

**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.

stratum or strata, and shall be based on a field determination of the depth, permeability, porosity, thickness, and extent of the strata.

PURPOSES

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

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

CONDITIONS WHERE PRACTICES APPLY

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.

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

This practice is also applicable where natural "sinkholes" are the vertical drain and erosion control or treatment of surface runoff is a concern.

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

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

Utilities and Permits. The landowner shall be responsible for locating all buried utilities in the project area, including drainage tile and other structural measures.

This practice is not applicable where development of the vertical drain will cause existing wetlands to be drained.

The landowner shall obtain all necessary permissions from regulatory agencies, including the Illinois Department of Agriculture, US Army Corps of Engineers, US Environmental Protection Agency, Illinois Environmental Protection Agency and Illinois Department of Natural Resources – Office of Water Resources, or document that no permits are required.

This practice does not apply where discharge from any animal confinement operation, private or municipal dump or landfill, or any other concentrated pollutant source may reach the drain.

Criteria Applicable to Sinkhole Treatment.

Sinkholes shall be backfilled with a graded filter and to grade with site soils. Filter gradations shall be based on the crevice/sinkhole opening and shall meet the requirements of Illinois NRCS Standard Drawings IL-ENG-209 or 210. For crevice/sinkhole openings greater than 12 inches, filter design shall be as per NEH, Part 633, Chapter 26 Gradation Design of Sand and Gravel Filters.

CRITERIA

The number, size and location of vertical drains shall be adequate to discharge the design drainage flow into the underlying

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Inlets installed in sinkholes shall be located directly over a visible crevice or sinkhole entrance. Rock or concrete may be used to bridge any gap at the entrance and to support the drain at the base. Openings in the inlet shall extend to the surface.

Surface inlets shall be designed to store the runoff from a 24-hour, 10-year storm for a maximum of 24 hours, where cropland is in the ponded area; or 48 hours, where no cropland exists in the ponded area. Inlets shall include a trash-rack.

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.

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 (O&M) plan shall be prepared for and reviewed with the landowner or operator. The plan shall specify that the treated areas and associated practices are inspected annually and after significant storm events to identify repair and maintenance needs.

The O&M plan shall detail the level of repairs needed to maintain the effectiveness and useful life of the practice.

The inlets to vertical drains shall be inspected periodically to insure that they are not plugged or damaged. Vegetative filters, sediment basins and other filters shall be maintained as per O&M requirements for each of the respective practice standards.

REFERENCES

National Engineering Handbook, Part 633, Chapter 26, Gradation Design of Sand and Gravel Filters.