

STATE COUNTY MAP

JOB #4

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SC-3410(059)	22059	1	1

PEMBINA COUNTY, NORTH DAKOTA PLANS FOR FEDERAL AID PROJECT SC-3410(059)

PEMBINA COUNTY HIGHWAY 1 (CMC 3410)
MILLING, HOT MIX ASPHALT OVERLAY,
FIBER HMA ADDITIVE (OPTION 1),
SHOULDER PREPARATION & INCIDENTALS

Project is located on Pembina County Highway 1 (CMC 3410), beginning at 148th Ave NE and ending at Interstate 29

GOVERNING SPECIFICATIONS

2014 Standard Specifications adopted by the North Dakota Department of Transportation and the Supplemental Specifications effective on the date the project is advertised.

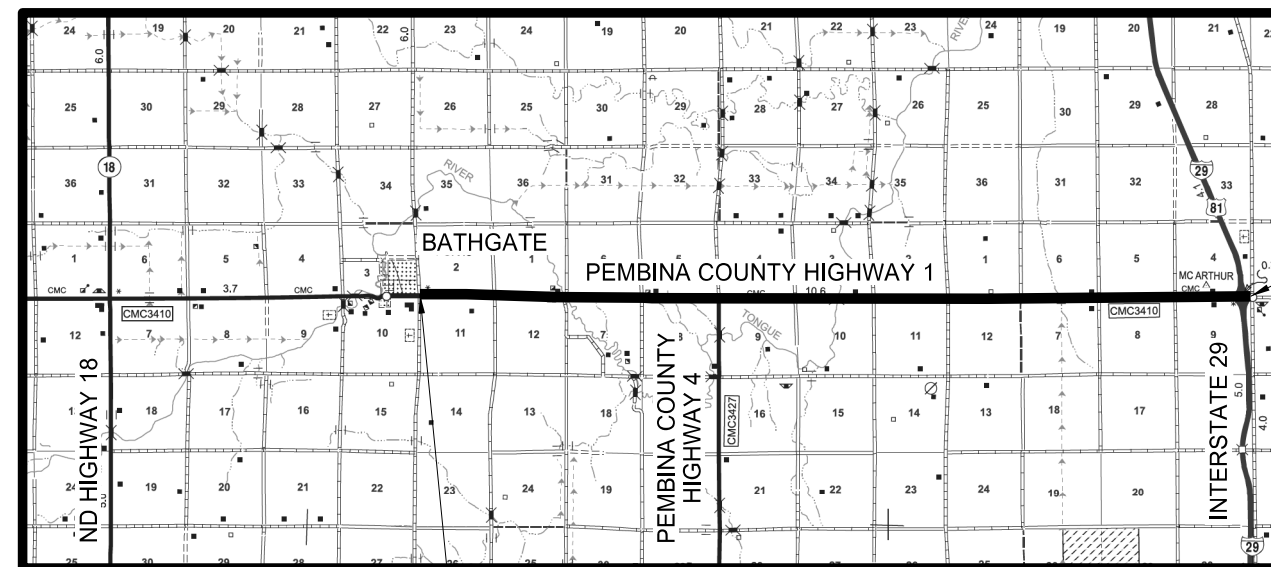
PROJECT LENGTH

	Gross Miles	Net Miles
Project ~ SC-3410(059)		
Mill, HMA Overlay, Fiber HMA Additive (Option 1), & Shoulder Preparation	10.634	10.616
Total	10.634	10.616

DESIGN DATA

Traffic SC-3410(059)		Average Daily			Est. 30th Max. Hr.
		Passenger	Trucks	Total	
Current Traffic	2017	155	25	180	18
Forecast Traffic	2037	170	30	200	20

Design Speed: 55 MPH
Minimum Sight Dist. for Stopping: 495 Feet



Twp. 163 N.
Twp. 162 N.

END PROJECT SC-3410(059)
STA 787+60 = A Point Approximately
228 Feet West of the Northeast Corner
of Sec. 9, Twp. 162 N., Rge. 51 W.

Rge. 54 W. | Rge. 53 W. | Rge. 52 W. | Rge. 51 W.

BEGIN PROJECT SC-3410(059)
STA 226+10 = A Point Approximately
43 Feet East of the Northeast Corner
of Sec. 10, Twp. 162 N., Rge. 53 W.
(East Edge of Radii/Intersection)

PS&E Correction Made August 2018
Surveyed & Designed Date July 2018

DESIGNER Ryan Sundberg, PE
DESIGNER _____
DESIGNER _____
DESIGNER _____
DESIGNER _____

This document was originally issued and sealed by Jeffrey D. Daley Registration Number PE- 7865, on 08/30/2018 and the original document is stored at the Pembina County Auditor's Office.

CERTIFICATION
I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION, AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF NORTH DAKOTA.

Jeffrey D. Daley /s/

DATE 08/30/2018 REGISTRATION NUMBER PE- 7865



864 W 12th STREET
GRAFTON, ND 58237-0229
(701) 352-1555, FAX (855) 288-8055
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PLAN SECTIONS

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30	1	Typical Sections
100	1	Traffic Control Devices List
100	2	Traffic Control Signing Layout

LIST OF STANDARD DRAWINGS

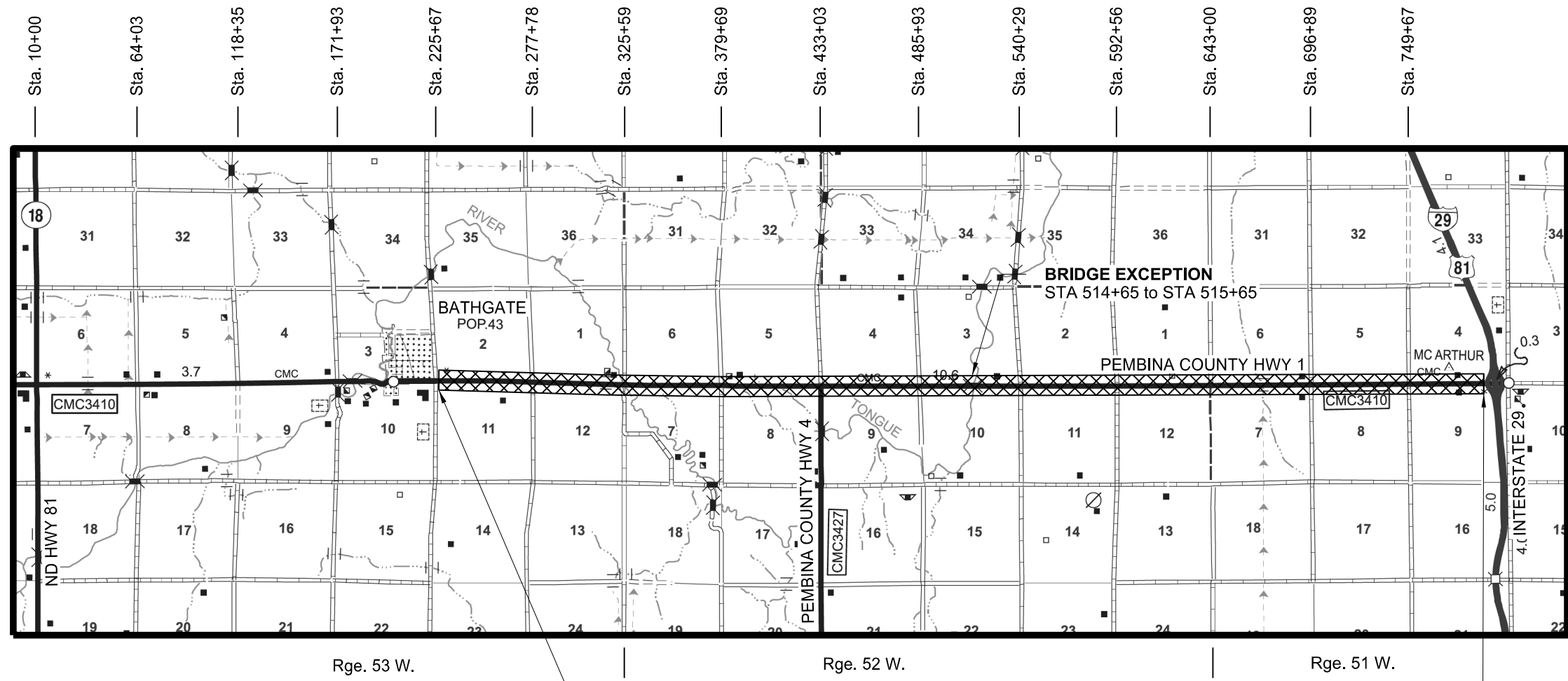
Number	Description
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SPECIAL PROVISIONS

Number	Description
SP 768(14)	Conditions of Contract Award

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 2.5" Mill, 3" Hot Mix Asphalt Overlay, Fiber HMA Additive (Option 1), Shoulder Preparation, & Incidentals



BEGIN PROJECT
 STA 226+10 = A Point Approximately
 43 Feet East of the Northeast Corner
 of Sec. 10, Twp. 162 N., Rge 53 W.
 (East Edge of Radii / Intersection)

END PROJECT SC-3410(059)
 STA 787+60 = A Point Approximately
 228 Feet West of the Northwest Corner
 of Sec. 9, Twp. 162 N., Rge 51 W.

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SC-3410(059) PEMBINA COUNTY, NORTH DAKOTA			
	SCOPE OF WORK		
	<table border="1"> <tr> <td>DRWN. BY RS</td> <td>CHKD. BY JM</td> <td>PROJECT NO. 6317113</td> </tr> </table>	DRWN. BY RS	CHKD. BY JM
DRWN. BY RS	CHKD. BY JM	PROJECT NO. 6317113	

PLAN NOTES

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100-P01 **DIMENSIONS:** Thicknesses shown on the typical sections for surfacing are approximate. It is intended that the plan tonnage provided by the basis of estimate will be used uniformly throughout the project unless otherwise authorized by the Engineer.

105-P01 **UTILITIES:** No utility relocations or adjustments are planned. All utilities on the project need to be protected and remain in existing locations.

108-P01 **CONSTRUCTION ACTIVITIES:** Conduct work activities during daylight hours only and schedule construction activities to accommodate traffic before dark. Open both lanes during non-working hours and keep one lane open during working hours.

203-P01 **COMMON EXCAVATION-SUBCUT:** The Engineer will determine the location and actual quantity of "COMMON EXCAVATION-SUBCUT" (see Subgrade Repair Detail on Section 20, Sheet 1).

Cut the existing asphalt leaving a vertical edge. Include the cost to cut a vertical edge in the price bid for "COMMON EXCAVATION-SUBCUT".

Delete the second paragraph of Standard Specification 203.04 C in its entirety.

230-P01 **SHOULDER PREPARATION:** Prior to paving, roll back existing material (earthen or aggregate) adjacent to the existing roadway asphalt shoulder (see Section 30, Sheet 1, Milling Typical Section). Material to be removed to a depth of approximately 3" below the milled surface, with the slope matching the milled roadway surface and daylight to the road inslope. Removed material will be stored on the existing roadway inslopes.

Place and compact milled material in this area, prior to paving.

Pull back the removed material from the inslope, shape and blend the material from the inslope, placing over the slough of the millings. Contractor will broadcast seed the disturbed areas with a seed mixture meeting NDDOT Standard Specifications 251.

Include all labor, material, and equipment required to perform this associated work in the bid item "SHOULDER PREPARATION".

302-P01 **AGGREGATE BASE COURSE CL 5:** The location and actual quantity of "AGGREGATE BASE COURSE CL 5" for subgrade repair will be determined in the field by the Engineer (see Subgrade Repair and Approach Details on Section 20, Sheet 1).

706 TONS of "AGGREGATE BASE COURSE CL 5" has been included in the plans for approach work, see Section 20, Sheet 1.

Millings will be allowed as a substitute for "AGGREGATE BASE COURSE CL 5" on the approaches, with a maximum particle size of 1.5". Include all labor, material, and equipment require for hauling, spreading, and compacting this material in the price bid for "AGGREGATE BASE COURSE CL 5".

411-P01 **MILLING PAVEMENT SURFACE:** Mill the existing roadway surface (See Milling Typical Section in Section 30, Sheet 1). The intent of the milling is to remove the depressed cracking by milling 2.5" across each lane, and to also correct the cross slope, achieving a minimum 2.1% cross slope. The centerline and outside edge milling depths may vary, as determined by the Engineer in the field, to achieve the minimum 2.1% cross slope.

Payment for milling is based on the top widths shown on the typical sections. Sloughs, if present, will not be measured for payment but will be incidental to the respective bid item for milling. If adjacent field drives, driveways, or section drives are paved, the Contractor will carry the milling through the approaches, as needed, to match mainline milling. This approach milling will be incidental to the bid item "MILLING PAVEMENT SURFACE", and will not be quantified for additional payment.

The approach at the Pembina County Highway 1 and Pembina County Highway 4 intersection will be milled according to the detail on Section 20, Sheet 1. The approach at Pembina County Highway 1 and Pembina County Highway 4 will be paid for as "MILLING PAVEMENT SURFACE".

The Contractor will taper the 2.5" to 3.0" over a 25' span, at the start and end of project, plus at both ends of the bridge exception.

The milled material will remain the property of the Owner, Pembina County. "MILLING PAVEMENT SURFACE" includes all labor, material and equipment required to mill, haul, and stockpile the millings at the Pembina County Shop, located in Cavalier, ND.

411-P02 **TEMPORARY ASPHALT WEDGES:** Place temporary asphalt or milled material wedges at the milled taper locations to allow for the smooth passage of vehicles. Include all costs for labor, materials, and equipment to install and remove the wedges in the unit price bid for "MILLING PAVEMENT SURFACE".

430-P01 **SUPERPAVE FAA 43:** Patch pavement surface areas showing signs of failure as per the Subgrade Repair Detail (see Section 20, Sheet 1), prior to mainline milling operations. Clean, tack and fill existing irregularities in the roadway with hot mix asphalt and compact in a separate operation. Compact the patching course with a minimum of one self-propelled pneumatic roller which meets NDDOT Standard Specification 151.01 A.3. All hot mix asphalt and asphalt cement required for the patching course will be measured and paid for by the ton of "SUPERPAVE FAA 43" and "PG 58S-34 ASPHALT CEMENT". This will be considered full payment for performing this work. The Engineer will mark all areas for patching, prior to patching work being performed.

Place the Superpave FAA 43 in two equal lifts as shown in the plans. Exercise extreme care not to mark or tear the new driving surface and keep all loaded trucks off the newly placed hot mix asphalt. Repair any damage to the newly paved surface at the Contractor's expense. RAP material is not allowed in the pavement design.

430-P02 **FIBER HMA ADDITIVE (OPTION 1):** Add an aramid fiber to the HMA mix during production. Aramid fiber will be mixed into the HMA per the manufacturers specifications. Aramid fibers must be treated to prevent them from becoming airborne during the mixing process, and the treatment must be soluble in the asphalt. Treated aramid fiber shall be continuously fed and mixed into the HMA per the dosage and mixing requirements of this specification. A certified QA/QC mixing technician shall perform continuous feeding of the treated aramid fibers into the asphalt during plant mixing operations for all of the Superpave FAA 43 quantities required for the project, and a certification report must be submitted upon project completion.

Fiber Properties	Measure
Material	Aramid Fiber (50% by weight)
Form	Filament Yarn / Monofilament
Tensile Strength	400,000 (psi)
Specific Gravity	1.44 – 1.45 (g/cm ³)
Melting Temperature	800 (°F)
Length	0.75 ± 0.05 (inch)

Provide the following information from the product supplier at least two weeks prior to asphalt production.

1. Identify the mixing plant and type (Batch or Continuous Drum).
2. Material data sheet for the aramid fiber describing aramid fiber and treatment properties, including the type, weight, and flash point of treatment material.
3. A certified QA/QC mixing plan including procedures for continuously feeding and measuring the amount of aramid fiber into the asphalt. The fiber supplier must approve the QA/QC mixing plan and provide certification of the QA/QC mixing technician at the asphalt mixing plant who is responsible for continuous feeding of the fiber into the HMA. The continuous feeding can be accomplished by using either manual or machine operated equipment for the entire fiber mixing process.

Aramid fiber must be stored in a dry environment, do not allow it to be in contact with moisture. The product dosage rate is estimated at 1.0 LBS/TON of mix. The Contractor will follow the manufacturers recommended process for mixing of the aramid fibers.

The aramid fiber will be "Ace Fiber by Surface Tech", "Forti-Fi by Forta", or an equal product, as approved by the Engineer.

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 Ryan Sundberg,
 Registration Number
 PE-10775,
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SC-3410(059)
 PEMBINA COUNTY, NORTH DAKOTA

PLAN NOTES

DRWN. BY RS	CHKD. BY JD	PROJECT NO. 6317113
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PLAN NOTES

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The final acceptance of the "FIBER HMA ADDITIVE" will include the following factors:

1. The Contractor will submit a QA/QC report which certifies the metering and continuous feeding of the aramid fiber was performed per the agreed to dosage rate in the mix design and all other requirements for this bid item by a certified technician, and that visual inspection was performed during the mixing process to certify no clumping of aramid fiber or treatment product occurred.

All costs associated with the furnishing of materials, equipment, labor, submittals, and reports will be included in the price bid for "FIBER HMA ADDITIVE".

704-P01 CONSTRUCTION SIGNING: Furnish the necessary signing as required by construction operations.

The required traffic control signs and devices are included in the "Traffic Control Devices List" and will be measured and paid at the contract unit price for each device. Payment will not be made for additional devices required to accommodate construction operations.

704-P02 TRAFFIC CONTROL FOR MILLING & BITUMINOUS PAVEMENT: Provide traffic control consisting of a temporary lane closure, flagging, and a pilot car.

Traffic control device quantities are based on the list below. Provide any additional devices at no additional cost to the Owner.

1. Standard D-704-15, layout A;
2. Standard D-704-20, layout G;
3. Standard D-704-22, layout K; and
4. Standard D-704-26, layouts EE and GG.

Place flaggers at the following intersection when the lane closure spans across it:

1. Pembina County Highway 4 / Pembina County Highway 1

762-P01 SHORT-TERM PAVEMENT MARKING: The quantity for short-term striping is based on three applications (milled surface, base course pavement lift, and wear course pavement lift).


762-P02 EDGE LINE: 6-inch white edge lines have been provided to be used throughout the project length. Continue edge lines through private drives and break for intersections.

762-050 PAVEMENT MARKING: If the Engineer and Contractor agree, plan quantity will be used as the measurement for payment for pavement marking items.

764-P01 RESET W-BEAM GUARDRAIL: The existing guardrail located at the bridge exception will need to be adjusted for height. The bid item "RESET W-BEAM GUARDRAIL" includes all equipment, labor, materials, and work required to remove, adjust, and reinstall the guardrail to the proper height. The bid item does not include the length of guardrail included on the end terminal reset. Contractor and Engineer will measure the actual height and length needed for adjustment before any work is performed. Payment will be made on actual length of guardrail reset. Contractor to follow NDDOT standards for installation of reset guardrail.

764-P02 RESET W-BEAM GUARDRAIL END TERMINAL: The existing guardrail located at the bridge exception will need to be adjusted for height. The bid item "RESET W-BEAM GUARDRAIL END TERMINAL" includes all equipment, labor, materials, and work required to remove, adjust, and reinstall the guardrail end terminals to the proper height. A terminal consists of the outermost 50' of guardrail and end cap. Contractor and Engineer will measure the actual height of end terminals needed for adjustment before any work is performed. Payment will be made on actual number of guardrail end terminals reset. Contractor to follow NDDOT standards for installation of reset guardrail end terminals.

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SC-3410(059) <small>PEMBINA COUNTY, NORTH DAKOTA</small>		
	PLAN NOTES	
DRWN. BY RS	CHKD. BY JD	PROJECT NO. 6317113

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ESTIMATE OF QUANTITIES

SPEC	CODE	DESCRIPTION	UNIT	PATCHING	MAINLINE	COUNTY HIGHWAY 4	DRIVES (38/25)*	TOTAL
103	0100	CONTRACT BOND	L SUM	-	1	-	-	1
203	0138	COMMON EXCAVATION-SUBCUT	CY	1,592	-	-	-	1,592
216	0100	WATER	M GAL	40	106	-	-	146
230	0125	SHOULDER PREPARATION	MILE	-	21,232	-	-	21,232
302	0120	AGGREGATE BASE COURSE CL 5	TON	1,996	-	10	706	2,712
401	0050	TACK COAT	GAL	382	19,969	23	391	20,765
411	0105	MILLING PAVEMENT SURFACE	SY	-	143,252	210	-	143,462
430	0043	SUPERPAVE FAA 43	TON	1,062	25,946	23	454	27,485
430	1000	CORED SAMPLE	EA	-	235	-	-	235
430	5815	PG 58S-34 ASPHALT CEMENT	TON	64	1,557	1	27	1,649
702	0100	MOBILIZATION	L SUM	-	1	-	-	1
704	0100	FLAGGING	MHR	-	1,062	-	-	1,062
704	1000	TRAFFIC CONTROL SIGNS	UNIT	-	1,202	-	-	1,202
704	1067	TUBULAR MARKERS	EA	-	180	-	-	180
704	1185	PILOT CAR	HR	-	531	-	-	531
706	0550	BITUMINOUS LABORATORY	EA	-	1	-	-	1
706	0600	CONTRACTOR'S LABORATORY	EA	-	1	-	-	1
709	0151	GEOSYNTHETIC MATERIAL TYPE R1	SY	4,777	-	-	-	4,777
762	0430	SHORT TERM 4IN LINE-TYPE NR	LF	-	47,898	-	-	47,898
762	1104	PVMT MK PAINTED 4IN LINE	LF	-	15,966	-	-	15,966
762	1106	PVMT MK PAINTED 6IN LINE	LF	-	112,300	-	-	112,300
764	1050	RESET W-BEAM GUARDRAIL	LF	-	418	-	-	418
764	1059	RESET W-BEAM GUARDRAIL END TERMINAL	EA	-	4	-	-	4

*(Section & Private Drives / Field Drives)

ESTIMATE OF QUANTITIES - OPTION 1

SPEC	CODE	DESCRIPTION	UNIT	PATCHING	MAINLINE	COUNTY HIGHWAY 4	DRIVES (38/25)*	TOTAL
430	0450	FIBER HMA ADDITIVE	LBS	1,062	25,946	23	454	27,485

SC-3410(059) PEMBINA COUNTY, NORTH DAKOTA		
		ESTIMATE OF QUANTITIES
DRAWN BY RS	CHKD. BY JD	PROJECT NO. 6317113

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BASIS OF ESTIMATE


PATCHING		MAINLINE		DRIVES			UNIT	DESCRIPTION
(10.616 MILES)		(10.616 MILES)		COUNTY	PRIVATE &	FIELD		
QUANTITY PER MILE	WIDTH	QUANTITY PER MILE	WIDTH	HIGHWAY 4	SECTION DRIVES (18/20)*	DRIVES (25)		
150	-	-	-	-	-	-	CY	Common Excavation-Subcut
188	-	-	-	10	12	10	TON	Aggregate Base Course CL 5 (1.875 TON/CY)
4	-	10	-	-	-	-	M GAL	Water (20 Gal/Ton Aggregate Base Course CL 5 & 10 M Gal per mile for Dust Palliative)
-	-	13,494	23'	210	-	-	SY	Milling Pavement Surface (2.5"; 2.5556 SY/LF)
-	-	719	24.5'	-	3	2	GAL	Tack Coat - Base Course (0.05 Gal/SY)
36	-	1,162	24.75'	-	4	3	GAL	Tack Coat - Milled Surface (0.08 Gal/SY)
-	-	1,209	24.5'	-	4	3	TON	Superpave FAA 43 - Base Course (2.0 Tons/CY)
100	-	1,235	24'	23	4	3	TON	Superpave FAA 43 - Wearing Course (2.0 Tons/CY)
6	-	147	-	1	0.5	0.5	GAL	PG 58S-34 (6.0%)
-	-	2 Cores/2000'/Lane/Lift Plus 1 Full Depth/Mile	-	-	-	-	EA	Cored Sample
-	-	100	-	-	-	-	MHR	Flagging
-	-	50	-	-	-	-	HR	Pilot Car
450	-	-	-	-	-	-	SY	Geosynthetic Material Type R1

* Private Drives / Section Drives

BASIS OF ESTIMATE - OPTION 1

PATCHING		MAINLINE		DRIVES			UNIT	DESCRIPTION
(10.616 MILES)		(10.616 MILES)		COUNTY	PRIVATE &	FIELD		
QUANTITY PER MILE	WIDTH	QUANTITY PER MILE	WIDTH	HIGHWAY 4	SECTION DRIVES (18/20)*	DRIVES (25)		
100	-	2,444	-	23	304	150	LBS	Fiber HMA Additive (Aramid Fiber Product @ 1.0 LBS/TON)

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SC-3410(059) PEMBINA COUNTY, NORTH DAKOTA		
		
BASIS OF ESTIMATE		
<small>DRAWN BY</small> RS	<small>CHECKED BY</small> JD	<small>PROJECT NO.</small> 6317113

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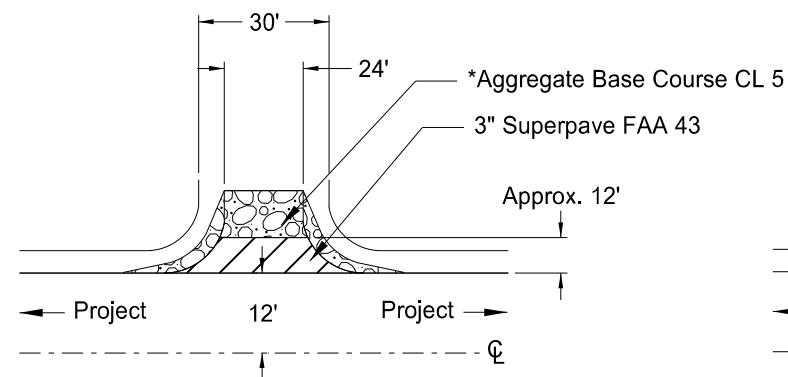
PAVEMENT MARKINGS

DESCRIPTION	UNIT	QUANTITY PER LOCATION
4" Yellow No Passing Zone (Solid Line)		
Sta. 509+26 to Sta. 515+63	RT LF	637
Sta. 514+58 to Sta. 519+97	LT LF	539
Sta. 783+47 to Sta. 791+09	RT LF	762
Sta. 787+38 to Sta. 787+60	LT LF	22
Subtotal (Yellow)	LF	1,960
4" Yellow Center Lines (10' Line, 30' Skip)		
Sta. 226+10 to Sta. 514+58	LF	7,212
Sta. 515+63 to Sta. 787+38	LF	6,794
Subtotal (Yellow)	LF	14,006
Total (Yellow)	LF	15,966
6" White Edge Lines (Solid Line)		
Sta. 226+10 to Sta. 787+60	LT & RT LF	112,300
Total (White)	LF	112,300
Total Pavement Marking Paint	LF	128,266

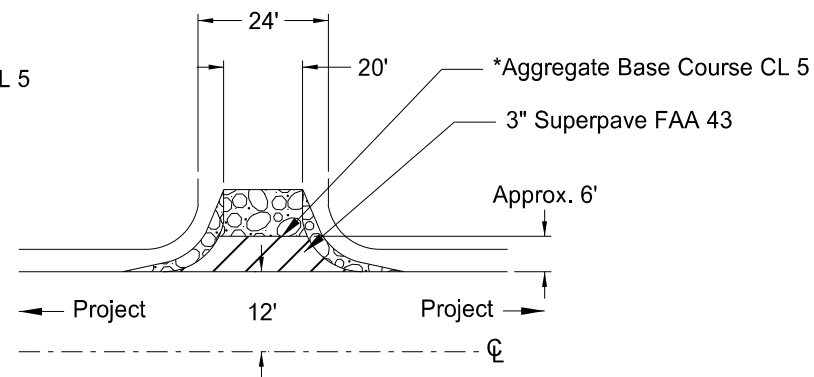
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SC-3410(059) PEMBINA COUNTY, NORTH DAKOTA		
	PAVEMENT MARKINGS	
	<small>DRAWN BY</small> RS	<small>CHECKED BY</small> JD

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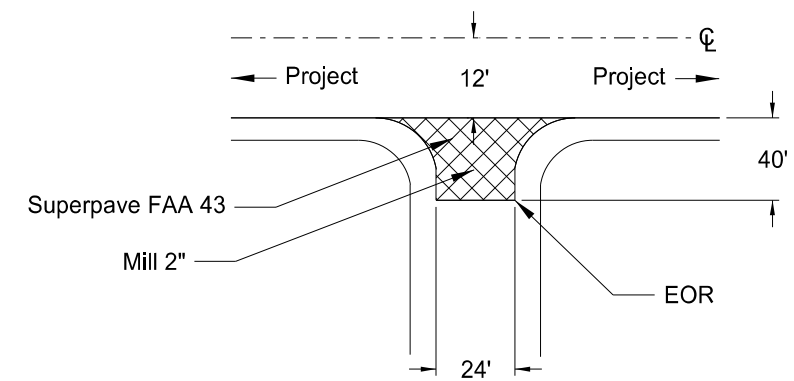


PRIVATE AND SECTION DRIVES



FIELD DRIVES

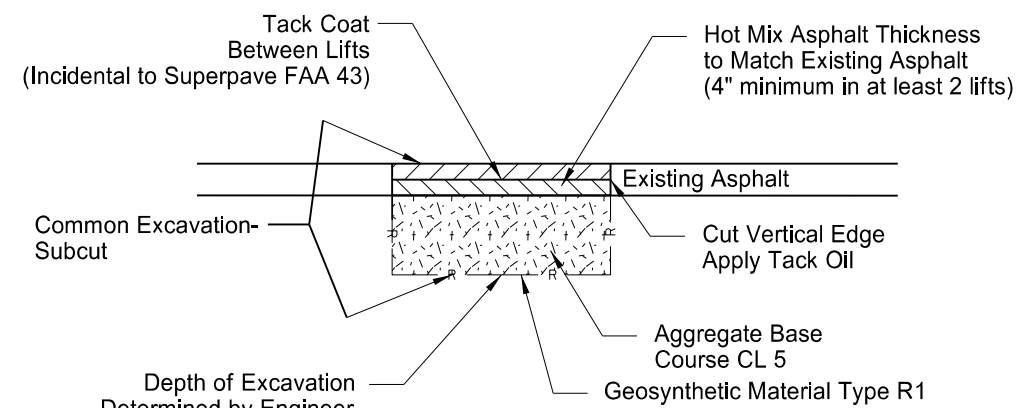
- * Aggregate Base Course CL 5 has been provided to fill in around the drives. This material will be required when sloughs are steeper than 4:1.
- ** Contractor may elect to use the roadway millings in place of the Aggregate Base Course CL 5, See Plan Note 411-P01.



PEMBINA COUNTY HIGHWAY 4

210 SY of "MILLING PAVEMENT SURFACE" has been provided for milling this approach.

23 TON of "SUPERPAVE FAA 43" has been provided for paving this approach.



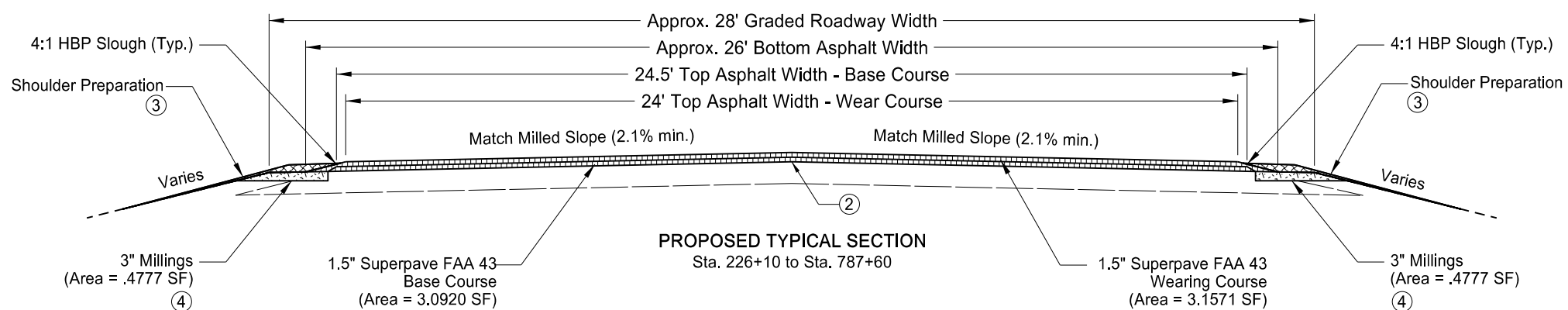
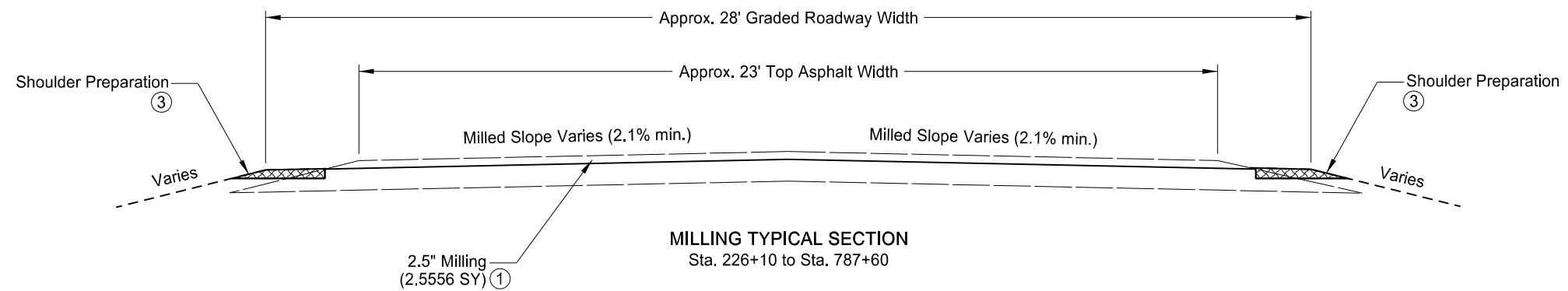
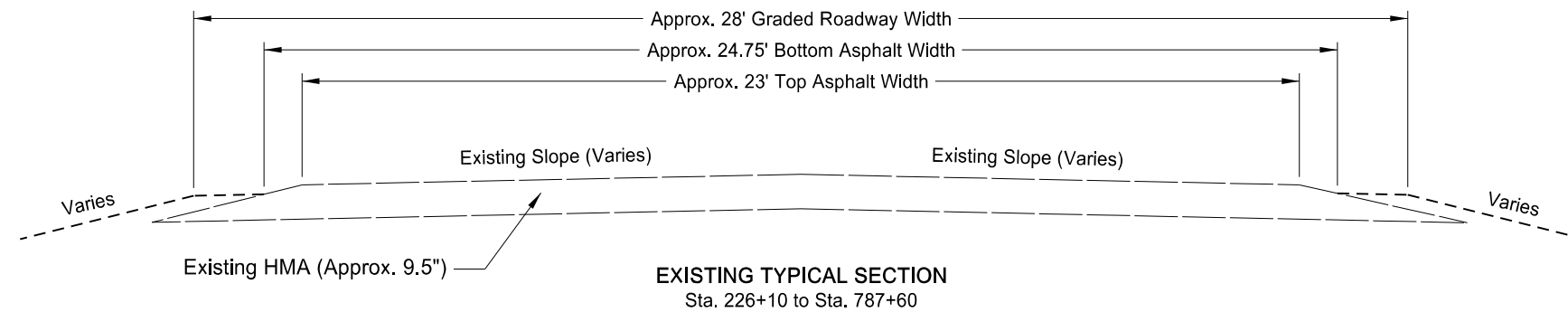
SUBGRADE REPAIR

- 1) Subgrade Repair at depths of 1 foot or greater shall be excavated to the full width of the lane and tapered at a ratio of 20:1 on the ends.
- 2) Geosynthetic Material Type R1 may be eliminated in the field by the Engineer.
- 3) Subgrade Repair operation to be performed before milling operation.

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SC-3410(059) PEMBINA COUNTY, NORTH DAKOTA		
	SUBGRADE REPAIR & APPROACH DETAILS	
	DRWN. BY RS	CHKD. BY JD
		PROJECT NO. 6317113

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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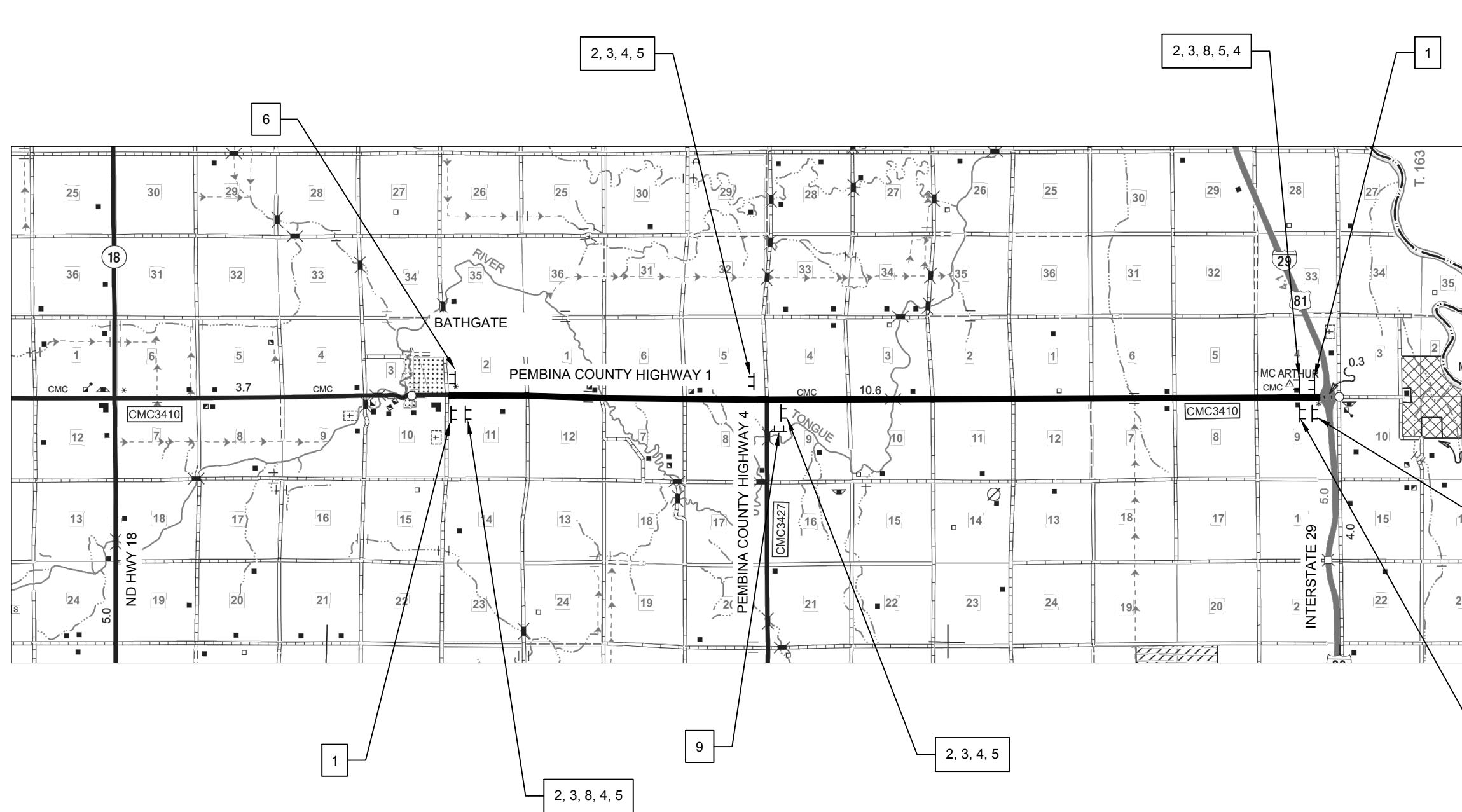


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- ① See plan note 411-P01 on Section 6, Sheet 1.
- ② Place base course \varnothing seam offset 6" from actual \varnothing
- ③ See plan note 230-P01 on Section 6, Sheet 1 for Shoulder Preparation information.
- ④ 3" fill material used (Millings) is included in the price bid for Shoulder Preparation. Area shown is approximate and could vary based on Contractor operations for Shoulder Preparation.

SC-3410(059) PEMBINA COUNTY, NORTH DAKOTA		
		TYPICAL SECTIONS
DRWN. BY RS	CHKD. BY JD	PROJECT NO. 6317117

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-3410(059)	100	2



- 1 W20-1-48 Post Mounted
- 2 G20-1-60 Post Mounted
- 3 R4-1-48 Post Mounted
- 4 R2-1-48/ R2-1a-24 (45 MPH) Post Mounted
- 5 W22-8-48/ W20-52-54 Post Mounted
- 6 G20-2-48 Post Mounted
- 7 R2-1-48 (55 MPH) Post Mounted
- 8 W3-5-48 (45 MPH) Post Mounted
- 9 G20-50a-72 Post Mounted

Existing speed limit signs within a reduced speed zone shall be covered. This work shall be incidental to other traffic control items.



This document was originally issued and sealed by Ryan Sundberg, Registration Number PE-10775, on 08/30/18 and the original document is stored at the Pembina County Auditor's Office.

SC-3410(059) PEMBINA COUNTY, NORTH DAKOTA		
	TRAFFIC CONTROL SIGNING LAYOUT	
	<small>DRWN. BY</small> RS	<small>CHKD BY</small> JD

The sign layout shown is for general information purposes only. The Contractor will be required to conform to the MUTCD and the Standard Drawings when installing the traffic control signing.