

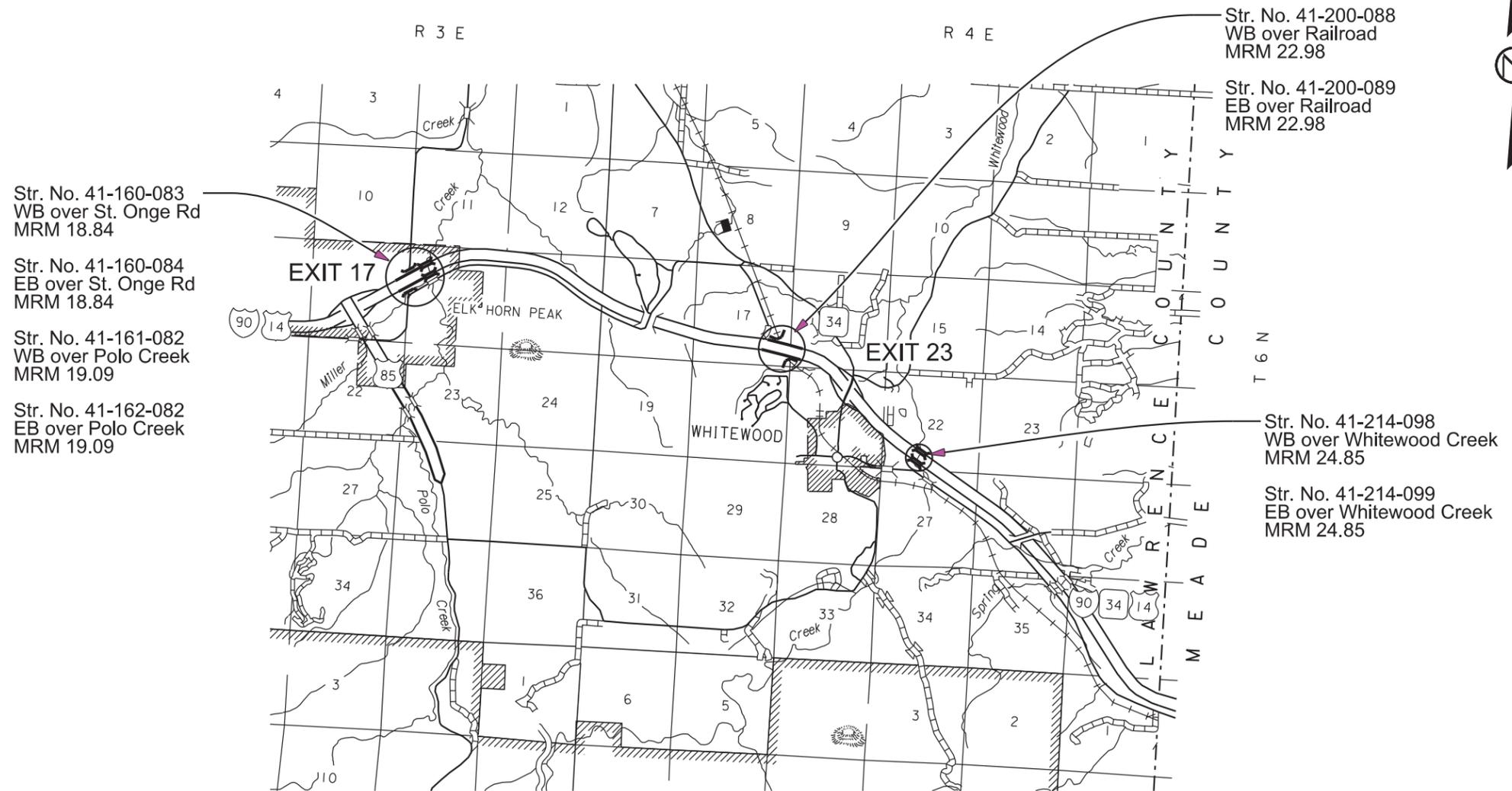
SECTION E: STRUCTURE PLANS

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E1	E82

Plotting Date: 12/30/2015

INDEX OF SHEETS

- E1 - General Layout and Index of Sheets
- E2 - Estimate of Structure Quantities
- E3 - E11 - Str. No. 41-160-083
- E12 - E15 - Str. No. 41-160-084
- E16 - E19 - Str. No. 41-161-082
- E20 - E28 - Str. No. 41-162-082
- E29 - E39 - Str. No. 41-200-088
- E40 - E49 - Str. No. 41-200-089
- E50 - E64 - Str. No. 41-214-098
- E65 - E82 - Str. No. 41-214-099



ESTIMATE OF QUANTITIES

Str. No. 41-160-083

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
410E2600	Membrane Sealant Expansion Joint	39.8	Ft
460E0172	Concrete Patching Material, Bridge Deck	97.8	CuFt
460E0300	Breakout Structural Concrete	1.8	CuYd
480E0200	Epoxy Coated Reinforcing Steel	123	Lb
480E0505	No. 5 Rebar Splice	3	Each
480E5000	Galvanic Anode	21	Each
491E0005	Two Coat Bridge Deck Polymer Chip Seal	575.5	SqYd
491E0110	Abrasive Blasting of Bridge Deck	575.5	SqYd
491E0120	Bridge Deck Grinding	575.5	SqYd
491E0130	Concrete Removal, Class A	4.0	SqYd
491E0140	Concrete Removal, Class B	4.0	SqYd

Str. No. 41-160-084

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
460E0172	Concrete Patching Material, Bridge Deck	290.3	CuFt
491E0005	Two Coat Bridge Deck Polymer Chip Seal	575.5	SqYd
491E0110	Abrasive Blasting of Bridge Deck	575.5	SqYd
491E0120	Bridge Deck Grinding	575.5	SqYd
491E0130	Concrete Removal, Class A	23.1	SqYd
491E0140	Concrete Removal, Class B	23.1	SqYd

Str. No. 41-161-082

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
460E0172	Concrete Patching Material, Bridge Deck	48.0	CuFt
491E0005	Two Coat Bridge Deck Polymer Chip Seal	443.6	SqYd
491E0110	Abrasive Blasting of Bridge Deck	443.6	SqYd
491E0120	Bridge Deck Grinding	443.6	SqYd
491E0130	Concrete Removal, Class A	4.0	SqYd
491E0140	Concrete Removal, Class B	4.0	SqYd

Str. No. 41-162-082

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
410E2600	Membrane Sealant Expansion Joint	39.8	Ft
460E0172	Concrete Patching Material, Bridge Deck	393.0	CuFt
460E0300	Breakout Structural Concrete	2.0	CuYd
480E0200	Epoxy Coated Reinforcing Steel	123	Lb
480E0505	No. 5 Rebar Splice	3	Each
480E5000	Galvanic Anode	21	Each
491E0005	Two Coat Bridge Deck Polymer Chip Seal	443.6	SqYd
491E0110	Abrasive Blasting of Bridge Deck	443.6	SqYd
491E0120	Bridge Deck Grinding	443.6	SqYd
491E0130	Concrete Removal, Class A	38.1	SqYd
491E0140	Concrete Removal, Class B	38.1	SqYd

Str. No. 41-200-088

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
410E0700	Abutment Joint Drain	1	Each
460E0172	Concrete Patching Material, Bridge Deck	91.7	CuFt
491E0005	Two Coat Bridge Deck Polymer Chip Seal	788.0	SqYd
491E0110	Abrasive Blasting of Bridge Deck	788.0	SqYd
491E0120	Bridge Deck Grinding	788.0	SqYd
491E0130	Concrete Removal, Class A	15.0	SqYd
491E0140	Concrete Removal, Class B	15.0	SqYd

Str. No. 41-200-089

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
460E0172	Concrete Patching Material, Bridge Deck	97.0	CuFt
491E0005	Two Coat Bridge Deck Polymer Chip Seal	788.0	SqYd
491E0110	Abrasive Blasting of Bridge Deck	788.0	SqYd
491E0120	Bridge Deck Grinding	788.0	SqYd
491E0130	Concrete Removal, Class A	11.2	SqYd
491E0140	Concrete Removal, Class B	11.2	SqYd

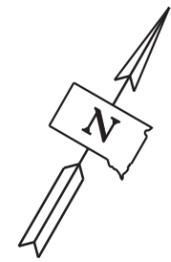
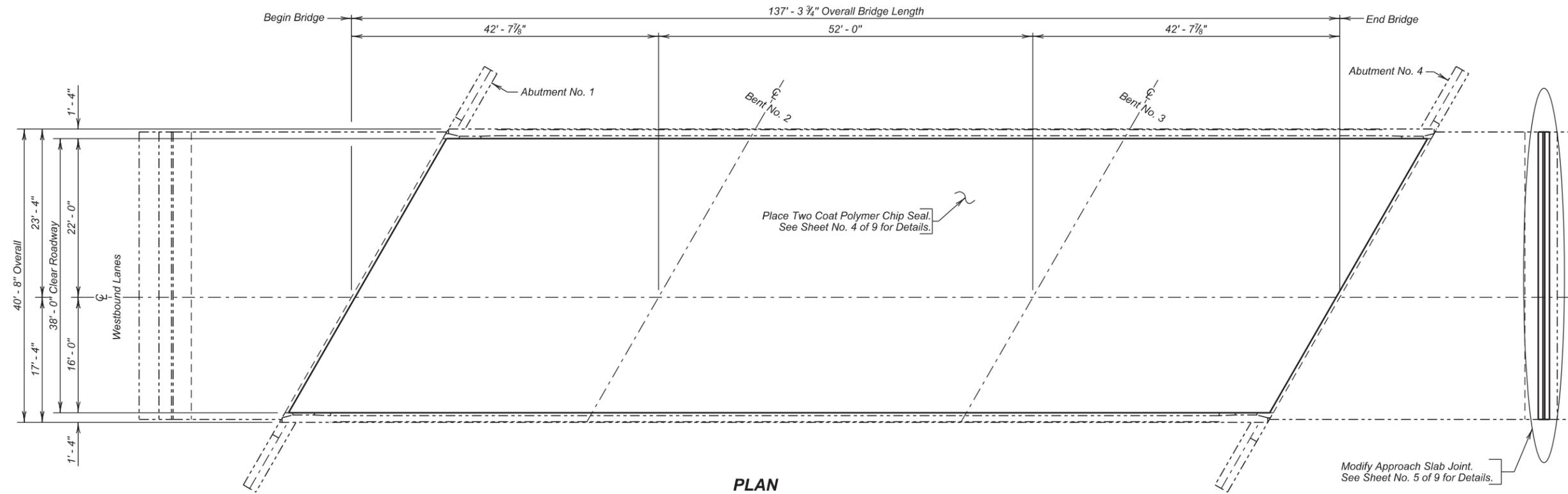
Str. No. 41-214-098

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
412E0120	Bridge Repainting, Class II	Lump Sum	LS
412E0500	Paint Residue Containment	Lump Sum	LS
460E0172	Concrete Patching Material, Bridge Deck	75.3	CuFt
460E0174	Concrete Patching Material, Miscellaneous	5.4	CuFt
460E0300	Breakout Structural Concrete	0.3	CuYd
480E5000	Galvanic Anode	5	Each
491E0005	Two Coat Bridge Deck Polymer Chip Seal	549.1	SqYd
491E0110	Abrasive Blasting of Bridge Deck	549.1	SqYd
491E0120	Bridge Deck Grinding	549.1	SqYd
491E0130	Concrete Removal, Class A	11.6	SqYd
491E0140	Concrete Removal, Class B	11.6	SqYd

Str. No. 41-214-099

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
410E0103	Fatigue Retrofit Steel Girder, Type C	144	Each
410E3010	Magnetic Particle Weld Inspection	176	In
412E0120	Bridge Repainting, Class II	Lump Sum	LS
412E0500	Paint Residue Containment	Lump Sum	LS
460E0172	Concrete Patching Material, Bridge Deck	35.2	CuFt
460E0174	Concrete Patching Material, Miscellaneous	4.3	CuFt
460E0300	Breakout Structural Concrete	0.1	CuYd
480E5000	Galvanic Anode	7	Each
491E0005	Two Coat Bridge Deck Polymer Chip Seal	549.1	SqYd
491E0110	Abrasive Blasting of Bridge Deck	549.1	SqYd
491E0120	Bridge Deck Grinding	549.1	SqYd
491E0130	Concrete Removal, Class A	6.1	SqYd
491E0140	Concrete Removal, Class B	6.1	SqYd

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E3	E82



PLAN

INDEX OF BRIDGE SHEETS -

- Sheet No. 1 - Layout for Upgrade
- Sheet No. 2 - Estimate of Structure Quantities and Notes
- Sheet No. 3 - Notes (Continued)
- Sheet No. 4 - Two Coat Polymer Chip Seal Details
- Sheet No. 5 - Approach Slab Joint Replacement
- Sheet Nos. 6-9 - Original Construction Plans

**(WESTBOUND LANES)
LAYOUT FOR UPGRADE**

FOR

137' - 3 3/4" CONTINUOUS CONCRETE BRIDGE

38' - 0" ROADWAY
 OVER LOCAL ROAD
 STR. NO. 41-160-083
 PCN 02PP

30°SKEW L.H.F.
 SEC. 14/15 - T6N - R3E
 IM 0901(171)18

LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION

MARCH 2016

PLANS BY:
 OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

DESIGNED BY KH LAWR02PP	CK. DES. BY KSK 02PPRA01	DRAFTED BY KR	<i>Kevin N. Coeden</i> BRIDGE ENGINEER
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ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
410E2600	Membrane Sealant Expansion Joint	39.8	Ft
460E0172	Concrete Patching Material, Bridge Deck	97.8	CuFt
460E0300	Breakout Structural Concrete	1.8	CuYd
480E0200	Epoxy Coated Reinforcing Steel	123	Lb
480E0505	No. 5 Rebar Splice	3	Each
480E5000	Galvanic Anode	21	Each
491E0005	Two Coat Polymer Bridge Deck Chip Seal	575.5	SqYd
491E0110	Abrasive Blasting of Bridge Deck	575.5	SqYd
491E0120	Bridge Deck Grinding	575.5	SqYd
491E0130	Concrete Removal, Class A	4.0	SqYd
491E0140	Concrete Removal, Class B	4.0	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.

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. 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 elsewhere 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 preconstruction meeting.

- Perform bridge deck grinding and repair the bridge deck by removing all loose and delaminated concrete from the bridge deck surface for the first and second phase of construction.
- Clean the bridge deck surface with abrasive blasting for the first phase of construction.
- Place a Two Coat Polymer Bridge Deck Chip Seal for the first phase of construction.
- Remove and replace east joint between approach slab and sleeper slab for the first phase of construction.
- Switch traffic and repeat steps 2 through 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.
- The concrete patching material used for the approach slab joint replacement shall conform to Section 491 of the Construction Specifications.

CONCRETE BREAKOUT

- The existing approach slab and sleeper slab 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.
- All broken out concrete, discarded reinforcing bars and expansion devices shall be disposed of by the Contractor. Any disposal of discarded material shall be in accordance with the Environmental Commitments.
- The contract unit price per cubic yard for "Breakout Structural Concrete" shall include breaking out concrete, cleaning, straightening existing reinforcing steel, removal of the existing armored device, and disposal of all broken out material.

MECHANICAL REBAR SPLICES

Mechanical splice devices will be required for the transverse reinforcing steel in the approach slab joint replacement. The mechanical rebar splices shall be in accordance with Section 480 of the Construction Specifications.

BRIDGE DECK GRINDING

The Contractor will have the option of grinding the entire deck surface during phase one. Any additional costs incurred for grinding the entire deck surface such as additional traffic control or cleaning shall be at no additional cost to the Department.

TWO COAT BRIDGE DECK POLYMER CHIP SEAL

The Two Coat Bridge Deck Polymer Chip Seal shall be applied in accordance with the Construction Specifications.

MEMBRANE SEALANT EXPANSION JOINT

- Install all membrane sealant expansion joints at the plan shown locations in conformance to the following notes.
- The Membrane Sealant shall be one of membrane sealant types from the approved product list for Membrane Sealant Expansion Joints.
- The manufacturer shall supply the membrane sealant in packaging that precompresses the membrane sealant. The precompressed dimension shall be as recommended by the sealant manufacturer to provide a water tight seal throughout a joint movement range of + 25% (minimum) from the specified joint opening dimension. In no case shall the precompressed dimension exceed 75% of the joint opening width. The foam sealant shall be slowly self-expanding to permit workers ample time to install the membrane sealant before the membrane sealant exceeds the joint opening width.
- The membrane sealant shall be supplied in pieces 5 feet in length or longer. The foam sealant shall be ultra-violet and ozone resistant.
- The bonding adhesive used to attach the membrane sealant to the adjacent concrete shall be approved by the membrane sealant manufacturer.
- Adhesive used to join adjacent pieces of the membrane sealant shall be as recommended by the manufacturer.
- If Styrofoam filler material is used in the construction, it shall be closed cell and water-tight as approved by the Engineer.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES FOR 137' - 3 3/4" CONT. CONCRETE BRIDGE

STR. NO. 41-160-083
JANUARY 2015

2 OF 9

DESIGNED BY KH LAWR02PP	CK. DES. BY KSK 02PPK02	DRAFTED BY KH	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
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MEMBRANE SEALANT EXPANSION JOINT (CONTINUED)

8. Use plywood or other material to protect concrete adjacent to the joint from spalling before any equipment is moved across the joint. Any spall areas will be repaired at the Contractor's expense by breaking out and replacing adjacent concrete, as approved by the Engineer.
9. The minimum ambient air temperature at the time of joint installation and adhesive curing shall be 40° F.
10. A technical representative of the membrane sealant manufacturer shall be present at the jobsite during installation. The technical representative shall be knowledgeable in the correct procedures for the preparation and installation of the joint material to ensure the Contractor installs the joint to the Manufacturers recommendations.
11. The joint opening shall be constant width and shall have smooth vertical sides. Surfaces of material adjacent to the joint shall be at the correct grade and crown as approved by the Engineer.
12. Concrete surfaces that will be in contact with the membrane sealant shall be thoroughly cleaned by abrasive blasting to remove all laitance and contaminants (such as oil, curing compounds, etc.) from the concrete surface. At a minimum two passes of abrasive blasting with the nozzle held at an angle to within 1 to 2 inches of the a concrete surface will be required. Cleaning of the concrete surfaces with solvents, wire brushing, or grinding shall not be permitted.
13. After abrasive blasting, but immediately prior to membrane joint installation, the entire joint contact surface shall be air blasted. The air compressor used for joint cleaning shall be equipped with trap devices capable of providing moisture-free and oil-free air at a recommended pressure of 90 psi. To obtain complete bonding with the adhesive, the adjacent concrete surfaces must be dry and clean. The contact surfaces for the joint shall be visually inspected by the Engineer immediately prior to joint installation to verify the surface is dry and clean.
14. Individual spliced sections shall be installed as per the manufacturers' recommendations. The membrane joint sealant manufacturer shall submit a detailed installation procedure to the Engineer at least 5 days prior to joint installation for his review.
15. Traffic shall not be allowed on the joint for a minimum 3 hours unless otherwise directed by the Engineer.
16. Forms for the joint shall be left in place for a minimum of 7 days. No construction equipment or traffic shall be allowed on the joint until the concrete has reached design strength. The joint edges shall be protected from damage by equipment and traffic.
17. The Membrane Sealant Expansion Joint will be measured in feet to the nearest one-tenth foot, complete in place. Measurement will be made of the overall horizontal length. The Membrane Sealant Expansion Joint will be paid for at the contract unit price per foot complete in place. Payment for this item shall be full compensation for furnishing all the required materials in place, inclusive of labor, equipment and incidentals necessary to complete the work in accordance with the plans and the foregoing specifications.

GALVANIC ANODES

1. The Contractor shall furnish and place Galvanic Anodes in the concrete repair areas specified in this plan set.
2. The galvanic anodes shall be supplied as one of the following:

Galvashield XP2
Vector Corrosion Technologies
13312 N 56th St, Suite 102
Tampa, FL 33617
Phone: (813) 830-7566
Website: www.vector-corrosion.com

Sentinel Silver
Euclid Chemical Company
19218 Redwood Road
Cleveland, OH 44110
Phone: (800) 312-7628
Website: www.euclidchemical.com

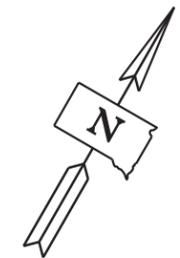
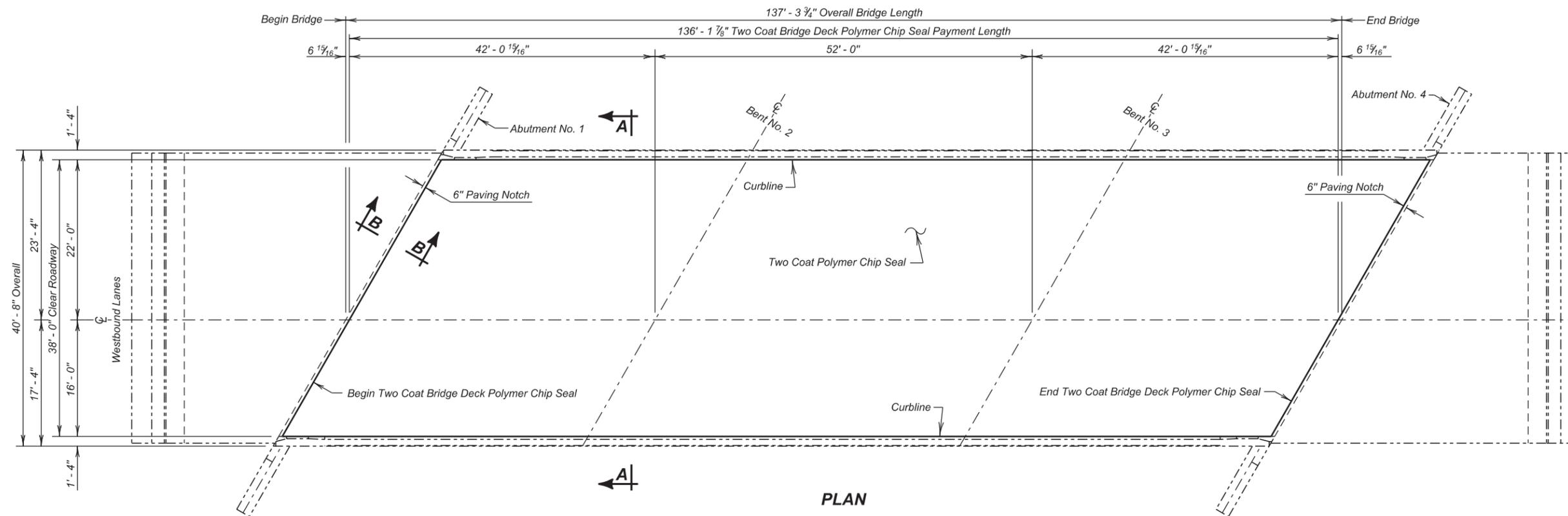
Sika Galvashield XP+
Sika Corporation US
201 Polito Avenue
Lyndhurst, NJ 07071
Phone: (800) 933-7452
Website: <http://usa.sika.com>
3. The anodes shall be placed in accordance with manufacturer's recommendations and as approved by the Engineer. The anodes have not been shown on the drawings. The Contractor shall provide shop drawings of the galvanic anode installation including locations of the individual anodes to the Office of Bridge Design.
4. The anodes shall be placed with a minimum ¾" cover and shall be set in Embedding Mortar per the manufacturer's recommendations. The anodes shall be fully encased in the concrete repair material. Where adequate cover does not exist, a concrete pocket shall be chipped out behind the anode to provide sufficient cover. The Contractor may need to chip around the reinforcing bar locally at the anode installation to make the electrical connection. The reinforcing steel at the connection location shall be cleaned per the manufacturer's recommendations to provide sufficient electrical connection and mechanical bond.
5. The electrical continuity of the electrical connections and reinforcing steel shall be confirmed per the manufacturer's recommendations.
6. The Contractor shall provide manufacturer's product literature and installation instructions to the Engineer 10 days prior to installation.
7. All costs associated with placing anodes including labor, equipment, materials and incidentals shall be included in the contract unit price per each for "Galvanic Anode".

NOTES (CONTINUED)
FOR
137' - 3¾" CONT. CONCRETE BRIDGE

STR. NO. 41-160-083
JANUARY 2015

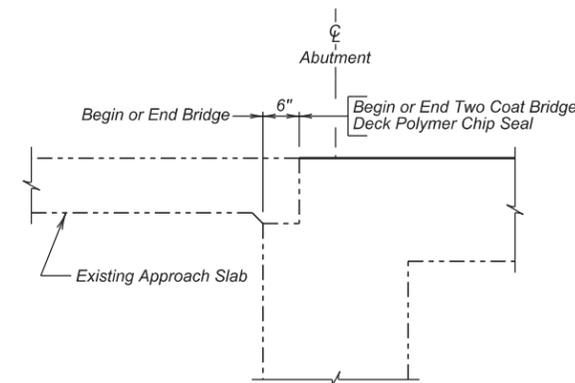
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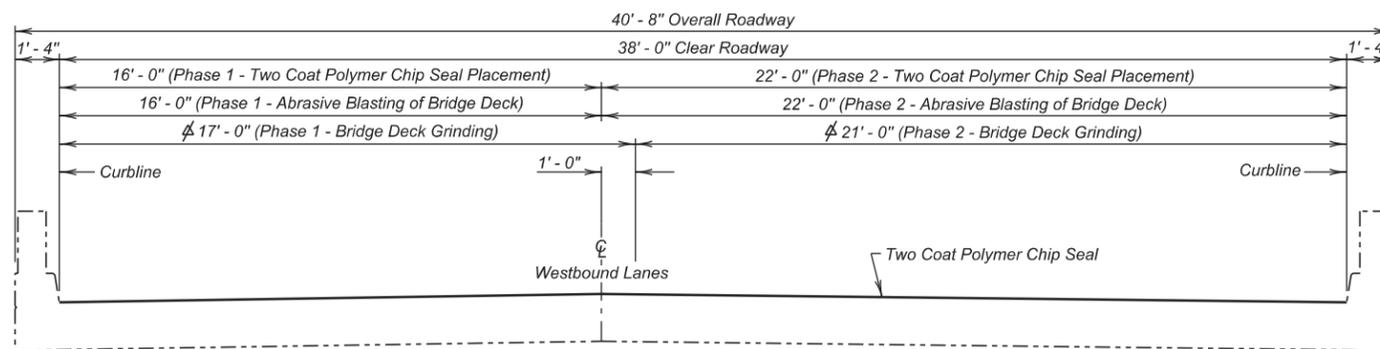


ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
		PHASE 1	PHASE 2
* Concrete Patching Material, Bridge Deck	Cu. Ft.	25.1	25.1
Two Coat Bridge Deck Polymer Chip Seal	Sq. Yd.	242.3	333.2
Abrasive Blasting of Bridge Deck	Sq. Yd.	242.3	333.2
Bridge Deck Grinding	Sq. Yd.	257.5	318.0
* Concrete Removal, Class A	Sq. Yd.	2.0	2.0
* Concrete Removal, Class B	Sq. Yd.	2.0	2.0

* Concrete Patching Material, Bridge Deck; Concrete Removal, Class A; and Concrete Removal, Class B may not be encountered and may be removed from the project at the direction of the Engineer.



SECTION B - B



SECTION A - A

(WESTBOUND LANES)
TWO COAT POLYMER CHIP SEAL DETAILS
 FOR
137' - 3 3/4" CONTINUOUS CONCRETE BRIDGE
 38' - 0" ROADWAY
 OVER LOCAL ROAD
 STR. NO. 41-160-083
 30°SKEW L.H.F.
 SEC. 14/15 - T6N - R3E
 IM 0901(171)18

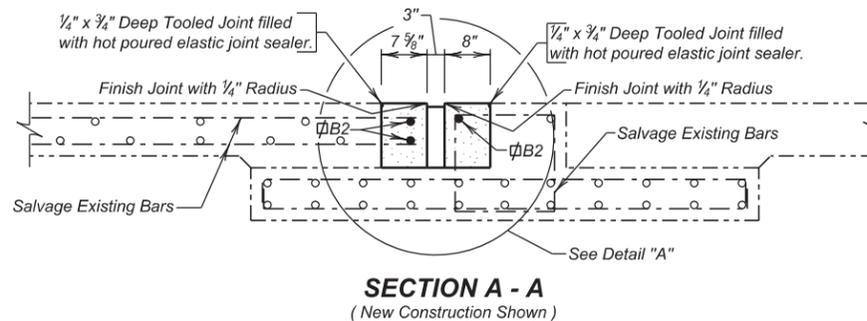
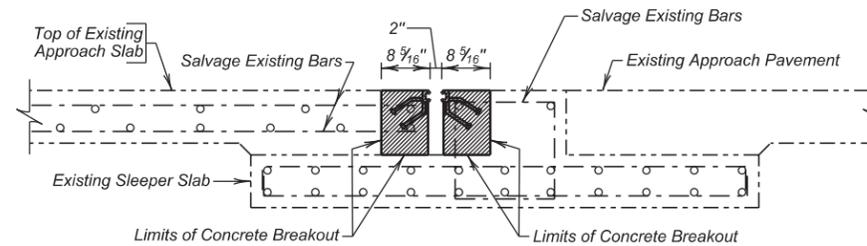
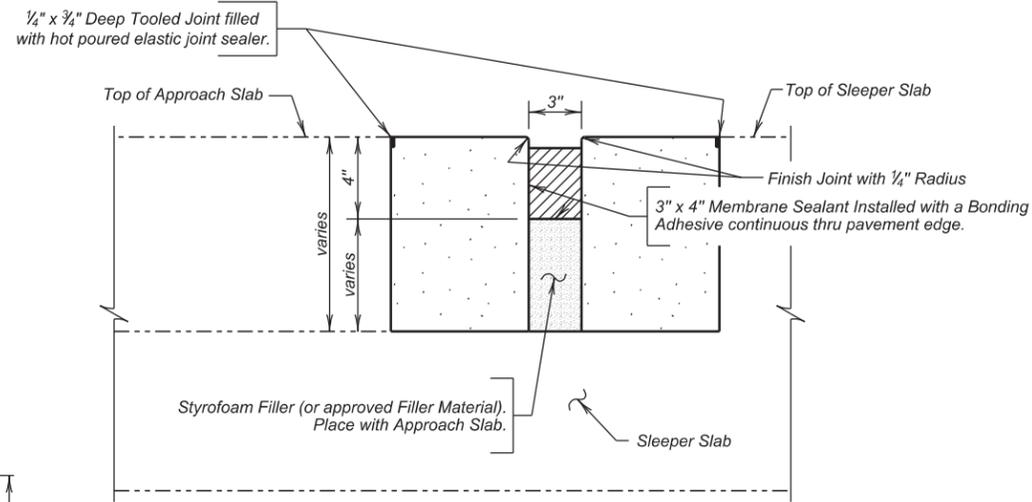
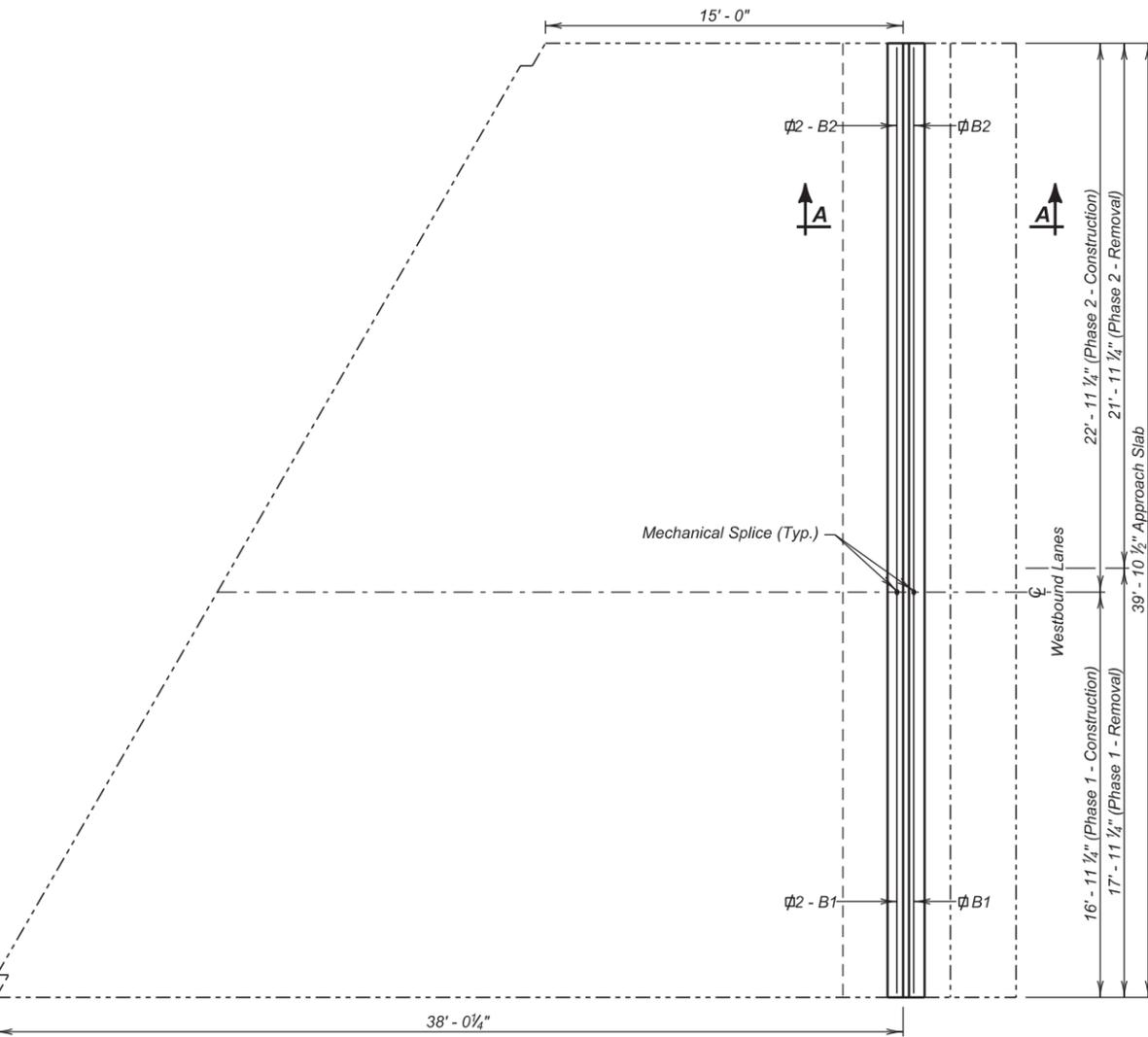
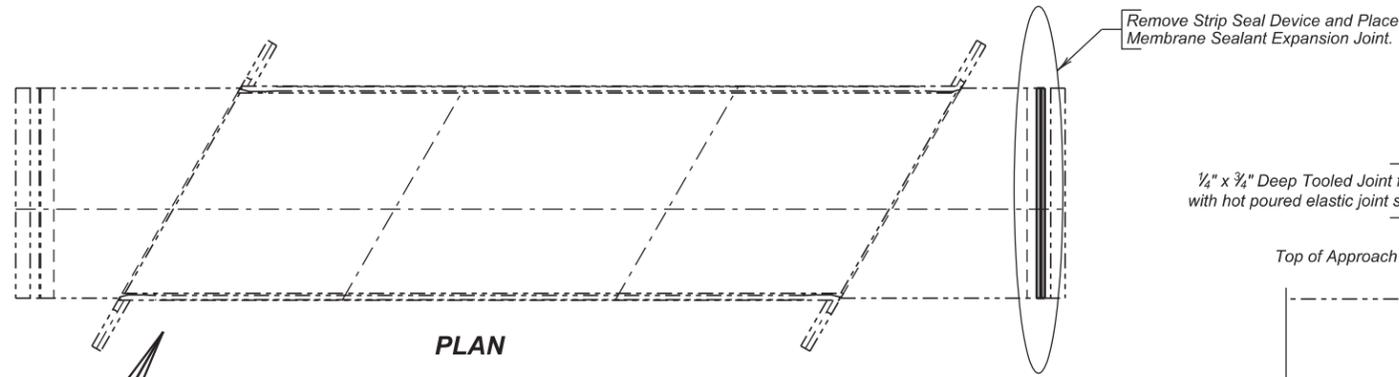
LAWRENCE COUNTY
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MARCH 2016

⚡ See Bridge Deck Grinding Notes on Sheet No. 2 of 9.

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
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REINFORCING SCHEDULE					Bending Details	
(For One Approach and Sleeper Slab)						
Mk.	No.	Size	Length	Type		
PHASE 1	ØB1	3	5	16' - 9"	Str.	NOTES: All dimensions are out to out of bars. All Bars to be Epoxy Coated. These bars shall be spliced with mechanical splice devices Equivalent Splice Lengths No. 5 - 2' - 6"
	ØB2	3	5	22' - 9"	Str.	
PHASE 2						



ITEM	UNIT	QUANTITY	
		PHASE 1	PHASE 2
Breakout Structural Concrete	Cu. Yd.	0.8	1.0
Concrete Patching Material, Bridge Deck	Cu. Ft.	20.2	27.4
Epoxy Coated Reinforcing Steel	Lb.	52	71
Membrane Sealant Expansion Joint	Ft.	16.9	22.9
No. 5 Rebar Splice	Each	3	-
Galvanic Anode	Each	9	12

(WESTBOUND LANES)
APPROACH SLAB JOINT REPLACEMENT
 FOR
137' - 3 3/4" CONTINUOUS CONCRETE BRIDGE
 38' - 0" ROADWAY 30°SKEW L.H.F.
 OVER LOCAL ROAD SEC. 14/15 - T6N - R3E
 STR. NO. 41-160-083 IM 0901(171)18

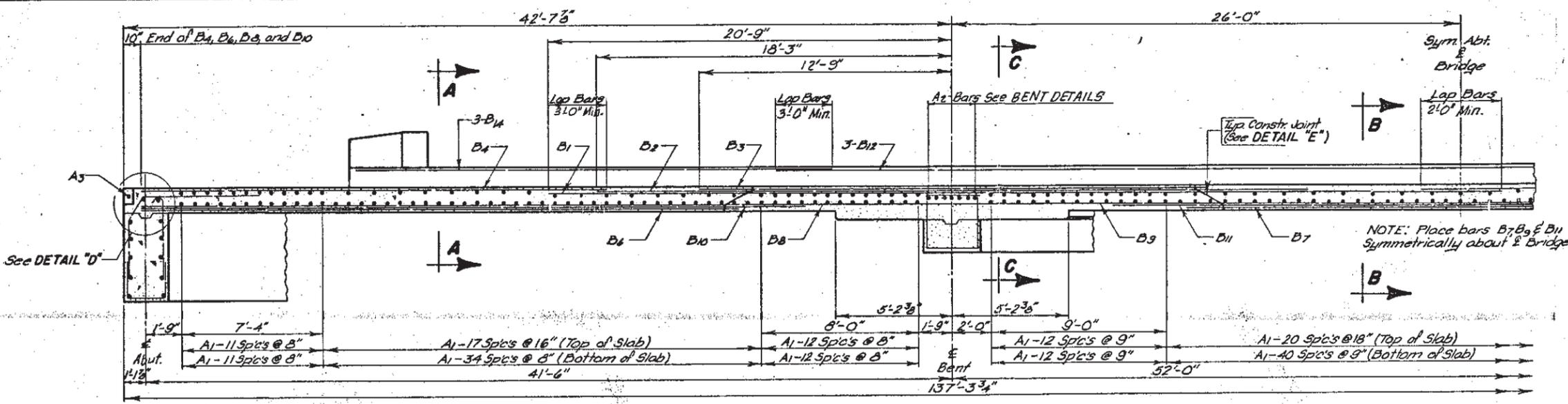
LAWRENCE COUNTY
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MARCH 2016

Shaded areas indicate limits of concrete breakout.

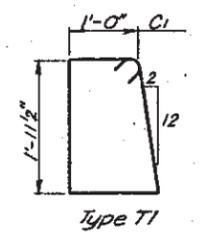
Concrete Patching Material, Bridge Deck

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HALF LONGITUDINAL SECTIONAL VIEW
(Railing not shown)

REINFORCING SCHEDULE					
Bending Details					
AK	No.	Size	Length	Type	
A ₁	308	5	46'-6"	Str.	
A ₃	2	5	43'-6"	Str.	
B ₁	48	10	48'-9"	Str.	
B ₂	44	11	36'-6"	Str.	
B ₃	92	10	26'-0"	Str.	
B ₄	48	9	24'-3"	Str.	
B ₅	12	11	42'-6"	Str.	
B ₆	92	11	30'-9"	Str.	
B ₇	46	11	28'-0"	Str.	
B ₈	46	10	41'-9"	Str.	
B ₉	23	10	52'-0"	Str.	
B ₁₀	44	11	34'-3"	Str.	
B ₁₁	22	11	35'-6"	Str.	
B ₁₂	12	11	48'-9"	Str.	
B ₁₃	6	11	52'-0"	Str.	
B ₁₄	12	8	24'-9"	Str.	
C ₁	268	4	7'-3"	TI	

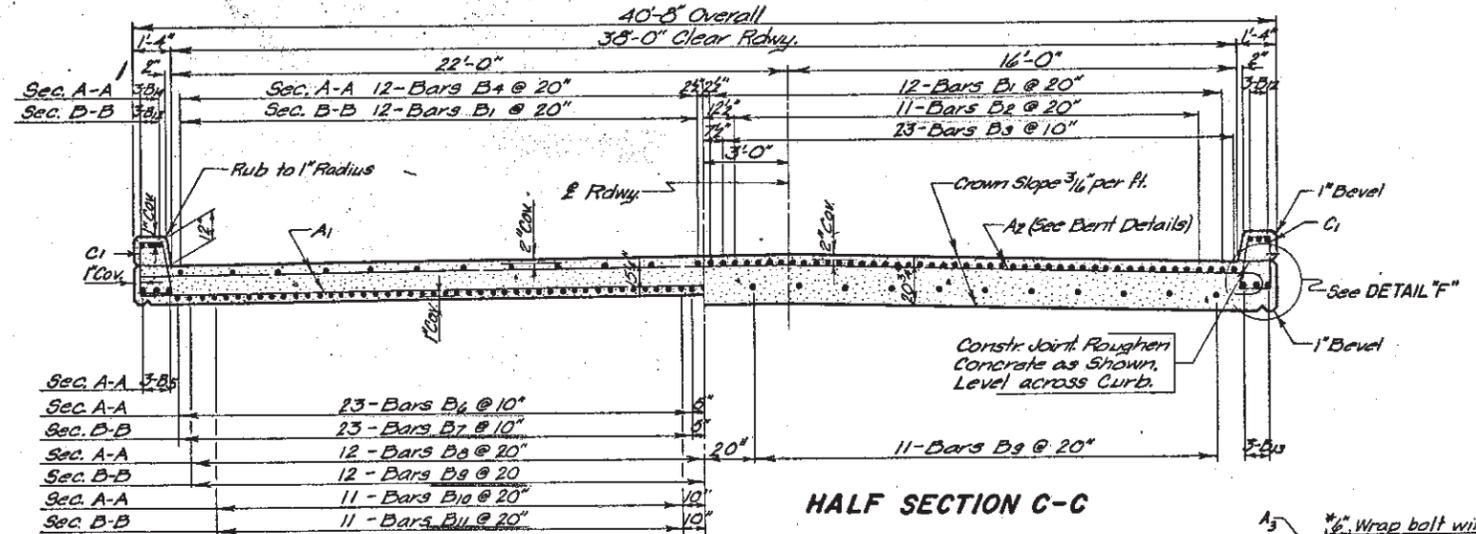


Note: All dimensions are out to out of bars.

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Class A Concrete	Cu Yds	273.6
Reinforcing Steel	Lbs	104,883
Structural Steel	Lbs	55
RT-3A Steel Railing	Lin Ft	260.1

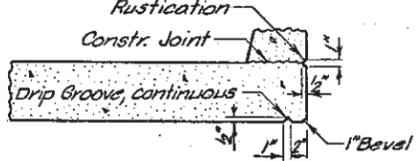
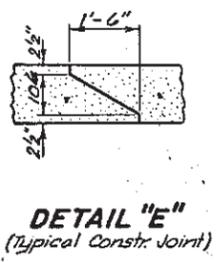
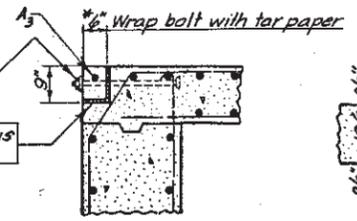
*Does not include slab and curbs directly over abutments or end blocks.
*The weight of 22-#8 x 26" galv. bolts.

- GENERAL NOTES—**
- These notes cover Abutments, Bents, Superstructure and Railing Details. The General Drawing will show elevations and other necessary notes and details.
 - Design Specifications: A.A.S.H.O. Specifications for Highway Bridges, 1965.
 - Piling: See General Drawing for length of piling.
 - Structural Steel: All #5 Bolts including washers, and all pile connections in Abutments shall be paid for as Structural Steel.
 - Reinforcing Steel: All reinforcing steel shall conform to A.S.T.M. Specifications.
 - Concrete: All concrete shall be Class "A".
- All exposed concrete corners and edges shall be chamfered to a 3/4" bevel unless otherwise noted. If necessary to facilitate construction, transverse construction joints may be made at the quarter points of each and any span adjacent to interior bents. If these joints are used, submit a concrete pouring sequence to the BRIDGE SECTION for approval.
- All costs for expansion joint filler and tar paper shall be included in the unit price bid for Class "A" Concrete.
 - Design Loading: HS20-44 A.A.S.H.O.
 - Limit Stresses: Concrete f_c = 1600 p.s.i.
Re-Steel f_s = 20,000 p.s.i.
 - Equivalent fluid pressure of earth, at 40 Lbs./sq. ft
 - Minimum Pile Loading = 24 tons for timber piling.



HALF SECTION C-C

HALF SECTION A-A
HALF SECTION B-B



ORIGINAL CONSTRUCTION PLANS

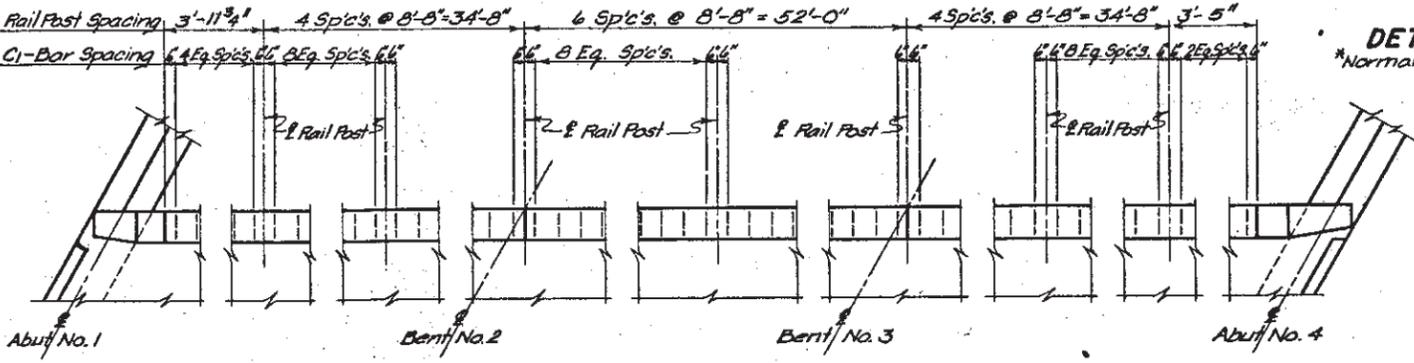
(WEST BOUND LANES)
SUPERSTRUCTURE DETAILS

FOR
137'-3 3/4" CONTINUOUS CONCRETE BRIDGE

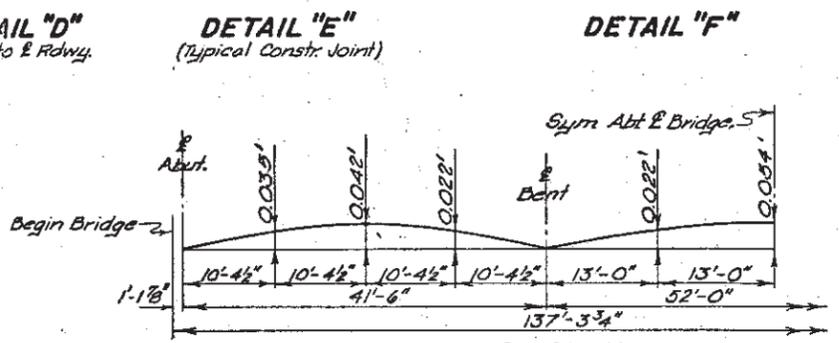
38'-0" ROADWAY 30° SKEW L.H.F.
OVER LOCAL ROAD SEC. 14/15-T6N-R3E
STA. 987+68.710 TO 989+06.019 I 90-12715
STR. NO. 41-160-083 LAWRENCE COUNTY

SOUTH DAKOTA HS20-44
DEPARTMENT OF HIGHWAYS (8 ALT.)
APRIL 1968 (3) (7) OF (9)

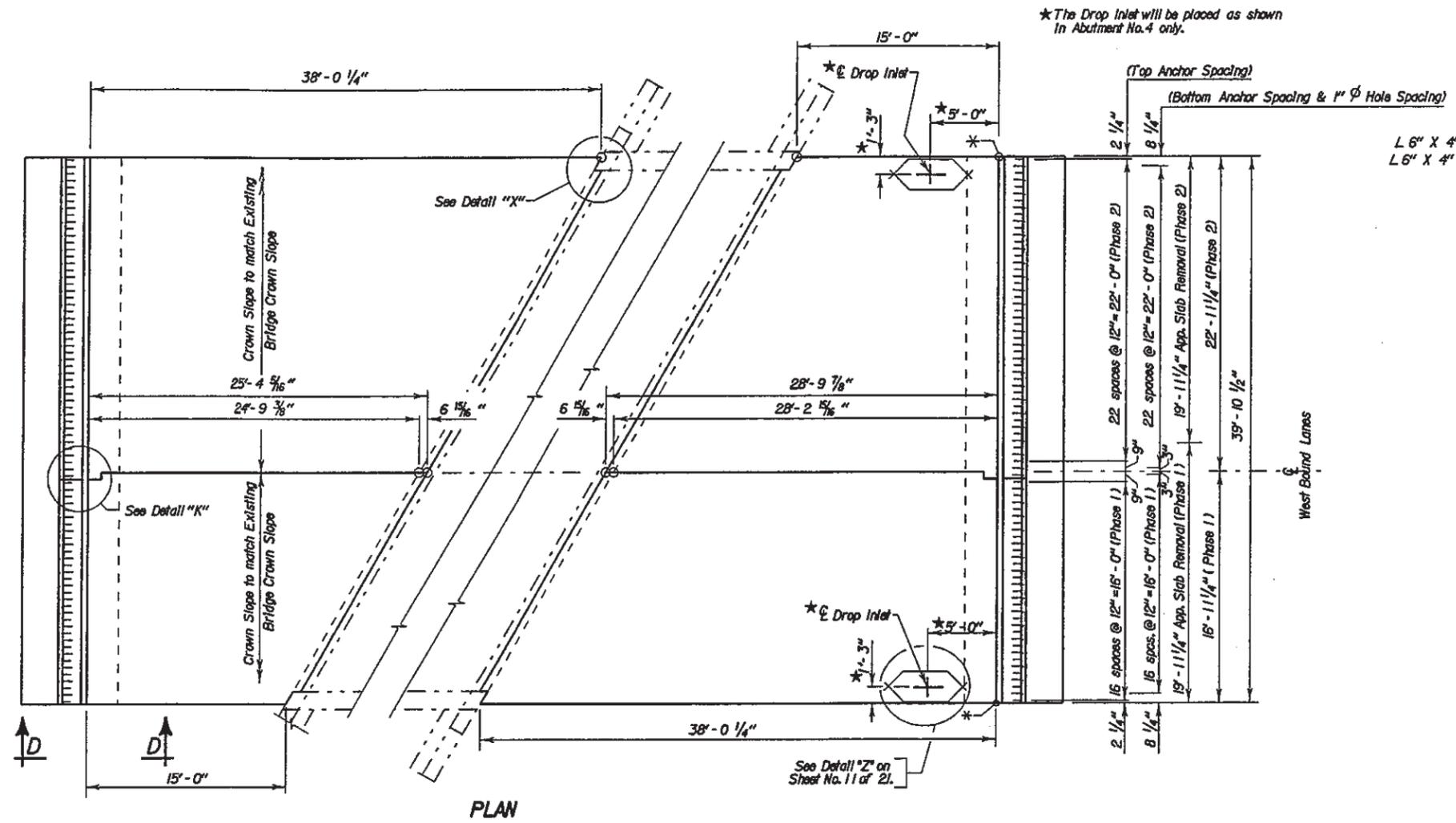
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	LEP	GA	[Signature]



RAIL POST & C₁ BAR SPACING

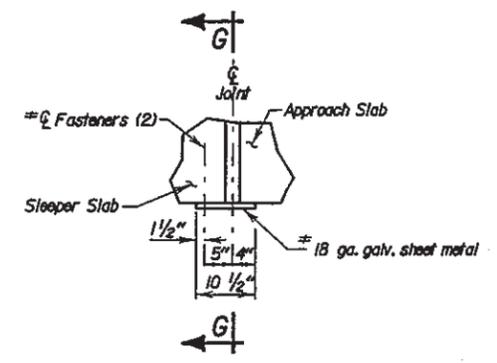
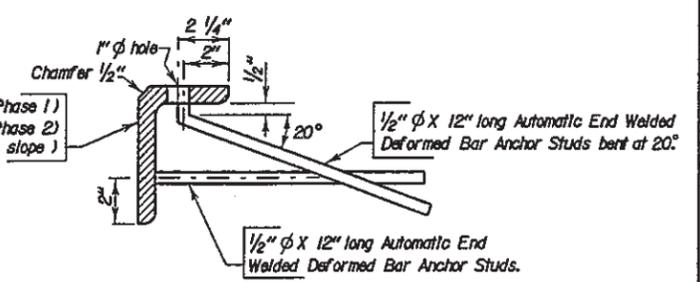


Camber is calculated for dead load plus plastic flow and shall be added to the proposed grade elevations at the respective stations to establish the elevations of the top of the finished roadway slab.



*The Drop Inlet will be placed as shown in Abutment No. 4 only.

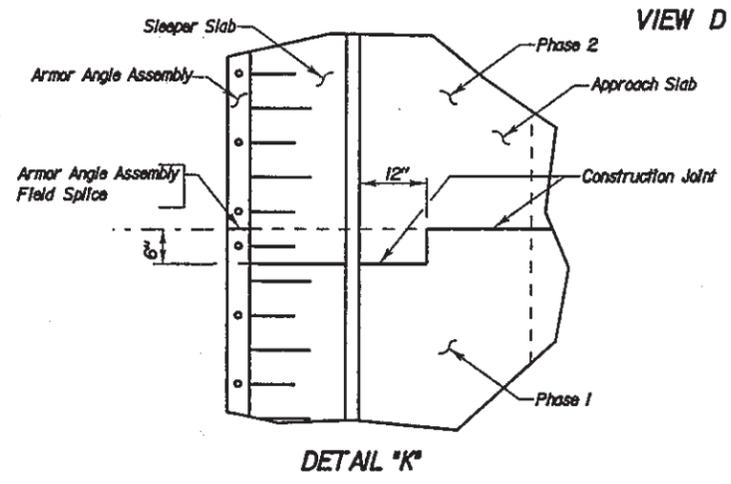
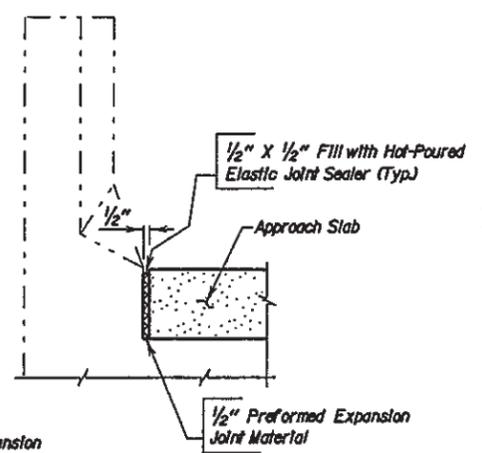
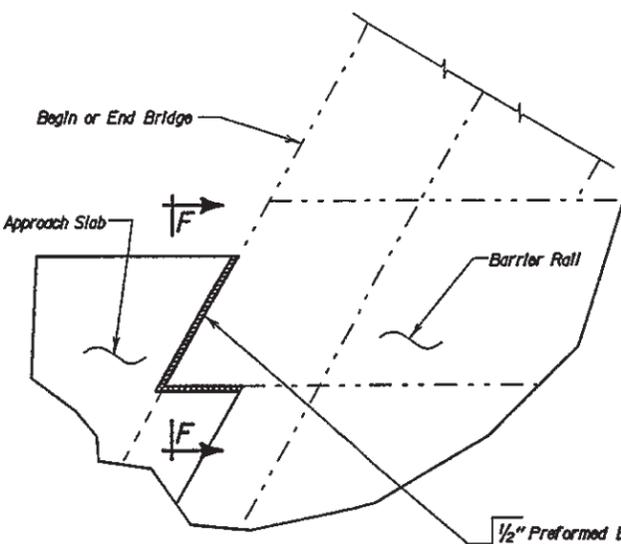
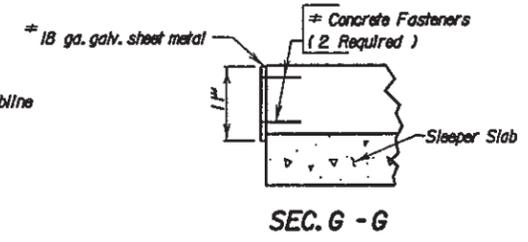
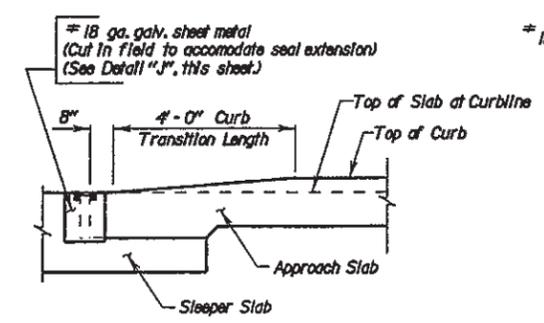
L 6" X 4" X 3/4" X 16'-11 1/4" (Phase 1)
 L 6" X 4" X 3/4" X 22'-11 1/4" (Phase 2)
 (conforms to crown slope)



*Attach 18 ga. galv. Sheet Metal to both ends of Sleeper Slab only after slab has been poured. Use fasteners that will not spall concrete, as approved by the Engineer.

*Elevation is Top of Slab back of Curb at this point. See Approach Slab Notes.

THE CONTRACTOR HAS THE OPTION OF BUILDING THE APPROACH SLABS FOR THE FULL WIDTH OF THE ROADWAY AT ONE TIME OR BUILDING THE APPROACH SLABS IN TWO PHASES USING THE PLAN SHOWN OPTIONAL CONSTRUCTION JOINT. ALL REFERENCES TO PHASE 1 AND PHASE 2 CONSTRUCTION ARE GIVEN IN THE EVENT THE CONTRACTOR ELECTS TO BUILD THE APPROACH SLABS IN TWO PHASES.



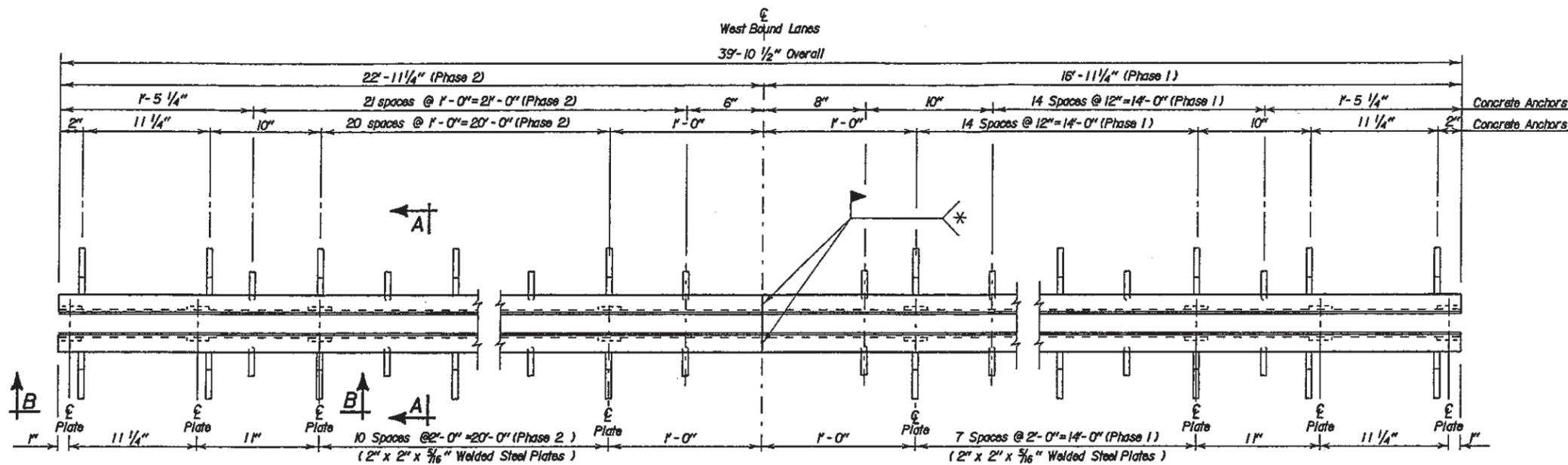
ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
 DETAILS OF APPROACH SLAB ADJ. TO BRIDGE
 FOR
137' - 3 3/4" CONTINUOUS CONCRETE BRIDGE
 38'-0" ROADWAY
 OVER LOCAL ROAD
 STR. NO. 41-160-083

SEC. 14/15-T6N-R3E
 IM 90-(K25) 19
 30° SKEW L. H. F.

LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 NOVEMBER 1999

DESIGNED BY EJA LAWR5361	DRAWN BY TB 5361A08	CHECKED BY CJD	APPROVED <i>John C. Cole</i> BRIDGE ENGINEER
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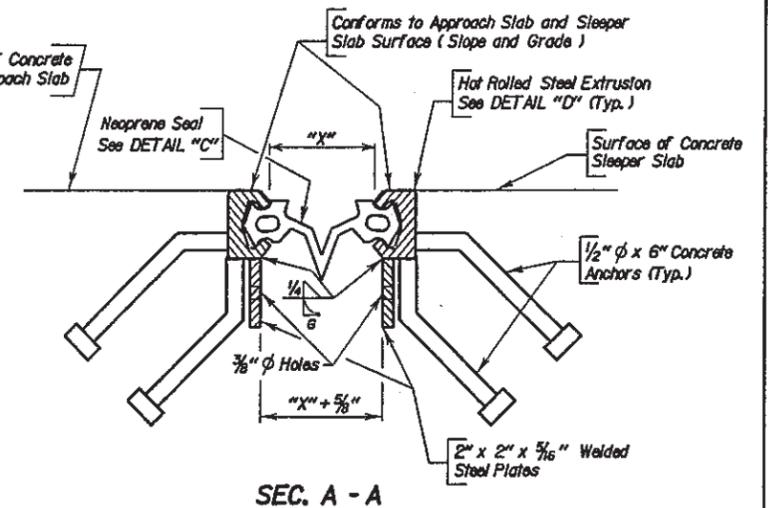
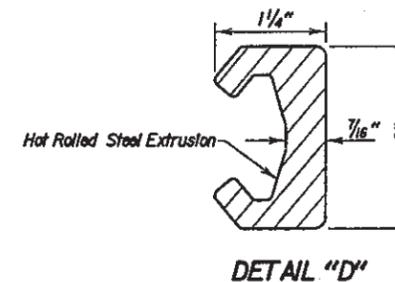


TEMP.	DIMENSION "X"
30°	2 1/4"
40°	2 3/16"
50°	2 1/8"
60°	2 1/16"
70°	2"
80°	1 5/8"
90°	1 7/8"

PLAN OF STRIP SEAL
(Neoprene Seal not shown)



DETAIL "C"
Neoprene Seal shall have a
3" movement capability.

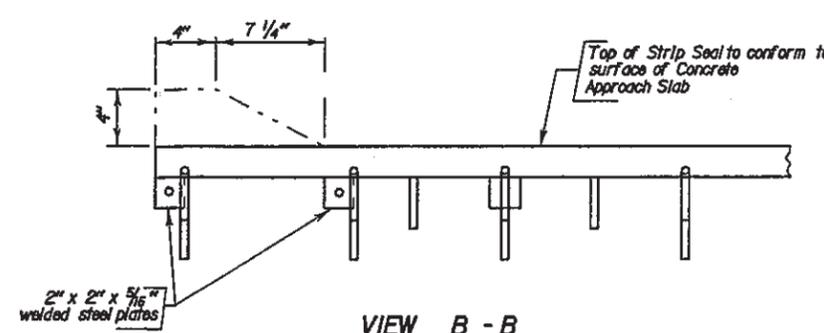


SEC. A - A

THE CONTRACTOR HAS THE OPTION OF BUILDING THE APPROACH SLABS FOR THE FULL WIDTH OF THE ROADWAY AT ONE TIME OR BUILDING THE APPROACH SLABS IN TWO PHASES USING THE PLAN SHOWN OPTIONAL CONSTRUCTION JOINT. ALL REFERENCES TO PHASE 1 AND PHASE 2 CONSTRUCTION ARE GIVEN IN THE EVENT THE CONTRACTOR ELECTS TO BUILD THE APPROACH SLABS IN TWO PHASES.

GENERAL NOTES:

- Materials for the Steel Extrusion shall conform to ASTM-A36, A242 or A588. Materials for the 2" x 2" x 5/16" welded steel plates shall conform to ASTM-A36. Material for the 1/2" diameter x 6" Concrete Anchors shall conform to Type A steel studs of Section 7 of the latest edition of the ANSI/AWS D1.1 Structural Welding Code-Steel.
- Material for the neoprene seal shall conform to ASTM D262B modified to omit the recovery test. No splices will be permitted in the neoprene seal.
- 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 installation of the neoprene seal shall be as recommended by its Manufacturer and approved by the Engineer, but in general shall be as follows: The neoprene seal shall be installed and bonded to the steel extrusion with a high-solids lubricant adhesive. The neoprene surfaces shall be roughened with a wire brush before the application of the lubricant adhesive. The neoprene seal may be installed either prior to or after the time the steel extrusions are concreted in the approach slabs. The steel extrusion shall be dry, clean, free from dirt, grease and contaminants at the time the neoprene seal is installed.
- Due to the length of the steel extrusions, splices are permitted. No welds shall be permitted in the internal section of the extrusion where the neoprene seal is located. Weld details shall be shown on the shop plans for approval by the Engineer. Welding shall be in accordance with latest edition of the ANSI/AWS D1.1 Structural Welding Code-Steel. Galvanize the steel extrusions and anything welded to them after all welding is completed. They shall be galvanized in accordance with AASHTO M111 (ASTM A123). If welded splices are used subsequent to galvanizing, the weld details and the procedures for preparing the surface for welding and repairing the galvanizing after welding shall be included with the shop plans.
- The thickness and shape of the neoprene seal may vary from the sketch shown (Detail "C" on this sheet) according to the manufacturer's design; however, the wedge lugs must properly fit the groove in the steel extrusion. Before installation, the shop plans of the proposed neoprene seal showing the fixed dimensions, thickness of neoprene seal, and dimensions pertinent to the fit of the neoprene seal in the steel extrusion shall be submitted to and approved by the Engineer.
- Since the configuration and dimensions of the steel extrusion may vary according to each manufacturer's design, they need not conform exactly to that shown in Detail "D", however, any deviations from the plan shown configuration or dimensions must be approved by the Office of Bridge Design.
- The Strip Seal Expansion Joint supplier shall submit a detailed gland installation procedure with the shop plans.
- The cost of welding shall be included in the unit cost for Strip Seal Expansion Joint.
- The neoprene seal shall be of sufficient length such that a minimum length of 6" shall extend beyond each end of the steel extrusions.
- The Strip Seal Expansion Joint will be measured in linear feet to the nearest one-tenth foot, complete in place. Measurement will be made of the overall horizontal length. The Strip Seal Expansion Joint will be paid for at the contract unit price per linear foot complete in place. Payment for this item shall be full compensation for furnishing all the required materials in place, inclusive of labor, equipment and incidentals necessary to complete the work in accordance with plans and the foregoing specifications.
- Due to phased construction, the steel extrusion shall be spliced in the field at the location shown above. The Weld Details and the procedures for preparing the surface for welding and repairing the galvanizing after welding shall be included with the shop plans.



VIEW B - B

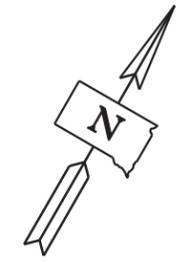
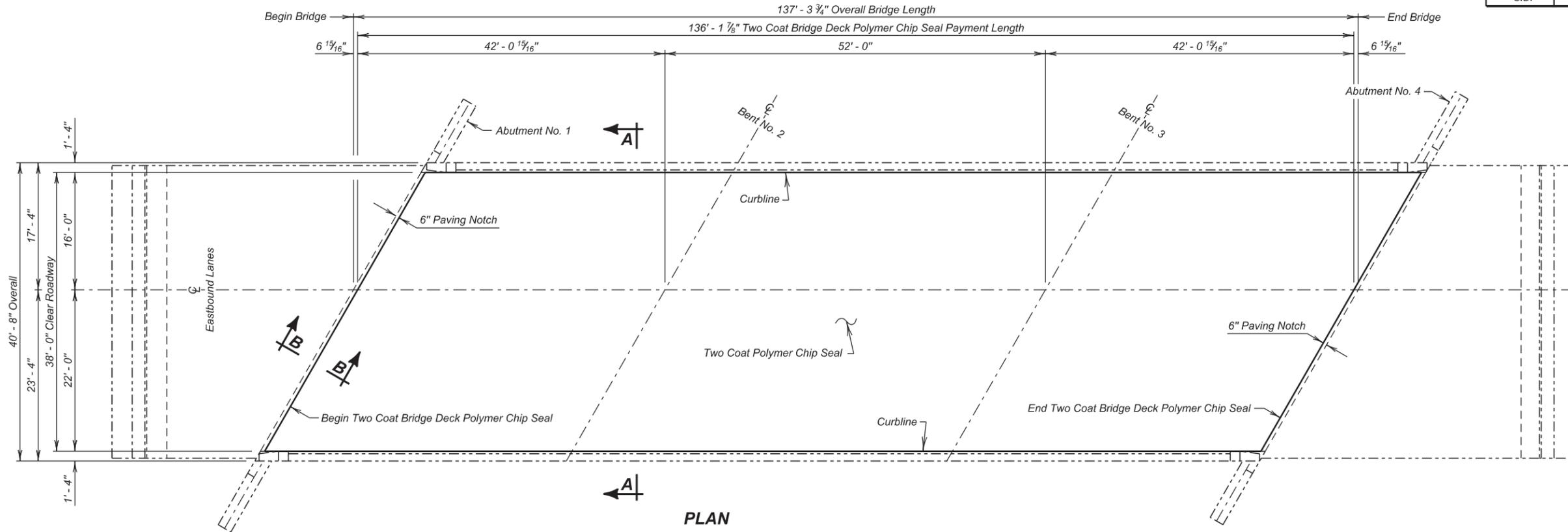
ESTIMATED QUANTITIES (For Two Approach Slabs)			
ITEM	UNIT	PHASE 1 QUANTITY	PHASE 2 QUANTITY
Strip Seal Expansion Joint	L.F.	33.9	45.9

ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
APPROACH SLAB JOINT DETAILS
FOR
137' - 3 3/4" CONTINUOUS CONCRETE BRIDGE
38'-0" ROADWAY
OVER LOCAL ROAD
STR. NO. 41-160-083

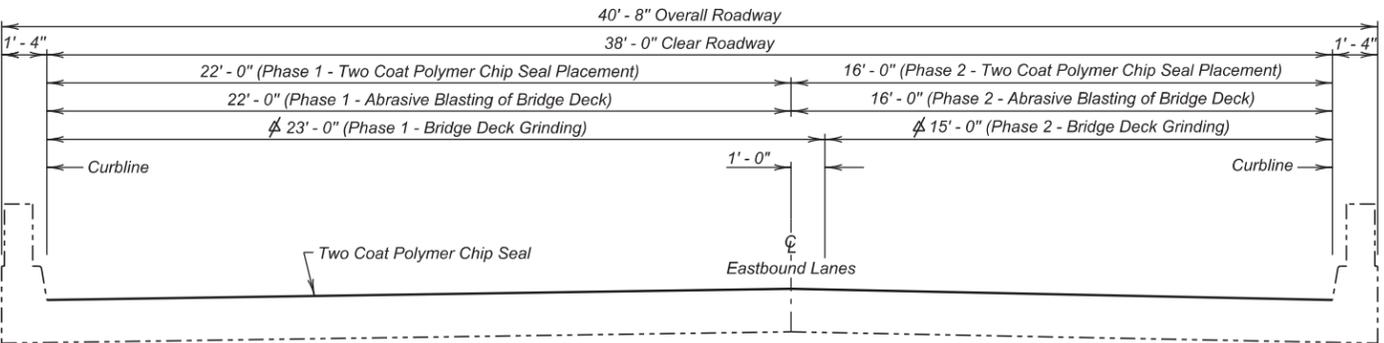
SEC. 14/15-T6N-R3E
IM 90-1(25) 19
30° SKEW L. H. F.

LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION
NOVEMBER 1999

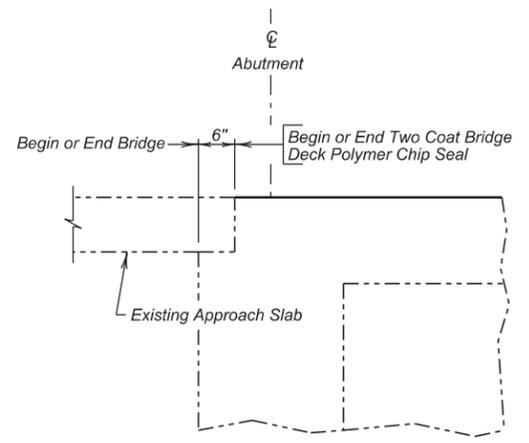


ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
		PHASE 1	PHASE 2
* Concrete Patching Material, Bridge Deck	Cu. Ft.	175.7	114.6
* Two Coat Bridge Deck Polymer Chip Seal	Sq. Yd.	333.2	242.3
Abrasive Blasting of Bridge Deck	Sq. Yd.	333.2	242.3
Bridge Deck Grinding	Sq. Yd.	348.3	227.2
* Concrete Removal, Class A	Sq. Yd.	14.0	9.1
* Concrete Removal, Class B	Sq. Yd.	14.0	9.1

* Concrete Patching Material, Bridge Deck; Concrete Removal, Class A; and Concrete Removal, Class B may not be encountered and may be removed from the project at the direction of the Engineer.



SECTION A - A



SECTION B - B

(EASTBOUND LANES)
 LAYOUT FOR UPGRADING & POLYMER CHIP SEAL DETAILS
 FOR
137' - 3 3/4" CONTINUOUS CONCRETE BRIDGE
 38' - 0" ROADWAY
 OVER LOCAL ROAD
 STR. NO. 41-160-084
 PCN 02PP

LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION

MARCH 2016

INDEX OF BRIDGE SHEETS -
 Sheet No. 1 - Layout for Upgrading and Polymer Chip Seal Details
 Sheet No. 2 - Estimate of Structure Quantities and Notes
 Sheet No. 3-4 - Original Construction Plans

∅ See Bridge Deck Grinding Notes on Sheet No. 2 of 4.

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
460E0172	Concrete Patching Material, Bridge Deck	290.3	CuFt
491E0005	Two Coat Polymer Bridge Deck Chip Seal	575.5	SqYd
491E0110	Abrasive Blasting of Bridge Deck	575.5	SqYd
491E0120	Bridge Deck Grinding	575.5	SqYd
491E0130	Concrete Removal, Class A	23.1	SqYd
491E0140	Concrete Removal, Class B	23.1	SqYd

SPECIFICATIONS

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.

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. 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 elsewhere 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 preconstruction meeting.

1. Perform bridge deck grinding and repair the bridge deck by removing all loose and delaminated concrete from the bridge deck surface for the first and second phase of construction.
2. Clean the bridge deck surface with abrasive blasting for the first phase of construction.
3. Place a Two Coat Polymer Bridge Deck Chip Seal for the first phase of construction.
4. Switch traffic and repeat steps 2 & 3 for the second phase of construction.

BRIDGE DECK GRINDING

The Contractor will have the option of grinding the entire deck surface during phase one. Any additional costs incurred for grinding the entire deck surface such as additional traffic control or cleaning shall be at no additional cost to the Department.

TWO COAT BRIDGE DECK POLYMER CHIP SEAL

The Two Coat Bridge Deck Polymer Chip Seal shall be applied in accordance with the Construction Specifications.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES FOR 137' - 3³/₄" CONT. CONCRETE BRIDGE

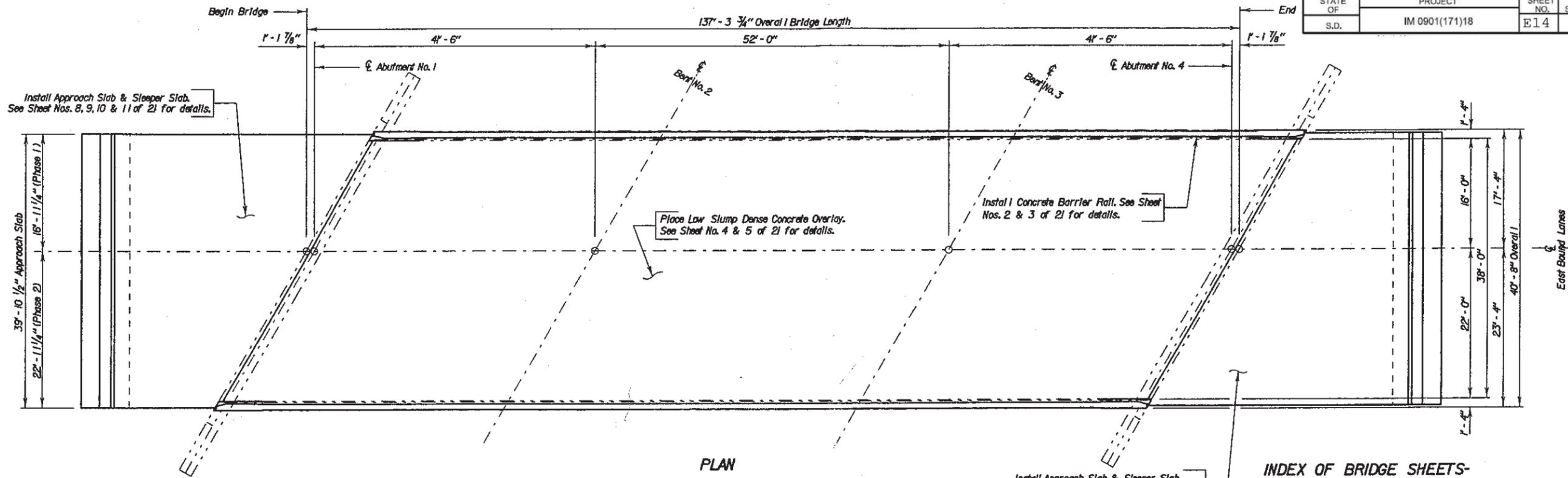
STR. NO. 41-160-084

JANUARY 2015

2 OF 4

DESIGNED BY KH	CK. DES. BY KSK	DRAFTED BY KH	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
LAWR02PP	02PPK802		

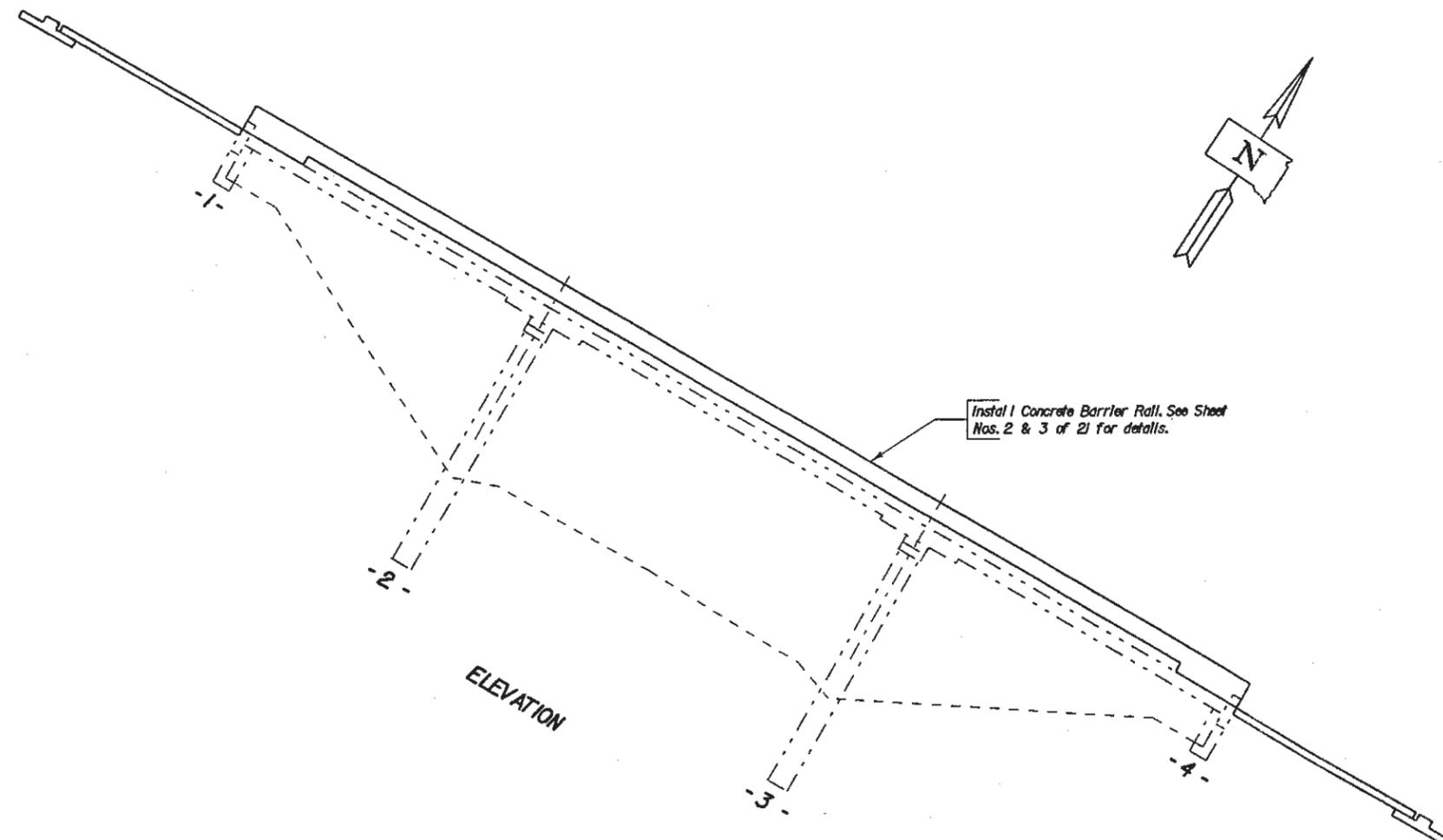
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E14	E82



PLAN

INDEX OF BRIDGE SHEETS-

- Sheet No. 1 - Layout for Upgrading
- Sheet No. 2 - Bridge Rail Replacement Details
- Sheet No. 3 - Bridge Rail Replacement Details (Continued)
- Sheet No. 4 - Deck Profiles for Low Slump Dense Concrete Overlay
- Sheet No. 5 - Deck Profiles for Low Slump Dense Concrete Overlay
- Sheet No. 6 - As - Built Elevation Survey
- Sheet No. 7 - As - Built Elevation Survey (Continued)
- Sheet No. 8 - Approach Slab Layout
- Sheet No. 9 - Details of Approach Slab Adjacent to Abutment No. 1
- Sheet No. 10 - Details of Approach Slab Adjacent to Abutment No. 4
- Sheet No. 11 - Details of Approach Slab Adjacent to Abutments
- Sheet No. 12 - Details of Approach Slab Joint
- Sheet No. 13 - Details of Standard Plate Nos. 460.03 & 630.79
- Sheet Nos. 14 through 21 - Original Construction Plans



ELEVATION

THE CONTRACTOR HAS THE OPTION OF BUILDING THE APPROACH SLABS FOR THE FULL WIDTH OF THE ROADWAY AT ONE TIME OR BUILDING THE APPROACH SLABS IN TWO PHASES USING THE PLAN SHOWN OPTIONAL CONSTRUCTION JOINT. ALL REFERENCES TO PHASE 1 AND PHASE 2 CONSTRUCTION ARE GIVEN IN THE EVENT THE CONTRACTOR ELECTS TO BUILD THE APPROACH SLABS IN TWO PHASES.

ORIGINAL CONSTRUCTION PLANS

(EAST BOUND LANES)
LAYOUT FOR UPGRADING

137'-3 3/4" CONTINUOUS CONCRETE BRIDGE

38'-0" ROADWAY
OVER LOCAL ROAD
STR. NO. 41-160-084
PCEMS NO. 5584

SEC. 14/15-T6N-R3E
IM 90-1(45) 18
30° SKEW L. H. F.

LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION

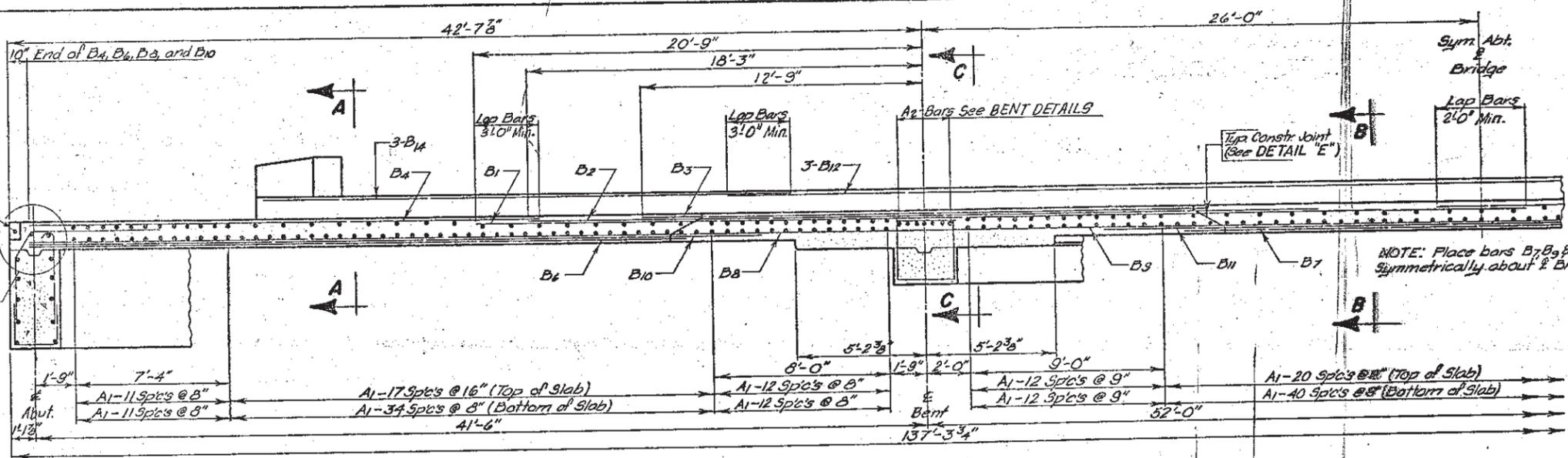
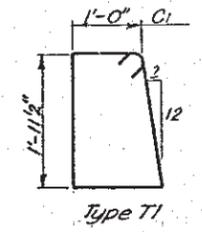
JUNE 2000 3 OF 4

PLANS BY : OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

DESIGNED BY EJA LAWR5584	DRAWN BY TB 5584SA01	CHECKED BY CJD	APPROVED <i>John C. Cole</i> BRIDGE ENGINEER
--------------------------------	----------------------------	-------------------	--

REINFORCING SCHEDULE					
BAR	No.	Size	Length	Type	Bending Details
A1	308	5	46'-6"	Str.	
A3	2	5	43'-6"	Str.	
B1	48	10	48'-9"	Str.	
B2	44	11	36'-6"	Str.	
B3	92	10	26'-0"	Str.	
B4	48	9	24'-3"	Str.	
B5	12	11	42'-6"	Str.	
B6	92	11	30'-9"	Str.	
B7	46	11	28'-0"	Str.	
B8	46	10	41'-9"	Str.	
B9	23	10	52'-0"	Str.	
B10	44	11	34'-3"	Str.	
B11	22	11	35'-6"	Str.	
B12	12	11	48'-9"	Str.	
B13	6	11	52'-0"	Str.	
B14	12	8	24'-9"	Str.	
C1	26B	4	7'-3"	TI	

Note: All dimensions are out to out of bars.



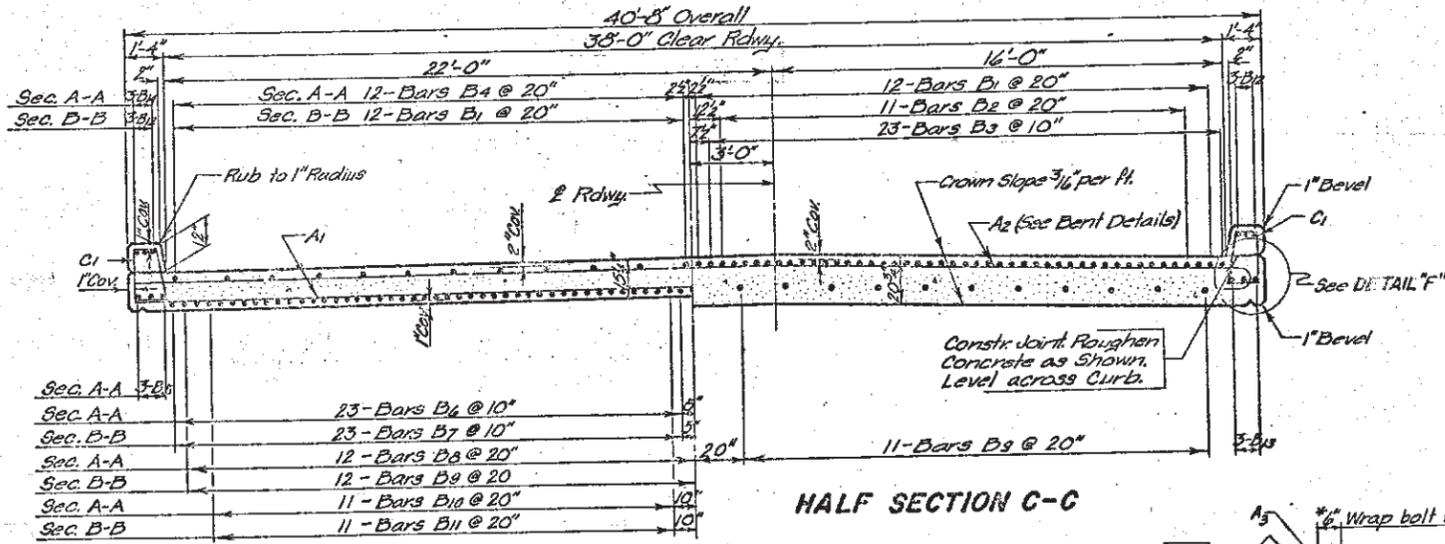
HALF LONGITUDINAL SECTIONAL VIEW
(Railings not shown)

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Class A Concrete	Cu. Yds.	873.6
Reinforcing Steel	Lbs.	104,885
Structural Steel	Lbs.	55
RT-3A Steel/Railing	Lin. Ft.	2601

*Does not include slabs and curbs directly over abutments or end blocks.
*The weight of 22- $\frac{5}{8}$ " x 26" galv. bolts.

GENERAL NOTES—

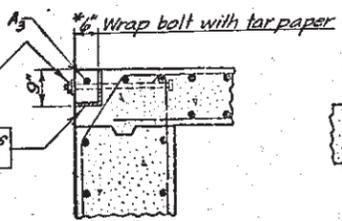
- These notes cover Abutments, Bents, Superstructure and Railing Details. The General Drawing will show elevations and other necessary notes and details.
 - Design Specifications: A.A.S.H.O. Specifications for Highway Bridges, 1965.
 - Filing: See General Drawing for length of piling.
 - Structural Steel: All $\frac{5}{8}$ " bolts including washers, and all pile connections in Abutments shall be paid for as Structural Steel.
 - Reinforcing Steel: All reinforcing steel shall conform to A.S.T.M. Specifications.
 - Concrete: All concrete shall be Class "A".
- All exposed concrete corners and edges shall be chamfered to a $\frac{3}{4}$ " bevel unless otherwise noted. If necessary to facilitate construction, transverse construction joints may be made at the quarter points of each and any span adjacent to interior bents. If these joints are used, submit a concrete pouring sequence to the BRIDGE SECTION for approval.
- All costs for expansion joint filler and tar paper shall be included in the unit price bid for Class "A" Concrete.
- Design Loading: HS20-44 A.A.S.H.O.
Limit Stresses: Concrete $f_c = 1600$ p.s.i.
Re-Steel $f_s = 20,000$ p.s.i.
Equivalent fluid pressure of earth at 40 Lbs./sq. ft.
Minimum Pile Loading = 24 tons for timber piling.



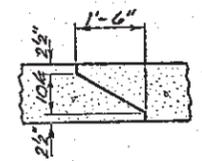
HALF SECTION C-C

HALF SECTION A-A
HALF SECTION B-B

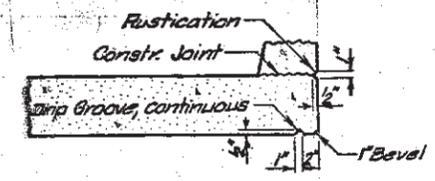
5" x 26" galv. bolts with wrought iron washers. 22 Req'd for the bridge. Wrap end with tar paper.
6" Premolded Bituminous Expansion Joint Filler.



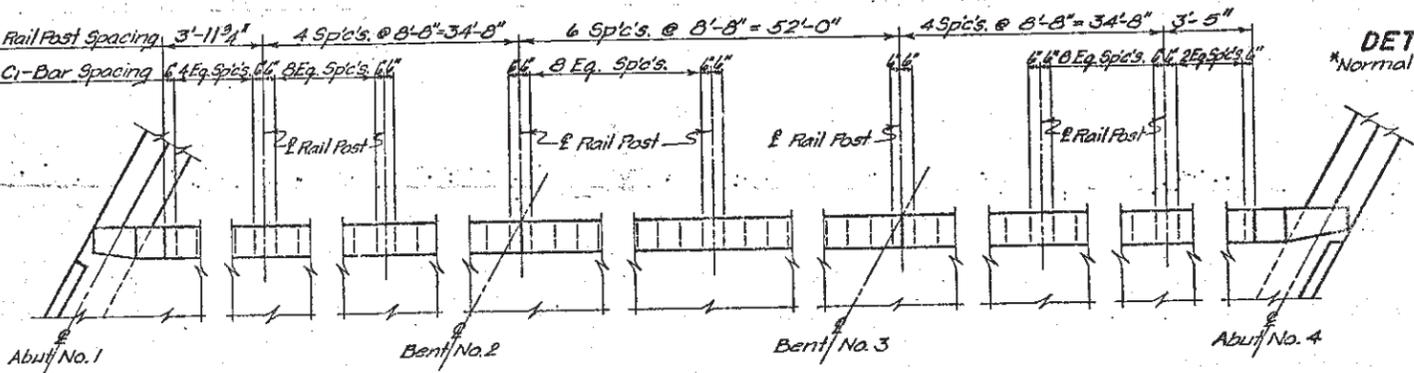
DETAIL "D"
*Normal to R.Rdwy.



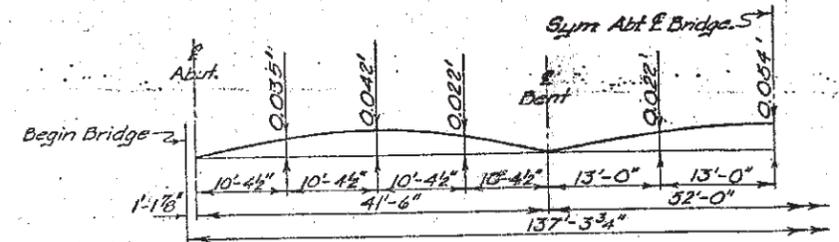
DETAIL "E"
(Typical Constr. Joint)



DETAIL "F"



RAIL POST & C1 BAR SPACING



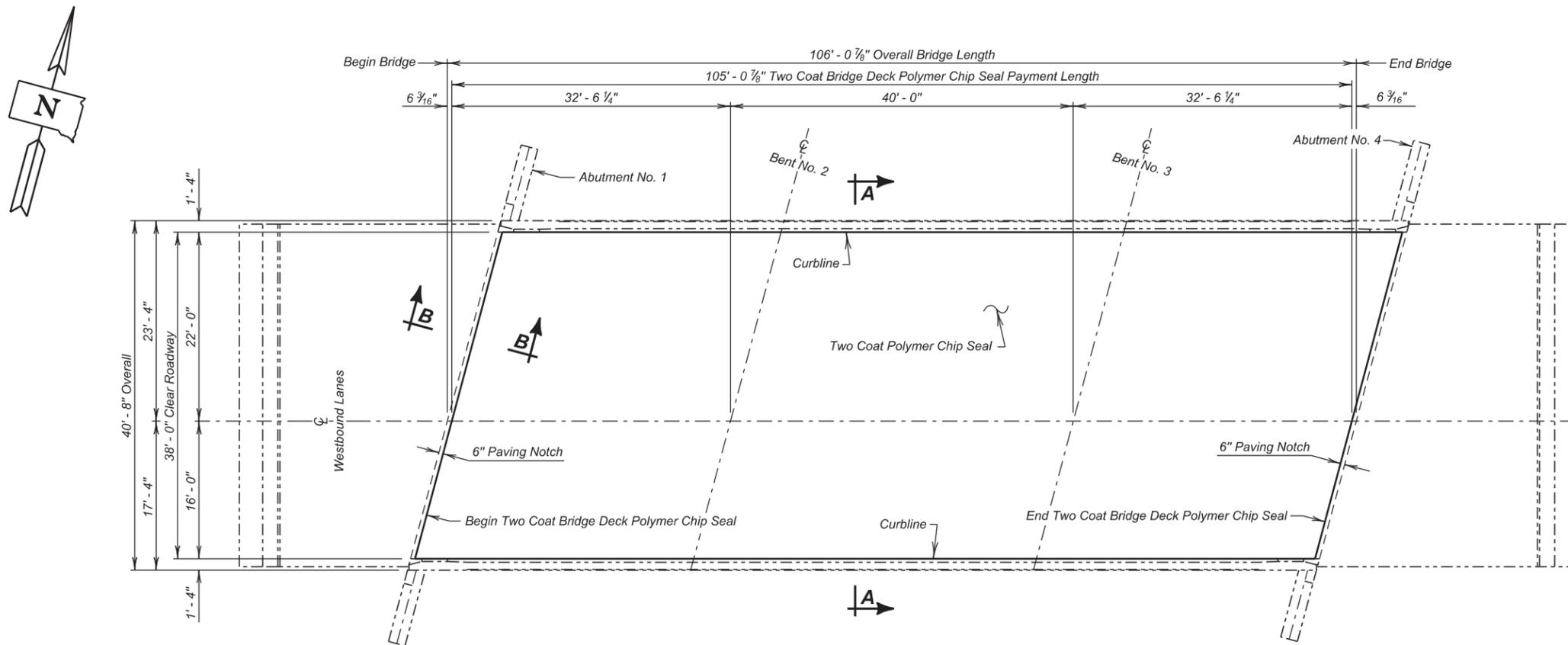
CAMBER DIAGRAM

Camber is calculated for dead load plus plastic flow and shall be added to the proposed grade elevations at the respective stations to establish the elevations of the top of the finished roadway slab.

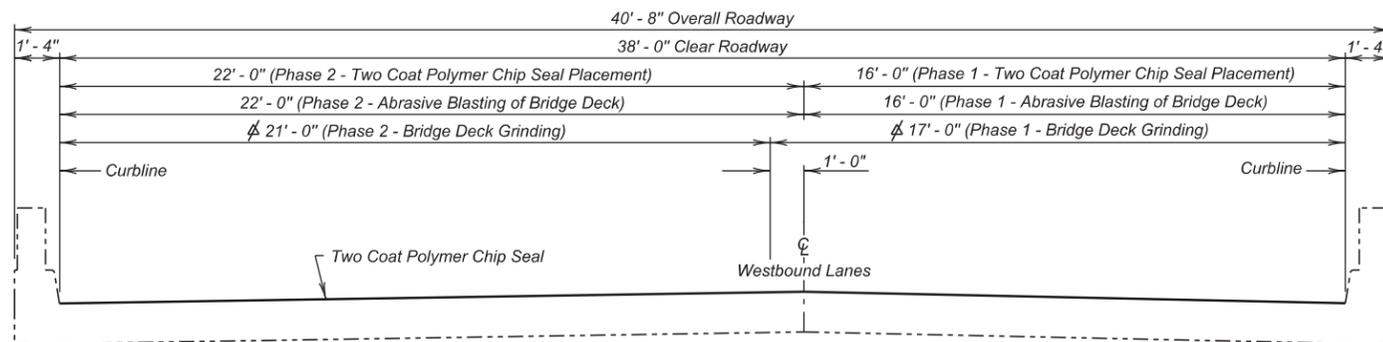
ORIGINAL CONSTRUCTION PLANS

(EAST BOUND LANES)
SUPERSTRUCTURE DETAILS
FOR
137'-3 3/4" CONTINUOUS CONCRETE BRIDGE
38'-0" ROADWAY 30° SKEW L.H.F.
OVER LOCAL ROAD SEC. 14/15-T6N-R3E
STA. 987+17.041 TO 988+54.350 I 90-1(27)IS
STR. NO. 41-160-084 LAWRENCE COUNTY
SOUTH DAKOTA HS20-44
DEPARTMENT OF HIGHWAYS (8 ALT.)
APRIL 1968 4 OF 4

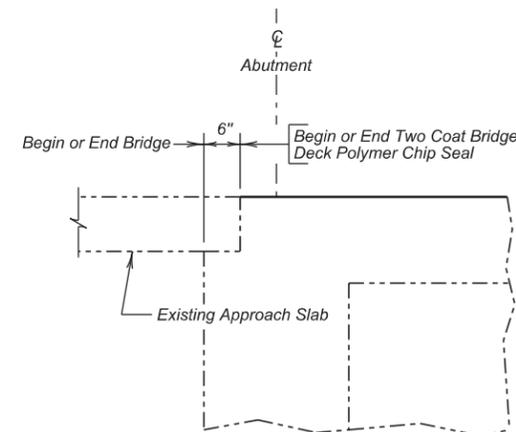
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	L.E.M.	GA	<i>[Signature]</i> BRIDGE ENGINEER



PLAN



SECTION A - A



SECTION B - B

ITEM	UNIT	QUANTITY	
		PHASE 1	PHASE 2
* Concrete Patching Material, Bridge Deck	Cu. Ft.	23.6	23.6
Two Coat Bridge Deck Polymer Chip Seal	Sq. Yd.	186.8	256.8
Abrasive Blasting of Bridge Deck	Sq. Yd.	186.8	256.8
Bridge Deck Grinding	Sq. Yd.	198.4	245.2
* Concrete Removal, Class A	Sq. Yd.	2.0	2.0
* Concrete Removal, Class B	Sq. Yd.	2.0	2.0

* Concrete Patching Material, Bridge Deck; Concrete Removal, Class A; and Concrete Removal, Class B may not be encountered and may be removed from the project at the direction of the Engineer.

(WESTBOUND LANES)
LAYOUT FOR UPGRADING & POLYMER CHIP SEAL DETAILS
FOR

106' - 0 7/8" CONTINUOUS CONCRETE BRIDGE

38' - 0" ROADWAY
OVER POLO CREEK
STR. NO. 41-161-082
PCN 02PP

15° SKEW L.H.F.
SEC. 14 - T6N - R3E
IM 0901(171)18

LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION

MARCH 2016

1 OF 4

INDEX OF BRIDGE SHEETS -

Sheet No. 1 - Layout for Upgrading and Epoxy Chip Seal Details
Sheet No. 2 - Estimate of Structure Quantities and Notes
Sheet Nos. 3 & 4 - Original Construction Plans

See Bridge Deck Grinding Notes on Sheet No. 2 of 4.

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
460E0172	Concrete Patching Material, Bridge Deck	47.2	CuFt
491E0005	Two Coat Bridge Deck Polymer Chip Seal	443.6	SqYd
491E0110	Abrasive Blasting of Bridge Deck	443.6	SqYd
491E0120	Bridge Deck Grinding	443.6	SqYd
491E0130	Concrete Removal, Class A	4.0	SqYd
491E0140	Concrete Removal, Class B	4.0	SqYd

SPECIFICATIONS

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.

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. 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 elsewhere 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 preconstruction meeting.

1. Perform bridge deck grinding and repair the bridge deck by removing all loose and delaminated concrete from the bridge deck surface for the first and second phase of construction.
2. Clean the bridge deck surface with abrasive blasting for the first phase of construction.
3. Place a Two Coat Polymer Bridge Deck Chip Seal for the first phase of construction.
4. Switch traffic and repeat steps 2 & 3 for the second phase of construction.

BRIDGE DECK GRINDING

The Contractor will have the option of grinding the entire deck surface during phase one. Any additional cost incurred for grinding the entire deck surface such as additional traffic control or cleaning shall be at no additional cost to the Department.

TWO COAT BRIDGE DECK POLYMER CHIP SEAL

The Two Coat Bridge Deck Polymer Chip Seal shall be applied in accordance with the Construction Specifications.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES FOR 106' - 0⁷/₈" CONT. CONCRETE BRIDGE

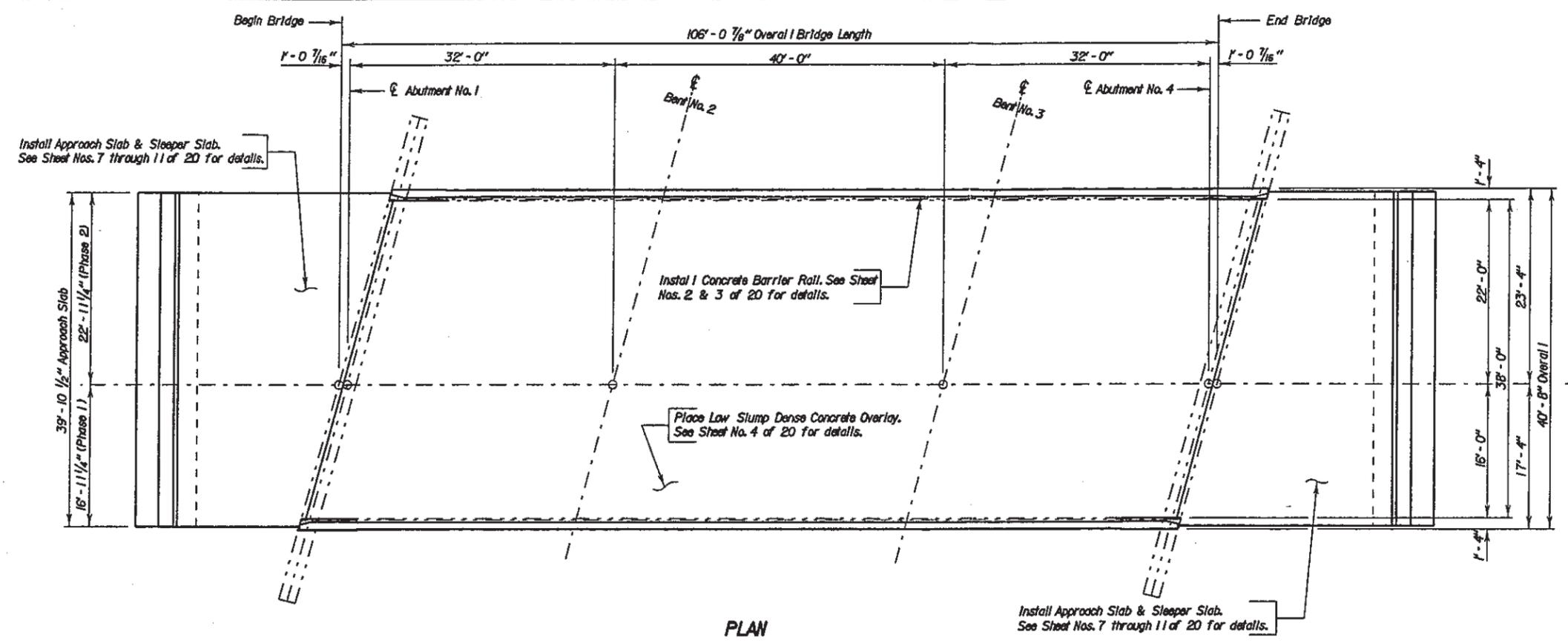
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JANUARY 2015

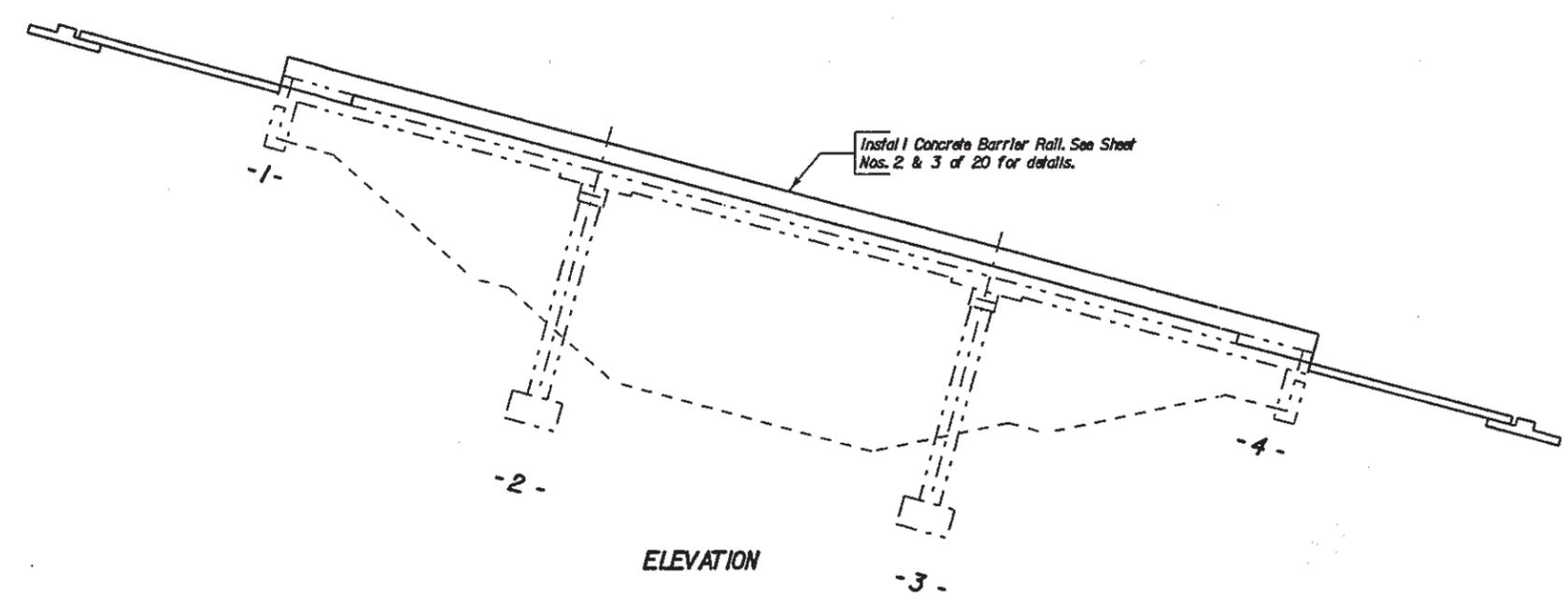
2 OF 4

DESIGNED BY KH	CK. DES. BY KSK	DRAFTED BY KH	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
LAWR02PP	02PPKC02		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E18	E82



PLAN



ELEVATION

- INDEX OF BRIDGE SHEETS-**
- Sheet No. 1 - Layout for Upgrading
 - Sheet No. 2 - Bridge Rail Modification Details
 - Sheet No. 3 - Bridge Rail Modification Details (Continued)
 - Sheet No. 4 - Deck Profiles for Low Slump Dense Concrete Overlay
 - Sheet No. 5 - As-Built Elevation Survey
 - Sheet No. 6 - As-Built Elevation Survey (Continued)
 - Sheet No. 7 - Approach Slab Layout
 - Sheet No. 8 - Details of Approach Slab Adjacent to Abutments
 - Sheet No. 9 - Details of Approach Slab Adjacent to Abutments
 - Sheet No. 10 - Details of Approach Slab Adjacent to Abutments
 - Sheet No. 11 - Details of Approach Slab Joint
 - Sheet No. 12 - Details of Standard Plate Nos. 460.12 & 630.70
 - Sheet Nos. 13 through 20 - Original Construction Plans

ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
 LAYOUT FOR UPGRADING
106'-0 7/8" CONTINUOUS CONCRETE BRIDGE
 38'-0" ROADWAY OVER POLO CREEK
 STR. NO. 41-161-082
 PCEMS NO. 5361

SEC. 14-T6N-R3E
 IM 90-(25) 19
 15° SKEW L. H. F.

THE CONTRACTOR HAS THE OPTION OF BUILDING THE APPROACH SLABS FOR THE FULL WIDTH OF THE ROADWAY AT ONE TIME OR BUILDING THE APPROACH SLABS IN TWO PHASES USING THE PLAN SHOWN OPTIONAL CONSTRUCTION JOINT. ALL REFERENCES TO PHASE 1 AND PHASE 2 CONSTRUCTION ARE GIVEN IN THE EVENT THE CONTRACTOR ELECTS TO BUILD THE APPROACH SLABS IN TWO PHASES.

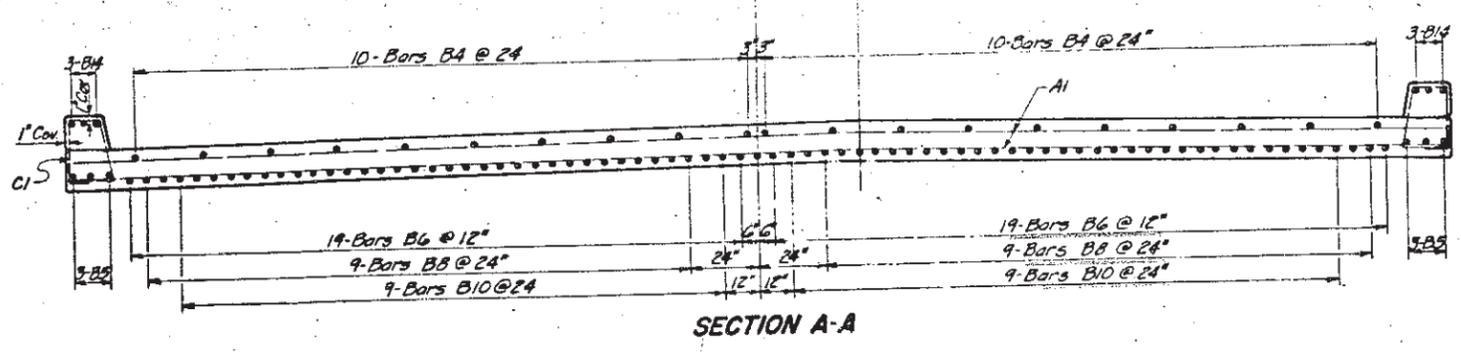
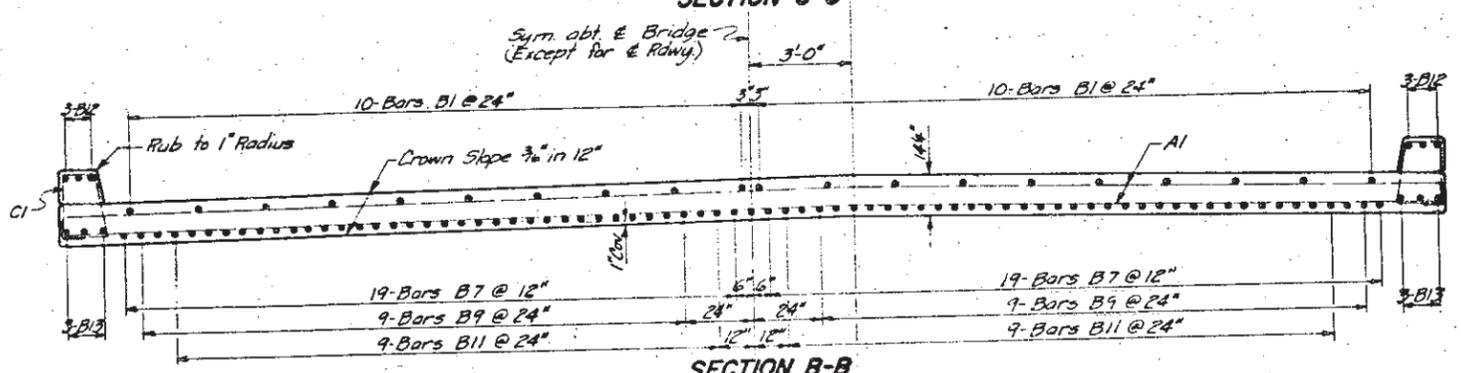
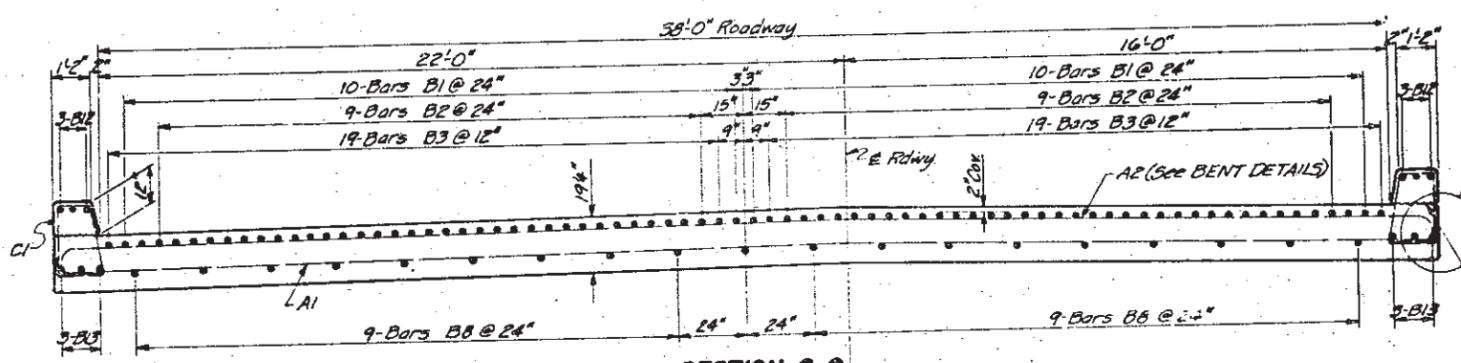
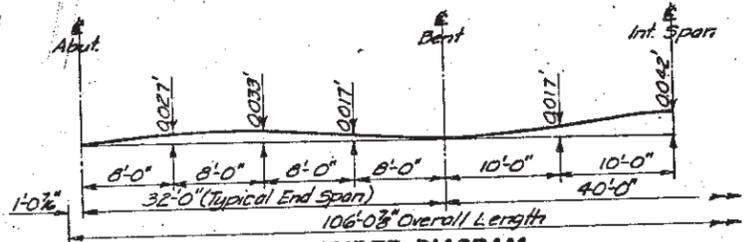
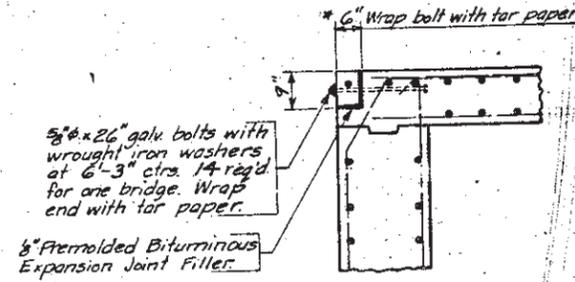
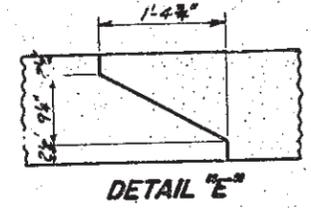
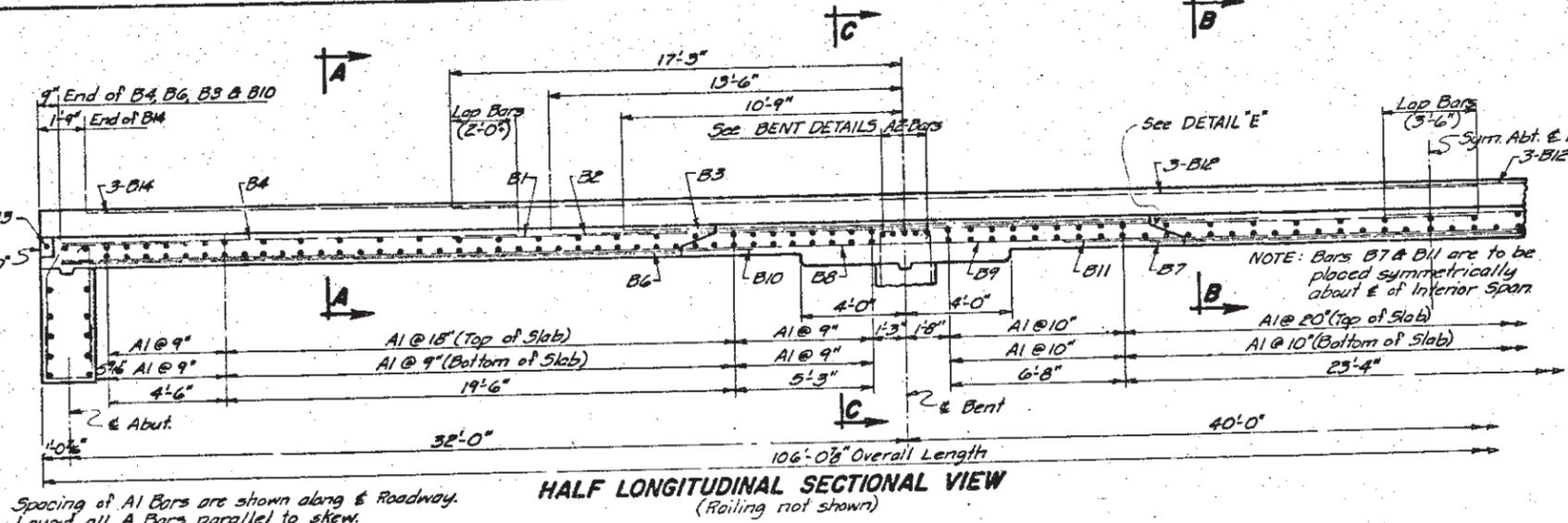
LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 NOVEMBER 1999

PLANS BY :
 OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

DESIGNED BY EJA LAWR5361	DRAWN BY TB 5361BBOI	CHECKED BY CJD	APPROVED <i>John C. Cole</i> BRIDGE ENGINEER
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REINFORCING SCHEDULE				
Mk. No.	Size	Length	Type	Bending Details
A1	210	5	41'-9"	Str.
A3	2	5	39'-0"	
B1	40	10	39'-0"	
B2	36	9	27'-0"	
B3	76	10	21'-6"	
B4	40	9	17'-6"	
B5	12	10	32'-9"	
B6	76	9	23'-6"	
B7	38	9	21'-6"	
B8	38	10	32'-3"	
B9	19	10	40'-0"	
B10	36	10	26'-6"	
B11	18	10	28'-0"	
B12	12	10	39'-0"	
B13	6	10	40'-0"	
B14	12	8	16'-6"	Str.
C1	192	4	7'-0"	T1

NOTE: All dimensions are out to out of bar.



NOTES--

These notes cover Substructure, Superstructure and Railing Details. The General Drawing for each structure will show elevations and other necessary notes and details.

DESIGN SPECIFICATIONS: A.A.S.H.O. Specifications for Highway Bridges, 1969.

PILING: See General Drawing for length of Treated Timber and Steel Piles.

STRUCTURAL STEEL: All 5/8" bolts, including washers, and all pile connections in Abuts. and all floor drains shall be paid for as Struct. Steel.

REINFORCING STEEL: All Reinforcing Steel shall conform to A.S.T.M.-A615, Grade 40.

CONCRETE: All concrete shall be Class 'A'. All exposed concrete corners and edges shall be chamfered to a 3/4" bevel unless noted otherwise. If necessary to facilitate construction, transverse construction joints may be made at the quarter points of each and any span, adjacent to interior bents. All costs for expansion joint filler and tar paper shall be included in the unit price bid per cu. yd. for Class 'A' Concrete.

DESIGN DATA: Design Loading: HS20-44 A.A.S.H.O. and Alternate Loading designated in P.P.M. 20-4, Sec. 4c. Unit Stresses: Concrete $f_c = 1600$ p.s.i. $n = 8$; Reinforcing Steel $f_s = 29,000$ p.s.i. (Int. Grade Steel). Equivalent fluid pressure of earth at 40' $w = 59$ p.s.f. Minimum Pile Loading = 24 tons per timber pile and 35 tons per steel pile.

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Class 'A' Concrete	Cu. Yds.	2097
Reinforcing Steel	Lbs.	53485
Structural Steel	Lbs.	130

* Does not include slab and curbs directly over abutments.
* Weight of 1/4"-5/8" Bolts and Washers and 8 floor drains.

ORIGINAL CONSTRUCTION PLANS

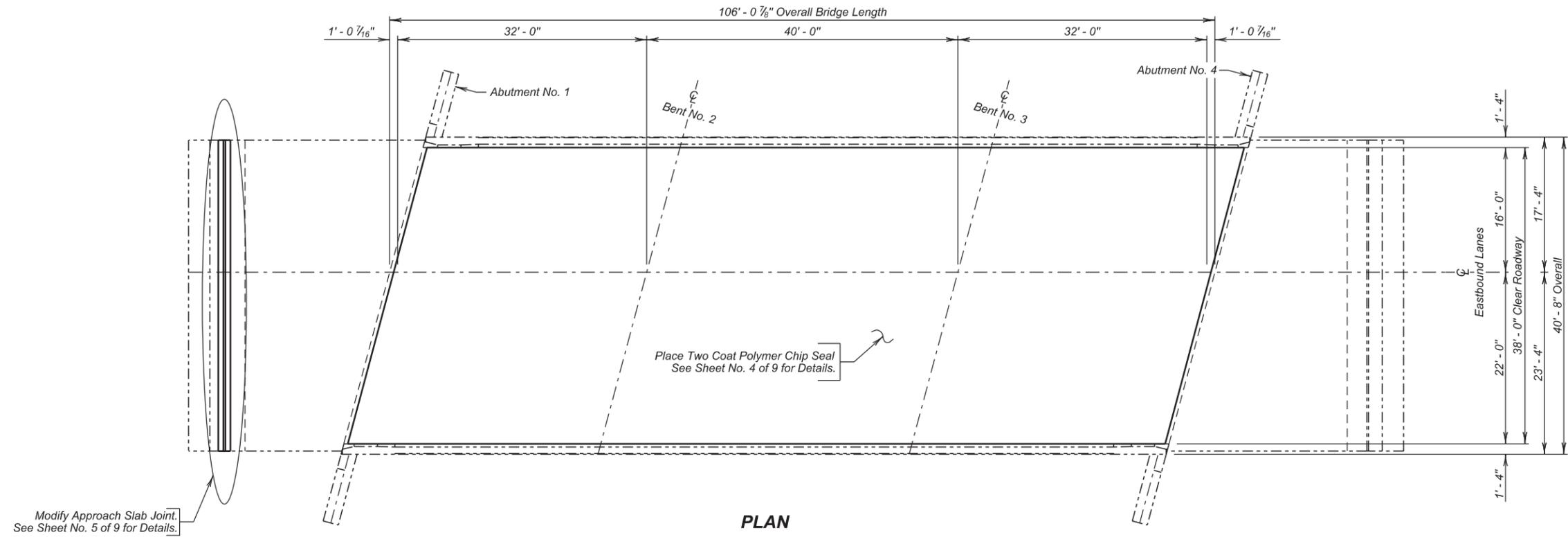
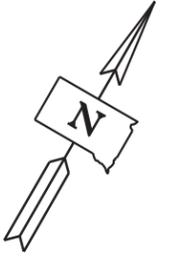
(WEST BOUND LANES)
SUPERSTRUCTURE DETAILS
FOR

106'-0 3/8" CONTINUOUS CONCRETE BRIDGE
38'-0" ROADWAY
OVER POLO CREEK
STA. 1000+08.219 TO 1001+14.289
STR. NO. 41-161-082 LAWRENCE COUNTY
SOUTH DAKOTA HS20-44
DEPARTMENT OF HIGHWAYS (3 ALT.)
MAY 1968

15' SKEW L.H.F.
SEC. 14-T6N-R3E
1 90-12715

DESIGNED BY	D.G.	CHECKED BY	K.R.S.	APPROVED	<i>[Signature]</i> BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E20	E82



PLAN

INDEX OF BRIDGE SHEETS -

- Sheet No. 1 - Layout for Upgrade
- Sheet No. 2 - Estimate of Structure Quantities and Notes
- Sheet No. 3 - Notes (Continued)
- Sheet No. 4 - Two Coat Polymer Chip Seal Details
- Sheet No. 5 - Approach Slab Joint Replacement
- Sheet Nos. 6 -9 - Original Construction Plans

**(EASTBOUND LANES)
LAYOUT FOR UPGRADE**

FOR

106' - 0 7/8" CONTINUOUS CONCRETE BRIDGE

38' - 0" ROADWAY
OVER POLO CREEK
STR. NO. 41-162-082
PCN 02PP

15° SKEW L.H.F.
SEC. 14 - T6N - R3E
IM 0901(171)18

LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION

MARCH 2016

PLANS BY:
OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

DESIGNED BY KH LAWR02PP	CK. DES. BY KSK 02PPRD01	DRAFTED BY KR <i>Kevin N. Coeden</i> BRIDGE ENGINEER
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ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
410E2600	Membrane Sealant Expansion Joint	39.8	Ft
460E0172	Concrete Patching Material, Bridge Deck	393.0	CuFt
460E0300	Breakout Structural Concrete	2.0	CuYd
480E0200	Epoxy Coated Reinforcing Steel	123	Lb
480E0505	No. 5 Rebar Splice	3	Each
480E5000	Galvanic Anode	21	Each
491E0005	Two Coat Polymer Bridge Deck Chip Seal	443.6	SqYd
491E0110	Abrasive Blasting of Bridge Deck	443.6	SqYd
491E0120	Bridge Deck Grinding	443.6	SqYd
491E0130	Concrete Removal, Class A	38.1	SqYd
491E0140	Concrete Removal, Class B	38.1	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.

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. 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 elsewhere 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 preconstruction meeting.

- Perform bridge deck grinding and repair the bridge deck by removing all loose and delaminated concrete from the bridge deck surface for the first and second phase of construction.
- Repair the bridge deck and approach slab by removing and replacing all loose and delaminated concrete from the surface for the first phase of construction.
- Clean the bridge deck surface with abrasive blasting for the first phase of construction.
- Place a Two Coat Polymer Bridge Deck Chip Seal for the first phase of construction.

- Remove and replace west joint between approach slab and sleeper slab for the first phase of construction.
- Switch traffic and repeat steps 2 through 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.

APPROACH SLAB REPAIR

- The removal and replacement of the delaminated concrete on the approach slab shall be in accordance with Section 491 of the Construction Specifications except as follows:
 - Curing compounds may be used to cure the approach slab concrete patches in accordance with Section 460.3M of the Construction Specifications.
 - The surface of the approach slab concrete patches shall be tined.

CONCRETE BREAKOUT

- The existing approach slab and sleeper slab 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.
- All broken out concrete, discarded reinforcing bars and expansion devices shall be disposed of by the Contractor. Any disposal of discarded material shall be in accordance with the Environmental Commitments.

- The contract unit price per cubic yard for "Breakout Structural Concrete" shall include breaking out concrete, cleaning, straightening existing reinforcing steel, removal of the existing armored device, and disposal of all broken out material.

MECHANICAL REBAR SPLICES

Mechanical splice devices will be required for the transverse reinforcing steel in the approach slab joint replacement. The mechanical rebar splices shall be in accordance with Section 480 of the Construction Specifications.

BRIDGE DECK GRINDING

The Contractor will have the option of grinding the entire deck surface during phase one. Any additional costs incurred for grinding the entire deck surface such as additional traffic control or cleaning shall be at no additional cost to the Department.

TWO COAT POLYMER BRIDGE DECK CHIP SEAL

The Two Coat Polymer Bridge Deck Chip Seal shall be applied in accordance with the Construction Specifications.

MEMBRANE SEALANT EXPANSION JOINT

- Install all membrane sealant expansion joints at the plan shown locations in conformance to the following notes.
- The Membrane Sealant shall be one of membrane sealant types from the approved product list for Membrane Sealant Expansion Joints.
- The manufacturer shall supply the membrane sealant in packaging that precompresses the membrane sealant. The precompressed dimension shall be as recommended by the sealant manufacturer to provide a water tight seal throughout a joint movement range of + 25% (minimum) from the specified joint opening dimension. In no case shall the precompressed dimension exceed 75% of the joint opening width. The foam sealant shall be slowly self-expanding to permit workers ample time to install the membrane sealant before the membrane sealant exceeds the joint opening width.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES FOR 106' - 0⁷/₈" CONT. CONCRETE BRIDGE

STR. NO. 41-162-082
JANUARY 2015

2 OF 9

DESIGNED BY KH	CK. DES. BY KSK	DRAFTED BY KH	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
LAWR02PP	02PPK002		

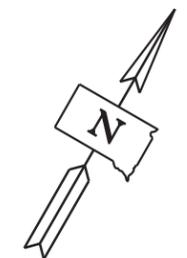
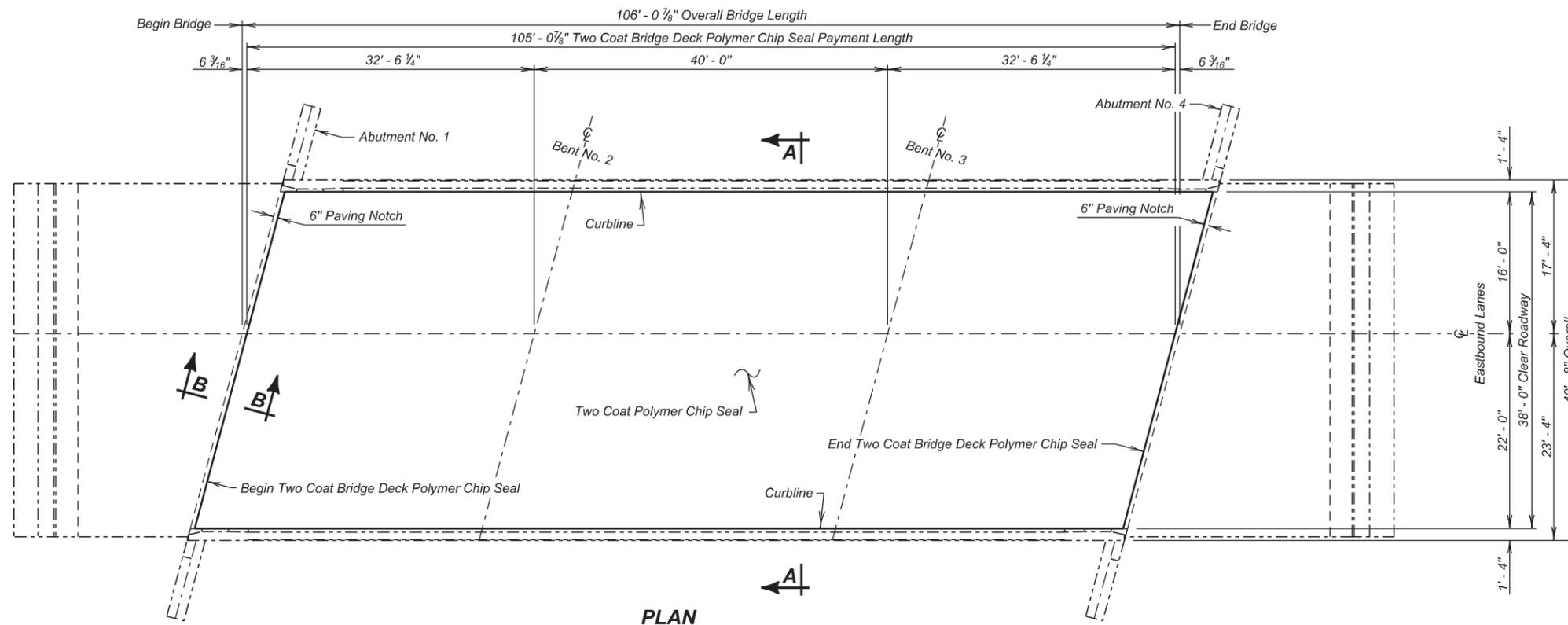
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E22	E82

MEMBRANE SEALANT EXPANSION JOINT (CONTINUED)

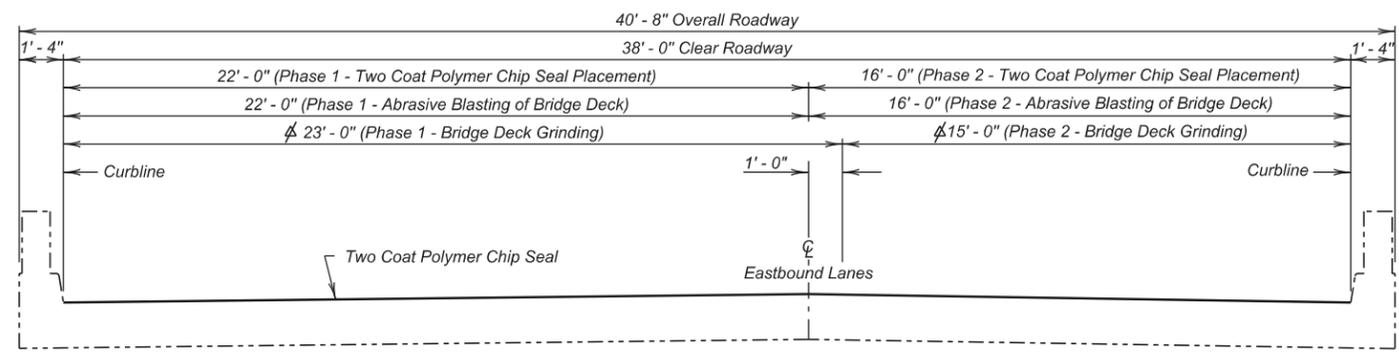
4. The membrane sealant shall be supplied in pieces 5 feet in length or longer. The foam sealant shall be ultra-violet and ozone resistant.
5. The bonding adhesive used to attach the membrane sealant to the adjacent concrete shall be approved by the membrane sealant manufacturer.
6. Adhesive used to join adjacent pieces of the membrane sealant shall be as recommended by the manufacturer.
7. If Styrofoam filler material is used in the construction, it shall be closed cell and water-tight as approved by the Engineer.
8. Use plywood or other material to protect concrete adjacent to the joint from spalling before any equipment is moved across the joint. Any spall areas will be repaired at the Contractor's expense by breaking out and replacing adjacent concrete, as approved by the Engineer.
9. The minimum ambient air temperature at the time of joint installation and adhesive curing shall be 40° F.
10. A technical representative of the membrane sealant manufacturer shall be present at the jobsite during installation. The technical representative shall be knowledgeable in the correct procedures for the preparation and installation of the joint material to insure the Contractor installs the joint to the Manufacturers recommendations.
11. The joint opening shall be constant width and shall have smooth vertical sides. Surfaces of material adjacent to the joint shall be at the correct grade and crown as approved by the Engineer.
12. Concrete surfaces that will be in contact with the membrane sealant shall be thoroughly cleaned by abrasive blasting to remove all laitance and contaminants (such as oil, curing compounds, etc.) from the concrete surface. At a minimum two passes of abrasive blasting with the nozzle held at an angle to within 1 to 2 inches of the a concrete surface will be required. Cleaning of the concrete surfaces with solvents, wire brushing, or grinding shall not be permitted.
13. After abrasive blasting, but immediately prior to membrane joint installation, the entire joint contact surface shall be air blasted. The air compressor used for joint cleaning shall be equipped with trap devices capable of providing moisture-free and oil-free air at a recommended pressure of 90 psi. To obtain complete bonding with the adhesive, the adjacent concrete surfaces must be dry and clean. The contact surfaces for the joint shall be visually inspected by the Engineer immediately prior to joint installation to verify the surface is dry and clean.
14. Individual spliced sections shall be installed as per the manufacturers' recommendations. The membrane joint sealant manufacturer shall submit a detailed installation procedure to the Engineer at least 5 days prior to joint installation for his review.
15. Traffic shall not be allowed on the joint for a minimum 3 hours unless otherwise directed by Engineer.
16. Forms for the joint shall be left in place for a minimum of 7 days. No construction equipment or traffic shall be allowed on the joint until the concrete has reached design strength. The joint edges shall be protected from damage by equipment and traffic.
17. The Membrane Sealant Expansion Joint will be measured in feet to the nearest one-tenth foot, complete in place. Measurement will be made of the overall horizontal length. The Membrane Sealant Expansion Joint will be paid for at the contract unit price per foot complete in place. Payment for this item shall be full compensation for furnishing all the required materials in place, inclusive of labor, equipment and incidentals necessary to complete the work in accordance with the plans and the foregoing specifications.

NOTES (CONTINUED)
 FOR
106' - 0⁷/₈" CONT. CONCRETE BRIDGE
 STR. NO. 41-162-082
 JANUARY 2015

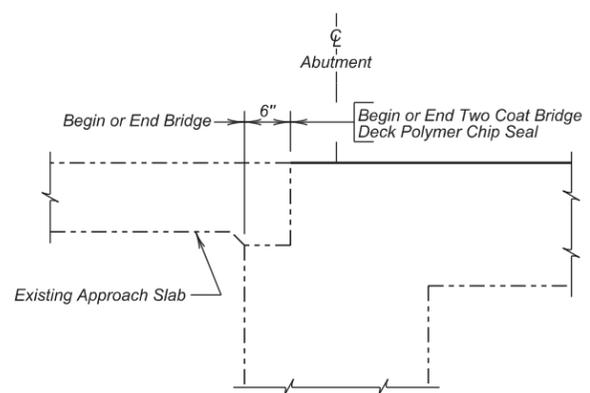
DESIGNED BY KH LAWR02PP	CK. DES. BY KSK 02PPK003	DRAFTED BY KH <i>Kevin N. Goeden</i> BRIDGE ENGINEER
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PLAN



SECTION A - A



SECTION B - B

ITEM	UNIT	QUANTITY	
		PHASE 1	PHASE 2
* Concrete Patching Material, Bridge Deck	Cu. Ft.	237.9	155.1
Two Coat Bridge Deck Polymer Chip Seal	Sq. Yd.	256.8	186.8
Abrasive Blasting of Bridge Deck	Sq. Yd.	256.8	186.8
Bridge Deck Grinding	Sq. Yd.	268.5	175.1
* Concrete Removal, Class A	Sq. Yd.	23.1	15.0
* Concrete Removal, Class B	Sq. Yd.	23.1	15.0

* Concrete Patching Material, Bridge Deck; Concrete Removal, Class A; and Concrete Removal, Class B may not be encountered and may be removed from the project at the direction of the Engineer.

(EASTBOUND LANES)
TWO COAT POLYMER CHIP SEAL DETAILS
 FOR
106' - 0 7/8" CONTINUOUS CONCRETE BRIDGE
 38' - 0" ROADWAY
 OVER POLO CREEK
 STR. NO. 41-162-082

15° SKEW L.H.F.
 SEC. 14 - T6N - R3E
 IM 0901(171)18

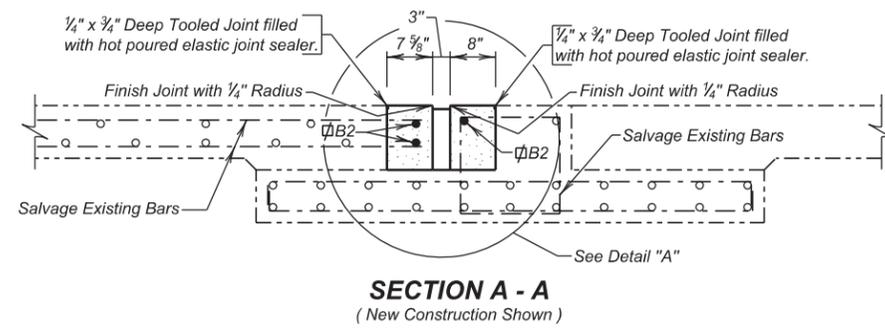
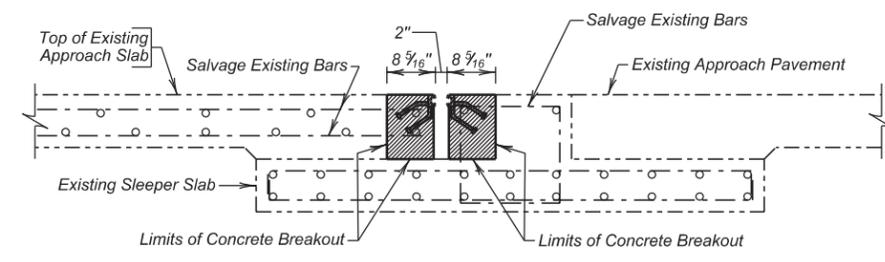
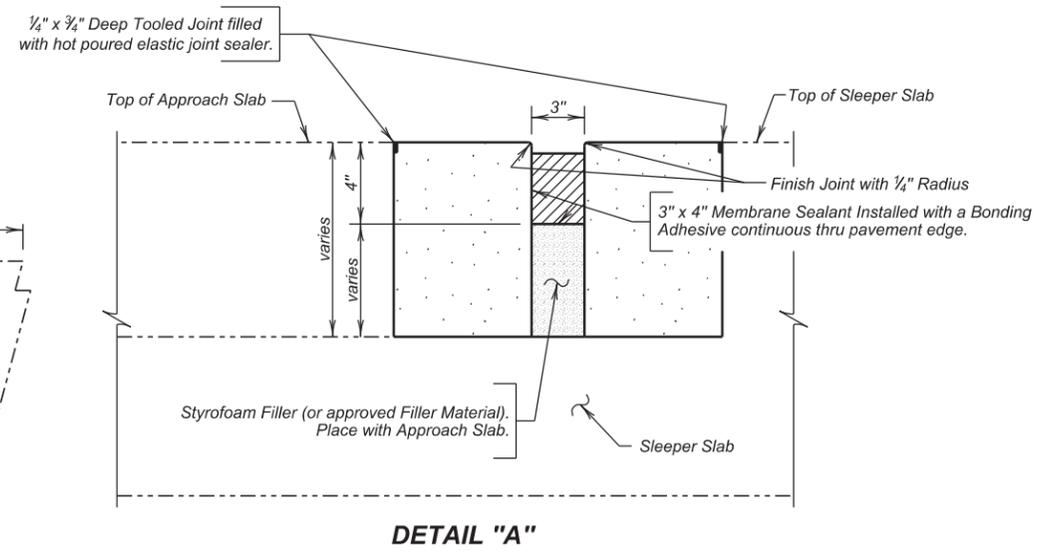
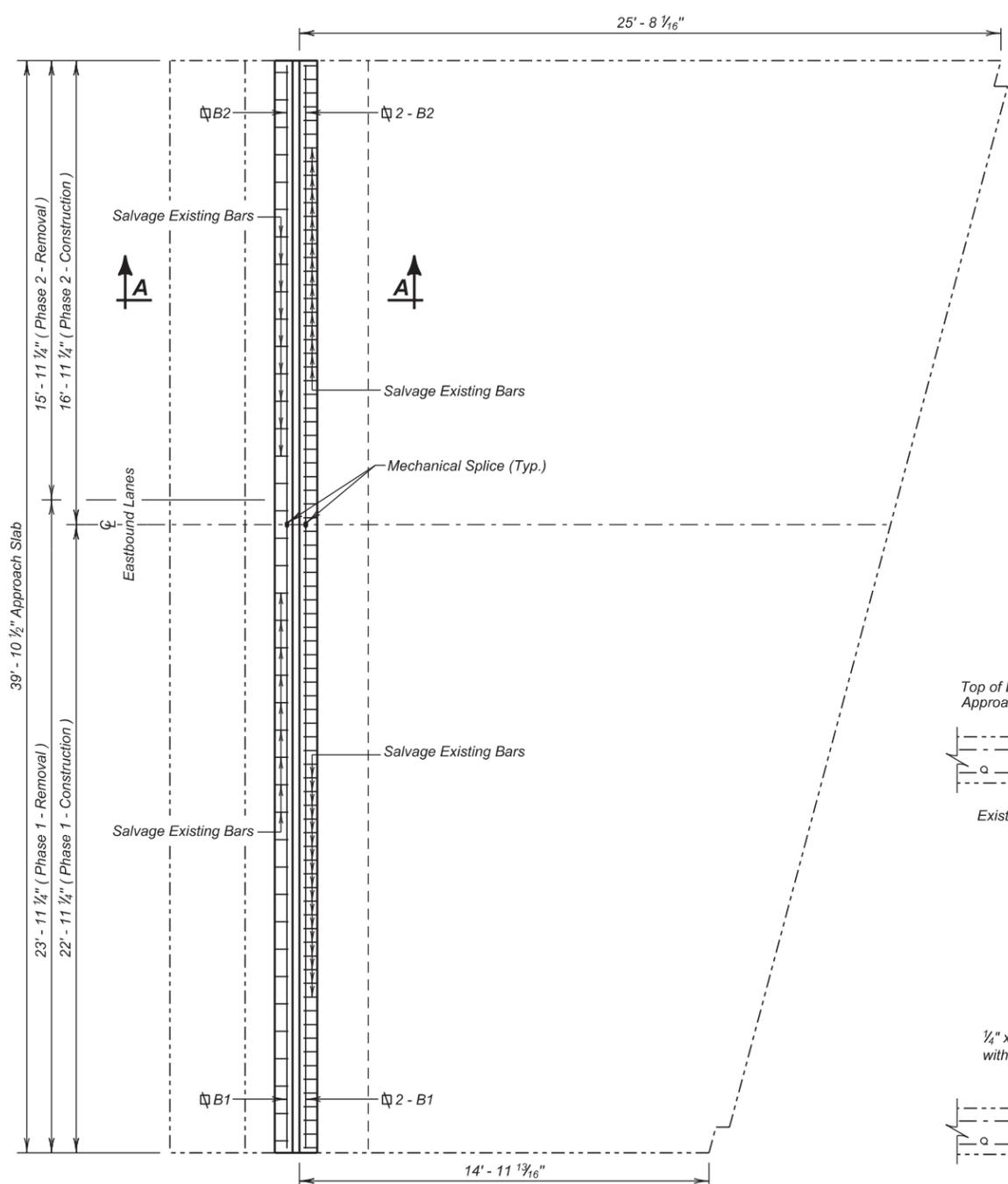
LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION

MARCH 2016

∅ See Bridge Deck Grinding Notes on Sheet No. 2 of 9.

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E24	E82

REINFORCING SCHEDULE					Bending Details		
Mk.	No.	Size	Length	Type			
PHASE 1	Ø B1	3	5	22' - 9"	Str.	NOTES: All dimensions are out to out of bars. All Bars to be Epoxy Coated. Ø These bars shall be spliced with mechanical splice devices Equivalent Splice Lengths No. 5 - 2' - 6"	
PHASE 2	Ø B2	3	5	16' - 9"	Str.		

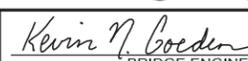


 Shaded areas indicate limits of concrete breakout.
 Concrete Patching Material, Bridge Deck

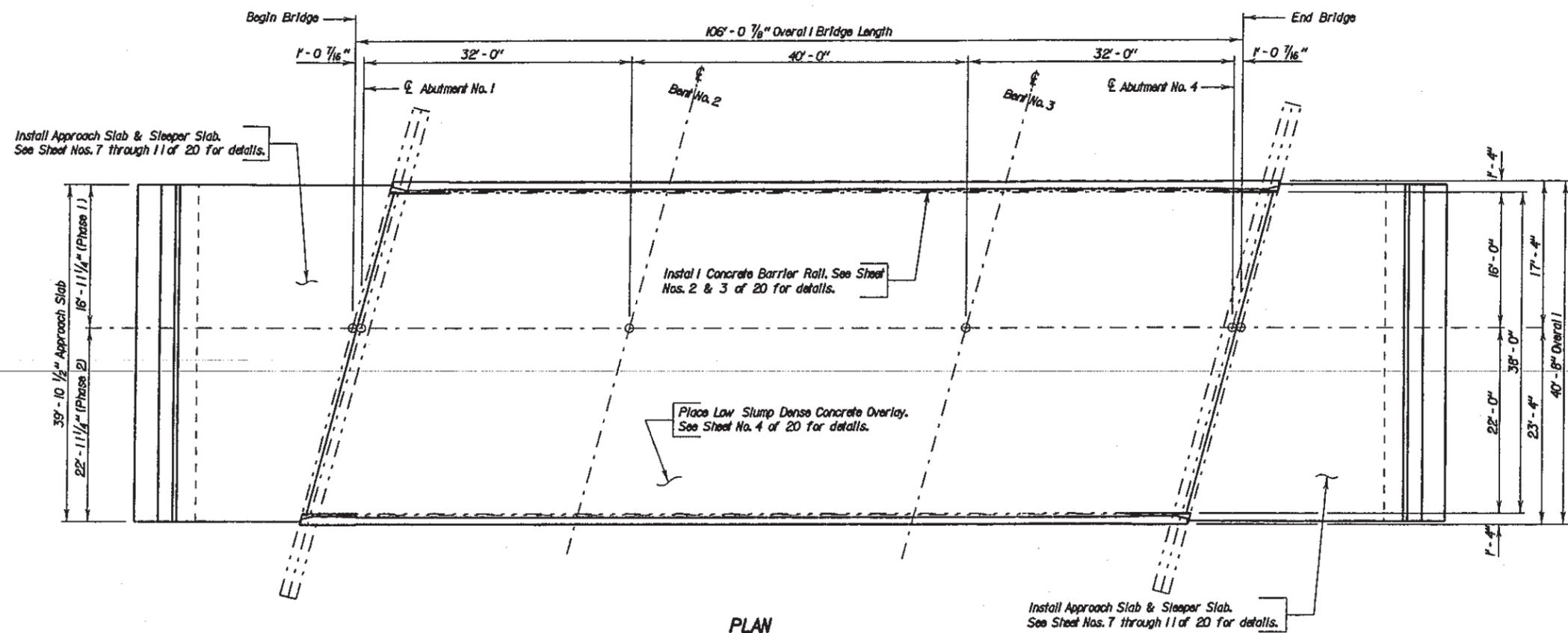
ITEM	UNIT	QUANTITY	
		PHASE 1	PHASE 2
Breakout Structural Concrete	Cu. Yd.	1.2	0.8
Concrete Patching Material, Bridge Deck	Cu. Ft.	29.9	22.1
Epoxy Coated Reinforcing Steel	Lb.	71	52
Membrane Sealant Expansion Joint	Ft.	22.9	16.9
No. 5 Rebar Splice	Each	3	-
Galvanic Anode	Each	12	9

(EASTBOUND LANES)
APPROACH SLAB JOINT REPLACEMENT
 FOR
106' - 0 7/8" CONTINUOUS CONCRETE BRIDGE
 38' - 0" ROADWAY
 OVER POLO CREEK
 STR. NO. 41-162-082
 15° SKEW L.H.F.
 SEC. 14 - T6N - R3E
 IM 0901(171)18

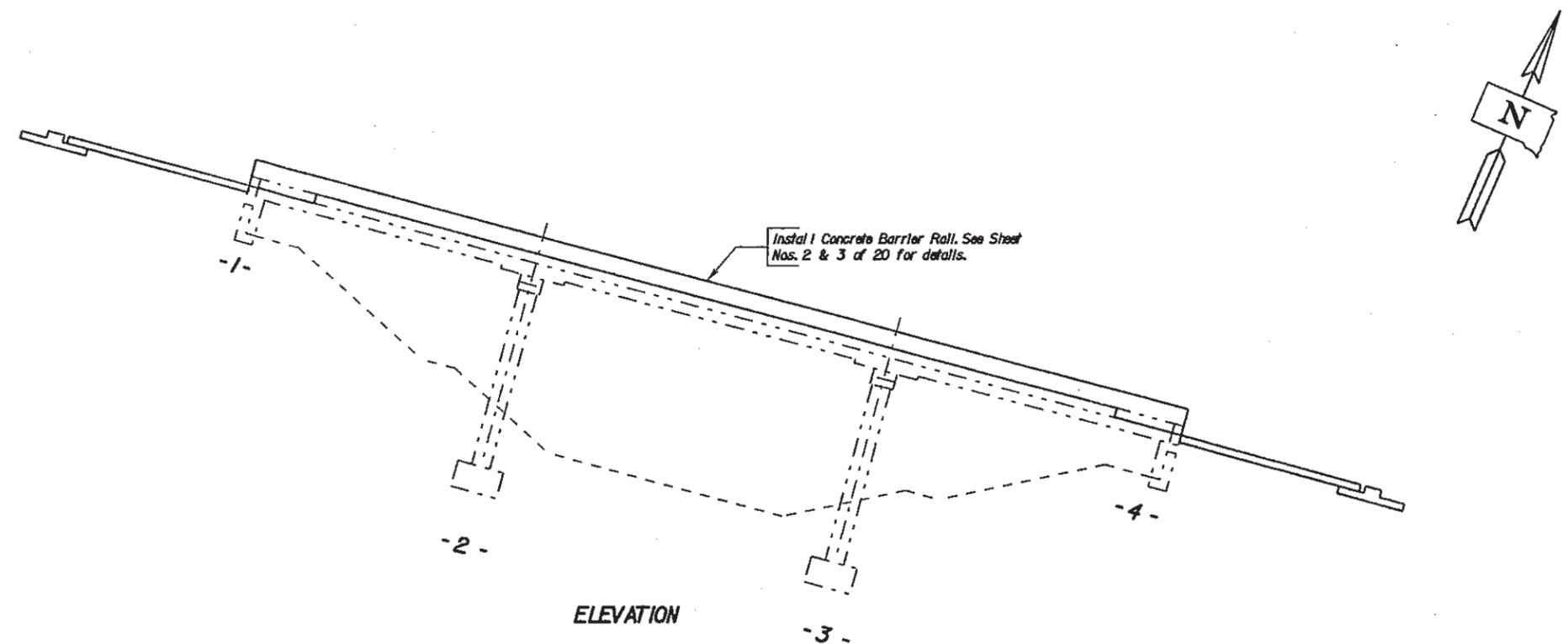
LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 MARCH 2016

DESIGNED BY KH LAWR02PP	CK. DES. BY KSK 02PPRD05	DRAFTED BY KR	 BRIDGE ENGINEER
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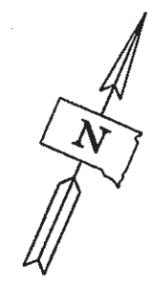
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E25	E82



PLAN



ELEVATION



- INDEX OF BRIDGE SHEETS-**
- Sheet No. 1 - Layout for Upgrading
 - Sheet No. 2 - Bridge Rail Replacement Details
 - Sheet No. 3 - Bridge Rail Replacement Details (Continued)
 - Sheet No. 4 - Deck Profiles for Low Slump Dense Concrete Overlay
 - Sheet No. 5 - As - Built Elevation Survey
 - Sheet No. 6 - As - Built Elevation Survey (Continued)
 - Sheet No. 7 - Approach Slab Layout
 - Sheet No. 8 - Details of Approach Slab Adjacent to Abutments
 - Sheet No. 9 - Details of Approach Slab Adjacent to Abutments
 - Sheet No. 10 - Details of Approach Slab Adjacent to Abutments
 - Sheet No. 11 - Details of Approach Slab Joint
 - Sheet No. 12 - Details of Standard Plate Nos. 460.03 & 630.79
 - Sheet Nos. 13 through 20 - Original Construction Plans

ORIGINAL CONSTRUCTION PLANS

(EAST BOUND LANES)
 LAYOUT FOR UPGRADING
106'-0 7/8" CONTINUOUS CONCRETE BRIDGE
 38'-0" ROADWAY
 OVER POLO CREEK
 STR. NO. 41-162-082
 PCEMS NO. 5584

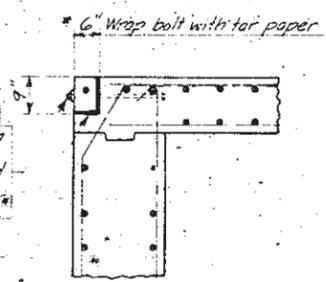
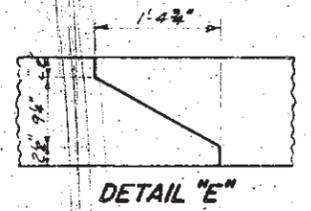
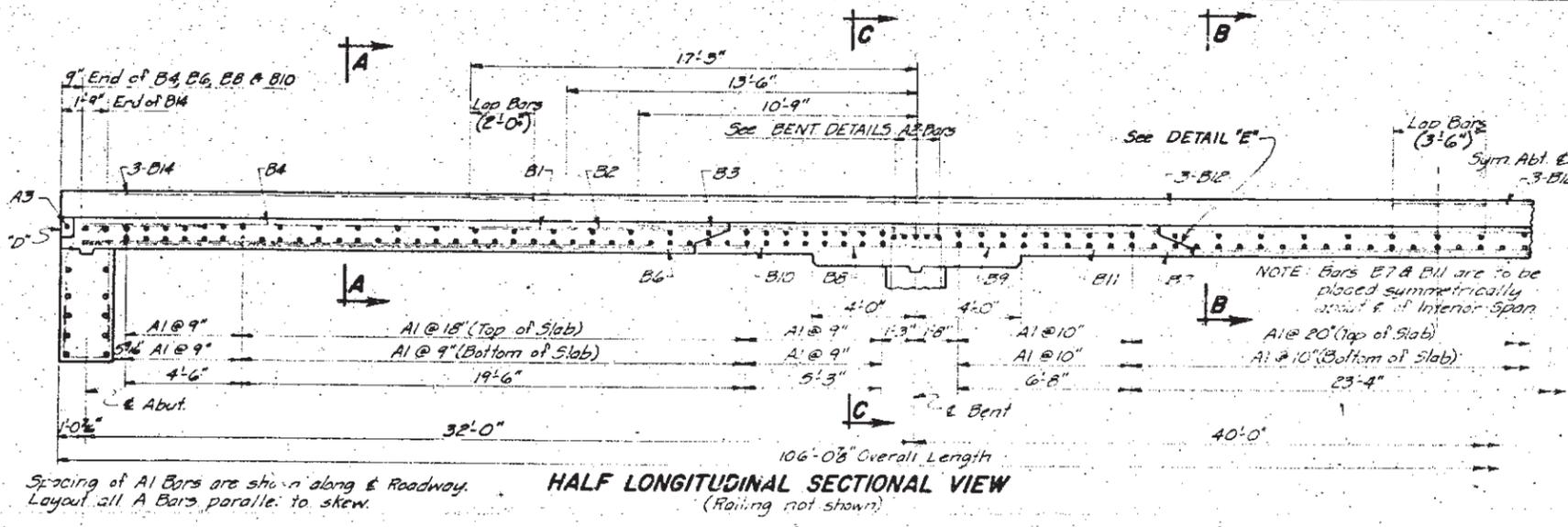
LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 JUNE 2000

THE CONTRACTOR HAS THE OPTION OF BUILDING THE APPROACH SLABS FOR THE FULL WIDTH OF THE ROADWAY AT ONE TIME OR BUILDING THE APPROACH SLABS IN TWO PHASES USING THE PLAN SHOWN OPTIONAL CONSTRUCTION JOINT. ALL REFERENCES TO PHASE 1 AND PHASE 2 CONSTRUCTION ARE GIVEN IN THE EVENT THE CONTRACTOR ELECTS TO BUILD THE APPROACH SLABS IN TWO PHASES.

DESIGNED BY EJA LAWR5584	DRAWN BY TB 5584S801	CHECKED BY CJD	APPROVED <i>John C. Cole</i> BRIDGE ENGINEER
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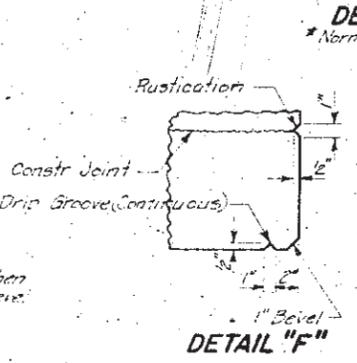
REINFORCING SCHEDULE					
Mk	No	Size	Length	Type	Bending Details
A1	210	5	41'-9"	Str	
A3	2	5	39'-0"	Str	
B1	40	10	39'-0"	Str	
B2	36	9	27'-0"	Str	
B3	76	10	21'-6"	Str	
B4	40	9	17'-6"	Str	
B5	12	10	32'-9"	Str	
B6	76	9	23'-6"	Str	
B7	38	9	21'-6"	Str	
B8	38	10	32'-3"	Str	
B9	19	10	40'-0"	Str	
B10	36	10	26'-6"	Str	
B11	18	10	28'-0"	Str	
B12	12	10	39'-0"	Str	
B13	6	10	40'-0"	Str	
B14	12	8	16'-6"	Str	
CI	192	4	7'-0"	TI	

NOTE: All dimensions are out to out of bar.

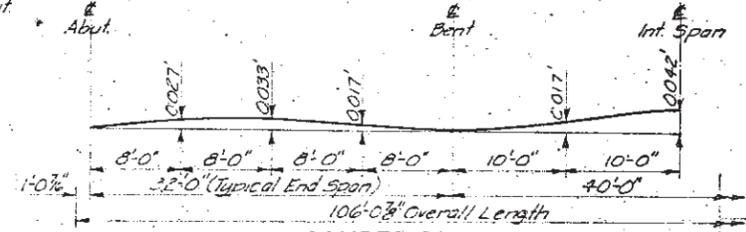


5/8" x 26" galv bolts with wrought iron washers at 6'-3" c/c, 14' req'd for one abut. Wrap end with tar paper.

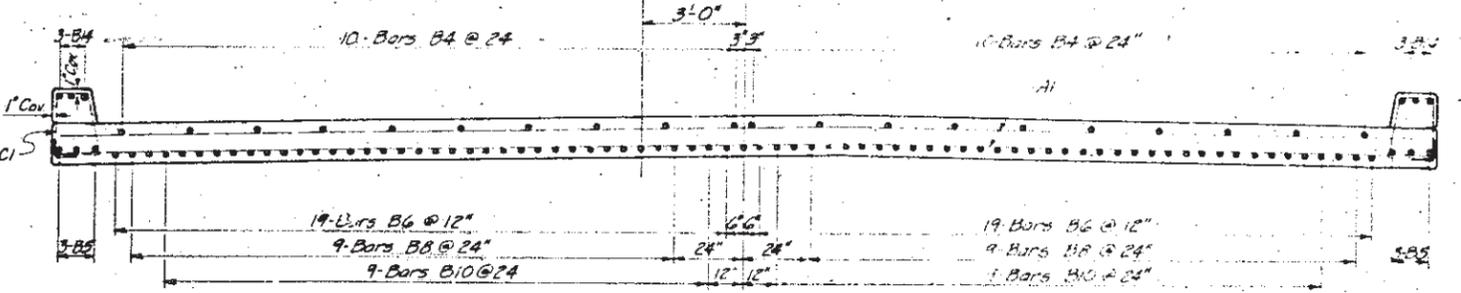
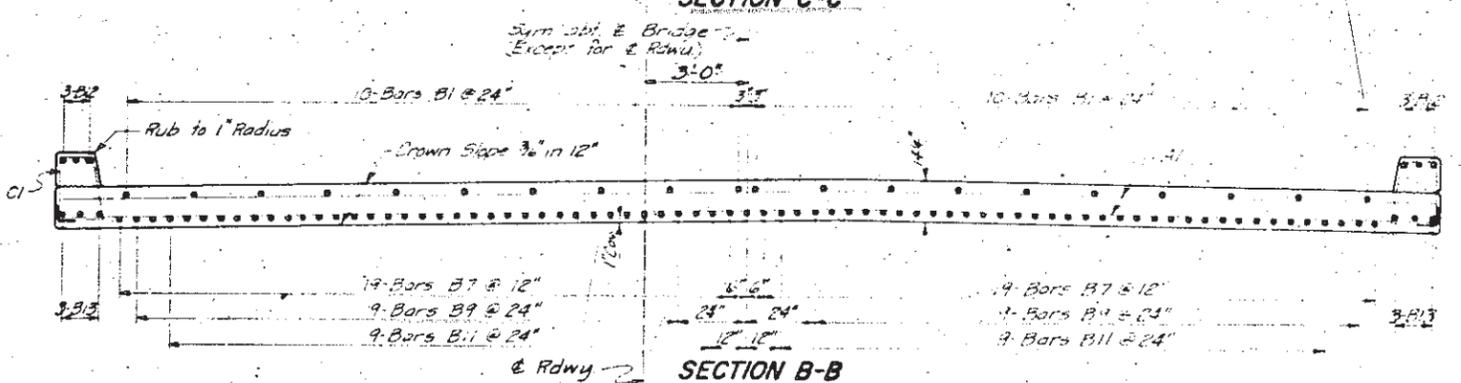
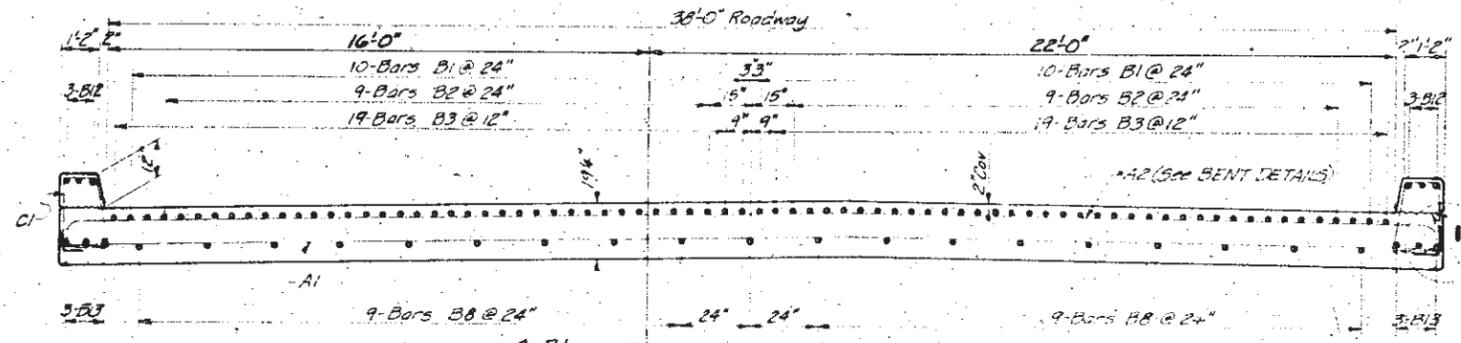
8" Premolded Bituminous Expansion Joint Filler.



Construction joint rustication concrete as shown. Level across curb.



Camber is calculated for dead load plus plastic flow and shall be added to the proposed grade elevations at the respective stations to establish the elevation of the top of the finished roadway slab.



NOTES-

These notes cover Substructure, Superstructure and Railing Details. The General Drawing for each structure will show elevations and other necessary notes and details.

DESIGN SPECIFICATIONS: AASHTO Specifications for Highway Bridges, 1969.

PILING: See General Drawing for length of Treated Timber and Steel Piles.

STRUCTURAL STEEL: All 5/8" bolts, including washers, and all pile connections in Abuts and all floor drains shall be paid for as Struct. Steel.

REINFORCING STEEL: All Reinforcing Steel shall conform to ASTM-A615, Grade 40.

CONCRETE: All concrete shall be Class "A". All exposed concrete corners and edges shall be chamfered to a 3/4" bevel unless noted otherwise. If necessary to facilitate construction, transverse construction joints may be made at the quarter points of each and any span, adjacent to interior bents. All costs for expansion joint filler and tar paper shall be included in the unit price bid per cu yd. for Class "A" Concrete.

DESIGN DATA: Design Loading: HS20-44 AASHTO and Alternate Loading designated in PPM 20-4, Sec 40. Unit Stresses: Concrete $f_c = 1600$ p.s.i., $n = 8$, Reinforcing Steel $f_s = 20000$ p.s.i. (Int. Grade Steel). Equivalent fluid pressure of earth at 40' $1/2$ sq. ft. Minimum Pile Loading = 24 tons per timber pile and 35 tons per steel pile.

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Class "A" Concrete	Cu Yds	2077
Reinforcing Steel	Lbs	59,485
Structural Steel	Lbs	130

* Does not include slab and curbs directly over abutments.
* Weight of 1 1/2" - 5/8" Bolts and Washers and 8 floor drains.

ORIGINAL CONSTRUCTION PLANS

(EAST BOUND LANES)
SUPERSTRUCTURE DETAILS
FOR

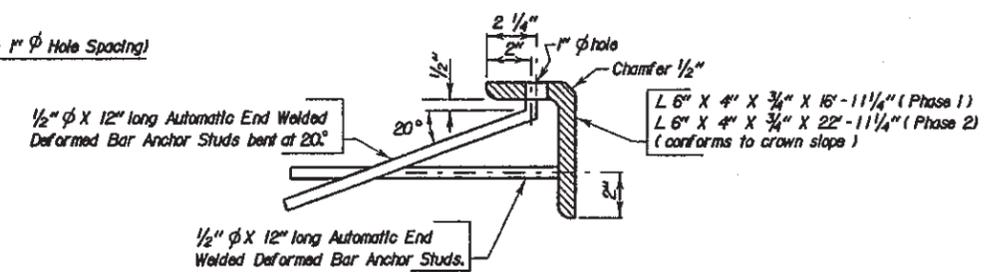
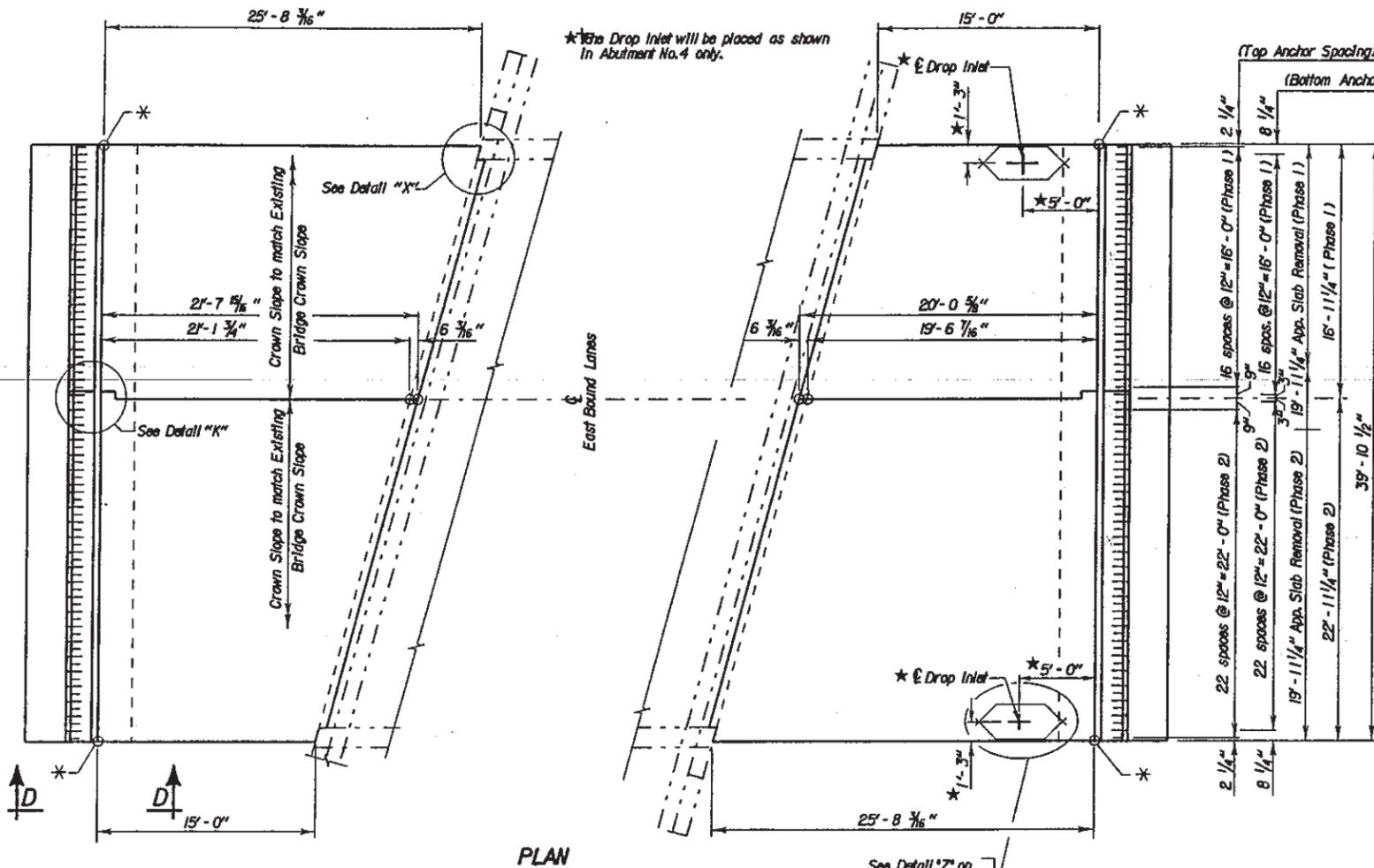
106'-0 7/8" CONTINUOUS CONCRETE BRIDGE
38'-0" ROADWAY 15° SKEW L.H.F.
OVER POLO CREEK SEC. 14-T6N-R3E
STA. 999+85.711 TO 1000+91.781 1 90-1(27)15
STR. NO. 41-162-082 LAWRENCE COUNTY

SOUTH DAKOTA HS20-44 (8 ALT.)
DEPARTMENT OF HIGHWAYS
MAY 1968 7 OF 9

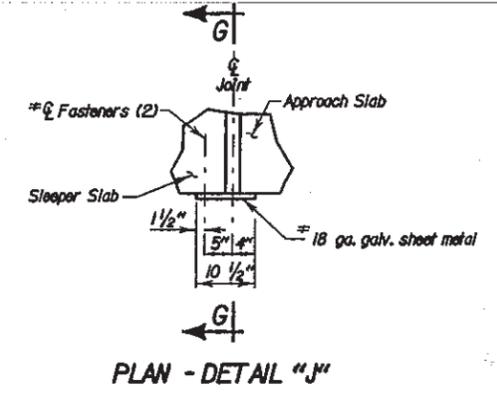
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	D.P.	K.R.S.	

BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E27	E82



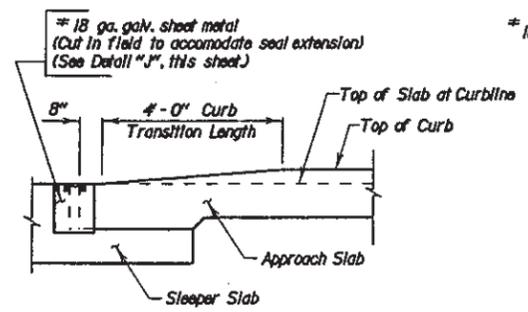
DETAIL "Y"
 (See Sheet No. 10 of 20 for location of detail.)
 (See Notes Regarding Armor Angle Assembly.)



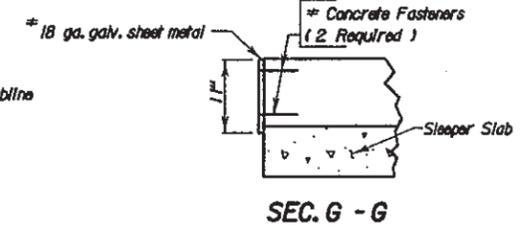
PLAN - DETAIL "J"
 Attach 18 ga. galv. Sheet Metal to both ends of Sleeper Slab only after slab has been poured. Use fasteners that will not spall concrete, as approved by the Engineer.

* Elevation is Top of Slab back of Curb at this point. See Approach Slab Notes.

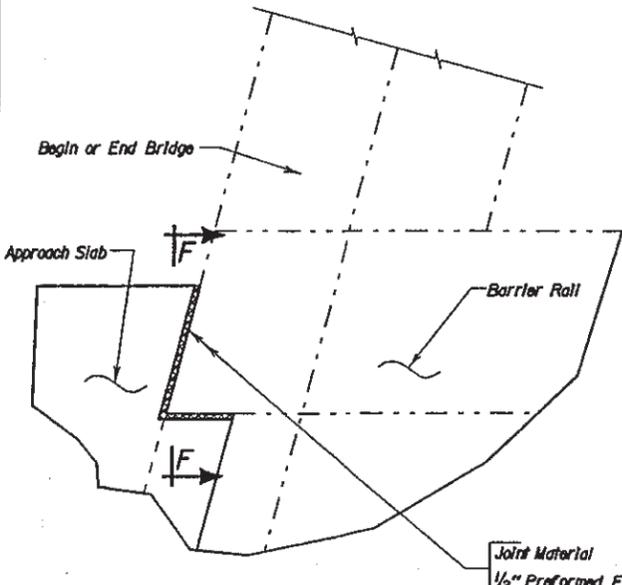
THE CONTRACTOR HAS THE OPTION OF BUILDING THE APPROACH SLABS FOR THE FULL WIDTH OF THE ROADWAY AT ONE TIME OR BUILDING THE APPROACH SLABS IN TWO PHASES USING THE PLAN SHOWN OPTIONAL CONSTRUCTION JOINT. ALL REFERENCES TO PHASE 1 AND PHASE 2 CONSTRUCTION ARE GIVEN IN THE EVENT THE CONTRACTOR ELECTS TO BUILD THE APPROACH SLABS IN TWO PHASES.



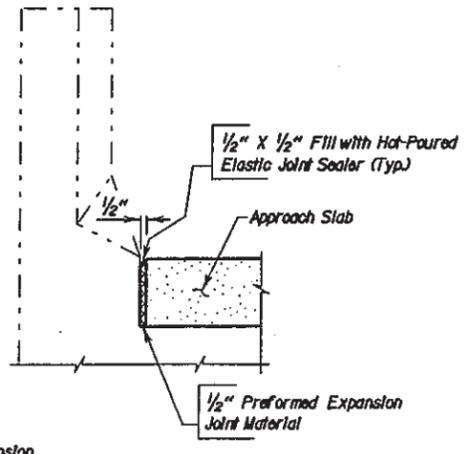
VIEW D - D



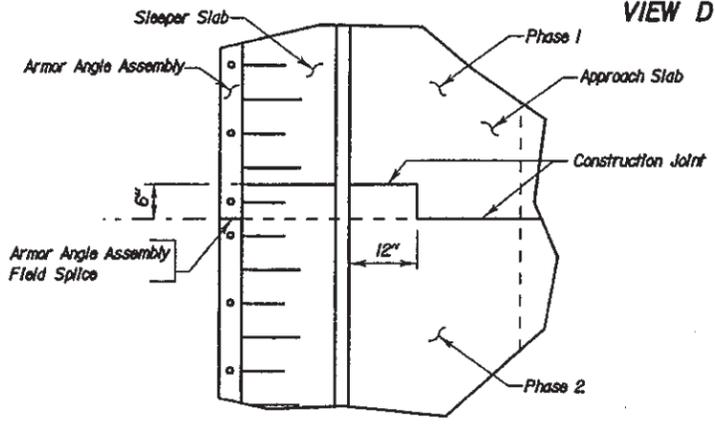
SEC. G - G



DETAIL "X"
 (Typical all four bridge corners)



SEC. F - F



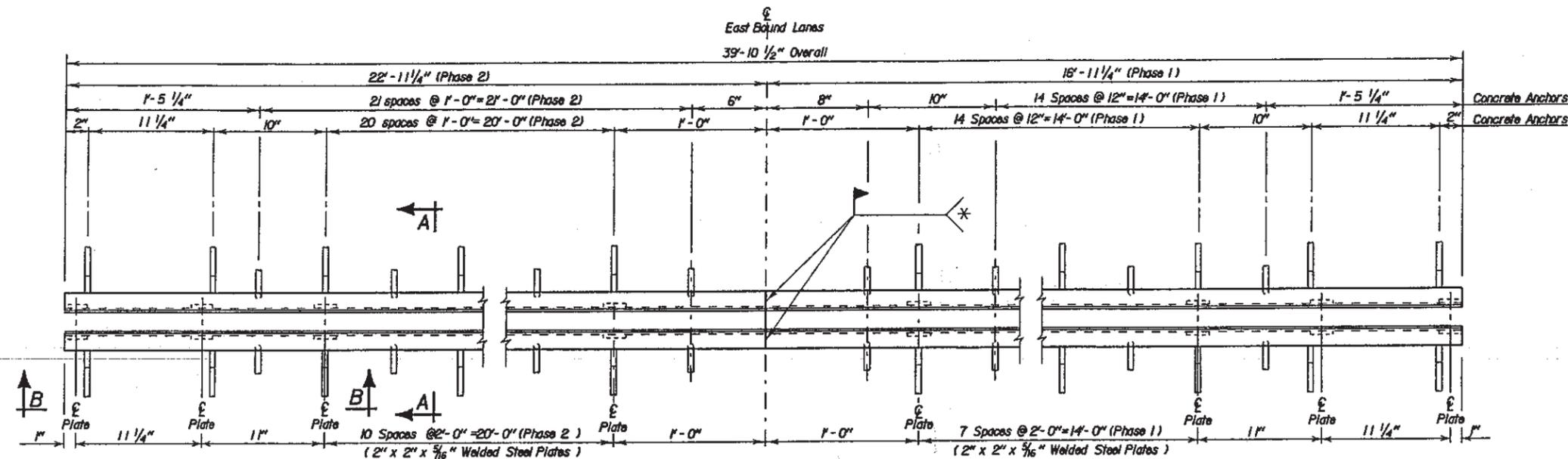
DETAIL "K"

ORIGINAL CONSTRUCTION PLANS

(EAST BOUND LANES)
 DETAILS OF APPROACH SLAB ADJ. TO BRIDGE
 FOR
106' - 0 7/8" CONTINUOUS CONCRETE BRIDGE
 38'-0" ROADWAY
 OVER POLO CREEK
 STR. NO. 41-162-082

SEC. 14-T6N-R3E
 IM 90-1(45) 18
 15" SKEW L. H. F.
 LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 JUNE 2000

DESIGNED BY EJA LAW5584	DRAWN BY TB 55845807	CHECKED BY CJD	APPROVED <i>John C. Cole</i> BRIDGE ENGINEER
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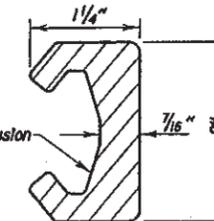


TEMP.	DIMENSION "X"
30°	2 1/4"
40°	2 3/16"
50°	2 1/8"
60°	2 1/16"
70°	2"
80°	1 15/16"
90°	1 7/8"

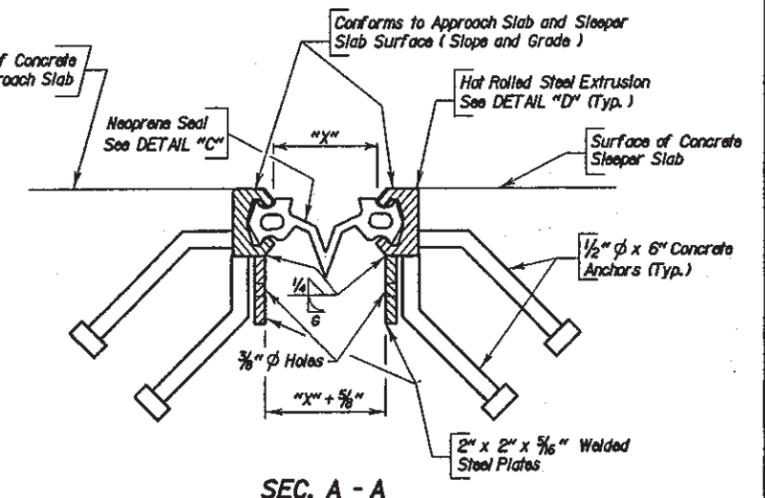
PLAN OF STRIP SEAL
(Neoprene Seal not shown)



DETAIL "C"
Neoprene Seal shall have a
3" movement capability.



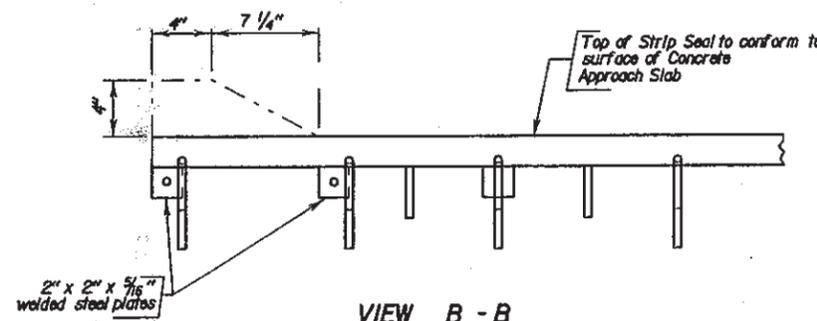
DETAIL "D"



SEC. A - A

GENERAL NOTES:

- Materials for the Steel Extrusion shall conform to ASTM-A36, A242 or A588. Materials for the 2" x 2" x 5/16" welded steel plates shall conform to ASTM-A36. Material for the 1/2" diameter x 6" Concrete Anchors shall conform to Type A steel studs of Section 7 of the latest edition of the ANSI/AWS D1.1 Structural Welding Code-Steel.
- Material for the neoprene seal shall conform to ASTM D262B modified to omit the recovery test. No splices will be permitted in the neoprene seal.
- 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 installation of the neoprene seal shall be as recommended by its Manufacturer and approved by the Engineer, but in general shall be as follows: The neoprene seal shall be installed and bonded to the steel extrusion with a high-solids lubricant adhesive. The neoprene surfaces shall be roughened with a wire brush before the application of the lubricant adhesive. The neoprene seal may be installed either prior to or after the time the steel extrusions are concreted in the approach slabs. The steel extrusion shall be dry, clean, free from dirt, grease and contaminants at the time the neoprene seal is installed.
- Due to the length of the steel extrusions, splices are permitted. No welds shall be permitted in the internal section of the extrusion where the neoprene seal is located. Weld details shall be shown on the shop plans for approval by the Engineer. Welding shall be in accordance with latest edition of the ANSI/AWS D1.1 Structural Welding Code-Steel. Galvanize the steel extrusions and anything welded to them after all welding is completed. They shall be galvanized in accordance with AASHTO M111 (ASTM A123). If welded splices are used subsequent to galvanizing, the weld details and the procedures for preparing the surface for welding and repairing the galvanizing after welding shall be included with the shop plans.
- The thickness and shape of the neoprene seal may vary from the sketch shown (Detail "C" on this sheet) according to the manufacturer's design; however, the wedge lugs must properly fit the groove in the steel extrusion. Before installation, the shop plans of the proposed neoprene seal showing the fixed dimensions, thickness of neoprene seal, and dimensions pertinent to the fit of the neoprene seal in the steel extrusion shall be submitted to and approved by the Engineer.
- Since the configuration and dimensions of the steel extrusion may vary according to each manufacturer's design, they need not conform exactly to that shown in Detail "D", however, any deviations from the plan shown configuration or dimensions must be approved by the Office of Bridge Design.
- The Strip Seal Expansion Joint supplier shall submit a detailed gland installation procedure with the shop plans.
- The cost of welding shall be incidental to the contract linear foot price bid for Strip Seal Expansion Joint.
- The neoprene seal shall be of sufficient length such that a minimum length of 6" shall extend beyond each end of the steel extrusions.
- The Strip Seal Expansion Joint will be measured in linear feet to the nearest one-tenth foot, complete in place. Measurement will be made of the overall horizontal length. The Strip Seal Expansion Joint will be paid for at the contract unit price per linear foot complete in place. Payment for this item shall be full compensation for furnishing all the required materials in place, inclusive of labor, equipment and incidentals necessary to complete the work in accordance with plans and the foregoing specifications.
- Due to phased construction, the steel extrusion shall be spliced in the field at the location shown above. The Weld Details and the procedures for preparing the surface for welding and repairing the galvanizing after welding shall be included with the shop plans.



VIEW B - B

ESTIMATED QUANTITIES (For Two Approach Slabs)			
ITEM	UNIT	PHASE 1 QUANTITY	PHASE 2 QUANTITY
Strip Seal Expansion Joint	L.F.	33.9	45.9

THE CONTRACTOR HAS THE OPTION OF BUILDING THE APPROACH SLABS FOR THE FULL WIDTH OF THE ROADWAY AT ONE TIME OR BUILDING THE APPROACH SLABS IN TWO PHASES USING THE PLAN SHOWN OPTIONAL CONSTRUCTION JOINT. ALL REFERENCES TO PHASE 1 AND PHASE 2 CONSTRUCTION ARE GIVEN IN THE EVENT THE CONTRACTOR ELECTS TO BUILD THE APPROACH SLABS IN TWO PHASES.

ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
APPROACH SLAB JOINT DETAILS

FOR
106'-0 7/8" CONTINUOUS CONCRETE BRIDGE

38'-0" ROADWAY
OVER POLO CREEK
STR. NO. 41-162-082

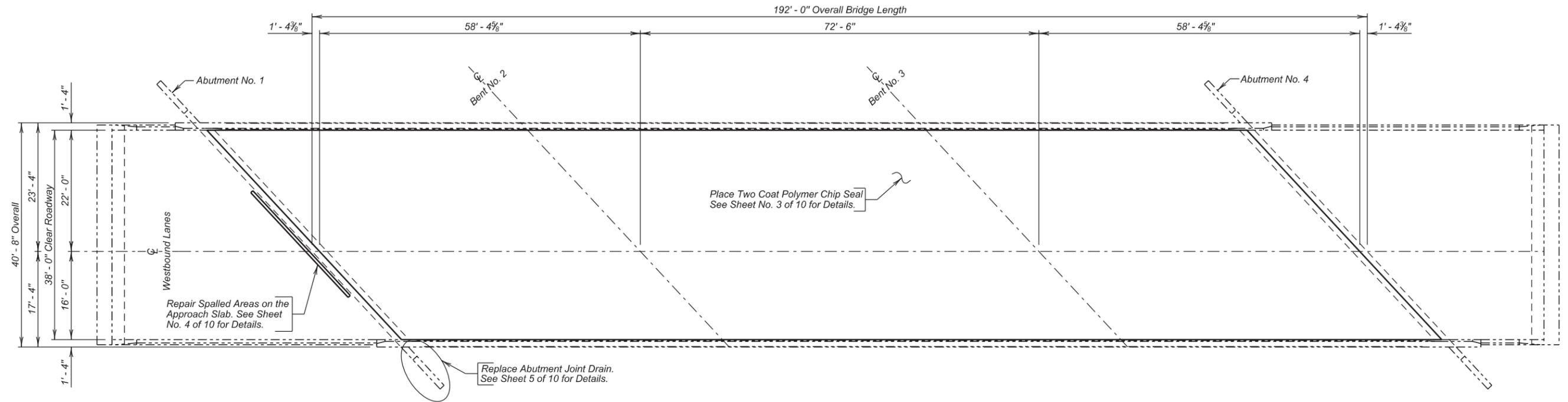
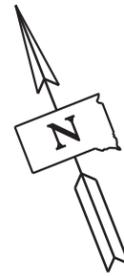
SEC. 14-T6N-R3E
IM 90-K45) 18
15° SKEW L. H. F.

LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION

JUNE 2000

9 OF 9

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E29	E82



PLAN

INDEX OF BRIDGE SHEETS -

- Sheet No. 1 - Layout for Upgrading
- Sheet No. 2 - Estimate of Structure Quantities and Notes
- Sheet No. 3 - Two Coat Polymer Chip Seal Details
- Sheet No. 4 - Approach Slab Repair
- Sheet No. 5 - Joint Drain Details
- Sheet Nos. 6 -10 - Original Construction Plans

(WESTBOUND LANES)
LAYOUT FOR UPGRADING
FOR

192' - 0" CONT. COMP. GIRDER BRIDGE
38' - 0" ROADWAY
OVER C. & N.W.R.R.
STR. NO. 41-200-088
PCN 02PP

43° SKEW R.H.F.
SEC. 17 - T6N - R4E
IM 0901(171)18

LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION

MARCH 2016

1 OF 10

PLANS BY:
OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

DESIGNED BY KH LAWR02PP	CK. DES. BY KSK 02PPRE01	DRAFTED BY KR	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
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ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
410E0700	Abutment Joint Drain	1	Each
460E0170	Concrete Patching Material, Bridge Deck	91.7	CuFt
491E0005	Two Coat Bridge Deck Polymer Chip Seal	788.0	SqYd
491E0110	Abrasive Blasting of Bridge Deck	788.0	SqYd
491E0120	Bridge Deck Grinding	788.0	SqYd
491E0130	Concrete Removal, Class A	15.0	SqYd
491E0140	Concrete Removal, Class B	15.0	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.

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. 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 elsewhere 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 preconstruction meeting.

- Perform bridge deck grinding and repair the bridge deck by removing all loose and delaminated concrete from the bridge deck surface for first and second phase of construction.
- Repair the bridge deck and approach slab by removing and replacing all loose and delaminated concrete from the surface for the first phase of construction.
- Clean the bridge deck surface with abrasive blasting for the first phase of construction.
- Place a Two Coat Bridge Deck Polymer Chip Seal for the first phase of construction.
- Repair spalled areas on approach slab adjacent to the finger type bridge expansion joint for the first phase of construction.

- Switch traffic and repeat steps 2 through 4 for the second phase of construction.
- Repair the bridge deck expansion joint drainage trough and re-attach the device to the abutment backwall.

GENERAL CONSTRUCTION NOTES

- 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.
- 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.

APPROACH SLAB REPAIR

- The removal and replacement of the delaminated concrete on the approach slab shall be in accordance with Section 491 of the Construction Specifications except as follows:
 - Curing compounds may be used to cure the approach slab concrete patches in accordance with Section 460.3M of the Construction Specification.
 - The surface of the approach slab concrete patches shall be tined.

BRIDGE DECK GRINDING

The Contractor will have the option of grinding the entire deck surface during phase one. Any additional costs incurred for grinding the entire deck surface such as additional traffic control or cleaning shall be at no additional cost to the Department.

TWO COAT BRIDGE DECK POLYMER CHIP SEAL

The Two Coat Bridge Deck Polymer Chip Seal shall be applied in accordance with the construction specifications.

ABUTMENT JOINT DRAIN

- Drainage assembly includes drainage trough and riprap. This includes any plates bolted to the finger joint or attached to the abutment backwall/seat.

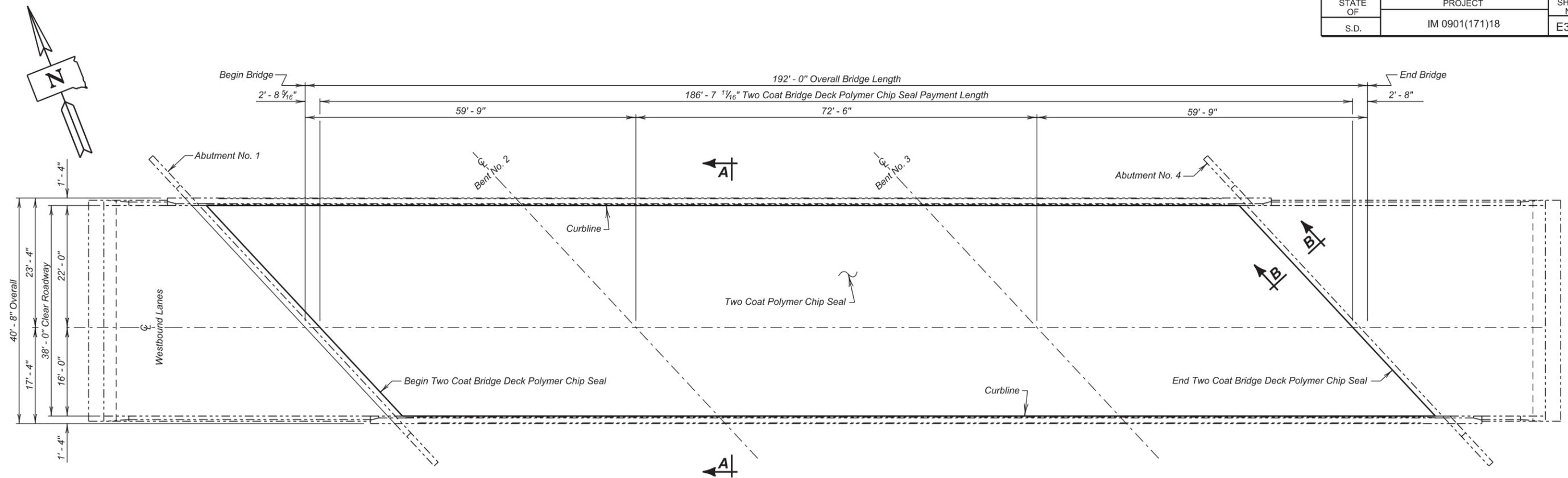
- All steel components, steel plates, bars and structural shapes shall be galvanized after shop welding in accordance with ASTM A123 except as stated in the following notes.
- The threads of all nuts and bolts to be galvanized shall be protected to ensure that a bolt or nut can still be fully threaded after the galvanizing process.
- All new structural steel plates and bars shall conform to ASTM A709, Grade 36. Material less than 1/4 inch thick may be ASTM A1011, Grade 36 except as specified in the notes below.
- Class A riprap shall conform to South Dakota Standard Specifications 830.1.A. The cost for furnishing and installing the rip rap shall be incidental to the contract unit price for Abutment Joint Drain.
- Material for the 3/8" diameter x 2 3/4" commercially available steel wedge-type bolts, nuts and washers shall be at the option of the contractor. The bolts, nuts and washers shall be either hot-dipped galvanized according to ASTM F2329 or made of corrosion resistant material. The wedge type anchors shall be installed in accordance with the manufacturer's recommendations.
- The 3/8" diameter bolts, nuts and washers shall conform to ASTM A307 and be galvanized in accordance with ASTM F2329 or made of some other corrosion resistant material.
- The hanging brackets and backup plates shall conform to ASTM – A709, Grade 36 and shall be galvanized in accordance with ASTM A123. The 1/4" diameter U-bolts, nuts and washers shall conform to ASTM – A307 and be galvanized in accordance with ASTM A123 or made of some other corrosion resistant material.
- The placement of the drainage channel is necessary to drain the water from the finger joint and diaper system away from the bridge. Should it be necessary, it shall be at the Engineer's option to adjust the gutter from the plans location to meet this requirement.
- After the drain length and slope are determined for each location, and approved by the Engineer, sketches of same shall be sent to the Office of Bridge Design and to the fabricator.
- The steel support posts shall be 7' – 0" long and conform to the requirement for Delineator Posts in Section 982 of the Standard Specifications. The posts shall be painted with high quality enamel of the color yellow.
- The cost of installing the abutment joint drains including all labor, riprap, materials, equipment, and incidentals necessary to complete the work shall be included in the contract unit price for Abutment Joint Drain.

**ESTIMATE OF STRUCTURE QUANTITIES AND NOTES
FOR
192' - 0" CONT. COMP. GIRDER BRIDGE**

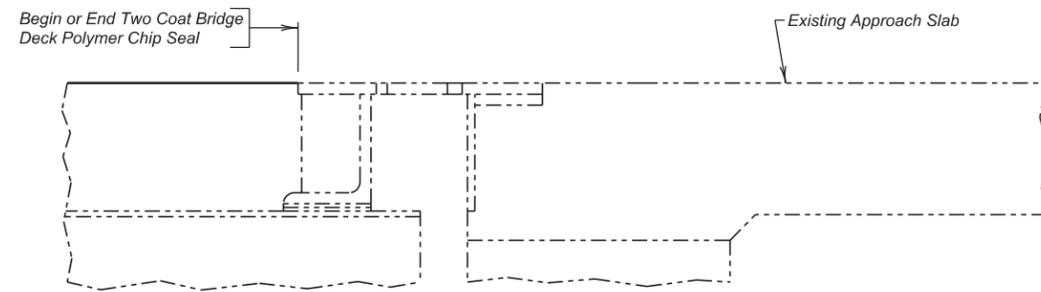
STR. NO. 41-200-088
NOVEMBER 2014

2 OF 11

DESIGNED BY KH	CK. DES. BY KSK	DRAFTED BY KH	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
LAWR02PP	02PPK02		



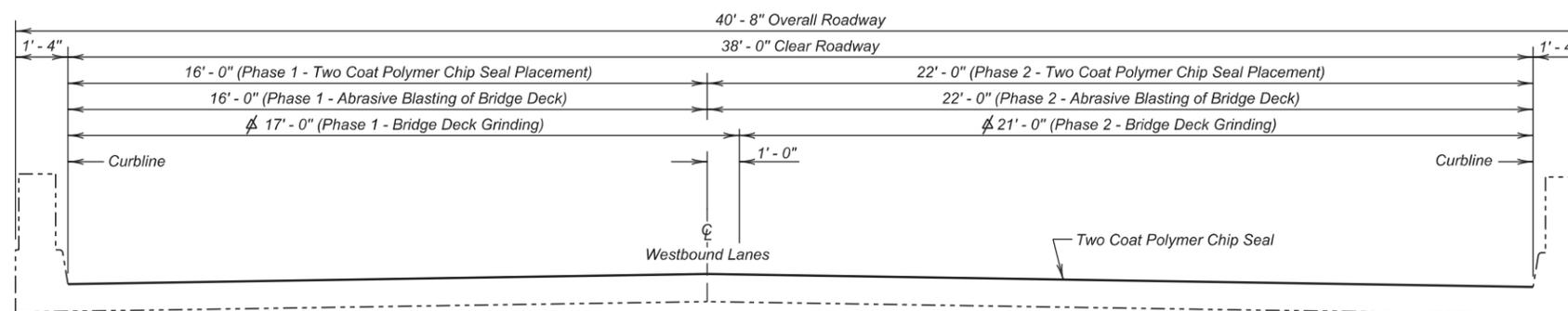
PLAN



SECTION B - B

ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
		PHASE 1	PHASE 2
* Concrete Patching Material, Bridge Deck	Cu. Ft.	38.7	47.8
Two Coat Bridge Deck Polymer Chip Seal	Sq. Yd.	331.8	456.2
Abrasive Blasting of Bridge Deck	Sq. Yd.	331.8	456.2
Bridge Deck Grinding	Sq. Yd.	352.6	435.4
* Concrete Removal, Class A	Sq. Yd.	6.1	7.5
* Concrete Removal, Class B	Sq. Yd.	6.1	7.5

* Concrete Patching Material, Bridge Deck; Concrete Removal, Class A; and Concrete Removal, Class B may not be encountered and may be removed from the project at the direction of the Engineer.

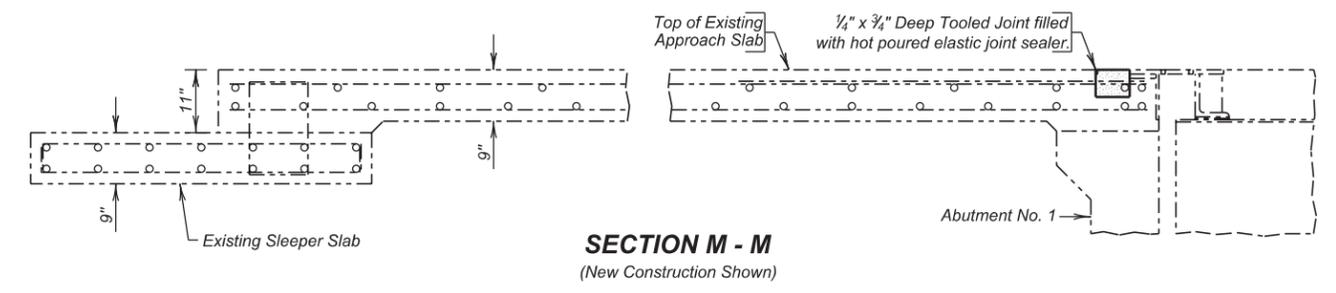
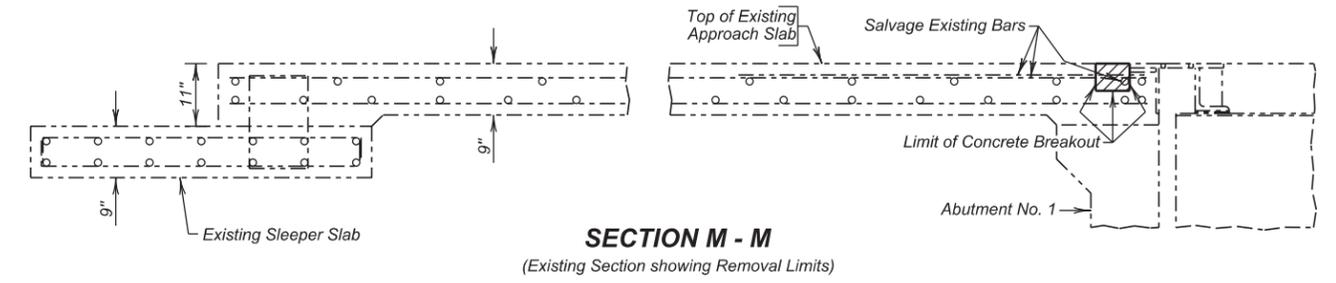
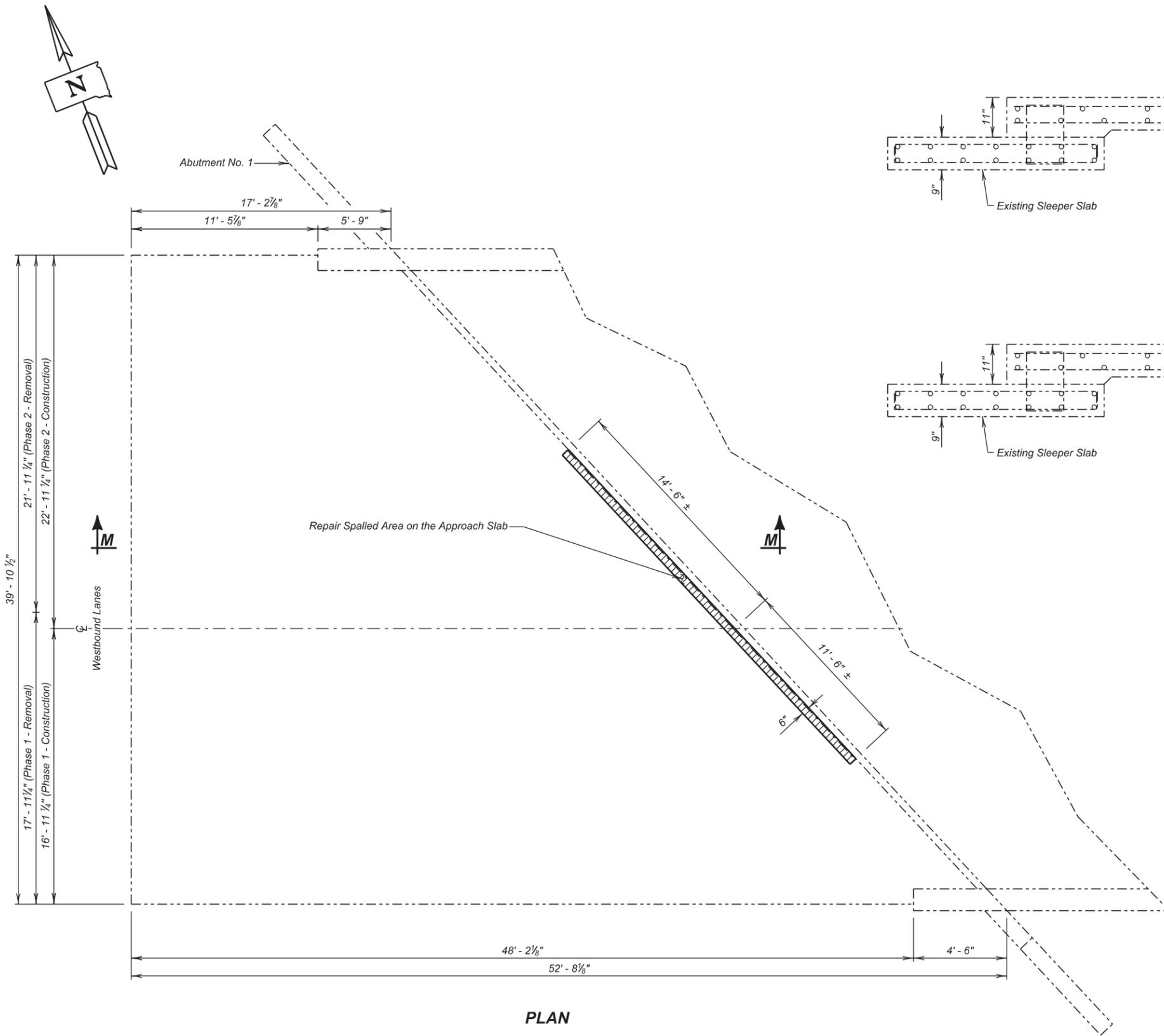


SECTION A - A

See Bridge Deck Grinding Notes on Sheet No. 2 of 10.

(WESTBOUND LANES)
 TWO COAT POLYMER CHIP SEAL DETAILS
 FOR
 192' - 0" CONT. COMPOSITE GIRDER BRIDGE
 38' - 0" ROADWAY
 OVER C. & N.W.R.R.
 STR. NO. 41-200-088
 43° SKEW R.H.F.
 SEC. 17 - T6N - R4E
 IM 0901(171)18

LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 MARCH 2016



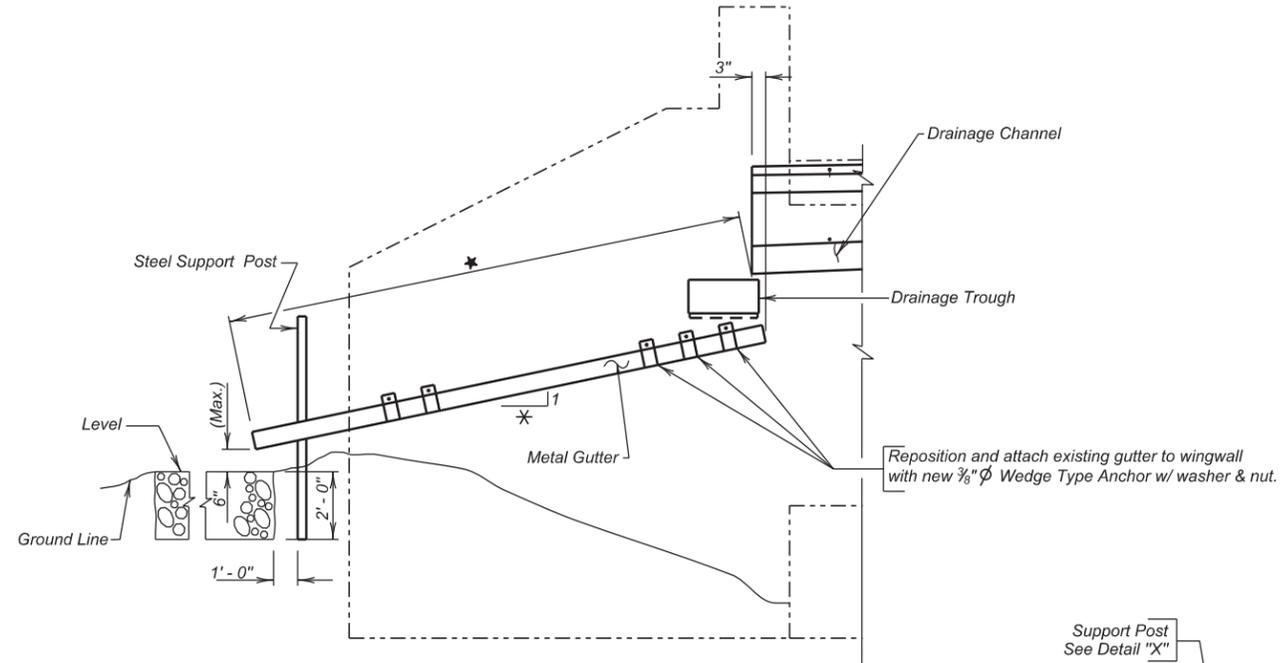
ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
		PHASE 1	PHASE 2
Concrete Removal, Class A	Sq. Yd.	0.6	0.8
Concrete Removal, Class B	Sq. Yd.	0.6	0.8
Concrete Patching Material, Bridge Deck	Cu. Ft.	2.4	2.8

- Shaded areas indicate limits of concrete removal.
- Concrete Patching Material

**(WESTBOUND LANES)
APPROACH SLAB REPAIR
FOR
192' - 0" CONT. COMP. GIRDER BRIDGE**
38' - 0" ROADWAY
OVER C. & N.W.R.R.
STR. NO. 41-200-088

43° SKEW R.H.F.
SEC. 17 - T6N - R4E
IM 0901(171)18

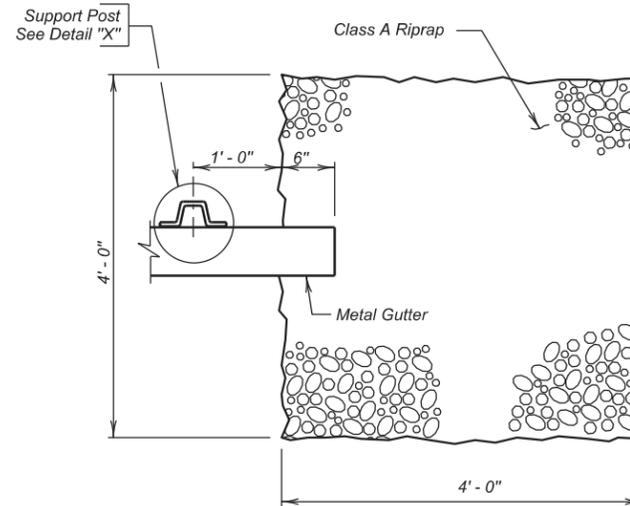
LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION
MARCH 2016



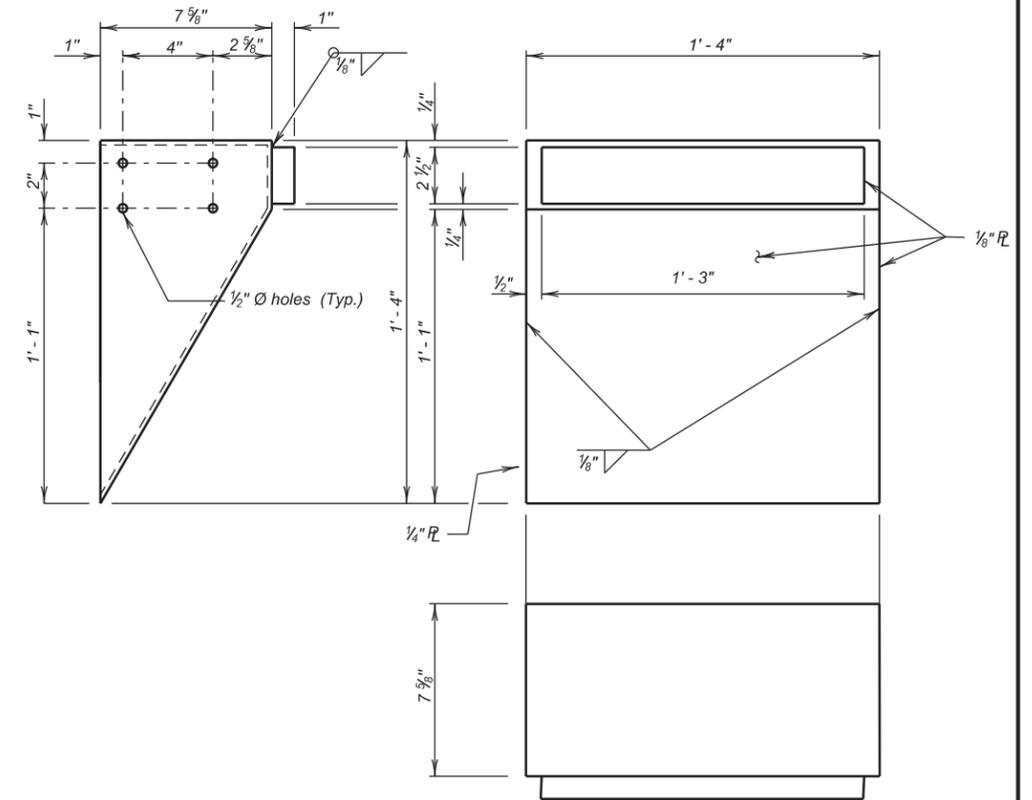
DRAIN DETAIL AT ABUTMENT WINGWALL

★ The position and length of the gutter at each location shall be determined in the field to the satisfaction of the engineer.

* Slope will be set in the field to clear the existing berm spill cone.

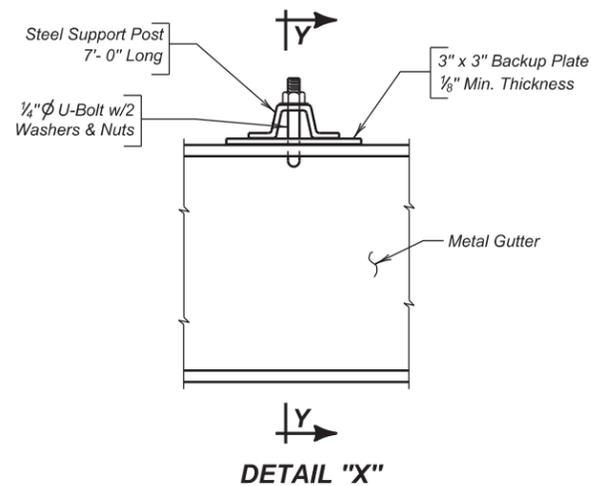


RIPRAP PLAN

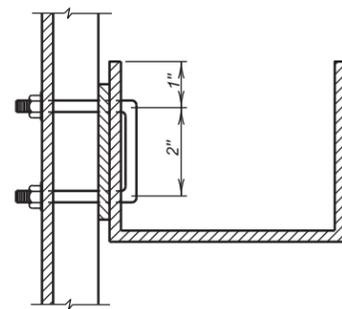


DRAINAGE TROUGH DETAILS

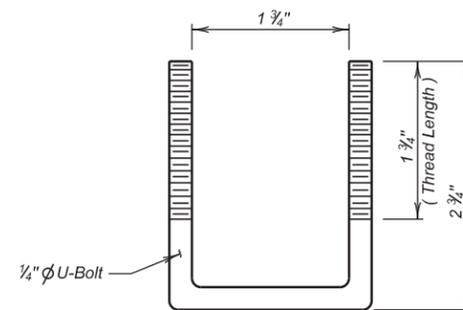
ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Abutment Joint Drain	Each	1



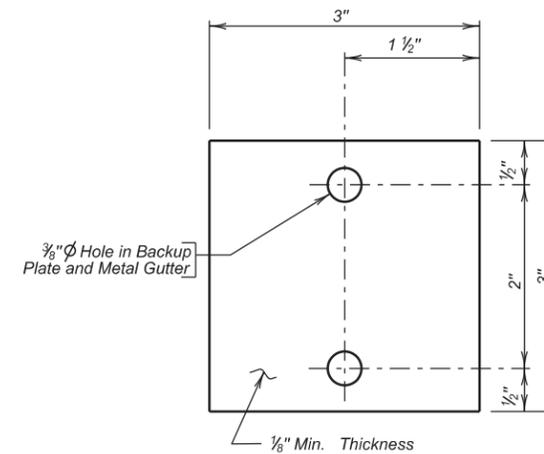
DETAIL "X"



SEC. Y - Y



U - BOLT

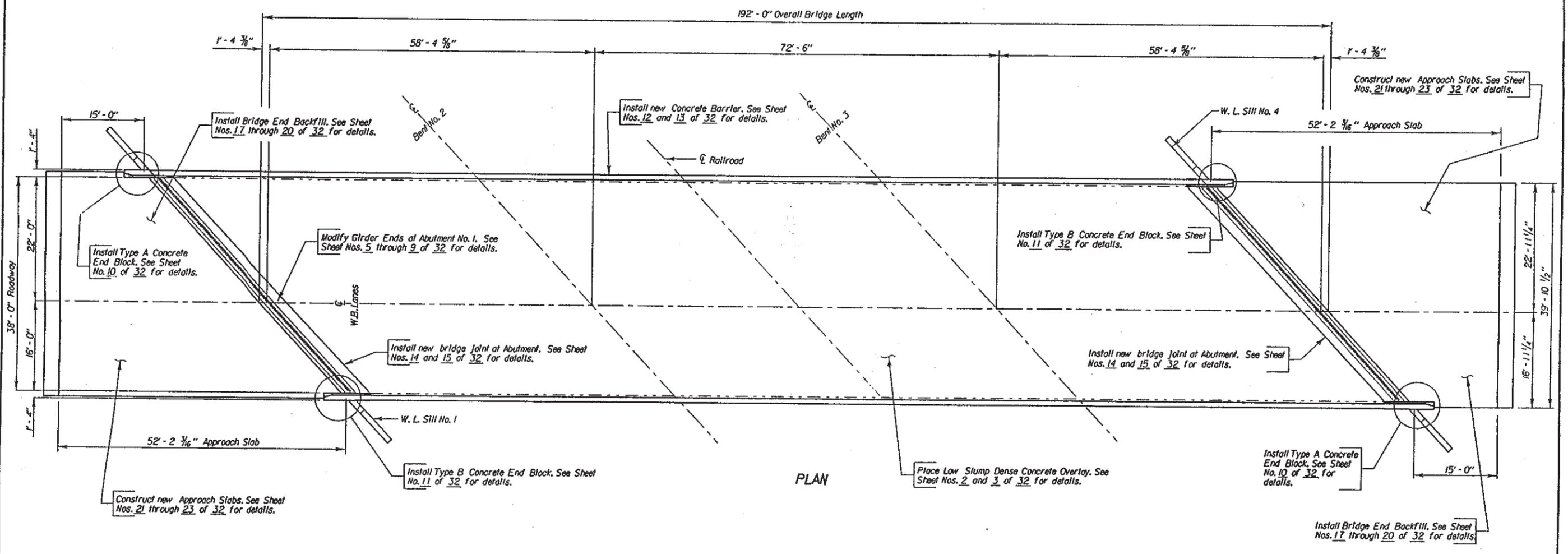


BACKUP PLATE

**(EAST BOUND LANES)
JOINT DRAIN DETAILS**
FOR
192' - 0" CONT. COMP. GIRDER BRIDGE
38' - 0" ROADWAY OVER C. & N.W.R.R. STR. NO. 41-200-089
43° SKEW R.H.F.
SEC. 17 - T6N - R4E
IM 0901(171)18

LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION
MARCH 2016

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E34	E82



PLAN

(WEST BOUND LANES)
 LAYOUT
 192'-0" CONT. COMP. GIRDER BRIDGE
 38'-0" ROADWAY 43° SKEW R. H. F.
 OVER C. & N. W. R. R. SEC. 17-T6N-R4E
 STR. NO. 41-200-088 IM 90-1(00) 22
 PCEMS 1953 LAWRENCE COUNTY

ORIGINAL CONSTRUCTION PLANS

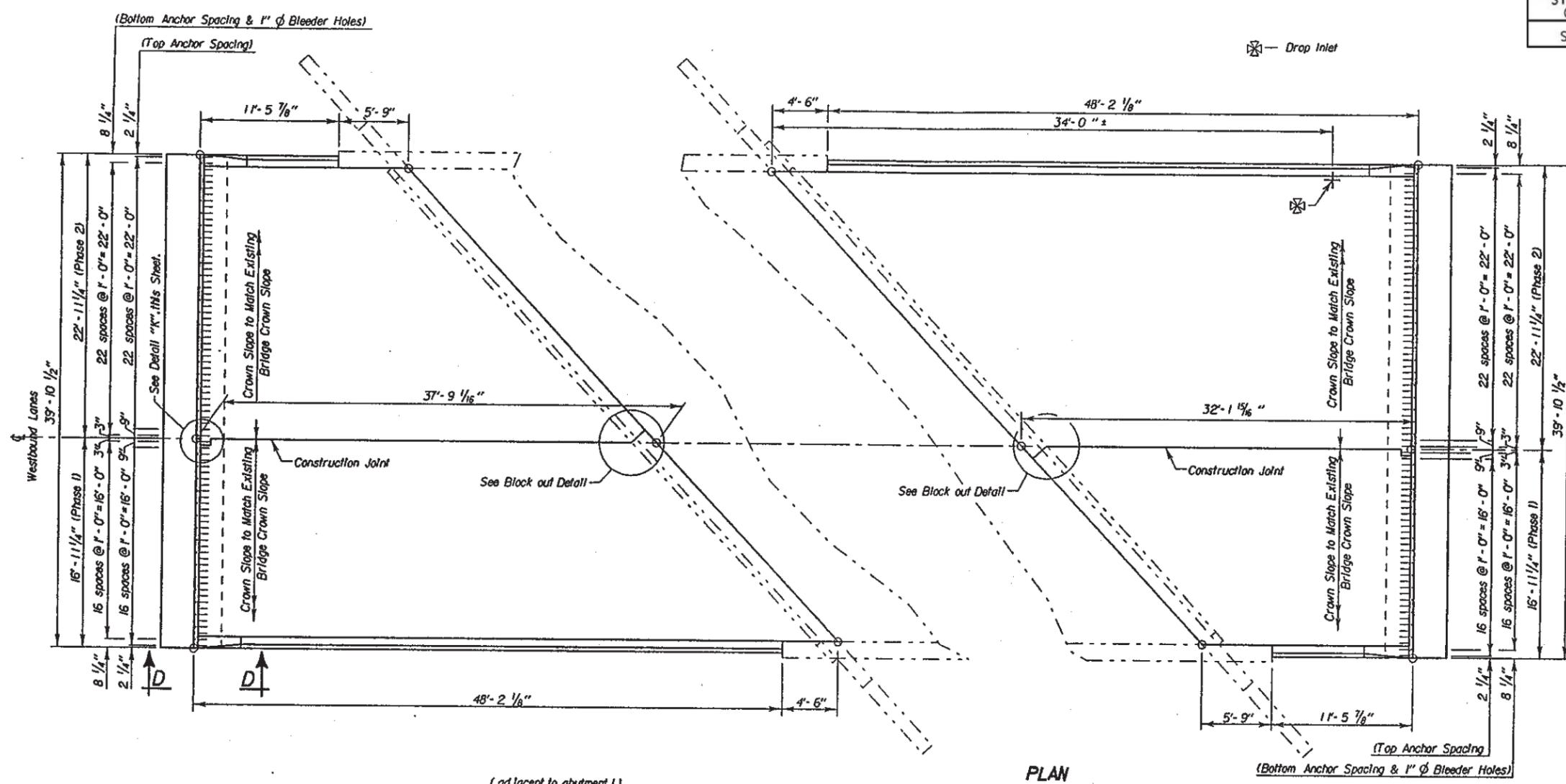
S. D. DEPT. OF TRANSPORTATION
 JANUARY 1998

- XI 71 - (1) (6) OF (11)

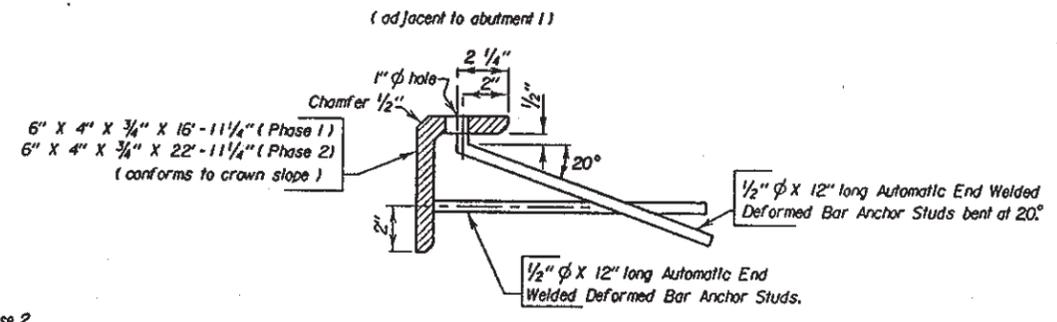
DESIGNED BY EJA LAWR1953	DRAWN BY GWP/EJA 1953PA01	CHECKED BY TJO	APPROVED <i>John C. Cole</i> BRIDGE ENGINEER
--------------------------------	---------------------------------	-------------------	--

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E36	E82

NOTE-
This sheet is to be used in conjunction with sheet Nos. 47 and 48 of 104.

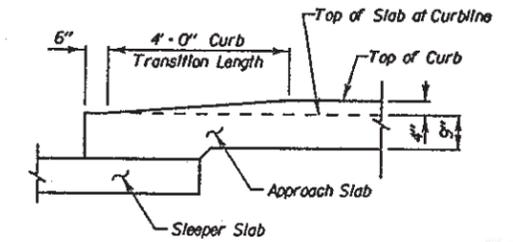


PLAN



DETAIL "X"

(See Sheet Nos. 22 and 23 of 32 for location of detail.)
(See Notes Regarding Armor Angle Assembly, Sheet No. 9 of 104.)



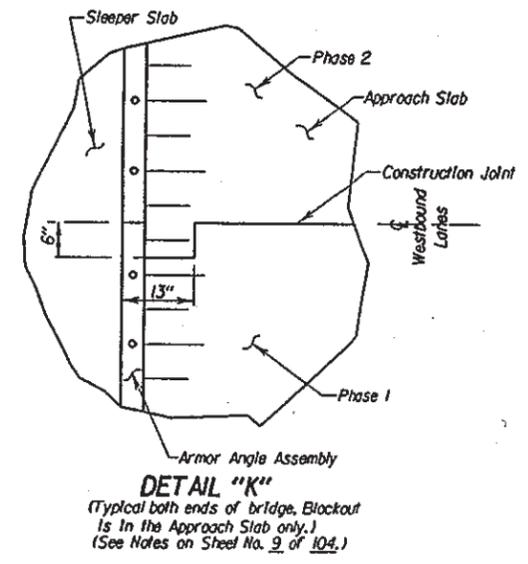
VIEW D - D

ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
DETAILS OF APPROACH SLAB
192'-0" CONT. COMP. GIRDER BRIDGE
38'-0" ROADWAY 43° SKEW R. H. F.
OVER C. & N. W. R. R. SEC. 17-T6N-R4E
STR. NO. 41-200-088
IM 90-1(100) 22

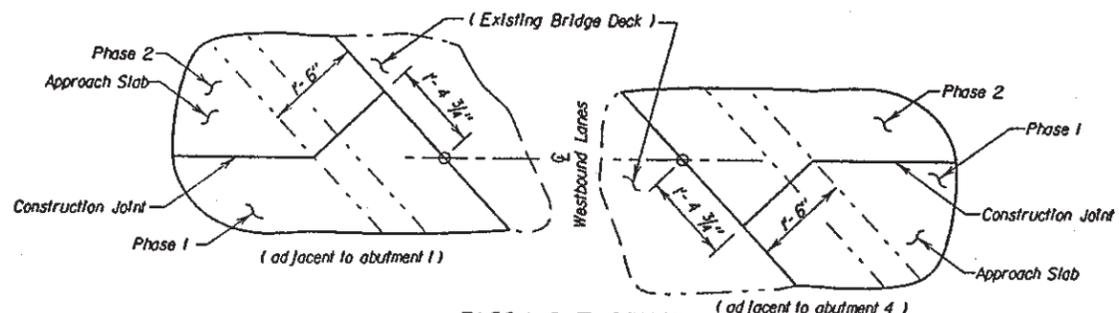
LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION
JANUARY 1998

DESIGNED BY EJA/TJO LAWR1953	DRAWN BY TB 1953PA21	CHECKED BY TJO/CJD	APPROVED <i>John C. Cole</i> BRIDGE ENGINEER
------------------------------------	----------------------------	-----------------------	--



DETAIL "K"

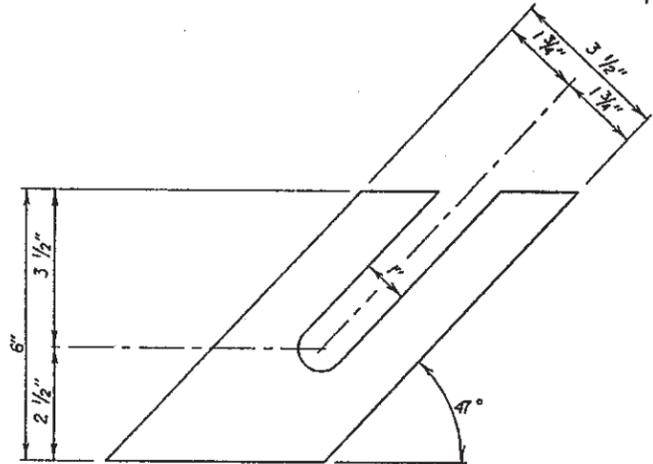
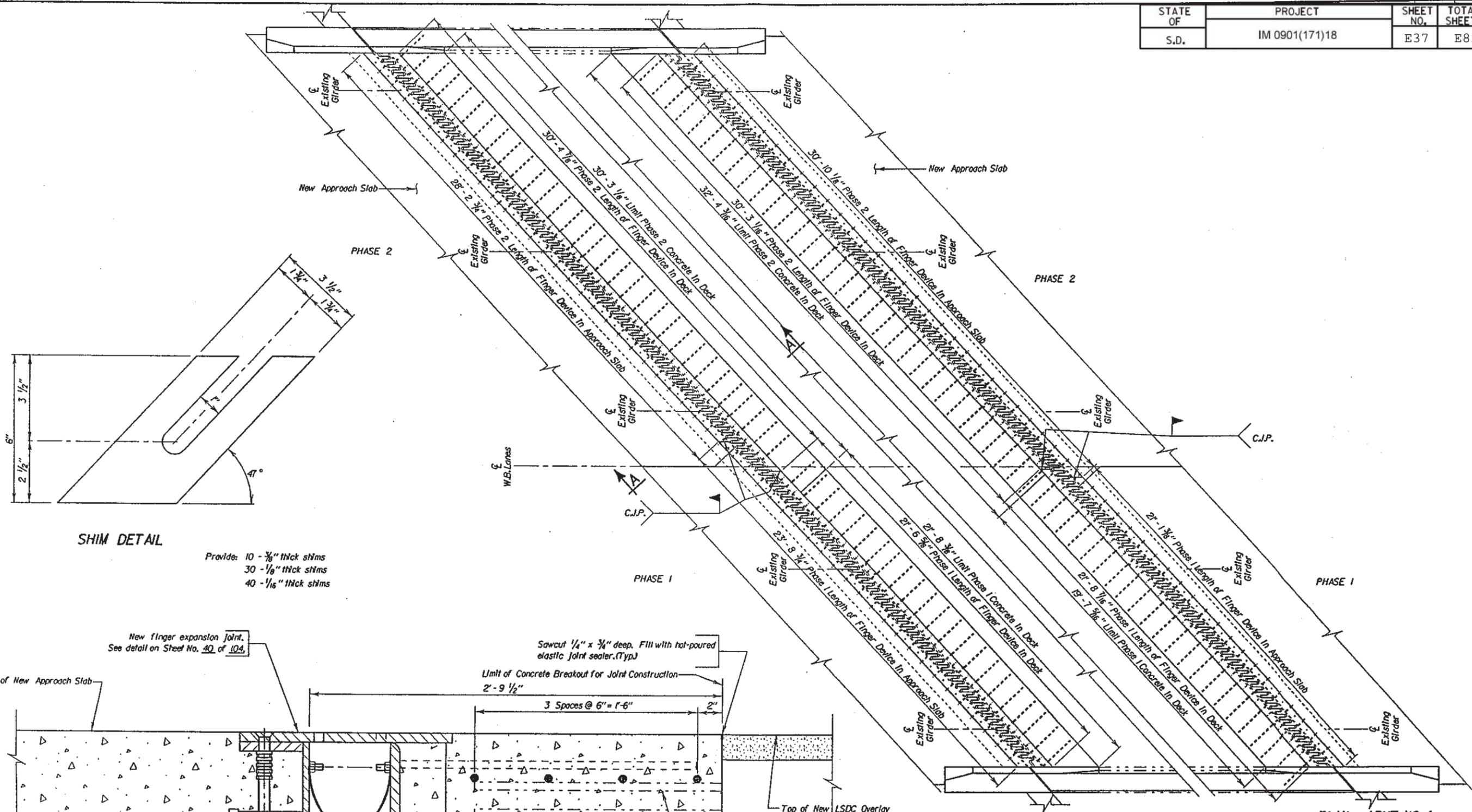
(Typical both ends of bridge. Blockout is in the Approach Slab only.)
(See Notes on Sheet No. 9 of 104.)



BLOCK OUT DETAIL

(See Notes on Sheet No. 9 of 104.)

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E37	E82



SHIM DETAIL

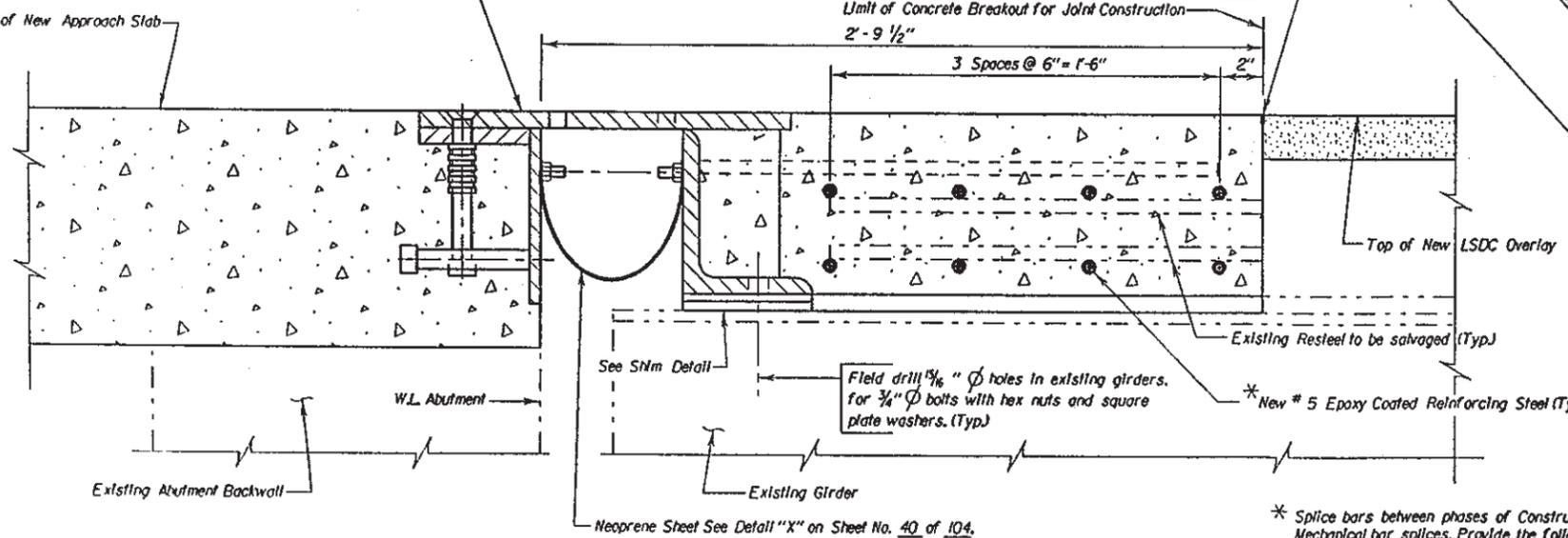
Provide: 10 - 3/8" thick shims
 30 - 1/8" thick shims
 40 - 1/16" thick shims

New finger expansion joint.
 See detail on Sheet No. 40 of 104.

Sawcut 1/4" x 3/4" deep. Fill with hot-poured elastic joint sealer. (Typ.)

Limit of Concrete Breakout for Joint Construction
 2'-9 1/2"

3 Spaces @ 6" = 1'-6"



SEC. A - A
 (Approach Slab Reinforcement not shown)
 (New Construction shown)

* Splice bars between phases of Construction with Mechanical bar splices. Provide the following bar lengths:
 8 @ 21'-6" for Phase 1 Abut. No. 1
 8 @ 21'-1" for Phase 1 Abut. No. 4
 8 @ 32'-0" for Phase 2 Abut. No. 1
 8 @ 32'-3" for Phase 2 Abut. No. 4

PLAN - ABUT. NO. 1
 PLAN - ABUT. NO. 4

ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
 JOINT REPLACEMENT AT ABUTMENTS FOR
192'-0" CONT. COMP. GIRDER BRIDGE
 38'-0" ROADWAY 43° SKEW R. H. F.
 OVER C. & N. W. R. R. SEC. 17-T6N-R4E
 STR. NO. 41-200-088 IM 90-1(00) 22
 LAWRENCE COUNTY

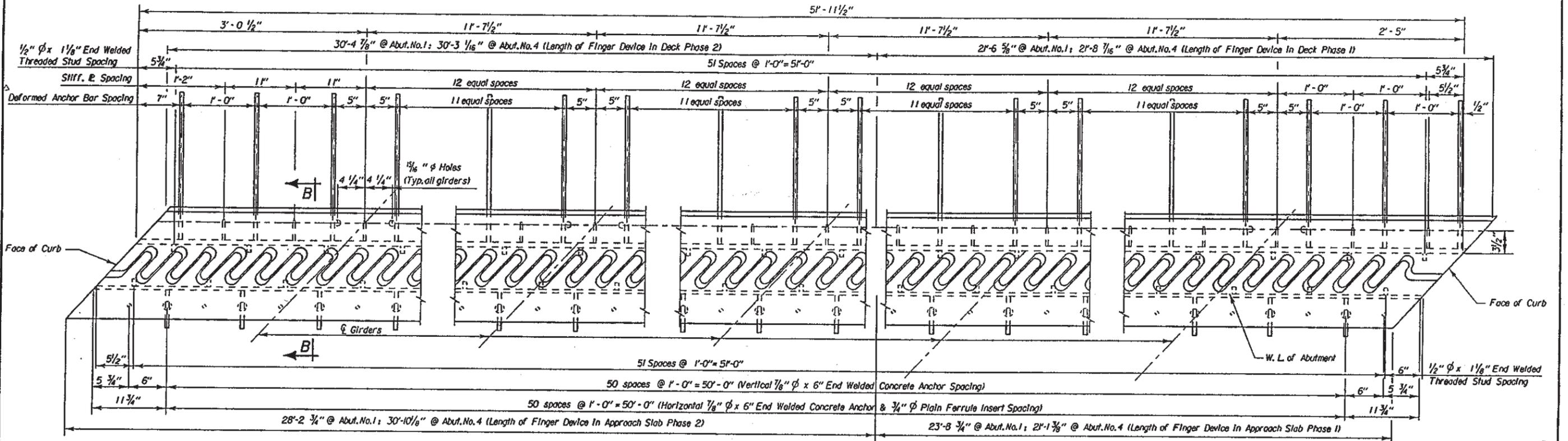
S. D. DEPT. OF TRANSPORTATION
 JANUARY 1998 (19) OF (11)

NOTE: Breakout limit between phases in the deck to place the new expansion device shall be at the centerline of the West Bound Lanes.

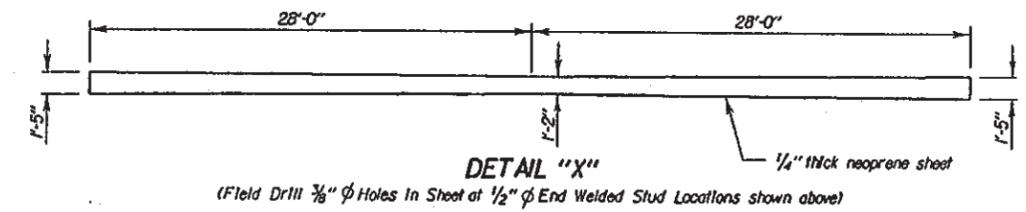
DESIGNED BY EJA LAWRI953	DRAWN BY EJA/GWP 1953PA14	CHECKED BY TJO	APPROVED John C. Cole BRIDGE ENGINEER
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△ Omit the Deformed Anchor bar adjacent to the Welded splice as shown on Sheet No. 14 of 32.

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E38	E82

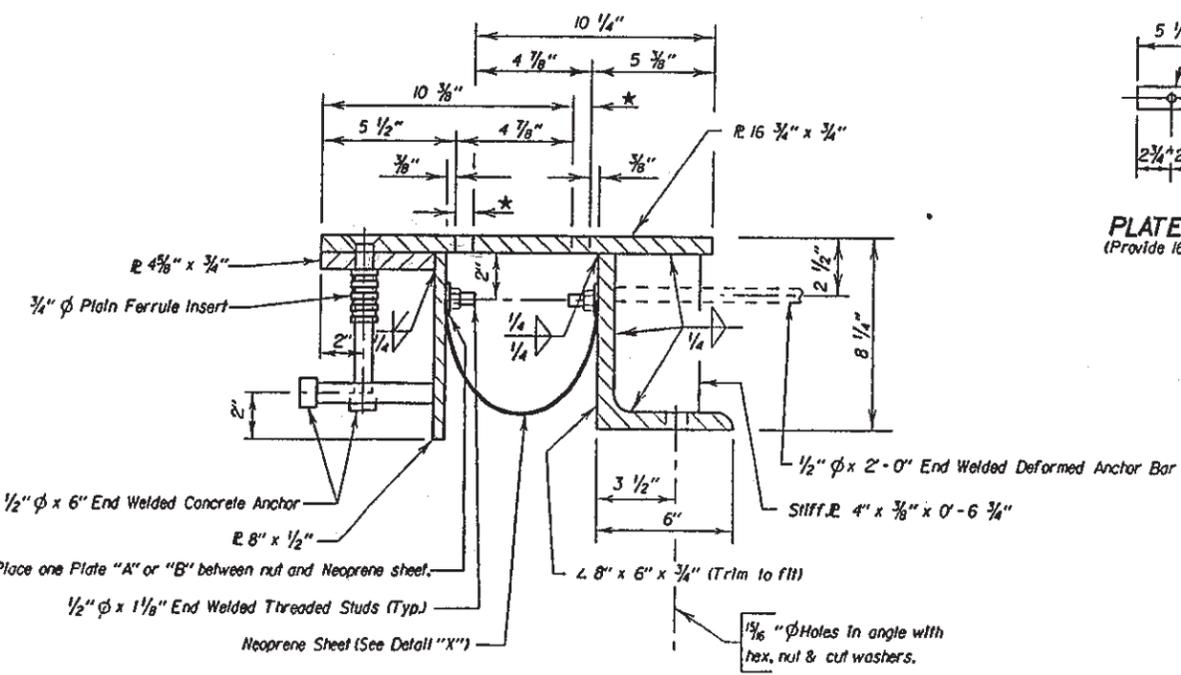


PLAN



DETAIL "X"

* Plates shall be placed as outline in the Replace Expansion Device at Abutments notes on Sheet No. 7 & 8 of 104.



SEC. B-B

Dimensions and angles are normal to W.L. Sill.

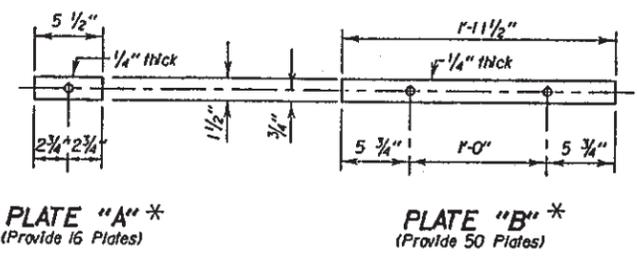


PLATE "A" *
(Provide 16 Plates)

PLATE "B" *
(Provide 50 Plates)

ORIGINAL CONSTRUCTION PLANS

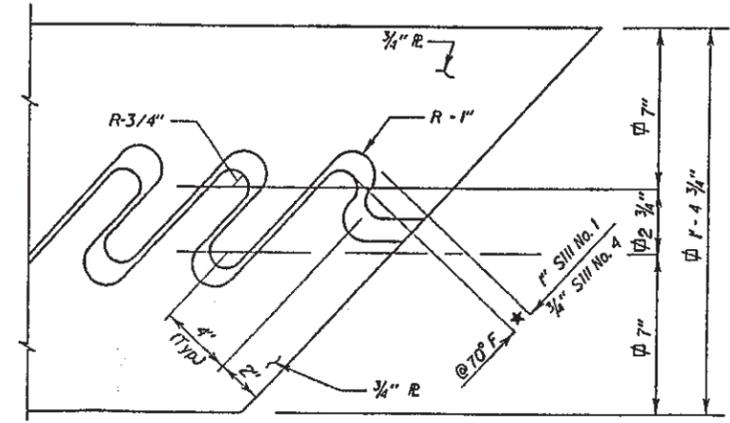
ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Replace Expansion Device	Each	2

	PHASE 1	PHASE 2
1. Class A45 Concrete	2.5 Cu.Yds.	4.0 Cu.Yds.
2. Epoxy Coated Re-Steel	357 Lbs.	536 Lbs.
3. Structural Steel in Armor Assembly	4926 Lbs.	6600 Lbs.
4. Neoprene Sheet	72.3 Sq.Ft.	36.2 Sq.Ft.
5. Mechanical Bar Spllices	16 Each	- Each

Items 1 thru 5 are approximate quantities contained in the above bid item and are for information only.

(WEST BOUND LANES)
 DETAILS FOR FINGER JOINT AT ABUTMENTS
 192'-0" CONT. COMP. GIRDER BRIDGE
 38'-0" ROADWAY
 OVER C. & N. W. R. R.
 STR. NO. 41-200-088

43° SKEW R. H. F.
 SEC. 17-T6N-R4E
 IM 90-1(00) 22

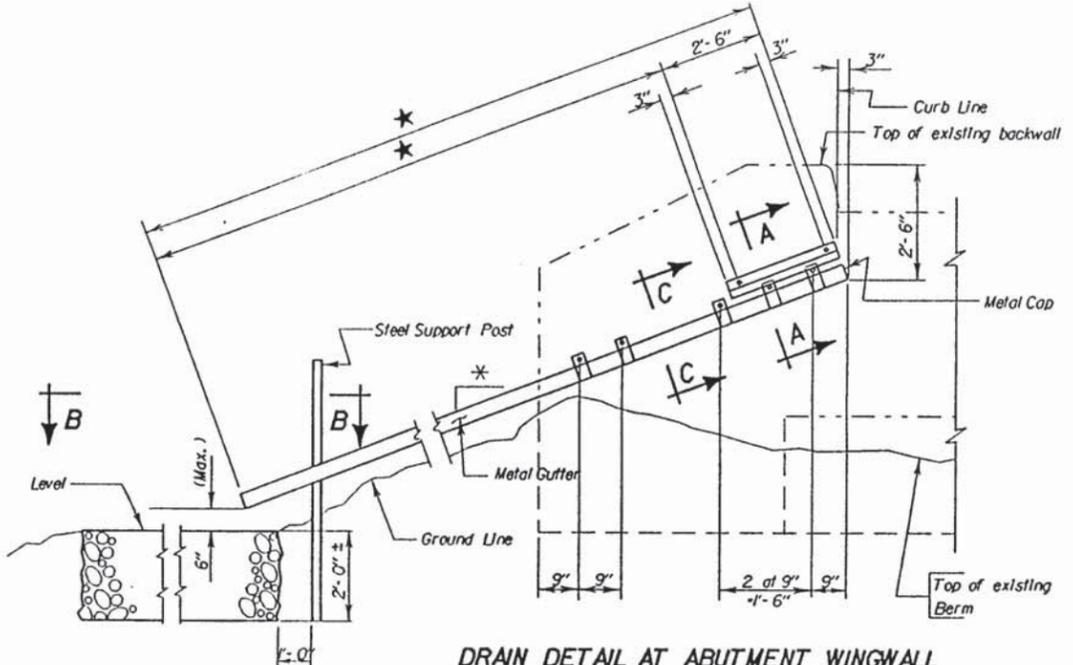


TOOTH LAYOUT

Dimensions shown will be used to fabricate the two halves of the finger plate from one plate. Joint opening will be zero for the dimensions shown.

LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 JANUARY 1998

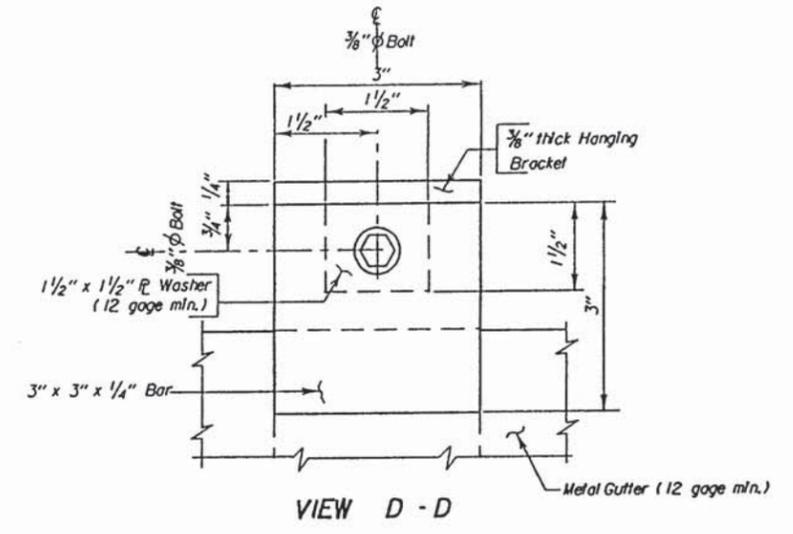
DESIGNED BY: EJA
 DRAWN BY: GWP
 CHECKED BY: TJO
 APPROVED: [Signature] BRIDGE ENGINEER



DRAIN DETAIL AT ABUTMENT WINGWALL

NOTES REGARDING ABUTMENT JOINT DRAIN

1. The drains and flashing shall be fabricated from hot-rolled carbon steel conforming to A.S.T.M.- A570. The material shall have a 12 gage minimum thickness. They shall be galvanized in accordance with A.S.T.M.- A526 coating designation G90, regular spangle.
2. Provide a 12 gage minimum metal cap at the upper end of the metal gutter with attachment details to be provided on the submitted shop drawings.
3. Class I riprap shall conform to South Dakota Standard Specifications 830.1.A -
4. Material for the 3/8" diameter x 2 3/4" commercially available steel wedge-type anchor bolts, nuts and washers shall be at the option of the contractor. The bolts, nuts and washers shall be either hot-dipped galvanized according to A.S.T.M.- A153 or made of corrosion resistant material. The wedge type anchors shall be installed in accordance with the manufacturer's recommendations.
5. The hanging brackets and backup plates shall conform to A.S.T.M.- A709, Grade 36 and shall be galvanized in accordance with A.S.T.M.- A123. The 1/4" diameter U-bolts, nuts and washers shall conform to A.S.T.M.- A307 and be galvanized in accordance with A.S.T.M.- A123 or made of some other corrosion resistant material.
6. The placement of the gutter on the backwall is necessary to drain the water from the strip seal or compression seal away from the bridge. Should it be necessary, it shall be at the ENGINEER'S option to adjust the gutter from the plans location to meet this requirement.
7. The cost of installing the abutment joint drains including all labor, riprap, materials, equipment, and incidentals necessary to complete the work shall be included in the unit price bid for "Abutment Joint Drain".
8. After the drain length and slope are determined for each location, and approved by the ENGINEER, sketches of same shall be sent to the Office of Bridge Design and to the fabricator.
9. The steel support posts shall be 7'-0" long and conform to the requirement for Delineator Posts in Section 982 of the S. D. Standard Specifications. The posts shall be painted with high quality enamel of the color yellow.



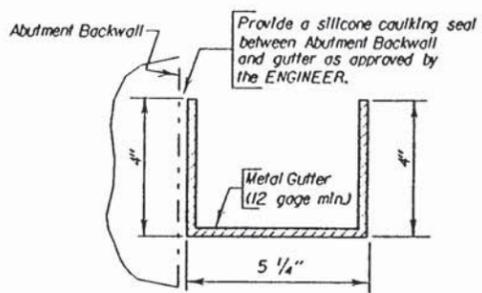
VIEW D - D

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Abutment Joint Drain	Each	4

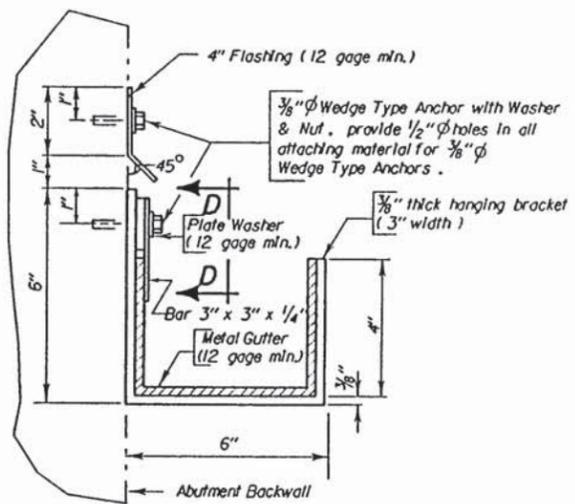
For informational purposes, the quantity of Class I Riprap shall be 5 ton.

★ The length of metal gutter will need to be determined in the field for each location individually prior to fabrication.

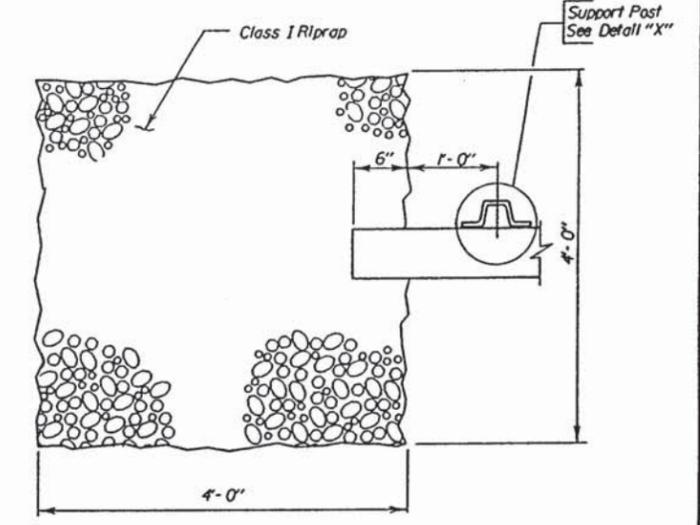
✱ Slope will be set in the field prior to fabrication to clear the existing berm spill cone.



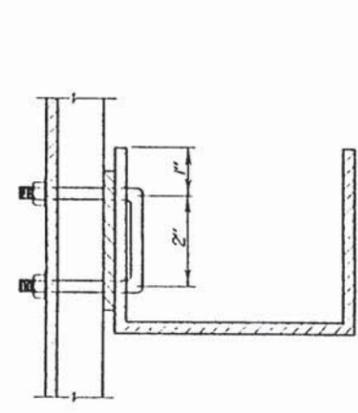
SECTION C - C
(Typical Gutter Section)



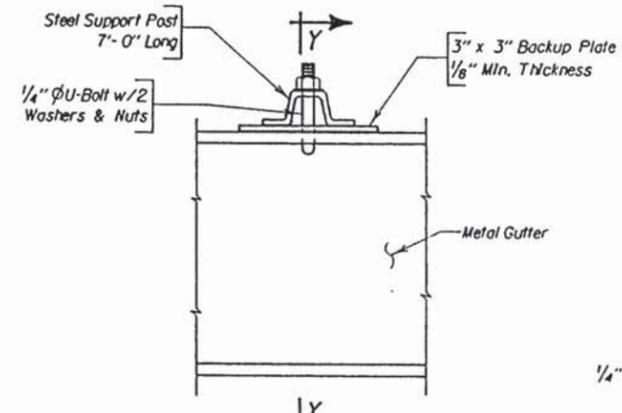
SECTION A - A
(Typical Gutter Section at Bracket)



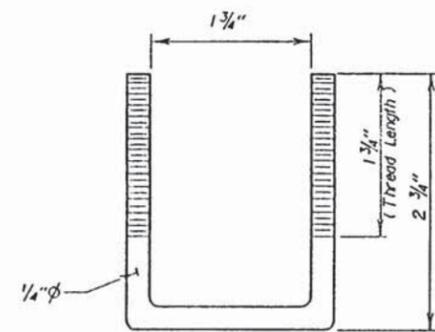
VIEW B - B
(Detail of Rockpile)



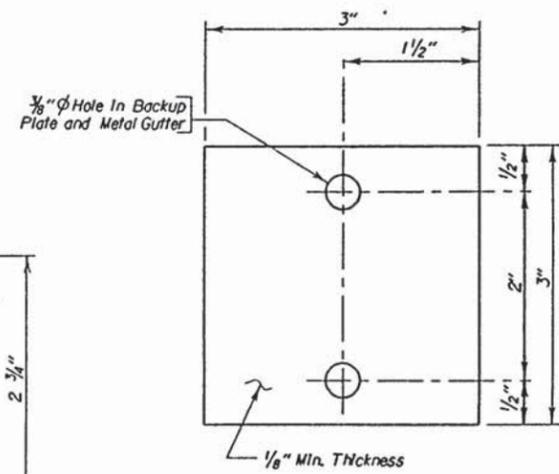
SEC. Y-Y



DETAIL 'X'



U - BOLT



BACKUP PLATE

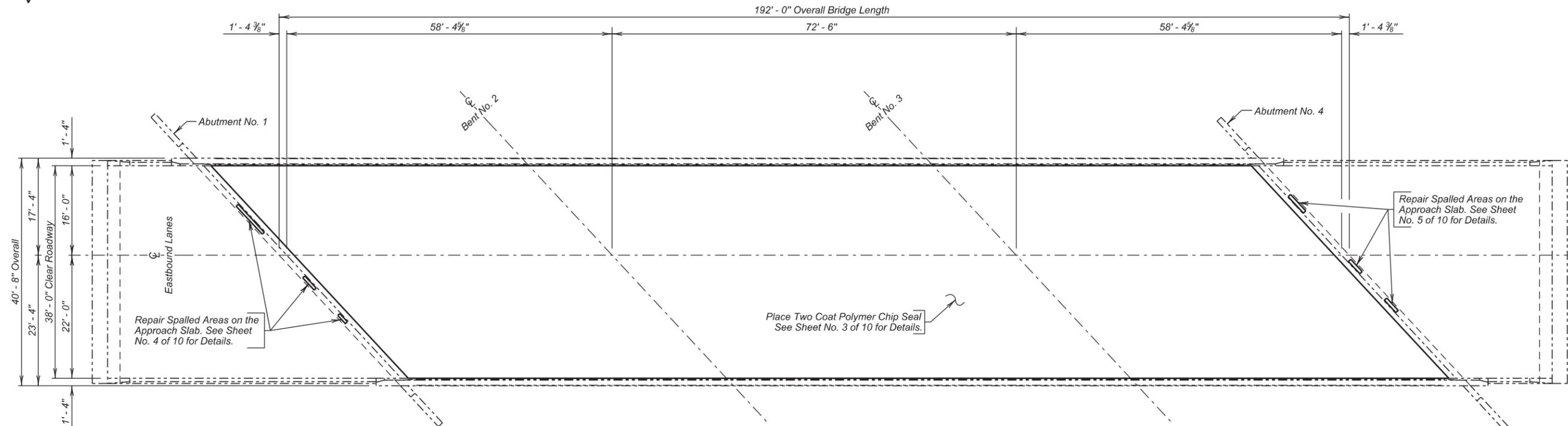
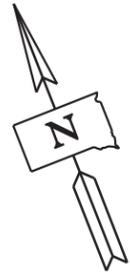
ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
ABUTMENT JOINT DRAIN DETAILS FOR
192'-0" CONT. COMP. GIRDER BRIDGE
 38'-0" ROADWAY 43° SKEW R. H. F.
 OVER C. & N. W. R. R. SEC. 17-T6N-R4E
 STR. NO. 41-200-088 IM 90-1(100) 22

LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 JANUARY 1998 11 OF 11

DESIGNED BY EJA LAWRI953	DRAWN BY GWP 1953PA16	CHECKED BY TJO	APPROVED John C. Cole BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E40	E82



PLAN

INDEX OF BRIDGE SHEETS -

- Sheet No. 1 - Layout for Upgrading
- Sheet No. 2 - Estimate of Structure Quantities and Notes
- Sheet No. 3 - Two Coat Polymer Chip Seal Details
- Sheet No. 4 - Approach Slab Repair
- Sheet No. 5 - Approach Slab Repair (Continued)
- Sheet Nos. 6-10 - Original Construction Plans

**(EASTBOUND LANES)
LAYOUT FOR UPGRADING
FOR**

192' - 0" CONT. COMPOSITE GIRDER BRIDGE
 38' - 0" ROADWAY
 OVER C. & N.W.R.R.
 STR. NO. 41-200-089
 PCN 02PP

43° SKEW R.H.F.
 SEC. 17 - T6N - R4E
 IM 0901(171)18

LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 NOVEMBER 2015

DESIGNED BY KH LAWR02PP	CK. DES. BY KSK 02PPRE01	DRAFTED BY KR	<i>Kevin N. Coeden</i> BRIDGE ENGINEER
-------------------------------	--------------------------------	------------------	---

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
460E0170	Concrete Patching Material, Bridge Deck	67.0	CuFt
491E0005	Two Coat Bridge Deck Polymer Chip Seal	788.0	SqYd
491E0110	Abrasive Blasting of Bridge Deck	788.0	SqYd
491E0120	Bridge Deck Grinding	788.0	SqYd
491E0130	Concrete Removal, Class A	11.2	SqYd
491E0140	Concrete Removal, Class B	11.2	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.

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. 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 elsewhere 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 preconstruction meeting.

- Perform bridge deck grinding and repair the bridge deck by removing all loose and delaminated concrete from the bridge deck surface for the first and second phase construction.
- Repair the bridge deck and approach slab by removing and replacing all loose and delaminated concrete from the surface for the first phase of construction.
- Clean the bridge deck surface with abrasive blasting for the first phase of construction.
- Place a Two Coat Bridge Deck Polymer Chip Seal for the first phase of construction.
- Repair spalled areas on approach slab adjacent to the finger type bridge expansion joint for the first phase of construction.
- Switch traffic and repeat steps 2 through 4 for the second phase of construction.

GENERAL CONSTRUCTION NOTES

- 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.
- 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.

APPROACH SLAB REPAIR

- The removal and replacement of the delaminated concrete on the approach slab shall be in accordance with Section 491 of the Construction Specifications except as follows:
 - Curing compounds may be used to cure the approach slab concrete patches in accordance with Section 460.3M of the Construction Specification
 - The surface of the approach slab concrete patches shall be tined.

BRIDGE DECK GRINDING

The Contractor will have the option of grinding the entire deck surface during phase one. Any additional costs incurred for grinding the entire deck surface such as additional traffic control or cleaning shall be at no additional cost to the Department.

TWO COAT BRIDGE DECK POLYMER CHIP SEAL

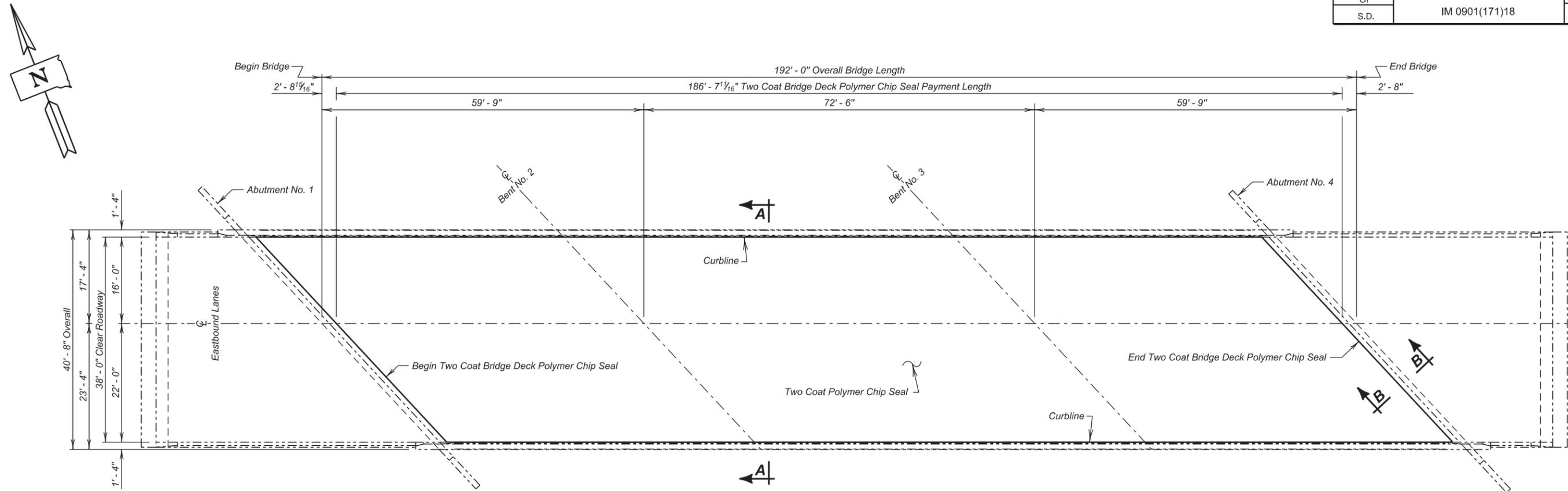
The Two Coat Bridge Deck Polymer Chip Seal shall be applied in accordance with the construction specifications.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES FOR 192' - 0" CONT. COMP. GIRDER BRIDGE

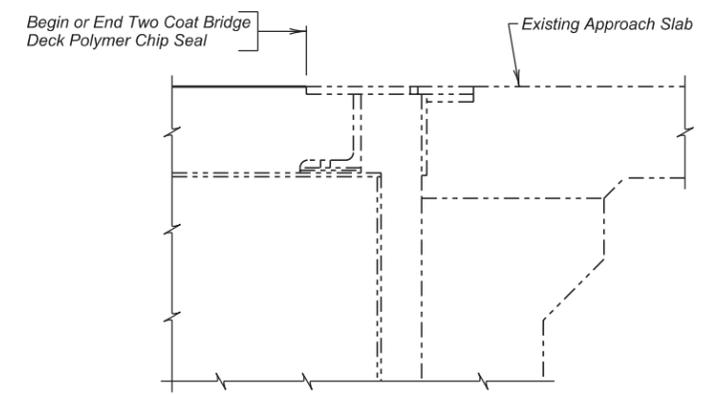
STR. NO. 41-200-089
NOVEMBER 2015

2 OF 10

DESIGNED BY KH	CK. DES. BY KSK	DRAFTED BY KH	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
LAWR02PP	02PPK02		



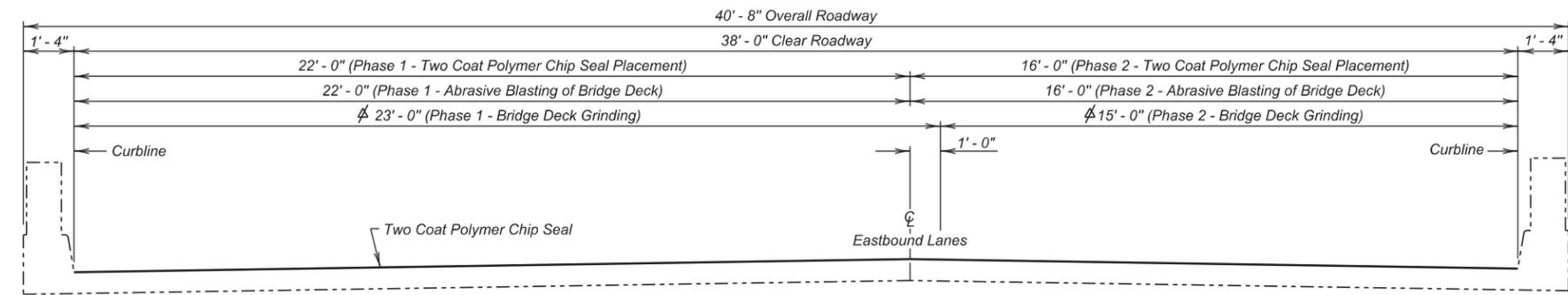
PLAN



SECTION B - B

ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
		PHASE 1	PHASE 2
* Concrete Patching Material, Bridge Deck	Cu. Ft.	37.7	24.6
Two Coat Bridge Deck Polymer Chip Seal	Sq. Yd.	456.2	331.8
Abrasive Blasting of Bridge Deck	Sq. Yd.	456.2	331.8
Bridge Deck Grinding	Sq. Yd.	477.0	311.0
* Concrete Removal, Class A	Sq. Yd.	5.9	3.9
* Concrete Removal, Class B	Sq. Yd.	5.9	3.9

* Concrete Patching Material, Bridge Deck; Concrete Removal, Class A; and Concrete Removal, Class B may not be encountered and may be removed from the project at the direction of the Engineer.

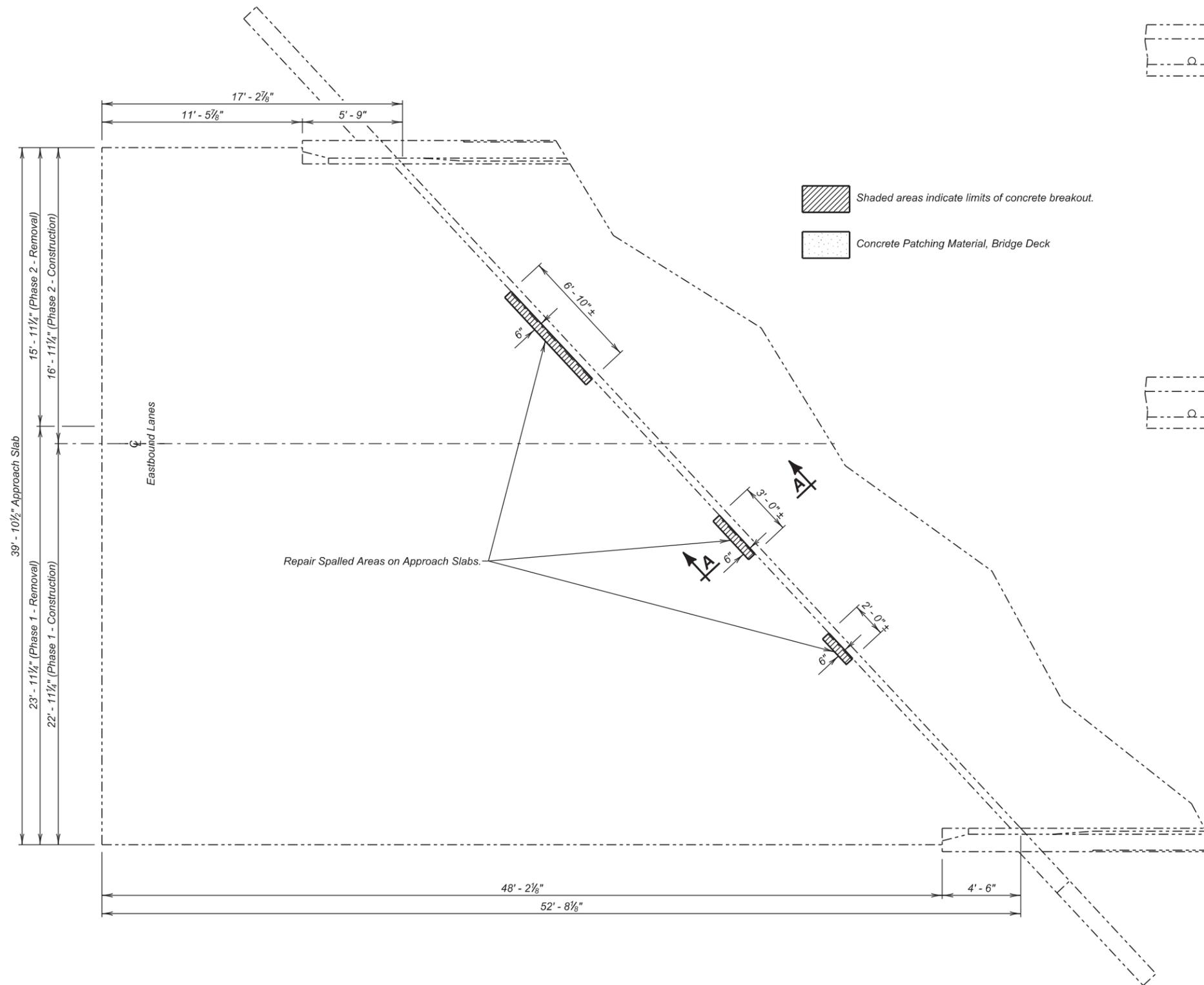


SECTION A - A

(EASTBOUND LANES)
 POLYMER CHIP SEAL DETAILS
 FOR
192' - 0" CONTINUOUS COMP. GIRDER BRIDGE
 38' - 0" ROADWAY
 OVER C. & N.W.R.R.
 STR. NO. 41-200-089
 43° SKEW R.H.F.
 SEC. 17 - T6N - R4E
 IM 0901(171)18

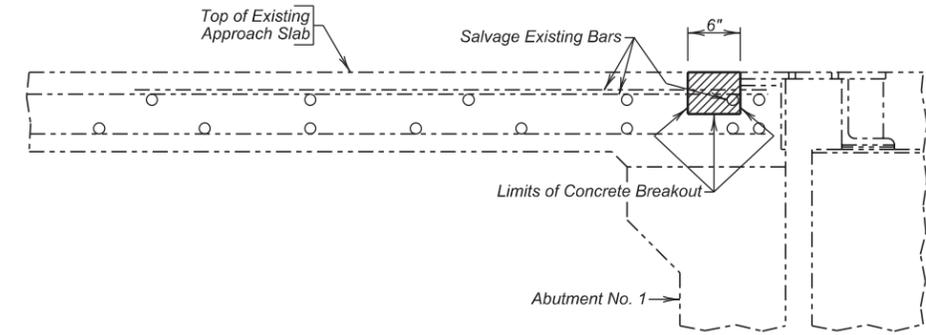
LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 NOVEMBER 2015

See Bridge Deck Grinding Notes on Sheet No. 2 of 10.

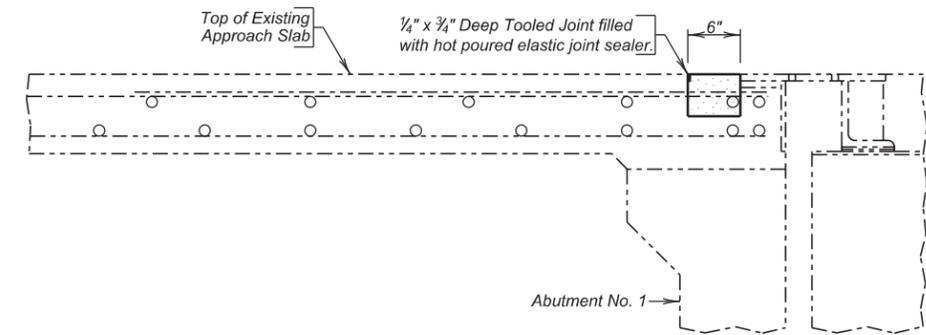


PLAN
(Abutment No. 1 Shown)

Shaded areas indicate limits of concrete breakout.
 Concrete Patching Material, Bridge Deck



SECTION A - A
(Existing Section showing Removal Limits)



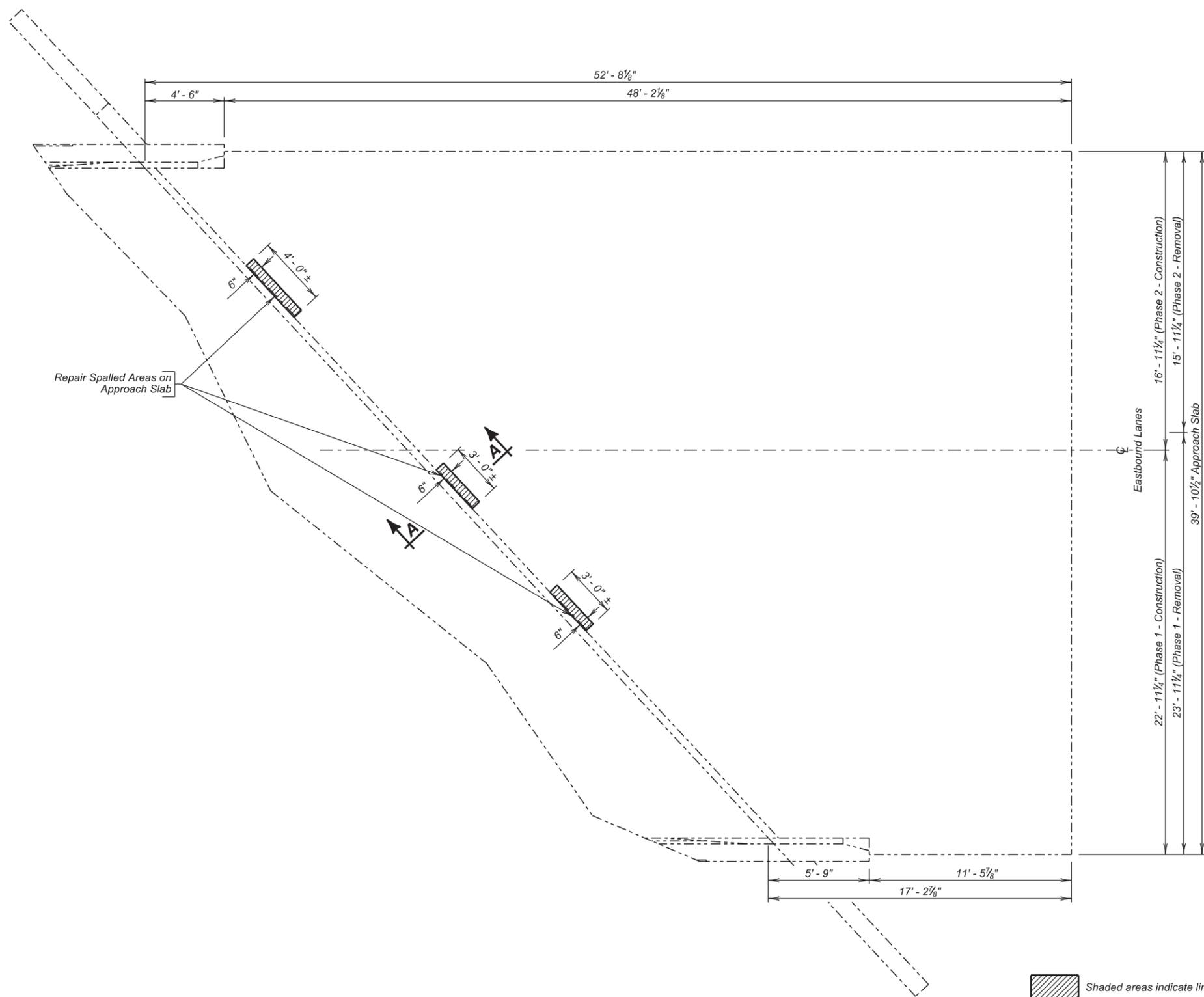
SECTION A - A
(New Construction Shown)

ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
		Phase 1	Phase 2
Concrete Removal, Type A	Sq. Yd.	0.3	0.4
Concrete Removal, Type B	Sq. Yd.	0.3	0.4
Concrete Patching Material, Bridge Deck	Cu. Ft.	1.0	1.4

(EASTBOUND LANES)
 APPROACH SLAB REPAIR
 FOR
 192' - 0" CONT. COMPOSITE GIRDER BRIDGE
 38' - 0" ROADWAY
 OVER RAILROAD
 STR. NO. 41-200-089
 43° SKEW R.H.F.
 SEC. 17-T6N-R4E
 IM 0901(171)18

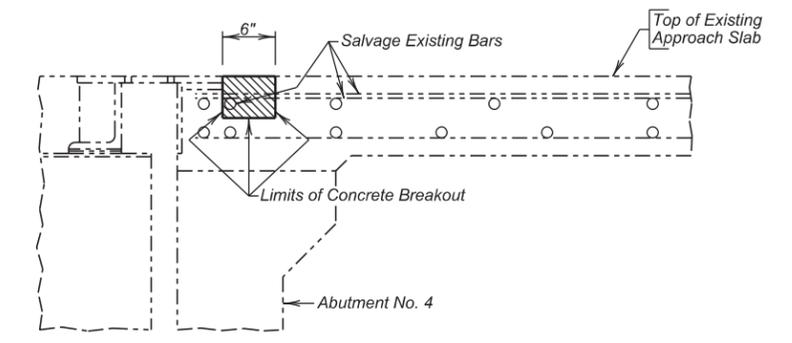
LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 NOVEMBER 2015

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E44	E82

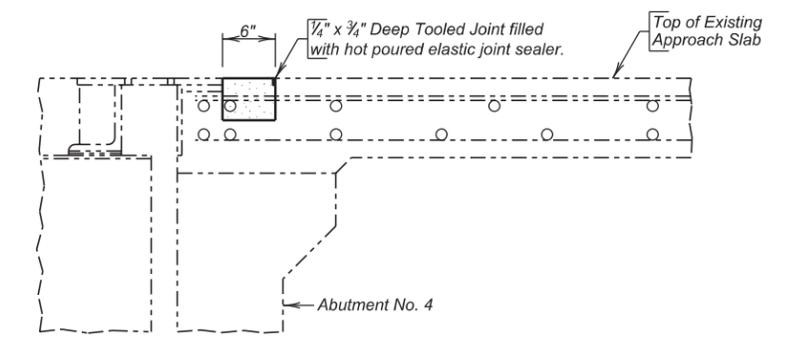


PLAN
(Abutment No. 4 Shown)

- Shaded areas indicate limits of concrete breakout.
- Concrete Patching Material, Bridge Deck



SECTION A - A
(Existing Section showing Removal Limits)



SECTION A - A
(New Construction Shown)

ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
		Phase 1	Phase 2
Concrete Removal, Type A	Sq. Yd.	0.4	0.3
Concrete Removal, Type B	Sq. Yd.	0.4	0.3
Concrete Patching Material, Bridge Deck	Cu. Ft.	1.4	0.9

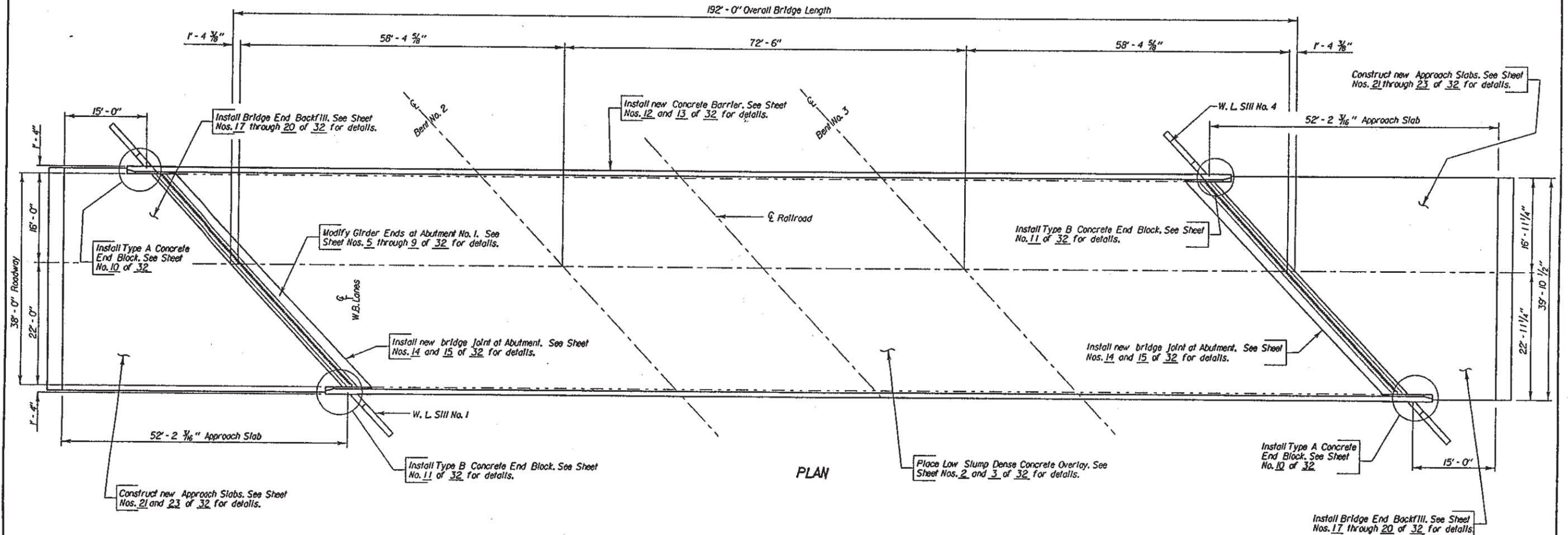
**EASTBOUND LANES
APPROACH SLAB REPAIR (CONTINUED)**
FOR
192' - 0" CONT. COMPOSITE GIRDER BRIDGE
38' - 0" ROADWAY
OVER RAILROAD
STR. NO. 41-200-089

43° SKEW R.H.F.
SEC. 17-T6N-R4E
IM 0901(171)18

LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION
NOVEMBER 2015

DESIGNED BY KH LAWR02PP	CK. DES. BY KSK 02PPKF06	DRAFTED BY KH	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E45	E82



PLAN

(EAST BOUND LANES)
LAYOUT
192'-0" CONT. COMP. GIRDER BRIDGE
38'-0" ROADWAY 43° SKEW R. H. F.
OVER C. & N. W. R. R.
STR. NO. 41-200-089 SEC. 17-T6N-R4E
PCEMS 1953 IM 90-1() 22
LAWRENCE COUNTY

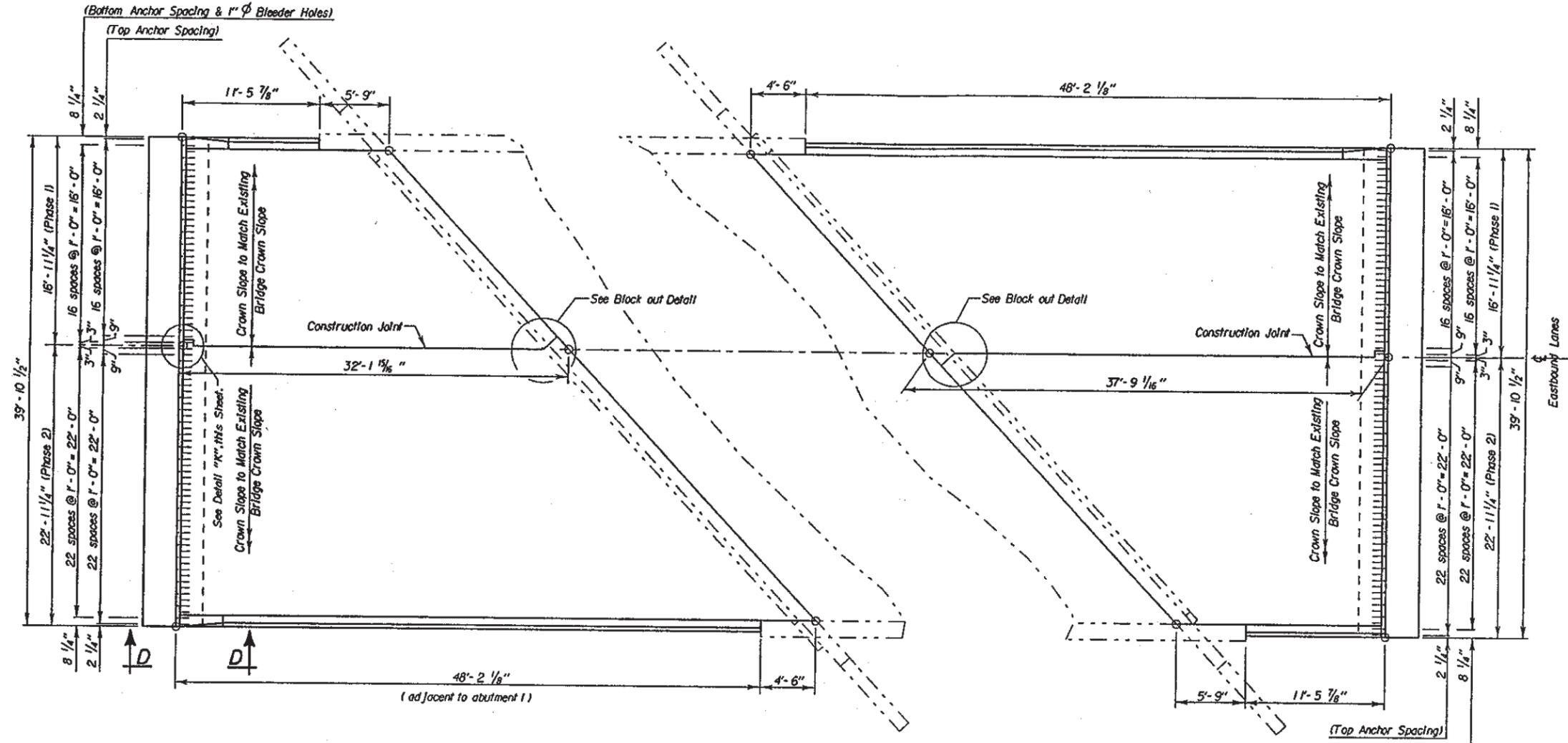
S. D. DEPT. OF TRANSPORTATION
JANUARY 1998

ORIGINAL CONSTRUCTION PLANS

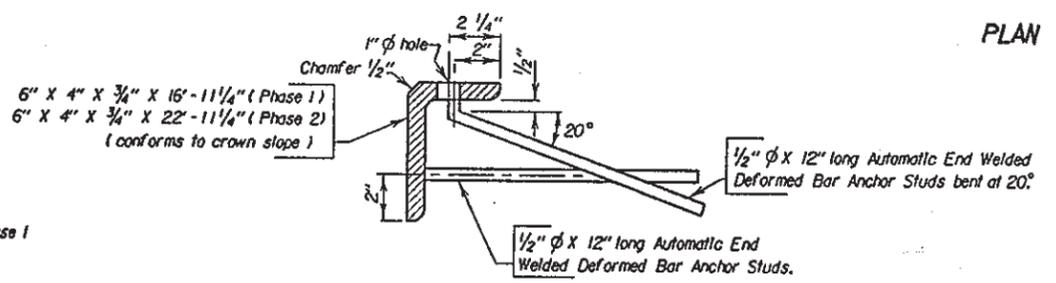
DESIGNED BY EJA LAWR1953	DRAWN BY GWP/EJA 1953PBD1	CHECKED BY TJO	APPROVED <i>John C. Cole</i> BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E47	E82

NOTE-
This sheet is to be used in conjunction with sheet Nos. 79 and 80 of 104.

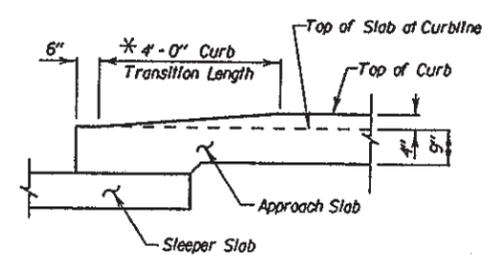


PLAN



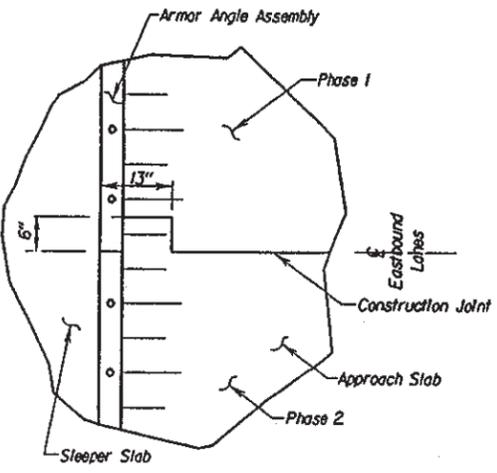
DETAIL "X"

(See Sheet Nos. 3 and 4 of 5 for location of detail.)
(See Notes Regarding Armor Angle Assembly, Sheet No. 9 of 104.)



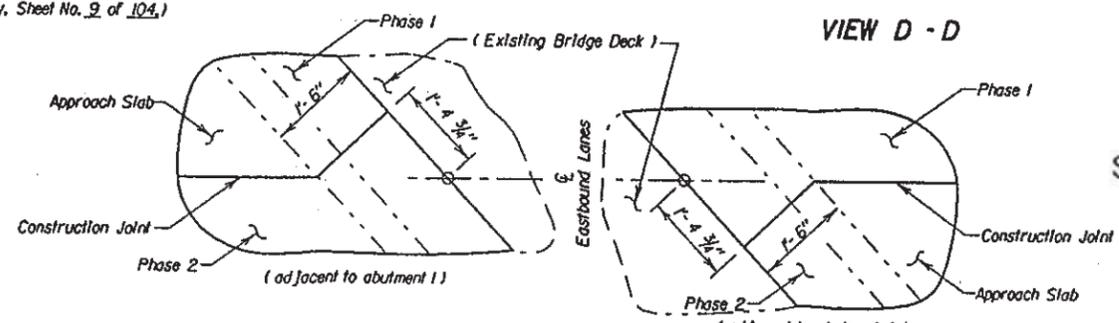
VIEW D - D

* The curb shall not taper on the south side of the approach adjacent to Abutment No. 4.



DETAIL "K"

(Typical both ends of bridge, Blockout is in the Approach Slab only.)
(See Notes on Sheet No. 9 of 104.)



BLOCK OUT DETAIL
(See Notes on Sheet No. 9 of 104.)

ORIGINAL CONSTRUCTION PLANS

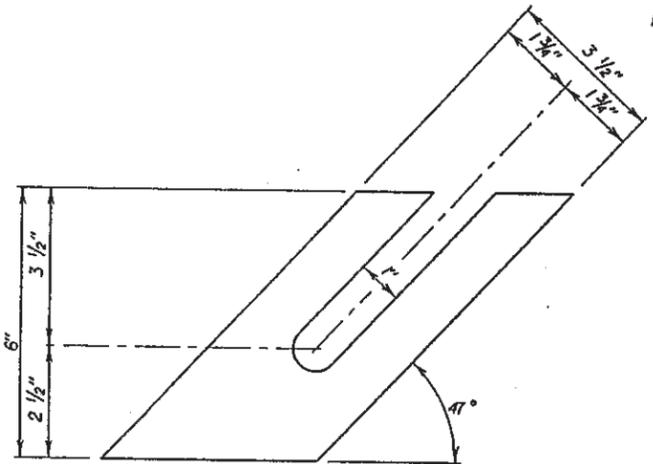
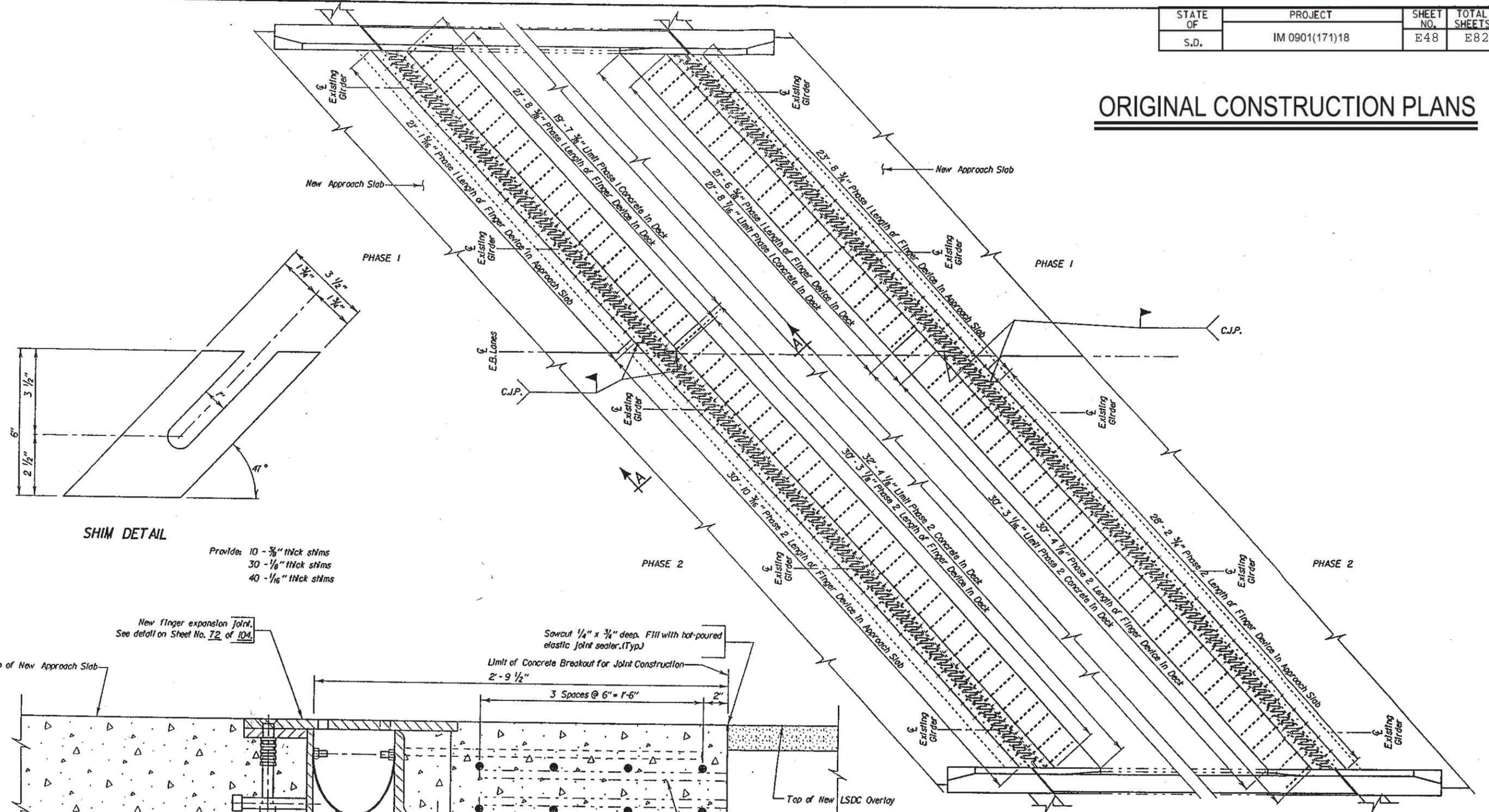
(EAST BOUND LANES)
DETAILS OF APPROACH SLAB
192'-0" CONT. COMP. GIRDER BRIDGE
38'-0" ROADWAY
OVER C. & N. W. R. R.
STR. NO. 41-200-089

45° SKEW R. H. F.
SEC. 17-T6N-R4E
IM 90-1(00) 22

LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION
JANUARY 1998

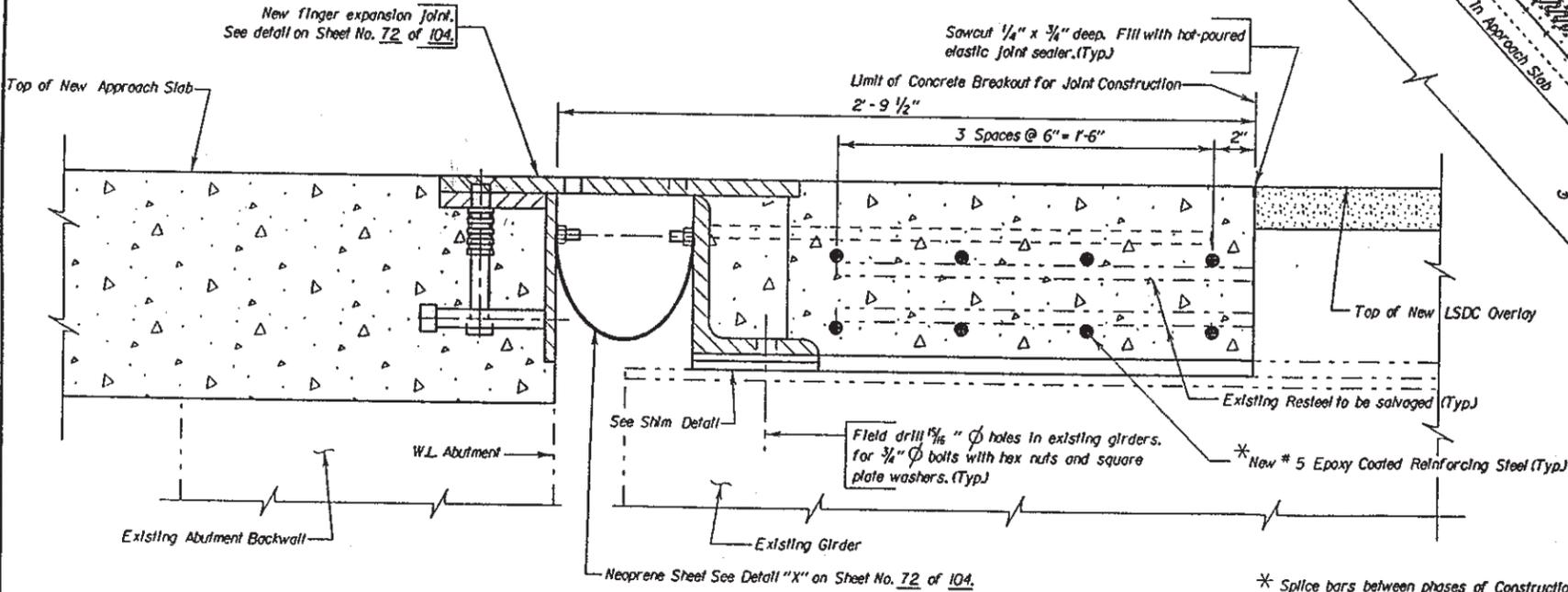
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
TJO/EJA LAWR1953	TB 1953PB21	TJO/CJD	<i>John C. Cole</i> BRIDGE ENGINEER

ORIGINAL CONSTRUCTION PLANS



SHIM DETAIL

Provide: 10 - 3/8" thick shims
 30 - 1/8" thick shims
 40 - 1/16" thick shims



SEC. A - A
 (Approach Slab Reinforcement not shown)
 (New Construction shown)

* Splice bars between phases of Construction with Mechanical bar splices. Provide the following bar lengths:
 8 @ 2'-3" for Phase 1 Abut. No. 1
 8 @ 2'-6" for Phase 1 Abut. No. 4
 8 @ 3'-3" for Phase 2 Abut. No. 1
 8 @ 3'-0" for Phase 2 Abut. No. 4

(EAST BOUND LANES)
JOINT REPLACEMENT AT ABUTMENTS FOR
192'-0" CONT. COMP. GIRDER BRIDGE
 38'-0" ROADWAY 43° SKEW R. H. F.
 OVER C. & N. W. R. R. SEC. 17-T6N-R4E
 STR. NO. 41-200-089 IM 90-1(00) 22
 LAWRENCE COUNTY

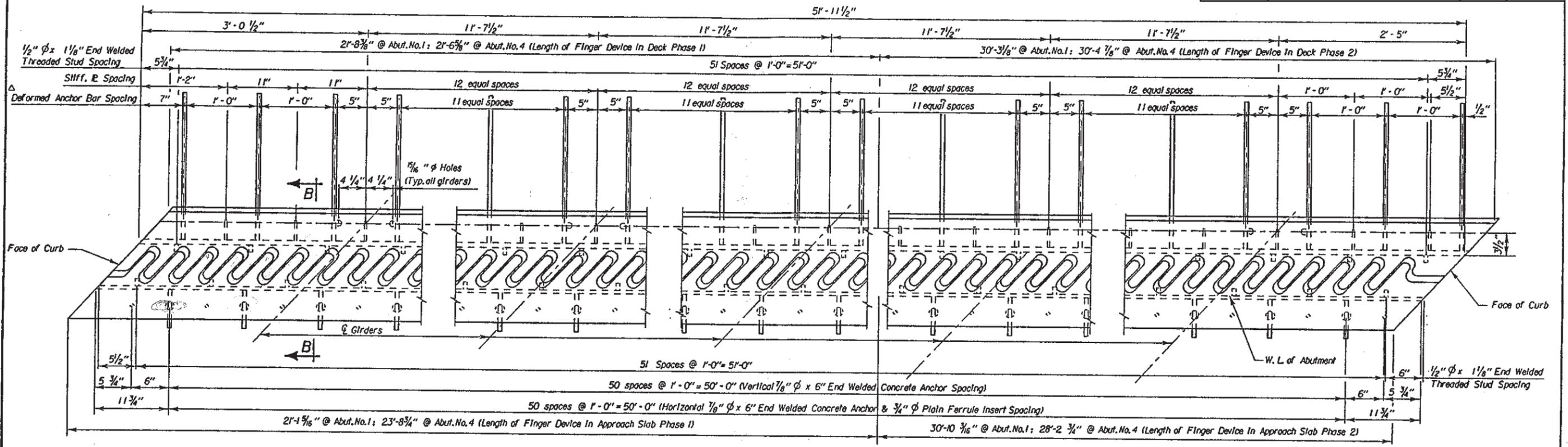
S. D. DEPT. OF TRANSPORTATION
 JANUARY 1998 9 OF 10

NOTE: Breakout limit between phases in the deck to place the new expansion device shall be at the centerline of the East Bound Lanes.

DESIGNED BY EJA LAWR1953	DRAWN BY EJA/GWP 1953PBI4	CHECKED BY TJO	APPROVED <i>J. C. Cole</i> BRIDGE ENGINEER
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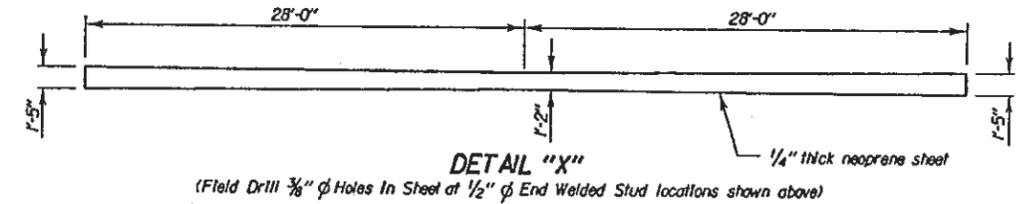
△ Omit the Deformed Anchor bar adjacent to the Welded splice as shown on Sheet No. 14 of 32.

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E49	E82



PLAN

* Plates shall be placed as outlined in the Replace Expansion Devices at Abutments notes on Sheet No. 7 & 8 of 104.

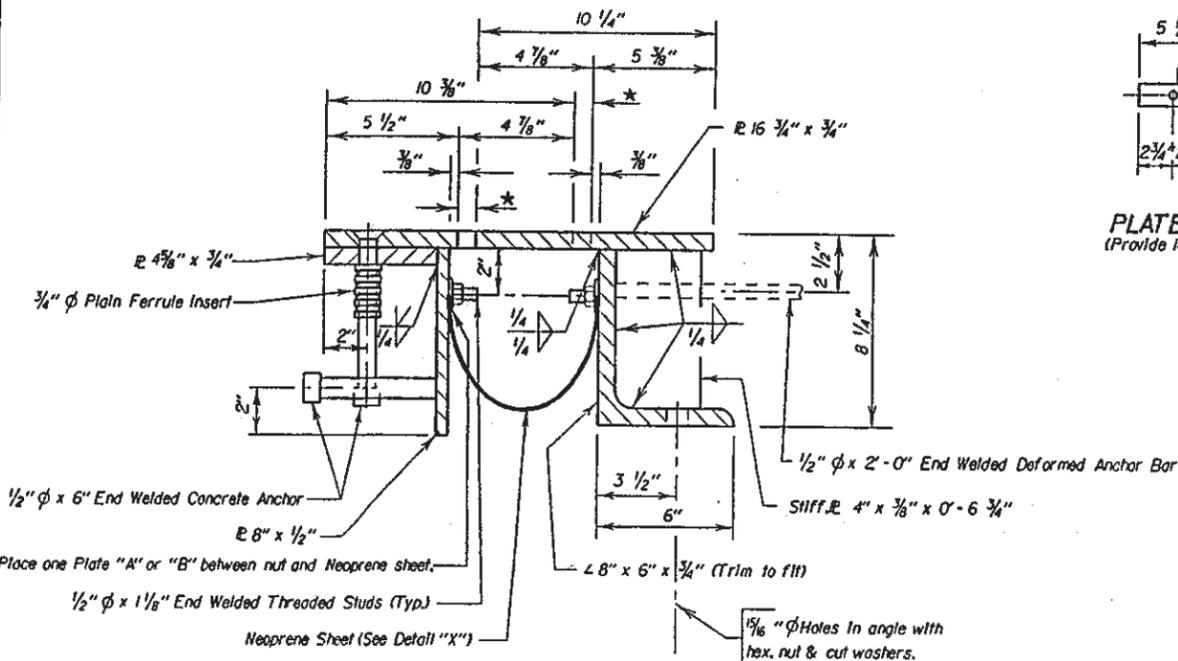


DETAIL "X"

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Replace Expansion Device	Each	2

	PHASE 1	PHASE 2
1. Class A45 Concrete	2.7 Cu.Yds.	3.8 Cu.Yds.
2. Epoxy Coated Re-Steel	355 Lbs.	536 Lbs.
3. Structural Steel in Armor Assembly	4828 Lbs.	6480 Lbs.
4. Neoprene Sheet	723 Sq.Ft.	362 Sq.Ft.
5. Mechanical Bar Splces	16 Each	- Each

Items 1 thru 5 are approximate quantities contained in the above bid item and are for information only.



SEC. B-B

Dimensions and angles are normal to W.L. SIII.

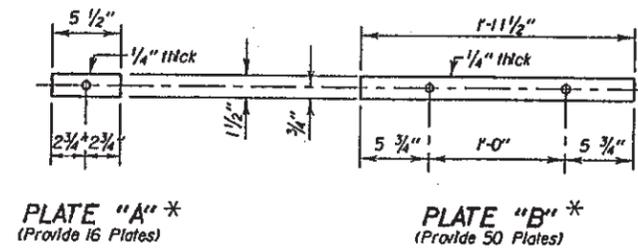
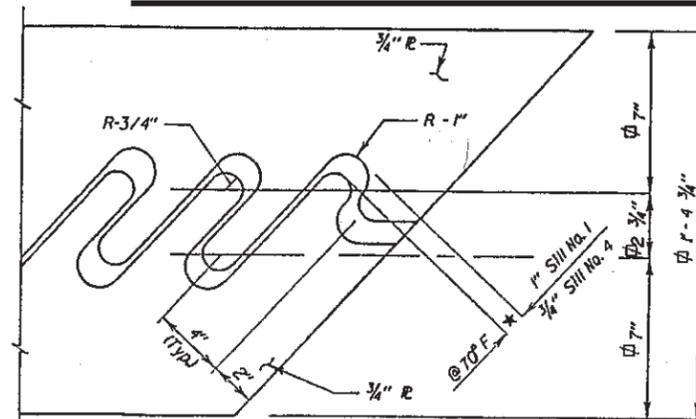


PLATE "A" *
(Provide 16 Plates)

PLATE "B" *
(Provide 50 Plates)

ORIGINAL CONSTRUCTION PLANS



TOOTH LAYOUT

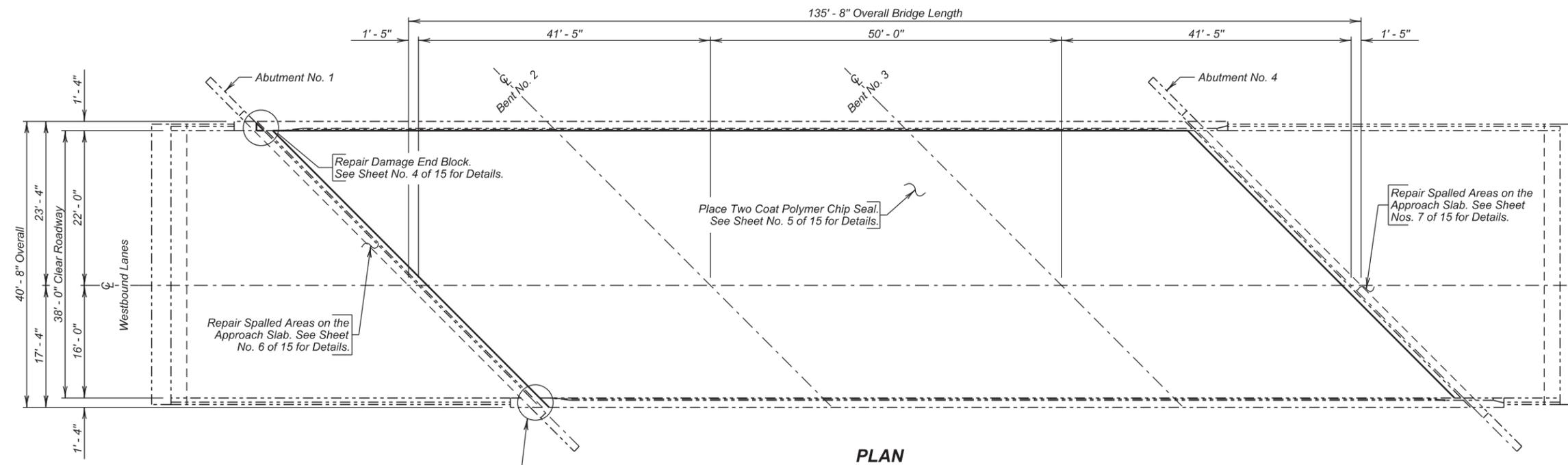
(EAST BOUND LANES)
 DETAILS FOR FINGER JOINT AT ABUTMENTS
 192'-0" CONT. COMP. GIRDER BRIDGE
 38'-0" ROADWAY
 OVER C. & N. W. R. R.
 STR. NO. 41-200-089

43° SKEW R. H. F.
 SEC. 17-T6N-R4E
 IM 90-1(00) 22

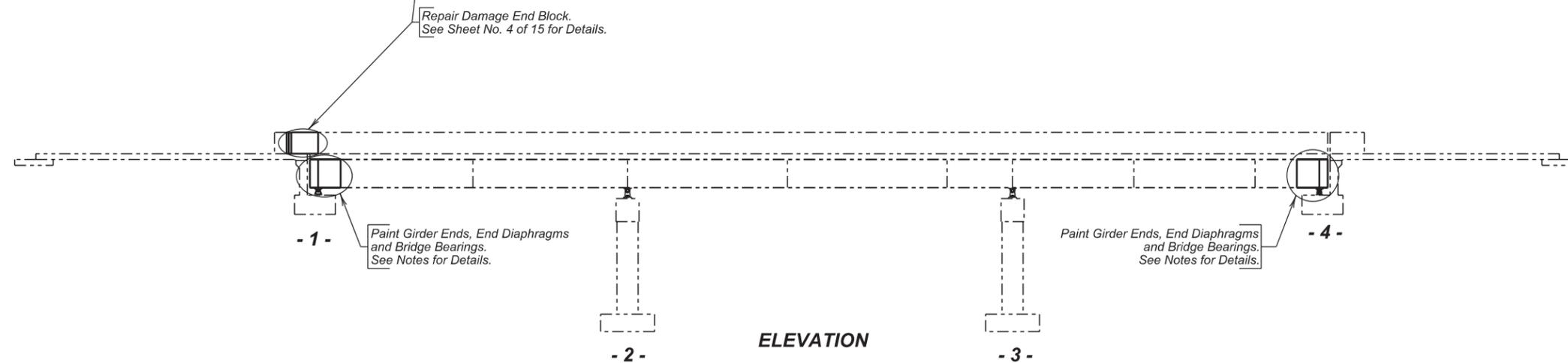
LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 JANUARY 1998

DESIGNED BY EJA LAWR953	DRAWN BY GWP 1953PB15	CHECKED BY TJO	APPROVED John C. Cole BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E50	E82



PLAN



ELEVATION

(WESTBOUND LANES)
LAYOUT FOR UPGRADING
FOR

135' - 8" I-BEAM BRIDGE

38' - 0" ROADWAY
OVER WHITEWOOD CREEK
STR. NO. 41-214-098
PCN 02PP

45° SKEW R.H.F.
SEC. 22 - T6N - R4E
IM 0901(171)18

LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION

NOVEMBER 2015

INDEX OF BRIDGE SHEETS -

- Sheet No. 1 - Layout for Upgrading
- Sheet No. 2 - Estimate of Structure Quantities and Notes
- Sheet No. 3 - Notes (Continued)
- Sheet No. 4 - End Block Repair Details
- Sheet No. 5 - Two Coat Polymer Chip Seal Details
- Sheet No. 6 - Approach Slab Repair
- Sheet No. 7 - Approach Slab Repair (Continued)
- Sheet No. 8 - 15 - Original Construction Plans

PLANS BY:
OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

DESIGNED BY KH LAWR02PP	CK. DES. BY KSK 02PPRF01	DRAFTED BY KR	<i>Kevin N. Coeden</i> BRIDGE ENGINEER
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ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
412E0120	Bridge Repainting, Class II	Lump Sum	LS
412E0500	Paint Residue Containment	Lump Sum	LS
460E0172	Concrete Patching Material, Bridge Deck	75.3	CuFt
460E0174	Concrete Patching Material, Miscellaneous	5.4	CuFt
460E0300	Breakout Structural Concrete	0.3	CuYd
480E5000	Galvanic Anode	5	Each
491E0005	Two Coat Bridge Deck Polymer Chip Seal	549.1	SqYd
491E0110	Abrasive Blasting of Bridge Deck	549.1	SqYd
491E0120	Bridge Deck Grinding	549.1	SqYd
491E0130	Concrete Removal, Class A	11.6	SqYd
491E0140	Concrete Removal, Class B	11.6	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.

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. 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 elsewhere 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 preconstruction meeting.

- Perform bridge deck grinding and repair the bridge deck by removing all loose and delaminated concrete from the bridge deck surface for the first and second phase of construction.
- Repair the bridge deck and approach slab by removing and replacing all loose and delaminated concrete from the surface for the first phase of construction.
- Clean the bridge deck surface with abrasive blasting for the first phase of construction.
- Place a Two Coat Bridge Deck Polymer Chip Seal for the first phase of construction.
- Repair spalled areas on approach slab adjacent to the finger type bridge expansion joint for the first phase of construction.

- Remove portion of the existing rail and end blocks for the first phase of construction.
- Repair the bridge rail and endblocks on the west end of the bridge for the first phase of construction.
- Switch traffic and repeat steps 2 through 7 for the second phase of construction.
- Paint girder ends adjacent to both abutments a distance of 4 feet from the girder ends.

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.
- The barrier curb shall be built normal to the grade.
- 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.
- 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 endblocks shall be cured in accordance with Section 460.3.N. of the Construction Specifications except that no curing compounds shall be allowed.

APPROACH SLAB REPAIR

- The removal and replacement of the delaminated concrete on the approach slab shall be in accordance with Section 491 of the Construction Specifications except as follows:
 - Curing compounds may be used to cure the approach slab concrete patches in accordance with Section 460.3M of the Construction Specification
 - The surface of the approach slab concrete patches shall be tined.

CONCRETE BREAKOUT

- The existing bridge rail 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.
- All broken out concrete, discarded reinforcing bars shall be disposed of by the Contractor. Any disposal of discarded material shall be in accordance with the Environmental Commitments.
- During concrete removal operations, no broken out concrete shall be allowed to fall into Whitewood Creek.
- The contract unit price per cubic yard for "Breakout Structural Concrete" shall include breaking out concrete, cleaning, straightening existing 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
135' - 8" I - BEAM VIADUCT

STR. NO. 41-214-098

NOVEMBER 2015

2 OF 15

DESIGNED BY KH	CK. DES. BY KSK	DRAFTED BY KH	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
LAWR02PP	02PPK002		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E52	E82

GALVANIC ANODE (CONTINUED)

2. The galvanic anodes shall be supplied as one of the following:

Galvashield XP2
 Vector Corrosion Technologies
 13312 N 56th St, Suite 102
 Tampa, FL 33617
 Phone: (813) 830-7566
 Website: www.vector-corrosion.com

Sentinel Silver
 Euclid Chemical Company
 19218 Redwood Road
 Cleveland, OH 44110
 Phone : (800) 321-7628
 Website: www.euclidchemical.com

Sika Galvashield XP+
 Sika Corporation US
 201 Polito Avenue
 Lyndhurst, NJ 07071
 Phone: (800)933-7452
 Website: <http://usa.sika.com>

- The anodes shall be placed in accordance with the manufacturer's recommendations and as approved by the Engineer. The anodes have not been shown on the drawings. The Contractor shall provide shop drawings of the galvanic anode installation including locations of the individual anodes to the Office of Bridge Design.
- The anodes shall be placed with a minimum of 3/4" cover and shall be set in Embedding Mortar per the manufacturer's recommendations. The anodes shall be fully encased in the concrete repair material. Where adequate cover does not exist, a concrete pocket shall be chipped out behind the anode to provide sufficient cover. The Contractor may need to chip around the reinforcing bar locally at the anode installation to make the electrical connection. The reinforcing steel at the connection location shall be cleaned per the manufacturer's recommendations to provide sufficient electrical connection and mechanical bond.
- The electrical continuity of the electrical connections and reinforcing steel shall be confirmed per the manufacturer's recommendations.
- The Contractor shall provide manufacturer's product literature and installation instructions to the Engineer 10 days prior to installation.
- All costs associated with placing anodes including labor, equipment, materials and incidentals shall be included in the contract unit price per each for "Galvanic Anode".

BRIDGE DECK GRINDING

The Contractor will have the option of grinding the entire deck surface during phase one. Any additional costs incurred for grinding the entire deck surface such as additional traffic control or cleaning shall be at no additional cost to the Department.

TWO COAT BRIDGE DECK POLYMER CHIP SEAL

The Two Coat Bridge Deck Polymer Chip Seal shall be applied in accordance with the construction specifications.

PAINT RESIDUE REMOVAL AND CONTAINMENT

- Paint removal on the existing bridge shall be in accordance with Section 412 of the Construction Specification except as modified by these notes.
- The Contractor shall plan his operations to prevent releases of lead-containing material and other particulate matter into the surrounding air, water, and onto the ground, soil, slope protection, and pavement. The Contractor shall be responsible for any corrective actions should a spill occur.
- Collect all visible paint particles and blasting residue containing paint at the end of each workday from the work area. Inspect outside the containment and collect any paint particles or blasting residue that escaped the work area. Collect waste material by manual means, vacuum, or another method approved by the Engineer. Do not use air pressure or streaming water to assist in the waste collection process that could disperse the waste material.
- In the event of a spill or inadvertent release, the Contractor shall immediately stop work, notify the Engineer, and report the release to the South Dakota Department of Environmental and Natural Resources (DENR). The Contractor shall be responsible for completing a spill reporting form and for all costs associated with appropriate corrective actions.

To report a release or spill, call DENR at (605) 773-3296 during regular office hours (8 a.m. to 5 p.m. Central time). To report the release after hours, on weekends or holidays, call State Radio Communications at (605) 773-3231. Reporting the release to DENR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, the Contractor must also contact local authorities to determine the local reporting requirements for releases. DENR recommends that spills also be reported to the National Response Center at (800) 424-8802.
- The Contractor shall haul and unload the 55 gallon containment drums with paint residue, blasting media, etc. to the SDDOT Maintenance Yard located near Sturgis for temporary storage. All costs associated with this work shall be included in the contract lump sum price for "Paint Residue Containment".
- If the Contractor elects to use containers other than 55 gallon barrels to hold paint residue, the Contractor shall be responsible for all testing and disposal at a permitted regional landfill. The Contractor shall be responsible for compliance of laws and regulations regarding storage, handling and shipping. Copies of all tests shipping and disposal documents shall be provided to the Office of Bridge Design.

BRIDGE REPAINTING, CLASS II

- Portions of the existing structure shall be painted in accordance with Section 412 of the Standard Specifications and in accordance with SSPC Standard PA1.
- After blast cleaning the surfaces to be painted, remove any trace blast products, dust or dirt from all surfaces including pockets and corners as approved by the Engineer.
- Paint Color

 Top Coat – The paint color shall be an approved green color. Prior to order the paint, a paint chip seal of the green color shall be submitted to the Department for color approval.

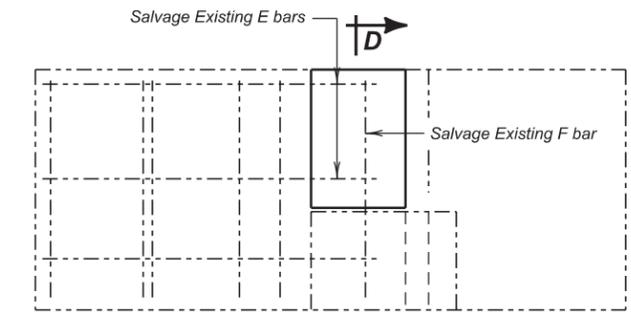
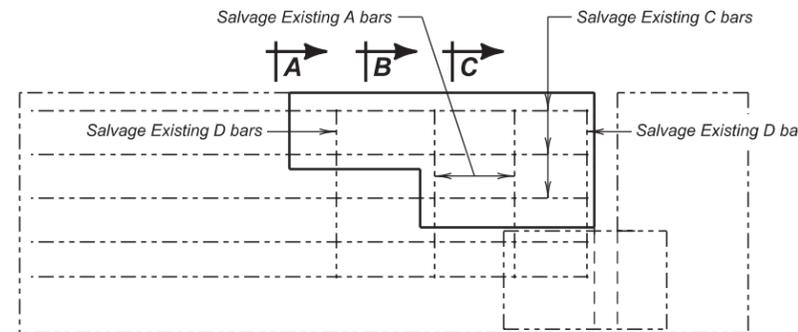
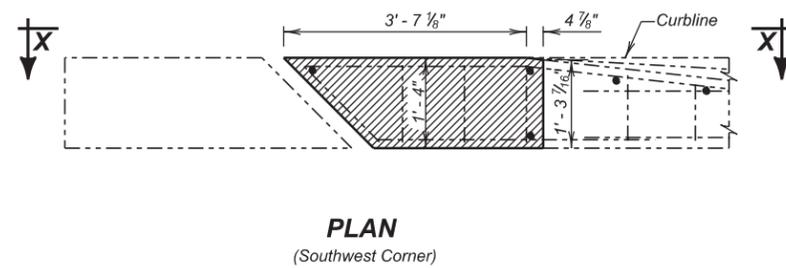
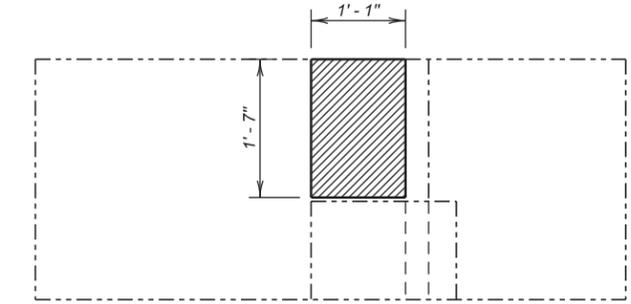
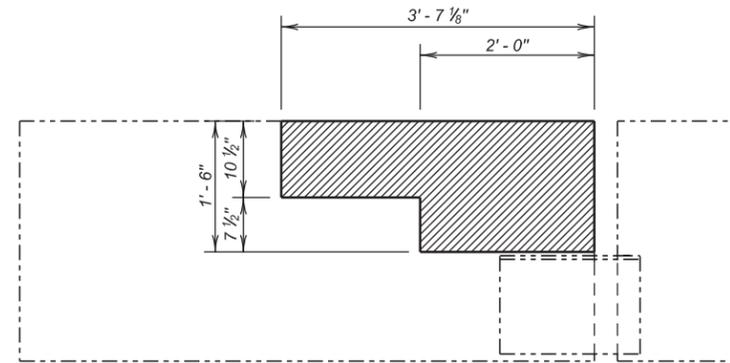
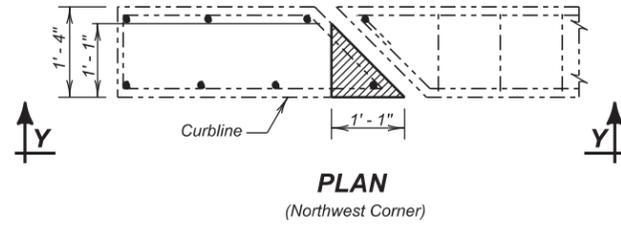
 Primer Coat – Color shall sharply contrast with top coat.
- For informational purposes, 336.7 square feet of structural steel will require painting. The quantity shown includes the following:

 All structural steel located within four feet of the girder ends. This includes the flanges, webs, stiffeners, bearings, and diaphragms.

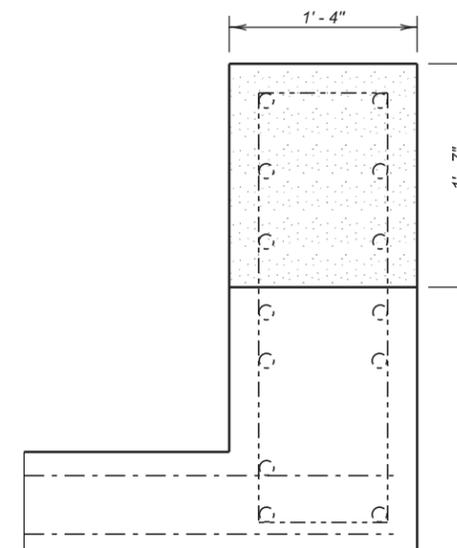
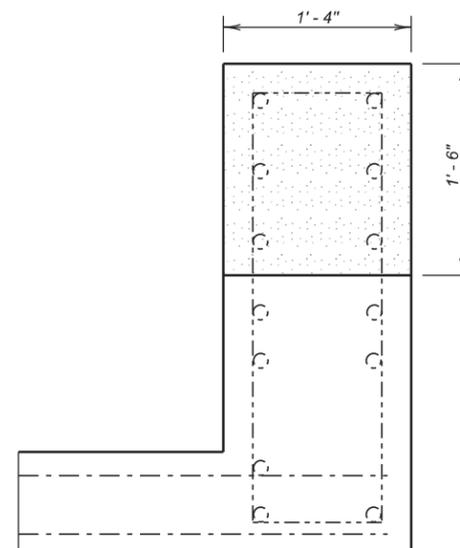
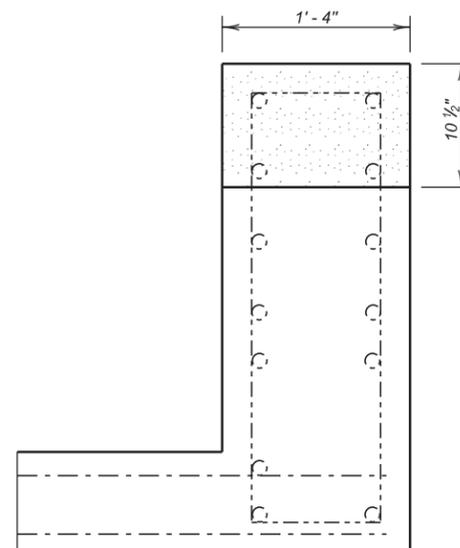
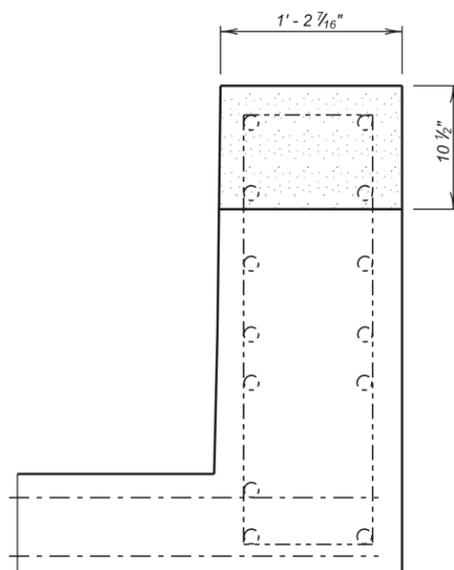
**NOTES (CONTINUED)
 FOR
 135' - 8" I - BEAM VIADUCT**

STR. NO. 41-214-098
 NOVEMBER 2015

DESIGNED BY KH LAWR02PP	CK. DES. BY KSK 02PPK003	DRAFTED BY KH	<i>Kevin N. Goeden</i> BRIDGE ENGINEER
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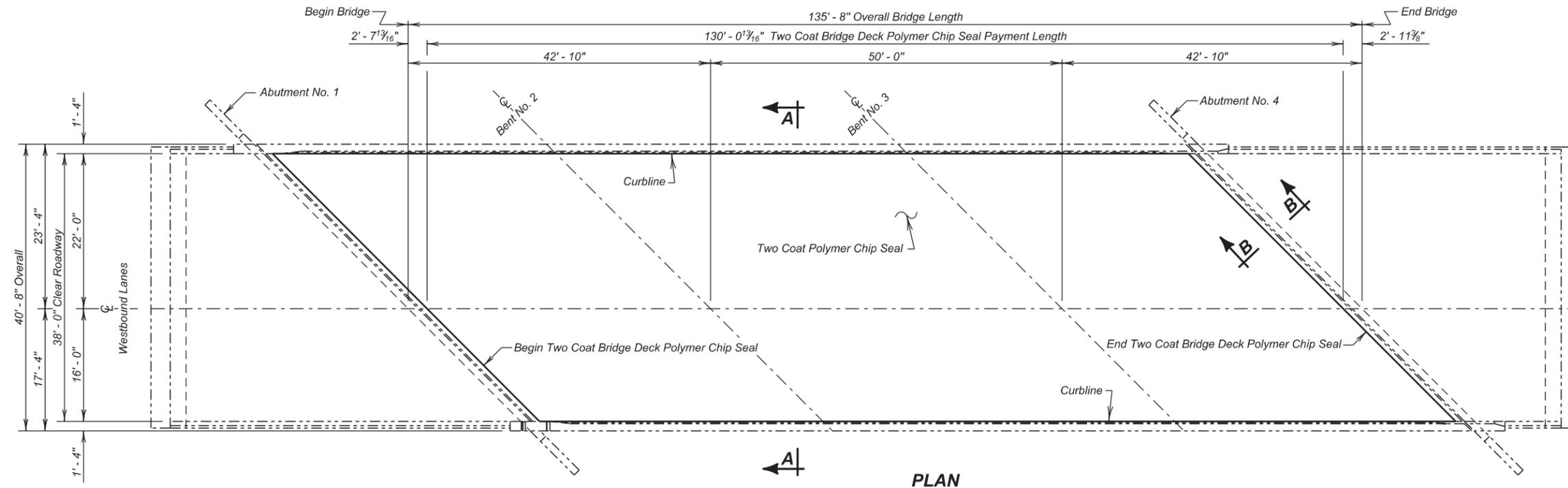
LEGEND:
 Shaded areas indicate limits of Concrete Breakout.



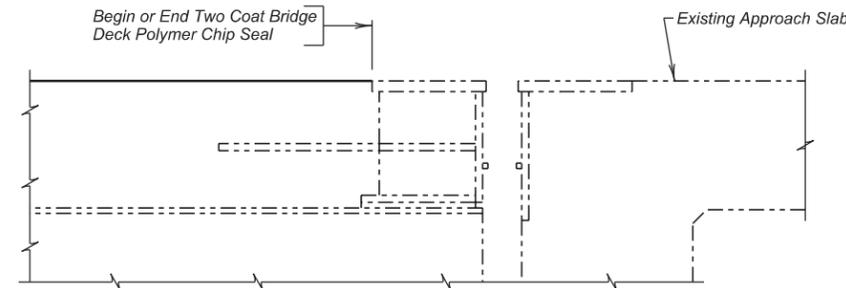
ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
		Phase 1	Phase 2
Breakout Structural Concrete	Cu. Yd.	0.2	0.1
Concrete Patching Material, Miscellaneous	Cu. Ft.	4.5	0.9
Galvanic Anode	Each	4	1

END BLOCK REPAIR DETAILS
 FOR
135' - 8" I-BEAM BRIDGE
 38' - 0" ROADWAY 45° SKEW R.H.F.
 OVER WHITEWOOD CREEK SEC. 22 - T6N - R4E
 STR. NO. 41-214-098 IM 0901(171)18

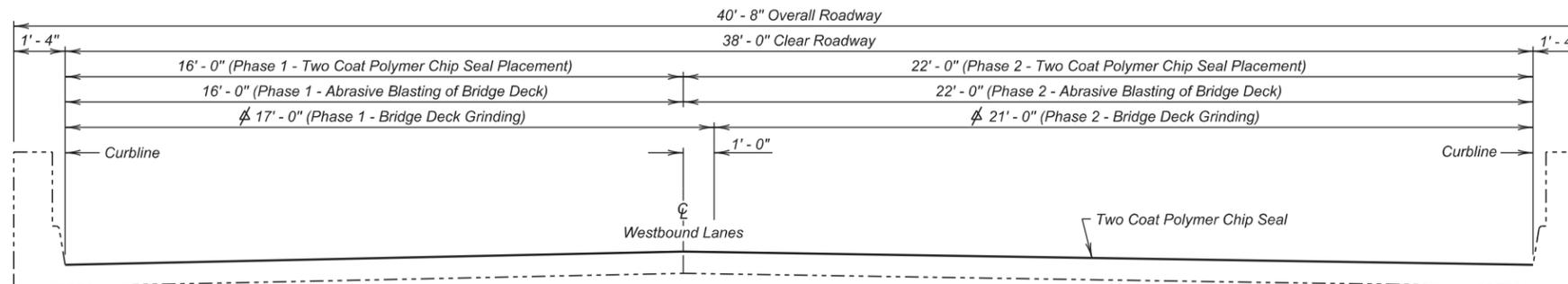
LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 NOVEMBER 2015



PLAN



SECTION B - B



SECTION A - A

ITEM	UNIT	QUANTITY	
		PHASE 1	PHASE 2
* Concrete Patching Material, Bridge Deck	Cu. Ft.	32.2	39.8
Two Coat Bridge Deck Polymer Chip Seal	Sq. Yd.	231.2	317.9
Abrasive Blasting of Bridge Deck	Sq. Yd.	231.2	317.9
Bridge Deck Grinding	Sq. Yd.	245.7	303.4
* Concrete Removal, Class A	Sq. Yd.	4.8	5.9
* Concrete Removal, Class B	Sq. Yd.	4.8	5.9

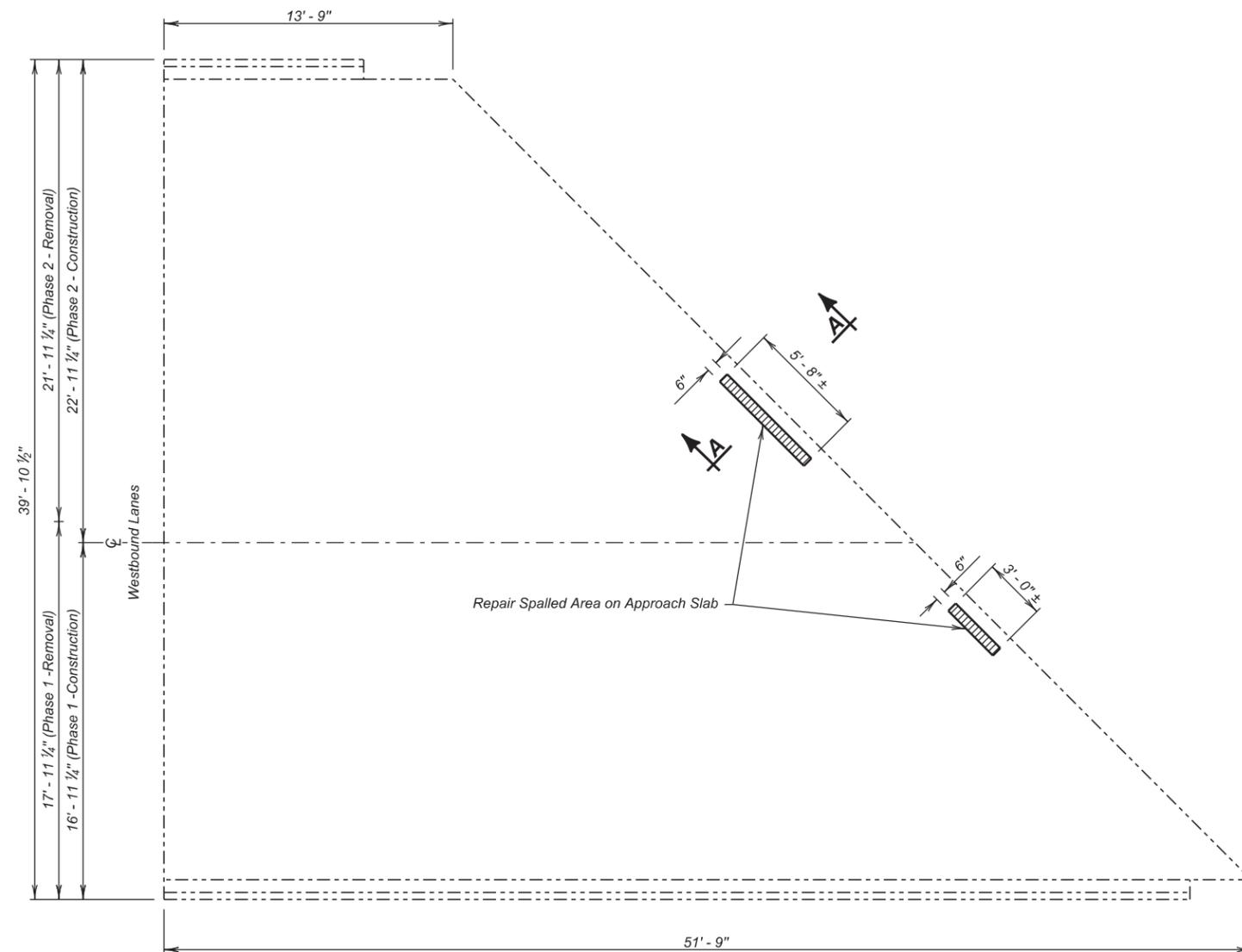
* Concrete Patching Material, Bridge Deck; Concrete Removal, Class A; and Concrete Removal, Class B may not be encountered and may be removed from the project at the direction of the Engineer.

(WESTBOUND LANES)
 TWO COAT POLYMER CHIP SEAL DETAILS
 FOR
135' - 8" I-BEAM BRIDGE
 38' - 0" ROADWAY
 OVER WHITEWOOD CREEK
 STR. NO. 41-214-098

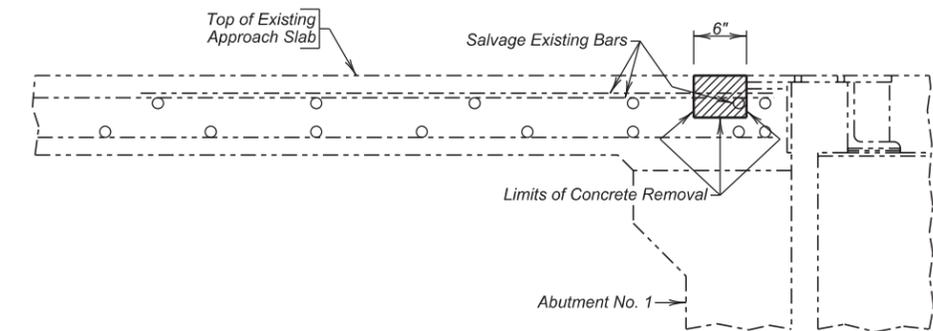
45° SKEW R.H.F.
 SEC. 22 - T6N - R4E
 IM 0901(171)18

LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 NOVEMBER 2015

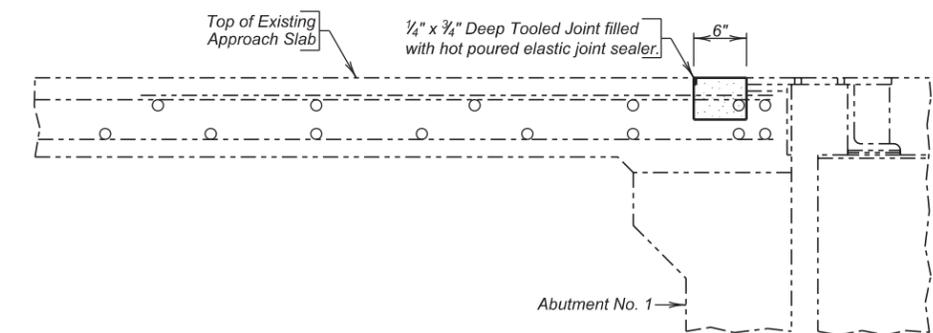
See Bridge Deck Grinding Notes on Sheet No. 2 of 15.



PLAN



SECTION A - A
(Existing Section showing Removal Limits)



SECTION A - A
(New Construction Shown)

-  Shaded areas indicate limits of concrete removal.
-  Concrete Patching Material, Bridge Deck

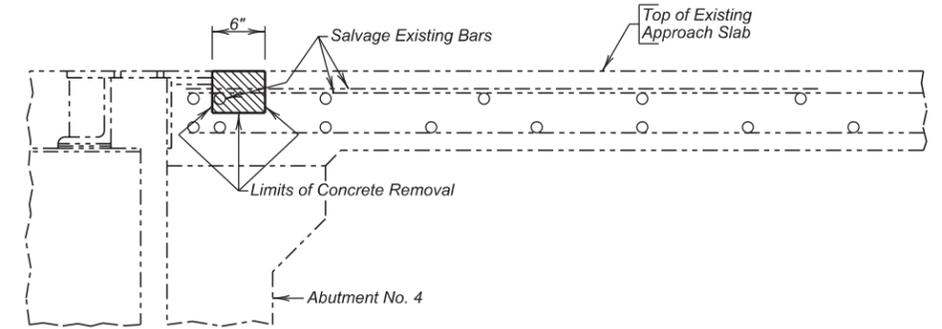
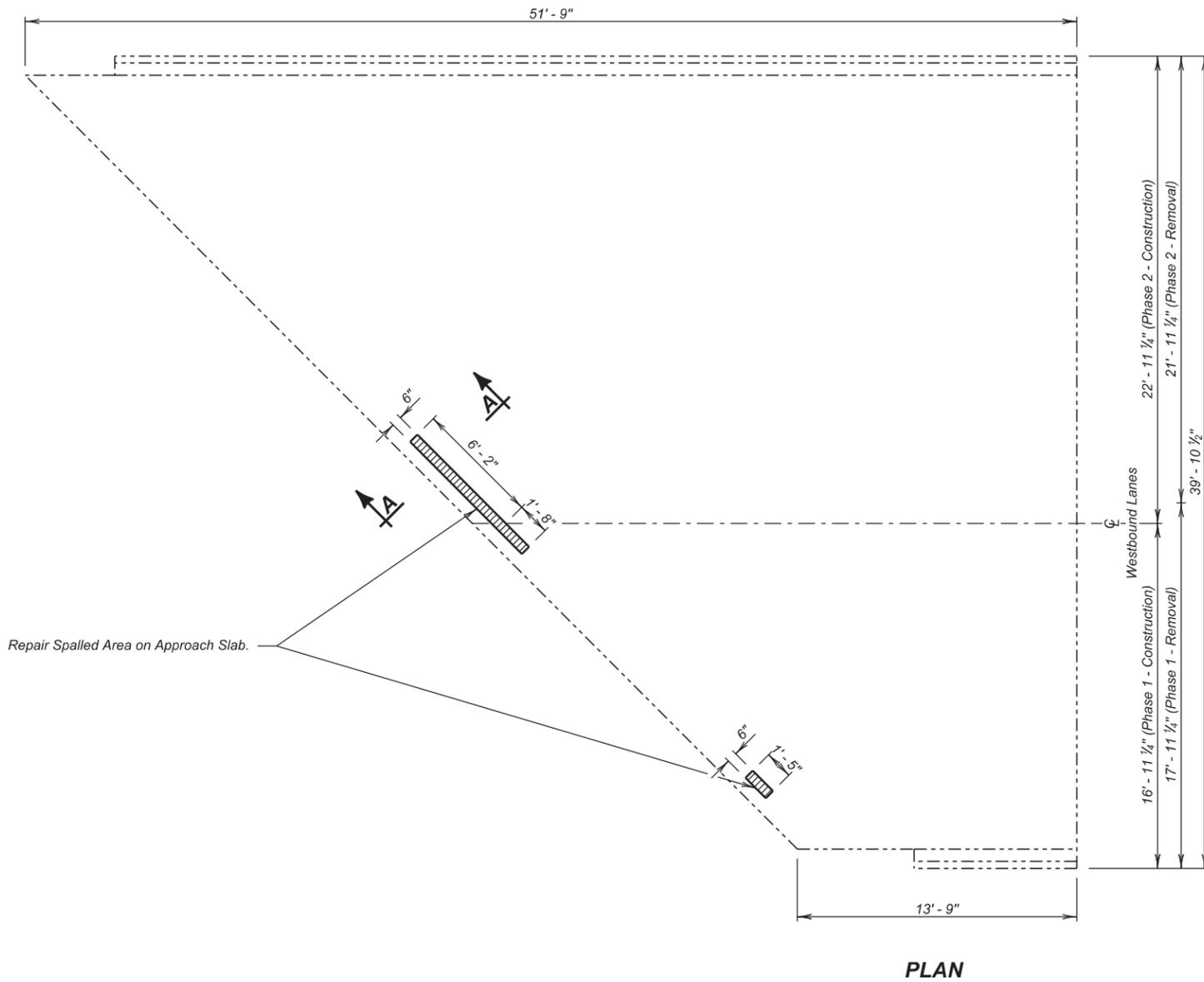
ESTIMATED QUANTITIES		QUANTITY	
		PHASE 1	PHASE 2
Concrete Removal, Class A	Sq. Yd.	0.2	0.3
Concrete Removal, Class B	Sq. Yd.	0.2	0.3
Concrete Patching Material, Bridge Deck	Cu. Ft.	0.6	1.1

**(WESTBOUND LANES)
APPROACH SLAB REPAIR DETAILS
FOR
135' - 8" I-BEAM BRIDGE**

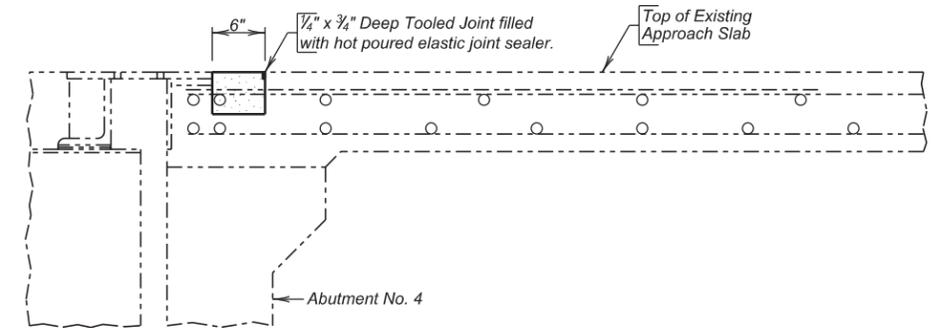
38' - 0" ROADWAY
OVER WHITEWOOD CREEK
STR. NO. 41-214-098

45° SKEW R.H.F.
SEC. 22 - T6N - R4E
IM 0901(171)18

LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION
NOVEMBER 2015



SECTION A - A
(Existing Section showing Removal Limits)



SECTION A - A
(New Construction Shown)

**(WESTBOUND LANES)
APPROACH SLAB REPAIR (CONTINUED)
FOR
135' - 8" I-BEAM BRIDGE
38' - 0" ROADWAY
OVER WHITEWOOD CREEK
STR. NO. 41-214-098**

45°SKEW R.H.F.
SEC. 22 - T6N - R4E
IM 0901(171)18

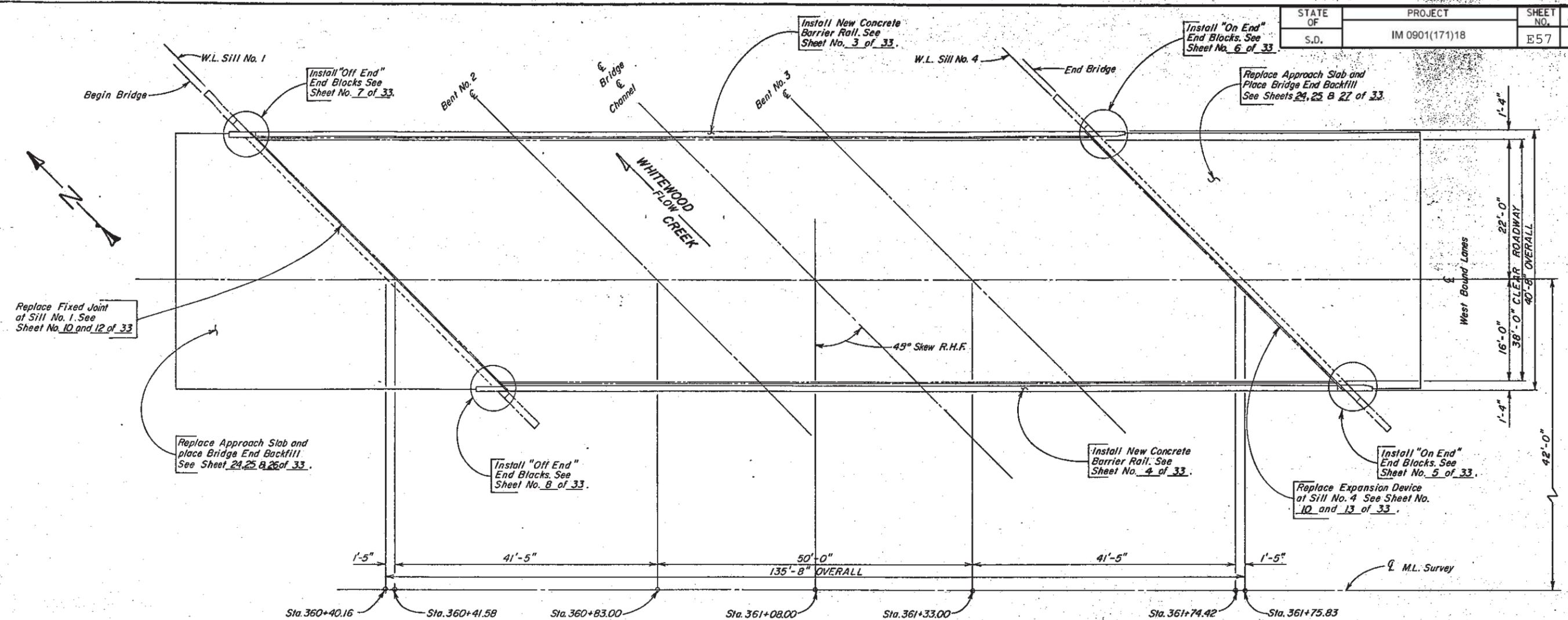
 Shaded areas indicate limits of concrete removal.

 Concrete Patching Material, Bridge Deck

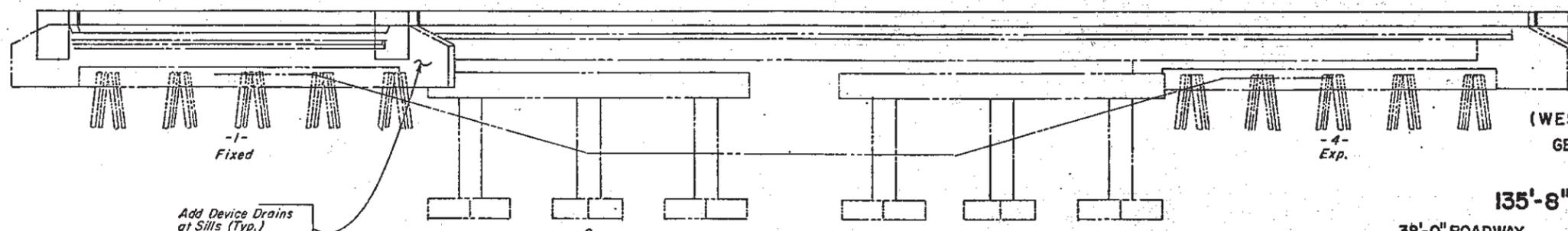
ESTIMATED QUANTITIES		QUANTITY	
		PHASE 1	PHASE 2
Concrete Removal, Class A	Sq. Yd.	0.1	0.3
Concrete Removal, Class B	Sq. Yd.	0.1	0.3
Concrete Patching Material, Bridge Deck	Cu. Ft.	0.4	1.2

LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION
NOVEMBER 2015

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E57	E82



PLAN



ELEVATION

(WEST BOUND LANES)
GENERAL DRAWING
FOR

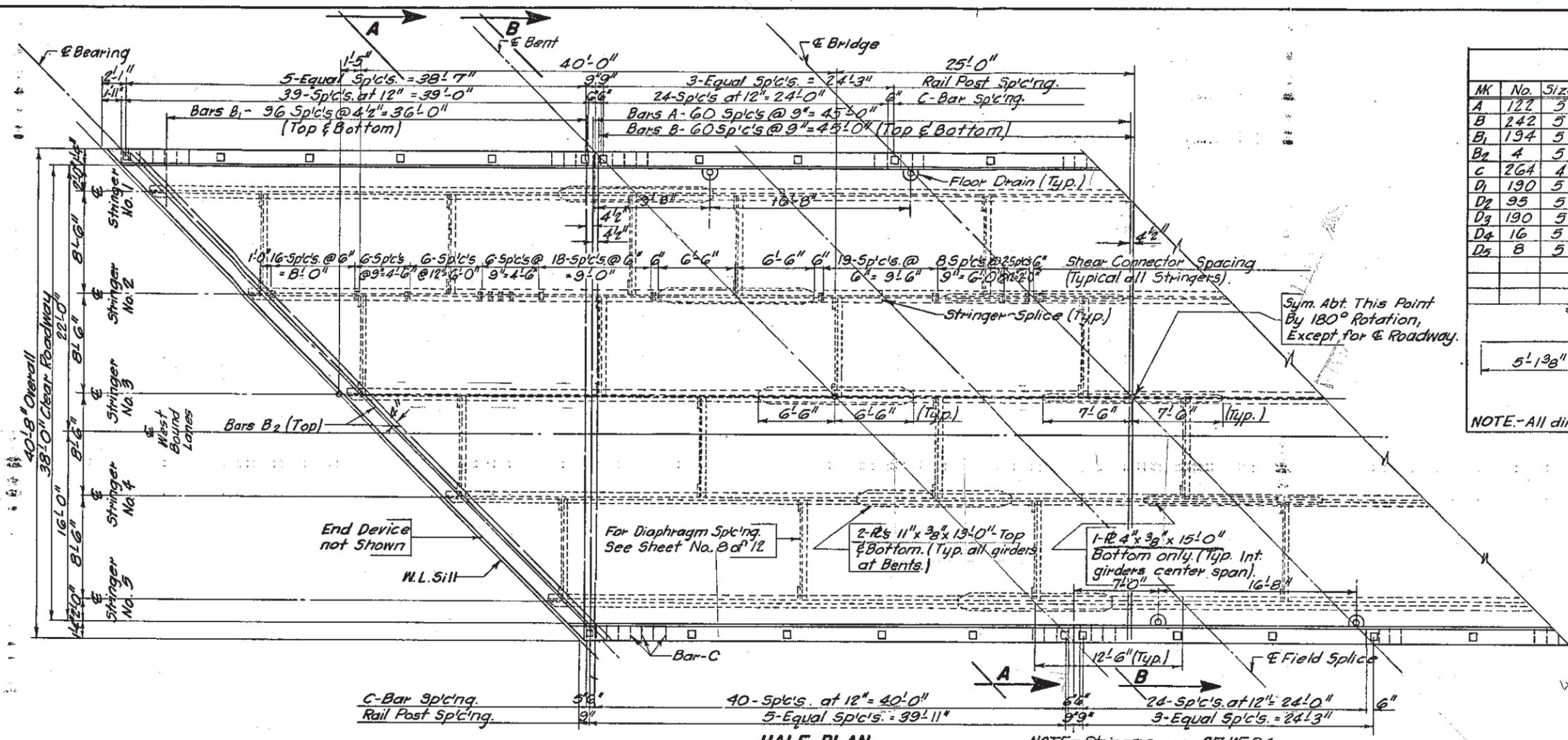
135'-8" I-BEAM VIADUCT

38'-0" ROADWAY OVER WHITEWOOD CREEK
45° SKEW R.H.F.
SEC. 22-T6N-R4E
STA. 360+40.167 TO 361+75.834
IR 90-1 (97) 24
STR. NO. 41-214-098
PCEMS NO. 2732
S.D. DEPT. OF TRANSPORTATION

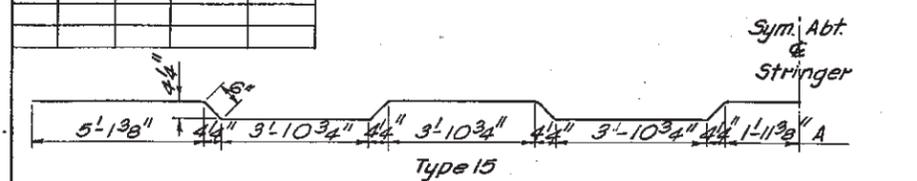
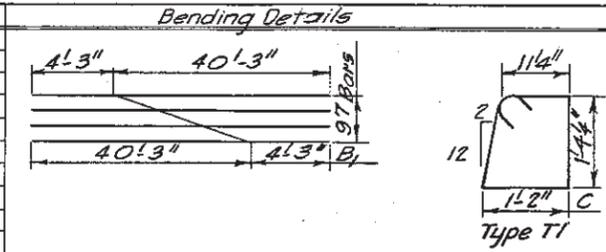
STR. NO. 41-214-098 MAY 1988

ORIGINAL CONSTRUCTION PLANS

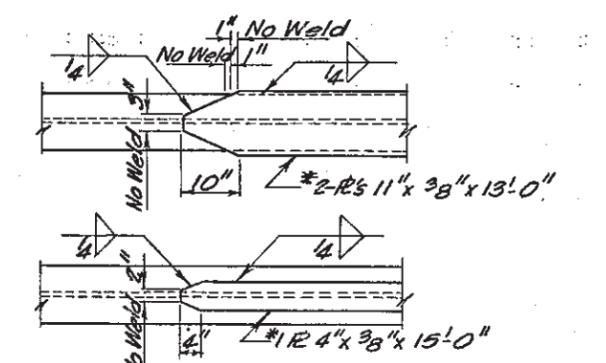
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	T.W.	T.W.	



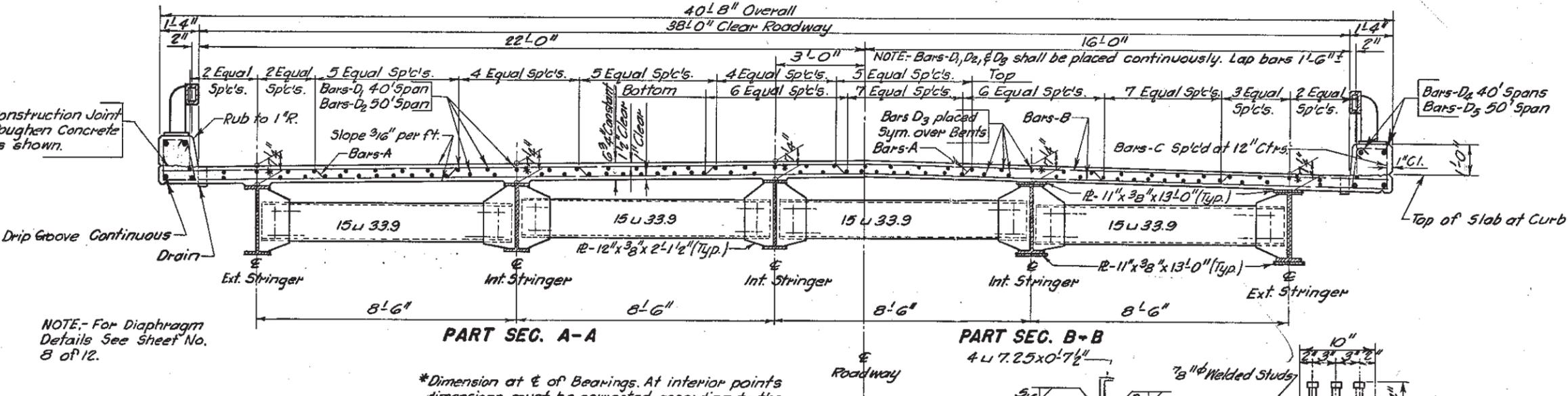
REINFORCING SCHEDULE				
MK	No.	Size	length	Type
A	122	5	41'-6"	15
B	242	5	40'-3"	Str.
B ₁	194	5	44'-6"	Str.
B ₂	4	5	57'-0"	Str.
C	264	4	5'-9"	T1
D ₁	190	5	24'-0"	Str.
D ₂	95	5	16'-0"	Str.
D ₃	190	5	37'-0"	Str.
D ₄	16	5	21'-6"	Str.
D ₅	8	5	25'-9"	Str.



NOTE: All dimensions are out to out of bars.



ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Class A Concrete	CU Yds.	125.2
Reinforcing Steel	Lbs.	39,845
Structural Steel	Lbs.	88,658
Type RT-3 Steel Railing	Lini.Ft.	267.7



CONCRETE PLACING NOTES.
 Concrete slab may be poured continuously provided concrete retardants are used and the Contractor has demonstrated capacity for such continuous operations. Transverse construction joints are permitted in the slab and shall be positioned near the stringer field splices or at approximately the 1/4 points from the E of bents. If transverse construction joints are used, the contractor shall submit to the BRIDGE SECTION for approval, plans and details of construction joints used, as well as a sequence for pouring. Curbs shall be poured after all of the slab has been poured. The expansion device shall be blocked off prior to pouring slab. After pouring all the slab, adjust and bolt devices and complete pour.

CHANNEL SHEAR CONNECTOR
WELDED STUD SHEAR CONNECTOR

Channel or Welded Stud Shear Connectors are spaced as shown above on HALF PLAN. The Contractor may substitute a row of 7/8" Welded Studs for each channel shear connector shown. Shear connectors will be paid for as structural steel based on the weight of channels, regardless of the type of connector used. Channels shall be placed on the stringers facing in the directions as shown on STRINGER LAYOUT.

ORIGINAL CONSTRUCTION PLANS
 (WEST BOUND LANES)
SUPERSTRUCTURE DETAILS
 FOR
135'-8" I-BEAM VIADUCT
 38'-0" ROADWAY 45° SKEW R.H.F.
 OVER WHITEWOOD CREEK SEC. 22-T6N-R4E
 STA. 360+40.167 TO 361+75.834 190-1 (15) 19
 STR. NO. 41-214-098 LAWRENCE COUNTY
 SOUTH DAKOTA HS20-44
 DEPARTMENT OF HIGHWAYS (& ALT.)
 OCT. 1964 7 9 OF 15

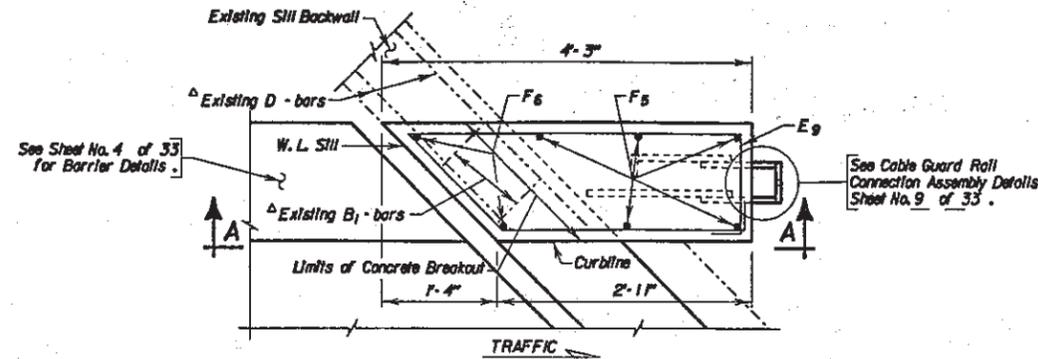
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	M.V.W.	J.L.H.	<i>[Signature]</i> BRIDGE ENGINEER

REINFORCING SCHEDULE (For One Anchor Block)					
Mk. No.	Size	Length	Type	Bonding Details	
D ₁	4	8	2'-9"	19B	
E ₉	4	4	10'-0"	T7	
E ₁₀	2	4	7'-2"	T7	
F ₅	5	7	5'-6"	Str.	
F ₆	2	7	3'-3"	Str.	

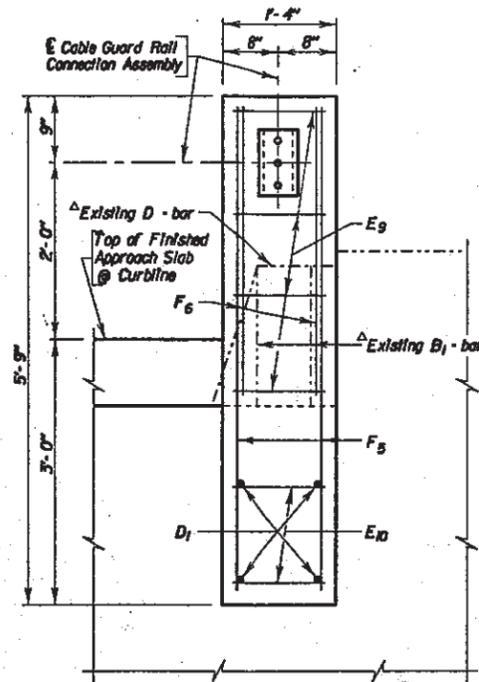
NOTE: Existing Reinforcing Steel that is exposed during concrete breakout shall be cleaned and epoxy coated. See "Notes Regarding Epoxy Coating Existing Reinforcing Steel" on Sheet No. 4 of 69 for details.

NOTE: All Rebar, including Dowels, to be Epoxy Coated. All dimensions are out to out of bars.

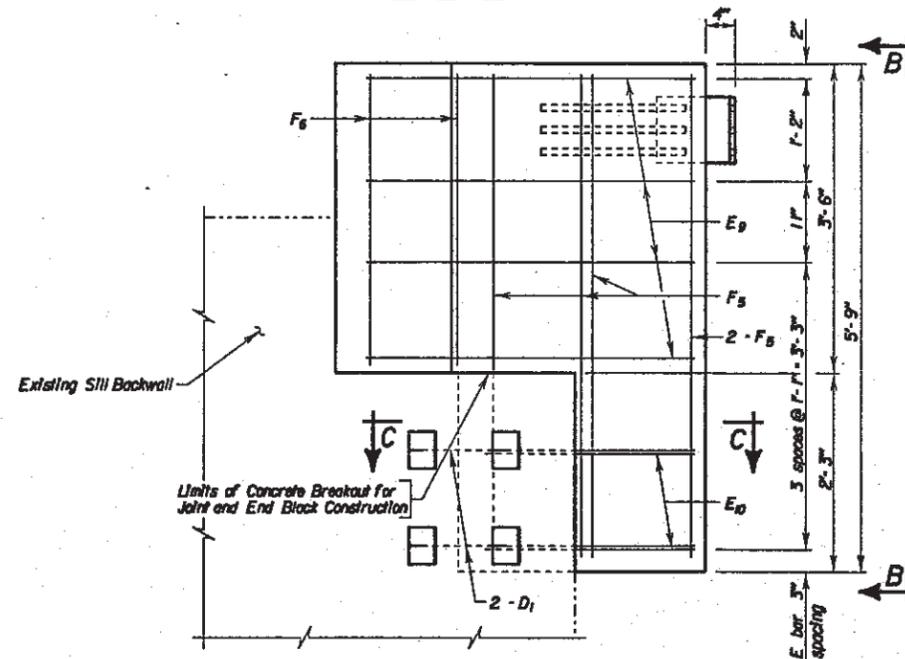
* Dowels



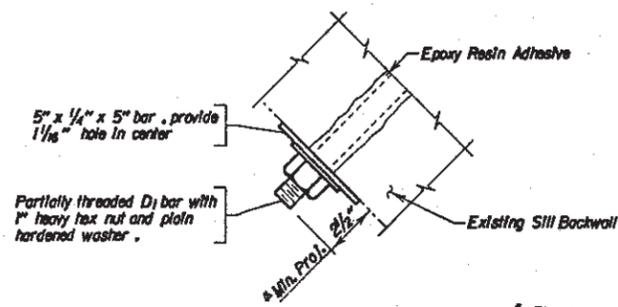
END BLOCK PLAN VIEW
(Joint Device not shown. See Sheet Nos. 10 or 11 of 33 for Details.)



VIEW B-B

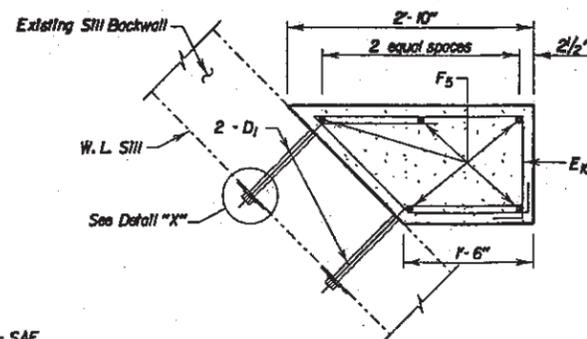


VIEW A-A



DETAIL "X"

1/4" Min. proj. with No. 9 DB-SAE Richmond threaded dowel bars



SEC. C-C

ORIGINAL CONSTRUCTION PLANS

"OFF END" END BLOCK DETAILS
(ABUT. NO. 1 RT. SIDE-WBL, ABUT. NO. 4 LT. SIDE-EBL)
FOR

135'-8" I-BEAM VIADUCT

38'-0" ROADWAY
OVER WHITEWOOD CREEK
STA. 360+40.17 TO 362+59.83
STR. NO. 41-214-098

45° SKEW R. H. F.
SEC. 22-T6N-R4E
IR 90-K97124

LAWRENCE COUNTY

S. D. DEPT. OF TRANSPORTATION

APRIL 1988

10 OF 15

DESIGNED BY DGB BLAWR2732	DRAWN BY D.A.H. B2732DH02	CHECKED BY DGB/TDW	APPROVED BRIDGE ENGINEER
---------------------------------	---------------------------------	-----------------------	-----------------------------

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E60	E82

REINFORCING SCHEDULE
(For 2 Bridges)

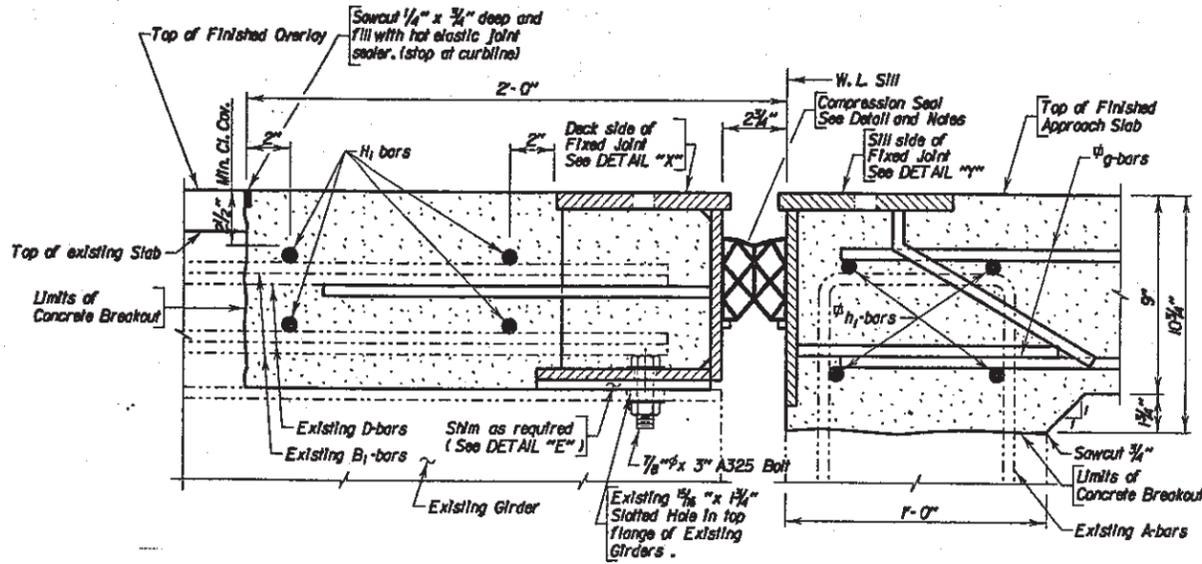
Bar No.	Size	Length	Type	Bending details
H ₁	4	5	25'-6"	Str.
H ₂	4	5	3'-6"	Str.

NOTES:
All bars to be Epoxy Coated.
All dimensions are out to out of bars.

ESTIMATED QUANTITIES
(For 2 Bridges)

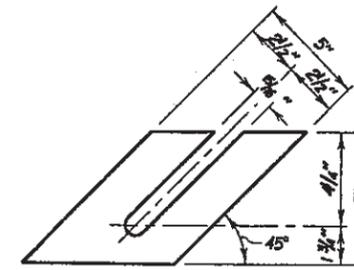
ITEM	UNIT	QUANTITY
Fixed Joint Modification	Each	2

Items 1 thru 4 are approximate quantities contained in the above Bid Item and are for information only.
 1. 5.2 Cu. Yds. Class "A45" Concrete.
 2. 476 Lbs. Epoxy Coated Rebar.
 3. 10754 Lbs. Structural Steel.
 4. 4.2 Cu. Yds. Breakout Structural Concrete.
 Includes Structural Steel on Sheet Nos. 21, 22 & 23 of 33.



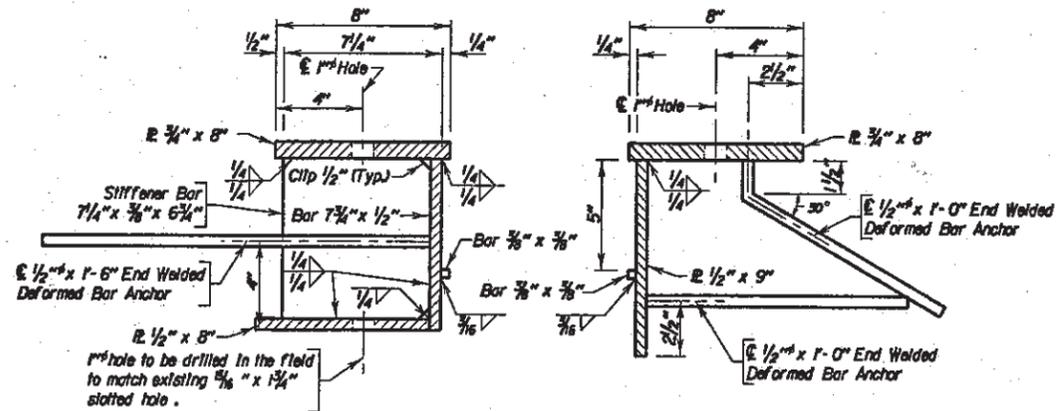
SEC. B - B

NOTE: For approach slab reinforcement see Sheet Nos. 26 and 27 of 33.



DETAIL "E"

Provide: 20 - 1/16" thick shims
 10 - 1/8" thick shims
 20 - 3/8" thick shims



DETAIL "X"

DETAIL "Y"



PREFORMED ELASTOMERIC COMPRESSION SEAL

NOTE -

The compression seal for these joints can be obtained from the following suppliers. Their addresses and type of compression seal required are listed below. Other compression seal suppliers may be accepted upon approval by the Office of Bridge Design.

WATSON, BOHMAN & ACME CORP.
 95 Pine/ew Drive
 Amherst, New York 1420 Phone (716) 691-7566
 Type: WJ-400 (4" x 4")

THE D.S. BROWN COMPANY
 P.O. Box 158
 North Baltimore, Ohio 45872 Phone (419) 257-3561
 Type: CV-4000 (4" x 4")

ORIGINAL CONSTRUCTION PLANS

DETAILS OF FIXED JOINT DEVICE AT SILL NO. 1

FOR

135'-8" I-BEAM VIADUCT

38'-0" ROADWAY 45° SKEW R. H. F.
 OVER WHITEWOOD CREEK SEC. 22-T6N-R4E
 STA. 360+40.167 TO 362+59.834 IR 90-K97124
 STR. NO. 41-214-098 HS20-44
 (ALT.)

LAWRENCE COUNTY

S. D. DEPT. OF TRANSPORTATION

APRIL 1988

11 OF 15

DESIGNED BY DGB	DRAWN BY D.A.H.	CHECKED BY DGB/TDW	APPROVED BRIDGE ENGINEER
--------------------	--------------------	-----------------------	-----------------------------

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E61	E82

REINFORCING SCHEDULE (For One Bridge)				
AK	No.	Size	Length	Type
H ₁	4	5	25'-6"	Sr.
H ₂	4	5	31'-6"	Sr.

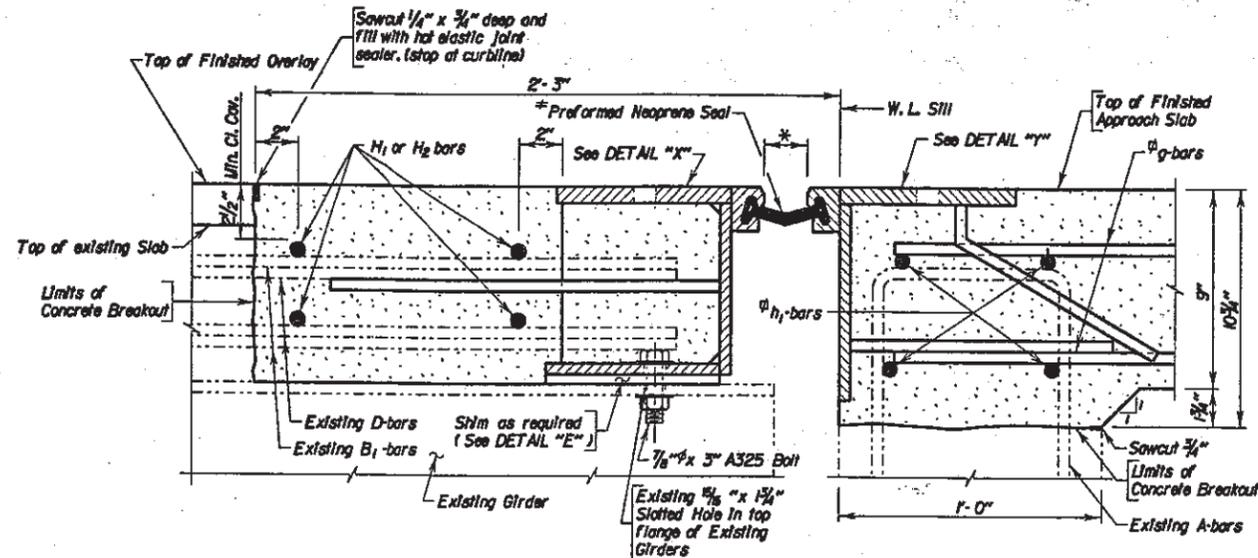
Notes:
All dimensions are out to out of bars
All bars to be Epoxy Coated

ESTIMATED QUANTITIES (For Two Bridges)		
ITEM	UNIT	QUANTITY
Replace Expansion Device	Each	2

- Items 1 thru 4 are approximate quantities contained in the above bid item and are for information only.
- 5.5 Cu. Yds. Class "A45" Concrete.
 - 476 Lbs. Epoxy Coated Re - Steel.
 - 12,784 Lbs. Structural Steel.
 - 4.6 Cu. Yds. Breakout Structural Concrete.

^Δ Includes Structural Steel on Sheet Nos. 14 thru 20 of 33.

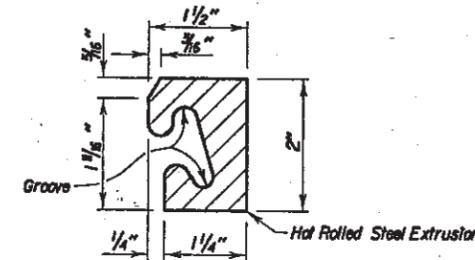
Temp.	"g" (in.)
-30°	3/16"
25°	2 7/16"
40°	2 3/8"
55°	2 1/8"
70°	2"
85°	1 7/8"
100°	1 5/8"
120°	1 1/2"



SEC. A - A

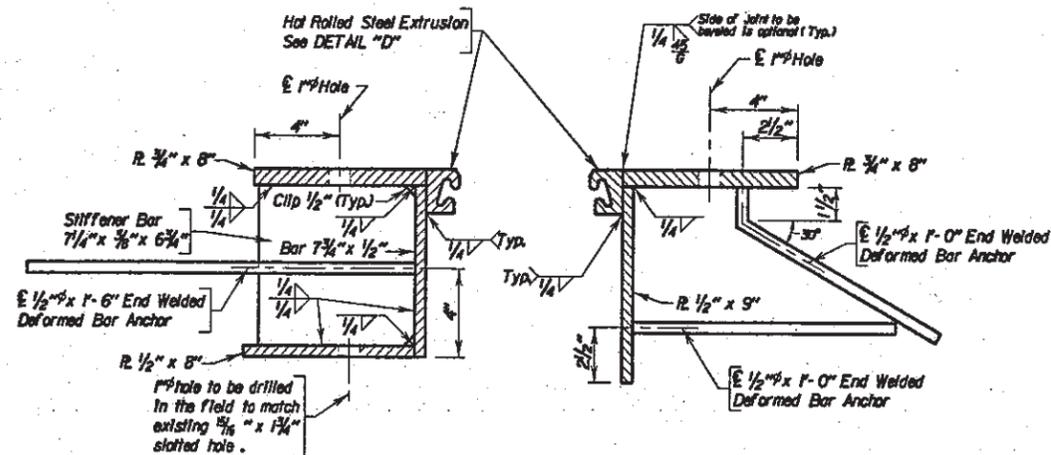
NOTE: Approach slab reinforcement. See Steel No's. 26 and 27 of 33 for placement.

NOTE: Seal shall have a 4 inch movement capability.



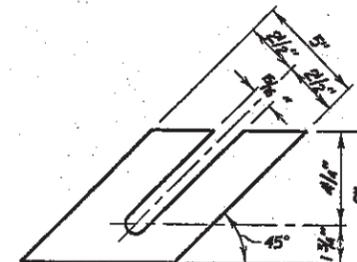
DETAIL "D"

NOTE:
Existing Reinforcing Steel that is exposed during concrete breakout shall be cleaned and epoxy coated. See "Notes Regarding Epoxy Coating of Existing Reinforcing Steel" on Sheet No. 4 of 69 for details.



DETAIL "X"

DETAIL "Y"



DETAIL "E"

- Provide:
- 20 - 1/16" thick shims
 - 10 - 1/8" thick shims
 - 20 - 3/8" thick shims

ORIGINAL CONSTRUCTION PLANS

DETAILS OF EXPANSION JOINT DEVICE AT SILL NO. 4

FOR

135'-8" I-BEAM VIADUCT

38'-0" ROADWAY 45° SKEW R. H. F.
OVER WHITEWOOD CREEK SEC. 22-T6N-R4E
STA. 360+40.167 TO 362+59.834 IR 90-K97124
STR. NO. 41-214-098 HS20-44
(± ALT.)

LAWRENCE COUNTY

S. D. DEPT. OF TRANSPORTATION

APRIL 1988

12 OF 15

DESIGNED BY DGB	DRAWN BY D.A.H.	CHECKED BY DGB/TDW	APPROVED BRIDGE ENGINEER
BLAWR2732	B2732DH05		

REINFORCING SCHEDULE

For one Approach Slab

Mk.	No.	Size	Length	Type	Bending Details
a1	14	5	18'-4"	Sir.	
a2	14	5	22'-8"	Sir.	
d1	84	4	5'-6"	2	
d2	42	4	4'-11"	T2	
e1	34	6	18'-4"	Sir.	
e2	34	3	18'-4"	Sir.	
e3	8	6	21'-4"		
e4	8	3	21'-4"		
e5	8	6	22'-7"		
e6	8	3	22'-7"		
e7	6	6	21'-8"		
e8	6	3	21'-8"		
e9	10	6	23'-4"		
e10	10	3	23'-4"		
o1	16	8	88'-6"		
o2	18	3	30'-0"		
o3	2	8	48'-6"		
o4	8	3	28'-0"		
o5	2	3	19'-6"		
o7	22	8	48'-8"		
o8	11	3	49'-2"		
o9	2	8	9'-2"		
o10	2	3	9'-2"		
n1	4	6	24'-0"		
n2	4	6	30'-8"	Sir.	
a3	4	3	7'-4"	19A	

NOTE -
 All dimensions are out to out of bars.
 * Bars to be epoxy coated.
 † Cut Bars

ESTIMATED QUANTITIES

(For Two Approach Slabs)

ITEM	UNIT	QUANTITY
Concrete Approach Slab Adjacent to Bridge	Sq.Yd.	289.7
Bridge Approach Sleeper Slab	Sq.Yd.	44.3

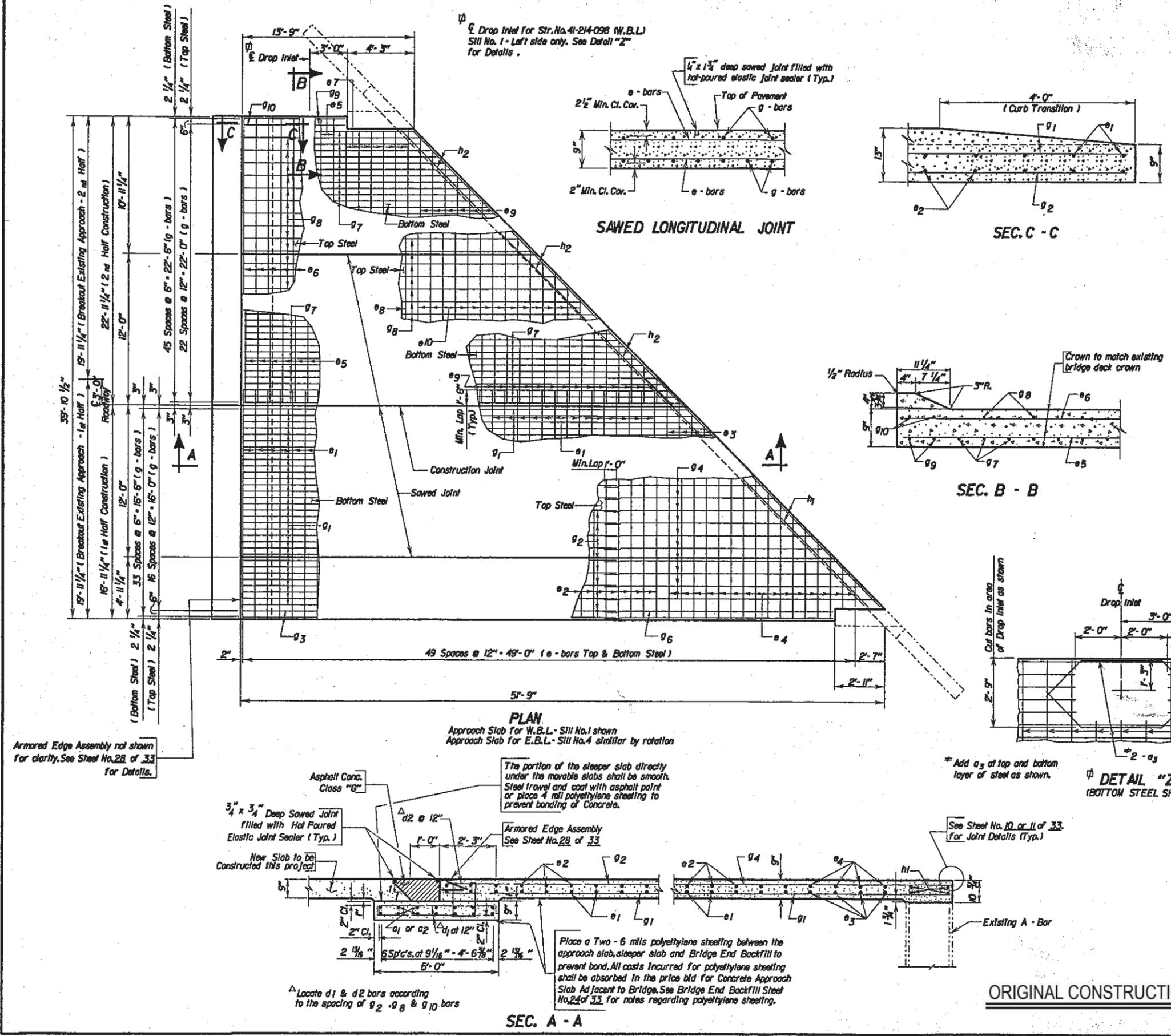
1. 73.3 Cu. Yds. Concrete In Approach Slabs.
 2. 17743 Lbs. re-steel In Approach Slabs.
 3. 2698 Lbs. Epoxy Coated Re-Steel In Approach Slabs
 4. 11.1 Cu. Yds. Concrete In Sleeper Slabs
 5. 1815 Lbs. Re-Steel In Sleeper Slabs
 6. 276 Lbs. Epoxy Coated Re-Steel In Sleeper Slabs
 7. 2105 Lbs. Structural Steel
- Items 1 thru 7 are approximate quantities contained in the bid items above and are for information only.

DETAILS OF APPROACH SLAB ADJACENT TO "OFF END" OF BRIDGE FOR 135'-8" I-BEAM VIADUCT

38'-0" ROADWAY 45° SKEW R.H.F.
 OVER WHITEWOOD CREEK SEC. 22-T6N-R4E
 STA. 360+40.17 TO 362+59.83 IR90-(K97)24
 STR. NO. 41-214-098 HS20-44
 LAWRENCE COUNTY (& ALT.)

S. D. DEPT. OF TRANSPORTATION
 APRIL 1988 (13) OF (15)

DESIGNED BY D.G.B. BLAWR2732	DRAWN BY W.C.P. B2732WPI2	CHECKED BY D.G.B.&T.D.W.	APPROVED BRIDGE ENGINEER
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ORIGINAL CONSTRUCTION PLANS

REINFORCING SCHEDULE
For one Approach Slab

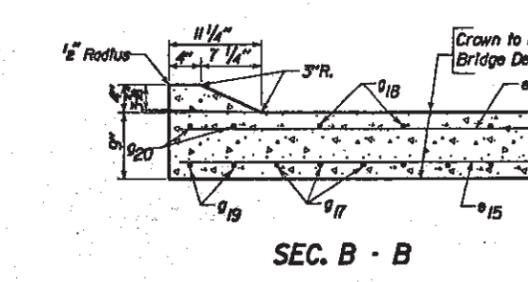
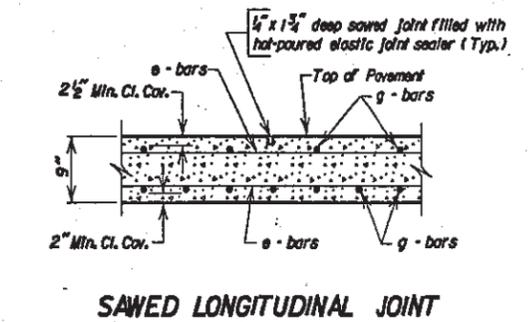
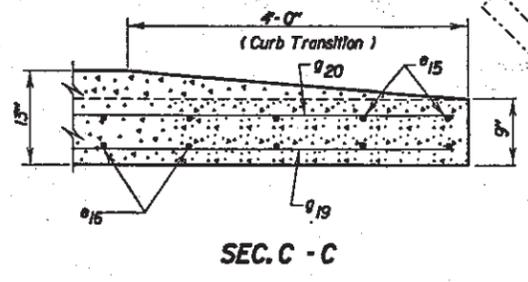
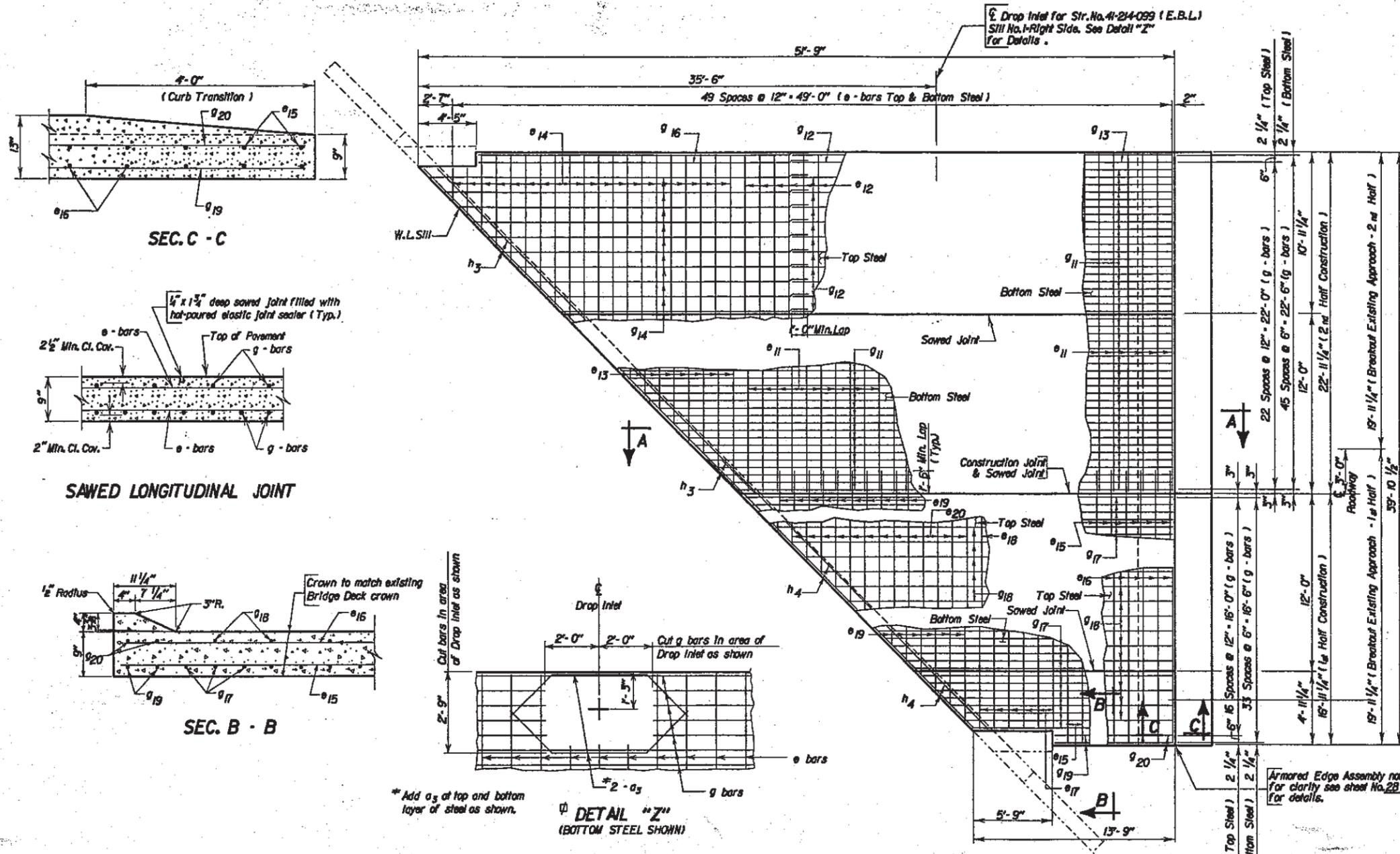
Mk.	No.	Size	Length	Type	Bending Details
C3	14	5	15'-4"	Str.	Type 19A
C4	14	5	22'-8"	Str.	
d3	84	4	5'-6"	2	Type T2
d4	42	4	4'-11"	T2	
a1	30	6	22'-7"	Str.	Type 2
a2	30	3	22'-7"	Str.	
a3	10	6	25'-4"	Str.	Type 2
a4	10	3	25'-4"	Str.	
a5	8	6	18'-4"	Str.	Type 2
a6	8	3	18'-4"	Str.	
a7	6	6	17'-6"	Str.	Type 2
a8	6	3	17'-6"	Str.	
a9	7	6	21'-0"	Str.	Type 2
a10	7	3	21'-0"	Str.	
a11	22	8	80'-6"	Str.	Type 2
a12	24	3	26'-0"	Str.	
a13	2	8	47'-3"	Str.	Type 2
a14	11	3	30'-0"	Str.	
a15	2	3	22'-3"	Str.	Type 2
a16	2	3	22'-3"	Str.	
a17	16	8	42'-6"	Str.	Type 2
a18	8	3	43'-0"	Str.	
a19	2	8	7'-8"	Str.	Type 2
a20	2	3	7'-8"	Str.	
a21	4	6	30'-8"	Str.	Type 2
a22	4	6	24'-0"	Str.	
a23	4	3	7'-4"	19A	

NOTE -
All dimensions are out to out of bars.
* Bars to be epoxy coated.
Cut Bars

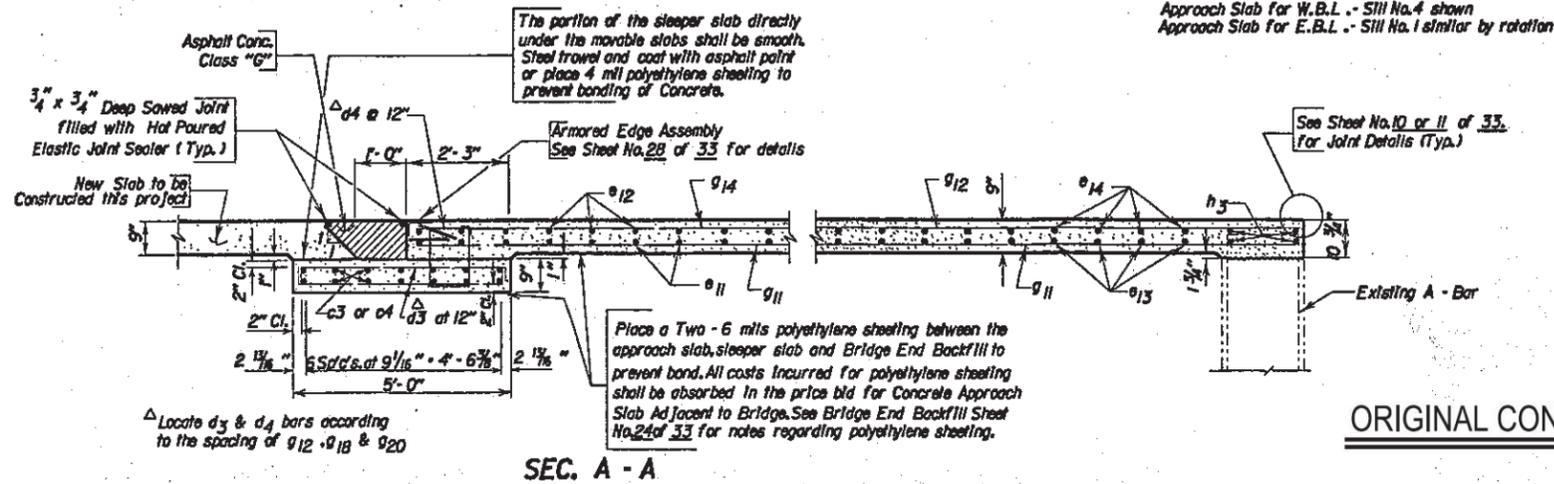
ESTIMATED QUANTITIES
(For Two Approach Slabs)

ITEM	UNIT	QUANTITY
Concrete Approach Slab Adjacent to Bridge	Sq.Yd.	288.4
Bridge Approach Sleeper Slab	Sq.Yd.	44.3

- 73.2 Cu. Yds. Concrete In Approach Slabs.
 - 17671 Lbs. Re-steel In Approach Slabs.
 - 2689 Lbs. Epoxy Coated Re-Steel In Approach Slabs
 - 111 Cu. Yds. Concrete In Sleeper Slabs
 - 1815 Lbs. Re-Steel In Sleeper Slabs
 - 276 Lbs. Epoxy Coated Re-Steel In Sleeper Slabs
 - 2105 Lbs. Structural Steel
- Items 1 thru 7 are approximate quantities contained in the bid items above and are for information only.



PLAN
Approach Slab for W.B.L. - Still No. 4 shown
Approach Slab for E.B.L. - Still No. 1 similar by rotation

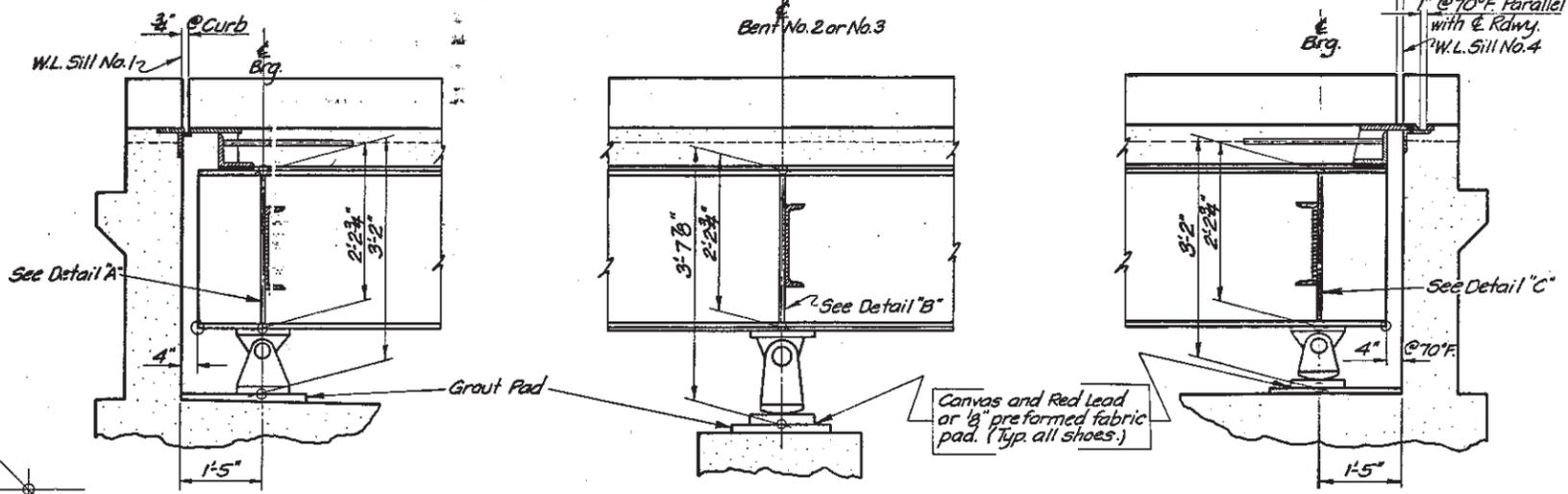
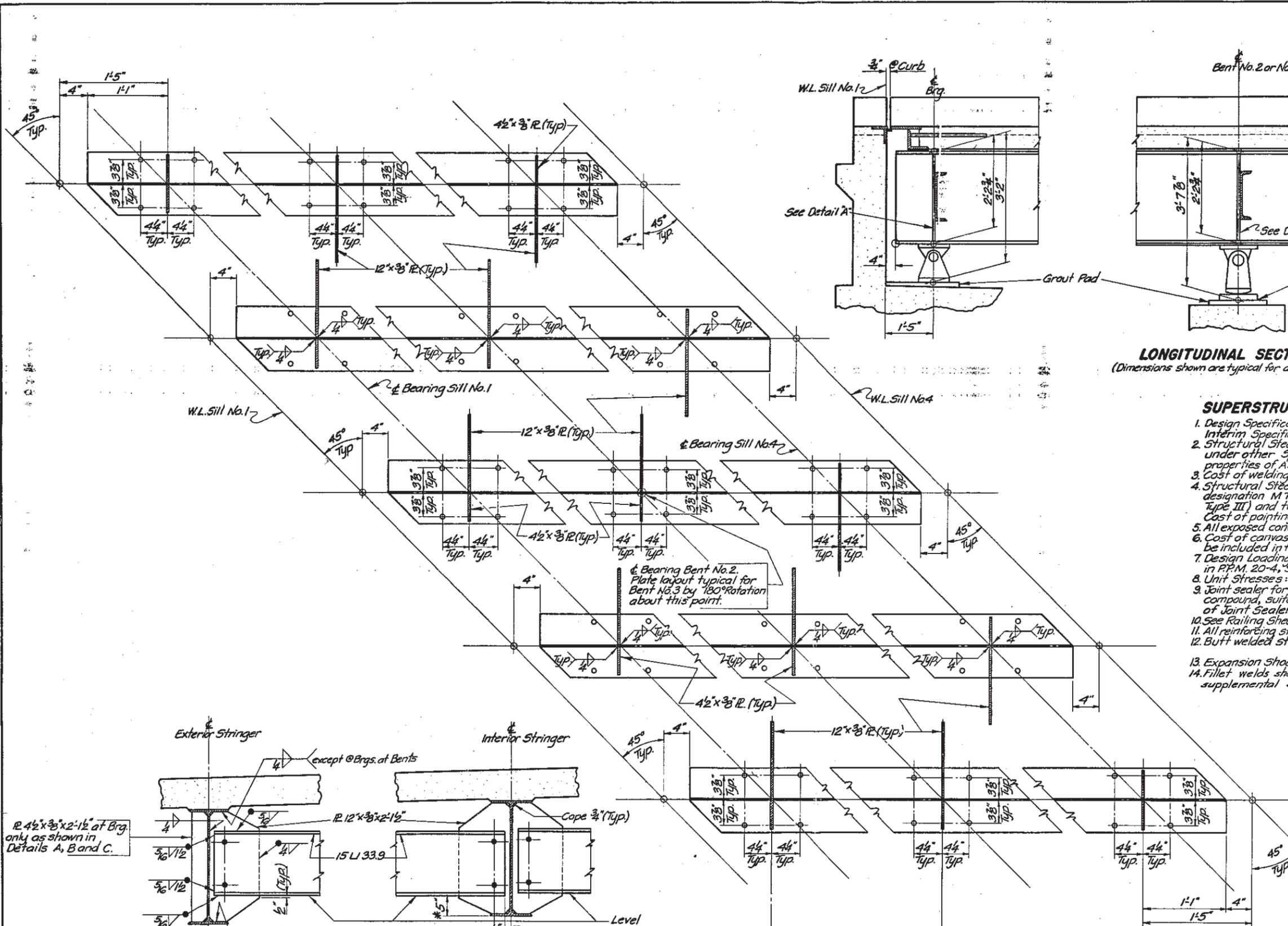


DETAILS OF APPROACH SLAB
ADJACENT TO "ON END" OF BRIDGE
FOR
135'-8" I-BEAM VIADUCT
38'-0" ROADWAY 45° SKEW R.H.F.
OVER WHITEWOOD CREEK SEC. 22-T6N-R4E
STA. 360+40.17 TO 362+59.83 IR90-K97)24
STR. NO. 41-214-098 HS20-44 (& ALT.)
LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 1988 (14) OF (15)

ORIGINAL CONSTRUCTION PLANS

DESIGNED BY D.G.B. BLAWR2732	DRAWN BY W.C.P. B2732WPII	CHECKED BY D.G.B. & T.D.W.	APPROVED BRIDGE ENGINEER
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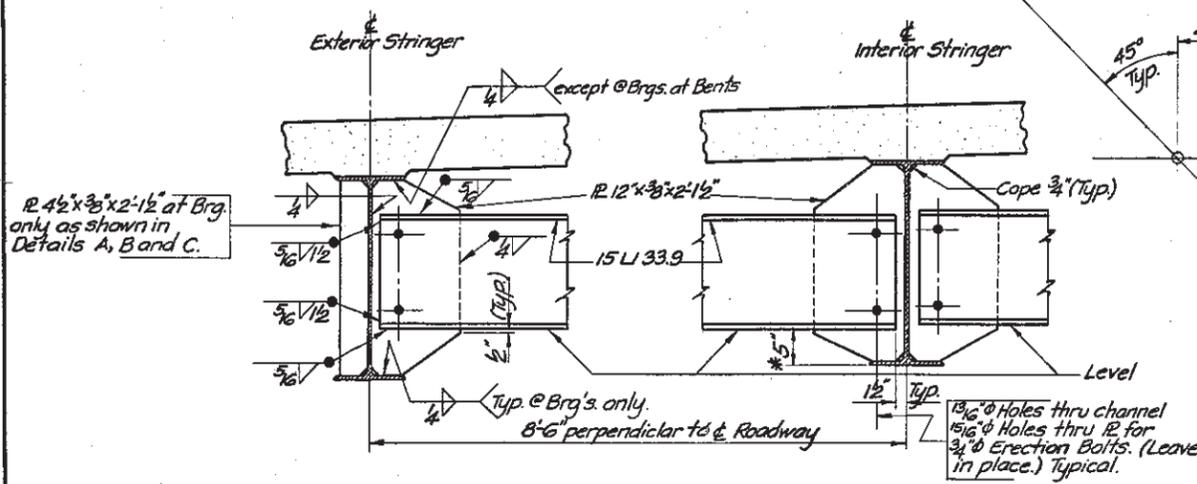
41007



LONGITUDINAL SECTION
(Dimensions shown are typical for all stringers.)

SUPERSTRUCTURE NOTES.—

1. Design Specifications: A.A.S.H.O. Specifications for Highway Bridges, 1961, with Interim Specifications for 1961, 1962, 1963, 1964.
2. Structural Steel members shall conform to A.S.T.M. A36 steel. Steel produced under other Specifications, but shown to possess the chemical and physical properties of A36 steel will be accepted for use where the latter is specified.
3. Cost of welding shall be included in the unit price bid for Structural Steel.
4. Structural Steel shall be painted with one shop coat of Red Lead Paint (A.A.S.H.O. designation M72 Type I) or Red Lead Iron Oxide Paint (A.A.S.H.O. designation M72 Type III) and two field coats of Aluminum Paint (A.A.S.H.O. designation M69.) Cost of painting shall be included in the unit price bid for Structural Steel.
5. All exposed concrete edges shall be chamfered 1" unless otherwise noted.
6. Cost of canvas and red lead or preformed fabric pads under bearing plates shall be included in the unit price bid for Structural Steel.
7. Design Loading: HS 20-44 A.A.S.H.O. and the Alternate Loading as designated in P.P.M. 20-4, Section 4c.
8. Unit Stresses: Re-steel $f_s = 20,000$ p.s.i., Concrete $f_c = 1600$ p.s.i.
9. Joint sealer for Bridges shall be an approved liquid polysulfide polymer, two component compound, suitable for sealing vertical and horizontal joints in concrete and metal. Cost of Joint Sealer shall be included in the unit price bid for Class "A" Concrete.
10. See Railing Sheet for details of handrails and drains.
11. All reinforcing steel shall conform to A.S.T.M. Specifications A305 and A15. (Intermediate Grade)
12. Butt welded stringer splices, shop or field, shall be radiographically inspected.
13. Expansion shoes shall be set vertical at 70°F.
14. Fillet welds shall be subjected to magnetic particle inspection as specified in the supplemental Specifications for Steel Structures, dated June 23, 1965.



DIAPHRAGMS

NOTE.—
1. All welds shown are typical for all diaphragms.
2. See Sheet No. 11 of 12 for diaphragm spacing.

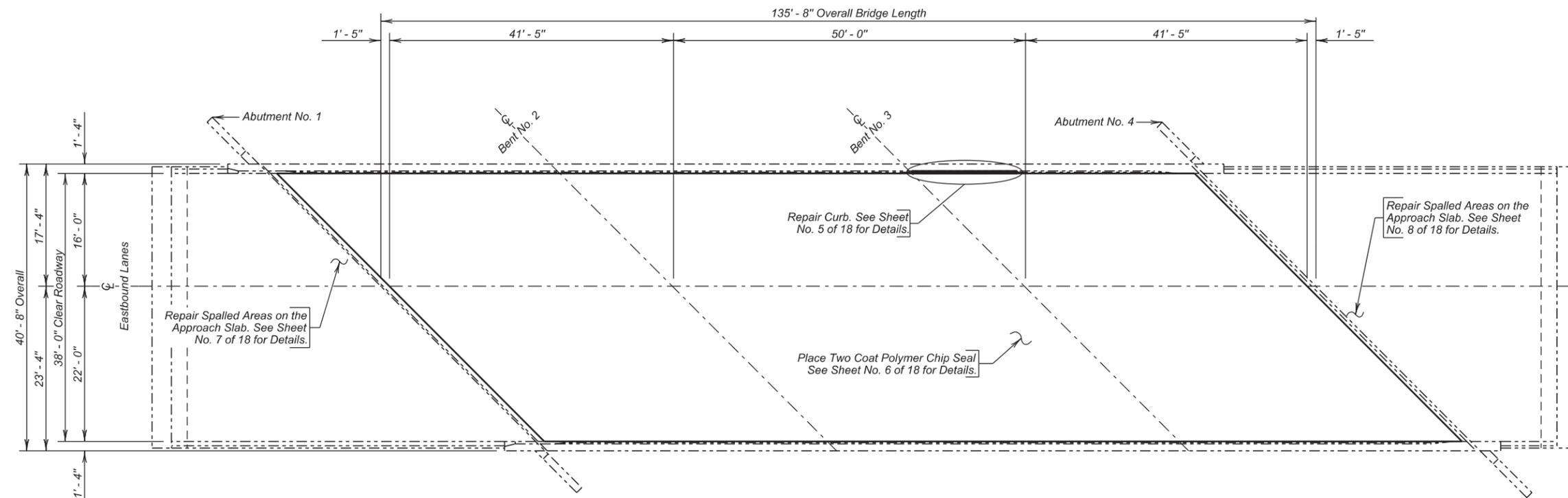
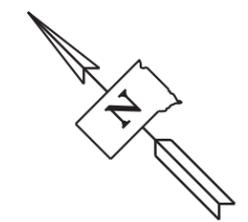
DETAIL "A" DETAIL "B" DETAIL "C"

ORIGINAL CONSTRUCTION PLANS

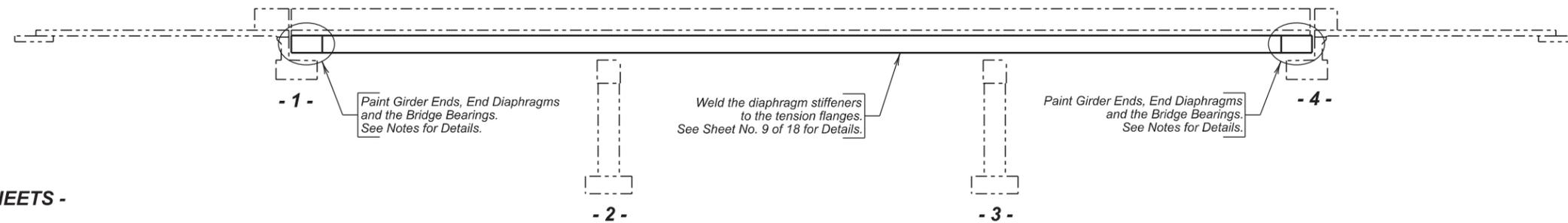
(WEST BOUND LANES)
SUPERSTRUCTURE DETAILS
FOR
135'-8" I-BEAM VIADUCT
38'-0" ROADWAY 45° SKEW R.H.F.
OVER WHITEWOOD CREEK SEC. 22-T6N-R4E
STA. 360+40.167 TO 361+75.834 190-1 (15) 19
STR. NO. 41-214-098 LAWRENCE COUNTY
SOUTH DAKOTA HS 20-44
DEPARTMENT OF HIGHWAYS (8 ALT.)
OCT. 1964 8 15 OF 15

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	R.C.M.	J.L.H.	<i>P. Schmitt</i> BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E65	E82



PLAN



ELEVATION

INDEX OF BRIDGE SHEETS -

- Sheet No. 1 - Layout for Upgrade
- Sheet No. 2 - Estimate of Structure Quantities and Notes
- Sheet No. 3 - Notes (Continued)
- Sheet No. 4 - Notes (Continued)
- Sheet No. 5 - Curb Repair Details
- Sheet No. 6 - Polymer Chip Seal Details
- Sheet No. 7 - Approach Slab Repair
- Sheet No. 8 - Approach Slab Repair (Continued)
- Sheet No. 9 - Details of Fatigue Retrofit Type "C"
- Sheet No. 10 - 18 - Original Construction Plans

(EASTBOUND LANES)
LAYOUT FOR UPGRADE
FOR

135' - 8" I-BEAM VIADUCT

38' - 0" ROADWAY
OVER WHITEWOOD CREEK
STR. NO. 41-214-099
PCN 02PP

45° SKEW R.H.F.
SEC. 22 - T6N - R4E
IM 0901(171)18

LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION
MARCH 2016

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
410E0103	Fatigue Retrofit Steel Girder, Type C	144	Each
410E3010	Magnetic Particle Weld Inspection	176.0	In
412E0120	Bridge Repainting, Class II	Lump Sum	LS
412E0500	Paint Residue Containment	Lump Sum	LS
460E0172	Concrete Patching Material, Bridge Deck	35.2	CuFt
460E0174	Concrete Patching Material, Miscellaneous	4.3	CuFt
460E0300	Breakout Structural Concrete	0.1	CuYd
480E5000	Galvanic Anode	7	Each
491E0005	Two Coat Bridge Deck Polymer Chip Seal	549.1	SqYd
491E0110	Abrasive Blasting of Bridge Deck	549.1	SqYd
491E0120	Bridge Deck Grinding	549.1	SqYd
491E0130	Concrete Removal, Class A	6.1	SqYd
491E0140	Concrete Removal, Class B	6.1	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. 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 elsewhere 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 preconstruction meeting.

- Perform bridge deck grinding and repair the bridge deck by removing all loose and delaminated concrete from the bridge deck surface for the first and second phase of construction.
- Repair the bridge deck and approach slab by removing and replacing all loose and delaminated concrete from the surface for the first phase of construction.
- Clean the bridge deck surface with abrasive blasting for the first phase of construction.

- Place a Two Coat Bridge Deck Polymer Chip Seal for the first phase of construction.
- Repair spalled areas on approach slab adjacent the compression seal joint for the first phase of construction.
- Switch traffic and repair curb spalls and where reinforcement steel is exposed for the second phase of construction.
- Repeat steps 1 through 5 for the second phase of construction.
- Weld diaphragm stiffeners to the tension flanges.
- Paint all girder ends adjacent to both abutments a distance of 4 feet from the girder ends.

GENERAL CONSTRUCTION – BRIDGE

- 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.
- 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 concrete barriers shall be cured in accordance with Section 460.3.N. of the Construction Specifications except that no curing compounds shall be allowed.

APPROACH SLAB REPAIR

- The removal and replacement of the delaminated concrete on the approach slab shall be in accordance with Section 491 of the Construction Specifications except as follows:
 - Curing Compounds may be used to cure the approach slab concrete patches in accordance with Section 460.3M of the Construction Specification.
 - The surface of the approach slab concrete patching shall be tined.

CONCRETE BREAKOUT

- The existing curb 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. The existing reinforcing steel that is to be reused in the new construction and that is exposed during concrete breakout shall be epoxy coated in accordance with the "Epoxy Coating Existing Reinforcing Steel" notes.

- All broken out concrete shall be disposed of by the Contractor. Any disposal of discarded material shall be in accordance with the Environmental Commitments.
- During concrete removal operations, no broken out concrete shall be allowed to fall into Whitewood Creek.
- The contract unit price per cubic yard for "Breakout Structural Concrete" shall include breaking out concrete, cleaning, straightening existing reinforcing steel and disposal of all broken out material.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES

FOR
135' - 8" I - BEAM VIADUCT

STR. NO. 41-214-099

JANUARY 2015

2 OF 18

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18		

GALVANIC ANODE

1. The Contractor shall furnish and place galvanic anodes in the concrete repair areas specified in this plan set.
2. The galvanic anodes shall be supplied as one of the following:

Galvashield XP2
Vector Corrosion Technologies
13312 N 56th St, Suite 102
Tampa, FL 33617
Phone: (813) 830-7566
Website: www.vector-corrosions.com

Sentinel Silver
Euclid Chemical Company
19218 Redwood Road
Cleveland, OH 44110
Phone: (800) 321-7628
Website: www.euclidchemical.com

Sika Galvashield XP+
Sika Corporation US
201 Polito Avenue
Lyndhurst, NJ 07071
Phone: (800) 933-7452
Website: <http://usa.sika.com>

3. The anodes shall be placed in accordance with manufacturer's recommendations and as approved by the Engineer. The anodes have not been shown on the drawings. The Contractor shall provide shop drawings of the galvanic anode installation including locations of the individual anodes to the Office of Bridge Design.
4. The anodes shall be placed with a minimum ¾" cover and shall be set in Embedding Mortar per the manufacturer's recommendations. The anodes shall be fully encased in the concrete repair material. Where adequate cover does not exist, a concrete pocket shall be chipped out behind the anode to provide sufficient cover. The Contractor may need to chip around the reinforcing bar locally at the anode installation to make the electrical connection. The reinforcing steel at the connection location shall be cleaned per the manufacturer's recommendations to provide sufficient electrical connection and mechanical bond.
5. The electrical continuity of the electrical connections and reinforcing steel shall be confirmed per the manufacturer's recommendations.
6. The Contractor shall provide manufacturer's product literature and installation instructions to the Engineer 10 days prior to installation.
7. All costs associated with placing anodes including labor, equipment, materials and incidentals shall be included in the contract unit price per each for "Galvanic Anode".

CURB REPAIR

1. Curb Repair will consist of breaking out portions of the existing bridge curb where there is exposed rebar and curb spalling, cleaning the existing reinforcing steel, installing galvanic anodes, and replacing with concrete patching material.
2. Areas where there is exposed rebar and localized spalling shall be repaired according to details on sheet 5 of 18. Additional areas for repair shall be determined by the Engineer.
3. Concrete shall be broken out to the limits in this plan set or until sound concrete is reached. At no time will the limits of concrete breakout be less than the amount to achieve a minimum of two inches of clear cover between the broken out concrete and the back face of the existing reinforcing steel.
4. Galvanic anodes shall be placed in the removal areas of the curb. See "Galvanic Anode" notes for instructions on placement.
5. Areas of curb repair shall be wet cured a minimum of seven days before any additional work shall be allowed.
6. All costs associated with blast cleaning the existing reinforcing steel shall be incidental to the various bid items.
7. All costs for labor, equipment, materials and incidentals necessary for placing the new concrete shall be included in the contract unit price per cubic foot for "Concrete Patching Material, Miscellaneous".

BRIDGE DECK GRINDING

The Contractor will have the option of grinding the entire deck surface during phase one. Any additional costs incurred for grinding the entire deck surface such as additional traffic control or cleaning shall be at no additional cost to the Department.

TWO COAT BRIDGE DECK POLYMER CHIP SEAL

The Two Coat Bridge Deck Polymer Chip Seal shall be applied in accordance with the Construction Specifications.

FATIGUE RETROFIT – STEEL GIRDER, TYPE "C"

1. This work consists of cleaning and removing paint in the areas where the existing diaphragm stiffeners bear on the top and bottom flanges of the main girder, welding the existing diaphragm stiffeners to the top and bottom flanges, and painting the finished welds to match the existing color.
2. Preparation of the base metal prior to welding shall be in accordance with Section 3 of the Bridge Welding Code. Existing paint shall be removed a distance of 4 inches from each side of the weld.

3. Preheat will be required. Preheat and interpass temperature requirements shall be in accordance with Section 4.2 of the Bridge Welding Code. The minimum preheat and interpass temperature shall be **155** degrees F determined from Annex VIII of the Bridge Welding Code for high restraint conditions. The use of temperature indicating crayons shall be a minimum acceptable method for monitoring preheat and interpass temperatures.
4. SMAW electrode atmospheric exposure requirements shall comply with Section 4.5 of the Bridge Welding Code. Electrodes shall be purchased in hermetically sealed containers. If the container shows evidence of damage, the electrodes shall be dried in a drying oven for at least one hour between 700 and 800 degrees F before they are used. Immediately after opening a hermetically sealed container, or removal from a drying oven, electrodes shall be stored in storage ovens at a temperature of 250 degrees F. Electrodes exposed to the atmosphere upon removal from drying, storage ovens or hermetically sealed containers shall be used within four hours maximum, or redried at 450 to 550 degrees F for two hours minimum. Electrodes exposed to the atmosphere for periods less than four hours may be returned to a storage oven and maintained at a minimum of 250 degrees F for a minimum of four hours before reissue. Electrodes shall be redried no more than one time. Electrodes which have been wet shall not be used.
5. All welds shall be cleaned in accordance with Section 3.11 of the Bridge Welding Code. Completed welds and adjacent areas shall be cleaned of all weld spatter, slag, smoke and heat affected paint.
6. The Contractor shall submit a Welding Procedure Specification on Form III-2 (on page 189 of the Bridge Welding Code) and notify the Department of the Contractor's welding schedule thirty days prior to any Fatigue Retrofit welding.
7. All costs for labor, materials and incidentals necessary to prepare the weld area, complete the weld and provide access to each weld for Nondestructive Testing shall be paid for at the Contract Unit Price bid per each for "Fatigue Retrofit - Steel Girder, Type C".
8. Removal of work affected paint and repainting the work affected areas is covered and paid for in the Bridge Repainting and Paint Residue Removal and Containment notes on Sheet No. 4 of 18.

NOTES (CONTINUED)

FOR

135' - 8" I - BEAM VIADUCT

STR. NO. 41-214-099

JANUARY 2015

3 OF 18

DESIGNED BY KH MEAD02PP	CK. DES. BY KSK 02PPRH03	DRAFTED BY KH <i>Kevin N. Boeden</i> BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18		

MAGNETIC PARTICLE INSPECTION

1. The Contractor shall be responsible for retaining a qualified Testing Agency to perform magnetic particle inspection (MT) and visual inspection on the fillet welds produced in the field under the payment item "Fatigue Retrofit - Steel Girder Type C". All of the MT and visual inspections shall be performed by an AWS Certified Welding Inspector qualified and certified in conformance with the provisions of AWS QC1. Additionally, personnel performing the Non Destructive testing (NDT) shall be qualified in conformance with the American Society for Nondestructive Testing's (ASNT) Recommended Practice No. SNT-TC-1A, or equivalent, as a NDT Level II inspector. The Testing Agency and inspectors provided shall be subject to the approval of the Bridge Construction Engineer.
2. Twenty percent of the weld locations will be tested using MT. A weld location is defined as 100% of the fillet weld length in one unit of "Fatigue Retrofit - Steel Girder Type C". The MT results shall be reported on Form III-6 in Annex III of the Bridge Welding Code. The MT Inspection shall be performed by the yoke method. The MT Inspection shall be in accordance with Section 6 of the Bridge Welding Code.
3. All of the completed fillet welds in "Fatigue Retrofit - Steel Girder Type C" shall be visually inspected for acceptance by the Testing Agency. The visual inspection shall be in accordance with Section 6 of the Bridge Welding Code. The Testing Agency shall record the locations of the visual inspection and the findings of the visual inspections together with detailed descriptions of all recommended repairs.
4. Based on the results of the Magnetic Particle Inspection and visual inspection, the Bridge Construction Engineer will determine the acceptability of the completed fillet welds and any recommended repairs. Any necessary repairs to the completed welds shall be accomplished in accordance with Chapter 12 of the Bridge Welding Code 2010 Edition. All weld repair procedures, should they be required, shall be approved prior to use by the Bridge Construction Engineer.
5. All costs incurred by the Magnetic Particle Inspection and visual inspection, including all labor, equipment, access provisions and any incidentals necessary to perform the inspection in accordance with these plans shall be incidental to the contract unit price per inch for "Magnetic Particle Weld Inspection".

PAINT RESIDUE REMOVAL AND CONTAINMENT

1. Paint removal on the existing bridge shall be in accordance with Section 412 of the Construction Specification except as modified by these notes.
2. The Contractor shall plan his operations to prevent releases of lead-containing material and other particulate matter into the surrounding air, water, and onto the ground, soil, slope protection, and pavement. The Contractor shall be responsible for any corrective actions should a spill occur.

3. Collect all visible paint particles and blasting residue containing paint at the end of each workday from the work area. Inspect outside the containment and collect any paint particles or blasting residue that escaped the work area. Collect waste material by manual means, vacuum, or another method approved by the Engineer. Do not use air pressure or streaming water to assist in the waste collection process that could disperse the waste material.
4. In the event of a spill or inadvertent release, the Contractor shall immediately stop work, notify the Engineer, and report the release to the South Dakota Department of Environmental and Natural Resources (DENR). The Contractor shall be responsible for completing a spill reporting form and for all costs associated with appropriate corrective actions.

To report a release or spill, call DENR at (605) 773-3296 during regular office hours (8 a.m. to 5 p.m. Central time). To report the release after hours, on weekends or holidays, call State Radio Communications at (605) 773-3231. Reporting the release to DENR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, the Contractor must also contact local authorities to determine the local reporting requirements for releases. DENR recommends that spills also be reported to the National Response Center at (800) 424-8802.
5. The Contractor shall haul and unload the 55 gallon containment drums with paint residue, blasting media, etc. to the SDDOT Maintenance Yard located near Sturgis for temporary storage. All costs associated with this work shall be included in the contract lump sum price for "Paint Residue Containment".
6. If the Contractor elects to use containers other than 55 gallon barrels to hold paint residue, the Contractor shall be responsible for all testing and disposal at a permitted regional landfill. The Contractor shall be responsible for compliance of laws and regulations regarding storage, handling and shipping. Copies of all tests shipping and disposal documents shall be provided to the Office of Bridge Design.

BRIDGE REPAINTING, CLASS II

1. Portions of the existing structure shall be painted in accordance with Section 412 of the Standard Specifications and in accordance with SSPC Standard PA1.
2. For informational purposes, 413.7 square feet of structural steel will require painting. The quantity shown includes the following:

The steel surface to be painted are the flanges, web, stiffeners, bearings and diaphragms within four feet of the girder ends for all girders adjacent to both abutments.

The steel surfaces to be painted are the flanges and stiffeners in the work affected areas for the fatigue retrofit. The quantity shown is for an area four inches on either side of all welds.

3. Paint Color

Top Coat – The paint color shall be an approved green color. Prior to ordering the paint, a paint chip of the green color shall be submitted to the Department for color approval.

Primer Coat – Color shall sharply contrast with the top coat.

NOTES (CONTINUED)

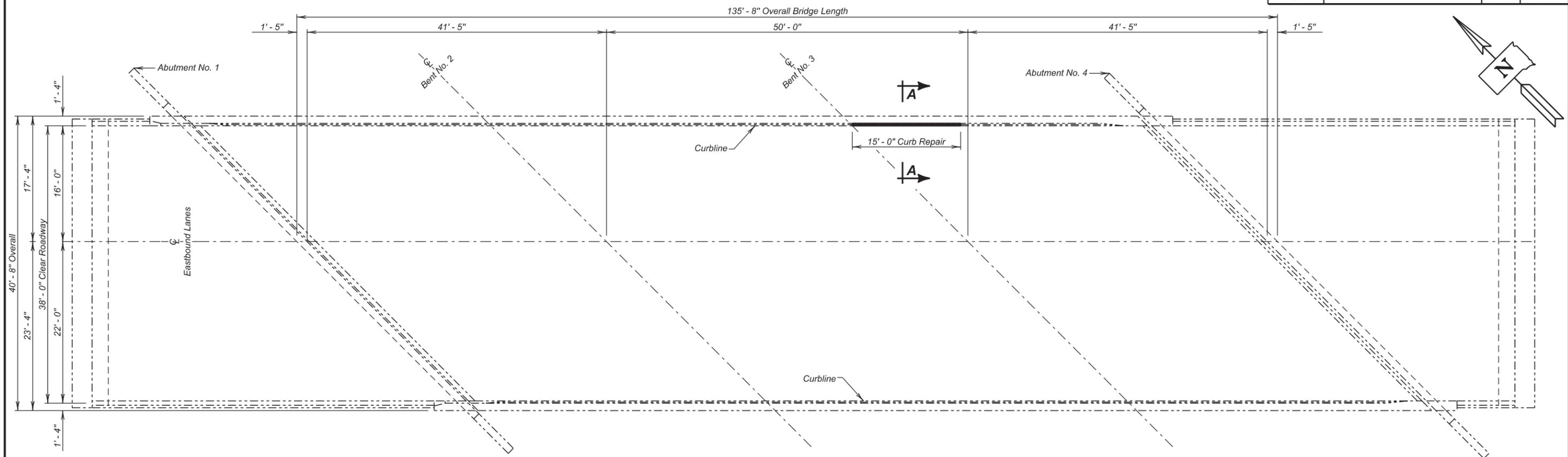
FOR
135' - 8" I - BEAM VIADUCT

STR. NO. 41-214-099

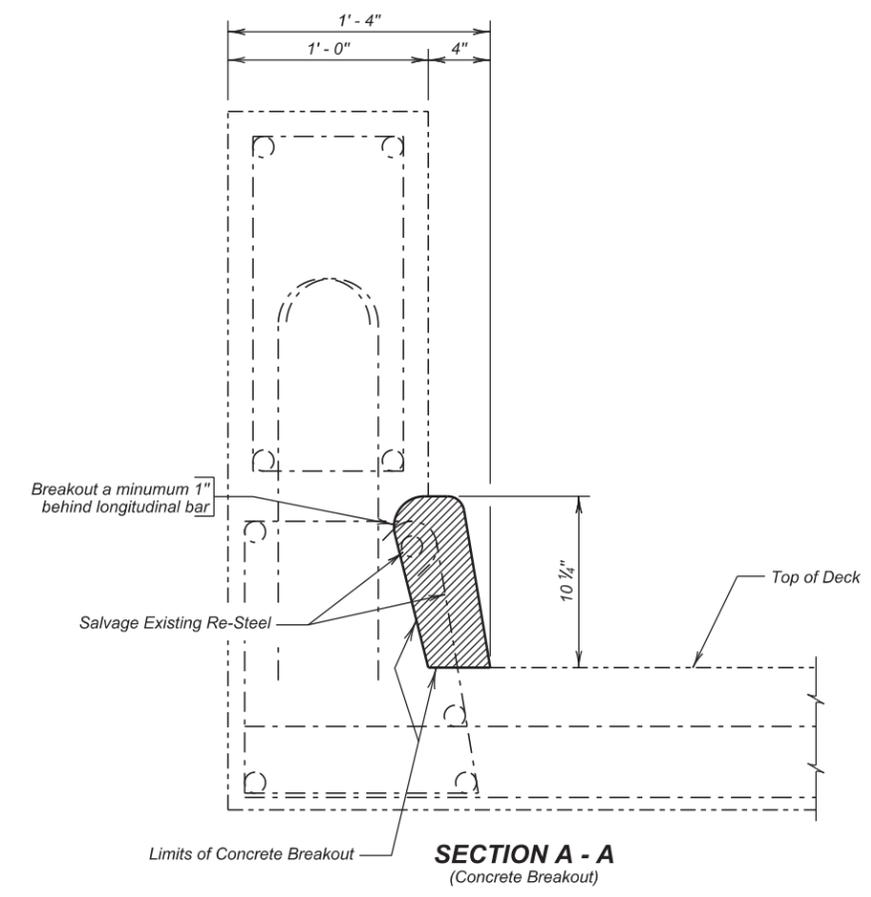
JANUARY 2015

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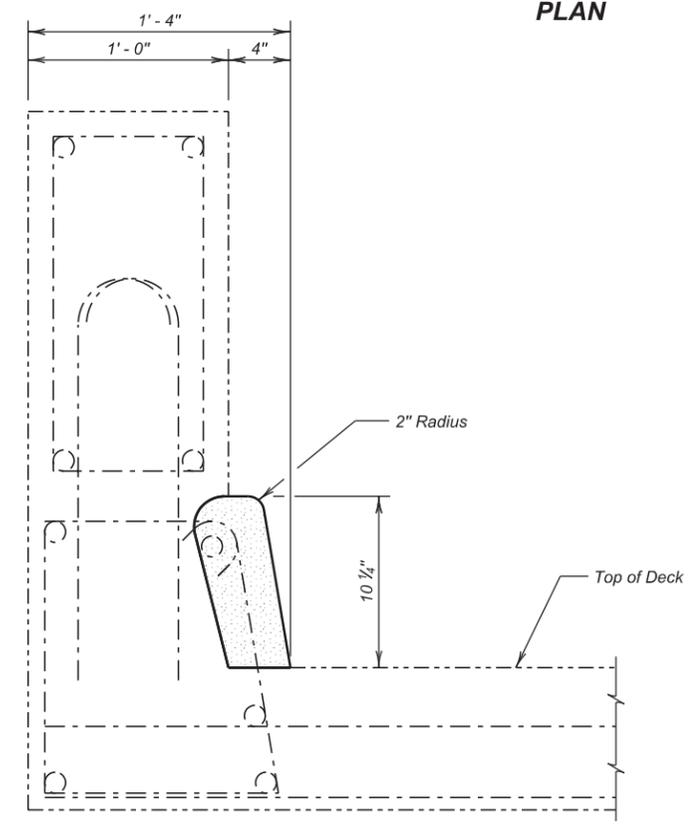
DESIGNED BY KH MEAD02PP	CK. DES. BY KSK 02PPRH04	DRAFTED BY KH <i>Kevin N. Boeden</i> BRIDGE ENGINEER
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PLAN



SECTION A - A
(Concrete Breakout)



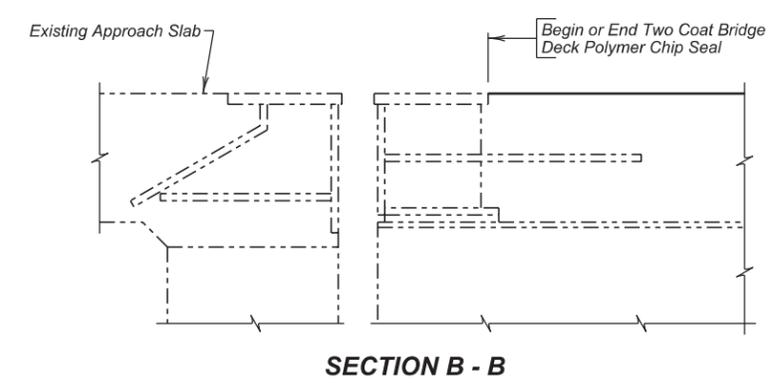
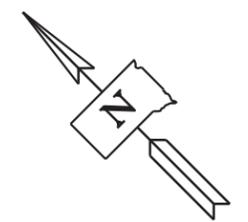
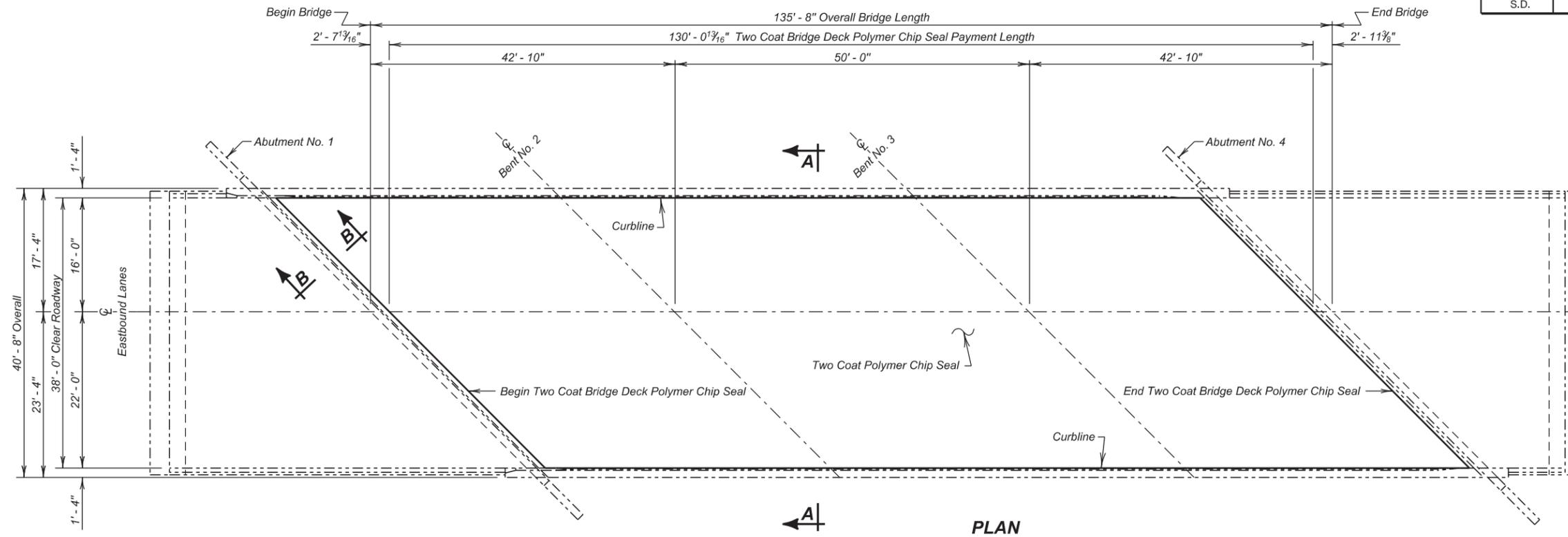
SECTION A - A
(New Construction)

ITEM	UNIT	QUANTITY	
		PHASE 1	PHASE 2
Breakout Structural Concrete	Cu. Yd.	—	0.1
Concrete Patching Material, Miscellaneous	Cu. Ft.	—	4.3
Galvanic Anode	Each	—	7

**(EASTBOUND LANES)
CURB REPAIR DETAILS**
FOR
135' - 8" I-BEAM VIADUCT
38' - 0" ROADWAY OVER WHITEWOOD CREEK
STR. NO. 41-214-099

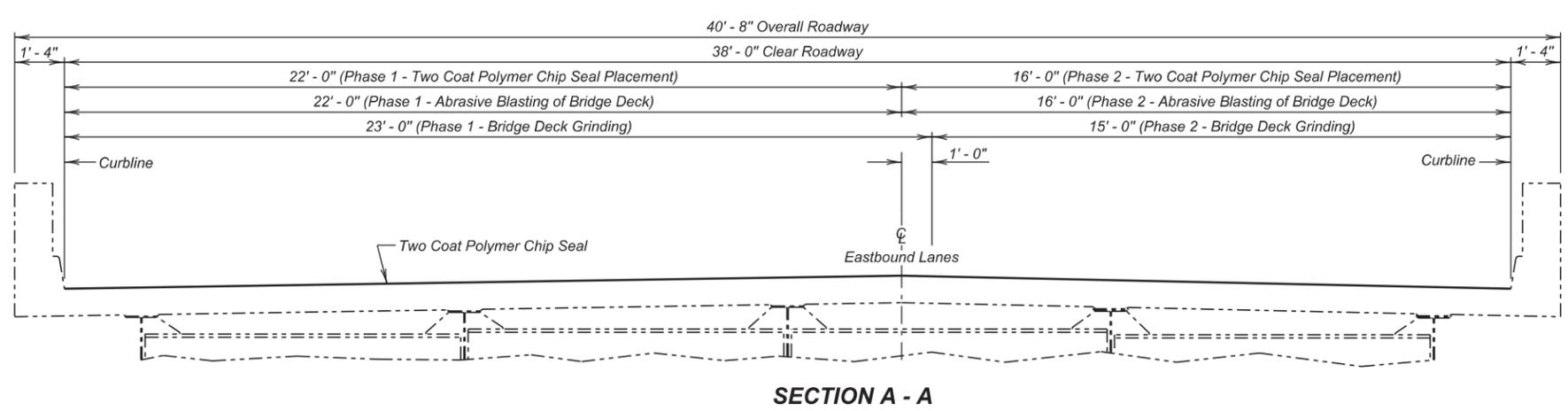
45° SKEW R.H.F.
SEC. 22 - T6N - R4E
IM 0901(171)18

LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION
MARCH 2016



ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
		PHASE 1	PHASE 2
* Concrete Patching Material, Bridge Deck	Cu. Ft.	12.8	12.8
Two Coat Bridge Deck Polymer Chip Seal	Sq. Yd.	317.9	231.2
Abrasive Blasting of Bridge Deck	Sq. Yd.	317.9	231.2
Bridge Deck Grinding	Sq. Yd.	332.4	216.7
* Concrete Removal, Class A	Sq. Yd.	2.0	2.0
* Concrete Removal, Class B	Sq. Yd.	2.0	2.0

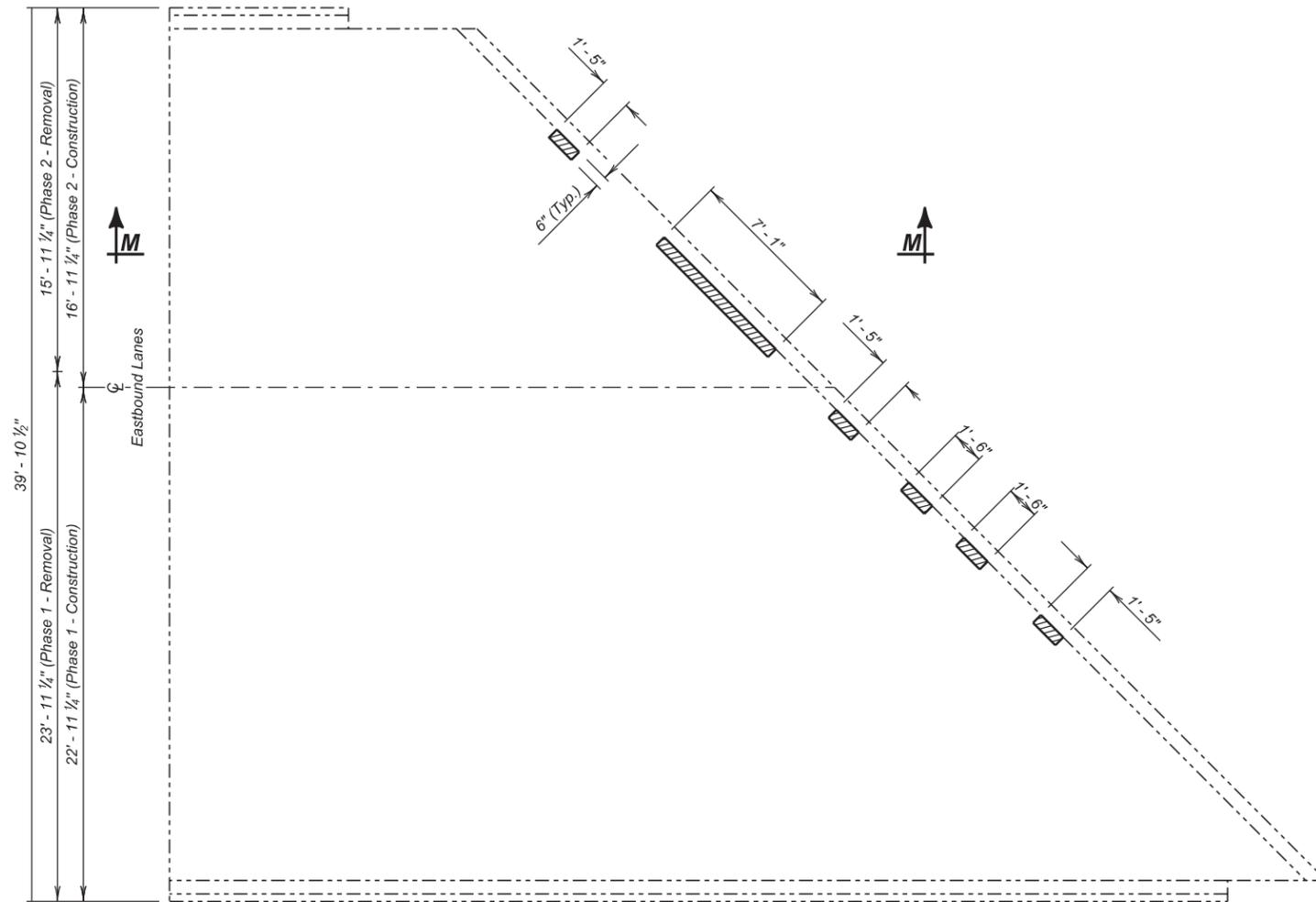
* Concrete Patching Material, Bridge Deck; Concrete Removal, Class A; and Concrete Removal, Class B may not be encountered and may be removed from the project at the direction of the Engineer.



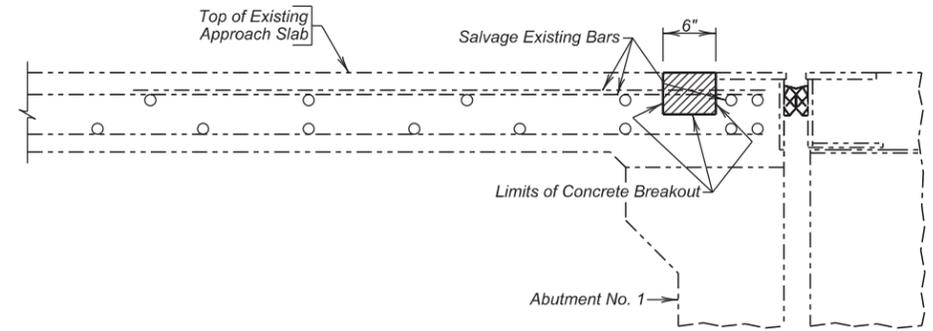
(EASTBOUND LANES)
 POLYMER CHIP SEAL DETAILS
 FOR
135' - 8" I-BEAM BRIDGE
 38' - 0" ROADWAY
 OVER WHITEWOOD CREEK
 STR. NO. 41-214-099

45° SKEW R.H.F.
 SEC. 22 - T6N - R4E
 IM 0901(171)18

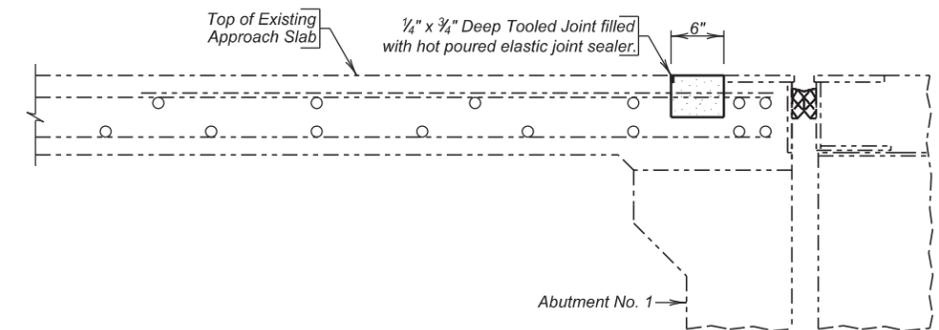
LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 MARCH 2016



PLAN



SECTION M - M
(Existing Section showing Removal Limits)



SECTION M - M
(Existing Section showing Removal Limits)

**(EASTBOUND LANES)
APPROACH SLAB REPAIR
FOR**

135' - 8" I-BEAM BRIDGE

38' - 0" ROADWAY
OVER WHITEWOOD CREEK
STR. NO. 41-214-099

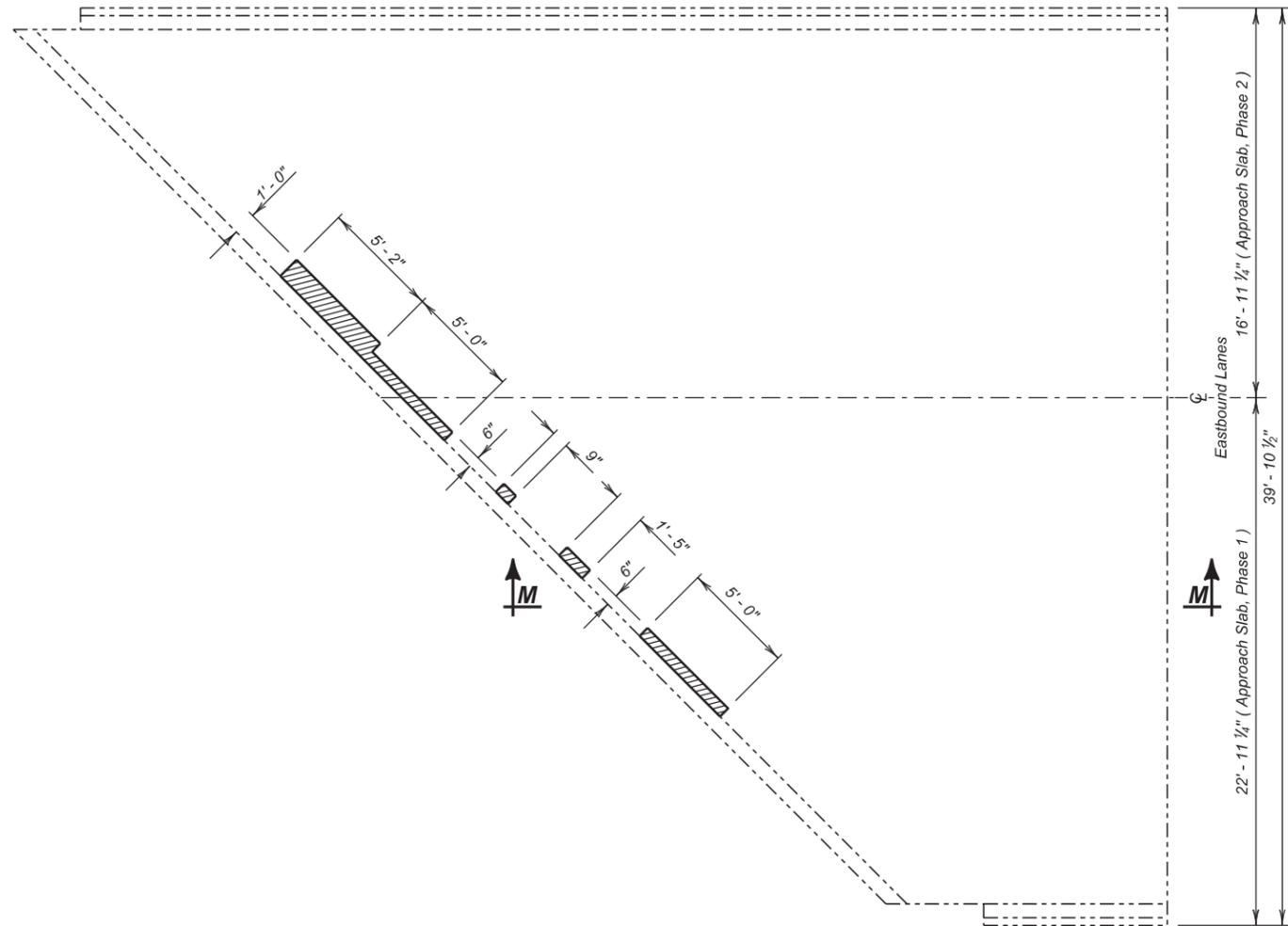
45°SKEW R.H.F.
SEC. 22 - T6N - R4E
IM 0901(171)18

ESTIMATED QUANTITIES		QUANTITY	
		PHASE 1	PHASE 2
Concrete Removal, Class A	Sq. Yd.	0.3	0.5
Concrete Removal, Class B	Sq. Yd.	0.3	0.5
Concrete Patching Material, Bridge Deck	Cu. Ft.	2.4	1.8

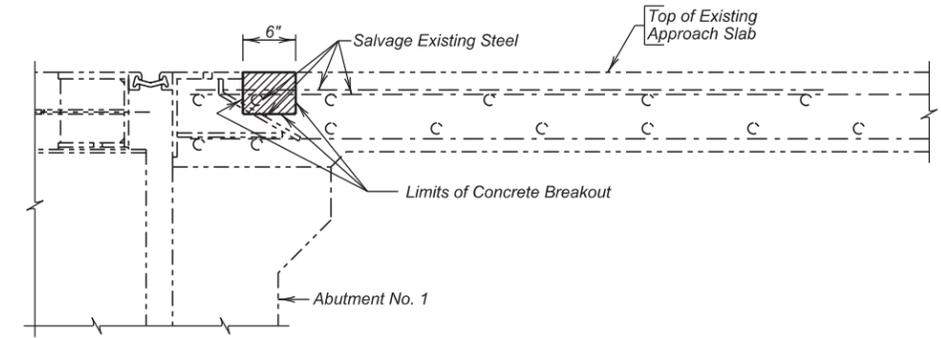
 Shaded areas indicate limits of concrete removal

 Concrete Patching Material, Bridge Deck

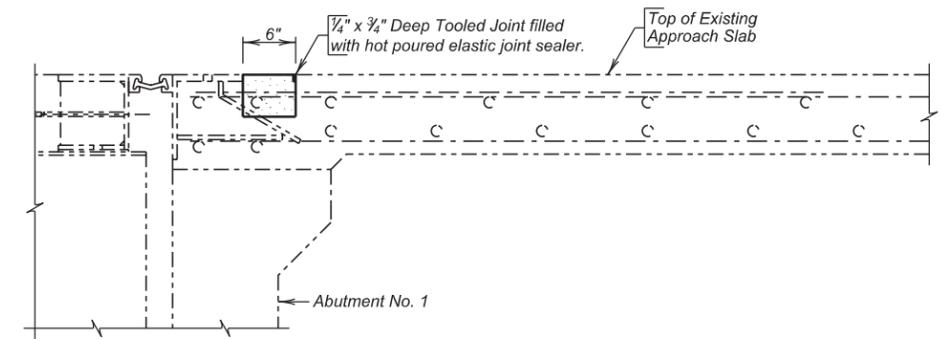
LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION
MARCH 2016



PLAN



SECTION M - M
(Existing Section showing Removal Limits)



SECTION M - M
(Existing Section showing Removal Limits)

ESTIMATED QUANTITIES		QUANTITY	
		PHASE 1	PHASE 2
Concrete Removal, Class A	Sq. Yd.	0.6	0.7
Concrete Removal, Class B	Sq. Yd.	0.6	0.7
Concrete Patching Material, Bridge Deck	Cu. Ft.	2.7	2.7

 Shaded areas indicate limits of concrete breakout.

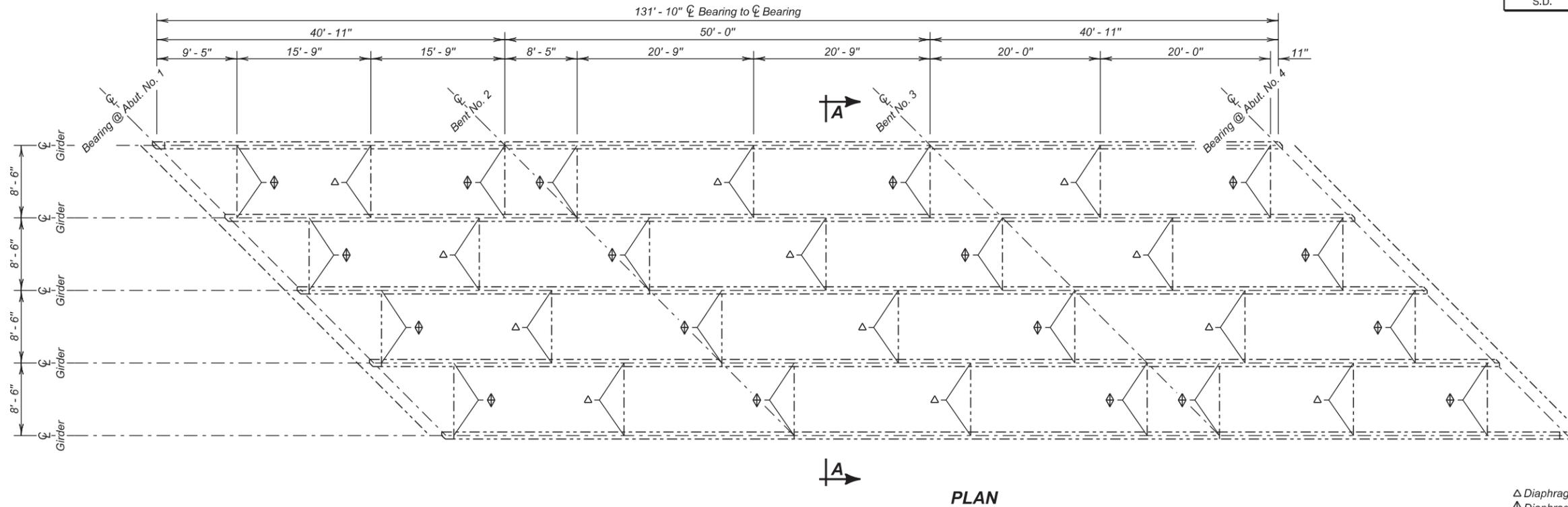
 Class A45 Concrete

(EASTBOUND LANES)
APPROACH SLAB REPAIR (CONTINUED)
FOR

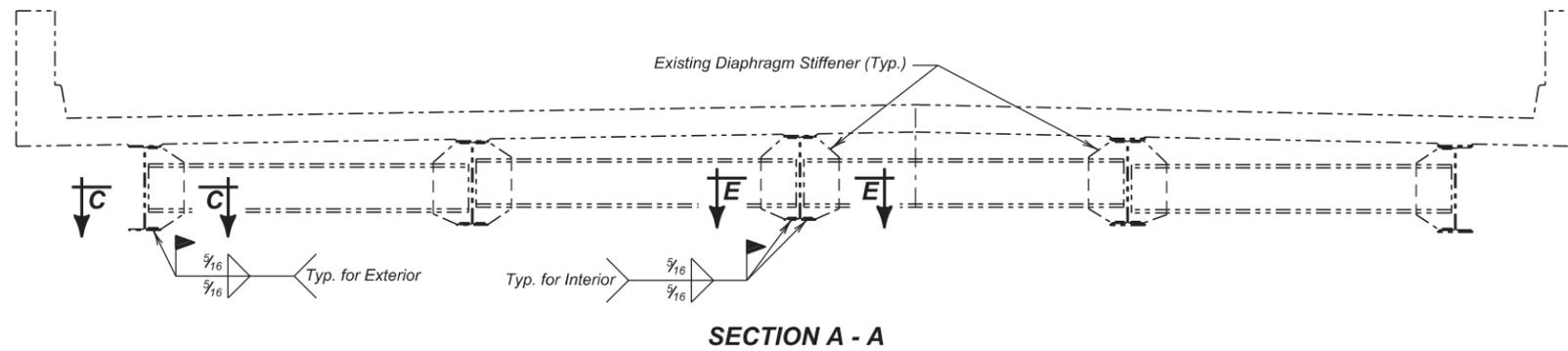
135' - 8" I-BEAM VIADUCT
38' - 0" ROADWAY
OVER WHITEWOOD CREEK
STR. NO. 41-214-099

45° SKEW R.H.F.
SEC. 22 - T6N - R4E
IM 0901(171)18

LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION
MARCH 2016

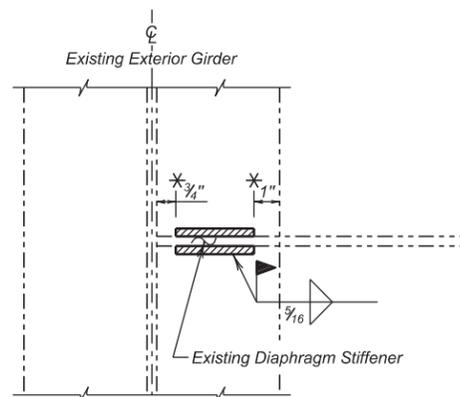


△ Diaphragm stiffener shall be welded to the top and bottom flanges.
 ⬠ Diaphragm stiffener shall be welded to the top flanges only.

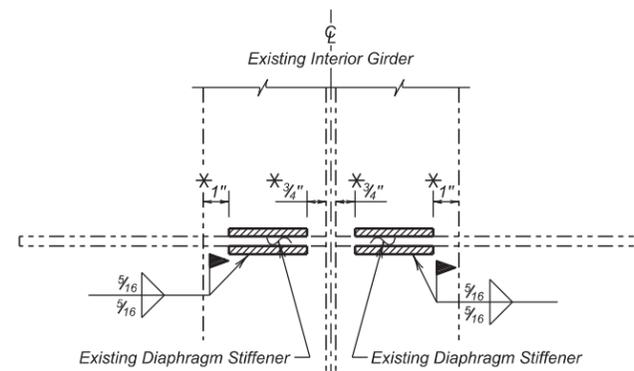


ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Fatigue Retrofit Steel Girder, Type C	Each	144
Magnetic Particle Weld Inspection	Inch	176.0
Bridge Repainting, Class II	LS	Lump Sum
Paint Residue Containment	LS	Lump Sum

Note: Welding both sides of one individual stiffener to a flange constitutes one unit of payment on a per each basis.



SECTION C - C
 (One typical unit of Fatigue Retrofit is shown.)



SECTION E - E
 (Two typical units of Fatigue Retrofit is shown.)

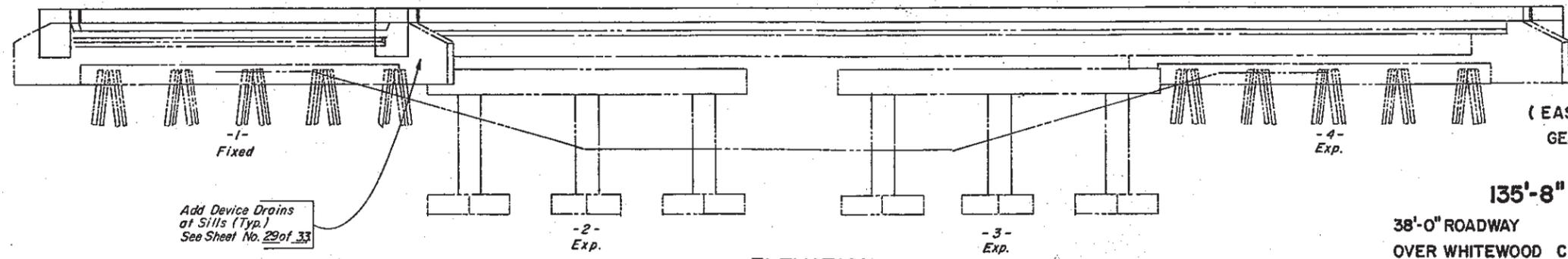
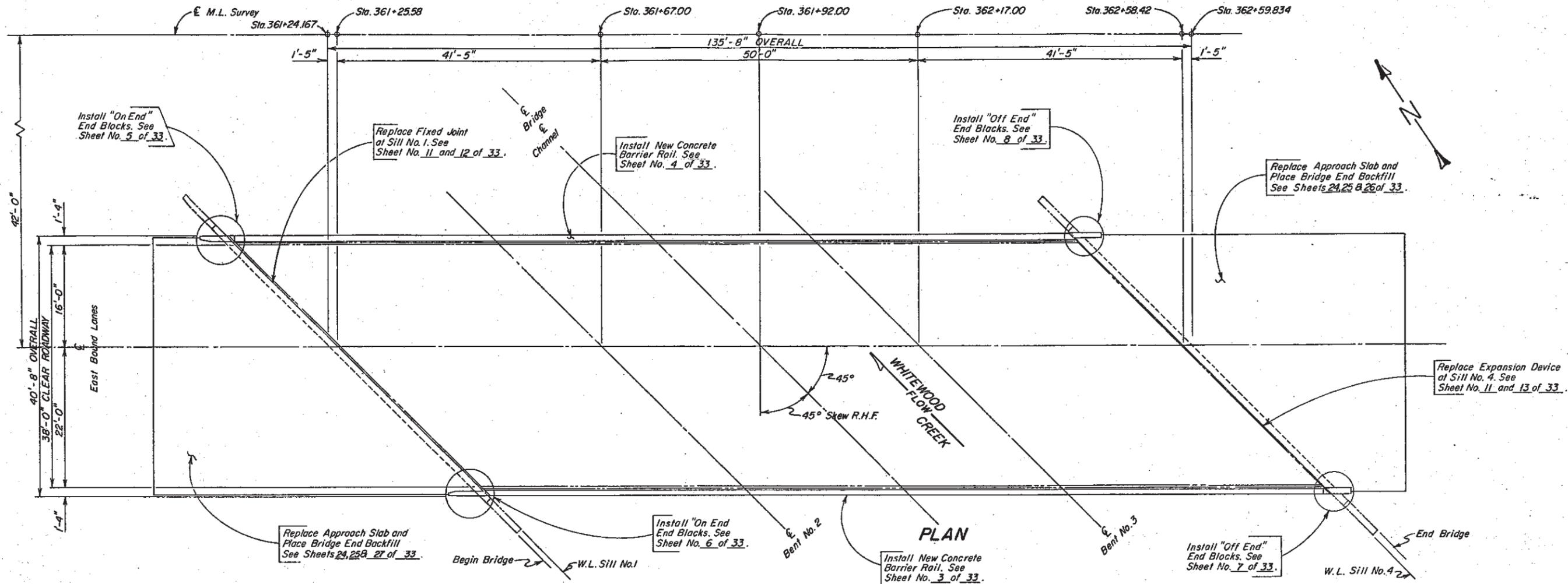
* No Weld

(EASTBOUND LANES)
 DETAILS OF FATIGUE RETROFIT TYPE "C"
 FOR
 135' - 8" I-BEAM VIADUCT
 38' - 0" ROADWAY OVER WHITEWOOD CREEK
 STR. NO. 41-214-099

45° SKEW R.H.F.
 SEC. 22 - T6N - R4E
 IM 0901(171)18

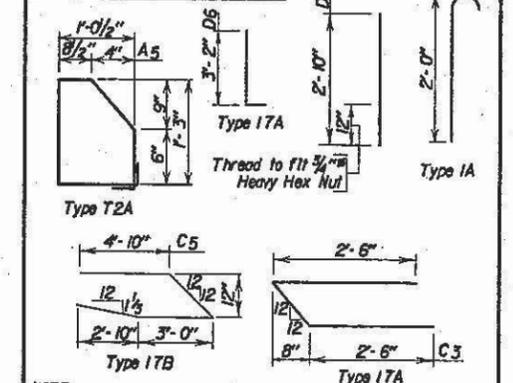
LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 MARCH 2016

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E74	E82



ORIGINAL CONSTRUCTION PLANS

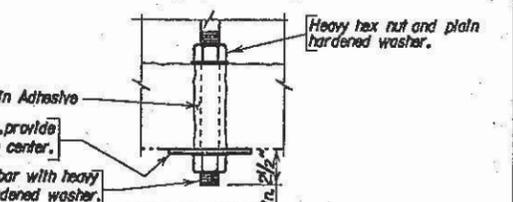
REINFORCING SCHEDULE (For One Barrier)					
Mk.	No.	Size	Length	Type	Bending Details
A	81	4	5'-7"	T1	9" A1
A1	8	4	7'-7"	T1	9" A1
A2	1	4	8'-3"	T1	9" A2
A3	1	4	7'-11"	T1	9" A3
A4	2	4	9'-3"	T1	9" A4
A5	4	4	5'-1"	T2A	9" A1
B	16	4	33'-0"	Str.	9" A1
C3	2	5	5'-11"	17A	9" A1
C5	4	5	12'-0"	17B	9" A1
D4	93	6	2'-8"	1A	9" A1
D5	7	6	2'-10"	Str.	9" A1
D6	2	6	3'-8"	17A	9" A1



NOTE - All dimensions are out to out of bars. All Bars and Dowels are Epoxy Coated. ϕ Dowels

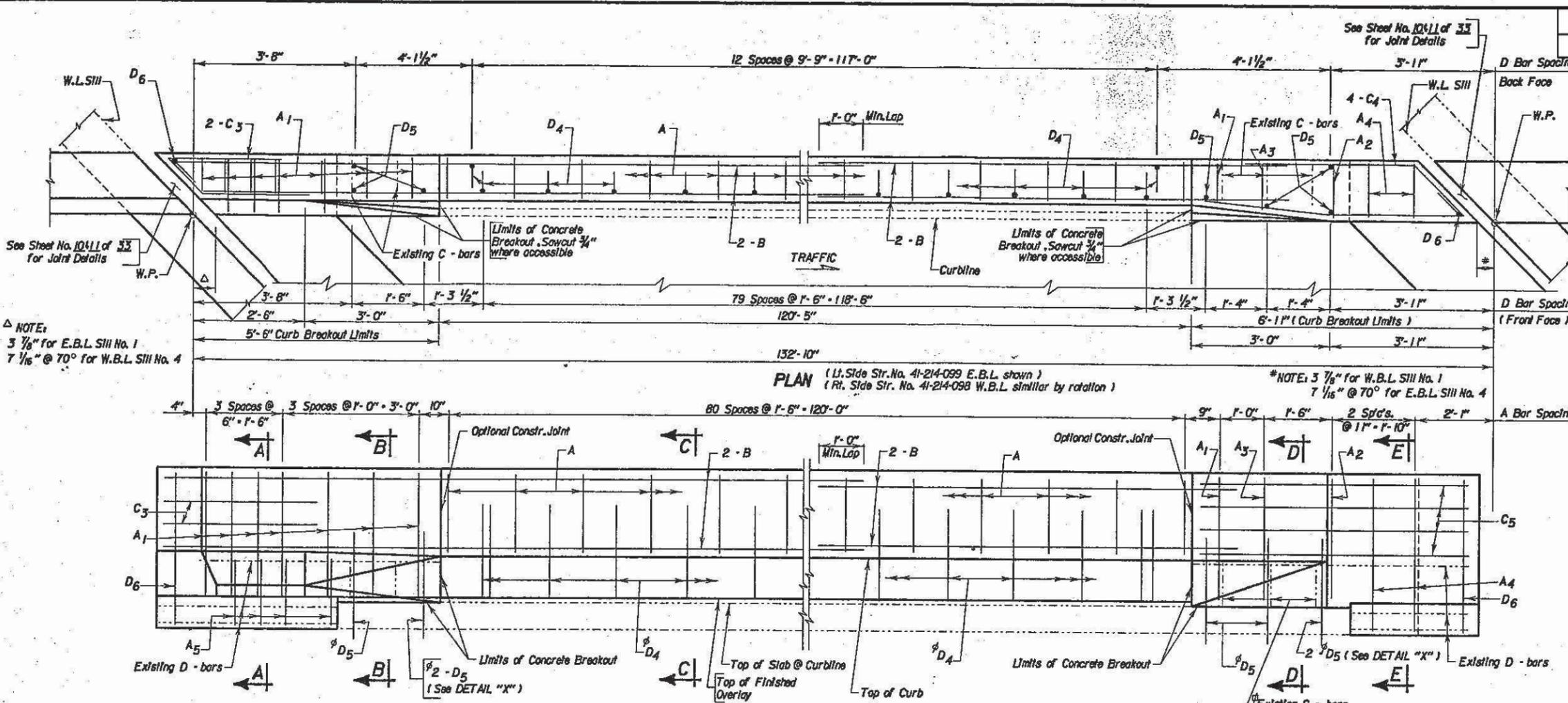
ESTIMATED QUANTITIES (For Two Barriers)			
ITEM	UNIT	QUANTITY	
Class "AAS" Concrete Bridge Riprap	Cu Yd.	20.0	
Epoxy Coated Reinf. for Concrete	Lb.	1671	
Breakout Structural Concrete	Cu Yd.	1.1	
Install Dowels in Concrete	Each	200	
Remove Bridge Railings	Lin.Ft.	267.7	

* Does not include 805 lbs. for dowels as these are included in the item "Install Dowels in Concrete."



DETAIL "X" RAIL REPLACEMENT
(LT. SIDE - E. B. L., RT. SIDE - W. B. L.)
FOR
135'-8" I-BEAM VIADUCT
38'-0" ROADWAY 45° SKEW R.H.F.
OVER WHITEWOOD CREEK SEC. 22-T6N-R4E
STA. 360+40.17 TO 362+59.83 IR90-119724
STR. NO. 41-214-099 HS20-44 (& ALT.)
LAWRENCE COUNTY

S. D. DEPT. OF TRANSPORTATION
MAY 1988 (11) OF (18)



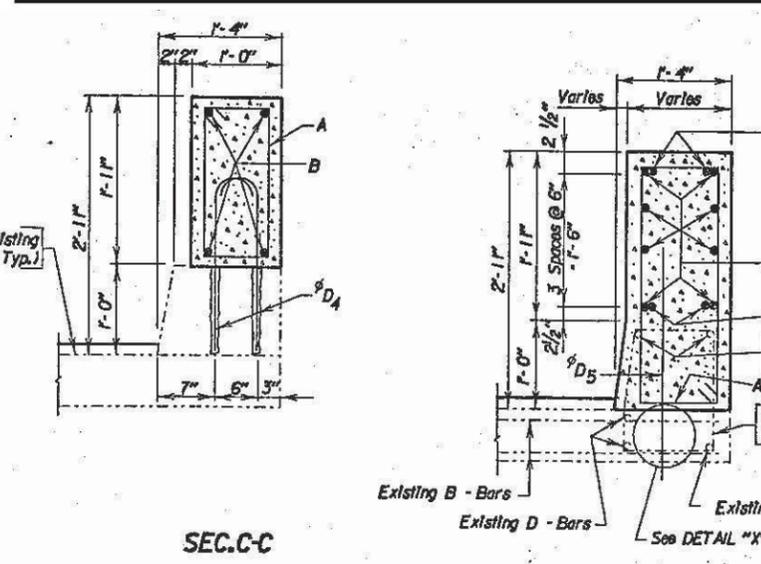
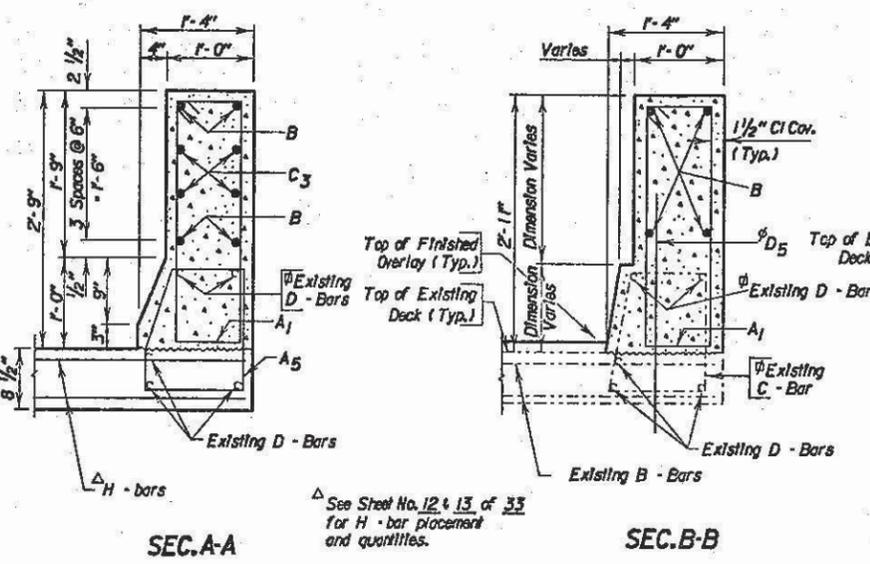
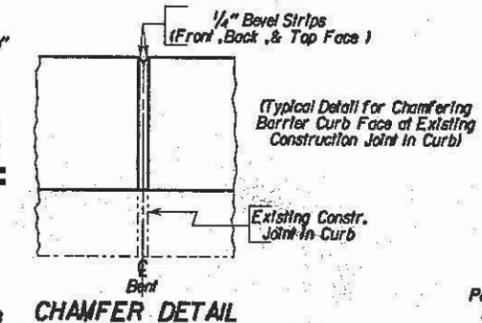
NOTE: 3/8" for E.B.L. S11 No. 1
7/16" @ 70° for W.B.L. S11 No. 4

NOTE: 3/8" for W.B.L. S11 No. 1
7/16" @ 70° for E.B.L. S11 No. 4

NOTE:
1. Existing Reinforcing Steel that is exposed during concrete breakout shall be cleaned and epoxy coated. See "Notes regarding Epoxy Coating Existing Reinforcing Steel" on Sheet No. 62 for Details.
2. If existing rebar is struck while drilling holes for Dowels the spacing can be shifted 2" longitudinally, 1" transversely or as approved by the Engineer to miss existing rebar.

ELEVATION
(End Blocks not shown for clarity)
 ϕ Dowels to be drilled in and grouted with epoxy. See "Notes Regarding Installing Dowels in Concrete" for specifications on materials and procedures.

ORIGINAL CONSTRUCTION PLANS



REINFORCING SCHEDULE				
For one Approach Slab				
Mk.	No.	Size	Length	Type
Bending Details				
c3	14	5	18'-4"	Str.
c4	14	5	22'-8"	Str.
d3	24	4	5'-6"	2
d4	42	4	4'-11"	T2
e1	30	6	22'-7"	Str.
e12	30	5	22'-7"	
e13	10	6	25'-4"	
e4	10	5	25'-4"	
e5	8	6	18'-4"	
e6	8	5	18'-4"	
e7	6	6	17'-6"	
e8	6	3	17'-6"	
e9	7	6	21'-0"	
e20	7	3	21'-0"	
e11	22	8	80'-6"	
e12	24	5	26'-0"	
e13	2	8	47'-3"	
e14	11	3	30'-0"	
e16	2	3	22'-3"	
e17	16	8	42'-6"	
e18	8	3	43'-0"	
e19	2	8	7'-8"	
e20	2	3	7'-8"	
e3	4	6	30'-8"	
e4	4	6	24'-0"	Str.
e5	4	3	7'-4"	19A

ESTIMATED QUANTITIES		
For Two Approach Slabs		
ITEM	UNIT	QUANTITY
Concrete Approach Slab Adjacent to Bridges	Sq.Yd.	288.4
Bridge Approach Sleeper Slab	Sq.Yd.	44.3

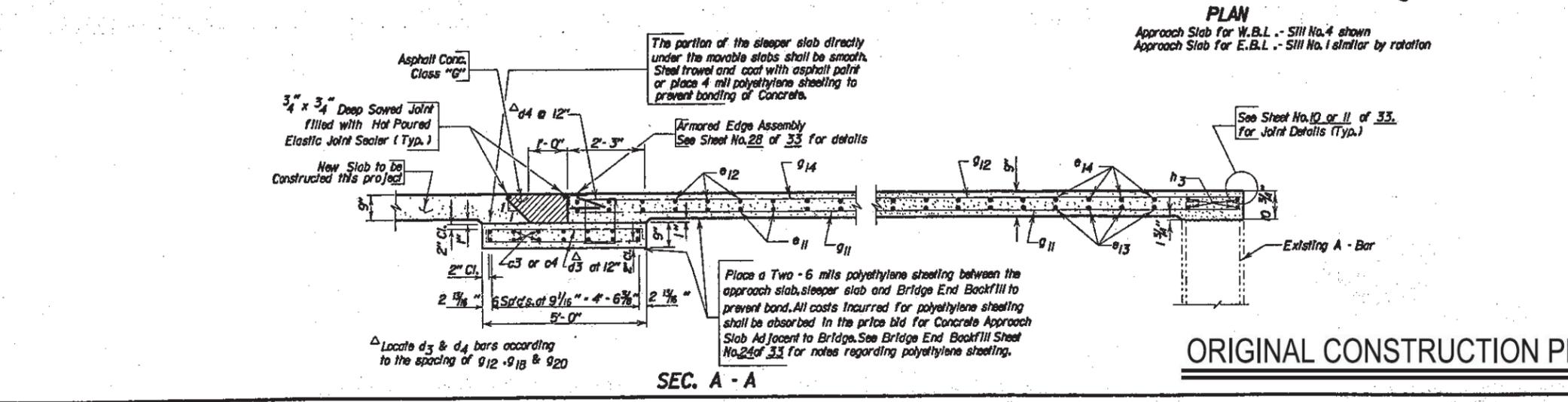
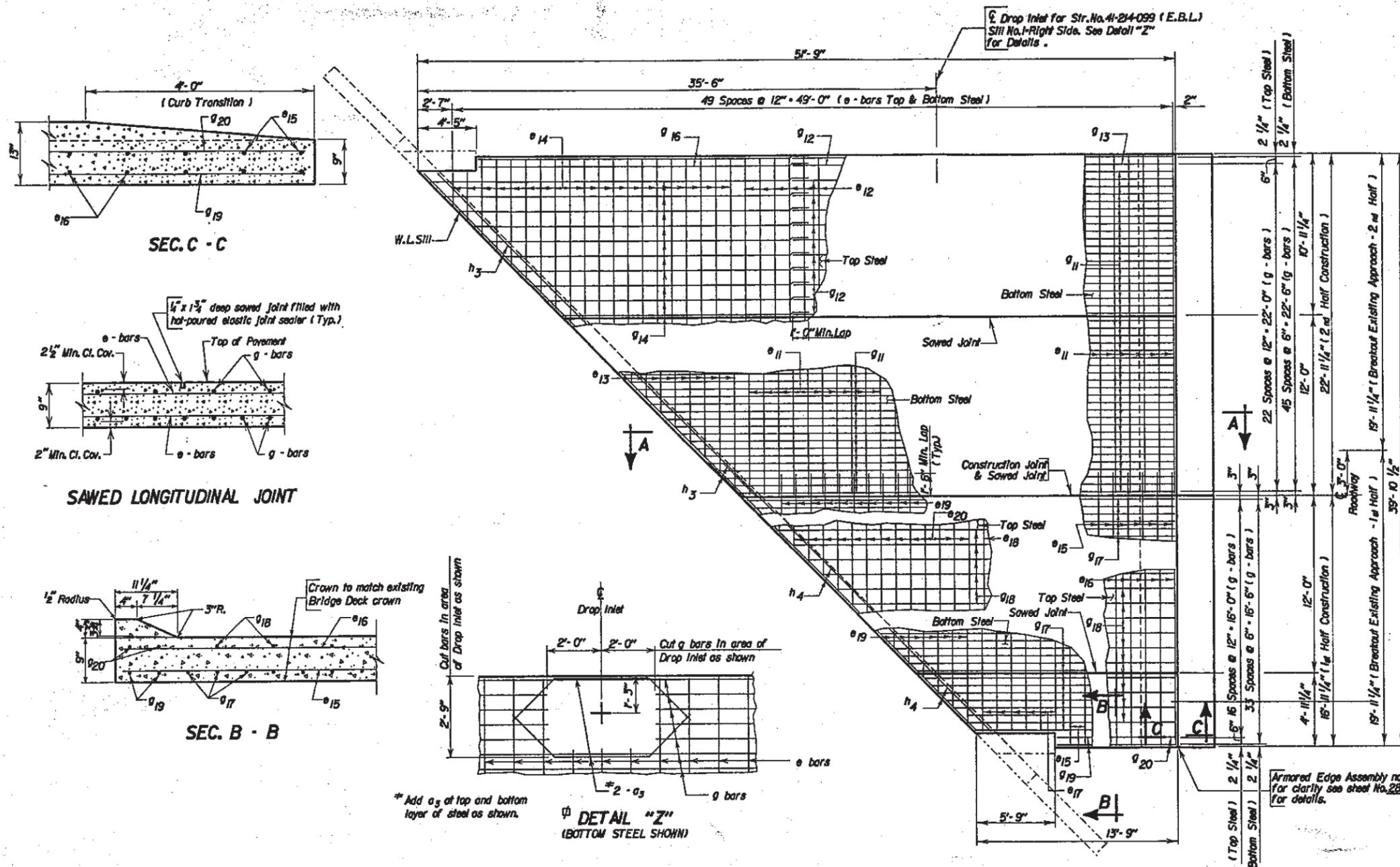
- 73.2 Cu.Yds. Concrete In Approach Slabs.
- 17671 Lbs. Re-steel In Approach Slabs.
- 2689 Lbs. Epoxy Coated Re-Steel In Approach Slabs
- 11.1 Cu. Yds. Concrete In Sleeper Slabs
- 1815 Lbs. Re-Steel In Sleeper Slabs
- 276 Lbs. Epoxy Coated Re-Steel In Sleeper Slabs
- 2105 Lbs. Structural Steel

Items 1 thru 7 are approximate quantities contained in the bid items above and are for information only.

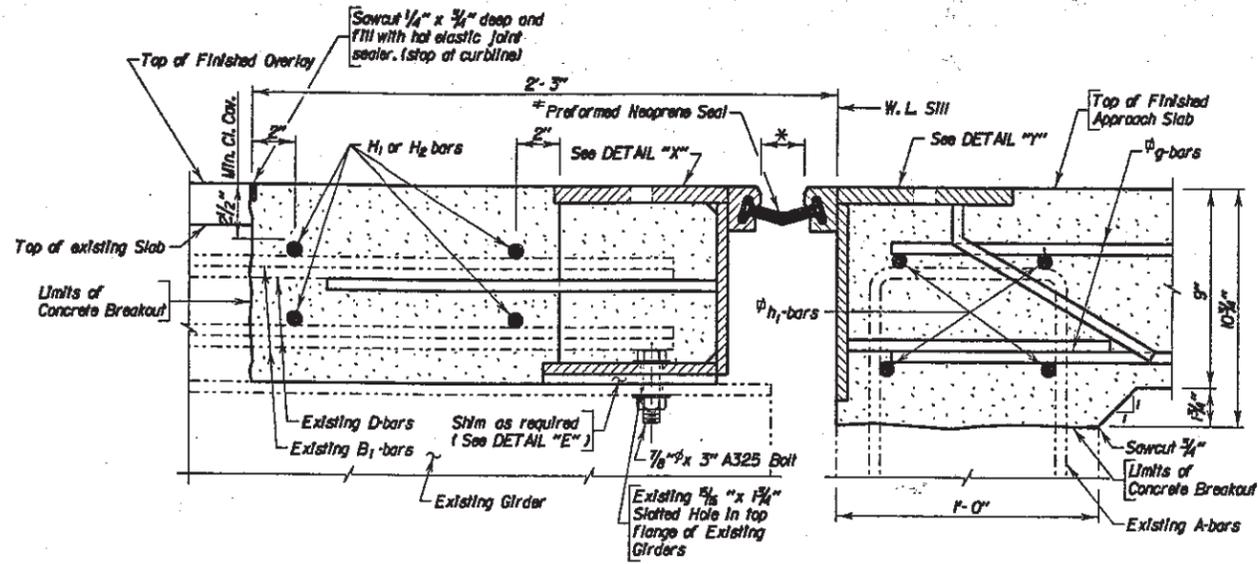
DETAILS OF APPROACH SLAB ADJACENT TO "ON END" OF BRIDGE FOR 135'-8" I-BEAM VIADUCT

38'-0" ROADWAY 45° SKEW R.H.F.
 OVER WHITEWOOD CREEK SEC. 22-T6N-R4E
 STA. 360+40.17 TO 362+59.83 IR90-(197)24
 STR. NO. 41-214-099 HS20-44 (& ALT.)
 LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 APRIL 1988 (13) OF (18)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
D.G.B.	W.C.P.	O.G.B. & I.D.W.	
BL AWR2732	B2732WP11		BRIDGE ENGINEER



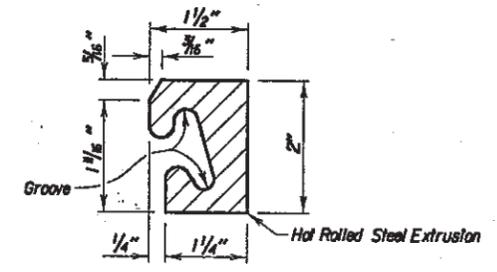
ORIGINAL CONSTRUCTION PLANS



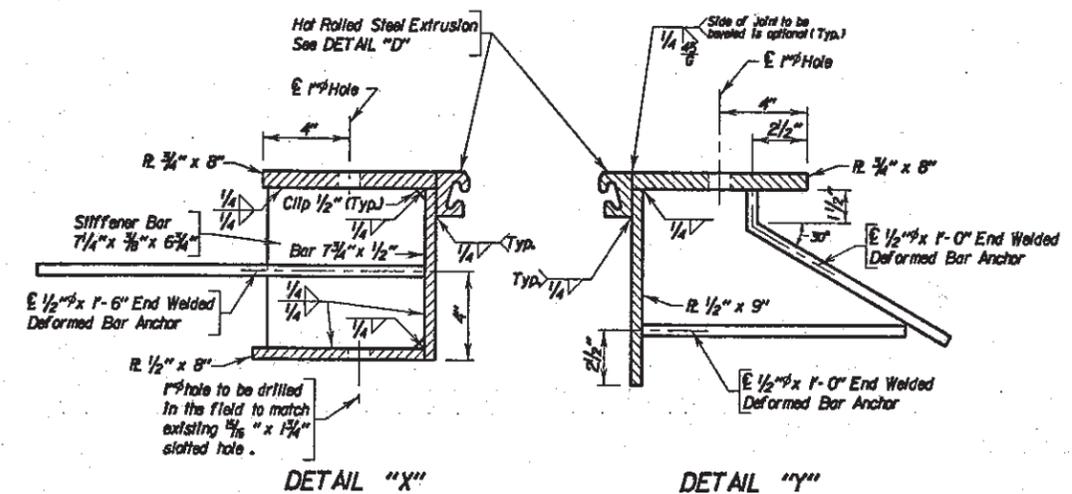
SEC. A - A

NOTE: Approach slab reinforcement. See Sheet No's. 26 and 27 of 33 for placement.
 NOTE: Seal shall have a 4 inch movement capability.

Temp.	"%" (In.)
-30°	3/8"
25°	2 3/8"
40°	2 1/8"
55°	2 1/8"
70°	2"
85°	1 3/4"
100°	1 1/8"
120°	1 1/8"

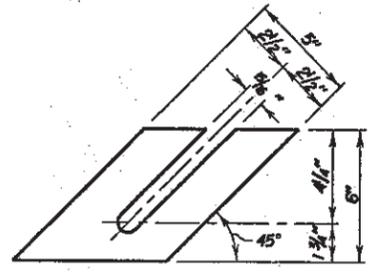


DETAIL "D"



DETAIL "X"

DETAIL "Y"



DETAIL "E"

Provide 20 - 1/16" thick shims
 10 - 1/8" thick shims
 20 - 3/8" thick shims

MK	No.	Size	Length	Type	Banding details
H1	4	5	25'-6"	Str.	
H2	4	5	31'-6"	Str.	

Notes:
 All dimensions are out to out of bars
 All bars to be Epoxy Coated

ITEM	UNIT	QUANTITY
Replaces Expansion Device	Each	2

Items 1 thru 4 are approximate quantities contained in the above bid item and are for information only.
 1. 5.5 Cu. Yds. Class "AAS" Concrete.
 2. 476 Lbs. Epoxy Coated Re - Steel.
 3. 12,784 Lbs. Structural Steel.
 4. 4.6 Cu. Yds. Breakout Structural Concrete.
 Includes Structural Steel on Sheet No's. 14 thru 20 of 33.

NOTE:
 Existing Reinforcing Steel that is exposed during concrete breakout shall be cleaned and epoxy coated. See "Notes Regarding Epoxy Coating of Existing Reinforcing Steel" on Sheet No. 4 of 69 for details.

ORIGINAL CONSTRUCTION PLANS
 DETAILS OF EXPANSION JOINT DEVICE AT SILL NO. 4
 FOR
 135'-8" I-BEAM VIADUCT
 38'-0" ROADWAY 45° SKEW R. H. F.
 OVER WHITEWOOD CREEK SEC. 22-T6N-R4E
 STA. 360+40.167 TO 362+59.834 IR 90-K97124
 STR. NO. 41-214-099 HS20-44
 (± ALT.)

LAWRENCE COUNTY
 S. D. DEPT. OF TRANSPORTATION
 APRIL 1988 14 OF 18

DESIGNED BY DGB BLAWR2132	DRAWN BY D.A.W. B2732DR05	CHECKED BY DGB/TDW	APPROVED BRIDGE ENGINEER
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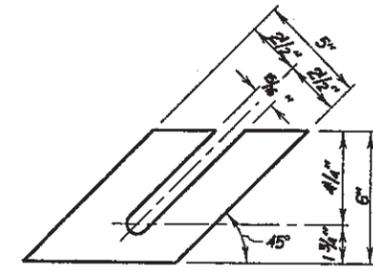
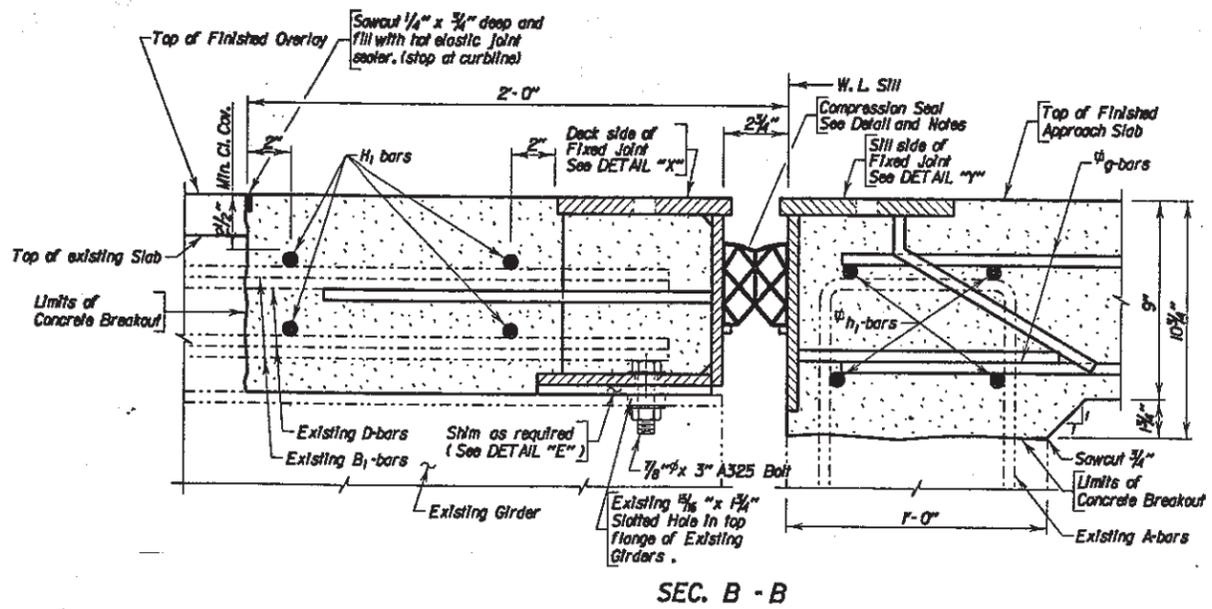
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(171)18	E79	E82

REINFORCING SCHEDULE (For 2 Bridges)				
Bar	No.	Size	Length	Type
H ₁	4	5	25'-6"	Str.
H ₂	4	5	31'-6"	Str.

NOTES:
All bars to be Epoxy Coated.
All dimensions are out to out of bars.

ESTIMATED QUANTITIES (For 2 Bridges)		
ITEM	UNIT	QUANTITY
Fixed Joint Modification	Each	2

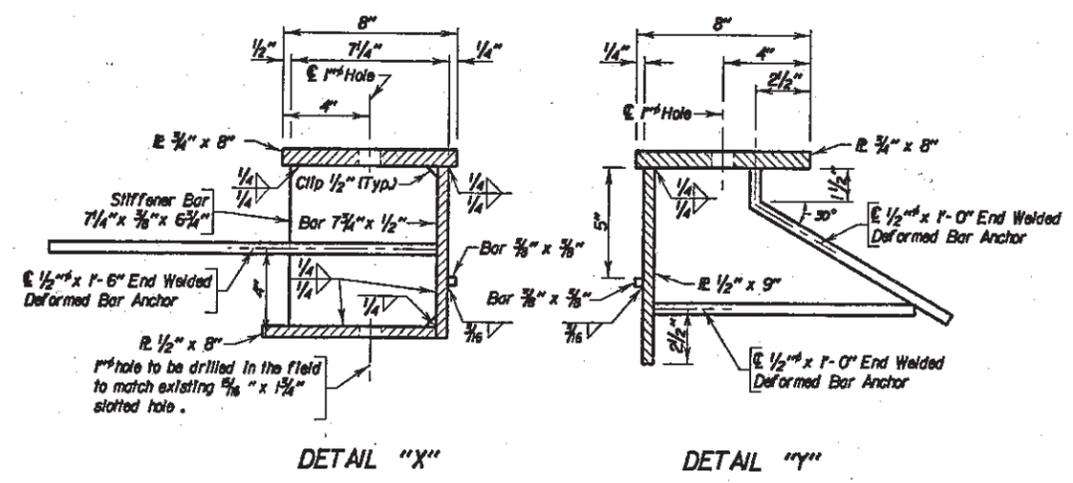
Items 1 thru 4 are approximate quantities contained in the above Bid item and are for information only.
1. 5.2 Cu. Yds. Class "A45" Concrete.
2. 476 Lbs. Epoxy Coated Rebar.
3. 10754 Lbs. Structural Steel.
4. 4.2 Cu. Yds. Breakout Structural Concrete.
^Δ Includes Structural Steel on Sheet Nos. 21, 22 & 23 of 33.



DETAIL "E"
Provide: 20 - 1/16" thick shims
10 - 1/8" thick shims
20 - 3/8" thick shims

NOTE: For approach slab reinforcement see Sheet Nos. 26 and 27 of 33.

NOTE:
Existing Reinforcing Steel that is exposed during concrete breakout shall be cleaned and epoxy coated. See "Notes Regarding Epoxy Coating of Existing Reinforcing Steel" on Sheet No. 4 of 69 for details.



PREFORMED ELASTOMERIC COMPRESSION SEAL

NOTE -
The compression seal for these joints can be obtained from the following suppliers. Their addresses and type of compression seal required are listed below. Other compression seal suppliers may be accepted upon approval by the Office of Bridge Design.

WATSON, BOWMAN & ACME CORP.
95 Pine/ow Drive
Amherst, New York 1420 Phone (716) 691-7566
Type: WJ - 400 (4" x 4")

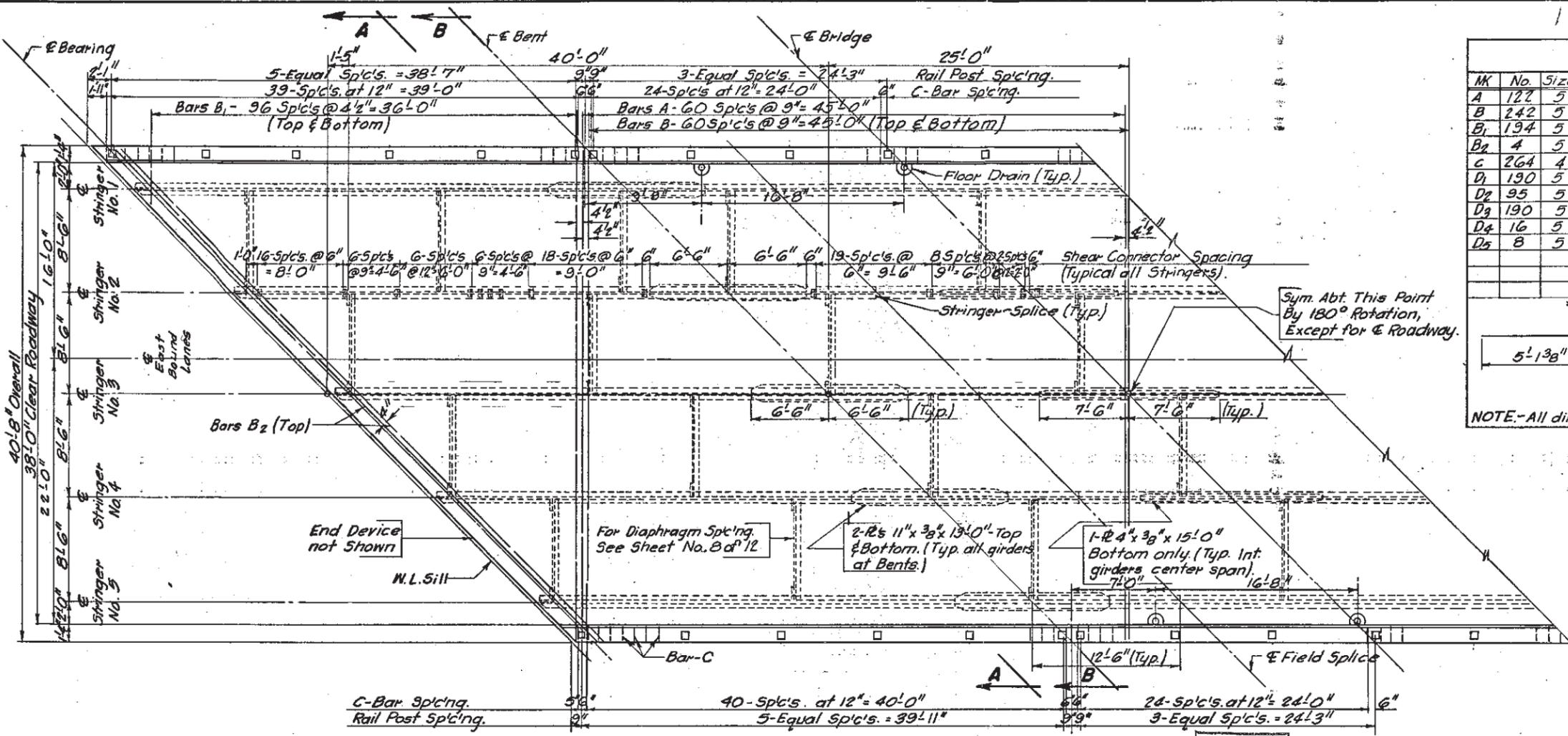
THE D.S. BROWN COMPANY
P.O. Box 158
North Ballmore, Ohio 45872 Phone (419) 257-3561
Type: CV - 400 (4" x 4")

ORIGINAL CONSTRUCTION PLANS

**DETAILS OF FIXED JOINT DEVICE AT SILL NO. 1
FOR
135'-8" I-BEAM VIADUCT**
38'-0" ROADWAY 45° SKEW R. H. F.
OVER WHITEWOOD CREEK SEC. 22-T6N-R4E
STA. 360+40.167 TO 362+59.834 IR 90-1(97)24
STR. NO. 41-214-099 HS20-44
(ALT.)

LAWRENCE COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 1988 (15) OF (18)

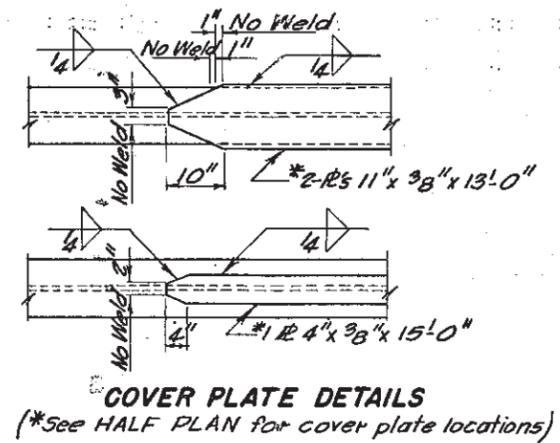
DESIGNED BY DGB	DRAWN BY D.A.H.	CHECKED BY DGB/TDW	APPROVED
BLAWR2732	B2732DH06		BRIDGE ENGINEER



REINFORCING SCHEDULE

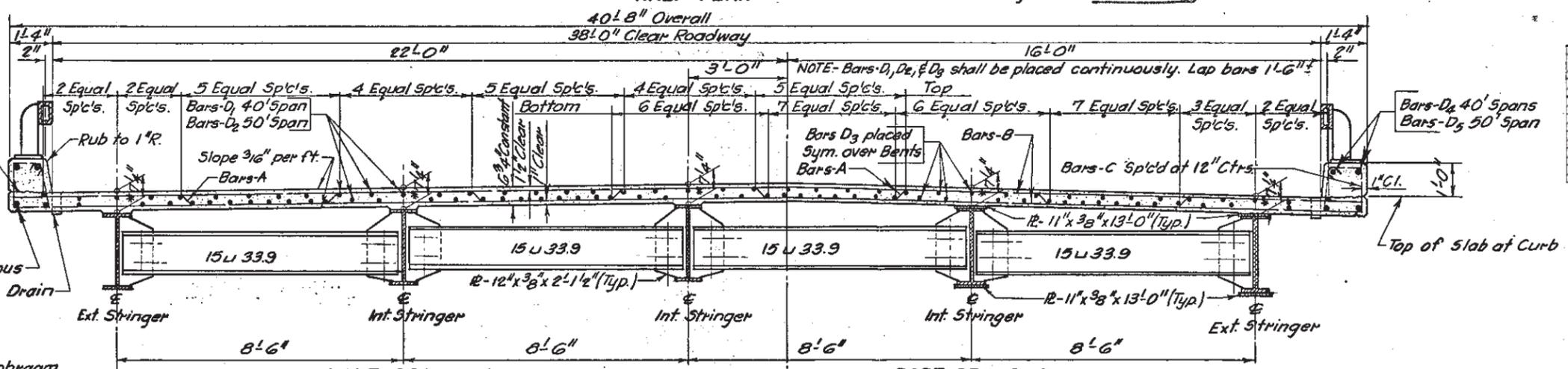
MK	No.	Size	length	Type	Bending Details
A	122	5	47'-6"	15	
B	242	5	40'-3"	Str.	
B ₁	194	5	44'-6"	Str.	
B ₂	4	5	57'-0"	Str.	
C	264	4	5'-9"	T1	
D	190	5	24'-0"	Str.	
D ₂	95	5	16'-0"	Str.	
D ₃	190	5	37'-0"	Str.	
D ₄	16	5	21'-6"	Str.	
D ₅	8	5	25'-9"	Str.	

NOTE: All dimensions are out to out of bars.



ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Class 'A' Concrete	Cu. Yds.	12.52
Reinforcing Steel	Lbs.	39,345
Structural Steel	Lbs.	89,655
Type RT-3 Steel Railing	Lin. Ft.	267.7



Construction Joint Roughen Concrete as shown.

NOTE: For Diaphragm Details See Sheet No. 8 of 12.

CONCRETE PLACING NOTES.-

Concrete slab may be poured continuously provided concrete retardants are used and the Contractor has demonstrated capacity for such continuous operations. Transverse Construction Joints are permitted in the slab and shall be positioned near the stringer field splices or at approximately the 1/4 points from the E of bents. If transverse construction joints are used, the contractor shall submit to the BRIDGE SECTION for approval, plans and details of construction joints used, as well as a sequence for pouring. Curbs shall be poured after all of the slab has been poured. The expansion device shall be blocked off prior to pouring slab. After pouring all the slab, adjust and bolt devices and complete pour.

CHANNEL SHEAR CONNECTOR

WELDED STUD SHEAR CONNECTOR

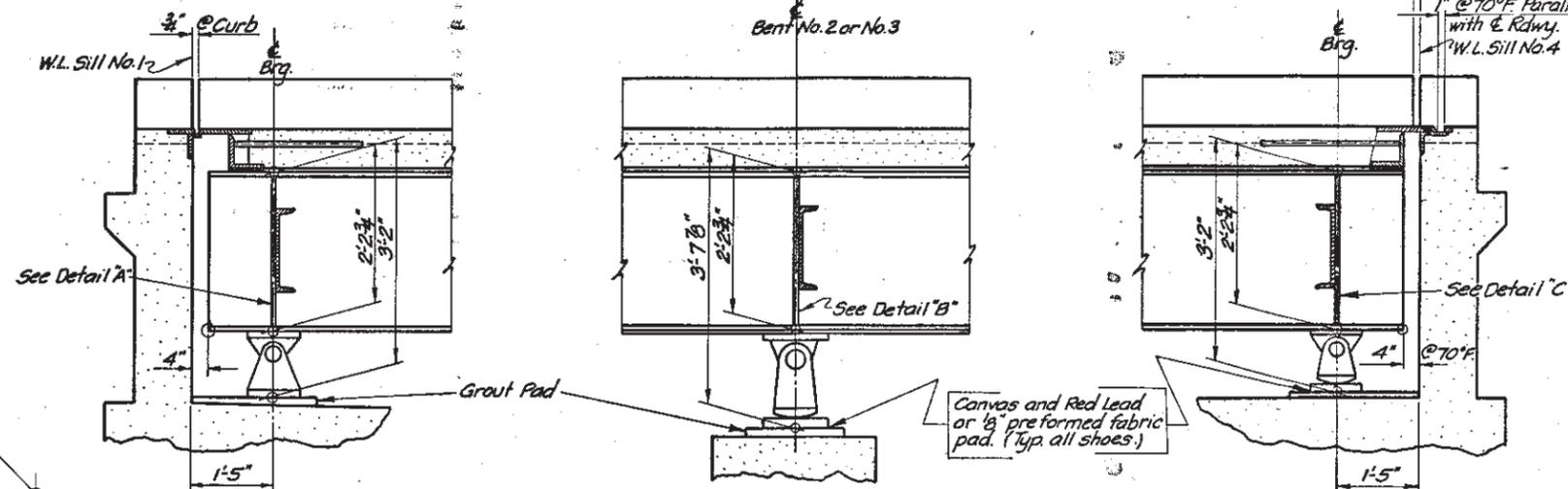
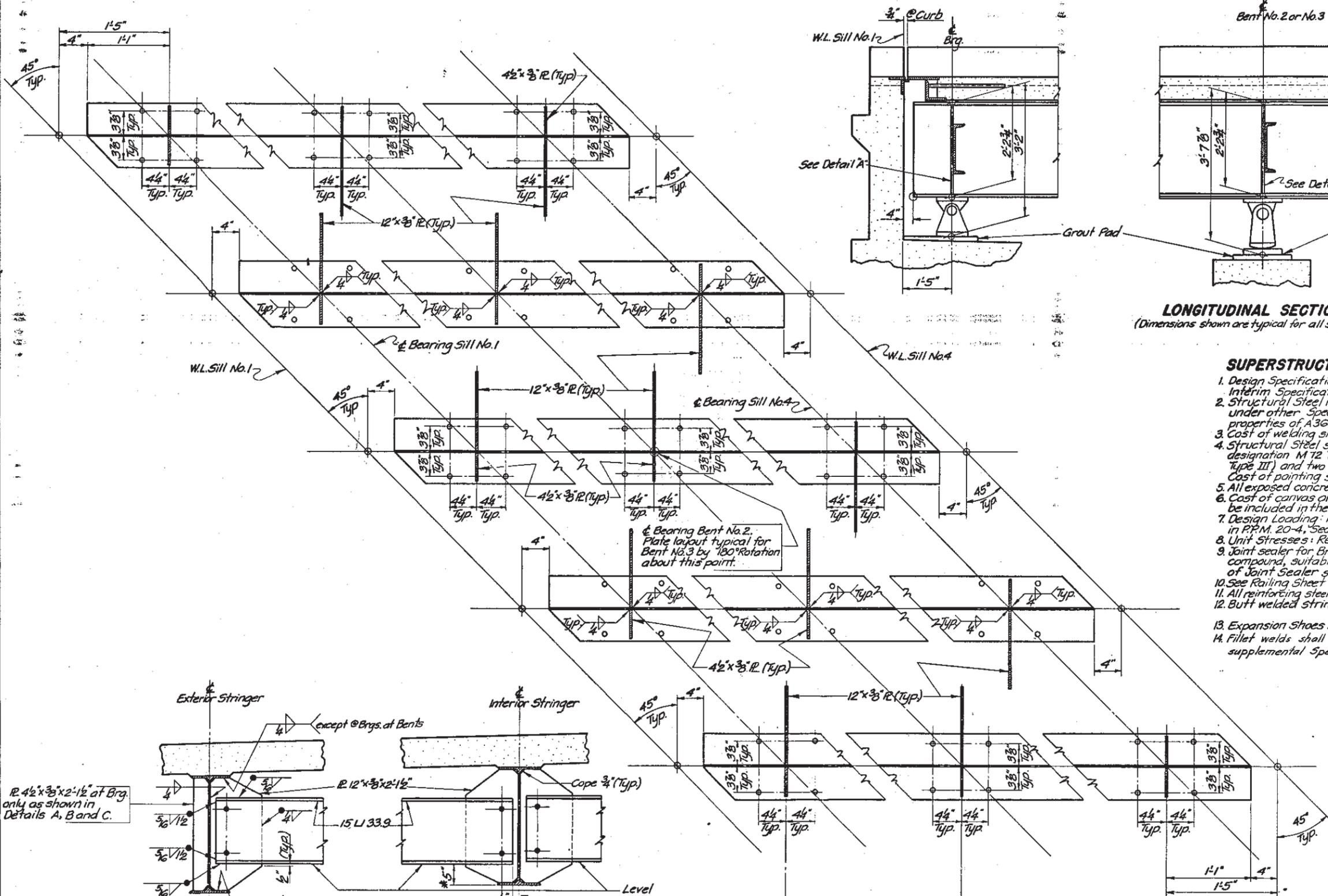
Channel or Welded Stud Shear Connectors are spaced as shown above on HALF PLAN. The Contractor may substitute a row of 7/8" φ Welded Studs for each channel shear connector shown. Shear connectors will be paid for as structural steel based on the weight of channels, regardless of the type of connector used. Channels shall be placed on the stringer's facing in the directions as shown on STRINGER LAYOUT.

ORIGINAL CONSTRUCTION PLANS

(EAST BOUND LANES)
SUPERSTRUCTURE DETAILS
 FOR
135'-8" I-BEAM VIADUCT
 38'-0" ROADWAY 45° SKEW R.H.F.
 OVER WHITEWOOD CREEK SEC. 22-T6N-R4E
 STA. 361+24.167 TO 362+59.834 190-1 (15) 19
 STR. NO. 41-214-099 LAWRENCE COUNTY
 SOUTH DAKOTA HS20-44
 DEPARTMENT OF HIGHWAYS (BALT.)
 OCT. 1964 (16) OF (18)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	M.W.	J.L.H.	

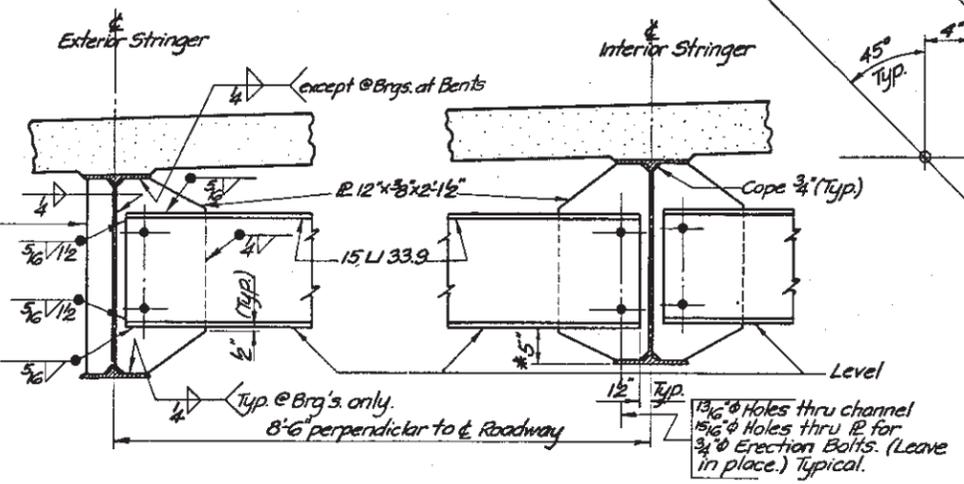
BRIDGE ENGINEER



LONGITUDINAL SECTION
(Dimensions shown are typical for all stringers.)

SUPERSTRUCTURE NOTES.—

- Design Specifications: A.A.S.H.O. Specifications for Highway Bridges, 1961, with Interim Specifications for 1961, 1962, 1963, 1964.
- Structural Steel members shall conform to A.S.T.M. A36 steel. Steel produced under other Specifications, but shown to possess the chemical and physical properties of A36 steel will be accepted for use where the latter is specified.
- Cost of welding shall be included in the unit price bid for Structural Steel.
- Structural Steel shall be painted with one shop coat of Red Lead Paint (A.A.S.H.O. designation M72 Type I) or Red Lead Iron Oxide Paint (A.A.S.H.O. designation M72 Type III) and two field coats of Aluminum Paint (A.A.S.H.O. designation M69.) Cost of painting shall be included in the unit price bid for Structural Steel.
- All exposed concrete edges shall be chamfered 1" unless otherwise noted.
- Cost of canvas and red lead or preformed fabric pads under bearing plates shall be included in the unit price bid for Structural Steel.
- Design Loading: HS 20-44 A.A.S.H.O. and the Alternate Loading as designated in R.P.M. 20-4, Section 4c.
- Unit Stresses: Re-steel $f_s = 20,000$ p.s.i., Concrete $f_c = 1600$ p.s.i.
- Joint sealer for Bridges shall be an approved liquid polysulfide polymer, two component compound, suitable for sealing vertical and horizontal joints in concrete and metal. Cost of Joint Sealer shall be included in the unit price bid for Class "A" Concrete.
- See Railing Sheet for details of handrails and drains.
- All reinforcing steel shall conform to A.S.T.M. Specifications A305 and A15 (Intermediate Grade).
- Butt welded stringer splices, shop or field, shall be radiographically inspected.
- Expansion Shoes shall be set vertical at 70° F.
- Fillet welds shall be subjected to magnetic particle inspection as specified in the supplemental Specifications for Steel Structures, dated June 29, 1965.



DIAPHRAGMS

* Place channel 5" above highest girder in each bay.

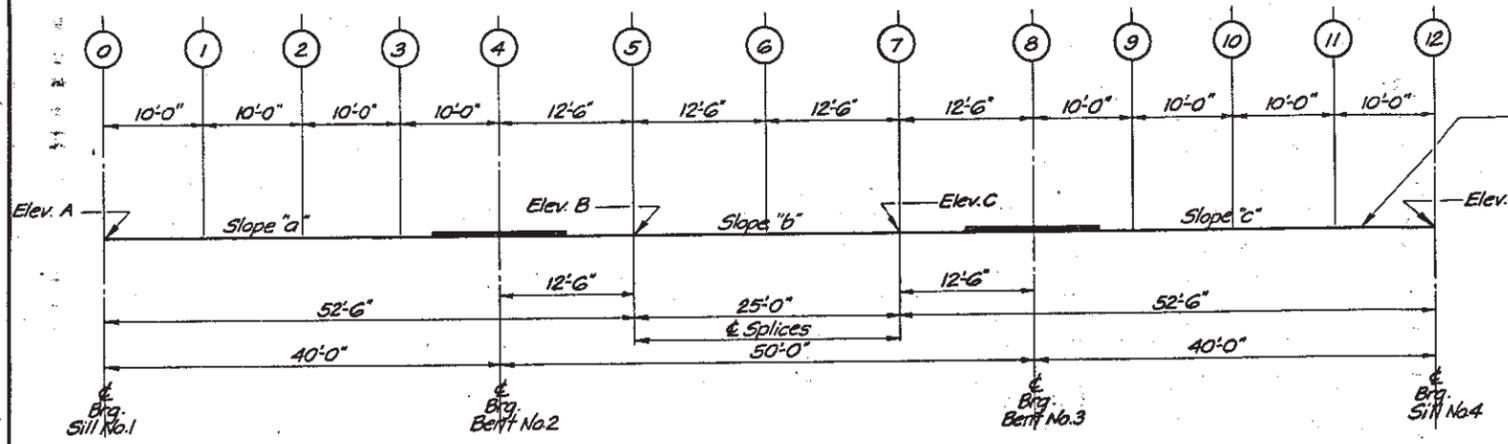
- NOTE.—**
- All welds shown are typical for all diaphragms.
 - See Sheet No. 11 of 12 for diaphragm spacing.

DETAIL "A" DETAIL "B" DETAIL "C"

ORIGINAL CONSTRUCTION PLANS

(EAST BOUND LANES)
SUPERSTRUCTURE DETAILS
 FOR
135'-8" I-BEAM VIADUCT
 38'-0" ROADWAY 45° SKEW P.H.F.
 OVER WHITEWOOD CREEK SEC. 22-T6N-R4E
 STA. 361+24.167 TO 362+59.834 190-1 (15) 19
 STR. NO. 41-214-099 LAWRENCE COUNTY
 SOUTH DAKOTA HS 20-44
 DEPARTMENT OF HIGHWAYS (B ALT.)
 OCT. 1964 17 OF 18

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	R.C.M.	J.L.H.	<i>[Signature]</i>
			BRIDGE ENGINEER

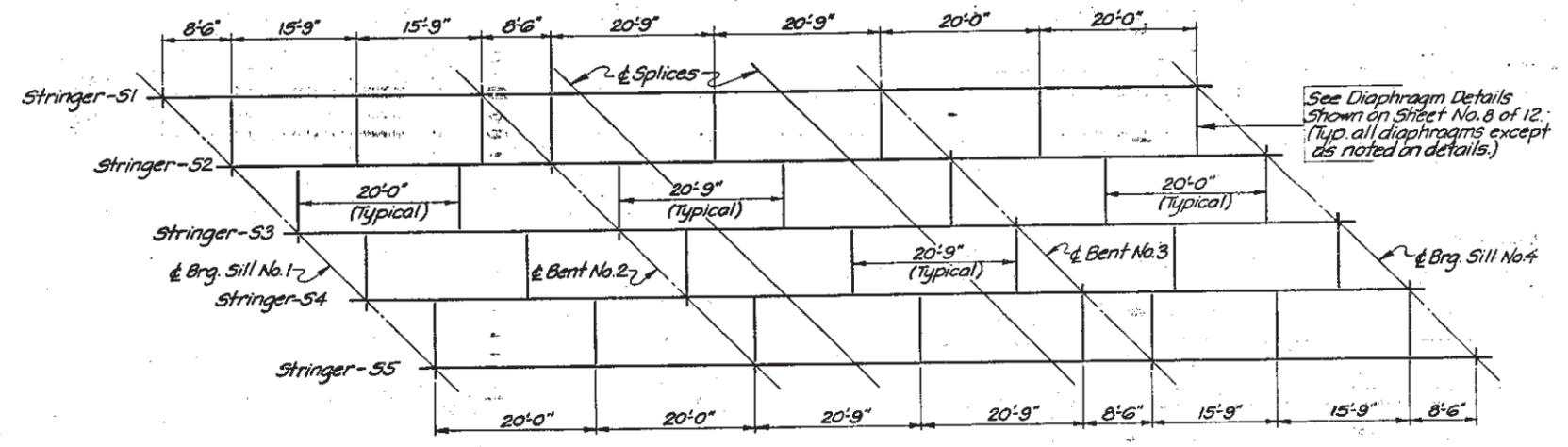


Stringer No.	Elevations (Top of Stringer)				Stringer Slopes in %		
	A	B	C	D	"a"	"b"	"c"
51	3586.846	3587.108	3587.228	3587.514	+0.50000	+0.47840	+0.54425
52	3587.021	3587.283	3587.402	3587.696	+0.50000	+0.47480	+0.56050
53	3587.102	3587.365	3587.484	3587.787	+0.50000	+0.47680	+0.57700
54	3587.012	3587.275	3587.396	3587.707	+0.50000	+0.48440	+0.59325
55	3586.922	3587.185	3587.309	3587.629	+0.50000	+0.49800	+0.60950

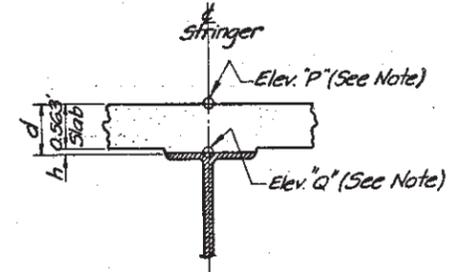
ERECTOR ELEVATION DIAGRAM

TABLE OF SLAB FORM ELEVATIONS AND COMPUTATIONS

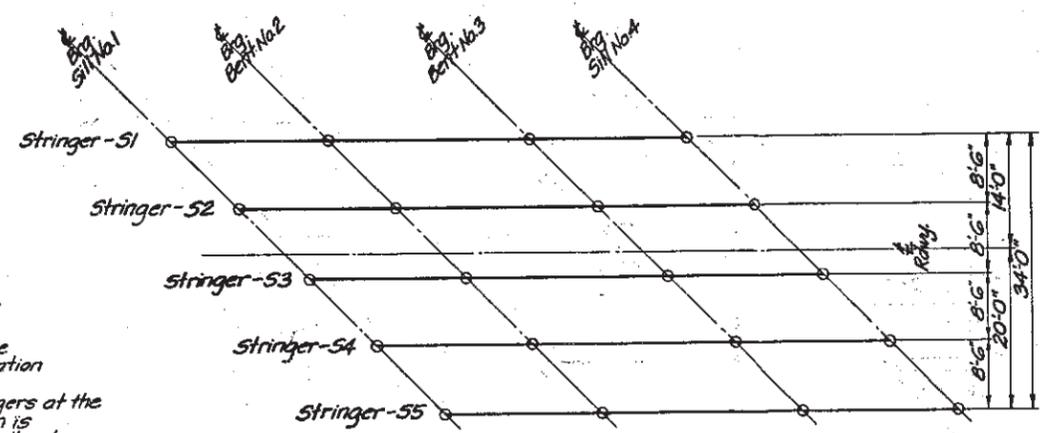
	0	1	2	3	4	5	6	7	8	9	10	11	12
Elev. P	3587.450	3587.516	3587.568	3587.607	3587.650	3587.722	3587.795	3587.847	3587.900	3587.959	3588.023	3588.077	3588.118
(-) Elev. Q													
(-) d													
(-) 0.563'													
(-) h													
Elev. P	3587.625	3587.691	3587.743	3587.782	3587.825	3587.897	3587.970	3588.022	3588.076	3588.137	3588.203	3588.258	3588.301
(-) Elev. Q													
(-) d													
(-) 0.563'													
(-) h													
Elev. P	3587.707	3587.773	3587.825	3587.864	3587.907	3587.979	3588.051	3588.104	3588.160	3588.222	3588.290	3588.347	3588.391
(-) Elev. Q													
(-) d													
(-) 0.563'													
(-) h													
Elev. P	3587.616	3587.683	3587.735	3587.774	3587.816	3587.889	3587.961	3588.006	3588.074	3588.138	3588.207	3588.265	3588.312
(-) Elev. Q													
(-) d													
(-) 0.563'													
(-) h													
Elev. P	3587.526	3587.592	3587.644	3587.683	3587.726	3587.799	3587.872	3587.929	3587.990	3588.055	3588.126	3588.186	3588.233
(-) Elev. Q													
(-) d													
(-) 0.563'													
(-) h													



DIAPHRAGM SPACING



NOTE.
 This table contains the necessary information to determine the depth of concrete in feet, over the stringers at the points shown. All calculations can be carried in the spaces provided. Elevation "P" is the elevation of the top of slab form, before any of the concrete has been poured. This elevation includes deflection due to all D.L. above stringers. Elevation "Q" is a field measured elevation taken on top of the stringers at the points shown. This elevation must be taken after stringer erection is completed, but prior to placing any of the concrete. Stringers shall not be supported by construction shoring while elevations are taken.



LAYOUT OF STRINGERS AND GROUT PADS

Str.	Sill No.1	Bent No.2	Bent No.3	Sill No.4
51	3583.679	3583.390	3583.640	3584.347
52	3583.854	3583.565	3583.816	3584.530
53	3583.936	3583.646	3583.900	3584.620
54	3583.846	3583.556	3583.814	3584.541
55	3583.756	3583.466	3583.729	3584.463

ORIGINAL CONSTRUCTION PLANS

(EAST BOUND LANES)
 ERECTION DATA AND DIAPHRAGM SPACING
 FOR
135'-8" I-BEAM VIADUCT
 38'-0" ROADWAY 45° SKEW R.H.F.
 OVER WHITEWOOD CREEK SEC. 22-T6N-R4E
 STA. 361+24.167 TO 362+59.834 190-1 (15) 19
 STR. NO. 41-214-099 LAWRENCE COUNTY
 SOUTH DAKOTA HS 20-44
 DEPARTMENT OF HIGHWAYS (8 ALT.)
 OCT. 1964 (18) OF (18)

Revised 7-1-66 (M.E.R.)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	R.C.M.	C.H.K.	<i>P.H. Schutt</i> BRIDGE ENGINEER