

**Clear Zone** is the relatively flat unobstructed area that is to be provided for safe use by errant vehicles and must be wide enough so that the sum of all the recoverable terrain within is equal to or greater than the value obtained in STEP 2. Recoverable terrain provided beyond nonrecoverable terrain must be a minimum of 10 feet. Areas beyond nonrecoverable and hazardous terrain cannot be used as recoverable or nonrecoverable terrain.

**Roadside Terrain** includes all surfaces along the roadway other than travel lanes, auxiliary lanes, and ramps. For the purpose of establishing clear zones and horizontal clearance requirements, roadside terrain is defined as recoverable, nonrecoverable, non-traversable, and hazardous as follows:

**Recoverable** when it is safely traversable and on a slope that is 1v:4h or flatter.

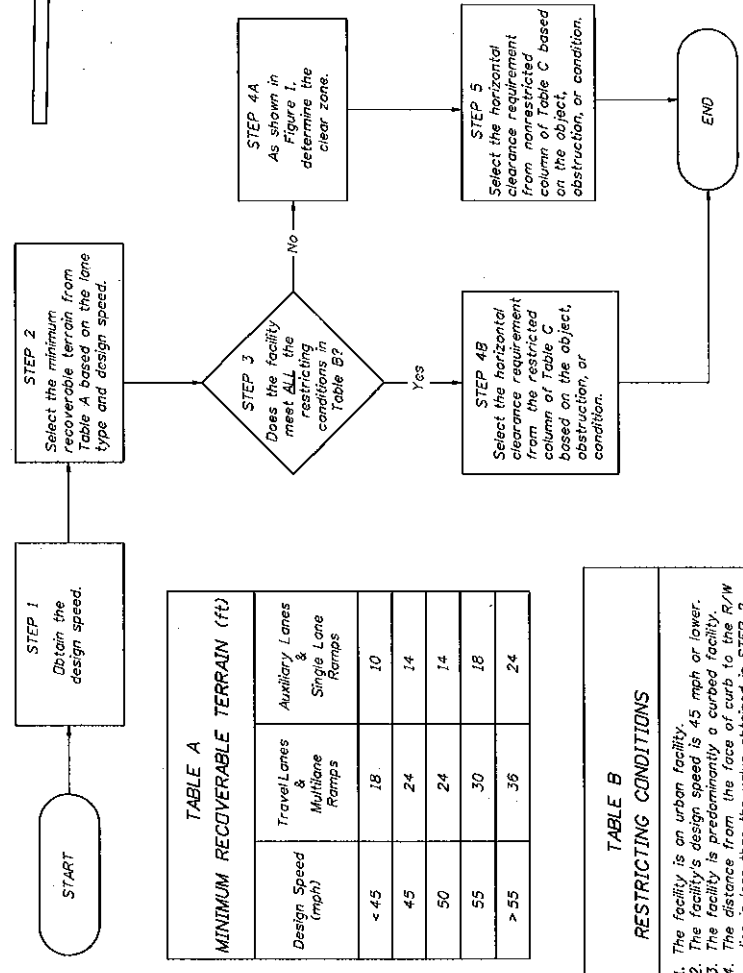
**Nonrecoverable** when it is safely traversable and on a slope that is steeper than 1v:4h but not steeper than 1v:3h.

**Nontraversable** when it is not safely traversable or on a slope that is steeper than 1v:3h.

**Hazardous** when a slope is steeper than 1v:3h and deeper than 6 feet as shown in Figure 2.

**Horizontal Clearance Requirements** are shown in Table C and are the required offsets to an object from a specified point on the roadway.

ROADSIDE TERRAIN  
FIGURE 1



**TABLE A**  
MINIMUM RECOVERABLE TERRAIN (ft)

Design Speed (mph)	Travel Lanes & Multilane Ramps	Auxiliary Lanes & Single Lane Ramps
< 45	18	10
45	24	14
50	24	14
55	30	18
> 55	36	24

**TABLE B**  
RESTRICTING CONDITIONS

- The facility is an urban facility.
- The facility's design speed is 45 mph or lower.
- The facility is predominantly a curbed facility.
- The distance from the face of curb to the R/W line is less than the value obtained in STEP 2.

PROCESS FOR DETERMINING HORIZONTAL CLEARANCE REQUIREMENTS AND CLEAR ZONES



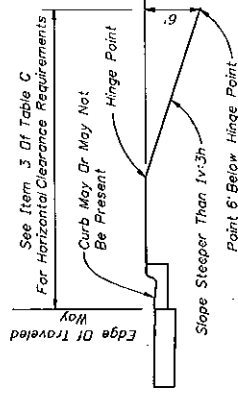
**GENERAL NOTES**

- When sidewalks are present, an unobstructed sidewalk width of at least 4 feet must be provided.
- When site specific conditions prohibit meeting the horizontal clearance requirements in TABLE C, the object, obstruction or condition must be mitigated, possibly by shielding. Otherwise, the Plans Preparation Manual, Volume 1, Chapters 2, 4, 21 and 25 or Chapters 5 and 9 of the Utility Accommodation Manual must be researched to determine viable alternatives. The minimum requirements in these manuals can only be reduced when a Design Variation or Design Exception has been approved in accordance with Chapter 23 of the Plans Preparation Manual, Volume 1 or a Utility Exception has been approved in accordance with Chapter 13 of the Utility Accommodation Manual.

**TABLE C**

**HORIZONTAL CLEARANCE REQUIREMENTS**

Item No.	OBJECTS, OBSTRUCTIONS OR CONDITIONS	HORIZONTAL CLEARANCE REQUIREMENTS	
		Restricted	Non-restricted
GENERAL	1 Above ground fixed hazards: All roadside objects, obstructions or conditions other than those listed below that exceed 4 inches in height and pose a hazard to errant vehicles and vehicle occupants.	Locate as close to the Right Of Way as practical and not less than 4 feet from face of curb.	Locate outside the clear zone as close to the Right Of Way as practical.
	2 All-FOOT approved guardrails, crash cushions, permanent or temporary concrete barriers, and guardrail end terminals.	Locate as shown in the Design Standards.	Locate as shown in the Design Standards.
	3 Drop-off hazards: Any point along a roadside slope steeper than 1v:3h that is deeper than 6 feet below the hinge point. See Figure 2.	Locate the point that is 6 feet below the hinge point no less than 22 feet from the traveled way.	Treat as roadside slopes in accordance with Design Standard 400.
	4 Mailboxes not shown in Design Standard 532.	Not to be used.	Not to be used.
	5 Mailboxes shown in Design Standard 532.	Locate in accordance with Design Standard 532. Outside roadways: Locate no less than 4 feet from face of curb in accordance with Design Standard 546. Inside medians: Locate no less than 6 feet from the edge of traffic lane and in accordance with Design Standard 546.	Locate in accordance with Design Standard 532. Locate outside the clear zone as close to the Right Of Way as practical and in accordance with Design Standard 546.
ROADWAY	6 Trees expected to become greater than 4 inches in diameter measured 6 inches above the ground.	Locate in accordance with Design Standard 546.	Locate in accordance with Design Standard 546.
	7 Trees not expected to become greater than 4 inches in diameter measured 6 inches above the ground.	Locate no less than 5 feet from the back of the guardrail post.	Locate no less than 5 feet from the back of the guardrail post.
	8 Canals behind guardrail.	Locate as close to the Right Of Way as practical and not less than 40 feet from the traveled way.	Design speeds of 50 mph and greater: Locate as close to the Right Of Way as practical and not less than 60 feet from the traveled way. Design speeds less than 50 mph: Locate as close to the Right Of Way as practical and not less than 50 feet from the traveled way.
DRAINAGE	9 Canals without guardrail.	Locate no less than 4 feet from face of curb.	Locate outside the clear zone.
	10 Culvert wing wall, endwall, retaining walls and flared end sections 6 feet and greater in depth.	Treat as drop-off hazard: See Item No. 3.	Treat as drop-off hazard: See Item No. 3.
TRAFFIC CONTROL DEVICES	11 Culvert wing wall, endwall, retaining walls and flared end sections 6 feet and greater in depth.	Locate as shown in Design Standards 272 and 273.	Locate as shown in Design Standards.
	12 Mitered end sections.	Locate no less than 4 feet from face of curb and in accordance with Design Standard 17302.	Locate in accordance with Design Standard 17302.
	13 Frangible sign supports.	Locate no less than 4 feet from face of curb.	Locate outside the clear zone.
	14 Overhead sign supports and other nonfrangible signs.	Locate no less than 4 feet from face of curb and not in medians.	Locate outside the clear zone and not in medians.
LIGHTING	15 Signal controller cabinets, signal poles, strain poles and mast arms.	Locate no less than 4 feet from face of curb and not in medians.	Locate 20 feet from travel lanes or 14 feet from auxiliary lanes. Not in medians. May be clear zone width when the clear zone is less than 20 feet.
	16 Conventional lighting (frangible and nonfrangible).	Not applicable.	Locate outside the clear zone.
STRUCT.	17 Highmast lighting.	Locate not less than 16 feet from edge of travel lane.	Locate outside the clear zone.
	18 Bridge piers and abutments: Above ground vertical structures.	Locate not less than 2 feet from face of curb.	Locate as close to the Right Of Way as practical.
UTILITIES	19 Fire hydrants with bases no higher than 4 inches above the ground.	Locate as close to the Right Of Way as practical and not less than 4 feet from face of curb and not in medians.	Locate outside the clear zone as close to the Right Of Way as practical and not within limited access facilities. May be placed 4 feet behind the back of shields that have been justified for other reasons.
	20 Utility installations: All above ground fixed objects.	Locate in accordance with Design Standard 17882.	Locate in accordance with Design Standard 17882.
RAILROADS	21 Railroad crossing traffic control devices.		



**DROP-OFF HAZARDS**

**FIGURE 2**

