

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
CONNECTICUT**

ROOF RUNOFF STRUCTURE

(No.)

CODE 558

DEFINITION

Structures that collect, control, and transport precipitation from roofs.

PURPOSE

To improve water quality, reduce soil erosion, increase infiltration, protect structures, and/or increase water quantity.

CONDITIONS WHERE PRACTICE APPLIES

Where roof runoff from precipitation needs to be:

- diverted away from structures or contaminated areas;
- collected, controlled, and transported to a stable outlet; or
- collected and used for other non-potable purposes such as irrigation.

CRITERIA

General Criteria Applicable to All Purposes

Laws and Regulations. All Federal, state, and local laws, rules, and regulations, including local inland wetland agency regulations, governing the construction and use of this practice as well as setbacks from wells, surface water and property boundaries shall be followed. Planned work shall comply with all federal, state, and local laws and permit conditions and requirements. **The landowner shall obtain all necessary permits prior to construction or any land clearing activities.**

The minimum design capacity for roof runoff structures shall be a 10-year storm frequency, 5-minute rainfall precipitation event, except where excluding roof runoff from manure management facilities. In that case, a 25-year frequency, 5-minute precipitation event shall be used to

design roof runoff structures (Refer to Agricultural Waste Management Field Handbook, NEH Part 651 Chapter 10 Appendix 10B). When gutters are used, the capacity of the downspout(s) must equal or exceed the gutter flow rate.

Runoff may empty into surface or Underground Outlets (620), or onto the ground surface. Outlets shall not discharge within a minimum of 50 feet of wells, wetlands or watercourses. Surface and underground outlets shall be sized to ensure adequate design capacity and shall provide for clean-out as appropriate. When runoff from roofs empties onto the ground surface, a stable outlet shall be provided. When runoff is conveyed through a gutter and downspout system, an elbow and energy dissipation device shall be placed at the end of the downspout to provide a stable outlet and direct water away from the building.

Surface or ground outlets such as rock pads, rock filled trenches with subsurface drains, concrete and other erosion-resistant pads, or preformed channels may be used, particularly where snow and ice are a significant load component on roofs.

In regions where snow and ice will accumulate on roofs, guards and sufficient supports to withstand the anticipated design load shall be included.

Roof runoff structures shall be made of durable materials with a minimum design life of ten years. Roof gutters and downspouts may be made of aluminum, galvanized steel, wood, or plastic. Aluminum gutters and downspouts shall have a minimum nominal thickness of 0.027 inches and 0.020 inches, respectively. Galvanized steel gutters and downspouts shall

be a minimum 28 gauge. Wood shall be clear and free of knots. Wood may be redwood, cedar, cypress, or other species that has the desired longevity. Plastics shall contain ultraviolet stabilizers. Dissimilar metals shall not be in contact with each other.

Rock-filled trenches and pads shall consist of poorly graded rock (all rock fragments approximately the same size) and be free of appreciable amounts of sand and/or soil particles. Crushed limestone shall not be used for backfill material unless it has been washed. Subsurface drains or outlets shall meet the material requirements of the applicable NRCS conservation practice standard.

Concrete appurtenances used shall meet the requirements of NRCS NEH Part 642, Chapter 2, Construction Specification 32 Structure Concrete.

Roof runoff structures shall be protected from damage by livestock and equipment.

Additional Criteria to Increase Infiltration

Runoff shall be routed onto pervious landscaped areas (e.g., lawns, mass planting areas, infiltration trenches, and natural areas) to increase infiltration of runoff. These areas shall be capable of infiltrating the runoff in such a way that replenishes soil moisture without adversely affecting the desired plant species.

Additional Criteria to Protect Structures

Runoff shall be directed away from structure foundations to avoid wetness and hydraulic loading on the foundation.

On expansive soils or bedrock, downspout extensions shall be used to discharge runoff a minimum of five (5) feet from the structure.

The discharge area for runoff must slope away from the protected structure.

Additional Criteria to Increase Water Quantity

Storage structures for non-potable purposes such as irrigation water shall be designed in accordance with NRCS conservation practice standards, as appropriate.

CONSIDERATIONS

Some designs may provide secondary benefits, e.g. rock pads may also reduce rodent problems around livestock and poultry barns.

PLANS AND SPECIFICATIONS

The plans and specifications shall show the location, spacing, size, and grade of all gutters and downspouts and type and quality of material to be used. Plans and specifications for other practices essential to the proper functioning of the roof runoff structure, such as underground outlet, shall be included. To the extent practical, specifications shall conform to NRCS National Engineering Handbook, Part 642.

AS-BUILT DRAWINGS

As-built drawings shall be prepared showing all pertinent elements and elevations as actually installed. As-built data and drawings will be provided to the owner/operator, regulatory state agency and participating partners upon construction completion.

OPERATION AND MAINTENANCE

An Operation and Maintenance (O&M) Plan shall be prepared for, reviewed with, and signed by the landowner or operator responsible for the application of this practice. The O&M Plan shall provide specific instructions for proper operation and maintenance of each component of this practice and shall detail the level of repairs needed to maintain the effectiveness and useful life of the practice.

The plan shall contain, but not be limited to, the following provisions:

- Keep roof runoff structures clean and free of obstructions that reduce flow.
- Make regular inspections and perform repair maintenance as needed to ensure proper functioning of the roof runoff structures.

REFERENCES

USDA-NRCS. 1999. National Engineering Handbook, Part 651, Agricultural Waste Management Field Handbook.