
Appendix G

Geometric Design Documentation

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**Project Design Criteria
Mainline**

Matrix 1 _____ **Row 11** _____

This checklist is to confirm interpretation of standards. Your project may require that additional/different/or fewer Design Elements be addressed.

Design Class	Full
Functional Class	Interstate
Design Year	2040
Design Speed	60 MPH
ADT	112,000-132,000
Truck Percentage	
Right of Way Width	Varies

DESIGN ELEMENT	Design Level (B/M/F)	Standard	REFERENCE & COMMENTS
Horizontal Alignment	F		
Stopping Sight Distance	F		Meets; DM Ex 1260-4,9 (July 2013)
Max. Superelevation	F		Meets; DM EX 1250-4b $e_{max} = 8\%$ (6% or less will be used)
Vertical Alignment	F		
Maximum Grade		3%	
Stopping Sight Distance	F	570'	Meets; DM EX 1260-1 and 1260-2
Passing Sight Distance		N/A	
Decision Sight Distance	F		BM EX 1260-15
Lane Width			
Number of Lanes	F	4	
Lane Width	F	12'	DM EX 1240-5, Lane width reduced to 11ft from Gravelly Lake Thorne and from Main Gate to DuPont-Steilacoom
Turning Roadway Width	N/A		
Shoulder Width			
Shoulder Width-Inside	F	10'	DM EX 1240-5, Shoulder width reduced at the Main gate Interchange to limit impacts to existing pavement and median (no widening to outside) Inside shoulder is 4ft. Within the Main Gate interchange the shoulder will be reduced to 4ft.
Shoulder Width-Outside	F	10'	DM EX 1240-5, Shoulder width reduced at the Main gate Interchange and to limit impacts to existing pavement and median (no widening to outside) Within the Main Gate

DESIGN ELEMENT	Design Level (B/M/F)	Standard	REFERENCE & COMMENTS
			interchange the shoulder will be reduced to 4ft. Shoulder width also reduced to 4' at Throne Lane interchange where NB on-ramp meets mainline.
Lane Transition			
Channelization Tapers	F		Per DM Section 1210.07
On/Off Connections	F		DM EX 1360-14a and 1360-13d
Median Width	F	22'	DM EX 1140-4; Shoulder width reduced at the Main gate Interchange to limit impacts to existing pavement and median (no widening to outside) Inside shoulder is 4ft with total median width equaling 10ft.
Cross Slope Lane	F	2%	Meets; DM EX 1230
Cross Slope Shoulder	F	2%	Meets; DM EX 1230
Fill/Ditch Slopes			
Fill Slopes	F	6:1	DM EX 1230
Ditch In-slopes	F	6:1	DM EX 1230 – Slopes of ___ used to minimize RW needs and impacts
Access	F	Full	
Clear Zone	F	34'	DM EX 1600-2
Signing	F		To be addressed during future design phase
Delineation	F		Meets; Preliminary layout only at this phase, to be addressed during future design phase
Illumination	F		To be addressed during future design phase
Basic Safety	N/A		
Bicycles			Bicycles are accommodated on cross streets at interchanges
Pedestrians			Pedestrians are accommodated on cross streets at interchanges

DESIGN ELEMENT	Design Level (B/M/F)	Standard	REFERENCE & COMMENTS
Bridges			
Lane Width			Mainline bridge width is designed to meet roadway.
Bridge #			
Number of Lanes			
Lane Width			
Shoulder Width			
Bridge #			
Shoulder Width-Inside			
Shoulder Width-Outside			
Vertical Clearance			
Bridge #	F	16.5'	Meets
Structural Capacity			
Bridge #			Per Bridge Design Manual
Intersections			
Design Vehicle		WB-67	
Turn Radii			
Intersection Radii - Left			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Radii - Right			
Intersection Angle			
			All ramp terminal intersections are roundabouts designed per chapter 1320.
Intersection Sight Distance			
Barriers			
Terminals & Transition Sections	F		Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)

<i>DESIGN ELEMENT</i>	Design Level (B/M/F)	Standard	<i>REFERENCE & COMMENTS</i>
<i>Standard Run</i>	F		Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Bridge Rail</i>	F		Rail Type to be selected in future design phase per DM Section 1610.04(3)

Project Design Criteria Ramps & Collector Distributors

Matrix 2 Row 11

This checklist is to confirm interpretation of design criteria. Your project may require that additional/different/or fewer Design Elements be addressed.

Design Class	I-1
Functional Class	Ramp – Berkeley Interchange NB Off Ramp - Alignment
Design Year	2040
Design Speed	40 MPH
ADT	
Truck Percentage	
Right of Way Width	Not less than required for all design elements, DM Ex 1140-5 (July 2012)

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
Horizontal Alignment	F			
Stopping Sight Distance		Full		Meets; DM Ex 1260-1 and 1260-2
Max. Superelevation		6%	MS	Max Super=6%; DM 1250.04 & Ex 1250-4b (June, 2009)
Vertical Alignment	F			
Maximum Grade		3% -5%	MS	Max Grade=3%; Downgrades up to 2% greater, DM 1360.05(3) & Ex 1360-5 (June, 2009)
Stopping Sight Distance		Full		Meets; DM Ex 1260-1, Ex 1260-2 & Ex 1260-7 (July 2013)
Passing Sight Distance		N/A		
Decision Sight Distance		N/A		
Lane Width	F			
Number of Lanes		1		Additional lanes for queuing at ramp terminals and meters
Lane Width		15'	MS	Lane=15'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Turning Roadway Width		15'	MS	Width=15'; DM 1240.04(3) & Ex 1240-3a (July, 2011)
Shoulder Width	F			
Shoulder Width-Inside		2'	MS	Shoulder=4'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Shoulder Width-Outside		8'	MS	Shoulder=8'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Lane Transition				
Channelization Tapers	F	1:20	MS	DM Ex 1360-14a (July, 2011)

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
On/Off Connections	F		MS	DM Ex 1360-06 (July, 2011)
Cross Slope Lane	F	2%	MS	Cross Slope=2%; DM 1230.04(1) & Ex 1230-1 (June, 2009)
Cross Slope Shoulder	F	2%	MS	Cross Slope=2%; DM 1230.04(3) & Ex 1230-1 (June, 2009)
Fill/Ditch Slopes				
Fill Slopes	F		MS	Max Slope=2:1; DM 1230.06(1) & Ex 1230-1 (June, 2009)
Ditch In-slopes	F		MS	Max Slope=2:1; DM 1230.06(1) & Ex 1230-1 (June, 2009)
Access	F	Full	MS	DM Ex 530-1a (June, 2009)
Clear Zone	F		MS	DM Chapter 1600
Signing	F		MS	DM Chapter 1020
Delineation	F		MS	DM Chapter 1030
Illumination	F		MS	DM Chapter 1040
Basic Safety		N/A		
Vertical Clearance		N/A		
Bridge #				
Bicycles		N/A		
Pedestrians		N/A		
Ramp Terminals				
Design Vehicle		WB -67		
Turn Radii				
Intersection Radii - Left	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Radii - Right	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
Intersection Angle	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Sight Distance		N/A		
Barriers				
Terminals & Transition Sections	F		MS	Rail Type to be selected in future design phase per DM Section 1610.04(3)
Standard Run	F		MS	Rail Type to be selected in future design phase per DM Section 1610.04(3)
Bridge Rail	F			Rail Type to be selected in future design phase per DM Section 1610.04(3)
Cross Roads				
Lane Width				
Number of Lanes		2-4		Number of lanes per traffic analysis
Lane Width		12'		
Turning Roadway Width				
Shoulder Width				
Shoulder Width-Inside		8'		Shoulder width in non-curbed areas
Shoulder Width-Outside		8'		
Fill/Ditch Slopes				
Fill Slopes				
Ditch In-slopes				
Access				
Clear Zone				

<i>DESIGN ELEMENT</i>	Design Level (B/M/F)	Standard	MS / DNMS	<i>REFERENCE & COMMENTS</i>
<i>Signing</i>	F			To be addressed during future design phase
<i>Delineation</i>	F			Meets; Preliminary layout only at this phase, to be addressed during future design phase
<i>Illumination</i>	F			To be addressed during future design phase
<i>Basic Safety</i>		N/A		
<i>Vertical Clearance</i>				
Bridge #				
<i>Bicycles</i>	F	5'		
<i>Pedestrians</i>	F	5'		
<i>Barriers</i>				
<i>Terminals & Transition Sections</i>				Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Standard Run</i>				Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Bridge Rail</i>				Rail Type to be selected in future design phase per DM Section 1610.04(3)

Project Design Criteria Ramps & Collector Distributors

Matrix 2 Row 11

This checklist is to confirm interpretation of design criteria. Your project may require that additional/different/or fewer Design Elements be addressed.

Design Class	I-1
Functional Class	Ramp – Berkeley Interchange NB On Ramp - Alignment
Design Year	2040
Design Speed	40 MPH
ADT	
Truck Percentage	
Right of Way Width	Not less than required for all design elements, DM Ex 1140-5 (July 2012)

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
Horizontal Alignment	F			
Stopping Sight Distance		Full		Meets; DM Ex 1260-1 and 1260-2
Max. Superelevation		6%	MS	Max Super=6%; DM 1250.04 & Ex 1250-4b (June, 2009)
Vertical Alignment	F			
Maximum Grade		3% -5%	MS	Max Grade=4%; Downgrades up to 2% greater, DM 1360.05(3) & Ex 1360-5 (June, 2009)
Stopping Sight Distance		Full		Meets; DM Ex 1260-1, Ex 1260-2 & Ex 1260-7 (July 2013)
Passing Sight Distance		N/A		
Decision Sight Distance		N/A		
Lane Width	F			
Number of Lanes		1		Additional lanes for queuing at ramp terminals and meters
Lane Width		15'	MS	Lane=15'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Turning Roadway Width		15'	MS	Width=15'; DM 1240.04(3) & Ex 1240-3a (July, 2011)
Shoulder Width	F			
Shoulder Width-Inside		2'	MS	Shoulder=4'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Shoulder Width-Outside		8'	DNMS	Shoulder=8'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
				Shoulder meets where practicable and is narrowed to 3ft to avoid impacts to JBLM barrier wall and residential properties
Lane Transition				
Channelization Tapers	F	1:20	MS	DM Ex 1360-14a (July, 2011)

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
On/Off Connections	F		MS	DM Ex 1360-06 (July, 2011)
Cross Slope Lane	F	2%	MS	Cross Slope=2%; DM 1230.04(1) & Ex 1230-1 (June, 2009)
Cross Slope Shoulder	F	2%	MS	Cross Slope=2%; DM 1230.04(3) & Ex 1230-1 (June, 2009)
Fill/Ditch Slopes				
Fill Slopes	F		MS	Max Slope=2:1; DM 1230.06(1) & Ex 1230-1 (June, 2009)
Ditch In-slopes	F		MS	Max Slope=2:1; DM 1230.06(1) & Ex 1230-1 (June, 2009)
Access	F	Full	MS	DM Ex 530-1a (June, 2009)
Clear Zone	F		MS	DM Chapter 1600
Signing	F		MS	DM Chapter 1020
Delineation	F		MS	DM Chapter 1030
Illumination	F		MS	DM Chapter 1040
Basic Safety		N/A		
Vertical Clearance		N/A		
Bridge #				
Bicycles		N/A		
Pedestrians		N/A		
Ramp Terminals				
Design Vehicle		WB -67		
Turn Radii				
Intersection Radii - Left	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Radii - Right	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
Intersection Angle	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Sight Distance		N/A		
Barriers				
Terminals & Transition Sections	F		MS	Rail Type to be selected in future design phase per DM Section 1610.04(3)
Standard Run	F		MS	Rail Type to be selected in future design phase per DM Section 1610.04(3)
Bridge Rail	F			Rail Type to be selected in future design phase per DM Section 1610.04(3)
Cross Roads				
Lane Width				
Number of Lanes		2-4		Number of lanes per traffic analysis
Lane Width		12'		
Turning Roadway Width				
Shoulder Width				
Shoulder Width-Inside		8'		Shoulder width in non-curbed areas
Shoulder Width-Outside		8'		
Fill/Ditch Slopes				
Fill Slopes				
Ditch In-slopes				
Access				
Clear Zone				

<i>DESIGN ELEMENT</i>	Design Level (B/M/F)	Standard	MS / DNMS	<i>REFERENCE & COMMENTS</i>
<i>Signing</i>	F			To be addressed during future design phase
<i>Delineation</i>	F			Meets; Preliminary layout only at this phase, to be addressed during future design phase
<i>Illumination</i>	F			To be addressed during future design phase
<i>Basic Safety</i>		N/A		
<i>Vertical Clearance</i>				
Bridge #				
<i>Bicycles</i>	F	5'		
<i>Pedestrians</i>	F	5'		
<i>Barriers</i>				
<i>Terminals & Transition Sections</i>				Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Standard Run</i>				Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Bridge Rail</i>				Rail Type to be selected in future design phase per DM Section 1610.04(3)

Project Design Criteria Ramps & Collector Distributors

Matrix 2Row 11

This checklist is to confirm interpretation of design criteria. Your project may require that additional/different/or fewer Design Elements be addressed.

Design Class	I-1
Functional Class	Ramp – Berkeley Interchange SB Off Ramp - Alignment
Design Year	2040
Design Speed	40 MPH
ADT	
Truck Percentage	
Right of Way Width	Not less than required for all design elements, DM Ex 1140-5 (July 2012)

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
Horizontal Alignment	F			
Stopping Sight Distance		Full		Meets; DM Ex 1260-1 and 1260-2
Max. Superelevation		6%	MS	Max Super=6%; DM 1250.04 & Ex 1250-4b (June, 2009)
Vertical Alignment	F			
Maximum Grade		3% -5%	MS	Max Grade=3%; Downgrades up to 2% greater, DM 1360.05(3) & Ex 1360-5 (June, 2009)
Stopping Sight Distance		Full		Meets; DM Ex 1260-1, Ex 1260-2 & Ex 1260-7 (July 2013)
Passing Sight Distance		N/A		
Decision Sight Distance		N/A		
Lane Width	F			
Number of Lanes		1		Additional lanes for queuing at ramp terminals and meters
Lane Width		15'	MS	Lane=15'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Turning Roadway Width		15'	MS	Width=15'; DM 1240.04(3) & Ex 1240-3a (July, 2011)
Shoulder Width	F			
Shoulder Width-Inside		2'	MS	Shoulder=4'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Shoulder Width-Outside		8'	MS	Shoulder=8'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Lane Transition				
Channelization Tapers	F	1:20	MS	DM Ex 1360-14a (July, 2011)

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
On/Off Connections	F		MS	DM Ex 1360-06 (July, 2011)
Cross Slope Lane	F	2%	MS	Cross Slope=2%; DM 1230.04(1) & Ex 1230-1 (June, 2009)
Cross Slope Shoulder	F	2%	MS	Cross Slope=2%; DM 1230.04(3) & Ex 1230-1 (June, 2009)
Fill/Ditch Slopes				
Fill Slopes	F		MS	Max Slope=2:1; DM 1230.06(1) & Ex 1230-1 (June, 2009)
Ditch In-slopes	F		MS	Max Slope=2:1; DM 1230.06(1) & Ex 1230-1 (June, 2009)
Access	F	Full	MS	DM Ex 530-1a (June, 2009)
Clear Zone	F		MS	DM Chapter 1600
Signing	F		MS	DM Chapter 1020
Delineation	F		MS	DM Chapter 1030
Illumination	F		MS	DM Chapter 1040
Basic Safety		N/A		
Vertical Clearance		N/A		
Bridge #				
Bicycles		N/A		
Pedestrians		N/A		
Ramp Terminals				
Design Vehicle		WB -67		
Turn Radii				
Intersection Radii - Left	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Radii - Right	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
Intersection Angle	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Sight Distance		N/A		
Barriers				
Terminals & Transition Sections	F		MS	Rail Type to be selected in future design phase per DM Section 1610.04(3)
Standard Run	F		MS	Rail Type to be selected in future design phase per DM Section 1610.04(3)
Bridge Rail	F			Rail Type to be selected in future design phase per DM Section 1610.04(3)
Cross Roads				
Lane Width				
Number of Lanes		2-4		Number of lanes per traffic analysis
Lane Width		12'		
Turning Roadway Width				
Shoulder Width				
Shoulder Width-Inside		8'		Shoulder width in non-curbed areas
Shoulder Width-Outside		8'		
Fill/Ditch Slopes				
Fill Slopes				
Ditch In-slopes				
Access				
Clear Zone				

<i>DESIGN ELEMENT</i>	Design Level (B/M/F)	Standard	MS / DNMS	<i>REFERENCE & COMMENTS</i>
<i>Signing</i>	F			To be addressed during future design phase
<i>Delineation</i>	F			Meets; Preliminary layout only at this phase, to be addressed during future design phase
<i>Illumination</i>	F			To be addressed during future design phase
<i>Basic Safety</i>		N/A		
<i>Vertical Clearance</i>				
Bridge #				
<i>Bicycles</i>	F	5'		
<i>Pedestrians</i>	F	5'		
<i>Barriers</i>				
<i>Terminals & Transition Sections</i>				Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Standard Run</i>				Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Bridge Rail</i>				Rail Type to be selected in future design phase per DM Section 1610.04(3)

Project Design Criteria Ramps & Collector Distributors

Matrix 2 Row 11

This checklist is to confirm interpretation of design criteria. Your project may require that additional/different/or fewer Design Elements be addressed.

Design Class	I-1
Functional Class	Ramp – Berkeley Interchange SB On Ramp - Alignment
Design Year	2040
Design Speed	40 MPH
ADT	
Truck Percentage	
Right of Way Width	Not less than required for all design elements, DM Ex 1140-5 (July 2012)

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
Horizontal Alignment	F			
Stopping Sight Distance		Full		Meets; DM Ex 1260-1 and 1260-2
Max. Superelevation		6%	MS	Max Super=6%; DM 1250.04 & Ex 1250-4b (June, 2009)
Vertical Alignment	F			
Maximum Grade		3% -5%	MS	Max Grade=4.5%; Downgrades up to 2% greater, DM 1360.05(3) & Ex 1360-5 (June, 2009)
Stopping Sight Distance		Full		Meets; DM Ex 1260-1, Ex 1260-2 & Ex 1260-7 (July 2013)
Passing Sight Distance		N/A		
Decision Sight Distance		N/A		
Lane Width	F			
Number of Lanes		1		Additional lanes for queuing at ramp terminals and meters
Lane Width		15'	MS	Lane=15'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Turning Roadway Width		15'	MS	Width=15'; DM 1240.04(3) & Ex 1240-3a (July, 2011)
Shoulder Width	F			
Shoulder Width-Inside		2'	MS	Shoulder=4'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Shoulder Width-Outside		8'	MS	Shoulder=8'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Lane Transition				
Channelization Tapers	F	1:20	MS	DM Ex 1360-14a (July, 2011)

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
On/Off Connections	F		MS	DM Ex 1360-06 (July, 2011)
Cross Slope Lane	F	2%	MS	Cross Slope=2%; DM 1230.04(1) & Ex 1230-1 (June, 2009)
Cross Slope Shoulder	F	2%	MS	Cross Slope=2%; DM 1230.04(3) & Ex 1230-1 (June, 2009)
Fill/Ditch Slopes				
Fill Slopes	F		MS	Max Slope=2:1; DM 1230.06(1) & Ex 1230-1 (June, 2009)
Ditch In-slopes	F		MS	Max Slope=2:1; DM 1230.06(1) & Ex 1230-1 (June, 2009)
Access	F	Full	MS	DM Ex 530-1a (June, 2009)
Clear Zone	F		MS	DM Chapter 1600
Signing	F		MS	DM Chapter 1020
Delineation	F		MS	DM Chapter 1030
Illumination	F		MS	DM Chapter 1040
Basic Safety		N/A		
Vertical Clearance		N/A		
Bridge #				
Bicycles		N/A		
Pedestrians		N/A		
Ramp Terminals				
Design Vehicle		WB -67		
Turn Radii				
Intersection Radii - Left	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Radii - Right	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
Intersection Angle	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Sight Distance		N/A		
Barriers				
Terminals & Transition Sections	F		MS	Rail Type to be selected in future design phase per DM Section 1610.04(3)
Standard Run	F		MS	Rail Type to be selected in future design phase per DM Section 1610.04(3)
Bridge Rail	F			Rail Type to be selected in future design phase per DM Section 1610.04(3)
Cross Roads				
Lane Width				
Number of Lanes		2-4		Number of lanes per traffic analysis
Lane Width		12'		
Turning Roadway Width				
Shoulder Width				
Shoulder Width-Inside		8'		Shoulder width in non-curbed areas
Shoulder Width-Outside		8'		
Fill/Ditch Slopes				
Fill Slopes				
Ditch In-slopes				
Access				
Clear Zone				

<i>DESIGN ELEMENT</i>	Design Level (B/M/F)	Standard	MS / DNMS	<i>REFERENCE & COMMENTS</i>
<i>Signing</i>	F			To be addressed during future design phase
<i>Delineation</i>	F			Meets; Preliminary layout only at this phase, to be addressed during future design phase
<i>Illumination</i>	F			To be addressed during future design phase
<i>Basic Safety</i>		N/A		
<i>Vertical Clearance</i>				
Bridge #				
<i>Bicycles</i>	F	5'		
<i>Pedestrians</i>	F	5'		
<i>Barriers</i>				
<i>Terminals & Transition Sections</i>				Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Standard Run</i>				Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Bridge Rail</i>				Rail Type to be selected in future design phase per DM Section 1610.04(3)

Project Design Criteria Ramps & Collector Distributors

Matrix 2Row 11

This checklist is to confirm interpretation of design criteria. Your project may require that additional/different/or fewer Design Elements be addressed.

Design Class	I-1
Functional Class	Ramp – Thorne Interchange SB Off Ramp - Alignment
Design Year	2040
Design Speed	40 MPH
ADT	
Truck Percentage	
Right of Way Width	Not less than required for all design elements, DM Ex 1140-5 (July 2012)

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
Horizontal Alignment	F			
Stopping Sight Distance		Full		Meets; DM Ex 1260-1 and 1260-2
Max. Superelevation		6%	MS	Max Super=6%; DM 1250.04 & Ex 1250-4b (June, 2009)
Vertical Alignment	F			
Maximum Grade		3% -5%	MS	Max Grade=3%; Downgrades up to 2% greater, DM 1360.05(3) & Ex 1360-5 (June, 2009)
Stopping Sight Distance		Full		Meets; DM Ex 1260-1, Ex 1260-2 & Ex 1260-7 (July 2013)
Passing Sight Distance		N/A		
Decision Sight Distance		N/A		
Lane Width	F			
Number of Lanes		1		Additional lanes for queuing at ramp terminals and meters
Lane Width		15'	MS	Lane=15'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Turning Roadway Width		15'	MS	Width=15'; DM 1240.04(3) & Ex 1240-3a (July, 2011)
Shoulder Width	F			
Shoulder Width-Inside		2'	MS	Shoulder=4'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Shoulder Width-Outside		8'	MS	Shoulder=8'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Lane Transition				
Channelization Tapers	F	1:20	MS	DM Ex 1360-14a (July, 2011)

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
On/Off Connections	F		MS	DM Ex 1360-06 (July, 2011)
Cross Slope Lane	F	2%	MS	Cross Slope=2%; DM 1230.04(1) & Ex 1230-1 (June, 2009)
Cross Slope Shoulder	F	2%	MS	Cross Slope=2%; DM 1230.04(3) & Ex 1230-1 (June, 2009)
Fill/Ditch Slopes				
Fill Slopes	F		MS	Max Slope=2:1; DM 1230.06(1) & Ex 1230-1 (June, 2009)
Ditch In-slopes	F		MS	Max Slope=2:1; DM 1230.06(1) & Ex 1230-1 (June, 2009)
Access	F	Full	MS	DM Ex 530-1a (June, 2009)
Clear Zone	F		MS	DM Chapter 1600
Signing	F		MS	DM Chapter 1020
Delineation	F		MS	DM Chapter 1030
Illumination	F		MS	DM Chapter 1040
Basic Safety		N/A		
Vertical Clearance		N/A		
Bridge #				
Bicycles		N/A		
Pedestrians		N/A		
Ramp Terminals				
Design Vehicle		WB -67		
Turn Radii				
Intersection Radii - Left	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Radii - Right	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
Intersection Angle	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Sight Distance		N/A		
Barriers				
Terminals & Transition Sections	F		MS	Rail Type to be selected in future design phase per DM Section 1610.04(3)
Standard Run	F		MS	Rail Type to be selected in future design phase per DM Section 1610.04(3)
Bridge Rail	F			Rail Type to be selected in future design phase per DM Section 1610.04(3)
Cross Roads				
Lane Width				
Number of Lanes		2-4		Number of lanes per traffic analysis
Lane Width		12'		
Turning Roadway Width				
Shoulder Width				
Shoulder Width-Inside		8'		Shoulder width in non-curbed areas
Shoulder Width-Outside		8'		
Fill/Ditch Slopes				
Fill Slopes				
Ditch In-slopes				
Access				
Clear Zone				

<i>DESIGN ELEMENT</i>	Design Level (B/M/F)	Standard	MS / DNMS	<i>REFERENCE & COMMENTS</i>
<i>Signing</i>	F			To be addressed during future design phase
<i>Delineation</i>	F			Meets; Preliminary layout only at this phase, to be addressed during future design phase
<i>Illumination</i>	F			To be addressed during future design phase
<i>Basic Safety</i>		N/A		
<i>Vertical Clearance</i>				
Bridge #				
<i>Bicycles</i>	F	5'		
<i>Pedestrians</i>	F	5'		
<i>Barriers</i>				
<i>Terminals & Transition Sections</i>				Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Standard Run</i>				Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Bridge Rail</i>				Rail Type to be selected in future design phase per DM Section 1610.04(3)

Project Design Criteria Ramps & Collector Distributors

Matrix 2 Row 11

This checklist is to confirm interpretation of design criteria. Your project may require that additional/different/or fewer Design Elements be addressed.

Design Class	I-1
Functional Class	Ramp – Thorne Interchange NB On Ramp - Alignment
Design Year	2040
Design Speed	40 MPH
ADT	
Truck Percentage	
Right of Way Width	Not less than required for all design elements, DM Ex 1140-5 (July 2012)

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
Horizontal Alignment	F			
Stopping Sight Distance		Full		Meets; DM Ex 1260-1 and 1260-2
Max. Superelevation		6%	MS	Max Super=6%; DM 1250.04 & Ex 1250-4b (June, 2009)
Vertical Alignment	F			
Maximum Grade		3% -5%	MS	Max Grade=3%; Downgrades up to 2% greater, DM 1360.05(3) & Ex 1360-5 (June, 2009)
Stopping Sight Distance		Full		Meets; DM Ex 1260-1, Ex 1260-2 & Ex 1260-7 (July 2013)
Passing Sight Distance		N/A		
Decision Sight Distance		N/A		
Lane Width	F			
Number of Lanes		1		Additional lanes for queuing at ramp terminals and meters
Lane Width		15'	MS	Lane=15'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Turning Roadway Width		15'	MS	Width=15'; DM 1240.04(3) & Ex 1240-3a (July, 2011)
Shoulder Width	F			
Shoulder Width-Inside		2'	MS	Shoulder=4'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Shoulder Width-Outside		8'	MS	Shoulder=8'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Lane Transition				
Channelization Tapers	F	1:20	MS	DM Ex 1360-14a (July, 2011)

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
On/Off Connections	F		MS	DM Ex 1360-06 (July, 2011)
Cross Slope Lane	F	2%	MS	Cross Slope=2%; DM 1230.04(1) & Ex 1230-1 (June, 2009)
Cross Slope Shoulder	F	2%	MS	Cross Slope=2%; DM 1230.04(3) & Ex 1230-1 (June, 2009)
Fill/Ditch Slopes				
Fill Slopes	F		MS	Max Slope=2:1; DM 1230.06(1) & Ex 1230-1 (June, 2009)
Ditch In-slopes	F		MS	Max Slope=2:1; DM 1230.06(1) & Ex 1230-1 (June, 2009)
Access	F	Full	MS	DM Ex 530-1a (June, 2009)
Clear Zone	F		MS	DM Chapter 1600
Signing	F		MS	DM Chapter 1020
Delineation	F		MS	DM Chapter 1030
Illumination	F		MS	DM Chapter 1040
Basic Safety		N/A		
Vertical Clearance		N/A		
Bridge #				
Bicycles		N/A		
Pedestrians		N/A		
Ramp Terminals				
Design Vehicle		WB -67		
Turn Radii				
Intersection Radii - Left	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Radii - Right	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
Intersection Angle	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Sight Distance		N/A		
Barriers				
Terminals & Transition Sections	F		MS	Rail Type to be selected in future design phase per DM Section 1610.04(3)
Standard Run	F		MS	Rail Type to be selected in future design phase per DM Section 1610.04(3)
Bridge Rail	F			Rail Type to be selected in future design phase per DM Section 1610.04(3)
Cross Roads				
Lane Width				
Number of Lanes		2-4		Number of lanes per traffic analysis
Lane Width		12'		
Turning Roadway Width				
Shoulder Width				
Shoulder Width-Inside		8'		Shoulder width in non-curbed areas
Shoulder Width-Outside		8'		
Fill/Ditch Slopes				
Fill Slopes				
Ditch In-slopes				
Access				
Clear Zone				

<i>DESIGN ELEMENT</i>	Design Level (B/M/F)	Standard	MS / DNMS	<i>REFERENCE & COMMENTS</i>
<i>Signing</i>	F			To be addressed during future design phase
<i>Delineation</i>	F			Meets; Preliminary layout only at this phase, to be addressed during future design phase
<i>Illumination</i>	F			To be addressed during future design phase
<i>Basic Safety</i>		N/A		
<i>Vertical Clearance</i>				
Bridge #				
<i>Bicycles</i>	F	5'		
<i>Pedestrians</i>	F	5'		
<i>Barriers</i>				
<i>Terminals & Transition Sections</i>				Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Standard Run</i>				Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Bridge Rail</i>				Rail Type to be selected in future design phase per DM Section 1610.04(3)

Project Design Criteria Ramps & Collector Distributors

Matrix 2Row 11

This checklist is to confirm interpretation of design criteria. Your project may require that additional/different/or fewer Design Elements be addressed.

Design Class	I-1
Functional Class	Ramp – Thorne Interchange SB off Ramp - Alignment
Design Year	2040
Design Speed	40 MPH
ADT	
Truck Percentage	
Right of Way Width	Not less than required for all design elements, DM Ex 1140-5 (July 2012)

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
Horizontal Alignment	F			
Stopping Sight Distance		Full		Meets; DM Ex 1260-1 and 1260-2
Max. Superelevation		6%	MS	Max Super=6%; DM 1250.04 & Ex 1250-4b (June, 2009)
Vertical Alignment	F			
Maximum Grade		3% -5%	MS	Max Grade=3%; Downgrades up to 2% greater, DM 1360.05(3) & Ex 1360-5 (June, 2009)
Stopping Sight Distance		Full		Meets; DM Ex 1260-1, Ex 1260-2 & Ex 1260-7 (July 2013)
Passing Sight Distance		N/A		
Decision Sight Distance		N/A		
Lane Width	F			
Number of Lanes		1		Additional lanes for queuing at ramp terminals and meters
Lane Width		15'	MS	Lane=15'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Turning Roadway Width		15'	MS	Width=15'; DM 1240.04(3) & Ex 1240-3a (July, 2011)
Shoulder Width	F			
Shoulder Width-Inside		2'	MS	Shoulder=4'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Shoulder Width-Outside		8'	MS	Shoulder=8'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Lane Transition				
Channelization Tapers	F	1:20	MS	DM Ex 1360-14a (July, 2011)

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
On/Off Connections	F		MS	DM Ex 1360-06 (July, 2011)
Cross Slope Lane	F	2%	MS	Cross Slope=2%; DM 1230.04(1) & Ex 1230-1 (June, 2009)
Cross Slope Shoulder	F	2%	MS	Cross Slope=2%; DM 1230.04(3) & Ex 1230-1 (June, 2009)
Fill/Ditch Slopes				
Fill Slopes	F		MS	Max Slope=2:1; DM 1230.06(1) & Ex 1230-1 (June, 2009)
Ditch In-slopes	F		MS	Max Slope=2:1; DM 1230.06(1) & Ex 1230-1 (June, 2009)
Access	F	Full	MS	DM Ex 530-1a (June, 2009)
Clear Zone	F		MS	DM Chapter 1600
Signing	F		MS	DM Chapter 1020
Delineation	F		MS	DM Chapter 1030
Illumination	F		MS	DM Chapter 1040
Basic Safety		N/A		
Vertical Clearance		N/A		
Bridge #				
Bicycles		N/A		
Pedestrians		N/A		
Ramp Terminals				
Design Vehicle		WB -67		
Turn Radii				
Intersection Radii - Left	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Radii - Right	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
Intersection Angle	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Sight Distance		N/A		
Barriers				
Terminals & Transition Sections	F		MS	Rail Type to be selected in future design phase per DM Section 1610.04(3)
Standard Run	F		MS	Rail Type to be selected in future design phase per DM Section 1610.04(3)
Bridge Rail	F			Rail Type to be selected in future design phase per DM Section 1610.04(3)
Cross Roads				
Lane Width				
Number of Lanes		2-4		Number of lanes per traffic analysis
Lane Width		12'		
Turning Roadway Width				
Shoulder Width				
Shoulder Width-Inside		8'		Shoulder width in non-curbed areas
Shoulder Width-Outside		8'		
Fill/Ditch Slopes				
Fill Slopes				
Ditch In-slopes				
Access				
Clear Zone				

<i>DESIGN ELEMENT</i>	Design Level (B/M/F)	Standard	MS / DNMS	<i>REFERENCE & COMMENTS</i>
<i>Signing</i>	F			To be addressed during future design phase
<i>Delineation</i>	F			Meets; Preliminary layout only at this phase, to be addressed during future design phase
<i>Illumination</i>	F			To be addressed during future design phase
<i>Basic Safety</i>		N/A		
<i>Vertical Clearance</i>				
Bridge #				
<i>Bicycles</i>	F	5'		
<i>Pedestrians</i>	F	5'		
<i>Barriers</i>				
<i>Terminals & Transition Sections</i>				Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Standard Run</i>				Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Bridge Rail</i>				Rail Type to be selected in future design phase per DM Section 1610.04(3)

Project Design Criteria Ramps & Collector Distributors

Matrix 2Row 11

This checklist is to confirm interpretation of design criteria. Your project may require that additional/different/or fewer Design Elements be addressed.

Design Class	I-1
Functional Class	Ramp – Thorne Interchange SB On Ramp - Alignment
Design Year	2040
Design Speed	40 MPH
ADT	
Truck Percentage	
Right of Way Width	Not less than required for all design elements, DM Ex 1140-5 (July 2012)

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
Horizontal Alignment	F			
Stopping Sight Distance		Full		Meets; DM Ex 1260-1 and 1260-2
Max. Superelevation		6%	MS	Max Super=6%; DM 1250.04 & Ex 1250-4b (June, 2009)
Vertical Alignment	F			
Maximum Grade		3% -5%	MS	Max Grade=3%; Downgrades up to 2% greater, DM 1360.05(3) & Ex 1360-5 (June, 2009)
Stopping Sight Distance		Full		Meets; DM Ex 1260-1, Ex 1260-2 & Ex 1260-7 (July 2013)
Passing Sight Distance		N/A		
Decision Sight Distance		N/A		
Lane Width	F			
Number of Lanes		1		Additional lanes for queuing at ramp terminals and meters
Lane Width		15'	MS	Lane=15'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Turning Roadway Width		15'	MS	Width=15'; DM 1240.04(3) & Ex 1240-3a (July, 2011)
Shoulder Width	F			
Shoulder Width-Inside		2'	MS	Shoulder=4'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Shoulder Width-Outside		8'	MS	Shoulder=8'; DM 1360.05(4) & Ex 1360-6 (July, 2010)
Lane Transition				
Channelization Tapers	F	1:20	MS	DM Ex 1360-14a (July, 2011)

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
On/Off Connections	F		MS	DM Ex 1360-06 (July, 2011)
Cross Slope Lane	F	2%	MS	Cross Slope=2%; DM 1230.04(1) & Ex 1230-1 (June, 2009)
Cross Slope Shoulder	F	2%	MS	Cross Slope=2%; DM 1230.04(3) & Ex 1230-1 (June, 2009)
Fill/Ditch Slopes				
Fill Slopes	F		MS	Max Slope=2:1; DM 1230.06(1) & Ex 1230-1 (June, 2009)
Ditch In-slopes	F		MS	Max Slope=2:1; DM 1230.06(1) & Ex 1230-1 (June, 2009)
Access	F	Full	MS	DM Ex 530-1a (June, 2009)
Clear Zone	F		MS	DM Chapter 1600
Signing	F		MS	DM Chapter 1020
Delineation	F		MS	DM Chapter 1030
Illumination	F		MS	DM Chapter 1040
Basic Safety		N/A		
Vertical Clearance		N/A		
Bridge #				
Bicycles		N/A		
Pedestrians		N/A		
Ramp Terminals				
Design Vehicle		WB -67		
Turn Radii				
Intersection Radii - Left	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Radii - Right	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle

DESIGN ELEMENT	Design Level (B/M/F)	Standard	MS / DNMS	REFERENCE & COMMENTS
Intersection Angle	F			All ramp terminal intersections are roundabouts designed per chapter 1320 and use of auto turn templates for design vehicle
Intersection Sight Distance		N/A		
Barriers				
Terminals & Transition Sections	F		MS	Rail Type to be selected in future design phase per DM Section 1610.04(3)
Standard Run	F		MS	Rail Type to be selected in future design phase per DM Section 1610.04(3)
Bridge Rail	F			Rail Type to be selected in future design phase per DM Section 1610.04(3)
Cross Roads				
Lane Width				
Number of Lanes		2-4		Number of lanes per traffic analysis
Lane Width		12'		
Turning Roadway Width				
Shoulder Width				
Shoulder Width-Inside		8'		Shoulder width in non-curbed areas
Shoulder Width-Outside		8'		
Fill/Ditch Slopes				
Fill Slopes				
Ditch In-slopes				
Access				
Clear Zone				

<i>DESIGN ELEMENT</i>	Design Level (B/M/F)	Standard	MS / DNMS	<i>REFERENCE & COMMENTS</i>
<i>Signing</i>	F			To be addressed during future design phase
<i>Delineation</i>	F			Meets; Preliminary layout only at this phase, to be addressed during future design phase
<i>Illumination</i>	F			To be addressed during future design phase
<i>Basic Safety</i>		N/A		
<i>Vertical Clearance</i>				
Bridge #				
<i>Bicycles</i>	F	5'		
<i>Pedestrians</i>	F	5'		
<i>Barriers</i>				
<i>Terminals & Transition Sections</i>				Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Standard Run</i>				Barrier Types and transitions to be determined in future design phase per DM Section 1610.04(2)(b)
<i>Bridge Rail</i>				Rail Type to be selected in future design phase per DM Section 1610.04(3)