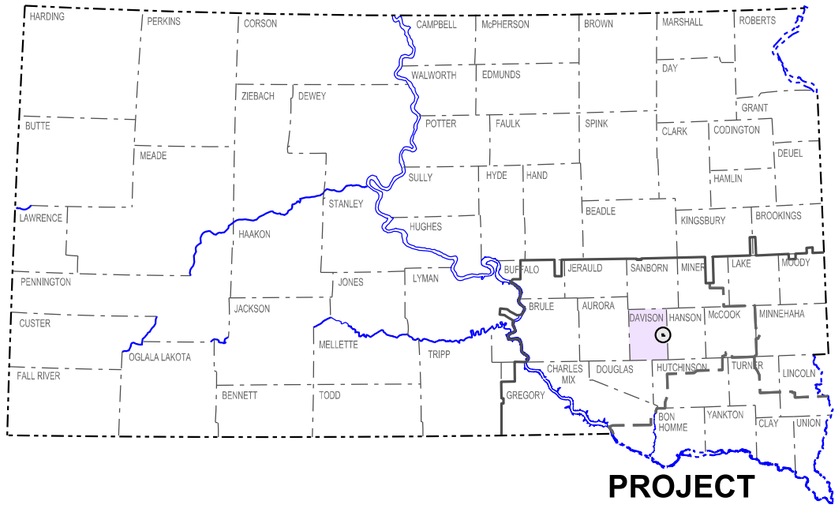
PLOT SCALE - 1:70000



STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED

PROJECT IM 0907(90)332
INTERSTATE 90
DAVISON COUNTY

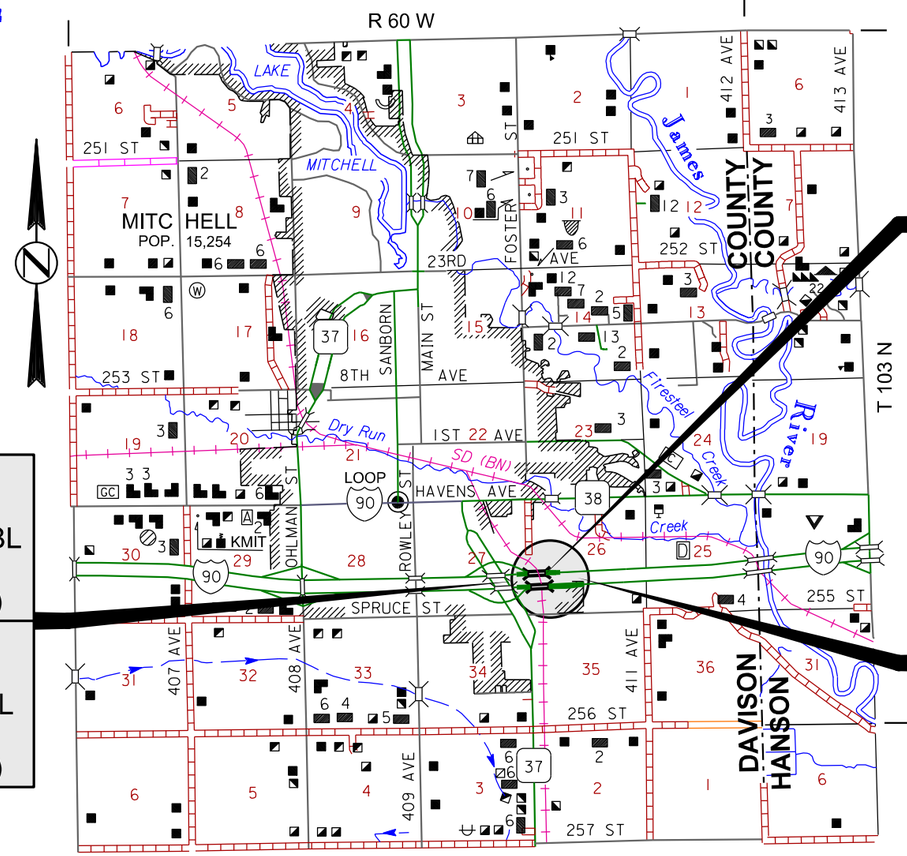
MEDIAN SHOULDER STRENGTHENING,
BRIDGE DECK POLYMER CHIP SEALS,
REPLACE APPROACH SLABS, APPROACH PAVEMENT,
MEMBRANE SEALANT EXPANSION JOINTS, BERM REPAIR,
ACCELERATION LANE, DECELERATION LANE TAPER,
DROP INLET WORK, PAVEMENT MARKING, SIGNING & GUARDRAIL
PCN 091U

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	1	141

Plotting Date: 03/26/2024

INDEX OF SHEETS

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Sheets 2 & 3	Estimates of Quantities
Sheets 4 & 5	Environmental Commitments
Sheet 6	Table for Guardrail & Delineation
Sheets 7 - 14	Plan Notes & SWPPP
Sheets 15 - 24	Traffic Control & Pavement Marking
Sheets 25 - 29	Permanent Signing
Sheets 30 - 52	Bridge Work at Structure No. 18-160-107
Sheets 53 - 75	Bridge Work at Structure No. 18-160-108
Sheets 76 - 83	Typical Sections
Sheets 84 & 85	Median Shoulder Strengthening
Sheets 86 - 91	Approach Work Adjacent to Structures
Sheets 92 - 99	Accel Lane & Decel Taper Details
Sheet 100	Membrane Sealant Expansion Joints
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Sheets 103 - 124	Standard Plates
Sheets 125 - 141	Cross Sections



STR. NO. 18-160-107 WBL
852+92.77 to 854+50.96
Continuous Concrete Bridge
158'-2¼"=0.030 Mile
MRM 332.42 WBL
Two Approach/Sleeper Slabs
1@28', 1@25'= 0.010 Mile

STR. NO. 18-160-108 EBL
853+32.32 to 854+90.51
Continuous Concrete Bridge
158'-2¼"=0.030 Mile
MRM 332.42 EBL
Two Approach/Sleeper Slabs
1@25', 1@29'= 0.010 Mile

BEGIN I90W
STA. 847+43
MRM 332.19 +0.097 WBL
MILEAGE 332.515
(550' W of Begin Bridge)

BEGIN I90E
STA. 847+83
MRM 332.19 +0.088 EBL
MILEAGE 332.537
(550' W of Begin Bridge)

END I90W
STA. 862+87
MRM 332.42 +0.160 WBL
MILEAGE 332.807
(836' E of End Bridge)

END I90E
STA. 870+99
MRM 332.42 +0.302 EBL
MILEAGE 332.975
(1,608' E of End Bridge)

DESIGN DESIGNATION

ROUTE	I90W	I90E
ADT(2022)	6,785	6,785
ADT(2042)	10,557	10,557
DHV	1,446	1,446
D	50%	50%
T DHV	10.0%	10.0%
T ADT	22.0%	22.0%
V	80 MPH	80 MPH

STORM WATER PERMIT
Receiving Waters: None
Area Disturbed: 3 Acres
Total Project Area: 14 Acres
Latitude:43,6920 (Google Maps)
Longitude: -98.0073 (Google Maps)

LENGTH	I90W		I90E	
Gross Length:	1,544'	0.292 Miles	2,316'	0.439 Miles
Bridge Length:	158'	0.030 Mile	158'	0.030 Mile
Appr/Slpr Slab Length:	53'	0.010 Mile	54'	0.010 Mile
Net Length:	1,333'	0.252 Miles	2,104'	0.399 Miles

1

November 5, 2025

PLOTTED FROM - TRM11NT15
PLOT NAME - 1
FILE - ...\PRJ2024\DAVS091U\TTL091U.DGN

ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	2	141

Rev. 4/5/24 & 9/30/25 MR

PCN 091U

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E4100	Construction Schedule, Category I	Lump Sum	LS
110E0100	Remove Concrete Footing(s)	Lump Sum	LS
110E0140	Remove Extruded Panel Sign	1	Each
110E0400	Remove Drop Inlet	1	Each
110E0420	Remove Drop Inlet Frame and Grate Assembly	1	Each
110E0500	Remove Pipe Culvert	2	Ft
110E0700	Remove 3 Cable Guardrail	1,024	Ft
110E0730	Remove Beam Guardrail	325.0	Ft
110E0740	Remove 3 Cable Guardrail Anchor Assembly	6	Each
110E0745	Remove 3 Cable Guardrail Slip Base Anchor Assembly	2	Each
110E0770	Remove W Beam Guardrail Breakaway Cable Terminal	4	Each
110E1010	Remove Asphalt Concrete Pavement	3,133.0	SqYd
110E1100	Remove Concrete Pavement	1,696.0	SqYd
110E1640	Remove Granular Material	1,562.0	CuYd
110E1690	Remove Sediment	11.0	CuYd
110E1693	Remove Erosion Control Wattle	1,088	Ft
120E0010	Unclassified Excavation	8,786	CuYd
120E0600	Contractor Furnished Borrow Excavation	11,172	CuYd
120E1000	Muck Excavation	71	CuYd
120E2000	Undercutting	2,773	CuYd
120E6100	Water for Embankment	199.0	MGal
120E6200	Water for Granular Material	55.0	MGal
230E0100	Remove and Replace Topsoil	Lump Sum	LS
260E2010	Gravel Cushion	4,626.0	Ton
320E1200	Asphalt Concrete Composite	191.0	Ton
380E0110	11" Nonreinforced PCC Pavement	3,491.0	SqYd
380E0800	PCC Shoulder Pavement	888.0	SqYd
380E6000	Dowel Bar	1,242	Each
380E6110	Insert Steel Bar in PCC Pavement	1,848	Each
410E2600	Membrane Sealant Expansion Joint	178.0	Ft
630E0500	Type 1 MGS	1,162.5	Ft
630E1501	Type 1 Retrofit Guardrail Transition	4	Each
630E2018	MGS MASH Tangent End Terminal	4	Each
632E0060	2.5' Diameter Fixed Support Concrete Footing	18.0	Ft
632E1210	S3x5.7 Steel Post	11.0	Ft
632E1270	W10x39 Steel Post	55.6	Ft
632E2220	Guardrail Delineator	34	Each
632E3113	Extruded Aluminum Sign, Nonremovable Copy High Intensity	6.3	SqFt
632E3115	Extruded Aluminum Sign, Nonremovable Copy Super/Very High Intensity	187.5	SqFt
633E1201	High Build Waterborne Pavement Marking Paint with Reflective Elements, White	45	Gal
633E1206	High Build Waterborne Pavement Marking Paint with Reflective Elements, Yellow	20	Gal

PCN 091U (CONTINUED)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
633E5050	Surface Preparation for Pavement Marking	12,121	Ft
634E0010	Flagging	160.0	Hour
634E0110	Traffic Control Signs	544.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	2	Each
634E0330	Temporary Raised Pavement Markers	7,700	Ft
634E0420	Type C Advance Warning Arrow Board	2	Each
634E0525	Linear Delineation System Panel, Barrier Mounted	136	Each
634E0700	Traffic Control Movable Concrete Barrier	136	Each
634E0750	Temporary Concrete Barrier End Protection	2	Each
634E0760	Temporary Concrete Barrier End Protection Module Set or Repair Kit	2	Each
634E3100	Reset Traffic Control Barrier End Protection	2	Each
670E0200	Type A Frame and Grate	2	Each
670E1010	2' x 3' Type B Drop Inlet	1	Each
670E5400	Precast Drop Inlet Collar	1	Each
670E6000	Adjust Drop Inlet	1	Each
730E0212	Type G Permanent Seed Mixture	96	Lb
732E0100	Mulching	7.4	Ton
734E0154	12" Diameter Erosion Control Wattle	4,350	Ft
734E0165	Remove and Reset Erosion Control Wattle	1,088	Ft
998E0100	Railroad Protective Insurance	Lump Sum	LS

STR. NO. 18-160-107 WBL

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
110E0010	Remove Concrete Bridge Approach Slab	287.6	SqYd
120E3120	Bridge Berm Repair	2	Each
260E1010	Base Course	28.0	Ton
410E2600	Membrane Sealant Expansion Joint	81.3	Ft
460E0150	Concrete Approach Slab for Bridge	222.1	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	65.5	SqYd
480E0504	No. 4 Rebar Splice	32	Each
480E0505	No. 5 Rebar Splice	48	Each
480E0506	No. 6 Rebar Splice	52	Each
491E0005	Two Coat Bridge Deck Polymer Chip Seal	682.7	SqYd
491E0110	Abrasive Blasting of Bridge Deck	682.7	SqYd
491E0120	Bridge Deck Grinding	682.7	SqYd
491E0130	Concrete Removal, Class A	4.0	SqYd
491E0140	Concrete Removal, Class B	4.0	SqYd
491E0172	Concrete Patching Material, Bridge Deck	54.0	CuFt

STR. NO. 18-160-108 EBL

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
110E0010	Remove Concrete Bridge Approach Slab	337.0	SqYd
120E3120	Bridge Berm Repair	2	Each
260E1010	Base Course	35.0	Ton
410E2600	Membrane Sealant Expansion Joint	95.6	Ft
460E0150	Concrete Approach Slab for Bridge	264.5	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	77.0	SqYd
480E0504	No. 4 Rebar Splice	34	Each
480E0505	No. 5 Rebar Splice	48	Each
480E0506	No. 6 Rebar Splice	53	Each
491E0005	Two Coat Bridge Deck Polymer Chip Seal	747.8	SqYd
491E0110	Abrasive Blasting of Bridge Deck	747.8	SqYd
491E0120	Bridge Deck Grinding	747.8	SqYd
491E0130	Concrete Removal, Class A	4.0	SqYd
491E0140	Concrete Removal, Class B	4.0	SqYd
491E0172	Concrete Patching Material, Bridge Deck	54.0	CuFt

SPECIFICATIONS

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

ESTIMATE OF QUANTITIES
(FOR INFORMATION ONLY)

BID ITEM NUMBER	ITEM	IM 0907(90)332 WBL QUANTITY	IM 0907(90)332 EBL QUANTITY	TOTAL QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	Lump Sum	Lump Sum	LS
009E4100	Construction Schedule, Category I	Lump Sum	Lump Sum	Lump Sum	LS
110E0100	Remove Concrete Footing(s)	Lump Sum	Lump Sum	Lump Sum	LS
110E0140	Remove Extruded Panel Sign	1	-	1	Each
110E0400	Remove Drop Inlet	-	1	1	Each
110E0420	Remove Drop Inlet Frame and Grate Assembly	1	-	1	Each
110E0500	Remove Pipe Culvert *(Determine actual removal length on construction)*	-	2	2	Ft
110E0700	Remove 3 Cable Guardrail	549	475	1024	Ft
110E0730	Remove Beam Guardrail	162.5	162.5	325	Ft
110E0740	Remove 3 Cable Guardrail Anchor Assembly	3	3	6	Each
110E0745	Remove 3 Cable Guardrail Slip Base Anchor Assembly	1	1	2	Each
110E0770	Remove W Beam Guardrail Breakaway Cable Terminal	2	2	4	Each
110E1010	Remove Asphalt Concrete Pavement	1392	1741	3133	SqYd
110E1100	Remove Concrete Pavement	358	1338	1696	SqYd
110E1640	Remove Granular Material	604	958	1562	CuYd
110E1690	Remove Sediment	3	8	11	CuYd
110E1693	Remove Erosion Control Wattle	263	825	1088	Ft
120E0010	Unclassified Excavation	121	8665	8786	CuYd
120E0600	Contractor Furnished Borrow Excavation	1889	9283	11172	CuYd
120E1000	Muck Excavation	-	71	71	CuYd
120E2000	Undercutting	-	2773	2773	SqYd
120E6100	Water for Embankment	20	179	199	MGal
120E6200	Water for Granular Material	18	37	55	MGal
230E0100	Remove and Replace Topsoil	Lump Sum	Lump Sum	Lump Sum	LS
260E2010	Gravel Cushion	1490	3136	4626	Ton
320E1200	Asphalt Concrete Composite	99	92	191	Ton
380E0110	11" Nonreinforced PCC Pavement	896	2595	3491	SqYd
380E0800	PCC Shoulder Pavement *(8" Thickness)*	444	444	888	SqYd
380E6000	Dowel Bar *(1½" x 18")*	372	870	1242	Each
380E6110	Insert Steel Bar in PCC Pavement *(1,664 No. 5 x 24" Tie, 184 1½" x 18" Dowel)*	722	1126	1848	Each
410E2600	Membrane Sealant Expansion Joint	82	96	178	Ft
630E0500	Type 1 MGS	637.5	525	1162.5	Ft
630E1501	Type 1 Retrofit Guardrail Transition	2	2	4	Each
630E2018	MGS MASH Tangent End Terminal	2	2	4	Each
632E0060	2.5' Diameter Fixed Support Concrete Footing	18	-	18	Ft
632E1210	S3x5.7 Steel Post	11	-	11	Ft
632E1270	W10x39 Steel Post	55.6	-	55.6	Ft
632E2220	Guardrail Delineator	18	16	34	Each
632E3113	Extruded Aluminum Sign, Nonremovable Copy High Intensity	6.3	-	6.3	SqFt
632E3115	Extruded Aluminum Sign, Nonremovable Copy Super/Very High Intensity	187.5	-	187.5	SqFt
633E1201	High Build Waterborne Pavement Marking Paint with Reflective Elements, White	20	25	45	Gal
633E1206	High Build Waterborne Pavement Marking Paint with Reflective Elements, Yellow	8	12	20	Gal
633E5050	Surface Preparation for Pavement Marking	5149	6972	12121	Ft
634E0010	Flagging	80	80	160	Hour
634E0110	Traffic Control Signs	272	272	544	SqFt
634E0120	Traffic Control Miscellaneous	Lump Sum	Lump Sum	Lump Sum	LS
634E0275	Type 3 Barricade	1	1	2	Each
634E0330	Temporary Raised Pavement Markers	3850	3850	7700	Ft
634E0420	Type C Advance Warning Arrow Board	1	1	2	Each
634E0525	Linear Delineation System Panel, Barrier Mounted	66	70	136	Each
634E0700	Traffic Control Movable Concrete Barrier	66	70	136	Each
634E0750	Temporary Concrete Barrier End Protection	1	1	2	Each
634E0760	Temporary Concrete Barrier End Protection Module Set or Repair Kit	1	1	2	Each
634E3100	Reset Traffic Control Barrier End Protection	1	1	2	Each
670E0200	Type A Frame and Grate	1	1	2	Each
670E1010	2' x 3' Type B Drop Inlet	-	1	1	Each
670E5400	Precast Drop Inlet Collar	-	1	1	Each
670E6000	Adjust Drop Inlet	1	-	1	Each
730E0212	Type G Permanent Seed Mixture	96	-	96	Lb
732E0100	Mulching	7.4	-	7.4	Ton
734E0154	12" Diameter Erosion Control Wattle	1050	3300	4350	Ft
734E0165	Remove and Reset Erosion Control Wattle	263	825	1088	Ft
998E0100	Railroad Protective Insurance	Lump Sum	Lump Sum	Lump Sum	LS

ENVIRONMENTAL COMMITMENTS (CONTINUED)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	4	141

Rev. 4/26/24 MR

ENVIRONMENTAL COMMITMENTS

The SDDOT is committed to protecting the environment and uses Environmental Commitments as a communication tool for the Engineer and Contractor to ensure that attention is given to avoid, minimize, and/or mitigate an environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency with permitting authority can delay a project if identified environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. During construction, the Project Engineer will verify that the Contractor has met Environmental Commitment requirements. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office.

Additional guidance on SDDOT's Environmental Commitments can be accessed through the Environmental Procedures Manual found at: https://dot.sd.gov/media/documents/EnvironmentalProceduresManual.pdf

For questions regarding change orders in the field that may have an effect on an Environmental Commitment, the Project Engineer will contact the Environmental Engineer at 605-773-3180 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

Once construction is complete, the Project Engineer will review all environmental commitments for the project and document their completion.

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that is about 5 feet tall and typically stops on wetlands, rivers, and agricultural lands along their migration route. An adult Whooping Crane is white with a red crown and a long, dark, pointed bill. Immature Whooping Cranes are cinnamon brown. While in flight, their long necks are kept straight and their long dark legs trail behind. Adult Whooping Cranes' black wing tips are visible during flight.

Action Taken/Required:

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pits, or staging areas associated with the project, cease construction activities in the affected area until the Whooping Crane departs and immediately contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

COMMITMENT C: WATER SOURCE

The Contractor will not withdraw water with equipment previously used outside the State of South Dakota or previously used in aquatic invasive species (AIS) positive waters within South Dakota without prior approval from the SDDOT Environmental Office. To prevent and control the introduction and spread of invasive species into the project vicinity, all equipment will be power washed with hot water (≥140 °F) and completely dried for a minimum of 7 days prior to subsequent use. South Dakota administrative rule 41:10:04:02 forbids the possession and transport of AIS; therefore, all attached dirt, mud, debris and vegetation must be removed and all compartments and tanks capable of holding standing water must be drained. This includes, but is not limited to, all equipment, pumps, lines, hoses and holding tanks.

The Contractor will not withdraw water directly from streams of the James, Big Sioux, and Vermillion watersheds without prior approval from the SDDOT Environmental Office.

Action Taken/Required:

The Contractor will obtain the necessary permits from the regulatory agencies such as the South Dakota Department of Agriculture and Natural Resources (DANR) and the United States Army Corps of Engineers (USACE) prior to water extraction activities.

Additional information and mapping of water sources impacted by Aquatic Invasive Species in South Dakota can be accessed at: https://sdleastwanted.sd.gov/maps/default.aspx

South Dakota Administrative Rule 41:10:04 Aquatic Invasive Species: https://sdlegislature.gov/rules/DisplayRule.aspx?Rule=41:10:04

COMMITMENT E: STORM WATER

Construction activities constitute 1 acre or more of earth disturbance and/or work in a waterway.

Action Taken/Required:

The DANR General Permit for Stormwater Discharges Associated with Construction Activities is required for construction activity disturbing one or more acres of earth and work in a waterway. The SDDOT is the owner of this permit and will submit the NOI to DANR 15 days prior to project start in order to obtain coverage under the General Permit. Work can begin once the DANR letter of approval is received.

The Contractor must adhere to the Special Provision Regarding Storm Water Discharges to Waters of the State.

The Contractor will complete the DANR Contractor Certification Form prior to the pre-construction meeting. The form certifies under penalty of law that the Contractor understands and will comply with the terms and conditions of the permit for this project. Work may not begin on this project until this form is signed and submitted to DANR.

The form can be found at: https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/docs/DANR_CGPAppendixCCA2018Fillable.pdf

COMMITMENT E: STORM WATER (CONTINUED)

The Contractor is advised that permit coverage may also be required for off-site activities, such as borrow and staging areas, which are the responsibility of the Contractor.

Storm Water Pollution Prevention Plan

The Storm Water Pollution Prevention Plan (SWPPP) will be developed prior to the submittal of the NOI and will be implemented for all construction activities for compliance with the permit. The SWPPP must be kept on-site and updated as site conditions change. Erosion control measures and best management practices will be implemented in accordance with the SWPPP.

The DOT 298 Form will be used for site inspections and to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents and retained for a minimum of three years.

The inspection will include disturbed areas of the construction site that have not been finally stabilized, areas used for storage materials, structural control measures, and locations where vehicles enter or exit the site. These areas will be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the SWPPP will be observed to ensure that they are operating correctly, and sediment is not tracked off the site.

Information on storm water permits and SWPPPs are available on the following websites:

SDDOT: https://dot.sd.gov/doing-business/environmental/stormwater

DANR: https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/stormwater/default.aspx

EPA: https://www.epa.gov/npdes

ENVIRONMENTAL COMMITMENTS (CONTINUED)

COMMITMENT H: WASTE DISPOSAL SITE

The Contractor will furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

Construction and/or demolition debris may not be disposed of within the Public ROW.

The waste disposal site(s) will be managed and reclaimed in accordance with the following from the General Permit for Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Agriculture and Natural Resources.

The waste disposal site(s) will not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Environmental Office and the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements will apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials will be buried in a trench separate from wood debris. The final cover over the construction and/or demolition debris will consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW will be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor will control the access to waste disposal sites not within the Public ROW with fences, gates, and placement of a sign or signs at the entrance to the site stating, No Dumping Allowed.

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period not to exceed the duration of the project. Prior to project completion, the waste will be removed from view of the ROW or buried, and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

Cost associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates and signs), and reclamation of the waste disposal site(s) will be incidental to the various contract items.

COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historic Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require a cultural resource review prior to scheduling the pre-construction meeting. This work includes but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor will arrange and pay for a record search and when necessary, a cultural resource survey. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review if the site was previously surveyed; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor will provide ARC with the following: a topographical map or aerial view in which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities within 100 feet of the inadvertent discovery will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office, who will contact the appropriate SHPO/THPO within 48 hours of the discovery to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor will not utilize a site known or suspected of having contaminated soil or water. The Contractor will provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

TABLE FOR REMOVAL AND INSTALLATION OF GUARDRAIL AND RELATED ITEMS

LOCATION			REMOVE 3 CABLE GUARDRAIL	REMOVE BEAM GUARDRAIL	REMOVE 3 CABLE GUARDRAIL ANCHOR ASSEMBLY	REMOVE 3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY	REMOVE W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	REMOVE ASPHALT CONCRETE PAVEMENT	CONTRACTOR FURNISHED BORROW EXCAVATION	GRAVEL CUSHION	ASPHALT CONCRETE COMPOSITE	TYPE 1 MGS	TYPE 1 RETROFIT GUARDRAIL TRANSITION	MGS MASH TANGENT END TERMINAL
BRIDGE CORNER	LANE-SHOULDER		Ft	Ft	Each	Each	Each	SqYd	CuYd	Ton	Ton	Ft	Each	Each
STRUCTURE 18-160-107														
MRM 332.42														
End Bridge L	WBL	Outside	270	81.25	2	-	1	59	1550	130	26	312.5	1	1
End Bridge R	WBL	Median	279	81.25	1	1	1	83	460	280	73	325	1	1
	WBL	**TOTALS:**	**549**	**162.5**	**3**	**1**	**2**	**142**	**2010**	**410**	**99**	**637.5**	**2**	**2**
STRUCTURE 18-160-108														
MRM 332.42														
Begin Bridge L	EBL	Median	253	81.25	1	1	1	96	200	276	73	325	1	1
Begin Bridge R	EBL	Outside	222	81.25	2	-	1	51	110	91	19	200	1	1
	EBL	**TOTALS:**	**475**	**162.5**	**3**	**1**	**2**	**147**	**310**	**367**	**92**	**525**	**2**	**2**
		TOTALS:	**1024**	**325**	**6**	**2**	**4**	**289**	**2320**	**777**	**191**	**1162.5**	**4**	**4**

TABLE OF GUARDRAIL DELINEATORS & OBJECT MARKERS

LOCATION			TYPE 2 OBJECT MARKER BACK TO BACK	TYPE 2 OBJECT MARKER	GUARDRAIL TERMINAL END OBJECT MARKER (ADHESIVE)	GUARDRAIL DELINEATOR			
					N.A.B.I.	BEAM		CABLE	
BRIDGE CORNER	LANE-SHOULDER		(M) #	(M) #	E #	(B) #		(C) #	
						Yellow	White	Yellow	White
WBL									
STRUCTURE 18-160-107									
MRM 332.42									
End Bridge L	WBL	Outside			1		9		
End Bridge R	WBL	Median			1	9			
EBL									
STRUCTURE 18-160-108									
MRM 332.42									
Begin Bridge L	EBL	Median			1	9			
Begin Bridge R	EBL	Outside			1		7		
		TOTALS	**-**	**-**	**4**	**18**	**16**	**-**	**-**
						34			

- For **KEY**, Refer to Standard Plate 632.40 - Sheet 1 of 4.

N.A.B.I. = Not A Bid Item - Cost is incidental to the contract unit prices for the various items.

UTILITIES

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

If utilities are identified near the improvement area through the SD One Call process as required by South Dakota Codified Law 49-7A and Administrative Rule Article 20:25; the Contractor will contact the Project Engineer to determine if project changes are necessary to avoid utility impacts.

JOINT PROTECTION

Before construction equipment is moved across a joint, the Contractor will be required to protect the concrete adjacent to joints within the vicinity of bridge ends, approach slabs, sleeper slab hats and pavement terminals from spalling.

It will be the Contractor's responsibility to secure the protective material in place so that it will not become a hazard.

Any spalled areas and damage to the joint will be repaired at the Contractor's expense by breaking out and replacing adjacent concrete and replacing damaged substrate in-kind. Proposed repairs and method must be submitted to the SDDOT and receive approval prior to implementation.

Cost for material, equipment and labor for installing and removing joint protection will be incidental to the contract unit prices for the various items.

EXISTING NRC PAVEMENT

The existing pavement is 11" Nonreinforced PCC Pavement.

Existing contraction joints are spaced approximately 20'. Longitudinal joints are reinforced with No. 5 x 30" deformed tie bars spaced 48" center to center. Transverse joints are reinforced with 1½" x 18" plain round dowel bars spaced 12" center to center.

The aggregate in the existing NRC Pavement is quartzite.

REMOVE ASPHALT CONCRETE PAVEMENT

Where existing asphalt concrete is to be removed at guardrail installations, the Contractor will remove enough material so that new guardrail surfacing can be placed. This material will become the property of the Contractor for disposal.

SHOULDER STRENGTHENING

Existing shoulder material will be removed, underlying granular material inspected, and 8" PCC Shoulder Pavement will be placed to strengthen the median shoulders at locations shown on the layouts for Shoulder Strengthening.

The Contractor will remove 16 inches of material (asphalt concrete & granular material) 4 feet wide (top width), 12 feet wide (bottom width). Some granular material will be retained for reshaping after placement of the shoulder strengthening. The Contractor will place 8 inches of gravel cushion, 8 inches of PCC Shoulder Pavement and reshape the retained granular material adjacent to the PCC Shoulder Pavement edge.

Cost for removing the asphalt concrete will be included in the contract unit price per square yard for Remove Asphalt Concrete Pavement.

Cost for removing the granular material will be included in the contract unit price per cubic yard for Remove Granular Material.

Cost for reshaping the retained granular material will be incidental to the contract unit price per ton for PCC Shoulder Pavement.

SHOULDER WORK PRIOR TO STRENGTHENING

Vegetation and accumulated material on or adjacent to the existing roadway edge will be removed by the Contractor, to the satisfaction of the Engineer, prior to shoulder strengthening. Any remaining windrow of accumulated material will be spread evenly on the inslope adjacent to the shoulder, to the satisfaction of the Engineer, following completion of the shoulder strengthening.

Cost for shoulder work including removal and replacement of topsoil will be incidental to the contract unit prices for the various items. Separate measurement and payment will not be made.

REMOVE AND REPLACE TOPSOIL

Prior to beginning surfacing operations, a 4" depth of topsoil will be salvaged from the inslopes. Following completion of surfacing operations, topsoil will be replaced on the inslope to the concrete/asphalt concrete edge.

The estimated amount of topsoil to be removed and replaced is:

Str. No.	Location	Description	Estimated Quantity CuYds
18-160-107	End Bridge L	Over GR Embankment	376
18-160-107	End Bridge R	Over GR Embankment	160
18-160-108	Begin Bridge R	Over GR Embankment	81
18-160-108	Begin Bridge L	Over GR Embankment	165
18-160-108	End Bridge R	Over Accel Lane Slope	957
		Total:	**1739 CuYds**

Cost for removing and replacing the topsoil will be incidental to the lump sum price for Remove and Replace Topsoil.

CONTRACTOR FURNISHED BORROW EXCAVATION

The Contractor will provide a suitable site for Contractor furnished borrow excavation material. The Contractor is responsible for obtaining required permits and clearances for the borrow site.

Prior to placement or removal of fill material, the Contractor will be required to remove four inches of topsoil and replace it following the placement of the new fill material.

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

The Contractor furnished borrow excavation material will be uniform in texture and free from organic material. The liquid limit will not exceed 45 and the plastic index will not exceed 25.

The Contractor will be responsible for the following minimum testing prior to use of each borrow site:

A minimum of one test for liquid limit and plastic index and a 4 point for each location and soil type, with samples obtained according to SD201.

The Department will be responsible for the following minimum testing:

A minimum of one test for liquid limit and plastic index and a 4 point for every major change in soil type. Independent Assurance testing will not be required.

Cost for water will be included in the contract unit price per MGal for Water for Embankment.

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

UNCLASSIFIED EXCAVATION

Material designated as Unclassified Excavation will be reused as fill material for construction of embankment.

The plan shown quantity will be the basis of payment. No measurement will be made.

SHRINKAGE FACTOR

Embankment plus 40%

WATER FOR EMBANKMENT

Compaction of earth embankment will be governed by the Specified Density Method.

Water for compaction of earth embankment will be applied at the rate of 10 gallons per cubic yard of embankment. Cost for water will be included in the contract unit price per MGal for Water for Embankment.

UNDERCUTTING

The existing embankment will be undercut in a manner that allows 2 feet of new embankment to be constructed below the new finished subgrade top. The remaining new embankment will be benched in to the existing inslope as per Section 120.3 B.2 of the Specifications.

GENERAL GEOLOGY

The project alignment traverses glacial terrain typical of eastern South Dakota. Included within this terrain may be areas of loess, shale, sand, gravel, glacial till and boulder till. As is the case with most glacial terrain, the material throughout the project can vary greatly in a short distance.

CLASSIFICATION OF EXCAVATION

Most of the material encountered should be able to be excavated using conventional methods associated with normal Unclassified Excavation. Muck Excavation will be required at the areas shown in the plans or as directed by the Engineer.

CONTINUOUS BENCHING

Embankment will be continuously benched at locations shown on the cross sections. Equipment will be sized appropriately to construct benches in accordance with Section 120 of the Specifications without impacting mainline pavement. Excavation required for benching will be classified as Unstable Excavation. Material excavated from benches will be suitable for use in embankment construction. A quantity of Unstable Excavation has been included in the Table of Earthwork Quantities.

UNSTABLE MATERIAL EXCAVATION

The areas of unstable material excavation are drawn on the cross sections with a normal depth of 2 feet. The estimated quantity of unstable material excavation will be paid for at the contract unit price per cubic yard for Unclassified Excavation.

All areas designated as Unstable will be excavated. The unstable material excavated will be placed outside the subgrade shoulder in the fill section.

Field measurement of unstable material excavation will not be made. However, if there are additional areas of unstable material excavation other than what is shown in the plans, the Engineer will direct removal of these areas and the additional areas will be measured according to the Engineer.

TABLE OF UNSTABLE MATERIAL EXCAVATION

Station	to	Station	L/R	Depth Ft	Quantity CuYds
855+40		869+00	R	2' Continuously Benched	5557

MUCK EXCAVATION

The areas of muck excavation are drawn on the cross sections with a normal depth of 3 feet.

Muck excavation consists of the removal of highly organic and/or highly saturated material from the designated areas shown on the cross sections. Highly organic muck material will not be used in the embankment but may be used as topsoil. Non-organic muck material may be used as embankment outside of the fill subgrade shoulder if it is properly handled and dried prior to placement in the embankment.

Field measurement of muck excavation will not be made unless the Engineer orders additional excavation, or when the Engineer determines, in accordance with Section 120.3 A.1 of the Specifications, that the classification of excavation be changed.

If the areas designated as muck excavation can be removed with similar equipment and procedures as used for unclassified excavation, the material will be measured and paid for as Unclassified Excavation.

TABLE OF MUCK EXCAVATION

Station	to	Station	L/R	Depth Ft	Quantity CuYds
868+75		870+25	R	3	71

EROSION REPAIR IN THE MEDIAN

During completion of the median guardrail embankment, the Contractor will also repair and reshape the eroded area in the median from 858+49 to 870+99 back to the typical median cross section.

Cost for repairing and reshaping will be incidental to contract unit price for Contractor Furnished Borrow Excavation. Cost for seeding and mulching this area will be included in the contract unit prices for Permanent Seeding and Mulching.

GRAVEL CUSHION

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

WATER FOR COMPACTION

The moisture content for compaction of the Gravel Cushion will be approximately optimum moisture of the material. The quantity for Water for Granular Material is based on 5% of the quantity of Gravel Cushion.

RESTORATION OF GRAVEL CUSHION

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

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

Cost for this work will be incidental to the contract unit price per square yard for 11" Nonreinforced PCC Pavement.

TABLE OF EARTHWORK QUANTITIES

	EXCAVATION					EMBANKMENT	
LOCATION	NABI EXCAVATION CUYDS	NABI UNSTABLE MATERIAL EXCAVATION CUYDS	UNDERCUT CUYDS	UNCLASSIFIED EXCAVATION CUYDS	MUCK EXCAVATION CUYDS	NABI EMBANKMENT CUYDS	CONTRACTOR FURNISHED BORROW EXCAVATION CUYDS
WB Deceleration Lane Taper	121	-	-	121	-	-	-121
EB Acceleration Lane & Taper	335	5557	2773	8665	71	17638	8973
WB Guardrail Embankment	-	-	-	-	-	2010	2010
EB Guardrail Embankment	-	-	-	-	-	310	310
TOTALS:	**456**	**5557**	**2773**	**8786**	**71**	**19958**	**11172**

NABI - Not a Bid Item

11" NONREINFORCED PCC PAVEMENT

The aggregate may require screening as determined by the Engineer.

The concrete mix used in the Portland Cement Concrete Pavement will conform to Section 380. The Contractor will submit a mix design for approval at least 2 weeks prior to use.

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

The Contractor will be required to place or insert No. 5 x 24" epoxy coated deformed tie bars in the longitudinal joints as detailed in the plans. Cost for this will work be incidental to the contract unit price per square yard for 11" Nonreinforced PCC Pavement.

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

The transverse construction joints will be handled in accordance with Standard Plate 380.15.

All driving surfaces of the mainline paving will be longitudinally tined from 6" each side of centerline pavement marking to 6" inside the outside pavement marking. All other areas will be textured as directed by the Engineer.

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

STEEL BAR INSERTION (NRCP)

Steel bars will conform to Section 1010.

The Contractor will insert the steel bars (1½" x 18" epoxy coated plain round dowel bars on 12" centers for transverse joints and No. 5 x 24" epoxy coated deformed tie bars on 30" centers for longitudinal joints) into drilled holes in the existing concrete pavement. The methods and material used to anchor the steel bar in the drilled hole will be as per Section 380.

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

Cost for this work will be included in the contract unit price per each for Insert Steel Bar in PCC Pavement.

ALKALI SILICA REACTIVITY

Fine aggregate will conform to Section 800.2 D Alkali Silica Reactivity (ASR) Requirements.

Below is a list of known fine aggregate sources and the average corresponding 14-day expansion values (as of 8-30-2023):

Source	Location	Expansion Value
Bachman	Winner, SD	0.335*
Bitterman	Delmont, SD	0.316*
Concrete Materials	Corson, SD	0.146
Concrete Materials - Vellek Pit	Yankton, SD	0.411**
Croell	Hot Springs, SD	0.089
Croell	Wasta, SD	0.212
Emme Sand & Gravel	Oneil, NE	0.217
Fisher S&G – Blair Pit	W of Vale, SD	0.171
Fisher S&G - Mickelson Pit	E of Nisland, SD	0.129
Fisher S&G - Vallery Pit	Nisland, SD	0.110
Fisher S&G	Rapid City, SD	0.092
Fisher S&G	Spearfish, SD	0.053
Fisher S&G	Wasta, SD	0.159
Fuchs	Pickstown, SD	0.275*
Henning – Tilstra Pit	Ash Creek, MN	0.199
Higman	Hudson, SD	0.187
Jensen	Herried, SD	0.276*
L.G. Everist	Akron, IA	0.257*
L.G. Everist	Brookings, SD	0.297*
L.G. Everist – Ode Pit	E Sioux Falls, SD	0.215
L.G. Everist – Nelson Pit	NE Sioux Falls, SD	0.156
L.G. Everist	Hawarden, IA	0.176
L.G. Everist	Summit, SD	0.184
Mark's S&G – Moerke Pit	Underwood, MN	0.165
Morris – Birdsall	Blunt, SD	0.229
Morris - Leesman	Blunt, SD	0.231
Morris - Richards Pit	Onida, SD	0.188
Morris - Shawn's Pit	E of Sturgis, SD	0.186
Northern Concrete Agg.	Rauville, SD	0.113
Northern Concrete Agg.	Luverne, MN	0.133
Opperman - Gunvordahl Pit	Burke, SD	0.363*

ALKALI SILICA REACTIVITY (CONTINUED)

Source	Location	Expansion Value
Opperman - Cahoy Pit	Herrick, SD	0.307*
Opperman - Jones Pit	Burke, SD	0.321*
Opperman - Randall Pit	Pickstown, SD	0.230
Pete Lien & Sons	Creston, SD	0.158
Pete Lien & Sons	Oral, SD	0.157
Pete Lien & Sons	Wasta, SD	0.226
Simon Materials - Beltline Pit	Scottsbluff, NE	0.277*
Thorpe Pit	Britton, SD	0.098
Wagner Building Supplies	Pickstown (Wagner), SD	0.251*
Winter Brothers- Whitehead Pit	Brookings, SD	0.197

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

The Department will use the running average of the last three or fewer known expansion test results for determining acceptability of the source. These expansion results are reported in the preceding table. Additional testing, when requested by the Contractor, will be performed by the Department at the Contractor's expense.

The values listed in the table are intended for use in bidding. If a previously tested pit by SDDOT with a test value less than 0.250 is discovered after letting to be 0.250 or greater, then the Department will accept financial responsibility if higher costs are incurred due to higher percent of fly ash requirement.

RUMBLE STRIPS

Rumble Strips will not be installed on or adjacent to acceleration / deceleration lanes / tapers.

Rumble Strips will be installed on the median shoulder throughout the length of the shoulder strengthening area.

SURFACING THICKNESS DIMENSIONS

At those locations where material must be placed to achieve a required elevation, the depth/quantity may be varied to achieve the required elevation.

ASPHALT CONCRETE COMPOSITE

Asphalt for Prime will not be required.

Asphalt for flush seal SS-1h or CSS-1h will be applied to the top of the top lift of Asphalt Concrete Composite. Asphalt for flush seal will be applied at a rate of 0.05 gallons per square yard except that over rumble strips the rate will be 0.075 gallons per square yard . The Asphalt for flush seal will be applied for the full width of the top layer of Asphalt Concrete Composite including bevels. Sand for flush seal will not be required.

FLUSH SEAL

Application of the flush seal will be completed within 10 working days following completion of the asphalt concrete resurfacing.

Application of flush seal may be eliminated by the Engineer. If the paved surface remains tight, the Engineer will notify the Contractor as soon as possible that the flush seal is unnecessary.

MEMBRANE SEALANT EXPANSION JOINTS

TABLE OF 3" MEMBRANE SEALANT EXPANSION JOINTS

WB Lanes STA	WB Lanes Location Description	MEMBRANE SEALANT EXPANSION JOINT	EB Lanes STA	EB Lanes Location Description	MEMBRANE SEALENT EXPANSION JOINT
852+65	W Edge of Sleeper Slab Hat, W of Bridge	42'	853+07	W Edge of Sleeper Slab Hat, W of Bridge	50'
854+76	E Edge of Sleeper Slab Hat, E of Bridge	40'	855+16	E Edge of Sleeper Slab Hat, E of Bridge	46'
	WB Lanes Totals:	**82'**		**EB Lanes Totals:**	**96'**
	3" Membrane Sealant Expansion Joint Total:	**178'**			

REMOVING CORRUGATED METAL PIPE

When it is necessary to remove a portion of CMP, it may be cut with a torch. If the culvert is cut with a torch, it will be painted with a galvanizing paint approved by the Engineer.

The Contractor is advised of the risk of lead exposure when cutting galvanized paint. The Contractor should plan his/her operations accordingly and inform employees of hazards of lead exposure.

Cost for this work will be included in the contract unit price per foot for Remove Pipe Culvert.

DROP INLETS, COLLARS, AND FRAMES & GRATES

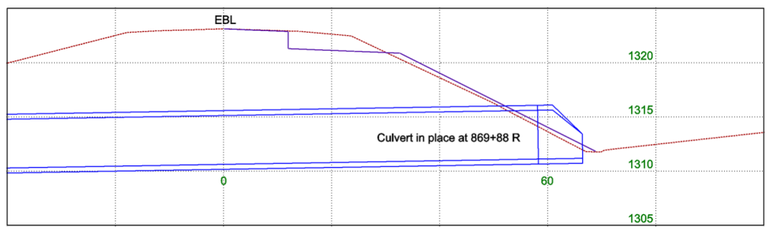
WB at End Bridge Left:
Remove and dispose of the existing drop inlet frame and grate and collar. Retain the existing drop inlet for reuse. A Type A frame and grate will be set on the drop inlet collar. The elevation of the frame and grate will be flush with the top of the finished bridge approach slab. Any further adjustments to the elevation will be accomplished with bricks and mortar. Cost for the adjustment work will be incidental to contract unit price per each for Adjust Drop Inlet.

EB at End Bridge Right:
Remove and dispose of the existing drop inlet, drop inlet frame and grate and collar. In order to remove the drop inlet and place a new drop inlet, a length of 12” CMP will need to be removed (actual length to be determined on construction). A Type A frame and grate will be set on a new drop inlet collar atop a new 2- x 3’ Type B Drop Inlet. The elevation of the frame and grate will be flush with the top of the finished bridge approach slab.

Payment for the frame and grates will be at the contract unit price per each Type A Frame & Grate.

CULVERT IN PLACE AT EBL 869+88 R

Fill depth within the vicinity of this culvert is less than 1’. The earthwork within the vicinity of this culvert must be accomplished without disturbing the culvert.



Any damage to the culvert as a result of the Contractor’s operations will be replaced in-kind at the Contractor’s expense.

PERMANENT SEEDING

Type G Permanent Seed Mixture will consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana, Walsh	7
Switchgrass	Dacotah, Forestburg, Nebraska 28, Pathfinder, Summer, Sunburst, Trailblazer	3
Indiangrass	Holt, Tomahawk, Chief, Nebraska 54	3
Big Bluestem	Bison, Bonilla, Champ, Sunnyview, Rountree, Bonanza	3
Oats or Spring Wheat: April through May. Winter Wheat: August through November.		10
	Total:	26

The areas to be seeded and mulched are estimated at 3.7 acres.

MULCHING (GRASS HAY OR STRAW)

If the Contractor uses a no-till drill, mulch may be applied prior to seeding and the mulch can then be punched into the soil by the no-till drill. If the Contractor uses this process, the no-till drill seeding will be completed immediately following the mulch application and the mulch will be punched into the soil at a 3-inch depth.

MYCORRHIZAL INOCULUM

Mycorrhizal inoculum will consist of mycorrhizal fungi spores and mycorrhizal fungi-infected root fragments in a solid carrier. The carrier may include organic materials, calcinated clay, or other materials consistent with application and good plant growth. The supplier will provide certification of the fungal species claimed and the live propagule count. The inoculum will include a minimum 25% the fungal species *Rhizophagus intraradices*. The remaining 75% may include other endomycorrhizal fungal species.

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

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

Product	Manufacturer
MycoApply	Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 www.mycorrhizae.com
AM 120 Multi Species Blend	Reforestation Technologies Int. Gilroy, CA Phone: 1-800-784-4769 www.reforest.com
LALRISE Prime and Max WP	Lallemand Specialties Inc. Milwaukee, WI Phone: 1-844-590-7781 www.lallemandplantcare.com

EROSION CONTROL WATTLE

If in the opinion of the Engineer, measures are necessary to restrain the flow of runoff and sediment, erosion control wattles will be installed at locations determined by the Engineer during construction. Refer to Standard Plate 734.06 for details.

The Contractor will provide certification that the erosion control wattles do not contain noxious weed seeds.

An estimated quantity of erosion control wattles will remain on the project until vegetation has been established. It is estimated that some of the erosion control wattles will remain on the project to decompose.

The erosion control wattle provided will be from the approved product list. The approved product list for erosion control wattle may be viewed at the following internet site:

http://apps.sd.gov/HC60ApprovedProducts/main.aspx

STORMWATER POLLUTION PREVENTION PLAN CHECKLIST

*(The numbers left of the title headings are **reference numbers** to the GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES (Stormwater Permit))*

5.3 (2): STAFF TRAINING/SWPPP IMPLEMENTATION

To promote stormwater management awareness specific for this project, the Contractor's Erosion Control Supervisor should provide correspondence of how the SWPPP will be implemented. The Contractor's Erosion Control Supervisor is responsible for providing this information at the preconstruction meeting, and subsequently completing an attendance log, which should identify site-specific implementation of the SWPPP and the names of the personnel who attended the preconstruction meeting. Documentation of the preconstruction meeting will be filed with the SWPPP documents.

5.3 (3): DESCRIPTION OF CONSTRUCTION ACTIVITIES

- **5.3 (3a): Project Limits** (See Title Sheet)
- **5.3 (3a): Project Description** (See Title Sheet)
- **5.3 (4): Site Map(s)** (See Title Sheet and Plans)
- **Major Soil Disturbing Activities** (check all that apply)
  - ☐ Clearing and grubbing
  - ☒ Excavation/borrow
  - ☒ Grading and shaping
  - ☒ Filling
  - ☐ Other (describe):
- **5.3 (3b): Total Project Area** 14 Acres
- **5.3 (3b): Total Area to be Disturbed** 3.7 Acres
- **5.3 (3c): Maximum Area Disturbed at One Time** 2 Acres
- **5.3 (3d): Existing Vegetative Cover (%)** 90%
- **5.3 (3d): Description of Vegetative Cover** Typical Eastern SD native and introduced roadside vegetation
- **5.3 (3e): Soil Properties:** A-6, A-7-6
- **5.3 (3f): Name of Receiving Water Body/Bodies** None
- **5.3 (3g): Location of Construction Support Activity Areas**

5.3 (3h): ORDER OF CONSTRUCTION ACTIVITIES

- **Special sequencing requirements** (see sheet).

The Contractor will enter the Estimated Start Date.

Description	Estimated Start Date
Install stabilized construction entrance(s).	
Install perimeter protection where runoff may exit site.	
Install perimeter protection around stockpiles.	
Install channel and ditch bottom protection.	
Clearing and grubbing.	
Remove and stockpile topsoil.	
Stabilize disturbed areas.	
Install utilities, storm sewers, curb and gutter.	
Install inlet and culvert protection after completing storm drainage and other utility installations.	
Final grading.	
Final paving.	
Removal of protection devices.	
Reseed areas disturbed by removal activities.	

5.3 (5): DESCRIPTION AND MAINTENANCE OF CONTROL MEASURES

All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report. Include the technical reasoning for selecting each control. (check all that apply)

Perimeter Controls (See Detail Plan Sheets)

Description	Estimated Start Date
☒ Natural Buffers (within 50 ft of Waters of State)	
☐ Silt Fence	
☒ Erosion Control Wattles	
☐ Temporary Berm / Windrow	
☐ Floating Silt Curtain	
☐ Stabilized Construction Entrances	
☐ Entrance/Exit Equipment Tire Wash	
☐ Other:	

Structural Erosion and Sediment Controls

Description	Estimated Start Date
☐ Silt Fence	
☐ Temporary Berm/Windrow	
☐ Erosion Control Wattles	
☐ Temporary Sediment Barriers	
☐ Erosion Bales	
☐ Temporary Slope Drain	
☐ Turf Reinforcement Mat	
☐ Riprap	
☐ Gabions	
☐ Rock Check Dams	
☐ Sediment Traps/Basins	
☐ Culvert Inlet Protection	
☐ Transition Mats	
☐ Median/Area Drain Inlet Protection	
☐ Curb Inlet Protection	
☐ Interceptor Ditch	
☐ Concrete Washout Facility	
☐ Work Platform	
☐ Temporary Water Barrier	
☐ Temporary Water Crossing	
☐ Permanent Stormwater Ponds	
☐ Permanent Open Vegetated Swales	
☐ Natural Depressions to allow for Infiltration	
☐ Sequential Systems that combine several practices	
☐ Other:	

Dust Controls

Description	Estimated Start Date
☐ Tarps & Wind impervious fabrics	
☐ Watering	
☐ Stockpile location/orientation	
☐ Dust Control Chlorides	
☐ Other	

Dewatering BMPs

Description	Estimated Start Date
☐ Sediment Basins	
☐ Dewatering bags	
☐ Weir tanks	
☐ Temporary Diversion Channel	
☐ Other:	

Stabilization Practices (See Detail Plan Sheets)

(Stabilization measures will begin the following work day whenever earth disturbing activity on any portion of the site has temporarily or permanently ceased. Temporary stabilization will be completed as soon as practicable but no later than 14 days after initiating soil stabilization activities (**3.18**))

Description	Estimated Start Date
☐ Vegetation Buffer Strips	
☐ Temporary Seeding (Cover Crop Seeding)	
☒ Permanent Seeding	
☐ Sodding	
☐ Planting (Woody Vegetation for Soil Stabilization)	
☒ Mulching (Grass Hay or Straw)	
☐ Fiber Mulching (Wood Fiber Mulch)	
☐ Soil Stabilizer	
☐ Bonded Fiber Matrix	
☐ Fiber Reinforced Matrix	
☐ Erosion Control Blankets	
☐ Surface Roughening (e.g. tracking)	
☐ Other:	

Wetland Avoidance

Will construction and/or erosion and sediment controls impinge on regulated wetlands? Yes ☐ No ☒ If yes, the structural and erosion and sediment controls have been included in the total project wetland impacts and have been included in the 404 permit process with the USACE.

5.3 (6): PROCEDURES FOR INSPECTIONS

- Inspections will be conducted at least once every 7 days.
- All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report.
- Silt fence will be inspected for depth of sediment and for tears to ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches $^1/_3$ of the height of the silt fence.
- Sediment basins and traps will be checked. Sediment will be removed when depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction.
- Check dams will be inspected for stability. Sediment will be removed when depth reaches ½ the height of the dam.
- All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations.
- Inspection and maintenance reports will be prepared on form DOT 298 for each site inspection, this form will also be used to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents.
- The SDDOT Project Engineer and Contractor's Erosion Control Supervisor are responsible for inspections. Maintenance and repair activities are the responsibility of the Contractor. The SDDOT Project Engineer will complete the inspection and maintenance reports and distribute copies per the distribution instructions on DOT 298.

5.3 (7): POST CONSTRUCTION STORMWATER MANAGEMENT

Stormwater management will be handled by temporary controls outlined in "DESCRIPTION AND MAINTENANCE OF CONTROL MEASURES" above, and any permanent controls needed to meet permanent stormwater management needs in the post construction period will be shown in the plans and noted as permanent.

5.3 (8): POLLUTION PREVENTION PROCEDURES

5.3 (8a): Spill Prevention and Response Procedures

➢ **Material Management**

- Housekeeping
  - Only needed products will be stored on-site by the Contractor.
  - Except for bulk materials the contractor will store all materials under cover and/or in appropriate containers.
  - Products must be stored in original containers and labeled.
  - Material mixing will be conducted in accordance with the manufacturer's recommendations.
  - When possible, all products will be completely used before properly disposing of the container off-site.
  - The manufacturer's directions for disposal of materials and containers will be followed.
  - The Contractor's site superintendent will inspect materials storage areas regularly to ensure proper use and disposal.
  - Dust generated will be controlled in an environmentally safe manner.

- Hazardous Materials
  - Products will be kept in original containers unless the container is not resealable and provide secondary containment as applicable.
  - Original labels and material safety data sheets will be retained in a safe place to relay important product information.
  - If surplus product must be disposed of, manufacturer's label directions for disposal will be followed.
  - Maintenance and repair of all equipment and vehicles involving oil changes, hydraulic system drain down, de-greasing operations, fuel tank drain down and removal, and other activities which may result in the accidental release of contaminants will be conducted on an impervious surface and under cover during wet weather to prevent the release of contaminants onto the ground.
  - Wheel wash water will be collected and allowed to settle out suspended solids prior to discharge. Wheel wash water will not be discharged directly into any stormwater system or stormwater treatment system.
  - Potential pH-modifying materials such as: bulk cement, cement kiln dust, fly ash, new concrete washings, concrete pumping, residuals from concrete saw cutting (either wet or dry), and mixer washout waters will be collected on site and managed to prevent contamination of stormwater runoff.

➢ **Spill Control Practices**

In addition to the previous housekeeping and management practices, the following practices will be followed for spill prevention and cleanup if needed.

- For all hazardous materials stored on site, the manufacturer's recommended methods for spill cleanup will be clearly posted. Site personnel will be made aware of the procedures and the locations of the information and cleanup supplies.
- Appropriate cleanup materials and equipment will be maintained by the Contractor in the materials storage area on-site. As appropriate, equipment and materials may include items such as brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for cleanup purposes.
- All spills will be cleaned immediately after discovery and the materials disposed of properly.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- After a spill a report will be prepared describing the spill, what caused it, and the cleanup measures taken. The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring, as well as clean up instructions in the event of reoccurrences.
- The Contractor's site superintendent, responsible for day-to-day operations, will be the spill prevention and cleanup coordinator.

➢ **Spill Response**

The primary objective in responding to a spill is to quickly contain the material(s) and prevent or minimize migration into stormwater runoff and conveyance systems. If the release has impacted on-site stormwater, it is critical to contain the released materials on-site and prevent their release into receiving waters. If a spill of pollutants threatens stormwater or surface water at the site, the spill response procedures outlined below must be implemented in a timely manner to prevent the release of pollutants.

- The Contractor's site superintendent will be notified immediately when a spill or the threat of a spill is observed. The superintendent will assess the situation and determine the appropriate response.
- If spills represent an imminent threat of escaping erosion and sediment controls and entering receiving waters, personnel will be directed to respond immediately to contain the release and notify the superintendent after the situation has been stabilized.
- Spill kits containing appropriate materials and equipment for spill response and cleanup will be maintained by the Contractor at the site.
- If oil sheen is observed on surface water (e.g. settling ponds, detention ponds, swales), action will be taken immediately to remove the material causing the sheen. The Contractor will use appropriate materials to contain and absorb the spill. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases.
- If a spill occurs the superintendent or the superintendent's designee will be responsible for completing the spill reporting form and for reporting the spill to SDDANR.
- Personnel with primary responsibility for spill response and cleanup will receive training by the Contractor's site superintendent or designee. The training must include identifying the location of the spill kits and other spill response equipment and the use of spill response materials.
- Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities.

5.3 (8b): WASTE MANAGEMENT PROCEDURES

➢ **Waste Disposal**

- All liquid waste materials will be collected and stored in approved sealed containers. All trash and construction debris from the site will be deposited in the approved containers. Containers will be serviced as necessary, and the trash will be hauled to an approved disposal site or licensed landfill. All onsite personnel will be instructed in the proper procedures for waste disposal and notices stating proper practices will be posted. The Contractor is responsible for ensuring waste disposal procedures are followed.

➢ **Hazardous Waste**

- All hazardous waste materials will be disposed of in a manner specified by local or state regulations or by the manufacturer. Site personnel will be instructed in these practices, and the Contractor will be responsible for seeing that these practices are followed.

➢ **Sanitary Waste**

- Portable sanitary facilities will be provided on all construction sites. Sanitary waste will be collected from the portable units which must be secured to prevent tipping and serviced in a timely manner by a licensed waste management Contractor or as required by any local regulations.

5.3 (9): CONSTRUCTION SITE POLLUTANTS

The following materials or substances are expected to be present on the site during the construction period. These materials will be handled as noted under the heading "POLLUTION PREVENTION PROCEDURES" (check all that apply).

- ☐ Concrete and Portland Cement
- ☐ Detergents
- ☐ Paints
- ☐ Metals
- ☐ Bituminous Materials
- ☐ Petroleum Based Products
- ☐ Diesel Exhaust Fluid
- ☐ Cleaning Solvents
- ☐ Wood
- ☐ Cure
- ☐ Texture
- ☐ Chemical Fertilizers
- ☐ Other:

Product Specific Practices

- **Petroleum Products**
  All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled.

- **Fertilizers**
  Fertilizers will be applied only in the amounts specified by the SDDOT. Once applied, fertilizers will be worked into the soil to limit the exposure to stormwater. Fertilizers will be stored in an enclosed area. The contents of partially used fertilizer bags will be transferred to sealable containers to avoid spills.

- **Paints**
  All containers will be tightly sealed and stored when not required for use. The excess will be disposed of according to the manufacturer's instructions and any applicable state and local regulations.

- **Concrete Trucks**
  Contractors will provide designated truck washout facilities on the site. These areas must be self-contained and not connected to any stormwater outlet of the site. Upon completion of construction, the area at the washout facility will be properly stabilized.

5.3 (10): NON-STORMWATER DISCHARGES

The following non-stormwater discharges are anticipated during the course of this project (check all that apply).

- ☐ Discharges from water line flushing.
- ☐ Pavement wash-water, where no spills or leaks of toxic or hazardous materials have occurred.
- ☐ Uncontaminated ground water associated with dewatering activities.

5.3 (11): INFEASIBILITY DOCUMENTATION

If it is determined to be infeasible to comply with any of the requirements of the Stormwater Permit, the infeasibility determination must be thoroughly documented in the SWPPP.

7.0: SPILL NOTIFICATION

In the event of a spill, the Contractor's site superintendent will make the appropriate notification(s), consistent with the following procedures:

- A release or spill of a regulated substance (includes petroleum and petroleum products) must be reported to SDDANR immediately **if any one of the following** conditions exists:
  - The release or spill threatens or is able to threaten waters of the state (surface water or ground water)
  - The release or spill causes an immediate danger to human health or safety
  - The release or spill exceeds 25 gallons
  - The release or spill causes a sheen on surface water
  - The release or spill of any substance that exceeds the ground water quality standards of ARSD Chapter 74:54:01
  - The release or spill of any substance that exceeds the surface water quality standards of ARSD Chapter 74:51:01
  - The release or spill of any substance that harms or threatens to harm wildlife or aquatic life
  - The release or spill is required to be reported according to Superfund Amendments and Reauthorization Act (SARA) Title III List of Lists, Consolidated List of Chemicals Subject to Reporting Under the Emergency Planning and Community Right to Know Act, US Environmental Protection Agency.

- To report a release or spill, call SDDANR at 605-773-3296 during regular office hours (8 a.m. to 5 p.m. Central Standard Time). To report the release after hours, on weekends or holidays, call South Dakota Emergency Management at 605-773-3231. Reporting the release to SDDANR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, you must also contact local authorities to determine the local reporting requirements for releases. A written report of the unauthorized release of any regulated substance, including quantity discharged, and the location of the discharge will be sent to SDDANR within 14 days of the discharge.

5.4: SWPPP CERTIFICATIONS

➢ **Certification of Compliance with Federal, State, and Local Regulations**

The Storm Water Pollution Prevention Plan (SWPPP) for this project reflects the requirements of all local municipal jurisdictions for storm water management and sediment and erosion control as established by ordinance, as well as other state and federal requirements for sediment and erosion control plans, permits, notices or documentation as appropriate.

➢ **South Dakota Department of Transportation**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



_____

Authorized Signature (See the General Permit, Section 7.4 (1))

➢ **Prime Contractor**

This section is to be executed by the General Contractor after the award of the contract. This section may be executed any time there is a change in the Prime Contractor of the project.

I certify under penalty of law that this document and all attachments will be revised or maintained under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____

Authorized Signature

CONTACT INFORMATION

The following personnel are duly authorized representatives and have signatory authority for modifications made to the SWPPP:

➢ **Contractor Information**:

- Prime Contractor Name: _____
- Contractor Contact Name: _____
- Address: _____
- _____
- City: _____State: _____Zip: _____
- Office Phone: _____Field: _____
- Cell Phone: _____Fax: _____

➢ **Erosion Control Supervisor**

- Name: _____
- Address: _____
- _____
- City: _____State: _____Zip: _____
- Office Phone: _____Field: _____
- Cell Phone: _____Fax: _____

➢ **SDDOT Project Engineer**

- Name: _____
- Business Address: _____
- Job Office Location: _____
- City: _____State: _____Zip: _____
- Office Phone: _____Field: _____
- Cell Phone: _____Fax: _____

➢ **SDDANR Contact Spill Reporting**
- Business Hours Monday-Friday (605) 773-3296
- Nights and Weekends (605) 773-3231

➢ **SDDANR Contact for Hazardous Materials.**
- (605) 773-3153

➢ **National Response Center Hotline**
- (800) 424-8802.

➢ **SDDANR Stormwater Contact Information**
- SDDANR Stormwater (800) 737-8676
- Surface Water Quality Program (605) 773-3351

5.5: REQUIRED SWPPP MODIFICATIONS

➢ **5.5 (1): Conditions Requiring SWPPP Modification**

The SWPPP must be modified, including the site map(s), in response to any of the following conditions:

- When a new operator responsible for implementation of any part the SWPPP begins work on the site.
- When changes to the construction plans, sediment and erosion control measures, or any best management practices on site that are no longer accurately reflected in the SWPPP. This includes changes made in response to corrective actions triggered by inspections.
- To reflect areas on the site map where operational control has been transferred (including the date of the transfer) or has been covered under a new permit since initiating coverage under this general permit.
- If inspections by site staff, local officials, SDDANR, or U.S. EPA determine that SWPPP modifications are necessary for compliance with the Stormwater Permit.
- To reflect any revisions to applicable federal, state, or local requirements that affect the control measures implemented at the site.
- If approved by the Secretary, to reflect any changes in chemical water treatment systems or controls, including the use of a different water treatment chemical, age rates, different areas, or methods of application.

➢ **5.5 (2): Deadlines for SWPPP Modification**

Any required revisions to the SWPPP must be completed within 7 calendar days following any of the items listed above.

➢ **5.5 (3): Documentation of Modifications to the Plan**

All SWPPP modification records are required to be maintained showing the dates of when the modification occurred. The records must include the name of the person authorizing each change and a brief summary of all changes.

➢ **5.5 (4): Certification Requirements**

All modifications made to the SWPPP must be signed and certified as required in Section 7.4.

➢ **5.5 (5): Required Notice to Other Operators**

If there are multiple operators at the site, the Contractor's Erosion Control Supervisor must notify each operator that may be impacted by the change to the SWPPP within 24 hours.

When modifications as described above occur, the SWPPP will be modified to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The SDDOT Project Engineer will modify the SWPPP using the DOT 298 form and drawings on the plan will be modified to reflect the needed changes. Copies of the DOT 298 forms and the SWPPP will be retained on site in a designated place for review throughout the course of the project. A copy of the DOT 298 form will be given to the Contractor Erosion Control Supervisor and a copy will be emailed to the SDDOT Environmental Section in accordance with the DOT 298 Form.

SEQUENCE OF OPERATIONS

The Contractor will submit a sequence of operations for approval two weeks prior to the preconstruction meeting. If changes to the sequence of operations are proposed during the project, these must be submitted for review a minimum of one week prior to potential implementation. Approval for changes to the sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work.

GENERAL TRAFFIC CONTROL

Existing guide, route, informational logo, regulatory, and warning signs will be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging, and resetting of existing traffic control devices, including delineation, will be the responsibility of the Contractor. Cost for this work will be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost will be replaced by the Contractor at no cost to the State.

All temporary traffic control sign locations will be set in the field by the Contractor and verified by the Engineer prior to installation.

All construction operations will be conducted in the general direction of traffic movement.

If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD, whichever is more stringent will be used, as determined by the Engineer.

Unless otherwise stated in these plans, work will not be allowed during hours of darkness.

Fixed location signing placed more than 4 calendar days prior to the start of construction will be covered or laid down until the time of construction. The covers must be approved by the Engineer prior to installation. The cost of materials, labor, and equipment necessary to complete this work will be incidental to other contract items. No separate payment will be made.

All fixed location signs, sign posts, and breakaway bases will be removed within 7 calendar days following pavement marking.

LANE CLOSURES

Interstate lane closures will be removed when work will not be occurring for a period of 3 or more calendar days. Activities that do not involve workers being present, such as curing time for concrete, constitute work. Lane closures will not be set up on a Friday if no work will be occurring on Saturday or Sunday. In these cases, the lane closure will be installed on Monday.

TRAFFIC CONTROL SIGNS

Traffic control signs have been included in a table for each site. Payment will only be for those signs used on each site.

WORK ZONE SPEED REDUCTION

The Department is required to obtain a speed reduction resolution prior to the installation of any SPEED LIMIT (R2-1) signs shown on standard plate 634.63. To provide adequate time for the resolution to be enacted, the Contractor will inform the Engineer a minimum of 3 weeks prior to the scheduled installation of any work zone speed reduction signs on the project. The information provided by the Contractor will include the anticipated date of sign installation, the newly reduced speed limit, the location of the work zone, and the anticipated completion date of work requiring the speed reduction.

TEMPORARY RAISED PAVEMENT MARKERS

Temporary raised pavement markers will be used for marking edge lines, lane lines, and centerlines. Temporary raised pavement markers will be used on all new permanent surfacing sections of roadway and on existing surfacing where temporary marking locations are different than existing marking locations, unless noted or as directed by the Engineer.

Temporary raised pavement markers will be attached to the roadway surface with a flexible non-permanent bituminous adhesive capable of being removed from the roadway surface or with an adhesive approved by the Engineer.

All costs to furnish, install, replace if necessary, and remove the markers will be incidental to the contract unit price per foot for "Temporary Raised Pavement Markers".

PERMANENT PAVEMENT MARKING

The Contractor will be required to repaint all existing pavement markings including centerline, edge line and lane lines. This list is approximate. The Contractor will be required to document and be able to relocate for replacement of the existing markings they are obliterated. The cost to duplicate the existing marking locations will be incidental to the contract unit prices for the various contract items.

HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

All materials will be applied as per manufacturer's recommendations. High build waterborne pavement marking paint will conform to the supplemental specifications for Section 980.1 B.

Reflective media consisting of glass beads as well as bonded core reflective elements will be adhered to the paint.

The bonded core reflective elements will contain either clear or yellow tinted microcrystalline ceramic beads bonded to the outer surface. The bonded core reflective elements will provide a 50/50 blend of dry to wet ratio of reflective element. All microcrystalline ceramic beads bonded to reflective elements will have a minimum index of refraction of 1.8 for dry retroreflectivity and 2.4 for wet retroreflectivity when tested using the liquid oil immersion method.

The Department will take retroreflectivity readings on the pavement marking lines no sooner than 3 days and no later than 30 days after the completion of all line applications required for an individual highway route using a portable retroreflectometer conforming to 30-meter geometry. Retroreflectivity readings will be taken on a test location with cleaning being limited to light hand brooming.

Pavement markings not conforming to the retroreflectivity requirements will be removed and replaced. If replacement of markings cannot be applied within the same year, the Contractor will schedule subject work to be completed no later than June 15th in the following year. Upon replacement, the retroreflectivity testing process will be done again requiring new readings.

The Department will randomly select one test location per mile of each edge line including ramps and one test location per mile of centerline (solid and/or skip line will be considered as one centerline). Three retroreflectivity readings will be taken at each test location. The three readings will be averaged and become the reading for that test location.

Initial readings:

Pavement Marking Color	Minimum Value
White	350 mc/m^2/lux
Yellow	275 mc/m^2/lux

HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT (CONTINUED)

All pavement markings not conforming to the requirements provided in these plans will be considered deficient and will be removed and replaced. Additional retroreflectivity readings will be taken by the Department to determine the limits of removal. The removal will be accomplished using suitable sand blasting or grinding equipment unless the Engineer authorizes other means. The removal process will remove at least 90% of the deficient line, with no excessive scarring of the existing pavement. The removal width will be one inch wider all around the nominal width of the pavement marking to be removed. Removal and replacement of the pavement markings will be at the Contractor's expense, with no cost incurred by the State.

RATES OF MATERIALS FOR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

Solid 4" line = 27.8 Gals/Mile
Dashed 4" line = 7.6 Gal/Mile
Glass Beads = 5.3 Lbs/Gal.
Composite Reflective Elements = 2.1 Lbs/Gal.

All cost for materials, labor and equipment necessary to furnish and install the pavement markings will be incidental to the contract unit price for the respective High Build Waterborne Pavement Marking Paint items.

SURFACE PREPARATION FOR PAVEMENT MARKING

The Contractor will prepare the pavement surface prior to applying the durable pavement marking in accordance with the following.

In areas where the existing groove meets the required depth and existing markings are still in place, the Contractor will clean the existing groove without adding additional depth beyond the required depth for the new pavement marking, including reflective media as noted below.

Description	Specification	Tolerance
Depth of Groove	Marking Thickness[1] + 15 mils	+ 5 mils

[1] Marking thickness will include the thickness of marking material and reflective media.

The cleaning will result in the existing pavement marking being adequately scuffed, abraded, and removed by light grinding or abrasive blasting or both to allow proper adhesion of the new durable pavement marking as per the manufacturer's recommendations to comply with product warranties.

Existing grooves not meeting the required depth will be re-grooved to the required depth for the new pavement marking, including reflective media. Equipment for grooving will be capable of the following:

- Grooving the total width of the groove in one pass or uniform depths with multiple passes.
- Grooving without causing damage to the pavement joints or joint sealant material.
- Provide uniform alignment and depth.
- Moving continuously to permit a mobile traffic work operation.

All costs associated with cleaning of the existing groove, including re-grooving, if needed, will be included in the contract unit price per foot for "Surface Preparation for Pavement Marking". Surface preparation will be measured as 4" equivalent.

TRAFFIC CONTROL MOVABLE CONCRETE BARRIERS

The work at the structure numbers 18-160-107 and 18-160-108 will require traffic control movable concrete barrier to be used during closure of a lane on Interstate 90. Lane closure at structures numbered 18-160-107 and 18-160-108 will require a total of 136 traffic control movable concrete barriers.

Concrete barriers will be provided by the State and are available for pickup from the SDDOT Maintenance Yard. 76 traffic control movable concrete barrier will be available at the SDDOT yard in Mitchell located at 1300 S Ohlman St in Mitchell. 60 traffic control movable concrete barrier will be available at the SDDOT yard in Kimball located ½ mile north of Kimball on SD 45. Traffic control movable concrete barriers will be hauled back to the SDDOT South Maintenance Yard from which they came when they are no longer needed on the project.

Barriers to be adjusted or moved will be disconnected from adjacent barriers to minimize damage to connecting pins. Pins damaged by the Contractor will be replaced at no cost to the Department.

Concrete barrier sections will be placed as depicted in the plans to comply with clear zone requirements and as required by the Engineer. The barriers will be pinned and bolted together as directed by the Engineer.

All costs associated with picking the barriers up from the SDDOT Maintenance Yard, transporting, setting, connecting, and hauling them back to the SDDOT Maintenance Yard will be incidental to the contract unit price per each for Traffic Control Movable Concrete Barrier.

After the initial placement, the concrete barriers may need to be adjusted. Adjustment of the barriers, where they do not need to be loaded on a truck for transport, will be incidental to the contract unit price per each for Traffic Control Movable Concrete Barrier. No additional payment will be made for barriers that are not immediately reset at a new location on the project and stored on-site until they are either reset on the project or returned to the SDDOT as indicated in these plans.

TEMPORARY CONCRETE BARRIER END PROTECTION

Crash attenuators meeting the requirements of NCHRP 350 or MASH TL-3 will be furnished and installed by the Contractor. Attachment of the attenuators to the concrete barriers will be by approved methods.

All costs associated with furnishing, transporting, initial setup, connecting, maintaining, and removing the crash attenuators will be incidental to the contract unit price per each for Temporary Concrete Barrier End Protection.

All costs associated with moving and resetting crash attenuators to accommodate traffic flows after initial set-up will be paid for at the contract unit price per each for Remove & Reset Temporary Concrete Barrier End Protection. All costs associated with removing from initial placement and resetting at a new location will be incidental to the contract unit price per each. No additional payment will be made for crash attenuators that are not immediately reset at a new location on the project and stored on-site until they are either reset or removed from the project as determined by the Engineer. No additional payment will be made for minor adjustments.

The Contractor will have replacement hardware available so that in the event the crash attenuator is hit and made unusable, the crash attenuator can be made functional within 24 hours. The cost of replacement will be incidental to the contract unit price per each for Temporary Concrete Barrier Module Set or Repair Kit. No payment will be made for the Temporary Concrete Barrier Module Set or Repair Kit if no repairs are necessary. Upon completion of the project, crash attenuators will remain the property of the Contractor.

BARRIER MOUNTED LINEAR DELINEATION SYSTEM PANELS

A linear delineation system (LDS) panel will be attached to each barrier section. The color will be the same as the nearest pavement marking, white along outside edgelines or yellow for the left side on one way traffic sections. The LDS will be 34 inches long and 6 inches in height and be constructed of aluminum formed into a shape to provide retroreflective properties across a wide range of angles. It will be sheeted with sheeting meeting the requirements of ASTM D4956 Type XI. The panels will be evenly spaced, with the top of the panel 4 inches below the top of the barrier. Installation will be as per the manufacturer's recommendations. This will allow for easy removal for replacement of damaged panels or to replace with an alternate color. The Contractor will furnish and install one panel along each side of the barrier if any panels are missing from the barriers. Replacement of damaged linear delineation system panels will be furnished and replaced by the Contractor. All costs associated with furnishing, installing, and replacing, if needed, will be incidental to the contract unit price per each for Linear Delineation System Panel, Barrier Mounted.

All LDS panels will remain attached to the barrier sections and will become the property of the State of South Dakota upon completion of the project.

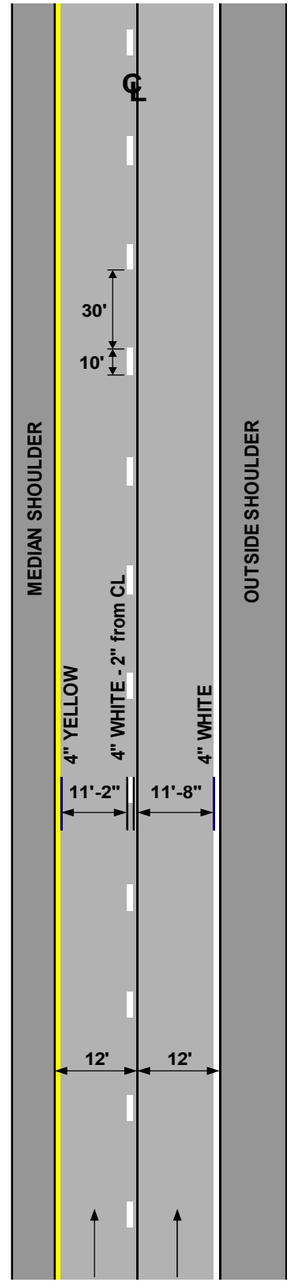
The Contractor will verify the number of LDS panels that will need to be installed or replaced on the Traffic Control Movable Concrete Barriers. The contract amount of LDS panels is an estimate and the full contract amount may not be needed.

Maintaining the linear delineation system, including moving LDS panels from one side of the barrier to the other side of the barrier to match the applicable color of the nearest pavement marking will be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	EXPRESSWAY / INTERSTATE NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R2-1	SPEED LIMIT 80	2	36" x 48"	12.0	24.0
R2-1	SPEED LIMIT 65	6	36" x 48"	12.0	72.0
R2-1	SPEED LIMIT 45	4	36" x 48"	12.0	48.0
R2-6aP	FINES DOUBLE (plaque)	2	36" x 24"	6.0	12.0
W3-5	SPEED REDUCTION AHEAD (65 MPH)	4	48" x 48"	16.0	64.0
W3-5	SPEED REDUCTION AHEAD (45 MPH)	2	48" x 48"	16.0	32.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	4	48" x 48"	16.0	64.0
W4-3	ADDED LANE (symbol)	1	48" x 48"	16.0	16.0
W20-1	ROAD WORK AHEAD	5	48" x 48"	16.0	80.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	4	48" x 48"	16.0	64.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
SPECIAL	EXIT 332 (3 digits) (45º ARROW)	1	60" x 48"	20.0	20.0
G20-2	END ROAD WORK	2	48" x 24"	8.0	16.0
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			544.0

DIVIDED ROADWAY
(ONE DIRECTION SHOWN)



PAVEMENT MARKING

Typical pavement marking as shown on this sheet will be applied throughout the entire length of divided roadway.

Traffic Control will be incidental to the cost of application. The striper and advance or trailing warning vehicle will be equipped with flashing amber lights and advance warning arrow board.

Application rates will be as follows:

DIVIDED ROADWAY (Rates for one line)
Solid Yellow Edgeline Rate = 27.8 Gals./Pass-Mile
Dashed White Centerline Rate = 7.6 Gals./Pass-Mile
Solid White Edgeline Rate = 27.8 Gals./Pass-Mile

ESTIMATED QUANTITIES (BASED ON ONE APPLICATION)	
HIGH BUILD WITH REFLECTIVE ELEMENTS	**QUANTITY**
WHITE	**45 GALLONS**
YELLOW	**20 GALLONS**

Included in the above quantities are:

Additional White (1 Application)		
Description		Gallons
4" Lines	650'	5
8" Lines	-	-
12" Gore Lines	760'	15
Crosswalks	-	-
24" Stop Lines	-	-
24" Hatches	-	-
Solid Areas	-	-
Arrows		
Left Arrows	-	-
Right Arrows	-	-
Straight Arrows	-	-
Combo Arrows	-	-
Lane Drop Arrows	-	-
Messages		
STOP	-	-
STOP AHEAD	-	-
R X R w/ Stop Lines	-	-
SCHOOL X-ING	-	-
Additional White:		20

Additional Yellow (1 Application)		
Description		Gallons
Transitions	-	-
4" Skip Lines	-	-
8" Lines	-	-
12" Lines	-	-
24" Hatches	-	-
Solid Areas	-	-
Additional Yellow:		-

Additional Quantities

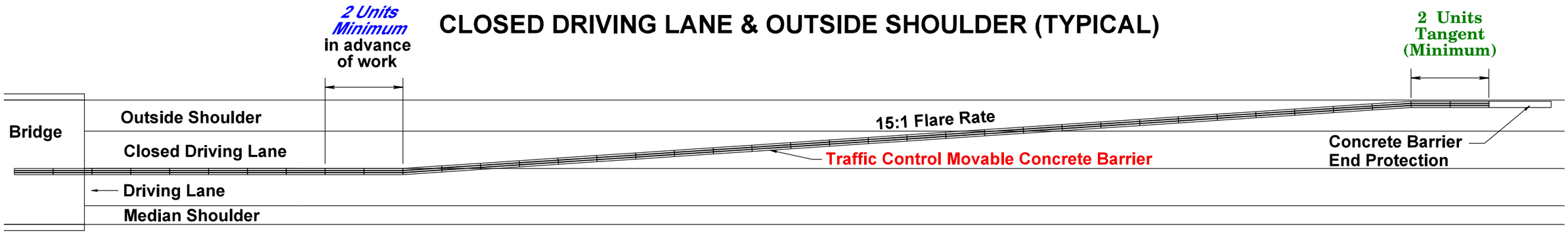
Rates of Coverage:	SqFt/Gal
4", 8" & 12" Lines -	50
24" Lines & Hatches -	30
Arrows, Messages and Solid Areas -	20

All pavement marking dimensions are based on 12' driving lanes.

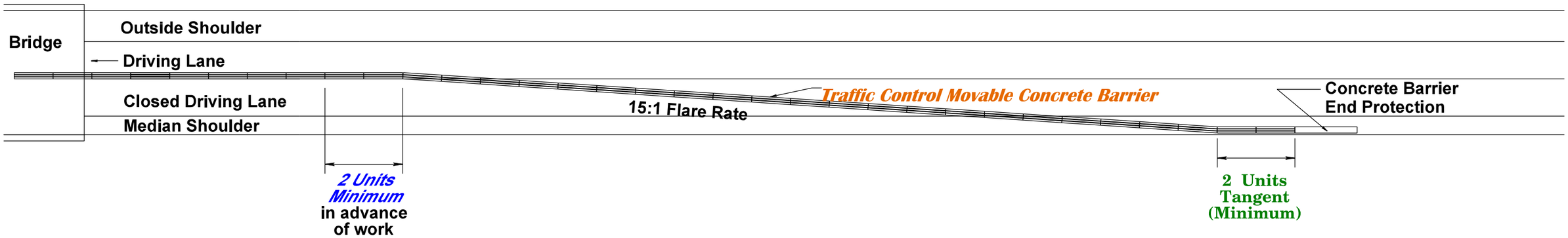
Pavement marking at On Ramps and at Off Ramps will be applied as detailed in these plans.

TRAFFIC CONTROL MOVABLE CONCRETE BARRIER

CLOSED DRIVING LANE & OUTSIDE SHOULDER (TYPICAL)

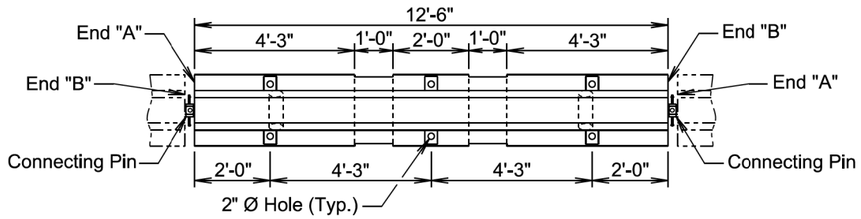


CLOSED DRIVING LANE & MEDIAN SHOULDER (TYPICAL)

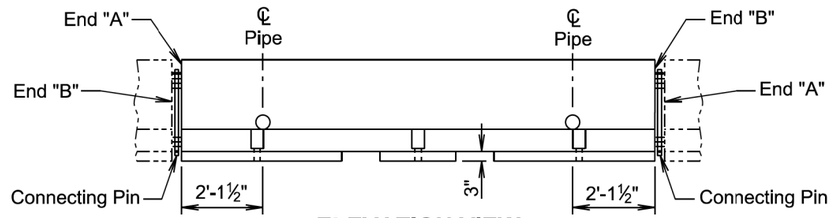


Structure Number	Structure Length + Approach & Shoulder work	**Barrier on Structure**	Work Space Length at Each End of Structure	**Barrier for Work Space**	Taper Length Outside Lane	**Barrier in Taper (Mainline and 10' Shoulder)**	**Tangent Barrier on Shoulder**	**Total Number of Barrier Per Structure/Right Lane Closure**
18-160-108 EBL	260	**21**	125 '	**20**	330 '	**27**	**2**	**70**
18-160-107 WBL	210	**17**	125 '	**20**	330 '	**27**	**2**	**66**
							SUBTOTAL:	**136**

PLOT SCALE - 1:229.583
PLOTTED FROM - TRM111119
PLOT NAME - 1
FILE - ...\DAVS091UTC\TC STD PLATES.DGN



PLAN VIEW



ELEVATION VIEW

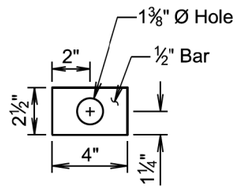
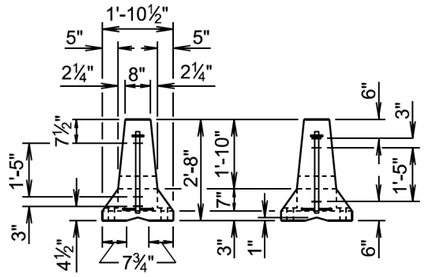
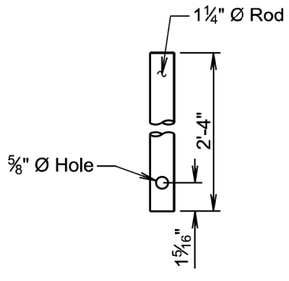


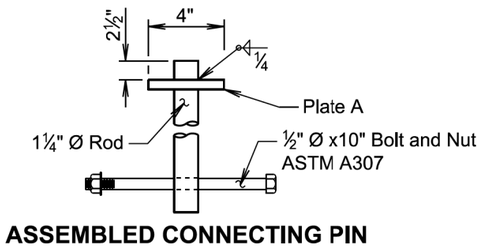
PLATE A



VIEW END A **VIEW END B**



CONNECTING PIN DETAIL



ASSEMBLED CONNECTING PIN

September 14, 2018

Published Date: 2024	SDDOT	TRAFFIC CONTROL MOVABLE CONCRETE BARRIERS (F SHAPE INTERIOR SECTION)	PLATE NUMBER 628.01 Sheet 1 of 2

GENERAL NOTES:

The detailed drawings are for illustrative purpose and depicts the current version of the F shape concrete barrier. If new movable concrete barriers are requested on a project, they will be constructed according to the F shape movable concrete barrier details on standard plate 628.10.

Each movable concrete barrier section weighs 5030 ± pounds.

Each movable concrete barrier section is detailed to provide end "A" to end "B" connection by insertion of a pin through steel loops.

The Jersey shape or any version of the F shape traffic control movable concrete barriers may be used on a project, however, only the same type or version will be used for each run of barriers.

Movable concrete barrier sections will be placed to provide uniform bearing of the sections with the paved surface as approved by the Engineer.

Movable concrete barrier sections will never be moved or lifted using the end loops.

Movable concrete barrier sections that have been damaged will not be used. Barrier sections are considered damaged if the loops are end welded onto existing damaged loops, loops are fractured, or there is exposed rebar from fractured concrete.

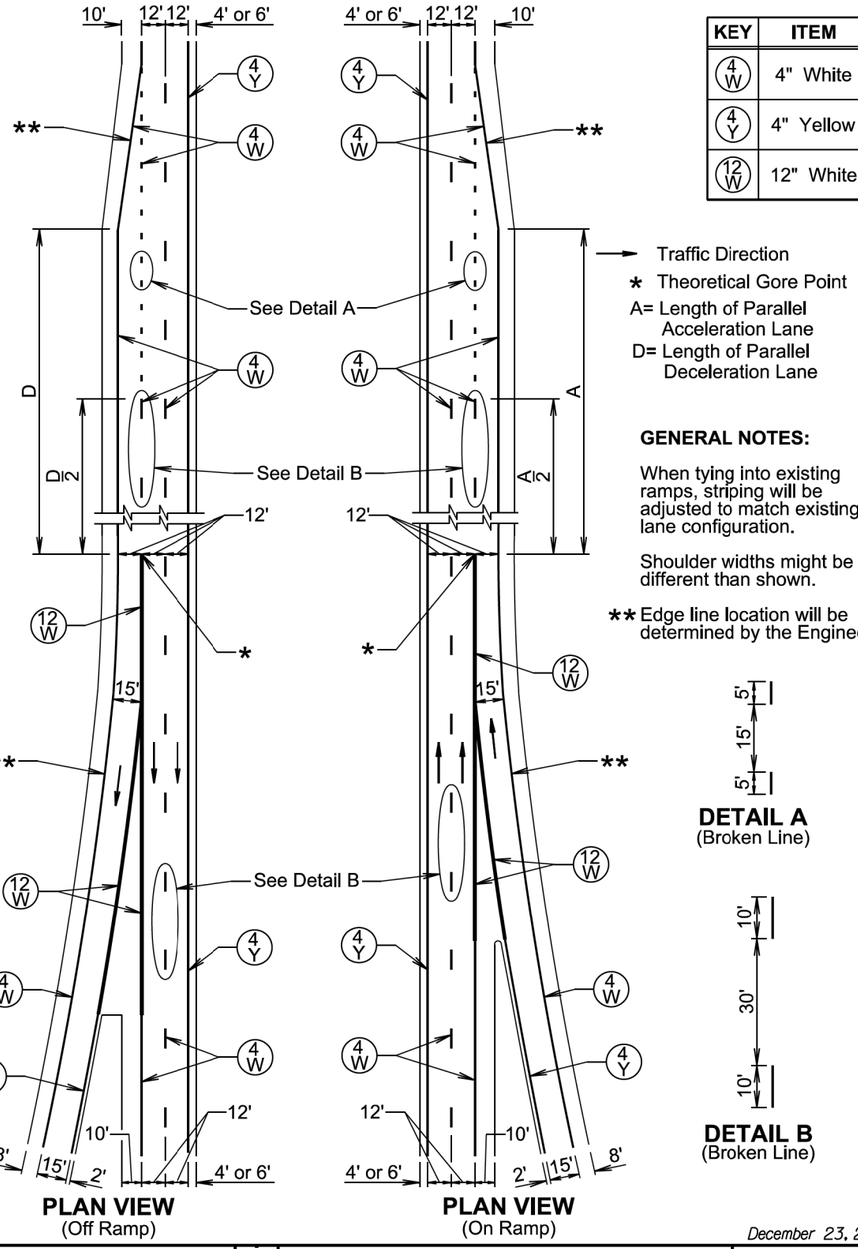
All cost for transporting the barriers from the specified location to the project site, installing, and returning the barriers to the specified location will be incidental to the contract unit price per each for "Traffic Control Movable Concrete Barrier".

If the concrete barriers need to be moved and reset on the project, requiring the barriers to be transported by truck, all cost for removing, transporting, and resetting the barriers will be incidental to the contract unit price per each for "Remove and Reset Traffic Control Movable Concrete Barrier". All cost for small shifts in alignment of the barriers, not requiring the barriers to be transported by truck, will be incidental to various contract items.

September 14, 2018

Published Date: 2024	SDDOT	TRAFFIC CONTROL MOVABLE CONCRETE BARRIERS (F SHAPE INTERIOR SECTION)	PLATE NUMBER 628.01 Sheet 2 of 2

Plot Scale - 1:200
- Plotted From - TRM111119
File - ...\davs\091\0\tctc Std Plates.dgn



KEY	ITEM
4W	4" White
4Y	4" Yellow
12W	12" White

→ Traffic Direction

* Theoretical Gore Point

A= Length of Parallel Acceleration Lane

D= Length of Parallel Deceleration Lane

GENERAL NOTES:

When tying into existing ramps, striping will be adjusted to match existing lane configuration.

Shoulder widths might be different than shown.

** Edge line location will be determined by the Engineer.

DETAIL A
(Broken Line)

DETAIL B
(Broken Line)

December 23, 2019

Published Date: 2024

SDDOT

PAVEMENT MARKING LAYOUT FOR PARALLEL INTERSTATE RAMPS

PLATE NUMBER 633.06

Sheet 1 of 1

* Messages on signs will vary depending on the operation being conducted.

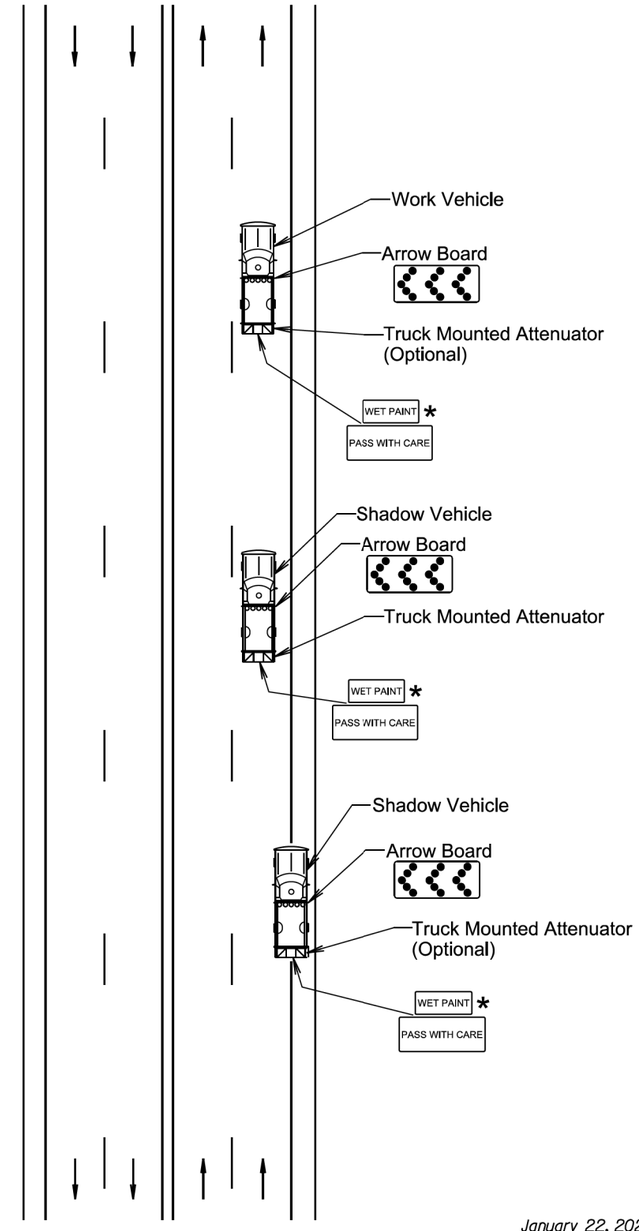
Vehicle-mounted signs will be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs will be covered or turned from view when work is not in progress.

Shadow and Work vehicles will display high-intensity rotating, flashing, oscillating, or strobe lights, flags, signs, or arrow boards.

Vehicle hazard warning signals will not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

Arrow boards will, as a minimum, be Type B, with a size of 60" x 30".

All costs associated with the traffic control for mobile operation including signs, arrow boards and equipment will be incidental to the contract lump sum price for "Traffic Control, Miscellaneous".



January 22, 2021

Published Date: 2024

SDDOT

MOBILE OPERATIONS ON MULTI-LANE HIGHWAYS

PLATE NUMBER 634.08

Sheet 1 of 1

Plot Scale - 1:200
Plotted From - TRM111119
File - ...\davs\091\Ultcltc Std Plates.dgn

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 65	1000
	(A) (B) (C)
70 - 80	1000 1500 2640

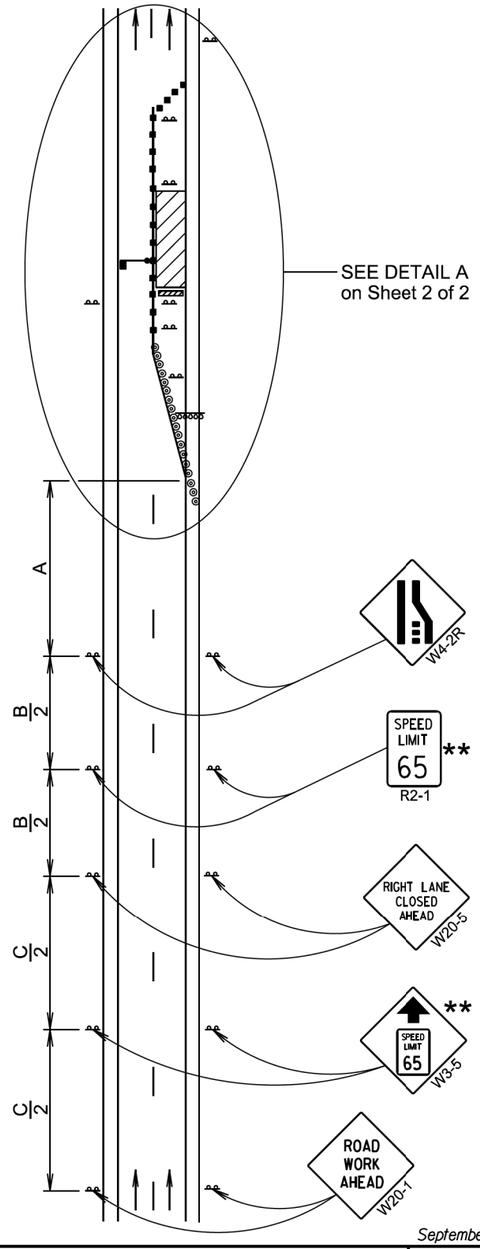
** Speed appropriate for location.

◎ Reflectorized Drum

■ Channelizing Device

ROAD WORK AHEAD sign is only required in advance of the first lane closure.

High speed is defined as having a posted speed limit greater than 45 mph.



September 22, 2021

Published Date: 2024	SDDOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 1 of 2

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)	Taper Length (Feet) (L)
0 -30	25	180
35 - 40	25	320
45	25	600
50	50 *	600
55	50 *	660
60 - 65	50 *	780
70 - 80	50 *	960

* Spacing is 40' for 42" cones.

** Speed appropriate for location.

*** Use speed limit designated for the condition when workers are present in the work space. Signs will be covered or removed when workers are not present.

■● Flagger (As Necessary)

◎ Reflectorized Drum

■ Channelizing Device

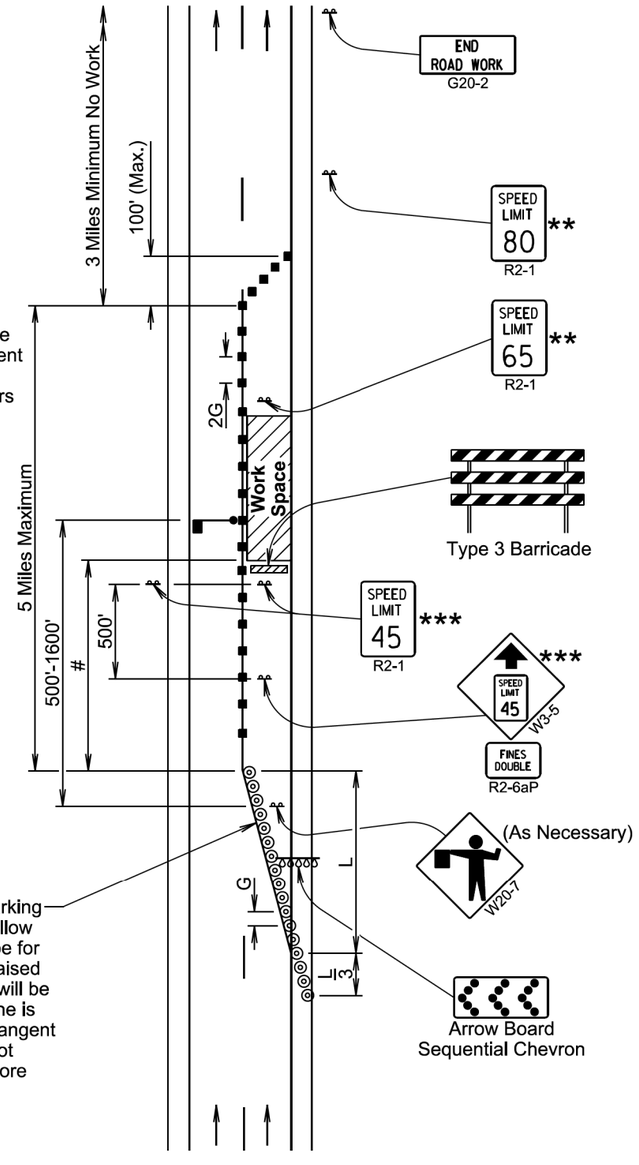
The Work Space will be a minimum of 500' from the end of the taper.

The FLAGGER sign will be used whenever there is a Flagger present.

The channelizing devices will be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

4" white temporary pavement marking tape for right lane closures, 4" yellow temporary pavement marking tape for left lane closures, or temporary raised pavement markers at 5' spacing will be installed in the taper when the lane is closed overnight, and along the tangent section where the skip lines do not exist and the lane is closed for more than 3 days.



DETAIL A

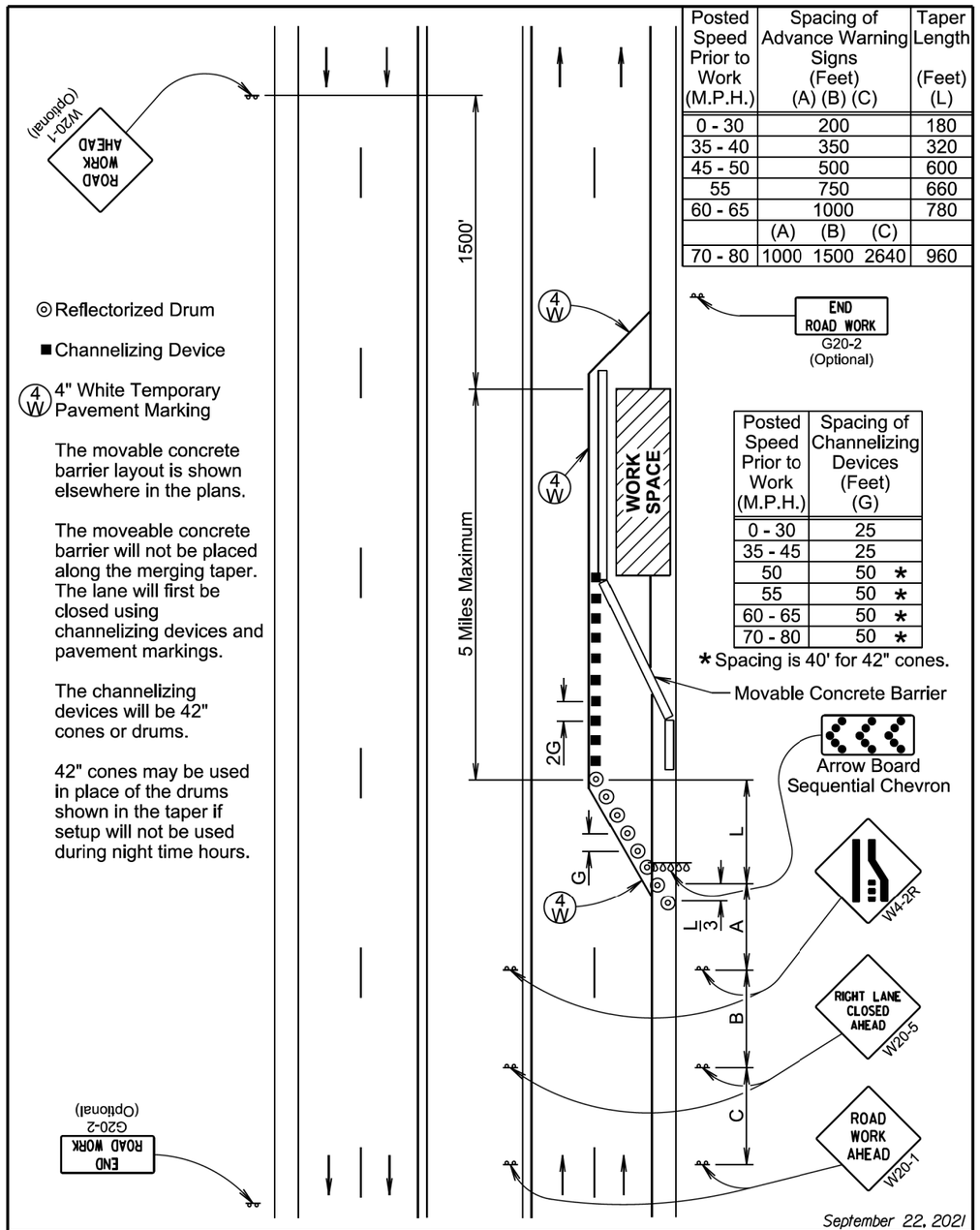
September 22, 2021

Published Date: 2024	SDDOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
			Sheet 2 of 2

Plot Scale - 1:200
Plotted From - TRMI11119
File - ...\davs091\Utc\tc Std Plates.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	22	141

Plotting Date: 01/23/2024



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	Taper Length (Feet) (L)
0 - 30	200	180
35 - 40	350	320
45 - 50	500	600
55	750	660
60 - 65	1000	780
	(A) (B) (C)	
70 - 80	1000 1500 2640	960

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 45	25
50	50 *
55	50 *
60 - 65	50 *
70 - 80	50 *

* Spacing is 40' for 42" cones.

◎ Reflectorized Drum

■ Channelizing Device

4W 4" White Temporary Pavement Marking

The movable concrete barrier layout is shown elsewhere in the plans.

The moveable concrete barrier will not be placed along the merging taper. The lane will first be closed using channelizing devices and pavement markings.

The channelizing devices will be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

September 22, 2021

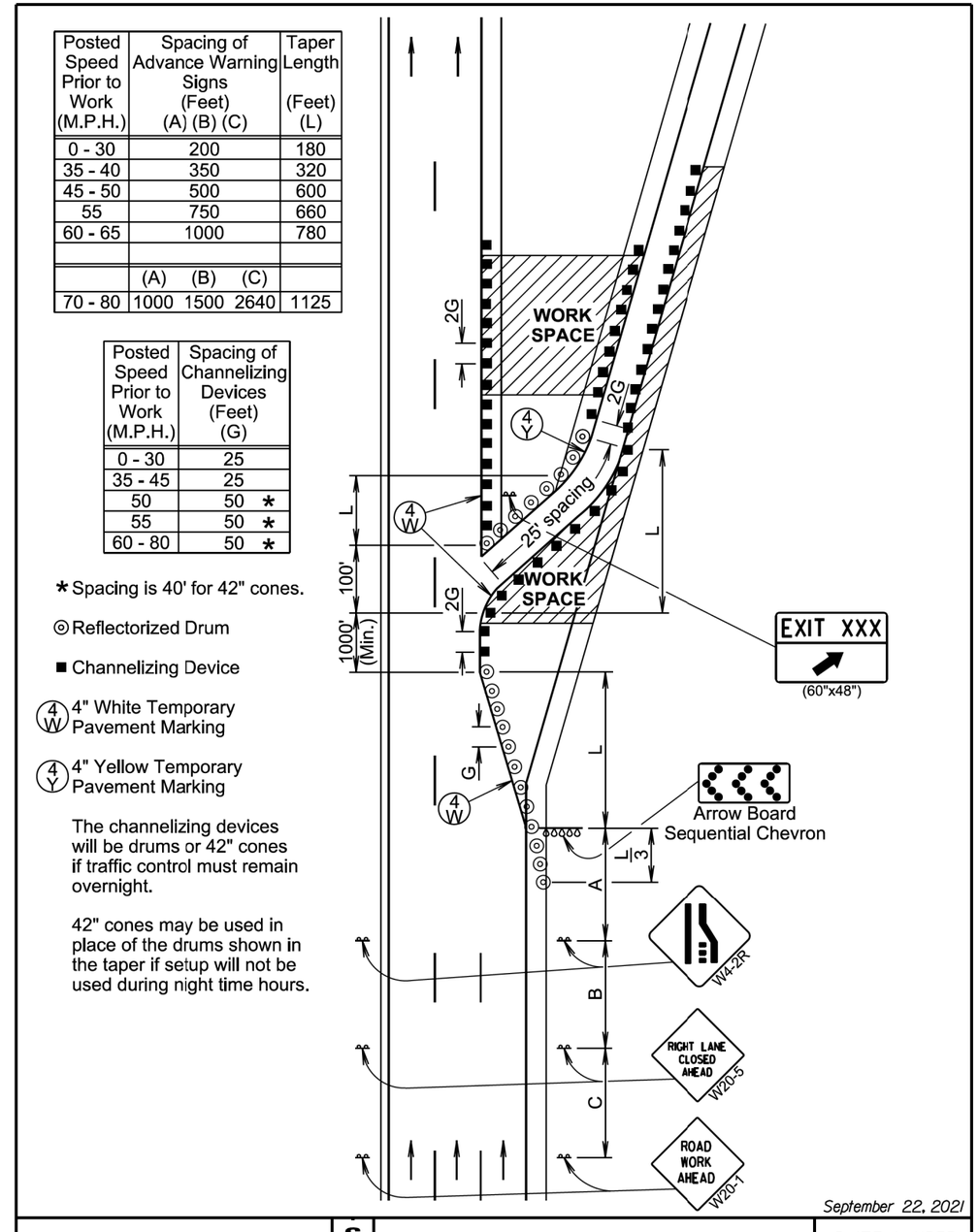
Published Date: 2024

SDDOT

LANE CLOSURE WITH BARRIER

PLATE NUMBER 634.65

Sheet 1 of 1



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	Taper Length (Feet) (L)
0 - 30	200	180
35 - 40	350	320
45 - 50	500	600
55	750	660
60 - 65	1000	780
	(A) (B) (C)	
70 - 80	1000 1500 2640	1125

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 45	25
50	50 *
55	50 *
60 - 80	50 *

* Spacing is 40' for 42" cones.

◎ Reflectorized Drum

■ Channelizing Device

4W 4" White Temporary Pavement Marking

4Y 4" Yellow Temporary Pavement Marking

The channelizing devices will be drums or 42" cones if traffic control must remain overnight.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

September 22, 2021

Published Date: 2024

SDDOT

WORK IN VICINITY OF EXIT RAMP

PLATE NUMBER 634.68

Sheet 1 of 1

Plot Scale - 1:200
Plotted From - TRM11119
File - ...\davs091\Utlctc Std Plates.dgn

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	Taper Length (Feet) (L)
0 - 30	200	180
35 - 40	350	320
45 - 50	500	600
55	750	660
60 - 65	1000	780
	(A) (B) (C)	
70 - 80	1000 1500 2640	1125

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 45	25
50	50 *
55	50 *
60 - 80	50 *

* Spacing is 40' for 42" cones.

◎ Reflectorized Drum

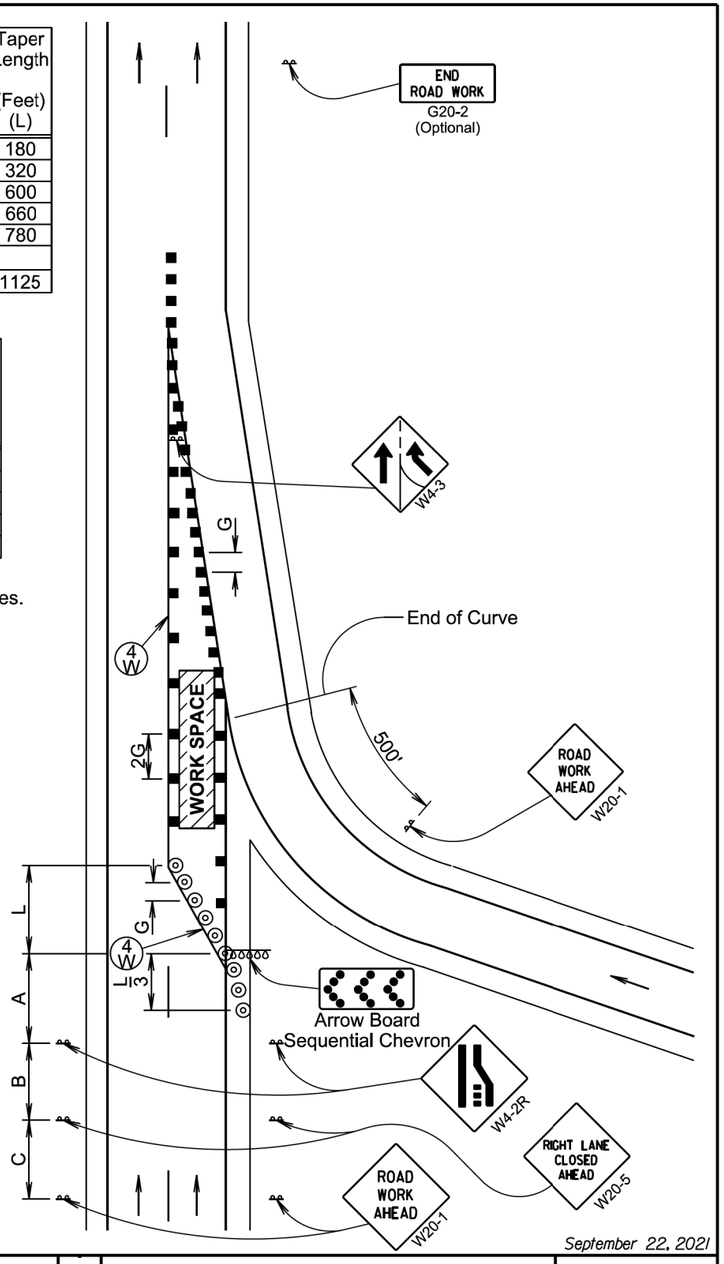
■ Channelizing Device

(4W) 4" White Temporary Pavement Marking

Temporary pavement markings will be used if traffic control must remain overnight.

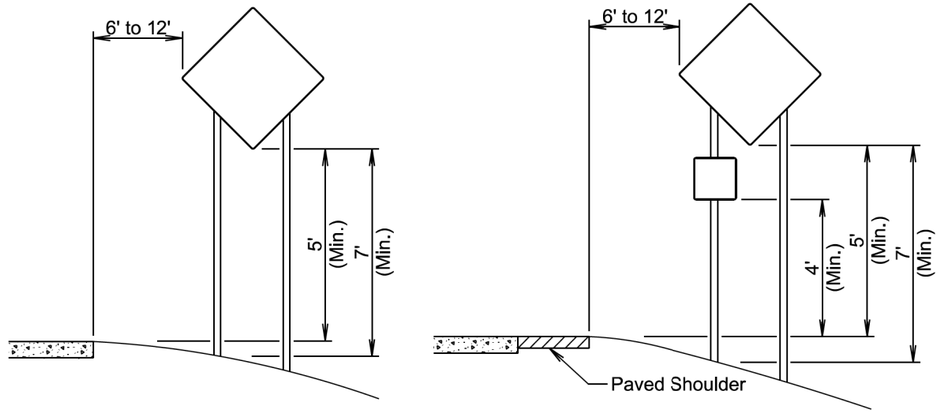
The channelizing devices will be drums or 42" cones if traffic control must remain overnight.

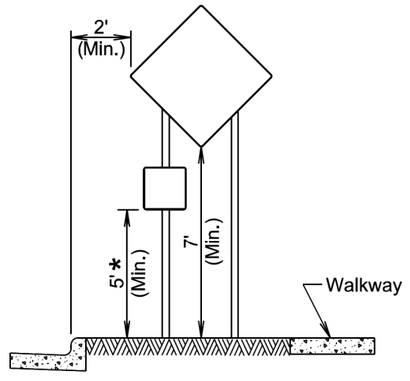
42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

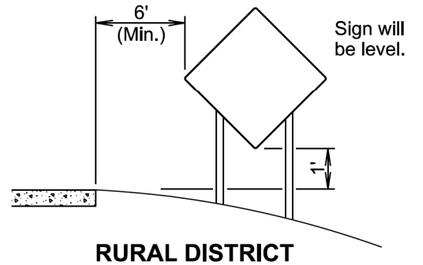


September 22, 2021

Published Date: 2024	SDDOT	WORK IN VICINITY OF ENTRANCE RAMP	PLATE NUMBER 634.70
			Sheet 1 of 1





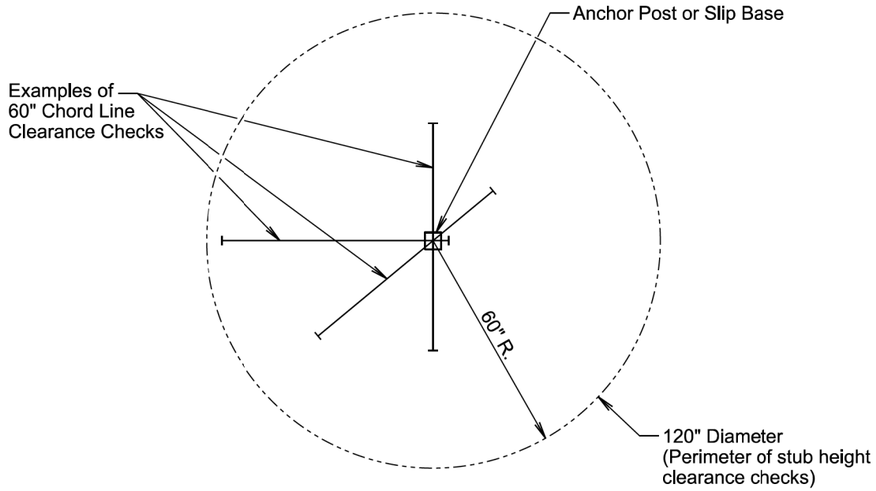


* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

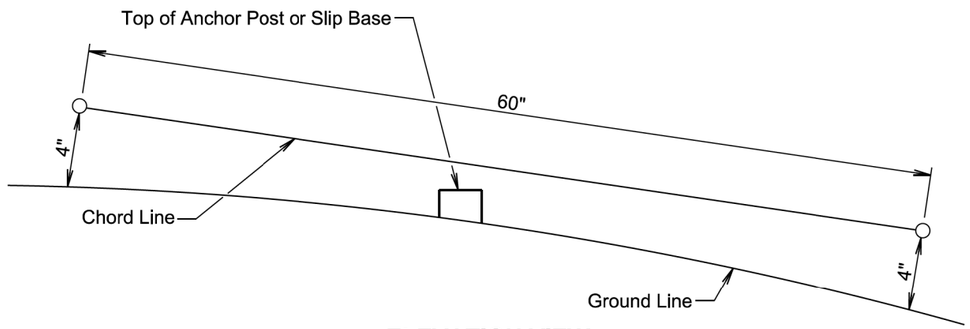
January 22, 2021

Published Date: 2024	SDDOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1

Plot Scale - 1:200
Plotted From - TPM111119
File - ...\davs091U\tc\tc Std Plates.dgn



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

The top of anchor posts and slip bases WILL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height will be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

January 22, 2021

Published Date: 2024	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

Plot Scale - 1:200
Plotted From - TRM111119
File - ...\davs091\Utc\tc Std Plates.dgn

GENERAL PERMANENT SIGNING

New sign installations will be staked in the field by the Contractor and checked by the Engineer. The Contractor will give the Engineer a minimum of one week to check staked locations prior to signpost installation. Lateral offset of signs will be as shown in the plans or as directed by the Engineer.

The Contractor will be responsible for contacting South Dakota One Call to locate the utilities at the staked sign installation locations.

When signs are mounted in an assembly, they will be 1-2 inches apart vertically and horizontally.

The height of the post must not exceed the minimum height needed by more than 0.5 feet. Any portion that extends above the sign will be cut off. No separate payment will be made for cutting the post or for that length cut off.

Aluminum U-Channel stiffeners will be used on all signs 36 inches or greater in width and will conform to ASTM B221 Alloy 6063-T6 or 6061-T6. The U-Channel will be 2 inches in width and free of holes. The U-Channel stiffeners will also be used to connect various signs together so that an entire sign assembly can be erected on a single installation. Stiffeners may be fastened to signs by use of 1/4-inch diameter drive rivets.

The Contractor will use 3/8-inch diameter rust proof machine sign bolts, flat metal washers, neoprene washers (against the sign sheeting), lock washers, and nuts to fasten the sign to the channel aluminum and posts. A minimum of two bolts will extend through each post.

Prior to ordering signs, the Contractor will verify dimensions, background, border, and legend of the signs.

Prior to use, the Contractor will provide documentation for the sign support devices showing they meet the applicable NCHRP 350 or MASH requirements.

The signs listed on the Sign Table in the plans as new installations will be provided for the locations specified.

Sign offset to be measured from centerline to left edge of sign.

REMOVE TRAFFIC SIGN

Existing signs that are shown as being removed in the Permanent Signing Table will become the property of the Contractor. Existing signposts and bases will be removed in their entirety. All existing signs, posts, and/or hardware removed will not be reused. Holes remaining from the removal of wood posts will be backfilled and compacted with material placed in layers not to exceed 6 inches in depth.

All costs associated with the removal of existing signs, posts, hardware, and backfilled holes will be incidental to the contract unit price per each for “Remove Extruded Panel Sign”. Quantities will be per assembly at the contract unit price per each.

NEW PERMANENT SIGNING

All signs will be manufactured in accordance with the sheeting manufacturer’s recommendations utilizing a matched component system, including inks, electronic cuttable films, and protective overlay films.

All costs associated with furnishing and installing the new permanent signs, and with furnishing and installing stiffeners and hardware will be incidental to the contract unit price per square foot for “Extruded Aluminum Sign, Nonremovable Copy High Intensity”, or “Extruded Aluminum Sign, Nonremovable Copy Super/Very High Intensity”.

DIGITALLY PRINTED SIGNS

Digitally printed signs will be allowed on this project. If the Contractor elects to provide digitally printed signs, such signs will adhere to the following specifications.

PROTECTIVE OVERLAY FILM

Permanent traffic signs printed with digital ink systems will be fabricated with a full sign protective overlay film designed to provide a smooth surface needed for retroreflectivity, and to protect the sign from fading and UV degradation. The overlaminate will comply with the retroreflective sheeting manufacturer’s recommendations to ensure proper adhesion and transparency and will also meet the reflective film durability as identified in Table 1.

Table 1: Retroreflective Film Minimum Durability Requirements

ASTM D4956 Type	Full Sign Replacement Term (years)	Sheeting Replacement Term (years)
I	0	7
III	7	10
IV	7	10
VIII	7	10
IX	7	12
XI	7	12

FABRICATION

Retroreflective sheeting will be applied to a properly cleaned and prepared aluminum sign blank in accordance with the retroreflective sheeting manufacturer’s recommendations. Sign legend will be applied using digital print technologies and systems in accordance with the retroreflective sheeting manufacturer’s recommendations and the requirements of these plans.

Finished signs will be free of ragged edges and must be supplied clean and free of scratches, grease, oil, lubricants or other contaminants. Minor blemishes (dirt speck, dust, etc.) may settle on the fresh ink surface or become entrapped between the sheeting surface and transparent overlay film due to static charge within the sign shop environment. Any blemish must be minor and not interfere with the communication of the sign message to the motorist. The blemish must not be visible to the naked eye when viewed from 30 feet or greater.

After application of the retroreflective sheeting, sign blanks will be stacked and packaged face to face, back to back, and protected in accordance with the sheeting manufacturer’s recommendations. Finished signs will be securely packaged to prevent damage during transit or storage according to the sheeting manufacturer’s recommendations.

TRAFFIC SIGN PERFORMANCE WARRANTY PROVISIONS

Based on the ASTM Type of sheeting specified, traffic control signs will be warranted for the duration shown in Table 1. Full product terms and conditions are as established by each sheeting manufacturer and may contain certain limitations based on sheeting and ink colors, and geographic exposure of the sign. A copy of the warranty document with complete details of terms and conditions will be supplied if requested by the Engineer.

CERTIFIED DIGITAL SIGN FABRICATOR

Sign fabricators using digital imaging methods to produce regulated traffic signs must be certified by the reflective sheeting manufacturer whose materials are used to produce the delivered signs.

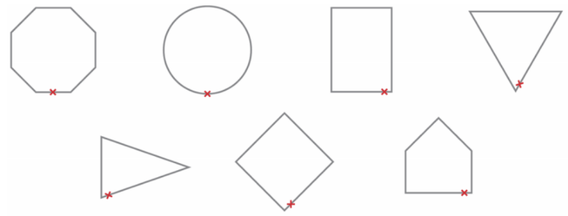
DIGITALLY PRINTED SIGNS (CONTINUED)

REV. 10-30-24, JMP

DATE TAGGING SIGNS WITH PERTINENT INFORMATION

All digitally printed signs are required to be date-tagged with the following 2 components:

1. Date tags on the back of signs
   Tags will have the following information and be fabricated with material and printing system that are as durable as the warranted sign.
   - Name of Sign Fabricator
   - Date the sign was fabricated (month and year)
   - Process that was used for sign fabrication (digitally printed)
   - Supplier of sheeting that was used for fabricating the sign.
2. Border date
   The month and year (mm/yyyy) of sign fabrication will be printed in the border of the sign in 3/8” sans serif font. Border date will be printed with the same warranted printed system as the sign face. The date should be printed in the locations indicated below.



SIGNPOST INSTALLATION IN CONCRETE

On concrete surfaces, a block out will be used for sign installation. The block out diameter will be sized accordingly depending on post size. Concrete surrounding the block out must not be cracked or damaged.

All costs associated with installation in concrete will be incidental to the sign installation.

REMOVE CONCRETE FOOTING

Concrete footings that are to be removed will be removed by the Contractor to a minimum of 2’ below the ground surface. Restoration of the disturbed area will be to the satisfaction of the Engineer.

The existing footings located at station 859+08 at Exit 332 will be removed by the Contractor as per these plans.

All costs for removing the concrete footings will be incidental to the contract lump sum price for “Remove Concrete Footing(s)”.

SIGN TABLE

I90 WB						632E3113	632E3115	632E1270	632E0060	110E0140				DOT USE	
MRM Centerline	Distance from Center-line to Left Edge of Sign	Description	Sign Code	Width (Inches)	Height (Inches)	Extruded Aluminum Sign, Nonremovable Copy High Intensity (SQFT)	Ext. Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SQFT)	W10x39 Steel Post	2.5' Diameter Fixed Support Concrete Footing (FT)	Remove Extruded Panel Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks		
854+41	23' L	MRM 332.42	D10-3b								EAST & WEST		Do Not Disturb		
860+81	77' L	EXIT 332	E1-5P	132	30		27.5	55.6	18.0'	1	EAST	2x Fixed Steel W10x39 I-Beams	Install new extruded panel signs on new fixed signpost beams. New inside post is 26.6 ft. and outside post is 29.0 ft..		
		SD37 I90 [Business] Mitchell Parkston (Right Up-Diagonal) Arrow	SPEC.	192	120		160.0						See Special Sign Detail. White legend on green background for E1-5P and special exit directional sign signs. See Two Post Fixed Sign Support Table. Existing sign assembly at Station 859+08. Remove existing concrete footings.		
		(Hospital) Symbol	SPEC.	30	30	6.3							White legend on blue background for special general service sign.		
868+81	45' L	[LOGO] Gas									EAST		Do Not Disturb		
					TOTAL	**6.3**	**187.5**	**55.6**	**18.0'**	**1**					

EXIT PLAQUE BRACE POST TABLE

ESTIMATED BRACE POST QUANTITIES					
DESCRIPTION	STATION	LOCATION	LANE	EXIT #	FLANGED POST S3 X 5.7 632E1210
Exit 332 / SD37 Mitchell ↗	860+77 L	I-90	WBL	332	5.5 X 2 = 11
See Standard Plate 632.35 for Erection Details.					**TOTAL = 11.0**

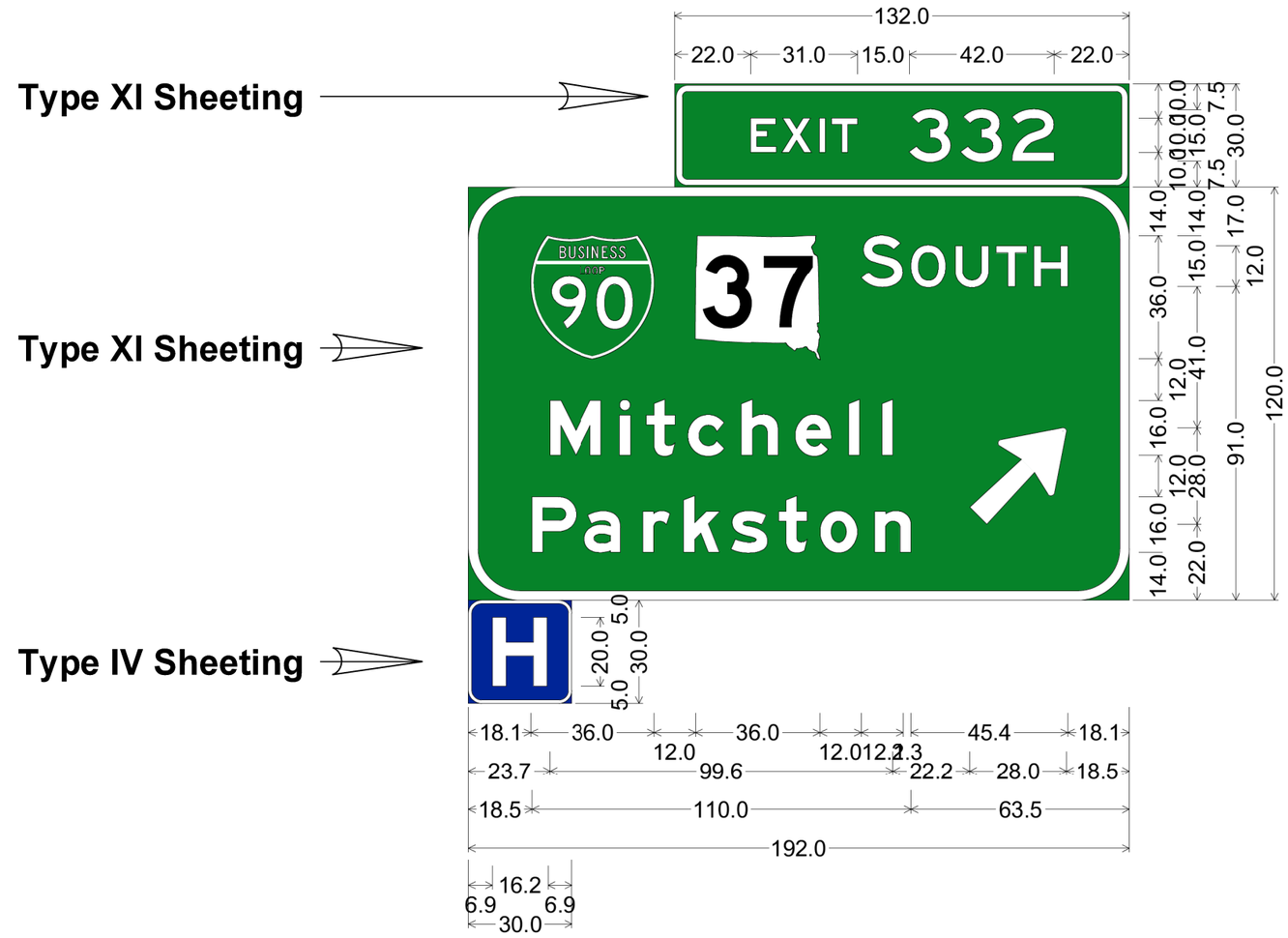
SPECIAL SIGN DETAIL

EXTRUDED ALUMINUM SIGNS WITH NONREMOVABLE COPY SUPER/VERY HIGH INTENSITY

Type XI Sheeting

Type XI Sheeting

Type IV Sheeting



3.8" Radius, 1.8" Border, 0.5" Indent, White on Green;
"EXIT", E 2K 108% spacing; "332", E 2K 131% spacing;

15.0" Radius, 2.8" Border, White on Green;
Rectangle Green; "SOUTH", E 2K; "Mitchell", E Mod 2K;
"Parkston", E Mod 2K; Arrow Custom - 35.7" 45°;

3.8" Radius, 1.0" Border, White on Blue;
"H", E Mod;

PLOT SCALE - 1.181.0904
PLOTTED FROM - TRM113314
PLOT NAME - $$PLOTNAME$$
FILE - ...\0910 SIGNING.DGN

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	28	141

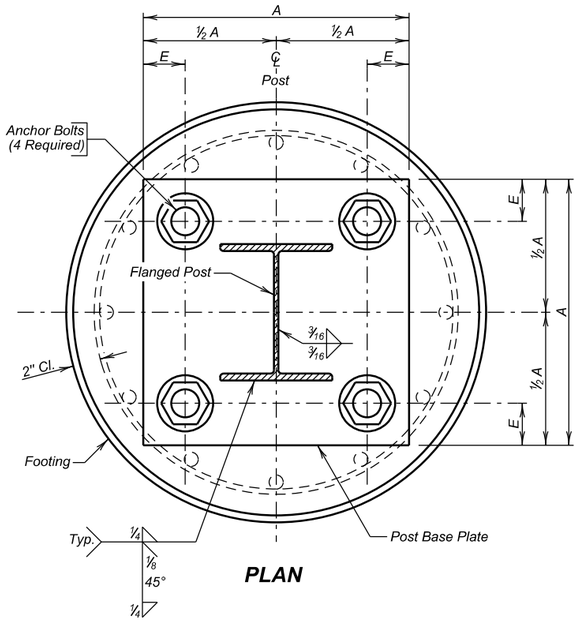
REV. 4-4-2024, JP

STATION	SIGN DESCRIPTION	SITE LOCATION	POST SIZE	FOOTING DIMENSIONS		POST BASE PLATE DIMENSIONS (in.)			ANCHOR BOLT SIZE DIMENSIONS			LONGITUDINAL STEEL QUANTITIES			# SPIRAL STEEL QUANTITIES	
				DIA.	DEPTH	A x A	E	THICK	DIA. (in.)	LENGTH	MINIMUM EMBEDMENT	NO	SIZE	LENGTH	DIA.	LENGTH
860+77	EXIT 332/I90(Bus.) SD37/ Mitchell Parkston Ar.	I90 WB MAINLINE	W 10x39	2' - 6"	9' - 0"	19 x 19	3.00	1	1 1/2	45"	30"	12 - #7 Bars		8'-8"	2'- 2"	78'

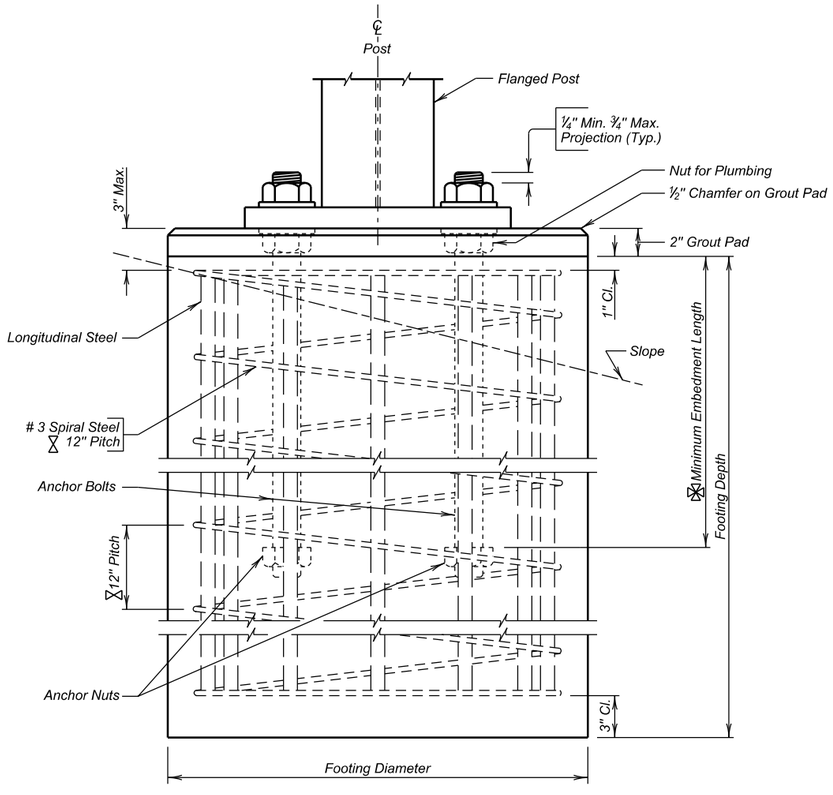
⧖ *# Spirals - Use 12" pitch and 1 ½ extra turns at each end. Use 1 ½ turns for lap at splice as required, or weld as approved by the Office of Bridge Design, Spirals may be smooth bars, Bar length shown does not include Splices.*

Dimensions are out to out of bars.

✠ *See Footing Detail*



PLAN



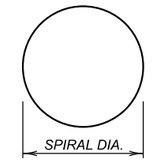
FOOTING DETAIL

NOTES

1. *Design Specification: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 2013 Edition with Interims through 2022.*
2. *Concrete Footings will be Class M6 - fc = 4000 p.s.i.*
3. *Structural Steel will comform to ASTM A36.*
4. *All Reinforcing Steel, except spirals, will conform to ASTM A615 Grade 60.*
5. *Spiral Reinforcing Steel may be fabricated from cold drawn wire ASTM A1064, or hot rolled plain or deformed bars conforming to the strength requirements of ASTM A615, Grade 60.*
6. *All Anchor Rods will conform to ASTM F1554, Grade 36 having a minimum yield stress of 36000 p.s.i. Anchor Bolts will be cleaned to remove any oil from the threading process before galvanizing.*
7. *Anchor Rods will have 7" thread length on both ends.*
8. *All nuts will conform to ASTM A563, DH. All nuts will be heavy hex. All washers will conform to ASTM F436.*
9. *All structural steel including the Steel Posts will be galvanized according to ASTM A123. The Nuts, Washers and 10" of one end of the Anchor Rods will be galvanized according to ASTM F2329.*
10. *All Rod Holes will be drilled. All plate cuts will preferably be Saw Cuts, however, Flame Cutting will be permitted providing all edges are ground smooth (metal projecting beyond the plane of the plate face will NOT be allowed).*
11. *All welding and weld inspection will be in accordance with the latest edition of AWS D 1.5 Structural Welding Code.*

SHOP PLANS

The fabricator will submit shop plans in accordance with the Specifications or in Adobe PDF format. Shop plan submittals will be sent to the Office of Bridge Design. Include design and check design, if applicable, with initial submittal.



ERECTION DETAILS

FOR

FIXED SIGN SUPPORTS

S. D. DEPT. OF TRANSPORTATION

DECEMBER 2016

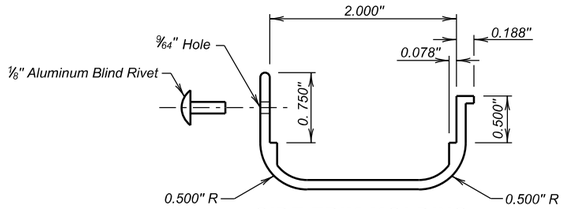
1 OF 2

DESIGNED BY	DRAWN BY	CHECKED BY	
RH/DM	RH/TB/MDG	RH/DM/PW	Steven A. Johnson
CNTYPCNX	PCNXDSPG	BSTDFSSA	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	29	141

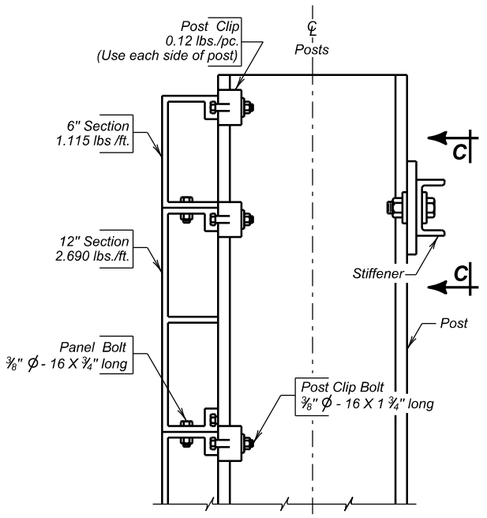
NOTE:
P = Number of Posts to be used
H = Vertical dimension of sign
L = Horizontal dimension of Main Sign

NOTE:
2 stiffeners are required when H is 8' - 0" or less
3 stiffeners are required when H is more than 8' - 0"

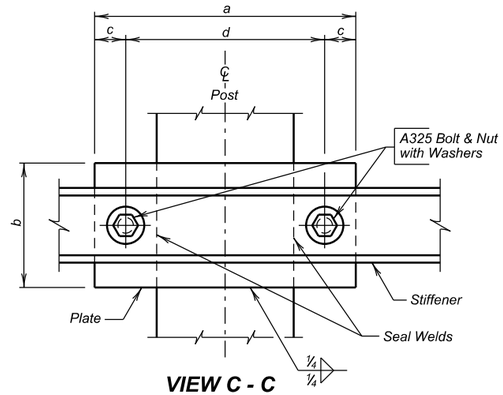


SIDE TRIM MOLDING

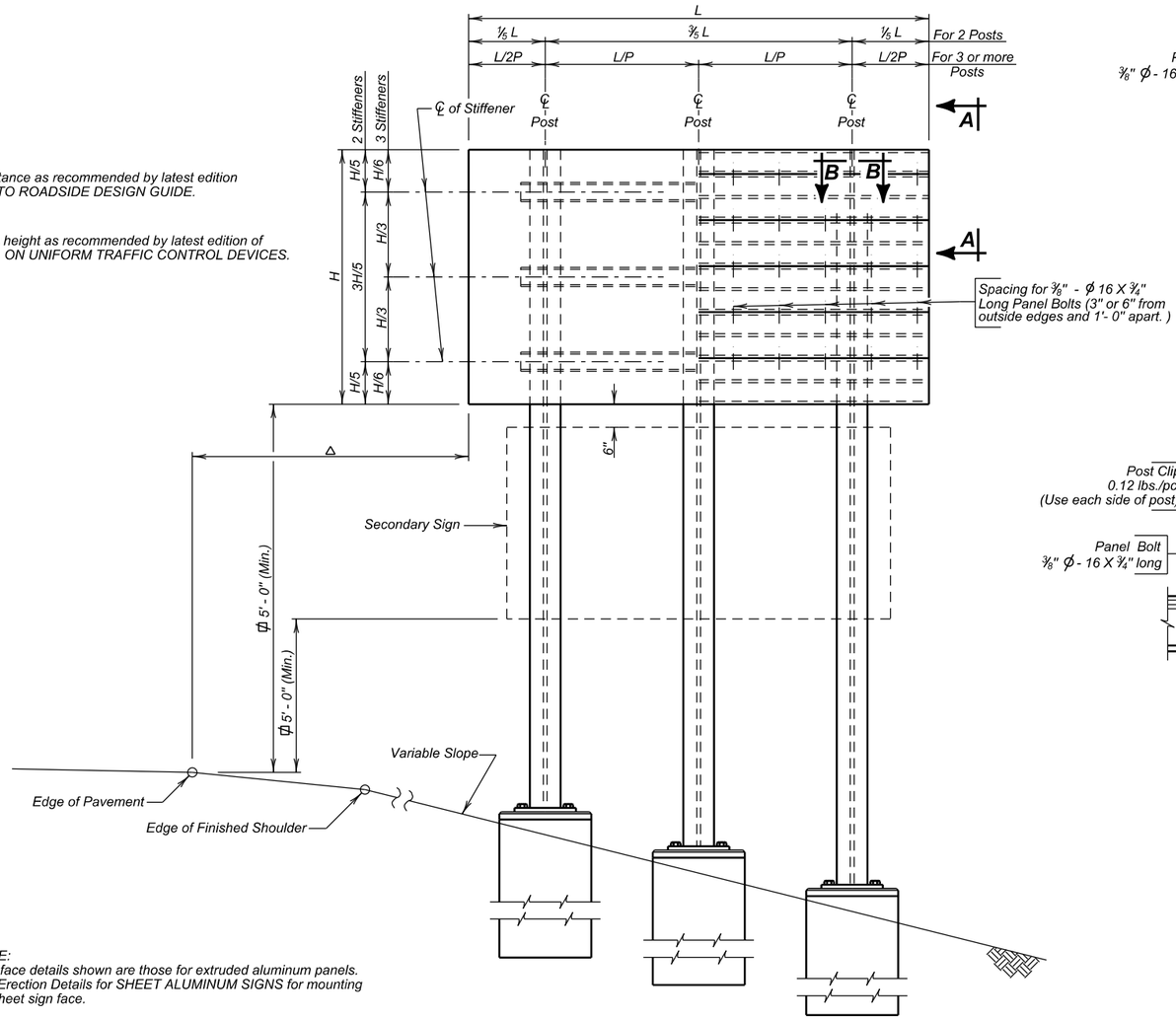
SideTrim Molding is required on all vertical edges of extruded panels. They will be fastened at a minimum of one (1) rivet per panel.



VIEW A - A



VIEW C - C



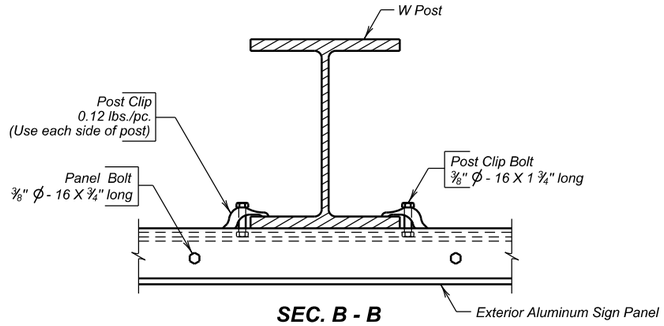
△ Clear distance as recommended by latest edition of AASHTO ROADSIDE DESIGN GUIDE.

℄ Mounting height as recommended by latest edition of MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

NOTE:
Sign face details shown are those for extruded aluminum panels. See Erection Details for SHEET ALUMINUM SIGNS for mounting flat sheet sign face.

ELEVATION

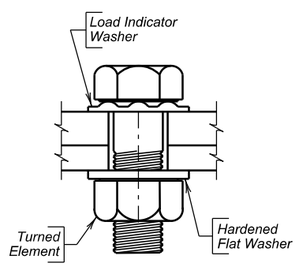
STIFFENER DATA							
Post	Stiffener	a	b	c	d	Bolt (A325)	Plate Thk.
S3X5.7 thru W8X21	C3X5	10 1/2"	5"	1 1/4"	8"	5/8" ϕ	5/16"
W8X24 thru W10X45	C5X6.7	13 1/2"	6"	1 1/2"	10 1/2"	7/8" ϕ	3/8"



SEC. B - B
(Stiffener not shown)

STIFFENER BOLTING PROCEDURE

High strength bolts will be tightened so as to obtain a minimum residual tension by the use of load indicator washers.



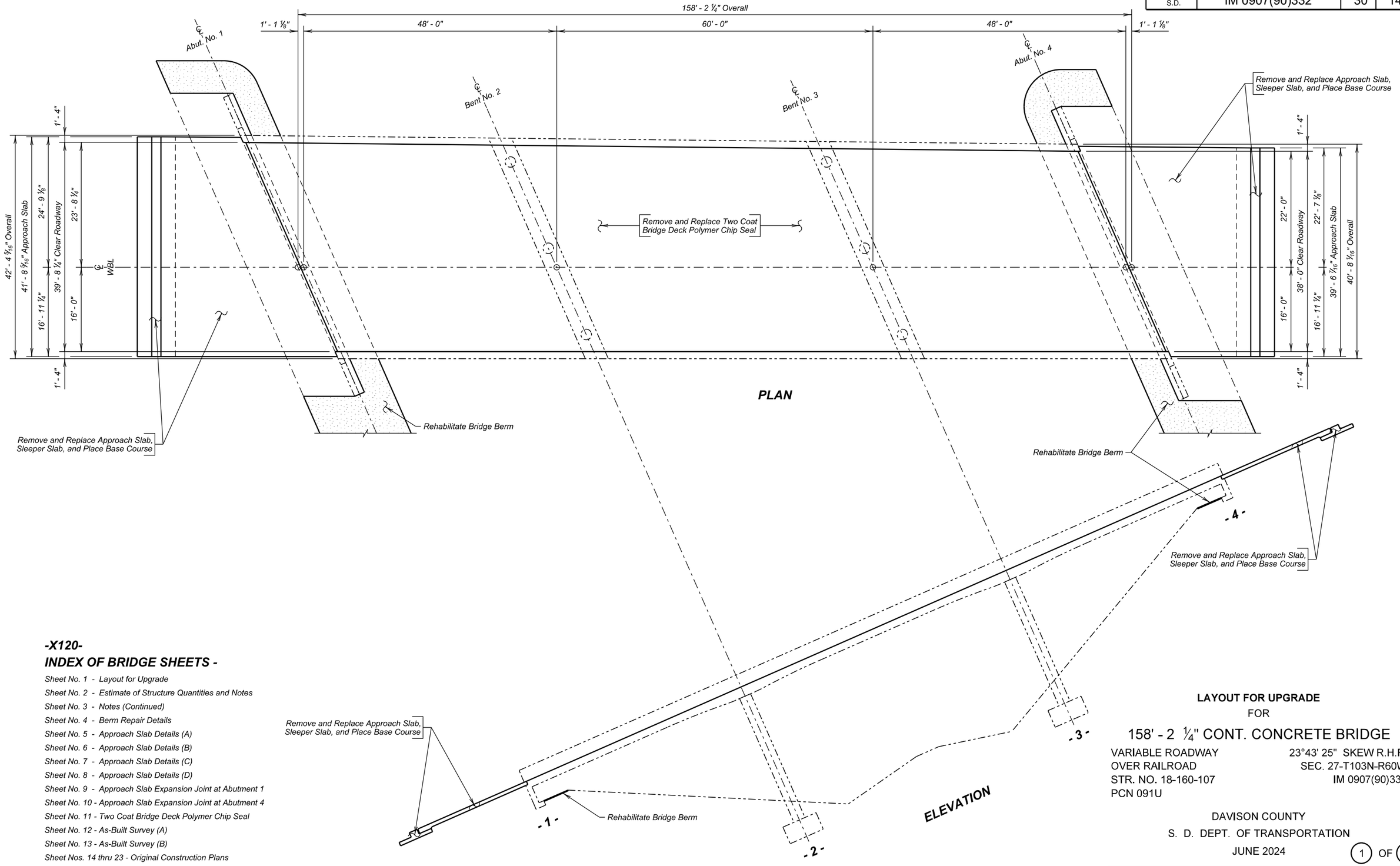
LOAD INDICATOR WASHER DETAIL

ERECTION DETAILS
FOR
FIXED SIGN SUPPORTS
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2016

2 OF 2

DESIGNED BY	DRAWN BY	CHECKED BY	
RH/DM	RH/TB/MDG	RH/DM/PW	Steve A. Johnson
CNTYPCNX	PCNXDSPG	BSTDFSSB	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	30	141



-X120-

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 - Berm Repair Details
Sheet No. 5 - Approach Slab Details (A)
Sheet No. 6 - Approach Slab Details (B)
Sheet No. 7 - Approach Slab Details (C)
Sheet No. 8 - Approach Slab Details (D)
Sheet No. 9 - Approach Slab Expansion Joint at Abutment 1
Sheet No. 10 - Approach Slab Expansion Joint at Abutment 4
Sheet No. 11 - Two Coat Bridge Deck Polymer Chip Seal
Sheet No. 12 - As-Built Survey (A)
Sheet No. 13 - As-Built Survey (B)
Sheet Nos. 14 thru 23 - Original Construction Plans

LAYOUT FOR UPGRADE

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY OVER RAILROAD
STR. NO. 18-160-107
PCN 091U

23°43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY

S. D. DEPT. OF TRANSPORTATION

JUNE 2024

1 OF 23

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

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	PII	Steve A. Johnson BRIDGE ENGINEER
DAVS091U	091UBA01		

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
110E0010	Remove Concrete Bridge Approach Slab	287.6	SqYd
120E3120	Bridge Berm Repair	2	Each
260E1010	Base Course	28	Ton
410E2600	Membrane Sealant Expansion Joint	81.3	Ft
460E0150	Concrete Approach Slab for Bridge	222.1	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	65.5	SqYd
480E0504	No. 4 Rebar Splice	32	Each
480E0505	No. 5 Rebar Splice	48	Each
480E0506	No. 6 Rebar Splice	52	Each
491E0005	Two Coat Bridge Deck Polymer Chip Seal	682.7	SqYd
491E0110	Abrasive Blasting of Bridge Deck	682.7	SqYd
491E0120	Bridge Deck Grinding	682.7	SqYd
491E0130	Concrete Removal, Class A	4.0	SqYd
491E0140	Concrete Removal, Class B	4.0	SqYd
491E0172	Concrete Patching Material, Bridge Deck	54.0	CuFt

SPECIFICATIONS

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

DETAILS AND DIMENSIONS OF EXISTING BRIDGE

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 elsewhere in the plans. Alternate sequence of operations may be submitted by the Contractor for approval by the Engineer a minimum of two weeks prior to the preconstruction meeting.

1. Remove the existing approach and sleeper slabs for the first phase of construction.
2. Rehabilitate Bridge Berm and place Base Course for the first phase of construction.
3. Replace approach slabs and sleeper slabs to the correct grade for the first phase of construction.
4. Replace sleeper slab joints with approved Membrane Sealant Expansion Joint for the first phase of construction.
5. Perform Bridge Deck Grinding for the first phase of construction.
6. 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.
7. Clean the bridge deck surface with abrasive blasting for the first phase of construction.
8. Place the Two Coat Bridge Deck Polymer Chip Seal for the first phase of construction.
9. Switch traffic and repeat steps 1 to 8 for the second phase of construction.

GENERAL CONSTRUCTION - BRIDGE

1. All reinforcing steel will conform to ASTM A615, Grade 60.
2. All exposed concrete corners and edges will be chamfered ¾" unless noted otherwise in the plans. Match existing chamfer if the existing chamfer differs.
3. Use 2" clear cover on all reinforcing steel except as shown otherwise.
4. 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.
5. Surfaces of fresh concrete at construction joints will be rough floated sufficiently to consolidate the surface. All construction joints will be cleaned of surface laitance, curing compounds and other foreign materials prior to placing fresh concrete against the joint.

REMOVAL OF CONCRETE BRIDGE APPROACH SLAB

1. The existing concrete approach and sleeper slabs adjacent to the structure will be completely removed by the Contractor.
2. The concrete and reinforcing steel from the removal will be disposed of by the Contractor at an approved site. An appropriate site will be as described in the Environmental Commitment Notes.
3. The quantity provided for Remove Concrete Bridge Approach Slab is computed using the plan area for the sleeper slab and the plan area for the approach slab determined separately.
4. All labor, tools, equipment, and any incidentals necessary for removal and disposal of the existing approach slabs, strip seal joints, and sleeper slabs will be incidental to the contract unit price per square yard for Remove Concrete Bridge Approach Slab.

DESIGN MIX OF CONCRETE

1. Class A45 Concrete will be used for the contract items Concrete Approach Slab for Bridge and Concrete Approach Sleeper Slab for Bridge.
2. 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.

COORDINATION WITH RAILROAD

1. During construction of the berm, the Contractor will not interfere with the operating railroad train movements. Construction activity must not take place within 25 ft. of the centerline track when train movements are occurring through the construction site and construction equipment will be removed from this zone prior to arrival of any train. See Special Provision for Working on Railroad Company Right-of-Way.
2. See Special Provision Regarding Railroad Protective Liability Insurance.

AS-BUILT ELEVATION SURVEY

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

ESTIMATE OF STRUCTURE QUANTITIES & NOTES

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

STR. NO. 18-160-107

JUNE 2024

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	PII	Steve A Johnson BRIDGE ENGINEER
DAVS091U	091UBA02		

BRIDGE BERM REPAIR

1. The bridge berms have erosion channels and settlement voids on the berm slope. The bridge berms will be rebuilt and reshaped to their original template.

2. Fill voids under the abutments and fill in erosion channels on the berm slope. Reconstruct the berms to at least 1-foot above the bottom of the abutment backwall. The berm will extend flat from the abutment backwall a minimum of 5' – 0" before the slope begins. The berm slope will be benched into stable embankment during reshaping and reconstruction. The soil will be placed in horizontal lifts perpendicular to the centerline of the structure.

3. Shape the fill in front of the wing walls to divert runoff from the inslopes away from the face of the berm slope. Reshape the inslopes from the wing walls to the end of the sleeper slab.

4. At the upper part of the berm slope, clearance between the structure and berm will prohibit the use of large compaction equipment. The soil in this area will be compacted using hand operated compaction equipment. Berm material will be placed in reduced lift thicknesses with adequate moisture to obtain density requirements.

5. Soil used to reconstruct the berm slope will be furnished by the Contractor and approved by the Engineer. The soil will have 100% passing the 1 ½ inch sieve, a maximum of 70% passing the #4 sieve, have a maximum Liquid Limit (LL) of 45 and a Plastic Index (PI) greater than 10 but less than 25. The Contractor will be responsible for one gradation, LL and PI test for each borrow source for berm reconstruction. The test results will be supplied to the Engineer in writing.

6. Compaction of the reconstructed berm and inslopes will be governed by the Ordinary Compaction Method.

7. No informational quantities are available. The Contractor will visit the site prior to determine necessary quantities.

8. The cost of the berm reconstruction will be incidental to the contract unit price per each for Bridge Berm Repair. This payment will be full compensation for furnishing all materials, labor, tools, and equipment necessary or incidental to the reconstruction of the bridge berm.

APPROACH SLABS

1. Bridge end backfill will be constructed in accordance with Section 430 of the Construction Specifications.

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

3. Prior to placing the Type B Drainage Fabric and Granular Bridge End Backfill, the existing granular 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 Gravel Cushion 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. Gravel Cushion will be in accordance with Section 882 of the Construction Specifications.

4. 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.

5. 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.

6. 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.

7. 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.

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

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

10. The quantity of Gravel Cushion 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.

11. 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.

12. 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 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. 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.

14. Any Gravel Cushion, 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.

BRIDGE DECK GRINDING

1. The existing bridge deck has a two-coat epoxy chip seal and pavement marking that will be removed.

2. The existing bridge deck has tining and pavement markings that will be removed.

TWO COAT BRIDGE DECK POLYMER CHIP SEAL

The polymer will be an epoxy urethane per the Department's Approved Products List for Bridge Deck Polymer Chip Seal.

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.

NOTES (CONTINUED)

FOR

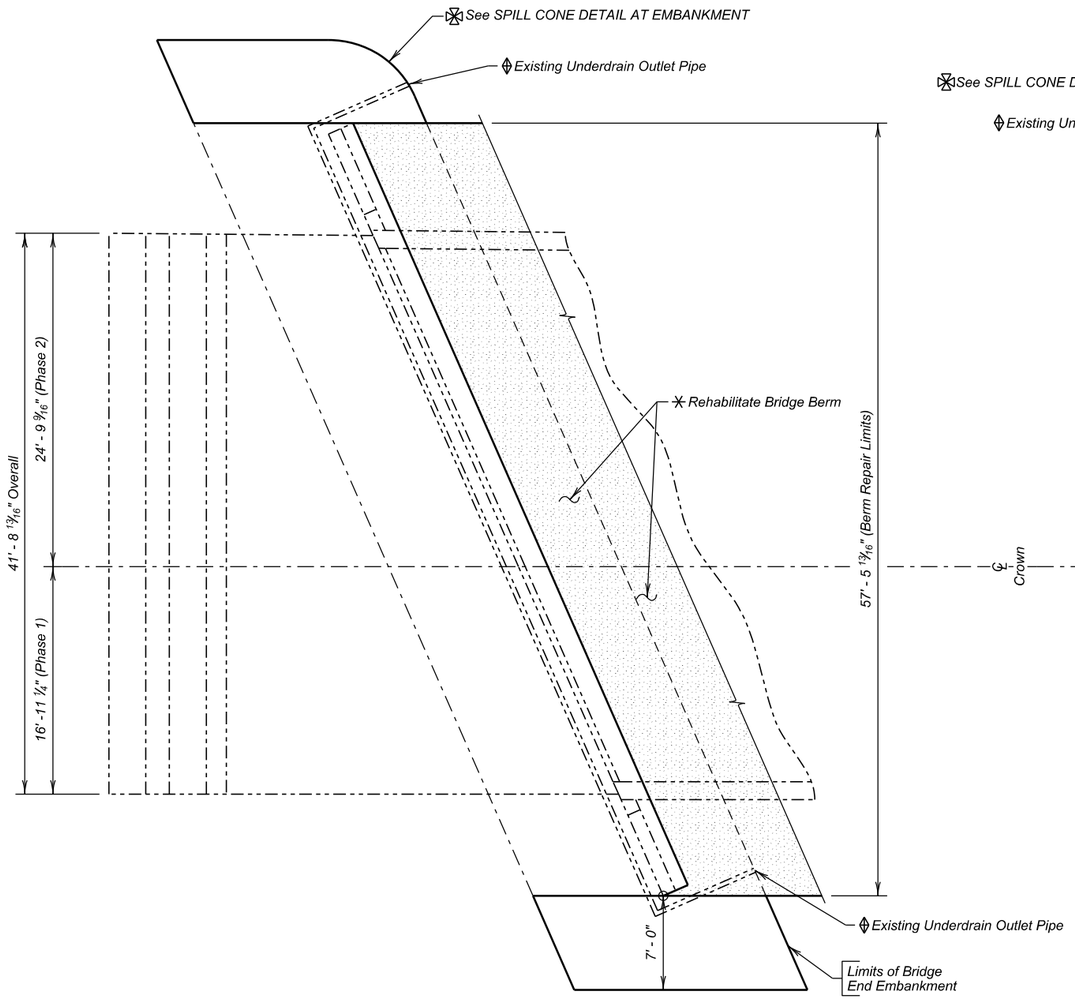
158' - 2 ¼" CONT. CONCRETE BRIDGE

STR. NO. 18-160-107

JUNE 2024

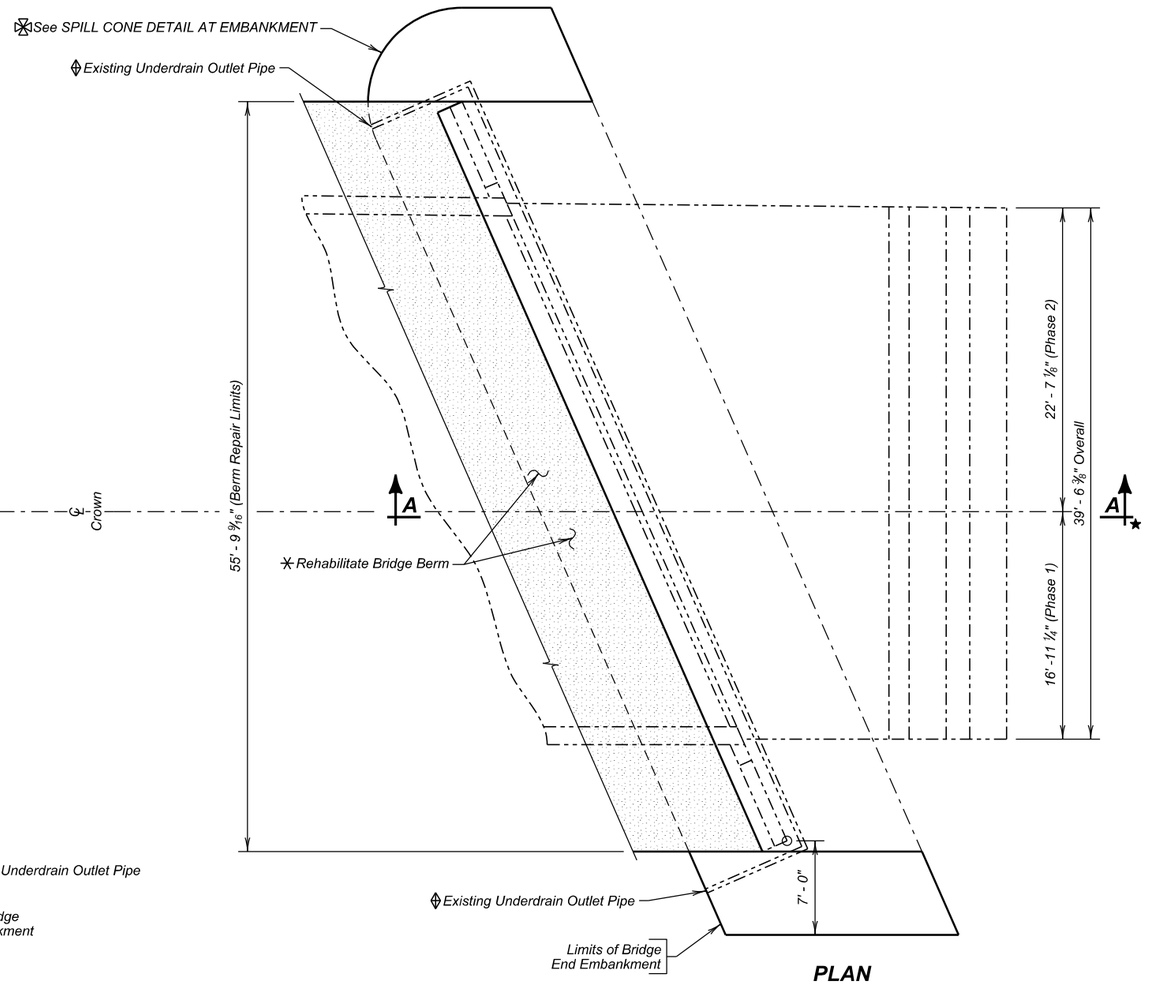
DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	PII	Steve A Johnson BRIDGE ENGINEER
DAVS091U	091UBA03		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	33	141



PLAN

(Approach Slab Adjacent to Abut. No. 1)



PLAN

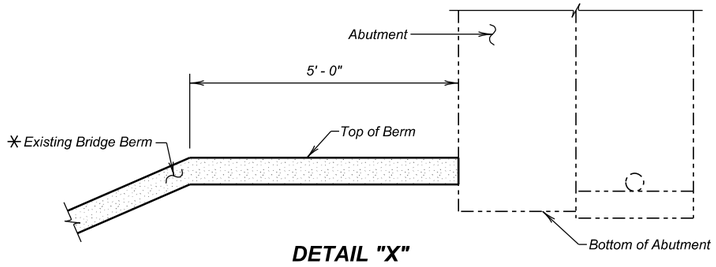
(Approach Slab Adjacent to Abut. No. 4)

GENERAL NOTES:

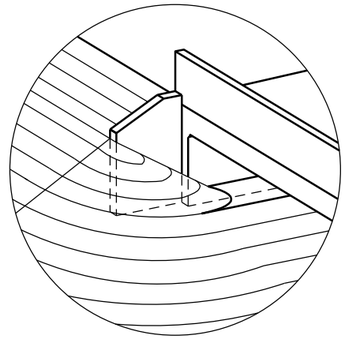
- *Perform excavation in a manner that limits disturbance to the existing bridge berm. Where disturbance can not be minimized or if the existing spill cone has eroded, rebuild as shown.*
- *The berms and slope protection are to be repaired to match the original templates. The swale below the outletpipe is also to be filled and reconstructed.*
- *Underdrain Outlets are not to be disturbed, damaged, or buried during construction. Any damage will be repaired at the expense of the Contractor.*
- *See Sheet 8 of 23 for SECTION A - A.*

ESTIMATED QUANTITIES
(For Both Abutments)

ITEM	UNIT	QUANTITY	
		Phase 1	Phase 2
Bridge Berm Repair	Each	1	1



DETAIL "X"



SPILL CONE DETAIL AT EMBANKMENT

BERM REPAIR DETAILS

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY OVER RAILROAD
STR. NO. 18-160-107

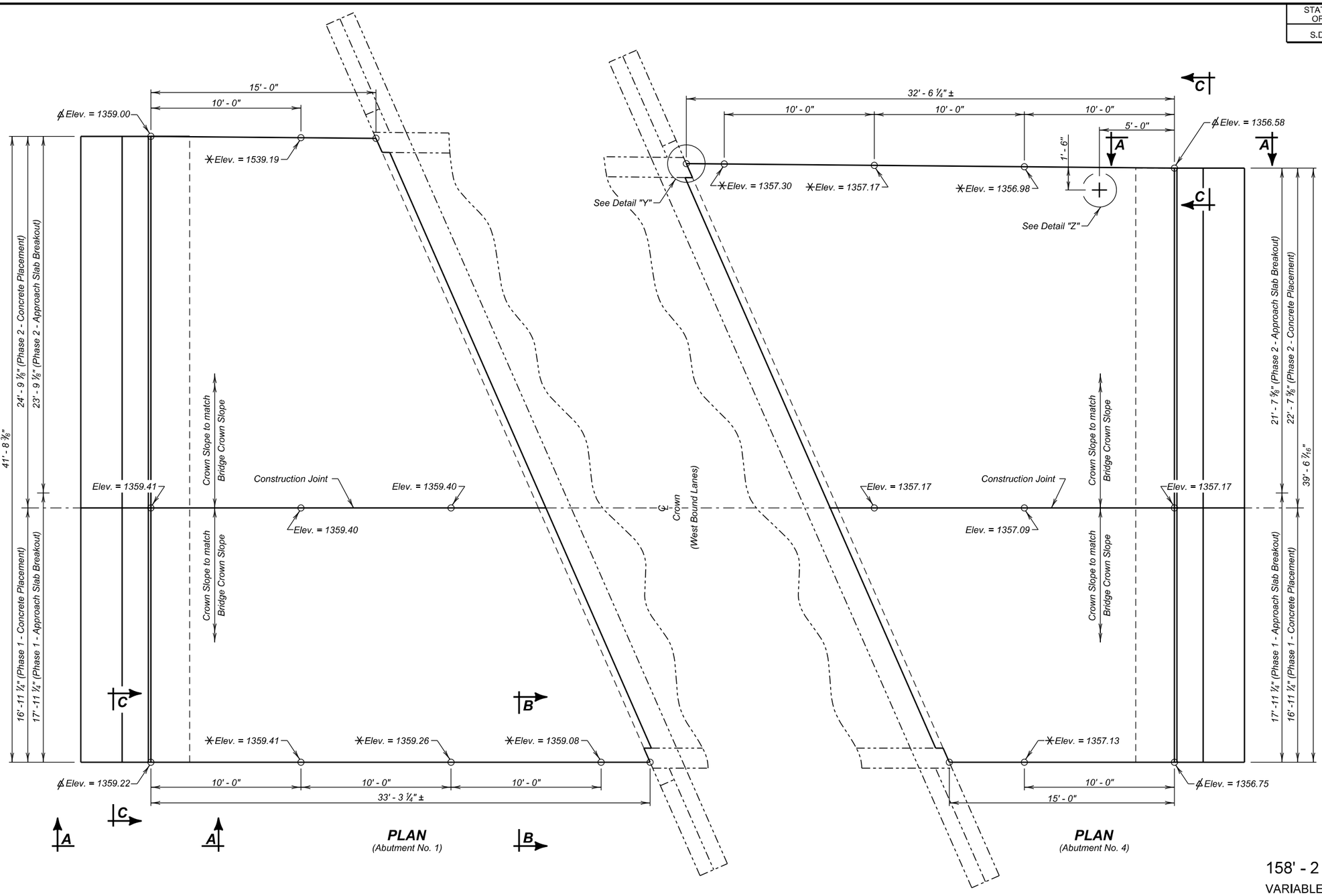
23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

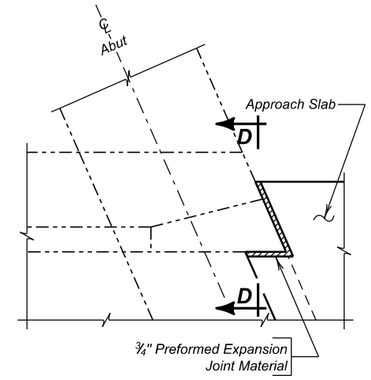
DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

4 OF 23

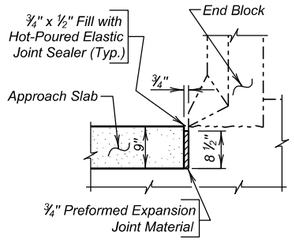
DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	PII	BRIDGE ENGINEER
DAVS091U	091UBA04		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	34	141

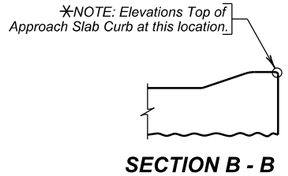




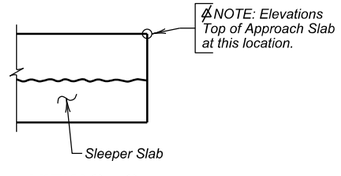
DETAIL "Y"



SECTION D - D



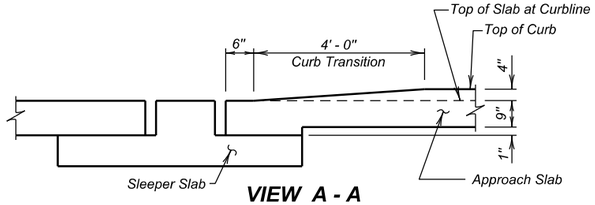
SECTION B - B



VIEW C - C

Survey Reference:

Survey Marker on SE wing
Elevation 1358.52



VIEW A - A

APPROACH SLAB DETAILS (A)

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY OVER RAILROAD
STR. NO. 18-160-107

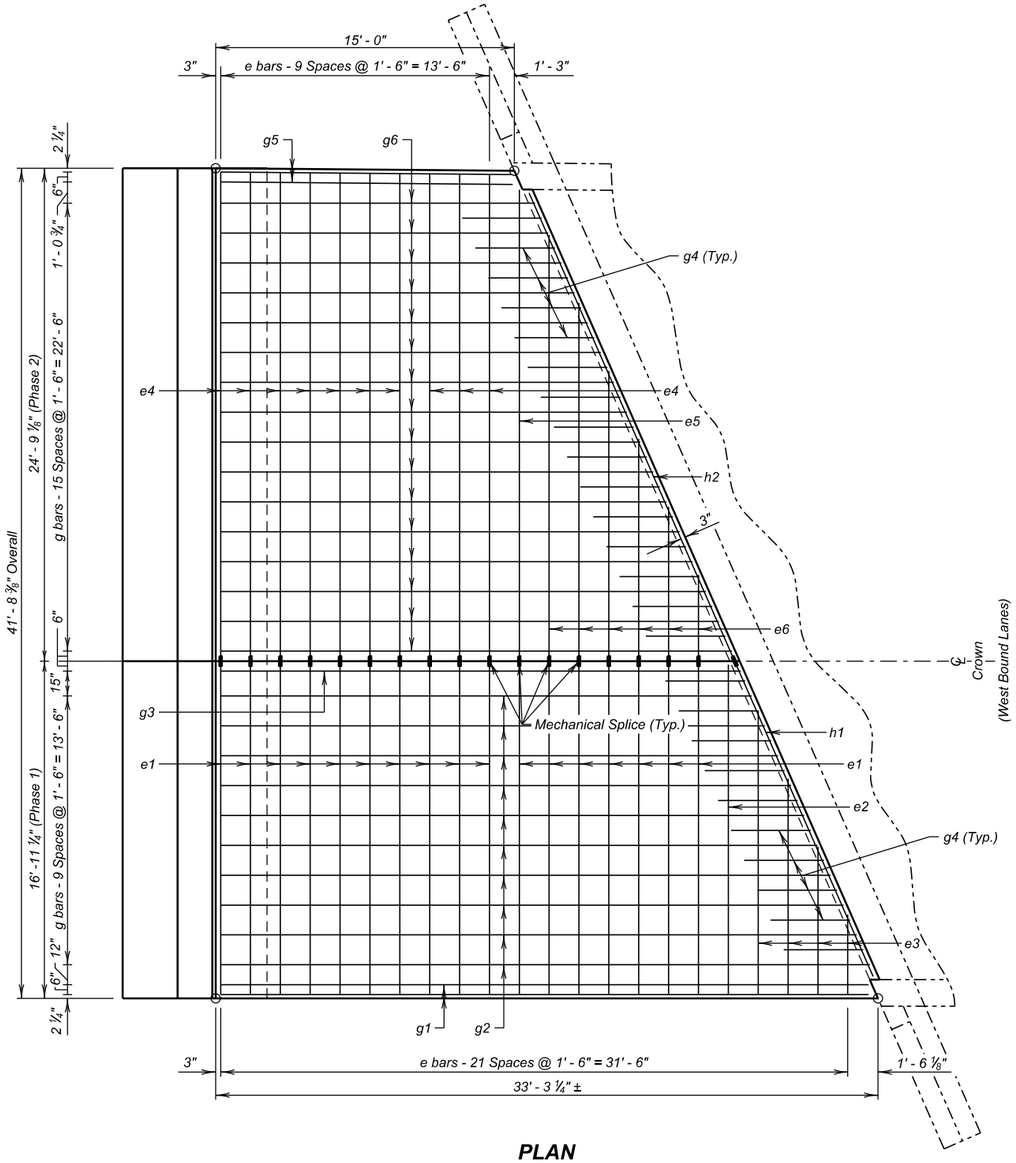
23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

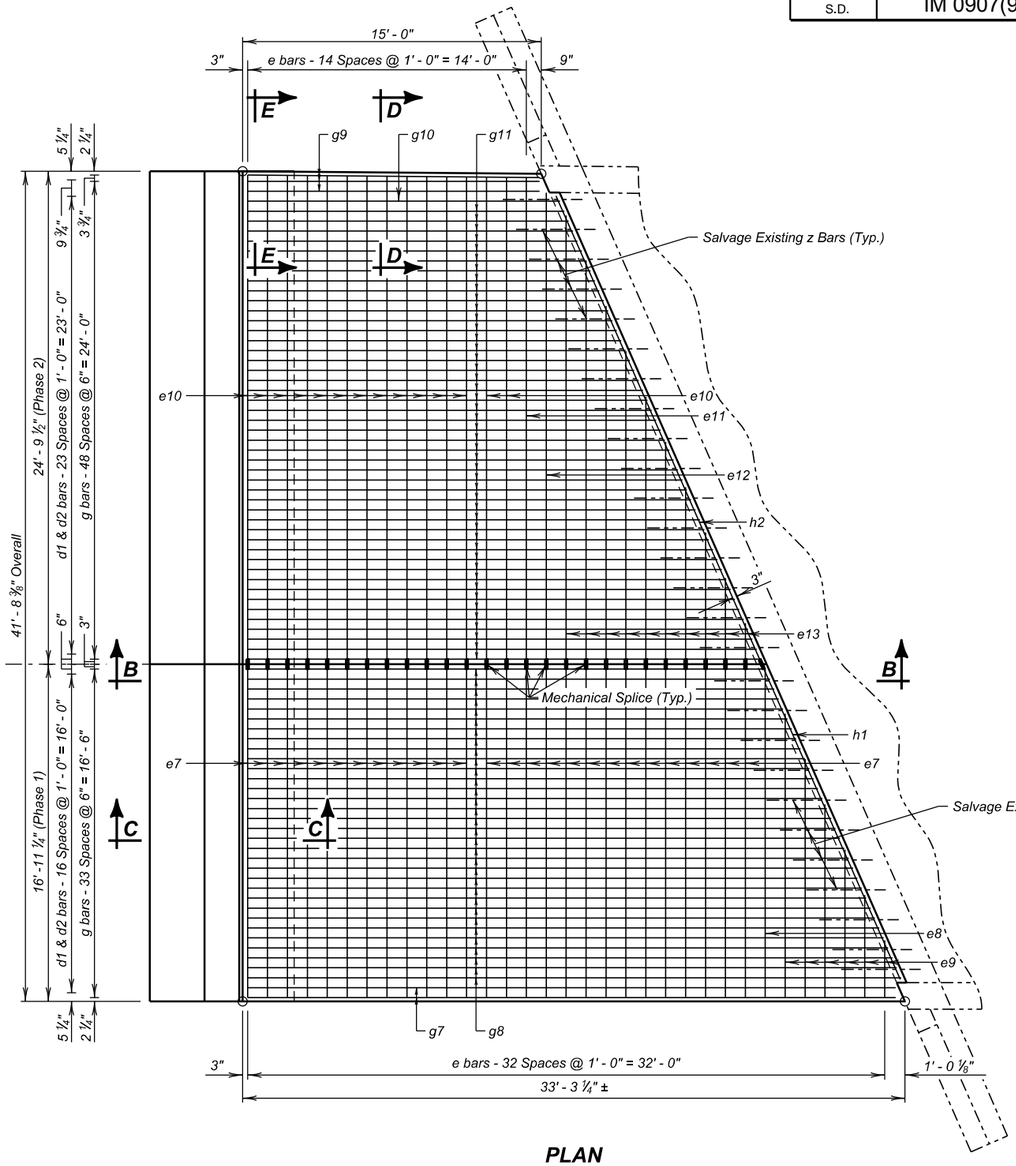
5 OF 23

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	PII	Steve A Johnson BRIDGE ENGINEER
DAVS091U	091UBA05		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	35	141



PLAN
(Top Steel)
(Approach Slab shown adjacent to Abutment No. 1)



PLAN
(Bottom Steel)
(Approach Slab shown adjacent to Abutment No. 1)

APPROACH SLAB DETAILS (B)

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY
OVER RAILROAD
STR. NO. 18-160-107

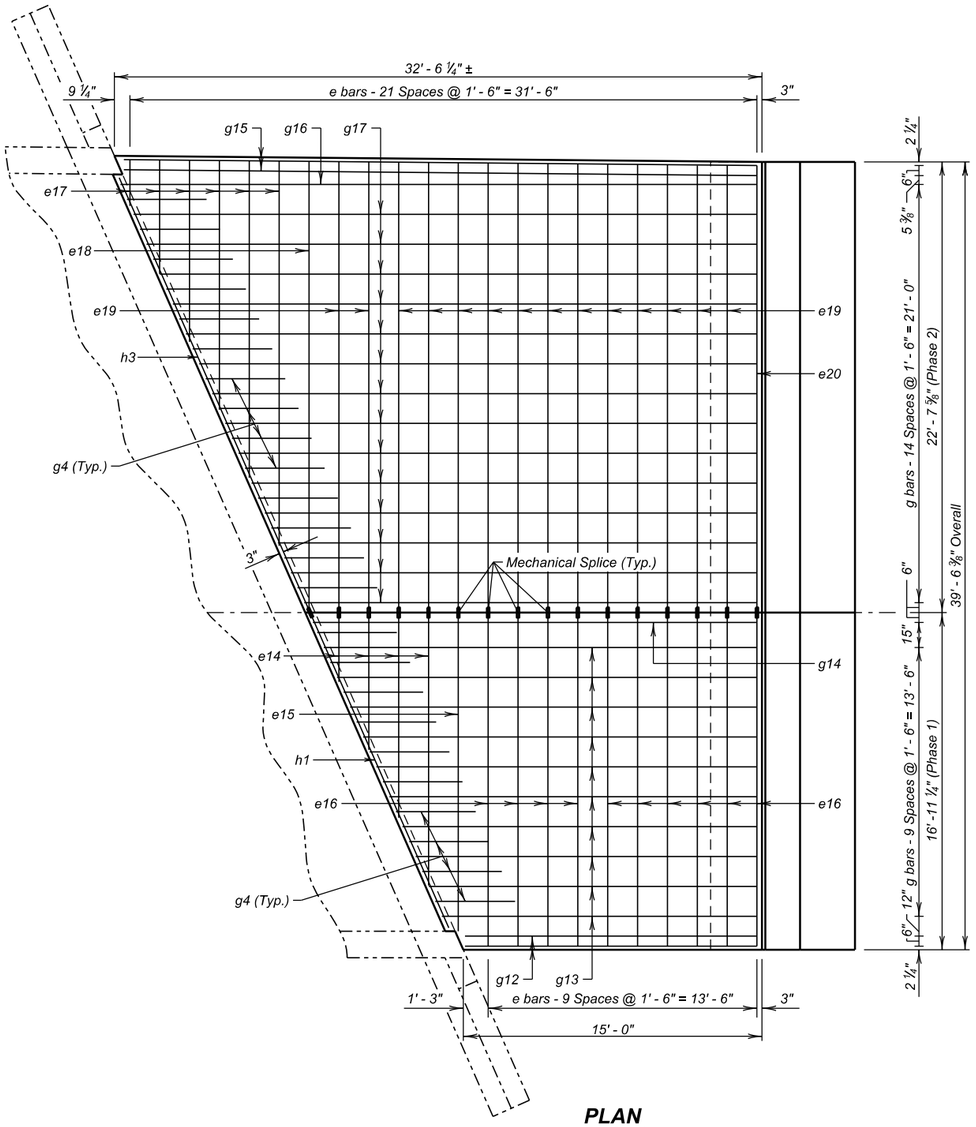
23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

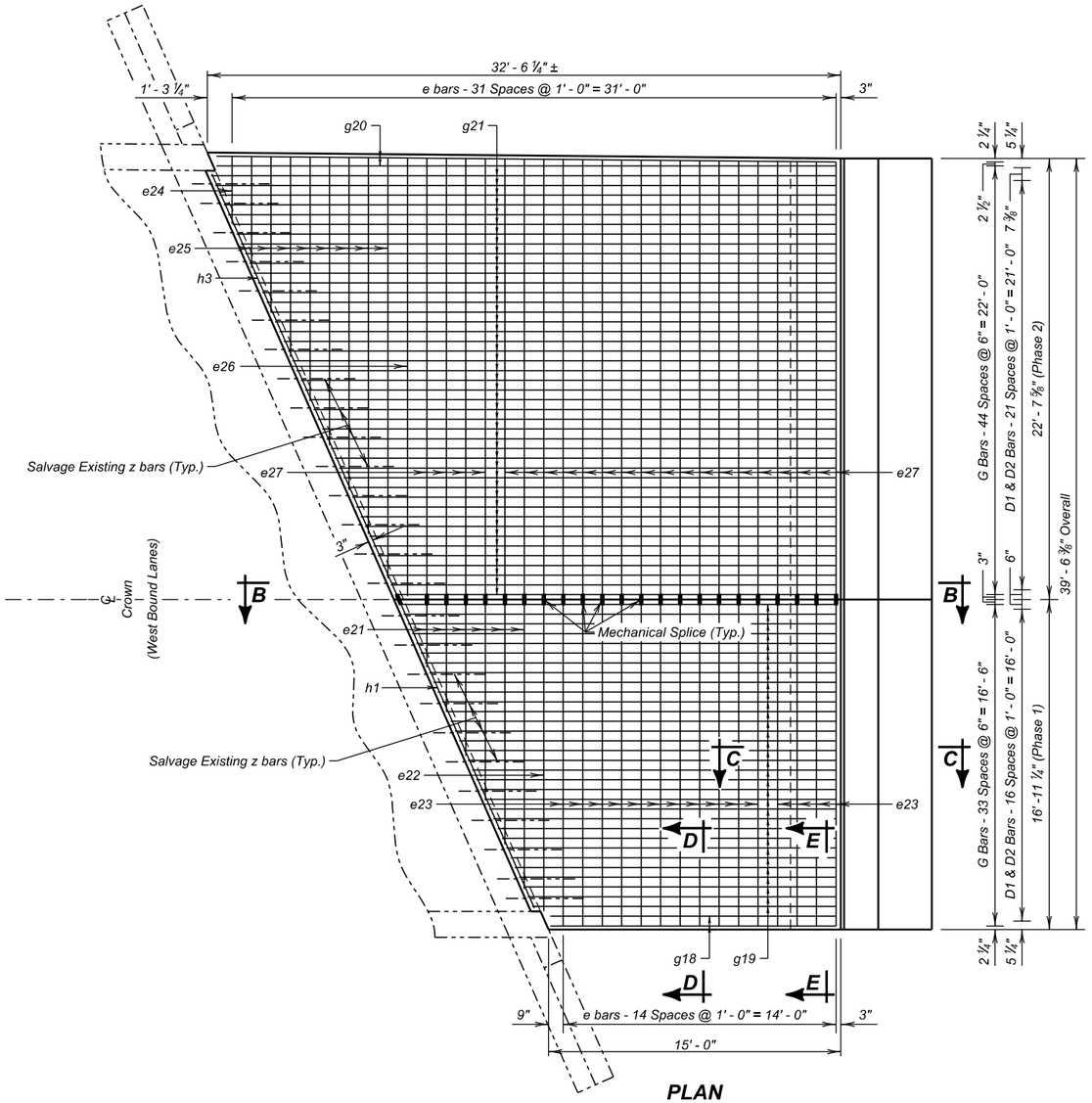
6 OF 23

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	PII	Steve A. Johnson BRIDGE ENGINEER
DAVS091U	091UBA06		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	36	141



PLAN
(Top Steel)
(Approach Slab shown adjacent to Abutment No. 4)



PLAN
(Bottom Steel)
(Approach Slab shown adjacent to Abutment No. 4)

APPROACH SLAB DETAILS (C)

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY OVER RAILROAD
STR. NO. 18-160-107

23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

7 OF 23

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	PII	Steve A Johnson BRIDGE ENGINEER
DAVS091U	091UBA07		

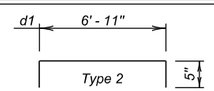
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	37	141

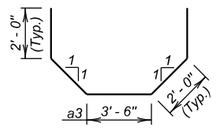
REINFORCING SCHEDULE
(For Two Approach Slabs)

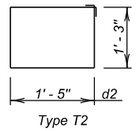
	Mk.	No.	Size	Length	Type
	Sleeper Slab (Phase 1)				
⊛	c1	48	5	16' - 5"	Str.
	d1	68	4	7' - 9"	2
	d2	34	4	6' - 1"	T2
	Approach Slab (Phase 1)				
⊛	e1	17	4	16' - 9"	Str.
	e2	1	4	16' - 7"	Str.
≠	e3	2	4	18' - 3"	Str.
⊛	e7	26	6	16' - 9"	Str.
	e8	1	6	16' - 6"	Str.
≠	e9	3	6	17' - 1"	Str.
≠ ⊛	e14	2	4	17' - 2"	Str.
⊛	e15	1	4	16' - 0"	Str.
⊛	e16	10	4	16' - 9"	Str.
≠ ⊛	e21	3	6	18' - 4"	Str.
⊛	e22	1	6	15' - 11"	Str.
⊛	e23	15	6	16' - 9"	Str.
	g1	2	4	32' - 6"	Str.
≠	g2	5	4	59' - 3"	Str.
	g3	1	4	26' - 1"	Str.
	g4	20	4	6' - 0"	Str.
	g7	2	8	32' - 6"	Str.
≠	g8	16	8	58' - 10"	Str.
	g12	2	4	14' - 8"	Str.
≠	g13	5	4	37' - 7"	Str.
	g14	1	4	22' - 3"	Str.
	g18	2	8	14' - 8"	Str.
≠	g19	16	8	38' - 0"	Str.
⊛	h1	4	6	17' - 3"	Str.

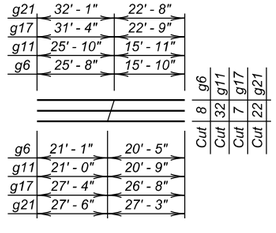
	Mk.	No.	Size	Length	Type
	Sleeper Slab (Phase 2)				
⊛	c2	24	5	24' - 4"	Str.
⊛	c3	24	5	22' - 2"	Str.
	d1	96	4	7' - 9"	2
	d2	48	4	6' - 1"	T2
	Approach Slab (Phase 2)				
	a3	3	4	11' - 6"	14
≠ ⊛	e4	5	4	49' - 0"	Str.
⊛	e5	1	4	23' - 8"	Str.
≠ ⊛	e6	3	4	25' - 9"	Str.
≠ ⊛	e10	7	6	49' - 0"	Str.
⊛	e11	1	6	24' - 5"	Str.
⊛	e12	1	6	23' - 8"	Str.
≠ ⊛	e13	5	6	24' - 7"	Str.
≠	e17	3	4	21' - 8"	Str.
	e18	1	4	22' - 6"	Str.
≠ ⊛	e19	7	4	45' - 1"	Str.
⊛	e20	1	4	22' - 5"	Str.
	e24	1	6	3' - 5"	Str.
≠	e25	4	6	27' - 3"	Str.
	e26	1	6	22' - 6"	Str.
≠ ⊛	e27	11	6	45' - 1"	Str.
	g4	29	4	6' - 0"	Str.
	g5	2	4	14' - 8"	Str.
≠	g6	8	4	41' - 6"	Str.
	g9	3	8	14' - 8"	Str.
	g10	1	8	15' - 8"	Str.
≠	g11	32	8	41' - 8"	Str.
	g15	2	4	31' - 9"	Str.
	g16	1	4	31' - 11"	Str.
≠	g17	7	4	54' - 1"	Str.
	g20	2	8	31' - 9"	Str.
≠	g21	22	8	54' - 8"	Str.
⊛	h2	2	6	25' - 8"	Str.
⊛	h3	2	6	23' - 10"	Str.

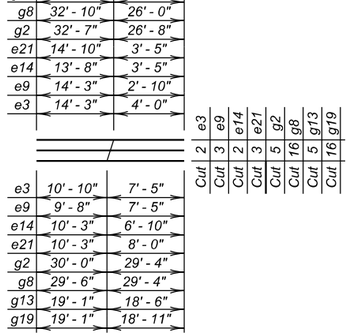
Bending Details

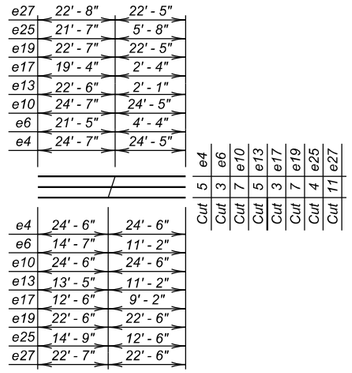












NOTES-
All Bars to be Epoxy Coated
All dimensions are out to out of bars.
≠ See Cutting Diagram
⊛ Splice (Mechanically Splice)

GENERAL NOTES:

ϕ 2" of material is used for estimation purposes only. Base Course will be placed and compacted to fill any low spots and bring backfill up to grade.

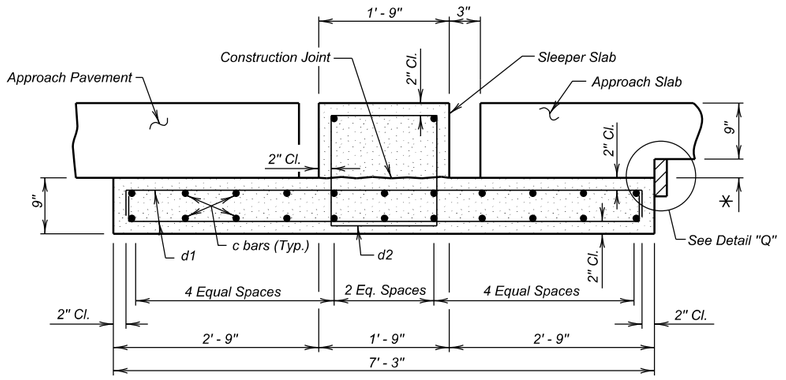
☆ For estimating purposes only, a factor of 1.89 Tons/Cu. Yd. was used to convert Cu. Yds. to Tons.

ESTIMATED QUANTITIES
(For Both Approach and Sleeper Slabs)

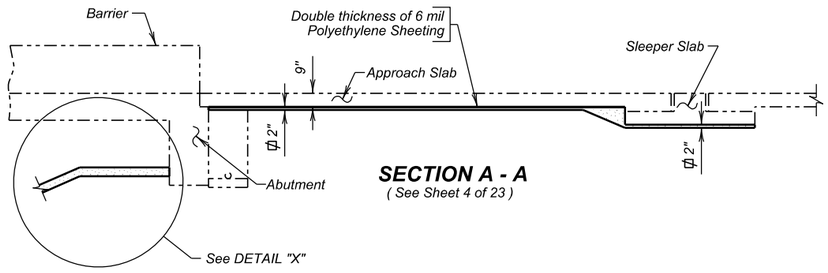
	ITEM	UNIT	QUANTITY Phase 1	QUANTITY Phase 2
☆ ϕ	Base Course	Ton	12	16
	Remove Concrete Bridge Approach Slab	SqYd	120.5	167.1
	Concrete Approach Slab for Bridge	SqYd	93.2	128.9
	Concrete Approach Sleeper Slab for Bridge	SqYd	27.3	38.2
	No. 4 Rebar Splice	Each	32	-
	No. 5 Rebar Splice	Each	48	-
	No. 6 Rebar Splice	Each	52	-

	PHASE 1	PHASE 2
1. Concrete in Approach Slabs.	23.3 CuYd	32.2 CuYd
2. Epoxy Coated Re-steel in Approach Slabs.	6,602 Lb	10,271 Lb
3. Concrete in Sleeper Slabs.	9.0 CuYd	12.6 CuYd
4. Epoxy Coated Re-steel in Sleeper Slabs.	1,312 Lb	1,856 Lb
5. 6 mil Polyethylene Sheeting (not including laps)	108.4 SqYd	150.0 SqYd

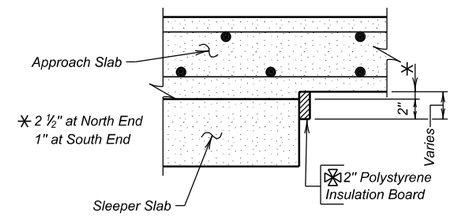
Items 1 thru 5 are approximate quantities contained in the above bid item and are for information only.



SECTION C - C
(Sleeper Slab)



SECTION A - A
(See Sheet 4 of 23)

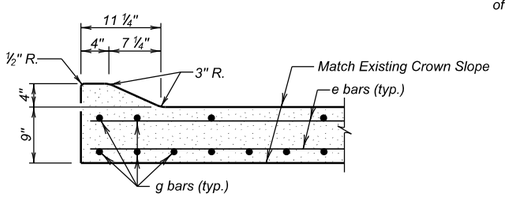


DETAIL "Q"

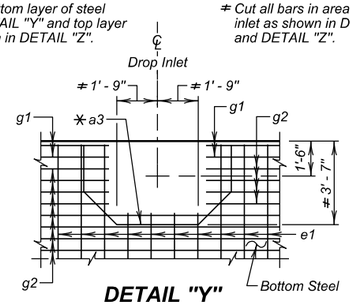
✳ Add a3 bar to bottom layer of steel as shown in DETAIL "Y" and top layer of steel as shown in DETAIL "Z".

≠ Cut all bars in area of drop inlet as shown in DETAIL "Y" and DETAIL "Z".

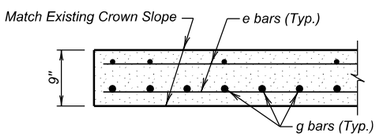
✠ The Polystyrene Insulation Board will be firmly attached to the sleeper slab by a method to be approved by the Engineer.



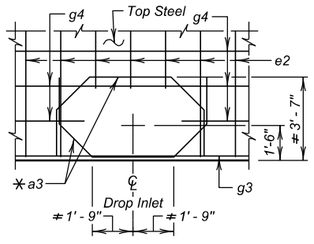
SECTION D - D



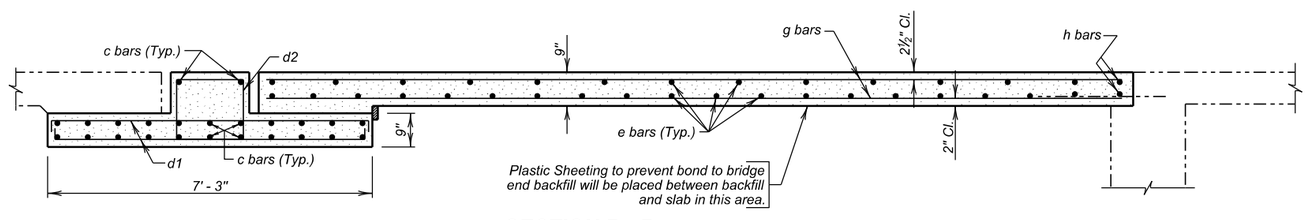
DETAIL "Y"
(Plan for Bottom Steel when drop inlet is used.)



SECTION E - E



DETAIL "Z"
(Plan for Top Steel when drop inlet is used.)



SECTION B - B

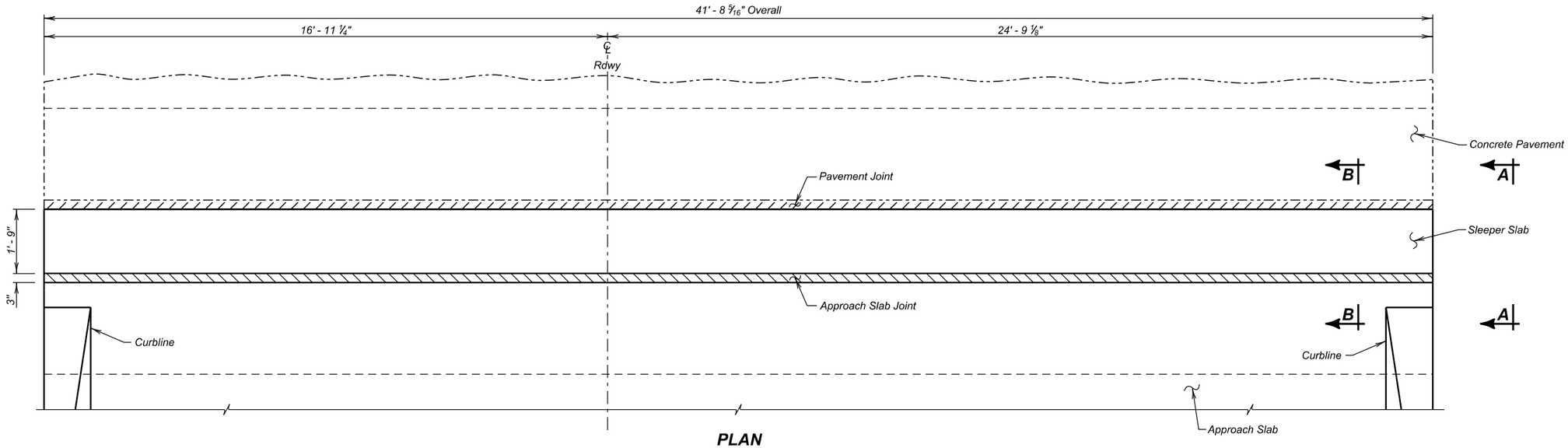
APPROACH SLAB DETAILS (D)
FOR
158' - 2 ¼" CONT. CONCRETE BRIDGE
VARIABLE ROADWAY OVER RAILROAD
STR. NO. 18-160-107
23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

8 OF 23

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	PII	Steve A Johnson BRIDGE ENGINEER
DAVS091U	091UBA08		

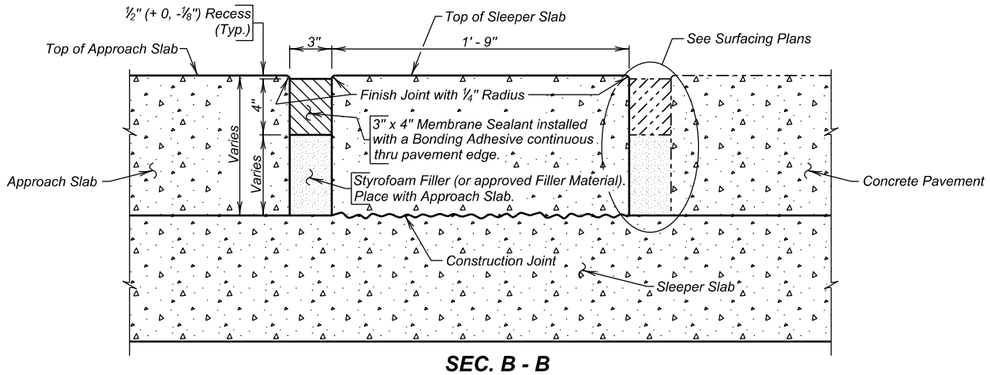
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	38	141



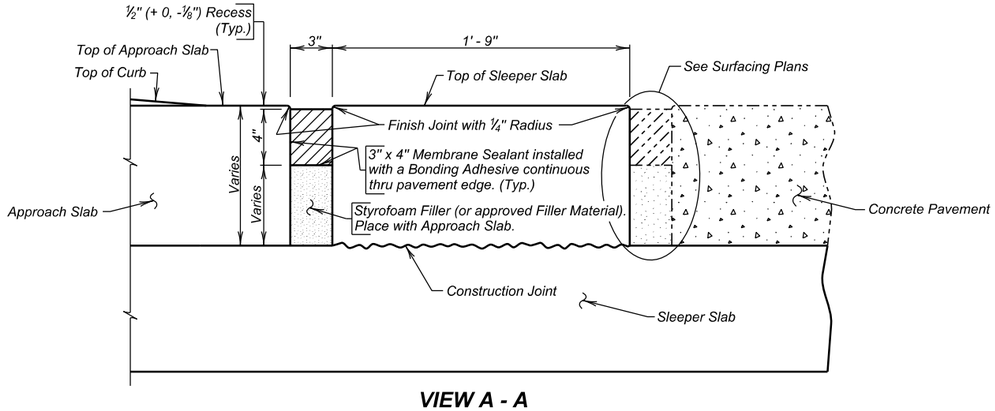
PLAN
(Begin Bridge Shown)

GENERAL NOTES

1. The membrane sealant will be on the approved product list for membrane sealant expansion joints.
2. The manufacturer will supply the membrane sealant in packaging that precompresses the membrane sealant. The precompressed dimension will be as recommended by the sealant manufacturer 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.
3. The membrane sealant will be supplied in pieces 5 feet in length or longer. The foam sealant will be ultra-violet and ozone resistant.
4. The bonding adhesive used to attach the membrane sealant to the adjacent concrete will be approved by the membrane sealant manufacturer.
5. Adhesive used to join adjacent pieces of the membrane sealant will be as recommended by the manufacturer.
6. If styrofoam filler material is used in the construction, it will be closed cell and water-tight as approved by the Engineer.
7. The minimum ambient air temperature at the time of joint installation and adhesive curing will be 40° F.
8. 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.
9. 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.
10. 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.
11. 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.
12. Traffic will not be allowed on the joint until the bonding adhesive has had time to cure, as recommended by the manufacturer.
13. 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.
14. 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.



SEC. B - B



VIEW A - A

APPROACH SLAB EXPANSION JOINT AT ABUTMENT 1
FOR
158' - 2 ¼" CONT. CONCRETE BRIDGE

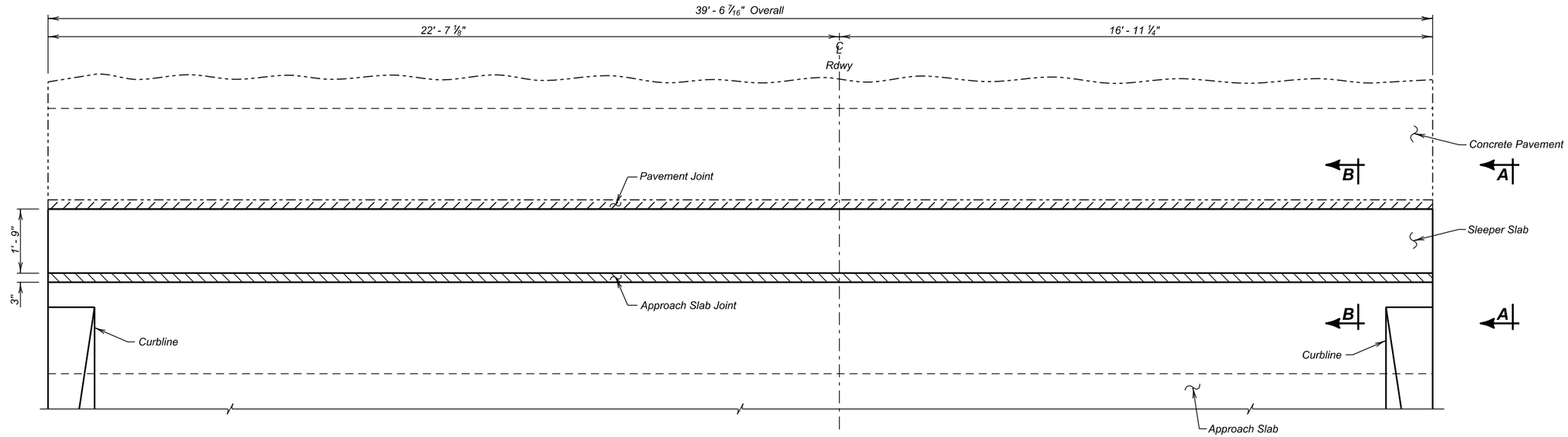
VARIABLE ROADWAY OVER RAILROAD
STR. NO. 18-160-107

23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	PII	BRIDGE ENGINEER
DAVS091U	091UBA09		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	39	141



PLAN
(End Bridge Shown)

ESTIMATED QUANTITIES (For Two Approach Slabs)		
ITEM	UNIT	QUANTITY
Membrane Sealant Expansion Joint	Ft.	81.3

APPROACH SLAB EXPANSION JOINT AT ABUTMENT 4

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY OVER RAILROAD
STR. NO. 18-160-107

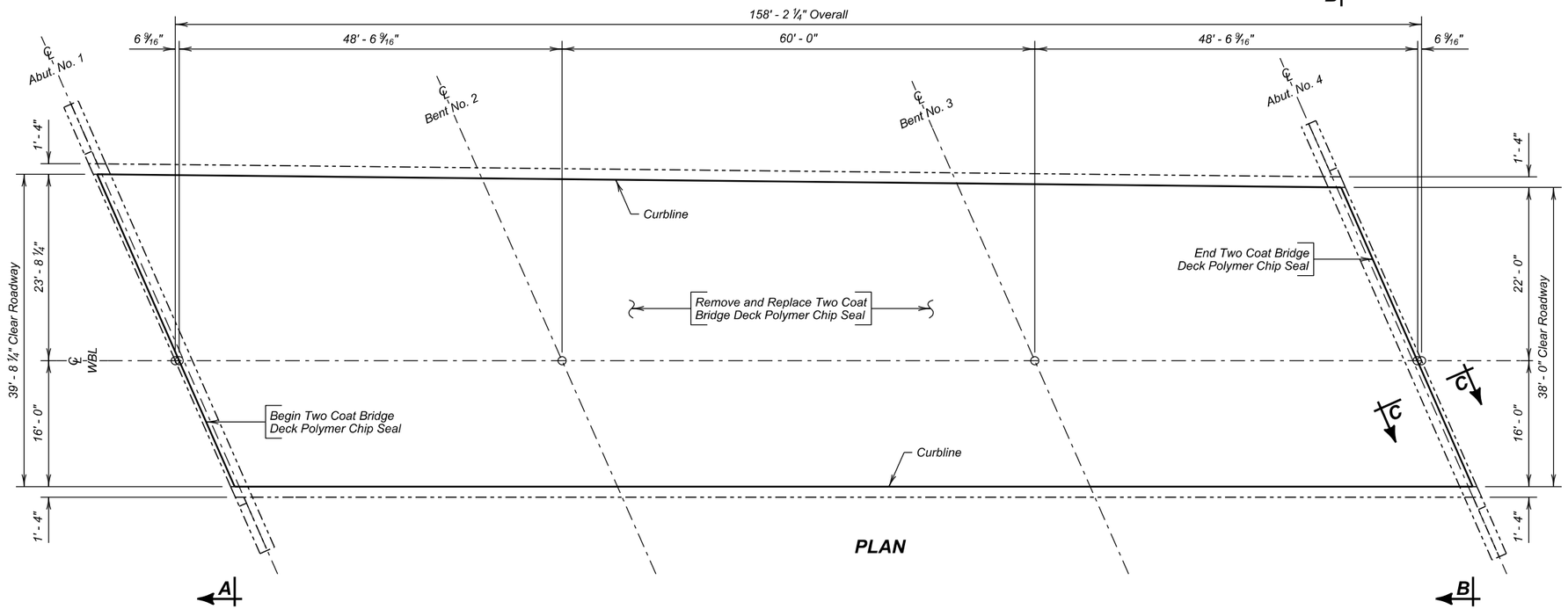
23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

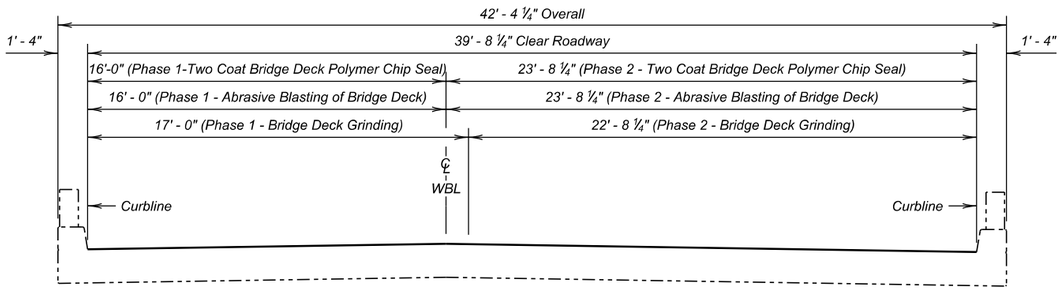
10 OF 23

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	PII	Steve A Johnson BRIDGE ENGINEER
DAVS091U	091UBA10		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	40	141

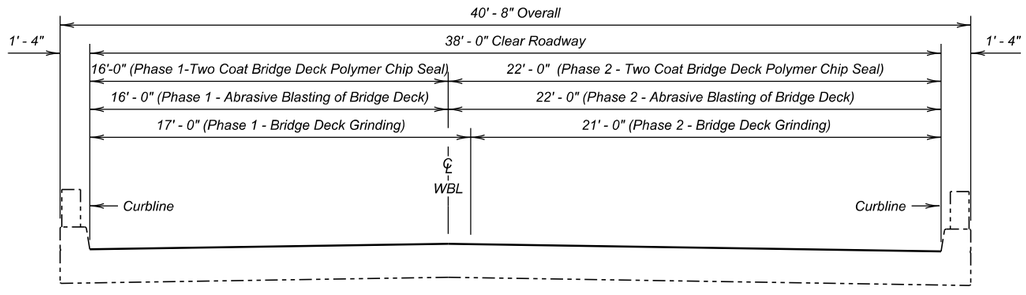


PLAN



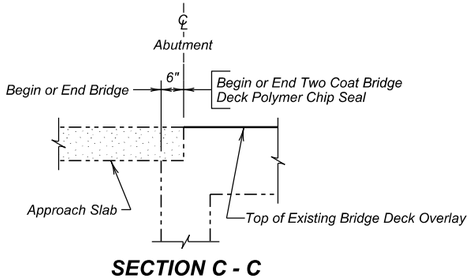
SECTION A - A

(Concrete shading and reinforcing steel not shown for clarity)



SECTION B - B

(Concrete shading and reinforcing steel not shown for clarity)



SECTION C - C

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY Phase I	QUANTITY Phase 2
	Two Coat Bridge Deck Polymer Chip Seal	SqYd	281.2	401.5
	Abrasive Blasting of Bridge Deck	SqYd	281.2	401.5
	Bridge Deck Grinding	SqYd	298.8	383.9
✳	Concrete Removal, Class A	SqYd	2.0	2.0
✳	Concrete Removal, Class B	SqYd	2.0	2.0
✳	Concrete Patching Material, Bridge Deck	CuFt	27.0	27.0

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

TWO COAT BRIDGE DECK POLYMER CHIP SEAL LAYOUT

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY — 23°43' 25" SKEW R.H.F.

OVER RAILROAD — SEC. 27-T103N-R60W

STR. NO. 18-160-107 — IM 0907(90)332

DAVISON COUNTY

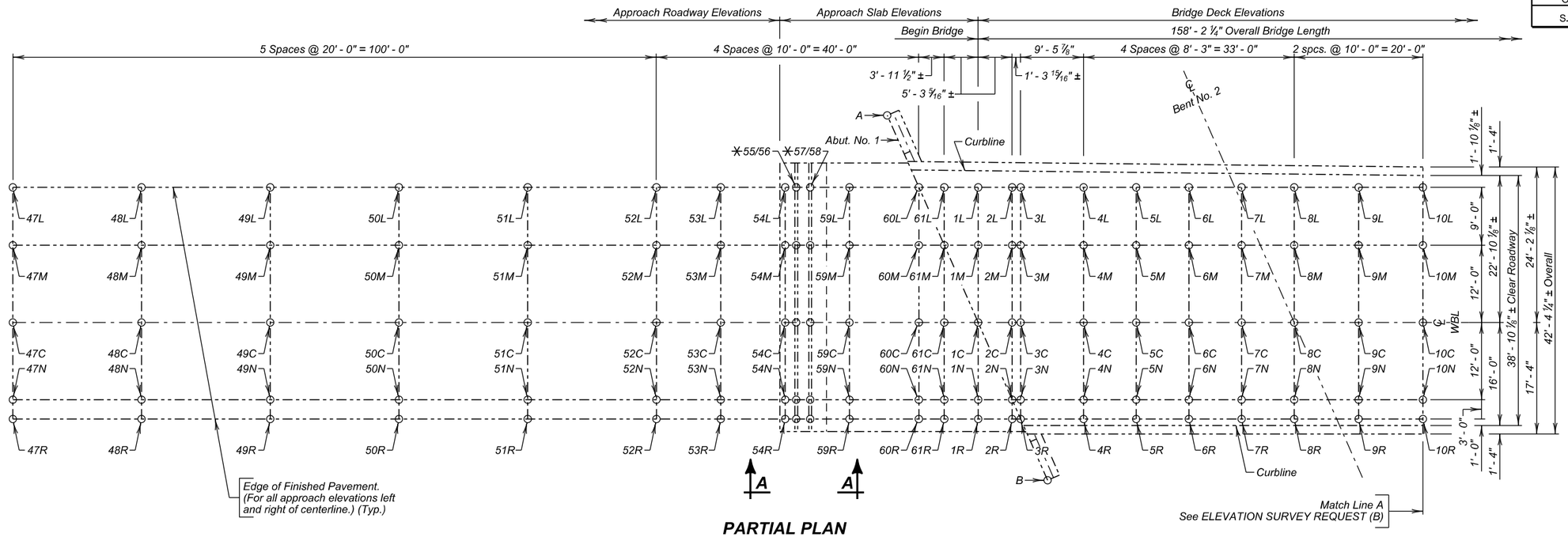
S. D. DEPT. OF TRANSPORTATION

JUNE 2024

11 OF 23

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	PII	Steve A Johnson BRIDGE ENGINEER
DAVS091U	091UBA11		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	41	141



PARTIAL PLAN

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Bridge Elevation Survey	LS	Lump Sum

Table of Elevations - Approach Roadway

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
47L		47M		47C		47N		47R	
48L		48M		48C		48N		48R	
49L		49M		49C		49N		49R	
50L		50M		50C		50N		50R	
51L		51M		51C		51N		51R	
52L		52M		52C		52N		52R	
53L		53M		53C		53N		53R	

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

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
54L		54M		54C		54N		54R	
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	
		60M		60C		60N		60R	
				61C		61N		61R	
						1N		1R	
								2R	

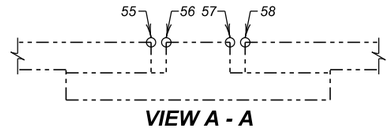
Table of Elevations - Bridge Deck

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
60L									
61L		61M							
1L		1M		1C					
2L		2M		2C		2N			
3L		3M		3C		3N		3R	
4L		4M		4C		4N		4R	
5L		5M		5C		5N		5R	
6L		6M		6C		6N		6R	
7L		7M		7C		7N		7R	
8L		8M		8C		8N		8R	
9L		9M		9C		9N		9R	
10L		10M		10C		10N		10R	

Bridge Ends	
Location	Elevation
A	
B	

Benchmark Description:

B.M. # _____
Location Description _____
Elevation _____



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.

NOTE:

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

AS-BUILT SURVEY (A)

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

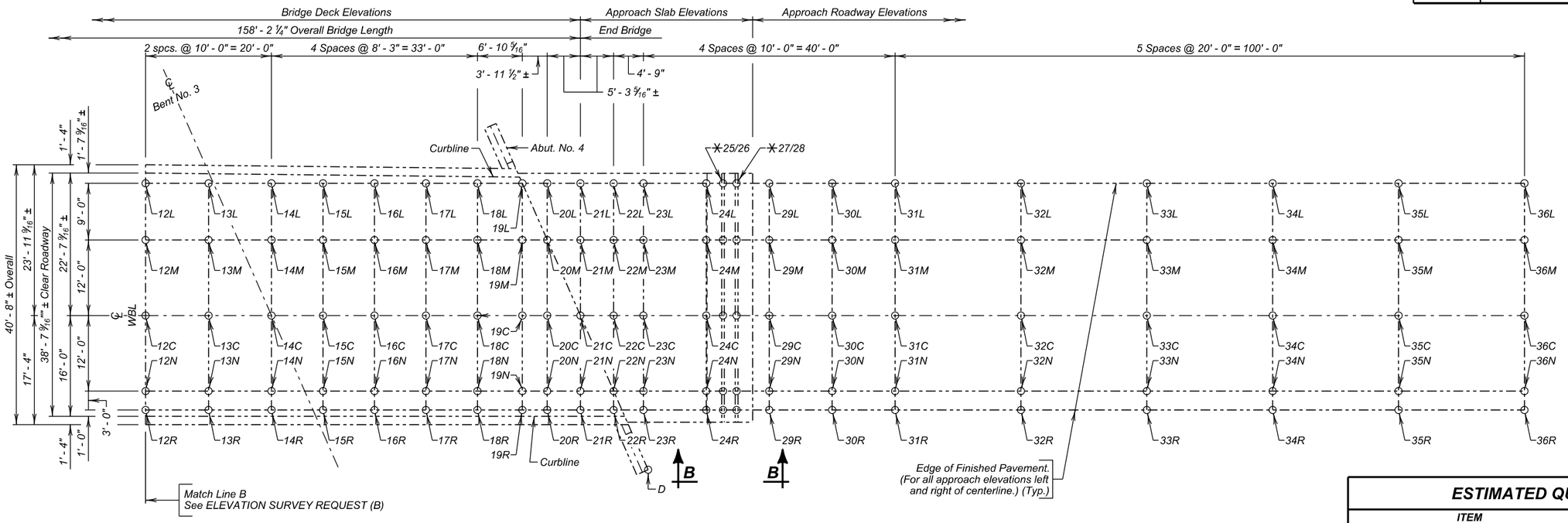
VARIABLE ROADWAY OVER RAILROAD
STR. NO. 18-160-107

23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	JB	Steve A Johnson BRIDGE ENGINEER
DAVS091U	091UBA12		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	42	141



PARTIAL PLAN

ESTIMATED QUANTITIES		
ITEM	***UNIT***	***QUANTITY***
Bridge Elevation Survey	*LS*	*Lump Sum*

Table of Elevations - Bridge Deck

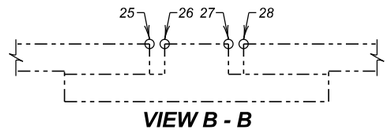
Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
12L		12M		12C		12N		12R	
13L		13M		13C		13N		13R	
14L		14M		14C		14N		14R	
15L		15M		15C		15N		15R	
16L		16M		16C		16N		16R	
17L		17M		17C		17N		17R	
18L		18M		18C		18N		18R	
19L		19M		19C		19N		19R	
		20M		20C		20N		20R	
				21C		21N		21R	
						22N		22R	

Table of Elevations - Approach Roadway

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
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	

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

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
20L									
21L		21M							
22L		22M		22C					
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	



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.*

NOTE:

The As-Built Elevations shall be based on the National Geodetic Survey North American Vertical Datum of 1988 and shall be recorded at the locations shown by the table on this sheet. The completed table shall 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.

Benchmark Description:

B.M. # _____
Location Description _____
Elevation _____

AS-BUILT SURVEY (B)

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY — 23° 43' 25" SKEW R.H.F.
OVER RAILROAD — SEC. 27-T103N-R60W
STR. NO. 18-160-107 — IM 0907(90)332

DAVISON COUNTY

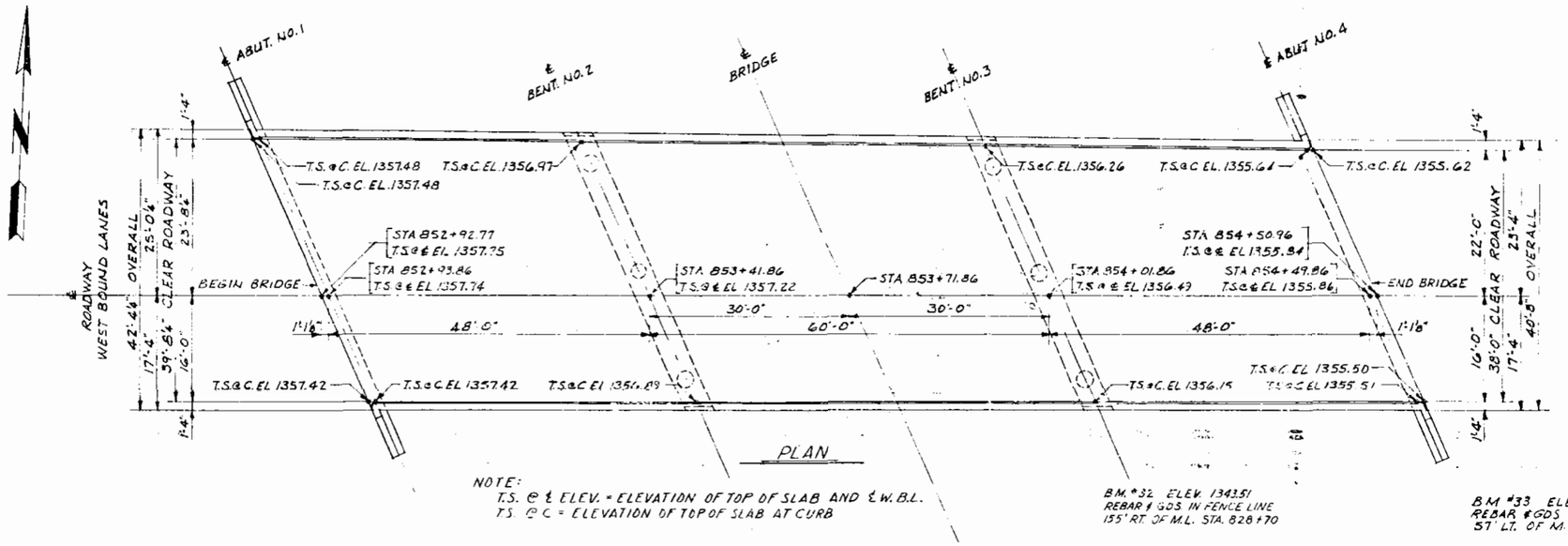
S. D. DEPT. OF TRANSPORTATION

JUNE 2024

13 OF 23

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	PII	Steve A Johnson BRIDGE ENGINEER
DAVS091U	091UBA13		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	43	141



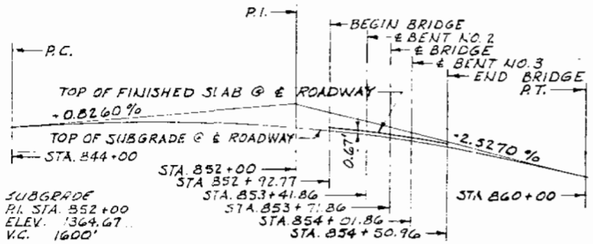
PLAN

NOTE:
T.S. @ ℄ ELEV. = ELEVATION OF TOP OF SLAB AND ℄ W.B.L.
T.S. @ C = ELEVATION OF TOP OF SLAB AT CURB

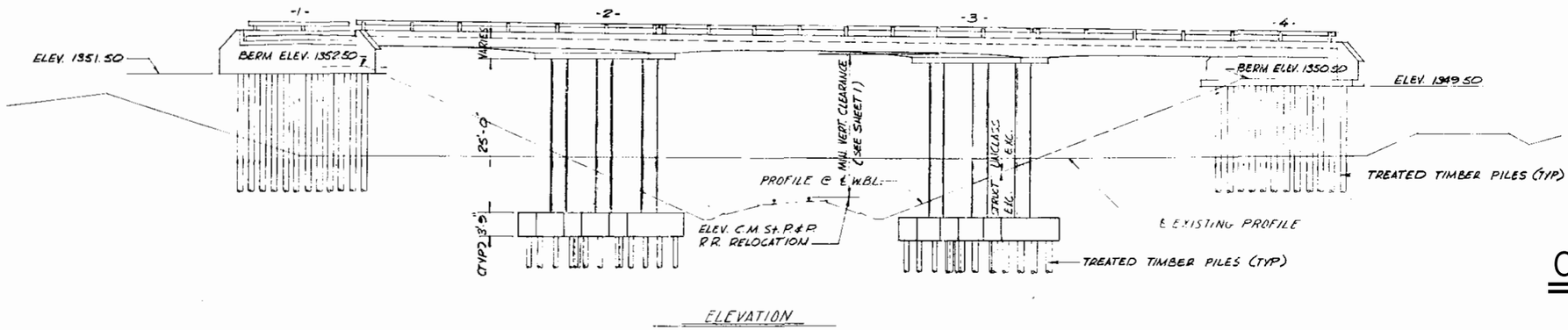
B.M. #32 ELEV. 1343.51
REBAR # GDS IN FENCE LINE
155' RT. OF M.L. STA. 828+70

B.M. #33 ELEV 1335.47
REBAR # GDS IN FENCE LINE
57' LT. OF M.L. STA 855+37

B.M. #34 ELEV. 1305.91
REBAR # GDS
179' LT. OF M.L. STA. 882+02



VERTICAL CURVE DATA



ELEVATION

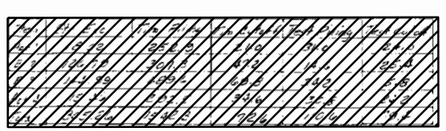
ESTIMATED QUANTITIES (W.B.L.)

ITEM	CL. A CONC. REF. STGE. S.M.I.	CL. A CONC. REF. STGE. S.M.I.	REINF. BARS LBS.	TIMBER PILES LIN. FT.	EXCAVATION CU. YDS.	
	CU. YDS.	LBS.		TIMBER & TEST	STRUCT.	UNCLASS.
EXPL. EXCAVATION						
ABUTMENT NO. 1	224.3	18,260	560	1650	135	15
BENT NO. 2	212.0	19,210		1540	125	14
BENT NO. 3	212.0	19,210		1540	125	14
ABUTMENT NO. 4	224.3	18,260	560	1650	135	15
TOTAL	872.6	74,940	1120	6380	520	58

△SEE GRADING PLANS FOR UNCLASSIFIED EXCAVATION.
ONE TREATED TIMBER TEST PILE SHALL BE DRIVEN AT EACH ABUTMENT AND BENT BEFORE REMAINING PILES ARE ORDERED.

PILE NOTE

PILES DRIVEN AT ABUTMENTS NO 1 AND 4, INCLUDING TEST PILES, SHALL OBTAIN THEIR FULL BEARING, 24 TONS, IN THE NATURAL GROUND BELOW THE NEW EMBANKMENT ELEVATIONS 1338.2± & 1338.0± RESPECTIVELY. PRE-BORED HOLES THRU THE FILL ARE REQUIRED AND SHALL HAVE A MINIMUM DIAMETER 2" LARGER THAN THE NOMINAL DIAMETER (3'-0" FROM THE BUTT) OF THE PILE.



E.E. 12-16-67 KDOT

ORIGINAL CONSTRUCTION PLANS

GENERAL DRAWING AND
QUANTITIES (W.B.L.)
FOR

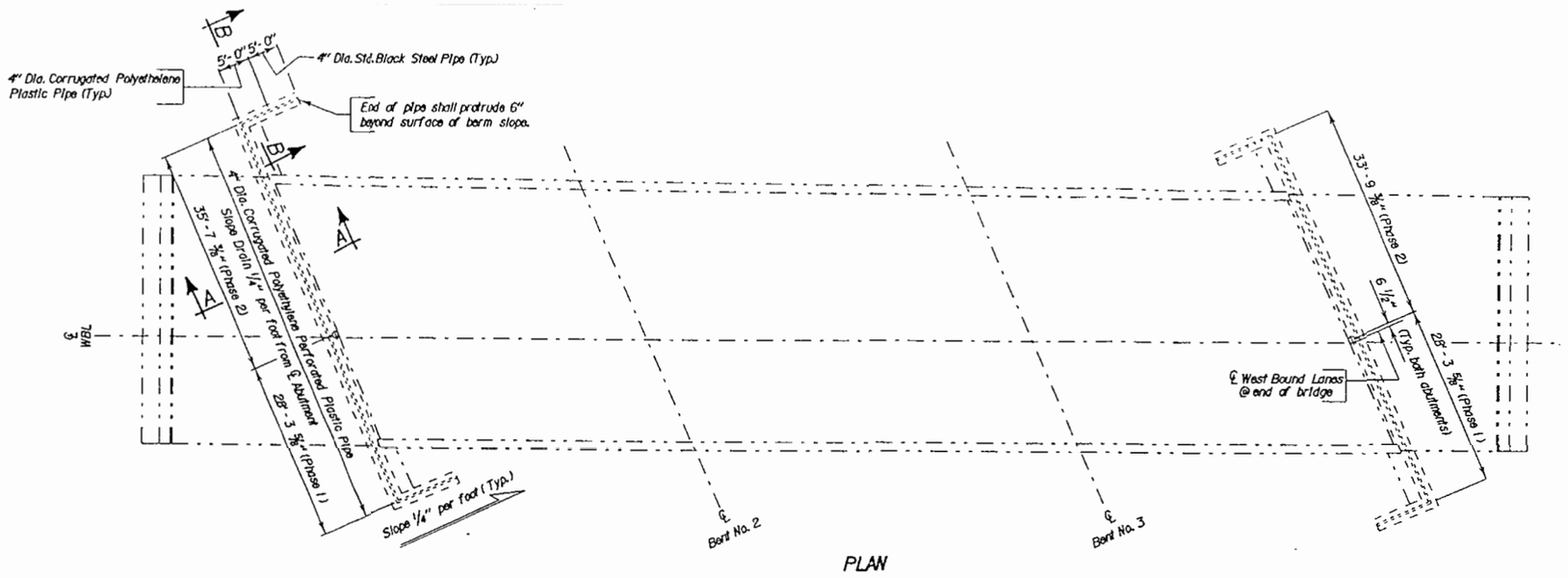
158'-2 ¼" CONTINUOUS CONCRETE BRIDGE

VARIABLE ROADWAY
OVER C.M.St.P & P.R.R. SEC. 27-T103N-R60W
STA. 852+92.77 TO STA. 854+50.96
DAVISON COUNTY I-90-7(16)328
23°-43.409' SKEW R.H.F.
SOUTH DAKOTA HS20-44 (& ALT.)

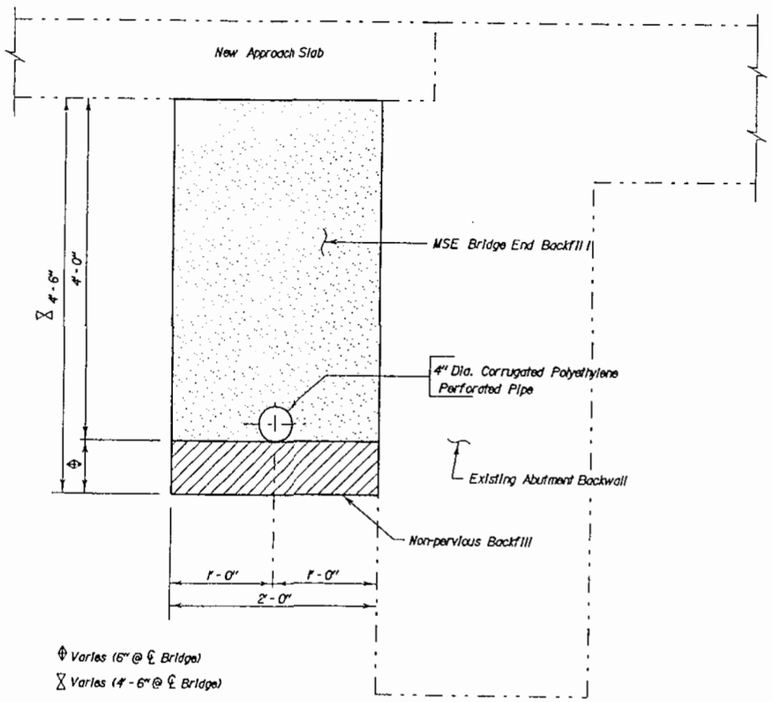
J. T. BANNER & ASSOC., INC.
CONSULTING ENGINEERS

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
M.G.H.	P.R.M.	J.O.E.	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	44	141

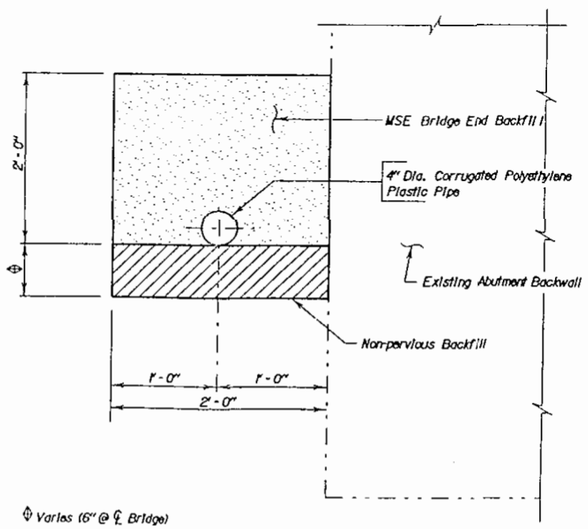


PLAN



SEC. A-A

(Shown adjacent to Abutment No. 1, Abutment No. 4 similar by opposite hand)



SEC. B-B

ESTIMATED QUANTITIES (For Two Abutments)			
		QUANTITY	
ITEM	UNIT	PHASE 1	PHASE 2
Underdrain Pipe, Bridge End Backfill	L.F.	76.6	68.4
Excavation, Bridge End Backfill	C.Y.	22.6	26.8
Backfill, MSE Bridge End	C.Y.	19.1	23.5

ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)

DETAILS OF DRAINAGE AT ABUTMENTS FOR

158' - 2 1/4" CONT. CONC. SLAB BRIDGE

VARIABLE ROADWAY — 23° 43.4' SKEW R. H. F.

STR. NO. 18-160-107 — SEC. 27-T103N-R60W

OVER RAILROAD — IM 90-7(40)319

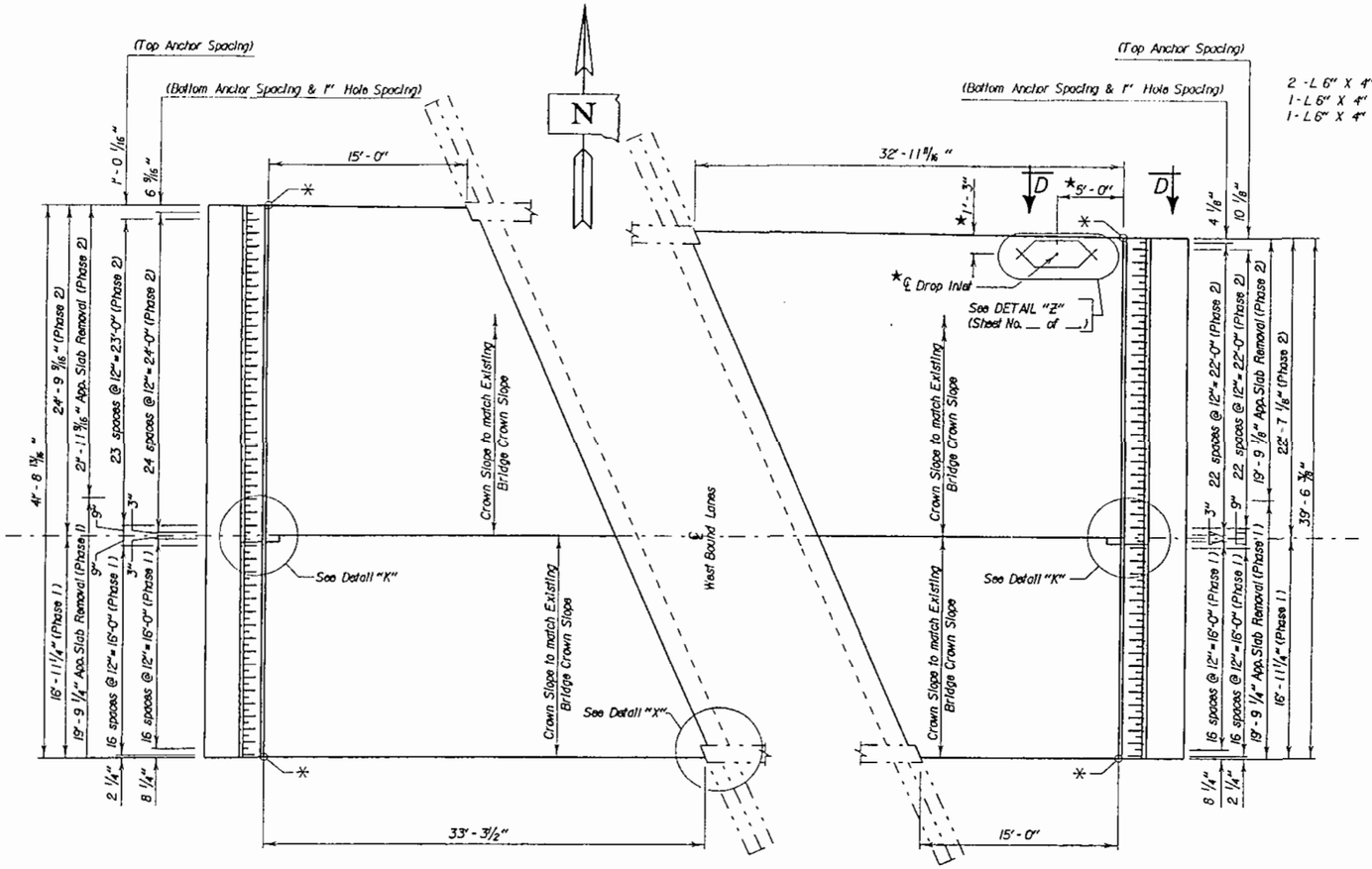
DAVISON COUNTY

S. D. DEPT. OF TRANSPORTATION — 15 OF 23

JULY 1999

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
EJA	EJA	CJD	John C. Cole
DAVS4970	4970MC08		BRIDGE ENGINEER

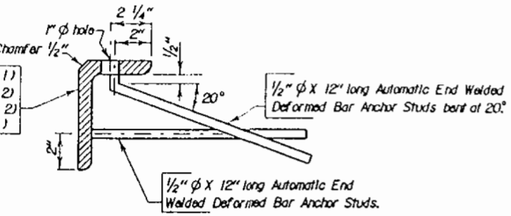
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	45	141



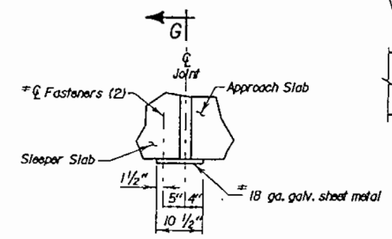
PLAN
(Approach slab shown adjacent to Abut. No. 1)

PLAN
(Approach slab shown adjacent to Abut. No. 4)

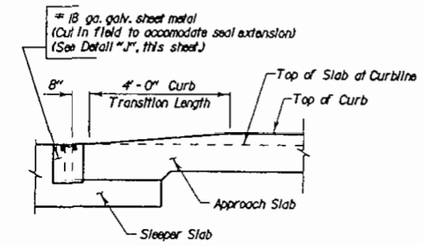
2 - L 6" X 4" X 3/4" X 16'-11 1/4" (Phase 1)
1 - L 6" X 4" X 3/4" X 22'-7 1/8" (Phase 2)
1 - L 6" X 4" X 3/4" X 24'-9 5/16" (Phase 2)
(conforms to crown slope)



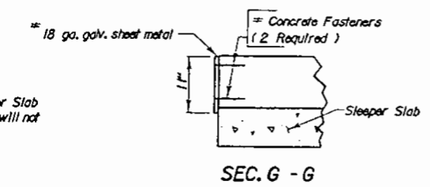
DETAIL "Y"
(See Sheet No. 12 of 28 for location of detail.)
(See Notes Regarding Armor Angle Assembly)



PLAN - DETAIL "J"



VIEW D - D

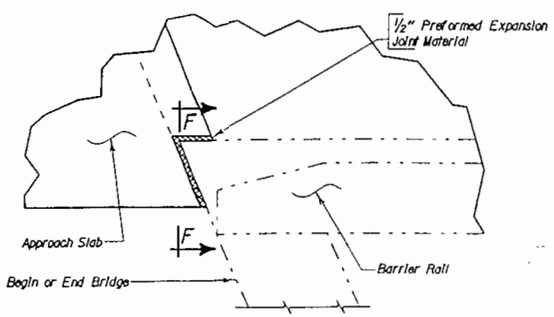


SEC. G - G

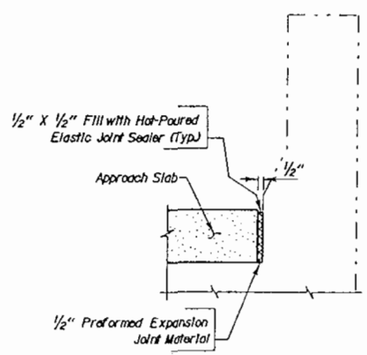
* Attach 18 ga. galv. Sheet Metal to both ends of Sleeper Slab only after slab has been poured. Use fasteners that will not spall concrete, as approved by the Engineer.

* Elevation Is Top of Slab back of Curb at this point. See Approach Slab Note No. 6 on Sheet No. 123 of 221.

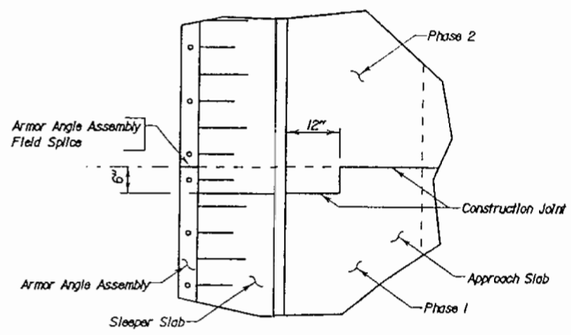
★ The drop Inlet will be placed as shown in Abutment No. 4 only. (Adjacent to the Northeast corner of the bridge).



DETAIL "X"
(Typical all four bridge corners)



SEC. F - F



DETAIL "K"
(Abut. No. 1 detail shown, Abut. No. 4 similar)

ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
APPROACH SLAB ADJACENT TO BRIDGE FOR
158'-2 1/4" CONT. CONC. SLAB BRIDGE

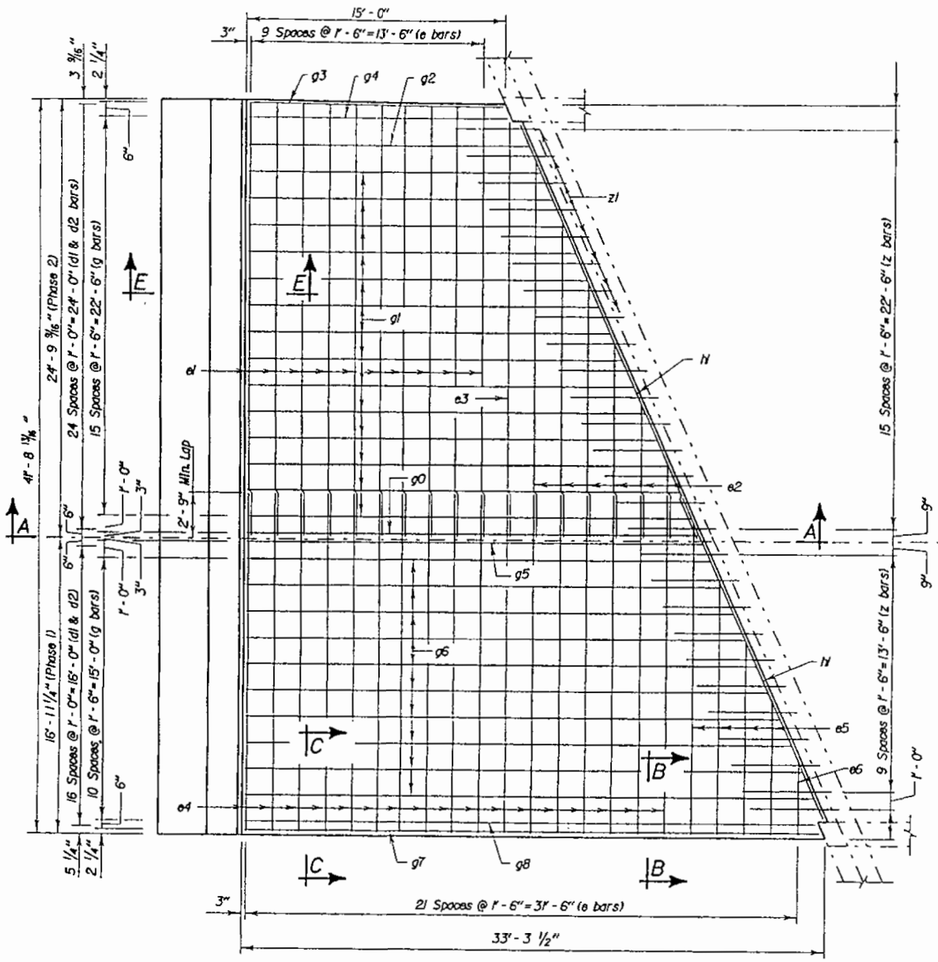
VARIABLE ROADWAY — 23.72° SKEW R.H.F.
STR. NO. 18-160-107 — SEC. 27-T103N-R60W
OVER RAILROAD — IM 90-7(40)319

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 1999

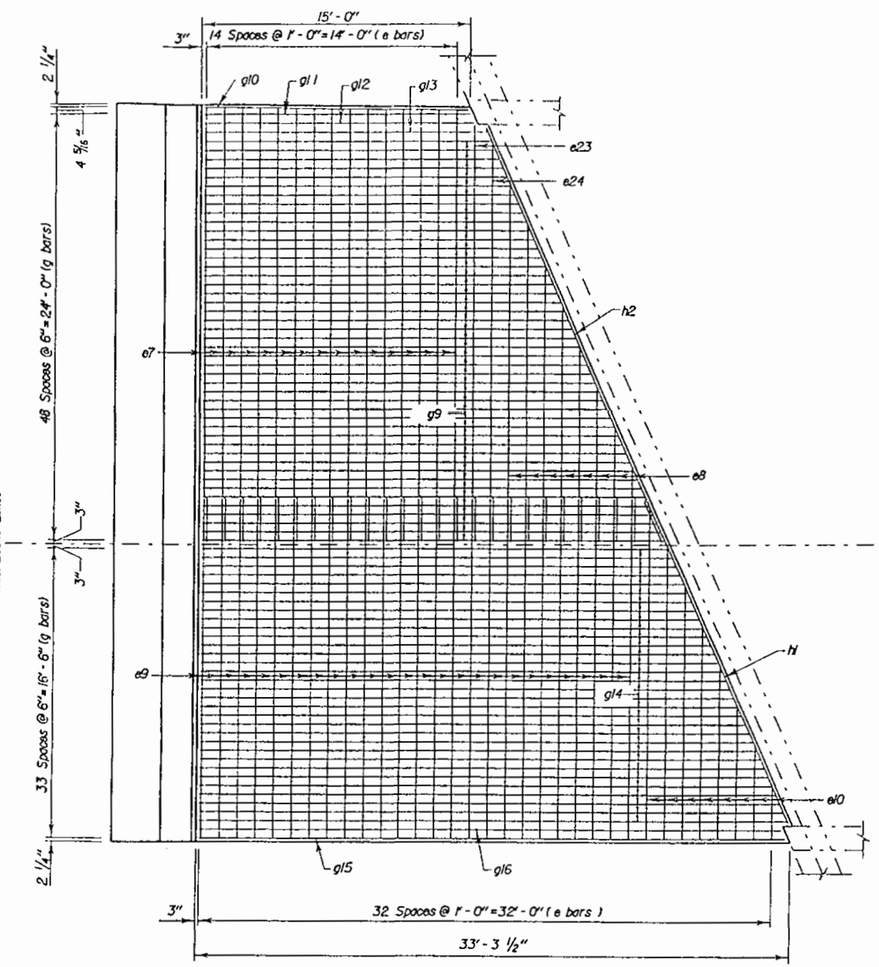
16 OF 23

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
EJA	EJA	CJD	BRIDGE ENGINEER
DAVS4970	4970PC09		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	46	141



PLAN
(Top Steel shown)



PLAN
(Bottom Steel shown)

ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
APPROACH SLAB ADJACENT TO ABUTMENT NO. 1
FOR

158'-2¼" CONT. CONC. SLAB BRIDGE

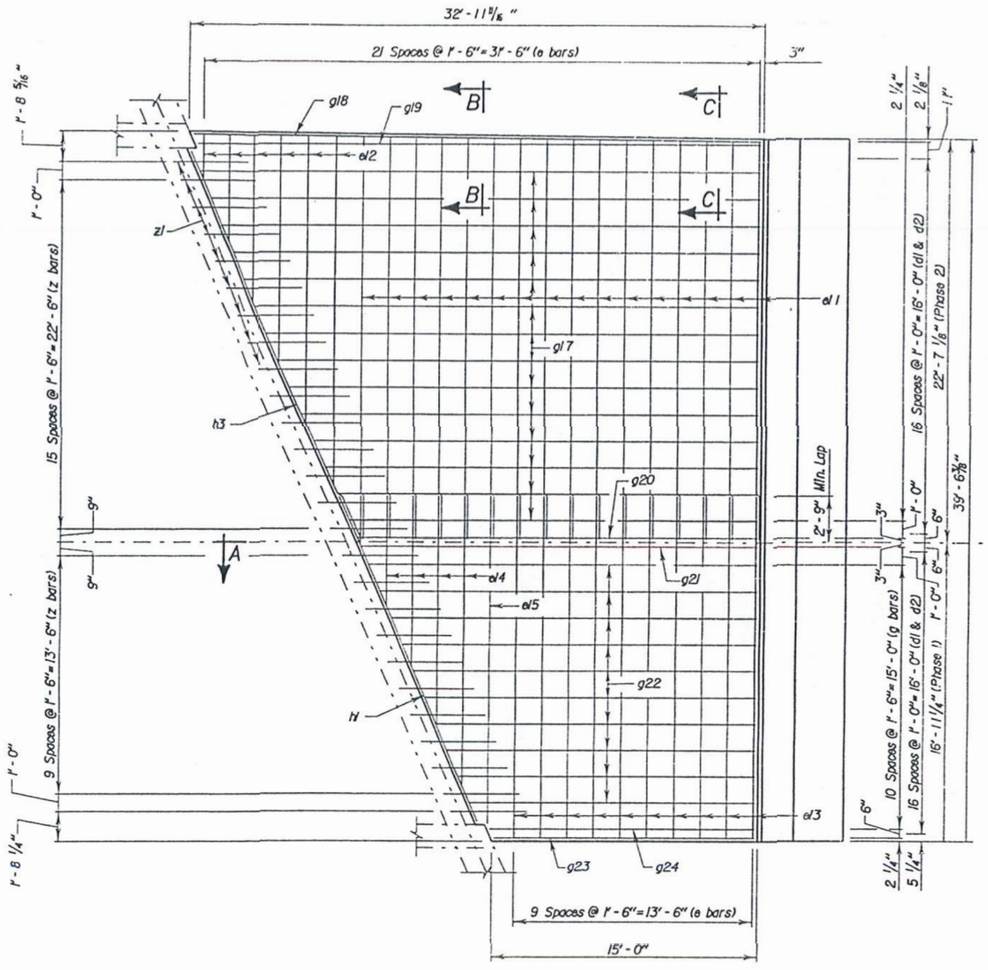
VARIABLE ROADWAY — 23.72° SKEW R.H.F.
STR. NO. 18-160-107 — SEC. 27-T103N-R60W
OVER RAILROAD — IM 90-7(40)319

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION

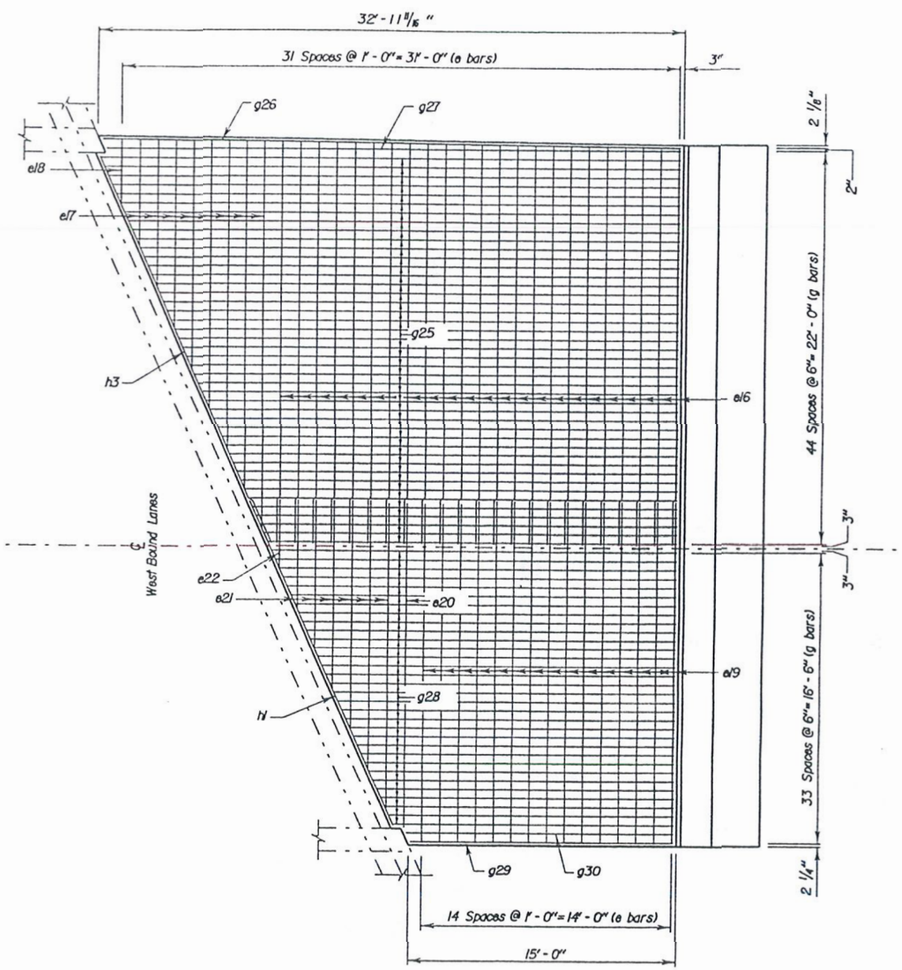
JUNE 1999 — (17) OF (23)

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
EJA	EJA	CJD	BRIDGE ENGINEER
DAVS4970	4970PC10		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	47	141



PLAN
(Top Steel shown)



PLAN
(Bottom Steel shown)

ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)

APPROACH SLAB ADJACENT TO ABUTMENT NO. 4

FOR

158'-2 1/4" CONT. CONC. SLAB BRIDGE

VARIABLE ROADWAY — 23.72° SKEW R.H.F.

STR. NO. 18-160-107 — SEC. 27-T103N-R60W

OVER RAILROAD — IM 90-7(40)319

DAVISON COUNTY

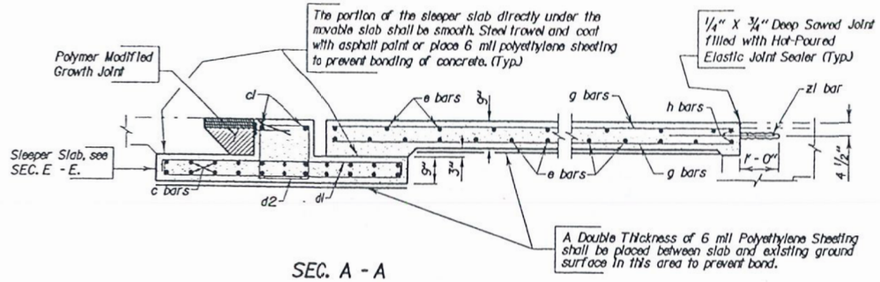
S. D. DEPT. OF TRANSPORTATION

JUNE 1999

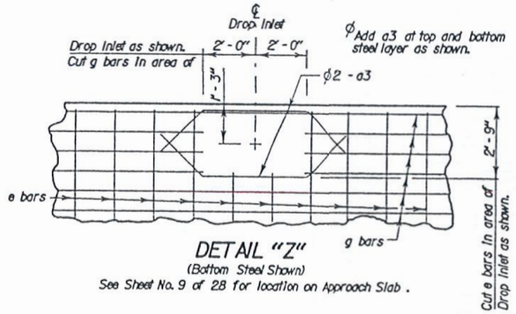
18 OF 23

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
EJA	EJA	CJD	BRIDGE ENGINEER
DAVS4970	4970PCI		

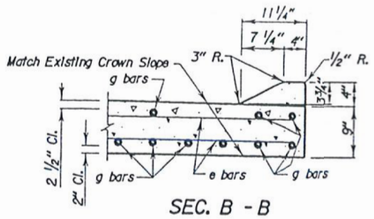
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	48	141



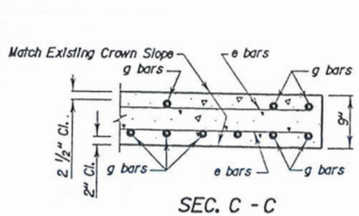
SEC. A - A



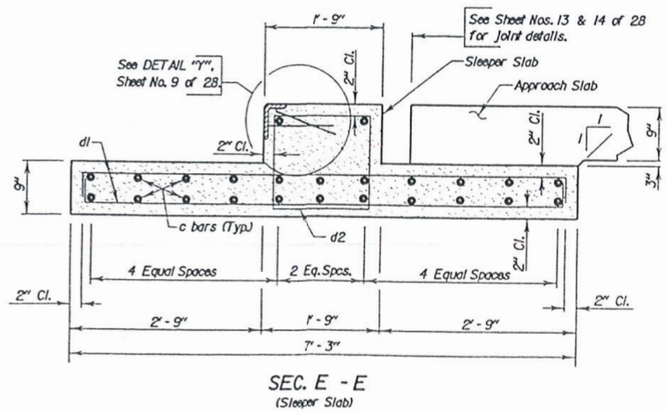
DETAIL "Z"
(Bottom Steel Shown)
See Sheet No. 9 of 28 for location on Approach Slab.



SEC. B - B



SEC. C - C

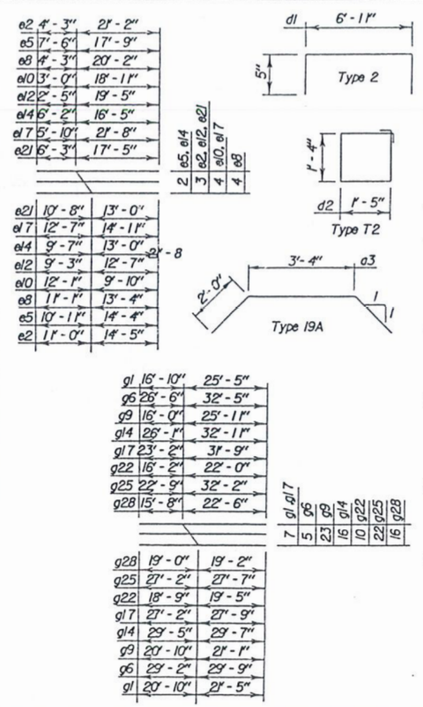


SEC. E - E
(Sleeper Slab)

REINFORCING SCHEDULE
(For Two Approach and Sleeper Slabs)

PHASE 1 Mk.	No.	Size	Length	Type
c1	48	5	19' - 6"	Str.
d1	68	4	7' - 9"	2
d2	34	4	6' - 3"	T2
e4	17	4	19' - 6"	Str.
* e5	2	4	25' - 3"	Str.
e6	1	4	4' - 0"	Str.
e9	25	6	19' - 6"	Str.
* e10	4	6	21' - 1"	Str.
e13	10	4	19' - 6"	Str.
* e14	2	4	22' - 7"	Str.
e15	1	4	18' - 7"	Str.
e19	15	6	19' - 6"	Str.
e20	1	6	18' - 5"	Str.
* e21	3	6	23' - 8"	Str.
e22	1	6	3' - 1"	Str.
g5	1	4	26' - 1"	Str.
g6	5	4	58' - 1"	Str.
g7	1	4	32' - 9"	Str.
g8	1	4	32' - 7"	Str.
* g14	16	8	59' - 0"	Str.
g15	1	8	32' - 10"	Str.
g16	1	8	32' - 7"	Str.
g21	1	4	22' - 6"	Str.
* g22	10	4	38' - 2"	Str.
g23	1	4	14' - 8"	Str.
g24	1	4	14' - 11"	Str.
* g28	16	8	38' - 2"	Str.
g29	1	8	14' - 8"	Str.
g30	1	8	14' - 11"	Str.
N	4	6	20' - 2"	Str.
△ z1	22	6	4' - 0"	Str.

Bending Details



PHASE 2 Mk.	No.	Size	Length	Type
a3	4	4	7' - 4"	19A
c2	24	5	24' - 3"	Str.
c3	24	5	24' - 11"	Str.
d1	110	4	7' - 9"	2
d2	55	4	6' - 3"	T2
e1	10	4	24' - 3"	Str.
* e2	3	6	25' - 5"	Str.
e3	1	4	23' - 5"	Str.
e7	15	6	24' - 3"	Str.
* e8	5	4	24' - 5"	Str.
e11	16	4	22' - 3"	Str.
* e12	3	4	21' - 10"	Str.
e16	23	6	22' - 3"	Str.
* e17	4	6	27' - 6"	Str.
e18	1	6	3' - 7"	Str.
e23	1	6	23' - 5"	Str.
e24	1	6	22' - 5"	Str.
g0	1	4	25' - 10"	Str.
* g1	7	4	42' - 3"	Str.
g2	1	4	16' - 2"	Str.
g3	1	4	14' - 8"	Str.
g4	1	4	15' - 0"	Str.
* g9	23	8	41' - 11"	Str.
g10	1	8	14' - 8"	Str.
g11	1	8	14' - 9"	Str.
g12	1	8	15' - 0"	Str.
g13	1	8	15' - 9"	Str.
* g17	7	4	15' - 11"	Str.
g18	1	4	32' - 1"	Str.
g19	1	4	31' - 10"	Str.
g20	1	4	22' - 9"	Str.
* g25	22	8	54' - 11"	Str.
g26	1	8	32' - 1"	Str.
g27	1	8	31' - 10"	Str.
h2	2	6	25' - 6"	Str.
h3	2	6	23' - 10"	Str.
△ z1	30	6	4' - 0"	Str.

Note -
All Dimensions are out to out of bars.
All Bars to be Epoxy Coated.
△ Dowels
* Cut Bars

ESTIMATED QUANTITIES
(For Two Approach and Sleeper Slabs)

ITEM	UNIT	PHASE 1 QUANTITY	PHASE 2 QUANTITY
Conc. Approach Slab (d Keyed to Bridge	C.Y.	92.8	125.8
Bridge Approach Sleeper Slab	C.Y.	27.3	38.9
Install Dowel in Concrete	Each	22	30

	PHASE 1	PHASE 2
1. Concrete in Approach Slabs.	24.3 Cu.Yd.	32.8 Cu.Yd.
⊛ 2. Epoxy Coated Re-Steel in Approach Slabs.	6929 Lb.	8887 Lb.
3. Concrete in Sleeper Slabs	7.6 Cu.Yd.	10.6 Cu.Yd.
4. Epoxy Coated Re - Steel in Sleeper Slabs.	1490 Lb.	2030 Lb.
5. Structural Steel in Armor Assembly.	845 Lb.	1182 Lb.
6. Polyethylene Sheeting	219 Sq.Yd.	280 Sq.Yd.

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
132 Lb.	180 Lb.

ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
DETAILS FOR APPROACH SLAB ADJACENT TO BRIDGE FOR

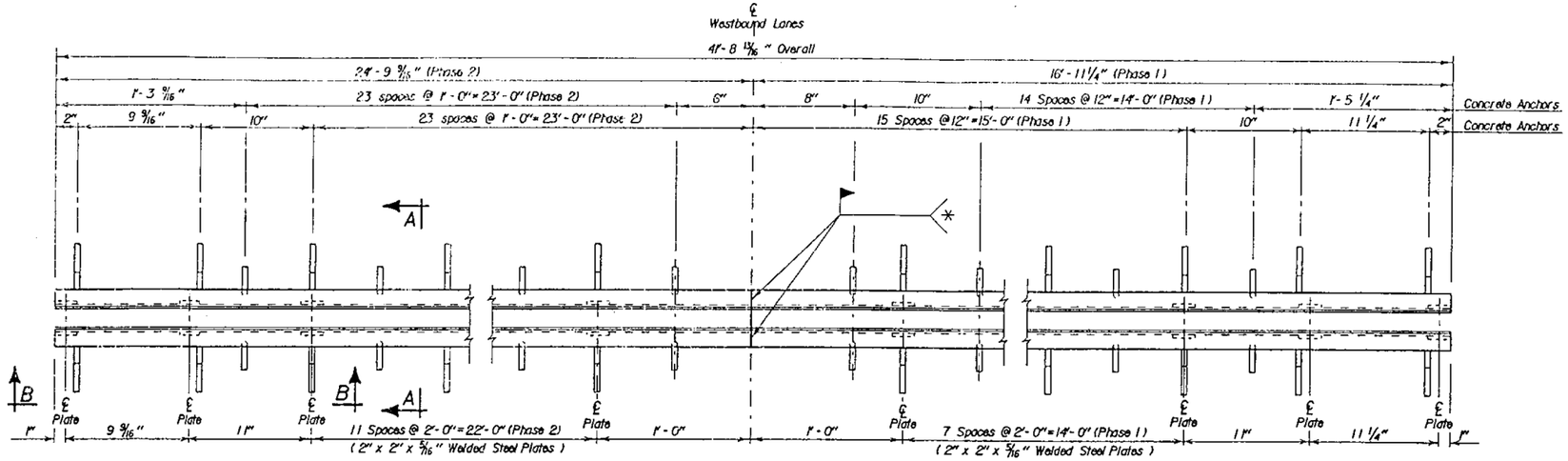
158'-2 1/4" CONT. CONC. SLAB BRIDGE

VARIABLE ROADWAY — 27.72° SKEW R.H.F.
STR. NO. 18-160-107 — SEC. 27-T103N-R60W
OVER RAILROAD — IM 90-7(40)319

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 1999

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
EJA	EJA	CJD	John C. Cole BRIDGE ENGINEER
DAVS4970	4970PC12		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	49	141



PLAN OF STRIP SEAL
(Neoprene Seal not shown)

TEMP.	DIMENSION "X"
30°	2 1/4"
40°	2 3/16"
50°	2 1/8"
60°	2 1/16"
70°	2"
80°	1 13/16"
90°	1 7/8"

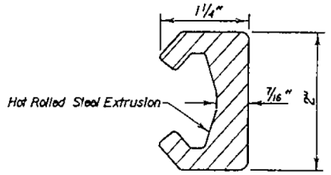
GENERAL NOTES:

1. Materials for the Steel Extrusion shall conform to ASTM-A36, A242 or A588. Materials for the 2" x 2" x 5/16" welded steel plates shall conform to ASTM-A36. Material for the 1/2" diameter x 6" Concrete Anchors shall conform to Type A steel studs of Section 7 of the latest edition of the ANSI/AWS D1.1 Structural Welding Code-Steel.
2. Material for the neoprene seal shall conform to ASTM D2628 modified to omit the recovery test. No splices will be permitted in the neoprene seal.
3. The lubricant-adhesive used to install the neoprene seal shall conform to the requirements of ASTM D4070. The neoprene seal and the lubricant adhesive should be supplied or recommended by the same source as they must be compatible.
4. The installation of the neoprene seal shall be as recommended by its Manufacturer and approved by the Engineer, but in general shall be as follows: The neoprene seal shall be installed and bonded to the steel extrusion with a high-solids lubricant adhesive. The neoprene surfaces shall be roughened with a wire brush before the application of the lubricant adhesive. The neoprene seal may be installed either prior to or after the time the steel extrusions are concreted in the approach slabs. The steel extrusion shall be dry, clean, free from dirt, grease and contaminates at the time the neoprene seal is installed.
5. Due to the length of the steel extrusions, splices are permitted. No welds shall be permitted in the internal section of the extrusion where the neoprene seal is located. Weld details shall be shown on the shop plans for approval by the Engineer. Welding shall be in accordance with latest edition of the ANSI/AWS D1.1 Structural Welding Code-Steel. Galvanize the steel extrusions and anything welded to them after all welding is completed. They shall be galvanized in accordance with AASHTO M111 (ASTM A123). If welded splices are used subsequent to galvanizing, the weld details and the procedures for preparing the surface for welding and repairing the galvanizing after welding shall be included with the shop plans.
6. The thickness and shape of the neoprene seal may vary from the sketch shown (Detail "C" on this sheet) according to the manufacturer's design; however, the wedge lugs must properly fit the groove in the steel extrusion. Before installation, the shop plans of the proposed neoprene seal showing the fixed dimensions, thickness of neoprene seal, and dimensions pertinent to the fit of the neoprene seal in the steel extrusion shall be submitted to and approved by the Engineer.
7. Since the configuration and dimensions of the steel extrusion may vary according to each manufacturer's design, they need not conform exactly to that shown in DETAIL "D", however, any deviations from the plan shown configuration or dimensions must be approved by the Office of Bridge Design.
8. The Strip Seal Expansion Joint supplier shall submit a detailed gland installation procedure with the shop plans.
9. The cost of welding shall be included in the unit cost for Strip Seal Expansion Joint.
10. The neoprene seal shall be of sufficient length such that a minimum length of 6" shall extend beyond each end of the steel extrusions.
11. The Strip Seal Expansion Joint will be measured in linear feet to the nearest one-tenth foot, complete in place. Measurement will be made of the overall horizontal length. The Strip Seal Expansion Joint will be paid for at the contract unit price per linear foot complete in place. Payment for this item shall be full compensation for furnishing all the required materials in place, inclusive of labor, equipment and incidentals necessary to complete the work in accordance with plans and the foregoing specifications.

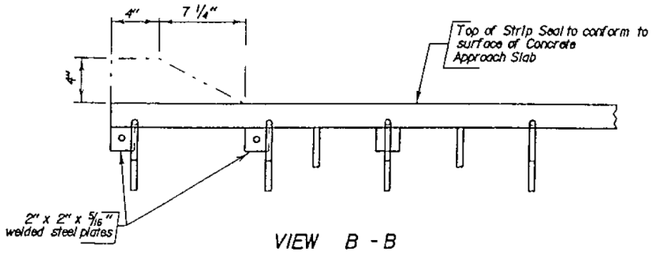
* 12. Due to phased construction, the steel extrusion shall be spliced in the field at the location shown above. The Weld Details and the procedures for preparing the surface for welding and repairing the galvanizing after welding shall be included with the shop plans.



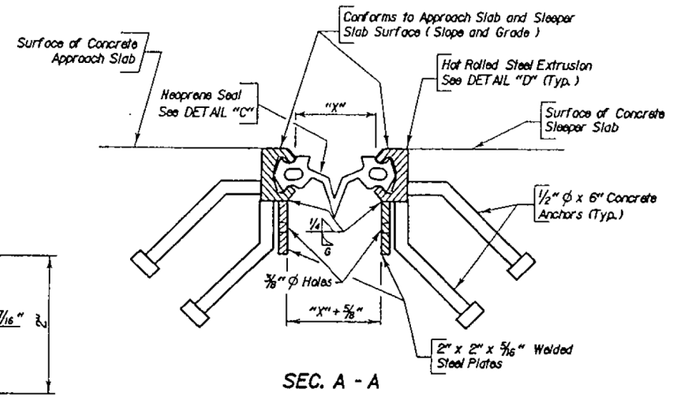
DETAIL "C"
Neoprene Seal shall have a 3" movement capability.



DETAIL "D"



VIEW B - B



SEC. A - A

ESTIMATED QUANTITIES			
ITEM	UNIT	PHASE 1 QUANTITY	PHASE 2 QUANTITY
Strip Seal Expansion Joint	L.F.	16.5	24.8

ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
DETAILS FOR APPROACH SLAB JOINT ADJACENT TO ABUTMENT NO. 1 FOR

158'-2 1/4" CONT. CONC. SLAB BRIDGE

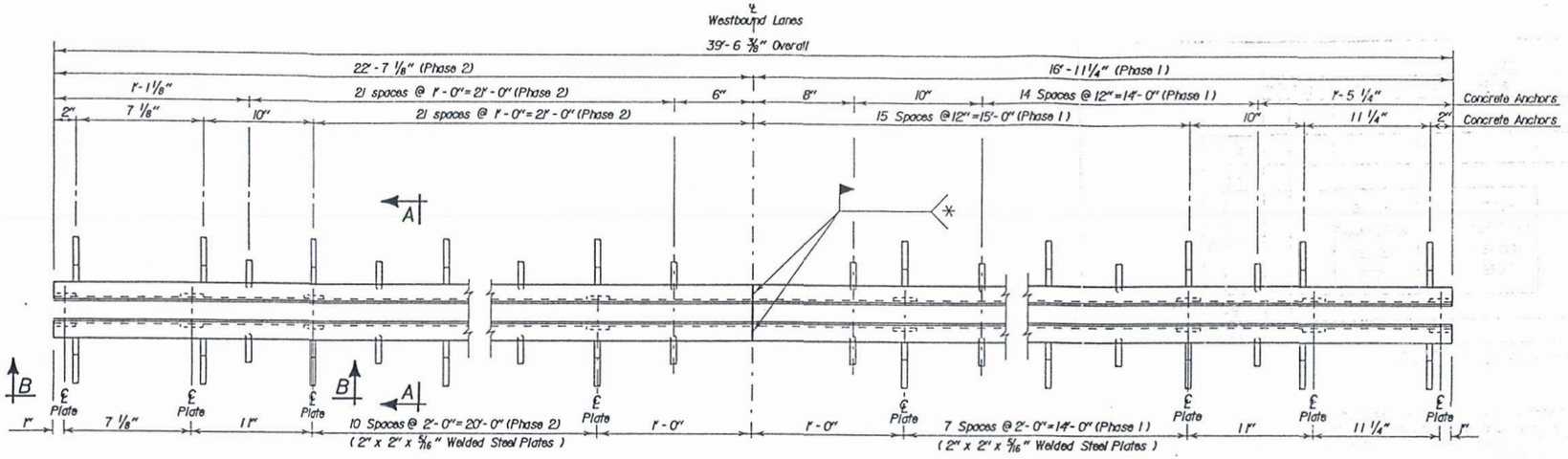
VARIABLE ROADWAY — 27.72° SKEW R.H.F.
STR. NO. 18-160-107 — SEC. 27-T103N-R60W
OVER RAILROAD — IM 90-7(40)319

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 1999

20 OF 23

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
EJA	EJA	CJD	BRIDGE ENGINEER
DAVS4970	4970PC13		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	50	141



PLAN OF STRIP SEAL
(Neoprene Seal not shown)

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

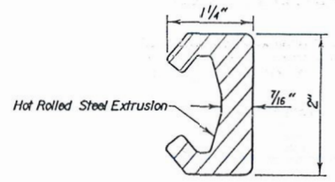
GENERAL NOTES:

1. Materials for the Steel Extrusion shall conform to ASTM-A36, A242 or A588. Materials for the 2" x 2" x 5/16" welded steel plates shall conform to ASTM-A36. Material for the 1/2" diameter x 6" Concrete Anchors shall conform to Type A steel studs of Section 7 of the latest edition of the ANSI/AWS D1.1 Structural Welding Code-Steel.
2. Material for the neoprene seal shall conform to ASTM D2628 modified to omit the recovery test. No splices will be permitted in the neoprene seal.
3. The lubricant-adhesive used to install the neoprene seal shall conform to the requirements of ASTM D4070. The neoprene seal and the lubricant adhesive should be supplied or recommended by the same source as they must be compatible.
4. The installation of the neoprene seal shall be as recommended by its Manufacturer and approved by the Engineer, but in general shall be as follows: The neoprene seal shall be installed and bonded to the steel extrusion with a high-solids lubricant adhesive. The neoprene surfaces shall be roughened with a wire brush before the application of the lubricant adhesive. The neoprene seal may be installed either prior to or after the time the steel extrusions are concreted in the approach slabs. The steel extrusion shall be dry, clean, free from dirt, grease and contaminates at the time the neoprene seal is installed.
5. Due to the length of the steel extrusions, splices are permitted. No welds shall be permitted in the internal section of the extrusion where the neoprene seal is located. Weld details shall be shown on the shop plans for approval by the Engineer. Welding shall be in accordance with latest edition of the ANSI/AWS D1.1 Structural Welding Code-Steel. Galvanize the steel extrusions and anything welded to them after all welding is completed. They shall be galvanized in accordance with AASHTO M111 (ASTM A123). If welded splices are used subsequent to galvanizing, the weld details and the procedures for preparing the surface for welding and repairing the galvanizing after welding shall be included with the shop plans.
6. The thickness and shape of the neoprene seal may vary from the sketch shown (Detail "C" on this sheet) according to the manufacturer's design; however, the wedge lugs must properly fit the groove in the steel extrusion. Before installation, the shop plans of the proposed neoprene seal showing the fixed dimensions, thickness of neoprene seal, and dimensions pertinent to the fit of the neoprene seal in the steel extrusion shall be submitted to and approved by the Engineer.
7. Since the configuration and dimensions of the steel extrusion may vary according to each manufacturer's design, they need not conform exactly to that shown in DETAIL "D", however, any deviations from the plan shown configuration or dimensions must be approved by the Office of Bridge Design.
8. The Strip Seal Expansion Joint supplier shall submit a detailed gland installation procedure with the shop plans.
9. The cost of welding shall be included in the unit cost for Strip Seal Expansion Joint.
10. The neoprene seal shall be of sufficient length such that a minimum length of 6" shall extend beyond each end of the steel extrusions.
11. The Strip Seal Expansion Joint will be measured in linear feet to the nearest one-tenth foot, complete in place. Measurement will be made of the overall horizontal length. The Strip Seal Expansion Joint will be paid for at the contract unit price per linear foot complete in place. Payment for this item shall be full compensation for furnishing all the required materials in place, inclusive of labor, equipment and incidentals necessary to complete the work in accordance with plans and the foregoing specifications.

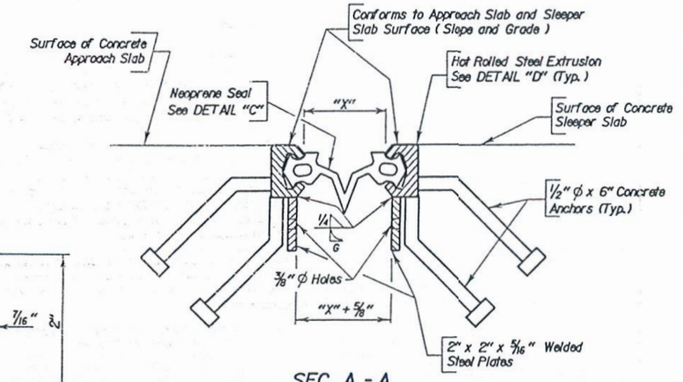
* 12. Due to phased construction, the steel extrusion shall be spliced in the Field at the location shown above. The Weld Details and the procedures for preparing the surface for welding and repairing the galvanizing after welding shall be included with the shop plans.



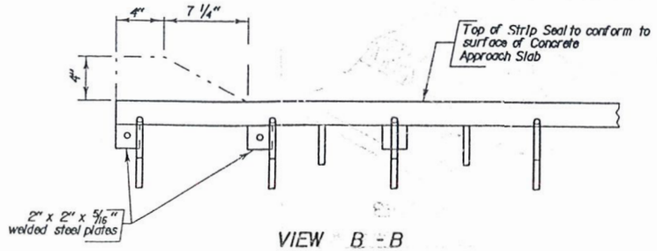
DETAIL "C"
Neoprene Seal shall have a 3" movement capability.



DETAIL "D"



SEC. A - A



VIEW B - B

ESTIMATED QUANTITIES

ITEM	UNIT	PHASE 1 QUANTITY	PHASE 2 QUANTITY
Strip Seal Expansion Joint	L.F.	16.9	22.6

ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
DETAILS FOR APPROACH SLAB JOINT ADJACENT TO ABUTMENT NO. 4 FOR
158'-2 1/4" CONT. CONC. SLAB BRIDGE

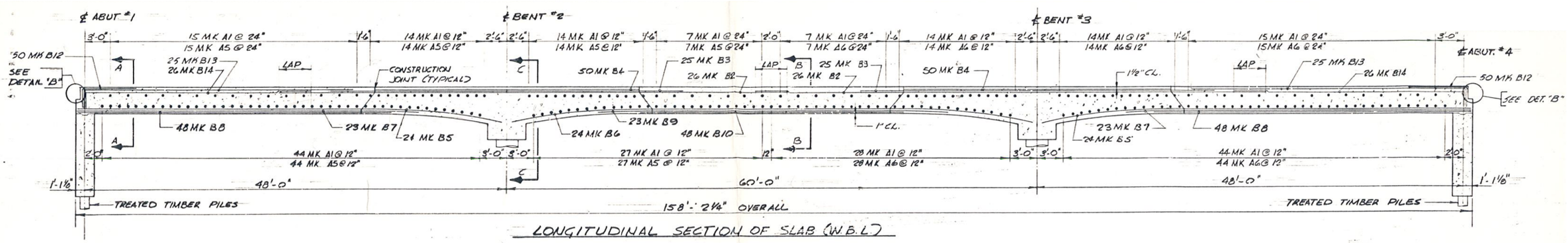
VARIABLE ROADWAY — 27.72° SKEW R.H.F.
STR. NO. 18-160-107 — SEC. 27-T103N-R60W
OVER RAILROAD — IM 90-7(40)319

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 1999

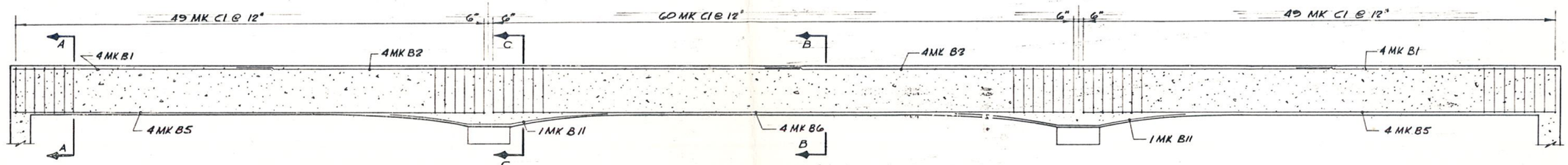
21 OF 23

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
EJA	EJA	CJD	BRIDGE ENGINEER
DAVS4970	4970PC14		

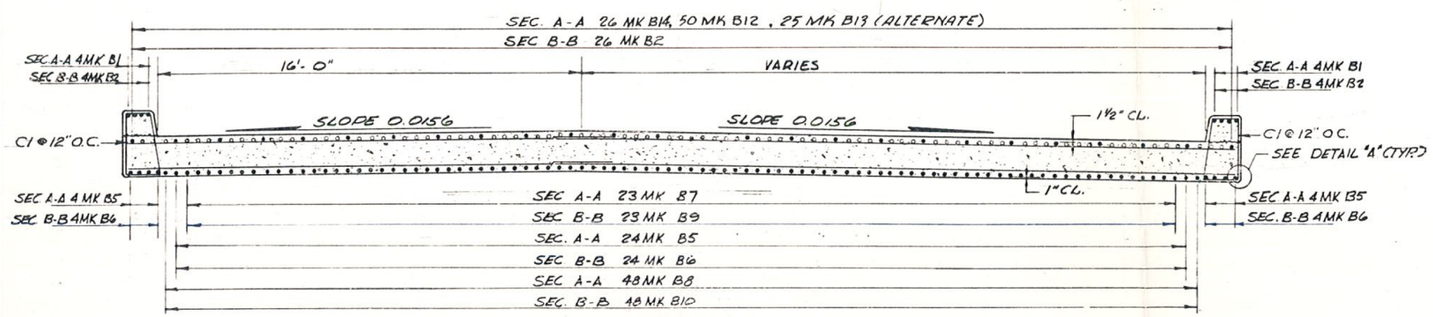
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	51	141



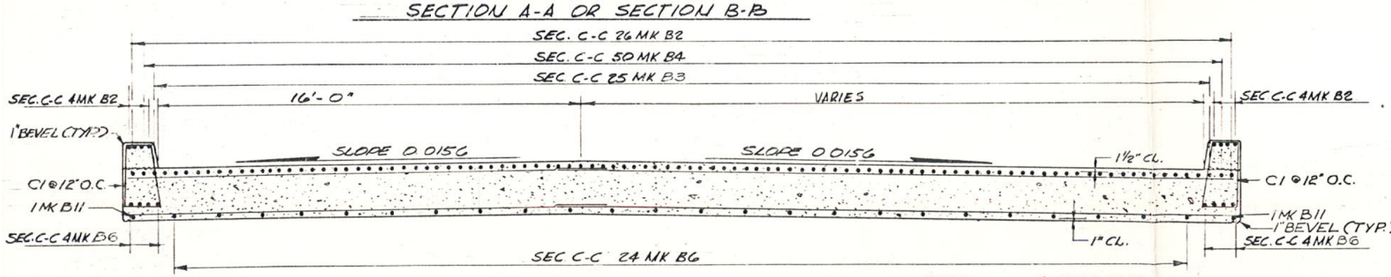
LONGITUDINAL SECTION OF SLAB (W.B.L.)



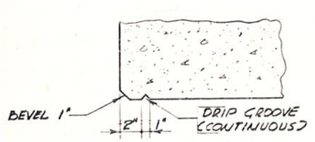
LONGITUDINAL SECTION OF CURB (W.B.L.)



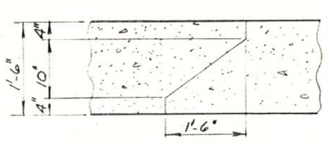
SECTION A-A OR SECTION B-B



SECTION C-C



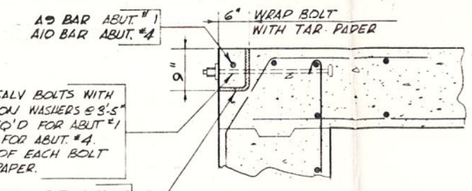
DETAIL "A"



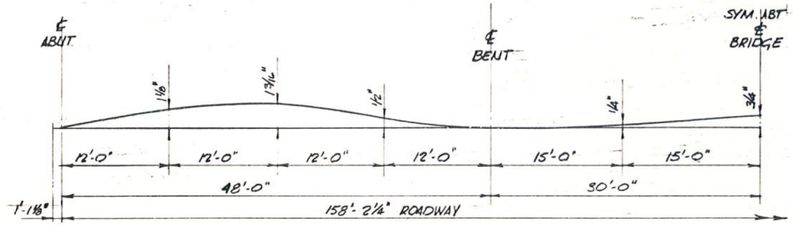
CONSTR. JOINT DETAIL TYPICAL

5/8" ℄ x 26" GALV. BOLTS WITH WROUGHT IRON WASHERS @ 8'-5" CTRS. 13 REQ'D FOR ABUT #1 & 13 REQ'D FOR ABUT #4. WRAP END OF EACH BOLT WITH TAR PAPER.

⅛" PREMOLDED BITUMINOUS EXPANSION JOINT FILLER



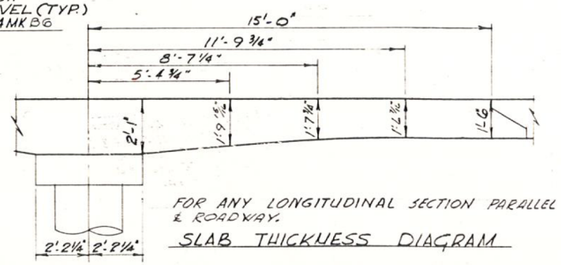
DETAIL "B"



CAMBER DIAGRAM

CAMBER IS CALCULATED FOR DEAD LOAD PLUS PLASTIC FLOW AND SHALL BE ADDED TO PROPOSED GRADE ELEVATIONS AT THE RESPECTIVE STATIONS TO ESTABLISH ELEVATION OF THE TOP OF THE FINISHED ROADWAY SLAB.

ESTIMATED QUANTITIES LOCATED AND CLOSE WAYS		
ITEMS	UNIT	AMOUNT
CLASS "A" CONCRETE	C.Y.	
REINFORCING STEEL	LBS.	
STRUCTURAL STEEL	LBS.	



FOR ANY LONGITUDINAL SECTION PARALLEL ℄ ROADWAY.

SLAB THICKNESS DIAGRAM

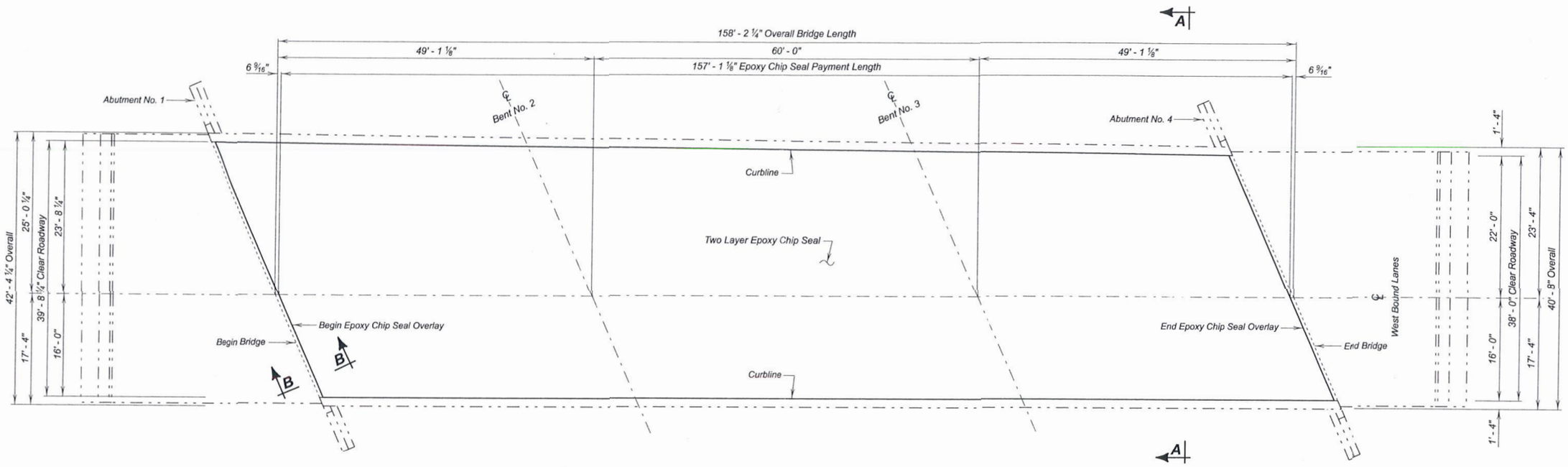
ORIGINAL CONSTRUCTION PLANS

SUPERSTRUCTURE DETAILS (W.B.L.)
FOR
158'-2 ¼" CONTINUOUS CONCRETE BRIDGE
VARIABLE ROADWAY
OVER C.M.St.P & P.R.R. SEC. 27-T103N-R60W
STA. 852+92.77 TO STA. 854+50.96
DAVISON COUNTY I-90-7(16)328
23°-43.409' SKEW R.H.F.
SOUTH DAKOTA HS20-44 (& ALT.)

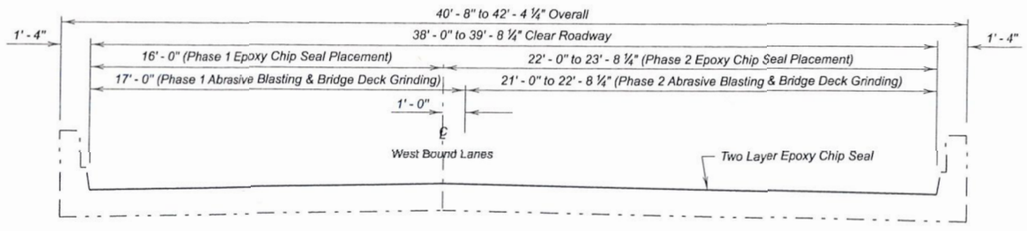
J. T. BANNER & ASSOC., INC.
CONSULTING ENGINEERS

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
A.M.	J.L.	J.O.E.	BRIDGE ENGINEER

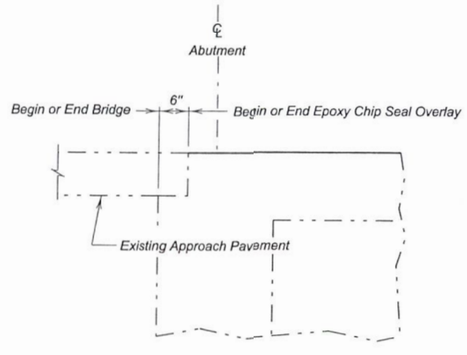
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	52	141



PLAN



SECTION A - A



SECTION B - B

NOTE :
✳ 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.

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY PHASE 1	QUANTITY PHASE 2
	Two Coat Epoxy Bridge Deck Chip Seal	SQ. YD.	291.2	307.1
	Abrasive Blasting of Bridge Deck	SQ. YD.	292.6	308.1
	Bridge Deck Grinding	SQ. YD.	276.8	292.7
✳	Concrete Patching Material	CU. FT.	27	27
✳	Concrete Removal, Class A	SQ. YD.	2	2
✳	Concrete Removal, Class B	SQ. YD.	2	2

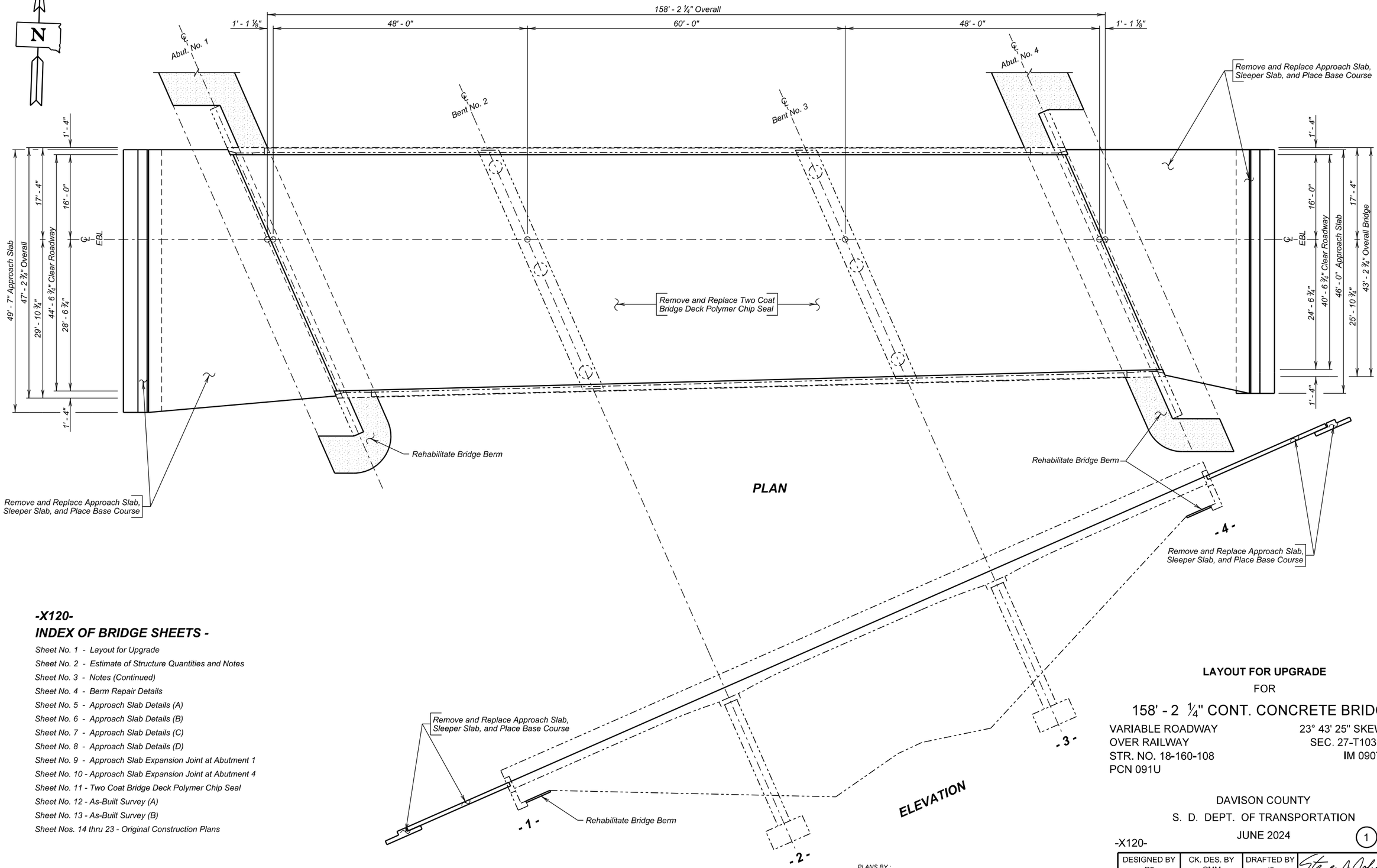
ORIGINAL CONSTRUCTION PLANS

(WEST BOUND LANES)
EPOXY CHIP SEAL DETAILS
FOR
158' - 2¼" CONTINUOUS CONCRETE BRIDGE
VARIABLE ROADWAY — 23°43' 25" SKEW R.H.F.
OVER RAILROAD — SEC. 27-T103N-R60W
STR. NO. 18-160-107 — IM 0907(53)319

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2011

DESIGNED BY	DRAWN BY	CHECKED BY	
EJA	EJA	TK	Kevin N. Goeden
DAVS6666	6666LE04		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	53	141



PLAN

ELEVATION

-X120-
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 - Berm Repair Details
Sheet No. 5 - Approach Slab Details (A)
Sheet No. 6 - Approach Slab Details (B)
Sheet No. 7 - Approach Slab Details (C)
Sheet No. 8 - Approach Slab Details (D)
Sheet No. 9 - Approach Slab Expansion Joint at Abutment 1
Sheet No. 10 - Approach Slab Expansion Joint at Abutment 4
Sheet No. 11 - Two Coat Bridge Deck Polymer Chip Seal
Sheet No. 12 - As-Built Survey (A)
Sheet No. 13 - As-Built Survey (B)
Sheet Nos. 14 thru 23 - Original Construction Plans

LAYOUT FOR UPGRADE

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY
OVER RAILWAY
STR. NO. 18-160-108
PCN 091U

23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

-X120-

1 OF 23

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

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	JB	Steve A. Johnson
DAVS091U	091UBB01		BRIDGE ENGINEER

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
110E0010	Remove Concrete Bridge Approach Slab	337.0	SqYd
120E3120	Bridge Berm Repair	2	Each
260E1010	Base Course	35	Ton
410E2600	Membrane Sealant Expansion Joint	95.6	Ft
460E0150	Concrete Approach Slab for Bridge	264.5	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	77.0	SqYd
480E0504	No. 4 Rebar Splice	34	Each
480E0505	No. 5 Rebar Splice	48	Each
480E0506	No. 6 Rebar Splice	53	Each
491E0005	Two Coat Bridge Deck Polymer Chip Seal	747.8	SqYd
491E0110	Abrasive Blasting of Bridge Deck	747.8	SqYd
491E0120	Bridge Deck Grinding	747.8	SqYd
491E0130	Concrete Removal, Class A	4.0	SqYd
491E0140	Concrete Removal, Class B	4.0	SqYd
491E0172	Concrete Patching Material, Bridge Deck	54.0	CuFt

SPECIFICATIONS

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

DETAILS AND DIMENSIONS OF EXISTING BRIDGE

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 elsewhere in the plans. Alternate sequence of operations may be submitted by the Contractor for approval by the Engineer a minimum of two weeks prior to the preconstruction meeting.

1. Remove the existing approach and sleeper slabs for the first phase of construction.
2. Rehabilitate Bridge Berm and place Base Course for the first phase of construction.
3. Replace approach slabs and sleeper slabs to the correct grade for the first phase of construction.
4. Replace sleeper slab joints with approved Membrane Sealant Expansion Joint for the first phase of construction.
5. Perform Bridge Deck Grinding for the first phase of construction.
6. 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.
7. Clean the bridge deck surface with abrasive blasting for the first phase of construction.
8. Place the Two Coat Bridge Deck Polymer Chip Seal for the first phase of construction.
9. Switch traffic and repeat steps 1 to 8 for the second phase of construction.

GENERAL CONSTRUCTION - BRIDGE

1. All reinforcing steel will conform to ASTM A615, Grade 60.
2. All exposed concrete corners and edges will be chamfered ¾" unless noted otherwise in the plans. Match existing chamfer if the existing chamfer differs.
3. Use 2" clear cover on all reinforcing steel except as shown otherwise.
4. 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.
5. Surfaces of fresh concrete at construction joints will be rough floated sufficiently to consolidate the surface. All construction joints will be cleaned of surface laitance, curing compounds and other foreign materials prior to placing fresh concrete against the joint.

REMOVAL OF CONCRETE BRIDGE APPROACH SLAB

1. The existing concrete approach and sleeper slabs adjacent to the structure will be completely removed by the Contractor.
2. The concrete and reinforcing steel from the removal will be disposed of by the Contractor at an approved site. An appropriate site will be as described in the Environmental Commitment Notes.
3. The quantity provided for Remove Concrete Bridge Approach Slab is computed using the plan area for the sleeper slab and the plan area for the approach slab determined separately.
4. All labor, tools, equipment, and any incidentals necessary for removal and disposal of the existing approach slabs, strip seal joints, and sleeper slabs will be incidental to the contract unit price per square yard for Remove Concrete Bridge Approach Slab.

DESIGN MIX OF CONCRETE

1. Class A45 Concrete will be used for the contract items Concrete Approach Slab for Bridge and Concrete Approach Sleeper Slab for Bridge.
2. 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.

COORDINATION WITH RAILROAD

1. During construction of the berm, the Contractor will not interfere with the operating railroad train movements. Construction activity must not take place within 25 ft. of the centerline track when train movements are occurring through the construction site and construction equipment will be removed from this zone prior to arrival of any train. See Special Provision for Working on Railroad Company Right-of-Way.
2. See Special Provision Regarding Railroad Protective Liability Insurance.

AS-BUILT ELEVATION SURVEY

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

ESTIMATE OF STRUCTURE QUANTITIES & NOTES

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

STR. NO. 18-160-108

JUNE 2024

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	PII	Steve A Johnson BRIDGE ENGINEER
DAVS091U	091UBB02		

BRIDGE BERM REPAIR

1. The bridge berms have erosion channels and settlement voids on the berm slope. The bridge berms will be rebuilt and reshaped to their original template.

2. Fill voids under the abutments and fill in erosion channels on the berm slope. Reconstruct the berms to at least 1-foot above the bottom of the abutment backwall. The berm will extend flat from the abutment backwall a minimum of 5' – 0" before the slope begins. The berm slope will be benched into stable embankment during reshaping and reconstruction. The soil will be placed in horizontal lifts perpendicular to the centerline of the structure.

3. Shape the fill in front of the wing walls to divert runoff from the inslopes away from the face of the berm slope. Reshape the inslopes from the wing walls to the end of the sleeper slab.

4. At the upper part of the berm slope, clearance between the structure and berm will prohibit the use of large compaction equipment. The soil in this area will be compacted using hand operated compaction equipment. Berm material will be placed in reduced lift thicknesses with adequate moisture to obtain density requirements.

5. Soil used to reconstruct the berm slope will be furnished by the Contractor and approved by the Engineer. The soil will have 100% passing the 1 ½ inch sieve, a maximum of 70% passing the #4 sieve, have a maximum Liquid Limit (LL) of 45 and a Plastic Index (PI) greater than 10 but less than 25. The Contractor will be responsible for one gradation, LL and PI test for each borrow source for berm reconstruction. The test results will be supplied to the Engineer in writing.

6. Compaction of the reconstructed berm and inslopes will be governed by the Ordinary Compaction Method.

7. No informational quantities are available. The Contractor will visit the site prior to determine necessary quantities.

8. The cost of the berm reconstruction will be incidental to the contract unit price per each for Bridge Berm Repair. This payment will be full compensation for furnishing all materials, labor, tools, and equipment necessary or incidental to the reconstruction of the bridge berm.

APPROACH SLABS

1. Bridge end backfill will be constructed in accordance with Section 430 of the Construction Specifications.

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

3. Prior to placing the Type B Drainage Fabric and Granular Bridge End Backfill, the existing granular 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 Gravel Cushion 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. Gravel Cushion will be in accordance with Section 882 of the Construction Specifications.

4. 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.

5. 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.

6. 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.

7. 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.

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

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

10. The quantity of Gravel Cushion 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.

11. 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.

12. 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 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. 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.

14. Any Gravel Cushion, 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.

BRIDGE DECK GRINDING

1. The existing bridge deck has a two-coat epoxy chip seal and pavement marking that will be removed.

2. The existing bridge deck has tining and pavement markings that will be removed.

TWO COAT BRIDGE DECK POLYMER CHIP SEAL

The polymer will be an epoxy urethane per the Department's Approved Products List for Bridge Deck Polymer Chip Seal.

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.

NOTES (CONTINUED)

FOR

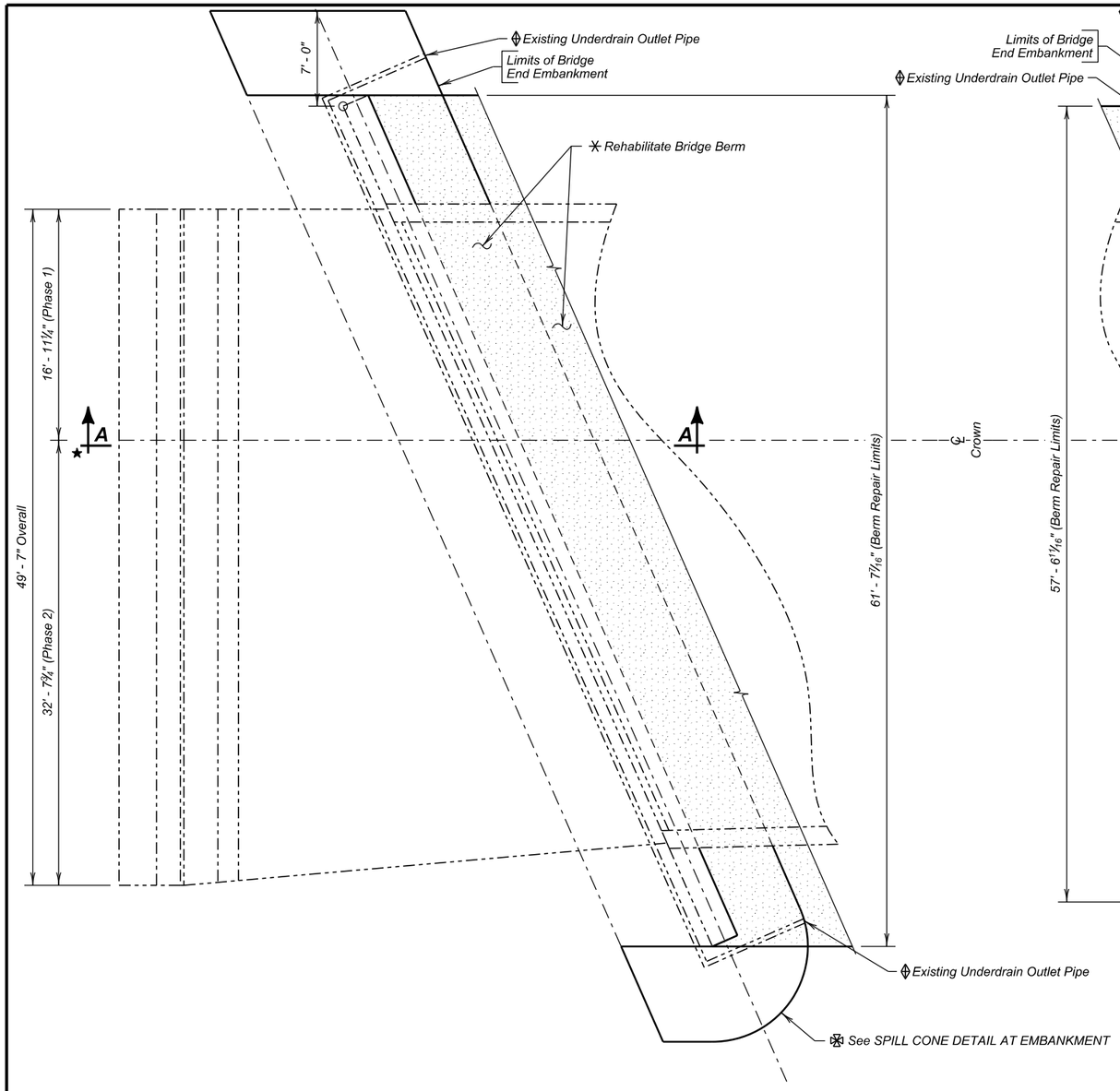
158' - 2 ¼" CONT. CONCRETE BRIDGE

STR. NO. 18-160-108

JUNE 2024

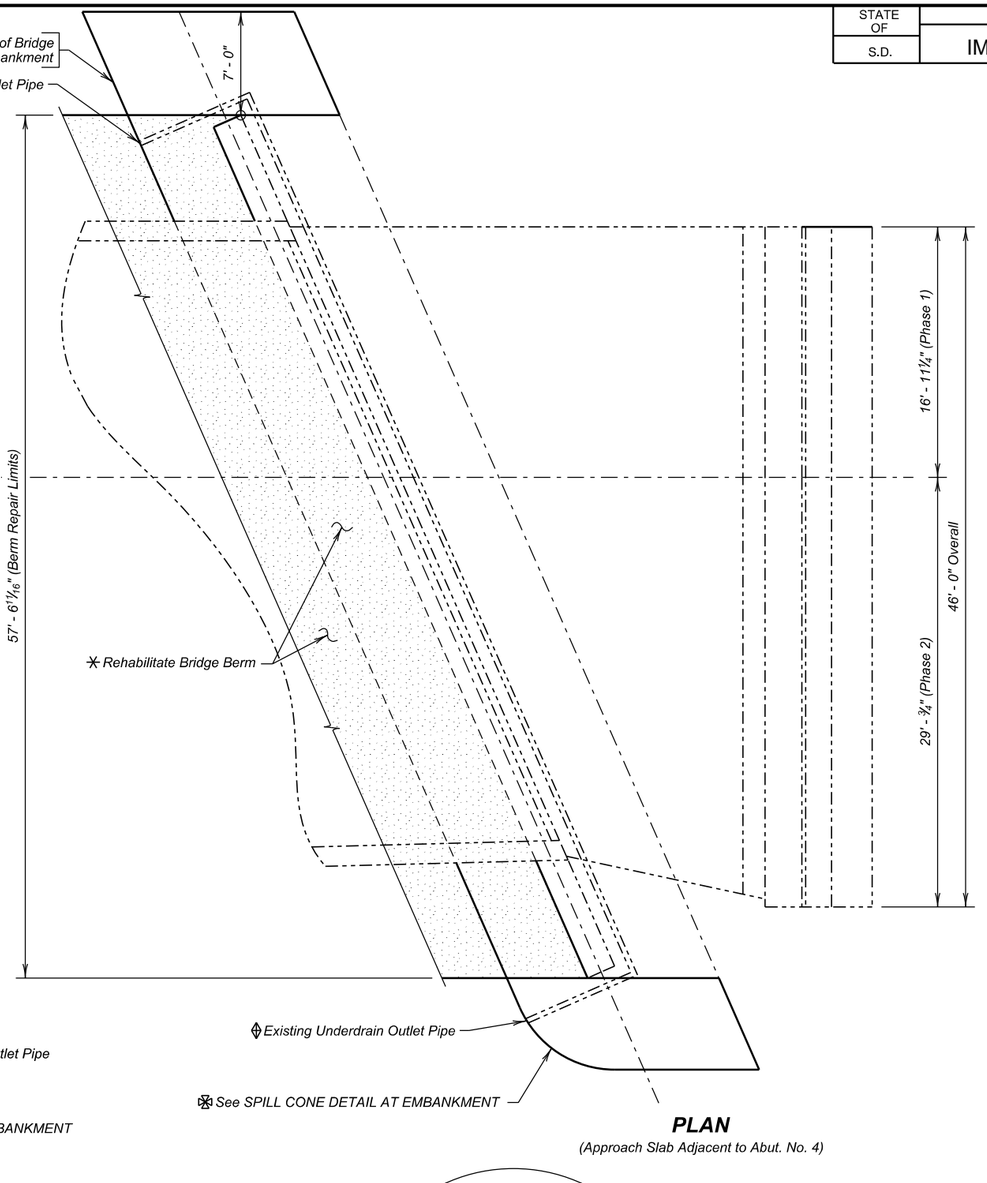
DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	PII	Steven A. Johnson BRIDGE ENGINEER
DAVS091U	091UBB03		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	56	141



PLAN

(Approach Slab Adjacent to Abut. No. 1)



PLAN

(Approach Slab Adjacent to Abut. No. 4)

GENERAL NOTES:

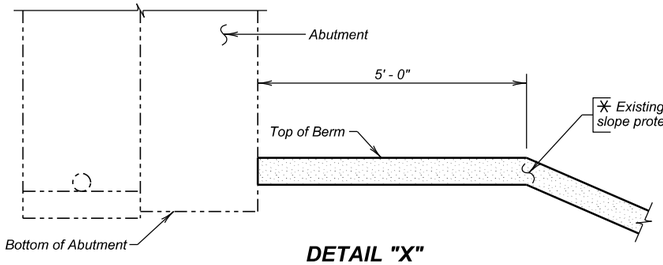
- Perform excavation in a manner that limits disturbance to the existing bridge berm. Where disturbance can not be minimized or if the existing spill cone has eroded, rebuild as shown.
- The berms and slope protection are to be repaired to match the original templates. The swale below the outletpipe is also to be filled and reconstructed.
- Underdrain Outlets are not to be disturbed, damaged, or buried during construction. Any damage will be repaired at the expense of the Contractor.
- ★ See Sheet 8 of 23 for SECTION A - A.

ESTIMATED QUANTITIES
(For Both Abutments)

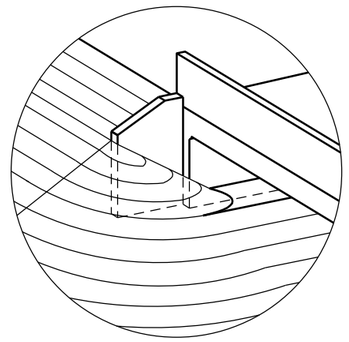
ITEM	UNIT	QUANTITY	
		Phase 1	Phase 2
Bridge Berm Repair	Each	1	1

Item 1 is an approximate quantity contained in the above contract items and is for information only.

	Phase 1	Phase 2
1. 6 mil Polyethylene Sheeting (not including laps)	112 SqYd	198 SqYd



DETAIL "X"



SPILL CONE DETAIL AT EMBANKMENT

BERM REPAIR DETAILS

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY OVER RAILWAY
STR. NO. 18-160-108

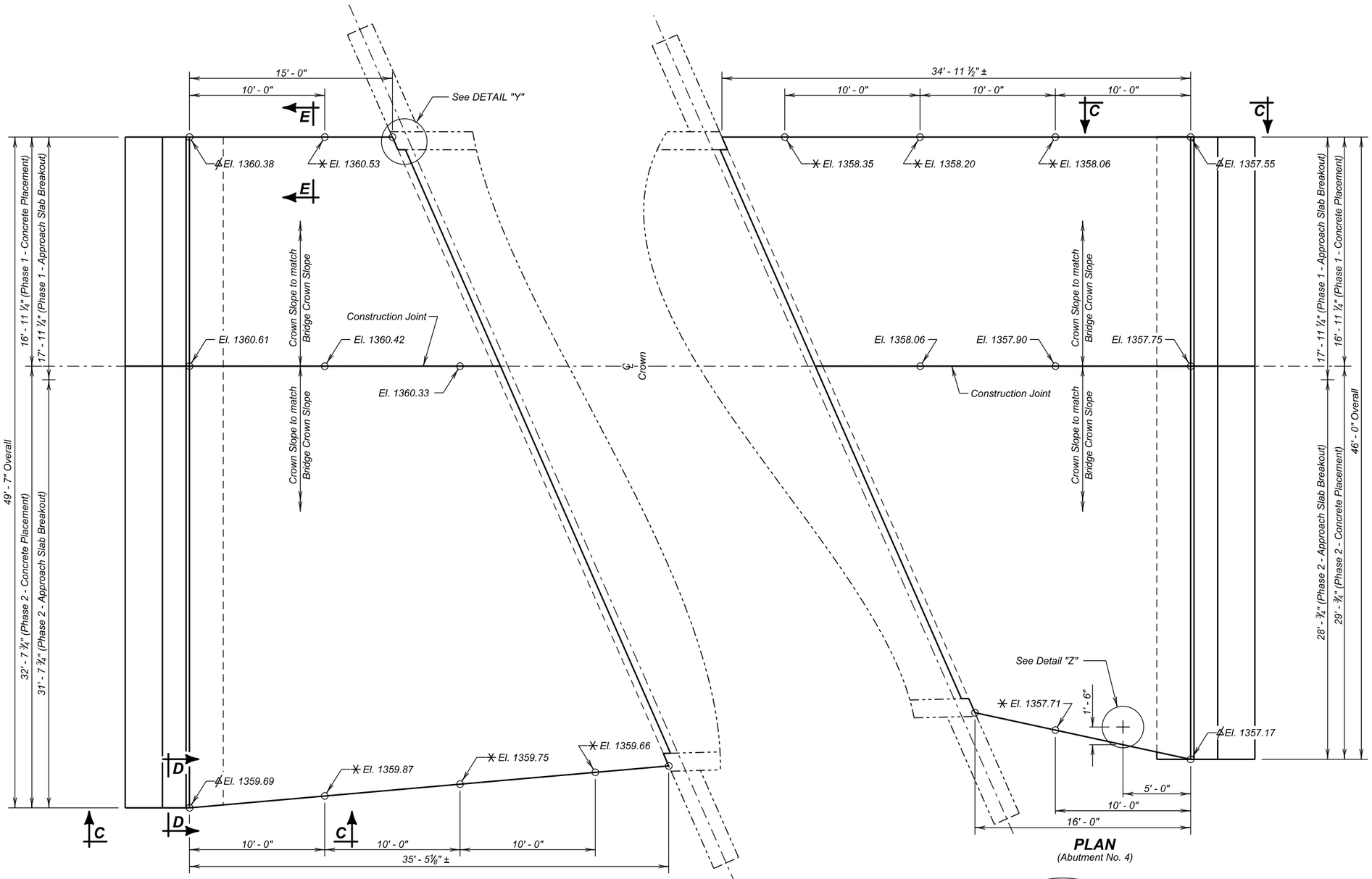
23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

4 OF 23

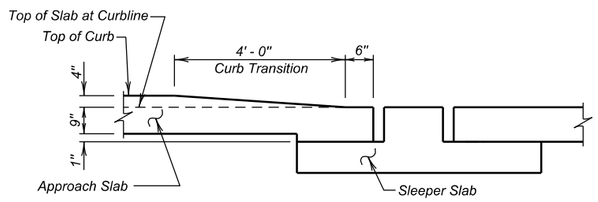
DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	JB	Steve A Johnson BRIDGE ENGINEER
DAVS091U	091UBB04		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	57	141



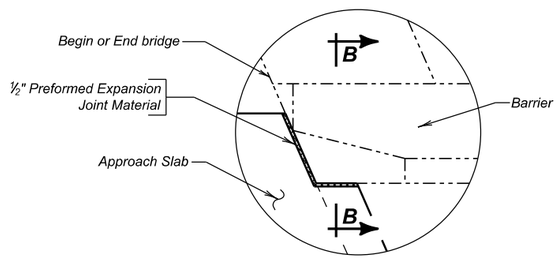
PLAN
(Abutment No. 1)

PLAN
(Abutment No. 4)

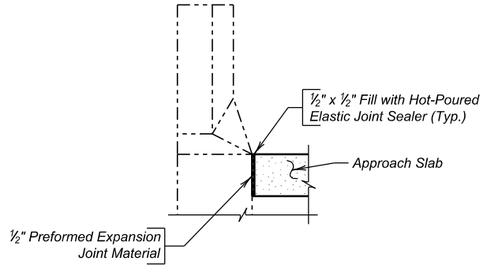


VIEW C - C

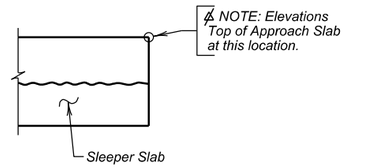
Survey Reference:
Brass Cap on SE wing
Elevation 1357.671



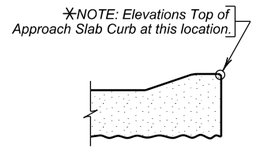
DETAIL "Y"



SECTION B - B



VIEW D - D



SECTION E - E

APPROACH SLAB DETAILS (A)

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY
OVER RAILWAY
STR. NO. 18-160-108

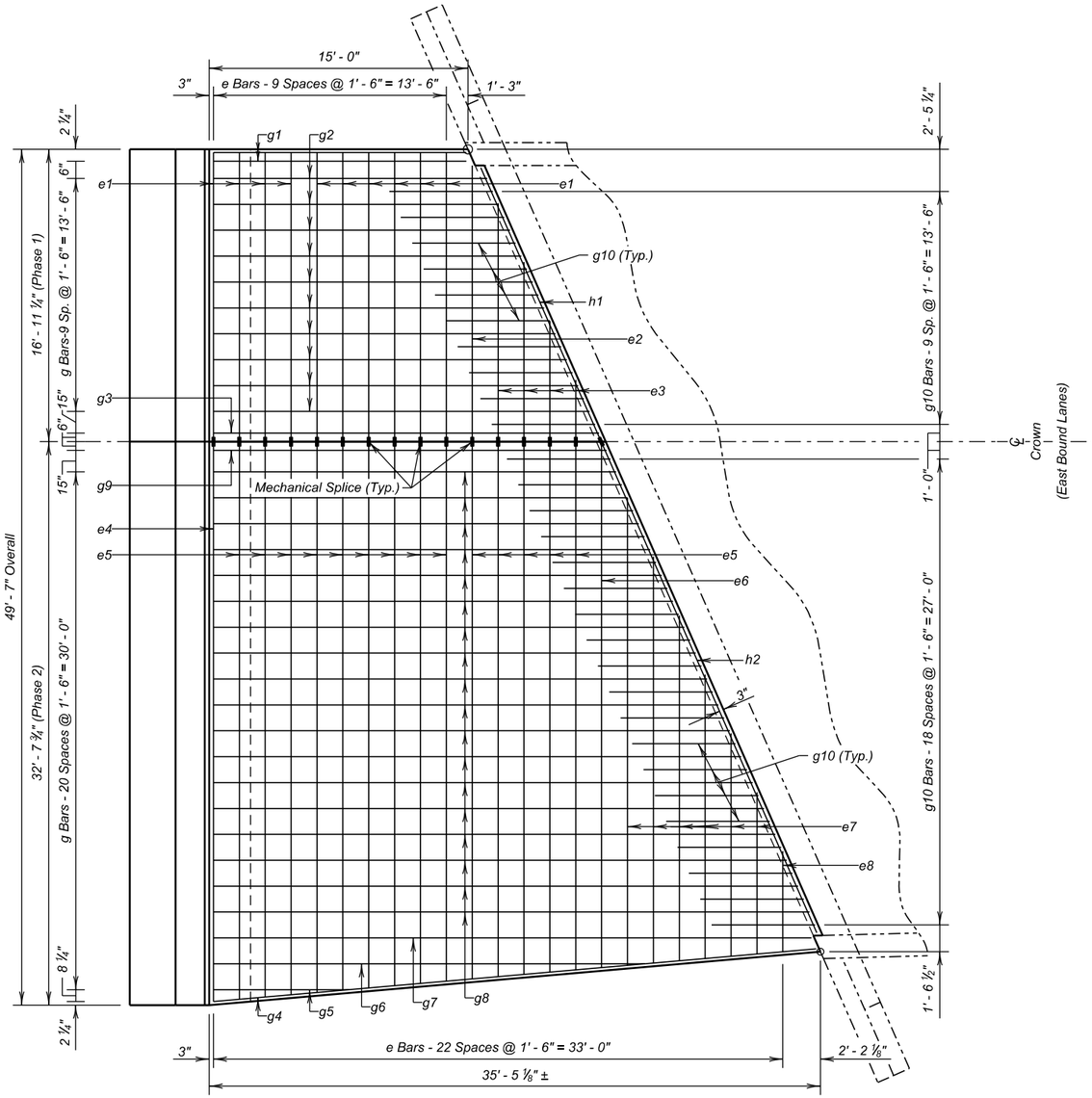
23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

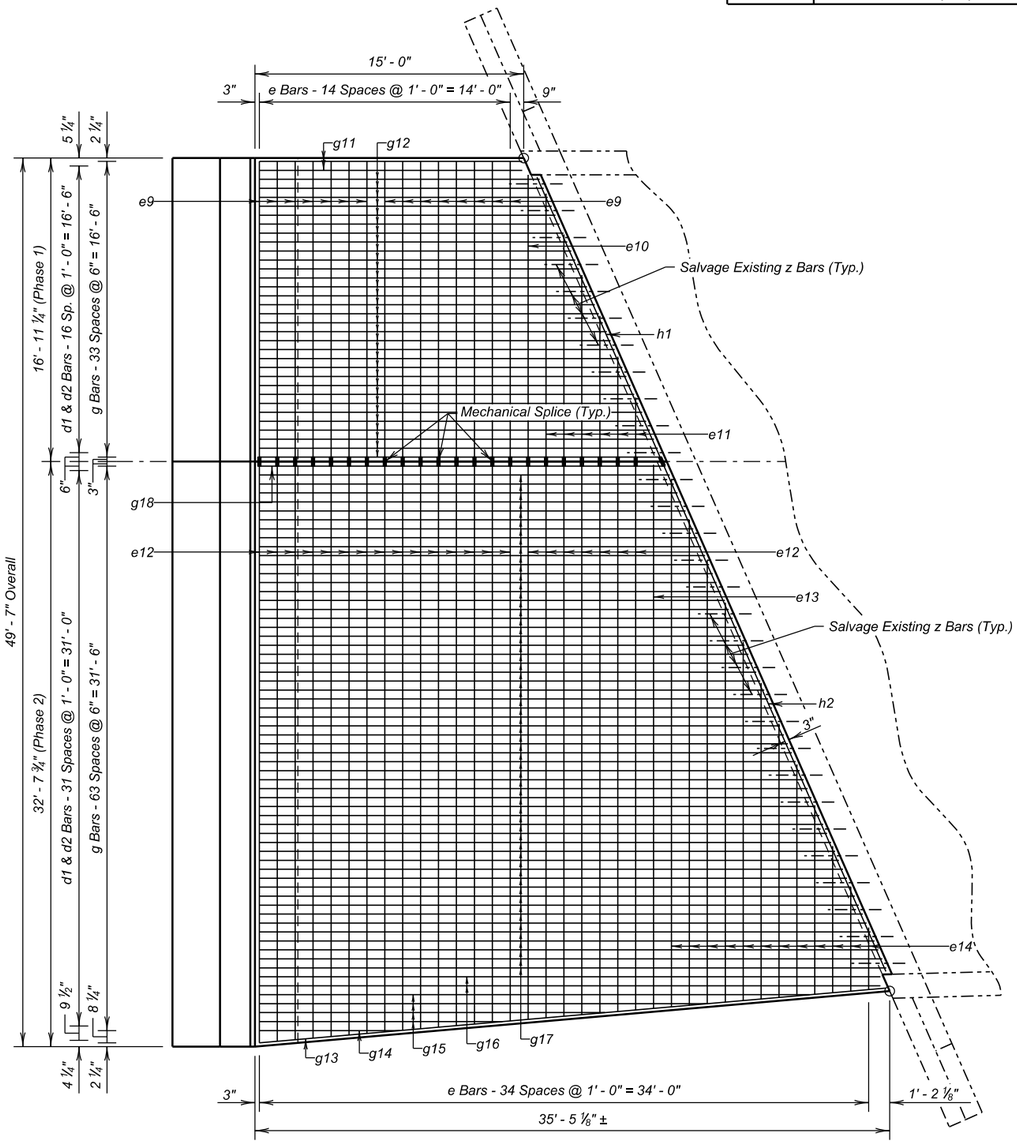
5 OF 23

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	JB	Steve A Johnson BRIDGE ENGINEER
DAVS091U	091UBB05		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	58	141



PLAN
(Top Steel)
(Approach Slab shown adjacent to Abutment No. 1)



PLAN
(Bottom Steel)
(Approach Slab shown adjacent to Abutment No. 1)

APPROACH SLAB DETAILS (B)

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY
OVER RAILWAY
STR. NO. 18-160-108

23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY

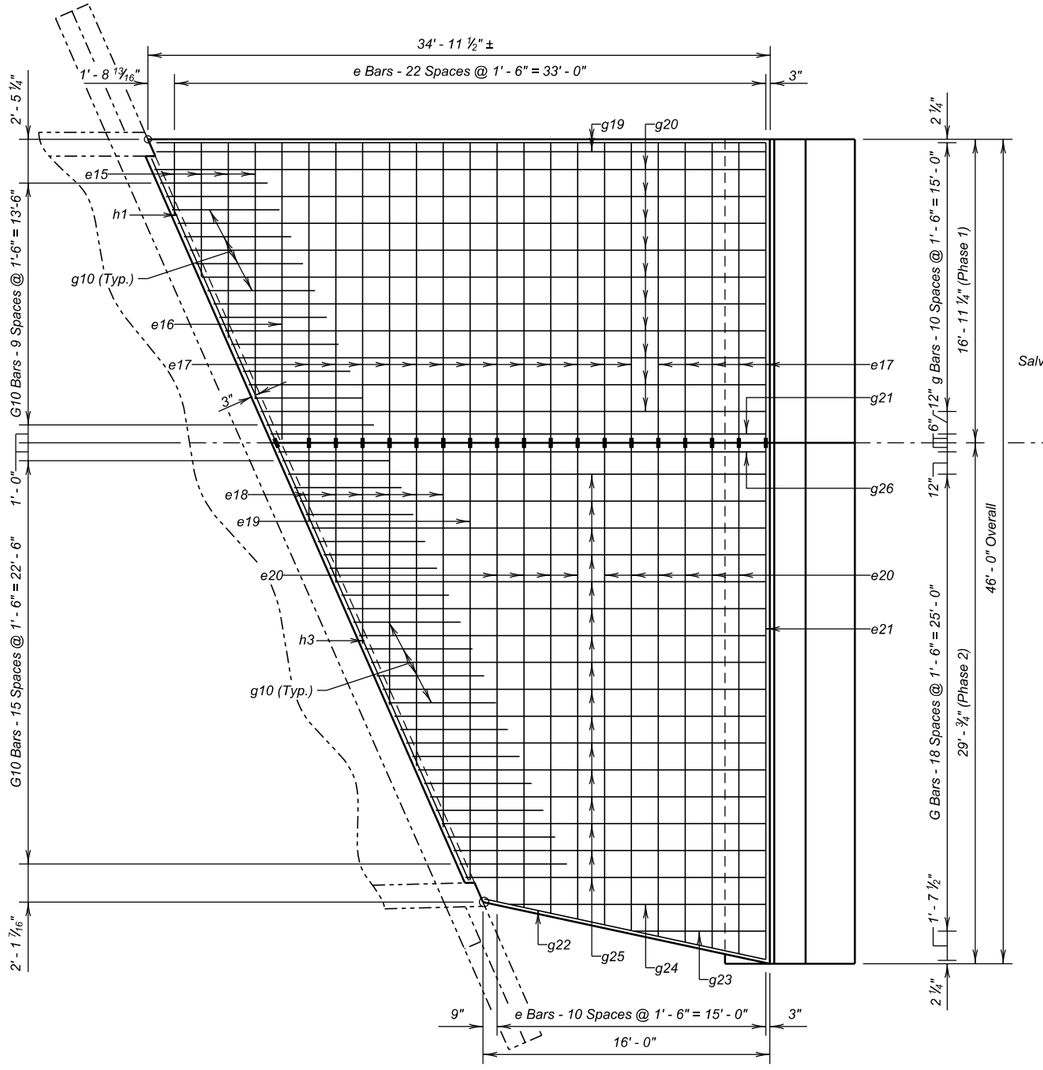
S. D. DEPT. OF TRANSPORTATION

JUNE 2024

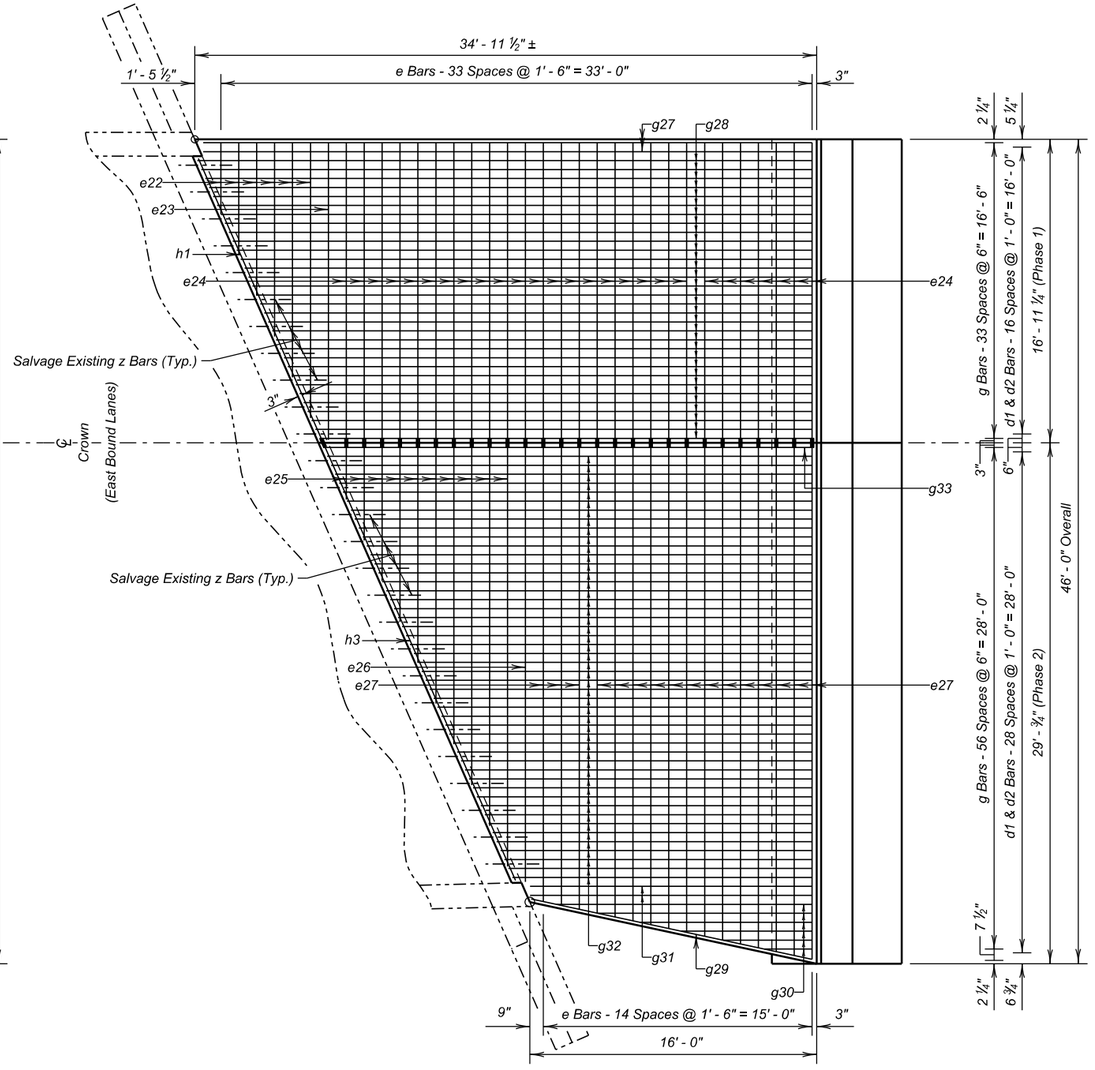
6 OF 23

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	JB/PII	Steve A. Johnson BRIDGE ENGINEER
DAVS091U	091UBB06		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	59	141



PLAN
(Top Steel)
(Approach Slab shown adjacent to Abutment No. 4)



PLAN
(Bottom Steel)
(Approach Slab shown adjacent to Abutment No. 4)

APPROACH SLAB DETAILS (C)

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY
OVER RAILWAY
STR. NO. 18-160-108

23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY

S. D. DEPT. OF TRANSPORTATION

JUNE 2024

7 OF 23

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	JB/PII	Steven A. Johnson BRIDGE ENGINEER
DAVS091U	091UBB07		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	60	141

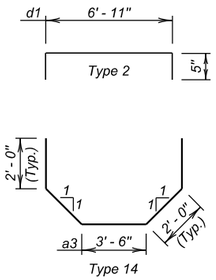
Revised 04/05/2024 P.I.

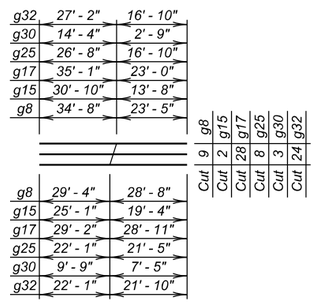
REINFORCING SCHEDULE
(For Two Approach Slabs)

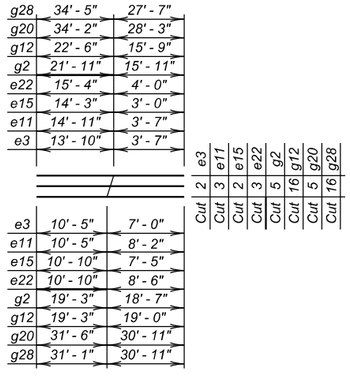
	Mk.	No.	Size	Length	Type
	Sleeper Slab (Phase 1)				
	c1	48	5	16' - 9"	Str.
	d1	68	4	7' - 9"	2
	d2	34	4	6' - 3"	T2
	Approach Slab (Phase 1)				
⊛	e1	10	4	16' - 9"	Str.
⊛	e2	1	4	16' - 0"	Str.
≠ ⊛	e3	2	4	17' - 5"	Str.
⊛	e9	15	6	16' - 9"	Str.
⊛	e10	1	6	16' - 0"	Str.
≠ ⊛	e11	3	6	18' - 6"	Str.
≠	e15	2	4	18' - 2"	Str.
	e16	1	4	16' - 7"	Str.
⊛	e17	18	4	16' - 9"	Str.
≠	e22	3	6	19' - 4"	Str.
	e23	1	6	16' - 7"	Str.
⊛	e24	27	6	16' - 9"	Str.
	g1	2	4	14' - 9"	Str.
≠	g2	5	4	37' - 10"	Str.
	g3	1	4	22' - 5"	Str.
	g10	20	4	6' - 0"	Str.
	g11	2	8	14' - 9"	Str.
≠	g12	16	8	38' - 3"	Str.
	g19	2	4	34' - 1"	Str.
≠	g20	5	4	62' - 5"	Str.
	g21	1	4	27' - 8"	Str.
	g27	2	8	34' - 1"	Str.
≠	g28	16	8	62' - 0"	Str.
	h1	4	6	17' - 4"	Str.

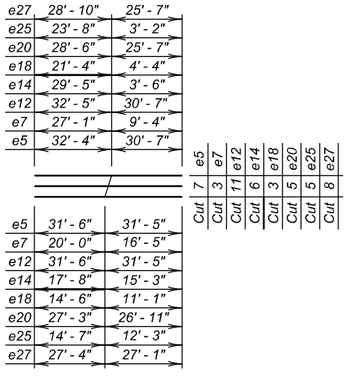
	Mk.	No.	Size	Length	Type
	Sleeper Slab (Phase 2)				
⊛	c2	24	5	32' - 6"	Str.
⊛	c3	24	5	28' - 11"	Str.
	d1	124	4	7' - 9"	2
	d2	62	4	6' - 3"	T2
	Approach Slab (Phase 2)				
	a3	3	4	11' - 6"	14
⊛	e4	1	4	32' - 5"	Str.
≠ ⊛	e5	7	4	62' - 11"	Str.
	e6	1	4	30' - 3"	Str.
≠	e7	3	4	36' - 5"	Str.
	e8	1	4	5' - 10"	Str.
≠ ⊛	e12	11	6	63' - 0"	Str.
	e13	1	6	30' - 4"	Str.
≠	e14	6	6	32' - 11"	Str.
≠ ⊛	e18	3	4	25' - 8"	Str.
⊛	e19	1	4	24' - 5"	Str.
≠ ⊛	e20	5	4	54' - 1"	Str.
⊛	e21	1	4	28' - 10"	Str.
≠ ⊛	e25	5	6	26' - 10"	Str.
⊛	e26	1	6	24' - 6"	Str.
≠ ⊛	e27	8	6	54' - 5"	Str.
	g4	1	4	35' - 2"	Str.
	g5	1	4	7' - 11"	Str.
	g6	1	4	25' - 1"	Str.
	g7	1	4	34' - 9"	Str.
≠	g8	9	4	58' - 0"	Str.
	g9	1	4	22' - 10"	Str.
	g10	35	4	6' - 0"	Str.
	g13	1	8	35' - 2"	Str.
	g14	1	8	7' - 11"	Str.
≠	g15	2	8	44' - 5"	Str.
	g16	2	8	34' - 9"	Str.
≠	g17	28	8	58' - 0"	Str.
	g18	1	8	22' - 9"	Str.
	g22	1	4	16' - 2"	Str.
	g23	1	4	7' - 5"	Str.
	g24	1	4	14' - 4"	Str.
≠	g25	8	4	43' - 6"	Str.
	g26	1	4	27' - 3"	Str.
	g29	1	8	16' - 1"	Str.
≠	g30	3	8	17' - 1"	Str.
	g31	2	8	15' - 10"	Str.
≠	g32	24	8	43' - 11"	Str.
	g33	1	8	27' - 4"	Str.
	h2	2	6	31' - 1"	Str.
	h3	2	6	26' - 8"	Str.

Bending Details









NOTES-
All Bars to be Epoxy Coated
All dimensions are out to out of bars.
≠ See Cutting Diagram
⊛ Splice (Mechanically Splice)

GENERAL NOTES:

℄ 2" of material is used for estimation purposes only. Base Course will be placed and compacted to fill any low spots and bring backfill up to grade.

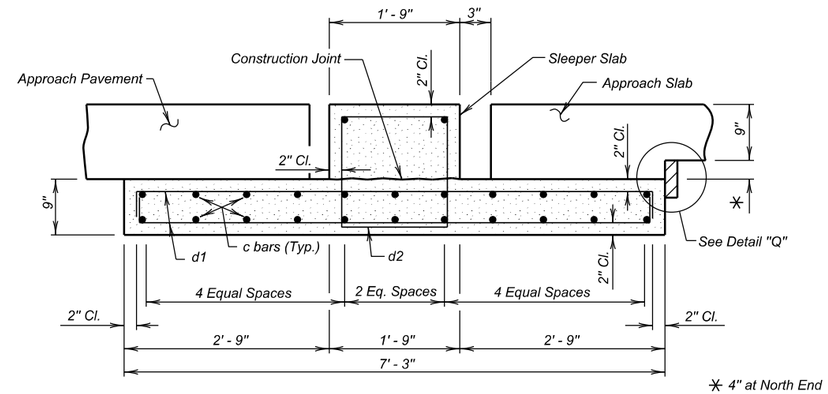
☆ For estimating purposes only, a factor of 1.89 Tons/Cu. Yd. was used to convert Cu. Yds. to Tons.

ESTIMATED QUANTITIES
(For Both Approach and Sleeper Slabs)

	ITEM	UNIT	QUANTITY Phase 1	QUANTITY Phase 2
☆℄	Base Course	Ton	12	23
	Remove Concrete Bridge Approach Slab	SqYd	129.2	207.8
	Concrete Approach Slab for Bridge	SqYd	95.5	169.0
	Concrete Approach Sleeper Slab for Bridge	SqYd	27.3	49.7
	No. 4 Rebar Splice	Each	34	-
	No. 5 Rebar Splice	Each	48	-
	No. 6 Rebar Splice	Each	53	-

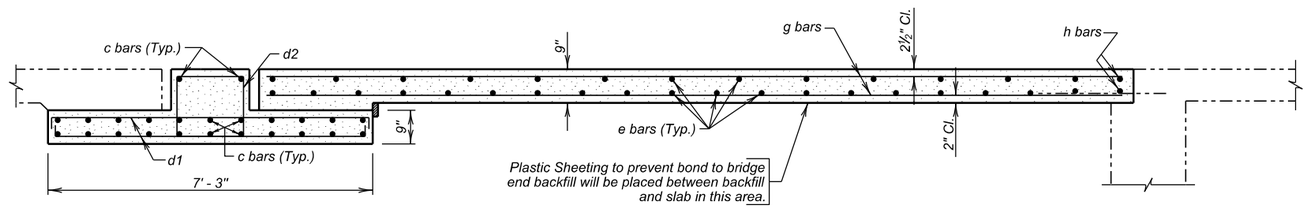
	PHASE 1	PHASE 2
1. Concrete in Approach Slabs.	23.9 CuYd	42.3 CuYd
2. Epoxy Coated Re-steel in Approach Slabs.	6,820 Lb	12,088 Lb
3. Concrete in Sleeper Slabs.	9.0 CuYd	16.4 CuYd
4. Epoxy Coated Re-steel in Sleeper Slabs.	1,316 Lb	2,438 Lb
5. 6 mil Polyethylene Sheeting (not including laps)	112 SqYd	198 SqYd

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

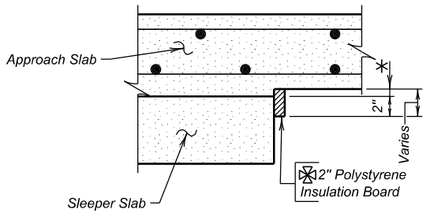


SECTION C - C
(Sleeper Slab)

✳ 4" at North End
1" at South End

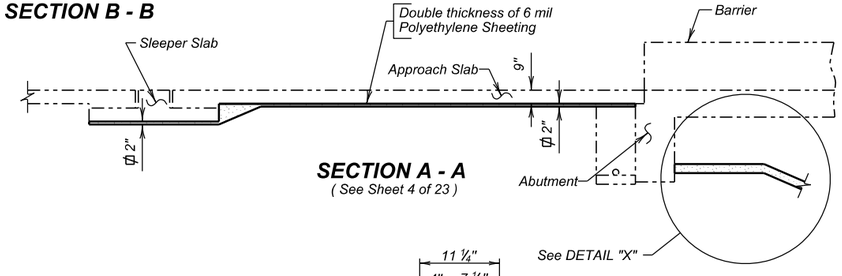


SECTION B - B

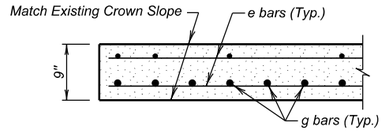


DETAIL "Q"

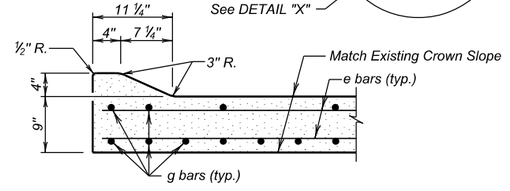
✠ *The Polystyrene Insulation Board will be firmly attached to the sleeper slab by a method to be approved by the Engineer.*



SECTION A - A
(See Sheet 4 of 23)



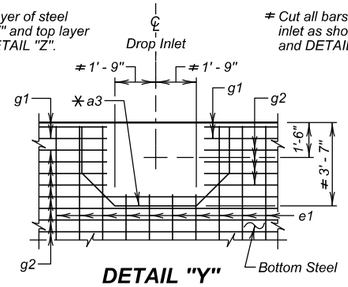
SECTION E - E



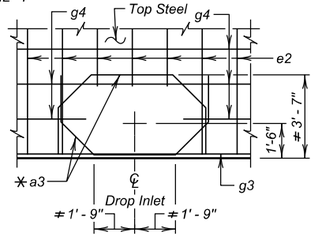
SECTION D - D

✳ *Add a3 bar to bottom layer of steel as shown in DETAIL "Y" and top layer of steel as shown in DETAIL "Z".*

≠ *Cut all bars in area of drop inlet as shown in DETAIL "Y" and DETAIL "Z".*



DETAIL "Y"
(Plan for Bottom Steel when drop inlet is used.)



DETAIL "Z"
(Plan for Top Steel when drop inlet is used.)

APPROACH SLAB DETAILS (D)

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY OVER RAILWAY
STR. NO. 18-160-108

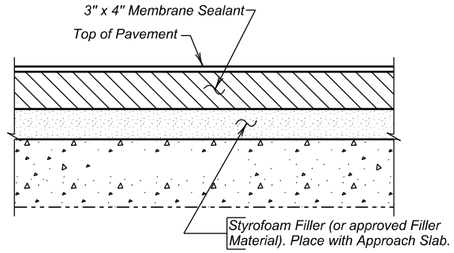
23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

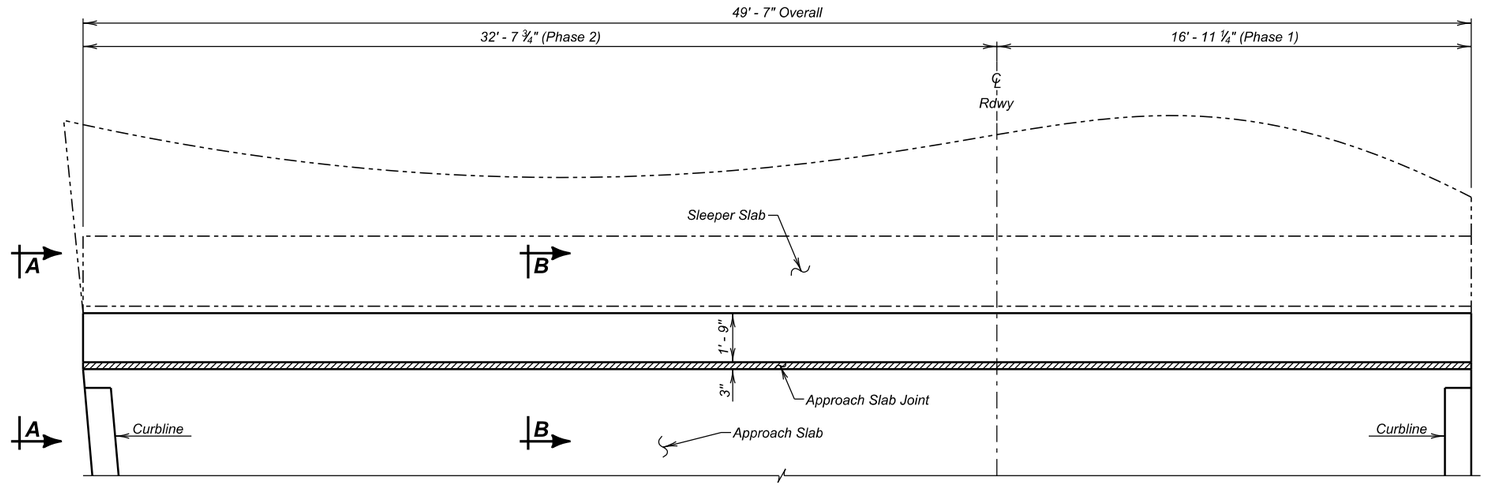
8 OF 23

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	PII	BRIDGE ENGINEER
DAVS091U	091UBB08		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	61	141



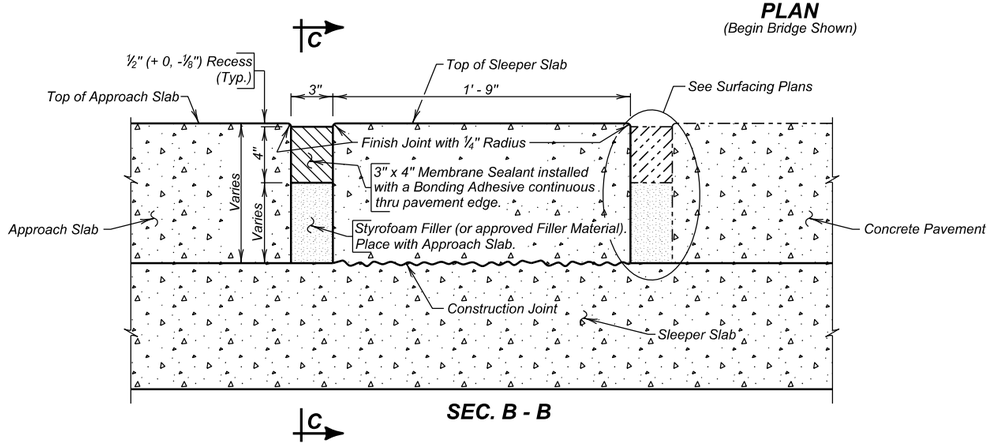
SECTION C - C



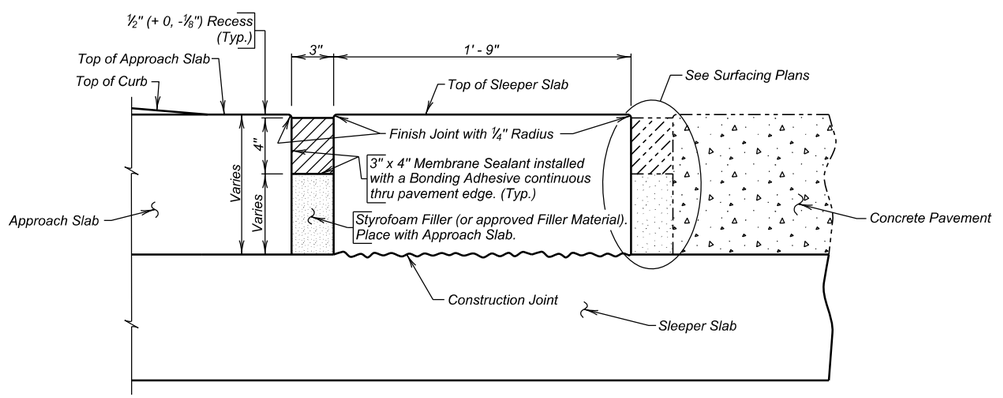
PLAN
(Begin Bridge Shown)

GENERAL NOTES

1. The Membrane Sealant will be on the approved product list for Membrane Sealant Expansion Joints.
2. The manufacturer will supply the membrane sealant in packaging that precompresses the membrane sealant. The precompressed dimension will be as recommended by the sealant manufacturer, however, in no case shall the precompressed dimension exceed 75% of the joint opening width. The foam sealant will be slowly self expanding to permit workers ample time to install the membrane sealant before the membrane sealant exceeds the joint opening width.
3. The membrane sealant will provide a water tight seal throughout a joint movement range of + 25% (minimum) from the specified joint opening dimension.
4. The membrane sealant will be supplied in pieces a minimum of 5 feet in length. The foam sealant will be ultra-violet and ozone resistant.
5. The bonding adhesive used to attach the membrane sealant to the adjacent concrete will be approved by the membrane sealant manufacturer.
6. Adhesive used to join adjacent pieces of the membrane sealant will be as recommended by the manufacturer.
7. If styrofoam filler material is used in the construction, it will be closed cell and water-tight as approved by the Engineer.
8. The minimum ambient air temperature at the time of joint installation and adhesive curing will be 40° F.
9. A technical representative of the membrane sealant manufacturer will be present at the jobsite during installation. The technical representative will be knowledgeable in the correct procedures for the preparation and installation of the joint material to ensure the Contractor installs the joint to the manufacturers' recommendations.
10. Surfaces that will be in contact with the membrane sealant will be thoroughly cleaned by abrasive blasting to remove all laitance and contaminants (such as oil, curing compounds, etc.) from the surface. At a minimum, two passes of abrasive blasting with the nozzle held at an angle to within 1 to 2 inches of the surface will be required. Cleaning of the surfaces with solvents, wire brushing, or grinding shall not be permitted.
11. After abrasive blasting, but immediately prior to membrane joint installation, the entire joint contact surface will be air blasted. The air compressor used for joint cleaning will be equipped with trap devices capable of providing moisture-free and oil-free air at a recommended pressure of 90 psi. To obtain complete bonding with the adhesive, the adjacent surfaces must be dry and clean. The contact surfaces for the joint will be visually inspected by the Engineer immediately prior to joint installation to verify the surface is dry and clean.
12. Individual spliced sections will be installed as per the manufacturers' recommendations. The membrane joint sealant manufacturer will submit a detailed installation procedure to the Engineer at least 5 days prior to joint installation for his review.
13. Traffic will not be allowed on the joint until the bonding adhesive has had time to cure, as recommended by the manufacturer.
14. Use plywood or other material to protect concrete adjacent to the joint from spalling before any equipment is moved across the joint. Any will areas will be repaired at the Contractor's expense by breaking out and replacing adjacent concrete, as approved by the Engineer.
15. The Membrane Sealant Expansion Joint will be measured in feet to the nearest one-tenth foot, complete in place. Measurement will be made of the overall horizontal length. The Membrane Sealant Expansion Joint will be paid for at the contract unit price per foot complete in place. Payment for this item will be full compensation for furnishing all the required materials in place, including labor, equipment and incidentals necessary to complete the work in accordance with the plans and the foregoing specifications.
16. The membrane sealant will be installed prior to winter. Housing and heating may be required to meet the manufacturer's requirements.



SEC. B - B



VIEW A - A

APPROACH SLAB EXPANSION JOINT AT ABUTMENT 1

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

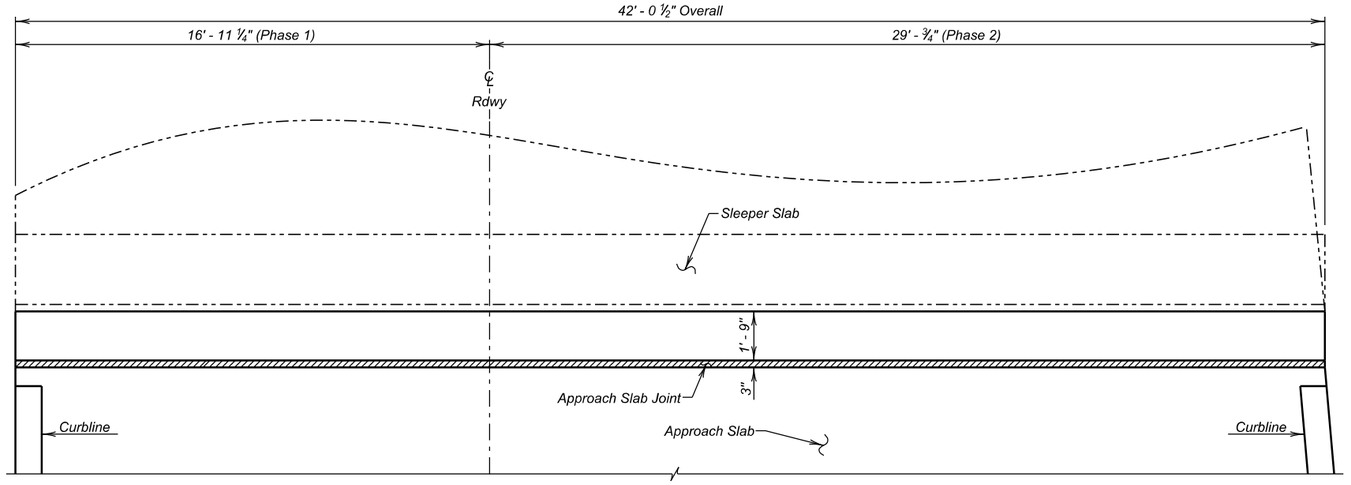
VARIABLE ROADWAY
OVER RAILWAY
STR. NO. 18-160-108

23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	JB	Steven A Johnson BRIDGE ENGINEER
DAVS091U	091UBB09		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	62	141



PLAN
(End Bridge Shown)

ESTIMATED QUANTITIES (For Two Approach Slabs)		
ITEM	UNIT	QUANTITY
Membrane Sealant Expansion Joint	Ft.	95.6

APPROACH SLAB EXPANSION JOINT AT ABUTMENT 4

FOR

158' - 2¼" CONTINUOUS CONCRETE BRIDGE

VARIABLE ROADWAY OVER RAILWAY
STR. NO. 18-160-108

23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

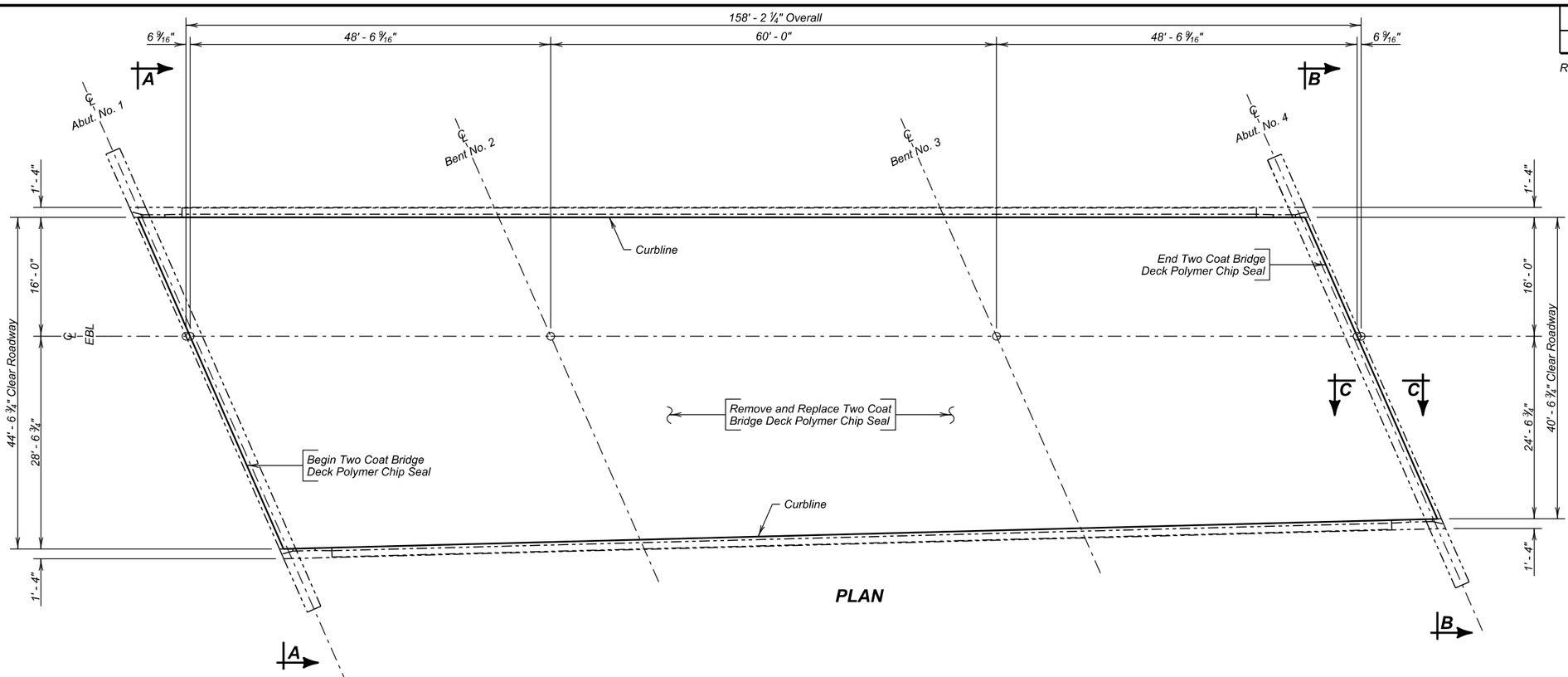
DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

10 OF 18

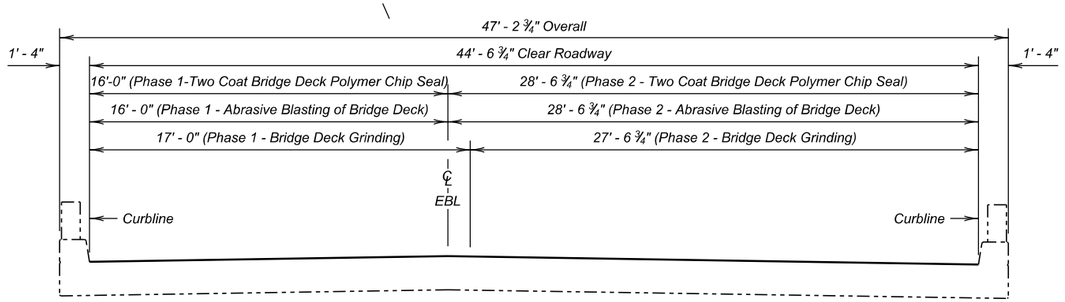
DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII DAVS091U	CMM 091UBB10	JB	Steve A Johnson BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	63	141

Revised 04/05/2024 P.I.

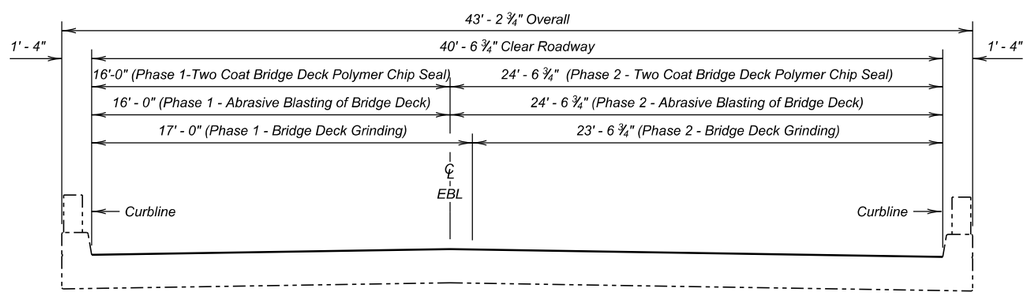


PLAN



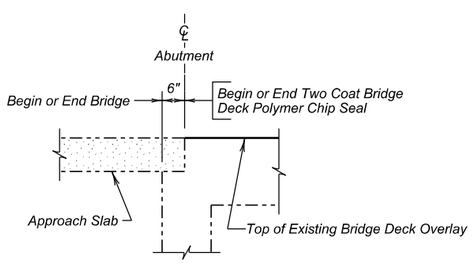
SECTION A - A

(Concrete shading and reinforcing steel not shown for clarity)



SECTION B - B

(Concrete shading and reinforcing steel not shown for clarity)



SECTION C - C

ESTIMATED QUANTITIES

	ITEM	UNIT	QUANTITY Phase I	QUANTITY Phase 2
	Two Coat Bridge Deck Polymer Chip Seal	SqYd	280.9	466.9
	Abrasive Blasting of Bridge Deck	SqYd	280.9	466.9
	Bridge Deck Grinding	SqYd	298.5	449.3
✳	Concrete Removal, Class A	SqYd	2.0	2.0
✳	Concrete Removal, Class B	SqYd	2.0	2.0
✳	Concrete Patching Material, Bridge Deck	CuFt	27.0	27.0

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

TWO COAT BRIDGE DECK POLYMER CHIP SEAL LAYOUT

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY OVER RAILROAD
STR. NO. 18-160-108

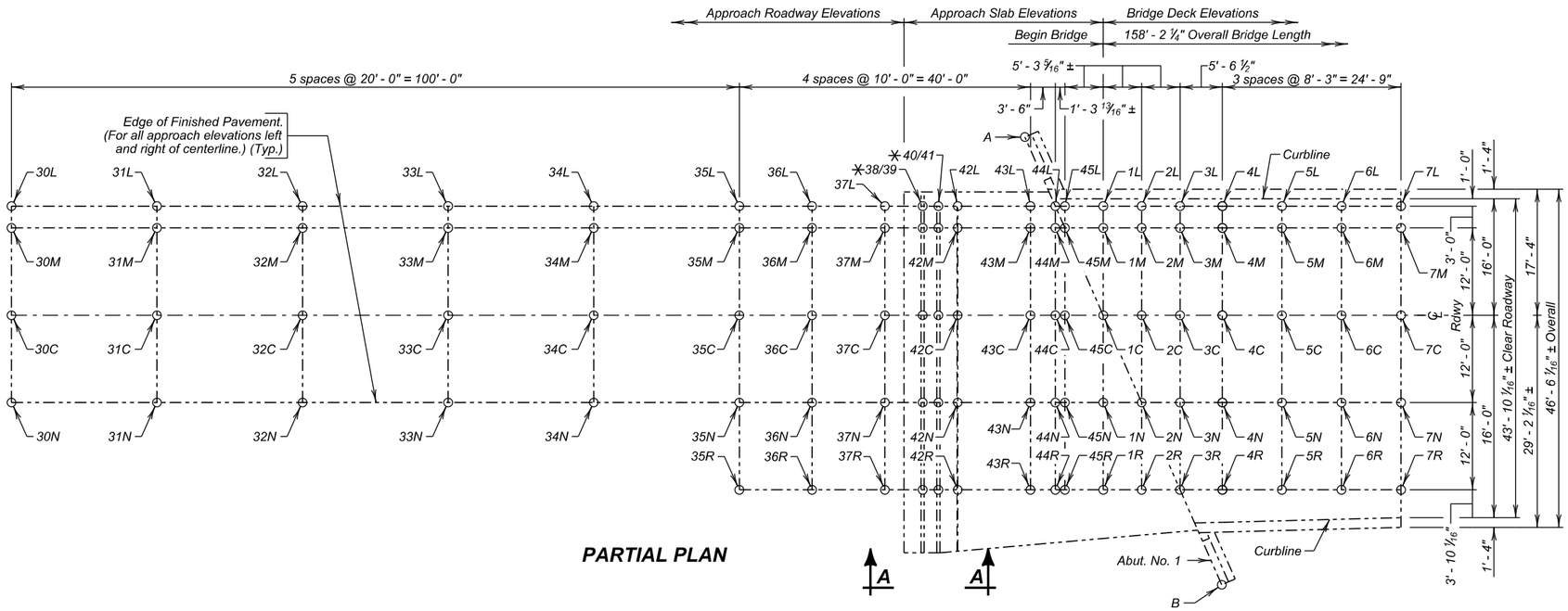
23°43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

11 OF 23

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	PII	Steven A Johnson BRIDGE ENGINEER
DAVS091U	091UBB11		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	64	141



PARTIAL PLAN

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Bridge Elevation Survey	LS	Lump Sum

Table of Elevations - Approach Roadway Elevations

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
30L		30M		30C		30N			
31L		31M		31C		31N			
32L		32M		32C		32N			
33L		33M		33C		33N			
34L		34M		34C		34N			
35L		35M		35C		35N		35R	
36L		36M		36C		36N		36R	
37L		37M		37C		37N		37R	

Table of Elevations - Bridge Deck Elevations

Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
44L									
45L		45M							
1L		1M		1C					
2L		2M		2C		2N			
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	

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

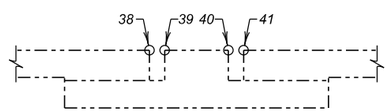
Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
38L		38M		38C		38N		38R	
39L		39M		39C		39N		39R	
40L		40M		40C		40N		40R	
41L		41M		41C		41N		41R	
42L		42M		42C		42N		42R	
43L		43M		43C		43N		43R	
		44M		44C		44N		44R	
				45C		45N		45R	
						1N		1R	
								2R	

Bridge Ends

Location	Elevation
A	
B	

Benchmark Description:

B.M. # ____
Location Description_____
Elevation _____



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.*

NOTE:

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

AS-BUILT ELEVATION SURVEY REQUEST (A)

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY OVER RAILWAY
STR. NO. 18-160-108

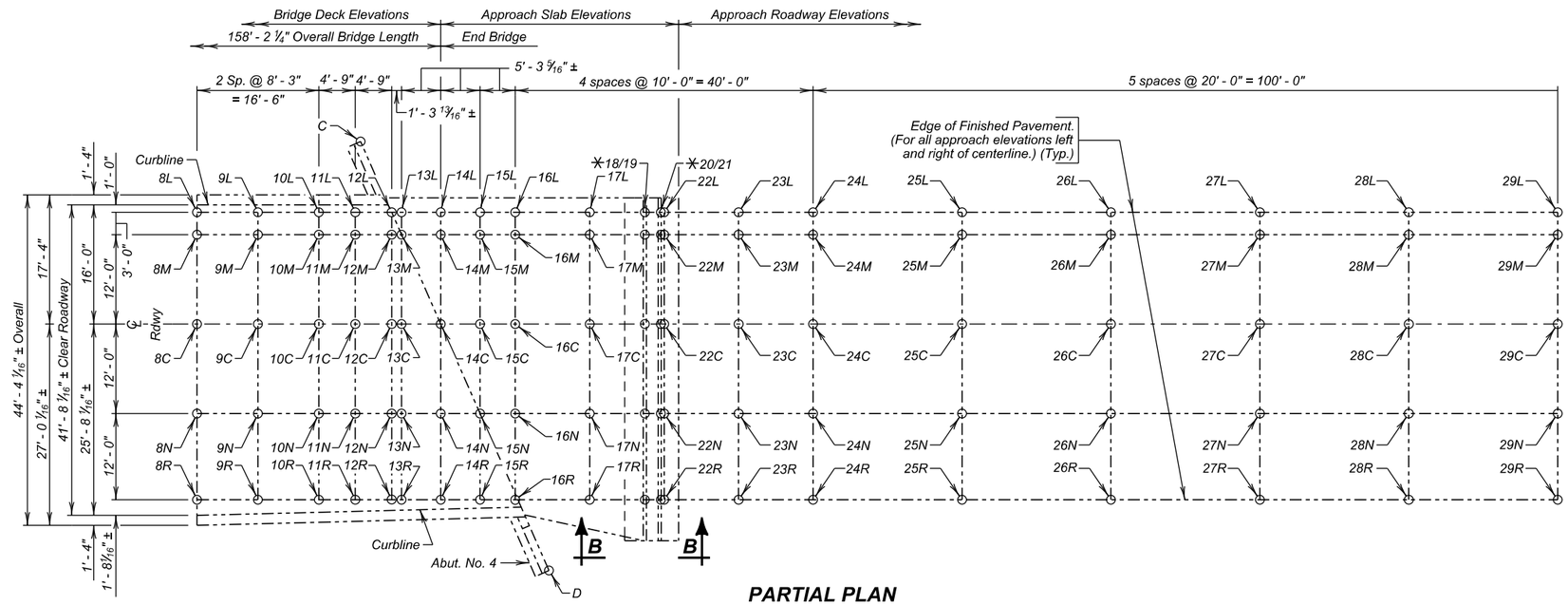
23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

12 OF 23

DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	JB	Steven A Johnson BRIDGE ENGINEER
DAVS091U	091UBB12		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	65	141



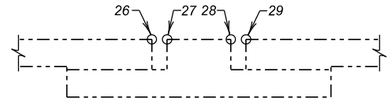
PARTIAL PLAN

Table of Elevations - Bridge Deck Elevations									
Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
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	
		13M		13C		13N		13R	
				14C		14N		14R	
						15N		15R	
								16R	

Table of Elevations - Approach Slab Joints (See VIEW B - B) and Approach Slab									
Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
13L									
14L		14M							
15L		15M		15C					
16L		16M		16C		16N			
17L		17M		17C		17N		17R	
18L		18M		18C		18N		18R	
19L		19M		19C		19N		19R	
20L		20M		20C		20N		20R	
21L		21M		21C		21N		21R	

Table of Elevations - Approach Roadway Elevations									
Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation	Location	Elevation
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	

Bridge Ends	
Location	Elevation
C	
D	



VIEW B - B

Benchmark Description:

B.M. # _____
Location Description_____
Elevation _____

✳ *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.*

NOTE:

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

AS-BUILT ELEVATION SURVEY REQUEST (B)

FOR

158' - 2 ¼" CONT. CONCRETE BRIDGE

VARIABLE ROADWAY OVER RAILWAY
STR. NO. 18-160-108

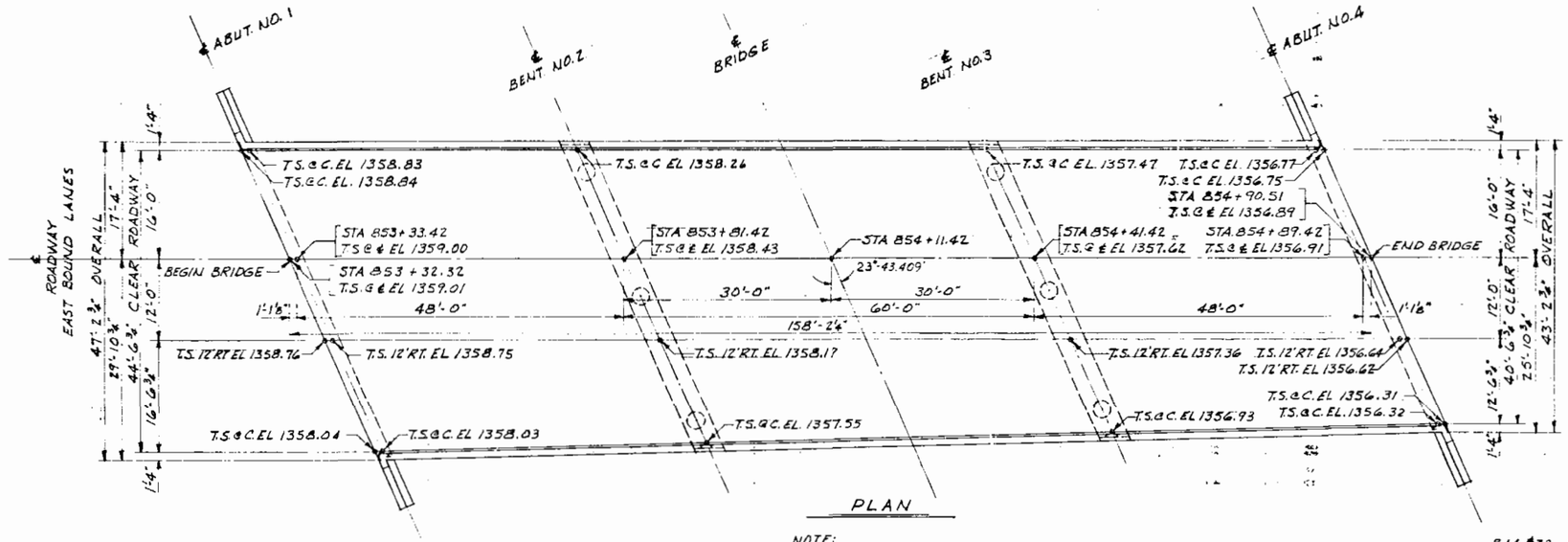
23° 43' 25" SKEW R.H.F.
SEC. 27-T103N-R60W
IM 0907(90)332

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2024

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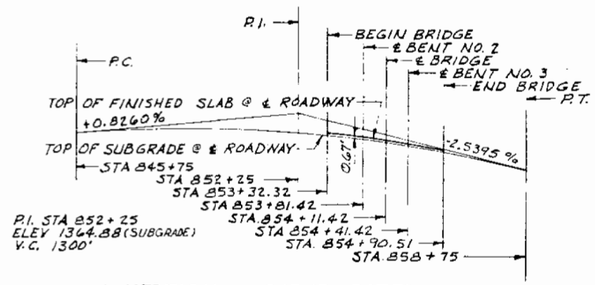
DESIGNED BY	CK. DES. BY	DRAFTED BY	
PII	CMM	JB	BRIDGE ENGINEER
DAVS091U	091UBB13		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	66	141



PLAN

NOTE:
T.S. @ ℄ ELEV. = ELEVATION OF TOP OF SLAB AND ℄ E.B.L.
T.S. @ 12'RT. = ELEVATION OF TOP OF SLAB 12' RIGHT OF ℄ E.B.L.
T.S. @ C = ELEVATION OF TOP OF SLAB AT CURB.

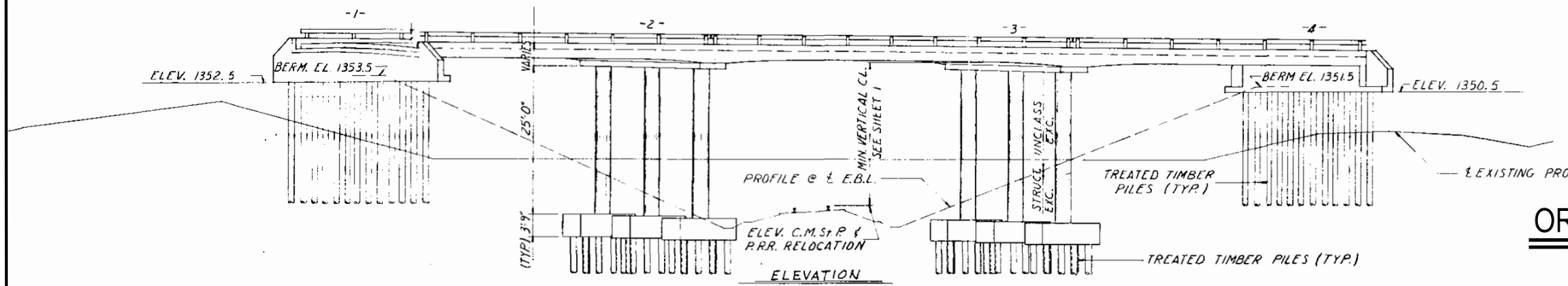


VERTICAL CURVE DATA

B.M. #32 ELEV. 1343.51
REBAR ℄ GDS IN FENCE LINE
135 Rt. OF M.L. STA. 828+70

B.M. #33 ELEV. 1335.47
REBAR ℄ GDS IN FENCE LINE
57' LT. OF M.L. STA. 853+37

B.M. #34 ELEV. 1305.91
REBAR ℄ GDS.
179' LT. OF M.L. STA. 882+02



ORIGINAL CONSTRUCTION PLANS

GENERAL DRAWING AND QUANTITIES (E.B.L.) FOR

158'-2 ¼" CONTINUOUS CONCRETE BRIDGE

VARIABLE ROADWAY
OVER C.M.St.P & P.R.R. SEC. 27-T103N-R60W
STA. 853+32.32 TO STA. 854+90.51
DAVISON COUNTY I-90-7(16)328
23°-43.409' SKEW R.H.F.
SOUTH DAKOTA HS20-44 (& ALT.)

STR. NO. 18-160-108

J.T. BANNER & ASSOC., INC.
CONSULTING ENGINEERS

14 OF 23

ESTIMATED QUANTITIES (E.B.L.)

ITEM	CL. A COM. EXC. CU. YDS.	REINF. STEEL STRUCT. LBS.	TYPE RT-3 STEEL SHEET PILING-LIN. FT.	TIMBER PILES-LIN. FT. TREATED TIMBER ⊕ TEST	EXCAVATION-CU. YDS. STRUCT. UNCLASS.
SUPERSTRUCTURE	424.1	146,378	710	311.6	
ABUTMENT NO. 1	27.8	2,700	420	1890' 10"	1952.1 90
BENT NO. 2	32.4	10,400		2940' 35"	2420.1 159
BENT NO. 3	51.9	17,350		2940' 35"	1640' 144
ABUTMENT NO. 4	25.8	2,550	300	1730' 30"	1855' 18
TOTAL	583.0	179,378 196,126	1430 1214	301.4' 311.6'	9860 — 410' — 370'

△ SEE GRADING PLANS FOR UNCLASSIFIED EXCAVATION.
⊕ ONE TREATED TIMBER TEST PILE SHALL BE DRIVEN AT EACH ABUTMENT AND BENT BEFORE REMAINING PILES ARE ORDERED.

PILE NOTE

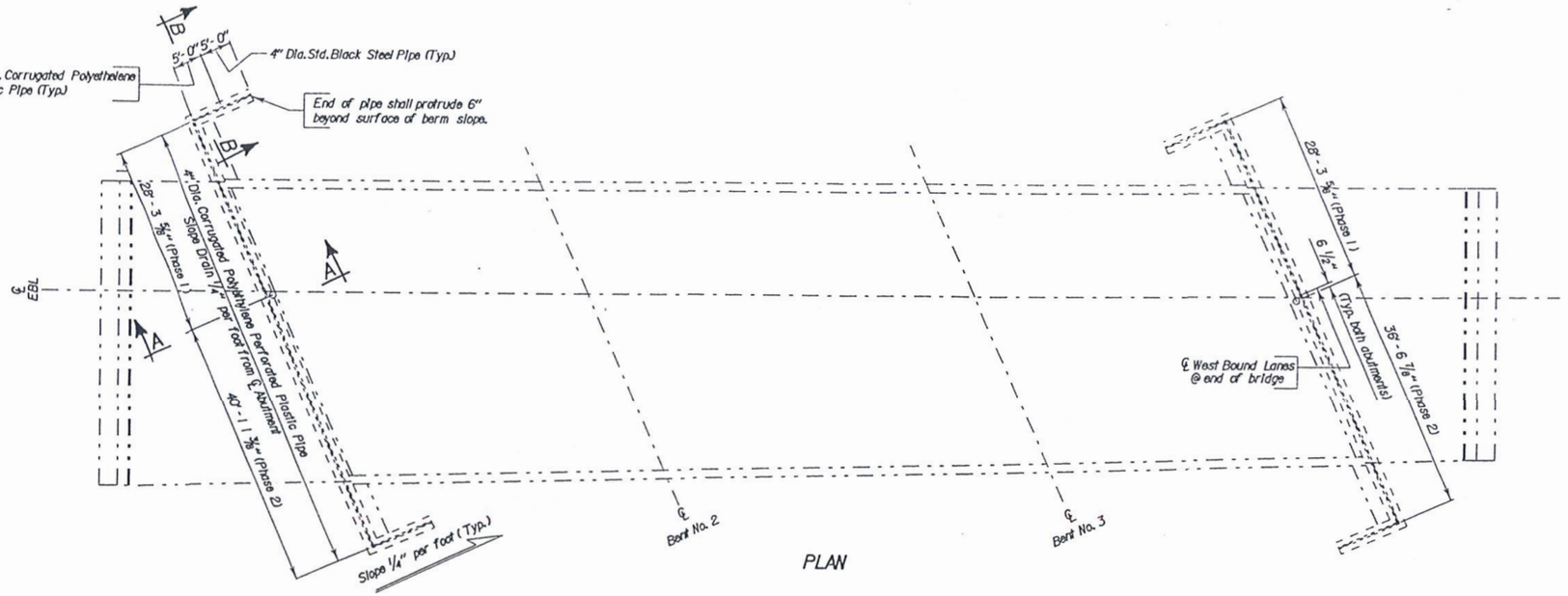
PILES DRIVEN AT ABUTMENTS NO. 1 AND 4, INCLUDING TEST PILES, SHALL OBTAIN THEIR FULL BEARING, (124 TONS), IN THE NATURAL GROUND BELOW THE NEW EMBANKMENT ELEVATIONS 1340.5± AND 1342.5± RESPECTIVELY. PRE-BORED HOLES THRU THE FILL ARE REQUIRED AND SHALL HAVE A MINIMUM DIAMETER 2" LARGER THAN THE NOMINAL DIAMETER (30" FROM THE BUTT) OF THE PILE.

Item	Str. Exc.	Tim. Piling	Tim. Cutoff	Test Piling	Test Cutoff
41	19.50	246.3	53.1	27.4	27.6
2	115.98	199.7	41.1	9.5	30.5
3	145.24	250.8	77.1	28.1	28.5
4	19.38	230.5	38.6	30.2	24.8
Str.	226.10	987.3	230.1	89.2	111.4

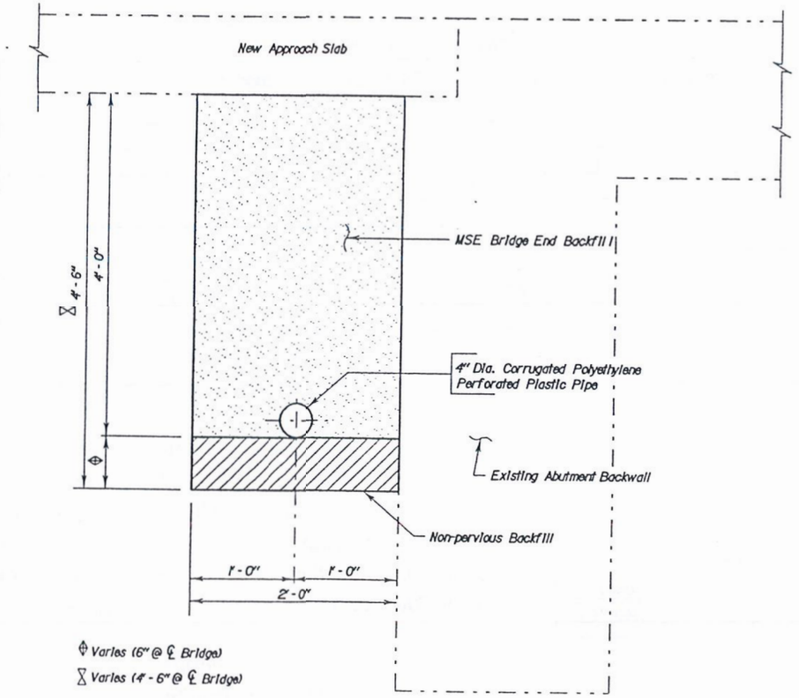
F.E. 12/14/67 K.E.D.

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
W.G.H.	P.E.M.	J.O.E.	BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	67	141

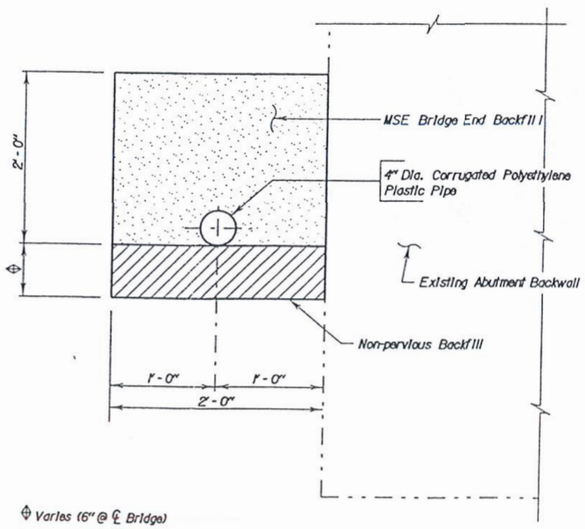


PLAN



SEC. A-A

(Shown adjacent to Abutment No. 1, Abutment No. 4 similar by opposite hand)



SEC. B-B

ESTIMATED QUANTITIES (For Two Abutments)			
		QUANTITY	
ITEM	UNIT	PHASE 1	PHASE 2
Underdrain Pipe, Bridge End Backfill	L.F.	76.6	97.5
Excavation, Bridge End Backfill	C.Y.	22.6	28.5
Backfill, MSE Bridge End	C.Y.	19.7	25.9

ORIGINAL CONSTRUCTION PLANS

(EAST BOUND LANES)

DETAILS OF DRAINAGE AT ABUTMENTS FOR

158' - 2 1/4" CONT. CONC. SLAB BRIDGE

VARIABLE ROADWAY — 23 ° 43. 4' SKEW R. H. F.

STR. NO. 18-160-108 — SEC. 27-T103N-R60W

OVER RAILROAD — IM 90-7(40)319

DAVISON COUNTY

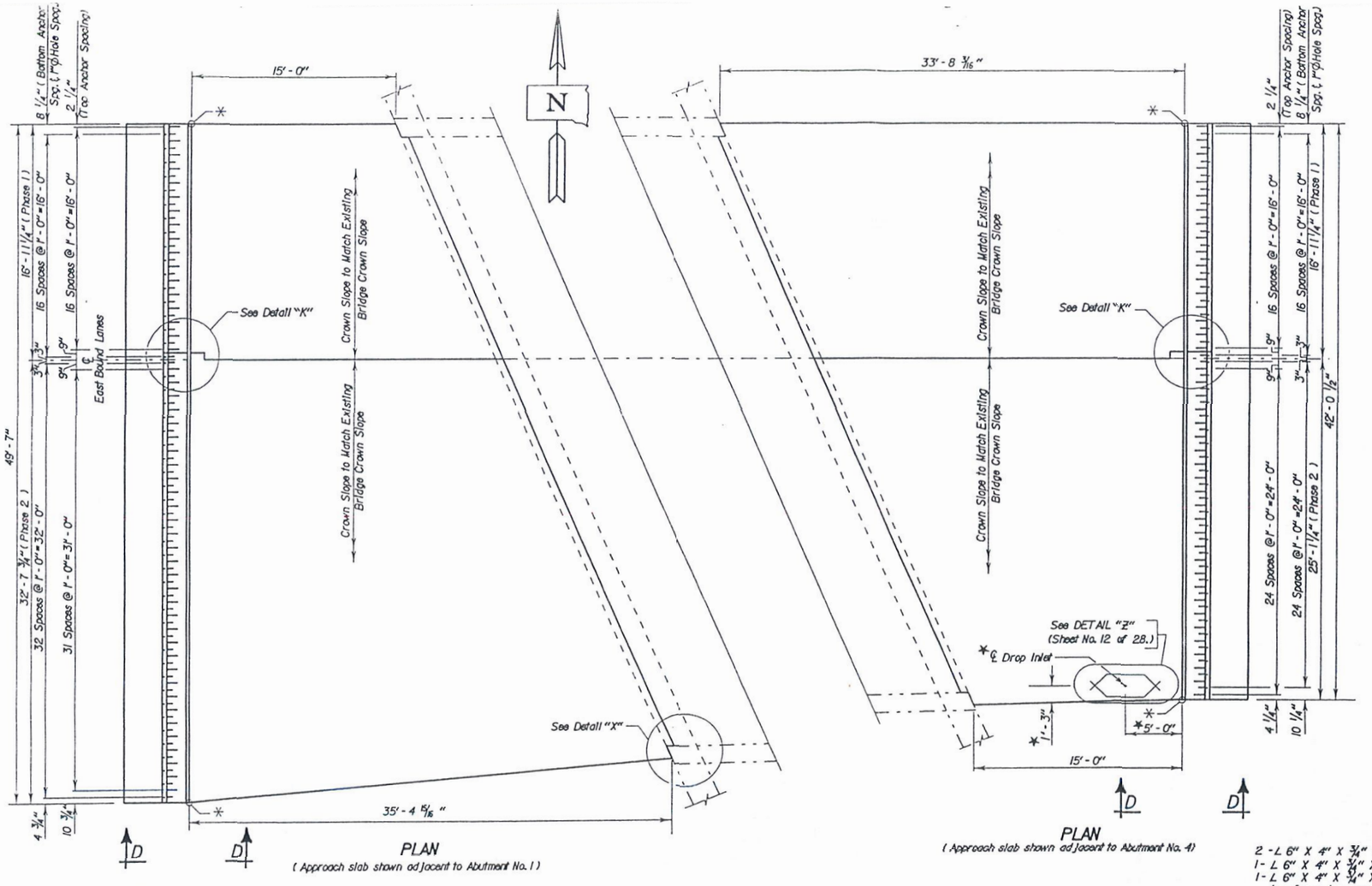
S. D. DEPT. OF TRANSPORTATION

JULY 1999

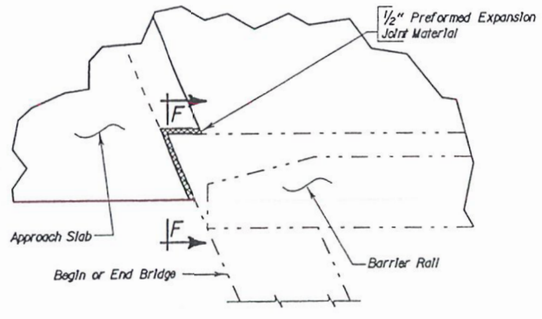
15 OF 23

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
EJA	EJA	CJD	John C. Cole
DAVS4970	4970PD08		BRIDGE ENGINEER

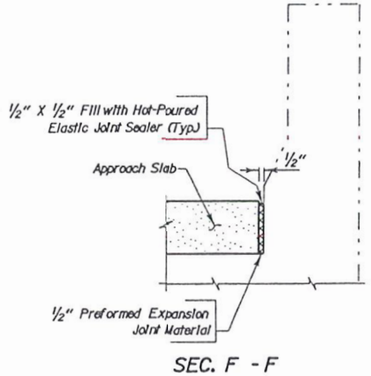
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	68	141



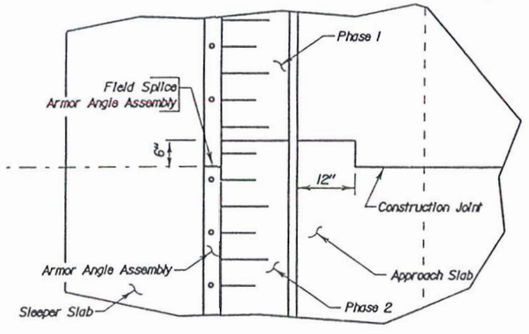
* Elevation is Top of Slab back of Curb at this point. See Approach Slab Note No. 6 on Sheet No. 123 of 221.



DETAIL "X"
(Typical all four bridge corners)

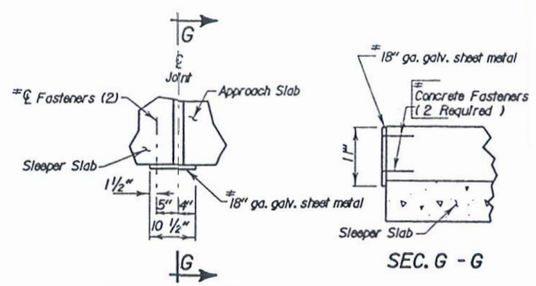


SEC. F - F



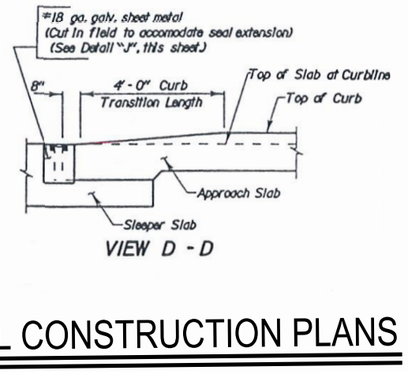
DETAIL "K"

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



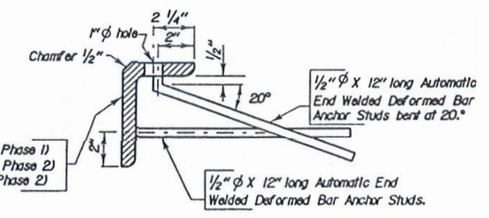
PLAN - DETAIL "J"

SEC. G - G



VIEW D - D

ORIGINAL CONSTRUCTION PLANS



DETAIL "Y"

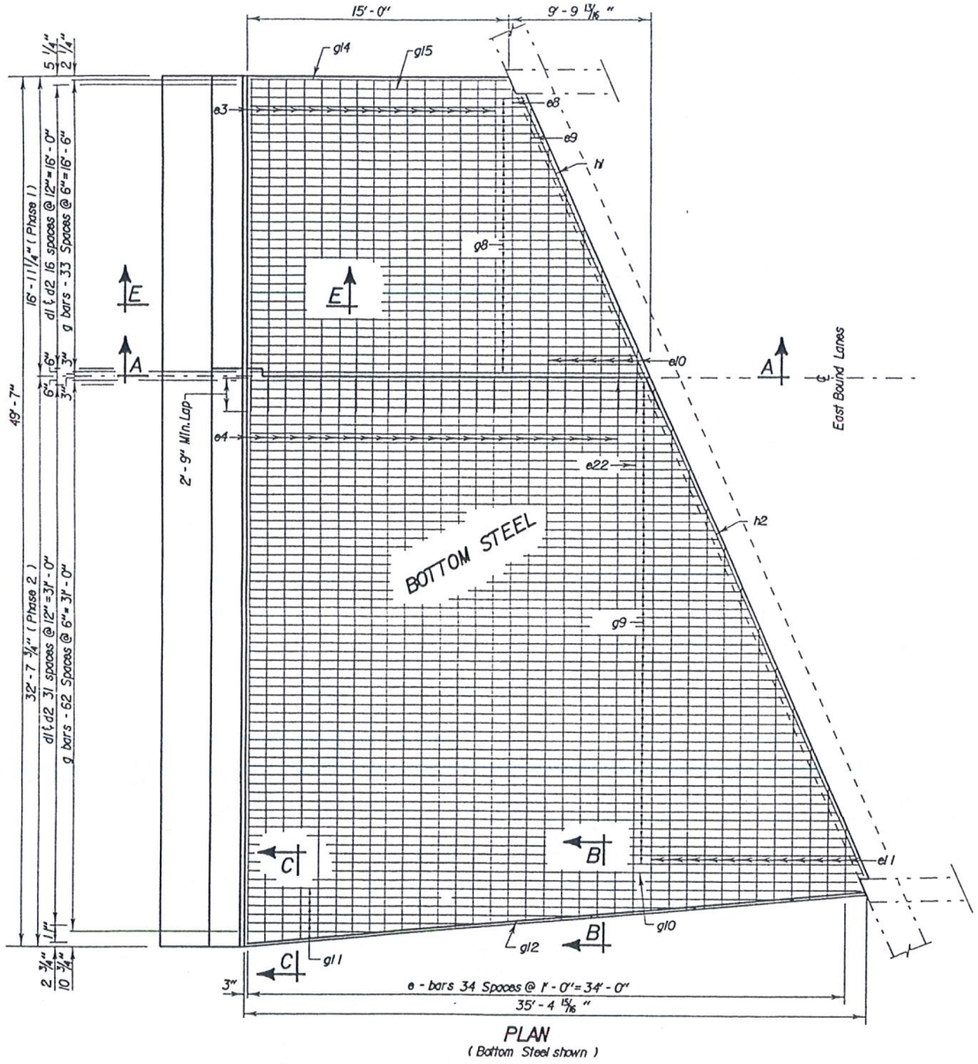
(See Notes Regarding Armor Angle Assembly, Sheet No. 123 of 221.)
(See Sheet No. 12 of 28 for location of details.)

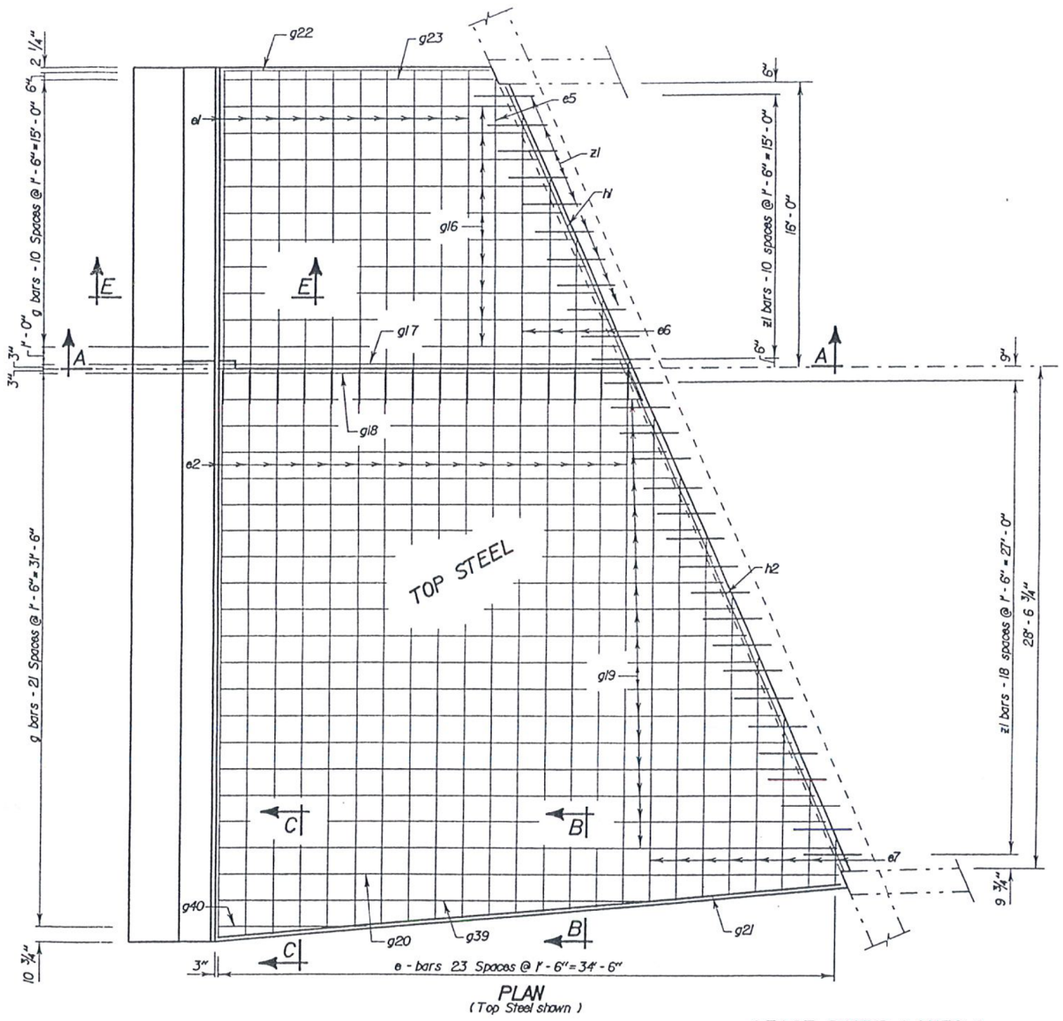
(EAST BOUND LANES)
LAYOUT FOR APPROACH SLABS
158' - 2 1/4" CONT. CONC. BRIDGE
VARIABLE ROADWAY OVER RAILROAD
STR. NO. 18-160-108
23° 43.409' SKEW
SEC. 27-T103N-R60W
IM 29-7(40)319
DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 1999

16 OF 23

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
CJD/EJA	CJD	CJD/EJA	BRIDGE ENGINEER
DAVS4970	4970PD09		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	69	141





ORIGINAL CONSTRUCTION PLANS

(EAST BOUND LANES)

DETAIL OF APPROACH SLAB AT ABUTMENT NO. 1

158' - 2 1/4" CONT. CONC. BRIDGE

VARIABLE ROADWAY — 23° 43.409' SKEW

OVER RAILROAD — SEC. 27-T103N-R60W

STR. NO. 18-160-108 — IM 29-7(40)319

DAVISON COUNTY

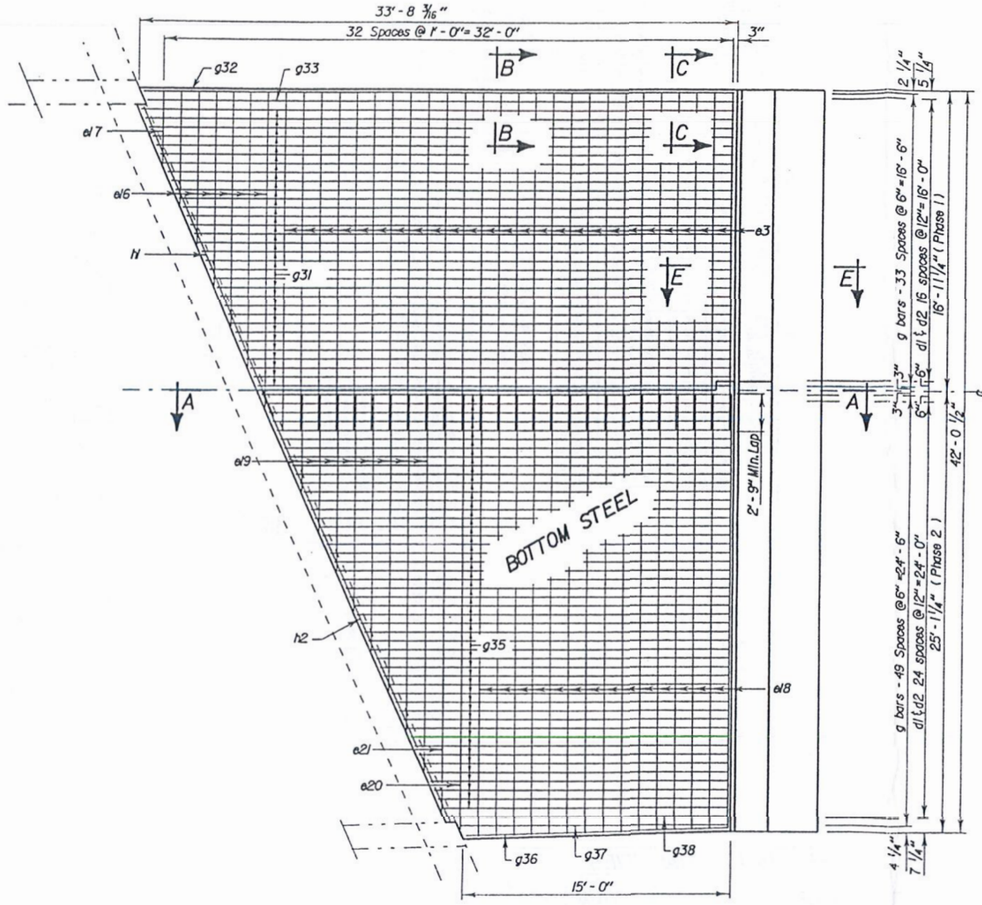
S. D. DEPT. OF TRANSPORTATION

JUNE 1999

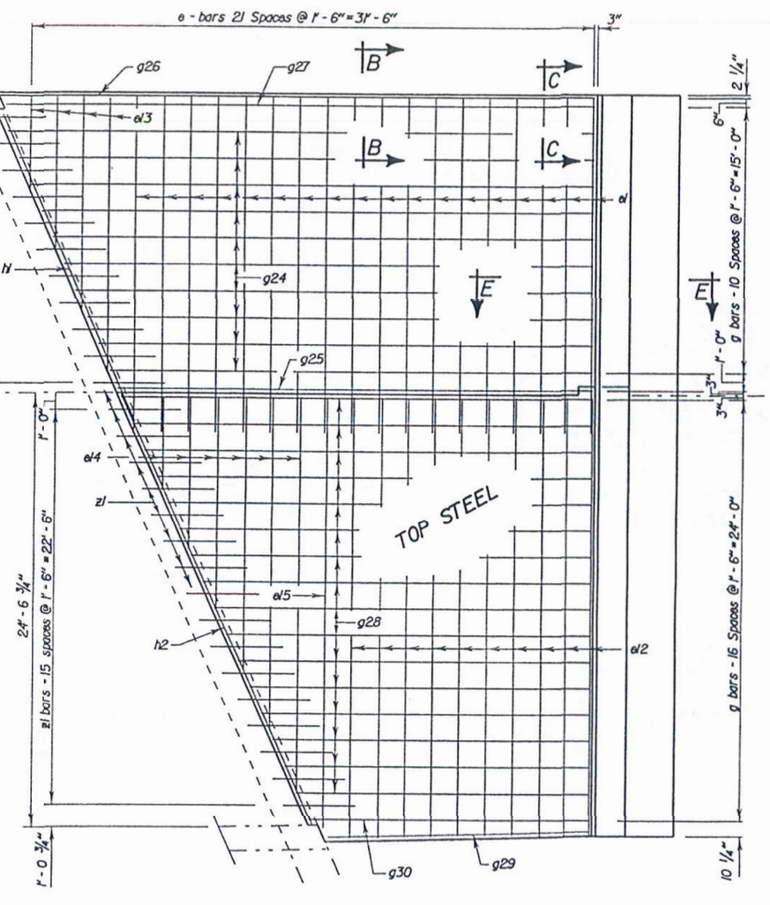
17 OF 23

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
EJA	CJD	CJD	John C. Cole
DAVS4970	4970PD10		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	70	141



PLAN
(Bottom Steel shown)



PLAN
(Top Steel shown)

ORIGINAL CONSTRUCTION PLANS

(EAST BOUND LANES)

DETAIL OF APPROACH SLAB AT ABUTMENT NO. 4

158' - 2 1/4" CONT. CONC. BRIDGE

VARIABLE ROADWAY — 23° 43.409' SKEW

OVER RAILROAD — SEC. 27-T103N-R60W

STR. NO. 18-160-108 — IM 29-7(40)319

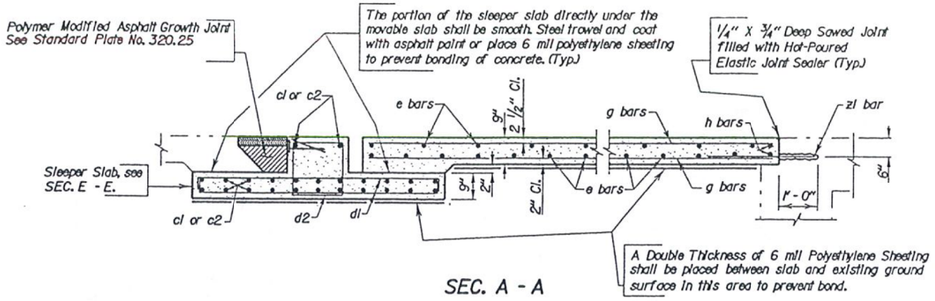
DAVISON COUNTY

S. D. DEPT. OF TRANSPORTATION

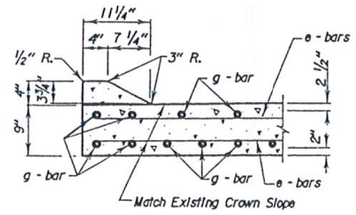
JUNE 1999 — 18 OF 23

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
EJA	CJD	CJD	John C. Cole
DAVS4970	4970PD11		BRIDGE ENGINEER

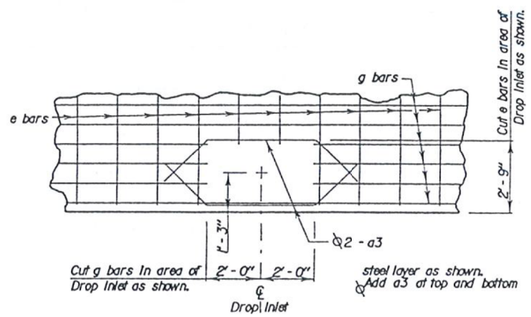
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	71	141



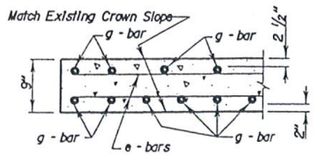
SEC. A - A



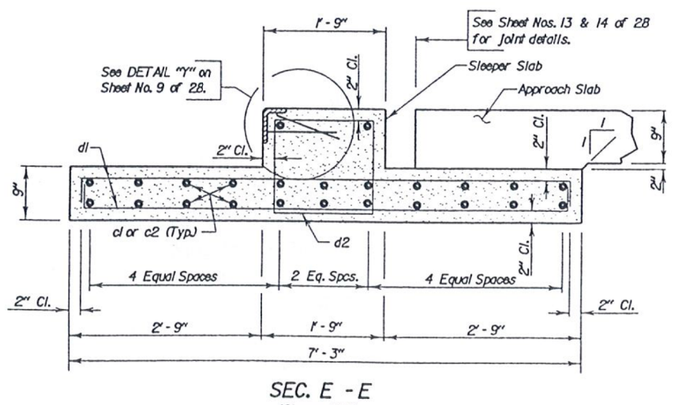
SEC. B - B



DETAIL "Z"
(Bottom Steel Shown)
See Sheet No. 9 of 28 for location on Approach Slab .



SEC. C - C



SEC. E - E
(Sleeper Slab)

REINFORCING SCHEDULE
(For Two Approach and Sleeper Slabs)

PHASE 1

	Mk.	No.	Size	Length	Type
	c1	48	5	19'-6"	Str.
	d1	68	4	7'-9"	2
	d2	34	4	6'-3"	T2
	e1	28	4	19'-6"	Str.
	e3	41	6	19'-6"	Str.
	e5	1	4	18'-3"	Str.
*	e6	2	4	21'-8"	Str.
	e8	1	6	18'-4"	Str.
	e9	1	6	17'-3"	Str.
*	e10	3	6	18'-4"	Str.
*	e13	2	4	20'-6"	Str.
*	e16	3	6	24'-0"	Str.
	e17	1	6	4'-0"	Str.
*	g8	16	8	38'-2"	Str.
	g14	1	8	14'-8"	Str.
	g15	1	8	14'-11"	Str.
*	g16	5	4	28'-3"	Str.
	g17	1	4	22'-6"	Str.
	g22	1	4	14'-8"	Str.
	g23	1	4	14'-11"	Str.
*	g24	5	4	59'-9"	Str.
	g25	1	4	25'-6"	Str.
	g26	1	4	33'-3"	Str.
	g27	1	4	33'-0"	Str.
*	g31	16	8	59'-8"	Str.
	g32	1	8	33'-3"	Str.
	g33	1	8	33'-0"	Str.
	h1	4	6	19'-4"	Str.
△	z1	22	6	4'-0"	Str.

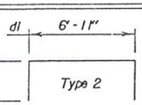
Bending Details

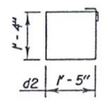
e2	30'-5"	32'-4"	
e4	30'-4"	32'-4"	
e6	15'-7"	16'-1"	
e7	2'-6"	26'-8"	
e10	3'-6"	14'-10"	
e11	3'-8"	28'-11"	
e13	5'-2"	15'-4"	
e14	5'-3"	22'-4"	
e16	6'-4"	17'-8"	
e19	5'-6"	21'-5"	
e19	12'-4"	14'-7"	
e16	10'-10"	13'-2"	
e14	12'-1"	15'-6"	
e13	8'-7"	11'-11"	
e11	15'-2"	17'-5"	
e10	8'-0"	10'-4"	
e7	12'-10"	16'-4"	
e6	9'-2"	12'-6"	
e4	31'-4"	31'-5"	
e2	31'-3"	31'-5"	

g8	15'-8"	22'-6"	
g9	22'-9"	34'-10"	
g11	7'-8"	34'-11"	
g16	16'-2"	22'-1"	
g19	23'-5"	34'-7"	
g24	26'-11"	32'-10"	
g28	16'-4"	26'-3"	
g31	26'-6"	33'-2"	
g35	15'-11"	26'-3"	
g35	21'-0"	21'-2"	
g31	29'-8"	30'-0"	
g28	21'-0"	21'-7"	
g24	29'-6"	30'-3"	
g19	28'-8"	29'-4"	
g16	18'-10"	19'-5"	
g11	18'-5"	24'-2"	
g9	28'-8"	28'-11"	
g8	19'-2"	19'-0"	

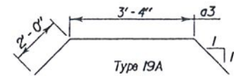
2	e6, e13		
3	e10, e14, e16		
4	e7, e9		
6	e11		
11	e4		
8	e2		

24	g35		
16	g31		
8	g28, g11		
5	g24, g16		
9	g19		
28	g9		
16	g8		





Type T2



Type 19A

Note -
All Dimensions are out to out of bars.
All Bars to be Epoxy Coated.
△ Dowels
* Cut Bars

PHASE 2

	Mk.	No.	Size	Length	Type
	c2	24	5	30'-2"	Str.
	c3	24	5	24'-11"	Str.
	d1	110	4	7'-9"	2
	d2	55	4	6'-3"	T2
*	e2	8	4	62'-8"	Str.
*	e4	11	6	62'-9"	Str.
*	e7	4	4	29'-2"	Str.
*	e11	6	6	32'-7"	Str.
	e12	10	4	24'-8"	Str.
*	e14	3	4	27'-7"	Str.
	e15	1	4	24'-6"	Str.
	e18	15	6	24'-8"	Str.
*	e19	4	6	26'-11"	Str.
	e20	1	6	24'-9"	Str.
	e21	1	6	23'-9"	Str.
	e22	1	6	30'-4"	Str.
*	g9	28	8	57'-7"	Str.
	g10	1	8	35'-0"	Str.
*	g11	3	8	42'-7"	Str.
	g12	1	8	35'-1"	Str.
	g18	1	4	22'-9"	Str.
*	g19	9	4	58'-0"	Str.
	g20	1	4	34'-8"	Str.
	g21	1	4	35'-1"	Str.
*	g28	8	4	42'-7"	Str.
	g29	1	4	14'-8"	Str.
	g30	1	4	15'-9"	Str.
*	g35	24	8	42'-2"	Str.
	g36	1	8	14'-8"	Str.
	g37	1	8	14'-11"	Str.
	g38	1	8	15'-9"	Str.
	g39	1	4	23'-7"	Str.
	g40	1	4	7'-6"	Str.
	h2	2	6	30'-10"	Str.
	h3	2	6	26'-7"	Str.
△	z1	35	6	4'-0"	Str.
	a3	4	4	7'-4"	19A

ESTIMATED QUANTITIES

ITEM	UNIT	PHASE 1 QUANTITY	PHASE 2 QUANTITY
Conc. Approach Slab Adjacent to Bridge	S.Y.	93.5	166.4
Bridge Approach Sleeper Slab	S.Y.	27.3	46.5
Install Dowel In Concrete	Each	22	35

	PHASE 1	PHASE 2
1. Concrete In Approach Slabs.	24.4 C.Y.	43.0 C.Y.
*2. Epoxy Coated Re-Steel In Approach Slabs.	6827 Lb.	11343 Lb.
3. Concrete In Sleeper Slabs	7.6 C.Y.	12.9 C.Y.
4. Epoxy Coated Re - Steel In Sleeper Slabs.	1470 Lb.	2178 Lb.
5. Structural Steel In Armor Assembly.	845 Lb.	1437 Lb.
6. Polyethylene Sheeting	220 S.Y.	396 S.Y.

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".

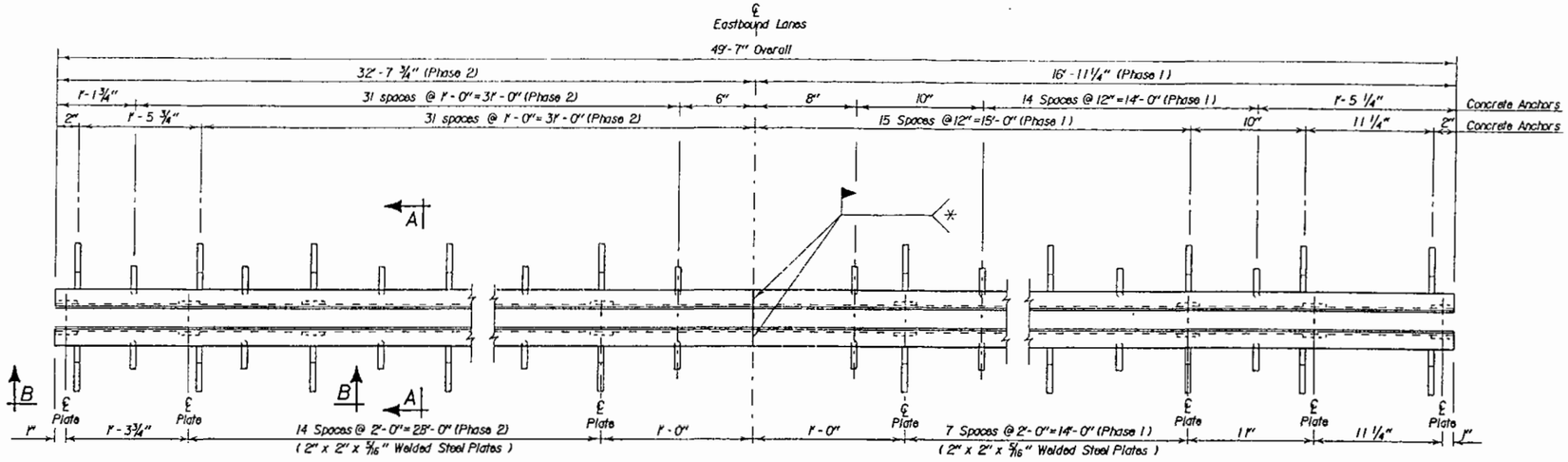
PHASE 1	PHASE 2
132 Lb.	210 Lb.

ORIGINAL CONSTRUCTION PLANS

(EAST BOUND LANES)
DETAIL OF APPROACH SLAB AT ABUTMENT NO. 1
158' - 2 1/4" CONT. CONC. BRIDGE
VARIABLE ROADWAY OVER RAILROAD
23° 43.409' SKEW
SEC. 27-T103N-R60W
STR. NO. 18-160-108
IM 29-7(40)319
DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 1999

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
EJA	CJD	CJD	BRIDGE ENGINEER
DAVS4970	4270P012		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	72	141



PLAN OF STRIP SEAL
(Neoprene Seal not shown)

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

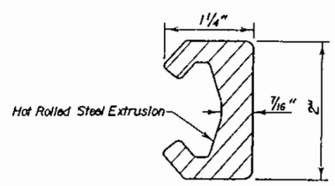
GENERAL NOTES:

1. Materials for the Steel Extrusion shall conform to ASTM-A36, A242 or A588. Materials for the 2" x 2" x 5/16" welded steel plates shall conform to ASTM-A36. Material for the 1/2" diameter x 6" Concrete Anchors shall conform to Type A steel studs of Section 7 of the latest edition of the ANSI/AWS D1.1 Structural Welding Code-Steel.
2. Material for the neoprene seal shall conform to ASTM D2628 modified to omit the recovery test. No splices will be permitted in the neoprene seal.
3. The lubricant-adhesive used to install the neoprene seal shall conform to the requirements of ASTM D4070. The neoprene seal and the lubricant adhesive should be supplied or recommended by the same source as they must be compatible.
4. The installation of the neoprene seal shall be as recommended by its Manufacturer and approved by the Engineer, but in general shall be as follows: The neoprene seal shall be installed and bonded to the steel extrusion with a high-solids lubricant adhesive. The neoprene surfaces shall be roughened with a wire brush before the application of the lubricant adhesive. The neoprene seal may be installed either prior to or after the time the steel extrusions are concreted in the approach slabs. The steel extrusion shall be dry, clean, free from dirt, grease and contaminates at the time the neoprene seal is installed.
5. Due to the length of the steel extrusions, splices are permitted. No welds shall be permitted in the internal section of the extrusion where the neoprene seal is located. Weld details shall be shown on the shop plans for approval by the Engineer. Welding shall be in accordance with latest edition of the ANSI/AWS D1.1 Structural Welding Code-Steel. Galvanize the steel extrusions and anything welded to them after all welding is completed. They shall be galvanized in accordance with AASHTO M111 (ASTM A123). If welded splices are used subsequent to galvanizing, the weld details and the procedures for preparing the surface for welding and repairing the galvanizing after welding shall be included with the shop plans.
6. The thickness and shape of the neoprene seal may vary from the sketch shown (Detail "C" on this sheet) according to the manufacturer's design; however, the wedge lugs must properly fit the groove in the steel extrusion. Before installation, the shop plans of the proposed neoprene seal showing the fixed dimensions, thickness of neoprene seal, and dimensions pertinent to the fit of the neoprene seal in the steel extrusion shall be submitted to and approved by the Engineer.
7. Since the configuration and dimensions of the steel extrusion may vary according to each manufacturer's design, they need not conform exactly to that shown in DETAIL "D", however, any deviations from the plan shown configuration or dimensions must be approved by the Office of Bridge Design.
8. The Strip Seal Expansion Joint supplier shall submit a detailed gland installation procedure with the shop plans.
9. The cost of welding shall be included in the unit cost for Strip Seal Expansion Joint.
10. The neoprene seal shall be of sufficient length such that a minimum length of 6" shall extend beyond each end of the steel extrusions.
11. The Strip Seal Expansion Joint will be measured in linear feet to the nearest one-tenth foot, complete in place. Measurement will be made of the overall horizontal length. The Strip Seal Expansion Joint will be paid for at the contract unit price per linear foot complete in place. Payment for this item shall be full compensation for furnishing all the required materials in place, inclusive of labor, equipment and incidentals necessary to complete the work in accordance with plans and the foregoing specifications.

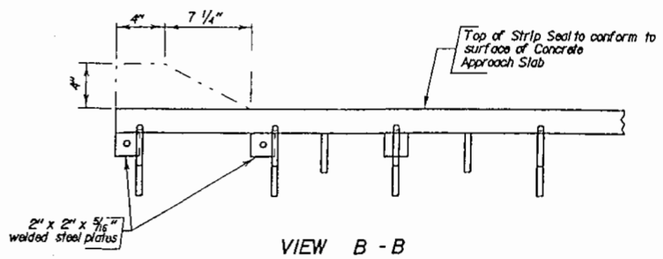
* 12. Due to phased construction, the steel extrusion shall be spliced in the Field at the location shown above. The Weld Details and the procedures for preparing the surface for welding and repairing the galvanizing after welding shall be included with the shop plans.



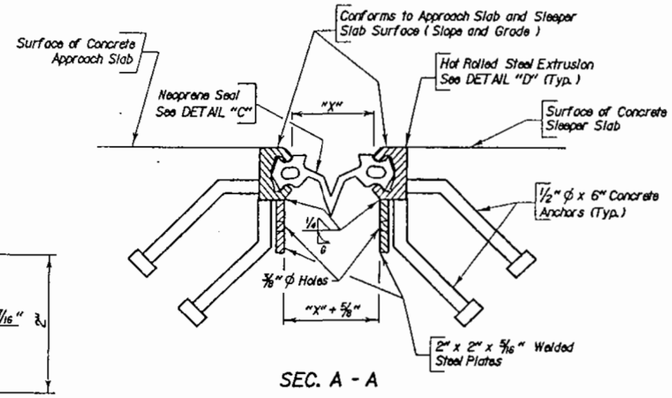
DETAIL "C"
Neoprene Seal shall have a 3" movement capability.



DETAIL "D"



VIEW B - B



SEC. A - A

ESTIMATED QUANTITIES			
ITEM	UNIT	PHASE 1 QUANTITY	PHASE 2 QUANTITY
Strip Seal Expansion Joint	L.F.	16.9	30.4

ORIGINAL CONSTRUCTION PLANS

(EAST BOUND LANES)
DETAILS FOR APPROACH SLAB JOINT ADJACENT TO ABUTMENT NO. 1 FOR

158'-2 1/4" CONT. CONC. SLAB BRIDGE

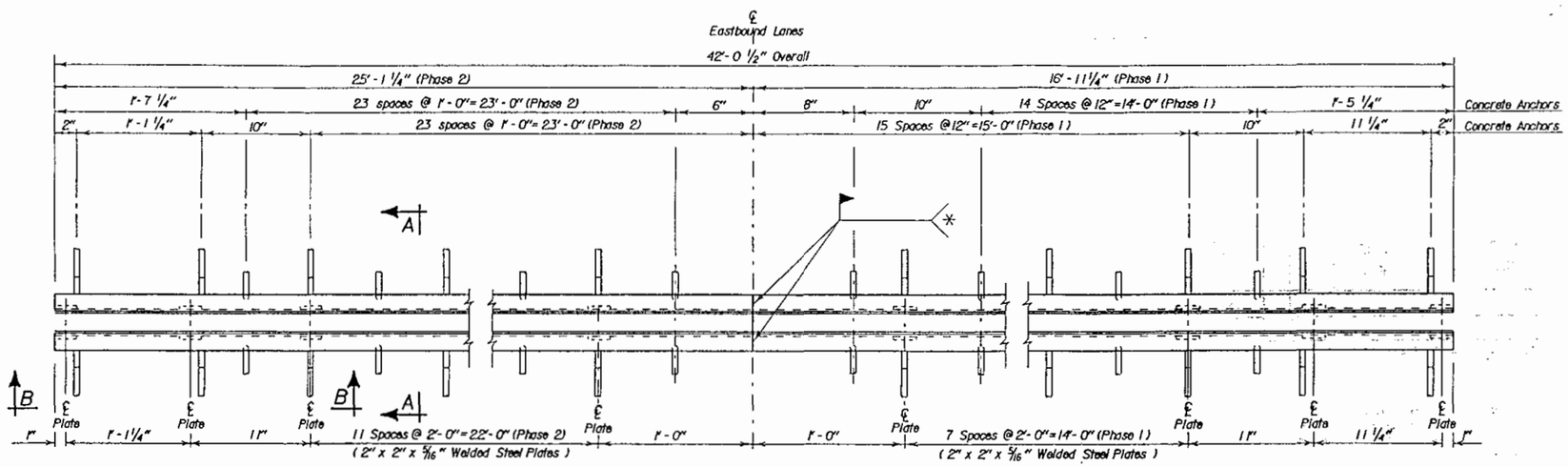
VARIABLE ROADWAY — 27.72° SKEW R.H.F.
STR. NO. 18-160-108 — SEC. 27-T103N-R60W
OVER RAILROAD — IM 90-7(40)319

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 1999

20 OF 23

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
EJA	EJA	CJD	BRIDGE ENGINEER
DAVS4970	4970PD13		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	73	141



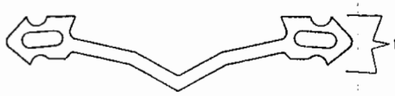
PLAN OF STRIP SEAL
(Neoprene Seal not shown)

TEMP.	DIMENSION "X"
30°	2 1/4"
40°	2 3/16"
50°	2 1/8"
60°	2 1/16"
70°	2"
80°	1 13/16"
90°	1 7/8"

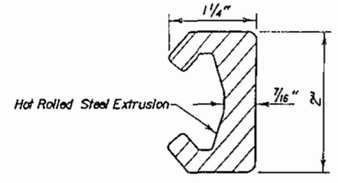
GENERAL NOTES:

1. Materials for the Steel Extrusion shall conform to ASTM-A36, A242 or A588. Materials for the 2" x 2" x 5/16" welded steel plates shall conform to ASTM-A36. Material for the 1/2" diameter x 6" Concrete Anchors shall conform to Type A steel studs of Section 7 of the latest edition of the ANSI/AWS D1.1 Structural Welding Code-Steel.
2. Material for the neoprene seal shall conform to ASTM D2628 modified to omit the recovery test. No splices will be permitted in the neoprene seal.
3. The lubricant-adhesive used to install the neoprene seal shall conform to the requirements of ASTM D4070. The neoprene seal and the lubricant adhesive should be supplied or recommended by the same source as they must be compatible.
4. The installation of the neoprene seal shall be as recommended by its Manufacturer and approved by the Engineer, but in general shall be as follows: The neoprene seal shall be installed and bonded to the steel extrusion with a high-solids lubricant adhesive. The neoprene surfaces shall be roughened with a wire brush before the application of the lubricant adhesive. The neoprene seal may be installed either prior to or after the time the steel extrusions are concreted in the approach slabs. The steel extrusion shall be dry, clean, free from dirt, grease and contaminates at the time the neoprene seal is installed.
5. Due to the length of the steel extrusions, splices are permitted. No welds shall be permitted in the internal section of the extrusion where the neoprene seal is located. Weld details shall be shown on the shop plans for approval by the Engineer. Welding shall be in accordance with latest edition of the ANSI/AWS D1.1 Structural Welding Code-Steel. Galvanize the steel extrusions and anything welded to them after all welding is completed. They shall be galvanized in accordance with AASHTO M111 (ASTM A123). If welded splices are used subsequent to galvanizing, the weld details and the procedures for preparing the surface for welding and repairing the galvanizing after welding shall be included with the shop plans.
6. The thickness and shape of the neoprene seal may vary from the sketch shown (Detail "C" on this sheet) according to the manufacturer's design; however, the wedge lugs must properly fit the groove in the steel extrusion. Before installation, the shop plans of the proposed neoprene seal showing the fixed dimensions, thickness of neoprene seal, and dimensions pertinent to the fit of the neoprene seal in the steel extrusion shall be submitted to and approved by the Engineer.
7. Since the configuration and dimensions of the steel extrusion may vary according to each manufacturer's design, they need not conform exactly to that shown in DETAIL "D", however, any deviations from the plan shown configuration or dimensions must be approved by the Office of Bridge Design.
8. The Strip Seal Expansion Joint supplier shall submit a detailed gland installation procedure with the shop plans.
9. The cost of welding shall be included in the unit cost for Strip Seal Expansion Joint.
10. The neoprene seal shall be of sufficient length such that a minimum length of 6" shall extend beyond each end of the steel extrusions.
11. The Strip Seal Expansion Joint will be measured in linear feet to the nearest one-tenth foot, complete in place. Measurement will be made of the overall horizontal length. The Strip Seal Expansion Joint will be paid for at the contract unit price per linear foot complete in place. Payment for this item shall be full compensation for furnishing all the required materials in place, inclusive of labor, equipment and incidentals necessary to complete the work in accordance with plans and the foregoing specifications.

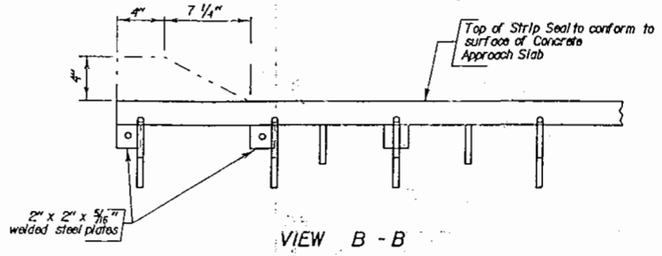
* 12. Due to phased construction, the steel extrusion shall be spliced in the Field at the location shown above. The Weld Details and the procedures for preparing the surface for welding and repairing the galvanizing after welding shall be included with the shop plans.



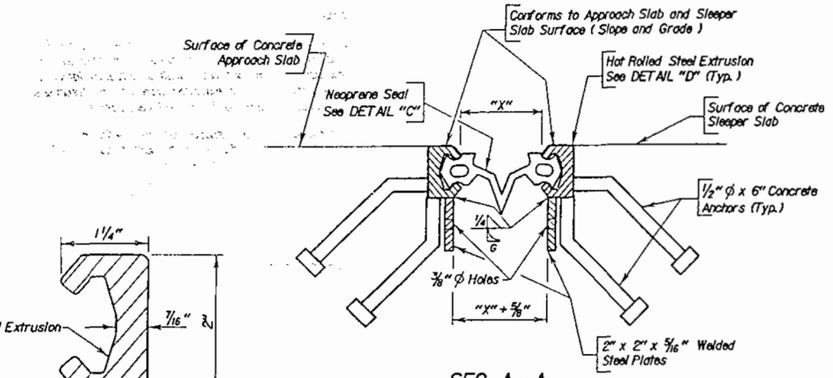
DETAIL "C"
Neoprene Seal shall have a 3" movement capability.



DETAIL "D"



VIEW B - B



SEC. A - A

ESTIMATED QUANTITIES			
ITEM	UNIT	PHASE 1 QUANTITY	PHASE 2 QUANTITY
Strip Seal Expansion Joint	L.F.	16.8	25.1

ORIGINAL CONSTRUCTION PLANS

(EAST BOUND LANES)
DETAILS FOR APPROACH SLAB JOINT ADJACENT TO ABUTMENT NO. 4 FOR
158'-2 1/4" CONT. CONC. SLAB BRIDGE

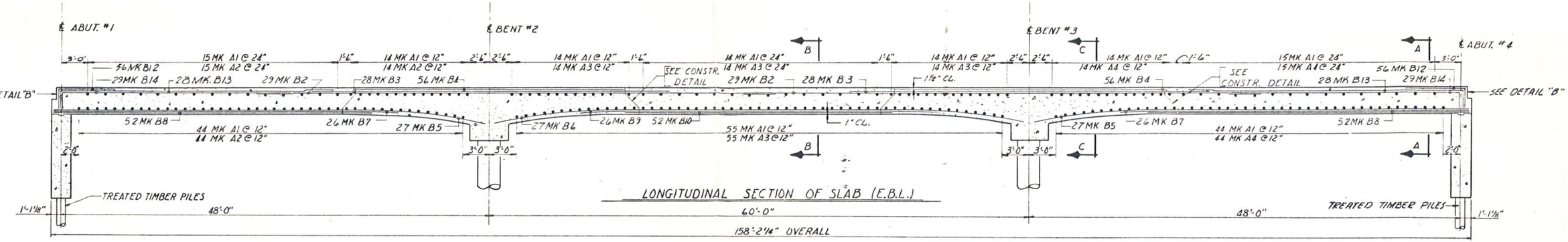
VARIABLE ROADWAY — 27.72° SKEW R.H.F.
STR. NO. 18-160-108 — SEC. 27-T103N-R60W
OVER RAILROAD — IM 90-7(40)319

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JULY 1999

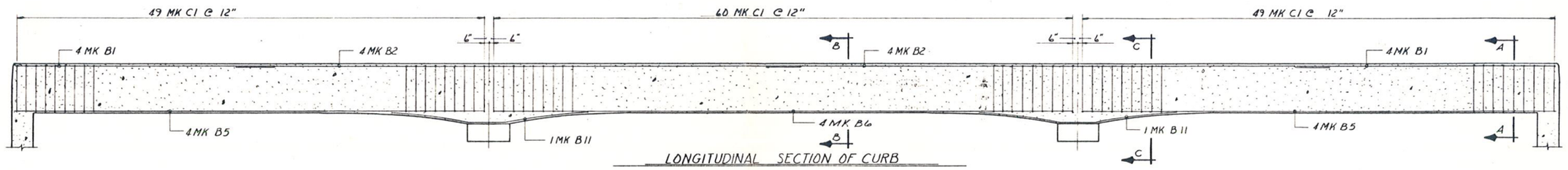
21 OF 23

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
EJA	EJA	CJD	BRIDGE ENGINEER
DAVS4970	4970PD14		

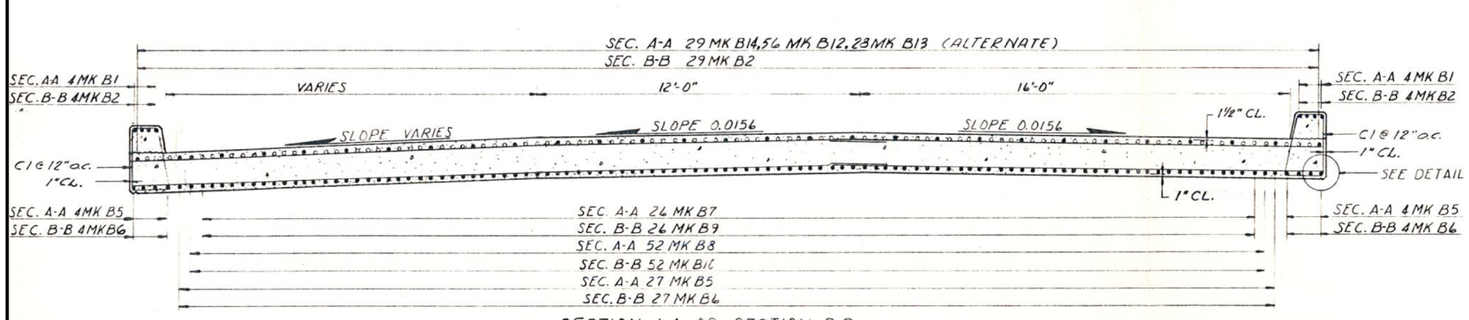
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	74	141



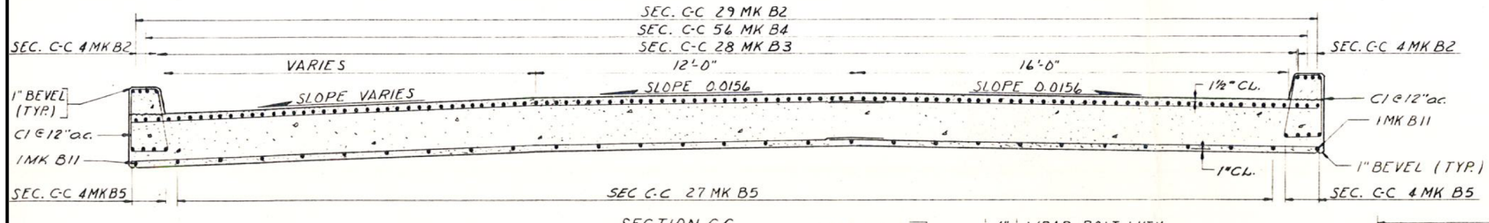
LONGITUDINAL SECTION OF SLAB (E.B.L.)



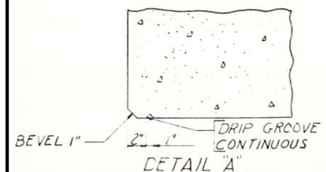
LONGITUDINAL SECTION OF CURB



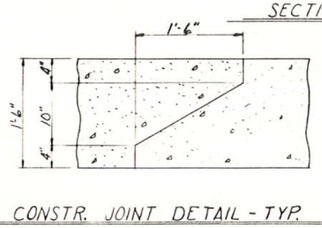
SECTION A-A OR SECTION B-B



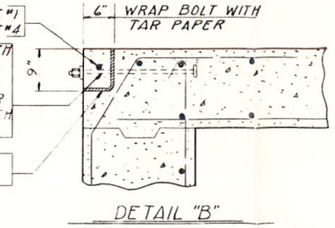
SECTION C-C



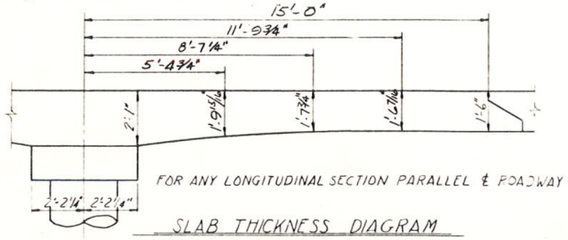
DETAIL "A"



CONSTR. JOINT DETAIL - TYP.

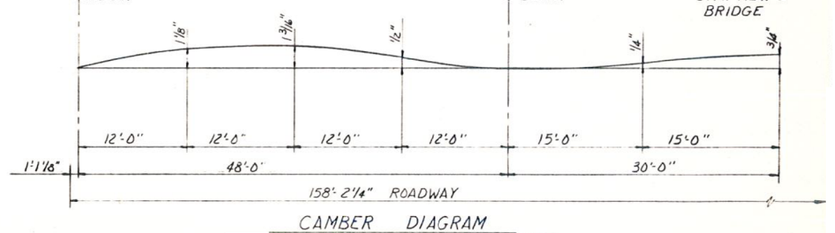


DETAIL "B"



FOR ANY LONGITUDINAL SECTION PARALLEL ℄ ROADWAY

SLAB THICKNESS DIAGRAM



CAMBER DIAGRAM

CAMBER IS CALCULATED FOR DEAD LOAD PLUS PLASTIC FLOW AND SHALL BE ADDED TO THE PROPOSED GRADE ELEVATIONS AT THE RESPECTIVE STATIONS TO ESTABLISH ELEVATION OF THE TOP OF THE FINISHED ROADWAY SLAB.

ESTIMATED QUANTITIES (CURB AND CURB-E.B.L.)

ITEM	UNIT	QUANTITY
CLASS "A" CONCRETE	CU. YDS.	67
REINFORCING STEEL	LBS.	14,577
STRUCTURAL STEEL	LBS.	72

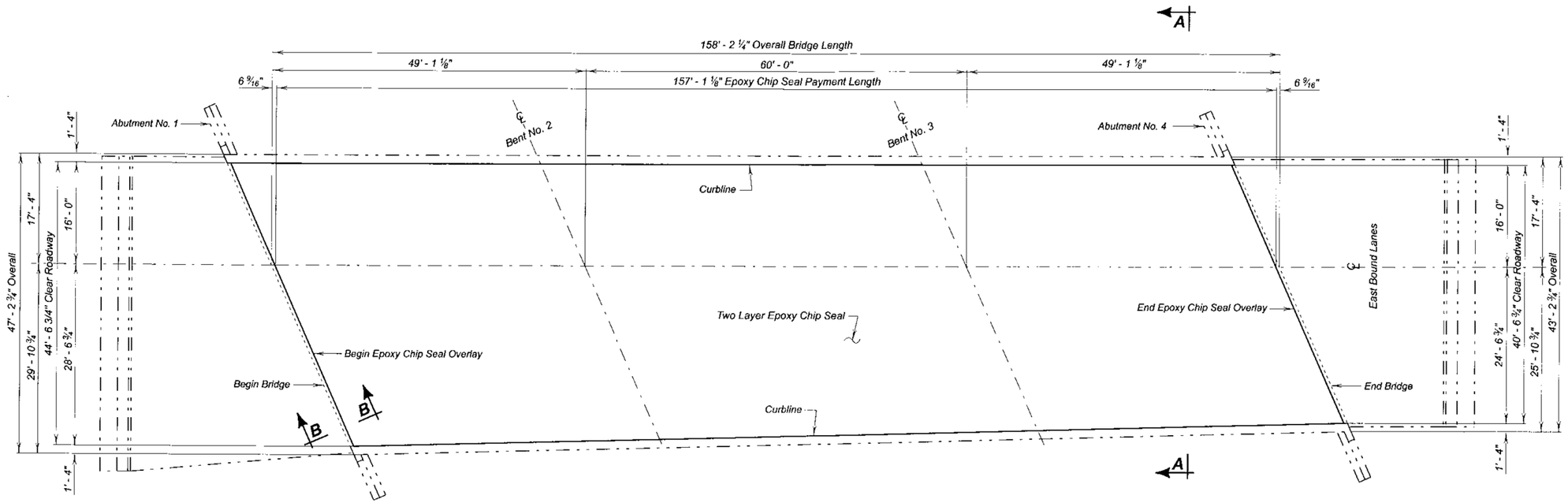
ORIGINAL CONSTRUCTION PLANS

SUPERSTRUCTURE DETAILS (E.B.L.)
FOR
158'-2 1/4" CONTINUOUS CONCRETE BRIDGE
VARIABLE ROADWAY
OVER C.M.St.P & P.R.R. SEC. 27-T103N-R60W
STA. 853+32.32 TO STA. 854+90.51
DAVISON COUNTY I-90-7(16)328
23°-43.409' SKEW R.H.F.
SOUTH DAKOTA HS20-44 (& ALT.)

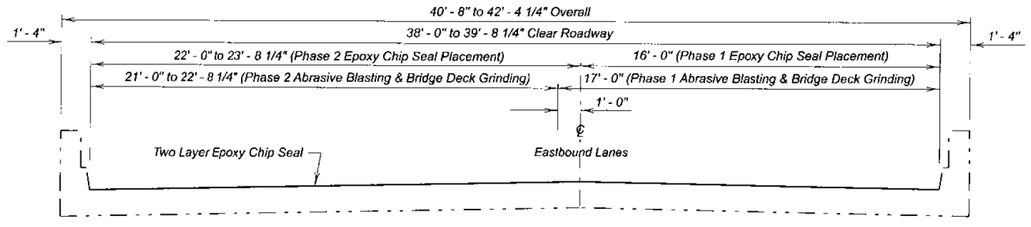
J.T. BANNER & ASSOC., INC.
CONSULTING ENGINEERS

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
K.M.	J.G.	J.A.E.	BRIDGE ENGINEER

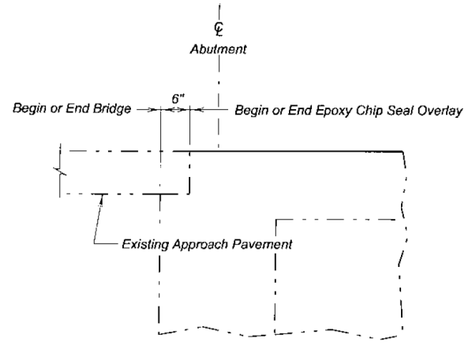
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0907(90)332	75	141



PLAN



SECTION A - A



SECTION B - B

NOTE :

✳ *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.*

ESTIMATED QUANTITIES			
		QUANTITY	
ITEM	UNIT	PHASE 1	PHASE 2
Two Coat Epoxy Bridge Deck Chip Seal	Sq. Yd.	261.2	401.6
Abrasive Blasting of Bridge Deck	Sq. Yd.	296.8	384
Bridge Deck Grinding	Sq. Yd.	280.8	384
✳ Concrete Patching Material	Cu. Ft.	27	27
✳ Concrete Removal, Class A	Sq. Yd.	2	2
✳ Concrete Removal, Class B	Sq. Yd.	2	2

ORIGINAL CONSTRUCTION PLANS

(EASTBOUND LANES)
EPOXY CHIP SEAL DETAILS
FOR
158' - 2¼" CONTINUOUS CONCRETE BRIDGE
VARIABLE ROADWAY — 23°43' 25" SKEW R.H.F.
OVER RAILROAD — SEC. 27-T103N-R60W
STR. NO. 18-160-108 — IM 0907(53)319

DAVISON COUNTY
S. D. DEPT. OF TRANSPORTATION
JUNE 2011

23 OF 23

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

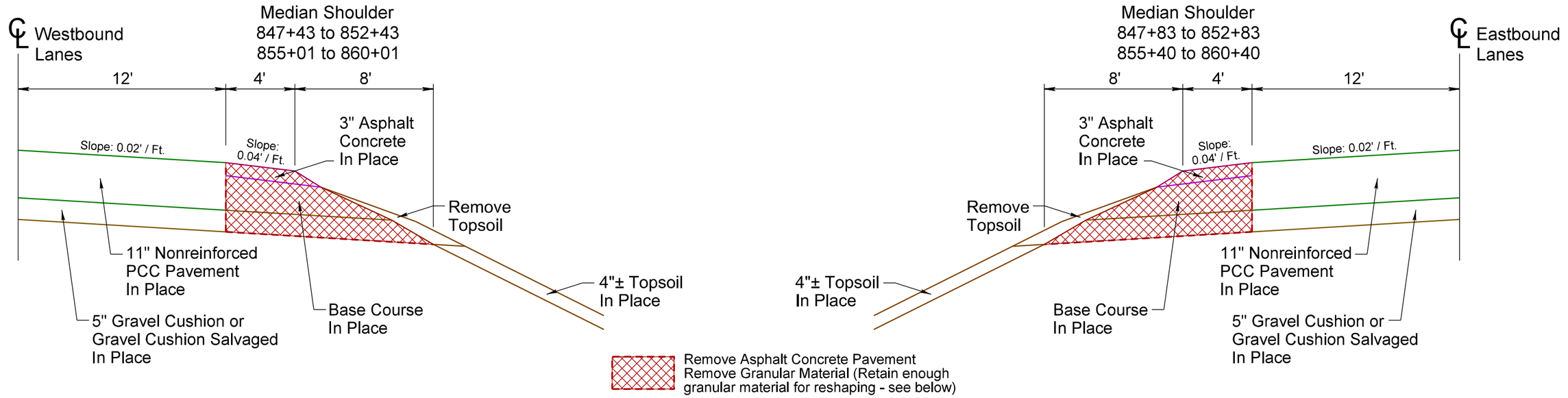
DESIGNED BY	DRAWN BY	CHECKED BY	
EJA	EJA	DJS	Kevin N Goeden BRIDGE ENGINEER
DAVS6666	6666LF05		

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	76	141

Plotting Date: 03/26/2024

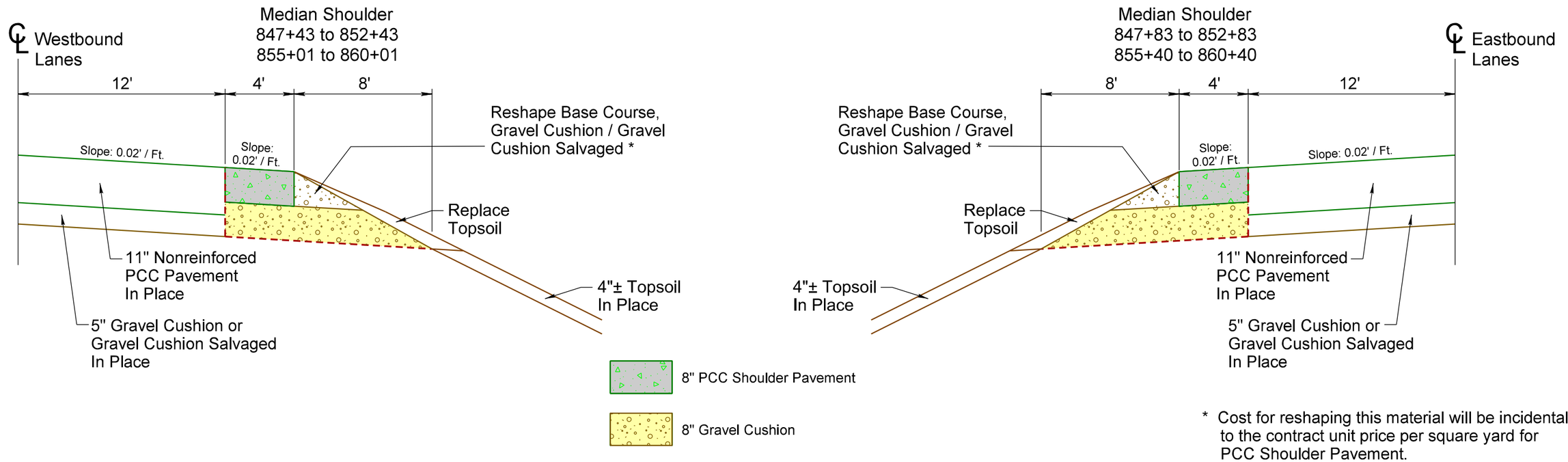
TYPICAL REMOVAL SECTION

I90 WBL & EBL Median Shoulder Strengthening



TYPICAL SURFACING SECTION

I90 WBL & EBL Median Shoulder Strengthening

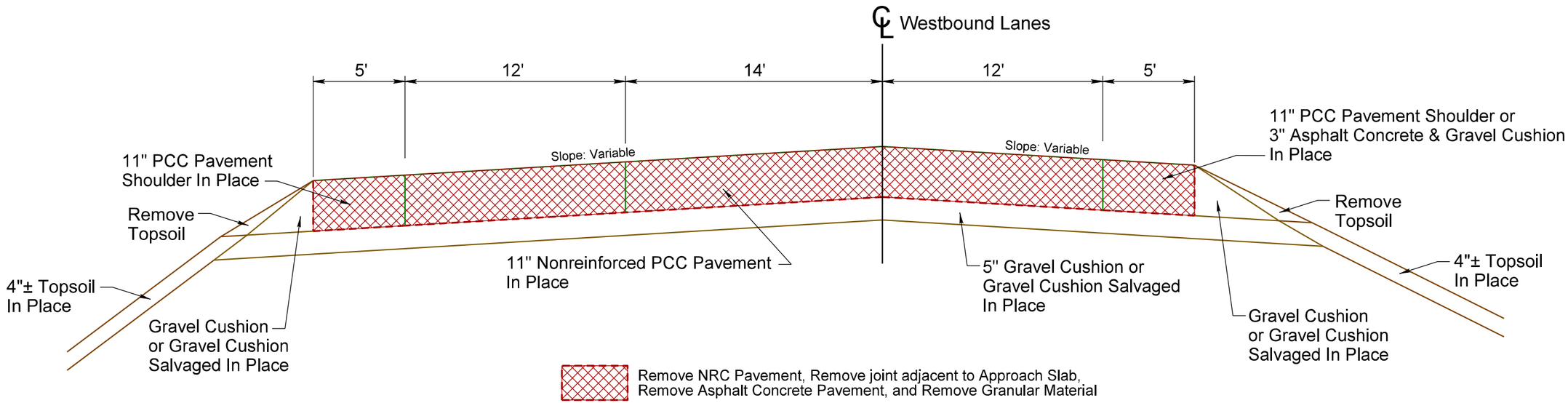


* Cost for reshaping this material will be incidental to the contract unit price per square yard for PCC Shoulder Pavement.

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PLOTTED FROM - TRMIINT15
PLOT NAME - 2
FILE - ...\PR\2024\DAVS0911U\PCCP091U.DGN

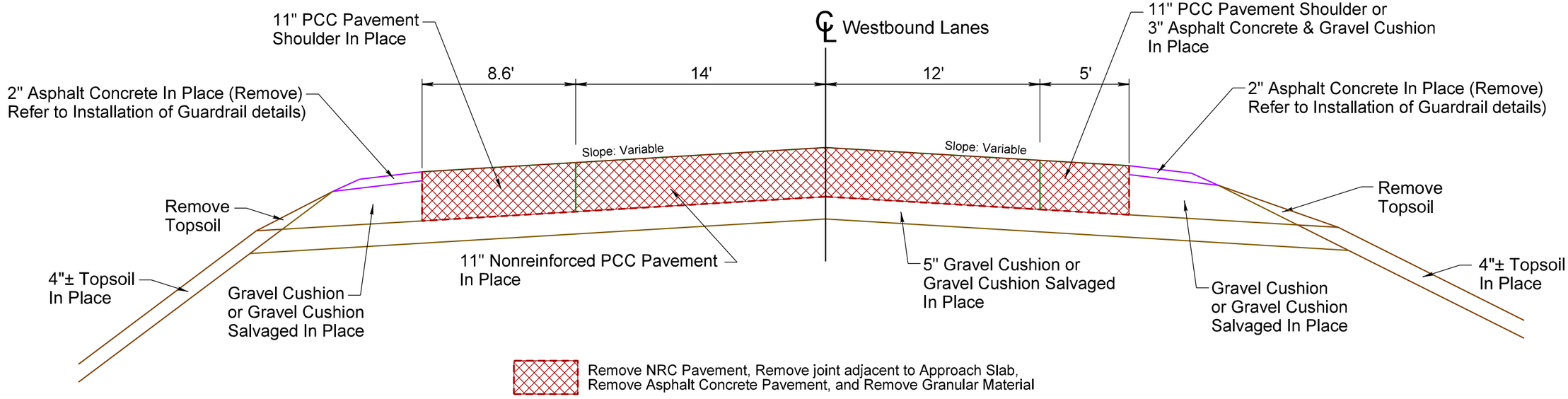
TYPICAL REMOVAL SECTION

I90 WBL - Adjacent to Approach Slab West of Bridge
852+43 to 852+65



TYPICAL REMOVAL SECTION

I90 WBL - Adjacent to Approach Slab East of Bridge
854+76 to 855+01



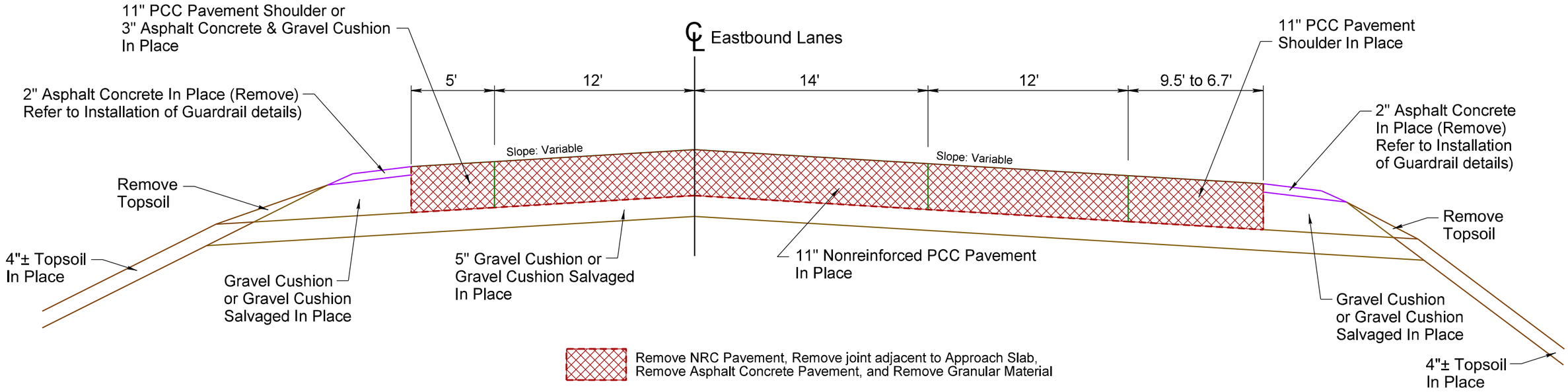
PLOT SCALE - 1:6
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PLOTTED FROM - TRM1INT15

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	78	141

Plotting Date: 03/26/2024

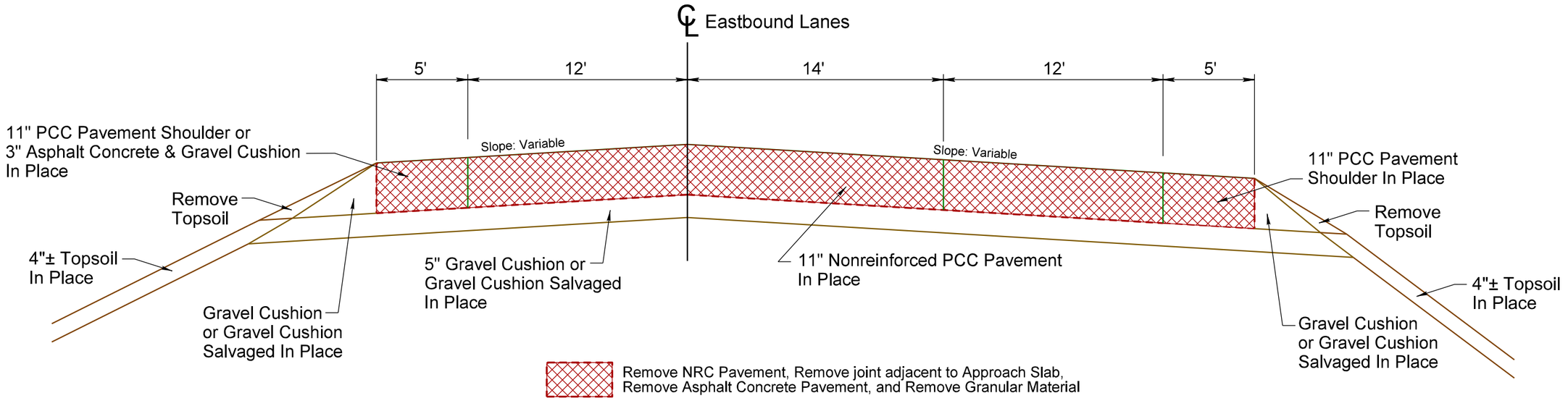
TYPICAL REMOVAL SECTION

I90 EBL - Adjacent to Approach Slab West of Bridge
852+83 to 853+08



TYPICAL REMOVAL SECTION

I90 EBL - Adjacent to Approach Slab East of Bridge
855+18 to 855+40



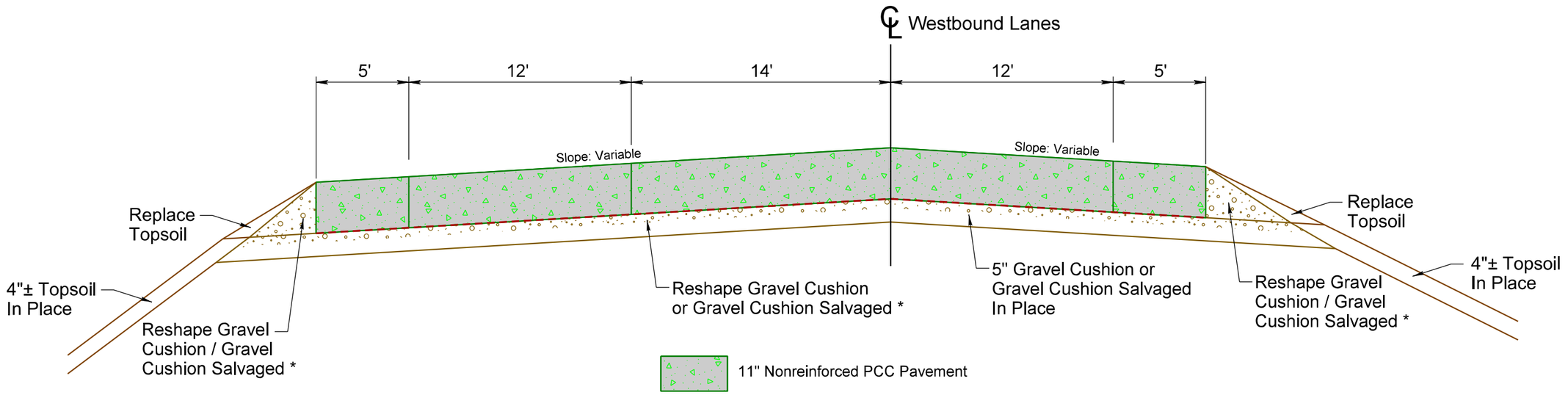
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PLOT NAME - 4
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PLOTTED FROM - TRM11NT15

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	79	141

Plotting Date: 03/26/2024

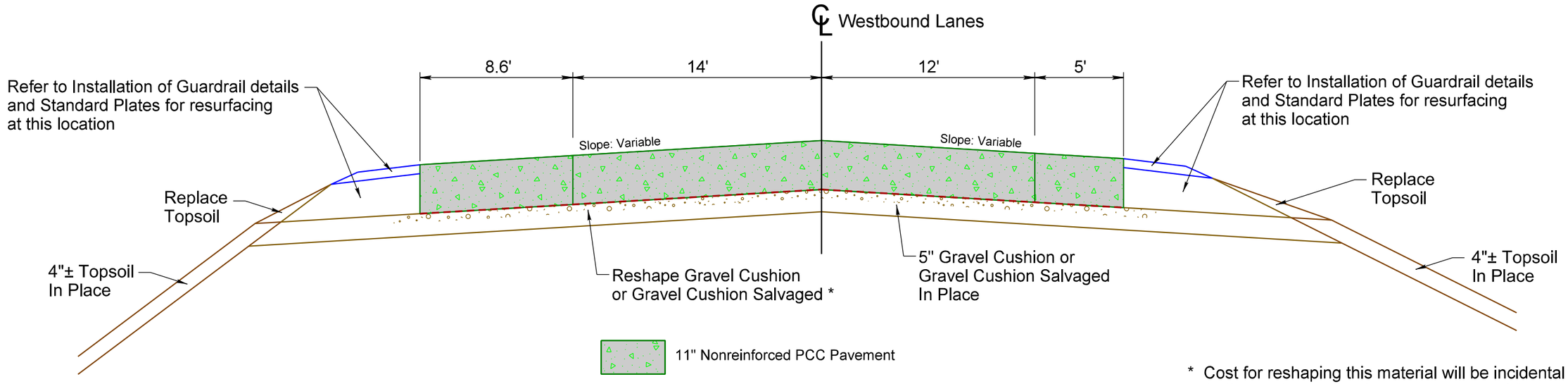
TYPICAL SURFACING SECTION

I90 WBL - Adjacent to Approach Slab West of Bridge
852+43 to 852+65



TYPICAL SURFACING SECTION

I90 WBL - Adjacent to Approach Slab East of Bridge
854+76 to 855+01



* Cost for reshaping this material will be incidental to the contract unit price per square yard for 11" Nonreinforced PCC Pavement.

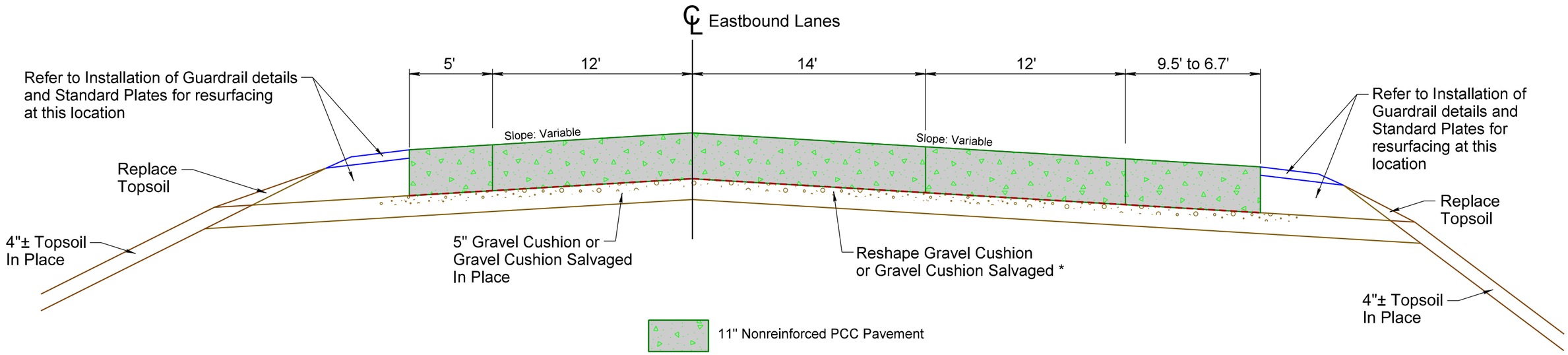
PLOT SCALE - 1:6
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PLOTTED FROM - TRM11NT15

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	80	141

Plotting Date: 03/26/2024

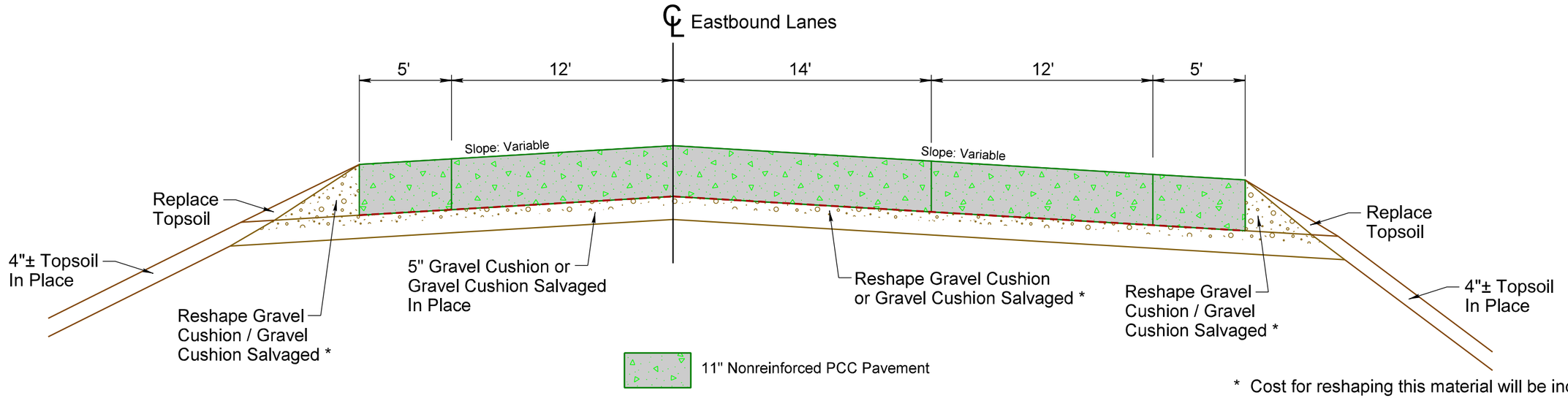
TYPICAL SURFACING SECTION

I90 EBL - Adjacent to Approach Slab West of Bridge
852+83 to 853+08



TYPICAL SURFACING SECTION

I90 EBL - Adjacent to Approach Slab East of Bridge
855+18 to 855+40



* Cost for reshaping this material will be incidental to the contract unit price per square yard for 11" Nonreinforced PCC Pavement.

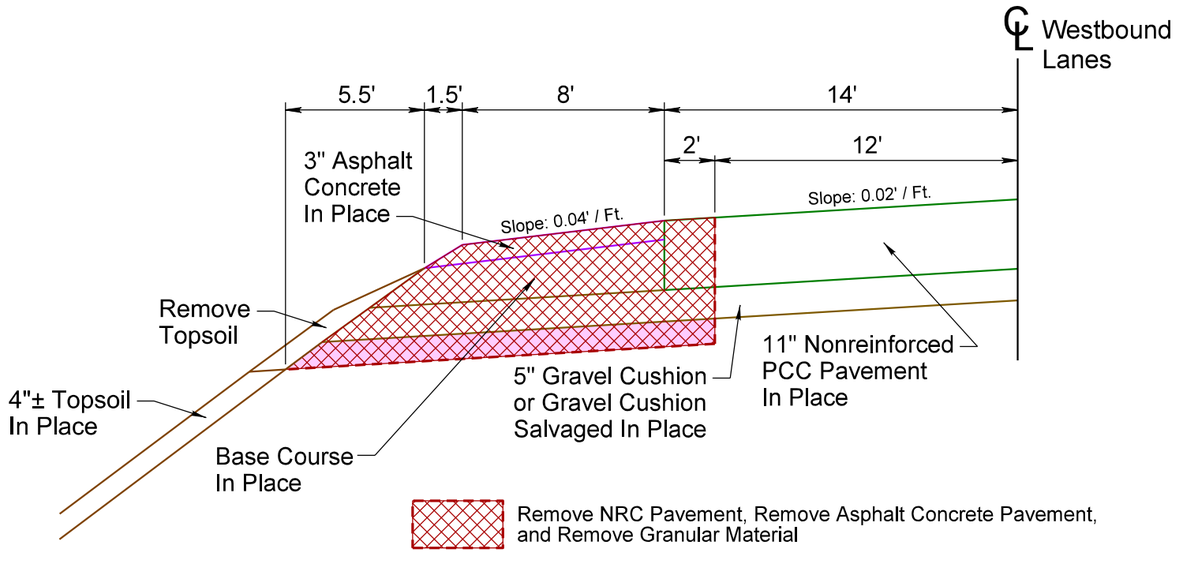
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PLOTTED FROM - TRMI1NT15

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	81	141

Plotting Date: 03/26/2024

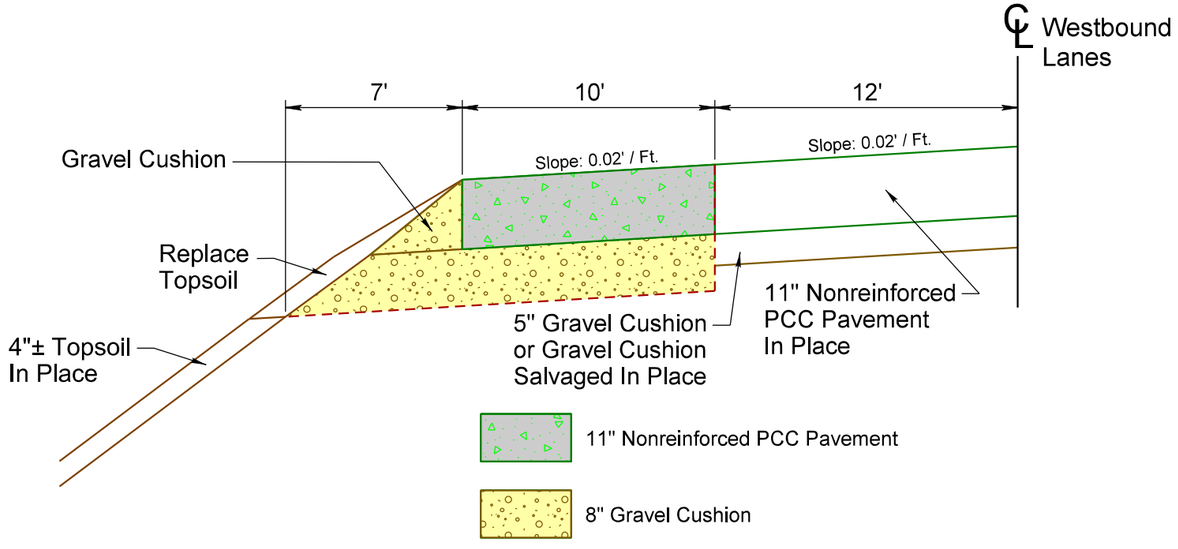
TYPICAL REMOVAL SECTION

I90 WBL - Deceleration Lane Taper
856+87 to 862+87



TYPICAL SURFACING SECTION

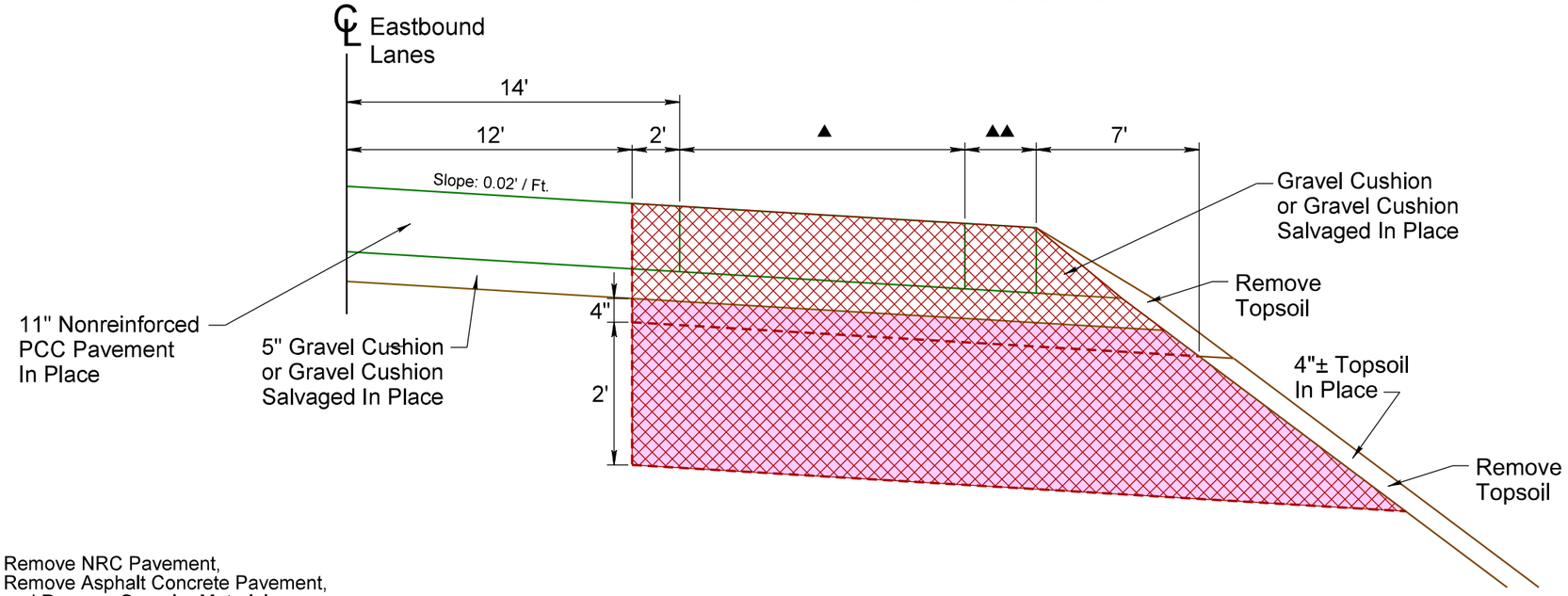
I90 WBL - Deceleration Lane Taper
856+87 to 862+87



PLOT SCALE - 1:6
PLOTTED FROM - TRMIINT15
PLOT NAME - 7
FILE - ...\PR\2024\DAVS091U\PCCP091U.DGN

TYPICAL REMOVAL SECTION

I90 EBL - Acceleration Lane & Taper
855+40 to 861+75



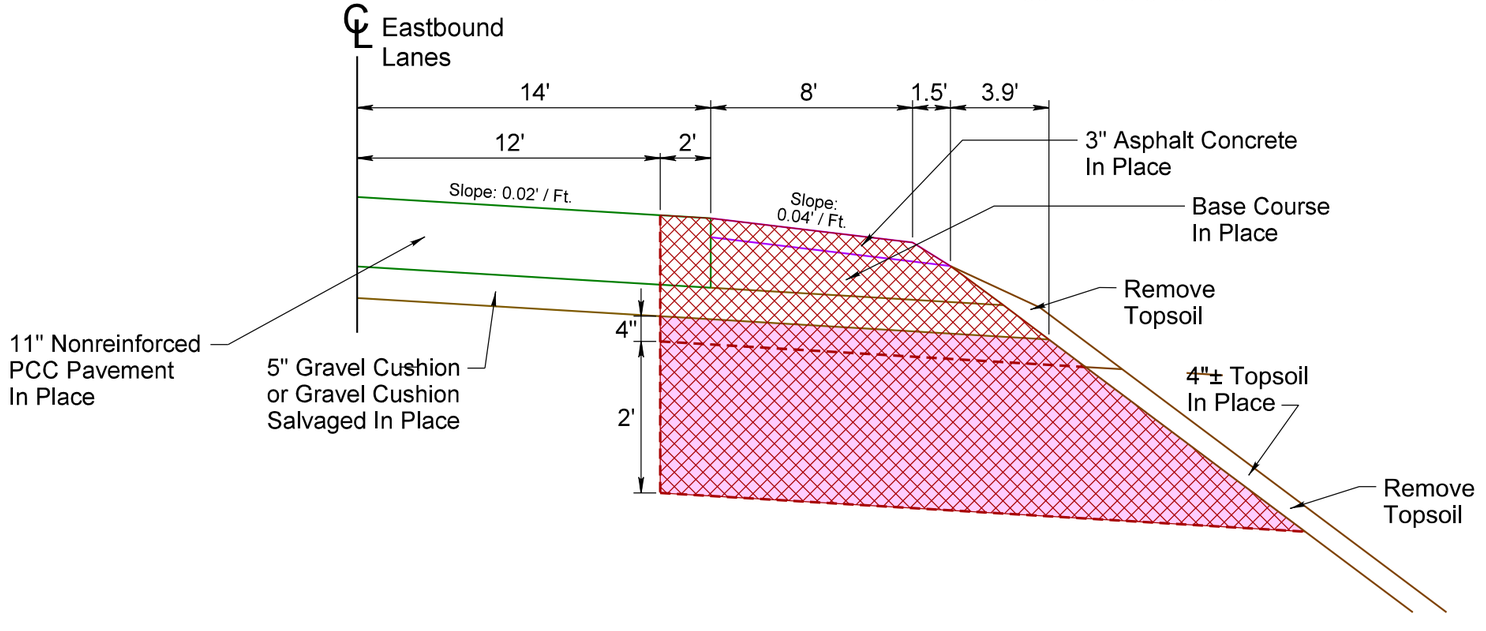
Transitions:	▲	▲▲
855+40 to 856+55	12'	4' to 2'
856+55 to 860+29	14' to 8'	-
860+29 to 861+75	8'	-

Remove NRC Pavement, Remove Asphalt Concrete Pavement, and Remove Granular Material

Unclassifed Excavation & 2' Undercut

TYPICAL REMOVAL SECTION

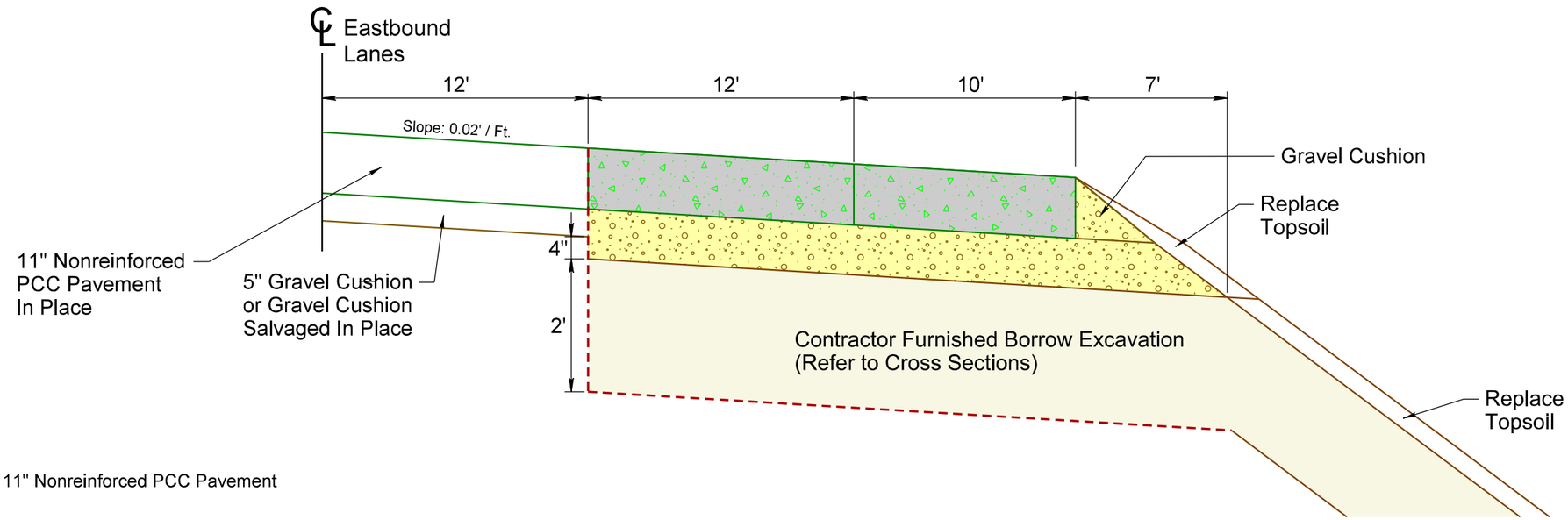
I90 EBL - Acceleration Lane & Taper
861+75 to 870+99



PLOT SCALE - 1:6
PLOTTED FROM - TRM11NT15
PLOT NAME - 8
FILE - ...\PRJ2024\DAVS091U\PCCP091U.DGN

TYPICAL GRADING & SURFACING SECTION

I90 EBL - Acceleration Lane & Taper
855+40 to 864+99



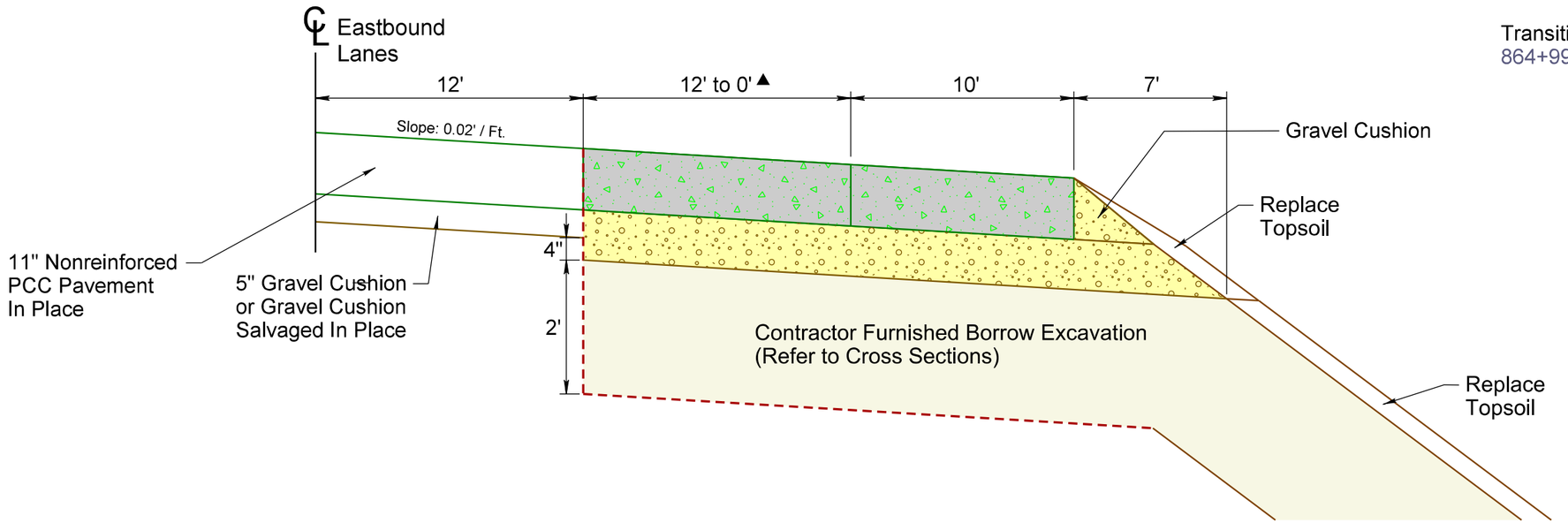
11" Nonreinforced PCC Pavement

8" Gravel Cushion

Contractor Furnished Borrow Excavation

TYPICAL GRADING & SURFACING SECTION

I90 EBL - Acceleration Lane & Taper
864+99 to 870+99



Transition:
864+99 to 870+99 12' to 0' ▲

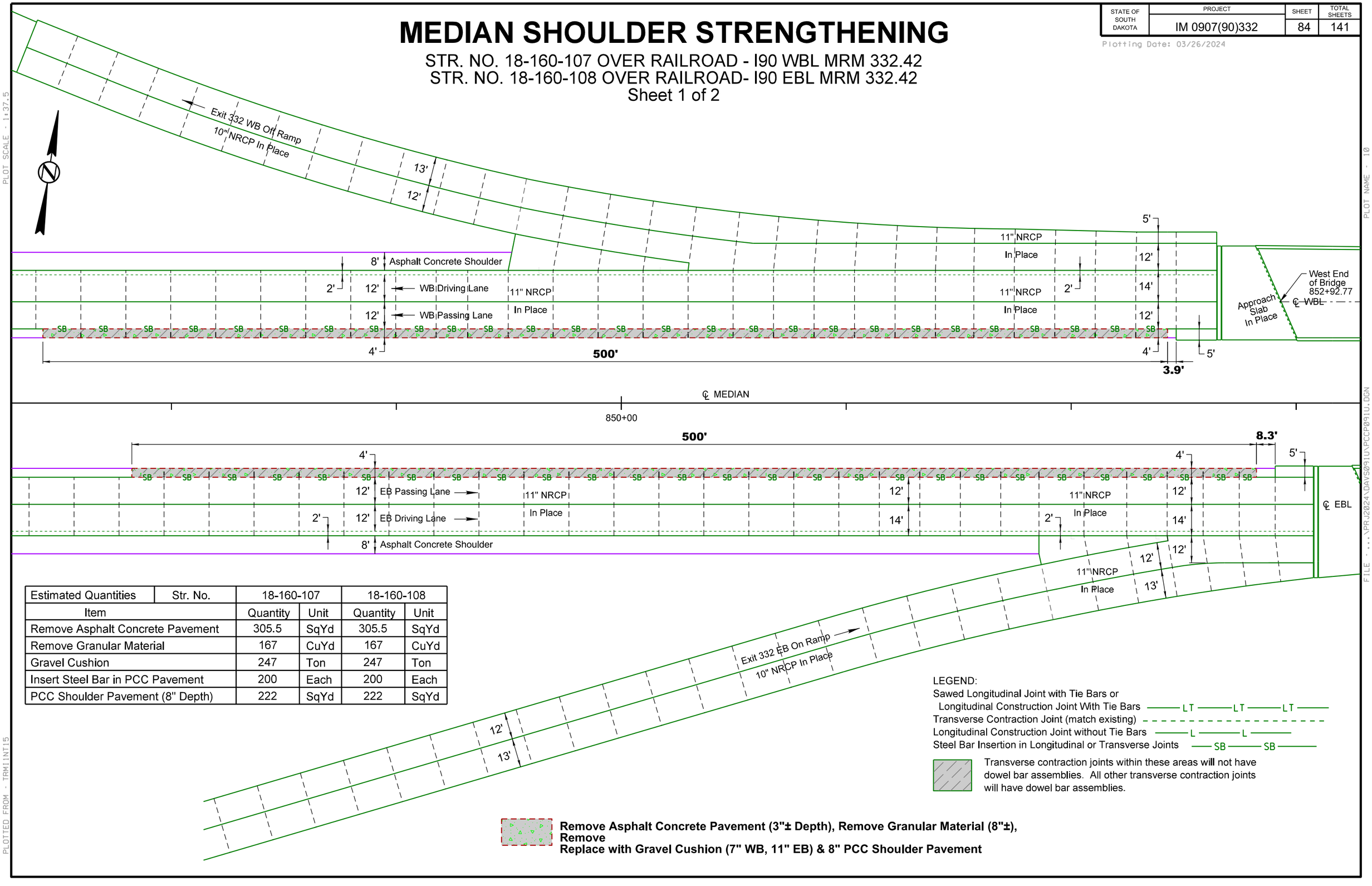
PLOT SCALE - 1:6
PLOT NAME - 9
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PLOTTED FROM - TRM1INT15

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	84	141

Plotting Date: 03/26/2024

MEDIAN SHOULDER STRENGTHENING

STR. NO. 18-160-107 OVER RAILROAD - I90 WBL MRM 332.42
STR. NO. 18-160-108 OVER RAILROAD- I90 EBL MRM 332.42
Sheet 1 of 2



Estimated Quantities	Str. No.	18-160-107		18-160-108	
Item		Quantity	Unit	Quantity	Unit
Remove Asphalt Concrete Pavement		305.5	SqYd	305.5	SqYd
Remove Granular Material		167	CuYd	167	CuYd
Gravel Cushion		247	Ton	247	Ton
Insert Steel Bar in PCC Pavement		200	Each	200	Each
PCC Shoulder Pavement (8" Depth)		222	SqYd	222	SqYd

LEGEND:

Sawed Longitudinal Joint with Tie Bars or Longitudinal Construction Joint With Tie Bars ——LT——LT——LT——

Transverse Contraction Joint (match existing) - - - - - - - - - - - - - - - - - -

Longitudinal Construction Joint without Tie Bars ——L——L——

Steel Bar Insertion in Longitudinal or Transverse Joints ——SB——SB——

Transverse contraction joints within these areas will not have dowel bar assemblies. All other transverse contraction joints will have dowel bar assemblies.

Remove Asphalt Concrete Pavement (3"± Depth), Remove Granular Material (8"±), Remove
Replace with Gravel Cushion (7" WB, 11" EB) & 8" PCC Shoulder Pavement

PLOT SCALE - 1:37.5

PLOT NAME - 10

FILE - ...\PRJ2024\DAYS091U\PCCP091U.DGN

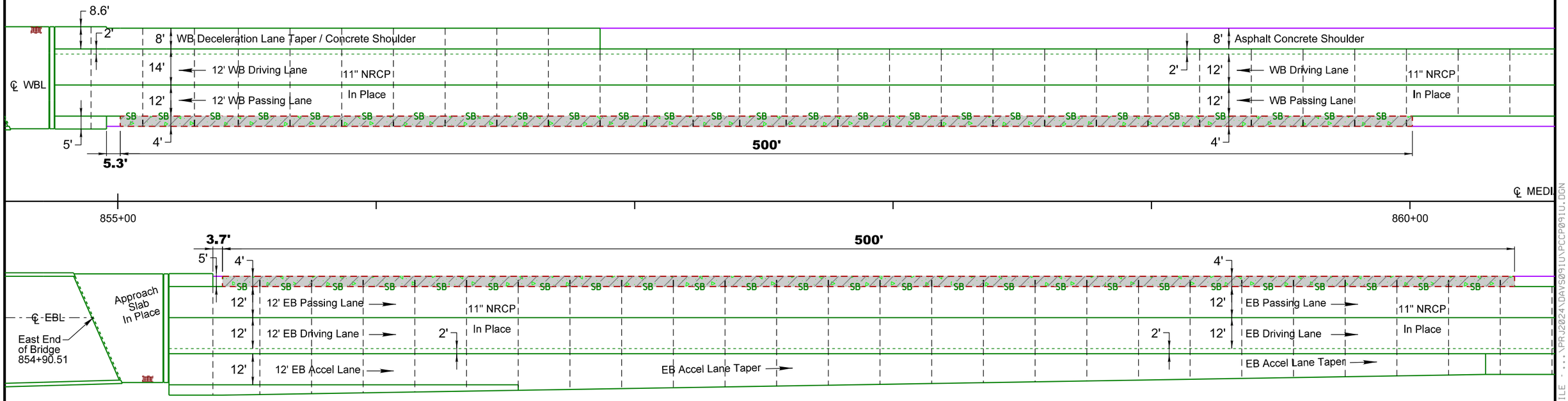
PLOTTED FROM - TRMI1NT15

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	85	141

Plotting Date: 03/26/2024

MEDIAN SHOULDER STRENGTHENING

STR. NO. 18-160-107 OVER RAILROAD - I90 WBL MRM 332.42
STR. NO. 18-160-108 OVER RAILROAD- I90 EBL MRM 332.42
Sheet 2 of 2



Estimated Quantities	Str. No.	18-160-107		18-160-108	
Item		Quantity	Unit	Quantity	Unit
Remove Asphalt Concrete Pavement		305.5	SqYd	305.5	SqYd
Remove Granular Material		167	CuYd	167	CuYd
Gravel Cushion		247	Ton	247	Ton
Insert Steel Bar in PCC Pavement		200	Each	200	Each
PCC Shoulder Pavement (8" Depth)		222	SqYd	222	SqYd

Remove Asphalt Concrete Pavement (3"± Depth) and Remove Granular Material (12"± WB, 16"± EB)
Replace with Gravel Cushion (7" WB, 11" EB) & 8" PCC Shoulder Pavement

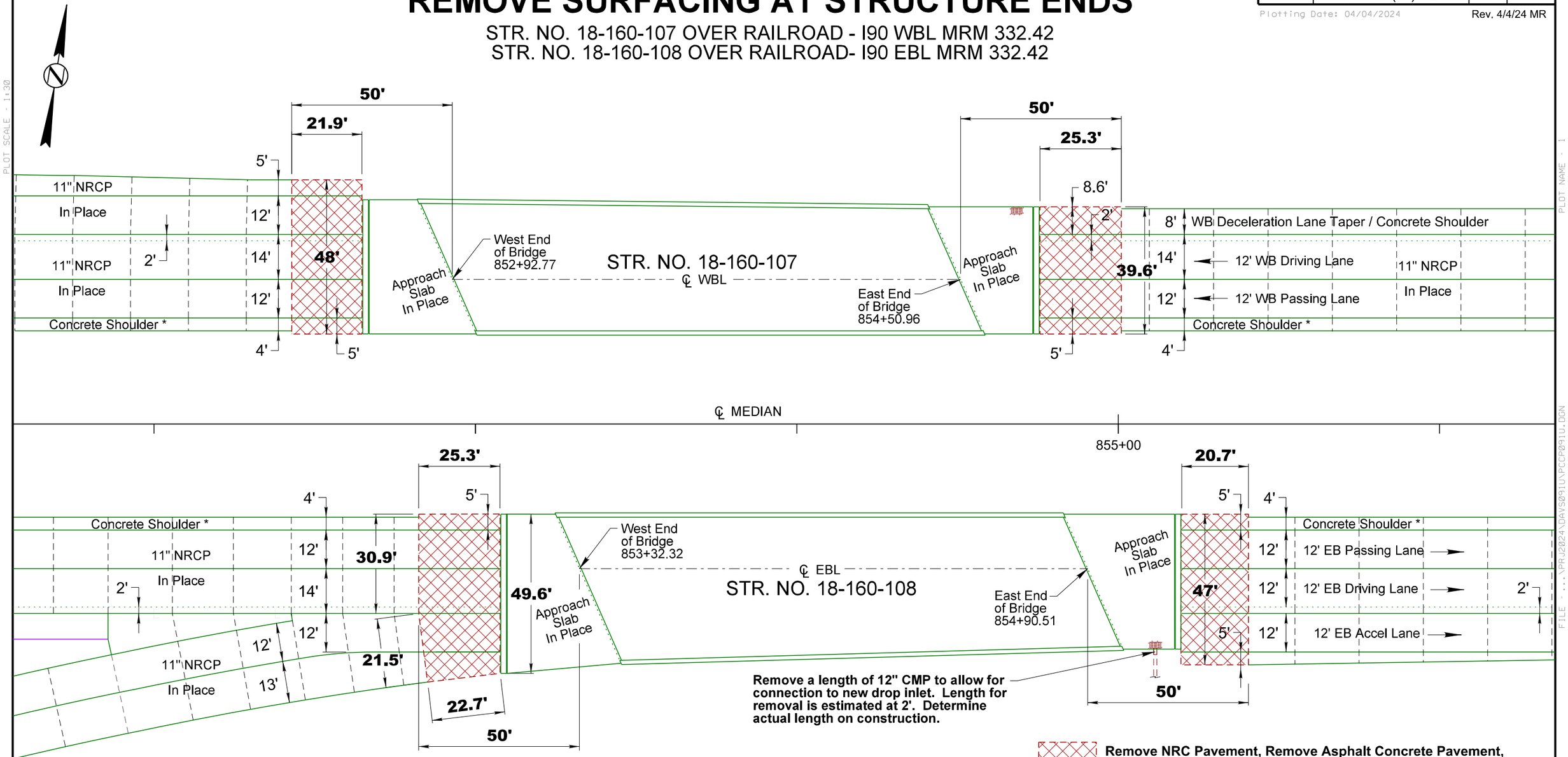
PLOT SCALE - 1:37.5
PLOT NAME - 11
FILE ...\PRJ2024\DAYS091U\PCCP091U.DGN
PLOTTED FROM - TRM11NT15

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	86	141

Plotting Date: 04/04/2024 Rev. 4/4/24 MR

REMOVE SURFACING AT STRUCTURE ENDS

STR. NO. 18-160-107 OVER RAILROAD - I90 WBL MRM 332.42
STR. NO. 18-160-108 OVER RAILROAD- I90 EBL MRM 332.42



Estimated Quantities	Str. No.	18-160-107		18-160-108	
Item		Quantity	Unit	Quantity	Unit
Remove Pipe Culvert		-	Ft	2	Ft
Remove Drop Inlet		-	Each	1	Each
Remove Drop Inlet Frame & Grate		1	Each	-	Each
Remove Granular Material		2	CuYd	3	CuYd
Remove Asphalt Concrete Pavement		5	SqYd	7	SqYd
Remove Concrete Pavement		224	SqYd	242	SqYd
Adjust Drop Inlet		1	Each	-	Each

Remove NRC Pavement, Remove Asphalt Concrete Pavement, and Remove Granular Material

WB - Remove Drop Inlet Frame & Grate and Adjust Drop Inlet so new frame will be flush with new slab

EB - Remove Drop Inlet

* 8" Concrete Shoulder In Place after Shoulder Strengthening (AC In Place prior to Shoulder Strengthening)

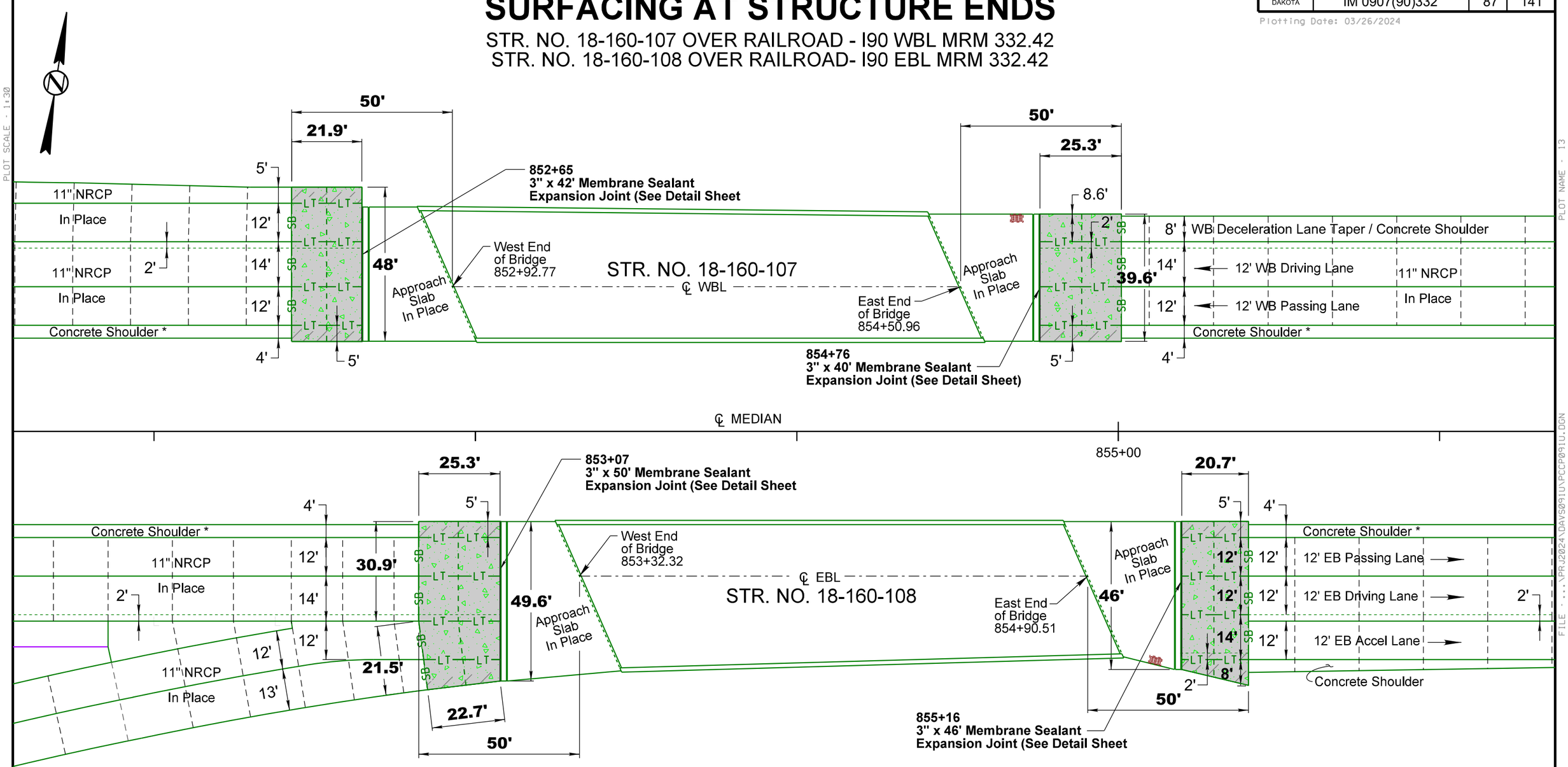
PLOT SCALE - 1:30
PLOT NAME - 1
PLOTTED FROM - TRM1INT15
FILE - ...\PRJ2024\DAVS091U\PCCP091U.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	87	141

Plotting Date: 03/26/2024

SURFACING AT STRUCTURE ENDS

STR. NO. 18-160-107 OVER RAILROAD - I90 WBL MRM 332.42
STR. NO. 18-160-108 OVER RAILROAD- I90 EBL MRM 332.42



Estimated Quantities	Str. No.	18-160-107		18-160-108	
Item		Quantity	Unit	Quantity	Unit
11" Nonreinforced PCC Pavement		229	SqYd	253	SqYd
Dowel Bar		72	Each	78	Each
Insert Steel Bar In PCC Pavement **		72	Each	80	Each
Type A Frame & Grate		1	Each	1	Each
2' x 3' Type B Drop Inlet		-	Each	1	Each
Precast Drop Inlet Collar		-	Each	1	Each

** 1½" x 18" Epoxy Coated Plain Round Dowel Bars

11" Nonreinforced PCC Pavement

LEGEND:
Sawed Longitudinal Joint with Tie Bars or
Longitudinal Construction Joint With Tie Bars ——LT——LT——LT——
Transverse Contraction Joint (Keep Joint Spacing between 10' & 13') - - - - - - - - -
Longitudinal Construction Joint without Tie Bars ——L——L——
Steel Bar Insertion in Longitudinal or Transverse Joints ——SB——SB——

Transverse contraction joints within these areas will not have dowel bar assemblies. All other transverse contraction joints will have dowel bar assemblies.

WB - Install Type A Frame & Grate

EB - Install 2' x 3' Type B Drop Inlet, Precast Drop Inlet Collar and Type A Frame & Grate

Cost for removing and replacing (reshaping) in place granular material to facilitate form placement adjacent to the approach slab / new concrete pavement will be incidental to the contract unit prices per square yard for the respective items.

PLOT SCALE - 1:30
PLOT NAME - 13
PLOTTED FROM - TRMJINT15
FILE - ...\PRJ2024\DAVS0910\PCCP091U.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	88	141

Plotting Date: 03/26/2024

APPROACH PAVEMENT PROFILES

STR. NO. 18-160-107 WBL - WEST END OF BRIDGE

PLOT SCALE - 1:9.6

PLOT NAME - 14

FILE - ...\190WBL\PROF091U_WBL.DGN

PLOTTED FROM - TRM1INT15

LEFT PROFILE
(Profile is 1'-0" from curb line)

CENTER PROFILE

RIGHT PROFILE
(Profile is 1'-0" from curb line)

Survey Points: 52 53 54 59 60 61 1 2 3 4 5 6 7 8

10' | 10' | 10' | 10' | 5'-3 15/16" | 5'-3 15/16" | 9'-5 7/8" | 8'-3" | 8'-3" | 8'-3" | 8'-3"

3'-11 1/2"

1'-3 15/16"

59.25 59.25* 59.16 59.15 59.11 59.09 59.06 59.06 59.06 59.04 59.02 59.06 58.97 58.87 58.87* 58.84 58.84 58.82 58.79 58.77 58.77 58.74 58.73 58.68 58.63 58.60 58.53 58.42 58.42* 58.31 58.19

55 56 57 58

Bridge Deck Grinding

Bridge Deck Grinding

NRC Pavement In Place

21.9' - 11" NRC Pavement

Approach Slab

59.65 59.65* 59.57 59.55 59.47 59.44 59.43 59.42 59.41 59.40 59.40 59.43 59.33 59.29 59.23 59.22 59.19 59.14 59.14* 59.13 59.12 59.10 59.08 59.04*

Sleeper Slab Hat

West End of Bridge

STR. NO. 18-160-107 WBL

58.95 58.96 58.96* 58.91 58.86 58.83 58.74 58.74* 58.65

Bridge Deck Grinding

4'-10 1/8"

4'-8 7/8"

59.45 59.45* 59.41 59.35 59.32 59.31 59.26 59.24 59.23 59.21 59.19 59.18 59.10 59.01 58.97 58.95 58.92 58.86 58.80 58.79* 58.83 58.78 58.79 58.69

NOTES: Add 1300 to all elevations shown on profile.

#.## = New Profile Elevation
#.## = New Profile Elevation (after grinding)
#.## = Existing Profile Elevation
* or * = Match Existing Elevation

APPROACH PAVEMENT PROFILES

STR. NO. 18-160-107 WBL - EAST END OF BRIDGE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	89	141

Plotting Date: 03/26/2024

PLOT SCALE = 1.0000 '/ IN

PLOT NAME - 15

FILE - ...\190WBL\PROF0910 WBL.DGN

PLOTTED FROM - TRM1INT15

STR. NO. 18-160-107 WBL

Approach Slab

Bridge Deck Grinding

Bridge Deck Grinding

Bridge Deck Grinding

East End of Bridge

Sleeper Slab Hat

25.3' - 11" NRC Pavement

NRC Pavement In Place

LEFT PROFILE

(Profile is 1'-0" from curb line)

57.50 57.39 57.31 57.20 57.07 57.07* 57.02 56.97 56.97 56.91 56.92 56.84 56.83 56.76 56.78 56.68 56.68 56.52 56.61 56.48 56.59 56.57 56.59 56.48 56.45 56.36 56.31 56.19 56.01 56.01*

CENTER PROFILE

57.87 57.78 57.67 57.54 57.41 57.41* 57.35 57.31 57.30 57.25 57.17 57.17* 57.18 57.10 57.13 57.04 56.98 56.91 56.89 56.87 56.92 56.90 56.84 56.82 56.76 56.64 56.62 56.48 56.48*

RIGHT PROFILE

(Profile is 1'-0" from curb line)

57.52 57.43 57.33 57.22 57.22* 57.12 57.09 57.04 57.00 56.93 56.93* 56.88 56.88* 56.83 56.83* 56.84 56.78 56.78 56.70 56.65 56.68 56.64 56.68 56.65 56.62 56.63 56.61 56.56 56.44 56.44 56.31 56.31*

	8'-3"	8'-3"	8'-3"	8'-3"	3'-11½" 6'-10⅝"	5'-3 15/16"	5'-3 15/16"	4'-9"	10'	10'	10'	10'
Survey Points:	14	15	16	17	18 19	20	21	22	23	24	29	30 31

25 26 27 28

NOTES: Add 1300 to all elevations shown on profile.

#.## = New Profile Elevation
#.## = New Profile Elevation (after grinding)
#.## = Existing Profile Elevation
* or * = Match Existing Elevation

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	90	141

Plotting Date: 03/26/2024

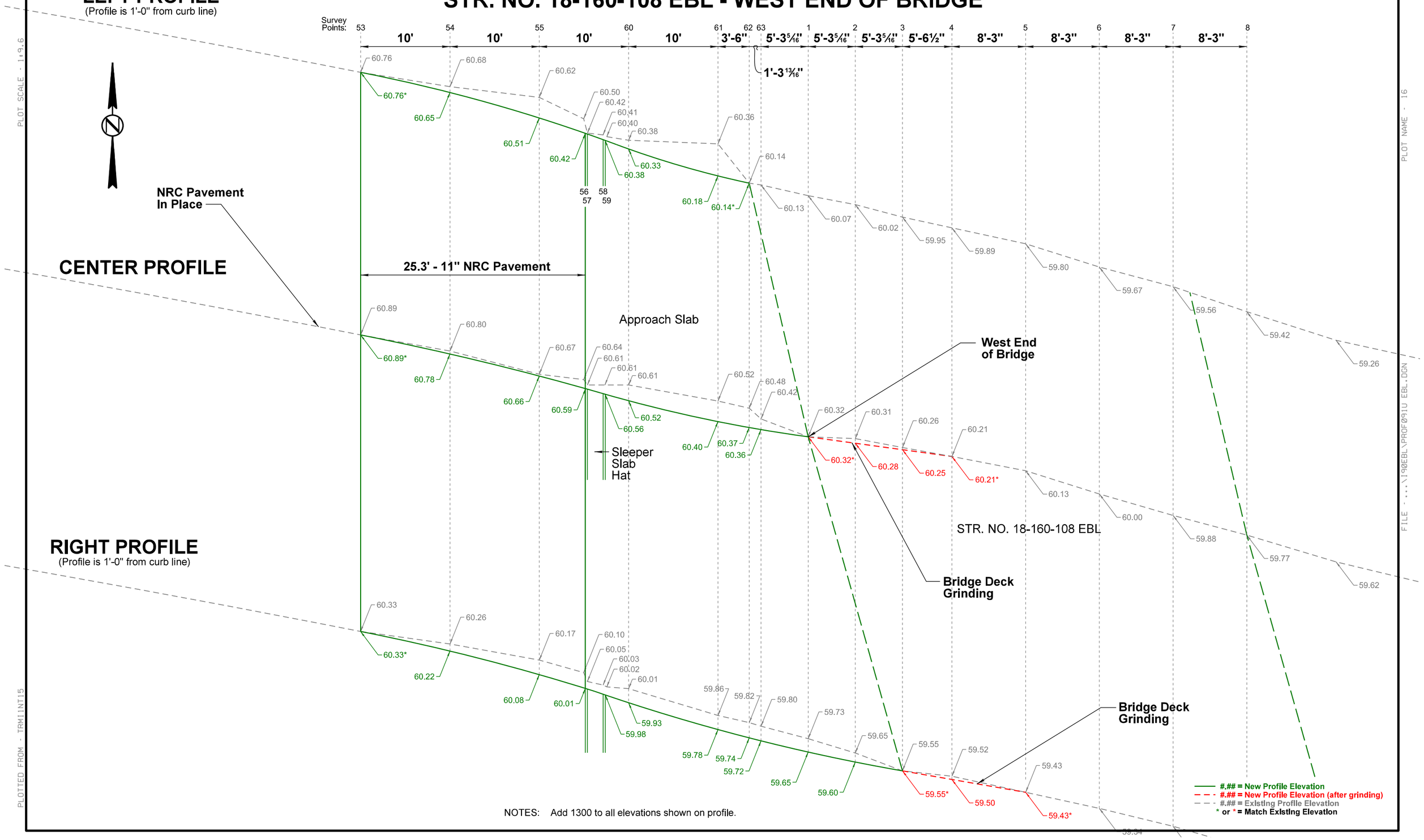
APPROACH PAVEMENT PROFILES

STR. NO. 18-160-108 EBL - WEST END OF BRIDGE

LEFT PROFILE
(Profile is 1'-0" from curb line)

CENTER PROFILE

RIGHT PROFILE
(Profile is 1'-0" from curb line)



NOTES: Add 1300 to all elevations shown on profile.

PLOT SCALE - 1:9.6
PLOT NAME - 16
FILE - ...\190EBL\PROF\091U EBL.DGN
PLOTTED FROM - TRM11NT15

APPROACH PAVEMENT PROFILES

STR. NO. 18-160-108 EBL - EAST END OF BRIDGE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	91	141

Plotting Date: 03/26/2024

PLOT SCALE - 1:9.6

PLOT NAME - 17

FILE - ...\190EBL\PROF091U EBL.DGN

PLOTTED FROM - TRM11NT15

STR. NO. 18-160-108 EBL

Approach Slab

Bridge Deck Grinding

East End of Bridge

Sleeper Slab Hat (New location 1' East of existing)

Bridge Deck Grinding

NRC Pavement In Place

20.7' - 11" NRC Pavement

LEFT PROFILE

(Profile is 1'-0" from curb line)

58.78 58.65 58.54 58.44 58.32 58.21 58.12 58.09 58.12 57.97 57.94 57.88 57.79 57.72 57.69 57.67 57.61 57.30 57.11

58.12* 58.04 58.02 57.93 57.85 57.76 57.60 57.48 57.44 57.45 57.27 57.11*

59.06 58.93 58.81 58.69 58.59 58.45 58.38 58.30 58.27 58.19 58.16 58.08 57.94 57.84 57.82 57.81 57.73 57.74 57.54 57.37

58.19* 58.10 58.02 57.86 57.74 57.70 57.71 57.53 57.37*

CENTER PROFILE

58.50 58.40 58.31 58.22 58.10 58.00 57.93 57.86 57.85 57.78 57.73 57.58 57.45 57.49 57.43 57.41 57.39 57.32 57.10 56.92

57.78* 58.68 57.58* 57.42 57.30 57.25 57.26 57.08 56.92*

26 27 28 29

26A 27A 28A 29A

▲ = Points 26A, 27A, 28A & 29A represent locations on either side of the new sleeper slab hat location, 1' East of corresponding survey points 26, 27, 28 & 29.

RIGHT PROFILE

(Profile is 1'-0" from curb line)

Survey Points:	14	15	16	17	18	19	20	21	22	23	24	25	30	31	32
	8'-3"	8'-3"	8'-3"	8'-3"	4'-9"	4'-9"	1'-3 13/16"	5'-3 5/16"	5'-3 5/16"	5'-3 5/16"	10'	10'	10'	10'	

#.## = New Profile Elevation

#.## = New Profile Elevation (after grinding)

#.## = Existing Profile Elevation

* or * = Match Existing Elevation

NOTES: Add 1300 to all elevations shown on profile.

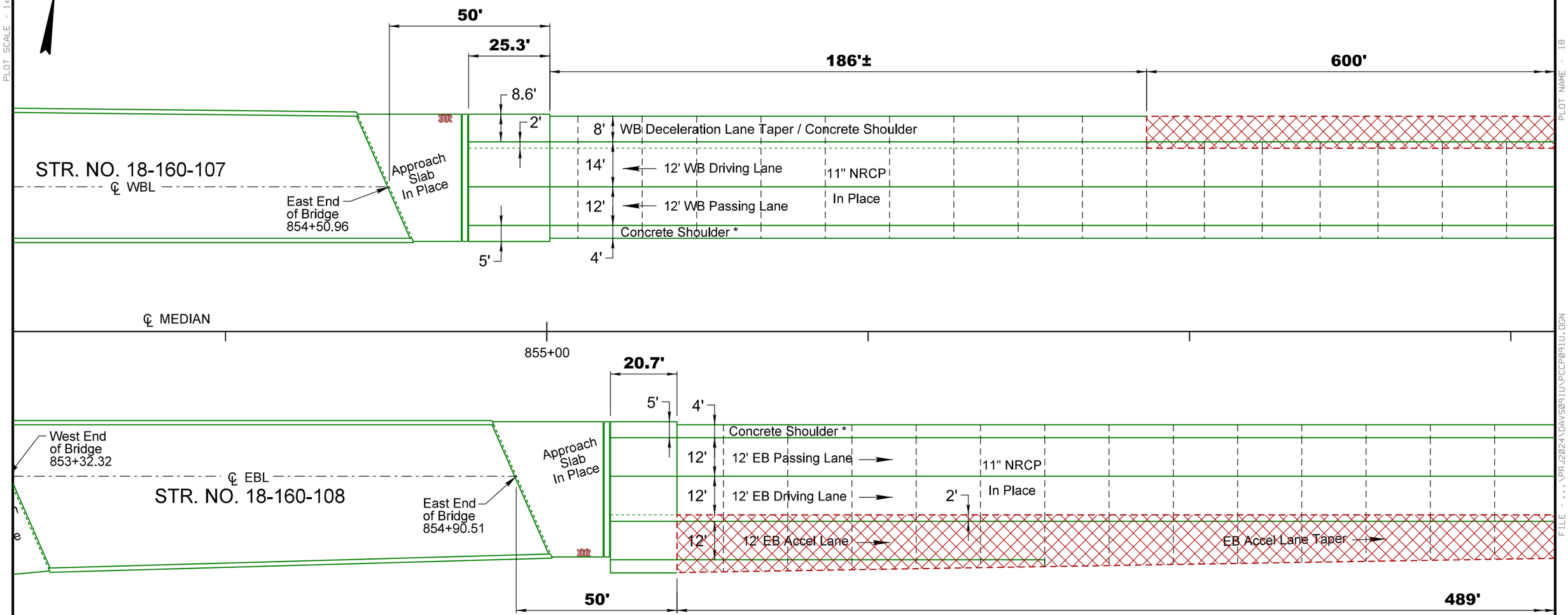
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	92	141

Plotting Date: 03/26/2024

REMOVE SURFACING ON APPROACH TO STRUCTURES

DECELERATION LANE TAPER EAST OF STR. NO. 18-160-107 OVER RAILROAD - I90 WBL MRM 332.42
ACCELERATION LANE & TAPER EAST OF STR. NO. 18-160-108 OVER RAILROAD- I90 EBL MRM 332.42

Sheet 1 of 4



Estimated Quantities	Location	WB Decel Taper		EB Accel Ln/Taper	
Item (Applies to Sheets 1 thru 4 of 4)		Quantity	Unit	Quantity	Unit
Remove Asphalt Concrete Pavement		634	SqYd	976	SqYd
Remove Concrete Pavement		134	SqYd	1,096	SqYd
Remove Granular Material		268	CuYd	621	CuYd
Unclassified Excavation		121	CuYd	335	CuYd

Remove NRC Pavement, Remove Asphalt Concrete Pavement, Remove Granular Material, and Unclassified Excavation

* 8" Concrete Shoulder In Place after Shoulder Strengthening (AC In Place prior to Shoulder Strengthening)

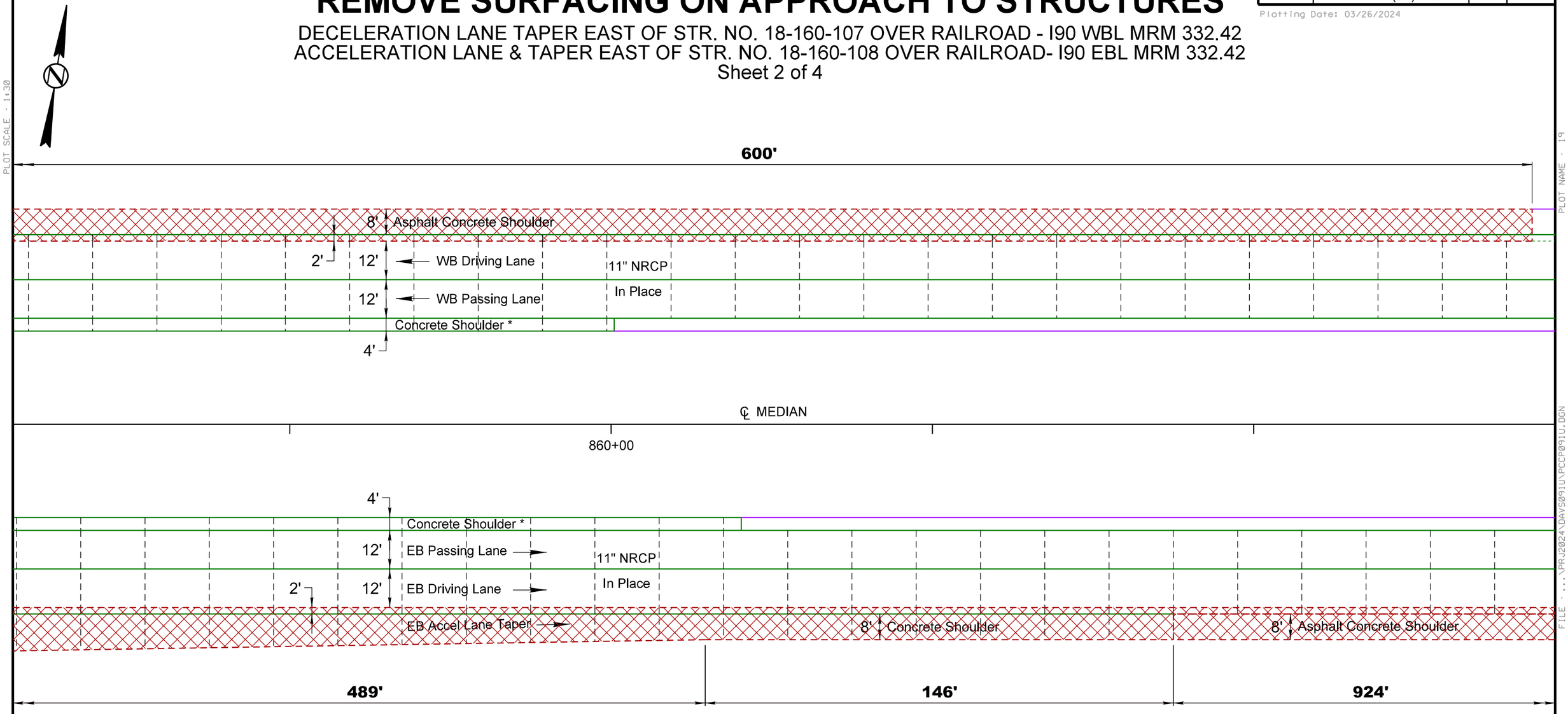
PLOT SCALE - 1:30
PLOT NAME - 18
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PLOTTED FROM - TRM1INT15

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	93	141

Plotting Date: 03/26/2024

REMOVE SURFACING ON APPROACH TO STRUCTURES

DECELERATION LANE TAPER EAST OF STR. NO. 18-160-107 OVER RAILROAD - I90 WBL MRM 332.42
ACCELERATION LANE & TAPER EAST OF STR. NO. 18-160-108 OVER RAILROAD- I90 EBL MRM 332.42
Sheet 2 of 4



Remove NRC Pavement, Remove Asphalt Concrete Pavement, Remove Granular Material, and Unclassified Excavation

* 8" Concrete Shoulder In Place after Shoulder Strengthening (AC In Place prior to Shoulder Strengthening)

PLOT SCALE - 1:30
PLOT NAME - 19
FILE - ...\PRJ2024\DAYS091U\PCCP091U.DGN
PLOTTED FROM - TRM11NT15

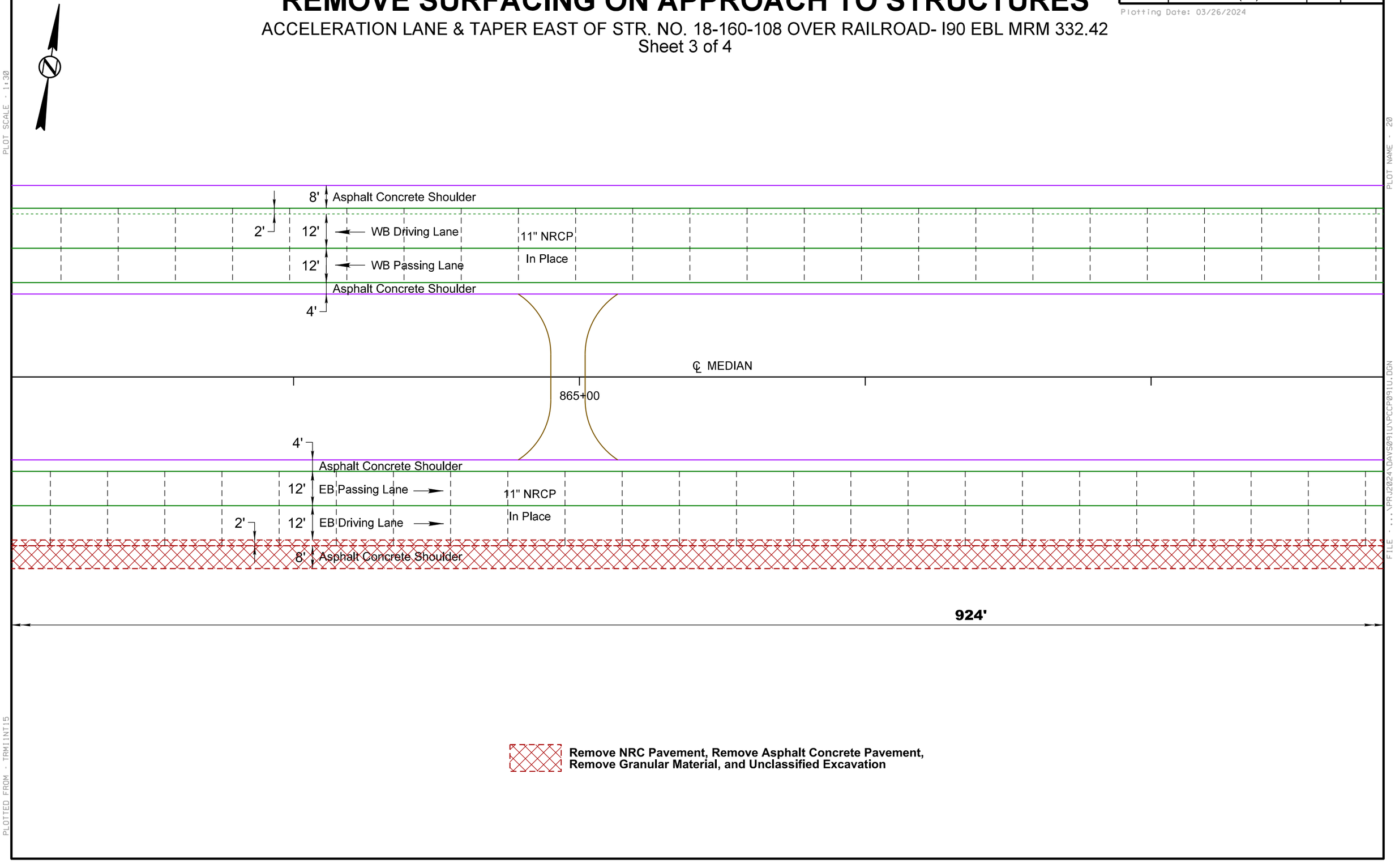
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	94	141

Plotting Date: 03/26/2024

REMOVE SURFACING ON APPROACH TO STRUCTURES

ACCELERATION LANE & TAPER EAST OF STR. NO. 18-160-108 OVER RAILROAD- I90 EBL MRM 332.42

Sheet 3 of 4



Remove NRC Pavement, Remove Asphalt Concrete Pavement, Remove Granular Material, and Unclassified Excavation

PLOT SCALE - 1:30

PLOT NAME - 20

FILE ...\PRJ2024\DAYS091U\PCCP091U.DGN

PLOTTED FROM - TRM11NT15

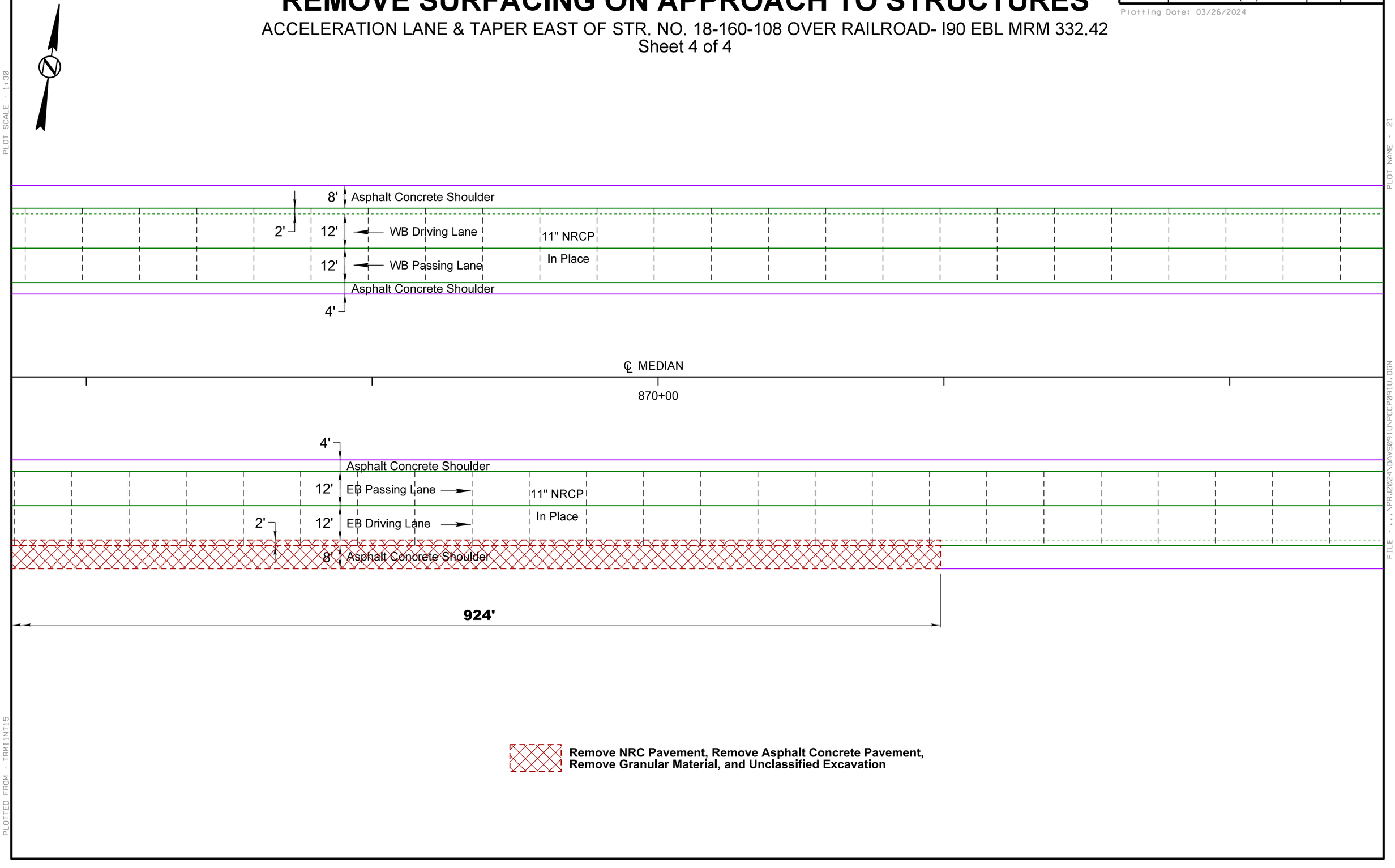
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	95	141

Plotting Date: 03/26/2024

REMOVE SURFACING ON APPROACH TO STRUCTURES

ACCELERATION LANE & TAPER EAST OF STR. NO. 18-160-108 OVER RAILROAD- I90 EBL MRM 332.42

Sheet 4 of 4



Remove NRC Pavement, Remove Asphalt Concrete Pavement, Remove Granular Material, and Unclassified Excavation

PLOT SCALE - 1:30
PLOT NAME - 21
FILE ...\PRJ2024\DAYS091U\PCCP091U.DGN
PLOTTED FROM - TRM11NT15

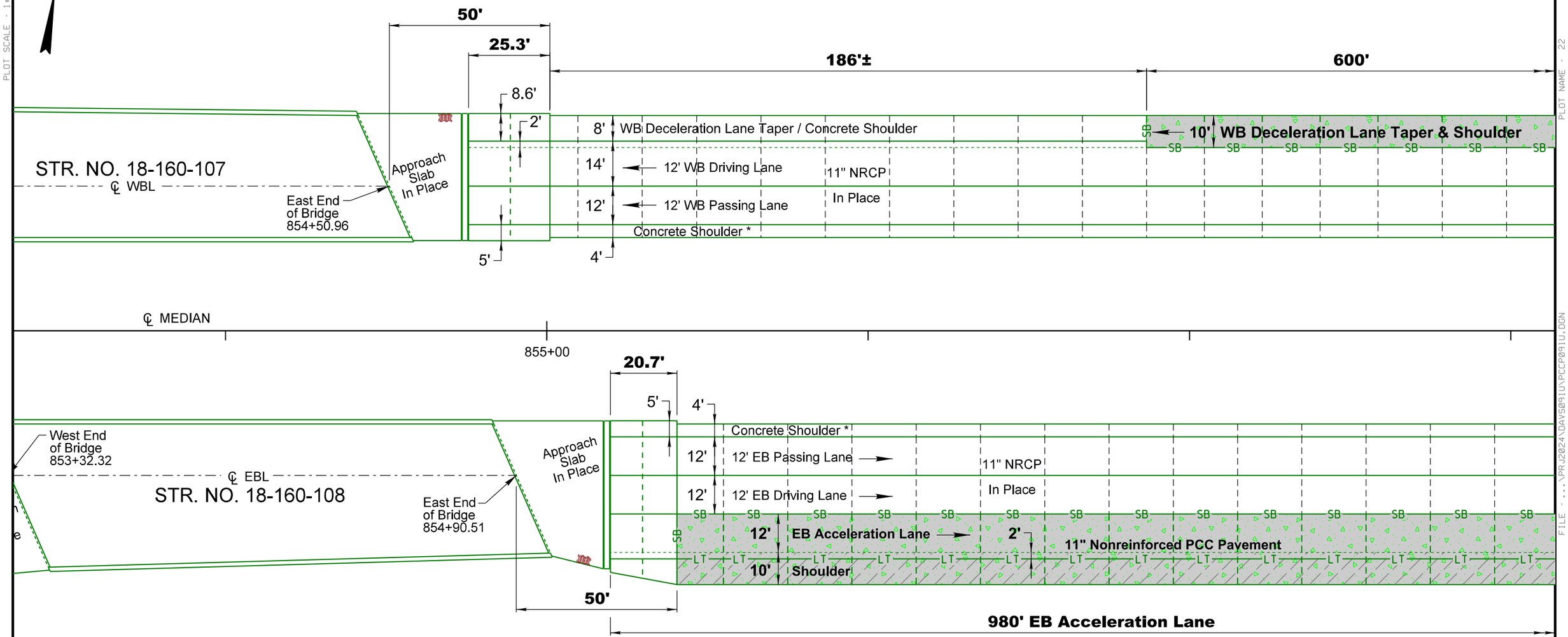
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	96	141

Plotting Date: 03/26/2024

SURFACING ON APPROACH TO STRUCTURES

DECELERATION LANE TAPER EAST OF STR. NO. 18-160-107 OVER RAILROAD - I90 WBL MRM 332.42
ACCELERATION LANE & TAPER EAST OF STR. NO. 18-160-108 OVER RAILROAD- I90 EBL MRM 332.42

Sheet 1 of 4



Estimated Quantities	Location	WB Decel Taper		EB Accel Ln/Taper	
Item (Applies to Sheet 1 thru 4 of 4)		Quantity	Unit	Quantity	Unit
Gravel Cushion		586	Ton	2,275	Ton
11" Nonreinforced PCC Pavement		667	SqYd	2,342	SqYd
Dowel Bar		300	Each	792	Each
Insert Steel Bar In PCC Pavement **		10	Each	22	Each
Insert Steel Bar In PCC Pavement ***		240	Each	624	Each

** 1½" x 18" Epoxy Coated Plain Round Dowel Bars

*** No. 5 x 24" Epoxy Coated Deformed Tie Bars

11" Nonreinforced PCC Pavement

LEGEND:
Sawed Longitudinal Joint with Tie Bars or
Longitudinal Construction Joint With Tie Bars ——LT——LT——LT——
Transverse Contraction Joint (Keep Joint Spacing between 10' & 13') - - - - - - - - -
Longitudinal Construction Joint without Tie Bars ——L——L——
Steel Bar Insertion in Longitudinal or Transverse Joints ——SB——SB——

Transverse contraction joints within these areas will not have dowel bar assemblies. All other transverse contraction joints will have dowel bar assemblies.

* 8" Concrete Shoulder In Place after Shoulder Strengthening (AC In Place prior to Shoulder Strengthening)

PLOT SCALE - 1:30
PLOT NAME - 22
FILE - ...\PRJ2024\DAVS\091U\PCCP091U.DGN
PLOTTED FROM - TRM1INT15

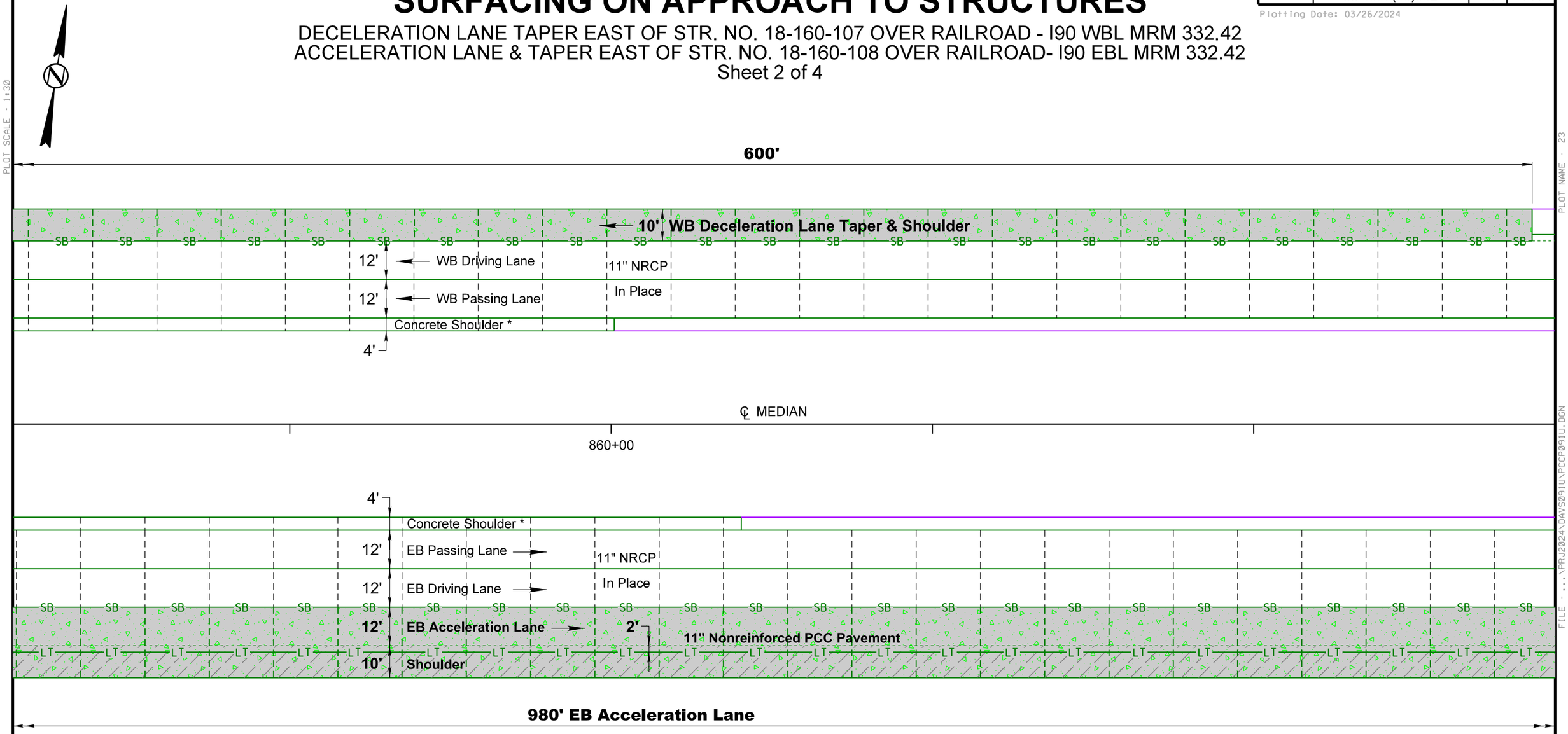
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	97	141

Plotting Date: 03/26/2024

SURFACING ON APPROACH TO STRUCTURES

DECELERATION LANE TAPER EAST OF STR. NO. 18-160-107 OVER RAILROAD - I90 WBL MRM 332.42
ACCELERATION LANE & TAPER EAST OF STR. NO. 18-160-108 OVER RAILROAD- I90 EBL MRM 332.42

Sheet 2 of 4



11" Nonreinforced PCC Pavement

LEGEND:

Sawed Longitudinal Joint with Tie Bars or
Longitudinal Construction Joint With Tie Bars ——LT——LT——LT——

Transverse Contraction Joint (Keep Joint Spacing between 10' & 13') - - - - - - - - -

Longitudinal Construction Joint without Tie Bars ——L——L——

Steel Bar Insertion in Longitudinal or Transverse Joints ——SB——SB——

Transverse contraction joints within these areas will not have dowel bar assemblies. All other transverse contraction joints will have dowel bar assemblies.

* 8" Concrete Shoulder In Place after Shoulder Strengthening (AC In Place prior to Shoulder Strengthening)

PLOT SCALE - 1:30

PLOT NAME - 23

FILE - ...\PRJ2024\DAYS091U\PCCP091U.DGN

PLOTTED FROM - TRM11NT15

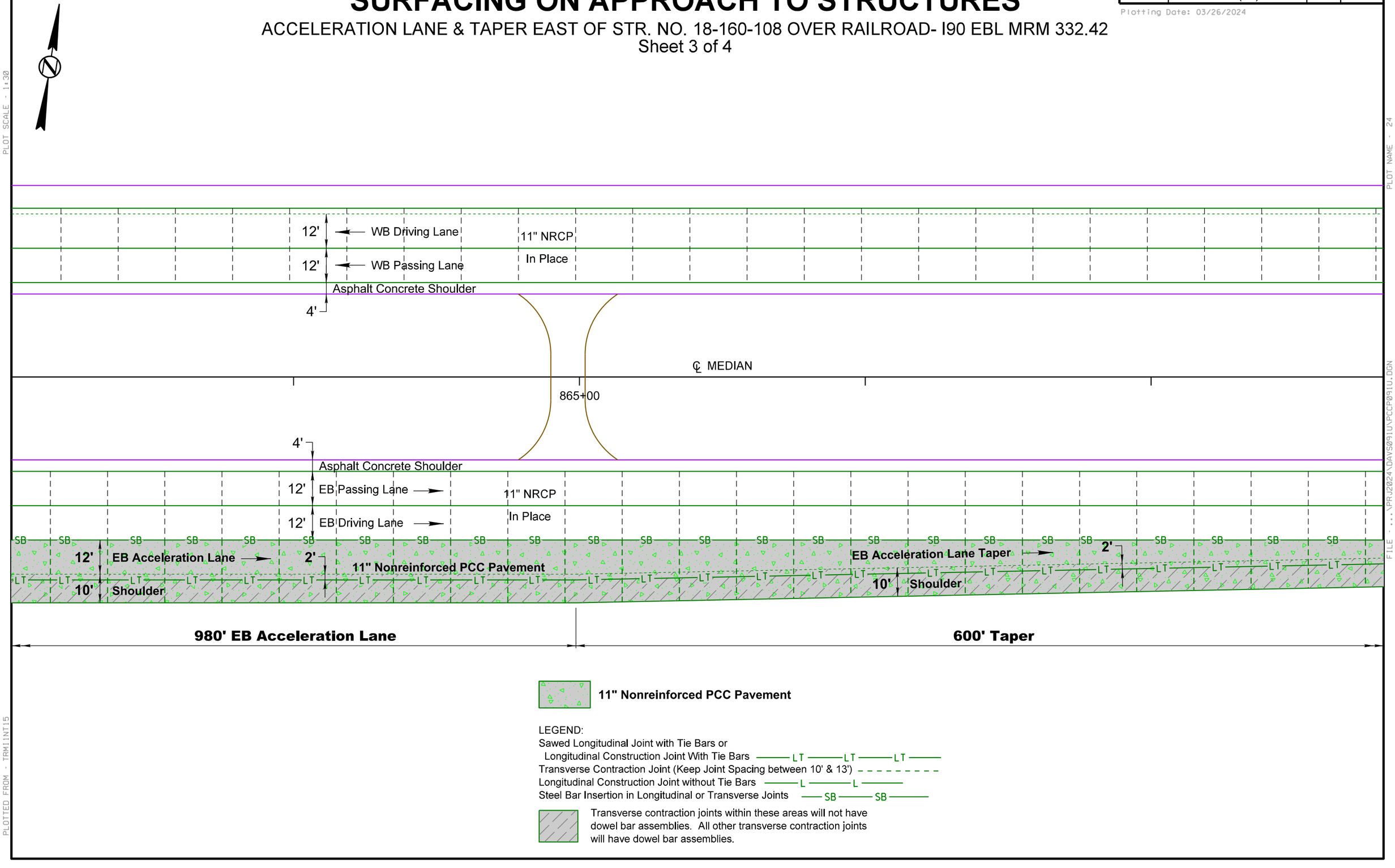
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	98	141

Plotting Date: 03/26/2024

SURFACING ON APPROACH TO STRUCTURES

ACCELERATION LANE & TAPER EAST OF STR. NO. 18-160-108 OVER RAILROAD- I90 EBL MRM 332.42

Sheet 3 of 4



11" Nonreinforced PCC Pavement

LEGEND:

Sawed Longitudinal Joint with Tie Bars or Longitudinal Construction Joint With Tie Bars ——LT——LT——LT——

Transverse Contraction Joint (Keep Joint Spacing between 10' & 13') - - - - - - - - -

Longitudinal Construction Joint without Tie Bars ——L——L——

Steel Bar Insertion in Longitudinal or Transverse Joints ——SB——SB——

Transverse contraction joints within these areas will not have dowel bar assemblies. All other transverse contraction joints will have dowel bar assemblies.

PLOT SCALE - 1:30

PLOT NAME - 24

FILE - ...\PRJ2024\DAVS091U\PCCP091U.DGN

PLOTTED FROM - TRMI1NT15

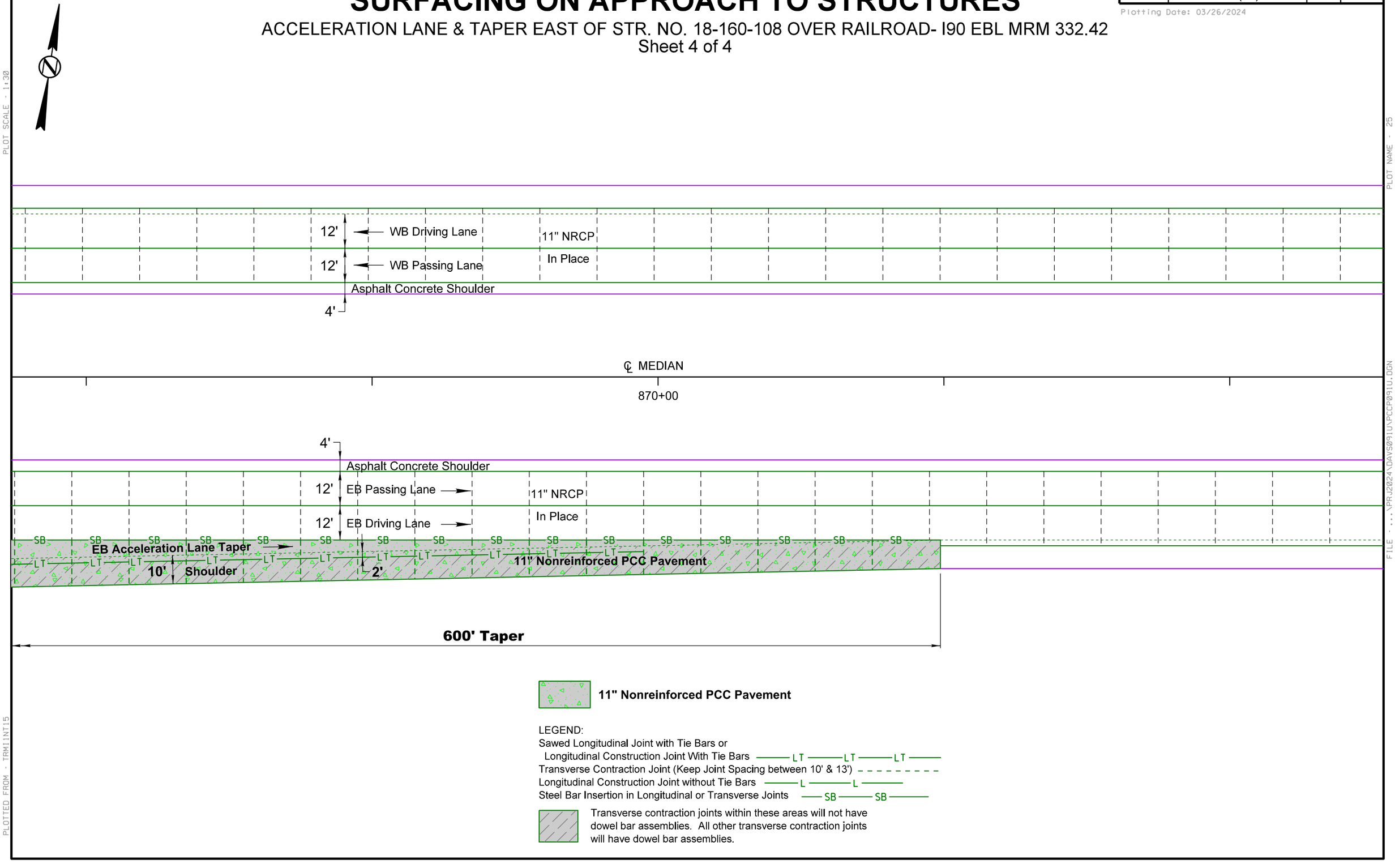
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	99	141

Plotting Date: 03/26/2024

SURFACING ON APPROACH TO STRUCTURES

ACCELERATION LANE & TAPER EAST OF STR. NO. 18-160-108 OVER RAILROAD- I90 EBL MRM 332.42

Sheet 4 of 4



11" Nonreinforced PCC Pavement

LEGEND:

Sawed Longitudinal Joint with Tie Bars or
Longitudinal Construction Joint With Tie Bars ——LT——LT——LT——

Transverse Contraction Joint (Keep Joint Spacing between 10' & 13') - - - - - - - - -

Longitudinal Construction Joint without Tie Bars ——L——L——

Steel Bar Insertion in Longitudinal or Transverse Joints ——SB——SB——

Transverse contraction joints within these areas will not have dowel bar assemblies. All other transverse contraction joints will have dowel bar assemblies.

PLOT SCALE - 1:30

PLOT NAME - 25

FILE - ...\PRJ2024\DAYS091U\PCCP091U.DGN

PLOTTED FROM - TRM11NT15

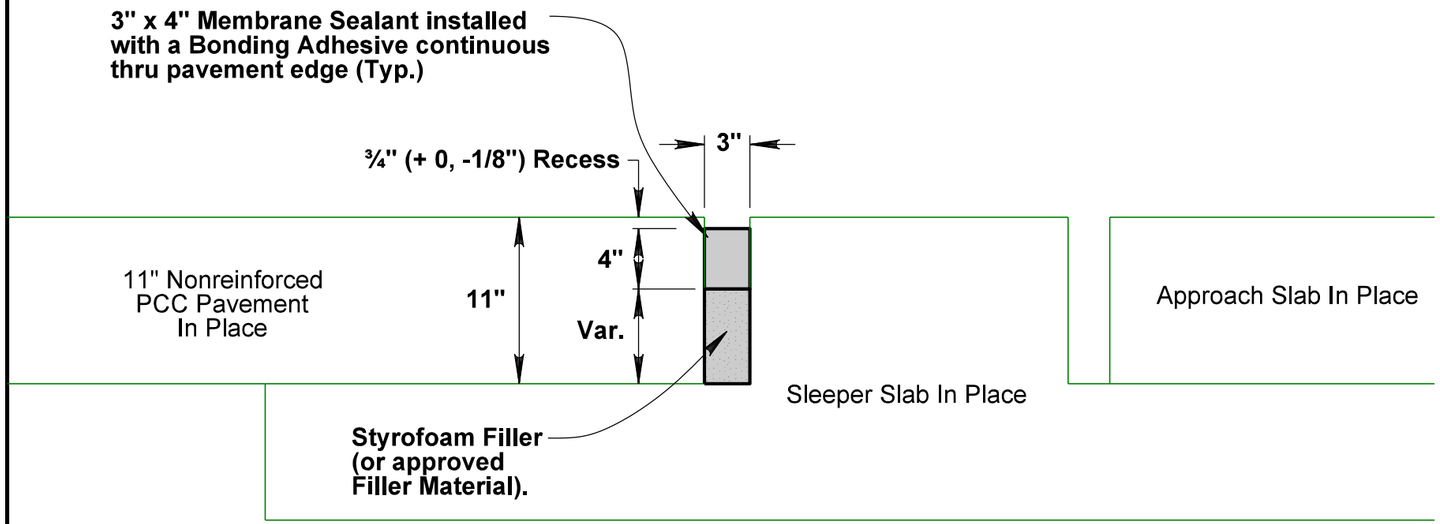
PLOT SCALE - 1=0.833333

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	100	141

Plotting Date: 03/26/2024

MEMBRANE SEALANT EXPANSION JOINT INSTALLATION AT BRIDGE APPROACH SLEEPER SLAB

I90 MRM 332.42
STR. NO. 18-160-107 WBL
STR. NO. 18-160-108 EBL



LOCATION	QUANTITY OF MEMBRANE SEALANT EXPANSION JOINT
MRM 332.42 WBL	1 @ 42' and 1 @ 40' = 82'
MRM 332.42 EBL	1 @ 50' and 1 @ 46' = 96'
TOTAL:	178'

GENERAL NOTES

1. *The Membrane Sealant will be on the approved product list for Membrane Sealant Expansion Joints.*

2. *The manufacturer will supply the membrane sealant in packaging that precompresses the membrane sealant. The precompressed dimension will be as recommended by the sealant manufacturer, however, in no case will the precompressed dimension exceed 75% of the joint opening width. The foam sealant will be slowly self expanding to permit workers ample time to install the membrane sealant before the membrane sealant exceeds the joint opening width.*

3. *The membrane sealant will provide a water tight seal throughout a joint movement range of + 25% (minimum) from the specified joint opening dimension.*

4. *The membrane sealant will be supplied in pieces a minimum of 5 feet in length. The foam sealant will be ultra-violet and ozone resistant.*

5. *The bonding adhesive used to attach the membrane sealant to the adjacent concrete and asphalt concrete will be approved by the membrane sealant manufacturer.*

6. *Adhesive used to join adjacent pieces of the membrane sealant will be as recommended by the manufacturer.*

7. *If Styrofoam filler material is used in the construction, it will be closed cell and water-tight as approved by the Engineer.*

8. *The minimum ambient air temperature at the time of joint installation and adhesive curing will be 40° F.*

9. *A technical representative of the membrane sealant manufacturer will be present at the jobsite during installation. The technical representative will be knowledgeable in the correct procedures for the preparation and installation of the joint material to ensure the Contractor installs the joint to the Manufacturers recommendations.*

10. *Surfaces that will be in contact with the membrane sealant will be thoroughly cleaned by abrasive blasting to remove all laitance and contaminants (such as oil, curing compounds, etc.) from the surface. At a minimum, two passes of abrasive blasting with the nozzle held at an angle to within 1 to 2 inches of the surface will be required. Cleaning of the surfaces with solvents, wire brushing, or grinding will not be permitted.*

11. *After abrasive blasting, but immediately prior to membrane joint installation, the entire joint contact surface will be air blasted. The air compressor used for joint cleaning will be equipped with trap devices capable of providing moisture-free and oil-free air at a recommended pressure of 90 psi. To obtain complete bonding with the adhesive, the adjacent surfaces must be dry and clean. The contact surfaces for the joint will be visually inspected by the Engineer immediately prior to joint installation to verify the surface is dry and clean.*

12. *Individual spliced sections will be installed as per the manufacturers' recommendations. The membrane joint sealant manufacturer will submit a detailed installation procedure to the Engineer at least 5 days prior to joint installation for his review.*

13. *Traffic will not be allowed on the joint until the bonding adhesive has had time to cure, as recommended by the manufacturer.*

14. *Use plywood or other material to protect concrete adjacent to the joint from spalling before any equipment is moved across the joint. Any spall areas will be repaired at the Contractor's expense by breaking out and replacing adjacent concrete and asphalt concrete, as approved by the Engineer.*

15. *The Membrane Sealant Expansion Joint will be measured in feet to the nearest one-tenth foot, complete in place. Measurement will be made of the overall horizontal length. The Membrane Sealant Expansion Joint will be paid for at the contract unit price per foot complete in place. Payment for this item will be full compensation for furnishing all the required materials in place, including labor, equipment and incidentals necessary to complete the work in accordance with the plans and the foregoing specifications.*

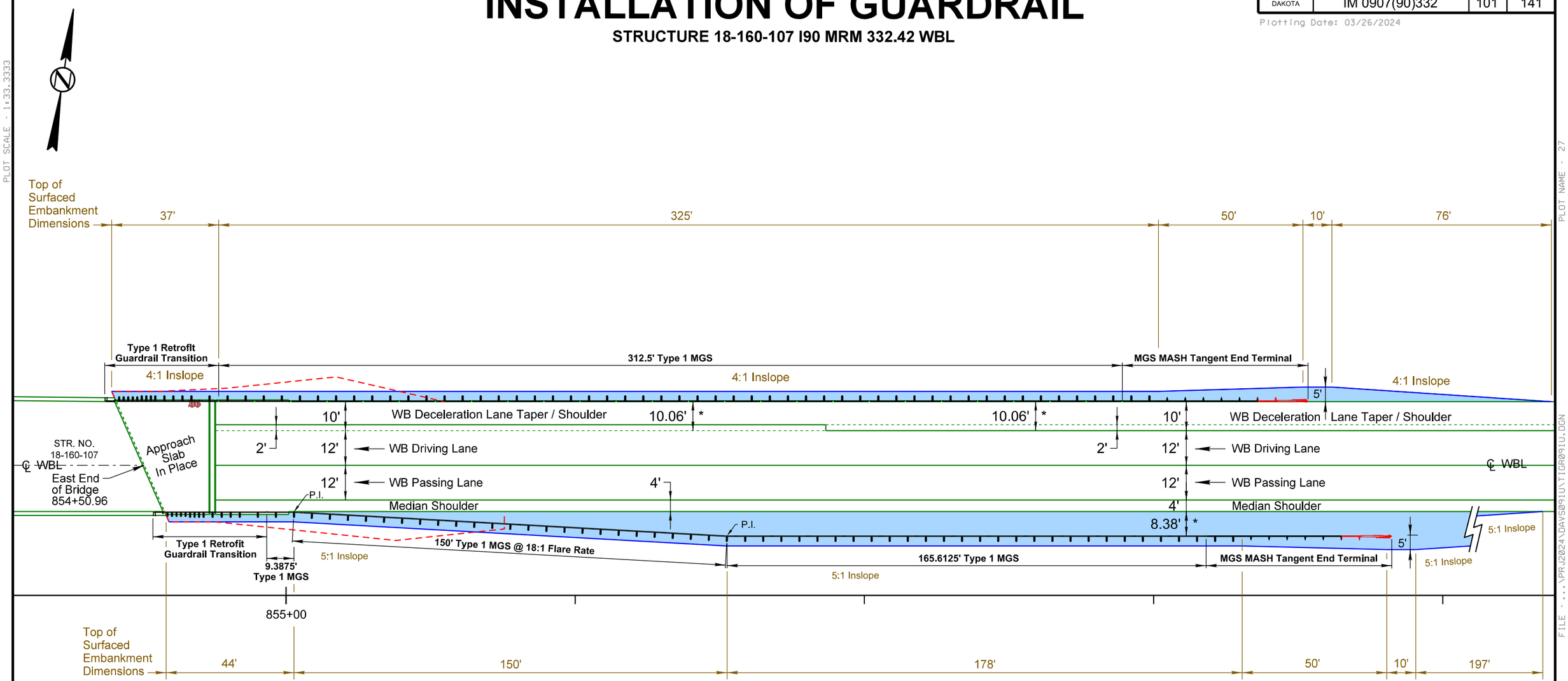
PLOTTED FROM - TRM11NT15
PLOT NAME - 26
FILE - ...\MEMBRANE JOINT AT BRIDGE APPR SLEEPER SLAB JOINT.DGN

INSTALLATION OF GUARDRAIL

STRUCTURE 18-160-107 I90 MRM 332.42 WBL

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	101	141

Plotting Date: 03/26/2024



* Dimension to front face of guardrail

Estimated Quantities	Str. No.	18-160-107			
	Location	WBL Median		WBL Outside	
Item		Quantity	Unit	Quantity	Unit
Remove Asphalt Concrete Pavement		83	SqYd	59	SqYd
Gravel Cushion		280	Ton	130	Ton
Asphalt Concrete Composite		73	Ton	26	Ton

Remove Asphalt Concrete Pavement (2" depth) from between this line and the existing shoulder edge

Place Gravel Cushion (where granular material is not already in place) and Place 2" Asphalt Concrete Composite

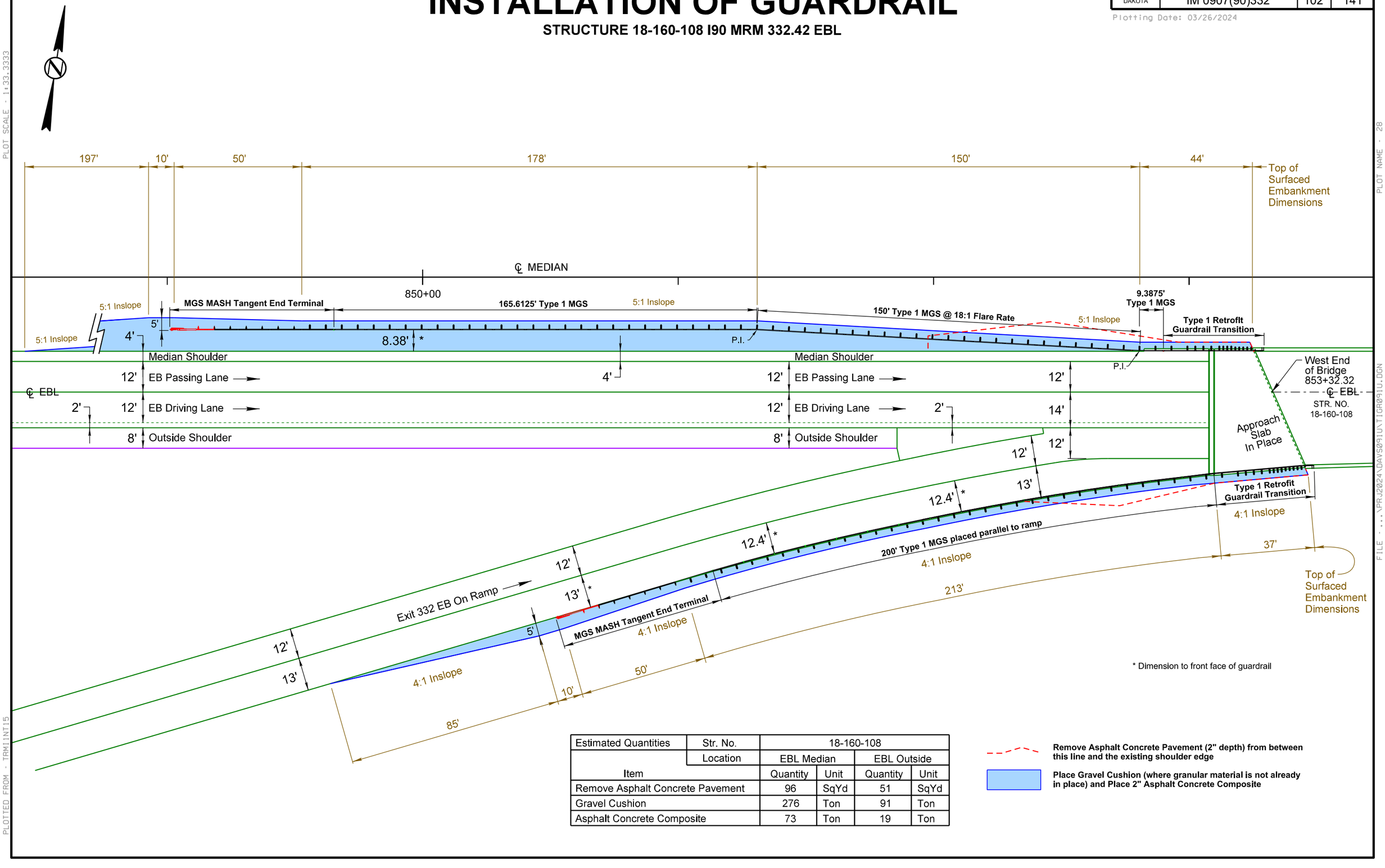
PLOT SCALE - 1:33.3333
PLOT NAME - 27
FILE - ...\PR\2024\DAVS091U\TTGR091U.DGN
PLOTTED FROM - TRMINT15

INSTALLATION OF GUARDRAIL

STRUCTURE 18-160-108 I90 MRM 332.42 EBL

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	102	141

Plotting Date: 03/26/2024



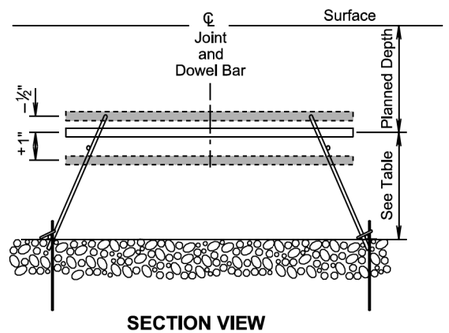
* Dimension to front face of guardrail

Estimated Quantities	Str. No.	18-160-108			
	Location	EBL Median		EBL Outside	
Item		Quantity	Unit	Quantity	Unit
Remove Asphalt Concrete Pavement		96	SqYd	51	SqYd
Gravel Cushion		276	Ton	91	Ton
Asphalt Concrete Composite		73	Ton	19	Ton

Remove Asphalt Concrete Pavement (2" depth) from between this line and the existing shoulder edge

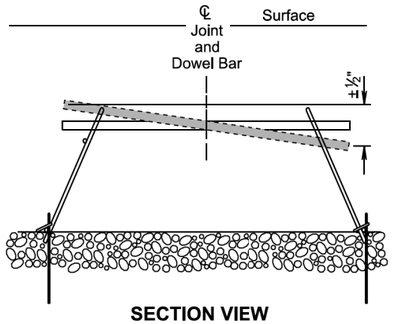
Place Gravel Cushion (where granular material is not already in place) and Place 2" Asphalt Concrete Composite

PLOT SCALE - 1:33.3333
PLOTTED FROM - TRM1INT15
PLOT NAME - 28
FILE - ...\PRJ2024\DAVS\09\UNTIGR091U.DGN



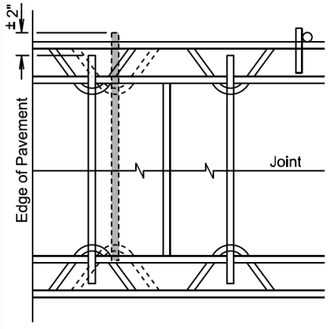
SECTION VIEW
VERTICAL TRANSLATION

Depth: mid-depth + 1 inch or – ½ inch



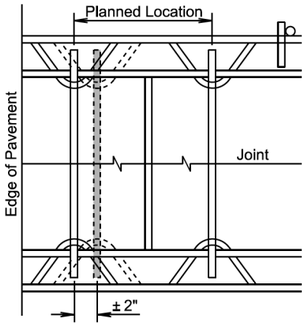
SECTION VIEW
VERTICAL TILT

Vertical rotational alignment: ½ inch over 18 inch



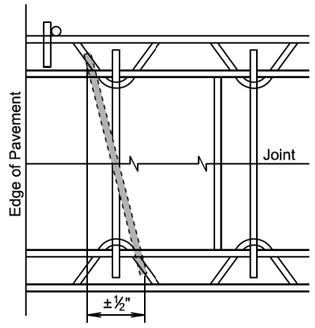
PLAN VIEW
LONGITUDINAL TRANSLATION

Longitudinal side shift: ± 2 inch for 18 inch bars



PLAN VIEW
HORIZONTAL TRANSLATION

Side shift ± 2 inch



PLAN VIEW
HORIZONTAL SKEW

Horizontal rotational alignment: ½ inch over 18 inch

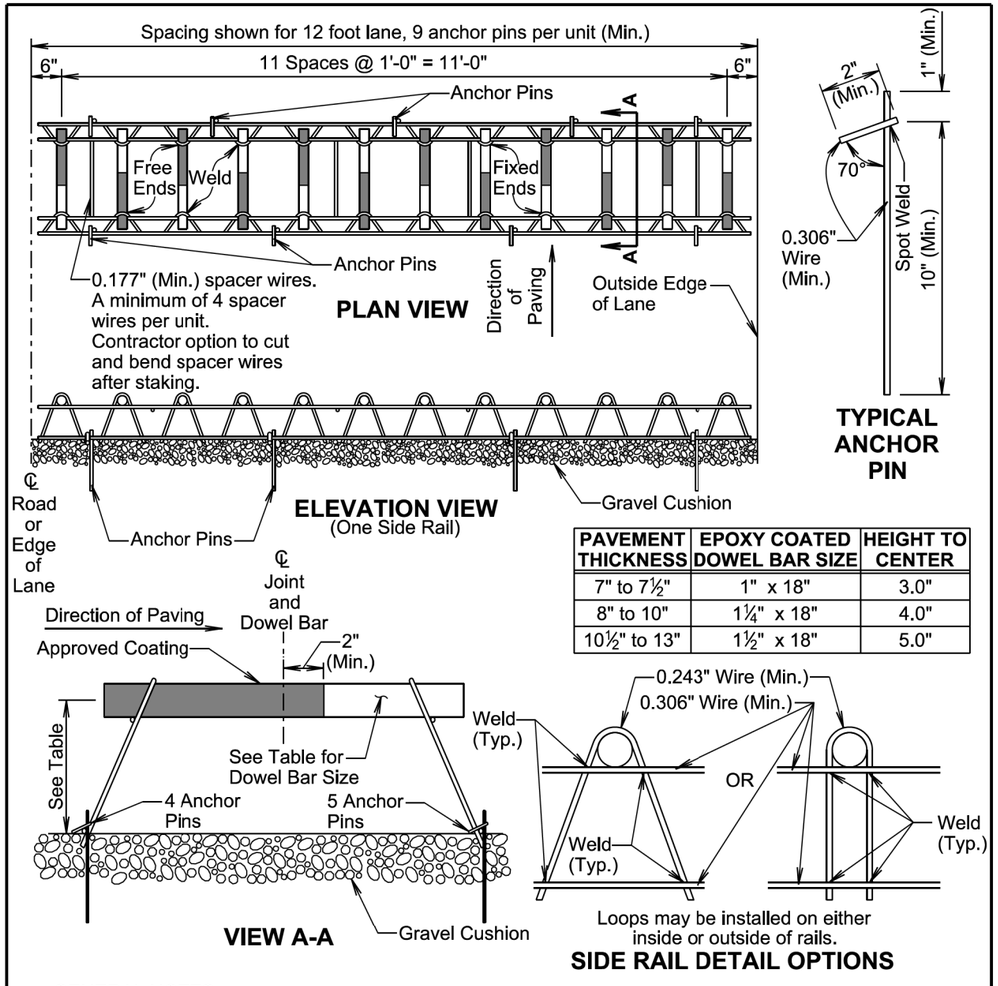
PAVEMENT THICKNESS	EPOXY COATED DOWEL BAR SIZE	HEIGHT TO CENTER
7" to 7½"	1" x 18"	3.0"
8" to 10"	1¼" x 18"	4.0"
10½" to 13"	1½" x 18"	5.0"

GENERAL NOTE:

The tolerances shown above represent the maximum deviation for acceptance of dowel bar placement.

November 19, 2022

Published Date: 2024	SDDOT	PCC PAVEMENT DOWEL BAR ALIGNMENT TOLERANCES	PLATE NUMBER 380.01 Sheet 1 of 1



PAVEMENT THICKNESS	EPOXY COATED DOWEL BAR SIZE	HEIGHT TO CENTER
7" to 7½"	1" x 18"	3.0"
8" to 10"	1¼" x 18"	4.0"
10½" to 13"	1½" x 18"	5.0"

GENERAL NOTES:

Longitudinal joint tie bars will be placed a minimum of 15 inches from the transverse contraction joint.

The transverse contraction joints will be sawed perpendicular to the centerline of the roadway. The transverse sawed joint will be centered over the dowel bars.

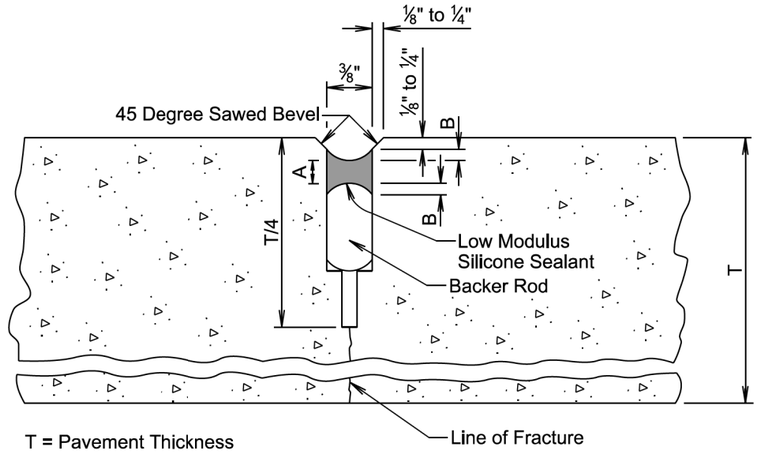
Supporting devices as shown on this sheet, or equivalent as approved by the Engineer, will be used to maintain proper horizontal and vertical alignment of the dowel bars.

All dowel bar alignment tolerances will be as shown in the PCC Pavement Dowel Bar Alignment Tolerances standard plate.

November 19, 2022

Published Date: 2024	SDDOT	PCC PAVEMENT DOWEL BAR ASSEMBLY FOR TRANSVERSE CONTRACTION JOINTS 12 Bar Assembly on Granular Base Material	PLATE NUMBER 380.04 Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 1
FILE - ...\STD PLATES\STD 380 PLATES.DGN
PLOTTED FROM - TRM11NT15



LOW MODULUS SILICONE SEALANT ALLOWABLE CONSTRUCTION TOLERANCES			
A (Min.) (in.)	A (Max.) (in.)	B (Min.) (in.)	B (Max.) (in.)
3/16	5/16	⅛	¼

GENERAL NOTES:

The first saw cut to control cracking will be a minimum of ¼ the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the low modulus silicone joint sealant will be necessary.

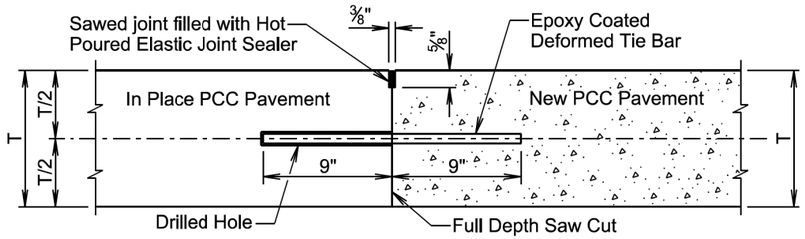
The backer rod will be a non-moisture absorbing resilient material approximately 25% larger in diameter than the width of the joint to be sealed.

November 19, 2022

Published Date: 2024	SDDOT	PCC PAVEMENT BEVELED TRANSVERSE CONTRACTION JOINT WITH OR WITHOUT DOWEL BAR ASSEMBLY	PLATE NUMBER 380.13
			Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 2
FILE - ...\STD PLATES\STD 380 PLATES.DGN
.PLOTTED FROM - TRM1INT15

DETAIL A
TRANSVERSE CONSTRUCTION JOINT WITH TIE BARS



T = In Place PCC Pavement and New PCC Pavement Thickness

GENERAL NOTES:

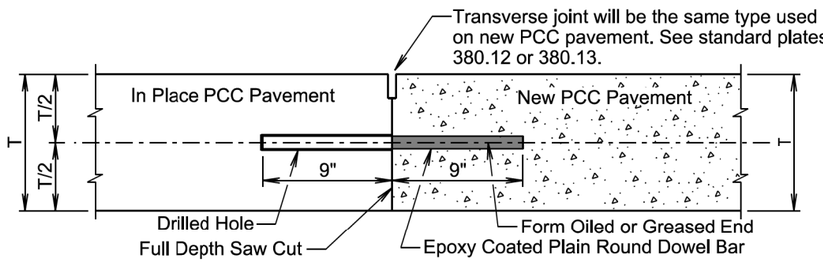
The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project.

See sheet 2 of 2 of this standard plate to determine if Detail A will be used.

The tie bars will be embedded a minimum depth of 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive or a non-shrink grout.

No. 9 epoxy coated deformed tie bars will be used in 10 inch thickness and less PCC Pavement and No. 11 epoxy coated deformed tie bars will be used in 10.5 inch thickness and greater PCC Pavement. The tie bar spacing will be 18 inches center to center and will be a minimum of 3 inches and a maximum of 9 inches from the pavement edges.

DETAIL B
TRANSVERSE CONSTRUCTION JOINT WITH DOWEL BARS



GENERAL NOTES: T = In Place PCC Pavement and New PCC Pavement Thickness

The term "In Place PCC Pavement" in the above drawing indicates that the in place PCC pavement was placed on a previous project or current project.

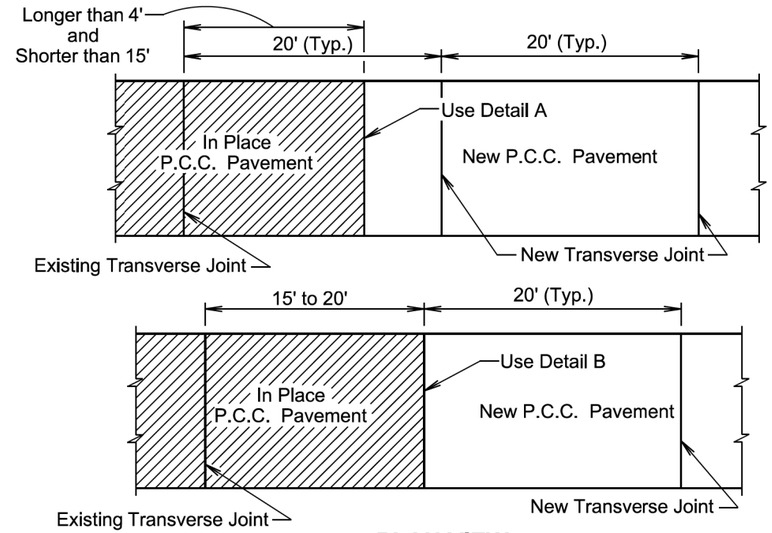
See sheet 2 of 2 of this standard plate to determine if Detail B will be used.

The plain round dowel bars will be embedded a minimum depth of 9 inches into the in place PCC pavement and anchored with an epoxy resin adhesive or a non-shrink grout.

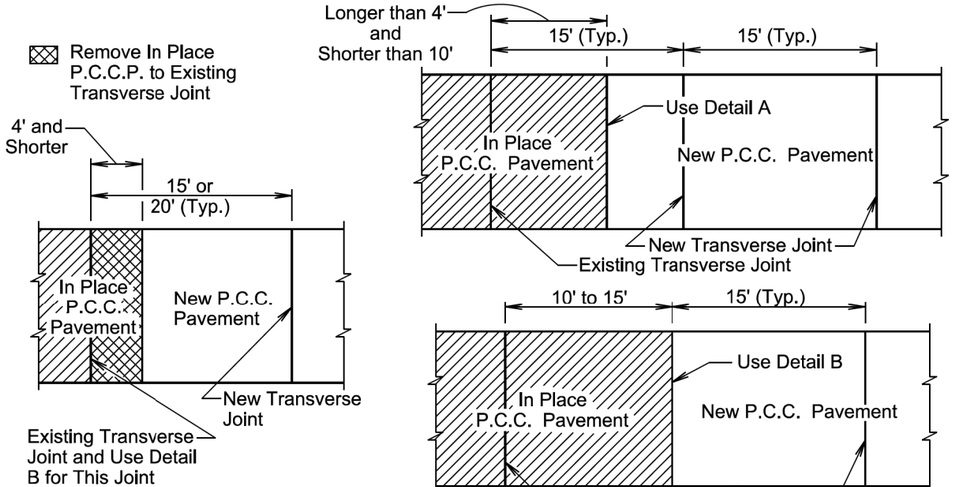
The epoxy coated plain round dowel bar size, number, and spacing will be the same as detailed on the corresponding dowel bar assembly standard plate (380.04, 380.05, 380.06, or 380.07). The epoxy coated plain round dowel bars will be a minimum of 3 inches and a maximum of 6 inches from the pavement edges.

January 22, 2023

Published Date: 2024	SDDOT	PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS	PLATE NUMBER 380.15	Sheet 1 of 2



PLAN VIEW
(For typical transverse joint spacing of 20' on the current project)



PLAN VIEW
(For typical transverse joint spacings of 15' or 20' on the current project)

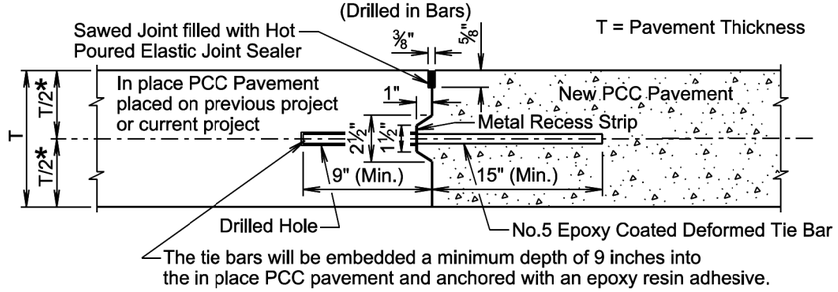
PLAN VIEW
(For typical transverse joint spacing of 15' on the current project)

January 22, 2023

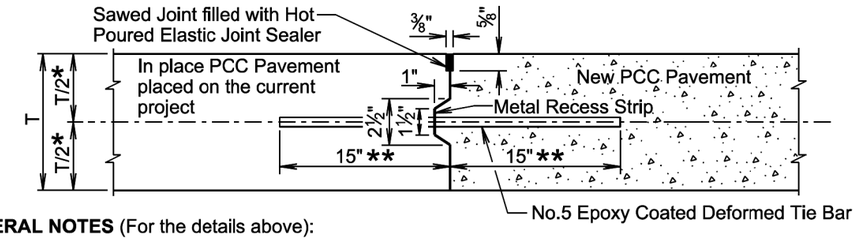
Published Date: 2024	SDDOT	PCC PAVEMENT TRANSVERSE CONSTRUCTION JOINTS WITH TIE BARS OR DOWEL BARS	PLATE NUMBER 380.15	Sheet 2 of 2

PLOT SCALE - 1:200
PLOT NAME - 3
FILE - ...\STD PLATES\STD 380 PLATES.DGN
.PLOTTED FROM - TRM1.INT15

LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS
(Drilled in Bars)



LONGITUDINAL CONSTRUCTION JOINT WITH TIE BARS
(Inserted or Formed in Bars)



GENERAL NOTES (For the details above):

The epoxy coated deformed tie bars will be spaced in accordance with the following tables:

TIE BAR SPACING 48" MAXIMUM	
Transverse Contraction Joint Spacing	Number of Tie Bars
6.5' to 10'	2
10.5' to 14'	3
14.5' to 18'	4
18.5' to 22'	5

TIE BAR SPACING 30" MAXIMUM	
Transverse Contraction Joint Spacing	Number of Tie Bars
5' to 7'	2
7.5' to 9.5'	3
10' to 12'	4
12.5' to 14.5'	5
15' to 17'	6
17.5' to 19.5'	7
20' to 22'	8

The tie bars will be placed a minimum of 15 inches from transverse contraction joints.

The required number of tie bars as shown in the table will be uniformly spaced within each panel. The uniformly spaced tie bars will be spaced a maximum of 48 inches center to center for a female keyway and will be spaced a maximum of 30 inches center to center for a vertical face and male keyway. The maximum tie bar spacing will apply to tie bars within each panel.

The keyway illustrated in the above details depict a female keyway.

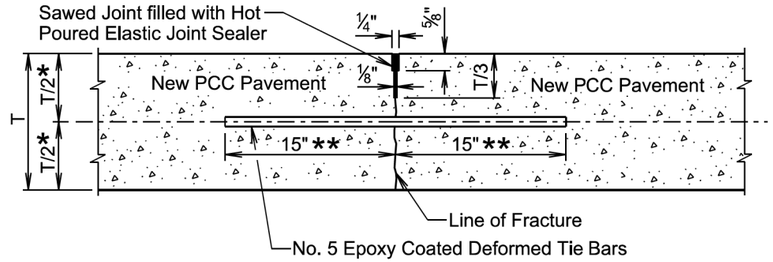
The keyway is optional and is not required. When concrete pavement is formed and a keyway is provided, a metal recess strip will be used. When concrete pavement is slip formed, a metal recess strip is not required.

* The vertical placement tolerance for any part of the tie bar will be ± T/6.
** The transverse placement (side shift) tolerance will be ± 3 inches when measured perpendicular to the longitudinal joint line.

November 19, 2022

Published Date: 2024	SDDOT	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.20
			Sheet 1 of 2

SAWED LONGITUDINAL JOINT WITH TIE BARS
(Poured Monolithically)



T = Pavement Thickness

GENERAL NOTES (For the detail above):

The epoxy coated deformed tie bars will be spaced in accordance with the following table:

TIE BAR SPACING 48" MAXIMUM	
Transverse Contraction Joint Spacing	Number of Tie Bars
6.5' to 10'	2
10.5' to 14'	3
14.5' to 18'	4
18.5' to 22'	5

The tie bars will be placed a minimum of 15 inches from the transverse contraction joints.

The required number of tie bars as shown in the table will be uniformly spaced within each panel with a maximum space of 48 inches center to center. The maximum tie bar spacing will apply to tie bars within each panel.

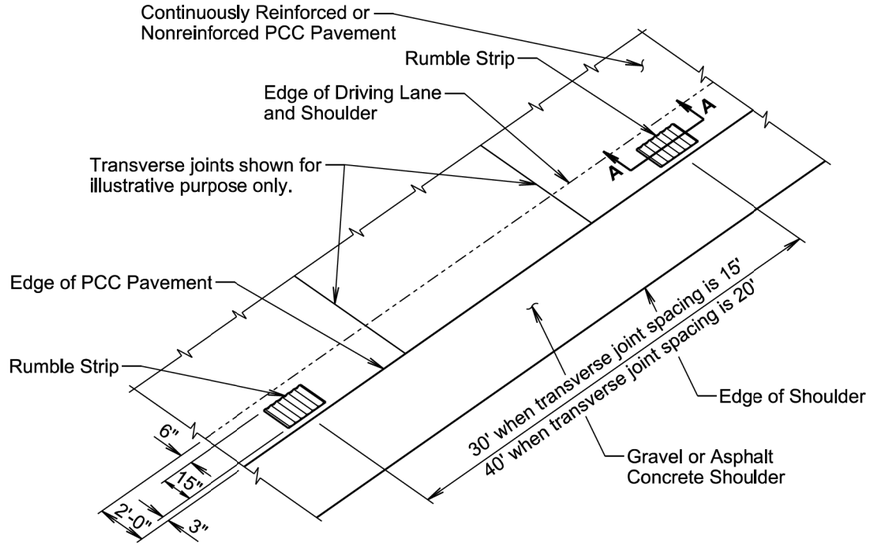
The first saw cut to control cracking will be a minimum of 1/3 the thickness of the pavement. Additional sawing for widening the saw cut to provide the width for the installation of the hot poured elastic joint sealer is necessary.

* The vertical placement tolerance for any part of the tie bar will be ± T/6.
** The transverse placement (side shift) tolerance will be ± 3 inches when measured perpendicular to the longitudinal joint line.

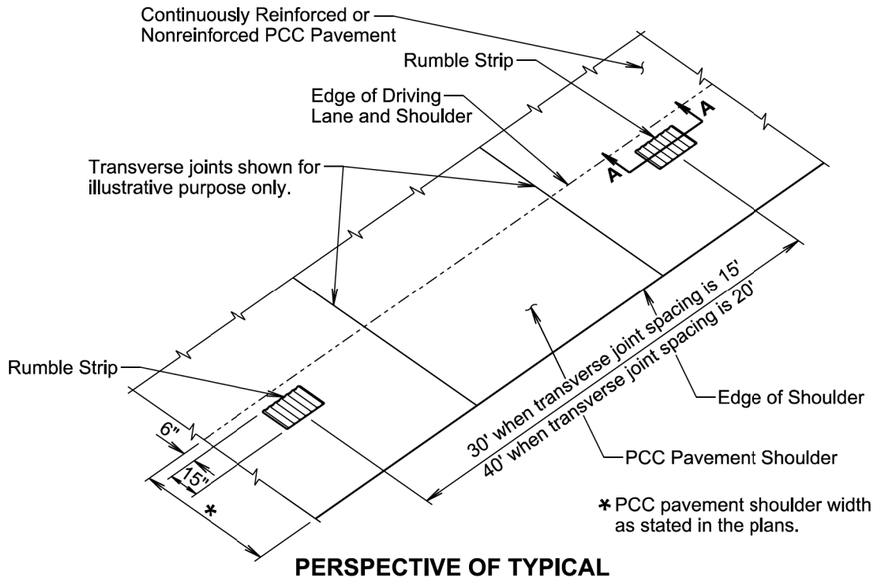
November 19, 2022

Published Date: 2024	SDDOT	PCC PAVEMENT LONGITUDINAL JOINTS WITH TIE BARS	PLATE NUMBER 380.20
			Sheet 2 of 2

PLOT SCALE - 1:200
PLOT NAME - 4
FILE - ...\STD PLATES\STD 380 PLATES.DGN
-PLOTTED FROM - TRM11NT15



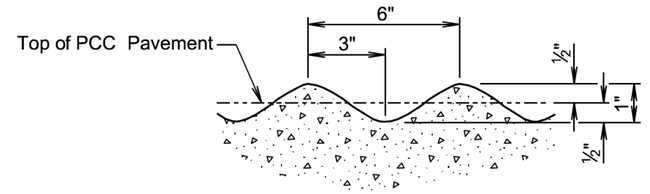
PERSPECTIVE OF TYPICAL RUMBLE STRIPS ON PCC PAVEMENT SHOULDER ADJACENT TO GRAVEL OR ASPHALT CONCRETE SHOULDER



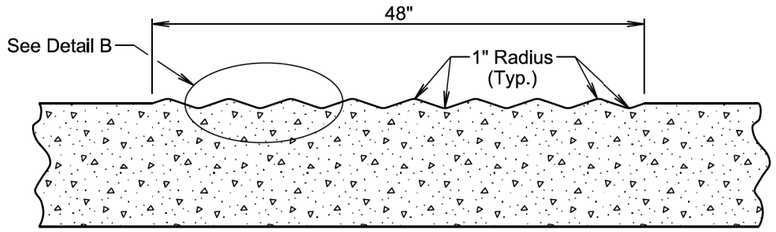
PERSPECTIVE OF TYPICAL RUMBLE STRIPS ON PCC PAVEMENT SHOULDER

November 19, 2022

Published Date: 2024	SDDOT	RUMBLE STRIP ON PCC PAVEMENT SHOULDER	PLATE NUMBER 380.53
			Sheet 1 of 2



DETAIL B



SECTION A-A

GENERAL NOTES:

The rumble strips will be evenly spaced and will not coincide with any transverse contraction joints.

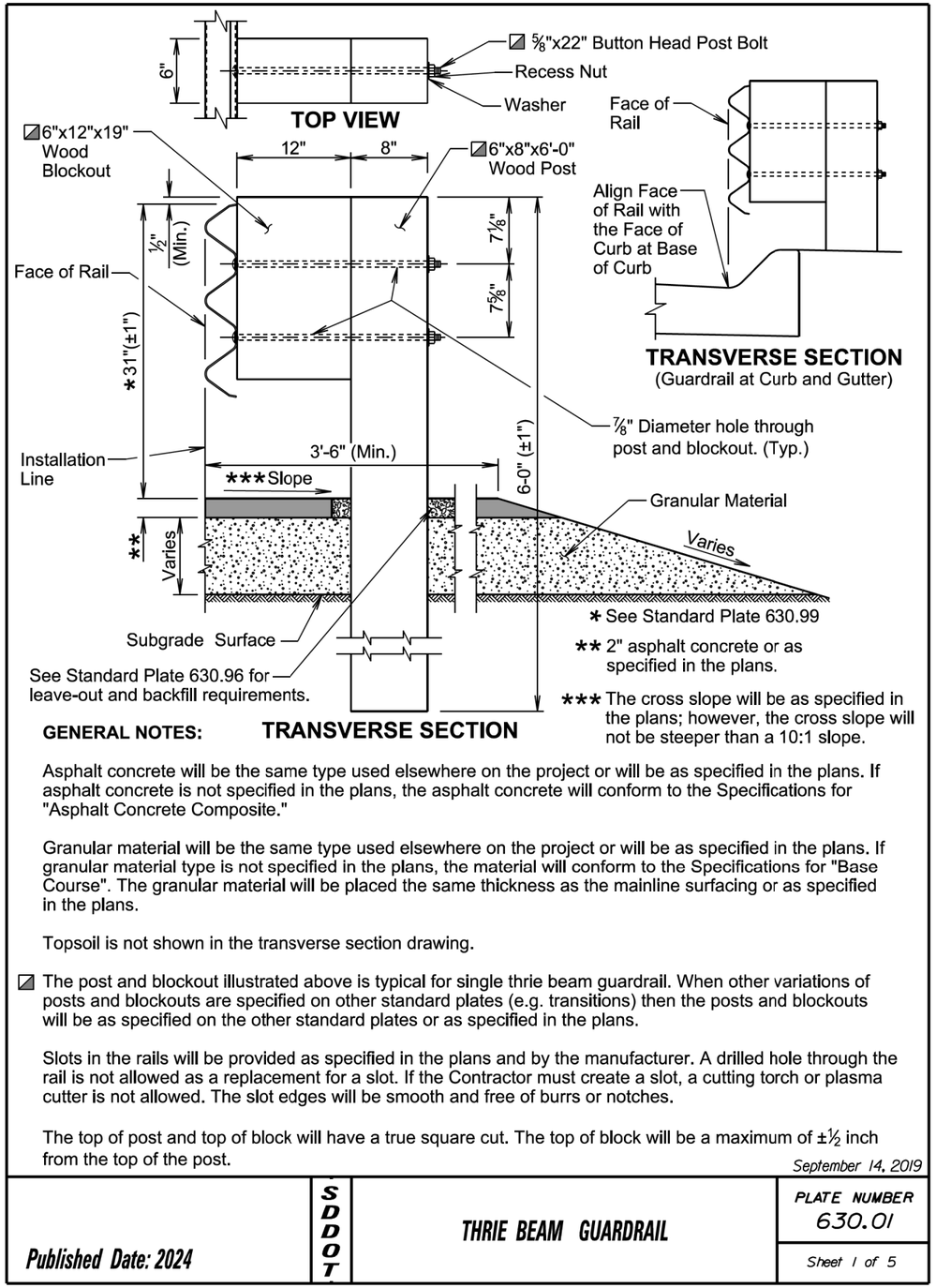
The rumble strips will NOT be placed along areas adjacent to entrance ramps, exit ramps, and gore areas.

Payment for constructing the PCC Pavement Rumble Strips will be incidental to the contract unit price per square yard for the corresponding PCC Pavement contract item.

November 19, 2022

Published Date: 2024	SDDOT	RUMBLE STRIP ON PCC PAVEMENT SHOULDER	PLATE NUMBER 380.53
			Sheet 2 of 2

PLOT SCALE - 1:200
PLOT NAME - 5
FILE - ...\STD PLATES\STD 380 PLATES.DGN
.PLOTTED FROM - TRM1INT15



GENERAL NOTES:

Asphalt concrete will be the same type used elsewhere on the project or will be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete will conform to the Specifications for "Asphalt Concrete Composite."

Granular material will be the same type used elsewhere on the project or will be as specified in the plans. If granular material type is not specified in the plans, the material will conform to the Specifications for "Base Course". The granular material will be placed the same thickness as the mainline surfacing or as specified in the plans.

Topsoil is not shown in the transverse section drawing.

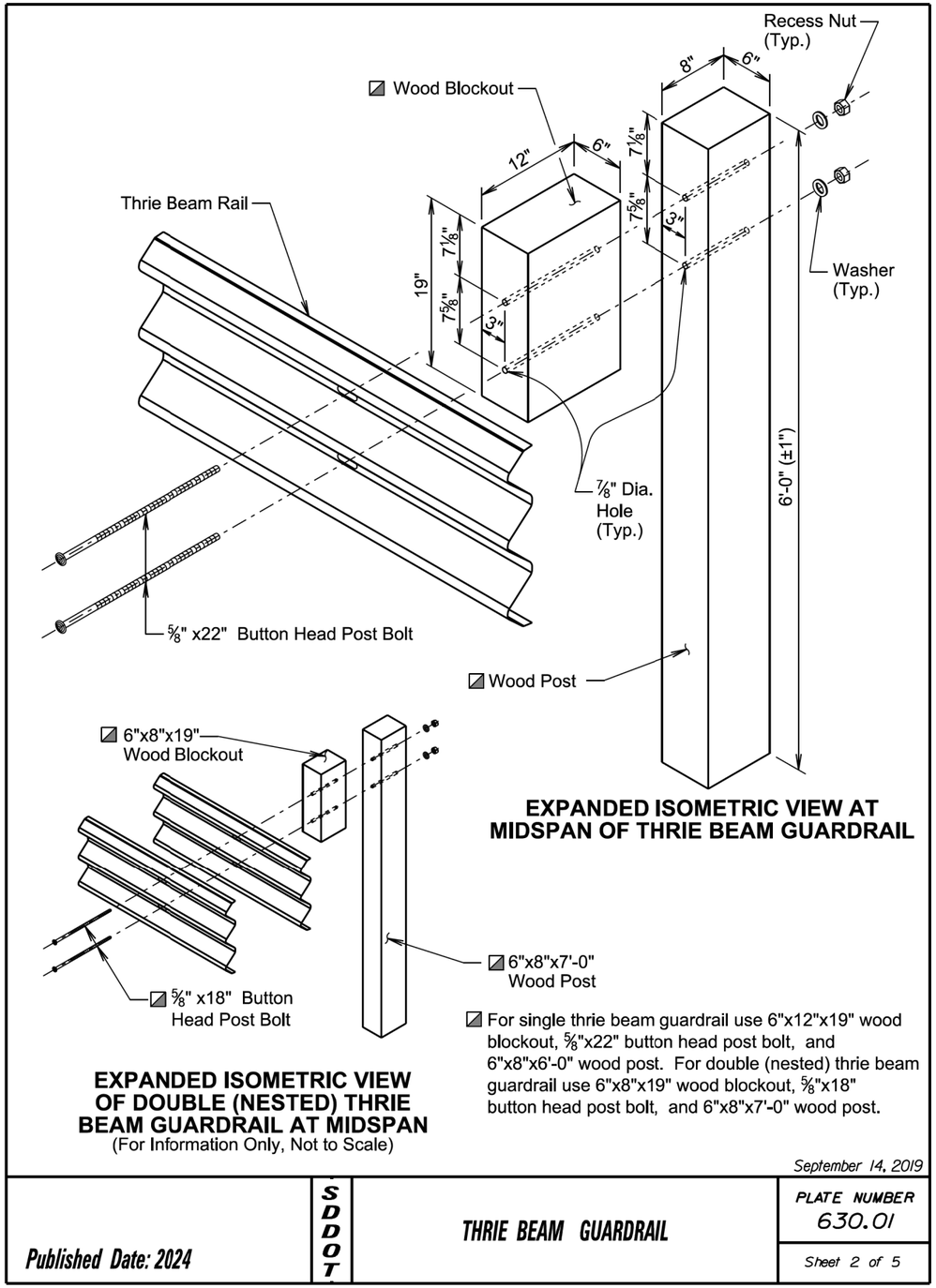
⧄ The post and blockout illustrated above is typical for single thrie beam guardrail. When other variations of posts and blockouts are specified on other standard plates (e.g. transitions) then the posts and blockouts will be as specified on the other standard plates or as specified in the plans.

Slots in the rails will be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges will be smooth and free of burrs or notches.

The top of post and top of block will have a true square cut. The top of block will be a maximum of ±½ inch from the top of the post.

September 14, 2019

Published Date: 2024	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 1 of 5



EXPANDED ISOMETRIC VIEW AT MIDSPAN OF THRIE BEAM GUARDRAIL

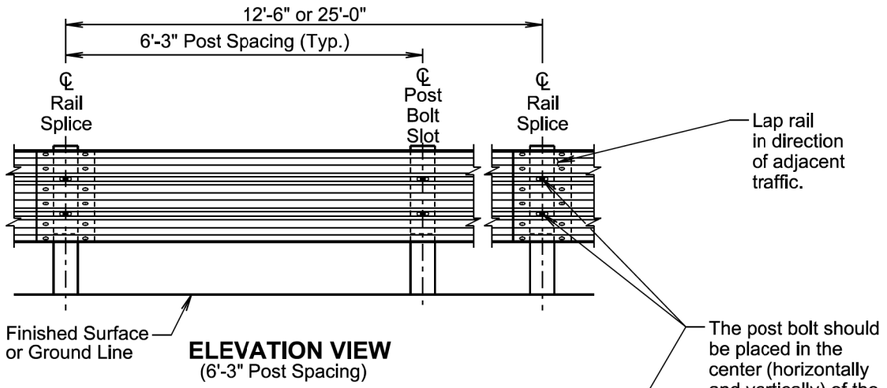
EXPANDED ISOMETRIC VIEW OF DOUBLE (NESTED) THRIE BEAM GUARDRAIL AT MIDSPAN
(For Information Only, Not to Scale)

⧄ For single thrie beam guardrail use 6"x12"x19" wood blockout, ⅝"x22" button head post bolt, and 6"x8"x6'-0" wood post. For double (nested) thrie beam guardrail use 6"x8"x19" wood blockout, ⅝"x18" button head post bolt, and 6"x8"x7'-0" wood post.

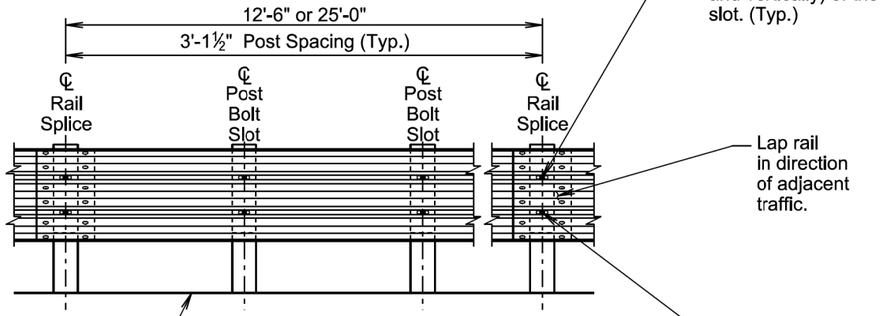
September 14, 2019

Published Date: 2024	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 2 of 5

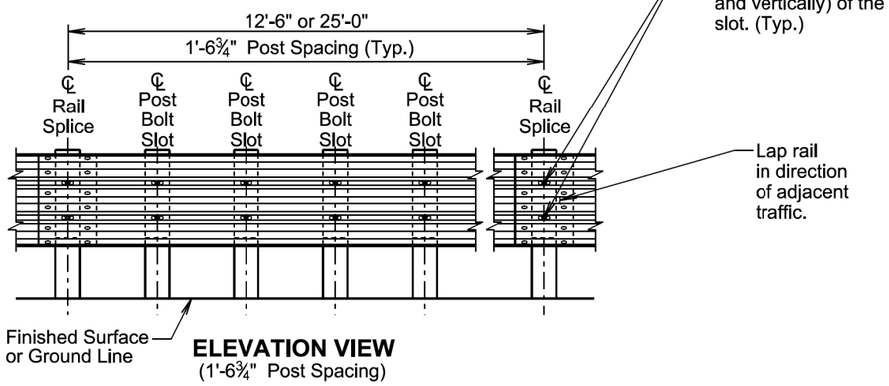
PLOT SCALE - 1:200
PLOT NAME - 6
FILE -...\STD PLATES\STD 630 PLATES.DGN
_PLOTTED FROM - TRM11NT15



ELEVATION VIEW
(6'-3" Post Spacing)



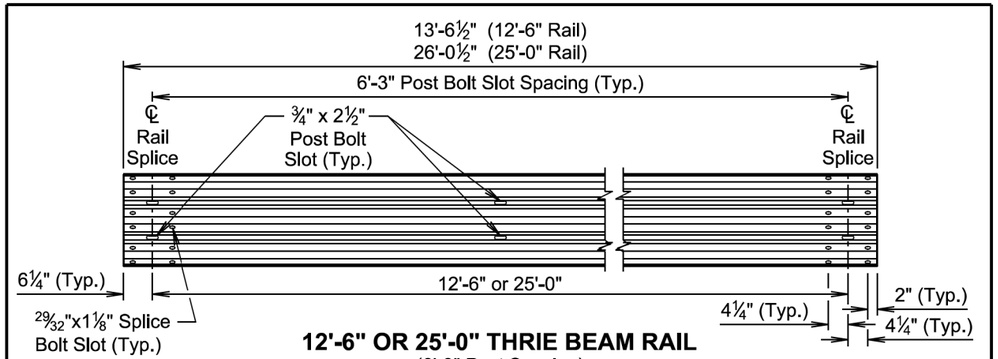
ELEVATION VIEW
(3'-1½" Post Spacing)



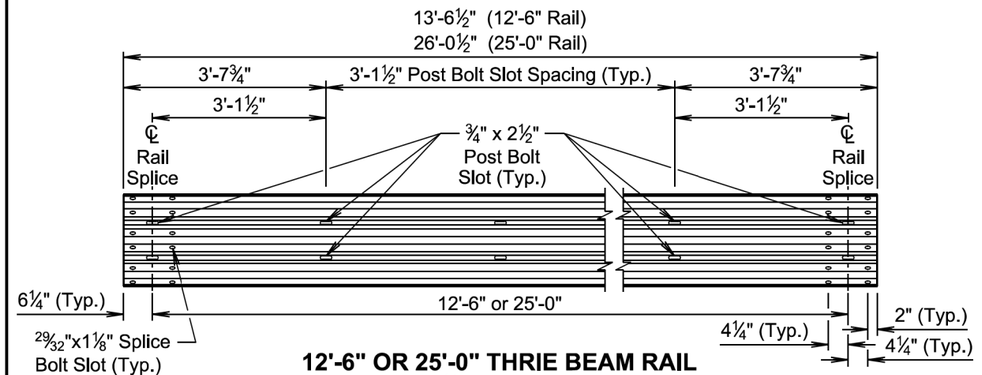
ELEVATION VIEW
(1'-6¾" Post Spacing)

September 14, 2019

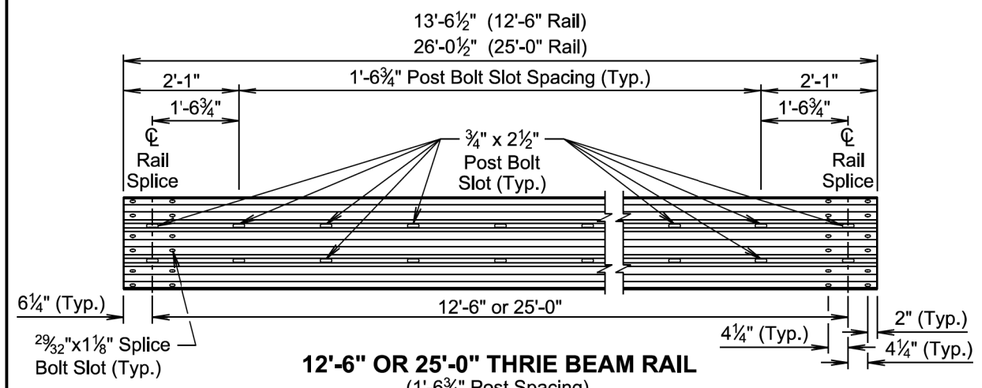
Published Date: 2024	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 3 of 5



12'-6" OR 25'-0" THRIE BEAM RAIL
(6'-3" Post Spacing)



12'-6" OR 25'-0" THRIE BEAM RAIL
(3'-1½" Post Spacing)

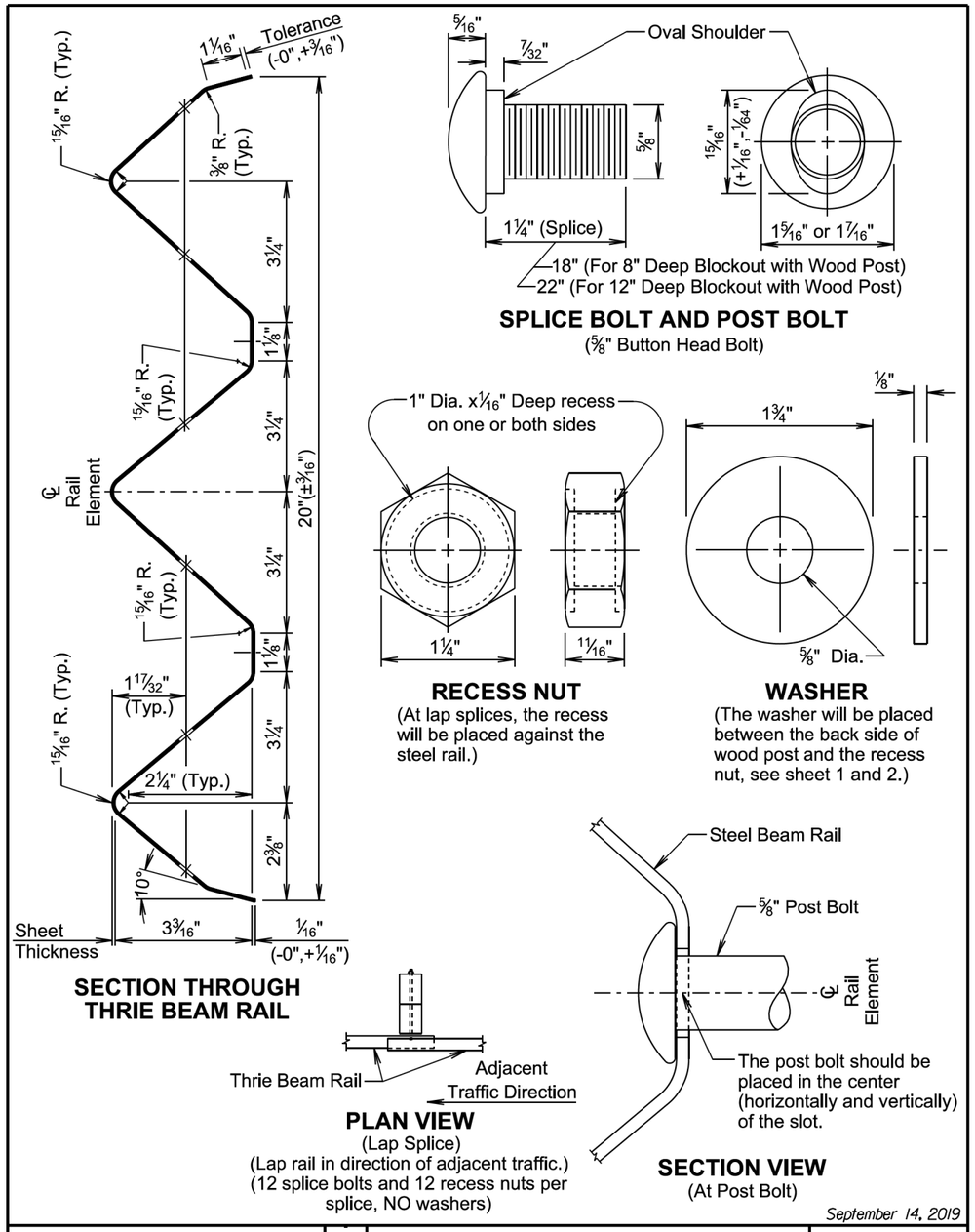


12'-6" OR 25'-0" THRIE BEAM RAIL
(1'-6¾" Post Spacing)

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Published Date: 2024	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 4 of 5

PLOT SCALE - 1:200
PLOT NAME - 7
FILE - ...\STD PLATES\STD 630 PLATES.DGN
_PLOTTED FROM - TRM11NT15



SPLICE BOLT AND POST BOLT
(5/8" Button Head Bolt)

RECESS NUT
(At lap splices, the recess will be placed against the steel rail.)

WASHER
(The washer will be placed between the back side of wood post and the recess nut, see sheet 1 and 2.)

SECTION THROUGH THRIE BEAM RAIL

PLAN VIEW
(Lap Splice)
(Lap rail in direction of adjacent traffic.)
(12 splice bolts and 12 recess nuts per splice, NO washers)

SECTION VIEW
(At Post Bolt)

September 14, 2019

Published Date: 2024

SDDOT

THRIE BEAM GUARDRAIL

PLATE NUMBER 630.01

Sheet 5 of 5

PLOT SCALE - 1:200
PLOT NAME - 8
FILE - ...\STD PLATES\STD 630 PLATES.DGN
.PLOTTED FROM - TRM11NT15

TYPE AND DETAILS OF MGS						
Type of MGS	W Beam Rail Single or Double (Nested)	Blockout Size	Blockout Material	Post Size	Post Material	Post Spacing
1	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	6'-3"
1C	Single	6"x12"x14"	Wood	6"x8"x7'-6"	Wood	6'-3"
2	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	3'-1½"
3	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	1'-6¾"
4	Double	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	6'-3"

STANDARD PLATE REFERENCE	
Type of MGS	See Standard Plate(s)
1	630.20, 630.22
1C	630.20, 630.25
2	630.20
3	630.20
4	630.20

GENERAL NOTES:

Asphalt concrete will be the same type used elsewhere on the project or will be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete will conform to the Specifications for "Asphalt Concrete Composite".

Granular material will be the same type used elsewhere on the project or will be as specified in the plans. If granular material type is not specified in the plans, the material will conform to the Specifications for "Base Course". The granular material will be placed the same thickness as the mainline surfacing or as specified in the plans.

Topsoil is not shown in the transverse section drawing on sheet 2 of 6.

All W beam rail will be Type 1 and Class A (12 Ga.) unless specified otherwise in the plans.

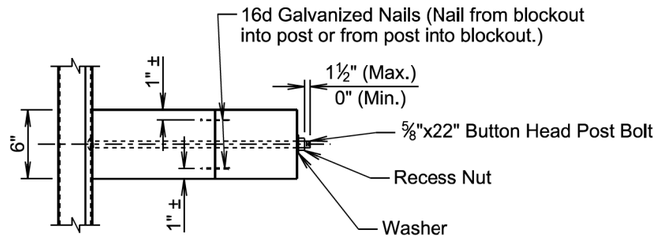
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used will be compatible with the total length of rail per site as shown in the plans.

Slots in the rails will be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges will be smooth and free of burrs or notches.

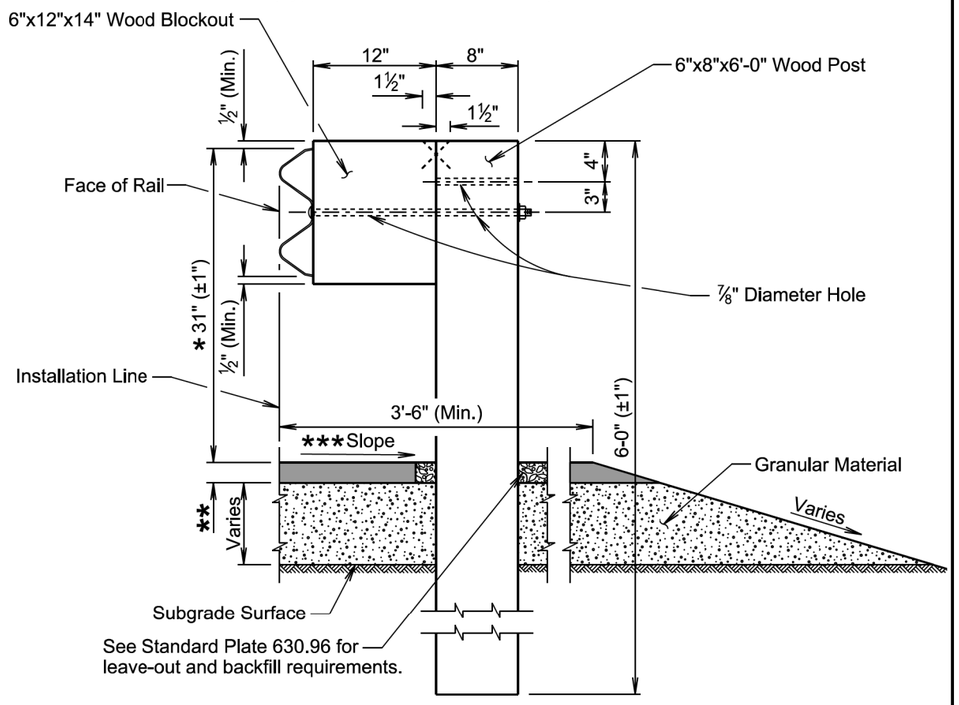
All costs for constructing the MGS including labor, equipment, and materials including all posts, blockouts, steel beam rail, and hardware will be incidental to the contract unit price per foot for the respective MGS contract item.

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			Sheet 1 of 6



TOP VIEW
(Type 1, 2, or 3 MGS Installation)



TRANSVERSE SECTION
(Type 1, 2, or 3 MGS Installation)

* See Standard Plate 630.99

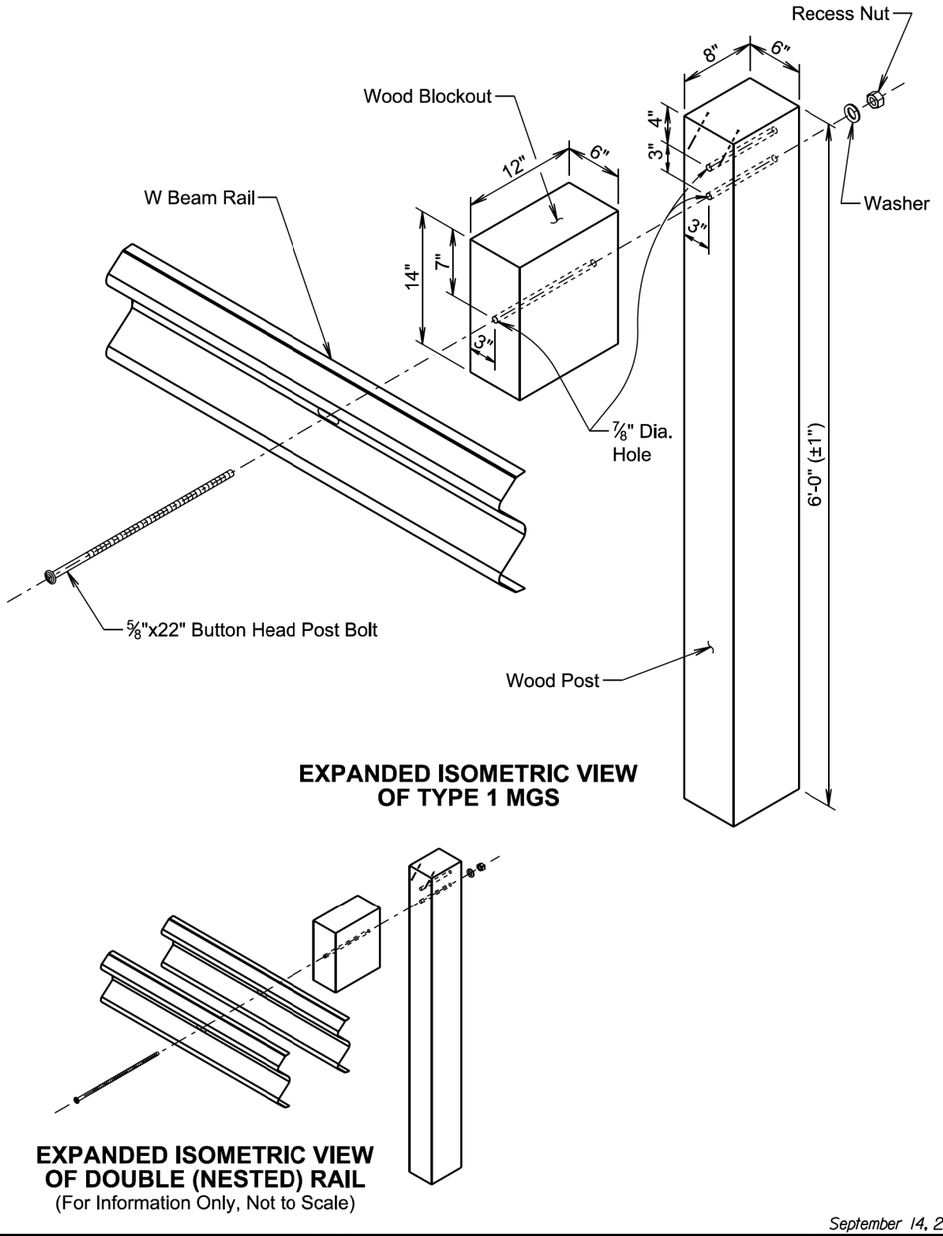
** 2" asphalt concrete or as specified in the plans.

*** The cross slope will be as specified in the plans; however, the cross slope will not be steeper than a 10:1 slope.

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Published Date: 2024	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 2 of 6

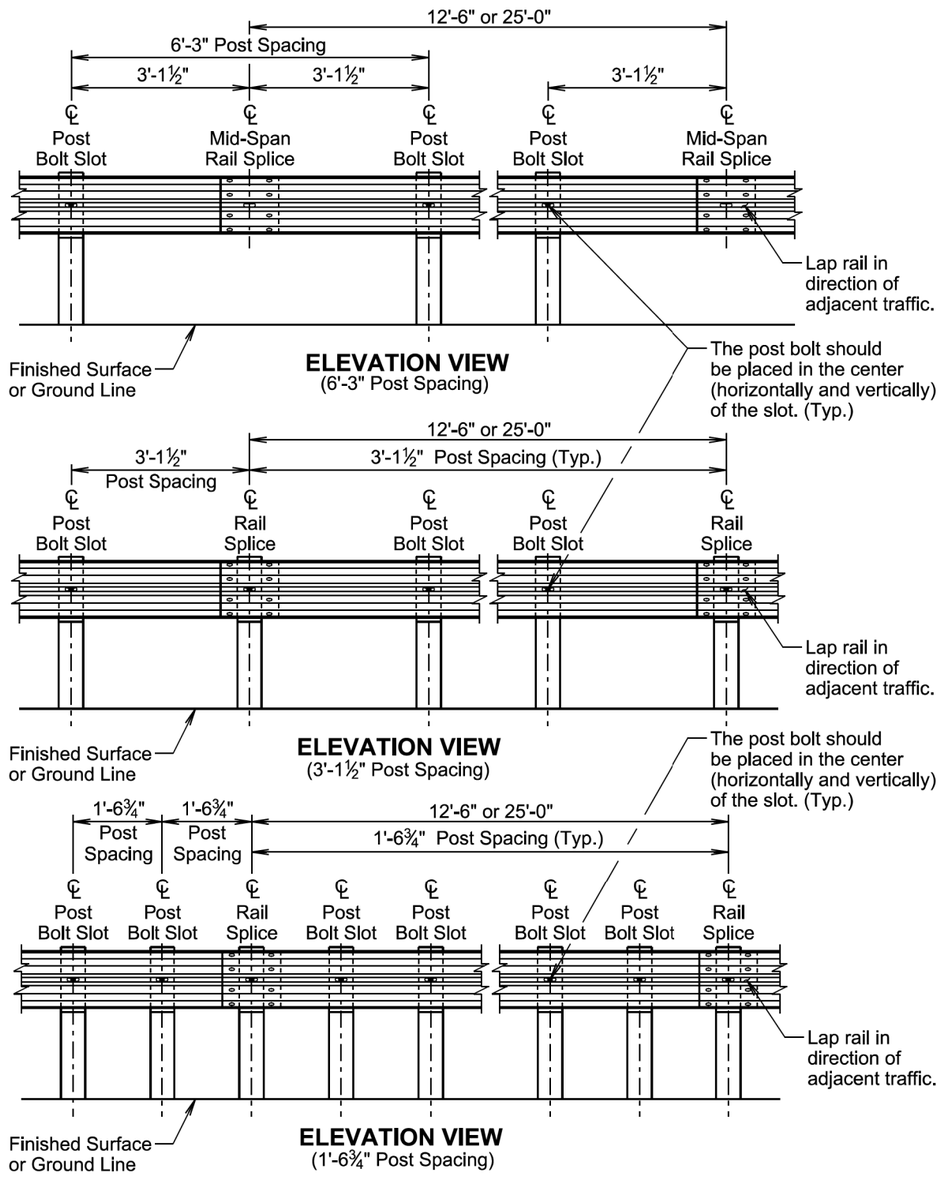
PLOT SCALE - 1:200
PLOT NAME - 9
FILE ...\STD PLATES\STD 630 PLATES.DGN
.PLOTTED FROM - TRM1INT15



EXPANDED ISOMETRIC VIEW OF TYPE 1 MGS

EXPANDED ISOMETRIC VIEW OF DOUBLE (NESTED) RAIL
(For Information Only, Not to Scale)

September 14, 2019



ELEVATION VIEW
(6'-3" Post Spacing)

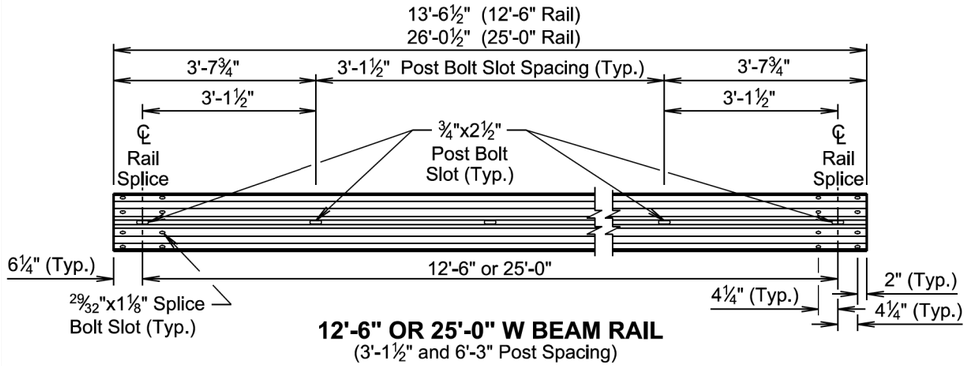
ELEVATION VIEW
(3'-1½" Post Spacing)

ELEVATION VIEW
(1'-6¾" Post Spacing)

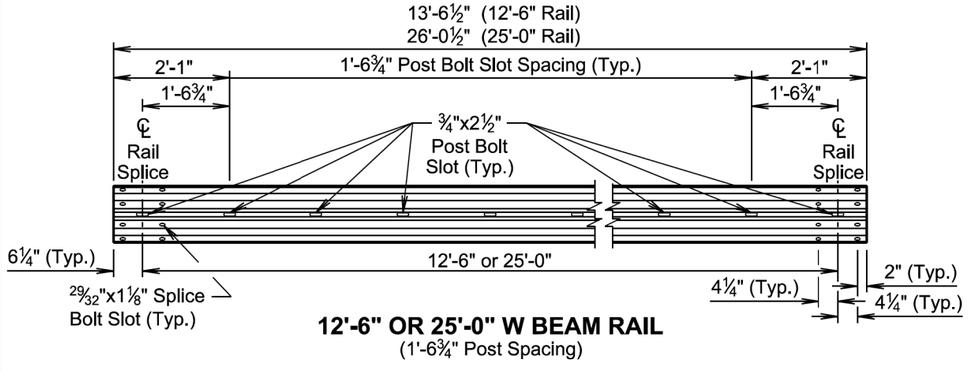
September 14, 2019

PLOT SCALE - 1:200
PLOTTED FROM - TRM11NT15
PLOT NAME - 10
FILE - ...\STD PLATES\STD 630 PLATES.DGN

PLOT SCALE - 1:200



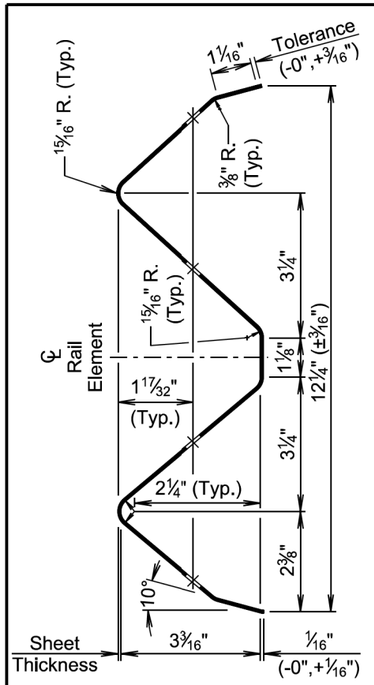
12'-6" OR 25'-0" W BEAM RAIL
(3'-1½" and 6'-3" Post Spacing)



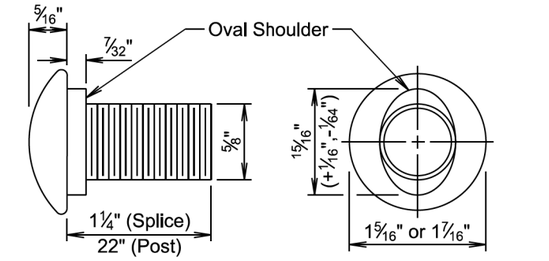
12'-6" OR 25'-0" W BEAM RAIL
(1'-6¾" Post Spacing)

September 14, 2019

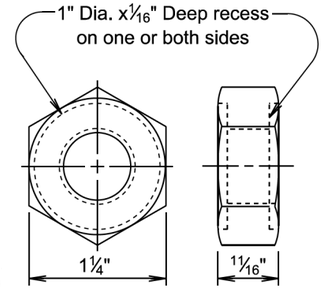
Published Date: 2024	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 5 of 6



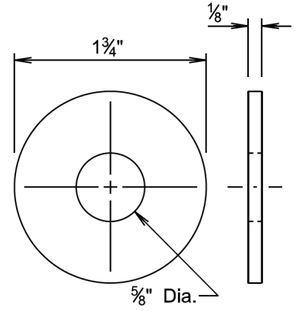
SECTION THROUGH W BEAM RAIL



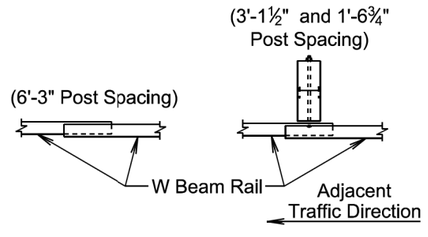
SPLICE BOLT AND POST BOLT
(⅝" Button Head Bolt)



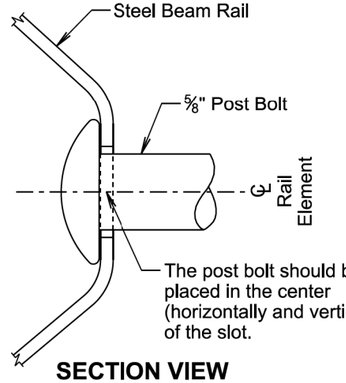
RECESS NUT
(At lap splices, the recess will be placed against the steel rail.)



WASHER
(The washer will be placed between the back side of wood post and the recess nut, see sheet 2 and 3.)



PLAN VIEW
(Lap Splice)
(Lap rail in direction of adjacent traffic.)
(8 splice bolts and 8 recess nuts per splice, NO washers)

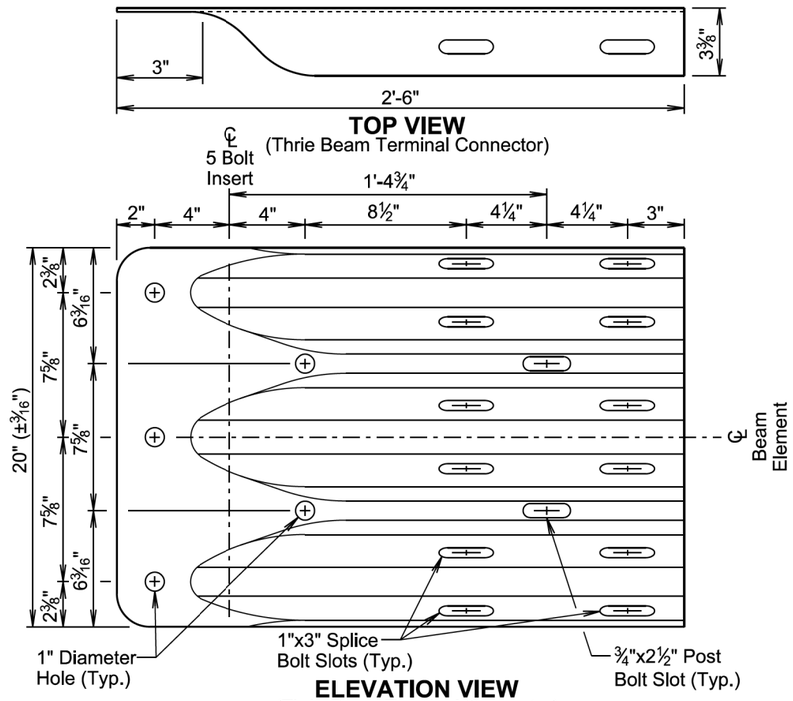


SECTION VIEW
(At Post Bolt)

September 14, 2019

Published Date: 2024	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 6 of 6

PLOT NAME - 11
FILE - ...\STD PLATES\STD 630 PLATES.DGN
.PLOTTED FROM - TRM11NT15



GENERAL NOTES:

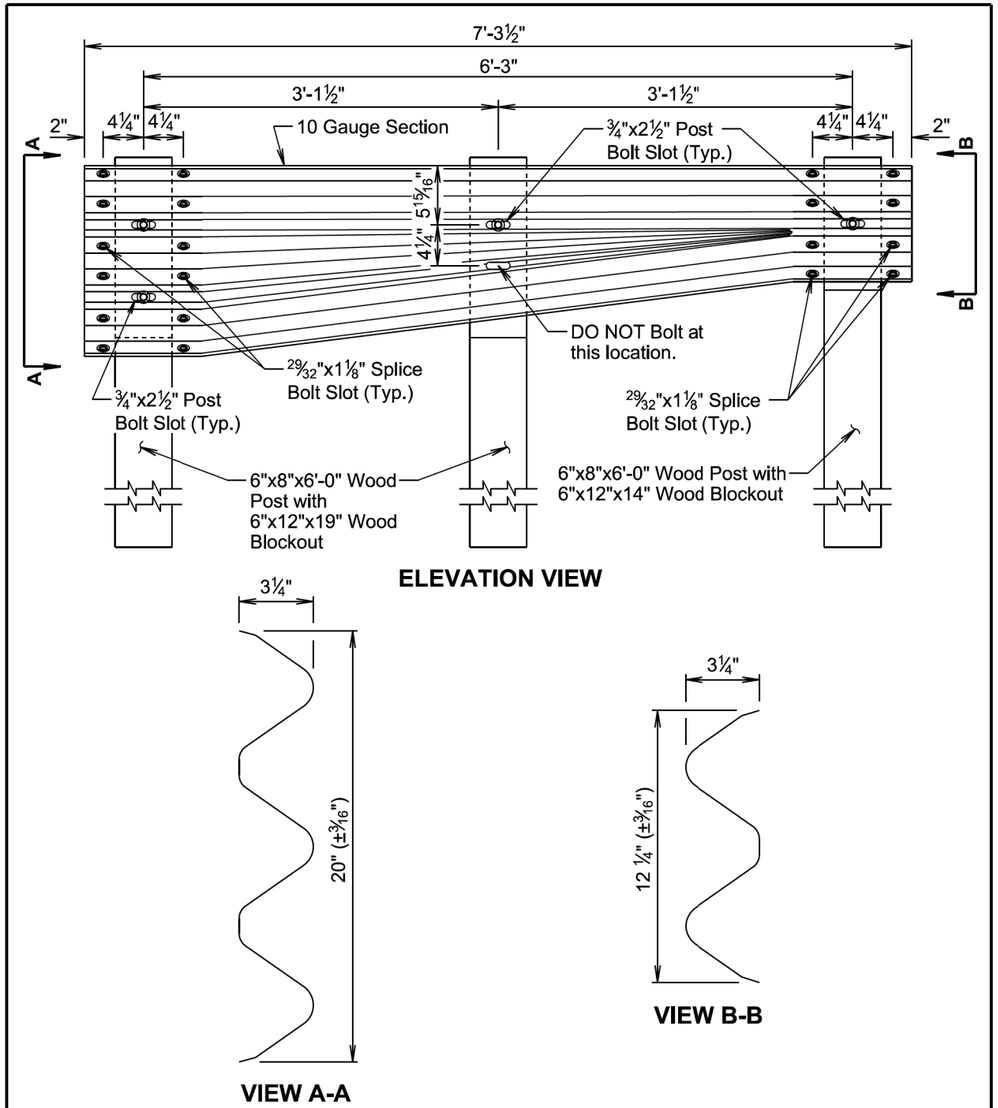
Thrie Beam Terminal Connectors will be 10 gauge.

When the thrie beam terminal connector is used to connect the rail to the bridge or concrete end block, 1" steel washers will be used at the lap splice and the washers will be in direct contact with the 3" slots of the thrie beam terminal connector. See the drawings above for the typical locations of the 1" steel washers.

There will be no separate payment for furnishing and installing the thrie beam terminal connector. All costs for furnishing and installing the thrie beam terminal connector will be incidental to the contract unit price of the respective guardrail item it is attached to.

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Published Date: 2024	SDDOT	*THRIE BEAM TERMINAL CONNECTOR*	*PLATE NUMBER* 630.47
			Sheet 1 of 1



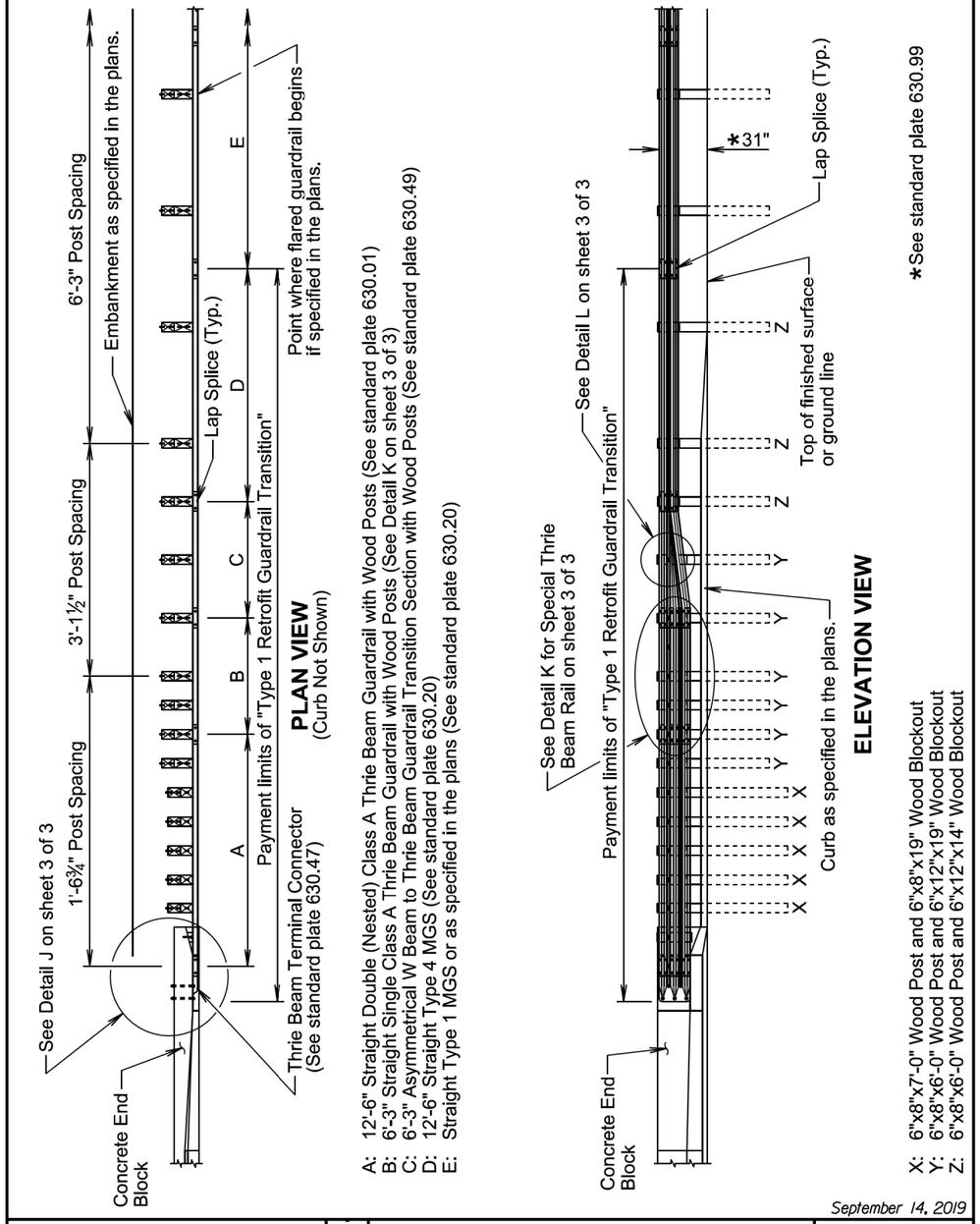
GENERAL NOTES:

All costs for furnishing and installing the asymmetrical W beam to thrie beam guardrail transition including labor, equipment, and materials including two posts, two blocks, asymmetrical W beam to thrie beam transition section, and hardware will be incidental to the contract unit price per each for the corresponding guardrail transition contract item.

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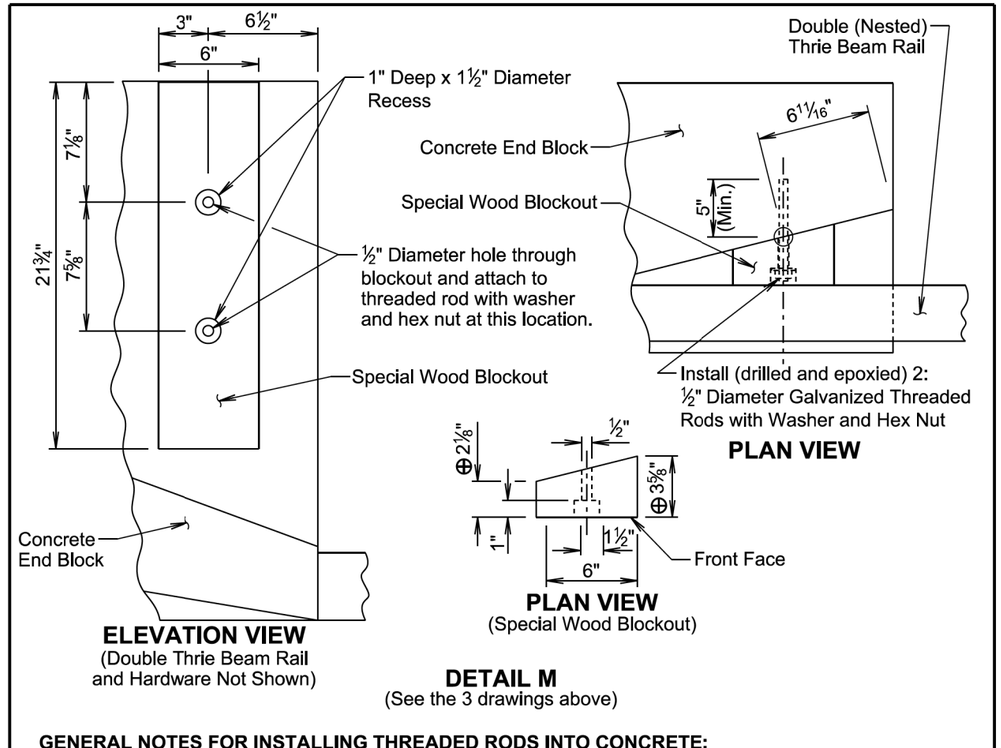
Published Date: 2024	SDDOT	*ASYMMETRICAL W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION*	*PLATE NUMBER* 630.49
			Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 12
FILE - ...\STD PLATES\STD 630 PLATES.DGN
_PLOTTED FROM - TRM11NT15



September 14, 2019

Published Date: 2024	SDDOT	TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.51
			Sheet 1 of 3



GENERAL NOTES FOR INSTALLING THREADED RODS INTO CONCRETE:

⊕ The dimensions shown are estimated based on original construction plans of the concrete end block. The special wood blockout will be cut as necessary such that the front face of the special wood blockout will align with the vertical front face of the concrete end block ±½".

The threaded rods will be ½" diameter and conform to ASTM F1554, Grade 55. The threaded rods will be embedded a minimum of 5" into the concrete.

The diameter of the drilled holes will not be less than ⅛" greater or more than ⅜" greater than the diameter of the threaded rods or as per the Manufacturer's recommendations. The holes will not be drilled using core bits. The drilled holes will be blown out with compressed air using a device that will reach the back of the hole to ensure that all debris or loose material has been removed prior to the epoxy injection.

The epoxy resin mixture will be of a type for bonding steel to hardened concrete and will conform to AASHTO M235 Type IV, Grade 3 (Equivalent to ASTM C881, Type IV, Grade 3).

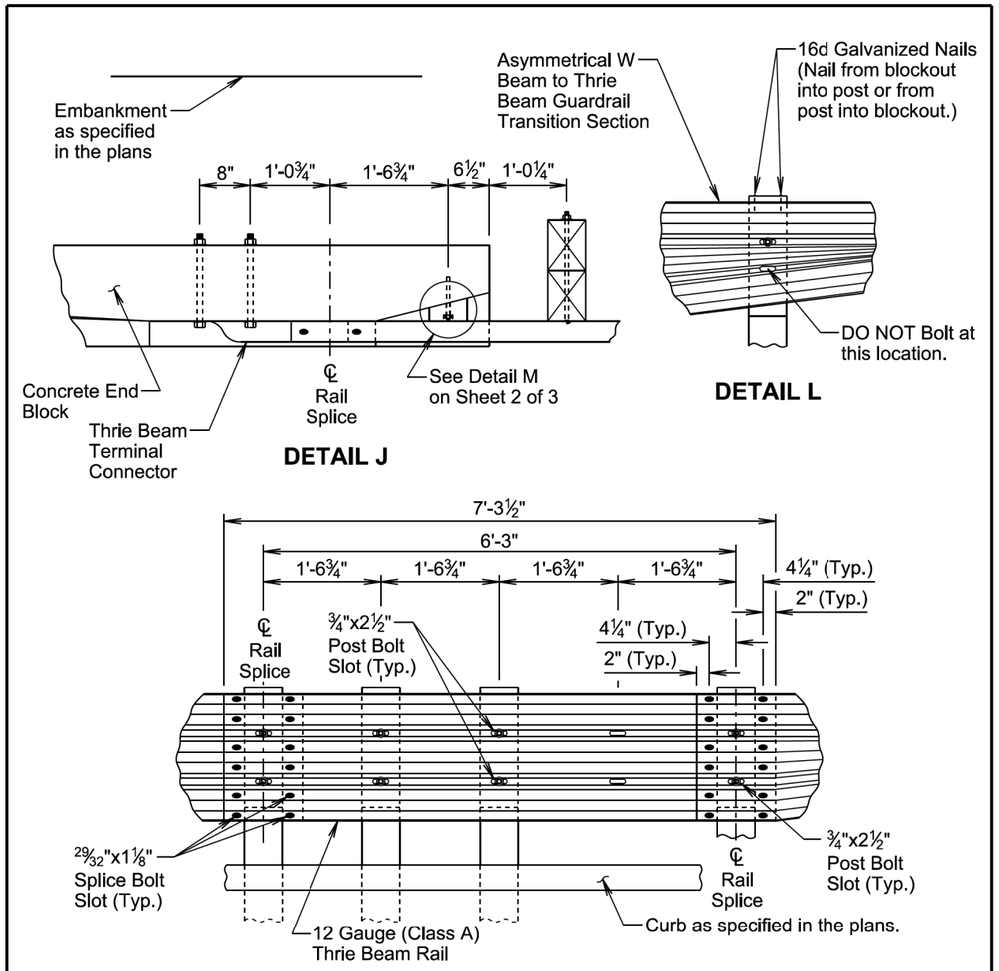
Mix epoxy resin as recommended by the Manufacturer and apply by an injection method as approved by the Engineer. Beginning at the back of the drilled holes, fill the holes ⅓ to ½ full of epoxy, or as recommended by the Manufacturer, prior to insertion of the steel rod. Rotate the steel rod during installation to eliminate voids and ensure complete bonding of the rod. Insertion of the rods by the dipping or painting methods will not be allowed.

Loads will not be applied to the epoxy grouted threaded rods until the epoxy resin has had sufficient time to cure as specified by the epoxy resin Manufacturer.

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Published Date: 2024	SDDOT	TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.51
			Sheet 2 of 3

PLOT SCALE - 1:200
PLOT NAME - 13
FILE ...\STD PLATES\STD 630 PLATES.DGN
PLOTTED FROM - TRMIINT15



DETAIL J

DETAIL L

DETAIL K
(Special Thrie Beam Rail)

GENERAL NOTES:

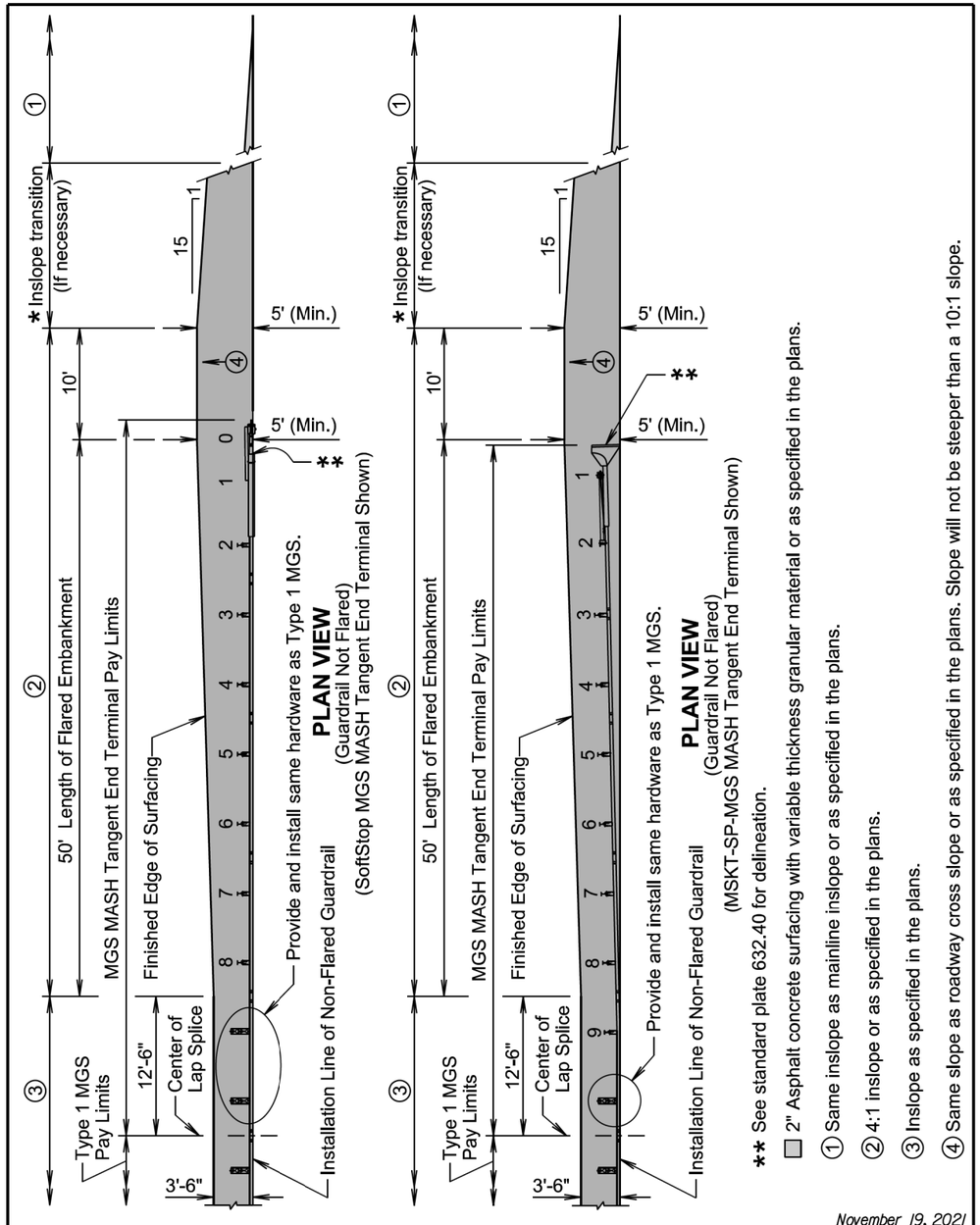
Throughout the type 1 retrofit guardrail transition, slots in the rails will be provided as specified in the plans and by the Manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges will be smooth and free of burrs or notches.

All costs for furnishing and installing the type 1 retrofit guardrail transition including labor, equipment, and materials which includes all rail sections, posts and blockouts, special blockout, hardware, and incidentals will be included in the contract unit price per each for "Type 1 Retrofit Guardrail Transition".

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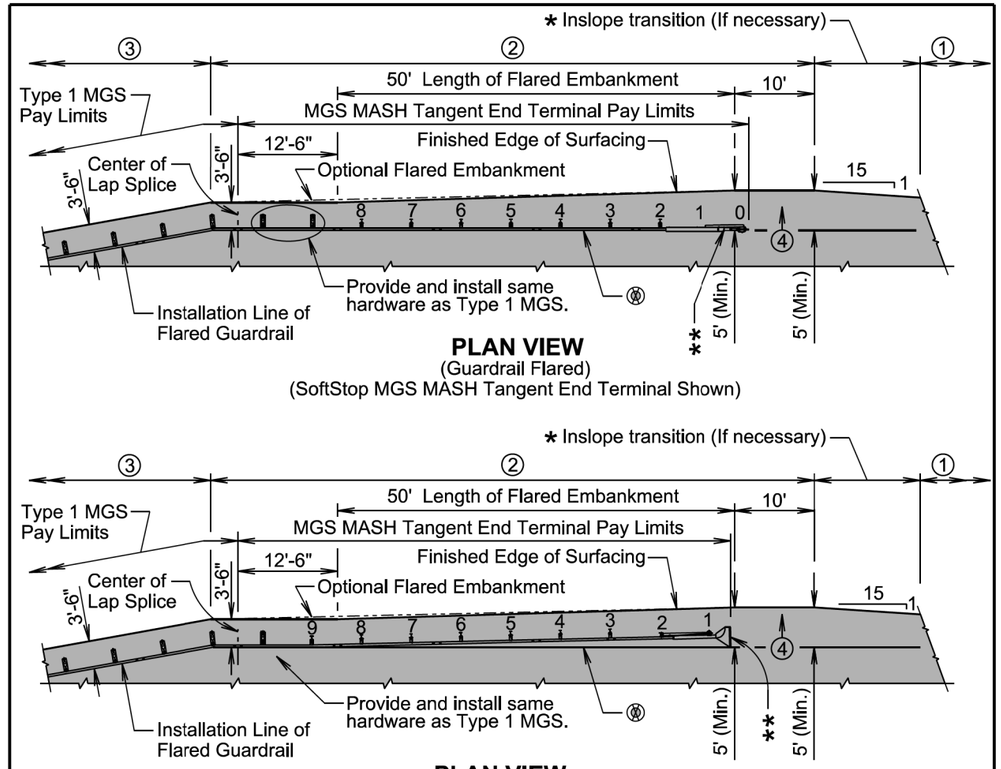
Published Date: 2024	SDDOT	***TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))***	*PLATE NUMBER* 630.51
			Sheet 3 of 3

PLOT SCALE - 1:200
PLOT NAME - 14
FILE - ...\STD PLATES\STD 630 PLATES.DGN
PLOTTED FROM - TRM11INT15



November 19, 2021

Published Date: 2024	SDDOT	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH TANGENT END TERMINAL	PLATE NUMBER 630.89 Sheet 1 of 2



GENERAL NOTES:

The MGS MASH tangent end terminals above are for illustrative purpose only. Pay limit length of the MGS MASH tangent end terminal is 62'-6".

* The length of inslope transition varies with the amount of change between inslopes. The length of the transition will change 100' for every whole number change in the inslope. For Example: If the inslope changes from a 5:1 to a 4:1 the length of the inslope transition would be 100'. If the inslope changes from a 6:1 to a 4:1 the length of the inslope transition would be 200'.

Ⓜ The installation reference line for MGS MASH tangent end terminals will always be parallel to the roadway.

Asphalt concrete will be the same type used elsewhere on the project or will be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete will conform to the Specifications for "Asphalt Concrete Composite."

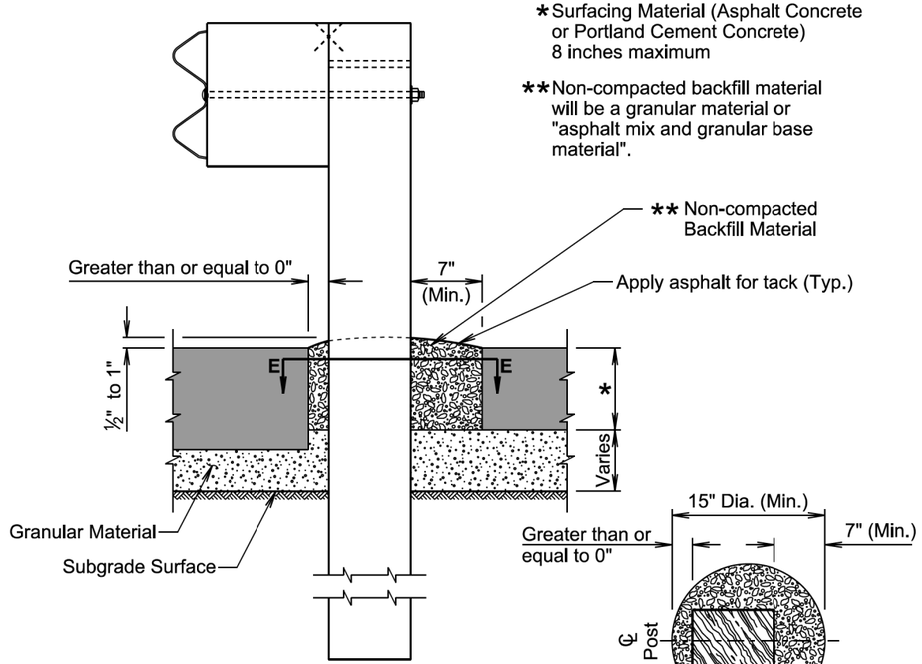
Granular material will be the same type used elsewhere on the project or will be as specified in the plans. If granular material type is not specified in the plans, the material will conform to the Specifications for "Base Course". The granular material will be placed the same thickness as the mainline surfacing or as specified in the plans.

November 19, 2021

Published Date: 2024	SDDOT	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH TANGENT END TERMINAL	PLATE NUMBER 630.89 Sheet 2 of 2

PLOT SCALE - 1:200
PLOT NAME - 15
FILE - ...\STD PLATES\STD 630 PLATES.DGN
PLOTTED FROM - TRMI1NT15

PLOT SCALE - 1:200



GENERAL NOTES:

The leave-out limits may be increased to accommodate construction equipment and tolerances.

When posts are installed in augured or dug holes, the backfill material will be compacted to the bottom of the pavement surfacing material to the satisfaction of the Engineer. The backfill material for the thickness of the pavement surfacing material will be non-compacted.

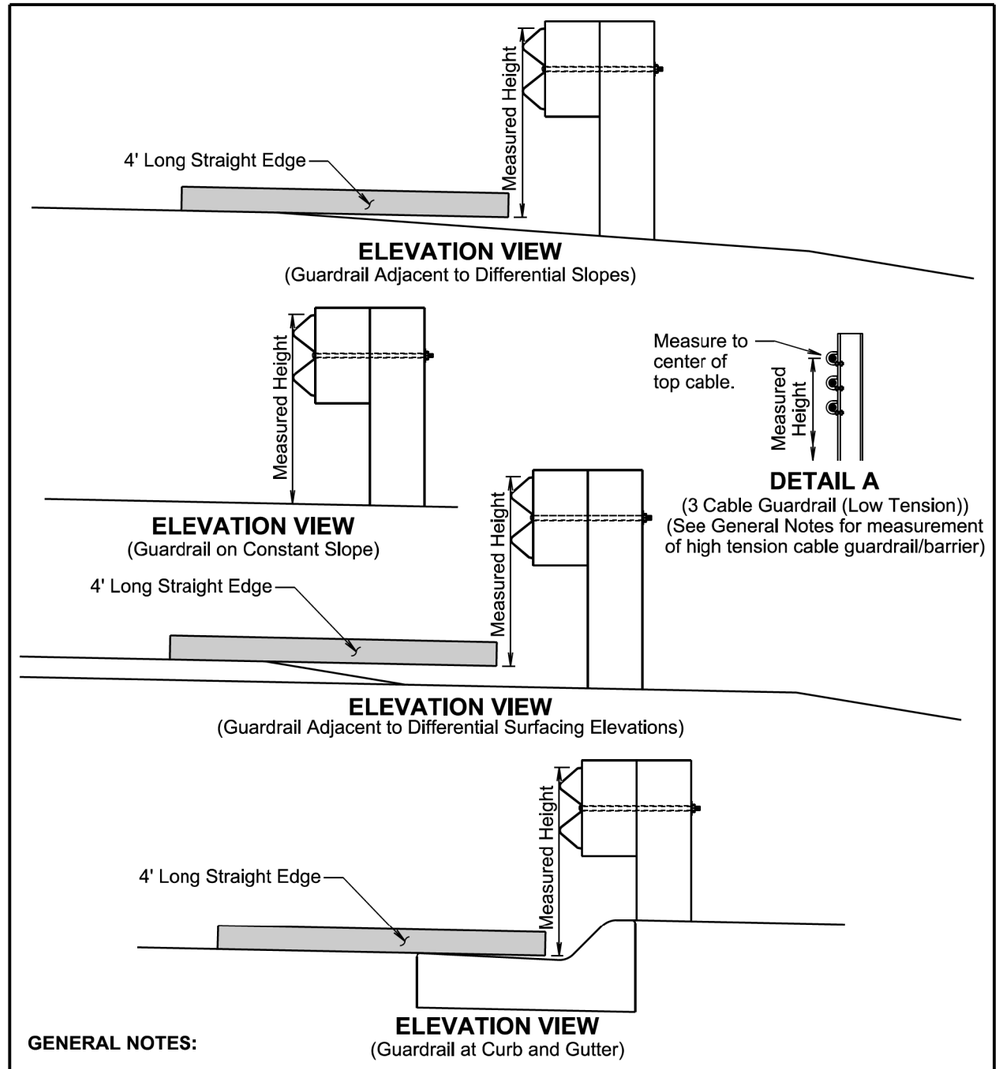
The backfill material will be mounded ½ inch to 1 inch above the top of the adjacent surfacing as illustrated above.

Asphalt for tack will be applied to the surface of the backfill material at the rate of 0.15 to 0.20 gallons per square yard.

All costs for constructing the leave-out including labor, equipment, and materials which includes the backfill material and tack coat will be incidental to the contract unit price for the respective guardrail contract item.

November 19, 2021

Published Date: 2024	SDDOT	GUARDRAIL POST INSTALLED IN ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE	PLATE NUMBER 630.96
			Sheet 1 of 1



GENERAL NOTES:

The W Beam guardrail shown is for illustrative purpose. The guardrail height for all types of guardrail systems except for high tension cable guardrail/barrier will be measured in accordance with this standard plate.

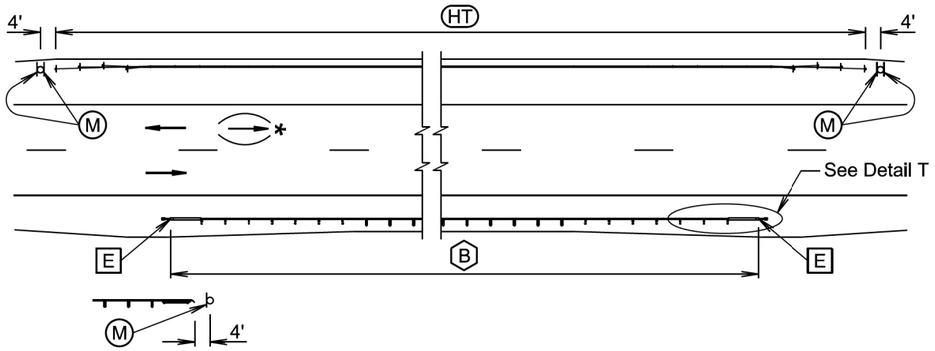
When measuring height of 3 cable guardrail (low tension) the height will be measured to the center of the top cable. See Detail A.

The height of high tension cable guardrail/barrier will be measured in accordance with the Manufacturer's installation instructions.

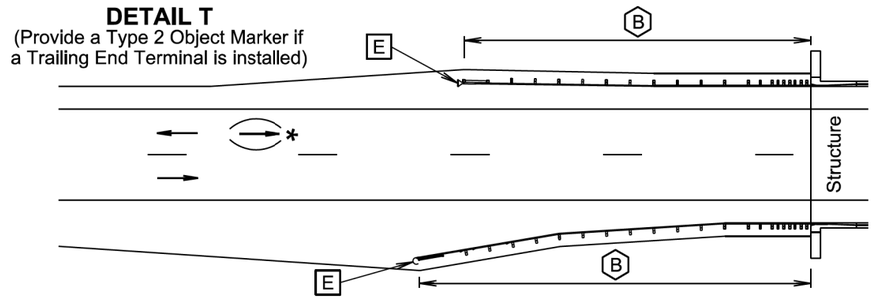
September 14, 2019

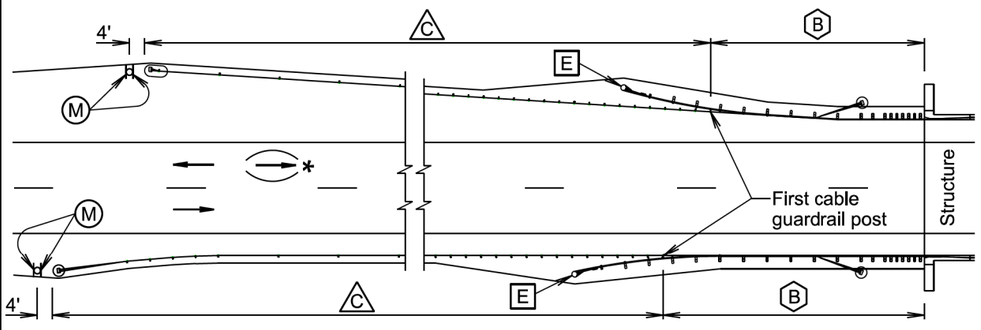
Published Date: 2024	SDDOT	MEASURING GUARDRAIL HEIGHT	PLATE NUMBER 630.99
			Sheet 1 of 1

PLOT NAME - 16
FILE - ...\STD PLATES\STD 630 PLATES.DGN
PLOTTED FROM - TRM11NT15



DETAIL T
(Provide a Type 2 Object Marker if a Trailing End Terminal is installed)





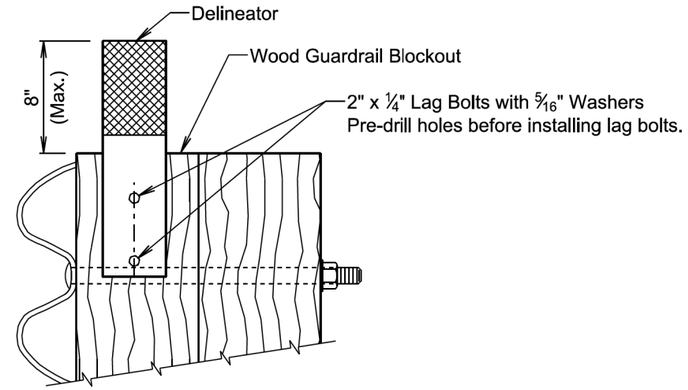
PLAN VIEW
(Typical Guardrail Layouts)

- (B) Steel Beam Guardrail Delineation
- [E] Guardrail End Terminal Object Marker
- (C) 3 Cable Guardrail (Low Tension) Delineation
- (HT) High Tension Cable Guardrail Delineation
- (M) Type 2 Object Marker

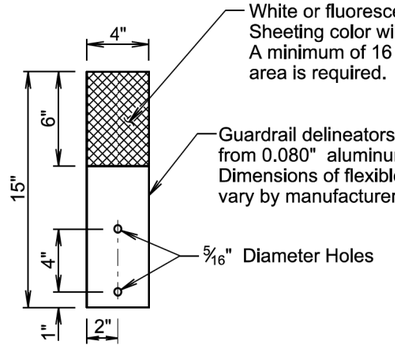
* For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.

December 23, 2019

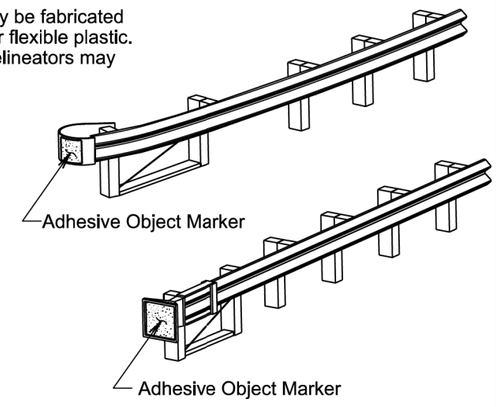
Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 1 of 4



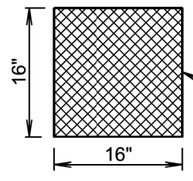
(B) STEEL BEAM GUARDRAIL DELINEATION



DELINEATOR
(For Steel Beam Guardrail)



[E] GUARDRAIL END TERMINAL OBJECT MARKER



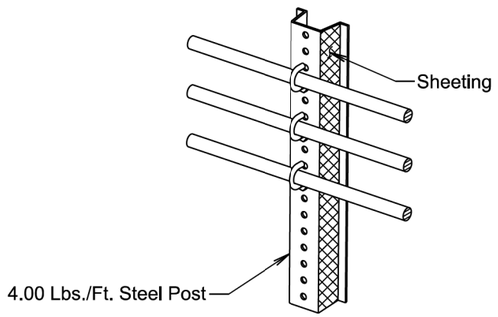
ADHESIVE OBJECT MARKER

Adhesive object marker dimensions may vary due to shape of terminal end. A minimum of 256 square inches of object marker sheeting area is required. The sheeting will be fluorescent yellow.

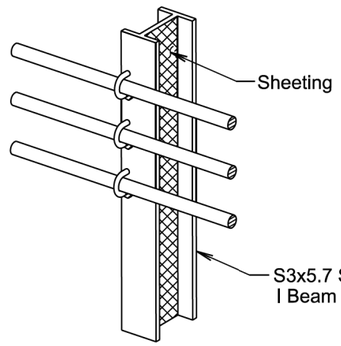
December 23, 2019

Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 2 of 4

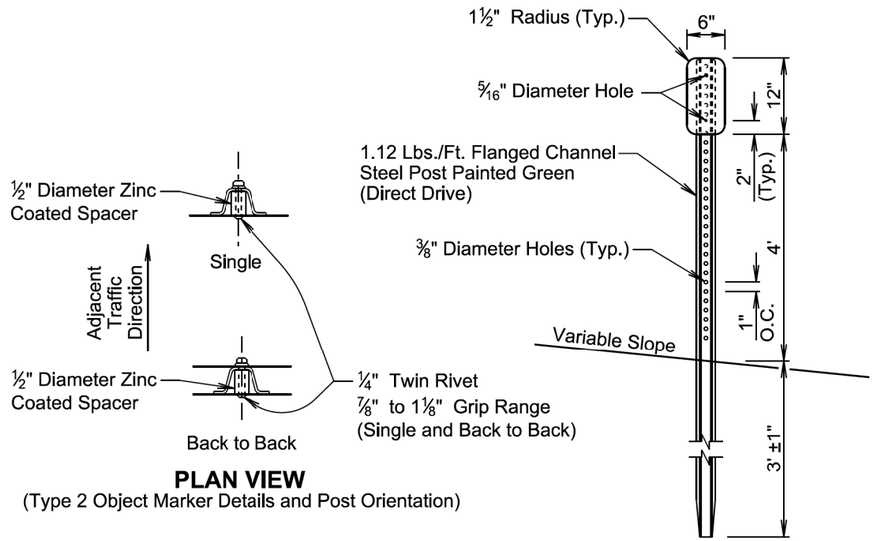
PLOT SCALE - 1:200
PLOT NAME - 17
FILE - ...\STD PLATES\STD 632 PLATES.DGN
.PLOTTED FROM - TRMI1NT15



C 3 CABLE GUARDRAIL (LOW TENSION) DELINEATION



C 3 CABLE GUARDRAIL (LOW TENSION) DELINEATION



PLAN VIEW
(Type 2 Object Marker Details and Post Orientation)

ELEVATION VIEW
(M) (Type 2 Object Marker)
(For Marking 3 Cable Guardrail (Low Tension) Anchor, High Tension Cable Guardrail Anchor, and Trailing End Terminal)

December 23, 2019

Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 3 of 4

GENERAL NOTES:

The delineation of high tension cable guardrail will be reflective sheeting placed back to back on every other post cap or cable spacer. The sheeting will be type XI in conformance with ASTM D4956. The color of the reflective sheeting shall be the same as the nearest pavement marking.

The delineators for steel beam guardrail and sheeting on 3 cable guardrail (low tension) posts will be covered with a minimum of 16 square inches of reflective sheeting. The reflective sheeting will be type XI in conformance with ASTM D4956. Along two-way roadways the sheeting will be on both sides of the delineators and guardrail posts and will be white in color. For one-way roadways the sheeting will only be required on the side facing traffic and the color will be the same as the nearest pavement marking, yellow on the left side of the roadway and white on the right side.

When steel beam guardrail is attached to a bridge the first delineator will be attached to the post nearest the bridge.

At bridges with guardrail less than 200 feet in length, a minimum of 4 delineators will be placed in addition to the end terminal yellow object marker. The spacing between the delineators will be approximately one third of the length of the guardrail.

At bridges with guardrail 200 feet and greater in length, including bridges that have steel beam guardrail transitioning to 3 cable guardrail (low tension), the delineators will be placed at a spacing of approximately 50 feet. Delineation will extend throughout the length of the guardrail system.

Steel beam guardrail that is not attached to a bridge and is less than 200 feet in length, a minimum of 4 delineators will be placed in addition to the end terminal yellow object markers. The spacing between the delineators will be approximately one third of the length of the guardrail.

Steel beam guardrail that is not attached to a bridge and is 200 feet and greater in length, including steel beam guardrail transitioning to 3 cable guardrail (low tension), the delineators will be placed at a spacing of approximately 50 feet. Delineation will extend throughout the length of the guardrail system.

All costs for furnishing and installing single or back to back guardrail delineation on 3 cable guardrail and steel beam guardrail will be included in the contract unit price per each for "Guardrail Delineator".

All costs for furnishing and installing the reflective sheeting on the cable spacers or post caps for the high tension cable guardrail will be incidental to the respective high tension cable guardrail contract item.

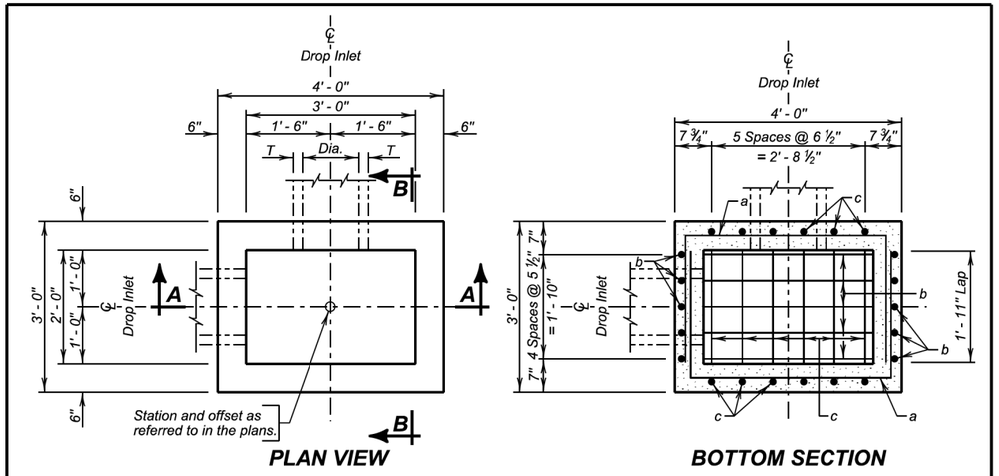
An adhesive object marker will be placed on the end of the W beam guardrail or MGS end terminal. The adhesive object marker dimensions may vary due to the shape of the terminal end. A minimum of 256 square inches of object marker reflective sheeting area is required. The reflective sheeting will be fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the adhesive object marker will be incidental to various contract items.

A type 2 object marker will be placed adjacent to the 3 cable guardrail (low tension) anchor, high tension cable guardrail anchor, and trailing end terminal at the location noted on sheet 1 of this standard plate. The type 2 object marker (6" x 12") will have fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the type 2 object marker including the steel post, 6" x 12" reflective panel, and hardware will be included in the contract unit price per each for "Type 2 Object Marker" for single-sided and "Type 2 Object Marker Back to Back" for back to back type 2 object markers.

December 23, 2019

Published Date: 2024	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 4 of 4

PLOT SCALE - 1:200
PLOT NAME - 18
FILE - ...\STD PLATES\STD 632 PLATES.DGN
.PLOTTED FROM - TRMIINT15



PLAN VIEW

BOTTOM SECTION

ESTIMATED QUANTITIES

ITEM	UNIT	CONSTANT QUANTITY	VARIABLE QUANTITY
✳ Class M6 Concrete	Cu. Yd.	0.26	0.22H
Reinforcing Steel	Lb.	83.03	28.97H
Frame and Grate Assembly	Each	1	———

DROP INLETS FOR 12" TO 24" DIAMETER PIPE

SPECIFICATIONS

Design Specifications: AASHTO LRFD Bridge Design Specifications, 2012 Edition.

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

GENERAL NOTES:

Design Live Load: HL-93. No construction loading in excess of legal load was considered.

Reinforcing steel shall conform to ASTM A615 grade 60. The d bars shall be lapped 12 inches with the b and c bars. Cut and bend reinforcing steel as required to place pipe(s) through the drop inlet wall.

Drop inlet may be precast. If precast drop inlet details differ from this standard plate, submit a checked design done by a SD registered P.E. and shop plans to the Office of Bridge Design for approval.

✳ Reduce total quantities of concrete by the amount of concrete displaced by the pipe(s). The total quantity of concrete shall be computed to the nearest hundredth of a cubic yard. The total quantity of reinforcing steel shall be computed to the nearest pound.

Drop inlet shown may be modified by the addition or omission of connecting pipes as noted elsewhere in the plans. All pipes entering drop inlet must fit between the inside face of walls and shall nct enter through the corners.

Maximum R.C.P. diameter shall not exceed 18 inches on the 2-foot wide side and shall not exceed 24 inches (24 inches for R.C. arch) on the 3-foot wide side of the drop inlet.

The dimension of H is in feet. Maximum H is 10 feet.

PIPE DISPLACEMENT REDUCTIONS

	Diameter (Inches)	Wall T (Inches)	Class M6 Concrete (Cu. Yd.)
R.C.P.	12	2	0.03
	15	2 ¼	0.04
	18	2 ½	0.05
	24	3	0.09
R.C. ARCH	18	2 ½	0.05
	24	3 ½	0.09

December 16, 2015

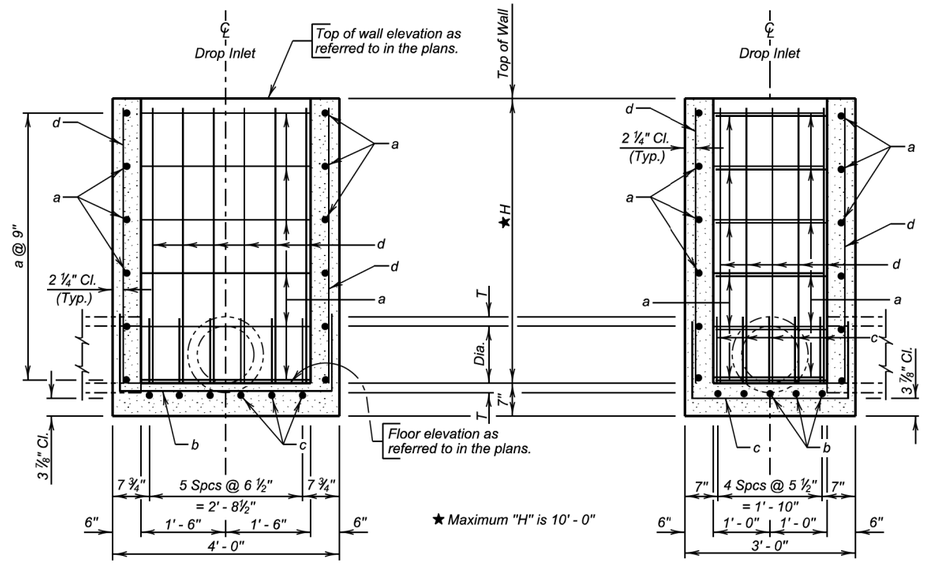
Published Date: 2024

SDDOT

2' X 3' TYPE B
REINFORCED CONCRETE DROP INLET

PLATE NUMBER 670.01

Sheet 1 of 2



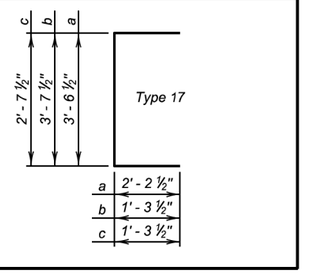
★ Maximum "H" is 10' - 0"

SEC. A - A

SEC. B - B

REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type	Bending Details
a	2.67H	4	8' - 0"	17	
b	5	5	6' - 3"	17	
c	6	4	5' - 3"	17	
d	22	4	H - 2"	Str.	



NOTE:
All dimensions are out to out of bars.

December 16, 2015

Published Date: 2024

SDDOT

2' X 3' TYPE B
REINFORCED CONCRETE DROP INLET

PLATE NUMBER 670.01

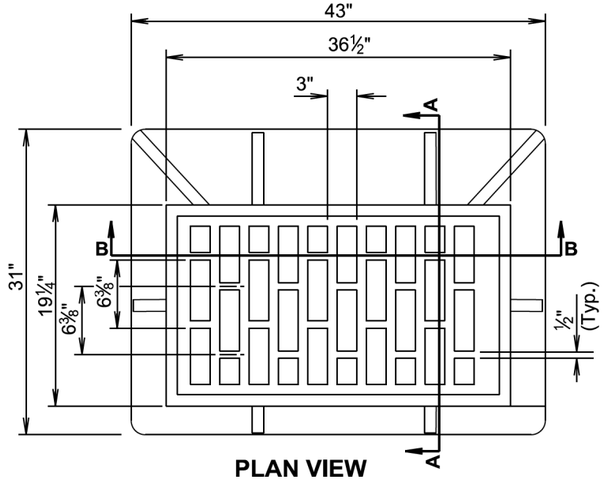
Sheet 2 of 2

PLOT SCALE - 1:200

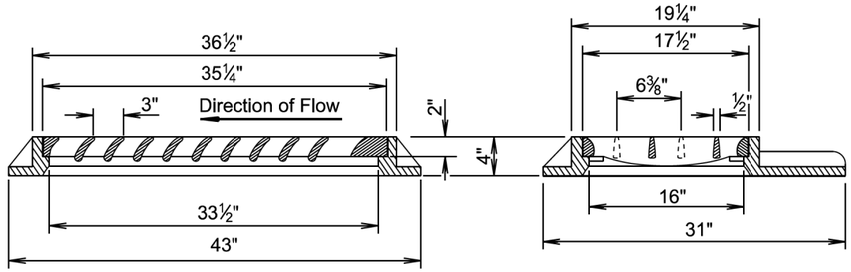
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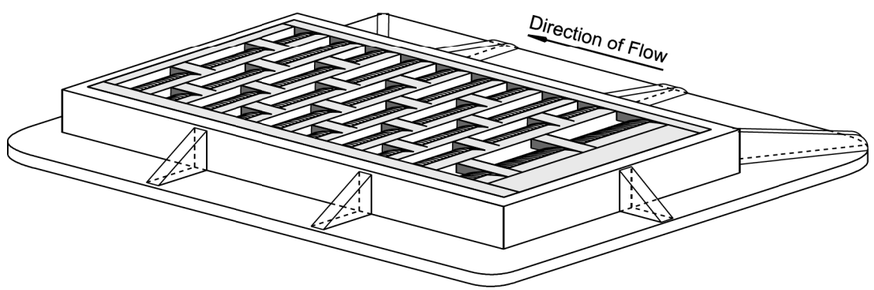
PLOTTED FROM - TRM11NT15



PLAN VIEW



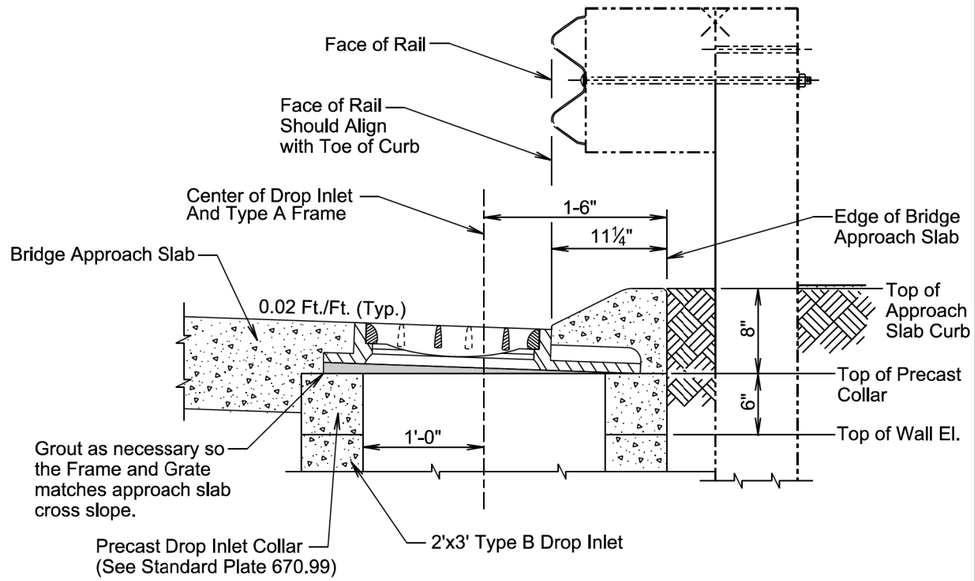
SECTION B-B **SECTION A-A**



ISOMETRIC VIEW

June 1, 2022

Published Date: 2024	SDDOT	TYPE A FRAME AND GRATE	PLATE NUMBER 670.78
			Sheet 1 of 2



ELEVATION VIEW

(Installation of Type A Frame and Grate in Bridge Approach Slab)

GENERAL NOTES:

The product dimensions may vary from those shown on the standard plate depending on the manufacturer. Grate size and configuration will be similar to the standard plate for hydraulic capacity and bicycle safety. Any variation in dimensions will be approved by the Engineer and the type A frame and grate will be from a manufacturer on the approved products list.

Design load for the grate will meet the requirements of AASHTO HL-93.

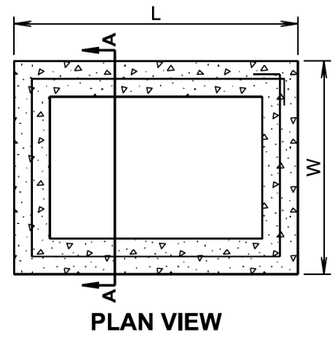
The type A frame and grate will be installed on a 2'x3' type B drop inlet.

The direction of flow is shown for illustrative purpose only. The grate will be installed to intercept the direction of flow.

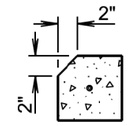
June 1, 2022

Published Date: 2024	SDDOT	TYPE A FRAME AND GRATE	PLATE NUMBER 670.78
			Sheet 2 of 2

PLOT SCALE - 1:200
PLOT NAME - 20
FILE - ...\STD PLATES\STD 670 PLATES.DGN
_PLOTTED FROM - TRM11INT15

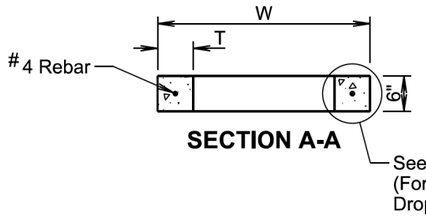


PLAN VIEW



For Type D Drop Inlets only:
Use Precast Drop Inlet Collar with
2" chamfer on L sides only.

DETAIL B



SECTION A-A

INFORMATIONAL QUANTITIES					
FRAME AND GRATE TYPE	L (Ft-in)	W (Ft-in)	T (in)	CLASS M6 CONCRETE (CuYd)	REINFORCING STEEL (Lb)
TYPE A, B, and E	4'-0"	3'-0"	6	0.11	9
TYPE C	5'-0"	4'-0"	6	0.15	11
TYPE D	4'-0"	2'-6"	6	0.10	8

GENERAL NOTES:

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

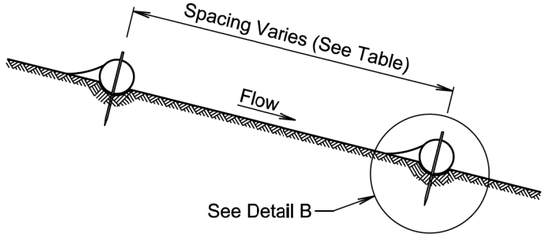
The ½" diameter bar will lap 6"± and will be centered in the concrete.

The cost of furnishing and installing Precast Drop Inlet Collars, including labor, materials, and incidentals will be incidental to the contract unit price per Each for "Precast Drop Inlet Collar".

June 1, 2022

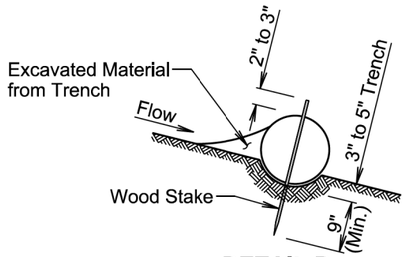
Published Date: 2024	SDDOT	*PRECAST DROP INLET COLLAR*	*PLATE NUMBER* 670.99
			Sheet 1 of 1

PLOT SCALE - 1:200
PLOT NAME - 21
FILE - ...\STD PLATES\STD 670 PLATES.DGN
.PLOTTED FROM - TRM1INT15

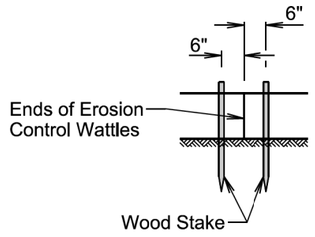


ELEVATION VIEW
(Cut or Fill Slope Installation)

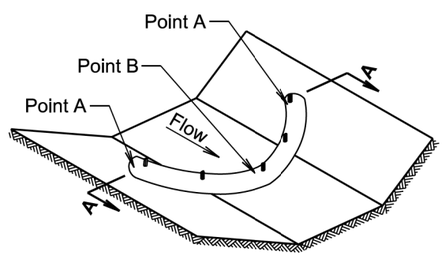
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft.)
1:1	10
2:1	20
3:1	30
4:1	40



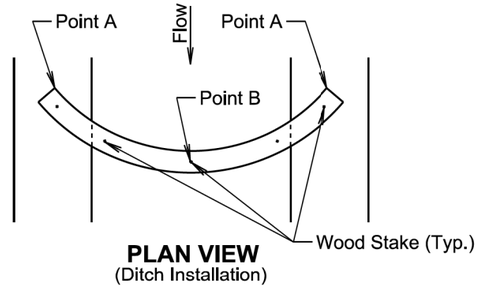
DETAIL B
(Typical of All Installations)



DETAIL C
(See General Notes)

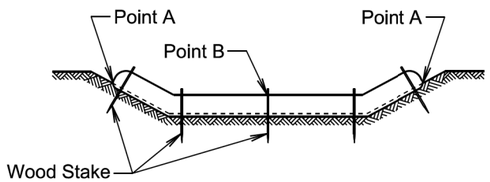


ISOMETRIC VIEW
(Ditch Installation)



PLAN VIEW
(Ditch Installation)

DITCH INSTALLATION	
Grade	Spacing (Ft.)
2%	150
3%	100
4%	75
5%	50



SECTION A-A

February 14, 2020

Published Date: 2024	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 1 of 2

GENERAL NOTES:

At cut or fill slope installations, wattles will be installed along the contour and perpendicular to the water flow.

At ditch installations, point A must be higher than point B to ensure that water flows over the wattle and not around the ends.

The Contractor will dig a 3" to 5" trench, install the wattle tightly in the trench so that daylight can not be seen under the wattle, and then compact the soil excavated from the trench against the wattle on the uphill side. See Detail B.

The stakes will be 1"x2" or 2"x2" wood stakes, however, other types of stakes such as rebar may be used only if approved by the Engineer. The stakes will be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles will be 3' to 4'.

Where installing running lengths of wattles, the Contractor will butt the second wattle tightly against the first and will not overlap the ends. See Detail C.

The Contractor and Engineer will inspect the erosion control wattles in accordance with the storm water permit. The Contractor will remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

Sediment removal, disposal, or necessary shaping will be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping will be incidental to the contract unit price per cubic yard for "Remove Sediment".

All costs for furnishing and installing the erosion control wattles including labor, equipment, and materials will be incidental to the contract unit price per foot for the corresponding erosion control wattle contract item.

All costs for removing the erosion control wattle from the project including labor, equipment, and materials will be incidental to the contract unit price per foot for "Remove Erosion Control Wattle".

February 14, 2020

Published Date: 2024	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 2 of 2

PLOT SCALE - 1:200
PLOT NAME - 22
FILE - ...\STD PLATES\STD 734 PLATES.DGN
.PLOTTED FROM - TRM11NT15

EBL ACCELERATION LANE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	125	141

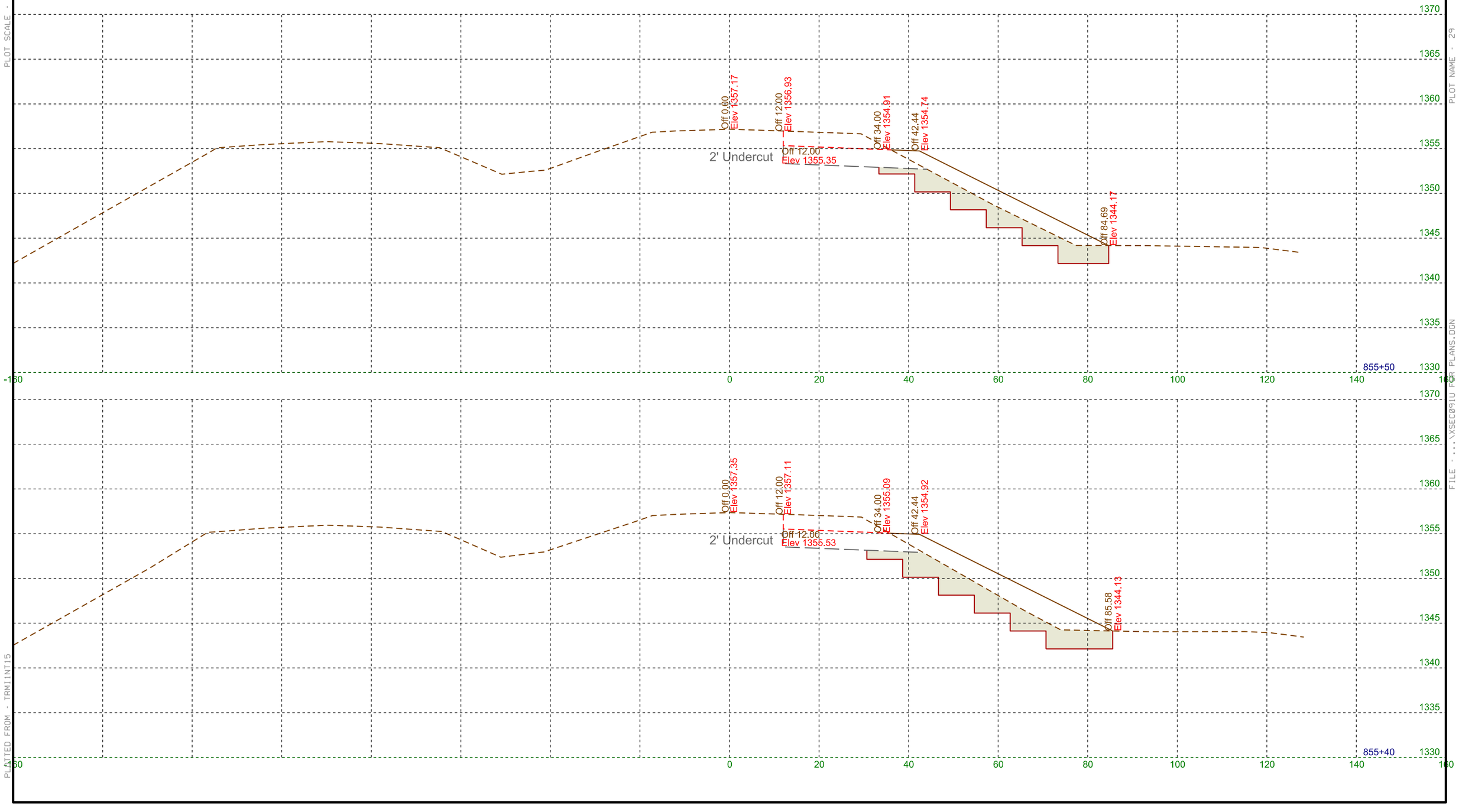
Plotting Date: 03/26/2024

PLOT SCALE - 1=20

PLOT NAME - 29

FILE - ...\XSEC091U FOR PLANS.DGN

PLOTTED FROM - TRM1INT15



EBL ACCELERATION LANE

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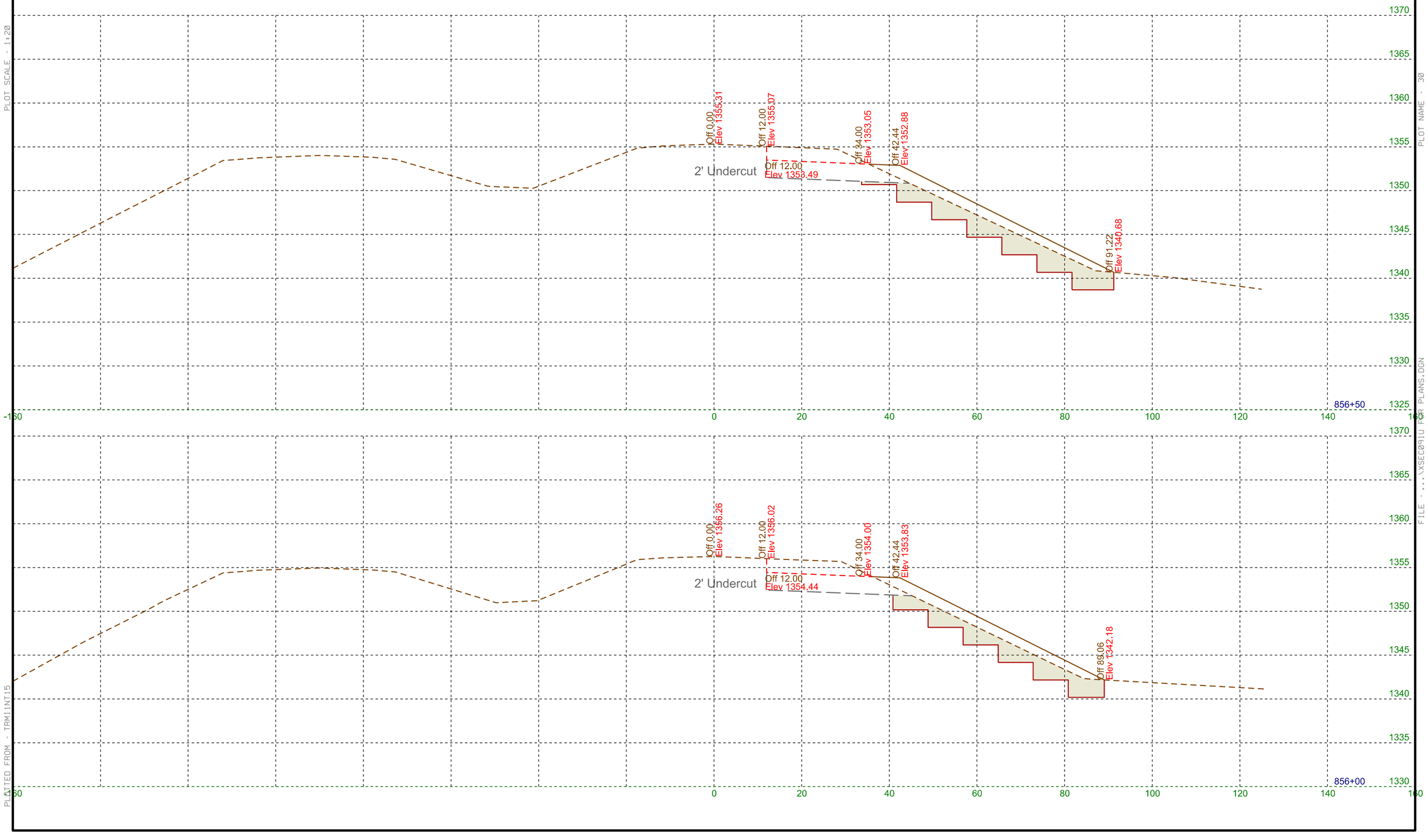
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PLOTTED FROM - TRM1INT15



EBL ACCELERATION LANE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	127	141

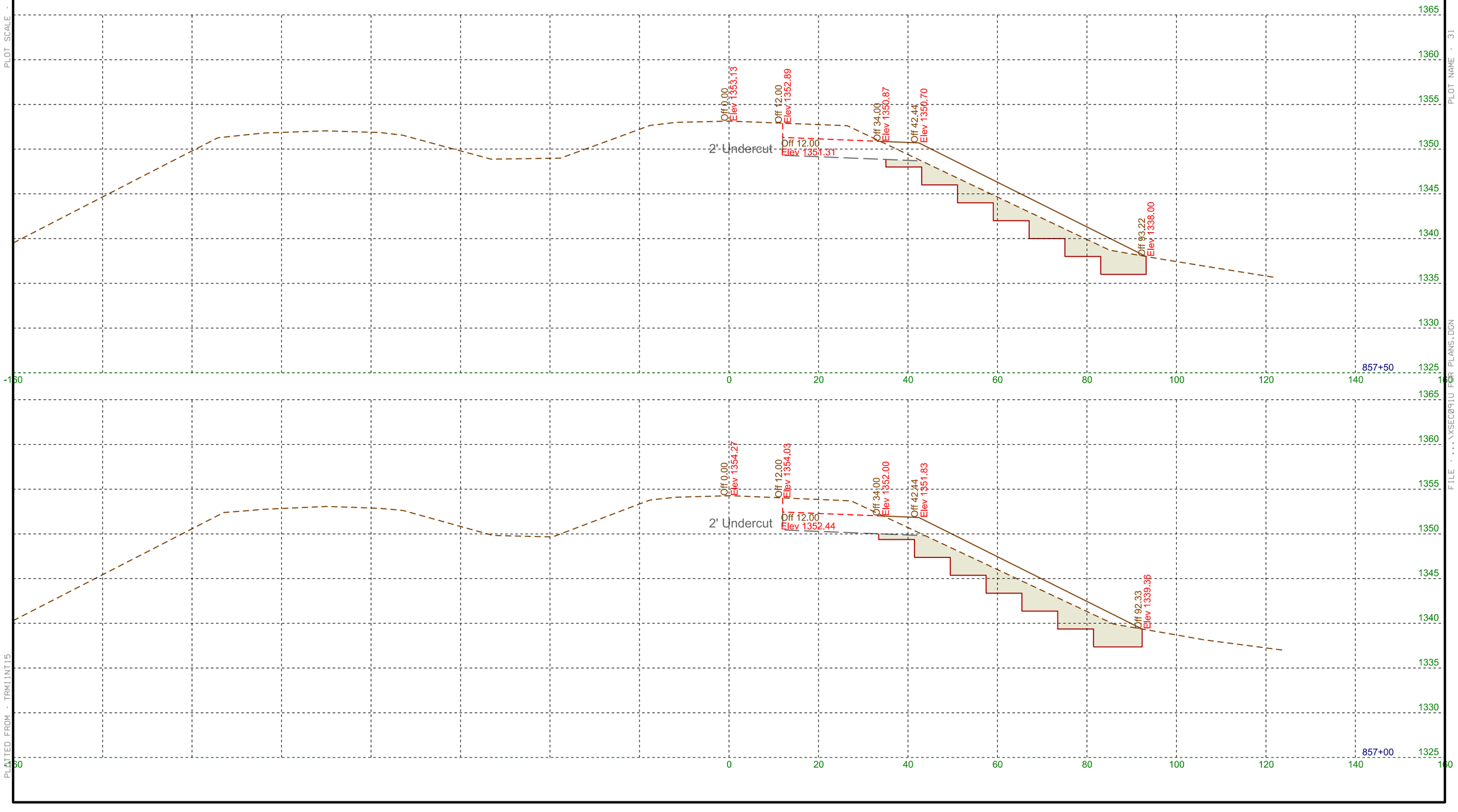
Plotting Date: 03/26/2024

PLOT SCALE - 1=20

PLOT NAME - 31

FILE - ...\XSEC091U FOR PLANS.DGN

PLOTTED FROM - TRM1INT15



EBL ACCELERATION LANE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	128	141

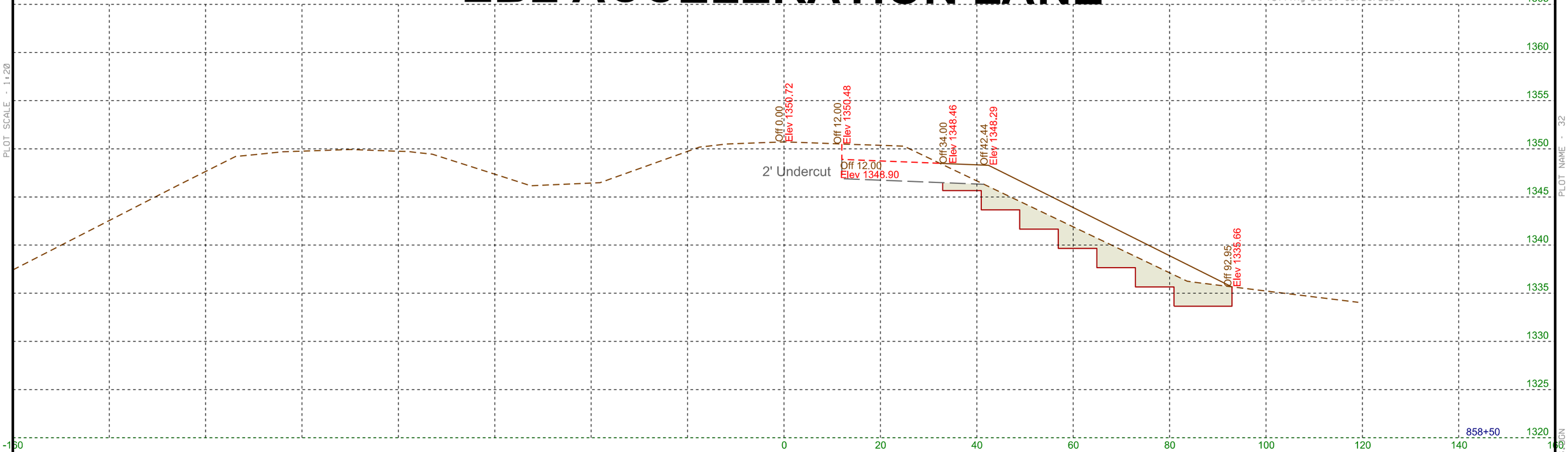
Plotting Date: 03/26/2024

PLOT SCALE - 1:20

PLOT NAME - 32

FILE - ...\XSEC0910 FOR PLANSIGN

PLOTTED FROM - TRM1INT15



EBL ACCELERATION LANE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	129	141

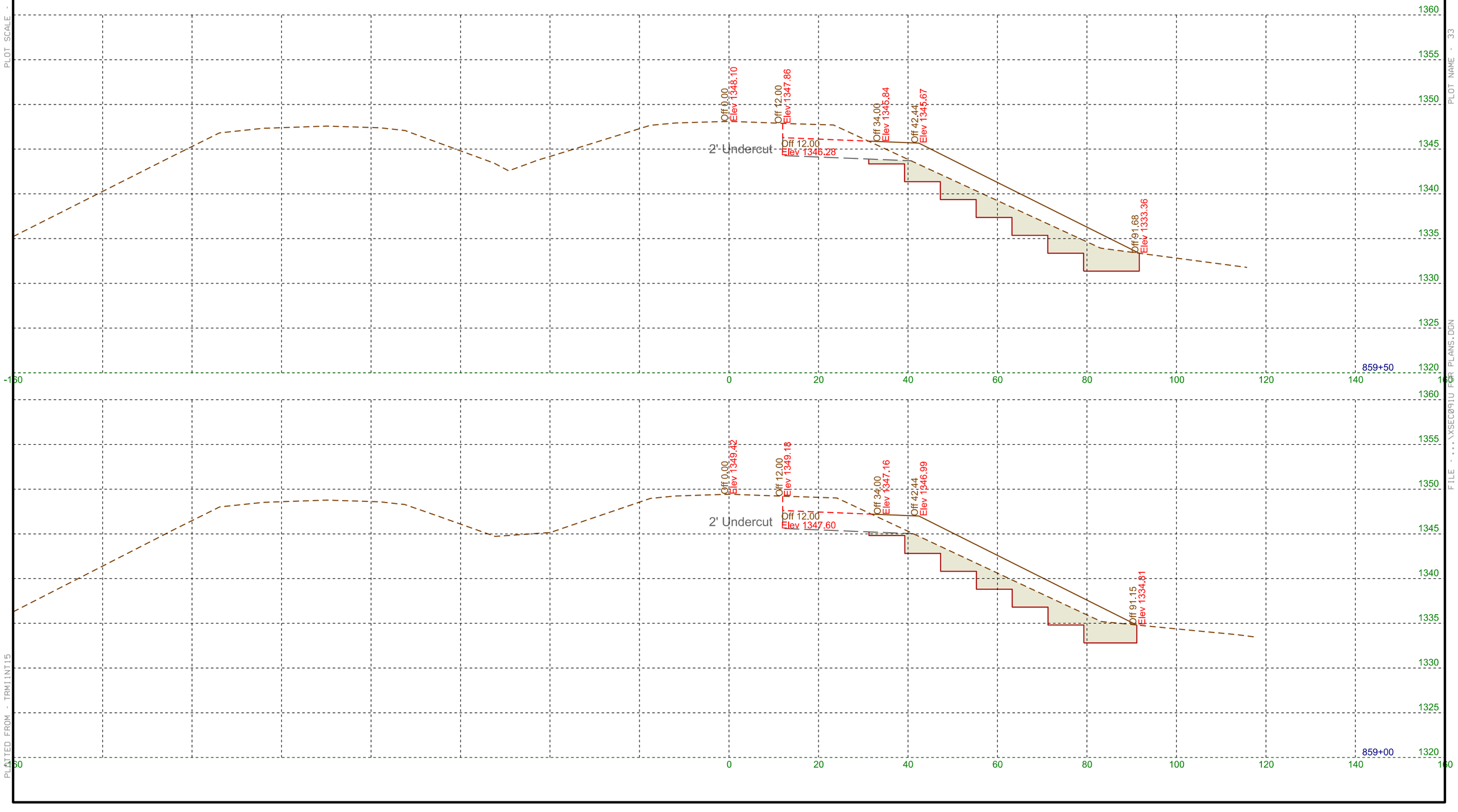
Plotting Date: 03/26/2024

PLOT SCALE - 1=20

PLOT NAME - 33

FILE - ...\XSEC091U FOR PLANS.DGN

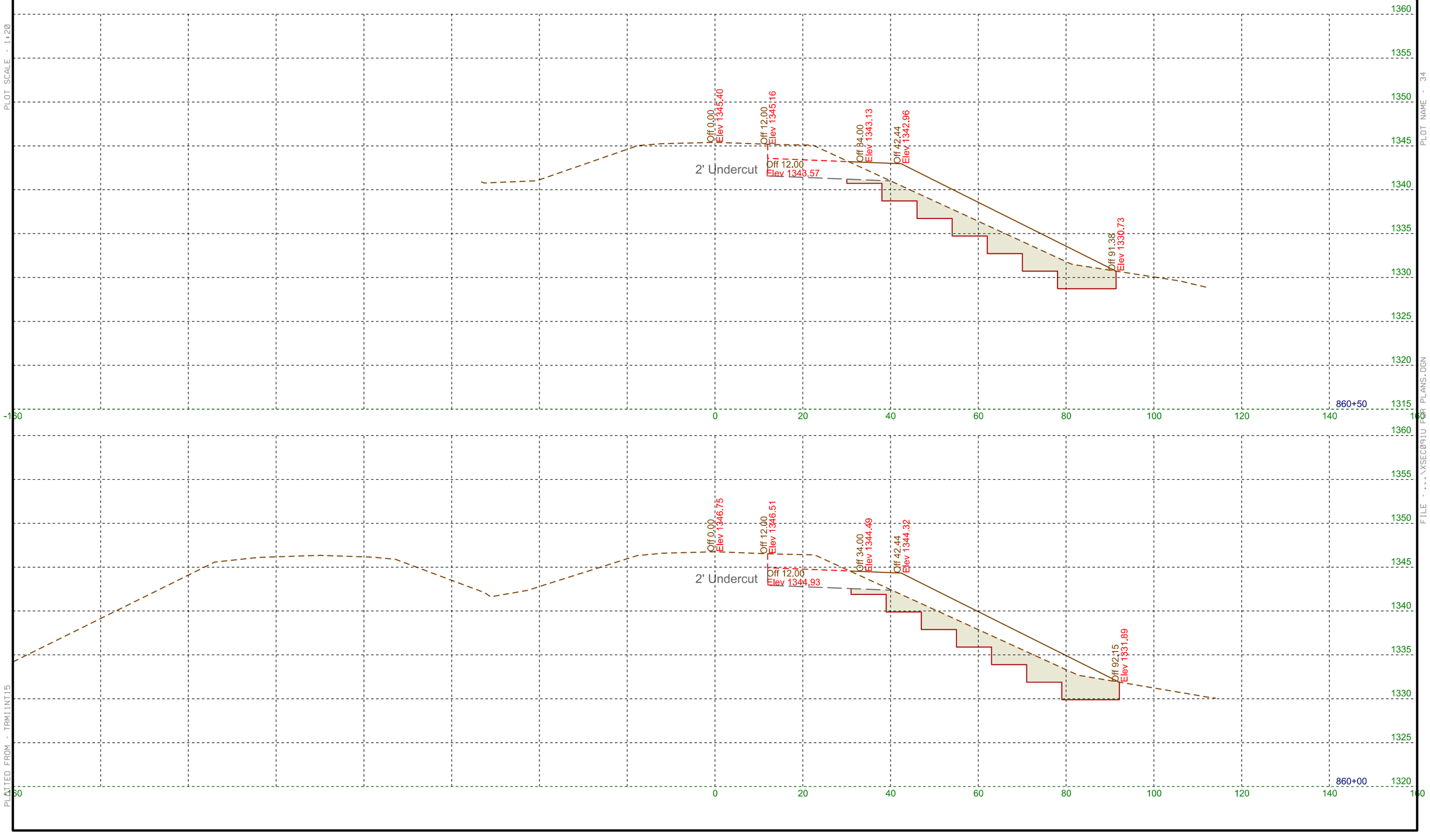
PLOTTED FROM - TRM1INT15



EBL ACCELERATION LANE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	130	141

Plotting Date: 03/26/2024



PLOT SCALE - 1:20

PLOTTED FROM - TRM1INT15

PLOT NAME - 34

FILE - ...\XSEC091U FOR PLANS.DGN

EBL ACCELERATION LANE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	131	141

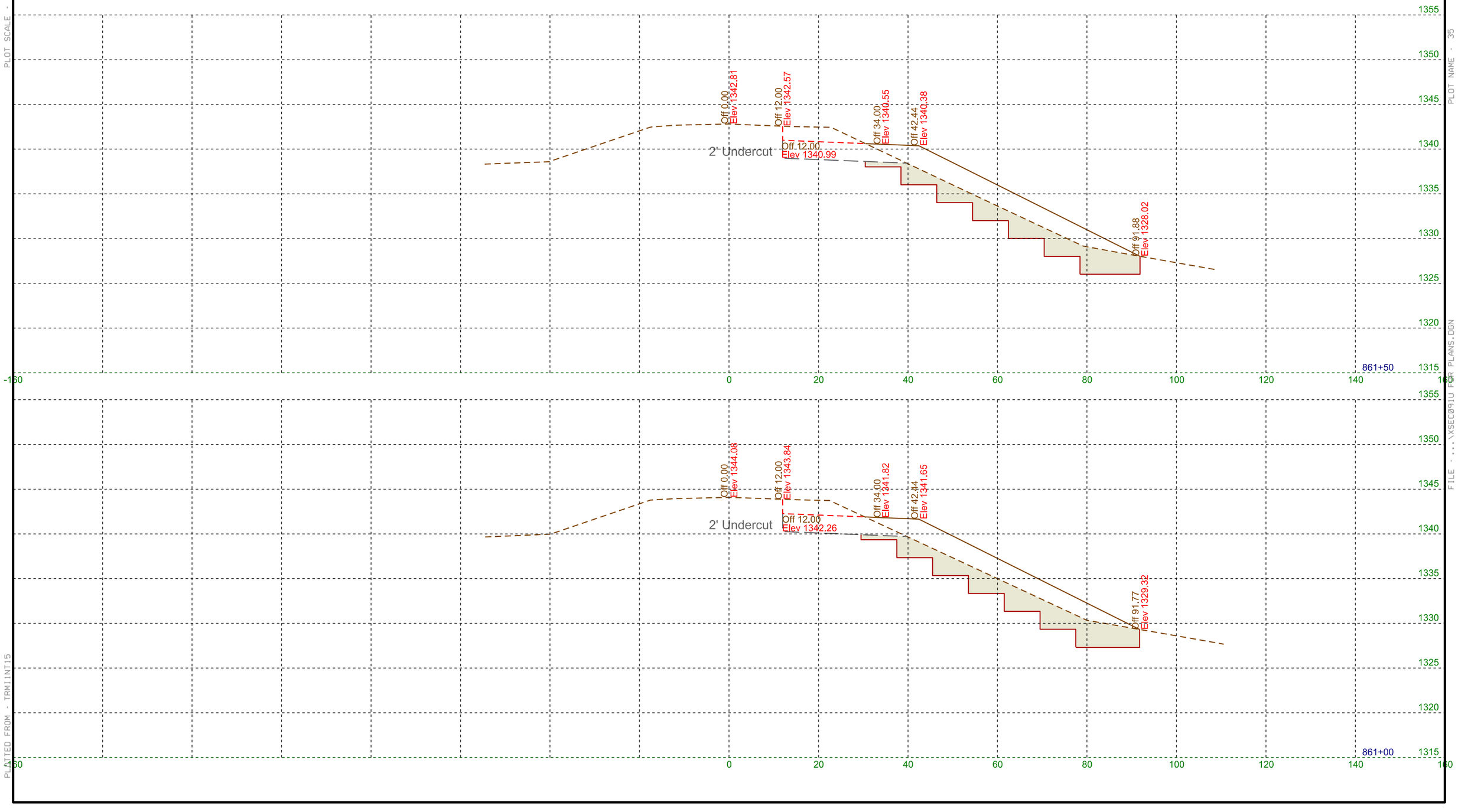
Plotting Date: 03/26/2024

PLOT SCALE - 1=20

PLOT NAME - 35

FILE - ...\XSEC091U FOR PLANS.DGN

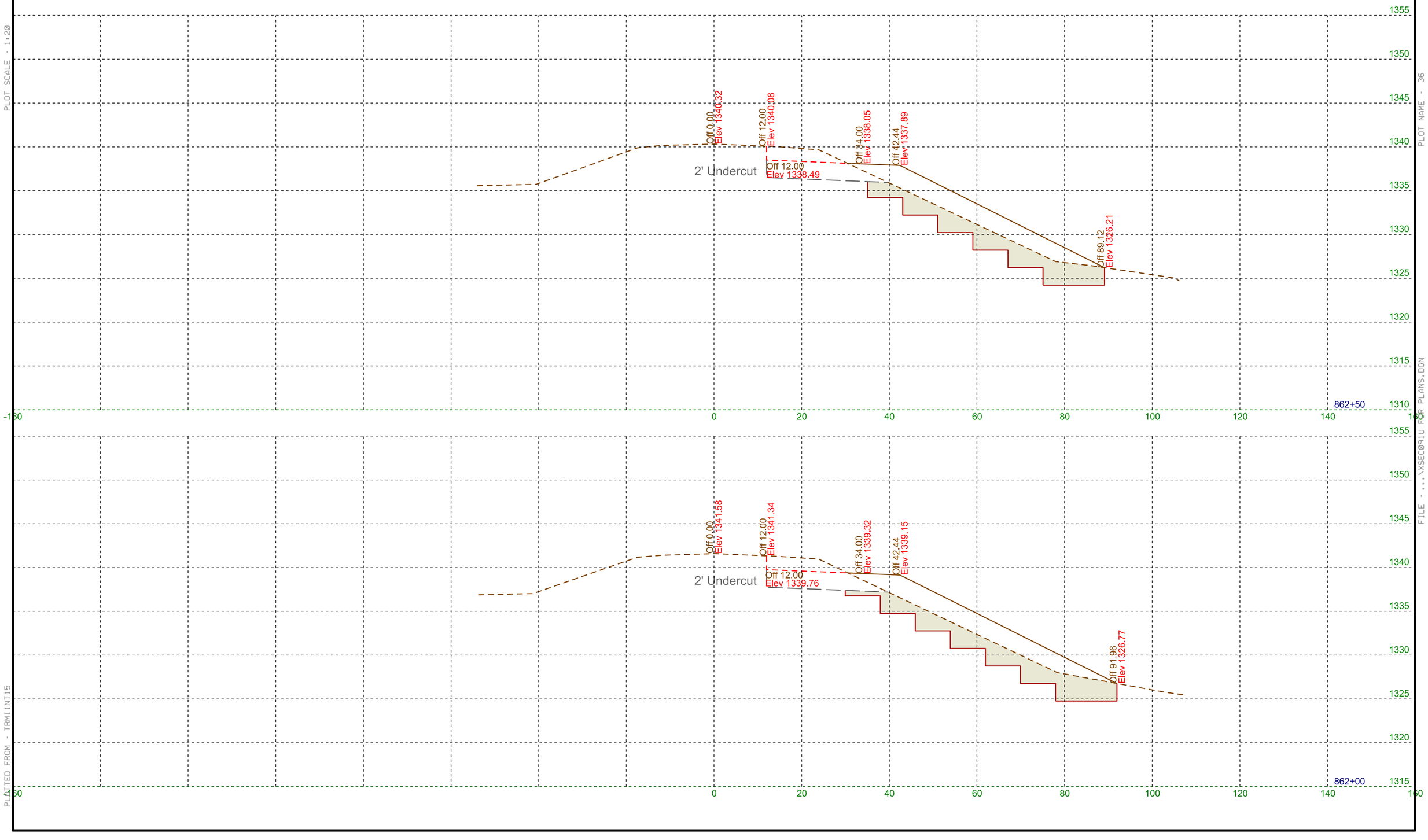
PLOTTED FROM - TRM11NT15



EBL ACCELERATION LANE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	132	141

Plotting Date: 03/26/2024



PLOT SCALE - 1:20

PLOTTED FROM - TRMI1NT15

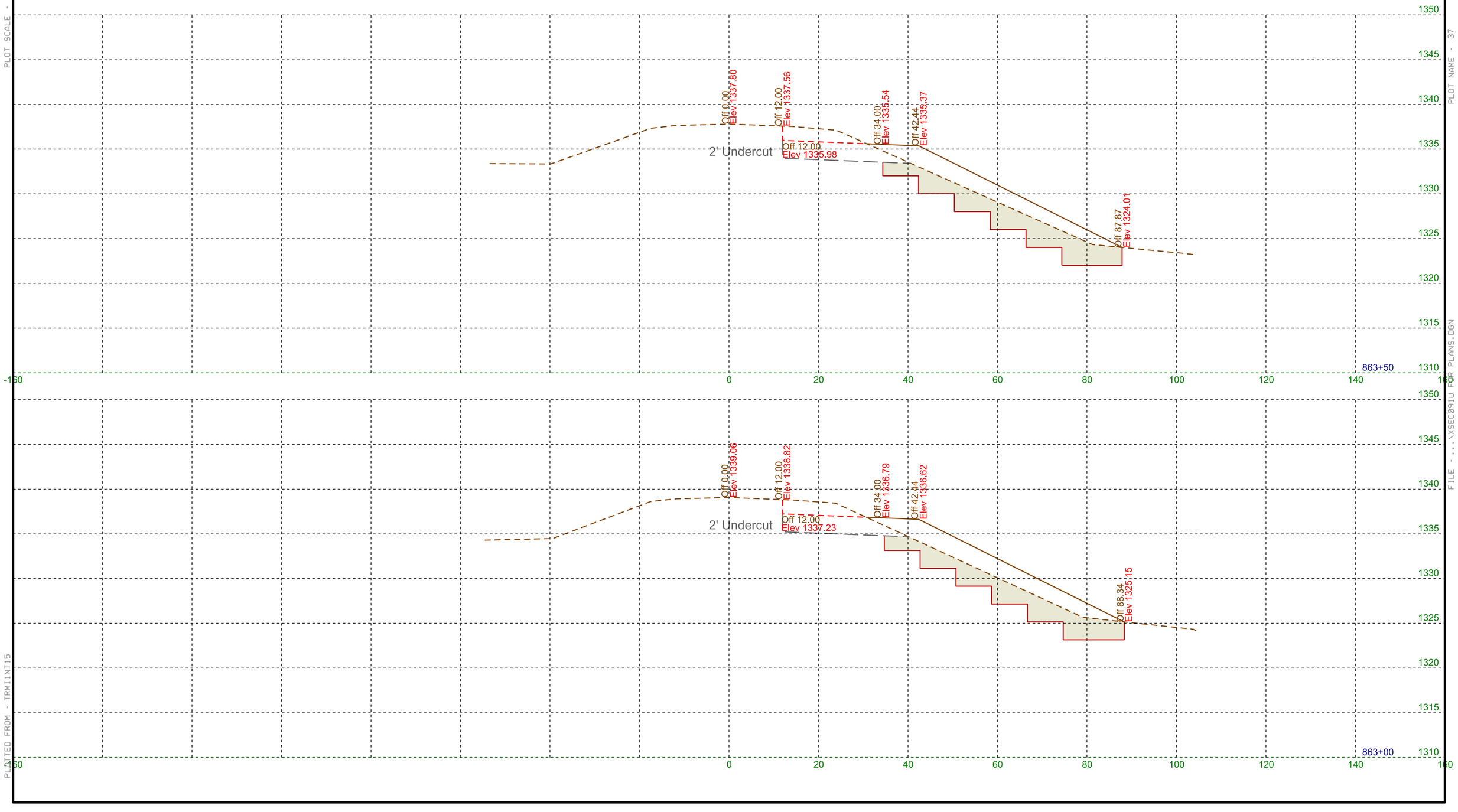
PLOT NAME - 36

FILE - ...\XSEC0910 FOR PLANS.DGN

EBL ACCELERATION LANE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	133	141

Plotting Date: 03/26/2024



PLOT SCALE - 1:20

PLOTTED FROM - TRM1INT15

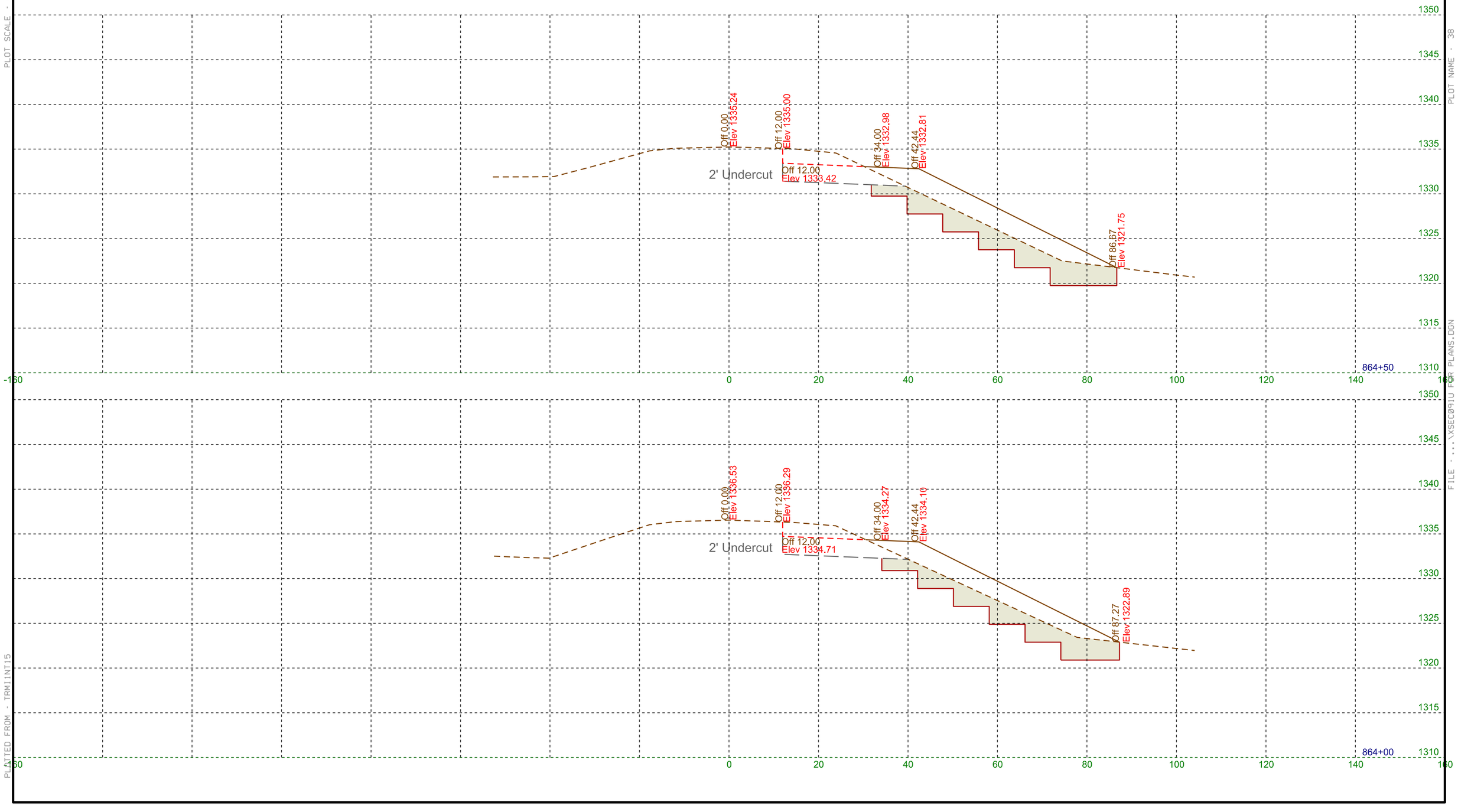
PLOT NAME - 37

FILE - ...\XSEC0910 FOR PLANS.DGN

EBL ACCELERATION LANE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	134	141

Plotting Date: 03/26/2024



PLOT SCALE - 1:20

PLOTTED FROM - TRM1INT15

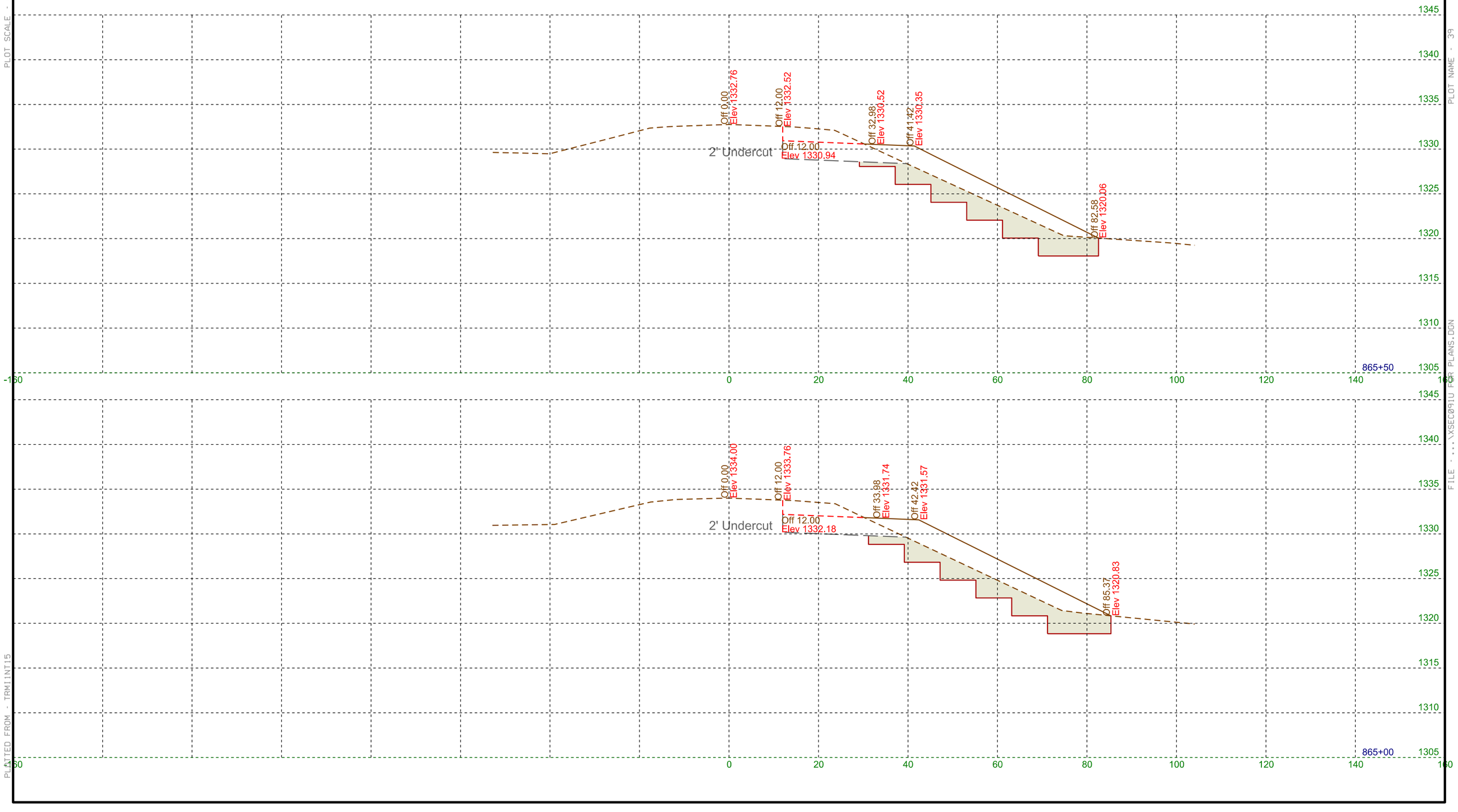
PLOT NAME - 38

FILE - ...\XSEC091U FOR PLANS.DGN

EBL ACCELERATION LANE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	135	141

Plotting Date: 03/26/2024



PLOT SCALE - 1:20

PLOTTED FROM - TRM1INT15

PLOT NAME - 39

FILE - ...\XSEC0910 FOR PLANS.DGN

EBL ACCELERATION LANE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	136	141

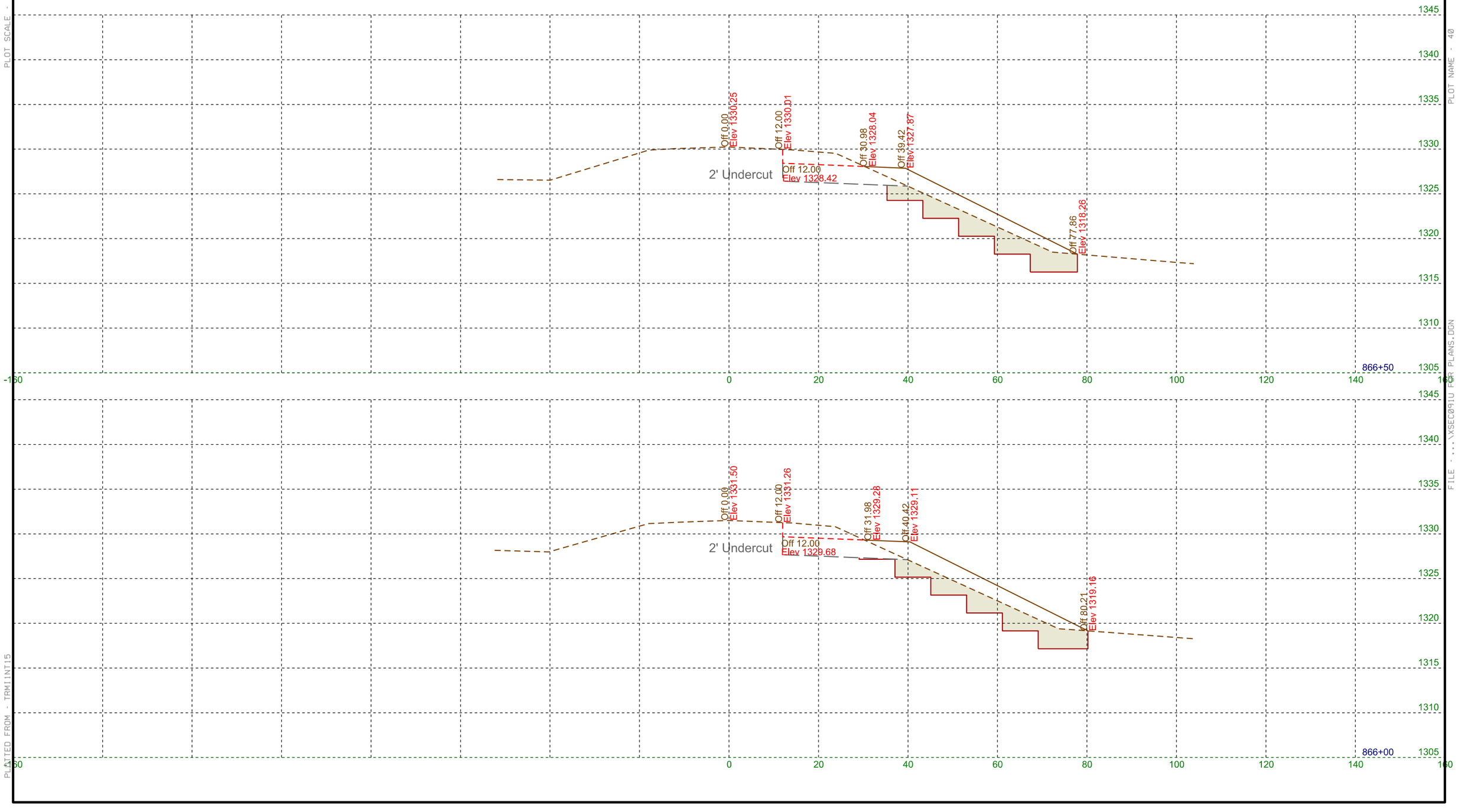
Plotting Date: 03/26/2024

PLOT SCALE - 1:20

PLOT NAME - 40

FILE - ...\XSEC091U FOR PLANS.DGN

PLOTTED FROM - TRM1INT15



EBL ACCELERATION LANE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	137	141

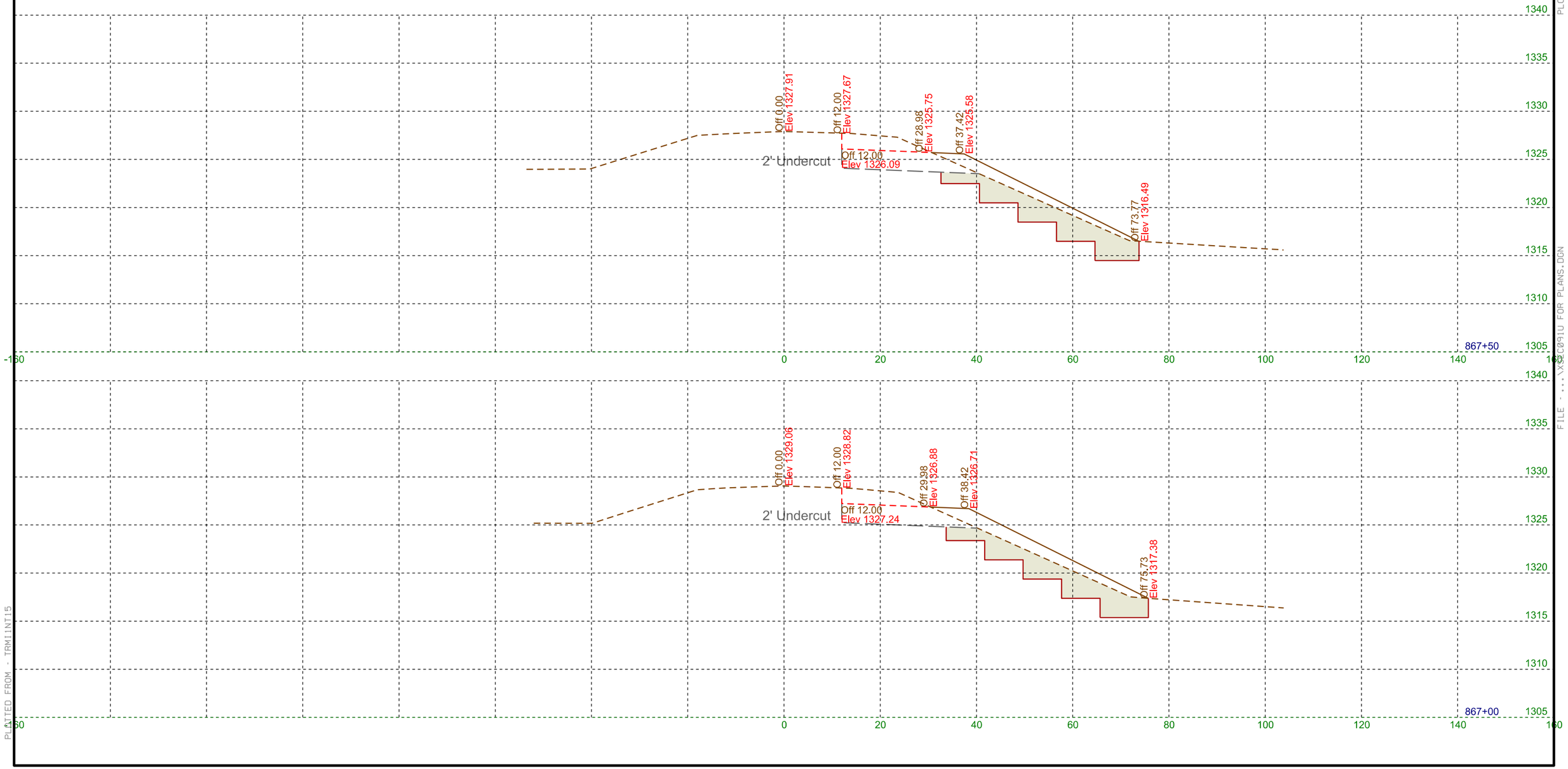
Plotting Date: 03/26/2024

PLOT SCALE - 1:20

PLOT NAME - 41

FILE - ...\XSC091U FOR PLANS.DGN

PLOTTED FROM - TRM1INT15



EBL ACCELERATION LANE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	138	141

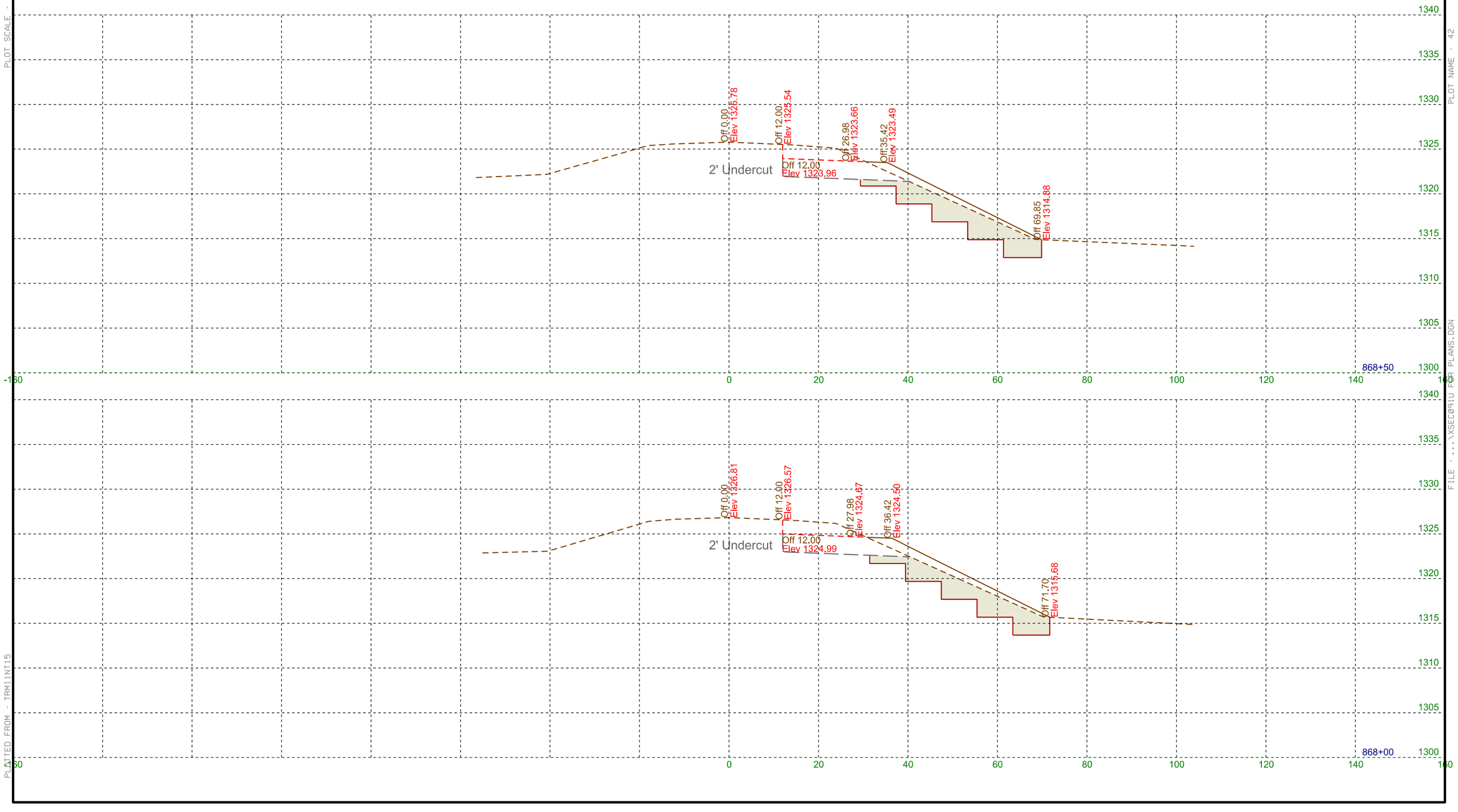
Plotting Date: 03/26/2024

PLOT SCALE - 1=20

PLOT NAME - 42

FILE - ...\XSEC091U FOR PLANS.DGN

PLOTTED FROM - TRM1INT15



EBL ACCELERATION LANE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	139	141

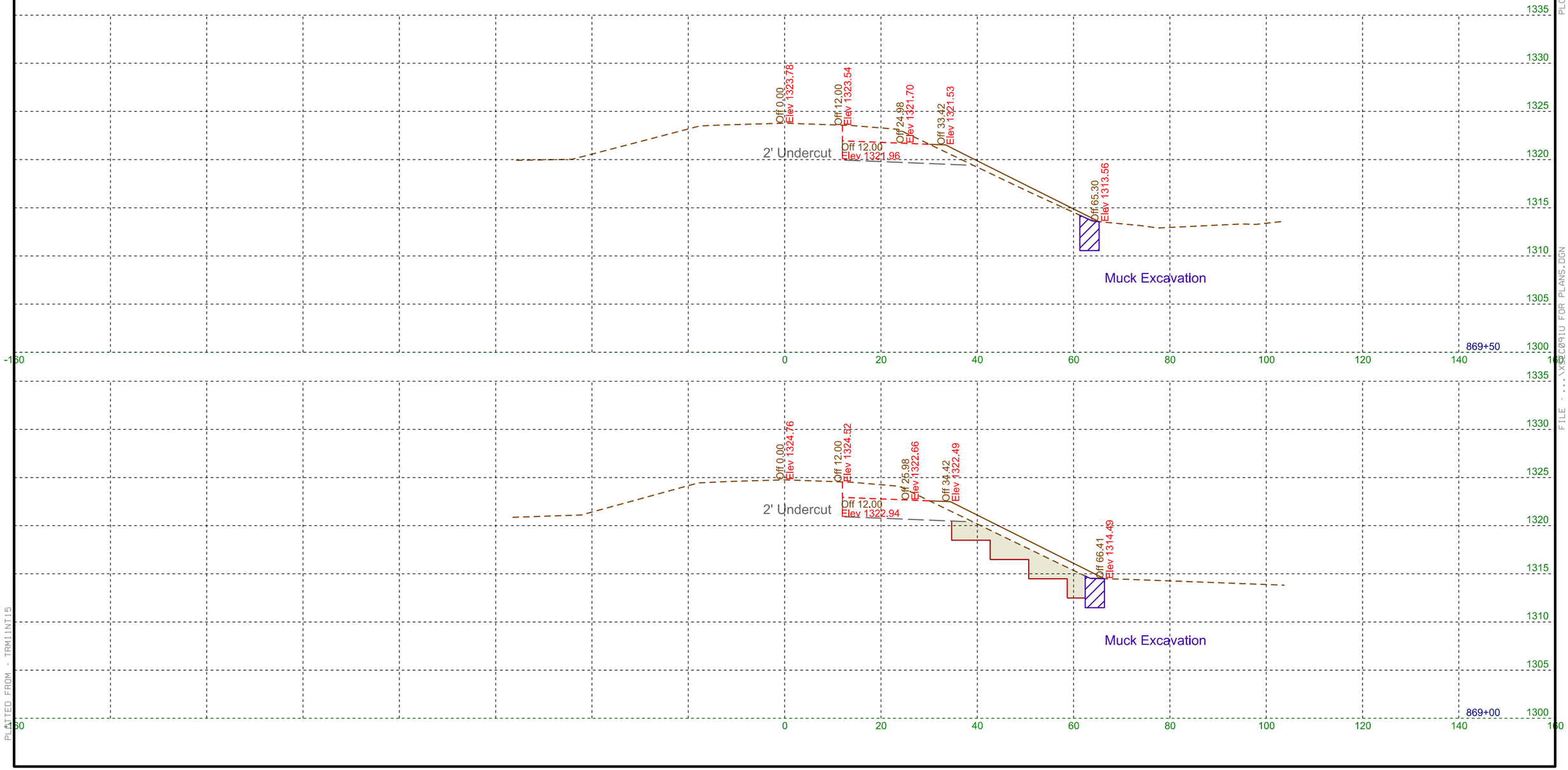
Plotting Date: 03/26/2024

PLOT SCALE - 1:20

PLOT NAME - 43

FILE - ...\XS091U FOR PLANS.DGN

PLOTTED FROM - TRM1INT15



EBL ACCELERATION LANE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	140	141

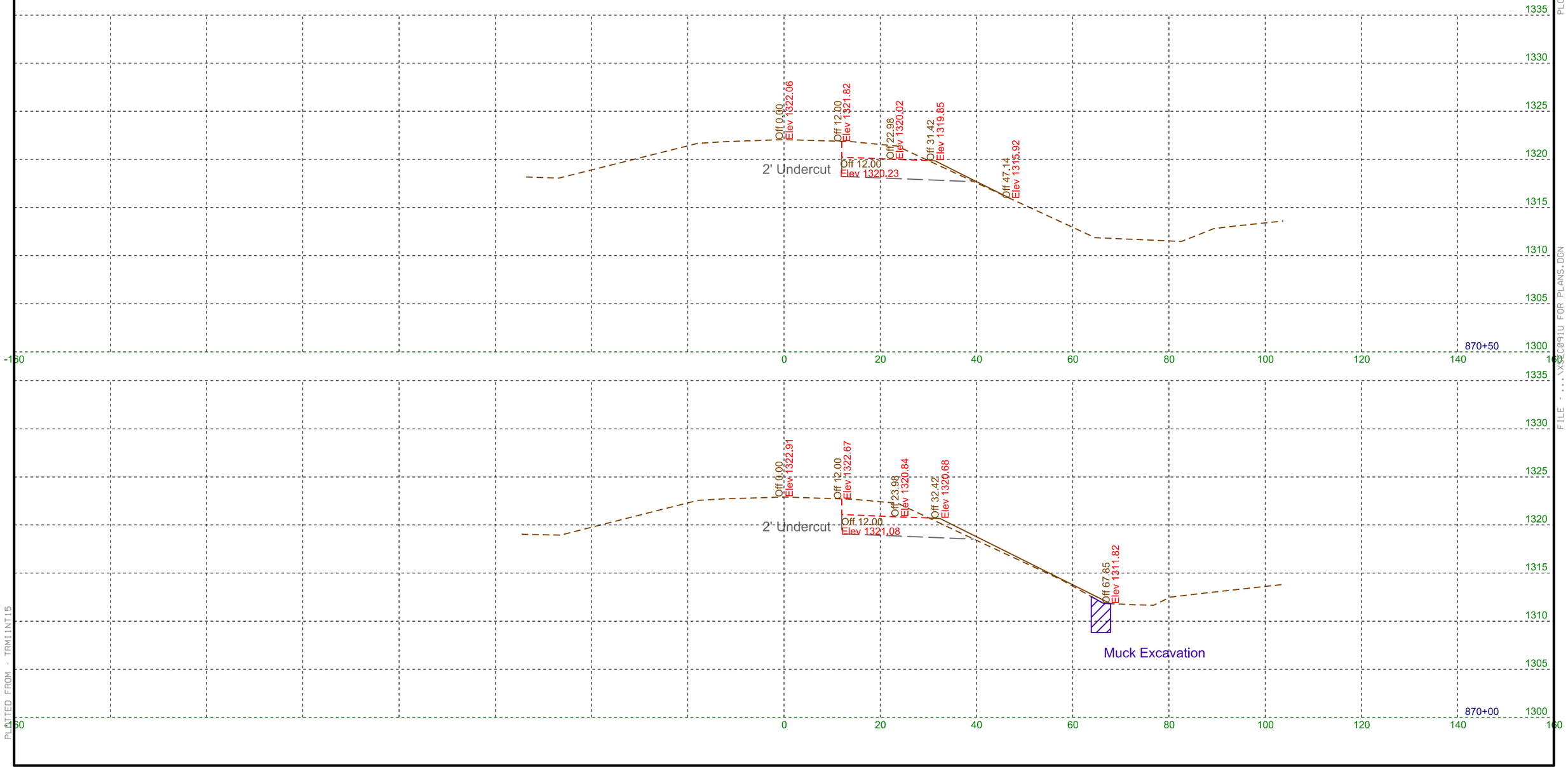
Plotting Date: 03/26/2024

PLOT SCALE - 1:20

PLOT NAME - 44

FILE - ...\XSC091U FOR PLANS.DGN

PLOTTED FROM - TRM1INT15



EBL ACCELERATION LANE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0907(90)332	141	141

Plotting Date: 03/26/2024

PLOT SCALE - 1:20

PLOT NAME - 45

FILE ...\XSEC091U FOR PLANS.DGN

PLOTTED FROM - TRM1INT15

