

NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD

ROOF RUNOFF STRUCTURE

(No.)  
Code 558



**DEFINITION**

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

**PURPOSES**

To support one or more of the following purposes:

- Improve water quality
- Reduce soil erosion
- Increase infiltration
- Protect structures
- Increase water quantity

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies where:

- Roof runoff structures are a component of an overall resource management system.
- Roof runoff needs to be diverted away from structures or contaminated areas.
- There is a need to collect, control, and transport runoff from roofs to a stable outlet.

- Roof runoff is collected and used for other purposes.

**CRITERIA**

**General Criteria Applicable To All Purposes**

**Laws and regulations.** Plan work to comply with all Federal, state, and local laws, rules, and regulations.

Impact to cultural resources, wetlands and Federal and state protected species shall be evaluated and avoided or minimized to the extent practicable during planning, design and implementation of this conservation practice in accordance with established National and Florida policy, General Manual (GM) Title 420-Part 401; Title 450-Part 401, Title 190-Parts 410.22 and 410.26, National Planning Procedures Handbook (NPPH) Florida Supplements to Parts 600.1 and 600.6, National Cultural Resources Procedures Handbook (NCRPH), National Food Security Act Manual (NFSAM), and the National Environmental Compliance Handbook (NECH).

**Design Capacity.** Design roof runoff structures to handle at minimum, a 10-year frequency, 5-minute rainfall precipitation event, except where excluding roof runoff from manure management systems. In that case, design roof runoff structures to handle a 25-year frequency, 5-minute precipitation event. Refer to Agricultural Waste Management Field Handbook (AWMFH), NEH Part 651, Appendix 10B for rainfall intensity maps.

When gutters are used, design the capacity of the downspout(s) to equal or exceed the gutter flow rate.

The AWMFH, Chapter 10, provides procedures for sizing gutters and downspouts.

**Outlets.** Empty the runoff into surface or underground outlets, or onto the ground surface.

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

Size surface and underground outlets to ensure adequate design capacity and provide clean-out for the outlets as appropriate. When roof runoff empties onto the ground surface, provide a stable outlet. When runoff is conveyed through a gutter and downspout system, place an elbow and energy dissipation device at the end of the downspout to provide a stable outlet and direct water away from the building.

Use surface or ground outlets such as rock pads, rock filled trenches with subsurface drains, concrete and other erosion-resistant pads, or preformed channels.

**Supports.** Provide adequate supports for gutters and downspouts to ensure the structure will withstand the anticipated design load.

**Materials.** Use roof runoff structures 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. Design aluminum gutters and downspouts with a nominal thickness of 0.027 inches and 0.020 inches, respectively. If galvanized steel gutters and downspouts are used, select at least 28 gauge material. Use wood that is clear and free of knots. Wood may be redwood, cedar, or cypress or other wise pressure treated. If plastics are used, select material containing ultraviolet stabilizers. Ensure dissimilar metals from being in contact with each other.

If rocks are used to fill trenches and pads, select poorly graded rock (all rock fragments approximately the same size) and free of appreciable amounts of sand and/or soil particles. Do not use crushed limestone for backfill material unless it has been washed. Select subsurface drains or outlets to be used to meet the material requirements of the applicable Florida NRCS conservation practice standard Subsurface Drain, Code 606 and/or Underground Outlet, Code 620.

Select concrete appurtenances to be used to meet the requirements of NRCS Construction Specification 32, Structure Concrete.

**Protection.** Protect roof runoff structures from damage by livestock and equipment.

#### **Additional Criteria to Increase Infiltration**

Route runoff onto pervious landscaped areas (e.g. lawns, mass planting areas, infiltration trenches

and natural areas) to increase infiltration of runoff. Select these areas to infiltrate the runoff in such a way that replenishes soil moisture without adversely affecting the desired plant species.

#### **Additional Criteria to Protect Structures**

Direct roof runoff away from structure foundations to avoid wetness and hydraulic loading on the foundation.

On expansive soils or bedrock, discharge runoff a minimum of five (5) feet from the structure by using downspout extensions.

Slope the discharge area for runoff away from the protected structure.

#### **Additional Criteria to Increase Water Quantity**

Design and install structures needed to collect and store water from roofs for potable and non-potable purposes in accordance with sound engineering principles. Design storage structures for non-potable purposes such as irrigation water in accordance with Florida NRCS conservation practice standards, as appropriate.

Construct potable water storage structures of materials and in a manner that will not increase the contamination of the stored water. Treat roof runoff collected and stored for potable uses prior to consumption and test periodically to assure that adequate quality is maintained for human consumption.

### **CONSIDERATIONS**

Avoid discharging outlets near wells or into structures that discharge directly into surface waters.

### **PLANS AND SPECIFICATIONS**

Describe the requirements for applying the practice to achieve its intended purpose in the plans and specifications. Show the location, spacing, size, length, and grade of all gutters, downspouts, and outlets and type and quality of material to be used in the plans and specifications. Include plans and specifications for other practices essential to the proper functioning of the roof runoff structure, such as underground outlet.

### **OPERATION AND MAINTENANCE**

Develop an operation and maintenance plan that is consistent with the purposes of the practice, intended life, safety requirements, and the criteria for the design. Include, but not be limited to, the following provisions in the plan:

- 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.
- Inspect roof runoff structures after each storm event.

### **REFERENCES**

AWMFH, NEH Part 651, Chapter 10  
AWMFH, NEH Part 651, Appendix 10B  
Florida NRCS Conservation Practice Standards  
    Subsurface Drain, Code 606  
    Underground Outlet, Code 620  
General Manual  
    Title 420-Part 401  
    Title 450-Part 401  
    Title 190-Parts 410.22 and 410.26  
National Cultural Resources Procedures Handbook  
National Environmental Compliance Handbook  
National Food Security Act Manual  
National Planning Procedures Handbook  
    Florida Supplements to Parts 600.1 and 600.6  
NRCS Construction Specification 32, Structure Concrete