

5.1 OVERVIEW

Structural practices for sustainable drainage design are those measures that are used to manage nonpoint source pollution (stormwater runoff quality) and peak flow rates from new development. This Chapter provides technical guidance for the design, construction, and maintenance of such measures. Sustainable practices designed per Chapter 4 and this Chapter will reduce total suspended solids (TSS) by at least 80% after the construction site has been permanently stabilized and maintain post-development peak runoff rates at pre-development levels for the 1.5" rainfall event. Sustainable drainage practices are required by all new development and redevelopment projects that disturb one acre or more of land, add 10,000 square feet of impervious cover, and projects less than one acre that are part of a larger common plan of development or sale that will result in disturbance of one acre or more. Projects whose final level of impervious cover is less than 20% or use stormwater credits to create an effective impervious cover less than 20% are exempt from the implementation of structural practices.

5.1.1. GENERAL DESIGN GUIDELINES

The following general guidelines apply to all permanent BMPs in this section.

1. SITING REQUIREMENTS:

- All water quality basins must lie outside the buffer zones; and
- All permanent BMPs receiving off-site runoff or serving a single-family subdivision should be shown within a drainage easement or conservation easement. Vegetative filter strips may be shown within the building set back of a lot in lieu of being located in a drainage easement. The easement or building setback must include appropriate restrictions regarding the amount and type of improvements that may be constructed.

2. SAFETY CONSIDERATIONS

- **Embankment Safety:** The design should direct grading to avoid drop-offs and other hazards. Side slopes of basins should be 3:1 (H:V) or flatter for grass stabilized slopes. Slopes steeper than 3:1 (H:V) must be stabilized with an appropriate slope stabilization practice;
- **Dam Safety:** See Section 299 of the TCEQ rules on Dams and Reservoirs for dam safety requirements. These rules apply to any barriers, including one for flood detention or water quality management, designed to impound liquid volumes and which has a dam height greater than six feet;
- **Hazardous Materials:** For developments that store or dispense hazardous materials a valve should be installed so that discharge from the BMP can be stopped in case runoff from a spill of hazardous material enters the basin. The control for the valve must be accessible at all times, including when the basin is full; and
- **Limit Access:** Fencing, landscaping and curb stops can be used to impede access to a facility. The primary spillway opening must not permit access by small children. If the facility is fenced, gates must be provided to allow access for inspections and maintenance.

3. STABILIZATION REQUIREMENT

A plan should be provided indicating how disturbed areas will be stabilized and re-vegetated. Revegetation must follow the guidelines in Chapter 3 and begin within 14 days of the end of construction activities. Erosion control must be provided to protect exposed soil on slopes greater than 3:1 and can be provided in the form of sod, matting, straw or other approved means.

4. VEGETATION REQUIREMENTS

The vegetation density for all permanent BMPs must be greater than 80% with no large bare areas. The filter area should be densely vegetated with a mix of erosion-resistant plant species that effectively bind the soil. Native or adapted grasses, shrubs, and trees are appropriate because they generally require less

fertilizer and are more drought resistant than exotic plants. Turf grass (vegetated filter strips) should be mowed to maintain a grass height of no more than 4-inches to keep the grass in an active growth phase. Permanent BMP areas should be managed to minimize or avoid the application of fertilizers, pesticides, or herbicides.

5. CONSTRUCTION-PHASE RUNOFF

Structural practices may be used as sediment basins during construction. Embankments and conveyances must be properly compacted with an emergency overflow outlet. Basins must have sediment accumulations removed, final grades restored, and stabilization achieved prior to completion. No portion of a basin using infiltration or filtration shall be used to collect or treat construction-phase runoff. No runoff shall be received by these facilities until site is completely stabilized.

6. MAINTENANCE REQUIREMENTS

Provide adequate maintenance access to all permanent BMP inlet and outlet structures, filtration and sedimentation areas. A fixed vertical sediment depth marker should be installed in the bottom of sedimentation areas to determine when sediment accumulation has exceeded limits set in the maintenance plan.

See Chapter 5 for Maintenance Plan requirements for all permanent BMPs.