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, 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, 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 and local criteria.

Sound engineering practices shall be followed to ensure 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 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.

Width. The minimum width of the roadbed is 14 ft for one-way traffic and 20 ft for two-way

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

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 (2:1) on heights of less than 4 feet. Stability determinations of cut and fill side slopes with heights of 4 feet or more, shall be determined by the responsible engineer. 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 (stream crossing), or grade dips for water management shall be provided at all natural drainageways. 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.

Table 1

Road Type	Storm Frequency
Forest Access Roads, Farm Field Access	2 year - 24 Hour
Farm Driveways, Recreation Facility Access Roads	10 year - 24 Hour
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.

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.

Water-breaks or water-bars 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 down the road, water bars should be considered. Table 2 provides recommended water-bar spacing. Water bars should be installed at a 30-degree angle down slope. 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.

Table 2 – Recommended Water-Bar

Road Grade (%)	Spacing (Ft.) [1/]
2 - 4	200
4 - 6	135
6 - 9	100
9 - 12	80
12 - 18	60

[1/] Recommended spacing based on average soil conditions and precipitation amounts.

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.

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.

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:

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.

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.

Erosion control. Roadbanks and disturbed areas shall be vegetated as soon as possible, with consideration of soil and climatic conditions. Skid trails, landings, logging, and similar roads shall be vegetated after harvesting or seasonal use is completed. Vegetated treatment shall be in accordance with NRCS conservation practice standard Critical Area Planting, Code 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 in conformance with NRCS conservation practice standard Mulching, Code 384 or in accordance with local regulations.

Roadside channels, cross drains, and drainage structure inlets and outlets shall be designed to be stable and in conformance with NRCS conservation practice standard 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, water and sediment control basins, and other conservation practices shall be used and maintained as needed.

CONSIDERATIONS

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. Consider using turnouts on single lane roads at least every 300 feet.

Provide parking space as needed to keep vehicles off the road or from being parked in undesirable locations.

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.

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 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.

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 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.
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. 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

Alabama NRCS Conservation Practice Standards:

Critical Area planting, Code 342
Mulching, Code 484
Structure for Water Control, Code 587

CONSTRUCTION SPECIFICATION

NATURAL RESOURCES CONSERVATION SERVICE

ACCESS ROAD

1. Scope

This item shall include all plans, specifications, and construction operations required for the installation of access roads. Construction operations shall be carried out in such a manner that erosion, air, water, and noise pollution will be minimized within legal limits as established by state regulations.

2. Clearing and Grubbing

All trees, stumps, roots, brush, weeds, and other objectionable material shall be removed from the area that will be required for the roadway including shoulders and ditches, and from similar areas required for side road approaches and inlet and outlet ditches. All such materials will be disposed of by burning, burying at approved locations or otherwise removed from the site and stacked. All burning shall conform to Alabama laws and regulations.

3. Excavation

All unsuitable materials shall be excavated from the roadbed areas and the space refilled with approved material before making fill upon it or before placing surfacing thereon.

4. Drainage Structures

Materials - pipe, steel, aggregates, cement, timbers, or other - shall be inspected by the technician before installation. Written certifications of conformance to specifications will be required if physical inspection is not conclusive.

Structures shall be on a firm foundation to the neat lines and grades shown on the plans. Selected backfill shall be placed around rigid structures in four (4) inch layers and thoroughly compacted.

Joints of pipe will be sealed in accordance with the manufacturers' specifications. Pipes will not be laid directly on rock; there must be a soil cushion of at least 6 inches between the pipe and rock.

Concrete must be of good quality and appearance. Batching, placing, and curing will conform to procedures recommended by the Portland Cement Association. Mixes shall be in accordance to those specified.

Diversions and side ditches shall conform to the line, grade, and section as specified on the plans.

The outlet end of culverts shall terminate on natural ground unless protective outlet structures are installed.

5. Construction

In the construction of roadbeds and embankments, fill material will be deposited in thin layers (maximum of 9 inches) and compacted with the controlled movement of the earth moving equipment.