

Berms and Benches

Design Manual
Chapter 3
Cross Sections

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This section provides information regarding berms and benches. Berms and benches are used for stability, special drainage, erosion control, and fencing. Use and placement of benches and berms should be reviewed with the Soils Design and Roadside Development Sections in the Office of Design.

Backslopes

Backslope Benches

Figure 1 shows Design Detail 4104, which provides design criteria for backslope benches in areas of deep cuts. Included in Figure 1 are plan and elevation views useful with Design Detail 4104. This type of bench is normally used in cut sections over 25 feet deep measured from the ditch bottom to the top of the cut; however, the location of the bench may not necessarily occur at the 25 foot level, depending upon soil conditions. The design, location, and possible additional need for backslope benches need to be coordinated with the Soils Design Section.

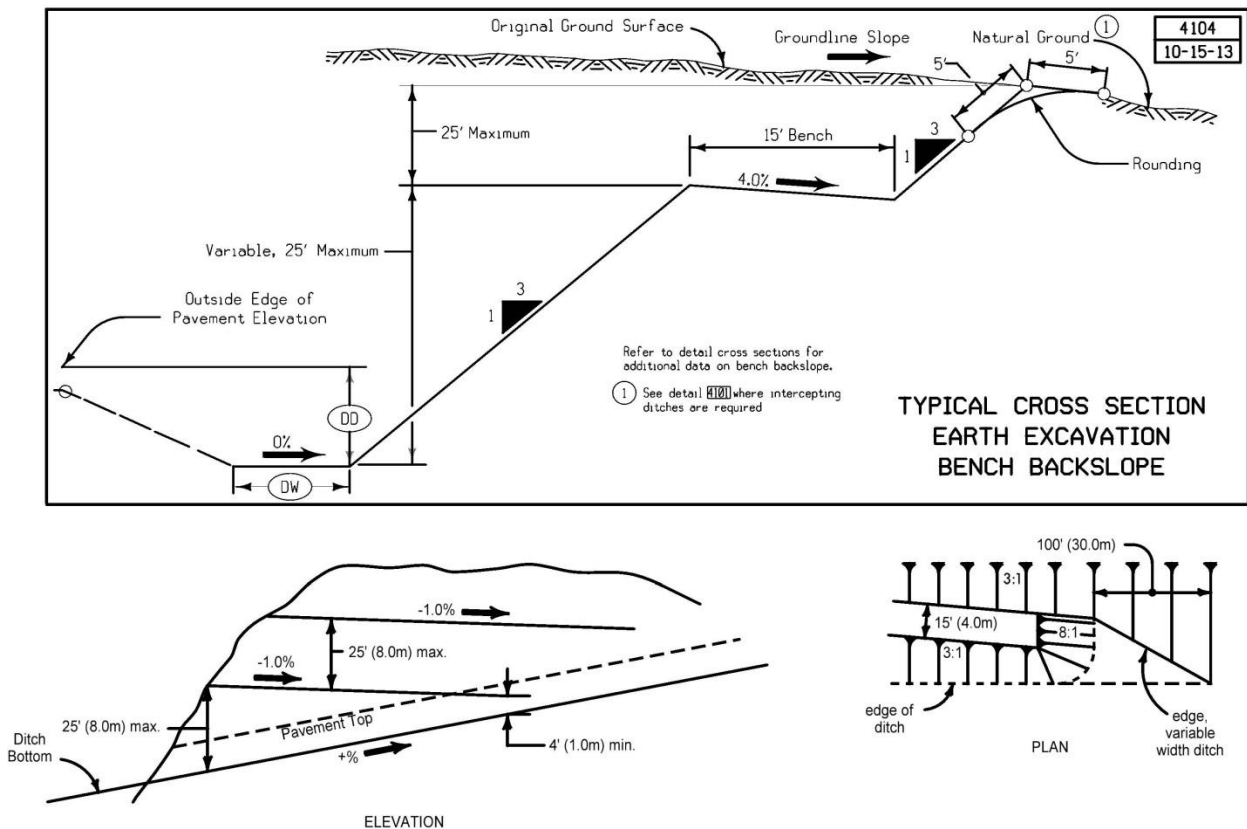


Figure 1: Design Typical 4104 with plan and elevation views.

Bench Cuts in Rock

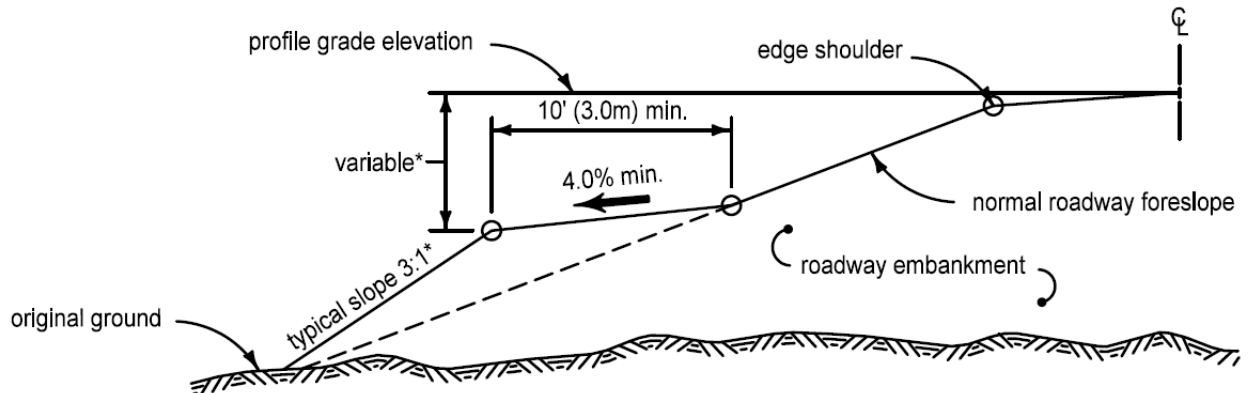
Situations occasionally arise that require placing cut areas through rock. Design Details 4110 and 4111 provide design criteria for bench cuts in cases where solid rock is encountered. Design Detail

[4107](#) provides criteria for cases where shale (or other inferior rock such as poor or very poor quality limestone) is encountered. Application, usage, design, location, and possible additional need for backslope benches in rock cut areas need to be coordinated with the Soils Section.

Foreslopes

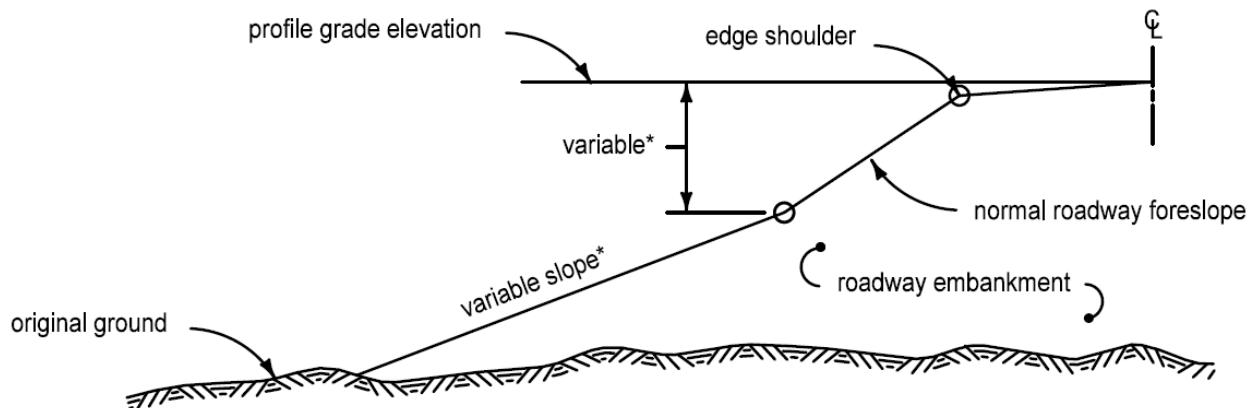
Berms

Occasionally berms are necessary to stabilize foreslopes. Figures 2 and 3 provide design criteria for two types of foreslope berms: general and stability.



*to be verified by the Soils Engineer for general foreslope berm.

Figure 2: General foreslope berm.



*designed by the Soils Engineer

Figure 3: Stability foreslope berm.

Bench Cuts

Bench cuts may be necessary to stabilize sliver fill foreslopes. Article [2107.03.C](#) of the Standard Specifications describes the standard practice for benching, etc. required with sliver fill and similar situations during construction, with no action needed in the plans. However, additional benching above and beyond those standard benches is sometimes needed. The need for, design of, and location of these benches are determined by the Soils Design Section. Figure 4 provides design criteria for this additional benching.

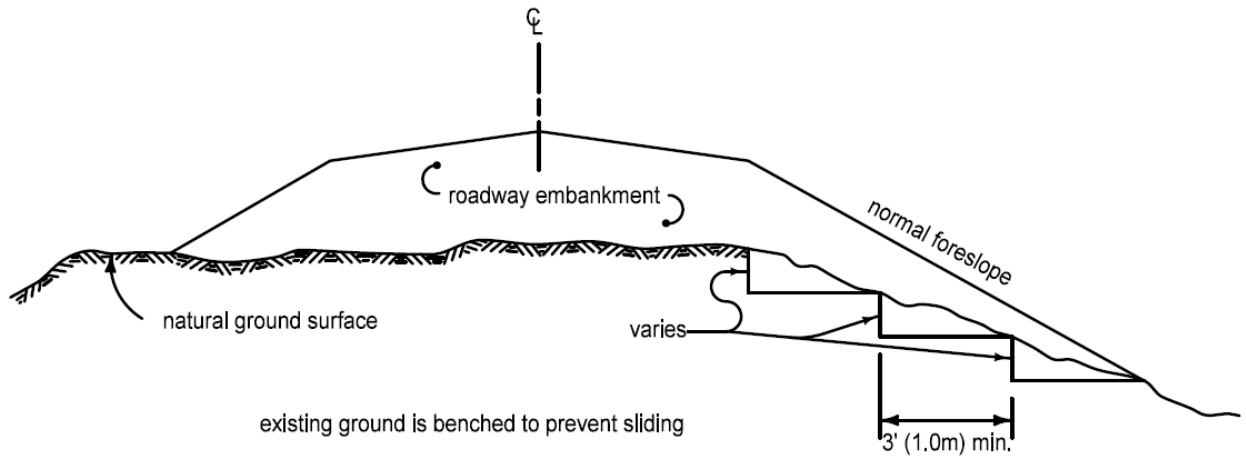


Figure 4: Bench cuts used to stabilize foreslope.

Chronology of Changes to Design Manual Section:

003J-001 Berms and Benches

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|-----------|---|
| 6/25/2019 | Revised
Updated hyperlinks.
Updated header logo and text. |
| 5/8/2013 | Revised
Updating Detail 4104 in Figure 1. |
| 9/13/2012 | Revised
Eliminate reference to 4106. Update spec reference. |
| 9/22/2000 | New material. |