

## 5.5 Disposal of Debris

Disposal of debris consists of the disposal of material resulting from grubbing and stripping operations within the clearing width. (For ease of reference, this material is simply called “debris” in this chapter.)

Accomplish disposal of debris by:

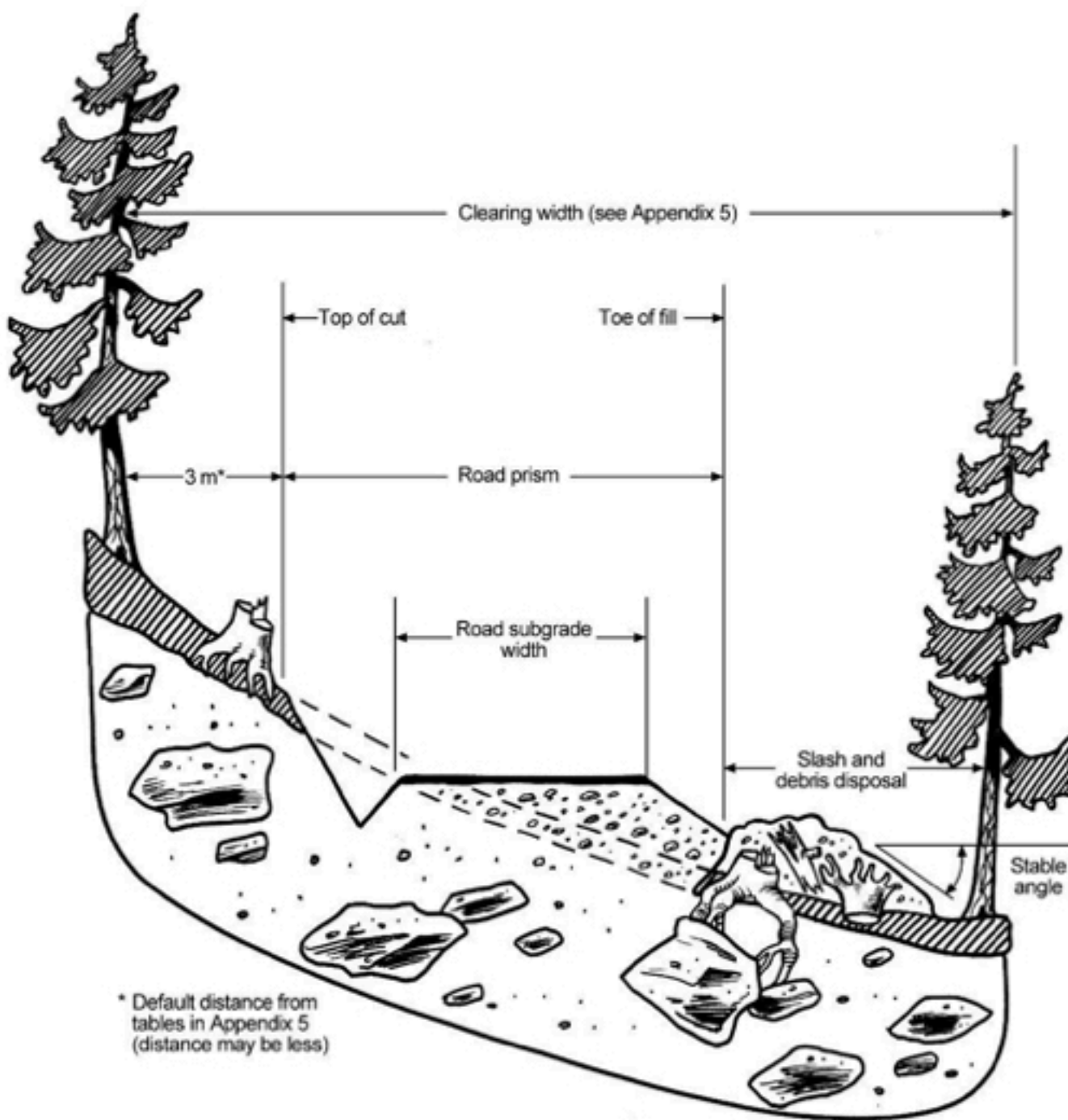
- piling and burning;
- scattering;
- burying; or
- endhauling it to a suitable disposal site for debris.

Do not deposit debris resulting from grubbing and stripping within the clearing width in areas where the debris could have a material adverse effect on forest resources or create hazards for any subsequent operations and/or adversely affect other values. In addition to any other required mitigation actions to prevent damage, immediately remove any debris that is deposited in such areas.

Ensure that the selected method of debris disposal:

- meet objectives of higher level plans (such as those for smoke management, aesthetics, or pest management);
- are compatible with terrain conditions;
- consider the slash volume, loading, species, and piece sizes;
- do not alter natural drainage patterns; and
- are compatible with other resource values.

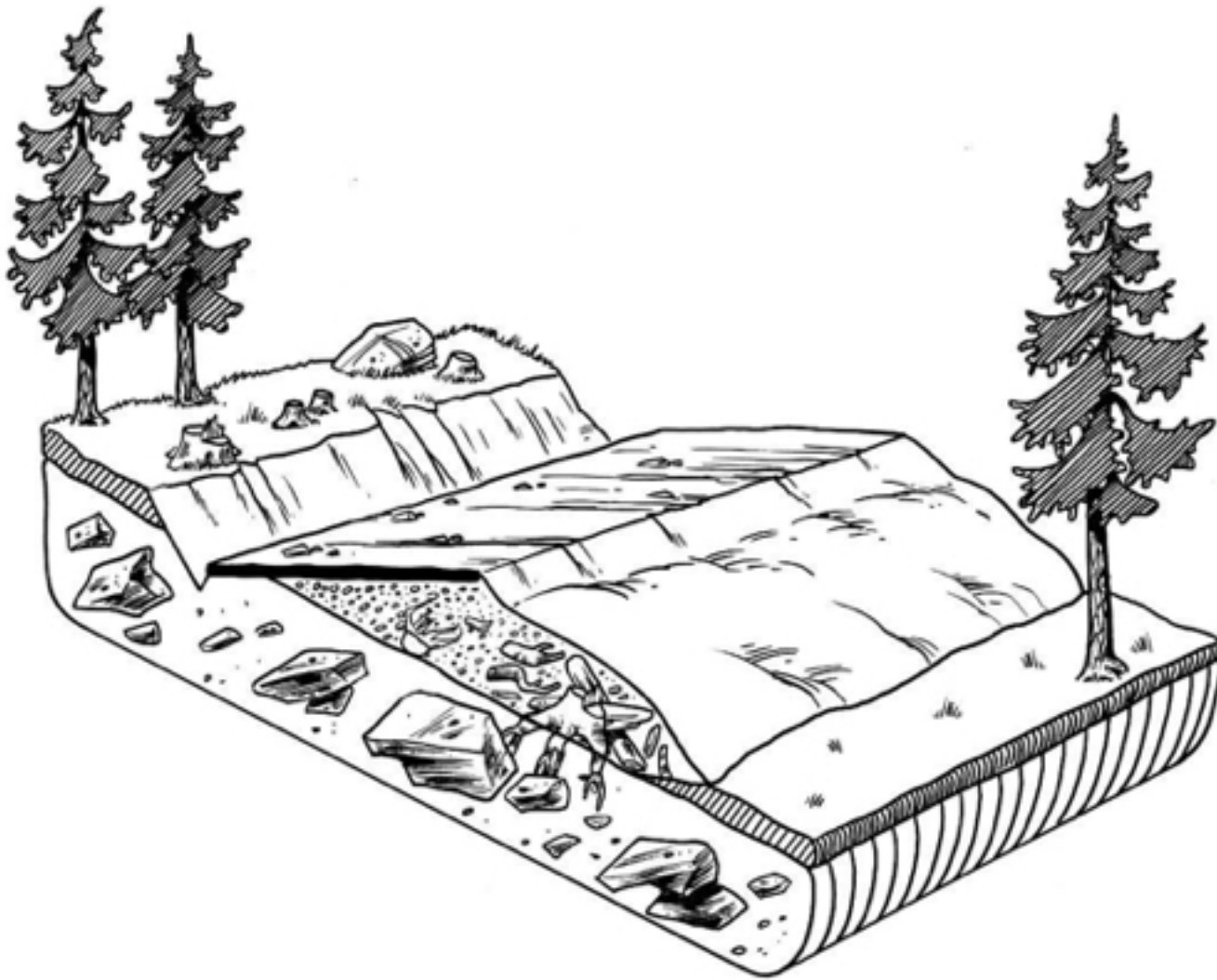
Figure 5-3 Debris placement for permanent road on terrain having a low likelihood of landslides (acceptable practice)



Carefully plan and locate disposal sites for debris and suitably place material to:

- provide for adequate support of the debris;
- maintain natural surface drainage patterns; and
- ensure that activities do not cause a landslide, gully, or uncontrolled erosion and sediment transport that have a material adverse effect on forest resources and other values.

Figure 5-4 Debris placement on typical short-term road



Do not place debris within the high-water mark of a water body (stream, wetland, lake) or in a manner that is likely to cause the debris to fall into a water body.

Generally, remove all organic debris from within the road prism width (Figure 5-2). However, where the road crosses areas not having a moderate or high likelihood of landslides, then incorporate stumps, roots, and embedded logs in the road prism as follows:

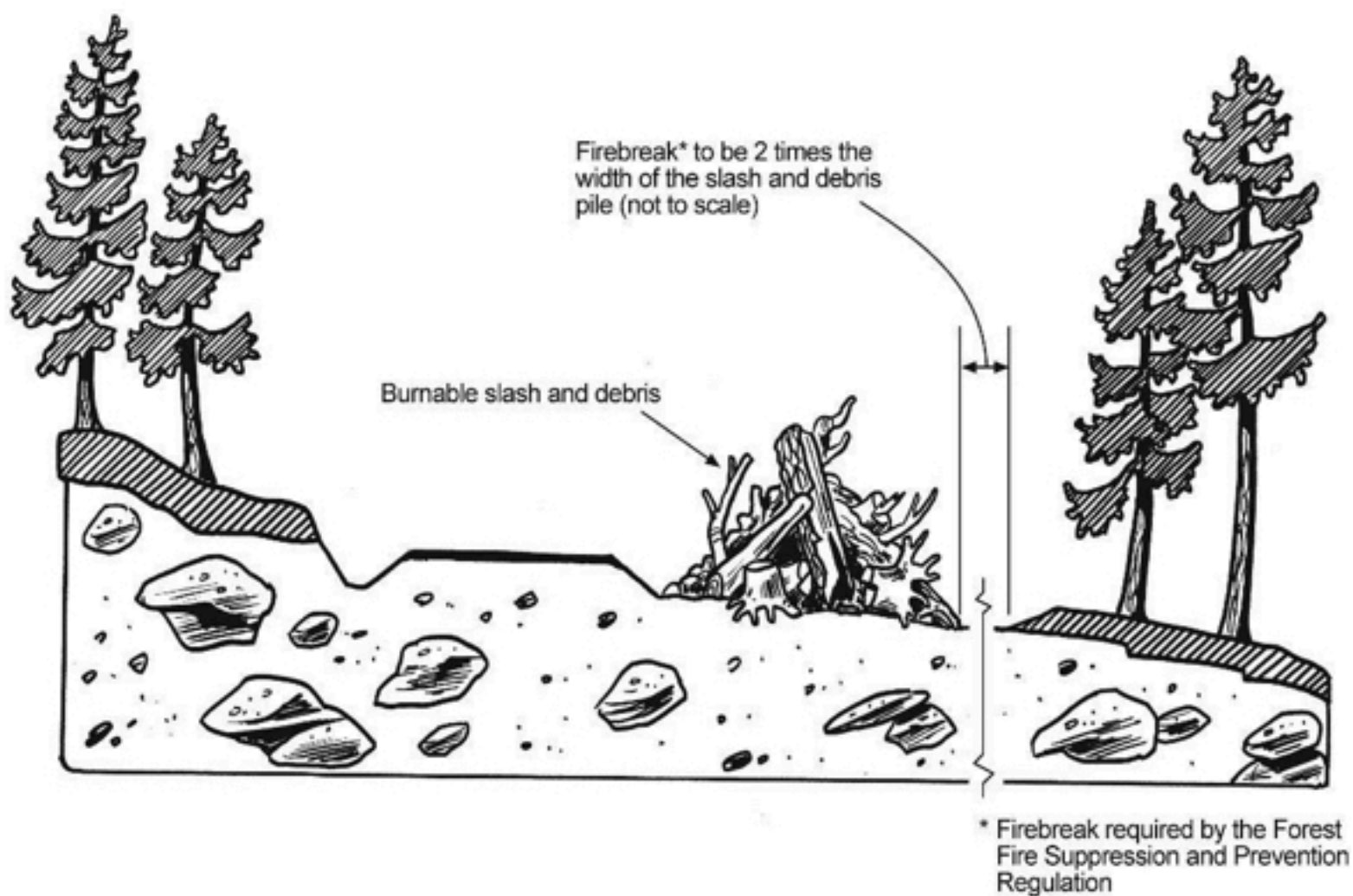
- leave or place stumps, roots, and embedded logs outside the road subgrade width on the downhill side (Figure 5-3).
- for a short-term road (Figure 5-4), leave or place stumps, roots, and embedded logs within the road subgrade width. For more information about short-term roads, see Construction of Short-Term Roads.

For either of the two situations above, report the presence of stumps, roots and embedded logs in the road prism as a part of as-built information. See Workers' Compensation Act: Occupational Health and Safety Regulation (Sec 26.79).

## 5.5.1 Piling & Burning

Consider piling and burning (Figure 5-5) in areas with heavy slash loading and moderate to high pest or fire hazard, and where smoke management objectives can be met.

Figure 5-5 Debris disposal by piling and burning



## 5.5.2 Scattering

This process is similar to mounding and windrowing, but does not require the debris to be buried (Figure 5-6). In low-density stands, spread debris among the standing timber in natural openings along the cleared area, thus reducing the clearing width required for disposal. Take care to avoid damaging the standing timber or eliminating plantable spots if the road is being constructed through an area proposed for eventual planting.

Place logs and stumps away from adjacent timber stands, positioned so they will not roll and so that they do not lie on top of one another.

Consider scattering where:

- sidecasting debris will not increase the likelihood of landslides;
- fire and pest hazards are low; and
- aesthetic concerns are not an issue.

Incidental burying may occur, but is not an objective. If the debris is bunched or spread, breach any continuous accumulations to accommodate drainage, snow removal, and wildlife passage.

Consider chipping or grinding up debris and then blow it along the cleared area or into the standing timber, away from watercourses, to help limit erosion of exposed soils and facilitate revegetation.

Breach accumulations of debris at all culvert locations to facilitate drainage. Remove debris accumulations at some locations where needed to permit the natural passage of livestock and wildlife.

Figure 5-6 Debris disposal by scattering



### 5.5.3 Burying

There are three methods for burying debris with soil materials:

- trenching;
- mounding or windrowing; and
- creation of pushouts.

Place all debris between the edge of the structural fill and standing timber (Figure 5-7), unless otherwise indicated in the construction drawings. Arrange the surface profile of the debris so as to imitate existing ground profiles. Next, compact the debris and then cover it with a layer of soil at least 300 mm thick. Compaction minimizes the hazards to livestock and wildlife stumbling in holes in the buried debris.

As well, place buried debris so as not to interfere with:

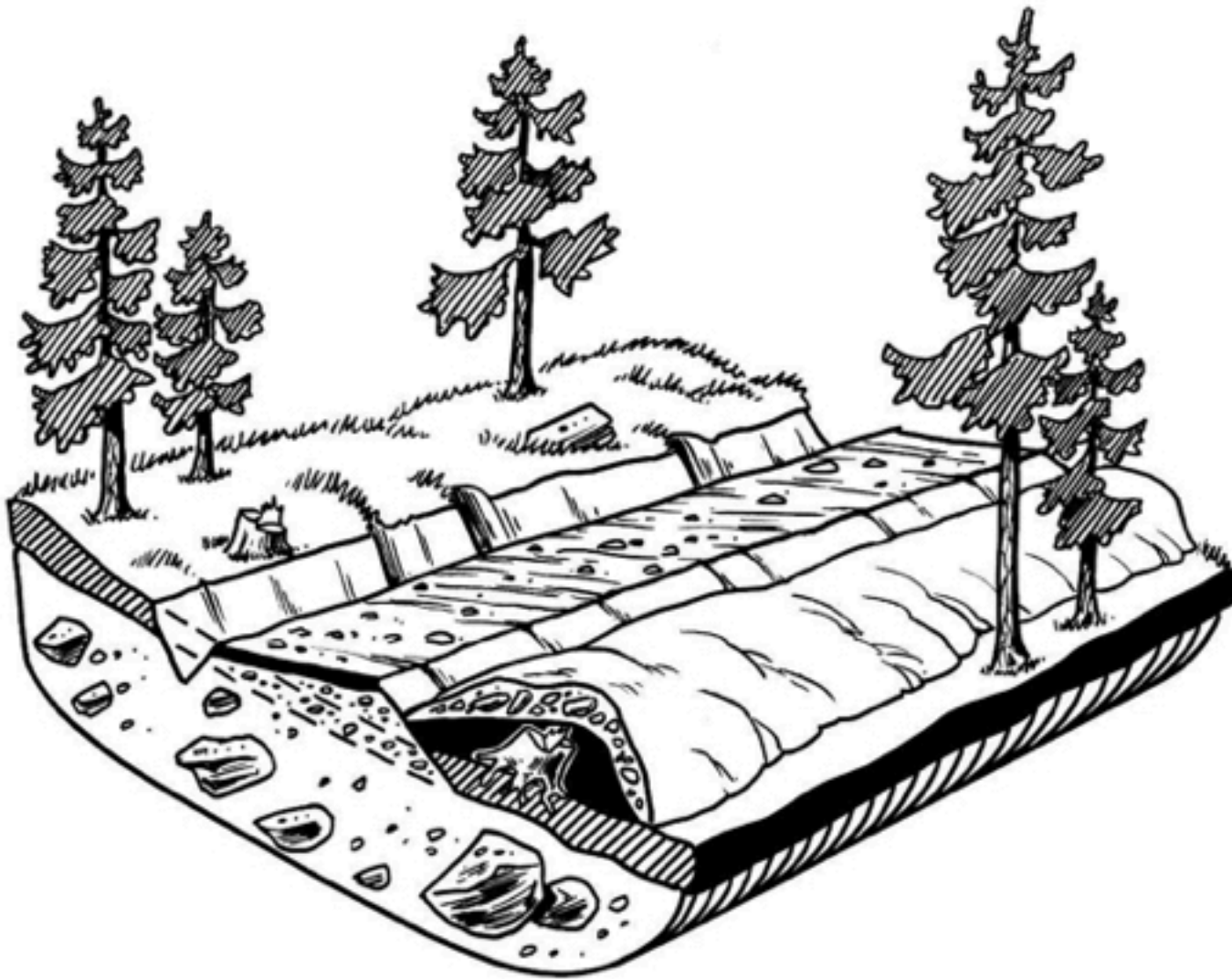
- roadway drainage, utilities, planned road improvements, snow removal, design sight distance, future developments, or standing timber; and

- any watercourse.

Furthermore, breach any resulting berms at each culvert location to facilitate drainage, and at other specified locations to permit the usual passage of livestock and wildlife.

Calculate the volume of debris and of soil cover per lineal metre of road. Generally, for every cubic metre of debris, utilize a metre of clearing for its disposal. When excessive debris volumes are encountered, consider other disposal methods.

Figure 5-7 Debris disposal by burying



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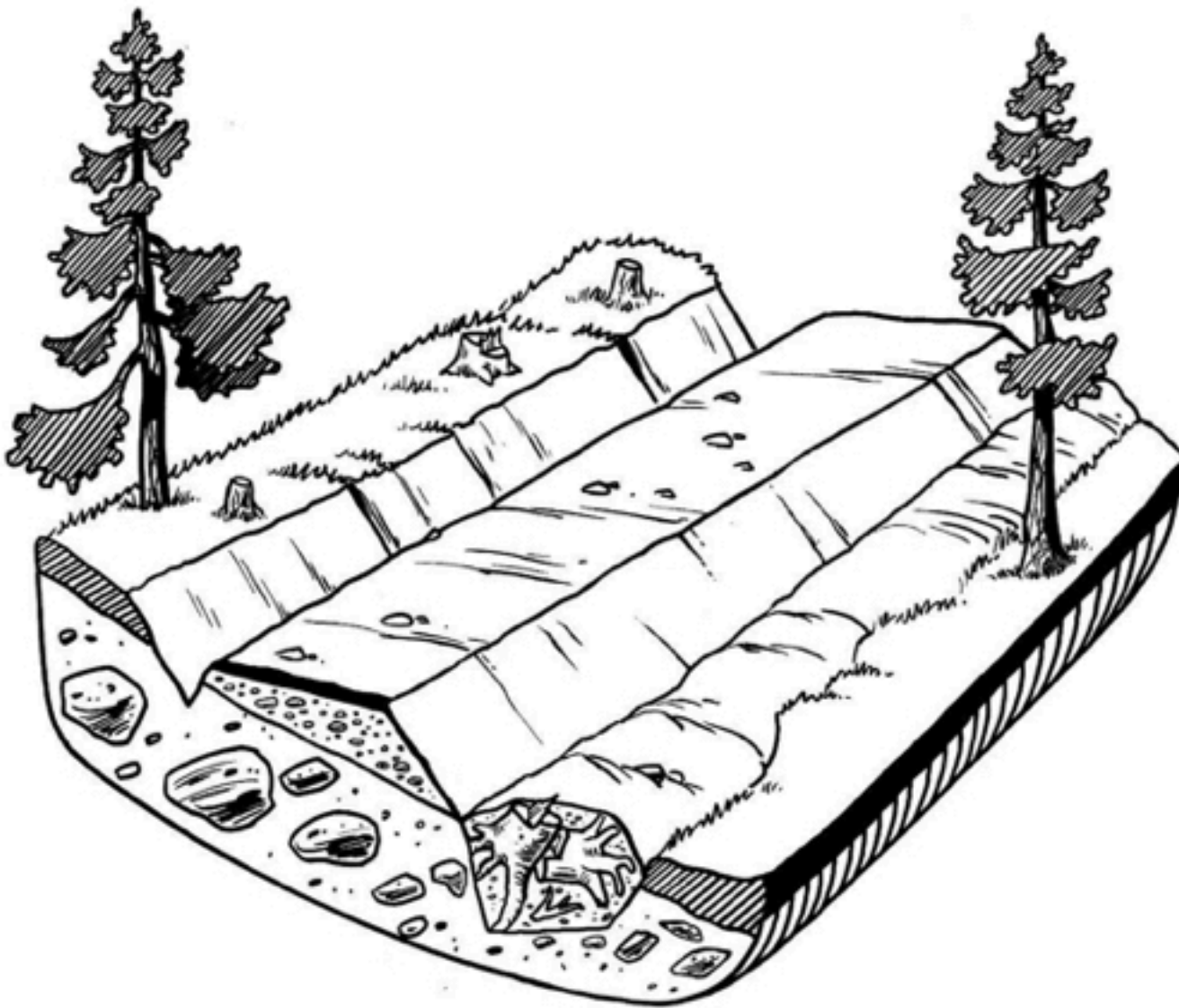
### **Trenching**

This method takes advantage of trenches that usually result from a particular subgrade construction technique, and not normally where a trench is dug solely for the purpose of burying debris. It works well where usable subgrade material occurs fairly continuously below a veneer of unsuitable soil. Use the excavated trench material to raise the subgrade above the normal ground line. Do not use trenching on natural slopes with greater than 20% slope angle, because it could undermine the road surface and cause long-term subgrade instability.

Place the debris in the resultant trench rather than spreading it over the ground surface. Determine the required size of the trench from the volume of debris to be buried. However, to minimize the size of the cleared area overall, use a deep, narrow trench instead of a shallow, wide trench (Figure 5-8).

To prevent undermining tree roots, leave 3m of cleared width between any standing timber and the trench. Ensure that the trench lies parallel to the roadway and is either continuous or intermittent, depending on the volume of debris. Place the woody debris on the bottom of the trench and compact it before covering it with soil and other strippings from the road prism.

Figure 5-8 Debris disposal by trenching



### **Mounding or windrowing**

With this method, accumulate all debris along one side of the cleared width between the road prism and the standing timber. Put into place the woody debris and then compact it with the grubbing equipment. Use stripped material from the road prism to cover the debris with additional mineral soil, as required, to ensure coverage by at least 300mm thickness of soil. Because of the difficulty of maintaining an adequate thickness of soil cover on the downslope side, the results of this method are not easy to control on natural slopes with greater than 50% slope angle.

## Creation of pushouts

Locate pushouts in natural openings along the cleared area and ensure that they are appropriate for the volume of material to be disposed. Do not push debris into standing timber and properly groom the piles to be stable and visually acceptable.

### 5.5.4 Endhauling Debris for Disposal

Where debris or other unsuitable material cannot be disposed of outside of the road prism or within the clearing width, endhaul it (i.e., load and haul) to a suitable disposal site for debris.

Endhaul debris from the road corridor in:

- steep or unstable terrain where this material is removed to maintain slope stability; and
- areas with high recreational value where aesthetics may be an issue.

### 5.5.5 Location of Disposal Sites for Debris

Identify all disposal sites for debris before construction. Ensure that an approved disposal site for debris is stable, well drained, and isolated from streams or wet sites; and does not have a material adverse effect on forest resources and other values. Sometimes, prepare and bench disposal sites in advance to enable stable placement of the endhauling debris. Avoid overloading of slopes. Where possible and practical, stockpile organic and fine-textured debris for placement over depleted borrow and gravel pits, quarries, and disposal sites for excavation spoil, as a means of facilitating revegetation.

Dispose of the debris endhauling to an approved disposal site by piling and burning, scattering, or burying. Whichever disposal method is used, ensure that the top of any remaining debris material is below the road surface (to allow for snowplowing and sight distance) and placed in a manner to allow surface water to drain away from the road.

Carefully place and pile debris to maintain slope stability at all times and take measures control erosion and sediment transport.