

TO: ALL BUILDING DIVISION PERSONNEL
FROM: DOUG WISE
DIVISION DIRECTOR IV
PREPARED BY: BUILDING DIVISION
SUBJECT: REGULATION OF LOT FILLING AND GRADING ACTIVITY
PPM #: PB-O-128

ISSUE DATE
August 17, 2018

EFFECTIVE DATE
August 11, 2022

PURPOSE:

To preserve existing and historical compliant drainage conveyance on developed and undeveloped lots of record outside of platted subdivisions with a master storm water management system. The regulations also serve to prevent adverse impacts and loss of storage capacity caused by unregulated fill activities within or outside a local drainage area, to protect the quality of the county's surface water resources, and preserve existing natural resources. To establish policy and procedure to allow reasonable on-site fill in compliance with Federal, State and County regulations.

UPDATES:

Future updates to this PPM are the responsibility of the Director of the Building Division, Deputy Building Official, Assistant Deputy Building Official, or Codes Product & Training Supervisor, under the authority of the Director of the Building Division.

AUTHORITY:

- Palm Beach County Amendments to the Florida Building Code, Building Volume, Chapter 1, Administration, Section 105.1 and 110.9 (PBC Building).
- ULDC Art. 11 – Subdivision, Platting and Required Improvements (PBC Land Development)
- ULDC Art. 14 - Environmental Standards (PBC ERM)
- ULDC Art. 15 – Health Regulations (FL DOH)
- ULDC Art. 18 – Flood Damage Prevention (PBC Building)
- Palm Beach County Code of Ordinances Section 27 Article VII – Storm Water Pollution Prevention - NPDES (PBC ERM & FL DEP)
- Water Resources – Florida Statutes Chapter 373 Part IV – Management and Storage of Surface Waters (SFWMD & FL DEP)
- Code of Federal Regulations (CFR) Parts 59 & 60 - NFIP (PBC Building)
- Section 404 of the United States Clean Water Act – US EPA (US ACOE)
- Local Water Control District Regulations (Various)

DEFINITIONS:

Minor Fill – A maximum of 20 cubic yards placed during any 24 month period for developed property maintenance.

Site Development Permit – a permit issued by the Building Division to facilitate compliant floodplain alterations, lot fill, or other infrastructure intended to facilitate future development.

Developed property maintenance – Landscaping, gardening, driveway maintenance, walkways, and recreational equipment.

Clean Fill – clean fill includes brick, concrete, dirt, top soil, gravel, sand, rubble, and cement. Clean fill does not include: Organic or biological waste including food or yard waste, Metals, Plastics, Cardboard, contaminated soil, asphaltic materials, glass, fiberglass, hazardous household waste such as but not limited to chemicals, appliances, tires, or electronics. Clean fill shall not contain any permitted materials larger than 3 inches in any dimension and the resulting aggregate shall be differentiated so as to result in a uniform soil matrix capable of supporting a building foundation.

Residential building area – the fill area that contains the house, garage, septic tank, and drain field and any pool and patio.

SFWMD Water Management System (WMS) – A SFWMD permitted master WMS (e.g., PUD, planned subdivision, etc.) shall mean a stormwater management system that meets all the SFWMD criteria in the Applicant’s Handbook, Volume II and has a storage capacity that is designed to accept runoff from the development, usually into a master lake system. The development has a storm sewer or swale/ditch system that conveys runoff to the storage system. The storage system has a discharge structure that regulates discharge to the outfall. Canal networks within local drainage entities do not typically provide adequate storage for flood prevention. Therefore, local drainage entities that are primarily drained by a canal network are not considered storage systems for the purposes of these regulations.

POLICY:

Placement of fill shall be strictly limited to:

1. Fill needed to facilitate the construction of a new structure placed subsequent to the issuance of a building permit by the Building Division.
2. Fill authorized under a valid site development permit issued by the Building Division.
3. Minor fill being placed for developed property maintenance purposes, i.e., landscaping, gardening, existing driveway maintenance, exclusive of drainage easements or designated wetlands.
4. Fill being placed pursuant to an approved Drainage Review by the Palm Beach County Land Development Division (Article 11, ULDC) or the Palm Beach County Building Division.
5. Fill being placed in accordance with an approved South Florida Water Management District Permit (SFWMD) or other Local Drainage District permit.
6. Fill being placed in accordance with an approved permit from the US Army Corps of Engineers (USACOE), a Florida Department of Transportation project, or a federal project located on federal or state lands.
7. Fill being placed in accordance with an approved permit from the Florida Department of Environmental Protection (DEP) or the Palm Beach County Environmental Resource Management Division (ERM).

This policy strictly prohibits:

1. Unauthorized property filling operations.
2. Excessive amounts of fill that may cause adverse effects of uncontrolled runoff from proposed development onto surrounding properties.
3. Use of organic or biological waste including food or yard waste, metals, plastics, cardboard, contaminated soil, asphaltic materials, glass, fiberglass, hazardous household waste such as but not limited to chemicals, appliances, tires, electronics or any other material which does not constitute clean fill as defined above.

PROCEDURE:

No property filling operation shall take place except as authorized in the Policy section of this PPM. Minor fill as defined in definitions and as listed in the policy section shall be exempt from review and permitting by the Building Division, but shall consist entirely of clean fill (as defined above) and shall not include new lot improvements or new development activity. All other filling operations, including pond filling, shall require a site development permit prior to placement of fill. All site development permits shall require in progress and final inspections to ensure compliance with all applicable regulations.

Permits for fill activities may be required by multiple agencies having jurisdiction over the site and project in question. For example, Palm Beach County Building Division takes primary jurisdiction on all fill activities on single parcels less than 10 acres in size. Palm Beach County ERM takes jurisdiction on all clearing of native vegetation, unless exempted by the ULDC, Article 14.c.7.c.8, and the review of site fill activities on parcels with proposed development uses specified in ULDC Article 14.c.7.c, and more specifically; multi-family residential lots over two units, commercial or industrial projects, construction of utilities, road right-of-way projects, canals, schools, government projects, agricultural uses ten acres in size or greater, projects requiring DRO review, and other construction unless exempted by Article 14.c.8.

SFWMD also takes jurisdiction on projects greater than 10 acres in size, but may elect to take jurisdiction on smaller sites. FL DEP takes jurisdiction on designated wetlands and requires NPDES compliance, all fill operations affecting more than one acre shall also comply with National Pollutant Discharge Elimination System (NPDES) regulations (Section 27, Article VII, PBC Code) for projects that disturb more than one (1) acre of soils. Local water management districts may elect to regulate activities within their jurisdictional boundaries, and Palm Beach County Land Development Division or Building Division takes jurisdiction for permitting all new subdivisions and for Drainage Reviews.

1. Application Procedure:

- a. Property Owners intending to fill portions of individual lots less than ten acres in size shall file appropriate documentation with the Building Division and obtain a Site Development permit.
 - i. If the fill is in conjunction with an issued Building permit for a commercial project, which has received an approved Drainage Review by the Land Development Division or the Building Division, no other action is required.
 - ii. If the fill is in conjunction with an issued Building Permit for a residential property, and is being placed in compliance with the approved plan on file with the Building Division no other action is required.
 - iii. All applications filed with the Building Division shall contain documentation sufficient to demonstrate the proposed fill activity will satisfy all criteria set forth in

the policy section, will not detrimentally impact surrounding properties, and will satisfy all Federal, State and County Regulations. This will require engineering drawings and signed and sealed storm water storage/stage calculations to confirm there will be no adverse impacts.

- iv. Applications filed for fill activity sited in a Special Flood Hazard area (SFHA) shall be required to provide signed and sealed stage-storage calculations and engineered analyses to demonstrate no detrimental impact to surrounding properties, by use of compensatory storage, or other approved method.
- b. For those fill projects involving new subdivision development with an engineered master storm water system, a Land Development permit or a Building Division site development permit shall be required prior to commencement.
 - i. This is in addition to any SFWMD permit and/or local drainage district permit which may also be required
 - ii. New subdivision development located within a Special Flood Hazard Area (SFHA) shall also require review and approval by the County Floodplain Administrator and must comply with Article 18 ULDC and CFR 60.
- c. Prior to commencement of any site work a Notice of Intent shall be filed with the Florida Department of Environmental Protection for all projects that will disturb one (1) acre or more of soil. Larger projects must meet additional criteria as established by Federal and FL DEP rule.
- d. All applicants should contact their local water control district prior to commencement of any filling activities, to ascertain their specific permitting requirements and rules, if any.
- e. For those fill projects involving designated wetlands, FL DEP authorization is required in advance. All parties shall contact FL DEP to identify designated wetland areas.
- f. Prior to commencement of any site filling, a site development permit from the Building Division shall be obtained.
- g. A signed and sealed copy by a Florida licensed surveyor of a topographic survey map of the existing lot shall be included in every submittal.

2. General Requirements for Single-Family Lot Filling, Draining and Grading

Absent an approved building permit to construct a structure that contains an approved site drainage plan, a site development permit is required for filling, grading and constructing drainage. Additionally, a separate lot-clearing permit may be required by the appropriate agency including, but not limited to, ERM, DEP, and the Zoning Division.

For all undeveloped lots that are not within a development that has a SFWMD permitted master WMS the following criteria applies. Single-family lots within this type of development do not convey runoff to a storage system, but instead drain into a local drainage entity canal, ditch, swale, or pipe. Historically, there is not sufficient regional storage within the development to handle storage for all the improved lots.

The following general criteria shall be met in establishing a filling, grading and drainage plan for all single-family lot, unless the Building Division and the local drainage entity jointly approve a different drainage plan design in advance of the application. The plan shall demonstrate:

- a. Protection of the surrounding properties from adverse impacts due to uncontrolled runoff from the proposed lot improvement, and

- b. Preservation of existing storm water storage on the lot. To facilitate these outcomes, the plan shall provide compensation for lost storage on the lot from fill placed within the residential building area. Sample calculations are provided as a guide at the end of this policy.

Projects that have a permitted SFWMD master WMS as defined above shall have a design that incorporates:

- a. The lot graded from the back of the lot to the constructed storm water system that conveys runoff to the constructed WMS.
- b. A berm/swale system on all lot lines except the lot line adjacent to the roadway to protect the adjacent lots from being impacted from the runoff generated by a 3-year 24-hour storm.
- c. Calculations submitted as part of the permit application to demonstrate adjacent properties have been protected.

3. Specific Requirements for Single-Family Lots 1.0 Acre or Less, Not Located in a SFWMD Permitted Master Storm water Management (SWM) System

General Criteria

- a. The design shall incorporate a swale/berm along the back property line with a high point located in the middle of the swale along the back property line.
- b. The design shall incorporate a swale that shall be sloped from the high point to the side property line on both sides. The swale will then turn and continue toward the front property line. The side yard swale shall connect to the average elevation of the top of the bank and the bottom elevation of the local drainage entity outfall ditch or swale within the local drainage entity road.
- c. The design shall incorporate a proposed bottom elevation starting at the high point and shown every 50 feet along the swale, including the local drainage entity road swale or ditch.
- d. The design shall incorporate a dry detention area large enough to hold the runoff from a 3-year 24-hour storm event on the site adjacent to the local entity roadway swale to provide additional storage within the community.

Swale/Berm Section

- a. The swale/berm typical section shall be shown on the submitted construction drawings.
- b. The grade for all swales shall be 0.3%, unless a different grade is jointly agreed to by the local drainage entity and the Building Division.
- c. The design shall incorporate a berm along all sides of the property (except the front) to prevent flow from a 3-year 24-hour storm event onto adjacent property.
- d. The grading scheme for the lot filling shall also include a dry detention area that stores lot runoff from a 3-year 24-hour storm event or large enough to limit the peak flow to the discharge that is allowed by the local drainage entity that is accepting the discharge.
- e. The dry detention area shall have a bleed down swale that is connected to the local drainage entity outfall ditch or swale in the road at the average elevation of the top of bank and bottom elevation of the local drainage entity outfall or swale.
- f. The bottom elevation of the dry detention area shall be between six inches and one foot below that of the bleed down swale elevation.
- g. As part of the fill application, signed and sealed calculations and drawings shall be submitted by an appropriate Florida licensed professional that demonstrates the storage requirements are met and demonstrates the swale system capacity is sufficient to meet the local drainage entity allowable discharge rate.

Utility Sewer System

It is assumed that all lots within this type of subdivision will have a drain field and septic tank, but there may be lots that are connected to a utility sewer system. If the lot has a house and septic tank with drain field, then the proposed residential building area shall have the minimum amount of fill and at an elevation needed to meet Health Department criteria. This area of fill shall then be sloped at 4' horizontal to 1' vertical to meet natural grade.

4. Specific Requirements for Single-Family Lots Greater than 1.0 Acre, Not Located in a SFWMD Master SWM System

General Criteria

- a. The design shall incorporate a swale/berm along the back property line with a high point located in the middle of the back property line or along a line that is between the toe of slope of the proposed residential building area and the back property line.
- b. The design shall incorporate a berm along all sides of the property (except the front) to prevent flow from a 3-year 24-hour storm event onto adjacent property.
- c. The swale/berm typical section shall be shown on the submitted construction drawings.
- d. The swale along the back property shall have a high point located in the middle of the swale at middle of the back property.
- e. The swale shall be sloped from the high point to the side property line on both sides. The swale will then turn and continue toward the front property line. The side yard swale shall connect to the average elevation of the top of the bank and the bottom elevation of the local drainage entity outfall ditch or swale within the local drainage entity road.
- f. The grade for all swales shall be 0.3%.
- g. There shall be a proposed bottom elevation starting at the high point and shown every 50 feet along the swale. An elevation shall be included for the top of bank and the bottom elevation of the local drainage entity road swale or ditch on the on the submitted topographic survey.
- h. The design shall incorporate a dry detention area large enough to hold the runoff from a 10-year 24-hour storm event on the site adjacent to the local entity roadway swale to provide additional storage within the community.

Grading Scheme for Lot Filling

- a. The grading scheme for the lot filling shall also include a dry detention area that stores the equivalent volume from the lot runoff for a 10-year 24-hour storm event.
- b. The dry detention area shall have a swale that bleeds down the dry detention area into a swale that connects to the outfall ditch or swale of the local drainage entity. The bleed down swale shall be large enough to bleed down the dry detention area to the bleed down swale elevation within 2 days.
- c. The bottom elevation of the dry detention area shall not be more than six inches below that of the bleed down swale elevation.
- d. As part of the fill application, signed and sealed calculations and drawings shall be submitted by an appropriate Florida licensed professional that demonstrates the storage requirements are met and demonstrates the swale system capacity is sufficient to meet the local drainage entity allowable discharge rate, if it is necessary.
- e. Should the maintenance and operation entity be a Home Owners' (HOA) or Property Owners' Association (POA), the applicant shall provide documentation acceptable to the Floodplain Administrator from the responsible entity authorizing the connection and providing any

specific criteria pertaining to connections to their water management system they may have before submitting the application to the Palm Beach County Building Division.

- f. The portion of the lot that will contain the proposed residential building area shall be the minimum amount of fill needed to meet Health Department criteria. This area of fill shall then be sloped at 4' horizontal to 1' vertical to meet natural grade. The area between the toe of slope for the above mentioned residential building area shall remain at natural grade, unless an alternative grading scheme is approved.

5. Additional Fill for Existing Lots

- a. In the event an existing lot already has an existing residential building area and the applicant wishes to bring additional fill onto the property under a new permit for lots greater than 1.0 acre, the following criteria shall be met.
- b. The grading scheme for the additional fill area shall include a dry detention area that stores the equivalent volume from the lot runoff for a 10-year 24-hour storm event for the additional fill area.
- c. The proposed fill area shall be the minimum amount of fill needed for the proposed intended land use, such as, a shed, garage, beehive, pool and deck, etc.
- d. The grading scheme shall also include the construction of a berm that prevents runoff from flowing onto the existing property from the additional filled area.
- e. The dry detention area shall have a swale that bleeds down the dry detention area into a swale that connects to the average elevation of the top of the bank and the bottom elevation of the local drainage entity outfall ditch or swale within the local drainage entity road.
- f. The grade for all swales shall be 0.3%.
- g. The bottom elevation of the dry detention area shall be between six inches and one foot below that of the bleed down swale elevation.
- h. There shall be a proposed bottom elevation starting at the high point and shown every 50 feet along the swale, an elevation shall be included for the top of bank and the bottom elevation of the local drainage entity road swale or ditch on the submitted topographic survey.
- i. Should the maintenance and operation entity be a Home Owners' (HOA) or Property Owners' Association (POA), the applicant shall provide documentation acceptable to the Floodplain Administrator from the responsible entity authorizing the connection and providing any specific criteria pertaining to connections to their water management system they may have before submitting the application to the Palm Beach County Building Division.
- j. Signed and sealed calculations and drawings by an appropriate Florida licensed professional shall be submitted as part of the fill application that demonstrates the storage requirements are met and the berm is high enough to prevent flow onto adjacent property during the appropriate storm event.
- k. Applications to fill existing ponds shall include calculations to demonstrate that the storage capacity of the existing pond is being maintained somewhere else on the subject site. The site plan shall show the size and location of the storage area that is being constructed as compensating storage.

6. Inspection and Certification Procedure for Building Division Fill Permits:

- a. All projects permitted by the Building Division shall require inspection and/or certification to confirm that proposed fill has been placed in accordance with the approved documentation filed with the permit.

- b. County staff may require as-built certifications, topographical surveys, grade stakes, or other means as necessary to verify conformance with all applicable regulations and the approved plans.
- c. County staff may also require “in-progress” inspections as necessary to verify the fill materials being placed fully comply with the definition of clean fill (above). Any fill material that is placed prior to inspection that is found not in compliance may be ordered to be removed from the site.
- d. At the time of final inspection, if applicable, County staff will also require proof of acceptance of the completed work from all other regulatory agencies governing the project, including, but not limited to SFWMD, DEP, USACOE, and local water control districts.

7. Violation Procedure:

- a. Violations of this policy may be subject to Code Enforcement citation under Florida Statute 162 for violations of Section 105.1, 110.9 and Article 18 of the ULDC, and Code Enforcement PPM # PE-O-020 in addition to any other enforcement actions available to the County and other agencies having jurisdiction.



Doug Wise, Building Director

Supersession History:

- 1. PPM# PB-O-0128, issued August 17, 2018
- 2. PPM# PB-O-0128, effective November 26, 2019
- 3. PPM# PB-O-0128, effective July 8, 2022
- 4. PPM# PB-O-0128, effective August 11, 2022

SELECTED CODE REFERENCES:

Florida Building Code, Chapter 1 excerpts:

105.1 Required. Any contractor, owner or owner’s authorized agent in accordance with Florida Statute Chapter 489 who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building, tenancy or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace any impact-resistant coverings, electrical, gas, mechanical or plumbing, fire protection systems, accessible elements, flood resistant elements, site drainage elements, the installation of which is regulated by this code or Article 18 of the ULDC, or to cause any such work to be done, shall first make application to the building official and obtain the required permit.

110.9 Impact of construction. All construction activity regulated by this code shall be performed in a manner so as not to adversely impact the condition of adjacent property, unless such activity is permitted to affect said property pursuant to a consent granted by the applicable property owner, under terms or conditions agreeable to the applicable property owner. This includes, but is not limited to, the control of dust, noise, water or drainage runoffs, debris, and the storage of construction materials. New construction activity shall not adversely impact legal historic surface water drainage flows serving adjacent properties, and may require special drainage design complying with engineering standards to preserve the positive drainage patterns of the affected sites. Accordingly, developers, contractors and owners of all new residential development,

resulting in a significant decrease of permeable land area on any parcel or has altered the drainage flow on the developed property shall, as a permit condition, provide a professionally prepared drainage plan clearly indicating compliance with this paragraph. Upon completion of the improvement, a certification from a licensed professional, as appropriate under Florida law, shall be submitted to the inspector in order to receive approval of the final inspection.

Article 1 ULDC Definitions excerpts:

Special Flood Hazard Area (SFHA) – for the purposes of Art. 18, the land area subject to flood hazards and shown on a Flood Insurance Rate Map or other flood hazard map as Zone A, AE, A1-30, A99, AR, AO, AH, V, VO, VE or V1-30. . [Ord. 2004-013] [Ord. 2017-026]

Flood Hazard Area - for the purposes of Art. 18, the greatest of the following three areas: [Ord. 2017-026]

- a. The area within a floodplain subject to a one-percent or greater chance of flooding in any year. [Ord. 2017-026]
- b. The area designated as a Flood Hazard Area on the community’s flood hazard map, or otherwise legally designated. [Ord. 2017-026]
- c. The area developed into Building sites without a master-engineered storm water drainage plan. [Ord. 2017-026]

Article 18 excerpts (applies to all sites not located within a Master Storm Water Drainage System, not just Special Flood Hazard Areas):

Grading and Earth Fill

1. Grading

On all new, permitted construction, regardless of flood-zone designation, grading shall keep all rainfall and runoff flow on the Building site, until discharged into the roadway drainage system or to public drainage ways adjacent to the property lines. Berms shall be constructed along lot lines, if necessary, to prevent storm water flow directly onto adjacent properties. Erosion sedimentation off the Building site shall be controlled until vegetative cover is established. The Floodplain Administrator require grading plans showing pre-construction and proposed finish earth grades.

2. Earth Fill

On all New Construction, earth fill brought onto the site of construction from another site shall be minimized to maximize existing floodwater storage capacity. Maximum volume of imported fill shall be limited to that necessary to raise an earth pad to elevate the slab-on-grade not more than six inches above minimum floor elevation set in this Article, with side slopes of the pad of 1:5 to 1V:4H starting ten feet from the slab edges.

3. Fill in Zone V

Structural fill shall not be utilized in Coastal High Hazard Areas (Zone V).

4. Lot and Building Site Drainage

Site grading immediately adjacent to the perimeter of each Building constructed as slab-on-grade shall be sloped so as to drain or direct water away from the Structure. The runoff shall be directed to a swale or detention area that prevents runoff from adversely impacting adjacent properties.

5. Exceptions from the Requirements in this Section

- a. Only on Building sites requiring raised septic mounds to PBC Health Department minimum elevations, will additional volume of fill be allowed to construct the mound;
- b. Earth fill dug from an on-site excavation shall be unregulated if in accordance with the regulations in the ULDC, and provided finish grade directs lot drainage back into the excavation;

- c. Any volume of fill for placement inside the perimeter foundation walls to raise an interior concrete slab to any higher elevation shall be allowed;
 - d. Fill shall be permitted to raise earthen berms on side property lines to prevent drainage onto adjacent lots, provided said berms have side slopes of 1:5 to 1:3, with a triangular cross section;
 - e. Fill shall be allowed inside retaining walls for Building access ramps or driveway ramps required by the American Disabilities Act (ADA);
 - f. Fill necessary to direct on-site drainage to the public roadway or drainage system may also be permitted;
 - g. Minimum fill for sites that have sloping topography that do not store floodwater shall be permitted.
- Any fill in excess of this minimum grading requirement shall be subject to approval of the Flood Damage Prevention Board as a Variance;
- h. Fill necessary for critical facilities and public service Buildings; and
 - i. Areas included within a South Florida Water Management District permit shall be filled and graded in accordance with the fill and grading design conditions identified in said permit even when elevations are more than six inches above the minimum floor elevation set in Art.18.D.5.A.2.

RESPONSIBLE AGENCY CONTACT INFORMATION:

Local Drainage Districts:

Lake Worth Drainage District 561-498-5363

Indian Trail Improvement District 561-793-0874

Northern Palm Beach County Improvement District 561-624-7830

South Indian River Water Control District 561-747-0550

Other Regulatory Agencies:

Florida Department of Environmental Protection 850-245-2465

Florida Department of Health 850-245-4444

South Florida Water Management District 561-686-8800

United States Army Corps of Engineers 561-683-0498

Palm Beach County Agencies:

Environmental Resource Management 561-233-2400

Land Development Division 561-684-4090

Building Division 561-233-5000

**Sample Calculations for Lot Filling
1.25 Acre Lot**

Lot Size: 1.25 acres x 43,560 sq. ft./acre = 54,450 sq. ft.

54,450 sq. ft. = 233' x 233'

Less 30' Road Easement on One side (if needed) = 203' x 233' = 47,300 sq. ft.

Pool & Patio = 50' x 30' = 1500 sq. ft. (assume not included in residential building area)

10 yr. -24 hr. Rainfall = 7" (ITID & SIRWCD)

Assume 4' Depth to Water Table with about 15% Impervious

Impervious Area = 47,300 sq. ft. x 15% = 7100 sq. ft. + 1500 sq. ft. = 8600 ft.

Pervious Area = 47,300 – 8600 = 38,700 sq. ft.

Available Soil Storage = Soil Storage Available with no compaction x % pervious area

Assume Pine Flatwoods where S = 9.0" S = 9.0" x 38,700 sq. ft./47,300 sq. ft. = 7.4"

SCS Runoff Formula: $Q = \frac{(P-0.2S)^2}{P + 0.8S}$ where Q = Runoff rate in inches and S = Soil Storage in inches
P = Rainfall Amount in inches

Developed Runoff Rate: $Q = \frac{(7-[0.2 \times 7.4])^2}{7 + (0.8 \times 7.4)} = \frac{(7-1.5)^2}{7+5.9} = \frac{30.25}{12.9} = 2.3''$

Runoff Volume = Runoff Rate x Site Area = 2.3" x 47,300 sq. ft. x 1 ft./12 in. = 9065 cf

Assume 1.0" per day discharge = 27 CSM/640 = 0.42 cfs/acre

Total Req'd Storage = Runoff volume – Discharge volume

= 2.3" – 1.0" = 1.3" x 47,300 sq. ft. x 1 ft./12 in. = 5124 cf

Dry Detention Area Required: (1) 55' x 55' x 0.5 ft. deep = 1512 cf

(2) 70' x 65' x 0.5 ft. deep = 2275 cf

(3) 50' x 55' x 0.5 ft. deep = 1375 cf

5162 cf > 5124 cf

Note: These sample calculations are based on a lot that is 1 ¼ acres in size and is assumed to be a square located in South Indian River Water Control District. Your lot size, configuration, and residential building area size may be different. Therefore, the designer will need to take that into consideration when calculating the size of the dry detention area needed to meet the criteria for the local drainage entity.

Another variable that will need to be taken into account is the type of soil which the lot contains. These calculations used the SFWMD soil storage chart for Pine Flatwoods, which make up the majority of the soils in western Palm Beach County. However, depending on where your lot is located you may need to adjust the calculations based on the type of soil on the lot.

Also, virtually all of ITID and SIRWCD have a 10-year 24-hour rainfall amount of 7". This amount was used in these sample calculations. The designer needs to verify the rainfall amount for the location of the lot in the area of

Palm Beach County in which it is located. The designer should also keep in mind that for lot sizes of one acre or less that are not part of a SFWMD permit subdivision with a master storm water management system will have a smaller required storage volume. The storage volume necessary to be stored in the dry detention area for this scenario will only be a 3-year 24-hour storm. Again, the designer will need to consult the SFWMD rainfall maps for the area in which the lot is located within Palm Beach County to obtain the correct rainfall amount.

Finally, the SCS runoff formula (used by SFWMD) can be used to calculate the required storage volume needed for the appropriate storm per that is in this PPM criteria. The sample dry detention area calculations assumed the depth to be no deeper than six inches, but the depth may be as much as one foot, if more storage is needed. The designer will need to take into account the Health Department regulations in determining the location of the dry detention area and swales in relation to the septic tank and drain field location. Also, the designer needs to keep in mind that the purpose of the dry detention area is to accept overflow runoff from the local entity roadside swale to lessen the flooding depth within the community. Therefore, the dry detention area needs to be located adjacent to the road right of way for easy access of the bleed down swale that connects the dry detention area to the roadside swale.

SAMPLE LOT CONFIGURATION
1 ¼ ACRE LOT
FF ELEV – 20.5' NGVD
N.G. ELEV – 15.5' NGVD

N.T.S.

