

EXAMPLE #1
6:1 SLOPE (FILL SLOPE)
60 M.P.H.
5000 ADT

ANSWER:
CLEAR ZONE
WIDTH = 30 FT.

EXAMPLE #2
6:1 SLOPE (CUT SLOPE)
60 M.P.H.
750 ADT

ANSWER:
CLEAR ZONE
WIDTH = 20 FT.

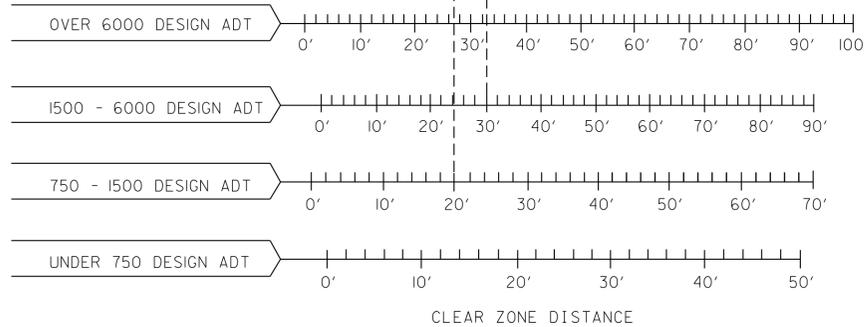
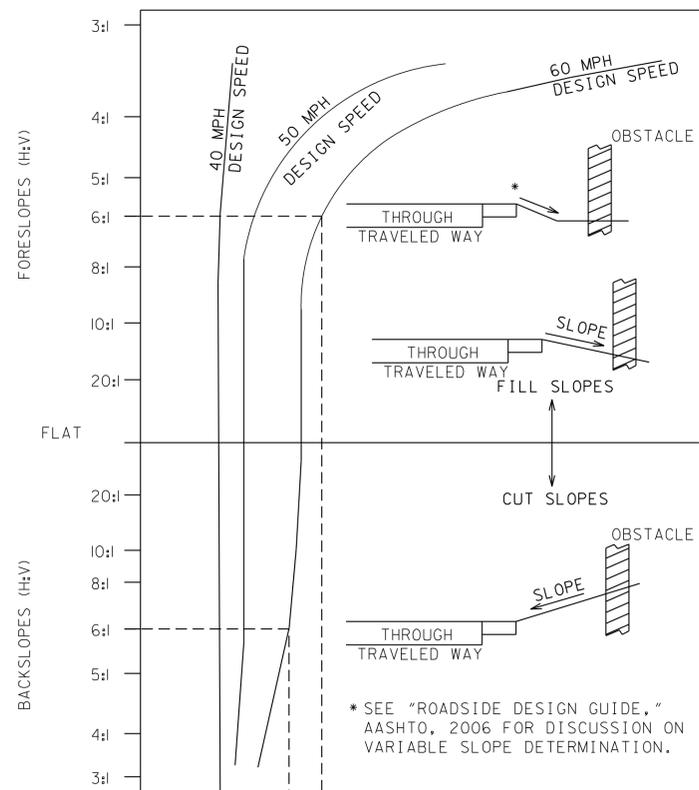


FIGURE A. CLEAR ZONE DISTANCE

DESIGN SPEED	DESIGN ADT	FORESLOPES (H:V)			BACKSLOPES (H:V)		
		6:1 OR FLATTER	5:1 TO 4:1	3:1	6:1 OR FLATTER	5:1 TO 4:1	3:1
40 MPH OR LESS	UNDER 750	7 - 10	7 - 10	④	7 - 10	7 - 10	7 - 10
	750 - 1500	10 - 12	12 - 14	④	10 - 12	10 - 12	10 - 12
	1500 - 6000	12 - 14	14 - 16	④	12 - 14	12 - 14	12 - 14
	OVER 6000	14 - 16	16 - 18	④	14 - 16	14 - 16	14 - 16
45-50 MPH	UNDER 750	10 - 12	12 - 14	④	10 - 12	8 - 10	8 - 10
	750 - 1500	14 - 16	16 - 20	④	14 - 16	12 - 14	10 - 12
	1500 - 6000	16 - 18	20 - 26	④	16 - 18	14 - 16	12 - 14
	OVER 6000	20 - 22	24 - 28	④	20 - 22	18 - 20	14 - 16
55 MPH	UNDER 750	12 - 14	14 - 18	④	10 - 12	10 - 12	8 - 10
	750 - 1500	16 - 18	20 - 24	④	16 - 18	14 - 16	10 - 12
	1500 - 6000	20 - 22	24 - 30	④	20 - 22	16 - 18	14 - 16
	OVER 6000	22 - 24	26 - 32 ③	④	22 - 24	20 - 22	16 - 18
60 MPH	UNDER 750	16 - 18	20 - 24	④	14 - 16	12 - 14	10 - 12
	750 - 1500	20 - 24	26 - 32 ③	④	20 - 22	16 - 18	12 - 14
	1500 - 6000	26 - 30	32 - 40 ③	④	24 - 26	18 - 22	14 - 18
	OVER 6000	30 - 32 ③	36 - 44 ③	④	26 - 28	24 - 26	20 - 22
65-70 MPH	UNDER 750	18 - 20	20 - 26	④	14 - 16	14 - 16	10 - 12
	750 - 1500	24 - 26	28 - 36 ③	④	20 - 22	18 - 20	12 - 16
	1500 - 6000	28 - 32 ③	34 - 42 ③	④	26 - 28	22 - 24	16 - 20
	OVER 6000	30 - 34 ③	38 - 46 ③	④	28 - 30	26 - 30	22 - 24

ADAPTED FROM TABLE 3.1 OF THE "ROADSIDE DESIGN GUIDE," AASHTO, 2006.

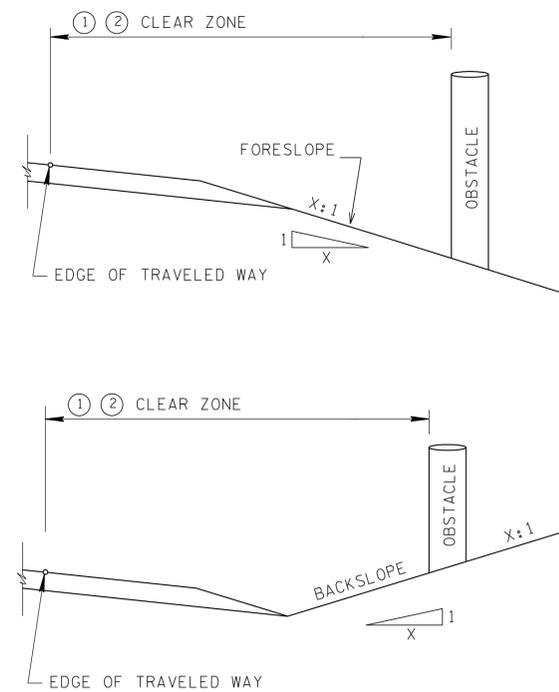


FIGURE B. FORESLOPE AND BACKSLOPE DIAGRAMS ⑥

RADIUS (FT)	DESIGN SPEEDS (MPH)						
	40	45	50	55	60	65	70
2,860	1.1	1.1	1.1	1.2	1.2	1.2	1.3
2,290	1.1	1.1	1.2	1.2	1.2	1.3	1.3
1,910	1.1	1.2	1.2	1.2	1.3	1.3	1.4
1,640	1.1	1.2	1.2	1.3	1.3	1.4	1.5
1,430	1.2	1.2	1.3	1.3	1.4	1.4	-
1,270	1.2	1.2	1.3	1.3	1.4	1.5	-
1,150	1.2	1.2	1.3	1.4	1.5	-	-
950	1.2	1.3	1.4	1.5	1.5	-	-
820	1.3	1.3	1.4	1.5	-	-	-
720	1.3	1.4	1.5	-	-	-	-
640	1.3	1.4	1.5	-	-	-	-
570	1.4	1.5	-	-	-	-	-
380	1.5	-	-	-	-	-	-

ADAPTED FROM TABLE 3.2 OF THE "ROADSIDE DESIGN GUIDE," AASHTO, 2006.

$CZ_c = (L_c)(K_{cz})$
WHERE CZ_c = CLEAR ZONE ON OUTSIDE OF CURVATURE, (FEET)
 L_c = CLEAR ZONE DISTANCE, (FEET) (FROM TABLE-A)
 K_{cz} = CURVE CORRECTION FACTOR

NOTE: THE CLEAR ZONE CORRECTION FACTOR IS APPLIED TO THE OUTSIDE OF CURVES ONLY. CURVES FLATTER THAN 2,860 FEET DO NOT REQUIRE AN ADJUSTED CLEAR ZONE.

FOOTNOTES

- ① CLEAR ZONE IS DEFINED IN THE "ROADSIDE DESIGN GUIDE," AASHTO, 2006, AS 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. SEE THE "ROADSIDE DESIGN GUIDE," AASHTO, 2006 FOR MORE DETAILED INFORMATION.
- ② CLEAR ZONE DISTANCES ARE RELATED TO DESIGN SPEED AND TRAFFIC VOLUME AS SHOWN IN TABLE A.
- ③ WHERE A SITE SPECIFIC INVESTIGATION INDICATES A HIGH PROBABILITY OF CONTINUING CRASHES, OR SUCH OCCURRENCES ARE INDICATED BY CRASH HISTORY, THE DESIGNER MAY PROVIDE CLEAR-ZONE DISTANCES GREATER THAN THE CLEAR ZONE SHOWN IN THE TABLE. 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.
- ④ SINCE RECOVERY IS LESS LIKELY ON THE UNSHIELDED, TRAVERSABLE 3:1 SLOPES, FIXED OBJECTS SHOULD NOT BE PRESENT IN THE VICINITY OF THE TOES OF THESE SLOPES. RECOVERY OF HIGH-SPEED VEHICLES THAT ENCOACH BEYOND THE EDGE OF THE SHOULDER MAY BE EXPECTED TO OCCUR BEYOND THE TOE OF THE SLOPE. DETERMINATION OF THE WIDTH OF THE RECOVERY AREA AT THE TOE OF THE SLOPE SHOULD TAKE INTO CONSIDERATION 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 3:1 SLOPE SHOULD INFLUENCE THE RECOVERY AREA PROVIDED AT THE TOE OF THE SLOPE. WHILE THE APPLICATION MAY BE LIMITED BY SEVERAL FACTORS, THE FORESLOPE PARAMETERS THAT MAY ENTER INTO DETERMINING A MAXIMUM DESIRABLE RECOVERY AREA ARE COVERED IN DETAIL IN THE "ROADSIDE DESIGN GUIDE," AASHTO, 2006.
- ⑤ THESE MODIFICATIONS ARE NORMALLY CONSIDERED ONLY WHEN CRASH HISTORIES INDICATE A NEED OR A SPECIFIC SITE INVESTIGATION SHOWS A DEFINITE CRASH POTENTIAL THAT COULD BE SIGNIFICANTLY LESSENER BY INCREASING THE CLEAR-ZONE WIDTH, AND WHEN SUCH INCREASES ARE COST EFFECTIVE.
- ⑥ SEE THE "ROADSIDE DESIGN GUIDE," AASHTO, 2006, FOR COMPOSITE ROADSIDE SECTIONS AND DISCUSSION ON OUTSIDE DITCHES AND CHANNELS.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

CLEAR ZONE CRITERIA