



Thomas L. Knight, P.E.
Professional Association
Planning, Design, Permitting, Inspection

February 15, 2016

Kenneth Comia
City of Groveland
156 S. Lake Avenue
Groveland, Florida 34736

Re: Construction Plan Review Submittal - Southgate

Dear Kenneth:

On behalf of our client, Southgate of Lake County, LLC, we are submitting for construction plan review of Southgate subdivision. The following documents are included with this submittal.

<u>Copies</u>	<u>Description</u>
1	Planning & Zoning Application – Construction Plan Review
1	Construction Plan Review Fee - \$800
1	Planning & Zoning Application – Concurrency Review
1	Concurrency Review Fee - \$200
2	Warranty Deed
2	Property Record Cards (3 parcels each)
2	Sanitary Sewer Collection/Transmission System Engineering Report
2	Potable Water Distribution System Engineering Report
2	Traffic Impact Analysis
1	St. Johns River Water Management District Permit Application
1	FDEP Application for a Specific Permit to Construct PWS Components
1	FDEP Notification/Application for Construction a Domestic Wastewater Collection/Transmission System
5	24"x36" Construction Plans for Southgate, sheets 1-35 of 35
1	11"x17" Construction Plans for Southgate, sheets 1-35 of 35
2	24"x36" Boundary Survey, sheet 1 of 1
2	24"x36" Sketch of Description, sheet 1 of 1
2	24"x36" Landscape Plans, sheet 1 of 1
1	11"x17" Landscape Plans, sheet 1 of 1
2	24"x36" Irrigation Plans, sheets 1-2 of 2
1	11"x17" Irrigation Plans, sheets 1-2 of 2
4	CDs

The CDs also contain the Stormwater Management Engineering Report and the Geotechnical Investigation for Southgate. The following information pertains to the stormwater management system and is directed to the city engineer.

There have been four environmental resource permits issued on this property by St. Johns River Water Management District. The last permit issued was permit #42-069-97648-4. This was a permit transfer due to a change of ownership from the previous owner, S.L.I.M.S. Properties, Inc. to the current owner, Southgate of Lake County, LLC. A warranty deed is attached verifying the applicant's real property interest in the project site. Permit #42-069-97642-4 expired on March 29, 2014.

On September 20, 2007 SJRWMD issued permit no. 42-069-97642-2 for construction of a stormwater management system with stormwater treatment by dry retention with underdrain and wet detention for Southgate Subdivision. The permit documents for this second permit include the following design parameters.

PRE-DEVELOPMENT

Basin A Total Area = 10.65 ac.
Basin A Impervious Area = 0.11 ac.

Basin B Total Area = 4.01 ac.
Basin B Impervious Area = 0.03 ac.

Basin C Total Area = 1.10 ac.
Basin C Impervious Area = 0.02 ac.

POST-DEVELOPMENT

Basin 1 Total Area = 3.85 ac.
Basin 1 Impervious Area = 1.50 ac.

Basin 2 Total Area = 11.91 ac.
Basin 2 Impervious Area = 5.30 ac.

Thomas L. Knight, P.E., Professional Association (TLK) was recently hired by the new owner to obtain construction plan approval for the subdivision. As part of our standard practice, I researched the state and local codes to determine if there were any changes that would affect the project as it was proposed under permit 42-069-67942-2. I also inspected the project site to determine if there were any changes on the ground. I determined that the conditions on the ground had not changed in any noticeable way with the exception of overgrown vegetation.

The proposed stormwater management system consists of one normally dry retention pond and one wet detention pond. WRA 1 is the retention pond that serves post-development basin 1. WRA 1 is equipped with an underdrain system that accelerates pond recovery. WRA 2 is a wet detention pond that serves post-development basin 2. WRA 2 is equipped with an overflow structure with bleed-down orifice to meet pond drawdown requirements.

The design of WRA 1 and WRA 2 has not been changed. All pond elevations, pond geometry, pond areas, pond volumes and pond overflow structures are identical to what is shown on the Stormwater Management Engineering Report of The Southgate Subdivision (the "Report") received by the District on August 23, 2007 as part of the permit no. 42-069-67942-2.

The addition of 15 lots has resulted in revisions to the total area of post-development Basin 2. The total area of Basin 2 has increased from 11.910 acres to 12.184 acres. The impervious areas for both post-development Basin 1 and post-development Basin 2 have also been revised.

Two-story homes will be constructed. The average building footprint is estimated to be 30' x 40'. A 2,400 sq.ft. home with a one-car garage would have a living area of approximately 2,000 sq.ft.. A 2,400 sq.ft. home with a two-car garage would have a living area of approximately 1,600 sq.ft..

PRE-DEVELOPMENT

Basin 1 Offsite Total Area = 0.14 ac.
Basin 1 Offsite Impervious Area = 0.02 ac.

Basin A Total Area = 10.51 ac.
Basin A Impervious Area = 0.09 ac.

Basin B Total Area = 4.01 ac.
Basin B Impervious Area = 0.03 ac.

Basin C Total Area = 1.10 ac.
Basin C Impervious Area = 0.02 ac.

POST-DEVELOPMENT

Basin 1 Total Area = 3.843 ac.
Basin 1 Impervious Area = 1.479 ac.

Basin 2 Total Area = 12.184 ac.
Basin 2 Impervious Area = 5.073 ac

Refer to the attached Post-Development Impervious Area Breakdown.

Basin 1 Total Area was reduced from 3.85 ac. to 3.843 ac. Basin 1 Impervious Area was reduced from 1.50 ac. to 1.479 ac. There is no need to analyze Basin 1 again as the revisions will result in a reduction in the required treatment volume and a reduction in runoff. WRA-1 has not been changed.

Basin 2 Total Area was increased from 11.91 ac. to 12.184 ac. Basin 2 Impervious Area was reduced from 4.27 ac. to 4.047 ac. The required treatment volume for WRA-2 is the greater of 1" of runoff from the drainage area or 2.5" of runoff from the impervious area. The required treatment volume will change.

Basin 2 Drainage Area = 530,748 sq.ft. = 12.184 ac.
Basin 2 Impervious Area = 176,303 sq.ft. = 4.047 ac.

Required Treatment Volume

$$1"/12 \times 530,748 \text{ sq.ft.} = 44,229 \text{ cu.ft.} = 1.015 \text{ ac-ft}$$

or

$$2.5''/12 \times 176,303 \text{ sq.ft.} = 36,730 \text{ cu.ft.} = 0.843 \text{ ac-ft}$$

$$\text{Required Treatment Volume} = 44,229 \text{ cu.ft.} = 0.843 \text{ ac-ft}$$

The orifice invert elevation will remain at elevation of 103.20 ft. The top of overflow structure will remain at elevation 105.18 ft. The treatment volume will be provided at elevation 104.08 ft. Refer to Appendix C of the stormwater report that was included in the aforementioned August 2007 submittal of this project. One-half of the treatment volume will be recovered in 24 to 30 hours.

The Permanent Pool Volume requirement of WRA-2, being a function of the drainage area and the impervious area, will also change.

Permanent Pool Volume

$$\text{Drainage Area (DA)} = 12.184 \text{ ac.}$$

$$\text{Impervious Area} = 4.047 \text{ ac.} = 33.22\%$$

$$\text{Weighed Rational Coefficient (C)} = 0.95(.3322) + 0.20(1-0.3322) = 0.449$$

$$\text{Wet Season (WS)} = 153 \text{ days}$$

$$\text{Wet Season Rainfall Depth (R)} = 30 \text{ inches}$$


$$\text{Residence Time (RT)} = 14 \text{ days}$$

$$\text{PPV} = (\text{DA})(\text{C})(\text{R})(\text{RT})/(\text{WS})(12\text{in/ft}) = (12.184)(0.449)(30)(14)/(153)(12) = 1.251 \text{ ac-ft}$$

The Permanent Pool Volume provided in WRA-2 is 3.333 ac-ft.

Should you have any questions or need additional information, please do not hesitate to contact me at (352) 267-4516 or tknight@knighteng.com.

Sincerely,



Thomas L. Knight, P.E.
President

Cc: Cary Malever

Project: Southgate

7/12/2015

Post-Development Impervious Area Breakdown

IMPERVIOUS AREA SUMMARY FOR WATER QUALITY TREATMENT & RECOVERY

DESCRIPTION	TOTAL BASIN	BUILDING	DRIVEWAY	PAVEMENT	CURB	SIDEWALK	TOTAL IMP.	PERCENT IMPERVIOUS	RUNOFF COEFFICIENT
	(SQ.FT.)	(SQ.FT.)	(SQ.FT.)	(SQ.FT.)	(SQ.FT.)	(SQ.FT.)	(SQ.FT.)		
BASIN 1	167,413	23,793	7,770	22,895	3,661	6,288	64,407	38.472	0.489
BASIN 2	530,748	87,100	26,250	40,397	6,484	16,072	176,303	33.218	0.449
TOTALS	698,161	110,893	34,020	63,292	10,145	22,360	240,710	34.478	0.459

IMPERVIOUS AREA SUMMARY FOR STORM ROUTING (INCLUDING WET POND AREA AT CONTROL ELEVATION)

DESCRIPTION	TOTAL BASIN	BUILDING	DRIVEWAY	PAVEMENT	CURB	SIDEWALK	WRA	TOTAL IMP.	TOTAL IMP.
	(SQ.FT.)	(SQ.FT.)	(SQ.FT.)	(SQ.FT.)	(SQ.FT.)	(SQ.FT.)	(SQ.FT.)	(SQ.FT.)	(ACRE)
BASIN 1	167,413	23,793	7,770	22,895	3,661	6,288	0	64,407	1.479
BASIN 2	530,748	87,100	26,250	40,397	6,484	16,072	44,678	220,981	5.073
TOTALS	698,161	110,893	34,020	63,292	10,145	22,360	44,678	285,388	6.552

NOTES:

1. DESIGN BUILDING IMPERVIOUS AREA PER LOT = 1,300 SQ.FT. INCLUDES BUILDING FOOTPRINT, WALKWAYS AND DETACHED STRUCTURES.
2. BASIN AREA, DRIVEWAY AREA, PAVEMENT AREA, CURB AREA, SIDEWALK AREA AND WRA AREA ARE EXACT MEASUREMENTS FROM CAD DRAWING.