

ERRATA

July 2015

Dear Customer:

Recently, we were made aware of some technical revisions that need to be applied to the *Roadside Design Guide*, 4th Edition.

Please replace the existing text with the corrected text to ensure that your edition is both accurate and current.

Text in bold indicates revisions made since the previous errata was released in February 2012.

AASHTO staff sincerely apologizes for any inconvenience.

Errata to *Roadside Design Guide*, 4th Edition

Page	Existing Text	Corrected Text																																														
3-3	In Table 3-1, U.S. Customary units, the backslopes for the Design Speed ≤ 40 mph were listed as <table><tr><th rowspan="2">Design ADT</th><th colspan="3">Backslope</th></tr><tr><th>1V:3H</th><th>1V:5H to 1V:4H</th><th>1V:6H or Flatter</th></tr><tr><td>Under 750</td><td>7–10</td><td>7–10</td><td>7–10</td></tr><tr><td>750–1500</td><td>12–14</td><td>12–14</td><td>12–14</td></tr><tr><td>1500–6000</td><td>14–16</td><td>14–16</td><td>14–16</td></tr><tr><td>Over 6000</td><td>16–18</td><td>16–18</td><td>16–18</td></tr></table>	Design ADT	Backslope			1V:3H	1V:5H to 1V:4H	1V:6H or Flatter	Under 750	7–10	7–10	7–10	750–1500	12–14	12–14	12–14	1500–6000	14–16	14–16	14–16	Over 6000	16–18	16–18	16–18	The attached replacement page shows the correct backslope values as follows: <table><tr><th rowspan="2">Design ADT</th><th colspan="3">Backslope</th></tr><tr><th>1V:3H</th><th>1V:5H to 1V:4H</th><th>1V:6H or Flatter</th></tr><tr><td>Under 750</td><td>7–10</td><td>7–10</td><td>7–10</td></tr><tr><td>750–1500</td><td>10–12</td><td>10–12</td><td>10–12</td></tr><tr><td>1500–6000</td><td>12–14</td><td>12–14</td><td>12–14</td></tr><tr><td>Over 6000</td><td>14–16</td><td>14–16</td><td>14–16</td></tr></table>	Design ADT	Backslope			1V:3H	1V:5H to 1V:4H	1V:6H or Flatter	Under 750	7–10	7–10	7–10	750–1500	10–12	10–12	10–12	1500–6000	12–14	12–14	12–14	Over 6000	14–16	14–16	14–16
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3-21	Example 3-D does not have “Discussion” text to follow after the figure.	Add the following text: “Discussion—Since the critical foreslope is within the suggested clear-zone distance of 9 to 10.5 m [30 to 34 ft], it should be flattened if practical or considered for shielding. However, if this is an isolated obstacle and the roadway has no significant crash history, it may be appropriate to do little more than delineate the drop-off in lieu of foreslope flattening or shielding.”																																														
3-26	Example 3-K, Curve 2—The cross sections in the figure need to be banked the opposite direction in order to correspond to the plan view as shown on page 3-27. Also, the dimension “[11 to 15 ft]” should be changed to “[10 to 15 ft].”	Substitute Example 3-K with the attached revised figure.																																														
3-28	Example 3-L, Curves 2 and 3—The cross sections in the figure need to be banked the opposite direction in order to correspond to the plan view as shown on page 3-29. Also, the dimension “[10.5 to 15 ft]” for Curve 2 should be changed to “[10 to 15 ft].”	Substitute Example 3-L with the attached revised figures.																																														
3-29	Example 3-L, Curve 4—The dimension “[14 to 16.8 ft]” for Curve 4 should be changed to “[14 to 16 ft].”	Substitute Example 3-L with the attached revised figure.																																														
5-12	For NU-GUARD by Nucor Marion in Table 5-3, the Test Level is listed as “3” and the FHWA Acceptance Letter is listed as “B-162.”	Change the Test Level for NU-GUARD to “3 and 4” and the FHWA Acceptance Letter to “B-162 and B-162B.”																																														
5-42	The second sentence of the last paragraph reads “The design incorporates 2.74-m [9-ft] long posts . . .”	Change the text to read “The design incorporates 2.74-m [9-ft] long <u>steel</u> posts . . .”																																														
5-43	In Figure 35(a), the U.S. customary drawing is missing a dimension line on the far left side; the metric drawing has an extra line connecting a dimension line to the top of the pavement.	Substitute Figure 5-35(a) with the attached revised figure.																																														

Errata to Roadside Design Guide, 4th Edition

Page	Existing Text	Corrected Text
5-49	Figure 5-39 refers to Figure 5-22.	The correct cross reference is to Figure 5-42.
5-58	Figure 5-47 has partial text missing.	Substitute Figure 5-47 with the attached revised figure.
6-2	Figure 6-1 shows incorrect metric and U.S. measurements for median widths.	Substitute Figure 6-1 with the attached revised figure.
6-7	Figure 6-4 shows incorrect image of Brifen Wire Rope Safety Fence.	Substitute Figure 6-4 with the attached revised figure.
8-9	Table 8-2 requires several changes under Height Terminals, Flared Terminals, and Tangent Terminals.	Substitute Table 8-2 with the attached revised table.
8-19	The first sentence of Section 8.3.7 reads “This section describes end terminals and their design criteria for two box-beam guardrail systems.”	Change this sentence to read “This section describes the terminals for the box-beam guardrail system discussed in Chapter 5.”
8-23	The first sentence of Section 8.4.2 includes “. . . in accordance with TL-2 or TL-3 conditions . . .”	Change this phrase to read “. . . in accordance with <u>TL-1</u>, TL-2, or TL-3 conditions . . .”
8-29	The final sentence of Section 8.4.2.2.2 states “Figure 8-28 shows this eight-bay system.”	Change this sentence to read “Figure 8-28 shows a <u>four</u>-bay system.”
8-31	The third sentence of Section 8.4.2.3 begins “Although some attenuators can . . .”	Change this sentence to read “Although some <u>crash cushions</u> can . . .”
8-31	In Table 8-7, text is missing from the FHWA Acceptance Level column (row 3).	Add “CC89A” after CC89.
8-32	The first sentence of Section 8.4.2.3.3 begins “The HEART™ is a proprietary, energy-absorbing, unidirectional crash cushion . . .”	Change this sentence to read “The HEART™ is a proprietary, energy-absorbing, <u>bidirectional</u> crash cushion . . .”
8-33	In Section 8.4.2.3.3, the last sentence reads: “The opposite direction crash test was not performed; therefore, until further testing is done, the HEART™ should be used only in locations with one-way traffic.”	Delete this sentence.
8-48 & 8-49	In Table 8-12, Sand Filled Barrels is placed in the wrong section.	Substitute Table 8-12 with the attached revised table.
10-10	The illustrations for Figures 10-4 and 10-5 need to be transposed. Also, the width of the Narrow Buffer Strip should be “≤1.2 m [4'-0”].	Substitute the attached page with the revised illustrations in the correct order.
11-7	Figure 11-5 shows incorrect measurement of taper for LS.	Substitute Figure 11-5 with the attached revised figure.

Errata to *Roadside Design Guide*, 4th Edition

Page	Existing Text	Corrected Text
G-1	Definition of Clear Zone reads: “The total roadside border area, starting at the edge of the traveled way, available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable slope, a non-recoverable slope, and/or a clear run-out area. The desired width is dependent upon the traffic volumes and speeds and on the roadside geometry.”	The definition should read: “The unobstructed, traversable area provided beyond the edge of the through traveled way for the recovery of errant vehicles. The clear zone includes shoulders, bike lanes, and auxiliary lanes, except those auxiliary lanes that function like through lanes.”

Highlighted Text Changed in July 2015 Errata

- c) For roadways with low volumes, it may not be practical to apply even the minimum values found in Table 3-1. Refer to Chapter 12 for additional considerations for low-volume roadways and Chapter 10 for additional guidance for urban applications.
- d) When design speeds are greater than the values provided, the designer may provide clear-zone distances greater than those shown in Table 3-1.

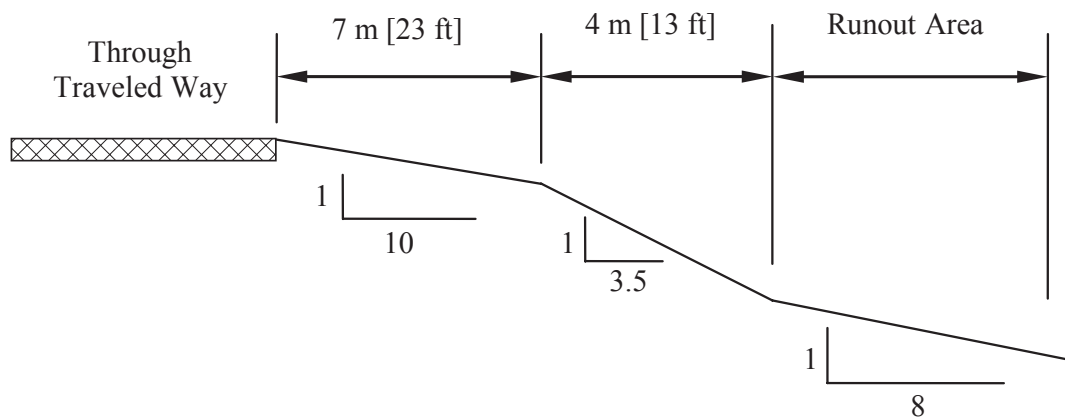
U.S. Customary Units

Design Speed (mph)	Design ADT	Foreslopes			Backslopes		
		1V:6H or flatter	1V:5H to 1V:4H	1V:3H	1V:3H	1V:5H to 1V:4H	1V:6H or flatter
≤40	UNDER 750 ^c	7–10	7–10	^b	7–10	7–10	7–10
	750–1500	10–12	12–14	^b	10–12	10–12	10–12
	1500–6000	12–14	14–16	^b	12–14	12–14	12–14
	OVER 6000	14–16	16–18	^b	14–16	14–16	14–16
45–50	UNDER 750 ^c	10–12	12–14	^b	8–10	8–10	10–12
	750–1500	14–16	16–20	^b	10–12	12–14	14–16
	1500–6000	16–18	20–26	^b	12–14	14–16	16–18
	OVER 6000	20–22	24–28	^b	14–16	18–20	20–22
55	UNDER 750 ^c	12–14	14–18	^b	8–10	10–12	10–12
	750–1500	16–18	20–24	^b	10–12	14–16	16–18
	1500–6000	20–22	24–30	^b	14–16	16–18	20–22
	OVER 6000	22–24	26–32 ^a	^b	16–18	20–22	22–24
60	UNDER 750 ^c	16–18	20–24	^b	10–12	12–14	14–16
	750–1500	20–24	26–32 ^a	^b	12–14	16–18	20–22
	1500–6000	26–30	32–40 ^a	^b	14–18	18–22	24–26
	OVER 6000	30–32 ^a	36–44 ^a	^b	20–22	24–26	26–28
65–70 ^d	UNDER 750 ^c	18–20	20–26	^b	10–12	14–16	14–16
	750–1500	24–26	28–36 ^a	^b	12–16	18–20	20–22
	1500–6000	28–32 ^a	34–42 ^a	^b	16–20	22–24	26–28
	OVER 6000	30–34 ^a	38–46 ^a	^b	22–24	26–30	28–30

Notes:

- a) When a site-specific investigation indicates a high probability of continuing crashes or when such occurrences are indicated by crash history, the designer may provide clear-zone distances greater than the clear zone shown in Table 3-1. Clear zones may be limited to 30 ft for practicality and to provide a consistent roadway template if previous experience with similar projects or designs indicates satisfactory performance.
- b) Because recovery is less likely on the unshielded, traversable 1V:3H fill slopes, fixed objects should not be present in the vicinity of the toe of these slopes. Recovery of high-speed vehicles that encroach beyond the edge of the shoulder may be expected to occur beyond the toe of slope. Determination of the width of the recovery area at the toe of slope should consider right-of-way availability, environmental concerns, economic factors, safety needs, and crash histories. Also, the distance between the edge of the through traveled lane and the beginning of the 1V:3H slope should influence the recovery area provided at the toe of slope. While the application may be limited by several factors, the foreslope parameters that may enter into determining a maximum desirable recovery area are illustrated in Figure 3-2. A 10-ft recovery area at the toe of slope should be provided for all traversable, non recoverable fill slopes.
- c) For roadways with low volumes it may not be practical to apply even the minimum values found in Table 3-1. Refer to Chapter 12 for additional considerations for low-volume roadways and Chapter 10 for additional guidance for urban applications.
- d) When design speeds are greater than the values provided, the designer may provide clear-zone distances greater than those shown in Table 3-1.

The designer may choose to modify the clear-zone distances in Table 3-1 with adjustment factors to account for horizontal curvature, as shown in Table 3-2. These modifications normally are considered only when crash histories indicate such a need, when a specific site investigation shows a definitive crash potential that could be significantly lessened by increasing the clear zone width, and when such increases are cost-effective. Horizontal curves, particularly for high-speed facilities, are usually superelevated to increase safety and provide a more comfortable ride. Increased banking on curves where the superelevation is inadequate is an alternate method of increasing roadway safety within a horizontal curve, except where snow and ice conditions limit the use of increased superelevation.



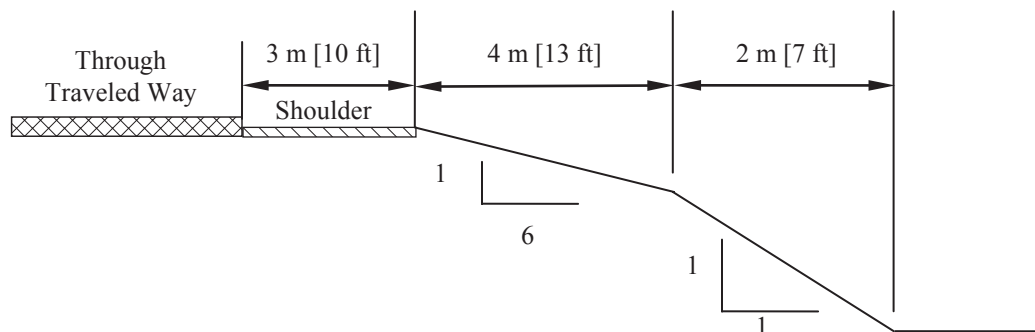
Discussion—Since the non-recoverable foreslope is within the recommended suggested clear-zone distance of the 1V:10H foreslope, a runout area beyond the toe of the non-recoverable foreslope is desirable. Using the steepest recoverable foreslope before or after the non-recoverable foreslope, a clear-zone distance is selected from Table 3-1. In this example, the 1V:8H foreslope beyond the base of the fill dictates a 9 to 10 m [30 to 32 ft] clear-zone distance. Since 7 m [23 ft] are available at the top, an additional 2 to 3 m [7 to 10 ft] could be provided at the bottom. Since this is less than the 3 m [10 ft] recovery area that should be provided at the toe of all the non-recoverable slopes the 3 m [10 ft] should be applied. All foreslope breaks may be rounded and no fixed objects would normally be built within the upper or lower portions of the clear-zone or on the intervening foreslope.

EXAMPLE 3-D

Design ADT: 12,000

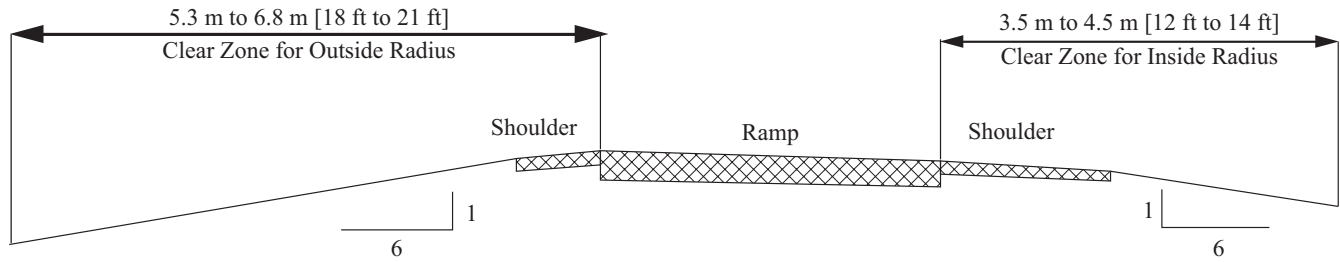
Design Speed: 110 km/h [70 mph]

Suggested clear-zone distance for 1V:6H foreslope: 9 to 10.5 m [30 to 34 ft] (from Table 3-1)



Discussion—Since the critical foreslope is within the suggested clear-zone distance of 9 to 10.5 m [30 to 34 ft], it should be flattened if practical or considered for shielding. However, if this is an isolated obstacle and the roadway has no significant crash history, it may be appropriate to do little more than delineate the drop-off in lieu of foreslope flattening or shielding.

EXAMPLE 3-K



Clear Zone for Simple Ramps Cross Section Curve 1

Curve 1

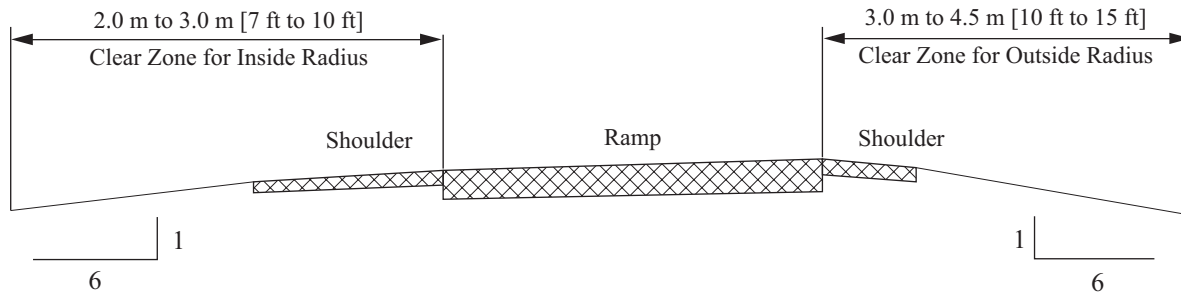
Design ADT: < 750

Design Speed: 90 km/h [55 mph]

Radius: 300 m [1000 ft]

Suggested clear-zone distance for 6:1 foreslopes along the inside of curve: 3.5 to 4.5 m [12 to 14 ft] (from Table 3-1)

Suggested clear-zone distance for 6:1 foreslopes along the outside of curve: $CZ_c = (L_c)(K_{cz}) = 3.5 \text{ to } 4.5 \text{ m [12 to 14 ft]} \times 1.5 = 5.3 \text{ to } 6.8 \text{ m [18 to 21 ft]}$ (from Tables 3-1 and 3-2)



Clear Zone for Simple Ramps Cross Section Curve 2

Curve 2

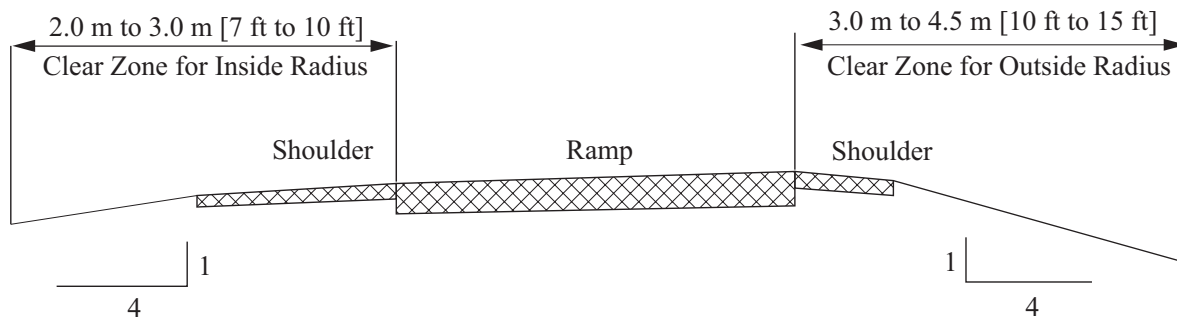
Design ADT: < 750

Design Speed: 50 km/h [30 mph]

Radius: 73 m [240 ft]

Suggested clear-zone distance for 6:1 foreslopes along the inside of curve: 2.0 to 3.0 m [7 to 10 ft] (from Table 3-1)

Suggested clear-zone distance for 6:1 foreslopes along the outside of curve: $CZ_c = (L_c)(K_{cz}) = 2.0 \text{ to } 3.0 \text{ m [7 to 10 ft]} \times 1.5 = 3.0 \text{ to } 4.5 \text{ m [10 to 15 ft]}$ (from Tables 3-1 and 3-2)



Clear Zone for Complex Ramps Cross Section Curve 2

Curve 2

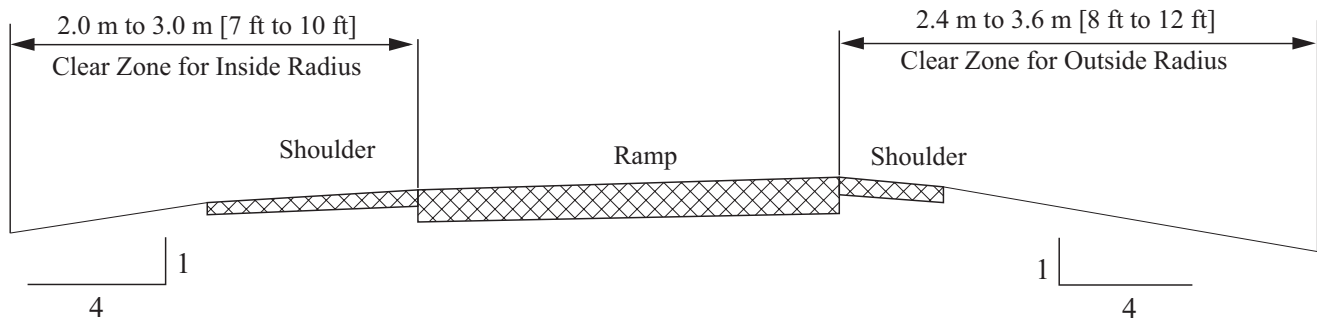
Design ADT: < 750

Design Speed: 50 km/h [30 mph]

Radius: 73 m [240 ft]

Suggested clear-zone distance for 4:1 foreslopes along the inside of curve: 2.0 to 3.0 m [7 to 10 ft] (from Table 3-1)

Suggested clear-zone distance for 4:1 foreslopes along the outside of curve: $CZ_c = (L_c)(K_{cz}) = 2.0 \text{ to } 3.0 \text{ m [7 to 10 ft]} \times 1.5 = 3.0 \text{ to } 4.5 \text{ m [10 to 15 ft]}$ (from Tables 3-1 and 3-2)



Clear Zone for Complex Ramps Cross Section Curve 3

Curve 3

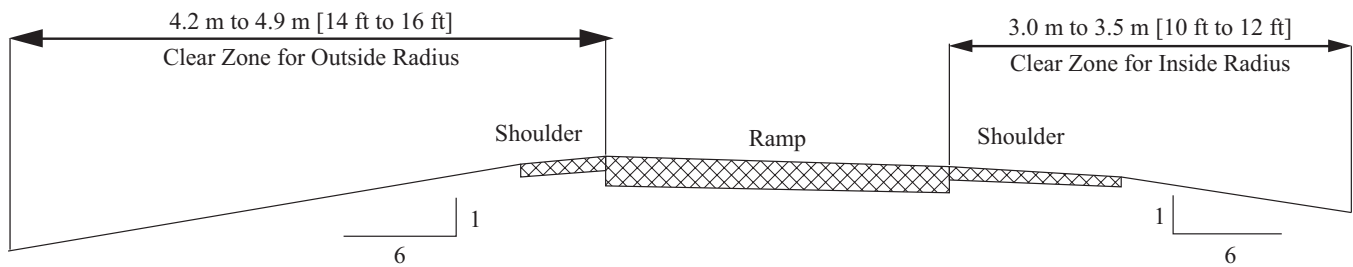
Design ADT: < 750

Design Speed: 60 km/h [40 mph] assuming traffic is accelerating to enter freeway.

Radius: 300 m [1,000 ft]

Suggested clear-zone distance for 4:1 foreslopes along the inside of curve: 2.0 to 3.0 m [7 to 10 ft] (from Table 3-1)

Suggested clear-zone distance for 4:1 foreslopes along the outside of curve: $CZ_c = (L_c)(K_{cz}) = 2.0 \text{ to } 3.0 \text{ m [7 to 10 ft]} \times 1.2 = 2.4 \text{ to } 3.6 \text{ m [8.4 to 12 ft]}$ (from Tables 3-1 and 3-2)



Clear Zone for Complex Ramps Cross Section Curve 4

Curve 4

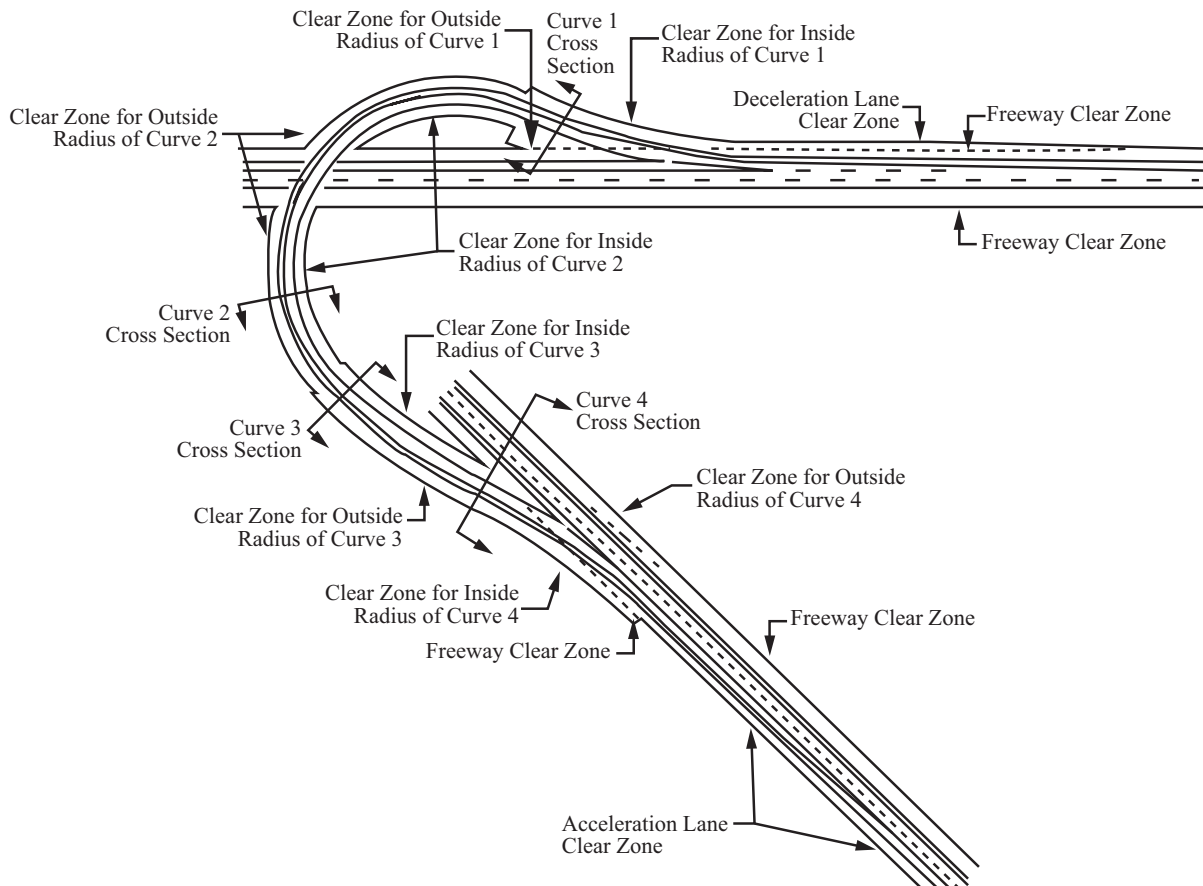
Design ADT: < 750

Design Speed: 80 km/h [50 mph] assuming traffic is accelerating to enter freeway.

Radius: 300 m [1,000 ft]

Suggested clear-zone distance for 6:1 foreslopes along the inside of curve: 3.0 to 3.5 m [10 to 12 ft] (from Table 3-1)

Suggested clear-zone distance for 6:1 foreslopes along the outside of curve: $CZ_c = (L_c)(K_{cz}) = 3.0 \text{ to } 3.5 \text{ m [10 to 12 ft]} \times 1.4 = 4.2 \text{ to } 4.9 \text{ m [14 to 16.8 ft]}$ (from Tables 3-1 and 3-2)



Clear Zone for Complex Ramps Plan View

Discussion—Refer to the bold line in the above figure for the overall suggested clear zone. As an alternative, the clear zones for ramp may be set at 9 m [30 ft] if previous experience with similar projects or designs indicates satisfactory experience. See Example J for the speed-change lane clear zones.