

## Forest Trails and Landings - 655

### Massachusetts Forest Trails and Landings Job Sheet

<b>Client:</b>	<b>Farm #:</b>	<b>Tract #:</b>
<b>Planned By:</b>	<b>Date:</b>	

#### DEFINITION

Forest trails and landings are temporary or infrequently used routes, paths or cleared areas within a forest.

#### WHERE USED

Forest trails are used on forested areas where permanent access roads are not needed. Forest trails (a.k.a. skid trails) are used to provide access for forest management activities and for the removal or collection of forest products to a landing. Landings are cleared or open areas used for temporary storage of forest products until they are removed from the site.



#### GENERAL CRITERIA

This practice will be used to minimize damage to resources, including forest soils and water bodies, by controlling erosion on forest trails and landings. This will often require the reshaping of trails and/or installation of structural measures to manage runoff and to reduce soil erosion and sedimentation.

Water flows will be controlled using road profile shaping techniques such as crowning, in-sloping and out-sloping, and/or through the installation of drainage structures such as water bars, and rolling (broad-based) dips. Runoff from trails and landings shall be directed into appropriate filter strips (e.g., existing dense vegetation, stone, heavy slash) or hay bale impoundments to remove sediments before discharging into wetlands, water bodies or vernal pools. Cut and fill slopes and the travel surface must be stabilized with appropriate material or vegetation (see Critical Area Planting practice standard 342). Fords and timber bridges may be used for temporary stream crossings.

#### Road Profile Shaping

There are 3 basic road cross sections typically used to remove surface water from forest trails: crowned, in-sloped, and out-sloped (Figure 2). The choice of which profile to use depends on the drainage needed, soil stability, slope (see Figure 1 for how to determine slope), and the expected volume of traffic on the road. Road profiles will vary as the terrain changes or as drainage problems are encountered.

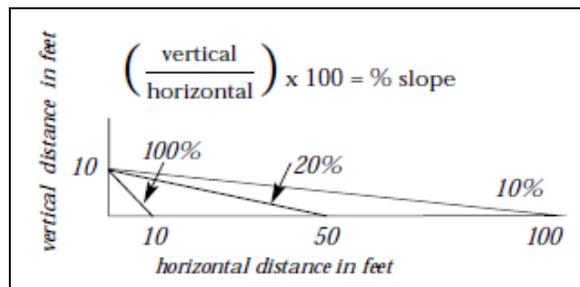


Figure 1. How to determine slope (from MA Forestry BMP Manual)

Crowning

To crown a road means to create a high point that runs lengthwise along the center line of the road. Either side of this high point is sloped at a 4% grade away from the center toward the outer edge of the road. Surface runoff is diverted into a vegetated buffer area or a ditch. Crowned fill section is used on flat ground where water standing on a road surface may be a problem. Crown and ditched section is for high volume roads on steep side hills.

Out-sloping

Out-sloping a road means building the road surface so that it is tilted outward 4 to 6% so water can run off the road surface. Out-sloping works well on terrain slopes of less than 20%, road grades of less than 8%, and stable soils. Out-slopes become a problem if maintenance is not performed as ruts could develop and act as channels.

In-sloping

In-sloping a road means building the road surface so that it is tilted inward towards the slope of the land 4 to 6% so that water can run off the road and collect in a shallow ditch. At the first opportunity available, the ditch is turned out into a vegetated buffer area to prevent runoff from coming back onto the road. In-sloping is for use terrain slopes greater than 20%, road grades greater than 8%, areas with fine textured soils, and areas where drainage is necessary.

**Drainage Structures**

Drainage structures are often needed on forest trails to manage runoff. Water bars and broad based ditches are the most commonly used drainage structures on forest trails.

Waterbars

Waterbars can be constructed with hand tools, but bulldozers are most commonly used. It is best to start at the end of the forest trail and work toward the landing so that completed work is not damaged by the construction equipment. Waterbars shall be installed at a downslope angle of approximately 30 degrees and should be at least 8 inches deep and installed with a 2 to 4% outslope (Figure 3). The outlet of the waterbar should drain away from the road and onto undisturbed vegetation, stone or dense slash. Space waterbars according to Figure 4 as outlet conditions allow.

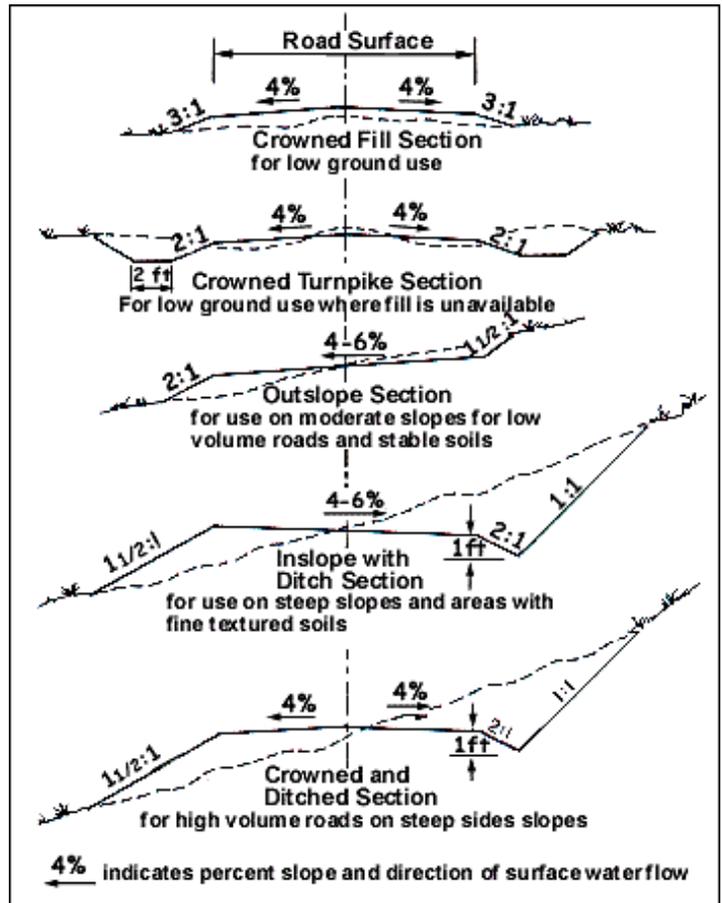
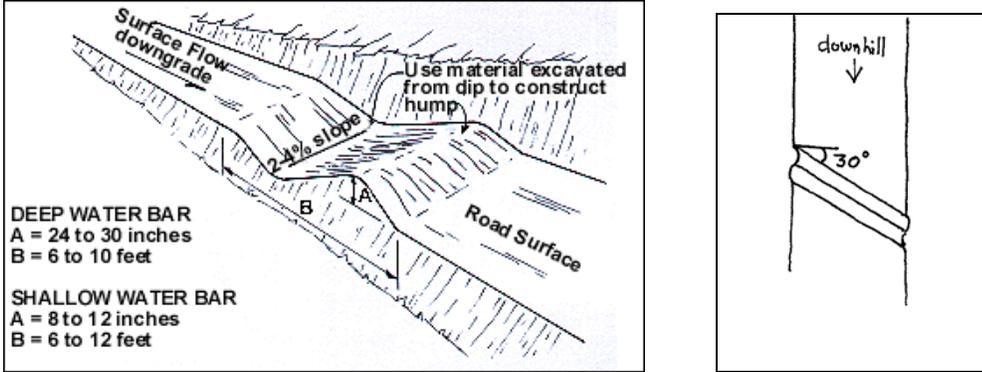
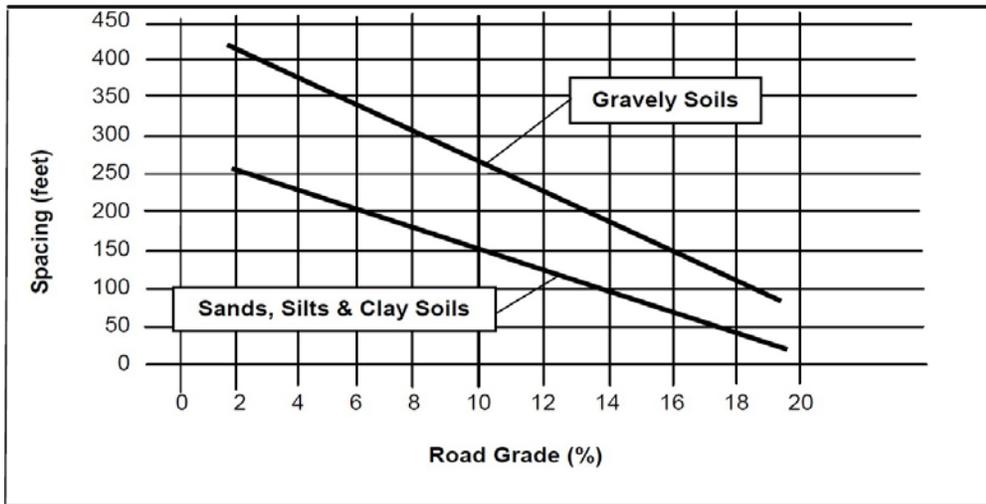


Figure 2. Dashed lines indicate natural land contours and solid lines indicate constructed road (from USFS).



**Figure 3.** Waterbars are narrow structures that may be shallow or deep. Deep water bars are usually used on roads that will be closed for extended periods (USFS).

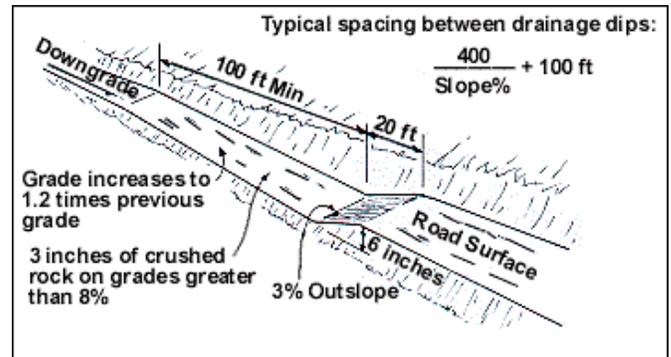


**Figure 4.** Spacing of waterbars

Rolling (Broad-based) Dips

Broad-based dips are shallow, wide depressions in the trail designed to divert water off a sloping trail (Figure 5). It is broad enough to accommodate hauling equipment easily, yet still move water off the trail to disperse in the forest. Broad based dips should only be used on forest trails having a 10% slope or less. The bottom of the dip should be out-sloped at least 3% and extend the full width of the trail. The dip and reverse grade section may require armoring with 3 inch crushed stone on slopes greater than 8% and on moist soils to prevent rutting. As with waterbars, the outflow should not discharge directly to a stream and the discharge area

should be protected with stone, dense vegetation, or heavy slash.



**Figure 5.** Broad based dips and the spacing formula (from USFS).

**Operation and Maintenance**

Trails should be inspected during the establishment period to ensure that drainage systems and structures for water control are properly functioning and that vegetation has attained full coverage where specified. Upon completion of logging, temporary measures should be eliminated or replaced with permanent bars; trails and landing should be properly graded and outsloped if needed, and the entire disturbed area seeded following the recommendations on the attached specifications sheet.

**RESOURCES FOR MORE INFORMATION**

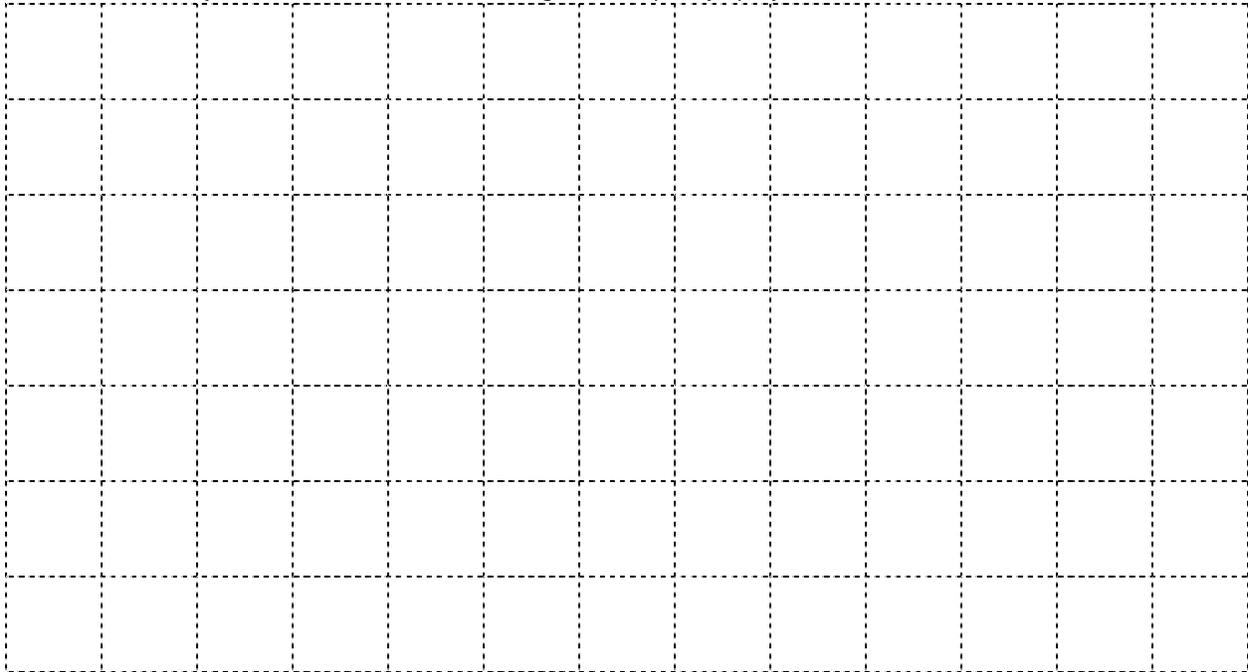
A Landowner's Guide to Building Forest Access Roads. USFS, 1998.

<http://na.fs.fed.us/spfo/pubs/stewardship/accessroads/accessroads.pdf>

Massachusetts Forestry Best Management Practices Manual. January 2000

Provide a map (may be attached) showing the location of the proposed practice and practice components.

Scale 1"= \_\_\_\_\_ ft. (NA indicates sketch not to scale; grid size=1/2" by 1/2")



## Massachusetts Forest Trails and Landings Job Sheet

**PURPOSE** (check all that apply)

<input type="checkbox"/> Forest Management	<input type="checkbox"/> Wildlife Habitat
<input type="checkbox"/> Logging	<input type="checkbox"/> Erosion Control

**STABILIZATION AND EROSION CONTROL** -Indicate treatment for each separate section of forest trail

Site #	Section ID	Length (ft)	% Grade	Prescription – include type (e.g., waterbars), quantity, spacing, size, cut & fill, width, length, etc.

Additional Specifications:

Operation and Maintenance:

**RECORD OF COMPLETION AND CHECK OUT CERTIFICATION:**

Treated Sites:	Date Completed by Client:	Date Inspected:	Inspector:

**Notes:**

The United States Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication program information (Braille, large print, audiotape, etc.) should contact the USDA Office of Communications (202) 720-2791.

To file a complaint of discrimination write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.