4.13 Multi-Purpose Detention Areas

Description: A facility designed primarily for another purpose, such as parking lots and rooftops that can provide water quantity control through detention of stormwater runoff.

LID/GI Consideration: Low land requirement, adaptable to many situations, and often a BMP used to treat runoff close to the source.

REASONS FOR LIMITED USE

- Controls for stormwater quantity only – not intended to provide water quality treatment

KEY CONSIDERATIONS

- Allows for multiple uses of site areas and reduces the need for downstream detention facilities
- Used in conjunction with water quality ~~structural control~~BMP
- Adequate grading and drainage must be provided to allow full use of facility's primary purposes following a storm event

STORMWATER MANAGEMENT SUITABILITY

- ☐ **Water Quality**
- ☑ **Channel/Flood Protection**

SPECIAL APPLICATIONS

- ☐ **Pretreatment**
- ☑ **High Density/Ultra-Urban**
- ☐ **Other:**

Residential Subdivision Use: *Yes*

Runoff Reduction Credit:

- 15% of the runoff reduction volume provided (A & B soils)

  0% of the runoff reduction volume provided (C & D soils)
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~~3.4.2~~4.13.1 General Description

Multi-purpose detention ~~areas~~ facilities are site areas primarily used for one or more specific activities that are also designed to provide for the temporary storage of stormwater runoff to reduce downstream water quantity impacts. Example of multi-purpose detention areas include:

- Parking Lots
- Rooftops
- Sports Fields
- Recessed Plazas

Multi-purpose detention areas are normally dry between rain events, and by their very nature must be useable for their primary function the majority of the time. As such, multi-purpose detention areas should not be used for extended detention (CP_v control).

Multi-purpose detention areas are not intended for water quality treatment and must be used in a treatment train approach with other ~~structural controls~~BMPs that provide treatment of the WQ_v (see Section ~~3~~4.1).

4.13.2 Design Criteria and Specifications

Location

- Multi-purpose detention areas can be located upstream or downstream of other ~~structural stormwater controls~~BMPs providing treatment of the water quality volume (WQ_v). See Section ~~3~~4.1 for more information on the use of multiple ~~structural controls~~BMPs in a treatment train.

General Design

- Multi-purpose detention areas are sized to temporarily store a portion or all of the volume of runoff required to provide overbank flood (Q_{p25}) protection (i.e., reduce the post-development peak flow of the 25-year storm event to the pre-development rate) and control the 100-year storm (Q_f) if required.

  Routing calculations must be used to demonstrate that the storage volume is adequate. See Section ~~2.2~~3.3 (*Storage Design*) for procedures on the design of detention storage.

- All multi-purpose detention facilities must be designed to minimize potential safety risks, potential property damage, and inconvenience to the facility's primary purposes. Emergency overflows are to be provided for storm events larger than the design storm. The overflow must not create a significant adverse impact to downstream properties or the conveyance system.

Parking Lot Storage

- Parking lot detention can be implemented in areas where portions of large, paved lots can be temporarily used for runoff storage without significantly interfering with normal vehicle and pedestrian traffic. Parking lot detention can be created in two ways: by using ponding areas along sections of raised curbing, or through depressed areas of pavement at drop inlet locations.

- The maximum depth of detention ponding in a parking lot, except at a flow control structure, should be 6 inches for a 10-year storm, and 9 inches for a 100-year storm. The maximum depth of ponding at a flow control structure is 12 inches for a 100-year storm.

- The storage area (portion of the parking lot subject to ponding) must have a minimum slope of 0.5% towards the outlet to ensure complete drainage following a storm. A slope of 1% or greater is recommended.

- Fire lanes used for emergency equipment must be free of ponding water for runoff events up to the extreme storm (100-year) event.

- Flows are typically backed up in the parking lot using a raised inlet.

Rooftop Storage

- Rooftops can be used for detention storage as long as the roof support structure is designed to address the weight of ponded water and is sufficiently waterproofed to achieve a minimum service life of 30 years. All rooftop detention designs must meet Georgia State Building Code and local building code requirements.

- The minimum pitch of the roof area subject to ponding is 0.25 inches per foot.

- The rooftop storage system must include another mechanism for draining the ponding area in the event that the primary outlet is clogged.

- See Section 4.11 for information and guidance on *Green Roof* practices.

Sports Fields

- Athletic facilities such as football fields, ~~and~~ soccer fields, and tracks can be used to provide stormwater detention. This is accomplished by constructing berms around the facilities, which in essence creates very large and shallow detention basins. Outflow can be controlled through the use of an overflow weir or other appropriate control structure. Proper grading must be performed to ensure complete drainage of the facility.

- In areas where the hydrologic soils groups are types A or B, a volume reduction credit of 15% can be claimed and incorporated into the overall design.

Public Plazas

- In high-density areas, recessed public common areas such as plazas and pavilions can be utilized for stormwater detention. These areas can be designed to flood no more than once or twice annually, and provide important open recreation space during the rest of the year.

~~3.4.2~~4.13.3 Inspection and Maintenance Requirements

~~Table 3.4.2~~4.13 1. Typical Maintenance Activities for Multi-Purpose Detention Areas
(Based on: Denver Urban Storm Drainage Manual, 1999)

Activity	Schedule
• Remove debris from ponding area to minimize outlet clogging and improve aesthetics.	Annually and following significant storm events
• Remove sediment buildup. • Repair and revegetate eroded areas. • Perform structural repairs to inlet and outlets.	As needed based on inspection
• Perform additional maintenance activities specific to the type of facility.	As required

All best management practices require proper maintenance. Without proper maintenance, BMPs will not function as originally designed and may cease to function altogether. The design of all BMPs includes considerations for maintenance and maintenance access. For additional information on inspection and maintenance requirements, see Appendix XX.

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