

5.14 Appendices

5.14.1 Tables to Establish Clearing Width

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Clearing width

The clearing width is shown in Table 5-3 and Table 5-4. Since clearing width calculations are straightforward, but very tedious, Tables 5-3 to 5-9 and accompanying Table 5-10 and Table 5-11 have been developed for convenience.

Note that the right-of-way width will not normally exceed 75m and the clearing width will not exceed the right-of-way width; any geometry in the tables in this Appendix that indicates clearing widths that approach or exceed the 75m width should be reconsidered and perhaps other road construction alternatives used.

These tables provide slope distances (not the horizontal distances) for establishing suitable offset distances from road centreline to facilitate easy field marking of the upper and lower clearing width boundaries. Note that the offset slope distances in the tables depend on several factors:

- unstabilized subgrade width;
- side slope angle of the natural ground surface; and
- angles of the fill and cut slopes.

On the tables in this appendix, the **clearing width** is the sum of the width determined from the tables and any additional width to account for special circumstances (see below, “Additions to Clearing Width”). The clearing width established from these tables may be expressed as:

Clearing width = offset distance on cut side of centreline (from tables) + offset distance on fill side of centreline (from tables) + additional width (if necessary)

For a specific subgrade width, these tables assume:

- no horizontal or vertical adjustments at the road centreline;
- 0.3m overburden thickness;
- 3.0m clearing allowance above the top of the cut slope to standing timber;

- selection of the appropriate cut and fill slope angles [Refer to the suggested cut and fill slope angles in [Chapter 3, Table 3-4 General guidelines for cut and fill slope angles for use in forest road design \(PDF\)](#)];
- a ditch depth of 0.5m;
- sidecast road construction with little or no longitudinal movement of material; and
- a minimum 3.0m distance from the road shoulder to the lower side clearing width boundary.

As well, it is assumed that where there is road fill, the toe of the fill slope demarcates the lower clearing width boundary. Therefore, to establish the clearing width when using these tables, include additional width allowances as required (e.g., additional width will be required for debris disposal on the lower side of the road below the toe of the fill slope).

Where the offset slope distance from the road centreline to the upper or lower clearing width boundaries exceeds 50m, consider using alternative construction methods, such as retaining walls, to reduce the clearing width requirements.

Determining clearing width from tables in this appendix

The following procedure is suggested:

Select the appropriate unstabilized subgrade width table (the tables have been developed for unstabilized subgrade widths of 4, 5, 6, 7, 8, 9, and 10 m). Do this after:

- adjusting the road subgrade width to compensate for cuts or fills (see following: [Adjustments to Road Subgrade Width in Tables to Compensate for Cuts and Fills at Road Centreline](#)); and
- adjusting the road subgrade width to compensate for road surfacing materials (see following: [Additions to Clearing Width](#)).

Choose the appropriate natural side slope angle in the selected subgrade width table. Based on the expected soil type to be encountered during road construction, choose the appropriate cut and fill slope angles for application in the tables. Details about selecting cut and fill slope angles for road design are given in [Forest Road Engineering Guidebook \(7.8MB\)](#) (Appendix 1: Field Identification of Soils).

To establish the upper clearing width boundary, read the offset slope distance from the appropriate cut slope angle column (the offset distance given in the cut slope angle column is a slope distance between the road centreline and the upper clearing width boundary).

Use a two-step procedure to establish the lower clearing width boundary. First, read the offset slope distance from the appropriate fill slope angle column (the offset distance given in the fill slope angle column is a slope distance between the road centreline and the toe of any

fill slope). Second, include any additional width allowances (such as those for debris disposal on the lower side of the road below the toe of the fill, and to accommodate sight distance), as explained following in Additions to Clearing Width).

Adjustments to road subgrade width to compensate for cuts and fills at road centreline

Limit the use of an adjusted road subgrade width in these tables for short sections of anticipated cuts or fills at the road centreline to the obvious locations in the field, such as where cuts are required through small ridges or fills across linear slope depressions of less than 3.0m deep. For longer sections of road through areas with deep gullies or high ridges, complete a geometric road design and determine the clearing width from these drawings.

To compensate for a cut at the centreline, adjust the road subgrade width as follows: Add 1.0m to the subgrade width for every 0.3m cut increment at centreline to determine the offset slope distance on the cut side of centreline. Subtract 1.0m from the subgrade width for every 0.3m cut increment at centreline to determine the offset slope distance on the fill side of centreline. For example, consider a 0.6m deep cut at centreline on a 6.0m wide unstabilized subgrade (assume surfacing material is not applied to the subgrade). Assume a natural side slope angle of 35% above and below the road centreline, and fill and cut slope angles of 1½H : 1V and 1H : 1V, respectively. In this case, adjust the unstabilized subgrade width by 2.0m as follows:

- choose the appropriate cut slope angle column from Table 5-7 (8.0 wide unstabilized subgrade) to determine the offset slope distance on the cut side of centreline; the offset slope distance from this table is 12.0m;
- choose the appropriate fill slope angle column from Table 5-3 (4.0m wide unstabilized subgrade) to determine the offset slope distance on the fill side of centreline; the offset slope distance from this table is 5.0m.

In this cut example, the clearing width (magnitude) is unchanged, but is shifted upslope with respect to the road centreline.

If, because of shallow side slopes, the 0.6m cut resulted in a through-cut instead of a fill slope, use the appropriate cut slope angle column from Table 5-3 (4.0m wide unstabilized subgrade) to obtain the required offset slope distance from centreline to the lower clearing width boundary.

To adjust for fills at the centreline, reverse the above procedure. For example, to allow for a 0.6m fill at centreline on a 6.0m wide road, adjust the unstabilized subgrade width by 2.0m as follows:

- choose the appropriate cut slope angle column from Table 5-3 (4.0m wide unstabilized subgrade) to determine the offset slope distance on the cut side of

centreline;

- choose the appropriate fill slope angle column from Table 5-7 (8.0m wide unstabilized subgrade) to determine the offset slope distance on the fill side of centreline.

Additions to clearing width

Compensate for Surfacing or Ballasting Material

Before selecting the appropriate unstabilized subgrade width table, compensate for the thickness of surfacing or ballasting material anticipated to be placed over the unstabilized subgrade surface. For example, where surfacing material is needed to provide a finished road running surface, select a wider unstabilized subgrade width when determining the clearing width from Tables 5-3 to 5-9. For every 0.3m of surfacing depth, allow for an additional 1.0m of unstabilized subgrade width.

For example, to obtain a 4.0m wide finished road running surface on subgrade soils that will require a 0.3m thickness of gravel, select Table 5-4 (5.0m wide unstabilized subgrade).

Compensate for Other Requirements

Calculate the extra width needed for turnouts, sight distance, snow removal, debris disposal, and similar needs on the fill side of road centreline. To determine the lower clearing width boundary, add this extra width to the offset slope distance (fill side of centreline) given in the tables.

For example, if winter use of the road will require snowplowing, the standing timber should be at least 4.0m or more away from the road shoulder. Since the tables will only provide for a minimum of 3.0m from the road shoulder to the lower clearing width boundary, simply add the additional 1.0 or 2.0m to the offset slope distance. Where natural side slope angles are greater than 20%, convert the extra width allowance to a slope distance, rounded up to the nearest metre, and then added to the offset slope distance determined from the tables.

Tables 5-3 to 5-9

Offset slope distances (m) from road centreline to upper (cut side) clearing width boundary and lower (fill side) clearing width boundary.

Table 5-3 Unstabilized Subgrade Width = 4m

Natural Side		

Natural Side Slope Angle	Fill Slope Angle			Cut Slope Angle					
	%	1H : 1V	1½H : 1V	2H : 1V	¼H : 1V	¾H : 1V	1H : 1V	1½H : 1V	2H : 1V
0-20	8	8	8	8	9	10	11	11	14
21-30	8	8	10	10	9	11	12	13	21
31-35	8	10	13	13	9	11	13	15	Use Table 5-11
36-40	8	12	Use Table 5-10	9	12	14	17		
41-45	9	15		10	12	15	20		
46-50	10	19		10	13	16	23		
51-54	10	24	Use alternative construction methods	10	14	18	41	Use alternative construction methods	
55-57	11	31		10	15	19	53		
58-60	12	45		11	16	20			

Table 5-9 Unstabilized Subgrade Width = 10m

Natural Side Slope Angle	Fill Slope Angle			Cut Slope Angle					
	%	1H : 1V	1½H : 1V	2H : 1V	¼H : 1V	¾H : 1V	1H : 1V	1½H : 1V	2H : 1V
0-20	8	8	8	8	9	10	11	12	15
21-30	8	8	11	11	9	11	12	14	Use Table 5-11
31-35	8	11	15	15	10	12	14	18	
36-40	9	13	Use Table 5-10	9	12	14	18		
41-45	10	16		10	13	16	21		
46-50	11	21		10	14	17	25		

36	19	21	23	25	27	29	31
38	22	24	27	29	32	34	36
40	26	29	32	35	38	41	
42	32	36	39	43	47	50	
44	42	52	Use alternative construction methods				

5.14.2 Project Tracking Checklist

Use this checklist to prepare a paper trail of key outputs prepared by consultants and sign-offs by the ministry.

- [Project Tracking Checklist \(PDF\)](#)