902.2. Stormwater Management Requirements

A. Intent and Purpose

It is the intent and purpose of this section to reduce existing and future flooding problems, improve surface water quality in the County, and protect the functions of natural features and surficial aquifer recharge.

B. Applicability

This section shall apply to all development where any portion of the development is within the jurisdiction of unincorporated Pasco County.

C. General Standards and Alternative Approaches

1. General Standards

The stormwater management methodologies and requirements shall be in accordance with this section.

The developer shall be responsible for obtaining any necessary permits for the stormwater management system required by local, State, or Federal agencies.

In addition to the specific standards of this section, stormwater management systems shall be designed to ensure:

a. Site alteration shall not contribute to water becoming a health hazard or encourage the breeding of mosquitoes;

b. The drainage area used in runoff calculation shall be the total watershed area, which may include areas beyond the site limits;

c. Flood, safety hazards, and health hazards are reduced; and

d. Groundwater recharge is enhanced where applicable; however, in an area designated as a groundwater recharge area, the developer shall limit runoff from the proposed site to no more than the predevelopment discharge.

2. Alternative and Innovative Approaches:

Alternative and innovative approaches to the design of water retention or detention structures and flow devices may be proposed.

If alternate and innovative stormwater management plans are proposed, it must be demonstrated to the satisfaction of the County Administrator or designee that the proposed development activity has been planned, designed, and will be constructed and maintained to meet each of the standards of this section.

D. Performance and Design Standards

To ensure attainment of the intent and purpose of this section and to ensure that standards will be met, the design, performance, construction, and maintenance of the drainage system shall be consistent with the following:

1. All new developments shall be required to provide a detention/retention system in order to detain/retain increased runoff caused by the development. Where public or private lakes, ponds, borrow pits, or similar type water detention/retention areas are incorporated in a comprehensive drainage plan, drainage calculations shall demonstrate that the facilities have sufficient capacity for the design storm. In the design of detention/retention facilities, the effective volume shall be based on the pond bottom or the seasonal high groundwater level, whichever is higher, as a minimum starting elevation of the stage/storage computations.

2. The rate of stormwater discharge from new developments shall be limited to amounts which are equal to or less than the rate of discharge which existed prior to development in accordance with Chapters 40D-4 and 40D-40, Florida Administrative Code (F.A.C.), in effect on December 29, 2011; provided, however, that Drainage Basins of Special Concern shall be subject to the requirements of this Code, Section 902.2.N.

3. The volume of stormwater discharge shall be in accordance with Chapters 40D-4 and 40D-40, F.A.C., in effect on December 29, 2011; provided, however, that Drainage Basins of Special Concern shall also be subject to the requirements of this Code, Section 902.2.N.

4. Protect or improve the quality of ground and surface water.

5. Maintain groundwater levels and enhance groundwater recharge where applicable.

6. Protect the wetlands for the storage of surface waters and the biological and physical reduction and assimilation of pollutants.

7. Prevent saltwater intrusion, where applicable, by adhering to Best Management Practices.

8. Prevent damages due to increased flooding.

9. Encourage the maintenance of the natural levels of salinity in estuarine areas.

10. Minimize adverse impacts to flora, fauna, fish, and wildlife habitats.

11. To otherwise further the objectives of this Code.

12. Channeling runoff directly into natural water bodies shall be prohibited, unless permitted by appropriate regulatory agencies. Runoff shall be routed through swales and other systems designed to increase time of concentration, decrease velocity, increase infiltration, allow suspended solids to settle, and otherwise remove pollutants.

13. Natural water courses shall not be dredged, cleared of vegetation, deepened, widened, straightened, stabilized, or otherwise altered without specific approval of the appropriate regulatory agencies. Water shall be retained or detained before it enters any natural water course in order to preserve the natural flow characteristics of the water course and to decrease siltation and other pollutants.

14. The area of land disturbed by development shall be as small as practicable. Those areas which are not to be disturbed shall be protected by an adequate barrier from construction activity. Whenever possible, natural vegetation shall be retained and protected.

15. No grading, cutting, or filling shall be commenced until erosion and sedimentation control devices have been installed between the disturbed area and water bodies, water courses, and wetlands.

16. Land which has been cleared for development and upon which construction has not been commenced shall be protected from erosion by appropriate techniques designed to revegetate the area.

17. The drainage system shall be designed so that sediment shall be retained on the site of the development.

18. Wetlands and other water bodies shall not be used as sediment traps.

19. Erosion and sedimentation facilities shall be regularly maintained to ensure proper function.

20. Artificial water courses shall be designed, considering soil type and side bank stabilization, so that the velocity flow does not cause erosion.

21. Vegetated buffer strips shall be provided or, where practicable, retained in their natural state along the banks of all water courses, water bodies, and/or wetlands.

22. Intermittent water courses, such as swales, shall be vegetated, except where flows exceed five (5) feet per second (fps), then they shall be concreted or otherwise sufficiently stabilized.

23. Although the use of wetlands for storing and purifying water is encouraged, care must be taken not to overload their capacity, thereby harming the wetlands and transitional vegetation. Wetlands should not be damaged by the construction of detention ponds.

24. Runoff shall be retained or detained on site, in accordance with the applicable SWFWMD Rules in effect on December 29, 2011.

25. Runoff from streets and parking lots shall be treated to reduce the quantity of oil and sediment entering receiving waters.

26. The banks of detention and retention areas shall slope at a gentle grade into the waters in accordance with the applicable County and SWFWMD Rules as a safeguard against drowning, personal injury, or other accidents, to encourage the growth of vegetation, and to allow the alternate flooding and exposure of areas along the shore as water levels periodically rise and fall.

27. The use of drainage detention and retention facilities and vegetated buffer zones as open space, recreation, and conservation areas shall be encouraged except where this Code is more stringent.

28. Development, including grading, shall take place in a manner that protects the roots and stability of trees.

29. General stormwater conveyance facilities include swales, ditches, channels, culverts, storm sewers, inlets, and weirs. The collection of stormwater runoff should be by positive gravity means without the use of siphons, pumps, or similar devices, unless specific approval is obtained.

30. Unless otherwise approved by the County, standard details and specifications for the construction of storm drainage systems shall conform to applicable sections of the latest editions of the following:

    a. Florida Department of Transportation (FDOT), *Roadway and Traffic Design Standards*, latest edition.

    b. FDOT, *Standard Specifications for Road and Bridge Construction*, latest edition.

E. System Designs (Frequency of Design Storms)

The drainage systems shall be designed for "design storms" resulting from rainfall of the following minimum frequencies:

1. Ten (10) Year: All storm sewers and culverts, except those crossing arterial roads. A minimum time of concentration of fifteen (15) minutes to the first inlet may be utilized in determining design flows.

2. Twenty-Five (25) Year/Twenty-Four (24) Hour: All floodways, ditches, channels, and detention/retention areas with outfalls (open drainage basin).

3. Fifty (50) Year: All storm sewers and culverts crossing arterial roads.

4. 100-Year/Twenty-Four (24) Hour: All retention areas without outfalls (closed drainage basin).

Rainfall intensity factors shall come from accepted meteorological and rainfall sources applicable to the County.

F. Runoff

Runoff and routing analysis shall be based on current hydrological design procedures. Computations shall include a tabulation of inflow, discharge, storage capacity, minimum and maximum water elevations, and retention/detention time to peak.

Basic hydrological calculations shall be based on commonly accepted procedures, such as those of:

1. Natural Resources Conservation Service

   a. *A Method for Estimating Volume and Rate of Runoff in Small Watersheds*, U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS), Technical Paper No. 149.

   b. *Urban Hydrology for Small Watersheds*, USDA, NRCS Technical Release No. 55.

   c. *National Engineering Handbook,* Section 4*, Hydrology*, U.S. Department of Agriculture, NRCS, latest edition.

   The NRCS, Type II, Florida Modified Rainfall Distribution, with antecedent moisture Condition II will be used. Other rainfall distributions may be utilized for design with prior approval of the County. The same shape factor shall be used for predevelopment

and postdevelopment calculations unless otherwise approved by the County.

2. Rational Method:

   a. *Drainage Manual*, FDOT, Volume 2A, latest edition.

   b. Standard Engineering Texts: The rational method of routing analysis may be used for systems serving projects with less than five (5) acres total contributing area.

   The rational method of routing analysis may be used for systems serving projects with less than five (5) acres total contributing area.

3. Others Alternatives as Approved by the County:

   Ultimate land usage shall be assumed for the selection of proper runoff coefficients or curve numbers within the basins involved. Weighted runoff coefficients or curve numbers shall be utilized where different coefficients or curve numbers exist within the areas comprising the basin.

G. <u>Standards for Detention/Retention, Stormwater Runoff Storage/Discharge, and Floodplain Encroachment</u>

1. The detention/retention of cumulative stormwater runoff in excess of predevelopment release rates shall be provided by sufficient storage capacity constructed on the property to be developed or within approved off-site drainage areas. Detention/retention storage capacity shall be based on a twenty-five (25) year/twenty-four (24) hour design for open basins. Design high water elevations shall be established in consideration of adjacent properties and facilities such that off-site drainage impacts are minimized.

2. The detention/retention facilities designed for the storage of stormwater to control runoff rates shall:

   a. Be designed in accordance with requirements of the SWFWMD Rules, the FDOT, or other agencies with jurisdiction.

   b. Be identified as a drainage easement on the final plat of a subdivision or duly recorded as such in other developments.

   c. Have bank slope grades not steeper than four (4) feet horizontal to one (1) foot vertical which shall be sodded to the seasonal high water elevation. Slopes steeper than 4:1 may be submitted for review and may be approved by the County. Wet ponds with slopes steeper than 4:1 may require the installation of a security fence.

d. Include an outlet structure in detention facilities sized to release, as a maximum, the predevelopment runoff rate, and designed to provide water quality treatment of the runoff from the contributing area, in accordance with applicable standards of the respective agencies (the SWFWMD Rules, the Florida Department of Environmental Protection, and the FDOT) having jurisdiction.

e. Be constructed to provide a minimum of six (6) inches of freeboard between the design high water elevation and the lowest berm elevation surrounding the detention/retention area.

f. Where practicable, include in detention areas an emergency overflow spillway or other structure acceptably protected from erosion with the invert no lower than the design high water level.

g. Have the discharge of controlling and overflow structures flow through an abutting drainage easement or public right-of-way in order to convey stormwater runoff away from the detention area.

h. Include special engineering features, such as skimmers, designed to remove oils and other objectionable materials, in accordance with criteria established by the SWFWMD Rules.

3. Off-site discharge is limited to amounts which will not cause adverse off-site impacts.

a. For a project or portion of a project located within an open drainage basin, the allowable discharge shall not exceed the historic discharge, which is the peak rate at which runoff leaves a parcel of land under existing site conditions. These criteria shall not apply to projects which have been discharging stormwater runoff directly to the Gulf of Mexico.

b. For a project or portion of a project located within a closed drainage basin, the required retention volume shall be the postdevelopment runoff volume, less the predevelopment runoff volume, computed using the SWFWMD's twenty-four (24) hour/100-year rainfall map, and the SCS, Type II, Florida modified twenty-four (24) hour rainfall distribution with an antecedent moisture Condition II. The total postdevelopment volume leaving the site shall be no more than the total predevelopment volume leaving the site for the design 100-year storm, unless otherwise approved by the County.

4. Maintenance of predevelopment, off-site low flow may be required in hydrologically sensitive areas.

5. Floodplain Encroachment

No net encroachment into the floodplain, up to that encompassed by the 100-year event, which will adversely affect either conveyance, storage, water quality, or adjacent lands will be allowed. Any required compensating storage shall be equivalently provided between the seasonal high water level and the 100-year flood level to allow storage function during all lesser flood events. A detailed flood study performed by a registered engineer that indicates no adverse impact to off-site flood elevations may be approved by the County to lessen or remove the flood plain compensation requirements.

6. Off-Site Lands

Adequate provisions shall be made to allow drainage from off-site, upstream areas to downstream areas without adversely affecting the upstream or downstream areas.

7. Exfiltration systems and percolation designed in conjunction with detention/retention systems:

a. The detention/retention facilities must have the capacity to retain the volume required for water quality treatment without considering discharges.

b. The seasonal high water level must be at least one (1) foot below the bottom of the exfiltration pipe.

c. Exfiltration should not be proposed for systems to be operated and maintained by the County, unless otherwise approved by the BCC.

d. Double ring infiltrometer tests shall be performed at each detention/retention facility. The said test shall be performed at the approximate elevation of infiltration.

e. A safety factor of 2.0 or more shall be applied in the exfiltration design to allow for geological uncertainties by dividing the percolation rate by the safety factor.

H. Storm Sewer Systems

The capacity of inlets, with the allowable head conditions, should equal or exceed the runoff from their individual drainage areas. The size, type, and location of storm sewer inlets, gratings, or other openings into an enclosed storm drainage system shall be in accordance with the FDOT *Drainage Manual*, latest edition, unless otherwise approved by the County.

1. Drainage Structures

a. Roadway Inlets: Roadway inlets in curb and gutter construction shall be designed and constructed to:

(1) Avoid abrupt changes in hydraulic slope and velocity.

(2) Limit the quantity of stormwater flowing in a street to a depth not to exceed two (2) inches below the crown of collector streets and arterial streets, unless otherwise approved in writing by the County, but in no case shall more than one-half the width of the outside lane be flooded at design flow. Limit the quantity of stormwater flowing in local residential streets to a depth not to exceed six (6) inches deep at the inlet at the design flow.

(3) Prevent design flows across street intersections unless concrete valley gutters are approved by the County.

(4) Have formed inverts a minimum of six (6) inches above the flow line to properly drain inlet bottoms.

(5) Have pipes cut flush with the inside wall.

(6) Provide for ease of maintenance.

b. Commercial Parking Lot Inlets: Commercial parking lot inlets shall be designed and constructed to:

(1) Accommodate a ten (10) year/twenty-four (24) hour storm.

(2) Have the hydraulic gradient at or below the inlet elevation.

I. Pipe Standards

1. The piping and appurtenances used in the stormwater collection system shall be designed to convey the runoff of a ten (10) year storm with a minimum time of concentration of not less than fifteen (15) minutes to the first inlet.

2. Unless otherwise approved by the County, reinforced concrete pipe (RCP) shall be used in all easements and street rights-of-way with the exception of residential driveways. All storm sewer pipes and culverts shall have a minimum of six (6) inches of cover from outside crown of pipe to bottom of roadway base course. The minimum cover of pipe in swale areas shall be one (1) foot, unless otherwise approved by the County.

3. Minimum pipe sizes, not including driveway culverts, shall be as follows:

Type	Minimum Size
Under Drains	6"
Pipe Culvert	18"
Box Culvert	3' X 3'

Application of these values to oval or elliptical pipe shall be based on equivalent round diameter.

4. Roughness coefficients for use in Manning's Formula for storm pipe and box culverts shall be as follows:

		N
a.	Concrete Pipe and Box Culverts	
	18"-30," inclusive	0.013
	36"-48," inclusive	0.012
	54" and up, including smooth concrete boxes of 15 square feet and up	0.011
b.	Corrugated Metal Pipe (CMP) or Aluminum Pipe	0.023
	Asphalt Coated	0.018

Applications of these values to oval or elliptical pipe shall be based on equivalent round diameter.

5. The slopes for culverts used as storm sewers shall produce a velocity within the following limits, unless otherwise approved by the County:

Maximum	Minimum
RCP 12 fps	2 fps
CMP 10 fps	3 fps

6. The maximum length of pipe without an access structure shall be:

   a. 18"-36" pipes: 400'

   b. 42" and over, and all box culverts: 500'

7. The minimum and maximum allowable hydraulic slopes shall be those that produce the aforementioned minimum and maximum velocities. Manholes may be used as drop structures where necessary to lessen slopes in storm sewers.

8. Culvert capacity shall be based on sound engineering practice. Detailed analysis and design shall be based on either inlet or outlet control, whichever is applicable, using appropriate entrance loss

coefficients and culvert nomographs. Backwater curve data, flood profiles, and other hydraulic information along a watershed reach shall be used to establish design water elevations and set the culvert crown elevations.

9. When required to control high groundwater conditions, underdrains shall be designed to maintain the groundwater table elevation at least twenty-four (24) inches below the edge of the pavement.

10. Unless otherwise approved by the County, driveways across roadside swales will require the placement of a drainage culvert (side drain) under the driveway in order not to impede flow in the swale resulting in an increase of backwater onto upstream property. Culverts in residential areas may be CMP or RCP with a minimum diameter of fifteen (15) inches. Culverts in commercial areas shall be RCP with a minimum diameter of eighteen (18) inches.

J. Scour and Erosion

It shall be the responsibility of the developer to control soil erosion by wind or water from the date of ground breaking until such time as the responsibility is transferred to an acceptable entity in accordance with this Code.

The developer's engineer must provide for use of sediment basins, straw bale dams, velocity checks, hydroseeding applications, etc., to minimize erosion within the limits of the site being developed and prevent damage to wetland systems which are to remain in the development.

The design of canals, streams, ditches, and other waterways shall be based on current open channel design procedures using the Chezy, Talbot, and/or Manning's Formula. Design velocities without erosion protection shall not exceed the maximums for soil types as shown below. Where design levels exceed the top of banks for the required design storm; i.e., twenty-five (25) year for major waterways and berms are not provided, the extent of flooding in the flood plain shall be shown. Runoff and roughness coefficients, safe velocities, nomographs, erosion control, and practical limitations on use of design formulas shall be based on current practice in the field of hydraulics, notwithstanding any requirements of this section.

Conditions such as alignment and presence of sever irregularities in smoothness will alter the allowable velocities. Maximum flow velocities for various soil types without erosion protection are as follows:

Type of Soil	Allowable Velocity
Fine Sand	1.50 fps
Sandy Loam	1.75 fps
Silt Loam	2.00 fps
Firm Loam	2.50 fps
Fine Gravel	2.50 fps

The above allowable velocities may be increased if appropriate erosion protection devices are provided and approved.

Where erosion protection structures are constructed in floodway banks and bottoms, the design section shall be selected to provide a maximum velocity of ten (10) fps with energy dissipation structures at flow discharges to unprotected floodways. Check dams designed to control velocities in open channels shall be detailed in the plans of the proposed development to provide acceptable erosion protection.

K. Lot Drainage

1. Drainage Plan

The finished grade of individual lots shall be shown on the construction plans. Generally, lots shall be graded in accordance with Types A, B, or C Typical Grading Plans as shown in Figures 902.2.A, 902.2.B, and 902.2.C. When topography or other features make such lot grading impractical, alternate standards may be presented for the County Administrator's or designee's review and approval.

The proposed minimum, finished floor elevation of all structures which may be constructed shall be included on the construction plans. As a minimum, the finished floor elevation shall be at least sixteen (16) inches above the highest crown line of the street lying between the projection of the side-building lines, unless otherwise approved by the County Administrator or designee. In no case shall finished floor elevations be specified below the 100-year flood plain as designated by the Federal Insurance Administration Flood Hazard Boundary Maps. When a detailed study from the Federal Emergency Management Agency (FEMA) has not been provided, the engineer shall submit the best available data for the 100-year base flood elevation for review and approval by the County Administrator or designee.

The Engineer of Record shall provide to Pasco County, signed and sealed design calculations for each typical lot demonstrating compliance with Pasco County's drainage criteria. The typical site-grading plan shall identify elevations, grades, ground cover, allowable tolerances, and quality-control plans addressing construction and post-construction phases. In addition, the Engineer of Record shall inspect the lot upon completion and complete the "as-built" certification prior to issuance of the Certificate of Occupancy (CO) for the associated unit.

2. Conditions

a. The following conditions may be modified as approved by the County Engineer and Public Works Director or designees.

(1) Prior to any construction on the lot, proper erosion and sedimentation controls shall be installed.

(2) Lots that back up to drainage-retention areas and/or wetland areas designed and permitted to receive discharge shall be "Type B" or "Type C" graded. A minimum fifteen (15) foot-wide drainage and access easement shall be provided along all rear lot-lines where there is a pipe or swale. Drainage and access easements shall extend to the road right-of-way at block ends. Side-yard, cross-access easements shall be provided connecting the rear-yard easement to the front right-of-way.

(3) Lots graded as "Type A," which back up to other lots, shall require the installation of gutters on the sides and backs connecting to roof leaders and discharging to the front of the lot. These lots do not require a drainage easement at the rear of the lots.

(4) Lots graded as "Type B" or "Type C," which back up to other lots or adjacent property, shall require that traffic-bearing grates be installed upon a Florida Department of Transportation (FDOT) inlet placed within each rear lot-line easement. Culverts connecting rear-yard inlets to acceptable outfalls shall be installed and shall be reinforced concrete pipe with premium sealed joints designed to sustain an H-20 loading. A minimum 7.5-foot-wide drainage and access easement shall be provided along all rear lot-lines for a total of fifteen (15) feet. Drainage and access easements shall extend to the road right-of-way at block ends. Side-yard cross-access easements shall be provided connecting the rear-yard easement to the front right-of-way.

(5) Side-yard swales shall be sloped to create positive outfall to the front and/or rear of each lot with velocities no greater than allowable for grassed stabilization, as in the FDOT Drainage Manual.

(6) A maintenance entity, other than and acceptable to the County, shall be designated to provide perpetual maintenance to all drainage and access easements. The approved maintenance entity shall provide annual inspections of side- and rear-yard easements and drainage facilities to verify that no modifications have been made to the grading and ground cover and to inspect any inlets and pipes to verify that no flow restrictions exist. Any modification or flow restriction

observed at any time shall be corrected. Additional inspections shall be performed if requested by an adjoining resident or the County. The maintenance entity shall have the right to file a lien to charge property owners for corrections or modifications and collect sufficient funds to perform required maintenance.

(7) Gutters and/or roof structures shall not discharge to side lot-lines.

b. For those approvals with a side-yard setback of less than 7.5 feet, the following additional criteria shall apply:

(1) A minimum five (5) foot wide drainage/access easement shall be provided on all side lot-lines for a minimum total of ten(10) feet.

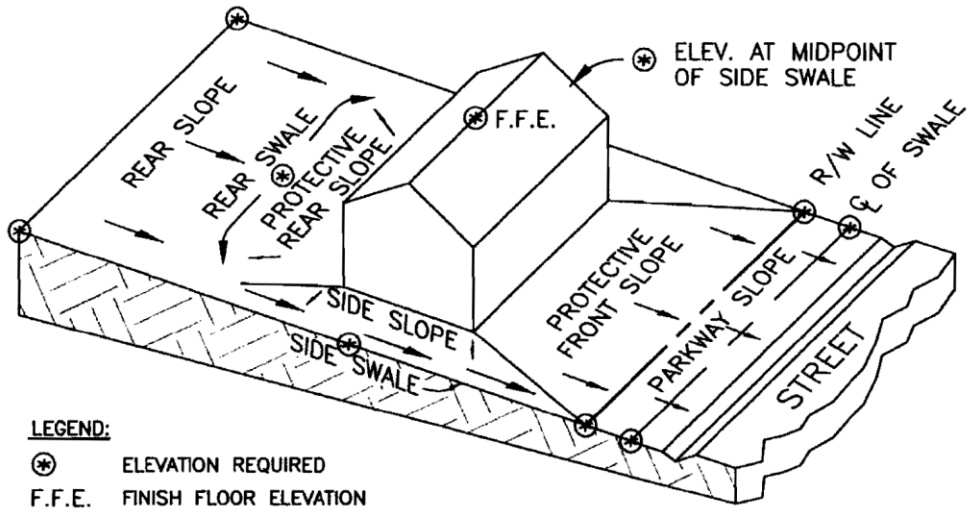
(2) No obstructions shall be permitted in the side-yard easements. This includes, but is not limited to, air conditioning systems, water softeners, pumps, fences, etc.

(3) Refer to 601.6.F.1, External Compatibility Setbacks.

(4) Height ranges are explained in Section 601.7.E.

FIGURE 902.2.A

TYPE A TYPICAL GRADING PLAN



LEGEND:

⊛ ELEVATION REQUIRED

F.F.E. FINISH FLOOR ELEVATION

NOTES:

1. FINISH FLOOR ELEVATION TO BE A MIN. 16" ABOVE ℄ OF ROAD GRADE AND BE AT OR ABOVE THE 100 YEAR FLOOD PLAIN.
2. FINISH FLOOR ELEVATIONS OF ADJACENT STRUCTURES, IF EXISTING, SHALL BE PROVIDED.
3. ELEVATION OF SWALE ℄ AT EACH PROPERTY LINE PROJECTION AND BOTH CULVERT INVERTS, IF EXISTING, SHALL BE PROVIDED.

PASCO COUNTY
DEVELOPMENT SERVICES

STORM DRAINAGE DETAIL

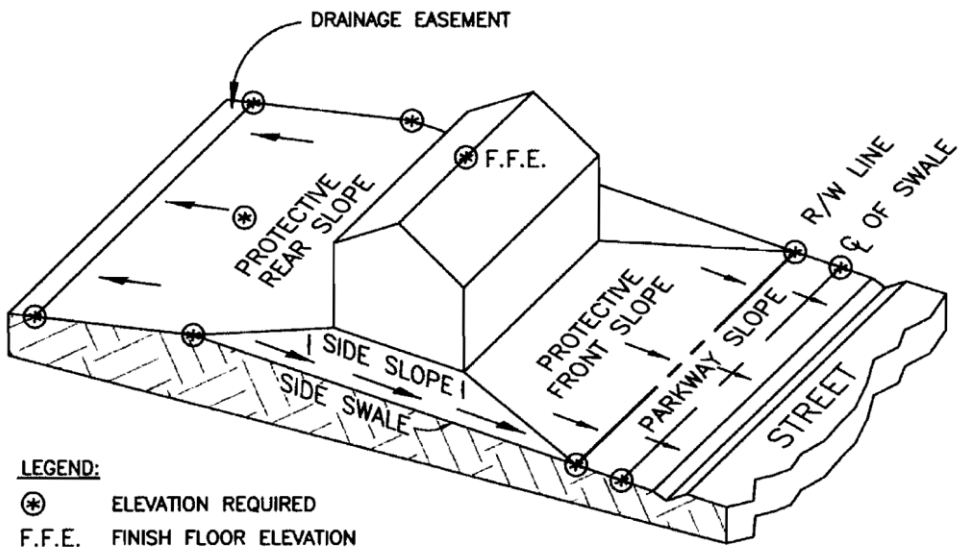
TYPICAL LOT GRADING TYPE "A"

SD 5
SHEET 1 OF 3

DATE:JAN 1998
TYPEA.DWG
C.JOLLY/RFP

FIGURE 902.2.B

TYPE B TYPICAL GRADING PLAN



LEGEND:

⊛ ELEVATION REQUIRED

F.F.E. FINISH FLOOR ELEVATION

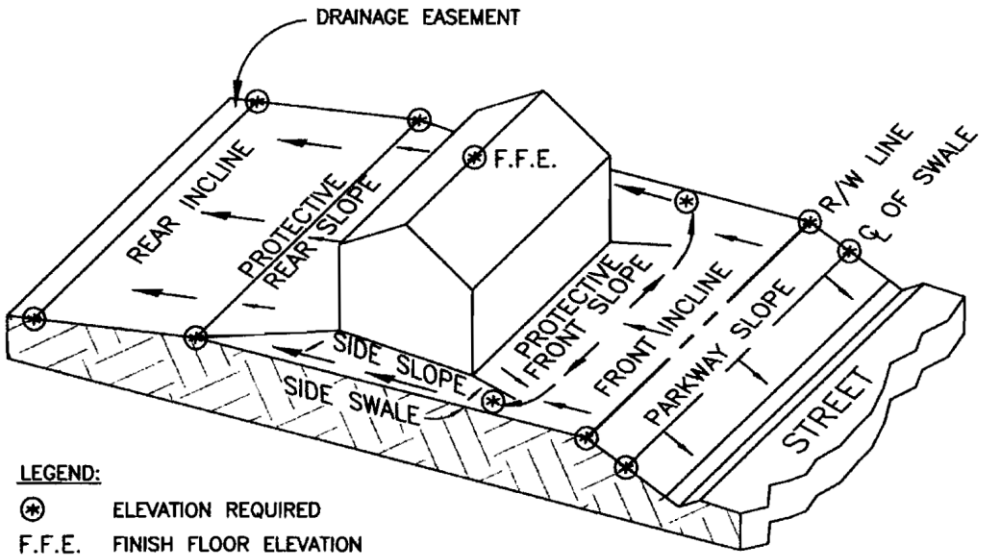
NOTES:

1. FINISH FLOOR ELEVATION TO BE A MIN. 16" ABOVE ℄ OF ROAD GRADE AND BE AT OR ABOVE THE 100 YEAR FLOOD PLAIN.
2. FINISH FLOOR ELEVATIONS OF ADJACENT STRUCTURES, IF EXISTING, SHALL BE PROVIDED.
3. ELEVATION OF SWALE ℄ AT EACH PROPERTY LINE PROJECTION AND BOTH CULVERT INVERTS, IF EXISTING, SHALL BE PROVIDED.

PASCO COUNTY DEVELOPMENT SERVICES	STORM DRAINAGE DETAIL	SD 6 SHEET 2 OF 3
	TYPICAL LOT GRADING TYPE "B"	DATE:JAN 1998 TYPEB.DWG C.JOLLY/RFP

FIGURE 902.2.C

TYPE C TYPICAL GRADING PLAN



LEGEND:

⊛ ELEVATION REQUIRED

F.F.E. FINISH FLOOR ELEVATION

NOTES:

1. FINISH FLOOR ELEVATION TO BE A MIN. 16" ABOVE ℄ OF ROAD GRADE AND BE AT OR ABOVE THE 100 YEAR FLOOD PLAIN.
2. FINISH FLOOR ELEVATIONS OF ADJACENT STRUCTURES, IF EXISTING, SHALL BE PROVIDED.
3. ELEVATION OF SWALE ℄ AT EACH PROPERTY LINE PROJECTION AND BOTH CULVERT INVERTS, IF EXISTING, SHALL BE PROVIDED.

PASCO COUNTY DEVELOPMENT SERVICES	STORM DRAINAGE DETAIL	SD 7 SHEET 3 OF 3
	TYPICAL LOT GRADING TYPE "C"	DATE:JAN 1998 TYPEC.DWG C.JOLLY/RFP

3. Drainage Plan Requirements for Individual Lots

For lots one (1) acre or less in size, two (2) copies of a drainage plan shall be submitted with the Building Permit Application for review and approval. The following information shall be included in the plan, which shall be signed and sealed by a Florida registered Professional Engineer.

a. The plan shall indicate the name of the development (if applicable), scale of plan, north arrow, and legend; parcel identification number or legal description sufficient to describe the size and location of the project site, including the plat book page and number, if platted; and the name, address, and telephone number of the builder, owner, and engineer/ surveyor.

b. The plan shall show the abutting sections of any roadway(s) and the corresponding elevations along the projection of the building lines onto the centerline of the roadway(s) and the elevations on all corners of the building pad. Lot elevation at a minimum of a 100-foot grid for lots larger than one (1) acre and a fifty (50) foot grid minimum for lots one (1) acre or less. A reference elevation may be assumed.

4. Lot Drainage Enforcement

a. Prior to constructing a structure on one (1) acre or less, the builder shall be required to provide an engineered lot grading plan with the Building Permit Application that does not cause an adverse impact on adjacent or off-site property.

b. As part of the Building Permit Application for any accessory structure on one (1) acre or less where impervious area is added or where a lot's contours are proposed to be altered for an area over 500 square feet, an engineered plan addressing the lot grading shall be required. These types of permits are additions, pools, slabs, etc.

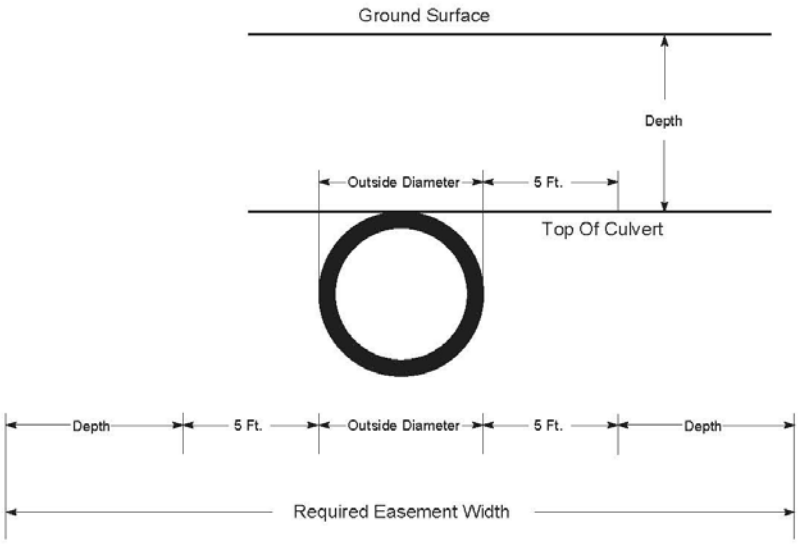
c. Prior to the release of the CO, or final inspection where no CO is issued, the developer/owner/builder shall execute the Affidavit of Lot Grading and Finished Floor Elevation Compliance, provide an as-built survey prepared by a surveyor and mapper registered in the State of Florida of the lot and the driveway construction, and return same to the County Administrator or designee. The as-built survey shall be in conformance with the approved Stormwater Management Plan and Report. Any deviations from the approved plan must be noted and will be reviewed for compliance with this Code.

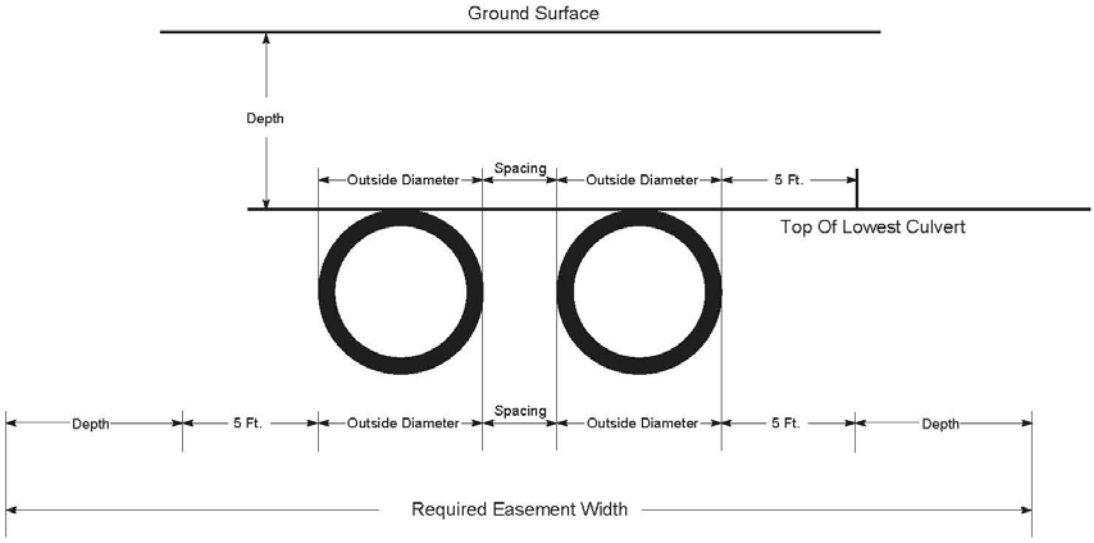
L. Swales, Culverts and Pipes

All swales, ditches, channels, and closed storm-drainage conduits within subdivisions shall be within an easement or dedicated right-of-way. Right-of-way or maintenance easements by instrument or plat dedication shall be provided for all facilities used to convey stormwater. The minimum width of said rights-of-way or easements shall conform to the widths shown in the following table:

	Minimum Controlled Width
Swales (except in right-of-way)	
• Rear Yard	5'
• Side Yard	10' (5' each side of swale centerline)
Pipes and Culverts	15' (7.5' each side of pipe centerline)
See Figure	The easement required shall be the greater of fifteen (15) feet or the combination of: • the outside diameter(s) of the culvert(s), plus • all spacings between culverts, plus • five (5) feet on both sides of the culvert(s), plus • the depth of the top of the lowest culvert. From the outer edge of any culvert, the easement must be at least five (5) feet plus the depth of the culvert.

Easements for Culverts/Pipes





A right-of-way or easement of fifteen (15) feet shall be provided for access to any stormwater detention/retention facility from a dedicated road or street. In addition, a continuous perimeter maintenance and operation easement, with a minimum width of fifteen (15) feet and slopes no steeper than 4:1 (horizontal/vertical), shall be provided landward of the control elevation water line.

M. <u>Dedication and Maintenance</u>

1. If a stormwater management system approved under this Code will function as an integral part of the County maintained regional system as determined by the County, the facilities may be required to be dedicated and formally accepted by the County.

2. All stormwater management systems that are not dedicated to the County shall be operated and maintained by one of the following entities:

   a. A local governmental unit, municipality, a special district, or an active water control district created pursuant to Chapter 298, Florida Statutes; a drainage district created by special act; a Community Development District created pursuant to Chapter 190, Florida Statutes; or a Special Assessment District created pursuant to Chapter 170, Florida Statutes; or other governmental unit.

   b. An officially franchised, licensed, or approved communication, water, sewer, electrical, or other public utility.

   c. The property owner or developer if:

      (1) Written proof is submitted in the appropriate form, by either letter or resolution, that a governmental entity or such other acceptable entity as set forth in this Code, Section 902.2.M.2.a or 902.2.M.2.b will accept the operation and maintenance of the stormwater management and discharge facility at a time certain in the future; and

      (2) A bond or other assurance of continued financial capacity to operate and maintain the system is submitted.

   d. For profit or nonprofit corporations, including homeowners' associations, property owners' associations, condominium owners' associations, or master associations if:

      (1) The owner or developer submits documents constituting legal capacity and a binding legal obligation between the entity and the County affirmatively taking responsibility for the operation and maintenance of the stormwater management facility.

(2) The entity has sufficient powers reflected in its organizational or operational documents to:

(a) Operate and maintain the stormwater management system as permitted by the County;

(b) Establish rules and regulations;

(c) Assess members;

(d) Contract for services; and

(e) Exist perpetually with the articles of incorporation providing that, if the entity is dissolved, the stormwater management system will be maintained by some other acceptable entity as described above.

3. The developer shall convey, at no cost to the County, a drainage easement within the project over all internal drainage features, and a drainage easement for an uninterrupted flow through the project of any offsite drainage sufficient to accommodate a 100-year/five-day, and 100-year/one-day, storm event within the limits of the easement without any increase in predevelopment upstream stages for the purpose of maintaining natural drainage and the free flow of stormwater and other surface waters. The drainage easements must also include a limited right of ingress and egress to perform maintenance activities related thereto for the County's agents and necessary equipment. The easement, encumbering SWFWMD jurisdictional wetlands, associated regulatory buffers, any channels, swales or ditches and access only, shall be dedicated prior to the final plat approval of any phase immediately adjacent to said easement. The easement dedication shall be substantially in the form approved by the Engineering Services Department except as may be modified as requested by the SWFWMD. It is expressly understood and agreed that the developer or its assigns will reserve onto itself rights of ownership of the easement premises not inconsistent with the easement rights granted in the easement to the County, including the grant of additional rights not in conflict with the rights granted in the easement; provided, however, that the developer or its assigns shall not conduct nor allow development on the easement premises. The County does not assume maintenance responsibility for these easements.

4. Phased Projects

a. If a project is to be constructed in phases, and subsequent phases will use the same stormwater management facilities as the initial phase or phases, the operation/maintenance entity

shall have the ability to accept responsibility for the operation and maintenance of the stormwater management systems of future phases of the project.

b. In phased developments that have an integrated stormwater management system but employ independent operation/ maintenance entities for different phases, the operation/ maintenance entities, either separately or collectively, shall have the responsibility and authority to operate and maintain the stormwater management system for the entire project. That authority shall include cross easements for stormwater management and the authority and ability of each entity to enter and maintain all facilities should any entity fail to maintain a portion of the stormwater management system within the project.

5. Applicant as Acceptable Entity: The applicant shall be an acceptable entity and shall be responsible for the operation and maintenance of the stormwater management system from the time construction begins until the stormwater management system is dedicated to and accepted by another acceptable entity.

6. Off-Site Drainage Facilities: The County Administrator or designee may allow stormwater runoff to be discharged into drainage facilities off-site pursuant to the following:

a. The off-site drainage facilities and channels leading to them are designed, constructed, and maintained in accordance with the requirements of this Code and the proper easement from the owner(s) of the property to be utilized is provided; and

b. Adequate provision is made for the sharing of construction and operating costs of the facilities. The developer may be required to pay a portion of the cost of constructing the facilities as a condition to receiving approval of the drainage plans.

When drainage facilities which are not within a previously recorded drainage easement are utilized for off-site drainage, the owner/ developer shall provide a drainage easement on the approved form with a legal description and sketch (certified by a Florida Registered Land Surveyor) for each off-site drainage facility. The drainage easement shall be submitted to the County Administrator or designee prior to the construction plan approval of the individual unit or phase affected.

N. Drainage Basins of Special Concern

1. Regulated Drainage Basins: The BCC may identify drainage basins or subbasins of Special Concern in order to protect the health, safety, and welfare of the public and to protect property.

   Designation of Drainage Basins or subbasins of Special Concern shall include the following steps:

   a. Documentation of the fact that the basin or subbasin is prone to flooding based on records of flooding occurrence and severity. The records can include photographs and statements from the County staff or area residents.

   b. Evaluation of basin or subbasin drainage characteristics and cause of flooding based on review of relevant information, including topographic maps; drainage features and structures, such as channels and culverts; surficial soils; land use; and soil stratigraphy. If warranted, this evaluation may include modeling of stormwater runoff generation and conveyance.

   c. Determination that the flooding would be exacerbated unless the provisions of this section are put in place.

      The area(s) shall be accurately depicted on maps that will be available from the County in digital and hard-copy format.

   d. Removal of the drainage Basin of Special Concern designation from any drainage Basin of Special Concern may be considered upon submittal of the following:

      (1) A scientific analysis and a proposal to remediate or otherwise improve the conditions that supported the designation.

      (2) Proposed funding for the implementation of the remediation plan.

      (3) The County Administrator or designee, in consultation with the SWFWMD, will consider whether the remediation plan presents a viable solution that is permitted and funded, and shall present same to the BCC, who shall make the final determination on the proposal.

2. Exemptions: The Drainage Basins of Special Concern requirements shall not apply to development having:

   a. An approved master drainage plan or stormwater management plan, which has not expired prior to the date the

BCC designated the area as a Drainage Basin of Special Concern. All subsequent stormwater management plans submitted in compliance with an approved, unexpired master drainage plan shall be exempt from this section.

b. A stormwater management plan for which a complete application for a stormwater management plan or drainage plan had been submitted to the County and not withdrawn prior to the date on which the applicable drainage basin is designated as one of special concern by the BCC and that is not subsequently denied or expired. The County and the applicant may agree to an earlier application date.

c. If required by the SWFWMD Rules, the County shall allow deviations from the Drainage Basin of Special Concern criteria to the extent necessary to prevent adverse impacts to wetlands or other surface waters when it is demonstrated that adverse impacts cannot otherwise be practicably avoided.

3. Existing Designated Drainage Basins of Special Concern:

a. Effective July 18, 2005, Tank Lake (west of the old railroad berm) and East Zephyrhills (excluding Lake Pasadena, but including Lake Dorothea, Lost Lake, and Silver Oaks) are designated as closed Drainage Basins of Special Concern as delineated on the maps attached as Maps 902.2.A and 902.2.B.

b. Effective September 27, 2005, Timber Oaks is designated as a closed Drainage Basin of Special Concern as delineated on the map attached as Map 902.2.C.

4. Basin Specific Design Standards: The BCC may establish special design standards applicable to new development activity within a specific Drainage Basin of Special Concern. Special design standards may include, but are not limited to, the following:

a. Maximum allowable peak rate of discharge per acre.

b. Minimum required retention volume required per acre.

5. Standard Design Regulations for Drainage Basins of Special Concern: Unless the BCC adopts a more stringent special design standard within any Drainage Basin of Special Concern, the following standard regulations shall be applicable to Drainage Basins of Special Concern:

a. Open Drainage Basin

(1) The maximum peak rate of stormwater runoff discharge from any development activity shall not exceed the prior existing maximum peak rate of stormwater runoff discharge for a two (2), ten (10), twenty-five (25), and 100-year return frequency storm event for a duration of twenty-four (24) hours.

(2) There shall be no net loss of storage volume from the most restrictive of:

(a) FEMA established floodplain storage volume.

(b) Storage volume below the elevation of a recorded County observed flooding.

(c) Calculated ponding based upon a 100-year return frequency, twenty-four (24) hour storm event.

(d) A more critical event standard, including a 100-year return frequency, ten (10) day storm event, defined in a County or SWFWMD approved study for the applicable drainage basin.

(3) The minimum habitable finished floor elevation shall be above the highest elevation established by the following criteria:

(a) This Code, Section 1103, Flood Damage Prevention.

(b) Recorded, County observed high water elevation, plus one (1) foot.

(c) Calculated ponding elevation based upon a 100-year return frequency, twenty-four (24) hour duration storm event, plus one (1) foot.

(d) A more critical event standard, including a 100-year return frequency, ten (10) day storm event, defined in a County- or SWFWMD-approved study for the applicable drainage basin, plus one (1) foot.

(4) Permit applicants may present for consideration off-site mitigation plans that demonstrate that the mitigation will be viable and sustainable in perpetuity.

b. Closed Drainage Basin

(1) The maximum peak rate of stormwater runoff discharge from any development activity shall not exceed the prior existing, maximum, peak rate of stormwater runoff discharge for a two (2), ten (10), twenty-five (25), and 100-year return frequency storm event for a duration of twenty-four (24) hours.

(2) Runoff volume shall be limited to predevelopment conditions such that there shall be no increase in the volume of runoff resulting from development activity for a 100-year return frequency, ten (10) day duration storm event.

(3) There shall be no net loss of storage volume from the most restrictive of:

(a) FEMA established floodplain storage volume.

(b) Storage volume below the elevation of a recorded, County observed flooding.

(c) Calculated ponding based upon a 100-year return frequency, ten (10) day storm event.

(d) A more critical event standard, including a 100-year return frequency, ten (10) day storm event, defined in a County or SWFWMD approved study for the applicable drainage basin.

(4) The minimum habitable finished floor elevation shall be above the highest elevation established by the following criteria:

(a) This Code, Section 1103, Flood Damage Prevention.

(b) Recorded, County observed flooding elevation, plus one (1) foot.

(c) Calculated elevation based upon a 100-year return frequency, ten (10) day duration storm event, plus one (1) foot.

(d) A more critical event standard, including a 100-year return frequency, ten (10) day storm event, defined in a County or SWFWMD approved study for the applicable drainage basin, plus one (1) foot.

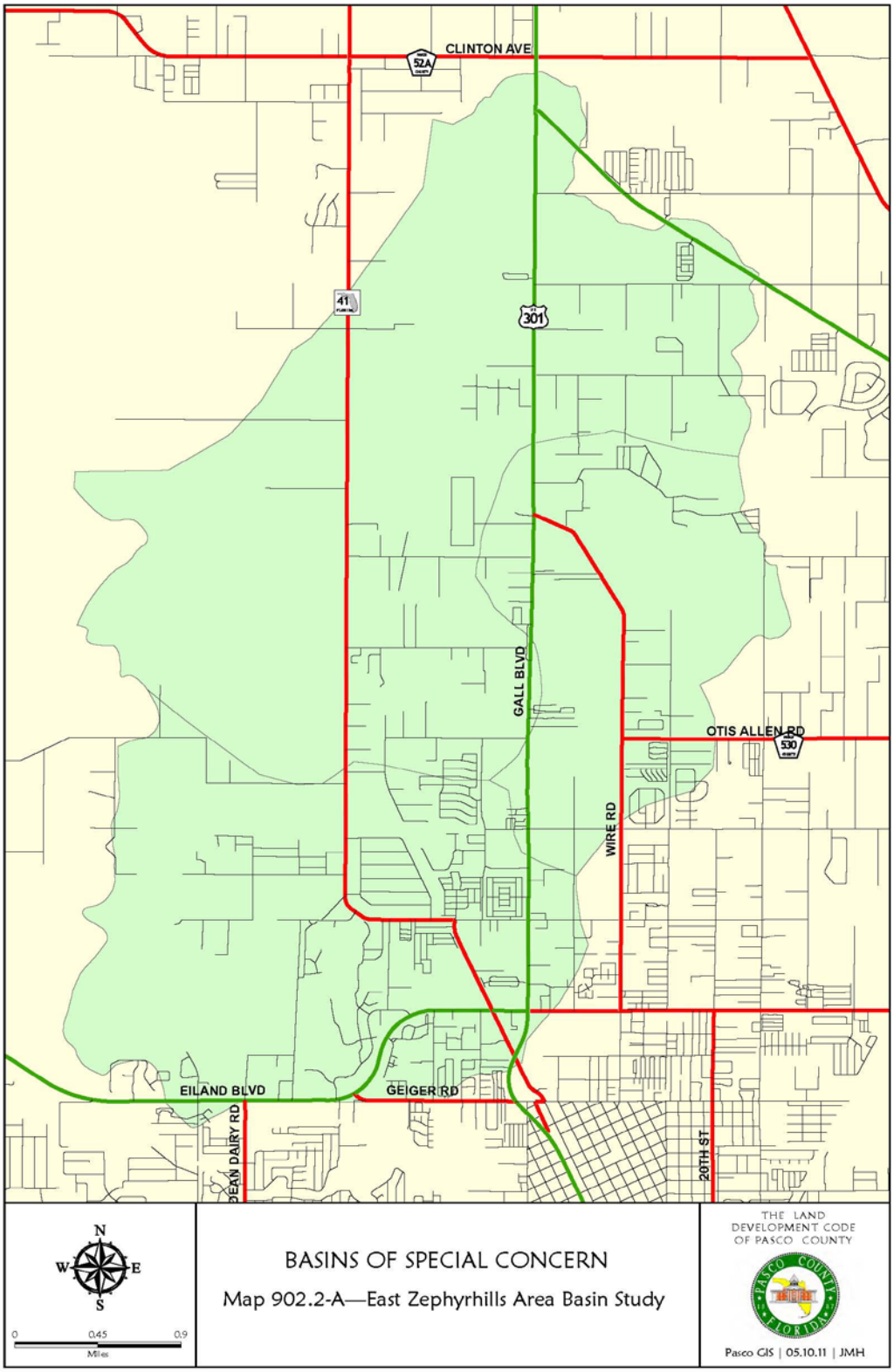
(5) Permit applicants may present for consideration, off-site mitigation plans demonstrating that the mitigation will be viable and sustainable in perpetuity.

O. <u>False Information</u>

It is a violation of this Code to knowingly furnish false information or information that is not supported by scientific data to the County or any official in charge of the administration of this section on any matter relating to the administration of this section.

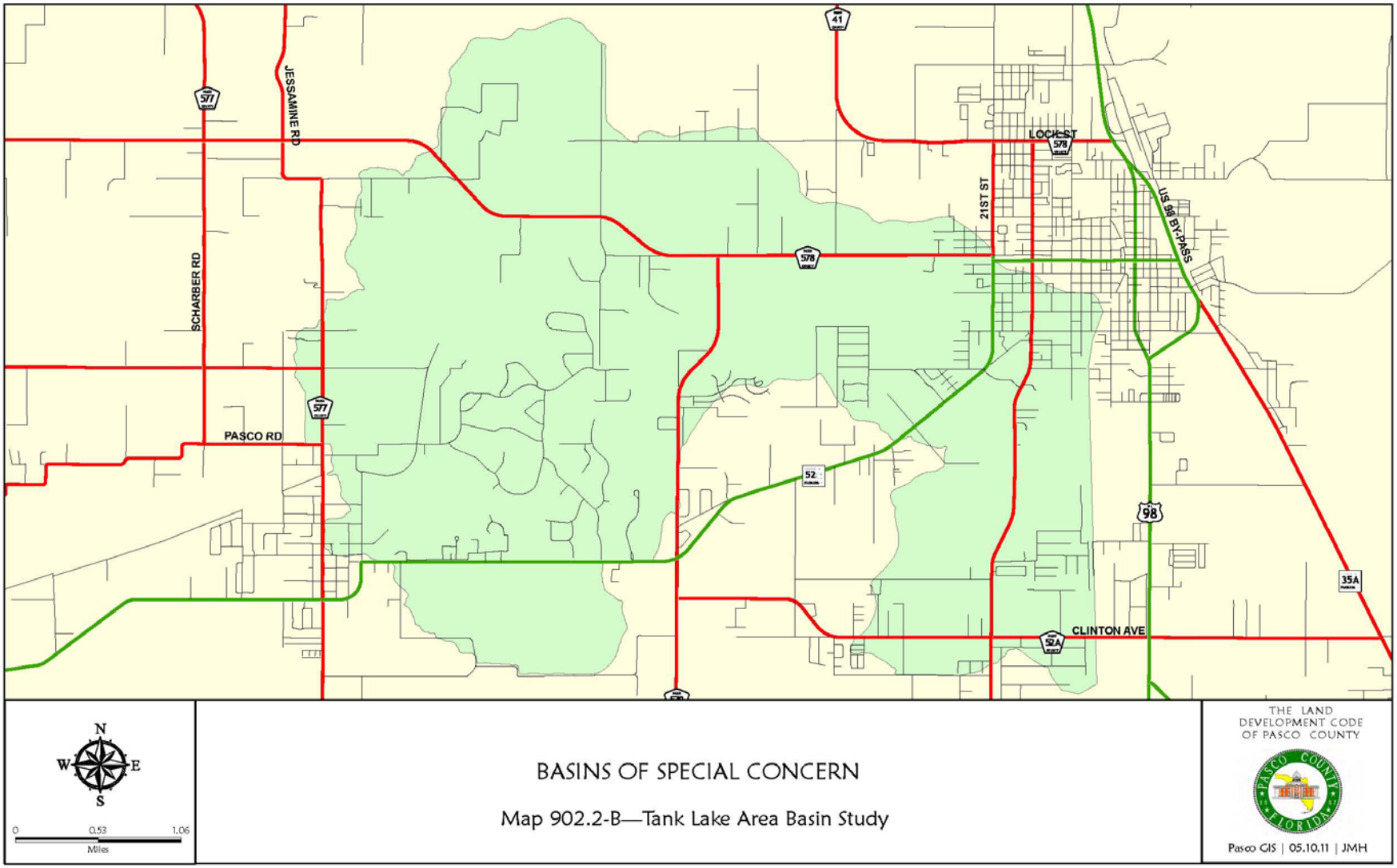
BASINS OF SPECIAL CONCERN

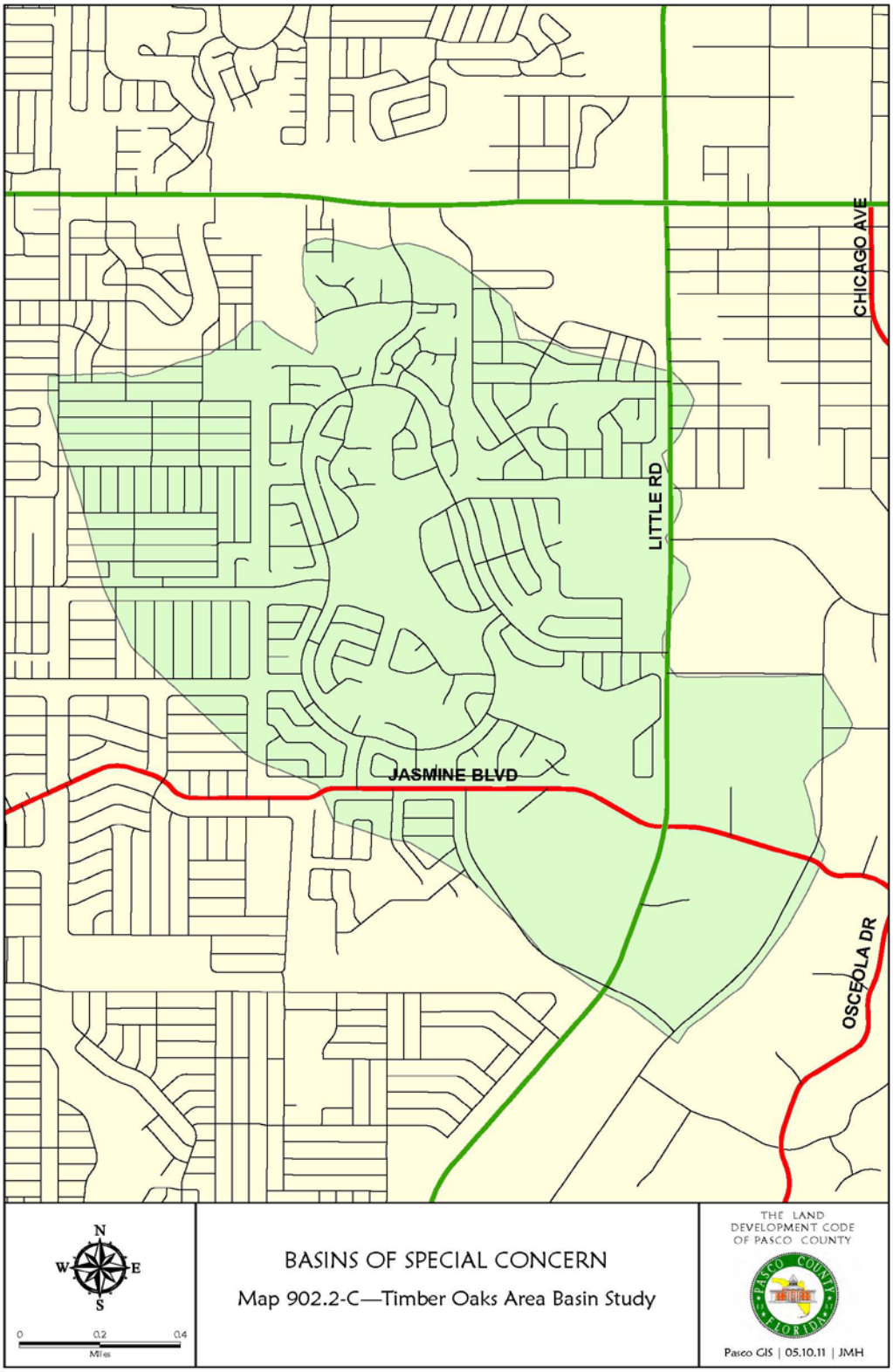
MAP 902.2-A - EAST ZEPHYRHILLS AREA BASIN STUDY



BASINS OF SPECIAL CONCERN

MAP 902.2-B - TANK LAKE AREA BASIN STUDY



BASINS OF SPECIAL CONCERN

MAP 902.2-C - TIMBER OAKS AREA BASIN STUDY