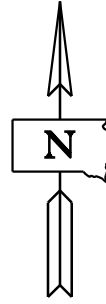


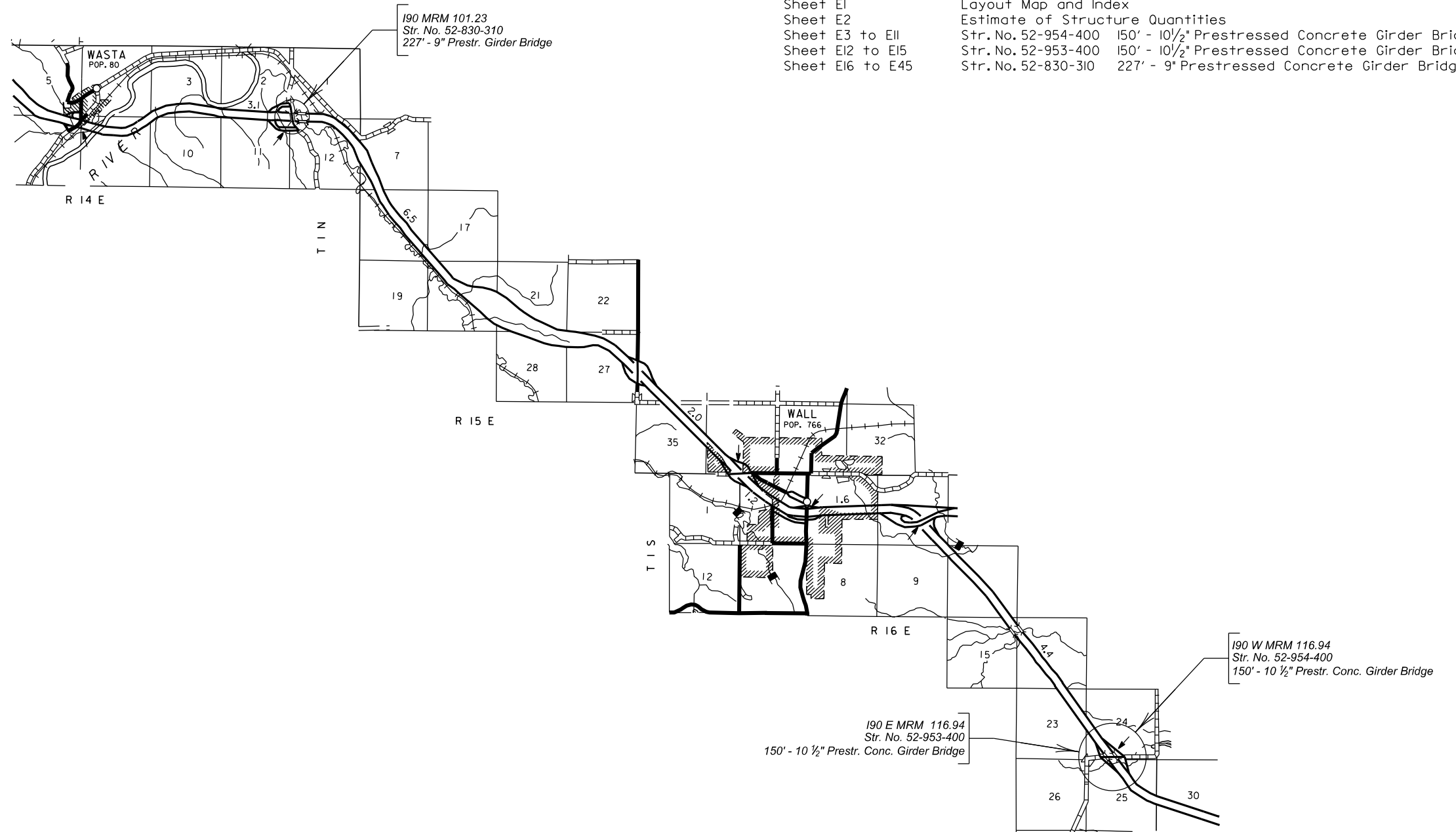
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E1	E44

# Section E: Structure Plans



## INDEX OF SHEETS -

Sheet E1	Layout Map and Index
Sheet E2	Estimate of Structure Quantities
Sheet E3 to E11	Str. No. 52-954-400 150' - 10 1/2" Prestressed Concrete Girder Bridge
Sheet E12 to E15	Str. No. 52-953-400 150' - 10 1/2" Prestressed Concrete Girder Bridge
Sheet E16 to E45	Str. No. 52-830-310 227' - 9" Prestressed Concrete Girder Bridge



## SECTION E – ESTIMATE OF STRUCTURE QUANTITIES

### Str. No. 52-954-400

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
550E0010	Low Slump Dense Concrete Bridge Deck Overlay	46	CuYd
550E0100	Concrete Removal Type 1A	670.5	SqYd
550E0105	Concrete Removal Type 2A	167.6	SqYd
550E0110	Concrete Removal Type 1B	86.9	SqYd
550E0120	Concrete Removal Type 1C	43.4	SqYd
550E0130	Concrete Removal Type 1D	43.4	SqYd
550E0140	Concrete Removal Type B	20.0	Ft
550E0200	Class A45 Concrete Fill	6.1	CuYd
550E0500	Finishing and Curing	670.6	SqYd

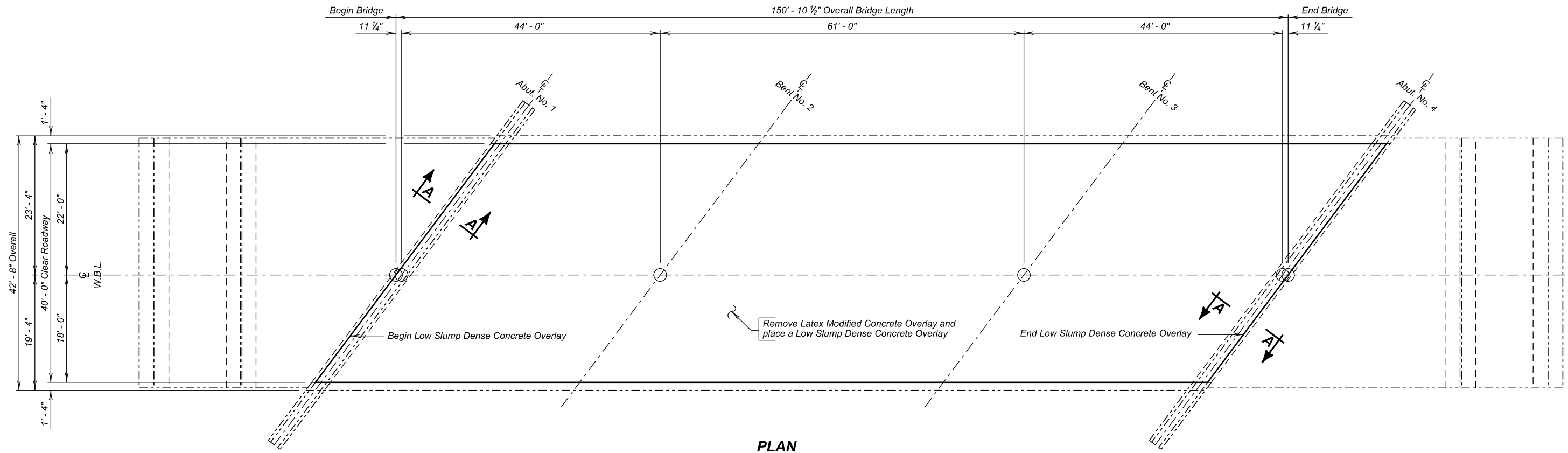
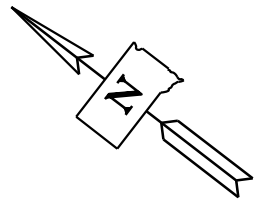
### Str. No. 52-953-400

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
491E0005	Two Coat Bridge Deck Polymer Chip Seal	670.6	SqYd
491E0110	Abrasive Blasting of Bridge Deck	670.6	SqYd
491E0120	Bridge Deck Grinding	670.6	SqYd
491E0130	Concrete Removal, Class A	7.8	SqYd
491E0140	Concrete Removal, Class B	7.8	SqYd
491E0172	Concrete Patching Material, Bridge Deck	49.6	CuFt

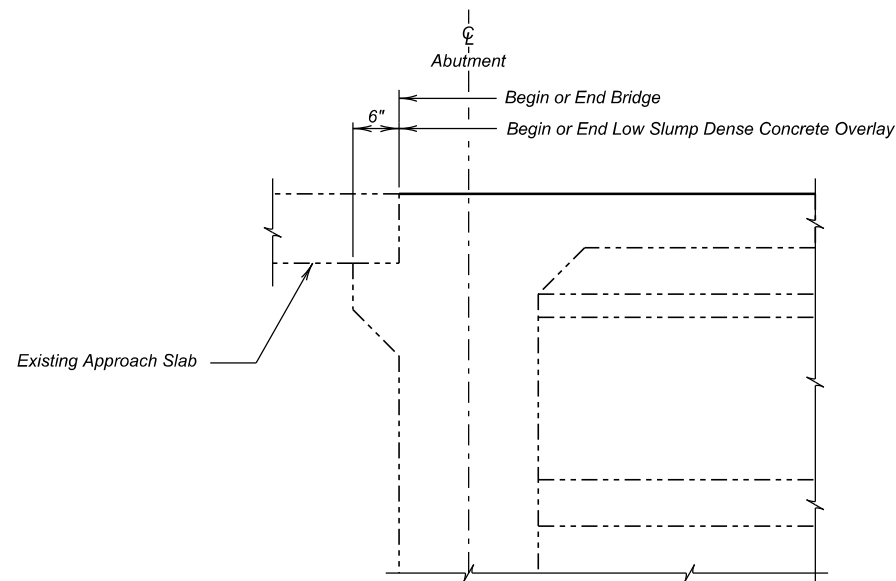
### Str. No. 52-830-310

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
110E0010	Remove Concrete Bridge Approach Slab	176.8	SqYd
410E2600	Membrane Sealant Expansion Joint	63.6	Ft
430E0300	Granular Bridge End Backfill	9.0	CuYd
460E0070	Class A45 Concrete, Bridge Repair	3.2	CuYd
460E0150	Concrete Approach Slab for Bridge	145.0	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	31.8	SqYd
460E0174	Concrete Patching Material, Miscellaneous	1.1	CuFt
460E0300	Breakout Structural Concrete	2.5	CuYd
460E0380	Install Dowel in Concrete	48	Each
480E0200	Epoxy Coated Reinforcing Steel	342	Lb
480E0504	No. 4 Rebar Splice	28	Each
480E0505	No. 5 Rebar Splice	32	Each
480E0506	No. 6 Rebar Splice	44	Each
480E5000	Galvanic Anode	36	Each
550E0010	Low Slump Dense Concrete Bridge Deck Overlay	62	CuYd
550E0100	Concrete Removal Type 1A	759.2	SqYd
550E0110	Concrete Removal Type 1B	193.3	SqYd
550E0120	Concrete Removal Type 1C	96.6	SqYd
550E0140	Concrete Removal Type B	20.0	Ft
550E0200	Class A45 Concrete Fill	16.7	CuYd
550E0500	Finishing and Curing	759.2	SqYd

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E3	E44



PLAN



SECTION A - A

**-X281-  
INDEX OF BRIDGE SHEETS -**

- Sheet No. 1 - Layout for Upgrade
- Sheet No. 2 - Estimate of Structure Quantities and Notes
- Sheet No. 3 - Deck Profiles For Low Slump Dense Concrete Bridge Deck Overlay (A)
- Sheet No. 4 - Deck Profiles For Low Slump Dense Concrete Bridge Deck Overlay (B)
- Sheet No. 5 - As-Built Elevation Survey (A)
- Sheet No. 6 - As-Built Elevation Survey (B)
- Sheet Nos. 7 thru 8 - Original Construction Plans

(WESTBOUND LANE)  
LAYOUT FOR UPGRADE

FOR  
**150' - 10 1/2" PRESTRESSED  
CONCRETE GIRDER BRIDGE**

40' - 0" ROADWAY                      36° 52' 11.4" L.H.F. SKEW  
OVER COUNTY ROAD                      SEC. 24/25-T1S-R16E  
STR. NO. 52-954-400                      IM 0902(186)101  
PCN 091L

PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION

FEBRUARY 2025

1 OF 8

-X281-

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

DESIGNED BY JRB PENN091L	CK. DES. BY CM 091LRA01	DRAFTED BY KR	<i>Steve A. Johnson</i> BRIDGE ENGINEER
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**ESTIMATE OF STRUCTURE QUANTITIES**

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
550E0010	Low Slump Dense Concrete Bridge Deck Overlay	46	CuYd
550E0100	Concrete Removal Type 1A	670.5	SqYd
550E0105	Concrete Removal Type 2A	167.6	SqYd
550E0110	Concrete Removal Type 1B	86.9	SqYd
550E0120	Concrete Removal Type 1C	43.4	SqYd
550E0130	Concrete Removal Type 1D	43.4	SqYd
550E0140	Concrete Removal Type B	20.0	Ft
550E0200	Class A45 Concrete Fill	6.1	CuYd
550E0500	Finishing and Curing	670.5	SqYd

**SPECIFICATIONS**

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

**DETAILS AND DIMENSIONS OF EXISTING BRIDGE**

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

**SCOPE OF BRIDGE WORK & SEQUENCE OF OPERATIONS**

All work on this structure 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, 2A, and B and place Class A45 Concrete Fill to the satisfaction of the Engineer for the first phase of construction.
2. Place a Low Slump Dense Concrete Bridge Deck Overlay to the elevations shown in the plans on the bridge deck for the first phase of construction.
3. Switch traffic and repeat steps 1 through 2 for the second phase of construction.

**LOW SLUMP DENSE CONCRETE BRIDGE DECK OVERLAY**

1. The preparation for resurfacing consists of Concrete Removal Type 1A on the entire bridge deck, and 2A as specified by the Engineer, 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.

2. Type 1A Removal will consist of removing the existing concrete overlay to a depth of 2 inches. There are some specific areas, identified on the Deck Profile plan sheets that require Type 1A Removal in excess of 2 inches.
3. Extreme care will be taken during the Type 1B Removal, Type 1C Removal, Type 1D Removal and Type B Removal to ensure 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.
4. Type 2A Removal, Type 1B Removal, Type 1C Removal, Type 1D Removal, Type B Removal and Class A45 Concrete Fill 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 is 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 shown quantity is necessary, payment for the additional quantity will be conformance with Section 550.5 of the Construction Specifications.
6. 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 size #3 will be substituted in lieu of sizes #1 and #15.
7. A minimum thickness of 2" of Low Slump Dense Concrete Bridge Deck Overlay will be maintained on the bridge deck.
8. 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, the Type 1A, 1B, 1C, 1D and Type B will not be done until work resumes in the spring. In the event that 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.

9. 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 as detailed in the plans to ensure that water drains to the deck drains or off the ends of the bridge.

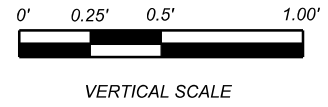
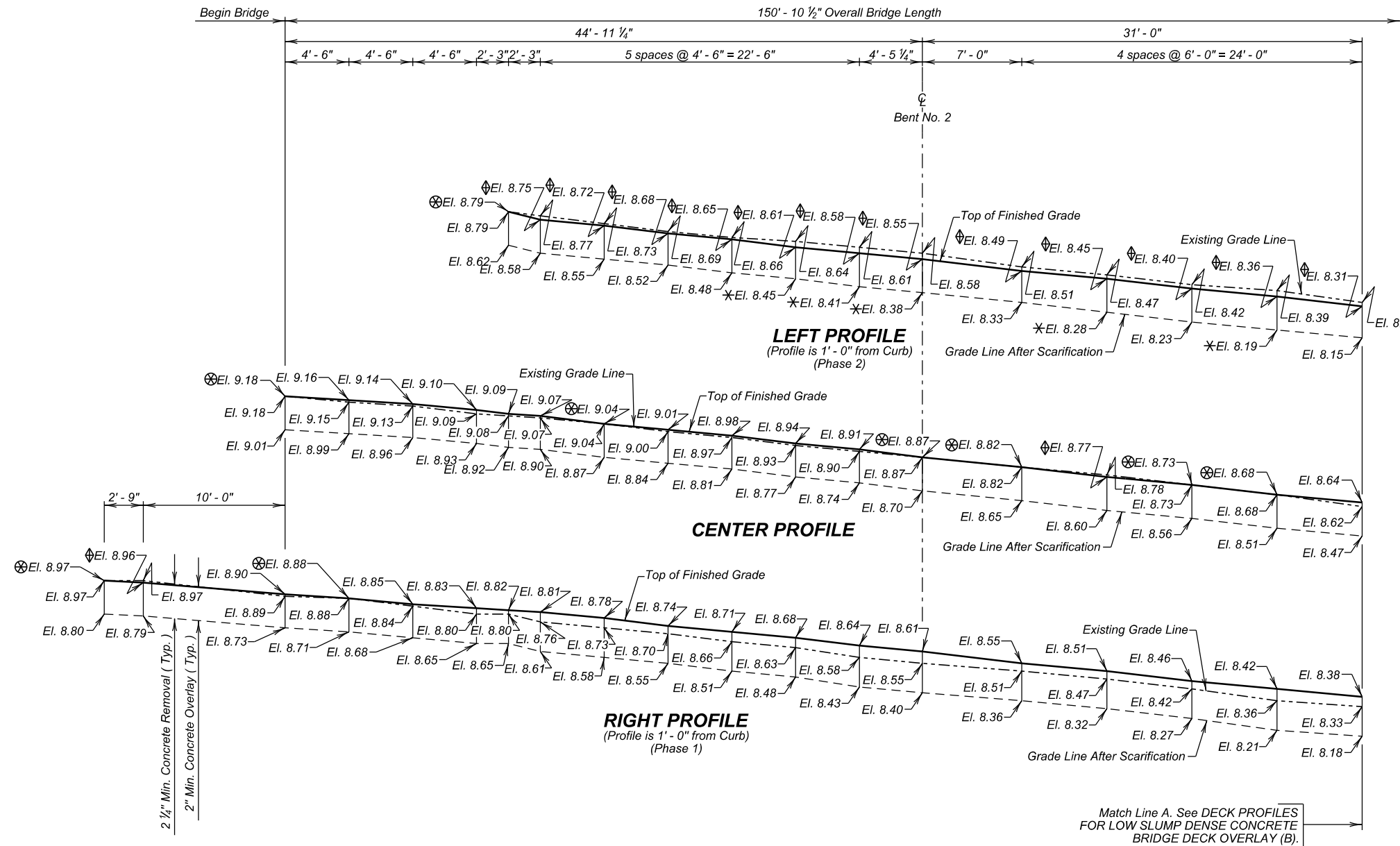
**AS-BUILT ELEVATION SURVEY**

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 deck 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 Senior Region Bridge Engineer. The elevations will be based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88). The Engineer will provide the Contractor with a description, elevation and location of the nearest benchmark that has a NAVD88 established elevation for the Contractor's use. All costs associated with obtaining 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.

**(WESTBOUND LANE)  
ESTIMATE OF STRUCTURE QUANTITIES AND NOTES  
FOR  
150' - 10 1/2" PRESTRESSED  
CONCRETE GIRDER BRIDGE**

STR. NO. 52-954-400  
FEBRUARY 2025

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E5	E44

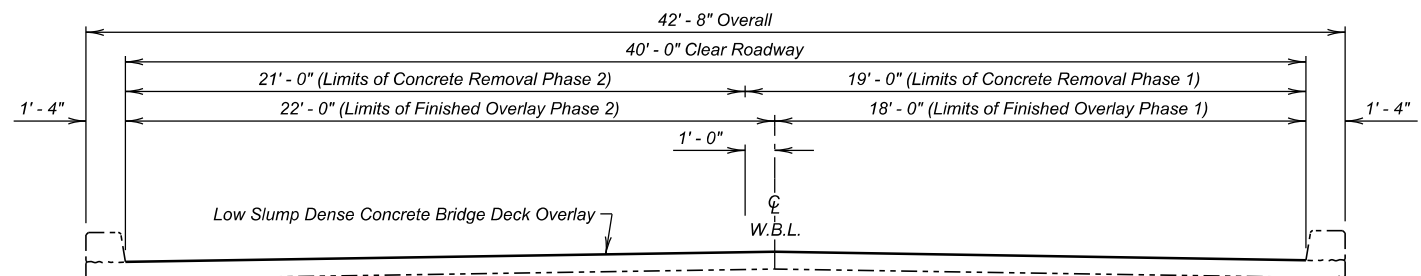


**Benchmark Description:**

B.M. # 116-A  
Rebar N.W. Corner of Bridge  
Elevation 2699.02

- NOTE:
- Add 2690.00 all elevations shown on profiles.
  - \* Scarify in excess of 2" in these areas.
  - ⊗ Existing Elevation is the same as the Finished Surface Elevation.
  - ⊕ Existing Elevation is higher than the Finished Surface Elevation.

Match Line A. See DECK PROFILES FOR LOW SLUMP DENSE CONCRETE BRIDGE DECK OVERLAY (B).



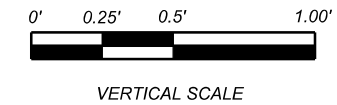
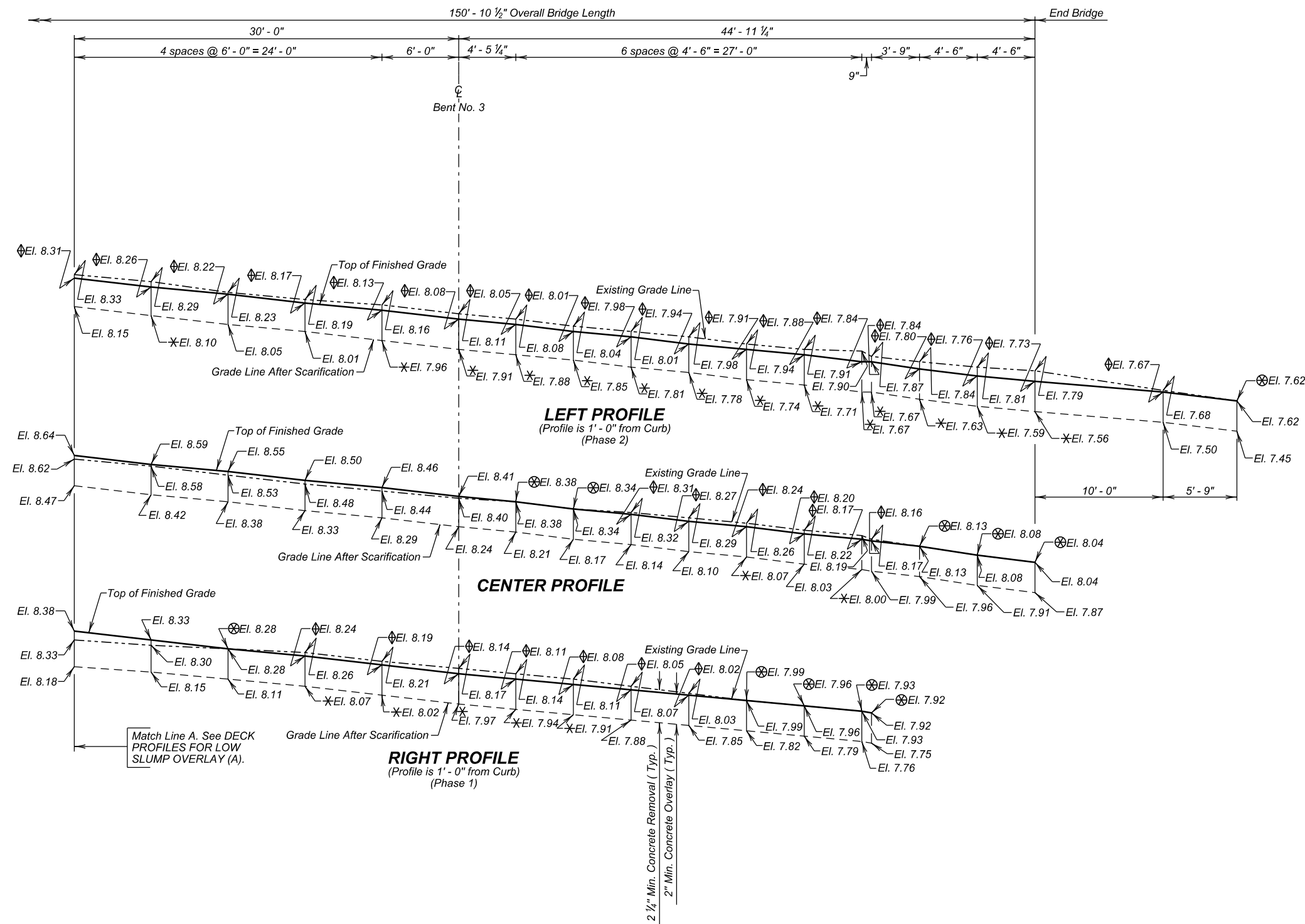
**TYPICAL SECTION**

**(WESTBOUND LANE)  
DECK PROFILES FOR LOW SLUMP DENSE  
CONCRETE BRIDGE DECK OVERLAY (A)**

FOR  
**150' - 10 1/2" PRESTRESSED  
CONCRETE GIRDER BRIDGE**  
40' - 0" ROADWAY 36° 52' 11.4" L.H.F. SKEW  
OVER COUNTY ROAD SEC. 24/25-T1S-R16E  
STR. NO. 52-954-400 IM 0902(186)101

PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION  
FEBRUARY 2025

DESIGNED BY JRB PENN091L	CK. DES. BY CM 091LRA03	DRAFTED BY KR	<i>Steve A. Johnson</i> BRIDGE ENGINEER
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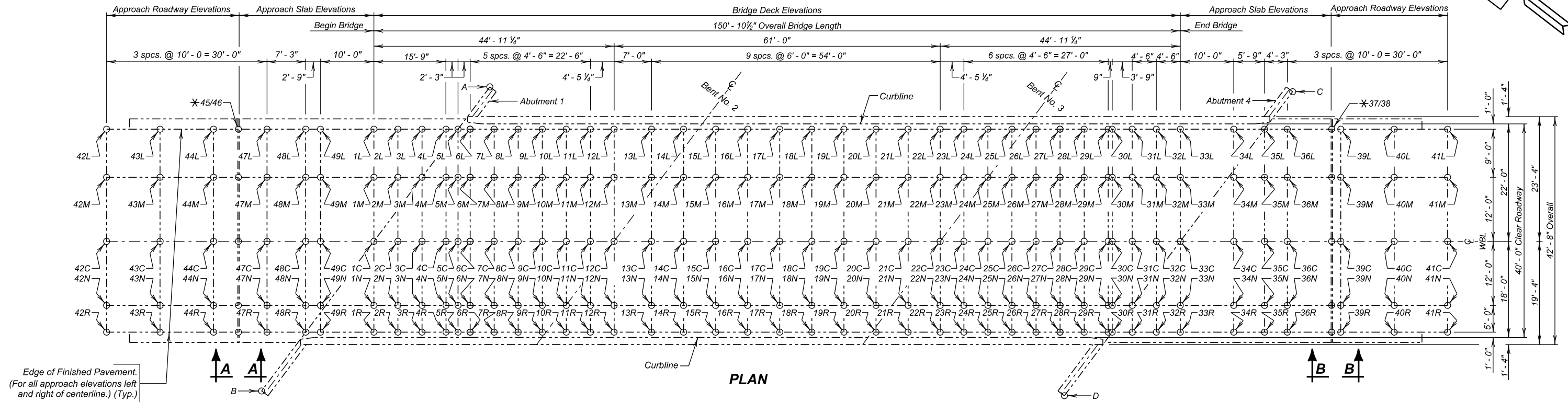
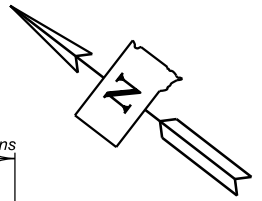
NOTE:

- Add 2690.00 all elevations shown on profiles.
- \* Scarify in excess of 2 1/4" in these areas.
- ⊗ Existing Elevation is the same as the Finished Surface Elevation.
- ⊕ Existing Elevation is higher than the Finished Surface Elevation.

ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
		Phase 1	Phase 2
Low Slump Dense Concrete Deck Overlay	Cu. Yd	25	21
Concrete Removal Type 1A	Sq. Yd	352.0	318.5
Concrete Removal Type 2A	Sq. Yd	88.0	79.6
Concrete Removal Type 1B	Sq. Yd	45.6	41.3
Concrete Removal Type 1C	Sq. Yd	22.8	20.6
Concrete Removal Type 1D	Sq. Yd	22.8	20.6
Concrete Removal Type B	Ft.	10.0	10.0
Class A45 Concrete Fill	Cu. Yd	3.2	2.9
Finishing and Curing	Sq. Yd	368.8	301.7

(WESTBOUND LANE)  
**DECK PROFILES FOR LOW SLUMP DENSE CONCRETE BRIDGE DECK OVERLAY (B)**  
 FOR  
**150' - 10 1/2" PRESTRESSED CONCRETE GIRDER BRIDGE**  
 40' - 0" ROADWAY 36° 52' 11.4" L.H.F. SKEW  
 OVER COUNTY ROAD SEC. 24/25-T1S-R16E  
 STR. NO. 52-954-400 IM 0902(186)101

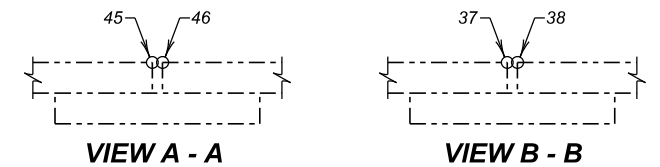
PENNINGTON COUNTY  
 S. D. DEPT. OF TRANSPORTATION  
 FEBRUARY 2025



Edge of Finished Pavement.  
(For all approach elevations left and right of centerline.) (Typ.)

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
42L		42M		42C		42N		42R	
43L		43M		43C		43N		43R	
44L		44M		44C		44N		44R	

Location	Elevation
A	
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 A - A and VIEW B - B.

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	
1L		1M							
2L		2M							
3L									
4L									

Location	Elevation
C	
D	

**Benchmark Description:**

B.M. # 116-A  
Rebar N.W. Corner of Bridge  
Elevation 2699.02

**NOTE:**

The elevations shall 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.

(WESTBOUND LANE)  
AS-BUILT ELEVATION SURVEY (A)  
FOR  
150' - 10 1/2" PRESTRESSED  
CONCRETE GIRDER BRIDGE  
40' - 0" ROADWAY 36° 52' 11.4" L.H.F. SKEW  
OVER COUNTY ROAD SEC. 24/25-T1S-R16E  
STR. NO. 52-954-400 IM 0902(186)101

PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION

FEBRUARY 2025

Table of Elevations - Bridge Deck									
Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
								48R	
								49R	
				1C		1N		1R	
				2C		2N		2R	
		3M		3C		3N		3R	
		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	
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			
32L		32M		32C					
33L		33M		33C					
34L									
35L									

Table of Elevations - Approach Slab Joints (See VIEW B - B) and Approach Slab									
Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
								31R	
						32N		32R	
						33N		33R	
		34M		34C		34N		34R	
		35M		35C		35N		35R	
36L		36M		36C		36N		36R	
37L		37M		37C		37N		37R	
38L		38M		38C		38N		38R	

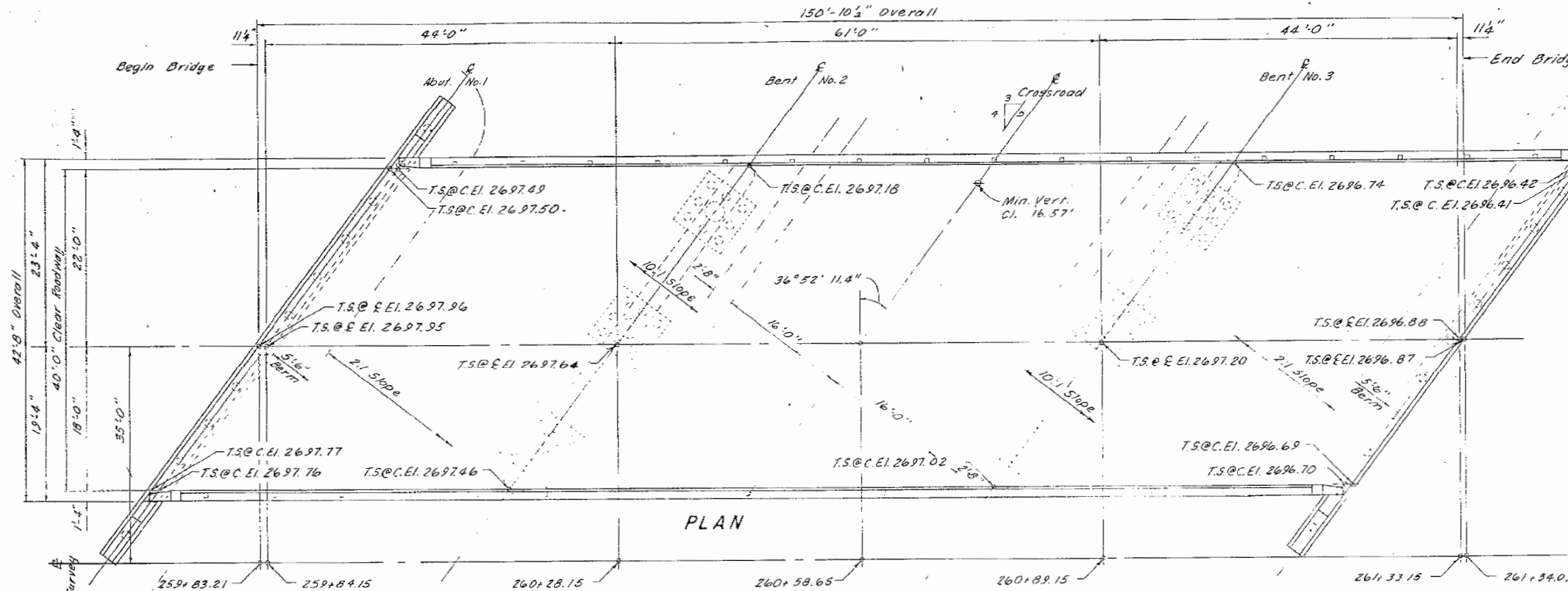
Table of Elevations - Approach Roadway									
Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
39L		39M		39C		39N		39R	
40L		40M		40C		40N		40R	
41L		41M		41C		41N		41R	

(WESTBOUND LANE)  
AS-BUILT ELEVATION SURVEY (B)  
FOR  
150' - 10 1/2" PRESTRESSED  
CONCRETE GIRDER BRIDGE  
40' - 0" ROADWAY 36° 52' 11.4" L.H.F. SKEW  
OVER COUNTY ROAD SEC. 24/25-T1S-R16E  
STR. NO. 52-954-400 IM 0902(186)101

PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION  
FEBRUARY 2025

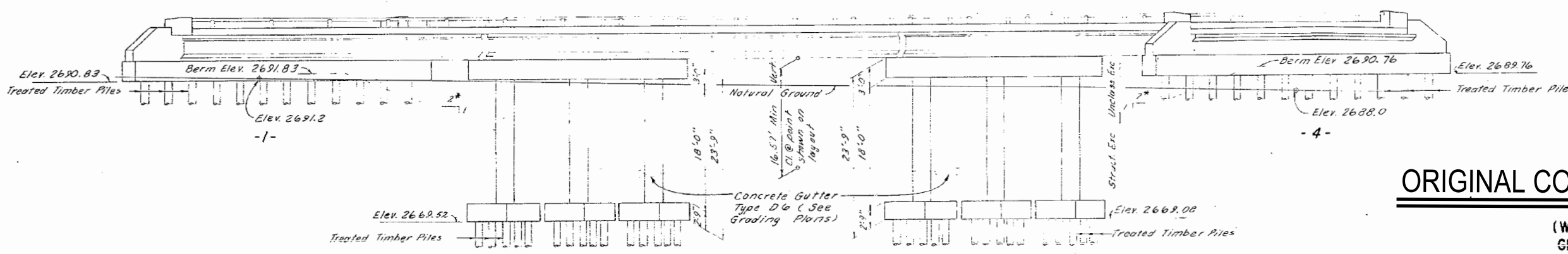


STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E9	E44



- SPECIFICATION NOTE -**
- USE SOUTH DAKOTA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, 1969 EDITION, AND REQUIRED PROVISIONS, SUPPLEMENTAL SPECIFICATIONS AND/OR SPECIAL PROVISIONS AS INCLUDED IN THE PROPOSAL. (TYPE II CEMENT IS REQUIRED)
- DESIGN MIX CONCRETE  
 SUBSTRUCTURE: 4,500 P.S.I. COMPRESSIVE  
 SUPERSTRUCTURE: 4,500 P.S.I. COMPRESSIVE
- GENERAL NOTES -**
- DESIGN SPECIFICATIONS: A.A.S.H.O. SPECIFICATIONS FOR HIGHWAY BRIDGES 1959 WITH INTERIM SPECIFICATIONS FOR 1970 AND 1971.
  - SEE NOTES ON SHEETS NO. 3 THRU NO. 10.
  - RAIL POSTS AND END BLOCKS SHALL BE BUILT NORMAL TO GRADE.
  - IN THE EVENT PILE SHOES ARE USED, SEE STANDARD PLATE NO. 301 (SHEET NO. 15) FOR DETAILS.
  - THE CONTRACTOR SHALL HAVE SUFFICIENT PILE SPLICE MATERIAL ON HAND BEFORE PILE DRIVING IS STARTED. FOR DETAILS SEE STANDARD PLATE NO. 333 (SHEET NO. 153) FOR DETAILS.
  - ELEVATIONS OF TOP OF BRIDGE SLAB ALONG E OF WESTBOUND LANES ARE 1 1/2" ABOVE E WESTBOUND SUBGRADE ELEVATIONS.
  - LONGITUDINAL ELEMENTS OF THE SLAB SHALL CONFORM TO THE VERTICAL CURVE.
  - STANDARD PLATES REFERRED TO IN THESE PLANS ARE PLATES PRINTED ON SHEET NO. 13 OF THESE PLANS AND ARE NOT INTENDED TO BE REFERRED TO THE STANDARD PLATES MANUAL.
  - THE CONTRACTOR SHALL IMPRINT ON THE STRUCTURE THE DATE OF CONSTRUCTION AS SPECIFIED AND DETAILED ON STANDARD PLATE NO. 308. THIS PLATE IS ON FILE AT CENTRAL, DISTRICT, AND RESIDENT OFFICES.
  - PILE DRIVING IS REQUIRED AT ABUTMENTS NO. 1 AND NO. 4.
  - TRAFFIC LOADING: HS 20-44 A.A.S.H.O. AND THE ALTERNATE LOADING AS DESIGNATED IN P.P.M. 20-4, SECTION 902.
  - ALL REINFORCING STEEL SHALL CONFORM TO A.S.T.M. SPECIFICATION A-615, GRADE 60, EXCEPT AS SPECIFICALLY NOTED.

NOTE:  
 T.S.@C.El. = Top of slab at curb elevation  
 T.S.@El. = Top of slab at centerline elevation



B.M. # 27 Elev. 2690.83  
 Iron Pin & Gds.  
 156' Rt. Sta. 256+00

B.M. # 28 Elev. 2672.20  
 Iron Pin & Gds.  
 150' Rt. Sta. 265+00

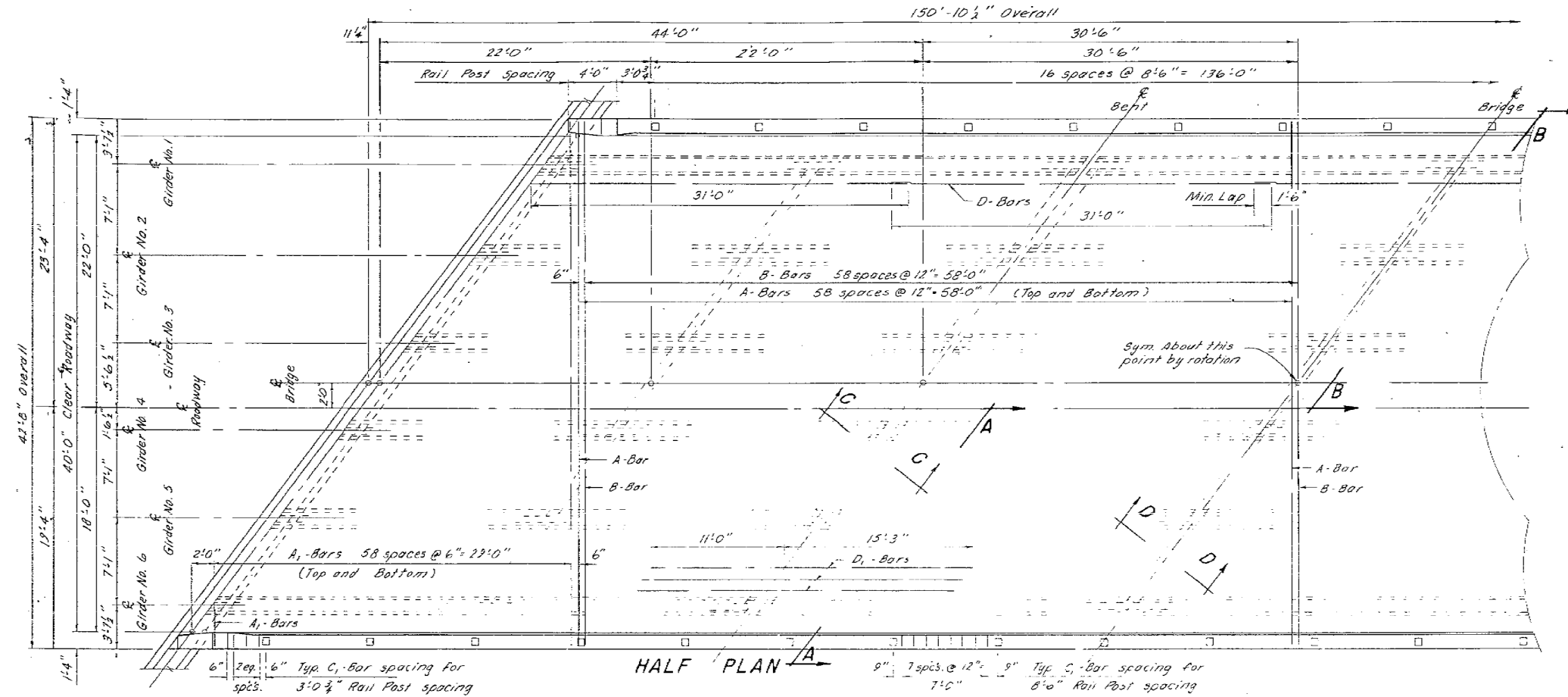
\* Normal to Abutment

**ORIGINAL CONSTRUCTION PLANS**

(WESTBOUND LANES)  
 GENERAL DRAWING  
 FOR  
 150'-10 1/2" PRESTR. CONC. GIRDER BRIDGE  
 40'-0" ROADWAY 36°52'11.4" SKEW L.H.F.  
 OVER LOCAL ROAD SEC. 24 & 25-TIS-R16E  
 STA. 259+83.21 TO 261+34.09 190-2(47)114

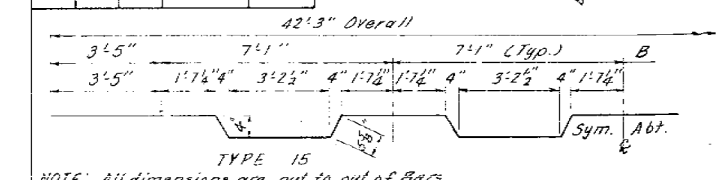
PENNINGTON COUNTY  
 STR. NO. 52-954-400 SOUTH DAKOTA HS20-44  
 DEPARTMENT OF HIGHWAYS (& ALT.)  
 MARCH 1971 7 OF 8

DESIGNED BY C.M.L.	DRAWN BY D.G.P.	CHECKED BY B.F.E.	APPROVED BRIDGE ENGINEER
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### REINFORCING SCHEDULE 52409

Mark	No.	Size	Length	Type	Bending Details
A	236	5	47'-3"	Str.	
A <sub>1</sub>	118	5	45'-9"	Str.	
B	117	5	43'-6"	15	
C <sub>1</sub>	268	4	5'-9"	T1	
D	570	5	31'-0"	Str.	
D <sub>1</sub>	92	5	26'-3"	Str.	
D <sub>2</sub>	8	5	12'-0"	Str.	
F <sub>1</sub>	70	4	9'-9"	34	
F <sub>2</sub>	105	4	7'-3"	34	
T <sub>1</sub>	12	8	4'-0"	34	
T <sub>2</sub>	6	7	40'-3"	Str.	
T <sub>3</sub>	30	4	7'-0"	Str.	
T <sub>4</sub>	50	5	6'-9"	Str.	
T <sub>5</sub>	40	5	7'-6"	Str.	
T <sub>6</sub>	4	6	44'-6"	Str.	
T <sub>7</sub>	2	4	44'-6"	Str.	



NOTE: All dimensions are out to out of Bars.  
 \* Bend in field to provide 1" Cl. to edge of Girder

ESTIMATED QUANTITIES		
Item	Unit	Quantity
* Class A Concrete Bridge	Cu Yds	176.8
* Reinforcement Concrete Masonry	Yds	46.68
* Prest. Conc. Beam Type II (83' 6")	No	12
* Prest. Conc. Beam Type II (80' 3")	No	6
* Steel Rolling - Type BT-3A	Lbs	286.8
* Structural Steel	Lbs	119

### SUPERSTRUCTURE NOTES - \* Includes End Blocks.

- INSERT T<sub>1</sub> BARS BEFORE PLACING FINAL OUTER GIRDER IN EACH SPAN.
- HOLES AND INSERTS SHALL BE PROVIDED AS DETAILED ON THIS SHEET AND SHEET NO. 8.
- HOLES FOR FORMING INSERTS SHALL BE FILLED WITH MORTAR.
- ALL EXPOSED EDGES SHALL BE CHAMFERED 1" UNLESS OTHERWISE SHOWN.
- ALL REINFORCING STEEL SHALL CONFORM TO A.S.T.M. SPECIFICATIONS A-615, GRADE 60, EXCEPT C<sub>1</sub>, B, F<sub>1</sub> AND F<sub>2</sub> BARS MAY BE GRADE 40.
- UNIT STRESSES: RESTEEL GRADE F<sub>0</sub>, F<sub>S</sub> = 24,000 P.S.I.; GRADE 40, F<sub>S</sub> = 20,000 P.S.I.; CONCRETE F<sub>C</sub> = 1,800 P.S.I.

### CONCRETE POURING SEQUENCE -

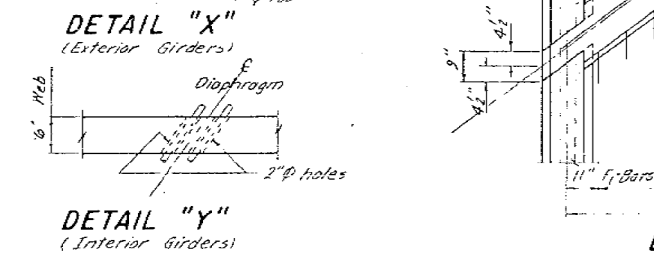
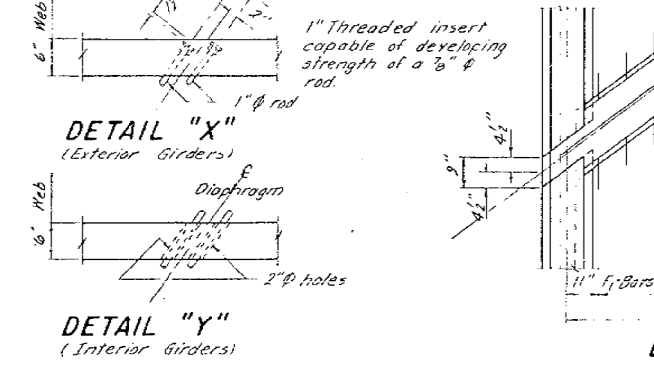
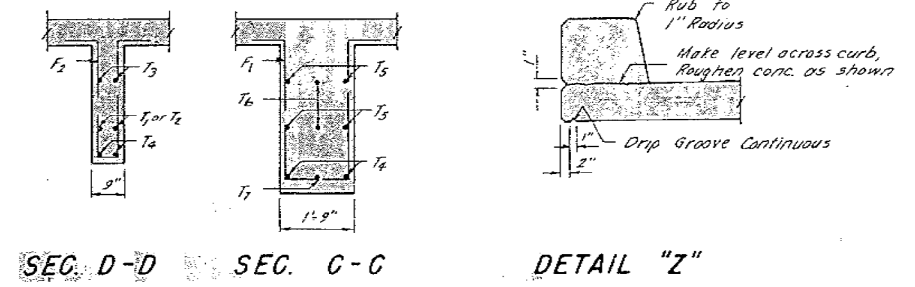
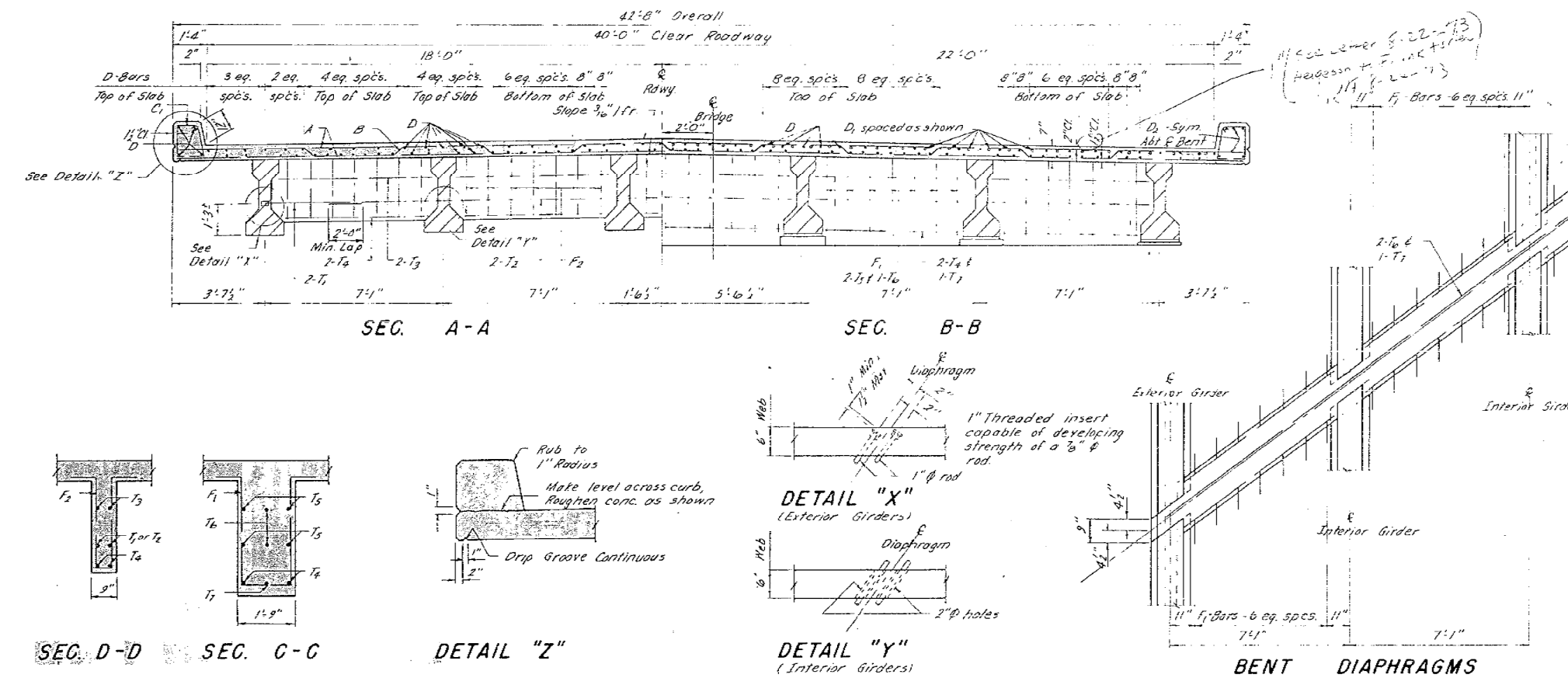
- POUR SHALL BE ONE CONTINUOUS OPERATION.
- SLAB, ABUTMENT BACKFILLS AND BEAT DIAPHRAGMS, SHALL BE POURED IN ONE CONTINUOUS POUR. INTERMEDIATE DIAPHRAGMS CAN BE POURED AS AN OPTIONAL POUR BEFORE THE SLAB IS POURED OR AS A PART OF THE CONTINUOUS POUR.
- THE CURB SHALL BE POURED AFTER THE SLAB HAS BEEN POURED.
- IF THE CONTRACTOR CAN NOT POUR THE SLAB IN ONE CONTINUOUS POUR - CONTACT THE BRIDGE SECTION. IT IS IMPORTANT TO NOTE THAT ANY INTERRUPTED SEQUENCE MUST BE CLOSELY CONTROLLED FOR BEST RESULTS.

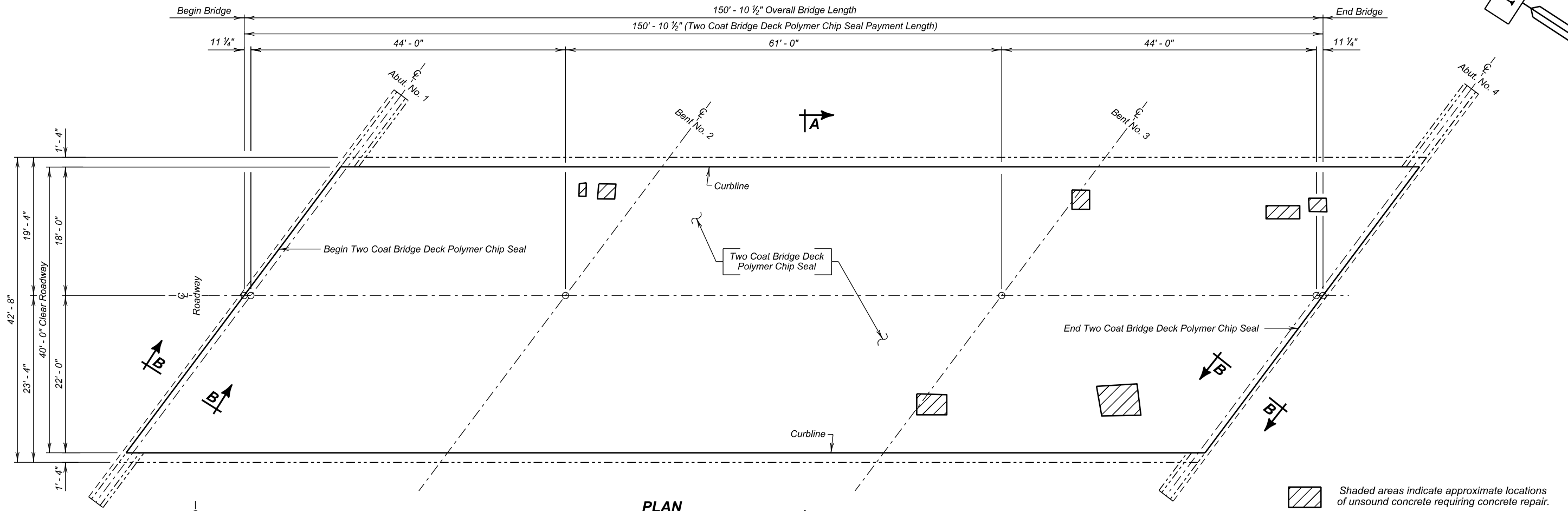
## ORIGINAL CONSTRUCTION PLANS

(WESTBOUND LANES)  
 SUPERSTRUCTURE DETAILS  
 FOR  
 150'-10 1/2" PRESTR. CONC. GIRDER BRIDGE  
 40'-0" ROADWAY 36°52'11.4" SKEW L.H.F.  
 OVER LOCAL ROAD SEC. 24 & 25-TIS-R16E  
 STA. 259+83.21 TO 261+34.09 1 90-2(47)114

PENNINGTON COUNTY  
 STR. NO. 52-954-400 SOUTH DAKOTA HS20-44  
 DEPARTMENT OF HIGHWAYS (8 ALT.)  
 MARCH 1971 (8) OF (8)

DESIGNED BY C.M.L.	DRAWN BY D.G.R.	CHECKED BY B.F.E.	APPROVED BRIDGE ENGINEER
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**PLAN**

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

ITEM	UNIT	QUANTITY	
		Phase 1	Phase 2
Two Coat Bridge Deck Polymer Chip Seal	SqYd	301.8	368.8
Abrasive Blasting of Bridge Deck	SqYd	301.8	368.8
Bridge Deck Grinding	SqYd	318.5	352.0
* Concrete Removal, Class A	SqYd	3.7	4.1
* Concrete Removal, Class B	SqYd	3.7	4.1
* Concrete Patching Material, Bridge Deck	CuFt	23.4	26.2

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

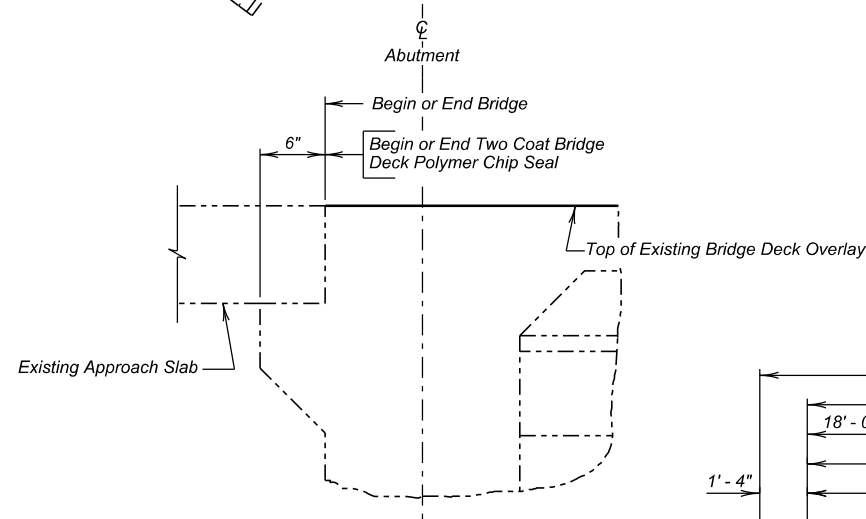
(EASTBOUND LANES)  
**TWO COAT BRIDGE DECK POLYMER CHIP SEAL LAYOUT FOR 150' - 10 1/2" PRESTRESSED CONCRETE GIRDER BRIDGE**

40' - 0" ROADWAY  
 OVER COUNTY ROAD  
 STR. NO. 52-953-400  
 PCN 091L

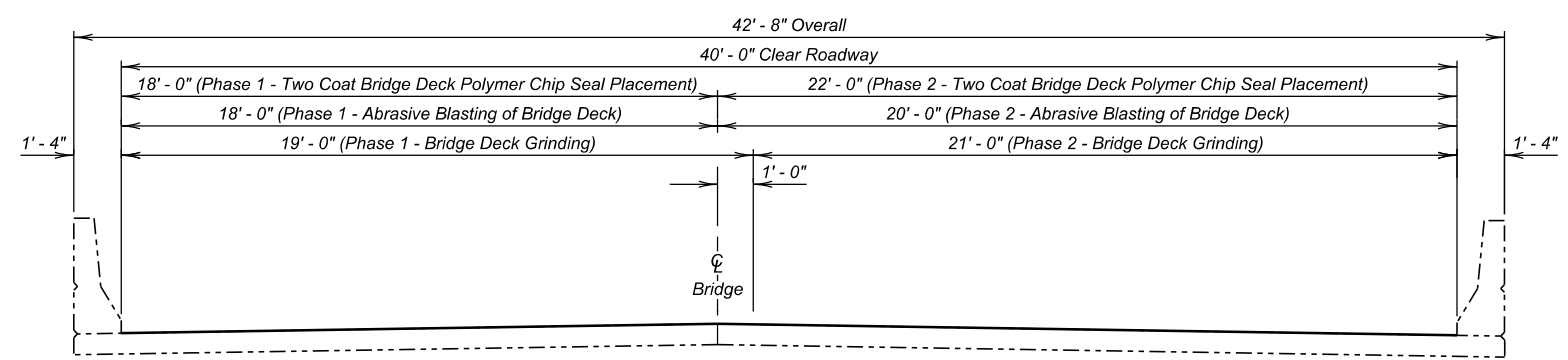
36° 52' 11" L.H.F. SKEW  
 SEC. 24/25-T1S-R16E  
 IM 0902(186)101

PENNINGTON COUNTY  
 S. D. DEPT. OF TRANSPORTATION

FEBRUARY 2025 **1** OF **4**



**SECTION B - B**



**SECTION A - A**  
 (Concrete shading and reinforcing steel not shown for clarity.)

**-X281- INDEX OF BRIDGE SHEETS -**  
 Sheet No. 1 - Two Coat Bridge Deck Polymer Chip Seal Layout  
 Sheet No. 2 - Estimate of Structure Quantities and Notes  
 Sheet Nos. 3 Thru 4 - Original Construction Plans

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

**-X281-**  
 DESIGNED BY: JRB  
 CK. DES. BY: CM  
 DRAFTED BY: JRB  
 PENN091L 091LBB01  
 Steve A. Johnson  
 BRIDGE ENGINEER

**ESTIMATE OF STRUCTURE QUANTITIES**

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
491E0005	Two Coat Bridge Deck Polymer Chip Seal	670.6	SqYd
491E0110	Abrasive Blasting of Bridge Deck	670.6	SqYd
491E0120	Bridge Deck Grinding	670.6	SqYd
491E0130	Concrete Removal, Class A	7.8	SqYd
491E0140	Concrete Removal, Class B	7.8	SqYd
491E0172	Concrete Patching Material, Bridge Deck	49.6	CuFt

**SPECIFICATIONS**

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

**DETAILS AND DIMENSIONS OF EXISTING BRIDGE**

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

**SCOPE OF BRIDGE WORK & SEQUENCE OF OPERATIONS**

All work on this structure 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.

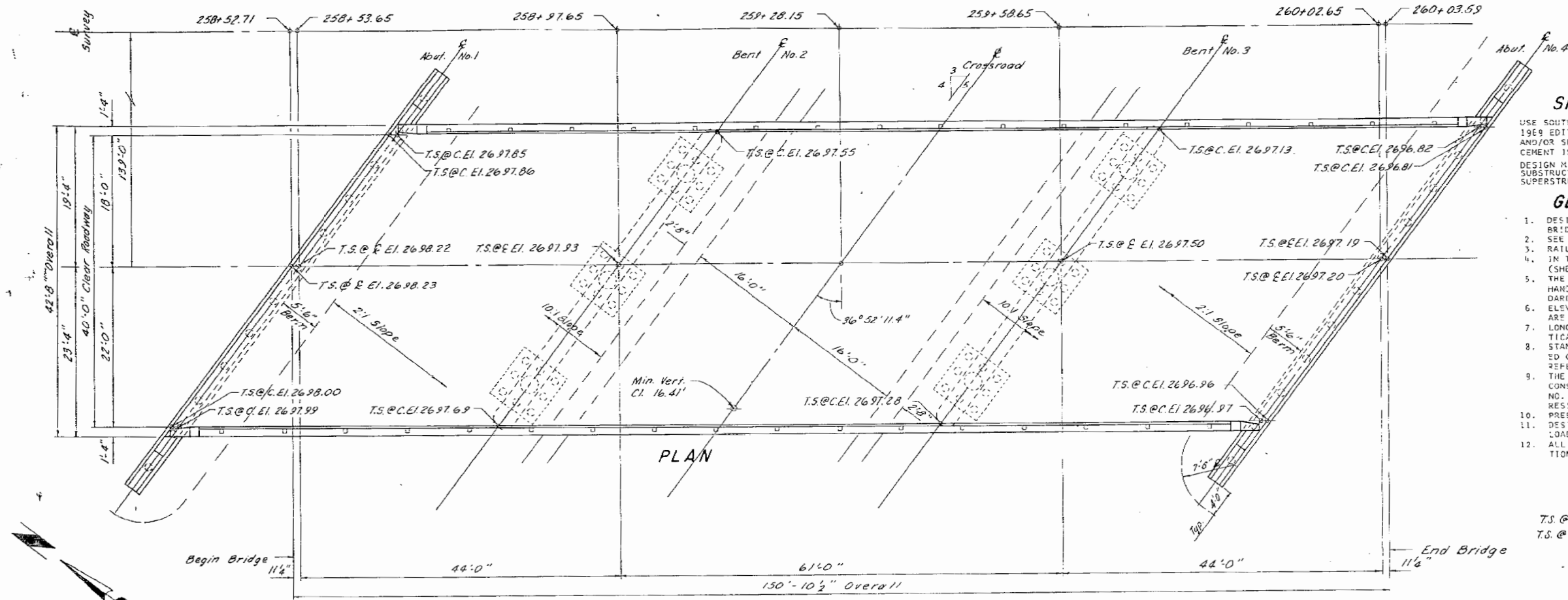
1. Perform Bridge Deck Grinding for the first phase of construction.
2. Where necessary, repair the bridge deck by removing and patching all loose and delaminated concrete from the bridge deck surface for the first phase of construction.
3. Clean the bridge deck surface with abrasive blasting for the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

**CONCRETE PATCHING MATERIAL, BRIDGE DECK**

1. In lieu of the 48-hour wet cure, the Contractor may use a wax-based curing compound after 4 hours of wet cure. The wax-based curing compound will be white pigmented and will be applied to the patch until the entire surface is white. After the 48-hour cure period, the curing compound will be completely sand blasted off and the surface of the patch will be allowed to air dry for a minimum of 48 hours before application of the polymer chip seal.
2. A thicker layer of the Two Coat Bridge Deck Polymer Chip Seal will not be used in place of Concrete Patching Material, Bridge Deck. Joint Nosing Material from the Department's Approved Products List may be used in limited amounts for Concrete Patching Material, Bridge Deck provided it is compatible with the polymer used for the chip seal and is approved by the manufacturer's representative. Patching with nosing material will not be allowed if the patch area is more than 9 square feet or goes below the top mat of reinforcing steel. Joint Nosing Material will be fully cured before application of the chip seal. If Joint Nosing Material is substituted for Concrete Patching Material it will be paid for at the contract unit price per cubic foot for Concrete Patching Material, Bridge Deck.

(EASTBOUND LANES)  
**ESTIMATE OF STRUCTURE QUANTITIES AND NOTES**  
 FOR  
**150' - 10 1/2" PRESTRESSED  
 CONCRETE GIRDER BRIDGE**  
 STR. NO. 52-953-400  
 FEBRUARY 2025

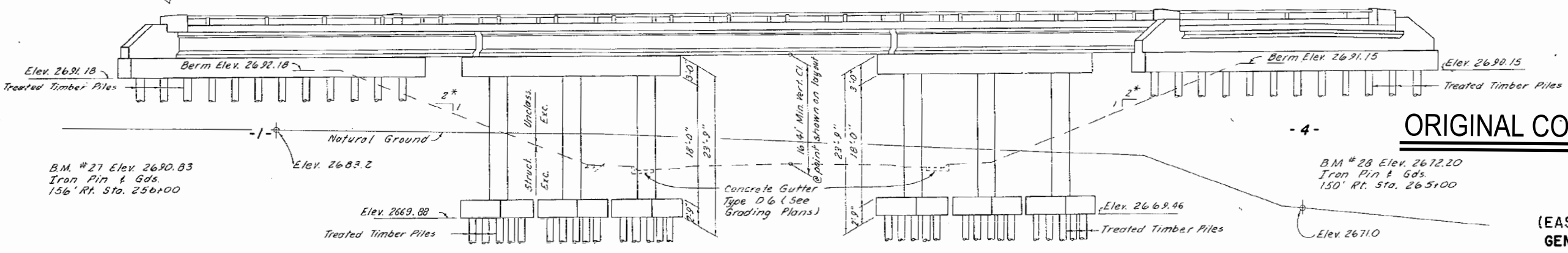
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E13	E44



**SPECIFICATION NOTE -**  
 USE SOUTH DAKOTA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, 1969 EDITION, AND REQUIRED PROVISIONS, SUPPLEMENTAL SPECIFICATIONS AND/OR SPECIAL PROVISIONS AS INCLUDED IN THE PROPOSAL. (TYPE II CEMENT IS REQUIRED)  
 DESIGN MIX CONCRETE  
 SUBSTRUCTURE: 4,500 P.S.I. COMPRESSIVE  
 SUPERSTRUCTURE: 4,500 P.S.I. COMPRESSIVE

- GENERAL NOTES -**
- DESIGN SPECIFICATIONS: A.A.S.H.O. SPECIFICATIONS FOR HIGHWAY BRIDGES 1969 WITH INTERIM SPECIFICATIONS FOR 1970 AND 1971.
  - SEE NOTES ON SHEETS NO. 3 THRU NO. 10.
  - RAIL POSTS AND END BLOCKS SHALL BE BUILT NORMAL TO GRADE.
  - IN THE EVENT PILE SHOES ARE USED, SEE STANDARD PLATE NO. 301 (SHEET NO. 13) FOR DETAILS.
  - THE CONTRACTOR SHALL HAVE SUFFICIENT PILE SPLICE MATERIAL ON HAND BEFORE PILE DRIVING IS STARTED. FOR DETAILS SEE STANDARD PLATE NO. 303.1 (SHEET NO. 13) FOR DETAILS.
  - ELEVATIONS FOR TOP OF BRIDGE SLAB ALONG E OF EASTBOUND LANES ARE 1" ABOVE E EASTBOUND SUBGRADE ELEVATIONS.
  - LONGITUDINAL ELEMENTS OF THE SLAB SHALL CONFORM TO THE VERTICAL CURVE.
  - STANDARD PLATES REFERRED TO IN THESE PLANS ARE PLATES PRINTED ON SHEET NO. 13 OF THESE PLANS AND ARE NOT INTENDED TO BE REFERRED TO THE STANDARD PLATES MANUAL.
  - THE CONTRACTOR SHALL IMPRINT ON THE STRUCTURE THE DATE OF CONSTRUCTION AS SPECIFIED AND DETAILED ON STANDARD PLATE NO. 305. THIS PLATE IS ON FILE AT CENTRAL, DISTRICT AND RESIDENT OFFICES.
  - PREBORING PILES IS REQUIRED AT ABUTMENTS NO. 1 AND NO. 4.
  - DESIGN LOADING: HS 20-44 A.A.S.H.O. AND THE ALTERNATE LOADING AS DESIGNATED IN P.P.M. 20-4, SECTION 4-C.
  - ALL REINFORCING STEEL SHALL CONFORM TO A.S.T.M. SPECIFICATION A-615, GRADE 60, EXCEPT AS SPECIFICALLY NOTED.

T.S.@C.El. - Top of Slab at Curb elevation  
 T.S.@E.El. - Top of Slab at centerline elevation



**ORIGINAL CONSTRUCTION PLANS**

(EASTBOUND LANES)  
 GENERAL DRAWING  
 FOR  
 150'-10 1/2" PRESTR. CONC. GIRDER BRIDGE  
 40'-0" ROADWAY 36°52'11.4" SKEW L.H.F.  
 OVER LOCAL ROAD SEC. 24 & 25-TIS-RI6E  
 STA. 258+52.71 TO 260+03.59 190-2(114)

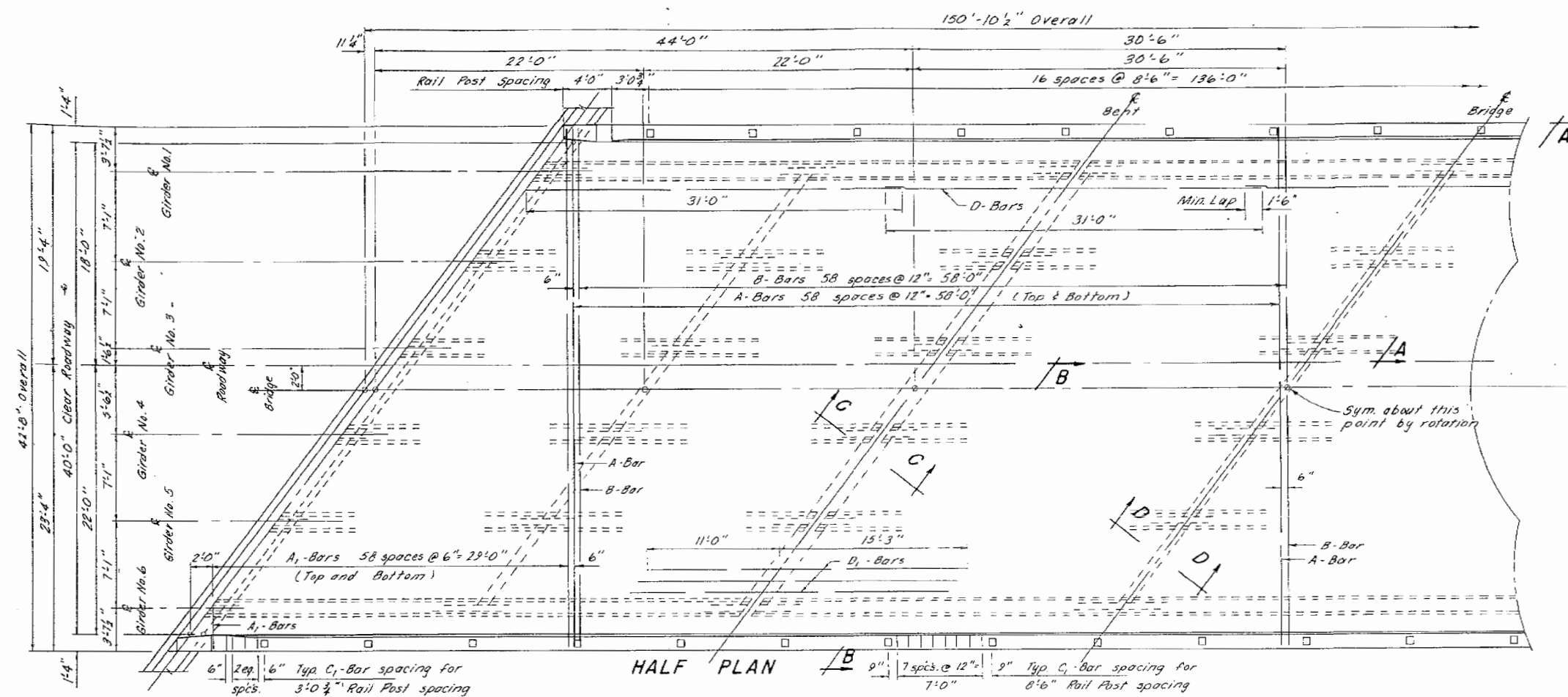
PENNINGTON COUNTY  
 STR. NO. 52-953-400 SOUTH DAKOTA HS20-44  
 DEPARTMENT OF HIGHWAYS (8 ALT.)

-X281- MARCH 1971

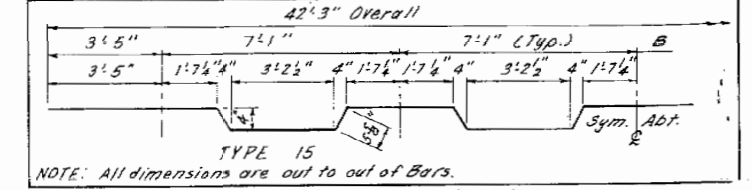
DESIGNED BY C.M.L.	DRAWN BY D.G.P.	CHECKED BY B.F.E.	APPROVED BRIDGE ENGINEER
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3 OF 4

\* Normal to Abutment



REINFORCING SCHEDULE 52409				
Mark	No.	Size	Length	Type
A	236	5	42'-3"	Str.
A <sub>1</sub>	178	5	45'-8"	Str.
B	117	5	43'-6"	15
C <sub>1</sub>	268	4	3'-9"	71
D	570	5	31'-0"	Str.
D <sub>1</sub>	92	5	26'-3"	Str.
D <sub>2</sub>	8	5	12'-0"	Str.
F <sub>1</sub>	70	4	9'-8"	54
F <sub>2</sub>	105	4	7'-3"	54
T <sub>1</sub>	12	8	4'-0"	Str.
T <sub>2</sub>	6	7	40'-3"	Str.
T <sub>3</sub>	30	4	7'-8"	Str.
T <sub>4</sub>	50	5	6'-9"	Str.
T <sub>5</sub>	40	5	7'-6"	Str.
T <sub>6</sub>	4	6	44'-6"	Str.
T <sub>7</sub>	2	4	44'-6"	Str.



NOTE: All dimensions are out to out of bars.  
\* Bend in field to provide 1" Cl. to edge of Girder.

ESTIMATED QUANTITIES		
Item	Unit	Quantity
4 Class A Concrete - Bridge	Cu. Yds	178.5
Reinforcement - Concrete Masonry	Lbs	46,634
Plexy Coat Bedm - Type II (43-5)	No.	12
Plexy Coat Bedm - Type II (60-8)	No.	16
Steel Rolling - Type A7-34	Lx Ft.	286.9
Structural Steel	Lbs.	172

**SUPERSTRUCTURE NOTES -** \* Includes End Blocks

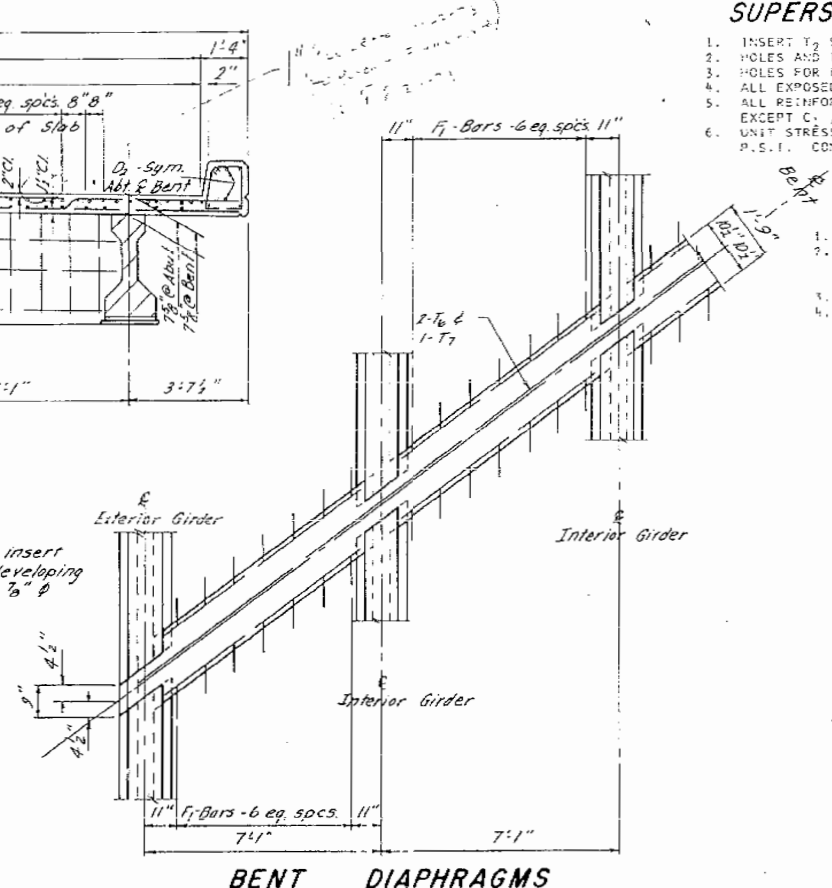
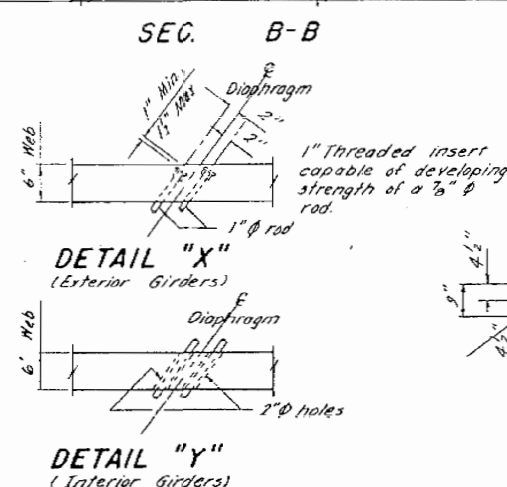
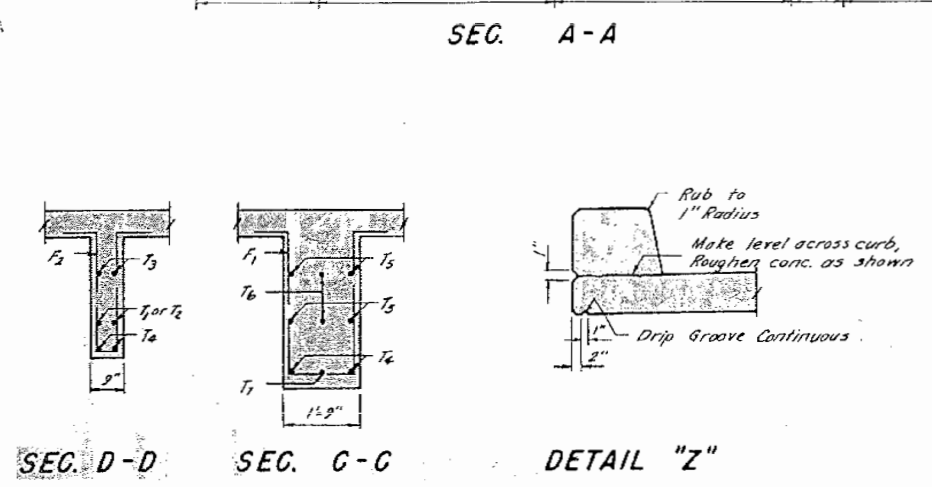
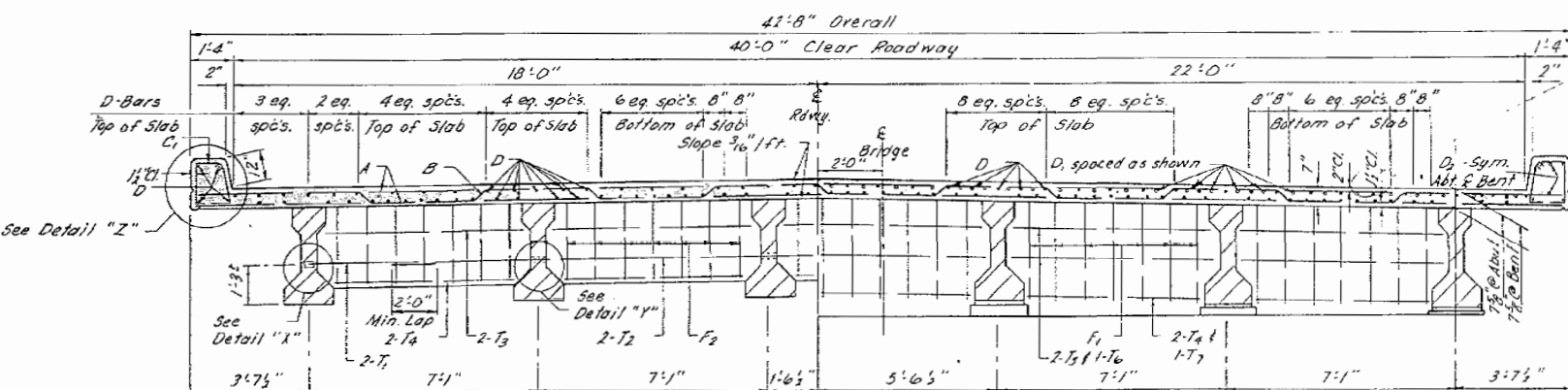
1. INSERT T<sub>2</sub> BARS BEFORE PLACING FINAL OUTER GIRDER IN EACH SPAN.
2. HOLES AND INSERTS SHALL BE PROVIDED AS DETAILED ON THIS SHEET AND SHEET NO. 8.
3. HOLES FOR FORMING INSERTS SHALL BE FILLED WITH MORTAR.
4. ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 1" UNLESS OTHERWISE SHOWN.
5. ALL REINFORCING STEEL SHALL CONFORM TO A.S.T.M. SPECIFICATIONS A-615, GRADE 60, EXCEPT C, D, F, AND T<sub>2</sub> BARS MAY BE GRADE 40.
6. UNIT STRESSES: RESTEEL GRADE C<sub>1</sub>, F<sub>2</sub> = 24,000 P.S.I.; GRADE 40, F<sub>3</sub> = 20,000 P.S.I.; CONCRETE F<sub>c</sub> = 1,800 P.S.I.

**CONCRETE POURING SEQUENCE -**

1. POUR SHALL BE IN CONTINUOUS OPERATION.
2. SLAB, ABUTMENT END, ALL CURB AND DIAPHRAGMS, SHALL BE POURED IN ONE CONTINUOUS POUR. INTERMEDIATE DIAPHRAGMS CAN BE POURED AS AN OPTIONAL POUR BEFORE THE SLAB IS POURED AS A PART OF THE CONTINUOUS POUR.
3. THE CURB SHALL BE POURED AFTER THE SLAB HAS BEEN POURED.
4. IF THE CONTRACTOR CAN NOT POUR THE SLAB IN ONE CONTINUOUS POUR - CONTACT THE BRIDGE SECTION. IT IS IMPORTANT TO NOTE THAT ANY INTERRUPTED SEQUENCE MUST BE CLOSELY CONTROLLED FOR BEST RESULTS.

**ORIGINAL CONSTRUCTION PLANS**

(EASTBOUND LANES)  
SUPERSTRUCTURE DETAILS  
FOR  
150'-10 1/2" PRESTR. CONC. GIRDER BRIDGE  
40'-0" ROADWAY 36°52' 11.4" SKEW L.H.F.  
OVER LOCAL ROAD SEC. 24 & 25-TIS-RIG  
STA. 258+52.71 TO 260+03.59 190-2( III)4  
PENNINGTON COUNTY  
STR. NO. 52-953-400 SOUTH DAKOTA HS20-44  
DEPARTMENT OF HIGHWAYS (8 ALT.)  
MARCH 1971 4 OF 4



SEC. D-D

SEC. C-C

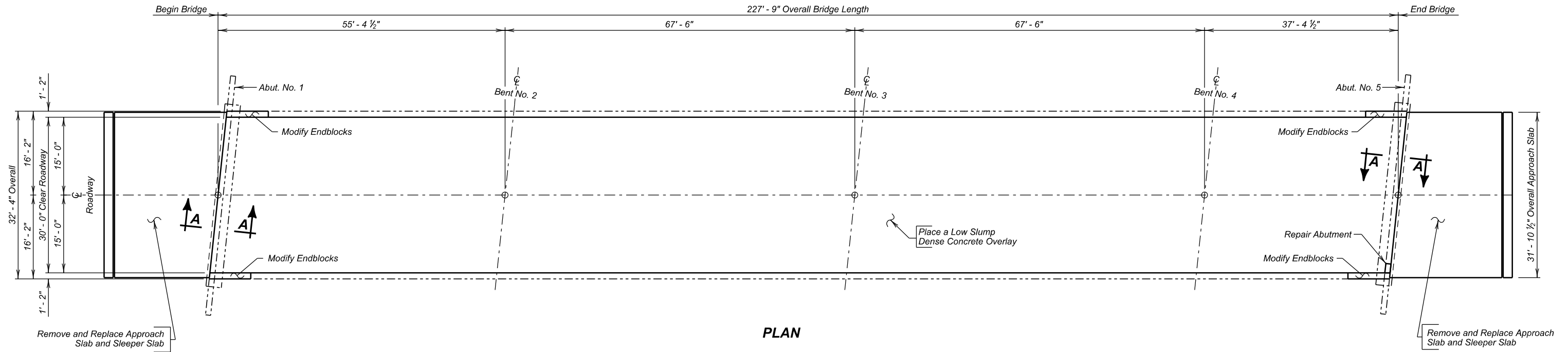
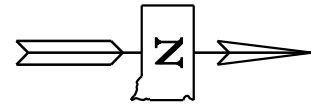
DETAIL "Z"

DETAIL "Y" (Interior Girders)

BENT DIAPHRAGMS

DESIGNED BY C.M.L.	DRAWN BY D.G.P.	CHECKED BY B.F.E.	APPROVED BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E15	E44



PLAN

**-X281-  
INDEX OF BRIDGE SHEETS -**

- Sheet No. 1 - Layout for Upgrade
- Sheet No. 2 - Estimate of Structure Quantities and Notes
- Sheet No. 3 - Notes (Continued)
- Sheet No. 4 - Notes (Continued)
- Sheet No. 5 - Abutment Repair Details
- Sheet No. 6 - Deck Profiles For Low Slump Dense Concrete Bridge Deck Overlay (A)
- Sheet No. 7 - Deck Profiles For Low Slump Dense Concrete Bridge Deck Overlay (B)
- Sheet No. 8 - Deck Profiles For Low Slump Dense Concrete Bridge Deck Overlay (C)
- Sheet No. 9 - End Block Breakout Details
- Sheet No. 10 - End Block Modification Details (A)
- Sheet No. 11 - End Block Modification Details (B)
- Sheet No. 12 - Approach Slab Details (A)
- Sheet No. 13 - Approach Slab Details (B)
- Sheet No. 14 - Approach Slab Details (C)
- Sheet No. 15 - Approach Slab Joint Details
- Sheet No. 16 - As-Built Elevation Survey (A)
- Sheet No. 17 - As-Built Elevation Survey (B)
- Sheet No. 18 - As-Built Elevation Survey (C)
- Sheet No. 19 - Standard Plate No. 630.92
- Sheet No. 20 thru 30 - Original Construction Plans

**LAYOUT FOR UPGRADE  
FOR  
227' - 9" PRESTRESSED  
CONCRETE GIRDER BRIDGE**

30' - 0" ROADWAY OVER I90 STR. NO. 52-830-310 PCN 091L  
6° L.H.F. SKEW SEC. 01-T1N-R14E IM 0902(186)101

PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION

FEBRUARY 2025

1 OF 30

-X281-

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

DESIGNED BY JRB PENN091L	CK. DES. BY CM 091LBC01	DRAFTED BY KR	<i>Steve A. Johnson</i> BRIDGE ENGINEER
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**ESTIMATE OF STRUCTURE QUANTITIES**

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
110E0010	Remove Concrete Bridge Approach Slab	176.8	SqYd
410E2600	Membrane Sealant Expansion Joint	63.6	Ft
430E0300	Granular Bridge End Backfill	9	CuYd
460E0070	Class A45 Concrete, Bridge Repair	3.2	CuYd
460E0150	Concrete Approach Slab for Bridge	145.0	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	31.8	SqYd
460E0174	Concrete Patching Material, Miscellaneous	1.1	CuFt
460E0300	Breakout Structural Concrete	2.5	CuYd
460E0380	Install Dowel in Concrete	48	Each
480E0200	Epoxy Coated Reinforcing Steel	342	Lb
480E0504	No. 4 Rebar Splice	28	Each
480E0505	No. 5 Rebar Splice	32	Each
480E0506	No. 6 Rebar Splice	44	Each
480E5000	Galvanic Anode	36	Each
550E0010	Low Slump Dense Concrete Bridge Deck Overlay	62	CuYd
550E0100	Concrete Removal Type 1A	759.2	SqYd
550E0110	Concrete Removal Type 1B	193.3	SqYd
550E0120	Concrete Removal Type 1C	96.6	SqYd
550E0140	Concrete Removal Type B	20.0	Ft
550E0200	Class A45 Concrete Fill	16.7	CuYd
550E0500	Finishing and Curing	759.2	SqYd

**SPECIFICATIONS**

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

**DETAILS AND DIMENSIONS OF EXISTING BRIDGE**

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

- All reinforcing steel will conform to ASTM A615, Grade 60.
- All exposed concrete corners and edges will be chamfered 3/4-inch unless noted otherwise in the plans. Match existing chamfer if the existing chamfer differs.
- Use 2-inch clear cover on all reinforcing steel except as shown otherwise.
- Barrier curbs and end blocks will be built perpendicular to the grade.
- 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.
- All lap splices are contact lap splices unless noted otherwise.

**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.

- Accomplish all Concrete Removal Type 1A, 1B, 1C, and B and place Class A45 Concrete Fill to the satisfaction of the Engineer for the first phase of construction.
- Place a Low Slump Dense Concrete Bridge Deck Overlay to the elevations shown in the plans on the bridge deck for the first phase of construction.
- Remove existing endblocks to the extent shown in the plans for the first phase of construction.
- Place endblocks as shown in the plans for the first phase of construction.
- Remove the existing approach and sleeper slabs for the first phase of construction.
- Place and compact backfill as needed and place approach slabs and sleeper slabs to the correct grade for the first phase of construction.
- Replace sleeper slab joints with approved Membrane Sealant Expansion Joint for the first phase of construction.
- Switch traffic and repeat steps 1 through 7 for the second phase of construction.
- Breakout and repair concrete on Abutment 5 to the extent shown in the plans for the second phase of construction.

**LOW SLUMP DENSE CONCRETE BRIDGE DECK OVERLAY**

- The preparation for resurfacing consists of Concrete Removal Type 1A on the entire bridge deck and Type 1B, Type 1C, 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.
- Concrete Removal Type 1C, Concrete Removal Type B and Class A45 Concrete Fill may not be encountered and may be omitted from the project as determined by the Engineer.
- Concrete Removal Type 1C and Class A45 Concrete Fill is not anticipated to exceed the plan shown quantities. If the Engineer determines that Concrete Removal Type 1C and/or Class A45 Concrete Fill in excess of the plan shown quantity is necessary, payment for the additional quantity will be in conformance with Section 550.5 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 course aggregate gradation will be in accordance with Section 820 of the Construction Specifications and size #3 will be substituted in lieu of sizes #1 and #15.
- A minimum thickness of 2" of Low Slump Dense Concrete will be maintained on the bridge deck.
- 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.

**ESTIMATE OF STRUCTURE QUANTITIES AND NOTES**

FOR  
**227' - 9" PRESTRESSED  
CONCRETE GIRDER BRIDGE**

STR. NO. 52-830-310

FEBRUARY 2025

2 OF 30



STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E17	E44

**LOW SLUMP DENSE CONCRETE BRIDGE DECK OVERLAY CONTINUED**

7. 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, the Type 1A, 1B, 1C, and Type B removal will not be done until work resumes in the spring. In the event that scarification has been started and due to unforeseen circumstances it becomes impossible to complete the placement of the Low Slump Dense Concrete Bridge Deck 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.
8. Due to a concurrent project below the structure, no Type 1D Concrete Removal will be allowed.
9. During placement of the Low Slump Dense Concrete Bridge Deck Overlay all vehicular traffic on the lane open for travel will be stopped by flaggers before entering onto the bridge and then allowed to proceed at a maximum of 5 MPH. To safely slow traffic to cross the bridge during the deck overlay period, two advance flaggers may be required.

**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 deck 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 Senior Region Bridge Engineer. The elevations will be based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88). The Engineer will provide the Contractor with a description, elevation and location of the nearest benchmark that has a NAVD88 established elevation for the Contractor's use. All costs associated with obtaining 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.

**CONCRETE BREAKOUT**

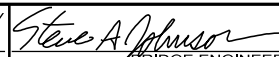
1. The existing end blocks and abutment no. 5 will be broken out to the limits shown on the plans. Breakout limits will be defined with a 3/4" deep sawcut (unless specified otherwise in these plans), where practical, as approved by the Engineer. Reinforcing steel that is exposed and is scheduled for 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 onto I90.
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.

**GALVANIC ANODE**

1. The Contractor will furnish and place galvanic anodes in the concrete repair areas specified in this plan set.
2. The galvanic anodes will be supplied as one of the following:
  - a. Galvashield XP2  
Vector Corrosion Technologies  
65114 140<sup>th</sup> Ave.  
Wabasha, MN 55981  
Phone: (507) 259-2481  
Website: [www.vector-corrosion.com](http://www.vector-corrosion.com)
  - b. Sentinel Silver  
Euclid Chemical Company  
19218 Redwood Road  
Cleveland, OH 44110  
Phone: (800) 321-7628  
Website: [www.euclidchemical.com](http://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 3/4" 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.

**NOTES CONTINUED**  
FOR  
**227' - 9" PRESTRESSED  
CONCRETE GIRDER BRIDGE**  
STR. NO. 52-830-310  
FEBRUARY 2025

DESIGNED BY JRB PENN091L	CK. DES. BY CM 091LBC03	DRAFTED BY JRB	 BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E18	E44

**VERTICAL SPALL REPAIR**

1. Concrete used in vertical patching applications on abutment no. 5 where forms are not practical will consist of one of the following products, or equal as approved by the Office of Bridge Design.
  - a. HD 25 VO  
Dayton Superior  
1125 Byers Road  
Miamisburg, OH 45342  
Phone: (800) 745-3700
  - b. MasterEmaco N400RS  
BASF Building Systems  
889 Valley Park Drive  
Shakopee, MN 55379  
Phone: (800) 433-9517
  - c. Meadow-Patch 20  
W.R.Meadows, Inc.  
P.O. Box 338  
Hampshire, IL 60140-0338  
Phone: (847) 214-2100
  - d. Speed Crete Red Line  
The Euclid Chemical Company  
19218 Redwood Rd.  
Cleveland, OH 44110  
Phone: (800) 321-7628
2. The concrete patch material will be applied and cured as recommended by the manufacturer and as approved by the Engineer.
3. The cost of furnishing and placing vertical patching material including all labor, equipment, tools, and any incidentals necessary to complete the work will be paid for at the contract unit price per cubic foot for Concrete Patching Material, Miscellaneous.

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

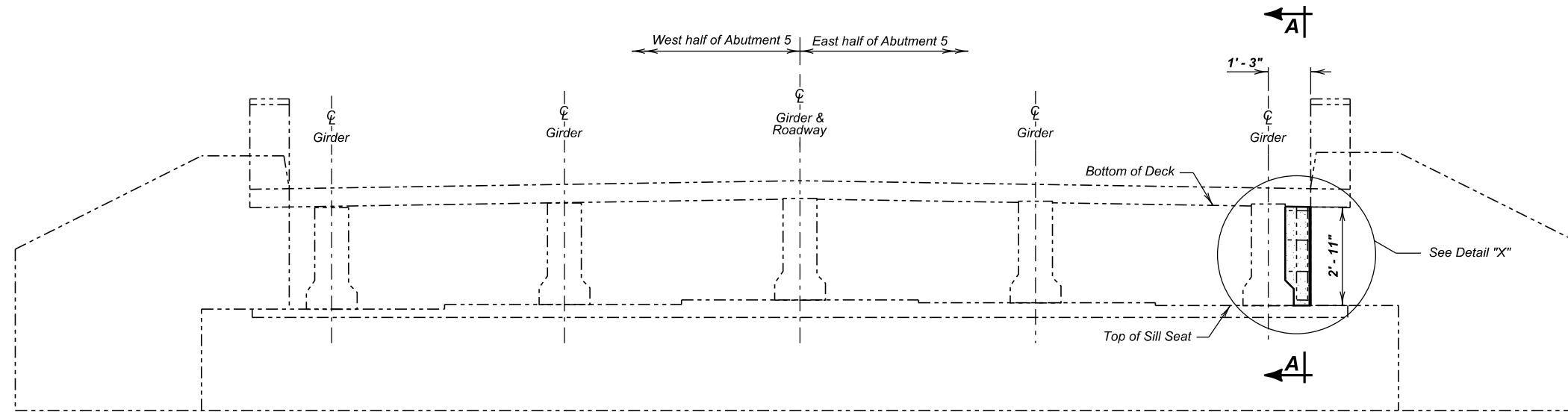
**APPROACH SLABS**

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 Select Granular 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.
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.

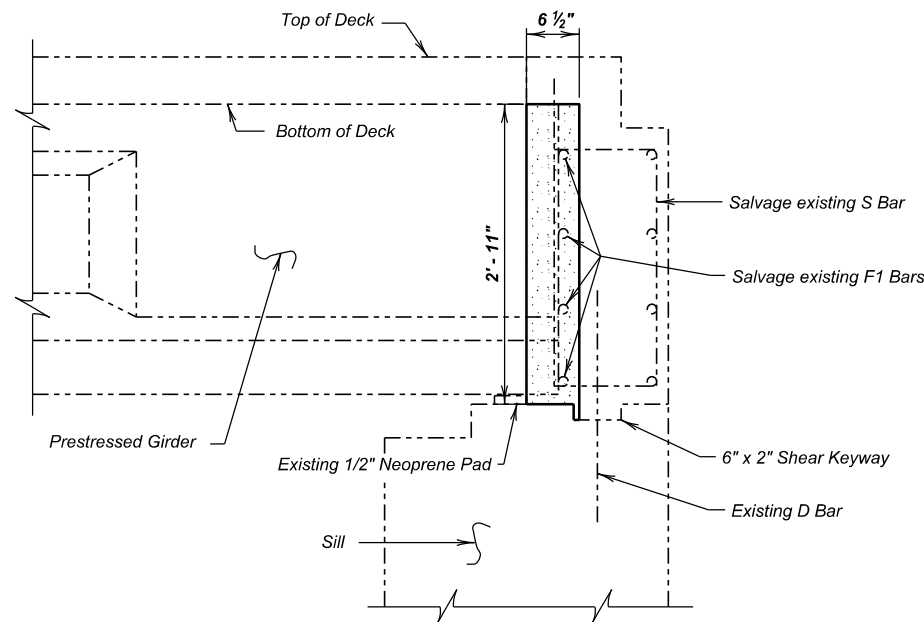
**NOTES CONTINUED**  
 FOR  
**227' - 9" PRESTRESSED**  
**CONCRETE GIRDER BRIDGE**  
 STR. NO. 52-830-310  
 FEBRUARY 2025

DESIGNED BY JRB PENN091L	CK. DES. BY CM 091LBC04	DRAFTED BY JRB	<i>Steve A. Johnson</i> BRIDGE ENGINEER
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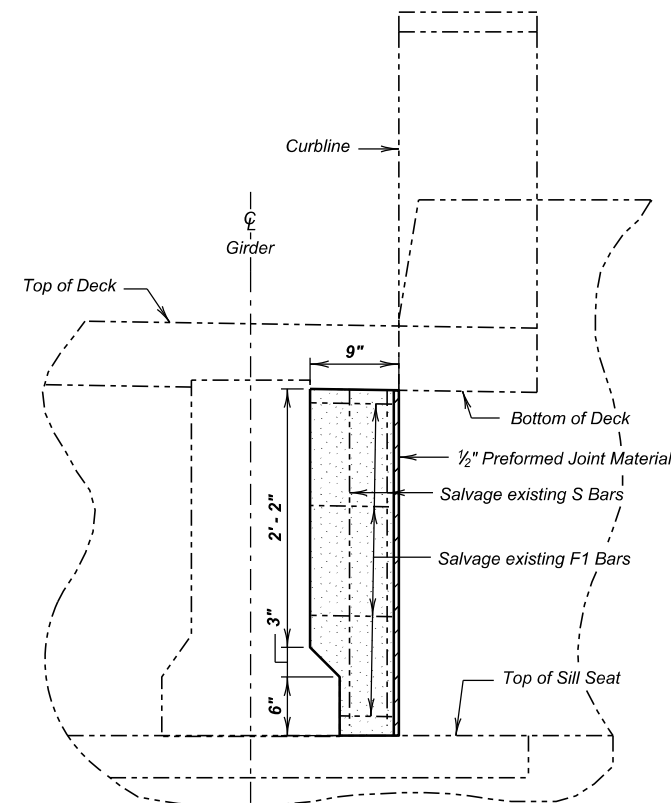


**ELEVATION OF ABUTMENT NO. 5**

 Limits of Concrete Breakout and Repair



**SECTION A - A**



**DETAIL "X"**

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
* Breakout Structural Concrete	CuYd	0.1
* Concrete Patching Material, Miscellaneous	CuFt	1.1
* Galvanic Anode	Each	4

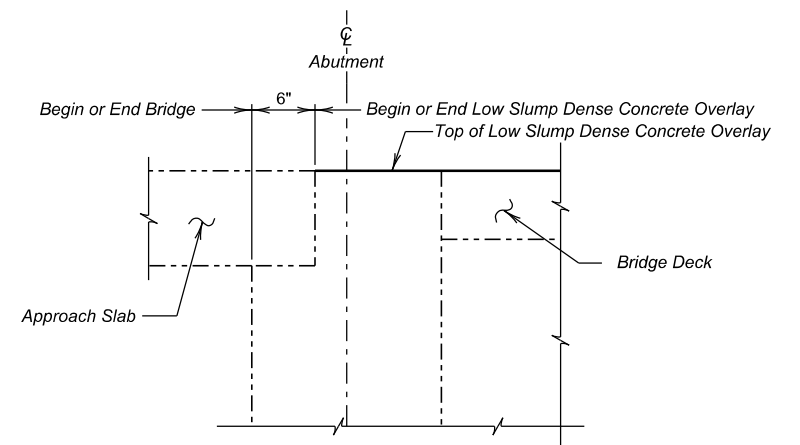
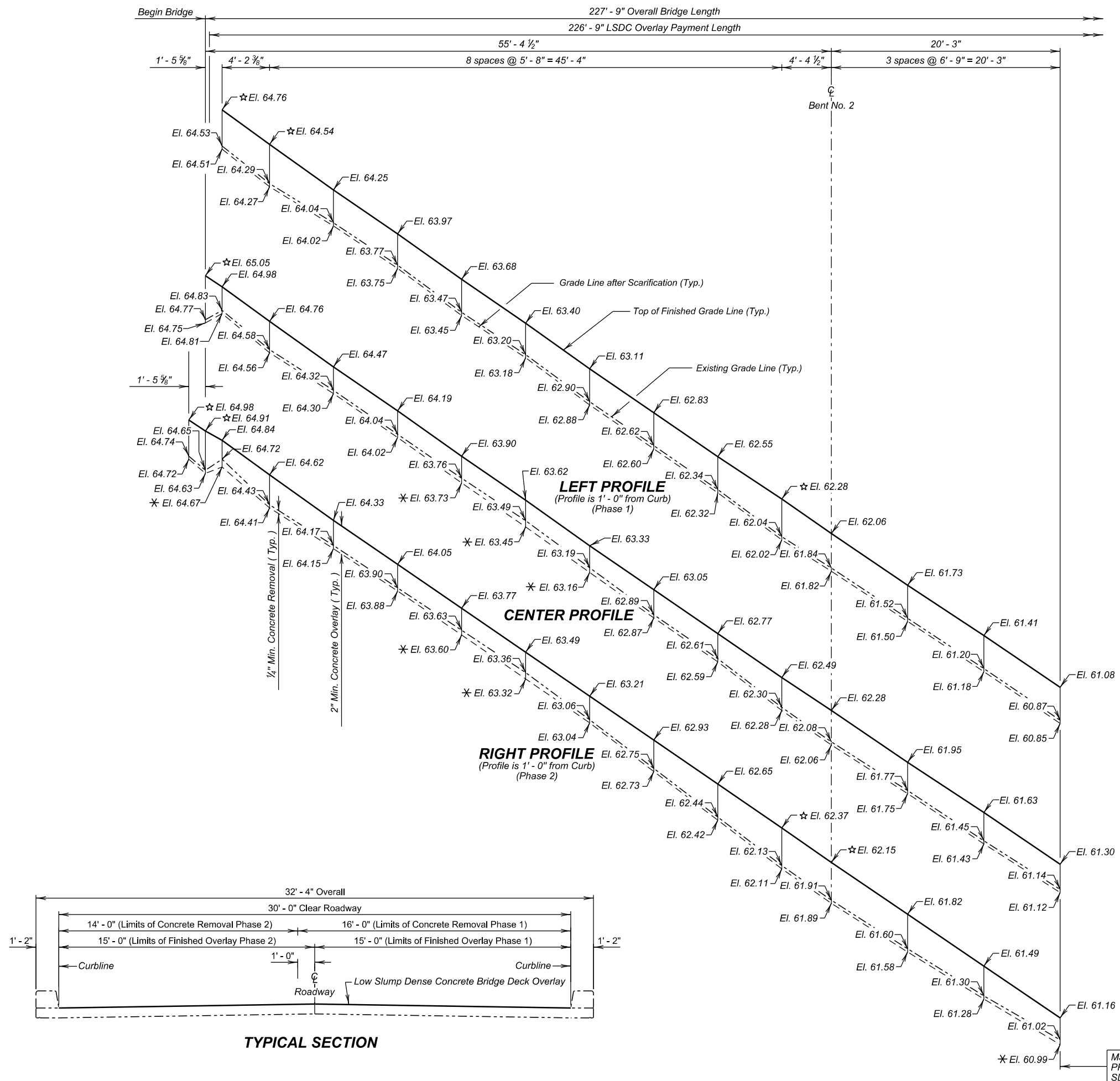
\* Quantity is based on approximate dimensions shown in these plans. Actual quantity will vary depending on field conditions.

**ABUTMENT REPAIR DETAILS  
FOR  
227' - 9" PRESTRESSED  
CONCRETE GIRDER BRIDGE**

30' - 0" ROADWAY OVER I90 STR. NO. 52-830-310  
6° L.H.F. SKEW SEC. 01-T1N-R14E IM 0902(186)101

PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION  
FEBRUARY 2025

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E20	E44



**SECTION A - A**  
(See LAYOUT FOR UPGRADE)

0' 0.25' 0.5' 1.00'

VERTICAL SCALE

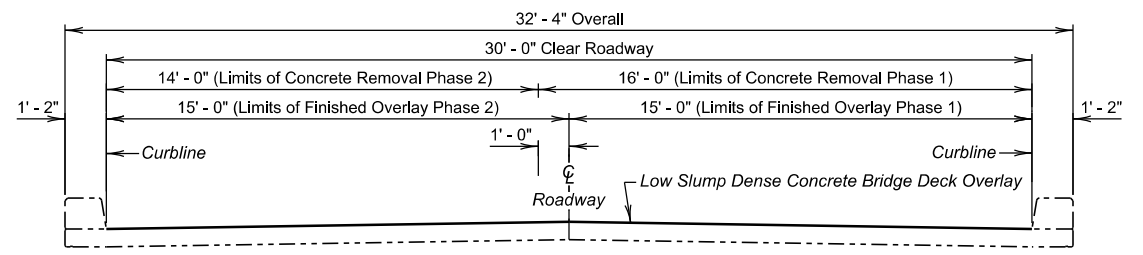
**Survey Reference:**  
B.M. # PK1  
Behind N.E. Guardrail  
Elevation 2351.42

**NOTE:**  
Add 2300.00 all elevations shown on profiles.  
✱ Scarification in excess of 1/4" in these areas.  
☆ Overlay placement in these locations exceeds 3" and will require consolidation with suitable spud vibrators. The vibration will be of sufficient duration and intensity to thoroughly consolidate the concrete without causing segregation or any damage to the concrete.

**DECK PROFILES FOR LOW SLUMP DENSE CONCRETE BRIDGE DECK OVERLAY (A) FOR 227' - 9" PRESTRESSED CONCRETE GIRDER BRIDGE**

30' - 0" ROADWAY OVER I90 STR. NO. 52-830-310  
6° L.H.F. SKEW SEC. 01-T1N-R14E IM 0902(186)101

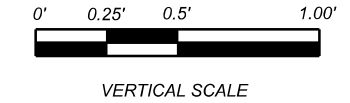
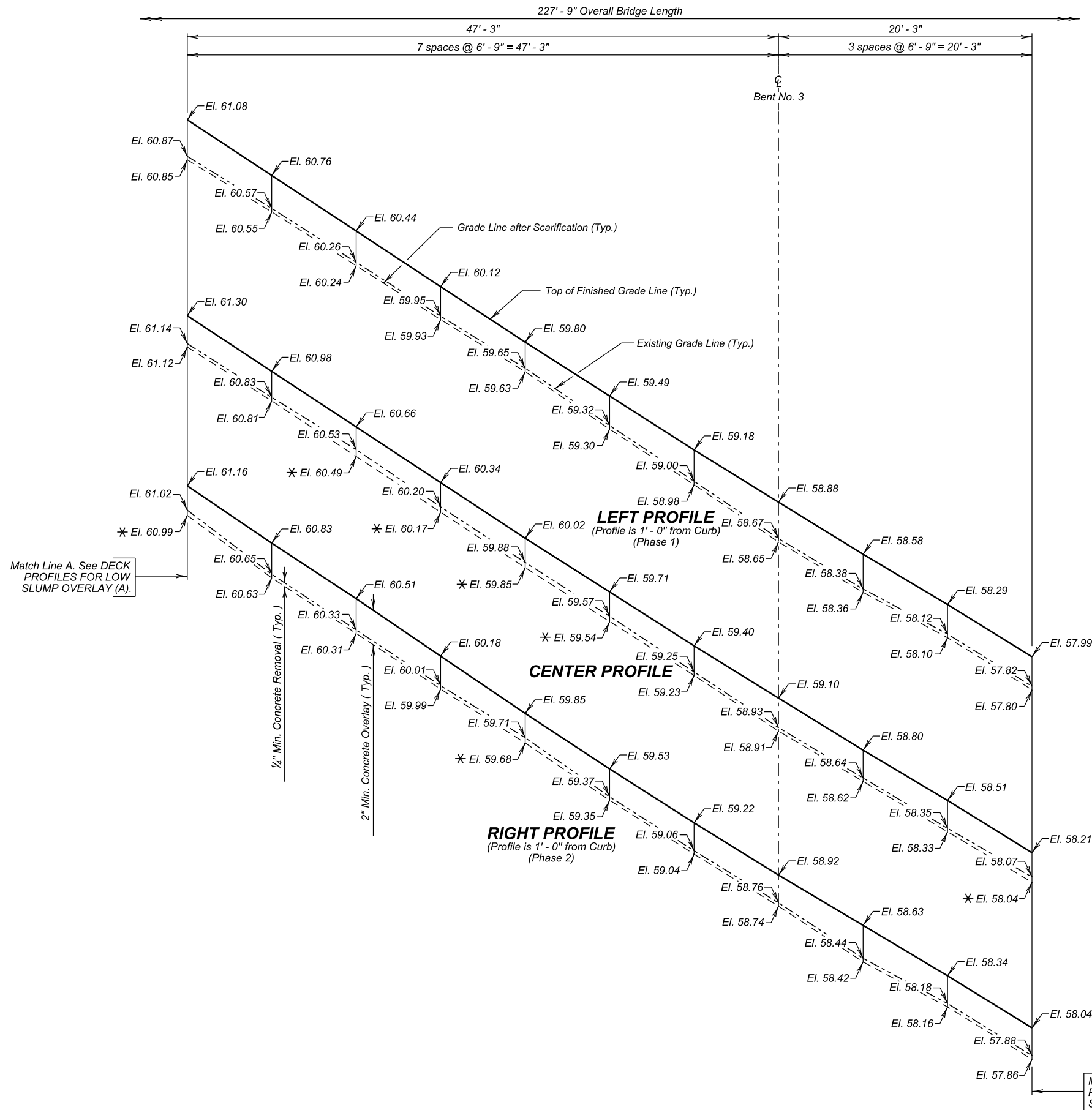
PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION  
FEBRUARY 2025



Match Line A. See DECK PROFILES FOR LOW SLUMP OVERLAY (B).

DESIGNED BY JRB PENN091L	CK. DES. BY CM 091LRC06	DRAFTED BY KR	Steve A. Johnson BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E21	E44



NOTE:

- Add 2300.00 all elevations shown on profiles.
- \* Scarify in excess of 1/4" in these areas.
- ☆ Overlay placement in these locations exceeds 3" and will require consolidation with suitable spud vibrators. The vibration will be of sufficient duration and intensity to thoroughly consolidate the concrete without causing segregation or any damage to the concrete.

**DECK PROFILES FOR LOW SLUMP DENSE CONCRETE BRIDGE DECK OVERLAY (B)**  
FOR  
**227' - 9" PRESTRESSED CONCRETE GIRDER BRIDGE**

30' - 0" ROADWAY OVER I90 STR. NO. 52-830-310

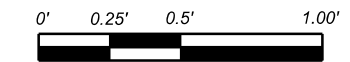
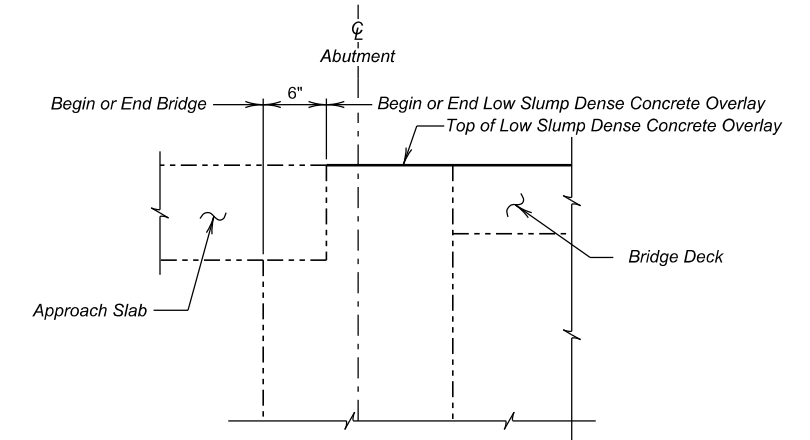
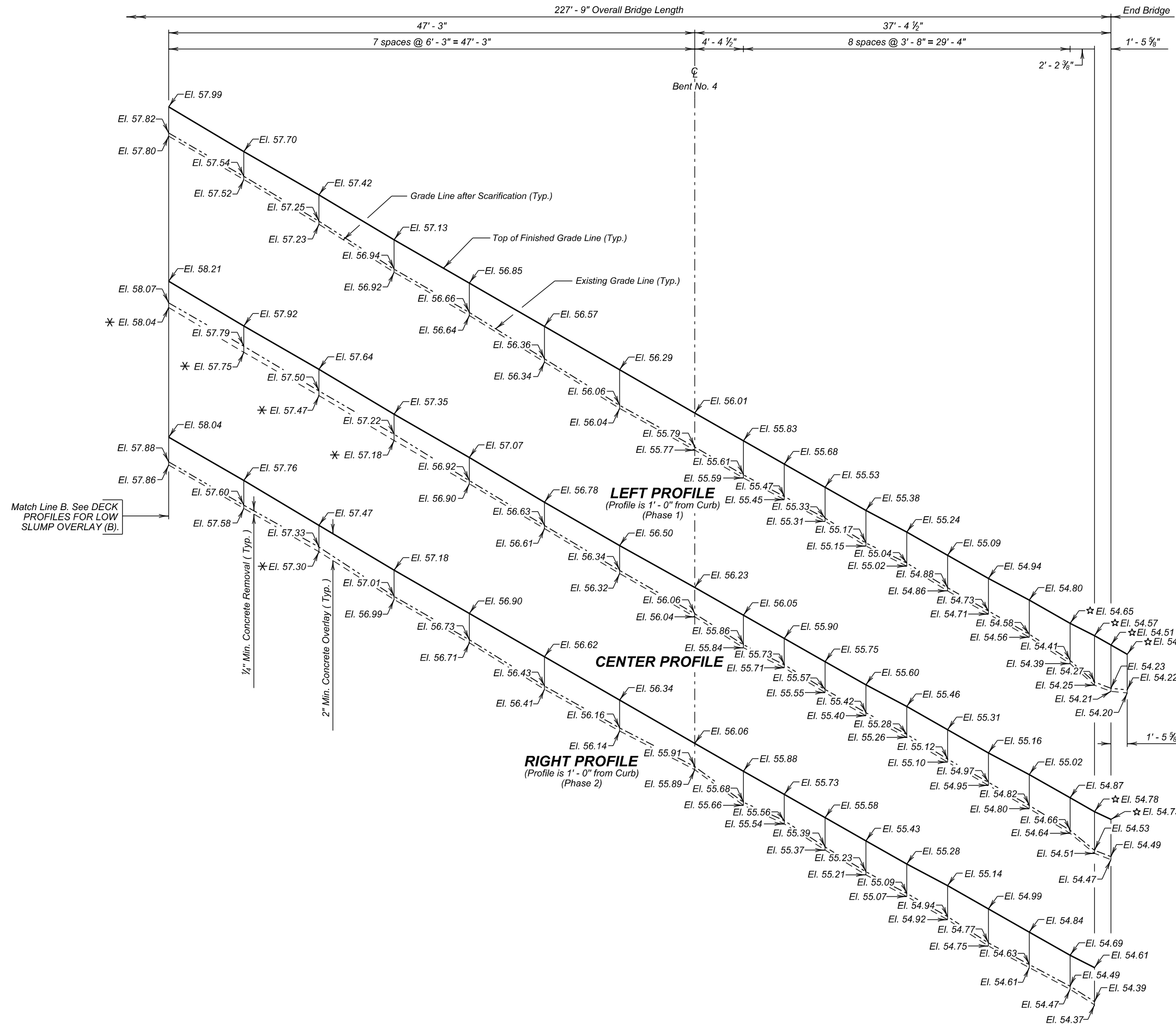
6° L.H.F. SKEW SEC. 01-T1N-R14E IM 0902(186)101

PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION

FEBRUARY 2025 **7** OF **30**

DESIGNED BY JRB PENN091L	CK. DES. BY CM 091LRC07	DRAFTED BY KR	<i>Steve A. Johnson</i> BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E22	E44



VERTICAL SCALE

NOTE :

Add 2300.00 all elevations shown on profiles.

\* Scarify in excess of 1/4" in these areas.

☆ Overlay placement in these locations exceeds 3" and will require consolidation with suitable spud vibrators. The vibration will be of sufficient duration and intensity to thoroughly consolidate the concrete without causing segregation or any damage to the concrete.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY	
		Phase 1	Phase 2
Low Slump Dense Concrete Deck Overlay	CuYd	32	30
Concrete Removal Type 1A	SqYd	404.9	354.3
Concrete Removal Type 1B	SqYd	103.1	90.2
Concrete Removal Type 1C	SqYd	51.5	45.1
Concrete Removal Type B	Ft	10.0	10.0
Class A45 Concrete Fill	CuYd	8.9	7.8
Finishing and Curing	SqYd	379.6	379.6

DECK PROFILES FOR LOW SLUMP DENSE CONCRETE BRIDGE DECK OVERLAY (C)

FOR 227' - 9" PRESTRESSED CONCRETE GIRDER BRIDGE

30' - 0" ROADWAY OVER I90 STR. NO. 52-830-310

6° L.H.F. SKEW SEC. 01-T1N-R14E IM 0902(186)101

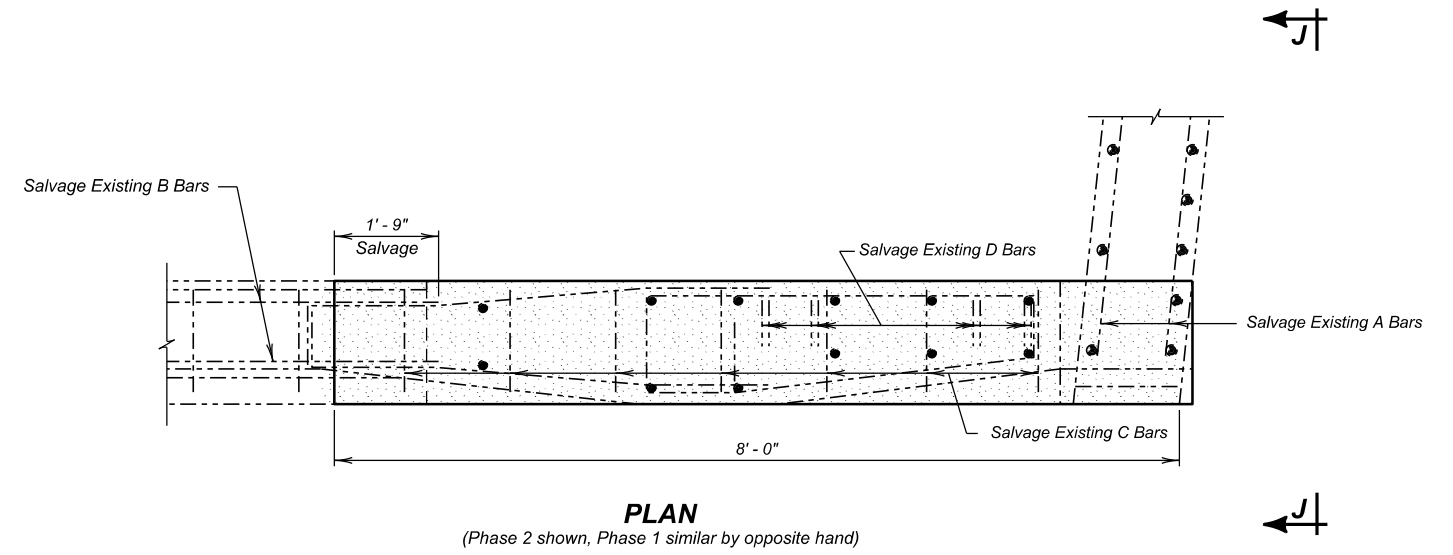
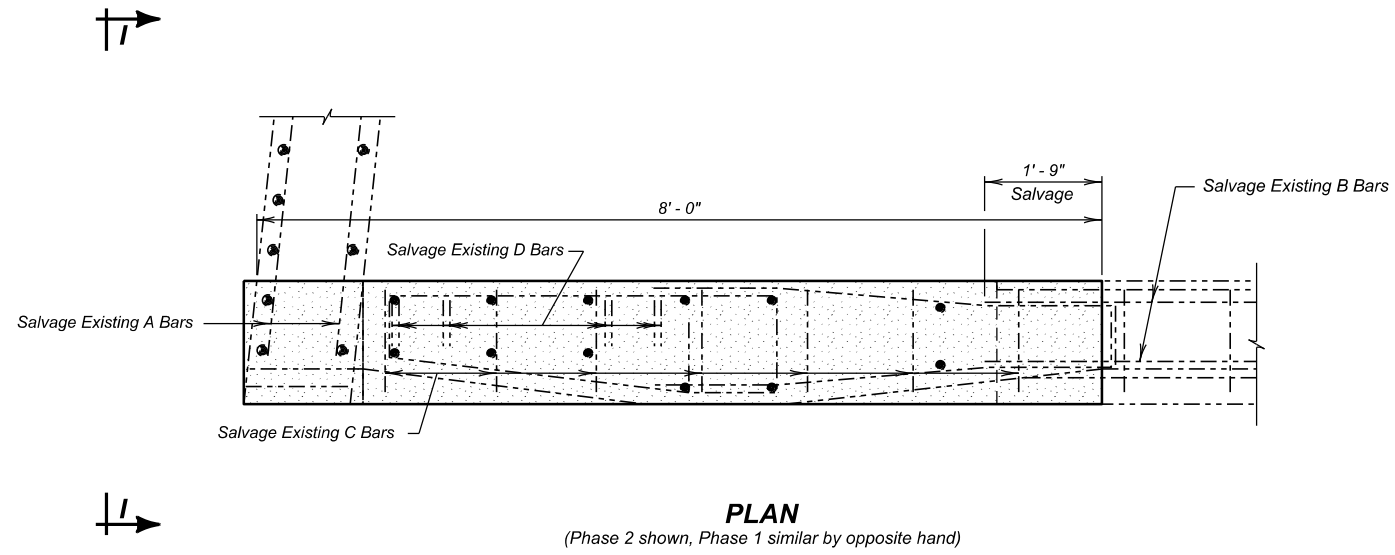
PENNINGTON COUNTY S. D. DEPT. OF TRANSPORTATION


FEBRUARY 2025

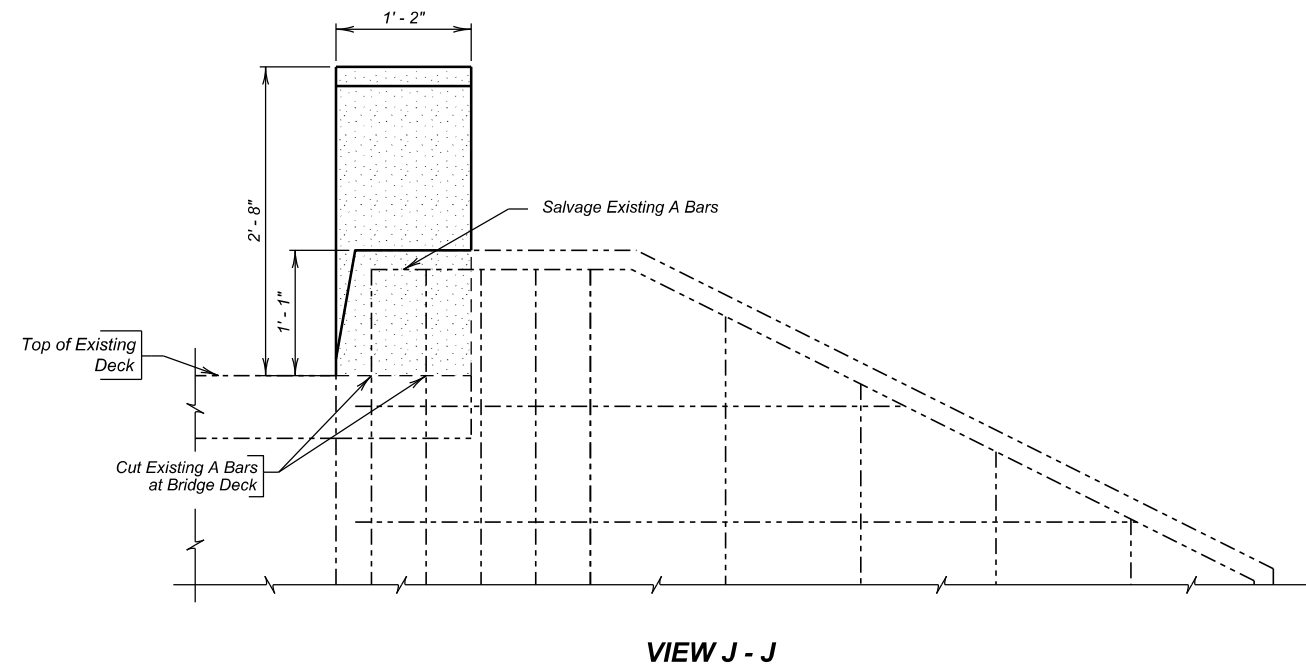
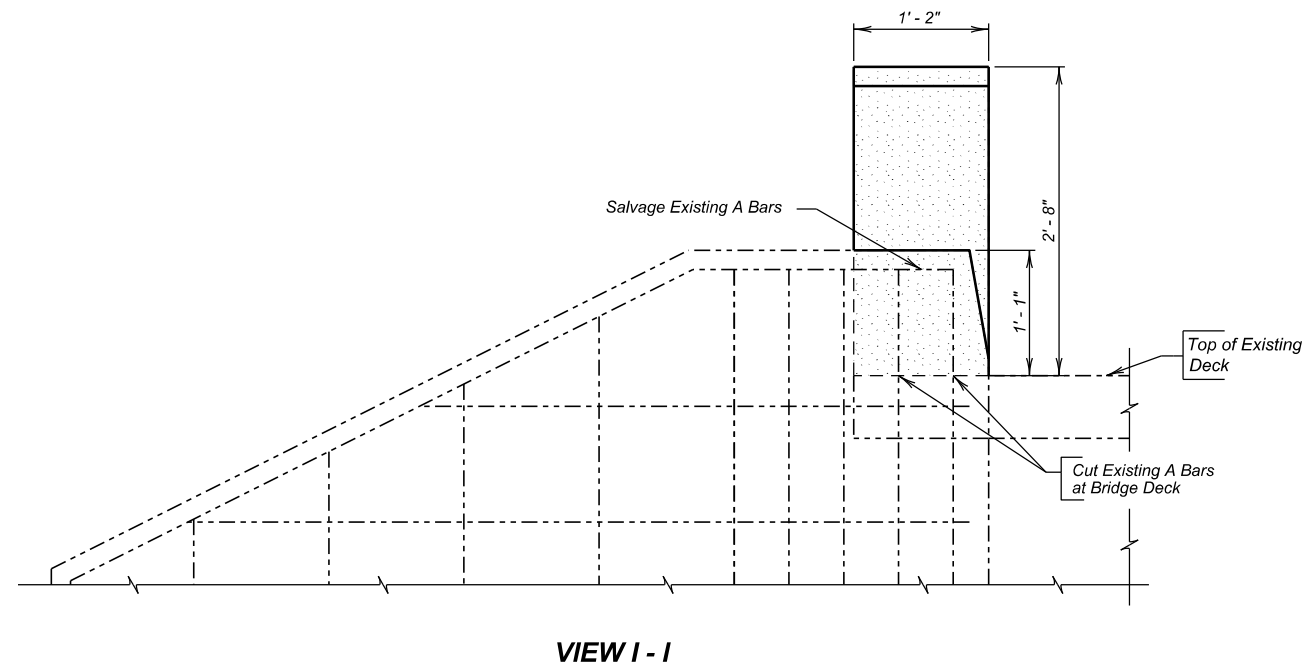
8 OF 30

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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E23	E44

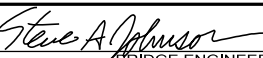


 Limits of Concrete Breakout

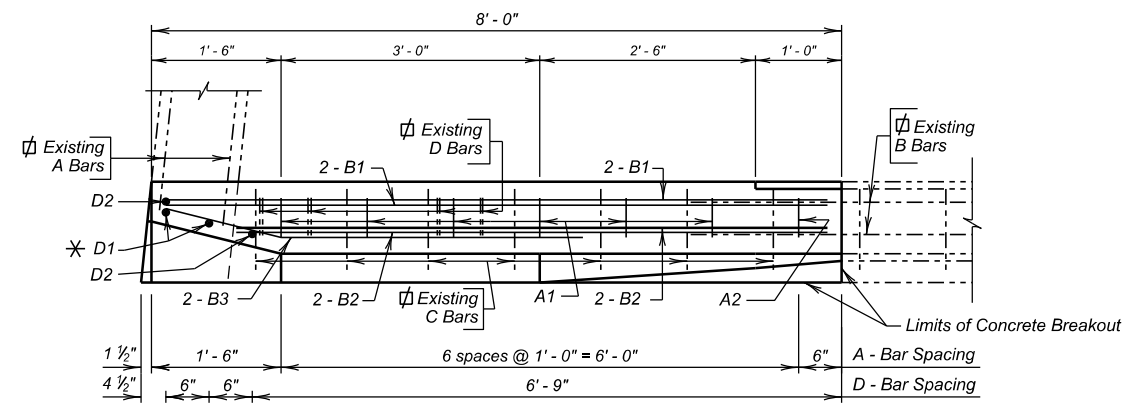


**END BLOCK BREAKOUT DETAILS**  
FOR  
**227' - 9" PRESTRESSED**  
**CONCRETE GIRDER BRIDGE**  
30' - 0" ROADWAY OVER I90 STR. NO. 52-830-310  
6° L.H.F. SKEW SEC. 01-T1N-R14E IM 0902(186)101

PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION  
FEBRUARY 2025

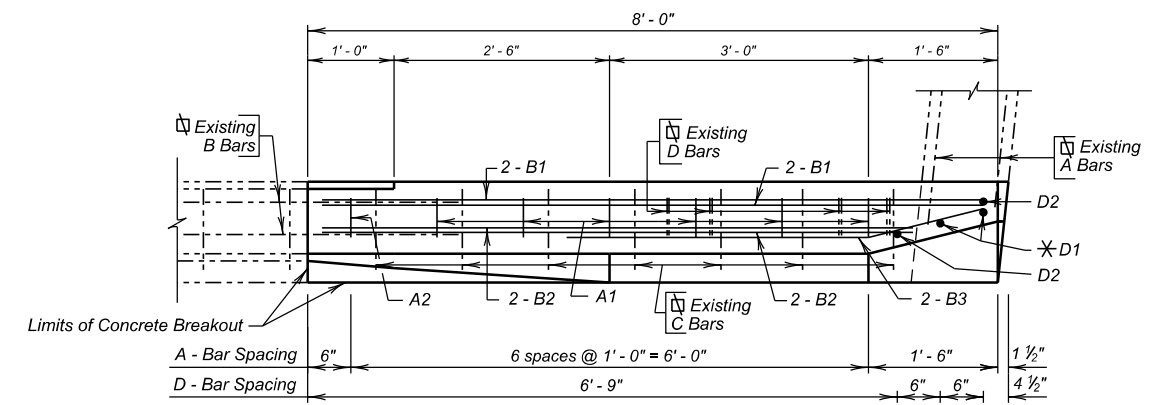
DESIGNED BY JRB PENN091L	CK. DES. BY CM 091LBC09	DRAFTED BY JRB	 BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E24	E44



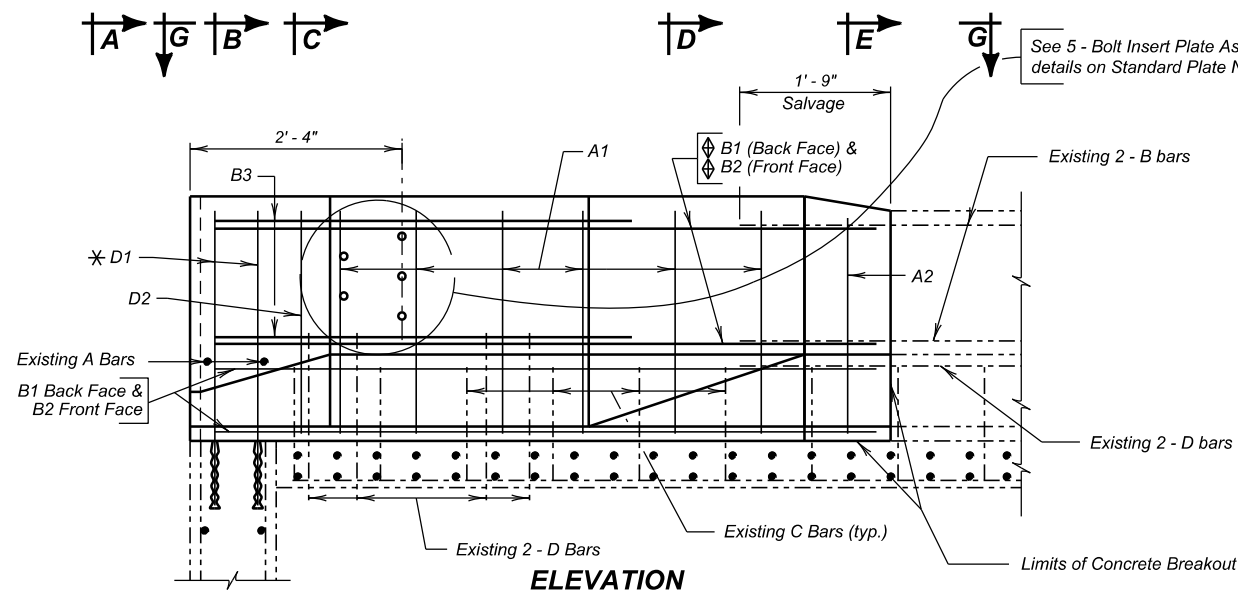
**PLAN**

(Phase 1 shown, Phase 2 similar by opposite hand)

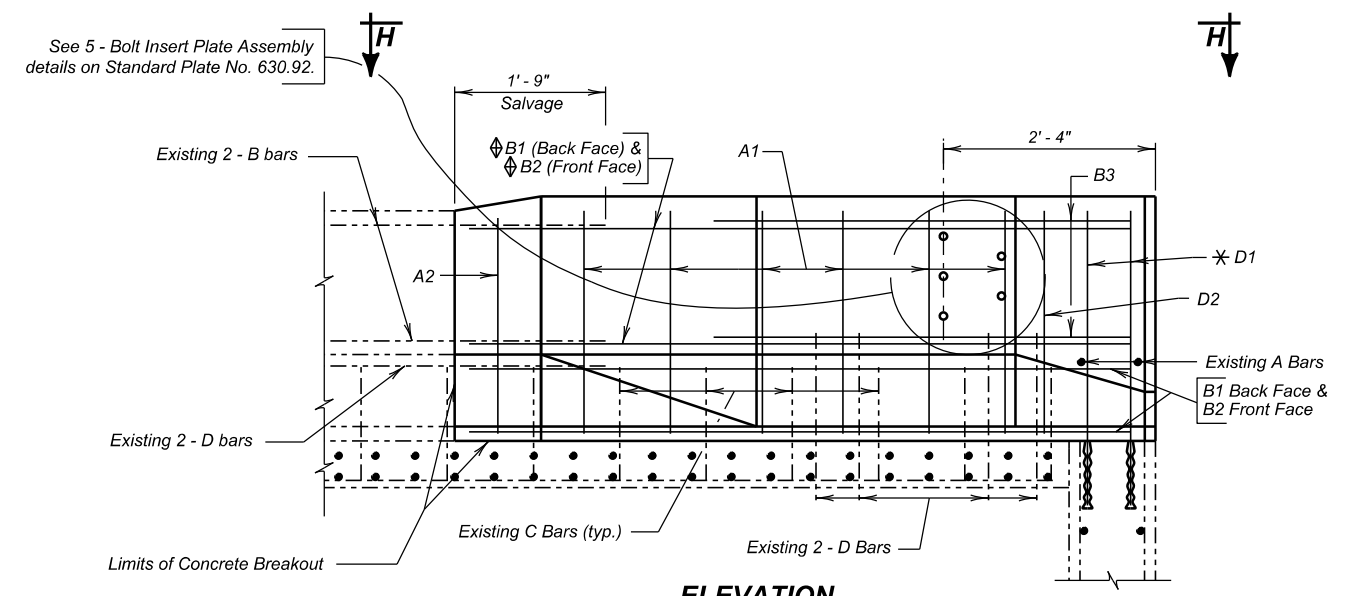


**PLAN**

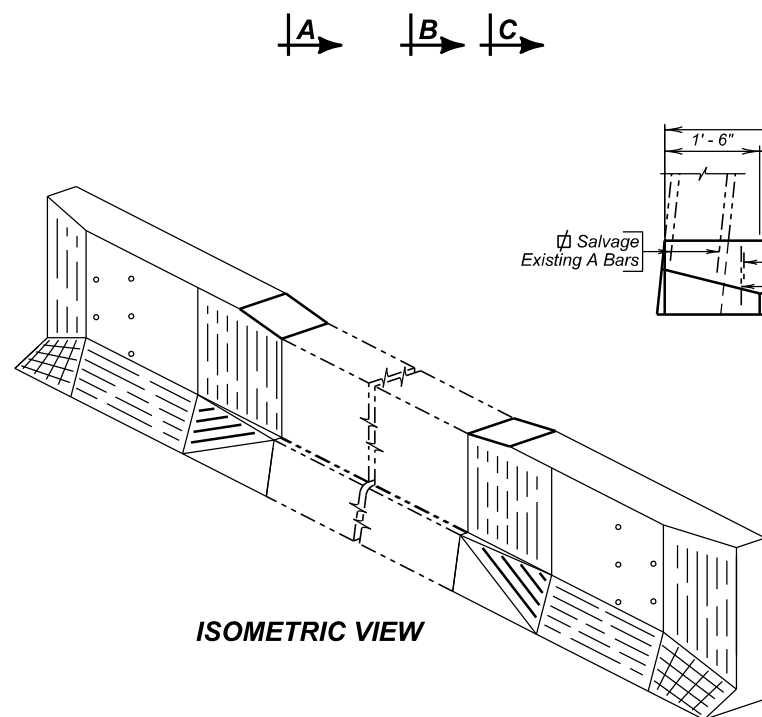
(Phase 1 shown, Phase 2 similar by opposite hand)



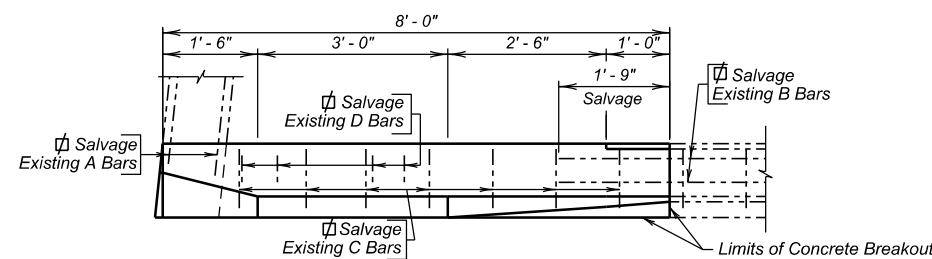
**ELEVATION**



**ELEVATION**

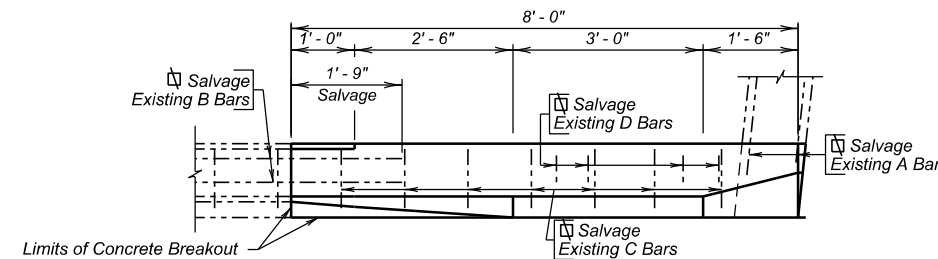


**ISOMETRIC VIEW**



**VIEW G - G**

(New reinforcement not shown)



**VIEW H - H**

(New reinforcement not shown)

**END BLOCK MODIFICATION DETAILS (A)**

**FOR  
227' - 9" PRESTRESSED  
CONCRETE GIRDER BRIDGE**

30' - 0" ROADWAY OVER I90 STR. NO. 52-830-310  
6° L.H.F. SKEW SEC. 01-T1N-R14E IM 0902(186)101

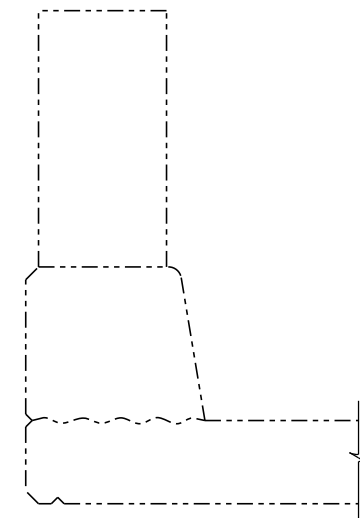
PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION

FEBRUARY 2025

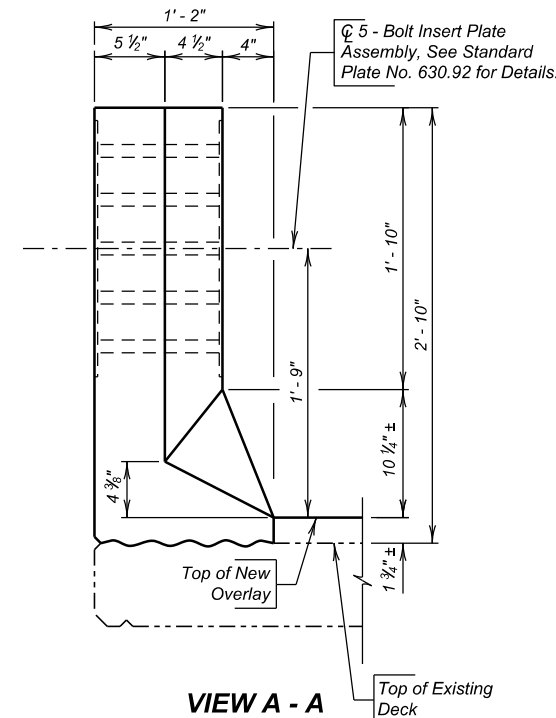
- ⊕ Galvanic anodes will be placed in areas where existing bars are in contact with new bars.
- ⊕ Bend Existing Bars where necessary to maintain 2" clear cover.
- \* D1 Dowels are to be drilled in and grouted with epoxy.
- ⊕ Min Lap 1' - 3"

DESIGNED BY JRB PENN091L	CK. DES. BY CM 091LBC10	DRAFTED BY JRB	<i>Steve A. Johnson</i> BRIDGE ENGINEER
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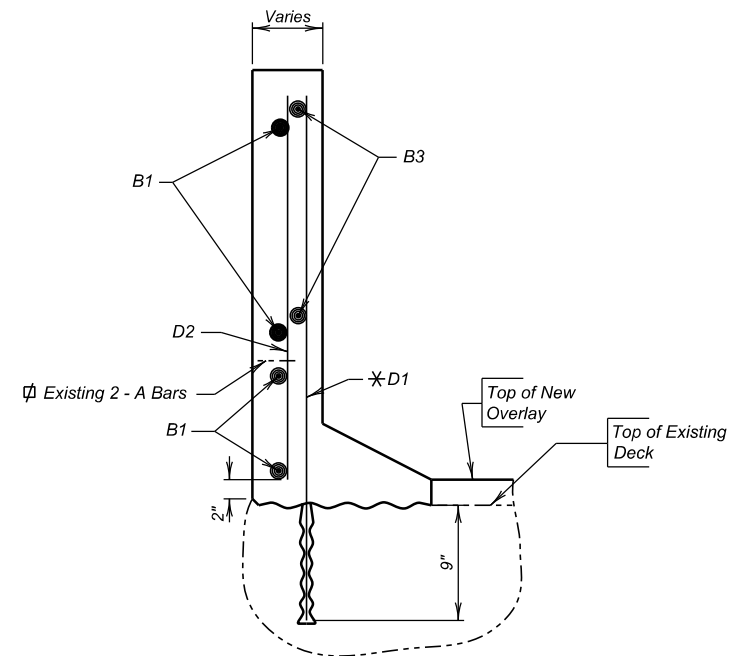




EXISTING CURB & RAIL



VIEW A - A



SECTION B - B

- ⊕ Min Lap 1' - 3"
- ⊕ Bend existing bars where necessary to maintain 2" clear cover.
- \* D1 Dowels are to be drilled in and grouted with epoxy.

### REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type	Bending Details	
					Phase 1	Phase 2
A1	12	4	6' - 9"	T2	6"	6"
A2	2	4	6' - 7"	T2		
B1	8	4	7' - 8"	Str.		
B2	8	4	6' - 10"	Str.		
B3	4	4	5' - 10"	19A		
Δ D1	4	6	3' - 5"	Str.		
D2	4	6	2' - 6"	Str.		

Phase 1		Phase 2	
A1	12	4	6' - 9"
A2	2	4	6' - 7"
B1	8	4	7' - 8"
B2	8	4	6' - 10"
B3	4	4	5' - 10"
Δ D1	4	6	3' - 5"
D2	4	6	2' - 6"

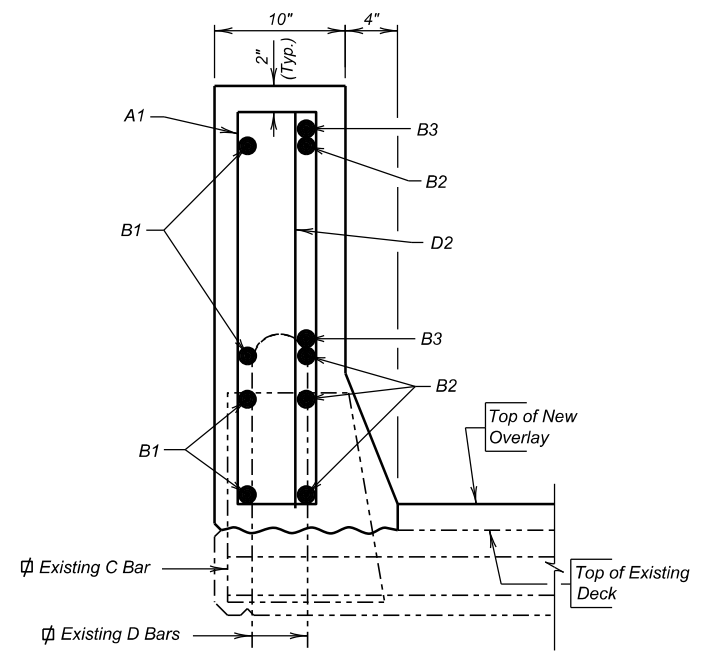
NOTES:  
 Δ Dowels  
 All bars are epoxy coated.  
 All dimensions are out to out of bars.

### ESTIMATED QUANTITIES

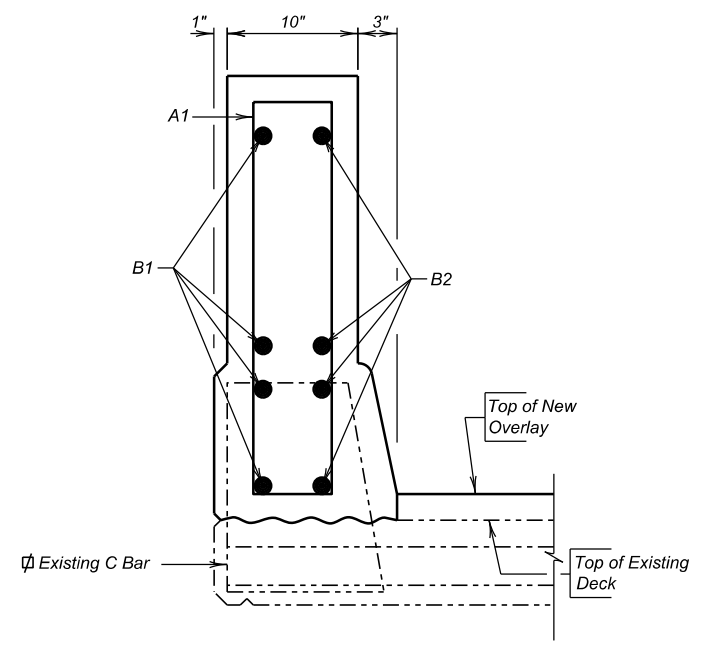
ITEM	UNIT	QUANTITY	
		PHASE 1	PHASE 2
Class A45 Concrete, Bridge Repair	CuYd	1.6	1.6
Breakout Structural Concrete	CuYd	1.2	1.2
Install Dowel in Concrete	Each	4	4
Epoxy Coated Reinforcing Steel	Lb.	171	171
Galvanic Anode	Each	16	16

⊗ Does not include the following quantities for D1 bars as these are incidental to the contract unit price per each for Install Dowel in Concrete.

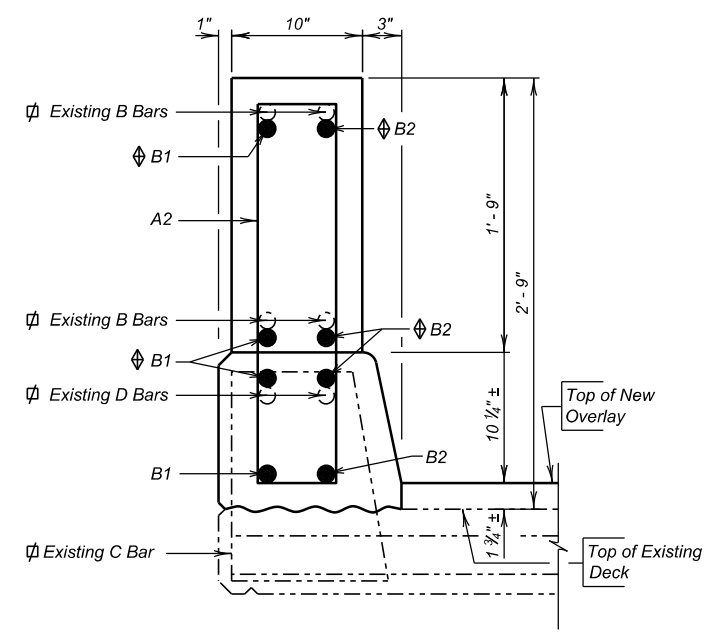
PHASE 1	PHASE 2
21 Lb.	21 Lb.



SECTION C - C



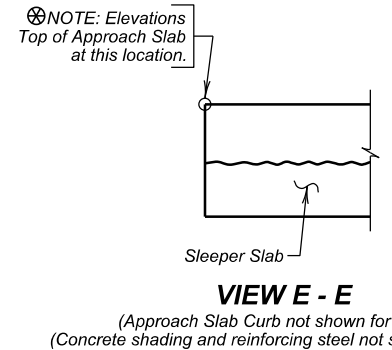
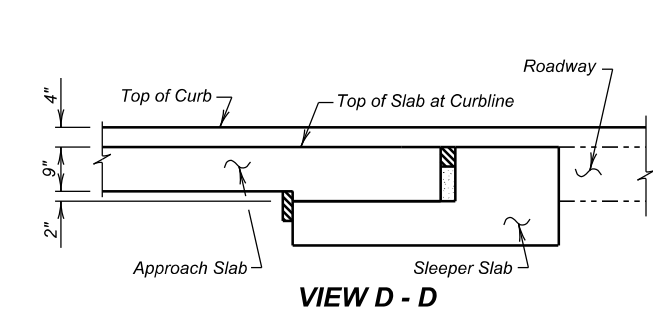
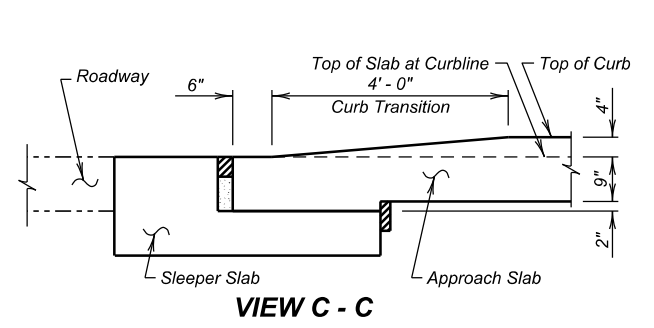
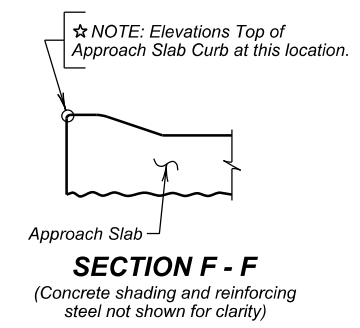
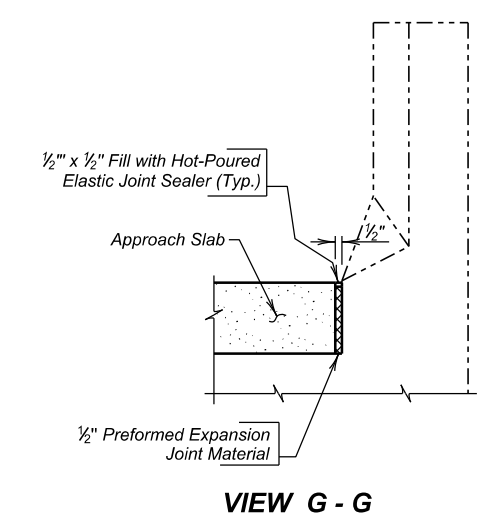
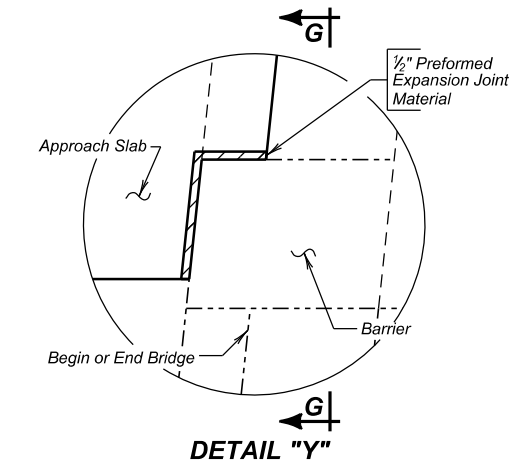
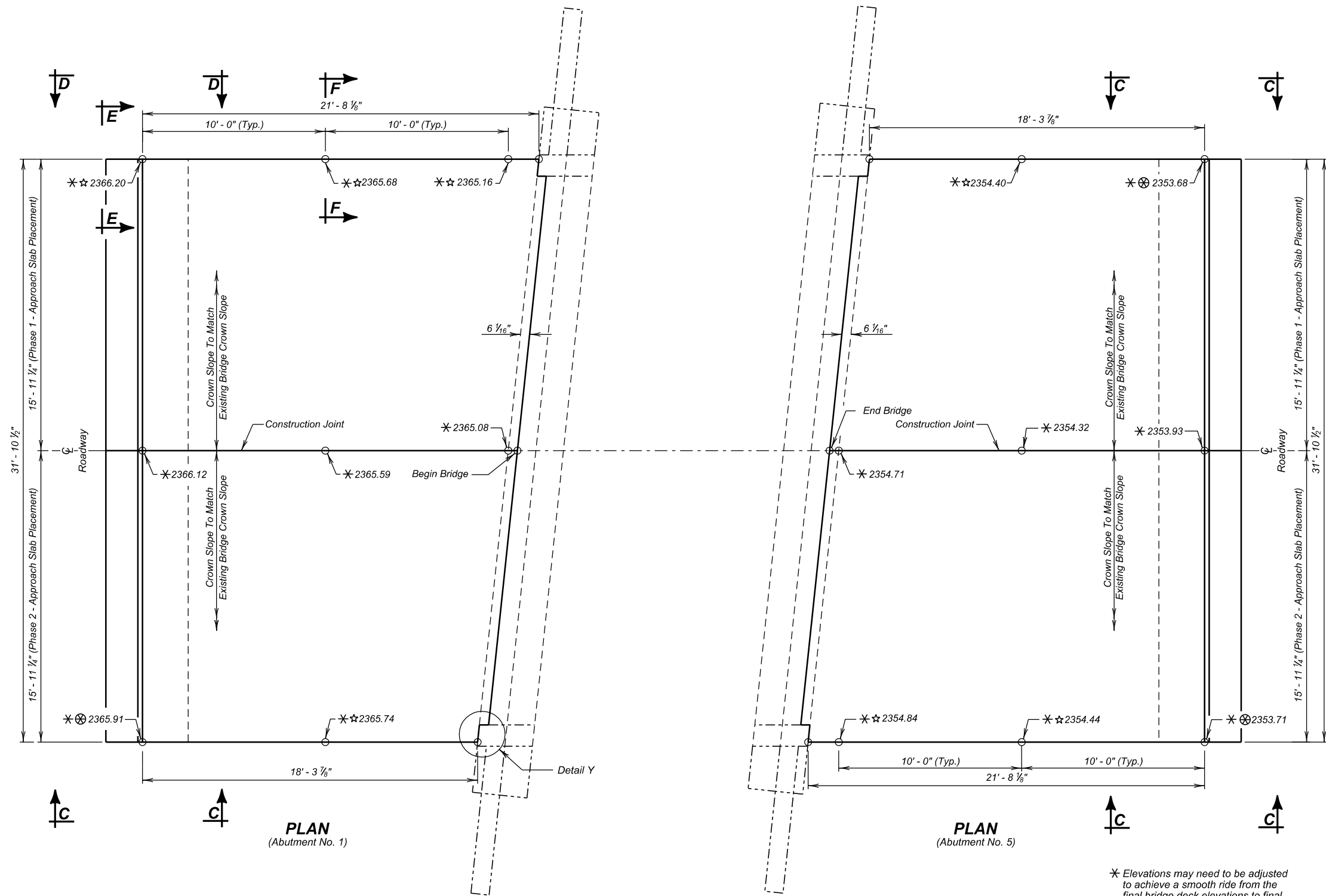
SECTION D - D



SECTION E - E

**END BLOCK MODIFICATION DETAILS (B)**  
 FOR  
**227' - 9" PRESTRESSED CONCRETE GIRDER BRIDGE**  
 30' - 0" ROADWAY OVER I90 STR. NO. 52-830-310  
 6° L.H.F. SKEW SEC. 01-T1N-R14E IM 0902(186)101

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E26	E44



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

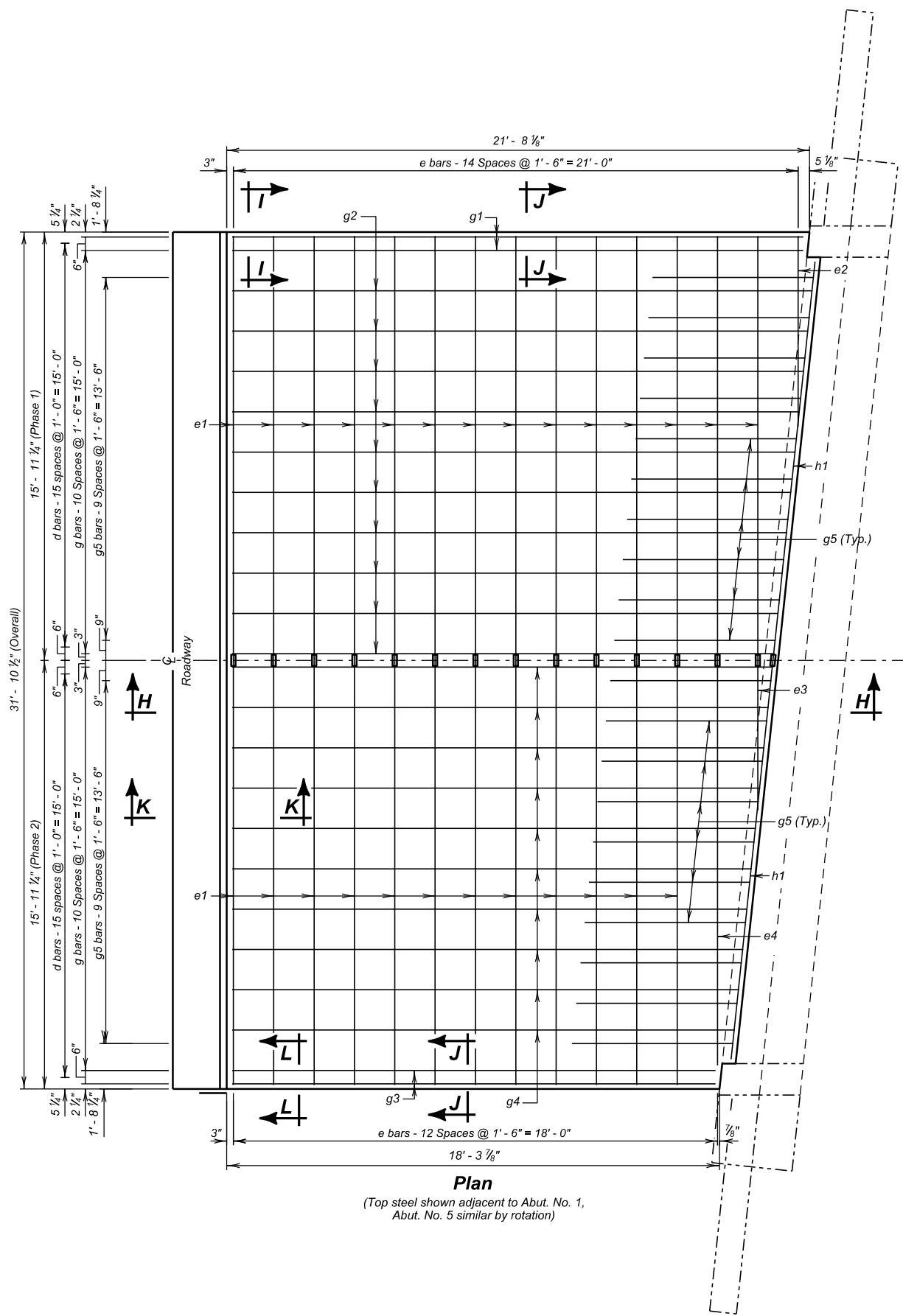
**Survey Reference:**  
 B.M. # PK 1  
 Behind NE Guardrail  
 Elevation 2351.42

**APPROACH SLAB DETAILS (A)**  
 FOR  
**227' - 9" PRESTRESSED CONCRETE GIRDER BRIDGE**  
 30' - 0" ROADWAY OVER I90 STR. NO. 52-830-310  
 6° L.H.F. SKEW SEC. 01-T1N-R14E IM 0902(186)101

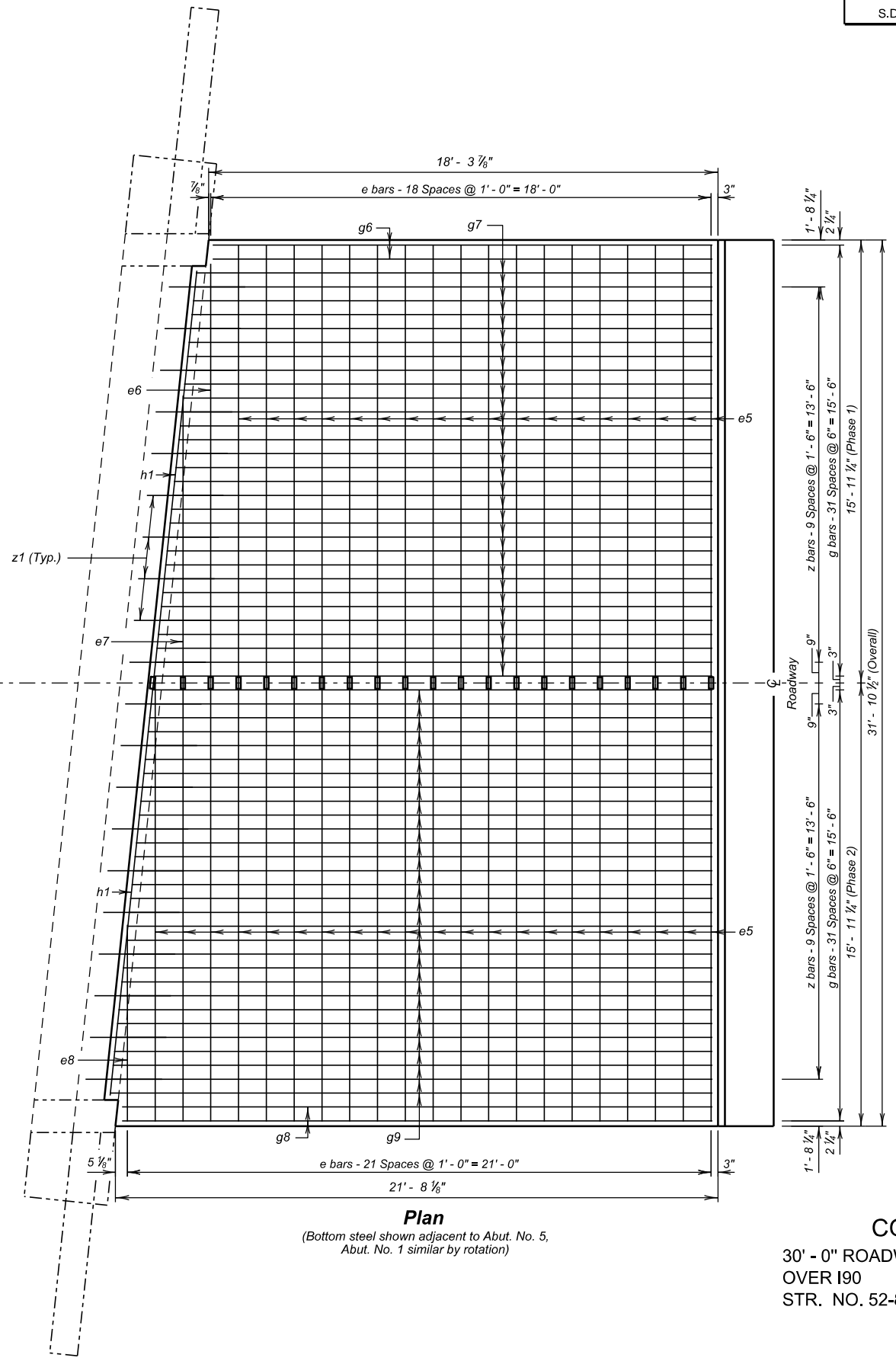
PENNINGTON COUNTY  
 S. D. DEPT. OF TRANSPORTATION  
 FEBRUARY 2025

DESIGNED BY JRB PENN091L	CK. DES. BY CM 091LBC12	DRAFTED BY JRB	<i>Steve A. Johnson</i> BRIDGE ENGINEER
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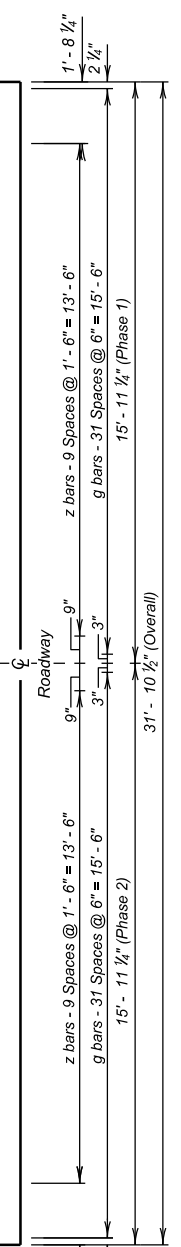
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E27	E44



**Plan**  
(Top steel shown adjacent to Abut. No. 1,  
Abut. No. 5 similar by rotation)



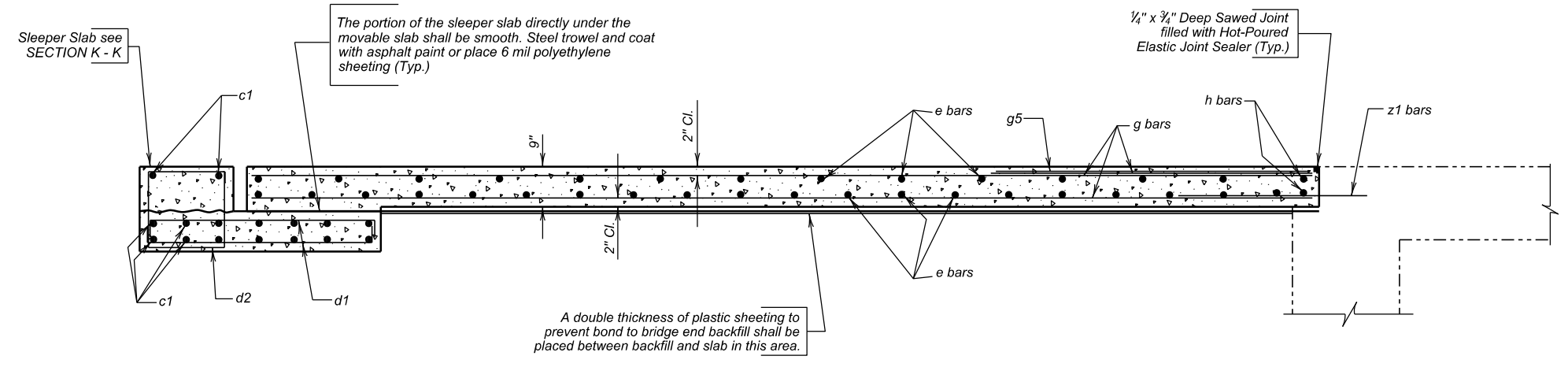
**Plan**  
(Bottom steel shown adjacent to Abut. No. 5,  
Abut. No. 1 similar by rotation)



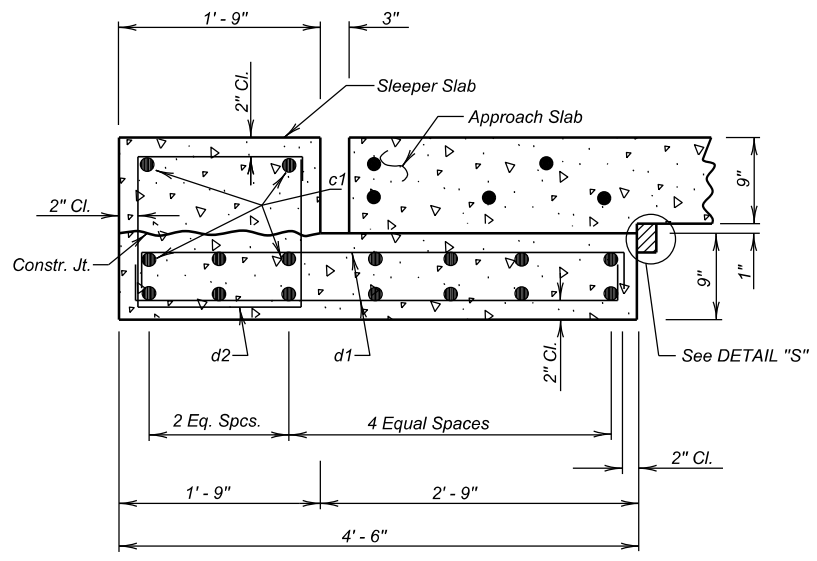
**APPROACH SLAB DETAILS (B)**  
FOR  
**227' - 9\" PRESTRESSED  
CONCRETE GIRDER BRIDGE**  
30' - 0" ROADWAY OVER I90 STR. NO. 52-830-310  
6° L.H.F. SKEW  
SEC. 01-T1N-R14E  
IM 0902(186)101

PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION  
FEBRUARY 2025

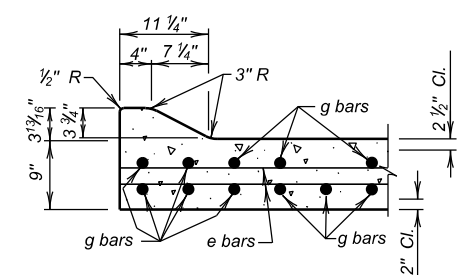
DESIGNED BY JRB PENN091L	CK. DES. BY CM 091LBC13	DRAFTED BY JRB	Steve A. Johnson BRIDGE ENGINEER
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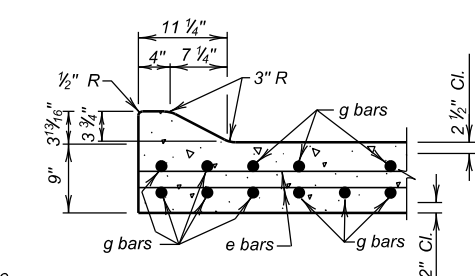
**SECTION H - H**



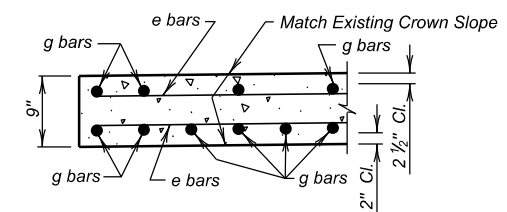
**SECTION K - K**  
(Sleeper Slab)



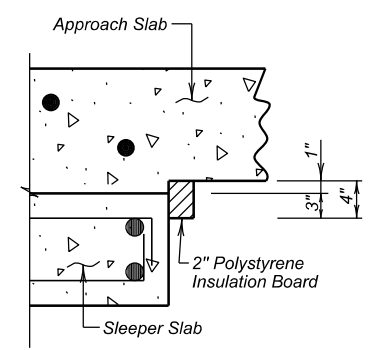
**SECTION I - I**



**SECTION J - J**

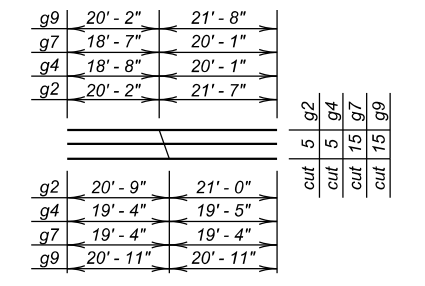
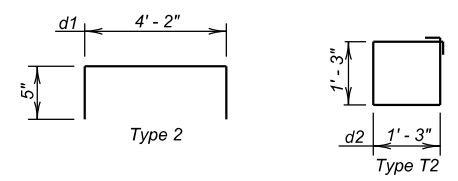


**SECTION L - L**



**DETAIL "S"**

REINFORCING SCHEDULE					
(For Two Approach and Two Sleeper Slabs)					
Mk.	No.	Size	Length	Bending Details	
				Type	
Phase 1					
∅	c1	32	5	15'-9"	Str.
∅	d1	64	4	5'-0"	2
∅	d2	32	4	5'-9"	T2
∅	e1	26	4	15'-9"	Str.
∅	e2	1	4	7'-1"	Str.
∅	e3	1	4	5'-7"	Str.
∅	e4	1	4	15'-1"	Str.
∅	e5	39	6	15'-9"	Str.
∅	e6	1	6	15'-1"	Str.
∅	e7	1	6	10'-4"	Str.
∅	e8	1	6	7'-1"	Str.
*	g1	2	4	21'-3"	Str.
*	g2	5	4	41'-9"	Str.
*	g3	2	4	18'-0"	Str.
*	g4	5	4	38'-9"	Str.
*	g5	20	4	6'-0"	Str.
*	g6	2	8	18'-0"	Str.
*	g7	15	8	38'-8"	Str.
*	g8	2	8	21'-3"	Str.
*	g9	15	8	41'-10"	Str.
∅	h1	4	6	14'-11"	Str.
∅	z1	20	7	2'-9"	Str.
Phase 2					
∅	c1	32	5	15'-9"	Str.
∅	d1	64	4	5'-0"	2
∅	d2	32	4	5'-9"	T2
∅	e1	26	4	15'-9"	Str.
∅	e2	1	4	7'-1"	Str.
∅	e3	1	4	5'-7"	Str.
∅	e4	1	4	15'-1"	Str.
∅	e5	39	6	15'-9"	Str.
∅	e6	1	6	15'-1"	Str.
∅	e7	1	6	10'-4"	Str.
∅	e8	1	6	7'-1"	Str.
*	g1	2	4	21'-3"	Str.
*	g2	5	4	41'-9"	Str.
*	g3	2	4	18'-0"	Str.
*	g4	5	4	38'-9"	Str.
*	g5	20	4	6'-0"	Str.
*	g6	2	8	18'-0"	Str.
*	g7	15	8	38'-8"	Str.
*	g8	2	8	21'-3"	Str.
*	g9	15	8	41'-10"	Str.
∅	h1	4	6	14'-11"	Str.
∅	z1	20	7	2'-9"	Str.



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

∅ Dowels  
 \* Cut Bars  
 □ Splice (Mechanically Spliced)

ESTIMATED QUANTITIES			
(For Two Approach and Two Sleeper Slabs)			
ITEM	UNIT	QUANTITY	
		Phase 1	Phase 2
Remove Concrete Bridge Approach Slab	SqYd	94.0	82.8
Concrete Approach Slab for Bridge	SqYd	72.5	72.5
Concrete Approach Sleeper Slab for Bridge	SqYd	15.9	15.9
No. 4 Rebar Splice	Each	28	—
No. 5 Rebar Splice	Each	32	—
No. 6 Rebar Splice	Each	44	—
Install Dowel in Concrete	Each	20	20

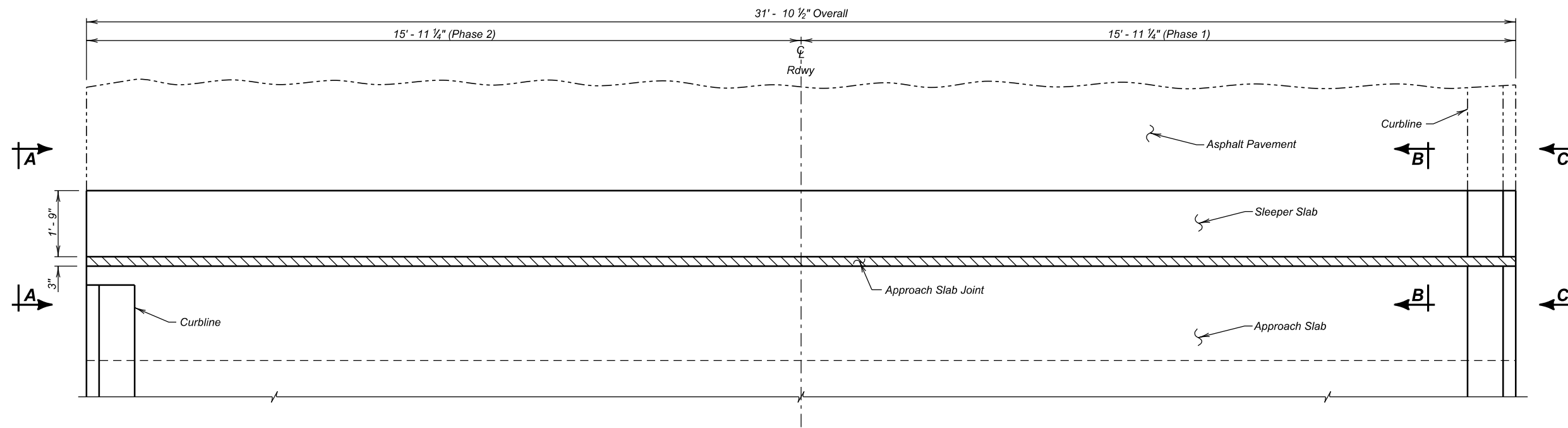
	PHASE 1	PHASE 2
1. Concrete in Approach Slabs.	18.1 CuYd	18.1 CuYd
2. Epoxy Coated Reinforcing Steel in Approach Slabs	5301 Lbs.	5301 Lbs.
3. Concrete in Sleeper Slabs	5.7 CuYd	5.7 CuYd
4. Epoxy Coated Reinforcing Steel in Sleeper Slabs	862 Lbs.	862 Lbs.
5. Epoxy Coated Reinforcing Steel in Dowels	112 Lbs.	112 Lbs.

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

**APPROACH SLAB DETAILS (C)**  
 FOR  
**227' - 9" PRESTRESSED CONCRETE GIRDER BRIDGE**  
 30' - 0" ROADWAY OVER I90 STR. NO. 52-830-310  
 6° L.H.F. SKEW SEC. 01-T1N-R14E IM 0902(186)101

PENNINGTON COUNTY  
 S. D. DEPT. OF TRANSPORTATION  
 FEBRUARY 2025

DESIGNED BY JRB PENN091L  
 CK. DES. BY CM 091LBC14  
 DRAFTED BY JRB  
 Steve A. Johnson  
 BRIDGE ENGINEER

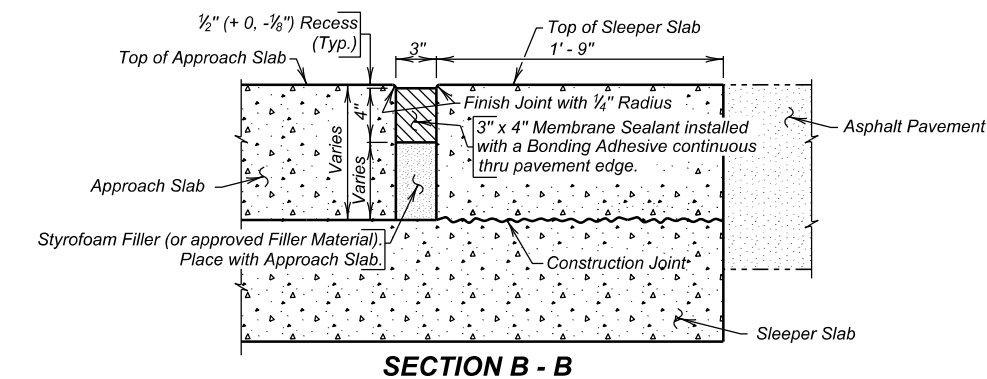


**GENERAL NOTES**

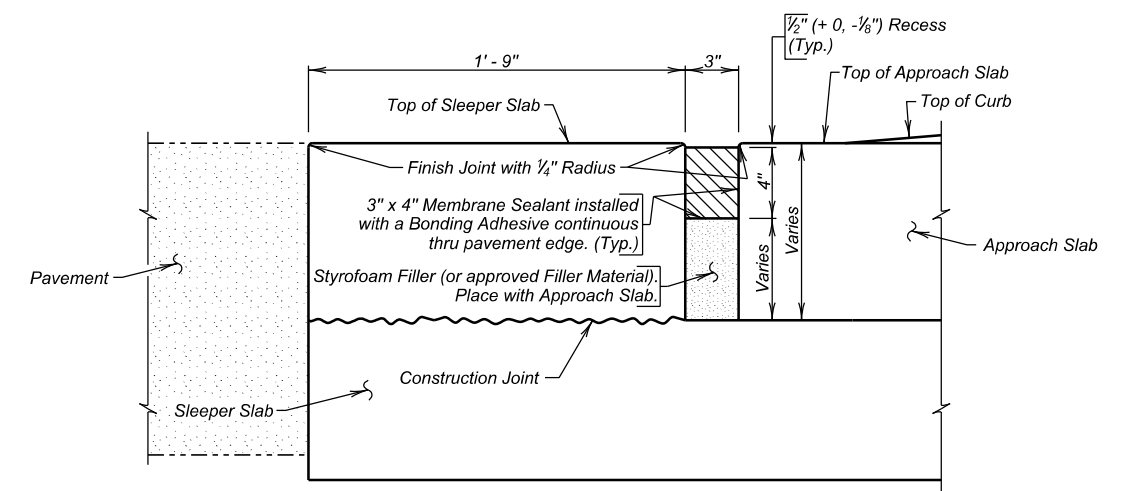
- The membrane sealant will be on the approved product list for membrane sealant expansion joints.
- The manufacturer will supply the membrane sealant in packaging that precompresses the membrane sealant. The precompressed dimension will be as recommended by the sealant manufacturer to provide a water tight seal throughout a joint movement range of + 25% (minimum) from the specified joint opening dimension. 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.
- The membrane sealant will be supplied in pieces 5 feet in length or longer. The foam sealant will be ultra-violet and ozone resistant.
- The bonding adhesive used to attach the membrane sealant to the adjacent concrete will be approved by the membrane sealant manufacturer.
- Adhesive used to join adjacent pieces of the membrane sealant will be as recommended by the manufacturer.
- If styrofoam filler material is used in the construction, it will be closed cell and water-tight as approved by the Engineer.
- The minimum ambient air temperature at the time of joint installation and adhesive curing will be 40° F.
- 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 insure the Contractor installs the joint to the Manufacturers recommendations.
- Concrete 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 concrete surface. At a minimum two passes of abrasive blasting with the nozzle held at an angle to within 1 to 2 inches of the concrete surface will be required. Cleaning of the concrete surfaces with solvents, wire brushing, or grinding will not be permitted.
- 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 concrete 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.
- 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.
- Traffic will not be allowed on the joint until the bonding adhesive has had time to cure, as recommended by the manufacturer.
- 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.
- 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.

**PLAN**

(Abut. No. 1 shown. Abut No. 5 similar by rotation except as stated in VIEW A - A)

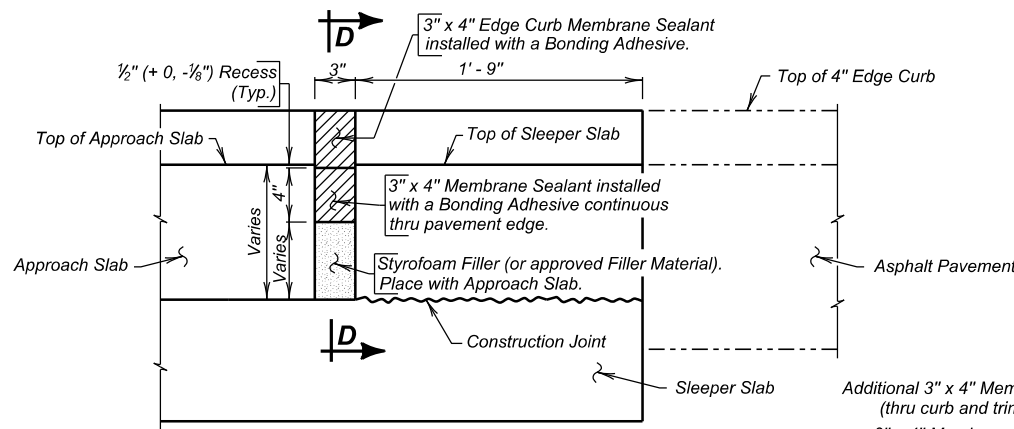


**SECTION B - B**



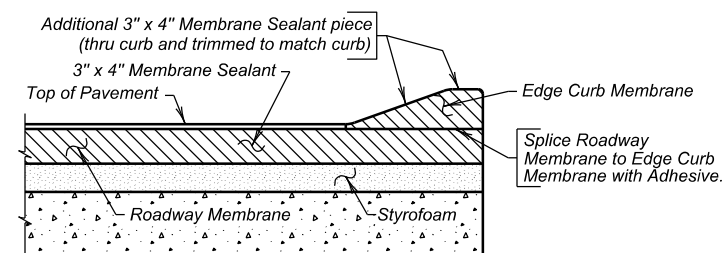
**VIEW A - A**

(Curb stops as shown except in SW corner of Abut. No. 1)



**VIEW C - C**

(Curb continues through joint in SW corner of Abut. No. 1 only)



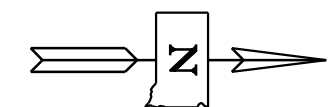
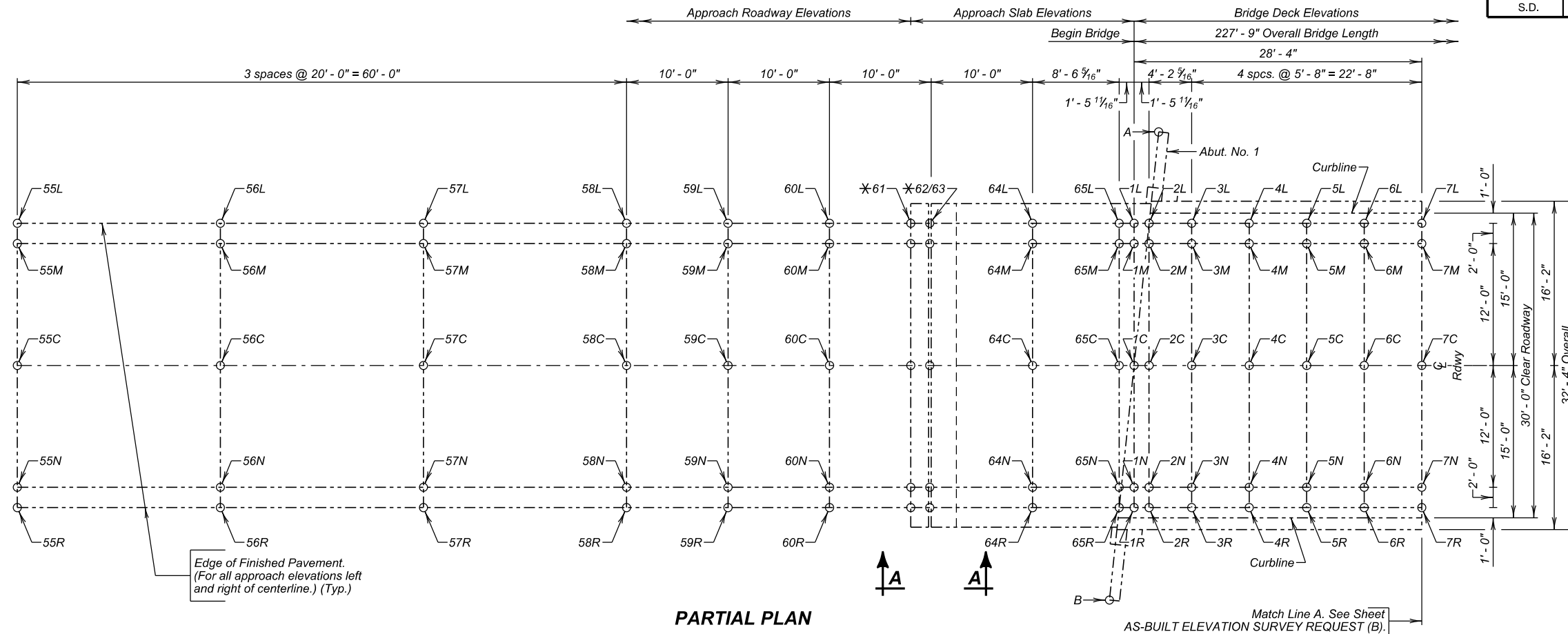
**SECTION D - D**

ESTIMATED QUANTITIES			
ITEM	UNIT	QUANTITY	
		Phase 1	Phase 2
Membrane Sealant Expansion Joint	Ft	31.8	31.8

**APPROACH SLAB JOINT DETAILS FOR 227' - 9" PRESTRESSED CONCRETE GIRDER BRIDGE**

30' - 0" ROADWAY OVER I90 STR. NO. 52-830-310  
 6° L.H.F. SKEW SEC. 01-T1N-R14E IM 0902(186)101

PENNINGTON COUNTY  
 S. D. DEPT. OF TRANSPORTATION  
 FEBRUARY 2025

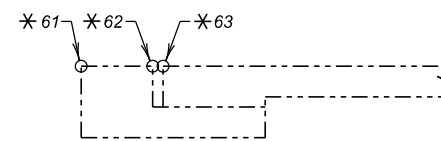


**PARTIAL PLAN**

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
55L		55M		55C		55N		55R	
56L		56M		56C		56N		56R	
57L		57M		57C		57N		57R	
58L		58M		58C		58N		58R	
59L		59M		59C		59N		59R	
60L		60M		60C		60N		60R	

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
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	
1L		1M							

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
						65N		65R	
						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	



**VIEW A - A**

\* 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.

AS-BUILT ELEVATION SURVEY (A)  
FOR  
227' - 9" PRESTRESSED  
CONCRETE GIRDER BRIDGE

30' - 0" ROADWAY  
OVER I-90  
STR. NO. 52-830-310

6° SKEW L.H.F.  
SEC. 1-T1N-R14E  
IM 0902(186)101

Location	Elevation
A	
B	

**Benchmark Description:**

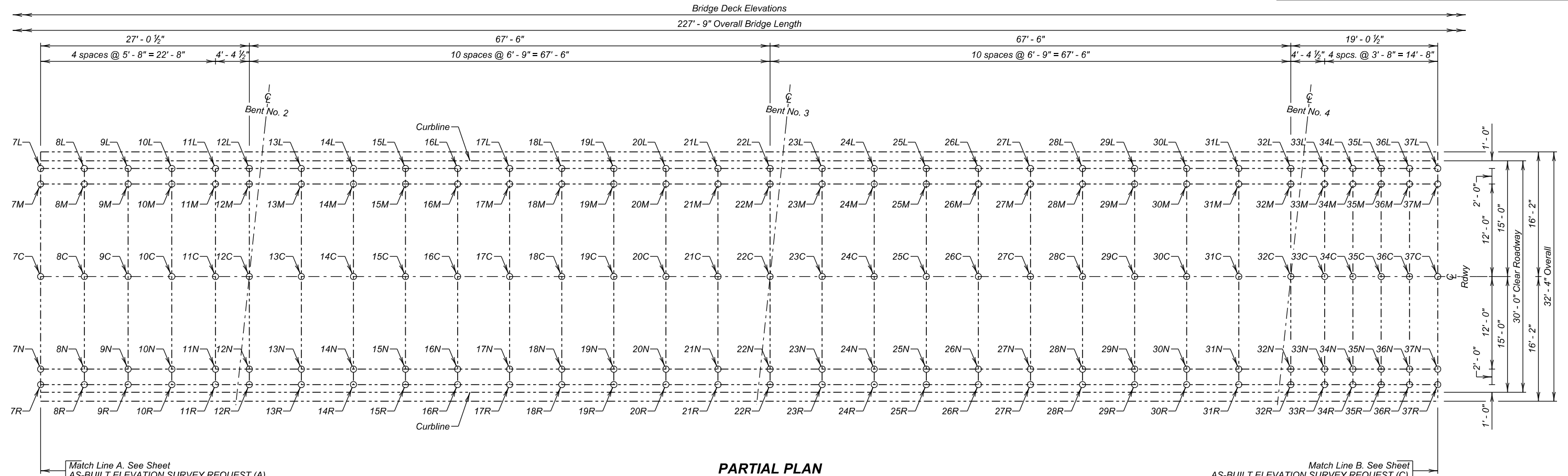
B.M. # PK 1  
Behind NE Guardrail  
Elevation 2351.42

**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.

PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION

FEBRUARY 2025

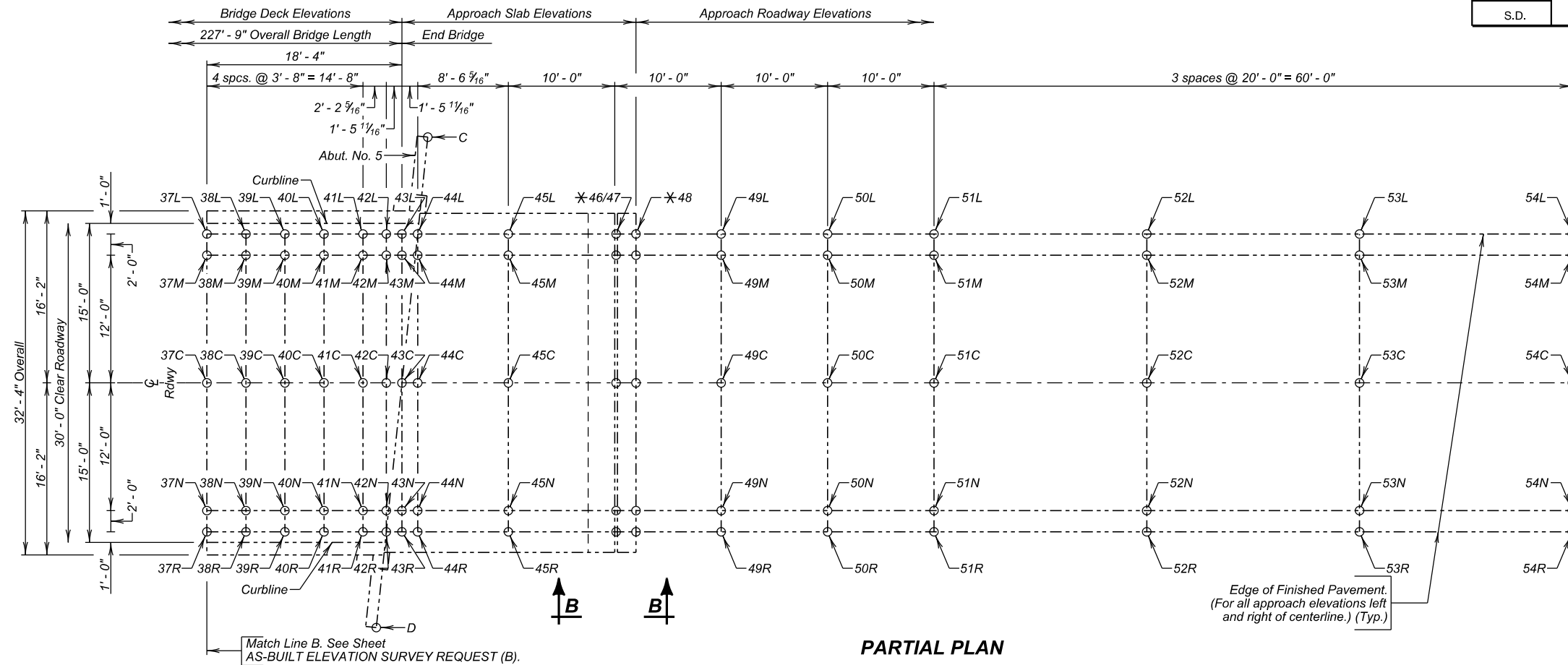


Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
7L		7M		7C		7N		7R	
8L		8M		8C		8N		8R	
9L		9M		9C		9N		9R	
10L		10M		10C		10N		10R	
11L		11M		11C		11N		11R	
12L		12M		12C		12N		12R	
13L		13M		13C		13N		13R	
14L		14M		14C		14N		14R	
15L		15M		15C		15N		15R	
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	
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	

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
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	

AS-BUILT ELEVATION SURVEY (B)  
FOR  
**227' - 9" PRESTRESSED  
CONCRETE GIRDER BRIDGE**  
30' - 0" ROADWAY OVER I-90  
STR. NO. 52-830-310  
6° SKEW L.H.F.  
SEC. 1-T1N-R14E  
IM 0902(186)101

PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION  
FEBRUARY 2025



**PARTIAL PLAN**

**Table of Elevations - Bridge Deck**

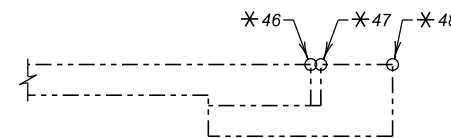
Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
37L		37M		37C		37N		37R	
38L		38M		38C		38N		38R	
39L		39M		39C		39N		39R	
40L		40M		40C		40N		40R	
41L		41M		41C		41N		41R	
42L		42M		42C		42N		42R	
43L		43M		43C					
44L									

**Table of Elevations - Approach Roadway**

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
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	

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

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
						43N		43R	
		44M		44C		44N		44R	
45L		45M		45C		45N		45R	
46L		46M		46C		46N		46R	
47L		47M		47C		47N		47R	
48L		48M		48C		48N		48R	



**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  
227' - 9" PRESTRESSED  
CONCRETE GIRDER BRIDGE

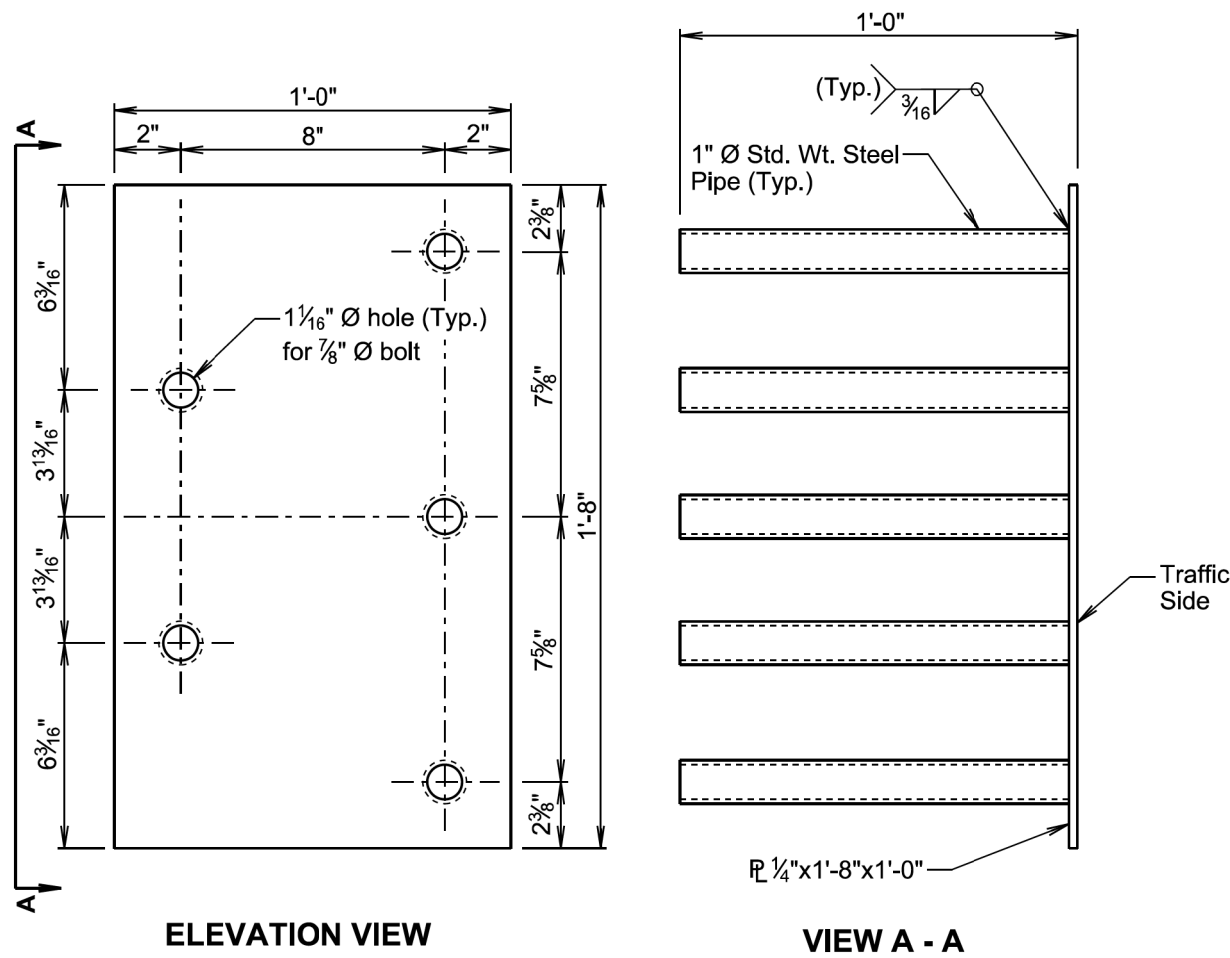
30' - 0" ROADWAY OVER I-90  
STR. NO. 52-830-310  
6° SKEW L.H.F.  
SEC. 1-T1N-R14E  
IM 0902(186)101

PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION  
FEBRUARY 2025

**Bridge Ends**

Location	Elevation
C	
D	





**GENERAL NOTES:**

Steel plate for the insert assembly will conform to ASTM A709, Grade 36. The steel pipes will conform to ASTM A53 or ASTM A500, Grade B.

Welding and weld inspection will be in conformance with AWS D1.1 - (Current Year) Structural Welding Code - Steel.

After fabrication, galvanize in accordance with AASHTO M111 (ASTM A123).

Bolts, nuts, and washers will be provided with each assembly. Bolts will be galvanized and conform to the requirements of ASTM A307, F-1554 Grade A325, or A449. Plain washers will be galvanized and conform to ASTM F844.

Bolt heads will be placed on the traffic side of the endblock. Bolt projection at the back side of the insert will not exceed 1 inch beyond the nut.

The cost of the 5 bolt insert plate assembly complete in place including welding and galvanizing will be incidental to the contract unit price per cubic yard for "Class A45 Concrete, Miscellaneous", "Class A45 Concrete, Bridge Deck", or "Class A45 Concrete, Bridge Repair", as applicable.

August 27, 2020

Published Date: 2025

S  
D  
D  
O  
T

**5 BOLT INSERT PLATE ASSEMBLY**

PLATE NUMBER  
630.92

Sheet 1 of 1

227' - 9" PRESTRESSED  
CONCRETE GIRDER BRIDGE  
STR. NO. 52-830-310  
FEBRUARY 2025

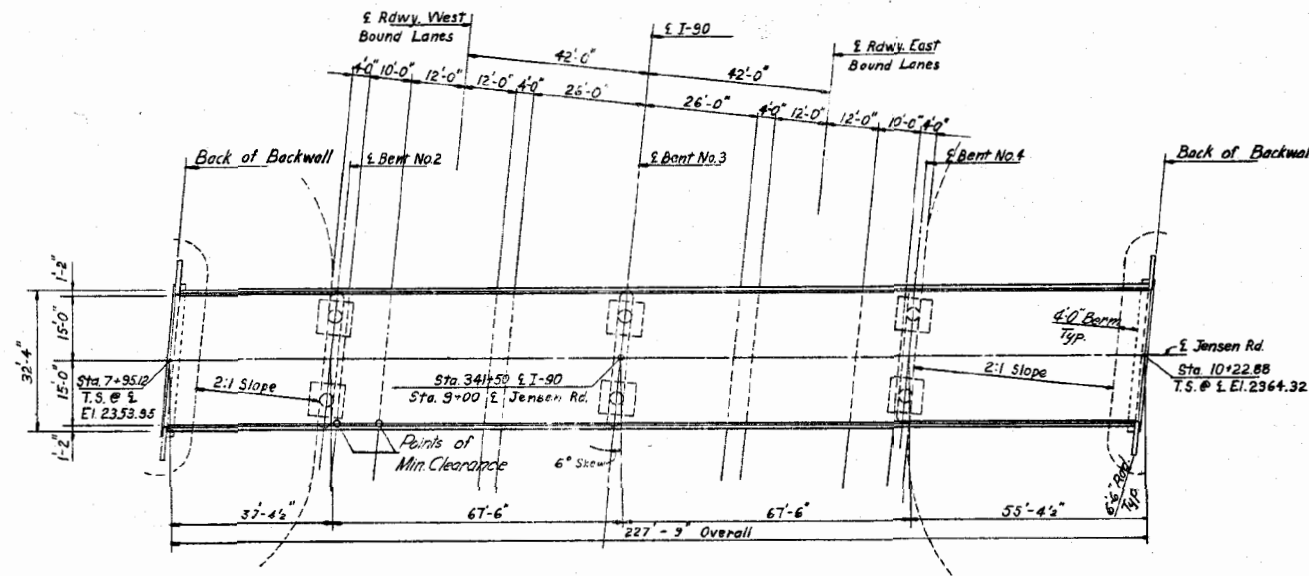
19 OF 30

-X-281-

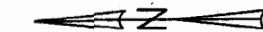
**INDEX OF BRIDGE SHEETS**

- Sheet No. 1 General Drawing & Estimated Quantities
- Sheet No. 2 Subsurface Investigation
- Sheet No. 3 Details of Sill No. 1
- Sheet No. 4 Details of Sill No. 5
- Sheet No. 5 Details of Bent No. 2
- Sheet No. 6 Details of Bent No. 3
- Sheet No. 7 Details of Bent No. 4
- Sheet No. 8 Details of Superstructure Sheet No. 1
- Sheet No. 9 Details of Superstructure Sheet No. 2
- Sheet No. 10 Details of Superstructure Sheet No. 3
- Sheet No. 11 Details of Prestressed Beams Sheet No. 1
- Sheet No. 12 Details of Prestressed Beams Sheet No. 2
- Sheet No. 13 Type RA-1M Steel Railing Details

Note:  
T.S. @ E. El. = Top of Slab at Center-Line Rdwy. Elevation.



**PLAN**

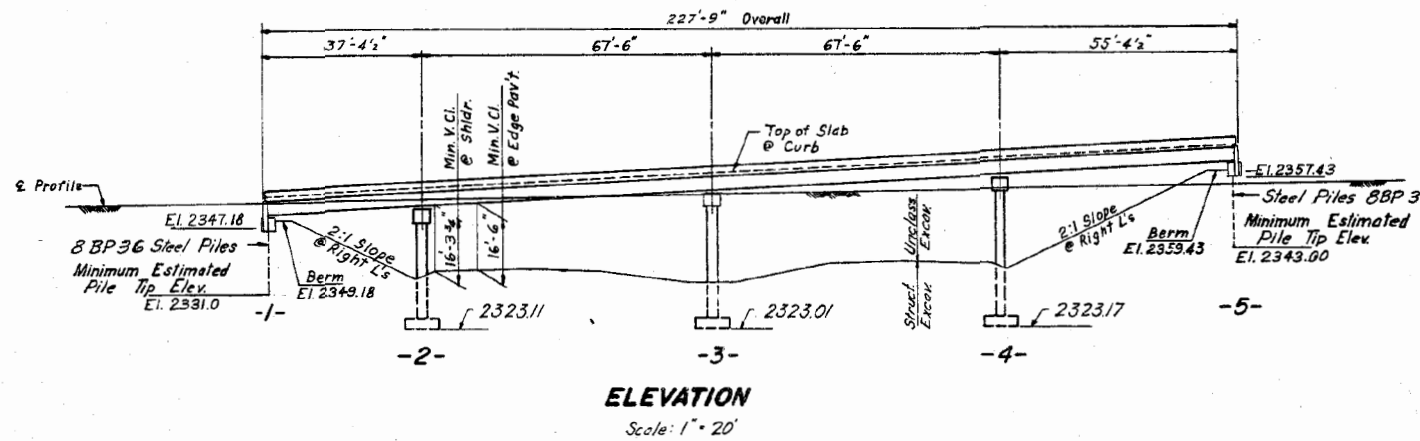


B.M. #32 Elev. 2359.15  
Iron Pin & Guards 150' RI  
Sta. 340+68.50 in Fence Line

B.M. #33 Elev. 2314.16  
Iron Pin & Guards 150' LI  
Sta. 350+36

**EXCAVATION NOTES—**

1. Footings for Bents No. 2, 3 & 4 shall be cast against solid undisturbed shale and carried into same approximately the depth of the footings. Limits of shale excavation for these footings shall be bounded as nearly as practicable by the real lines as shown in the details of footings for Bents No. 2, 3 & 4 on Sheet No. 5, 6 & 7 respectively, of the plans.
2. Shale shall develop a minimum bearing value of 3.3 tons per sq ft. If the bearing value is less than 3.3 tons per sq ft, communicate with the BRIDGE SECTION.
3. Final footing elevations for Bents No. 2, 3 & 4 shall be established before ordering column reinforcing steel for the respective Bents.



**ELEVATION**

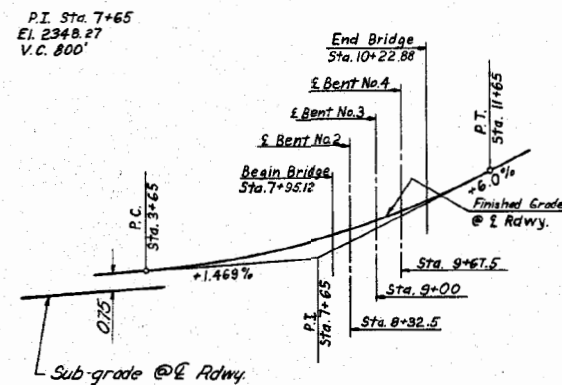
Scale: 1" = 20'

**SPECIFICATION NOTE—**

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

**GENERAL NOTES—**

1. Longitudinal Elements of the Slab shall Conform to the Vertical Curve.
2. Rail Posts shall be built vertical.
3. Cost of all Premolded Expansion Joint Filler and Neoprene Pads shall be included in the unit price bid for Class "A" Concrete.



**VERTICAL CURVE DATA**

ITEM	ESTIMATED QUANTITIES		Prestressed Beams Each	Type "X" Steel	Steel Piles - LBS	Excavation - Cu Yds
	CU Yds	Lbs				
Superstr.	193.1	18,945	14	6	5	
Sill No. 1	15.3	1,045	54.6"	4,378	5 @ 20' x 100' x 36" = 3,600	21
Bent No. 2	35.2	6,100				39
Bent No. 3	34.6	6,447				38
Bent No. 4	35.8	6,810				34
Sill No. 5	15.3	1,045			6 @ 20' x 120' x 36" = 4,320	21
<b>Totals</b>	<b>327.7</b>	<b>70,392</b>		<b>4,578</b>	<b>7,820</b>	<b>183</b>

\* All unclassified excavation to be done by others.  
\* One 8BP36 Steel Bearing Test Pile shall be driven at Sills No. 1 and No. 5 before remaining piles are ordered.

**ORIGINAL CONSTRUCTION PLANS**

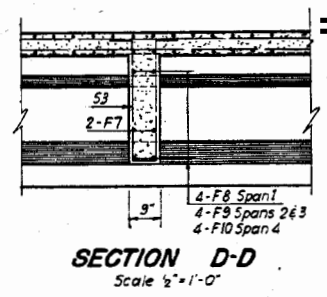
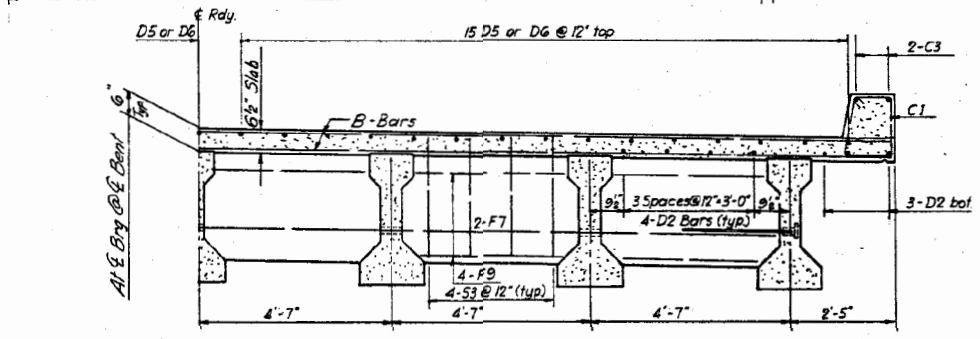
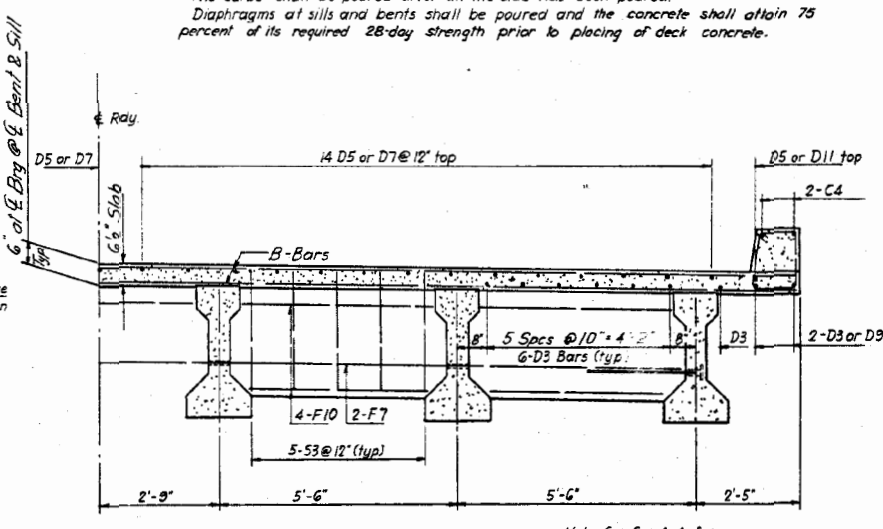
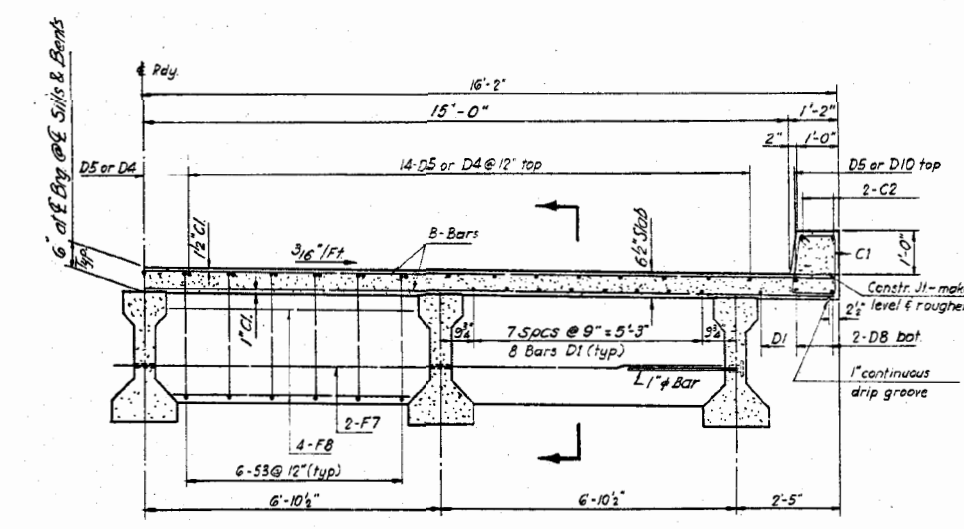
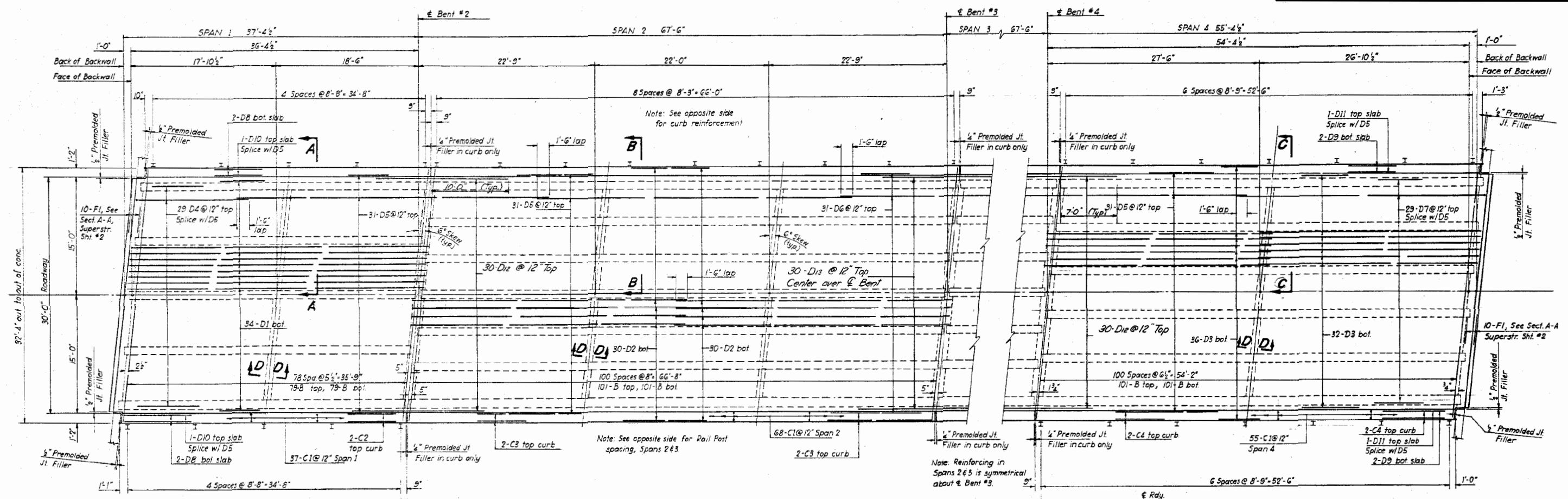
STR-830-310

**GENERAL DRAWING & ESTIMATED QUANTITIES FOR**

**227'-9" PRESTRESSED BEAM BRIDGE**  
**30'-0" ROADWAY** **6° SKEW L.H.F.**  
**OVER I-90 STA. 341+50** **SEC. 12-TIN-RI4E**  
**STA. 7+95.12 TO STA. 10+22.88 JENSEN RD.**

**PENNINGTON COUNTY H20-S16-44**  
**SOUTH DAKOTA I-90-2(22)96**  
**DEPARTMENT OF HIGHWAYS**

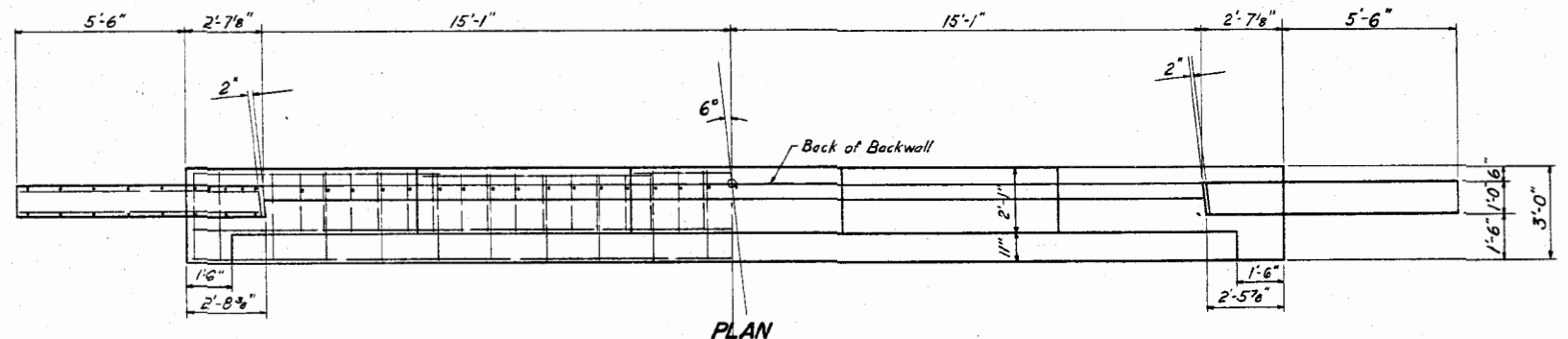
DESIGNED BY H.F.	DRAWN BY R.L.W.	CHECKED BY W.E.M.	APPROVED <i>[Signature]</i> BRIDGE ENGINEER
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**ORIGINAL CONSTRUCTION PLANS**

DETAILS OF SUPERSTRUCTURE SHEET NO.1  
FOR  
227'-9" PRESTRESSED BEAM BRIDGE  
30'-0" ROADWAY 6° SKEW L.H.F.  
OVER I-90 STA. 341+50 SEC. 12-TIN-14E  
STA. 7+95.12 TO STA. 10+22.88 JENSEN ROAD  
PENNINGTON COUNTY H20-S16-44  
SOUTH DAKOTA I-90-2(22)96  
DEPARTMENT OF HIGHWAYS  
STR. NO. 52-830-310

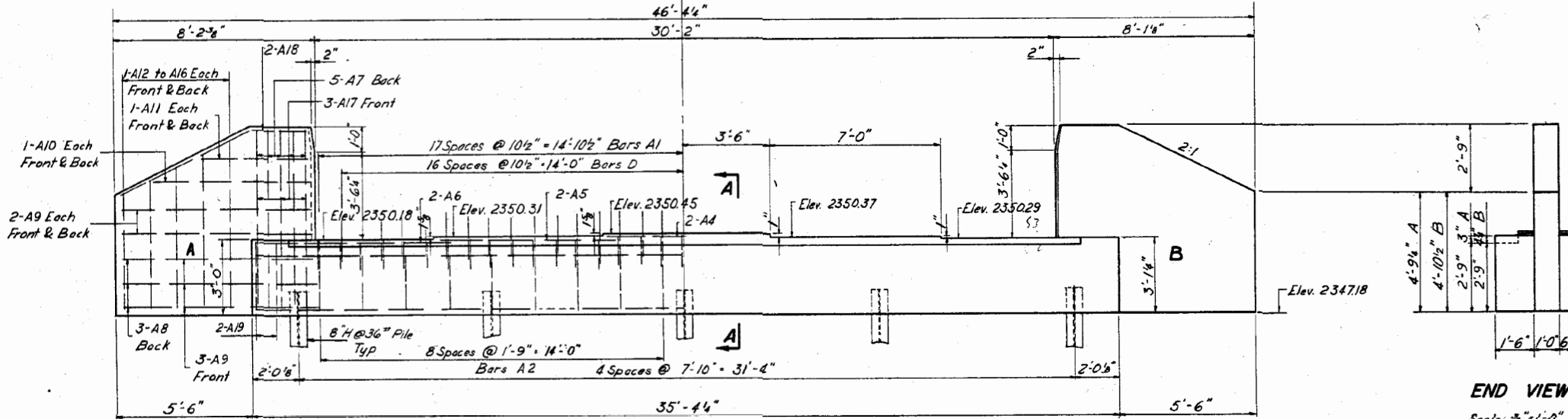
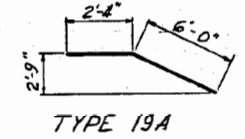
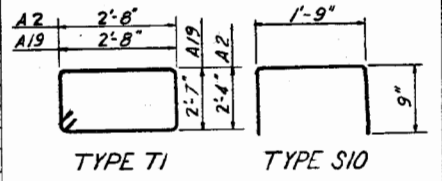
DESIGNED BY H.F.	DRAWN BY D.B.	CHECKED BY W.E.N.	APPROVED <i>[Signature]</i> BRIDGE ENGINEER
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**PLAN**  
Scale: 3/8" = 1'-0"

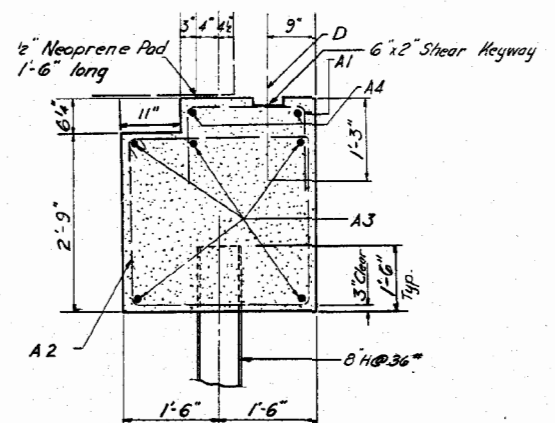
50.13  
4 5/7  
54 7/1

REINFORCING SCHEDULE					
Mark	No.	Size	Length	Type	Bending Details
A1	35	4	3'-3"	S10	All dimensions are out to out of bars
A2	18	4	11'-0"	T1	
A3	5	5	35'-0"	Str.	
A4	2	5	6'-9"	Str.	
A5	4	5	7'-9"	Str.	
A6	4	5	8'-0"	Str.	
A7	10	6	7'-3"	Str.	
A8	6	6	7'-9"	Str.	
A9	14	4	7'-9"	Str.	
A10	4	4	6'-9"	Str.	
A11	4	4	4'-9"	Str.	
A12	4	4	4'-6"	Str.	
A13	4	4	5'-0"	Str.	
A14	4	4	3'-6"	Str.	
A15	4	4	6'-0"	Str.	
A16	4	4	6'-6"	Str.	
A17	6	4	7'-3"	Str.	
A18	4	5	8'-3"	19A	
A19	4	4	11'-6"	T1	
D	33	6	2'-6"	Str.	



**END VIEW**  
Scale: 3/8" = 1'-0"

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Class 'A' Concrete	Cu Yds	15.5
Reinforcing Steel	Lbs	1045
Struct. Excavation	Cu Yds	21
Signal Pile (18" dia, 36")	N/A	8



**SECTION A-A**  
Scale: 3/8" = 1'-0"

**ELEVATION**  
Scale: 3/8" = 1'-0"

**GENERAL NOTES**

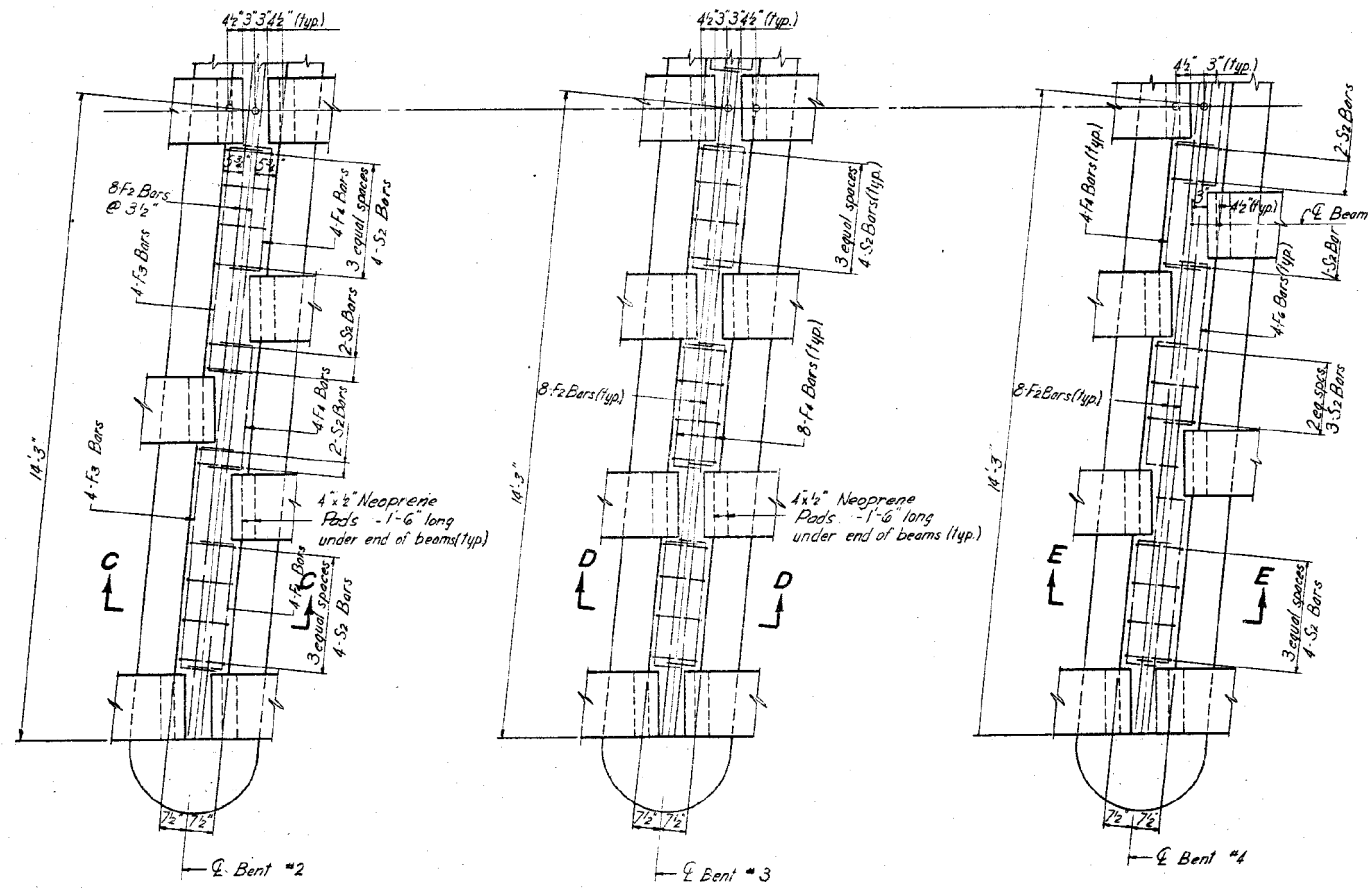
- All exposed edges shall be combed 1" except as shown.
- Use 2" clear cover on all reinforcing except as shown.
- Piling shall develop a minimum bearing value of 32 Tons per pile.
- See General Drawing for lengths of Steel Piles.
- Design Loading: H20-S16-44 A.A.S.H.O.
- Unit Stresses: Re- Steel -  $f_s = 20,000$  p.s.i. (Int. Grade)  
Concrete -  $f_c = 1600$  p.s.i.
- All reinforcing steel bars shall conform to A.S.T.M. Specifications A305 (T-Current) and A15 (T-Current) intermediate Grade.

**ORIGINAL CONSTRUCTION PLANS**

DETAILS OF SILL NO. 1  
FOR  
227'-9" PRESTRESSED BEAM BRIDGE  
30'-0" ROADWAY 6° SKEW L.H.F  
OVER I-90 STA. 341+50 SEC. 12-TIN-RI4E  
STA. 7+95.12 TO STA. 10+22.88 JENSEN RD.  
PENNINGTON COUNTY H20-S16-44  
STR. NO. 52-830-310 SOUTH DAKOTA I-90-2(22)96  
DEPARTMENT OF HIGHWAYS

DESIGNED BY H.F.	DRAWN BY R.L.W.	CHECKED BY W.E.N.	APPROVED <i>[Signature]</i> BRIDGE ENGINEER
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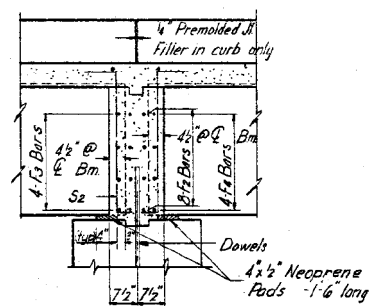
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E37	E44



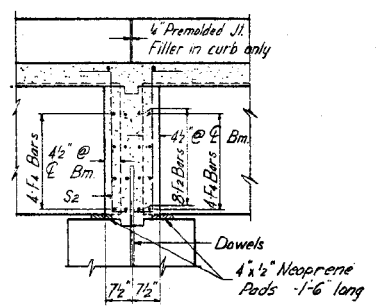
PLAN

PLAN  
Scale: 1/2" = 1'-0"

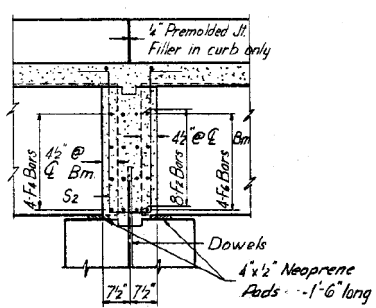
PLAN



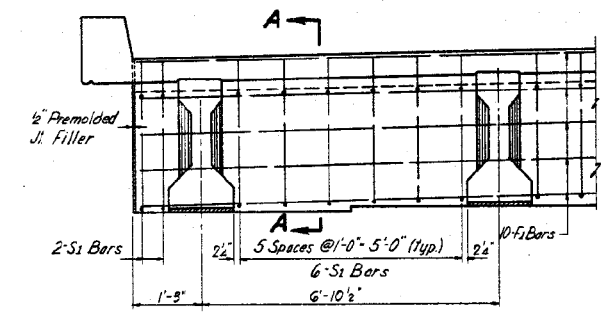
SECTION C-C  
DIAPHRAGM DETAILS  
BENT NO. 2



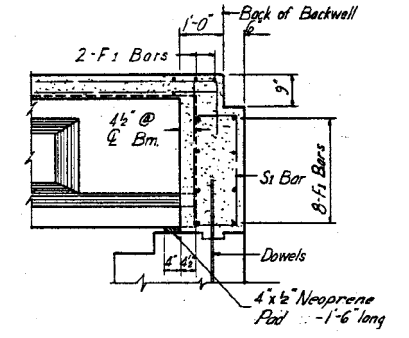
SECTION D-D  
DIAPHRAGM DETAILS  
BENT NO. 3  
Scale: 1/2" = 1'-0"



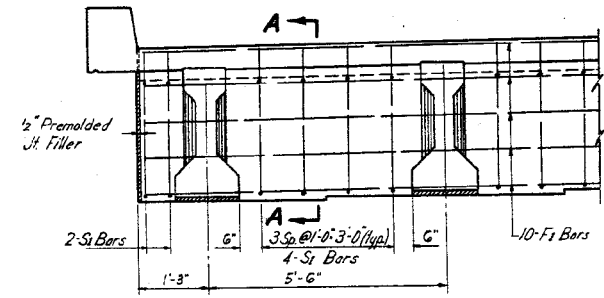
SECTION E-E  
DIAPHRAGM DETAILS  
BENT NO. 4



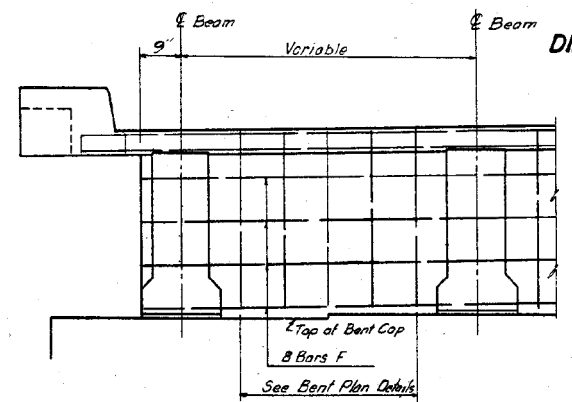
SILL NO. 1  
Scale: 1/2" = 1'-0"



SECTION A-A  
Scale: 1/2" = 1'-0"



SILL NO. 5  
Scale: 1/2" = 1'-0"



DIAPHRAGM AT BENTS

DIAPHRAGM DETAILS AT SILLS

# ORIGINAL CONSTRUCTION PLANS

DETAILS OF SUPERSTRUCTURE SHEET NO. 2

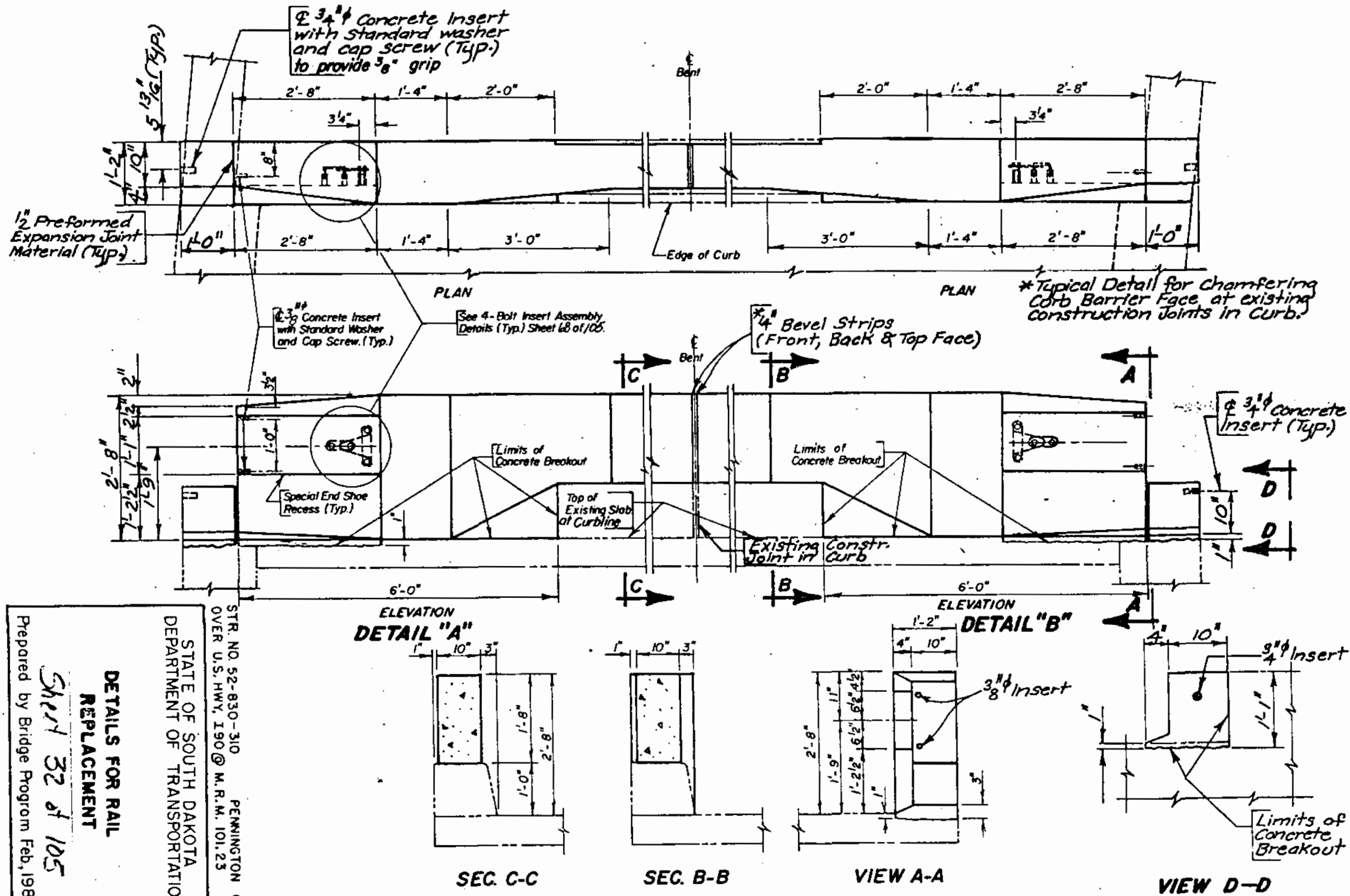
FOR  
227'-9" PRESTRESSED BEAM BRIDGE

30'-0" ROADWAY 6° SKEW L.H.F.  
OVER 1-90 STA. 341+50 SEC. 12-TIN-14E  
STA. 7+95.12 TO STA. 10+22.88 JENSEN ROAD  
PENNINGTON COUNTY H20-S16-44  
STR. NO. 52-830-310 SOUTH DAKOTA I-90-2(22)96

DEPARTMENT OF HIGHWAYS

NYROP, TIDWELL & ASSOC. INC. SIOUX FALLS, SOUTH DAKOTA	DESIGNED BY H.F.	DRAWN BY R.L.W.	CHECKED BY W.E.N.	APPROVED <i>[Signature]</i> BRIDGE ENGINEER
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0902(186)101	E38	E44



PENNINGTON & JACKSON COUNTIES  
LR 90-2 (12) / 1

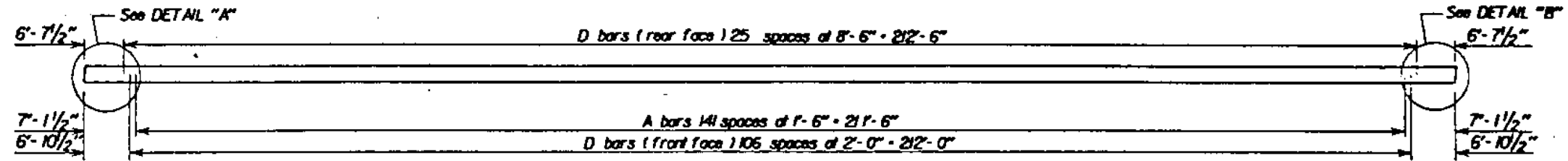
STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION

STR. NO. 52-830-310  
OVER U.S. HWY. 190 @ M.R.M. 101.25  
PENNINGTON CO.

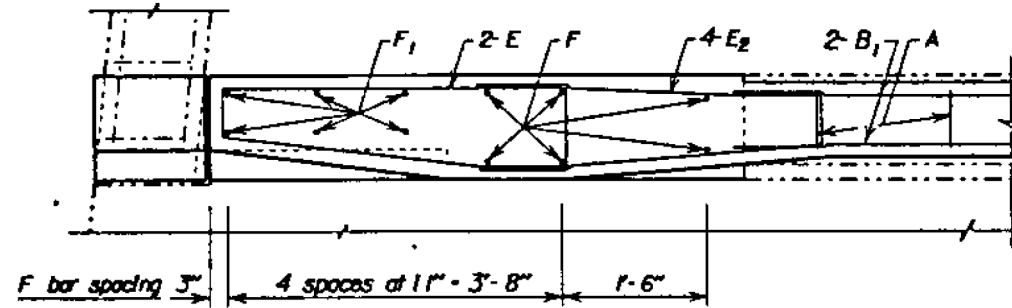
**DETAILS FOR RAIL  
REPLACEMENT**

Sheet 32 of 105

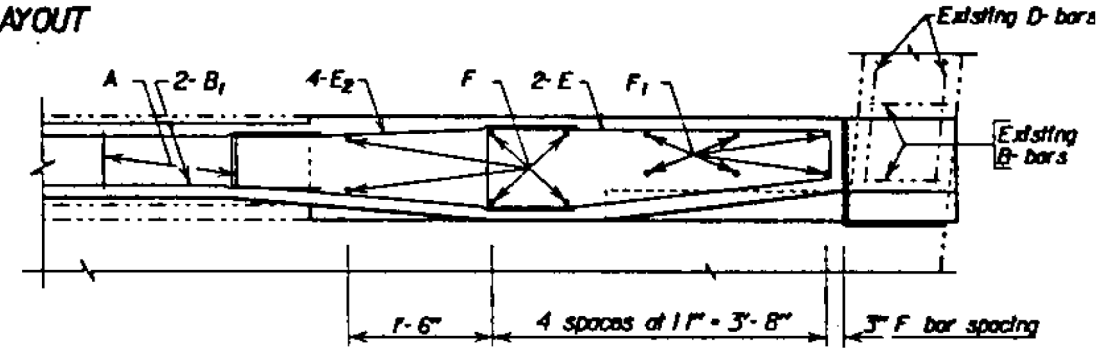
Prepared by Bridge Program Feb, 1986



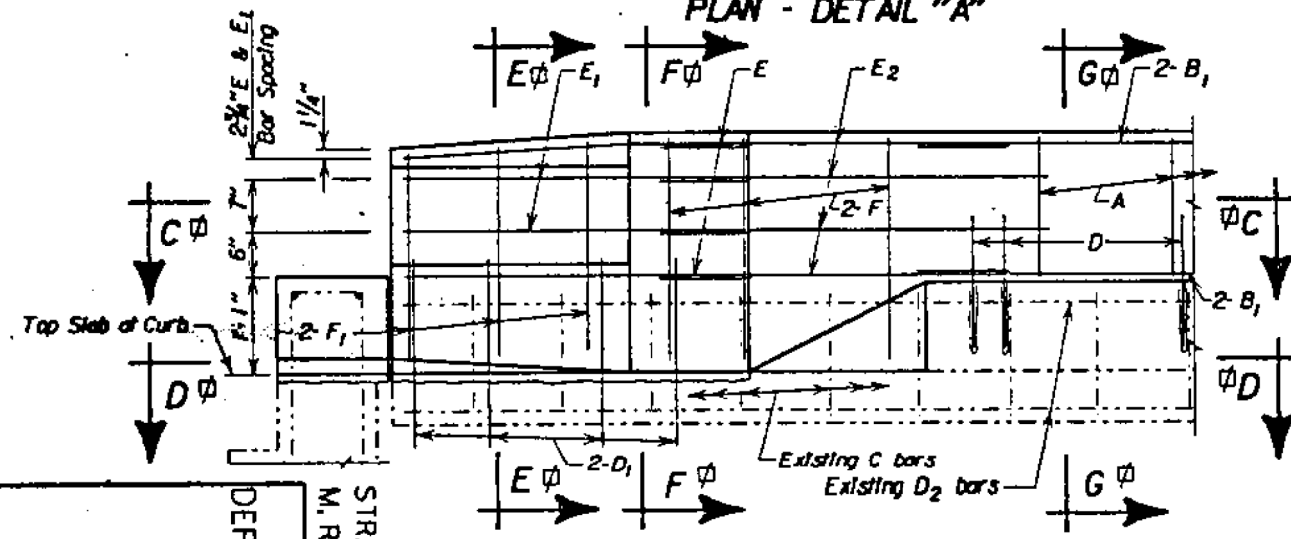
REINFORCING STEEL LAYOUT



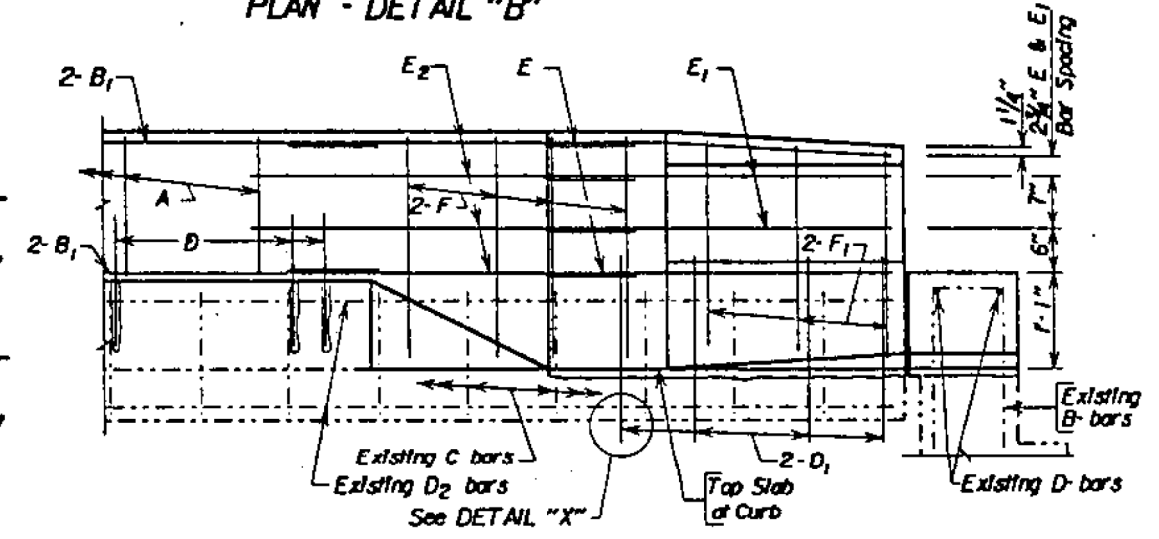
PLAN - DETAIL "A"



PLAN - DETAIL "B"

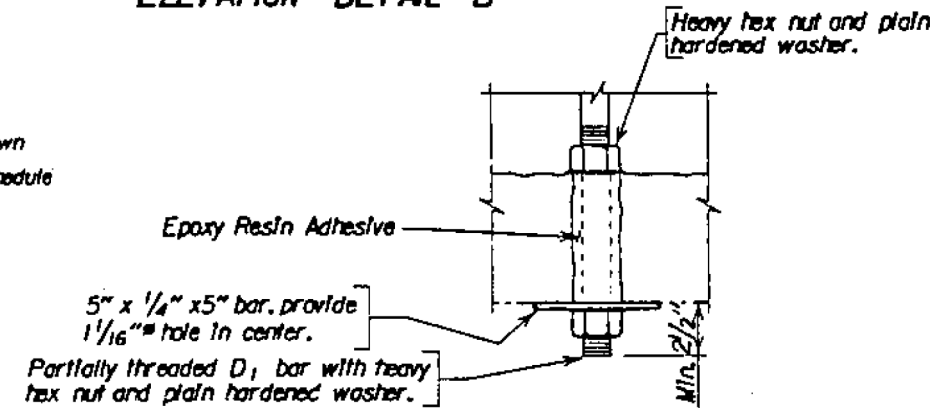


ELEVATION - DETAIL "A"



ELEVATION - DETAIL "B"

NOTE: Sections C-C, D-D, E-E, F-F and G-G are shown on Sheet 31 of 105 along with the Reinforcing Schedule



DETAIL "X"

ORIGINAL CONSTRUCTION PLANS

IR 90-2 (15) 71  
PENNINGTON & JACKSON COUNTIES

STR. NO. 52-830-310 PENNINGTON COUNTY  
 M.R.M. 101.23 OVER U.S. HWY. 190  
 STATE OF SOUTH DAKOTA  
 DEPARTMENT OF TRANSPORTATION  
 REINFORCEMENT  
 DETAILS FOR RAIL  
 REPLACEMENT  
 Sheet 35 of 105  
 Prepared by Bridge Program Apr., 1986

### REINFORCING SCHEDULE (For One Bridge)

Mk.	No.	Size	Length	Type	Bending Details
A	282	4	4'-9"	T1	
B <sub>1</sub>	48	4	36'-8"	Str.	
*D	266	7	2'-10"	IA	
*D <sub>1</sub>	16	8	2'-11"	IA	
E	8	4	10'-3"	T7A	
E <sub>1</sub>	8	4	10'-2"	T2A	
E <sub>2</sub>	16	4	9'-3"	S10A	
F	24	6	2'-6"	Str.	
F <sub>1</sub>	24	6	2'-4"	Str.	

All dimensions are out to out of bars.

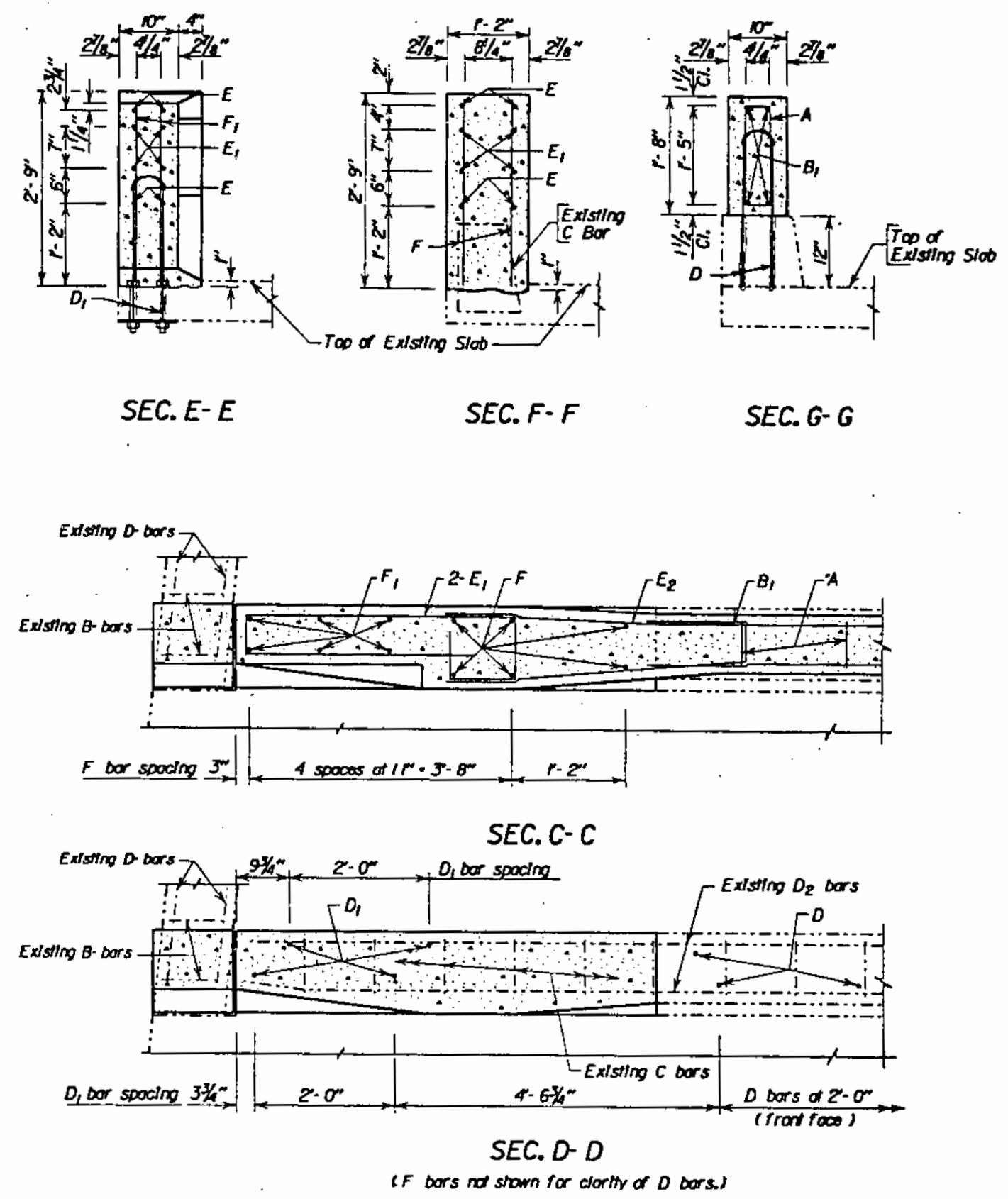
### ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Class "A-5" Concrete Bridge Repair	Cu. Yds.	24.5
* Reinforcement Concrete Masonry	Lbs.	2453
Install Dowels In Concrete	Each	282
Breakout Structural Concrete	Cu. Yds.	1.2
Remove Bridge Rolling	Un. Ft.	458

STR. NO. 52-830-310 PENNINGTON COUNTY  
 M. R. M. 101.23 OVER U.S. HWY. 190  
 STATE OF SOUTH DAKOTA  
 DEPARTMENT OF TRANSPORTATION  
 REINFORCEMENT  
 DETAILS FOR RAIL  
 REPLACEMENT  
 Sheet 34 of 105  
 Prepared by Bridge Program Apr., 1986

\* Does not include 1931 lbs. for dowels as these are included in the item "Install Dowels In Concrete."

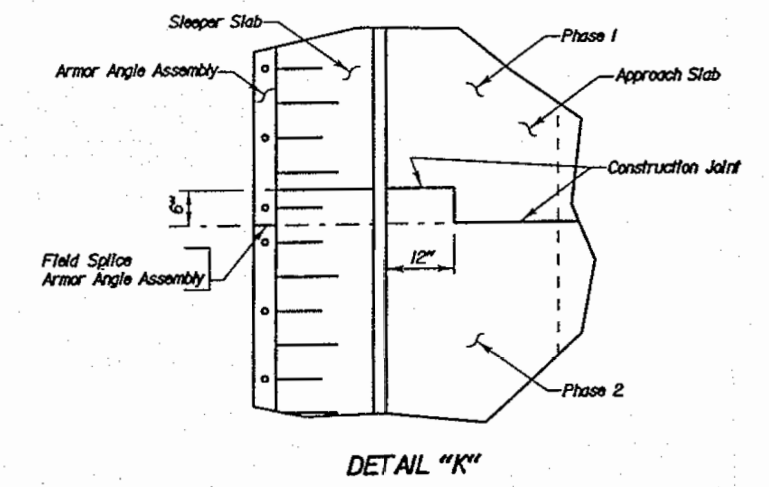
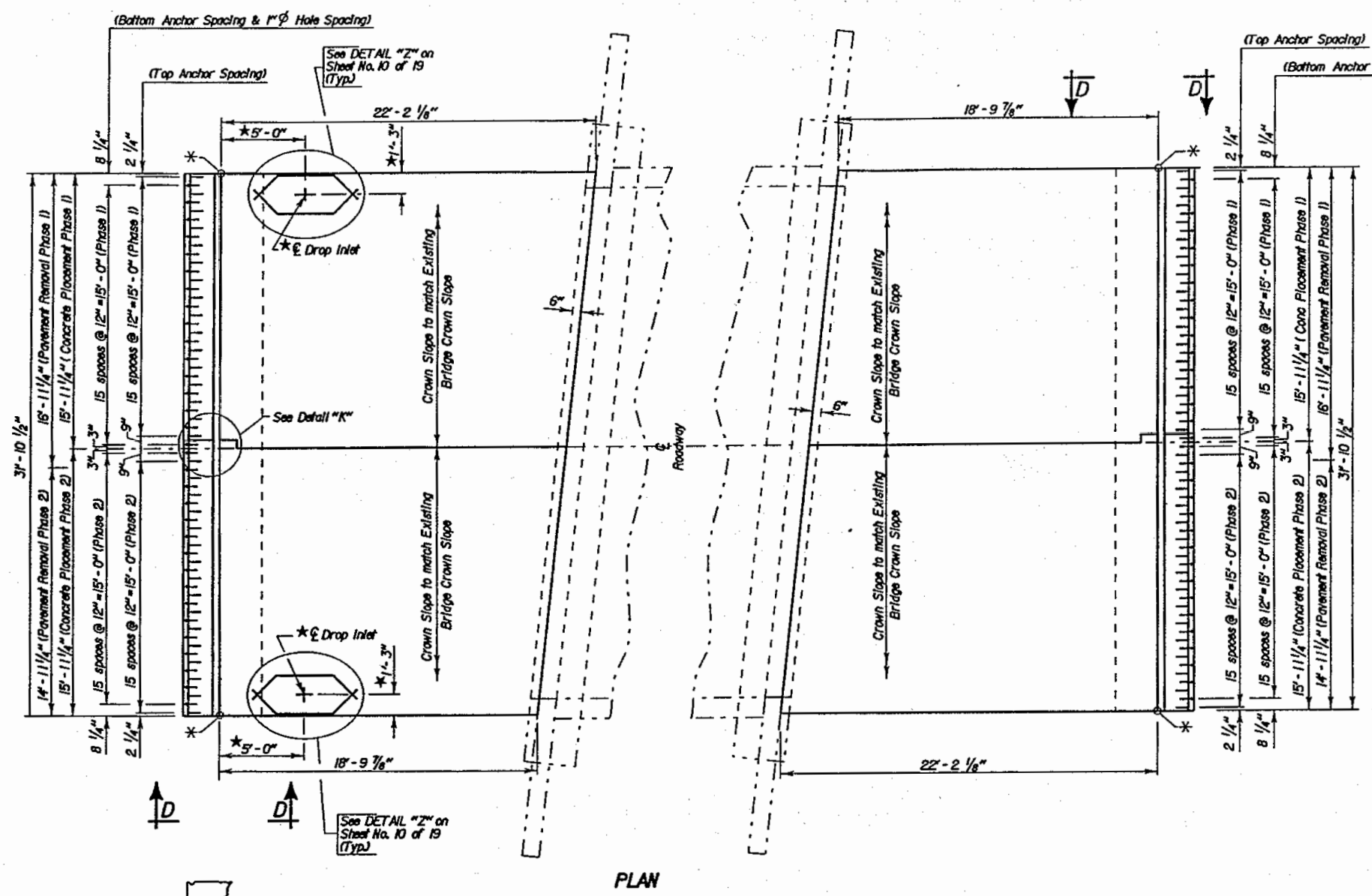
NOTE: If existing resteel is struck while drilling holes for Dowels, the spacing can be shifted 2" longitudinally, 1" transversely or as approved by the Engineer to miss the existing steel.



IR 90-2 (15) 71  
 PENNINGTON & JACKSON COUNTIES

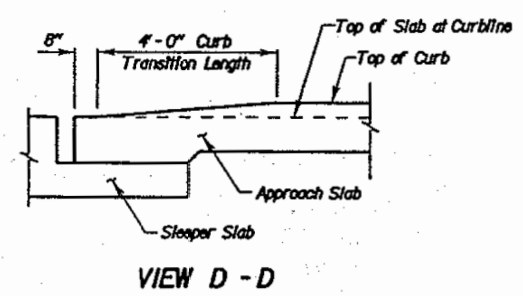
## ORIGINAL CONSTRUCTION PLANS



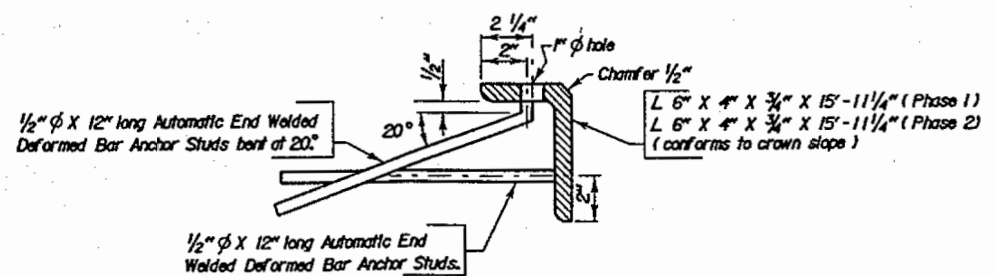


\* Elevation is Top of Slab back of Curb at this point. See Approach Slab Notes.

\* The Drop Inlets will be placed as shown in Abutment No. 5 only.



VIEW D - D



DETAIL "Y"

( See Sheet No. 10 of 19 for location of detail.)  
( See Notes Regarding Armor Angle Assembly.)

## ORIGINAL CONSTRUCTION PLANS

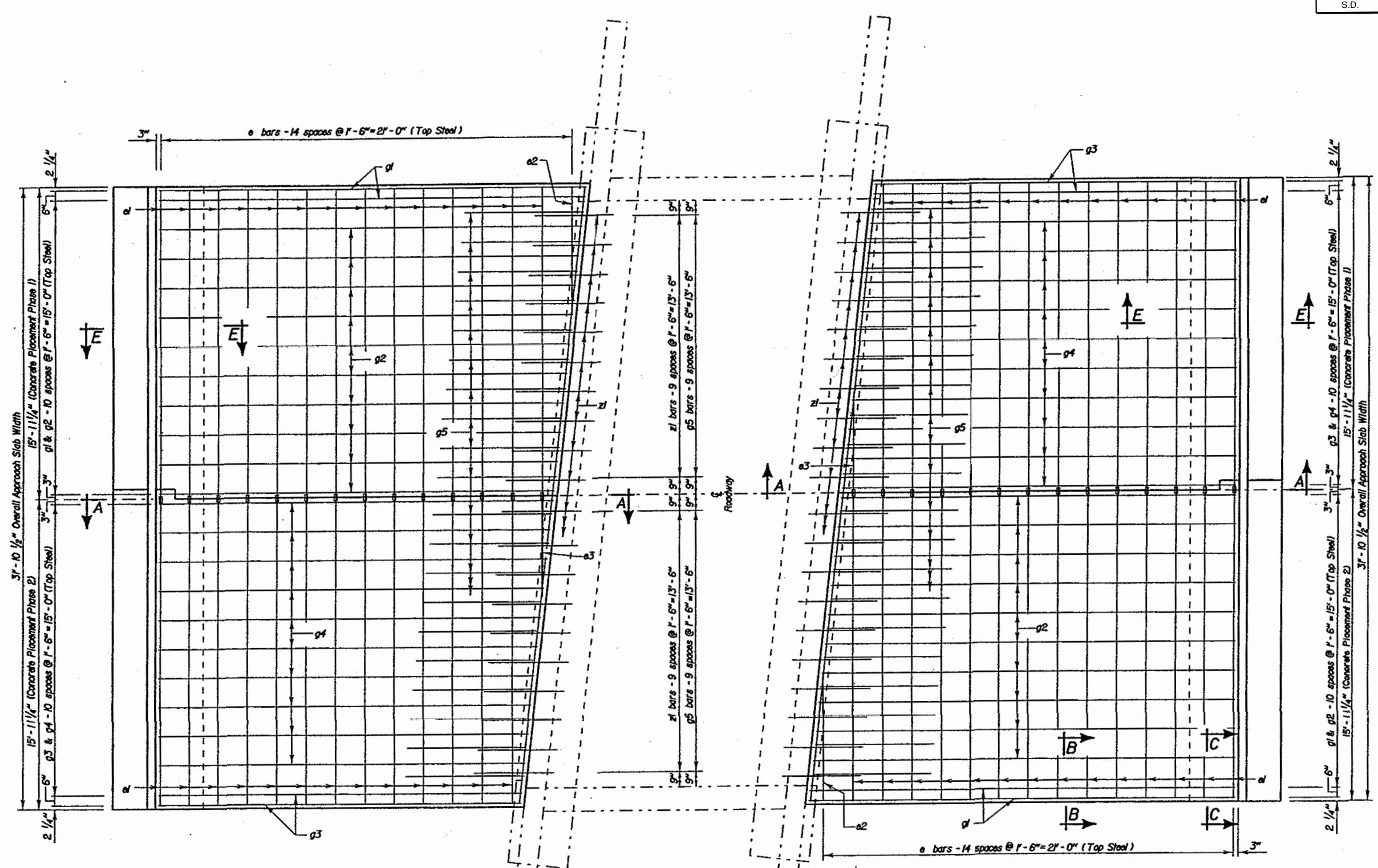
LAYOUT OF APPROACH SLABS  
ADJACENT TO BRIDGE FOR  
**227' - 9" PRESTRESSED GIRDER BRIDGE**  
30'-0" ROADWAY  
OVER I90  
STR. NO. 52-830-310

6° SKEW L. H. F.  
SEC. I-TIN-RI4W  
IM 90-2(00) 101

PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION  
OCTOBER 2000

DESIGNED BY CJD/EJA PENN3942	DRAWN BY CJD 3942C007	CHECKED BY EJA/CJD	APPROVED <i>J. C. Cole</i> BRIDGE ENGINEER
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Use this sheet in conjunction with Sheet Nos. 8, 9 & 10 of 19.



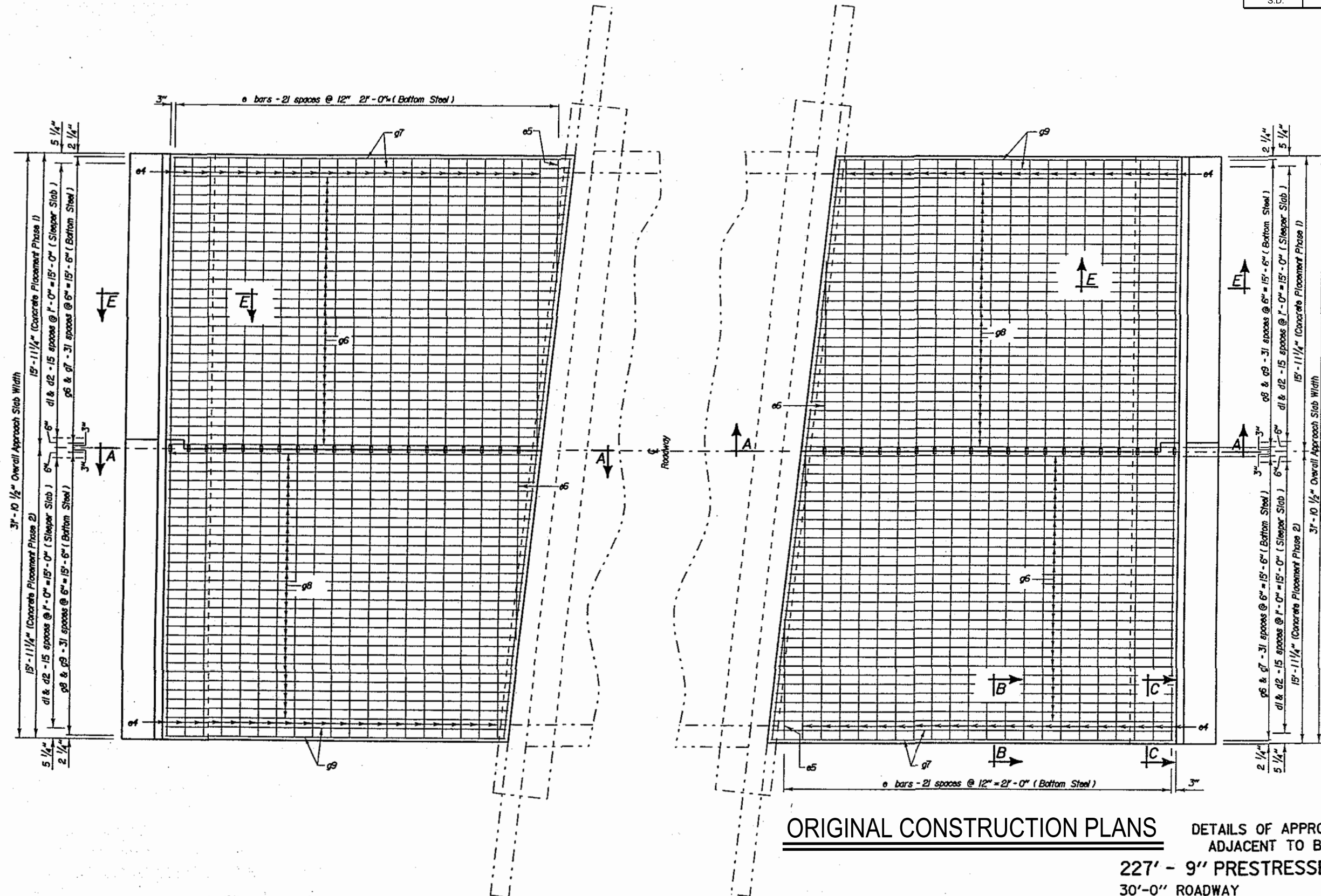
**ORIGINAL CONSTRUCTION PLANS**

DETAILS OF APPROACH SLABS  
 ADJACENT TO BRIDGE FOR  
**227' - 9" PRESTRESSED GIRDER BRIDGE**  
 30'-0" ROADWAY 6° SKEW L. H. F.  
 OVER I90 SEC. I-TIN-R14W  
 STR. NO. 52-830-310 IM 90-2(00)101

PENNINGTON COUNTY  
 S. D. DEPT. OF TRANSPORTATION  
 OCTOBER 2000

DESIGNED BY CJD/EJA PENN3542	DRAWN BY CJD 3942C008	CHECKED BY EJA/CJD	APPROVED <i>John C. Cole</i> BRIDGE ENGINEER
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Use this sheet in conjunction with Sheet Nos. 7, 9 & 10 of 13.



PLAN  
(BOTTOM STEEL)

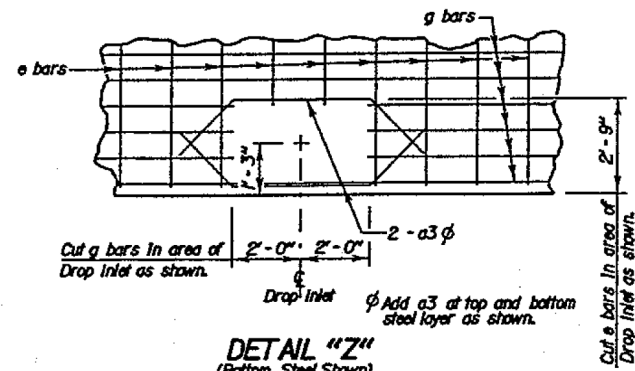
**ORIGINAL CONSTRUCTION PLANS**

DETAILS OF APPROACH SLABS  
ADJACENT TO BRIDGE FOR  
**227' - 9" PRESTRESSED GIRDER BRIDGE**  
30'-0" ROADWAY  
OVER I90  
STR. NO. 52-830-310

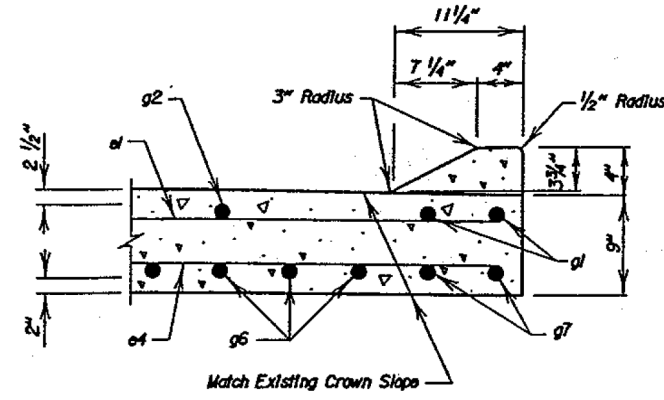
6° SKEW L. H. F.  
SEC. I-TIN-RI4W  
IM 90-2(00) 101  
PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION  
OCTOBER 2000

Use this sheet in conjunction with Sheet Nos. 7, 8 & 10 of 19.

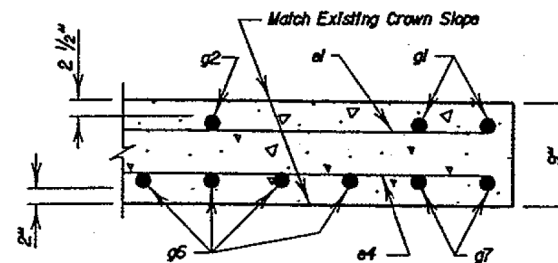
DESIGNED BY CJD/EJA PENN3942	DRAWN BY CJD 3342CD09	CHECKED BY EJA/CJD	APPROVED <i>John C. Cole</i> BRIDGE ENGINEER
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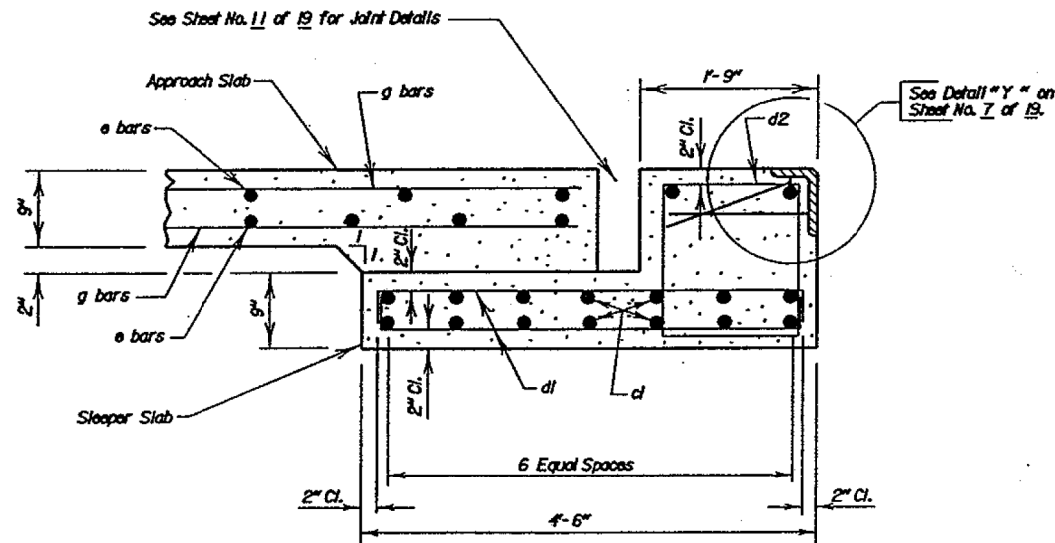
**DETAIL "Z"**  
(Bottom Steel Shown)  
See Sheet No. 7 of 19 for location on Approach Slabs.



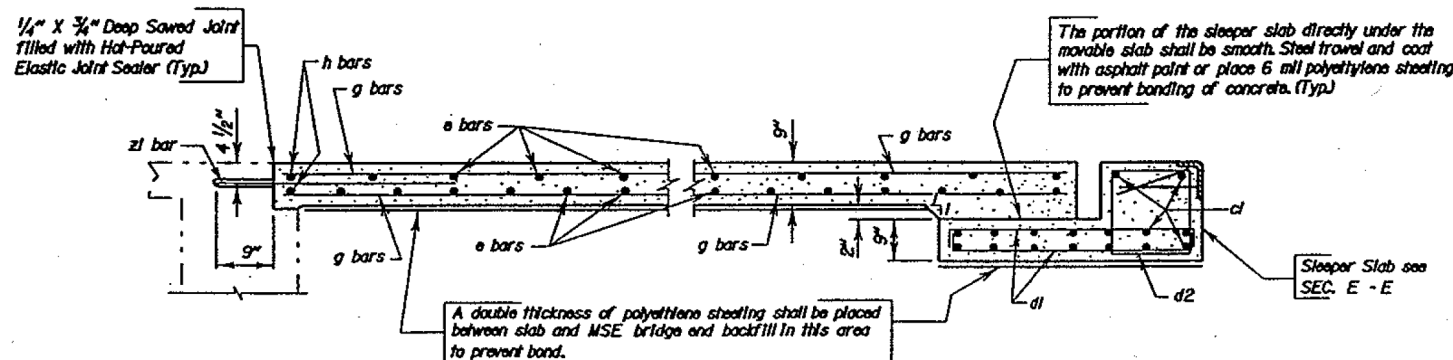
**SEC. B - B**  
See Sheet No. 8 and 9 of 19 for location on Approach Slabs.



**SEC. C - C**  
See Sheet No. 8 and 9 of 19 for location on Approach Slabs.

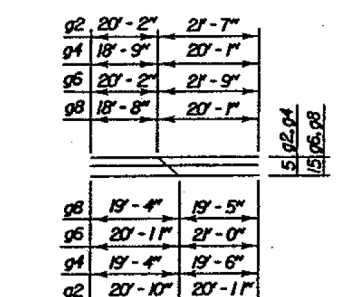
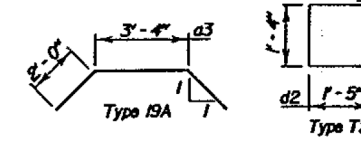


**SEC. E - E**  
(Sleeper Slab)  
See Sheet Nos. 7, 8 and 9 of 19 for location on Approach Slabs.



**SEC. A - A**  
See Sheet Nos. 7, 8 and 9 of 19 for location on Approach Slabs.

REINFORCING SCHEDULE (For Two Approaches and Sleeper Slabs)				
Mk.	No.	Size	Length	Type
a3	4	4	7'-4"	19A
Δ d1	32	5	15'-9"	Str.
d1	64	4	5'-0"	2
d2	32	4	6'-3"	T2
Δ d1	27	4	15'-9"	Str.
e2	1	4	6'-6"	Str.
e3	1	4	5'-2"	Str.
Δ e4	40	6	15'-9"	Str.
e5	1	6	6'-6"	Str.
e6	1	6	10'-4"	Str.
g1	2	4	21'-9"	Str.
*g2	5	4	4'-9"	Str.
*g3	2	4	18'-6"	Str.
*g4	5	4	38'-10"	Str.
*g5	20	4	6'-0"	Str.
*g6	15	8	4'-11"	Str.
*g7	2	8	21'-9"	Str.
*g8	15	8	38'-9"	Str.
*g9	2	8	18'-6"	Str.
Δ N	4	6	15'-10"	Str.
*z1	20	6	4'-0"	Str.
a3	4	4	7'-4"	19A
Δ d1	32	5	15'-9"	Str.
d1	64	4	5'-0"	2
d2	32	4	6'-3"	T2
Δ d1	27	4	15'-9"	Str.
e2	1	4	6'-6"	Str.
e3	1	4	5'-2"	Str.
Δ e4	40	6	15'-9"	Str.
e5	1	6	6'-6"	Str.
e6	1	6	10'-4"	Str.
g1	2	4	21'-9"	Str.
*g2	5	4	4'-9"	Str.
*g3	2	4	18'-6"	Str.
*g4	5	4	38'-10"	Str.
*g5	20	4	6'-0"	Str.
*g6	15	8	4'-11"	Str.
*g7	2	8	21'-9"	Str.
*g8	15	8	38'-9"	Str.
*g9	2	8	18'-6"	Str.
Δ N	4	6	15'-10"	Str.
*z1	20	6	4'-0"	Str.



Note -  
All Bars to be Epoxy Coated.  
All Dimensions are out to out of bars.  
★ DOWELS  
\* Cut Bars  
Δ These bars shall be spliced using mechanically spliced devices. Equivalent splice length for No. 5 Rebar is 2'-0" & for No. 6 Rebar is 2'-6".

ITEM	UNIT	ESTIMATED QUANTITIES	
		PHASE 1	PHASE 2
Concrete Approach Slab for Bridge	Sq. Yd.	72.5	72.7
Concrete Approach Sleeper Slab for Bridge	Sq. Yd.	15.9	15.9
Install Dowel in Concrete	Each	20	20
Δ No. 4 Rebar Splice	Each	27	—
Δ No. 5 Rebar Splice	Each	32	—
Δ No. 6 Rebar Splice	Each	44	—

	PHASE 1	PHASE 2
1. Concrete in Approach Slabs (Cu. Yd.)	18.9	18.9
* 2. Epoxy Coated Re-Steel in Approach Slabs (Lb.)	5227	5227
3. Concrete in Sleeper Slabs (Cu. Yd.)	5.9	5.9
4. Epoxy Coated Re-Steel in Sleeper Slabs (Lb.)	873	873
5. Structural Steel in Armor Assembly (Lb.)	795	795
6. Polyethylene Sheeting (Sq. Yd.)	157	157

Items 1 thru 6 are approximate quantities contained in the above bid item and are for information only.

\* Does not include the following quantities for z1 bars as these are paid for in the bid item "Install Dowel in Concrete".

PHASE 1	PHASE 2
120 Lb.	120 Lb.

**ORIGINAL CONSTRUCTION PLANS** DETAILS OF APPROACH SLABS  
ADJACENT TO BRIDGE FOR  
**227' - 9" PRESTRESSED GIRDER BRIDGE**  
30'-0" ROADWAY 6° SKEW L. H. F.  
OVER I90 SEC. I-TIN-RI4W  
STR. NO. 52-830-310 IM 90-2(100)101

PENNINGTON COUNTY  
S. D. DEPT. OF TRANSPORTATION  
OCTOBER 2000

DESIGNED BY CJD/EJA PENN3942	DRAWN BY CJD 3942CJD10	CHECKED BY EJA/CJD	APPROVED John C. Cole BRIDGE ENGINEER
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Use this sheet in conjunction with Sheet Nos. 7, 8 & 9 of 19.