

**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.

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, private or public use, 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, rules, and regulations.

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

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 follow natural contours and slopes where possible 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 potential pollution, roads shall be located away from watercourses and utilize buffers where possible to protect waterbodies.

Alignment. The gradient 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 stream crossings, the road should be aligned so that it crosses perpendicular to the channel as much as possible. The preferred placement of crossings is at the point of meander crossover or stable straight sections of the channel.

Width. The minimum width of the roadbed is 14 feet for one-way traffic and 20 feet 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 shall be increased approximately 4 feet for trailer traffic. The shoulder width may be either gravel or grass. Turnouts shall be used on single lane roads where vehicles travel in both directions on a limited basis. Where turnouts are used, road width shall be increased to a minimum of 20 feet for a distance of at least 30 feet.

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. 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 shall 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, roadside ditches, water bars (also called water breaks), 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 or bridge is installed in a drainage way, its minimum capacity shall convey the design storm runoff without causing erosion or road overtopping. Table 1 lists minimum design storm frequencies for various road types. 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.

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. Ditch channels shall be designed to be on stable grades or protected with structures or linings for stability.

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

Table 1. Minimum Design Storm Frequencies According to Road Type.

Road Type	Storm Frequency
Forest Access Roads, Farm Field Access Roads	2 year - 24 hour
Farm Driveways, Recreation Facility Access Roads	10 year - 24 hour
Public Access Roads, Camp grounds, etc.	25 year - 24 hour

Water bars (or water breaks) may be used to control surface runoff on low-intensity use forest, ranch or similar roads. A grade dip is a "stretched-out" water bar with total length ranging from 30 to 50 feet. Water bars should be considered on steep grades where runoff and erosion is anticipated down the road. Consider grade dips in areas with more traffic.

Water bars must be constructed of materials that are compatible with the use and maintenance of the road surface. To allow for drainage from the road surface to a roadside ditch or sheet flow area, water bars of 10 inch to 30 inch height shall be oriented at a 10 to 25 degree angle to the road, and graded for a 1 to 3% cross-drainage slope. The total length of road disturbance may range from 6 to 12 feet. The uphill end of the water bar shall be connected to the upper bank of the road to prevent water by-pass. Water bar discharge areas must be well vegetated or use other erosion resistant materials for energy dissipation. See Figure 1 Recommended Spacing of Relief Culverts and Water Bars Based on Soil Type.

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 (including dust) 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 either (1) a geotextile material, or (2) a rock aggregate subbase, both of which must be specifically designed for road stabilization applications when the road is used on a regular basis.

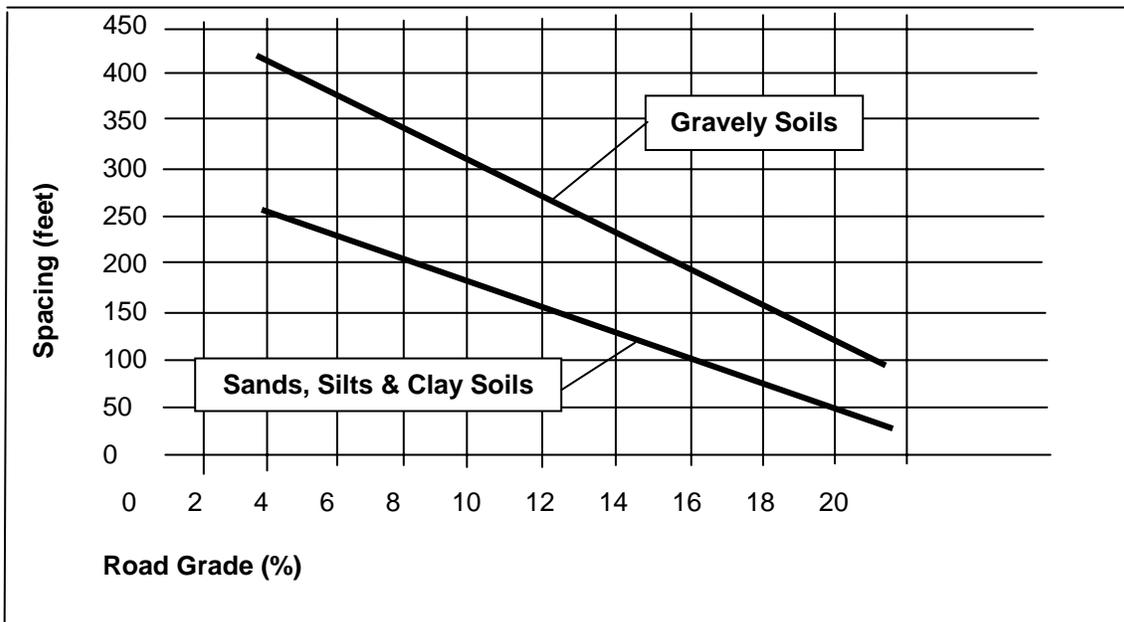
Unsurfaced roads may require controlled access to prevent damage or hazardous conditions during adverse climatic conditions.

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.

Construction Operations. Construction operations should be carried out in such a manner that soil erosion and also air and water pollution are minimized and held within legal limits. Construction shall include the following requirements as necessary for the job:

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 performed as specified.
4. Road surfacing shall be performed as specified.
5. Topsoil placement on the road shoulders and ditches shall be done as required.
6. Measures must be in place to limit the generation of particulate matter during construction.

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



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.

Provide a turnaround at the end of dead end roads. In some areas, turnarounds may also be desirable for stream, lake, recreation, or other access purposes.

Provide parking space as needed 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 as required in the Oklahoma NRCS Conservation Practice Standard Critical Area Planting (342). If the use of vegetation is precluded and protection against erosion is needed, protection shall be provided by non-vegetative materials, such as gravel or other organic or inorganic material as required in the Oklahoma NRCS Conservation Practice Standard Mulching (484), or in accordance with local regulations.

Roadside channels, cross drains, and drainage structure inlets and outlets shall be designed to be stable as required in the Oklahoma NRCS Conservation Practice Standard Structure for Water Control (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, water and sediment control basins, and other conservation practices shall be used and maintained as needed.

**NRCS OK
May 2004**

CONSIDERATIONS

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

Consideration should be given to matching culvert or bridge openings to the width/depth ratio of the active stream channel dimensions.

Consideration should be given to passage of higher flood flows in the floodplain zone without excessive velocities in the base channel.

Consider a minimum cut or fill slope of 4 horizontal to 1 vertical if slopes are to be mowed.

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

Access roads should be located where minimal adverse impacts will affect wetlands, water bodies, wildlife habitat, and air quality.

Consideration should be given to the following:

- 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 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 to 4 feet.
- Limiting the number of vehicles and vehicle speed will reduce the potential for generation of particulate matter and

decrease safety and air quality concerns.

- Effects on fish passage through culverts or bridges. Refer to the FOTG Fish Passage (396) conservation practice standard for design criteria.

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

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

1. Inspect access roads once per year and after major storms to determine needed maintenance.
2. Inspect culverts, roadside ditches, water bars and outlets after each major runoff event and restore flow capacity as needed.
3. Minimize the damage to vegetative buffers adjacent to the road when it is necessary to chemically treat the road surface to maintain erosion protection.
4. Maintain vegetated areas in adequate cover and control noxious weeds to meet the intended purpose(s). Re-seed and mow as needed to maintain a good vegetative stand on berms, ditches, and the side slopes. Remove undesirable trees and shrubs from the side slopes.
5. Maintain the roadway surface in a good condition, which includes periodic grading or repair of the surface. Fill low areas in travel treads and re-grade, as needed, to maintain road cross section. Prevent surface ponding by grading to remove depressions.
6. Inspect roads with water-bars periodically to insure proper cross section for drainage is available, and outlets are stable.
7. Conservation practices that limit particulate matter emissions should be incorporated into long-term maintenance plans.
8. Limit livestock usage to periods that permit use without damage.
9. Repair vandalism, vehicular, or livestock damage to earthfill sections and drainage structures, outlets, or other appurtenances.
10. If fences are installed, they shall be maintained to provide warning and/or to prevent unauthorized human or livestock entry.

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE GENERAL SPECIFICATIONS**

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ACCESS ROAD SPECIFICATIONS

Construction operations shall be carried out in such a manner that erosion and air and water pollution are minimized and held within legal limits. State and local laws concerning pollution abatement must be followed. The completed job shall present a workmanlike finish and shall conform to the lines, grades, and elevations shown in the drawings and as staked in the field.

All operations shall be carried out in a safe and skillful manner. Safety and health regulations shall be observed and appropriate safety measures used.

Construction shall be according to the following requirements as specified for the job:

- All trees, stumps, roots, brush, weeds, and other objectionable material shall be removed from the work area, including side approaches and inlet and outlet ditches, and disposed of as directed.
- All unsuitable material shall be excavated or otherwise removed from the roadbed area prior to placing fill or placing surfacing materials.
- The roadbed shall be graded to the required elevations. Gradation shall be such that a stable base will be formed.
- All areas which require filling will be scarified prior to placement of fill. All fill shall be compacted to the specified density.
- Approved materials will be used to make the required fills. Aggregate for the subbase shall be clean and free from deleterious substances. It shall be of such quality that it will bind readily to form a stable subbase to the lines, grades, and cross section shown on the plans. Geotextile may be used for subbase stability.
- Surfacing shall be done as specified. Placement of the surface course shall be in accordance with sound highway construction practice for the surface material used.
- Roads shall be planned and laid out according to good landscape management principles.
- All disturbed areas shall be revegetated.