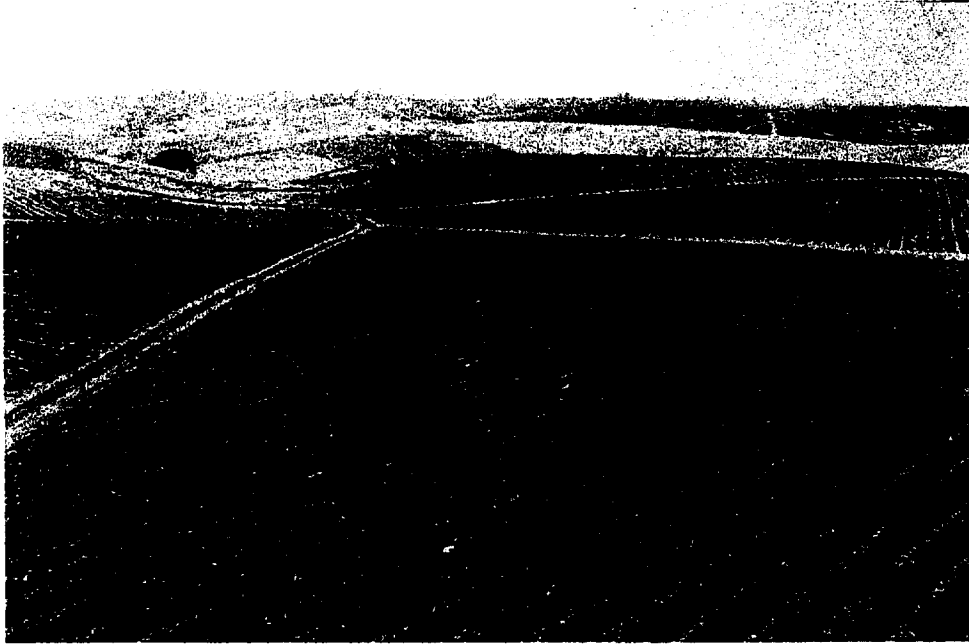


FARM WATER QUALITY PLANNING MANAGEMENT PRACTICE

**Access Road
#560**

*University of California Cooperative Extension
Natural Resources Conservation Service*



Access roads are travelways constructed as part of a conservation plan. The purpose is to provide a fixed route for travel for moving produce, equipment, and supplies and to provide access for proper operation maintenance and management of conservation enterprises. The location and design of the road will prevent concentrated runoff, thereby preventing erosion. The use of vegetative materials, gravel, or mulches on the roadway may reduce erosion from the road surface.

Advantages

- Reduced erosion from fields when used to break up long field runs

Disadvantages

- May require changes in irrigation and/or field operation

Practice Costs

Installation Cost Range:
\$25/ft

Practice Effectiveness for Reducing Water Quality NPS Pollution Potential

Erosion-sheet & rill	Erosion-streambank	Pesticides-leaching	Pesticides-dissolved in runoff	Pesticides-adsorbed to sediment	Nutrients-leaching	Nutrients-surface waters
negligible	slight to moderate					slight

Empty boxes indicate information not yet collected for this practice

Additional sources of information regarding access roads:

- Your local NRCS, UCCE, and RCD offices
- UC Sustainable Agriculture Research and Extension Program <http://www.sarep.ucdavis.edu/>
- The picture and some of the information in this management sheet has been taken from the Natural Resource Conservation Service (NRCS) Handbook of Conservation Practices practice #560. Contact your local NRCS office or visit <http://www.nrcs.usda.gov> for more information.

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE SPECIFICATION

560 - ACCESS ROAD

I. SCOPE

The work shall consist of constructing a road to the lines and grades shown on the drawings.

II. CLEARING

Trees, stumps, roots, brush, weeds, and other objectionable material shall be removed from the work area. The limits of clearing will be marked by means of stakes, flags, or tree markings in the field. All combustible material residue from clearing shall be burned, buried, or piled in designated disposal areas. Burning shall be performed according to local regulations.

III. CUTS AND FILLS

All excavation shall be made to the cut slopes and grades. Suitable materials from excavation are to be used in earthfills. The earthfill shall be placed in layers not to exceed 8 inches and compacted to same density as the undisturbed materials. Should the fill material be either too wet or too dry, the moisture shall be adjusted by allowing the material to dry or by adding water so that the fill material has the proper moisture content as determined by the Engineer.

Prior to placing any earthfill, all unsuitable material shall be removed and the surface compacted.

IV. SURFACING

After completion of cuts and fills, the road surface shall be graded smooth, culverts and/or water crossings installed and then surfaced.

Surfacing, when specified, shall be accomplished by placing 3 inches of gravel over the road surface.

V. STRUCTURES FOR WATER CONTROL

Culverts of sizes and lengths specified shall be placed at the locations and grades as shown on the drawings. The installation shall conform to the requirements of Construction Specification, Structure for Water Control (CMP Conduit).

When rock riprap or grouted rock is specified, these measures will be installed to conform to the requirements of the Construction Specification for these practices.

VI. VEGETATIVE COVER

Unless otherwise specified, a protective cover of vegetation shall be established on the disturbed area. The planting of vegetative materials shall conform to the requirements of Practice Specification 342, Critical Area Planting.

VII. SPECIAL MEASURES

Measures and construction methods shall be incorporated as needed and practical that enhance fish and wildlife values. Special attention shall be given to protecting visual resources and maintaining key shade, food and den trees.

VIII. CONSTRUCTION OPERATIONS

Construction operations shall be done in such a manner that erosion and air and water pollution are minimized and held within legal limits. The owner, operator, Contractor or other persons will conduct all work and operations in accordance with proper safety codes for the type of construction being performed with due regards to the safety of all persons and property.

The completed job shall be workmanlike and present a good appearance.

OPERATION AND MAINTENANCE ITEMS

A properly operated and maintained access road is an asset to your farm. This access road was designed and installed as a travelway on your farm. The estimated life span of this system is at least 10 years. The life of this system can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require you to perform periodic operation and maintenance to maintain satisfactory performance. Here are some recommendations to help

you develop a good operation and maintenance program.

Maintain the roadway surface in a good condition, which includes periodic grading.

Prevent surface ponding by grading to remove depressions.

Limit livestock use to periods that permit usage without damage.

If fences are installed, they shall be maintained to provide warning and/or prevent unauthorized human or livestock entry.

Removal of debris or blockage of stream crossings culverts or bridges.

Eradicate or otherwise remove all rodents or burrowing animals. Immediately repair any damage caused by their activity.

Immediately repair any vandalism, vehicular, or livestock damage to any earthfills, spillways, or outlets or other apparatuses.

Other items specific to your project are listed on the "Practice Requirement" sheet.

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

ACCESS ROAD

(Feet)

CODE 560

DEFINITION

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

PURPOSES

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, 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.

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

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

insure that the road meets the requirements of its intended use and that maintenance requirements are in line with operating budgets.

Clearing of land and disposal shall be carried out in accordance with state laws and county ordinances.

The cross-section shall be adequate to carry collected water to protected drop inlets or on protected waterways to appropriate release points. Roads may be out-sloped only where adequate provisions are made to collect the runoff water and to discharge the flow into stable watercourses.

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 water bodies.

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 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 a minimum of 2 feet of shoulder width on each side of the tread width.

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. The minimum width of a single lane field road is 10 feet.

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.

Types of Field Roads

1. Ingress-egress roads (commonly called connecting roads) are used as the main travel routes into and out of the field and may be constructed on grades as steep as loaded vehicles can travel safely, usually no steeper than 10 percent. These roads should be surfaced with either gravel or asphalt.
2. Diversion roads are placed around the hillside either on a contour or on a grade less than 2 percent. They have a cross-section sloped inward to collect and convey runoff water to a designed outlet. These roads are used mainly during harvest and are usually surfaced with a vegetative cover.
3. Bench roads are constructed either on a contour or a grade less than 2 percent and have a cross-section sloped outward. However, on hillsides where bench roads are constructed, a diversion road is to be constructed to collect the runoff at intervals of 15 feet of vertical distance.
4. Ridge roads (sometimes called fire breaks) are constructed along ridges mainly to control the spread of fire. These roads are always maintained in a "bare" condition.
5. Logging roads are constructed in forested areas to provide management control of forest and removal of logs during timber harvesting.
6. Pasture or rangeland roads are constructed in rangeland to provide for pasture management.

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, 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 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

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. When roads are at cross slope with the land, waterbars and drop inlets shall be installed across the roadway at intervals. Where water is to be conveyed along the road for more than 150 feet, a protected ditch 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 chart for Recommended Spacing of Relief Culverts and Water Bars Based on Soil Type.

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. 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.

To convey water down a hillside, the installation of Grassed Waterway (412) or Underground Outlet (620) will be necessary. In order to reduce sediment pollution, it may be necessary to construct Sediment Basins (350). These measures are to be designed according to the applicable practice standard.

Surfacing - Access roads shall be given a wearing course or surface treatment if required by traffic needs, soil, climate, erosion control, or 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 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.

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.

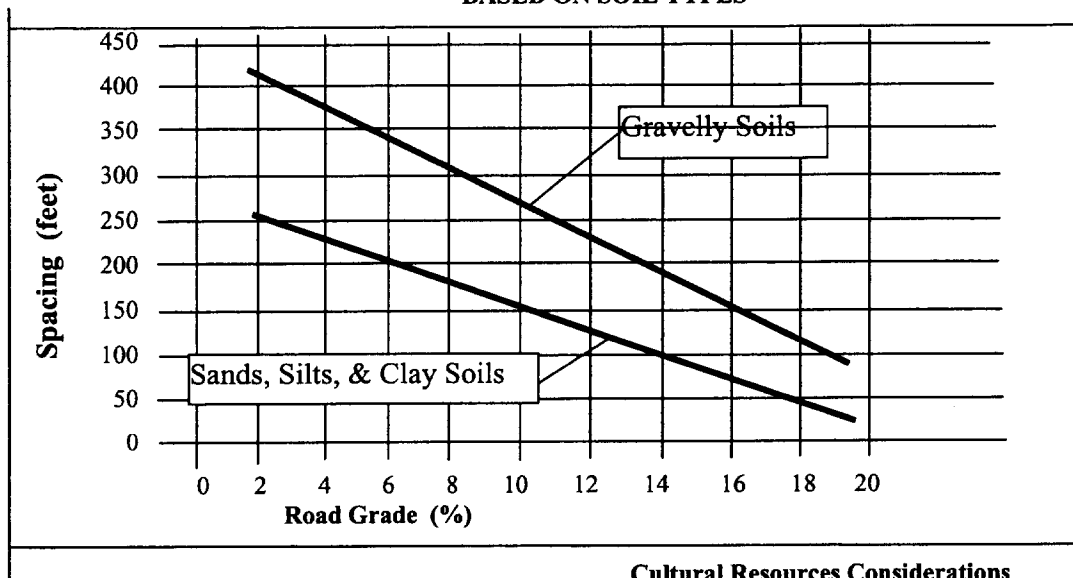
Traffic safety - Passing lanes, turnouts, guardrails, signs, and other facilities as needed for safe traffic flow shall be provided. Traffic safety shall be a prime factor in selecting the angle and grade of the intersection with public highways. Preferably, the angles shall be not less than 85 degrees. 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.

The turning radius of roads shall consider the minimum radius of the farm equipment or trucks that are expected to use the road.

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). 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 (see Mulching), 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). If protection is needed, riprap or other similar materials shall be used.

**RECOMMENDED SPACING FOR RELIEF CULVERTS AND WATER BARS
BASED ON SOIL TYPES**



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

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

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

Air Quality Considerations

To reduce impaired air quality from dust from access roads, consideration should be given to the following:

- Effects from untreated, unpaved roads during harvest or heavy use periods;
- Effects from excessive speed and uncontrolled access on unpaved access roads;
- Effects from lack of dust control during construction of roads.

Cultural Resources Considerations

NRCS's objective is to avoid any effect to cultural resources and protect them in their original location. Determine if installation of this practice will have any effect on any cultural resources. Document any specific considerations for cultural resources in the design docket and the Practice Requirements worksheet.

GM 420, Part 401, the California Environmental Handbook and the California Environmental Assessment Worksheet provide guidance on how the NRCS must account for cultural resources. The Field Office Technical Guide, Section II contains general information, with Web sites for additional information.

Endangered Species Considerations

Determine if installation of this practice with any others proposed will have any effect on any federal or state listed Rare, Threatened, or Endangered species or their habitat. NRCS's objective is to benefit these species and others of concern or at least not have any adverse effect on a listed species. If the Environmental Evaluation indicates the action may adversely affect a listed species or result in adverse modification of habitat of listed species which has been determined to be critical habitat, NRCS will advise the land user of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the landowner selects one of the alternative conservation treatments for installation; or at the

request of the landowners, NRCS may initiate consultation with the Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game. If the Environmental Evaluation indicates the action will not affect a listed species or result in adverse modification of critical habitat, consultation generally will not apply and usually would not be initiated. Document any special considerations for endangered species in the Practice Requirements worksheet.

Water Quantity

- 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.
- Effects on snowcatch and melt on water budget components.

Water Quality

The type of construction, maintenance, and the road's location determine the road's effect on water quality. When the access road is located across the slope, the runoff from the area upslope of the road may be retarded in the roadside ditches. This may cause sediment to be deposited in the ditch and along the roadside, reducing sediment delivery to the receiving waters. Runoff from the area downslope of the road may not be affected except where the road culverts or low water crossings may concentrate the discharge of the runoff from an uphill area. This may result in a higher carrying capacity of the outlet channel resulting in increased bank and channel erosion and direct transport of this detached sediment, deicing salts and related pollutants. There may be a concentration of pollutants in the roadside ditches, increased infiltration, and an increase in soluble chemicals being percolated into the soil water and into the ground water. Watch for:

- 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 the visual quality of water resources.

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. Maintain vegetated areas in adequate cover. Re-seed and mow as needed.
3. Fill low areas in travel treads and re-grade, as needed, to maintain road cross section.
4. Inspect roads with water-bars periodically to insure proper cross section is available and outlets are stable.