DYNAMIC MESSAGE SIGNS
STP-A-000-S(345)--22-00
STATEWIDE

LETTING DATE 3/18/08

IOWA ONE CALL℠
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811

Iowa Department of Transportation
Highway Division

PLANS OF PROPOSED IMPROVEMENTS ON THE

PRIMARY ROAD SYSTEM
STATEWIDE

DYNAMIC MESSAGE SIGNS

DMS installation at various locations
in Pottawatamie, Harrison, and
Woodbury Counties

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

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

NO MILEAGE SUMMARY

For Project Location Map
Refer to Sheet No. A.02

REVISIONS

TOTAL
38
PROJECT INDENTIFICATION NUMBER
05-00-000-010
PROJECT NUMBER
STP-A-000-S(345)--22-00
R.O.W. PROJECT NUMBER

INDEX OF SHEETS

INDEX OF SEALS

SHEET NO.	NAME	TYPE
A.01	Jeremey J. Vortherms	Primary Signature Block
V.01	William T. Tucker	Structural

LICENSED PROFESSIONAL ENGINEER
Jeremey J. Vortherms
15310
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.

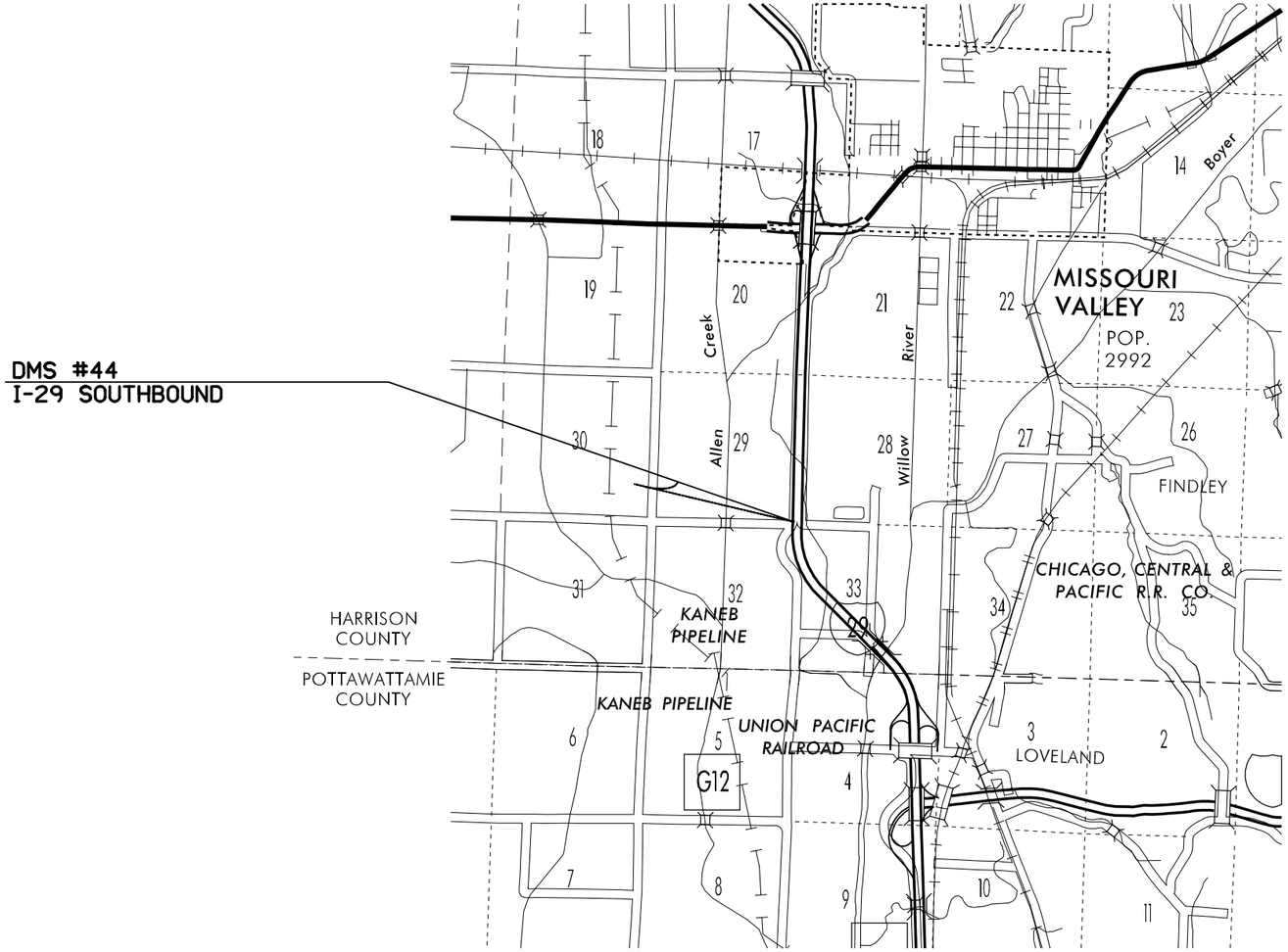
Signature 01/02/08
Date
Jeremey J. Vortherms
Printed or Typed Name

My license renewal date is December 31, 20 09

Pages or sheets covered by this seal:
A.01-A.04, B.01-B.12, C.01-C.05, N.01-N.11

COUNCIL BLUFFS AREA
POTTAWATTAMIE COUNTY

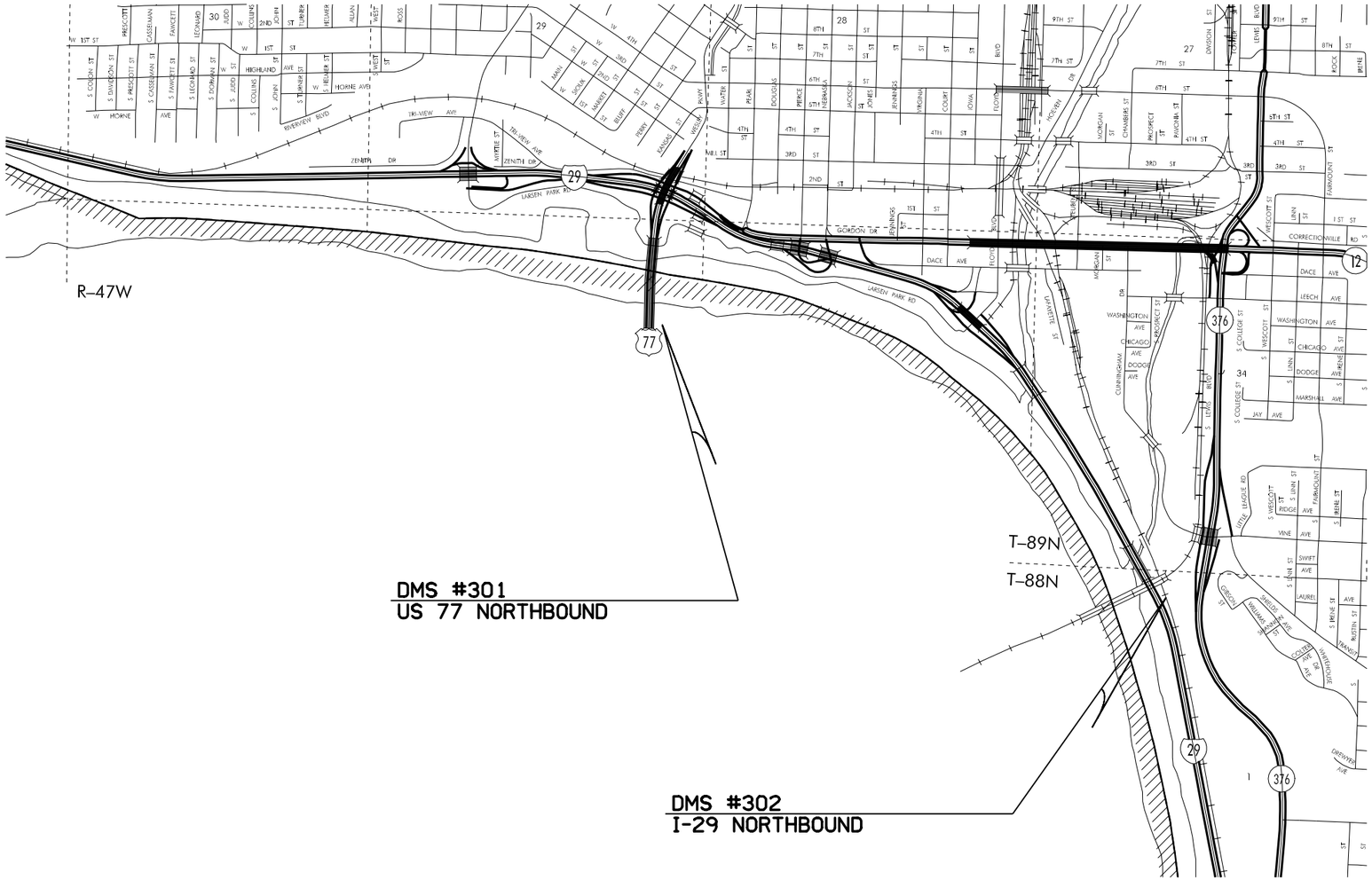
ENGLISH 720 Resolution	Iowa Department of Transportation	OFFICE OF TRAFFIC & SAFETY	DESIGN TEAM VORTHERMS/THEDE	STATEWIDE COUNTY	PROJECT NUMBER STP-A-000-S(345)--22-00	SHEET NUMBER A.02	
SYSTEMTIME	USERNAME	DGNSPEC					



LOCATION MAP SCALE
0 Ø.5 1 1.5
Miles

LOVELAND VICINITY
HARRISON COUNTY

ENGLISH 720 Resolution	Iowa Department of Transportation	OFFICE OF TRAFFIC & SAFETY	DESIGN TEAM VORTHERMS/THEDE	STATEWIDE COUNTY	PROJECT NUMBER STP-A-000-S(345)--22-00	SHEET NUMBER A.03
SYSTEMTIME	USERNAME	DGNSPEC				



LOCATION MAP SCALE
0 0.2 0.4 0.6
Miles

SIOUX CITY AREA
WOODBURY COUNTY

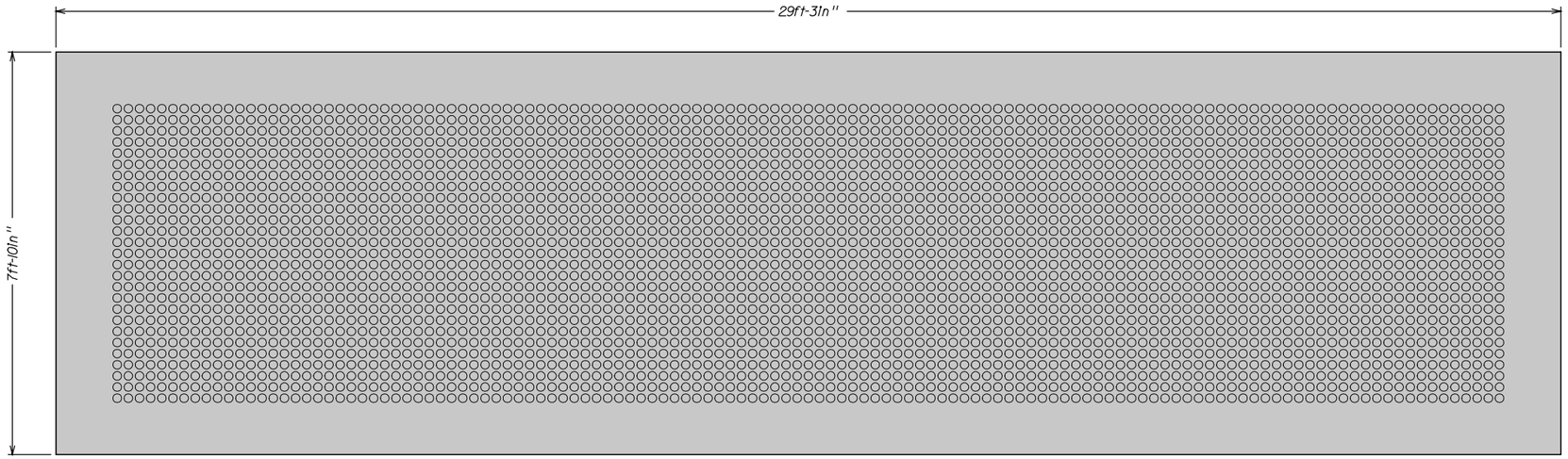
ENGLISH 720 Resolution	Iowa Department of Transportation	OFFICE OF TRAFFIC & SAFETY	DESIGN TEAM VORTHERMS/THEDE	STATEWIDE COUNTY	PROJECT NUMBER STP-A-000-S(345)--22-00	SHEET NUMBER A.04	
SYSTEMTIME	USERNAME	DGNSPEC					

DIMENSIONAL INFORMATION

Manufacturer: Daktronics
Model Number: VF-1000-27X125-18-W
Type: Full Matrix
Pixels: 125 x 27 (width x height)

Height: 7'10"
Width: 29'3"
Depth: 3'11"
Weight: 3950 lbs

Locations: 42,44,46 .



TRANPORTATION REQUIREMENTS

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

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

To avoid damage to the sign during tranport, consult the sign manufacturer to determine the correct method to secure the sign to the trailer. Any damage incurred duing 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.

The sign must be blocked up at least three inches from the ground. When the sign is not to be stored on concrete, extra blocking should be used to account for settlement.

To avoid damaging the bottom skin of the housing, blocking shall be placed directly beneath the sign's internal structural supports.

LIFTING REQUIREMENTS

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

Before beginning, make sure that the crane is rated to lift the weight of the sign.

Any damage incurred during lifting shall be the responsibility of the Contractor. The information presented below is from the literature provided by each manufacturer. Consult the manufaturer for complete lifting requirements.

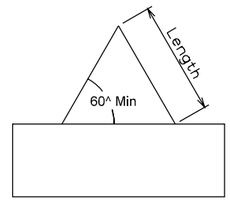
** Skyline Sign Lift Procedure **

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 in order 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.

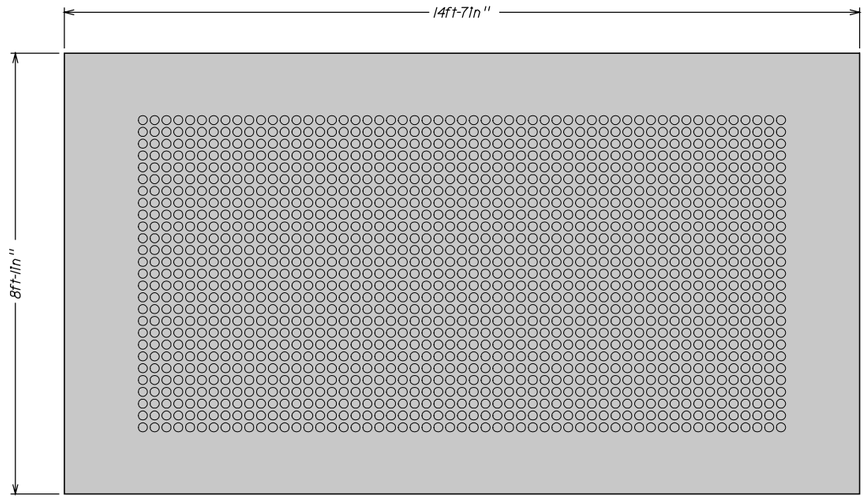
LARGE DYNAMIC MESSAGE SIGN TYPICAL DIMENSIONS

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"
Weight: 2800 lbs

Locations: 301,302 .



TRANPORTATION REQUIREMENTS

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

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

To avoid damage to the sign during tranport, consult the sign manufacturer to determine the correct method to secure the sign to the trailer. Any damage incurred duing 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.

The sign must be blocked up at least three inches from the ground. When the sign is not to be stored on concrete, extra blocking should be used to account for settlement.

To avoid damaging the bottom skin of the housing, blocking shall be placed directly beneath the sign's internal structural supports.

LIFTING REQUIREMENTS

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

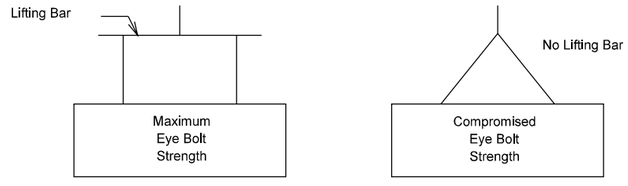
Before beginning, make sure that the crane is rated to lift the weight of the sign.

Any damage incurred during lifting shall be the responsibility of the Contractor. The information presented below is from the literature provided by each manufacturer. Consult the manufaturer for complete lifting requirements.

** Daktronics Signs **

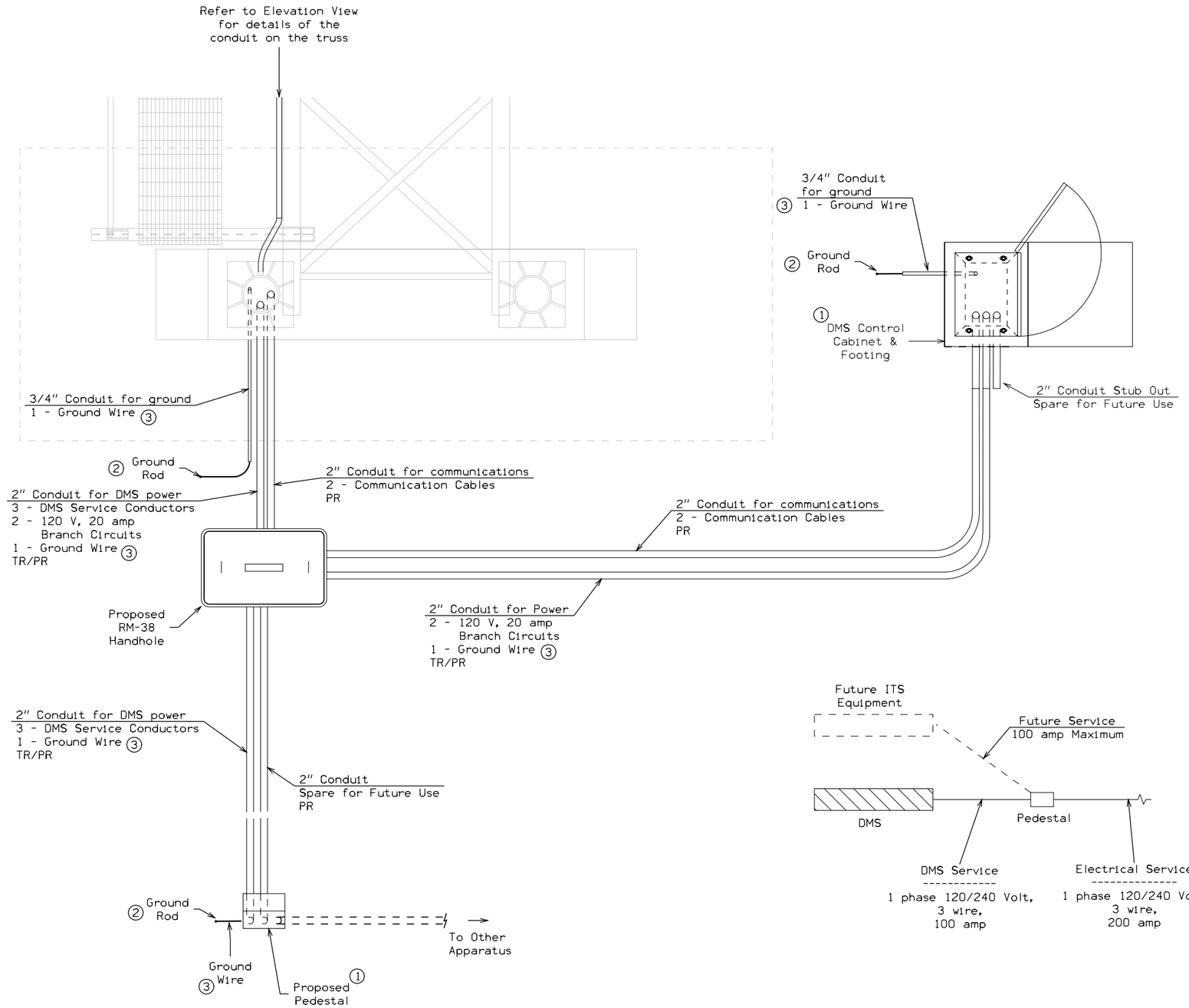
When removing an existing sign, the eyebolts used to lift the sign will need to be furnished by the Contractor. New signs will arrive equipped with eyebolts to be used to lift the unit. Take special care to ensure that the rated load of the eyebolts is not exceeded. Consult Daktronics for specific information about the eyebolts.

The figures below illustrate the correct (left example) and the incorrect (right example) method of lifting a sign. Lift the sign with the lifting bar as shown on the left. Use every lifting point (eyebolt) provided. Not doing so may cause the eyebolts to fail.



After installation, plug and seal the eyebolt openings as per the manufacturer's requirements. Any damage incurred by improperly sealed openings shall be the responsibilty of the Contractor.

SMALL DYNAMIC MESSAGE SIGN TYPICAL DIMENSIONS



PLAN VIEW

ELECTRIC SERVICE SCHEMATIC

SITE WIRING NOTES:

High voltage and low voltage wires shall not be run in the same conduit. Use one conduit for power supply and branch circuit wires, and the other conduit for communication wires.

All wires shall be sized per NEC requirements when no size is indicated in the plans.

The DMS control cabinet and equipment will be furnished by others; and installed by the Contractor. The DMS control cabinet is designed to accommodate equipment to operate the DMS, including optional communication equipment. No other equipment shall be installed in the DMS control cabinet. The DMS power supply wires shall NOT pass through the DMS control cabinet.

The communication cables will be furnished by others; and installed by the Contractor. The Contractor shall leave 10 foot of slack on each end of each cable, coiled neatly in the DMS and in the DMS control cabinet.

The Contractor shall install the equipment and wiring from the Utility Company's service point to the DOT disconnect pedestal in accordance with the Utility Company's requirements. The DOT requires that all service wires inside the ROW be installed in conduit.

The DMS power supply wires, run from the disconnect pedestal to the DMS power supply, shall NOT pass through the DMS control cabinet.

Grounding shall meet the requirements of DOT Specification 2523.04, and those outlined on this sheet. Testing of the ground system shall be completed prior to backfilling, and prior to the installation of any equipment. The Engineer will witness all testing, and will be provided neatly bound, test results.

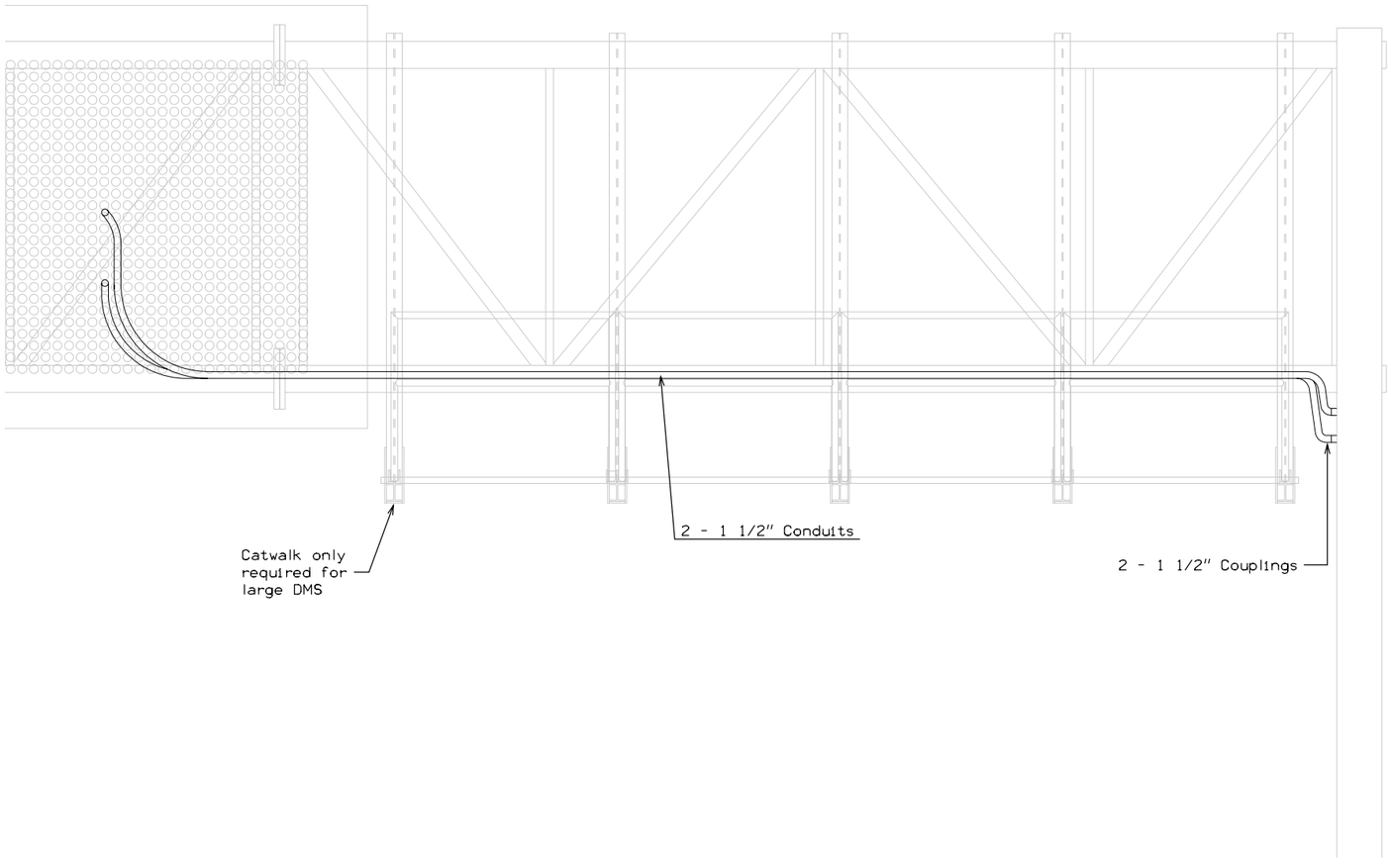
(1) Refer to other drawings for specific details.

(2) Ground rods shall be copper, 5/8" diameter x 8' minimum length. Additional ground rods may be required per NEC Article 250. Install a Ground Rod Enclosure to allow visual inspection of the ground rod and clamp. Refer to other drawings for specific details.

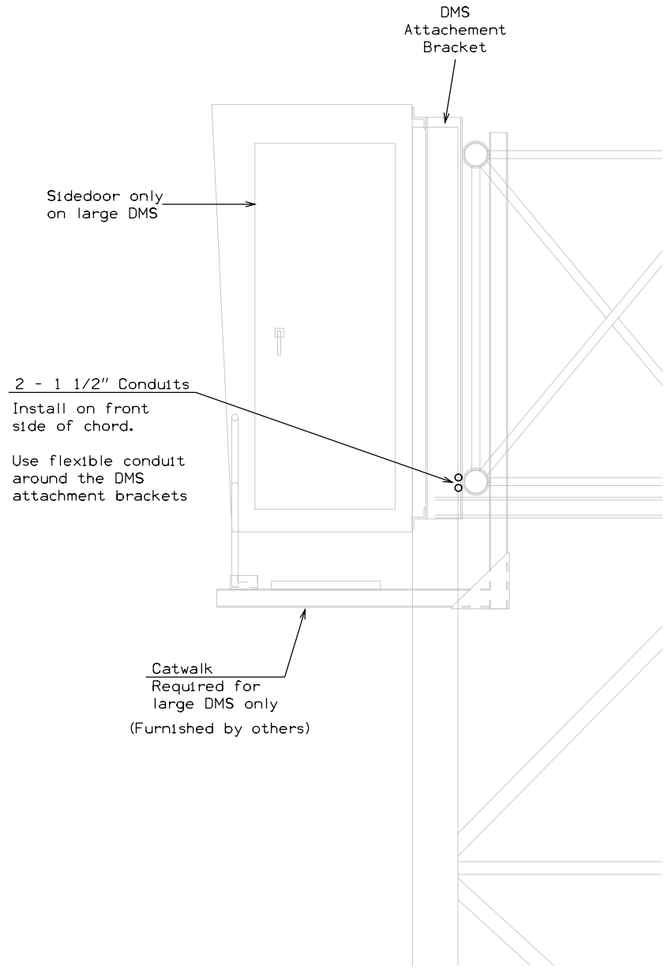
(3) The grounding electrode conductor (Ground Wire) shall meet the following requirements:

- it shall be copper and of the guage appropriately matched to the largest service conductor,
- it shall be connected to the ground rod with a clamp suitable for direct burial (if applicable),
- it shall be bonded to the control cabinet ground nut (if applicable),
- it shall be bonded to the truss leg gound nut (if applicable), and
- it shall be connected to the neutral bus in the pedestal (if applicable).

SITE WIRING DETAILS FOR DMS INSTALLATION ON A SIGN TRUSS (SHEET 1 OF 2)



ELEVATION VIEW



SIDE VIEW

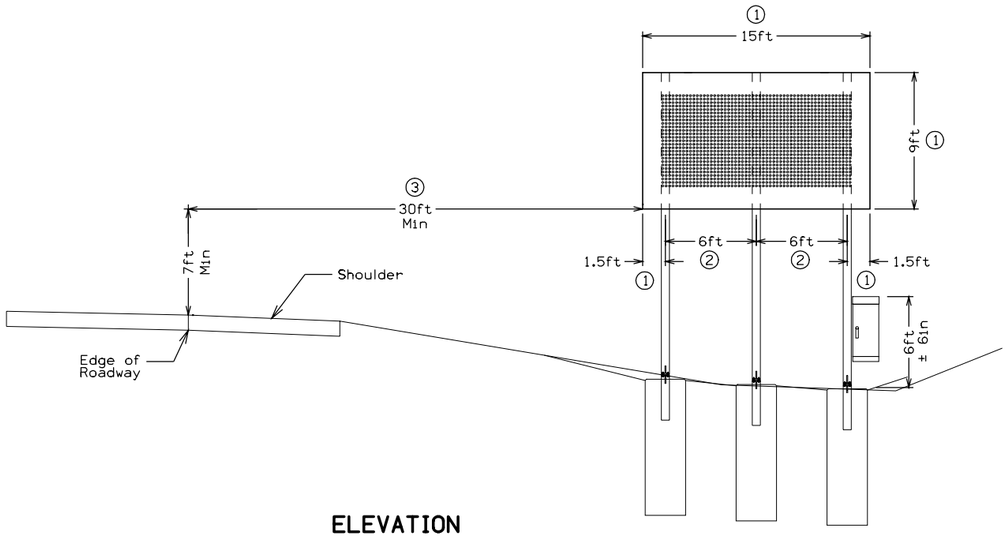
Conduit banded to the truss chord should be rigid. Conduit used to make connections to the truss or DMS couplings may be rigid or flexible.

All conduit, fittings, seals and gaskets shall be weatherproof as per NEC requirements.

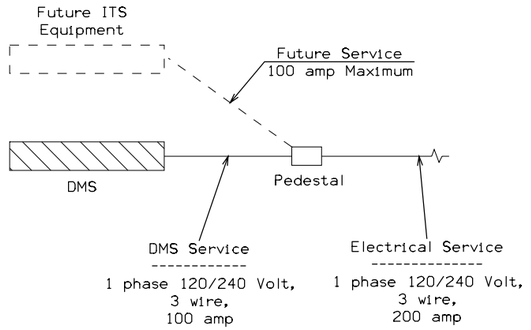
Banding material shall be stainless steel. Conduit shall be banded at regular intervals not to exceed 4 feet.

High voltage and low voltage wires shall not be run in the same conduit. Use one conduit for power supply and branch circuit wires, and the other conduit for communication wires.

SITE WIRING DETAILS FOR DMS INSTALLATION ON A SIGN TRUSS (SHEET 2 OF 2)



ELEVATION

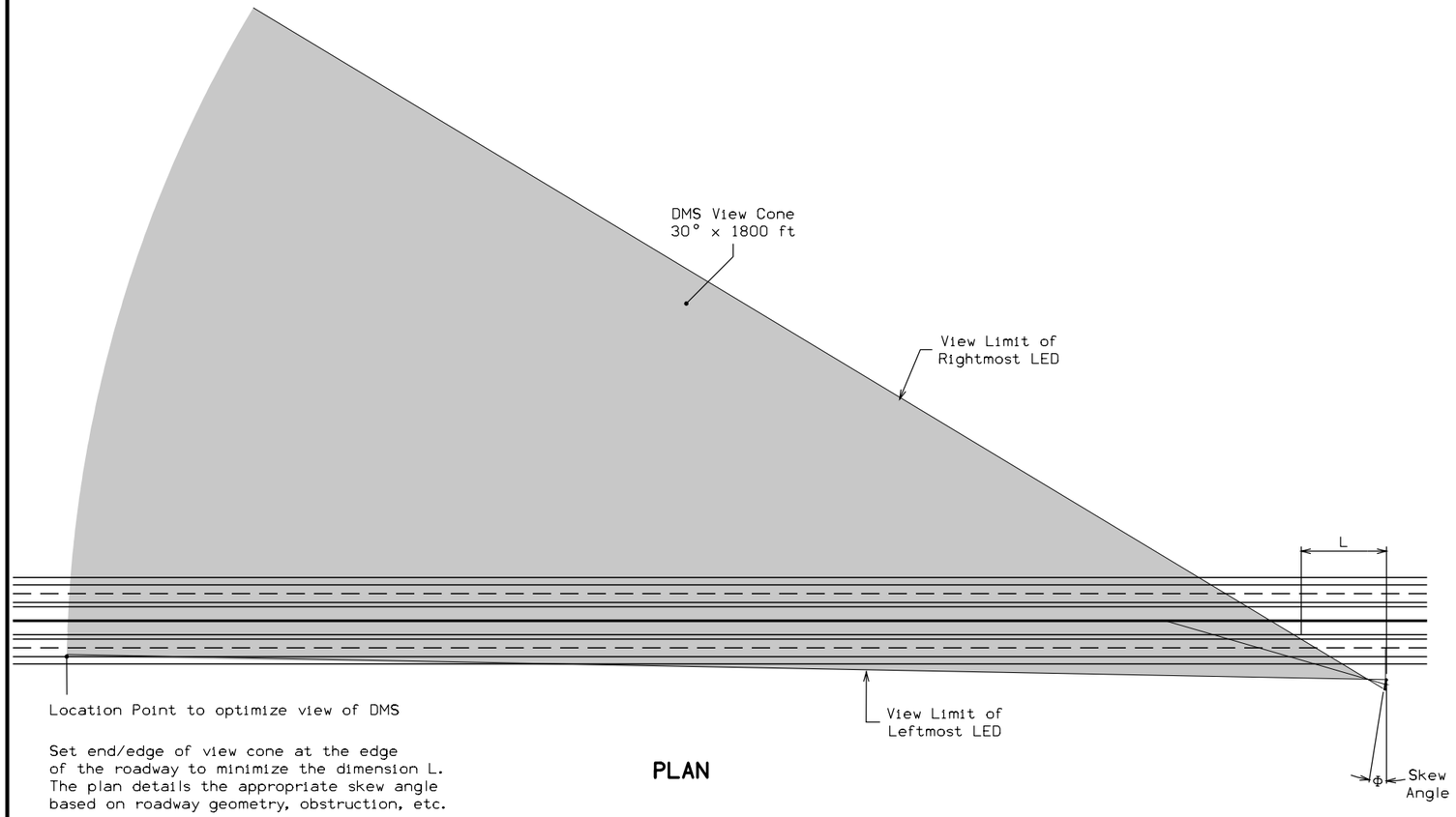


ELECTRIC SERVICE SCHEMATIC

① Nominal dimensions. Actual DMS to be installed as follows:
- top of sign shall be flush with the top of posts, and
- the sign shall be centered horizontally on the posts.

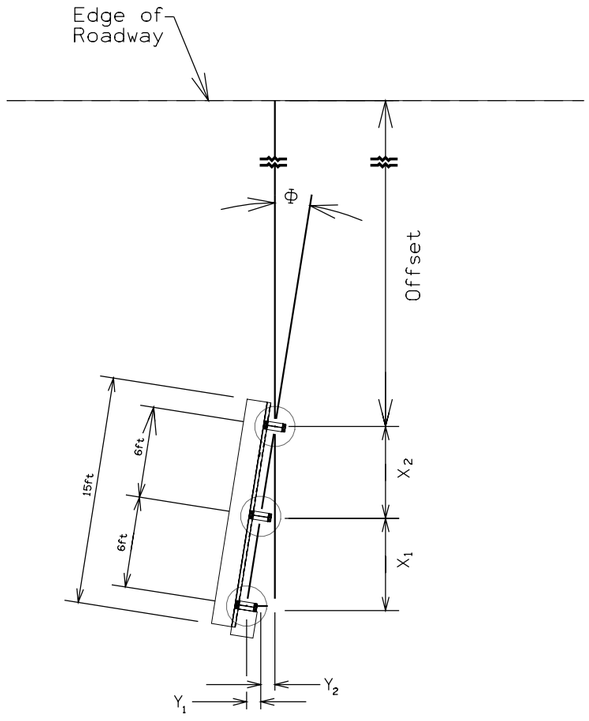
② Posts shall be installed 6 foot center-to-center, regardless of the actual DMS size.

③ Minimum offset is required to be 30 feet to meet clearzone requirements unless the DMS is protected by another measure. The steel posts are not considered breakaway for this installation because of the DMS weight, and because the control cabinet is installed on the leg.



Set end/edge of view cone at the edge of the roadway to minimize the dimension L. The plan details the appropriate skew angle based on roadway geometry, obstruction, etc.

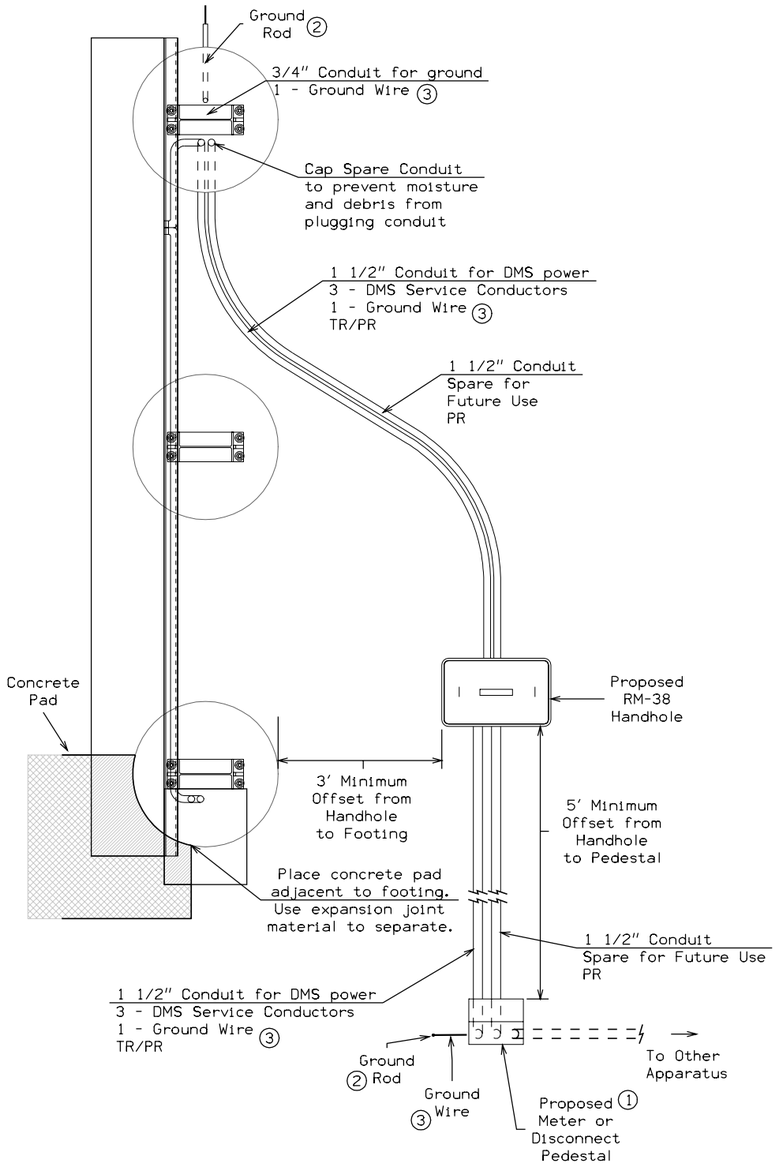
PLAN



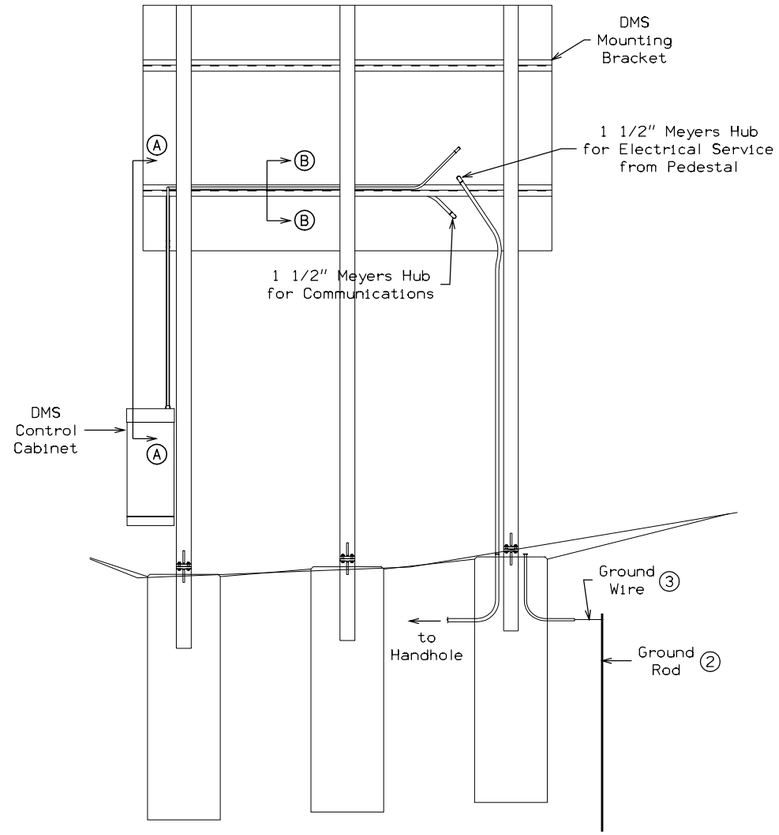
FOOTING
STAKING DIAGRAM

SITE INSTALLATION DETAILS FOR DMS INSTALLATION ON STEEL POSTS

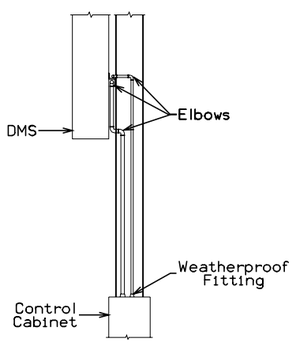
ENGLISH 720 Resolution	Iowa Department of Transportation	OFFICE OF TRAFFIC & SAFETY	DESIGN TEAM VORTHERMS/THEDE	STATEWIDE COUNTY	PROJECT NUMBER STP-A-000-S(345)--22-00	SHEET NUMBER B.05
SYSTEMTIME	USERNAME	DGNSPEC				



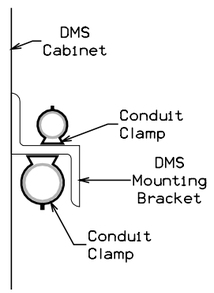
PLAN VIEW



REAR VIEW



SECTION A-A



SECTION B-B

SITE WIRING NOTES:

High voltage and low voltage wires shall not be run in the same conduit. Use one conduit for power supply and branch circuit wires, and the other conduit for communication wires.

All wires shall be sized per NEC requirements when no size is indicated in the plans.

The DMS control cabinet and equipment will be furnished by others; and installed by the Contractor. The DMS control cabinet is designed to accommodate equipment to operate the DMS, including optional communication equipment. No other equipment shall be installed in the DMS control cabinet. The DMS power supply wires shall NOT pass through the DMS control cabinet.

The communication cables will be furnished by others; and installed by the Contractor. The Contractor shall leave 10 foot of slack on each end of each cable, coiled neatly in the DMS and in the DMS control cabinet.

The Contractor shall furnish and install all materials for the branch circuits, and shall terminate all conductors at the control cabinet and at the DMS to provide a completed electrical system.

The Contractor shall install the equipment and wiring from the Utility Company's service point to the DOT disconnect pedestal in accordance with the Utility Company's requirements. The DOT requires that all service wires inside the ROW be installed in conduit.

The DMS service conductors, which are installed between the pedestal and the DMS power supply, shall NOT pass through the DMS control cabinet.

Grounding shall meet the requirements of DOT Specification 2523.04, and those outlined on this sheet. Testing of the ground system shall be completed prior to backfilling, and prior to the installation of any equipment. The Engineer will witness all testing, and will be provided neatly bound, test results.

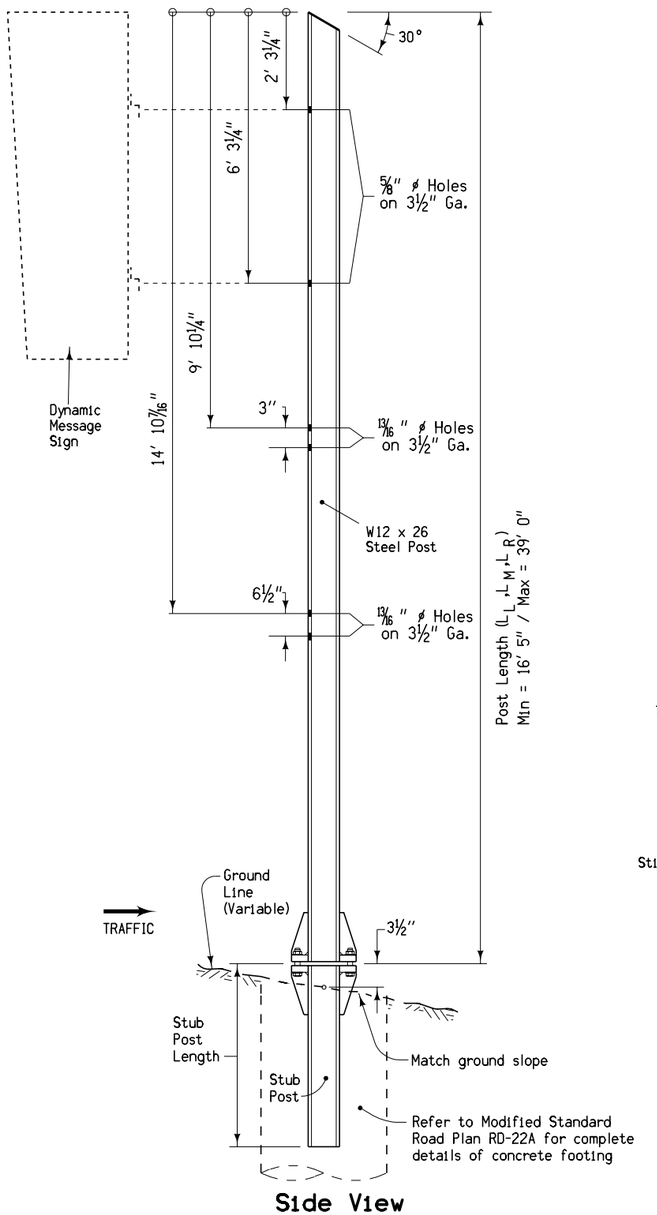
(1) Refer to other drawings for specific details.

(2) Ground rods shall be copper, ⅝" diameter x 8' minimum length. Additional ground rods may be required per NEC Article 250. Install a Ground Rod Enclosure to allow visual inspection of the ground rod and clamp. Refer to other drawings for specific details.

(3) The grounding electrode conductor (Ground Wire) shall meet the following requirements:

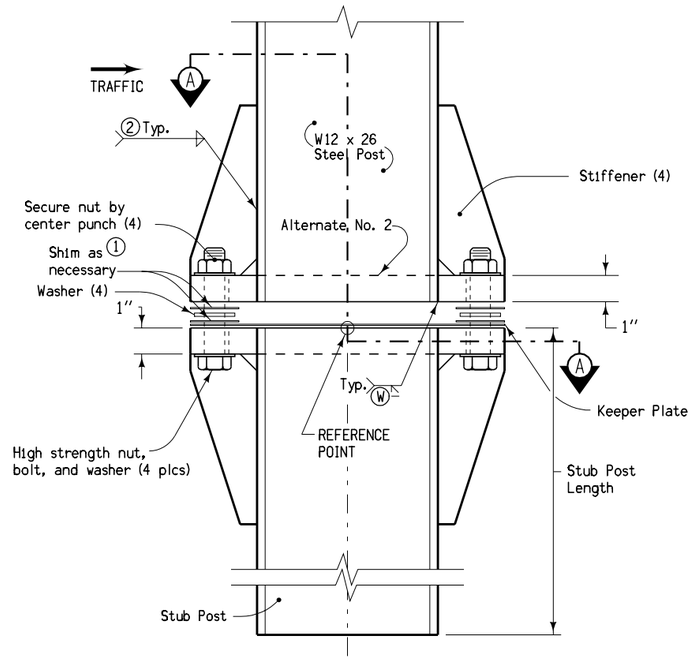
- it shall be copper and of the guage appropriately matched to the largest service conductor,
- it shall be connected to the ground rod iwth a clamp suitable for direct burial (if applicable),
- it shall be bonded to the control cabinet ground nut (if applicable),
- it shall be bonded to the truss leg gound nut (if applicable), and
- it shall be connected to the neutral bus in the pedestal (if applicable).

SITE WIRING DETAILS FOR DMS INSTALLATION ON STEEL POSTS



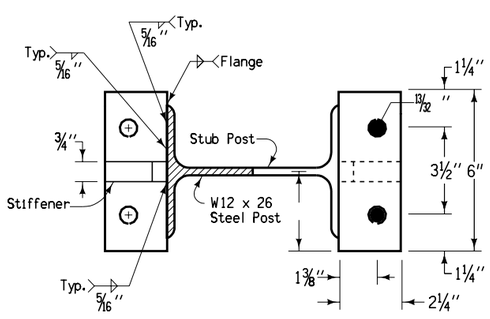
Side View

TYPICAL SIGN INSTALLATION



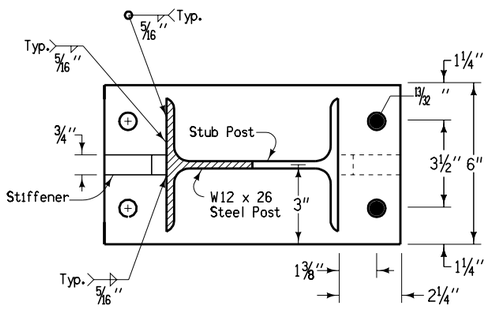
Side View

BASE PLATE



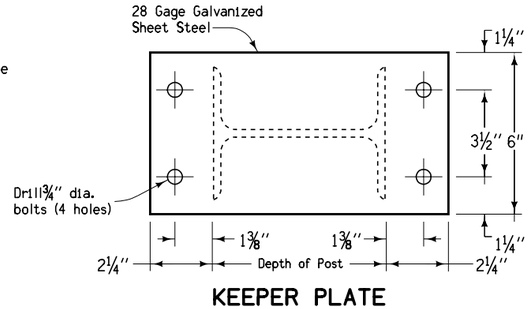
Section A-A (Plan)

BASE ALTERNATE 1

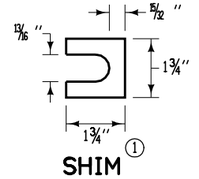


Section A-A (Plan)

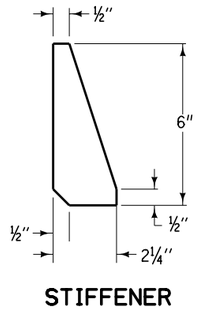
BASE ALTERNATE 2



KEEPER PLATE



SHIM ①



STIFFENER

Details shown are for signs installed to the right of traffic. This shall be the default unless specified otherwise by the contract documents. For signs installed to the left of traffic, the notches in the breakaway base plate shall be beveled in the direction opposite of that shown (dashed lines).

Breakaway base shall be fabricated by either of two methods:

ALTERNATE NUMBER 1 - Base plates (2 each), shall be welded to sides of sign post and stub post flanges.

ALTERNATE NUMBER 2 - Base plate (1 each), shall be welded to end of sign post and stub post by continuous fillet weld. When fully assembled, the bolt holes and notches in the stub post plate and the sign post plate shall be properly matched and aligned.

① Sign post shall be plumbed by installing shims. The Contractor shall furnish two shims each of 0.012" and 0.032" thickness (total of 4 per post). Shims shall be brass stock or strip conforming to ASTM B 36.

② Welds shall be continuous fillet welds and of a depth equal to the thickness of the flange for the post unless otherwise specified.

Contract Item:

Steel Posts for Dynamic Message Signs

MODIFIED STANDARD ROAD PLAN

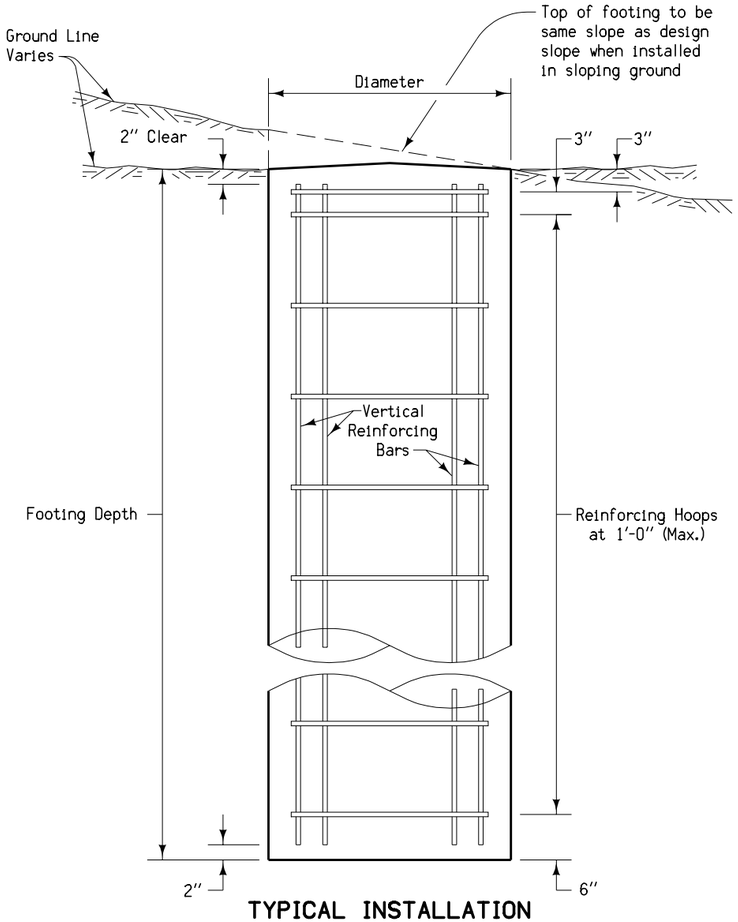
REVISION

RD-21A

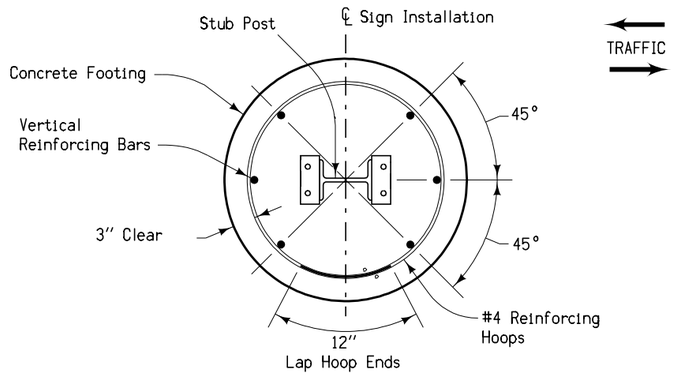
SHEET 1 of 1

REVISIONS:

STEEL POSTS FOR DYNAMIC MESSAGE SIGNS

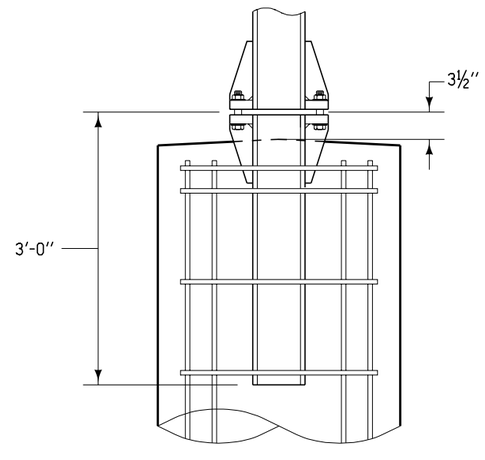


TYPICAL INSTALLATION
NORMAL FOOTING IN EARTH



PLAN VIEW

(REINFORCING PLACEMENT AND SIGN ORIENTATION)
Note: Refer to Modified RD-21A for details of sign post and stub.



TYPICAL BREAKAWAY POST INSTALLATION

GENERAL NOTES:

Material and methods for construction of concrete footings for breakaway sign posts detailed hereon shall be in conformance with current Standard and Supplemental Specifications.

The footing shall be constructed as shown for normal footing in earth. Where solid rock is encountered, the alternate design for footing in solid rock may be used with the approval of the Engineer.

All excavation for the footing shall be disposed of in the area adjacent to the footing and shaped to normal ground contour, unless directed otherwise by the Engineer.

The stub post shall be held in proper position by an approved device which will ensure that it remains in proper position upon completion of concrete placement.

Structural grade concrete shall be used for the footing.

The contract price for size of footing required shall be full compensation for construction of footing as detailed hereon, including all necessary excavation regardless of character.

FOOTING REINFORCING DATA					
Post Size	Stub Length	Footing		Vertical Rein. Bar	
		Diameter	Depth	Size	Length (1)
W12x26	3'-0"	2'-8"	9'-0"	No. 8	8'-8

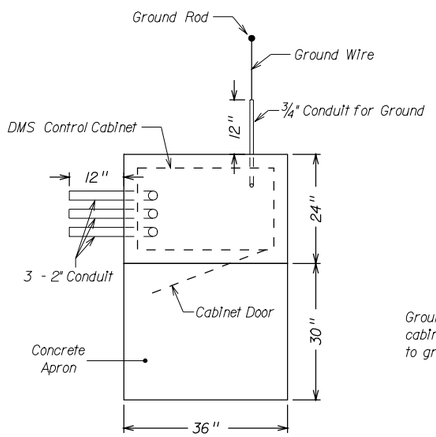
(1) Lengths are for normal footings. Required length may vary where alternate rock design is used.

MODIFIED
STANDARD ROAD PLAN

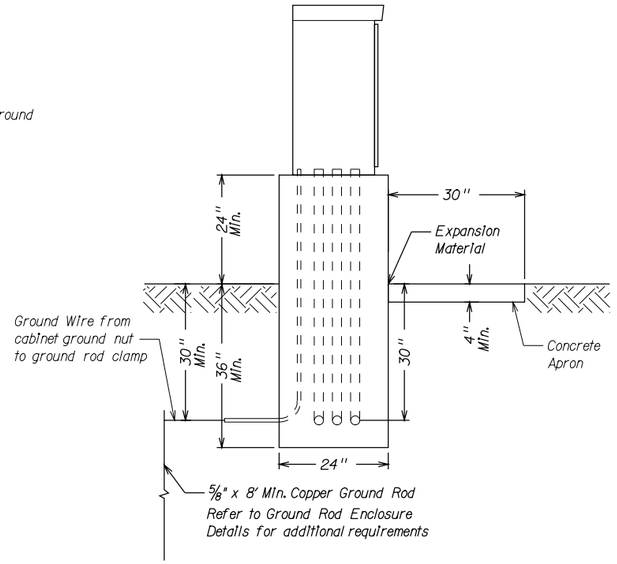
REVISION
RD-22A
SHEET 1 of 1

REVISIONS:

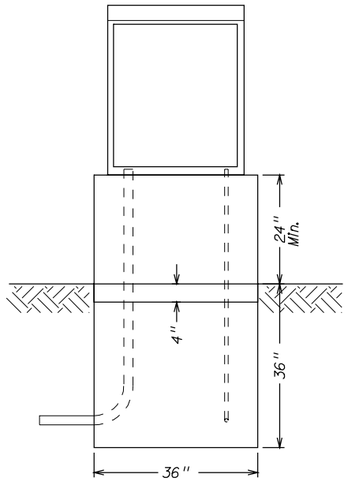
SIGN POST FOOTING DETAILS
FOR DYNAMIC MESSAGE SIGNS



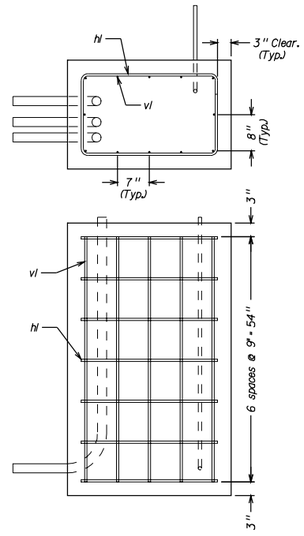
Top View



Side View



Front View



Epoxy reinforcement required to meet DOT specification section 2404

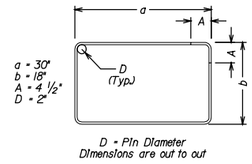
Reinforcing Details

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

Conduits shall be positioned to fit inside the cabinet with a minimum clearance of 2" to all sides. Use the proposed cabinet to establish exact dimensions and placement.

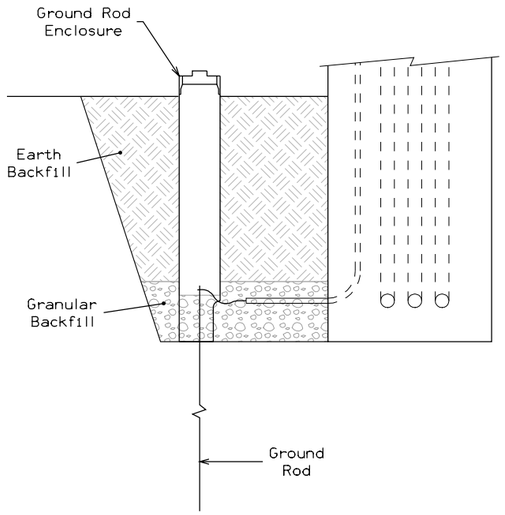
EPOXY REINFORCMENT QUANTITIES per footing				
BAR	QTY	SIZE	LENGTH	WEIGHT
v1	12	#4	54	36.1
h1	7	#4	105	40.9
Total Weight				77.0

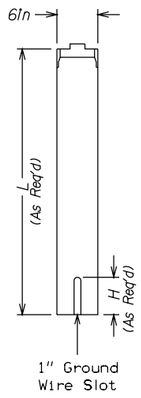
CONCRETE QUANTITIES per footing
1.11 cu yd



HOOP DETAILS

DMS CONTROL CABINET FOOTING DETAILS





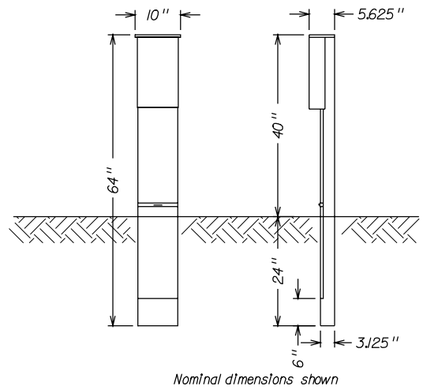
Use 6" Schedule 40 PVC and appropriate fittings for Ground Rod Enclosure. Secure all fittings to the standpipe with appropriate adhesive.

Install the ground rod, ground wire, clamp, and complete the testing prior to installing the the ground rod enclosure.

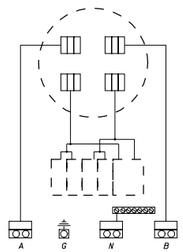
Fit the ground rod enclosure over the ground rod end prior to placing the backfill. The ground wire is to remain free and clear of the ground wire slot. Granular backfill is required for a depth equal to the ground wire slot lenght plus 3".

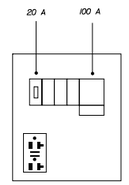
The enclosure shall protrude from the finished grade a minimum of 3" and a maximum of 6".

GROUND ROD ENCLOSURE DETAILS



Nominal dimensions shown



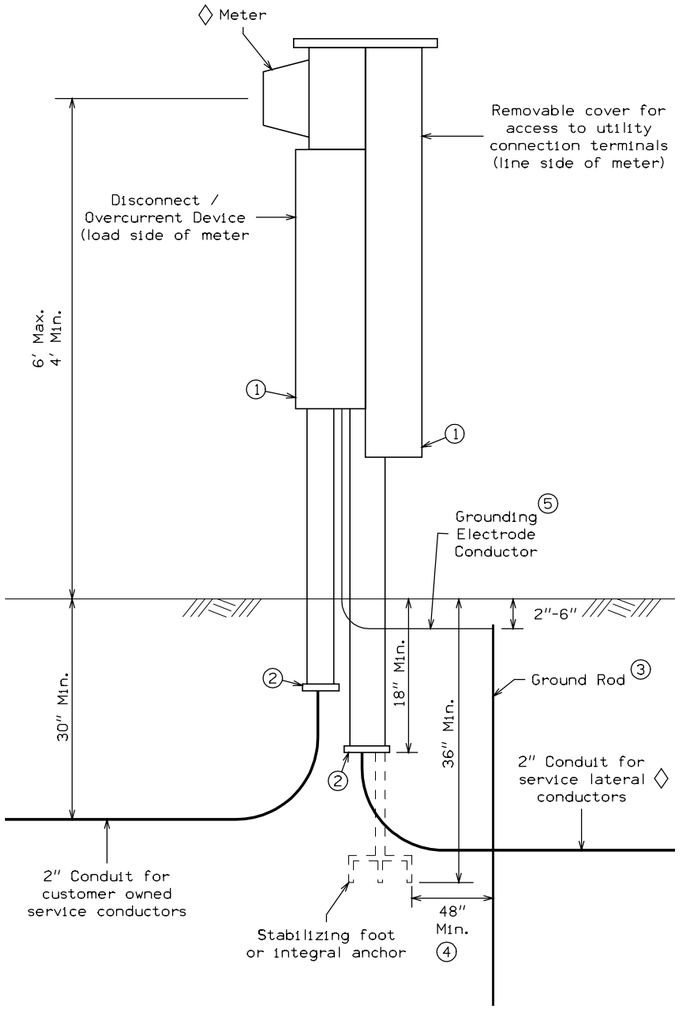


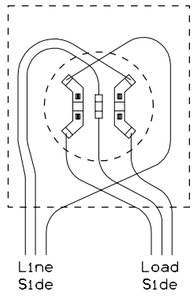
Service In:
- 60 hertz AC, 1 phase, 120/240 Volt 3 wire, 100 amp

Enclosure Details:
- Type 3R
- direct buried
- lockable, hinged cover
- 6 circuit interior to accept standard plug-in type circuit breakers

Features:
- one 20 amp, 120 volt GFI receptacle
- 100 amp, 120/240 volt circuit breaker (for DMS power)
- 20 amp, 120 volt circuit breaker (for receptacle)

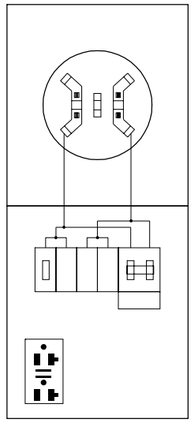
DISCONNECT PEDESTAL DETAILS





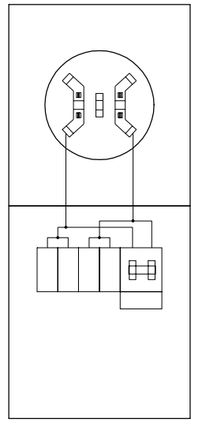
SELF-CONTAINED METER SOCKET WIRING DIAGRAM

for 1 phase 120/240 Volt, 3 wire, 200 amp service



OPTION A

Features:
- 6 circuit interior to accept standard plug-in type circuit breakers
- 100 amp, 120/240 volt circuit breaker (for DMS power)
- 20 amp, 120 volt circuit breaker (for receptacle)
- one 20 amp, 120 volt GFI receptacle



OPTION B

Features:
- 6 circuit interior to accept standard plug-in type circuit breakers
- 100 amp, 120/240 volt circuit breaker (for DMS power)

DISCONNECT / OVERCURRENT DEVICE WIRING DIAGRAM

GENERAL NOTES:

The utility company will furnish and install all ◇ marked items. The Contractor shall be responsible for all other items.

An address shall be permanently posted on the outside of the pedestal, below the meter.

All pedestal materials shall be aluminum or steel. Steel shall be a minimum 14 gauge, and shall be plated or galvanized. The finish shall be tough, non-fading and have a long service life.

A clear working space of not less than 36 inches in front, and 30 inches left and right of the pedestal shall be maintained.

Backfill around the pedestal shall be well tamped along the full 36 inch minimum embedment length.

Line-side service shall be 60 hertz alternating current, 1-phase 120/240 volt, 3 wire, 200 amp.

Load-side service shall be 60 hertz alternating current, 1-phase 120/240 volt, 3 wire, 100 amp.

All service equipment shall be UL listed, and shall meet the utility company specifications.

Grounding system shall meet the requirements of DOT Specification 2423.04, NEC Article 250, the utility company, and all other applicable codes.

Pedestal shall be bonded to the neutral conductor. The neutral conductor shall be equipped with a lug for exclusive use of a copper ground wire.

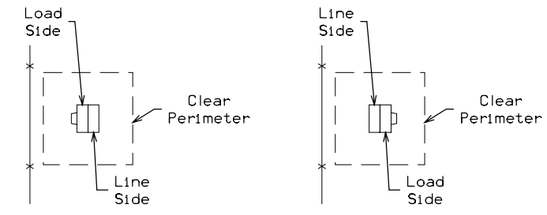
(1) Provision to secure enclosure. Line-side provision shall be for either a seal, lock, or sealable bolt to secure the enclosure. Key locks will not be approved.

(2) Metal edges at cable entrances shall be equipped to prevent damage for cables.

(3) Ground rod shall be copper, 5/8" diameter x 8' minimum length. Additional ground rods may be required per NEC Article 250.

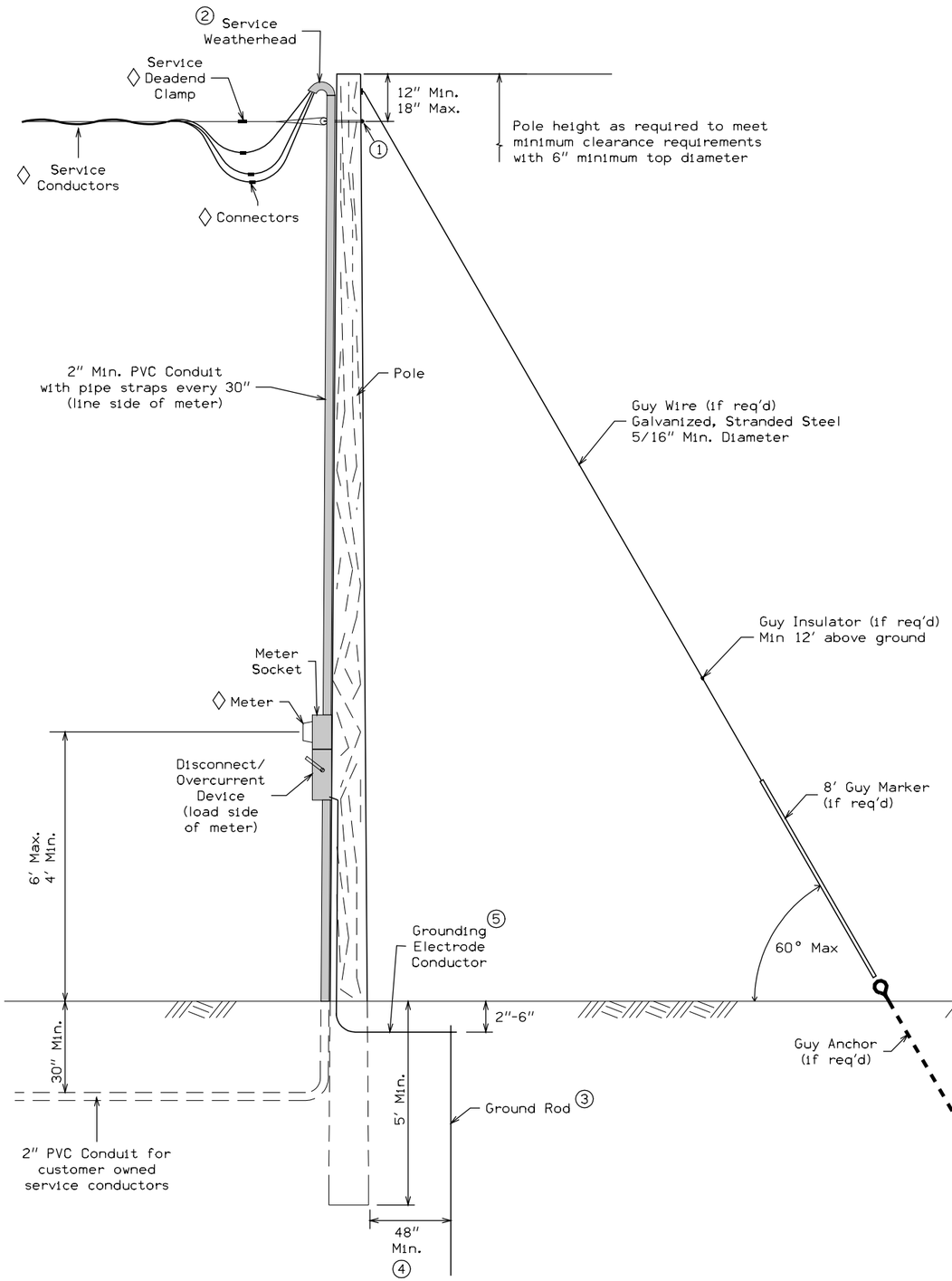
(4) The ground rod shall not be closer that 4 feet from the pedestal to prevent damage when the underground service lateral conductors are installed.

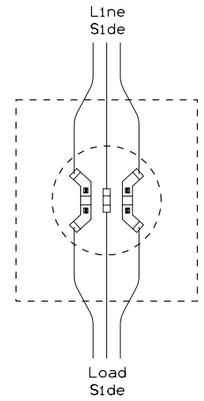
(5) The grounding electrode conductor shall meet the following requirements
- it shall be copper and of the gauge appropriately matched to the largest service conductor,
- it shall be connected to the neutral bus in the disconnect/ overcurrent device,
- it shall be connected to the ground rod with a clamp suitable for direct burial, and
- it shall not be placed inside the service conduits.



METER ORIENTATION

METER PEDESTAL DETAILS





SELF-CONTAINED METER SOCKET WIRING DIAGRAM

for 1 phase 120/240 Volt, 3 wire, 200 amp service

GENERAL NOTES:

The utility company will furnish and install all ◇ marked items. The Contractor shall be responsible for all other items.

All disconnect and overcurrent device enclosure materials shall be aluminum or steel. Steel shall be a minimum 14 gauge, and shall be plated or galvanized. The finish shall be tough, non-fading and have a long service life.

A clear working space of not less than 36 inches in front, and 30 inches left and right of the meter shall be maintained.

Line-side service shall be 60 hertz alternating current, 1-phase 120/240 volt, 3 wire, 200 amp.

Load-side service shall be 60 hertz alternating current, 1-phase 120/240 volt, 3 wire, 100 amp.

All service equipment shall be UL listed, and shall meet the utility company specifications.

Grounding system shall meet the requirements of DOT Specification 2423.04, NEC Article 250, the utility company, and all other applicable codes.

① Insulated service bracket and eye bolt.

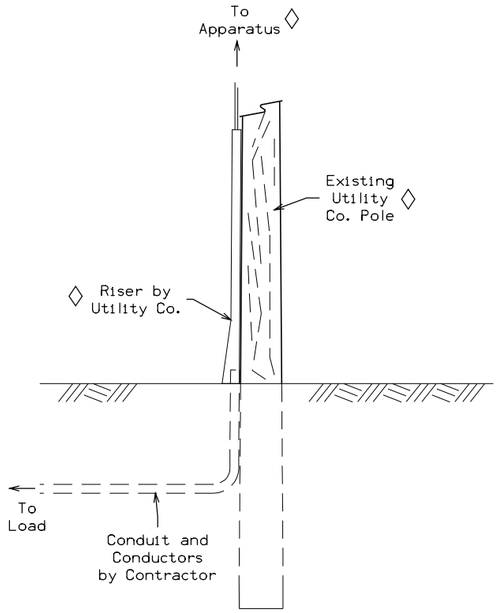
② Service weatherhead shall be located above the service attachment point to insure a positive drip loop.

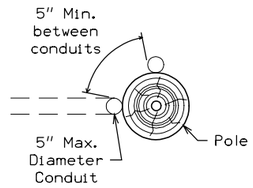
③ Ground rod shall be copper, 5/8" diameter x 8' minimum length. Additional ground rods may be required per NEC Article 250.

④ The ground rod shall not be closer that 4 feet from the pole to prevent damage when the underground customer service conductors are installed.

⑤ The grounding electrode conductor shall meet the following requirements
- it shall be copper and of the gauge appropriately matched to the largest service conductor,
- it shall be connected to the neutral bus in the disconnect/ overcurrent device,
- it shall be connected to the ground rod with a clamp suitable for direct burial, and
- it shall not be placed inside the service conduits.

METER POLE DETAILS





GENERAL NOTES:

The utility company will furnish and install all ◊ marked items. The Contractor shall be responsible for all other items.

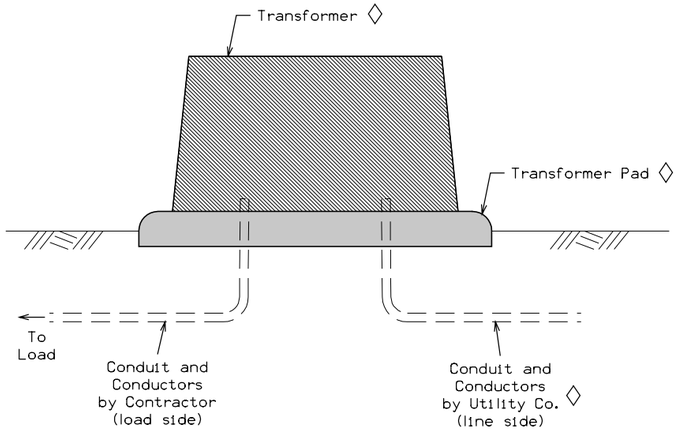
The Contractor shall contact the utility company prior to installation to identify an approved conduit position, and to determine how much conductor shall be coiled at the base of the pole in order to reach the apparatus.

When more than one conduit is installed on the riser, the conduits must have a minimum spacing of 5 inches, and be placed against the pole. This is in order to accommodate the utility company's cable guard.

Conduits shall be installed so that the top end is 4 to 6 inches above the final grade.

Where conduit is to be extended to a location where the utility company is installing a replacement pole or new pole, the conduit shall not be installed until the pole work has been completed by the utility company.

UNDERGROUND CONDUIT AT UTILITY COMPANY RISERS



GENERAL NOTES:

The utility company will furnish and install all ◊ marked items. The Contractor shall be responsible for all other items.

The Contractor shall contact the utility company to determine the following:
- an approved conduit location
- how much conduit to leave sticking out of the ground in order to make final connections
- how much conductor to leave coiled at the base of the transformer in order to make final connections

Where conduit is to be extended to a location where the utility company is installing a new transformer, coordinate with the utility company to determine if the transformer will be installed before or after the conduit extension.

UNDERGROUND CONDUIT AT PAD MOUNTED TRANSFORMERS

GENERAL NOTES

All electrical service supplied shall be:
60 hertz alternating current
1-phase 120/240 volt,
3 wire,
200 amp

Details of power service shall be coordinated with the DOT contact (if specified) and the utility company.

The Contractor shall make each DMS available to the DOT for testing forty-eight hours after installing the DMS on its support structure (either a truss or steel posts). Thus, the final power connections shall be completed within 48 hours of installing the DMS.

The final service connections by the utility company shall be completed prior to installing the DMS.

The Contractor shall notify the utility company 60 days prior to the date power service is required at a site. At the time of notification, the Contractor shall have completed all work required by the utility company in order to make final service connections, and shall make the site available to inspection by the utility company.

UTILITY COMPANY INFORMATION

LOCATION	DOT CONTACT	UTILITY CO CONTACT
Site #42 Council Bluffs / I-29 SB	Jeff Owen 712-243-7636	MidAmerican Energy Tim Theobald - -
Site #44 Loveland / I-29 SB	Jeff Owen 712-243-7636	MidAmerican Energy Tim Theobald - -
Site #46 Council Bluffs / I-80 WB	Jeff Owen 712-243-7636	MidAmerican Energy Tim Theobald - -
Site #301 Sioux City / US 77 NB	Steve Botos 712-239-2113	Nebraska Power Kent Zimmerman 712-204-0408
Site #302 Sioux City / I-29 NB	Steve Botos 712-239-2113	MidAmerican Energy Steve Fisher 712-233-4834

ELECTRICAL SERVICE COMPONENTS

DMS TYPE	PEDESTAL TYPE	CONDUIT & WIRE	OTHER EQUIPMENT	CONDUIT & WIRE	OTHER EQUIPMENT	NOTES AND SPECIAL REQUIREMENTS
LARGE DMS	50' [1]	[1]	260' [1]	[1]	10' [1]	[E]	METER PEDESTAL AT ROW LINE WITH METER FACING THE INTERSTATE. TRENCH CONDUIT TO EXISTING UTILITY POLE AND LEAVE 50' OF SLACK COILED AT THE BASE OF THE POLE.
LARGE DMS	25' [1]	[1]	50' [1]	[1]			INSTALL NEW SERVICE POLE AND METER/DISCONNECT AT ROW LINE ADJACENT TO THE UTILITY COMPANY'S SERVICE POINT. THE METER/DISCONNECT IS TO FACE THE FRONTAGE ROAD.
LARGE DMS	80' [1]	[1]	50' [1]	[E]			METER PEDESTAL AT ROW LINE WITH METER FACING THE LOCAL STREET. TRENCH CONDUIT TO EXISTING UTILITY POLE AND LEAVE 50' OF SLACK COILED AT THE BASE OF THE POLE.
SMALL DMS	10' [1]	[1]	145' [1]	[1]			METER PEDESTAL ADJACENT TO SIDEWALK WITH METER FACING THE LOCAL STREET.
SMALL DMS	25' [1]	[1]					METER PEDESTAL AT ROW LINE WITH METER FACING THE INTERSTATE.

DMS SIGN
HANDHOLE
METER PEDESTAL
DISCONNECT PEDESTAL
PAD MOUNTED TRANSFORMER
METER POLE W/ METER SOCKET & DISCONNECT
EXISTING UTILITY POLE

[E] EXISTING ITEM
[1] CONTRACTOR FURNISH & INSTALL ITEM
[2] UTILITY COMPANY FURNISH & INSTALL ITEM

UTILITY COMPANY INFORMATION & ELECTRICAL SERVICE EQUIPMENT

ESTIMATED PROJECT QUANTITIES

100-1A
07-15-97

Item No.	Item Code	Item	Unit	Total	As Built Quan.
1	2102-2625000	EMBANKMENT-IN-PLACE	CY	498.3	
2	2402-2720000	EXCAVATION, CL 20	CY	342.5	
3	2403-0100000	STRUCT CONC (MISCELLANEOUS)	CY	112.14	
4	2404-7775005	REINFORC STEEL, EPOXY COATED	LB	11223	
5	2505-4008100	RMV G'RAIL	LF	131.25	
6	2505-4008200	INSTALL OF G'RAIL	LF	375.00	
7	2505-4021762	G'RAIL TERMINAL, BEAM, FLARED, RE-76	EACH	2	
8	2505-6000111	HIGH TENSION CABLE G'RAIL	LF	626.2	
9	2505-6000121	HIGH TENSION CABLE G'RAIL, END ANCHOR	EACH	6	
10	2505-6000131	HIGH TENSION CABLE G'RAIL,SPARE PART KIT	EACH	1	
11	2509-0000016	TEMP CRASH CUSHION, SEVERE USE (SU)	EACH	7	
12	2509-0000024	PERMANENT CRASH CUSHION, SEVERE USE (SU)	EACH	2	
13	2509-0000026	PERMANENT CRASH CUSHION SPARE PARTS KIT	EACH	1	
14	2528-8400048	TEMP BARRIER RAIL, CONC	LF	2300	
15	2528-8445110	TRAFFIC CONTROL	LS	1	
16	2528-9290004	CHANGEABLE MESSAGE SIGN, PORTABLE	CDAY		
17	2533-4980005	MOBILIZATION	LS	1	
18	2599-9999005	OVERHEAD SIGN SUPPORT STRUCTURE, 70'	EACH	2	
19	2599-9999005	OVERHEAD SIGN SUPPORT STRUCTURE, 75'	EACH	1	
20	2599-9999005	CONCRETE FOOTING FOR DMS STEEL POSTS	EACH	6	
21	2599-9999005	DMS INSTALLATION, 125 X 27 PIXEL SIGN (LARGE DMS)	EACH	3	
22	2599-9999005	DMS INSTALLATION, 55 X 27 PIXEL SIGN (SMALL DMS)	EACH	2	
23	2599-9999009	STEEL POST FOR DMS SIGNS	LF	132	
24	2599-9999015	HIGH TENSION CABLE G'RAIL, HMA MOW STRIP	SQ	113.3	

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
RE-2A	01-12-99	1	Formed Steel 'W' Beam Railing Terminal Sections
RE-2B	04-03-01	1	Formed Steel Beam Railing Transition and Terminal Sections (Thrie Beam)
RE-7	04-15-03	1	Delineators and Object Markers
RE-12A	10-19-04	1	Formed Steel Beam Guardrail and Posts for Blocked-Out Guardrail (W-Beam)
RE-12B	10-19-04	1	Formed Steel Beam Guardrail and Posts for Blocked-Out Guardrail (Thrie Beam)
RE-47	04-17-07	1	Type 3 Object Marker
RE-48A	10-19-04	1	Details of Marker and Delineator Placement (at Bridges)
RE-64B	04-19-05	1	Guardrail Installation (Bridge Ends) (less than Full Shoulder-Width Bridge)
RE-71	04-15-08	4	Temporary Barrier Rail (Precast Concrete)
RE-76	10-16-07	1	Guardrail Terminal (FLEAT-350)
RE-85	04-17-07	2	Temporary Crash Cushions - Sand Barrel Details
RE-88	04-15-08	2	High Tension Cable Guardrail
RL-14A	10-17-06	2	Guardrail Grading
RM-33	10-03-00	1	Electrical Installation Details (Roadway Ducts)
RM-38	04-27-99	1	Junction Box (Fiber Reinforced Concrete)
TC-1	10-17-06	1	Work not Affecting Traffic
TC-402	10-16-07	1	Shoulder Closure
TC-418	10-16-07	1	Lane Closure on Divided Highway
TC-420	10-16-07	2	Lane Closure at Ramps
TC-451	10-16-07	1	Temporary Road Closure on Divided Highway

ESTIMATE REFERENCE INFORMATION

100-4A
10-29-02

Item No.	Item Code	Description
1	2102-2625000	EMBANKMENT-IN-PLACE Item includes quantities associated with construction of an HMA Mow Strip, and Concrete Barrier Rail. HMA Mow Strip = 15.1 CY Guardrail Grading = 204.6 CY Attenuator Grading = 278.6 CY
2	2402-2720000	EXCAVATION, CL 20
3	2403-0100000	STRUCT CONC (MISCELLANEOUS)
4	2404-7775005	REINFORC STEEL, EPOXY COATED Items are for the installation of (3) new overhead sign trusses. Refer to tabulation OVERHEAD for locations and details. Refer to site detail sheets for specific site requirements.
5	2505-4008100	RMV G'RAIL Refer to tabulation 110-7A for locations and details. Includes the removal of 25 ft of guardrail that is to be reinstalled. Requires the removal of posts and end anchorages which shall be incidental. All guardrail materials removed shall become the property of the Contractor.
6	2505-4008200	INSTALL OF G'RAIL Refer to tabulations 110-7A for location of guardrail reinstallation, and 108-8A for locations of new guardrail installations.
7	2505-4021762	G'RAIL TERMINAL, BEAM, FLARED, RE-76 Refer to tabulation 108-8A for locations.
8	2505-6000111	HIGH TENSION CABLE G'RAIL
9	2505-6000121	HIGH TENSION CABLE G'RAIL, END ANCHOR Items are for permanent safety protection at various locations. Refer to tabulation 108-9A locations and details. Refer to site detail sheets for specific site requirements.
10	2505-6000131	HIGH TENSION CABLE G'RAIL,SPARE PART KIT Item is for furnishing repair parts to the DOT for the installed High Tension Cable Guardrail system. Spare Part Kits shall be delivered to the location specified by the Engineer, but will most likely be the nearest maintenance facility in Council Bluffs.
11	2509-0000016	TEMP CRASH CUSHION, SEVERE USE (SU) Item is to attenuate temporary barrier rail locations. Refer to tabulation 108-30 for locations.
12	2509-0000024	PERMANENT CRASH CUSHION, SEVERE USE (SU) Item is for attenuation of a sign truss footing located in the median. Refer to tabulation 108-30 for locations.
13	2509-0000026	PERMANENT CRASH CUSHION SPARE PARTS KIT Item is for furnishing repair parts to the DOT for the installed Permanent Crash Cushions. Spare Part Kits shall be delivered to the location specified by the Engineer, but will most likely be the nearest maintenance facility in Council Bluffs.
14	2528-8400048	TEMP BARRIER RAIL, CONC Items are for traffic control at various locations. Refer to tabulations 108-33 for locations. Refer to site detail sheets for specific site requirements.

Item No.	Item Code	Description
15	2528-8445110	TRAFFIC CONTROL Traffic control notes and details are found on the site detail sheets.
16	2528-9290004	CHANGEABLE MESSAGE SIGN, PORTABLE The Contractor is to furnish any signs necessary for traffic control. Refer the Standard Road Plans for requirements.
17	2533-4980005	MOBILIZATION
18	2599-9999005	OVERHEAD SIGN SUPPORT STRUCTURE, 70'
19	2599-9999005	OVERHEAD SIGN SUPPORT STRUCTURE, 75' Items are for the fabrication and installation of steel sign trusses. Refer to the V sheets for dimensions and details. These items are covered by Section 2423 of the DOT specifications.
20	2599-9999005	CONCRETE FOOTING FOR DMS STEEL POSTS Item is for the installation of a Small DMS on steel posts. Refer to site detail sheets for specific site requirements. This item is covered by Section 2524 of the DOT specifications.
21	2599-9999005	DMS INSTALLATION, 125 X 27 PIXEL, LARGE DMS The work performed under this bid item shall consist of furnishing all labor, apparatus, and materials to construct, install, and place in operation, a complete dynamic message sign (DMS) system. The Contractor shall furnish and install all components of the system not furnished by the DOT or utility company serving the DMS system, including all incidental items appurtenant to the operation of the system. For general purposes, the installation of the DMS includes, but is not limited to: - attaching the DMS to the sign truss, - installation of the utility pole including conduit, meter socket, disconnect, and all incidental items appurtenant to the electrical service, - connection of the electrical service from the utility pole to the DMS master power panel including conduit and cabling, - construction of the control cabinet footing, - installation of the conduit between the sign truss footing and the control cabinet footing, - installation of the control cabinet and control cabinet equipment, - and installation of the wiring between the DMS and the control cabinet including two branch circuits and two communication cables. For this project, the Large DMS vendor is Daktronics, Inc. of Brookings, South Dakota. The following items will be provided by the DOT, or the DMS vendor: DMS, DMS-to-sign truss attachment brackets, control cabinet, control cabinet equipment, and communication cables to connect the DMS to the control cabinet equipment. All arrangements to initiate and accept delivery of the DOT furnished equipment shall be coordinated with the Engineer. Delivery shall be witnessed by the Engineer, and proof of delivery shall be required for all items. Proof of delivery shall consist of an invoice that clearly identifies each item being delivered, initialed by the accepting party, the delivering party, and the witness. Upon acceptance of equipment, the Contractor shall be 100% liable for safe handling, storage, and installation of the equipment. Any damaged equipment shall be replaced at the Contractor's expense, without additional compensation. MEASUREMENT: Then Engineer will count the number of Overhead DMS signs installed. PAYMENT: The Contractor shall be paid the contract unit price for each Overhead DMS sign installed.

ESTIMATE REFERENCE INFORMATION

100-4A
10-29-02

Item No.	Item Code	Description
22	2599-9999005	DMS INSTALLATION, 55 X 27 PIXEL, SMALL DMS The work performed under this bid item shall consist of furnishing all labor, apparatus, and materials to construct, install, and place in operation, a complete dynamic message sign (DMS) system. The Contractor shall furnish and install all components of the system not furnished by the DOT or utility company serving the DMS system, including all incidental items appurtenant to the operation of the system. For general purposes, the installation of the DMS includes, but is not limited to: - attaching the DMS to the steel posts or sign truss, as specified in the plans, - installation of the utility pole including conduit, meter socket, disconnect, and all incidental items appurtenant to the electrical service, - connection of the electrical service from the utility pole to the DMS master power panel including conduit and cabling, - construction of the control cabinet footing, if required, - installation of the conduit between the sign truss footing and the control cabinet footing, if required, - installation of the control cabinet and control cabinet equipment, - and installation of the wiring between the DMS and the control cabinet including two branch circuits and two communication cables. For this project, the Small 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 truss attachment brackets and/or DMS-to-Post attachment hardware, control cabinet, control cabinet equipment, and communication cables to connect the DMS to the control cabinet equipment. All arrangements to initiate and accept delivery of the DOT furnished equipment shall be coordinated with the Engineer. Delivery shall be witnessed by the Engineer, and proof of delivery shall be required for all items. Proof of delivery shall consist of an invoice that clearly identifies each item being delivered, initialed by the accepting party, the delivering party, and the witness. Upon acceptance of equipment, the Contractor shall be 100% liable for safe handling, storage, and installation of the equipment. Any damaged equipment shall be replaced at the Contractor's expense, without additional compensation. MEASUREMENT: Then Engineer will count the number of Side of Road DMS signs installed. PAYMENT: The Contractor shall be paid the contract unit price for each Side of Road DMS sign installed.
23	2599-9999009	STEEL POST FOR DMS SIGNS Items are for the installation of a Small DMS on steel posts. Refer to site detail sheets for specific site requirements. This item is covered by Section 2524 of the DOT specifications.
24	2599-9999018	HIGH TENSION CABLE G'RAIL, HMA MOW STRIP This item shall consist of installing a Hot Mix Asphalt pad along the installation line of a High Tension Cable Guardrail installation. The HMA mow strip is intended to prevent the accumulation of debris and vegetation which may interfere with the function and/or maintenance of the installation. The HMA mix shall conform to the requirements of temporary/detour pavment and shall be 6" thick unless otherwise indicated. Refer to typical 7199 for locations and details. Measurement: The Engineer shall measure the area of the HMA Mow Strip installed. Payment: The Contractor shall be paid the contract unit price for the area installed. This payment shall be full compensation for furnishing all material, equipment, and labor and for the performance of all work necessary to provide a finished mow strip.

01-20-84 204-2

All holes resulting from operations of the contractor, including removal of guardrail posts, fence posts, utility poles, or foundation studies, shall be filled and consolidated to finished grade as directed by the engineer to prevent future settlement. The voids shall be filled as soon as practical - preferably the day created and not later than the following day. Any portion of the right-of-way or project limits (including borrow areas and operation sites) disturbed by any such operations shall be restored to an acceptable condition. This operation shall be considered incidental to other bid items in project.

10-22-93 204-4

All guardrail materials that are removed and not reused on this project shall become the property of the contractor. Any material to be used on this project that is damaged due to the carelessness of the contractor shall be replaced at the contractor's expense without cost to the State of Iowa.

06-22-84 251-2

The contractor is hereby notified that removal of any existing traffic markers, warning devices or guardrail barriers shall be scheduled subject to the approval of the Engineer. The contractor may be required to place temporary warning devices at certain locations where replacement features are not installed the same day during which any such removals take place.

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
Council Bluffs Area	
NHS-080-1(318)0--11-78	Missouri River Bridge - Structure
NHS-080-1(335)0--11-78	Missouri River Bridge - Grading
IM-080-1(334)2--13-78	24th St Interchange - Grade & Pave
IM-080-1(326)2--13-78	24th St Interchange - Signals
Sioux City Area	
BRF-77-2(9)--38-97	US 77 Bridge Deck Overlay
BRF-77-2(10)--38-97	US 77 Bridge Washing
IMN-029-5(99)72--0E-43	I-29 PCC Patching

Contractor shall lift the DMS into position with their own equipment. Use of DOT equipment shall not be allowed.

DMS shall not be installed if the work to be completed by the utility company is not one hundred percent complete. This will require that all activities by the Contractor necessary to commence utility work be completed in an appropriate time frame.

Contractor shall complete all electrical and communication work within 48 hours of installing the DMS on its support structure.

DMS shall be ready for testing 48 hours after installation on its support structure.

Shop drawing submittals will be allowed to be made electronically in order to expedite material ordering, if desired.

Drawings shall be submitted via PDF if an electronic submittal is made. Drawings will be reviewed and returned in PDF format regardless of format submitted.

Submittals shall be coordinated with the Resident Construction Engineer.

Electronic drawings may be sent to:
Jeremey.Vortherms@dot.iowa.gov

TABULATION OF SPECIAL EVENTS

102-15
10-29-02

Event	Location	Date
COUNCIL BLUFFS AREA		
College World Series	Omaha, NE	June 13 - 23
Fireworks Display		July 4th
Septemberfest		Late August - Early September
River City Roundup		Late September
SIOUX CITY AREA		
NAIA National Wrestling Tourney	Sioux City, IA	March 6-8
NAIA Women's Basketball Tourney	Sioux City, IA	March 12-18
Tri-State Trails Tour		May 17
- Site #301: The sidewalk along US 77 is to be open to unrestricted use.		
Awesome Biker Nights		June 20-21
Big Parade/Saturday in the Park		July 4-5
Rivercade		July 16-20
Artsplash		August 30-31
Siouxland Lewis & Clark Marathon		October 18
- Site #301: The sidewalk along US 77 is to be open to unrestricted use.		

SIGNING NOTES

SIGN-NOTE
09-25-02

SIGN INSTALLATION QUALTIY CONTROL NOTES

Post lengths have been derived from the proposed grading cross sections and shall be field verified.

Sleight differences between the design template and the actual field conditions should be expected. These variations should be resolved by doing some localized grading and shaping. Material needed to meet the site requirements of RD-21A and RD-22A should be obtained from the footing excavation and/or the area immediately adjacent to the footing. Any reshaping work shall not substantially change the foreslopes or the drainage in the vicinity of the sign.

Significant differences between the design template and the actual field conditions need to be resolved in this manner. The location shall be surveyed and the actual template drawn on the cross section. Each post length shall be recalculated and compared to the maximum allowable leg length. If all of the leg lengths are less than or equal to the maximum allowable leg length, then the proposed post design will be sufficient. If any leg is greater than the maximum allowable leg length, then the cross section with the actual template drawn (including offsets and elevation from the survey shown) shall be submitted to the Engineer. The Engineer may forward this information on to the design Engineer in order to complete a new post design.

The Contractor shall install the footings & stub posts, and posts in accordance with the following tolerances:

-the elevation difference from the edge of pavement to the bottom of the sign shall be ±6 inches (150 mm) the dimension shown.

-the elevation difference between the top of the highest post and the lowest post at a site shall be less than 2 inches (50 mm).

Footing construction is the controlling activity that substantially affects the quality of the site installation. It is imperative that the elevation difference between the stubs is exactly the same as the elevation difference between the post lengths. The Contractor shall, upon request by the Engineer, submit documentation detailing the site field shots in order to verify site installation.

TABULATION OF MATERIALS FOR OVERHEAD SIGN SUPPORT STRUCTURES

OVERHEAD
09-25-02

STRUCTURE TYPE/LENGTH	LOCATION		DIR OF TRAVEL	MEDIAN FOOTING OFFSET (Ft)	OUTSIDE FOOTING OFFSET (Ft)	DIMENSION 'L'		FOOTING TYPE (SEE ROAD STANDARD)	FOUNDATION QUANTITIES			
									EXCAVATION (CLASS 20)	REINFORCING		STRUCTURAL CONCRETE
	MILEPOST	STATION				MEDIAN (Ft)	OUTSIDE (Ft)		(Cu Yd)	STEEL (Lb)	EPOXY-COATED STEEL (Lb)	(Cu Yd)
DMS #42 - 70'		221+50	I-29 SB	0	70	0	2		119.5		3644	36.36
DMS #44 - 75'		1035+00	I-29 SB	0	75	1	3		107.5		3838	38.4
DMS #46 - 70'		1034+00	I-80 WB	0	70	1	2		115.5		3741	37.38
TOTALS									342.5	0	11223	112.14

NOTE: The 'L' dimention and the quantities shown in the table above are for estimating purposes only. The Contractor will verify the 'L' dimension based on actual field conditions and foreslopes before ordering any material to construct the footings.

REMOVE or REMOVE & REINSTALL BEAM GUARDRAIL

110-7A
04-19-05

(1) Lane(s) to which the installation is adjacent.

Location			Side	Steel Beam Guardrail		Posts		End Anchorage			Remarks
No.	(1) Direction of Traffic	Station		Remove (Lin. Ft.)	Remove & Reinstall (Lin. Ft.)	Remove (No.)	Remove & Reinstall (No.)	Remove (No.)	Remove & Reinstall (No.)	Type	
#42	I-29 SB	222+45	RT	50		10		1		RE-76	
#46	I-80 WB	1035+30	LT		25		3				
#46	I-80 WB	1033+52.5	LT	56.25		11		1		RE-76	

(1) Lane(s) to which the installation is adjacent.
A = Approach
T = Trailing

GRADING FOR GUARDRAIL INSTALLATIONS

Refer to Standard Road Plans RL-14A, RL-14B, and Typical 4303

107-23
04-15-08

Location				Standard or Typical Number	Type	Dimensions (Feet)												Class 10 Excavation	Embankment In Place	Remarks
						(BY)		(Z)		(X1)	(Y1)	(X2)	(Y2)	(X3)	(Y3)	(X4)	(Y4)			
No.	(1) Direction of Traffic	Station	Side			A	T	A	T									Cu. Yds.	Cu. Yds.	
#42	SB	220+80	RT	RL-14A	1	8		50		75	4					112.5	8		94.7	
#44	WB	1035+40	RT	RL-14A	4	8		50		12.5	4	87.5	4	150	4	187.5	8		109.9	GUARDRAIL FOLLOWS SHOULDER

STEEL BEAM GUARDRAIL AT BRIDGE END POST AND CONCRETE BARRIER

Refer to Standard Road Plans RE-48A, RE-64A, RE-64B, and RE-65B

108-8A
04-19-05

Location					Case	Standard Road Plan	Layout Lengths					Materials Required						Delineators and Object Markers				Bid Items					Remarks
							(STS)	(VT1)	(VF)	(VT2)	(ET)	STS		'W' Beam (2)	Posts (3)	Posts (4)	CRT Posts	Type	Delineator	Object Marker		Installation of Guardrail	Anchorage and Terminal Systems				
No.	(1) Direction of Traffic	End A=Approach T=Trailing	Side O = Outside M = Median	Station			(18.75')				Terminal (37.5')	Thrie Beam (25.0')	Transition Section (6.25')	(VT1) + (VF) + (VT2) + (ET)	6"x 8"x 7' with 6"x 8" Spacer Blocks (6 or 7)	6"x 8"x 6' with 6"x 8" Spacer Blocks	6"x 8"x 6' with 6"x 8" Spacer Blocks (5)		Single White	Type 2	Type 3	(STS) + (VT1) + (VF) + (VT2) + (ET)	RE-69A	RE-69B	RE-69C	RE-76	
							Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	No.	No.	No.		D-1W	OM2-3YV	OM-3L OM-3R	Lin. Ft.	No.	No.	No.	No.	
#42	SB	A	0	222+45	A	RE-64B	N/A	125	0	0	37.5			162.5		19	5	2		5		162.5				1	
#44	WB	A	0	1033+52.5	B	RE-64B	UAC	12.5	75	62.5	37.5			187.5		23	5	2		7		187.5				1	

(1) Lane(s) to which the obstacle is adjacent.
(2) Includes (1) special 12.5' section of 'W' Beam, see RE-76.
(3) (6) 6"x 8"x 7' posts required when RE-69C is specified.
(4) The last two posts of the RE-76 Terminal section are included as part of that bid item.

HIGH TENSION CABLE GUARDRAIL

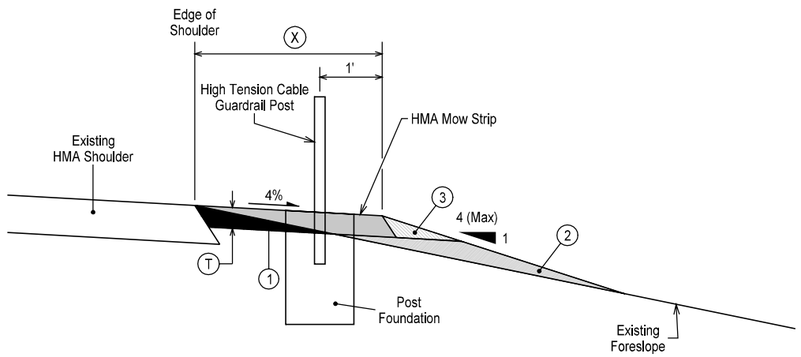
Refer to Standard Road Plan RE-88.

108-9A
04-15-08

(1) Lane(s) to which the installation is adjacent.

Location				Dimensions						Remarks
No.	(1) Direction of Traffic	Station	Side	Offset, D_O Ft.	Approach, C_A Ft.	Obstacle, C_O Ft.	Trailing, C_T Ft.	Protection Length $(C_A+C_O+C_T)$ Ft.	End Anchor No.	
#44	I-29 SB	1034+97.08 to 1037+00.82	LT	6	194.9	11.8		206.7	2	
#44	I-29 SB	1037+97.08 to 1037+06.90	RT	2	201	11.8		212.8	2	
#44	I-29 NB	1032+99.18 to 1035+05.92	LT	6	194.9	11.8		206.7	2	

7199
12-12-06



(1) Remove existing fillet.
(2) New embankment placed prior to HMA Mow Strip.
(3) New embankment placed after HMA Mow Strip.
(4) Bid Items

Items (1) (2) & (3) shall be included in the price bid for Embankment in Place.

TYPICAL SECTION HOT MIX ASPHALT MOW STRIP FOR HIGH TENSION CABLE GUARDRAIL ADJACENT TO PAVED SHOULDER

Location					(X)	Quantities (4)	
Road Identification	Station To Station		Dir.	Side	Feet	Embankment in Place CY	HMA Mow Strip SY
#44 I-29 SB	1034+35	1037+75	SB	RT	3	15.1	113.3

TEMPORARY BARRIER RAIL

108-33
04-15-08

No.	Station To Station		Length Lin. Ft.	(Select One) Concrete RE-71	(Select One) Steel RE-89	Remarks
#42	219+70	223+35	362.5	X		SB - MEDIAN (29 SECTIONS)
	219+00	221+65	262.5	X		SB - OUTSIDE (21 SECTIONS)
	223+10	221+10	200	X		NB - MEDIAN (16 SECTIONS)
#44	1037+45	1034+35	300	X		SB - MEDIAN (24 SECTIONS)
	1037+80	1034+35	337.5	X		SB - OUTSIDE (27 SECTIONS)
	1032+55	1035+65	300	X		NB - MEDIAN (24 SECTIONS)
#46	1036+20	1033+40	275	X		WB - MEDIAN (22 SECTIONS)
	1036+00	1033+30	262.5	X		WB - OUTSIDE (21 SECTIONS)

CRASH CUSHIONS

108-30
10-16-07

(1) Lane(s) to which the installation is adjacent.
(2) Complete this section when using the Temporary Crash Cushion bid item. Refer to Standard Road Plan RE-85.

R - (Redirective)
SU - (Severe Use)

No.	(1) Direction of Traffic	Location Station	Side	Obstacle Width Feet	Bid Item(s) (Select one) Temporary	Bid Item(s) (Select one) Permanent	(Select one if applicable) R	(Select one if applicable) SU	Sand Barrel Details (2) (V) Length Feet	(W) Length Feet	(X) Length Feet	(Y) Length Feet	(Z) Length Feet	Embankment in Place Cu.Yds.	Remarks
#42	I-29 SB	219+70	LT	2	X			X						--	ON SHOULDER
#42	I-29 SB	219+00	RT	2	X			X						4.4	AT EDGE OF SHOULDER
#44	I-29 SB	1037+45	LT	2	X			X						4.4	AT EDGE OF SHOULDER
#44	I-29 SB	1037+80	RT	2	X			X						4.4	AT EDGE OF SHOULDER
#44	I-29 NB	1032+55	LT	2	X			X						4.4	AT EDGE OF SHOULDER
#46	I-80 WB	1036+20	LT	2	X			X						--	ON MEDIAN CROSSOVER
#46	I-80 WB	1036+00	RT	2	X			X						--	ON SHOULDER
#42	I-29 SB	221+50	LT	2		X		X						83.0	FLATTEN MEDIAN SLOPES
#42	I-29 NB	221+50	LT	2		X		X						178.0	FLATTEN MEDIAN SLOPES

0 20
FEET

SITE DETAILS FOR DMS #42
I-29 SOUTHBOUND
COUNCIL BLUFFS - POTTAWATTAMIE CO.

ENGLISH 720 Resolution	Iowa Department of Transportation	OFFICE OF TRAFFIC & SAFETY	DESIGN TEAM VORTHERMS/THEDE	STATEWIDE COUNTY	PROJECT NUMBER STP-A-000-S(345)--22-00	SHEET NUMBER N.01

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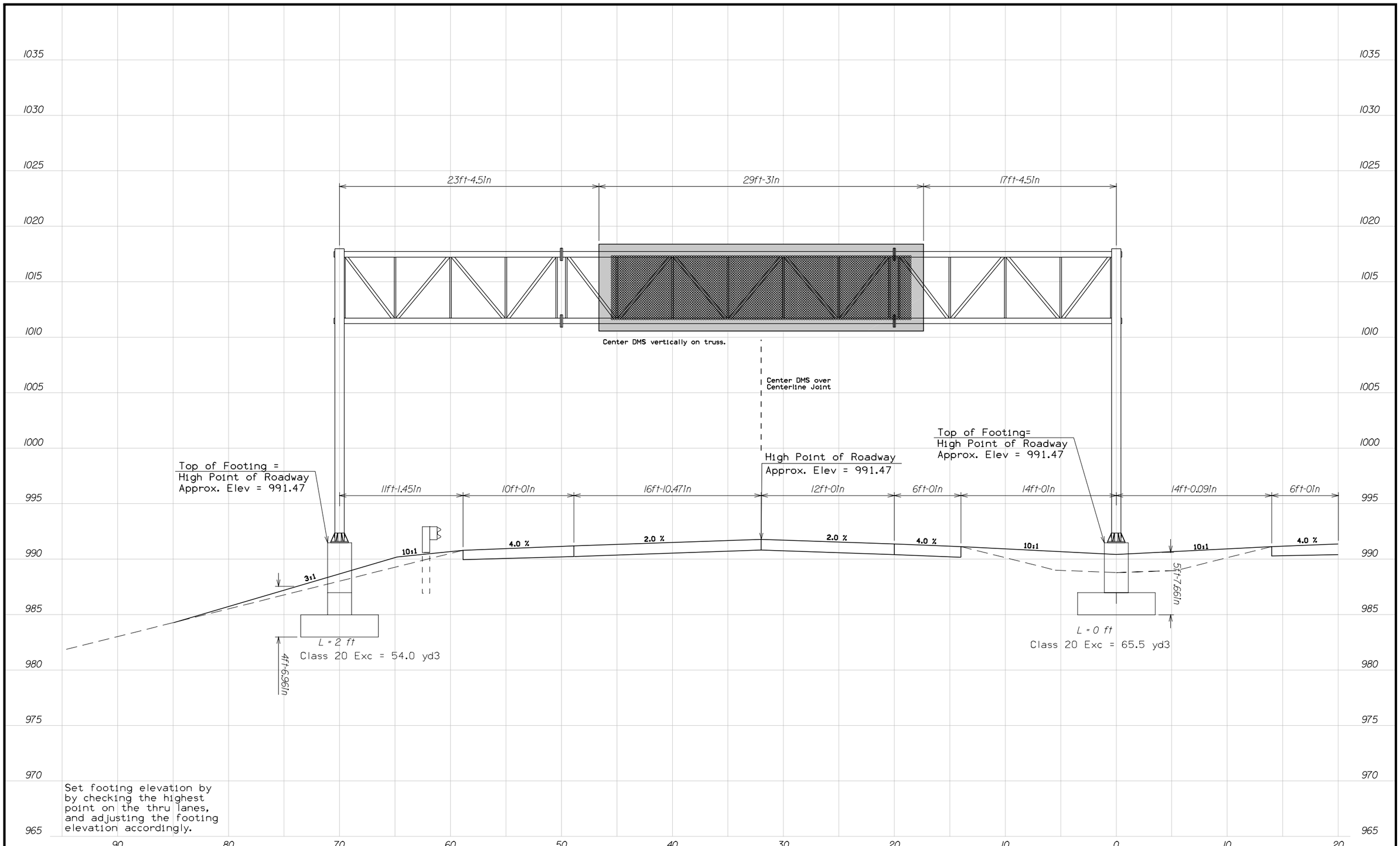


SITE #42 | I-29 SOUTHBOUND POTTAWATTAMIE COUNTY | STA 221+50 PROPOSED 70' TRUSS

Cross Section is looking north, against traffic.

ENGLISH 720 Resolution	Iowa Department of Transportation	OFFICE OF TRAFFIC & SAFETY	DESIGN TEAM VORTHERMS/THEDE	STATEWIDE COUNTY	PROJECT NUMBER STP-A-000-S(345)--22-00	SHEET NUMBER N.02
SYSTEMTIME	USERNAME	DGNSPEC				

SAMPLE STAGING SEQUENCE

Setup initial traffic control
Guardrail removals
Footing construction
Guardrail grading
Install sign truss and DMS
Install guardrail
Final seeding

GENERAL

Maintain traffic two lanes of traffic in each direction except as noted:
- a road closure (TC-451) is to be used to install the truss and DMS, and
- lane clousures (TC-418 & TC-420) are to be used to install the TBR.

Lane closures and road closures are allowed at night only.

Install traffic control at this site in accordance with listed Standard Road Plans. For additional complementary information, refer to Part 6 of the Manual on Uniform Traffic Control Devices and to the current Standard Specifications.

OUTSIDE WORK AREA

Protect outside footing and work area with temporary barrier rail (TBR) at all times. Place TBR along the roadway starting at the thrie beam connection to the bridge abutment wall. Once the end terminal is removed from the guardrail becomes a hazard and is required to be protected.

MEDIAN WORK AREA

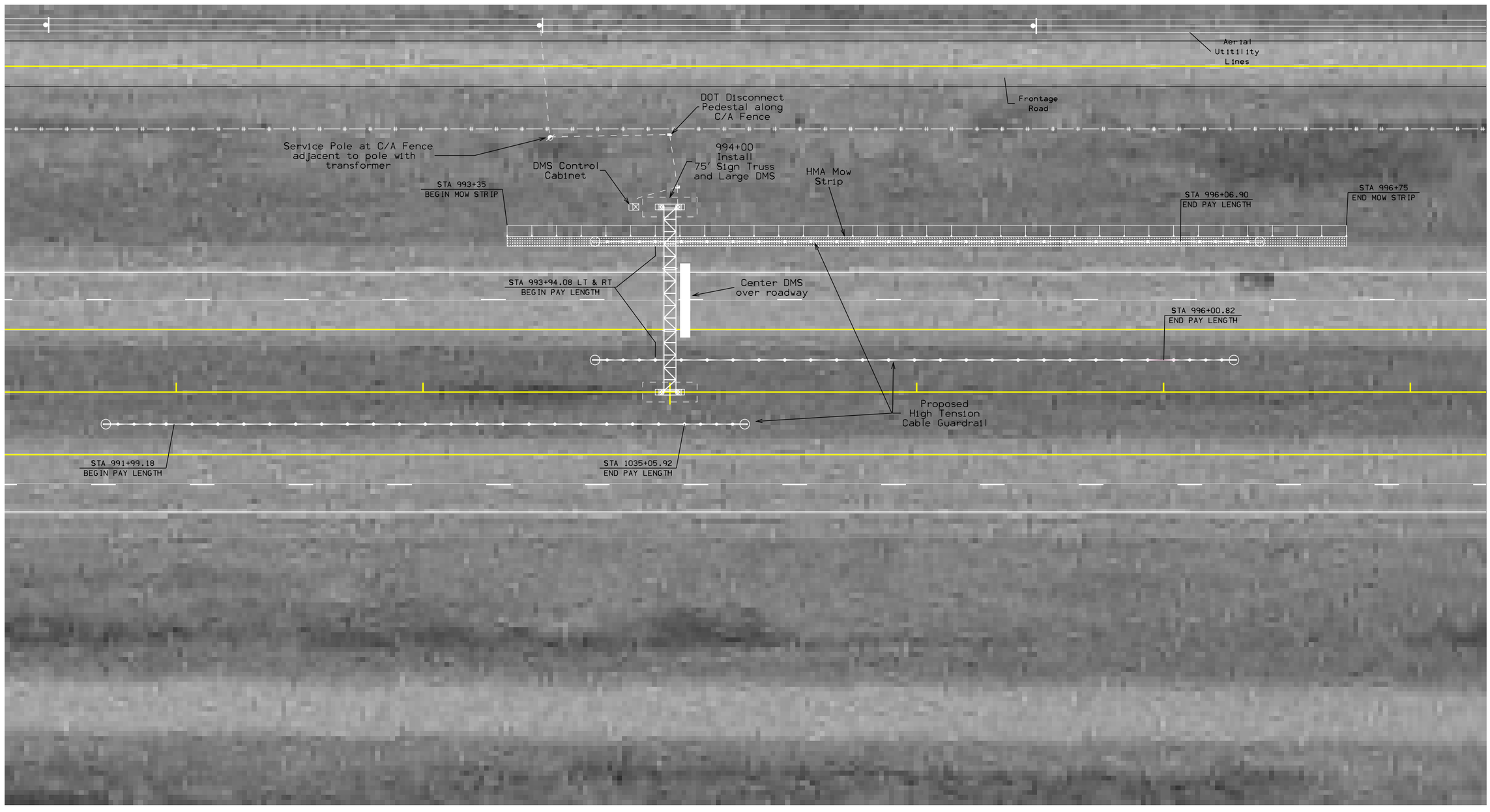
Protect the median footing and work area with TBR at all times. The NB installation of TBR is to start behind the attenuator for the bridge pier, and will not require a temporary attenutor.

TRAFFIC CONTROL STANDARD ROAD PLANS

TC-1	TC-420
TC-402	TC-451
TC-418	RE-71

0 20 FEET

TRAFFIC CONTROL FOR DMS #42
I-29 SOUTHBOUND
COUNCIL BLUFFS - POTTAWATTAMIE CO.



0 20 FEET

SITE DETAILS FOR DMS #44
I-29 SOUTHBOUND
LOVELAND - HARRISON CO.

ENGLISH 720 Resolution	Iowa Department of Transportation	OFFICE OF TRAFFIC & SAFETY	DESIGN TEAM VORTHERMS/THEDE	STATEWIDE COUNTY	PROJECT NUMBER STP-A-000-S(345)--22-00	SHEET NUMBER N.04	

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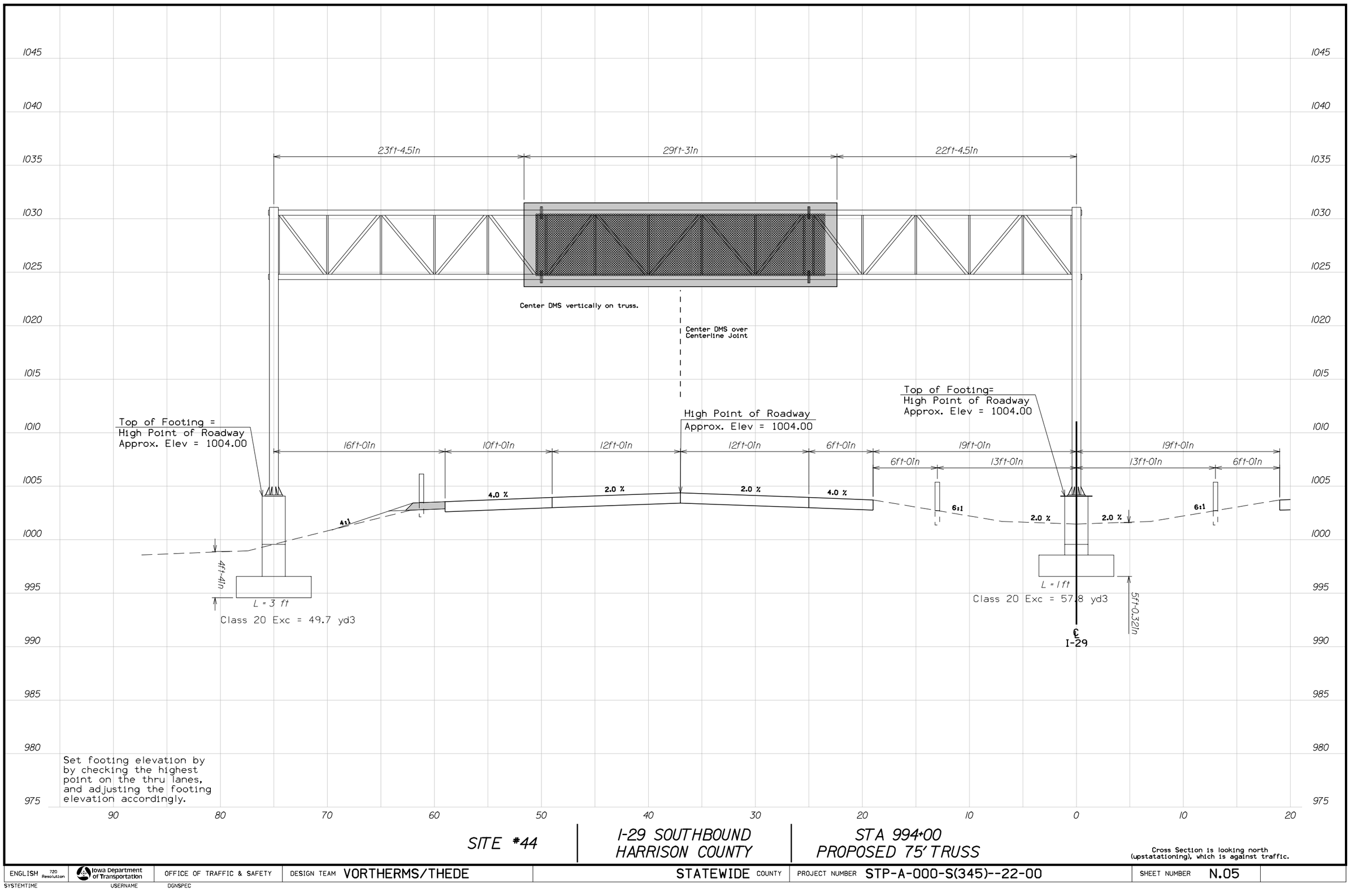


Set footing elevation by by checking the highest point on the thru lanes, and adjusting the footing elevation accordingly.

SITE #44

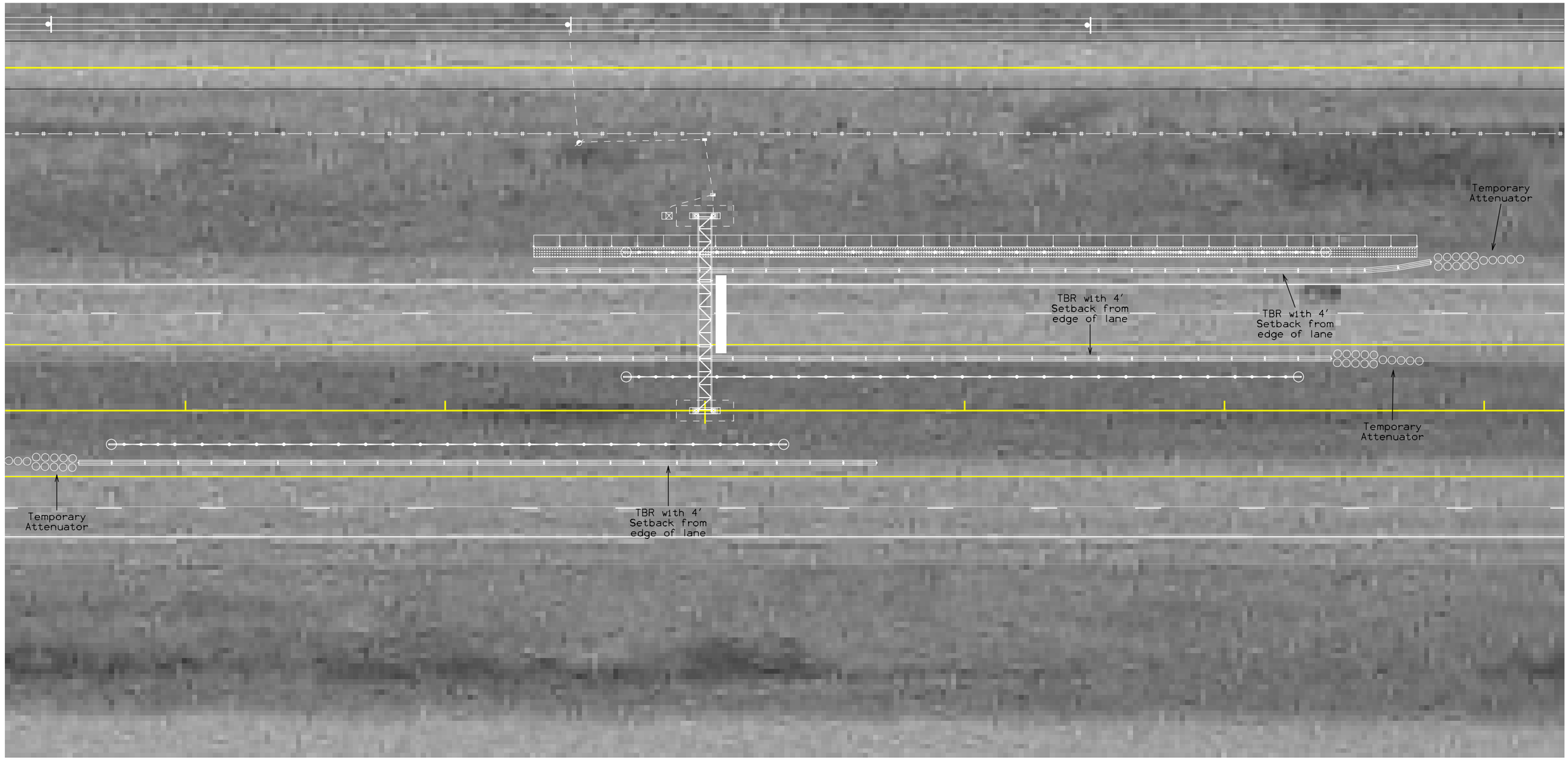
I-29 SOUTHBOUND
HARRISON COUNTY

STA 994+00
PROPOSED 75' TRUSS

Cross Section is looking north (upstatationing), which is against traffic.

SAMPLE STAGING SEQUENCE

Setup initial traffic control
Footing construction
Install sign truss and DMS
Install guardrail
Final seeding



GENERAL

Maintain traffic two lanes of traffic in each direction except as noted:
- a road closure (TC-451) is to be used to install the truss and DMS, and
- lane clousures (TC-418 & TC-420) are to be used to install the TBR.

Lane closures and road closures are allowed at night only.

Install traffic control at this site in accordance with listed Standard Road Plans. For additional complementary information, refer to Part 6 of the Manual on Uniform Traffic Control Devices and to the current Standard Specifications.

OUTSIDE WORK AREA

Protect outside footing and work area with temporary barrier rail (TBR) at all times. Flare the TBR away from the roadway to provide the maximum offset possible.

MEDIAN WORK AREA

Protect the median footing and work area with TBR until the cable guardrail is installed.

TRAFFIC CONTROL STANDARD ROAD PLANS

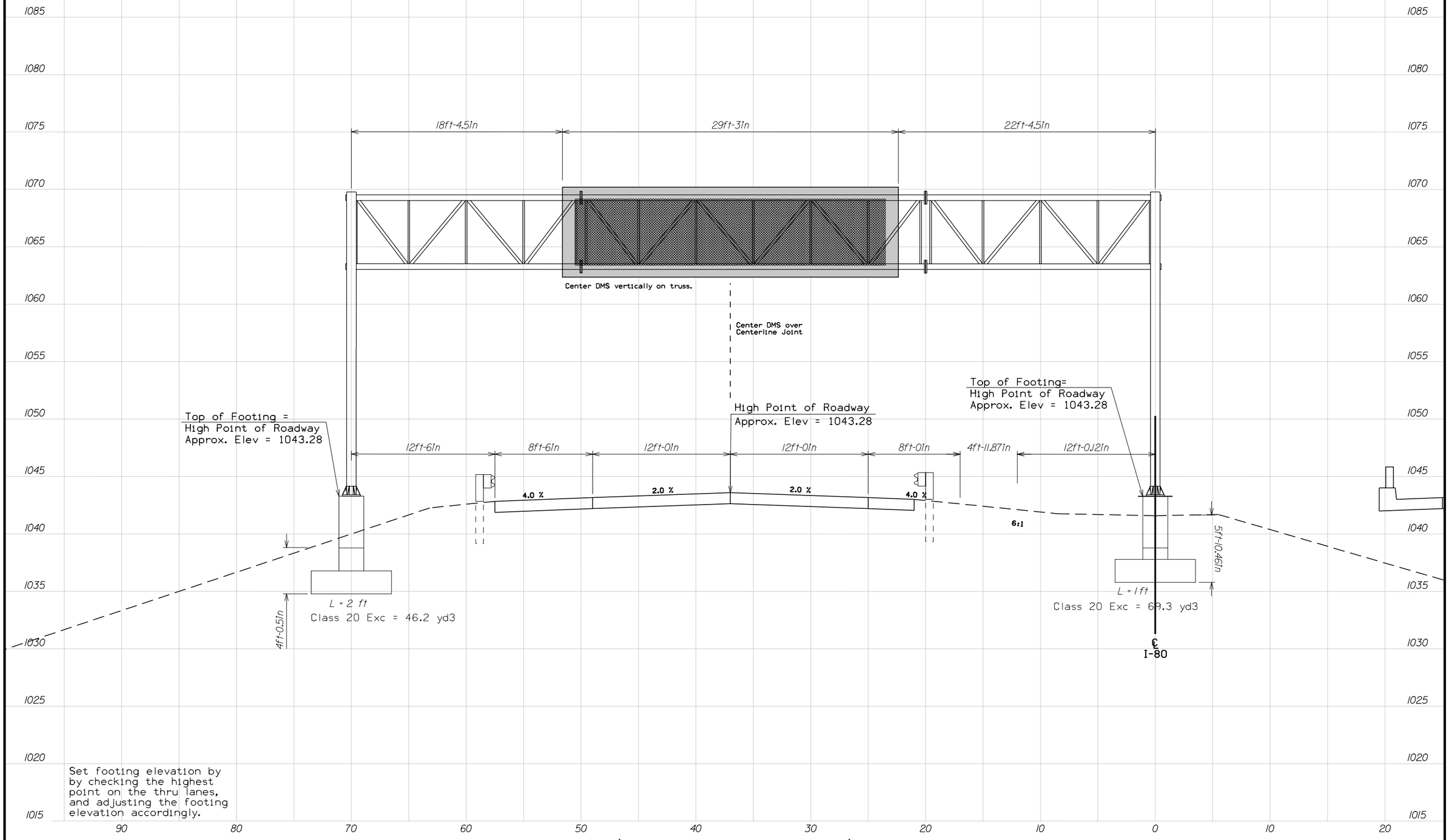
TC-1	TC-420
TC-402	TC-451
TC-418	RE-71

0 20 FEET

TRAFFIC CONTROL FOR DMS #44
I-29 SOUTHBOUND
LOVELAND - HARRISON CO.

0 20
FEET

SITE DETAILS FOR DMS #46
I-80 WESTBOUND
COUNCIL BLUFFS - POTTAWATTAMIE CO.



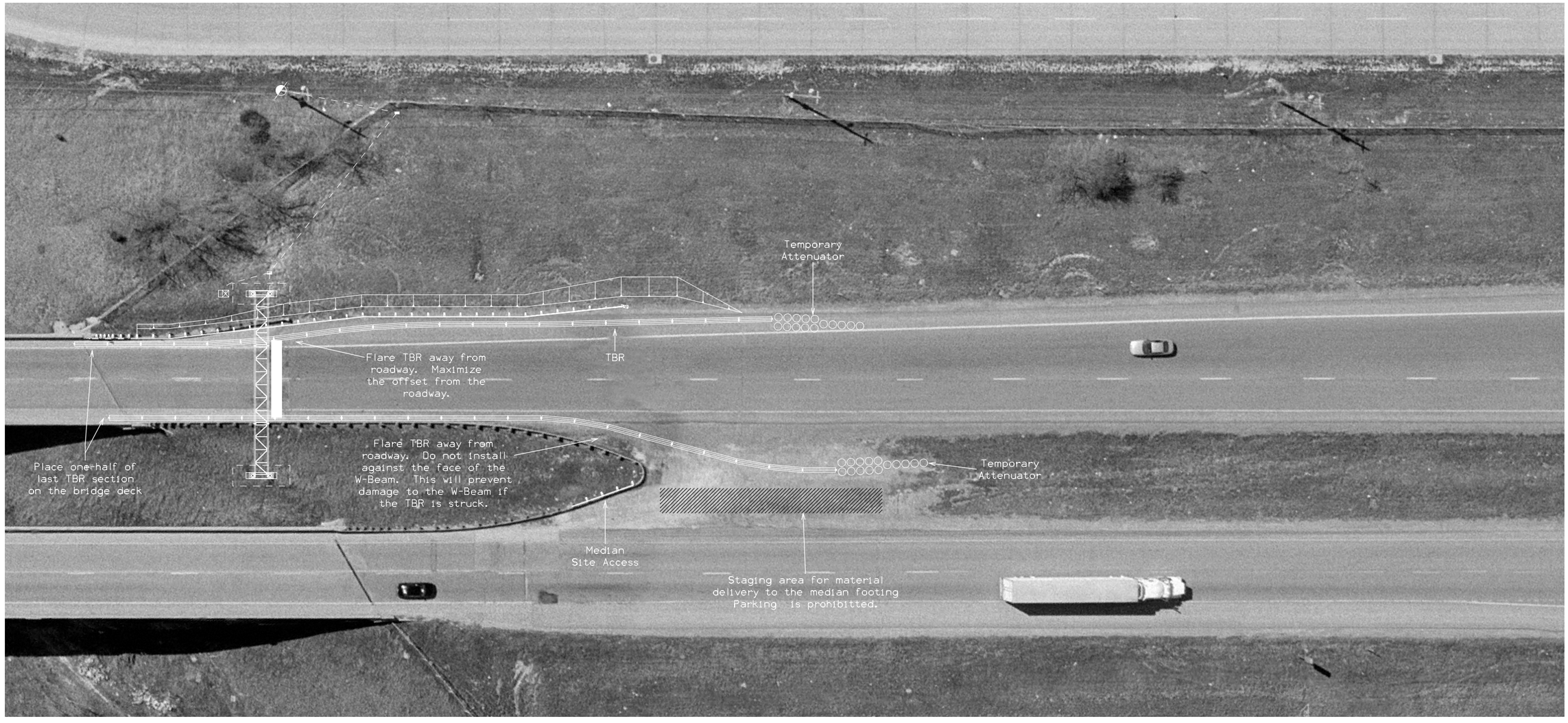
SITE #46 | I-80 WESTBOUND POTTAWATTAMIE COUNTY | STA 1034+00 PROPOSED 70' TRUSS

Cross Section is looking east (upstationing), which is against traffic.

ENGLISH 720 Resolution	Iowa Department of Transportation	OFFICE OF TRAFFIC & SAFETY	DESIGN TEAM VORTHERMS/THEDE	STATEWIDE COUNTY	PROJECT NUMBER STP-A-000-S(345)--22-00	SHEET NUMBER N.08	
SYSTEMTIME	USERNAME	DGNSPEC					

SAMPLE STAGING SEQUENCE

Setup initial traffic control
Guardrail removals
Footing construction
Guardrail grading
Install sign truss and DMS
Install guardrail
Final seeding



GENERAL

Maintain traffic two lanes of traffic in each direction except as noted:
- a road closure (TC-451) is to be used to install the truss and DMS, and
- lane clousures (TC-418 & TC-420) are to be used to install the TBR.

Lane closures and road closures are allowed at night only.

Install traffic control at this site in accordance with listed Standard Road Plans. For additional complementary information, refer to Part 6 of the Manual on Uniform Traffic Control Devices and to the current Standard Specifications.

OUTSIDE WORK AREA

Protect outside footing and work area with temporary barrier rail (TBR) at all times. Flare the TBR away from the roadway to provide the maximum offset possible.

MEDIAN WORK AREA

The existing median guardrail will become a hazard once a portion of the w-beam is removed to access the site. Install the TBR before removing any w-beam. Protect the work area with TBR until the w-beam is reinstalled.

TRAFFIC CONTROL STANDARD ROAD PLANS

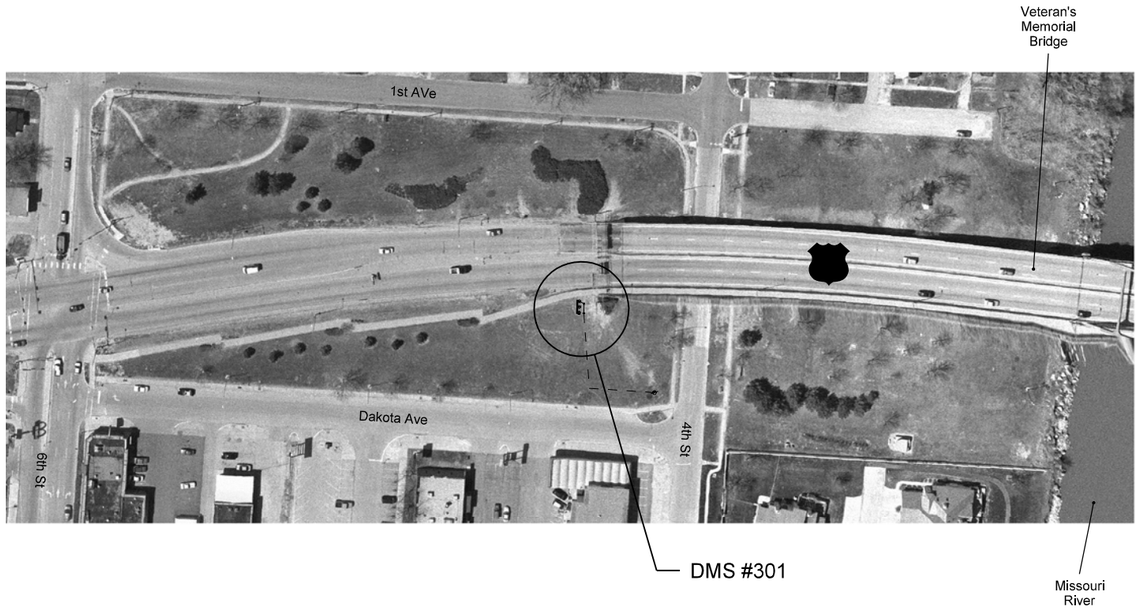
TC-1	TC-420
TC-402	TC-451
TC-418	RE-71

0 20
FEET

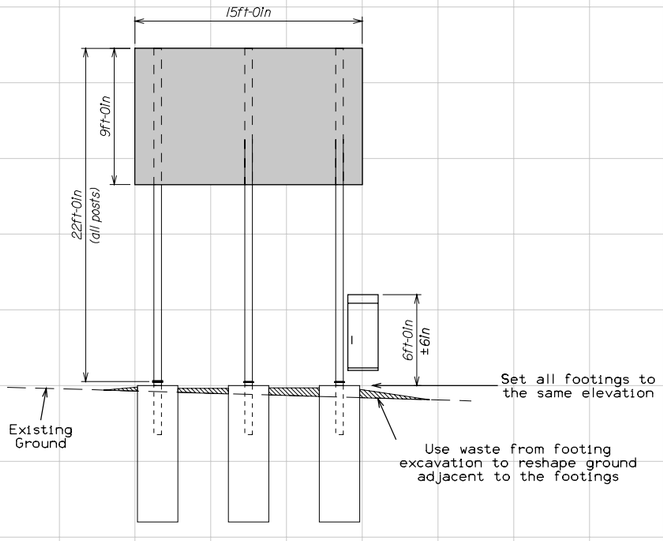
TRAFFIC CONTROL FOR DMS #46
I-80 WESTBOUND
COUNCIL BLUFFS - POTTAWATTAMIE CO.

ENGLISH 720 Resolution	Iowa Department of Transportation	OFFICE OF TRAFFIC & SAFETY	DESIGN TEAM VORTHERMS/THEDE	STATEWIDE COUNTY	PROJECT NUMBER STP-A-000-S(345)--22-00	SHEET NUMBER N.09	

18-JAN-2008 16:17 jvorthe w:\Projects\0000001005\TrafEng\00-000S-345\00000S345_n09.sht



LOCATION MAP

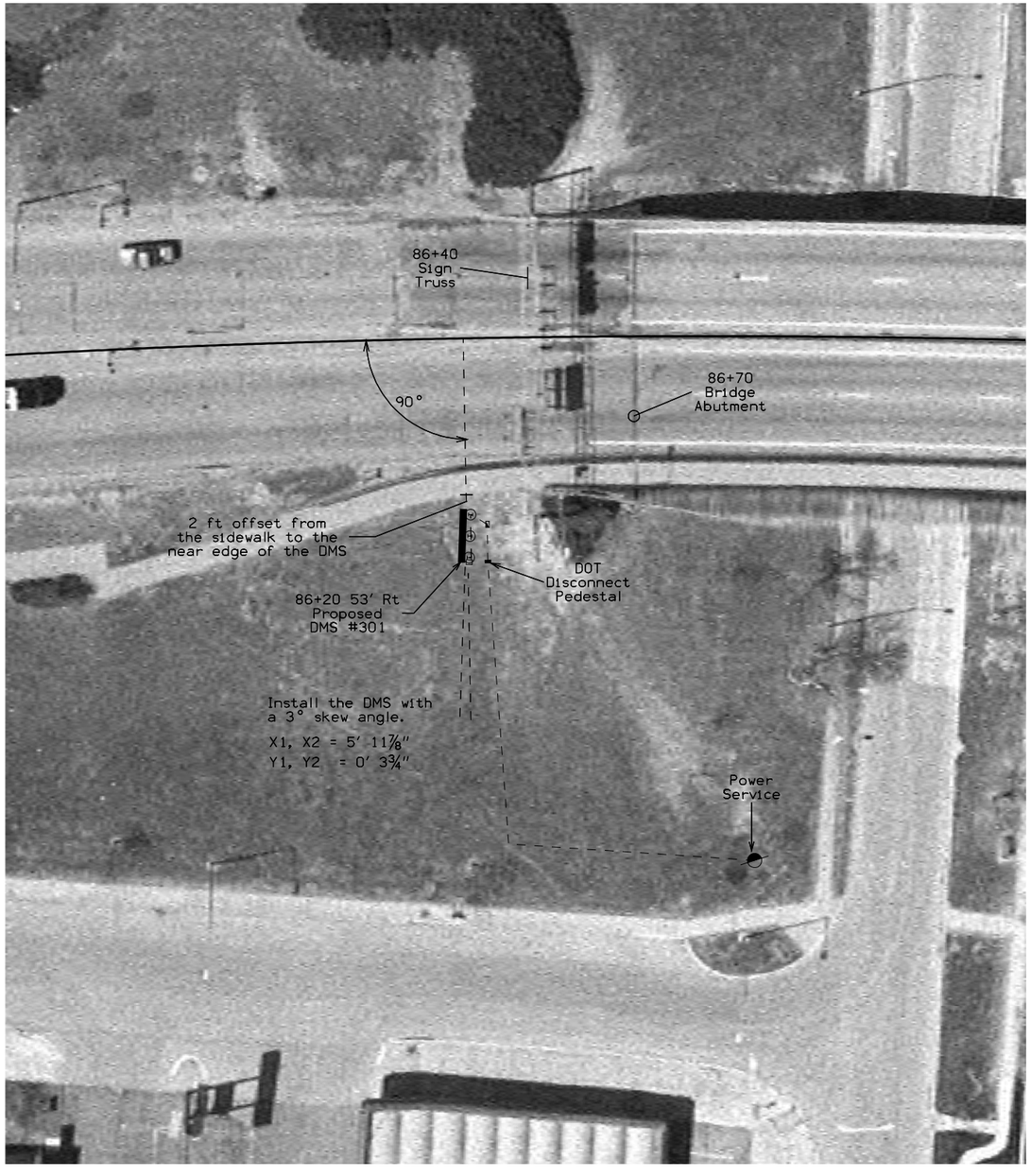


ELEVATION VIEW

looking at face of sign

Maintain traffic on US 77 at all times. Access the site from the adjacent local streets.

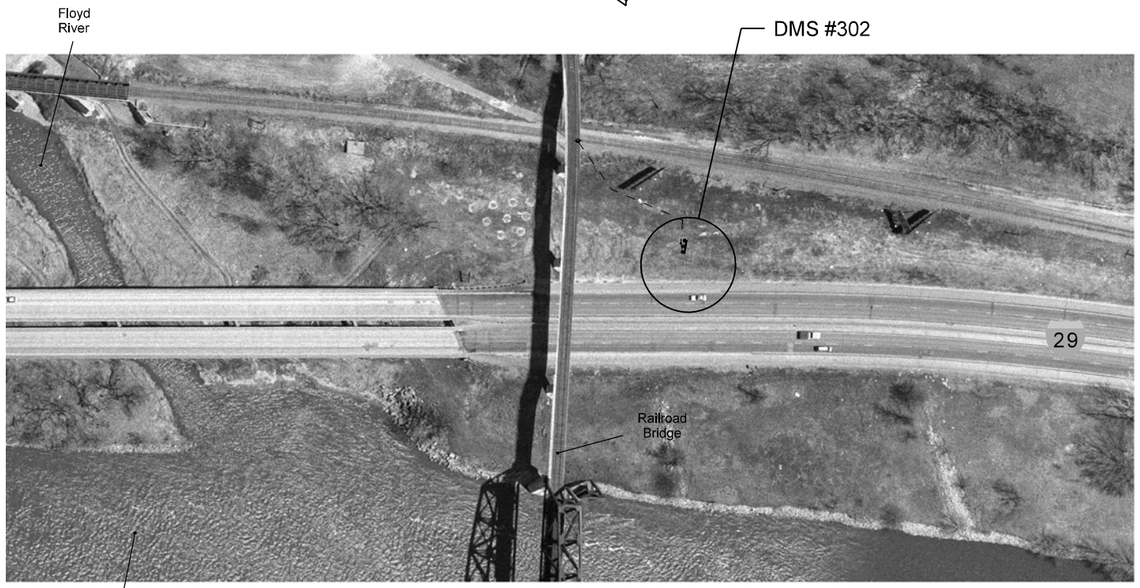
Open the sidewalk, along US 77, for unrestricted use during the Tri-State Trails Tour on May 17, 2008 and the Siouxland Lewis & Clark Marathon on October 18, 2008.



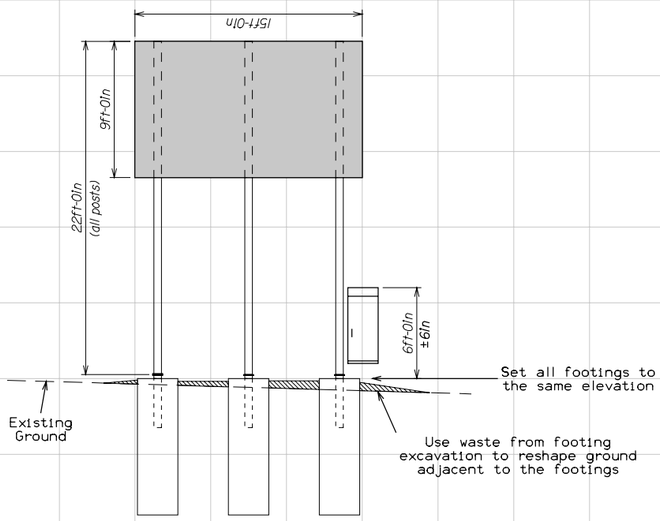
0 20
FEET

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

ENGLISH 720 Resolution	Iowa Department of Transportation	OFFICE OF TRAFFIC & SAFETY	DESIGN TEAM VORTHERMS/THEDE	STATEWIDE COUNTY	PROJECT NUMBER STP-A-000-S(345)--22-00	SHEET NUMBER N.10
SYSTEMTIME	USERNAME	DGNSPEC				



LOCATION MAP



ELEVATION VIEW

looking at face of sign

Maintain traffic on I-29 at all times.
Access the site from the shoulder.

0 20
FEET

SITE DETAILS FOR DMS #302
I-29 - NORTHBOUND
SIOUX CITY - WOODBURY CO

ENGLISH 720 Resolution	Iowa Department of Transportation	OFFICE OF TRAFFIC & SAFETY	DESIGN TEAM VORTHERMS/THEDE	STATEWIDE COUNTY	PROJECT NUMBER STP-A-000-S(345)--22-00	SHEET NUMBER N.11	
SYSTEMTIME	USERNAME	DGNSPEC					

ANCHOR BOLT NOTES:

PROCEDURE FOR TIGHTENING ANCHOR BOLT NUTS ON OVERHEAD SIGN TRUSS.

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
GREATER THAN $1\frac{1}{2}\Phi$"	1/12 TURN	1/12 TURN	1/6 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 SIGN, LUMINAIRES AND TRAFFIC SIGNALS, SERIES OF 2001 INCLUDING INTERMS UP TO 2006.

STAINLESS STEEL U-BOLT NOTES:

1) UNLESS OTHERWISE NOTED ON THE PLAN, ALL STAINLESS STEEL U-BOLTS SHALL BE FURNISHED WITH STAINLESS STEEL REGULAR HEXAGONAL NUTS, JAM NUTS AND WASHERS UNDER BOTH HEADS AND NUTS. STAINLESS STEEL U-BOLTS SHALL MEET REQUIREMENTS OF ASTM A320, TYPE 304 OR ASTM F593 GROUP 1, 2, OR 3 CONDITION A.

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

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. ALL STEEL PIPE SHALL COMPLY WITH THE REQUIREMENTS OF ASTM A53 GRADE B, TYPE E OR S.

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

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

MAGNETIC PARTICLE TESTING SHALL BE PREFORMED ON THE POST TO BASE PLATE AND STIFFENER FILLET WELDS.

SPECIFICATIONS:

DESIGN: A.A.S.H.T.O. STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, SERIES OF 2001 INCLUDING INTERMS UP TO 2006; STATE STANDARD FATIGUE DESIGN. AMERICAN INSTITUTE OF STEEL CONSTRUCTION, THIRTEENTH EDTION.

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.

GENERAL NOTES:

ALL TRUSSES ARE DESIGNED FOR 30 lb/ft^2 WIND PRESSURE ON TRUSS MEMBERS AND 40 PSF ON DMS.

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

SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL.

SHOP DRAWINGS SHALL INDICATE LEFT AND RIGHT SUPPORTS.

THE PRECISE ALIGNING AND ERECTING OF ALL COMPONENTS OF THE OVERHEAD SIGN TRUSS AND ITS SUPPORTS SHALL BE CONSIDERED ESSENTIAL. THE CONTRACTOR SHALL SUBMIT DOCUMENTATION TO THE ENGINEER SHOWING THAT THE VARIOUS COMPONENTS HAVE BEEN MEASURED AND ARE LOCATED WITHIN THE TOLERANCES LISTED BELOW.

FOUNDATIONS AND ANCHOR BOLTS:

1) EACH FOUNDATION SHALL BE ACCURATELY LOCATED, WITH THE CENTER OF THE TWO ANCHOR BOLT GROUPS NOT MORE THAN 1 INCH FROM THE PLAN LOCATION IN THE DIRECTION PARALLEL WITH AND PERPENDICULAR TO THE OVERHEAD TRUSS.

2) THE TWO FOUNDATIONS SHALL BE PARALLEL, WITH THE DISTANCES ALONG THE OVERHEAD TRUSS BETWEEN CENTERS OF FRONT AND REAR ANCHOR BOLT GROUPS DIFFERING BY NOT MORE THAN 1 INCH.

3) ELEVATIONS OF THE TOP OF EACH FOUNDATION SHALL BE WITHIN 1 INCH OF PLAN ELEVATION.

4) 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.

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

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

7) WELDING 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 ALUMINUM AND STEEL STRUCTURE:

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

2) STICK-OUT OF EACH TRUSS LOWER CHORD SHALL BE WITHIN $2\frac{3}{4}$ AND $5\frac{1}{2}$ INCHES MEASURED FROM OUTER U-BOLT TO INSIDE OF CHORD END PLATE.

3) THE TRUSS SHALL BE SQUARE WITHIN SUPPORTS. HORIZONTAL LINE BETWEEN CHORDS SHALL BE LEVEL WITHIN $\frac{1}{16}$ INCH PER FOOT OF HORIZONTAL, AND VERTICAL LINE BETWEEN CHORDS SHALL BE PLUMB WITHIN $\frac{1}{16}$ INCH PER FOOT OF VERTICAL.

STRUCTURAL DESIGN

LICENSED PROFESSIONAL ENGINEER
William D. Tucker
11362
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.

William D. Tucker — 12/28/07
Signature — Date

William D. Tucker
Printed or Typed Name

My license renewal date is December 31, 2009

Pages or sheets covered by this seal: SHEETS V.01 THRU V.05

DESIGN #	COUNTY	TRUSS LENGTH	LOCATION	STATION
908	HARRISON	75'-0	S.B. I-29	1035+00
1208	POTTAWATTAMIE	70'-0	S.B. I-29	221+50
1308	POTTAWATTAMIE	70'-0	W.B. I-80	1034+00

DESIGN FOR

GALVANIZED OVERHEAD SIGN TRUSS WITH GALVANIZED STEEL SUPPORTS

INDEX AND NOTES

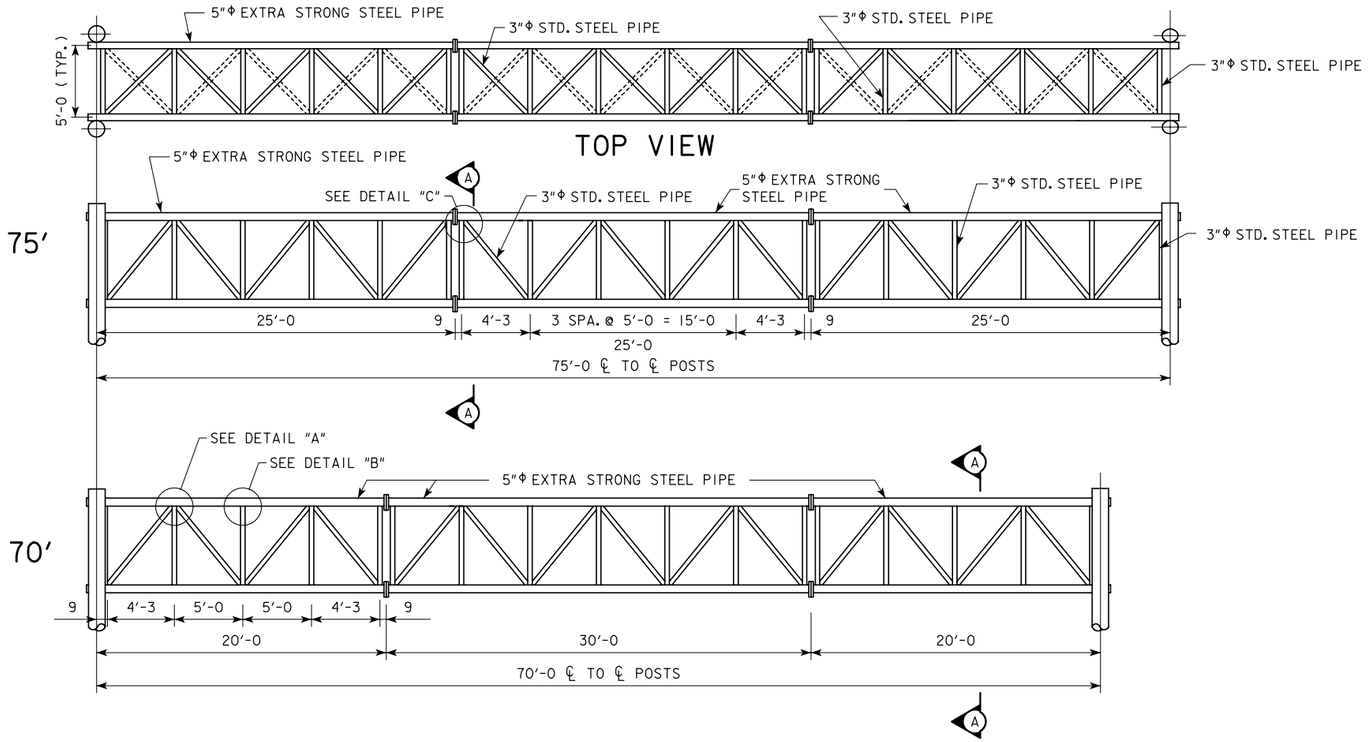
DECEMBER, 2007

STATEWIDE

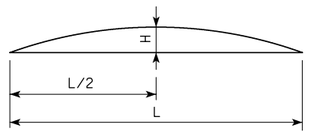
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 5 FILE NO. 30313 DESIGN NO. SEE TABLE

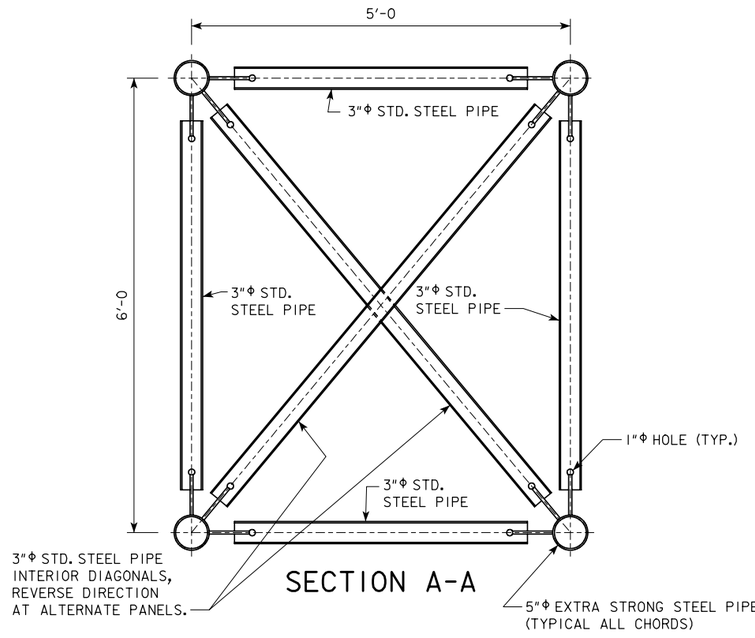
DESIGN TEAM JRH / JSZ / KFD | STATEWIDE | PROJECT NUMBER STP-A-000-S(345)--22-00 | SHEET NUMBER V.01



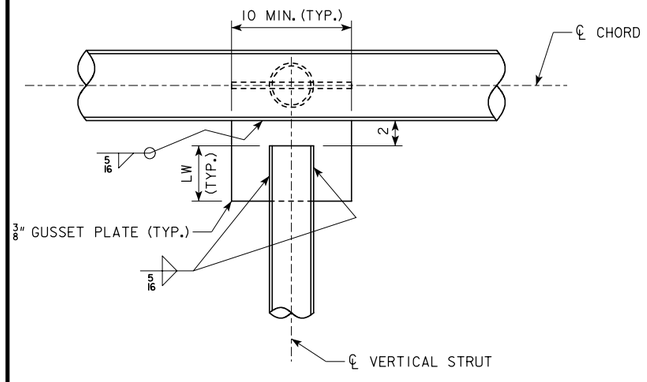
SPAN L	CAMBER H
75'	$1\frac{7}{8}$
70'	$1\frac{3}{8}$



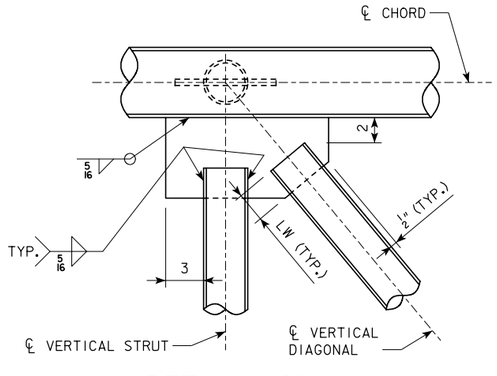
CAMBER DIAGRAM



SECTION A-A



DETAIL "B"



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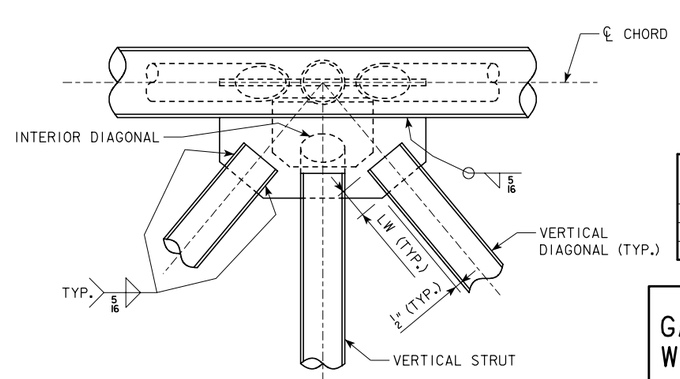


DETAIL "A"
FOR 3"Φ STD. STEEL PIPE
LW (MIN.) = $3\frac{1}{2}$"

DESIGN #	COUNTY	TRUSS LENGTH	LOCATION	STATION
908	HARRISON	75'-0	S.B. I-29	1035+00
1208	POTTAWATTAMIE	70'-0	S.B. I-29	221+50
1308	POTTAWATTAMIE	70'-0	W.B. I-80	1034+00

DESIGN FOR

GALVANIZED OVERHEAD SIGN TRUSS WITH GALVANIZED STEEL SUPPORTS

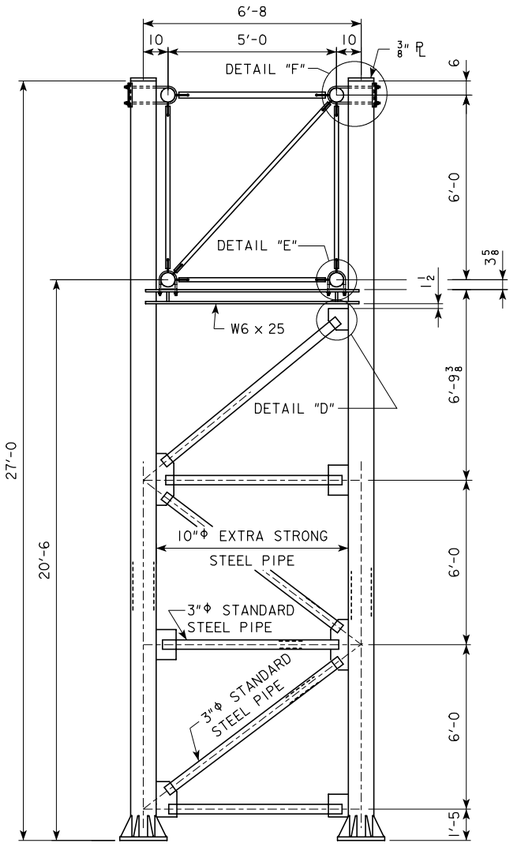
ELEVATION VIEWS

DECEMBER, 2007

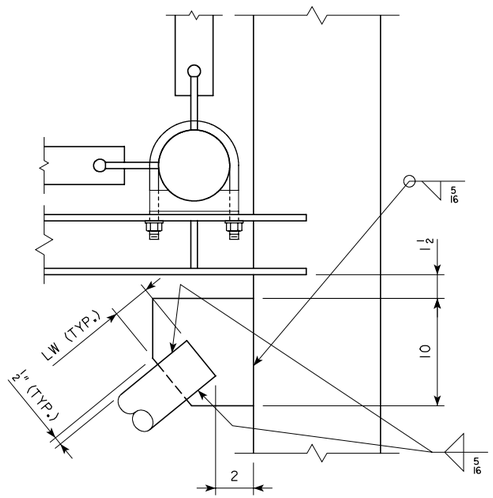
STATEWIDE

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 5 FILE NO. 30313 DESIGN NO. SEE TABLE

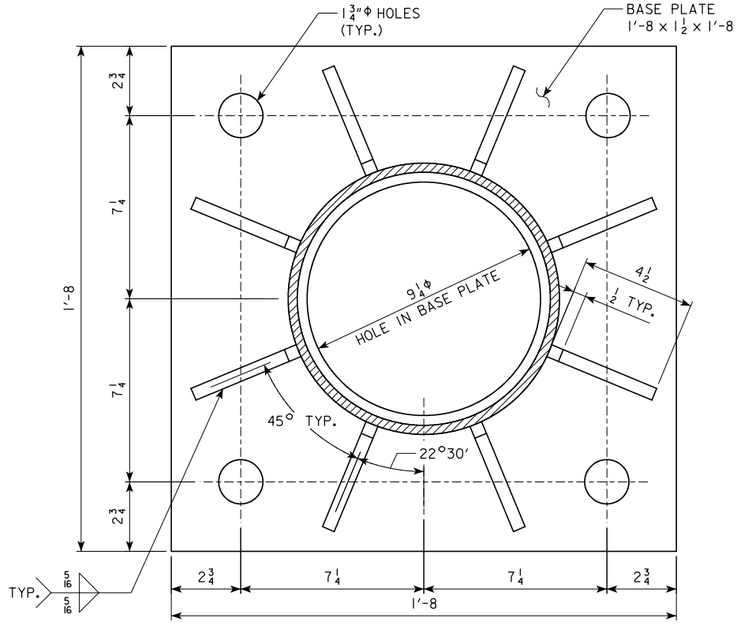


END VIEW OF TRUSS SUPPORT

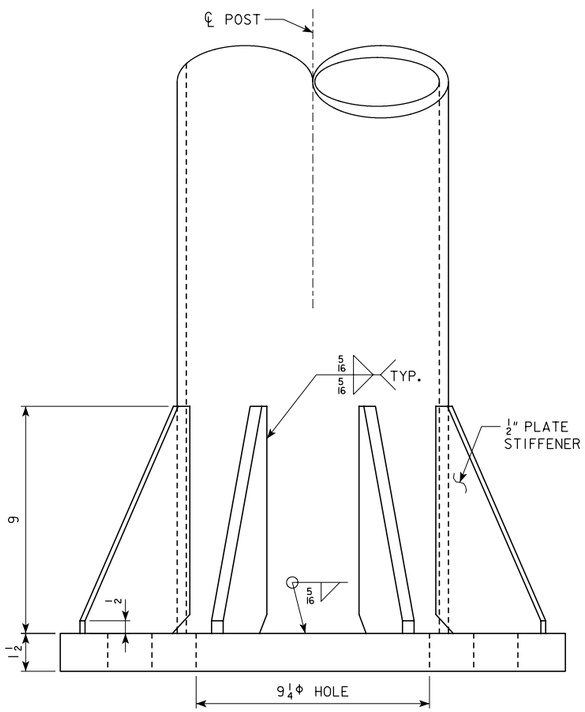


DETAIL "D"

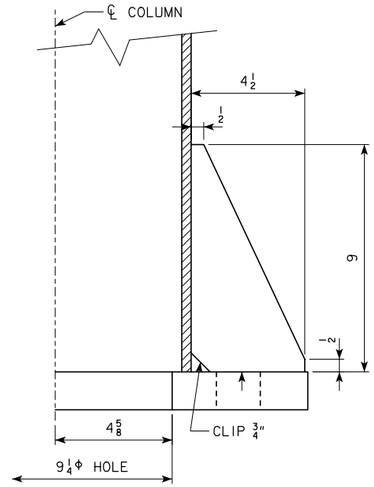
FOR 3"Φ STD. STEEL PIPE LW (MIN.) = 3 1/2"



BASE PLATE PLAN



BASE SIDE VIEW



BASE
CROSS-SECTION

NOTE: SEE DESIGN SHEET 4 FOR DETAILS "E" & "F".

DESIGN #	COUNTY	TRUSS LENGTH	LOCATION	STATION
908	HARRISON	75'-0	S.B. I-29	1035+00
1208	POTTAWATTAMIE	70'-0	S.B. I-29	2211+50
1308	POTTAWATTAMIE	70'-0	W.B. I-80	1034+00

DESIGN FOR

GALVANIZED OVERHEAD SIGN TRUSS WITH GALVANIZED STEEL SUPPORTS

BASE PLATE DETAILS

DECEMBER, 2007

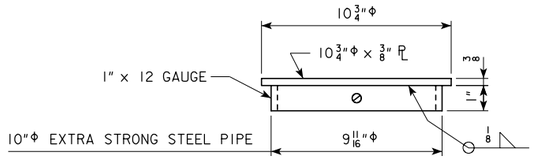
STATEWIDE

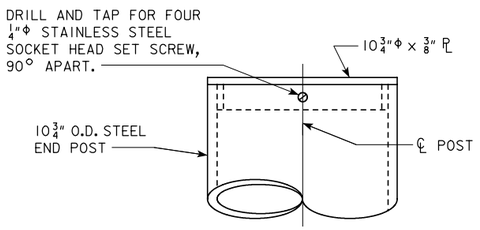
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 5 FILE NO. 30313 DESIGN NO. SEE TABLE

DESIGN TEAM JRH / JSZ / KFD | STATEWIDE | PROJECT NUMBER STP-A-000-S(345)--22-00 | SHEET NUMBER V.03

28-DEC-2007 09:10 jzimmer W:\Projects\0000001005\BRFinal\00000345.brg 000908S003 \\NTPPRTSVR2\BrgPDF





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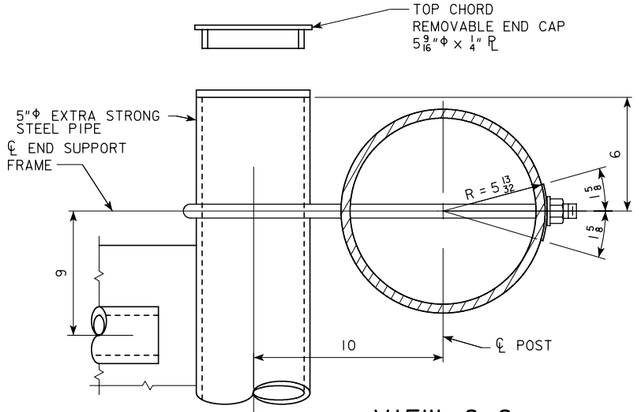
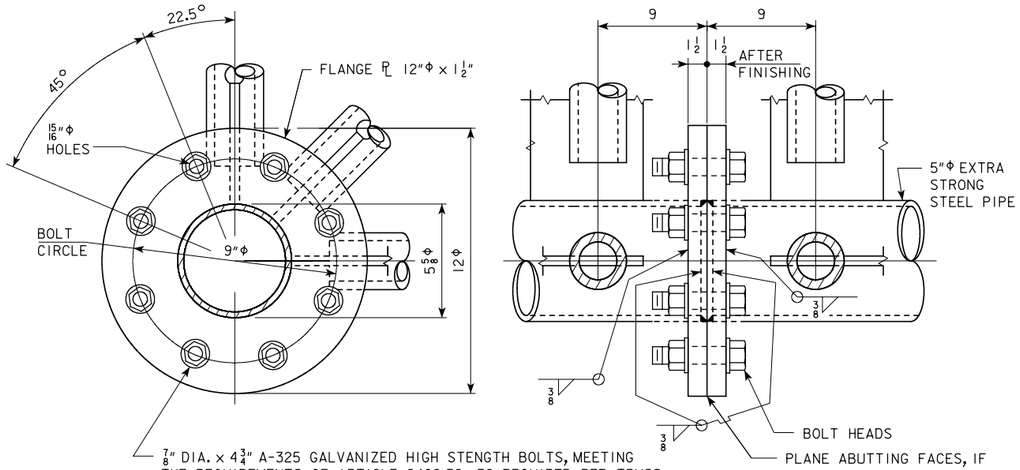


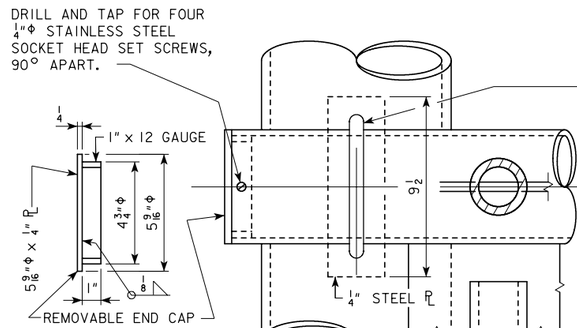
VIEW C-C



7/8" DIA. x 4 3/4" A-325 GALVANIZED HIGH STENGTH BOLTS, MEETING THE REQUIREMENTS OF ARTICLE 2408.39. 32 REQUIRED PER TRUSS SPLICE, 64 HARDENED WASHERS REQUIRED PER TRUSS SPLICE. HARDENED WASHER WILL BE PROVIDED UNDER BOTH HEAD AND NUT OF BOLT
32 - 7/8" DIA. HEAVY HEX NUTS REQUIRED PER TRUSS SPLICE. DRILL
8 - 15/16" DIA. HOLES IN EACH FLANGE. HIGH STRENGTH BOLT SHALL BE TENSIONED BY TURN-OF-NUT METHOD.

CHORD SPLICE

NOTE:
FLANGES MAY BE WELDED TO CHORD MEMBERS AFTER FINISHING PROVIDED PROPER ALIGNMENT IS SECURED.



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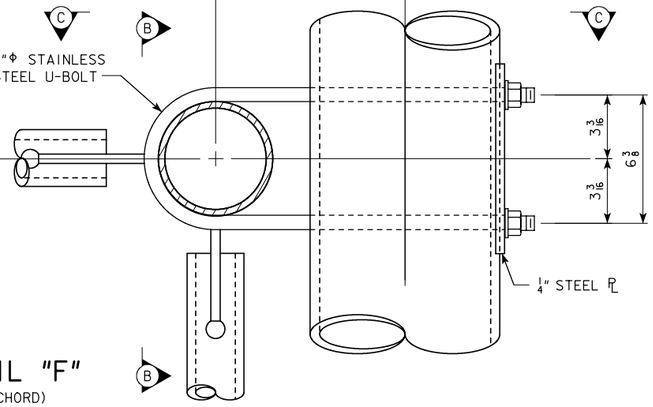
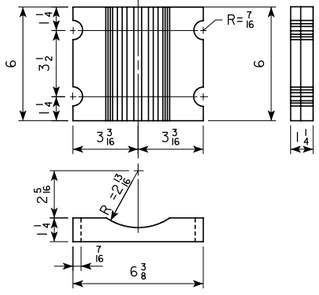
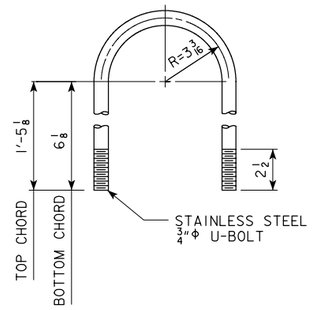
VIEW B-B



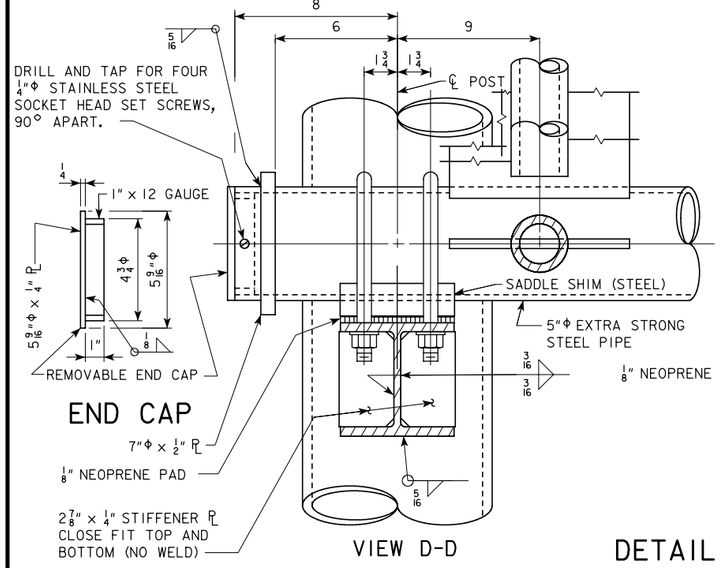
DETAIL "F"
(TOP CHORD)



SADDLE SHIM DETAIL



STAINLESS STEEL U-BOLT DETAIL



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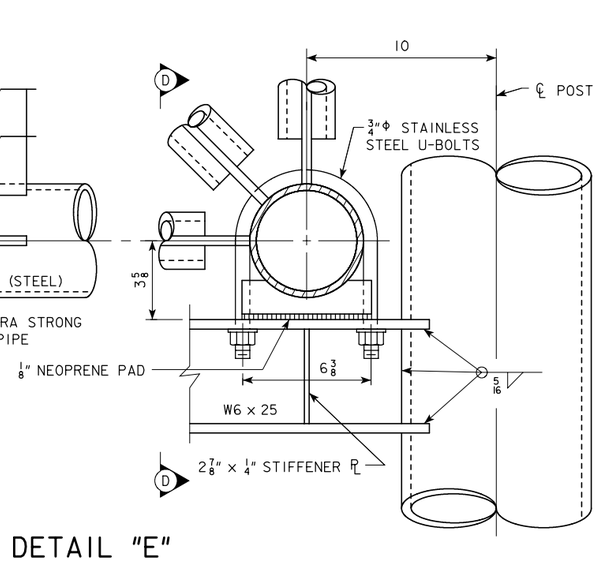
VIEW D-D



DETAIL "E"
(BOTTOM CHORD)

NOTE: SEE DESIGN SHEET 3 FOR LOCATION OF DETAILS "E" & "F".

DESIGN #	COUNTY	TRUSS LENGTH	LOCATION	STATION
908	HARRISON	75'-0	S.B. I-29	1035+00
1208	POTTAWATTAMIE	70'-0	S.B. I-29	221+50
1308	POTTAWATTAMIE	70'-0	W.B. I-80	1034+00

DESIGN FOR

GALVANIZED OVERHEAD SIGN TRUSS WITH GALVANIZED STEEL SUPPORTS

TRUSS SUPPORT & CHORD SPLICE DETAILS

DECEMBER, 2007

STATEWIDE

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 4 OF 5 FILE NO. 30313 DESIGN NO. SEE TABLE

DESIGN TEAM JRH / JSZ / KFD | STATEWIDE | PROJECT NUMBER STP-A-000-S(345)--22-00 | SHEET NUMBER V.04

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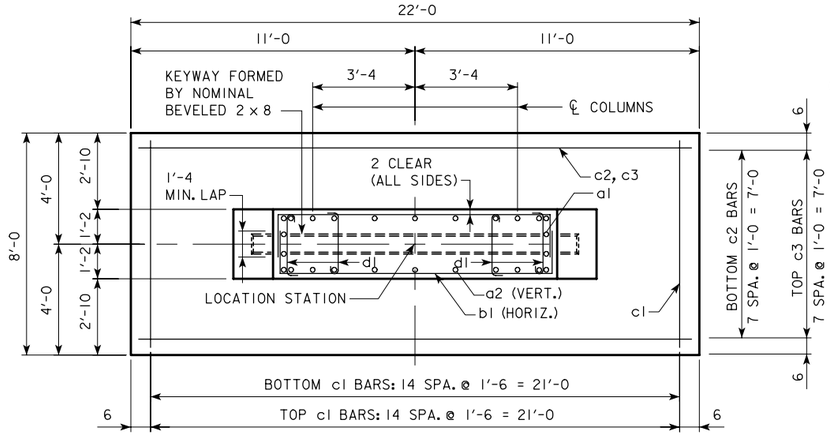
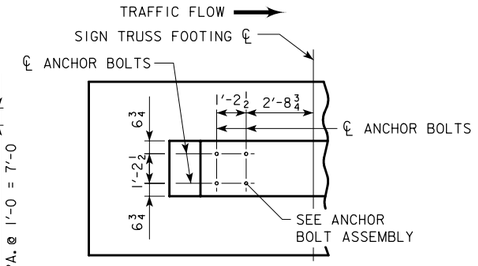
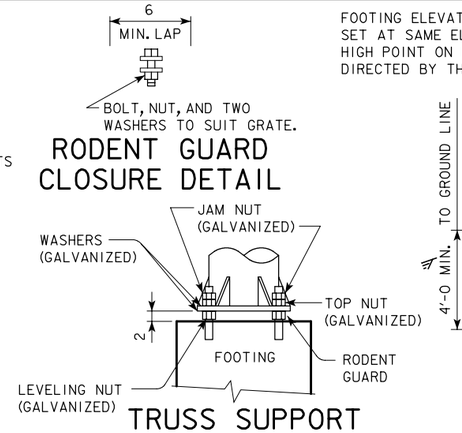


PLAN

(ANCHOR BOLT ASSEMBLIES NOT SHOWN.)

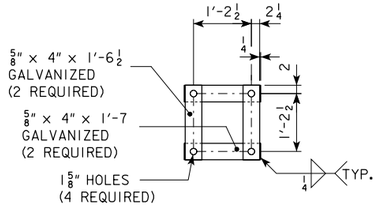


ANCHOR BOLT PLACEMENT DETAILS



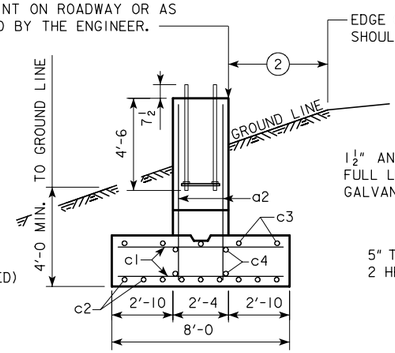
RODENT GUARD CLOSURE DETAIL

TRUSS SUPPORT CONNECTION DETAIL

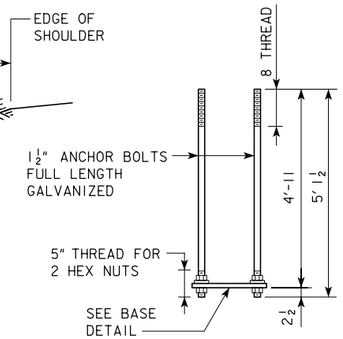


GALVANIZED BASE DETAIL

FOOTING ELEVATION IS TO BE SET AT SAME ELEVATION AS HIGH POINT ON ROADWAY OR AS DIRECTED BY THE ENGINEER.



END ELEVATION



GALVANIZED ANCHOR BOLT ASSEMBLY

GENERAL NOTES:

STRUCTURAL CONCRETE, CLASS C, SHALL BE USED FOR THE FOOTING.

EXCAVATION FOR FOOTING SHALL BE TO NEAT LINES AND CONCRETE SHALL BE PLACED AGAINST THE UNDISTURBED MATERIAL. ALL EXCAVATION FOR THE FOOTING SHALL BE DISPOSED OF IN THE AREA ADJACENT TO THE FOOTING AND SHAPED TO NORMAL GROUND CONTOUR, UNLESS OTHERWISE DIRECTED BY THE ENGINEER. MAXIMUM DESIGN BEARING CAPACITY IS 1.0 TONS PER SQUARE FOOT.

THE REQUIREMENTS PER FOOTING ARE TWO ANCHOR BOLT ASSEMBLIES INCLUDING SHIMS, NUTS (5 PER BOLT) AND WASHERS. REFER TO HARDWARE CLASSIFICATION TABLE FOR MATERIALS AND GALVANIZING REQUIREMENTS.

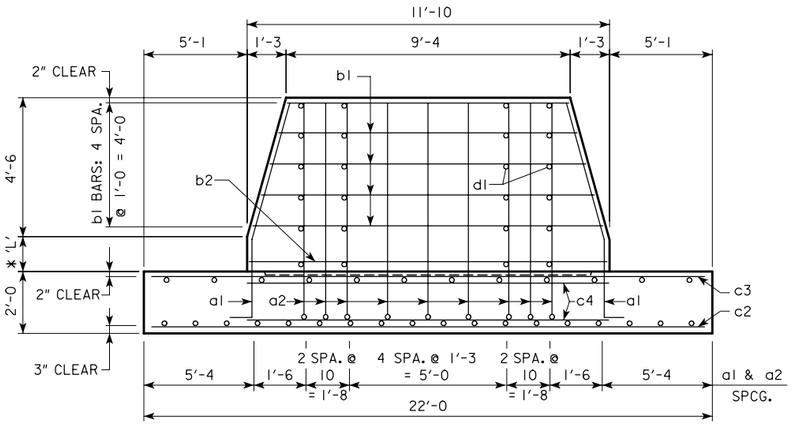
A RODENT GUARD SHALL BE PLACED BETWEEN THE CONCRETE FOOTING AND THE BASE PLATE, SEE MATERIALS I.M. 443.01.

PRICE BID FOR CONTRACT ITEMS SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY TO CONSTRUCT OVERHEAD SIGN FOOTING AS DETAILED HEREON. THE COST OF FURNISHING AND INSTALLING ANCHOR BOLT ASSEMBLIES, AND RODENT GUARDS ARE TO BE INCLUDED IN THE UNIT PRICE BID FOR STRUCTURAL CONCRETE. CONTRACT ITEMS FOR OVERHEAD SIGN FOOTING CONSTRUCTION ARE:

EPOXY COATED REINFORCING STEEL, POUNDS
STRUCTURAL CONCRETE (MISCELLANEOUS), CUBIC YARDS
EXCAVATION, CUBIC YARDS OF CLASS SPECIFIED

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

(2) SEE FOOTING TABULATION.



SIDE ELEVATION

(ANCHOR BOLT ASSEMBLIES NOT SHOWN.)

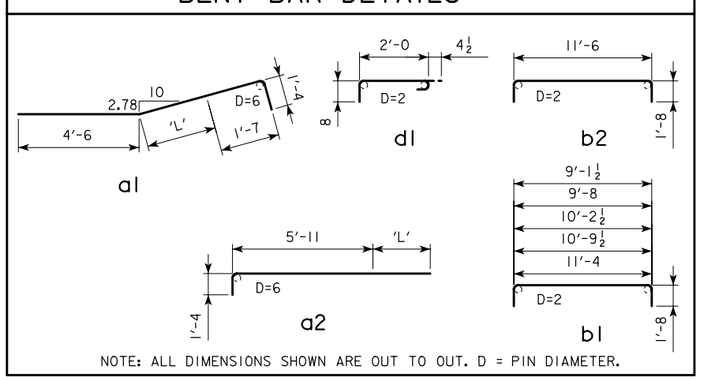
* 'L' SHALL NOT EXCEED 6'-0

CONCRETE PLACEMENT QUANTITIES

(ONE FOOTING)

ITEM	'L' = 0	EACH 1'-0 OF 'L'
WALL	4.12	1.02
FOOTING	13.04	
TOTAL (C.Y.)	17.16	1.02

BENT BAR DETAILS (SHOP BEND ALL BARS)



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

REINFORCING BAR LIST - EPOXY COATED

(ONE FOOTING)

	SIZE	SHAPE	'L' = 0 NO.	LENGTH	WEIGHT	SPACING	EACH 1'-0 OF 'L' NO.	LENGTH	WEIGHT
a1	8		8	7'-5	158	SEE DETAIL	8	1'-0 (A)	21
a2	8		18	7'-3	348	SEE DETAIL	18	1'-0 (A)	48
b1	4		10	Varies	91	1'-0	---	---	---
b2	4		---	---	---	---	2 (B)	14'-10	20
c1	6		30	7'-6	338	1'-6	---	---	---
c2	8		8	21'-6	459	1'-0	---	---	---
c3	6		8	21'-6	258	1'-0	---	---	---
c4	4		4	11'-10	32	SEE DETAIL	---	---	---
d1	4		20	3'-0 1/2	41	SEE DETAIL	4 (C)	3'-0 1/2	8
					TOTAL 1725 lbs				TOTAL 97 lbs

(A) ADDITIONAL LENGTH TO BAR a1 OR a2 FOR 'L' > 0

(B) TWO IN EACH 1'-0 OF 'L'.

(C) FOUR IN EACH 1'-0 OF 'L'.

DESIGN #	COUNTY	TRUSS LENGTH	LOCATION	STATION
908	HARRISON	75'-0	S.B. I-29	1035+00
1208	POTTAWATTAMIE	70'-0	S.B. I-29	221+50
1308	POTTAWATTAMIE	70'-0	W.B. I-80	1034+00

DESIGN FOR

GALVANIZED OVERHEAD SIGN TRUSS WITH GALVANIZED STEEL SUPPORTS

FOOTING DETAILS

DECEMBER, 2007

STATEWIDE

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 5 OF 5 FILE NO. 30313 DESIGN NO. SEE TABLE

DESIGN TEAM JRH / JSZ / KFD | STATEWIDE | PROJECT NUMBER STP-A-000-S(345)--22-00 | SHEET NUMBER V.05

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