

**UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE**

CONSERVATION PRACTICE STANDARD

**FOREST TRAILS AND LANDINGS
(Acre)**

CODE 655

DEFINITION

A route, travel-way or cleared area within a forest.

PURPOSE

- Provide access to forest stands for management
- Provide access for removal and collection of forest products
- Provide access to forested areas for recreation.
- Minimize onsite and off-site damage to resources during periods of access.

CONDITIONS WHERE PRACTICE APPLIES

On forested areas.

GENERAL CRITERIA

Trails and landings will be of a size, gradient, number and location to economically and efficiently accomplish the intended purpose and expected users equipment. They shall be configured to minimize adverse onsite and offsite impacts such as accelerated erosion, riparian zone degradation, stream channel and streambank damage, hydrology modification, other water resource damage, aesthetics or unacceptable damage to advance regeneration, residual growing stock, wildlife habitat, fragmentation, or restrict wildlife movement.

Timing and use of equipment will be commensurate with site and soil conditions to maintain site

productivity and minimize soil erosion, displacement and compaction.

Slash debris and vegetative material left on the site after construction will not present an unacceptable fire or pest hazard or interfere with the intended purpose.

Water bars, rolling dips, timber bridges, rock plunge pools, and other drainage measures for trails shall be of sufficient size, intervals and gradient for adequate drainage and erosion control.

Trails and landings where appropriate shall be sufficiently revegetated to control erosion. See Woodland Reference 16-7, "Erosion Control and Wildlife Plantings For Forestry Operations."

Noxious plants will not be used for revegetation.

Comply with applicable federal, state and local laws and regulations during the installation, operation and maintenance of this practice.

CRITERIA FOR FOREST ACCESS TRAILS

- A. Location: Access trails will be located to serve the purpose intended, to facilitate the control and disposal of water, and to utilize topographic features. Trails should follow the natural contour and slopes to minimize problems with drainage patterns.
- B. Gradient, Alignment, and Width: Grades should be kept below 10 percent where possible and roads should follow the contour as much as possible. Grades 15 to 20 percent may occur for short distances (200 to 300 feet). Minimum road width should be 12 to 14 feet.

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Turnouts can be constructed at intervals of about 300 feet if desired. Minimum widths of 16 feet should be used on all curves and on areas of substantial cut or fill. Access trails should not be located too close to watercourses. See section on Filter Strips for distance.

C. Filter Strips: A filter strip is a buffer of vegetation left between a disturbed area and a watercourse. Vegetation may be planted or natural. Water from disturbed areas should not only enter a buffer or filter strip, but also should be spread into the buffer. This may require placement of brush, rocks, and logs to supplement natural vegetation and litter. For additional information, see FOTG Standard 393 – Filter Strip. The following guide may be used according to the slope of the land:

Slope of Land (percent)	Width of Filter Strip ^{1/} (feet)
0	25
10	45
20	65
30	85
40	105
50	125
60	145

^{1/} This is a guide only. There are situations when lesser distances would be adequate.

D. Broad Based Drainage Dips: Broad based dips should be used on permanent travel routes for removing runoff where neither intermittent nor permanent streams cross the road. Broad based dips are probably the most effective way of gathering surface water and routing it safely off the road. This type of dip should not be used on roads with grades greater than 10 percent. Crushed stone should be used on dips when slopes exceed 8 percent.

Care should be taken to ensure adequate drainage at the out-flow of the dip and adequate buffer zone to allow filtering of the water. The discharge area should be protected with either stone, grass, sod, heavy litter, brush, logs of anything that will reduce the velocity of the water. Natural litter may be adequate in most cases if the terrain is not too steep. The correct spacing for broad based dips are as follows:

Road Grade (percent)	Approximate Distance Needed between dips (feet)
1	500
2	300
5	180
10	140

E. Water Breaks: Water breaks or water bars should be installed on sloping access trails and skid trails where there is a severe erosion hazard. The structures may be shallow or deep, depending on need. Deep breaks are usually used on access trails or skid trails that will be closed to vehicular traffic. Water breaks are installed at a 30 degree angle down slope. The following spacings are recommended between water breaks:

Road Grade (percent)	Approximate Distance Between Water Breaks (feet)
1	400
2	250
5	125
10	80
15	60
20	50

F. Pipe Culverts: Pipe culverts are applicable on permanent access trails where vehicular traffic will be relatively heavy. Pipe culverts should cross the road on a positive grade in line with the drainage pattern. If erosion is a problem on the inlet end, a headwall must be provided. A 12-inch pipe is the smallest that should be used. Culvert diameters for various drainage areas are as follows:

Area Above Pipe (acres)	Recommended Pipe Diameter (inches)
2	12
4	15
7	18
12	21
16	24
27	30
47	36
64	42
90	48

Area Above Pipe (acres)	Recommended Pipe Diameter (inches)
120	54
160	60
205	66
250	72
350	78

- G. Bridges: Bridges should be used at crossings which are too large for culverts. Crossings should be at right angles to the stream. Approaches to bridges should be reasonably level for a distance of about 50 feet. Alternative road locations may be used to avoid constructing bridges.
- H.
- I. Fords: Fords may be used where the stream bed is firm, banks are low and stable and the stream is shallow.

CRITERIA FOR HARVEST SKID TRAILS

Forest harvest skid trails should be planned and located to avoid damage to residual trees, minimize erosion and provide an economical route for skidding trees. Avoid joining several skid trails at one point as the disturbed area will continue to expand at the trail intersection. The gradient of skid trails should not exceed 15 percent. Sections of skid trail may be up to 20 percent if the distance does not exceed 300 feet. Do not construct skid trails straight up and down the slope but along a gradual angle across the slope to reduce the velocity of runoff water. Water bars, and other erosion control measures for harvest trails shall be of sufficient size, intervals and gradient for adequate drainage and erosion control. It may be desirable to vegetate skid trails to help reduce erosion and to enhance wildlife habitat. See NRCS Woodland Reference 16-7, "Erosion Control and Wildlife Plantings for Forestry Operations."

CRITERIA FOR HARVEST LANDINGS

Landings are product transfer points that receive a very high volume of traffic. The landing area should be as small as possible and should be located as far away from streams as possible. At a minimum, landings should be located no closer than 50 feet from the nearest Streamside Management Zone (SMZ). Erosion control measures should be used when necessary to prevent sediment from entering into nearby streams or water bodies. Landings should preferably be located on sites with good drainage and slopes of 2 to 5 percent. Landings are areas that have high levels of human activity and often become eyesores or public health hazards because of careless littering and waste

disposal. Garbage and trash generated from lunches and machinery parts packaging should be hauled away to an appropriate trash receptacle. Careless dumping of oil and lubricants must be avoided. They should be collected and disposed of in accordance with state approved waste disposal procedures.

Landings should be either site prepared and regenerated or seeded to perennial vegetation after harvesting is completed. See NRCS Forest Land Reference 16-7, "Erosion Control and Wildlife Plantings for Forestry Operations."

Logging slash and debris left on the site after harvesting will not present an unacceptable fire or pest hazard or interfere with the intended purpose.

Comply with applicable laws and regulations, including the state's Best Management Practices (BMPs).

CONSIDERATIONS

Assure safe ingress and egress to site.

Locate landings and trails to preserve aesthetics qualities.

Landings and trails may be closed for erosion control, safety and liability, and reduced maintenance costs.

Landings and trails may be used for wildlife food and cover plantings.

Landings and trails may be utilized as firebreaks.

Consider cultural resources and environmental concerns such as threatened and endangered species of plants and animals, natural areas and wetlands.

PLANS AND SPECIFICATIONS

Specifications for applying this practice shall be prepared for each site and recorded using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation. Specifications for revegetation of landings and trails should include species, timing and method of application.

OPERATION AND MAINTENANCE

Periodic inspections of landings and trails will be conducted and where necessary repairs will be made.

Landings and trails utilized as firebreaks will be properly maintained to accomplish this purpose.

Landings and trails may be closed for erosion control, safety and liability, and reduced maintenance costs.

Landings and trails no longer needed can be “put to bed” by removing high maintenance structures, such as culverts and bridges, and can be restored to a vegetative cover by planting and seeding.

REFERENCES

Alabama Cooperative Extension Service. July 1994. BMP Pocket Guide For Logging. Circular ANR-806.

Alabama Forestry Commission. Alabama's Best Management Practices for Forestry.

Soil Conservation Service. Forest Service. 1977. Woodlands of the Northeast – Erosion and Sediment Control Guides.