

## **Roof Top Storage**

### **Description**

Roof top storage is used to reduce the peak discharge of stormwater from roof tops, thereby reducing storm sewer loadings, stream bank erosion and flooding. This method is most often used in densely developed areas where other means of stormwater detention are no longer available or have become very expensive to implement. Where water quality benefits are desired, this BMP is used in conjunction with other BMPs.

### **Other Terms Used to Describe**

Roof top storage is essentially a specialized detention basin. Findams and roof top detention barriers are devices used to detain water on rooftops.

### **Pollutants Controlled and Impacts**

The primary purpose of roof top storage is to reduce the peak discharge rate from roof tops. This helps reduce stream bank erosion and storm sewer hydraulic loadings. The majority of pollutant removal is accomplished when this BMP is used in conjunction with other BMPs, normally infiltration BMPs such as Infiltration Trenches or dutch drains.

### **Application**

#### **Land Use**

Urban and urbanizing areas

#### **Soil/Topography/Climate**

This BMP can be used under almost any condition. If used in conjunction with infiltration BMPs, soils with a high infiltration rate will be necessary. Where the discharge is to the ground in an area with steep slopes, special erosion protection should be used.

#### **When to Apply**

This BMP can be applied on new or existing structures at any time.

#### **Where to Apply**

Apply in highly urbanized or urbanizing areas where storm sewer capacity is a concern. Roof top storage can be very effective in helping to maintain the pre-development flow rate from a site if it is required of all buildings constructed in a new development.

### **Relationship With Other BMPs**

Where possible, roof top storage should be used in conjunction with infiltration BMPs such as dutch drains or Infiltration Trenches. Riprap should be used where erosion protection is needed at the discharge. Runoff can be directed to a Grassed Waterway (or swale) rather than the storm sewer.

## **Specifications**

### **Planning Considerations:**

This BMP is most effective if required of an entire development prior to beginning construction. A hydrologic study should be performed by a competent professional engineer. Roof top storage would be required where the volume of runoff exceeds the rate of infiltration, or where storm sewer capacity is a problem.

### **Design Considerations:**

**Roof top storage design should be done by registered professional engineers.**

### **Weight:**

The most important design consideration is the ability of the roof to hold the weight of the water being detained. In most cases, roofs designed to carry snow weight in the winter will be sufficient to hold the weight of large rain events. An overflow must be considered for very large rain events which may exceed the capacity of the roof.

### **Storm Design:**

At a minimum, the roof storage and other necessary BMPs should reduce the peak flow of the runoff from the storm frequency used to design the local stormwater collection system to pre-development levels. It may be desirable or required to also design for larger, less frequent storms.

### **Outlets:**

The desired release rate is achieved through the use of orifices or weirs around the outlet.

There are two alternatives for the discharge of water from the roof:

1. **Surface Drainage:** The roof drains directly to the ground surface. The surface outlet must be protected with some sort of Stabilized Outlet. Adequate drainage away from the structure must be assured. It is desirable to discharge the water over the land surface as a sheet flow rather than a concentrated flow. Avoid surface ponding.
2. **Subsurface Infiltration:** Downspouts are directed to an infiltration BMP such as an Infiltration Trench or dutch drain. The permeability of the soils must be adequate to use this technique (see the Infiltration Trench BMP for specifications). A surface overflow from the downspout is necessary for flows greater than design. This is not recommended where pollutant loadings from stormwater are such that they may infiltrate to the groundwater.

## **Maintenance**

Periodic inspection and maintenance is essential in keeping outlets free from debris. Inspection and repair of waterproofing should occur frequently.