

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

ACCESS ROAD

(Feet)

CODE 560

DEFINITION

An access road is an established route for equipment and vehicles.

PURPOSES

An access road is used to provide a fixed route for vehicular travel for resource activities involving the management of timber, livestock, agriculture, wildlife habitat, and other conservation enterprises.

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; e.g. control of forest fires, logging and forest management activities, access to remote recreation areas, or access for maintenance of facilities.

This practice does not apply to temporary or infrequently used trails used for logging. Use Indiana (IN) Field Office Technical Guide (FOTG) Standard (655) Forest Trails and Landings. Trails and walkways used for animals, pedestrians, or off-road vehicles are addressed in IN FOTG Standard (575) Trails and Walkways.

CRITERIA

Use of this standard requires compliance with all applicable federal, state, and local laws and regulations.

Access roads will 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.

Native plant species will be used whenever possible. Known invasive species will not be used.

Location. Roads will 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. Roads will generally follow natural contours and slopes to minimize disturbance of drainage patterns. Roads will be located where they can be maintained and where water management problems are not created. To reduce potential pollution, roads will be located away from water bodies and watercourses to the extent practical. Overland flow will not be impeded. Use buffers where possible to protect water bodies.

Alignment. The gradient and horizontal alignment will be adapted to the intensity of use, mode of travel, the type of equipment

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service State Office, or download it from the Field Office Technical Guide for your State.

and load weights, and the level of development.

Grades normally will not exceed 10 percent except for short lengths. Maximum grades of 15 percent will 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 stream crossings, the road will be aligned so that it crosses perpendicular to the channel as much as possible. Refer to IN FOTG Standard (578) Stream Crossing for the crossing itself.

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 width of 10 feet, with greater widths at curves and turnouts. The two-way traffic width will be increased approximately 4 feet for trailer traffic. The shoulder width may be either gravel or grass.

Turnouts will be used on single lane roads where vehicles travel in both directions on a limited basis. Where turnouts are used, road width will be increased to a minimum of 20 feet for a distance of at least 30 feet.

Provide a turnaround at the end of dead end roads. Size the turnaround for the anticipated vehicle type that will be using the road. In some areas, turnarounds may also be desirable for stream, lake, recreation, or other access purposes.

Provide parking space as needed to keep vehicles from parking on the shoulder or other undesirable locations.

Side Slopes. All cuts and fills will be designed to have stable slopes of a minimum of 2 horizontal to 1 vertical on heights of less than 4 feet. For short lengths, rock areas, or very steep hillsides, steeper slopes may be permitted, if soil conditions warrant and special stabilization measures are installed.

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

Drainage. The type of drainage structure used will depend on the intended use and runoff conditions. Culverts, bridges, fords, or grade dips for water management will be provided at all natural drainage ways. The capacity and design will be consistent with sound engineering principles and will be adequate for the class of vehicle, type of road, development, or use. When a culvert or bridge is installed in a drainage way, its minimum capacity will convey the design storm runoff without causing erosion or road overtopping. Table 1 lists minimum design storm frequencies for various road types.

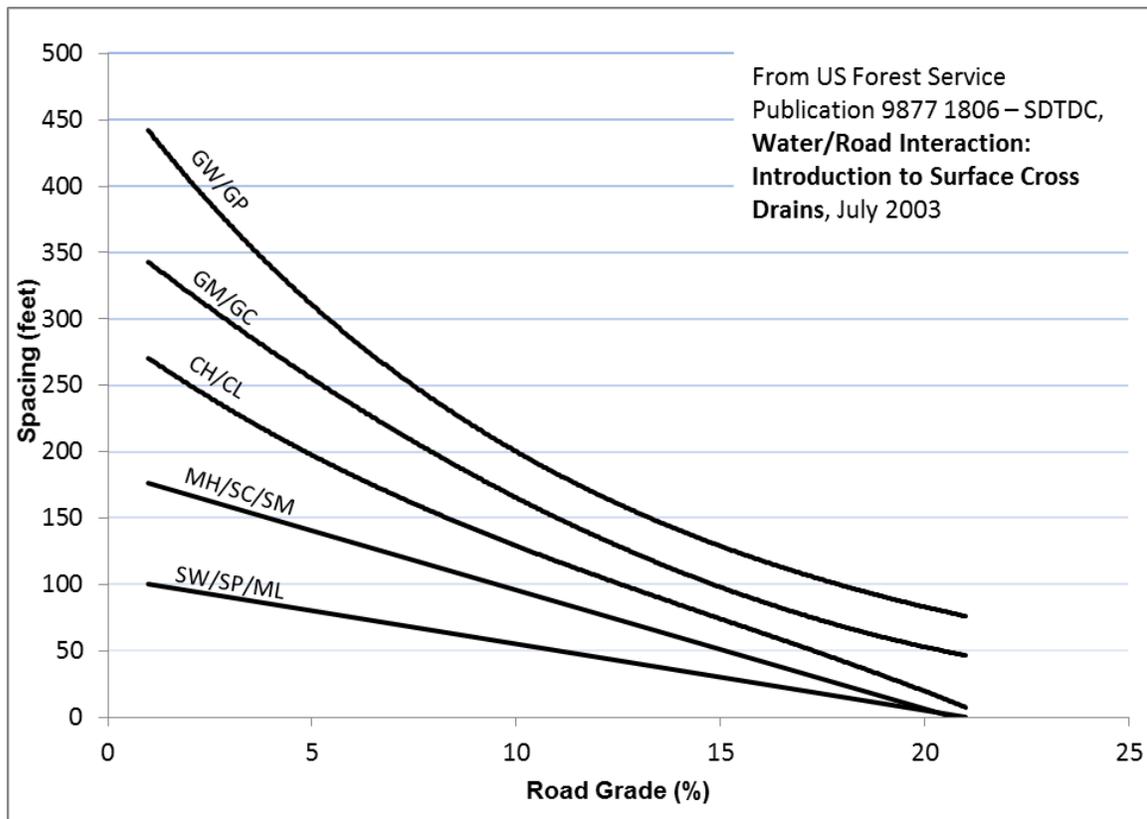
Table 1 – minimum design storm frequencies

Road Type	Storm Frequency
Intermittent; Forest Access Roads, Farm Field Access Roads	2 year - 24 Hour
Frequent; Farm Driveways, Recreation Facility Access Roads	10 year - 24 Hour
High Intensity; Public Access Roads, Camp grounds, etc.	25 year - 24 Hour

An erosion-resistant low point or overflow area may be constructed across the access road to supplement culvert capacity on non-public use roads. Culverts, bridges, fords and hardened overflow areas should be installed so the road crossing does not significantly impact fish migration. Use IN FOTG Standard (578) Stream Crossings.

Surface cross drains, water-bars, diversions or broad based dips may be used to control surface runoff on low-intensity use forest, ranch or similar roads. On steep grades where runoff and erosion is anticipated, water bars or other erosion control measures will be constructed. 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. Refer to Figure 1 for Spacing of Water Bars.

Figure 1. Recommended Spacing of Surface Cross Drains (water bars) Based on Soil Types



Roadside ditches will be adequate to provide surface drainage for the roadway and deep enough to serve as outlets for subsurface drainage. At a minimum, the roadside ditch will be 1.0 foot below the top of road surface to provide internal drainage. Ditch channels will be designed to be on stable grades or protected with structures or linings for stability. Provide a stable outlet for the ditch. Protection may include riprap or other similar materials. Use IN FOTG Standards (587) Structure for Water Control; Standard (468) Lined Waterway or Outlet; or Standard (410) Grade Stabilization Structure if needed.

Surface crown as needed to direct road runoff into side drainage ditches. Unobstructed flow into the ditches must be maintained to prevent flows from causing roadside erosion.

Surfacing. Access roads will 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 will be underlain with a geotextile material specifically designed for road stabilization applications when the road is used on a regular basis. Use the criteria in IN FOTG Standard (561) Heavy Use Area.

Un-surfaced roads may require controlled access to prevent damage or hazardous conditions during adverse climatic conditions. Toxic and acid-forming materials will 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.

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

Construction Operations. Construction operations will be carried out in such a manner that erosion and air and water pollution are minimized. Construction will include the following requirements as necessary for the job:

1. Trees, stumps, roots, brush, weeds, and other objectionable material will be removed from the work area.
2. Unsuitable material will be removed from the roadbed area.
3. Grading, sub-grade preparation, and compaction will be done as needed.
4. Surfacing will be done as needed.
5. Measures must be in place to limit the generation of particulate matter during construction.

Traffic Safety. Passing lanes, turnouts, guardrails, signs, and other facilities as needed for safe traffic flow will be provided. Traffic safety will be a prime factor in selecting the angle and grade of the intersection with public highways. Preferably, the angles will be not less than 85 degrees. The public highway will 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 will not be less than 300 feet or as required by local regulations. Design an intersection to a public highway to meet applicable federal, state and local criteria.

Erosion Control. If soil and climatic conditions are favorable, road banks and disturbed areas will be vegetated as soon as possible and skid trails, landings, logging, and similar roads will be vegetated after harvesting or seasonal use is completed (see IN FOTG Standard (342) Critical Area Planting). If the use of vegetation is precluded and protection against erosion is needed, protection will be provided by non-vegetative materials, such as gravel or other organic or inorganic material (see IN FOTG Standard (484) Mulching), or in accordance with local regulations.

Roadside channels, cross drains, and drainage structure inlets and outlets will be designed to be stable (see IN FOTG Standard (587) Structure for Water Control).

If protection is needed, riprap or other similar materials will be used.

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

CONSIDERATIONS

The considerations section contains information that is optional to the planner.

Consider visual resources and environmental values during the planning and designing of the road system.

When available, consider using organic biodegradable materials as a surface treatment.

Consider using additional conservation practices to reduce the potential for generation and transport of particulate matter emissions such as IN FOTG Standard (380) Windbreak/Shelterbelt Establishment.

During adverse weather, some roads may become unsafe or may be damaged by use. Consider restricting access to the road at that time.

Access roads should be located where minimal adverse impacts will affect wetlands, water bodies, watercourses, wildlife habitat, and air quality. Consideration should be given to the following:

- Utilizing buffers where possible to protect surface water.
- Effects on downstream flows or aquifers that would affect 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 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 minimum.
- 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

Prepare plans and specifications for each field or treatment unit according to the planning criteria and operation and maintenance requirements of this standard. Specifications will describe the requirements to apply the practice to achieve the intended purpose for the practice site.

As a minimum, include:

- A plan view of the proposed road that shows water features, known utilities, and other features that affect the design.
- Road width and length with profile and typical cross section(s) including turnouts, parking, and turnarounds.
- Design road grades or maximum grades when applicable.
- Soils investigation. Location of soil borings and plot of the soil/geologic boring showing the USCS, as needed
- Type and thickness of surface treatment including any sub-base preparation.
- Grading plan.
- Cut and fill slopes where applicable.
- Planned drainage features.
- Location, size, type, length and invert elevations of all required water control structures.
- Vegetative requirements that include vegetation materials to be used, establishment rates, and season of planting.
- Erosion and sediment control measures, such as surface cross drains/water bars, as needed, including detailed designs.
- Safety features.
- Construction and material specifications.

OPERATION AND MAINTENANCE

An operation and maintenance plan will be developed and carried out for the life of the practice:

1. Inspect culverts, roadside ditches, water bars and outlets after each major runoff event and restore flow capacity as needed. Ensure proper cross section is available and outlets are stable.
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).
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 ensure 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.
7. Selection of chemical treatment(s) for surface treatment or snow/ice removal, as needed. Select the chemicals used for surface treatment or snow and ice removal to minimize adverse effects on stabilizing vegetation.
8. Selection of dust control measures, as needed.

REFERENCES

United States Forest Service. July 2003. *Water/Road Interaction: Introduction to Surface Cross Drains* (Publication 9877 1806 – SdTDC).