SUWANNEE RIVER WATER MANAGEMENT DISTRICT

ENVIRONMENTAL RESOURCE PERMIT APPLICANT'S HANDBOOK VOLUME II

(DESIGN REQUIREMENTS FOR STORMWATER TREATMENT AND MANAGEMENT SYSTEMS)

FOR USE WITHIN THE GEOGRAPHIC LIMITS OF THE SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Volume II is incorporated by reference in 62-330, F.A.C. and 40B-400, F.A.C.

These types of system are commonly referred to as underground vaults or underground storage units. Operation and maintenance is of great concern as sediment accumulation and clogging by fines can reduce the life of the system.

5.3.2 Criteria

Exfiltration trench systems shall comply with all applicable requirements of Part II, III, and IV of this volume. The bottom of pond is not required to be flat; however, the exfiltration trench does have to be flat. The pond shall have a freeboard of 1 foot above the maximum stage in order to function properly during storms greater than the design storm. The ponds shall be equipped with an emergency discharge system designed to pass runoff resulting from storm events larger than the design storm. Overflow structures shall be designed such that the top of the structure is below the top of the pond and above the maximum stage. Ponds with berms greater than 5 feet from the top of the berm to the lowest natural ground elevation shall comply with Section 5.8 of this Volume. The system cannot cause adverse secondary impacts to adjacent wetlands or other surface waters. The inspection and cleanout ports shall be located at the inlet and terminus of the system, and at a minimum, every 400 feet and every bend of 45 or more degrees. Standard precast concrete inlets and manholes may be used for inspection and cleanout access. Inlet structures shall include sediment sumps. 48 hours prior to the construction of the WQTS, the district shall be notified and district staff shall be present during the installation.

Exfiltration trench systems shall be designed so that aggregate in the trench is enclosed in filter fabric. Filter fabric may also be utilized directly surrounding the perforated pipe. The exfiltration trench system shall be designed so that the invert elevation of the trench is at or above the seasonal high ground water table elevation.

5.4 Wet Detention Design Criteria and Guidelines

5.4.1 Description

Wet detention systems are permanently wet ponds which are designed to slowly release collected stormwater runoff through an outlet structure. Wet detention systems are the recommended BMP for sites with moderate to high water table conditions. Wet detention treatment systems provide significant removal of both dissolved and suspended pollutants by taking advantage of physical, chemical, and biological processes within the pond. Wet detention systems offer an effective alternative for the long term control of water levels in the pond, provide a predictable recovery of storage volumes within the pond, and are easily maintained by the maintenance entity. **In addition to providing good removal of pollutants from runoff, wet detention systems also provide other benefits such as flood detention, passive recreational activities adjacent to ponds, storage of runoff for irrigation, and pleasing aesthetics. As stormwater treatment systems, these ponds should not be designed to promote in-water recreation (i.e., swimming, fishing, and boating).**

5.4.2 Criteria

Wet detention ponds shall comply with all applicable requirements of Part II, III, and IV of this volume. The control elevation shall be set at or above the SHGWT and at or above the design tailwater elevation. The bottom of wet detention ponds are not required to be flat. The detention pond shall have a freeboard of 1 foot above the maximum stage in order to function properly during storms greater than the design storm. Wet detention ponds shall be equipped with an emergency discharge system designed to pass runoff resulting from storm events larger than the design storm. Overflow structures shall be designed such that the top of the structure is below the top of the pond and above the maximum stage. Wet detention ponds with berms greater than 5 feet from the top of the berm to the lowest natural ground elevation shall comply with Section 5.8 of this Volume. Storage volumes in detention ponds shall be calculated so as not to include any volumes below the SHGWT. The system cannot cause adverse

secondary impacts to adjacent wetlands or other surface waters. The pond must be designed so that the pond side slopes are no steeper than 4H: 1V (horizontal: vertical). Drawdown devices with a width smaller than 3 inches shall include a device to eliminate clogging. The flow path of water from the inlets to the outlet should be maximized to ensure treatment. If short flow paths are unavoidable, the effective flow path can be increased by adding diversion barriers such as islands, peninsulas, or baffles to the pond. Inlet structures shall be designed to dissipate the energy of water entering the pond. A dewatering plan, if required, shall be the minimum plan required to provide reasonable assurance that water discharged for the site will meet state water quality standards. If the contractor discovers the plan is ineffective, he shall design and implement a plan that is effective.

5.4.3 Permanent Pool

The permanent pool shall be sized to provide at least a 14-day residence time based upon average wet season rainfall (rainfall occurring over the wettest four months of an average year). Additional permanent pool volume is required for wet detention systems which directly discharge to OFWs. The maximum depth of the permanent pool shall be 12 feet. The minimum depth of the permanent pool shall be 2 feet. An aerobic environment should be maintained throughout the water column in wet detention ponds.

5.5 Swales Systems Design Criteria and Guidelines for Swale Systems

5.5.1 Description

Swales are a man-made or natural system shaped or graded to required dimensions and designed for the conveyance and rapid infiltration of stormwater runoff. Swales are designed to infiltrate a defined quantity of runoff through the permeable soils of the swale floor and side slopes into the shallow ground water aquifer. Turf is established to promote infiltration and stabilize the side slopes. The swale holds water only during and immediately after a storm event, thus the system is normally "dry." Swales provide excellent removal of stormwater pollutants. Substantial amounts of suspended solids, oxygen demanding materials, heavy metals, bacteria, some varieties of pesticides and nutrients such as phosphorus are removed as runoff percolates through the vegetation and soil profile. Besides pollution control, swale systems can be utilized to promote the recharge of groundwater to prevent saltwater intrusion in coastal areas, and to maintain ground water levels in aquifer recharge areas. Swales can be incorporated into the design of a stormwater management system to help meet the runoff volume criteria. Swales can also be utilized to provide pre-treatment of runoff prior to its release to another treatment BMPs.

5.5.2 Criteria

Swale systems shall comply with all applicable requirements of Part II, III, and IV of this volume. Swales, must be designed to treat, through percolation or evapotranspiration, the required water quality volumes as found in Part IV of this volume or a volume of stormwater equal to at least 80 percent of the runoff resulting from a design storm with a three-year, one-hour rainfall depth and SCS type II distribution falling on average antecedent moisture conditions. Swale shall have side slopes no steeper than or equal to 3:1 (horizontal to vertical). Construction of swale systems must be in conformance with procedures that avoid degradation of swale infiltration capacity due to compaction and construction sedimentation. Swales shall be stabilized with vegetative cover suitable for soil stabilization, stormwater treatment, and nutrient uptake. The swale shall be designed to take into account the soil erodibility, soil percolation, slope, slope length, and drainage area so as to prevent erosion and reduce pollutant concentrations.

5.6 Vegetated Natural Buffers Design Criteria and Guidelines

5.6.1 Description