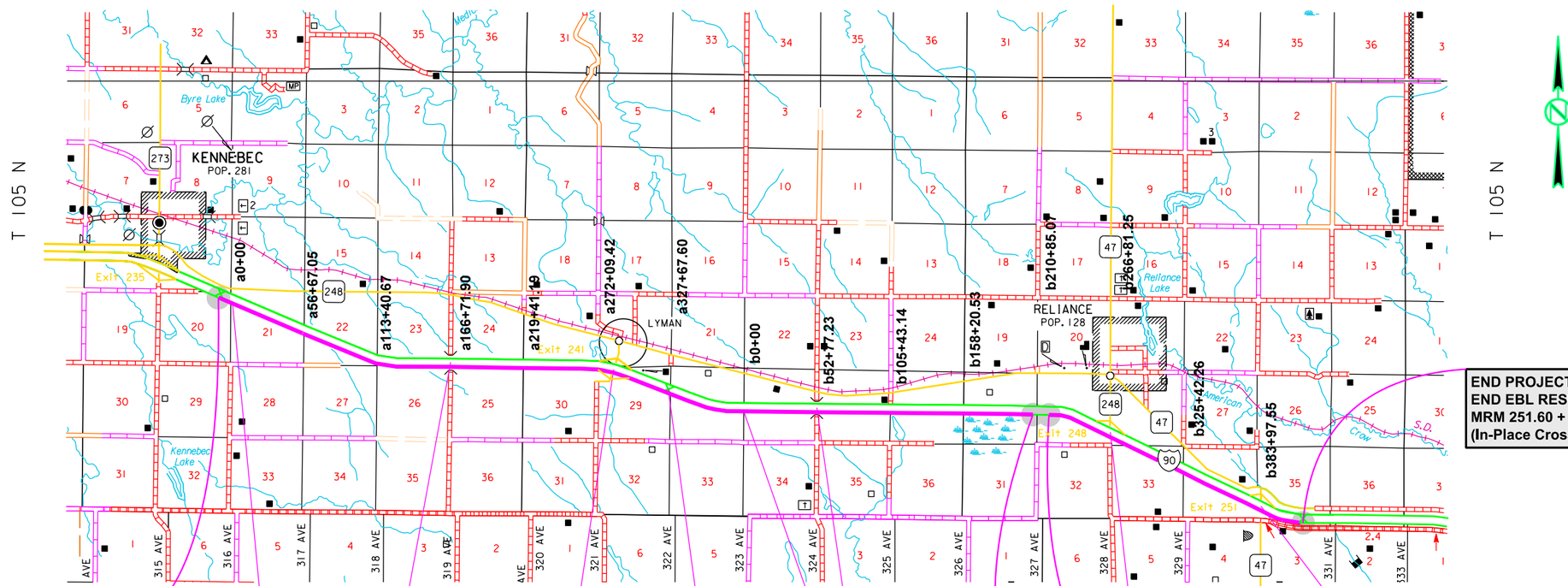
SECTION F: SURFACING PLANS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F1	F53

Plotting Date: 04/16/2025

INDEX OF SHEETS



BEGIN PROJECT IM 0905(121)236
BEGIN EBL RESURFACING at Station 493+00
MRM 236.00+0.218 (EB Lanes)
(In-Place Median Crossover)

Equation:
Station 507+11.11 Bk =
Station a0+00 Ah

Str. No. 43-313-221
EBL - MRM 241.90
(Guardrail)

Str. No. 43-290-220
EBL - MRM 239.66
(Guardrail)

Station a308+43
MRM 242.12 + 0.198
(In-Place Median Crossover)

Equation:
Station a382+38.69 Bk
= Station b0+00 Ah

Str. No. 43-340-225
EBL - MRM 244.75
(Guardrail)

END IM 0905(121)236
END EBL RESURFACING
Station 209+80
MRM 247.00 + 0.679 (EB Lanes)

BEGIN IM 0905(121)236
BEGIN EBL RESURFACING
Station 220+79
MRM 247.00 + 0.915 (EB Lanes)

Str. No. 43-380-228
EBL - MRM 248.79
(For Information Only)

Str. No. 43-401-238
EBL - MRM 251.09
(Guardrail)

END PROJECT IM 0905(121)236
END EBL RESURFACING at Station b421+48
MRM 251.60 + 0.000 (EB Lanes)
(In-Place Crossover)

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E3210	Construction Staking	31.794	Mile
009E3250	Miscellaneous Staking	31.794	Mile
009E3301	Engineer Directed Surveying/Staking	40.0	Hour
009E3320	Checker	Lump Sum	LS
009E4200	Construction Schedule, Category II	Lump Sum	LS
110E0700	Remove 3 Cable Guardrail	1,764	Ft
110E0730	Remove Beam Guardrail	700.0	Ft
110E0740	Remove 3 Cable Guardrail Anchor Assembly	12	Each
110E0745	Remove 3 Cable Guardrail Slip Base Anchor Assembly	4	Each
110E1010	Remove Asphalt Concrete Pavement	1,781.0	SqYd
120E0010	Unclassified Excavation	614	CuYd
120E0100	Unclassified Excavation, Digouts	763	CuYd
120E0600	Contractor Furnished Borrow Excavation	3,015	CuYd
210E0100	Shoulder Clearing	30.5	Mile
210E1000	Shoulder Preparation	1.000	Mile
260E1010	Base Course	1,526.0	Ton
260E1030	Base Course, Salvaged	1,076.4	Ton
* 260E6000	Granular Material, Furnish	4,360.4	Ton
270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	1,226.4	Ton
* 270E0200	Blend, Haul, and Stockpile Granular Material	10,901.0	Ton
320E0005	PG 58-34 Asphalt Binder	693.7	Ton
320E1070	Class HR Asphalt Concrete	20,966.6	Ton
320E3000	Compaction Sample	3	Each
320E5010	Saw and Seal Shoulder Joint	161,177	Ft
320E7012	Grind 12" Rumble Strip or Stripe in Asphalt Concrete	15.5	Mile
330E0100	SS-1h or CSS-1h Asphalt for Tack	60.5	Ton
330E0300	SS-1h or CSS-1h Asphalt for Fog Seal	27.0	Ton
332E0010	Cold Milling Asphalt Concrete	120,267	SqYd
360E0042	CRS-2P Asphalt for Surface Treatment	168.1	Ton
360E1200	Modified Cover Aggregate	1,149.1	Ton
380E5100	Continuously Reinforced PCC Pavement Repair	181.8	SqYd
380E6110	Insert Steel Bar in PCC Pavement	268	Each
380E6500	Planing PCC Pavement	694.0	SqYd
* 450E8900	Cleanout Pipe Culvert	4	Each
600E0300	Type III Field Laboratory	1	Each
630E0500	Type 1 MGS	2,287.5	Ft
630E1501	Type 1 Retrofit Guardrail Transition	8	Each
630E2018	MGS MASH Tangent End Terminal	8	Each
632E2220	Guardrail Delineator	65	Each

*** - Denotes Non-Participating**

PROJECT SCOPE OF WORK

The work required for the projects includes, but is not limited to, the following items, not listed in order of execution.

The Contractor is encouraged to inspect the project sites prior to bidding to evaluate the extent of work that will be required for construction.

- Traffic Control Installations
- Guardrail Embankment Reconstruction
- Erosion Control Installations (Temporary & Permanent)
- Unclassified Excavation for Digouts & Backfill Operations
- Cold Milling Asphalt Concrete
- Mainline Heave Repair
- Planing PCC Pavement Transitions
- CRC Spall Repairs
- Approach Guardrail Installations
- Shoulder & Mainline Heave Repair Asphalt Paving
- Mainline Heave Repair & Shoulder Surface Treatment
- Permanent Pavement Markings
- Shoulder Rumble Strips
- Remove Project Temporary Signing
- Seed & Mulch Disturbed Areas
- Complete Any Remaining Project Cleanup

SURFACING THICKNESS DIMENSIONS

The plans shown spread rates will be applied even though the thickness may vary from that shown on the plans.

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

SHOULDER CLEARING

The Contractor will notify the Winner Area Office at (605) 961-4926 at least two weeks prior to commencing work on the surface of the highway so SDDOT personnel can mow or spray along the shoulder inslopes. The Department will not be responsible for the effectiveness of the mowing or spraying.

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 cold milling operations. Any remaining windrow of accumulated material will be spread evenly on the inslope adjacent to the asphalt shoulder, to the satisfaction of the Engineer.

Each shoulder will be measured for payment. Costs associated with this work will be included in the contract unit price per mile for “Shoulder Clearing”.

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 Engineer to determine modifications that will be necessary to avoid utility impacts.

05/05/2025 Revision by VAM

CONTROL OF ACCESS

If a contractor’s operations would require access to the interstate ROW in any locations not currently designated as public access, prior approval must be obtained from the Department. All requests will be reviewed on the basis of safety and construction sequencing. The Contractor will not assume that all requests will be granted.

The Contractor will be responsible for all safety control and signing measures.

Anytime the Contractor operations have ceased for the day, any entrances approved in a control of access area will be closed by the Contractor.

The request for access will be provided in writing to the Engineer two weeks in advance of any proposed break in control of access.

PROTECTION OF BRIDGE JOINTS

It may be necessary to use special methods and equipment to remove/place material as close as practical to structure appurtenances. Also, the Contractor will mask all expansion joints prior to any removal/placement of material near the joints. The joints will be protected throughout completion of the work. Once the masking has been removed any loose material contained within the joint will be cleaned from the joint. Any damage to the expansion joints along with any existing structure appurtenances will be repaired by the Contractor to the satisfaction of the Engineer at no cost to the Department. All costs related to this work will be incidental to various contract items.

SHOULDER PREPARATION

Included in the Estimate of Quantities is 0.5 miles of Shoulder Preparation for each shoulder for a total of 1 mile of Shoulder Preparation to be used at locations determined by the Engineer.

Where indicated by the Engineer the existing shoulder material will be scarified, reprocessed if required, reshaped, reworked and compacted in accordance with Section 260.3.C to the shape of the typical sections prior to asphalt concrete placement on the shoulder. Cost for this work will be incidental to the contract unit price per mile for “Shoulder Preparation”. Compaction will be to the satisfaction of the Engineer.

Shoulder Shaping will be paid for at the contract unit price per mile. Payment will be full compensation for scarifying, reprocessing, reworking, reshaping and compacting, equipment, labor, and incidentals necessary to satisfactorily complete the work.

Water needed for compaction will be incidental to the contract unit price per mile for “Shoulder Preparation”.

UNDERDRAINS

Backwall, approach, roadway cutoff, and sleeper slab underdrains are currently in-place at structure locations throughout the project. Underdrain outlets are not to be disturbed or buried during completion of any project work.

Any damage to underdrain pipe due to work associated with this project will be repaired at the expense of the Contractor.

EDGE DRAINS AND OUTLETS IN PLACE

Edge drains and outlets are in place adjacent to the underlying CRC Pavement at various locations within the project.

Edge drains will be retained in place. The Contractor will exercise care in performing pavement repair operations so as not to damage edge drains. Any damage to edge drains incurred as result of the Contractor's operations will be corrected by the Contractor. The Engineer will determine the extent of the damage and specify repair or replacement. Cost for repair or replacement will be entirely at the Contractor's expense.

COLD MILLING ASPHALT CONCRETE

The Los Angeles Abrasion Loss value on the aggregate used for the in-place asphalt concrete was 21. This value was obtained from testing during construction of the in-place asphalt concrete.

Cold milling asphalt concrete will be done according to the typical section(s). The milling depth on the shoulders will be measured from the top of the concrete. In areas where maintenance patches have raised and/or widened the shoulder, additional asphalt concrete will be milled to provide a uniform typical section from edge of concrete to the edge of the finished shoulder. Any additional costs associated with this additional cold milling will be incidental to the contract unit price per square yard for Cold Milling Asphalt Concrete. Cold milling asphalt is estimated to produce **14,508.4** tons of cold milled asphalt concrete material.

An estimated **8,117.8** tons of cold milled asphalt concrete material will be used on this project as RAP in the Class HR Hot Mixed Asphalt Concrete mixture. The Contractor is responsible to assure enough asphalt concrete salvage is available for the Class HR Hot Mixed Asphalt Concrete and that no vegetation, topsoil, subgrade, or other foreign material is incorporated into the RAP used in the Class HR Hot Mixed Asphalt Concrete mixture.

The remainder of the salvaged asphalt concrete milled material estimated at **6,390.6** tons will be blended and stockpiled according to the Blend, Haul, and Stockpile Granular Material plan note.

UNCLASSIFIED EXCAVATION, DIGOUTS

The locations and extent of digout areas will be determined in the field by the Engineer. The digouts will be extended through the shoulder and backfilled with granular material that will daylight to the inslope to allow water to escape the subsurface. The backfilling material for the digouts will be Base Course.

Included in the Estimate of Quantities are **50** cubic yards of Unclassified Excavation, Digouts and **75** square yards of Remove Asphalt Concrete Pavement per mile for the removal of asphalt and unstable material throughout the project.

Included in the Estimate of Quantities are **100** tons of Base Course per mile for backfill of Unclassified Excavation, Digouts.

SHRINKAGE FACTOR: Embankment +50%

GUARDRAIL EMBANKMENT RECONSTRUCTION

General

The existing guardrail embankment will require reconstruction along with additional embankment being placed to accommodate the MGS Guardrail System installations on the project. The existing embankments are to be reshaped according to the details provided in these plans.

Embankment fill material will be available from excess Unclassified Excavation material and Contractor Furnished Borrow Excavation material. The placement of fill material will be benched into the existing embankment as directed by the Engineer.

Compaction of the fill material will be to the satisfaction of the Engineer.

Remove and Replace Topsoil (Refer to "Section D" for details)

Unclassified Excavation

Unclassified Excavation quantity will be as noted in the tables in the guardrail installation sheets located elsewhere in the plans. Unclassified Excavation will not be measured for payment and the basis of payment will be plans quantity.

Unclassified Excavation material will include a combination of asphalt mix and granular base material along with earthen embankment material. The granular and earthen material will be allowed to be incorporated into the reconstructed embankment for embankment fill at the discretion of the Engineer. The asphalt mix material and any material the Engineer deems not usable for the reconstruction of the embankment will become the property of the Contractor for their disposal.

Contractor Furnished Borrow Excavation

The Contractor will provide a suitable site for Contractor furnished borrow excavation material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material will be approved by the Engineer. Restoration of the Contractor furnished borrow excavation site will be the responsibility of the Contractor.

The plans quantity for "Contractor Furnished Borrow Excavation" as shown in the Estimate of Quantities will be the basis of payment for this item.

Erosion Control Measures (Refer to "Section D" for details)

WATER FOR COMPACTION

Granular Material

The cost of water for compaction of the granular material will be incidental to the various other contract items. A minimum of 4% moisture will be required at the time of compaction unless otherwise directed by the Engineer.

Embankment

Water for Embankment is estimated at the rate of 10 gallons of water per cubic yard of Embankment minus Waste. No separate payment will be made for the Water for Embankment as all costs will be incidental to the various other contract items.

BASE COURSE, SALVAGED

Base Course, Salvaged will be obtained from the Salvage And Stockpile Asphalt Mix And Granular Base Material stockpile and may be used without further gradation testing. The material will be used to accommodate the construction of the base layer at guardrail embankment widening sites, where necessary, as noted elsewhere in the plans.

The Contractor will ensure the Base Course, Salvaged material contains no more than 50% salvaged asphalt mix material and at least 50% granular material (salvaged or virgin). Blended material will be to the satisfaction of the Engineer.

Compaction will be to the satisfaction of the Engineer.

All other requirements for Base Course, Salvaged will apply.

SALVAGE AND STOCKPILE ASPHALT MIX AND GRANULAR BASE MATERIAL

The Los Angeles Abrasion Loss value on the aggregate used for the in-place asphalt concrete was 21. This value was obtained from testing during construction of the in-place asphalt concrete.

An estimated **1,226.4** tons of asphalt mix and granular base material will be salvaged from the existing highway shoulders for 500 feet from each end of the structures as according to the in-place surfacing typical sections. The material will be stockpiled at a site furnished by the Contractor that is satisfactory to the Engineer and used on the project as Base Course, Salvaged. An estimated **1,076.4** tons of Base Course, Salvaged will be used to accommodate the construction of the base layer at guardrail embankment widening sites, where necessary, as noted elsewhere in the plans.

Salvaged material will be processed to meet the requirements of Section 884.2 D.7 prior to stockpiling. The Contractor will ensure that no vegetation, topsoil, subgrade, or other foreign material is incorporated into the salvaged asphalt mix and granular base material.

The quantity of salvaged asphalt mix and granular base material may vary from the plans.

The quantity of salvageable material is estimated from the in-place surfacing typical sections.

The salvaged material not used on the project estimated at **150.0** tons will hauled, blended and stockpiled at the site as described in the Blend, Haul, And Stockpile Granular Material plan note.

GRANULAR MATERIAL, FURNISH

Granular material will be furnished by the Contractor for use in blending with the salvaged asphalt mix material from this project.

The granular material will be Base Course meeting the requirements of Section 882.

BLEND, HAUL, AND STOCKPILE GRANULAR MATERIAL

Excess salvaged asphalt concrete and excess salvaged asphalt mix and granular base material estimated at **6,540.6** tons (for informational purposes only) will be blended with **4,360.4** tons of Granular Material, Furnish and will be hauled, blended and stockpiled at the following site.

at SDDOT stockpile site on the west side of US183
in Lyman County approximately 1 mile south of Presho
(SE¼ Sec22 T105N R77W of the 5th P.M.)

The Contractor will have approval from the Engineer of the stockpile location prior to stockpiling the material within the aforementioned site.

A computerized scale, portable platform scale, stationary commercial scale, stationary commercial plant, portable plant scale, or a belt scale along with a scale operator will be provided by the Contractor at the stockpile site to weigh the salvaged material prior to blending.

The salvaged asphalt concrete material will be crushed to meet the requirements of Section 884.2 D.3 prior to blending into the stockpile.

Salvaged asphalt concrete material will be blended with Granular Material, Furnish at a rate of 60% salvaged asphalt mix material and 40% Granular Material, Furnish to obtain stockpile material. Material will be uniformly blended to the satisfaction of the Engineer.

No further gradation testing of the blended material will be required.

All other costs for crushing, hauling, stockpiling, and blending salvaged asphalt concrete material and Granular Material, Furnish will be incidental to the contract unit price per ton for “Blend, Haul, And Stockpile Granular Material”.

CLASS HR ASPHALT CONCRETE

Virgin mineral aggregate for Class HR Asphalt Concrete will conform to the requirements for Class E, Type 1. If the virgin mineral aggregate is limestone it will consist of a minimum of 80 percent crushed limestone ledge rock.

An estimated **8,117.8** tons of RAP is needed for the Class HR mixture. The Class HR Asphalt Concrete will include 40 percent RAP in the mixture. RAP will be obtained from the material produced by cold milling on this project.

When directed by the Engineer, the Contractor will saw and remove a total of three undamaged compaction cores per asphalt concrete lift from designated area(s) and repair the hole(s) to the satisfaction of the Engineer. All costs associated with the compaction cores will be incidental to the contract unit price per each for “Compaction Sample”.

All other requirements for Class HR Asphalt Concrete will apply.

ADDITIONAL QUANTITIES

Included in the Table of Additional Quantities are 200 tons of Class HR Hot Mixed Asphalt Concrete, 6.6 tons of PG58-34 Asphalt Binder, and 1 ton of SS-1h or CSS-1h Emulsified Asphalt for Tack for spot leveling throughout the Heave Repair area prior to the mainline asphalt paving lift as specified elsewhere in the plans. The material will be placed as directed by the Engineer.

CHECKING SPREAD RATES

The Contractor will be responsible for checking Asphalt Concrete spread rates and taking the weigh delivery tickets as the surfacing material arrives on the project and is placed onto the roadway.

The Contractor will compute the required spread rates for each typical surfacing section and create a spread chart prior to the start of material delivery and placement. The Engineer will review and check the Contractor’s calculations and spread charts. The station to station spread will be written on each ticket as the surfacing material is delivered to the roadway.

At the end of each day’s shift, the Contractor will verify the following:

- All tickets are present and accounted for,
- The quantity summary for each item is calculated,
- The amount of material wasted if any,
- Each day’s ticket summary is marked with the corresponding ‘computed by’,
- The ticket summary is initialed and certified that the delivered and placed quantity is correct.

All daily tickets and the summary by item will be given to the Engineer no later than the following morning.

If the checker is not properly and accurately performing the required duties, the Contractor will correct the problem or replace the checker with an individual capable of performing the duties to the satisfaction of the Engineer. Failure to do so will result in suspension of the work.

The Department will perform depth checks. The Contractor will be responsible for placement of material to the correct depth unless otherwise directed by the Engineer. If the placed material is not within a tolerance of ±1/2 inch of the plan shown depth, the Contractor will correct the problem at no additional cost to the Department. Excess material above the tolerance will not be paid for. Achieving the correct depth may require picking up and moving material or other action as required by the Engineer.

All costs for providing the Contractor furnished checker and performing all related duties will be incidental to the contract lump sum price for the “Checker”. No allowances will be made to the contract lump sum price for Checker due to authorized quantity variations unless the quantities for the material being checked vary above or below the estimated quantities by more than 25 percent. Payment for the Checker will then be increased or decreased by the same proportion as the placed material quantity bears to the estimated material quantity.

GRIND RUMBLE STRIPS IN ASPHALT CONCRETE

Installation

Asphalt concrete rumble strips will be constructed on the median shoulder and on the outside shoulder throughout the Heave Repair surfacing limits only. Rumble strips will be paid for at the contract unit price per mile for “Grind 12” Rumble Strip or Stripe in Asphalt Concrete”. It is estimated that **15.5** miles of asphalt concrete rumble strips will be required.

Rumble strip installation will be completed prior to application of the Asphalt Surface Treatment (Chip Seal) and pavement markings.

Roadway Cleaning

The Contractor will be required to remove loose material from the driving surface and/or asphalt shoulders of the roadway. Loose material may be swept to the edge of shoulders, and it will be the Contractor’s responsibility to ensure the loose material does not enter any vegetated areas and/or waterways.

All costs associated with the work will be incidental to the contract unit price per mile for “Grind 12” Rumble Strip or Stripe in Asphalt Concrete”.

TYPE III FIELD LABORATORY

The Contractor will provide high-speed broadband internet connection to the field lab. The multiport internet connection may be hardwired, through a cellular method, or other approved service that allows Wi-Fi connection. Prior to obtaining the internet connection, the Contractor will submit the internet connection’s technical data to the Area Office to check for compatibility with the state’s computer equipment. The Contractor’s personnel are prohibited from using the internet connection unless pre-approved by the Project Engineer. The internet service will be incidental to the contract unit price per each for “Type III Field Laboratory”.

CLEANOUT PIPE CULVERTS

Outlet culverts and the culvert end sections at drop inlet locations will need cleaning and inspection as specified in the plans and will be scheduled such that there is adequate time to evaluate if any repairs are required and to allow for ordering and delivery of pipe culvert repair materials.

Material in the existing pipe culverts and pipe culvert end sections will be cleaned out by water flushing or other approved methods. The Contractor will implement appropriate sediment control measures prior to cleaning in order to prevent discharges from the project boundaries to comply with the Storm Water Permit.

The pipe culvert will be cleaned to the satisfaction of the Engineer and the cleaning will be adequate to determine pipe condition and potential repair techniques.

All costs to dewater, clean pipes, dispose of removed materials will be incidental to the contract unit price per each for “Cleanout Pipe Culvert” and will only be paid for a maximum of one time for each pipe culvert.

Table of Cleanout Pipe Culvert

Location	Existing Culvert Size (Inches)	Existing Culvert Length (ft)	Cleanout Pipe Culvert (Each)
MRM 239.66 Begin Bridge (Rt)	12	32	1
MRM 241.90 Begin Bridge (Rt)	12	32	1
MRM 244.75 Begin Bridge (Rt)	12	32	1
MRM 251.09 Begin Bridge (Rt)	12	52	1
		Total:	4

TABLE OF SUPERELEVATION

Station	To	Station	Remarks
493+00		507+11.11	Normal Crown Section
Equation: Station 507+11.11 Bk = Station a0+00 Ah			
a0+00		a101+14.99	Normal Crown Section
a101+14.99		a103+93.99	Superelevation Transition
a103+93.99		a132+98.39	0º 45’ 00” Curve Lt. 0.034 Superelevation Rate
a132+98.39		a135+77.39	Superelevation Transition
a135+77.39		a262+27.31	Normal Crown Section
a262+27.31		a265+06.31	Superelevation Transition
a265+06.31		a291+23.49	0º 45’ 00” Curve Rt. 0.034 Superelevation Rate
a291+23.49		a294+02.49	Superelevation Transition
a294+02.49		a347+28.50	Normal Crown Section
a347+28.50		a350+07.50	Superelevation Transition
a350+07.50		a376+26.53	0º 45’ 00” Curve Lt. 0.034 Superelevation Rate
a376+26.53		a379+05.53	Superelevation Transition
a379+05.53		a382+38.69	Normal Crown Section
Equation: Station a382+38.69 Bk = Station b0+00 Ah			
b0+00		b214+37.29	Normal Crown Section
b214+37.29		b217+56.79	Superelevation Transition
b217+56.79		b241+68.49	1º 00’ 00” Curve Rt. 0.042 Superelevation Rate
b241+68.49		b244+87.99	Superelevation Transition
b244+87.99		b393+59.82	Normal Crown Section
b393+59.82		b396+79.32	Superelevation Transition
b396+79.32		b420+97.83	1º 00’ 00” Curve Lt. 0.042 Superelevation Rate
b420+97.83		b421+48.00	Superelevation Transition

TABLE OF CONSTRUCTION STAKING
(See Special Provision for Contractor Staking)

Roadway and Description	Begin Station	End Station	Number of Lanes	Length (Ft)	Length (Mile)	Lane Factor	*Sets of Stakes	Construction Staking Quantity (Mile)	Miscellaneous Staking Quantity (Mile)	Slope Staking Quantity (Mile)	**Grade Staking Quantity (Mile)
I-90 EBL Median & Outside Shoulders (1 Lane per Shoulder - AC Pavement)	493+00	a165+73.70	1	17,984.81	3.406	2	-	6.812	6.812	-	-
I-90 EBL Median & Outside Shoulders (1 Lane per Shoulder - AC Pavement)	a167+70.20	a283+81.50	1	11,611.90	2.199	2	-	4.398	4.398	-	-
I-90 EBL Median & Outside Shoulders (1 Lane per Shoulder - AC Pavement)	a285+98.50	b51+75.80	1	14,815.99	2.806	2	-	5.612	5.612	-	-
I-90 EBL Median & Outside Shoulders (1 Lane per Shoulder - AC Pavement)	b53+78.70	b264+43.10	1	19,765.40	3.743	2	-	7.486	7.486	-	-
I-90 EBL Median & Outside Shoulders (1 Lane per Shoulder - AC Pavement)	b267+90.30	b386+13.10	1	11,822.80	2.239	2	-	4.478	4.478	-	-
I-90 EBL Median & Outside Shoulders (1 Lane per Shoulder - AC Pavement)	b388+58.90	b421+48.00	1	3,289.10	0.623	2	-	1.246	1.246	-	-
I-90 EBL Mainline Heave Repair (2 Lane - AC Pavement)	b207+80.00	b220+79.00	2	1,299.00	0.246	1	-	0.246	0.246	-	-
Median & Outside Shoulder Guardrail Embankment Inslopes (4 Sites)	At 500' from Begin Structure	At Begin Structure	1	4,000	0.758	2	-	1.516	1.516	-	-
							Totals:	**31.794**	**31.794**	**-**	**-**

* 1 = Top of Granular Material Blue Top Stakes Only (Asphalt Concrete Pavement)

** Grade Staking Quantity = (Length) x (Lane Factor) x (Sets of Stakes)

ASPHALT SURFACE TREATMENT (CHIP SEAL)

GENERAL NOTES

The Asphalt Surface Treatment will only be applied to the Shoulders and throughout the Heave Repair after the Class HR Asphalt Concrete surfacing has been placed. Application of the surface treatment will be applied to the widths specified in the plans.

The Asphalt for Surface Treatment that is delivered for use on this project will be used in the order it is received. Storage of asphalt for surface treatment will only be allowed at the end of the workday. The material that is placed in storage will be the first material used the following day.

MODIFIED COVER AGGREGATE

Modified Cover Aggregate and CRS-2P Asphalt for Surface Treatment will be applied after the Class HR Asphalt Concrete surfacing has been placed. Modified Cover Aggregate will conform to the following gradation requirements:

Passing 3/8 inch sieve	100%
Passing No. 4 sieve	0-75%
Passing No. 8 sieve	0-30%
Passing No. 40 sieve	0-6%
Passing No. 200 sieve	0-1.5%

Should the material fail the No. 200 sieve requirements, the Contractor will shut down operations until the Engineer determines if changes or corrections are required. Application of the cover aggregate will be maintained within 500 feet or have a time limit of 1 minute between the application of the CRS-2P Asphalt for Surface Treatment and the application of the cover aggregate, whichever amounts to a shorter time period.

The Contractor will continue chip spreader progress, forward, through the asphalt application at any end where work will be temporarily shut down for more than 5 minutes, to allow for satisfactory uniform rolling of the placed aggregate. The Contractor will not allow the chip spreader, trucks, rollers, or other equipment to lie dormant on the aggregate while transitioning between asphalt distributor loads and/or any other temporary shutdown of production before uniform rolling is completed.

All passes of the rollers will be completed within 8 minutes of application of the CRS-2P Asphalt for Surface Treatment.

After an aggregate stockpile has been produced, the Contractor will submit an aggregate sample to the asphalt supplier a minimum of 14 days prior to starting the project to allow time to evaluate the compatibility and design of the surface treatment. A copy of the test results will be submitted to the Engineer and Bituminous Engineer for approval prior to starting the asphalt surface treatment work.

Quality testing on the Modified Cover Aggregate for abrasion and soundness are required by specification. The Contractor will notify the Winner Area Office prior to sampling and a representative from the Winner Area Office will witness all sampling of aggregates to be submitted to the Central Testing Laboratory for quality assurance. Satisfactory test results for the Cover Aggregate will be obtained prior to its use on the project.

FOG SEAL

The fog seal will be placed following the completion of the asphalt surface treatment. Prior to the application of the fog seal, the Contractor will be required to broom the asphalt surface treatment. A CSS-1h or SS-1h emulsion will be used for the fog seal application. The Asphalt for Fog Seal used will be compatible with the aggregate used.

The Contractor will fog seal the entirety of the asphalt surface treatment surface, including the sluff.

CRC PAVEMENT REPAIR

SCOPE OF WORK

This project consists of full depth replacement of Continuously Reinforced Concrete Pavement (CRCP) and Spall Repair in areas where major failures have occurred. Full depth areas may vary in length and width; however, the minimum length is (typically 4) feet for partial lane width repair areas and the minimum length is (typically 4.5) feet for full lane width repair areas. Minimum size for small repair areas – existing steel maintained, is 1 foot x 1 foot.

EXISTING CRC PAVEMENT

The existing pavement is 10” x 26’ CRC Pavement. The longitudinal reinforcing steel consists of No. 5 deformed bars spaced 4¾” center to center, and the transverse reinforcing steel consists of No. 4 deformed bars spaced 42” center to center.

RESTORATION OF GRAVEL CUSHION

An inspection of the gravel cushion will be made after removing 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 prices per square yard for “Continuously Reinforced PCC Pavement Repair”.

GRAVEL CUSHION

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

SAW AND SEAL LONGITUDINAL JOINTS (CRCP)

Longitudinal joints (in line with existing longitudinal joints) at concrete repair areas will be sawed and sealed.

Joint sealing will conform to Section 380.3 P.

Longitudinal joints will be sealed with Low Modulus Silicone Sealant or Hot Poured Elastic Joint Sealer.

Acceptance of the Low Modulus Silicone Sealant and Hot Poured Elastic Joint Sealer will be based on visual inspection by the Engineer.

Cost for sawing and sealing of the longitudinal construction joint will be incidental to the contract unit price per square yard for “Continuously Reinforced PCC Pavement Repair”.

CONTINUOUSLY REINFORCED PCC PAVEMENT REPAIR

New pavement thickness will equal existing pavement thickness ($T_N = T$).

Locations and size (length or width) of pavement repair areas are subject to change in the field, at the discretion of the Engineer, at no additional cost to the state. Payment will be based on actual area replaced.

The Engineer will mark the location of the area to be repaired on construction. Where repair crosses both lanes, the passing lane should be repaired first.

Full Lane Width Repair and Partial Lane Width Repair

The Contractor will saw the in-place concrete transversely at four locations for each repair area. Two saw cuts will be full depth. The other two saw cuts will be partial depth saw cuts and will be made to a depth just above the in place reinforcing steel and be placed outside of the previous full depth saw cuts. The outside cuts will be a minimum of 6” from the nearest tight crack outside of the patch.

The Contractor will lift out or break out the center section (including reinforcing steel). In the salvaged rebar sections of the repair areas, the use of 30 or 60 pound hammers will be allowed outside of one foot from the newly created header joint. To prevent damage to the joint and surrounding concrete, only light chipping hammers (not exceeding 15 pounds) will be allowed within the last foot adjacent to the newly created header joint to remove the remaining concrete at each end of the repair area, leaving the reinforcing steel in place.

Small Repair – Existing Steel Retained

The Contractor will saw the in-place concrete around the periphery of each repair area to a depth of 2” (above the in place reinforcing steel). The cuts will be a minimum of 6” from the nearest tight crack outside of the patch.

Light chipping hammers (not exceeding 15 pounds) will be used to remove the concrete from the repair area, leaving the reinforcing steel in place.

Saw cuts that extend beyond the repair area will be minimized and filled with a non-shrinkage mortar mix at the Contractor’s expense.

Care will be taken not to cut, bend or otherwise damage the in place reinforcing steel. Damage to in place reinforcing steel or to in place concrete beyond the repair area will be replaced at the Contractor’s expense, to the satisfaction of the Engineer.

The Contractor will remove and dispose of the in-place concrete and in place asphalt concrete.

Existing exposed reinforcing steel and concrete faces will be cleaned by sandblasting and compressed air to remove dirt and debris prior to placement of concrete.

Place reinforcing steel according to the notes for REINFORCING STEEL (CRCP) and STEEL BAR INSERTION (CRCP).

Concrete placed adjacent to asphalt concrete shoulders will be formed full depth to match the width of existing concrete pavement. The excavated area of the asphalt concrete shoulder adjacent to repair areas will be filled with asphalt concrete.

Concrete will not be placed in the repair areas before 12:00pm and should be placed in the late afternoon. Temperature of the concrete at the time of placement will be between 50°F and 90°F. The temperature of the concrete will be maintained above 40°F during the curing period.

Concrete will meet the requirements stated in Section 380 of the specifications, except as modified by the following notes:

The fine aggregate will be screened over a one-inch square-opening screen just prior to introduction into the concrete paving mix if required by the Engineer.

The slump requirement will be limited to 3" maximum after water reducer is added and the concrete will contain 4.5% to 7.0% entrained air. The concrete will contain a minimum of 50% coarse aggregate by weight. Coarse aggregate will be crushed ledge rock, Size No. 1 unless an alternative gradation is approved by the Concrete Engineer as part of the mix design submittal. The mix design will contain at least 650 lbs of Type I or II cement or 600 lbs of Type III cement per cubic yard. The minimum 28 day compressive strength will be 4,000 psi. The Contractor is responsible for the mix design used. The Contractor will submit a mix design and supporting documentation for approval at least 2 weeks prior to use.

The use of a water reducer at manufacturer’s recommended dosage will be required.

Concrete will be cured with white pigmented curing compound (AASHTO M148, Type 2) applied as soon as practical at a rate of 125 square feet per gallon. Concrete will be cured a minimum of 48 hours before opening to traffic. The 48 hours is based upon a concrete surface temperature of 60ºF or higher throughout the cure period. If the concrete temperature falls below 60ºF, the cure time will be extended, or other measures taken, at no additional cost to the State. A strength of 3,000 psi must be attained prior to opening to traffic.

Concrete will be covered with suitable insulation blanket consisting of a layer of closed cell polystyrene foam protected by at least one layer of plastic. Insulation blanket will have an R-value of at least 0.5, as rated by the manufacturer. Insulation blanket will be left in place, except for joint sawing operations until 3,000 psi is attained. Insulation blanket will be overlapped on to the existing concrete by 4’. This requirement for covering repair areas with insulation blankets may be waived during periods of hot weather upon approval of the Engineer.

Upon placement of the concrete, repair areas will be straight edged to ensure a smooth riding surface and will be textured longitudinally with the pavement by finishing with a stiff broom. Repair areas will then be checked with a 10’ foot straight edge. The permissible longitudinal and transverse surface deviation will be 1/8” in 10’.

Cost for performing the aforementioned work including sawing, chipping and removing concrete, sandblasting, cleaning, furnishing and placing concrete and reinforcing steel, finishing and curing, replacing asphalt concrete shoulders, labor and equipment will be included in the contract unit price per square yard for “Continuously Reinforced PCC Pavement Repair”.

REINFORCING STEEL (CRCP)

Reinforcing steel will conform to Section 1010.

After removal of the in-place concrete and repair of the gravel cushion, new reinforcing steel will be installed. Refer to the CRC Pavement Repair Area layouts for details.

At full lane and partial lane width repair areas:
New longitudinal bars will be lap spliced with the preserved in place longitudinal bars (New bar diameter to match in place bar diameter).

Additional transverse bars will be centered between the in place transverse bars throughout the length of the repair area. The spacing of transverse bars in the completed repair area should be half the spacing of the in place transverse reinforcing steel.

The additional transverse bars will be lap spliced with No. 5 x 24" epoxy coated deformed tie bars inserted 9" into the existing concrete. Drilled holes will be required. Tie bars will be inserted according to the notes for STEEL BAR INSERTION (CRCP).

At full lane width repair areas:
Additional longitudinal bars will be centered between every other set of two spliced longitudinal bars throughout the width of the repair area. These additional bars will extend 9" into the existing concrete on both sides of the repair area. Drilled holes will be required and the additional longitudinal bars will be inserted in accordance with the notes for STEEL BAR INSERTION (CRCP). The additional longitudinal bars will then be lap spliced.

Cost for this work, including reinforcing steel, ties, labor and equipment will be incidental to the contract unit price per square yard for "Continuously Reinforced PCC Pavement Repair".

STEEL BAR INSERTION (CRCP)

Steel bars will conform to Section 1010.

Locations and quantities of concrete repair are subject to change in the field at the discretion of the Engineer. The Contractor will be responsible for ordering the actual quantity of steel bars necessary to complete the work.

Longitudinal deformed tie bars will be inserted 9 inches into the in-place concrete at the transverse joint and centered between every other set of two spliced longitudinal bars throughout the width of the repair area. Transverse deformed bars will be lap spliced with deformed tie bars which are inserted 9 inches into the in-place concrete at the longitudinal joint throughout the length of the repair area. Refer to the notes for REINFORCING STEEL (CRCP). An epoxy resin adhesive must be used to anchor the steel bar in the drilled hole as per Section 380.3 C.1.

Holes drilled into the existing concrete pavement will be located at mid-depth of the slab and true and normal except that in transverse joints, the drilled in longitudinal steel bar angle will be slightly under 90° to allow for centering of the lap splice between existing longitudinal steel.

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.

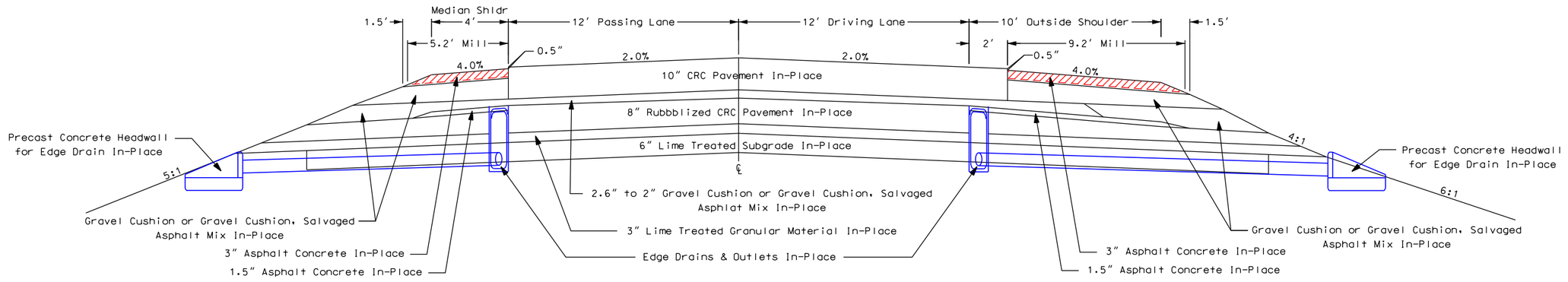
Cost for drilling holes, furnishing and applying epoxy resin adhesive, furnishing and inserting No. 5 x 24" epoxy coated deformed tie bars into the drilled holes, furnishing and inserting No. 5 longitudinal reinforcing steel bars into the drilled holes, and any incidentals necessary to complete the work will be included in the contract unit price per each for "Insert Steel Bar in PCC Pavement".

TYPICAL SURFACING SECTIONS

SECTION 1

Station 498+04.0 to Station a0+35.6
Station a5+63.6 to Station a160+89.7
Station a172+54.1 to Station a253+81.0
Station a274+87.1 to Station a278+97.5
Station a290+82.5 to Station a294+69.8
Station a308+17.7 to Station b46+91.8
Station b58+62.6 to Station b148+63.2
Station b187+70.4 to Station b207+80
Station 220+79 to Station b248+13.5
Station b255+81.6 to Station b261+75.1
Station b270+58.2 to Station b275+15.1
Station b288+64.5 to Station b369+95.6
Station b377+64.0 to Station b381+29.1
Station b393+42.9 to Station b396+59.3
Station b410+05.0 to Station b416+44

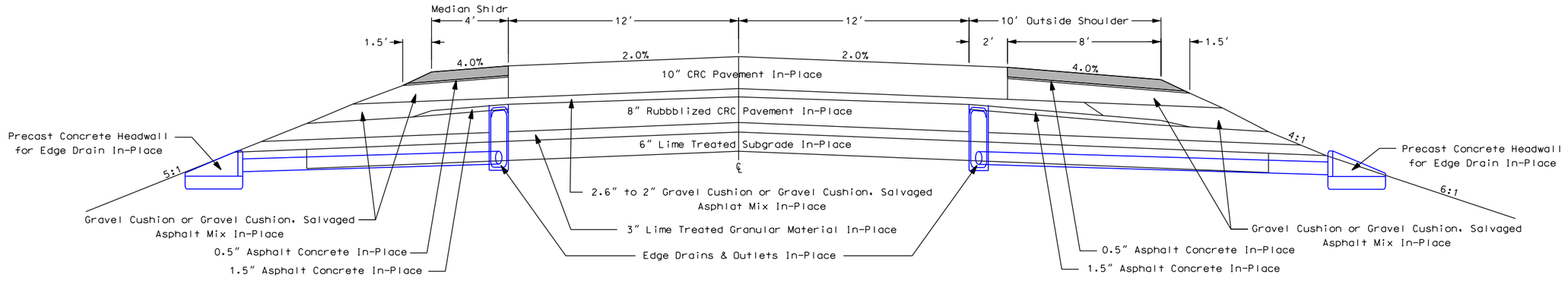
COLD MILLING ASPHALT CONCRETE & IN-PLACE SECTION



Cold Milling @ 4.0%
(3″ From top of Concrete)

3″ Class HR Asphalt Concrete

SHOULDER ASPHALT CONCRETE RESUFACING SECTION



TYPICAL SURFACING SECTIONS

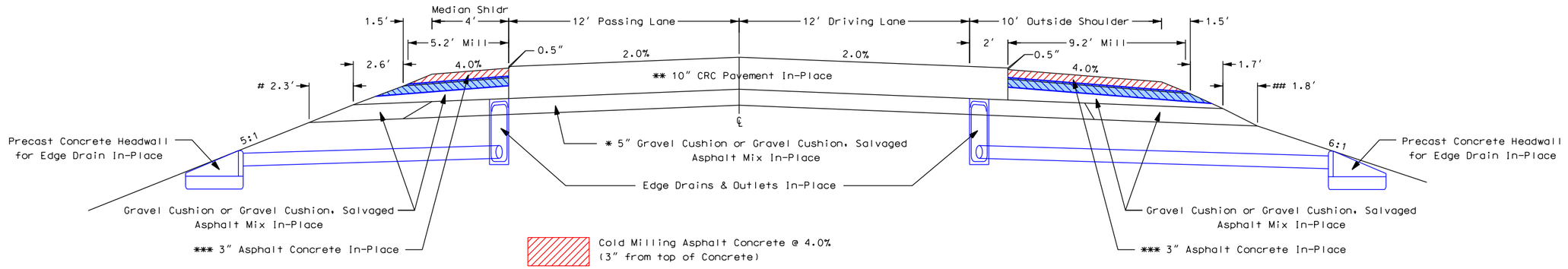
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F11	F53

Plotting Date: 04/16/2025

SECTION 2

Station 493+00 to Station 498+04
Station a0+35.6 to Station a5+63.6
Station a160+89.7 to Station a165+93.7
Station a167+50.2 to Station a172+54.10
Station a253+81.0 to Station a266+14.6
Station a278+87.5 to Station a284+01.5
Station a285+78.5 to Station a290+82.5
Station b46+91.8 to Station b51+95.8
Station b53+58.7 to Station b58+62.6
Station b148+63.2 to Station b187+70.4
Station b381+29.1 to Station b386+33.1
Station b388+38.9 to Station b393+42.9
Station b416+44 to Station b421+48

COLD MILLING ASPHALT CONCRETE & IN-PLACE SECTION



Cold Milling Asphalt Concrete @ 4.0% (3″ from top of Concrete)

3″ Class HR Asphalt Concrete

3″ Salvage and Stockpile Asphalt Mix and Granular Base Material and replace with 3″ Class HR Asphalt Concrete for 500′ from each end of the structure (including concrete shoulder area & approach slab) for shoulder strengthening at the following structures (quantities are included in the Table of Additional Quantities)

- Structure No. 43-290-220 (MRM 239.66)
- Structure No. 43-313-221 (MRM 241.90)
- Structure No. 43-340-225 (MRM 244.75)
- Structure No. 43-401-238 (MRM 251.09)

TRANSITIONS:
Station a0+35.6 to Station a5+63.6
Station a253+81.0 to Station a266+14.6
Station b148+63.2 to Station b187+70.4
* 13.6″
# 6.3′
4.9′

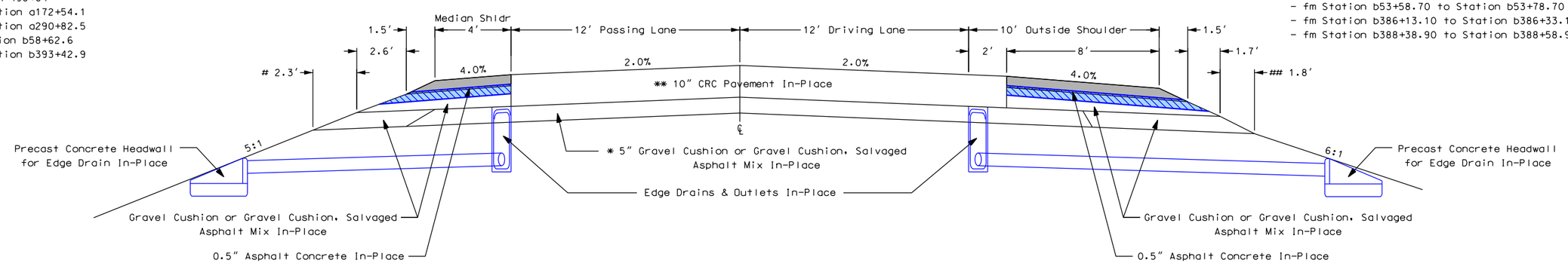
Station a160+89.7 to Station a164+33.7
Station a278+97.5 to Station a282+41.5
Station b46+91.8 to Station b50+35.8
Station b381+29.1 to Station b384+73.1
Station b416+44 to Station b419+88
* 13.6″ to 5″
# 6.3′ to 2.3′
4.9′ to 1.8′

Station 494+60 to Station 498+04
Station a169+10.1 to Station a172+54.1
Station b287+38.5 to Station a290+82.5
Station b55+18.6 to Station b58+62.6
Station b389+98.9 to Station b393+42.9
* 5″ to 13.6″
# 2.3′ to 6.3′
1.8′ to 4.9′

** 10.5″ NRC Pavement In-Place
- fm Station a164+93.70 to Station a165+93.70
- fm Station a167+50.20 to Station a168+50.20
- fm Station a283+01.50 to Station a284+01.50
- fm Station a285+78.50 to Station a286+78.50
- fm Station b50+95.80 to Station b51+95.80
- fm Station b53+58.70 to Station b54+58.70
- fm Station b385+33.10 to Station b386+33.10
- fm Station b388+38.90 to Station b389+38.90

*** 10.5″ NRC Pavement In-Place (Shoulder AC Paving Exception)
- fm Station a165+73.70 to Station a165+93.70
- fm Station a167+50.20 to Station a167+70.20
- fm Station a283+81.50 to Station a284+01.50
- fm Station a285+78.50 to Station a285+98.50
- fm Station b51+75.80 to Station b51+95.80
- fm Station b53+58.70 to Station b53+78.70
- fm Station b386+13.10 to Station b386+33.10
- fm Station b388+38.90 to Station b388+58.90

SHOULDER ASPHALT CONCRETE RESUFACING SECTION



TYPICAL SURFACING SECTIONS

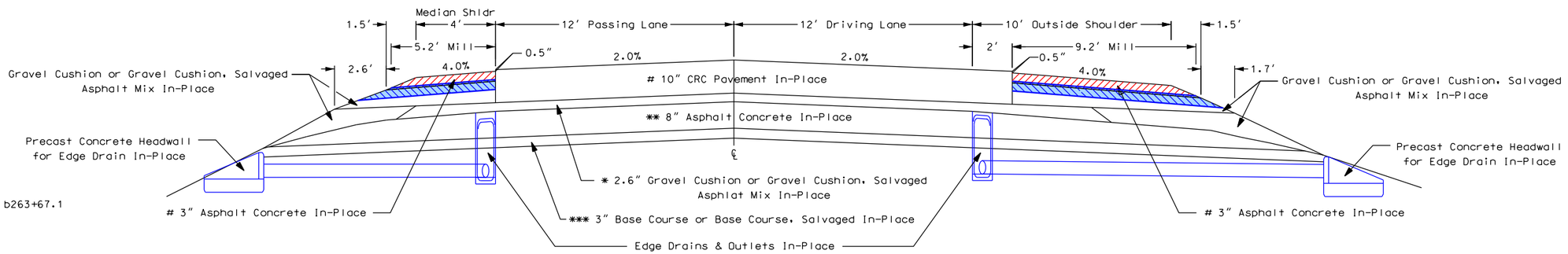
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F12	F53

Plotting Date: 04/16/2025

SECTION 3

Station b261+75.1 to Station b265+23.1
Station b267+10.3 to Station b270+58.2

COLD MILLING ASPHALT CONCRETE & IN-PLACE SECTION



TRANSITIONS:
Station b261+75.1 to Station b263+67.1
** 8″ to 3.2″
*** 3″ to 7.8″

Station b263+67.1 to Station b264+31.1
** 3.2″ to 0″
*** 7.8″ to 9.4″

Station b264+31.1 to Station b264+43.1
* 2.6″ to 0″
** 0″
*** 9.4″ to 10.7″

Station b264+43.1 to Station b265+23.1
11″ NRC Pavement In-Place
* 0″
** 0″
*** 13″ Base Course In-Place

Station b267+10.3 to Station b267+90.3
11″ NRC Pavement In-Place
* 0″
** 0″
*** 13″ Base Course In-Place

Station b267+90.3 to Station b268+02.2
* 0″ to 2.6″
** 0″
*** 10.7″ to 9.4″

Station b268+02.2 to Station b268+66.2
** 0″ to 3.2″
*** 9.4″ to 7.8″

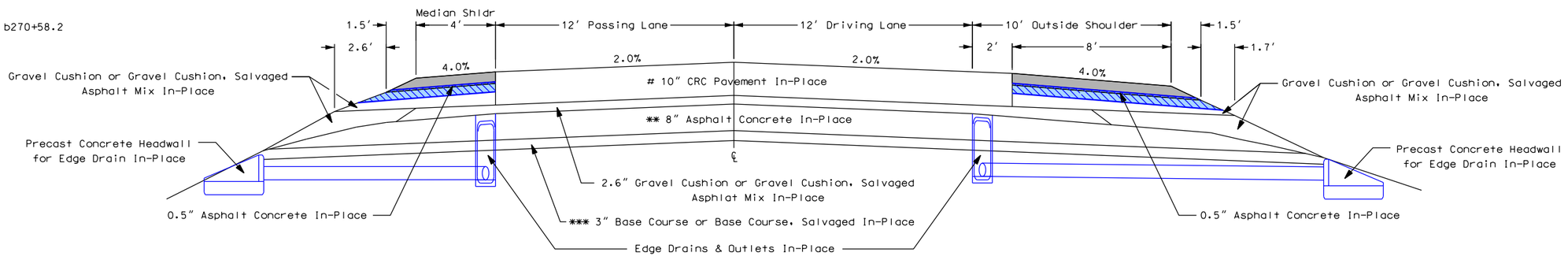
Station b268+66.2 to Station b270+58.2
** 3.2″ to 8″
** 7.8″ to 3″

Cold Milling @ 4.0%
(3″ From top of Concrete)

3″ Class HR Asphalt Concrete

3″ Salvage and Stockpile Asphalt Mix and Granular Base Material and replace with 3″ Class HR Asphalt Concrete for 500′ from each end of the structure (including concrete shoulder area & approach slab) for shoulder strengthening at the following structure (quantities are included in the Table of Additional Quantities)
- Structure No. 43-380-228 (MRM 248.79)

SHOULDER ASPHALT CONCRETE RESUFACING SECTION



TYPICAL SURFACING SECTIONS

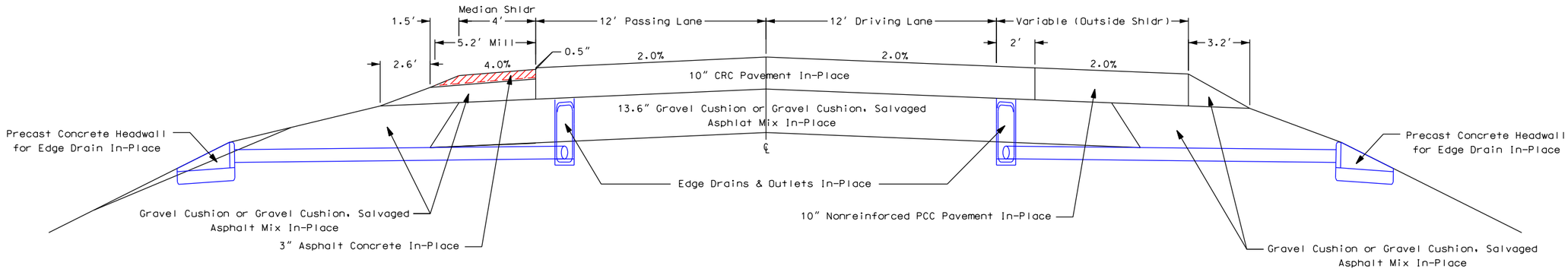
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F13	F53

Plotting Date: 04/16/2025

SECTION 4

I90 EBL
Exit 241 Off Ramp
Station a266+14.6 to Station a269+65

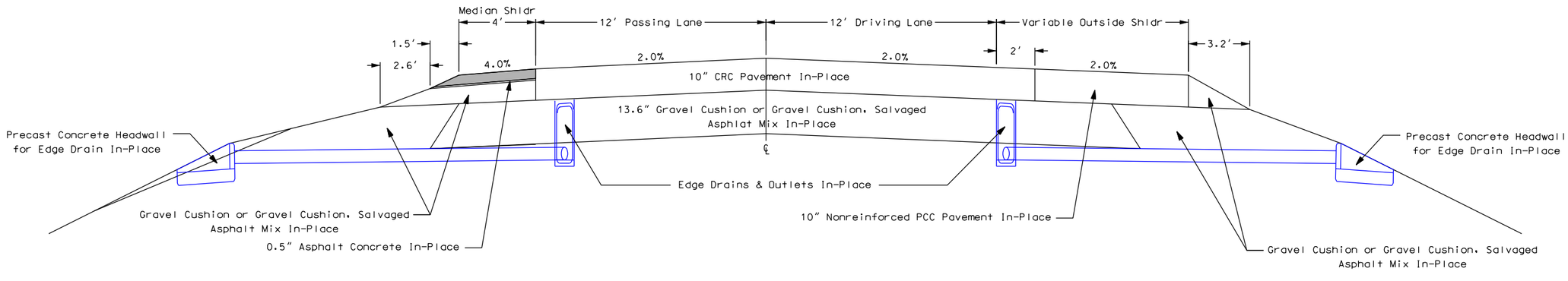
COLD MILLING ASPHALT CONCRETE & IN-PLACE SECTION



Cold Milling @ 4.0%
(3″ From top of Concrete)

3″ Class HR Asphalt Concrete

SHOULDER ASPHALT CONCRETE RESUFACING SECTION



TYPICAL SURFACING SECTIONS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F14	F53

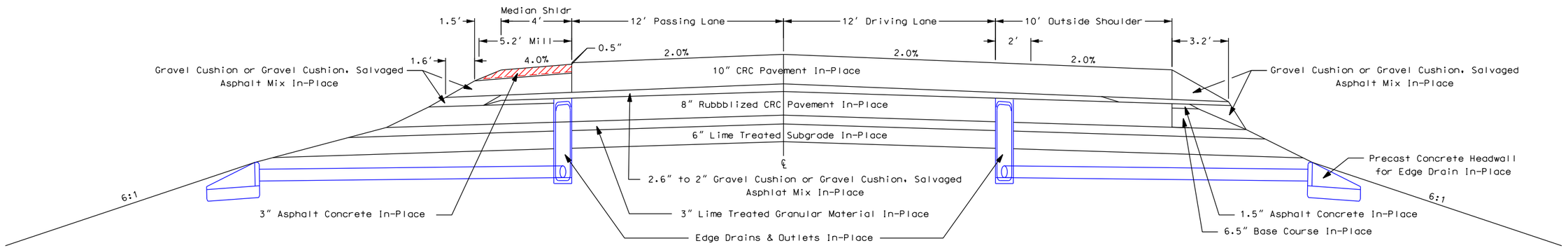
Plotting Date: 04/16/2025

SECTION 5

I90 EBL Ramp Gore Areas

Station a269+65.0 to Station a274+87.7 - Exit 241 Off Ramp
Station a294+69.8 to Station a308+17.7 - Exit 241 On Ramp
Station b248+13.5 to Station b255+81.6 - Exit 248 Off Ramp
Station b275+15.1 to Station b288+64.5 - Exit 248 On Ramp
Station b369+95.6 to Station b377+64.0 - Exit 251 Off Ramp
Station b396+59.3 to Station b410+05.0 - Exit 251 On Ramp

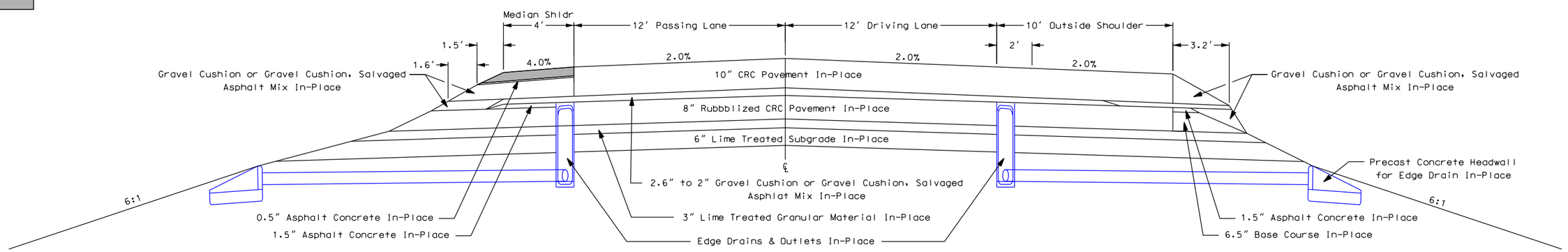
COLD MILLING ASPHALT CONCRETE & IN-PLACE SECTION



Cold Milling @ 4.0%
(3″ From top of Concrete)

3″ Class HR Asphalt Concrete

SHOULDER ASPHALT CONCRETE RESUFACING SECTION



TYPICAL MAINLINE PCC PAVEMENT PLANING, SPOT RESURFACING, COLD MILLING ASPHALT CONCRETE, & REMOVE ASPHALT CONCRETE SECTION (HEAVE REPAIR)

** All quantities throughout the Heave Repair Section limits are included in the Table of Additional Quantities **

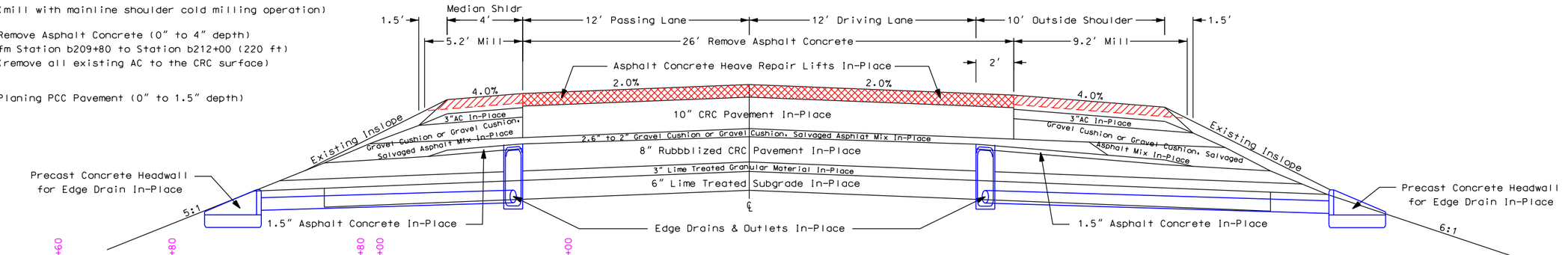
HEAVE REPAIR SECTION
Station b207+80 to Station b220+79

Cold Milling Asphalt Concrete (3" depth @ 4.0%)
fm Station b209+80 to Station b220+79 (1,099 ft)
(mill with mainline shoulder cold milling operation)

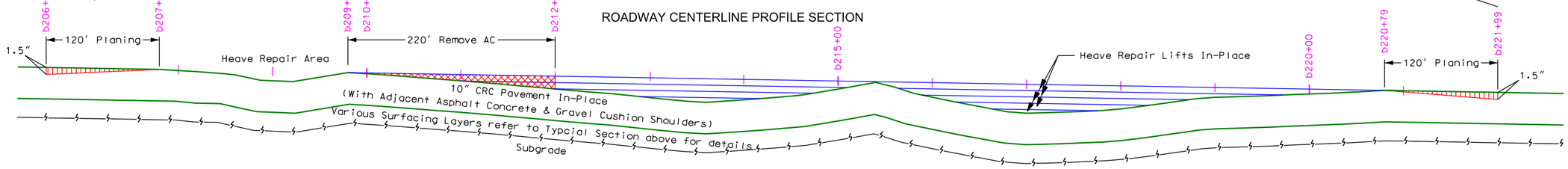
Remove Asphalt Concrete (0" to 4" depth)
fm Station b209+80 to Station b212+00 (220 ft)
(remove all existing AC to the CRC surface)

Planing PCC Pavement (0" to 1.5" depth)

COLD MILLING ASPHALT CONCRETE (SHOULDERS), REMOVE ASPHALT CONCRETE (MAINLINE), & IN-PLACE SECTION



ROADWAY CENTERLINE PROFILE SECTION



ASPHALT CONCRETE RESURFACING

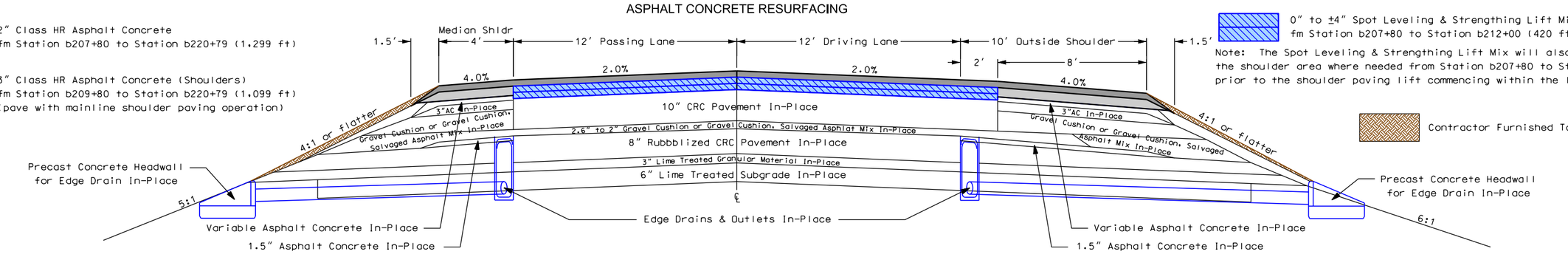
2" Class HR Asphalt Concrete
fm Station b207+80 to Station b220+79 (1,299 ft)

3" Class HR Asphalt Concrete (Shoulders)
fm Station b209+80 to Station b220+79 (1,099 ft)
(pave with mainline shoulder paving operation)

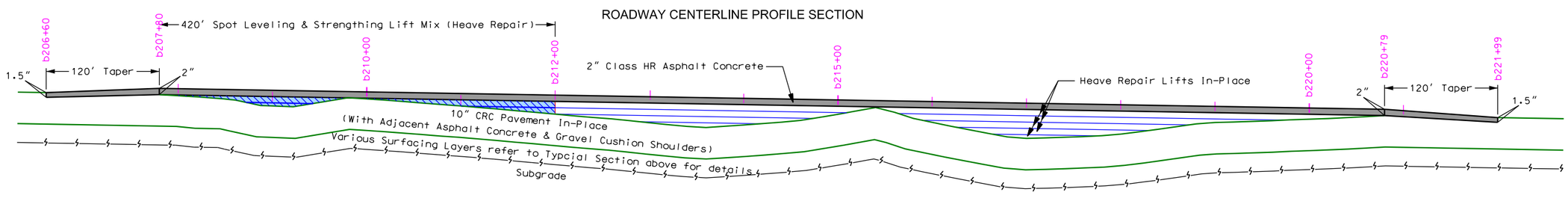
0" to ±4" Spot Leveling & Strengthing Lift Mix for Heave Repair
fm Station b207+80 to Station b212+00 (420 ft)

Note: The Spot Leveling & Strengthing Lift Mix will also extend throughout the shoulder area where needed from Station b207+80 to Station b209+80 prior to the shoulder paving lift commencing within the limits.

Contractor Furnished Topsoil



ROADWAY CENTERLINE PROFILE SECTION



RATES OF MATERIALS

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM-CR 0905(121)236	F16	F53

SECTION 1, 2, 3, 4, & 5 (per mile)

Median Shoulder (Lt)

Station 493+00 to Station a165+73.70 (thru equation)
Station a167+70.20 to Station a283+81.50
Station a285+98+50 to Station b51+75.80 (thru equation)
Station b53+78.70 to Station b264+43.10
Station b267+90.30 to Station b386+13.10
Station b388+58.90 to Station b421+48.00

COLD MILLING ASPHALT CONCRETE

Cold Milling Asphalt Concrete is computed at the rate of 3,051 square yards, applied 5.2 feet wide.

CLASS HR HOT MIXED ASPHALT CONCRETE

Asphalt Mix Materials	Quantity
Aggregate (60% Contractor Furnished)	263 Tons
Salvaged Asphalt Concrete (40%)	176 Tons
PG 58-34 Asphalt Binder	15 Tons
Total Mix	**454 Tons**

The exact proportions of these materials will be determined on construction.

Provide SS-1h or CSS-1h Asphalt for Tack at the rate of 1.5 ton applied 6.5 feet wide prior to application of Class HR Hot Mixed Asphalt Concrete. (Rate = 0.09 gallon per square yard)

ASPHALT SURFACE TREATMENT (CHIP SEAL)

Provide CRS-2P Asphalt for Surface Treatment at the rate of 3.8 ton applied 4 feet wide. (Rate = 0.38 gallon per square yard)

Provide Modified Cover Aggregate at the rate of 26 ton applied 4 feet wide. (Rate = 22 pounds per square yard)

Provide SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 0.7 ton applied 5.5 feet wide. (Rate = 0.05 gallon per square yard)

SECTION 1, 2, & 3 (per mile)

Outside Shoulder (Rt)

Station 493+00 to Station a165+73.70 (thru equation)
Station a167+70.20 to Station a266+14.60
Station a274+87.10 to Station a283+81.50
Station a285+98.50 to Station a294+69.80
Station a308+17.70 to Station b51+75.80 (thru equation)
Station b53+78.70 to Station b248+13.50
Station b255+81.60 to Station b264+43.10
Station b267+90.30 to Station b275+15.10
Station b288+64.50 to Station 369+95.60
Station b377+64.00 to Station b386+13.10
Station b388+58.90 to Station b396+59.30
Station 410+05.00 to Station 421+48.00

COLD MILLING ASPHALT CONCRETE

Cold Milling Asphalt Concrete is computed at the rate of 5,397 square yards, applied 9.2 feet wide.

CLASS HR HOT MIXED ASPHALT CONCRETE

Asphalt Mix Materials	Quantity
Aggregate (60% Contractor Furnished)	490 Tons
Salvaged Asphalt Concrete (40%)	327 Tons
PG 58-34 Asphalt Binder	28 Tons
Total Mix	**845 Tons**

The exact proportions of these materials will be determined on construction.

Provide SS-1h or CSS-1h Asphalt for Tack at the rate of 7.6 ton applied 8 feet wide prior to application of Class HR Hot Mixed Asphalt Concrete. (Rate = 0.09 gallon per square yard)

ASPHALT SURFACE TREATMENT (CHIP SEAL)

Provide CRS-2P Asphalt for Surface Treatment at the rate of 3.8 ton applied 4 feet wide. (Rate = 0.38 gallon per square yard)

Provide Modified Cover Aggregate at the rate of 52 ton applied 8 feet wide. (Rate = 22 pounds per square yard)

Provide SS-1h or CSS-1h Asphalt for Fog Seal at the rate of 1.2 ton applied 9.5 feet wide. (Rate = 0.05 gallon per square yard)

CONTROL & HORIZONTAL ALIGNMENT DATA

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)136	F17	F53

CONTROL DATA

POINT	DESCRIPTION	NORTHING	EASTING	ELEVATION
305A	305 A 5' X 5/8" REBAR W CAP ON APP. TO CONC PLANT NORTH SIDE	568308.046	2091901.639	1761.542
I-90 MRM 234.90	NGS MRM 234.90	570499.291	2089167.855	1735.964
I-90 MRM 237.64	NGS I-90 MRM 237.64	565337.403	2102756.718	1711.002
I-90 MRM 242.00	NGS I-90 MRM 242.00 SOUTH ROW FENCE SOUTH EB ON RAMP	562388.560	2125427.05	1773.280
I-90 MRM244.24	NGS OR1067 NORTH ROW FENCE WB LANE	560386.134	2136653.771	1786.764
I-90 MRM 244.50	NGS HARN OR 1066	560098.695	2138078.788	1789.260
REBAR	5/8" X 5' REBAR MEDIAN	563055.337	2114365.384	1832.221
I-90 MRM 251.30	I-90 EXIT 251 EB LANE ON RAMP SOUTH ROW FENCE	553102.719	2172283.739	1816.672

HORIZONTAL ALIGNMENT DATA

The following alignment data for the project can be retrieved electronically from the Bid Letting office upon request:

I-90 Median Alignment: *05EF Median.alg*

The coordinates shown on this sheet are based on the South Dakota State Plane Coordinate System. South Zone NAD 83(2011); epoch 2010.00
Geoid12B; SF = 0.9998373990
The elevations shown on this sheet are based on NAVD 83.

TABLE OF PROJECT STATIONING

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM-CR 0905(121)236	F18	F53

SECTION	STATION	TO	STATION		DESCRIPTION	PROJECT GROSS LENGTH	EXCEPTION LENGTH	PROJECT NET LENGTH
2	**Begin Project** 493+00.00	to	498+04.00		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	504.00'		504.00'
1	498+04.00	to	507+11.11		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	907.11'		907.11'
Equation	*Eq: 507+11.11 Bk = a0+00 Ah*				-	-		-
1	a 0+00.00	to	a 0+35.60		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	35.60'		35.60'
2	a 0+35.60	to	a 5+63.60		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	528.00'		528.00'
1	a 5+63.60	to	a 160+89.70		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	15,526.10'		15,526.10'
2	a 160+89.70	to	a 161+15.70		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	26.00'		26.00'
2	a 161+15.70	to	a 165+73.70		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders - AC strengthening segment)	458.00'		458.00'
Exception	a 165+73.70	to	a 167+70.20		Structure No. 43-290-220 (MRM 239.66), Approach/Sleeper Slabs (44'), & NRC Shoulder Pavement (40')	196.50'	196.50'	-
2	a 167+70.20	to	a 172+28.20		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders - AC strengthening segment)	458.00'		458.00'
2	a 172+28.20	to	a 172+54.10		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	25.90'		25.90'
1	a 172+54.10	to	a 253+81.00		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	8,126.90'		8,126.90'
2	a 253+81.00	to	a 266+14.60		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	1,233.60'		1,233.60'
4	a 266+14.60	to	a 269+65.00		I-90 EB at Exit 241 Off-Ramp -- Asphalt Concrete Shoulder Resurfacing (median shoulder only)	350.40'		350.40'
5	a 269+65.00	to	a 274+87.70		I-90 EB at Exit 241 Off-Ramp -- Asphalt Concrete Shoulder Resurfacing (median shoulder only)	522.70'		522.70'
1	a 274+87.10	to	a 278+97.50		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	410.40'		410.40'
2	a 278+97.50	to	a 279+23.50		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	26.00'		26.00'
2	a 279+23.50	to	a 283+81.50		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders - AC strengthening segment)	458.00'		458.00'
Exception	a 283+81.50	to	a 285+98.50		Structure No. 43-313-221 (MRM 241.90), Approach Slabs (44'), & NRC Shoulder Pavement (40')	217.00'	217.00'	-
2	a 285+98.50	to	a 290+56.50		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders - AC strengthening segment)	458.00'		458.00'
2	a 290+56.50	to	a 290+82.50		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	26.00'		26.00'
1	a 290+82.50	to	a 294+69.80		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	387.30'		387.30'
5	a 294+69.80	to	a 308+17.70		I-90 EB Exit 241 On-Ramp -- Asphalt Concrete Shoulder Resurfacing (median shoulder only)	1,347.90'		1,347.90'
1	a 308+17.70	to	a 382+38.69		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	7,420.99'		7,420.99'
Equation	*Eq: a382+38.69 Bk = b0+00 Ah*				-	-		-
1	b 0+00.00	to	b 46+37.80		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	4,637.80'		4,637.80'
1	b 46+37.80	to	b 46+91.80		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	54.00'		54.00'
2	b 46+91.80	to	b 47+17.80		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	26.00'		26.00'
2	b 47+17.80	to	b 51+75.80		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders - AC strengthening segment)	458.00'		458.00'
Exception	b 51+75.80	to	b 53+78.70		Structure No. 43-340-225 (MRM 244.75), Approach Slabs (44'), & NRC Shoulder Pavement (40')	202.90'	202.90'	-
2	b 53+78.70	to	b 58+36.70		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders - AC strengthening segment)	458.00'		458.00'
2	b 58+36.70	to	b 58+62.60		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	25.90'		25.90'
1	b 58+62.60	to	b 148+63.20		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	9,000.60'		9,000.60'
2	b 148+63.20	to	b 187+70.40		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	3,907.20'		3,907.20'
1	b 187+70.40	to	b 207+80.00		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	2,009.60'		2,009.60'
Heave Repair	b 207+80.00	to	b 220+79.00		I-90 EB Heave Repair Area Mainline & Shoulder Resurfacing (both shoulders & mainline)	1,299.00'		1,299.00'
1	b 220+79.00	to	b 248+13.50		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	2,734.50'		2,734.50'
5	b 248+13.50	to	b 255+81.60		I-90 EB Exit 248 Off-Ramp -- Asphalt Concrete Shoulder Resurfacing (median shoulder only)	768.10'		768.10'
1	b 255+81.60	to	b 260+50.60		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	469.00'		469.00'
1	b 260+50.60	to	b 261+75.10		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders - AC strengthening segment)	124.50'		124.50'
3	b 261+75.10	to	b 264+43.10		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders - AC strengthening segment)	268.00'		268.00'
Exception	b 264+43.10	to	b 267+90.30		Structure No. 43-380-228 (MRM 248.79), Approach Slabs (55'), & NRC Shoulder Pavement (160')	347.20'	347.20'	-
3	b 267+90.30	to	b 270+58.20		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders - AC strengthening segment)	267.90'		267.90'
1	b 270+58.20	to	b 271+82.80		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders - AC strengthening segment)	124.60'		124.60'
1	b 271+82.80	to	b 275+15.10		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	332.30'		332.30'
5	b 275+15.10	to	b 288+64.50		I-90 EB Exit 248 On-Ramp -- Asphalt Concrete Shoulder Resurfacing (median shoulder only)	1,349.40'		1,349.40'
1	b 288+64.50	to	b 369+95.60		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	8,131.10'		8,131.10'
5	b 369+95.60	to	b 377+64.00		I-90 EB Exit 251 Off-Ramp -- Asphalt Concrete Shoulder Resurfacing (median shoulder only)	768.40'		768.40'
1	b 377+64.00	to	b 381+29.10		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	365.10'		365.10'
2	b 381+29.10	to	b 381+59.10		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	30.00'		30.00'
2	b 381+59.10	to	b 386+13.10		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders - AC strengthening segment)	454.00'		454.00'
Exception	b 386+13.10	to	b 388+58.90		Structure No. 43-401-238 (MRM 251.09), Approach Slabs (52'), & NRC Shoulder Pavement (40')	245.80'	245.80'	-
2	b 388+58.90	to	b 393+12.90		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders - AC strengthening segment)	454.00'		454.00'
2	b 393+12.90	to	b 393+42.90		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	30.00'		30.00'
1	b 393+42.90	to	b 396+59.30		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	316.40'		316.40'
5	b 396+59.30	to	b 410+05.00		I-90 EBL Exit 251 On-Ramp -- Asphalt Concrete Shoulder Resurfacing (median shoulder only)	1,345.70'		1,345.70'
1	b 410+05.00	to	b 416+44.00		I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	639.00'		639.00'
2	b 416+44.00	to	b 421+48.00	**End Project**	I-90 EB -- Asphalt Concrete Shoulder Resurfacing (both shoulders)	504.00'		504.00'
					TOTALS	**81,798.40'** **15.492 Miles**	**1,209.40'** **0.229 Miles**	**80,589.00'** **15.263 Miles**

Exception Length:	1209.40'	0.229 Miles
Mainline Heave Repair:	1,299.00'	0.246 Miles
Section 1:	61,752.90'	11.696 Miles
Section 2:	10,548.60'	1.998 Miles
Section 3:	535.90	0.101 Miles
Section 4:	350.40'	0.066 Miles
Section 5:	6,102.20'	1.156 Miles

TABLE OF MATERIAL QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM-CR 0905(121)236	F19	F53

Description / Location	Section Length	(Info Only) Water For Granular Material	Cold Milling Asphalt Concrete	Planing PCC Pavement	Remove Asphalt Concrete Pavement	Shoulder Preparation	Unclassified Excavation, Digouts	Base Course	Salvage and Stockpile Asphalt Mix and Granular Base Material	Base Course, Salvaged	Granular Material, Furnish	Blend, Haul, and Stockpile Granular Material	ASPHALT PAVING			ASPHALT SURFACE TREATMENT		
													Class HR Hot Mixed Asphalt Concrete	PG 58-34 Asphalt Binder	SS-1h or CSS-1h Asphalt For Tack	CRS-2P Asphalt For Surface Treatment	Modified Cover Aggregate	SS-1h or CSS-1h Asphalt For Fog Seal
	(Mile)	(MGal)	(SqYd)	(SqYd)	(SqYd)	(Mile)	(CuYd)	(Ton)	(Ton)	(Ton)	(Ton)	(Ton)	(Ton)	(Ton)	(Ton)	(Ton)	(Ton)	(Ton)
Section 1	11.696	-	98,807	-	-	-	-	-	-	-	-	-	15,193.1	502.9	43.2	133.3	912.3	22.2
Section 2	1.998	-	16,879	-	-	-	-	-	-	-	-	-	2,595.4	85.9	7.4	22.8	155.8	3.8
Section 3	0.101	-	853	-	-	-	-	-	-	-	-	-	131.2	4.3	0.4	1.2	7.9	0.2
Section 4	0.066	-	201	-	-	-	-	-	-	-	-	-	30.0	1.0	0.1	0.3	1.7	0.0
Section 5	1.156	-	3,527	-	-	-	-	-	-	-	-	-	524.8	17.3	1.7	4.4	30.1	0.0
Section Totals		-	120,267	-	-	-	-	-	-	-	-	-	18,474.5	611.4	52.8	162.0	1,107.8	26.2
Table of Additional Quantities Totals		24.9	-	694	1,781	1.000	763	1,526.0	1,226.4	1,076.4	4,360.4	10,901.0	2,492.1	82.3	7.7	6.1	41.3	0.8
Project Totals		**24.9**	**120,267**	**694**	**1,781**	**1.000**	**763**	**1,526.0**	**1,226.4**	**1,076.4**	**4,360.4**	**10,901.0**	**20,966.6**	**693.7**	**60.5**	**168.1**	**1,149.1**	**27.0**

Tonnage shown in the table above for Asphalt Concrete is based on a compacted depth as detailed in the plans.

TABLE OF ADDITIONAL QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM-CR 0905(121)236	F20	F53

Description / Location	(Info Only) Water For Granular Material (MGal)	Planing PCC Pavement (SqYd)	Remove Asphalt Concrete Pavement (SqYd)	Shoulder Preparation (Mile)	Unclassified Excavation, Digouts (CuYd)	Base Course (Ton)	Salvage and Stockpile Asphalt Mix and Granular Base Material (Ton)	Base Course, Salvaged (Ton)	Granular Material, Furnish (Ton)	Blend, Haul, and Stockpile Granular Material (Ton)	ASPHALT PAVING: Class HR Hot Mixed Asphalt Concrete (Ton)	ASPHALT PAVING: PG 58-34 Asphalt Binder (Ton)	ASPHALT PAVING: SS-1h or CSS-1h Asphalt For Tack (Ton)	ASPHALT SURFACE TREATMENT: CRS-2P Asphalt For Surface Treatment (Ton)	ASPHALT SURFACE TREATMENT: Modified Cover Aggregate (Ton)	ASPHALT SURFACE TREATMENT: SS-1h or CSS-1h Asphalt For Fog Seal (Ton)
Guardrail Surfacing																
Str. No. 43-290-220 (MRM 239.66)	1.9	-	-	-	-	-	-	199.5	-	-	87.7	2.9	0.3	-	-	-
Str. No. 43-313-221 (MRM 241.90)	3.4	-	-	-	-	-	-	355.3	-	-	90.0	3.0	0.3	-	-	-
Str. No. 43-340-225 (MRM 244.75)	2.5	-	-	-	-	-	-	260.8	-	-	87.9	2.9	0.3	-	-	-
Str. No. 43-401-238 (MRM 251.09)	2.5	-	-	-	-	-	-	260.8	-	-	94.9	3.1	0.3	-	-	-
Blend, Haul, and Stockpile remaining salvaged asphalt concrete (cold milled material)	-	-	-		-	-	-	-	4,360.4	10,901.0	-	-	-	-	-	-
500' Additional AC for Shoulder Strengthening at Structure Ends	-	-	-	-	-	-	1,226.4	-	-	-	1,296.1	42.9	3.2	-	-	-
Heave Repair (fm Station b207+80 to Station b220+79)	-	694	636	-	-	-	-	-	-	-	635.5	20.9	2.3	6.1	41.3	0.8
Spot Leveling for Heave Repair Area	-	-	-	-	-	-	-	-	-	-	200.0	6.6	1.0	-	-	-
Shoulder Preparation	-	-	-	1.000	-	-	-	-	-	-	-	-	-	-	-	-
Digouts (Surfacing / Subgrade Repair Areas)	14.6	-	1,145	-	763	1,526.0	-	-	-	-	-	-	-	-	-	-
Project Totals	**24.9**	**694**	**1,781**	**1.000**	**763**	**1,526.0**	**1,226.4**	**1,076.4**	**4,360.4**	**10,901.0**	**2,492.1**	**82.3**	**7.7**	**6.1**	**41.3**	**0.8**

Tonnage shown in the table above for Asphalt Concrete is based on a compacted depth as detailed in the plans.

All work at the sites above will be completed to the satisfaction of the Engineer.

All quantities in the table are included in the "Table of Material Quantities".

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM-CR 0905(121)236	F21	F53

SUMMARY OF ASPHALT CONCRETE

Description / Location	Compaction WITH Specified Density for Class HR Asphalt Concrete (Ton)	Compaction WITHOUT Specified Density for Class HR Asphalt Concrete (Ton)
Section 1		
8' Outside Shoulder w/1.5' bevel	9,883.1	-
4' Median Shoulder w/1.5' bevel	5,310.0	-
Section 2		
8' Outside Shoulder w/1.5' bevel	1,688.3	-
4' Median Shoulder w/1.5' bevel	907.1	-
Section 3		
8' Outside Shoulder w/1.5' bevel	85.3	-
4' Median Shoulder w/1.5' bevel	45.9	-
Section 4		
4' Median Shoulder w/1.5' bevel	30.0	-
Section 5		
4' Median Shoulder w/1.5' bevel	524.8	-
Table of Additional Quantities		
500' Additional AC for Shoulder Strengthening at Structure Ends	-	1,296.1
Heave Repair (fm Station b207+80 to Station b220+79)	635.5	-
Spot Leveling for Heave Repair Area	-	200.0
Guardrail Surfacing	-	360.5
Totals =	**19,110.0**	**1,856.6**

TABLES FOR CRC PAVEMENT REPAIR

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM-CR 0905(121)236	F22	F53

TABLE FOR CRC PAVEMENT REPAIR ON IM 0905(121)236 - PCN 06P1 EB

					EB PASSING LANE		EB DRIVING LANE		
MRM	DISP	DMI		STA.	L Ft	W Ft	L Ft	W Ft	CRCP REPAIR SqYds
237.00	0.046	237.046	a	29+59			6.5	14	10.1
237.00	0.116	237.116	a	33+29			20	6	13.3
237.00	0.124	237.124	a	33+74			6	5	3.3
237.00	0.192	237.192	a	37+31			5	5	2.8
237.00	0.205	237.205	a	37+98			10	4	4.4
238.00	0.065	238.065	a	83+42			5	5	2.8
238.00	0.171	238.171	a	89+03	5	5			2.8
238.00	0.468	238.468	a	104+69			5	5	2.8
238.00	0.568	238.568	a	110+00			8	4	3.6
239.00	0.759	239.759	a	172+75			15	14	23.3
240.00	0.167	240.167	a	194+41	8	4			3.6
240.00	0.532	240.532	a	213+71			10	5	5.6
240.00	0.845	240.845	a	230+20			20	6	13.3
241.00	0.438	241.438	a	261+30	10	5			5.6
242.00	0.017	242.017	a	292+31			5	5	2.8
244.00	0.047	244.047	b	16+97			5	5	2.8
247.00	0.906	247.906	b	220+75	12	5			6.7
248.00	0.666	248.666	b	260+33			24	7	18.7
248.00	0.702	248.702	b	262+21	6	5			3.3
249.00	0.271	249.271	b	292+29			10	5	5.6
249.00	0.986	249.986	b	330+00	5	5			2.8
251.00	0.132	251.132	b	390+37	4	4			1.8
251.00	0.133	251.133	b	390+40	4	4			1.8
251.00	0.155	251.155	b	391+57	8	4			3.6
251.00	0.168	251.168	b	292+25			5	5	2.8
251.00	0.598	251.598	b	415+00			4	4	1.8
TOTALS:									**151.8**
ADDITIONAL QUANTITIES:									**30.0**
GRAND TOTAL									**181.8**

TABLES FOR CRC PAVEMENT REPAIR

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM-CR 0905(121)236	F23	F53

TABLE FOR CRC PAVEMENT REPAIR ON IM 0905(121)236 - PCN 06P1 EB

					REINFORCING STEEL (CRCP) FOR EB DRIVING LANE (STEEL FOR CRCP IS NOT A BID ITEM - ACTUAL STEEL QUANTITIES WILL VARY DUE TO LOCATION AND SIZE OF INDIVIDUAL REPAIR AREAS)												INSERT STEEL BAR IN PCC PAVEMENT (CRCP) EB DRIVING LANE		
					No. 5 Longitudinal Bars to be lap spliced with existing bars		Lap Splice	Lap Stagger & Cutoff	No. 5 Longitudinal Bars to be spliced together between every other existing longitudinal bar		Lap Splice	Lap Stagger & Cutoff	No. 5 Longitudinal Bars to be spliced together between every other existing longitudinal bar		Lap Splice	Lap Stagger & Cutoff	No. 4 Transverse Bars to be lap spliced with No. 5 x 24" bars		New Trans Bar Spacing	Reinforcing Steel Lbs	INSERT No. 5 LONG. BARS Each	INSERT No. 5 x 24" TIE BARS Each	INSERT BAR TOTAL Each
MRM	DISP	DMI		STA.	# bars @ length	Length	Length		# bars @ length	Length	Length		# bars @ length	Length	Length		# bars @ length	Length					
237.00	0.046	237.046	a	29+59	35 bars @ 66" =	192.50'	20"	-	18 bars @ 58" =	87.00'	20"	-	18 bars @ 58" =	87.00'	20"	-	3 bars @ 162" =	40.50'	1.75'	409.314	36	6	42
237.00	0.116	237.116	a	33+29	15 bars @ 213" =	266.25'	25"	19"									9 bars @ 66" =	49.50'	1.75'	310.765		18	18
237.00	0.124	237.124	a	33+74	13 bars @ 62" =	67.17'	19"	-									3 bars @ 54" =	13.50'	1.75'	79.076		6	6
237.00	0.192	237.192	a	37+31	13 bars @ 52" =	56.33'	16"	-									2 bars @ 54" =	9.00'	1.75'	64.764		4	4
238.00	0.065	238.065	a	83+42	13 bars @ 52" =	56.33'	16"	-									2 bars @ 54" =	9.00'	1.75'	64.764		4	4
238.00	0.468	238.468	a	104+69	13 bars @ 52" =	56.33'	16"	-									2 bars @ 54" =	9.00'	1.75'	64.764		4	4
239.00	0.759	239.759	a	172+75	35 bars @ 153" =	446.25'	25"	19"	18 bars @ 85" =	127.50'	25"	19"	18 bars @ 138" =	207.00'	25"	19"	6 bars @ 162" =	81.00'	1.75'	868.430	36	12	48
240.00	0.532	240.532	a	213+71	13 bars @ 101" =	109.42'	25"	11"									4 bars @ 54" =	18.00'	1.75'	126.149		8	8
240.00	0.845	240.845	a	230+20	15 bars @ 213" =	266.25'	25"	19"									9 bars @ 66" =	49.50'	1.75'	310.765		18	18
242.00	0.017	242.017	a	292+31	13 bars @ 52" =	56.33'	16"	-									2 bars @ 54" =	9.00'	1.75'	64.764		4	4
244.00	0.047	244.047	b	16+97	13 bars @ 52" =	56.33'	16"	-									2 bars @ 54" =	9.00'	1.75'	64.764		4	4
248.00	0.666	248.666	b	260+33	18 bars @ 261" =	391.50'	25"	19"									12 bars @ 78" =	78.00'	1.75'	460.439		24	24
249.00	0.271	249.271	b	292+29	13 bars @ 101" =	109.42'	25"	11"									4 bars @ 54" =	18.00'	1.75'	126.149		8	8
251.00	0.168	251.168	b	292+25	13 bars @ 52" =	56.33'	16"	-									2 bars @ 54" =	9.00'	1.75'	64.764		4	4
TOTALS:					**235 bars**	**2187'**			**36 bars**	**215'**			**36 bars**	**294'**			**62 bars**	**402'**		**3080 Lbs**	**72**	**124**	**196**
ADDITIONAL QUANTITIES:					**50 bars**	**440'**			**10 bars**	**40'**			**10 bars**	**60'**			**10 bars**	**80'**		**620 Lbs**	**10**	**20**	**30**
GRAND TOTAL					**285 bars**	**2627'**			**46 bars**	**255'**			**46 bars**	**354'**			**72 bars**	**482'**		**3700 Lbs**	**82**	**144**	**226**

NOTES

* In Full Width CRCP Repair Areas, where the repair area length L is greater than or equal to 16', the inserted longitudinal bars shall be of variable length to facilitate random staggering of the lap splices. The length given here is an average and does not represent the actual bar length (it is used only for establishing the total bar length needed) . Refer to the details for CRC PAVEMENT REPAIR for actual bar lengths.

TABLE FOR CRC PAVEMENT REPAIR ON IM 0905(121)236 - PCN 06P1 EB

					REINFORCING STEEL (CRCP) FOR EB PASSING LANE (STEEL FOR CRCP IS NOT A BID ITEM - ACTUAL STEEL QUANTITIES WILL VARY DUE TO LOCATION AND SIZE OF INDIVIDUAL REPAIR AREAS)							INSERT STEEL BAR IN PCC PAVEMENT (CRCP) EB PASSING LANE	
					No. 5 Longitudinal Bars to be lap spliced with existing bars		Lap Splice	Lap Stagger & Cutoff	No. 4 Transverse Bars to be lap spliced with No. 5 x 24" bars		New Trans Bar Spacing	Reinforcing Steel Lbs	INSERT No. 5 x 24" TIE BARS Each	INSERT BAR TOTAL Each
MRM	DISP	DMI		STA.	# bars @ length	Length	Length		# bars @ length	Length				
238.00	0.171	238.171	a	89+03	13 bars @ 52" =	56.33'	16"	-	2 bars @ 54" =	9.00'	1.75'	64.764	4	4
241.00	0.438	241.438	a	261+30	13 bars @ 101" =	109.42'	25"	11"	4 bars @ 54" =	18.00'	1.75'	126.149	8	8
247.00	0.906	247.906	b	220+75	13 bars @ 117" =	126.75'	25"	19"	5 bars @ 54" =	22.50'	1.75'	147.230	10	10
248.00	0.702	248.702	b	262+21	13 bars @ 62" =	67.17'	19"	-	3 bars @ 54" =	13.50'	1.75'	79.076	6	6
249.00	0.986	249.986	b	330+00	13 bars @ 52" =	56.33'	16"	-	2 bars @ 54" =	9.00'	1.75'	64.764	4	4
TOTALS:					**65 bars**	**416'**			**16 bars**	**72'**		**482 Lbs**	**32**	**32**
ADDITIONAL QUANTITIES:					**10 bars**	**80'**			**-**	**10'**		**100 Lbs**	**10**	**10**
GRAND TOTAL					**75 bars**	**496'**			**16 bars**	**82'**		**582 Lbs**	**42**	**42**

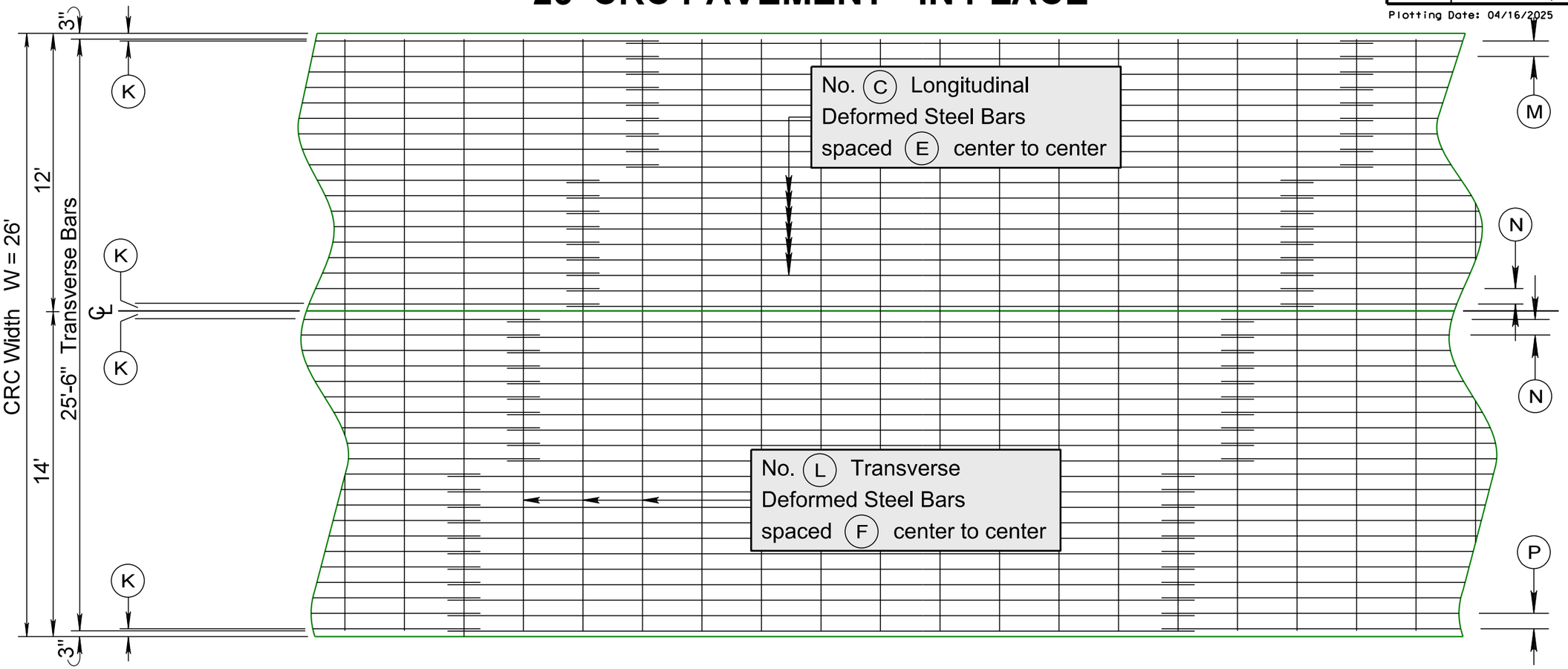
NOTES

* In Full Width CRCP Repair Areas, where the repair area length L is greater than or equal to 16', the inserted longitudinal bars shall be of variable length to facilitate random staggering of the lap splices. The length given here is an average and does not represent the actual bar length (it is used only for establishing the total bar length needed) . Refer to the details for CRC PAVEMENT REPAIR for actual bar lengths.

26' CRC PAVEMENT - IN PLACE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F24	F53

Plotting Date: 04/16/2025

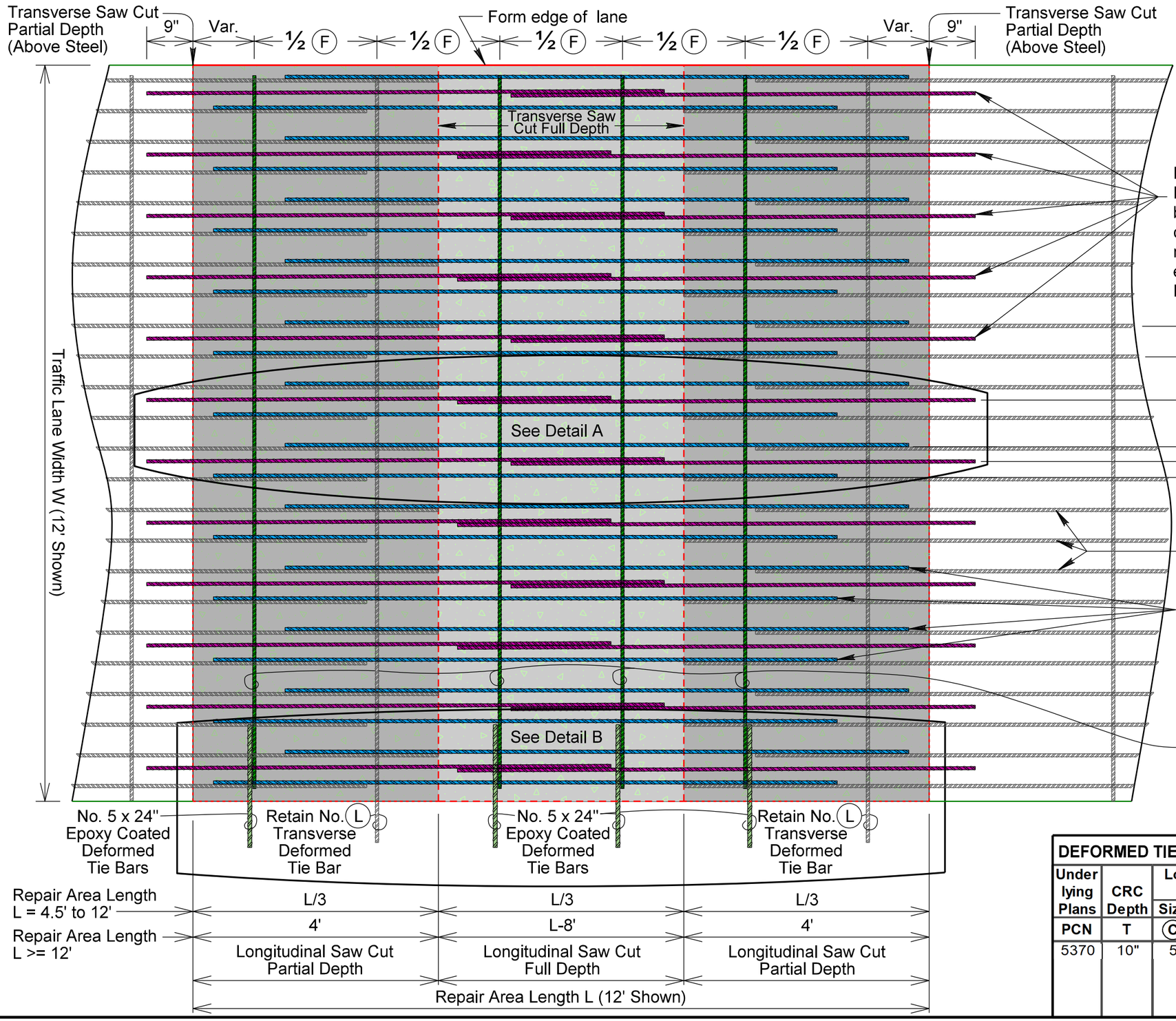


PIERRE REGION INTERSTATE CRC PAVEMENT KEY & DIMENSIONS	Underlying Plans	CRC Depth	CRC Width	Longitudinal Steel Size	Longitudinal Steel Spacing	Transverse Steel Size	Transverse Steel Spacing	Perimeter Bar Spacing			
Location	PCN	T	W	C	E	L	F	K	M	N	P
I90E MRM 236.00 + 0.218 to 251.60 + 0.000	5370	10"	26'	5	4¾"	4	42"	3⅛"	4¾"	4¾"	5"

CRC PAVEMENT REPAIR (FULL LANE WIDTH) - TYPICAL

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F25	F53

Plotting Date: 04/16/2025



DEFORMED TIE BAR DIMENSIONS KEY

Underlying Plans	CRC Depth	Longitudinal Steel		Transverse Steel	
		Size	Spacing	Size	Spacing
PCN	T	C	E	L	F
5370	10"	5	4 3/4"	4	42"

CRC REPAIR AREA KEY

- Remove Concrete Retain Reinforcing Steel
- Remove Concrete Remove Reinforcing Steel

PLOT SCALE - 1:1.7

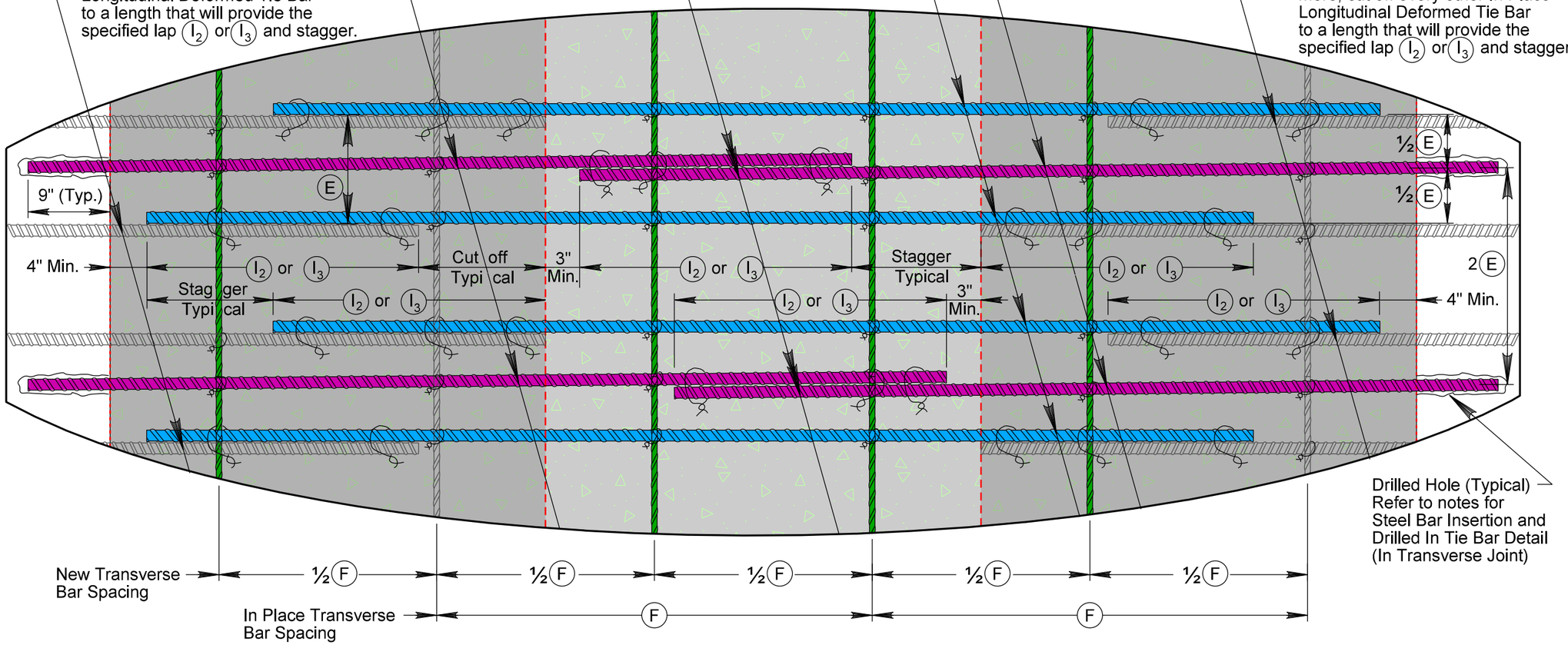
PLOTTED FROM - TRPR26947

PLOT NAME - 5

FILE - ...\CRC FULL WIDTH REPAIR.DGN

CRC PAVEMENT REPAIR (FULL LANE WIDTH)

Detail A



DEFORMED TIE BAR KEY

- No. (C) Longitudinal Deformed Tie Bar In Place (Retain)
- Place No. (C) Longitudinal Deformed Tie Bar (Tie to In Place No. (C) Longitudinal Bars)
- Place No. (C) Longitudinal Deformed Tie Bar (Place bars into drilled holes in existing concrete on both sides of the repair area and tie the bars to each other and to No. (L) Transverse Bars)
- No. (L) Transverse Deformed Tie Bar In Place (Retain)
- Place No. (L) Transverse Deformed Tie Bar (Tie to No. (C) Longitudinal Bars)

DEFORMED TIE BAR DIMENSIONS KEY

Underlying Plans	CRC Depth	Longitudinal Steel		Transverse Steel	
		Size	Spacing	Size	Spacing
PCN	T	(C)	(E)	(L)	(F)
5370	10"	5	4 3/4"	4	42"

Note: All lapped bars will have a minimum of two ties per lap.

LAP SPLICE LENGTH KEY

- (I1) Lap Splice length for Repair Area Length L < 4.5' (Not Available).
- (I2) Lap Splice length for Repair Area Length L = 4.5' to 8'.
- (I3) Lap Splice length for Repair Area Length L > 8'.

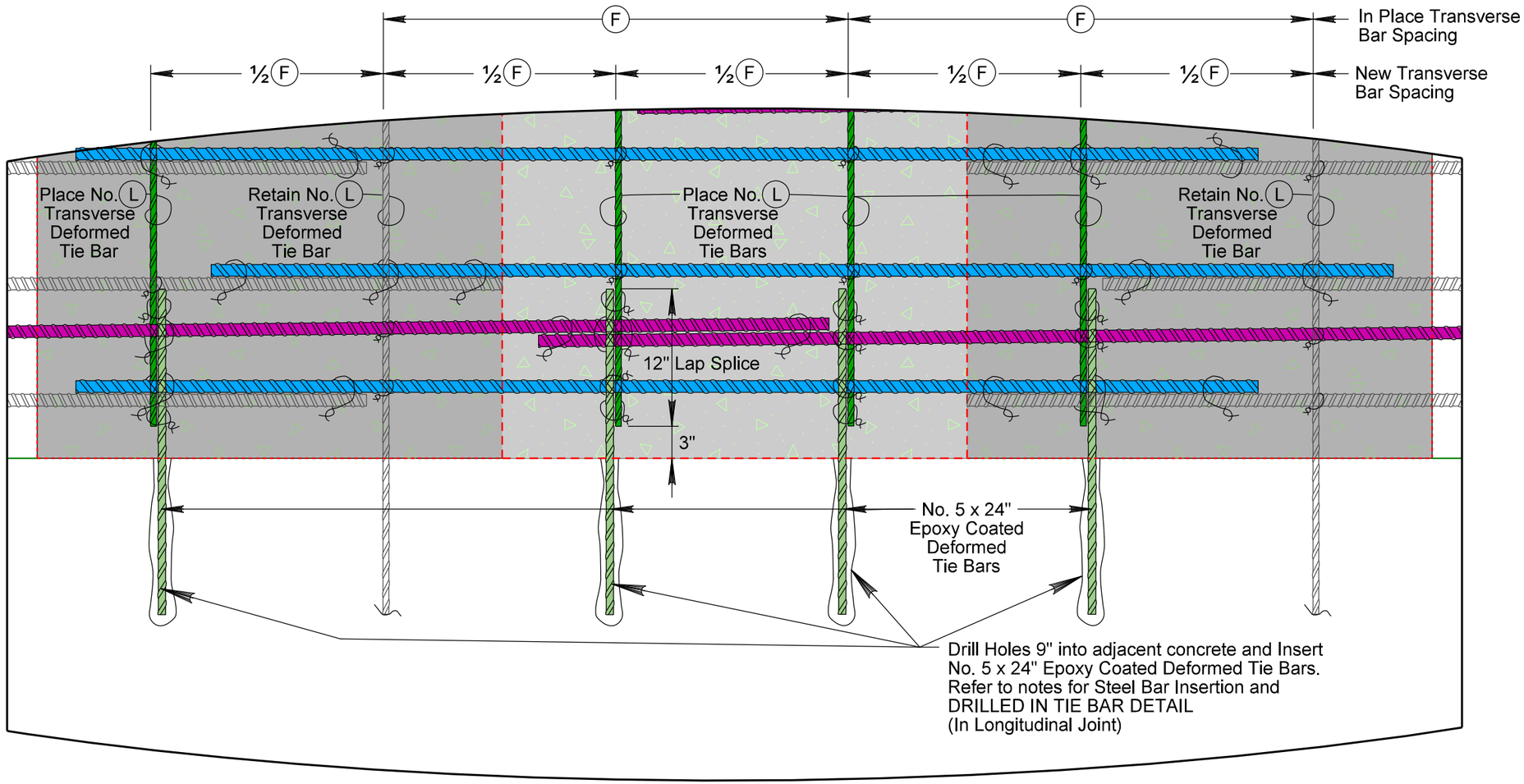
See CRC Pavement Repair - Reinforcing Steel Details for Longitudinal Bar Counts: (G), (H1) & (H2)

CRC REPAIR AREA KEY

- Remove Concrete Retain Reinforcing Steel
- Remove Concrete Remove Reinforcing Steel

CRC PAVEMENT REPAIR (FULL LANE WIDTH)

Detail B



DEFORMED TIE BAR KEY

- No. C Longitudinal Deformed Tie Bar In Place (Retain)
- Place No. C Longitudinal Deformed Tie Bar (Tie to In Place No. C Longitudinal Bars)
- Place No. C Longitudinal Deformed Tie Bar (Place bars into drilled holes in existing concrete on both sides of the repair area and tie the bars to each other and to No. L Transverse Bars)
- No. L Transverse Deformed Tie Bar In Place (Retain)
- Place No. L Transverse Deformed Tie Bar (Tie to No. C Longitudinal Bars)

DEFORMED TIE BAR DIMENSIONS KEY

Underlying Plans	CRC Depth	Longitudinal Steel		Transverse Steel	
		Size	Spacing	Size	Spacing
PCN	T	C	E	L	F
5370	10"	5	4 3/4"	4	42"

Note: All lapped bars will have a minimum of two ties per lap.

CRC REPAIR AREA KEY

- Remove Concrete Retain Reinforcing Steel
- Remove Concrete Remove Reinforcing Steel

PLOT SCALE - 1:1.07

PLOTTED FROM - TRPR26947

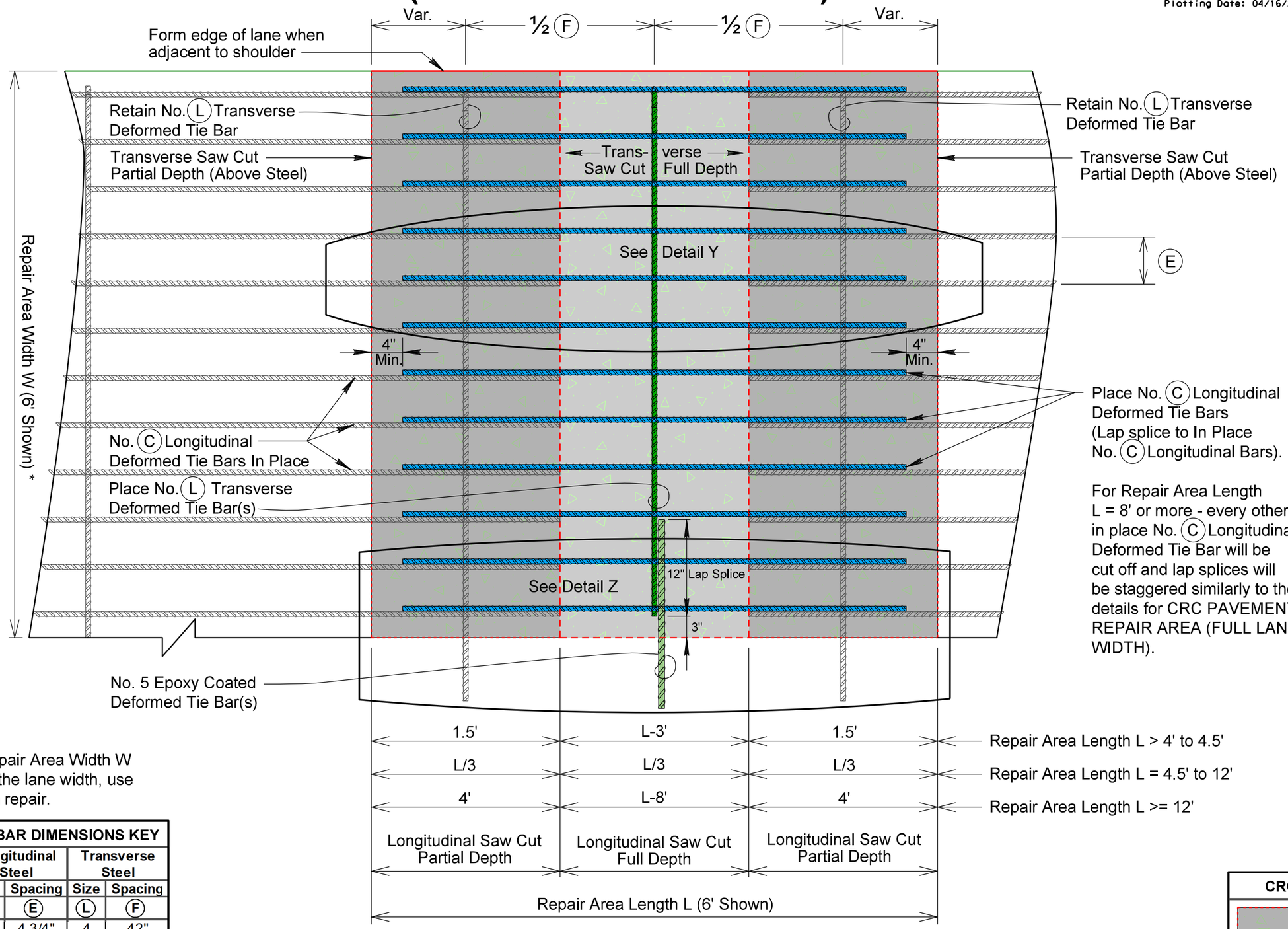
PLOT NAME - 7

FILE - ...\CRC FULL WIDTH REPAIR.DGN

CRC PAVEMENT REPAIR (PARTIAL LANE WIDTH) - TYPICAL

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F28	F53

Plotting Date: 04/16/2025



* When the Repair Area Width W exceeds half the lane width, use full lane width repair.

DEFORMED TIE BAR DIMENSIONS KEY

Underlying Plans	CRC Depth	Longitudinal Steel		Transverse Steel	
		Size	Spacing	Size	Spacing
PCN	T	(C)	(E)	(L)	(F)
5370	10"	5	4 3/4"	4	42"

CRC REPAIR AREA KEY

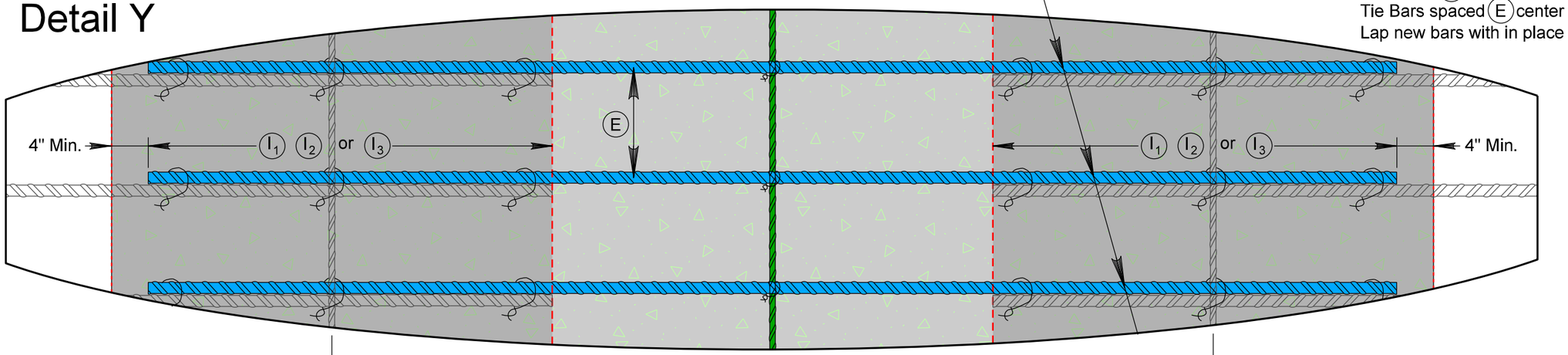
- Remove Concrete Retain Reinforcing Steel
- Remove Concrete Remove Reinforcing Steel

CRC PAVEMENT REPAIR (PARTIAL LANE WIDTH)

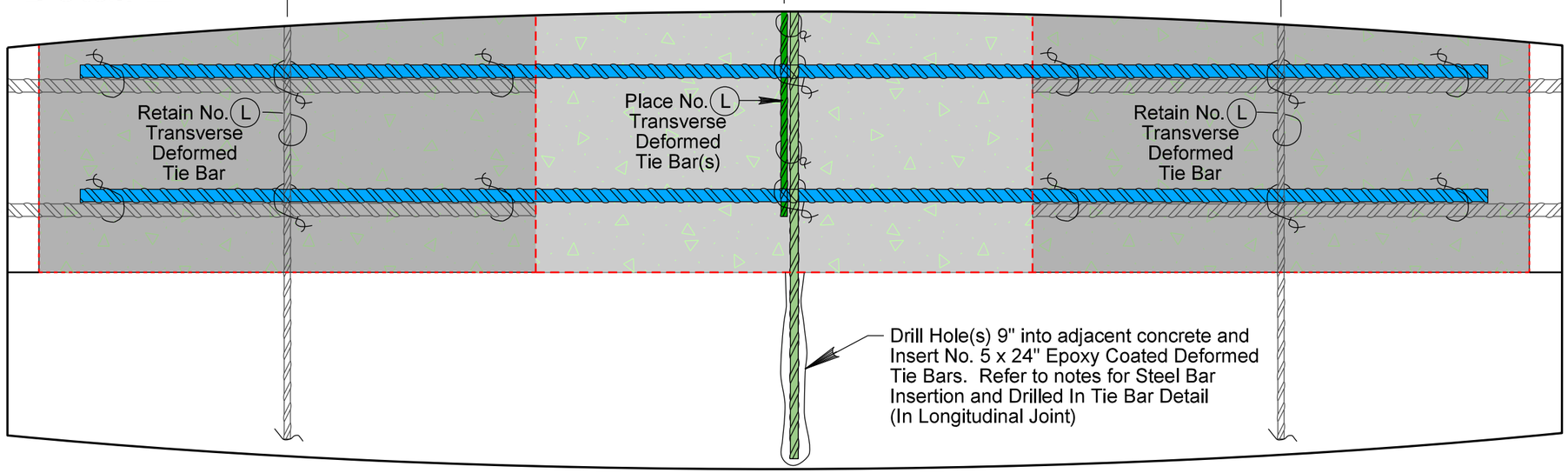
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F29	F53

Plotting Date: 04/16/2025

Detail Y



Detail Z



For Repair Area Length L = 8' or more - every other in place No. C Longitudinal Deformed Tie Bar will be cut off and lap splices will be staggered similarly to the details for CRC PAVEMENT REPAIR AREA (FULL LANE WIDTH).

DEFORMED TIE BAR DIMENSIONS KEY

- No. L Transverse Deformed Tie Bar In Place (Retain)
- Place No. L Transverse Deformed Tie Bar (Tie to No. C Longitudinal Bars)
- No. C Longitudinal Deformed Tie Bar In Place (Retain)
- Place No. C Longitudinal Deformed Tie Bar (Tie to In Place No. C Longitudinal Bars)

Underlying Plans	CRC Depth	Longitudinal Steel		Transverse Steel	
		Size	Spacing	Size	Spacing
PCN	T	C	E	L	F
5370	10"	5	4 3/4"	4	42"

LAP SPLICE LENGTH KEY

- l_1 Lap Splice length for Repair Area Length L = 4' to 4.5'.
- l_2 Lap Splice length for Repair Area Length L = 4.5' to 8'.
- l_3 Lap Splice length for Repair Area Length L > 8'.

Note: All lapped bars will have a minimum of two ties per lap.

CRC REPAIR AREA KEY

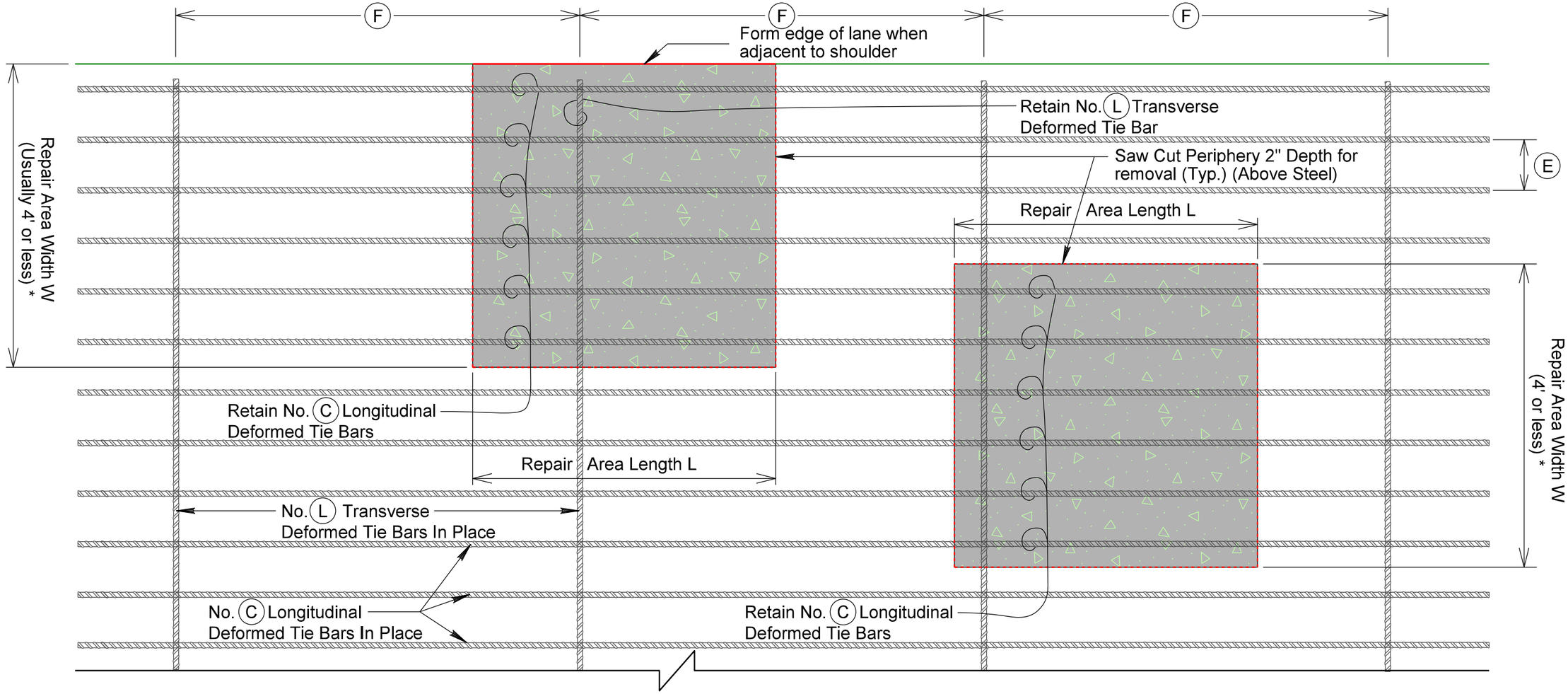
- Remove Concrete Retain Reinforcing Steel
- Remove Concrete Remove Reinforcing Steel

CRC PAVEMENT REPAIR - EXISTING STEEL RETAINED (TYPICAL)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F30	F53

Plotting Date: 04/16/2025

PLAN VIEW



* When Repair Width W exceeds 4', usually use partial lane width repair.
When Repair Width W exceeds half the lane width, usually use full lane width repair.

However, a Repair Width W exceeding 4' might be used when doing a small repair adjacent to an existing repair, in order to match the width of the existing repair.

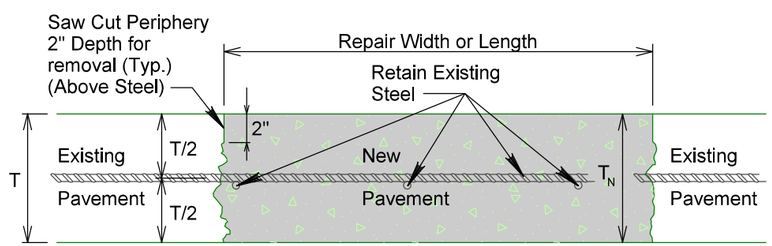
DEFORMED TIE BAR DIMENSIONS KEY

No. L Transverse Deformed Tie Bar In Place (Retain)

No. C Longitudinal Deformed Tie Bar In Place (Retain)

Underlying Plans	CRC Depth	Longitudinal Steel		Transverse Steel	
		Size	Spacing	Size	Spacing
PCN	T	C	E	L	F
5370	10"	5	4 3/4"	4	42"

PROFILE VIEW



T = Existing pavement thickness.
T_N = New pavement thickness.

CRC REPAIR AREA KEY

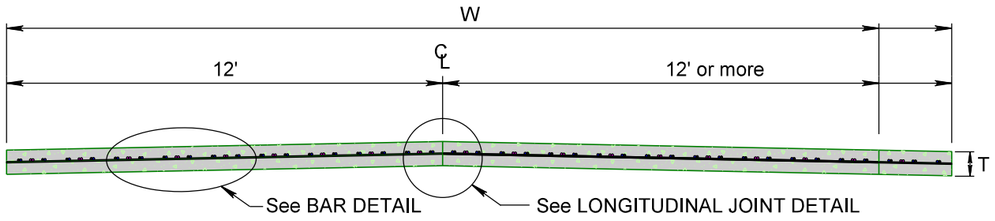
Remove Concrete
Retain Reinforcing Steel

CRC PAVEMENT REPAIR - REINFORCING STEEL DETAILS

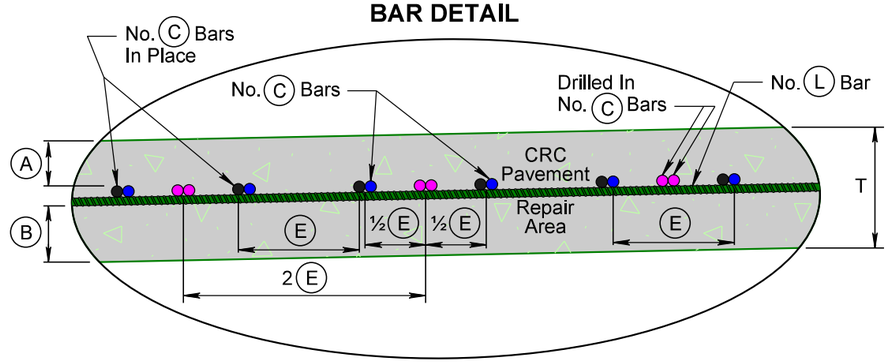
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F31	F53

Plotting Date: 04/16/2025

TRANSVERSE SECTION SHOWING STEEL PLACEMENT



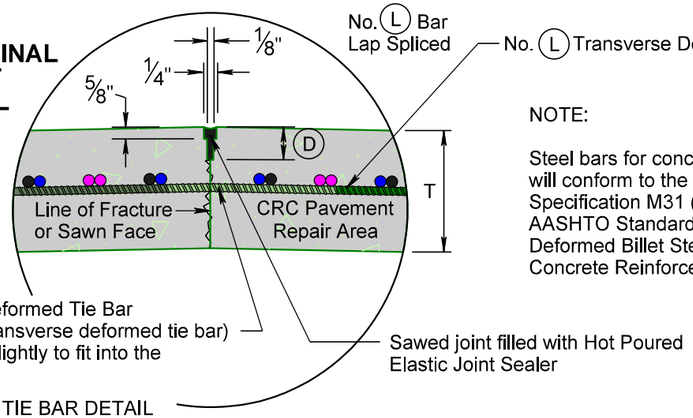
BAR DETAIL



Placement of longitudinal steel bars may vary from +1/2" to -1/2" vertically and 3/4" horizontally.
Placement of transverse steel bars may vary from +1/2" to -1/2" vertically and 2" horizontally.

The transverse deformed steel bars will be positioned on acceptable chairs.

LONGITUDINAL JOINT DETAIL

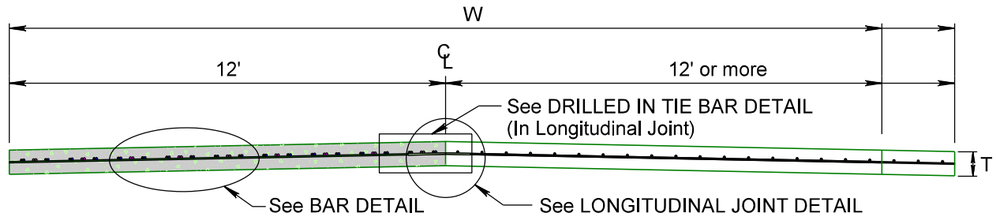


See DRILLED IN TIE BAR DETAIL (In Longitudinal Joint)

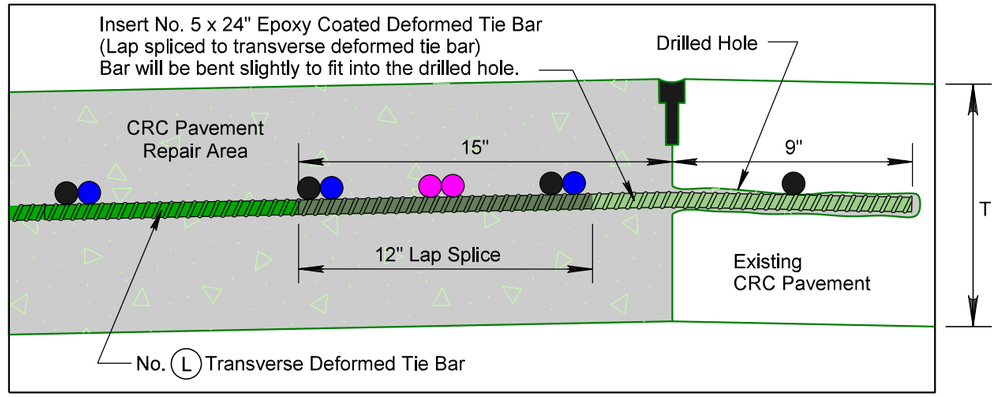
NOTE:

Steel bars for concrete reinforcement will conform to the requirements of Specification M31 (Grade 60) of the AASHTO Standard Specifications for Deformed Billet Steel Bars for Concrete Reinforcement.

TRANSVERSE SECTION SHOWING STEEL PLACEMENT

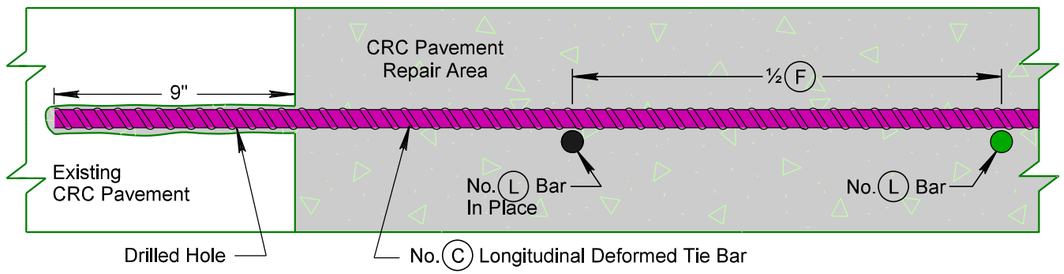


DRILLED IN TIE BAR DETAIL (In Longitudinal Joint)



LONGITUDINAL SECTION SHOWING STEEL PLACEMENT

DRILLED IN TIE BAR DETAIL (In Transverse Joint)



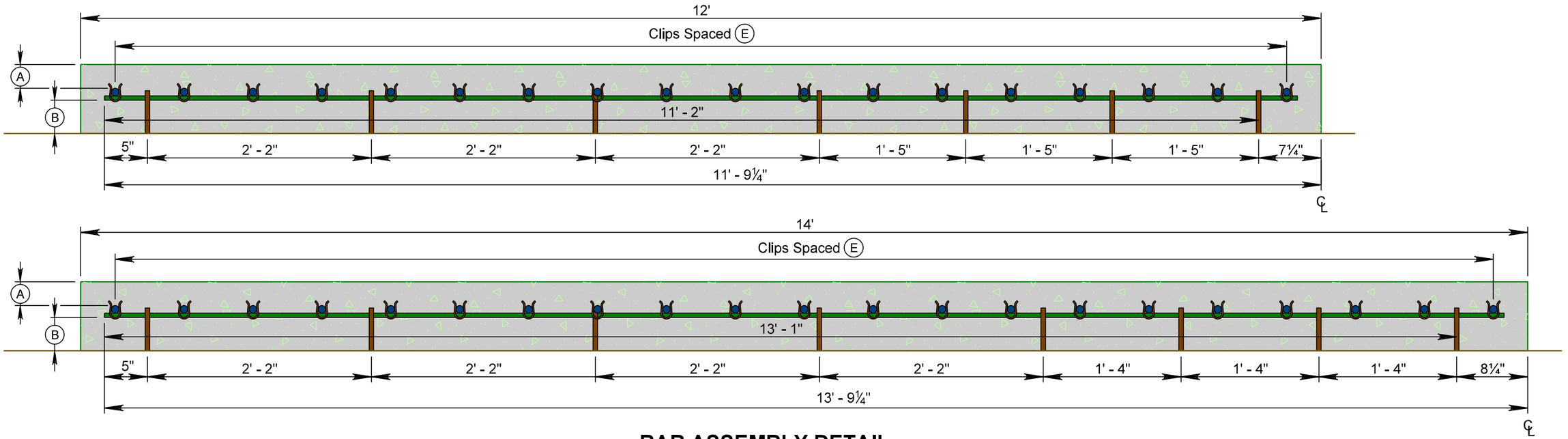
CRC PAVEMENT IN PLACE & CRC PAVEMENT REPAIR KEY & DIMENSIONS

Location	Underlying Plans	CRC Depth	CRC Width	Clearance		Longitudinal Steel		Saw Cut Depth	Transverse Steel		Longitudinal Bar Count (full lane width repair)						Lap Splice Length (for Repair Length L)			Not Assigned	Perimeter Bar Spacing				Chair Width
				Top	Bottom	Size	Spacing		Size	Spacing	12' Wide Slab			14' Wide Slab			L<4.5'	L= 4.5' to 8'/9'	L>=8'/9'						
	PCN	T	W	A	B	C	E	D	L	F	G	H_1	H_2	G	H_1	H_2	I_1	I_2	I_3	-	K	M	N	P	R
I90E MRM 236.00 +0.218 to MRM 251.60 +0.000	5370	10"	26'	3 1/2"	5 3/8"	5	4 3/4"	2 1/4"	4	42"	30	15	15	35	17	17	14"	14" to 25"	25"	-	3 1/8"	4 3/4"	4 3/4"	5"	5"

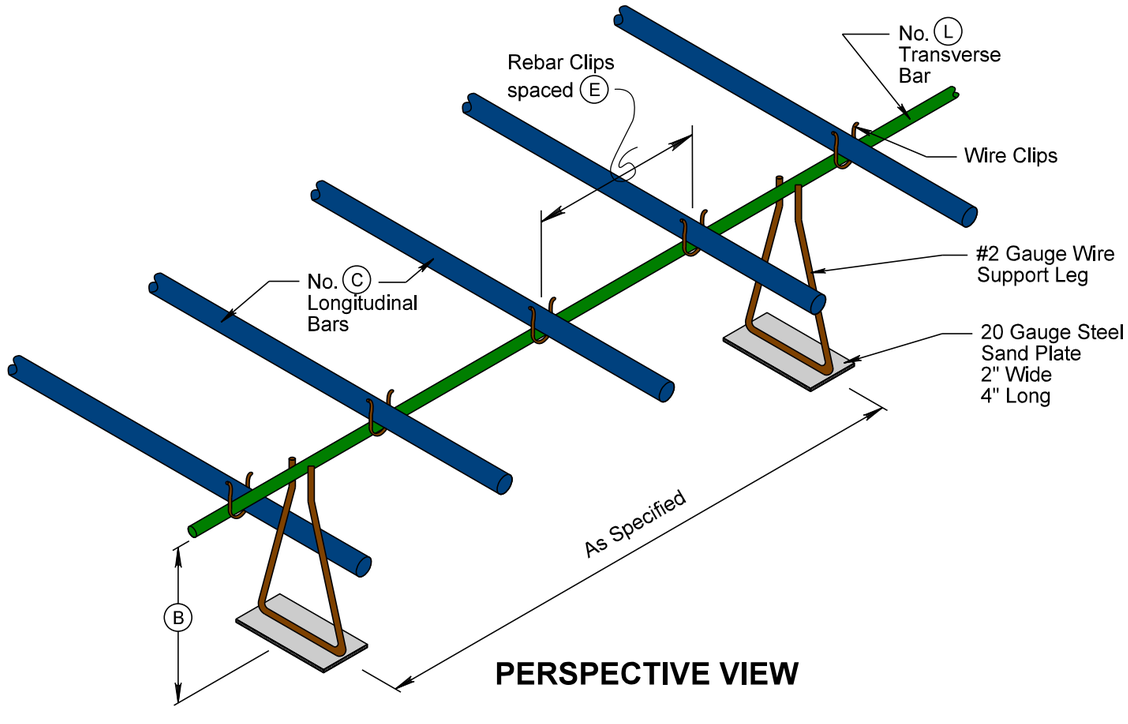
CRC PAVEMENT CHAIR DETAILS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F32	F53

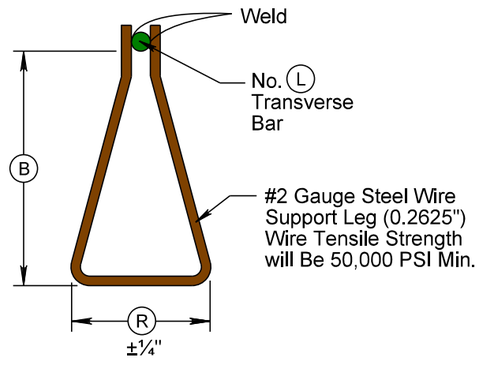
Plotting Date: 04/16/2025



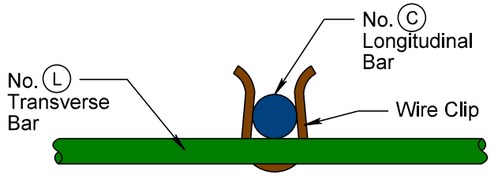
BAR ASSEMBLY DETAIL



PERSPECTIVE VIEW



CHAIR DETAIL



CLIP DETAIL

DEFORMED TIE BAR DIMENSIONS KEY

Underlying Plans	CRC Depth	CRC Width	Clearance		Longitudinal Steel		Saw Cut Depth	Transverse Steel		Chair Width
			Top	Bottom	Size	Spacing		Size	Spacing	
PCN	T	W	A	B	C	E	D	L	F	R
5370	10"	26'	3 1/2"	5 3/8"	5	4 3/4"	2 1/4"	4	42"	5"

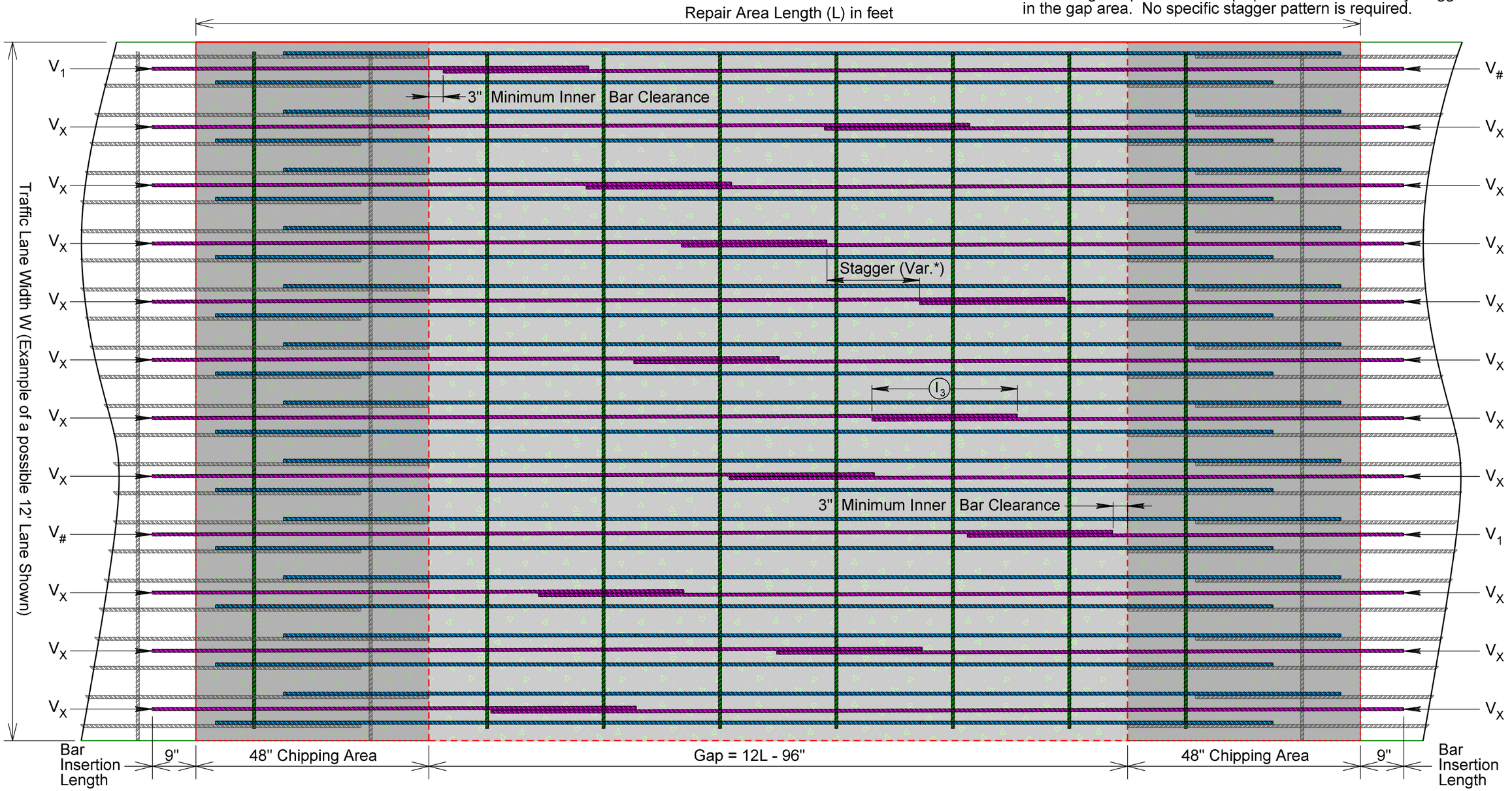
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F33	F53

Plotting Date: 04/16/2025

CRC PAVEMENT REPAIR - INSERTED LONGITUDINAL BAR LENGTHS

(For Full Width Repair Area Length L >= 16') - TYPICAL

* In order to minimize concentration of steel, bar lengths will be cut to the lengths specified and lap splices will be randomly staggered in the gap area. No specific stagger pattern is required.

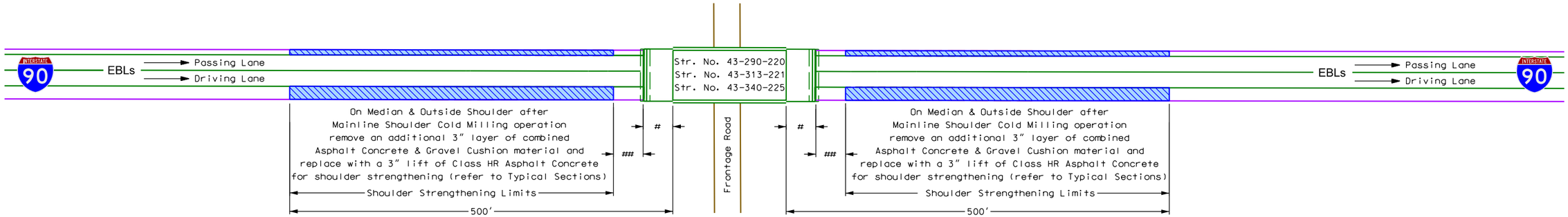


V_1 = Shortest Bar Length	$V_\#$ = Longest Bar Length	V_X = Any Other Inserted Longitudinal Bar Length	LAP SPLICE LENGTH KEY	CRC REPAIR AREA KEY
V_1 = Bar Insertion Length 9" + Chipping Area +48" + Inner Bar Clearance +3" + Lap Splice Length + I_3	$V_\#$ = Bar Insertion Length +9" + Chipping Area +48" + Gap +12L - 96" - Inner Bar Clearance - 3"	$V_X = V_1 + \frac{(X - 1) \times (V_\# - V_1)}{(\# - 1)}$ where X is the number of any bar from the shortest to the longest, and where # is the number of bars required on each side of the repair area.	I_3 Lap Splice Length For CRC Depth < 11" I_3 = 25" For CRC Depth >= 11" I_3 = 30"	Remove Concrete Retain Reinforcing Steel Remove Concrete Remove Reinforcing Steel
V_1 = 60" + I_3	$V_\#$ = 12L - 42"			

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F34	F53

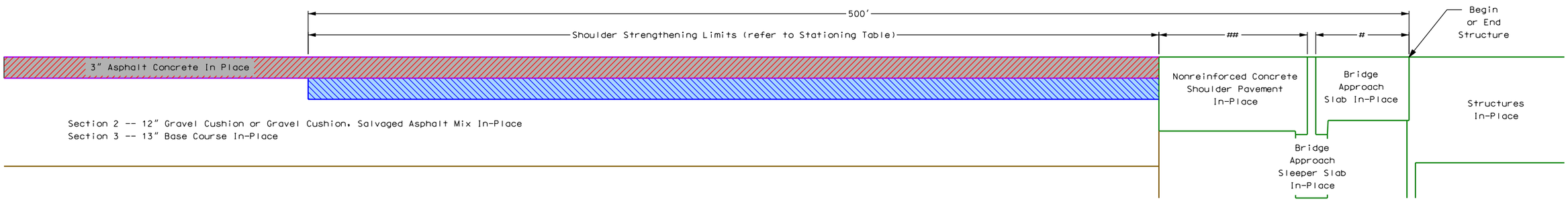
Plotting Date: 04/16/2025

LAYOUT FOR SHOULDER RESURFACING AT STRUCTURE ENDS
TO STRENGTHEN SHOULDERS STRUCTURES



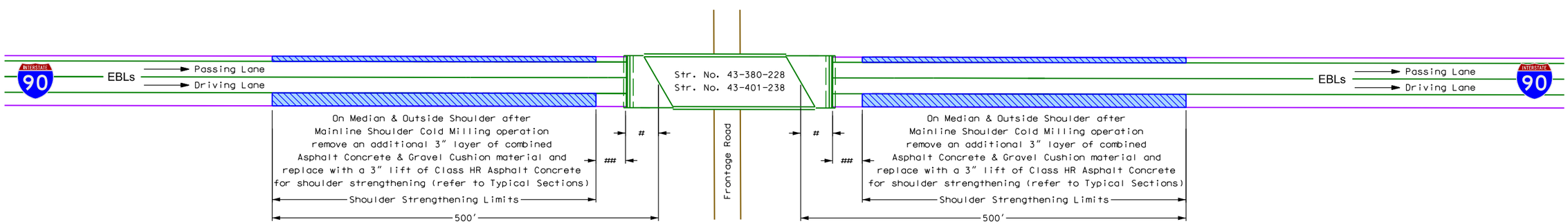
Approach / Sleeper Slab In-Place
Nonreinforced Concrete Shoulder Pavement In-Place

SHOULDER ELEVATION LAYOUT



3" Salvage and Stockpile Asphalt Mix and Granular Base Material and replace with 3" Class HR Asphalt Concrete for shoulder strengthening (quantities are included in the Table of Additional Quantities)

3" Cold Milling Asphalt Concrete & 3" Class HR Asphalt Concrete (completed with the mainline shoulder milling and paving operation)

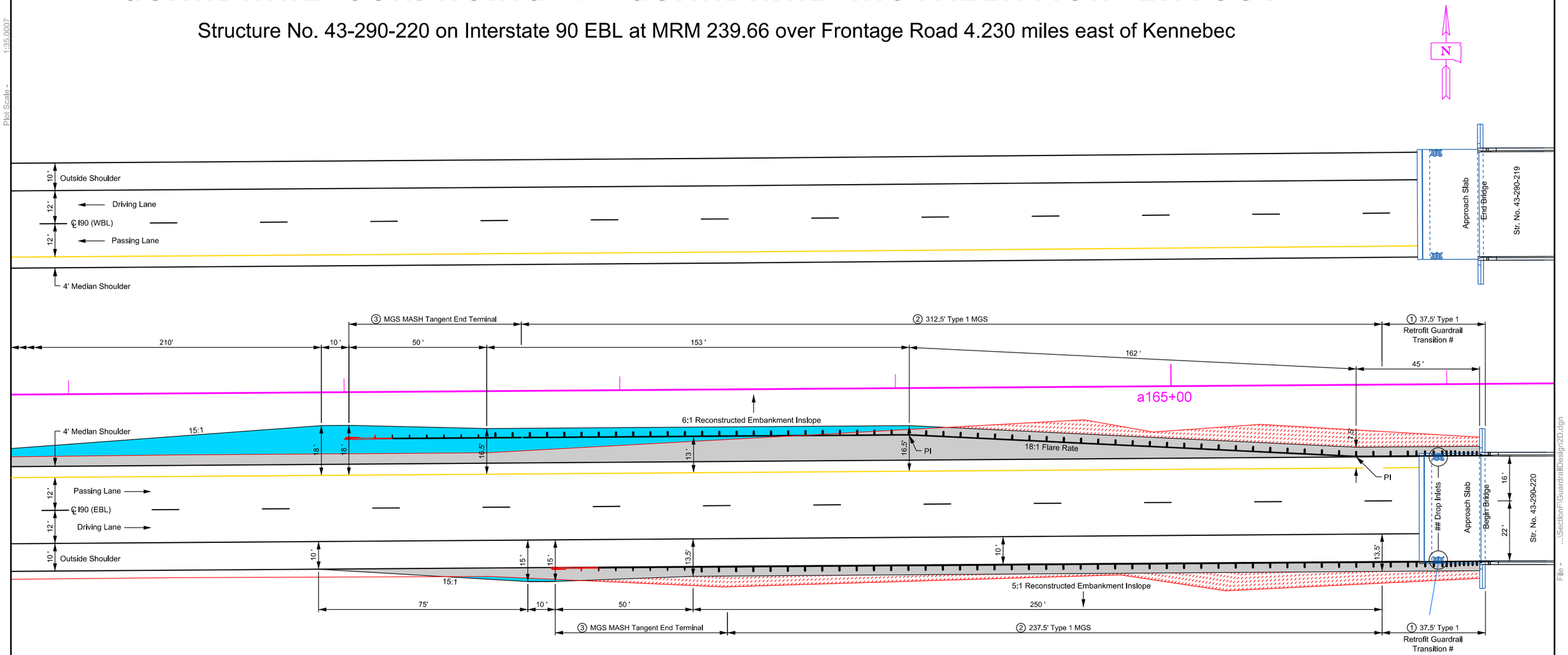


STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F35	F53

Plotting Date: 04/24/2025

GUARDRAIL REMOVAL, EMBANKMENT RECONSTRUCTION, GUARDRAIL SURFACING & GUARDRAIL INSTALLATION LAYOUT

Structure No. 43-290-220 on Interstate 90 EBL at MRM 239.66 over Frontage Road 4.230 miles east of Kennebec



Unclassified Excavation (Guardrail Embankment Reconstruction) - Removal of the existing surfacing and embankment at a 6:1 slope (median) and 5:1 slope (outside).

Beginning of Existing Embankment Inslope

GUARDRAIL EMBANKMENT RECONSTRUCTION
Contractor Furnished Borrow Excavation & Unclassified Excavation fill material constructed to the specified finished embankment slopes

SURFACING
13" Base Course, Salvaged base layer with a 2" Class HR Hot Mixed Asphalt Concrete finished lift constructed to match the adjacent finished shoulder cross slope

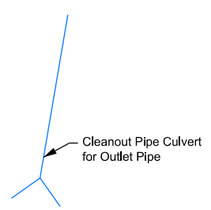
UNCLASSIFIED EXCAVATION
2" Asphalt Mix, Granular Base, & Earthen Material removal

NEW SURFACING
2" Class HR Hot Mixed Asphalt Concrete finished lift constructed to match the adjacent finished shoulder cross slope

TABLE OF ESTIMATED QUANTITIES

LOCATION	*	**	GUARDRAIL REMOVAL						GUARDRAIL EMBANKMENT RECONSTRUCTION						GUARDRAIL INSTALLATION			
									Unclassified Excavation				Informational Only					
									Excavation Area									
I90 (EBL)	GUARDRAIL SURFACING QUANTITIES	EROSION CONTROL MEASURES	Remove 3 Cable Guardrail (Ft)	Remove 3 Cable Guardrail Anchor Assembly (Each)	Remove 3 Cable Guardrail Slip Base Anchor Assembly (Each)	Remove Beam Guardrail (Ft)	*** Remove W Beam Guardrail Breakaway Cable Terminal (Each)	*** Remove W Beam Deformed End Terminal (Each)	Excavation Guardrail Embankment Reconstruction (CuYd)	Excavation 2" Asphalt Mix, Granular Base, & Earthen Material (CuYd)	Unclassified Excavation (CuYd)	Contractor Furnished Borrow Excavation (CuYd)	Water For Embankment (MGal)	Disturbed Embankment Area (Acre)	① Type 1 Retrofit Guardrail Transition (Each)	② Type 1 MGS (Ft)	③ MGS MASH Tangent End Terminal (Each)	Guardrail Delineator (Each)
Median Shoulder	*	**	199.0	1	1	81.25	***1	***1	49	21	70	257	3.5	0.358	1	312.5	1	9
Outside Shoulder	*	**	238.0	2	-	93.75	***1	***1	17	9	26	513	5.3	0.640	1	237.5	1	7
Totals:	*	**	437.0	3	1	175.0	***2	***2	66	30	96	770	8.8	0.998	2	550.0	2	16

Except for informational quantities, all quantities in the table above are included in the Estimate of Quantities.
* Refer to "Table of Additional Quantities"
** Refer to "Section D" for information and details
*** Informational Only - All cost to remove steel beam terminals will be incidental to the contract unit price per foot for "Remove Beam Guardrail".
Guardrail Delineators will be installed per applicable Standard Plate(s)



2'-1 1/4" of guardrail overlaps onto structure.

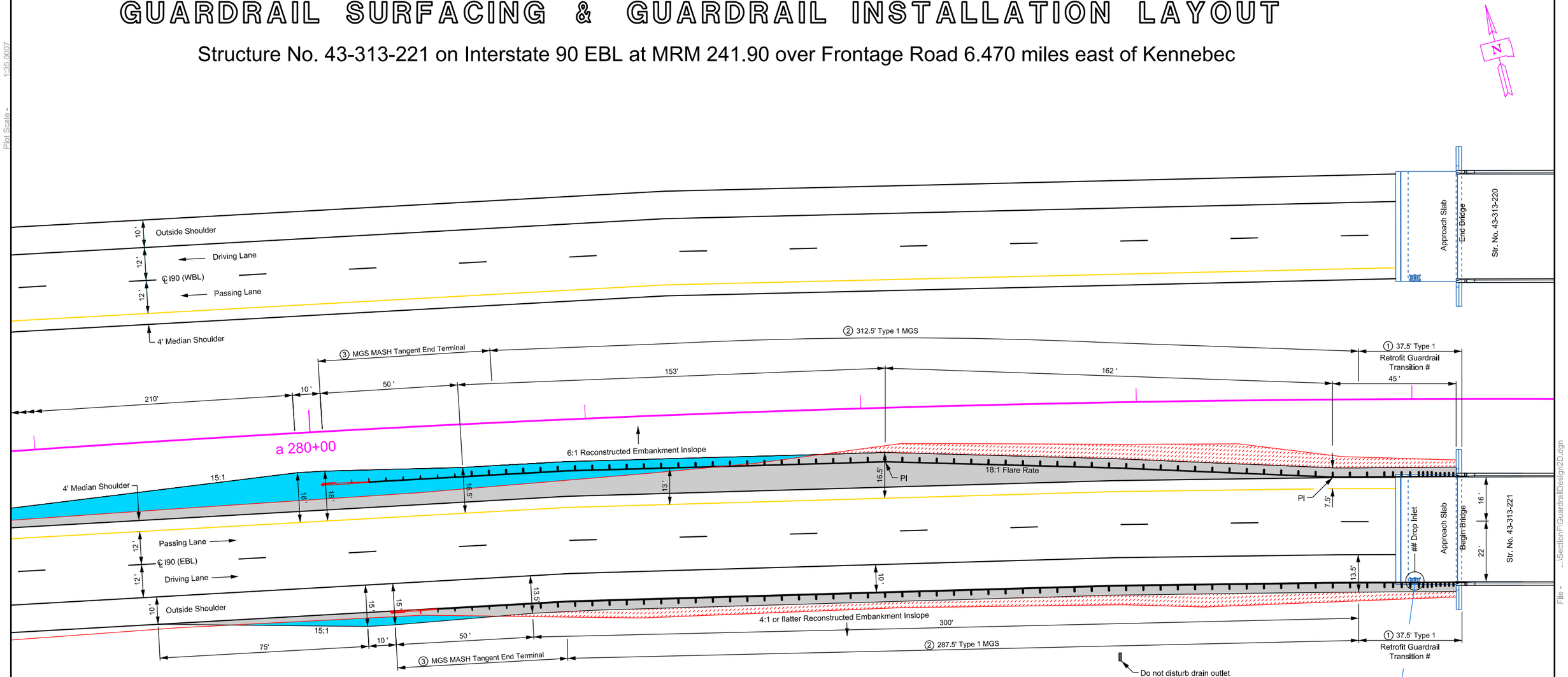
The Contractor will ensure the in-place drop inlets and outlet culvert are not damaged during the installation of guardrail posts. Any damage to the in-place drop inlets and outlet culvert will be replaced at the Contractor's expense to the satisfaction of the Engineer.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F36	F53

Plotting Date: 04/24/2025

GUARDRAIL REMOVAL, EMBANKMENT RECONSTRUCTION, GUARDRAIL SURFACING & GUARDRAIL INSTALLATION LAYOUT

Structure No. 43-313-221 on Interstate 90 EBL at MRM 241.90 over Frontage Road 6.470 miles east of Kennebec



Unclassified Excavation (Guardrail Embankment Reconstruction) - Removal of existing surfacing and embankment at a 6:1 slope (median) and 4:1 slope or flatter (outside) to approximately mid-slope intercept point.

Beginning of Existing Embankment Inslope

GUARDRAIL EMBANKMENT RECONSTRUCTION
Contractor Furnished Borrow Excavation & Unclassified Excavation fill material constructed to the specified finished embankment slopes

SURFACING
13" Base Course, Salvaged base layer with a 2" Class HR Hot Mixed Asphalt Concrete finished lift constructed to match the adjacent finished shoulder cross slope

UNCLASSIFIED EXCAVATION
2" Asphalt Mix, Granular Base, & Earthen Material removal

NEW SURFACING
2" Class HR Hot Mixed Asphalt Concrete finished lift constructed to match the adjacent finished shoulder cross slope

TABLE OF ESTIMATED QUANTITIES

LOCATION	*	**	GUARDRAIL REMOVAL						GUARDRAIL EMBANKMENT RECONSTRUCTION						GUARDRAIL INSTALLATION			
									Unclassified Excavation				Informational Only					
									Excavation Area									
I90 (EBL)	GUARDRAIL SURFACING QUANTITIES	EROSION CONTROL MEASURES	Remove 3 Cable Guardrail	Remove 3 Cable Guardrail Anchor Assembly	Remove 3 Cable Guardrail Slip Base Anchor Assembly	Remove Beam Guardrail	*** Remove W Beam Guardrail Breakaway Cable Terminal	*** Remove W Beam Deformed End Terminal	Excavation Guardrail Embankment Reconstruction	Excavation 2" Asphalt Mix, Granular Base, & Earthen Material	Unclassified Excavation	Contractor Furnished Borrow Excavation	Water For Embankment	Disturbed Embankment Area	① Type 1 Retrofit Guardrail Transition	② Type 1 MGS	③ MGS MASH Tangent End Terminal	Guardrail Delineator
			(Ft)	(Each)	(Each)	(Ft)	(Each)	(Each)	(CuYd)	(CuYd)	(CuYd)	(CuYd)	(MGal)	(Acre)	(Each)	(Ft)	(Each)	(Each)
Median Shoulder	*	**	183.0	1	1	81.25	**1	**1	62	22	84	965	9.7	0.513	1	312.5	1	9
Outside Shoulder	*	**	270.0	2	-	93.75	**1	**1	73	9	82	344	3.4	0.568	1	287.5	1	8
Totals:	*	**	453.0	3	1	175.0	**2	**2	135	31	166	1,309	12.1	1.081	2	600.0	2	17

Except for informational quantities, all quantities in the table above are included in the Estimate of Quantities.
* Refer to "Table of Additional Quantities"
** Refer to "Section D" for information and details
*** Informational Only - All cost to remove steel beam terminals will be incidental to the contract unit price per foot for "Remove Beam Guardrail".
Guardrail Delineators will be installed per applicable Standard Plate(s)

2'-1 1/4" of guardrail overlaps onto structure.

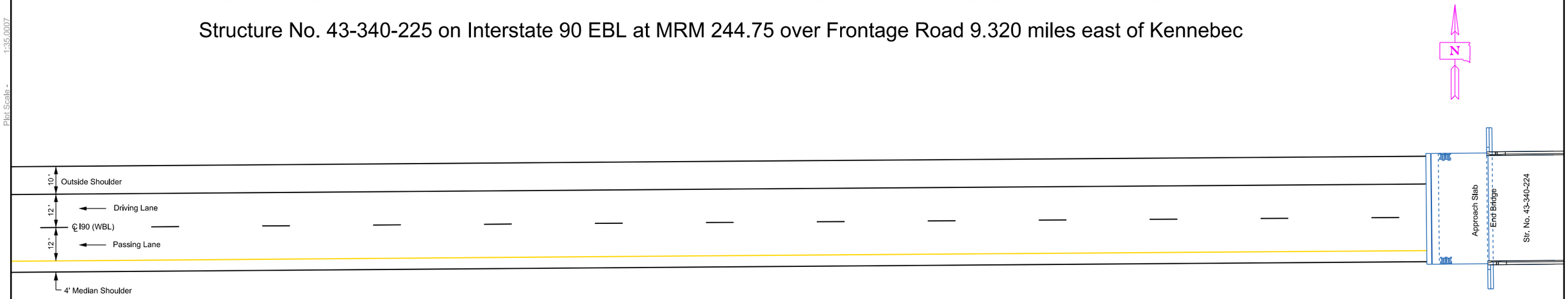
The Contractor will ensure the in-place drop inlets and outlet culvert are not damaged during the installation of guardrail posts. Any damage to the in-place drop inlets and outlet culvert will be replaced at the Contractor's expense to the satisfaction of the Engineer.

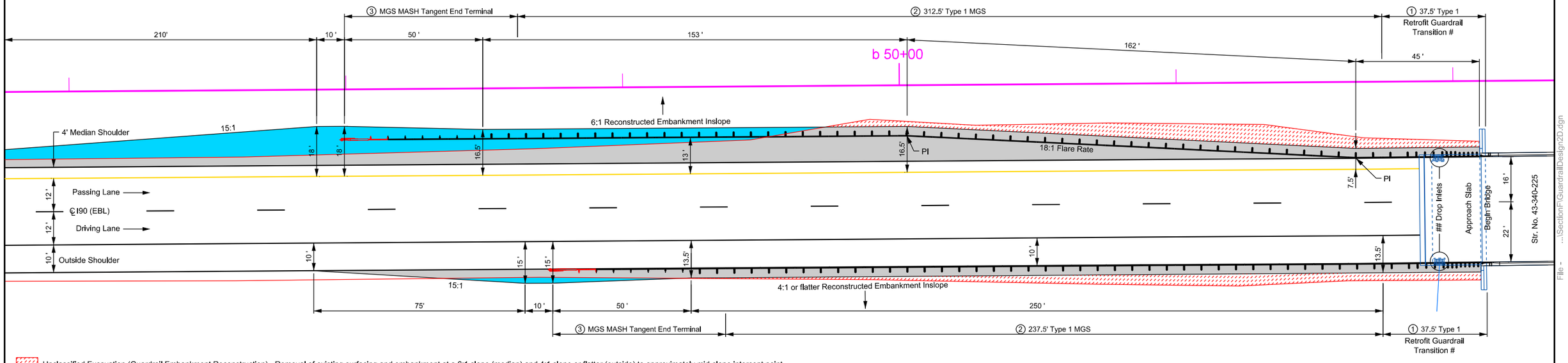
GUARDRAIL REMOVAL, EMBANKMENT RECONSTRUCTION, GUARDRAIL SURFACING & GUARDRAIL INSTALLATION LAYOUT

Structure No. 43-340-225 on Interstate 90 EBL at MRM 244.75 over Frontage Road 9.320 miles east of Kennebec

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F37	F53

Plotting Date: 04/24/2025





Unclassified Excavation (Guardrail Embankment Reconstruction) - Removal of existing surfacing and embankment at a 6:1 slope (median) and 4:1 slope or flatter (outside) to approximately mid-slope intercept point.

Beginning of Existing Embankment Inslope

GUARDRAIL EMBANKMENT RECONSTRUCTION
Contractor Furnished Borrow Excavation & Unclassified Excavation fill material constructed to the specified finished embankment slopes

SURFACING
13" Base Course, Salvaged base layer with a 2" Class HR Hot Mixed Asphalt Concrete finished lift constructed to match the adjacent finished shoulder cross slope

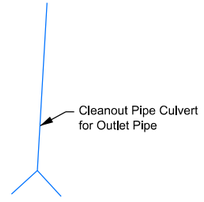
UNCLASSIFIED EXCAVATION
2" Asphalt Mix, Granular Base, & Earthen Material removal

NEW SURFACING
2" Class HR Hot Mixed Asphalt Concrete finished lift constructed to match the adjacent finished shoulder cross slope

TABLE OF ESTIMATED QUANTITIES

LOCATION	* GUARDRAIL SURFACING QUANTITIES	** EROSION CONTROL MEASURES	GUARDRAIL REMOVAL						GUARDRAIL EMBANKMENT RECONSTRUCTION						GUARDRAIL INSTALLATION			
									Unclassified Excavation				Informational Only					
									Excavation Area		Unclassified Excavation	Contractor Furnished Borrow Excavation			① Type 1 Retrofit Guardrail Transition	② Type 1 MGS	③ MGS MASH Tangent End Terminal	Guardrail Delineator
I90 (EBL)			Remove 3 Cable Guardrail (Ft)	Remove 3 Cable Guardrail Anchor Assembly (Each)	Remove 3 Cable Guardrail Slip Base Anchor Assembly (Each)	Remove Beam Guardrail (Ft)	*** Remove W Beam Guardrail Breakaway Cable Terminal (Each)	*** Remove W Beam Deformed End Terminal (Each)	Excavation Guardrail Embankment Reconstruction (CuYd)	Excavation 2" Asphalt Mix, Granular Base, & Earthen Material (CuYd)	(CuYd)	(CuYd)	Water For Embankment (MGal)	Disturbed Embankment Area (Acre)	(Each)	(Ft)	(Each)	(Each)
Median Shoulder	*	**	199.0	1	1	81.25	***1	***1	81	22	103	446	4.5	0.405	1	312.5	1	9
Outside Shoulder	*	**	238.0	2	-	93.75	***1	***1	37	8	45	23	0.2	0.271	1	237.5	1	7
Totals:	*	**	437.0	3	1	175.0	***2	***2	118	30	148	469	4.7	0.676	2	550.0	2	16

Except for informational quantities, all quantities in the table above are included in the Estimate of Quantities.
* Refer to "Table of Additional Quantities"
** Refer to "Section D" for information and details
*** Informational Only - All cost to remove steel beam terminals will be incidental to the contract unit price per foot for "Remove Beam Guardrail".
Guardrail Delineators will be installed per applicable Standard Plate(s)



2'-1 1/4" of guardrail overlaps onto structure.

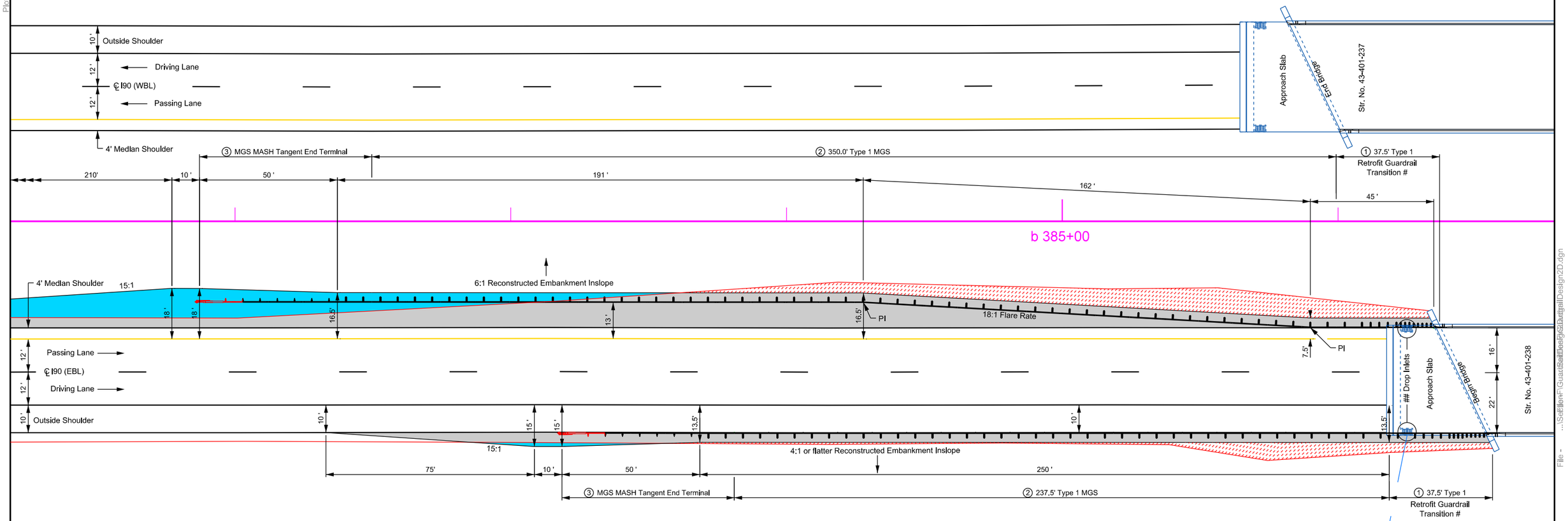
The Contractor will ensure the in-place drop inlets and outlet culvert are not damaged during the installation of guardrail posts. Any damage to the In-place drop inlets and outlet culvert will be replaced at the Contractor's expense to the satisfaction of the Engineer.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F38	F53

Plotting Date: 04/24/2025

GUARDRAIL REMOVAL, EMBANKMENT RECONSTRUCTION, GUARDRAIL SURFACING & GUARDRAIL INSTALLATION LAYOUT

Structure No. 43-401-238 on Interstate 90 EBL at MRM 251.09 over Frontage Road 2.320 miles east of Reliance



Unclassified Excavation (Guardrail Embankment Reconstruction) - Removal of existing surfacing and embankment at a 6:1 slope (median) and 4:1 slope or flatter (outside) to approximately mid-slope intercept point.

Beginning of Existing Embankment Inslope

GUARDRAIL EMBANKMENT RECONSTRUCTION
Contractor Furnished Borrow Excavation & Unclassified Excavation fill material constructed to the specified finished embankment slopes

SURFACING
13" Base Course, Salvaged base layer with a 2" Class HR Hot Mixed Asphalt Concrete finished lift constructed to match the adjacent finished shoulder cross slope

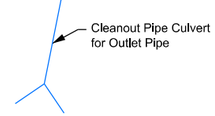
UNCLASSIFIED EXCAVATION
2" Asphalt Mix, Granular Base, & Earthen Material removal

NEW SURFACING
2" Class HR Hot Mixed Asphalt Concrete finished lift constructed to match the adjacent finished shoulder cross slope

TABLE OF ESTIMATED QUANTITIES

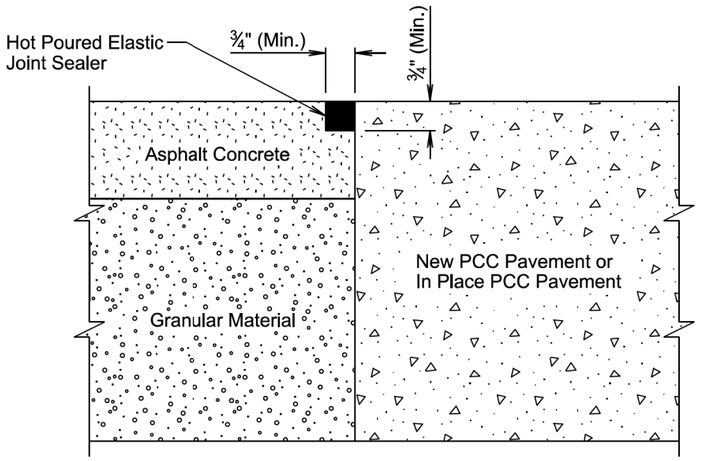
LOCATION	*	**	GUARDRAIL REMOVAL						GUARDRAIL EMBANKMENT RECONSTRUCTION						GUARDRAIL INSTALLATION			
									Unclassified Excavation			Contractor Furnished Borrow Excavation	Informational Only		①	②	③	
									Excavation Area		Unclassified Excavation							
I90 (EBL)	GUARDRAIL SURFACING QUANTITIES	EROSION CONTROL MEASURES	Remove 3 Cable Guardrail (Ft)	Remove 3 Cable Guardrail Anchor Assembly (Each)	Remove 3 Cable Guardrail Slip Base Anchor Assembly (Each)	Remove Beam Guardrail (Ft)	*** Remove W Beam Guardrail Breakaway Cable Terminal (Each)	*** Remove W Beam Deformed End Terminal (Each)	Excavation Guardrail Embankment Reconstruction (CuYd)	Excavation 2" Asphalt Mix, Granular Base, & Earthen Material (CuYd)	(CuYd)	(CuYd)	Water For Embankment (MGal)	Disturbed Embankment Area (Acre)	Type 1 Retrofit Guardrail Transition (Each)	Type 1 MGS (Ft)	MGS MASH Tangent End Terminal (Each)	Guardrail Delineator (Each)
Median Shoulder	*	**	199.0	1	1	81.25	***1	***1	117	27	144	441	4.4	0.492	1	350.0	1	9
Outside Shoulder	*	**	238.0	2	-	93.75	***1	***1	51	9	60	26	0.3	0.340	1	237.5	1	7
Totals:	*	**	437.0	3	1	175.0	***2	***2	168	36	204	467	4.7	0.832	2	587.5	2	16

Except for informational quantities, all quantities in the table above are included in the Estimate of Quantities.
* Refer to "Table of Additional Quantities"
** Refer to "Section D" for information and details
*** Informational Only - All cost to remove steel beam terminals will be incidental to the contract unit price per foot for "Remove Beam Guardrail".
Guardrail Delineators will be installed per applicable Standard Plate(s)



2'-1 1/4" of guardrail overlaps onto structure.

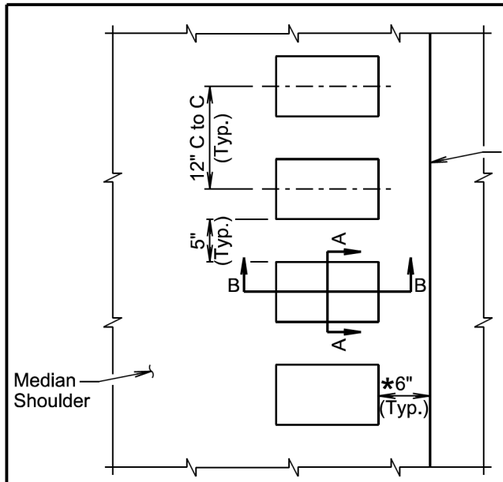
The Contractor will ensure the in-place drop inlets and outlet culvert are not damaged during the installation of guardrail posts. Any damage to the in-place drop inlets and outlet culvert will be replaced at the Contractor's expense to the satisfaction of the Engineer.



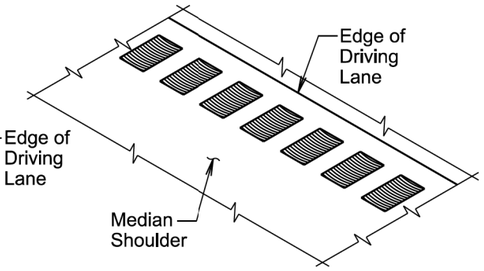
TRANSVERSE SECTION
(Asphalt Concrete Shoulder Joint)

September 14, 2019

Published Date: 2025	SDDOT	ASPHALT CONCRETE SHOULDER JOINT ADJACENT TO PCC PAVEMENT	PLATE NUMBER 320.15
			Sheet 1 of 1

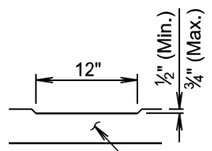


PLAN VIEW
(Typical Rumble Strip in Asphalt Concrete)

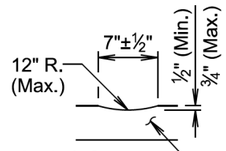


PERSPECTIVE VIEW
(Typical Rumble Strip in Asphalt Concrete)

* When PCC pavement width from centerline to edge of pavement is 12', the rumble strip may be placed a maximum of 2' from the edge of the driving lane.



SECTION B-B



SECTION A-A

GENERAL NOTES:

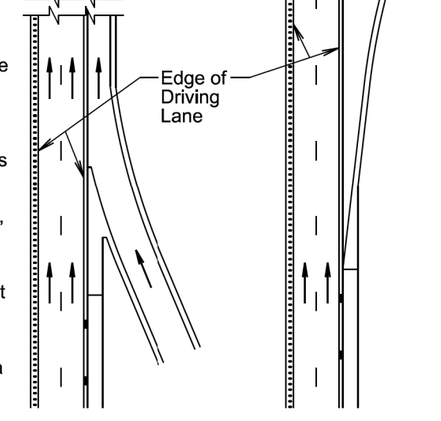
A rumble strip will be constructed on all of the asphalt concrete median shoulders by grinding continuous indentations in the asphalt concrete. The rumble strip will receive a flush seal or asphalt surface treatment as specified in the plans.

A rumble strip should be placed through median crossovers as directed by the Engineer.

A rumble strip will not be constructed through entrance ramps, exit ramps, gore areas, bridge decks, and bridge approach slabs.

Prior to constructing the rumble strip the Contractor will submit to the Engineer, for approval, the proposed method of constructing the rumble strip.

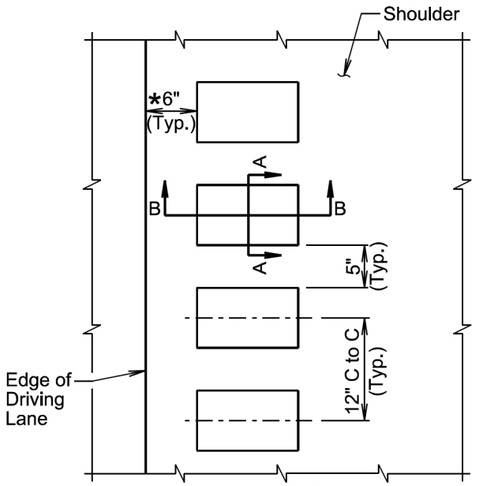
Measurement of the rumble strip will be to the nearest 0.1 of a mile for each median shoulder. Measurement and payment of the rumble strip will include the segments adjacent to median crossovers, entrance ramps, exit ramps, gore areas, bridge decks, and bridge approach slabs without rumble strips. Payment for constructing the rumble strip will be at the contract unit price per mile for "Grind 12" Rumble Strip or Stripe in Asphalt Concrete".



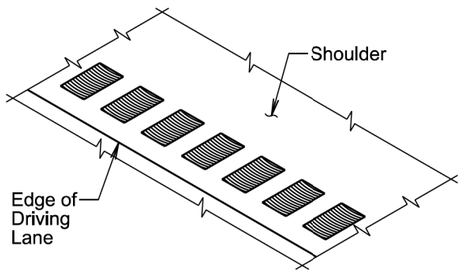
ENTRANCE RAMP **EXIT RAMP**
PLAN VIEW

March 31, 2024

Published Date: 2025	SDDOT	12" RUMBLE STRIP IN ASPHALT CONCRETE ON INTERSTATE MEDIAN SHOULDER	PLATE NUMBER 320.30
			Sheet 1 of 1

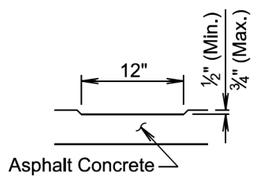


PLAN VIEW
(Typical Rumble Strip in Asphalt Concrete)

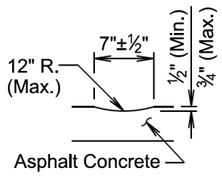


PERSPECTIVE VIEW
(Typical Rumble Strip in Asphalt Concrete)

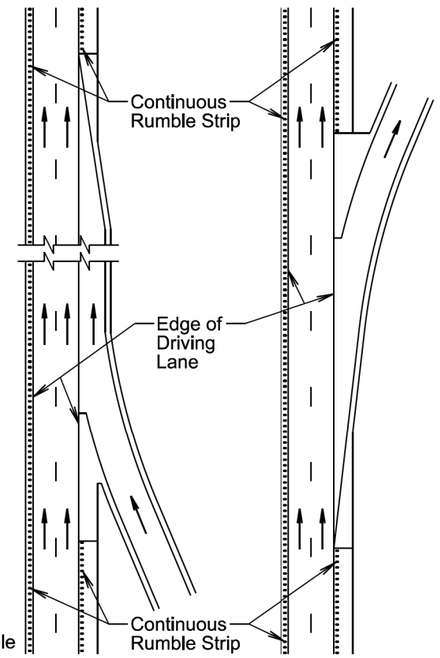
* When PCC pavement width from centerline to edge of pavement is 12', the rumble strip may be placed a maximum of 2' from the edge of the driving lane.



SECTION B-B



SECTION A-A



ENTRANCE RAMP **EXIT RAMP**
PLAN VIEW

GENERAL NOTES:

A rumble strip will be constructed on all of the asphalt concrete shoulders by grinding continuous indentations in the asphalt concrete. The rumble strip will receive a flush seal or asphalt surface treatment as specified in the plans.

A rumble strip should be placed through median crossovers as directed by the Engineer.

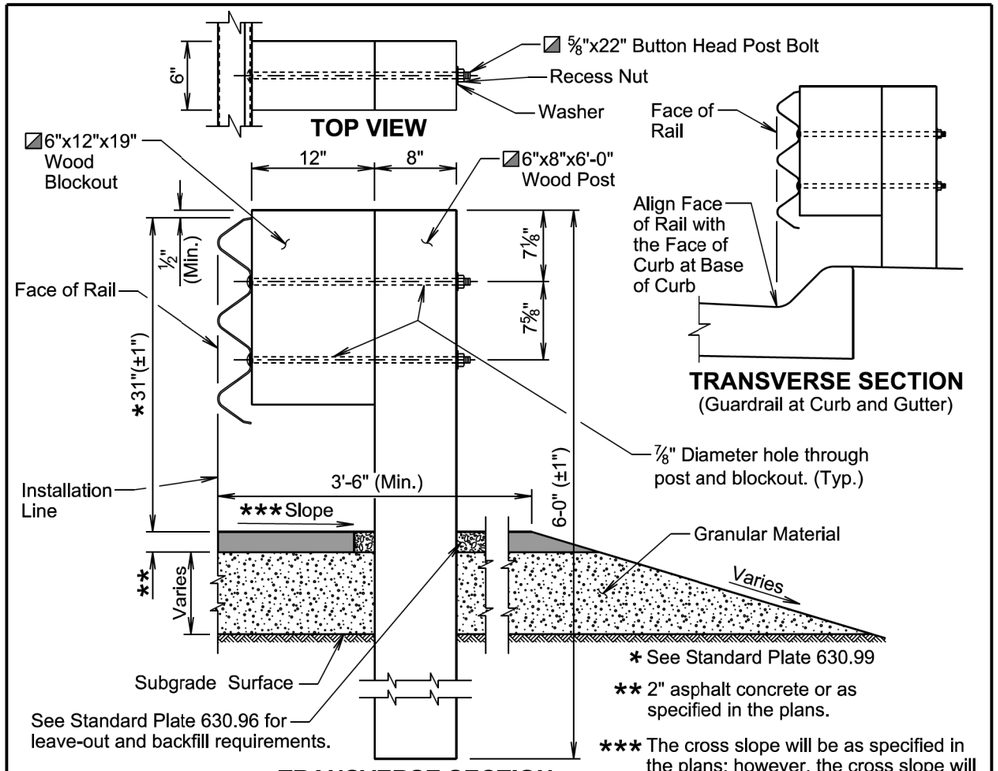
A rumble strip will not be constructed through entrance ramps, exit ramps, gore areas, bridge decks, and bridge approach slabs.

Prior to constructing the rumble strip the Contractor will submit to the Engineer, for approval, the proposed method of constructing the rumble strip.

Measurement of the rumble strip will be to the nearest 0.1 of a mile for each shoulder. Measurement and payment of the rumble strip will include the segments adjacent to median crossovers, entrance ramps, exit ramps, gore areas, bridge decks, and bridge approach slabs without rumble strips. Payment for constructing the rumble strip will be at the contract unit price per mile for "Grind 12" Rumble Strip or Stripe in Asphalt Concrete".

September 14, 2019

Published Date: 2025	SDDOT	12" RUMBLE STRIP IN ASPHALT CONCRETE ON INTERSTATE SHOULDERS	PLATE NUMBER 320.32
			Sheet 1 of 1



* 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.

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.

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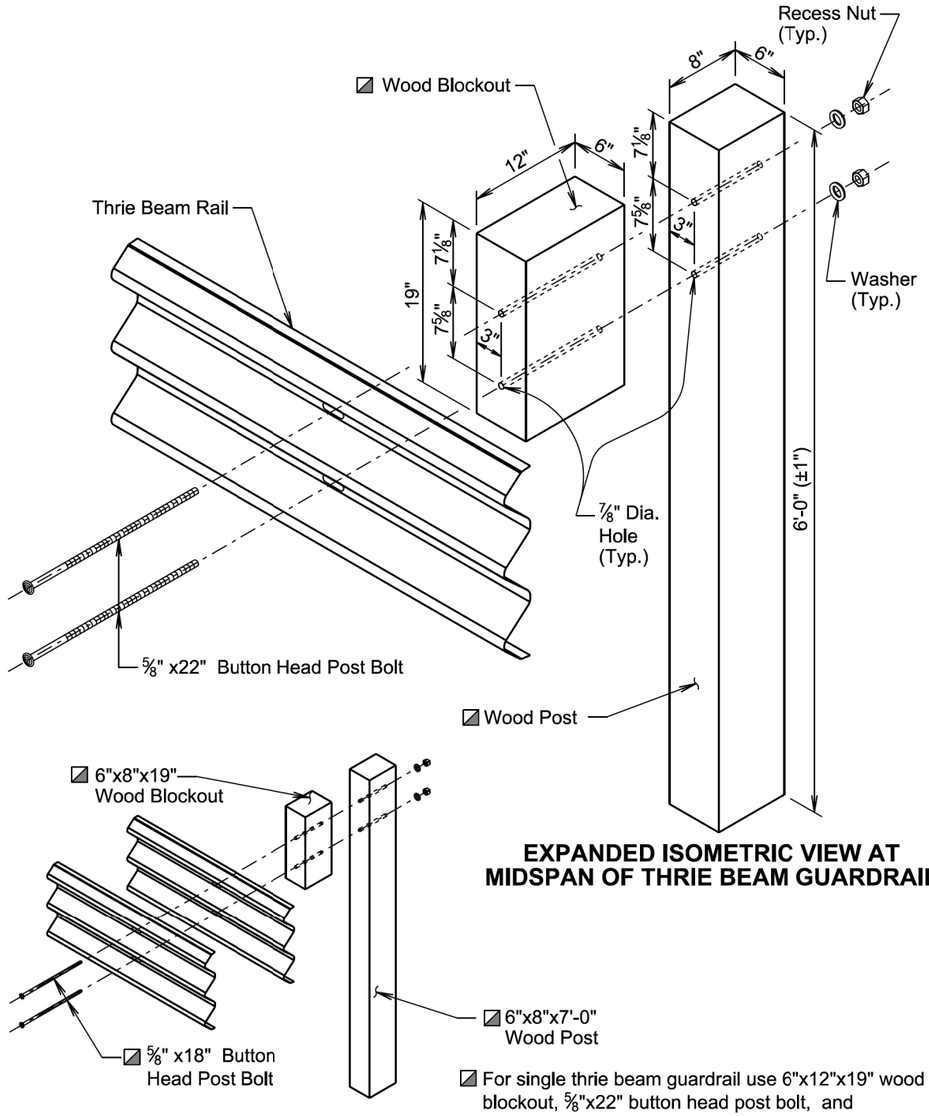
Published Date: 2025	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 1 of 5



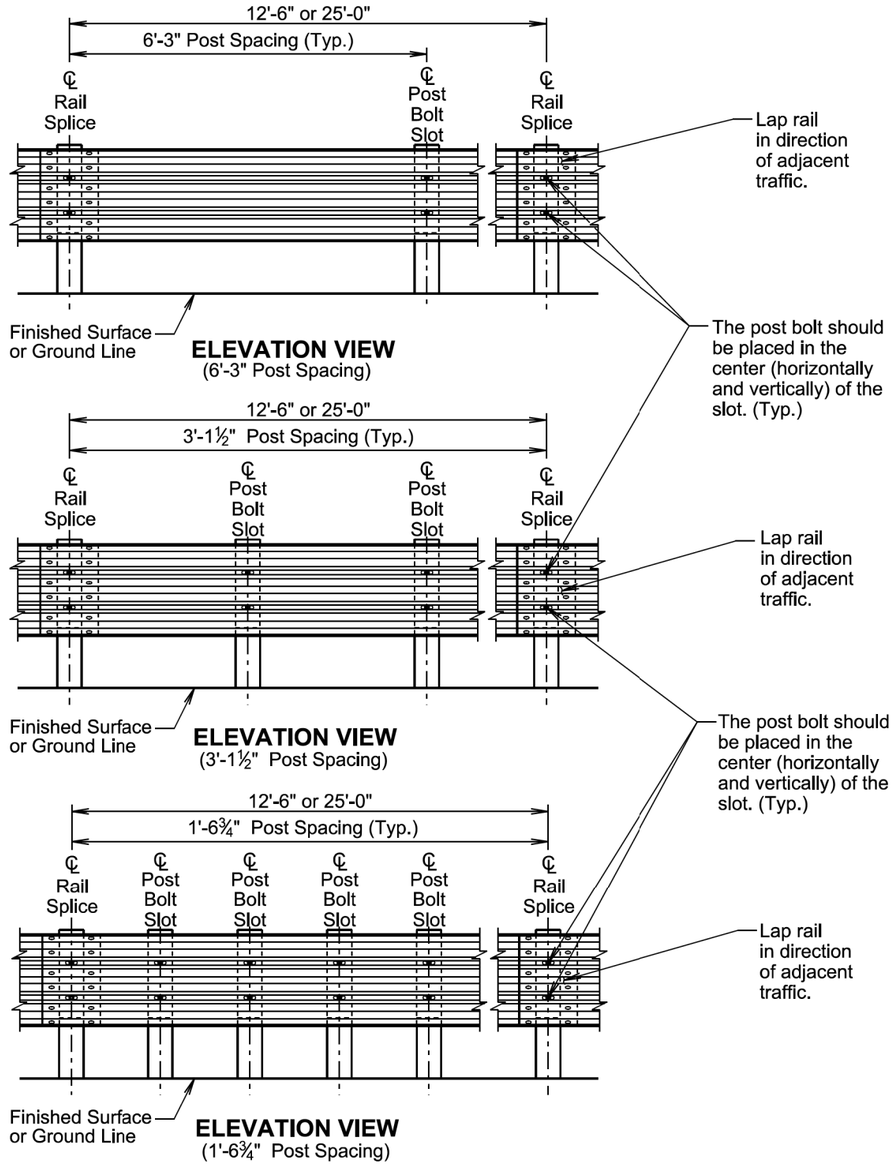
EXPANDED ISOMETRIC VIEW AT MIDSPAN OF THRIE BEAM GUARDRAIL

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: 2025	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 2 of 5



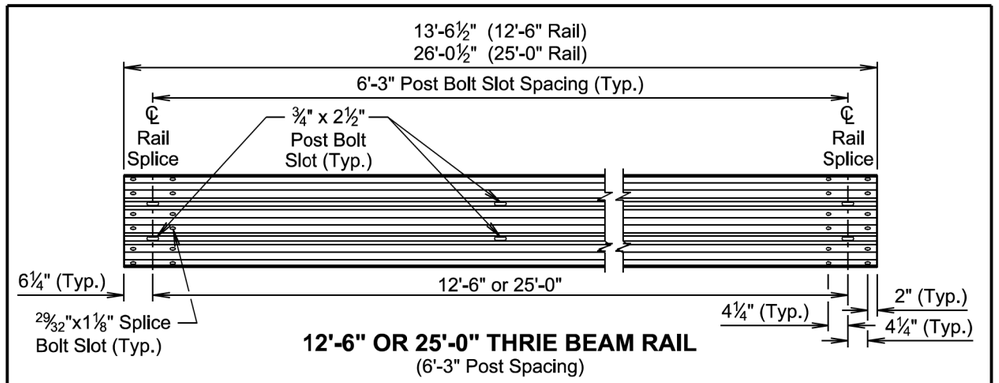
ELEVATION VIEW
(6'-3" Post Spacing)

ELEVATION VIEW
(3'-1½" Post Spacing)

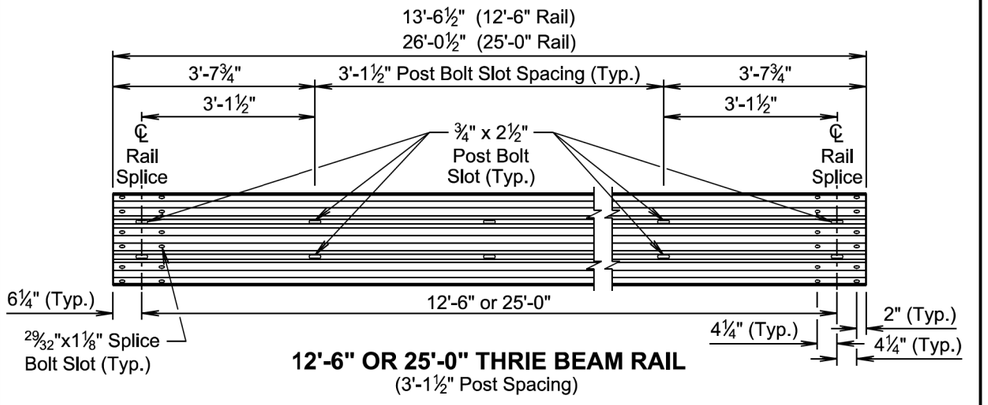
ELEVATION VIEW
(1'-6¾" Post Spacing)

September 14, 2019

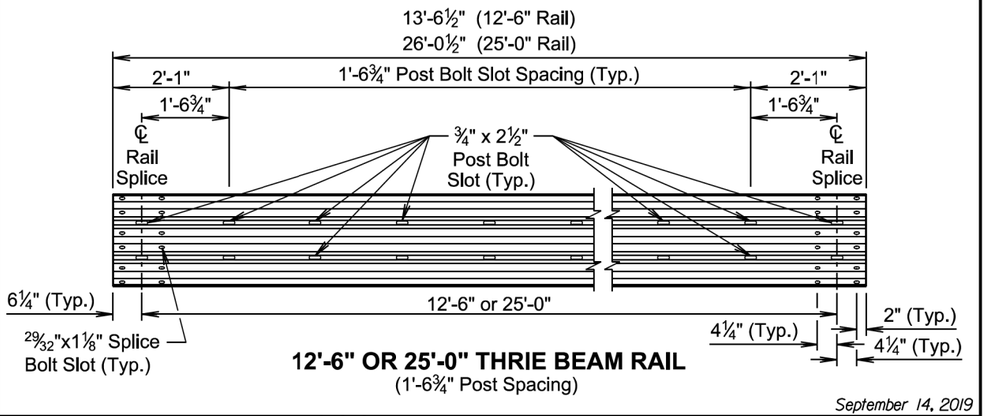
Published Date: 2025	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 3 of 5



12'-6" OR 25'-0" THRIE BEAM RAIL
(6'-3" Post Spacing)



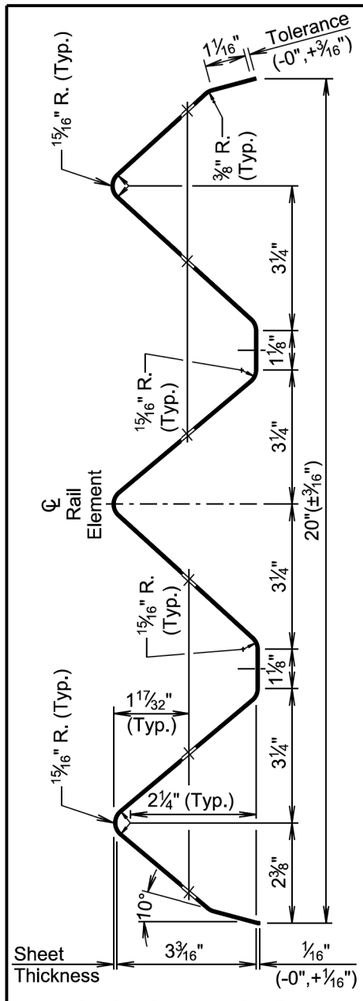
12'-6" OR 25'-0" THRIE BEAM RAIL
(3'-1½" Post Spacing)



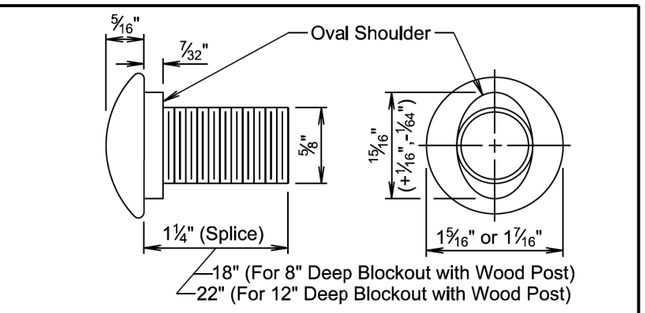
12'-6" OR 25'-0" THRIE BEAM RAIL
(1'-6¾" Post Spacing)

September 14, 2019

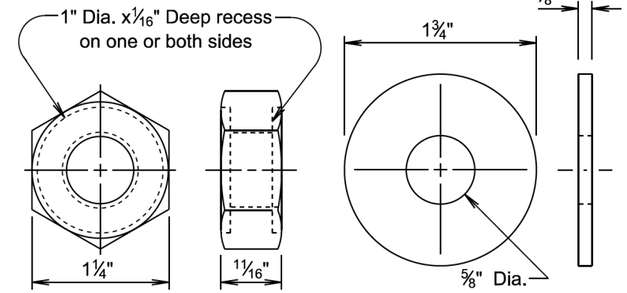
	SDDOT		
Published Date: 2025		***THRIE BEAM GUARDRAIL***	***PLATE NUMBER 630.01***
			Sheet 4 of 5



SECTION THROUGH THRIE BEAM RAIL

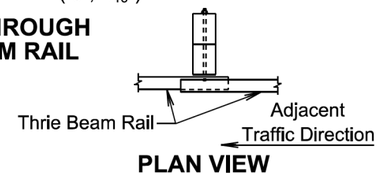


SPLICE BOLT AND POST BOLT
(⅝" Button Head Bolt)

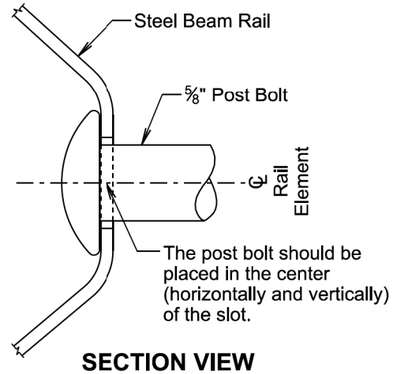


RECESS NUT
(At lap splices, the recess will be placed against the steel rail.)

WASHER
(The washer will be placed between the back side of wood post and the recess nut, see sheet 1 and 2.)



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

	SDDOT		
Published Date: 2025		***THRIE BEAM GUARDRAIL***	***PLATE NUMBER 630.01***
			Sheet 5 of 5

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.

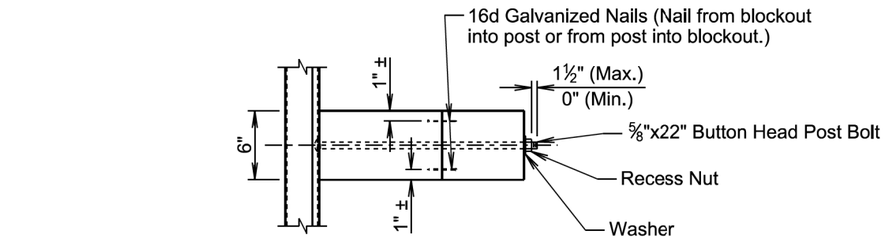
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used will be compatible with the total length of rail per site as shown in the plans.

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.

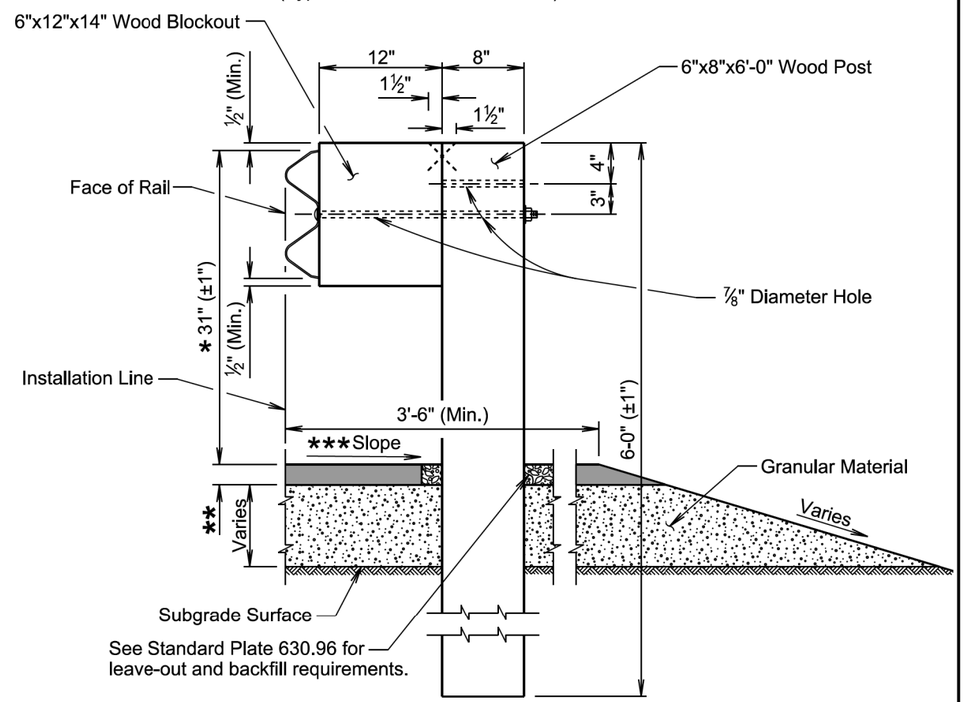
All costs for constructing the MGS including labor, equipment, and materials including all posts, blockouts, steel beam rail, and hardware will be incidental to the contract unit price per foot for the respective MGS contract item.

September 14, 2019

Published Date: 2025	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 1 of 6



TOP VIEW
(Type 1, 2, or 3 MGS Installation)



TRANSVERSE SECTION
(Type 1, 2, or 3 MGS Installation)

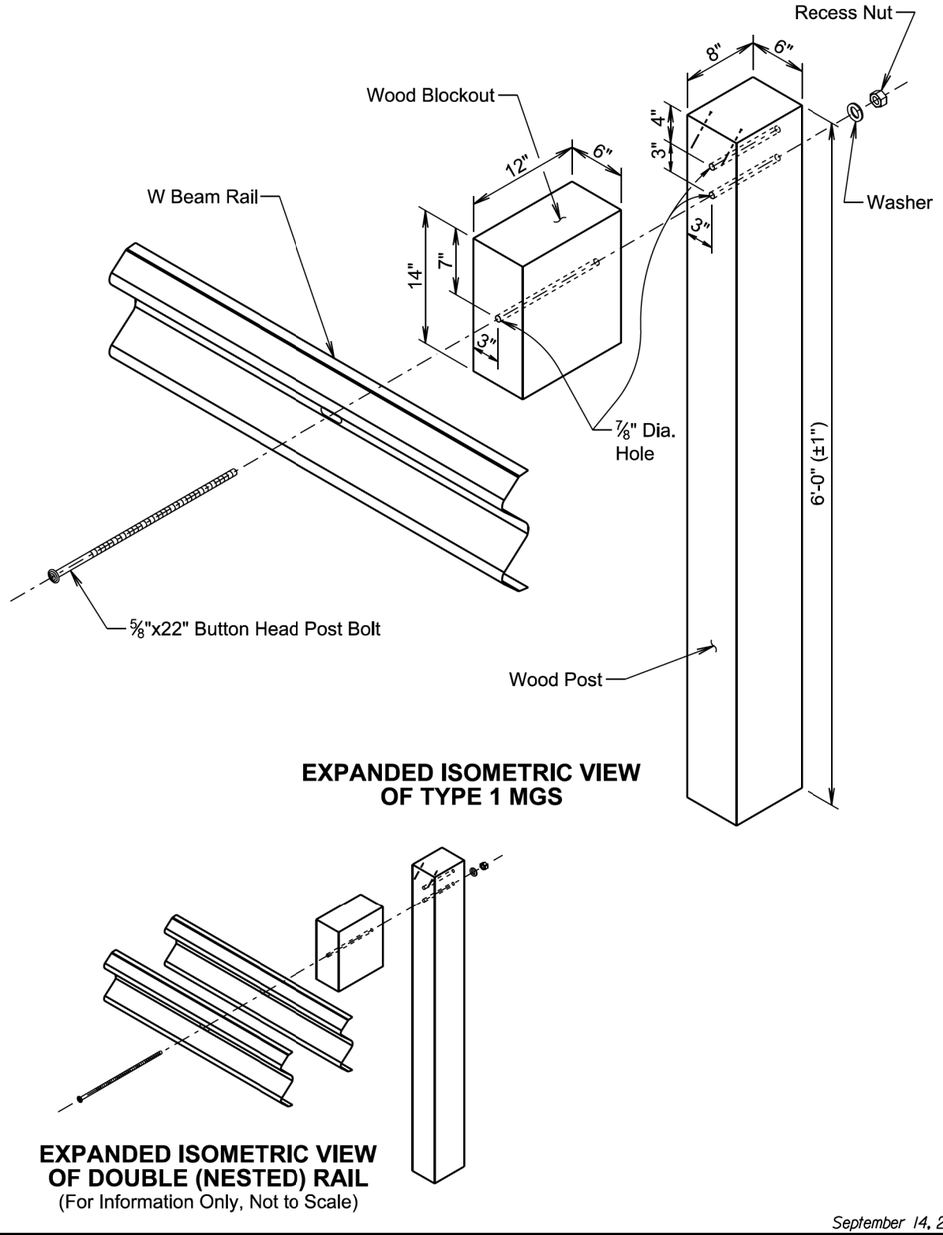
* See Standard Plate 630.99

** 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.

September 14, 2019

Published Date: 2025	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 2 of 6

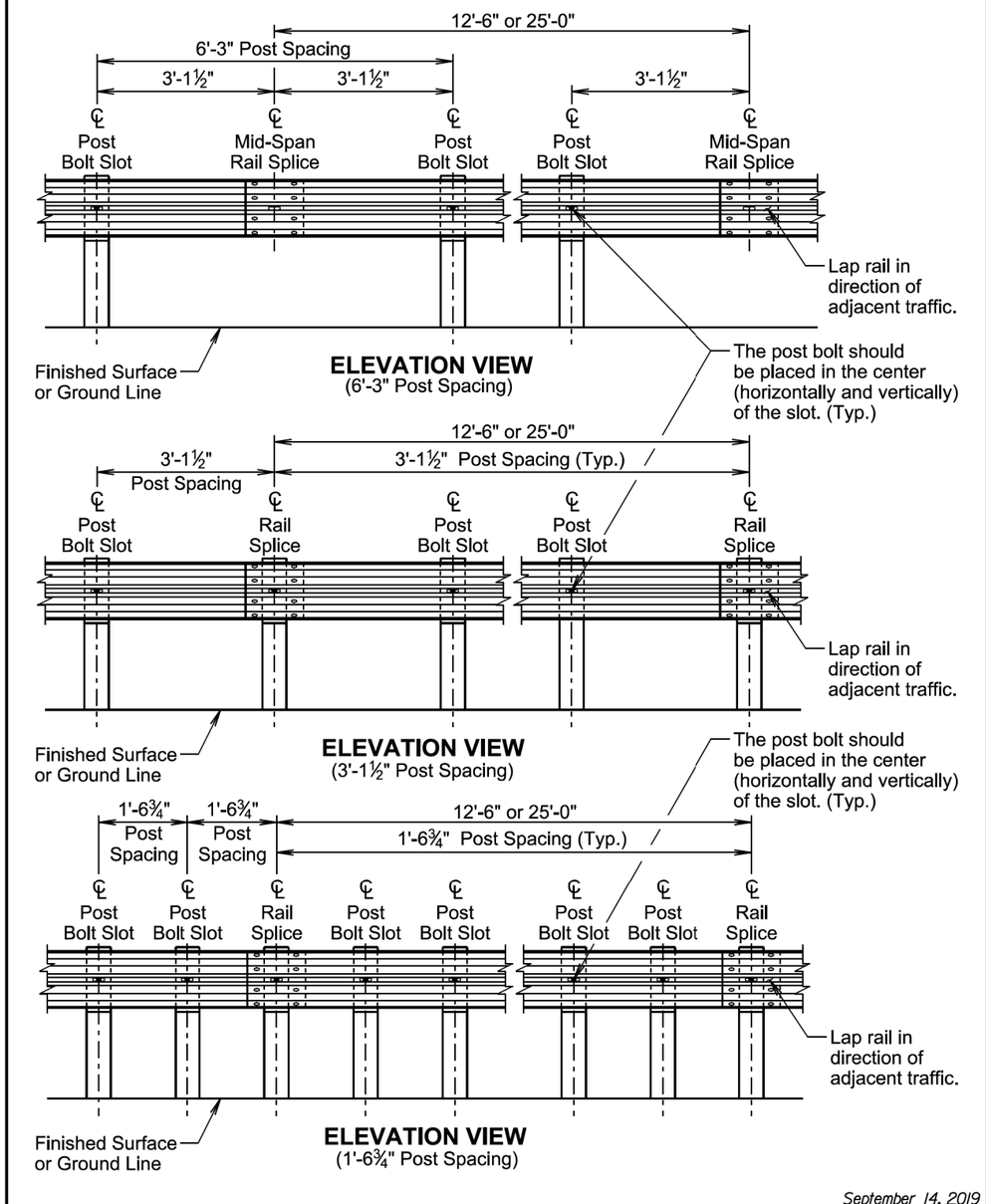


EXPANDED ISOMETRIC VIEW OF TYPE 1 MGS

EXPANDED ISOMETRIC VIEW OF DOUBLE (NESTED) RAIL
(For Information Only, Not to Scale)

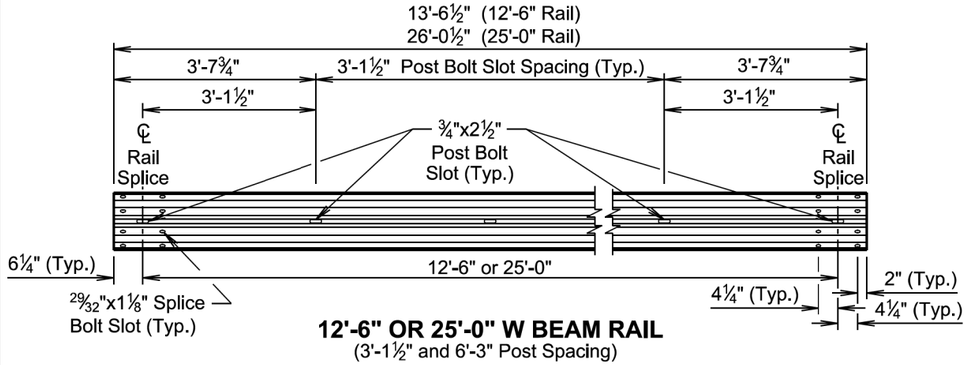
September 14, 2019

Published Date: 2025	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 3 of 6

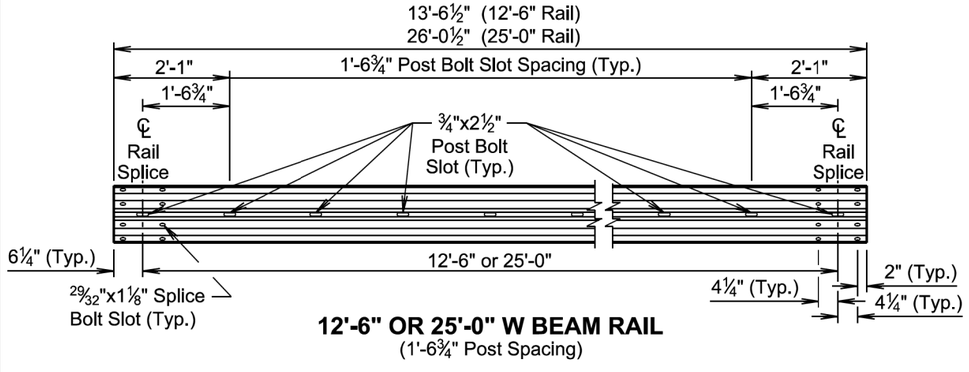


September 14, 2019

Published Date: 2025	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 4 of 6



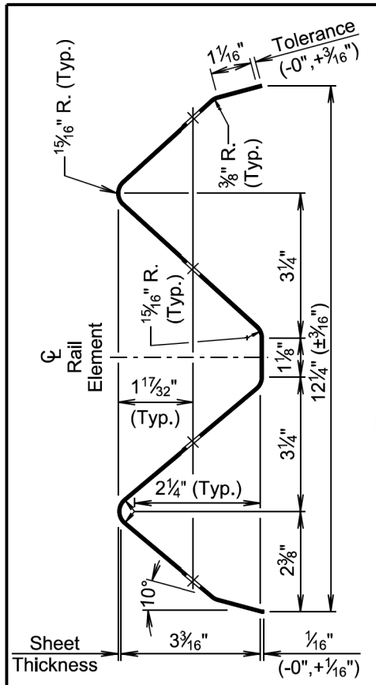
12'-6" OR 25'-0" W BEAM RAIL
(3'-1½" and 6'-3" Post Spacing)



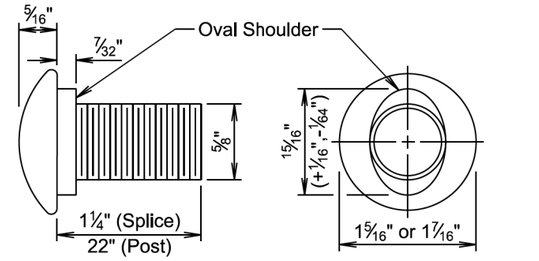
12'-6" OR 25'-0" W BEAM RAIL
(1'-6¾" Post Spacing)

September 14, 2019

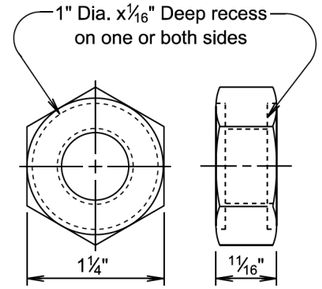
Published Date: 2025	SDDOT	*MIDWEST GUARDRAIL SYSTEM (MGS)*	*PLATE NUMBER* 630.20
			Sheet 5 of 6



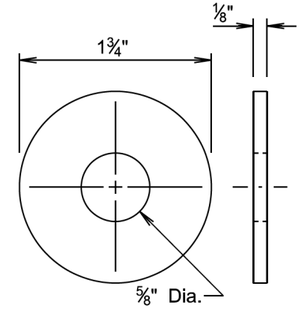
SECTION THROUGH W BEAM RAIL



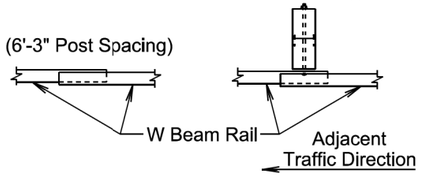
SPLICE BOLT AND POST BOLT
(⅝" Button Head Bolt)



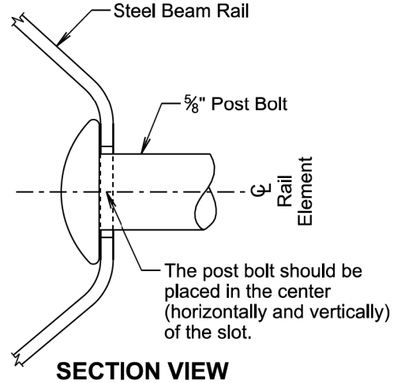
RECESS NUT
(At lap splices, the recess will be placed against the steel rail.)



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)

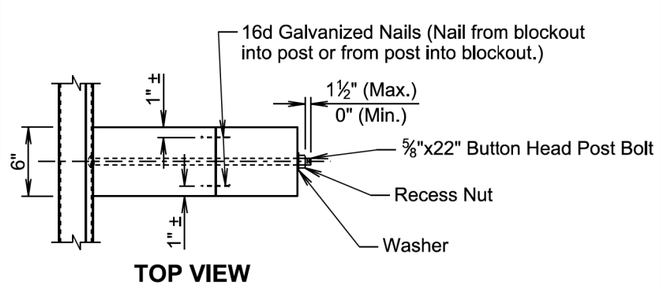


SECTION VIEW
(At Post Bolt)

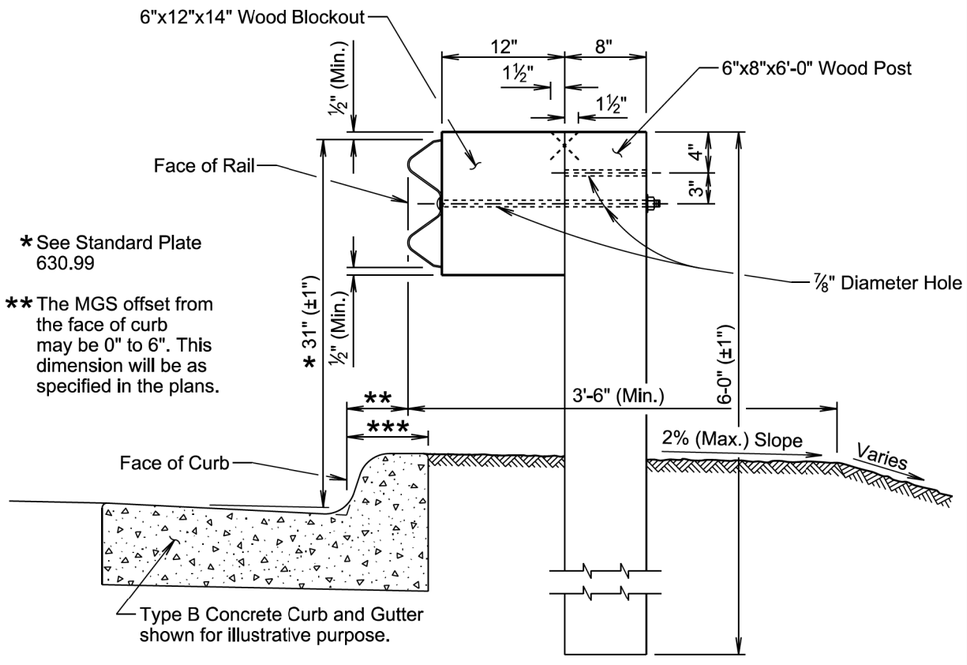
September 14, 2019

Published Date: 2025	SDDOT	*MIDWEST GUARDRAIL SYSTEM (MGS)*	*PLATE NUMBER* 630.20
			Sheet 6 of 6

CONCRETE CURB AND GUTTER TYPE	DIMENSION *** (in.)
B and BL	8
D	12
F and FL	10
R	11



TOP VIEW



* See Standard Plate 630.99

** The MGS offset from the face of curb may be 0" to 6". This dimension will be as specified in the plans.

TRANSVERSE SECTION

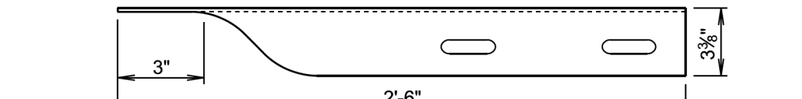
GENERAL NOTES:

The guardrail on this standard plate is Type 1 MGS. See standard plate 630.20 for specifications regarding Type 1 MGS.

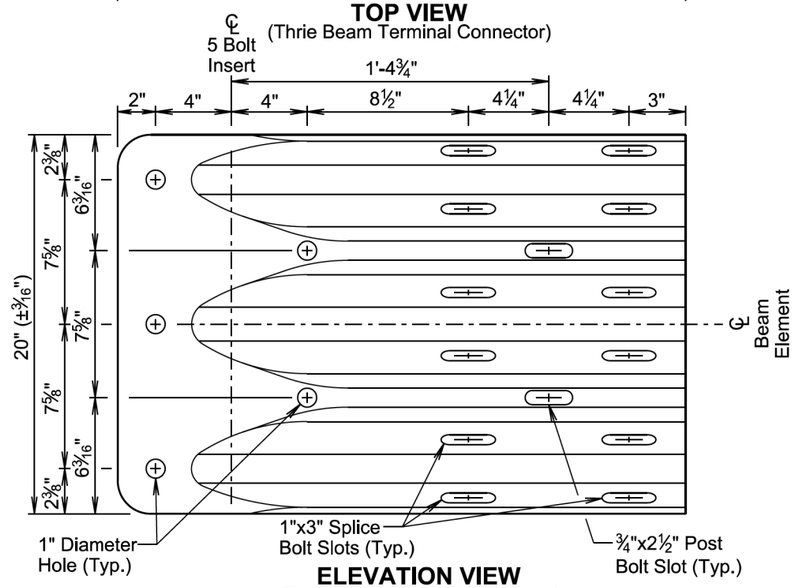
When PCC pavement or asphalt concrete pavement is adjacent to the post, see standard plate 630.96 for leave-out and backfill requirements.

September 14, 2019

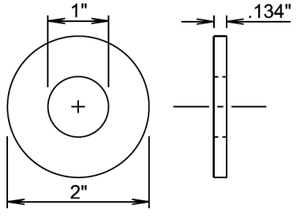
Published Date: 2025	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS) AT CURB AND GUTTER	PLATE NUMBER 630.22
			Sheet 1 of 1



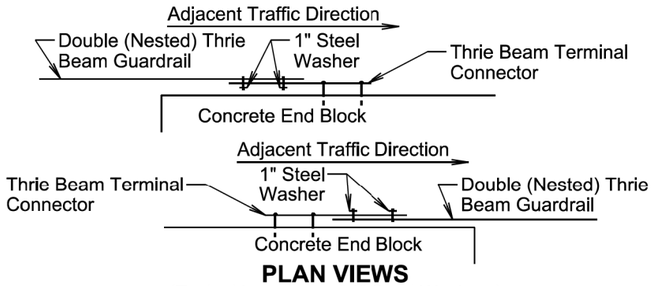
TOP VIEW
(Thrie Beam Terminal Connector)



ELEVATION VIEW
(Thrie Beam Terminal Connector)



1" STEEL WASHER
(12 washers required)



PLAN VIEWS
(Typical Locations of 1" Steel Washers)
(Washers are required at these lap splices)

GENERAL NOTES:

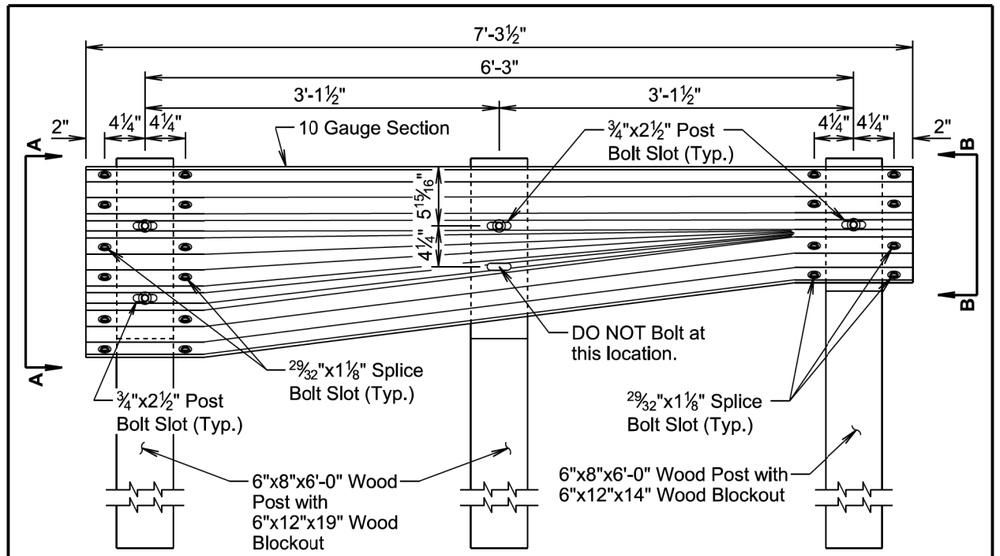
Thrie Beam Terminal Connectors will be 10 gauge.

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.

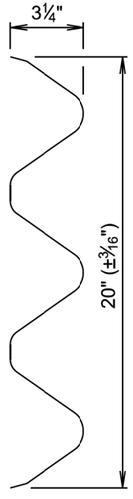
There will be no separate payment for furnishing and installing the thrie beam terminal connector. All costs for furnishing and installing the thrie beam terminal connector will be incidental to the contract unit price of the respective guardrail item it is attached to.

September 14, 2019

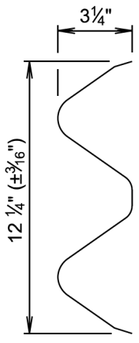
Published Date: 2025	SDDOT	THRIE BEAM TERMINAL CONNECTOR	PLATE NUMBER 630.47
			Sheet 1 of 1



ELEVATION VIEW



VIEW A-A



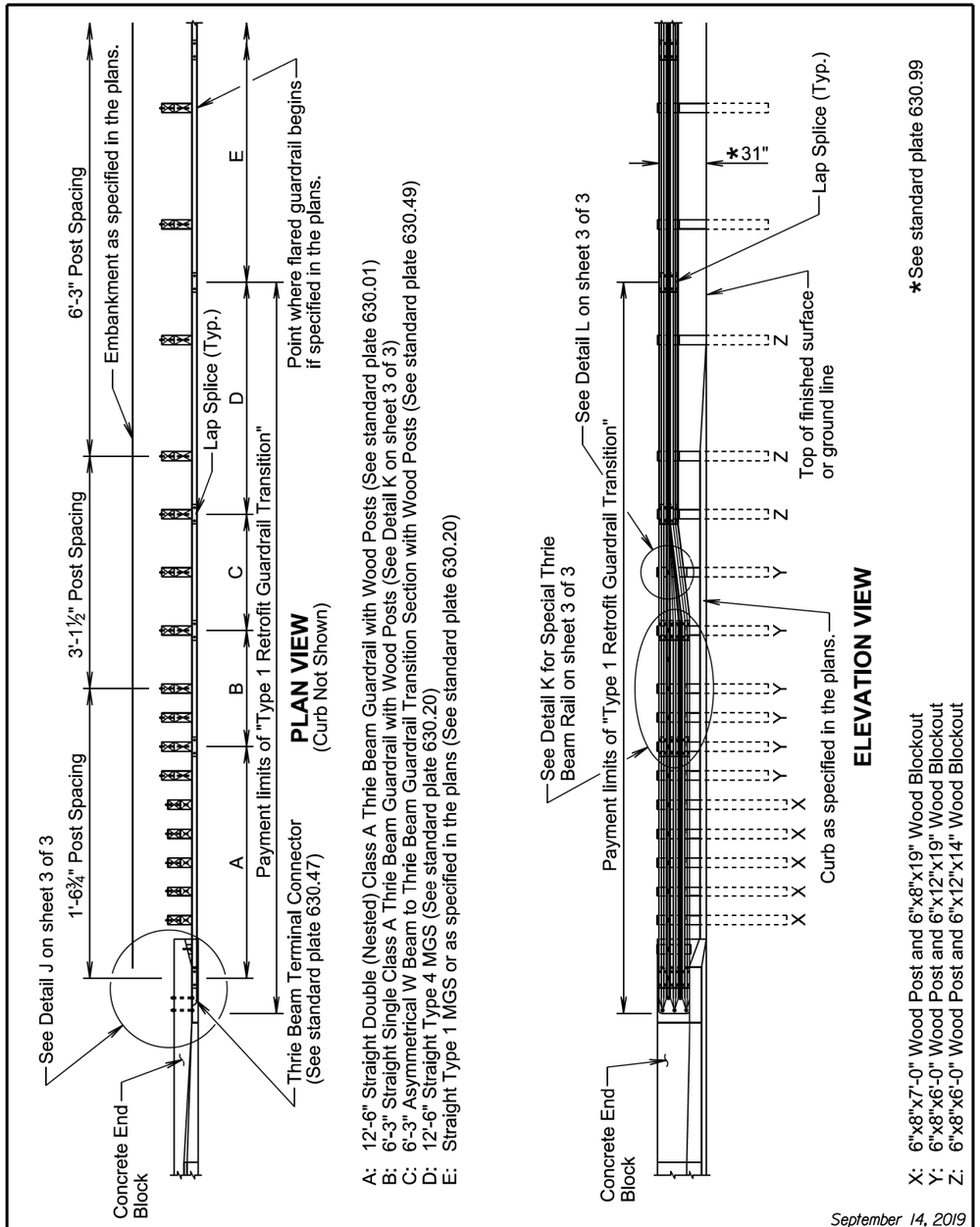
VIEW B-B

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.

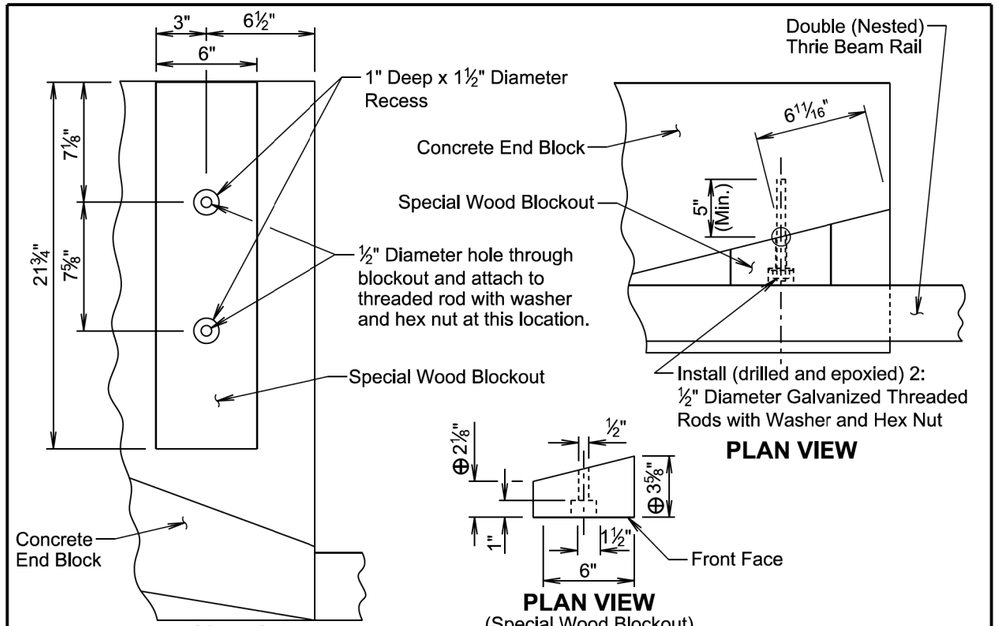
September 14, 2019

Published Date: 2025	SDDOT	ASYMMETRICAL W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION	PLATE NUMBER 630.49 Sheet 1 of 1



September 14, 2019

Published Date: 2025	SDDOT	TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.51 Sheet 1 of 3



DETAIL M
(See the 3 drawings above)

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.

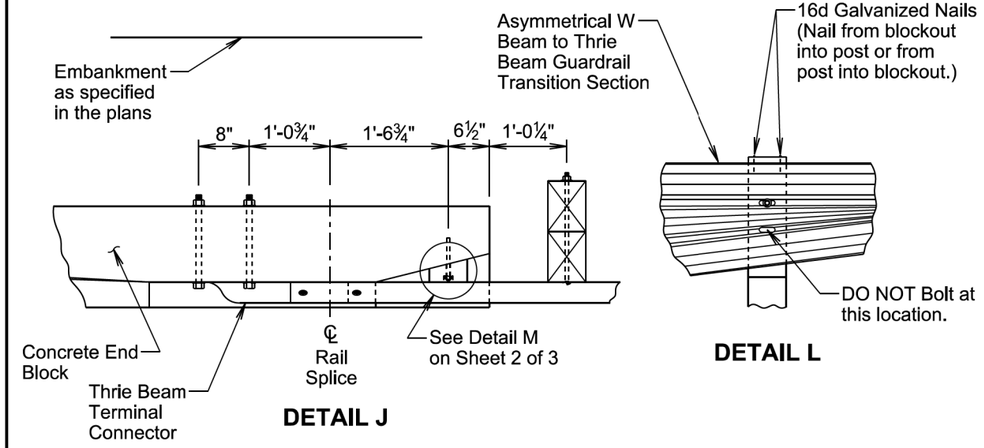
The epoxy resin mixture will be of a type for bonding steel to hardened concrete and will conform to AASHTO M235 Type IV, Grade 3 (Equivalent to ASTM C881, Type IV, Grade 3).

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.

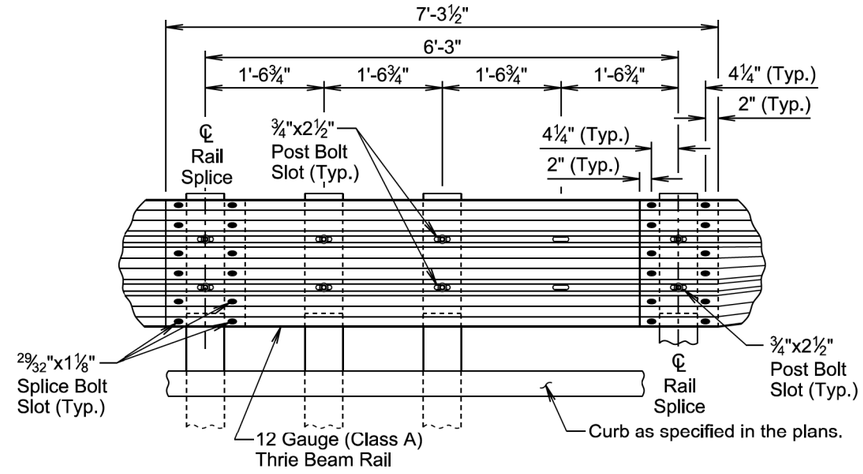
September 14, 2019

Published Date: 2025	SDDOT	TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.51 Sheet 2 of 3



DETAIL J

DETAIL L



DETAIL K
(Special Thrie Beam Rail)

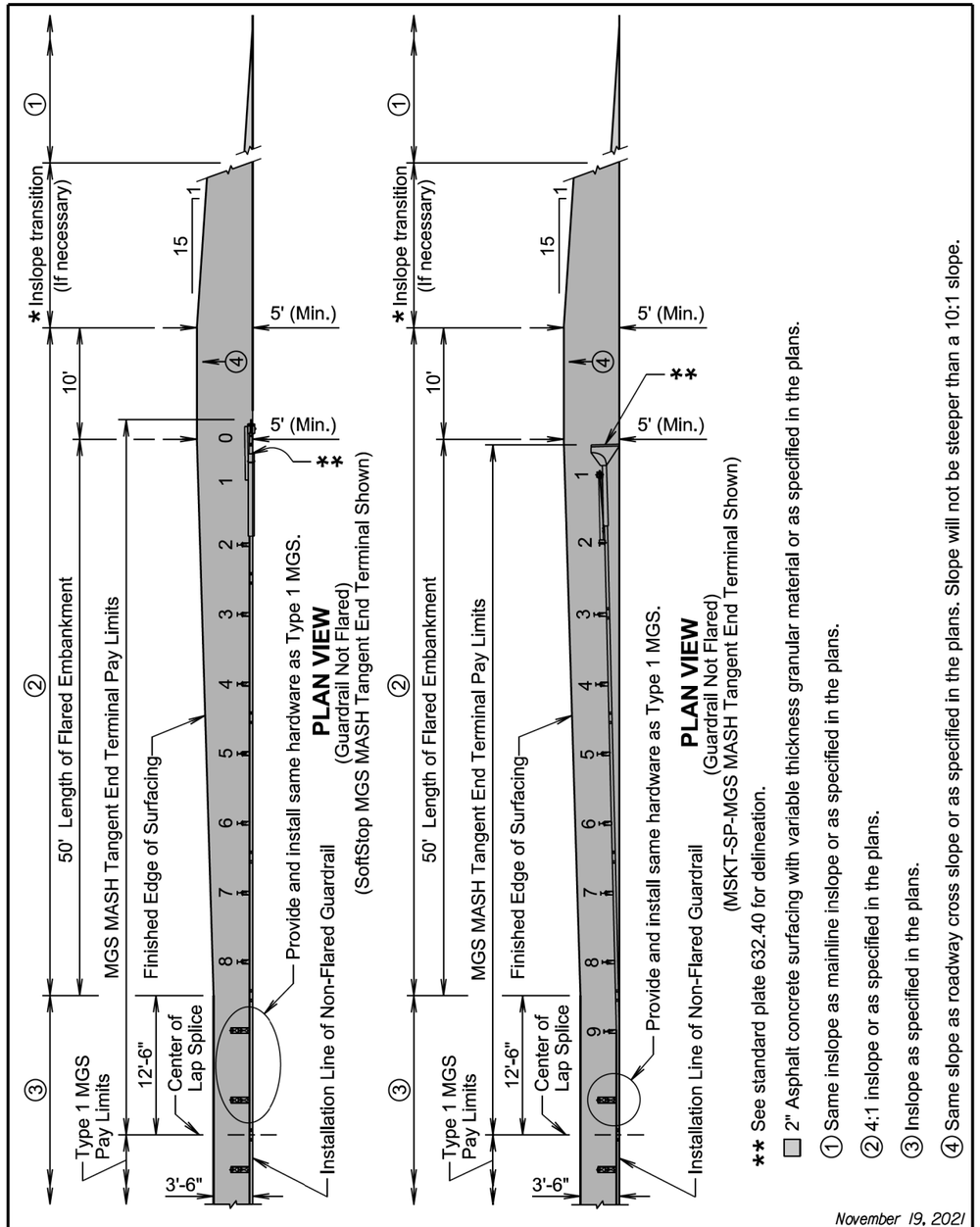
GENERAL NOTES:

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".

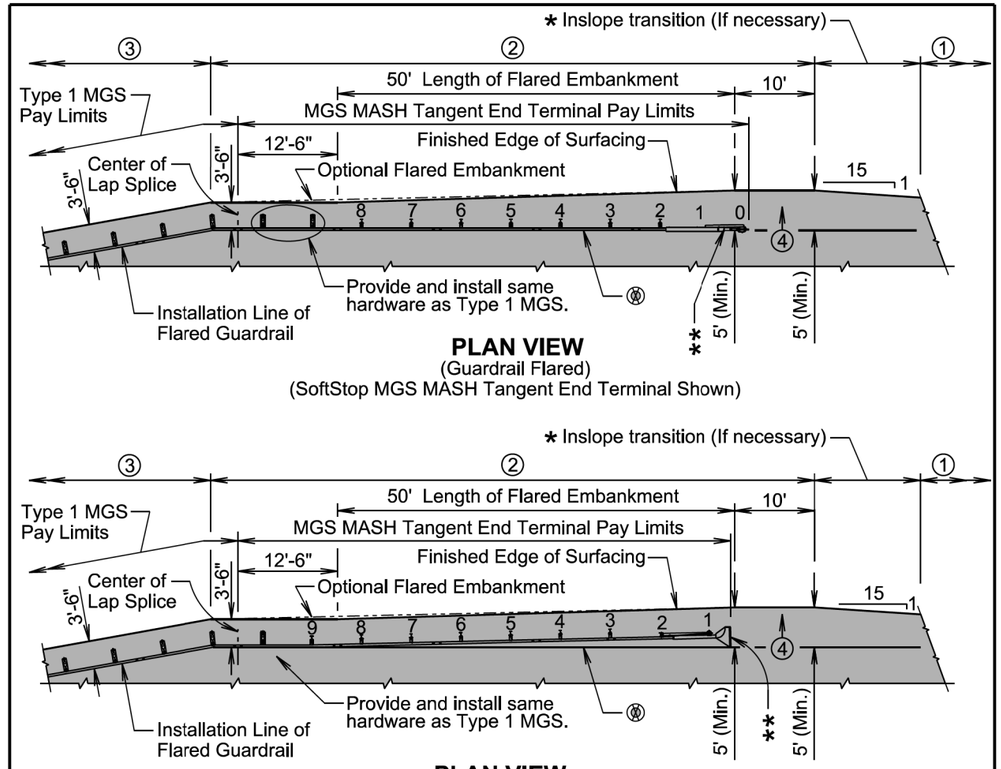
September 14, 2019

Published Date: 2025	SDDOT	TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.51 Sheet 3 of 3



November 19, 2021

Published Date: 2025	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'.

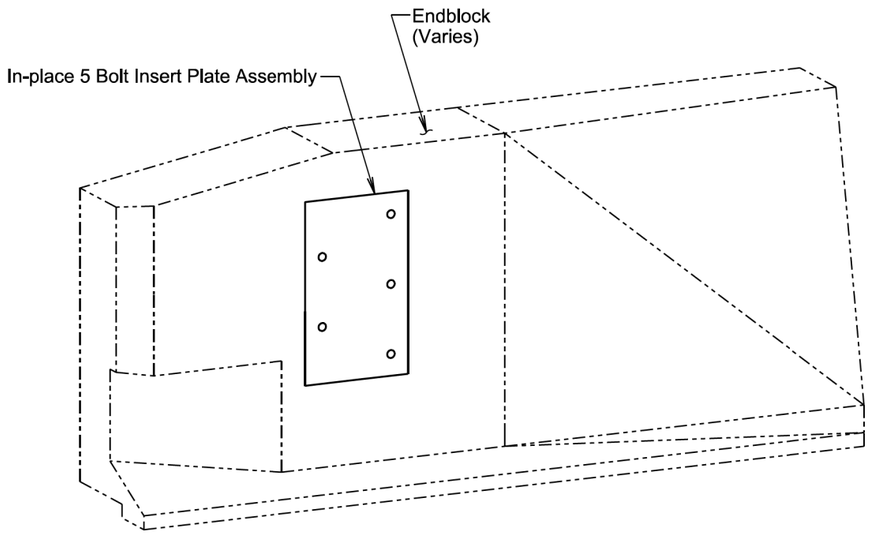
Ⓜ The installation reference line for MGS MASH tangent end terminals will always be parallel to the roadway.

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: 2025	SDDOT	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH TANGENT END TERMINAL	PLATE NUMBER 630.89
			Sheet 2 of 2



ISOMETRIC VIEW

GENERAL NOTES:

Bolts, nuts, and washers are furnished with each new assembly. Where guardrail is to be reset, bolts will be salvaged and reset for guardrail installation. Any hardware damaged or lost from the Contractor's operation will be replaced at no additional cost to the State.

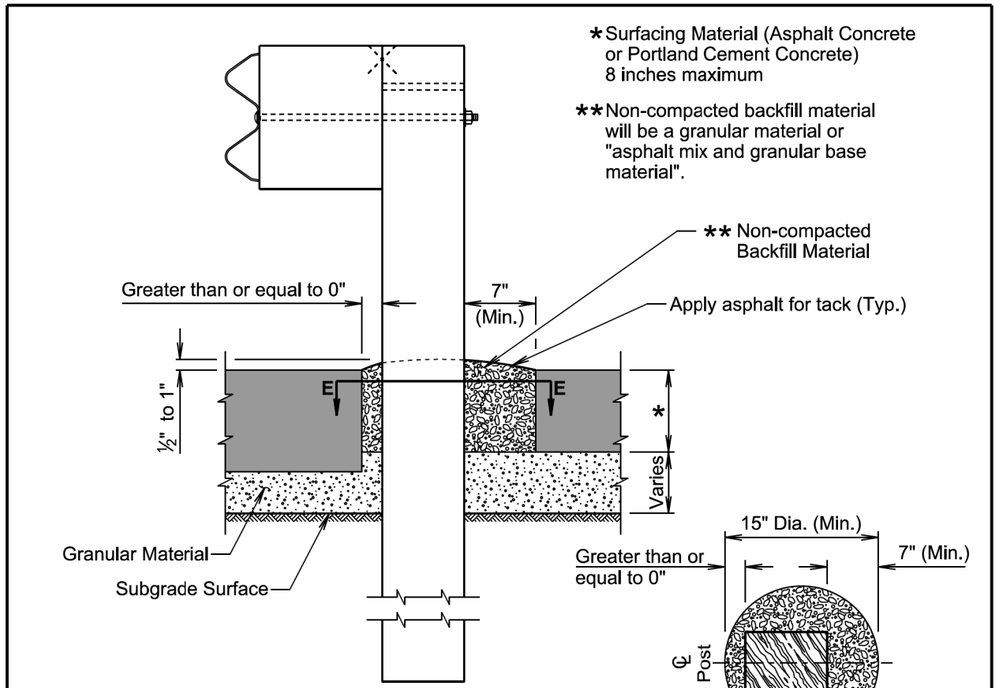
New bolts, if required, will be galvanized and conform to the requirements of ASTM A307, F-1554 Grade A325, or A449. Plain washers will be galvanized and conform to ASTM F844.

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

All costs for salvaging, resetting, and refurnishing lost hardware will be incidental to the contract unit price for the respective guardrail contract item.

November 19, 2022

Published Date: 2025	SDDOT	GUARDRAIL ATTACHMENT TO BRIDGE ENDBLOCKS	PLATE NUMBER 630.93
			Sheet 1 of 1



TRANSVERSE SECTION
(Wood post shown for illustrative purpose only)

SECTION E-E
(Round option for leave-out and backfill limits)
(Wood post shown for illustrative purpose only)

GENERAL NOTES:

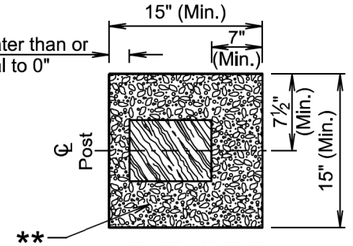
The leave-out limits may be increased to accommodate construction equipment and tolerances.

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.

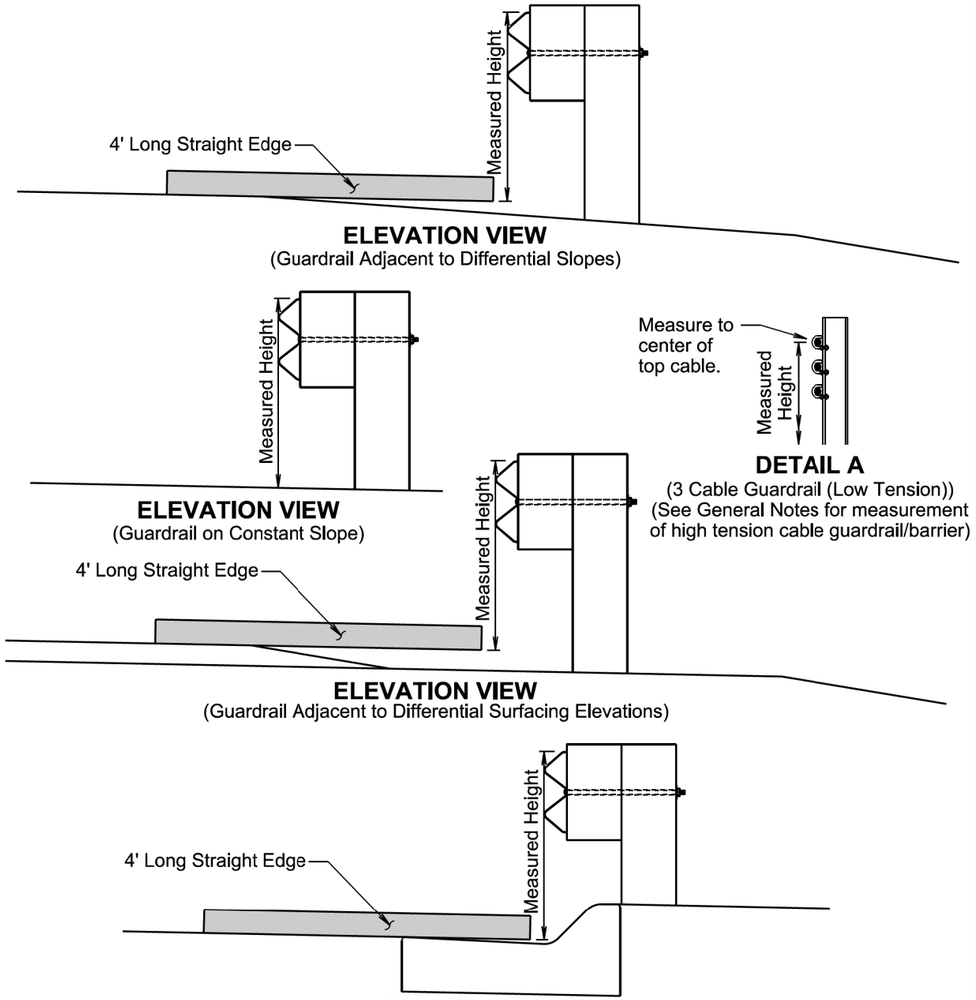
All costs for constructing the leave-out including labor, equipment, and materials which includes the backfill material and tack coat will be incidental to the contract unit price for the respective guardrail contract item.



SECTION E-E
(Square option for leave-out and backfill limits)
(Wood post shown for illustrative purpose only)

November 19, 2021

Published Date: 2025	SDDOT	GUARDRAIL POST INSTALLED IN ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE	PLATE NUMBER 630.96
			Sheet 1 of 1



GENERAL NOTES:

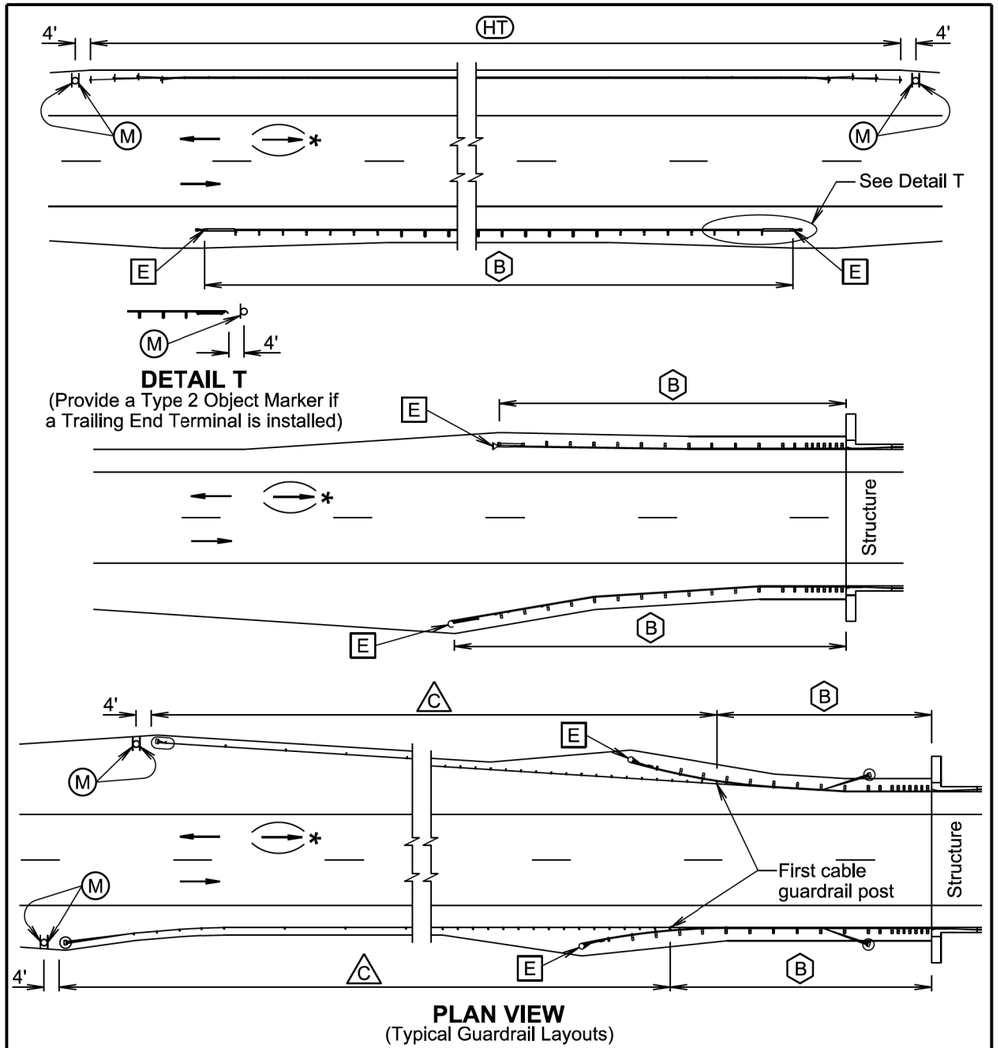
The W Beam guardrail shown is for illustrative purpose. The guardrail height for all types of guardrail systems except for high tension cable guardrail/barrier will be measured in accordance with this standard plate.

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: 2025	SDDOT	MEASURING GUARDRAIL HEIGHT	PLATE NUMBER 630.99
			Sheet 1 of 1



(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

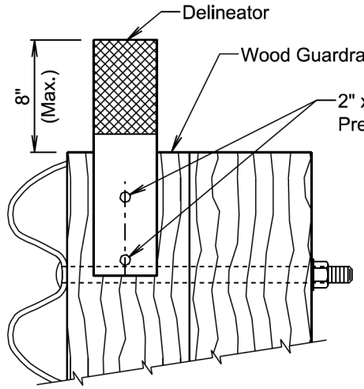
*For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.

March 31, 2024

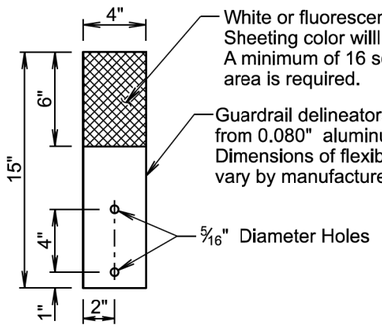
Published Date: 2025	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 1 of 4

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-CR 0905(121)236	F52	F53

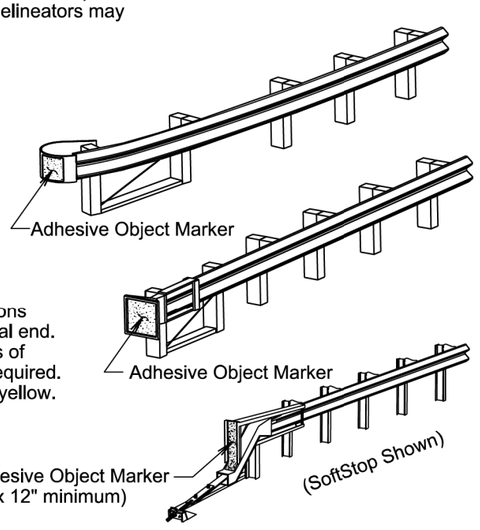
Plotting Date: 04/15/2025



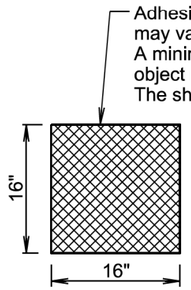
Ⓑ STEEL BEAM GUARDRAIL DELINEATION



DELINEATOR
(For Steel Beam Guardrail)



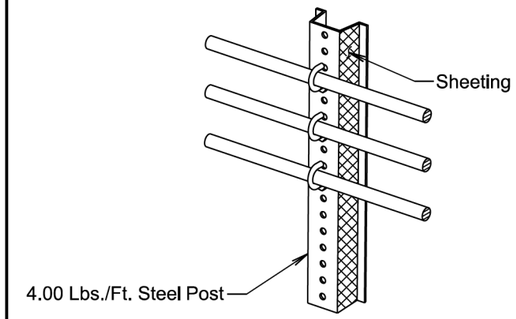
Ⓔ GUARDRAIL END TERMINAL OBJECT MARKER



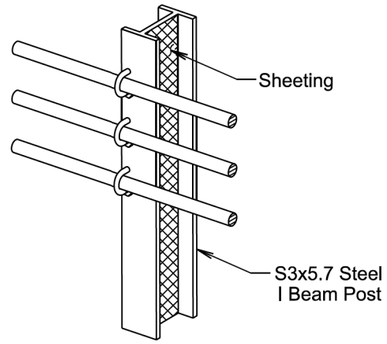
ADHESIVE OBJECT MARKER

March 31, 2024

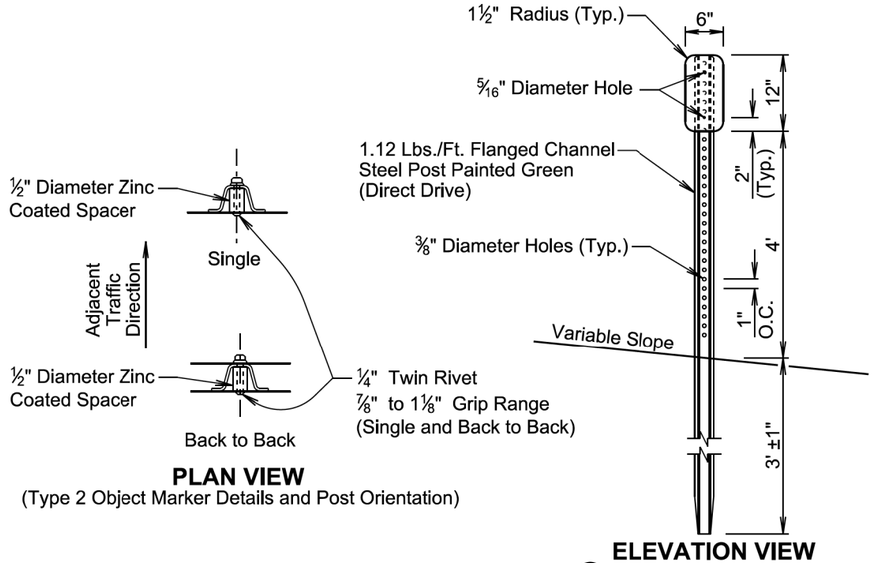
Published Date: 2025	SDDOT	DELINEATION GUARDRAIL	PLATE NUMBER 632.40
			Sheet 2 of 4



Ⓒ 3 CABLE GUARDRAIL (LOW TENSION) DELINEATION



Ⓒ 3 CABLE GUARDRAIL (LOW TENSION) DELINEATION



PLAN VIEW
(Type 2 Object Marker Details and Post Orientation)

ELEVATION VIEW
Ⓜ (Type 2 Object Marker)
(For Marking 3 Cable Guardrail (Low Tension) Anchor, High Tension Cable Guardrail Anchor, and Trailing End Terminal)

March 31, 2024

Published Date: 2025	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 3 of 4

Plot Scale - 1:200

- Plotted From - TRPR26947

File - ...\Design\Section\Std Plates.dgn

GENERAL NOTES:

The delineation of high tension cable guardrail will be reflective sheeting placed back to back on every third post cap or cable spacer. Maximum spacing of delineation will not exceed 35 feet. The sheeting will be type XI in conformance with ASTM D4956. The color of the reflective sheeting will 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 on end terminals with sufficient surface area. Other end terminals (SoftStop) will require an adhesive object marker with a minimum size of 6" x 12". 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.

March 31, 2024

Published Date: 2025	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40 Sheet 4 of 4