

Project No.

PCN

N Jct. of 15 to N of Sheyenne



Prepared by

**NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
BISMARCK, NORTH DAKOTA**

<http://www.dot.nd.gov/>

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SCOPING REPORT

Report Completed By: Jared Loegering

A. GENERAL INFORMATION

Project Number:

District: Devils Lake

Location: N Jct. of 15 to N of Sheyenne

Reference Point: RP 128.300 -139.161-10.861 miles

Counties: Eddy

Legal Description: T149N, R66W, Sec 33 to T150N, R66W, Sec 9

Functional and Funding Roadway Classification: Interregional Corridor

National Highway System: Yes

Project Schedule: Proposed to be added to the STIP for a 2020 Major Rehabilitation

dTIMS Recommendations: Constrained: PM 2020 Unconstrained: PM 2019

B. PURPOSE, NEED, AND IMPROVEMENT

Purpose and Need of Project:

The IRI score is in the good to excellent range. The distress score is in the good range. There are longitudinal and transverse cracks on the roadway along with alligator cracking.

Proposed Improvements:

A Major Rehabilitation Full Depth Reclamation with widening is proposed to extend the service life and provide operational improvements to the roadway. The safety items that will be addressed are safety hardware that does not meet NCHRP 350 standards or better and safety items within the 20' clear zone. A 90-1 survey will also be completed and areas needing safety improvements will be addressed. There is an exception area for the widening from RP 128.30 to 128.504. This was reconstructed in 2014 as part of project No. SNH-3-281(109)128, PCN 18881. No work is proposed through this exception area.

A decision item is included to widen the roadway to 40 feet to allow for 8 foot shoulders. This option would go beyond the design guideline requirements. This option is proposed because traffic is forecasted to continue to increase and to keep roadway width continuity with the surrounding corridor. 8 foot shoulders would also allow trucks the ability to pull off the roadway.

Sheyenne City Section:

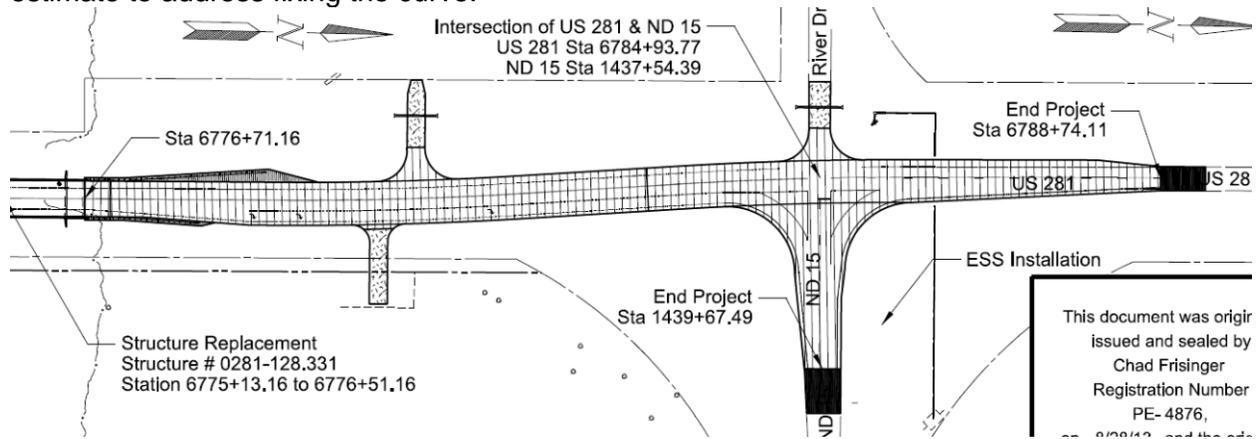
Two options are provided for the curb and gutter section through Sheyenne. The first option is a mill and overlay. The second option is reconstruction and replacing the curb and gutter and sidewalk.

Turning Lanes:

The district has requested that a right and left turning lane be constructed on US 281 at approximately RP 134.7 at 25th St. NE. The traffic operations section will complete a study to find if the requested turning lanes and any additional turning lanes are warranted along the roadway. A decision item is included to address the districted requested turning lanes and a cost is included in the estimate.

Horizontal Curve:

The district would like the curve at the intersection of ND 15 and US 281 be investigated and re-aligned. When this intersection was reconstructed in 2014 as part of project No. SNH-3-281(109)128, PCN 18881, the horizontal curve was moved from approximately 0.4 miles south of the intersection to approximately 0.15 miles south. The district has taken public complaints and concerns about the curve's proximity to the intersection, and the district agrees. When ND 15 traffic is stopped at the intersection they are directly in line with north bound US 281 traffic before the curve and go around them. The district, as well as the public, feels that this situation lends itself to unnecessary dangers. A cost estimate and decision item is included in the estimate to address fixing the curve.



Rockford Canal Bridge:

The district has requested that the structure over the Rockford Canal at RP 131.01 be replaced with a pipe or pipes. The Bureau of Reclamation and the Garrison Diversion District have drainage issues in this vicinity and are working on plans to breach the canal. If this is completed the canal will have a pipe installed. The topography is also such that the guardrail requires two district sections to monitor and remove snow from it during the winter. A cost estimate and decision item is included to address the structure.

C. TRAFFIC AND CRASH ANALYSIS

Traffic:

RP 128.30 to 128.504

	Year	Truck AADT	Total AADT	Flexible ESALs
Current Traffic	2014	395	1,940	340
Forecast Traffic	2034	590	2,680	505

RP 128.504 to 139.161

	Year	Truck AADT	Total AADT	Flexible ESALs
Current Traffic	2014	345	1,410	295
Forecast Traffic	2034	515	1,955	440

Speed Limit:

From RP	To RP	Speed Limit

From RP	To RP	Speed Limit
128.300	128.341	50 mph
128.341	138.344	65 mph
138.344	138.535	45 mph
138.535	138.975	25 mph
138.975	139.161	45 mph

Crash Analysis:

There were a total of 21 crashes from 11/1/2009 to 10/31/2014. Animal crashes were not included. The crash rate per 1 million vehicles is 0.7421.

- 6 of 10 single vehicle crashes were ran off roadway crashes and 5 of 6 were due to ice/snow road conditions

No other trends were identified and no recommendations at this time.

D. EXISTING ROADWAY CHARACTERISTICS

	International Roughness Index (IRI)	Distress Score	Rut
Excellent	< =60	≥ 98	< 0.25"
Good	61 – 99	88 – 97	0.25" to 0.375"
Fair	100 – 145	77 – 87	0.376" to 0.50"
Poor	> 145	≤ 76	> 0.50"

Segment 1, RP 128.300 to 128.504

Actual Age	IRI	IRI Rating	SI or SCI	Faulting
1	N/A	N/A	N/A	N/A
Effective Age	Distress	Distress Score	Rutting	Rutting Score
1	N/A	N/A	N/A	N/A

CONSTRUCTION HISTORY				
Year	Construction	Depth (in)	Width (ft)	Oil
2014	GRADE		57.0	
2014	AGGREGATE BASE	18.0	46.0	
2014	HBP-SUPERPAVE-FAA 45	3.5	8.0-24.0-8.0	PG 58-28
2014	HBP-SUPERPAVE-FAA 45	2.0	8.0-24.0-8.0	PG 64-34

Segment 2, RP 128.504 to 133.627

Actual Age	IRI	IRI Rating	SI or SCI	Faulting
18	56	Excellent	0	N/A
Effective Age	Distress	Distress Score	Rutting	Rutting Score
15	88	Good	0.16	Excellent

CONSTRUCTION HISTORY				
Year	Construction	Depth (in)	Width (ft)	Oil
1940	GRADE	-	36.0	-
1940	TRAFFIC SERVICE GRAVE	1.0	34.0	-
1940	STABILIZED BASE	4.0	32.0	-
1940	COLD BITUMINOUS PAVEM	1.5	22.0	SC-4

CONSTRUCTION HISTORY				
Year	Construction	Depth (in)	Width (ft)	Oil
1954	HOT BIT PAVEMENT	1.0	30.0	120-150
1954	HOT BIT PAVEMENT	2.0	24.0	120-150
1985	HOT BIT PAVEMENT	2.0	28.0	85-100
1988	CONTRACT CHIP SEAL	-	28.0	HFMS-2
1997	HOT BIT PAVEMENT	1.5	28.0	120-150
2000	DISTRICT CHIP SEAL	-	24.0	MC-3000
2010	HOT BIT PAVEMENT	2.0	28.0	PG 58-28
2014	SLURRY SEAL	-	25.0	-

Segment 3, RP 133.627 to 138.504

Actual Age	IRI	IRI Rating	SI or SCI	Faulting
22	52	Excellent	0	N/A
Effective Age	Distress	Distress Score	Rutting	Rutting Score
15	91	Good	0.17	Excellent

CONSTRUCTION HISTORY				
Year	Construction	Depth (in)	Width (ft)	Oil
1984	GRADE	-	44.0	-
1984	TRAFFIC SERVICE GRAVE	2.0	42.0	-
1985	AGGREGATE BASE	6.0	42.0	-
1985	RECYCLED HOT BIT PAVM	2.0	28.0	200-300
1985	HOT BIT PAVEMENT	2.0	28.0	85-100
1985	AGGREGATE BASE	3.0	5.0-0.0-5.0	-
1988	CONTRACT CHIP SEAL	-	28.0	HFMS-2
1993	HOT BIT PAVEMENT	3.0	24.0	120-150
2000	DISTRICT CHIP SEAL	-	26.0	MC-3000
2010	HOT BIT PAVEMENT	2.0	27.0	PG 58-28
2014	SLURRY SEAL	-	25.0	-

Segment 4, RP 138.504 to 138.958

Actual Age	IRI	IRI Rating	SI or SCI	Faulting
22	N/A	N/A	N/A	N/A
Effective Age	Distress	Distress Score	Rutting	Rutting Score
15	N/A	N/A	N/A	N/A

CONSTRUCTION HISTORY				
Year	Construction	Depth (in)	Width (ft)	Oil
1940	CURB & GUTTER FACE-FA	-	36.0	-
1940	STABILIZED BASE	4.0	35.0	-
1940	COLD BITUMINOUS PAVEM	1.5	32.0	SC-4
1954	HOT BIT PAVEMENT	2.0	34.0	120-150
1985	HOT BIT PAVEMENT	2.0	34.0	85-100
1988	CONTRACT CHIP SEAL	-	34.0	HFMS-2
1993	HOT BIT PAVEMENT	3.0	24.0	120-150
2000	DISTRICT CHIP SEAL	-	24.0	MC-3000
2010	HOT BIT PAVEMENT	2.0	27.0	PG 58-28
2014	MICROSURFACING	-	34.0	-

Segment 5, RP 138.958 to 139.161

Actual Age	IRI	IRI Rating	SI or SCI	Faulting
22	57	Excellent	0	N/A
Effective Age	Distress	Distress Score	Rutting	Rutting Score
15	94	Good	0.16	Excellent

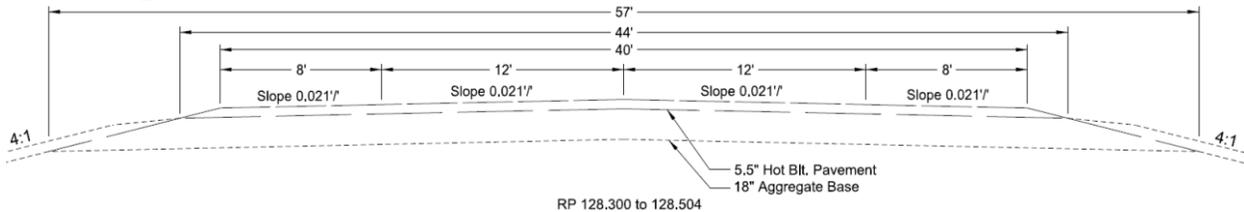
CONSTRUCTION HISTORY				
Year	Construction	Depth (in)	Width (ft)	Oil
1984	GRADE	-	44.0	-
1984	TRAFFIC SERVICE GRAVE	2.0	42.0	-
1985	AGGREGATE BASE	6.0	42.0	-
1985	RECYCLED HOT BIT PAVM	2.0	28.0	200-300
1985	HOT BIT PAVEMENT	2.0	28.0	85-100
1985	AGGREGATE BASE	3.0	5.0-0.0-5.0	-
1988	CONTRACT CHIP SEAL	-	28.0	HFMS-2
1993	HOT BIT PAVEMENT	3.0	24.0	120-150
2001	DISTRICT CHIP SEAL	-	24.0	MC-3000
2010	HOT BIT PAVEMENT	2.0	27.0	PG 58-28
2014	MICROSURFACING	-	25.0	-

Existing Foreslopes:

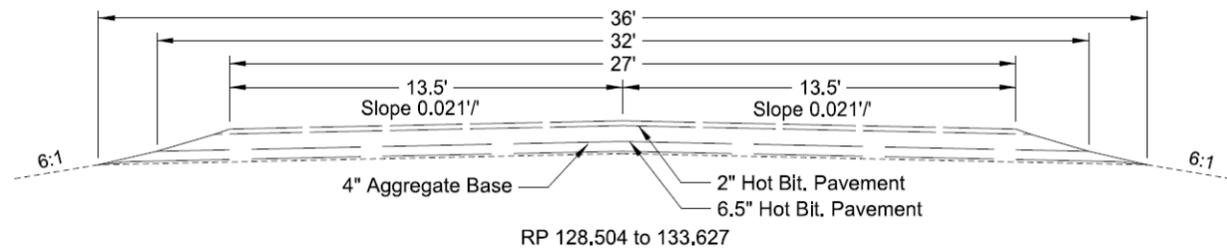
RP 128.300 to 128.504: 4:1, RP 128.504 to 139.161: 6:1

Existing Typical Sections:

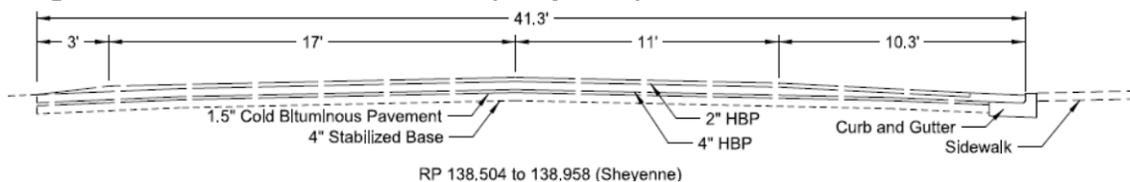
Segment 1, RP 128.300 to 128.504



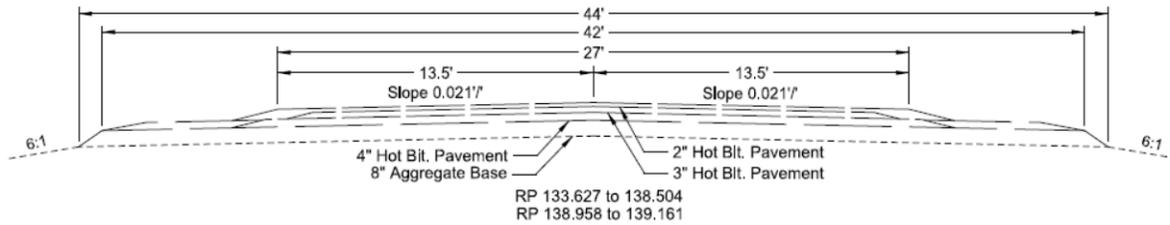
Segment 2, RP 128.504 to 133.627



Segment 4, RP 138.504 to 138.958 (Sheyenne)



Segment 3 and 5, RP 133.627 to 138.504 and RP 138.958 to 139.161



E. EXISTING GEOMETRY

Horizontal Curves:

Use existing, sign when less than posted speed. Using a design speed of 65mph, all of the superelevations need to be addressed.

Location	Radius (ft)		Superelevation (%)	
	Existing	Required	Existing	Required
RP 133.698	4939	1657	3.1	3.3
RP 134.529	4939	1657	3.1	3.3
RP 135.253	1736	1657	5.7	5.9
RP 135.592	1736	1657	5.7	5.9
RP 136.497	3604	1657	3.5	4.2
RP 136.744	3604	1657	3.5	4.2

Vertical Curves: The vertical curves were checked and none of the vertical curves need to be addressed.

F. EXISTING STRUCTURES

Structures:

Bridge No.	Description	Feature	Length (ft)	Width (ft)	Rating
0281-128.331	New Rockford North	James River	138	40	93.1
Recommended Improvement: New bridge built in 2014. Do Nothing.					
0281-131.010	2 North of New Rockford	N Rockford Canal NR2-9	94	40	94.4
Recommended Improvement: Barrier End Modification & Joint Repair. Estimated Cost: \$30,000 No recommendation for the removal and replacement of the canal with a pipe or pipes.					
0281-138.102	Single, 8X8X117' RCB	Creek	8	-	85.9
Recommended Improvement: Do Nothing					

Centerline Pipes:

There are 27 centerline pipes on the project, three 15" RCP, six 18" RCP, four 21" RCP, ten 24" RCP, one 27" RCP, two 30" RCP, and one 36" RCP. It is assumed that all the centerline pipes will need to be extended to accommodate the clear zone requirements and roadway widening. The district has also noted that the existing end sections need to be tied as the road is widened. A cost is included in the estimate to address the centerline pipe work.

G. LAND INTERESTS

Communities:

Corporate Limits of New Rockford, RP 127.49 to 128.504, Population 1,380

Corporate Limits of Sheyenne, RP 138.508 to 138.970, Population 200

Reservation:

None

Surface Trust Lands:

RP 135.971 to RP 136.481, T150N, R66W, Sec 22

Refuge:

None

Adjacent Land Usage:

Agricultural, Residential and Commercial

H. ISSUES AND APPURTENANCES CHECKLIST

1. Curb and Gutter? Yes No
There is curb and gutter in the town of Sheyenne. If the mill and overlay option is selected through Sheyenne only the damaged curb and gutter will be replaced. If the reconstruction is selected through Sheyenne, all curb will be replaced.
2. Sidewalk? Yes No
There is a sidewalk in the town of Sheyenne.
If reconstruction is selected through Sheyenne the sidewalk will be replaced. Multiple buildings have awnings that hang over the sidewalk and have posts placed into the sidewalk.
3. Multi-Use Path? Yes No
4. ADA Ramps? Yes No
There are existing ADA ramps in the town of Sheyenne.
5. Detectable Warning Panels? Yes No
There are existing detectable warning panels in the town of Sheyenne.
6. Lighting? Yes No
There is lighting in the town of Sheyenne. No suggested improvements.
7. Signals? Yes No
8. Storm Sewer? Yes No
9. Manholes? Yes No
10. Other Underground Work? Yes No
11. Parking Facilities? Yes No
12. Frontage Roads? Yes No
13. Utility Issues? Yes No
Possible utility issues due to widening.
14. Landscaping? Yes No
15. Approach or Ditch Block Flattening? Yes No
All steep approaches are to be addressed under the Major Rehab Strategy.

16. T Intersection Recovery Approaches? Yes No
17. Fence? Yes No
18. Railroad Crossings? Yes No
19. Detours? Yes No
20. Automatic Traffic Recorder Locations? Yes No
21. Weigh-In-Motion Sites? Yes No
22. ITS (Deicing, Snow Gates, VMS, RWIS, etc.)? Yes No
There is an existing camera site at RP 128.5. No Suggested improvements.
23. Highway Patrol/Truck Pullouts or Rest Areas? Yes No
24. Additional Right of Way? Yes No
Additional right of way may be needed to accommodate the widening on the project. There also may be some right of way issues near some homes at approximately RP 132.0 where the right of way may infringe on homeowners lawns and some fences and trees may need to be removed.
25. Drainage Issues? Yes No
26. Snow Impact Areas? Yes No
27. Subgrade Issues? Yes No
28. Noise Analysis: Type I Project? Yes No Maybe
29. Maintenance Issues? Yes No
30. Guard Rail? Yes No

RP	L/R	Length (ft)	Suggested Improvement
128.2724	R	223	No Improvements at this time.
128.2865	L	149	No Improvements at this time.
128.3147	L	75	No Improvements at this time.
128.3147	R	75	No Improvements at this time.
128.3289	L	223	No Improvements at this time.
128.3289	R	149	No Improvements at this time.

31. Riprap? Yes No
At RP 134.2 water is near the roadway and will need riprap. A cost is included in the estimate to address the riprap.
32. Milling? Yes No
Milling will be required if the mill and overlay option is selected through Sheyenne.

33. Local Road Safety Program? Yes X No _____
 The LRSP recommends signing and striping upgrades at the Intersection of US 281 and 28th St NE (Eddy7). The LRSP recommends upgrading Stop Sign, Junction Sign, Stop Ahead Sign, and the Stop Bar. These recommendations will be addressed through the HSIP process.

I. Load Restrictions

Travel Information Map Proposed Load Restriction: Legal weight
HPCS Load Restriction: Legal weight
Projected load restrictions after project is completed: Legal weight

J. Roadway Widths

Required minimum Roadway Width: 36'

Surrounding Corridor Roadway Widths:

US 281 (North and South of Project):

North and South of project: Project is planned to widen out to 36' or 40'.

ND 15 (East of Project): 24'

K. PERFORMANCE GUIDELINES

Design Speed: 25, 45, 50, and 65 mph

Clear Zone (from edge of driving lane): 20' for areas under 2000 AADT, AASHTO for areas over 2000 AADT

Ride/Distress Goal: Excellent

Operational Reliability: Highly Reliable

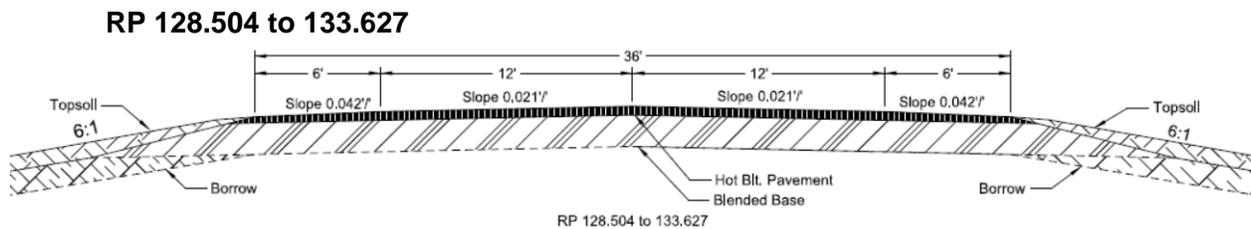
Foreslope: 4:1

L. PROPOSED IMPROVEMENTS

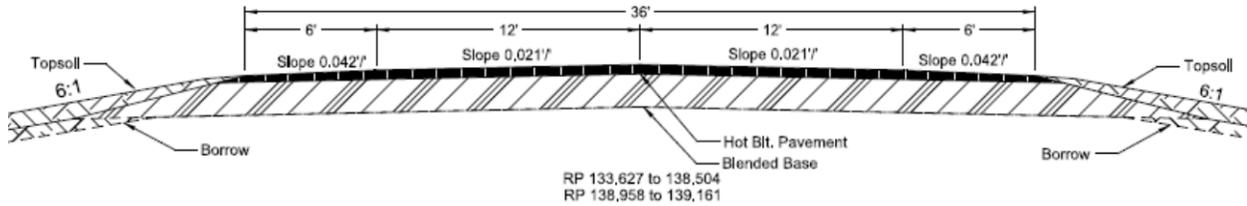
A Major Rehabilitation Full Depth Reclamation with widening is proposed. The safety items that will be addressed are safety hardware that does not meet NCHRP 350 standards or better and safety items within the 20' clear zone. A 90-1 survey will also be completed and areas needing safety improvements will be addressed.

Proposed Typical Sections:

Option 1: 36' Wide Roadway

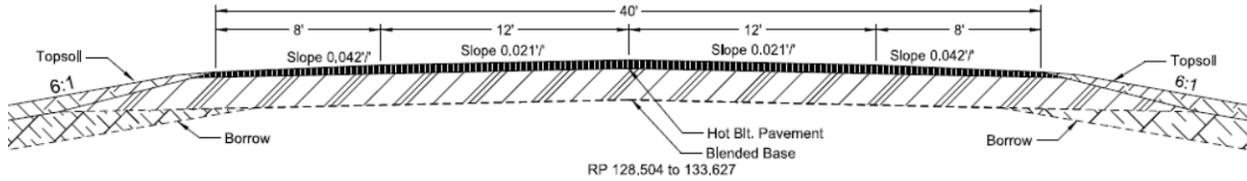


RP 133.627 to 138.504 and RP 138.958 to 139.161

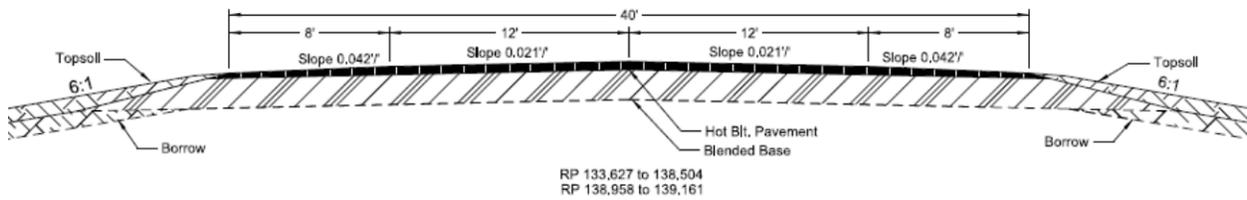


Option 2: 40' Wide Roadway

RP 128.504 to 133.627

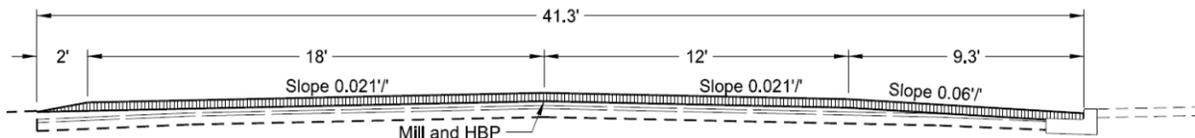


RP 133.627 to 138.504 and RP 138.958 to 139.161

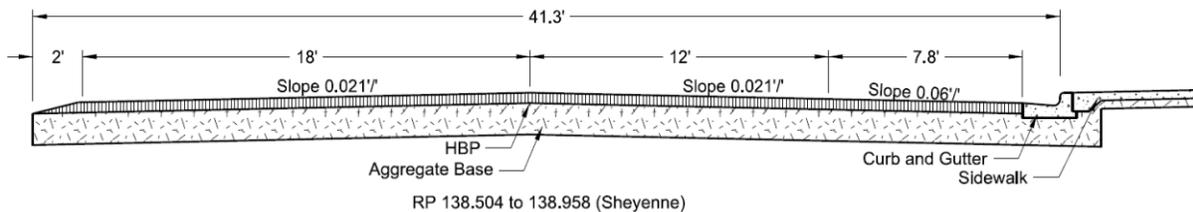


Sheyenne City Section: RP 138.504 to 138.958

Option 1: Mill and Overlay: This option would require the replacement of damaged curb and gutter and sidewalk.



Option 2: Reconstruction: This option would replace all curb and gutter and sidewalk.



Turning Lanes:

The district has requested that a right and left turning lane be constructed on US 281 at approximately RP 134.7 at 25th St. NE. A decision item is included to address the districted requested turning lanes and a cost is included in the estimate.

Horizontal Curve:

The district would like the curve at the intersection of ND 15 and US 281 be investigated and re-aligned. A cost estimate and decision item is included in the estimate to address the curve.

Rockford Canal Bridge:

The district has requested that the structure over the Rockford Canal at RP 131.01 be replaced with a pipe or pipes. A cost estimate and decision item is included to address the structure.

M. ADDITIONAL COMMENTS

District Engineer:

Need to look at any option through Sheyenne to repair road and provide ADA requirements. The canal structure would be an opportunity if they breach the canal ahead of this project, to remove a structure and reduce maintenance costs and an issue during winter.

Decision 1: Yes

Decision 2: Option 2

Decision 3: Check Items 1, 2, 3 and 4.

Safety Division Director: No comments.

N. COST ESTIMATE

(Inflation factor of 4% was used to estimate costs for bid year 2020)

ITEM	ESTIMATED COST
Contract Bond	\$74,000
Mobilization	\$396,000
Hot Bit Pavement (5" HBP, Includes AC, Tack, Prime and cores)	\$4,843,000
Field Lab and Office	\$20,000
Traffic Control	\$150,000
Pavement Markings and Rumble Strips	\$54,000
Borrow and Water	\$1,157,000
Aggregate Base	\$1,765,000
Seeding, Mulching, and Erosion Control	\$225,000
Topsoil	\$523,000
Mine and Blend	\$548,000
Riprap	\$129,000
Centerline Pipe Extensions	\$150,000
Subtotal	\$10,034,000
20% Engineering	\$2,007,000
Construction and CE Total Cost	\$12,041,000
Decision Items (All items include 20% engineering)	
Decision 2: Sheyenne	
Mill and Overlay	\$320,000
Reconstruction	\$620,000
Decision 3:	
Item 1: Widen Roadway to 8-foot shoulders	\$1,523,000
Item 2: Re-align Horizontal Curve	\$500,000
Item 3: Replace Rockford Canal Structure	\$350,000
Construction and CE Total Cost Including Decision Items	\$15,034,000

O. DECISIONS

1. Should this project advance as a major rehabilitation widening, Full Depth Reclamation, with an HBP overlay for an estimated cost of **\$12,041,000**?

Yes No

2. Which Options should advance for the Sheyenne City section?

Option 1: Mill and Overlay. **Estimated cost \$320,000**

Option 2: Reconstruction. **Estimated cost \$620,000**

Option 3: Advance none.

3. Which items should be chosen for this project?

Item 1: Widen Roadway to 8 foot shoulders (40 foot Roadway Top)

Estimated cost \$1,523,000

* Item 2: Re-align horizontal curve. **Estimated cost \$500,000**

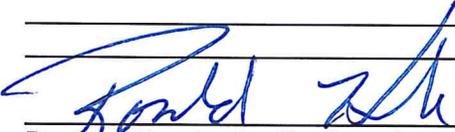
* Item 3: Replace Rockford Canal structure with pipe. **Estimated cost \$350,000**

* Item 4: Install district requested left and right turn lanes if they are found to be NOT warranted (assumed all warranted turn lanes will be installed).

Item 5: Advance all items to the Environmental Document as decision items.

Item 6: Advance none.

* DDE Comments: Bring Forth to PCR with discussion and study


Deputy Director for Engineering

5/3/15
Date