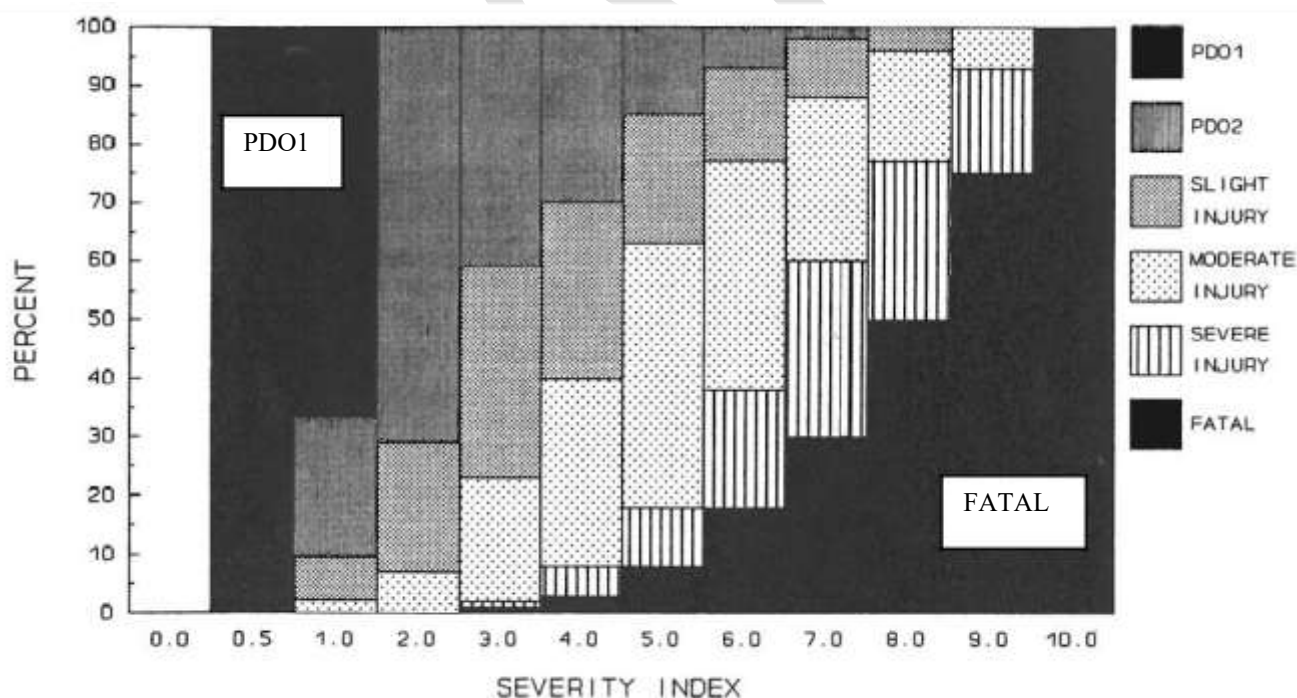


Appendix A: MTO Severity Index Tables

1. Severity Indices

The MTO Severity Index Tables are based primarily on the Suggested Severity Indices Tables in Appendix A of the AASHTO Roadside Design Guide (1996) and NCHRP Synthesis 202 Severity Indices for Roadside Features (1994). The MTO Severity Index Tables are used during preparation of Guide Rail Evaluation Reports on highway rehabilitation and reconstruction projects to justify replacement of barriers and for evaluation of alternative roadside safety treatments using MTO's Roadside Evaluation Manual and MTO's Roadside.xlsx program.

Severity Indices (SI) are based on a zero to ten scale. An SI of zero represents a roadside feature that will likely not result in any damage or injury when impacted or traversed by an errant vehicle. An SI of 10 represents a roadside feature that will likely result in a fatal crash when impacted or traversed by an errant vehicle. Table A-1 shows the distribution of collision classifications estimated within each SI. For example, a roadside feature with an SI of 4.0 when impacted or traversed by an errant vehicle has an estimated probability of 30% of resulting in property damage only, a 67% probability of being an injury crash, and 3% probability of being a fatal crash.



Collision Type Distribution vs Severity Index
(AASHTO Roadside Design Guide, Figure A.8, 1996)
Table A-1

SI values have been developed for many roadside features for a range of design speeds from 50 km/h to 120 km/h. Roadside features listed in the MTO Severity Index tables include various foreslope and backslope configurations, drainage ditches, and various objects such as trees, poles, piers, barriers, terminal systems, and culvert treatments.

2. Surface Condition:

For foreslopes, backslopes, and intersecting slopes, different surface conditions for selecting the appropriate SI for evaluations are described in Table A-2. Existing slopes that are relatively uniform, firm, and well drained should be assumed to have Type A Surface Conditions. This would also apply to new slopes constructed in accordance with OPSS 206.

SURFACE CONDITION	DESCRIPTION
A	Smooth and firm all seasons.
B	Smooth but subject to deep rutting by errant vehicles half of the year.
C	Shallow gullies (100 to 200 mm deep), scattered small boulders (under 225-mm projections), scattered small trees (diameters 75 to 100 mm), or structurally substantial woody brush. Features spaced so that nearly all encroaching vehicles will encounter them.
D	Medium gullies (approximately 250 mm deep), boulders or riprap (projecting approximately 300 mm), or medium trees (diameters 175 to 225 mm). Features spaced so that they will be encountered by all encroaching vehicles. It is assumed that density of features will preclude deep penetration of roadside. If this assumption is not valid, SIs for high, steep slopes may be considerably higher than values shown.
E	Deep gullies (over 0.5 m deep), large boulders or heavy riprap (over 450-mm projecting), large trees (diameters over 350 mm). Features spaced so that they will be encountered by all encroaching vehicles. It is assumed that density of features will preclude deep penetration of roadside. If this assumption is not valid, SIs for high, steep slopes may be considerably higher than values shown.

Surface Condition for Selection of Severity Index for Foreslopes and Backslopes
(AASHTO Roadside Design Guide, Table A.13.1, Page A-47, 1996)

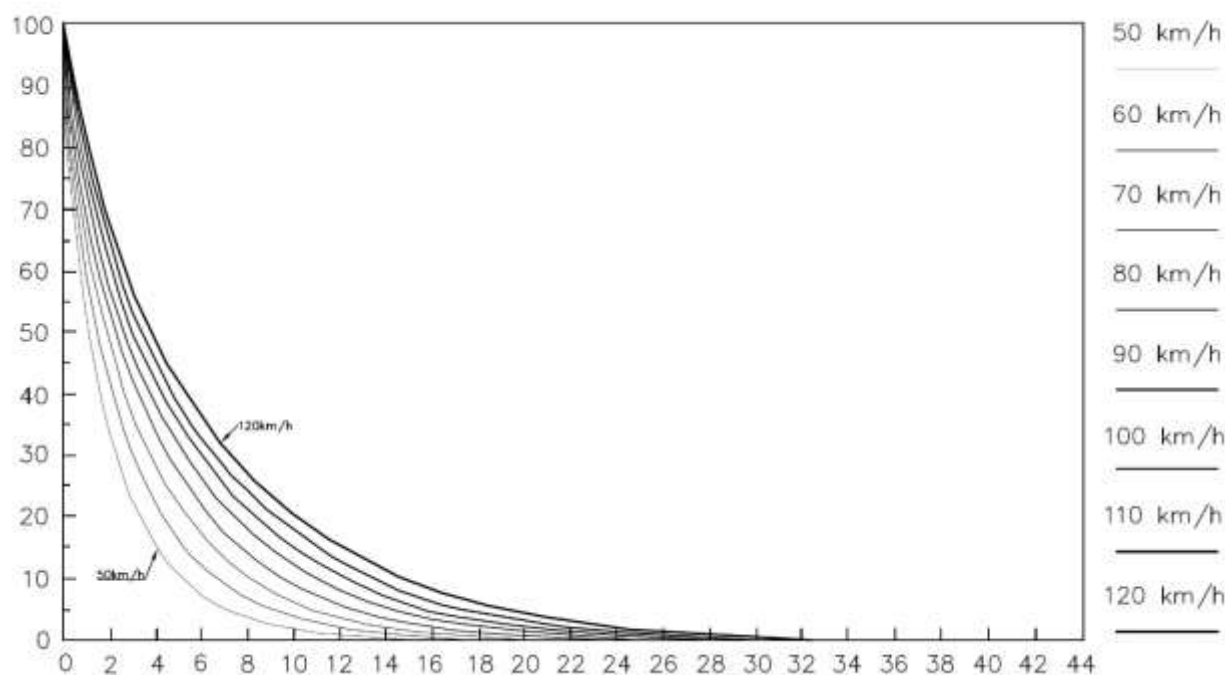
Table A-2

3. Adjusting Offset Distances for Slopes (For Roadside.xlsx):

Roadside foreslopes and backslopes affect encroaching vehicles in two basic ways. The steepness and roughness of a slope affects the severity of the encroachment, and the steepness and orientation of the slope affects the lateral extent of the encroachment beyond the travelled way.

A critical foreslope (steeper than 3H:1V) will have a higher SI than a recoverable foreslope (e.g. 4H:1 or flatter), as the probability of an errant vehicle overturning on a critical slope is significantly higher than on a recoverable slope. The SIs for critical, non-recoverable, and recoverable foreslopes also increase as the height of the embankment increases.

Estimated lateral extent of encroachment probabilities for errant vehicles starting at 0 m (edge of travelled way which 100% of errant vehicles encroach beyond) out to 45 m in 0.25 m increments for a range of design speeds from 50 km/h to 120 km/h are available in Tables A.1.1 through A.1.8 in Appendix A of the AASHTO Roadside Design Guide (1996). The referenced tables are also summarized in the graph presented in Figure A-1 below.



Lateral Extent of Encroachment vs Probability
(AASHTO Roadside Design Guide, Figure A.1, Page A-11, 1996)
Figure A-1

The steepness and orientation of a foreslope or backslope adjacent to a high-speed highway affects the lateral extent of the encroachment beyond the travelled way. If the roadside is sloping upward (positive), the probability that the errant vehicle will encroach a specified distance from the travelled way is reduced due to the beneficial effect of the upward slope on braking and steering. Conversely, if the roadside is sloping downward (negative), the probability that the errant vehicle will encroach beyond a specified distance is increased due to the negative effect of the downward slope. For evaluation of objects located on or beyond slopes, or for evaluation of areas of concern such as foreslopes, backslopes, or roadside ditches, it is necessary to adjust the horizontal lateral offsets measured from plans or in the field. For this reason, adjusted lateral offsets should be used for evaluation of objects or areas of concern using Roadside.xlsx.

Adjusted lateral offsets should be calculated by multiplying the distance or width on a given slope by a slope equivalency factor as follows:

$$E_s = (f + s) / f = 1 + s / f$$

Where: E_s = slope equivalency factor
 f = braking and cornering coefficient of friction = 0.4
 s = slope of the foreslope or backslope (rise divided by run)

Where slopes have differing steepness, the equivalent width of each portion should be calculated and summed to determine the total adjusted offset.

To illustrate how the steepness and orientation of slopes, and the applicable slope equivalency factor affects the lateral extent of the encroachment beyond the travelled way, see Example 1.

Example 1:

Figure A-2 shows a large tree offset 10_m from the travelled way, and the roadside is flat (slopes of 10H:1V or flatter). For a design speed of 120 km/h, in accordance with Table A.1.8 in the AASHTO Roadside Design Guide (1996), the probability of errant vehicles encroaching laterally by more than 10.0_m from the travelled way is 20%.

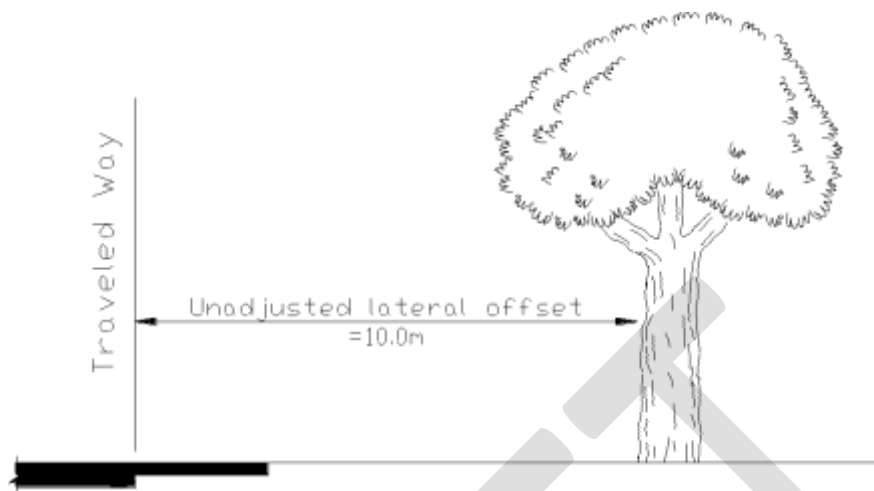


Figure A-2

Figure A-3 also shows a large tree offset 10_m from the travelled way, however, the tree is located 1.5_m beyond the toe of a 4H:1V (negative) foreslope. To account for the downward slope, the 5.0_m wide 4H:1V slope is multiplied by E_s , resulting in an adjusted width of 1.87_m for the slope ($E_s = 1 + (-0.25 / 0.4) = 0.375$). Therefore, the total adjusted lateral offset to the tree from the travelled way is 6.87_m ($3.0 + 0.5 + 1.87 + 1.5$). For a design speed of 120 km/h, in accordance with Table A.1.8 in the AASHTO Roadside Design Guide (1996), the probability of errant vehicles encroaching laterally by more than 7.0_m from the travelled way is 35%.

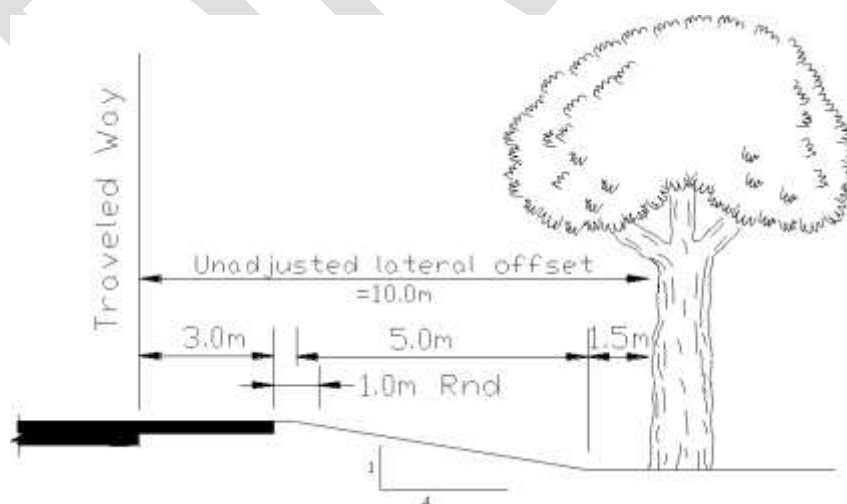


Figure A-3

Conversely, as shown in Figure A-4, a large tree is still offset 10_m from the travelled way, but located at the top of a 6.6_m wide 3H:1V (positive) backslope. To account for the upward slope, the 6.6_m wide 3H:1V (positive) slope is multiplied by E_s , resulting in an

adjusted width of 12.04_m for the slope ($E_s = 1 + (0.33 / 0.4) = 1.825$). Therefore, the total adjusted lateral offset to the tree from the travelled way is 15.45_m ($3.0 + 0.4 + 12.04$).

For a design speed of 120 km/h, in accordance with Table A.1.8 in the AASHTO Roadside Design Guide (1996), the probability of errant vehicles encroaching laterally by more than 15.5_m from the travelled way is 9-%.

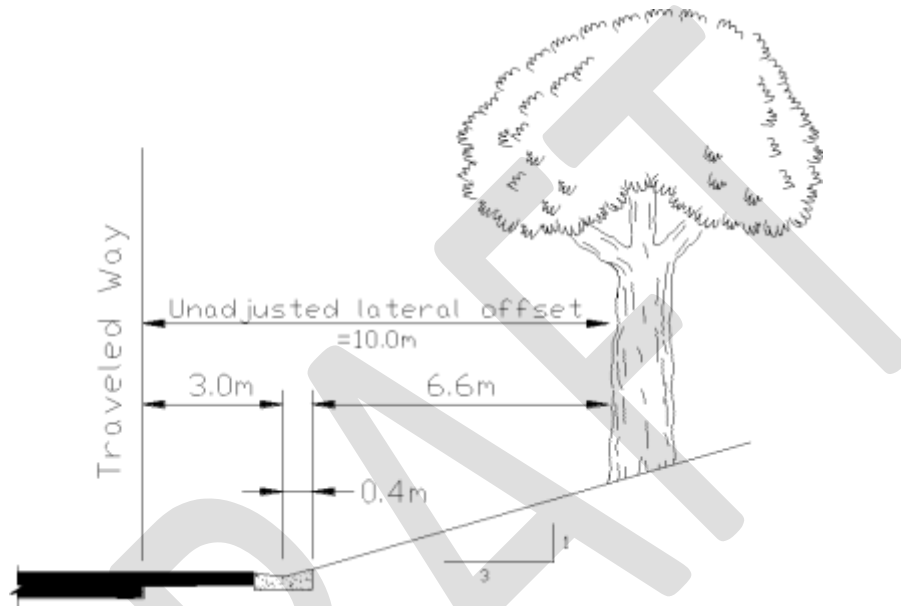


Figure A-4

Severity Indices:**Foreslopes: 10:1V and 8H:1V**

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Foreslope ∞ :1 (Flat)	0.0	A	F	0.1	0.2	0.2	0.3	0.4	0.5	0.7	0.8
		B	F	0.3	0.4	0.4	0.5	0.6	0.8	1.0	1.1
		C	F	0.4	0.6	0.8	1.0	1.1	1.3	1.5	1.8
		D	F	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
Foreslope 10H:1V	0.15	A	F	0.2	0.3	0.5	0.6	0.7	0.9	1.1	1.2
		B	F	0.4	0.5	0.7	0.8	0.9	1.1	1.3	1.6
		C	F	0.7	0.9	1.1	1.3	1.4	1.6	1.9	2.2
		D	F	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥ 0.3	A	F	0.4	0.5	0.7	0.8	1.0	1.2	1.4	1.3
		B	F	0.6	0.7	0.9	1.0	1.2	1.4	1.6	1.9
		C	F	0.9	1.1	1.3	1.5	1.7	1.9	2.2	2.5
		D	F	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
Foreslope 8H:1V	0.15	A	F	0.3	0.4	0.6	0.7	0.8	1.0	1.2	1.3
		B	F	0.5	0.6	0.8	0.9	1.0	1.2	1.4	1.7
		C	F	0.8	1.0	1.2	1.4	1.5	1.7	2.0	2.3
		D	F	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥ 0.3	A	F	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.9
		B	F	0.6	0.8	1.0	1.2	1.4	1.6	1.9	2.2
		C	F	0.9	1.2	1.4	1.7	1.9	2.1	2.5	2.9
		D	F	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

Foreslopes: 6H:1V and 4H:1V

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Foreslope 6H:1V	0.15	A	F	0.5	0.8	1.0	1.3	1.5	1.7	1.9	2.0
		B	F	0.7	1.0	1.2	1.5	1.7	1.9	2.1	2.2
		C	F	1.1	1.4	1.7	2.0	2.2	2.4	2.6	2.9
		D	F	2.9	3.4	3.9	4.4	4.9	5.5	5.9	6.3
		E	F	3.3	3.7	4.1	4.6	5.2	5.8	6.4	6.9
	≥ 0.3	A	F	0.5	0.8	1.0	1.3	1.6	1.9	2.1	2.2
		B	F	0.7	1.0	1.2	1.5	1.8	2.1	2.3	2.6
		C	F	1.1	1.4	1.7	2.0	2.3	2.6	2.9	3.2
		D	F	3.0	3.8	4.0	4.5	5.0	5.6	6.0	6.4
		E	F	3.4	3.8	4.2	4.7	5.3	5.9	6.5	7.0
Foreslope 4H:1V	0.15	A	F	0.5	0.7	0.9	1.1	1.3	1.5	1.7	2.0
		B	F	0.7	0.9	1.1	1.3	1.5	1.7	2.0	2.3
		C	F	1.0	1.3	1.5	1.8	2.0	2.2	2.6	3.0
		D	F	3.0	3.5	4.0	4.5	5.0	5.6	6.0	6.4
		E	F	3.4	3.8	4.2	4.7	5.3	5.9	6.5	7.0
	0.3	A	F	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.5
		B	F	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.9
		C	F	1.7	2.0	2.2	2.5	2.7	2.9	3.2	3.5
		D	F	3.2	3.6	4.0	4.5	5.0	5.6	6.0	6.4
		E	F	3.5	3.9	4.3	4.8	5.4	6.0	6.6	7.1
	≥ 2	A	F	1.3	1.6	1.8	2.1	2.3	2.5	2.7	2.8
		B	F	1.5	1.8	2.0	2.3	2.5	2.7	2.9	3.2
		C	F	1.9	2.2	2.5	2.8	3.0	3.2	3.5	3.7
		D	F	3.2	3.6	4.0	4.5	5.0	5.6	6.0	6.4
		E	F	3.5	3.9	4.3	4.8	5.4	6.0	6.6	7.1

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

Foreslopes: 3H:1V

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height m	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Foreslope 3H:1V	0.15	A	F								
		B	F								
		C	F	1.2	1.5	1.7	2.0	2.2	2.5	2.9	3.3
		D	F	3.2	3.6	4.0	4.5	5.0	5.6	6.0	6.4
		E	F	3.5	3.9	4.3	4.8	5.4	6.0	6.6	7.1
	0.3	A	F	1.6	1.8	2.0	2.2	2.4	2.6	2.8	2.9
		B	F	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.3
		C	F	2.0	2.3	2.5	2.9	3.1	3.4	3.6	3.9
		D	F	3.3	3.7	4.1	4.6	5.1	5.7	6.1	6.5
		E	F	3.6	4.0	4.4	4.9	5.5	6.1	6.7	7.2
	0.6	A	F	1.7	1.9	2.1	2.3	2.5	2.8	2.9	3.0
		B	F	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.4
		C	F	2.2	2.5	2.7	3.0	3.2	3.5	3.7	4.0
		D	F	3.3	3.7	4.1	4.6	5.1	5.7	6.1	6.5
		E	F	3.6	4.0	4.4	4.9	5.5	6.1	6.7	7.2
	1.2	A	F	1.8	2.0	2.2	2.5	2.7	3.0	3.1	3.1
		B	F	2.0	2.2	2.4	2.7	2.9	3.1	3.3	3.6
		C	F	2.3	2.6	2.9	3.2	3.4	3.6	3.9	4.2
		D	F	3.3	3.7	4.1	4.6	5.1	5.7	6.1	6.5
		E	F	3.6	4.0	4.4	4.9	5.5	6.1	6.7	7.2
	2	A	F	2.0	2.3	2.5	2.8	3.0	3.3	3.5	3.6
		B	F	2.2	2.5	2.7	3.0	3.2	3.5	3.7	4.0
		C	F	2.6	2.9	3.2	3.5	3.7	4.0	4.3	4.6
		D	F	3.4	3.8	4.2	4.7	5.2	5.8	6.2	6.6
		E	F	3.7	4.1	4.5	5.0	5.6	6.2	6.8	7.3

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

Foreslopes: 3H:1V

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height m	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Foreslope 3H:1V (cont.)	4	A	F	2.0	2.3	2.5	2.8	3.0	3.3	3.5	3.6
		B	F	2.2	2.5	2.8	3.1	3.3	3.6	3.9	4.2
		C	F	2.5	2.8	3.2	3.6	3.8	4.1	4.5	4.9
		D	F	3.5	3.9	4.3	4.8	5.3	5.9	6.3	6.7
		E	F	3.8	4.2	4.6	5.1	5.7	6.3	6.9	7.4
	6	A	F	2.1	2.6	2.8	3.2	3.4	3.7	3.9	4.0
		B	F	2.2	2.7	2.9	3.3	3.5	3.8	4.1	4.3
		C	F	2.5	2.8	3.2	3.6	3.8	4.2	4.6	5.0
		D	F	3.5	3.9	4.3	4.8	5.3	5.9	6.3	6.7
		E	F	3.8	4.2	4.6	5.1	5.7	6.3	6.9	7.4
	8	A	F	2.2	2.6	3.0	3.4	3.6	3.9	4.1	4.2
		B	F	2.3	2.7	3.1	3.5	3.7	4.0	4.2	4.3
		C	F	2.5	2.8	3.2	3.6	3.9	4.2	4.6	5.0
		D	F	3.5	3.9	4.3	4.8	5.3	5.9	6.3	6.7
		E	F	3.8	4.2	4.6	5.1	5.7	6.3	6.9	7.4
	≥10	A	F	2.3	2.7	3.1	3.5	3.7	4.0	4.2	4.3
		B	F	2.4	3.0	3.4	3.8	4.0	4.3	4.4	4.5
		C	F	2.5	3.3	3.7	4.1	4.3	4.6	4.7	5.1
		D	F	3.5	3.9	4.3	4.8	5.3	5.9	6.3	6.7
		E	F	3.8	4.2	4.3	5.1	5.7	6.3	6.9	7.4

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

Foreslopes: 2H:1V

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height m	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Foreslope 2H:1V	0.15	A	F	2.0	2.3	2.5	2.8	3.0	3.3	3.5	3.6
		B	F	2.2	2.5	2.8	3.1	3.3	3.6	3.9	4.2
		C	F	2.5	2.8	3.2	3.6	3.8	4.1	4.5	4.9
		D	F	3.5	3.9	4.3	4.8	5.3	5.9	6.3	6.7
		E	F	3.8	4.2	4.6	5.1	5.7	6.3	6.9	7.4
	0.3	A	F	2.1	2.6	2.8	3.2	3.4	3.7	3.9	4.0
		B	F	2.2	2.7	2.9	3.3	3.5	3.8	4.1	4.3
		C	F	2.5	2.8	3.2	3.6	3.8	4.2	4.6	5.0
		D	F	3.5	3.9	4.3	4.8	5.3	5.9	6.3	6.7
		E	F	3.8	4.2	4.6	5.1	5.7	6.3	6.9	7.4
	0.6	A	F	2.2	2.6	3.0	3.4	3.6	3.9	4.1	4.2
		B	F	2.3	2.7	3.1	3.5	3.7	4.0	4.2	4.3
		C	F	2.5	2.8	3.2	3.6	3.9	4.2	4.6	5.0
		D	F	3.5	3.9	4.3	4.8	5.3	5.9	6.3	6.7
		E	F	3.8	4.2	4.6	5.1	5.7	6.3	6.9	7.4
	1.2	A	F	2.3	2.7	3.1	3.5	3.7	4.0	4.2	4.3
		B	F	2.4	3.0	3.4	3.8	4.0	4.3	4.4	4.5
		C	F	2.5	3.3	3.7	4.1	4.3	4.6	4.7	5.1
		D	F	3.5	3.9	4.3	4.8	5.3	5.9	6.3	6.7
		E	F	3.8	4.2	4.3	5.1	5.7	6.3	6.9	7.4
	2	A	F	2.9	3.2	3.5	3.8	4.0	4.3	4.5	4.8
		B	F	2.3	2.9	3.4	4.0	4.2	4.5	4.8	5.1
		C	F	2.6	3.2	3.9	4.5	4.7	5.0	5.4	5.8
		D	F	3.5	3.9	4.3	4.8	5.3	5.9	6.3	6.7
		E	F	3.8	4.2	4.6	5.1	5.7	6.3	6.9	7.4

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

Foreslopes: 2H:1V

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Foreslope 2H:1V (cont.)	4	A	F	3.1	3.4	3.8	4.2	4.4	4.6	4.8	5.1
		B	F	2.5	3.1	3.8	4.4	4.6	4.8	5.1	5.4
		C	F	2.8	3.5	4.2	4.9	5.1	5.3	5.7	6.1
		D	F	3.8	4.1	4.5	4.9	5.4	6.0	6.4	6.8
		E	F	3.9	4.3	4.7	5.2	5.8	6.4	7.0	7.5
	6	A	F	3.3	3.6	3.9	4.3	4.5	4.7	4.9	5.2
		B	F	3.2	3.6	4.1	4.5	4.7	4.9	5.2	5.5
		C	F	2.9	4.0	4.5	4.9	5.2	5.4	6.1	6.2
		D	F	3.8	4.1	4.5	4.9	5.4	6.0	6.4	6.8
		E	F	3.9	4.3	4.7	5.2	5.8	6.4	7.0	7.5
	8	A	F	3.6	3.9	4.1	4.4	4.6	4.8	5.0	5.3
		B	F	3.8	4.1	4.3	4.6	4.8	5.0	5.3	5.6
		C	F	4.1	4.4	4.7	5.0	5.2	5.4	5.8	6.2
		D	F	3.8	4.1	4.5	4.9	5.4	6.0	6.4	6.8
		E	F	3.9	4.3	4.7	5.2	5.8	6.4	7.0	7.5
	10	A	F	4.1	4.3	4.5	4.7	4.9	5.2	5.4	5.5
		B	F	4.2	4.4	4.6	4.8	5.0	5.3	5.5	5.8
		C	F	4.4	4.7	4.9	5.2	5.4	5.7	6.0	6.3
		D	F	3.8	4.1	4.5	4.9	5.4	6.0	6.4	6.8
		E	F	3.9	4.3	4.7	5.2	5.8	6.4	7.0	7.5
	14	A	F	4.5	4.7	4.9	5.1	5.3	5.5	5.7	6.0
		B	F	4.6	4.8	5.0	5.2	5.4	5.6	5.9	6.2
		C	F	4.7	5.0	5.2	5.5	5.7	5.9	6.3	6.7
		D	F	3.8	4.1	4.5	4.9	5.4	6.0	6.4	6.8
		E	F	3.9	4.3	4.7	5.2	5.8	6.4	7.0	7.5

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

Foreslopes: 2H:1V

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Slope (H:V)	Height (m)	Surface Condition (**)		50	60	70	80	90	100	110	120
Foreslope 2H:1V (cont.)	18	A	F	4.8	5.0	5.2	5.4	5.6	5.8	6.0	6.3
		B	F	4.9	5.1	5.3	5.5	5.7	5.9	6.1	6.4
		C	F	4.9	5.2	5.4	5.7	5.9	6.1	6.4	6.7
		D	F	3.8	4.1	4.5	4.9	5.4	6.0	6.4	6.8
		E	F	3.9	4.3	4.7	5.2	5.8	6.4	7.0	7.5
	22	A	F	4.9	5.1	5.3	5.5	5.7	5.9	6.1	6.4
		B	F	5.0	5.2	5.4	5.6	5.8	6.0	6.2	6.5
		C	F	5.1	5.3	5.5	5.7	5.9	6.2	6.5	6.8
		D	F	3.8	4.1	4.5	4.9	5.4	6.0	6.4	6.8
		E	F	3.9	4.3	4.7	5.2	5.8	6.4	7.0	7.5
	26	A	F	4.8	5.1	5.3	5.6	5.8	6.1	6.3	6.4
		B	F	4.9	5.2	5.4	5.7	5.9	6.2	6.4	6.5
		C	F	5.0	5.3	5.5	5.8	6.0	6.3	6.6	6.9
		D	F	3.8	4.1	4.5	4.9	5.4	6.0	6.4	6.8
		E	F	3.9	4.3	4.7	5.2	5.8	6.4	7.0	7.5
	30	A	F	4.8	5.1	5.32	5.6	5.9	6.2	6.4	6.5
		B	F	4.9	5.2	5.4	5.7	6.0	6.3	6.5	6.6
		C	F	5.0	5.3	5.5	5.8	6.1	6.4	6.6	6.9
		D	F	3.8	4.1	4.5	4.9	5.4	6.0	6.4	6.8
		E	F	3.9	4.3	4.7	5.2	5.8	6.4	7.0	7.5
	≥34	A	F	4.8	5.1	5.3	5.6	5.9	6.2	6.4	6.7
		B	F	4.9	5.3	5.4	5.7	6.0	6.3	6.5	6.8
		C	F	5.0	5.3	5.5	5.8	6.1	6.4	6.6	6.9
		D	F	3.8	4.1	4.5	4.9	5.4	6.0	6.6	7.3
		E	F	3.9	4.3	4.7	5.2	5.8	6.4	7.0	7.5

*S = Approach Side, C = Corner, F = Traffic Face, A = S,C, and F

** See Table A-2

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Foreslopes: 1.5H:1V

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Slope (H:V)	Height (m)	Surface Condition (**)		50	60	70	80	90	100	110	120
Foreslope 1.5H:1V (cont.)	0.15	A	F	0.9	1.3	1.7	2.2	2.4	2.7	3.0	3.3
		B		1.1	1.5	1.9	2.4	2.6	2.9	3.3	3.7
		C	F	1.4	1.9	2.4	2.9	3.1	3.5	3.9	4.3
		D		3.3	3.8	4.3	4.8	5.3	5.9	6.3	6.7
		E		3.7	4.1	4.5	5.0	5.6	6.2	6.8	7.3
	0.3	A		2.4	2.6	2.8	3.0	3.2	3.5	3.7	4.0
		B		2.6	2.8	3.0	3.2	3.4	3.7	4.0	4.3
		C	F	2.9	3.2	3.4	3.7	3.9	4.2	4.6	5.0
		D	F	3.3	3.8	4.3	4.8	5.3	5.9	6.4	6.9
		E	F	3.7	4.1	4.5	5.0	5.6	6.2	6.9	7.6
	2	A	F	3.3	3.6	3.9	4.2	4.5	4.8	5.0	5.3
		B	F	3.2	3.5	3.7	4.0	4.4	4.8	5.2	5.6
		C	F	3.6	3.9	4.2	4.5	4.9	5.3	5.8	6.3
		D	F	3.4	3.9	4.4	4.9	5.4	6.0	6.5	7.0
		E	F	3.7	4.1	4.5	5.0	5.6	6.2	6.9	7.6
	4	A	F	3.8	4.1	4.4	4.7	4.9	5.2	5.4	5.7
		B	F	3.8	4.1	4.5	4.9	5.4	5.9	6.2	6.5
		C	F	4.8	5.0	5.2	5.4	5.8	6.3	6.8	7.3
		D	F	3.8	4.1	4.5	4.9	5.4	6.0	6.5	7.0
		E	F	3.8	4.2	4.6	5.1	5.7	6.3	7.0	7.7
	6	A	F	4.1	4.4	4.7	5.0	5.2	5.5	5.7	6.0
		B	F	4.7	4.4	4.7	5.5	5.9	6.3	6.6	7.0
		C	F	5.3	5.4	5.7	5.9	6.2	6.7	7.2	7.6
		D	F	3.9	4.2	4.6	5.0	5.5	6.0	6.6	7.2
		E	F	3.9	4.3	4.7	5.1	5.8	6.4	7.1	7.8

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

Foreslopes: 1.5H:1V

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Foreslope 1.5H:1V (cont.)	8	A	F	4.3	4.6	4.9	5.2	5.4	5.7	5.9	6.2
		B	F	5.5	5.6	5.8	5.9	6.3	6.6	7.0	7.4
		C	F	5.7	5.9	6.1	6.3	6.6	7.0	7.5	8.0
		D	F	3.9	4.2	4.6	5.0	5.5	6.0	6.6	7.3
		E	F	3.9	4.3	4.7	5.2	5.8	6.4	7.1	7.8
	10	A	F	4.9	5.2	5.4	5.7	6.0	6.3	6.6	6.9
		B	F	6.4	6.5	6.7	6.8	7.2	7.6	7.8	8.1
		C	F	6.8	6.9	7.1	7.2	7.6	8.0	8.2	8.5
		D	F	4.0	4.3	4.7	5.1	5.6	6.1	6.7	7.4
		E	F	4.0	4.4	4.8	5.3	5.9	6.5	7.2	7.9
	14	A	F	5.4	5.7	5.9	6.2	6.6	6.9	7.2	7.5
		B	F	7.1	7.2	7.4	7.5	7.9	8.2	8.5	8.8
		C	F	7.5	7.6	7.8	7.9	8.2	8.5	8.8	9.1
		D	F	4.0	4.3	4.7	5.1	5.6	6.1	6.7	7.4
		E	F	4.0	4.4	4.8	5.3	5.9	6.5	7.2	7.9
	18	A	F	5.8	6.1	6.4	6.7	7.1	7.4	7.7	8.0
		B	F	7.6	7.7	7.9	8.0	8.4	8.7	9.0	9.3
		C	F	7.9	8.0	8.0	8.3	8.6	8.9	9.2	9.5
		D	F	4.0	4.3	4.7	5.1	5.6	6.1	6.7	7.4
		E	F	4.0	4.4	4.8	5.3	5.9	6.5	7.2	7.9
	22	A	F	6.2	6.5	6.8	7.1	7.4	7.7	8.0	8.3
		B	F	7.7	7.9	8.1	8.3	8.6	8.9	9.1	9.2
		C	F	8.0	8.2	8.4	8.6	8.8	9.1	9.3	9.4
		D	F	4.0	4.3	4.7	5.1	5.6	6.1	6.7	7.4
		E	F	4.2	4.5	4.9	5.3	5.9	6.5	7.2	7.9

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

Foreslopes: 1.5H:1V

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Slope (H:V)	Height (m)	Surface Condition (**)		50	60	70	80	90	100	110	120
Foreslope 1.5H:1V (cont.)	26	A	F	6.3	6.6	6.9	7.2	7.5	7.8	8.1	8.4
		B	F	7.9	8.1	8.3	8.5	8.8	9.1	9.3	9.6
		C	F	8.0	8.3	8.5	8.8	9.0	9.2	9.4	9.7
		D	F	4.1	4.4	4.8	5.2	5.6	6.1	6.7	7.4
		E	F	4.2	4.5	4.9	5.3	5.9	6.5	7.2	7.9
	30	A	F	6.6	6.9	7.1	7.4	7.7	8.0	8.3	8.6
		B	F	7.8	8.1	8.3	8.6	8.8	9.1	9.4	9.7
		C	F	8.0	8.3	8.5	8.8	9.0	9.2	9.4	9.7
		D	F	4.1	4.4	4.8	5.2	5.54	6.1	6.7	7.4
		E	F	4.2	4.5	4.9	5.3	5.9	6.5	7.2	7.9
	34	A	F	6.8	7.1	7.3	7.6	7.8	8.1	8.4	8.7
		B	F	7.9	8.2	8.4	8.7	8.9	9.2	9.4	9.7
		C	F	8.1	8.4	8.6	8.9	9.0	9.21	9.4	9.7
		D	F	4.1	4.4	4.8	5.2	5.6	6.1	6.7	7.4
		E	F	4.2	4.5	4.9	5.3	5.9	6.5	7.2	7.9
	≥ 38	A	F	6.9	7.2	7.4	7.7	7.9	8.2	8.5	8.8
		B	F	8.0	8.3	8.5	8.8	9.0	9.3	9.5	9.8
		C	F	8.3	8.5	8.7	8.9	9.1	9.3	9.5	9.8
		D	F	4.1	4.4	4.8	5.2	5.6	6.1	9.7	7.4
		E	F	4.2	4.5	4.9	5.3	5.9	6.5	7.2	7.9

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

Foreslopes: Vertical with and without water present:

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Water Depth (m)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Foreslope Vertical (Drop-Off)	0	0	F	0.1	0.2	0.2	0.3	0.4	0.5	0.7	0.8
		1	F	2.6	2.7	2.9	3.0	3.2	3.4	3.6	3.7
		2	F	4.4	4.7	4.9	5.2	5.4	5.7	5.9	6.2
		4	F	6.2	6.4	6.6	6.8	7.0	7.2	7.4	7.7
		≥6	F	7.9	8.1	8.3	8.5	8.7	8.8	9.0	9.1
	0.3	0	F	2.6	2.9	3.1	3.4	3.6	3.9	4.1	4.4
		1	F	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.7
		2	F	4.6	4.9	5.2	5.5	5.9	6.2	6.6	7.0
		4	F	6.3	6.6	6.9	7.2	7.4	7.7	7.9	8.2
		≥6	F	8.2	8.3	8.5	8.6	8.8	9.0	9.2	9.3
	2	0	F	3.8	4.1	4.3	4.6	4.8	5.1	5.3	5.6
		1	F	4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.7
		2	F	6.7	6.8	7.0	7.1	7.3	7.5	7.7	7.8
		4	F	7.6	7.7	7.9	8.0	8.2	8.4	8.6	8.7
		≥6	F	8.4	8.5	8.7	8.8	9.0	9.2	9.4	9.5
	4	0	F	5.7	5.8	5.8	5.9	6.1	6.3	6.5	6.6
		1	F	5.7	5.9	6.1	6.3	6.5	6.7	6.9	7.0
		2	F	7.4	7.5	7.7	7.8	8.0	8.2	8.4	8.5
		4	F	8.0	8.1	8.3	8.4	8.6	8.8	9.0	9.1
		≥6	F	8.6	8.7	8.9	9.0	9.2	9.4	9.6	9.7
	6	0	F	6.6	6.7	6.8	6.9	7.0	7.2	7.4	7.5
		1	F	6.8	6.9	7.1	7.3	7.4	7.6	7.8	7.9
		2	F	7.8	7.9	8.1	8.2	8.4	8.6	8.8	8.9
		4	F	8.2	8.3	8/5	8.7	8.9	9.1	9.3	9.4
		≥6	F	8.7	8.8	9.0	9.1	9.3	9.5	9.7	9.8

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

Foreslopes: Vertical with and without water present (continued):

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Slope (H:V)	Height (m)	Water Depth (m)		50	60	70	80	90	100	110	120
Foreslope Vertical (Drop-Off)	8	0	F	7.4	7.5	7.7	7.8	7.9	8.0	8.2	8.3
		1	F	7.8	7.9	8.1	8.2	8.3	8.4	8.6	8.7
		2	F	8.1	8.2	8.4	8.5	8.7	8.9	9.1	9.2
		4	F	8.3	8.5	8.7	8.9	9.1	9.3	9.5	9.6
		≥6	F	8.8	8.9	9.1	9.2	9.4	9.6	9.8	9.9
	10	0	F	8.6	8.8	9.0	9.2	9.2	9.2	9.3	9.3
		1	F	8.7	8.9	9.1	9.3	9.4	9.4	9.6	9.7
		2	F	9.2	9.3	9.3	9.4	9.5	9.6	9.8	9.9
		4	F	9.5	9.6	9.6	9.7	9.8	9.8	9.9	9.9
		≥6	F	9.7	9.8	9.8	9.9	10.0	10.0	10.0	10.0
	14	0	F	9.5	9.6	9.6	9.7	9.8	9.8	9.8	9.8
		1	F	9.6	9.7	9.7	9.8	9.8	9.8	9.9	9.9
		2	F	9.6	9.7	9.7	9.8	9.9	9.9	10.0	10.0
		4	F	9.8	9.9	9.9	10.0	10.0	10.0	10.0	10.0
		≥6	F	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	18	0	F	9.9	9.9	9.9	9.9	9.9	9.9	10.0	10.0
		1	F	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
		2	F	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
		4	F	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
		≥6	F	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	≥ 22	0	F	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
		1	F	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
		2	F	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
		4	F	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
		≥6	F	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

Backslopes: Located beyond 10H:1V foreslopes (positive or negative) and beyond parallel flat bottom roadside ditches with ditch bottom 2.5 m wide or greater.

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Slope (H:V)	Height (m)	Surface Condition (**)		50	60	70	80	90	100	110	120
Backslope 10H:1V	0.15	A	F	0.1	0.1	0.1	0.2	0.3	0.4	0.6	0.7
		B	F	0.2	0.3	0.3	0.4	0.5	0.7	0.9	1.0
		C	F	0.6	0.7	0.9	1.0	1.1	1.3	1.5	1.8
		D	F	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥ 0.3	A	F	0.1	0.1	0.1	0.2	0.3	0.3	0.5	0.6
		B	F	0.1	0.1	0.3	0.4	0.5	0.6	0.8	0.9
		C	F	0.6	0.7	0.9	1.0	1.1	1.3	1.5	1.8
		D	F	2.6	3.2	3.9	4.5	5.1	5.7	6.3	7.0
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
Backslope 8H:1V	0.15	A	F	0.1	0.1	0.2	0.3	0.4	0.4	0.6	0.7
		B	F	0.1	0.2	0.4	0.5	0.6	0.7	0.9	1.0
		C	F	0.6	0.7	0.9	1.0	1.1	1.3	1.5	1.8
		D	F	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥ 0.3	A	F	0.1	0.1	0.1	0.2	0.3	0.3	0.5	0.6
		B	F	0.1	0.2	0.2	0.3	0.4	0.6	0.8	0.9
		C	F	0.6	0.7	0.9	1.0	1.1	1.3	1.5	1.8
		D	F	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

*S = Approach Side, C = Corner, F = Traffic Face, A = S, C, and F

** See Table A-2

Backslopes: Located beyond 10H:1V foreslopes (positive or negative) and beyond parallel flat bottom roadside ditches with ditch bottom 2.5 m wide or greater.

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Slope (H:V)	Height (m)	Surface Condition (**)		50	60	70	80	90	100	110	120
Backslope 6H:1V	0.15	A	F	0.1	0.1	0.3	0.4	0.5	0.5	1.7	0.8
		B	F	0.3	0.4	0.4	0.5	0.6	0.8	1.0	1.1
		C	F	0.6	0.7	0.9	1.0	1.1	1.3	1.5	1.8
		D	F	2.8	3.6	3.8	4.3	4.8	5.4	5.9	6.4
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥ 0.5	A	F	0.1	0.1	0.1	0.2	0.3	0.3	0.5	0.6
		B	F	0.1	0.2	0.4	0.5	0.5	0.6	0.8	0.9
		C	F	0.6	0.7	0.9	1.0	1.1	1.3	1.5	1.8
		D	F	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
Backslope 4H:1V	≥ 0.15	A	F	0.1	0.1	0.3	0.4	0.5	0.6	0.8	0.9
		B	F	0.4	0.5	0.5	0.6	0.7	0.9	1.1	1.2
		C	F	0.7	0.8	1.0	1.1	1.3	1.4	1.6	1.7
		D	F	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
Backslope 3H:1V	0.15	A	F	0.2	0.3	0.5	0.6	0.7	0.7	0.9	1.0
		B	F	0.4	0.5	0.7	0.8	0.9	1.1	1.3	1.4
		C	F	0.8	0.9	1.1	1.2	1.4	1.6	1.8	1.9
		D	F	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥ 1	A	F	0.3	0.4	0.6	0.7	0.9	1.2	1.3	1.4
		B	F	0.7	0.8	1.0	1.1	1.3	1.5	1.7	1.8
		C	F	1.3	1.4	1.6	1.7	1.9	2.1	2.3	2.4
		D	F	2.9	3.4	3.9	4.4	4.9	5.5	6.0	6.5
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

Backslopes: Located beyond 10H:1V foreslopes (positive or negative) and beyond parallel flat bottom roadside ditches with ditch bottom 2.5 m wide or greater.

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Backslope 2H:1V	0.15	A	F	0.4	0.5	0.7	0.8	1.0	1.2	1.4	1.7
		B	F	0.7	0.8	1.0	1.1	1.3	1.5	1.7	2.0
		C	F	1.0	1.1	1.3	1.4	1.6	1.9	2.2	2.5
		D	F	2.9	3.4	3.9	4.4	4.9	5.5	6.0	6.5
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.3	A	F	0.5	0.6	0.8	0.9	1.1	1.3	1.6	1.9
		B	F	0.9	1.0	1.2	1.3	1.4	1.6	1.9	2.2
		C	F	1.4	1.5	1.7	1.8	1.9	2.1	2.3	2.6
		D	F	3.0	3.5	4.0	4.5	5.0	5.6	6.1	6.6
		E	F	3.3	3.7	4.1	4.6	5.2	5.8	6.4	7.1
	0.6	A	F	0.7	0.8	1.0	1.1	1.3	1.5	1.8	2.1
		B	F	1.1	1.2	1.4	1.5	1.7	1.9	2.1	2.4
		C	F	1.9	2.0	2.2	2.3	2.4	2.6	2.8	3.1
		D	F	3.0	3.5	4.0	4.5	5.0	5.6	6.1	6.6
		E	F	3.3	3.7	4.1	4.6	5.2	5.8	6.4	7.1
	≥ 1.2	A	F	0.8	0.9	1.1	1.2	1.5	1.8	2.1	2.4
		B		1.2	1.3	1.5	1.6	1.8	2.1	2.3	2.6
		C	F	2.0	2.1	2.3	2.4	2.5	2.7	2.9	3.2
		D	F	3.0	3.5	4.0	4.5	5.0	5.6	6.1	6.6
		E	F	3.3	3.7	4.1	4.6	5.2	5.8	6.4	7.1

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

Backslopes: Located beyond 10H:1V foreslopes (positive or negative) and beyond parallel flat bottom roadside ditches with ditch bottom 2.5 m wide or greater.

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Backslope 1.5H:1V	0.15	A	F	0.3	0.6	0.8	1.1	1.4	1.8	2.2	2.6
		B	F	0.6	0.9	1.1	1.4	1.7	2.1	2.5	2.9
		C	F	0.9	1.2	1.4	1.7	2.1	2.5	3.0	3.5
		D	F	2.9	3.4	3.9	4.4	1.9	5.5	6.0	6.5
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.3	A	F	0.5	0.8	1.0	1.3	1.6	2.0	2.6	3.1
		B	F	0.9	1.2	1.4	1.7	1.9	2.3	2.9	3.4
		C	F	1.4	1.7	1.9	2.2	2.4	2.8	3.3	3.8
		D	F	3.0	3.5	4.0	4.5	5.0	5.6	6.1	6.6
		E	F	3.3	3.7	4.1	4.6	5.2	5.8	6.4	7.1
	0.6	A	F	0.9	1.1	1.3	1.5	1.8	2.2	2.7	3.2
		B	F	1.3	1.5	1.7	1.9	2.2	2.6	3.1	3.6
		C	F	2.1	2.3	2.5	2.7	2.9	3.2	3.8	4.3
		D	F	3.0	3.5	4.0	4.5	5.0	5.6	6.1	6.6
		E	F	3.3	3.7	4.1	4.6	5.2	5.8	6.4	7.1
	≥ 1.2	A	F	1.0	1.2	1.4	1.6	2.0	2.4	2.8	3.2
		B	F	1.4	1.6	1.8	2.0	2.3	2.7	3.2	3.7
		C	F	2.2	2.4	2.6	2.8	3.0	3.4	3.9	4.4
		D	F	3.1	3.6	4.1	4.6	5.1	5.7	6.2	6.7
		E	F	3.3	3.7	4.1	4.6	5.2	5.8	6.4	7.1

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

Backslopes: Located beyond 10H:1V foreslopes (positive or negative) and beyond parallel flat bottom roadside ditches with ditch bottom 2.5 m wide or greater.

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Backslope 1H:1V	0.15	A	F	0.4	0.7	1.0	1.3	1.7	2.2	2.8	3.3
		B	F	0.7	1.0	1.3	1.6	2.0	2.5	3.1	3.6
		C	F	1.0	1.3	1.6	1.9	2.4	2.9	3.5	4.2
		D	F	2.9	3.4	3.9	4.4	4.9	5.5	6.0	6.5
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.3	A	F	0.7	1.0	1.3	1.6	2.0	2.4	3.1	3.8
		B	F	1.1	1.4	1.7	2.0	2.3	2.7	3.4	4.1
		C	F	1.6	1.9	2.2	2.5	2.8	3.2	3.8	4.5
		D	F	3.0	3.5	4.0	4.5	5.0	5.6	6.1	6.6
		E	F	3.3	3.7	4.1	4.6	5.1	5.8	6.4	7.1
	0.6	A	F	1.0	1.3	1.5	1.8	2.2	2.6	3.3	4.0
		B	F	1.4	1.7	1.9	2.2	2.6	3.0	3.6	4.1
		C	F	2.2	2.5	2.7	3.0	3.2	3.6	4.2	4.9
		D	F	3.0	3.5	4.0	4.5	5.0	5.6	6.1	6.6
		E	F	3.3	3.7	4.1	4.6	5.2	5.8	6.4	7.1
	≥ 1.2	A	F	1.1	1.4	1.6	1.9	2.3	2.8	3.4	3.9
		B	F	1.5	1.8	2.0	2.3	2.7	3.1	3.7	4.2
		C	F	2.3	2.6	2.8	3.1	3.4	3.8	4.4	4.9
		D	F	3.1	3.6	4.1	4.6	5.1	5.7	6.2	6.7
		E	F	3.3	3.7	4.1	4.6	5.2	5.8	6.4	7.1

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

Backslopes Located beyond 10H:1V foreslopes (positive or negative) and beyond parallel flat bottom roadside ditches with ditch bottom 2.5 m wide or greater.

Object Type and Characteristics			Object Surface (*)	Severity Index, SI							
Slope (H:V)	Height (m)	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Backslope Vertical ***	0.15	A	F	0.5	0.8	1.1	1.4	1.9	2.4	3.0	3.7
		B	F	0.8	1.1	1.4	1.7	2.2	2.7	3.3	4.0
		C	F	1.1	1.4	1.7	2.0	2.5	3.1	3.8	4.5
		D	F	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.3	A	F	0.7	1.0	1.3	1.6	2.0	2.5	3.2	3.9
		B	F	1.1	1.4	1.7	2.0	2.4	2.8	3.5	4.2
		C	F	1.6	1.9	2.2	2.5	2.9	3.3	3.9	4.6
		D	F	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.6	A	F	1.0	1.3	1.6	1.9	2.2	2.6	3.2	3.9
		B	F	1.1	1.4	1.7	2.0	2.3	2.7	3.3	4.0
		C	F	1.6	1.9	2.2	2.5	2.8	3.2	3.8	4.3
		D	F	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥ 1.0	A	F	1.0	1.3	1.6	1.9	2.2	2.6	3.2	3.9
		B	F	1.0	1.3	1.6	1.9	2.2	2.6	3.2	3.9
		C	F	1.5	1.8	2.1	2.4	2.7	3.1	3.7	4.2
		D	F	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	F	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

*** Relatively smooth uniform rock cut face = Surface Condition

A Jagged rock cut face = Surface Condition E

Parallel Roadside V-Ditches ****Parallel Roadside V-Ditches ****

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Foreslope	Backslope	Depth (m)		50	60	70	80	90	100	110	120
2H:1V	2H:1V	0.15	F	1.2	1.5	1.7	2.0	2.4	2.8	3.4	3.9
		0.3	F	1.7	1.8	2.0	2.1	2.5	2.9	3.5	4.0
		0.6	F	1.9	2.0	2.2	2.3	2.7	3.1	3.6	4.1
		1.0	F	2.0	2.1	2.3	2.4	2.7	3.1	3.6	4.1
		1.2	F	2.1	2.2	2.4	2.5	2.8	3.2	3.7	4.2
	3H:1V	0.15	F	1.1	1.4	1.6	1.9	2.2	2.6	3.1	3.6
		0.3	F	1.5	1.7	1.9	2.1	2.4	2.8	3.2	3.6
		0.6	F	1.8	1.9	2.1	2.2	2.5	2.9	3.4	3.9
		1.0	F	1.9	2.0	2.2	2.3	2.5	2.9	3.5	4.0
		1.2	F	2.0	2.1	2.3	2.4	2.6	3.0	3.6	4.1
3H:1V	2H:1V	0.15	F	1.2	1.5	1.7	2.0	2.4	2.8	3.4	3.9
		0.3	F	1.6	1.7	1.9	2.0	2.4	2.8	3.4	3.9
		0.6	F	1.9	2.0	2.0	2.1	2.5	2.9	3.4	3.9
		1.0	F	2.0	2.1	2.1	2.2	2.5	2.9	3.4	3.9
		1.2	F	2.1	2.2	2.2	2.3	2.6	3.0	3.4	3.8
	3H:1V	0.15	F	1.1	1.4	1.6	1.9	2.2	2.6	3.1	3.6
		0.3	F	1.4	1.6	1.8	2.0	2.3	2.7	3.1	3.5
		0.6	F	1.7	1.8	2.0	2.1	2.3	2.7	3.1	3.5
		1.0	F	1.8	1.9	2.1	2.2	2.4	2.7	3.1	3.5
		1.2	F	2.0	2.1	2.1	2.2	2.4	2.8	3.2	3.6
	4H:1V	0.15	F	1.1	1.3	1.5	1.7	1.9	2.3	2.7	3.1
		0.3	F	1.3	1.5	1.7	1.9	2.1	2.4	2.8	3.2
		0.6	F	1.6	1.7	1.9	2.0	2.2	2.4	2.8	3.2
		1.0	F	1.9	2.0	2.0	2.1	2.2	2.5	2.9	3.3
		1.2	F	1.8	1.9	2.1	2.2	2.3	2.5	2.9	3.3

*S = Approach Side, C = Corner, F = Traffic Face, A = S,C, and F

** For ditch configurations where the ditch bottom is 2.5 m wide or greater, the foreslope and backslope should be treated as independent features with offsets adjusted for intervening slopes. The estimated Severity Indices in this table assumes rounding is insufficient to have a beneficial effect

Parallel Roadside V-Ditches ** (continued)

Parallel Roadside V-Ditches ** (continued)

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Foreslope	Backslope	Depth (m)		50	60	70	80	90	100	110	120
4H:1V	2H:1V	0.15	F	1.1	1.4	1.6	1.9	2.3	2.7	3.2	3.7
		0.3	F	1.1	1.4	1.6	1.9	2.3	2.7	3.2	3.7
		0.6	F	1.2	1.5	1.7	2.0	2.3	2.7	3.2	3.7
		1.0	F	1.2	1.5	1.7	2.0	2.3	2.7	3.1	3.5
		1.2	F	1.2	1.5	1.7	2.0	2.3	2.7	3.1	3.5
	3H:1V	0.15	F	1.0	1.2	1.4	1.6	1.9	2.3	2.7	3.1
		0.3	F	1.1	1.3	1.5	1.7	1.9	2.3	2.7	3.1
		0.6	F	1.0	1.3	1.5	1.8	2.0	2.3	2.7	3.1
		1.0	F	1.1	1.4	1.6	1.9	2.1	2.3	2.7	3.1
		1.2	F	1.1	1.4	1.7	2.0	2.1	2.3	2.7	3.1
	4H:1V	0.15	F	0.9	1.1	1.3	1.5	1.7	2.0	2.3	2.6
		0.3	F	1.0	1.2	1.4	1.6	1.8	2.1	2.3	2.6
		0.6	F	1.1	1.3	1.5	1.7	1.9	2.2	2.4	2.5
		1.0	F	1.0	1.3	1.5	1.8	2.0	2.2	2.4	2.7
		1.2	F	1.1	1.4	1.6	1.9	2.1	2.3	2.5	2.6

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** For ditch configurations where the ditch bottom is 2.5 m wide or greater, the foreslope and backslope should be treated as independent features with offsets adjusted for intervening slopes. The estimated Severity Indices in this table assumes rounding is insufficient to have a beneficial effect

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Parallel Roadside V-Ditches ** (continued)

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Foreslope	Backslope	Depth (m)		50	60	70	80	90	100	110	120
6H:1V (cont.)	2H:1V	0.15	F	0.8	1.1	1.3	1.6	2.0	2.4	2.9	3.4
		0.3	F	0.8	1.1	1.3	1.6	2.0	2.4	2.9	3.4
		0.6	F	0.7	1.0	1.2	1.5	1.9	2.3	2.7	3.1
		1.0	F	0.6	0.9	1.1	1.4	1.4	1.8	2.2	2.5
		1.2	F	0.6	0.9	1.1	1.4	1.8	2.2	2.4	2.7
	3H:1V	0.15	F	0.7	0.9	1.1	1.3	1.6	1.9	2.2	2.5
		0.3	F	0.7	0.9	1.1	1.3	1.6	1.9	2.2	2.5
		0.6	F	0.7	0.9	1.1	1.3	1.6	1.9	2.2	2.5
		1.0	F	0.5	0.8	1.0	1.3	1.6	1.9	2.1	2.4
		1.2	F	0.5	0.8	1.0	1.3	1.6	1.9	2.1	2.4
	4H:1V	0.15	F	0.5	0.7	0.9	1.1	1.3	1.6	1.9	2.2
		0.3	F	0.4	0.7	0.9	1.2	1.4	1.7	1.9	2.2
		0.6	F	0.6	0.8	1.0	1.2	1.4	1.7	1.9	2.2
		1.0	F	0.6	0.8	1.0	1.2	1.5	1.8	2.0	2.1
		1.2	F	0.6	0.8	1.0	1.2	1.5	1.8	2.0	2.1
	6H:1V	0.15	F	0.5	0.6	0.8	0.9	1.1	1.3	1.5	1.6
		0.3	F	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.7
		0.6	F	0.6	0.7	0.9	1.0	1.2	1.5	1.7	2.0
		1.0	F	0.5	0.7	0.9	1.1	1.3	1.6	1.8	2.1
		1.2	F	0.4	0.7	0.9	1.2	1.4	1.6	1.9	2.2

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** For ditch configurations where the ditch bottom is 2.5 m wide or greater, the foreslope and backslope should be treated as independent features with offsets adjusted for intervening slopes. The estimated Severity Indices in this table assumes rounding is insufficient to have a beneficial effect

Intersecting Slopes – Negative (down)

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Slope (H:V)	Height (m)	Surface Condition (**)		50	60	70	80	90	100	110	120
Intersecting Slopes (negative) 10H:1V	0.3	A	S	0.7	0.8	1.0	1.1	1.4	1.7	2.0	2.3
		B	S	0.9	1.0	1.2	1.3	1.4	1.6	2.2	2.9
		C	S	1.2	1.4	1.6	1.8	1.9	2.1	2.8	3.5
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥ 1.0	A	S	0.6	0.8	1.0	1.2	1.5	1.9	2.3	2.7
		B	S	0.8	1.0	1.2	1.4	1.7	2.1	2.6	3.1
		C	S	1.1	1.4	1.6	1.9	2.2	2.6	3.2	3.7
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
Intersecting Slope (negative) 8H:1V	0.3	A	S	1.3	1.4	1.6	1.7	1.9	2.1	2.4	2.7
		B	S	1.5	1.6	1.8	1.9	2.1	2.3	2.7	3.1
		C	S	1.8	2.0	2.2	2.4	2.6	2.9	3.3	3.7
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	1	A	S	1.4	1.6	1.8	2.0	2.2	2.5	3.0	3.5
		B	S	1.6	1.8	2.0	2.2	2.4	2.7	3.3	3.8
		C	S	1.9	2.2	2.4	2.7	2.9	3.2	3.8	4.5
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	2	A	S	1.4	1.6	1.8	2.0	2.3	2.7	3.2	3.7
		B	S	1.6	1.8	2.0	2.2	2.5	2.9	3.5	4.0
		C	S	1.9	2.2	2.4	2.7	3.0	3.4	4.0	4.7
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

*S = Approach Side, C = Corner, F = Traffic Face, A = S,C, and F

** See Table A-2.

Intersecting Slopes – Negative (down)**Intersecting Slopes – Negative
(down)**

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Intersecting Slopes (negative) 8H:1V	≥ 4	A	S	1.4	1.6	1.8	2.0	2.3	2.7	3.3	3.8
		B	S	1.6	1.8	2.0	2.2	2.5	2.9	3.5	4.2
		C	S	1.9	2.2	2.4	2.7	3.0	3.4	4.1	4.8
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
Intersecting Slope (negative) 6H:1V	0.3	A	S	1.7	1.8	2.0	2.1	2.3	2.5	2.7	3.0
		B	S	1.9	2.0	2.2	2.3	2.5	2.7	3.0	3.3
		C	S	2.2	2.4	2.6	2.8	3.0	3.2	3.6	4.0
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	1	A	S	2.1	2.3	2.5	2.7	2.9	3.3	3.7	4.1
		B	S	2.3	2.5	2.7	2.9	3.1	3.5	4.0	4.5
		C	S	2.6	2.9	3.1	3.4	3.6	4.0	4.6	5.1
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	2	A	S	2.3	2.6	2.9	3.2	3.5	3.9	4.4	4.9
		B	S	2.5	2.8	3.1	3.4	3.7	4.1	4.7	5.2
		C	S	2.8	3.1	3.5	3.9	4.2	4.6	5.2	5.7
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	4	A	S	2.2	2.5	2.9	3.3	3.7	4.2	4.8	5.3
		B	S	2.4	2.7	3.1	3.5	3.9	4.4	5.0	5.5
		C	S	2.7	3.1	3.5	4.0	4.4	4.9	5.5	6.0
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

Intersecting Slopes – Negative (down)
Intersecting Slopes – Negative (down)
(continued)

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Slope (H:V)	Height (m)	Surface Condition (**)		50	60	70	80	90	100	110	120
Intersecting Slopes (negative) 6H:1V	6	A	S	2.2	2.5	2.9	3.3	3.7	4.2	4.9	5.5
		B	S	2.4	2.7	3.1	3.5	3.9	4.4	5.0	5.6
		C	S	2.7	3.1	3.5	4.0	4.4	4.9	5.5	6.0
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥ 8	A	S	2.2	2.5	2.9	3.3	3.7	4.2	4.9	5.6
		B	S	2.4	2.7	3.1	3.5	3.9	4.4	5.0	5.7
		C	S	2.7	3.1	3.5	4.0	4.4	4.9	5.5	6.0
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
Intersecting Slope (negative) 4H:1V	0.3	A	S	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.2
		B	S	2.1	2.2	2.4	2.5	2.7	2.9	3.2	3.5
		C	S	2.4	2.6	2.8	3.0	3.2	3.4	3.8	4.2
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	1	A	S	2.6	2.8	3.0	3.2	3.4	3.6	4.0	4.4
		B	S	2.8	3.0	3.2	3.4	3.6	3.9	4.3	4.7
		C	S	3.1	3.4	3.6	3.9	4.1	4.4	4.9	5.4
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	2	A	S	3.5	3.7	3.9	4.1	4.3	4.6	5.0	5.4
		B	S	3.6	3.8	4.0	4.2	4.5	4.8	5.2	5.6
		C	S	3.8	4.1	4.3	4.6	5.0	5.3	5.7	6.1

		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

*S = Approach Side, C = Corner, F = Traffic Face, A = S,C, and F

** See Table A-2.

Intersecting Slopes – Negative (down) (continued)

Intersecting Slopes – Negative (down) (continued)

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Intersecting Slopes (negative) 4H:1V (cont.)	4	A	S	3.7	4.1	4.5	5.0	5.2	5.5	5.9	6.3
		B	S	3.8	4.2	4.6	5.1	5.4	5.7	6.1	6.5
		C	S	4.0	4.5	5.0	5.5	5.8	6.2	6.6	7.0
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	6	A	S	3.7	4.3	4.8	5.4	5.9	6.4	6.8	7.2
		B	S	3.8	4.4	4.9	5.5	6.1	6.6	7.0	7.4
		C	S	3.9	4.5	5.2	5.8	6.4	7.0	7.4	7.8
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	8	A	S	3.7	4.3	4.8	5.4	6.0	6.6	7.2	7.7
		B	S	3.8	4.4	4.9	5.5	6.2	6.8	7.3	7.8
		C	S	3.9	4.5	5.2	5.8	6.5	7.1	7.5	7.9
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	10	A	S	3.7	4.3	4.8	5.4	6.0	6.6	7.2	7.9
		B	S	3.8	4.4	4.9	5.5	6.2	6.8	7.4	7.9
		C	S	3.9	4.5	5.2	5.8	6.5	7.1	7.5	7.9
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
		A	S	3.7	4.3	4.8	5.4	6.0	6.6	7.2	7.9

	≥14	B	S	3.8	4.4	4.9	5.5	6.2	6.8	7.4	7.9
		C	S	3.9	4.5	5.2	5.8	6.5	7.1	7.5	7.9
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

*S = Approach Side, C = Corner, F = Traffic Face, A = S,C, and F

** See Table A-2

–Intersecting Slopes – Negative (down) (continued)

Intersecting Slopes – Negative (down) (continued)

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Slope (H:V)	Height (m)	Surface Condition (**)		50	60	70	80	90	100	110	120
Intersecting Slopes (negative) 3H:1V	0.3	A	S	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.2
		B	S	2.1	2.2	2.4	2.5	2.7	2.9	3.2	3.5
		C	S	2.4	2.6	2.8	3.0	3.2	3.4	3.8	4.2
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	1	A	S	2.7	2.9	3.1	3.3	3.5	3.7	4.0	4.3
		B	S	2.7	3.0	3.2	3.5	3.6	3.9	4.3	4.7
		C	S	3.1	3.4	3.6	3.9	4.1	4.4	4.9	5.4
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	2	A	S	3.8	4.0	4.2	4.4	4.6	4.8	5.1	5.4
		B	S	3.9	4.1	4.3	4.5	4.7	5.0	5.3	5.6
		C	S	4.2	4.4	4.6	4.8	5.0	5.3	5.6	5.9
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	4	A	S	4.8	5.0	5.2	5.4	5.7	6.0	6.2	6.5
		B	S	4.9	5.1	5.3	5.5	5.9	6.2	6.4	6.7
		C	S	5.1	5.3	5.5	5.7	6.1	6.4	6.8	7.2
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4

		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	6	A	S	4.9	5.3	5.7	6.1	6.4	6.7	6.9	7.2
		B	S	5.0	5.4	5.8	6.2	6.6	6.9	7.1	7.4
		C	S	5.2	5.6	5.9	6.3	6.7	7.0	7.3	7.7
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2.

Intersecting Slopes – Negative (down) (continued)

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Inter-secting Slopes (negative) 3H:1V (cont.)	8	A	S	5.0	5.6	6.1	6.7	7.0	7.3	7.5	7.8
		B	S	5.1	5.7	6.2	6.8	7.2	7.5	7.7	8.0
		C	S	5.2	5.8	6.3	6.9	7.3	7.6	7.8	8.1
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	10	A	S	4.9	5.6	6.3	7.0	7.4	7.8	8.2	8.6
		B	S	5.0	5.7	6.4	7.1	7.5	7.9	8.3	8.7
		C	S	5.1	5.8	6.5	7.2	7.6	8.0	8.4	8.8
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	14	A	S	4.9	5.6	6.3	7.0	7.5	7.9	8.3	8.7
		B	S	5.0	5.7	6.4	7.1	7.5	7.9	8.3	8.7
		C	S	5.1	5.8	6.5	7.2	7.6	8.0	8.4	8.8
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥ 18	A	S	4.9	5.6	6.3	7.0	7.5	8.0	8.4	8.8
		B	S	5.0	5.7	6.4	7.1	7.6	8.0	8.4	8.8
		C	S	5.1	5.8	6.5	7.2	7.6	8.0	8.4	8.8
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

*S = Approach Side, C = Corner, F = Traffic Face, A = S,C, and F

** See Table A-2.

Intersecting Slopes – Negative (down) (continued)Intersecting Slopes – Negative (down)
(continued)

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Inter-secting Slopes (negative) 2H:1V	0.3	A	S	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.2
		B	S	2.1	2.2	2.4	2.5	2.7	2.9	3.2	3.5
		C	S	2.4	2.6	2.8	3.0	3.2	3.4	3.8	4.2
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	1	A	S	2.9	3.0	3.2	3.3	3.5	3.7	4.0	4.3
		B	S	2.9	3.1	3.3	3.5	3.6	3.9	4.3	4.7
		C	S	3.3	3.5	3.7	3.9	4.1	4.4	4.9	5.4
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	2	A	S	4.1	4.2	4.4	4.5	4.7	4.9	5.1	5.4
		B	S	4.1	4.2	4.4	4.5	4.7	5.0	5.3	5.6
		C	S	4.2	4.4	4.6	4.8	5.0	5.3	5.6	5.9
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	4	A	S	5.5	5.6	5.6	5.7	5.9	6.2	6.4	6.5
		B	S	5.5	5.6	5.6	5.7	6.0	6.3	6.5	6.6
		C	S	5.6	5.7	5.7	5.8	6.1	6.4	6.6	6.7
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	6	A	S	3.0	6.2	6.4	6.6	6.8	7.1	7.3	7.4
		B	S	6.0	6.2	6.4	6.6	6.9	7.2	7.4	7.5
		C	S	6.1	6.3	6.5	6.7	7.0	7.3	7.5	7.6
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2.

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Intersecting Slopes – Negative (down) (continued)

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Inter-secting Slopes (negative) 2H:1V (cont.)	8	A	S	6.5	6.8	7.1	7.4	7.6	7.9	8.1	8.2
		B	S	6.5	6.8	7.1	7.4	7.7	8.0	8.2	8.3
		C	S	6.6	6.9	7.2	7.5	7.8	8.1	8.3	8.4
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	10	A	S	7.0	7.4	7.8	8.3	8.5	8.7	8.9	9.0
		B	S	7.0	7.4	7.8	8.3	8.5	8.8	9.0	9.1
		C	S	7.1	7.5	7.9	8.4	8.6	8.9	9.1	9.2
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	14	A	S	7.2	7.6	8.0	8.5	8.7	9.0	9.2	9.3
		B	S	7.2	7.6	8.0	8.5	8.7	9.0	9.2	9.3
		C	S	7.2	7.6	8.0	8.5	8.7	9.0	9.2	9.3
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	18	A	S	7.3	7.7	8.1	8.6	8.9	9.1	9.3	9.4
		B	S	7.3	7.7	8.1	8.6	8.9	9.1	9.3	9.4
		C	S	7.3	7.7	8.1	8.6	8.9	9.1	9.3	9.4
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥ 22	A	S	7.2	7.7	8.2	8.7	8.9	9.1	9.3	9.4
		B	S	7.2	7.7	8.2	8.7	8.9	9.1	9.3	9.4
		C	S	7.2	7.7	8.2	8.7	8.9	9.1	9.3	9.4
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

*S = Approach Side, C = Corner, F = Traffic Face, A = S,C, and F

** See Table A-2.

Intersecting Slopes – Negative (down) (continued)Intersecting Slopes – Negative (down)
(continued)

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Intersecting Slopes (negative) 1½H:1V	0.3	A	S	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.2
		B	S	2.1	2.2	2.4	2.5	2.7	2.9	3.2	3.5
		C	S	2.4	2.6	2.8	3.0	3.2	3.4	3.8	4.2
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	1	A	S	2.9	3.0	3.2	3.3	3.5	3.7	4.0	4.3
		B	S	2.9	3.1	3.3	3.5	6.3	3.9	4.3	4.7
		C	S	3.3	3.5	3.7	3.9	4.1	4.4	4.9	5.4
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	2	A	S	4.1	4.2	4.4	4.5	4.7	4.9	5.1	5.4
		B	S	4.1	4.2	4.4	4.5	4.7	5.0	5.3	5.6
		C	S	4.2	4.4	4.6	4.8	5.0	5.3	5.6	5.9
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	4	A	S	5.6	5.7	5.7	5.8	6.0	6.2	6.4	6.5
		B	S	5.6	5.7	5.7	5.8	6.0	6.3	6.5	6.6
		C	S	5.5	5.6	5.8	5.9	6.1	6.4	6.6	6.7
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	6	A	S	6.3	6.5	6.6	6.7	6.9	7.1	7.4	7.4
		B	S	6.3	6.5	6.6	6.7	6.9	7.2	7.4	7.5
		C	S	6.3	6.5	6.6	6.7	6.9	7.2	7.4	7.5
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

** See Table A-2

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Intersecting Slopes – Negative (down) (continued)

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Intersecting Slopes (negative) 1½H:1V (cont.)	8	A	S	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.3
		B	S	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.3
		C	S	7.0	7.2	7.4	7.6	7.8	8.0	8.2	8.3
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	10	A	S	7.9	8.2	8.5	8.8	8.9	8.9	9.1	9.2
		B	S	7.9	8.2	8.5	8.8	8.9	8.9	9.1	9.2
		C	S	7.9	8.2	8.5	8.8	8.9	8.9	9.1	9.2
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	14	A	S	8.3	8.6	8.8	9.1	9.2	9.3	9.5	9.6
		B	S	8.3	8.6	8.8	9.1	9.2	9.3	9.5	9.6
		C	S	8.3	8.6	8.8	9.1	9.2	9.3	9.5	9.6
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	18	A	S	8.5	8.8	9.0	9.3	9.4	9.5	9.5	9.5
		B	S	8.5	8.8	9.0	9.3	9.4	9.5	9.5	9.5
		C	S	8.5	8.8	9.0	9.3	9.4	9.5	9.5	9.5
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥ 22	A	S	8.6	8.9	9.1	9.4	9.5	9.5	9.6	9.6
		B	S	8.6	8.9	9.1	9.4	9.5	9.5	9.6	9.6
		C	S	8.6	8.9	9.1	9.4	9.5	9.5	9.6	9.6
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

*S = Approach Side, C = Corner, F = Traffic Face, A = S,C, and F

** See Table A-2.

Intersecting Slopes – Vertical Drop With and Without Water Present

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Water Depth (m)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Inter-secting Slopes (negative) Vertical Drop	0.0	0	S	0.1	0.2	0.2	0.3	0.4	0.5	0.7	0.8
		1	S	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.7
		2	S	4.3	4.6	4.8	5.1	5.3	5.6	5.8	6.1
		4	S	6.0	6.2	6.4	6.6	6.8	7.0	7.2	7.5
		≥6	S	7.5	7.7	7.9	8.1	8.3	8.4	8.6	8.7
	0.3	0	S	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.2
		1	S	2.6	2.9	3.1	3.4	3.6	3.9	4.1	4.4
		2	S	4.3	4.6	4.9	5.2	5.6	5.9	6.3	6.7
		4	S	6.0	6.3	6.6	6.9	7.1	7.4	7.6	7.9
		≥6	S	7.9	8.0	8.2	8.3	8.5	8.7	8.9	9.0
	1	0	S	2.9	3.0	3.2	3.3	3.5	3.7	4.0	4.3
		1	S	3.2	3.4	3.6	3.8	4.0	4.2	4.5	4.8
		2	S	5.4	5.6	5.8	6.0	6.3	6.6	6.8	7.1
		4	S	6.5	6.8	7.0	7.3	7.5	7.7	7.9	8.2
		≥6	S	8.0	8.1	8.3	8.4	8.6	8.8	9.0	9.1
	2	0	S	4.1	4.2	4.4	4.5	4.7	4.9	5.1	5.4
		1	S	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.7
		2	S	6.5	6.6	6.8	6.9	7.1	7.3	7.5	7.6
		4	S	7.3	7.4	7.6	7.7	7.9	8.1	8.3	8.4
		≥6	S	8.1	8.2	8.4	8.5	8.7	8.9	9.1	9.2
	4	0	S	5.7	5.8	5.8	5.9	6.0	6.2	6.4	6.5
		1	S	5.7	5.8	6.0	6.1	6.2	6.4	6.7	7.0
		2	S	7.2	7.3	7.5	7.6	7.8	8.0	8.2	8.3
		4	S	7.8	7.9	8.1	8.2	8.4	8.6	8.8	8.9
		≥6	S	8.4	8.5	8.7	8.8	9.0	9.2	9.4	9.5
	≥8	Any Depth	S	Use Values From Foreslopes - Vertical							

*S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

Intersecting Slopes – Positive (up) ***

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Slope (H:V)	Height (m)	Surface Condition (**)		50	60	70	80	90	100	110	120
Intersecting Slopes (positive) 10H:1V	0.15	A	S	0.3	0.4	0.6	0.7	0.9	1.1	1.3	1.6
		B	S	0.5	0.6	0.8	0.9	1.1	1.3	1.5	1.8
		C	S	0.9	1.0	1.2	1.3	1.5	1.7	2.0	2.3
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.3	A	S	0.4	0.5	0.7	0.8	1.2	1.5	1.9	2.3
		B	S	0.6	0.7	0.9	1.0	1.4	1.7	2.1	2.5
		C	S	0.8	1.0	1.2	1.4	1.8	2.1	2.5	2.9
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥0.6	A	S	0.4	0.5	0.7	0.8	1.2	1.6	2.0	2.4
		B	S	0.6	0.7	0.9	1.0	1.4	1.8	2.2	2.6
		C	S	0.8	1.0	1.2	1.4	1.8	2.2	2.6	3.0
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

* S = Approach Side, C = Corner, F = Traffic Face, A = S, C, and F

** See Table A-2.

*** The condition addressed in this table is a relatively simple one where the vehicle encounters an intersecting upward slope that connects to a relatively level and wide surface at its upper limit. Transitions between forelope or backslope and intersecting slopes are not addressed, nor is the condition where a vehicle might vault over a dyke or a narrow intersecting roadway. Developing SIs for other conditions will require special analysis and engineering judgment.

Intersecting Slopes – Positive (up) * (continued)**

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Slope (H:V)	Height (m)	Surface Condition (**)		50	60	70	80	90	100	110	120
Intersecting Slopes (positive) 8H:1V (cont.)	0.15	A	S	0.3	0.4	0.6	0.7	0.9	1.1	1.3	1.6
		B	S	0.5	0.6	0.8	0.9	1.1	1.3	1.5	1.8
		C	S	0.9	1.0	1.2	1.3	1.5	1.7	2.0	2.3
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥1	A	S	0.3	0.6	0.9	1.2	1.7	2.1	2.3	2.6
		B	S	0.5	0.8	1.1	1.4	1.8	2.2	2.5	2.8
		C	S	0.7	1.0	1.4	1.8	2.2	2.6	2.9	3.2
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

* S = Approach Side, C = Corner, F = Traffic Face, A = S,C, and F

** See Table A-2.

*** The condition addressed in this table is a relatively simple one where the vehicle encounters an intersecting upward slope that connects to a relatively level and wide surface at its upper limit. Transitions between forelope or backslope and intersecting slopes are not addressed, nor is the condition where a vehicle might vault over a dyke or a narrow intersecting roadway. Developing SIs for other conditions will require special analysis and engineering judgment.

Intersecting Slopes – Positive (up) * (continued)**

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Slope (H:V)	Height (m)	Surface Condition (**)		50	60	70	80	90	100	110	120
Intersecting Slopes (positive) 6H:1V (cont.)	0.15	A	S	0.3	0.4	0.6	0.7	0.9	1.1	0.3	1.6
		B	S	0.5	0.6	0.8	0.9	1.1	1.3	1.5	1.8
		C	S	0.7	0.9	1.1	1.3	1.5	1.8	2.0	2.3
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.3	A	S	0.5	0.8	1.2	1.6	2.0	2.3	2.6	2.9
		B	S	0.7	1.0	1.4	1.8	2.1	2.4	2.8	3.2
		C	S	1.0	1.3	1.7	2.1	2.4	2.7	3.1	3.5
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.6	A	S	0.5	0.9	1.3	1.8	2.1	2.4	2.7	3.0
		B	S	0.8	1.1	1.5	1.9	2.2	2.5	2.9	3.3
		C	S	1.0	1.4	1.8	2.3	2.5	2.8	3.2	3.6
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥1	A	S	0.4	0.9	1.4	1.9	2.2	2.5	2.8	3.1
		B	S	0.7	1.1	1.5	2.0	2.3	2.6	3.0	3.4
		C	S	0.9	1.4	1.9	2.4	2.6	2.9	3.3	3.7
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

* S = Approach Side, C = Corner, F = Traffic Face, A = S, C, and F

** See Table A-2

*** The condition addressed in this table is a relatively simple one where the vehicle encounters an intersecting upward slope that connects to a relatively level and wide surface at its upper limit. Transitions between forelope or backslope and intersecting slopes are not addressed, nor is the condition where a vehicle might vault over a dyke or a narrow intersecting roadway. Developing SIs for other conditions will require special analysis and engineering judgment.

Intersecting Slopes – Positive (up) * (continued)**

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Slope (H:V)	Height (m)	Surface Condition (**)		50	60	70	80	90	100	110	120
Intersecting Slopes (positive) 4H:1V (cont.)	0.15	A	S	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.7
		B	S	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.9
		C	S	0.6	0.9	1.1	1.4	1.6	1.8	2.1	2.4
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.3	A	S	1.3	1.6	1.9	2.2	2.6	3.0	3.3	3.6
		B	S	1.5	1.8	2.0	2.3	2.7	3.1	3.5	3.9
		C	S	1.8	2.1	2.3	2.6	3.0	3.4	3.8	4.2
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.6	A	S	1.6	1.9	2.1	2.4	2.8	3.2	3.5	3.8
		B	S	1.7	2.0	2.2	2.5	2.9	3.3	3.6	3.9
		C	S	2.2	2.4	2.6	2.8	3.2	3.6	3.9	4.2
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥1	A	S	1.6	1.9	2.1	2.4	2.8	3.2	3.6	4.0
		B	S	1.7	2.0	2.2	2.5	2.9	3.3	3.7	4.1
		C	S	2.2	2.4	2.6	2.8	3.2	3.6	4.0	4.4
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

* S = Approach Side, C = Corner, F = Traffic Face, A = S, C, and F

** See Table A-2

*** The condition addressed in this table is a relatively simple one where the vehicle encounters an intersecting upward slope that connects to a relatively level and wide surface at its upper limit. Transitions between forelope or backslope and intersecting slopes are not addressed, nor is the condition where a vehicle might vault over a dyke or a narrow intersecting roadway. Developing SIs for other conditions will require special analysis and engineering judgment.

Intersecting Slopes – Positive (up) * (continued)**

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Inter-secting Slopes (positive) 3H:1V	0.15	A	S	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.7
		B	S	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.9
		C	S	0.6	0.9	1.1	1.4	1.6	1.8	2.1	2.4
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.3	A	S	1.8	2.1	2.4	2.7	3.1	3.5	3.9	4.3
		B	S	1.9	2.2	2.5	2.8	3.2	3.6	4.0	4.4
		C	S	2.2	2.5	2.8	3.1	3.5	3.9	4.2	4.5
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.6	A	S	1.8	2.1	2.5	2.9	3.3	3.7	4.1	4.5
		B	S	1.9	2.2	2.6	3.0	3.4	3.8	4.2	4.6
		C	S	2.2	2.5	2.9	3.3	3.7	4.0	4.4	4.8
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥1	A	S	1.9	2.2	2.6	3.0	3.4	3.8	4.2	4.6
		B	S	2.0	2.3	2.7	3.1	3.5	3.9	4.3	4.7
		C	S	2.1	2.5	2.9	3.4	3.8	4.1	4.5	4.9
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

* S = Approach Side, C = Corner, F = Traffic Face, A = S,C, and F

** See Table A-2.

*** The condition addressed in this table is a relatively simple one where the vehicle encounters an intersecting upward slope that connects to a relatively level and wide surface at its upper limit. Transitions between forelope or backslope and intersecting slopes are not addressed, nor is the condition where a vehicle might vault over a dyke or a narrow intersecting roadway. Developing SIs for other conditions will require special analysis and engineering judgment.

Intersecting Slopes – Positive (up) * (continued)**

Object Type and Characteristics			Object Surface (*)	Severity Index							
Slope (H:V)	Height (m)	Surface Condition (**)		Design Speed – km/h							
				50	60	70	80	90	100	110	120
Inter-secting Slopes (positive) 2H:1V	0.15	A	S	0.4	0.5	0.7	0.8	1.0	1.2	1.4	1.7
		B	S	0.6	0.7	0.9	1.0	1.2	1.4	1.6	1.9
		C	S	0.8	1.0	1.2	1.4	1.6	1.8	2.1	2.4
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.3	A	S	2.1	2.5	2.9	3.4	3.9	4.4	4.8	5.2
		B	S	2.2	2.6	3.0	3.5	4.0	4.5	4.9	5.3
		C	S	2.3	2.8	3.3	3.8	4.2	4.7	5.1	5.5
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.6	A	S	2.5	2.8	3.2	3.6	4.1	4.6	5.0	5.4
		B	S	2.6	2.9	3.3	3.7	4.2	4.7	5.1	5.5
		C	S	2.8	3.1	3.5	3.9	4.4	4.9	5.3	5.7
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥1	A	S	2.6	2.9	3.3	3.7	4.2	4.7	5.1	5.5
		B	S	2.7	3.0	3.4	3.8	4.3	4.8	5.2	5.6
		C	S	2.9	3.2	3.6	4.0	4.5	4.9	5.3	5.7
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

* S = Approach Side, C = Corner, F = Traffic Face, A = S,C, and F

** See Table A-2

*** The condition addressed in this table is a relatively simple one where the vehicle encounters an intersecting upward slope that connects to a relatively level and wide surface at its upper limit. Transitions between forelope or backslope and intersecting slopes are not addressed, nor is the condition where a vehicle might vault over a dyke or a narrow intersecting roadway. Developing SIs for other conditions will require special analysis and engineering judgment.

Intersecting Slopes – Positive (up) * (continued)**

Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Slope (H:V)	Height (m)	Surface Condition (**)		50	60	70	80	90	100	110	120
Intersecting Slopes (positive) 1½H:1V	0.15	A	S	0.4	0.5	0.7	0.8	1.0	1.2	1.5	1.8
		B	S	0.6	0.7	0.9	1.0	1.2	1.5	1.7	2.0
		C	S	0.8	1.0	1.2	1.4	1.6	1.9	2.1	2.4
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.3	A	S	2.4	2.9	3.4	3.9	4.3	4.8	5.3	5.8
		B	S	2.5	3.0	3.5	4.0	4.4	4.9	5.4	5.9
		C	S	2.7	3.2	3.7	4.2	4.6	5.1	5.5	5.9
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.6	A	S	2.6	3.1	3.6	4.1	4.6	5.2	5.6	6.0
		B	S	2.7	3.2	3.7	4.2	4.7	5.3	5.7	6.1
		C	S	2.8	3.1	3.5	3.9	4.4	4.9	5.3	5.7
		D	S	2.9	3.4	3.9	4.4	4.9	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	≥1	A	S	2.7	3.2	3.7	4.2	4.7	5.3	5.7	6.1
		B	S	2.8	3.3	3.8	4.3	4.8	5.4	5.8	6.2
		C	S	3.0	3.5	4.0	4.5	5.0	5.5	5.9	6.3
		D	S	3.0	3.5	4.0	4.5	5.0	5.5	5.9	6.3
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0

* S = Approach Side, C = Corner, F = Traffic Face, A = S,C, and F

** See Table A-2.

*** The condition addressed in this table is a relatively simple one where the vehicle encounters an intersecting upward slope that connects to a relatively level and wide surface at its upper limit. Transitions between forelope or backslope and intersecting slopes are not addressed, nor is the condition where a vehicle might vault over a dyke or a narrow intersecting roadway. Developing SIs for other conditions will require special analysis and engineering judgment.

Intersecting Slopes – Positive (up) * (continued)**

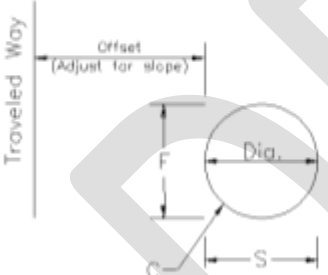
Object Type and Characteristics			Object Surface (*)	Severity Index							
				Design Speed – km/h							
Slope (H:V)	Height (m)	Surface Condition (**)		50	60	70	80	90	100	110	120
Intersecting Slopes (positive) 1H:1V	0.15	A	S	0.4	0.5	0.7	0.8	1.0	1.3	1.5	1.8
		B	S	0.6	0.7	0.9	1.0	1.2	1.5	1.7	2.0
		C	S	0.8	1.0	1.2	1.4	1.6	1.9	2.1	2.4
		D	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.3	A	S	2.9	3.3	3.7	4.2	4.7	5.3	5.8	6.3
		B	S	3.0	3.4	3.8	4.3	4.8	5.4	5.8	6.2
		C	S	3.2	3.6	4.0	4.5	5.0	5.5	5.9	6.3
		D	S	3.2	3.6	4.0	4.5	5.0	5.5	5.9	6.3
		E	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	7.0
	0.6	A	S	3.0	3.5	4.0	4.5	5.0	5.6	6.2	6.7
		B	S	3.1	3.6	4.1	4.6	5.1	5.6	6.2	6.7
		C	S	3.3	3.8	4.3	4.8	5.2	5.7	6.3	6.8
		D	S	3.3	3.8	4.3	4.8	5.2	5.7	6.3	6.8
		E	S	3.3	3.8	4.3	4.8	5.2	5.7	6.3	7.0
	≥1	A	S	3.1	3.6	4.1	4.6	5.1	5.7	6.3	6.8
		B	S	3.2	3.7	4.2	4.7	5.2	5.7	6.3	6.8
		C	S	3.4	3.9	4.4	4.9	5.3	5.8	6.4	6.9
		D	S	3.4	3.9	4.4	4.9	5.3	5.8	6.4	6.9
		E	S	3.4	3.9	4.4	4.9	5.3	5.8	6.4	7.0

* S = Approach Side, C = Corner, F = Traffic Face, A = S,C, and F

** See Table A-2

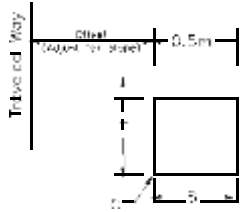
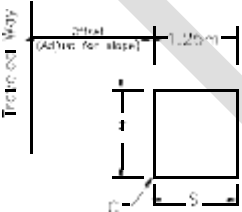
*** The condition addressed in this table is a relatively simple one where the vehicle encounters an intersecting upward slope that connects to a relatively level and wide surface at its upper limit. Transitions between forelope or backslope and intersecting slopes are not addressed, nor is the condition where a vehicle might vault over a dyke or a narrow intersecting roadway. Developing SIs for other conditions will require special analysis and engineering judgment.

Fixed Objects

Object Type and Characteristics		Object Surface (*)	Severity Index							
			Design Speed – km/h							
			50	60	70	80	90	100	110	120
Trees or stumps (diameter measured at 15 cm above ground)	Diameter = 50 mm	A	0.2	0.3	0.3	0.4	0.5	0.5	0.7	0.8
	Diameter = 100 mm	A	1.0	1.1	1.1	1.2	1.3	1.5	1.7	2.0
	Diameter = 150 mm	A	2.5	2.6	2.6	2.7	2.9	3.0	3.2	3.3
	Diameter = 200 mm	A	3.2	3.5	3.7	4.0	4.3	4.6	5.0	5.4
	Diameter = 250 mm	A	3.2	3.6	4.0	4.5	5.0	5.6	6.2	6.7
	Diameter = 300 mm	A	3.3	3.7	4.1	4.6	5.1	5.7	6.4	7.1
	Diameter > 300 mm	A	3.4	3.8	4.2	4.7	5.2	5.8	6.5	7.2
Utility Poles	Diameter = 200 mm	A	3.1	3.4	3.6	3.9	4.2	4.5	4.9	5.3
	Diameter = 250 mm	A	3.1	3.5	3.9	4.4	4.9	5.5	6.1	6.6
	Diameter = 300 mm	A	3.3	3.7	4.1	4.6	5.1	5.6	6.3	7.0
	Diameter > 300 mm	A	3.4	3.8	4.2	4.7	5.2	5.8	6.5	7.2
Round 	Diameter = 0.5 m	S	3.0	3.4	3.8	4.3	4.8	5.4	6.0	6.5
		C	3.4	3.8	4.2	4.7	5.2	5.8	6.5	7.2
		F	2.6	3.0	3.4	3.9	4.4	4.9	5.3	5.7
	Diameter = 1.0 m	S	2.8	3.3	3.8	4.3	4.8	5.3	5.9	6.4
		C	3.3	3.7	4.1	4.6	5.1	5.7	6.4	7.1
		F	2.5	2.9	3.3	3.8	4.3	4.7	5.0	5.3
	Diameter > 2.0 m	S	2.7	3.2	3.7	4.2	4.7	5.3	5.9	6.4
		C	3.2	3.6	4.0	4.5	5.0	5.6	6.3	7.0
		F	2.6	2.9	3.3	3.7	4.2	4.7	5.2	5.7

S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

Fixed Objects (continued)

Object Type and Characteristics		Object Surface (*)	Severity Index							
			Design Speed – km/h							
			50	60	70	80	90	100	110	120
Rectangular: Width of approach side equal to 0.5 m Face parallel to roadway, sides are perpendicular. 	Height = 0.15 m	S	0.2	0.3	0.5	0.6	0.7	0.8	0.9	0.9
		C	0.2	0.3	0.5	0.6	0.7	0.8	0.9	0.9
		F	0.4	0.5	0.7	0.8	1.0	1.2	1.4	1.5
	Height = 0.3 m	S	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		C	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		F	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.2
	Height = 0.5 m	S	3.2	3.6	4.0	4.5	5.1	5.7	6.3	6.8
		C	3.2	3.6	4.0	4.5	5.1	5.7	6.3	6.8
		F	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.2
	Height = 0.6 m	S	3.4	3.8	4.2	4.7	5.2	5.8	6.5	7.2
		C	3.4	3.8	4.2	4.7	5.2	5.8	6.5	7.2
		F	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.2
	Height > 1.0 m	S	3.4	3.9	4.4	4.9	5.4	6.0	6.7	7.4
		C	3.4	3.9	4.4	4.9	5.4	6.0	6.7	7.4
		F	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.2
Rectangular: Width of approach side is 1.25 m. Face is parallel to roadway, sides are perpendicular. 	Height = 0.15 m	S	0.5	0.6	0.8	0.9	1.1	1.3	1.5	1.8
		C	0.5	0.6	0.8	0.9	1.1	1.3	1.5	1.8
		F	0.4	0.5	0.7	0.8	1.0	1.2	1.4	1.5
	Height = 0.3 m	S	2.6	3.2	3.7	4.3	4.8	5.3	5.8	6.3
		C	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		F	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.2
	Height = 0.5 m	S	3.0	3.5	4.0	4.5	5.0	5.6	6.2	6.7
		C	3.2	3.6	4.0	4.5	5.1	5.7	6.3	6.8
		F	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.2
	Height = 0.6 m	S	3.1	3.6	4.1	4.6	5.1	5.7	6.4	7.1
		C	3.4	3.8	4.2	4.7	5.2	5.8	6.5	7.2
		F	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.2
	Height > 1.0 m	S	3.3	3.8	4.3	4.8	5.3	5.9	6.6	7.3
		C	3.4	3.9	4.4	4.9	5.4	6.0	6.7	7.4
		F	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.2

S = Approach Side, C = Corner, F = Traffic Face, A = S, C, and F

Fixed Objects (continued)

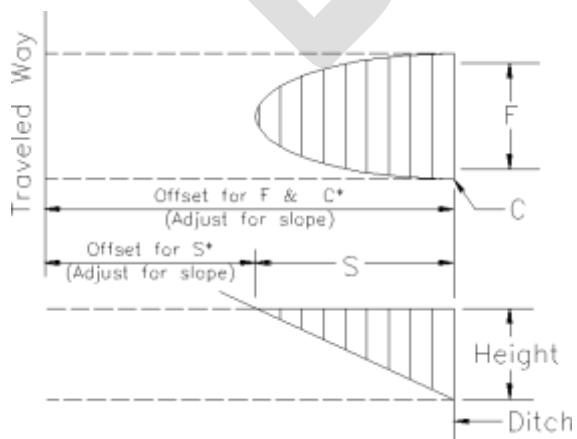
Object Type and Characteristics		Object Surface (*)	Severity Index							
			Design Speed – km/h							
			50	60	70	80	90	100	110	120
Rectangular: Width of approach side is 2 m or greater. Face is parallel to traffic and sides are perpendicular.	Height = 0.15 m	S	0.5	0.7	0.9	1.1	1.3	1.6	1.9	2.2
		C	0.5	0.7	0.9	1.1	1.3	1.6	1.9	2.2
		F	0.4	0.5	0.7	0.8	1.0	1.2	1.4	1.5
	Height = 0.3 m	S	2.5	3.1	3.6	4.2	4.7	5.3	5.8	6.3
		C	2.8	3.3	3.8	4.3	4.8	5.4	5.9	6.4
		F	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.3
	Height = 0.5 m	S	2.9	3.4	3.9	4.4	4.9	5.5	6.1	6.6
		C	3.2	3.6	4.0	4.5	5.1	5.7	6.3	6.8
		F	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.2
	Height = 0.6 m	S	2.8	3.4	4.1	4.7	5.1	5.6	6.3	7.0
		C	3.5	3.8	4.2	4.6	5.2	5.8	6.5	7.2
		F	1.9	2.0	2.2	2.3	2.5	2.7	3.0	3.3
	Height > 1.0 m	S	3.2	3.7	4.2	4.7	5.2	5.8	6.5	7.2
		C	3.4	3.9	4.4	4.9	5.4	6.0	6.7	7.4
		F	1.9	2.0	2.2	2.3	2.5	2.7	2.9	3.3

S = Approach Side, C = Corner, F = Traffic Face, A = S, C, and F

Culverts

Object Type and Characteristics		Object Surface (*)	Severity Index							
			Design Speed – km/h							
Description	Height		50	60	70	80	90	100	110	120
Culvert Ends: Culvert Axis Transverse to traffic Culvert End Type A	0.3 m	S	0.4	0.5	0.7	0.8	0.9	1.1	1.3	1.4
		C	1.4	1.7	2.0	2.3	2.7	3.1	3.4	3.7
		F	2.3	2.6	2.9	3.2	3.4	3.7	4.0	4.3
	0.5 m	S	0.6	0.7	0.9	1.0	1.2	1.4	1.6	1.7
		C	1.7	2.1	2.5	3.0	3.4	3.8	4.3	4.8
		F	2.1	2.4	2.8	3.2	3.4	3.6	4.0	4.4
	0.6 m	S	1.5	1.8	2.2	2.6	2.9	3.2	3.6	4.0
		C	1.9	2.5	3.2	3.8	4.3	4.8	5.3	5.8
		F	2.2	2.5	2.8	3.1	3.3	3.6	4.0	4.4
	1.0 m	S	2.1	2.5	2.9	3.4	3.8	4.2	4.7	5.2
		C	2.0	2.6	3.1	3.7	4.3	4.9	5.5	6.0
		F	2.2	2.5	2.8	3.1	3.5	3.8	4.1	4.4
	1.2 m	S	2.6	3.0	3.4	3.9	4.3	4.8	5.4	5.9
		C	1.6	2.2	2.9	3.5	4.2	4.8	5.4	6.1
		F	2.1	2.5	2.9	3.4	3.8	4.1	4.3	4.6
	1.8 m	S	2.9	3.3	3.7	4.2	4.7	5.2	5.8	6.5
		C	1.1	1.8	2.5	3.2	3.9	4.5	5.1	5.8
		F	1.6	2.1	2.6	3.1	3.4	3.8	4.2	4.6
	2.4 m	S	3.0	3.5	4.0	4.5	5.0	5.6	6.2	6.7
		C	0.2	1.0	1.9	2.7	3.4	4.1	4.7	5.4
		F	1.5	1.9	2.3	2.8	3.3	3.7	4.1	4.5

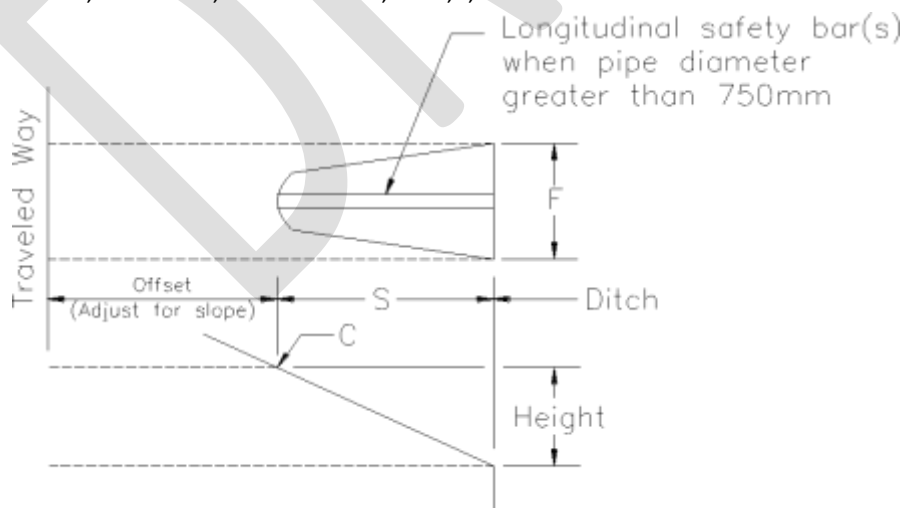
S = Approach Side, C = Corner, F = Traffic Face, A = S, C, and F



Culverts (continued)

Object Type and Characteristics		Object Surface (*)	Severity Index							
			Design Speed – km/h							
Description	Height		50	60	70	80	90	100	110	120
Culvert Ends: Culvert Axis Transverse to traffic Safety Slope End Treatment per OPSD 801.040, or Concrete Box with Safety Bars. Slope of Treatment matches adjacent 4H:1V or 6H:1V Foreslope	0.3 m	S,C,&F	0.2	0.3	0.5	0.6	0.8	1.0	1.3	1.6
	0.5 m	S,C,&F	0.4	0.5	0.7	0.8	1.2	1.6	2.0	2.4
	0.6 m	S,C,&F	0.3	0.6	0.9	1.2	1.7	2.1	2.3	2.6
	1.0 m	S,C,&F	0.5	1.0	1.5	2.0	2.3	2.6	3.0	3.4
	1.2 m	S,C,&F	1.5	1.8	2.1	2.4	2.8	3.2	3.5	3.6
	1.8 m	S,C,&F	1.9	2.3	2.5	2.8	3.0	3.3	3.5	3.6

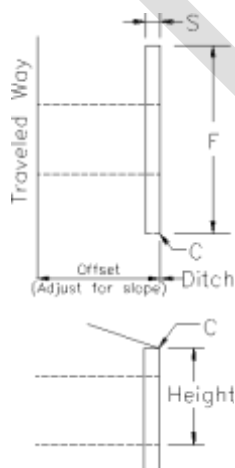
S = Approach Side, C = Corner, F = Traffic Face, A = S,C, and F



Culverts (continued)

Object Type and Characteristics		Object Surface (*)	Severity Index							
			Design Speed – km/h							
Description	Height		50	60	70	80	90	100	110	120
Culvert Ends: Culvert Axis Transverse to traffic Culvert Headwall Parallel to Traffic and Tied into Foreslope	0.3 m	C,S	2.4	2.7	3.0	3.3	3.6	3.9	4.3	4.7
		F	2.1	2.4	2.7	3.0	3.3	3.6	3.8	4.1
	0.5 m	C,S	3.0	3.3	3.5	3.8	4.1	4.4	4.6	4.9
		F	2.6	2.9	3.1	3.4	3.6	3.9	4.1	4.4
	0.6 m	C,S	3.2	3.5	3.8	4.1	4.4	4.7	5.0	5.3
		F	2.8	3.1	3.3	3.6	3.8	4.1	4.3	4.6
	1.0 m	C,S	3.9	4.2	4.5	4.8	5.0	5.3	5.5	5.8
		F	3.0	3.3	3.6	3.9	4.1	4.4	4.6	4.9
	1.2 m	C,S	4.3	4.5	4.7	4.9	5.2	5.5	5.8	6.1
		C,S	3.5	3.7	3.9	4.1	4.3	4.6	4.8	5.1
	1.8 m	F	4.8	5.0	5.2	5.4	5.7	6.0	6.3	6.6
		C,S	4.0	4.2	4.4	4.6	4.8	5.1	5.3	5.6
	2.4 m	F	5.2	5.4	5.6	5.8	6.0	6.3	6.6	6.9
		C,S	4.6	4.7	4.9	5.0	5.2	5.5	5.7	6.0

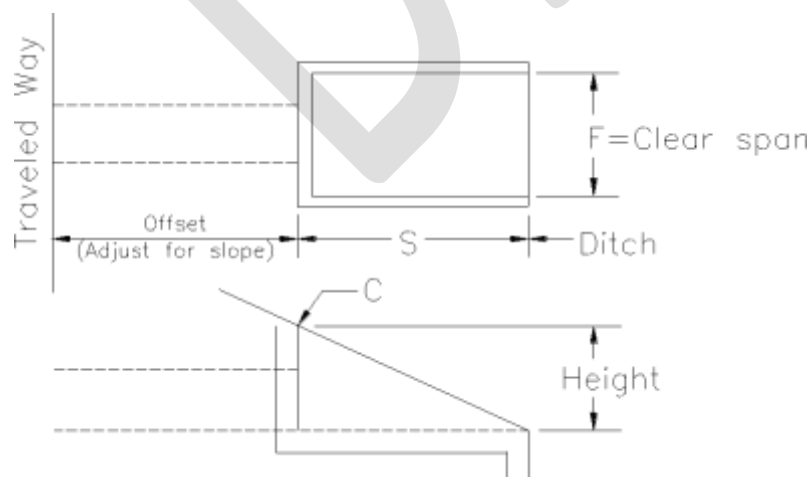
S = Approach Side, C = Corner, F = Traffic Face, A = S,C, and F



Culverts (continued)

Object Type and Characteristics		Object Surface (*)	Severity Index							
			Design Speed – km/h							
Description	Height		50	60	70	80	90	100	110	120
Culvert Ends: Culvert Axis Transverse to traffic Culvert End with Headwalls perpendicular to Traffic	0.3 m	S,C,&F	1.2	1.4	1.6	1.8	2.0	2.3	2.6	2.9
	0.5 m	S,C,&F	1.5	1.7	1.9	2.1	2.4	2.8	3.5	4.2
	0.6 m	S,C,&F	1.6	1.9	2.1	2.4	2.8	3.1	3.3	3.6
	1.0 m	S,C,&F	1.7	2.1	2.5	3.0	3.2	3.5	3.8	4.1
	1.2 m	S,C,&F	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5
	1.8 m	S,C,&F	3.0	3.3	3.6	3.9	4.3	4.6	4.9	5.2
	2.4 m	S,C,&F	3.3	3.6	4.0	4.4	4.8	5.1	5.5	5.9

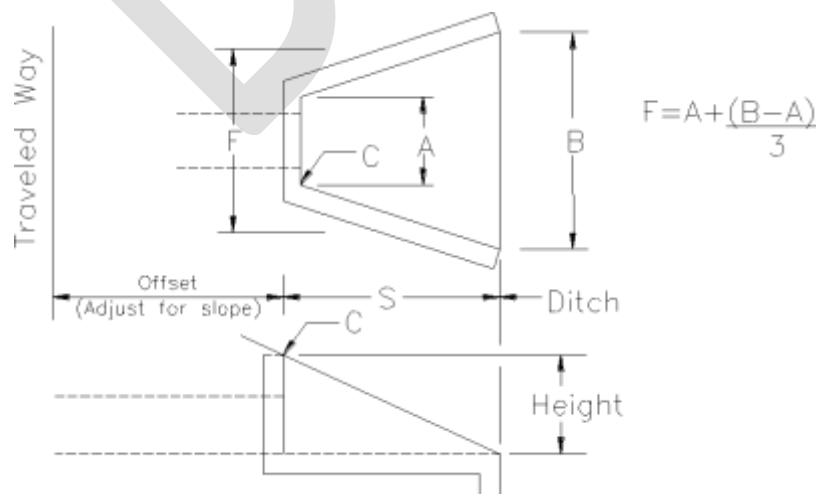
S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F



Culverts (continued)

Object Type and Characteristics		Object Surface (*)	Severity Index							
			Design Speed – km/h							
Description	Height		50	60	70	80	90	100	110	120
Culvert Ends: Culvert Axis Transverse to traffic Culvert End with Wingwalls	0.3 m	S	1.8	2.1	2.3	2.6	2.9	3.1	3.3	3.4
		C	2.2	2.5	2.8	3.1	3.4	3.7	3.9	4.2
		F	1.8	2.0	2.2	2.4	2.7	3.0	3.2	3.3
	0.5 m	S	2.5	2.7	2.9	3.1	3.2	3.4	3.7	4.0
		C	3.0	3.2	3.4	3.6	3.8	4.1	4.3	4.6
		F	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.8
	0.6 m	S	2.6	2.8	3.0	3.2	3.4	3.7	4.0	4.3
		C	3.0	3.3	3.5	3.8	4.0	4.3	4.6	4.9
		F	2.3	2.6	2.8	3.1	3.3	3.5	3.8	4.1
	1.0 m	S	2.7	3.0	3.4	3.8	4.0	4.2	4.4	4.5
		C	3.3	3.6	4.0	4.4	4.6	4.8	5.0	5.3
		F	2.7	3.0	3.3	3.6	3.8	4.0	4.2	4.3
	1.2 m	S	3.3	3.5	3.7	3.9	4.1	4.3	4.6	4.9
		C	3.9	4.1	4.3	4.5	4.7	5.0	5.3	5.6
		F	3.1	3.3	3.5	3.7	3.9	4.1	4.4	4.7
	1.8 m	S	3.9	4.0	4.2	4.3	4.5	4.8	5.1	5.4
		C	4.4	4.6	4.8	5.0	5.2	5.5	5.8	6.1
		F	3.7	3.8	4.0	4.1	4.3	4.6	4.9	5.2
	2.4 m	S	4.3	4.4	4.6	4.7	4.9	5.1	5.2	5.2
		C	5.0	5.1	5.3	5.4	5.6	5.8	6.0	6.1
		F	4.1	4.2	4.4	4.5	4.7	4.9	5.0	5.0

S = Approach Side, C = Corner, F = Traffic Face, A = S, C, and F



Barrier Terminals, Attenuators, Breakaway Signs, and Frangible Base Luminaires

Object Type and Characteristics	Object Surface (*)	Severity Index							
		Design Speed – km/h							
		50	60	70	80	90	100	110	120
3-Cable guide rail system on cedar posts.	F	2.0	2.3	2.5	2.8	3.1	3.4	3.6	3.8
High Tension 3-Cable or 4-Cable guide rail systems with steel posts	F	2.0	2.3	2.5	2.8	3.0	3.3	3.5	3.6
Semi-rigid steel beam guide rail systems on steel posts: *	F	2.0	2.3	2.5	2.9	3.1	3.4	3.6	3.7
Concrete Barrier systems (Permanent/Embedded) **	F	2.1	2.4	2.6	3.0	3.2	3.5	3.7	3.8
Temporary Concrete Barrier Systems, unrestrained *	F	2.1	2.4	2.6	3.0	3.2	3.5	3.7	3.8
Temporary Concrete Barrier Systems, restrained *	F	2.1	2.4	2.6	3.0	3.2	3.5	3.7	3.8

S = Approach Side, C = Corner, F= Traffic Face, A = S,C, and F

* NCHRP Report 350 TL-3 or TL-4 systems, and MASH TL-3 Systems

** NCHRP Report 350 and MASH TL-3, TL-4 and TL-5 Systems

Barrier Terminals, Attenuators, Breakaway Signs, and Frangible Base Luminaires (continued)

Object Type and Characteristics	Object Surface (*)	Severity Index							
		Design Speed – km/h							
		50	60	70	80	90	100	110	120
High tension Cable Guide Rail Terminal	F	2.0	2.3	2.5	2.8	3.0	3.3	3.5	3.6
	C&S	1.8	2.0	2.2	2.4	2.5	2.7	2.9	3.2
Steel Beam or Box Beam Energy Attenuating Terminals (e.g., SBEAT, SBT, BB-BEAT, QuadTrend) ***	F (**)	2m @ 2.1	2m @ 2.3	2m @ 2.5	2m @ 2.7	2m @ 2.9	2m @ 3.2	2m @ 3.5	2m @ 3.8
	C&S	2.1	2.3	2.5	2.7	2.9	3.2	3.5	3.8
Energy Attenuator Terminals for Concrete Barrier - Temporary and Permanent installations ****	F	2.1	2.3	2.5	2.7	2.9	3.2	3.5	3.8
	C&S	2.1	2.3	2.5	2.7	2.9	3.2	3.5	3.8
Breakaway Sign Support Systems **	A	1.8	2.0	2.2	2.4	2.5	2.7	2.9	3.2
Frangible Base Luminaire Poles ***	A	1.9	2.2	2.4	2.6	2.8	3.0	3.3	3.4

* S = Approach Side, C = Corner, F = Traffic Face, A = S, C, and F

** Dimension above “@” sign is length of device at impact end of system to be analyzed using the noted severity index.

*** NCHRP Report 350 or MASH TL-3 Systems

**** NCHRP Report 350 TL-2 systems for low speed installations with posted speeds < 70km/h, and TL-3 systems for high-speed installations with posted speeds ≥ 70km/h.

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