

## **Parking Lot Storage**

### **Description**

Storage of stormwater on parking lots is used primarily to reduce the peak discharge of stormwater from the surrounding area during moderate storms. This method may provide a limited amount of treatment by allowing settling of the largest particles. Modular Pavement and grass areas may be used to promote infiltration. Care must be taken to either restrict use of the parking lot during storms or insure that vehicles won't be damaged and are accessible. Parking lot storage is most attractive in highly urbanized areas where there are few alternatives for stormwater detention.

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

Parking Lot Storage is essentially a specialized detention basin.

### **Pollutants Controlled and Impacts**

The primary purpose of parking lot storage is to reduce peak runoff from small sites and provide some flood storage. This helps reduce stream bank erosion and flooding.

Some large solids may be removed by settling, but because detention time is small it is unlikely to result in significant improvement. Where settling does occur, the settled solids must be removed often to prevent resuspension in future runoff events. In order to gain any significant pollutant removal, other BMPs will need to be used in conjunction with this one to form a "treatment train."

### **Application**

#### **Land Use**

Predominately urban, but can be used anywhere.

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

This BMP will work best in areas that do not have a steep slope. Parking lot slope should be 1% or less. Detention time will be important in climates where freezing may occur. As an additional use, intentional freezing for ice rinks may be desired in parking lots that are not otherwise used in winter.

#### **When to Apply**

This BMP may be applied at any time in the construction project, however, it is primarily designed for use when the project is complete. If used during the construction phase, special measures may have to be taken to prevent excess solids from being discharged through the outlet and overflow.

#### **Where to Apply**

This BMP is most applicable in urbanized or urbanizing areas where there are few alternatives available for stormwater detention. The parking lot should be under utilized, such as overflow lots, or have special uses, such as for special events.

## **Relationship with other BMPs**

This BMP is most effective when used in conjunction with other BMPs that allow for infiltration or sediment trapping. These BMPs include: Grassed Waterway, Modular Pavement, Infiltration Trench, Buffer/Filter Strip, Catch Basin, and Street Sweeping.

## **Specifications**

### **Planning Considerations:**

This is a permanent BMP and should be included in the initial design of the project, especially when multiple BMPs will be used which will affect the landscaping and parking lot configuration. Parking lot use must be properly managed during storm events. Overflow lots or other lots which are not normally used work best for parking lot storage. In some cases, parking lot use may have to be restricted during storm events.

A **spill response plan** must be developed which clearly defines the emergency steps to be taken in the event of an accidental release of large quantities of harmful substances to the parking lot at any time. As a result of this plan, design changes such as shut off valves or gates may be needed.

### **Design Considerations:**

**NOTE: All structural best management practices should be designed by a registered professional engineer.**

A possible configuration of parking lot detention is shown in Exhibit 1.

### **Watershed Size:**

Watershed size should be kept small. The contributing watershed should normally be no more than the runoff from the parking lot and nearby buildings.

### **Slope:**

The parking lot should slope toward the outlet(s) by not less than 0.5% and not more than 1%.

### **Water Depth:**

If the parking lot is in use during storm events, then the maximum water depth can be no more than 6 inches.

### **Volume:**

At a minimum, storage volume should be sufficient to detain 0.5 inches of runoff from the surface of the parking lot and adjacent impervious area draining to the parking lot. Larger storage volumes will provide better treatment. Discharge to the receiving stream should be at the pre-development rate or at a rate determined by ordinance or law. The release rate is controlled by the outlet structure which is therefore the most critical part of the design. The outlet should be chosen to achieve the desired release rate, while maintaining less than 6 inches of water in the parking lot. Unlike other detention basins, in parking lot storage the parking lot should be drained as quickly as possible, while at the same time meeting the minimum detention necessary to reduce peak flows in the receiving stream. It is critical to analyze the hydrology of the entire receiving stream to insure that the peak release from the parking lot does not coincide with the arrival of peak flows from upstream in the watershed.

Often it is not possible to meet the desired storage volume or discharge criteria without the use of additional BMPs such as Infiltration Trenches or Grassed Waterways (or swales) in conjunction with parking lot storage.

**Spillway:**

A spillway for flows larger than design must be included. Proper care must be taken to protect the discharge channel of the spillway from erosion problems.

**Construction Considerations:**

Construction should not begin until up-slope areas are stabilized and all necessary soil erosion BMPs are in place.

At the conclusion of construction, stabilize the surrounding area outlet following the guidance in the Seeding and Mulching, or Sodding BMPs.

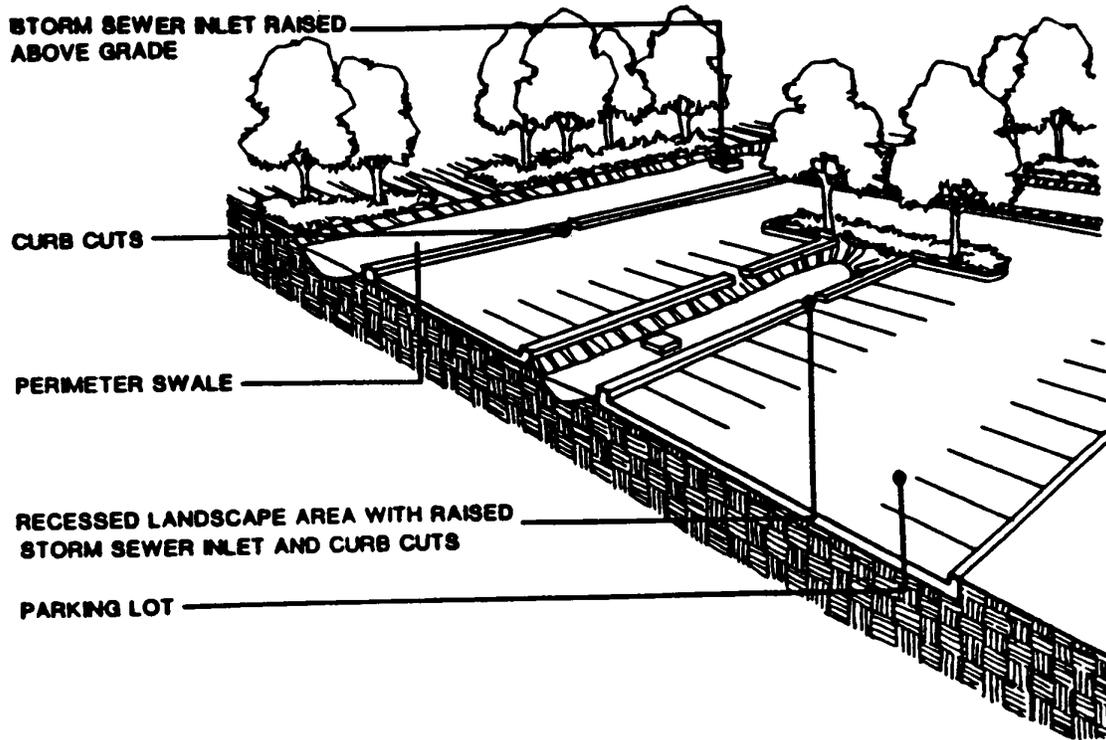
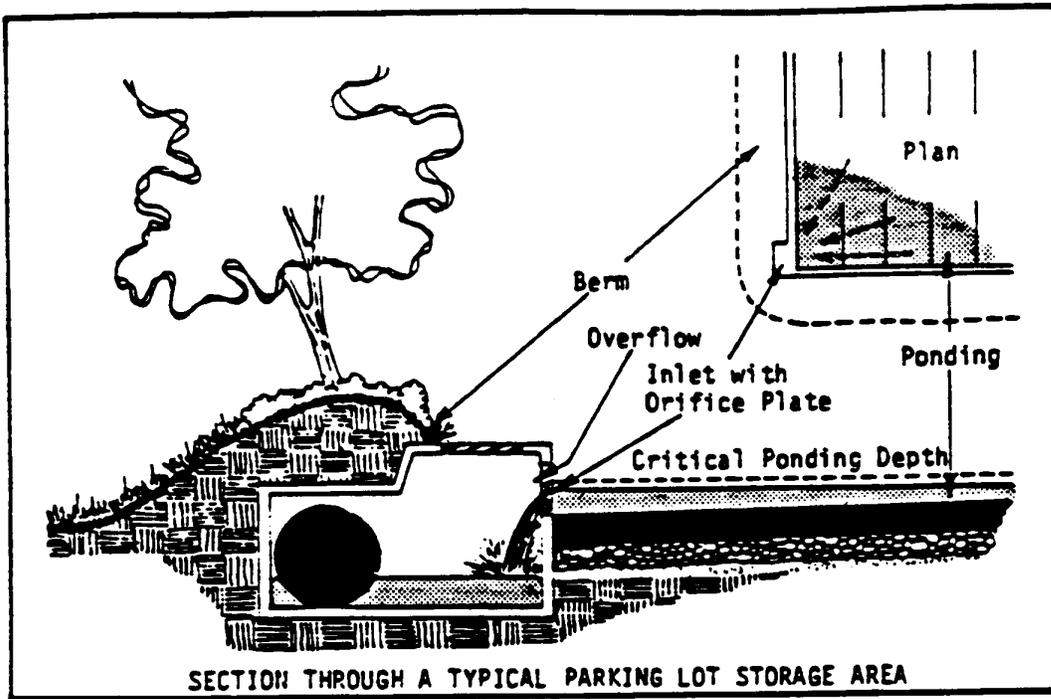
**Maintenance**

Sweep and clear debris from the parking lot after storms. Regularly inspect and clean the release drain.

**Exhibits**

Exhibit 1: Typical Parking Lot Configuration. The Florida Development Manual: A Guide to Sound Land and Water Development. State of Florida, Department of Environmental Regulation. 1988.

Exhibit 1: Typical Parking Lot Detention Configuration



Source: Florida Development Manual: A Guide to Sound Land and Water Development. State of Florida, Department of Environmental Regulation. 1988.