

STATE OF	PROJECT	SHEET	TOTAL SHEETS
DAKOTA	0001-469	1	16
Plotting Date:	07/26/2013		

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# **ESTIMATE OF QUANTITIES**

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
410E0020	Structural Steel	Lump Sum	LS
460E0380	Install Dowel in Concrete	27	Each
632E3115	Extruded Aluminum Sign, Nonremovable Copy Super/Very High Intensity	48.0	SqFt
634E0010	Flagging	50	Hour
634E0100	Traffic Control	525	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Panel	1	Each

# PERMANENT SIGNING

The Contractor shall furnish all signs, hardware, and labor for installation of permanent signs in size, type, and quantity as shown in these plans and/or as required by the Engineer.

The Contractor shall provide all labor and equipment necessary to install permanent signing, remove existing signs, and reset existing signs as detailed in these plans and/or as required by the Engineer. Payment for furnishing and installing permanent signs shall be paid for at the contract unit price for each type of sign based on sheeting requirements per square foot of sign. All signs shall have ASTM D4956-04 Type XI (Super/Very High Intensity).

Existing signing shall be replaced, left in place, or temporarily covered as needed to safely direct traffic through the project or as directed by the Engineer.

# STRUCTURAL STEEL, MISCELLANEOUS

All costs associated with furnishing and installing the sign supports shall be incidental to the contract unit price per lump sum for "Structural Steel, Miscellaneous.

# DATE DECAL

The Contractor shall affix a state furnished date decal to each new sign installed. Each decal is an approximately 2" X 2" self-adhesive sticker with removable paper backing and black numerals on a white background. The date decal displays the last two digits of the year the sign was manufactured (as illustrated).



One decal shall be placed in the extreme lower left corner of the back of flat aluminum signs.

Sign supports or other obstructions shall not block the view of the date decal upon completion of the sign installation.

Cost for installing of date decal on new signs shall be incidental to the contract unit price for the various signing bid items.

# FURNISH & INSTALL EXTRUDED ALUMINUM SIGN, NONREMOVABLE COPY SUPER/VERY HIGH INTENSITY

Measurement of sign area will include payment for the entire extruded aluminum sign backing. This payment for signs designated as Extruded Aluminum Sign shall include all labor (including installing date decals), equipment, and materials to complete the work, and shall be paid for at the contract unit price per square foot for Extruded Aluminum Sign, Nonremovable Copy Super/Very High Intensity.

Contractor shall furnish and install a 144" x 48" W19-1 sign as shown below:



# SHEETING REQUIREMENTS

All legend and border utilizing the color black shall be vinyl or screen printed black, non-reflectorized material. All other legend and border shall be of same type of sheeting as the background of the same sign. All signs shall have micro-cube corner prismatic reflectorized background, Type XI as per AASHTO designation M 268 (ASTM D4956-04).

# SIGN LEGEND, BORDER, BACKGROUND, AND MOUNTING

All sign material shall comply with Section 982 of the Standard Specifications.

The sign colors shall be as stipulated in the MUTCD.

# **SEQUENCE OF OPERATIONS – GENERAL NOTES**

- 1. Requests to deviate from the sequence of operations shall be submitted in writing to the Engineer for review. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work. An alternate sequence shall be submitted for review a minimum of one week prior to potential implementation.
- 2. Unless otherwise stated in these plans, no work will be allowed during hours of darkness. Hours of darkness are defined, as 1/2 hour after sunset until 1/2 hour before sunrise.
- 3. Storage of vehicles and equipment shall be as near the right-of-way as possible. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage of the vegetation, surfacing, embankment, delineators, and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

# **SEQUENCE OF OPERATIONS – GENERAL NOTES (CONTINUED)**

- Miscellaneous.
- breakaway supports.
- Control, Miscellaneous.

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4. Existing guide, route, informational logo, regulatory, and warning signs shall be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Non-applicable signing shall be covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 36 hours. The cost of removing or covering non-applicable signs shall be incidental to the contract lump sum price for, Traffic Control,

5. Construction signing mounted on portable supports shall not be used for duration of more than 3 days, unless approved by the Engineer. Construction signing that remains in the same location for more than 3 days shall be mounted on fixed location, ground mounted,

6. If inappropriate/conflicting pavement markings exist, the markings shall be removed and replaced with applicable temporary pavement markings when the work duration is more than 3 days. When the work duration is less than 3 days, the channelizing devices in the area where the pavement markings conflict shall be placed at a spacing of ½ G. Pavement marking removals shall be paid for at the contract unit price for Remove Pavement Marking, 4" or equivalent. Temporary pavement marking shall be paid for at the contract unit bid price for Temporary Pavement Marking. The additional channelizing devices shall be incidental to the contract lump sum price for Traffic

7. The quantity of Signs paid for will be for the greatest number of installations per sign in place at any one time regardless of the number of set-ups on the project.

8. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

9. All materials and equipment shall be stored a minimum distance of 30' from the traveled way during nonworking hours.

10. The Contractor shall provide documentation that all breakaway sign supports comply with FHWA NCHRP 350 or MASH crash-worthv requirements. The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.

11. The Contractor shall be required to have a person available 24 hour/day. 7 days/week to maintain traffic control devices. The name and cellular telephone number of this individual shall be given to the Engineer at the preconstruction meeting.

12. The Contractor or designated traffic control subcontractor shall make night inspections at the initial set up of traffic control and every week thereafter to ensure the adequacy, legibility and reflectivity of each sign and device. A written summary of each inspection shall be given to the Engineer within 24 hours after completion of the inspection. The cost for the nighttime inspection work shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

# **SEQUENCE OF OPERATIONS – GENERAL NOTES (CONTINUED)**

- 13. Vehicles working in traffic or alongside traffic shall be equipped with a flashing amber light visible from all directions. The amber light shall be mounted on the uppermost part of the contractor's vehicle. Lights must have peak intensity within the range of 40 to 400 candelas and must flash at  $75 \pm 15$  flashes per minute. Vehicle flasher/hazard lights are not acceptable.
- 14. All construction operations shall be conducted in the general direction of traffic movement.
- 15. If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD whichever is more stringent shall be used.
- 16. Temporary Road Markers shall be used for lane closure tapers or lane shift tapers. Temporary Road Markers used for tapers and shifts will not be measured for payment and will be incidental to the contract lump sum price for Traffic Control, Miscellaneous.
- 17. Drums are required in all lane closure tapers.
- 18. Construction related traffic shall not cross interstate traffic. Construction traffic shall only enter and exit the interstate by the use of existing interchanges. The use of maintenance crossovers is not allowed.
- 19. Barrels shall be spaced every 100' when used for edge lines as shown on the traffic control sheets.
- 20. At the end of each day's work all traffic, control devices shall be pulled off the roadway and taken down and traffic shall be opened to two lanes. Applicable signing shall remain in place, i.e. "Road Work Ahead" etc.
- 21. When using Standard Plate No. 634.66 barrels shall be used in all locations. 42" cones will not be allowed.
- 22. I-190 traffic shall not be stopped at any time.
- 23. The Contractor's employee vehicles will not be allowed to park on the interstate median or shoulder at any time.
- 24. The Interstate shall be kept open to one lane traffic in each direction at all times.
- 25. Anamosa Street shall be kept open to one lane traffic in each direction at all times.
- 26. Construction vehicles shall exit or enter the construction work zone at locations identified by the Engineer. At no time shall construction vehicles utilize the maintenance crossovers or the I-190 median to exit or enter I-190 traffic.
- 27. Construction equipment shall not be unloaded from the shoulders of I-190 while under two-way traffic.
- 28. At the end of each day's work all traffic, control devices shall be pulled off the roadway and taken down and traffic shall be opened to two lanes. Applicable signing shall remain in place, i.e. "Road Work Ahead" etc.

# SEQUENCE OF OPERATIONS - GENERAL NOTES (CONTINUED)

- 29. Road Work Ahead signs shall be placed at applicable intersecting roads and as directed by the Engineer.
- 30. The Contractor shall be responsible for obtaining a right to work permit from the City of Rapid City Engineering Services Division (605-394-4154) which shall include a maintenance of traffic plan for any lane closures and sidewalk closures on Anamosa Street. All costs associated with this work shall be incidental to the contract unit price per lump sum "Traffic Control, Miscellaneous"

# TABLE OF TRAFFIC CONTROL

SIGN CODE	SIGN SIZE	DESCRIPTION	#	UNITS PER SIGN	UNITS
G20-2	36" x 18"	END ROAD WORK	3	17	51
R9-9	24" x 12"	SIDEWALK CLOSED	2	4	8
R9-11	24" x 18"	SIDEWALK CLOSED AHEAD, CROSS HERE	2	7	14
W1-3	48" x 48"	REVERSE TURN SIGN (L or R)	1	34	34
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W20-1	48" x 48"	ROAD WORK AHEAD	4	34	136
W20-5	48" x 48"	LT. OR RT. LANE CLOSED AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	1	34	34
****		TYPE III BARRICADE - 8 FT. DOUBLE SIDED	2	56	112

TOTAL UNITS 525

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 Sheet No. 2 Estimate of Structure Quantities and Notes

 Sheet No. 3 Notes (Continued)

 Sheet No. 4 Sign Support Details

 Sheet No. 5 Sign Support Details (Continued)

 Sheet No. 6 Sign Support Details (Continued)

 Sheet No. 7 Details for Adding Curb Reinforcement at Existing Sign

 Sheet Nos. 8 thru 10 Original Construction Plans

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### LAYOUT FOR SIGN SUPPORT

FOR

 166' - 0" CONTINUOUS CONCRETE BRIDGE

 40' - 0" ROADWAY
 0° SKEW

 OVER INTERSTATE 190
 SEC. 25/35 -T2N-R7E

 STR. NO. 52-410-290
 000I-469

 PCN I2WC
 000I-469

PENNINGTON COUNTY

S. D. DEPT. OF TRANSPORTATION

APRIL 2013

(1) OF(10)

	DESIGNED BY KSK	CK. DES. BY TK	DRAFTED BY JRK	Kevin M. Goeden
PORTATION	PENNI2WC	I2WCKA01		BRIDGE ENGINEER

# **ESTIMATE OF STRUCTURE QUANTITIES**

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
410E0030	Structural Steel, Miscellaneous	LS	Lump Sum
460E0380	Install Dowel in Concrete	27	Each

# **SPECIFICATIONS**

- 1. Design Specifications: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals, 2009 Edition using Working Stress Method.
- 2. Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2004 Edition and Required Provisions, Supplemental Specifications and/or Special Provisions as included in the Proposal.
- 3. Welding and Welding Inspection shall be in conformance with ANSI/AASHTO/AWS D1.5M/D1.5:2002 Bridge Welding Code unless otherwise noted in this plan set.

# DETAILS AND DIMENSIONS OF EXISTING BRIDGE

All details and dimensions of the existing bridge, contained in these plans, are based on the original construction plans and shop plans and are provided as information only. It is the Contractor's responsibility to inspect and verify the actual field conditions and any necessary as-built dimensions affecting the satisfactory completion of the work required for this project.

# **GENERAL CONSTRUCTION NOTES**

- 1. All work on this structure shall be accomplished with the traffic control shown in the plans.
- 2. All new reinforcing steel shall conform to ASTM-A615. Grade 60.
- 3. Welder certification shall be in accordance with section 410.3.H of the Construction Specifications.
- 4. All steel plates and shapes shall be ASTM A709 Gr. 36 T2. All steel components shall be galvanized after shop welding in accordance with ASTM A123.

### INSTALLING DOWELS IN CONCRETE

- 1. Holes drilled in the existing concrete shall be true and normal or as shown in the plans. Drilling holes using a core drill shall not be allowed. Care shall be taken not to damage the existing reinforcing steel. It is likely that some of the existing reinforcing steel shown in the original construction plans may have been placed out of position during original construction. Therefore, prior to the start of drilling any holes in the concrete, an effort will be made by Department forces to mark on the concrete surface where practical any locations of the in-place reinforcing steel. In spite of this precaution, the Contractor can still expect to encounter and have to drill through reinforcing steel or shift the dowel spacing as approved by the Engineer to miss the existing reinforcing steel. If the Contractor shifts the dowel spacing, the unused drill holes shall be completely filled with the epoxy resin in accordance with note number 9 under "Installing Dowels in Concrete" as approved by the Engineer.
- 2. Oversized holes drilled in the curb line to accommodate bolt heads and washers for the 1" diameter bolts will require an amount of grout to be placed below the washer at the back of the hole. This will be accomplished with one of the products from the list under the note "Concrete Repair"
- 3. The epoxy resin mixture shall be of a type for bonding steel to hardened concrete and shall conform to AASHTO M235 Type IV, Grade 3 (Equivalent to ASTM C881, Type IV, Grade 3), for horizontal bars and AASHTO M235 Type IV, Grade 1, 2 or 3 (Equivalent to ASTM C881, Type IV, Grade 1, 2 or 3) for vertical bars.
- 4. The diameter of the drilled holes shall not be less than 1/8 inch greater, nor more than 3/8 inch greater than the diameter of the dowels or as per the Manufacturer's recommendations. The drilled holes shall be blown out with compressed air using a device that will reach the back of the hole to ensure that all debris or loose material has been removed prior to epoxy injection.
- 5. Mix epoxy resin as recommended by the Manufacturer and apply by an injection method as approved by the Engineer. Beginning at the back of the drilled holes, fill the holes 1/3 to 1/2 full of epoxy, or as recommended by the Manufacturer, prior to insertion of the steel bar. Care shall be taken to prevent epoxy from running out of the horizontal holes prior to steel bar insertion. Rotate the steel bar during installation to eliminate voids and ensure complete bonding of the bar. Insertion of the bars by the dipping or painting method will not be allowed.
- 6. No loads shall be applied to the epoxy grouted dowel bars until the epoxy resin has had sufficient time to cure as specified by the epoxy resin manufacturer. It will not be permissible to apply load the bolts until the concrete patch material under the bolt head has had sufficient time to cure according to its manufacturer.
- 7. Embed lower level dowels a minimum of 10" or to the manufacturer's recommendation whichever is greater into existing concrete.

# INSTALLING DOWELS IN CONCRETE

- be filled with Epoxy.

# **BOLT TESTING**

The certified mill test reports for all bolts used on the project shall include the test results for all of the testing specified in section 972.2.D of the Standard Specifications. Some of these tests are supplemental tests that must be requested at the time the bolts are ordered. It is the responsibility of the Contractor to notify the bolt supplier of these requirements.

# SHOP PLANS

Shop plans shall be required as specified by Section 410.3.A of the Construction Specifications.

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8. Dowel bars used to attach the sign support to the bridge shall be 1" threaded rod conforming to ASTM A1554 Grade 36, Bolts shall be 1" diameter conforming to ASTM A307. Threaded rods and bolts shall be galvanized in accordance with ASTM A153.

9. Epoxy coated bars shall be drilled into existing curb as shown in the plan set. Bars must be below the sidewalk surface. If the spacing shown in the plans need to be adjusted, any abandoned holes shall

10. The cost of epoxy resin, dowels, bolts, nuts, washers, installation and other incidental items shall be incidental to the contract unit price per each for "Install dowel in Concrete".

> ESTIMATE OF STRUCTURE QUANTIES AND NOTES FOR 166' – 0" CONT. CONCRETE BRIDGE

# Str. No. 52-410-290

**APRIL 2013** 

DESIGNED BY:	DRAWN BY:	CHECKED BY:	
KSK	KSK	TK	Kern 1. Coeden
PENNI2WC	<b>I2WCNOTE</b>		BRIDGE ENGINEER

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# **CONCRETE REPAIR**

Holes drilled in the curb line to recess bolt head shall be repaired using one of the approved products recommended for use in a vertical application.

Two types of approved patching material for grouting bold heads in curb line are

Speed Crete® Red Line Euclid Chemical 19218 Redwood Road Cleveland, OH 44110 Phone: (800) 321-7625 www.tamms.com

Thorite ® Rapid Vertical BASF Construction Chemicals, LLC. 889 Vally Park Drive Shakopee, MN 55379 Phone: (800) 433-9517 www.chemrex.com

Use one of the above patching products, or an approved equal. Whichever concrete patching product is chosen the Contractor shall provide technical literature to the Engineer prior to its use.

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NOTES (CONTINUED)						
FOR						
166' – 0" CONT. CONCRETE BRIDGE						
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	ESIGNED BY KSK PENNI2WC	CK. DES. BY TK I2WCKA04	DRAFTED BY JRK	Kevin T	1. Coe BRIDGE	din	



SEC. E-E

	ESTIMATED QUAN	TITIES	
	ITEM	UNIT	QUANTITY
	Install Dowel in Concrete	Each	12
$\star$	Structural Steel, Miscellaneous	LS	Lump Sum
	★ For informational purposes only, the estimated	total structi	ural steel

# PENNINGTON COUNTY

S. D. DEPT. OF TRANSPORTATION

		APRIL 2013	5 OF 10
DESIGNED BY KSK PENNI2WC	CK. DES. BY TK I2WCKA05	DRAFTED BY JRK	Kevin M. Coeden BRIDGE ENGINEER





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DETAIL "N" (Typical Dowel Spacing)

	ESTIMATED QUANTITIES				
	ITEM	UNIT	QUANTITY		
☆	Install Dowel in Concrete	Each	15		

A For Information purposes only, the estimated quantity for #7 bars is 54 lb.

DETAILS FOR ADDING CURB REINFORCEMENT				
AT EXISTING SIGN				
FOR				

166' - 0" CONTINUOUS CONCRETE BRIDGE 40' - 0" ROADWAY 0° SKEW OVER INTERSTATE 190 SEC. 25/35 -T2N-R7E STR. NO. 52-410-290 0001-469

PENNINGTON COUNTY

S. D. DEPT. OF TRANSPORTATION

		APRIL 2013	3 (7) OF (10)
DESIGNED BY KSK PENNI2WC	CK. DES. BY TK I2WCKA07	DRAFTED BY	Kevin M. Coeden BRIDGE ENGINEER



	STATE		PROJECT	SHEET	
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DESIGNED BY	DRAWN BY	CHECKEDBY	APPROVED 1
	<u>R.C.M.</u>	R.E.J.	BRIDGE ENGINEER





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	Plotting Date	07/26/2013		









