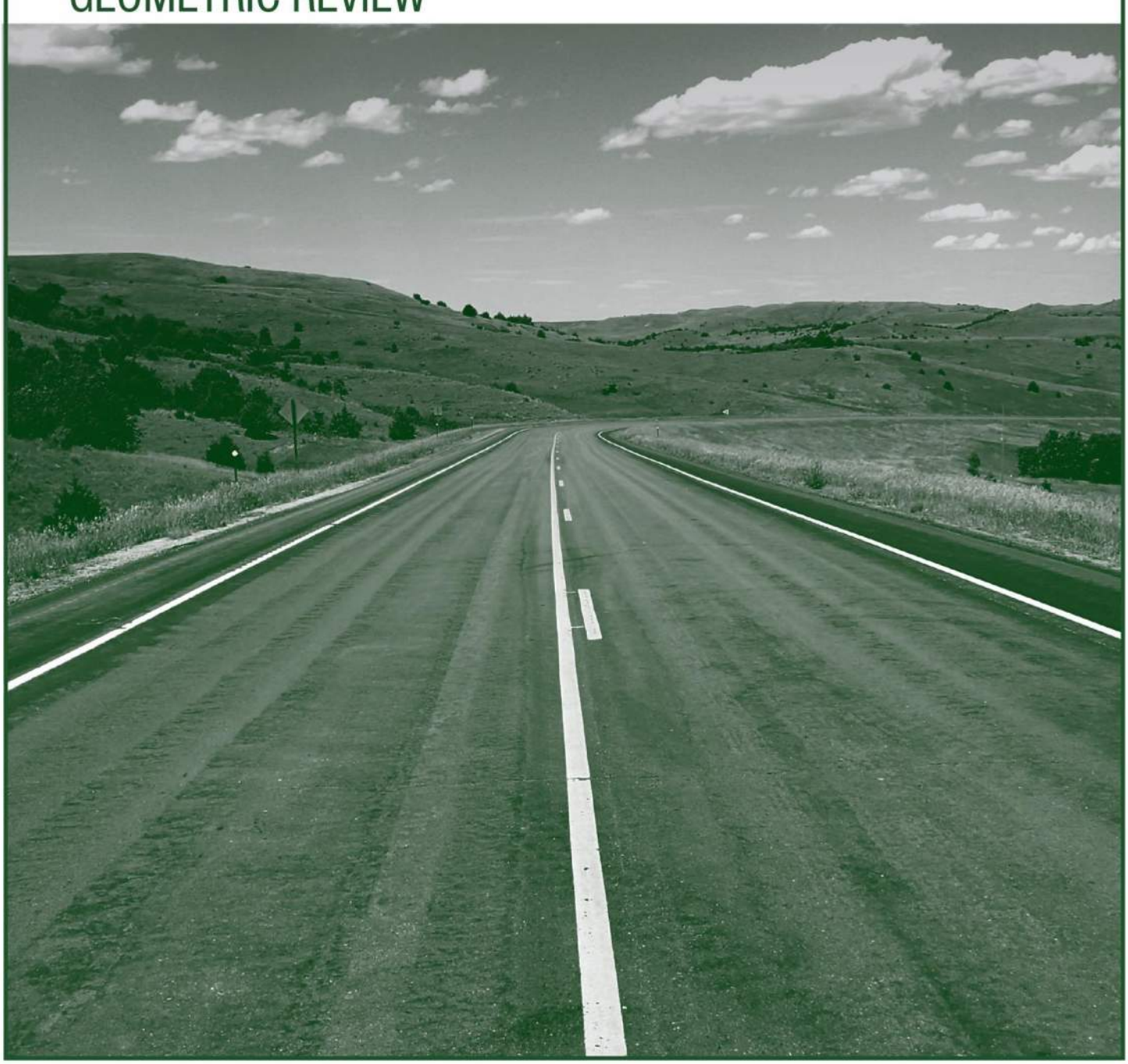
November 2019

Appendix B

GEOMETRIC REVIEW



SD44/PLATTE-WINNER BRIDGE CORRIDOR STUDY AND ENVIRONMENTAL ASSESSMENT

Agreement No. 410583, Work Order PD-19-16

Project Nos. HP5596(19); P0044()290, PCN 05X0

PROJECT MEMORANDUM

SD44 GEOMETRIC REVIEW

To: Study Advisory Team (SDDOT, FHWA, SDGFP)

From: Tim Thoreen, Jon Wiegand, Jennica Wilcox, and Jordan Horejsi

Date: July 5, 2017

Document Summary

This memorandum provides an overview of SD44 existing geometrics within the study area (extending between SD47 to SD50) in comparison to current design criteria and standards.

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HRGreen

Introduction

The HR Green roadway design team evaluated the SD44 corridor roadway geometrics against current design criteria and standards as provided in the latest version of the SDDOT Road Design Manual (as of April 2017). A comparison is made to a 65 mph and 70 mph design speed when applicable. Roadway geometrics were identified on SDDOT-provided construction plans of projects dating back to the initial construction of the SD44 corridor.

Review Components

The SD44 roadway geometric review focused on four primary elements for new or reconstructed roadways:

- Typical Sections
- Foreslope
- Horizontal Alignment
- Vertical Alignment

The attached table provides an overview of these four elements throughout the study area, with the following components:

- Roadway Element – design element
- Design Guidance – 70 mph or 65 mph design speed
- Source – Design guidance source; typically SDDOT Road Design Manual with page, figure, or table reference
- Existing Condition – geometric condition as noted on the construction plans
- Existing Plan Reference location – construction plan reference, including project number, plan set sheet number and plan set pdf page number
- Comments – notes whether the existing condition meets 65 mph or 70 mph design speeds based on current design standards

The locations of horizontal and vertical curves can be cross-referenced to the attached figure.

While the goal is to incorporate the latest improvement into the table, the study team acknowledges there is the possibility improvements may have been missed due to the number of projects along this corridor and nature of work. There are also situations where a tolerance to the design criteria may be applicable, such as maximum grades allowed to be 1 percent steeper in certain conditions, which would lead to a slightly different conclusion.

Findings

Throughout the SD44 study area corridor, there were several vertical and horizontal geometric design elements that do not meet current design criteria or standards, many of which are associated with grade through the rolling terrain along the Missouri River valley. Other vertical elements that were often noted include the minimum K value, stopping sight distance, and minimum curve length. Horizontally, length of curve and minimum curve radius were two items frequently identified.

The most recent resurfacing project, PCN 04X2 in 2016, notes shoulder widths of 4-feet on the SD 44 segment typical sections west of the Missouri River. Because this project did not require any subgrade widening, the typical section design would be applicable to Resurfacing, Restoration, and Rehabilitation (3R) projects and

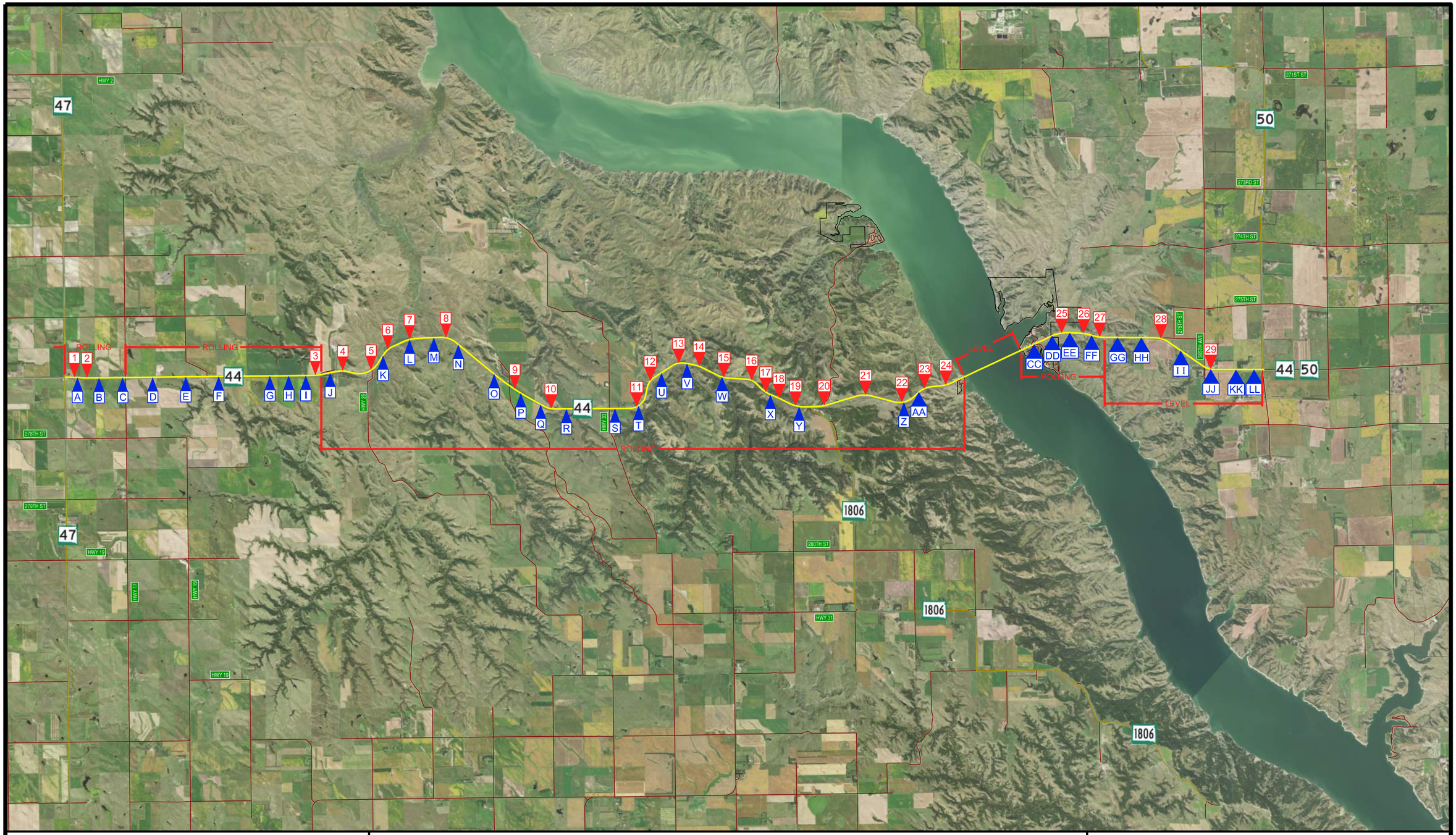
SDDOT Road Design Manual Table 7-3: Lane & Shoulder Widths for 3R Projects (Other than NHS) guidelines. In the case of this project, the guidelines for a roadway between 551 and 1500 ADT would apply: the combined lane and shoulder width should be a minimum of 12 feet. The existing 12-foot lane plus 4-foot wide shoulder would meet the recommendations for a 3R project (but not for new construction or reconstruction per SDDOT Road Design Manual Table 7-1).

Superelevation through horizontal curves was not measured in the field and therefore concluded as unknown. It is likely that the superelevation rate often varies from the original target rate throughout the corridor due to the number of times the highway has been overlaid.

Conclusions

As part of an overall assessment of the highway corridor, the evaluation of existing conditions with current design criteria and standards represents one perspective of the highway. It is understood that design standards change and the highway itself was constructed decades ago using standards current at that time. Further, geotechnical issues with the underlying soil conditions pose another consideration. Any changes to highway alignment or disturbance to the existing grade and hills can create a chain reaction of impacts, resulting in a broad area in need of slope flattening, hydraulic improvements, and stabilization.

This information will be used moving forward to help identify geometric issues and needs as part of the project as well as supplement analyses such as existing and future-year traffic operations and safety. This document will also be the basis for recommending improvements when opportunities arise along the corridor as part of the overall SD44 Environmental Assessment. An example would be in a location where the alignment may be realigned as part of the overall project development. This could be an opportunity to address identified concerns by flattening a vertical curve or increasing the radius of a horizontal curve.



HORIZONTAL CURVE IDENTIFIER

VERTICAL CURVE IDENTIFIER

2017 EXISTING CONDITIONS GEOMETRIC REVIEW
WITH CURRENT DESIGN STANDARDS

South Dakota DOT
Project HP5596(19) 3616 P; P0044()290 3014 N, PCN 05X0
SD 44/Platte-Winner Bridge Corridor Study and Environmental Assessment

Gregory and Charles Mix Counties

HRGreen

NORTH

0 4,000 8,000
Feet

Table 1: SD 44 - STA 2+98.40 TO 876+33.63 - SD 47 TO BRIDGE					
Roadway Element	**Design Guidance*** (70 mph design speed when applicable)	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Typical Section Elements					
Lane Width	12'	SD DOT Table 7-1, Page 7-5	12'	DOC. 04X2, Sheet 4-8, PDF Page 6-9	**MEETS GUIDANCE BASED ON TRAFFIC VOLUMES**
Shoulder Width	6' Surfaced	SD DOT Table 7-1, Page 7-5	4', 6' (STA 731+25 - 799+00)	DOC. 04X2, Sheet 4-8, PDF Page 6-9	**DOES NOT MEET GUIDANCE BASED ON TRAFFIC VOLUMES**
Lane Cross Slope	2.00%	SD DOT Page 7-9	2.00%	DOC. 04X2, Sheet 4-8, PDF Page 6-9	**MEETS GUIDANCE**
Shoulder Cross Slope	4.00%	SD DOT Page 7-13	2.00%	DOC. 04X2, Sheet 4-8, PDF Page 6-9	**DOES NOT MEET GUIDANCE**
Foreslope					
Adjacent to shoulder	4:1 to clear zone	SD DOT 7-21, SD DOT 10-10	4:1	DOC. 01FW, SHEET B6, PDF PAGE 11	**MEETS GUIDANCE**
Clear Zone	30 feet from edge of traveled lane	SD DOT Table 7-9 page 7-22, SD DOT 10-7	30'	DOC. 01FW, SHEET B6, PDF PAGE 11	**MEETS GUIDANCE**
Beyond Clear Zone	3:1	SD DOT 7-21, SD DOT 10-10	3:1	DOC. 01FW, SHEET B6, PDF PAGE 11	**MEETS GUIDANCE**
Horizontal Alignment					
SEE TABLE 2 FOR HORIZONTAL CURVE CRITERIA					
Vertical Alignment					
SEE TABLE 3 FOR VERTICAL CURVE CRITERIA					

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 2: SD 44 - STA 2+98.40 TO 876+33.63 - SD 47 TO BRIDGE					
Roadway Element	**Design Guidance*** 70 mph *(65 mph)*	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Curve 1 - Horizontal Alignment		**R1 = 5+34.74-11+59.99**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	11459.16'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	625.25'	DOC. 02V0, SHEET B17, PDF PAGE 22	**DOES NOT MEET 65 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 2 - Horizontal Alignment		**R2 = 17+47.24-23+59.74**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	11459.16'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	612.50'	DOC. 02V0, SHEET B17, PDF PAGE 22	**DOES NOT MEET 65 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 3 - Horizontal Alignment		**R3 = 216+27.63-226+67.18**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	5729.58'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1039.55'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 65 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 4 - Horizontal Alignment		**R4 = 240+48.32-248+72.20**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	1909.86'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 65 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	823.88'	DOC. 02V0, SHEET B17, PDF PAGE 22	**DOES NOT MEET 65 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 5 - Horizontal Alignment		**R5 = 254+55.02-278+00.85**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	1909.86'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 65 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	2345.83'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 6 - Horizontal Alignment		**R6 = 298+25.71-308+92.88**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	1909.86'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 65 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1067.17'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 2: SD 44 - STA 2+98.40 TO 876+33.63 - SD 47 TO BRIDGE					
Roadway Element	**Design Guidance*** 70 mph *(65 mph)*	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Curve 7 - Horizontal Alignment		**R7 = 319+56.08-330+13.64**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	2864.79'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1057.56'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 8 - Horizontal Alignment		**R8 = 350+82.48-366+31.93**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	2083.48'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1549.45'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 9 - Horizontal Alignment		**R9 = 404+49.79-448+40.22**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	22918.32'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	4390.43'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 10 - Horizontal Alignment		**R10 = 458+52.73-468+21.64**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	1909.86'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 65 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	968.91'	DOC. 02V0, SHEET B17, PDF PAGE 22	**DOES NOT MEET 65 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 11 - Horizontal Alignment		**R11 = 533+36.03-552+93.56**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	1432.40'	DOC. 02V0, SHEET B17, PDF PAGE 22	**DOES NOT MEET 65 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1957.53	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 12 - Horizontal Alignment		**R12 = 569+61.99-580+99.72**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	1432.40'	DOC. 02V0, SHEET B17, PDF PAGE 22	**DOES NOT MEET 65 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1137.73'	DOC. 02V0, SHEET B17, PDF PAGE 22	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 2: SD 44 - STA 2+98.40 TO 876+33.63 - SD 47 TO BRIDGE					
Roadway Element	**Design Guidance*** 70 mph *(65 mph)*	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Curve 13 - Horizontal Alignment		**R13 = 599+89.50-610+68.04**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	1432.40'	DOC. 02V0, SHEET B18, PDF PAGE 23	**DOES NOT MEET 65 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1078.54'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 14 - Horizontal Alignment		**R14 = 618+22.88-626+44.52**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	2864.79'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	821.64'	DOC. 02V0, SHEET B18, PDF PAGE 23	**DOES NOT MEET 65 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 15 - Horizontal Alignment		**R15 = 640+53.52-652+19.42**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	2864.79'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1165.90'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 16 - Horizontal Alignment		**R16 = 666+64.93-677+35.19**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	1432.40'	DOC. 02V0, SHEET B18, PDF PAGE 23	**DOES NOT MEET 65 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1070.26'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 17 - Horizontal Alignment		**R17 = 681+10.28-692+73.09**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	2864.79'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1162.81'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 18 - Horizontal Alignment		**R18 = 695+98.82-703+90.63**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	11459.16'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	791.81'	DOC. 02V0, SHEET B18, PDF PAGE 23	**DOES NOT MEET 65 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 2: SD 44 - STA 2+98.40 TO 876+33.63 - SD 47 TO BRIDGE					
Roadway Element	**Design Guidance*** 70 mph *(65 mph)*	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Curve 19 - Horizontal Alignment		**R19 = 710+05.80-723+73.23**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	2864.79'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1367.43'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 20 - Horizontal Alignment		**R20 = 731+90.19-744+81.18**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	4583.66'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1290.99'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 21 - Horizontal Alignment		**R21 = 769+71.44-783+78.96**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	2546.48'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1407.52'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 22 - Horizontal Alignment		**R22 = 802+42.93-822+13.08**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	1909.86'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 65 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1968.15'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22	6.00%	DOC. 01FW, SHEET B3 PDF PAGE 8	**MEETS 70 MPH DESIGN SPEED**
Curve 23 - Horizontal Alignment		**R23 = 826+30.79-839+10.74**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	1909.86'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 65 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1279.95'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 24 - Horizontal Alignment		**R24 = 855+34.01-864+98.43**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	2864.79'	DOC. 02V0, SHEET B18, PDF PAGE 23	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	964.42'	DOC. 02V0, SHEET B18, PDF PAGE 23	**DOES NOT MEET 65 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 3: SD 44 - STA 2+98.40 TO 876+33.63 - SD 47 TO BRIDGE					
Roadway Element	**Design Guidance*** 70 mph *(65 mph)*	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Curve A - Vertical Alignment - 6+10.00 - 26+20.00					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	505	DOC. 27122, PDF Page 23	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	1044'	DOC. 27122, PDF Page 23	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	983'	SD DOT Vertical Curve Design, Page 6-15	2010'	DOC. 27122, PDF Page 23	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-3.49%	DOC. 27122, PDF Page 23	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	0.49%	DOC. 27122, PDF Page 23	**MEETS MINIMUM**
Curve B - Vertical Alignment - 26+20.00 - 38+00.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	161	DOC. 27122, PDF Page 24	**MEETS 65 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	662'	DOC. 27122, PDF Page 24	**MEETS 65 MPH DESIGN SPEED**
Minimum Curve Length	1324'	SD DOT Vertical Curve Design, Page 6-15	1180'	DOC. 27122, PDF Page 24	**DOES NOT MEET 65 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	3.83%	DOC. 27122, PDF Page 24	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	-3.49%	DOC. 27122, PDF Page 24	**MEETS MINIMUM**
Curve C - Vertical Alignment - 38+10.00 - 68+70.00					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	668	DOC. 27122, PDF Page 24	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	1200'	DOC. 27122, PDF Page 24	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	1132'	SD DOT Vertical Curve Design, Page 6-15	3060'	DOC. 27122, PDF Page 24	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	3.83%	DOC. 27122, PDF Page 24	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	-0.76%	DOC. 27122, PDF Page 24	**MEETS MINIMUM**
Curve D - Vertical Alignment - 75+50.00 - 98+50.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	785	DOC. 27122, PDF Page 25	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	3025'	DOC. 27122, PDF Page 25	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	531'	SD DOT Vertical Curve Design, Page 6-15	2300'	DOC. 27122, PDF Page 25	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-3.69%	DOC. 27122, PDF Page 25	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	-0.76%	DOC. 27122, PDF Page 25	**MEETS MINIMUM**

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 3: SD 44 - STA 2+98.40 TO 876+33.63 - SD 47 TO BRIDGE					
Roadway Element	**Design Guidance*** 70 mph *(65 mph)*	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Curve E - Vertical Alignment - 98+50.00 - 111+50.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	245	DOC. 27122, PDF Page 26	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	960'	DOC. 27122, PDF Page 26	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	961'	SD DOT Vertical Curve Design, Page 6-15	1300'	DOC. 27122, PDF Page 26	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-3.69%	DOC. 27122, PDF Page 26	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	1.62%	DOC. 27122, PDF Page 26	**MEETS MINIMUM**
Curve F - Vertical Alignment - 119+50.00 - 144+00.00					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	503	DOC. 27122, PDF Page 27	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	1041'	DOC. 27122, PDF Page 27	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	1205'	SD DOT Vertical Curve Design, Page 6-15	2450'	DOC. 27122, PDF Page 27	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-3.26%	DOC. 27122, PDF Page 27	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	1.62%	DOC. 27122, PDF Page 27	**MEETS MINIMUM**
Curve G - Vertical Alignment - 144+00.00 - 162+00.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	581	DOC. 27122, PDF Page 28	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	2217'	DOC. 27122, PDF Page 28	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	561'	SD DOT Vertical Curve Design, Page 6-15	1800'	DOC. 27122, PDF Page 28	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-3.26%	DOC. 27122, PDF Page 28	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	-0.16%	DOC. 27122, PDF Page 28	**DOES NOT MEET MINIMUM**
Curve H - Vertical Alignment - 188+00.00 - 202+00.00					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	590	DOC. 27122, PDF Page 29	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	1128'	DOC. 27122, PDF Page 29	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	587'	SD DOT Vertical Curve Design, Page 6-15	1400'	DOC. 27122, PDF Page 29	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-2.53%	DOC. 27122, PDF Page 29	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	-0.16%	DOC. 27122, PDF Page 29	**DOES NOT MEET MINIMUM**

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 3: SD 44 - STA 2+98.40 TO 876+33.63 - SD 47 TO BRIDGE					
Roadway Element	**Design Guidance*** 70 mph *(65 mph)*	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Curve I - Vertical Alignment - 206+00.00 - 214+00.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	202	DOC. 27122, PDF Page 30	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	807'	DOC. 27122, PDF Page 30	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	717'	SD DOT Vertical Curve Design, Page 6-15	800'	DOC. 27122, PDF Page 30	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-2.53%	DOC. 27122, PDF Page 30	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	1.43%	DOC. 12155, PDF Page 30	**MEETS MINIMUM**
Curve J - Vertical Alignment - 220+90.00 - 246+50.00					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	276	DOC. 27122, PDF Page 30	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	771'	DOC. 27122, PDF Page 30	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	2329'	SD DOT Vertical Curve Design, Page 6-15	2600'	DOC. 27122, PDF Page 30	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-8.00%	DOC. 27122, PDF Page 30	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	1.43%	DOC. 12155, PDF Page 30	**MEETS MINIMUM**
Curve K - Vertical Alignment - 270+50.00 - 301+00.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	216	DOC. 27122, PDF Page 32	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	855'	DOC. 27122, PDF Page 32	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	1709'	SD DOT Vertical Curve Design, Page 6-15	2034.3'	DOC. 27122, PDF Page 32	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-7.00%	DOC. 27122, PDF Page 32	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	2.44%	DOC. 27122, PDF Page 32	**MEETS MINIMUM**
Curve L - Vertical Alignment - 316+00.00 - 346+00.00					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	486	DOC. 27122, PDF Page 35	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	1024'	DOC. 27122, PDF Page 35	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	1526'	SD DOT Vertical Curve Design, Page 6-15	3000'	DOC. 27122, PDF Page 35	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-3.74%	DOC. 27122, PDF Page 35	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	2.44%	DOC. 12155, PDF Page 35	**MEETS MINIMUM**

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 3: SD 44 - STA 2+98.40 TO 876+33.63 - SD 47 TO BRIDGE					
Roadway Element	**Design Guidance*** 70 mph *(65 mph)*	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Curve M - Vertical Alignment - 346+00.00 - 356+00.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	147	DOC. 27122, PDF Page 35	**DOES NOT MEET 65 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	612'	DOC. 27122, PDF Page 35	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Curve Length	1230'	SD DOT Vertical Curve Design, Page 6-15	1000'	DOC. 27122, PDF Page 35	**DOES NOT MEET 65 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-3.74%	DOC. 27122, PDF Page 35	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	3.05%	DOC. 12155, PDF Page 35	**MEETS MINIMUM**
Curve N - Vertical Alignment - 365+60.00 - 373+60.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	271	DOC. 27122, PDF Page 36	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	1152'	DOC. 27122, PDF Page 36	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	534'	SD DOT Vertical Curve Design, Page 6-15	800'	DOC. 27122, PDF Page 36	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	6.00%	DOC. 27122, PDF Page 36	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	3.05%	DOC. 12155, PDF Page 36	**MEETS MINIMUM**
Curve O - Vertical Alignment - 392+00.00 - 423+00.00					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	525	DOC. 27122, PDF Page 37	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	1065'	DOC. 27122, PDF Page 37	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	1458'	SD DOT Vertical Curve Design, Page 6-15	3100'	DOC. 27122, PDF Page 37	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	6.00%	DOC. 27122, PDF Page 37	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	0.10%	DOC. 12155, PDF Page 37	**DOES NOT MEET MINIMUM**
Curve P - Vertical Alignment - 423+00.00 - 437+00.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	2177	DOC. 27122, PDF Page 38	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	A = 0.64, SSD IS NOT EFFECTED BY SUCH A SMALL CHANGE	DOC. 27122, PDF Page 38	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	117'	SD DOT Vertical Curve Design, Page 6-15	1400'	DOC. 27122, PDF Page 38	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	0.74%	DOC. 27122, PDF Page 38	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	0.10%	DOC. 12155, PDF Page 38	**DOES NOT MEET MINIMUM**

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 3: SD 44 - STA 2+98.40 TO 876+33.63 - SD 47 TO BRIDGE					
Roadway Element	**Design Guidance*** 70 mph *(65 mph)*	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Curve Q - Vertical Alignment - 444+00.00 - 456+00.00					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	367	DOC. 27122, PDF Page 40	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	890'	DOC. 27122, PDF Page 40	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	809'	SD DOT Vertical Curve Design, Page 6-15	1200'	DOC. 27122, PDF Page 40	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-2.53%	DOC. 27122, PDF Page 40	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.50%	SD DOT Vertical Curve Design, Page 6-10	0.74%	DOC. 27122, PDF Page 40	**MEETS MINIMUM**
Curve R - Vertical Alignment - 463+40.00 - 475+90.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	147	DOC. 27122, PDF Page 40	**DOES NOT MEET 65 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	609'	DOC. 27122, PDF Page 40	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Curve Length	1544'	SD DOT Vertical Curve Design, Page 6-15	1250'	DOC. 27122, PDF Page 40	**DOES NOT MEET 65 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	6.00%	DOC. 27122, PDF Page 40	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.50%	SD DOT Vertical Curve Design, Page 6-10	-2.53%	DOC. 27122, PDF Page 40	**MEETS MINIMUM**
Curve S - Vertical Alignment - 475+90.00 - 535+90.00					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	517	DOC. 27122, PDF Page 42	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	1056'	DOC. 27122, PDF Page 42	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	2868'	SD DOT Vertical Curve Design, Page 6-15	6000'	DOC. 27122, PDF Page 42	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	6.00%	DOC. 27122, PDF Page 42	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	-5.61%	DOC. 27122, PDF Page 42	**MEETS MINIMUM**
Curve T - Vertical Alignment - 535+90.00 - 554+10.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	4667	DOC. 27122, PDF Page 46	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	A = 0.39, SSD IS NOT EFFECTED BY SUCH A SMALL CHANGE	DOC. 27122, PDF Page 46	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	71'	SD DOT Vertical Curve Design, Page 6-15	1820'	DOC. 27122, PDF Page 46	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-6.00%	DOC. 27122, PDF Page 46	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	-5.61%	DOC. 27122, PDF Page 46	**MEETS MINIMUM**

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 3: SD 44 - STA 2+98.40 TO 876+33.63 - SD 47 TO BRIDGE					
Roadway Element	**Design Guidance*** 70 mph *(65 mph)*	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Curve U - Vertical Alignment - 583+95.50 - 602+04.50					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	167	DOC. 27122, PDF Page 47	**MEETS 65 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	681'	DOC. 27122, PDF Page 47	**MEETS 65 MPH DESIGN SPEED**
Minimum Curve Length	1965'	SD DOT Vertical Curve Design, Page 6-15	1809'	DOC. 27122, PDF Page 47	**DOES NOT MEET 65 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-6.00%	DOC. 27122, PDF Page 47	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	4.85%	DOC. 27122, PDF Page 47	**MEETS MINIMUM**
Curve V - Vertical Alignment - 602+06.00 - 642+06.00					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	492	DOC. 27122, PDF Page 48	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	1030'	DOC. 27122, PDF Page 48	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	2008'	SD DOT Vertical Curve Design, Page 6-15	4000'	DOC. 27122, PDF Page 48	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	4.85%	DOC. 27122, PDF Page 48	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	-3.28%	DOC. 27122, PDF Page 48	**MEETS MINIMUM**
Curve W - Vertical Alignment - 642+06.00 - 655+94.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	150	DOC. 27122, PDF Page 49	**DOES NOT MEET 65 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	620'	DOC. 27122, PDF Page 49	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Curve Length	1679'	SD DOT Vertical Curve Design, Page 6-15	1388'	DOC. 27122, PDF Page 49	**DOES NOT MEET 65 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	6.00%	DOC. 27122, PDF Page 49	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	-3.28%	DOC. 27122, PDF Page 49	**MEETS MINIMUM**
Curve X - Vertical Alignment - 685+02.00 - 710+12.00					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	610	DOC. 27122, PDF Page 52	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	1148'	DOC. 27122, PDF Page 52	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	1016'	SD DOT Vertical Curve Design, Page 6-15	2510'	DOC. 27122, PDF Page 52	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	6.00%	DOC. 27122, PDF Page 52	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	1.89%	DOC. 27122, PDF Page 52	**MEETS MINIMUM**

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 3: SD 44 - STA 2+98.40 TO 876+33.63 - SD 47 TO BRIDGE					
Roadway Element	**Design Guidance*** 70 mph *(65 mph)*	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Curve Y - Vertical Alignment - 710+12.00 - 748+20.00					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	483	DOC. 27122, PDF Page 54	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	1021'	DOC. 27122, PDF Page 54	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	1949'	SD DOT Vertical Curve Design, Page 6-15	3808'	DOC. 27122, PDF Page 54	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-6.00%	DOC. 27122, PDF Page 54	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	1.89%	DOC. 27122, PDF Page 54	**MEETS MINIMUM**
Curve Z - Vertical Alignment - 804+50.00 - 814+50.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	146	DOC. 27122, PDF Page 58 & 60	**DOES NOT MEET 65 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	606'	DOC. 27122, PDF Page 58 & 60	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Curve Length	1243'	SD DOT Vertical Curve Design, Page 6-15	1000'	DOC. 27122, PDF Page 58 & 60	**DOES NOT MEET 65 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-6.00%	DOC. 27122, PDF Page 58 & 60	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	0.86%	DOC. 27122, PDF Page 58 & 60	**MEETS MINIMUM**
Curve AA - Vertical Alignment - 822+00.00 - 855+00.00					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	481	DOC. 27122, PDF Page 60	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	1019'	DOC. 27122, PDF Page 60	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	1696'	SD DOT Vertical Curve Design, Page 6-15	3300'	DOC. 27122, PDF Page 60	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-6.00%	DOC. 27122, PDF Page 60	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	0.86%	DOC. 27122, PDF Page 60	**MEETS MINIMUM**
Curve BB - Vertical Alignment - 868+67.00 - 877+07.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	140	DOC. 27122, PDF Page 62	**DOES NOT MEET 65 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	586'	DOC. 27122, PDF Page 62	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Curve Length	1086'	SD DOT Vertical Curve Design, Page 6-15	840'	DOC. 27122, PDF Page 62	**DOES NOT MEET 65 MPH DESIGN SPEED**
Grade					
Maximum Grade	3% - Level, 4% - Rolling *(3% - Level, 4% - Rolling)*	SD DOT Table 6-1, Page 6-8	-6.00%	DOC. 27122, PDF Page 62	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	0.00%	DOC. 27122, PDF Page 62	**DOES NOT MEET MINIMUM**

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 4: SD 44 - STA 10+00.00 TO 66+55.50 - BRIDGE					
Roadway Element	**Design Guidance*** 70 mph	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Typical Section Elements					
Lane Width	12'	SD DOT Table 7-1, Page 7-5	12'	DOC 00XY & 003X, Sheet 20, PDF page 21; Sheet 13, PDF page 14	**MEETS GUIDANCE BASED ON TRAFFIC VOLUMES**
Shoulder Width	6' Surfaced	SD DOT Table 7-1, Page 7-5	2'	DOC 00XY & 003X, Sheet 20, PDF page 21; Sheet 13, PDF page 14	**DOES NOT MEET GUIDANCE BASED ON TRAFFIC VOLUMES**
Lane Cross Slope	2.00%	SD DOT Page 7-9			**UNKNOWN VERIFY IN FIELD**
Shoulder Cross Slope	4.00%	SD DOT Page 7-13			**UNKNOWN VERIFY IN FIELD**
Horizontal Alignment - no horizontal curves across bridge span					
Vertical Alignment - no vertical curves across bridge span					
Grade					
Maximum Grade	3% - Level	SD DOT Table 6-1, Page 6-8	0.00%	DOC. 5450, Sheet 34 - 40, PDF page 34-40	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	0.00%	DOC. 5450, Sheet 34 - 40, PDF page 34-40	**DOES NOT MEET MINIMUM**

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 5: SD 44 - STA1 66+55.50 to STA1 244+94.42 (STA2 8+62.35) to STA2 49+84.28 - BRIDGE TO SD 50					
Roadway Element	**Design Guidance*** 70 mph	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Typical Section Elements					
Lane Width	12'	SD DOT Table 7-1, Page 7-5	12'	DOC 002K, SHEET 4-7, PDF PAGE 5-8	**MEETS GUIDANCE BASED ON TRAFFIC VOLUMES**
Shoulder Width	6' Surfaced	SD DOT Table 7-1, Page 7-5	8'	DOC 002K, SHEET 4-7, PDF PAGE 5-8	**MEETS GUIDANCE BASED ON TRAFFIC VOLUMES**
Lane Cross Slope	2.00%	SD DOT Page 7-9	2.00%	DOC 002K, SHEET 4-7, PDF PAGE 5-8	**MEETS GUIDANCE**
Shoulder Cross Slope	4.00%	SD DOT Page 7-13	4.00%	DOC 002K, SHEET 4-7, PDF PAGE 5-8	**MEETS GUIDANCE**
Foreslope					
Adjacent to shoulder	4:1 to clear zone	SD DOT 7-21, SD DOT 10-10	4:1	DOC 002K, SHEET 4-7, PDF PAGE 5-8	**MEETS GUIDANCE**
Clear Zone	30 feet from edge of traveled lane	SD DOT Table 7-9 page 7-22, SD DOT 10-7	Variable	DOC. 12155, Sheet 2, PDF Page 2	**UNKNOWN**
Beyond Clear Zone	3:1	SD DOT 7-21, SD DOT 10-10	4:1	DOC. 12155, Sheet 2, PDF Page 2	**MEETS GUIDANCE**
Horizontal Alignment					
SEE TABLE 6 FOR HORIZONTAL CURVE CRITERIA					
Vertical Alignment					
SEE TABLE 7 FOR VERTICAL CURVE CRITERIA					

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 6: SD 44 - STA1 66+55.50 to STA1 244+94.42 (STA2 8+62.35) to STA2 49+84.28 - BRIDGE TO SD 50					
Roadway Element	**Design Guidance*** 70 mph *(65 mph)*	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Curve 25 - Horizontal Alignment		**R1 = 94+09.22 - 109+92.55**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	3274.05'	DOC. 12155, SHEET 11, PDF PAGE 11	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1583.33'	DOC. 12155, SHEET 11, PDF PAGE 11	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 26 - Horizontal Alignment		**R2 = 118+82.46 - 129+22.46**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	4583.66'	DOC. 12155, SHEET 12, PDF PAGE 12	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1040'	DOC. 12155, SHEET 12, PDF PAGE 12	**MEETS 65 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 27 - Horizontal Alignment		**R3 = 131+18.79 - 141+26.57**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	5729.58'	DOC. 12155, SHEET 12, PDF PAGE 12	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1007.78'	DOC. 12155, SHEET 12, PDF PAGE 12	**MEETS 65 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 28 - Horizontal Alignment		**R4 = 184+59.90 - 198+39.90**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	2291.83'	DOC. 12155, SHEET 15, PDF PAGE 15	**MEETS 70 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1380'	DOC. 12155, SHEET 15, PDF PAGE 15	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**
Curve 29 - Horizontal Alignment		**R5 = 233+26.55 - 244+94.42**			
Minimum Curve Radius e_{max} = 6%	2040' *(1660')*	SD DOT Table 5-3, Page 5-22	1909.86'	DOC. 12155, SHEET 16, PDF PAGE 16	**MEETS 65 MPH DESIGN SPEED**
Length of Curve	1050' *(975')*	SD DOT Page 5-4	1167.87'	DOC. 12155, SHEET 16, PDF PAGE 16	**MEETS 70 MPH DESIGN SPEED**
Superelevation e_{max}	6.00% *(6.00%)*	SD DOT Table 5-3, Page 5-22			**UNKNOWN VERIFY IN FIELD**

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 7: SD 44 - STA1 66+55.50 to STA1 244+94.42 (STA2 8+62.35) to STA2 49+84.28 - BRIDGE TO SD 50					
Roadway Element	**Design Guidance*** 70 mph *(65 mph)*	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Curve CC - Vertical Alignment - 66+55.50 - 76+55.50					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	344	DOC. 12155, PDF Page 10	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	1427'	DOC. 12155, PDF Page 10	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	527'	SD DOT Vertical Curve Design, Page 6-15	1000'	DOC. 12155, PDF Page 10	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	2.91%	DOC. 12155, PDF Page 10	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	0.00%	DOC. 12155, PDF Page 10	**DOES NOT MEET MINIMUM**
Curve DD - Vertical Alignment - 89+50.00 - 102+50.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	637	DOC. 12155, PDF Page 11	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	5262'	DOC. 12155, PDF Page 11	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	370'	SD DOT Vertical Curve Design, Page 6-15	1300'	DOC. 12155, PDF Page 11	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	4.95%	DOC. 12155, PDF Page 11	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	2.91%	DOC. 12155, PDF Page 11	**MEETS MINIMUM**
Curve EE - Vertical Alignment - 102+50.00 - 126+50.00					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	500	DOC. 12155, PDF Page 12	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	1039'	DOC. 12155, PDF Page 12	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	1187'	SD DOT Vertical Curve Design, Page 6-15	2400'	DOC. 12155, PDF Page 12	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	4.95%	DOC. 12155, PDF Page 12	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	0.15%	DOC. 12155, PDF Page 12	**DOES NOT MEET MINIMUM**
Curve FF - Vertical Alignment - 126+50.00 - 143+50.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	350	DOC. 12155, PDF Page 12	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	1332'	DOC. 12155, PDF Page 12	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	879'	SD DOT Vertical Curve Design, Page 6-15	1700'	DOC. 12155, PDF Page 12	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	4% - Rolling *(4% - Rolling)*	SD DOT Table 6-1, Page 6-8	5.00%	DOC. 12155, PDF Page 12	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	0.15%	DOC. 12155, PDF Page 12	**DOES NOT MEET MINIMUM**

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 7: SD 44 - STA1 66+55.50 to STA1 244+94.42 (STA2 8+62.35) to STA2 49+84.28 - BRIDGE TO SD 50					
Roadway Element	**Design Guidance*** 70 mph *(65 mph)*	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Curve GG - Vertical Alignment - 143+65.96 - 156+34.04					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	528	DOC. 12155, PDF Page 13	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	1068'	DOC. 12155, PDF Page 13	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	593'	SD DOT Vertical Curve Design, Page 6-15	1268.08'	DOC. 12155, PDF Page 13	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	3% - Level *(3% - Level)*	SD DOT Table 6-1, Page 6-8	5.00%	DOC. 12155, PDF Page 13	**DOES NOT MEET 65 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	2.60%	DOC. 12155, PDF Page 13	**MEETS MINIMUM**
Curve HH - Vertical Alignment - 172+60.00 - 194+60.00					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	484	DOC. 12155, PDF Page 14	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	1022'	DOC. 12155, PDF Page 14	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	1124'	SD DOT Vertical Curve Design, Page 6-15	2200'	DOC. 12155, PDF Page 14	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	3% - Level *(3% - Level)*	SD DOT Table 6-1, Page 6-8	2.60%	DOC. 12155, PDF Page 14	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	1.95%	DOC. 12155, PDF Page 14	**MEETS MINIMUM**
Curve II - Vertical Alignment - 203+50.00 - 219+50.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	475	DOC. 12155, PDF Page 15	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	A = 1.69, SSD IS NOT EFFECTED BY SUCH A SMALL CHANGE	DOC. 12155, PDF Page 15	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	305'	SD DOT Vertical Curve Design, Page 6-15	800'	DOC. 12155, PDF Page 15	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	3% - Level *(3% - Level)*	SD DOT Table 6-1, Page 6-8	1.95%	DOC. 12155, PDF Page 15	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	0.26%	DOC. 12155, PDF Page 15	**DOES NOT MEET MINIMUM**
Curve JJ - Vertical Alignment - 233+00.00 - 241+00.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	963	DOC. 12155, PDF Page 16	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	A = 0.83, SSD IS NOT EFFECTED BY SUCH A SMALL CHANGE	DOC. 12155, PDF Page 16	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	151'	SD DOT Vertical Curve Design, Page 6-15	800'	DOC. 12155, PDF Page 16	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	3% - Level *(3% - Level)*	SD DOT Table 6-1, Page 6-8	0.57%	DOC. 12155, PDF Page 16	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	0.26%	DOC. 12155, PDF Page 16	**DOES NOT MEET MINIMUM**

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.

Table 7: SD 44 - STA1 66+55.50 to STA1 244+94.42 (STA2 8+62.35) to STA2 49+84.28 - BRIDGE TO SD 50					
Roadway Element	**Design Guidance*** 70 mph *(65 mph)*	**Source**	**Existing Condition**	**Exist. Plan Ref. Location**	**Comments**
Curve KK - Vertical Alignment - 30+00.00 - 38+00.00					
Sag Curve					
Minimum K Value	181 *(157)*	SD DOT Table 6-6, Page 6-16	1860	DOC. 12155, PDF Page 17	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-6, Page 6-16	A = 0.43, SSD IS NOT EFFECTED BY SUCH A SMALL CHANGE	DOC. 12155, PDF Page 17	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	78'	SD DOT Vertical Curve Design, Page 6-15	800'	DOC. 12155, PDF Page 17	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	3% - Level *(3% - Level)*	SD DOT Table 6-1, Page 6-8	1.00%	DOC. 12155, PDF Page 17	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	0.57%	DOC. 12155, PDF Page 17	**MEETS MINIMUM**
Curve LL - Vertical Alignment - 45+90.00 - 53+90.00					
Crest Curve					
Minimum K Value	247 *(193)*	SD DOT Table 6-5, Page 6-16	888	DOC. 12155, PDF Page 17	**MEETS 70 MPH DESIGN SPEED**
Stopping Sight Distance	730' *(645')*	SD DOT Table 6-5, Page 6-16	1598'	DOC. 12155, PDF Page 17	**MEETS 70 MPH DESIGN SPEED**
Minimum Curve Length	223'	SD DOT Vertical Curve Design, Page 6-15	800'	DOC. 12155, PDF Page 17	**MEETS 70 MPH DESIGN SPEED**
Grade					
Maximum Grade	3% - Level *(3% - Level)*	SD DOT Table 6-1, Page 6-8	1.00%	DOC. 12155, PDF Page 17	**MEETS 70 MPH DESIGN SPEED**
Minimum Grade	0.30%	SD DOT Vertical Curve Design, Page 6-10	0.10%	DOC. 12155, PDF Page 17	**DOES NOT MEET MINIMUM**

*Comparison based on design speed when applicable. Forecasted volumes within 551-1500 ADT range.