LETTING DATE
06/16/09

DYNAMIC MESSAGE SIGNS
ITS-000-S(395)--25-97
WOODBURY Co.

	TOTAL
	15
PROJECT IDENTIFICATION NUMBER	
09-00-000-010	
PROJECT NUMBER	
ITS-000-S(395)--25-97	

Iowa Department of Transportation

Highway Division

PLANS OF PROPOSED IMPROVEMENTS ON THE

INTERSTATE and PRIMARY ROAD SYSTEM

WOODBURY COUNTY

DYNAMIC MESSAGE SIGNS

Two Locations on I-29 and US 77 in Sioux City Area

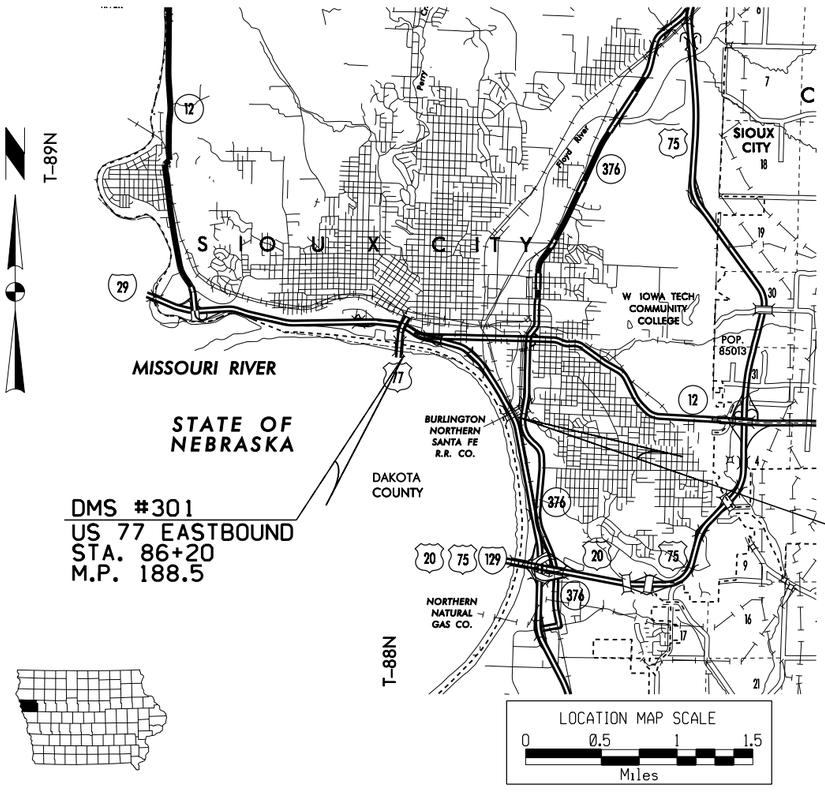
SCALES: As Noted

The Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2001, plus applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions, shall apply to construction work on this project.

Value Engineering Saves. Refer to Article 1105.15 of the Specifications.

NO MILEAGE SUMMARY

IOWA ONE CALL℠
1-800-292-8989
www.iowaonecall.com
811 Dial before you dig



INDEX OF SHEETS

STANDARD ROAD PLANS

105-4
10-16-07

The following Standard Road Plans shall be considered applicable to construction work on this project.

Number	Date	Sheets	Title
RM-38	04-27-99	1	Junction Box (Fiber Reinforced Concrete)
TC-1	10-17-06	1	Work not Affecting Traffic
TC-402	10-21-08	1	Shoulder Closure

INDEX OF SEALS

SHEET NO.	NAME	TYPE
A.01	John M. Narigon	Primary Signature Block
V.1	James R. Hauber	Structural Details

LICENSED PROFESSIONAL ENGINEER
John M. Narigon
11842
IOWA

I hereby certify that this plan was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

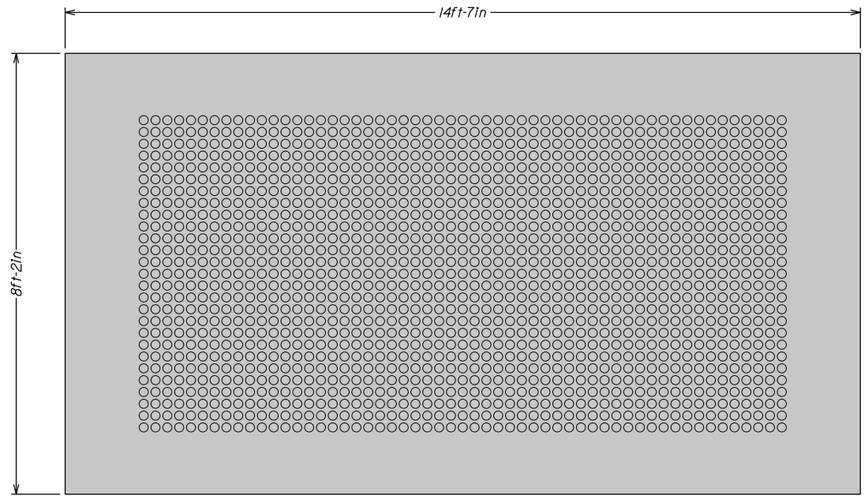
Signature — Date: 04/06/2009

John M. Narigon
Printed or Typed Name

My license renewal date is December 31, 2009

Pages or sheets covered by this seal:
A.01, B.01-B.03, C.01-C.02, J.01, N.01, X.01-X.02

DIMENSIONAL INFORMATION



Manufacturer: Skyline
Model Number: VMSLED-L-3-18F-27X55-I
Type: Full Matrix
Pixels: 55 x 27 (width x height)

Height: 8'2"
Width: 14'7"
Depth: 1'4"

TRANSPORTATION REQUIREMENTS

All material and equipment necessary to transport the sign to or from the storage site and/or installation site shall be furnished by the Contractor.

The sign shall be transported in the upright position. At no point in time shall the sign be laid on its side, front, or back.

To avoid damage to the sign during transport, consult the sign manufacturer to determine the correct method to secure the sign to the trailer.

Any damage incurred during transportation shall be the responsibility of the Contractor.

STORAGE REQUIREMENTS

All material and equipment necessary to store the sign at the designated site shall be furnished by the Contractor.

The sign shall be stored upright and level. At no point in time shall the sign be laid on its side, front, or back.

When the sign is not to be stored on concrete, extra blocking shall be used to account for settlement.

Remove all shipping support legs from the DMS after installation on the support structure.

During transportation and storage, the DMS shall be secured at all times to prevent tipping. The DMS shall be secured with dead man anchors or other suitable methods. The DMS shall not be marred by the selected method. Tipping may be caused by any number of reasons, but high winds and other weather related events are the primary concern while the DMS is on the ground.

Any damage resulting from the failure to properly secure the DMS shall be the responsibility of the Contractor.

ATTACHMENT HARDWARE

All materials necessary to attach the DMS to the support structure will be furnished with the DMS.

LIFTING REQUIREMENTS

The following procedures shall be followed when lifting the sign for either removal or installation, including lifting the sign from the storage site to the trailer or the reverse, and from the trailer to the support structure or the reverse.

The crane and lifting bar shall be rated to lift a minimum of 2000 pounds.

Any damage incurred during lifting shall be the responsibility of the Contractor.

The information presented below is from the literature provided by the manufacturer. Consult the manufacturer for complete lifting requirements.

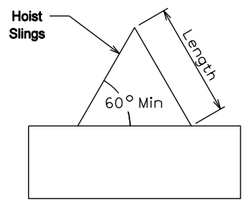
** Skyline Sign Lift Procedure **

When removing an existing sign, the pick angles or lifting brackets may need to be furnished by the Contractor. Consult Skyline for specific information about the pick angle or lifting bracket requirements.

1. When the sign arrives, it should remain secured at all times, either to the trailer or to the crane, until fully mounted on the sign support structure or until secured to the ground.

2. Remove the strapping blocks from the top of the sign to free the brackets to attach the lifting sling.

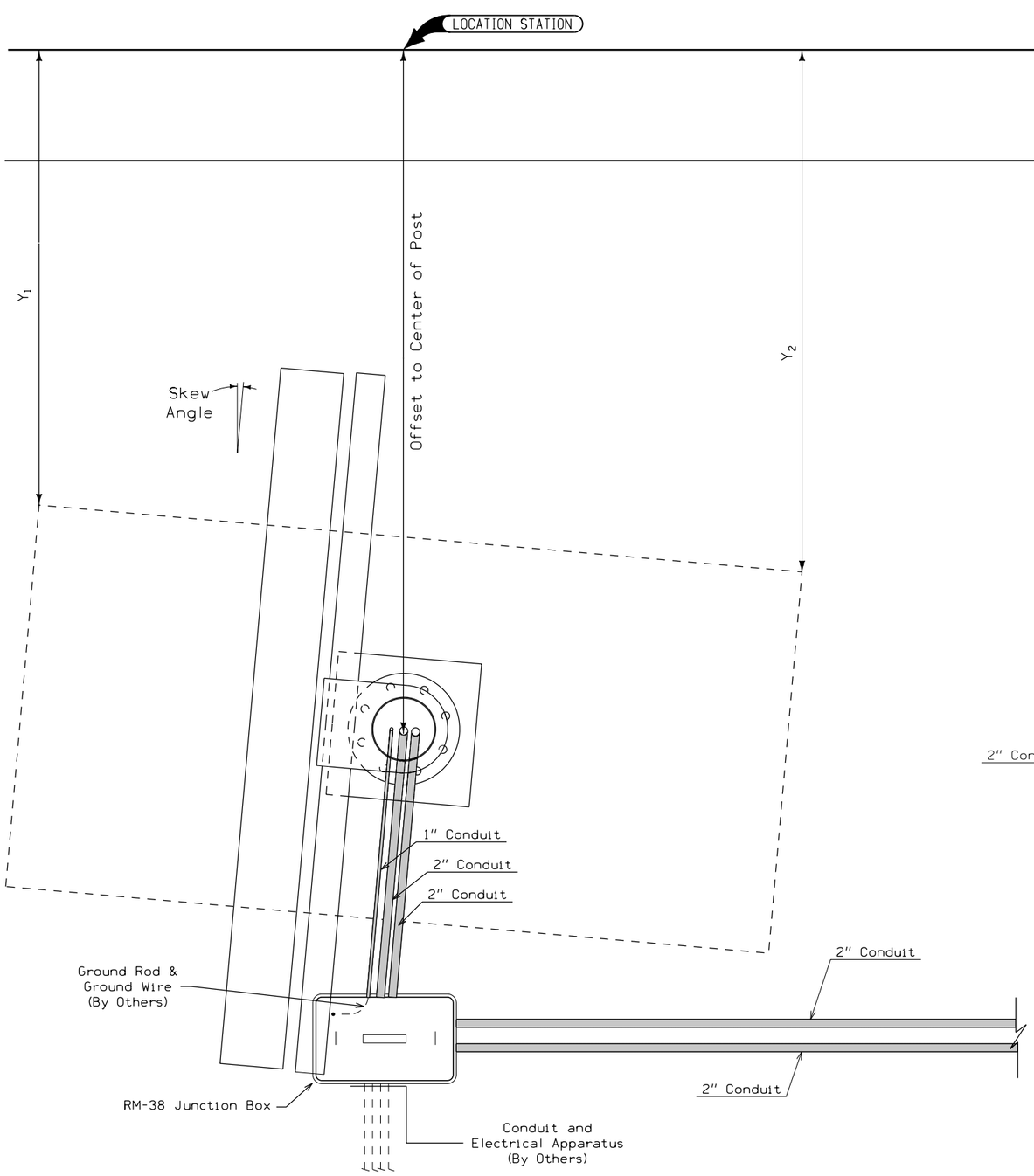
3. Secure the crane's lifting slings to the sign using the appropriate sling length. Attach the slings to the pick angles on the top of the sign using the appropriate spreader bars and/or clevises. Calculate the hoisting sling's length by measuring the distance between the pick angles and a minimum 60° inside angle with the sign.



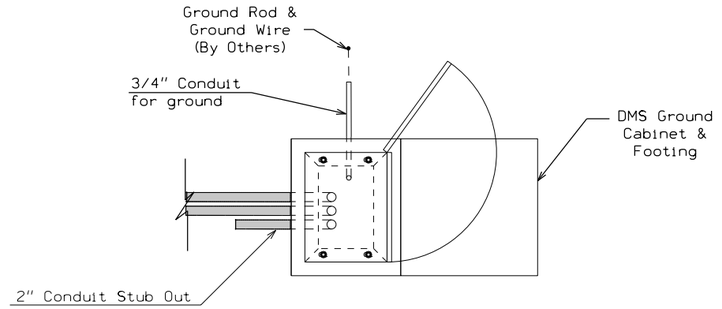
4. Lift the sign into position.

5. If applicable, remove any shipping support legs from the underside of the DMS, and lifting support angles from the top of the DMS. Plug and seal all openings as per the manufacturer's requirements. Any damage incurred by improperly sealed openings shall be the responsibility of the Contractor.

DETAILS OF ROADSIDE DYNAMIC MESSAGE SIGN



PLAN VIEW



SITE INSTALLATION NOTES:

Contractor is to install the sign footing, sign support structure, DMS, the ground cabinet footing, ground cabinet, RM-38 junction box, and conduit between the handhole and each footing.

All wiring for communications, electrical service, and grounding will be completed by the DOT.

The DOT will furnish the ground cabinet to be installed.

The ground cabinet footing shall be located within 25 feet of the RM-38 junction box, beside or behind the DMS and oriented as indicated relative to traffic. In locations with a ditch, the footing shall not be located within the ditch bottom, but should be located beyond the top of the backslope, if possible. The Engineer shall approve the location and orientation prior to placement of the footing.

Install socket type bell ends on conduit protruding from the footing. Finished conduit (including bell end) is to protrude 5 to 6 inches from the top of footing.

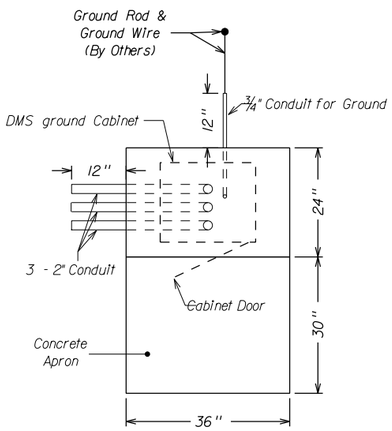
Mark the locations of all conduit entering the sign support structure footing and the ground cabinet footing. Locate marks on the side the conduit enters, near the top, to ensure visibility after backfilling and shaping.

Install handhole and conduit as per sections 2523.01, 2523.09, 2523.10, 2523.11, and 2523.13.

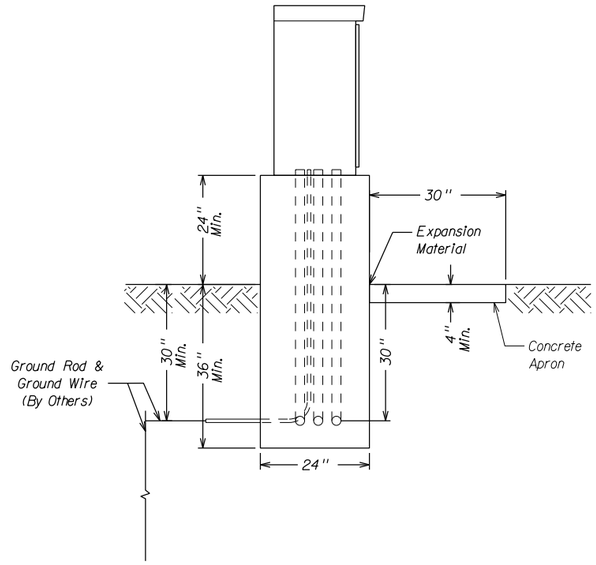
Complete site restoration as per section 2523.18.

SITE INSTALLATION DETAILS FOR ROADSIDE DYNAMIC MESSAGE SIGN

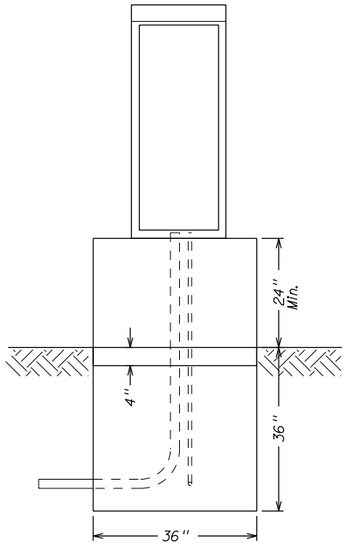
IOWA DEPARTMENT OF TRANSPORTATION	OFFICE OF TRAFFIC & SAFETY	DESIGN TEAM NARIGON/VOGEL	WOODBURY COUNTY	PROJECT NUMBER ITS-000-S(395)--25-97	SHEET NUMBER B.02	



Top View



Side View



Front View

Center DMS Cabinet on footing and attach with pull out anchors. Refer to IM 453.09 for approved anchors.

Center conduits in the footing. Prior to pouring the footing, confirm that no conflicts exist between the conduit placement and the ground cabinet. Maintain at least 2" of clearance to the edge of the ground cabinet.

Cap all open ends of conduit before backfilling. For future reference, mark the locations of all conduit entering the footing on the side which the conduit enters. Locate marks near the top to ensure they remain visible after backfilling and shaping.

Install socket type bell ends on conduit protruding from the footing. Finished conduit (including bell end) is to protrude 5 to 6 inches from the top of footing.

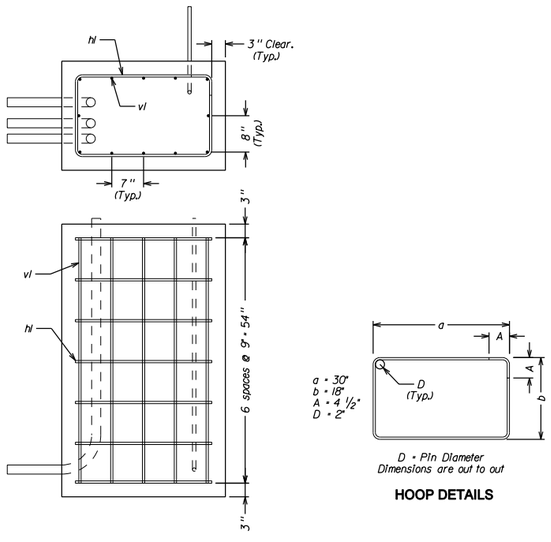
Use Class C Structural Concrete for the footing. Meet the requirements of section 2403 for placement of the concrete. The top of the footing is to be level, and the top edges rounded with an edger.

Provide forms of sufficient strength to prevent warping, bulging, or other deflections. Refer to Section 2403.07 E for additional requirements.

Epoxy coated reinforcement to meet the requirements of section 2404.

Conduit to meet the requirements of section 2323.10.

Excavation, backfilling, and site restoration to meet the requirements of sections 2523.09, 2523.13, and 2523.18, respectively.



HOOP DETAILS

Reinforcing Details

EPOXY COATED REINFORCEMENT QUANTITIES per footing				
BAR	QTY	SIZE	LENGTH	WEIGHT
v1	12	#4	54	36.1
h1	7	#4	105	40.9
Total Weight				77.0

CONCRETE QUANTITIES per footing location	
Footing	1.11 cu yd
Pad	0.09 cu yd

DMS GROUND CABINET FOOTING DETAILS

ESTIMATED PROJECT QUANTITIES

100-1A
07-15-97

Item No.	Item Code	Item	Unit	Total	As Built Quan.
1	2402-2720000	EXCAVATION, CLASS 20	CY	60	
2	2403-0100000	STRUCTURAL CONCRETE (MISCELLANEOUS)	CY	23.0	
3	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	2240	
4	2526-8285000	CONSTRUCTION SURVEY	LS	1	
5	2528-8445110	TRAFFIC CONTROL	LS	1	
6	2533-4980005	MOBILIZATION	LS	1	
7	2599-9999005	ROADSIDE DMS, INSTALL	EACH	2	
8	2599-9999005	STEEL ROADSIDE DMS SIGN SUPPORT	EACH	2	

04-15-08 232-3A

EROSION CONTROL: (Rural Seeding)

Following completion of work in a disturbed area, the area shall be seeded, fertilized, and mulched as follows:

SEEDING:

3 lbs. of Fescue or Fawn per 1000 sq. ft.

FERTILIZER:

17 lbs. of 13-13-13 (or equivalent) commercial fertilizer per 1000 sq. ft.

MULCH:

70 lbs. of dry cereal straw per 1000 sq. ft. All mulch shall be consolidated into the soil with a mulch stabilizer.

The preparation of the seedbed and the furnishing and application of seed, fertilizer, and mulch shall be considered incidental to mobilization and no extra compensation will be allowed.

04-03-01 203-2

During construction of this project, the contractor will be required to coordinate his operations with those of other contractors working within the same area. Other work in progress during the same period of the time will include construction of the following projects:

Project	Type of Work
BRFN-77-2(11)--39-97	Bridge Washing
IMN-29-5(200)72--0E-43	PCC Patching
MPIN-29-3(703)141--0N-97	HMA Crack Filling

ESTIMATE REFERENCE INFORMATION

100-4A
10-29-02

Item No.	Item Code	Description
1	2402-2720000	EXCAVATION, CLASS 20 Refer to Tabulation 192-1.
2	2403-0100000	STRUTURAL CONCRETE (MISCELLANEOUS) Refer to Tabulation 192-1 and "V" sheets for details.
3	2404-7775005	REINFORCING STEEL, EPOXY COATED Refer to Tabulation 192-1 and "V" sheets for details.
4	2526-8285000	CONSTRUCTION SURVEY
5	2528-8445110	TRAFFIC CONTROL Refer to Tabulation 108-23 and Sheet J.01.
6	2533-4980005	MOBILIZATION
7	2599-9999005	ROADSIDE DMS, INSTALL Refer to Tabulation 192-1 and "V" sheets. Work shall consist of furnishing all labor, equipment, and materials to construct and dynamic message sign (DMS), generally including, but not limited to: - attachment of the DMS to the support structure - construction of the ground cabinet footing - installation of an RM-38 junction box - installation of the conduit between the sign support structure footing and the ground cabinet footing - installation of the ground cabinet - transport DMS and associated appurtenances from storage area - remove existing 3' "Z" brackets on back of signs and replace with DOT provided 5" "Z" brackets The Roadside DMS vendor is Skyline Products, Inc. of Colorado Springs, Colorado. The following items will be provided by the DOT or the DMS vendor: DMS, DMS-to-sign support structure attachment hardware, and ground cabinet. The Contractor shall assume full responsibility for the DOT furnished materials prior to accessing them. This assumption of responsibility shall be documented with an itemized invoice clearly identifying each item and shall be signed and dated by the Contractor and the Engineer. Lacking a signed invoice, the default date of assumption of responsibility for these materials shall be the date the contract between the DOT and the Contractor is signed. Upon the assumption of responsibility for any and all materials, the Contractor shall be wholly liable for safe handling, storage, and installation of the equipment. Any damaged equipment shall be replaced at the Contractor's expense, without additional compensation. The DMS's and related equipment are stored in the Iowa DOT Hamilton Avenue Maintenance Facility in Sioux City, IA. METHOD OF MEASUREMENT: The Engineer will count the number of Roadside DMS signs installed. BASIS OF PAYMENT: The Contractor shall be paid the contract unit price for each Roadside DMS sign installed. This payment shall be full compensation for furnishing all material, equipment (except as noted above) and labor and for the performance of all work necessary, including transport of all provided materials from their present location, to provide the DMS installation.
8	2599-9999005	STEEL ROADSIDE DMS SIGN SUPPORT For the fabrication and installation of steel sign supports. Refer to the V sheets for dimensions and details. These items shall be constructed as per section 2423.

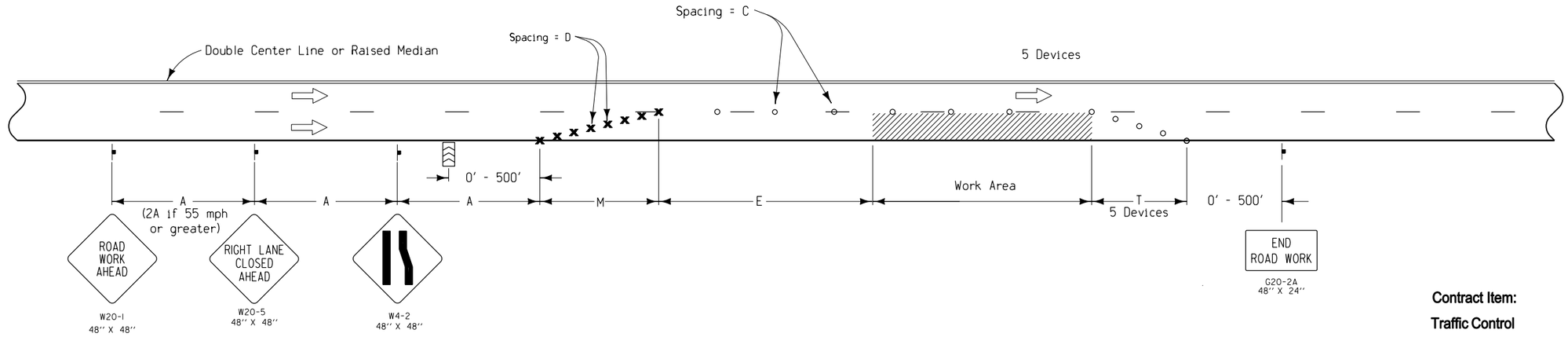
TABULATION OF MATERIALS FOR STEEL ROADSIDE DMS SIGN SUPPORT

Refer to Site Installation Details on Sheet B.02, Sheet N.01 and "V" Sheets.

192-1
03-17-09

DMS NUMBER	LOCATION				HORIZONTAL OFFSET TO CENTER OF POST (Ft)	SKEW ANGLE (Degrees)	OFFSETS TO NEAR CORNERS OF FOOTING		LENGTH OF POST (Ft)	FOUNDATION QUANTITIES		
	ROUTE	STATION	MILEPOST	DIR OF TRAVEL			Y_1 (Ft)	Y_2 (Ft)		EXCAVATION (CLASS 20) (Cu Yd)	REINFORCING - EPOXY- COATED STEEL (Lb)	STRUCTURAL CONCRETE (Cu Yd)
301	US 77	86+20	188.5	NB	19.20[1]	3	15.00[1]	15.57[1]	16.0	30	1120	11.5
302	I-29	407+25	146.6	NB	46.0	6	40.79	43.81	30.0	30	1120	11.5
									TOTALS	60	2240	23.0

[1] Measured from back of curb.



Contract Item:
Traffic Control

LEGEND

- Traffic Sign
- Drum
- 42" Channelizer or Vertical Panel
- Arrow Panel
- Work Area
- Direction of Traffic

SPEED LIMIT (mph)	A	C	D	E	M	T
35 or less	250'	40'	35'	0'-200'	245'	50'
40	500'	80'	40'	0'-300'	320'	50'
45	700'	80'	45'	0'-400'	630'	100'
50	700'	80'	45'	400'	630'	100'
55 - 60	1000'	100'	55'	600'	770'	100'

(1) **Place two drums in the closed lane at the beginning of the work zone.**

MODIFIED STANDARD ROAD PLAN TC-419

RIGHT LANE CLOSURE ON

MULTI-LANE HIGHWAY

TRAFFIC CONTROL PLAN

108-23
04-04-89

DMS #301

US 77 shall remain open to traffic at all times.

Closure of the right lane of eastbound traffic as detailed hereon shall be limited to the hours of 9:00 AM to 3:00 PM or at other times as designated by the Engineer.

Sidewalks shall remain open during "Special Events" as detailed in Tabulation 102-15 or at other times as designated by the Engineer.

DMS #302

I-29 shall remain open to 4 lanes of traffic in the current configuration at all times.

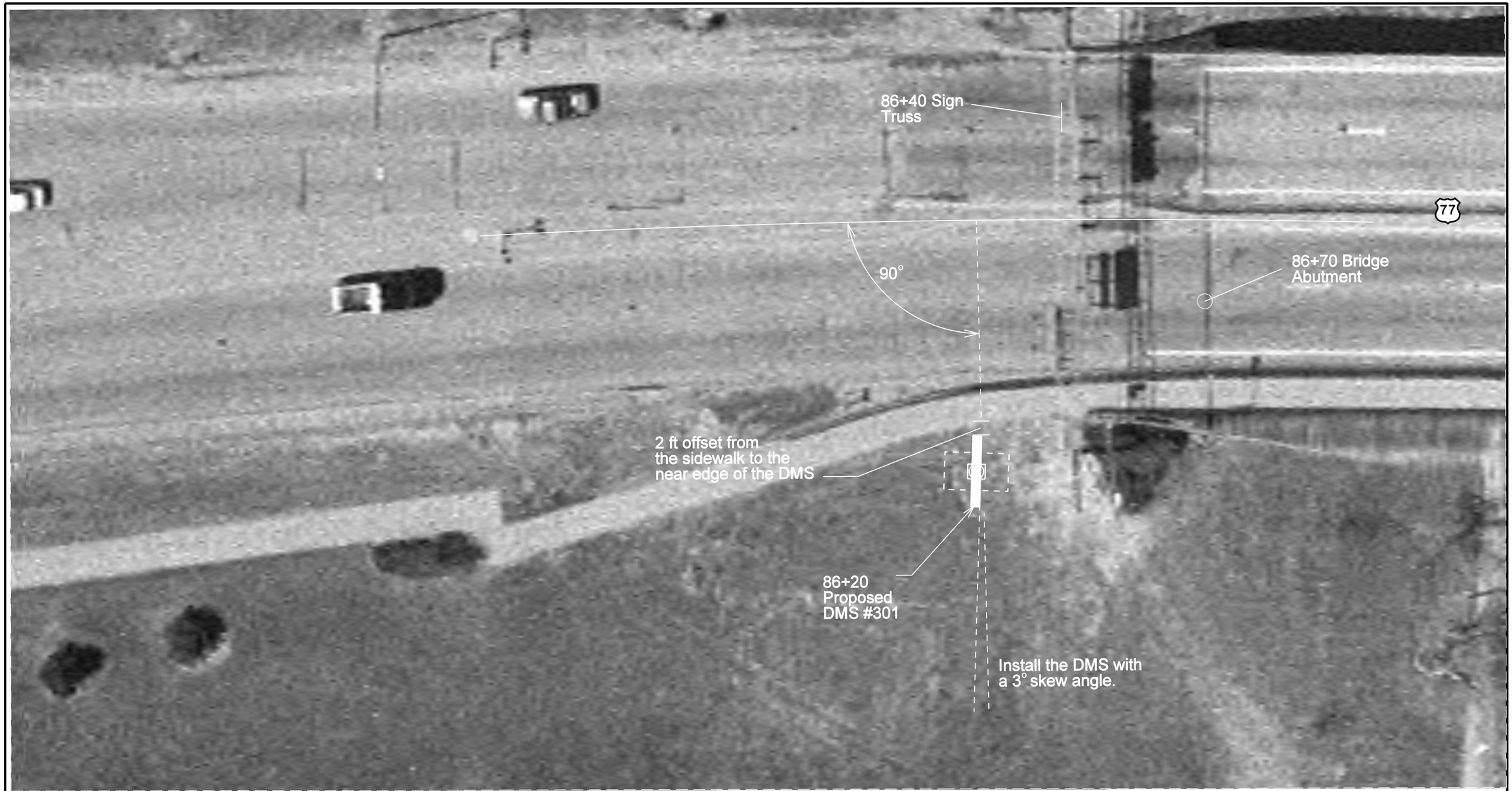
TABULATION OF SPECIAL EVENTS

102-15
10-29-02

Event	Location	Date
Tri-State Trails Tour Bike Ride		May 16, 2009 *
Siouxland Lewis and Clarke Marathon		October 17, 2009 *

* Appropriate date in subsequent years should construction extend beyond 2009.

DETAILS OF TRAFFIC CONTROL



0 10
FEET

SITE DETAILS FOR DMS #301
US 77 - NORTHBOUND
SOUTH SIOUX CITY

IOWA DEPARTMENT OF TRANSPORTATION	OFFICE OF TRAFFIC & SAFETY	DESIGN TEAM NARIGON/VOGEL	WOODBURY COUNTY	PROJECT NUMBER ITS-000-S(395)--25-97	SHEET NUMBER N.01

4/20/2009 jnarigo W:\Projects\0000001005\TrafEng\97-000S-395\97000S395_n01.sht

ANCHOR BOLT NOTES:

PROCEDURE FOR TIGHTENING ANCHOR BOLT NUTS ON STEEL ROADSIDE D.M.S. SUPPORT.

1) THIS WORK SHALL BE PERFORMED ONLY ON DAYS WITH WINDS LESS THAN 15 MPH. ALL TIGHTENING OF THE NUTS IS TO BE DONE IN THE PRESENCE OF THE INSPECTOR. ONCE THE TIGHTENING PROCEDURE IS STARTED IT MUST BE COMPLETED ON ALL OF THE BASE PLATE NUTS WITHOUT PAUSE OR DELAY.

2) PROPERLY SIZED WRENCHES DESIGNED FOR TIGHTENING NUTS AND/OR BOLTS SHALL BE USED TO AVOID ROUNDING OR OTHER DAMAGE TO THE NUTS. ADJUSTABLE END OR PIPE WRENCHES MAY NOT BE USED.

3) BASE PLATE, ANCHOR RODS AND NUTS ARE TO BE FREE OF ANY DIRT OR DEBRIS.

4) APPLY STICK WAX OR BEES WAX TO THE THREADS AND BEARING SURFACES OF THE ANCHOR BOLT, NUTS, AND WASHERS.

5) TIGHTEN TOP NUTS SO THEY FULLY CONTACT THE BASE PLATE. TIGHTEN LEVELING NUTS TO SNUG TIGHT CONDITION. SNUG TIGHT IS DEFINED AS THE FULL EFFORT OF ONE PERSON ON A WRENCH WITH A LENGTH EQUAL TO 14 TIMES THE BOLT DIAMETER BUT NOT LESS THAN 18 INCHES. APPLY THE FULL EFFORT AS CLOSE TO THE END OF THE WRENCH AS POSSIBLE. PULL FIRMLY BY LEANING BACK AND USING ENTIRE BODY WEIGHT ON THE END OF THE WRENCH UNTIL THE NUT STOPS ROTATING. USE A MINIMUM OF TWO SEPARATE PASSES OF TIGHTENING. SEQUENCE THE TIGHTENING IN EACH PASS SO THAT THE NUT ON THE OPPOSITE SIDE, TO THE EXTENT POSSIBLE, WILL BE SUBSEQUENTLY TIGHTENED UNTIL ALL OF THE NUTS IN THAT PASS HAVE BEEN TIGHTENED.

6) TIGHTEN TOP NUTS TO SNUG TIGHT AS DESCRIBED FOR THE LEVELING NUTS.

7) MATCH-MARK THE TOP NUTS AND BASE PLATE USING PAINT, CRAYON, OR OTHER APPROVED MEANS TO PROVIDE A REFERENCE FOR DETERMINING THE RELATIVE ROTATION OF THE NUT AND BASE PLATE DURING TIGHTENING. USING A STRIKING OR HYDRAULIC WRENCH, FURTHER TIGHTEN THE TOP NUTS IN TWO PASSES AS LISTED IN THE FOLLOWING TABLE. USE A SEQUENCE OF TIGHTENING IN EACH PASS SO THAT THE NUT ON THE OPPOSITE SIDE, TO THE EXTENT POSSIBLE, WILL BE SUBSEQUENTLY TIGHTENED UNTIL ALL NUTS IN THAT PASS HAVE BEEN TURNED. DO NOT ROTATE THE LEVELING NUT DURING THE TOP NUT TIGHTENING.

ANCHOR BOLT SIZE	FIRST PASS	SECOND PASS	TOTAL ROTATION
LESS THAN OR EQUAL TO $1\frac{1}{2}\Phi$"	1/6 TURN	1/6 TURN	1/3 TURN

8) LUBRICATE, PLACE AND TIGHTEN THE JAM NUTS TO SNUG TIGHT.

DESIGN STRESSES:

DESIGN STRESSES FOR MATERIALS ARE IN ACCORDANCE WITH A.A.S.H.T.O STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, SERIES OF 2001 WITH CURRENT INTERIMS.

SPECIFICATIONS:

DESIGN: A.A.S.H.T.O. STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, SERIES OF 2001 WITH CURRENT INTERIMS.
CONSTRUCTION: IOWA D.O.T. STANDARD SPECIFICATIONS, SERIES 2001 PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

STAINLESS STEEL BOLTING NOTES:

1) UNLESS OTHERWISE NOTED ON THE PLAN, ALL STAINLESS STEEL BOLTS AND U-BOLTS SHALL BE FURNISHED WITH STAINLESS STEEL REGULAR HEXAGONAL NUTS, JAM NUTS AND WASHERS UNDER BOTH HEADS AND NUTS.

2) IN CASE STAINLESS STEEL LOCK WASHERS ARE USED IN LIEU OF JAM NUTS, THE REGULAR WASHERS UNDER NUTS ARE TO BE OMITTED.

3) STAINLESS STEEL BOLTS SHALL COMPLY WITH ASTM A320 OR F593 AS PER STANDARD SPECIFICATIONS. STAINLESS STEEL PARTS SHALL COMPLY WITH ASTM A240, 300 SERIES.

STEEL NOTES:

ALL STEEL SHAPES, BARS, AND PLATES SHALL COMPLY WITH ASTM A36 EXCEPT MINOR PARTS APPROVED BY THE ENGINEER MAY COMPLY WITH ASTM A575 GRADE M1020. THE GALVANIZED METAL BAR GRATING INCLUDING BEARING BAR, CROSS BARS AND BANDING BARS SHALL COMPLY WITH THE REQUIREMENTS OF ASTM A1011 TYPE 2. ALL STEEL PIPE SHALL COMPLY WITH THE REQUIREMENTS OF ASTM A53 GRADE B, TYPE E OR S OR API 5L GRADE B. ALL ROUND HSS SHALL COMPLY WITH THE REQUIREMENTS OF ASTM A 500 GRADE B.

ALL STEEL SECTIONS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. PROVIDE VENT HOLES FOR GALVANIZING.

ALL ANCHOR BOLT MATERIAL SHALL COMPLY WITH THE REQUIREMENTS OF IOWA DOT MATERIALS IM 453.08.

STEEL WELDING SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE AWS SPECIFICATIONS D1.1, STRUCTURAL WELDING CODE-STEEL.

ULTRASONIC TESTING SHALL BE PREFORMED ON THE POST TO BASE PLATE WELDS.

THE $\frac{3}{4}\Phi$ A325 GALVANIZED BOLTS SHALL BE TENSIONED BY TURN OF THE NUT METHOD.

GENERAL NOTES:

ALL D.M.S. SUPPORTS ARE DESIGNED FOR 40.2 lb/ft^2 WIND PRESSURE ON MEMBERS AND SIGN PANELS.

ALL PIPES, SHAPES, AND PLATES SHALL BE STRUCTURAL STEEL COMPLYING WITH THE ASTM SPECIFICATIONS NOTED.

SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL.

CLEAR DISTANCE FROM FACE OF CONCRETE TO THE NEAREST REINFORCING BAR SHALL BE 2" UNLESS OTHERWISE SHOWN.

THE ANCHOR BOLT ASSEMBLY SHALL BE CENTERED AT THE CENTER OF SHAFT AND SECURELY WIRED IN PLACE BEFORE CONCRETE IS PLACED.

THE FOOTING SHALL BE BACKFILLED PRIOR TO ERECTING SIGN SUPPORT.

DESIGN ALLOWABLE SOIL BEARING IS 1.0 TONS PER SQ. FT.

ALL REINFORCING TO BE GRADE 60.

ALL CONCRETE TO BE CLASS "C" STRUCTURAL CONCRETE.

KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. IN ADDITION, THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO A MAXIMUM OF 10 DEGREES FROM VERTICAL.

FOUNDATIONS AND ANCHOR BOLTS:

1) THE ELEVATION AT THE OF THE TOP OF THE FOUNDATION SHALL BE WITHIN 1 INCH OF PLAN ELEVATION.

2) ANCHOR BOLT GROUPS SHALL BE LOCATED ACCURATELY BY TEMPLATE OR OTHER POSITIVE MEANS, WITH CENTERS OF ADJACENT ANCHOR BOLT GROUPS WITHIN $\frac{3}{16}$ INCH OF THE CORRECT DISTANCE APART.

3) ANCHOR BOLTS SHALL BE PLUMB WITHIN $\frac{1}{4}$ INCH PER FOOT FROM VERTICAL.

4) ANCHOR BOLTS SHALL PROJECT ABOVE TOP OF FOUNDATION WITHIN $\frac{1}{4}$ INCH OF THE PLAN DIMENSION.

5) WELDING OR BENDING OF ANCHOR BOLTS SHALL NOT BE ALLOWED. THE CONTRACTOR SHALL OBTAIN A TEMPLATE FROM THE MANUFACTURER / FABRICATOR FOR PROPER PLACEMENT OF THE ANCHOR BOLTS.

COMPLETED STEEL STRUCTURE:

1) THE SUPPORT COLUMN SHALL BE PLUMB WITHIN $\frac{1}{16}$ INCH PER FOOT OF VERTICAL IN TWO PERPENDICULAR DIRECTIONS.

2) HORIZONTAL LINE BETWEEN CHORDS SHALL BE LEVEL WITHIN $\frac{1}{16}$ INCH PER FOOT OF HORIZONTAL.

STRUCTURAL DESIGN

LICENSED PROFESSIONAL ENGINEER
James R. Hauber
18418
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

James Hauber 4-1-09
Signature Date

James R. Hauber
Printed or Typed Name

My license renewal date is December 31, 2010

Pages or sheets covered by this seal: V.1 THRU V.5

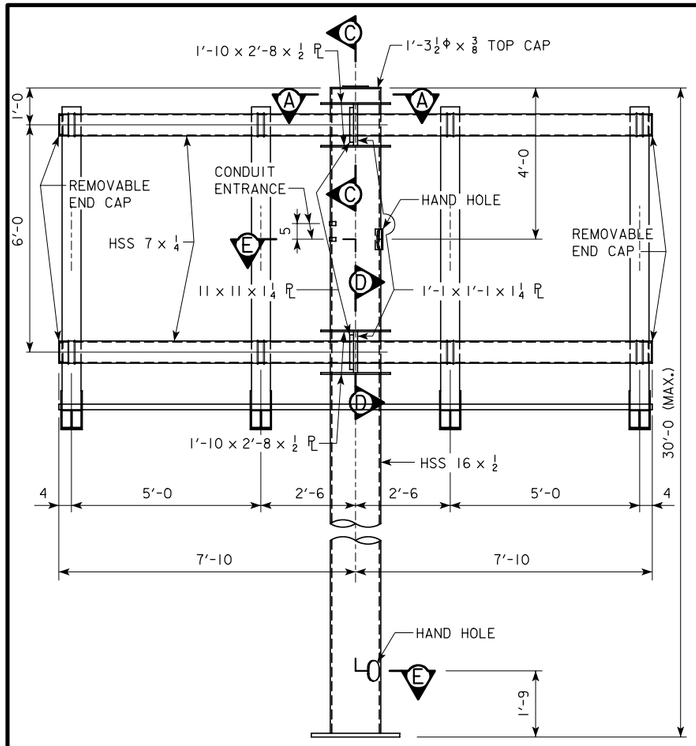
DESIGN FOR
STEEL ROADSIDE D.M.S. SUPPORT
GENERAL NOTES

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

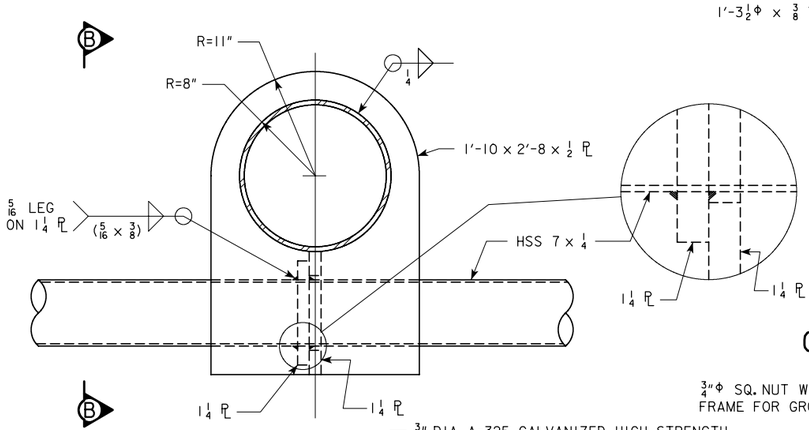
CANTILEVERSIGNTRUSS.DGN - 5257 - THIS SHEET ISSUED ??.

DESIGN TEAM JRH/DAW/HLA | WOODBURY COUNTY | PROJECT NUMBER ITS-000-S(395)--25-97 | SHEET NUMBER V.1

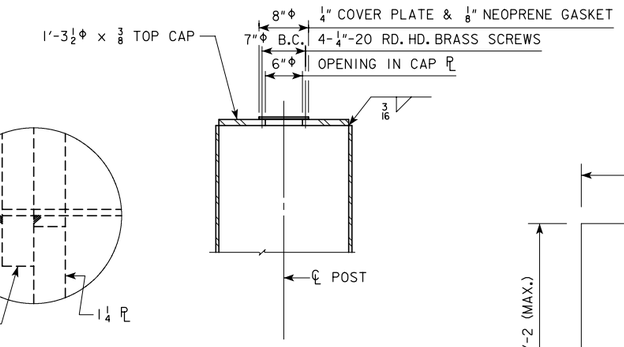
02-APR-2009 14:14 dwrigh2 W:\Projects\0000001009\BRFinal\97000S395.brg 970000S001 \\ntpprtsvr2\BrgPDF



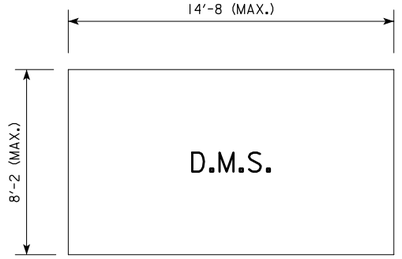
ELEVATION



SECTION A-A



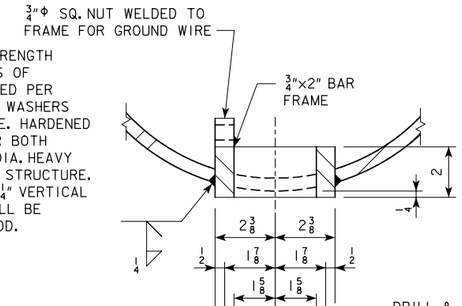
COVER PLATE DETAIL



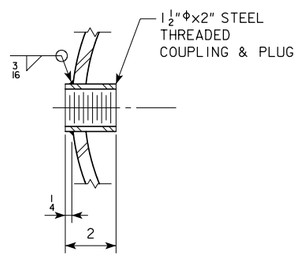
D.M.S. LIMITS FOR SIGN SUPPORT DESIGN.

1700 LBS. MAX.
1'-4 MAX. DEPTH

¾" DIA. A-325 GALVANIZED HIGH STRENGTH BOLTS, MEETING THE REQUIREMENTS OF ARTICLE 2408.39. 8 BOLTS REQUIRED PER SUPPORT STRUCTURE, 16 HARDENED WASHERS REQUIRED PER SUPPORT STRUCTURE. HARDENED WASHERS WILL BE PROVIDED UNDER BOTH HEAD AND NUT OF BOLTS. 8 - ¾" DIA. HEAVY HEX NUTS REQUIRED PER SUPPORT STRUCTURE. DRILL 4 - 15/16" DIA. HOLES IN EACH 1¼" VERTICAL PLATE. HIGH STRENGTH BOLTS SHALL BE TENSIONED BY TURN-OF-NUT METHOD.



DETAIL "B"



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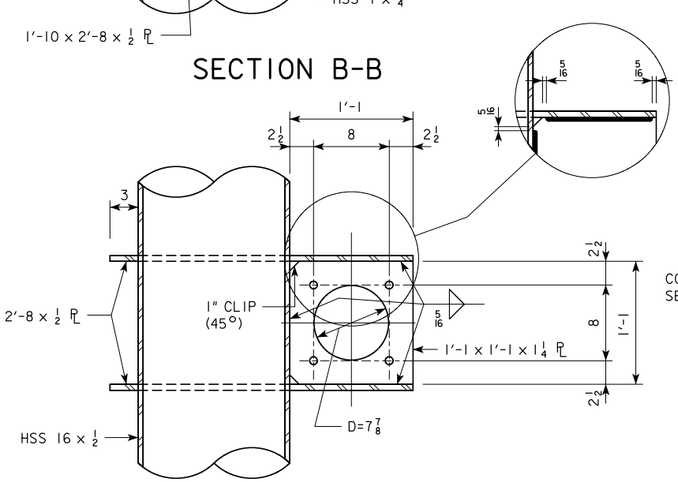

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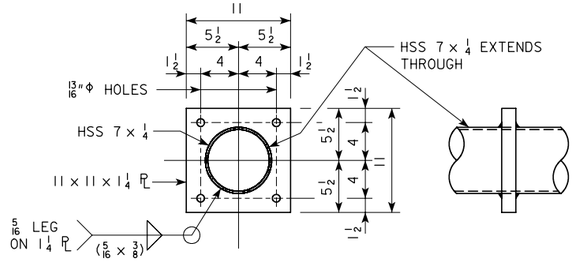

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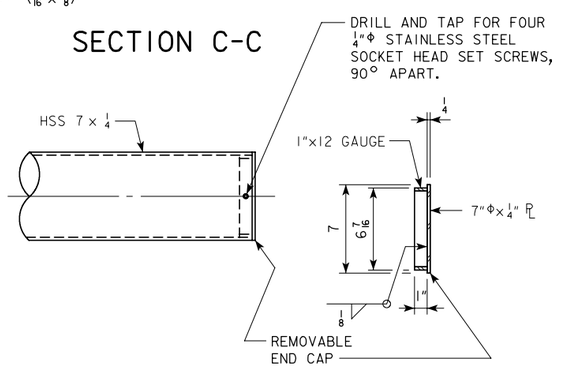
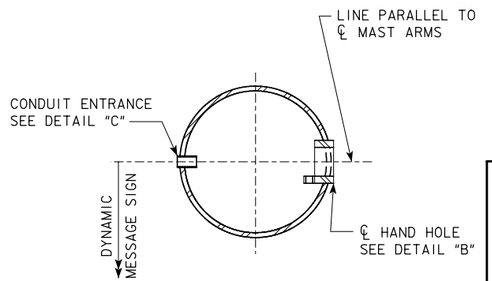


END CAP DETAIL

SECTION D-D

(HSS 7 x ¼ NOT SHOWN)



SECTION E-E

DESIGN FOR

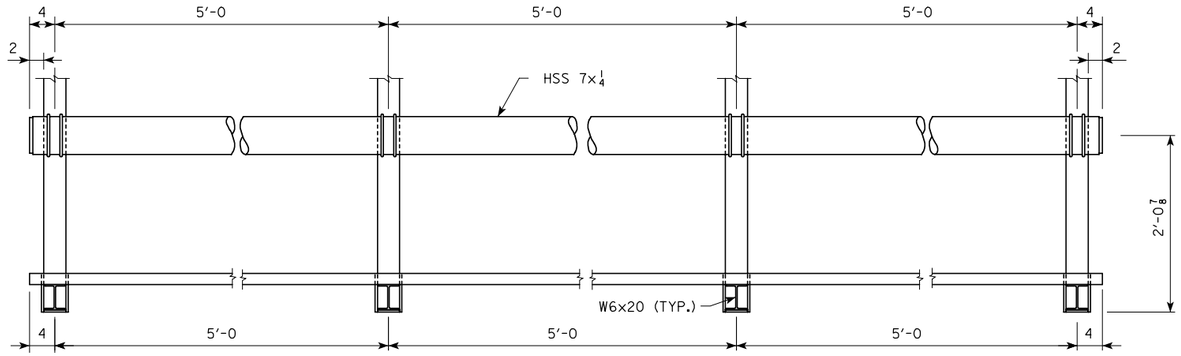
STEEL ROADSIDE D.M.S. SUPPORT

SIGN SUPPORT DETAILS

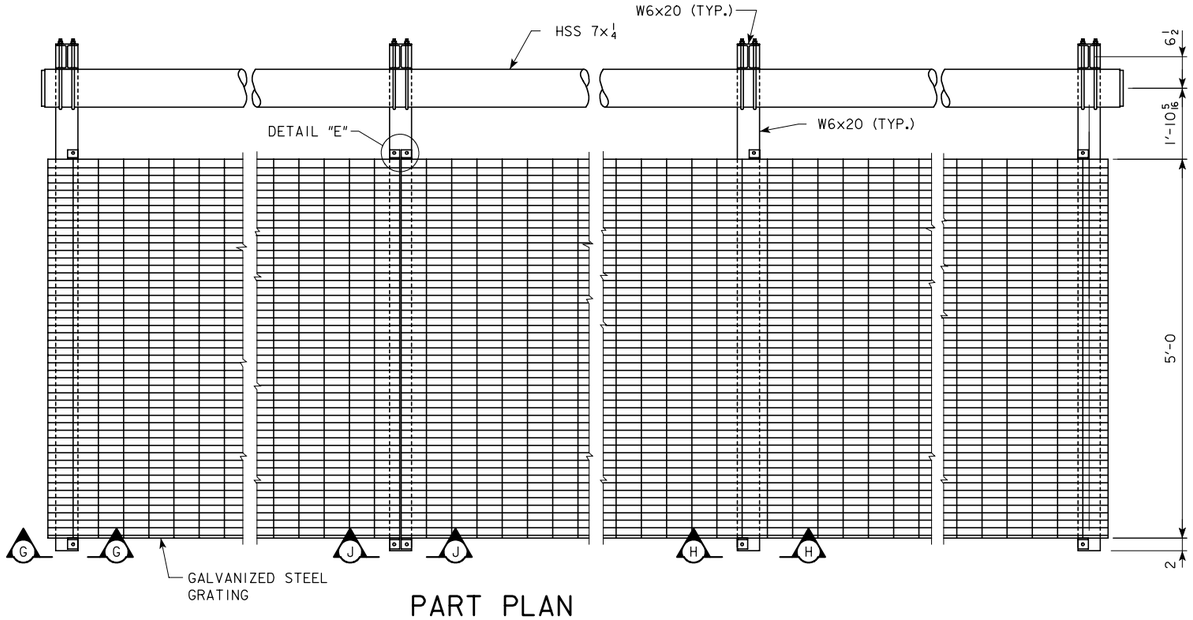
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN TEAM JRH/DAW/HLA	CANTILEVER SIGN TRUSS	WOODBURY COUNTY	PROJECT NUMBER ITS-000-S(395)--25-97	SHEET NUMBER V.2

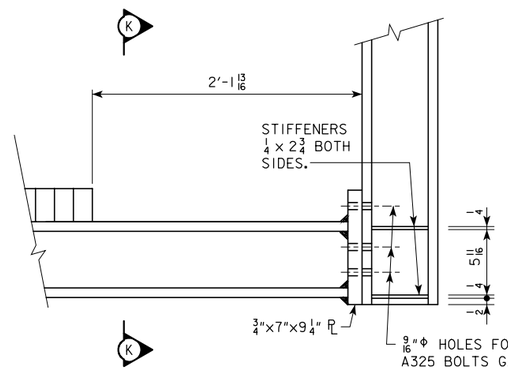
02-APR-2009 14:14 dwrigh2 W:\Projects\0000001009\BRFinal\97000S395.brg 970000S002 \\ntpprtsvr2\BrgPDF



PART ELEVATION



PART PLAN



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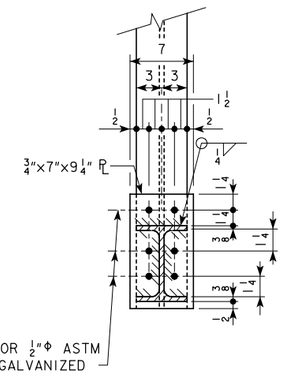
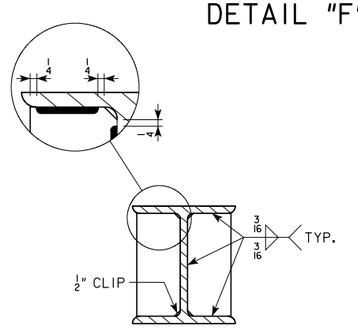
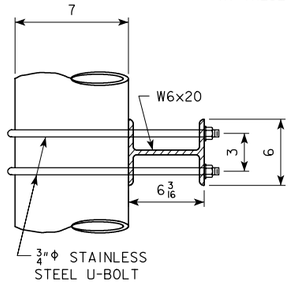


SECTION K-K

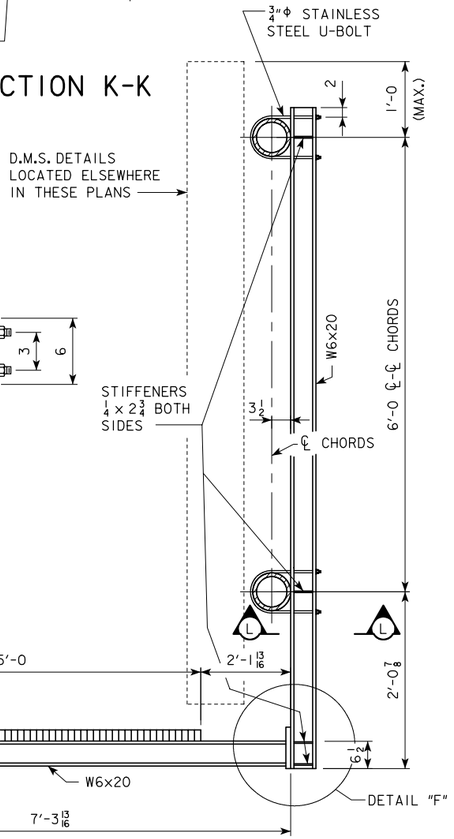


TYPICAL STIFFENER DETAIL

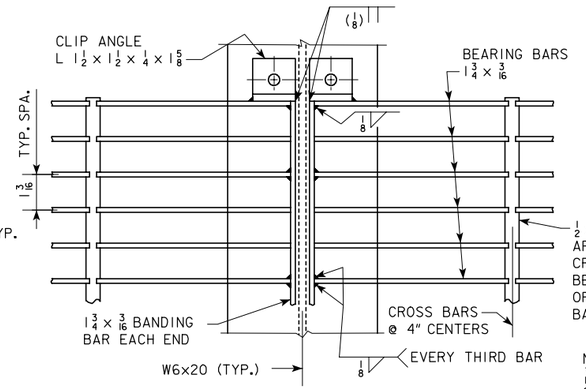
STAINLESS STEEL U-BOLT DETAIL



SECTION L-L



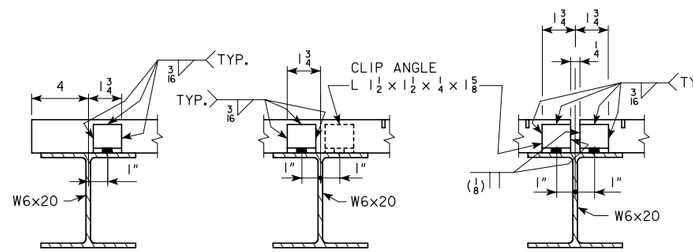
TYPICAL WORK PLATFORM SECTION



DETAIL "E"

½ × 3/16 CROSS BARS OR APPROVED EQUAL. CROSS BARS ARE TO BE PRESSURE LOCKED OR WELDED TO BEARING BARS.

NOTE:
7/16"Φ HOLE IN CLIP ANGLE AND 7/16"Φ HOLE IN W6×20 FOR ⅜"Φ STAINLESS STEEL BOLT. ADJUST CLIP SO GRATING BEARS ON BEAM.



DESIGN FOR

STEEL ROADSIDE D.M.S. SUPPORT

WORK PLATFORM DETAILS

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN TEAM JRH/DAW/HLA	WOODBURY COUNTY	PROJECT NUMBER ITS-000-S(395)--25-97	SHEET NUMBER V.3

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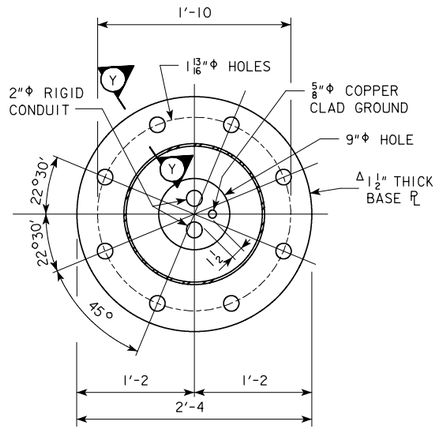
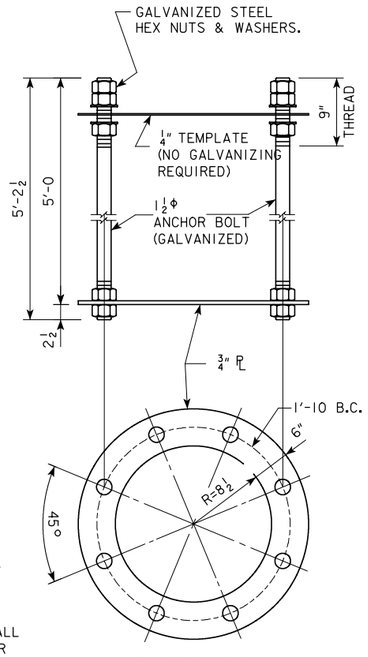
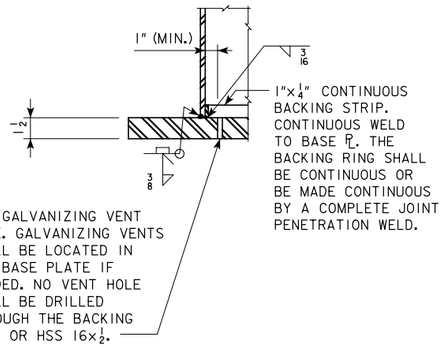


SECTION X-X

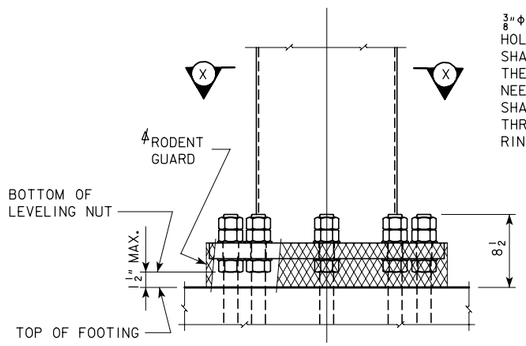


ANCHOR BOLT ASSEMBLY

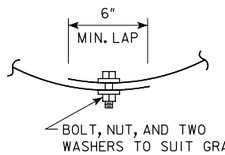
(ALL ANCHOR BOLT MATERIAL SHALL COMPLY WITH THE REQUIREMENTS OF IOWA DOT MATERIALS I.M. 453.08.)



SECTION Y-Y



POST BASE DETAIL



RODENT GUARD CLOSURE DETAIL

RODENT A RODENT GUARD SHALL BE PLACED BETWEEN THE CONCRETE FOOTING AND THE BASE PLATE, SEE MATERIALS I.M. 443.01.

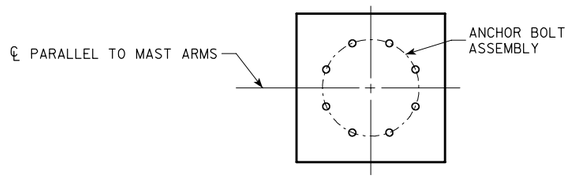
AS AN ALTERNATE STAINLESS STEEL STANDARD GRADE WIRE CLOTH, 1/4" MAXIMUM OPENING WITH A MINIMUM WIRE DIAMETER OF AWG. NO. 16 WITH A MINIMUM 2" LAP. SECURE TO BASE PLATE AFTER ERECTION WITH 3/4" STAINLESS STEEL BANDING.

DESIGN FOR

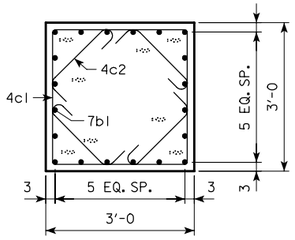
STEEL ROADSIDE D.M.S. SUPPORT

SIGN SUPPORT DETAILS

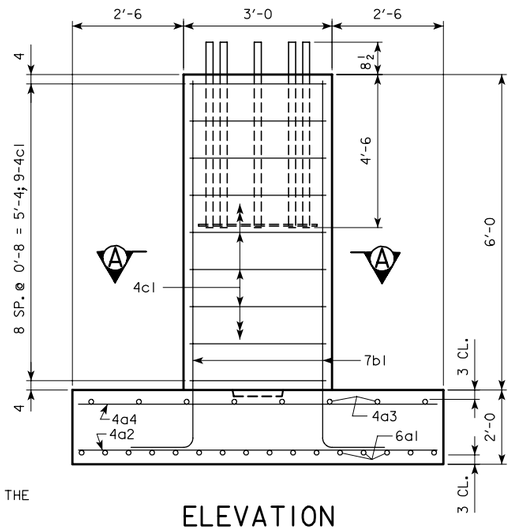
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION



TOP VIEW

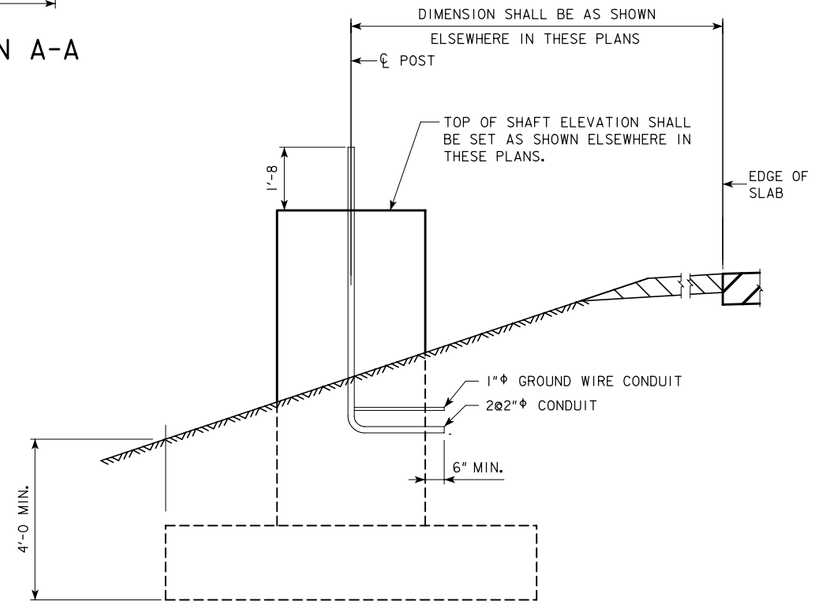


SECTION A-A

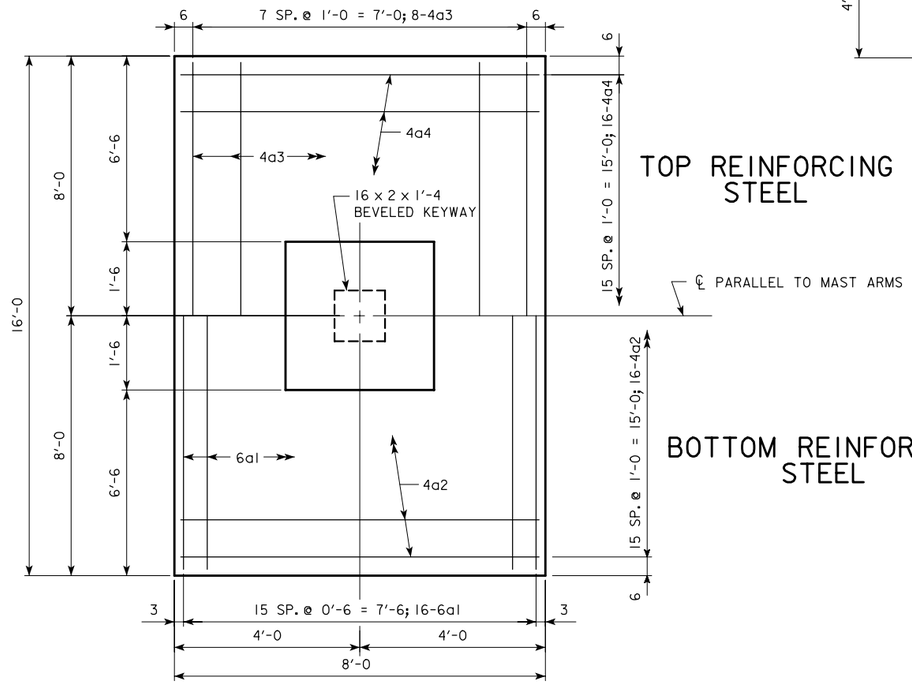


ELEVATION

THE JOINT BETWEEN THE SHAFT AND FOOTING SHALL BE ROUGH.



ELEVATION - TOP OF SHAFT AND BACKFILL



TOP REINFORCING STEEL

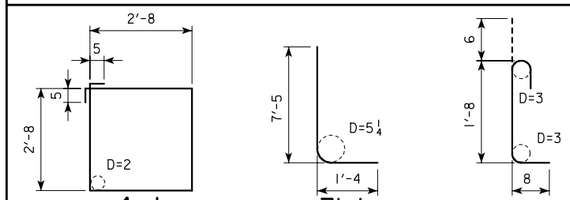
BOTTOM REINFORCING STEEL

FOOTING PLAN

EPOXY-COATED REINFORCING BAR LIST

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6a1	FOOTING BOTT., LONGIT.	—	16	15'-8	377
4a2	FOOTING BOTT., TRANSV.	—	16	7'-8	82
4a3	FOOTING TOP, LONGIT.	—	8	15'-8	84
4a4	FOOTING TOP, TRANSV.	—	16	7'-8	82
7b1	FOOTING TO SHAFT DOWEL	L	20	8'-9	358
4c1	SHAFT HOOPS	□	9	11'-6	69
4c2	SHAFT TIES	⊔	36	2'-10	68
	REINFORCING STEEL - EPOXY COATED TOTAL (LBS.)				1120

BENT BAR DETAILS



NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

ESTIMATED CONCRETE QUANTITIES

SHAFT	2.0
FOOTING	9.5
TOTAL - CU. YDS.	11.5

FOOTING ESTIMATED QUANTITIES

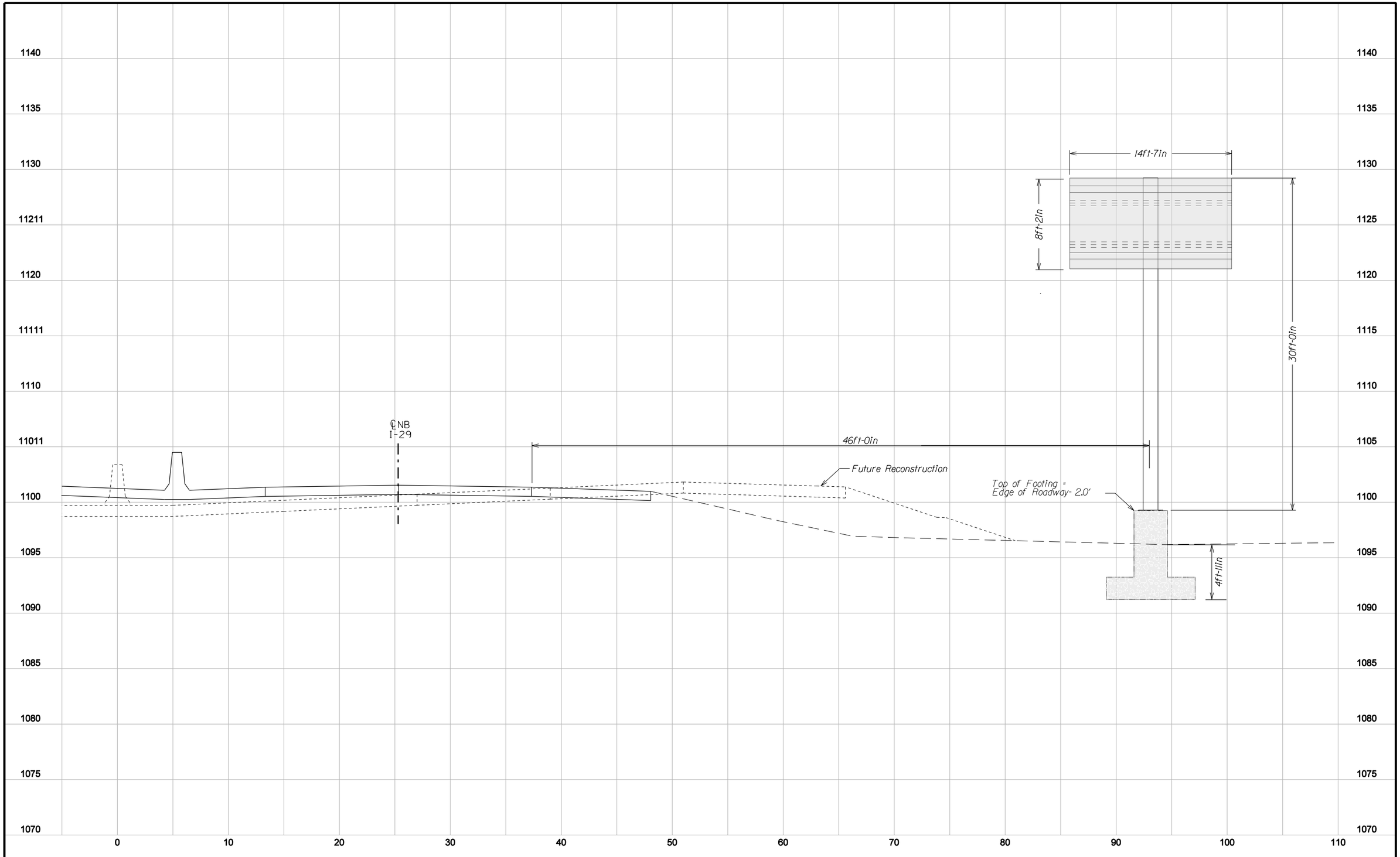
ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE	CU. YDS.	11.5
REINFORCING STEEL-EPOXY COATED	LBS.	1120

DESIGN FOR

STEEL ROADSIDE D.M.S. SUPPORT

FOOTING DETAILS

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION



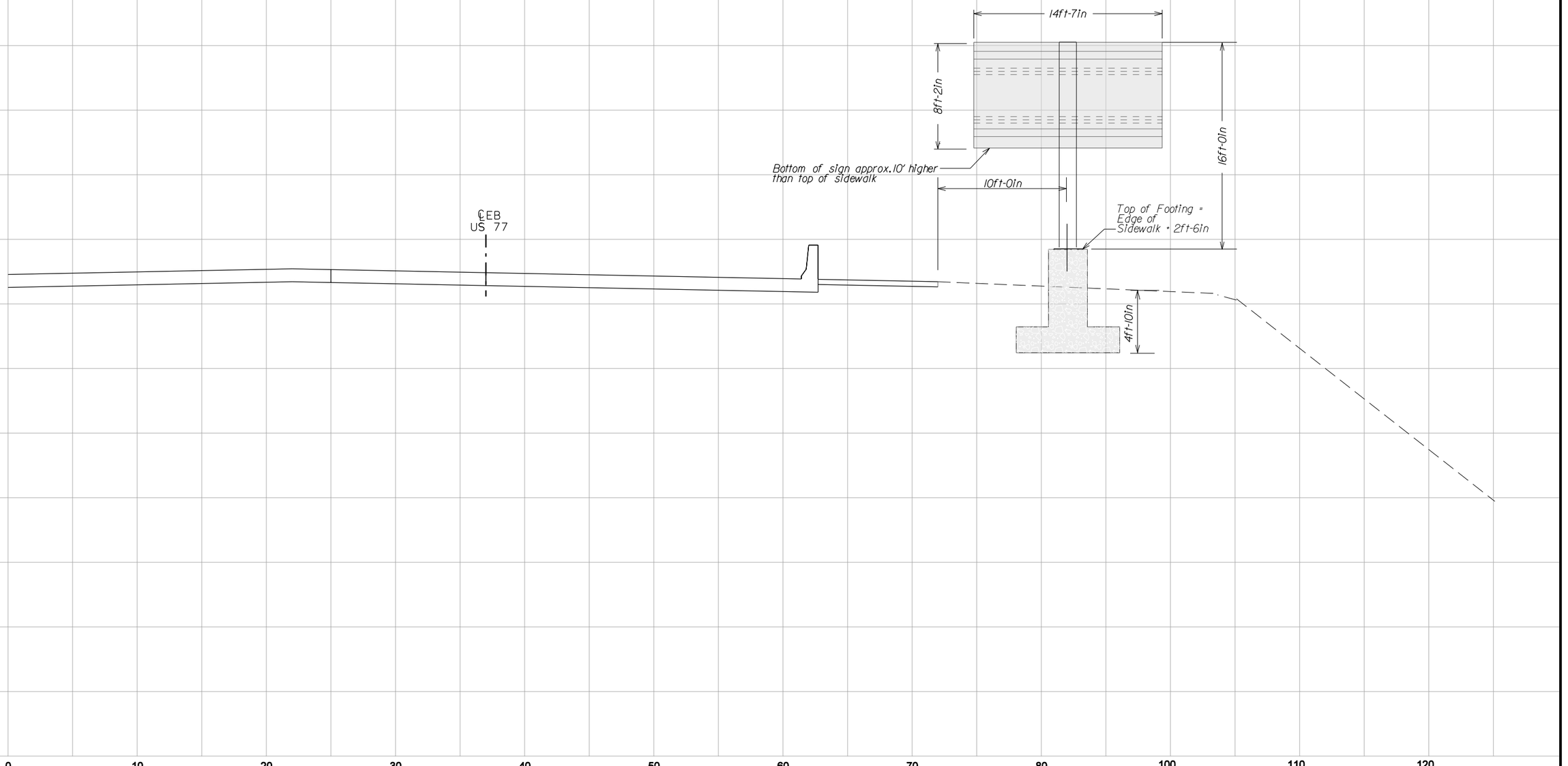
STA 407+25
PROPOSED DMS

I-29 NORTHBOUND

DMS #302

IOWA DEPARTMENT OF TRANSPORTATION	OFFICE OF TRAFFIC & SAFETY	DESIGN TEAM NARIGON/VOGEL	WOODBURY COUNTY	PROJECT NUMBER ITS-000-S(395)--25-97	SHEET NUMBER X.02

4/20/2009 jnarigo W:\Projects\0000001005\TrafEng\97-000S-395\XS.dgn



STA 86+20
PROPOSED DMS

US 77 EASTBOUND

DMS #301

IOWA DEPARTMENT OF TRANSPORTATION	OFFICE OF TRAFFIC & SAFETY	DESIGN TEAM NARIGON/VOGEL	WOODBURY COUNTY	PROJECT NUMBER ITS-000-S(395)--25-97	SHEET NUMBER X.01

4/20/2009 jnarigo W:\Projects\0000001005\TrafEng\97-000S-395\XS.dgn