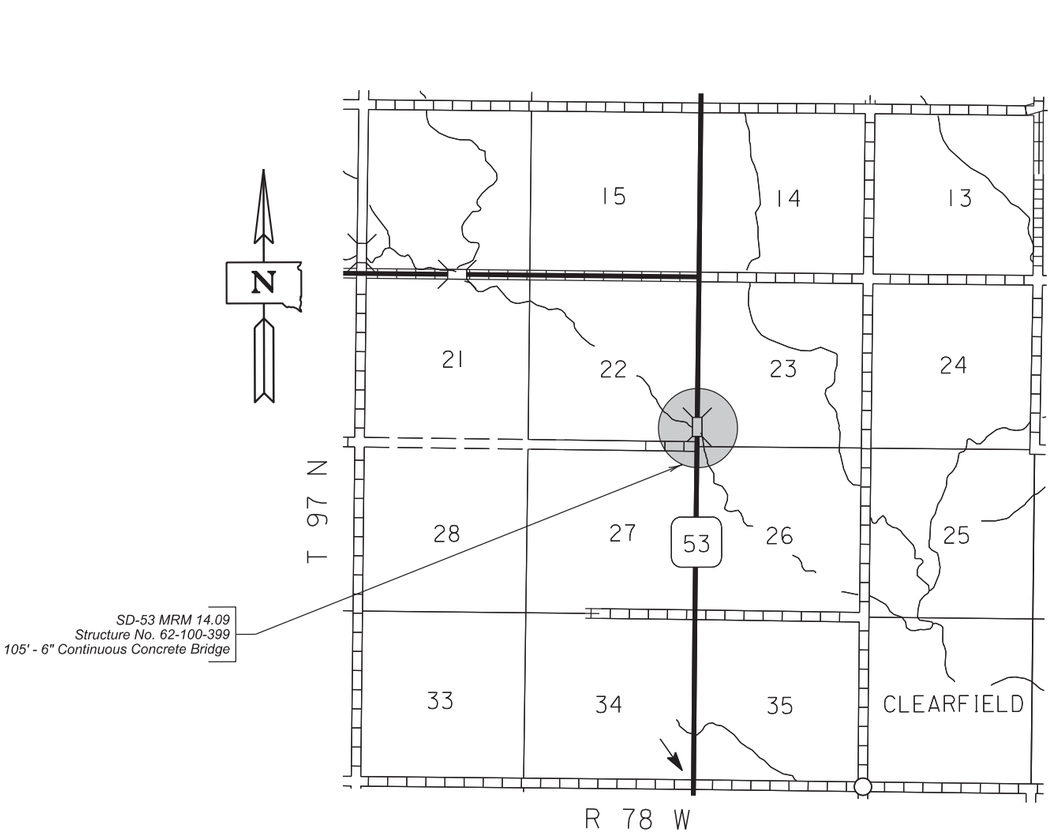
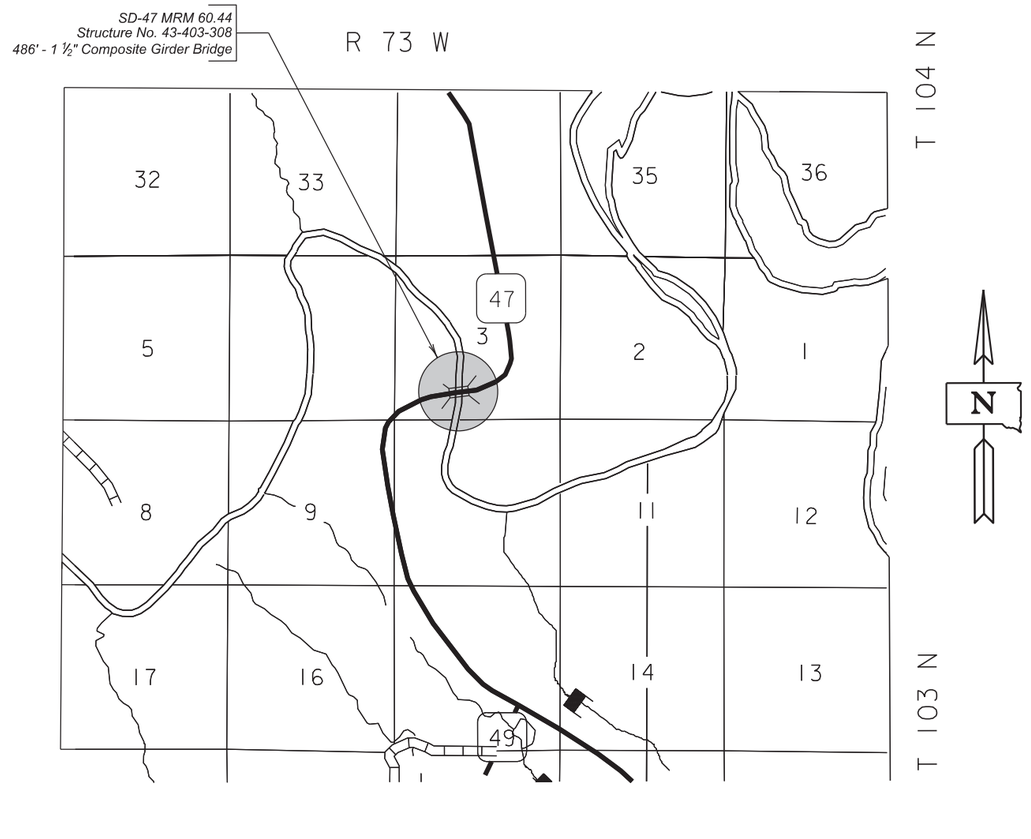
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E1	E52

SECTION E: STRUCTURE PLANS

INDEX OF SHEETS





SECTION E – ESTIMATE OF STRUCTURE QUANTITIES

PCN 090U

Str. No. 62-100-399

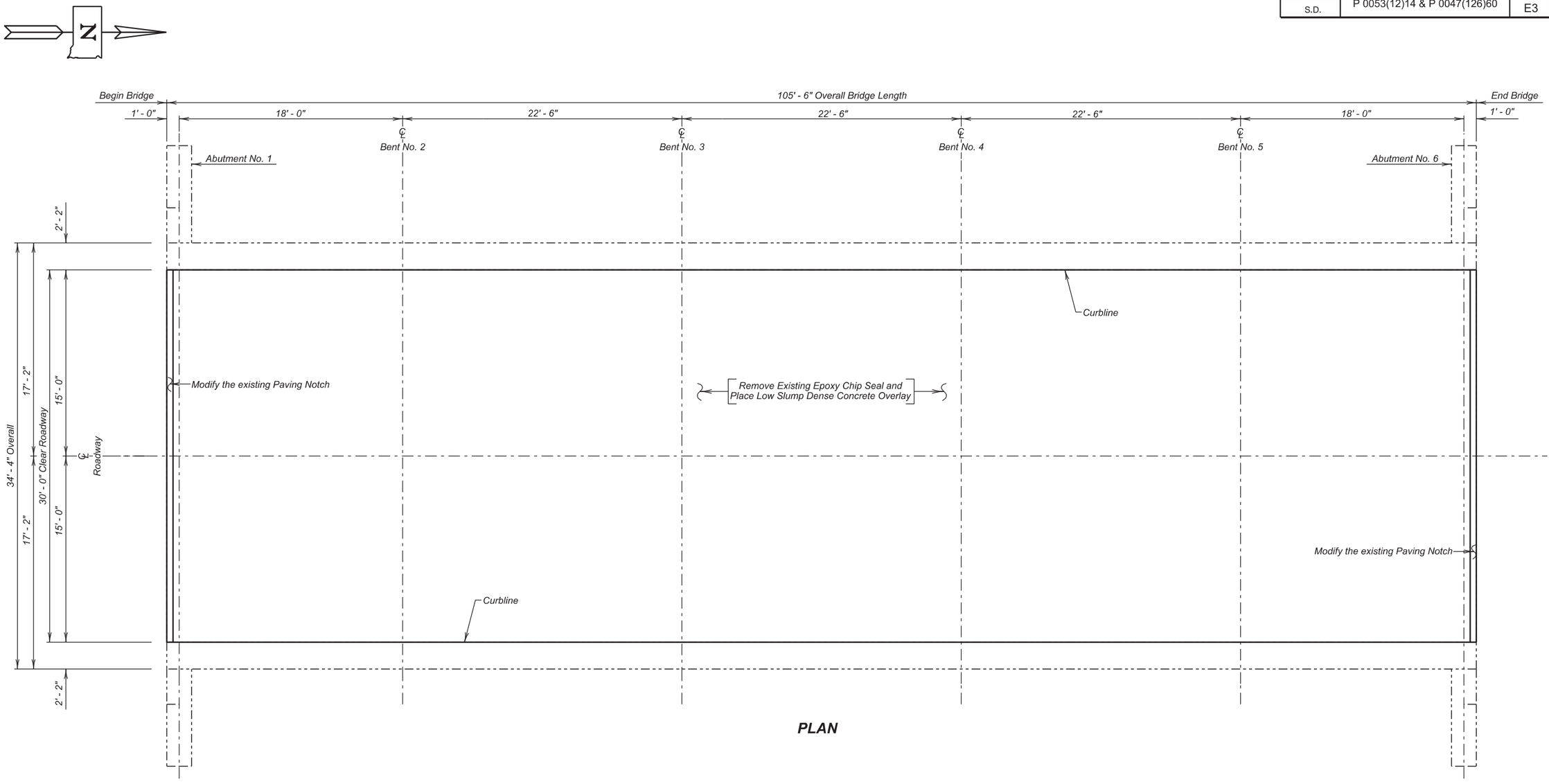
BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
460E0300	Breakout Structural Concrete	1.0	CuYd
460E0380	Install Dowel in Concrete	16	Each
480E0200	Epoxy Coated Reinforcing Steel	56	Lb
550E0010	Low Slump Dense Concrete Bridge Deck Overlay	28	CuYd
550E0100	Concrete Removal Type 1A	351.6	SqYd
550E0110	Concrete Removal Type 1B	119.8	SqYd
550E0120	Concrete Removal Type 1C	59.8	SqYd
550E0130	Concrete Removal Type 1D	59.8	SqYd
550E0140	Concrete Removal Type B	20.0	Ft
550E0200	Class A45 Concrete Fill	15.4	CuYd
550E0500	Finishing and Curing	351.6	SqYd

PCN 09LF

Str. No. 43-403-308

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
110E0010	Remove Concrete Bridge Approach Slab	187.9	SqYd
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
410E2300	Strip Seal Expansion Joint	34.6	Ft
410E2600	Membrane Sealant Expansion Joint	67.8	Ft
430E0300	Granular Bridge End Backfill	9.2	CuYd
460E0030	Class A45 Concrete, Bridge Deck	5.4	CuYd
460E0150	Concrete Approach Slab for Bridge	154.2	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	33.8	SqYd
460E0300	Breakout Structural Concrete	4.6	CuYd
460E0380	Install Dowel in Concrete	44	Each
460E4000	Nonmetallic Fiber Reinforced Concrete Overlay	127.3	CuYd
480E0200	Epoxy Coated Reinforcing Steel	850	Lb
480E0504	No. 4 Rebar Splice	28	Each
480E0505	No. 5 Rebar Splice	32	Each
480E0506	No. 6 Rebar Splice	56	Each
480E5000	Galvanic Anode	136	Each
550E0100	Concrete Removal Type 1A	1,707.6	SqYd
550E0110	Concrete Removal Type 1B	170.7	SqYd
550E0120	Concrete Removal Type 1C	85.4	SqYd
550E0130	Concrete Removal Type 1D	85.4	SqYd
550E0140	Concrete Removal Type B	20.0	Ft
550E0200	Class A45 Concrete Fill	18.4	CuYd
550E0500	Finishing and Curing	1,707.6	SqYd

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E3	E52



PLAN

LAYOUT FOR UPGRADE

FOR

105' - 6" CONTINUOUS CONCRETE BRIDGE

30' - 0" ROADWAY — 0° SKEW

OVER WILLOW CREEK — SEC. 22/23-T97N-R78W

STR. NO. 62-100-399 — P 0053(12)14

TRIPP COUNTY

S. D. DEPT. OF TRANSPORTATION

AUGUST 2025

-X020-

1 OF 11

-X020-

INDEX OF BRIDGE SHEETS

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

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JH/JRB	TJM	JH	Steve A Johnson BRIDGE ENGINEER
TRIP090U	090UBA01		

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
460E0300	Breakout Structural Concrete	1.0	CuYd
460E0380	Install Dowel in Concrete	16	Each
480E0200	Epoxy Coated Reinforcing Steel	56	Lb
550E0010	Low Slump Dense Concrete Bridge Deck Overlay	28	CuYd
550E0100	Concrete Removal Type 1A	351.6	SqYd
550E0110	Concrete Removal Type 1B	119.8	SqYd
550E0120	Concrete Removal Type 1C	59.8	SqYd
550E0130	Concrete Removal Type 1D	59.8	SqYd
550E0140	Concrete Removal Type B	20.0	Ft
550E0200	Class A45 Concrete Fill	15.4	CuYd
550E0500	Finishing and Curing	351.6	SqYd

SPECIFICATIONS

Construction Specifications: Standard Specifications for Roads and Bridges, 10-1-25 Version; Required Provisions; and Special Provisions as included in the Proposal. The Standard Specifications for Roads and Bridges is available for download and viewing at https://dot.sd.gov/doing-business/contractors/standard-specifications.

DETAILS AND DIMENSIONS OF EXISTING BRIDGE

1. 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.

2. The stationing shown in the original construction plans is reversed from the current project. As such, labels for the begin and end of bridge as well as the substructure units are reversed.

3. The elevations shown in the original construction plans are not based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

SCOPE OF BRIDGE WORK & SEQUENCE OF OPERATIONS

All work on this structure will 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. Accomplish all Concrete Removal Type 1A, 1B, 1C, 1D, 2A, and B and place Class A45 Concrete Fill to the satisfaction of the Engineer for the first phase of construction.

2. Breakout paving notches for the first phase of construction.

3. Place a Low Slump Dense Concrete Bridge Deck Overlay and fill paving notch to the elevations shown in the plans on the bridge deck for the first phase of construction.

4. Switch traffic and repeat steps 1 through 3 for the second phase of construction.

GENERAL CONSTRUCTION - BRIDGE

1. All reinforcing steel will conform to ASTM A615, Grade 60.

2. Use 2-inch clear cover on all reinforcing steel except as shown otherwise.

3. Requests for construction joints or reinforcing steel 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.

4. All lap splices are contact lap splices unless noted otherwise.

LOW SLUMP DENSE CONCRETE BRIDGE DECK OVERLAY

1. The preparation for resurfacing consists of Concrete Removal Type 1A on the entire bridge deck and Type 1B, Type 1C, Type 1D and Type B over the deck surface as detailed on the plan sheets. Such removal will be in conformance with these plans and Section 550 of the Construction Specifications. Extreme care will be taken during the Concrete Removal 1A to assure that the existing reinforcing steel is not damaged. In the event that reinforcing steel damage inadvertently occurs, the Bridge Construction Engineer will be immediately notified. Any damaged reinforcing steel will be repaired by the Contractor, as approved by the Engineer, at no additional cost to the Department.

2. Extreme care will be taken during Removal Type 1B, 1C, 1D, and B to ensure that the existing reinforcing steel is not damaged. In the event reinforcing steel damage inadvertently occurs, the Bridge Construction Engineer will be immediately notified. Any damaged reinforcing steel will be repaired by the Contractor, as approved by the Engineer, at no additional cost to the Department.

3. Class A45 Concrete Fill and Concrete Removal Type 1B, 1C, 1D, and B may not be encountered and may be omitted from the project as determined by the Engineer.

4. A minimum thickness of 2" of Low Slump Dense Concrete will be maintained on the bridge deck.

5. Concrete Removal Type 1C, Concrete Removal Type 1D, and Class A45 Concrete Fill are not anticipated to exceed the plan shown quantities. If the Engineer determines that Concrete Removal Type 1C, Concrete Removal Type 1D, and/or Class A45 Concrete Fill in excess of the plan quantity shown is necessary, payment for the additional quantity will conform with Section 550.5 of the Construction Specifications.

6. The coarse aggregate in the existing bridge deck is a natural aggregate. The coarse aggregate in the low slump bridge deck overlay will be limestone in accordance with Section 820 of the Construction Specifications. No other type of course aggregate will be allowed.

7. Concrete used in the Low Slump Dense Concrete Bridge Deck Overlay will meet the requirements of Section 550 of the Construction Specifications. Class A45 Concrete Fill will be an approved A45 Concrete Mix Design mixed and proportioned in accordance with Section 460 of the construction specifications with the following modifications: the coarse aggregate gradation will be in accordance with Section 820 of the Construction Specifications and the size #3 will be substituted in lieu of sizes #1 and #15. In addition, both the Low Slump Dense Concrete Bridge Deck Overlay and Class A45 Concrete Fill will conform to the following Alkali Silica Reactivity (ASR) requirements:

   a. Fine aggregates from sources that have not been tested by the Department will be submitted to the Department's Materials and Surfacing Central Materials Laboratory for ASR testing 30 days prior to performing the concrete mix design.

   b. When a fine aggregate supplier changes location within the pit, the fine aggregate from the new location in the pit will be submitted for testing.

   c. When more than one source of fine aggregate is blended to meet the gradation specifications, the expansion value of the blended sands will be used. Blended sources will be treated as a new source and it will be the responsibility of the Contractor to submit the blended samples for testing 30 days prior to performing the concrete mix design.

   d. ASR testing will be performed in accordance with ASTM C1260, except that the gradation of the material used for testing will be as produced from the source. The fine aggregate will only be sampled at the source by a Department representative or in the presence of a Department representative.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES

FOR

105' - 6" CONTINUOUS CONCRETE BRIDGE

STR. NO. 62-100-399

AUGUST 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JH/JRB	TJM	JH	Steve A Johnson BRIDGE ENGINEER
TRIP090U	090UHA02		

LOW SLUMP DENSE CONCRETE BRIDGE DECK OVERLAY (CONT.)

e. The Department will use the running average of the last three known expansion test results or less for determining acceptability of the source. Additional testing, when requested by the Contractor, will be performed by the Department at the Contractor's expense.

f. A list of known fine aggregate sources and the average corresponding 14-day expansion values as of October 2024 is provided below in Table 1.

Table 1 Fine Aggregate Sources, October 2024

Source	Location	Expansion Value
Bachman	Winner, SD	0.335*
Bitterman	Delmont, SD	0.316*
Concrete Materials	Corson, SD	0.146
Concrete Materials – Vellek Pit	Yankton, SD	0.411**
Croell	Hot Springs, SD	0.089
Croell	Wasta, SD	0.212
Emme Sand & Gravel	Oneil, NE	0.217
Fisher S&G – Blair Pit	W of Vale, SD	0.171
Fisher S&G – Mickelson Pit	E of Nisland, SD	0.129
Fisher S&G – Vallery Pit	Nisland, SD	0.110
Fisher S&G	Rapid City, SD	0.092
Fisher S&G	Spearfish, SD	0.053
Fisher S&G	Wasta, SD	0.159
Fuchs	Pickstown, SD	0.275*
Henning – Tilstra Pit	Ash Creek, MN	0.199
Higman	Hudson, SD	0.187
Jensen	Herried, SD	0.276*
L.G. Everist	Akron, IA	0.257*
L.G. Everist	Brookings, SD	0.297*
L.G. Everist – Ode Pit	E Sioux Falls, SD	0.222
L.G. Everist – Nelson Pit	NE Sioux Falls, SD	0.156
L.G. Everist	Hawarden, IA	0.211
L.G. Everist	Summit, SD	0.184
Mark's S&G – Moerke Pit	Underwood, MN	0.165
Morris – Birdsall	Blunt, SD	0.229
Morris – Leesman	Blunt, SD	0.231
Morris – Richards Pit	Onida, SD	0.188
Morris – Shawn's Pit	E of Sturgis, SD	0.186
Northern Concrete Agg.	Rauville, SD	0.113
Northern Concrete Agg.	Luverne, MN	0.154
Opperman – Gunvordahl Pit	Burke, SD	0.363*
Opperman – Cahoy Pit	Herrick, SD	0.307*
Opperman – Jones Pit	Burke, SD	0.321*
Opperman – Randall Pit	Pickstown, SD	0.230
Pete Lien & Sons	Creston, SD	0.158
Pete Lien & Sons	Oral, SD	0.157
Pete Lien & Sons	Wasta, SD	0.255*
Simon Materials – Beltline Pit	Scottsbluff, NE	0.277*
Thorpe Pit	Britton, SD	0.098
Valley S&G – Van Beek Pit	Rock Valley, IA	0.228
Wagner Building Supplies	Pickstown (Wagner), SD	0.251*
Winter Brothers – Whitehead Pit	Brookings, SD	0.197

* Consult Table 2 for these sources.
** These sources will not be used.

g. The values in Table 1 are intended for use in bidding. If a pit, previously tested by SDDOT, with a test value less than 0.250% is discovered after letting to be 0.250% or greater, then the Department will accept financial responsibility if higher costs are incurred due to a higher required percentage of fly ash and/or a higher amount of lithium nitrate is added to the concrete mix.

h. Based on course aggregate composition and expansion test results, the Contractor will use Table 2 to determine the percentage of cement to be replaced with Class F Modified Fly Ash (in accordance with Section 605 of the Construction Specifications) and/or specified rate of lithium nitrate (30% solution by weight)to be provided in the concrete mix for the Low Slump Dense Concrete Bridge Deck Overlay and Class A45 Concrete Fill. Fine aggregate with a 14-day expansion value of 0.400 or greater will not be used.

Table 2 Cement Replacement

Coarse Aggregate	Fine Aggregate Expansion Value	Cement Type	Fly Ash	Lithium Nitrate
Limestone	< 0.250%	Type I or II	-----	2.0 gallon/cubic yard
		Type I or II	20% Min.	-----
Limestone	≥ 0.250%	Type I or II	-----	3.0 gallon/cubic yard
		Type I or II	25%	-----

i. Grout for bonding new concrete to old concrete will meet the requirements of Section 550 of the Construction Specifications.

j. All material, labor, equipment, and incidental costs to meet ASR requirements will be included in the contract unit price for Low Slump Dense Concrete Bridge Deck Overlay or Class A45 Concrete Fill.

8. Suppliers of Lithium are listed below:

   a. BASF Construction Chemical
   23700 Chagrin Boulevard
   Beachwood, Ohio 44122
   1-612-961-8575
   website: www.master-builders-solutions.basf.us/en-us

   b. FMC Corporation
   2801 Yorkmont Road, Suite 300
   Charlotte, North Carolina 28208
   1-704-868-5300
   website: www.fmclithium.com

9. No traffic will be allowed to operate on the scarified portion of the bridge deck. If it appears that the entire Low Slump Dense Concrete Bridge Deck Overlay cannot be completed prior to winter, Concrete Removal Type 1A, 1B, 1C, 1D, and B will not be done until work resumes in the spring. In the event, scarification has been started and due to unforeseen circumstances, it becomes impossible to complete the placement of the overlay on the entire surface of the structure prior to winter the Office of Bridge Design will be notified. Recommendations for handling winter traffic will then be made. These recommendations may include, but are not limited to, filling extra depth removal areas with Class A45 Concrete, placing an asphalt overlay on the uncompleted area so that the entire roadway width may be opened to traffic, removal of the asphalt overlay when work is resumed and scarifying an additional 1/4" of depth on the bridge deck. The cost of this work, including asphalt overlay, scarification, Class A45 Concrete, extra low slump dense concrete and all other items incidental to this work, will be at the expense of the Contractor.

10. The paving notch will be cleaned by abrasive blasting as approved by the Engineer. Reinforcing steel will be placed in the paving notch according to the plans. The modified paving notch will be filled with Low Slump Dense Concrete during the placement of the Low Slump Dense Concrete Bridge Deck Overlay.

11. It will be necessary for the Contractor to shape the surface of the Low Slump Dense Concrete Bridge Deck Overlay within one foot of the curb to ensure that water drains to the deck drains or off the ends of the bridge.

NOTES (CONTINUED)
FOR
105' - 6" CONTINUOUS CONCRETE BRIDGE

STR. NO. 62-100-399
AUGUST 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JH/JRB	TJM	JH	BRIDGE ENGINEER
TRIP090U	090UHA03		

CONCRETE BREAKOUT

1. The existing paving notches will be broken out to the limits shown on the plans. Breakout limits will 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 will be cleaned and straightened to the satisfaction of the Engineer. Care will 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 will be replaced or repaired, as approved by the Engineer, by the Contractor at no cost to the Department.

2. All broken out concrete and discarded reinforcing steel will become the property of the Contractor and will be disposed of at a site obtained by the Contractor and approved by the Engineer. An appropriate site will be as described in the Environmental Commitments.

3. During concrete removal operations, no concrete will be allowed to fall into Willow Creek.

4. The contract unit price per cubic yard for Breakout Structural Concrete will include breaking out concrete, cleaning, straightening reinforcing steel, and disposal of all broken out material.

AS-BUILT ELEVATION SURVEY

The Contractor will be responsible for producing an as-built elevation survey soon after construction is complete and before the bridge is completely opened to traffic The Contractor will be responsible for recording the as-built elevations at the locations shown by the table of as-built elevations shown in the plans. The completed table will be given to the Engineer who will forward a copy to the Bridge Maintenance Engineer in the Office of Bridge Design and the Region Bridge Engineer. The elevations will be based on the control points provided in the plans. The Contractor will be responsible for verifying the control points provided in the plans. All costs associated with obtaining the elevations at the locations shown in the table and for the benchmark shown in the plans, including all equipment, labor and any incidentals required will be incidental to the contract lump sum price for Bridge Elevation Survey.

NOTES (CONTINUED)

FOR

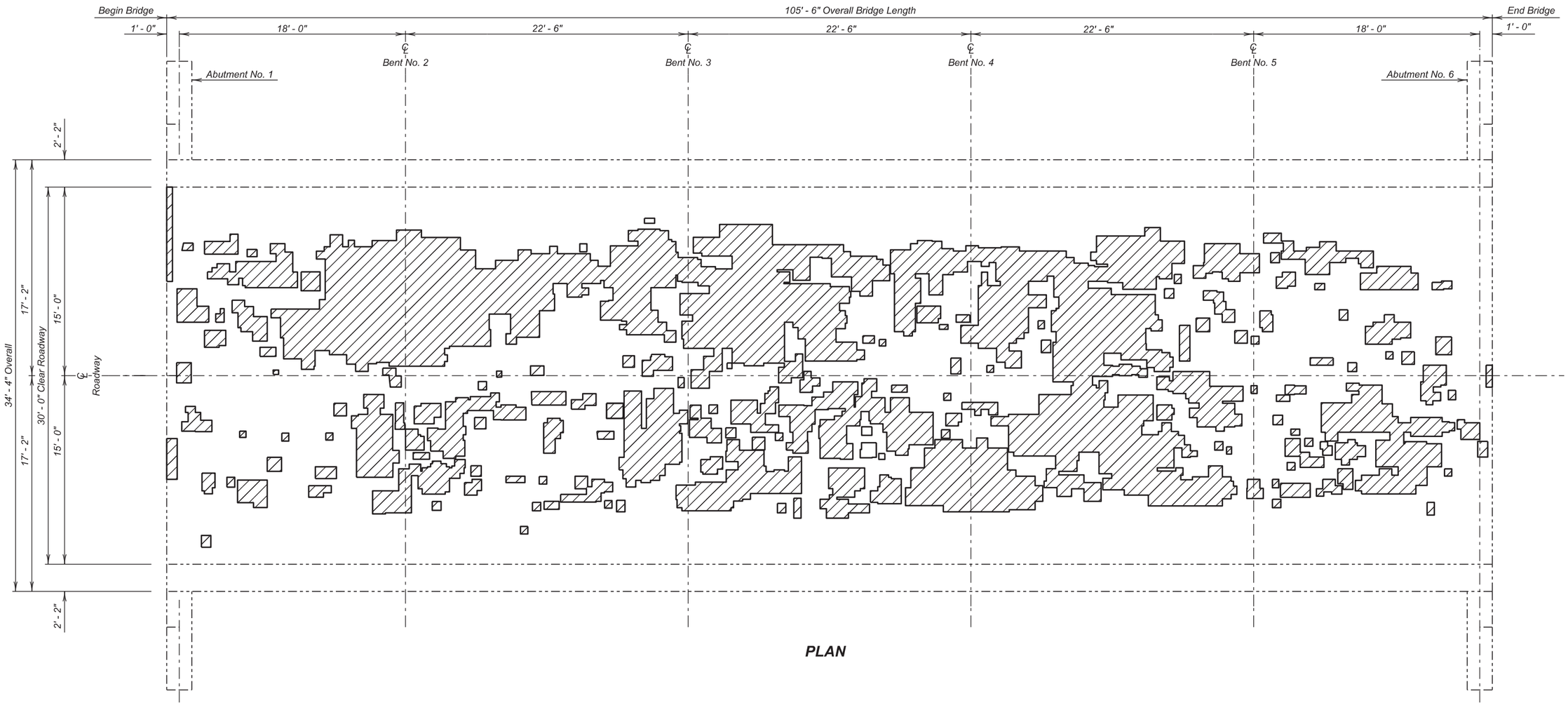
105' - 6" CONTINUOUS CONCRETE BRIDGE

STR. NO. 62-100-399

AUGUST 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JH/JRB	TJM	JH	BRIDGE ENGINEER
TRIP090U	090UHA04		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E7	E52



PLAN

LEGEND:

Shaded areas indicate approximate locations of unsound concrete requiring concrete repair.

DECK DELAMINATION DETAILS

FOR

105' - 6" CONTINUOUS CONCRETE BRIDGE

30' - 0" ROADWAY — 0° SKEW

OVER WILLOW CREEK — SEC. 22/23-T97N-R78W

STR. NO. 62-100-399 — P 0053(12)14

TRIPP COUNTY

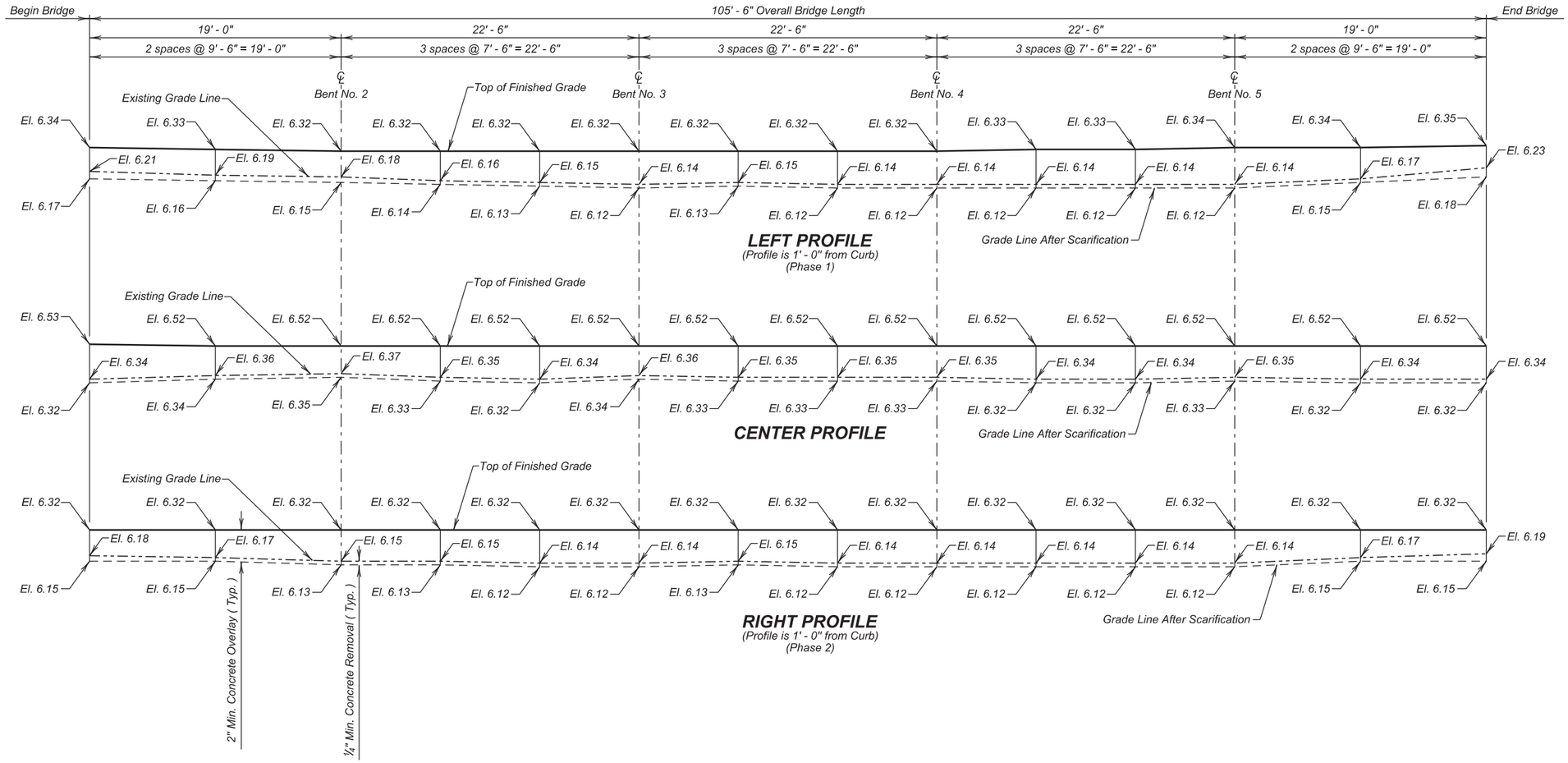
S. D. DEPT. OF TRANSPORTATION

AUGUST 2025

5 OF 11

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JH/JRB	TJM	JH	Steve A Johnson BRIDGE ENGINEER
TRIP090U	090UBA05		

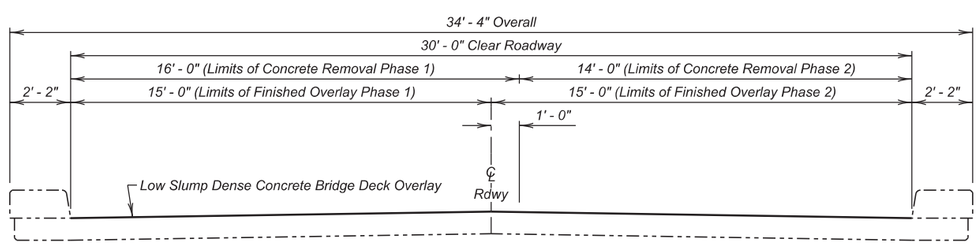
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E8	E52



Benchmark Description:

Control Point C
Location Description: NE Wing of Bridge
Elevation: 2316.59

NOTE :
Add 2300.00 all elevations shown on profiles.



TYPICAL SECTION

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY	
		Phase I	Phase 2
Low Slump Dense Concrete Deck Overlay	Cu. Yd	14	14
Concrete Removal Type 1A	Sq. Yd	187.6	164.0
Concrete Removal Type 1B	Sq. Yd	63.9	55.9
Concrete Removal Type 1C	Sq. Yd	31.9	27.9
Concrete Removal Type 1D	Sq. Yd	31.9	27.9
Concrete Removal Type B	Ft.	10.0	10.0
Class A45 Concrete Fill	Cu. Yd	8.2	7.2
Finishing and Curing	Sq. Yd	175.8	175.8

DECK PROFILES FOR LOW SLUMP DENSE CONCRETE BRIDGE DECK OVERLAY

FOR

105' - 6" CONTINUOUS CONCRETE BRIDGE

30' - 0" ROADWAY — 0° SKEW
OVER WILLOW CREEK — SEC. 22/23-T97N-R78W
STR. NO. 62-100-399 — P 0053(12)14

TRIPP COUNTY

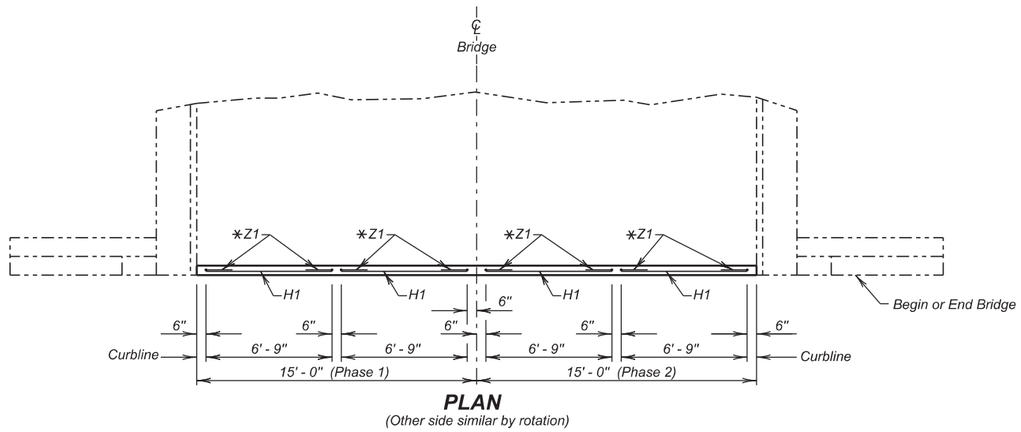
S. D. DEPT. OF TRANSPORTATION

AUGUST 2025

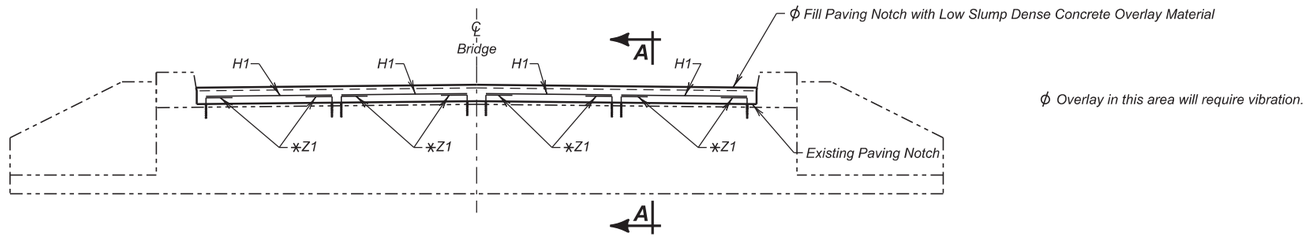
6 OF 11

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JH/JRB	TJM	KR	Steve A Johnson BRIDGE ENGINEER
TRIP090U	090UBA06		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E9	E52



PLAN
(Other side similar by rotation)



ELEVATION
(Bridge barrier not shown)

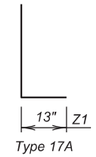
ϕ *Overlay in this area will require vibration.*

∗ *Z1 Dowels are to be drilled in and grouted with epoxy.*

REINFORCING SCHEDULE
(For Both Ends of Bridge)

	Mk.	No.	Size	Length	Type
Phase 1	△Z1	8	5	2' - 6"	17A
	H1	4	5	6' - 9"	Str.
Phase 2	△Z1	8	5	2' - 6"	17A
	H1	4	5	6' - 9"	Str.

Bending Details



Type 17A

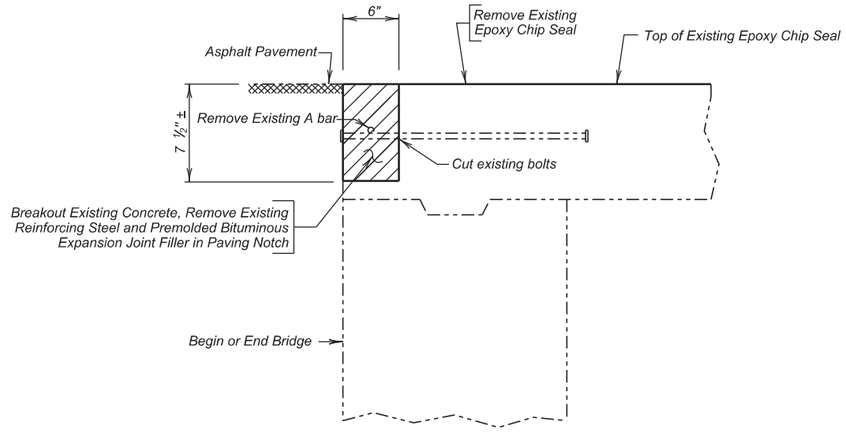
NOTES:
All dimensions are out to out of bars.
All bars to be Epoxy Coated.
△ *Dowels*

ESTIMATED QUANTITIES

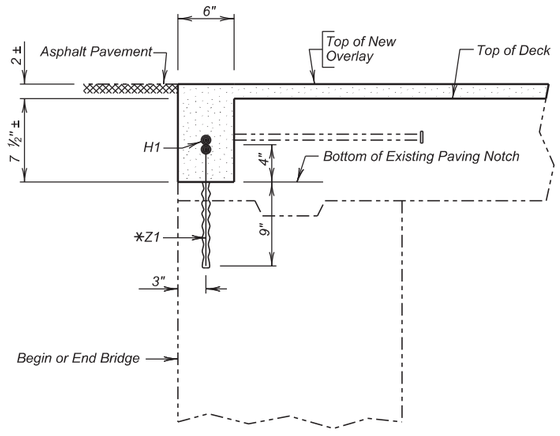
ITEM	UNIT	QUANTITY Phase I	QUANTITY Phase 2
Breakout Structural Concrete	CuYd	0.5	0.5
Install Dowel in Concrete	Each	8	8
⊛ Epoxy Coated Reinforcing Steel	Lb	28	28

⊛ *Does not include the following quantities for z1 bars as these are incidental to the contract unit price per each for Install Dowel in Concrete.*

PHASE I	PHASE 2
21 Lb.	21 Lb.



SECTION A - A
(Removal Details)



SECTION A - A
(Section after Reconstruction)

NOTE:

For overlay removal quantities and milling depths see DECK PROFILES FOR LOW SLUMP DENSE CONCRETE BRIDGE DECK OVERLAY sheet.

PAVING NOTCH MODIFICATION DETAILS

FOR

105' - 6" CONTINUOUS CONCRETE BRIDGE

30' - 0" ROADWAY — 0° SKEW
OVER WILLOW CREEK — SEC. 22/23-T97N-R78W
STR. NO. 62-100-399 — P 0053(12)14

TRIPP COUNTY

S. D. DEPT. OF TRANSPORTATION

AUGUST 2025

7 OF 11

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JH/JRB	TJM	JH	Steve A Johnson BRIDGE ENGINEER
TRIP090U	090UBA07		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E10	E52

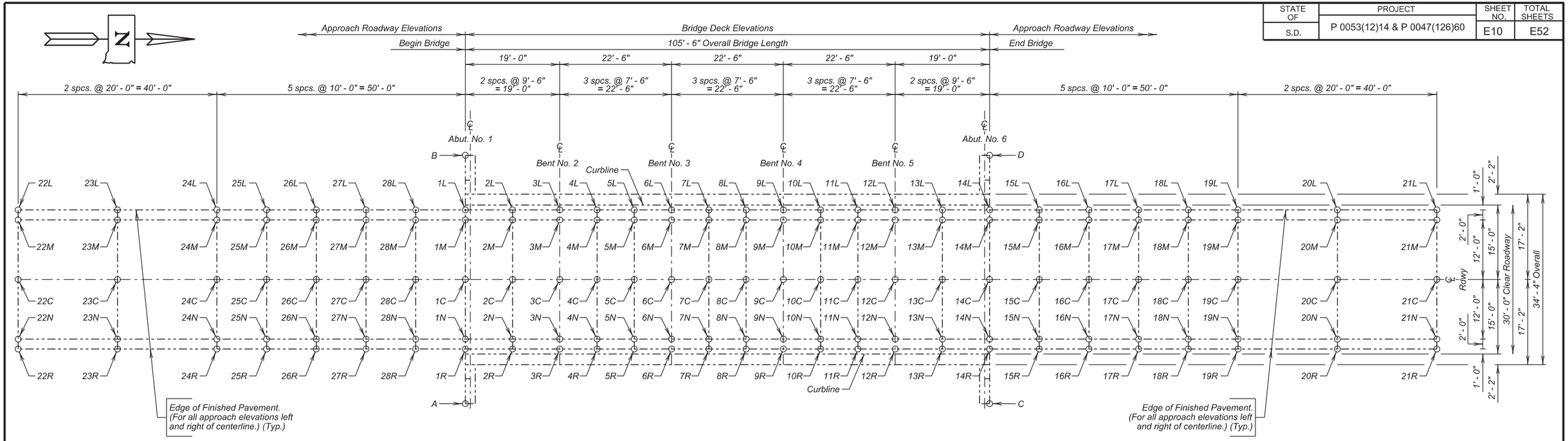


Table of Elevations - Approach Roadway

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
15L		15M		15C		15N		15R	
16L		16M		16C		16N		16R	
17L		17M		17C		17N		17R	
18L		18M		18C		18N		18R	
19L		19M		19C		19N		19R	
20L		20M		20C		20N		20R	
21L		21M		21C		21N		21R	
22L		22M		22C		22N		22R	
23L		23M		23C		23N		23R	
24L		24M		24C		24N		24R	
25L		25M		25C		25N		25R	
26L		26M		26C		26N		26R	
27L		27M		27C		27N		27R	
28L		28M		28C		28N		28R	

Table of Elevations - Bridge Deck

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
1L		1M		1C		1N		1R	
2L		2M		2C		2N		2R	
3L		3M		3C		3N		3R	
4L		4M		4C		4N		4R	
5L		5M		5C		5N		5R	
6L		6M		6C		6N		6R	
7L		7M		7C		7N		7R	
8L		8M		8C		8N		8R	
9L		9M		9C		9N		9R	
10L		10M		10C		10N		10R	
11L		11M		11C		11N		11R	
12L		12M		12C		12N		12R	
13L		13M		13C		13N		13R	
14L		14M		14C		14N		14R	

Bridge Ends	
Location	Elevation
A	
B	
C	
D	

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Bridge Elevation Survey	LS	Lump Sum

Benchmark Description:

Control Point C
Location Description: NE wing of bridge
Elevation: 2316.59

NOTE:

The elevations will be based on the National Geodetic Survey North American Vertical Datum of 1988 and will be recorded at the locations shown by the table on this sheet. The completed table will be given to the Engineer who will forward a copy to the Bridge Maintenance Engineer in the Office of Bridge Design and the Senior Region Bridge Engineer.

AS-BUILT ELEVATION SURVEY
FOR

105' - 6" CONTINUOUS CONCRETE BRIDGE

30' - 0" ROADWAY — 0° SKEW
OVER WILLOW CREEK — SEC. 22/23-T97N-R78W
STR. NO. 62-100-399 — P 0053(12)14

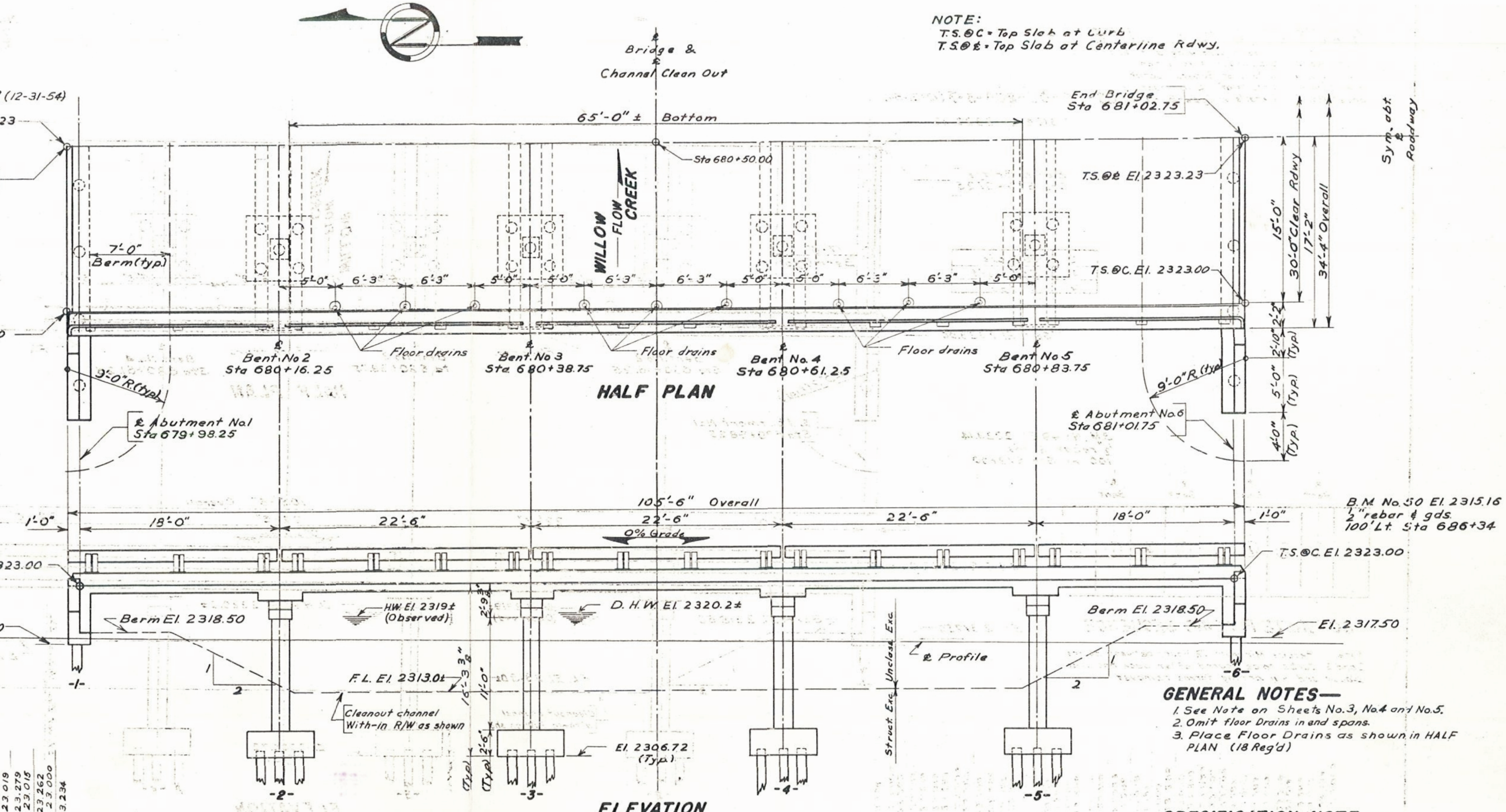
TRIPP COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2025

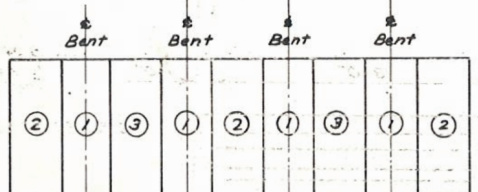
DESIGNED BY	CK. DES. BY	DRAFTED BY	
KR/JRB	TJM	KR	Steven A. Johnson BRIDGE ENGINEER
TRIP090U	090UBA08		

-X020-

INDEX OF BRIDGE SHEETS—

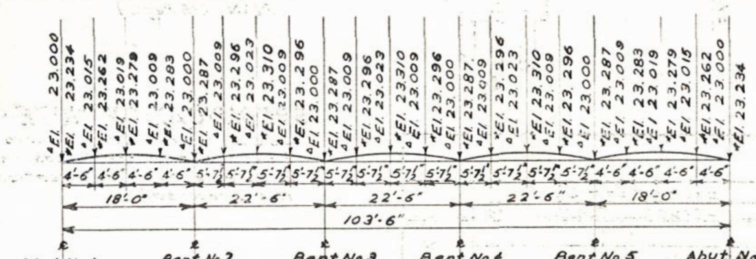
Q	1000 c.f.s.
A	556 sq.ft.
V	18 f.p.s.





CONCRETE PLACING SEQUENCE

Note: Require Minimum 72 Hours between pours 2 and 3. Curbs to be poured after deck has been placed and supporting forms removed.



CURB & ℄ ELEVATIONS

(Note: Add 2300' to all Elevations shown in diagram)

NOTE:
Elevations shown are Δ Top of Finished Slab at Curb and at ℄ Roadway, which provide Camber for Dead Load Deflection plus Plastic Flow. Do not use Camber Dimensions shown on sheet No. 3 of Bridge Plans.

ESTIMATED QUANTITIES

ITEM	Cl. "A" Concrete Cu. Yds.	Steel - Lbs. Reinf.	Steel - Lbs. Struct.	Type B steel Railing Lin. ft.	Piling - Lin. ft. Treated Timber	Piling - Lin. ft. φ Test	Excavation - Cu. Yds. Struct.	Excavation - Cu. Yds. Unclassified	
Superstructure	123.7	36,845	200	213.3					*INCIDENTAL WORK
Abutment No. 1	17.9	1815	380		7@25' = 175	1@30' = 30'	10		
Bent No 2, No 3, No 4, & No 5	51.0	11,505			38@20' = 760	2@25' = 50'	170		
Abutment No 6	17.9	1815	380		7@25' = 175	1@30' = 30'	10		
Totals	210.5	51,980	960	213.3	1110	φ 110	190	Δ	

φ One Treated Timber Test Pile shall be driven at Abutments No. 1 & No 6 and Bents No. 2 & No. 4 before remaining piles are ordered.
Δ See Grading Plans for Unclassified Excavation.
*INCIDENTAL WORK: In place on ℄ Sta 679+17 to Sta 679+71 54' (3 span) x 16' Roadway Timber bridge. Remove Plank Flooring. Stringers, bent and abutment caps, and abutment backing. Care shall be taken not to injure the structural properties of wood materials. Remove all piling to 1'± below finished ground line. All spikes, nails, bolts and screws shall be removed from salvaged material. All salvable material shall be placed neatly within the right-of-way as directed by the ENGINEER, to be picked up by County forces. All other materials shall be disposed of as directed by the ENGINEER.

GENERAL NOTES—

1. See Note on Sheets No. 3, No. 4 and No. 5.
2. Omit floor Drains in end spans.
3. Place Floor Drains as shown in HALF PLAN (18 Req'd)

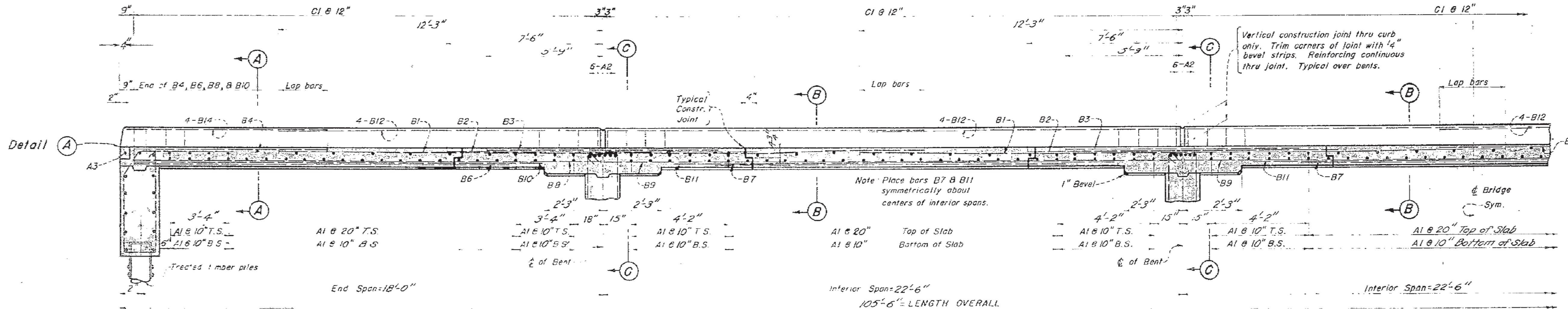
SPECIFICATION NOTE —

Use Current South Dakota Standard Specifications for Roads and Bridges, and the Supplemental Specifications as included in the proposal.

ORIGINAL CONSTRUCTION PLANS

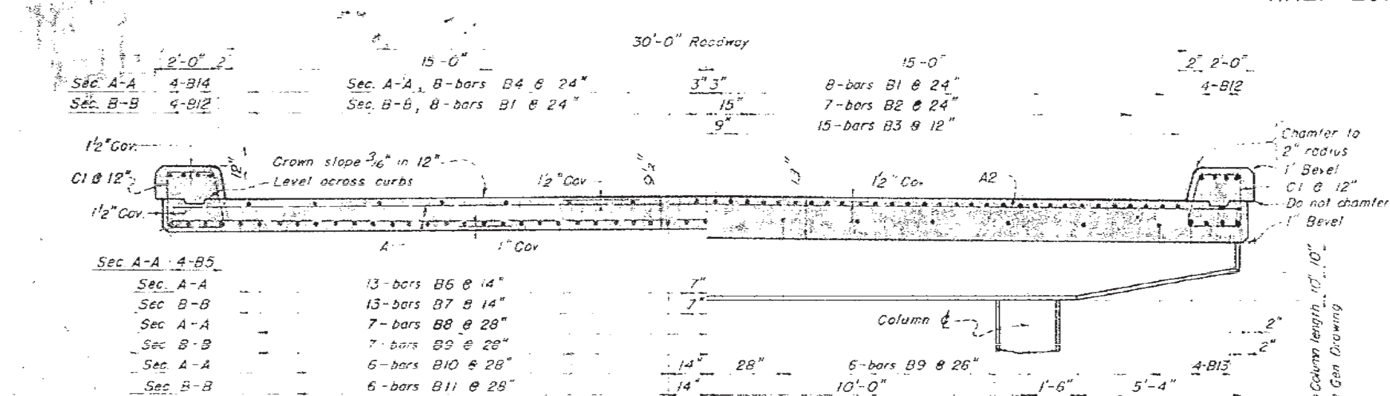
GENERAL DRAWING AND QUANTITIES
FOR
105'-6" CONTINUOUS CONCRETE BRIDGE
30'-0" ROADWAY
OVER WILLOW CREEK SEC. 22/23-T97N-R78W
STA. 679+97.25 TO STA. 681+02.75 C9951
STR. NO. 62-100-399 TRIPP COUNTY H20-S16-44
SOUTH DAKOTA
DEPARTMENT OF HIGHWAYS
JULY 1962

-X020-



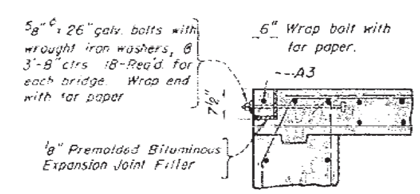
HALF LONGITUDINAL SECTIONAL VIEW

(Railing not shown)



HALF SECTION A-A / HALF SECTION B-B (As shown and noted)

HALF SECTION C-C



DETAIL (A)

NOTES

These notes cover substructure, superstructure, and railing details. The General Plan for the structure will show spans, elevations, and other necessary notes and details.

CONSTRUCTION SPECIFICATIONS: South Dakota Highway Commission's "Standard Specifications for Roads and Bridges," current issue, shall govern unless noted otherwise herein, on plans, or in Special Provisions.

PILING: All piles shall be treated timber. Bent Piling shall develop a minimum bearing value of 24 Tons per pile. Abutment Piling shall develop a minimum bearing value of 20 Tons per pile.

STRUCTURAL STEEL: All 5/8"⌀ and 1"⌀ bolts including washers, 4"x5/8" bent bars, and floor drains shall be paid for as Structural Steel.

CONCRETE: Class A Concrete shall develop a minimum allowable compressive strength of 4000 p.s.i. at 28 days. All exposed concrete corners and edges shall be chamfered to a 3/4" bevel unless otherwise noted. Transverse construction joints will be made at the quarter points of each 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: H20-S16-44 A.A.S.H.O. Unit stresses: Concrete, f_c=1600 p.s.i., n=8; Reinforcing f_s=20,000 p.s.i. (Int. Grade Steel). Equivalent fluid pressure of earth at 40#/sq. ft.

ORIGINAL CONSTRUCTION PLANS

SLAB DATA

REINFORCING SCHEDULE

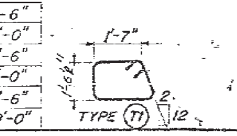
Length Overall	End Span	Interior Span	A1 No	A1 Size	A1 Length	A2 No	A2 Size	A2 Length	A2 Type	A2 B	A3 No	A3 Size	A3 Length	B1 No	B1 Size	B1 Length	B2 No	B2 Size	B2 Length	B3 No	B3 Size	B3 Length	B4 No	B4 Size	B4 Length
94'-0"	16'	20'	141	5/8	33'-5"	24	7/8	35'-3"	1	33'-7"	2	5/8	29'-9"	64	7/8	23'-0"	56	7/8	13'-0"	120	3/4	9'-0"	32	3/4	7'-3"
105'-6"	18'	22'-6"	195	5	33'-6"	24	8	31'-6"			2	5	29'-9"	64	7	24'-6"	56	8	15'-0"	120	8	11'-6"	32	7	8'-0"
117'-0"	20'	25'	179				1"	35'-9"							7/8	28'-0"		7/8	16'-6"		7/8	12'-0"			8'-9"
128'-6"	22'	27'-6"	200				1"								1"	31'-0"		1"	16'-6"		7/8	12'-0"			9'-3"
140'-0"	24'	30'	218				1"								1"	33'-6"		1"	16'-0"		3/4	12'-0"			10'-0"
151'-6"	26'	32'-6"	238				1"								1"	36'-0"		1"	20'-0"		1"	14'-0"			10'-9"
163'-0"	28'	35'	256				1"									38'-6"		1"	21'-0"		1"	16'-0"			11'-6"
174'-6"	30'	37'-6"	[illegible]				1"									41'-0"		1"	21'-0"		1"	15'-0"			12'-3"
186'-0"	32'	[illegible]	[illegible]				1"									43'-6"		1"	23'-0"			[illegible]			13'-0"
197'-6"	34'	42'-6"	315				1"								1 1/8	46'-6"		1 1/8	19'-6"		1"	12'-0"			13'-6"
209'-0"	36'	45'	335	5/8	33'-6"	24	1"	35'-9"	1	33'-7"	2	5/8	29'-9"	64	1 1/8	49'-0"	56	1 1/8	20'-6"	120	1 1/8	13'-6"	32	3/4	14'-3"

Length Overall	B5 No	B5 Size	B5 Length	B6 No	B6 Size	B6 Length	B7 No	B7 Size	B7 Length	B8 No	B8 Size	B8 Length	B9 No	B9 Size	B9 Length	B10 No	B10 Size	B10 Length	B11 No	B11 Size	B11 Length
94'-0"	16	3/4	16'-9"	52	7/8	13'-6"	78	7/8	14'-0"	26	7/8	16'-3"	39	7/8	20'-0"	24	7/8	14'-6"	36	7/8	16'-0"
105'-6"	16	7	18'-9"	52	9	15'-3"	78	9	16'-0"	26	8	18'-3"	39	8	22'-6"	24	8	16'-6"	36	8	20'-0"
117'-0"		7/8	20'-9"		7/8	15'-6"		7/8	15'-0"		1"	20'-3"		1"	25'-0"		1"	17'-6"		1"	19'-0"
128'-6"		1"	22'-9"		7/8	17'-0"		7/8	16'-0"		1"	22'-3"		1"	27'-6"		1"	19'-0"		1"	20'-0"
140'-0"		1"	24'-9"		1"	19'-0"		1"	19'-0"		1"	24'-3"		1"	30'-0"		1"	20'-6"		1"	23'-0"
151'-6"		1"	26'-9"		7/8	19'-6"		7/8	17'-0"		1"	26'-3"		1"	32'-6"		1"	21'-6"		1"	22'-6"
163'-0"		1"	28'-9"		1"	21'-0"		1"	19'-0"		1"	28'-3"		1"	35'-0"		1"	23'-6"		1"	25'-0"
174'-6"		1"	30'-9"		1"	22'-6"		1"	21'-6"		1"	30'-3"		1"	37'-6"		1"	25'-0"		1"	27'-0"
186'-0"		1"	32'-9"		1"	24'-0"		1"	24'-0"		1"	32'-3"		1"	40'-0"		1"	26'-6"		1"	28'-0"
197'-6"		1 1/8	34'-9"		1"	24'-[illegible]		1"	22'-6"		1 1/8	34'-3"		1 1/8	42'-6"		1 1/8	27'-6"		1 1/8	28'-6"
209'-0"	16	1 1/8	36'-9"	52	1"	26'-6"	78	1"	25'-0"	26	1 1/8	36'-3"	39	1 1/8	45'-0"	24	1 1/8	29'-0"	36	1 1/8	31'-0"

Length Overall	B12 No	B12 Size	B12 Length	B13 No	B13 Size	B13 Length	B14 No	B14 Size	B14 Length	C1 No	C1 Size	C1 Length	C1 Type	A	B	Dimensions "T"	"H"	"a"	"b"	"c"	"d"	"e"	"f"	Length Overall
94'-0"	32	3/4	23'-0"	24	3/4	20'-0"	16	3/4	7'-0"	198	1/2	7'-6"	T1	7"	1'-5 1/2"	8 1/2"	11 1/2"	11'-6"	6'-6"	4'-6"	24"	2'-0"	3'-0"	94'-0"
105'-6"	32	7	24'-6"	24	7	22'-6"	16	7	8'-0"	218	4	7'-3"	T1											105'-6"
117'-0"		7/8	28'-0"		7/8	25'-0"			9'-3"	244		7'-9"			1'-6 3/4"	9 3/4"	13 1/4"	14'-0"	8'-3"	6'-0"	30"	3'-0"	4'-0"	117'-0"
128'-6"		1"	31'-0"		1"	27'-6"			9'-9"	264		8'-0"			1'-7 1/2"	10 1/2"	14 1/4"	15'-6"	8'-3"	6'-0"	33"	3'-0"	4'-0"	128'-6"
140'-0"		1"	33'-6"		1"	30'-0"			10'-6"	290		8'-0"			1'-8"	11"	15"	16'-9"	8'-0"	6'-0"	36"	3'-0"	5'-0"	140'-0"
151'-6"		1"	36'-0"		1"	32'-6"			[illegible]	310		8'-3"			1'-8 3/4"	11 3/4"	16"	18'-0"	10'-0"	7'-0"	39"	4'-0"	5'-0"	151'-6"
163'-0"		1"	38'-6"		1"	35'-0"			12'-0"	336		8'-3"			1'-9 1/2"	12 1/2"	17"	19'-3"	10'-6"	8'-0"	42"	4'-0"	6'-0"	163'-0"
174'-6"		1"	41'-0"		1"	37'-6"			12'-9"	356		8'-6"			1'-10 1/4"	13 1/4"	18"	20'-6"	10'-6"	7'-6"	45"	5'-0"	6'-0"	174'-6"
186'-0"		1"	43'-6"		1"	40'-0"			13'-6"	382		8'-6"			1'-11"	14"	19"	21'-9"	11'-6"	9'-3"	48"	5'-0"	7'-0"	186'-0"
197'-6"		1 1/8	46'-6"		1 1/8	42'-6"			14'-0"	402		8'-9"			1'-11 3/4"	14 3/4"	20"	23'-3"	9'-9"	6'-0"	51"	5'-0"	7'-0"	197'-6"
209'-0"	32	1 1/8	49'-0"	24	1 1/8	45'-0"	16	3/4	14'-9"	428	1/2	8'-9"	T1	7"	2'-0 1/2"	15 1/2"	21"	24'-6"	10'-3"	6'-9"	54"	6'-0"	8'-0"	209'-0"

BAR BENDS

Note: All detail dimensions are out to out.

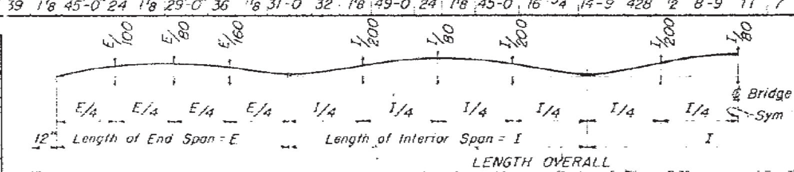


ESTIMATED QUANTITIES

Length Overall	Two Abutments: Class A Concrete Cu Yds*	Two Abutments: Reinforcing Steel Lbs	Two Abutments: Number of Piles	Two Abutments: Structural Steel Lbs	Four Interior Bents: Class A Concrete Cu Yds Constant Quantity	Four Interior Bents: Cu Yds/Lin ft for 8 columns "Q"	Four Interior Bents: Reinforcing Steel Lbs Constant Quantity	Four Interior Bents: Lbs/Lin ft for 8 columns "R"	Four Interior Bents: Number of Piles	Slabs & Curbs: Class A Concrete Cu Yds	Slabs & Curbs: Reinforcing Steel Lbs	Slabs & Curbs: 5/8"⌀ Bolts	Slabs & Curbs: Number of Floor Drains	Slabs & Curbs: Structural Steel Lbs	Totals: ⊕ Class A Concrete Cu Yds	Totals: ⊕ Reinforcing Steel Lbs	Totals: ⊕ Structural Steel Lbs	Totals: ⊕ Number of Piles
94'-0"	35.6	3620	16	760	34.7	0.824	4465	128.4	32	99.4	24,505	18	20	200	[illegible]+("Q"x"L")	32,700+("R"x"L")	960	48
105'-6"	35.8	3630	16	760	41.9	0.824	7620	354.8	40	123.7	36,64[illegible]	18	18	200				
117'-0"	"	"	16	760	34.7	0.824	4510	128.4	32	140.6	33,740		26	270	210.9+ "	41,880+ "	1030	48
128'-6"			16	760	45.1	0.824	4680	128.4	40	165.3	38,425		30	320	246.0+ "	47,715+ "	1080	56
140'-0"			18	855	48.5	0.896	5115	159.5	40	188.3	45,520		30	330	270.4+ "	54,205+ "	1185	58
151'-6"			18	855	46.5	0.896	5470	159.5	40	216.6	49,015		36	400	298.6+ "	58,115+ "	1255	58
163'-0"			18	855	46.6	1.185	6305	193.3	48	246.6	57,835		36	420	328.8+ "	67,770+ "	1275	66
174'-6"			20	950	46.6	1.185	6345	193.3	48	278.6	66,550		36	435	360.8+ "	76,525+ "	1385	68
186'-0"			20	950	61.9	1.390	10215	251.4	64	312.6	72,000		40	500	410.1+ "	85,845+ "	1450	84
197'-6"			20	950	63.2	1.611	10285	254.8	64	348.4	79,210		48	590	447.2+ "	93,125+ "	1540	84
209'-0"	35.8	3630	20	950	68.8	1.611	10590	254.8	64	386.2	88,275	18	48	610	490.6+ "	102,495+ "	1560	84

* Includes slabs and curbs directly over abutments.

⊕ Bid Items.



CAMBER DIAGRAM

Camber is calculated for dead load plus plastic flow. Camber is calculated thus using the 186'-0" Bridge as an illustration: E=32' and I=40', I/80=40/80=1/2, provide 1/2" camber at centers of interior spans. The values obtained for camber shall be added to the proposed grade elevations at the respective stations to establish the elevation of the top of the finished roadway slab.

The slab shall also be raised 5/8" additional over the interior bents at Roadway ℄ to provide for dead load deflection and plastic flow at the ℄ of the bents as noted on details thereof.

SUPERSTRUCTURE DETAILS FOR

105'-6" CONT. CONCRETE BRIDGE

30'-0" ROADWAY

OVER WILLOW CREEK SEC. 22/23-T97N-R78W

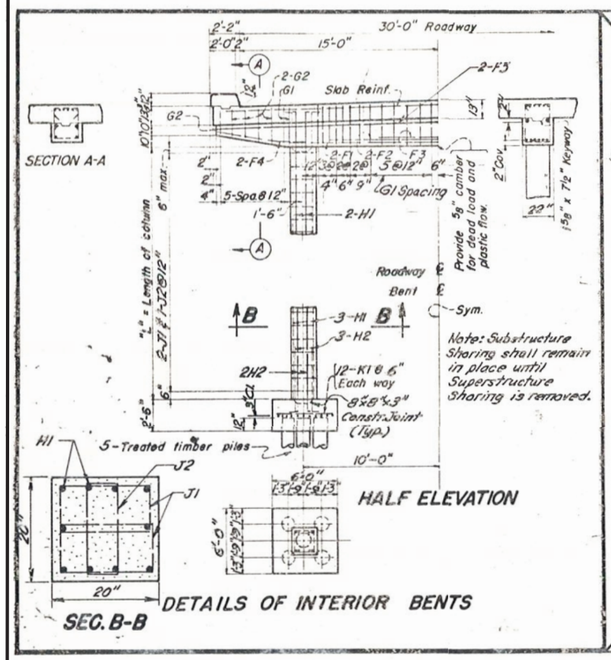
STA. 679+97.25 TO 681+02.75 C995

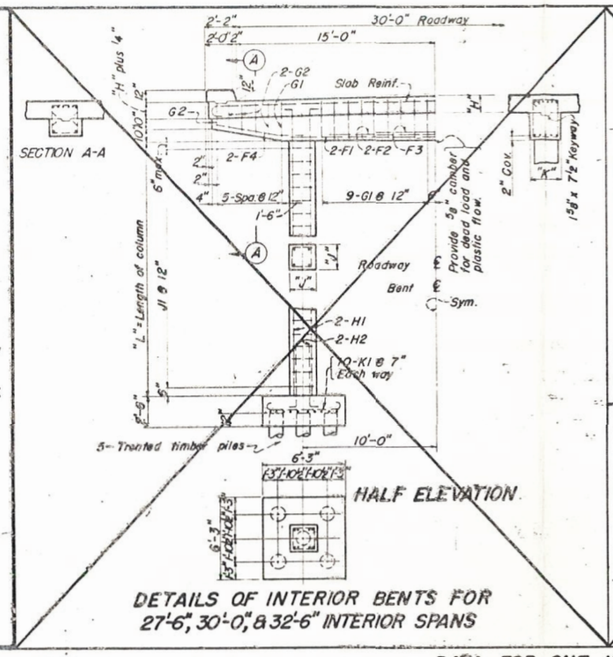
STR. NO. 62-100-399 TRIPP COUNTY

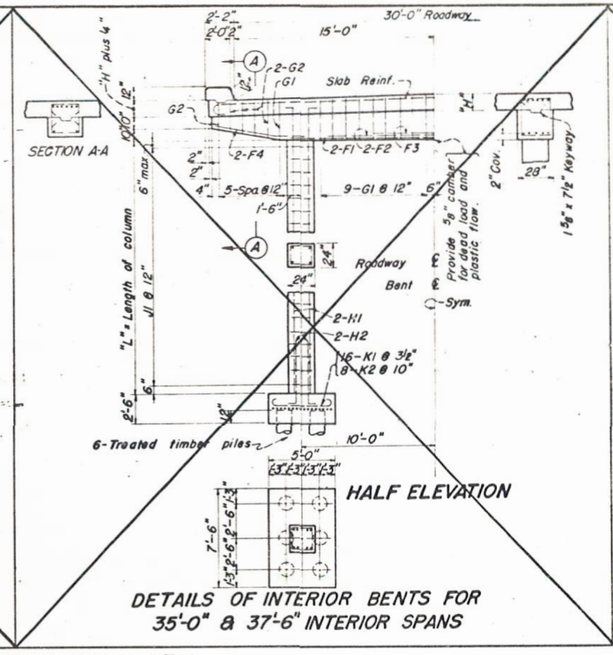
SOUTH DAKOTA H20-S16-44

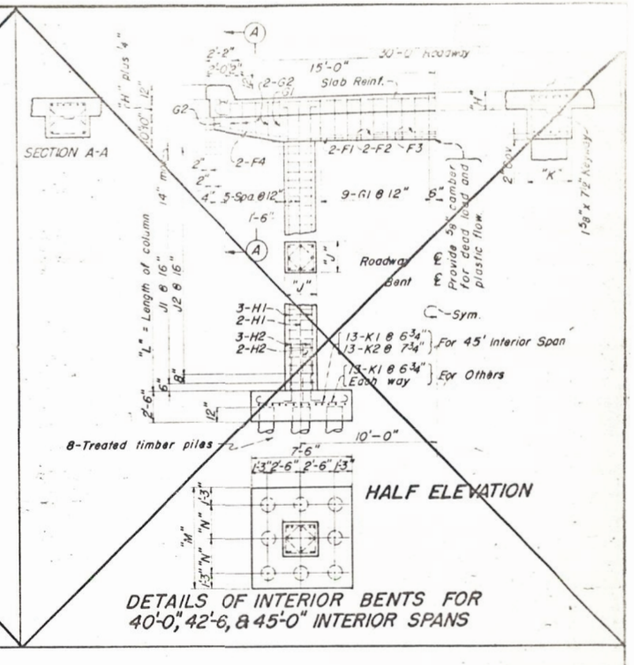
STATE HIGHWAY COMMISSION

1948









DETAILS OF INTERIOR BENTS

DETAILS OF INTERIOR BENTS FOR 27'-6", 30'-0", & 32'-6" INTERIOR SPANS

DETAILS OF INTERIOR BENTS FOR 35'-0" & 37'-6" INTERIOR SPANS

DETAILS OF INTERIOR BENTS FOR 40'-0", 42'-6, & 45'-0" INTERIOR SPANS

DATA FOR ONE INTERIOR BENT

REINFORCING SCHEDULE

LENGTH OF INTERIOR SPAN	F1 No.	F1 Size	F1 Length	F2 No.	F2 Size	F2 Length	F3 No.	F3 Size	F3 Length	F4 No.	F4 Size	F4 Length	F4 Type	G1 No.	G1 Size	G1 Length	G1 Type	G1 A	G1 B	G1 C	G2 No.	G2 Size	G2 Length	G2 Type	G2 B	G2 C
20'	2	1⅛	22'-0"	2	1⅛	16'-0"	1	1⅛	9'-0"	4	½	7'-0"	16	20	½	9'-9"	T1	7"	1'-9"	2'-6"	18	½	6'-3"	S3	1'-7½"	1'-9"
22'-6"	2	10	22'-6"	2	10	16'-3"	2	10	12'-0"	4	6	7'-0"	16	30	4	9'-3"	T1	5"	1'-7"	2'-8"	18	4	5'-9"	S3	1'-8½"	1'-7"
25'																10'-0"				2'-8"			6'-6"		1'-9"	
27'-6"																10'-3"			1'-9"	2'-9"			6'-9"		1'-10"	1'-9"
30'		1⅛			1⅛			1⅛								10'-9"			1'-11"	2'-9½"			7'-0"		1'-10½"	1'-11"
32'-6"		1¼			1¼			1¼								10'-9"			1'-11"	2'-10½"			7'-0"		1'-11"	1'-11"
35'																11'-3"			2'-1"	2'-11½"			7'-3"		2'-0"	2'-1"
37'-6"																11'-6"			2'-1"	3'-0½"			7'-6"		2'-1"	2'-1"
40'																12'-0"			2'-3"	3'-1½"			7'-9"		2'-2"	2'-3"
42'-6"																12'-6"			2'-5"	3'-2½"			8'-3"		2'-3"	2'-5"
45'	2	1¼	22'-0"	2	1¼	16'-0"	1	1¼	9'-0"	4	½	7'-0"	16	20	½	12'-9"	T1	7"	2'-5"	3'-3½"	18	½	8'-3"	S3	2'-4"	2'-5"

LENGTH OF INTERIOR SPAN	H1 No.	H1 Size	H1 Length	H1 Type	H1 A	H1 B	H2 No.	H2 Size	H2 Length	H2 Type	H2 A	H2 B	J1 No.	J1 Size	J1 Length	J1 Type	J1 A	J1 B	J1 C	J2 No.	J2 Size	J2 Length	J2 Type	J2 A	J2 B	J2 C
20'	8	1"		2	1'-2"	"L"+2'-5"	8	1"	6'-6"	2	1'-2"	5'-4"	✳	⅜	6'-6"	T1	5"	1'-4¾"	1'-4¾"	—	—	—	—	—	—	—
22'-6"	20	9	A+B	2	1'-2"	"L"+2'-4"	20	9	4'-3"	2	1'-2"	3'-6"		4	5'-3"	T1	5"	1'-5"	10"	⊠	4	5'-0"	T1	5"	1'-5"	7¾"
25'						"L"+2'-7"														—	—	—	—	—	—	—
27'-6"		1"	Length = A+B		1'-2"	"L"+2'-8"		1"	6'-6"		1'-2"	5'-4"			6'-6"			1'-4¾"	1'-4¾"	—	—	—	—	—	—	—
30'		1⅛			1'-3"	"L"+2'-8"		1⅛	7'-3"		1'-3"	6'-0"			7'-3"			1'-6¾"	1'-6¾"	—	—	—	—	—	—	—
32'-6"		1⅛			1'-3"	"L"+2'-9"		1⅛	7'-3"		1'-3"	6'-0"			7'-3"			1'-6¾"	1'-6¾"	—	—	—	—	—	—	—
35'		1¼			1'-5"	"L"+2'-10"		1¼	7'-9"		1'-5"	6'-4"			7'-9"			1'-8¾"	1'-8¾"	—	—	—	—	—	—	—
37'-6"	8	1¼			1'-5"	"L"+2'-11"	8	1¼	7'-9"		1'-5"	6'-4"	✳		7'-9"			1'-8¾"	1'-8¾"	—	—	—	—	—	—	—
40'	16	1"			1'-2"	"L"+3'-0"	16	1"	6'-6"		1'-2"	5'-4"	⊠		8'-6"			1'-10¾"	1'-10¾"	⊠	⅜	6'-6"	T1	5"	1'-4½"	1'-4½"
42'-6"	16	1"			1'-2"	"L"+3'-1"	16	1"	6'-6"		1'-2"	5'-4"	⊠		9'-3"			2'-0¾"	2'-0¾"	⊠	⅜	7'-0"	T1	5"	1'-6"	1'-6"
45'	16	1"		2	1'-2"	"L"+3'-2"	16	1"	6'-6"	2	1'-2"	6'-4"	⊠	⅜	9'-3"	T1	5"	2'-0¾"	2'-0¾"	⊠	⅜	7'-0"	T1	5"	1'-6"	1'-6"

LENGTH OF INTERIOR SPAN	K1 No.	K1 Size	K1 Length	K1 Type	K1 B	F5 No.	F5 Size	F5 Length	F5 Type	F5 B	DIMENSIONS "H"	DIMENSIONS "J"	DIMENSIONS "K"	DIMENSIONS "L"	DIMENSIONS "M"	DIMENSIONS "N"	LENGTH OF INTERIOR SPAN	BAR BENDS Note: Out to out dimensions.
20'	44	⅝	5'-6"	1	4'-4"	—	—	—	—	—	11½"	—	—		—	—	20'	
22'-6"	48	7	5'-6"	—	—	2	6	33'-6"	—	—	13"	—	—	See General Drawing for length "L"	—	—	22'-6"	
25'	44		5'-6"		4'-4"	—	—	—	—	—	13¼"	—	—		—	—	25'	
27'-6"	40		6'-9"		5'-7"	—	—	—	—	—	14¼"	20"	24"		—	—	27'-6"	
30'	40		6'-9"		5'-7"	—	—	—	—	—	15"	22"	26"		—	—	30'	
32'-6"	40		6'-9"		5'-7"	—	—	—	—	—	16"	22"	26"		—	—	32'-6"	
35'	32		8'-0"		6'-10"	16	⅝	5'-6"	1	4'-4"	17"	—	—		—	—	35'	
37'-6"	32	⅝	8'-0"		6'-10"	16	⅝	5'-6"	1	4'-4"	18"	—	—		—	—	37'-6"	
40'	52	1"	9'-0"		6'-10"	—	—	—	—	—	19"	26"	30"		7'-6"	2'-6"	40'	
42'-6"	52	1"	9'-0"		6'-10"	—	—	—	—	—	20"	28"	32"		7'-6"	2'-6"	42'-6"	
45'	26	1"	10'-0"	1	7'-10"	26	1"	9'-0"	1	6'-10"	21"	28"	32"	✡	8'-6"	3'-0"	45'	

✳ Number req'd equals "L" in inches divided by 3.

⊠ Number req'd equals "L" in inches divided by 6.

✡ "L" shall not exceed 25' or be less than 11'.

Note: Chamfer all exposed corners and edges to a 1" bevel on interior bents and abutments.

FRONT ELEVATION
DETAILS OF ABUTMENT

DETAIL (A)
(Typical for all abutment piles)

DETAIL (B)

SECTION A-A

SECTION B-B

SECTION C-C

REINFORCING SCHEDULE
(For two abutments)

No.	Size	Length	Mark	Type	A	BAR BENDS
8	1"	26'-6"	S1	Str.	—	
4	1"	35'-9"	S2	1	—	
8	1"	10'-0"	S3	16	—	
8	⅝	36'-9"	T1	2	—	
8	⅝	34'-0"	T2	Str.	—	
12	½	9'-9"	T3		—	
4	½	7'-9"	T4		—	
4	½	5'-9"	T5		—	
12	⅝	10'-0"	T6		—	
4	⅝	8'-0"	T7		—	
4	⅝	6'-0"	T8	Str.	—	
60	½	18'-0"	U1	17	—	
16	⅝	18'-6"	U2	18	—	
8	½	4'-10"	V1	Str.	—	
4		4'-6"	V2		—	
4		4'-0"	V3		—	
4		3'-6"	V4		—	
4		3'-0"	V5		—	
4		2'-6"	V6		—	
4		2'-0"	V7	Str.	—	
8		8'-0"	V8	19	5'-8"	
4		7'-9"	V9		5'-5"	
4		7'-3"	V10		4'-11"	
4		6'-9"	V11		4'-5"	
4		6'-3"	V12		3'-11"	
4		5'-9"	V13		3'-5"	
4	½	5'-3"	V14	19	2'-11"	

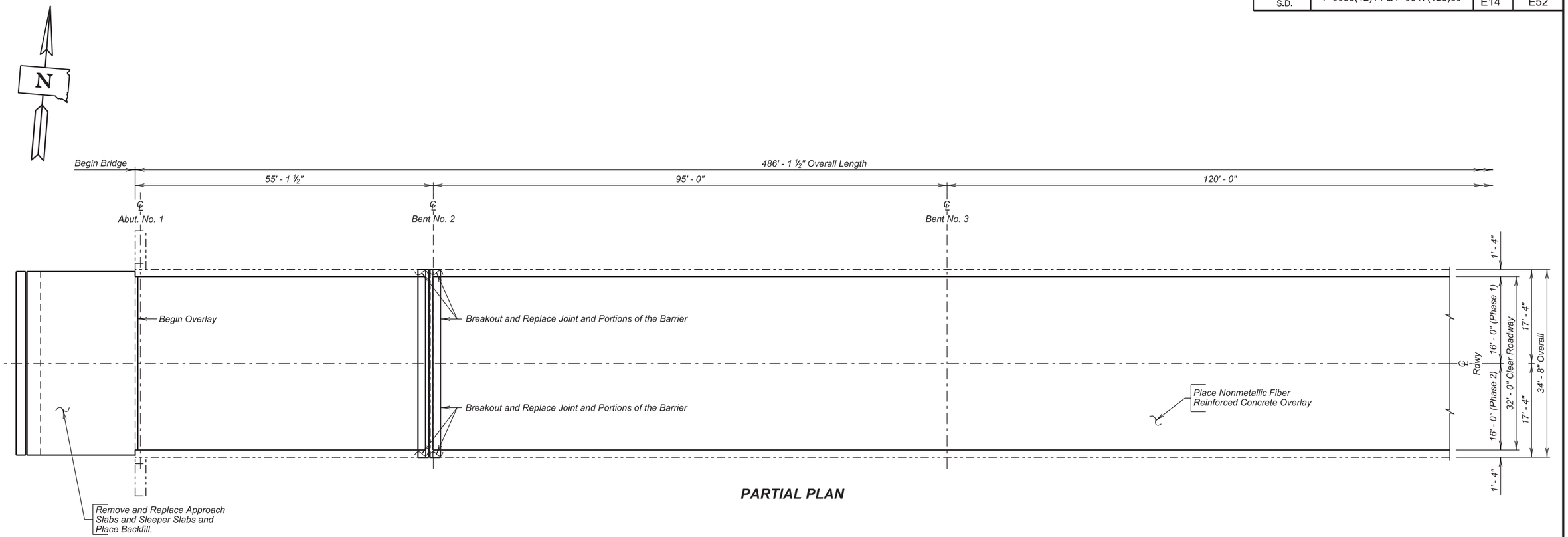
Note: All detail dimensions are out to out.

ORIGINAL CONSTRUCTION PLANS

SUBSTRUCTURE DETAILS
STR. NO. 62-100-399 FOR
105'-6" CONTINUOUS CONCRETE BRIDGE
30'-0" ROADWAY
OVER WILLOW CREEK SEC. 22/23- T97N- R78W
STA. 679+97.25 TO 681+02.75 C 9951
TRIPP COUNTY
SOUTH DAKOTA H20-S16-44
STATE HIGHWAY COMMISSION
1948

⑪ OF ⑪

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E14	E52



PARTIAL PLAN

-X071-

INDEX OF BRIDGE SHEETS -

LAYOUT FOR UPGRADE (A)

FOR

486' - 1½" COMPOSITE GIRDER BIRDGE

32' - 0" ROADWAY — 0° SKEW
OVER WHITE RIVER — SEC. 3-T103-R73W
STR. NO. 43-403-308 — P 0047(126)60
PCN 09LF

LYMAN COUNTY

S. D. DEPT. OF TRANSPORTATION

AUGUST 2025

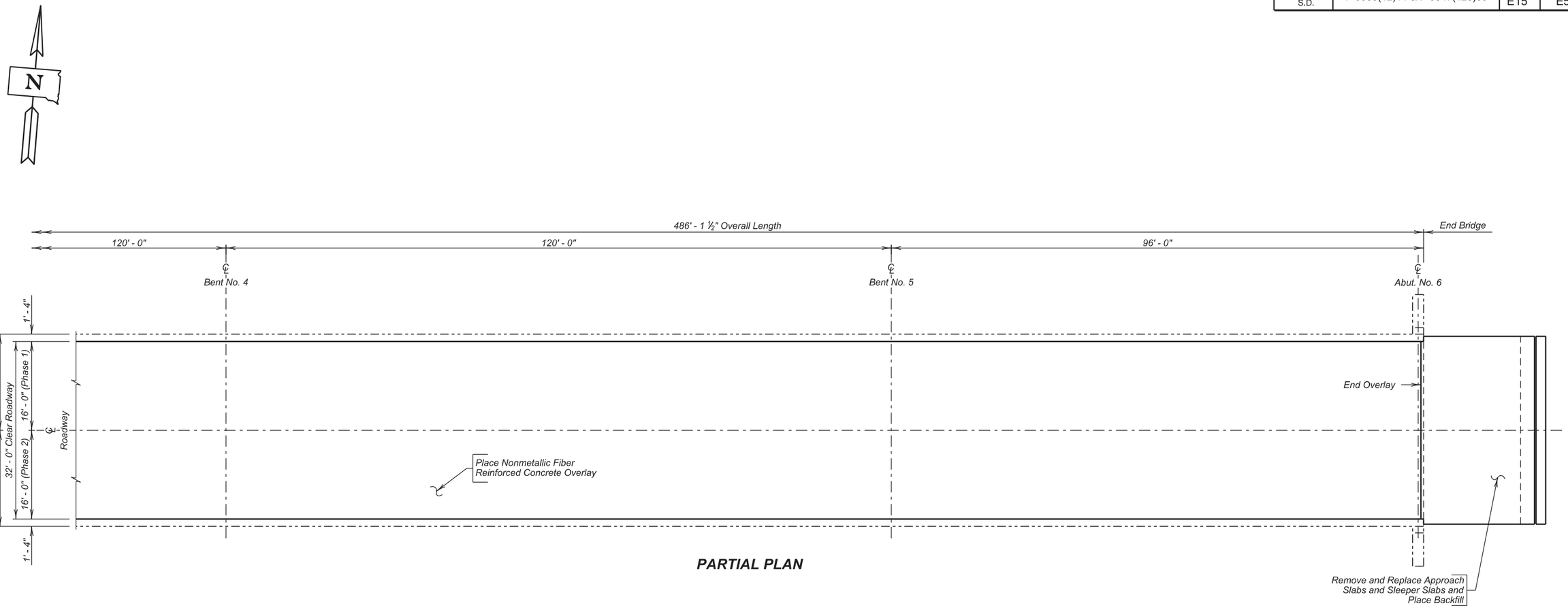
1 OF 39

-X071-

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

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	KR	Steve A Johnson BRIDGE ENGINEER
LYMN09LF	09LFRB01		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E15	E52



PARTIAL PLAN

LAYOUT FOR UPGRADE (B)

FOR

486' - 1½" COMPOSITE GIRDER BIRDGE

32' - 0" ROADWAY — 0° SKEW

OVER WHITE RIVER — SEC. 3-T103-R73W

STR. NO. 43-403-308 — P 0047(126)60

LYMAN COUNTY

S. D. DEPT. OF TRANSPORTATION

AUGUST 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	KR	Steve A. Johnson BRIDGE ENGINEER
LYMN09LF	09LFRB02		

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
110E0010	Remove Concrete Bridge Approach Slab	187.9	SqYd
410E0030	Structural Steel, Miscellaneous	Lump Sum	LS
410E2300	Strip Seal Expansion Joint	34.6	Ft
410E2600	Membrane Sealant Expansion Joint	67.8	Ft
430E0300	Granular Bridge End Backfill	9.2	CuYd
460E0030	Class A45 Concrete, Bridge Deck	5.4	CuYd
460E0150	Concrete Approach Slab for Bridge	154.2	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	33.8	SqYd
460E0300	Breakout Structural Concrete	4.6	CuYd
460E0380	Install Dowel in Concrete	44	Each
460E4000	Nonmetallic Fiber Reinforced Concrete Overlay	127.3	CuYd
480E0200	Epoxy Coated Reinforcing Steel	850	Lb
480E0504	No. 4 Rebar Splice	28	Each
480E0505	No. 5 Rebar Splice	32	Each
480E0506	No. 6 Rebar Splice	56	Each
480E5000	Galvanic Anode	136	Each
550E0100	Concrete Removal Type 1A	1707.6	SqYd
550E0110	Concrete Removal Type 1B	170.7	SqYd
550E0120	Concrete Removal Type 1C	85.4	SqYd
550E0130	Concrete Removal Type 1D	85.4	SqYd
550E0140	Concrete Removal Type B	20.0	Ft
550E0200	Class A45 Concrete Fill	18.4	CuYd
550E0500	Finishing and Curing	1707.6	SqYd

SPECIFICATIONS

1. Construction Specifications: Standard Specifications for Roads and Bridges, 10-1-25 Version; Required Provisions; and Special Provisions as included in the Proposal. The Standard Specifications for Roads and Bridges is available for download and viewing at https://dot.sd.gov/doing-business/contractors/standard-specifications.

2. All Welding and Welding Inspection will be in conformance with the latest edition of the AASHTO/AWS D1.5M/D1.5 Bridge Welding unless otherwise noted in this plan set.

DETAILS AND DIMENSIONS OF EXISTING BRIDGE

1. 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.

2. The stationing shown in the original construction plans is reversed from the current project. As such, labels for the begin and end of bridge as well as the substructure units are reversed.

GENERAL CONSTRUCTION - BRIDGE

1. All reinforcing steel will conform to ASTM A615, Grade 60.

2. All exposed concrete corners and edges will be chamfered ¾-inch unless noted otherwise in the plans. Match existing chamfer if the existing chamfer differs.

3. Use 2-inch clear cover on all reinforcing steel except as shown otherwise.

4. Barrier curbs will be built perpendicular to the grade.

5. Requests for construction joints or reinforcing steel 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.

6. Snap ties, if used in the barrier curb formwork, will be corrosion resistant. The corrosion resistant ties will be inert in concrete and compatible with the reinforcing steel.

7. All lap splices are contact lap splices unless noted otherwise.

BOLT TESTING

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

SCOPE OF BRIDGE WORK & SEQUENCE OF OPERATIONS

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

1. Accomplish all Concrete Removal Type 1A, 1B, 1C, 1D, and B and place Class A45 Concrete Fill to the satisfaction of the Engineer for the first phase of construction.

2. Breakout concrete around strip seal joint and barrier as shown in the plans for the first phase of construction.

3. Remove existing strip seal joint and reinforcement as shown in the plans for the first phase of construction.

4. Remove the existing approach and sleeper slabs for the first phase of construction.

5. Place new strip seal joint and reinforcement as shown in the plans for the first phase of construction.

6. Place Galvanic Anodes for the first phase of construction.

7. Place concrete around new strip seal joint and in barrier as shown in the plans for the first phase of construction.

8. Place a Nonmetallic Fiber Reinforced Concrete Overlay to the elevations shown in the plans on the bridge deck for the first phase of construction.

9. Replace approach slabs and sleeper slabs to the correct grade for the first phase of construction.

10. Replace sleeper slab joints with approved Membrane Sealant Expansion Joint for the first phase of construction.

11. Switch traffic and repeat steps 1 through 10 for the second phase of construction.

CONCRETE BREAKOUT

1. The existing joint and barrier will be broken out to the limits shown in the plans. Breakout limits will be defined with a 3/4" deep sawcut (unless specified otherwise in the plans), where practical, as approved by the Engineer. Reinforcing steel that is exposed and is scheduled for use in the new construction will be cleaned and straightened to the satisfaction of the Engineer. Care will 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 will be replaced or repaired, as approved by the Engineer, by the Contractor at no cost to the Department.

2. All broken out concrete, joint material, and discarded reinforcing steel will become the property of the Contractor and will be disposed of at a site obtained by the Contractor and approved by the Engineer. An appropriate site will be as described in the Environmental Commitment Notes in the plans.

3. During concrete removal operations, no concrete will be allowed to fall into the White River.

4. The contract unit price per cubic yard for Breakout Structural Concrete will include breaking out concrete, cleaning and straightening reinforcing steel, and disposal of all broken out and removed material.

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES

FOR

486' - 1 ½" COMPOSITE GIRDER BRIDGE

STR. NO. 43-403-308

AUGUST 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	JRB	Steven A. Johnson
LYMN09LF	09LFBB03		BRIDGE ENGINEER

GALVANIC ANODE

1. The Contractor will furnish and place galvanic anodes at the interface between old and new concrete at the joint and barrier repair area.

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

    a. Galvashield XP2
    Vector Corrosion Technologies
    65114 140th Ave.
    Wabasha, MN 55981
    Phone: (507) 259-2481
    Website: www.vector-corrosion.com

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

    c. Sika FerroGard 670
    Sika Corporation US
    201 Polito Avenue
    Lyndhurst, NJ 07071
    Phone: (800) 933-7452
    Website: http://usa.sika.com

3. The anodes will 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 will provide shop drawings of the galvanic anode installation including locations of the individual anodes to the Office of Bridge Design.

4. The anodes will be placed with a minimum ¾" cover and will be set in embedding mortar per the manufacturer's recommendations. The anodes will be fully encased in the concrete repair material. Where adequate cover does not exist, a concrete pocket will be chipped out behind the anode to provide minimum 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 will be cleaned per the manufacturer's recommendations to provide electrical connection and mechanical bond.

5. The electrical continuity of the connections and reinforcing steel will be confirmed per the manufacturer's recommendations.

6. In area of concrete repair where anodes are placed, the epoxy coating on the reinforcing steel will not require touch up.

7. The Contractor will provide manufacturer's product literature and installation instructions to the Engineer 10 days prior to installation.

8. All costs associated with placing anodes including labor, equipment, materials and incidentals will be included in the contract unit price per each for Galvanic Anode.

REMOVAL OF CONCRETE BRIDGE APPROACH SLAB

1. The existing concrete approach and sleeper slabs adjacent to the structure will be completely removed by the Contractor.

2. The concrete and reinforcing steel from the removal will be disposed of by the Contractor at an approved site. An appropriate site will be as described in the Environmental Commitment Notes.

3. The quantity provided for Remove Concrete Bridge Approach Slab is computed using the plan area for the sleeper slab and the plan area for the approach slab determined separately.

4. All labor, tools, equipment, and any incidentals necessary for removal and disposal of the existing approach slabs, strip seal joints, and sleeper slabs will be incidental to the contract unit price per square yard for Remove Concrete Bridge Approach Slab.

DESIGN MIX OF CONCRETE

1. Class A45 Concrete will be used for the contract items Concrete Approach Slab for Bridge and Concrete Approach Sleeper Slab for Bridge.

2. Class A45 Concrete, Bridge Deck will be used in the bridge deck and barrier for the joint repair.

3. The type of cement, concrete strength requirements, aggregate requirements, slump, and air requirements for the contract items Concrete Approach Sleeper Slab for Bridge, Concrete Approach Slab for Bridge, and Class A45 Concrete, Bridge Deck will conform to the requirements of Section 460 of the Construction Specifications.

APPROACH SLABS

1. Excavation for placement of new approach slabs and sleeper slabs will be done with minimal disturbance to the underlying material.

2. Prior to the placement of the approach and sleeper slabs, the existing MSE Bridge End Backfill material will be compacted using at least four complete passes of a smooth face vibratory roller or vibratory plate compactor. A layer of type B drainage fabric will be placed and Base Course will be used as required to fill any low spots and to achieve the elevation needed for installation of the new approach and sleeper slabs. The existing and fill material will be thoroughly watered prior to and during compaction. Base Course will be in accordance with Section 882 of the Construction Specifications.

3. The top of approach slab elevations will be subject to the approval of the Engineer. Care will be taken to provide a smooth transition from the bridge deck elevations to the new pavement elevations established in the field so as to prevent any dips or bumps in the areas of the bridge ends or ends of the new approach slabs. The maximum rate of grade transition through the approach slab will be 1/8 inch per 10 feet.

4. Sleeper slab riser will be cast with or later than the approach slab. Care will be taken to ensure the correct grade is maintained across the joint.

5. The portion of the sleeper slab below the construction joint may be precast. If the bottom portion of the sleeper slab is precast, the Contractor will submit proposed lifting and setting plans to the Bridge Construction Engineer for approval. In addition, if reinforcing or other details differ from those shown in the plans, the Contractor will submit proposed alternate details for approval.

6. The use of an Engineer approved vibratory screed will be required during placement of Class A45 Concrete for the approach slabs. Concrete placement in front of the screed will be kept parallel to the screed.

7. The concrete in the approach slab will be tined perpendicular to the centerline of the roadway.

8. The new approach slabs and sleeper slabs will have a surface finish as specified in Section 460.3 L.4 of the Construction Specifications.

9. The quantity of Base Course required to fill any low spots or voids is based on a 2-inch layer under the area of the approach slab. The actual quantity may vary.

10. The concrete approach slabs will be cured in accordance with Section 460.3 M of the Construction Specifications. The minimum 7-day cure time requirement will be waived. The approach slabs will be cured until a minimum compressive strength of 4,000 psi is reached.

11. Concrete Approach Sleeper Slab for Bridge will be paid for at the contract unit price per square yard. This payment will be full compensation for excavation; furnishing, hauling, and placing all materials including: concrete, concrete anchors, and reinforcing steel; for disposal of all excavated material and surplus materials; labor; tools; equipment; and any incidentals necessary to complete this item of work.

NOTES (CONTINUED)
FOR
486' - 1 ½" COMPOSITE GIRDER BRIDGE

STR. NO. 43-403-308
AUGUST 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	JRB	Steven A. Johnson BRIDGE ENGINEER
LYMN09LF	09LFBB04		

APPROACH SLABS (CONTINUED)

12. Concrete Approach Slab for Bridge will be paid for at the contract unit price per square yard. This payment will be full compensation for excavation; furnishing, hauling, and placing all materials including: concrete, asphalt paint or 6 mil polyethylene sheeting, elastic joint sealer, and reinforcing steel; for disposal of all excavated material and surplus materials; labor; tools; equipment; and any incidentals necessary to complete this item of work.

13. Any Base Course, type B drainage fabric, and compaction required to fill any low spots or voids will be paid for at the contract unit price per cubic yard for Granular Bridge End Backfill. This payment will be full compensation for furnishing, hauling, and placing all materials including disposal of all surplus materials; labor; tools; equipment; and any incidentals necessary to complete this item of work.

STRIP SEAL INSTALLATION

1. Materials for structural plates will conform to ASTM A709, Grade 36. Material for the steel extrusion will conform to ASTM A36 or A588. All steel components, steel plates, and structural shapes will be galvanized after shop welding in accordance with ASTM A123.

2. Bolts will be 3/4" diameter ASTM F3125 Grade A325. Each bolt will be supplied with a heavy hex nut and square washer. Bolt is to be turned 1/3 turn beyond snug tight. The rotational-capacity test will not be required for erection bolts.

3. The end-welded concrete anchors will conform to Type A steel studs of the latest edition of ANSI/AWS D1.5 Structural Steel Welding Code. The end-welded deformed bar anchors will be commercially available Fluxed Deformed Bar Anchor Studs, automatically end-welded, with material conforming to ASTM A1064.

4. The configuration and dimensions of the steel extrusions and neoprene seal may vary according to each Manufacturer's design. The shape of the neoprene seal will be compatible with the steel extrusions. Material for the neoprene seal will conform to that specified in ASTM D2628 modified to omit the recovery test. No splices will be permitted in the neoprene seal.

5. The lubricant adhesive used to install the neoprene seal will conform to the requirements of ASTM D4070. The neoprene seal and the lubricant adhesive must be compatible.

6. The steel extrusions will be dry, clean, and free of all surface contaminants when the neoprene seal is installed. The installation of the preformed neoprene seal will be as recommended by the Manufacturer and approved by the Engineer, but in general will be installed and bonded to the steel extrusion with a high-solids lubricant adhesive. The preformed neoprene seal will be installed after the steel extrusions are installed in the bridge deck.

7. The two steel extrusions of the new expansion joint will be placed parallel to each other at the required joint opening as specified by the joint installation table.

8. The complete expansion device will be set at the correct grade and crown slope and securely supported during placement of Class A45 Concrete. Care will be taken to ensure that the correct grade is maintained across the joint.

9. The cost of furnishing, galvanizing, welding, and installing all required materials including labor, equipment, and incidentals necessary to complete the work in accordance with the plans will be included in the contract unit price per foot for Strip Seal Expansion Joint.

AS-BUILT ELEVATION SURVEY

The Contractor will be responsible for producing an as-built elevation survey soon after construction is complete and before the bridge is completely opened to traffic The Contractor will be responsible for recording the as-built elevations at the locations shown by the table of as-built elevations shown in the plans. The completed table will be given to the Engineer who will forward a copy to the Bridge Maintenance Engineer in the Office of Bridge Design and the Region Bridge Engineer. The elevations will be based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88) and will use the control point provided in the plans. The Contractor will be responsible for verifying the NAVD88 elevation for the control point provided in the plans. All costs associated with obtaining the NAVD88 elevations at the locations shown in the table and for the control point shown in the plans, including all equipment, labor and any incidentals required will be incidental to the contract lump sum price for Bridge Elevation Survey.

NONMETALLIC FIBER REINFORCED CONCRETE OVERLAY

1. The overlay placed on the existing bridge deck will consist of a Nonmetallic Fiber Reinforced concrete.

2. The preparation for resurfacing consists of Concrete Removal Type 1A on the entire bridge deck and Type 1B, Type 1C, Type 1D and Type B over the deck surface as detailed on the plan sheets. Such removal will be in conformance with these plans and Section 550 of the Construction Specifications. Extreme care will be taken during the Concrete Removal 1A to assure that the existing reinforcing steel is not damaged. In the event that reinforcing steel damage inadvertently occurs, the Bridge Construction Engineer will be immediately notified. Any damaged reinforcing steel will be repaired by the Contractor, as approved by the Engineer, at no additional cost to the Department.

3. Extreme care will be taken during Removal Type 1B, 1C, 1D, and B to ensure that the existing reinforcing steel is not damaged. In the event reinforcing steel damage inadvertently occurs, the Bridge Construction Engineer will be immediately notified. Any damaged reinforcing steel will be repaired by the Contractor, as approved by the Engineer, at no additional cost to the Department.

4. Class A45 Concrete Fill and Concrete Removal Type 1B, 1C, 1D, and B may not be encountered and may be omitted from the project as determined by the Engineer.

5. Concrete Removal Type 1C, Concrete Removal Type 1D, and Class A45 Concrete Fill are not anticipated to exceed the plan shown quantities. If the Engineer determines that Concrete Removal Type 1C, Concrete Removal Type 1D, and/or Class A45 Concrete Fill in excess of the plan quantity shown is necessary, payment for the additional quantity will conform with Section 550.5 of the Construction Specifications.

6. Concrete used in the Nonmetallic Fiber Reinforced Concrete Overlay will meet the requirements of Section 550 of the Construction Specifications except as noted. The Nonmetallic Fiber Reinforced Concrete at the time of placement will contain 6.5 percent plus or minus 1.0 percent entrained air and slump of the concrete will be maintained between 1 ½ and 4 ½ inches. Class A45 Concrete Fill will be an approved A45 Concrete Mix Design mixed and proportioned in accordance with Section 460 of the construction specifications with the following modifications: the coarse aggregate gradation will be in accordance with Section 820 of the Construction Specifications and the size #3 will be substituted in lieu of sizes #1 and #15. In addition, both the Nonmetallic Fiber Reinforced Concrete Overlay and Class A45 Concrete Fill will conform to the following Alkali Silica Reactivity (ASR) requirements:

   a. Fine aggregates from sources that have not been tested by the Department will be submitted to the Department's Materials and Surfacing Central Materials Laboratory for ASR testing 30 days prior to performing the concrete mix design.

   b. When a fine aggregate supplier changes location within the pit, the fine aggregate from the new location in the pit will be submitted for testing.

   c. When more than one source of fine aggregate is blended to meet the gradation specifications, the expansion value of the blended sands will be used. Blended sources will be treated as a new source and it will be the responsibility of the Contractor to submit the blended samples for testing 30 days prior to performing the concrete mix design.

   d. ASR testing will be performed in accordance with ASTM C1260, except that the gradation of the material used for testing will be as produced from the source. The fine aggregate will only be sampled at the source by a Department representative or in the presence of a Department representative.

NOTES (CONTINUED)

FOR

486' - 1 ½" COMPOSITE GIRDER BRIDGE

STR. NO. 43-403-308

AUGUST 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	JRB	Steven A. Johnson BRIDGE ENGINEER
LYMN09LF	09LFBB05		

NONMETALLIC FIBER REINFORCED CONCRETE OVERLAY (CONT.)

e. The Department will use the running average of the last three known expansion test results or less for determining acceptability of the source. Additional testing, when requested by the Contractor, will be performed by the Department at the Contractor's expense.

f. A list of known fine aggregate sources and the average corresponding 14-day expansion values as of October 2024 is provided below in Table 1.

Table 1: Fine Aggregate Sources, October 2024

Source	Location	Expansion Value
Bachman	Winner, SD	0.335*
Bitterman	Delmont, SD	0.316*
Concrete Materials	Corson, SD	0.146
Concrete Materials – Vellek Pit	Yankton, SD	0.411**
Croell	Hot Springs, SD	0.089
Croell	Wasta, SD	0.212
Emme Sand & Gravel	Oneil, NE	0.217
Fisher S&G – Blair Pit	W of Vale, SD	0.171
Fisher S&G – Mickelson Pit	E of Nisland, SD	0.129
Fisher S&G – Vallery Pit	Nisland, SD	0.110
Fisher S&G	Rapid City, SD	0.092
Fisher S&G	Spearfish, SD	0.053
Fisher S&G	Wasta, SD	0.159
Fuchs	Pickstown, SD	0.275*
Henning – Tilstra Pit	Ash Creek, MN	0.199
Higman	Hudson, SD	0.187
Jensen	Herried, SD	0.276*
L.G. Everist	Akron, IA	0.257*
L.G. Everist	Brookings, SD	0.297*
L.G. Everist – Ode Pit	E Sioux Falls, SD	0.222
L.G. Everist – Nelson Pit	NE Sioux Falls, SD	0.156
L.G. Everist	Hawarden, IA	0.211
L.G. Everist	Summit, SD	0.184
Mark's S&G – Moerke Pit	Underwood, MN	0.165
Morris – Birdsall	Blunt, SD	0.229
Morris – Leesman	Blunt, SD	0.231
Morris – Richards Pit	Onida, SD	0.188
Morris – Shawn's Pit	E of Sturgis, SD	0.186
Northern Concrete Agg.	Rauville, SD	0.113
Northern Concrete Agg.	Luverne, MN	0.154
Opperman – Gunvordahl Pit	Burke, SD	0.363*
Opperman – Cahoy Pit	Herrick, SD	0.307*
Opperman – Jones Pit	Burke, SD	0.321*
Opperman – Randall Pit	Pickstown, SD	0.230
Pete Lien & Sons	Creston, SD	0.158
Pete Lien & Sons	Oral, SD	0.157
Pete Lien & Sons	Wasta, SD	0.255*
Simon Materials – Beltline Pit	Scottsbluff, NE	0.277*
Thorpe Pit	Britton, SD	0.098
Valley S&G – Van Beek Pit	Rock Valley, IA	0.228
Wagner Building Supplies	Pickstown (Wagner), SD	0.251*
Winter Brothers – Whitehead Pit	Brookings, SD	0.197

* These sources will require Type II cement with a fly ash content of 25% in the concrete mix.
** These sources will not be used.

g. The values in Table 1 are intended for use in bidding. If a pit, previously tested by SDDOT, with a test value less than 0.250% is discovered after letting to be 0.250% or greater, then the Department will accept financial responsibility if higher costs are incurred due to a higher required percentage of fly ash and/or a higher amount of lithium nitrate is added to the concrete mix.

h. Based on course aggregate composition and expansion test results, the Contractor will use Table 2 to determine the percentage of cement to be replaced with Class F Modified Fly Ash (in accordance with Section 605 of the Construction Specifications) and/or specified rate of lithium nitrate (30% solution by weight) to be provided in the concrete mix for the Nonmetallic Fiber Reinforced Concrete Overlay and Class A45 Concrete Fill. Fine aggregate with a 14-day expansion value of 0.400 or greater will not be used.

Table 2: Cement Replacement

Coarse Aggregate	Fine Aggregate Expansion Value	Cement Type	Fly Ash	Lithium Nitrate
Limestone or Granite	< 0.250%	Type I or II	-----	2.0 gallon/cubic yard
		Type I or II	20% Min.	-----
Limestone or Granite	≥ 0.250%	Type I or II	-----	3.0 gallon/cubic yard
		Type I or II	25%	-----
Quartzite	< 0.250%	Type I or II	-----	3.0 gallon/cubic yard
		Type I or II	25%	-----
Quartzite	≥ 0.250%	Type I or II	-----	3.5 gallon/cubic yard
		Type I or II	25%	1.5 gallon/cubic yard
		Type I or II	30%	-----

i. Grout for bonding new concrete to old concrete will meet the requirements of Section 550 of the Construction Specifications.

j. All material, labor, equipment, and incidental costs to meet ASR requirements will be included in the contract unit price for Nonmetallic Fiber Reinforced Concrete Overlay or Class A45 Concrete Fill.

7. Suppliers of Lithium are listed below:

a. BASF Construction Chemical
23700 Chagrin Boulevard
Beachwood, Ohio 44122
1-612-961-8575
website: www.master-builders-solutions.basf.us/en-us

b. FMC Corporation
2801 Yorkmont Road, Suite 300
Charlotte, North Carolina 28208
1-704-868-5300
website: www.fmclithium.com

NOTES (CONTINUED)
FOR
486' - 1 ½" COMPOSITE GIRDER BRIDGE

STR. NO. 43-403-308
AUGUST 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	JRB	Steve A. Johnson BRIDGE ENGINEER
LYMN09LF	09LFBB06		

NONMETALLIC FIBER REINFORCED CONCRETE OVERLAY (CONT.)

8. No traffic will be allowed to operate on the scarified portion of the bridge deck. If it appears that the entire Nonmetallic Fiber Reinforced Concrete Overlay cannot be completed prior to winter, Concrete Removal Type 1A, 1B, 1C, 1D, and B will not be done until work resumes in the spring. In the event, scarification has been started and due to unforeseen circumstances, it becomes impossible to complete the placement of the overlay on the entire surface of the structure prior to winter the Office of Bridge Design will be notified. Recommendations for handling winter traffic will then be made. These recommendations may include, but are not limited to, filling extra depth removal areas with Class A45 Concrete, placing an asphalt overlay on the uncompleted area so that the entire roadway width may be opened to traffic, removal of the asphalt overlay when work is resumed and scarifying an additional 1/4" of depth on the bridge deck. The cost of this work, including asphalt overlay, scarification, Class A45 Concrete, extra Nonmetallic Fiber Reinforced Concrete Overlay and all other items incidental to this work, will be at the expense of the Contractor.

9. It will be necessary for the Contractor to shape the surface of the Nonmetallic Fiber Reinforced Concrete Overlay within one foot of the curb to ensure that water drains to the deck drains or off the ends of the bridge.

10. Where a bridge deck finishing machine cannot be used, a vibratory screed will be used and the type of screed will be approved by the Engineer.

11. The Nonmetallic Fiber Reinforcement will be a macro fiber approximately 1 ½ inch or longer (W.R. Grace – STRUX 90/40 or approved equal) at an addition rate of 8 lb/cubic yard. The fiber will be designed specifically for use in concrete and will be supplied by a manufacturer with a documented history of providing fibers for use in concrete.

12. A test placement of the Nonmetallic Fiber Reinforced Concrete will be required to determine acceptable mixing sequencing and finishing techniques before any Nonmetallic Fiber Reinforced Concrete is placed on the bridge deck. The test placement can be any location on or off the project site as approved by the Engineer. The test placement must be the same size as the anticipated batch size for the actual placement or as approved by the Engineer.

13. Mixing concrete by Section 460.3.E will be allowed as long as the mixing method ensures a uniform disbursement of the nonmetallic fibers in the concrete mix. The Contractor will submit a mixing method to the Engineer for approval.

14. Nonmetallic Fiber Reinforced Concrete will be measured to the nearest cubic yard of concrete placed. Deductions will not be made for material wasted in the finishing operations unless the waste becomes excessive.

15. Nonmetallic Fiber Reinforced Concrete Overlay will be paid for at the contract unit price per cubic yard. Payment will be full compensation for labor, equipment, materials, test pour, and all incidental work required.

NOTES (CONTINUED)

FOR

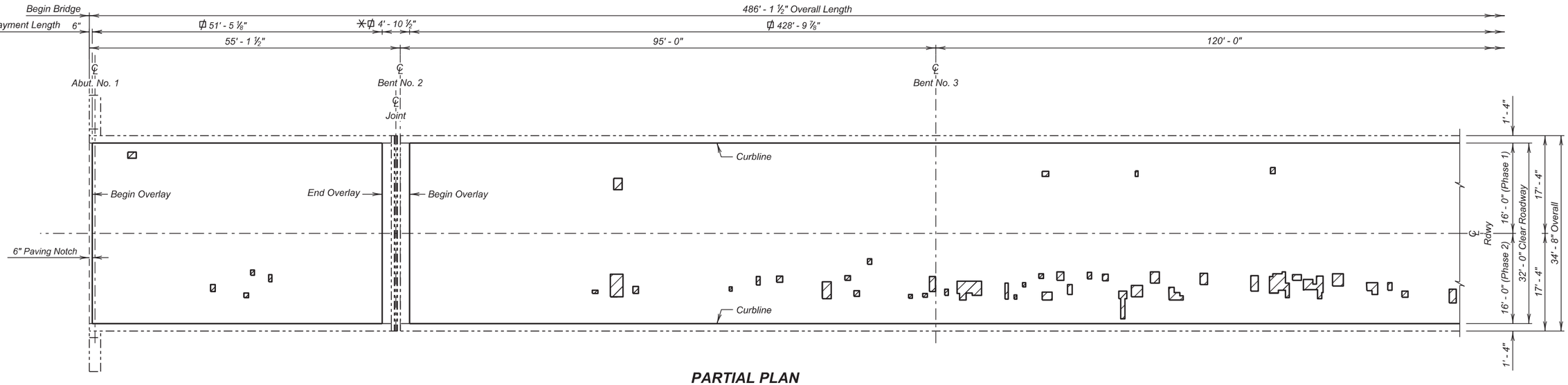
486' - 1 ½" COMPOSITE GIRDER BRIDGE

STR. NO. 43-403-308

AUGUST 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB LYMN09LF	TJM 09LFBB07	JRB	Steven A. Johnson BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E21	E52



PARTIAL PLAN

LEGEND:

- ⏢ *Dimensions based on a temperature of 70°*
- ⚹ *No overlay will be placed in this area*
- ▨ *Shaded areas indicate approximate locations of unsound concrete requiring concrete repair.*

DECK DELAMINATION DETAILS (A)

FOR

486' - 1½" COMPOSITE GIRDER BIRDGE

32' - 0" ROADWAY
OVER WHITE RIVER
STR. NO. 43-403-308

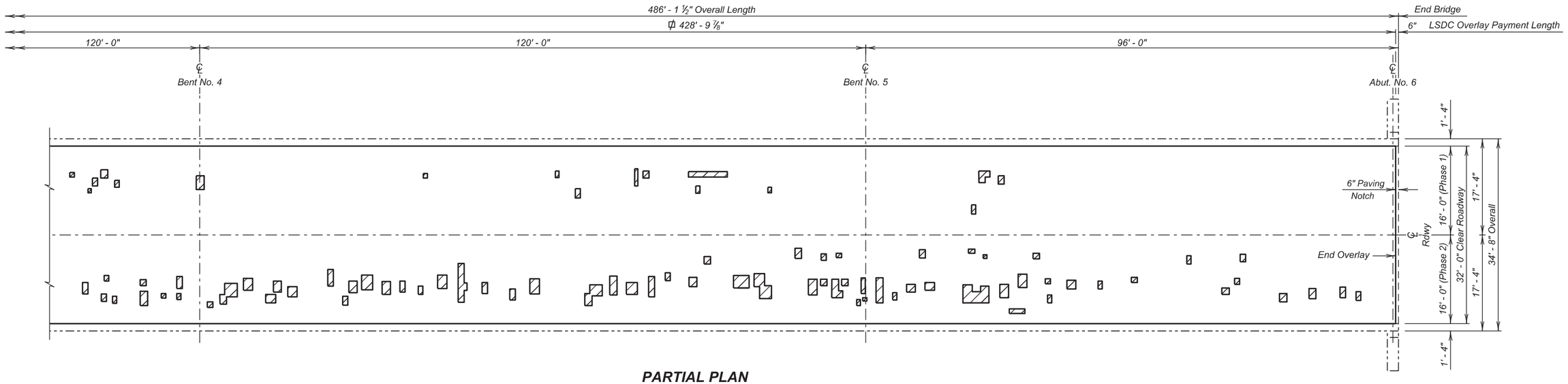
0° SKEW
SEC. 3-T103-R73W
P 0047(126)60

LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2025

8 OF 39

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	JRB	Steven A Johnson BRIDGE ENGINEER
LYMN09LF	09LFBB08		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E22	E52



PARTIAL PLAN

LEGEND:

℄ *Dimensions based on a temperature of 70°*

Shaded areas indicate approximate locations of unsound concrete requiring concrete repair.

DECK DELAMINATION DETAILS (B)

FOR

486' - 1½" COMPOSITE GIRDER BIRDGE

32' - 0" ROADWAY — 0° SKEW

OVER WHITE RIVER — SEC. 3-T103-R73W

STR. NO. 43-403-308 — P 0047(126)60

LYMAN COUNTY

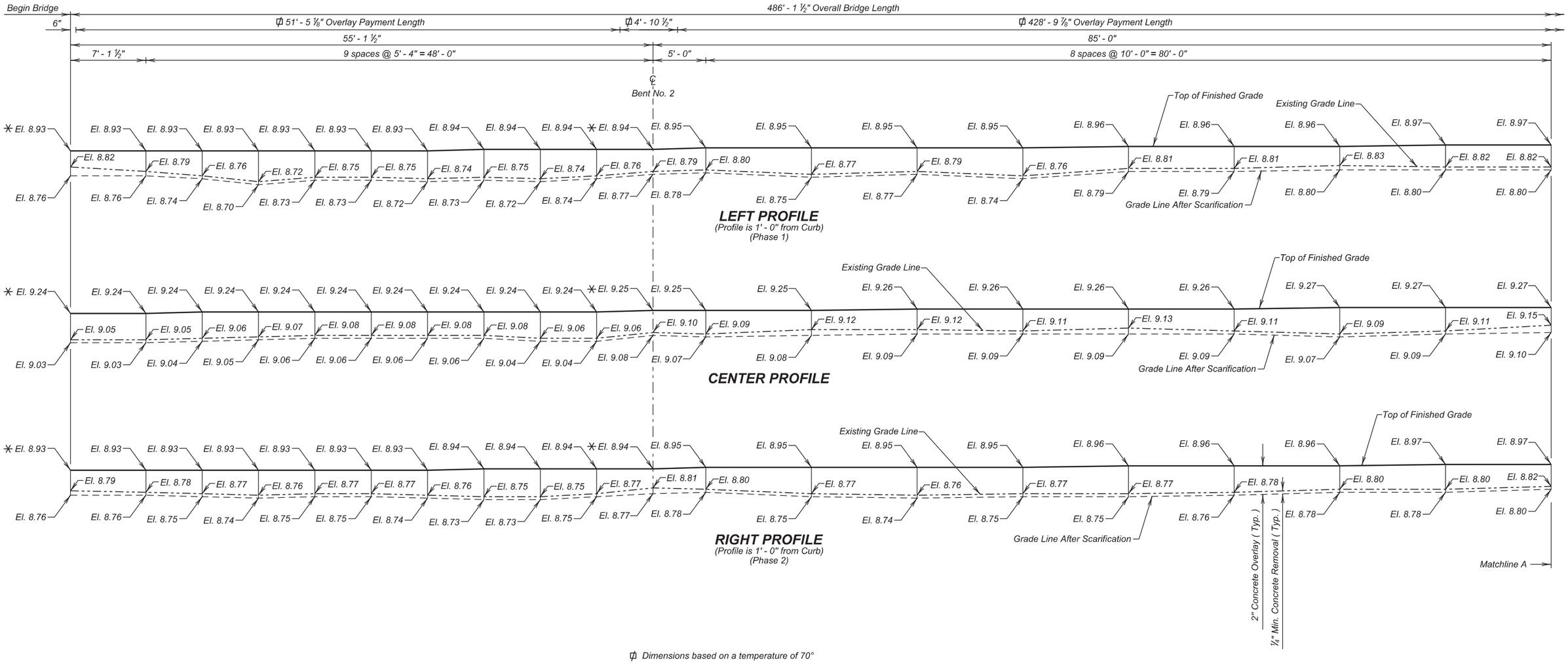
S. D. DEPT. OF TRANSPORTATION

AUGUST 2025

9 OF 39

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	JRB	Steve A. Johnson BRIDGE ENGINEER
LYMN09LF	09LFBB09		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E23	E52



℄ *Dimensions based on a temperature of 70°*

✳ *Overlay starts before or after point indicated but are provided for reference. Transitions to approach slabs and joints should be smooth.*

0' .25' .5' 1.00'

VERTICAL SCALE

Benchmark Description:

B.M. # CP 38
Location Description: NE Corner of Bridge Rebar & Grds w/Alum. Cap
Elevation: 1406.605

NOTE :
Add 1400.00 all elevations shown on profiles.

DECK PROFILES FOR NONMETALLIC FIBER REINFORCED CONCRETE OVERLAY (A)

FOR

486' - 1½" COMPOSITE GIRDER BIRDGE

32' - 0" ROADWAY
OVER WHITE RIVER
STR. NO. 43-403-308

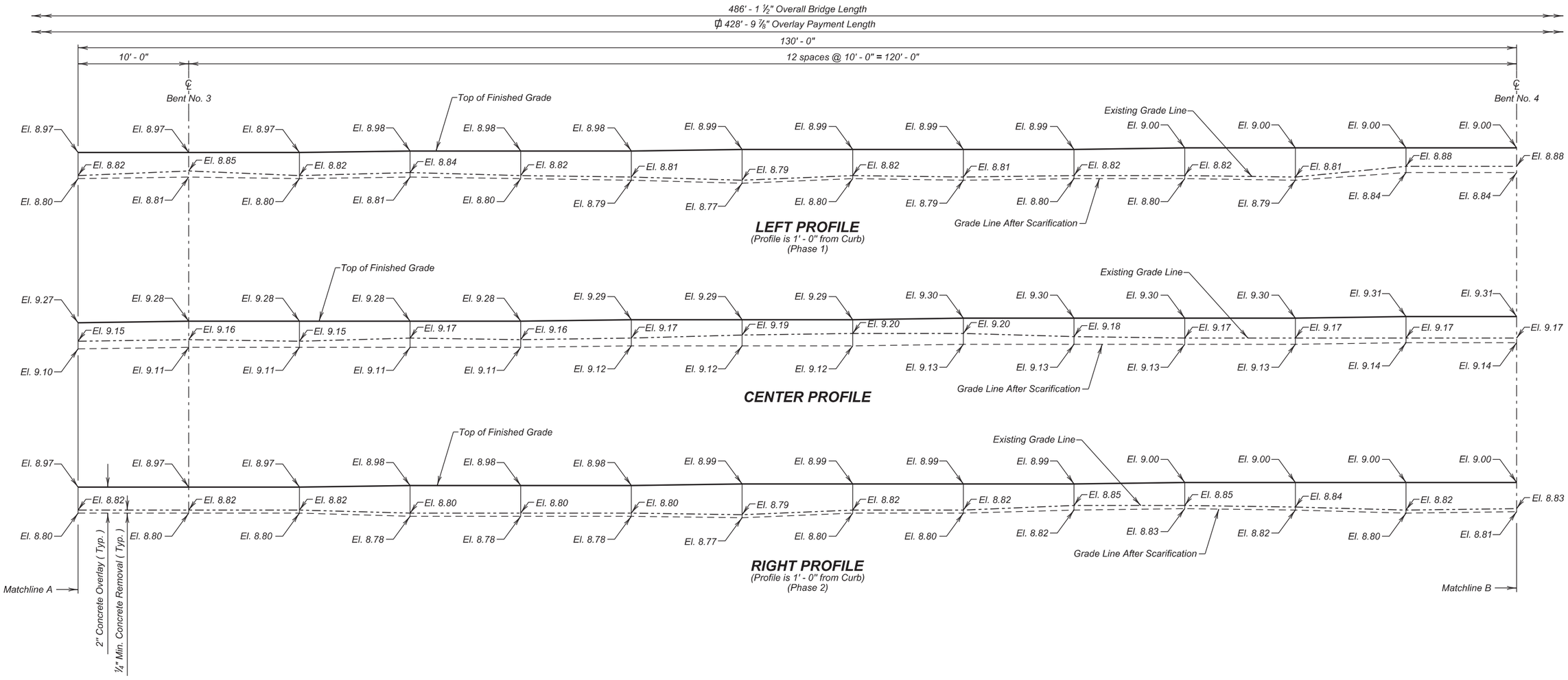
0° SKEW
SEC. 3-T103-R73W
P 0047(126)60

LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2025

10 OF 39

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	KR	Steven A. Johnson BRIDGE ENGINEER
LYMN09LF	09LFRA10		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E24	E52



0' .25' .5' 1.00'

VERTICAL SCALE

℄ Dimensions based on a temperature of 70°

NOTE :
Add 1400.00 all elevations shown on profiles.

DECK PROFILES FOR NONMETALLIC FIBER REINFORCED CONCRETE OVERLAY (B)

FOR

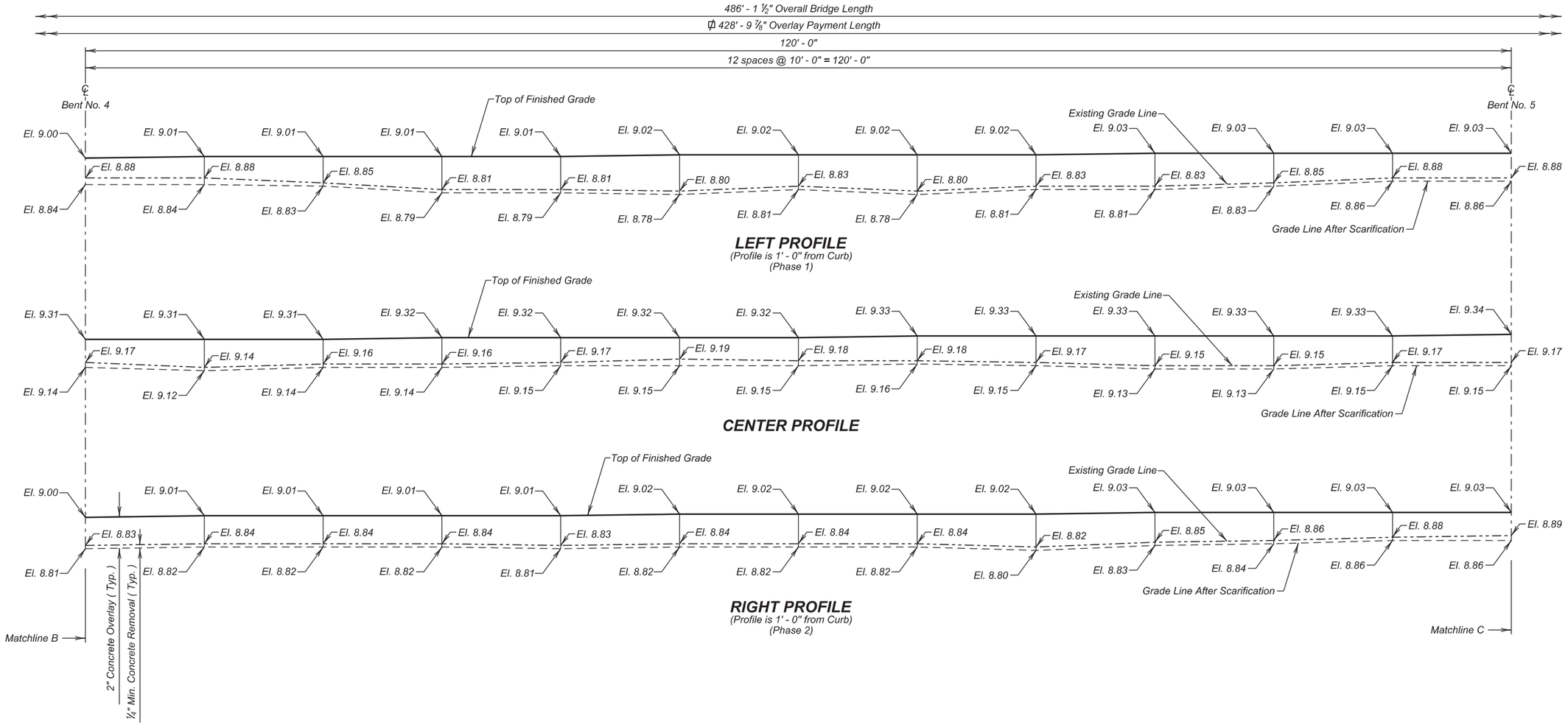
486' - 1½" COMPOSITE GIRDER BIRDGE

32' - 0" ROADWAY — 0° SKEW
OVER WHITE RIVER — SEC. 3-T103-R73W
STR. NO. 43-403-308 — P 0047(126)60

LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	KR	Steve A Johnson BRIDGE ENGINEER
LYMN09LF	09LFRA11		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E25	E52



0' .25' .5' 1.00'

VERTICAL SCALE

℄ Dimensions based on a temperature of 70°

NOTE :
Add 1400.00 all elevations shown on profiles.

DECK PROFILES FOR NONMETALLIC FIBER REINFORCED CONCRETE OVERLAY (C)

FOR

486' - 1½" COMPOSITE GIRDER BIRDGE

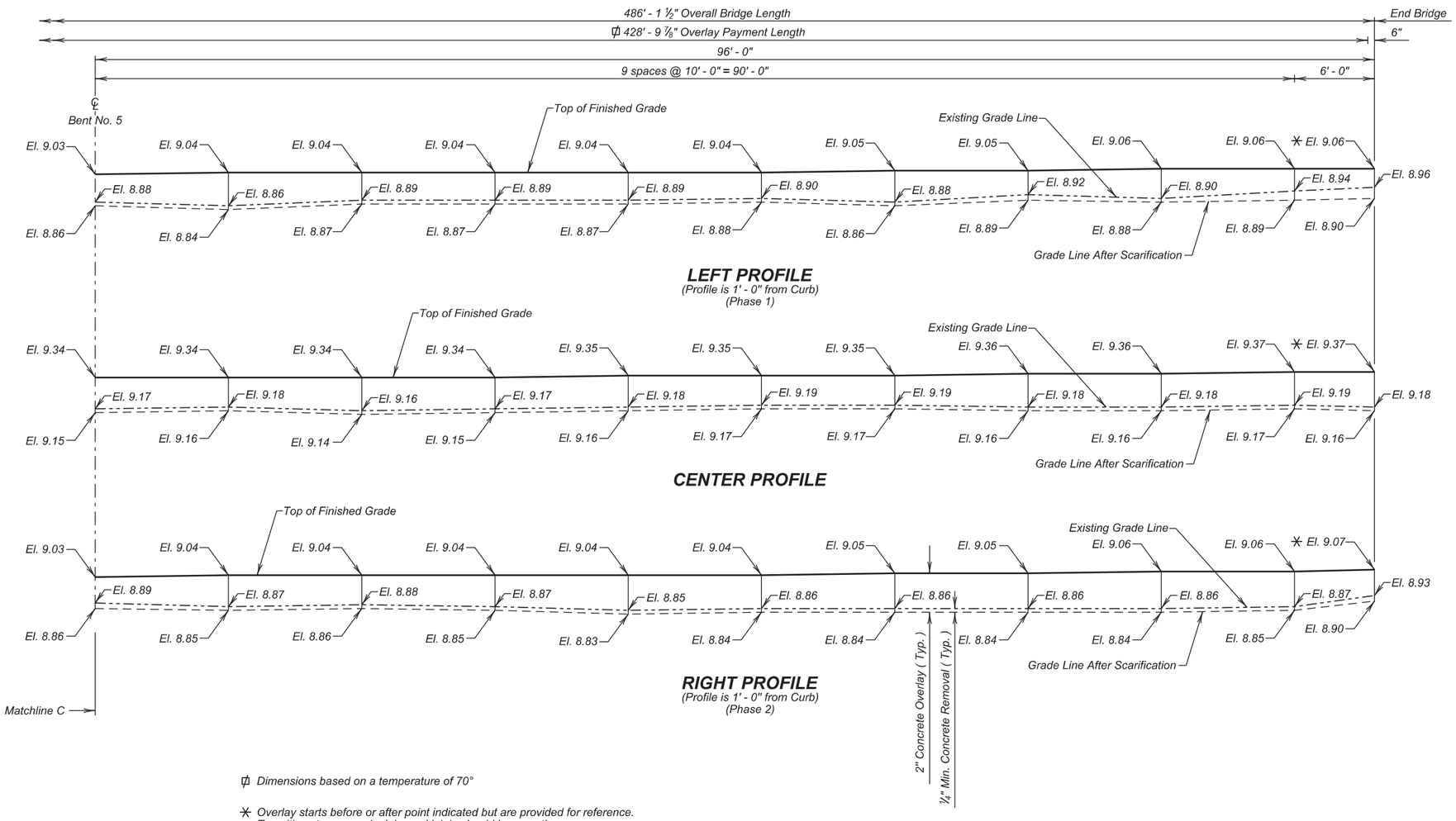
32' - 0" ROADWAY — 0° SKEW
OVER WHITE RIVER — SEC. 3-T103-R73W
STR. NO. 43-403-308 — P 0047(126)60

LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2025

12 OF 39

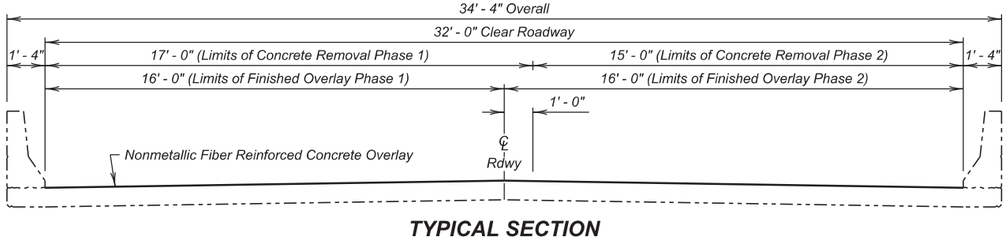
DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	KR	Steven A. Johnson BRIDGE ENGINEER
LYMN09LF	09LFRA12		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E26	E52



℄ Dimensions based on a temperature of 70°

✳ Overlay starts before or after point indicated but are provided for reference. Transitions to approach slabs and joints should be smooth.



TYPICAL SECTION

NOTE :

Add 1400.00 all elevations shown on profiles.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY	
		Phase I	Phase 2
Nonmetallic Fiber Reinforced Concrete Overlay	CuYd	63.4	63.9
Concrete Removal Type 1A	SqYd	907.2	800.4
Concrete Removal Type 1B	SqYd	90.7	80.0
Concrete Removal Type 1C	SqYd	45.4	40.0
Concrete Removal Type 1D	SqYd	45.4	40.0
Concrete Removal Type B	Ft.	10.0	10.0
Class A45 Concrete Fill	CuYd	9.8	8.6
Finishing and Curing	SqYd	853.8	853.8

DECK PROFILES FOR NONMETALLIC FIBER REINFORCED CONCRETE OVERLAY (D)

FOR

486' - 1½" COMPOSITE GIRDER BIRDGE

32' - 0" ROADWAY
OVER WHITE RIVER
STR. NO. 43-403-308

0° SKEW
SEC. 3-T103-R73W
P 0047(126)60

LYMAN COUNTY

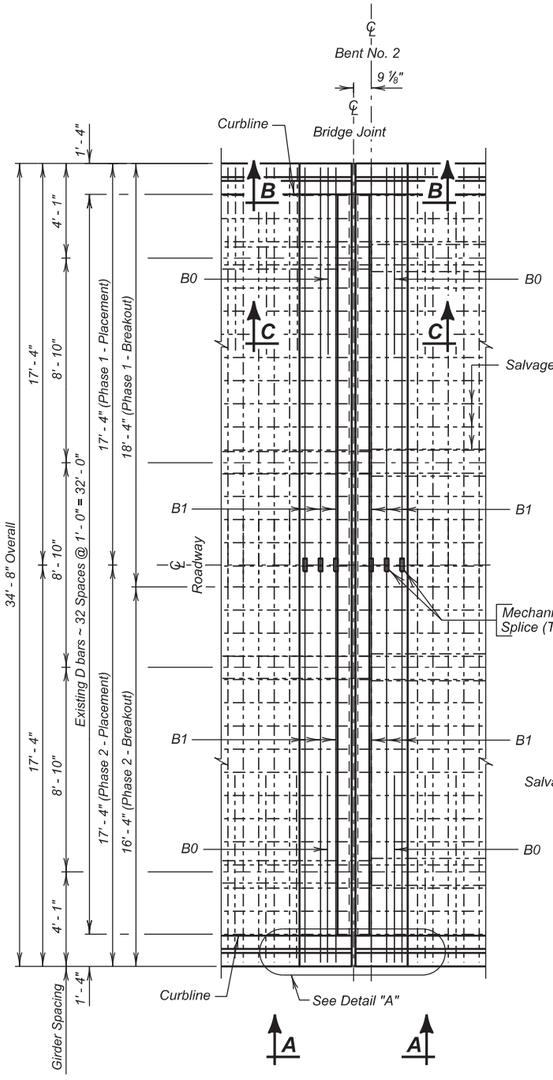
S. D. DEPT. OF TRANSPORTATION

AUGUST 2025

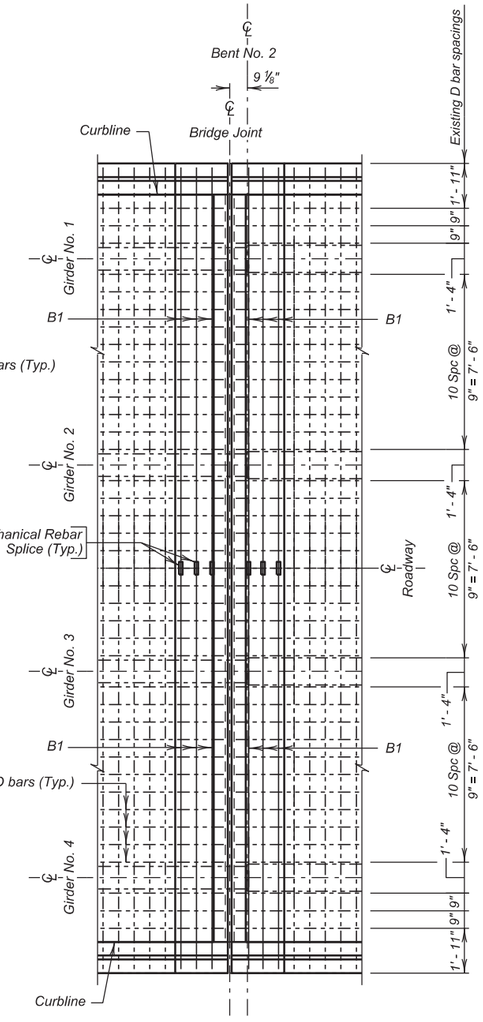
13 OF 39

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	KR	Steve A Johnson BRIDGE ENGINEER
LYMN09LF	09LFRA13		

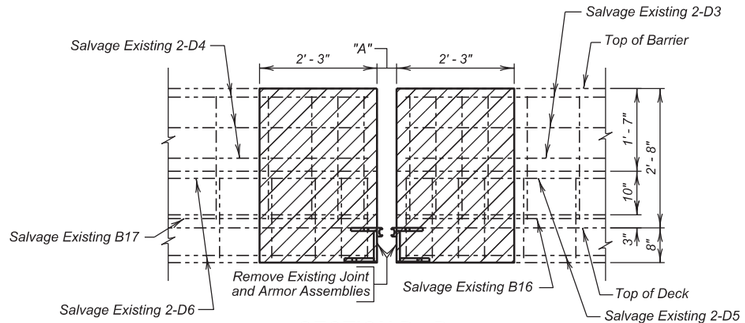
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E27	E52



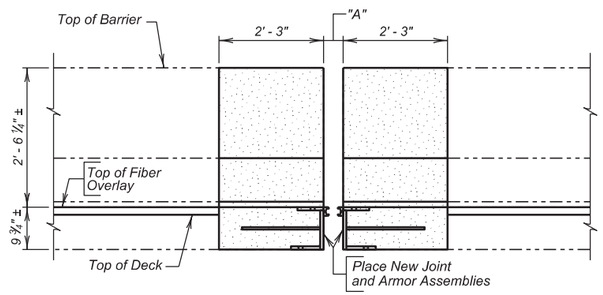
PARTIAL PLAN
(Top Steel)
(Barrier Reinforcing Steel not shown for clarity)



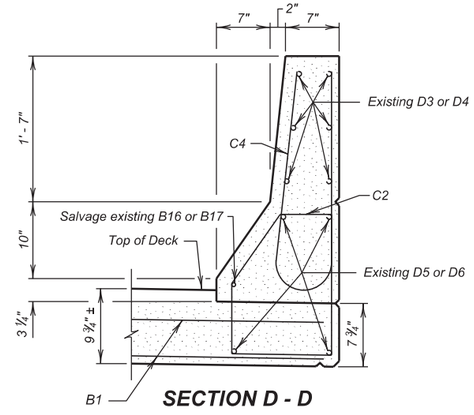
PARTIAL PLAN
(Bottom Steel)
(Barrier Reinforcing Steel not shown for clarity)



SECTION B - B
(Deck reinforcement not shown for clarity)



SECTION B - B
(Reinforcement not shown for clarity)

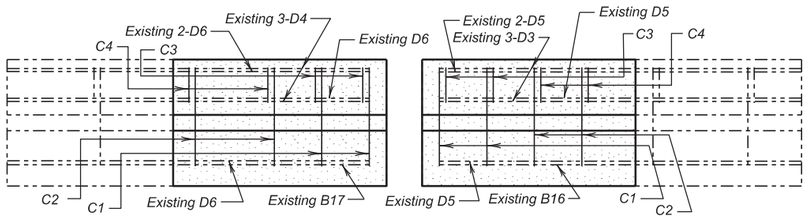


SECTION D - D

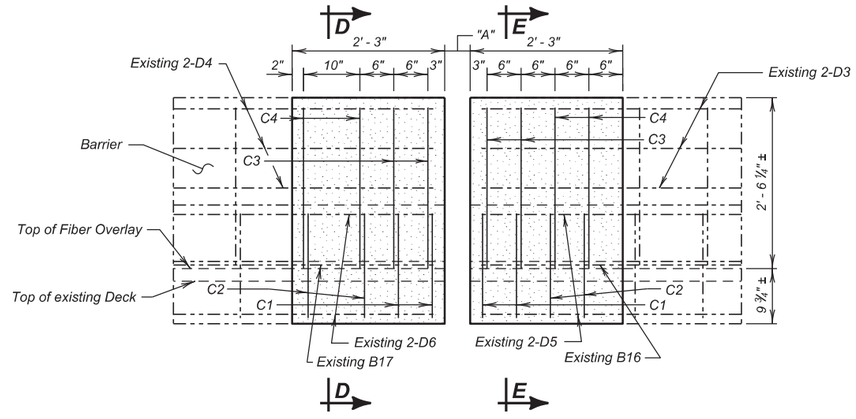
Concrete Breakout

Concrete Placement

TEMP.	DIMENSION "A"
30°	5 5/16"
40°	5 ⅛"
50°	4 15/16"
60°	4 11/16"
70°	4 ½"
80°	4 5/16"
90°	4 1/16"



Detail "A"
(Joint not shown for clarity)



VIEW A - A
(Joint and deck reinforcement not shown for clarity)

JOINT AND BARRIER REPAIR DETAILS (A)
FOR
486' - 1½" COMPOSITE GIRDER BIRDGE

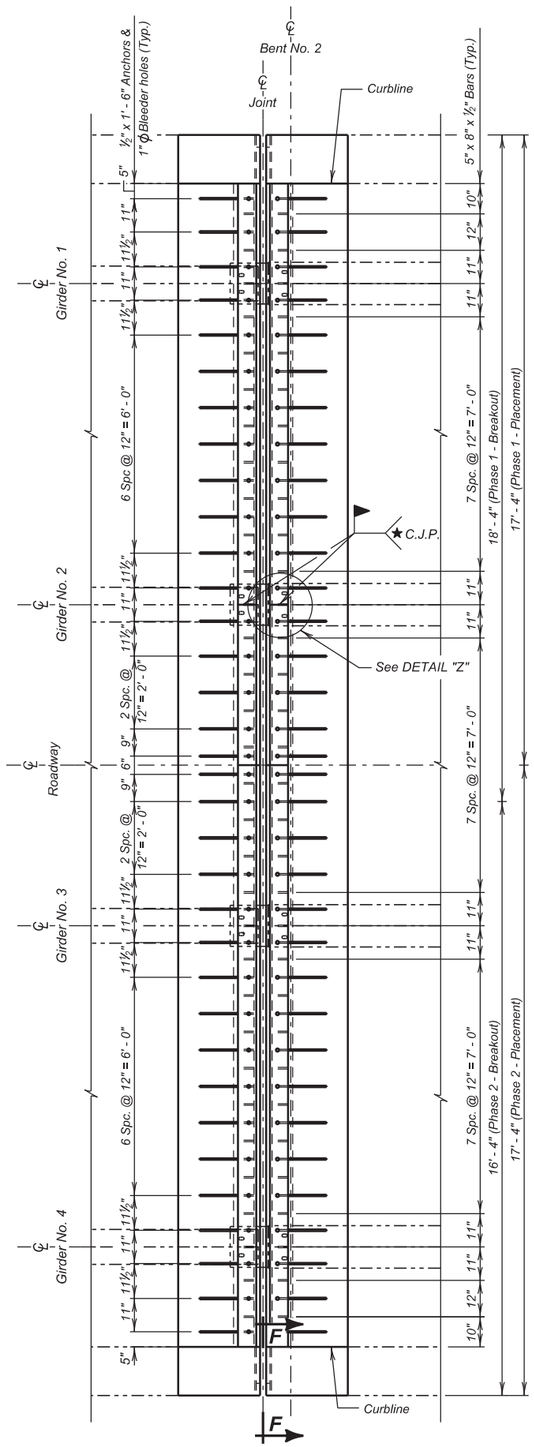
32' - 0" ROADWAY
OVER WHITE RIVER
STR. NO. 43-403-308

0° SKEW
SEC. 3-T103-R73W
P 0047(126)60

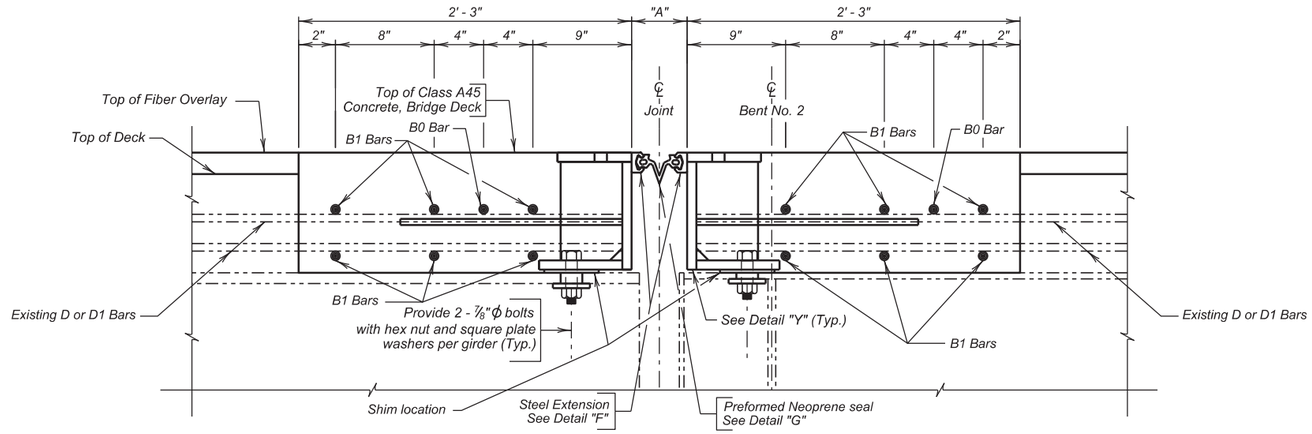
LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	JRB	Steve A Johnson BRIDGE ENGINEER
LYMN09LF	09LFBB14		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E28	E52



PARTIAL PLAN
(Showing joint only for clarity)

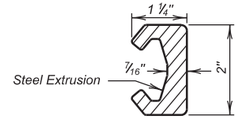


SECTION C - C
(Shading not shown for clarity)

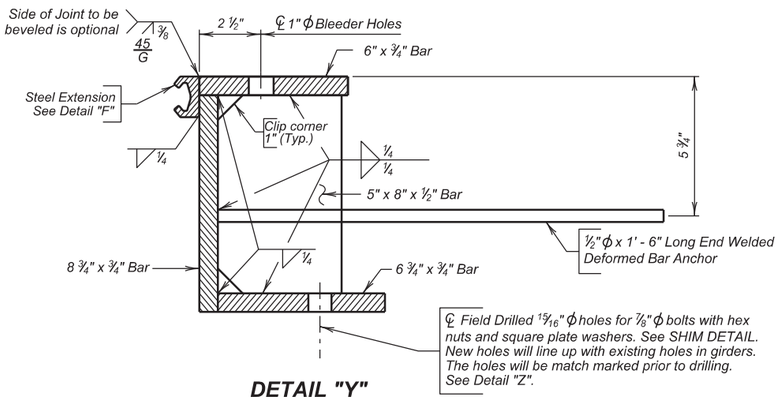
★ Note: Complete Joint Penetration Butt Splice at construction joint to be shown on shop plans for approval.

TEMP.	DIMENSION "A"
30°	5 5/16"
40°	5 ⅛"
50°	4 15/16"
60°	4 1/16"
70°	4 ½"
80°	4 5/16"
90°	4 1/16"

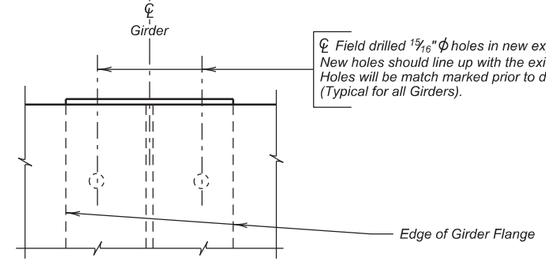
DETAIL "G"
Neoprene Seal will have a 4" movement capability.



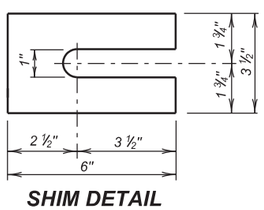
DETAIL "F"



DETAIL "Y"



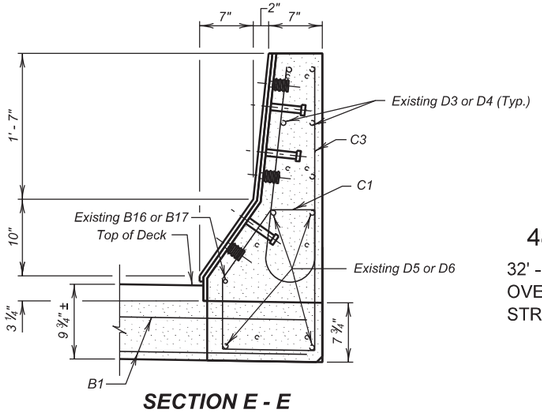
DETAIL "Z"



SHIM DETAIL

QUANTITY	THICKNESS
8	1"
8	¾"
8	⅝"
12	½"
8	¼"
4	⅜"
12	⅛"
12	1/16"

Note: Quantity shown is the total number of shims required



SECTION E - E

JOINT AND BARRIER REPAIR DETAILS (B)
FOR
486' - 1½" COMPOSITE GIRDER BIRDGE

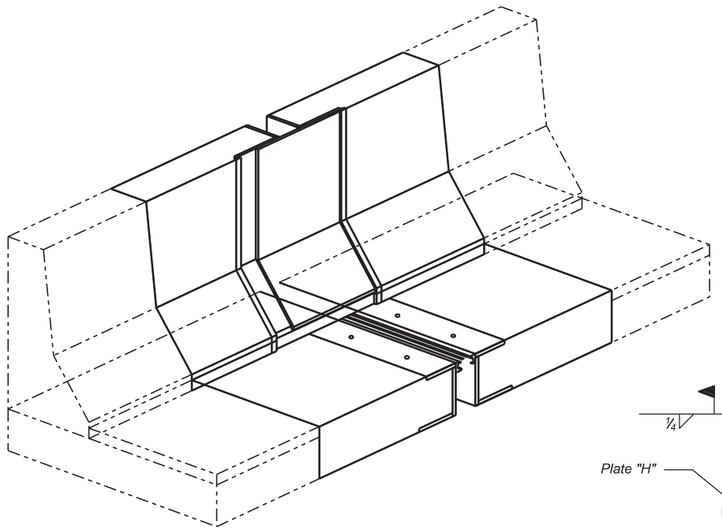
32' - 0" ROADWAY
OVER WHITE RIVER
STR. NO. 43-403-308

0° SKEW
SEC. 3-T103-R73W
P 0047(126)60

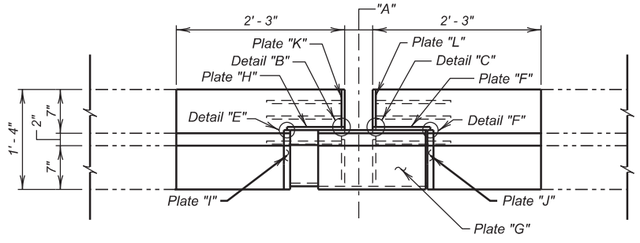
LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	JRB	Steve A Johnson BRIDGE ENGINEER
LYMN09LF	09LFBB15		

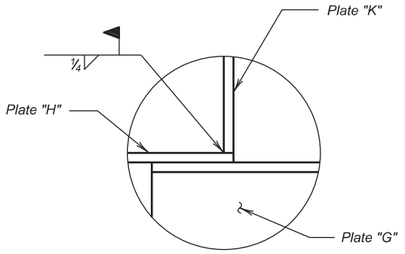
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E29	E52



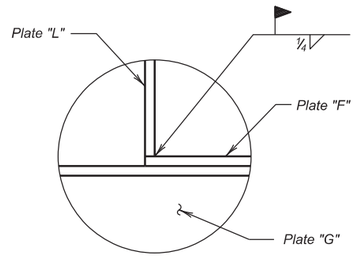
ISOMETRIC VIEW



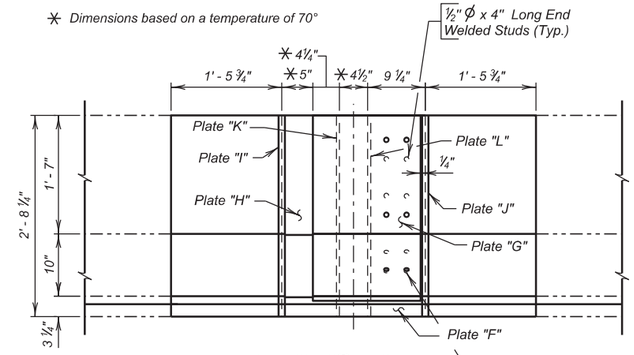
PLAN VIEW
(Other side similar by opposite hand)



DETAIL "B"

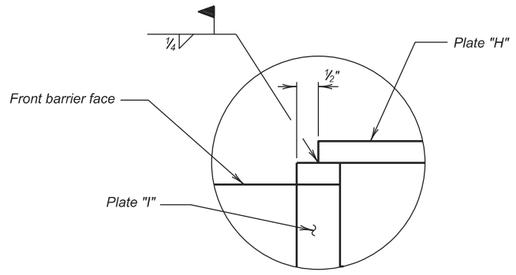


DETAIL "C"

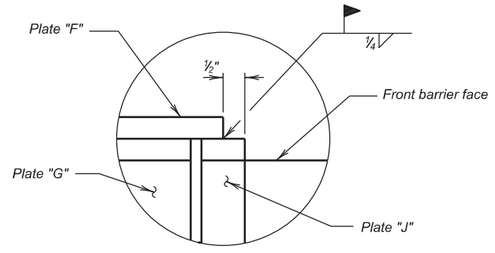


ELEVATION VIEW
(Other side similar by opposite hand)

℄ ¾" Ø Plain Ferrule Inserts and ℄ ¾" Ø Socket Countersunk Head Cap Screws. Recess ⅛" (Typ.)



DETAIL "E"



DETAIL "F"

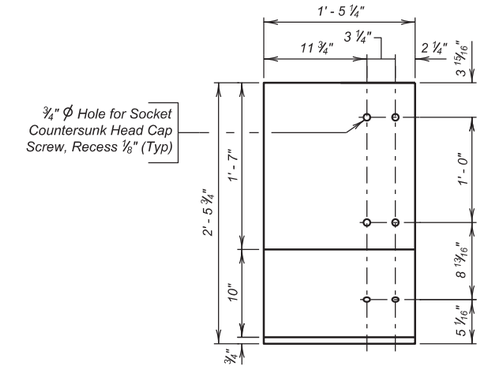


PLATE "G"

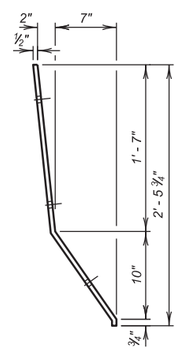


PLATE "G"

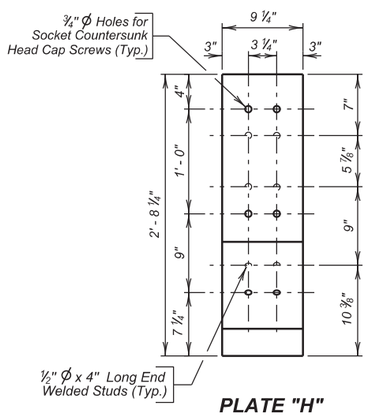


PLATE "H"

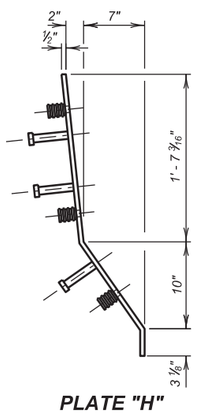


PLATE "H"

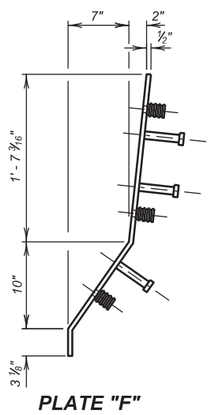


PLATE "F"

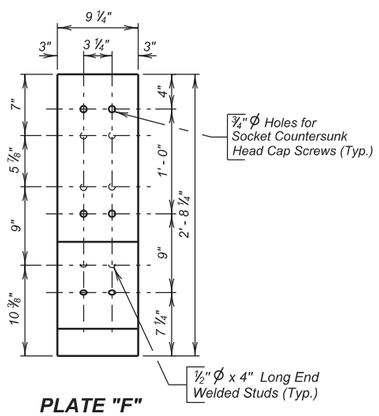


PLATE "F"

JOINT AND BARRIER REPAIR DETAILS (C)
FOR
486' - 1½" COMPOSITE GIRDER BIRDGE

32' - 0" ROADWAY
OVER WHITE RIVER
STR. NO. 43-403-308

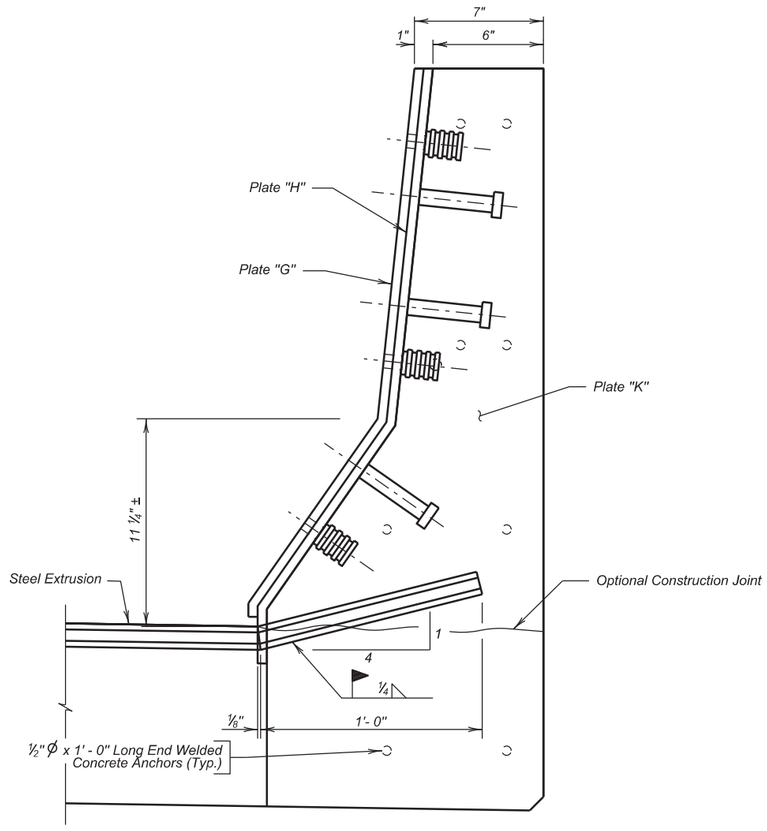
0° SKEW
SEC. 3-T103-R73W
P 0047(126)60

LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2025

16 OF 39

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	JRB	Steve A Johnson BRIDGE ENGINEER
LYMN09LF	09LFBB16		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E30	E52



VIEW F - F
(Typical)
(Reinforcing steel not shown)

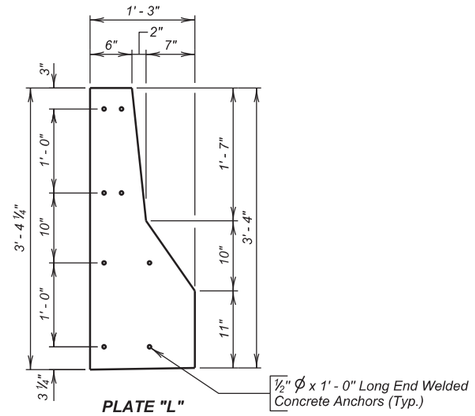


PLATE "L"

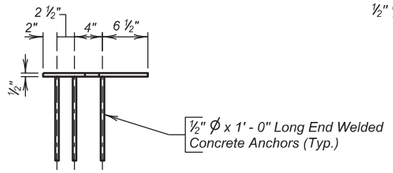


PLATE "L"

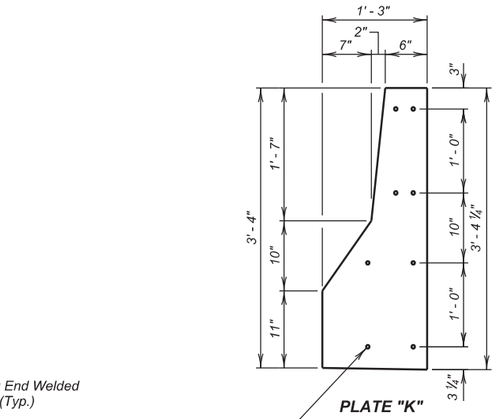


PLATE "K"

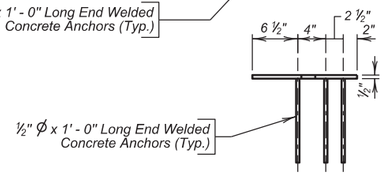
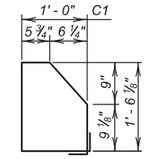


PLATE "K"

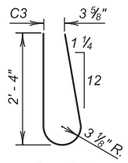
REINFORCING SCHEDULE

	Mk.	No.	Size	Length	Type
Phase 1	B0	2	6	8' - 1"	Str.
	⏀B1	12	6	17' - 2"	Str.
	C1	4	5	5' - 8"	T2A
	C2	4	5	5' - 9"	T2A
	C3	4	5	5' - 0"	S11
	C4	4	5	5' - 1"	S11
Phase 2	B0	2	6	8' - 1"	Str.
	⏀B1	12	6	17' - 2"	Str.
	C1	4	5	5' - 8"	T2A
	C2	4	5	5' - 9"	T2A
	C3	4	5	5' - 0"	S11
	C4	4	5	5' - 1"	S11

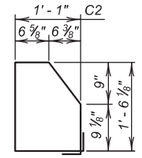
Bending Details



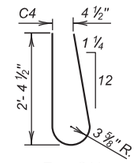
Type T2A



Type S11



Type T2A



Type S11

NOTES :
All bars are epoxy coated.
All dimensions are out to out of bars.
⏀ Splice (Mechanically Spliced)

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY PHASE I	QUANTITY PHASE 2
Structural Steel, Miscellaneous	LS	Lump Sum	
Strip Seal Expansion Joint	Ft	17.3	17.3
Class A45 Concrete, Bridge Deck	CuYd	2.7	2.7
Breakout Structural Concrete	CuYd	2.4	2.2
Epoxy Coated Reinforcing Steel	Lb	425	425
Galvanic Anode	Each	68	68
No. 6 Rebar Splice	Each	12	-

The total estimated quantity for the structural steel components listed are shown below and is for information only. Miscellaneous Structural Steel accounts for the cover plates.

	PHASE I	PHASE 2
1. Strip Seal Expansion Joint	2290 Lbs	2290 Lbs
2. Miscellaneous Structural Steel	310 Lbs	310 Lbs

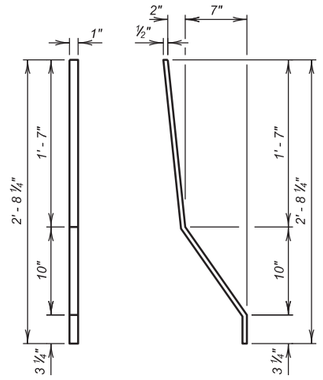


PLATE "J" **PLATE "J"**

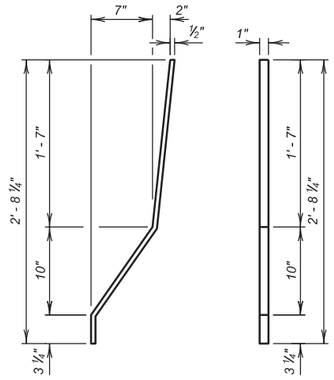


PLATE "I" **PLATE "I"**

JOINT AND BARRIER REPAIR DETAILS (D)
FOR
486' - 1½" COMPOSITE GIRDER BIRDGE

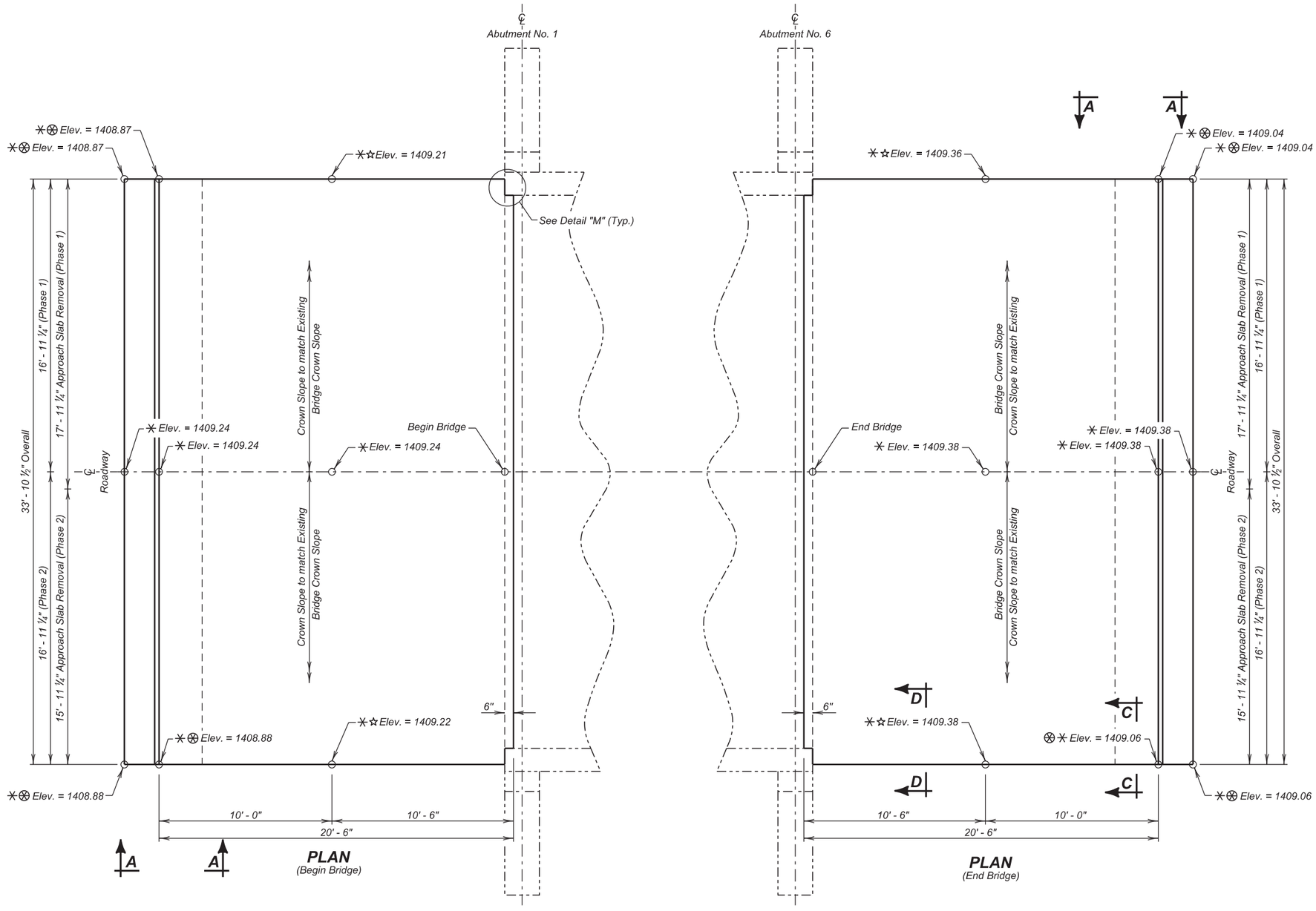
32' - 0" ROADWAY
OVER WHITE RIVER
STR. NO. 43-403-308

0° SKEW
SEC. 3-T103-R73W
P 0047(126)60

LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2025

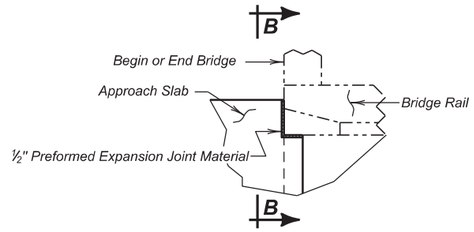
DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	JRB	Steve A Johnson BRIDGE ENGINEER
LYMN09LF	09LFBB17		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E31	E52

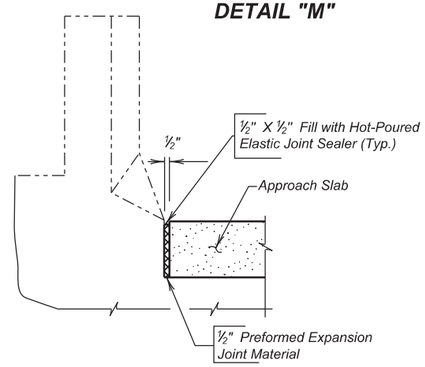


PLAN
(Begin Bridge)

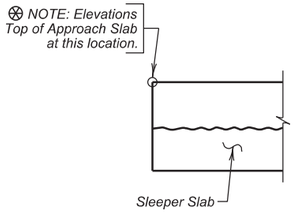
PLAN
(End Bridge)



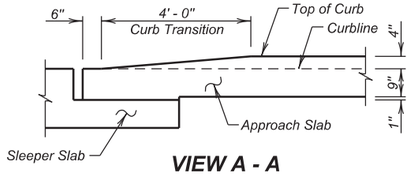
DETAIL "M"



SECTION B - B



VIEW C - C
(Approach Slab Curb not shown for clarity.)
(Concrete shading and reinforcing steel not shown for clarity)

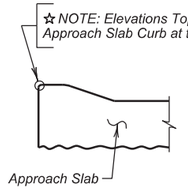


VIEW A - A

⊹ *Elevations may need to be adjusted to achieve a smooth ride from the final bridge deck elevations to final pavement elevations.*

Benchmark Description:

Control Point 38
NE Corner of Bridge, Rebar and Grds w/Alum. Cap
Elevation = 1406.605



SECTION D - D
(Concrete shading and reinforcing steel not shown for clarity)

APPROACH SLAB LAYOUT
FOR
486' - 1 ½" COMPOSITE GIRDER BRIDGE

32' - 0" ROADWAY
OVER WHITE RIVER
STR. NO. 43-403-308

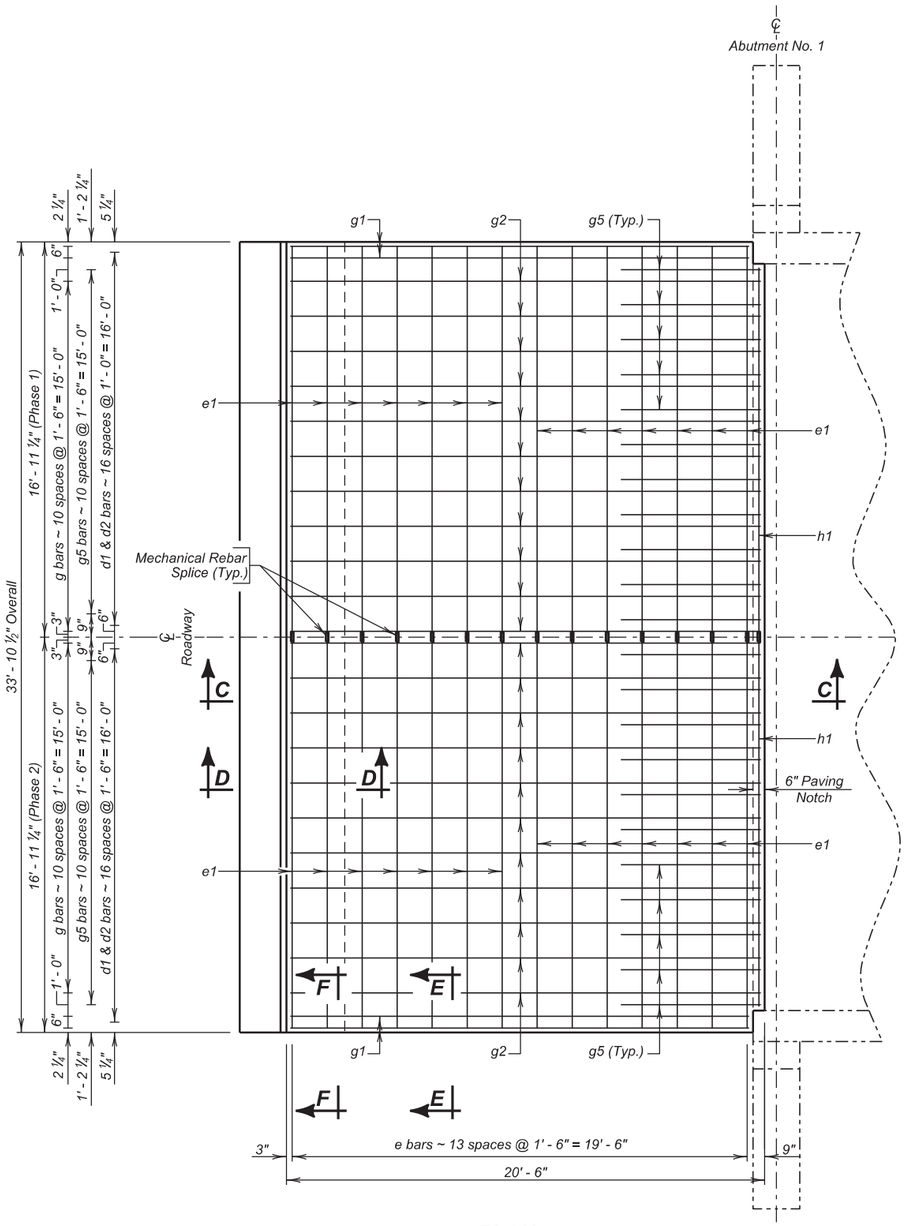
0° SKEW
SEC. 3-T103N-R73W
P 0047(126)60

LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2025

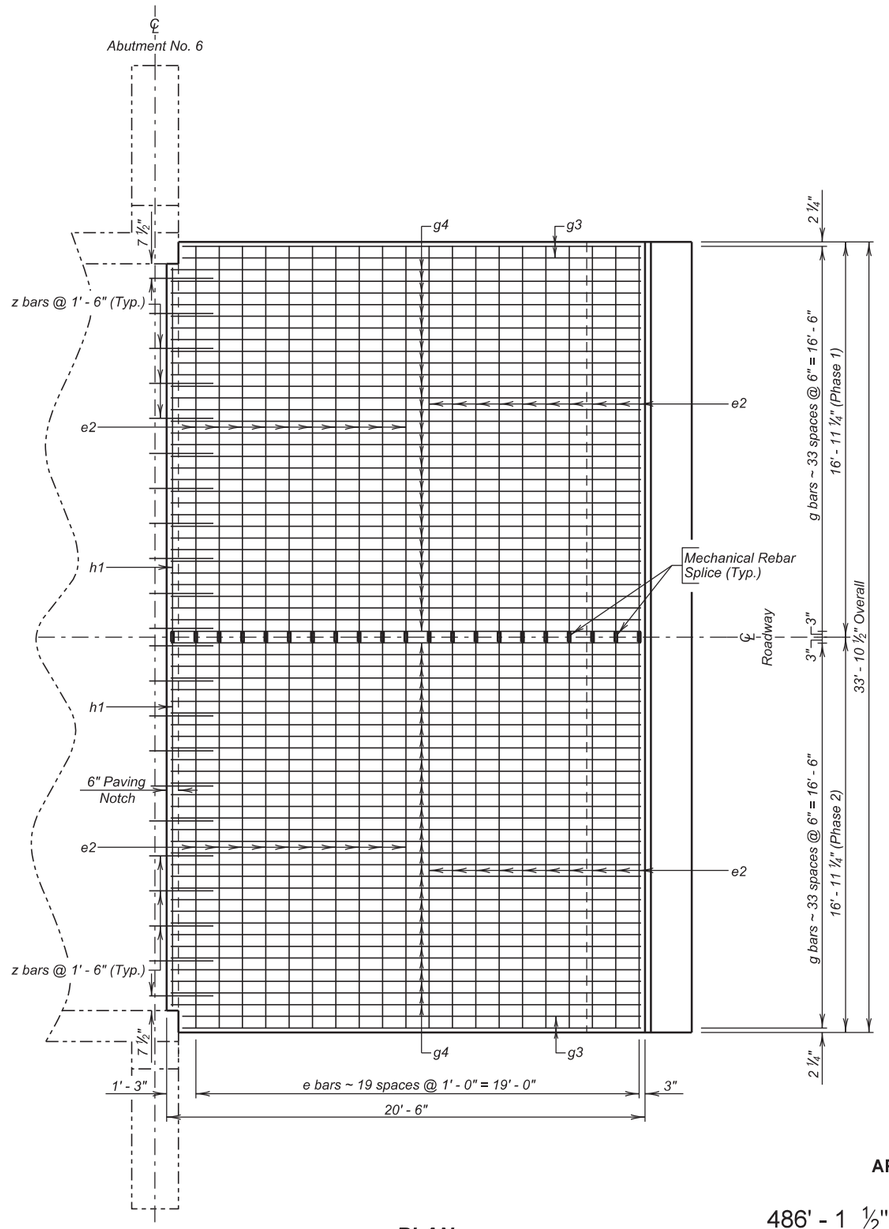
18 OF 39

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	JRB	Steven A. Johnson BRIDGE ENGINEER
LYMN09LF	09LFBB18		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E32	E52



PLAN
(Top Steel Shown)
(Shown adj. to Abut. No. 1, Abut No. 6 similar by opposite hand.)



PLAN
(Bottom Steel Shown)
(Shown adj. to Abut. No. 6, Abut No. 1 similar by opposite hand.)

APPROACH SLAB DETAILS (A)
FOR
486' - 1 ½" COMPOSITE GIRDER BRIDGE

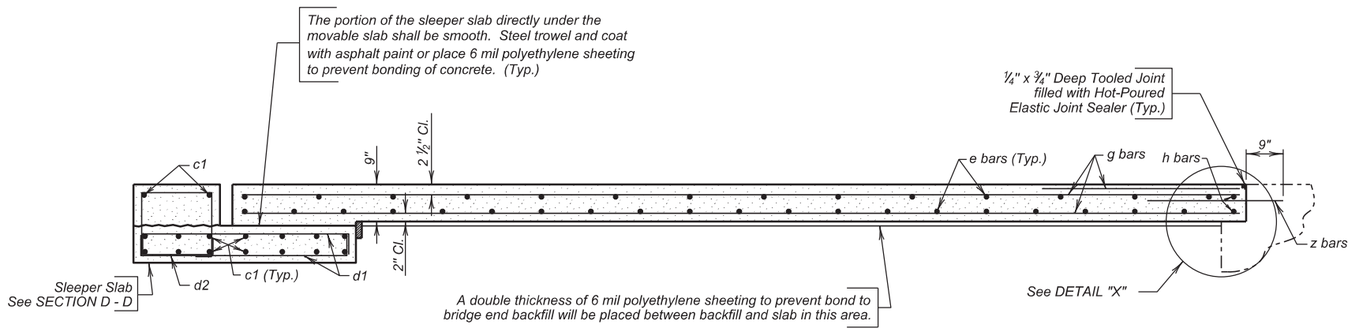
32' - 0" ROADWAY
OVER WHITE RIVER
STR. NO. 43-403-308

0° SKEW
SEC. 3-T103N-R73W
P 0047(126)60

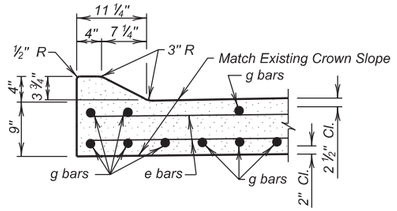
LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	JRB	Steven A. Johnson BRIDGE ENGINEER
LYMN09LF	09LFBB19		

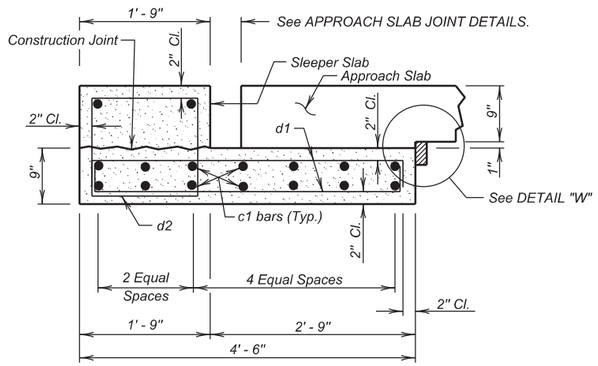
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E33	E52



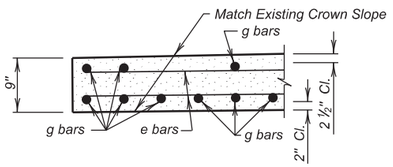
SECTION C - C



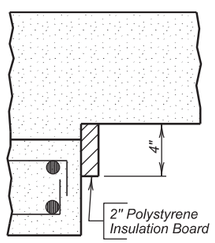
SECTION E - E



SECTION D - D
(Sleeper Slab)

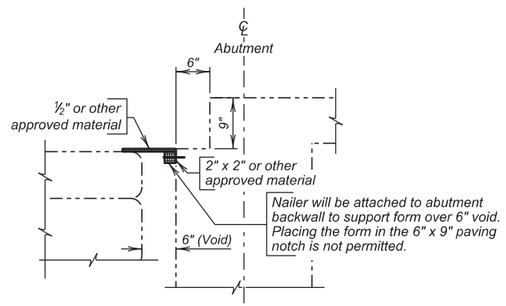


SECTION F - F



DETAIL "W"

The Polystyrene Insulation Board will be firmly attached to the sleeper slab by a method to be approved by the Engineer.



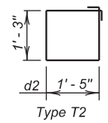
DETAIL "X"

REINFORCING SCHEDULE
(For Two Approach and Two Sleeper Slabs)

PHASE 1

Mk.	No.	Size	Length	Type
c1	32	5	16' - 9"	Str.
d1	68	4	5' - 0"	17
d2	34	4	6' - 1"	T2
e1	28	4	16' - 9"	Str.
e2	40	6	16' - 9"	Str.
g1	4	4	19' - 8"	Str.
g2	22	4	20' - 2"	Str.
g3	4	8	19' - 8"	Str.
g4	64	8	20' - 2"	Str.
g5	22	4	6' - 0"	Str.
h1	4	6	15' - 10"	Str.
z1	22	7	2' - 9"	Str.

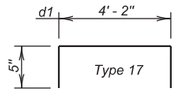
Bending Details



Type T2

PHASE 2

Mk.	No.	Size	Length	Type
c1	32	5	16' - 9"	Str.
d1	68	4	5' - 0"	17
d2	34	4	6' - 1"	T2
e1	28	4	16' - 9"	Str.
e2	40	6	16' - 9"	Str.
g1	4	4	19' - 8"	Str.
g2	22	4	20' - 2"	Str.
g3	4	8	19' - 8"	Str.
g4	64	8	20' - 2"	Str.
g5	22	4	6' - 0"	Str.
h1	4	6	15' - 10"	Str.
z1	22	7	2' - 9"	Str.



Type 17

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

Splice (Mechanically Spliced)
Dowels

ESTIMATED QUANTITIES
(For Two Approach and Two Sleeper Slabs)

	ITEM	UNIT	QUANTITY PHASE I	QUANTITY PHASE 2
	Remove Concrete Bridge Approach Slab	SqYd	99.5	88.4
	Concrete Approach Slab for Bridge	SqYd	77.1	77.1
	Concrete Approach Sleeper Slab for Bridge	SqYd	16.9	16.9
⊛	Install Dowel in Concrete	Each	22	22
	No. 4 Rebar Splice	Each	28	-
	No. 5 Rebar Splice	Each	32	-
	No. 6 Rebar Splice	Each	44	-

Items 1 thru 4 are approximate quantities contained in the above bid items and are for information only.

		PHASE I	PHASE 2
1.	Concrete in Approach Slabs.	19.3 CuYd	19.3 CuYd
⊛ 2.	Epoxy Coated Re-Steel in Approach Slabs	5508 Lb	5508 Lb
3.	Concrete in Sleeper Slabs	6.4 CuYd	6.4 CuYd
4.	Epoxy Coated Re-Steel in Sleeper Slabs	925 Lb	925 Lb

⊛ *Does not include the following quantities for z1 bars as these are paid for in the Bid Item "Install Dowel in Concrete".*

PHASE I	PHASE 2
124 Lb.	124 Lb.

APPROACH SLAB DETAILS (B)

FOR

486' - 1 ½" COMPOSITE GIRDER BRIDGE

32' - 0" ROADWAY
OVER WHITE RIVER
STR. NO. 43-403-308

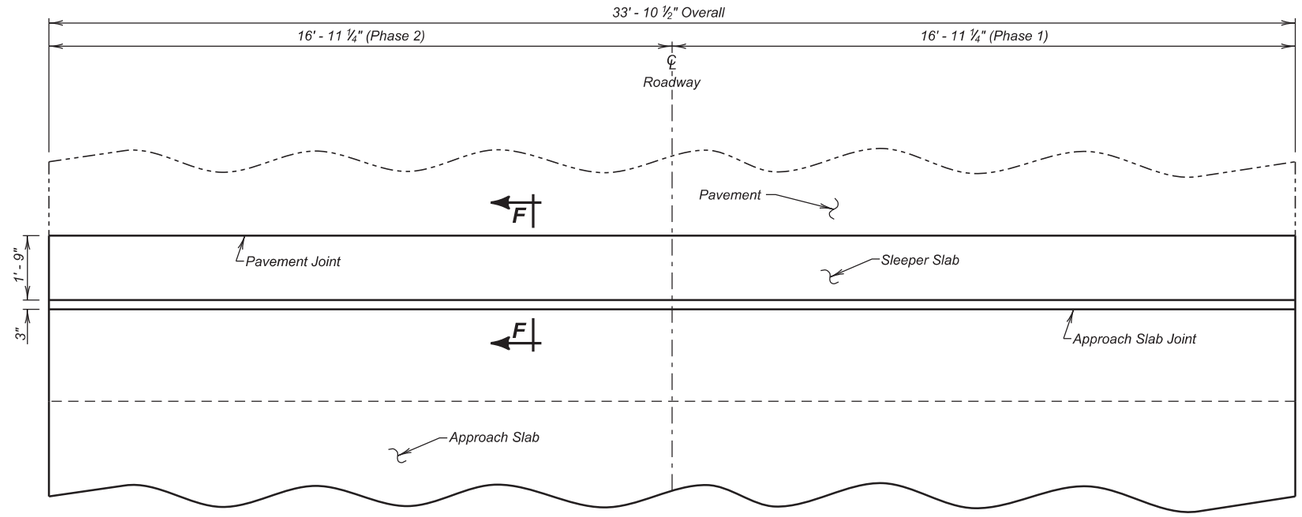
0° SKEW
SEC. 3-T103N-R73W
P 0047(126)60

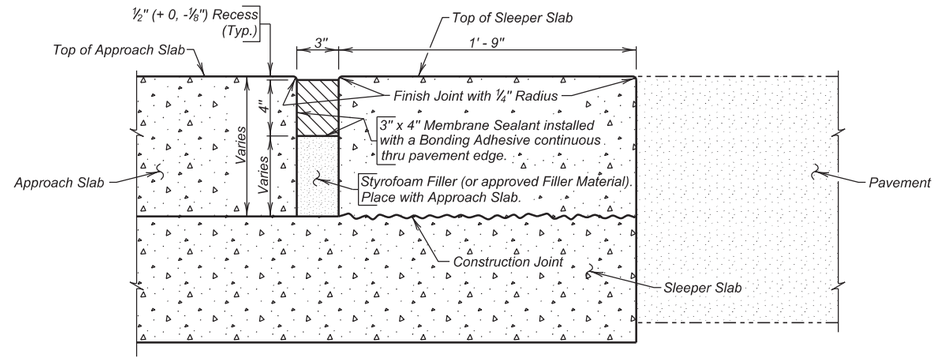
LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2025

20 OF 39

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	JRB	Steve A Johnson BRIDGE ENGINEER
LYMN09LF	09LFBB20		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E34	E52





SECTION F - F

GENERAL NOTES

1. The membrane sealant will be on the approved product list for Membrane Sealant Expansion Joints.
2. The manufacturer will supply the membrane sealant in packaging that precompresses the membrane sealant. The precompressed dimension will be as recommended by the sealant manufacturer, however, in no case will the precompressed dimension exceed 75% of the joint opening width. The foam sealant will be slowly self expanding to permit workers ample time to install the membrane sealant before the membrane sealant exceeds the joint opening width.
3. The membrane sealant will provide a water tight seal throughout a joint movement range of + 25% (minimum) from the specified joint opening dimension.
4. The membrane sealant will be supplied in pieces a minimum of 5 feet in length. The foam sealant will be ultra-violet and ozone resistant.
5. The bonding adhesive used to attach the membrane sealant to the adjacent concrete will be approved by the membrane sealant manufacturer.
6. Adhesive used to join adjacent pieces of the membrane sealant will be as recommended by the manufacturer.
7. If styrofoam filler material is used in the construction, it will be closed cell and water-tight as approved by the Engineer.
8. The minimum ambient air temperature at the time of joint installation and adhesive curing will be 40° F.
9. A technical representative of the membrane sealant manufacturer will be present at the jobsite during installation. The technical representative will 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.
10. Surfaces that will be in contact with the membrane sealant will be thoroughly cleaned by abrasive blasting to remove all laitance and contaminants (such as oil, curing compounds, etc.) from the surface. At a minimum, two passes of abrasive blasting with the nozzle held at an angle to within 1 to 2 inches of the surface will be required. Cleaning of the surfaces with solvents, wire brushing, or grinding will not be permitted.
11. After abrasive blasting, but immediately prior to membrane joint installation, the entire joint contact surface will be air blasted. The air compressor used for joint cleaning will 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 surfaces must be dry and clean. The contact surfaces for the joint will be visually inspected by the Engineer immediately prior to joint installation to verify the surface is dry and clean.
12. Individual spliced sections will be installed as per the manufacturers' recommendations.The membrane joint sealant manufacturer will submit a detailed installation procedure to the Engineer at least 5 days prior to joint installation for his review.
13. Traffic will not be allowed on the joint until the bonding adhesive has had time to cure, as recommended by the manufacturer.
14. 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.
15. 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 will be full compensation for furnishing all the required materials in place, including labor, equipment and incidentals necessary to complete the work in accordance with the plans and the foregoing specifications.

ESTIMATED QUANTITIES
(For Two Approach Slabs)

ITEM	UNIT	QUANTITY	
		Phase I	Phase 2
Membrane Sealant Expansion Joint	Ft	33.9	33.9

APPROACH SLAB JOINT DETAILS
FOR
486' - 1 ½" COMPOSITE GIRDER BRIDGE

32' - 0" ROADWAY
OVER WHITE RIVER
STR. NO. 43-403-308

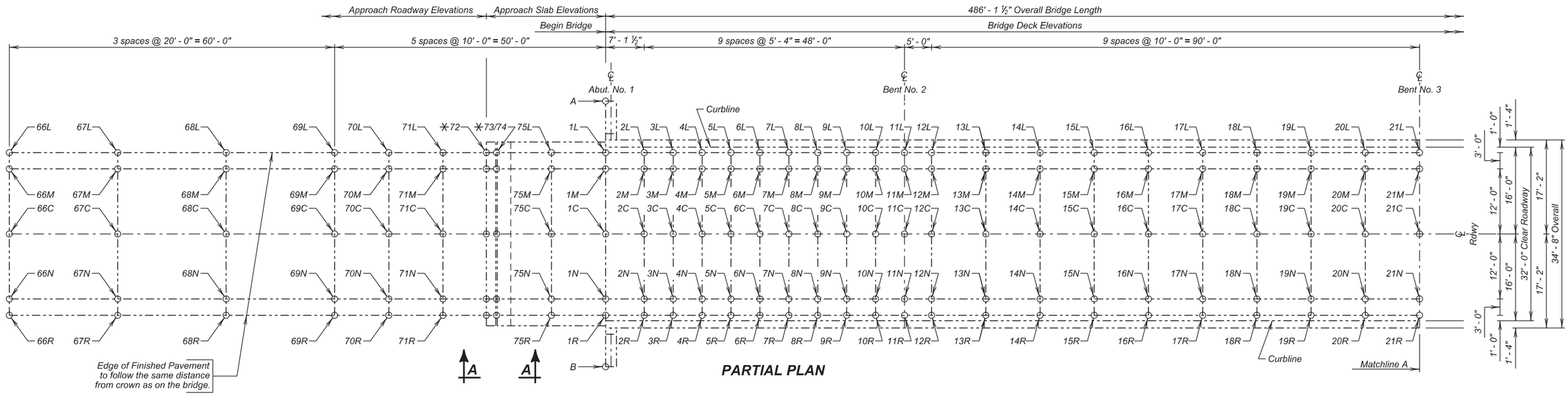
0° SKEW
SEC. 3-T103N-R73W
P 0047(126)60

LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2025

21 OF 39

DESIGNED BY	CK. DES. BY	DRAFTED BY	
JRB	TJM	KR	BRIDGE ENGINEER
LYMN09LF	09LFBB21		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E35	E52



PARTIAL PLAN

Table of Elevations - Bridge Deck

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
1L		1M		1C		1N		1R	
2L		2M		2C		2N		2R	
3L		3M		3C		3N		3R	
4L		4M		4C		4N		4R	
5L		5M		5C		5N		5R	
6L		6M		6C		6N		6R	
7L		7M		7C		7N		7R	
8L		8M		8C		8N		8R	
9L		9M		9C		9N		9R	
10L		10M		10C		10N		10R	
11L		11M		11C		11N		11R	
12L		12M		12C		12N		12R	
13L		13M		13C		13N		13R	
14L		14M		14C		14N		14R	
15L		15M		15C		15N		15R	
16L		16M		16C		16N		16R	
17L		17M		17C		17N		17R	
18L		18M		18C		18N		18R	
19L		19M		19C		19N		19R	
20L		20M		20C		20N		20R	
21L		21M		21C		21N		21R	

Table of Elevations - Approach Roadway

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
66L		66M		66C		66N		66R	
67L		67M		67C		67N		67R	
68L		68M		68C		68N		68R	
69L		69M		69C		69N		69R	
70L		70M		70C		70N		70R	
71L		71M		71C		71N		71R	

Table of Elevations - Approach Slab Joints (See VIEW A - A) and Approach Slab

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
72L		72M		72C		72N		72R	
73L		73M		73C		73N		73R	
74L		74M		74C		74N		74R	
75L		75M		75C		75N		75R	

Bridge Ends

Location	Elevation
A	
B	

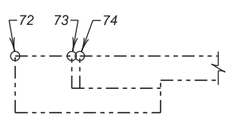
Benchmark Description:

Control Point 38
NE corner of Bridge Rebar & grds w/Alum. Cap
Elevation 1406.605

✳ Labels for all the points at the joints are not shown for clarity. These points follow the same labeling sequence as the adjacent points. Details for these point locations are also shown in VIEW A - A.

NOTE:

The elevations will be based on the National Geodetic Survey North American Vertical Datum of 1988 and will be recorded at the locations shown by the table on this sheet. The completed table will be given to the Engineer who will forward a copy to the Bridge Maintenance Engineer in the Office of Bridge Design and the Region Bridge Engineer.



VIEW A - A

AS-BUILT ELEVATION SURVEY (A)
FOR
486' - 1 ½" COMPOSITE GIRDER BRIDGE

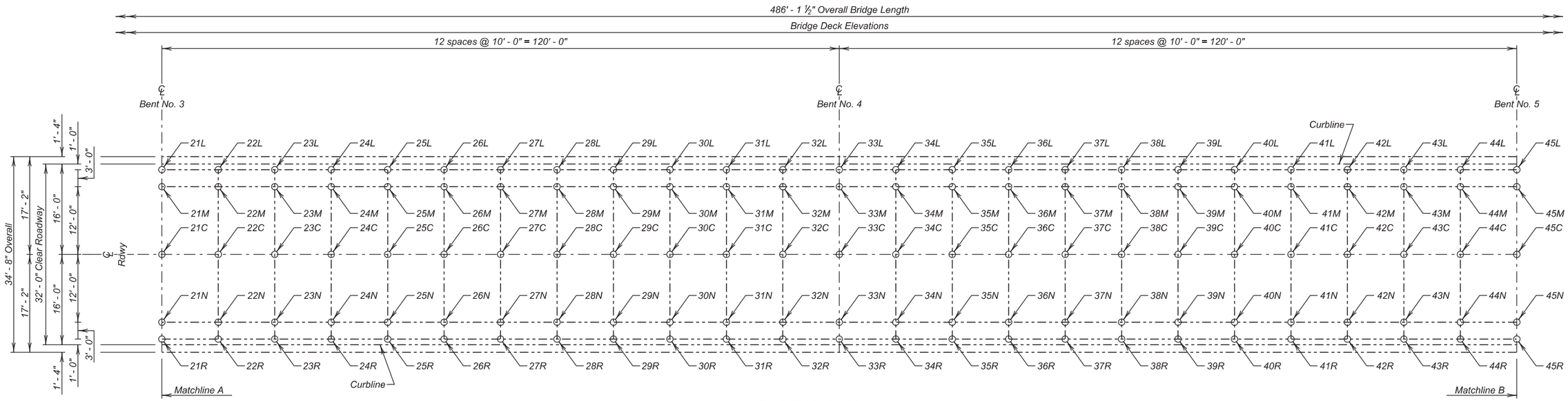
32' - 0" ROADWAY
OVER WHITE RIVER
STR. NO. 43-403-308

0° SKEW
SEC. 3-T103N-R73W
P 0047(126)60

LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
KR/TJM	JRB	KR	Steve A. Johnson BRIDGE ENGINEER
LYMN09LF	09LFBB22		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E36	E52



PARTIAL PLAN

Table of Elevations - Bridge Deck

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
21L		21M		21C		21N		21R	
22L		22M		22C		22N		22R	
23L		23M		23C		23N		23R	
24L		24M		24C		24N		24R	
25L		25M		25C		25N		25R	
26L		26M		26C		26N		26R	
27L		27M		27C		27N		27R	
28L		28M		28C		28N		28R	
29L		29M		29C		29N		29R	
30L		30M		30C		30N		30R	
31L		31M		31C		31N		31R	
32L		32M		32C		32N		32R	
33L		33M		33C		33N		33R	
34L		34M		34C		34N		34R	
35L		35M		35C		35N		35R	
36L		36M		36C		36N		36R	
37L		37M		37C		37N		37R	
38L		38M		38C		38N		38R	
39L		39M		39C		39N		39R	
40L		40M		40C		40N		40R	
41L		41M		41C		41N		41R	
42L		42M		42C		42N		42R	
43L		43M		43C		43N		43R	
44L		44M		44C		44N		44R	
45L		45M		45C		45N		45R	

AS-BUILT ELEVATION SURVEY (B)
FOR
486' - 1 ½" COMPOSITE GIRDER BRIDGE

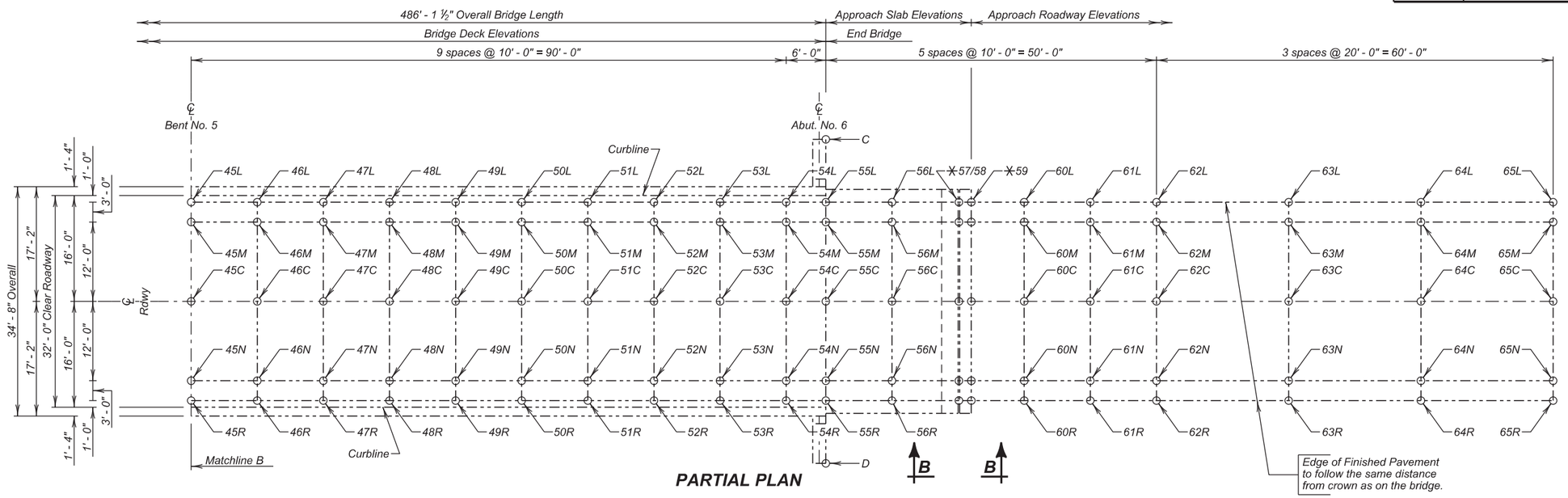
32' - 0" ROADWAY
OVER WHITE RIVER
STR. NO. 43-403-308

0° SKEW
SEC. 3-T103N-R73W
P 0047(126)60

LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2025

DESIGNED BY	CK. DES. BY	DRAFTED BY	
KR/TJM	JRB	KR	BRIDGE ENGINEER
LYMN09LF	09LFBB23		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E37	E52



PARTIAL PLAN

Table of Elevations - Bridge Deck

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
45L		45M		45C		45N		45R	
46L		46M		46C		46N		46R	
47L		47M		47C		47N		47R	
48L		48M		48C		48N		48R	
49L		49M		49C		49N		49R	
50L		50M		50C		50N		50R	
51L		51M		51C		51N		51R	
52L		52M		52C		52N		52R	
53L		53M		53C		53N		53R	
54L		54M		54C		54N		54R	
55L		55M		55C		55N		55R	

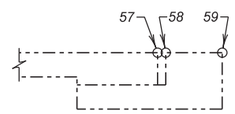
Table of Elevations - Approach Roadway

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
60L		60M		60C		60N		60R	
61L		61M		61C		61N		61R	
62L		62M		62C		62N		62R	
63L		63M		63C		63N		63R	
64L		64M		64C		64N		64R	
65L		65M		65C		65N		65R	

Table of Elevations - Approach Slab Joints (See VIEW B - B) and Approach Slab

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
56L		56M		56C		56N		56R	
57L		57M		57C		57N		57R	
58L		58M		58C		58N		58R	
59L		59M		59C		59N		59R	

Bridge Ends	
Location	Elevation
C	
D	



VIEW B - B

⚹ Labels for all the points at the joints are not shown for clarity. These points follow the same labeling sequence as the adjacent points. Details for these point locations are also shown in VIEW B - B.

AS-BUILT ELEVATION SURVEY (C)
FOR
486' - 1 ½" COMPOSITE GIRDER BRIDGE

32' - 0" ROADWAY
OVER WHITE RIVER
STR. NO. 43-403-308

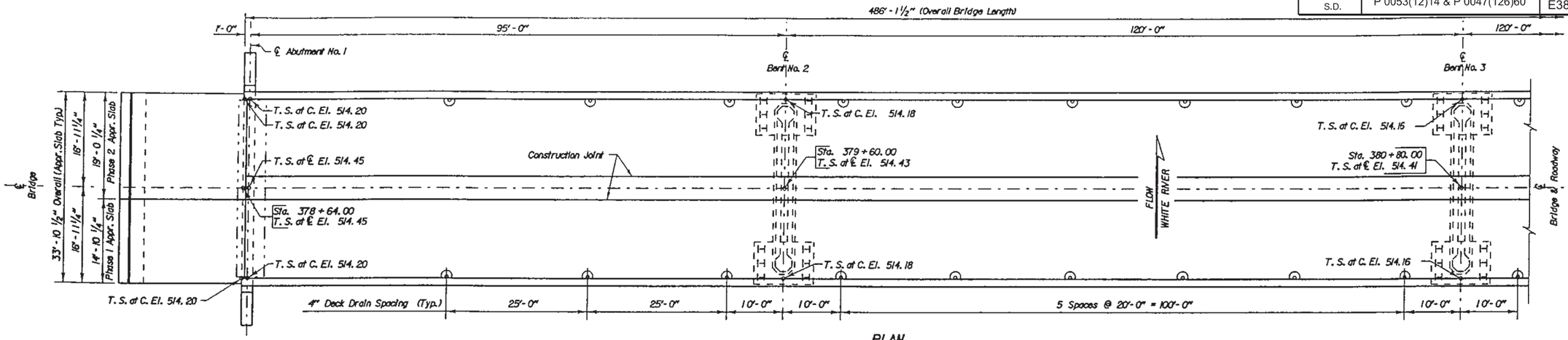
0° SKEW
SEC. 3-T103N-R73W
P 0047(126)60

LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2025

24 OF 39

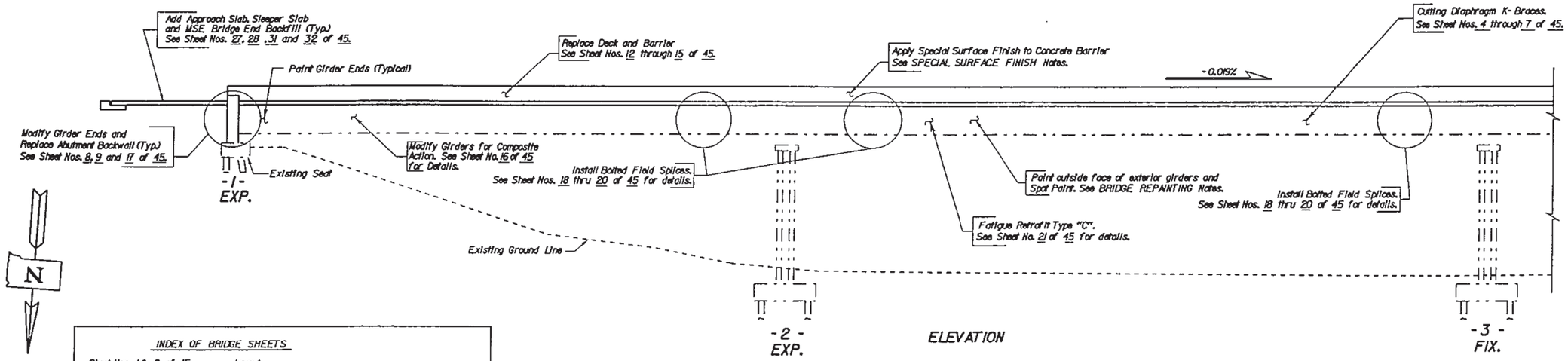
DESIGNED BY	CK. DES. BY	DRAFTED BY	
KR/TJM	JRB	KR	Steve A Johnson BRIDGE ENGINEER
LYMN09LF	09LFBB24		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E38	E52



PLAN

LEGEND:
T.S. at ℄ El. = Top of Slab at Center Line Elevation
T.S. at C. El. = Top of Slab at Curb Elevation



ELEVATION

INDEX OF BRIDGE SHEETS

See "SCOPE OF BRIDGE WORK" for a further explanation of the work to be done.

Benchmark:
75' LT. 15' East of West
West End of Bridge
5' Rebar by REA Pole w/guard
Elevation 500.00

NOTE-
This sheet is to be used in conjunction with sheet 2 of 45.

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

ORIGINAL CONSTRUCTION PLANS

LAYOUT

FOR UPGRADING OF

486' - 1½" COMP. GIRDER BRIDGE

32' - 0" ROADWAY — SEC. 3-T103N-R73W
OVER WHITE RIVER — 0° SKEW
STA. 378+64.00 TO 383+50.13 — BRF 0047(16)60
STR. NO. 43-403-308 — HS 20-44 & ALT.
PCEMS 3968

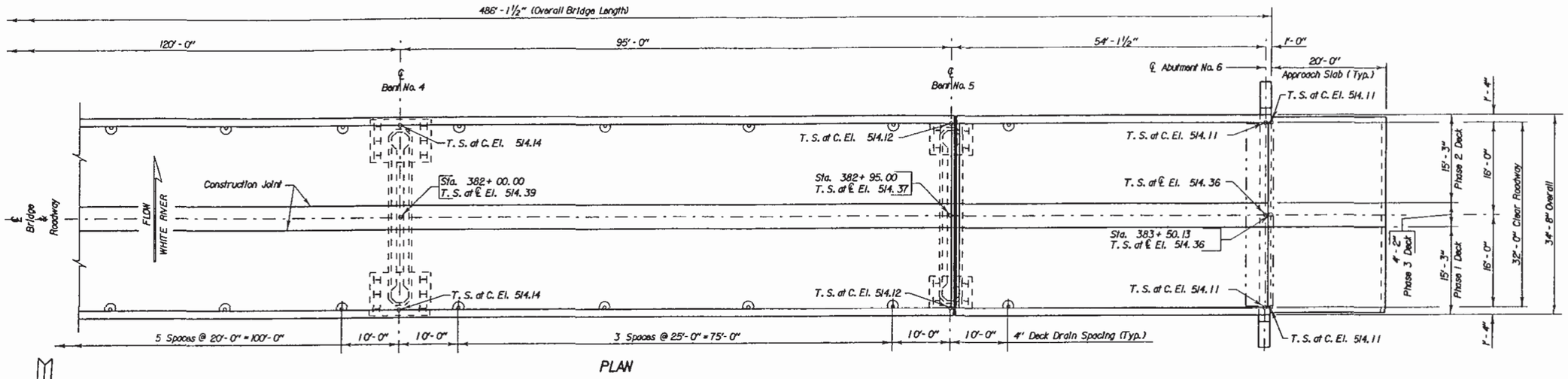
LYMAN COUNTY

S. D. DEPT. OF TRANSPORTATION

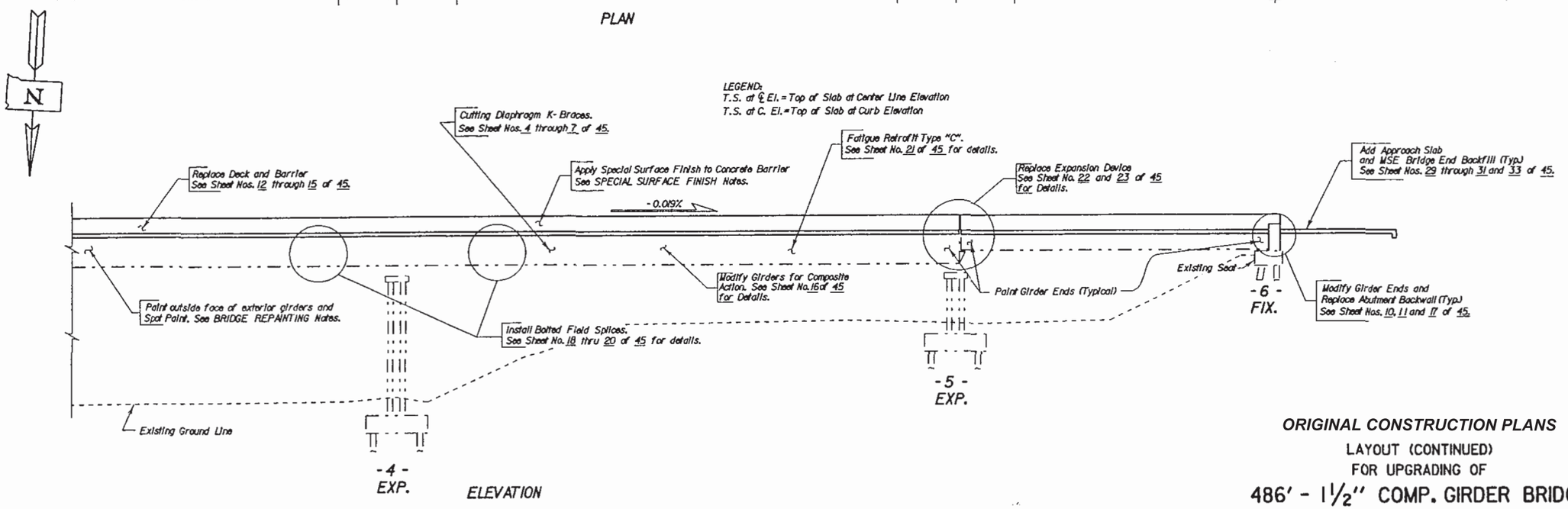
-XOTI- DECEMBER 2000 (25) OF (39)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
TJO	TJO	DPV	BRIDGE ENGINEER
LYMN3968	3968T001		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E39	E52



PLAN



ELEVATION

LEGEND:
T.S. at ℄ El. = Top of Slab at Center Line Elevation
T.S. at C. El. = Top of Slab at Curb Elevation

NOTE-
This sheet is to be used in conjunction with sheet 1 of 45 .

Benchmark:
75' LT. 15' East of West
West End of Bridge
5' Rebar by REA Pole w/guard
Elevation 500.00

See "SCOPE OF BRIDGE WORK" for a further explanation of the work to be done.

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

ORIGINAL CONSTRUCTION PLANS

LAYOUT (CONTINUED)
FOR UPGRADING OF

486' - 1½" COMP. GIRDER BRIDGE

32' - 0" ROADWAY — SEC. 3-T103N-R73W
OVER WHITE RIVER — 0° SKEW
STA. 378+64.00 TO 383+50.13 — BRF 0047(16)60
STR. NO. 43-403-308 — HS 20-44 & ALT.
PCEMS 3968

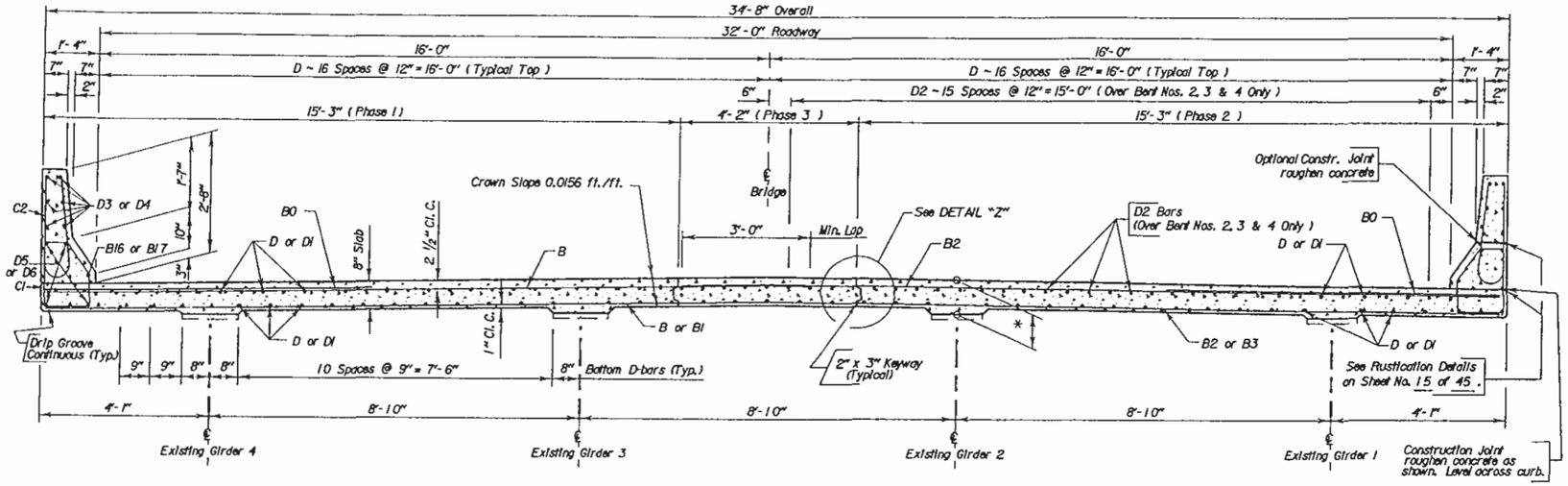
LYMAN COUNTY

S. D. DEPT. OF TRANSPORTATION

-X07I- DECEMBER 2000 (26) OF (39)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
TJO	TJO	DPV	BRIDGE ENGINEER
LYNN3968	3968T002		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E40	E52



TYPICAL SECTION

* Dimensions are at ℄ bearing. At other points along the girders this dimension shall be computed as shown on the Slab Form Elevations Sheet.

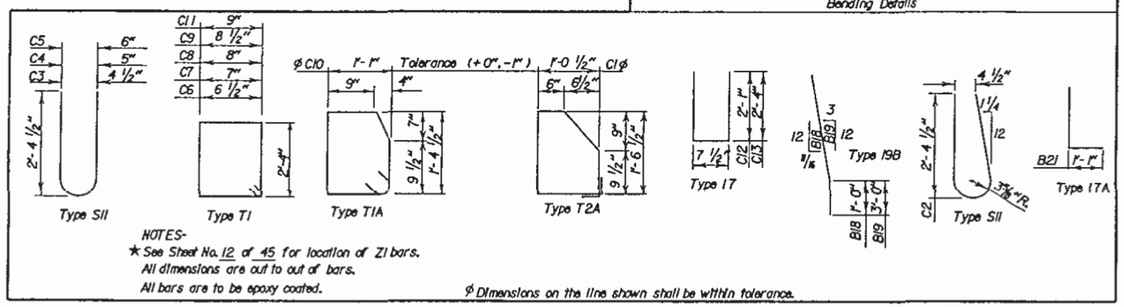
REINFORCING SCHEDULE

Wk.	No.	Size	Length	Type
Phase 1 (15'-3")				
B	1087	6	18'-2"	Str.
B0	361	6	8'-1"	Str.
B1	361	5	18'-2"	Str.
B15	6	5	14'-6"	Str.
B16	10	4	45'-0"	Str.
B17	1	4	52'-9"	Str.
B18	4	4	8'-6"	19B
B19	6	8	4'-3"	19B
B20	6	5	2'-4"	Str.
B21	6	6	3'-2"	17A
C1	480	5	5'-10"	T2A
C2	466	5	5'-1"	S11
C3	2	5	5'-0"	S11
C4	2	5	5'-0"	S11
C5	2	5	5'-1"	S11
C6	2	5	6'-8"	T1
C7	2	5	6'-9"	T1
C8	2	5	6'-11"	T1
C9	2	5	7'-0"	T1
C10	8	6	6'-0"	T1A
C11	8	5	7'-1"	T1
C12	2	6	4'-9"	17
C13	2	5	5'-3"	17
D	341	5	41'-0"	Str.
D1	31	5	53'-3"	Str.
D2	126	6	23'-9"	Str.
D3	60	5	45'-3"	Str.
D4	6	5	42'-2"	Str.
D5	40	5	45'-0"	Str.
D6	4	5	53'-11"	Str.
★ Z1	36	7	2'-0"	Str.

Wk.	No.	Size	Length	Type
Phase 2 (15'-3")				
B0	361	6	8'-1"	Str.
B2	1087	6	19'-2"	Str.
B3	361	5	19'-2"	Str.
B15	6	5	14'-6"	Str.
B16	10	4	45'-0"	Str.
B17	1	4	52'-9"	Str.
B18	4	4	8'-6"	19B
B19	6	8	4'-3"	19B
B20	6	5	2'-4"	Str.
B21	6	6	3'-2"	17A
C1	480	5	5'-10"	T2A
C2	466	5	5'-1"	S11
C3	2	5	5'-0"	S11
C4	2	5	5'-0"	S11
C5	2	5	5'-1"	S11
C6	2	5	6'-8"	T1
C7	2	5	6'-9"	T1
C8	2	5	6'-11"	T1
C9	2	5	7'-0"	T1
C10	8	6	6'-0"	T1A
C11	8	5	7'-1"	T1
C12	2	6	4'-9"	17
C13	2	5	5'-3"	17
D	341	5	41'-0"	Str.
D1	31	5	53'-3"	Str.
D2	126	6	23'-9"	Str.
D3	60	5	45'-3"	Str.
D4	6	5	42'-2"	Str.
D5	40	5	45'-0"	Str.
D6	4	5	53'-11"	Str.
★ Z1	36	7	2'-0"	Str.

Phase 3 (4'-2")				
D	110	5	41'-0"	Str.
D1	10	5	53'-3"	Str.
D2	36	6	23'-9"	Str.
★ Z1	10	7	2'-0"	Str.

Bending Details



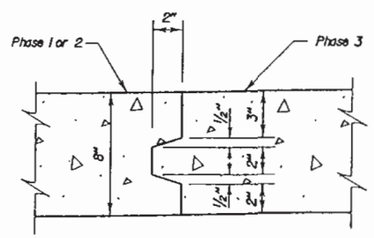
NOTES-
★ See Sheet No. 12 of 45 for location of Z1 bars.
All dimensions are out to out of bars.
All bars are to be epoxy coated.

ø Dimensions on the line shown shall be within tolerance.

NOTE-

This sheet to be used in conjunction with Sheet No. 12 of 45.

All Barrier Curb Details shown on Sheet Nos. 14 & 15 of 45.



DETAIL "Z"
(Typical for all slab construction joints)

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY		
		Phase 1	Phase 2	Phase 3
Class A45 Concrete, Bridge Deck	Cu Yd	230.7	230.9	49.9
Epoxy Coated Reinforcing Steel	Lb	73,224	75,233	6,585
Removal of Concrete Bridge Slab	Sq Yd	940	905	———
Special Surface Finish	Sq Ft	1681	1681	———
Modify Girder Ends	Each	4	4	———
Bridge Repairing, Class II	LS	———	———	Lump Sum
Stud Shear Connector	Each	1,169	1,169	———
No. 7 Rebar Splice	Each	36	36	10
Deck Drains, Girder Bridge	Each	20	20	———

For Informational Purposes:
There is 1.1641 Cu. Yds. of Class A45 Concrete per 12'-0" End Block.
There is 0.0842 Cu. Yds. of Class A45 Concrete per Linear Foot of Barrier.
The estimated area for Bridge Repairing is 8040 Sq. Ft.

ORIGINAL CONSTRUCTION PLANS

SUPERSTRUCTURE DETAILS
FOR UPGRADING OF

486' - 1½" COMP. GIRDER BRIDGE

32' - 0" ROADWAY — SEC. 3-T103N-R73W
OVER WHITE RIVER — 0° SKEW
STA. 378+64.00 TO 383+50.13 — BRF 0047(16)60
STR. NO. 43-403-308 — HS 20-44 & ALT.

LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2000

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
TJO		DPV	BRIDGE ENGINEER
LYMN3968	3968T013		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E41	E52

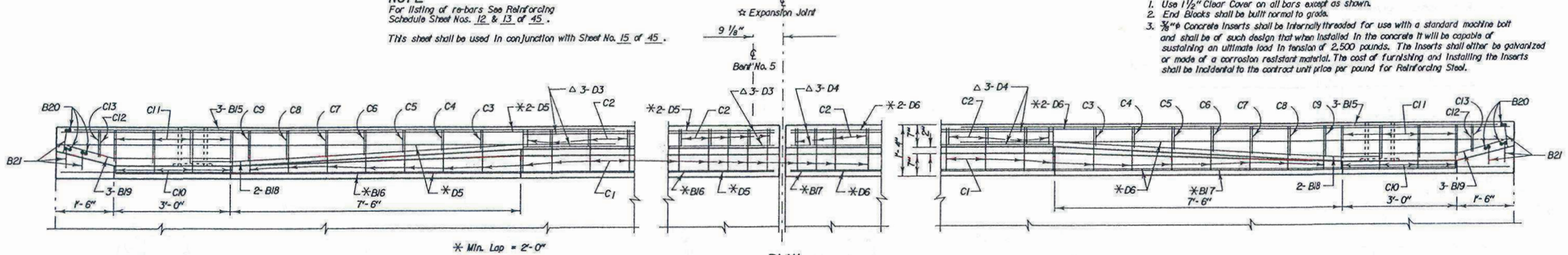
☆ For Joint Details See Sheet Nos. 22 & 23 of 45 .

NOTE-
For listing of re-bars See Reinforcing Schedule Sheet Nos. 12 & 13 of 45 .

This sheet shall be used in conjunction with Sheet No. 15 of 45 .

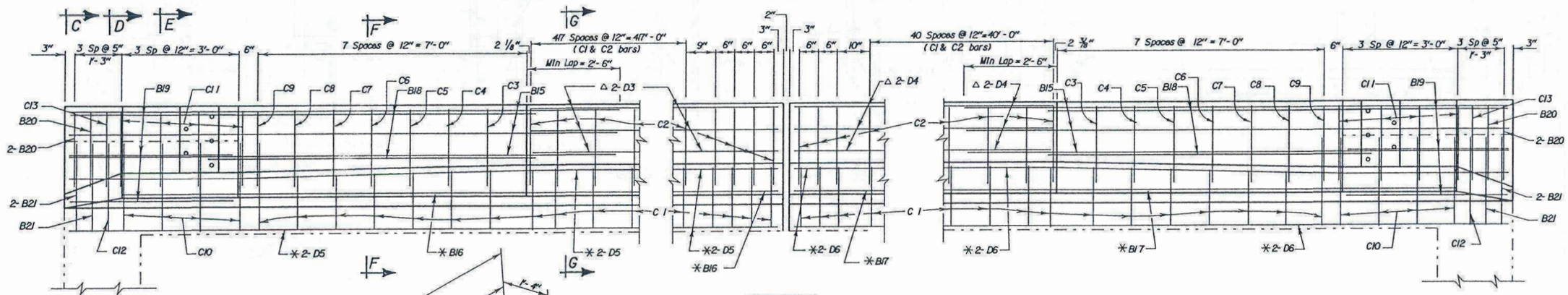
GENERAL NOTES -

1. Use 1½" Clear Cover on all bars except as shown.
2. End Blocks shall be built normal to grade.
3. ⅜"ø Concrete Inserts shall be internally threaded for use with a standard machine bolt and shall be of such design that when installed in the concrete it will be capable of sustaining an ultimate load in tension of 2,500 pounds. The inserts shall either be galvanized or made of a corrosion resistant material. The cost of furnishing and installing the inserts shall be incidental to the contract unit price per pound for Reinforcing Steel.

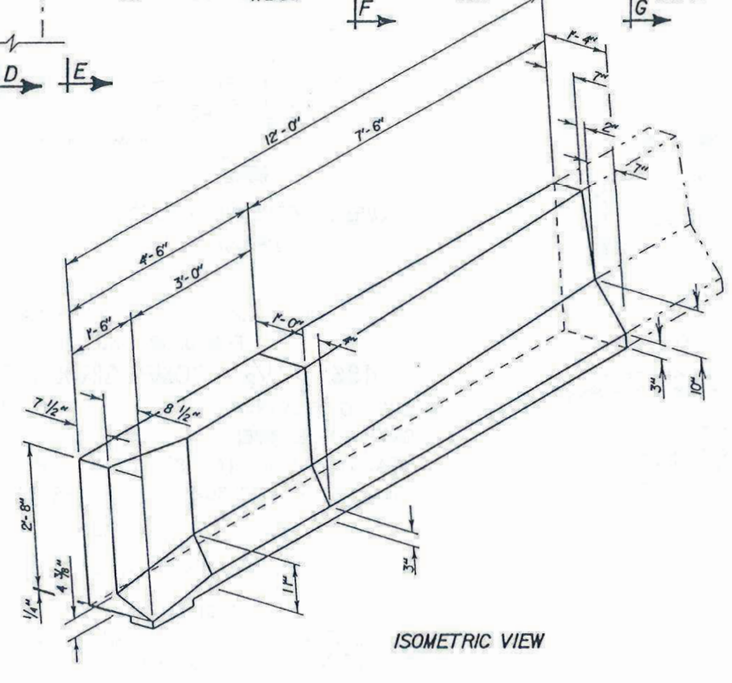


* Min. Lap = 2'- 0"
△ Min. Lap = 3'- 6"

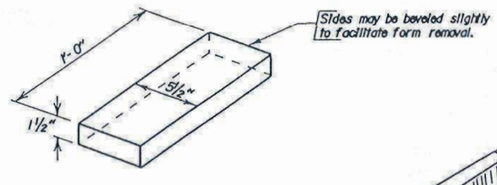
PLAN



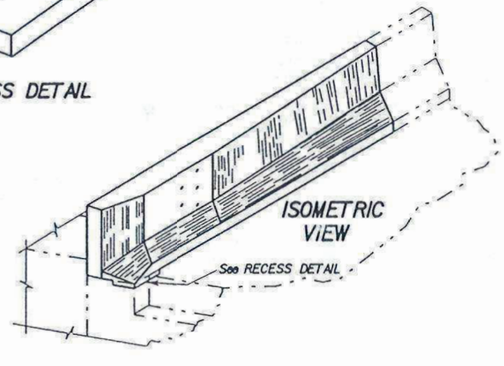
ELEVATION



ISOMETRIC VIEW



RECESS DETAIL



ORIGINAL CONSTRUCTION PLANS

END BLOCK & BARRIER CURB DETAILS
FOR UPGRADING OF

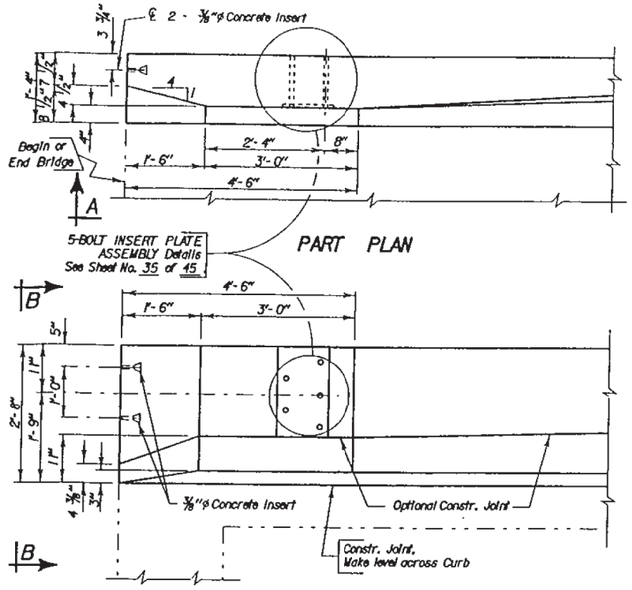
486' - 1½" COMP. GIRDER BRIDGE

32' - 0" ROADWAY — SEC. 3-T103N-R73W
OVER WHITE RIVER — 0° SKEW
STA. 378+64.00 TO 383+50.13 — BRF 0047(116)60
STR. NO. 43-403-308 — HS 20-44 & ALT.

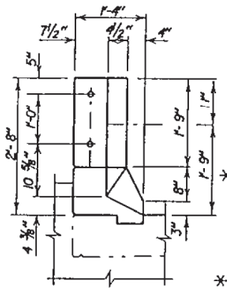
LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2000

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
TJO	TJO	DPV	BRIDGE ENGINEER
LYMN3968	3968T014		

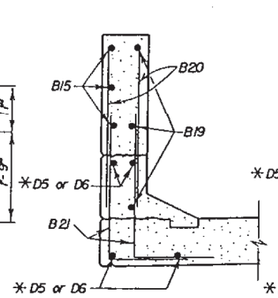
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E42	E52



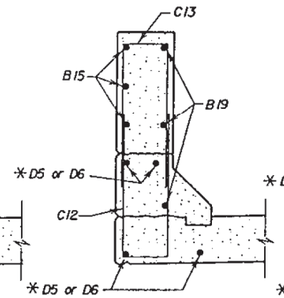
VIEW A - A



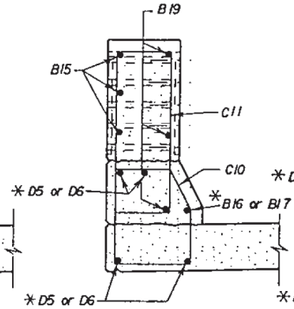
VIEW B - B



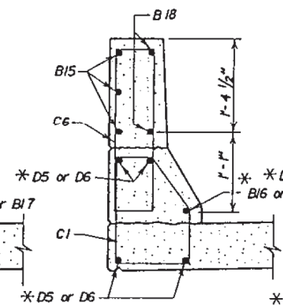
SEC. C - C



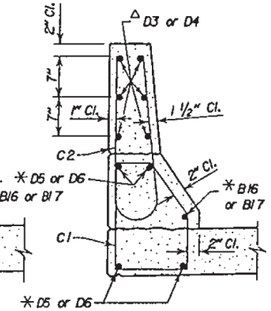
SEC. D - D



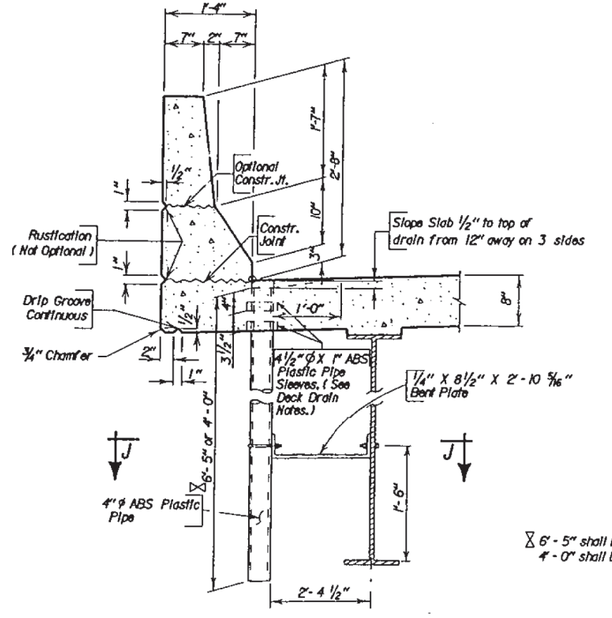
SEC. E - E



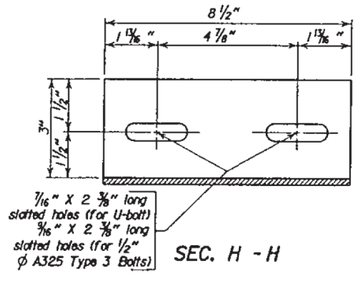
SEC. F - F



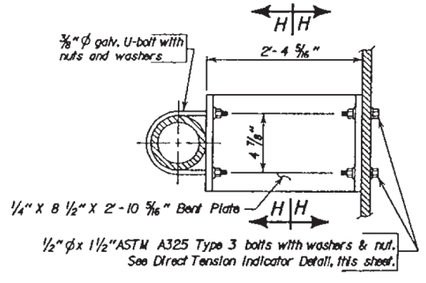
SEC. G - G



DRAIN AND BARRIER DETAILS
(Reinforcing Steel not shown for clarity)



SEC. H - H



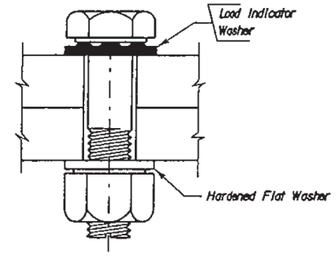
SEC. J - J

* Min. Lap = 2'-0"
△ Min. Lap = 3'-6"

⧖ 6'-5" shall be the length used on the Plate Girders and 4'-0" shall be the length used on the Rolled Beams.

NOTE: The connection between the drop tube and web of girder shall be made prior to the placing of the deck slab. See Sheet Nos. 1 & 2 of 45 for spacing of deck drains and see Deck Drain Notes.

This sheet shall be used in conjunction with Sheet No. 14 of 45 .



DIRECT TENSION INDICATOR DETAIL

ORIGINAL CONSTRUCTION PLANS

END BLOCK & BARRIER CURB DETAILS
FOR UPGRADING OF

486' - 1½" COMP. GIRDER BRIDGE

32' - 0" ROADWAY — SEC. 3-T103N-R73W
OVER WHITE RIVER — 0° SKEW
STA. 378+64.00 TO 383+50.13 — BRF 0047(16)60
STR. NO. 43-403-308 — HS 20-44 & ALT.

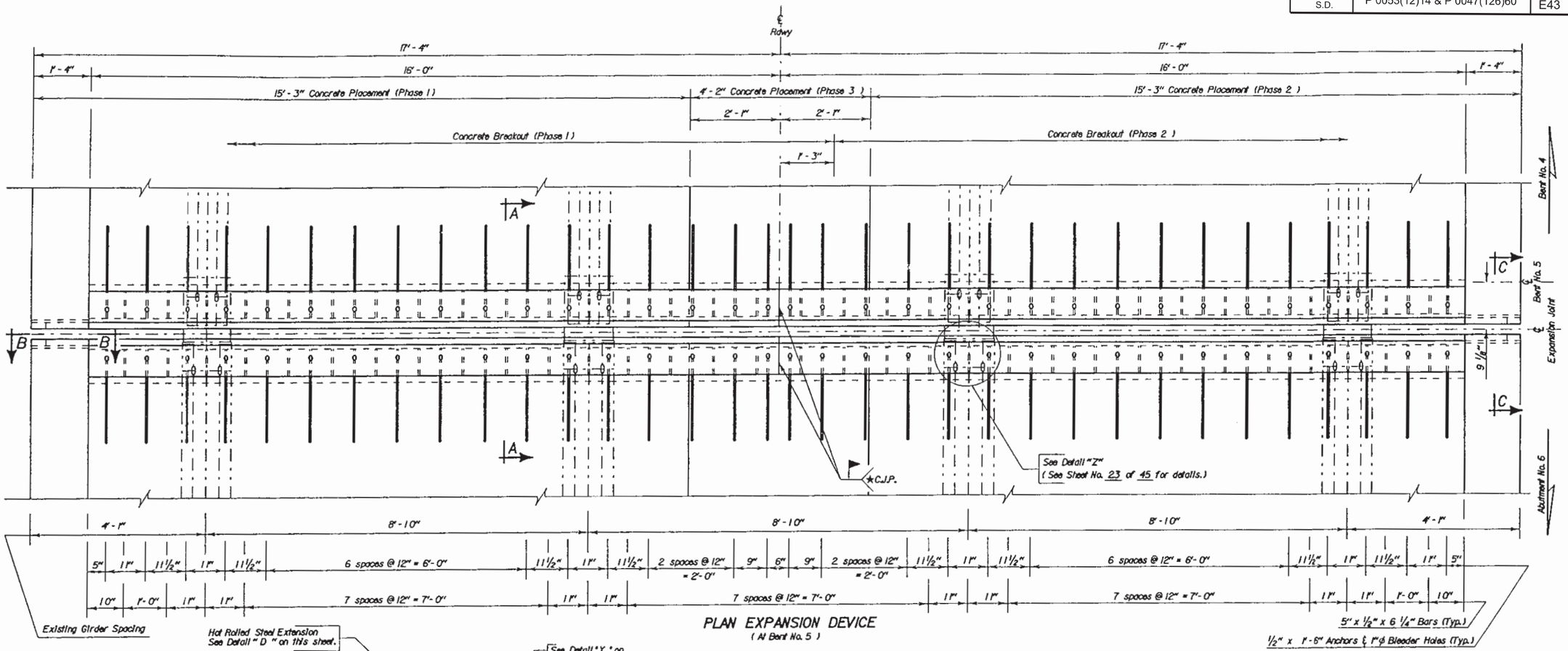
LYMAN COUNTY

S. D. DEPT. OF TRANSPORTATION

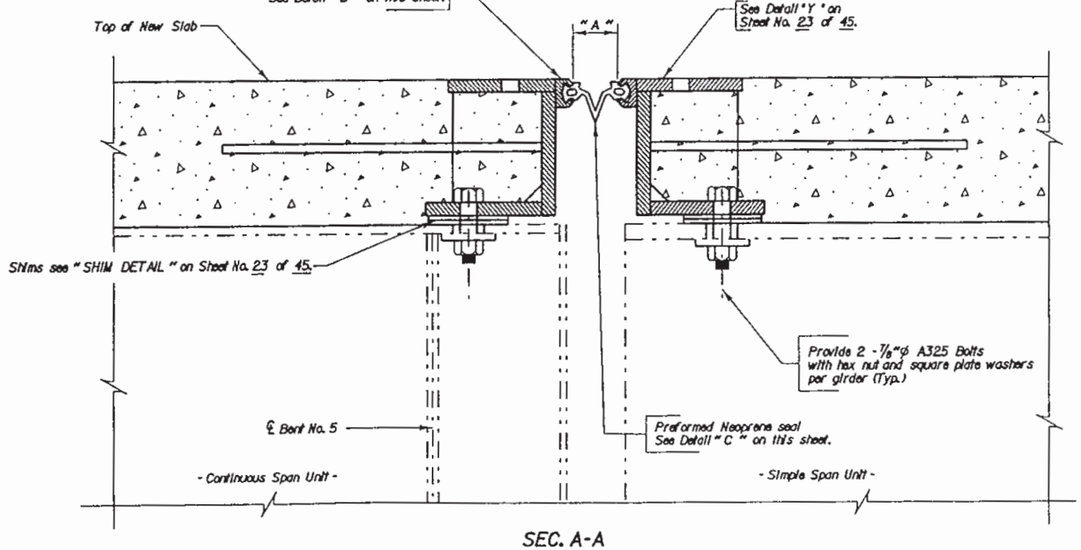
DECEMBER 2000 — 29 OF 39

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
TJO	TJO	DPV	John C. Cole
LYMN3968	3968T015		BRIDGE ENGINEER

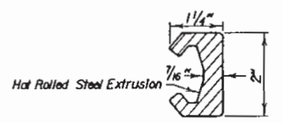
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E43	E52



PLAN EXPANSION DEVICE
(At Bent No. 5)



SEC. A-A
(Reinforcing Steel not Shown)



DETAIL "D"

DETAIL "C"
Neoprene Seal shall have a 4" movement capability.

★ Note: Complete Joint Penetration Butt Splice at construction joint to be shown on shop plans for approval.

TEMP.	DIMENSION "A"
30°	2 13/16"
40°	2 5/8"
50°	2 7/16"
60°	2 3/16"
70°	2"
80°	1 13/16"
90°	1 9/16"

NOTE: Use this sheet in conjunction with Sheet No. 23 of 45.

ESTIMATED QUANTITIES
(At one Bent)

ITEM	UNIT	QUANTITY
Replace Expansion Device	Each	1

For Informational purposes only.

	Phase 1	Phase 2
Structural Steel	2121 LB	2121 LB

ORIGINAL CONSTRUCTION PLANS

REPLACE EXPANSION DEVICE AT BENT NO. 5

FOR UPGRADING OF

486' - 1½" COMP. GIRDER BRIDGE

32' - 0" ROADWAY — SEC. 3-T103N-R73W

OVER WHITE RIVER — 0° SKEW

STA. 378+64.00 TO 383+50.13 — BRF 0047(16)60

STR. NO. 43-403-308 — HS 20-44 & ALT.

LYMAN COUNTY

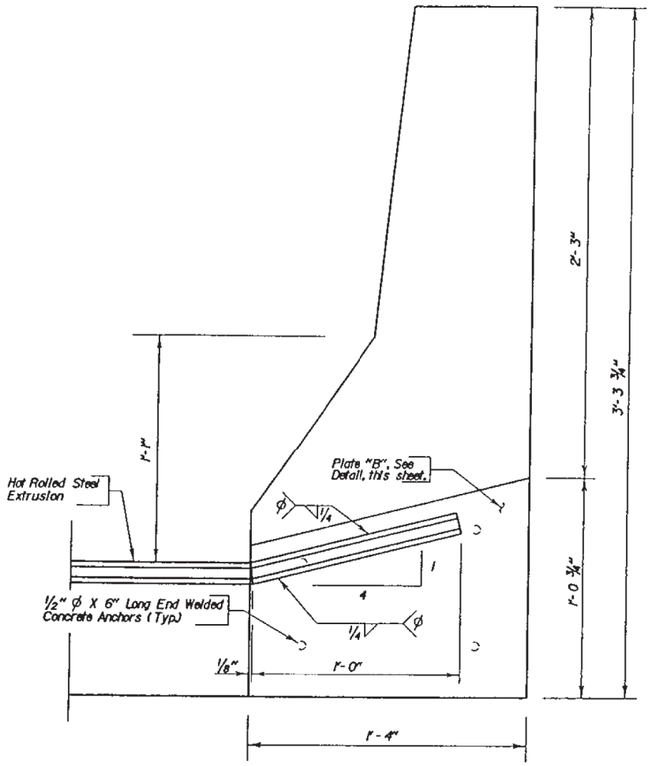
S. D. DEPT. OF TRANSPORTATION

DECEMBER 2000

30 OF 39

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
TJO	TJO	DPV	BRIDGE ENGINEER
LYMN3968	39681022		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E44	E52



VIEW B-B
(Typical)

ϕ Field Weld Optional

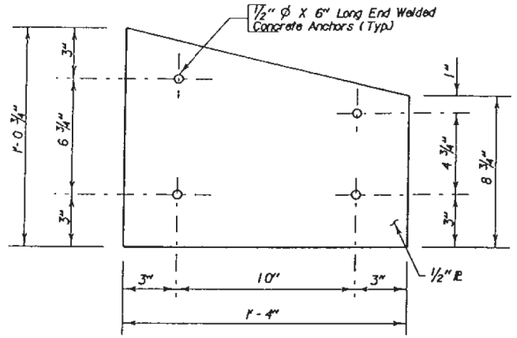


PLATE "A"
(Plate "A" is 1/2" thick)

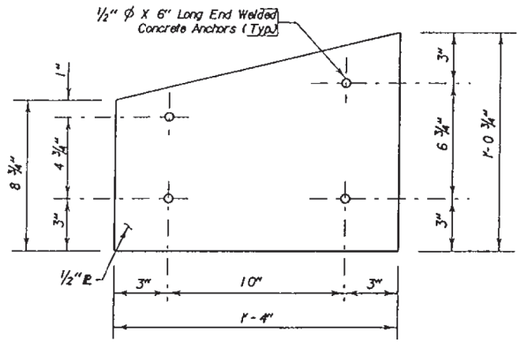
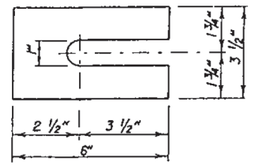


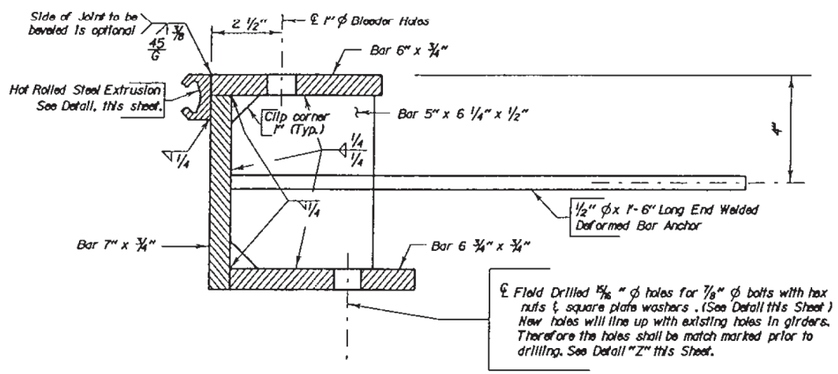
PLATE "B"
(Plate "B" is 1/2" thick)



SHIM DETAIL

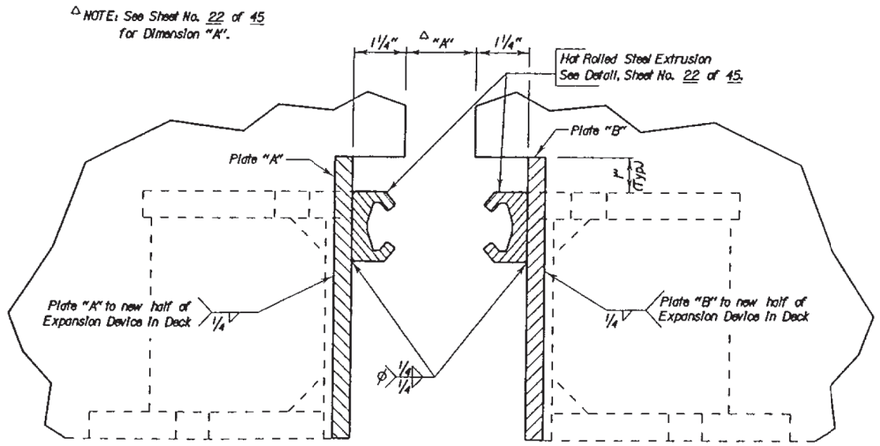
QUANTITY	THICKNESS
8	1"
8	3/4"
8	5/8"
12	1/2"
8	1/4"
4	3/8"
12	1/8"
12	1/16"

Provide per replaced expansion device

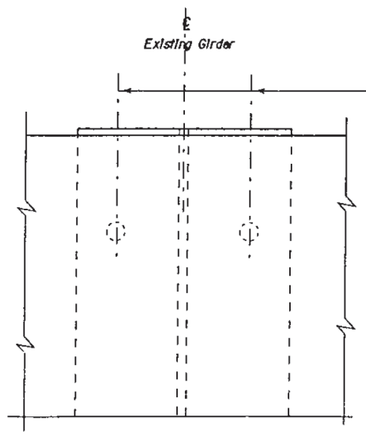


DETAIL "Y"

△NOTE: See Sheet No. 22 of 45 for Dimension "A".



SECTION C-C



℄ Field drilled 15/16" ϕ holes in new expansion device. New holes should line up with the existing holes in girders. Therefore the holes shall be match marked prior to drilling. (Typical for all Girders)

DETAIL "Z"

ORIGINAL CONSTRUCTION PLANS

REPLACE EXPANSION DEVICE AT BENT NO. 5
FOR UPGRADING OF

486' - 1 1/2" COMP. GIRDER BRIDGE

32' - 0" ROADWAY — SEC. 3-T103N-R73W
OVER WHITE RIVER — 0° SKEW
STA. 378+64.00 TO 383+50.13 — BRF 0047(16)60
STR. NO. 43-403-308 — HS 20-44 & ALT.

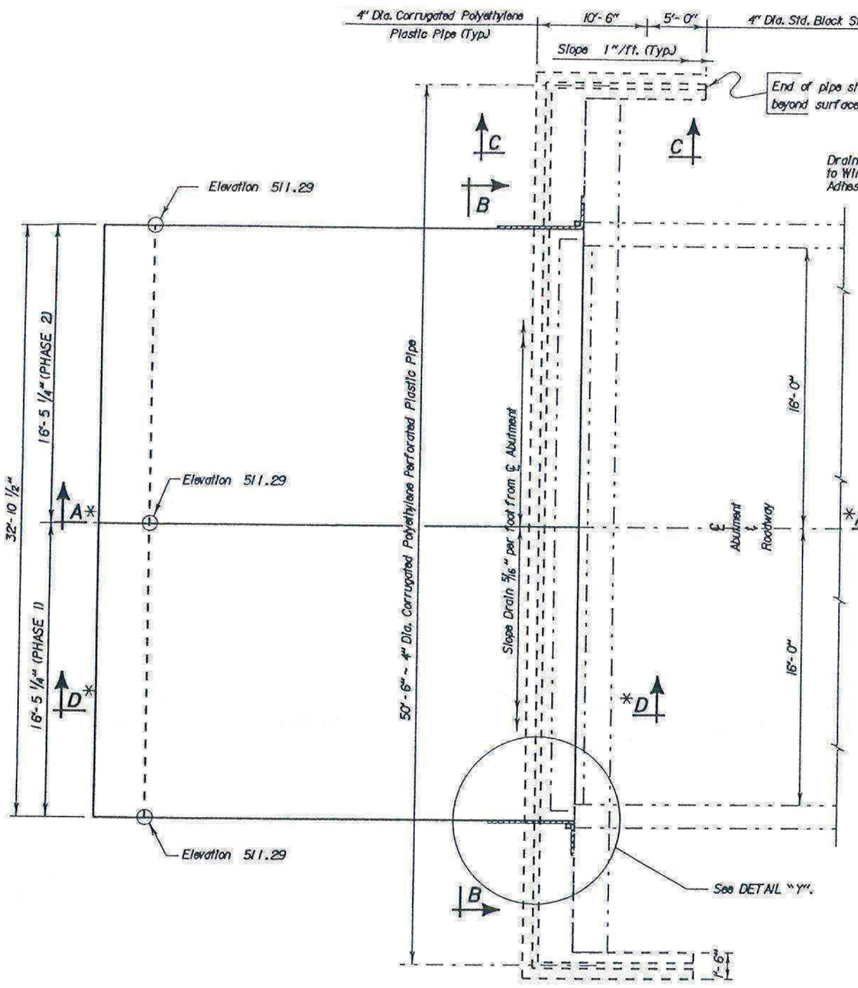
LYMAN COUNTY

S. D. DEPT. OF TRANSPORTATION

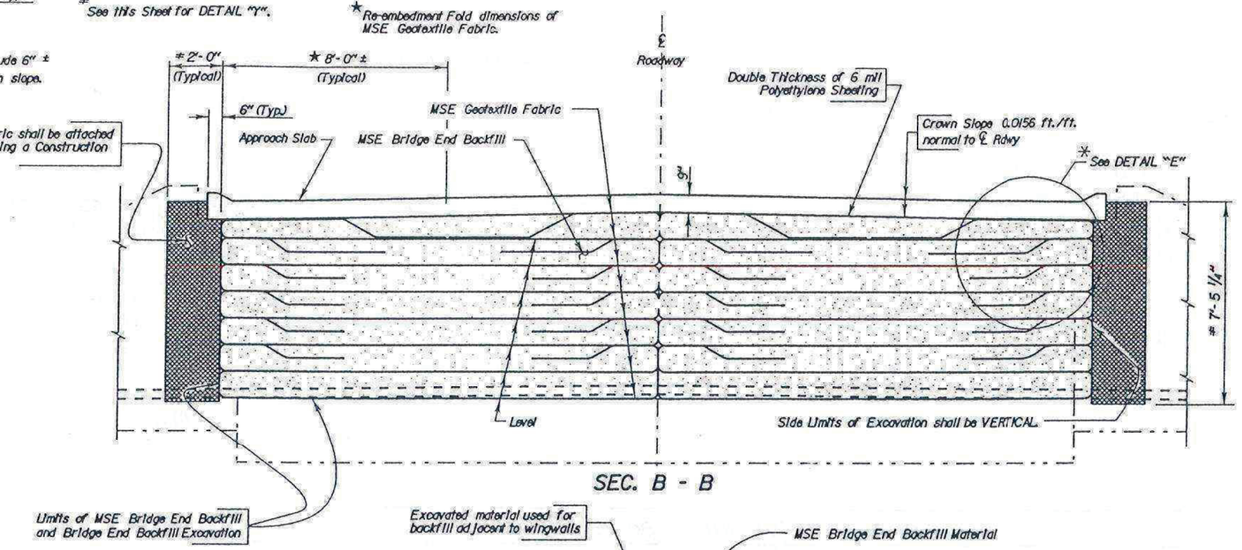
DECEMBER 2000 — 31 OF 39

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
TJO	TJO	DPV	BRIDGE ENGINEER
LYMN3968	39681023		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E45	E52

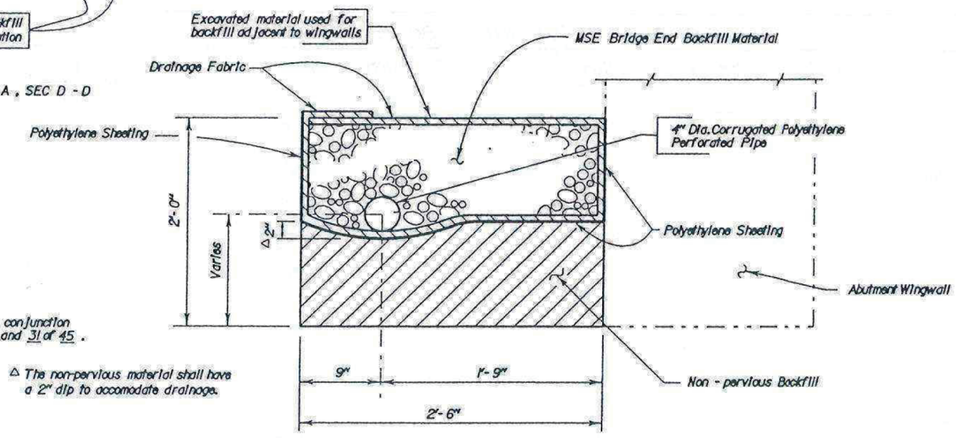


PLAN
(Abutment No. 1)



SEC. B - B

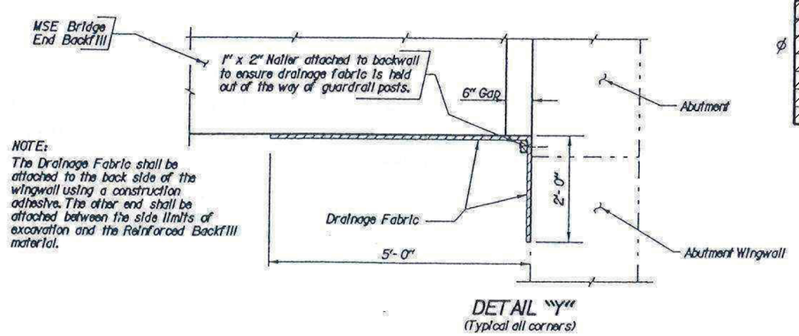
* See Sheet No. 28 of 45 for SEC. A - A, SEC D - D and Detail "E".



NOTE-
This sheet to be used in conjunction with Sheet No's. 27, 28 and 31 of 45.

Δ The non-pervious material shall have a 2" dip to accomodate drainage.

SEC. C-C
(Typ.)



NOTE:
The Drainage Fabric shall be attached to the back side of the wingwall using a construction adhesive. The other end shall be attached between the side limits of excavation and the Reinforced Backfill material.

DETAIL "Y"
(Typical all corners)

ESTIMATED QUANTITIES
(For Abutment No. 1)

ITEM	UNIT	QUANTITY PHASE 1	QUANTITY PHASE 2
Bridge End Backfill Under drain Pipe	Ft.	41	41
Bridge End Backfill Excavation	Cu/d.	68	68
MSE Bridge End Backfill	Cu/d.	65	65
Type B Drainage Fabric	Sq/d.	13	13
MSE Geotextile Fabric	Sq/d.	524	524

ϕ

1. 50.5 ft. 4" dia. Corrugated Polyethylene Perforated Plastic Pipe for Abutment No. 1.
2. 21.0 ft. 4" dia. Corrugated Polyethylene Plastic Pipe for Abutment No. 1.
3. 10.0 ft. 4" dia. Std. Block Steel Pipe for Abutment No. 1.
4. 1,630 sq. ft. 6 mil Polyethylene Sheeting, not including laps.

Items 1 thru 4 are approximate quantities contained in the above bid items and are for information only.

ϕ Bridge End Backfill Excavation will not be measured. Plans quantity payment will be full compensation for this item.

ORIGINAL CONSTRUCTION PLANS

DETAILS OF MSE BRIDGE END BACKFILL AT ABUT. NO. 1

FOR

486' - 1½" COMP. GIRDER BRIDGE

32' - 0" ROADWAY — SEC. 3-T103N-R73W
OVER WHITE RIVER — 0° SKEW
STA. 378+64.00 TO 383+50.13 — BRF 0047(16)60
STR. NO. 43-403-308 — HS 20-44 & ALT.

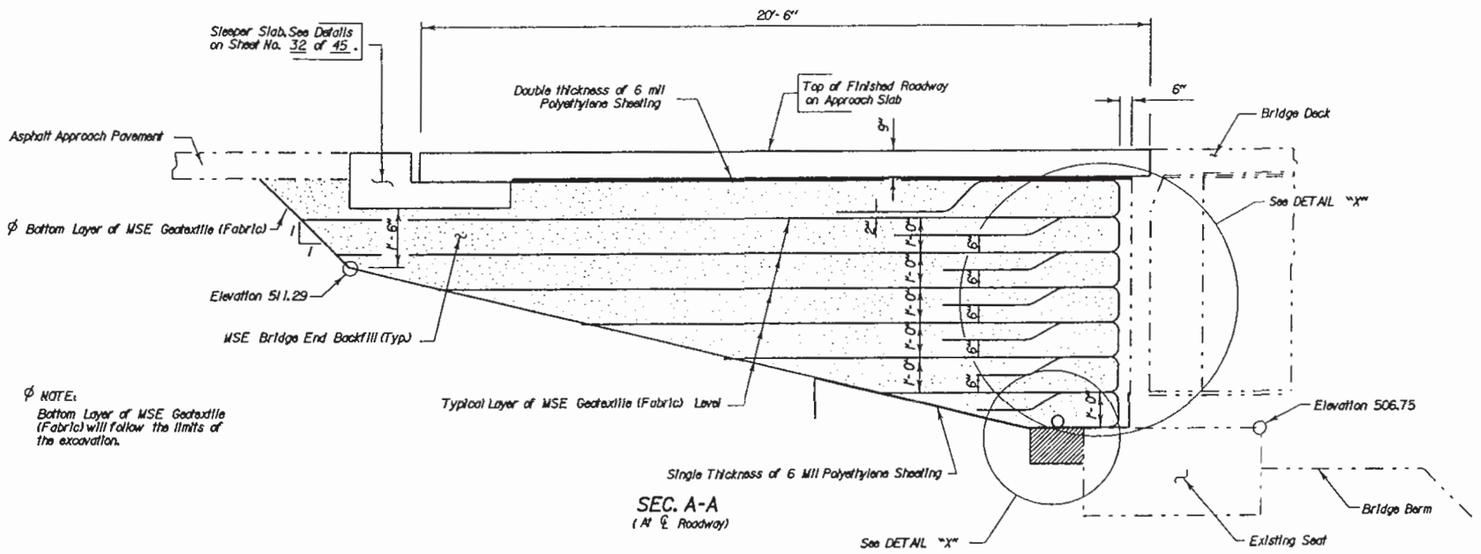
LYMAN COUNTY

S. D. DEPT. OF TRANSPORTATION

DECEMBER 2000

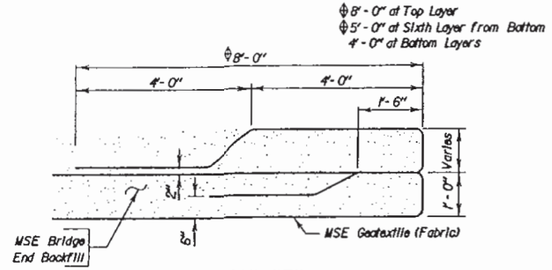
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
TJO/DPV	LH	TJO/DPV	BRIDGE ENGINEER
LYMN3968	3968T027		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E46	E52

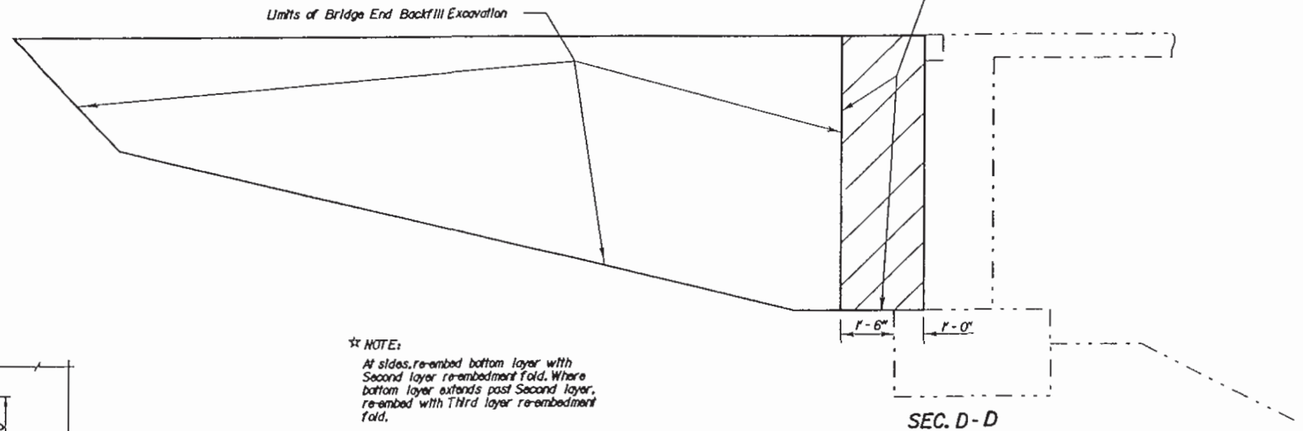


SEC. A-A
(At ℄ Roadway)

Ø NOTE:
Bottom Layer of MSE Geotextile (Fabric) will follow the limits of the excavation.



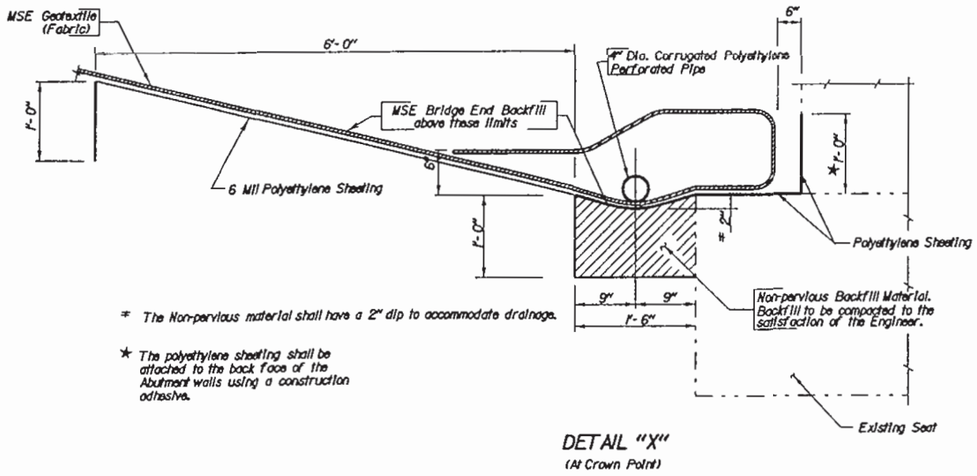
DETAIL "Z"
Typical Fabric Lift and Wrap
(Showing Second and Above Lifts Normal to Abutment Backwall)



SEC. D-D

☆ NOTE:
At sides, re-embed bottom layer with Second layer re-embedment fold. Where bottom layer extends past Second layer, re-embed with Third layer re-embedment fold.

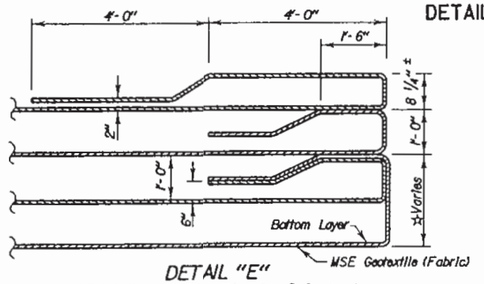
NOTE:
This sheet to be used in conjunction with Sheet No. 27 of 45.



The Non-pervious material shall have a 2" dip to accommodate drainage.

☆ The polyethylene sheeting shall be attached to the back face of the Abutment walls using a construction adhesive.

DETAIL "X"
(At Crown Point)



DETAIL "E"
(Fabric Wrap at Sides adjacent to ℄ Roadway)

ORIGINAL CONSTRUCTION PLANS (Typ.)

DETAILS OF MSE BRIDGE END BACKFILL AT ABUT. NO. 1, CONT.
FOR
486' - 1½" COMP. GIRDER BRIDGE

32' - 0" ROADWAY — SEC. 3-T103N-R73W
OVER WHITE RIVER — 0° SKEW
STA. 378+64.00 TO 383+50.13 — BRF 0047(16)60
STR. NO. 43-403-308 — HS 20-44 & ALT.

LYMAN COUNTY

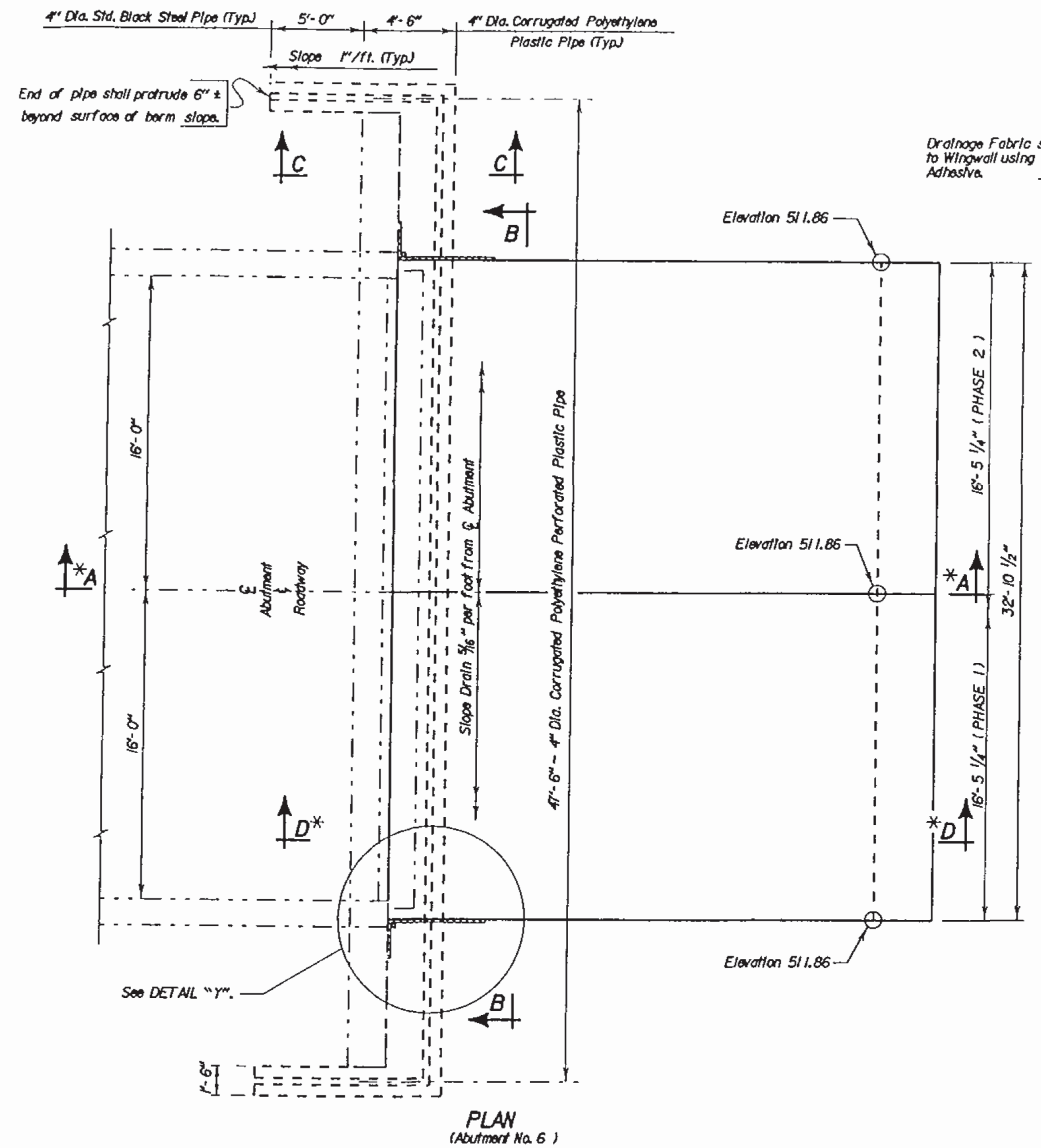
S. D. DEPT. OF TRANSPORTATION

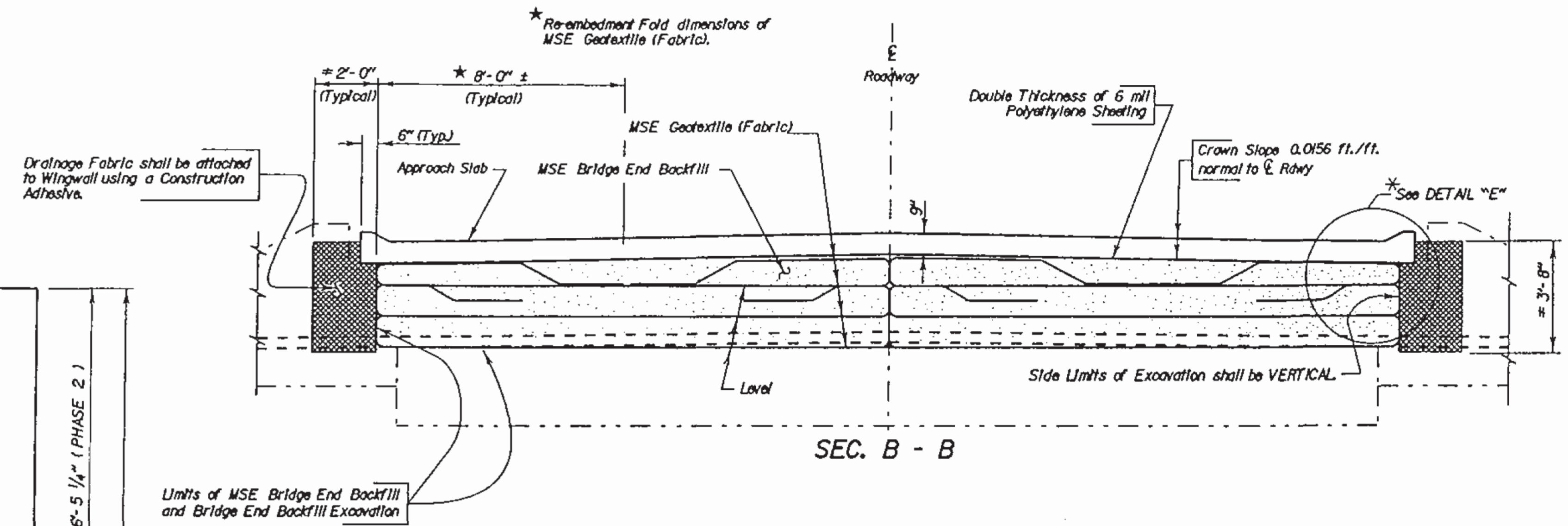
DECEMBER 2000

(33) OF (39)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
TJO/DPV		TJO/DPV	BRIDGE ENGINEER
LYMN3968	39681028		

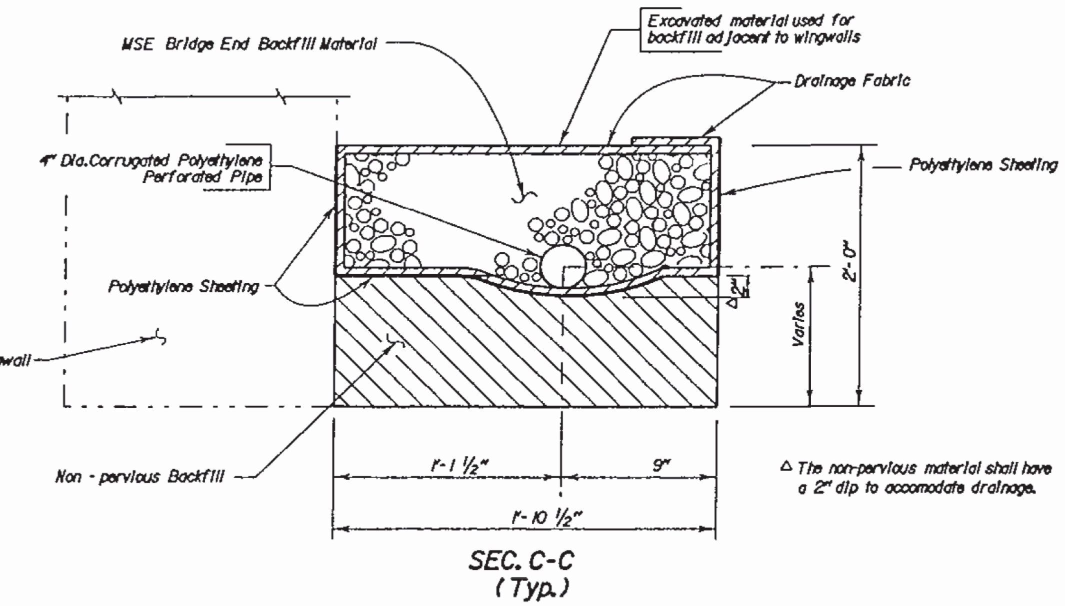
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E47	E52

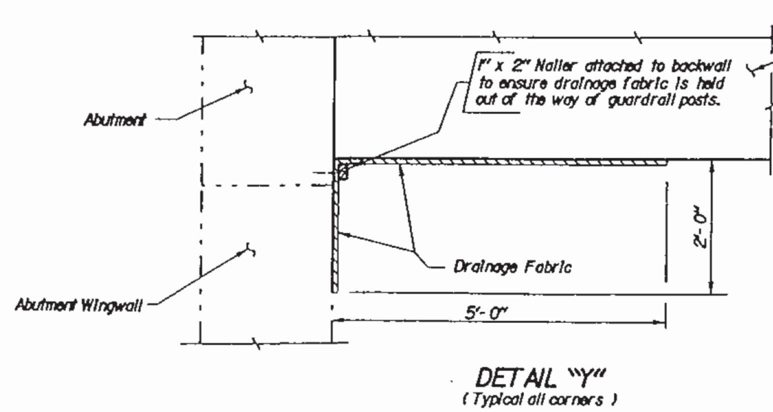




* See Sheet No. 30 of 45 for SEC. A - A, SEC. D - D and Detail "E".

NOTE-
This sheet to be used in conjunction with Sheet No's. 30 and 31 of 45.





NOTE:
The Drainage Fabric shall be attached to the back side of the wingwall using a construction adhesive. The other end shall be attached between the side limits of excavation and the Reinforced Backfill material.

ESTIMATED QUANTITIES (For Abutment No. 6)		QUANTITY	
ITEM	UNIT	PHASE 1	PHASE 2
Bridge End Backfill Underdrain Pipe	Ft	34	34
∅ Bridge End Backfill Excavation	CuYd	38	38
MSE Bridge End Backfill	CuYd	32	32
Type B Drainage Fabric	SqYd	8	8
MSE Geotextile Fabric	SqYd	270	270

1. 47.5 ft. 4" dia. Corrugated Polyethylene Perforated Plastic Pipe for Abutment No. 6.
2. 9.0 ft. 4" dia. Corrugated Polyethylene Plastic Pipe for Abutment No. 6.
3. 10.0 ft. 4" dia. Std. Black Steel Pipe for Abutment No. 6.
4. 1,686 sq. ft. 6 mil Polyethylene Sheeting, not including laps.

Items 1 thru 4 are approximate quantities contained in the above bid items and are for information only.

∅ Bridge End Backfill Excavation will not be measured. Plans quantity payment will be full compensation for this item.

ORIGINAL CONSTRUCTION PLANS

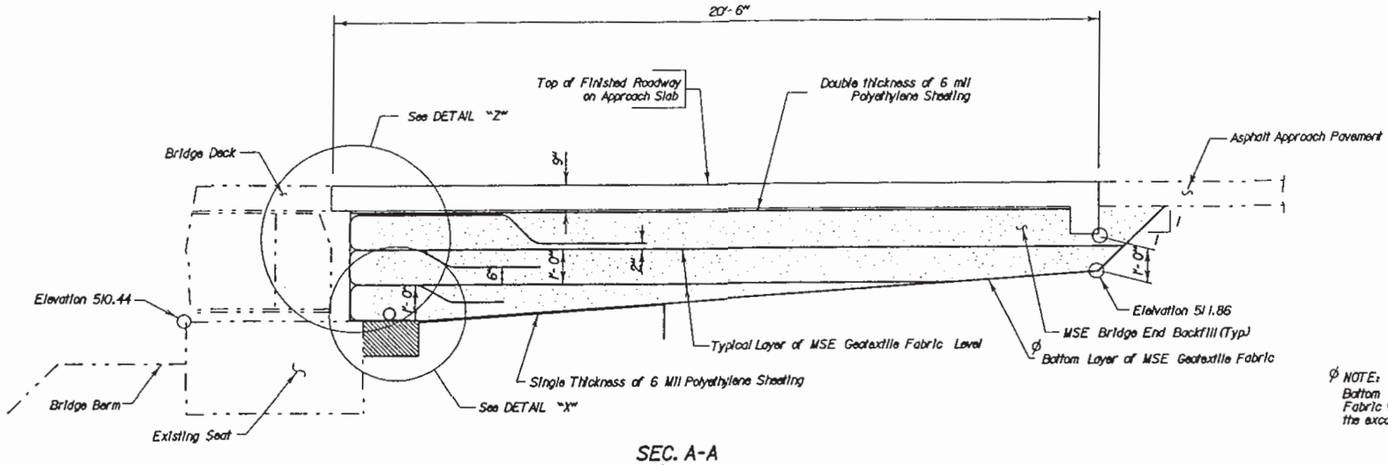
DETAILS OF MSE BRIDGE END BACKFILL AT ABUT. NO. 6
FOR
486' - 1 1/2" COMP. GIRDER BRIDGE

32' - 0" ROADWAY — SEC. 3-T103N-R73W
OVER WHITE RIVER — 0° SKEW
STA. 378+64.00 TO 383+50.13 — BRF 0047(16)60
STR. NO. 43-403-308 — HS 20-44 & ALT.

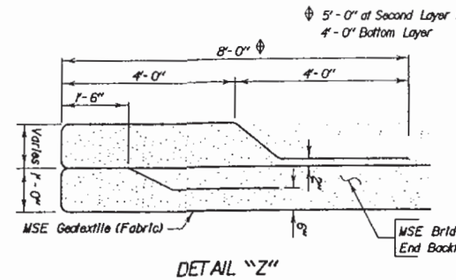
LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2000 — 34 OF 39

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
TJO/DPV	LYH	TJO/DPV	[signature] BRIDGE ENGINEER
LYMN3968	3968T029		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E48	E52

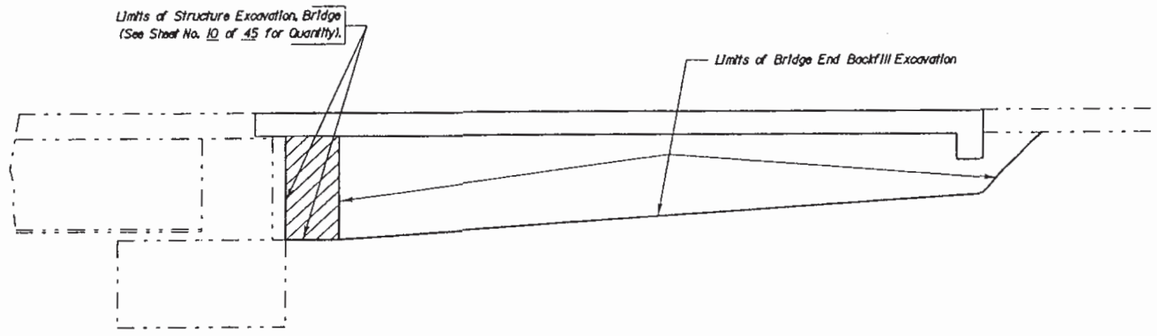


SEC. A-A
(At ℄ Roadway)



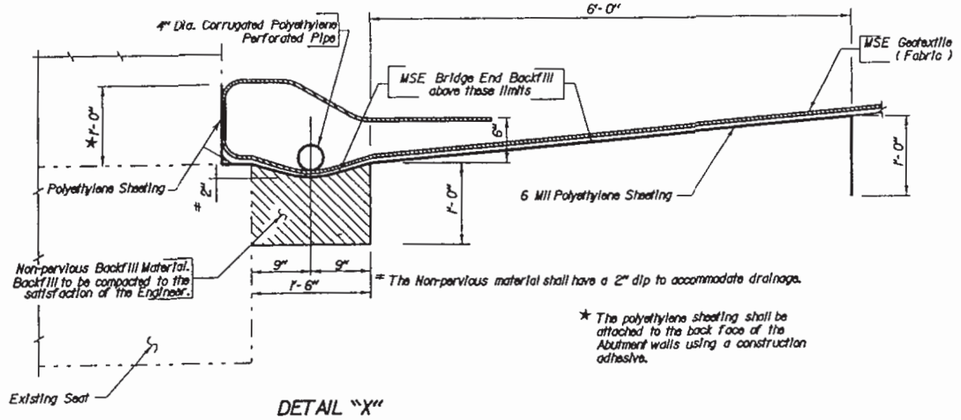
DETAIL "Z"
Typical Fabric Lift and Wrap
(Showing Second and Above Lifts Normal to Abutment Backwall)

℄ NOTE:
Bottom Layer of MSE Geotextile Fabric will follow the limits of the excavation.



SEC. D-D
(Typ.)

NOTE:
This sheet to be used in conjunction with Sheet No. 29 and 31 of 45 .

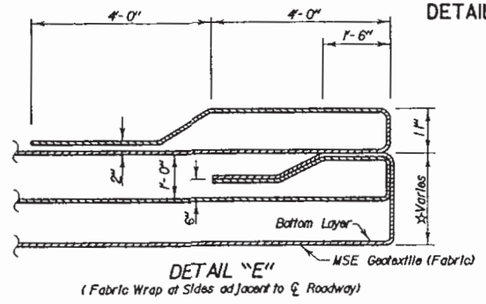


DETAIL "X"
(At Crown Point)

The Non-pervious material shall have a 2" dip to accommodate drainage.

★ The polyethylene sheeting shall be attached to the back face of the Abutment walls using a construction adhesive.

☆ NOTE:
At sides, re-embed bottom layer with Second layer re-embedment fold. Where bottom layer extends past Second layer, re-embed with Third layer re-embedment fold.



DETAIL "E"
(Fabric Wrap at Sides adjacent to ℄ Roadway)

ORIGINAL CONSTRUCTION PLANS

DETAILS OF MSE BRIDGE END BACKFILL AT ABUT. NO. 6, CONT.
FOR
486' - 1½" COMP. GIRDER BRIDGE

32' - 0" ROADWAY — SEC. 3-T103N-R73W
OVER WHITE RIVER — 0° SKEW
STA. 378+64.00 TO 383+50.13 — BRF 0047(16)60
STR. NO. 43-403-308 — HS 20-44 & ALT.

LYMAN COUNTY

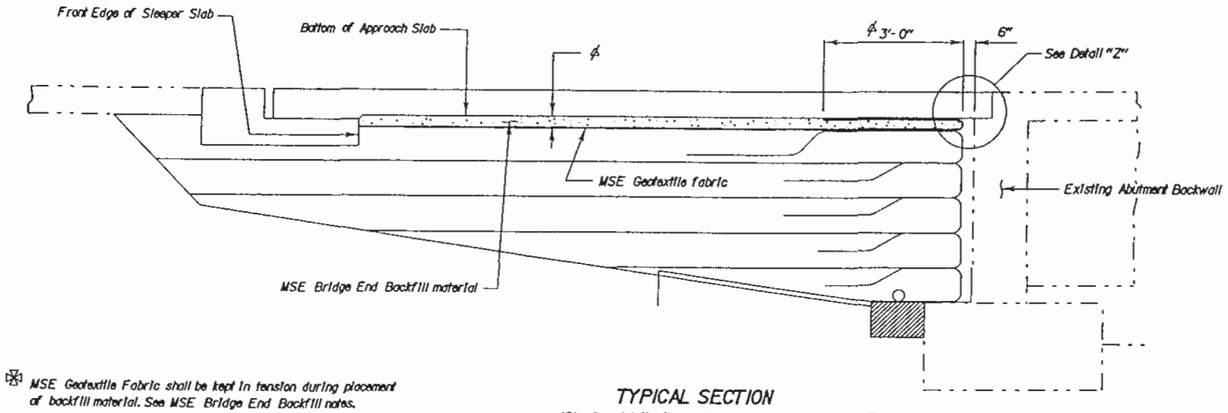
S. D. DEPT. OF TRANSPORTATION

DECEMBER 2000

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
TJO/DPV	39581030	TJO/DPV	BRIDGE ENGINEER
LYMN3968			

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E49	E52

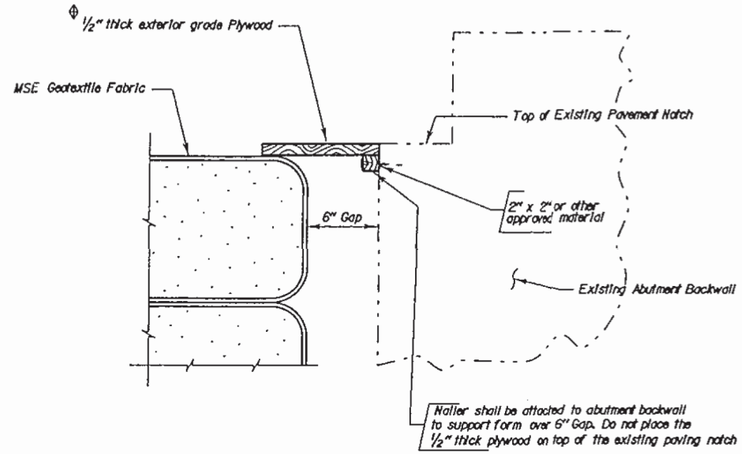
ϕ Any additional MSE Bridge End Backfill material placed to fine grade the bridge end backfill to final elevation shall be wrapped in MSE Geotextile fabric to prevent migration of the material into the 6" void adjacent to the abutment backwall. Fabric shall extend to the front edge of the sleeper slab.



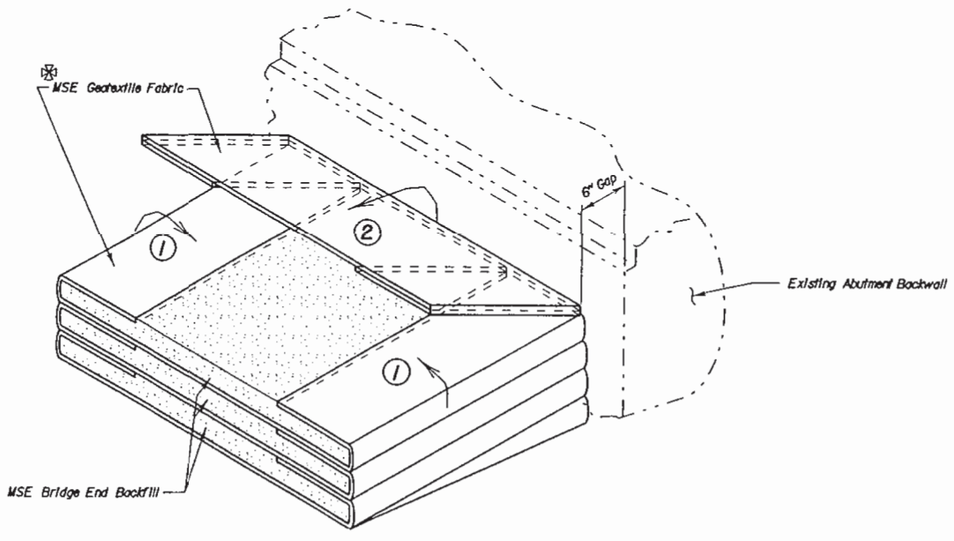
✠ MSE Geotextile Fabric shall be kept in tension during placement of backfill material. See MSE Bridge End Backfill notes.

TYPICAL SECTION
(Showing details for grade filling material when used)

Φ Place top of plywood level with top of existing paving notch.



DETAIL "Z"
(Showing details for plywood form placed over 6" opening)



DETAILS OF MSE GEOTEXTILE FABRIC FOLDING
(Folding detail applies to each layer of construction)
(Folding is shown per phase of construction)

NOTE:
This sheet to be used in conjunction with Sheet Nos. 27 thru 30 of 45 .

NOTE:
The details shown on this sheet shall be used for both Abutments except there will be no 6" opening at the backwall of Abutment No. 6.

ORIGINAL CONSTRUCTION PLANS

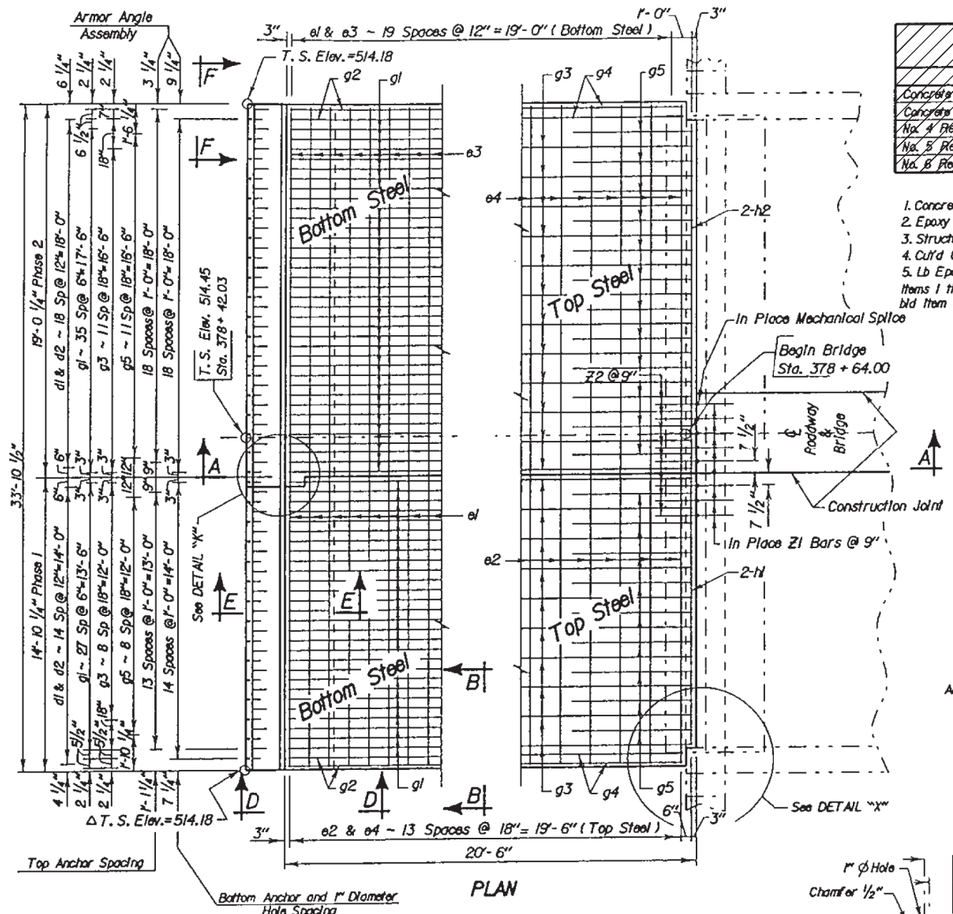
DETAILS OF MSE BRIDGE END BACKFILL, CONT.
FOR
486' - 1½" COMP. GIRDER BRIDGE

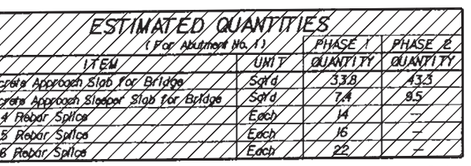
32' - 0" ROADWAY — SEC. 3-T103N-R73W
OVER WHITE RIVER — 0° SKEW
STA. 378+64.00 TO 383+50.13 — BRF 0047(16)60
STR. NO. 43-403-308 — HS 20-44 & ALT.

LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2000

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
TJO/DPV	LYN	TJO/DPV	BRIDGE ENGINEER
LYMN3968	3968T03I		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E50	E52





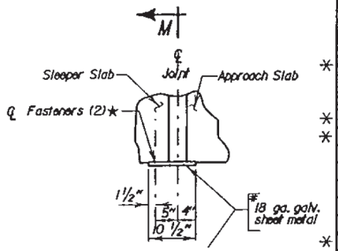
DETAIL "K"

ESTIMATED QUANTITIES (For Abutment No. 1)			
ITEM	UNIT	PHASE 1 QUANTITY	PHASE 2 QUANTITY
Concrete Approach Slab for Bridge	Sq Yd	33.8	43.3
Concrete Approach Sleeper Slab for Bridge	Sq Yd	7.4	8.5
No. 4 Rebar Splice	Each	14	–
No. 5 Rebar Splice	Each	16	–
No. 6 Rebar Splice	Each	22	–

	PHASE 1	PHASE 2
1. Concrete In Approach Slabs.	8.8 Cu Yds	11.3 Cu Yds
2. Epoxy Coated Re-Steel In Approach Slabs.	2 503 lb	3 173 lb
3. Structural Steel In Armor Assembly.	370 lb	475 lb
4. Cu Yd Concrete In Sleeper Slab.	2.7 Cu Yd	3.5 Cu Yd
5. Lb Epoxy Coated Re-Steel In Sleeper Slab.	408 lb	521 lb

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

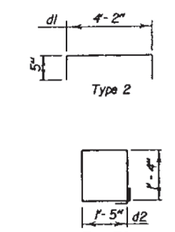
★ Attach #18 ga. galv. Sheet Metal to Sleeper Slab only, after slab has been poured. Use fasteners that will not spall concrete, as approved by the Engineer.



REINFORCING SCHEDULE

	Mk.	No.	Size	Length	Type
	Phase 1				
*	c1	16	5	14'-8"	Str.
	d1	30	4	5'-0"	2
	d2	15	4	6'-3"	T2
*	e1	20	6	14'-8"	Str.
*	e2	14	4	14'-8"	Str.
	g1	28	8	20'-2"	Str.
	g2	2	8	19'-8"	Str.
	g3	10	4	20'-2"	Str.
	g4	2	4	19'-8"	Str.
	g5	9	4	6'-0"	Str.
*	h1	2	6	13'-9"	Str.
*	Z2	18	7	2'-0"	Str.
	Phase 2				
*	c2	16	5	18'-10"	Str.
	d1	38	4	5'-0"	2
	d2	19	4	6'-3"	T2
*	e3	20	6	18'-10"	Str.
*	e4	14	4	18'-10"	Str.
	g1	36	8	20'-2"	Str.
	g2	2	8	19'-8"	Str.
	g3	12	4	20'-2"	Str.
	g4	2	4	19'-8"	Str.
	g5	12	4	6'-0"	Str.
*	h2	2	6	17'-11"	Str.
*	Z2	23	7	2'-0"	Str.

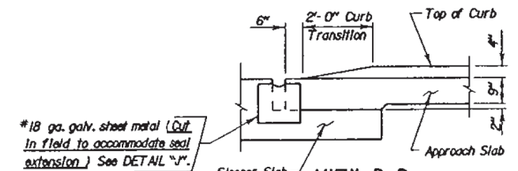
Bending Details

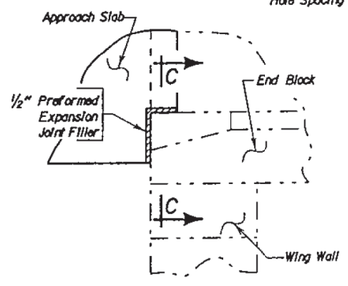


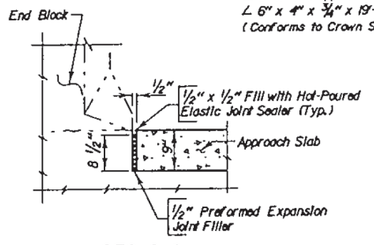
★ Equivalent Splice Lengths
No. 4 - 1'-7"
No. 5 - 2'-0"
No. 6 - 2'-5"

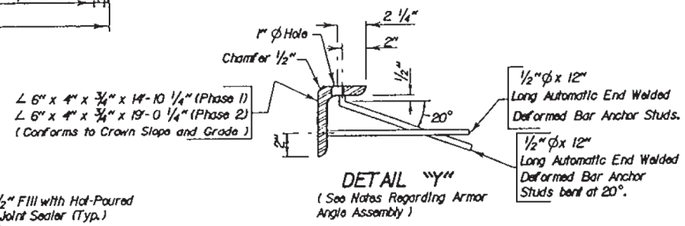
★ These bars shall be spliced using mechanical splice devices

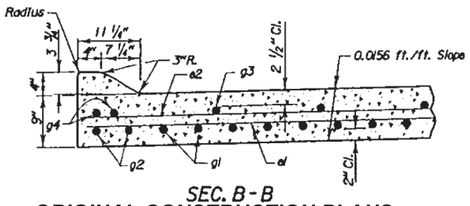
NOTE –
All Bars to be Epoxy Coated.
All dimensions are out to out of bars.

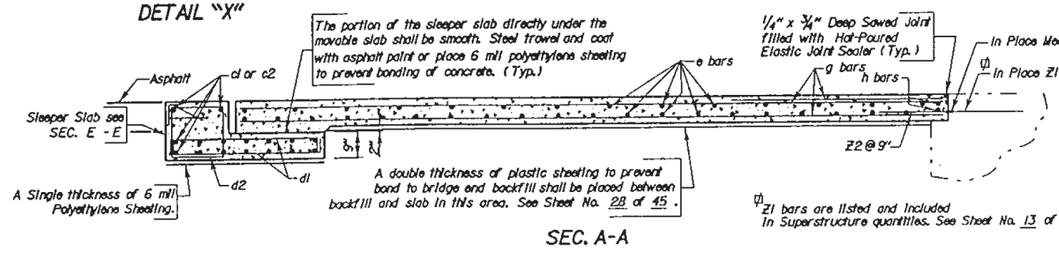


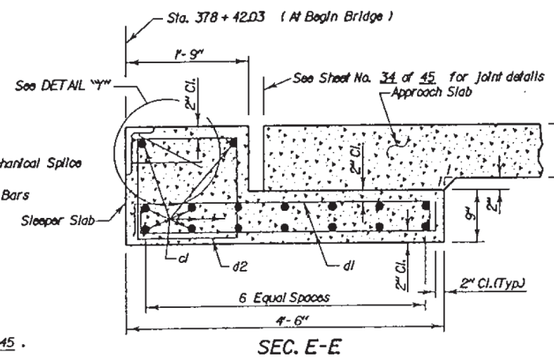












ORIGINAL CONSTRUCTION PLANS

DETAILS OF APPROACH SLAB ADJ. TO ABUT. NO. 1

FOR UPGRADING OF

486' - 1½" COMP. GIRDER BRIDGE

32'- 0" ROADWAY — SEC. 3-T103N-R73W

OVER WHITE RIVER — 0° SKEW

STA. 378+64.00 TO 383+50.13 — BRF 0047(16)60

STR. NO. 43-403-308 — HS 20-44 & ALT.

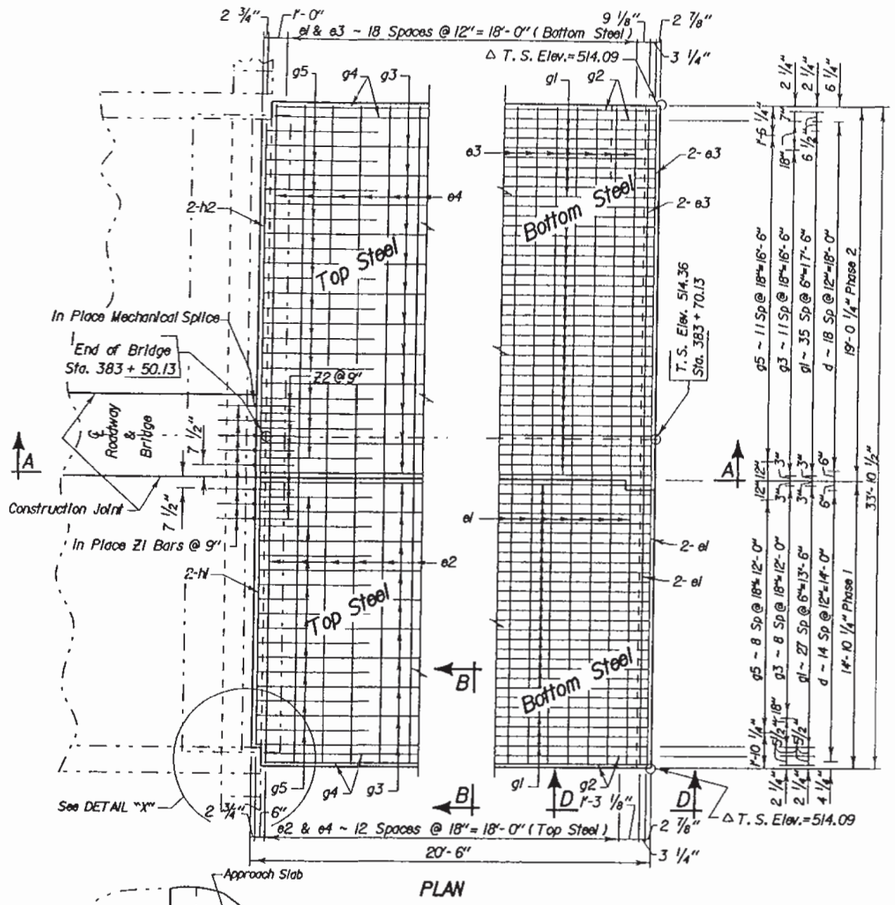
LYMAN COUNTY

S. D. DEPT. OF TRANSPORTATION

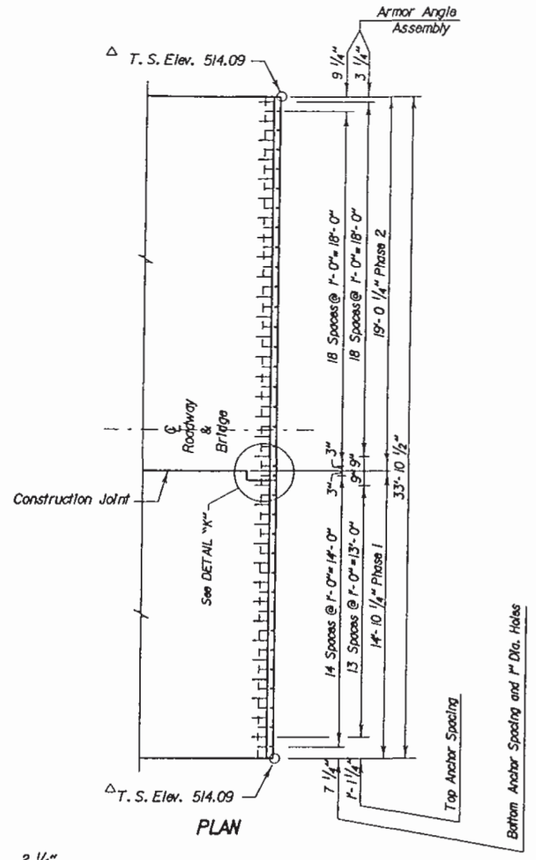
DECEMBER 2000

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
TJO/DPV	39681032	TJO/DPV	BRIDGE ENGINEER
LYMN3968			

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E51	E52



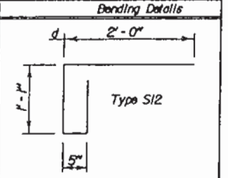
PLAN



PLAN

REINFORCING SCHEDULE

	Mk.	No.	Size	Length	Type
	Phase 1				
	d	15	4	4'-5"	S12
*	e1	23	6	14'-8"	Str.
*	e2	15	4	14'-8"	Str.
	g1	28	8	20'-2"	Str.
	g2	2	8	19'-8"	Str.
	g3	10	4	20'-2"	Str.
	g4	2	4	19'-8"	Str.
	g5	9	4	6'-0"	Str.
*	h1	2	6	13'-9"	Str.
*	Z2	18	7	2'-0"	Str.
	Phase 2				
	d	19	4	4'-5"	S12
*	e3	23	6	18'-10"	Str.
*	e4	15	4	18'-10"	Str.
	g1	36	8	20'-2"	Str.
	g2	2	8	19'-8"	Str.
	g3	12	4	20'-2"	Str.
	g4	2	4	19'-8"	Str.
	g5	12	4	6'-0"	Str.
*	h2	2	6	17'-11"	Str.
*	Z2	23	7	2'-0"	Str.



* Equivalent Splice Lengths
No. 4 - 1'-7"
No. 5 - 2'-0"
No. 6 - 2'-5"

* These bars shall be spliced using mechanical splice devices.

NOTE –
All Bars to be Epoxy Coated.
All dimensions are out to out of bars.

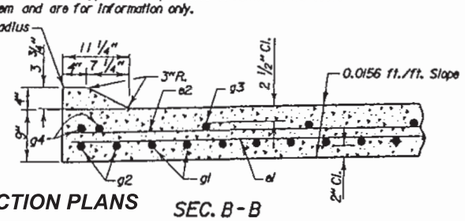
ESTIMATED QUANTITIES

(For Abutment No. 6)

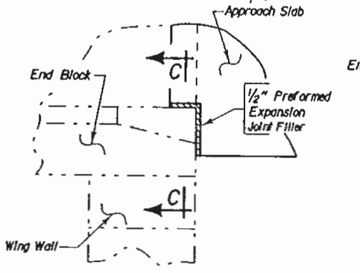
ITEM	UNIT	PHASE 1 QUANTITY	PHASE 2 QUANTITY
Concrete Approach Slab for Bridge	Sq Yd	33.8	45.3
No. 4 Rebar, Splice	Each	15	—
No. 6 Rebar, Splice	Each	23	—

	PHASE 1	PHASE 2
1. Concrete In Approach Slabs.	8.8 Cu Yd	11.4 Cu Yd
2. Epoxy Coated Re-Steel In Approach Slabs.	2623 lb	3327 lb
3. Structural Steel In Armor Assembly.	370 lb	475 lb

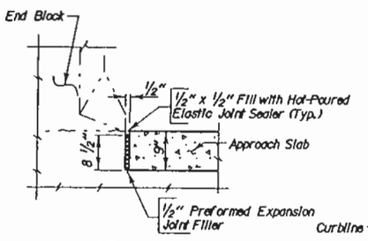
Items 1 thru 3 are approximate quantities contained in the above bid item and are for information only.



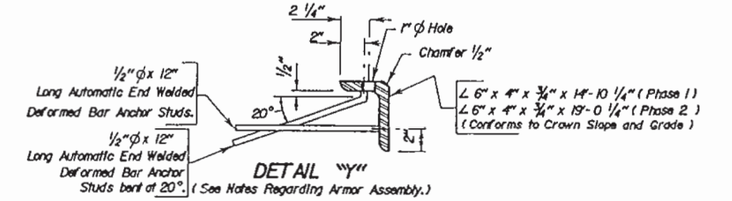
SEC. B-B



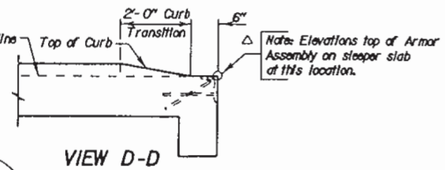
DETAIL "X"



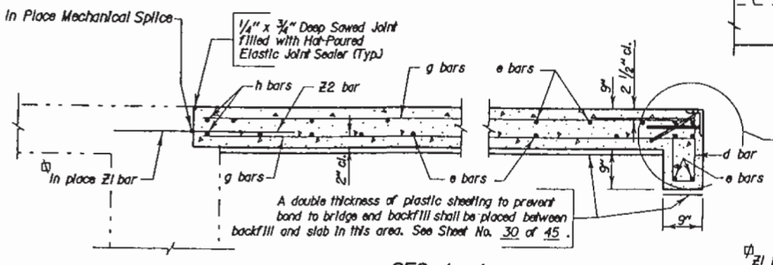
SEC. C-C



DETAIL "Y" (See Notes Regarding Armor Assembly.)

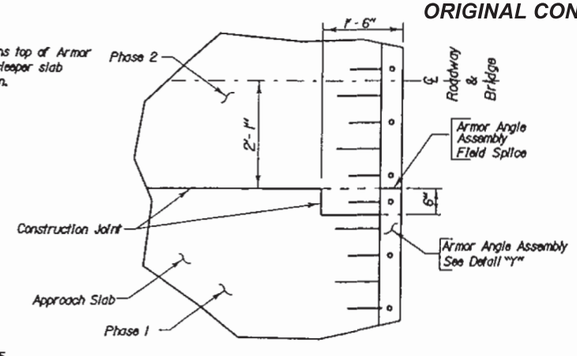


VIEW D-D



SEC. A - A

ψ Z1 bars are listed and included in Superstructure quantities. See Sheet No. 13 of 45 .



DETAIL "K"

ORIGINAL CONSTRUCTION PLANS

DETAILS OF APPROACH SLAB ADJ. TO ABUT. NO. 6
FOR UPGRADING OF

486' - 1½" COMP. GIRDER BRIDGE

32'- 0" ROADWAY — SEC. 3-T103N-R73W
OVER WHITE RIVER — 0° SKEW
STA. 378+64.00 TO 383+50.13 — BRF 0047(16)60
STR. NO. 43-403-308 — HS 20-44 & ALT.

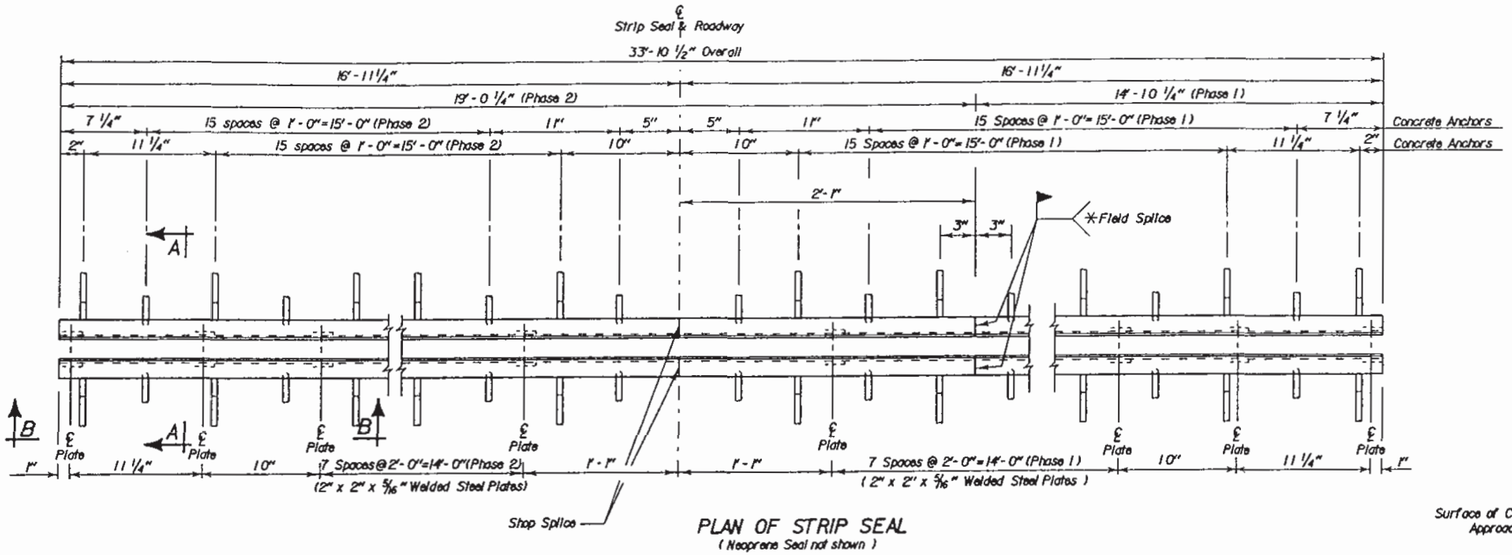
LYMAN COUNTY

S. D. DEPT. OF TRANSPORTATION

DECEMBER 2000 (38) OF (39)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
TJO/DPV	JJH	TJO/DPV	John C. Cole
LYMN3968	3968T033		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 0053(12)14 & P 0047(126)60	E52	E52



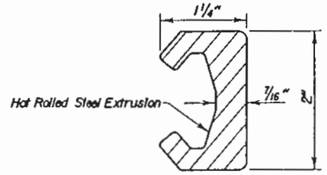
PLAN OF STRIP SEAL
(Neoprene Seal not shown)

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

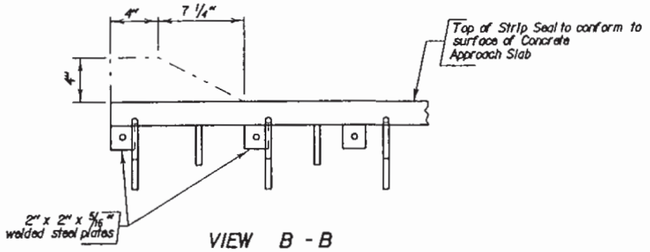
GENERAL NOTES :

1. 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"ϕ x 6" Concrete Anchors shall conform to ASTM A-108.
2. Material for the Neoprene Seal shall conform to ASTM D2628 modified to omit the recovery test. No splices will be permitted in the Neoprene Seal.
3. 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 contaminates at the time the Neoprene Seal is installed.
4. 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 ANSI/AWS D1.1-90 Structural Welding Code. 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.
5. 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 Strip 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.
6. 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.
7. The lubricant-adhesive may be one or two component at the supplier's option. The Neoprene Seal and lubricant-adhesive should be supplied or recommended by the same source as they must be compatible. The lubricant adhesive must have a solids content by weight of at least 65 percent and 250 percent minimum elongation. It may not contain solvents with a Flash Point below 80° F.
8. 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.
9. The Strip Seal Expansion Joint supplier shall submit a detailed gland installation procedure with the shop plans.
10. The cost of welding shall be included in the unit cost for Strip Seal Expansion Joint.
11. The Neoprene Seal shall be of sufficient length such that a minimum length of 6" shall extend beyond each end of the Steel Extrusions.
- * 12. 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.

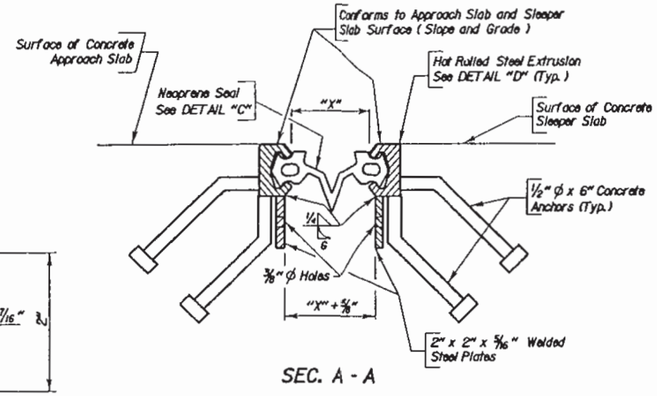
DETAIL "C"
Neoprene Seal shall have a 3" movement capability.



DETAIL "D"



VIEW B - B



SEC. A - A

ESTIMATED QUANTITIES
(For One Approach Slab)

ITEM	UNIT	QUANTITY
Strip Seal Expansion Joint	Ft	33.9

ORIGINAL CONSTRUCTION PLANS

APPROACH SLAB JOINT DETAILS
AT ABUTMENT NO. 1 FOR

486' - 1 1/2" COMP. GIRDER BRIDGE

32' - 0" ROADWAY — SEC. 3-T103N-R73W
OVER WHITE RIVER — 0° SKEW
STA. 378+64.00 TO 383+50.13 — BRF 0047(16)60
STR. NO. 43-403-308 — HS 20-44 & ALT.

LYMAN COUNTY
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2000

39 OF 39

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
TJO	TJO	DPV	BRIDGE ENGINEER
LYMN3968	39E8T034		