

## STORMWATER CRITERIA

### December 11, 2008 Summary Matrix

ISSUE	CURRENT	PROPOSED
	PURPOSE & AUTHORITY	PURPOSE & AUTHORITY
Removed exceptions.	Any land alteration activity, modification of existing stormwater management system, or modification of existing site other than subdivisions, site plans, or single family homes which results in stormwater quality degradation of flooding must be approved by the Surface Water Improvement Division.	All land alteration activities, modification of existing stormwater management system, or modification of existing site must be approved by the Department assigned by the County Manager to administer the standards herein (Department).
	GLOSSARY	DEFINITIONS
Changed "GLOSSARY" to "DEFINITIONS". Moved definitions to beginning of document. Added more terms.	Relocated to the beginning of document.	Additional terms.
	BACKGROUND	GENERAL
New section added. Clarification of the protection of surrounding property owners from adverse potential flooding impacts created by new development.		3.1 (c) - Unless an easement from the affected property owners is obtained, backwater effects resulting from changes to the existing drainage system shall not: 1) Increase water elevations or cause adverse flooding impacts to other properties; 2) Decrease the discharge rate of the stormwater control structures upstream of the development; 3) Increase the depth of roadway flooding upstream of the development.
Language added to clarify water quantity requirements and allowable peak discharge rates and volumes.		3.1 (d) - The detention or retention of stormwater runoff generated by new developments will be required so that the peak discharge rate will not be greater than it was prior to such development. Detention of the runoff volume may be required in certain situations.
New section added pertaining to Special Area of Stormwater Concern (SASC).		3.2 (c) - A Special Area of Concern (SASC) must meet more stringent design standards and criteria. See section 10.1 (a). The current list of SASC include the following areas: 1) West Cocoa 2)Canaveral Groves 3) North Merritt Island 4) Upper Eau Gallie 5) Crane Creek 6) Police Foundation 7) Grant-Valkaria. The above list may be modified or amended to include additional SASC as they are identified by Brevard County staff. The general SASC drainage areas are show in Exhibit "B". For more specific information for SASC, please contact Brevard County Natural Resources Management Office (NRMO) or Land Development.
SJRWMD does not allow untreated stormwater to be discharged directly to wetlands. The new criteria follows the SJRWMD and ensures the right to discharge to wetlands is protected for multiple properties.	1.2 Water Quality - Site alterations shall minimize siltation and pollution of Class 1, 2 & 3 waters or Outstanding Florida Waters (OFW) of the State and shall optimize the natural retention and filtering capabilities of wetlands. 1.4 - The use of existing wetlands for stormwater treatment rather than destruction of the wetlands is encouraged.	3.5 Wetlands may be used for stormwater quantity attenuation. Pretreatment is required prior to discharge into wetlands. Wetlands receiving discharges from multiple upland owners will be protected by a drainage easement providing access to all upland owners. See The Wetland Protection Ordinance (Chapter 62, Article X, Division 4, Section 62-3691) and or NRMO for specific details.
New section added regarding legal and positive outfalls for stormwater management systems and the criteria required for those projects that do not have a positive and/or legal outfall.		3.8 Attenuation Requirements (a) If a legal, positive outfall is available, the project shall be designed to attenuate the pre-development vs. post-development peak flow for the design storm event. A legal outfall must be to a publically maintained conveyance system or to an area in which the right to discharge is guaranteed by a legal instrument or by riparian law. (b) If a positive outfall is available, however, there is no legal documentation ensuring the right to use the positive outfall, the project shall be designed to attenuate the pre-development vs. post-development volume for the required storm event in addition to the requirements of paragraph (a). The discharge shall match the flow characteristics and location of the pre-development flow. (c) If an adequate positive outfall is not available, off-site improvements shall be required to provide one, or the project shall be designed as a landlocked basin. (See sections 9 & 10 for design criteria).
	WAIVERS	WAIVERS
No Changes		

	PURPOSE & AUTHORITY	EXEMPTIONS
New section added for exemptions.		5. The following activities shall be exempt from these criteria provided the proposed work does not alter the purpose or intent of the drainage system & does not adversely impact adjacent properties: a) Single-family and duplex residences and accessory structures that are not part of a subdivision or site plan; b) Subdividing of lands into no more than two lots, each being 2.5 acres or larger in size, where no new paved streets are proposed; c) The one-time construction of any structure or addition not otherwise exempt, not exceeding two thousand (2,000) square feet of impervious area, or 10% of the original impervious area of the site, whichever is less; d) Maintenance work performed on existing mosquito control drainage canals for the purpose of public health and welfare; e) Maintenance work on utility or transportation systems; f) Any maintenance, alteration, renewal, use or improvement to an existing structure not changing or affecting the rate of volume of stormwater runoff; g) Bona-fide agricultural pursuits, including forestry, except where the flow rate or volume of stormwater runoff from the applicant's land may increase; h) See below.
Agricultural zoned properties under SCS plans or SJRMWD permits are changed to exempt agricultural zoned projects, but not the entire property. This is to ensure that a pumping permit at one end of a property does not act as a blanket exemption to exempt drainage system changes at the other end of the property.	These criteria do not apply to Agricultural zoned properties which are under or entering a Soil Conservation Service Conservation Plan or a St. Johns River Water Management District agricultural discharge permit.	5.0 (h) Agricultural zoned projects that are under or entering into a SCS plan or SJRWMD ERP. Exemption to SJRWMD requirements to obtain a permit does not constitute the holding of a permit.
	PLAN PREPARATION	SUBMITTAL REQUIREMENTS
Geotechnical - Specifies the minimum spacing, depth and number of test borings required.	3.0 (c)(4)-A subsurface investigation report following ASTM standards and performed by a geotechnical engineer shall be submitted with construction plans and shall include: <b>a.</b> Test borings at 500 ft intervals along roadways to a depth sufficient to locate the groundwater table or to a depth five (5) feet below the proposed centerline grade, whichever is greater. Additional bores may be required in muck areas to determine the limits of such areas. <b>b.</b> Test bores in all stormwater ponds to determine seasonal high groundwater levels to the satisfaction of the Reviewer. If dry ponds are proposed, the test bore should extend to 10 feet below the existing ground to determine the presence of hardpan or impermeable layers. Permeability rates are required where infiltration calculations are required.	6.2 Geotechnical Report - A subsurface exploration report following ASTM standards shall be signed and sealed by a licensed geotechnical engineer and submitted with construction plans. The geotechnical report shall include the following: (a) Borings spaced at a maximum of 500-ft intervals along all roads. Borings shall be provided at 500 ft intervals for all swales greater than 250 ft from the edge of road pavement. The borings shall extend to a depth of five feet (5) below the proposed centerline grade; whichever is greater. Additional borings may be required in areas with muck to determine the extent of the muck layers. (b) Borings in all stormwater facilities to determine the seasonal high table. At least one boring shall be required for each separate pond. For sites less than one acre in size, no more than two borings shall be required for the entire stormwater management system. (c) If retention or dry detention is proposed, the borings must extend to 10 feet below the existing ground elevation or two (2) feet below the proposed pond bottom, whichever is greater, to determine the presence of hardpan or low permeability layers.
Geotechnical (cont.) - Describes the minimum required information and analyses required within the report.		6.2 (d) The ground surface elevations adjacent to each boring shall be field surveyed and shown in the geotechnical report. (e) Permeability tests are required where infiltration calculations are used. In-situ field permeability tests are preferred over laboratory tests performed on samples removed from the field. The permeability test must be representative of the bottom elevation of the proposed pond or exfiltration system. (f) The geotechnical report must state the appropriate values to use for each of the following: 1. The effective aquifer base elevation(s) 2. The horizontal hydraulic conductivity 3. The vertical hydraulic conductivity 4. The soil porosity (g) The Department may require additional borings or greater depths of borings in special circumstances.
Design Calculations - 6.3 (a), (b) & (c) were added to clarify the elements expected in the design calculations and to make the review of the project easier by summarizing much of the critical information into one place.	3.0 (c) Drainage Calculations - Drainage calculations shall be attached providing the following information: 6.3 (d), (e) & (f), if the revised criteria have the same language as (1), (2), & (3) of the current criteria.	6.3 Design Calculations - Design calculations shall be provided in a separate, bound document with all the information required to allow the Department to duplicate the work submitted. Design calculations shall be signed and sealed by a licensed engineer and shall provide the following information: (a) Copies of the pre-development and post-development drainage basin maps. The copies may be full size sheets folded and placed in map pockets or may be 11-inch by 17-inch sheets and bound in the calculations booklet. (b) A concise, complete narrative that describes the existing and proposed drainage conditions, states the total project area, describes any known flooding or water quality problems on, or adjacent to, the proposed site or its receiving waters, states the location of the legal positive outfalls (if any) and summarizes the drainage easements that will be required and provided. (c) See below.

<p>Design Calculations (cont.) - 6.3 (g), (h), (i) &amp; (j) were added to ensure that review of the design storm event accurately reflects the true pre- and post-development site conditions.</p>		<p>6.3 (c) A drainage summary table outlining the following: 1. The 25-year design high water elevations for each pond; 2. The top of bank for each pond; 3. The bottom elevation of each pond; 4. The lowest finished floor elevation in the development; 5. The lowest road crown elevation in the development; 6. The normal water level in each pond; 7. The seasonal high groundwater table at the bottom of each dry pond; 8. The peak velocity of flow (for the design event) for each pipe outlet; 9. The existing and proposed peak discharge rates (for the pond design event) at each outfall, and; 10. If volume calculations are required, the Summary Table shall include: a. The existing discharge volume at each outfall, and b. The proposed discharge volume at each outfall. (g) Flood routing calculations conforming to the FDOT drainage design tabulations forms. (h) Complete pre-development and post-development node diagrams. (i) All forms, reports, and graphs of model inputs and outputs. (j) All photos, diagrams, and maps used to provide input data for the model.</p>
<p>Record drawings are now called as-built drawings in conformance with other departments and state agencies. Clarification on information required on the as-built drawings.</p>	<p>3.0 (d) Record drawings - After construction of the required improvements, one (1) copy of the Record Drawings signed and sealed by a PLS shall be provided to the Surface Water Improvement Division by the Land Development Division for Subdivisions and Site plans. Said Record Drawing shall provide elevations, dimensions, and sizes of the constructed stormwater facilities.</p>	<p>6.5 As-built drawings - After construction of the required improvements, paper and electronic media copies of the as-built drawings shall be submitted for review and approval. The as-built drawings shall provide elevations, dimensions, sizes and all other pertinent information for the constructed stormwater facilities. The as-built drawings must be signed and sealed by PLS.</p>
	<p><b>COMPUTER SOFTWARE</b></p>	<p><b>COMPUTER SOFTWARE</b></p>
<p>Specifies that FEMA projects are required to use FEMA approved software.</p>	<p>2.3 Computer programs used for drainage calculations shall meet the approval of the Reviewer. Stormwater systems with more than one pond should use multiple pond routing software. The Reviewer shall maintain a list of approved software which shall be kept at the office of Engineering Design and Review Division and may be viewed during normal business hours. Software not on this list shall be submitted to the Reviewer along with any documentation and manuals prior to plan submittal. The software will be evaluated against approved software to determine its applicability.</p>	<p>7. Computer programs used for drainage calculations shall meet the approval of the Department. Stormwater systems shall be modeled with software intended for that system and according to the methodology in the software manuals. The Department may require software documentation and manuals prior to completion of the review. If a project will require approval from FEMA, only FEMA approved software will be allowed for that project.</p>
	<p><b>EASEMENTS</b></p>	<p><b>EASEMENTS</b></p>
<p>The vehicle access easement is now specifically required and shall be 20 feet wide, conforming to SJRMWD requirements. Additional width may be required for equipment when turning or using equipment with protruding counterweights.</p>	<p>2.2 (b) 1. Drainage easements shall be given over any portion of a stormwater system not within a right of way and necessary for the functioning of the system. The easement shall include the facility plus any required access area to be used for maintenance.</p>	<p>8. A vehicular access easement shall be provided from a public right of way to the control structure of a stormwater management system. The vehicular access shall be stabilized and shall be no less than 20 feet wide. The Department may require additional width if obstructions due to equipment are, or will be near the easement.</p>
<p>For open channels and wet ponds, the minimum width stabilized maintenance access easement has been increased from 15 feet to 20 feet to ensure adequate room for equipment used for long-term maintenance and repairs.</p>	<p>2.2 (b) 2. The facility width for open systems shall be measured from top of bank to top of bank. The following criteria establishes the required minimum width of drainage easement. Drainage System (other than swales): Open drainage systems: Top width 20 ft or less =&gt; minimum width access easement is 15 ft on one side; Top width 20 ft to 40 ft =&gt; minimum width 15 ft on both sides; Top width greater than 40 ft =&gt; 20 ft on both sides.</p>	<p>8. (c) The following criteria establish the required minimum widths of drainage easements: Drainage system (other than swales): Open Channels/Wet Ponds: Top width 20 ft or less =&gt; minimum maintenance easement width is 20 ft on one side; Top width greater than 20 ft =&gt; minimum maintenance easement width is 20 ft on both sides.</p>

	DESIGN CRITERIA	DESIGN STORM & FREEBOARD
Added 100-yr/24-hr storm requirement for isolated outfalls to protect downstream properties from adverse flooding impacts when developments discharge to isolated wetlands, ponds or basin. Added freeboard requirements for stormwater management systems to reduce the possibility of flooding and damage due to overtopping. Overtopping and seepage are the two most common causes of earthen dam failures.		9.0 Isolated Stormwater Management Systems (Discharge to a Land-Locked basin, system or wetland) => Design Storm & Freeboard: 100 Year, 24-Hour Design Storm; Stormwater ponds greater than 1.0 acre must have a minimum of 1.0 ft of freeboard. Stormwater ponds less than 1.0 acre at the design peak stage must have a minimum of 0.5 ft of freeboard.
Increased the hydraulic grade line requirement to local street pipe systems streets and changed minimum required storm event for all roadside swales, arterial and collector streets, and other storm sewer systems to 25 year, 24 hour storm design due to costly road repairs for damage to public roadways created by repetitive exposure to high water elevations.	4.1 Roadside Swales; 10 Year, 24 Hour Design Storm. Arterial and Collector Street Storm Sewer Systems; 10 Year, 24 Hour Design Storm; Hydraulic Gradient Line (HGL) must be a minimum of 1.0 ft below the gutter line. Local Street Pipe Systems: Design Storm, 10 year, Hydraulic Grade Line 0.5 feet below gutter line.	9. Roadside Swales; 25 Year, 24 Hour Design Storm; Peak design stage must be at least 1.0 ft below the edge of pavement. Arterial and Collector Street Storm Sewer Systems; 25 Year, 24 Hour Design Storm; Hydraulic Gradient Line (HGL) must be a minimum of 1.0 ft below the gutter line. Other Storm Sewer Systems (Including local roadways); 25 year, 24 hour; HGL must be a minimum of 1.0 ft below gutter line.
New section added for requiring the 50-yr/24-hr storm for systems conveying off-site flows to provide additional flood protection.		9. Systems conveying off-site flows through a site - Design Storm, 50 Year, 24 Hour
Rainfall amount requirements are now referenced through SJRWMD's latest technical publication or NOAA's most current rainfall data to be consistent with State agencies.		9. Rainfall amounts shall be in accordance with the SJRWMD's most current technical publication or the National Oceanic & Atmospheric Administration's (NOAA) most current rainfall data; the more stringent of the two.
The requirement for flood prone areas and properties in areas where the current FEMA maps are inadequate. An example of inadequate maps is the West Cocoa area near Range Rd. This area experienced extensive flooding during Hurricane Wilma, a less than 100 year event, yet is shown to be outside of the 100 year flood plain on the FEMA maps.		9. Developments within flood prone areas, as determined by the Department, shall also model the 100 year, 24 hour storm event, regardless of FEMA flood zone.
	DESIGN CRITERIA	STORMWATER MANAGEMENT SYSTEM DESIGN CRITERIA
New requirements added to protect downstream and adjacent properties from adverse flooding impacts.		10.1 Peak Attenuation for Landlocked & Isolated Systems. The post-development peak discharge rate and/or volume must not exceed the pre-development peak discharge rate and/or volume resulting from the design storm as follows: a) For systems with an isolated, positive outfall, or in a SASC, the post-development volume shall not exceed the pre-development volume at hour 36 resulting from the 100 year, 24 hour storm. b) Systems without a positive outfall (landlocked) must retain the entire volume for the 25 year, 96 hour storm event. c) Systems discharging to land-locked basins which are adjacent to properties not owned by the owner of the stormwater management system must not cause an increase in the total pre-development flood stage.
Equations and formulas have been replaced with references to the SJRWMD standards. This replacement will reduce the possibility of conflicting criteria between the SJRWMD and the Brevard County Stormwater Utility Department.	4.3 - 4.4 Equations & formulas used for calculating stormwater rates and volumes.	10. Stormwater Management Systems shall meet SJRWMD design criteria unless otherwise noted. 10.5 Treatment Volume - a) Stormwater management systems shall comply with the SJRWMD treatment volume criteria in Florida Administrative Code (F.A.C.) 40C-42. b) Stormwater management systems must comply with the FDEP and SJRWMD criteria in Chapter 62-303, F.A.C. for receiving water bodies identified as Impaired Surface Waters by FDEP. (c) For projects with proposed impervious surface area exempt from SJRWMD or FDEP permitting due to thresholds, a stormwater management system must be designed to provide water quality treatment volume equivalent or greater to, one inch of rainfall over the impervious area.

Seepage analysis requirements added for storage facilities which could potentially cause dangerous conditions downstream in the event of berm failure. Seepage and overtopping are the two most common causes of earthen dam failures.		10.2 Seepage Analysis - Treatment Facilities meeting any of the following criteria shall have slope stability and seepage analyses performed by a geotechnical engineer. a) The volume contained within the system between the maximum water level of the design storm and the lowest ground surface at the foot of the treatment facility berm is greater than three (3) acre-feet. If the foot of the berm is a drainage way, the height of the opposite bank shall be used. b) The height of the treatment facility berm is greater than three (3) feet at its maximum height as determined in (a). c) As deemed necessary by the Department.
Changes have been made to prevent any part of a stormwater management system from lowering the seasonal high groundwater table below the normal groundwater table.	(d) Groundwater Table - The seasonal high groundwater table may be lowered to the normal groundwater table depth with the following exceptions: 2) Barrier Islands	10.6 When possible, stormwater management systems should be controlled at the seasonal high water table; however, the control elevation shall be no lower than the normal water elevation. The seasonal high groundwater table shall not be lowered at all in the following circumstances: b) When the system will increase salt water intrusion on a barrier island.
This additional language addresses the requirements for including base flow, the flow of groundwater into the detention facility, to the flow from a storm event when calculating the effects of a storm.		10.9 Wet Detention Facility Recovery Design - Recovery devices in wet detention systems shall be designed in accordance with recognized formulas and constants and as follows: a) The minimum orifice shall be 3-inches. b) The invert of the lowest outfall control elevation must not be lower than the normal water table. 1) If the invert is lower than the seasonal high water table, then the base flow, based on the seasonal high water table, must be added to the flow of the design storm for the entire period of the model run. The base flow must be included in the drawdown calculations. 2) The base flow must be based on the seasonal high water table and the elevation of the lowest outfall control. c) All recovery devices must be designed to minimize clogging.
The maximum side slopes for wet detention facilities have been increased for facilities without fences and 3:1 for facilities with fences. This brings the maximum side slopes into conformance with SJRWMD criteria. The effect will be more storage volume on a smaller footprint for developers.	4.4 (h) Side Slopes - Wet ponds shall have side slopes no steeper than 5:1 to 2 feet below the normal water surface and 2:1 to 12 foot maximum depth and 5 foot minimum depth can be waived if littoral vegetation is planted in the areas less than 5 feet deep. The littoral plant types shall follow SJRWMD criteria for littoral zones. Dry ponds shall have side slopes no steeper than 3:1.	10.11 Side Slopes (a) Wet detention facilities without fences shall have maximum side slopes of 4:1 down to 2 feet below the normal groundwater elevation and 2:1 side slopes to the maximum depth. B) Wet detention facilities with fences shall have maximum side slopes of 3:1 down to 2 feet below the normal groundwater elevation and 2:1 side slopes when the slopes are hardened (i.e. concrete lined) or when retaining walls are employed. c) Dry facilities shall have side slopes no steeper than 3:1. Ponds with side slopes steeper than 4:1 must be fenced.
The revisions specify the slope treatment for all slopes steeper than 3:1.	4.4 (i) Slope Protection - The disturbed areas in and around the ponds shall be revegetated as follows: Side slopes and Berms: 5:1 and up =seed and mulch. 4:1 and steeper = sod.	10.12 Erosion Protection -Disturbed areas shall be treated as follows, except channel bottoms which are continuously wet or areas which have other treatment specified: (a) Slopes flatter than 5:1 must be seeded and mulched or hydroseeded. (b) Slopes from 5:1 to 3:1 must be sodded. (c) Slopes from 3:1 to 2:1 must be sodded and staked. (d) Slopes steeper than 2:1 must have engineered lining applied.
Additional language added to specifically address swales located inside subdivision lot lines to ensure they serve for conveyance purposes only.		10.14 - Swales- Residential subdivision swales along side and rear lot lines must not be used as retention or detention facilities.
Changes clarifying the approved uses of wetlands to be consistent with current SJRWMD criteria.	1.2 Water Quality - Site alterations shall minimize siltation and pollution of Class 1, 2 & 3 waters or Outstanding Florida Waters (OFW) of the State and shall optimize the natural retention and filtering capabilities of wetlands. 1.4 - The use of existing wetlands for stormwater treatment rather than destruction of the wetlands is encouraged.	10.15 In certain circumstances, created wetlands may be used for treatment when approved by SJRWMD and Brevard County NRMO. Natural wetlands may be used for peak rate attenuation, but not for water quality treatment, as approved by SJRWMD and NRMO.
	<b>ROADWAY (PAVEMENT) DRAINAGE DESIGN</b>	<b>ROADWAY DRAINAGE DESIGN</b>
This additional criteria reinforces the new design criteria noted in section 9.0 to reduce the duration the road base material is subjected to high water levels to reduce the on-going road repairs by County Road & Bridge Dept.		11.1 (c) In subdivisions, the lowest point of the road pavement must be a minimum of 1.0 ft above the peak stage of the required design storm event.
Specifies the material to be used for ditch blocks in swales.	4.5 (e) .....Ditch blocks in roadside swales shall have a minimum height of 12-inches and shall not be constructed of earth.	11.3 Swales - (f) Ditch blocks in roadside swales shall have a maximum height of 12-inches. Ditch blocks shall be constructed of 3000 psi concrete.

The changes reduce the acceptable spread for all roadways, except interior subdivision roadways, to six feet from the flow line of the curb from one lane. This is in conformance with the Transportation Department's requirements and a simplification of FDOT's standards. The new language also specifies the width to use if curb and gutter is not used.	4.5 (h) Stormwater Spread in Traveled Lane - Inlets shall be spaced at all low points, intersections and along continuous grades so as to prevent the spread of water from exceeding tolerable limits. The acceptable tolerable limits for multilane arterial and collector roadways is defined as one traveled lane width. The acceptable tolerable limit for interior subdivision roadways is defined as the seven feet from the face of the curb if curb and gutter are used.	11.5 Stormwater Spread into Traveled Lane - Inlets shall be placed at all low points and along continuous grades as to prevent the spread of water from exceeding tolerable limits. (a) The acceptable limit for all roadways is four feet from the flowing of the curb if curb and gutter are used. Design per FDOT Drainage Handbook for Storm Drains.
	<b>STORM SEWER &amp; CULVERT DESIGN</b>	<b>STORM SEWER &amp; CROSS DRAIN DESIGN</b>
Adds the requirement that all pipe ends must have end treatments and expands the types of end treatments allowed.	4.6 (i) All pipe outlets shall have headwalls or mitered end sections.	12.8 End Treatments - All pipe inlets and outlets shall have end treatments such as; headwalls, mitered end sections, or flared end sections. Other end treatments require approval by the Department.
	<b>OPEN CHANNEL DESIGN</b>	<b>CHANNEL DESIGN</b>
The changes drop the differentiation between bare soil types and adds the staked sod and rip rap categories.	4.7(e) Maximum Allowable Velocities for Unlined Open Channels on Bare Soils. Silt or Fine Sand, 1.50 fps; Sandy Loam, 1.75 fps; Silt Loam, 2.00 fps; Firm Loam 2.50 fps; Stiff Clay, 3.57 fps; Hardpans, 6.00 fps. (f) Maximum Allowable Velocities for Lined Open Channels. Sod, 4.0 fps; Concrete Ditch Paving, 10.0 fps.	13.1 Maximum Allowable Velocities for Channels - Soil, 1.5 fps; Sod, 4.0 fps; Stake Sod 5.0 fps; Rip Rap 6.0 fps; Rigid, 10.0 fps.
Allows minor channels to have only 0.5 feet of freeboard versus 1.0 ft for all other channels.	4.7 (j) Minimum Freeboard - A minimum freeboard of 1.0 ft shall be maintained between peak water surfaces designed from Section 4.1 and the top of slope for all open channels.	13.4 Minimum Freeboard - A minimum freeboard of 1.0 ft shall be maintained between the design high water level and the top of slope for all channels. Minor channel systems can be reduced to 0.5 feet of freeboard.
Changes the slope treatment for slopes steeper than 3:1 and removes the requirement of Department approval.	4.7 (l) Erosion Protection - All open channels shall be seeded or sodded for erosion and silt control. If side slopes are steeper than 5:1 they must be sodded. Side slopes steeper than 3:1 may only be used with Reviewer approval.	13.5 Erosion Protection - Disturbed areas shall be treated as follows, except channel bottoms which are continuously wet or areas which have other treatment specified: (a) Slopes flatter than 5:1 shall be seeded and mulched or hydro seeded. (b) Slopes from 5:1 to 3:1 shall be sodded. (c) Slopes from 3:1 to 2:1 shall be stake sodded. (d) Slopes steeper than 2:1 shall have engineered lining applied.
	<b>EXFILTRATION SYSTEMS</b>	<b>EXFILTRATION SYSTEMS</b>
Sections (c), (d) and (e) add guarantees that the exfiltration system will be properly maintained and operated for the long-term.	4.8 Exfiltration trenches may only be used with the approval of the Reviewer. The feasibility of long term maintenance and effectiveness must be demonstrated to the satisfaction of the Reviewer.	14. (a) Exfiltration trenches must meet the requirements of the SJRMWD and may only be used with the approval of the Department. (b) Exfiltration systems are discouraged, except in highly permeable soils. (c) Proposed systems must provide an operation and maintenance manual and additional assurances of a responsible entity and adequate funding for regular maintenance. (d) The maintenance criteria must be added to the HOA documents. Recorded copies of the HOA documents with the operation and maintenance manual specific to the system must be provided. (e) The operation and maintenance manuals must include a certification signed by the property owner stating: " I hereby verify that I have read the operation and maintenance manual and understand the maintenance requirements of the treatment system for the above referenced project. I understand that failure to maintain the system in working order will result in fines as described in Section 62.3754 of the Brevard County Code."
	<b>EROSION &amp; SEDIMENT CONTROL</b>	<b>EROSION &amp; SEDIMENT CONTROL</b>
A new ordinance specifically addressing erosion & sediment control is being created concurrently with the revised Stormwater Criteria; therefore, the language within the stormwater criteria has been removed.	All of section 6.0 Erosion and Sediment Control for construction has been moved to the new Construction Waste, Sediment and Erosion Control Ordinance.	

	MAINTENANCE ENTITY	STORMWATER FACILITIES MAINTENANCE
<p>The 2nd paragraph clarifies the property owner's (s') responsibility if another maintenance entity doesn't exist. (b) The 3rd paragraph specifies that the deed restrictions will include language pertaining to the long-term maintenance and operation of the system. (c) The 2nd sentence of the 4th paragraph makes clear that alteration or failure to maintain the system is a violation. (d) The last paragraph clarifies the County's right to remedy deficiencies at the violator's expense. (d) The warning in the original stormwater utility mitigation credits may be revoked has been removed as redundant and counter productive to the mitigation credit program. (e) This language clarifies the County's right to remedy deficiencies at the violator's expense.</p>	<p>7. Maintenance of stormwater management systems is the responsibility of the maintenance entity. A maintenance entity must be established to maintain the stormwater system. The maintenance entity shall meet the requirements of the SJRWMD rules (Chapter 40C-42 F.A.C. as may be occasionally amended) regardless of whether a SJRWMD permit is required or not. The maintenance entity shall maintain the stormwater management system so that it functions according to the original design intent. Stormwater management systems which are improperly maintained s determined by the Surface Water Improvement Division may be subject to having their stormwater utility mitigation credits revoked and the maintenance entity may be subject to the penalties set forth in this ordinance.</p>	<p>17. (New 2nd ¶) In the event a maintenance entity has dissolved, cannot be contacted, or was never created, the property owner(s) shall be the maintenance entity. Deed Restrictions shall include provisions for maintenance of the stormwater treatment system in accordance with the approved plans and plat, as applicable. (New 3rd ¶) Deed restrictions shall include provisions for maintenance of the stormwater management system in accordance with the approved plans and plat, as applicable. (New 4th ¶) All parts of the stormwater management system affecting discharge to the County's MS4 or to waters of the State shall be operated and maintained so as to function in accordance with permitted design, or performance criteria, and in compliance with federal, state, or local permit conditions and regulations. Facilities, structural controls, and other BMPs found to be altered, or not maintained in accordance with permitted design or performance criteria, are in violation of these criteria.</p> <p>(New 5th ¶;) Should the maintenance entity fail to maintain or restore a deficiency within an established deadline, the work may be performed by a designated governmental agency or a contractor and the expense for the said repairs will be charged to the maintenance entity.</p>
<p>This new section provides exemption to the vegetation maintenance criteria for older systems (not design to a specific criteria), natural areas, and areas which were designed with heavy vegetation taken into account.</p>		<p>Stormwater management systems which were not designed and constructed to meet specific storage requirements, and where stormwater was directed to an existing lake, borrow pit, or wetland area which is providing treatment, are exempt from maximum vegetation coverage limits. For stormwater management systems which were designed to include natural vegetated dry retention areas in combination with swales, wet ponds, or other treatment methods, the natural vegetated areas are exempt from the maximum vegetation coverage limits, as long as the other areas (swales, wet ponds etc.) are maintained.</p>
<p>Lawn chemicals, including fertilizers, herbicides, and pesticides, which are detrimental in general, to water quality and the overall health of aquatic systems. This new section bans the direct application of these chemicals of water unless specifically allowed by law.</p>		<p>17.2 General Maintenance - All exposed ground surface areas of the stormwater management system shall be maintained to prevent erosion, either through vegetative coverings or surface armoring. All portions of the stormwater management banks, berms, and/or dikes shall be maintained at, or above, design elevations to prevent discharge at any location other than the designed outfall point through the outfall structure(s). All stormwater management systems shall be inspected and trash and debris removed at least annually. Lawn chemicals shall not be applied directly to water, including, but not limited to ponds, canals, and streams, except as allowed by state, federal, and county law.</p>
<p>This section ensures that wet ponds will be maintained in a way that their capacity is not overly reduced by vegetation and that the vegetation is maintained in a proper manner.</p>		<p>17.4 Wet Ponds - Pond side slopes shall be stabilized or vegetated to prevent areas of wash outs and for erosion control. A minimum of 75 percent of the designed open water area of wet ponds shall be maintained, with no coverage by plant growth. Pond storage volume and geometry shall be maintained to the dimensions shown on the approved plans. Littoral zone coverage with wetland plants shall be maintained to SJRWMD standards. Planting of native vegetation at or near the shore/bank littoral zone is permitted and encouraged. Cattails are not considered a desirable species and should be removed when greater than 25 percent coverage is present. Vegetation shall be mowed frequently enough to provide access to the ponds for inspections and maintenance. Debris from vegetation control shall not be discharged into or disposed of in the pool area of the pond.</p>

<p>This language specifies that cleaning accumulated sand and debris and excess vegetation from the system is part of maintaining the stormwater management system.</p>		<p>17.7 Dry Ponds, Swales, and Channels - Vegetation in dry ponds and conveyance systems shall be maintained so as to maintain flow and storage capacities. Debris from vegetation control shall not be discharged into or disposed of within the banks of ponds or conveyance systems. Planting of native vegetation at or near the shore/bank littoral zone of wet conveyance systems is permitted and encouraged. Cattails are not considered a desirable species and should be removed when greater than 25 percent coverage is present. Dry ponds shall have no more than 25 percent coverage by plant growth (excluding approved vegetation). Inlets or catch basins shall remain clear of debris or vegetation obstructing flow or restricting capacity of such structure. Accumulated sand or debris must be removed periodically from inside catch basins, storm drains, spillways, and conveyance pipes.</p>
<p>This section specifies that maintenance of fences is considered part of maintaining the system.</p>		<p>17.9 Fences - When fences are installed they shall remain free of breaks and cleared of excessive vegetation. Gates shall be maintained in operating condition.</p>
<p>Stormwater facilities are meant to be used for stormwater. Any other use contributes to the pollution of Brevard County waters and/or waters of the State. Many of the prohibited wastes also interfere with the proper functioning of the system to the detriment of general public.</p>		<p>17.10 Waste Disposal Prevention No part of the stormwater facility shall be used for the disposal or storage of trash, debris, yard waste, fill materials, top soil, or any other solid or liquid wastes not generated by a rainfall event, except as listed below.</p>
		<p><b>INSPECTION AND MONITORING FOR COMPLIANCE</b></p>
<p>New section added to allow County personnel access to all stormwater management systems that discharge to the County's MS4 or surface waters of the state and the possible consequences for failure to do so.</p>		<p>County personnel shall be granted access for inspection of facilities discharging or suspected of discharging to the County's MS4 or surface waters of the State in order to effectuate the provisions of this ordinance and to investigate violations or potential violations of any of the terms herein. All structures and processes, which allow discharges to the County's MS4, as well as records concerning them, shall be made accessible to County personnel for this purpose. The maintenance entity of a facility discharging stormwater is in violation of these criteria, if the maintenance entity denies County personnel reasonable access to the premises. If County personnel have been refused access to any part of the premises and are able to demonstrate probable cause to believe that there may be a violation of this ordinance, or to protect the overall public health, safety, and welfare of the community, then the County may seek issuance of a search warrant from any court of competent jurisdiction.</p>
<p><b>EXHIBITS</b></p>	<p><b>EXHIBITS</b></p>	<p><b>EXHIBITS</b></p>
<p>Removed references to calculations, formulas, etc. Added maps showing general locations of the current SASC.</p>	<p>Previous exhibits removed.</p>	<p>Exhibit "A-1" for SASC.</p>