Approved Scope

FROM: Brian Rogness

Date: 7/18/2023

Re:

P-B-PT 0028(48)346 Hamlin **PCN 06NG**
SD28 - Fm 458th Ave East of Lake Poinsett to 5.2 miles W of Estelline
Grading, Structures & Interim Surfacing

CC:

Dan Martell - Aberdeen Region
Mark Peterson - Aberdeen Region
Jeff Senst - Aberdeen Region
Earl Berg - Administration
Joanne Hight - Administration
Dave Madden - Bridge Design
Todd Thompson - Bridge Design
Travor Diegel - Materials & Surfacing
Tanner Fitzke - Materials & Surfacing
Scott Rabern - Materials & Surfacing
Phillip Clements - Project Development
Mark Malone - Project Development
Andy Vandel - Project Development
Levi Briggs - Roadway Design
John Less - Roadway Design
Kelly VanDeWiele - Roadway Design
Matt Brey - Watertown Area
Josh Olson - Aberdeen Region
Scott L Schneider - Aberdeen Region
Jeff Steen - Aberdeen Region
Bridget Carnahan - Administration
Steve Johnson - Bridge Design
Kevin Marton - Bridge Design
Kathryn Johnson - Engineering/Planning
Joe Feller - Materials & Surfacing
Kevin Griese - Materials & Surfacing
Mark Reiss - Planning & Programs
Mark Leiferman - Project Development
Brace Prouty - Project Development
Joel Gengler - Right of Way
Sarah Gilkerson - Roadway Design
Karen Olson - Roadway Design
Brooke White - Statewide Area
Todd Hertel - Watertown Area

Approved Scope

P-B-PT 0028(48)346 Hamlin **PCN 06NG**
SD28 - Fm 458th Ave East of Lake Poinsett to 5.2 miles W of Estelline
Grading, Structures & Interim Surfacing

Executive Summary of Project Approved Scope

This is a grading project that should be designed to fix the horizontal and vertical curves to meet a 70 mph design speed. The project is designated as a 4R project and will include grading, structure replacement and interim sufacing on SD 28 from 458th Ave (MRM 346.00 + 0.000) East to 460th Ave (MRM 349.00 + 0.300). This project includes approach grading and a bridge replacement over the Big Sioux River, approximately 1 mile west of Estelline on SD 28 MRM 353.53.

The surfacing for this project is included in PCN 05Q7.

All pipe will be replaced with this grading project. The new culverts shall all meet 30' clearzone requirements. Structures 29-227-144 and 29-277-160 will be replaced on this project.

It is anticipated that compensatory wetland mitigation will be needed. The environmental office will provide an estimate of wetland mitigation needs based on the project limits developed by road design.

The existing ROW width is 150'. Temporary easements will likely be required. Permanent ROW take is anticipated with this project and will depend on new alignment of roadway.

After re-occurring flooding conditions, riprap was placed in 1995 along the inslope of this segment to protect the roadway from erosion due to the adjacent highwater. Subsequently in 1997, this segment of the roadway was overtopped and remained underwater. Therefore a grade raise was completed using ER funding and state maintenance forces to place riprap and a gravel base course on the existing grade. The segment was then surfaced with asphalt

concrete.

Since the top of the existing riprap placed on the inslope is at or near the centerline grade elevation and this elevation for the riprap is required for bank protection, the roadway prism through this segment will require another grade raise and widening. The cross-section for the roadway widening shall be designed as per table 7.1 of the SDDOT Roadway Design Manual; whereas the roadway lane and shoulder width shall be 12 ft. and 6 ft. respectively. The cross-section shall also be designed to provide a 30 ft. clear zone. Also, the preliminary surfacing recommendation is to provide a section that includes 12 of base course and 5 of asphaltic concrete.

The tie-in on the west end of the grade raise and widening to the existing roadway profile is located in the middle of the 55 MPH horizontal curve at MRM 348.38 + 0.212 (PI = Sta. 559+91). Therefore, the design shall include a re-alignment of the roadway to provide for a 70 MPH curve. Along with this re-alignment, the intersecting Hamlin County Roads within the curve will also be altered and/or eliminated. Specifically, the intersection of the south 459th Ave. and SD Hwy 28 (MRM 348.94) will be eliminated. The remaining segment of 459th Ave that is north of the 194th St intersection will become either a dead-end road or abandoned/obliterated. If this roadway is abandoned/obliterated the intersection of 459th Ave. and 194th St. will then become a T Intersection. East of this intersection, 194th Street will hook north into SD Hwy 28 and also become a T Intersection. The intersection of 192nd St (MRM 346.333) and 459th Ave (MRM 347.445) and shall include re-alignment to make these "T" intersections. See Appendix for visual aid.

A warranted left turn lane will be provided for SD Hwy 28 westbound traffic at this intersection of SD Hwy 28 and 194th St and a unwarranted left turn lane for the eastbound traffic at this intersection.

It is the responsibility of the designer to design the project to meet or exceed the current minimum SDDOT design standards and policies. The designer shall coordinate any improvements not included in the scope of work involving grading, ROW needs, inslope flattening, and/or pipe/drainage work with the Environmental Office and assigned Transportation Planning Engineer for any additional environmental clearances that may be required. The designer shall verify with the Pavement Engineer that the surfacing recommendation provided in the Approved Scope is the most current recommendation before proceeding with the project design.

Segments

Highway	Beg MRM	Beg Disp	End MRM	End Disp	Length	County
028	346.00		349.00	0.300	3.299	Hamlin
028	346.94					Hamlin
028	353.00	0.194	353.53	0.095	0.221	Hamlin

028	353.53					Hamlin

Fund Source Summary			
PCN	**FY**	**Cost**	**STIP Category**
06NG	2025	6.581	MinArt
06NG	2025	2.031	Bridge

Preferred Letting Date: Unknown

COORDINATORS:
Scope Coordinator - Brian Rogness
Grading Squad - Mark Malone

OVERALL PROJECT NEEDS

Type	Description
Public Involvement (Public Mtg, Public Hearing, Landowner Mtg)	Landowner meetings will be needed and a public meeting will likely be needed.

The roadway will be realigned to increase safety and bring the curves up to design speed.

ENVIRONMENTAL NEEDS

Type	Description
4f(Parks, Historical Sites, Game Production Area)	A Game Production Area SE of SD 28 and 458th Ave and Waterfowl Production Area S of 194th St. See map in Appendix.
Storm Water Pollution Prevention Plan (SWPPP)	
Threatened & Endangered Species	Likely a Topeka Shinner area
Wetlands	Wetland impacts are anticipated.

Check with the Environmental Office for additional environmental clearances needed during design.

A 404 permit will be needed on this project.

UTILITY NEEDS

To be determined. Contact the Utility Office in the Office of Road Design for additional information.

Utility Notification Required	YES	**SUE Needed**		**SUE (Modified Phase 2) Needed**	

AGREEMENT / RESOLUTION NEEDS and/or Other Agency Coordination

Org Type	Org Name	Need Type	Agree?	Description
Other		ROW		
Tribal		Section 106 consultation		
US Corp of Engineers (404 Permit)		Permit		

SURVEY NEEDS

Type	Description
Drainage	
Reconstruction	Survey will need to be wider than normal because the roadway will be realigned.

BenchMark Determine as Design Proceeds **Harn Point** Determine as Design Proceeds

Survey will need to be wider than normal because the roadway will be realigned. The intersecting roads at MRM 346.33, MRM 347.445 and MRM 348.94 will need survey as they will be realigned to make T intersections.

Survey will be required for approach grading and structure replacement at structure number 29-277-260 (MRM 353.53).

Drainage surveys will be required at the two structures for DA"s > 1000 acres. In addition, the OBD will need a drainage survey 500 ft. up and down stream at structure number 29-280-162 (structure is just downstream of str. no. 29-277-260).

CONSTRUCTABILITY NEEDS

Type	Description
Detour	
Road Closure	

The detour anticipated for this project is I 29 to SD 22 to US 81.

Approval

Office	Approved	Office	Approved	Office	Approved
Aberdeen Region	Yes	Administration	Yes	Bridge Design	Yes
Materials & Surfacing	Yes	Roadway Design	Yes	Watertown Area	Yes

Confirmation of Approval

		Date	

		Approved	

BACKGROUND INFORMATION

Grading - 1952 - file:/U:\rd\Misc\MicroFilm\Plans\29110.pdf

Grading - 1952 -file:/U:\rd\Misc\MicroFilm\Plans\29101.pdf

Asphalt Surfacing - 1954 - file:/U:\rd\Misc\MicroFilm\Plans\29109.pdf

Asphalt Resurfacing - 1972 - file:/U:\rd\Misc\MicroFilm\Plans\29128.pdf

Asphalt Resurfacing - 1998 -file:/U:\rd\Misc\MicroFilm\Plans\4825.pdf

Asphalt Resurfacing - 2019 - file:/U:\rd\Misc\MicroFilm\Plans\05EV.pdf

Projects In Area

Fiscal Year	Status	PCN	Project #	Location	Improvement Desc
2019	Closed	05EV	P 0028(38) 341	SD28 - Fm the N Jct of US81 to the E City Limits of Estelline	Mill & AC Resurfacing, Pipe Work
2023	Awarded	06K5	PH 0010 (152)	Various Locations in the Watertown Area.	Modify Intersection
2025	Programmed	04HM	P-PH 0028 (36)355	SD28 - Fm Estelline to SD15	Grading, Interim Surfacing, Replace Str RCBC, Approach Slab

Traffic Data

Project

2018 ADT	888	**d:**	52.0%
2038 ADT	1070	T DHV:	8.6%
DHV:	121	T ADT:	19.0%

Future Development None Anticipated

25 Year Projected ADT - 1110 30 Year Projected ADT- 1154 35 Year Projected ADT - 1199

Crash Data

Period from 2014 to 2018

Project	
Weighted Accident Rate	1.50
Number of Fatal	0
Number of Injury:	0
Number of Property Damage:	8

The crashes shown below are for the 5-year period from 2014-2018.

The 8 crashes were animal/vehicle crashes.

Roadway

SD28 - Fm 192nd St East of Lake Poinsett to 5.2 miles W of Estelline

Posted Speed Limit	65 MPH	**% Passing**	61%
# of Lanes & Width	2 - 12'	**Shoulder Width**	5'
Typical Inslope	4:1	**Median Type**	N/A
# & % Length of Grades	13 72.80 0 to 3% 5 27.20 >3 to 4%	**Climbing Lanes, Turn Lanes, etc.**	N/A
# of Horiz Curves at each DesignSpeed	3 55 mph 2 65 mph	**# of Vertical Curves at each Design Speed - Crest (Sag)**	0(1) 50 mph 0(3) 55 mph 5(2) 60 mph 1(1) 65 mph 1(0) 70 mph 3(2) 80 mph

Structures (Bridges and Box Culverts over 20')			
Structure Number	29-227-144	**MRM Number**	028+346.94
Historical	Bridge is not eligible for the National Register of Historic Places		
Year Built	1951		
Location	SD028 5.0 E JCT US 81 over LAKE POINSETT OUTLET		
Bridge Type & Size	67 ft x 30 ft roadway,3 spans, Concrete continuous Slab Bridge, 0 degree skew		
Structure Capacity	HS-31.9		
Eligible for BRF Funds	No		
Deficiency Classification	Not Deficient		

Structure Number	29-277-160	**MRM Number**	028+353.53
Historical	Bridge is not eligible for the National Register of Historic Places		
Year Built	1951		
Location	SD028 2.3 W DEUEL CO LINE over BIG SIOUX RV		
Bridge Type & Size	163.5 ft x 30 ft roadway,3 spans, Steel Stringer/Multi-beam or Girder Bridge, 0.0 degree skew		
Structure Capacity	HS-28.5		
Eligible for BRF Funds	No		
Deficiency Classification	Not Deficient		

Structures Data (Box Culverts and Miscellaneous)	
Historical	
Retaining Walls	
Other Structures	

Lighting	No

Existing Signals	No

Pedestrian Flasher	No

Excluded

Needs Book Year 2018

HIGHWAY 028
Beginning MRM = 341.99
Ending MRM = 355.52

RURAL

HIGHWAY 028
Beginning MRM = 341.99
Ending MRM = 355.52

IDENTIFICATION							
Federal Aid System	STP	STP	STP	STP	STP	STP	STP
Funding Category	M(NA	M(NA	M(NA	M(NJ	M(NJ	M(NA	M(NA
Functional Classification	R-M[A	R-M[A	R-M[A	R-M[A	R-M[A	R-M[A	R-M[A
Direction							
Beginning MRM	341.99	348.38	348.38	354.49	354.72	355.02	355.52
MRM Displacement	0.000	0.385	0.811	0.056	0.016	0.049	0.000
Segment Length	6.755	0.226	5.468	0.228	0.408	0.421	1.229
Year Built	1952	1997	1952	1953	1950	1950	1950
Year Last Improved	1999	1999	1999	1999	1999	1999	2010
Year Last Sealed	2009	2009	2009	2009	2009	2009	2013
ROADWAY CONDITIONS							
Surface Condition Index	1.48	1.31	1.48	0.94	0.00	2.54	3.72
Roughness Index	4.51 (17)	3.38 (17)	4.51 (17)	3.82 (17)	3.82 (17)	4.36 (17)	4.71 (17)
ASPHALT INDEX VALUES							
Transverse Cracking	0.13 (17)	0.00 (17)	0.17 (17)	0.00 (17)	0.00 (17)	2.08 (17)	4.50 (17)
Fatigue Cracking	4.27 (17)	4.80 (17)	4.11 (17)	4.20 (17)	1.40 (17)	3.60 (17)	4.38 (17)
Patching/Patch Deterioration	4.83 (17)	5.00 (17)	4.89 (17)	5.00 (17)	4.67 (17)	5.00 (17)	5.00 (17)
Block Cracking	3.93 (17)	4.30 (17)	3.71 (17)	3.50 (17)	1.52 (17)	3.48 (17)	3.36 (17)
Rut Index	4.45 (17)	4.52 (17)	4.54 (17)	4.58 (17)	4.54 (17)	4.45 (17)	4.82 (17)
Rut Depth(Inches) AVG/MAX	0.20 / 0.50	0.10 / 0.30	0.10 / 0.40	0.10 / 0.30	0.10 / 0.30	0.20 / 0.20	0.10 / 0.20
CONCRETE INDEX VALUES							
D-Cracking/ASR							
Joint Spalling							
Corner Cracking							
Faulting / CRCP Block Cracking							
Joint Seal Damage							
Punchouts							
STRUCTURAL DESCRIPTION							
Surface Type	THK	TONS	THK	THK	THK	THK	THK
Shoulder Type - Primary/Secondary	AC/N/D	AC/N/D	AC/N/D	C & G/N/D	C & G/N/D	AC/NONE	AC/NONE
Surface Width	24 (024)	24 (024)	24 (024)	36 (036)	36 (036)	24 (024)	24 (024)
Left Shoulder Width-Prim/Sec	5 (05) / 0 (0)	1 (01) / 0 (0)	5 (05) / 0 (0)	2 (02) / 0 (0)	2 (02) / 0 (0)	3 (03) / 0 (0)	1 (01) / 0 (0)
Right Shoulder Width-Prim/Sec	5 (05) / 0 (0)	1 (01) / 0 (0)	5 (05) / 0 (0)	2 (02) / 0 (0)	2 (02) / 0 (0)	3 (03) / 0 (0)	1 (01) / 0 (0)
Widths-ROWY/ROW-Predom/Min	034/150/150	026/150/150	034/150/150	040/92/092	040/92/092	030/100/100	026/100/100
Roadbed Layer 1	2009/TS3/0.4	2009/TS3/0.4	2009/TS3/0.4	2009/TS3/0.4	2009/TS3/0.4	2009/TS3/0.4	2013/TS3/0.4
Roadbed Layer 2	2002/TS3/0.4	2002/TS3/0.4	2002/TS3/0.4	2002/TS3/0.4	2002/TS3/0.4	2002/TS3/0.4	2012/TC/0.0
Roadbed Layer 3	2001/TC/0.0	2001/TC/0.0	2001/TC/0.0	2001/TC/0.0	2001/TC/0.0	2001/TC/0.0	2010/AE3/1.5
Roadbed Layer 4	1999/AL3/1.5	1999/AL3/1.5	1999/AL3/1.5	1999/AL3/2.0	1999/AL3/2.0	1999/AL3/2.0	1991/AE2/0.5
Roadbed Layer 5	1999/AL3/1.3	1997/AE3/1.5	1999/AL3/1.3	0/AA3/1.3	1972/AE4/1.0	0/AA3/0.5	1989/TS3/0.5
Roadbed Layer 6	0/AA3/0.3	1997/AE3/1.5	1997/AA3/0.3	1989/TS3/0.5	1959/AE3/3.0	1989/TS3/0.5	1972/AE4/1.5
Roadbed Layer 7	1989/TS3/0.5	1997/BUA/12.0	1989/TS3/0.5	1972/AE4/1.5	1950/BUS/7.0	1972/AE4/1.5	1959/AE3/3.0
Roadbed Layer 8	1972/AE4/3.0		1972/AE4/3.0	1953/AE4/1.2		1959/AE3/3.0	1950/BUS/7.0
Roadbed Layer 9	1953/AE4/1.2		1953/AE4/1.2	1953/BUS/7.0		1950/BUS/7.0	
Roadbed Layer 10	1953/BUS/7.0		1953/BUS/7.0				
Roadbed Layer 11	1952/BUS/6.0		1952/BUS/6.0				
Roadbed Layer 12							
Number Of Structures	2	0	1	0	0	0	0
Number Of Box Culverts	0	0	0	0	0	0	0
3 YR AVG MAINTENANCE COSTS							
Mainline	$128	$540	$396	$398	$397	$397	$396
Shoulders	$0	$0	$0	$0	$0	$0	$0
Structure	$67	$0	$9	$9	$10	$10	$9
Other	$4082	$17522	$4884	$4884	$4863	$4865	$4863
Total	$4277	$18066	$5289	$5288	$5270	$5268	$5269
Total 3 Year Main Contract Amount	$1492	$6456	$1731	$1732	$1730	$1732	$1731
TRAFFIC							
Current ADT	815	815	959	1616	1554	1103	1103
Projected 20 Year ADT	982	982	1156	1947	1873	1329	1329
Number Of Trucks	155	155	149	105	109	141	141
CRASHES							
Weighted Crash Rate	1.49	0.00	1.88	0.68	1.06	0.50	3.23
Number of Fatal	0	0	0	0	0	0	0
Number Of Injury	0	0	0	0	1	0	2
Number Of Property Damage	19	0	18	2	0	1	2
MAINLINE IMPROVEMENTS							
Project Programmed	YES	YES	YES	YES	YES	YES	YES
PCN	05EV	05EV	05EV	05EV	05EV	04HM	04HM
Improvement Type	MILL AC OVLY	MILL AC OVLY	MILL AC OVLY	MILL AC OVLY	MILL AC OVLY	RECON GRVL	RECON GRVL
Estimated Improvement Cost	$2203	$74	$1783	$74	$133	$815	$1797
Improvement Year	2019	2019	2019	2019	2019	2025	2025
PCN						05Q7	05Q7
Improvement Type	ROUTE/SEAL	ROUTE/SEAL	ROUTE/SEAL	ROUTE/SEAL	ROUTE/SEAL	RECON AC	RECON AC
Estimated Improvement Cost	$35	$1	$28	$2	$3	$158	$463
Improvement Year	2021	2021	2021	2021	2021	2028	2028

Page 261

Summary of Design Data, Needs and Treatment Types per Scope Improvement Type

Scope Improvement Type	Yes	No
ADA		X
GRADING	X	
HYDRAULIC	X	
MAINTENANCE		X
RAILROAD		X
RESEARCH		X
REST AREA/BLDG SITES		X
RESURF/SURFACING	X	
ROW	X	
ROADSIDE DEVELOPMENT	X	
SAFETY	X	
STRUCTURE	X	
TRAFFIC		X

GRADING			
Design Elements	MRM 346 to 349.00+0.300		
Terrain	Rolling		
Design Speed	70 mph		
Typical Grading Section			
Lanes	2-12'	**Shoulder Width**	6'
Sidewalk			
Bike Trails			
Ditch Type	Rural (Standard or Sloped) **Inslope** 4:1 **Depth** 3.5' **Width** 20' **Backslope** 5:1 or 7:1		
Clear Zone	30'		
Median	**Median Type** None **Centerline to Centerline Inslope Depth Width**		
Comment			
Design Elements	MRM 353.53		
Terrain	Rolling		
Design Speed	70 MPH		
Typical Grading Section			
Lanes	2-12' lanes	**Shoulder Width**	6'
Sidewalk	N/A		
Bike Trails	N/A		
Ditch Type	Rural (Standard or Sloped) **Inslope** 4:1 **Depth** 3.5' **Width** 20' **Backslope** 5:1 or 7:1		
Clear Zone	30'		
Median	**Median Type** None **Centerline to Centerline Inslope Depth Width**		
Comment			

Geometric Needs	Comments/Recommendations	
Horizontal Curves Below Design Speed	All shall meet design speed	
Vertical Curves Below Design Speed	All shall meet design speed	
Intersection Horizontal Sight Distance Problems	None Existing	
Intersection Vertical Sight Distance Problems	None Existing	

Grades Steeper than Design Speed	All shall meet design speed	
Parking	None	
Design Vehicle	WB-67	

Geotechnical Needs	**Comments/Recommendations**	
Undercut Needed	3'	Undercut depth to be determined by the Geotechnical Office.
Material Availability	Salvage and stockpile existing surface	
Borrow or Waste	Project should balance	Earthwork should be determined during design.
Soils/Foundations	Muck	Locations of muck material will be determined by the Geotechnical Office.
	Unstable Material	Locations of unstable material will be determined by the Geotechnical Office.

List of applicable GRADING Treatment types based on Identified needs are as follows:	
Need	**Treatment Type**
Vertical Alignment	Medium Grading
Horizontal Alignment	Medium Grading
Shoulder Width	Medium Grading

Summary

MRM 348.38 + 0.000 to MRM 349.00 + 0.000 (approximate)

After re-occurring flooding conditions, riprap was placed in 1995 along the inslope of this segment to protect the roadway from erosion due to the adjacent highwater. Subsequently in 1997, this segment of the roadway was overtopped and remained underwater. Therefore a grade raise was completed

using ER funding and state maintenance forces to place riprap and a gravel base course on the existing grade. The segment was then surfaced with asphalt concrete.

Since the top of the existing riprap placed on the inslope is at or near the centerline grade elevation and this elevation for the riprap is required for bank protection, the roadway prism through this segment will require another grade raise and widening. The cross-section for the roadway widening shall be designed as per table 7.1 of the SDDOT Roadway Design Manual; whereas the roadway lane and shoulder width shall be 12 ft. and 6 ft. respectively. The cross-section shall also be designed to provide a 30 ft. clear zone. Also, the preliminary surfacing recommendation is to provide a section that includes 12 of base course and 5 of asphaltic concrete.

The tie-in on the west end of the grade raise and widening to the existing roadway profile is located in the middle of the 55 MPH horizontal curve at MRM 348.38 + 0.212 (PI = Sta. 559+91). Therefore, the design shall include a re-alignment of the roadway to provide for a 70 MPH curve. Along with this re-alignment, the intersecting Hamlin County Roads within the curve will also be altered and/or eliminated. Specifically, the intersection of the north-south 459th Ave. and SD Hwy 28 will be eliminated. The remaining segment of 459th Ave that is north of the intersection with 194th St. will become either a dead-end road or abandoned/obliterated. If this roadway is abandoned/obliterated the intersection of 459th Ave. and 194th St. will then become a T Intersection. East of this intersection, 194th Street will hook north into SD Hwy 28 and also become a T Intersection. A left turn lane will be provided for SD Hwy 28 westbound traffic at this intersection of SD Hwy 28 and 194th St. The north intersection 459th Ave and SD 28 and 194th St and SD 28 shall include re-alignment to make these T intersections.

HYDRAULIC

Hydraulic Needs	Comments/Recommendations
Water Overtop Areas or Lake Elevations	Located At: Near the intersection of 194th St - MRM 348.38+0.520
Storm Sewer	None
Basin (Sedimentation, Retention, Detention,Storage)	None
Special Outlets	None
Pipe Capacity or Condition	**RC Pipe Treatment**: Replace; **Comments/Recommendations**: **CM Pipe Treatment**: Replace; **Comments/Recommendations**:
Erosion (Ditch, Channel, Stream, or River)	Bank Protection: Erosion Protection: Riprap:
Stream Relocation	None
FEMA Flood Plain	No

List of applicable HYDRAULIC Treatment types based on Identified needs are as follows:	
Need	**Treatment Type**
Erosion (Ditch, Channel, Stream, River)	Erosion Protection
Erosion (Ditch, Channel, Stream, River)	Riprap

Overflow of Highway	Grading
Pipe Condition	Replace Pipe

Summary

Water has overtopped the roadway near the intersection of 194th St - MRM 348.38 + 0.520 and Structure No. 29-227-144, MRM 346.94. There is riprap for the bank protection at MRM 348.38 + 0.520. Structure No. 29-227-144 was overtopped in 2011 and 2019 with a depth of 12" and 5" respectively. The Region Bridge Engineer suggested raising the bottom of the deck a minimum of 3'.

RESURF/SURFACING

Resurfacing (3R) Needs

Location Description	2018 Traffic	2038 Traffic	Terrain	Comment
MRM 346 to 349.00+0.300	888	1070	Rolling	

Criteria	Existing Data	Min Design Criteria	Scope and/or Comment
Speed	65 mph	65 mph	
Lane Width	12'	10'	
Shoulder Width	5'	2'	
Horizontal Alignment	# of Curves: 3 — Design Speed: 55 mph # of Curves: 2 — Design Speed: 65 mph	Radius = 1660'	
Vertical Alignment	# of Crests / # of Sags / Design Speed: / 1 / 50 mph / 3 / 55 mph 5 / 2 / 60 mph 1 / 1 / 65 mph 1 / 0 / 70 mph 3 / 2 / 80 mph	645 ft Crest (193) Sag (157) If the design traffic volume is 1500 or less, existing vertical curves should meet a design speed of no less than 20 mph below overall project design speed.	
Grade	# of Grades / % Length / Range: 13 / 72.80 / 0 to 3% 5 / 27.20 / >3 to 4%	5% Is allowed if there Is less than a 500' tangent.	
Cross Slope	3%	Maintain existing cross slope.	
Super-elevation		7% Maximum	
Bridge	30'	24'	

Width			
Structural Capacity	31.9 & 28.5	HS-15 <= 1500 ADT	
Lateral Offset		review policy	
Vertical Clearance	N/A	14'	
Guardrail		review Road Design Manual	
Clear Zone		According to policy for ADT < 1000, install object markers for 36' or larger pipes, box culverts, or cattle passes inside the clear zone.	
Typical Inslope		3: 1	
Approach Slope		review Road Design Manual	
Drainage Structures		review Road Design Manual	
ADA Req		review Road Design Manual	
Mailboxes		review Road Design Manual & Std Plates	

Interim Surfacing	Blotter	
Shoulders	AC	
Final Surfacing	AC Surfacing	

List of applicable RESURF/SURFACING Treatment types based on Identified needs are as follows:	
Need	**Treatment Type**
Surfacing	AC Surfacing

Summary

Interim Surfacing with grading project

Preliminary Surfacing Recommendation:

4.5" of AC & 12" of Base Course

Asphalt Shoulders

Table 7-1 specifies gravel shoulders but due to most of the project being in a superelevated curve and past water overtopping the roadway as discussed with the Pavement Design Engineer.

REVISED surfacing design recommendation letter:

U:\ms\prj\haml04HM\Documents\P-PH 0028(36)355 P 0028(43)355 P 0028(48)346 Deuel Hamlin Counties PCN 06NG 04HM 05Q7 Revised Surfacing Design.docx
<file://STATE.SD.LOCAL/WORK/TRPR1/ms/prj/haml04HM/Documents/P-PH%200028(36)355%20P%200028(43)355%20P%200028(48)346%20Deuel%20%20Hamlin%20Counties%20PCN%2006NG%2004HM%2005Q7%20Revised%20Surfacing%20Design.docx>

ROW

ROW Needs	Comments/Recommendations
Acquisition	**Type** / **Width** / **Area** / **Units** / **Comments/Recommendations**: Blockouts [Other] / 0 / 0.000 / / Realigning curves and making T intersections on section line roads
Parcels Impacted	16 Estimated
Displacement / Relocation	Relocation: Realigning curves to meet 70 mph design speed and increase safety
Type(s) of ROW necessary	Permanent Temporary

List of applicable ROW Treatment types based on Identified needs are as follows:

Need	Treatment Type
Right of Way	Permanent ROW
Right of Way	Temporary Easements

Summary

The roadway alignment will be adjusted to bring the design speed up to 70 mph throughout the segment and make the intersecting roads at the curves T intersections. Permanent ROW will be required and depend on the new alignment determined by Road Design.

ROADSIDE DEVELOPMENT	
List of applicable ROADSIDE DEVELOPMENT Treatment types based on Identified needs are as follows:	
Need	**Treatment Type**
Erosion Control	Typical Erosion Control (seed, fertilizer, etc.)
Summary Provide typical erosion control for this project. There may be special seed mixtures for the Game Production Area and Waterfowl Production Area.	

SAFETY	
Safety Needs	**Comments/Recommendations**
Lighting	None

List of applicable SAFETY Treatment types based on Identified needs are as follows:	
Need	**Treatment Type**
Pavement Marking	Pavement Marking (paint, epoxy, tape, durable)
Signs	Sign
Rumble Strips	Shoulder Rumble Strips/Stripes

Summary

Provide permanent pavement marking paint for the entire length of the project.

All traffic control signing on this segment shall be posted according to the current MUTCD.

Update the object markers per SDDOT policy DOT-OS-OT-7.2.

Shoulder rumble strips are recommended on the final Aspahlt Concrete surface by the SDDOT Highway Safety Engineer.

STRUCTURE			
Structure Needs	**Comments/Recommendations**		
Structure Number	29-227-144	**MRM Number**	346.94
Location	SD028 5.0 E JCT US 81 over LAKE POINSETT OUTLET		
Disposition of Existing Structures	Remove/Replace		
Structure Location	Drainage Crossing		
Vertical Clearance	NA		
Horizontal Clearance	Install Guardrail		
Size of Structure	To be determined by the Office of Bridge Design		
Sidewalk / Bike path	None		
Skew	0.0 degree skew		
Horizontal Curve			
Bridge Rail	MASH Barrier		
Erosion Protection	Bank Protection		
Utilities on Structure	No		

Structure Needs	**Comments/Recommendations**		
Structure Number	29-277-160	**MRM Number**	353.53
Location	SD028 2.3 W DEUEL CO LINE over BIG SIOUX RV		
Disposition of Existing Structures	Remove/Replace		
Structure Location	Drainage Crossing		

Vertical Clearance	NA	
Horizontal Clearance	Install Guardrail	
Size of Structure	To be determined by the Office of Bridge Design	
Sidewalk / Bike path		
Skew	0.0 degree skew	
Horizontal Curve	No	
Bridge Rail	MASH Barrier	
Erosion Protection	Bank Protection	
Utilities on Structure	No	

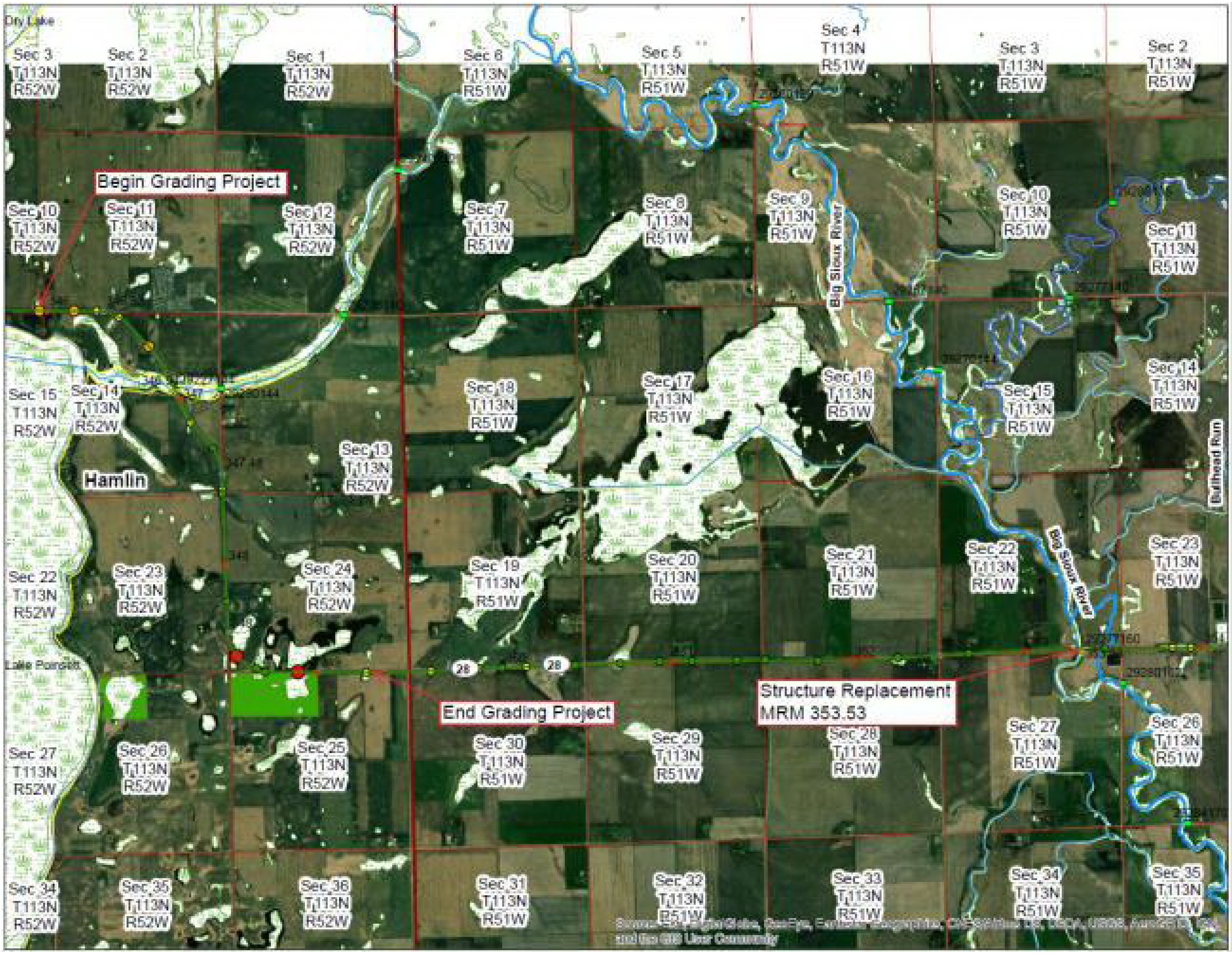
Retaining Walls and Miscellaneous	
Other Structures	

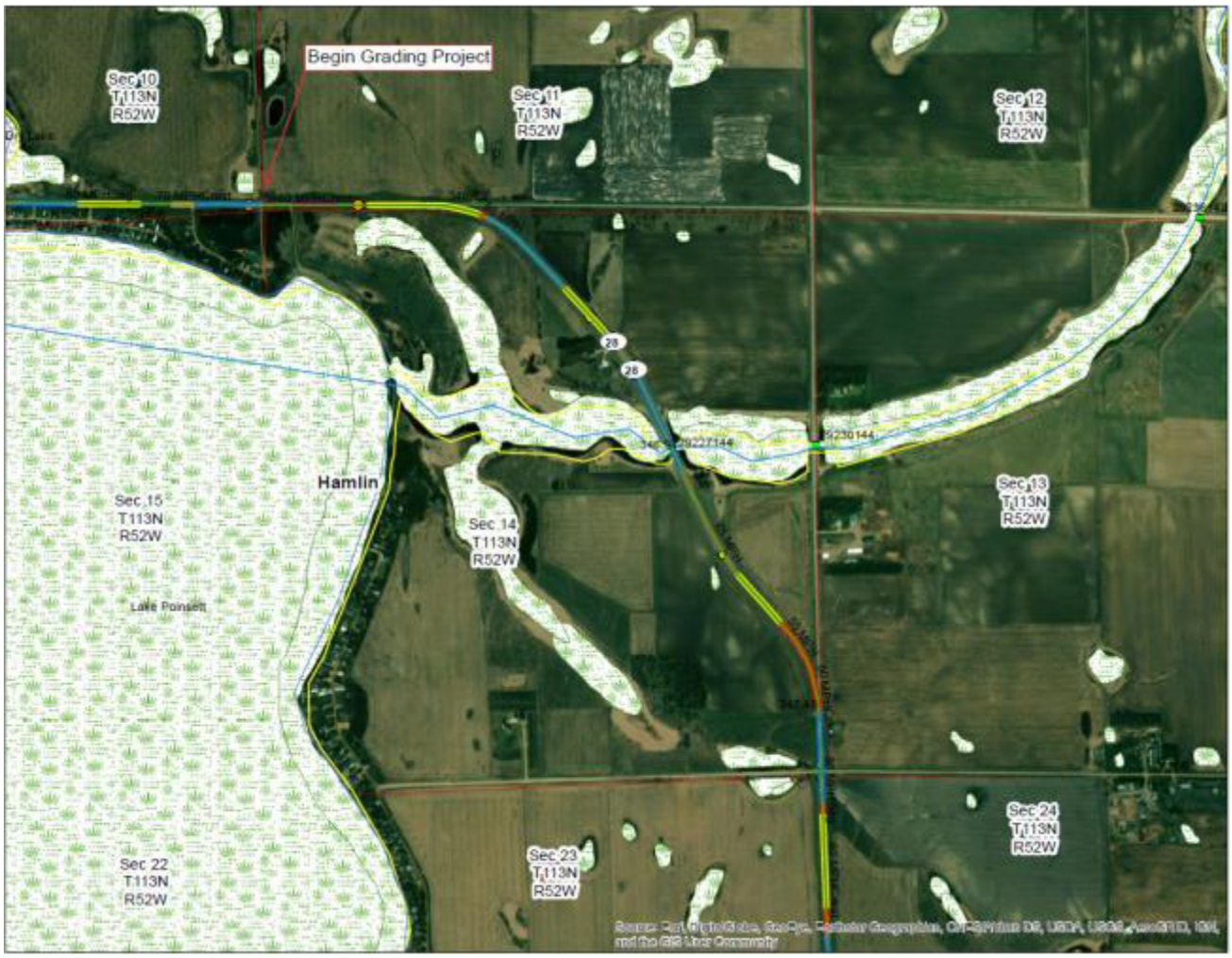
List of applicable STRUCTURE Treatment types based on Identified needs are as follows:	
Need	**Treatment Type**
Bridge	Replace Structure

Summary

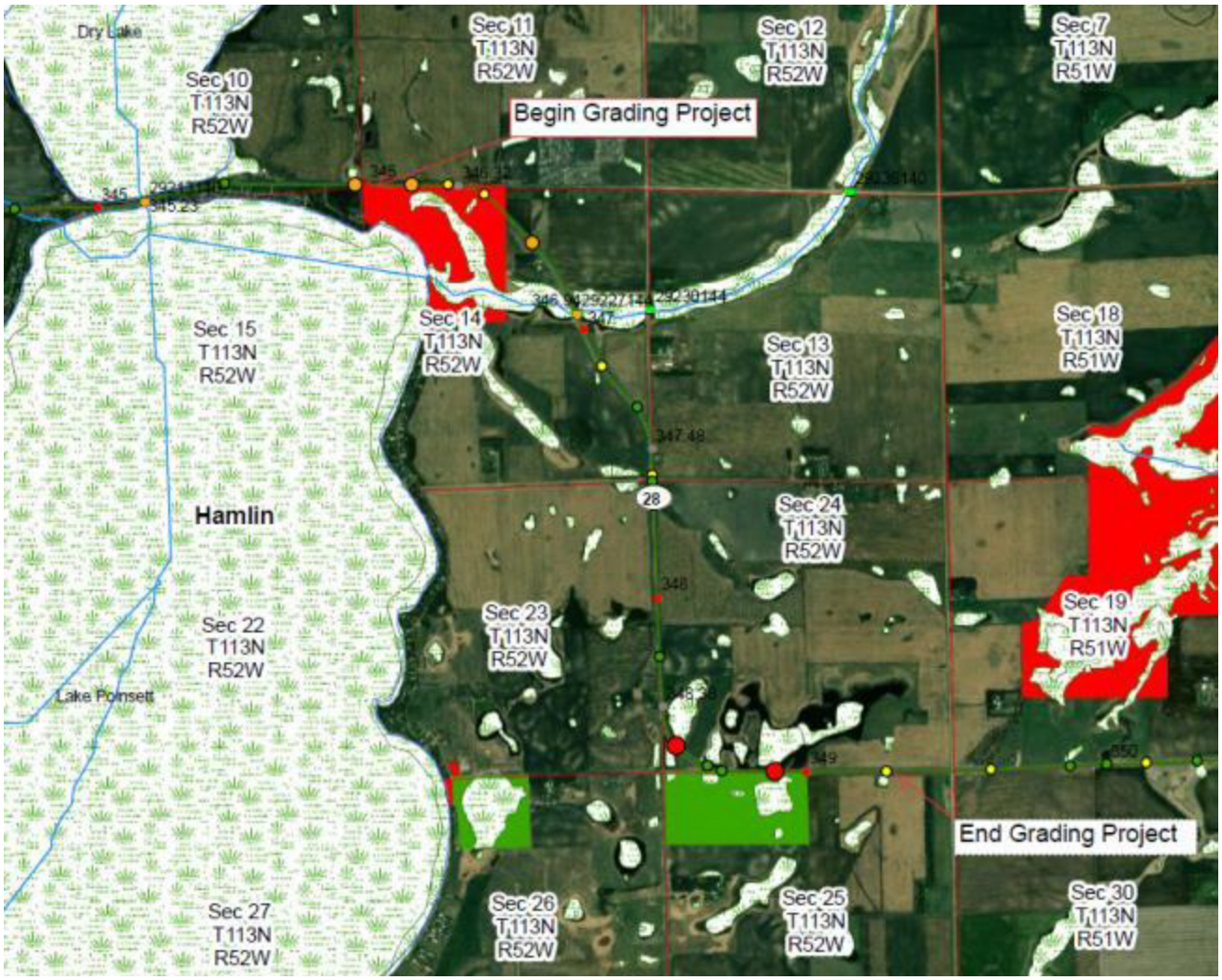
Structures 29-227-144 and 29-277-160 will be replaced on this project.

Appendix


Begin Grading Project
End Grading Project
Structure Replacement
MRM 353.53
Hamlin
Big Sioux River
Bullhead Run
Dry Lake
Lake Poinsett


Begin Grading Project
Sec 10
T113N
R52W
Sec 11
T113N
R52W
Sec 12
T113N
R52W
28
28
Hamlin
Sec 15
T113N
R52W
Sec 14
T113N
R52W
Sec 13
T113N
R52W
Lake Poinsett
Sec 22
T113N
R52W
Sec 23
T113N
R52W
Sec 24
T113N
R52W


Sec 13
T 113N
R52W
Sec 14
T 113N
R52W
Sec 18
T 113N
R51W
Sec 23
T 113N
R52W
Sec 24
T 113N
R52W
Hamlin
Sec 19
T 113N
R51W
28
28
End Grading Project
Sec 26
T 113N
R52W
Sec 25
T 113N
R52W
Sec 30
T 113N
R51W


Dry Lake
Sec 11
T113N
R52W
Sec 12
T113N
R52W
Sec 7
T113N
R51W
Sec 10
T113N
R52W
Begin Grading Project
345
Sec 15
T113N
R52W
Sec 14
T113N
R52W
Sec 13
T113N
R52W
Sec 18
T113N
R51W
347.48
28
Hamlin
Sec 24
T113N
R52W
348
Sec 23
T113N
R52W
Sec 19
T113N
R51W
Sec 22
T113N
R52W
Lake Pomsett
349
End Grading Project
Sec 26
T113N
R52W
Sec 25
T113N
R52W
Sec 30
T113N
R51W
Sec 27
T113N
R52W


Obliterate 459th Ave from SD 28 to 194th St.
Hamlin
28
194 ST
194 ST
SD HWY 28
Make intersecting road a "T" intersection.
459 AVE