NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

VERTICAL DRAIN
(No.)
CODE 630

DEFINITION

A well, pipe, pit, or bore in porous, underground strata into which drainage water can be discharged.

PURPOSE

Provide an outlet for drainage water from a surface or subsurface drainage system.

CONDITIONS WHERE PRACTICE APPLIES

This practice is applicable in locations where the underlying strata can receive, transmit or store the design drainage flow and other drainage outlets are not available and cannot be provided at a reasonable cost. This practice is also applicable where natural "sinkholes" are the vertical drain, and where erosion control or treatment of surface runoff is a concern.

This practice is applicable only in locations where a determination has been made that it is not contrary to state laws or regulations, and that it will not cause pollution of underground waters.

CRITERIA

The number, size and location of vertical drains shall be adequate to discharge the design drainage flow into the underlying stratum or strata, and shall be based on a field determination of the depth, permeability, porosity, thickness and extent of the strata.

The minimum diameter of shallow uncased wells shall be 6 in. and of deep cased wells, 4 in.

A suitable filter system, desilting basin or other means necessary for removing sediment from the water shall be provided before it enters the well.

Well casings shall be of adequate strength and longevity to serve planned needs.

CONSIDERATIONS

Significant diversions into underground storage areas may have an effect on the peak discharge rate from a watershed. Planners should consider this, and take steps to mitigate any potential negative effects this may have on riparian habitat downstream from the structure.

Significant additions to subsurface water sources may raise local water tables or cause undesirable surface discharges down gradient from the vertical drain.

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

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

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.

Some species are year-round residents in some streams, such as, freshwater shrimp. Other species, such as steelhead and salmon, utilize streams during various seasons. Be aware that during critical periods, such as spawning, eggs in gravel's and rearing of young may preclude activities in the stream that may directly affect the stream habitat during those periods. For example there should be no disturbance of stream gravel beds that may have eggs in them. That could include any equipment in the stream or even walking in the stream or work upstream that may result in sediment depositing in the gravel beds. Document any special considerations for endangered species in the Practice Requirements Worksheet.

Water Quantity

1. Effect on the aquifer recharge.
2. Effect on the water table.
3. Effect on the volume of downstream flow to downstream users and uses.

Water Quality

1. Potential hazard to ground water quality from the discharge of drainage water containing dissolved substances.
2. Potential for land use changes that may impair aquifer quality.

PLANS AND SPECIFICATIONS

Plans and specifications for installing vertical drains shall be in keeping with this standard, and shall describe the requirements for properly installing the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

An operation and maintenance plan must be prepared by the Designer for use by the owner or other responsible for operating this practice. The plan should provide specific instructions for operating and maintaining the system to insure that it functions properly. It should also provide for periodic inspections and prompt repair or replacement of damage components. The plan shall be site specific and include but not be limited to the following:

- Periodic inspection of the inlets to vertical drains to ensure that they are not plugged or damaged.
- Vegetative filters, sediment basins and other filters shall be maintained as per Operation and Maintenance requirements for each of the respective practice standards.