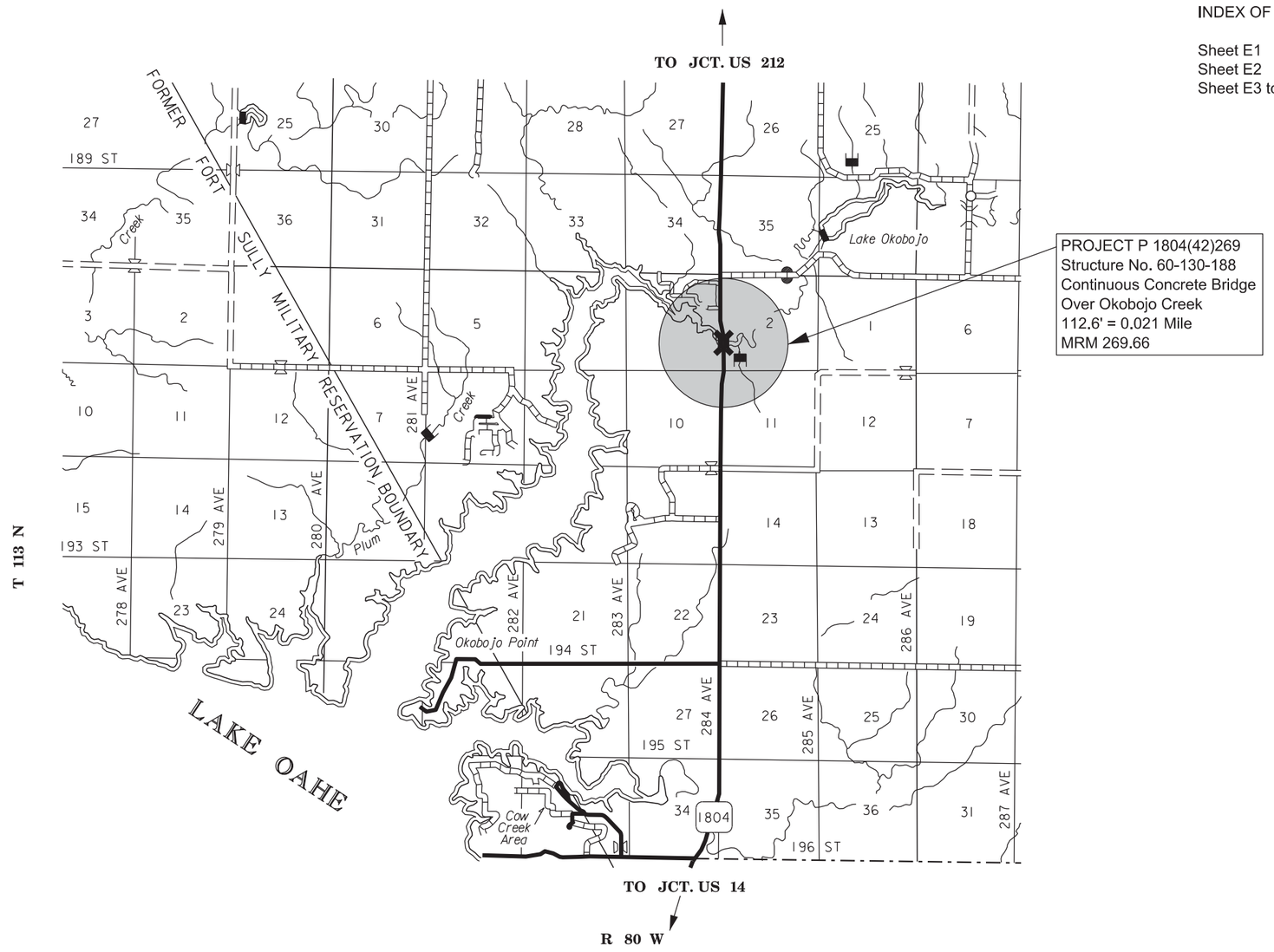
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 1804(42)269	E1	E7

SECTION E: STRUCTURE PLANS

INDEX OF SHEETS

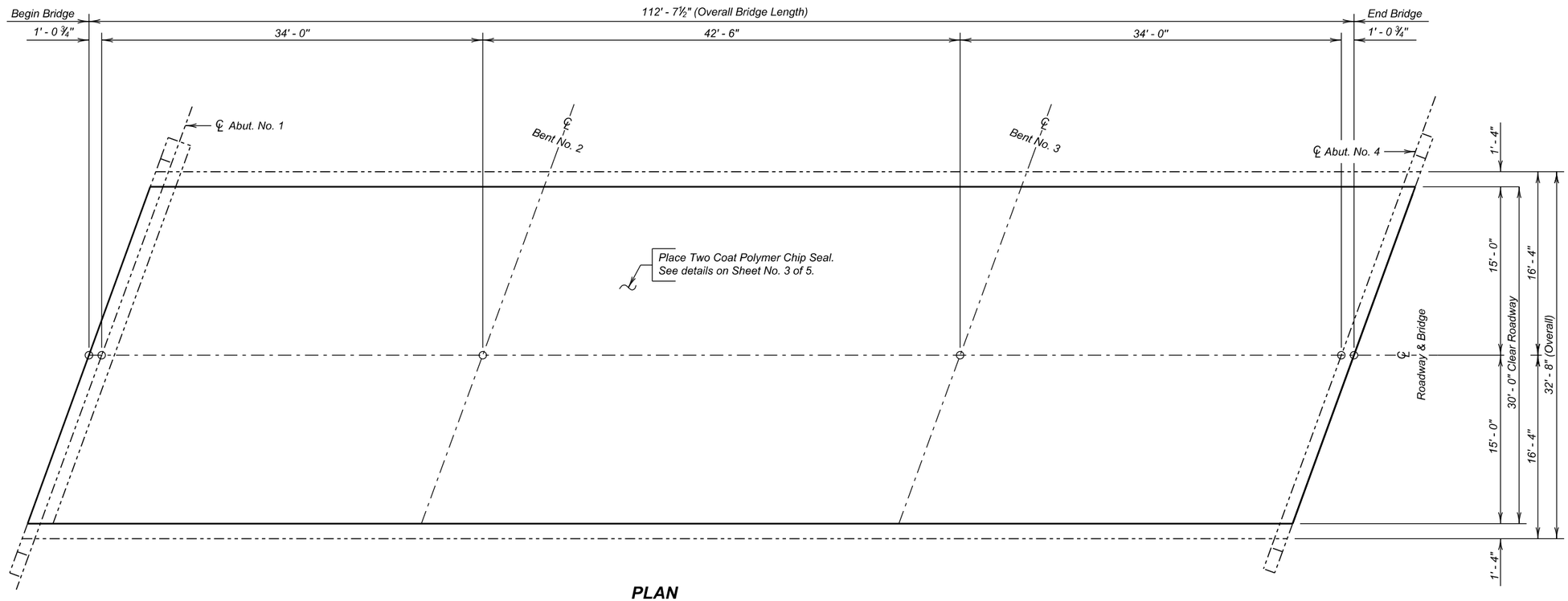
Sheet E1	Layout Map and Index
Sheet E2	Estimate of Structure Quantities
Sheet E3 to E7	Structure No. 60-130-188



ESTIMATE OF STRUCTURE QUANTITIES

Bid Item Number	Item	Quantity	Unit
460E0172	Concrete Patching Material, Bridge Deck	251.8	CuFt
491E0005	Two Coat Bridge Deck Polymer Chip Seal	375.4	SqYd
491E0110	Abrasive Blasting of Bridge Deck	375.4	SqYd
491E0120	Bridge Deck Grinding	375.4	SqYd
491E0130	Concrete Removal, Class A	21.7	SqYd
491E0140	Concrete Removal, Class B	21.7	SqYd

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 1804(42)269		



PLAN

LAYOUT FOR UPGRADING

FOR

112' - 7½" CONTINUOUS CONCRETE BRIDGE

30' - 0" ROADWAY — 20°SKEW L.H.F.
OVER OKOBOJO CREEK — SEC. 2/3 - T113N-R80W
STR. NO. 60-130-188 — P 1804(42)269
PCN 03A9

SULLY COUNTY

S. D. DEPT. OF TRANSPORTATION

FEBRUARY 2015

1 OF 5

INDEX OF BRIDGE SHEETS -

Sheet No. 1 - Layout for Upgrading
Sheet No. 2 - Estimate of Structure Quantities and Notes
Sheet No. 3 - Polymer Chip Seal Details
Sheet No. 4 - Original Construction Plans
Sheet No. 5 - Original Construction Plans

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

DESIGNED BY	CK. DES. BY	DRAFTED BY	
KSK	MM	KR	Kevin N. Goeden
SULY03A9	03A9KA01		BRIDGE ENGINEER

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
460E0172	Concrete Patching Material, Bridge Deck	251.8	CuFt
491E0005	Two Coat Bridge Deck Polymer Chip Seal	375.4	SqYd
491E0110	Abrasive Blasting of Bridge Deck	375.4	SqYd
491E0120	Bridge Deck Grinding	375.4	SqYd
491E0130	Concrete Removal, Class A	21.7	SqYd
491E0140	Concrete Removal, Class B	21.7	SqYd

SPECIFICATIONS

1. Design Specifications: AASHTO Standard Specifications for Highway Bridges 2002 17th Edition with 2003 Interim using Working Stress Design.

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

1. Perform bridge deck grinding on the entire bridge deck.

2. Repair the bridge deck by removing all loose and delaminated concrete from the bridge deck surface for the first and second phase of construction.

3. Clean the bridge deck surface with abrasive blasting for the first phase of construction.

4. Place the Two Coat Polymer Bridge Deck Chip Seal for the first phase of construction.

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

TWO COAT BRIDGE DECK POLYMER CHIP SEAL

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

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES

FOR

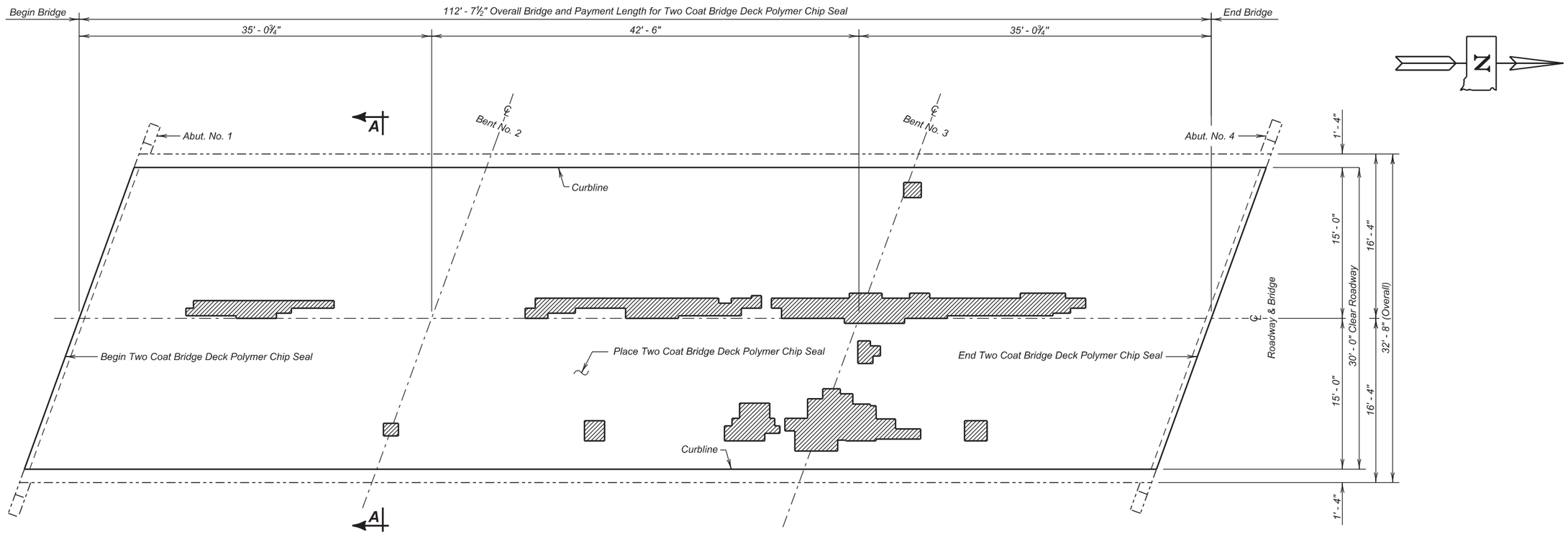
112' - 7½" CONTINUOUS CONCRETE BRIDGE

STR. NO. 60-130-188

MARCH 2015

DESIGNED BY	CK. DES. BY	DRAFTED BY	
KSK	MM	KR	Kevin N. Goeden
SULY03A9	03A9RA02		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 1804(42)269	E5	E7



PLAN

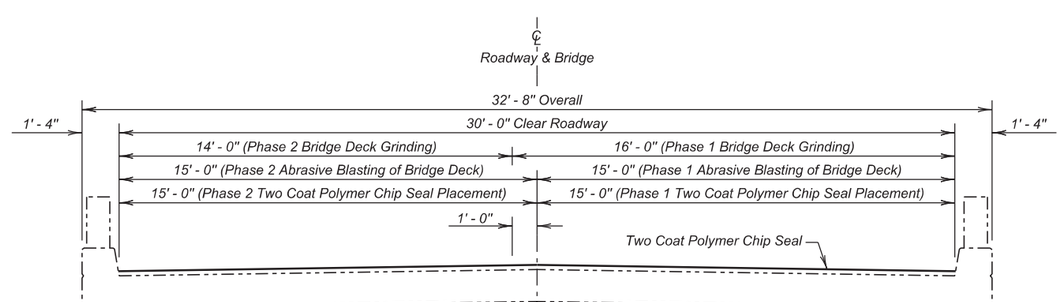
LEGEND

Shaded areas indicate approximate locations of unsound concrete requiring concrete repair

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY Phase I	QUANTITY Phase 2
✳ Concrete Patching Material, Bridge Deck	Cu. Ft.	134.3	117.5
Two Coat Polymer Bridge Deck Chip Seal	Sq. Yd.	187.7	187.7
Abrasive Blasting of Bridge Deck	Sq. Yd.	187.7	187.7
Bridge Deck Grinding	Sq. Yd.	200.2	175.2
✳ Concrete Removal, Class A	Sq. Yd.	11.6	10.1
✳ Concrete Removal, Class B	Sq. Yd.	11.6	10.1

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



SECTION A - A

POLYMER CHIP SEAL DETAILS

FOR

112' - 7½" CONTINUOUS CONCRETE BRIDGE

30' - 0" ROADWAY — 20°SKEW L.H.F.
OVER OKOBOJO CREEK — SEC. 2/3 - T113N-R80W
STR. NO. 60-130-188 — P 1804(42)269

SULLY COUNTY

S. D. DEPT. OF TRANSPORTATION

FEBRUARY 2015

3 OF 5

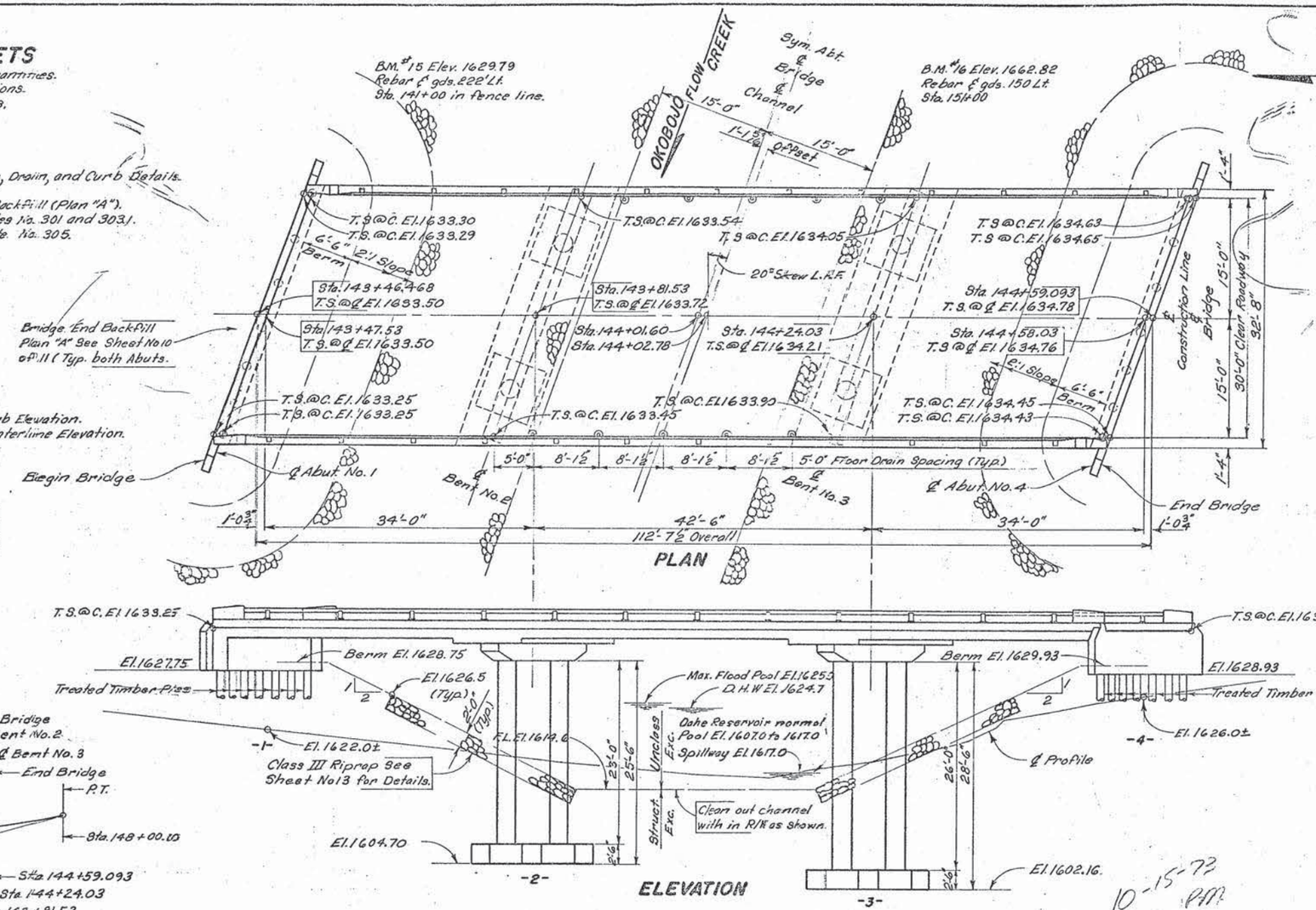
DESIGNED BY	CK. DES. BY	DRAFTED BY	
KSK	MM	KR	Kevin N. Boeden
SULY03A9	03A9KA03		BRIDGE ENGINEER

-X020-

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	P 1804(42)269	E6	E7

INDEX OF BRIDGE SHEETS

Sheet No.1 - General Drawing and Quantities.
Sheet No.2 - Subsurface Investigations.
Sheet No.3 - Superstructure Details.
Sheet No.4 - Details of Abut. No.1.
Sheet No.5 - Details of Abut. No.4.
Sheet No.6 - Details of Bent No.2.
Sheet No.7 - Details of Bent No.3.
Sheet No.8 - Type RT-3A Steel Railing, Drain, and Curb Details.
Sheet No.9 - End Block Details.
Sheet No.10 - Details of Bridge End Backfill (Plan "A").
Sheet No.11 - Details of Standard Plates No. 301 and 303.1.
Sheet No.12 - Details of Standard Plate No. 305.
Sheet No.13 - Riprap Details.

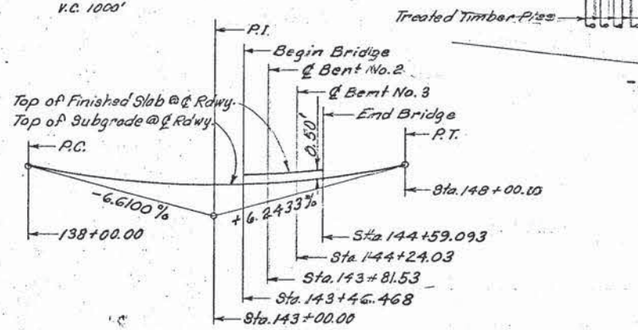


PLAN

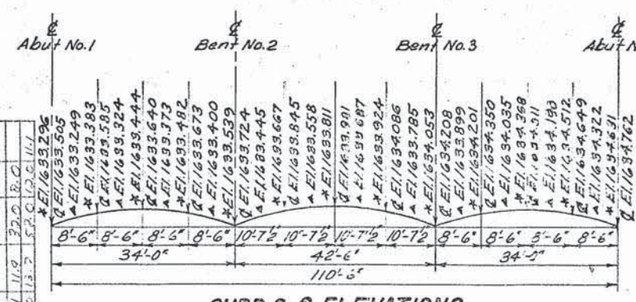
Q 25	2400 c.f.s.
A	453 sq. ft.
V	5.3 f.p.s.

NOTE:
T.S. @ C El. = Top of Slab at Curb Elevation.
T.S. @ ℄ El. = Top of Slab at Centerline Elevation.

ELEVATION



VERTICAL CURVE DATA



CURB & ℄ ELEVATIONS

Elevations indicated with * are top of finished slab at left curb and with ▲ are finished slab at right curb and with ℄ are top of slab at centerline of roadway. Camber for Dead Load Deflection Plus Plastic Flow, shown on Sheet No.3 of Bridge Plans, have been included in the elevations shown above.

ESTIMATED QUANTITIES

ITEM	Class "A" Concrete Bridge	Reinforcement Conc. Masonry	Structural Steel	Steel Railing Type RT-3A	Timber Bearing Piles	* Timber Test Piles	Structure Excavation Bridge	Unclassified Excavation	▲ Incidental Work	Pile Shoes	Bridge End Backfill	Abutment Piling	Riprap Class III
UNIT	Cu Yd	Lb	Lb	LF	LF	LF	Cu Yd	Cu Yd	L.S.	Each	℄ L.B.	LF	Ton
Superstructure	⊙ 115.6	⊙ 47,800	⊙ 120	213.9									
Abutment No.1	18.8	1,910			6@25'=150	1@30'=30	8			1		45	365
Bent No.2	21.3	4,738					92						
Bent No.3	22.2	4,905					112						
Abutment No.4	13.0	1,910			6@35'=210	1@40'=40	8			1		20	315
Totals	214.8	61,265	120	213.9	360	70	220	△ —	1 Lump Sum	14	1 Lump Sum	65	680

△ See Grading Plans for Unclassified Excavation.
* One Treated Timber Test Pile shall be driven at Abutments No.1 and No.4 before remaining piles are ordered.
℄ For information only - The approximate amount of granular backfill required will be 110 Cu Yds and the length of the 6" ϕ perforated metal pipe will be 132 feet, total for both Abutments.
⊙ Includes End Block Quantities. For End Block Quantities See Sheet No. 9.
* All-Steel pile shoes shall be shown on Standard Plate No. 301.
▲ Incidental Work. - In place 150± left of Sta. 144+20± to Sta. 144+80± is a 2-span 60'x24' clear roadway pre-cast concrete Bridge, with a steel Galv. Flex Beam railing, pre-cast concrete plank (7½'x18') abutments, pre-cast (channel sections) concrete bridge deck and a pre-cast pile bent. Dismantle and remove the Flex Beam railing, rail posts and the pre-cast concrete channel type bridge deck and salvage. All galvanized hardware shall be salvaged. Break down the concrete caps and dismantle the concrete pre-cast plank pile (7½'x18') abutments, pull if possible, piles shall be removed to 2'± below Flow Line of stream, for salvage. Steel ice breaker shall be dismantled and removed to 2'± below flow line of stream and salvaged. Care shall be taken not to injure the structural properties of any member of the steel railing, pre-cast rail posts, pre-cast deck sections or galvanized hardware in the structure during removal or storage operations. All salvaged materials shall be placed neatly within an area left of Sta. 143± as provided by Sully County and not to exceed 300'± from the existing location as directed by the ENGINEER to be picked up by Sully County forces for reuse. All broken concrete, from abutments and the pre-cast pile bent, which shall be removed to 2'± below stream Flow Line, and other materials not salvaged shall be disposed of by the contractor as directed by the ENGINEER.

10-15-72 PM

DESIGN MIX OF CONCRETE —

Substructure: 4,000 p.s.i. compressive
Superstructure: 4,500 p.s.i. compressive

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 required)

GENERAL NOTES —

1. Design Specifications: A.A.S.H.O. Specifications for Highway Bridges 1969, with interim Specifications for 1970 and 1971.
2. See Notes on Sheet No.1 thru No.13
3. Piles at Abutments No.1 and No.4 shall be prebored.
4. All reinforcing steel shall conform to A.S.T.M. A615, Grade 40, and A615, Grade 60 as specified on plans sheets herein.
5. Design Loading HS20-44 A.A.S.H.O.
6. Standard Plates referred to in these plans are the plates printed on Sheets No.11 and No.12 of 13 of these plans and are not intended to be referred to the Standard Plate Manual.
7. Place floor drains as shown in plan (10 required).
8. The Contractor shall imprint on the structure the date of construction as specified and detailed on Standard Plate No. 308 which is on file with the the ENGINEER.
9. Furnish and install inserts and eyebolts as shown on Standard Plate No. 305.
10. Longitudinal elements of the slab shall conform to the vertical curve.
11. Rail Posts and End Blocks shall be built normal to grade.
12. The Contractor shall have sufficient pile splice material on hand before pile driving is started. See Standard Plate No. 303.1 for splice details.

EXCAVATION NOTES —

1. Footings for Bents No.2 and No.3 shall be cast upon solid undisturbed shale and carried into same to the elevation shown. Limits of shale excavation, below top of footings, shall be bound as nearly as practicable by the neat lines as shown in details of footings for Bents No.2 and No.3 on Sheets No.6 and No.7 of 13. Open last foot of excavation immediately prior to placement of Concrete.
2. Shale shall develop a minimum bearing value of 4.0 Tons per square foot. If the bearing value is less than 4.0 Tons per square foot, communicate with the BRIDGE SECTION.
3. Final footing elevation for Bents No.2 and No.3 shall be established before ordering Column reinforcing steel for the respective bents. If final footing elevations must differ from those shown, communicate with BRIDGE SECTION.

ORIGINAL CONSTRUCTION PLANS

GENERAL DRAWING AND QUANTITIES
FOR
112'-7½" CONTINUOUS CONCRETE BRIDGE
30'-0" ROADWAY — 20° SKEW L.H.F.
OVER OKOBOJO CREEK — SEC. 2/3-T113N-R80W
STA. 143+46.468 TO 144+59.093 — S8052
STR. NO. 60-130-188 — SULLY COUNTY
SOUTH DAKOTA — HS20-44
DEPARTMENT OF HIGHWAYS
DEC. 1970 — (4 OF 5)

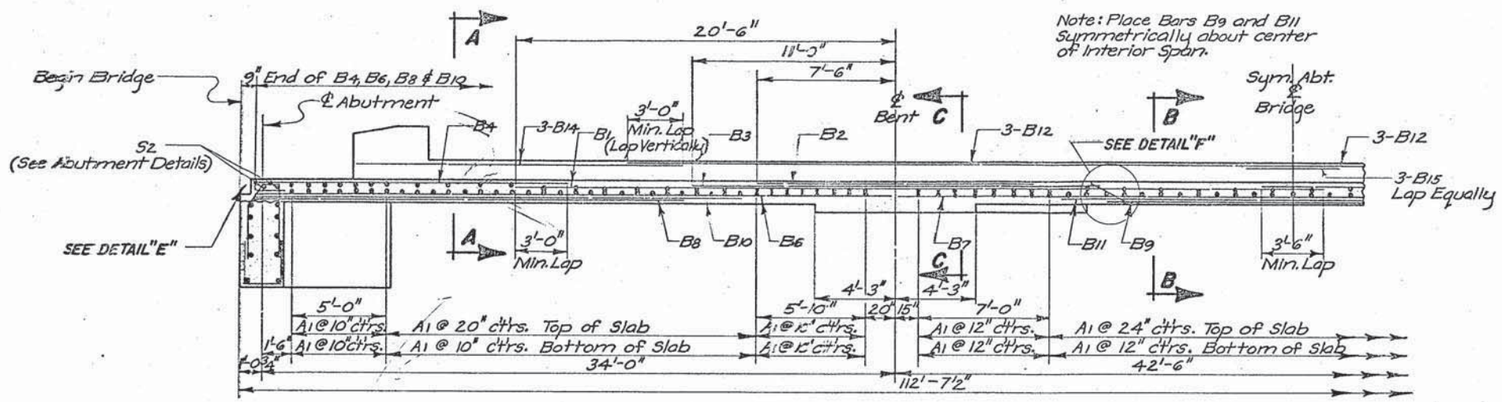
-X020-

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	Ed. R.	W.C.P.	

PLANS BY BRIDGE SEC. S. DAK. DEPT. HWYS.

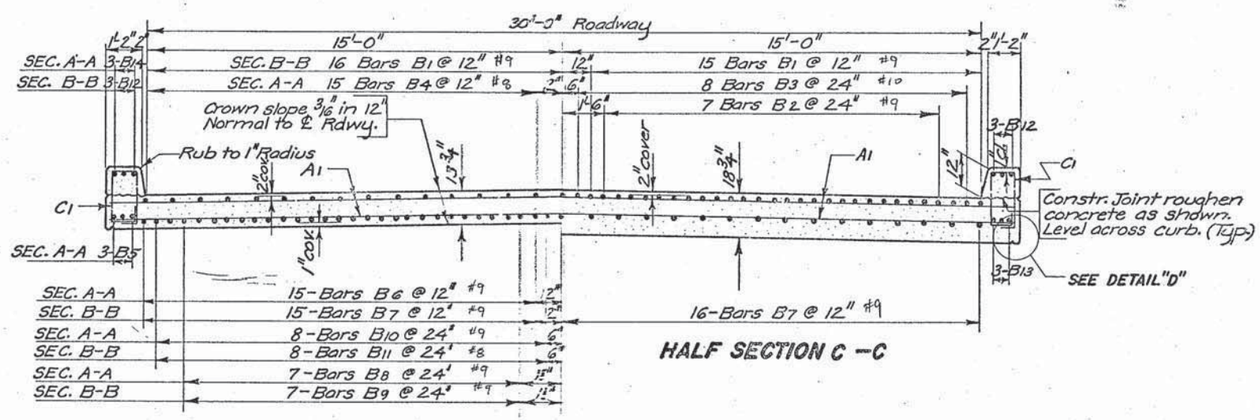
BRIDGE ENGINEER

STATE OF S.D.	PROJECT P 1804(42)269	SHEET NO. E7	TOTAL SHEETS E7



HALF LONGITUDINAL SECTIONAL VIEW
(All dimensions shown are parallel to ℄ Rdwy.)

Note:
Place A1 bars on 20° skew L.H.F.
(Parallel to ℄ Bent & Abut's.)



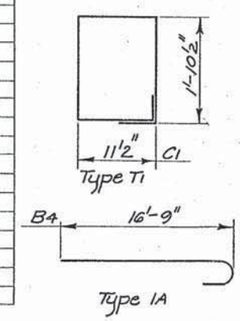
HALF SECTION C-C

HALF SECTION A-A
HALF SECTION B-B
As shown and noted
(All Sections taken perpendicular to ℄ Rdwy.)

REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type
A1	197	5	34'-5"	Str.
B1	62	9	43'-6"	Str.
B2	28	9	15'-0"	Str.
B3	32	10	22'-0"	Str.
B4	62	8	17'-10"	1A
B5	12	8	34'-9"	Str.
B6	62	9	34'-3"	↑
B7	31	9	42'-6"	
B8	28	9	23'-0"	
B9	14	9	20'-0"	
B10	32	9	26'-0"	
B11	16	8	25'-0"	
B12	12	9	41'-9"	
B13	6	8	42'-6"	
B14	12	8	17'-3"	↓
B15	6	6	5'-0"	Str.
*C1	210	4	7'-0"	T1

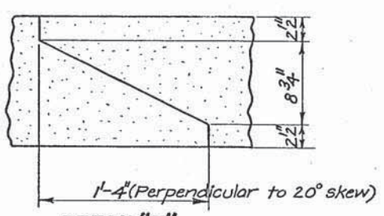
Bending Details



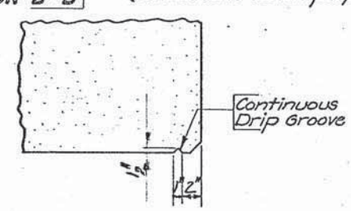
*C1 Bar may be A.S.T.M. A615, Grade 40 Steel.
Note: All dimensions are out to out of bars.

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Class "A" Concrete, Bridge	Cu. Yds.	174.4
Reinforcement Conc. Masonry	Lbs.	47,465



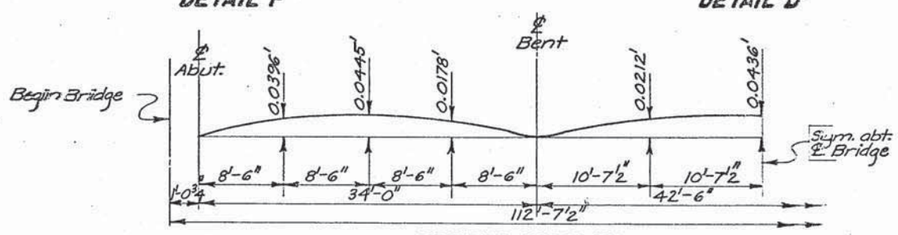
DETAIL "F"



DETAIL "D"

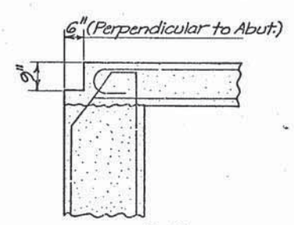
NOTES—

1. Design Specifications: AASHO Specifications for Highway Bridges, 1969, with interim specifications for 1970.
2. All floor drains shall be paid for as structural steel.
3. See General Drawing for length of Timber Bearing Piles.
4. All reinforcing steel shall conform to A.S.T.M. A615, Grade 60.
5. All exposed concrete corners and edges shall be chamfered to a ¾" bevel unless noted otherwise.
6. Transverse slab construction joints may be used as provided in the "Special Provisions for Concrete Bridges," dated June 18, 1969.
7. Design Loading: HS20-44 AASHO.
8. Design Unit Stresses: Concrete fc = 1,800 p.s.i fc = 4,500 p.s.i.
   Reinf. Steel fs = 24,000 p.s.i
9. Minimum Pile Loading for Timber Bearing Piles = 24 Tons per pile.

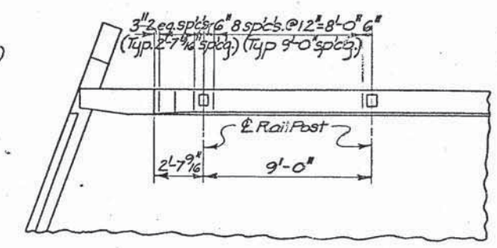


CAMBER DIAGRAM

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



DETAIL "E"



C1 BAR SPACING

ORIGINAL CONSTRUCTION PLANS

SUPERSTRUCTURE DETAILS
FOR
112'-7½" CONTINUOUS CONCRETE BRIDGE

30'-0" ROADWAY — 20° SKEW L.H.F.
OVER OKOBOJO CREEK — SEC. 2/3-T113N-R80W
STA. 143+46.468 TO 144+59.093 — S 8052
STR. NO. 60-130-188 — SULLY COUNTY
SOUTH DAKOTA — HS 20-44
DEPARTMENT OF HIGHWAYS
NOV. 1970 — 5 OF 5

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	W.C.P.	D.C.	BRIDGE ENGINEER