

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

ACCESS ROAD

(ft)
CODE 560

DEFINITION

A travel-way for equipment and vehicles constructed as part of a conservation plan.

PURPOSE

To provide a fixed route for vehicular travel for resource activities involving the management of timber, livestock, agriculture, wildlife habitat, and other conservation enterprises while protecting the soil, water, air, fish, wildlife, and other adjacent natural resources.

CONDITIONS WHERE PRACTICE APPLIES

Where access is needed from a private or public road or highway to a land use enterprise or conservation measure, or where travel ways are needed in a planned land use area.

Access roads range from seasonal use roads, designed for low speed and rough driving conditions, to all-weather roads heavily used by the public and designed with safety as a high priority. Some roads are only constructed for a single purpose; i.e. control of forest fires, logging and forest management activities, access to remote recreation areas, or access for maintenance of facilities.

DESIGN CRITERIA

Access roads shall be designed to serve the enterprise or planned use with the expected vehicular or equipment traffic. The type of vehicle or equipment, speed, loads, soil, climatic, and other conditions under which vehicles and equipment are expected to operate

need to be considered. Planned work shall comply with all federal, state and local laws and regulations.

Where general public use is anticipated, roads shall be designed to meet applicable federal, state, or local criteria.

Sound engineering practices shall be followed to insure that the road meets the requirements of its intended use and that maintenance requirements are acceptable.

Location. Roads shall be located to serve the purpose intended, to facilitate the control and disposal of surface and subsurface water, to control or reduce erosion, to make the best use of topographic features, and to include scenic vistas where possible. The roads should generally follow natural contours and slopes to minimize disturbance of drainage patterns. Roads shall be located where they can be maintained and where water management problems are not created. To reduce pollution, roads shall be located away from watercourses. Utilize buffers where possible to protect waterbodies. Where mud on a public way is likely, apply gravel, wood chips or slash for a minimum distance of 50 feet on all road sections between woodland harvesting landing areas and public roadways.

Alignment. The gradient and vertical and horizontal alignment shall be adapted to the intensity of use, mode of travel, the type of equipment and load weights, and the level of development.

Grades normally should not exceed 10 percent except for short lengths. Maximum grades of 18 percent should only be exceeded if necessary for special uses such as logging roads, field access roads, fire protection roads, or other roads not accessible for use by the general public.

For timber harvest operations, access to landings should be limited to 2 to 5 percent grades. For constructed skid roads the normal maximum grade is 15% with a maximum of 20% permitted for a distance of 100 feet and a return back to the normal grade or flatter.

Roads for truck hauling timber should not exceed 10% grade normally, but when needed could be a maximum of 20% for a distance of 100 feet.

For stream crossings, the road should be aligned so that it crosses perpendicular to the channel as much as possible.

Width. The minimum width of the roadbed is 14 ft for one-way traffic and 20 ft for two-way traffic. The roadbed width includes a tread-width of 10 feet for one-way traffic or 16 feet for two-way traffic. Each type of road also requires 2 feet of shoulder width on each side. Single-lane logging or special-purpose roads can have a minimum road bed width of 10 ft, with greater widths at curves and turnouts. The two-way traffic width shall be increased approximately 4 ft for trailer traffic. The shoulder width may be either gravel or grass. For areas with substantial cuts and fills, increase the minimum shoulder width to 3 feet on each side of the tread width.

Where turnouts are used, road width shall be increased to a minimum of 20 ft for a distance of 30 ft.

Side slopes. All cuts and fills shall be designed to have stable slopes of a minimum of 2 horizontal to 1 vertical on heights of less than 4 feet. Road fills 4 feet or greater shall be designed to have stable side slopes not less than 2 horizontal to 1 vertical unless justified by accepted engineering stability analysis. Slope stabilization utilizing rock, timber, concrete or other materials to retain fill shall be designed (and documented) using sound engineering principles to ensure stability for site conditions and class of vehicle, type of road, development or use. For short lengths, steeper slopes may be permitted, if soil conditions warrant and special stabilization measures are installed.

Areas with geological conditions and soils subject to slides shall be avoided or treated to prevent slides.

Drainage. The type of drainage structure used will depend on the type of enterprise and runoff conditions. Culverts, bridges, fords, or grade dips for water management shall be provided at all natural drainage ways. The capacity and design shall be consistent with sound engineering principles and shall be adequate for the class of vehicle, type of road, development, or use.

When a culvert is installed, its minimum capacity shall convey the design storm frequency listed in Table 1, without causing erosion or road overtopping. Table 1 lists minimum design storm frequencies for various road types.

Table 1

Road Type	Storm Frequency
Forest Access Roads, Field Access Roads, Driveways, or Facility Access Roads	10 year - 24 Hour
Public Access Roads, Etc.	25 year - 24 Hour

For non-public use roads, an erosion-resistant low point or overflow area may be constructed across the access road to supplement culvert capacity to safely pass the 10 year storm event. Culverts, bridges, fords and hardened overflow areas should be installed so the road crossing does not significantly impact fish migration.

Culvert and Cross drainage guidance is provided in practice standards for "Stream Crossings", Code 578 and "Structures for Water Control", Code 587. When a bridge is installed, it shall conform to standards and specifications for "Stream Crossings", Code 578.

Roadside ditches shall be adequate to provide surface drainage for the roadway and deep enough, as needed to serve as outlets for subsurface drainage. At a minimum, the roadside ditch shall be 1.0 foot below the top of road surface to provide internal drainage. Channels shall be designed to be on stable grades or protected with structures or linings for stability. When passing the design storm discharge, channel linings shall be designed to meet "Lined Waterway", Code 468. Chutes or

other grade stabilization structures shall meet "Grade Stabilization Structure", Code 410.

Water breaks or bars may be used to control surface runoff on low-intensity, unpaved roads. On steep grades where runoff and erosion is anticipated down the road, water bars should be considered. Water bars must be constructed of materials that are compatible with the use and maintenance of the road surface. Water bar discharge areas must be well vegetated or have other erosion resistant materials. See Figure 1 for the recommended spacing of water bars.

Surface crowning can also help direct road runoff into the side drainage ditches. Unobstructed flow into the ditches must be maintained to prevent flows from causing roadside erosion.

As a minimum, access roads for timber hauling trucks in timber harvesting operations shall have drainage measures designed and installed according to information provided in the Best Management Practices for Erosion Control on Timber Harvesting Operations in New Hampshire resource manual.

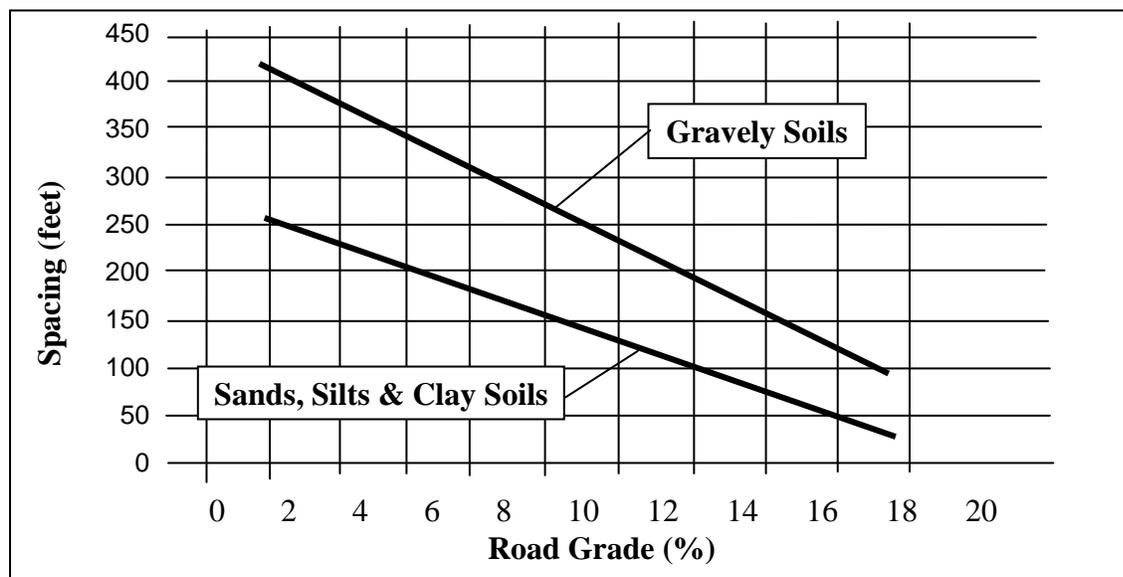
Surfacing. Access roads shall be given a wearing course or surface treatment if required by traffic needs, soil, climate, erosion control, or particulate matter emission control. The type of treatment, if needed, depends on local conditions, available materials, and the existing road base. If these factors or the volume of traffic is not a problem, no special treatment of the surface is required. On weak bearing capacity soils such as silts, organics, and clays, the surface treatment should be underlain with a geotextile material specifically designed for road stabilization applications when the road is used on a regular basis.

Unsurfaced roads may require controlled access to prevent damage or hazardous conditions during adverse climatic conditions.

Toxic and acid-forming materials shall not be used on roads. This should not be construed to prohibit use of chemicals for dust control and snow and ice removal after considering potential impacts on stabilizing vegetation.

Utilize additional conservation practices to reduce the potential for generation and transport of particulate matter emissions.

**Figure 1
Recommend Spacing of Relief Culverts and Water Bars Based on Soil Types**



Construction Operations. Construction operations should be carried out in such a manner that erosion and air and water pollution

are minimized and held within legal limits. Construction shall include the following requirements as necessary for the job:

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resource Conservation Service. NH supplement is underlined.

1. Trees, stumps, roots, brush, weeds, and other objectionable material shall be removed from the work area.
2. Unsuitable material shall be removed from the roadbed area.
3. Grading, sub-grade preparation, and compaction shall be done as needed.
4. Surfacing shall be done as needed.
5. Measures must be in place to limit the generation of particulate matter during construction.
6. Culverts and cross drains should be properly bedded and backfilled with fill material compacted around the pipe to prevent piping along it. There shall be a minimum of 1.0 foot compacted fill over the pipe to protect the pipe.

Traffic safety. Passing lanes, turnouts, guardrails, signs, and other facilities as needed for safe traffic flow shall be provided. Traffic safety shall be a prime factor in selecting the angle and grade of the intersection with public highways. Preferably, the angles shall be not less than 85 degrees. The public highway shall be entered either at the top of a hill or far enough from the top or a curve to provide visibility and a safe sight distance. The clear sight distance to each side shall not be less than 300 feet, or as required by local regulations, if site conditions permit.

Dead end roads shall be provided with a turnaround. In some areas turnarounds may also be desirable for stream, lake, recreation, or other access purposes.

Parking space as needed should be provided to keep vehicles off the road or from being parked in undesirable locations.

Erosion control. If soil and climatic conditions are favorable, roadbanks and disturbed areas shall be vegetated as soon as possible and skid trails, landings, logging, and similar roads shall be vegetated after harvesting or seasonal use is completed (see Critical Area Planting, Code 342). If the use of vegetation is precluded and protection against erosion is needed, protection shall be provided by nonvegetative materials, such as gravel or other organic or inorganic

material (see Mulching, Code 484), or in accordance with local regulations.

Roadside channels, cross drains, and drainage structure inlets and outlets shall be designed to be stable (see Structure for Water Control, Code 587). If protection is needed, riprap or other similar materials shall be used.

Watercourses and water quality shall be protected during and after construction by erosion-control facilities and maintenance. Filter strips, sediment and water control basins, and other conservation practices shall be used and maintained as needed.

CONSIDERATIONS

Visual resources and environmental values shall be considered in planning and designing the road system.

When available, consider using organic bio-degradable materials as a surface treatment.

Access roads should be located where minimal adverse impacts will affect wetlands, waterbodies and wildlife habitat. Consideration should be given to the following:

- Effects on downstream flows or aquifers that would effect other water uses or users.
- Effects on the volume and timing of downstream flow to prohibit undesirable environmental, social, or economic effects.
- Short-term and construction-related effects of this practice on the quality of on-site downstream water courses.
- Overall effects on erosion and the movement of sediment, pathogens, and soluble and sediment-attached substances that would be carried by runoff from construction activities.
- Effects on wetlands and water-related wildlife habitats that would be associated with the practice.
- Establishing vegetation on road shoulders wider than the 2-4 ft.

- Limiting the number of vehicles and vehicle speed will reduce the potential for generation of particulate matter and decrease safety and air quality concerns.

PLANS AND SPECIFICATIONS

Plans and specifications for constructing access roads shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

An operation and maintenance plan will be developed and provided for all practices shown on the drawings. As a minimum, these measures will be carried out for the life of the practice:

1. Inspect culverts and roadside ditches, water bars and outlets after each major runoff event and restore flow capacity as needed.
2. Minimize the damage to vegetative buffers adjacent to the road when it is necessary to chemically treat the road surface to maintain erosion protection.

3. Maintain vegetated areas in adequate cover to meet the intended purpose(s). Re-seed and mow as needed.
4. Fill low areas in travel treads and re-grade, as needed, to maintain road cross section.
5. Inspect roads with water bars periodically to insure proper cross section is available and outlets are stable.
6. Conservation practices that limit particulate matter emissions should be incorporated into long-term maintenance plans.

REFERENCES

1. Engineering Field Handbook, USDA, Natural Resources Conservation Service.
2. National Handbook of Conservation Practices, USDA, Natural Resources Conservation Service.
3. Handbook of Steel Drainage and Highway Construction Products, Third Edition, American Iron and Steel Institute, Washington, D.C. 1983.