NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

Roof Runoff Management
(No.)
No. 558

Definition

A facility for collecting, controlling, and disposing of runoff water from roofs. Such facilities include but are not limited to erosion-resistant channels or subsurface drains with rock-filled trenches along building foundations below eaves, roof gutters, downspouts, and appurtenances.

Purpose

To prevent roof runoff water from flowing across concentrated waste areas, barnyards, roads and alleys, and to reduce pollution and erosion, improve water quality, prevent flooding, improve drainage, and protect the environment.

Conditions Where Practice Applies

This practice applies where: (1) a roof runoff management facility is included in an overall plan for a waste management system; (2) roof runoff water may come in contact with wastes or cause soil erosion; and (3) barnyard flood protection or improved drainage is needed.

Federal, State, and Local Laws[1]

Design and construction activities shall comply with all federal, state, and local laws, rules, and regulations governing pollution abatement, health, and safety. The owner or operator shall be responsible for securing all required permits or approvals and for performing in accordance with such laws and regulations. NRCS employees are not to assume responsibility for procuring these permits, rights, or approvals, or for enforcing laws and regulations. NRCS may provide the landowner or operator with technical information needed to obtain the required rights or approvals to construct, operate, and maintain the practice.

Permits may be required from the following agencies:

1. ***West Virginia Department of Health***
2. ***West Virginia Department of Agriculture***

Planning Considerations

Water Quantity

1. Effects on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, deep percolation, and ground water recharge.
2. Effects on downstream flows or aquifers that would affect other water uses and users.
3. Potential water management to conserve water for livestock drinking and wash-down water.

Water Quality

1. Effects on erosion and the movement of sediment, pathogens, and soluble and sediment-attached substances carried by runoff.
2. The effects on wetlands and water-related wildlife habitats.

Design Criteria

Capacity. Design of roof runoff management facilities shall be based on the runoff from a 10-

year frequency, 5-minute rainfall except that a 25-year frequency, 5-minute rainfall shall be used to design such facilities for exclusion of roof runoff from waste treatment lagoons, waste storage ponds, or similar practices. ***Peak rainfall amounts of 0.55 in. and 0.65 in., respectively, shall be used for the 10- and 25-year values.***

Gutters and downspouts will be designed according to procedures contained in NENTC Agricultural Engineering Technical Note No. 1 or AWMFH Section 651.1001(a). Rock-filled trenches, erosion resistant channels and pipe outlets will be designed according to criteria contained in WV Standards for Grassed or Lined Waterway or Outlet, Subsurface Drain, Structure for Water Control, Underground Outlets or other practices, as appropriate.

Materials. Roof gutters and downspouts may be made of aluminum, galvanized steel, wood, or plastic. Aluminum gutters and downspouts shall have a nominal thickness of at least 0.027 and 0.019 in. respectively. Galvanized steel gutters and downspouts shall be at least 28 gage. Wood shall be clear and free of knots. A water-repellent preservative shall be applied to the flow area of wood other than redwood, cedar, or cypress. Plastics shall contain ultraviolet stabilizers. Dissimilar metals shall not be in contact with each other. ***Outlet pipes, gravel, riprap, and other materials shall be as specified in appropriate WV Engineering Standards.***

Supports. Gutter supports shall have sufficient strength to withstand anticipated water, snow, and ice loads. They shall have a maximum spacing of 48 in. for galvanized steel and 32 in. for aluminum or plastic. Wood gutters shall be mounted on fascia boards using furring blocks that are a maximum of 24 in. apart. Downspouts shall be securely fastened at the top and bottom with intermediate supports that are a maximum of 10 ft. apart.

Outlets. The water from roof runoff management facilities may empty into surface drains or underground outlets, or onto the ground surface. When downspouts empty onto the ground surface, there shall be an elbow to direct water away from the building and splash blocks or other protection shall be provided to prevent erosion. ***Underground outlet pipes will have small animal guards installed.***

Protection. Roof runoff management facilities and outlets shall be protected from damage by livestock and equipment. Where appropriate, snow and ice guards may be installed on roofs to protect gutters and reduce the hazard to humans and animals below. Gutters may be installed below the projection of the roof line to further reduce gutter damage from snow and ice. ***Fences installed to protect outlet structures will conform to WV Standard 472, Livestock Exclusion or 382 Fencing. All disturbed areas will be vegetated according to requirements in WV Standard 342, Critical Area Planting.***

Plans and Specifications

Plans and specifications for installing roof runoff management facilities shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

Operation and Maintenance

Operation and maintenance items for this facility may be included in the O&M plan for the associated waste, erosion or drainage system. Items to be considered in maintaining the roof runoff management system are:

1. ***Periodic inspection.***
2. ***Repair of broken or weakened components.***
3. ***Inspection after each major storm event.***
4. ***Clean out, if leaves or other debris have collected in the system.***

[1]Bold italics is information added to the National standard by West Virginia.

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE GENERAL SPECIFICATIONS

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Materials. Roof gutters and downspouts will be of the type and size specified on the drawings. Wood shall be clear and free of knots. A water-repellent preservative shall be applied to the flow area of wood other than redwood, cedar, or cypress. Plastics shall contain ultraviolet stabilizers. Dissimilar metals shall not be in contact with each other.

Supports. Gutter supports shall be installed as recommended by the manufacturer. They shall have a maximum spacing of 48 in. for galvanized steel and 32 in. for aluminum or plastic. Wood gutters shall be mounted on fascia boards using furring blocks that are a maximum of 24 in. apart. Downspouts shall be securely fastened at the top and bottom with intermediate supports that are a maximum of 10 ft. apart.

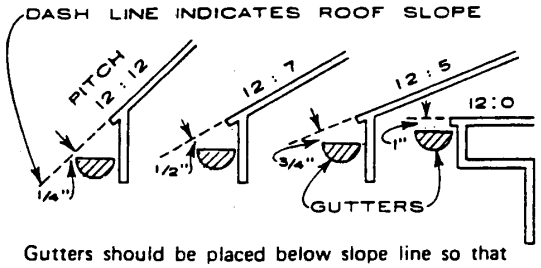
Where snow and ice are a problem, gutters will be installed as shown in Figure 1.

Outlets. Outlet facilities will be installed as shown on the drawings. When downspouts empty onto the ground surface, there shall be an elbow to direct water away from the building and splash blocks or other protection, as shown on the drawings, shall be provided to prevent erosion.

Upon completion of construction, all disturbed areas will be graded smooth and blend with the surrounding ground. Vegetation will be established by applying seeding and mulching materials as described on the drawings.

Construction operations shall be carried out in such a manner that erosion, air pollution, and water pollution will be minimized and held within legal limits.

Specifications for outlet facilities and other associated work, such as seeding and fencing, will be prepared using the WV 700 Series Specifications, National Engineering Handbook, Section 20 Specifications, or the specifications attached to the appropriate WV Standard.



Gutters should be placed below slope line so that snow and ice can slide clear. Steeper pitch requires less clearance.

Figure 1. Placing of Gutters.