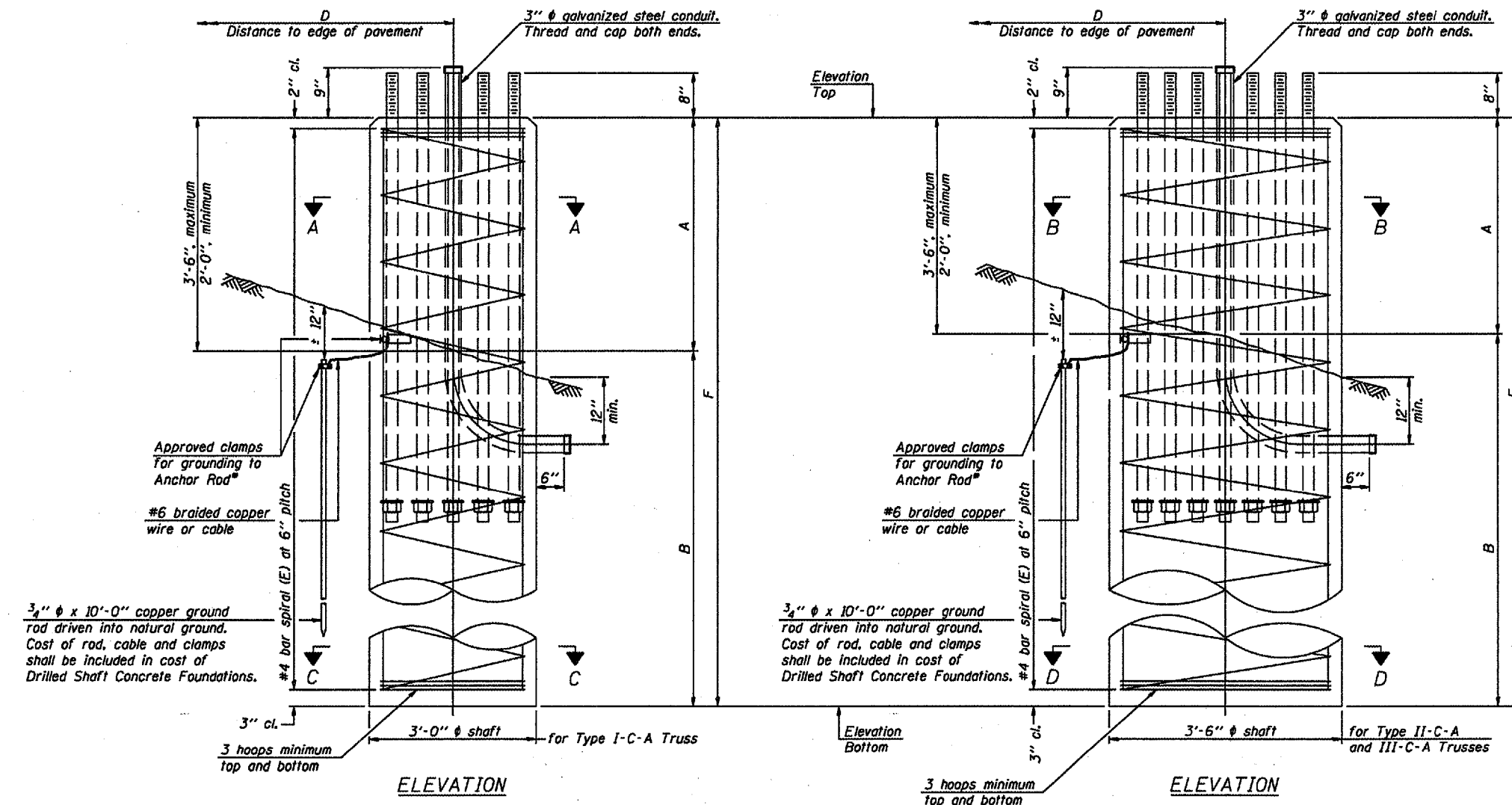
Structure Number	Station	H
5C010U045R012.76	30 + 00	21' - 0"

Note: "H" based on 15'-0" or actual sign height, whichever is greater.

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 25 of 51
Contract Number 44949

• Grind anchor rod to bright finish at ground clamp location before installing clamp.



NOTES:
The foundation dimensions shown in the Foundation Design Table are based on the presence of mostly cohesive soils with an average Unconfined Compressive Strength (Q_u) of at least 1.25 tsf, which must be determined by previous soil investigations at the jobsite. When other conditions are indicated, the boring data will be included in the plans and the foundation dimensions shown in the Foundation Data Table will be the result of site specific designs.
If the conditions encountered are different than those indicated, the Contractor shall notify the Engineer to determine if the foundation dimensions need to be modified. If dimensions "B" or "F" are revised by more than 12" by the Contractor, "as-built" plans shall be prepared and submitted to the District Bureau of Operations for future reference.
No sonotubes or decomposable forms shall be used below the lower conduit entrance. Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.
Concrete shall be placed monolithically, without construction joints.
Backfill shall be placed per Article 502 of Standard Specification and prior to erection of support column.
A normal surface finish followed by a Bridge Seat Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in "Drilled Shaft Concrete Foundation".

Structure Number	Station	Truss Type	Shaft Diameter	Elevation Top	Elevation Bottom	Q_u	A	B	F	Class SI Concrete Cubic Yards
5C010U045R012.76	30 + 00	III-C-A	3' - 6"	781.80			3' - 0"	32' - 0"	35' - 0"	12.50

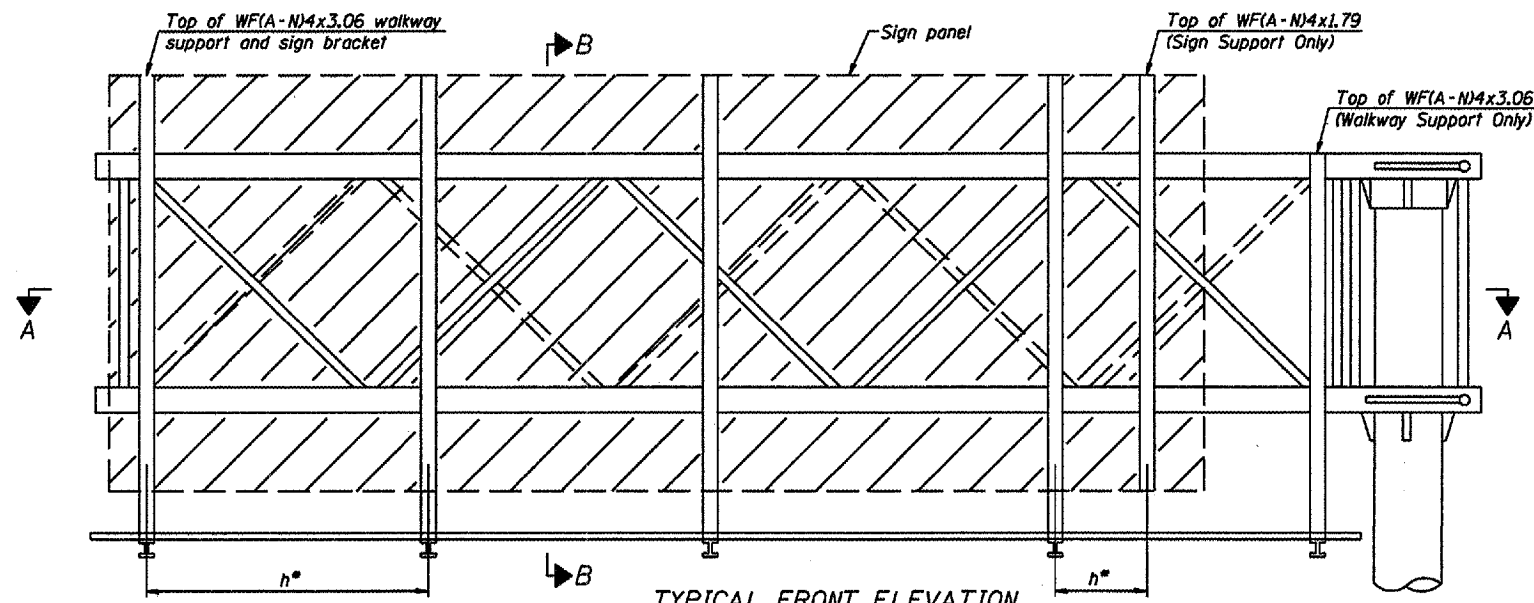
Truss Type	Post Base Sheet	Maximum Cantilever Length (ft)	Maximum Total Sign Area (sq ft)	Shaft Diameter (in)	"B" Depth (ft)	Anchor Rods		Anchor Rod Circle Diameter (in)
						No.	Diameter (in)	
I-C-A	OSC-A-4	25	170	3.0	16.0	8	2	22
II-C-A	OSC-A-5	30	170	3.5	17.0	12	2	30
II-C-A	OSC-A-5	30	340	3.5	21.5	12	2	30
III-C-A	OSC-A-5	35	170	3.5	19.0	12	2	30
III-C-A	OSC-A-5	35	250	3.5	22.5	12	2	30
III-C-A	OSC-A-5	35	400	3.5	26.5	12	2	30
III-C-A	OSC-A-5	40	400	3.5	32.0	12	2	30

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES

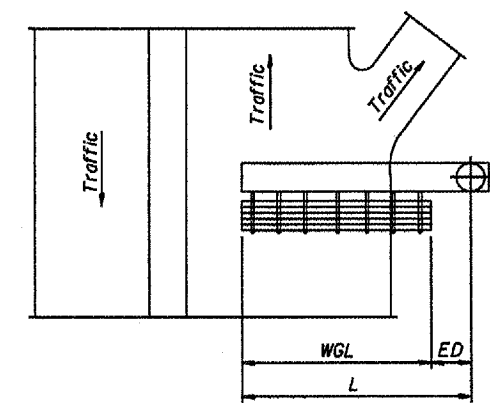
NUMBER	REVISION	DATE

CANTILEVER SIGN STRUCTURES
DRILLED SHAFT
ALUMINUM TRUSS & STEEL POST

District 5
Overhead Sign
Structure Replacement

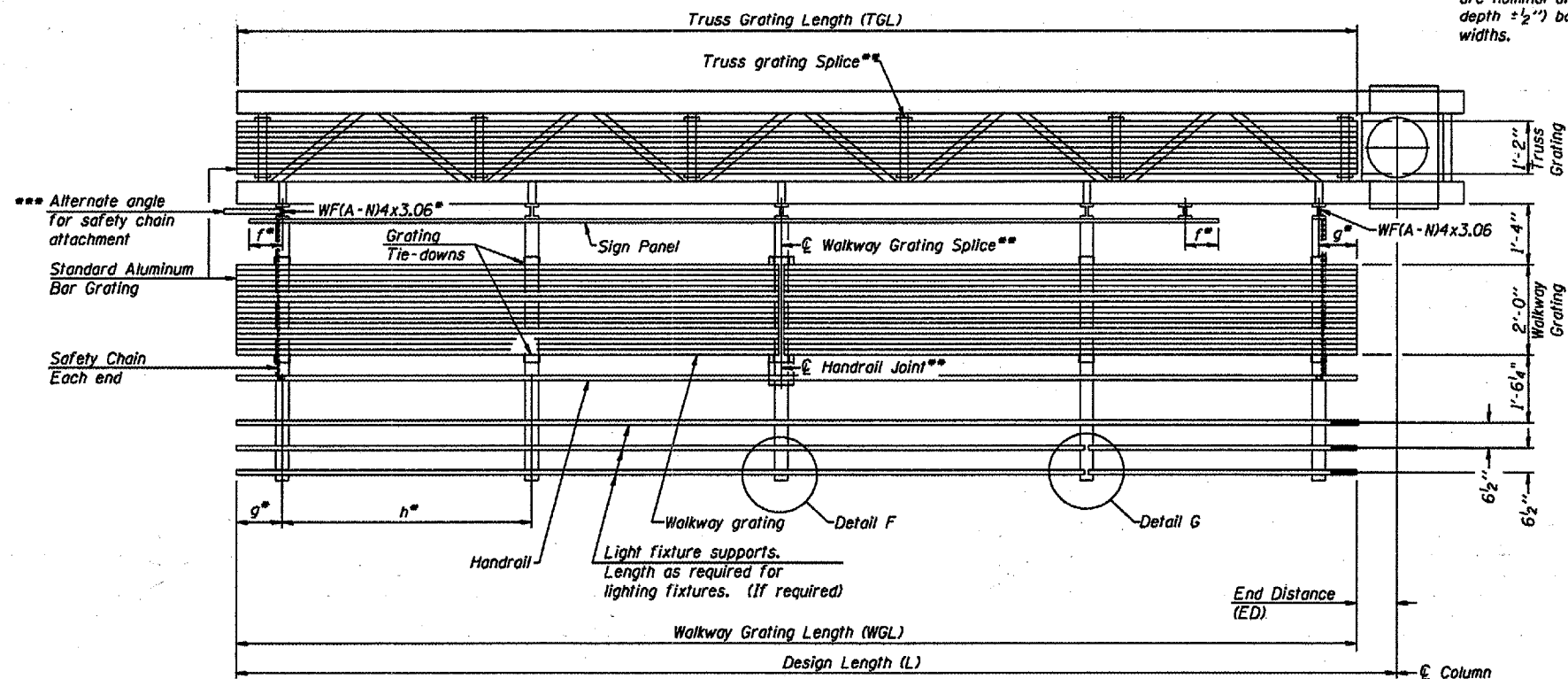


TYPICAL FRONT ELEVATION
With lights and handrail omitted for clarity.



PLAN
WALKWAY AND HANDRAIL SKETCH
(Road plan beneath truss varies)

Walkway and truss grating dimensions are nominal and may vary (width ± 1/2", depth ± 1/2") based on available standard widths.



SECTION A-A

Truss grating to facilitate inspection shall run full length of cantilevers. Cost of truss grating is included in Overhead Sign Structure Cantilever.

Handrail and walkway grating shall span a minimum of three brackets between splices.
** Use and location of handrail joints or grating splices are optional, based on lengths needed and material availability.

$$TGL = L - \left(\frac{\text{Post O.D.}}{2} + 6'' \right)$$

Structure Number	Station	WGL	ED	TGL
5C010U045R012.76	30 + 00			38' - 3"

The length shown is for truss grating

Notes:
 • Space walkway brackets WF(A-N)4x3.06 and sign brackets WF(A-N)4x1.79 for efficiency and within limits shown:
 f = 12" maximum, 4" minimum (End of sign to center of nearest bracket)
 g = 12" maximum, 4" minimum (End of walkway to center of nearest bracket)
 h = 6'-0" maximum (center to center sign and/or walkway support brackets, WF(A-N)4x1.79 or WF(A-N)4x3.06)
 *** If walkway bracket at safety chain location is behind sign, add angle to bracket. See alternate safety chain attachment on base sheet OSC-A-B
 For details of sign placement, sign/walkway brackets, truss and walkway gratings, grating splices and Section B-B, see Base Sheet OSC-A-7.
 For details of handrail, handrail joint, safety chain and Details F and G, see Base Sheet OSC-A-8.

BRACKET TABLE

Sign Width		Number Brackets Required
Greater Than	Less Than or Equal To	
	8'-0"	2
	14'-0"	3
	20'-0"	4
	26'-0"	5
	32'-0"	6

CANTILEVER SIGN STRUCTURES
ALUMINUM WALKWAY DETAILS
ALUMINUM TRUSS & STEEL POST

District 5
Overhead Sign
Structure Replacement

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES

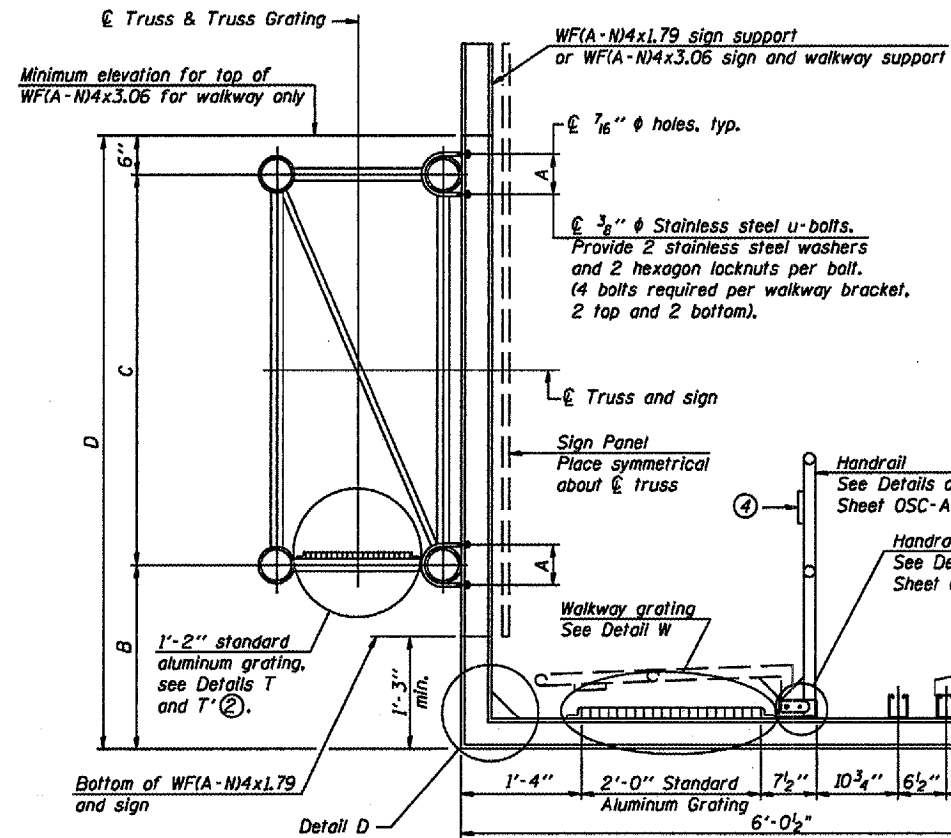
7/01/2006

NUMBER	REVISION	DATE

OSC-A-6

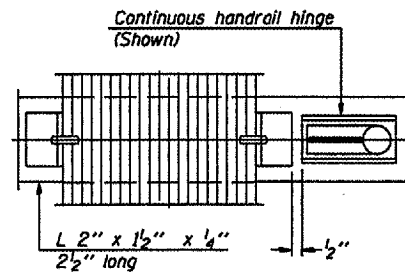
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 27 of 51
Contract Number 44949



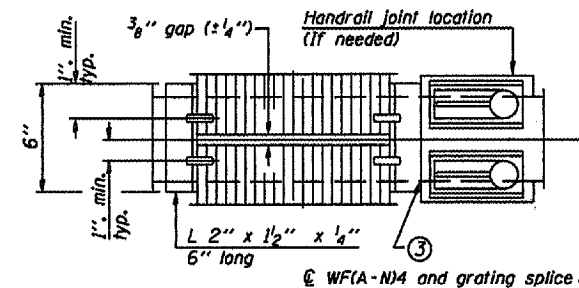
SECTION B-B

Sign shall be even with the top of the bracket, but it may extend no more than 6" above the top of the bracket for field adjustments.

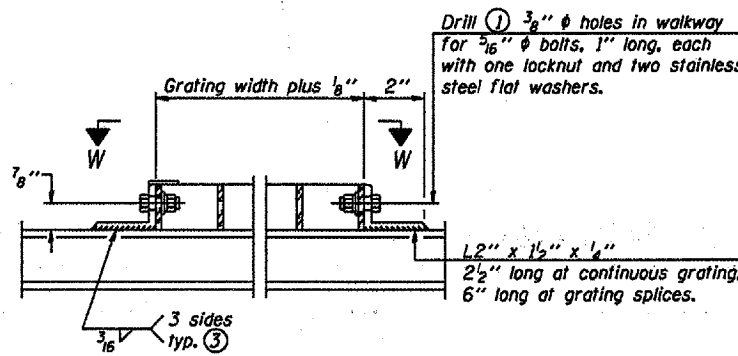


(CONTINUOUS WALKWAY GRATING)

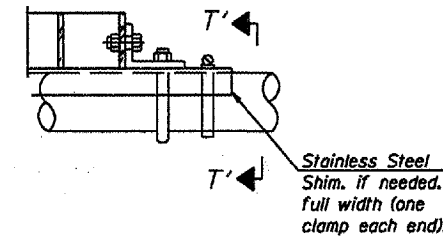
SECTION W-W



(AT WALKWAY GRATING SPLICE)

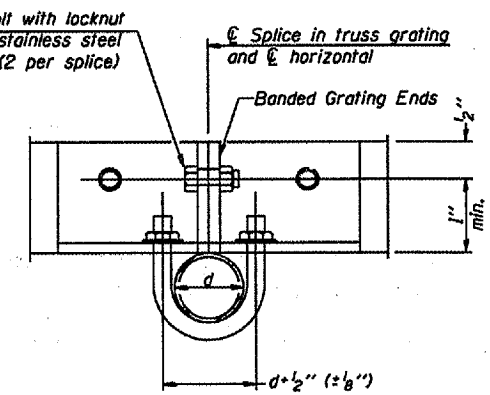


DETAIL W
(Walkway grating)

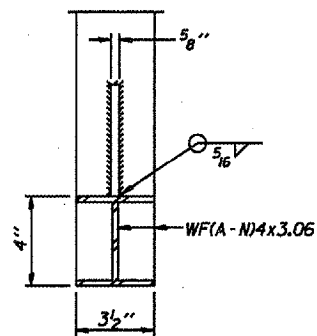


DETAIL T'
(Truss grating splice)

Details not shown same as Detail T. Alternate materials may be used subject to the Engineer's review and approval.

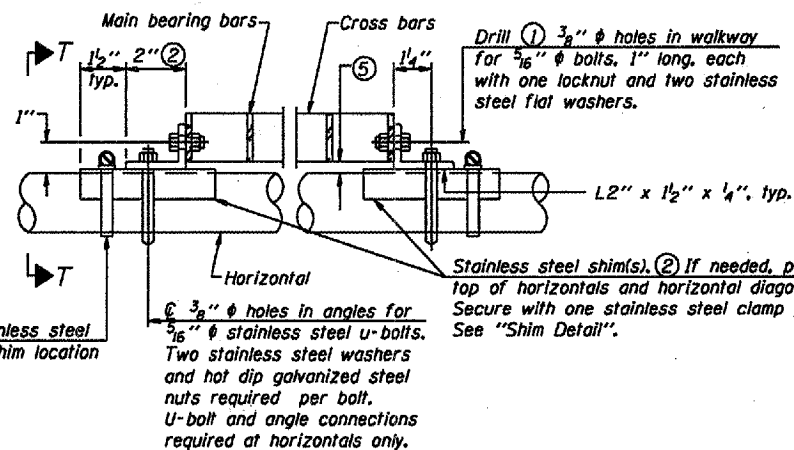


SECTION T'-T'



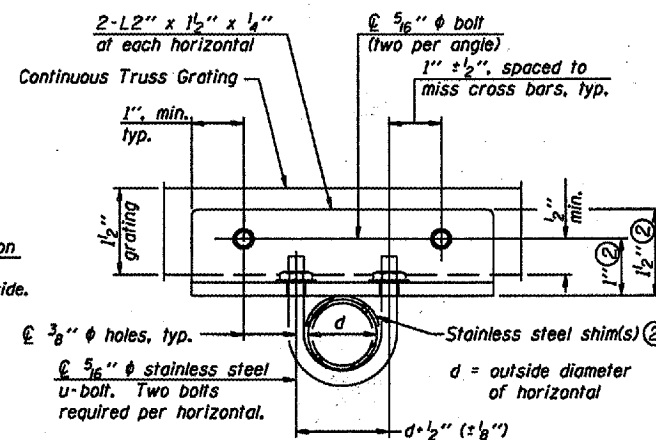
SECTION D-D

Screw type stainless steel tube clamp at shim location



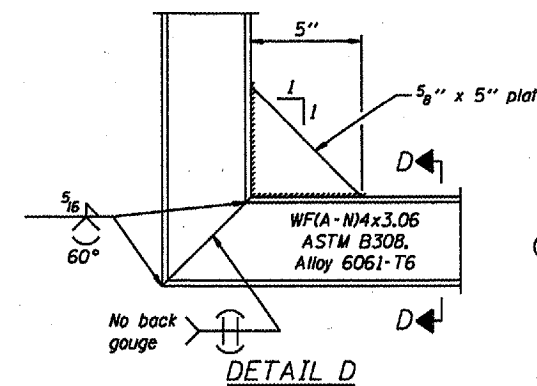
DETAIL T

(Continuous Truss grating)

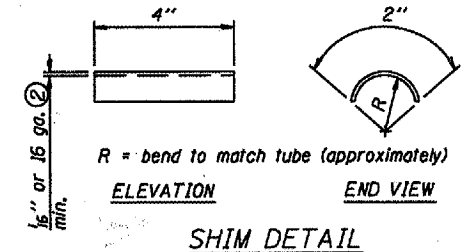


SECTION T-T

This Sheet For Information Only



DETAIL D



R = bend to match tube (approximately)
ELEVATION
END VIEW
SHIM DETAIL

NUMBER	REVISION	DATE

DESIGNED -		20
CHECKED -	EXAMINED	
DRAWN -	PASSED	ENGINEER OF BRIDGE DESIGN
CHECKED -		ENGINEER OF BRIDGES AND STRUCTURES

OSC-A-7

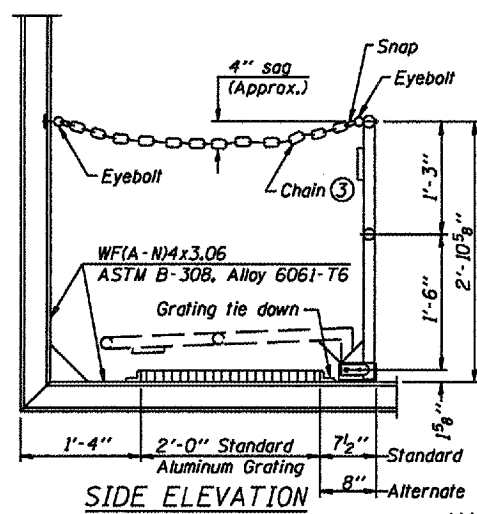
7/01/2006

- Drilling holes in grating may be done in shop or field, based on Contractor's preference and subject to accurate alignment.
- Stainless steel shims shall be placed as shown in Detail T if needed to compensate for alignment variations between horizontal and diagonal pipes beyond adjustment provided by angles. Thicker shims may be used subject to shims performing properly.
- If Handrail Joint present, weld angle to WF(A-N)4 and 1/4" extension bars. (See Base Sheet OSC-A-B.)
- 1/8" x 1/2" x 2" welded to handrail posts to protect locations that contact grating.
- Tube to grating gap may vary from 0 to 1/2", max. to align walkway, allow for camber, etc.

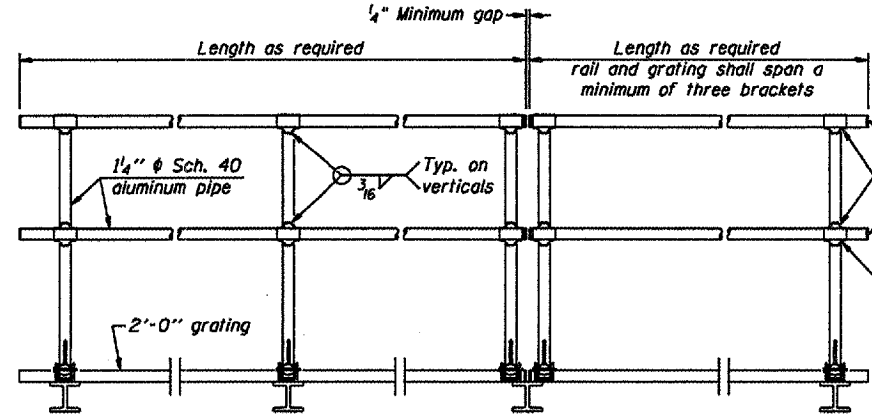
Structure Number	Station	A	B	C	D

CANTILEVER SIGN STRUCTURES
WALKWAY DETAILS
ALUMINUM TRUSS & STEEL POST

District 5
Overhead Sign
Structure Replacement



SIDE ELEVATION
(Showing Safety Chain W/O Sign)

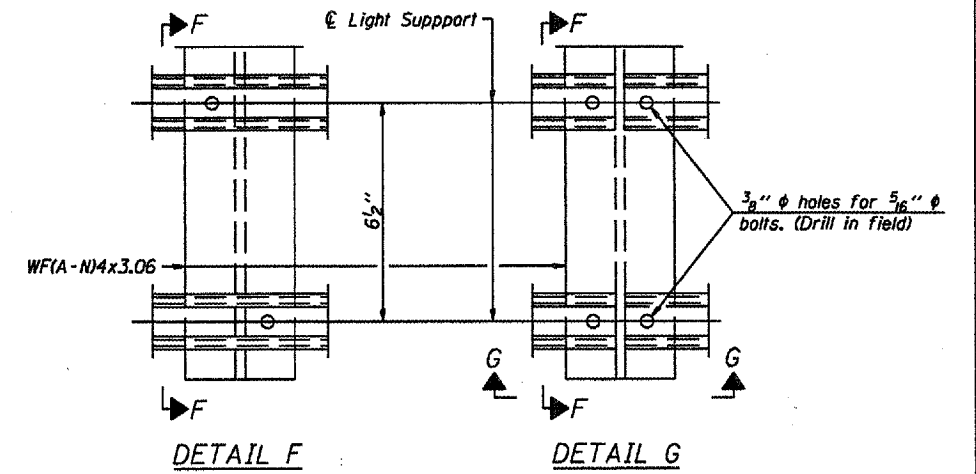


FRONT ELEVATION

HANDRAIL DETAILS

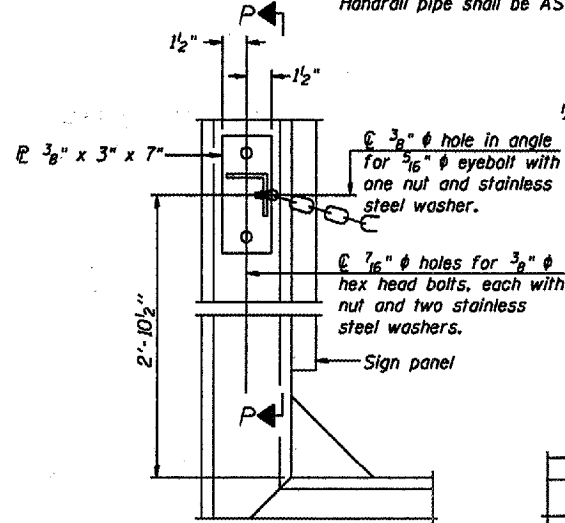
Handrail pipe shall be ASTM B241 or B429, Alloy 6063-T6 or Alloy 6061-T6.

- ① Install standard force-fit end caps or weld 1/2" end plates with 1/8" c.f.w. and grind smooth. (All rail ends)
- ② Horizontal handrail member shall be continuous thru fitting. Provide 7/16" hole in fitting for 3/8" bolt. Field drill 7/16" hole in horizontal rail member. Provide locknut and two stainless steel washers for bolt. (Use 5/16" eyebolts in 1/6" holes on top rail at ends only.)



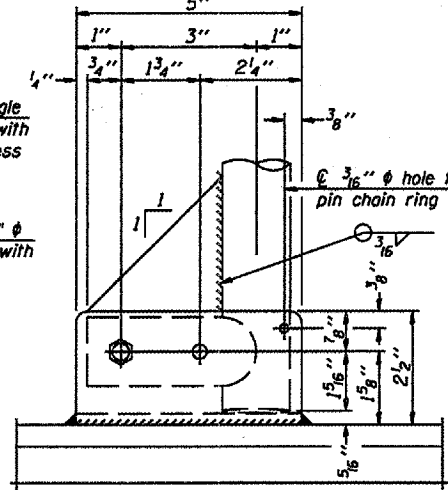
DETAIL F

DETAIL G

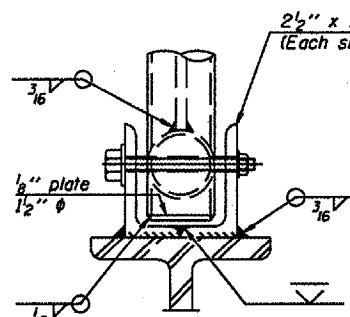


ALTERNATE SAFETY CHAIN ATTACHMENT

(With Sign Present)
Items not shown same as "Side Elevation" of "Handrail Details"

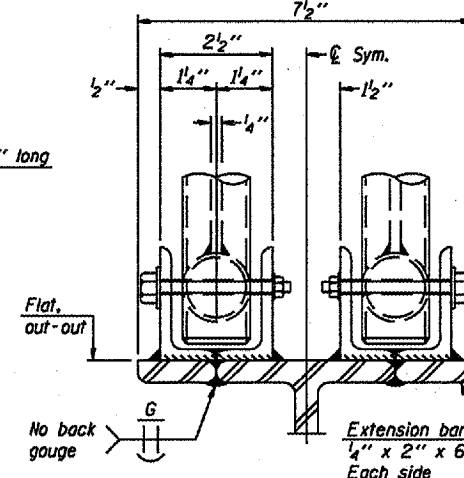


SIDE ELEVATION



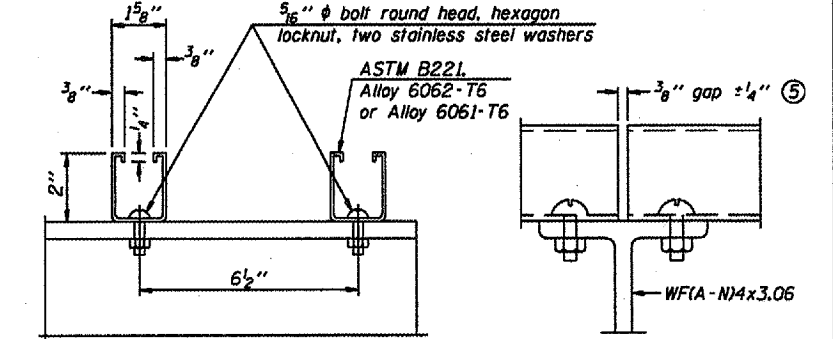
FRONT ELEVATION

Details not shown same as "ELEVATION" at right.



ELEVATION AT HANDRAIL JOINT ④

Details not shown same as "FRONT ELEVATION"

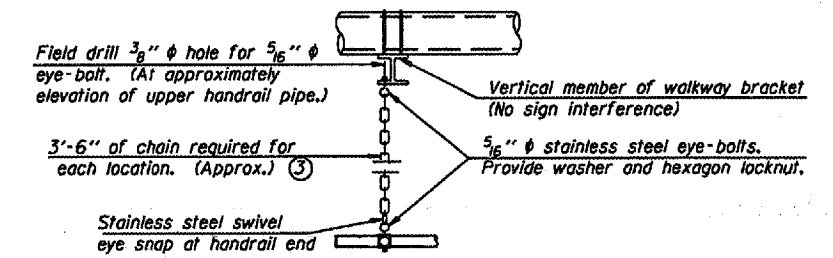


SECTION F-F

SECTION G-G

LIGHTING FIXTURE MOUNTS (IF REQUIRED)

- ⑤ Field cut ends of light support channels shall be free of burrs or hazardous projections and coated with zinc-rich primer or equivalent.



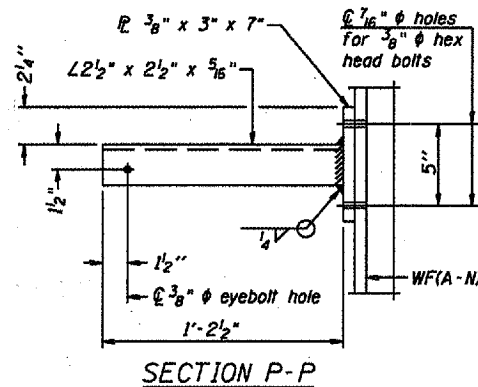
SAFETY CHAIN

One required for each end of each walkway.

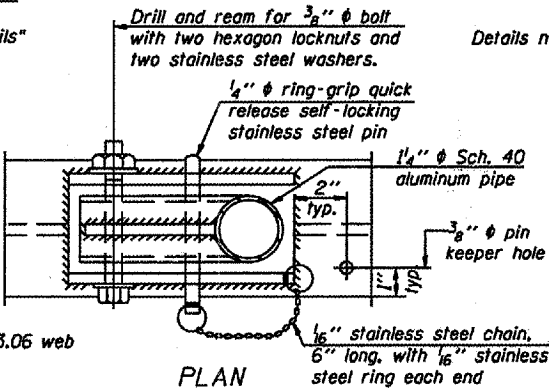
This Sheet For Information Only

CANTILEVER SIGN STRUCTURES
HANDRAIL DETAILS
ALUMINUM TRUSS & STEEL POST

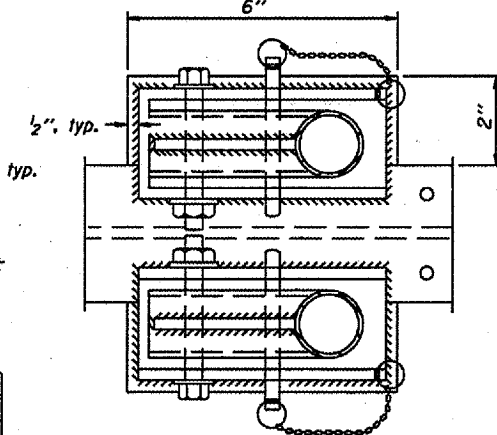
District 5
Overhead Sign
Structure Replacement



SECTION P-P

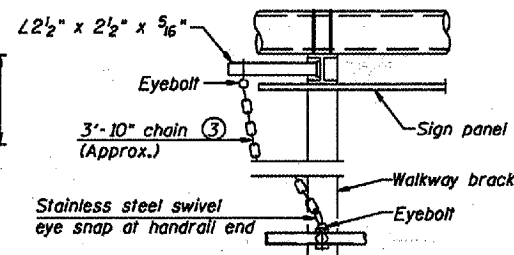


DETAIL E HANDRAIL HINGE



PLAN AT HANDRAIL JOINT

Details not shown same as "PLAN"



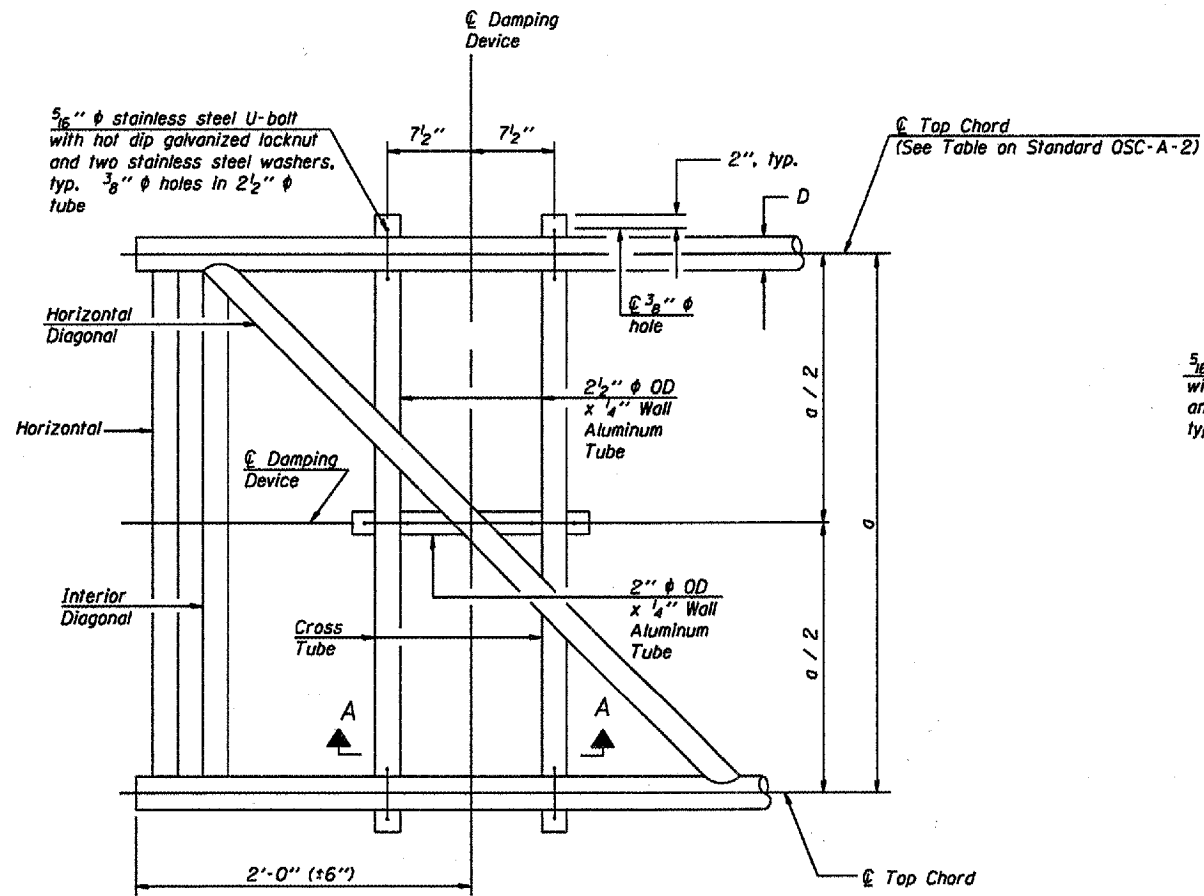
ALTERNATE SAFETY CHAIN ATTACHMENT

Details not shown similar to "Safety Chain" Details (Walkway omitted for clarity)

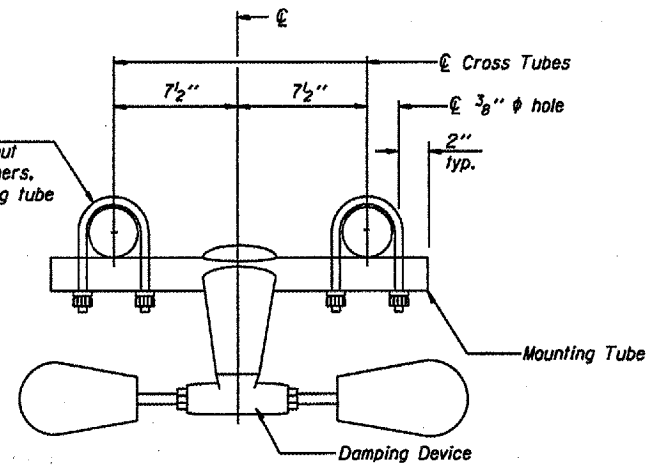
- ③ 3/16" Type 304L stainless steel chain, approximately 12 links per foot.
- ④ Extrusions may be used in lieu of the details shown, with approval of the Engineer.

DESIGNED	20
CHECKED	EXAMINED
DRAWN	PASSED
CHECKED	ENGINEER OF BRIDGES AND STRUCTURES

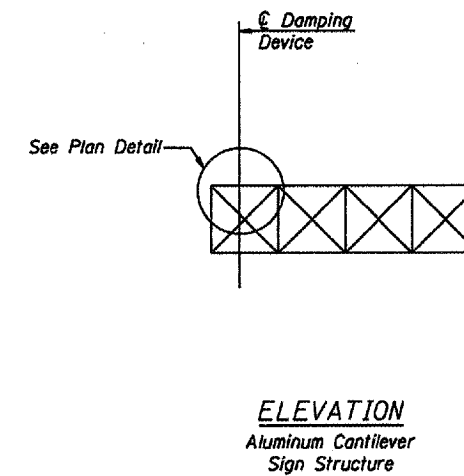
NUMBER	REVISION	DATE



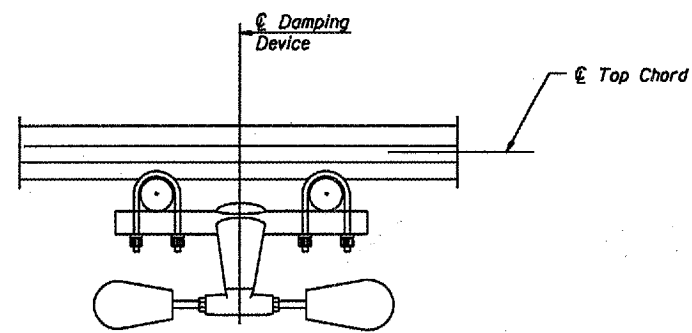
PLAN DETAIL



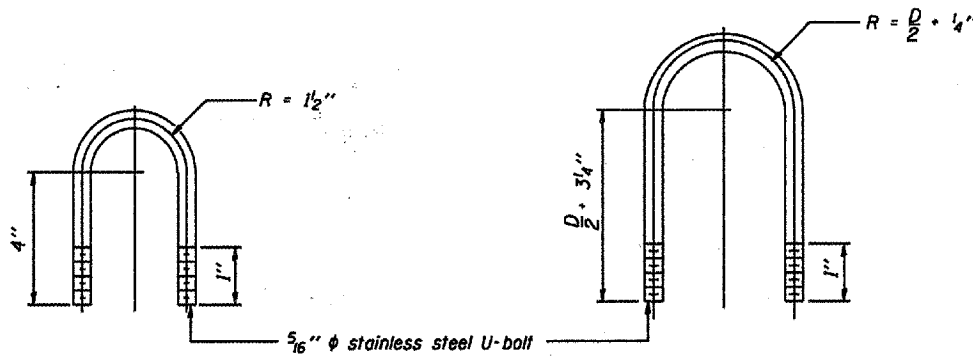
TRUSS DAMPING
DEVICE CONNECTION DETAIL



ELEVATION
Aluminum Cantilever
Sign Structure



SECTION A-A



DAMPING DEVICE MOUNTING
TUBE U-BOLT DETAIL
(Typical)

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

GENERAL NOTES

- Damper: One damper per truss. (31 lbs. Stockbridge-Type Aluminum)
Materials: Aluminum tubes shall be ASTM B221 alloy 6061 temper T6

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES

OSC-A-D

7/01/2006

CANTILEVER SIGN STRUCTURE
DAMPING DEVICE

District 5
Overhead Sign
Structure Replacement

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

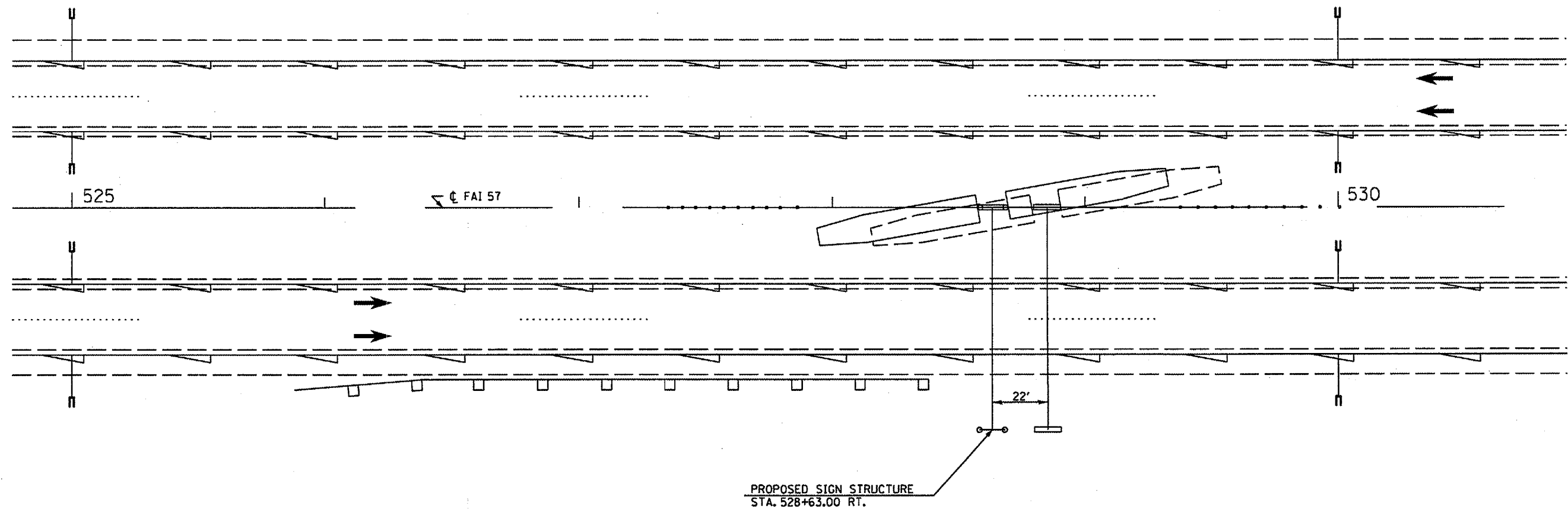
Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 30 of 51
Contract Number 44949

IMPACT ATTENUATORS, RELOCATE (NON-REDIRECTIVE), TEST LEVEL 3 (Z0030350)

	STATION	QUANTITY (EACH)
MED.	528+57.00	1.0
MED.	528+69.00	1.0
TOTAL =		2.0

GUARD POSTS REMOVAL (63400205)

	STATION	QUANTITY (EACH)
MED.	527+94.00	5
MED.	529+33.00	5
TOTAL =		10



GUARD POSTS (63400105)

	STATION	QUANTITY (EACH)
MED.	527+94.00	10.0
MED.	529+33.00	10.0
TOTAL =		20.0

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

20
EXAMINED
ENGINEER OF BRIDGE DESIGN
PASSED
ENGINEER OF BRIDGES AND STRUCTURES

OVERHEAD SIGN STRUCTURE
5S0101057R 236.24

District 5
Overhead Sign
Structure Replacement

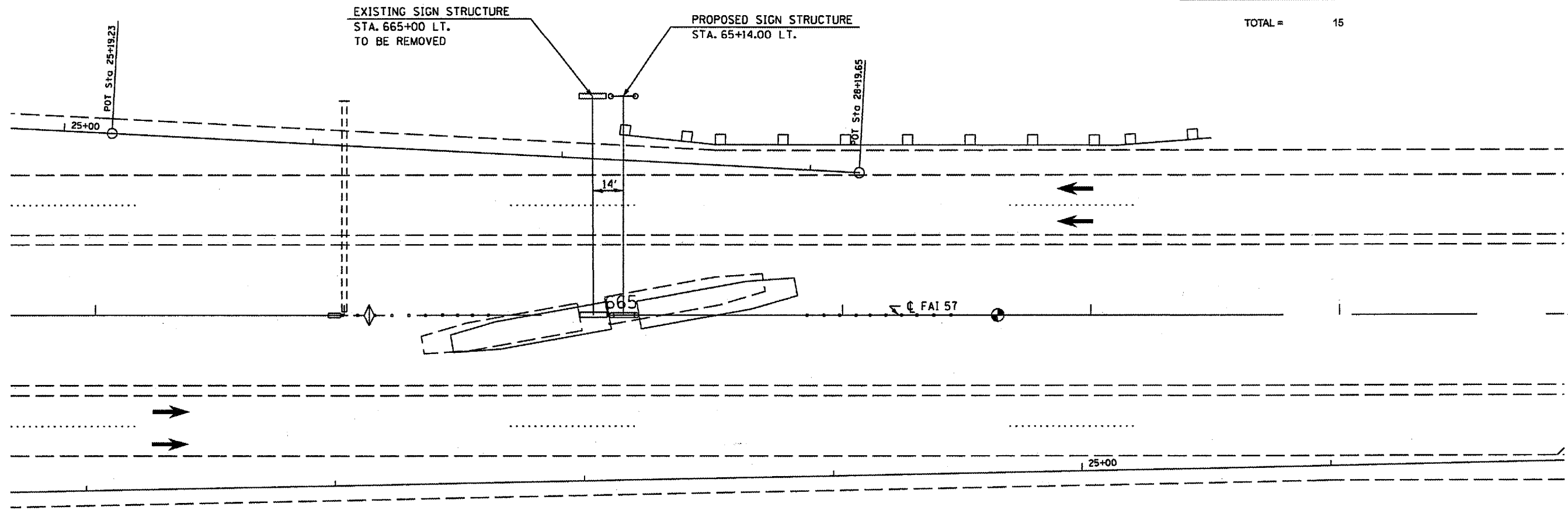
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 31 of 51
Contract Number 44949

GUARD POSTS REMOVAL (63400205)

	STATION	QUANTITY (EACH)
MED.	664+43.00	7
MED.	665+90.00	8
TOTAL =		15



IMPACT ATTENUATORS, RELOCATE (NON-REDIRECTIVE), TEST LEVEL 3 (Z0030350)

	STATION	QUANTITY (EACH)
MED.	665+06.00	1.0
MED.	665+18.00	1.0
TOTAL =		2.0

GUARD POSTS (63400105)

	STATION	QUANTITY (EACH)
MED.	664+43.00	10.0
MED.	665+90.00	10.0
TOTAL =		20.0

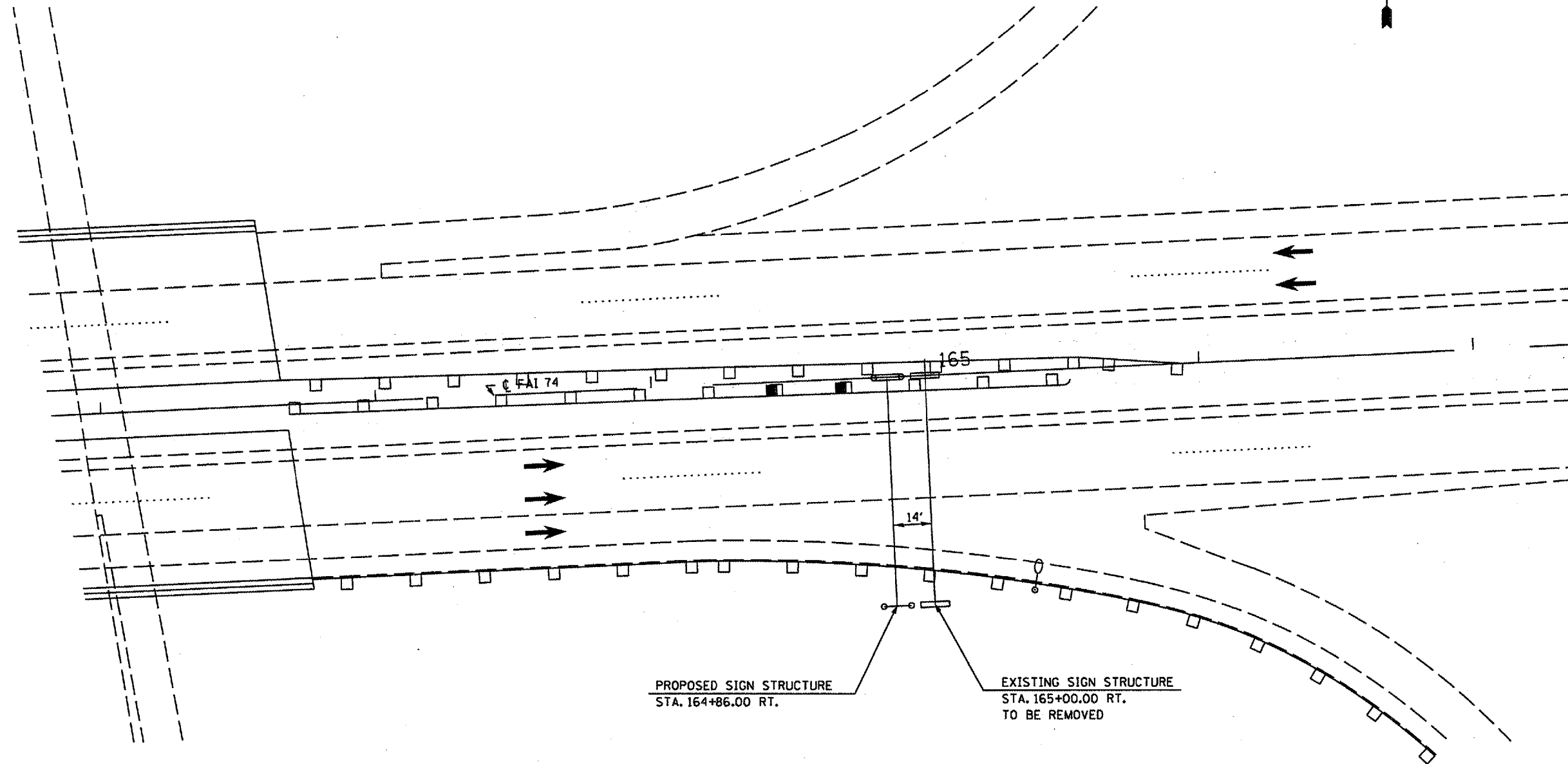
DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	ENGINEER OF BRIDGE DESIGN
CHECKED -	PASSED
	ENGINEER OF BRIDGES AND STRUCTURES

OVERHEAD SIGN STRUCTURE
5S0101057L 238.44

District 5
Overhead Sign
Structure Replacement

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 32 of 51
Contract Number 44949



STEEL PLATE BEAM GUARDRAIL, TYPE B (63000005)

	STATION	TO	STATION	QUANTITY (FOOT)
MED RT.	164+42.00		164+92.00	50.0
TOTAL =				50.0

GUARDRAIL REMOVAL (63200310)

	STATION	TO	STATION	QUANTITY (FOOT)
MED RT.	164+42.00		164+92.00	50.0
TOTAL =				50.0

GUARDRAIL MARKERS (78200405)

	STATION	QUANTITY (EACH)
MED RT.	164+42.00	1.0
TOTAL =		1.0

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

EXAMINED	20
PASSED	ENGINEER OF BRIDGE DESIGN
	ENGINEER OF BRIDGES AND STRUCTURES

OVERHEAD SIGN STRUCTURE
5S0101074R 179.10

District 5
Overhead Sign
Structure Replacement

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 33 of 51
Contract Number 44949

TRAFFIC BARRIER TERMINAL TYPE 1, SPECIAL (TANGENT): (63100167)

STATION	TO	STATION	QUANTITY (EACH)
MED RT.	1880+41.25	1880+91.25	1.0
TOTAL =			1.0

TERMINAL MARKER - DIRECT APPLIED (78201000)

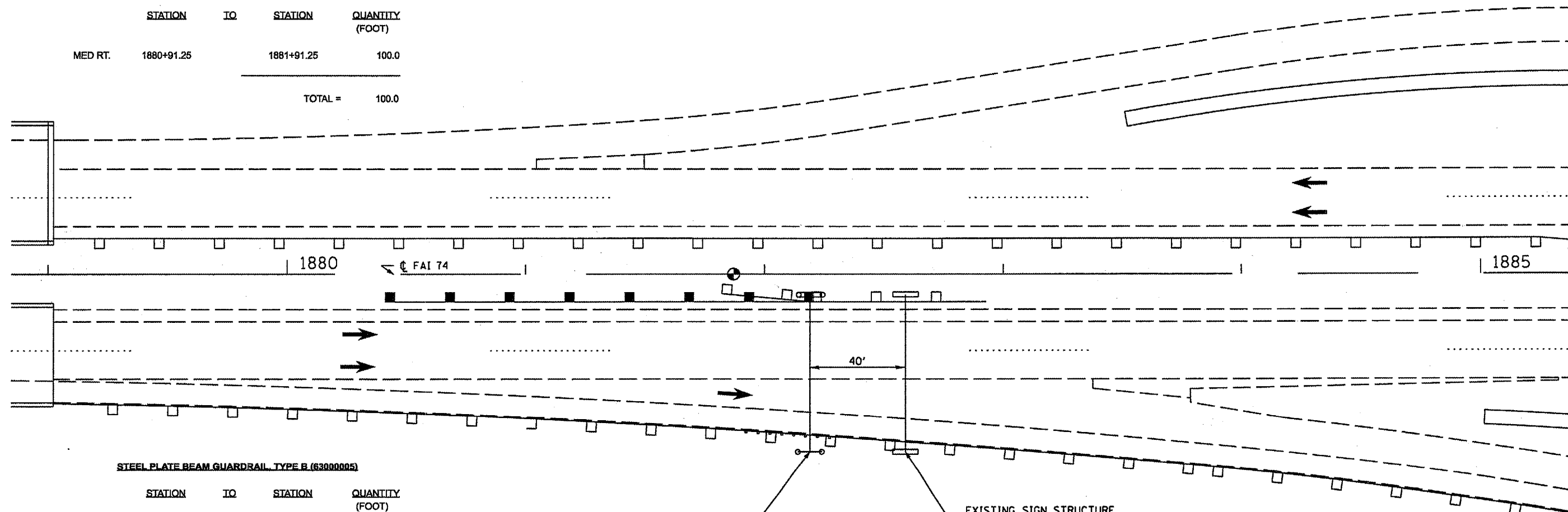
STATION	QUANTITY (EACH)
MED RT. 1881+28.75	1.0
TOTAL =	1.0

STEEL PLATE BEAM GUARDRAIL, STEEL POSTS (63300730)

STATION	TO	STATION	QUANTITY (EACH)
OUTSIDE RT.	1881+75.00	1882+25.00	8.0
TOTAL =			8.0

STEEL PLATE BEAM GUARDRAIL, TYPE A (63000000)

STATION	TO	STATION	QUANTITY (FOOT)
MED RT.	1880+91.25	1881+91.25	100.0
TOTAL =			100.0



STEEL PLATE BEAM GUARDRAIL, TYPE B (63000005)

STATION	TO	STATION	QUANTITY (FOOT)
MED RT.	1881+91.25	1882+41.25	50.0
TOTAL =			50.0

PROPOSED SIGN STRUCTURE
STA. 1882+19.00 RT.

EXISTING SIGN STRUCTURE
STA. 1882+59.00 RT.
TO BE REMOVED

GUARDRAIL MARKERS (76200405)

STATION	TO	STATION	QUANTITY (EACH)
MED RT.	1881+28.75	1882+41.25	3.0
TOTAL =			3.0

GUARDRAIL REMOVAL (63200310)

STATION	TO	STATION	QUANTITY (FOOT)
MED RT.	1881+91.25	1882+41.25	50.0
TOTAL =			50.0

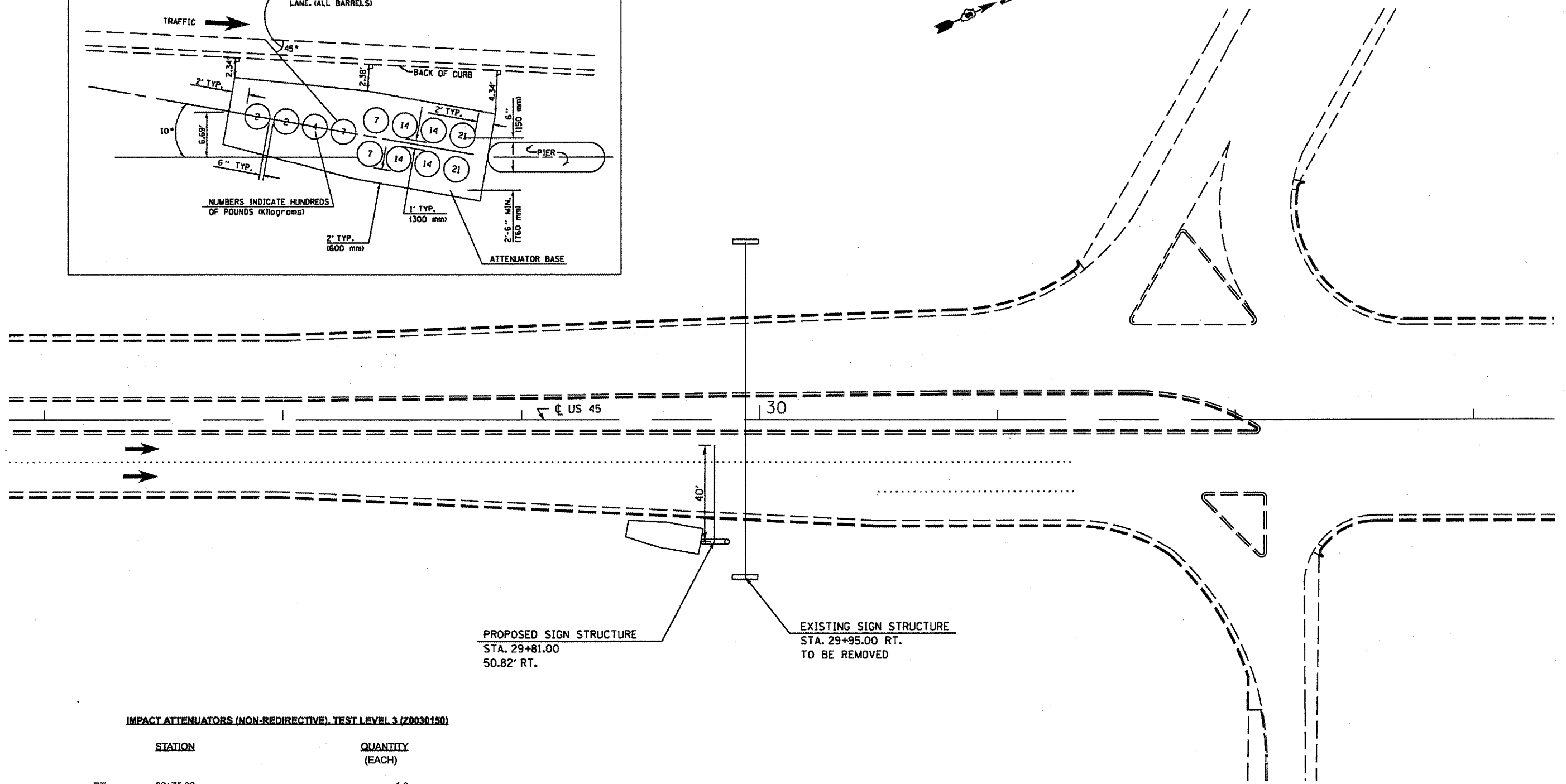
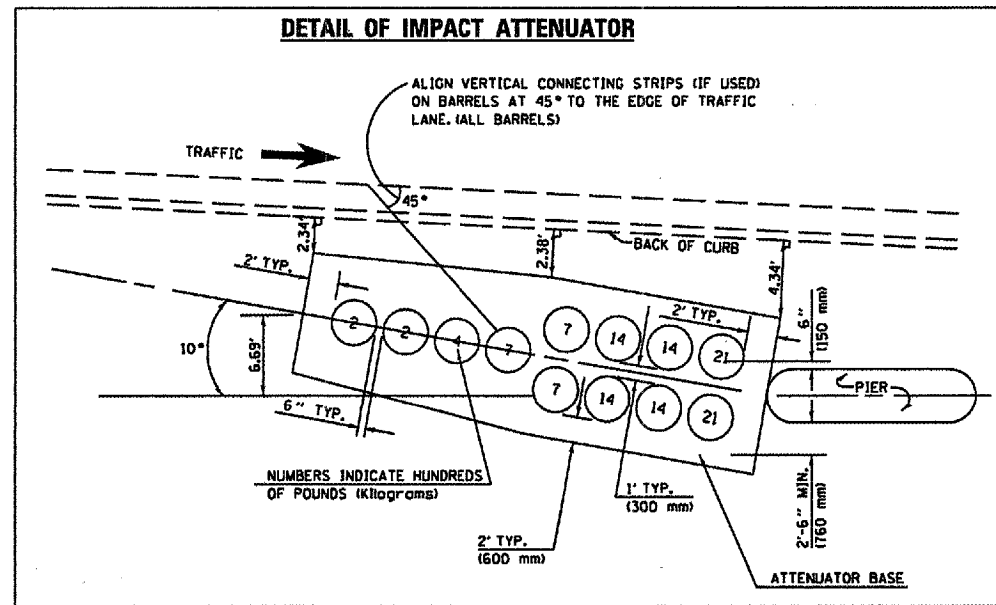
DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

20
EXAMINED
ENGINEER OF BRIDGE DESIGN
PASSED
ENGINEER OF BRIDGES AND STRUCTURES

OVERHEAD SIGN STRUCTURE
550101074R 213.40

District 5
Overhead Sign
Structure Replacement





IMPACT ATTENUATORS (NON-REDIRECTIVE), TEST LEVEL 3 (Z0030150)

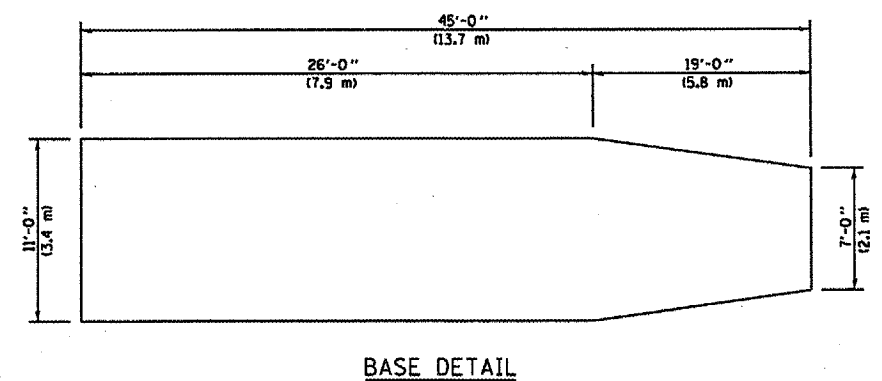
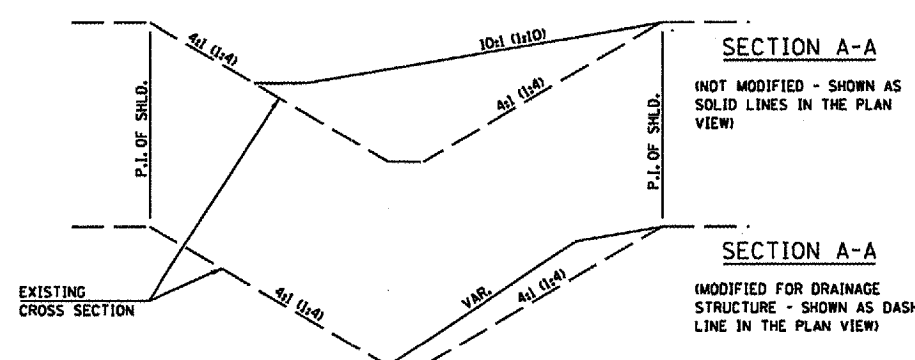
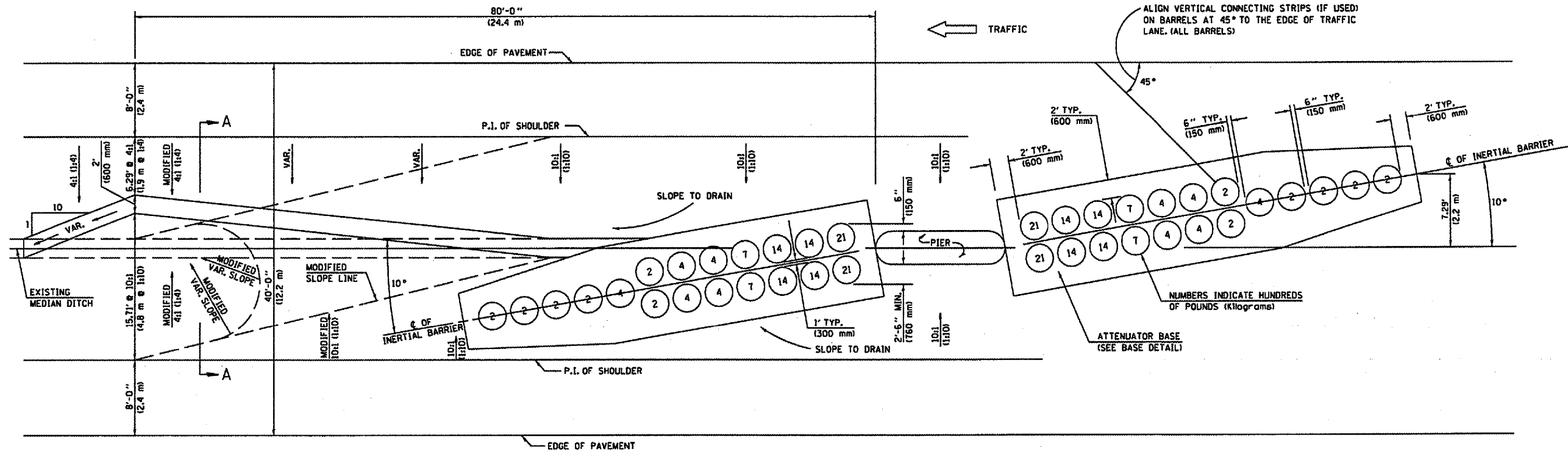
STATION	QUANTITY (EACH)
RT. 29+75.00	1.0
TOTAL =	1.0

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES

OVERHEAD SIGN STRUCTURE
5S010U045R 012.76

District 5
Overhead Sign
Structure Replacement

70 MPH (110 km/h) DESIGN - 40' (12 m) MEDIAN



GENERAL NOTES

- ALL 10:1 (1:10) SLOPES SHOWN ON THIS DETAIL SHALL BE CONSTRUCTED 10:1 (1:10) OR FLATTER.
- ANY EXISTING DRAINAGE STRUCTURES LOCATED WITHIN THE 80' (24.4 m) WORKING AREA SHALL BE MODIFIED OR LEFT IN PLACE AS SHOWN ON THE PLANS. WHERE THE EXISTING DRAINAGE STRUCTURES ARE TO REMAIN IN PLACE, THE SLOPES ARE TO BE CONSTRUCTED AS SHOWN AS MODIFIED SLOPES ON THIS DETAIL AND AS DIRECTED BY THE ENGINEER.
- THE SLOPES AS SHOWN ON THIS DETAIL SHALL APPLY TO BOTH ENDS OF THE BRIDGE PIERS.
- THE LENGTH X WIDTH OF MODULE LAYOUT IS 41.0' x 7.0' : 19 MODULES - 14,400 LBS. (12.5 m x 2.1 m : 19 MODULES - 6532 kg).
- IN AREAS OF 10:1 (1:10) SLOPES PRECEDING THE ATTENUATOR IN THE MEDIAN INSTALLATION, FOUR WOOD POSTS SHALL BE PLACED AT 5' (1.5 m) INTERVALS IN THE MEDIAN C. SEE SPECIAL PROVISIONS.

Note: All dimensions are in INCHES (millimeters) unless otherwise shown.

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES

DATE	REVISIONS	NAME
11/06	Replaced Detail E-151A	TJB

ILLINOIS DEPARTMENT OF TRANSPORTATION

IMPACT ATTENUATORS
(NON-REDIRECTIVE)
TEST LEVEL 3

DISTRICT 5 DETAIL NO. Z003015B



Illinois Department of Transportation

Memorandum

To: Operations Attn: Kevin Woods
From: Project Implementation - Materials
Subject: FOUNDATION BORING LOGS *Seal & Log*
Date: December 18, 2006

FAI Rt. 57 & FAI Rt. 74
Structure No.: Mast Arm Foundations
Champaign & Vermilion Counties
Soil Borings for Mast Arm Foundations.

Attached are the foundation boring logs for the below listed locations. Please note that soil borings were not taken at location #4 because of safety concerns. However, it was observed that the existing soils at location 4 consist of embankment and not natural in-situ soils.

- Location 1: Truss # 5S011057R236.24 - I-57 Northbound, 1 mile North of I-74.
- Location 2: Truss # 5S011057R238.44 - I-57 Southbound, 1 mile North of I-74.
- Location 3: Truss # 5S010U45R012.76 - U.S. Route 45 Northbound at I-74 East Exit Ramp.
- Location 4: Truss # 5S010I074R179.10 - I-74 Eastbound, Southwest Corner of I-57 Interchange.
- Location 5: Truss # 5S0921074R213.40 - I-74 Eastbound, Tilton Exit Offramp at G Street.

If you have any questions, or require any additional information, please contact Ron Wagoner, Region 3 - District 5 Geotechnical Engineer, at (217) 466-7271.

CNA/gjn

S:\SOILS\2006 Soil Work\MAST.ARMS .doc

DEC 18 2006 10:30 AM

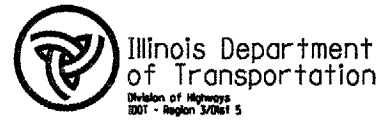
Attachments

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

20
EXAMINED
ENGINEER OF BRIDGE DESIGN
PASSED
ENGINEER OF BRIDGES AND STRUCTURES

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 37 of 51
Contract Number 44949



SOIL BORING LOG

Page 1 of 1

Date 12/14/06

ROUTE FAI Rt. 57 DESCRIPTION Most Arm on I-57 for Exit # 237A-B LOGGED BY CNA
SECTION _____ LOCATION SE, SEC. 34, TWP. 19N, RNC. 08E, 3rd PM
COUNTY Champaign DRILLING METHOD Hollow Stem Auger HAMMER TYPE Automatic

STRUCT. NO. Station	D E P T H	B L O W S	U C S	M O I S T	Surface Water Elev. _____ ft	D E P T H	B L O W S	U C S	M O I S T	Stream Bed Elev. _____ ft	Groundwater Elev.:	D E P T H	B L O W S	U C S	M O I S T	First Encounter _____ ft	Upon Completion _____ ft	After _____ Hrs.	
																			(ft)
55011057R236.24																			
1 MAST ARM																			
Station 529+15																			
Offset 37.0 ft Lt. of NB CL																			
Ground Surface Elev. 753.5																			
Black Silty Clay (Topsoil)																			
751.5																			
Brown Mottled Silty Clay																			
2																			
3																			
26																			
747.5																			
Brown Sandy Clay Loam Till with Intermittent Sand Seams																			
0																			
1																			
19																			
745.5																			
Gray Clay Loam Till with Intermittent Sand Seams																			
0																			
1		0.4																	
15		B																	
2																			
4		2.3																	
14		S																	
6																			
740.5																			
Gray Clay Loam Till																			
2																			
3		2.9																	
12		B																	
5																			
2																			
4		2.0																	
12		B																	
8																			
3																			
6		6.0																	
11		B																	
10																			

1/18/2007 3:05:46 PM S:\SOILBORING LOGS\CHAMPAIGN COUNTY\MAST ARM 5 S 010 1057 R 236.24.DPJ

An assumed centerline elevation of 100.00 and station of 10+00 is used when this information is not available.
The Unconfined Compressive Strength (UCS) Failure Mode is Indicated by (B-Bulge, S-Shear, P-Penetrator)
The SPT (N Value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	ENGINEER OF BRIDGE DESIGN
CHECKED -	PASSED
	ENGINEER OF BRIDGES AND STRUCTURES



SOIL BORING LOG

Page 1 of 1

Date 12/15/06

ROUTE FAI Rt. 74 DESCRIPTION Most Arm of G Street Off Ramp LOGGED BY CNA
SECTION _____ LOCATION SW, SEC. 18, TWP. 19N, RNC. 12W, 2nd PM
COUNTY Vermilion DRILLING METHOD Hollow Stem Auger HAMMER TYPE Automatic

STRUCT. NO. Station	D E P T H	B L O W S	U C S	M O I S T	Surface Water Elev. _____ ft	D E P T H	B L O W S	U C S	M O I S T	Stream Bed Elev. _____ ft	Groundwater Elev.:	D E P T H	B L O W S	U C S	M O I S T	First Encounter _____ ft	Upon Completion _____ ft	After _____ Hrs.	
																			(ft)
55092-1074 R 213.40																			
1 MAST ARM																			
Station 165+06																			
Offset 31.0 ft Rt.																			
Ground Surface Elev. 769.9																			
Asphalt (Shoulder Pavement)																			
768.9																			
Gray to Black Mixed Sandy Clay Loam (Embankment)																			
4																			
3																			
13																			
5																			
3																			
5																			
761.9																			
Gray Clay to Silty Clay (Embankment)																			
6																			
6																			
8																			
4																			
4																			
13																			
6																			
758.9																			
Gray to Brown Mottled Sandy Clay Loam (Embankment)																			
3																			
4		3.3																	
22		B																	
7																			
5																			
12																			
11																			
5																			
7																			
11																			
10																			

1/18/2007 3:06:51 PM S:\SOILBORING LOGS\VERMILION COUNTY\MAST ARM 092-1074 R 213.40.DPJ

An assumed centerline elevation of 100.00 and station of 10+00 is used when this information is not available.
The Unconfined Compressive Strength (UCS) Failure Mode is Indicated by (B-Bulge, S-Shear, P-Penetrator)
The SPT (N Value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 38 of 51
Contract Number 44949



SOIL BORING LOG

Page 1 of 1

Date 11/29/06

ROUTE FAI Rt. 57 DESCRIPTION Most Arm at Olympian Drive - Exit 238 LOGGED BY CNA

SECTION _____ LOCATION SW, SEC. 26, TWP. 20N, RNG. 8E, 3rd PM

COUNTY Champaign DRILLING METHOD Hollow Stem Auger HAMMER TYPE Automatic

STRUCT. NO. 55 010 1057 L
Station 238.44
665+00

BORING NO. 1 MAST ARM
Station 694.90
Offset 46.0 ft Lt.
Ground Surface Elev. 759.3 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter _____ ft
Upon Completion DRY ft
After _____ Hrs. _____ ft

Description	Depth (ft)	Blow Count (1/6")	Blow Count (tsf)	Blow Count (12)	Soil Description				
					D	B	U	M	
Brown Sandy Clay Loam (Backfill)	0								
	2								
	2								
	5								
753.3									
Brown/Gray Mottled Clay Loam	2								
	3	1.8		16					
	5	B							
751.3									
Brown Clay Loam Till	2								
	4	3.9		14					
	8	B							
	10								
	6	4.7		14					
	10	B							
746.3									
Gray Clay Loam Till	3								
	7	5.4		11					
	10	B							
	15								
	3								
	7	4.9		11					
	8	B							
	3								
	5	3.5		12					
	8	B							
	20								

11/18/2007 3:00:11 PM S:\SOILS\BORING LOGS\CHAMPAIGN CNTY\10-5758 MAST ARM 010-1057 L 238.44.RPJ

An assumed centerline elevation of 100.00 and station of 10+00 is used when this information is not available.
The Unconfined Compressive Strength (UCS) Failure Mode is Indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N Value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

EXAMINED	20
PASSED	ENGINEER OF BRIDGE DESIGN
	ENGINEER OF BRIDGES AND STRUCTURES



SOIL BORING LOG

Page 1 of 1

Date 11/28/06

ROUTE US Rt. 45 DESCRIPTION Most Arm over Rt. 45 just South of FAI 74 LOGGED BY CNA

SECTION _____ LOCATION SW, SEC. 4, TWP. 19N, RNG. 9E, 3rd PM

COUNTY Champaign DRILLING METHOD Hollow Stem Auger HAMMER TYPE Automatic

STRUCT. NO. 55 010 U045
Station RO12.76
30+00

BORING NO. 1 MAST ARM
Station 30+04
Offset 66.0 ft Rt.
Ground Surface Elev. 725.3 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

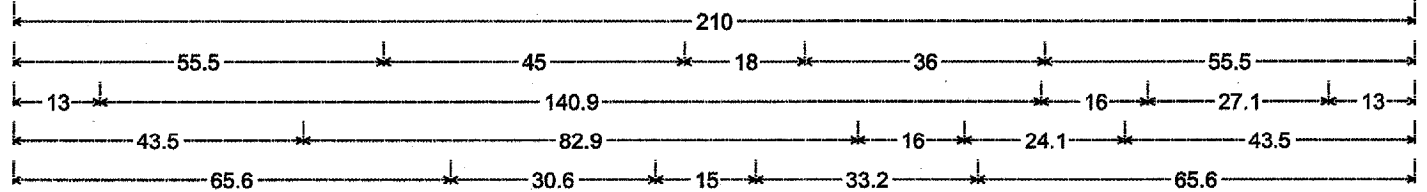
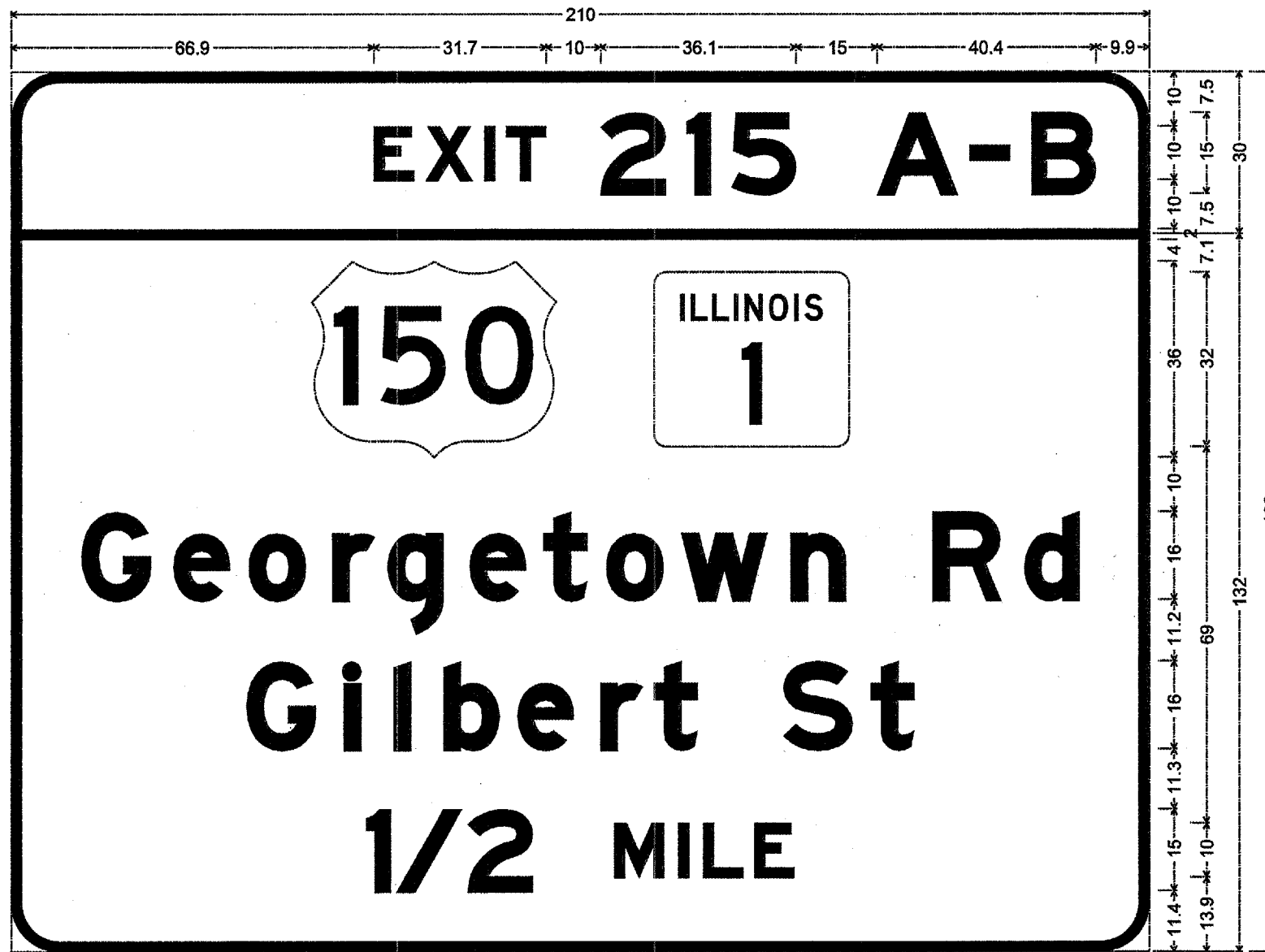
Groundwater Elev.:
First Encounter _____ ft
Upon Completion DRY ft
After _____ Hrs. _____ ft

Description	Depth (ft)	Blow Count (1/6")	Blow Count (tsf)	Blow Count (12)	Soil Description				
					D	B	U	M	
Brown/Gray Mottled Silty Clay	0								
	1								
	2								
	5								
719.3									
Brown Sandy Clay Loam	1								
	2	1.2		15					
	3	B							
717.3									
Brown Silty Clay Loam	1								
	3	2.1		16					
	4	S							
	10								
714.3									
Gray Clay Loam Till	0								
	2	1.2		19					
	4	B							
	2								
	2								
(No Sample - Rock Stuck in Sampler)	15								
	2								
	4	2.5		11					
	5	B							
	2								
	4	3.0		11					
	5	B							
	20								

11/18/2007 3:00:50 PM S:\SOILS\BORING LOGS\CHAMPAIGN CNTY\10-5758 MAST ARM 010-U045 R 012.76.RPJ

An assumed centerline elevation of 100.00 and station of 10+00 is used when this information is not available.
The Unconfined Compressive Strength (UCS) Failure Mode is Indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N Value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)



9.0" Radius, 2.0" Border, White on Green;
[EXIT 215 A-B] E Mod;
9.0" Radius, 2.0" Border, White on Green;
[Georgetown Rd] E Mod; [Gilbert St] E Mod; [1/2 MILE] E Mod;

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES



9.0" Radius, 2.0" Border, White on Green;
[EXIT 214] E Mod;
9.0" Radius, 2.0" Border, White on Green;
[G Street] E Mod; Arrow 80 - 25.0" 45°;

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 40 of 51
Contract Number 44949

District 7
Overhead Sign Structure Replacement

Location No.:	7-01	State I.D. No.:	7S058I072R137.1		
County:	Macon	Route:	1-72	M.P.:	137.1
				Direction:	EB
Description of Work	Unit	Quantity			
REMOVE OVERHEAD SIGN STRUCTURE - SPAN	EACH	1.00			
OVERHEAD SIGN STRUCTURE - SPAN, TYPE I A	FOOT	89.00			
DRILLED SHAFT CONCRETE FOUNDATION	CU YD	20.40			
REMOVE CONCRETE FOUNDATION OVERHEAD	EACH	4.00			
STRUCTURAL STEEL SUPPORT OVERHEAD SIGN STRUCTURE	EACH	2.00			
REMOVE & REINSTALL SIGN PANEL	SQ FT	155.50			
REMOVE & REINSTALL WALKWAY	FOOT	31.00			
FURNISH & INSTALL SAFETY CHAIN	EACH	2.00			
REPAIR HANDRAIL LOCKING PIN CONNECTION	EACH	6.00			
This structure is being completely replaced.					
Design or as built plans for this structure are not available.					

Location No.:	7-02	State I.D. No.:	7S058I072R138.1		
County:	Macon	Route:	1-72	M.P.:	138.1
				Direction:	EB
Description of Work	Unit	Quantity			
REMOVE OVERHEAD SIGN STRUCTURE SPAN	EACH	1.00			
OVERHEAD SIGN STRUCTURE - SPAN, TYPE II A	FOOT	108.00			
DRILLED SHAFT CONCRETE FOUNDATION	CU YD	24.60			
REMOVE CONCRETE FOUNDATION OVERHEAD	EACH	2.00			
STRUCTURAL STEEL SUPPORT OVERHEAD SIGN STRUCTURE	EACH	2.00			
REMOVE & REINSTALL SIGN PANEL	SQ FT	343.00			
REMOVE & REINSTALL WALKWAY	FOOT	63.00			
FURNISH & INSTALL SAFETY CHAIN	EACH	2.00			
REPAIR HANDRAIL LOCKING PIN CONNECTION	EACH	9.00			
REPLACE / TIGHTEN CLIP PER SIGN	EACH	2.00			
DISCONNECT / RECONNECT ELECTRIC SERVICE	EACH	1.00			
RELOCATE ELECTRIC SERVICE	EACH	1.00			

Location No.:	7-03	State I.D. No.:	7S058U051R000.41		
County:	Macon	Route:	U. S. 51	M.P.:	0.41
				Direction:	NB
Description of Work	Unit	Quantity			
REMOVE OVERHEAD SIGN STRUCTURE - SPAN	EACH	1.00			
OVERHEAD SIGN STRUCTURE - SPAN, TYPE IA	FOOT	95.00			
DRILLED SHAFT CONCRETE FOUNDATION	CU YD	20.40			
REMOVE CONCRETE FOUNDATION OVERHEAD	EACH	4.00			
STRUCTURAL STEEL SUPPORT OVERHEAD SIGN STRUCTURE	EACH	2.00			
REMOVE & REINSTALL SIGN PANEL	SQ FT	488.00			
REMOVE & REINSTALL WALKWAY	FOOT	49.25			
REPLACE / TIGHTEN CLIP PER SIGN	EACH	3.00			
REPAIR HANDRAIL LOCKING PIN CONNECTION	EACH	8.00			
FURNISH & INSTALL SAFETY CHAIN	EACH	2.00			
DISCONNECT / RECONNECT ELECTRIC SERVICE	EACH	1.00			
RELOCATE ELECTRIC SERVICE	EACH	1.00			

GENERAL NOTES

DESIGN: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. ("AASHTO Specifications")

CONSTRUCTION: Current (at time of letting) Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, Supplemental Specifications and Special Provisions. ("Standard Specifications")

LOADING: 90 M.P.H. WIND VELOCITY

WALKWAY LOADING: Dead load plus 500 lbs. concentrated live load.

DESIGN STRESSES:

Field Units
F_c = 3,500 p.s.i.
f_y = 60,000 p.s.i. (reinforcement)

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 Standard Specifications.

MATERIALS: Aluminum Alloys as shown throughout plans. All Structural Steel Pipe shall be ASTM A53 Grade B with a minimum yield of 35,000 p.s.i., or A500 Grade B or C with a minimum yield of 46,000 p.s.i. If A500 pipe is substituted for A53, then the outside diameter shall be as detailed and wall thickness greater than or equal to A53.

All Structural Steel Plates and Shapes shall conform to AASHTO M270 Gr. 36, Gr. 50 or Gr. 50W*. 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.

FASTENERS FOR ALUMINUM TRUSSES: All bolts noted as "high strength" must satisfy the requirements of AASHTO M164 (ASTM A325), or approved alternate, and must have matching lock nuts. Threaded studs for splices (if Members interfere) must satisfy the requirements of ASTM A449, ASTM A193, Grade B7, or approved alternate, and must have matching lock nuts. Bolts and lock nuts not required to be high strength must satisfy the requirements of ASTM A307. All bolts and lock nuts must be hot dip galvanized per AASHTO M232. The lock nuts must 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 AND EYEBOLTS: U-Bolts and Eyebolts must 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 must 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 lock nut.

GALVANIZING: All Steel Grating, Plates, Shapes and Pipe shall be Hot Dip Galvanized after fabrication in accordance with AASHTO M111. Painting is not permitted.

ANCHOR RODS: Shall conform to AASHTO M314 Gr. 36 or 55 with a minimum Charpy V-Notch (CVN) energy of 15 lb.-ft. at 40° F.

CONCRETE SURFACES: All concrete surfaces above an elevation 6" below the lowest final ground line at each foundation shall be cleaned and coated with Bridge Seat Sealer in accordance with the Standard Specifications.

REINFORCEMENT BARS: Reinforcement Bars designated (E) shall be epoxy coated in accordance with the Standard Specifications.

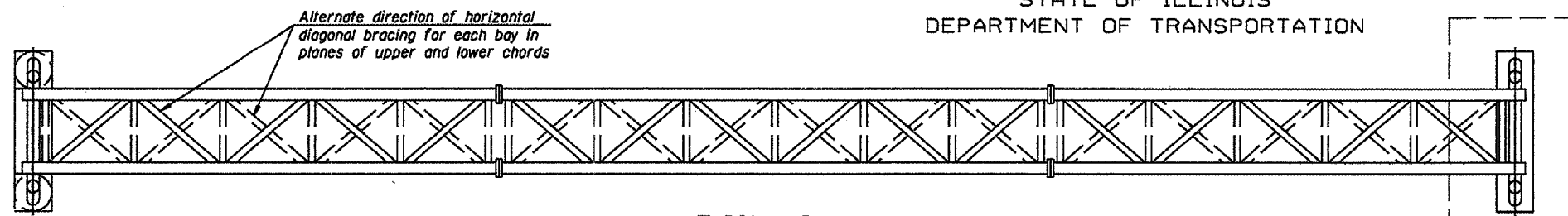
FOUNDATIONS: The contract unit price for Concrete Foundations and Drilled Shaft Concrete Foundations shall include reinforcement bars complete in place.

* If M270 Gr. 50W (M222) steel is proposed, chemistry for plate to be used shall first be approved by the Engineer as suitable for galvanizing and welding.

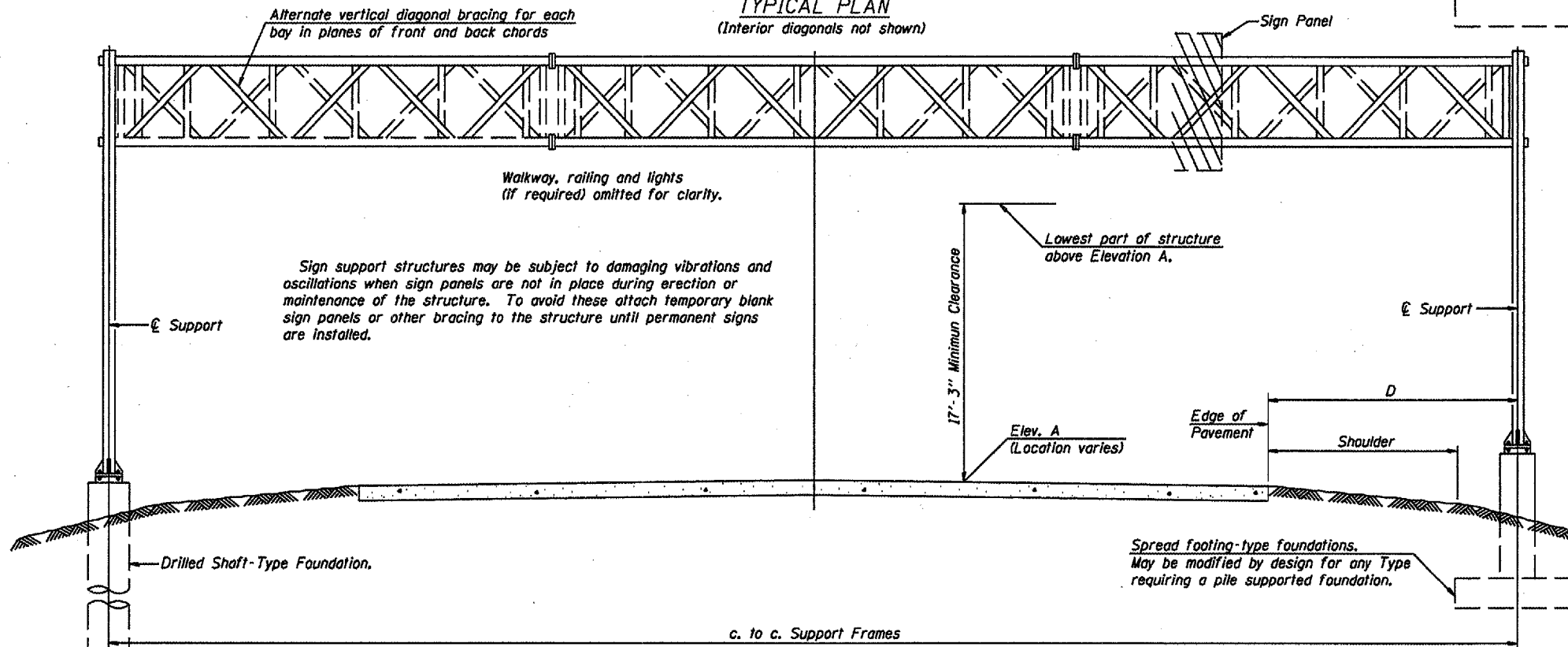
**OVERHEAD SIGN STRUCTURES
GENERAL PLAN & ELEVATION
ALUMINUM TRUSS & STEEL SUPPORTS**

District 7
Overhead Sign
Structure Replacement

Revised 2/26/07



TYPICAL PLAN
(Interior diagonals not shown)

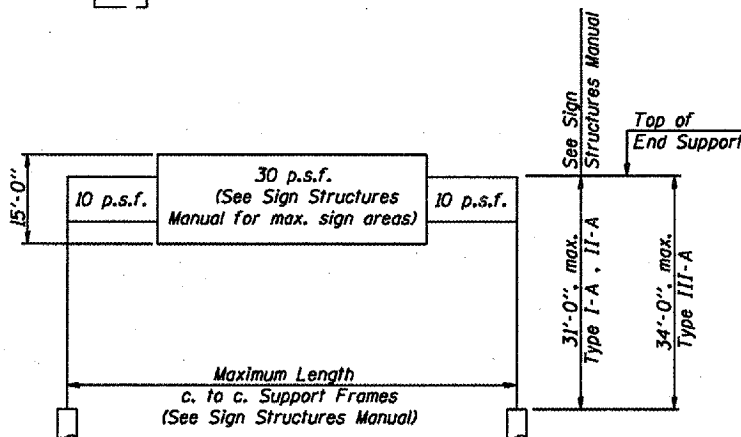


TYPICAL ELEVATION
(Looking at Face of Signs**)

Elev. A = Elevation at point of minimum clearance to sign, walkway support or truss.

Structure Number	Station	Design Truss Type	c. to c. Supports	Elev. A	Dim. D	Height of Tallest Sign	Total Sign Area
7S0581072R137.1	674 + 00	I - A	89' - 0"			14' - 6"	155.50
7S0581072R138.1	727 + 00	II - A	108' - 0"			12' - 0"	343.0
7S058U051R000.41	763 + 00	I - A	95' - 0"			13' - 6"	488.0

**Looking upstation for structures with signs both sides.



DESIGN WIND LOADING DIAGRAM

Parameters shown are basis for I.D.O.T. Standards and Sign Manual Tables. Installations not within dimensional limits shown require special analysis for all components.

DESIGNED -		20
CHECKED -	EXAMINED	
DRAWN -	PASSED	ENGINEER OF BRIDGE DESIGN
CHECKED -		ENGINEER OF BRIDGES AND STRUCTURES

OS-A-1 11/01/2006

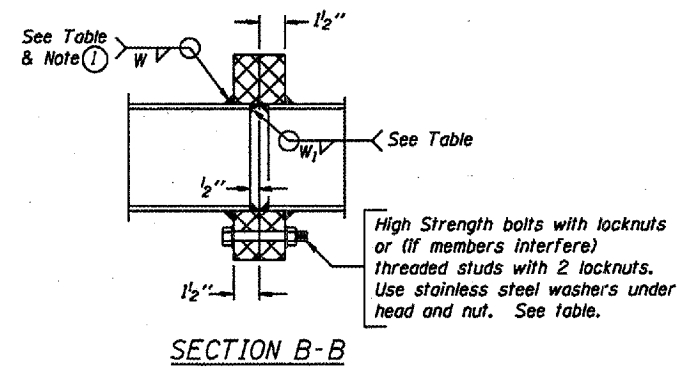
NUMBER	REVISION	DATE

TOTAL BILL OF MATERIAL

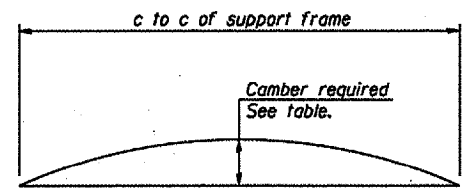
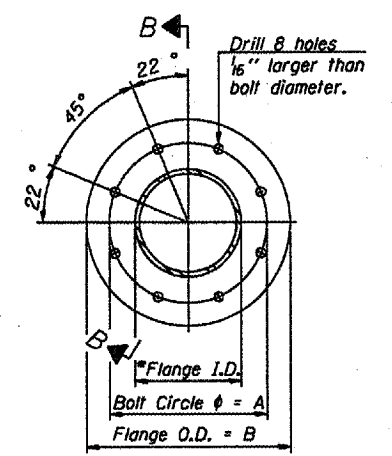
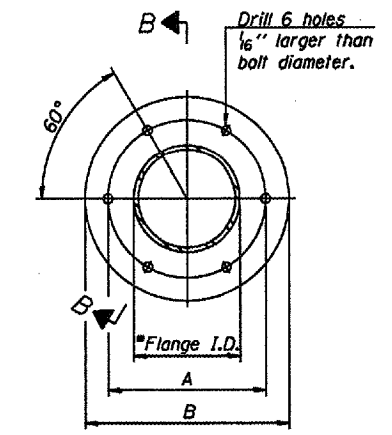
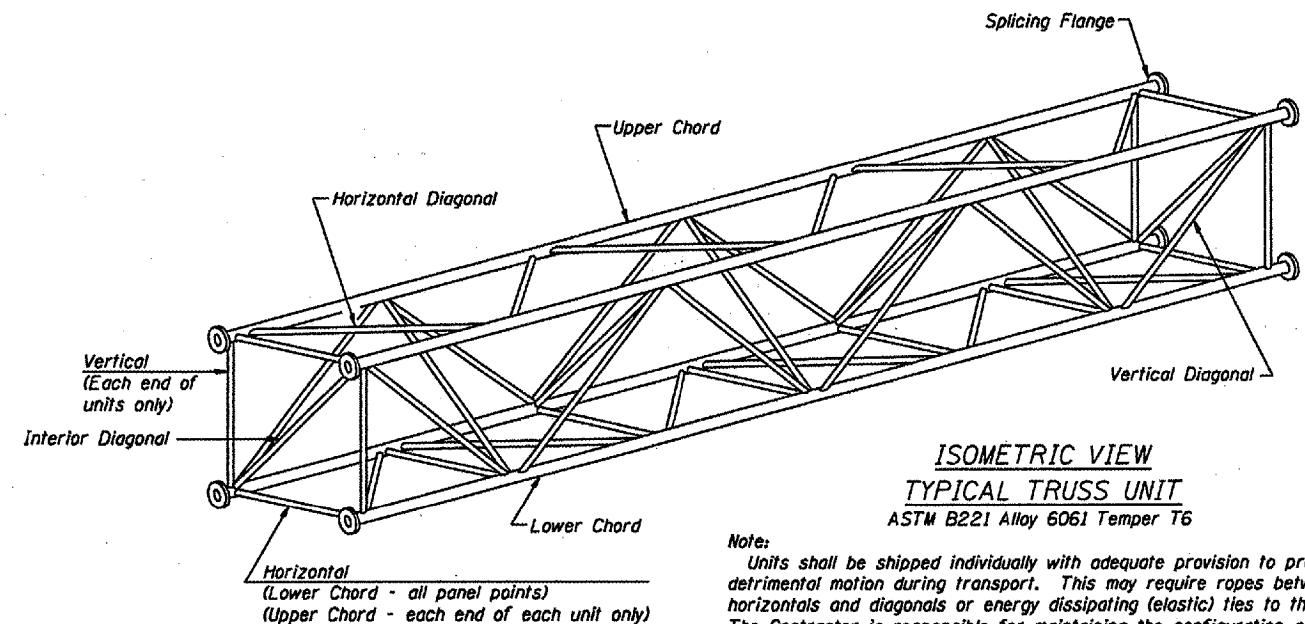
ITEM	UNIT	TOTAL
OVERHEAD SIGN STRUCTURE SPAN TYPE I-A	Foot	
OVERHEAD SIGN STRUCTURE SPAN TYPE II-A	Foot	
OVERHEAD SIGN STRUCTURE SPAN TYPE III-A	Foot	
OVERHEAD SIGN STRUCTURE WALKWAY TYPE A	Foot	
CONCRETE FOUNDATIONS	Cu. Yds.	
DRILLED SHAFT CONCRETE FOUNDATIONS	Cu. Yds.	

TRUSS UNIT TABLE

Structure Number	Station	Design Truss Type	Exterior Units (2)			Interior Unit				Upper & Lower Chord		Verticals; Horizontals; Vertical, Horizontal, and Interior Diagonals		Camber at Midspan	Splicing Flange					
			No. Panels per Unit	Unit Lgth.(L _e)	Panel Lgth.(P)	No. Req'd.	No. Panels per Unit	Unit Lgth.(L _i)	Panel Lgth.(P)	O.D.	Wall	O.D.	Wall		Bolts		Weld Sizes		A	B
															No./Splice	Dia.	W	W ₁		
7S0581072R137.1	674 + 00	I - A	6	30'-4 1/2"	4'-9"	1	6	29'-9"	4'-9"	5'	5/16"	2 1/2"	5/16"	2 3/4"	6	7/8"	5/16"	1/4"	8 3/4"	11 3/4"
7S0581072R138.1	727 + 00	II - A	7	38'-5 3/4"	5'-2 3/4"	1	6	32'-7 1/2"	5'-2 3/4"	6 1/2"	5/16"	3"	5/16"	3 1/2"	6	1"	3/8"	1/4"	11"	14 1/2"
7S058U051R000.41	763 + 00	I - A	7	33'-11 1/2"	4'-7"	1	6	28'-9"	4'-7"	5 1/2"	5/16"	2 1/2"	5/16"	3"	6	7/8"	3/8"	1/4"	9 1/4"	12 1/4"

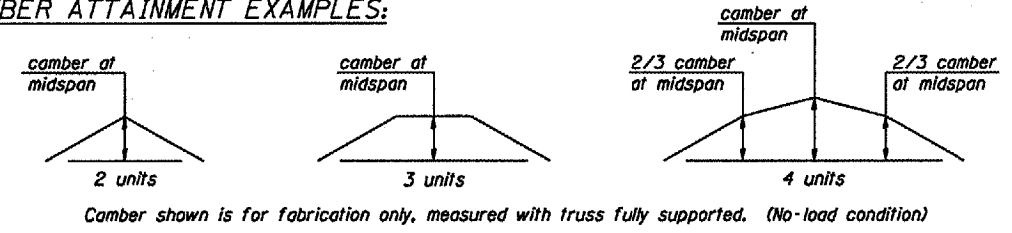


① Splicing Flanges shall be attached to each truss unit with the truss shop assembled to camber shown. Truss units shall be in proper alignment and flange surfaces shall be shop bolted into full contact before welding. Sufficient external welds or tacks shall be made to secure flanges until remaining welds are made after disassembly. Adjacent flanges shall be "match marked" to insure proper field assembly.



CAMBER DIAGRAM
Camber curve shown is theoretical. Actual camber attained by slope changes at splices between units.

CAMBER ATTAINMENT EXAMPLES:

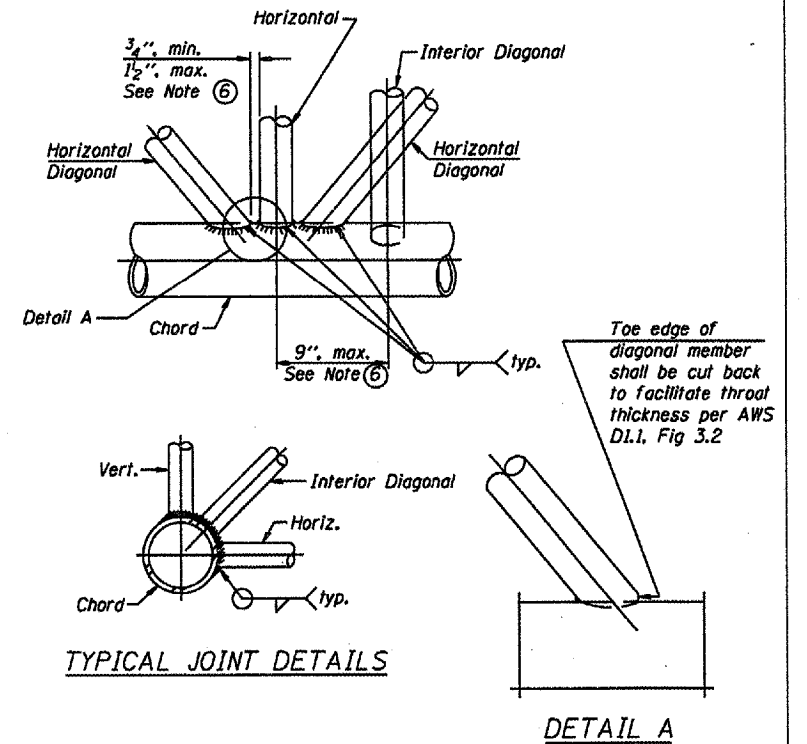
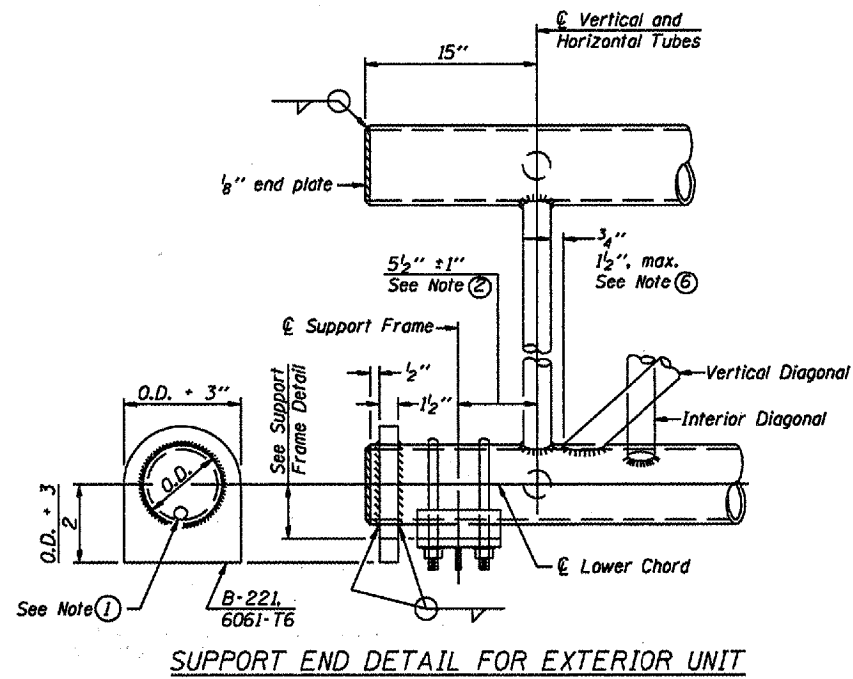
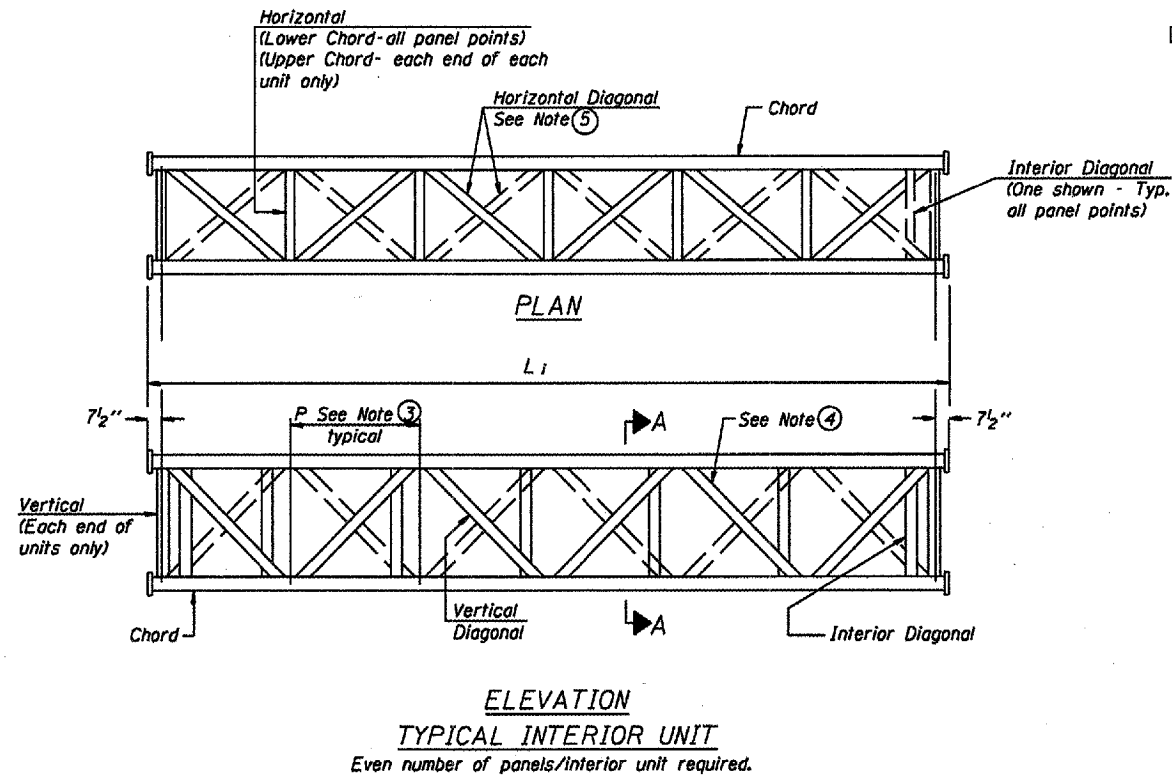


NUMBER	REVISION	DATE

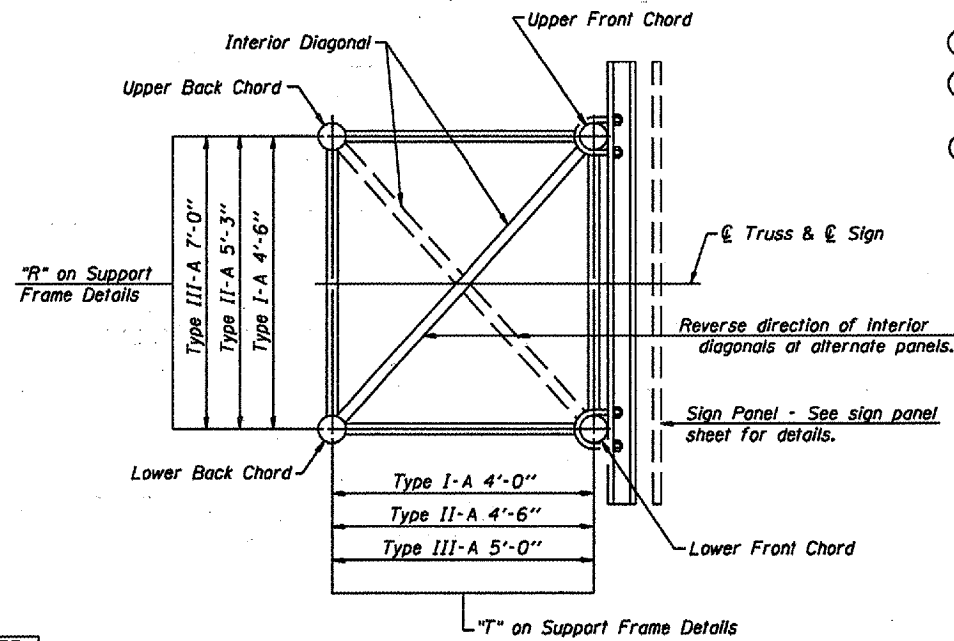
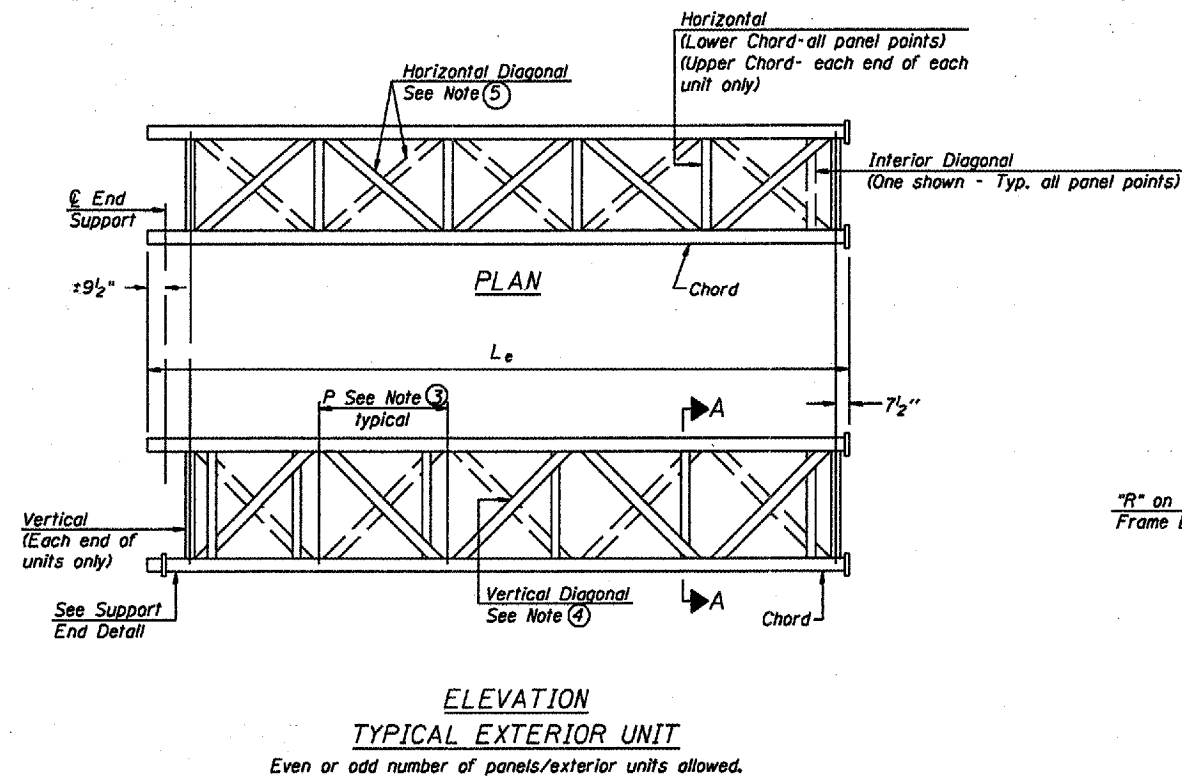
DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES

OVERHEAD SIGN STRUCTURES
ALUMINUM TRUSS DETAILS
FOR TRUSS TYPES I-A, II-A AND III-A

District 7
Overhead Sign
Structure Replacement



- NOTES**
- Contractor may alternatively use standard aluminum drive-fit cap to close end. 1/2" ϕ drain hole in end plate/drive-fit cap. (Typ. at ends of all chords)
 - 5 1/2" end dimension may vary by $\pm 1"$ to provide uniform panel spacing (P).
 - Panel spacing (P) shall be uniform for entire truss and between 4'-0" and 5'-0" for Type I-A or 4'-0" and 5'-6" for Types II-A and III-A.
 - Vertical Diagonals in front and back face shall alternate.
 - Hidden lines show wind bracing alternates direction between planes of top and bottom chords.
 - All diagonals shall be detailed for minimum offset from the panel point based on the following: Offset shall be such as to provide a 3/4" minimum to 1/2" maximum clearance between any diagonal and any horizontal or vertical member, and to provide clearance for U-bolt connections of signs or walkway brackets.



OVERHEAD SIGN STRUCTURES
ALUMINUM TRUSS DETAILS
FOR TRUSS TYPES I-A, II-A AND III-A

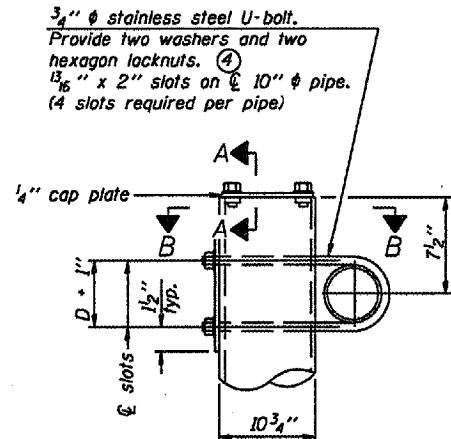
District 7
Overhead Sign
Structure Replacement

DESIGNED	20
CHECKED	EXAMINED
DRAWN	PASSED
CHECKED	ENGINEER OF BRIDGES AND STRUCTURES

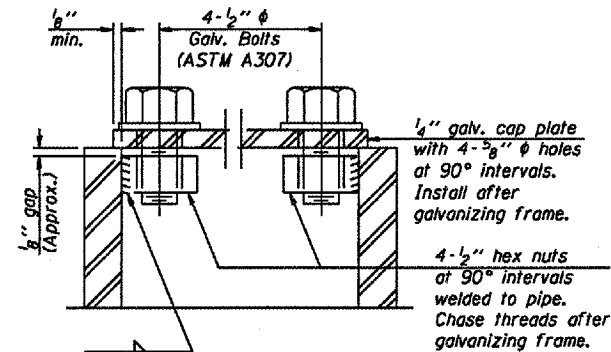
OS-A-2

7/01/2006

NUMBER	REVISION	DATE

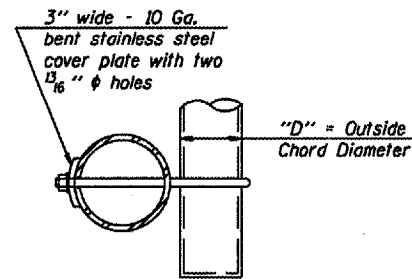


DETAIL A

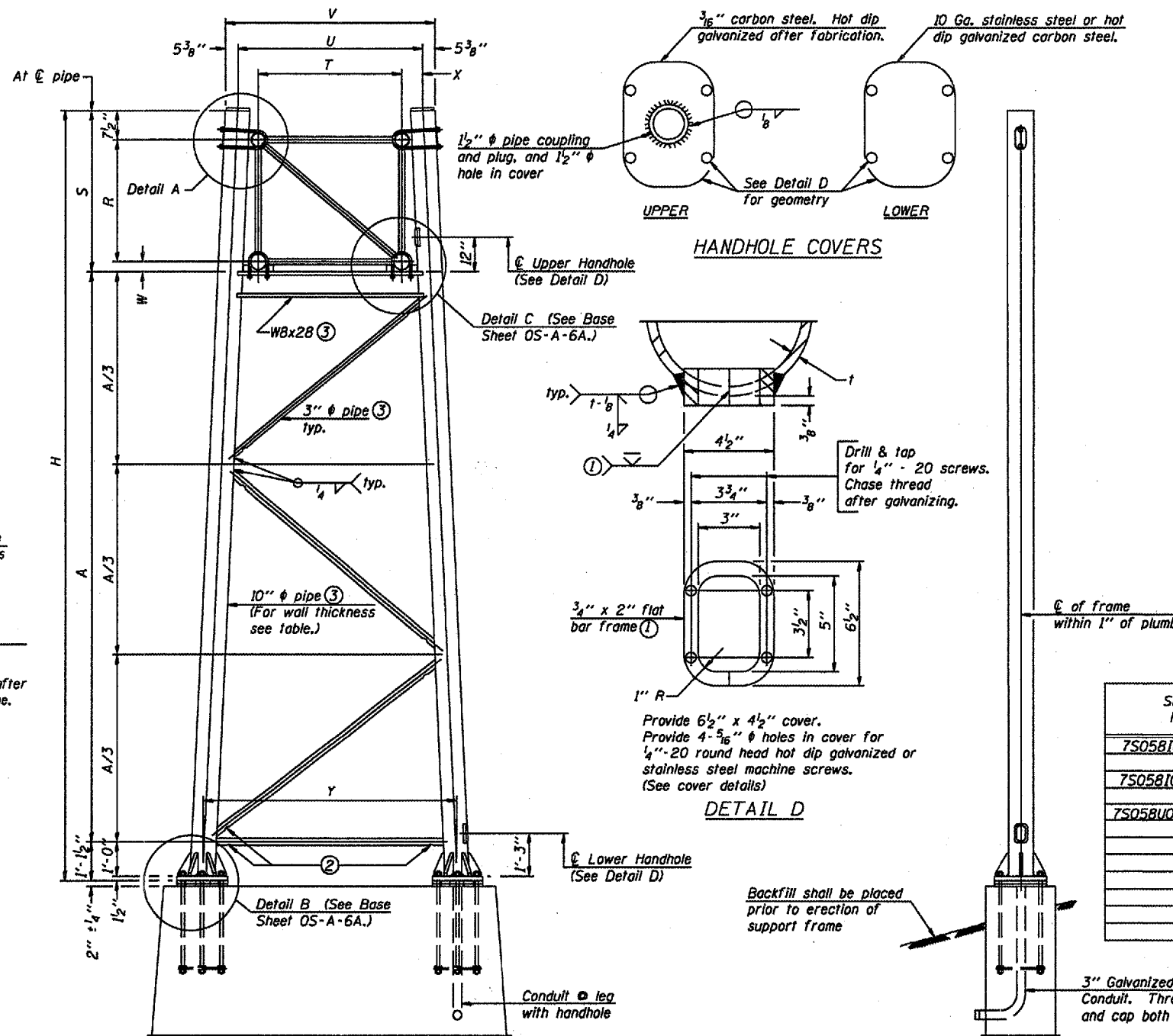


SECTION A-A

As an alternate to bolts, may use galvanized drive-fit caps installed after galvanizing frame.



SECTION B-B



DETAIL D

10" Ø PIPE TRUSS SUPPORT FRAME

Support Design Loads: See Base Sheet OS-A-1 for design and loading criteria.
Load combinations checked include deadload plus:
a) 100% wind normal to sign, 20% parallel to sign
b) 60% wind normal to sign, 30% parallel to sign

- 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 Base Sheet OS-A-1.
- ④ See General Notes for fasteners.
- ⑤ Dimensions shown are based on selection criteria in the Sign Structures Manual. Nonstandard applications must have dimensions verified or amended as appropriate.
- ⑥ "H" based on 15'-0" or actual sign height, whichever is greater.

Structure Number	Station	Support		Truss Type	Pipe Wall Thickness	H ⑥	A
		Left	Right				
7S0581072R137.1	674 + 00	X	X	I - A	0.279	28'-9"	22'-2"
7S0581072R138.1	727 + 00	X	X	II - A	0.365(STD)	29'-4"	21'-11 1/4"
7S058U051R000.41	763 + 00	X	X	I - A	0.279	28'-0"	21'-5"

END ELEVATION

Truss Type	Dimensions							
	R	S	T	U	V	W	X	Y
I-A	4'-6"	5'-5 1/2"	4'-0"	5'-6"	6'-4 3/4"	4"	9"	8'-3"
II-A ⑤	5'-3"	6'-3 1/4"	4'-6"	6'-1"	6'-11 3/4"	4 3/4"	9 1/2"	8'-3"

NUMBER	REVISION	DATE

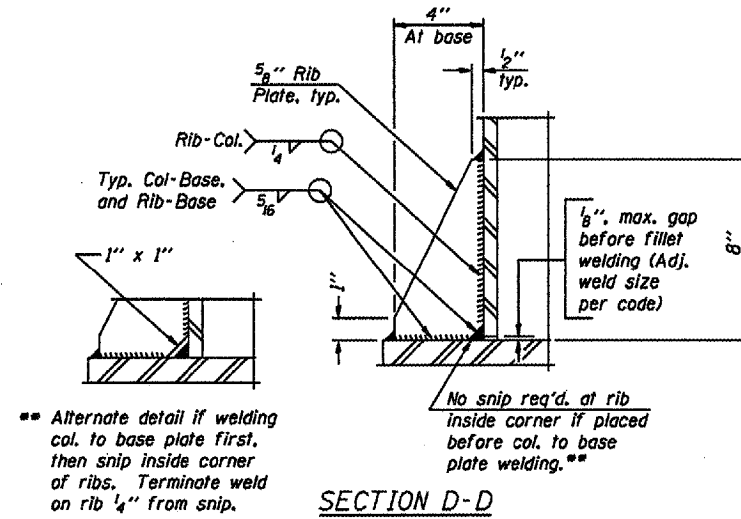
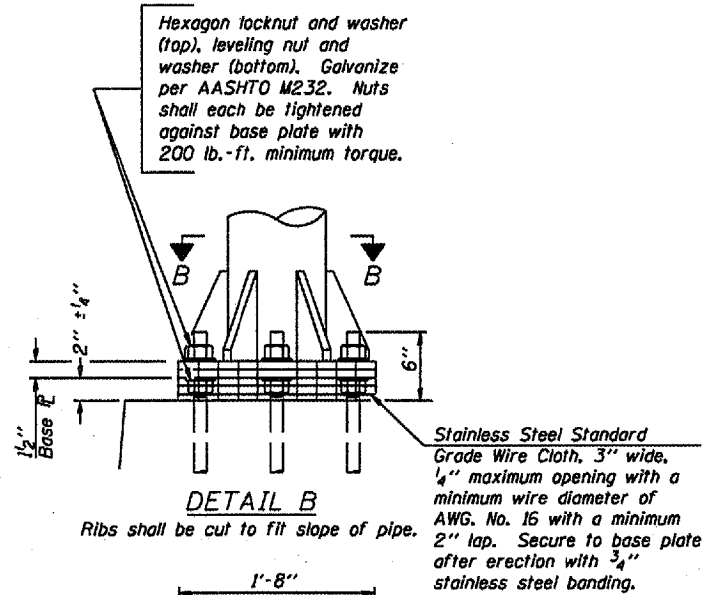
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CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES

OS-A-6

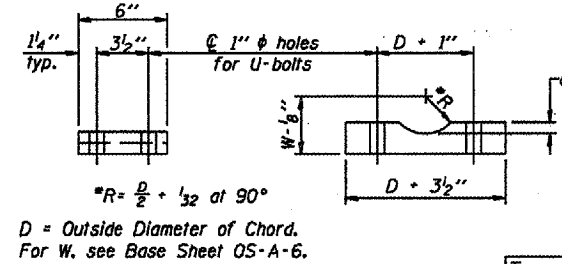
7/01/2006

OVERHEAD SIGN STRUCTURES
SUPPORT FRAME FOR ALUMINUM TRUSS

District 7
Overhead Sign
Structure Replacement

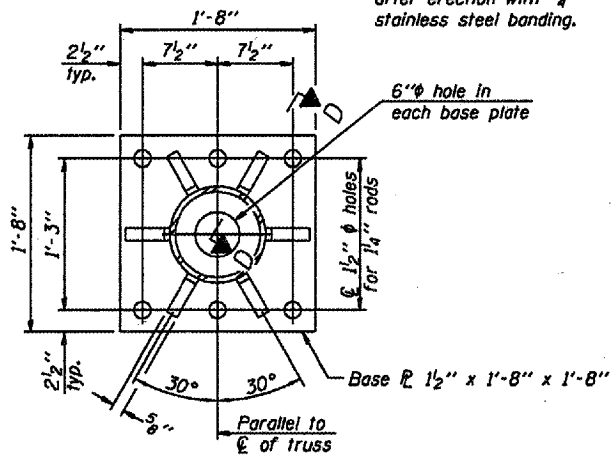


SECTION D-D

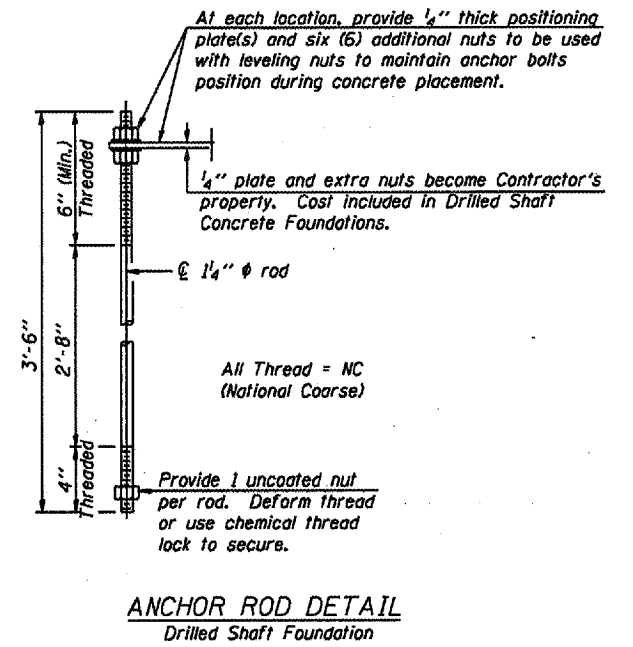
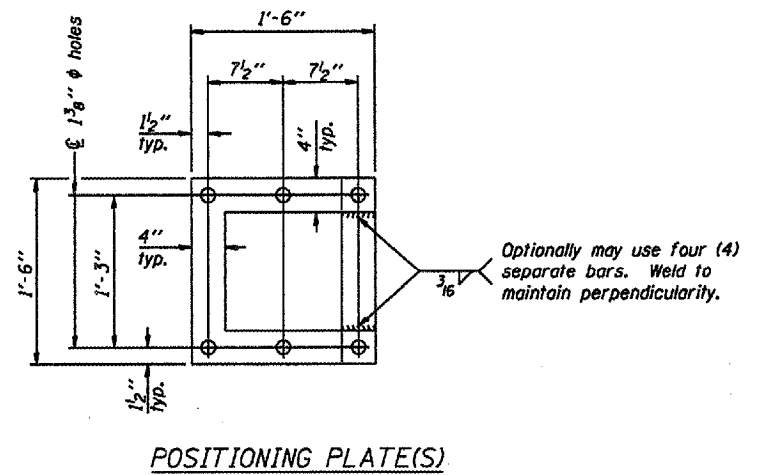
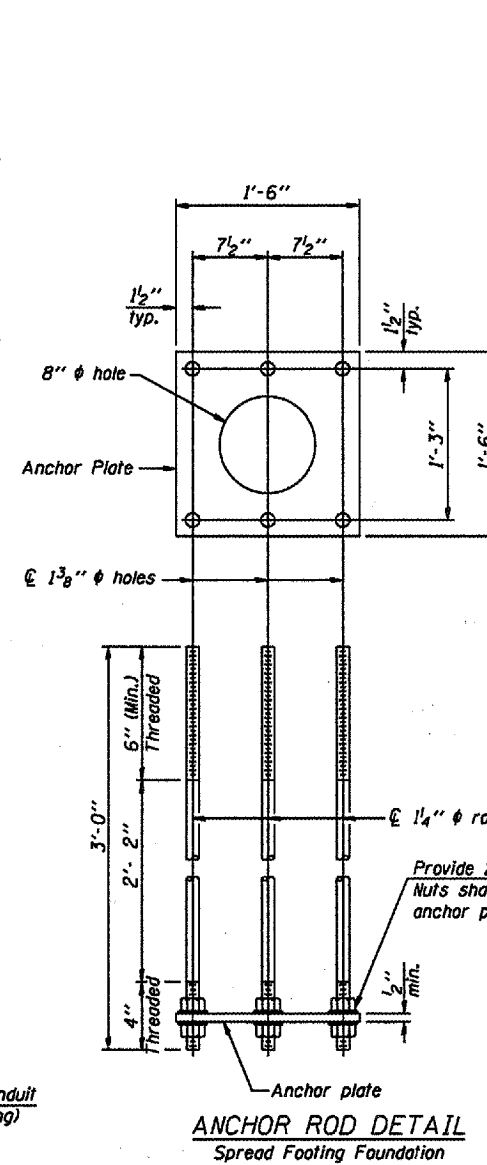


SADDLE SHIM DETAIL
ASTM B26 Alloy 356-F
or
ASTM B209 Alloy 6061-T651
(4 required per sign truss)

Truss Chord Nominal Dia.	a
5"	3/4"
5 1/2"	13/16"
6"	7/8"
6 1/2"	5/8"
7"	1"



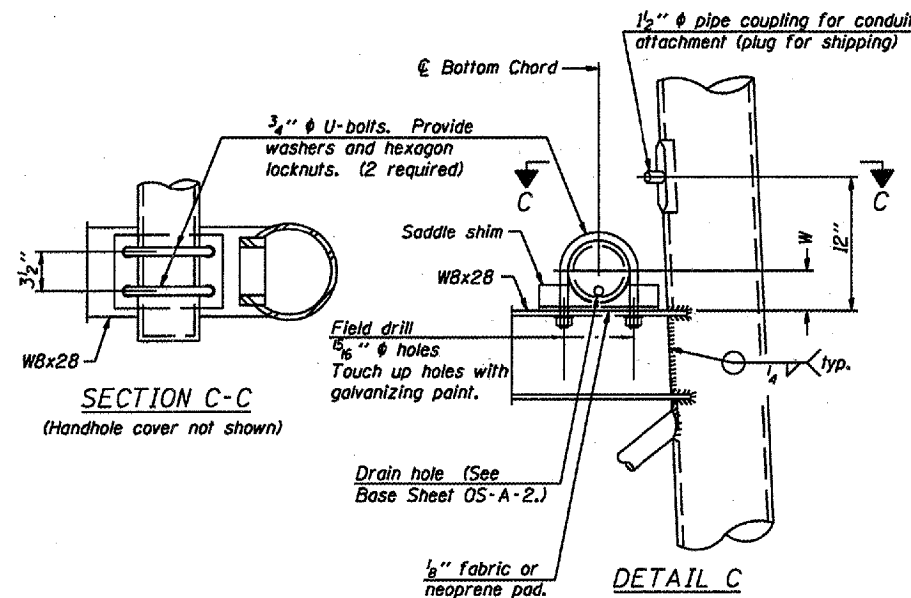
SECTION B-B



Anchor rods shall conform to AASHTO M314 Grade 36 or 50 and meet Charpy V-Notch (CVN) energy of 15 lb.-ft. at 40° F. Galvanize upper 12" per AASHTO M232. No welding shall be permitted on rods.

10" phi PIPE SUPPORT FRAME DETAILS

OVERHEAD SIGN STRUCTURES
SUPPORT FRAME DETAILS ALUMINUM TRUSS



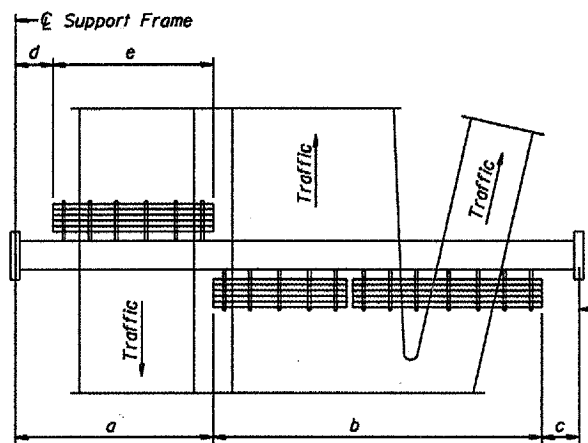
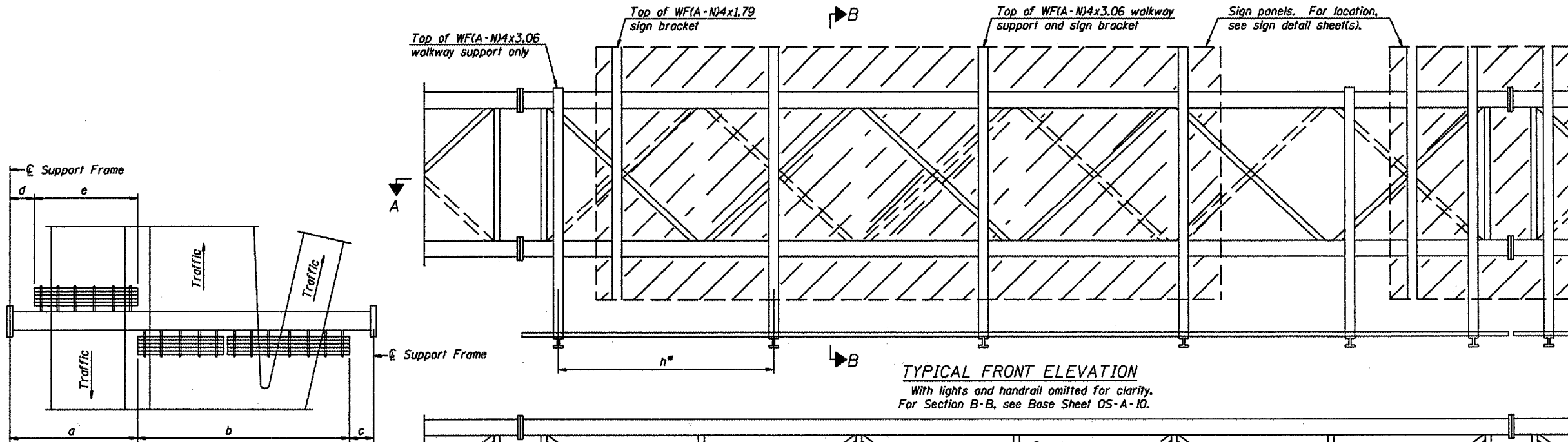
NUMBER	REVISION	DATE

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGE DESIGN
	ENGINEER OF BRIDGES AND STRUCTURES

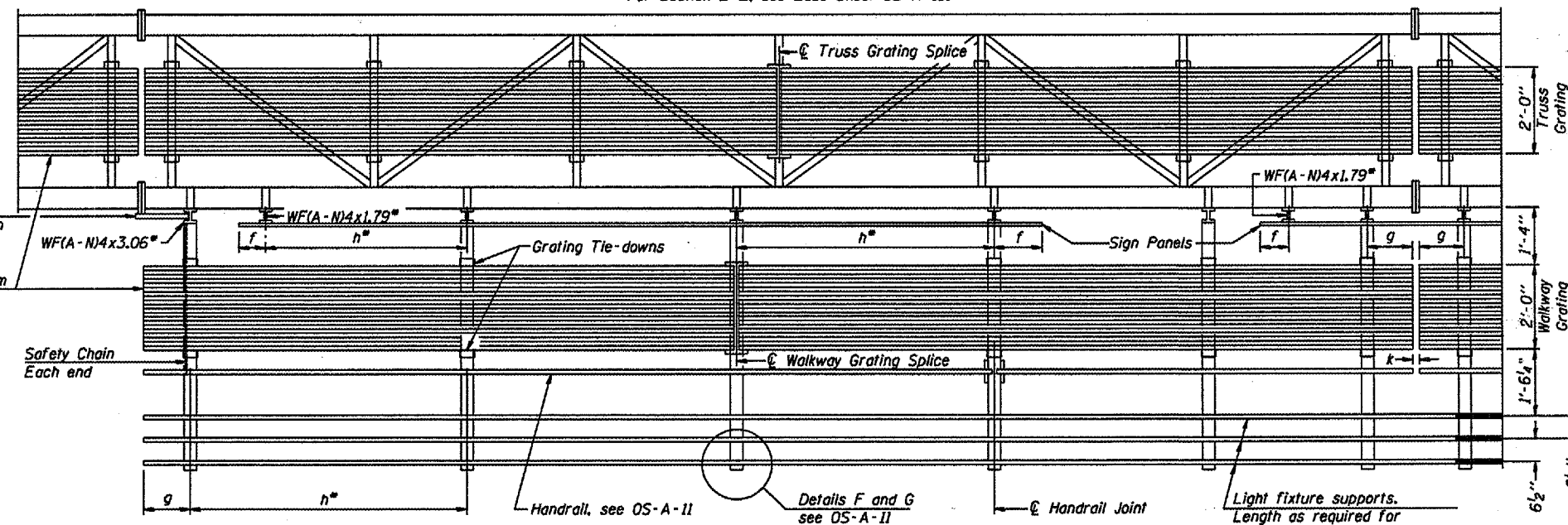
OS-A-6A

7/01/2006

District 7
Overhead Sign
Structure Replacement



PLAN
WALKWAY AND HANDRAIL SKETCH
(Road plan beneath truss varies)



SECTION A-A

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.
Handrail joints, grating, and light support splices placed as needed.

Truss grating to facilitate inspection shall run full length (center to center of support frames) ±12" on overhead trusses.
Cost of truss grating is included in "Overhead Sign Structure".

BRACKET TABLE

Sign Width		Number Brackets Required
Greater Than	Less Than or Equal To	
8'-0"	8'-0"	2
14'-0"	14'-0"	3
20'-0"	20'-0"	4
26'-0"	26'-0"	5
32'-0"	32'-0"	6

** Alternate angle
for safety chain
attachment

Standard Aluminum
Grating, see
Details T and W

Walkway and Truss Grating
width dimensions are nominal
and may vary ±1/2" based on
available standard widths.

- Notes:
- Space walkway brackets WF(A-N)4x3.06 and sign brackets WF(A-N)4x1.79 for efficiency and within limits shown:
 - f = 12" maximum, 4" minimum (End of sign to center of nearest bracket)
 - g = 12" maximum, 4" minimum (End of walkway grating to center of nearest support bracket)
 - h = 6'-0" maximum (center to center of sign and/or walkway support brackets, WF(A-N)4x1.79 or WF(A-N)4x3.06)
 - k = 2" maximum gap between adjacent walkway grating sections and handrail ends
 - ** If walkway bracket at safety chain location is behind sign, add angle to bracket, see Alternate Safety Chain Attachment on Base Sheet OS-A-11.
- For Details T and W, Section B-B and Grating Splice Details see Base Sheet OS-A-10.
For Handrail Details see Base Sheet OS-A-11.

Structure Number	Station	a	b	c	d	e	Walkway Grating and Handrail Lengths
7S0581072R137.1	674 + 00						91' - 4"
7S0581072R138.1	727 + 00						109' - 7"
7S058U051R000.41	763 + 00						96' - 8"

The length shown is for the truss grating.

OVERHEAD SIGN STRUCTURES
ALUMINUM WALKWAY DETAILS

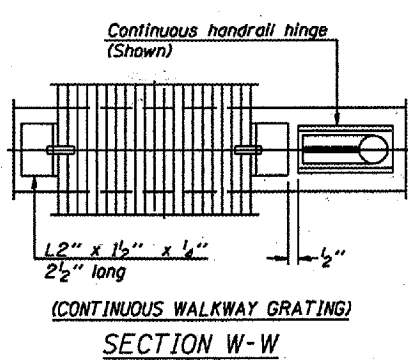
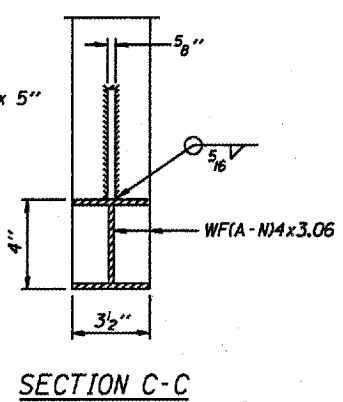
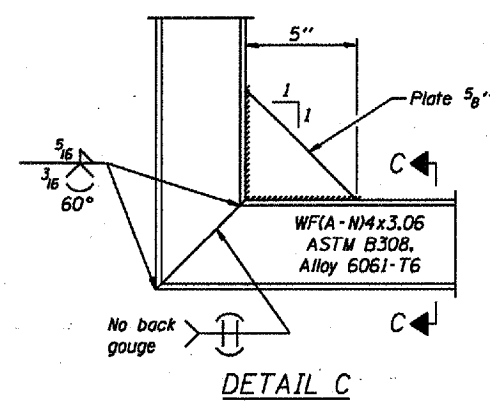
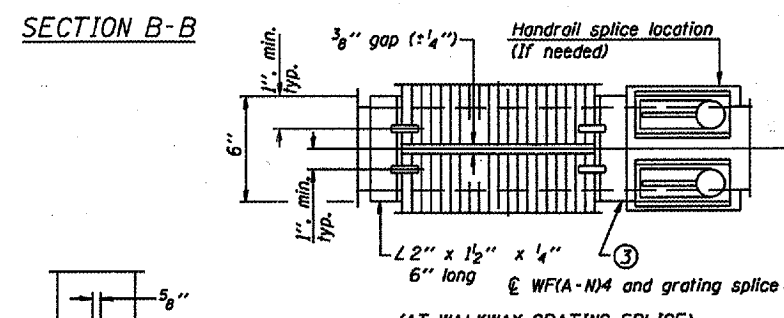
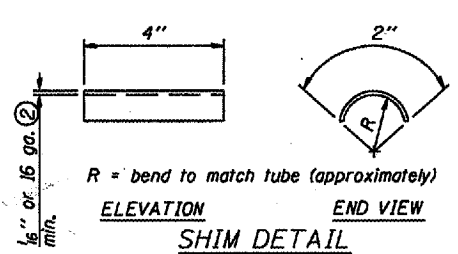
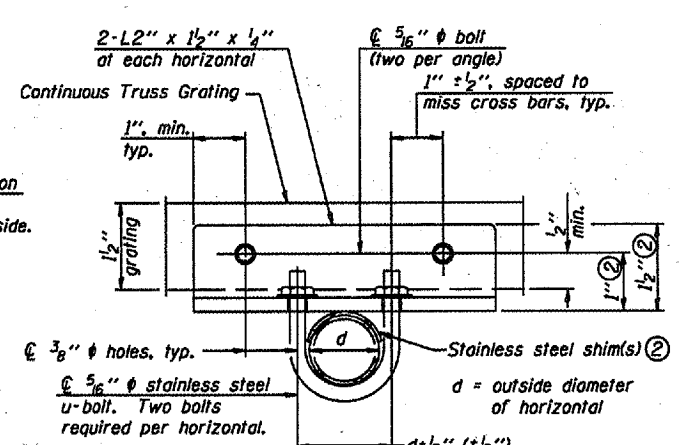
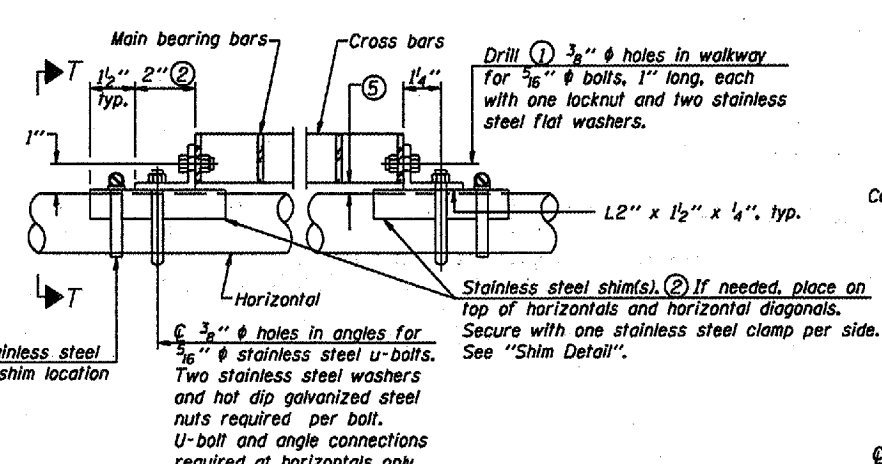
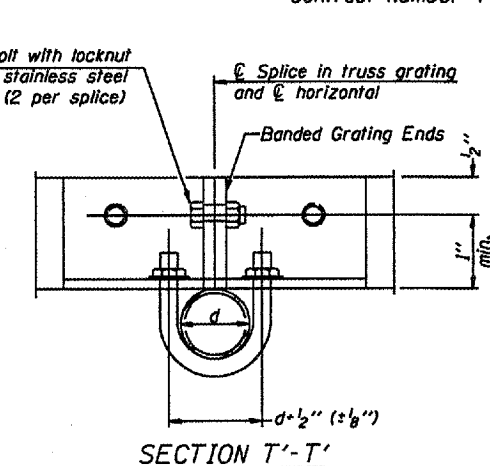
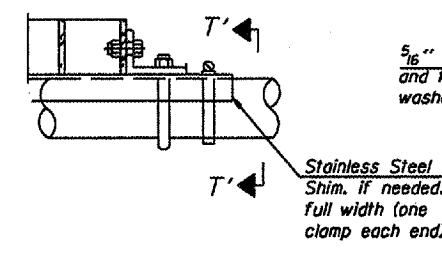
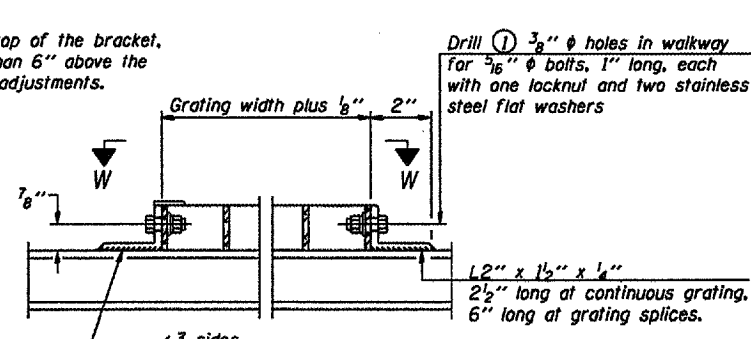
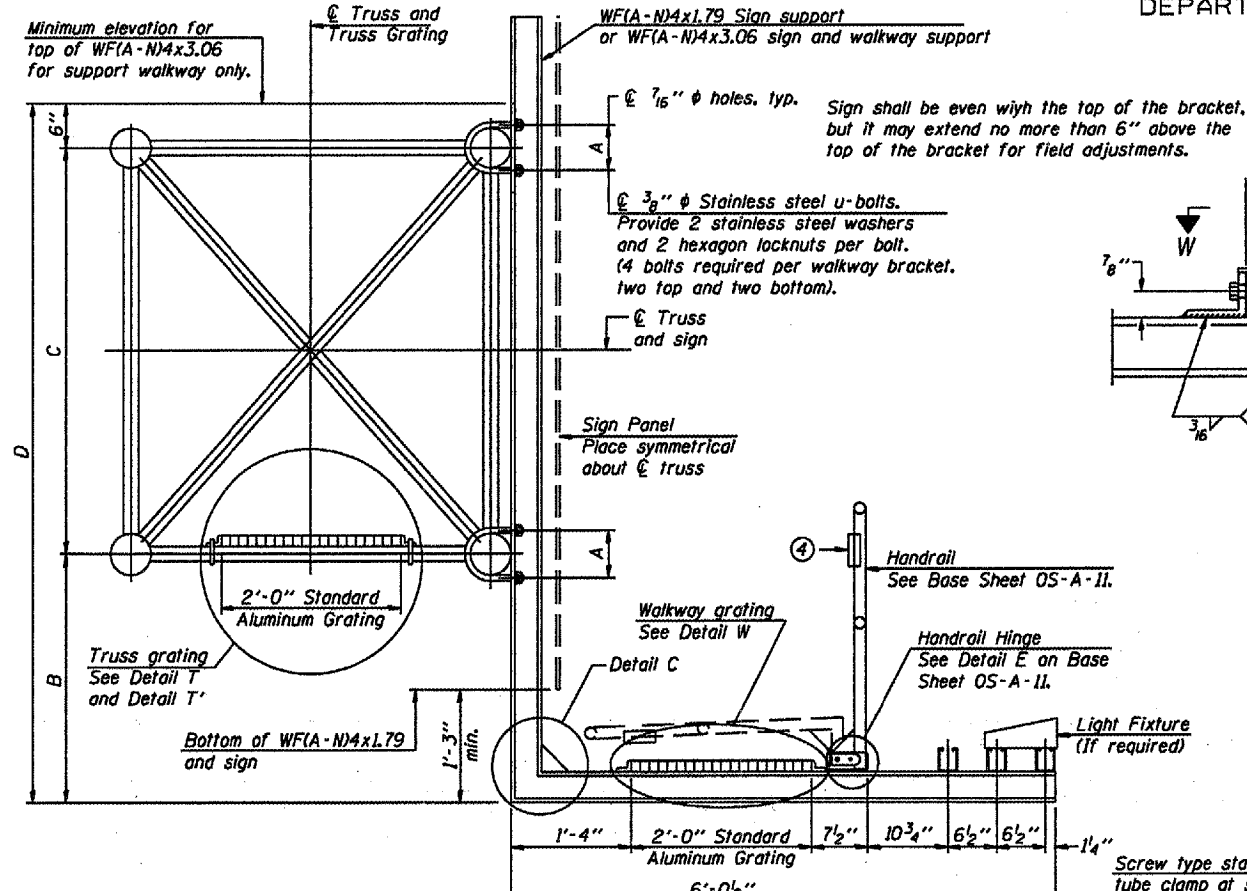
District 7
Overhead Sign
Structure Replacement

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES

NUMBER	REVISION	DATE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Various Routes
OVD SIN STR REP & REPL 2007-16
Various Counties
Sheet 47 of 51
Contract Number 44949



This Sheet For Information Only
SPECIFICATIONS FOR STANDARD ALUMINUM GRATING

Main Bearing Bars shall be 3/16" x 1 1/2" on 1 3/16" centers and conform to ASTM B221 Alloy 6061-T6.
Cross bars shall be 3/16" x 1 1/2" on 4" centers and conform to ASTM B221 Alloy 6063-T5 or 6061-T6.

OR

Aluminum Grating with modified "I" sections for main bearing bars shall meet the following requirements:
Main bars shall conform to ASTM B221 Alloy 6061-T6 and have a minimum section modulus equal to 0.0705 in.³ per bar, a depth of 1 1/2", spaced on 1 3/16" centers.
Cross bars shall conform to ASTM B221 Alloy 6063-T5 or T-42 and spaced on 4" centers.

- Drilling holes in grating may be done in shop or field, based on Contractor's preference and subject to accurate alignment.
- Stainless steel shims shall be placed as shown in Detail T if needed to compensate for alignment variations between horizontal and diagonal pipes beyond adjustment provided by angles. Thicker shims may be used subject to shims performing properly.
- If Handrail Joint present, weld angle to WFA-N)4 and 1/4" extension bars. (See Base Sheet OS-A-11.)
- 1/8" x 1/2" x 2" welded to handrail posts to protect locations that contact grating.
- Tube to grating gap may vary from 0 to 1/2", max. to align walkway, allow for camber, etc.

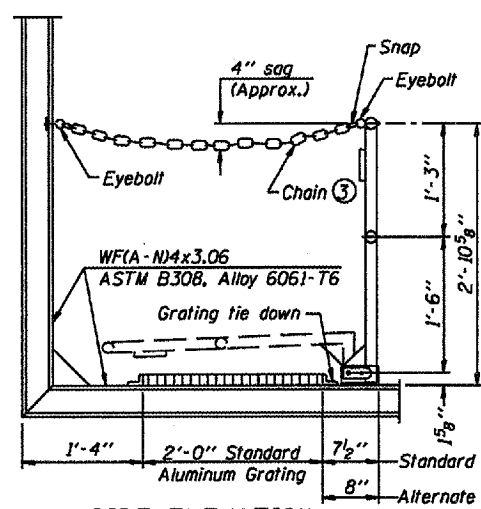
Structure Number	Station	A	B	C	D

OVERHEAD SIGN STRUCTURES
ALUMINUM WALKWAY DETAILS

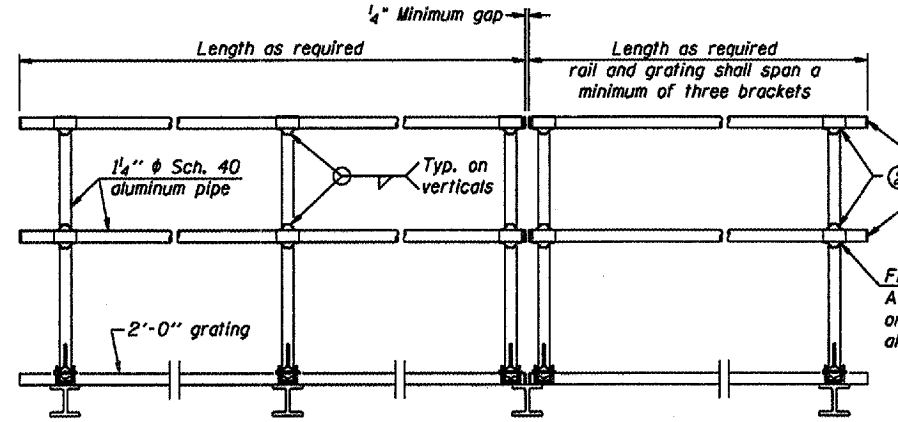
District 7
Overhead Sign
Structure Replacement

DESIGNED -	20
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SIDE ELEVATION
(Showing safety chain w/o sign)

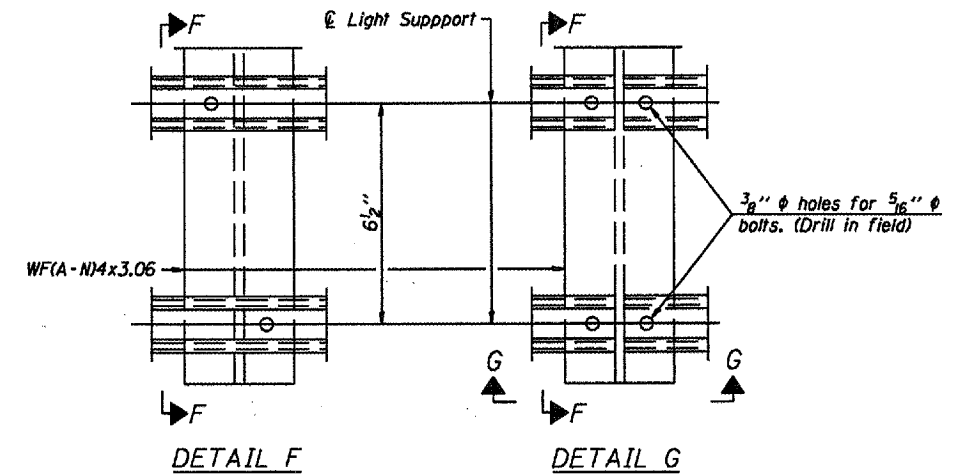


FRONT ELEVATION

HANDRAIL DETAILS

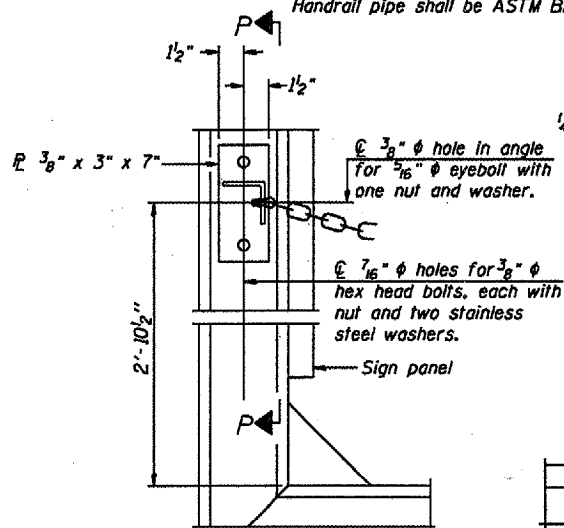
Handrail pipe shall be ASTM B241 or B429, Alloy 6063-T6 or Alloy 6061-T6.

- 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 fitting. Provide 1/16" hole in fitting for 3/8" bolt. Field drill 1/16" hole in horizontal rail member. Provide locknut and two stainless steel washers for bolt. (Use 5/16" eyebolts in 1/16" holes on top rail at ends only.)



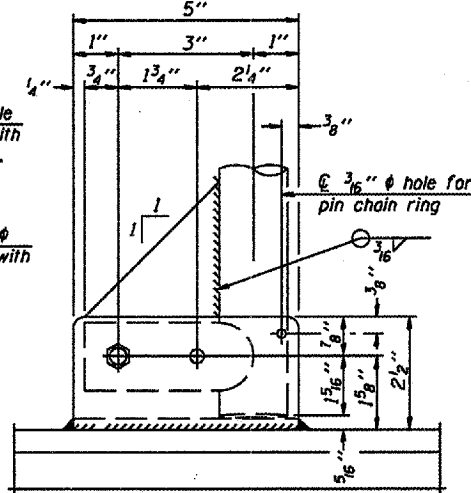
DETAIL F

DETAIL G

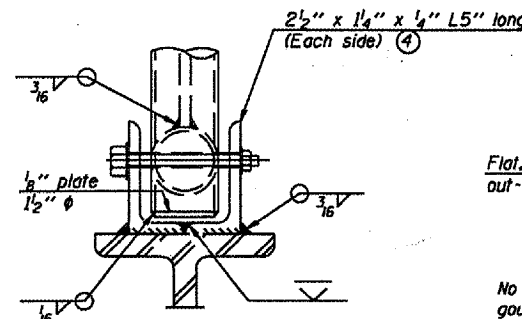


ALTERNATE SAFETY CHAIN ATTACHMENT
(With Sign Present)

Items not shown same as "Side Elevation" of "Handrail Details"

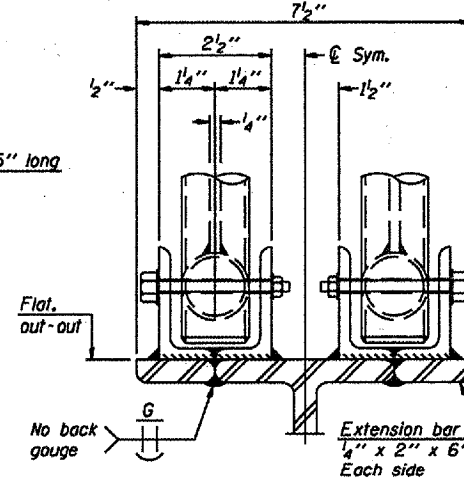


SIDE ELEVATION

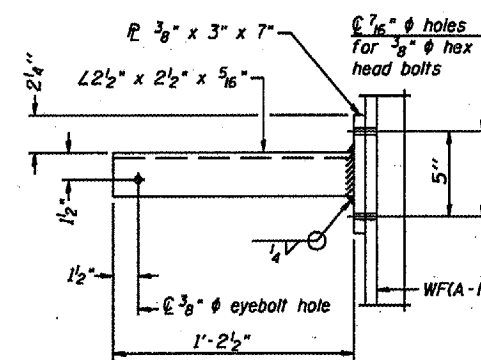


FRONT ELEVATION

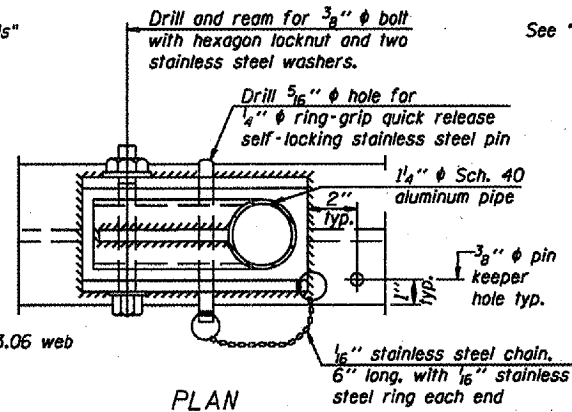
See "Elevation" at right for dimensions.



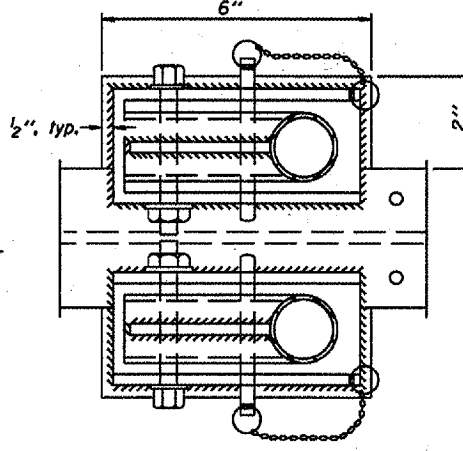
ELEVATION AT HANDRAIL JOINT



SECTION P-P



DETAIL E HANDRAIL HINGE



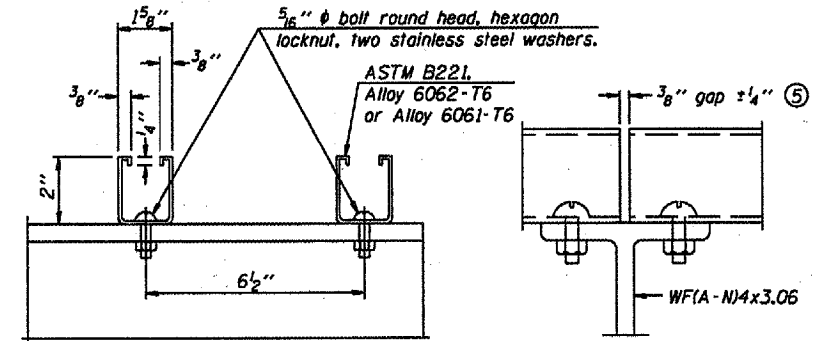
PLAN AT HANDRAIL JOINT

Details not shown same as "PLAN"

DESIGNED	-
CHECKED	-
DRAWN	-
CHECKED	-

EXAMINED	-	20
PASSED	-	ENGINEER OF BRIDGE DESIGN
	-	ENGINEER OF BRIDGES AND STRUCTURES

NUMBER	REVISION	DATE

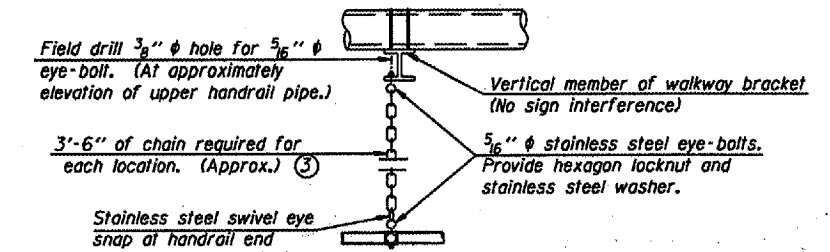


SECTION F-F

SECTION G-G

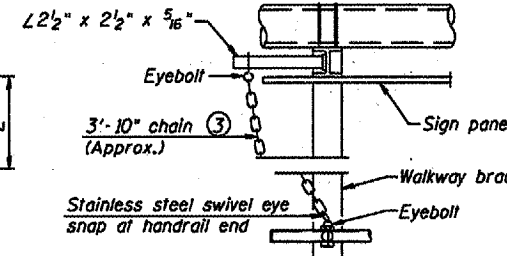
LIGHTING FIXTURE MOUNTS (IF REQUIRED)

- ⑤ Field cut ends of light support channels shall be free of burrs or hazardous projections and coated with zinc-rich primer or equivalent.



SAFETY CHAIN

One required for each end of each walkway.



ALTERNATE SAFETY CHAIN ATTACHMENT

Details not shown similar to "Safety Chain" Details (Walkway omitted for clarity)

- ③ 3/16" Type 304L stainless steel chain, approximately 12 links per foot.

- ④ Extrusions may be used in lieu of the details shown, with approval of the Engineer.

**OVERHEAD SIGN STRUCTURES
ALUMINUM HANDRAIL DETAILS**

District 7
Overhead Sign
Structure Replacement

For anchor rod size and placement, see Support Frame Detail Sheet.

Anchor rod shall be ground or filed to bright metal at clamp and cable connection location.

BAR LIST - EACH FOUNDATION

Bar	Number	Size	Length	Shape
v(E)	24	#9	F less 5"	—
#4 bar spiral (E) - see Side Elevation				

NOTES:

The foundation dimensions shown are based on the presence of mostly cohesive soils with an average Unconfined Compressive Strength (Q_u) of at least 1.25 tsf, which must be determined by previous soil investigations at the jobsite. When other conditions are indicated, the boring data will be included in the plans and the foundation dimensions shown will be the result of site specific designs.

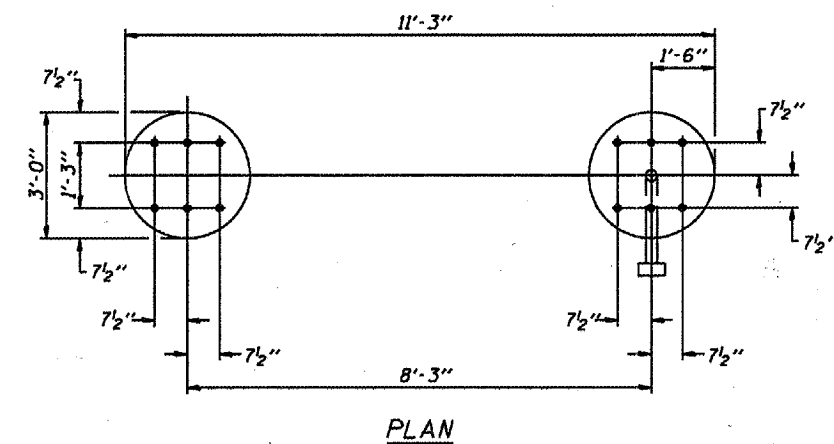
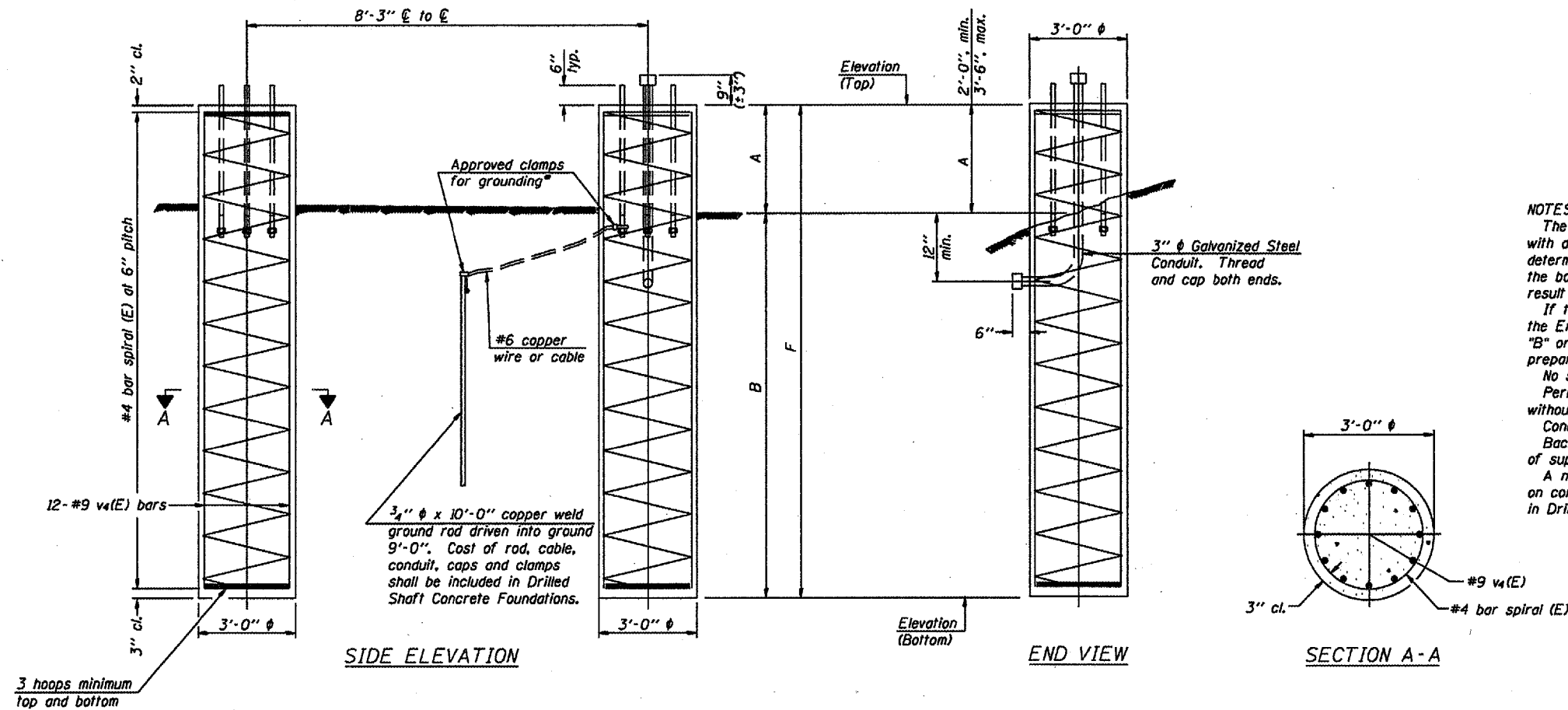
If the conditions encountered are different than those indicated, the Contractor shall notify the Engineer to determine if the foundation dimensions need to be modified. If dimensions "B" or "F" are revised by more than 12" by the Contractor, "as-built" plans shall be prepared and submitted to the District Bureau of Operations for future reference.

No sonotubes or decomposable forms shall be used below the lower conduit entrance. Permanent metal forms or other shielding may not be left in place below that elevation without the Engineer's written permission.

Concrete shall be placed monolithically, without construction joints.

Backfill shall be placed per Article 502 of Standard Specification and prior to erection of support column.

A normal surface finish followed by a Bridge Seat Sealer application will be required on concrete surfaces above the lowest elevation 6" below finished ground line. Cost included in Drilled Shaft Concrete Foundation.



Structure Number	Station	Left Foundation			Right Foundation			Class SI Concrete (Cu. Yds.)				
		Elevation Top	Elevation Bottom	A	B	F	Elevation Top		Elevation Bottom	A	B	F
7S0581072R137.1	674 + 00			3' - 0"	16' - 6"	19' - 6"			3' - 0"	16' - 6"	19' - 6"	20.40
7S0581072R138.1	727 + 00			3' - 0"	20' - 6"	23' - 6"			3' - 0"	20' - 6"	23' - 6"	24.60
7S058U051R000.41	763 + 00			3' - 0"	16' - 6"	19' - 6"			3' - 0"	16' - 6"	19' - 6"	20.40

DESIGNED -	20
CHECKED -	EXAMINED
DRAWN -	PASSED
CHECKED -	ENGINEER OF BRIDGES AND STRUCTURES

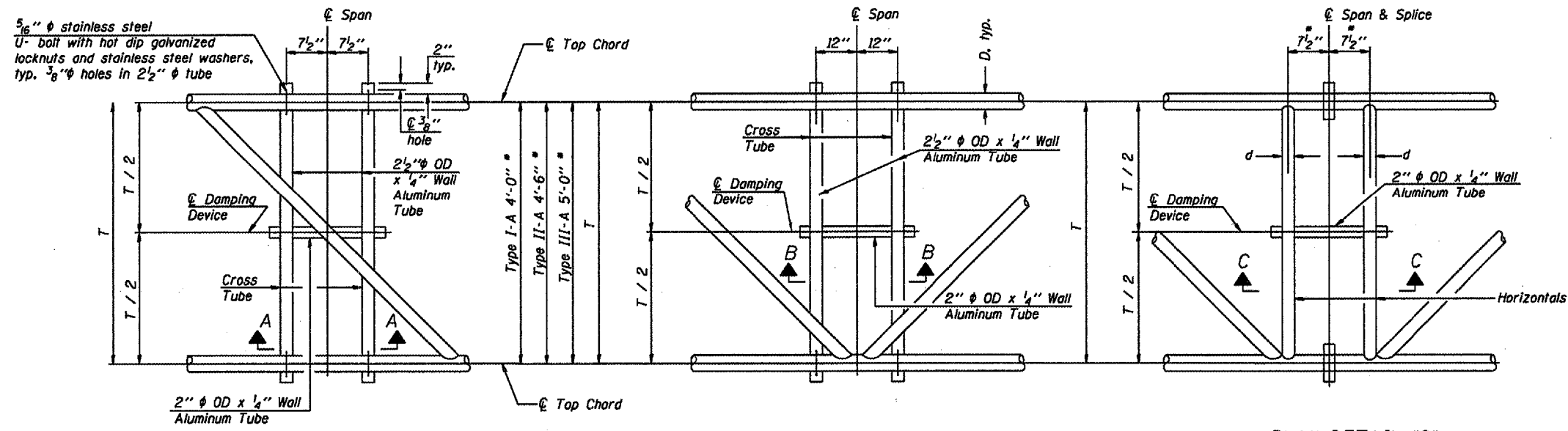
NUMBER	REVISION	DATE

DETAILS FOR 10" Ø SUPPORT FRAME
TYPE I-A or II-A TRUSS

OVERHEAD SIGN STRUCTURES
DRILLED SHAFT DETAILS

District 7
Overhead Sign
Structure Replacement

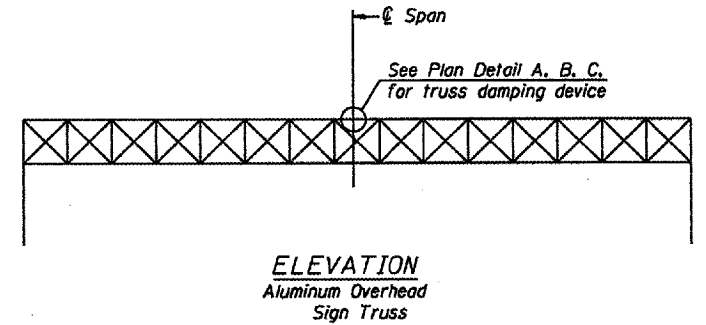
* Center of horizontal to center of splice dimension may vary. Verify before drilling holes in mounting tube.



PLAN DETAIL "A"
Span between Panel Points

PLAN DETAIL "B"
Span at Panel Point

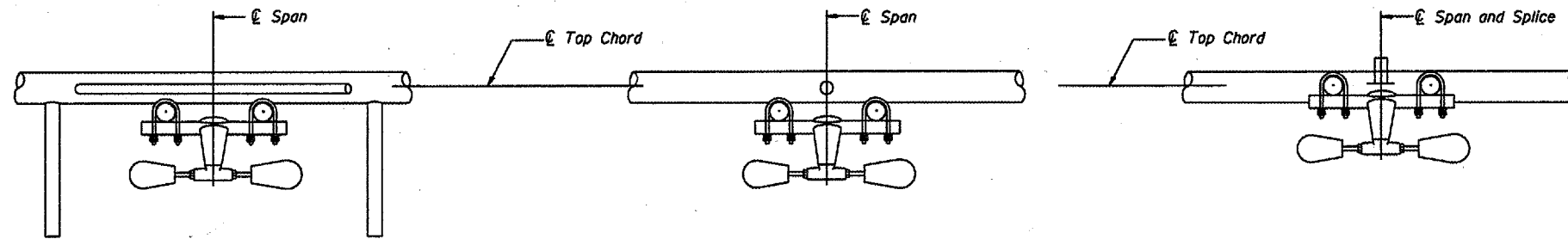
PLAN DETAIL "C"
Span at Chord Splice



ELEVATION
Aluminum Overhead
Sign Truss

NOTES
Damper: One damper per truss.
(31 lbs. Stockbridge-Type Aluminum)
Cost included in Overhead Sign Structure...

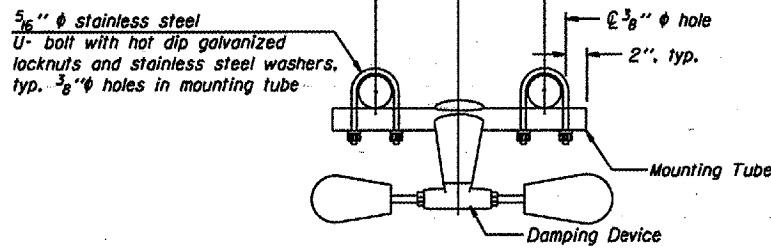
Materials: Aluminum tubes shall be ASTM B221
alloy 6061 temper T6. Cost included in
Overhead Sign Structure...



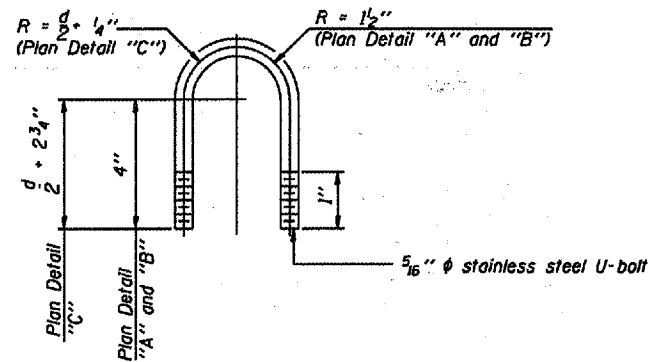
SECTION A-A

SECTION B-B

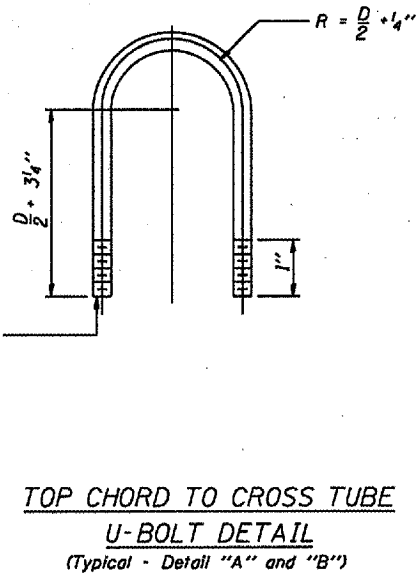
SECTION C-C



TRUSS DAMPING
DEVICE CONNECTION DETAIL
(Typical)



DAMPING DEVICE MOUNTING
TUBE U-BOLT DETAIL
(Typical)



TOP CHORD TO CROSS TUBE
U-BOLT DETAIL
(Typical - Detail "A" and "B")

DESIGNED	20
CHECKED	EXAMINED
DRAWN	PASSED
CHECKED	ENGINEER OF BRIDGES AND STRUCTURES

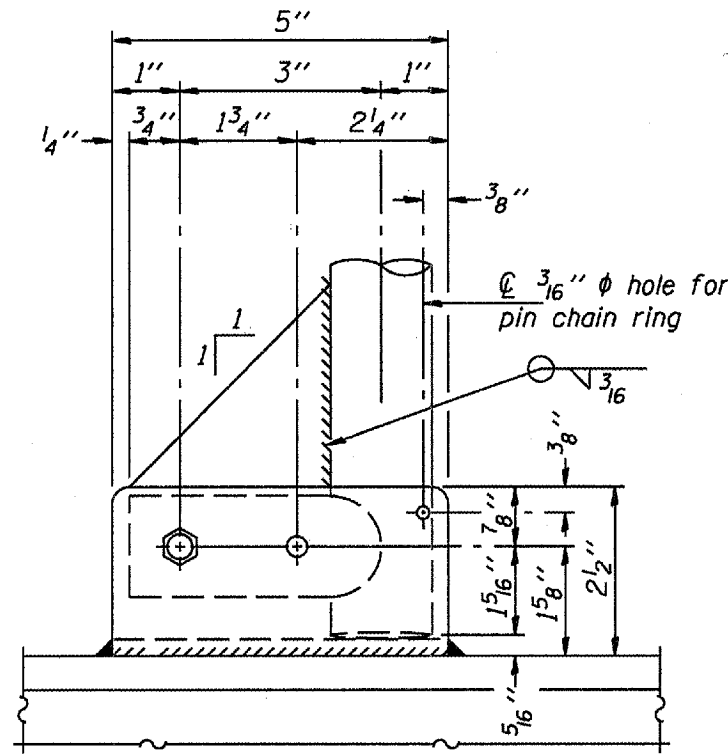
OS-A-D

7/01/2006

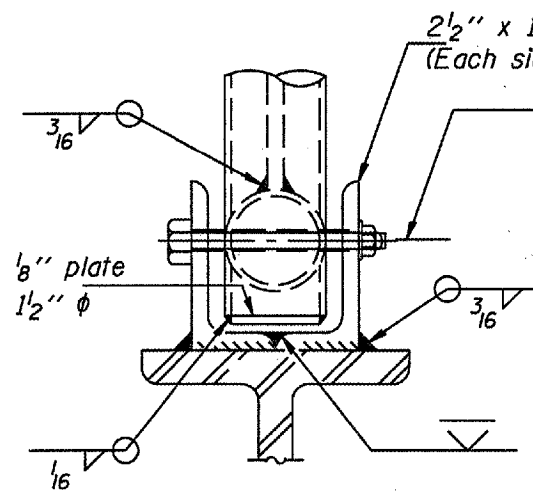
OVERHEAD SIGN STRUCTURE
DAMPING DEVICE

District 7
Overhead Sign
Structure Replacement

STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION



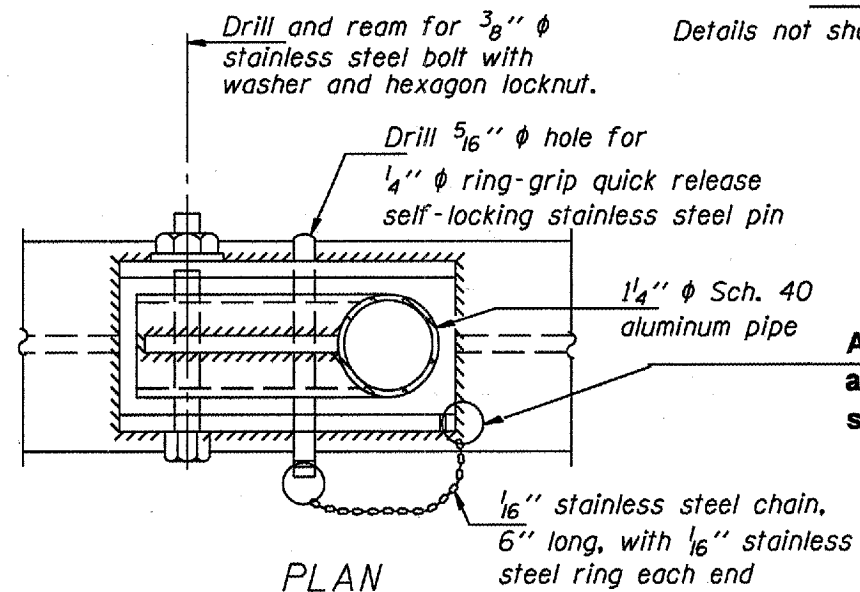
SIDE ELEVATION



FRONT ELEVATION

The existing locking pin hole to be reamed for proper alignment and a new oversized stainless steel pin to be installed.

Details not shown same as "ELEVATION" at right.



PLAN

DETAIL E HANDRAIL HINGE

A new stainless steel chain shall be attached to the angle with a 1/16" stainless steel ring.

OVERHEAD SIGN STRUCTURES
 HANDRAIL HINGE REPAIR DETAIL