

Department of Transportation

Office of Project Development

700 E Broadway Avenue

Pierre, South Dakota 57501-2586 605/773-3268

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September 16, 2016

ADDENDUM NO. 1

RE: Item #3, September 21, 2016 Letting - IM-PH 0291(122)0, PCN 02PT, Lincoln, Union County - Deck Overlay, Approach Slabs, and Approach Guardrail, Epoxy Chip Seal, Abutment & Column Repr & Joint Modification

TO WHOM IT MAY CONCERN:

The following addenda to the plans shall be inserted and made a part of your proposal for the referenced project.

SPECIAL PROVISIONS: NO CHANGE

BID ITEM FILE: *Bidders must log in to retrieve the addendum bid item file that must be loaded into the SDEBS to incorporate the revisions listed here.*

Quantities for Bid Items were changed:

Bid Item 120E0010 "Unclassified Excavation" changed from 145 to 425 CuYd

Bid Item 320E1200 "Asphalt Concrete Composite" changed from 144.0 to 700.0 Ton

Bid Item 480E5000 "Galvanic Anode" changed from 368 to 574 Each

Bid Item 634E0525 "Linear Delineation System Panel, Barrier Mounted" changed from 500 to 596 Each

Bid Item 634E0700 "Traffic Control Movable Concrete Barrier" changed from 250 to 298 Each

Bid Item 634E0750 "Temporary Concrete Barrier End Protection" changed from 2 to 4 Each

Bid Item 634E0755 "Remove and Reset Temporary Concrete Barrier End Protection" changed from 4 to 2 Each

PLANS: Please destroy sheets 2, 3, 4, 9, 10, 11, 36, 48, 74, 82, 155, 164, 196, and 201 and replace with the enclosed sheets, dated 9/12/16, 9/14/16, and 9/16/16.

Sheet 2: Bid Items were removed:

Bid Item 628E1100 "Movable F Shape Concrete Barrier, Interior Section"

Bid Items were added:

Bid Item 480E5000 "Galvanic Anode" for Structure 64-164-405

Quantities for Bid Items were changed:

Bid Item 120E0010 "Unclassified Excavation" changed from 145 to 425 CuYd

Bid Item 320E1200 "Asphalt Concrete Composite" changed from 144.0 to 700.0 Ton

Bid Item 634E0525 "Linear Delineation System Panel, Barrier Mounted" changed from 500 to 596 Each

Bid Item 634E0700 "Traffic Control Movable Concrete Barrier" changed from 250 to 298 Each
Bid Item 634E0750 "Temporary Concrete Barrier End Protection" changed from 2 to 4 Each
Bid Item 634E0755 "Remove and Reset Temporary Concrete Barrier End Protection" changed from 4 to 2 Each

Sheet 3: For Structure 64-165-405 & 64-149-367, the Estimate of Quantities for Bid Item "Galvanic Anode" was revised.

Sheet 4: For Structures 43-065-230, the Estimate of Quantities for Bid Item "Galvanic Anode" was revised.

Sheet 9: STRENGTHENING SHOULDERS PRIOR TO WORK note was added. And note placement was adjusted

Sheet 10: Note placement was adjusted

Sheet 11: MAINTENANCE OF TRAFFIC note was revised.

Sheet 36: Bid Item 480E5000 "Galvanic Anode" was added.

Sheet 48: Estimate of Quantities Table was revised to include "Galvanic Anode".

Sheet 74: Bid Item 480E5000 "Galvanic Anode" was revised.

Sheet 82: Estimate of Quantities Table was revised to include "Galvanic Anode".

Sheet 155: Bid Item 480E5000 "Galvanic Anode" was revised.

Sheet 164: Estimate of Quantities Table was revised to include "Galvanic Anode".

Sheet 196: Bid Item 480E5000 "Galvanic Anode" was revised.

Sheet 201: Estimate of Quantities Table was revised to include "Galvanic Anode" and informational quantities for structural steel have been revised.

Sincerely,

Sam Weisgram
Engineering Supervisor

SW/cj

CC: Craig Smith, Mitchell Region Engineer
Rod Gall, Yankton Area Engineer

ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-PH 0291(122)0	2	284

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IM 0291(122)0 – PCN 02PT

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0700	Remove 3 Cable Guardrail	2,226	Ft
110E0730	Remove Beam Guardrail	962.5	Ft
110E0740	Remove 3 Cable Guardrail Anchor Assembly	12	Each
110E0745	Remove 3 Cable Guardrail Slip Base Anchor Assembly	6	Each
110E0770	Remove W Beam Guardrail Breakaway Cable Terminal	9	Each
110E1010	Remove Asphalt Concrete Pavement	844.0	SqYd
110E1100	Remove Concrete Pavement	1,385.0	SqYd
110E7510	Remove Pipe End Section for Reset	2	Each
110E7700	Remove Drop Inlet Frame and Grate Assembly for Reset	12	Each
120E0010	Unclassified Excavation	425	CuYd
120E0600	Contractor Furnished Borrow Excavation	2,620	CuYd
260E1010	Base Course	276.0	Ton
320E1200	Asphalt Concrete Composite	700.0	Ton
380E0110	11" Nonreinforced PCC Pavement	888.0	SqYd
380E0120	11.5" Nonreinforced PCC Pavement	862.0	SqYd
380E6000	Dowel Bar	252	Each
380E6110	Insert Steel Bar in PCC Pavement	180	Each
380E6302	Reseal PCC Pavement Joint - Hot Pour	132	Ft
450E4759	18" CMP 16 Gauge, Furnish	46	Ft
450E4760	18" CMP, Install	46	Ft
450E9001	Reset Pipe End Section	2	Each
629E0100	3 Cable Guardrail	3,718	Ft
629E0300	3 Cable Guardrail Slip Base Anchor Assembly	10	Each
629E0400	3 Cable Guardrail Anchor Assembly	10	Each
630E0110	Straight Double Class A Thrie Beam Guardrail with Wood Posts	125.0	Ft
630E1010	Straight Class A W Beam Guardrail with Wood Posts	625.0	Ft
630E2000	W Beam to Thrie Beam Guardrail Transition	10	Each
630E2030	W Beam Guardrail Breakaway Cable Terminal	10	Each
630E2110	Beam Guardrail Post and Block	8	Each
632E2220	Guardrail Delineator	83	Each
632E2520	Type 2 Object Marker	10	Each
633E3000	Durable Pavement Marking, 4" White	11,133	Ft
633E3005	Durable Pavement Marking, 4" Yellow	9,579	Ft
633E3035	Durable Pavement Marking, 24" Yellow	72	Ft
633E3040	Durable Pavement Marking, Area	43	SqFt
633E3045	Durable Pavement Marking, Arrow	4	Each
633E5050	Surface Preparation for Pavement Marking	17,330	Ft
633E5051	Surface Preparation for Pavement Marking	43	SqFt
633E5052	Surface Preparation for Pavement Marking	4	Each
634E0010	Flagging	200.0	Hour
634E0110	Traffic Control Signs	3,016.2	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS

IM 0291(122)0 – PCN 02PT (CONTINUED)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
634E0285	Type 3 Barricade, 8' Double Sided	38	Each
634E0330	Temporary Raised Pavement Markers	26,304	Ft
634E0420	Type C Advance Warning Arrow Board	8	Each
634E0525	Linear Delineation System Panel, Barrier Mounted	596	Each
634E0600	4" Temporary Pavement Marking Tape Type I	7,632	Ft
634E0700	Traffic Control Movable Concrete Barrier	298	Each
634E0705	Remove and Reset Traffic Control Movable Concrete Barrier	118	Each
634E0750	Temporary Concrete Barrier End Protection	4	Each
634E0755	Remove and Reset Temporary Concrete Barrier End Protection	2	Each
634E0760	Temporary Concrete Barrier End Protection Module Set or Repair Kit	1	Each
634E0900	Portable Temporary Traffic Control Signal	5	Unit
634E1002	Detour Signing	109.2	SqFt
634E1215	Contractor Furnished Portable Changeable Message Sign	2	Each
670E7000	Reset Drop Inlet Frame and Grate Assembly	12	Each
734E0010	Erosion Control	Lump Sum	LS

Structure 64-164-405

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
110E0010	Remove Concrete Bridge Approach Slab	210.2	SqYd
410E0700	Abutment Joint Drain	2	Each
410E2100	Finger Type Expansion Joint Assembly	2	Each
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
412E0100	Bridge Repainting, Class I	Lump Sum	LS
430E0300	Granular Bridge End Backfill	8.0	CuYd
460E0150	Concrete Approach Slab for Bridge	197.8	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	23.2	SqYd
480E0504	No. 4 Rebar Splice	28	Each
480E0505	No. 5 Rebar Splice	14	Each
480E0506	No. 6 Rebar Splice	48	Each
480E5000	Galvanic Anode	56	Each
550E0010	Low Slump Dense Concrete Bridge Deck Overlay	181	CuYd
550E0100	Concrete Removal Type 1A	2,454.6	SqYd
550E0110	Concrete Removal Type 1B	245.5	SqYd
550E0120	Concrete Removal Type 1C	122.7	SqYd
550E0130	Concrete Removal Type 1D	122.7	SqYd
550E0140	Concrete Removal Type B	20.0	Ft
550E0200	Class A45 Concrete Fill	27.3	CuYd
550E0500	Finishing and Curing	2,455.2	SqYd

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.

ESTIMATE OF QUANTITIES (CONTINUED)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-PH 0291(122)0	3	284

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Structure 64-165-405

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0040	Remove Concrete Bridge Slab	96.5	SqYd
410E0700	Abutment Joint Drain	2	Each
410E2100	Finger Type Expansion Joint Assembly	2	Each
410E2600	Membrane Sealant Expansion Joint	31.8	Ft
430E0300	Granular Bridge End Backfill	4.7	CuYd
460E0150	Concrete Approach Slab for Bridge	79.6	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	17.8	SqYd
460E0172	Concrete Patching Material, Bridge Deck	43.7	CuFt
460E0174	Concrete Patching Material, Miscellaneous	10.5	CuFt
460E0300	Breakout Structural Concrete	0.4	CuYd
460E0380	Install Dowel in Concrete	60	Each
480E0504	No. 4 Rebar Splice	15	Each
480E0505	No. 5 Rebar Splice	24	Each
480E0506	No. 6 Rebar Splice	26	Each
480E5000	Galvanic Anode	93	Each
491E0007	Two Coat Bridge Deck Polymer High Friction Chip Seal	1,837.4	SqYd
491E0110	Abrasive Blasting of Bridge Deck	1,837.4	SqYd
491E0120	Bridge Deck Grinding	1,837.4	SqYd
491E0130	Concrete Removal, Class A	6.7	SqYd
491E0140	Concrete Removal, Class B	6.7	SqYd

Structure 64-154-385

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
110E0010	Remove Concrete Bridge Approach Slab	234.6	SqYd
410E2600	Membrane Sealant Expansion Joint	167.6	Ft
430E0300	Granular Bridge End Backfill	16.7	CuYd
460E0070	Class A45 Concrete, Bridge Repair	5.2	CuYd
460E0150	Concrete Approach Slab for Bridge	190.4	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	67.4	SqYd
460E0300	Breakout Structural Concrete	5.2	CuYd
460E0380	Install Dowel in Concrete	26	Each
480E0200	Epoxy Coated Reinforcing Steel	522	Lb
480E0504	No. 4 Rebar Splice	28	Each
480E0505	No. 5 Rebar Splice	48	Each
480E0506	No. 6 Rebar Splice	44	Each
480E5000	Galvanic Anode	56	Each
550E0010	Low Slump Dense Concrete Bridge Deck Overlay	42	CuYd
550E0100	Concrete Removal Type 1A	555.6	SqYd
550E0110	Concrete Removal Type 1B	55.6	SqYd
550E0120	Concrete Removal Type 1C	27.8	SqYd
550E0130	Concrete Removal Type 1D	27.8	SqYd
550E0140	Concrete Removal Type B	20.0	Ft
550E0200	Class A45 Concrete Fill	11.4	CuYd
550E0500	Finishing and Curing	555.6	SqYd

Structure 64-155-385

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
110E0010	Remove Concrete Bridge Approach Slab	234.6	SqYd
410E2600	Membrane Sealant Expansion Joint	167.6	Ft
430E0300	Granular Bridge End Backfill	16.7	CuYd
460E0070	Class A45 Concrete, Bridge Repair	5.2	CuYd
460E0150	Concrete Approach Slab for Bridge	190.4	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	67.4	SqYd
460E0300	Breakout Structural Concrete	5.2	CuYd
460E0380	Install Dowel in Concrete	26	Each
480E0200	Epoxy Coated Reinforcing Steel	522	Lb
480E0504	No. 4 Rebar Splice	28	Each
480E0505	No. 5 Rebar Splice	48	Each
480E0506	No. 6 Rebar Splice	44	Each
480E5000	Galvanic Anode	56	Each
550E0010	Low Slump Dense Concrete Bridge Deck Overlay	40	CuYd
550E0100	Concrete Removal Type 1A	555.6	SqYd
550E0110	Concrete Removal Type 1B	55.6	SqYd
550E0120	Concrete Removal Type 1C	27.8	SqYd
550E0130	Concrete Removal Type 1D	27.8	SqYd
550E0140	Concrete Removal Type B	20.0	Ft
550E0200	Class A45 Concrete Fill	11.4	CuYd
550E0500	Finishing and Curing	555.6	SqYd

Structure 64-149-367

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0300	Remove Concrete Curb and Gutter	148	Ft
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
410E2220	Replace Expansion Device	2	Each
460E0070	Class A45 Concrete, Bridge Repair	8.8	CuYd
460E0174	Concrete Patching Material, Miscellaneous	151.6	CuFt
460E0300	Breakout Structural Concrete	5.6	CuYd
460E0380	Install Dowel in Concrete	28	Each
460E8050	Composite Fabric Wrap, Concrete Repair	979	SqFt
480E0200	Epoxy Coated Reinforcing Steel	1,126	Lb
480E5000	Galvanic Anode	101	Each

ESTIMATE OF QUANTITIES (CONTINUED)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-PH 0291(122)0	4	284

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Structure 64-008-205

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
410E0570	Bridge End Support	Lump Sum	LS
460E0174	Concrete Patching Material, Miscellaneous	128.1	CuFt
460E0300	Breakout Structural Concrete	4.4	CuYd
460E0380	Install Dowel in Concrete	16	Each
480E0200	Epoxy Coated Reinforcing Steel	68	Lb
480E5000	Galvanic Anode	160	Each
550E0010	Low Slump Dense Concrete Bridge Deck Overlay	72	CuYd
550E0100	Concrete Removal Type 1A	967.3	SqYd
550E0105	Concrete Removal Type 2A	241.3	SqYd
550E0110	Concrete Removal Type 1B	96.7	SqYd
550E0120	Concrete Removal Type 1C	48.4	SqYd
550E0130	Concrete Removal Type 1D	48.4	SqYd
550E0140	Concrete Removal Type B	20.0	Ft
550E0200	Class A45 Concrete Fill	7.7	CuYd
550E0500	Finishing and Curing	967.4	SqYd

Structure 64-006-164

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0010	Remove Concrete Bridge Approach Slab	301.4	SqYd
410E2600	Membrane Sealant Expansion Joint	167.6	Ft
430E0300	Granular Bridge End Backfill	14.6	CuYd
460E0150	Concrete Approach Slab for Bridge	257.1	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	67.5	SqYd
460E0380	Install Dowel in Concrete	14	Each
480E0504	No. 4 Rebar Splice	34	Each
480E0505	No. 5 Rebar Splice	48	Each
480E0506	No. 6 Rebar Splice	54	Each

Structure 42-065-230

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
410E0550	Jack Superstructure, Steel Girder Bridge	Lump Sum	LS
410E2220	Replace Expansion Device	2	Each
460E0174	Concrete Patching Material, Miscellaneous	16.2	CuFt
460E0300	Breakout Structural Concrete	0.6	CuYd
460E0310	Breakout and Replace Grout Pad	1	Each
480E5000	Galvanic Anode	52	Each

Structure 64-005-164

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0010	Remove Concrete Bridge Approach Slab	301.4	SqYd
410E2600	Membrane Sealant Expansion Joint	167.6	Ft
430E0300	Granular Bridge End Backfill	14.6	CuYd
460E0150	Concrete Approach Slab for Bridge	257.1	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	67.5	SqYd
460E0380	Install Dowel in Concrete	14	Each
480E0504	No. 4 Rebar Splice	34	Each
480E0505	No. 5 Rebar Splice	48	Each
480E0506	No. 6 Rebar Splice	54	Each

UTILITIES

The Contractor shall contact the involved utility companies through South Dakota One Call (1-800-781-7474) prior to starting work. It shall be the responsibility of the Contractor to coordinate work with the utility owners to avoid damage to existing facilities.

Utilities are not planned to be affected on this project. If utilities are identified near the improvement area, the Contractor shall contact the Project Engineer to determine modifications that will be necessary to avoid utility impacts.

SURFACING THICKNESS DIMENSIONS

Plans tonnage will be applied even though the thickness may vary from that shown on the plans.

At those locations where material must be placed to achieve a required elevation, plans tonnage may be varied to achieve the required elevation.

EXISTING NRC PAVEMENT**At Str. No. 64-164-405:**

The existing pavement is 11" x 24' Nonreinforced PCC Pavement.

Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1 1/4" x 18" plain round dowel bars spaced 12" center to center.

The aggregate in the existing NRC Pavement is quartzite.

At Str. No. 64-165-405:

The existing pavement is 11" x 24' Nonreinforced PCC Pavement.

Existing contraction joints are spaced at approximately 15'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1 1/4" x 18" plain round dowel bars spaced 12" center to center.

The aggregate in the existing NRC Pavement is quartzite.

At Str. Nos. 64-154-385 & 64-155-385:

The existing pavement is 11 1/2" x 26' Nonreinforced PCC Pavement.

Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1 1/4" x 18" plain round dowel bars spaced 12" center to center.

The aggregate in the existing NRC Pavement is quartzite.

At Str. Nos. 64-005-164 & 64-006-164:

The 40' of existing pavement between the approach slab and the Continuously Reinforced to Nonreinforced PCC Pavement Terminal is 11" x 26' Nonreinforced PCC Pavement.

Existing contraction joints are spaced at approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1 1/4" x 18" plain round dowel bars spaced 12" center to center.

The aggregate in the existing NRC Pavement is quartzite.

STRENGTHENING SHOULDERS PRIOR TO WORK

Existing shoulder material shall be removed and Asphalt Concrete Composite shall be placed to strengthen the median and outside shoulders prior to beginning work on the structures shown in the following table.

Structure	End	Unclassified Excavation Cu.Yds.	Asphalt Concrete Composite Tons
64-154-385	Approach	40	79
	Departure	30	60
64-155-385	Approach	40	79
	Departure	30	60
64-005-164	Approach	40	79
	Departure	30	60
64-006-164	Approach	40	79
	Departure	30	60
TOTAL:		280	556

The Contractor shall remove 8 inches of material (asphalt concrete & gravel cushion) 4 feet wide x 200 feet long on approach to the structure and 4 feet wide x 150 feet long on departure from the structure. The Contractor shall place 8 inches of Asphalt Concrete Composite in lifts not to exceed three inches in these areas. The top lift shall be three inches in depth.

Cost for removing the shoulder material shall be included in the contract unit price per cubic yard for Unclassified Excavation.

Cost for all other work involved shall be included in the contract unit price for Asphalt Concrete Composite.

RESTORATION OF GRAVEL CUSHION

An inspection of the gravel cushion subgrade shall be made after removing concrete from each pavement replacement area. Areas of excess moisture shall be dried to the satisfaction of the Engineer. Loose material shall be removed. Each replacement area shall be leveled and compacted to the satisfaction of the Engineer.

If additional gravel cushion material is required, the Contractor shall furnish, place and compact gravel cushion to the satisfaction of the Engineer at no additional cost to the State.

Cost for this work shall be incidental to the contract unit price per square yard for the corresponding bid item for Nonreinforced PCC Pavement.

GRAVEL CUSHION

If quarried ledge rock is used in the Gravel Cushion, a maximum blend of 40% quarried ledge rock will be allowed.

NONREINFORCED PCC PAVEMENT

The aggregate may require screening as determined by the Engineer.

Fine aggregate shall conform to Section 800.2 D Alkali Silica Reactivity (ASR) Requirements of the Specifications.

The concrete mix shall be A45 according to section 460.

In lieu of an automatic subgrader operating from a preset line, a motor grader or other suitable equipment may be used to trim the gravel cushion to final grade prior to placement of concrete. There will be no direct payment for trimming of the gravel cushion for PCC pavement. The trimming will be considered incidental to the related items required for PCC Pavement.

Automatic dowel bar inserters will not be allowed on this project.

A construction joint will be sawed whenever new concrete pavement is placed adjacent to existing concrete pavement.

NONREINFORCED PCC PAVEMENT (CONTINUED)

The transverse contraction joints shall be perpendicular to the centerline as detailed in the standard plates 380.01 and 380.08. In multilane areas the transverse contraction joints shall be perpendicular to the centerline and be in a straight line across the width of the pavement. In special situations the Engineer may pre-approve transverse contraction joints that do not meet these requirements. All nonconforming transverse contraction joints that are not pre-approved shall be removed at the Contractor's expense. Any method of placement that cannot produce these requirements shall not be allowed to continue.

In addition to traditional field inspection of reinforcement, a Ground Penetrating Radar (GPR) unit may be used to verify reinforcement locations in the hardened concrete. The GPR may be used anytime prior to the Acceptance of Field Work being issued. All costs related to corrective measures, including but not limited to concrete removal or cutting of reinforcement, price deducts, and delays to the project schedule shall be the responsibility of the Contractor.

The surface of the mainline paving shall be longitudinally tined. All other areas shall be tined as directed by the Engineer. The surface of the mainline paving shall be tined to within 2 or 3 feet of the face of the curb. A self-propelled mechanical tiner will not be required.

TIE BARS AND LONGITUDINAL JOINTS

The use of automatic tie bar inserters will only be allowed on the vertical edge of longitudinal construction joints. The use of automatic tie bar inserters will not be allowed on sawed longitudinal joints.

Tie bars shall be held in the specified position parallel to the slab surface and perpendicular to the centerline by a supporting device. Tie bars or tie bar baskets shall be securely staked to the roadbed and shall hold the bar at the correct spacing, alignment, and elevation.

Tie bars will not require supports if inserted into the side of the pavement during slip form paving of the longitudinal construction joint operation. Failure to acquire the correct tie bar locations or position in the construction joint shall require the bars to be corrected and a change made to the operation which may include drilling and epoxy bars or other methods as approved by the engineer.

The final position of each tie bar shall be within the following tolerances:

- Vertical Placement: $\pm T/6$ for any part of the tie bar (T = slab thickness)
- Transverse Placement (side shift): ± 3 inches when measured perpendicular to the longitudinal joint line

If the tie bar does not meet the requirements and tolerances specified, corrective action shall be performed at the Contractor's expense to the satisfaction of the engineer.

STEEL BAR INSERTION

Locations and quantities of concrete replacement are subject to change in the field at the discretion of the Engineer. The Contractor will be responsible for ordering the actual quantity of steel bars necessary to complete the work.

The Contractor shall insert the steel bars (1 1/2" x 18" epoxy coated plain round dowel bars and No. 11 x 18" epoxy coated deformed tie bars for transverse joints and No. 5 x 24" epoxy coated deformed tie bars for longitudinal joints) into drilled holes in the existing concrete pavement. An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole.

Plain round dowel bars shall be cut to the specified length by sawing and shall be free from burring or other deformations. Shearing will not be permitted.

STEEL BAR INSERTION (CONTINUED)

Steel bars shall be inserted in the transverse joint on 18" centers. The first steel bar in the transverse joint shall be placed 9" from the edge of the slab closest to centerline. Steel bars shall be inserted in the longitudinal joint on 30" centers and shall be a minimum of 15" from either transverse joint. A typical one-lane patch 12' wide and 6' long will require 18 steel bars (8 in each transverse joint and 2 in the longitudinal joint). It will be necessary to laterally adjust the location of some of the inserted steel bars when the dimensions above interfere with existing steel bar locations.

A rigid frame or mechanical device will be required to guide the drill to ensure proper horizontal and vertical alignment of the steel bars in the drilled holes.

The epoxy used to hold the steel bars in the drilled holes shall start to gel before placing fresh concrete or as per manufacturer's recommendations.

Cost for the epoxy resin adhesive, steel bars, drilling of holes, inserting the steel bars into the drilled holes and all other items incidental to the insertion of the steel bars shall be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

SAW AND SEAL JOINTS

All longitudinal and transverse joints at concrete replacement areas shall be sawed and sealed.

Joints shall not be sealed unless they are thoroughly clean and dry. Cleaning shall be accomplished by sand blasting and other tools as necessary. Just prior to sealing, each joint shall be blown out using a jet of compressed air to remove all traces of dust.

Longitudinal and Transverse joints may be sealed with either Hot Poured Elastic Joint Sealer or Low Modulus Silicone Sealant.

Acceptance of the Low Modulus Silicone Sealant and Hot Poured Elastic Joint Sealer will be based on visual inspection by the Engineer.

Cost for sawing and sealing of the longitudinal construction joint and transverse joints shall be incidental to the contract unit price per square yard for the corresponding bid item for Nonreinforced PCC Pavement.

REMOVE ASPHALT CONCRETE PAVEMENT

The Contractor shall remove 2" of the existing guardrail surfacing so that new guardrail surfacing can be placed. Refer to the following table for Remove Asphalt Concrete Pavement quantities.

STRUCTURE	REMOVE ASPHALT CONCRETE PAVEMENT SQYD
64-164-405	
Southwest Corner	68
64-154-385	
Northeast Corner	89
Northwest Corner	74
64-155-385	
Southeast Corner	64
Southwest Corner	82
64-005-164	
Northeast Corner	110
Northwest Corner	156
64-006-164	
Southeast Corner	75
Southwest Corner	126
TOTAL:	844

RESEAL PCC PAVEMENT JOINT AT CONTINUOUSLY REINFORCED TO NONREINFORCED PCC PAVEMENT TERMINALS

Existing expansion joints for the Continuously Reinforced to Nonreinforced PCC Pavement Terminals near the structures 64-005/006-164 shall be cleaned and resealed with Hot Poured Elastic Joint Sealer.

Joints shall not be sealed unless they are thoroughly clean and dry. Cleaning shall be accomplished by sandblasting and other tools as necessary. Sand blasting of both sides of the vessel shall be accomplished simultaneously with a mechanical device approved by the Engineer. Just prior to sealing, each joint shall be blown out using a jet of compressed air to remove all traces of dust.

It is not essential that all of the sealant be removed. Remaining sealant adhering to the sides may remain in place if the Engineer determines that it is not detrimental to the joint.

Cost for cleaning and resealing longitudinal joints shall be included in the contract unit price per foot for Reseal PCC Pavement Joint – Hot Pour.

RESET DROP INLET FRAME & GRATE

The Contractor shall reset drop inlet frame and grates on drop inlets that are in place at structures shown in the table below.

The elevations of the frame and grate shall be flush with the top of the finished approach slab.

STR.NO. LOCATION	LANE-SHOULDER	CLASS M6 CONCRETE CU.YDS.	REMOVE & RESET FRAME & GRATE EACH
64-164-405 – MRM 0.05			
West End	SBL-Median	0.03	1
West End	SBL-Outside	0.03	1
East End	SBL-Median	0.01	1
East End	SBL-Outside	0.01	1
64-154-385 – MRM 2.48			
South End	SBL-Median	0.03	1
South End	SBL-Outside	0.03	1
North End	SBL-Median	0.02	1
North End	SBL-Outside	0.02	1
64-155-385 – MRM 2.48			
South End	NBL-Median	0.02	1
South End	NBL-Outside	0.02	1
North End	NBL-Median	0.01	1
North End	NBL-Outside	0.01	1

TOTALS: 0.24* 12

*The quantity of Class M6 Concrete shall be incidental to the contract unit price per each for Reset Drop Inlet Frame and Grate Assembly.

CONTRACTOR FURNISHED BORROW EXCAVATION

The Contractor shall provide a suitable site for Contractor furnished borrow excavation material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material shall be approved by the Engineer. The plans quantity for Contractor Furnished Borrow Excavation as shown in the Estimate of Quantities will be the basis of payment for this item.

Prior to placement or removal of fill material, the Contractor will be required to remove four inches of topsoil and replace it following the placement of the new fill material. Removing and replacing topsoil will not be measured for payment but shall be incidental to the contract unit price per cubic yard for Contractor Furnished Borrow Excavation.

The Contractor will be allowed to place topsoil in lieu of fill material if the fill depth is one foot or less. By doing this the Contractor will not be required to remove and replace the four inches of in place topsoil.

CONTRACTOR FURNISHED BORROW EXCAVATION (CONTINUED)

Compaction of the fill material shall be to the satisfaction of the Engineer.

It is not anticipated that water for compaction will be required; however, if in the opinion of the Engineer the fill material is extremely dry, water may be ordered and placed to the satisfaction of the Engineer. Cost for water shall be incidental to the contract unit price per cubic yard for Contractor Furnished Borrow Excavation.

Restoration of the Contractor furnished borrow excavation site shall be the responsibility of the Contractor.

WATER FOR COMPACTION

Cost for water for compaction of the Base Course shall be incidental to the contract unit prices for the various contract items. The moisture required at the time of compaction will be 6%± unless otherwise directed by the Engineer.

CORRUGATED METAL PIPE

Corrugated metal pipes shall have 2 3/8-inch X 1/2-inch corrugations for 42-inch and smaller round pipe and 48-inch and smaller arch pipe unless otherwise stated in the plans. Corrugated metal pipes shall have 3-inch X 1-inch or 5-inch X 1-inch corrugations for 48-inch and larger round pipe and 54-inch and larger arch pipe unless otherwise stated in the plans.

PERMANENT SEEDING AND MULCHING

The areas to be seeded and mulched include all disturbed areas within the right-of-way resulting from the work required by this contract.

Type C Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana	16
Canada Wildrye	Mandan	2
Total:		18

The areas to be seeded and mulched are estimated at 2.1 acres.

Cost for seeding and mulching shall be incidental to the contract lump sum price for Erosion Control.

MYCORRHIZAL INOCULUM

Mycorrhizal inoculum shall consist of mycorrhizal fungi spores and mycorrhizal fungi-infected root fragments in a solid carrier. The carrier may include organic materials, calcinated clay, or other materials consistent with application and good plant growth. The supplier shall provide certification of the fungal species claimed and the live propagule count. The inoculum shall include the following fungal species:

Glomus intraradices 25% *Glomus aggregate* 25%
Glomus mosseae 25% *Glomus etunicatum* 25%

All seed shall be inoculated by the seed supplier with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed shall be incidental to the contract lump sum price for Erosion Control.

The mycorrhizal inoculum shall be as shown below or an approved equal:

<u>Product</u> MycoApply	<u>Manufacturer</u> Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 http://www.mycorrhizae.com/
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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-PH 0291(122)0	11	284

REV. 09/14/16 dw

SEQUENCE OF OPERATIONS

Work on the twin continuous composite girder structures over the Big Sioux River at MRM 0.05, Str. Nos. 64-164/165-405 will not be allowed to concur with work on the twin continuous concrete structures over River Drive at N. Sioux City, MRM 2.48, Str. Nos. 64-154/155-385. Work on all other structures may concur with the work on either of Big Sioux River at MRM 0.05, Str. Nos. 64-164/165-405 or River Drive at N. Sioux City, MRM 2.48, Str. Nos. 64-154/155-385.

Exit 53 crossroad (structure number 42-065-230) traffic shall be controlled with stop control per *Plate Number 634.25*.

The following Sequence of Operations is to be followed unless an alternative is submitted a minimum of two weeks prior to the preconstruction meeting and approved.

1. Install Traffic Control devices per the details in these plans.
2. Complete bridge work.
3. Install either temporary or permanent pavement marking per the direction of the Engineer on closed lanes prior to opening to traffic.
4. Remove and relocate traffic control to complete bridge work at another site.
5. Repeat sequence for other site.

MAINTENANCE OF TRAFFIC

Sufficient traffic control devices have been included in these plans for four interstate mainline structure lane closures; four interstate mainline non-structure lane closures; two crossroad lane closures using traffic signals, one at structure number 64-149-367 Northshore Drive and one at structure number 64-008-205 SD 50 over Interstate 29; and one two way stop crossroad closure at structure number 42-065-230.

In tangent sections of interstate crossroad lane closures, Channelizing device spacing shall be reduced from 2G to G. During periods of no work on interchange crossroads, eight foot double-sided Type 3 Barricades shall be placed at 50 foot spacing in the work area.

Mobile work traffic control shall be only used for continuously moving work operations such as grooving or applying pavement marking for temporary or permanent pavement marking.

Holes adjacent to centerline in the lane open to traffic created during removal and replacement of PCC Pavement Repair areas shall be filled with gravel cushion material and cold-mix asphalt concrete prior to opening the lane to traffic. Gravel cushion material and cold-mix asphalt concrete shall be furnished by the Contractor.

Holes in the asphalt concrete shoulders created during removal and replacement of PCC Pavement areas shall be filled with hot-mix asphalt concrete (to match the shoulder surfacing) prior to opening the lane to traffic. Hot-mix asphalt concrete shall be furnished and installed by the Contractor at no additional cost to the State.

Cost for furnishing, hauling and placing gravel cushion material and asphalt concrete shall be incidental to the contract unit price per square yard for 11" or 11.5" Nonreinforced PCC Pavement.

TRAFFIC CONTROL MOVABLE CONCRETE BARRIER

The work at the structure numbers 64-164/165-405 at the Big Sioux River, MRM 0.05; 64-154/155-385 at River Drive, North Sioux City, MRM 2.48; and at 64-005/006-164 over a creek, MRM 30.92 will all require traffic control movable concrete barrier to be used during closure of a lane on Interstate 29. Lane closure at structures numbered 64-164/165-405 at the Big Sioux River will require 188 traffic control movable concrete barrier, lane closures at structures numbered 64-154/155-385 at River Drive, North Sioux City will require 118 traffic control movable concrete barrier. Lane closures at structures numbered 64-005/006-164 at I-29, MRM 30.92 will require 110 traffic control movable concrete barrier.

218 traffic control movable concrete barrier shall be obtained from the State South Maintenance Yard, located west of Solberg Avenue south of Interstate 229 at Sioux Falls, hauled, used on the project, and 218 traffic control movable concrete barrier returned to the Sioux Falls State maintenance yard upon completion of the project.

80 traffic control movable concrete barrier shall be obtained from the State DOT Junction City Maintenance shop located just east of I-29 Exit 26, hauled, used on the project, and 80 traffic control movable concrete barrier returned to the SDDOT Junction City maintenance yard at the completion of the project.

The number of traffic control movable concrete barrier used shall be approved by the Engineer.

The cost to pick up the traffic control movable concrete barrier from the Sioux Falls DOT South Maintenance Yard or the Junction City DOT Maintenance Yard, place it for traffic control, and return the traffic control movable barrier to the yard shall be paid for at the contract unit price per each for Traffic Control Movable Concrete Barrier.

REMOVE AND RESET TRAFFIC CONTROL MOVABLE CONCRETE BARRIER

118 traffic control movable concrete barrier are anticipated to be relocated and reset to another work site within the project.

Cost for relocating and resetting the traffic control movable concrete barrier for a different traffic control phase shall be paid for at the contract unit price per each for Remove and Reset Traffic Control Movable Concrete Barrier.

TEMPORARY CONCRETE BARRIER END PROTECTION MODULE SET OR REPAIR KIT

The Contractor shall furnish crash tested and approved end protection on movable concrete barrier installed on this project. End protection shall be installed parallel to the roadway and a minimum of two traffic control movable concrete barrier shall be installed in line with and behind the end protection. The end protection shall be attached to the traffic control movable concrete barrier as specified by the manufacturer.

Costs for furnishing, installing, maintaining, and removing the end protection will be paid for at the contract unit price per each for Temporary Concrete Barrier End Protection. The concrete Barrier End Protection shall meet the requirements of TL3 for NCHRP 350 or MASH.

The Contractor will be required to have immediately available replacement parts for the end protection. The Contractor will be expected to repair the end protection within 24 hours after impact or damage.

Costs for replacement modules shall be paid for at the contract unit price per each for Temporary Concrete Barrier End Protection Module Set or Repair Kit.

REMOVE AND RESET TEMPORARY CONCRETE BARRIER END PROTECTION

Cost to move and reset the concrete barrier end protection shall be included in the contract unit price per each for Remove and Reset Temporary Concrete Barrier End Protection.

LINEAR DELINEATION SYSTEM PANEL, BARRIER MOUNTED

A linear delineation system panel shall be attached to each side of the barrier section. The color shall be the same as the nearest pavement marking, white along outside edge lines or yellow for the left side on one way traffic sections. The linear delineation system shall be 34 inches long and 6 inches in height and be constructed of aluminum formed into a shape to provide retroreflective properties across a wide range of angles. It shall be sheeted with ASTM D4956 Type XI sheeting. The panel shall be installed at the center of the barrier when measured along the length, with the top of the panel 4 inches below the top of the barrier. Installation shall be as per the manufacturer's recommendation using stainless steel inserts and bolts. This will allow for easy removal for replacement of damaged panels or to replace with an alternate color.

Replacement of damaged linear delineation system panels shall be furnished and replaced by the Contractor. All costs associated with furnishing, installing, and maintaining the linear delineation system shall be included in the contract unit price per each for Linear Delineation System Panel, Barrier Mounted.

4" TEMPORARY PAVEMENT MARKING TAPE TYPE I

The quantity for white 24" stop lines is estimated at 4" equivalent {432 feet}.

Quantity for yellow four inch no passing zone marking at stop conditions is estimated to be 7200 feet.

INCIDENTS

An incident is an emergency road user occurrence, a natural disaster, or other unplanned event that affects or impedes the normal flow of traffic such as an accident, hazardous materials spill, or similar event.

The Contractor shall set up a meeting prior to start of work to plan and coordinate responses to an incident. The Contractor shall invite the Department of Transportation, the South Dakota Highway Patrol, the City of North Sioux City, the City of Sioux City, City of Vermillion, Clay County, and other local emergency response and law enforcement entities as deemed necessary to the meeting. The Engineer shall conduct the meeting.

The Contractor will assist in maintaining traffic as required by these plan notes and as agreed to at the meeting.

The Contractor will be required to modify messages on portable changeable message signs or relocate portable changeable message signs. The Contractor may be asked to provide flaggers to direct or detour of traffic. The Contractor should be prepared to relocate advance warning signs if determined to be necessary for a major traffic incident lasting for more than two hours. Ground mounted advance warning signs may be covered and additional portable warning signs provided.

No additional payment will be made for the modification of portable changeable message sign messages or the relocation of portable changeable message signs. Cost for flagging shall be paid at the contract unit price per Hour for Flagging. Cost for the relocation of an advanced warning sign due to an incident shall be 50% of the designated sign rate as per Section 634.5 Basis of Payment in the Standard Specifications. Cost for additional signs shall be paid at the contract unit bid price per square foot for Traffic Control Signs.

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	LumpSum	LS
110E0010	Remove Concrete Bridge Approach Slab	210.2	SqYd
410E0700	Abutment Joint Drain	2	Each
410E2100	Finger Type Expansion Joint Assembly	2	Each
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
412E0100	Bridge Repainting, Class I	LumpSum	LS
430E0300	Granular Bridge End Backfill	8.0	CuYd
460E0150	Concrete Approach Slab for Bridge	197.8	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	23.2	SqYd
480E0504	No. 4 Rebar Splice	28	Each
480E0505	No. 5 Rebar Splice	14	Each
480E0506	No. 6 Rebar Splice	48	Each
480E5000	Galvanic Anode	56	Each
550E0010	Low Slump Dense Concrete Bridge Deck Overlay	181.4	CuYd
550E0100	Concrete Removal Type 1A	2454.6	SqYd
550E0110	Concrete Removal Type 1B	245.5	SqYd
550E0120	Concrete Removal Type 1C	122.7	SqYd
550E0130	Concrete Removal Type 1D	122.7	SqYd
550E0140	Concrete Removal Type B	20.0	Ft
550E0200	Class A45 Concrete Fill	27.3	CuYd
550E0500	Finishing and Curing	2455.2	SqYd

SPECIFICATIONS

- Design Specifications: AASHTO Standard Specifications for Highway Bridges 17th Edition using Working Stress Design.
- Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.
- All Welding and Welding Inspection shall be in conformance with the AASHTO/AWS Bridge Welding Code D1.5M/D1.5:2010 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.

SHOP PLANS

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

SCOPE OF BRIDGE WORK & SEQUENCE OF OPERATIONS

All work on this structure shall be accomplished with the traffic control shown in the plans. Alternate sequence of operations may be submitted by the Contractor for approval by the Engineer a minimum of two weeks prior to the pre-construction meeting.

- Accomplish all Concrete Removal Type 1A, 1B, 1C, 1D, and B and place Class A45 Concrete Fill to the satisfaction of the Engineer for the first phase of construction.
- Place a Low Slump Dense Concrete Bridge Deck Overlay to the elevations shown in the plans on the bridge deck for the first phase of construction.
- Remove the existing approach slabs for the first phase of construction.
- Breakout the existing bridge joints on both ends of the structure for the first phase of construction.
- Fill low spots in the bridge end backfill for the first phase of construction.
- Install the new Finger Expansion Devices for the first phase of construction.
- Install the Sleeper Slab and Approach Slabs for the first phase of construction.
- Switch traffic and repeat steps 1 through 7 for the second phase of construction.

GENERAL CONSTRUCTION - BRIDGE

- All mild reinforcing steel shall conform to ASTM A615, Grade 60.
- All exposed concrete corners and edges shall be chamfered 3/4" unless noted otherwise in the plans. Match existing chamfer if the existing chamfer differs.
- Use 2" clear cover on all reinforcing steel except as shown otherwise.
- Request for construction joints or resteel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.
- Surfaces of fresh concrete at construction joints shall be rough floated sufficiently to consolidate the surface. All construction joints shall be cleaned of surface laitance, curing compounds and other foreign materials prior to placing fresh concrete against the joint.
- The type of vibratory screed shall be approved by the Engineer.

DESIGN MIX OF CONCRETE

- Class A45 Concrete shall be used for the bid items Concrete Approach Slab for Bridge and Concrete Approach Sleeper Slab.
- The Type of cement, concrete strength requirements, aggregate requirements, slump and air requirements for the contract items Concrete Approach Sleeper Slab for Bridge, Concrete Approach Slab for Bridge, and Class A45 Concrete, Bridge Repair shall conform to the requirements of Section 460 of the Construction Specifications.

REMOVAL OF CONCRETE BRIDGE APPROACH SLAB

- The existing concrete approach and sleeper slab adjacent to the structure shall be completely removed by the Contractor.
- The crushed concrete and reinforcing steel from the removal shall be disposed of by the Contractor at an approved site. An appropriate site will be as described in the Environmental Commitment notes in this set of plans.
- All labor, tools, equipment and any incidentals necessary for removal and disposal of the existing approach and sleeper slabs shall be incidental to the contract unit price per square yard for "Remove Concrete Bridge Approach Slab".

MODIFY EXISTING BRIDGE END BACKFILL

- This work consists of bringing the existing bridge end backfill material up to the required elevation and repairing any damage to the in-place bridge end backfill material as approved by the Engineer.
- Granular bridge end backfill shall conform to Section 882 of the Construction Specification. Granular material shall be placed and compacted using a smooth face vibratory roller or vibratory plate compactor according to Section 430.3 B of the Construction Specification.
- The Reinforcement Fabric (MSE) shall conform to section 831 of the Construction Specification.
- The polyethylene sheeting shall be a minimum thickness of 6 mils and shall be sufficiently durable such that it will not puncture or tear when installed as intended.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES FOR 557' - 0" CONT. COMP. GIRDER BRIDGE

STR. NO. 64-164-405

OCTOBER 2015

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ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
110E0040	Remove Concrete Bridge Approach Slab	96.5	SqYd
410E0700	Abutment Joint Drain	2	Each
410E2100	Finger Type Expansion Joint Assembly	2	Each
410E2600	Membrane Sealant Expansion Joint	31.8	Ft
430E0300	Granular Bridge End Backfill	4.7	CuYd
460E0150	Concrete Approach Slab for Bridge	79.6	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	17.8	SqYd
460E0172	Concrete Patching Material, Bridge Deck	43.7	CuFt
460E0174	Concrete Patching Material, Miscellaneous	10.5	CuFt
460E0300	Breakout Structural Concrete	0.4	CuYd
460E0380	Install Dowel in Concrete	60	Each
480E0504	No. 4 Rebar Splice	15	Each
480E0505	No. 5 Rebar Splice	24	Each
480E0506	No. 6 Rebar Splice	26	Each
480E5000	Galvanic Anode	93	Each
491E0007	Two Coat Bridge Deck Polymer High Friction Chip Seal	1837.4	SqYd
491E0110	Abrasive Blasting of Bridge Deck	1837.4	SqYd
491E0120	Bridge Deck Grinding	1837.4	SqYd
491E0130	Concrete Removal, Class A	6.7	SqYd
491E0140	Concrete Removal, Class B	6.7	SqYd

SPECIFICATIONS

- Design Specifications: AASHTO Standard Specifications for Highway Bridges 17th Edition using Working Stress Design.
- Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.
- All Welding and Welding Inspection shall be in conformance with AASHTO/AWS Bridge Welding Code D1.5M/D1.5:2010 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.

SHOP PLANS

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

SCOPE OF BRIDGE WORK & SEQUENCE OF OPERATIONS

All work on this structure shall be accomplished with the traffic control shown in the plans. Alternate sequence of operations may be submitted by the Contractor for approval by the Engineer a minimum of two weeks prior to the pre-construction meeting.

- Breakout the Existing Expansion Joints on both ends of the bridge for the first phase of construction.
- Breakout the Approach Slab on the North End of the bridge for the first phase of construction.
- Perform bridge deck grinding and repair the bridge deck by removing all loose and delaminated concrete from the bridge deck surface for the first phase of construction.
- Install the new Finger Expansion Devices at both ends of the bridge for the first phase of construction.
- Clean the deck surface with abrasive blasting for the first phase of construction.
- Place the Two Coat Polymer Bridge High Friction Deck Chip Seal for the first phase of construction.
- Fill the low spots of the bridge end backfill for the first phase of construction.
- Install the sleeper slab and approach slab on the north end of the bridge for the first phase of construction.
- Repair the spalled areas of bridge deck soffit for the first phase of construction.
- Switch traffic and repeat steps 1 through 9 for the second phase of construction.

GENERAL CONSTRUCTION - BRIDGE

- All mild reinforcing steel shall conform to ASTM A615, Grade 60.
- All exposed concrete corners and edges shall be chamfered 3/4" unless noted otherwise in the plans. Match existing chamfer if the existing chamfer differs.
- Use 2" clear cover on all reinforcing steel except as shown otherwise.
- Request for construction joints or resteel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.

- Surfaces of fresh concrete at construction joints shall be rough floated sufficiently to consolidate the surface. All construction joints shall be cleaned of surface laitance, curing compounds and other foreign materials prior to placing fresh concrete against the joint.
- The type of vibratory screed shall be approved by the Engineer.

DESIGN MIX OF CONCRETE

- Class A45 Concrete shall be used for the bid items Concrete Approach Slab for Bridge and Concrete Approach Sleeper Slab for Bridge.
- The Type of cement, concrete strength requirements, aggregate requirements, slump and air requirements for the contract items Concrete Approach Slab for Bridge and Concrete Approach Sleeper Slab for Bridge shall conform to the requirements of Section 460 of the Construction Specifications.

REMOVAL OF CONCRETE BRIDGE APPROACH SLAB

- The existing concrete approach and sleeper slab adjacent Abutment No. 4 shall be completely removed by the Contractor.
- The crushed concrete and reinforcing steel from the removal shall be disposed of by the Contractor at an approved site. An appropriate site will be as described in the Environmental Commitment notes in this set of plans.
- All labor, tools, equipment and any incidentals necessary for removal and disposal of the existing approach and sleeper slabs shall be incidental to the contract unit price per square yard for "Remove Concrete Bridge Approach Slab".

MODIFY EXISTING BRIDGE END BACKFILL

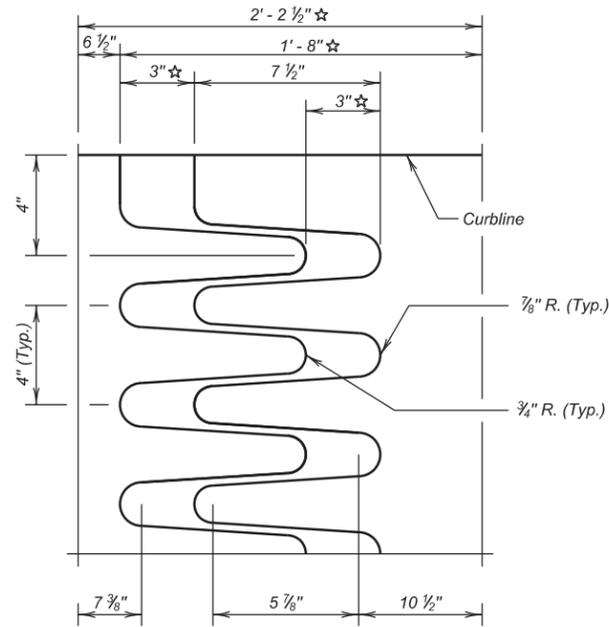
- This work consists of bringing the existing bridge end backfill material up to the required elevation and repairing any damage to the in-place bridge end backfill material as approved by the Engineer.
- Granular bridge end backfill shall conform to Section 882 of the Construction Specification. Granular material shall be placed and compacted using a smooth face vibratory roller or vibratory plate compactor according to Section 430.3 B of the Construction Specification.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES
FOR
558' - 1 3/4" COMP. GIRDER BRIDGE

STR. NO. 64-165-405

OCTOBER 2015

(2) OF (33)



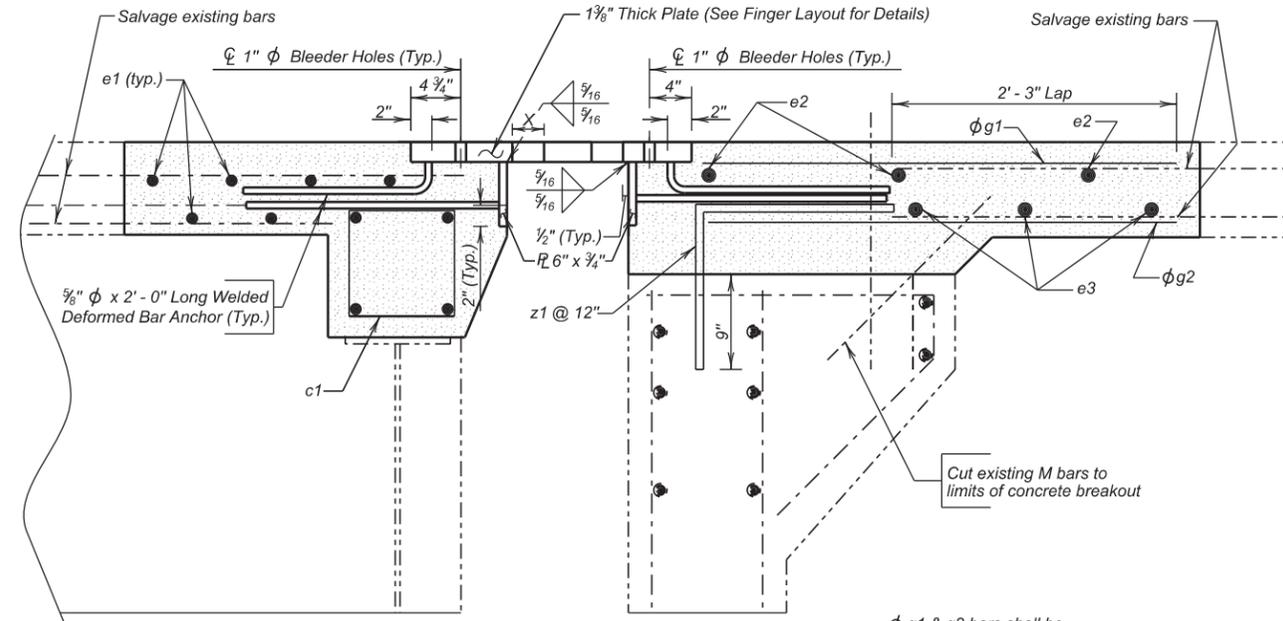
☆ Dimensions shown at 70° F

★ Complete Joint Penetration, Butt splice at crown point to be shown on shop plans for approval.

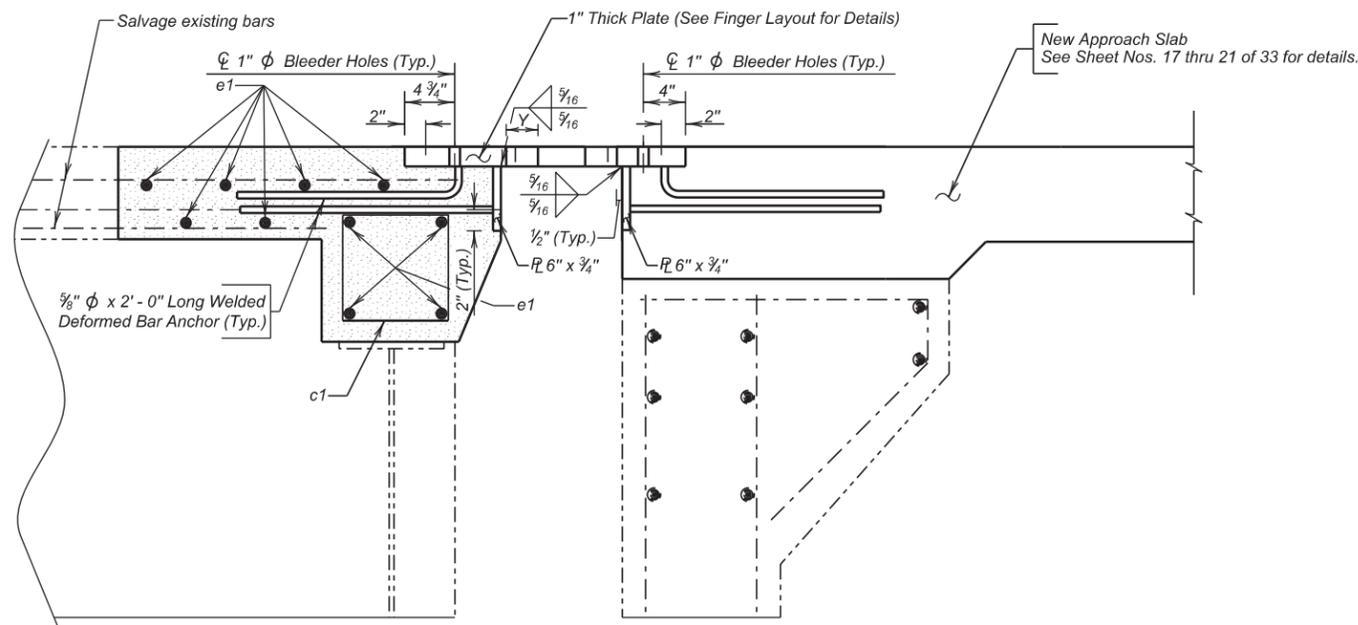
Temp.	Dimension "X"	Dimension "X"
30°	4 3/16"	3 1/2"
40°	3 15/16"	3 3/8"
50°	3 3/8"	3 1/4"
60°	3 1/16"	3 1/8"
70°	3"	3"
80°	2 11/16"	2 7/8"
90°	2 3/8"	2 3/4"
100°	2 1/16"	2 5/8"

Note: Temperature in above Table Corresponds to Interior Girder Temperature.

Note: Temperature in above Table Corresponds to Interior Girder Temperature.



SECTION B - B



SECTION C - C

(z bar in abutment backwall not shown. See Approach Slab details on sheet no. 19 of 32)

Mk.	No.	Size	Length	Type	Bending Details	
PHASE 1	c1	22	4	4'-1"	T2	
	e1	20	7	14'-10"	Str.	
	e2	3	4	14'-10"	Str.	
	e3	3	6	14'-10"	Str.	
	g1	10	4	3'-9"	Str.	
PHASE 2	g2	30	8	3'-9"	Str.	
	Δz1	15	6	3'-1"	17A	
	c1	22	4	4'-1"	T2	
	e1	20	7	14'-10"	Str.	
	e2	3	4	14'-10"	Str.	

NOTES --
All dimensions are out to out of bars.
All reinforcing steel is to be epoxy coated.
Δ Dowels

ITEM	UNIT	QUANTITY
Finger Type Expansion Joint Assembly	Each	2
Install Dowel in Concrete	Each	30
Galvanic Anode	Each	66

Items 1 thru 6 are approximate quantities contained in the above bid item for Abutment No. 1 and are for information only.

	PHASE 1	PHASE 2
1. Class A45 Concrete	4.3 Cu.Yd.	4.3 Cu.Yd.
*2. Structural Steel	3558 Lb.	3558 Lb.
3. Concrete Breakout	5.1 Cu.Yd.	4.2 Cu.Yd.
4. No. 4 Rebar Splice	3 Ea.	
5. No. 6 Rebar Splice	3 Ea.	
6. No. 7 Rebar Splice	10 Ea.	
7. Epoxy Coated Reinforcing Steel	755 Lb.	755 Lb.

Items 1 thru 5 are approximate quantities contained in the above bid item for Abutment No. 4 and are for information only.

	PHASE 1	PHASE 2
1. Class A45 Concrete	1.7 Cu.Yd.	1.7 Cu.Yd.
*2. Structural Steel	3558 Lb.	3558 Lb.
3. Concrete Breakout	1.8 Cu.Yd.	1.6 Cu.Yd.
6. No. 6 Rebar Splice	3 Ea.	
7. Epoxy Coated Reinforcing Steel	333 Lb.	333 Lb.

* Structural Steel Informational quantity includes all finger expansion plates, anchor bars, and end block expansion plates.

Does not include the following quantities for z1 bars as these are included in the "Install Dowel in Concrete" quantity

	PHASE 1	PHASE 2
	70 Lb.	70 Lb.

(NORTH BOUND LANES)
FINGER EXPANSION JOINT DETAILS

FOR
558' - 1 3/4" COMP. GIRDER BRIDGE
30' - 0" ROADWAY
OVER BIG SIOUX RIVER
STR. NO. 64-165-405

0° SKEW
SEC. 26-T89N-R48W
IM-PH 0291(122)0

UNION COUNTY
S. D. DEPT. OF TRANSPORTATION
OCTOBER 2015

Use this sheet in conjunction with Sheet Nos. 7 thru 9 of 33.

DESIGNED BY KSK UNIN02PT	CK. DES. BY MM 02PTRB10	DRAFTED BY KR	Kevin N. Goeden BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM-PH 0291(122)0	155	284

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
110E0300	Remove Concrete Curb and Gutter	148	Ft
410E0030	Structural Steel, Miscellaneous	LumpSum	LS
410E2220	Replace Expansion Device	2	Each
460E0070	Class A45 Concrete, Bridge Repair	8.8	CuYd
460E0174	Concrete Patching Material, Miscellaneous	151.6	CuFt
460E0300	Breakout Structural Concrete	5.6	CuYd
460E0380	Install Dowel in Concrete	28	Each
460E8050	Composite Fabric Wrap, Bridge Repair	978.6	SqFt
480E0200	Epoxy Coated Reinforcing Steel	1126	Lb
480E5000	Galvanic Anode	101	Each

SPECIFICATIONS

- Design Specifications: AASHTO Standard Specifications for Highway Bridges 2002 17th Edition using Working Stress Design.
- Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.
- All Welding and Welding Inspection shall be in conformance with the AASHTO/AWS Bridge Welding Code D1.5M/D1.5:2010 unless otherwise noted in the 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.

SHOP PLANS

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

SCOPE OF BRIDGE WORK & SEQUENCE OF OPERATIONS

All work on this structure shall be accomplished with the traffic control shown in the plans. Alternate sequence of operations may be submitted by the Contractor for approval by the Engineer two weeks prior to the pre-construction meeting.

- Repair the abutment sills on Abutment No. 1 and Abutment No. 5.

- Repair the columns at all three bents.
- Breakout the bridge deck, barrier curb and joint at Abutment No. 1 & 5 for the first phase of construction
- Place strip seal expansion devices at Abutments No. 1 and No. 5 for the first phase of construction.
- Remove and replace the concrete curb and gutter at both ends of the bridge for the first phase of construction.
- Repair the spalled and delaminated areas of the barrier for the first phase of construction.
- Place an additional rail post on the abutment backwalls for the first phase of construction.
- Switch traffic and repeat steps 3 through 7 for the second phase of construction.

GENERAL CONSTRUCTION – BRIDGE

- All mild reinforcing steel shall conform to ASTM A615, Grade 60.
- Use 2" clear cover on all reinforcing steel except as shown otherwise.
- All exposed concrete corners and edges shall be chamfered $\frac{3}{4}$ " unless noted otherwise in the plans.
- Surfaces of the fresh concrete at construction joints shall be rough floated sufficiently to consolidate the surface. All construction joints shall be cleaned of surface laitance, curing compounds and other foreign materials prior to placing fresh concrete against the joint.
- Barrier curbs shall be built normal to the grade.
- Request for construction joints or resteel splices other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.
- Snap ties, if used in the barrier curb formwork, shall be epoxy coated. The epoxy coating shall be inert in concrete and compatible with the coating applied to the new epoxy coated reinforcing steel.
- The concrete barriers shall be cured in accordance with Section 460.3 M. of the Construction Specifications except that no curing compounds shall be allowed.
- The Contractor shall only imprint one year plate on the structure. The year plate shall contain the date the existing bridge was built and shall be located as specified and detailed on Standard Plate No. 460.03.

DESIGN MIX OF CONCRETE

- Class A45 Concrete shall be used for the bid item Replace Expansion Device and Class A45 Concrete, Bridge Repair.
- The Type of cement, concrete strength requirements, aggregate requirements, slump and air requirements for the contract item Replace Expansion Device and Class A45 Concrete, Bridge Repair shall conform to the requirements of Section 460 of the Construction Specifications.

REPLACE EXPANSION DEVICE

- The end welded concrete anchors shall conform to Type A steel studs of Section 7 of the latest edition of the AWS D1.1 Structural Welding Code-Steel.
- Material for the Steel Extrusion shall conform to ASTM A36, A242 or A588.
- All steel components, steel plates, bars and structural shapes shall be galvanized after shop welding in accordance with ASTM A123.
- Material for the Neoprene Strip shall conform to that specified in ASTM D2628 modified to omit the recovery test. No splices will be permitted in the Neoprene Strip. The Neoprene strip shall not be installed in phases.
- The lubricant-adhesive used to install the neoprene seal shall conform to the requirements of ASTM D4070. The neoprene seal and the lubricant-adhesive should be supplied or recommended by the same source as they must be compatible.
- The expansion joint, with the exception of the neoprene strip, will be installed one-half roadway width at a time while allowing for one-way traffic at all times.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES

FOR
293' - 3" BOX GIRDER BRIDGE

STR. NO. 64-149-367

OCTOBER 2015

2 OF 21

DESIGNED BY KSK UNIN02PT	CK. DES. BY MM 02PTRE02	DRAFTED BY KSK	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM-PH 0291(122)0	196	284

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
410E0550	Jack Superstructure, Steel Girder	LumpSum	LS
410E2220	Replace Expansion Device	2	Each
460E0174	Concrete Patching Material, Miscellaneous	16.2	CuFt
460E0300	Breakout Structural Concrete	0.6	CuYd
460E0310	Breakout and Replace Grout Pad	1	Each
480E5000	Galvanic Anode	52	Each

SPECIFICATIONS

- Design Specifications: AASHTO Standard Specifications for Highway Bridges 17th Edition using Working Stress Design.
- Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.
- All Welding and Welding Inspection shall be in conformance with the AASHTO/AWS Bridge Welding Code D1.5M/D1.5:2010 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.

SCOPE OF BRIDGE WORK & SEQUENCE OF OPERATIONS

All work on this structure shall be accomplished with the traffic control shown in the plans. Alternate sequence of operations may be submitted by the Contractor for approval by the Engineer a minimum of two weeks prior to the pre-construction meeting.

- Repair the grout pad on Abutment No. 1.
- Repair the abutment sills on Abutment No. 1 and Abutment No. 5.
- Breakout the bridge deck and barrier curb and joint at Abutment No. 1 & 5 for the first phase of construction.
- Place strip seal expansion devices at Abutment Nos. 1 and 5 for the first phase of construction.
- Switch traffic and repeat steps 3 and 4 for the second phase of construction.

GENERAL CONSTRUCTION - BRIDGE

- All mild reinforcing steel shall conform to ASTM A615, Grade 60.
- All exposed concrete corners and edges shall be chamfered 3/4" unless noted otherwise in the plans. Match existing chamfer if the existing chamfer differs.
- Use 2" clear cover on all reinforcing steel except as shown otherwise.
- Request for construction joints or resteel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.
- Surfaces of fresh concrete at construction joints shall be rough floated sufficiently to consolidate the surface. All construction joints shall be cleaned of surface laitance, curing compounds and other foreign materials prior to placing fresh concrete against the joint.
- Barrier curbs and End block shall be built normal to the grade.
- Contractor shall only imprint one year plate on the structure. The year plate shall contain the date the existing bridge was built and shall be located as specified and detailed on Standard Plate No. 460.03.
- Snap ties, if used in the barrier curb formwork, shall be epoxy coated. The epoxy coating shall be inert in concrete and compatible with the coating applied to the new epoxy coated reinforcing steel.
- The concrete barriers shall be cured in accordance with Section 460.3 M of the Construction Specifications except that no curing compounds shall be allowed.

DESIGN MIX OF CONCRETE

- Class A45 Concrete shall be used for the bid items "Replace Expansion Device" and "Class A45 Concrete, Bridge Repair".
- The Type of cement, concrete strength requirements, aggregate requirements, slump and air requirements for the contract item "Replace Expansion Device" and "Class A45 Concrete, Bridge Repair" shall conform to the requirements of Section 460 of the Construction Specifications.

CONCRETE BREAKOUT

- The existing abutment sills, bridge deck and bridge barrier shall be broken out to the limits shown on the plans. Breakout limits shall be defined with a 3/4" deep sawcut (unless specified otherwise in these plans), where practical, as approved by the Engineer. Reinforcing steel that is exposed and is scheduled for use in the new construction shall be cleaned and straightened to the satisfaction of the Engineer. Care shall be taken not to damage the existing reinforcing steel that is to be reused in the new construction during concrete breakout. Any reinforcing steel that is damaged during concrete breakout shall be replaced or repaired, as approved by the Engineer, by the Contractor at no cost to the Department.
- Extreme care shall be used not to nick, gouge, scratch, or damage in any other way, the existing steel girders when breaking out the abutment sills, concrete deck and barriers. Prior to deck removal, the limits of the girder top flanges shall be marked on top of the bridge deck. The Contractor shall not be allowed to use any impact type breakout equipment larger than power driven hand tools for slab removal within six inches of the actual limits of the top flange. At no time shall the use of any breakout method that will nick, gouge, or scratch the flange, or any other structural steel component to be reused, be allowed. In the event that any nicks, gouges, scratches, or other damage occur, the Office of Bridge Design shall be immediately notified. All damaged shall be repaired by the Contractor as recommended by the Office of Bridge Design. All costs involved in repairing any damage, including any non-destructive testing that may be required, shall be at the expense of the Contractor.
- All broken out concrete shall be disposed of by the Contractor, in accordance with the Environmental Commitments.
- During concrete removal operations, no broken out concrete shall be allowed to fall onto Interstate 29.
- The contract unit price per cubic yard for "Breakout Structural Concrete" shall include breaking out concrete, straightening reinforcing steel, and disposal of all broken out material.

GALVANIC ANODES

- The Contractor shall furnish and place Galvanic anodes in the concrete repair areas specified in this plan set.

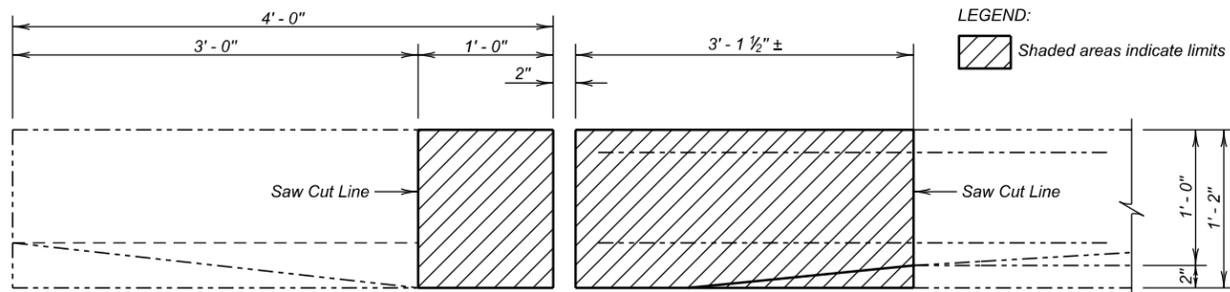
ESTIMATE OF STRUCTURE QUANTITIES AND NOTES
FOR
254' - 0" CONT. COMPOSITE GIRDER BRIDGE

STR. NO. 42-065-230

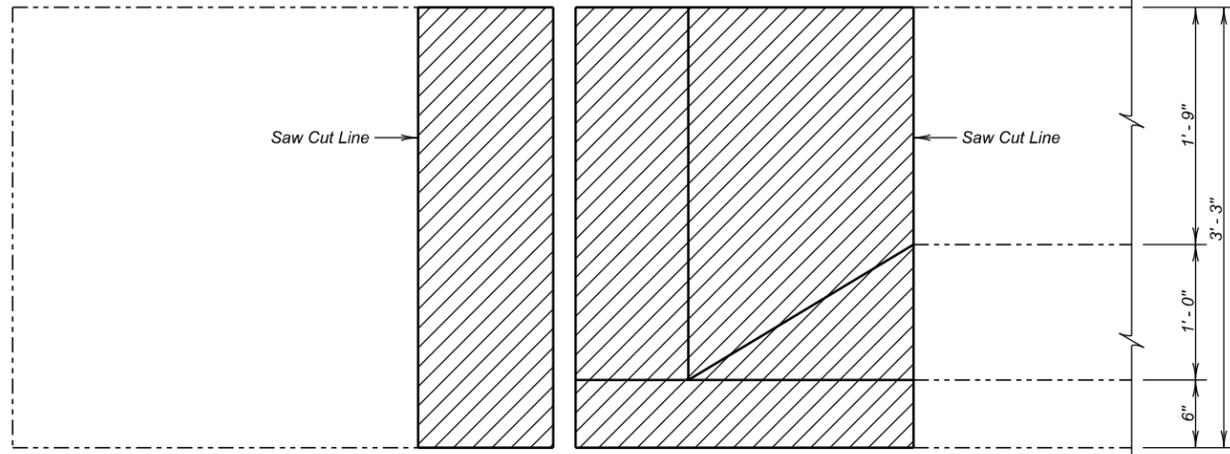
OCTOBER 2015

2 OF 16

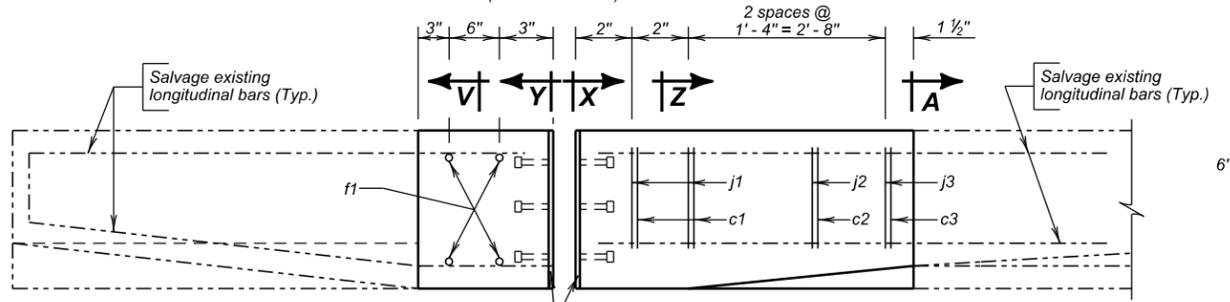
DESIGNED BY KSK LINC02PT	CK. DES. BY MM 02PTRG02	DRAFTED BY KSK	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
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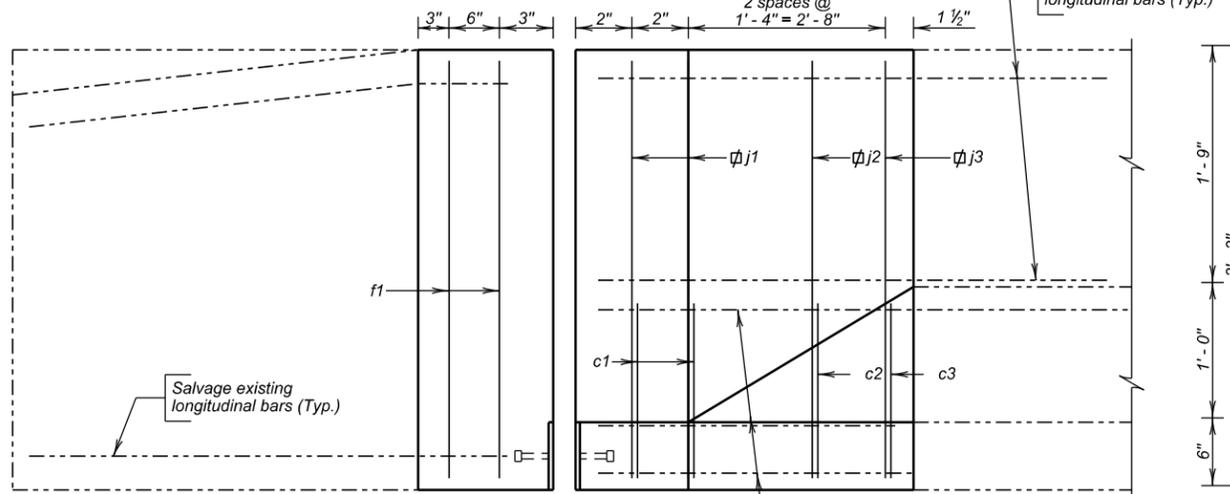
PLAN
(Breakout Shown)



ELEVATION
(Breakout Shown)

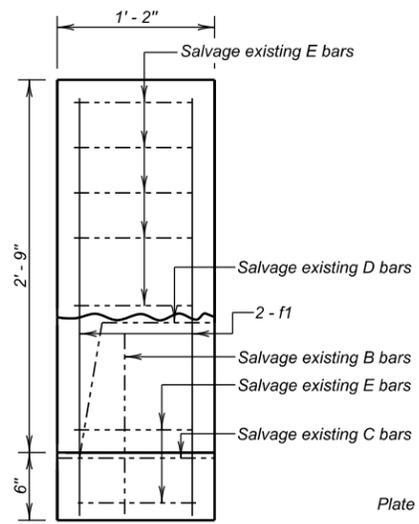


PLAN
(Reconstruction Shown)

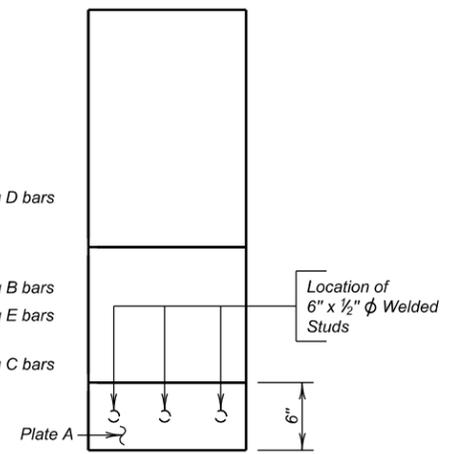


ELEVATION
(Reconstruction Shown)

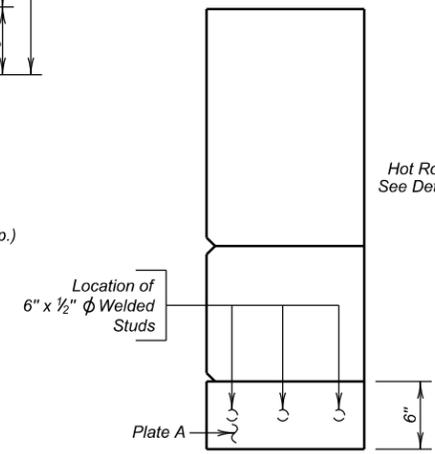
LEGEND:
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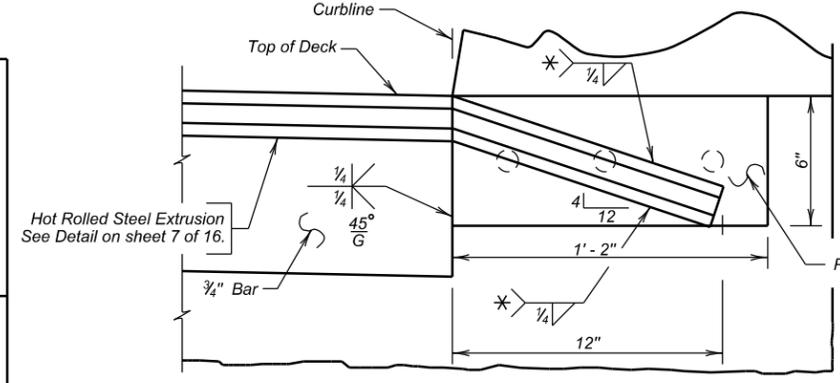
SEC. V - V



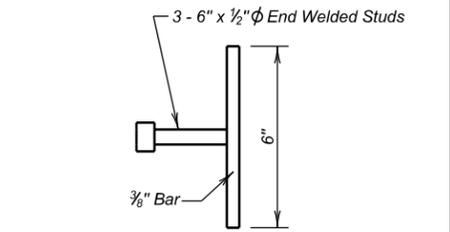
SEC. Y - Y



SEC. X - X



SEC. B - B



VIEW C - C

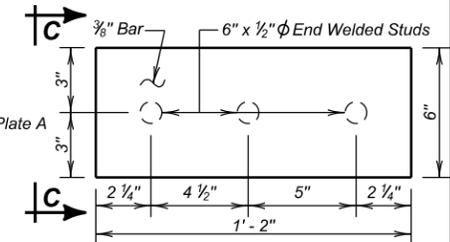


PLATE "A"

REINFORCING SCHEDULE					Bending Details	
Mk.	No.	Size	Length	Type		
b1	16	5	14'-9"	Str.		
c1	8	5	5'-4"	T8	9 1/2" c1	7 1/2" j3
c2	4	5	5'-3"	T8	8 1/2" c2	8 1/2" j2
c3	4	5	5'-2"	T8	7 1/2" c3	10" j1
f1	16	6	3'-0"	Str.		
j1	8	4	8'-3"	T2		
j2	4	4	8'-0"	T2		
j3	4	4	7'-11"	T2		

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Replace Expansion Device	Each	2
Galvanic Anode	Each	42

- Items 1 thru 5 are approximate quantities contained in the above bid items and are for informational purposes only.
- | | Phase 1 | Phase 2 |
|------------------------------------|------------|-------------|
| 1. Class A45 Concrete: | 3.5 Cu. Yd | 3.5 Cu. Yd. |
| 2. Epoxy Coated Reinforcing Steel: | 246 Lb. | 246 Lb. |
| 3. Structural Steel: | 3670 Lb. | 3670 Lb. |
| 4. Breakout Structural Concrete: | 3.7Cu. Yd | 3.4 Cu. Yd |
| 5. No. 5 Rebar Splice | 8 Each | - |

JOINT REPLACEMENT DETAILS (CONTINUED)

254' - 0" CONT. COMPOSITE GIRDER BRIDGE
30' - 0" ROADWAY
OVER INTERSTATE 29
STR. NO. 42-065-230

0° SKEW
SEC. 31/6-T97/96N-R50W
IM-PH 0291(122)0

LINCOLN COUNTY
S. D. DEPT. OF TRANSPORTATION

OCTOBER 2015 7 OF 16

DESIGNED BY KSK LINC02PT	CK. DES. BY MM 02PTRG07	DRAFTED BY KR	Kevin N. Goeden BRIDGE ENGINEER
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Use this sheet in conjunction with sheet no. 5 & 6 of 17.