TRIANGLE PLAZA AT LELY RESORT

ENGINEERING REPORT FOR: SITE DEVELOPMENT PLAN AMENDMENT

1st Submittal: May 2017

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1 GENERAL PROJECT INFORMATION

1.1 SITE LOCATION AND EXISTING CONDITIONS

Triangle Plaza at Lely Resort is 7.15 acre facility located in Collier County, Florida, within Section 33/34, Township 50 South, Range 26 East, and is situated north of Tamiami Trail East (U.S. 41), west of Triangle Boulevard. The zoning designation of the site is "PUD". The existing developed site includes a parking lot, Steakhouse, Hobby Lobby, and a Chase Bank.

1.2 PROJECT OVERVIEW

The proposed project includes construction of one (1) building, removal of pavement, modification of water main, fire main and the drainage system.

1.3 PROJECT ACCESS

Access will be from Triangle Boulevard.

1.4 SURFACE WATER MANAGEMENT OVERVIEW

The existing surface water management system is permitted under SFWMD ERP Permit No 11-00429-S, Application No 130225-6. The system consists of a dry detention system to provide the required water quality treatment prior to discharge. Storm sewers, swales and overland flow convey run-off to the storage area.

The property owners association is responsible for maintaining the surface water management system.

1.5 UTILITIES OVERVIEW

Potable water and sanitary sewer service is provided by Collier County, both of which are currently available onsite.

2 WATER HYDRAULIC ANALYSIS

2.1 INTRODUCTION

Potable water for the Triangle Plaza at Lely Resort is provided by 4" watermain and 8" fire main that branches from Triangle Boulevard. The water system is designed to accommodate the maximum daily flow for First Watch and retail offices, existing Hobby Lobby, and existing Outback steakhouse. Potable water will be provided by the Collier County Utilities Department. A separate 8" fire main exists that will provide the required fire flows for the development.

2.2 SYSTEM PERFORMANCE

The water mains have been sized to provide sufficient potable service to the existing Steakhouse, existing Hobby Lobby, and proposed Building #1 (First Watch restaurant and Office/Retail). Since the existing Outback Steakhouse, existing Hobby Lobby, and the proposed First Watch and proposed office building are served by single meter, fixture units of both building were used to calculate the meter size. Based on the water meter sizing chart provided by the Collier County Utilities Department, the existing meter size of 2" will remain adequate under the proposed conditions. A Water Meter Sizing Worksheet is provided in the submittal package.

2.3 FIRE FLOW ANALYSIS

Proposed Building 1 is type II (000) construction and is sprinklered. The fire flow was calculated for the building. This calculation resulted in a necessary fire flow of 1,000 gallons per minute in addition to domestic requirements at a residual pressure of not less than twenty (20) psi. A table showing the fire flow calculation for the proposed building can be seen below:

REQUIRED FIRE FLOW CALCULATION									
Building	Area Under Roof(SF)	Building Type per FBC	Sprinklers	Sprinkler Value	FFPC Fire Flow (gpm)	Required Fire Flow (gpm)			
Restaurant	6,217	Type II (000)	Yes	0.25	1,250	1,000			

Notes:

Fire flow requirements determined from Florida Fire Prevention Code and National Fire Prevention

Association. Fire flow requirements are per Table 18.4.5.1.2 in the FFPC and NFPA

The fire flow requirement is reduced 75% with an approved fire sprinkler system but must be

1000 gpm minimum regardless of fire sprinkler credit

The conducted fire flow indicates an available 3,018 gpm @ 20 psi residual. The design service connection pressure is based on Collier County's Utility Ordinance. Based on above calculation the conducted fire flow is adequate to handle the required fire flow. The fire flow test result is shown next page:

GREATER NAPLES FIRE RESCUE DISTRICT FIRE AND LIFE SAFETY 2700 N Horseshoe Dr. • Naples, FL 34104 Phone: (239)774-2800 Fax: (239)774-3116 Hydrant Flow Test Date: 5.5.17 Time: 0845 Tested By: 9 Location: Triangle Plaza-Triangle Block and U.S. 41 Requested By: Zachary Taylor, JR. EVANSERg. Date: 5/3/ 17 zache revansengineering com comments: Zach's cell # 478-0219 Hydrant Flow Discharge Static Pressure: 83 Residual Pressure: 40 Port Size: 4/2 Flow PSI: 20 GPM: 1752 Port Size: Flow PSI: GPM: Port Size: Flow PSI: GPM: Total Flow: 1752 Fire Flow @ 20 PSI Residual: 3018 Inspector comments: Foured requested hydrant Fire Official's Signature Inspection Fee: \$ 150 Paid By: DCredit Card archeck Date Received: 5/3 Check #: 20.48 Professionalism ~ Integrity ~ Compassion

3 SEWER HYRAULIC ANALYSIS

3.1 SYSTEM PERFORMANCE

The Triangle Plaza at Lely Resort will be served by an onsite gravity system discharging to the existing triangle Boulevard lift station. The sewer provider is Collier County Public Utilities.

3.2 SEWER CALCULATIONS

3.2.1 *Estimated average daily flow summary:*

<u>Proposed Building 1 (First Watch – Unit 101)</u> Number of regular seats: 155 Flow rates regular seats: 40 gpd (Based on 64E-6.008 Table I) = 40 gpd Average potable water = (155* 40) = 6,200 gpd Peak potable water = 6,200 gpd x 4.5 = 27,900 gpd = 29.06 gpm (Hours of operation = 16 hours)</u>

<u>Proposed Building 1 (Offices – Unit 102):</u> 15 GPD per 100 square feet of floor space based on DEP 64E-6.008 Table I. Total square footage of building = 2,450 Average daily flow = (2450/100) x 15 GPD = 367.5 GPD Peak factor = 4.5 Design Peak flow = 367.5 GPD x 4.5 = 1653.75 GPD = 1.15 GPM

Existing Hobby Lobby: Number of employees = 32 Flow per employee = 15 GPD Average Daily Flow = 32 x 15 GPD = 480 GPD Peak factor = 4.5 Design Peak Total = 0.73 GPM * 4.5 = 3.27 GPM

Existing Outback Steakhouse:

Estimated flow for Outback Steakhouse is obtained from previously permitted report. The calculation is shown below: Units/Seats = 227 Per Capita Flow = 33.98 GPD Average Daily Flow = 7,714 GPD Peak Factor = 4 Design Peak Flow = 7,714 GPD x 4= 30,856 GPD = 21.43 GPM

Total Sewage flow from existing Steakhouse, existing Hobby Lobby and proposed Building 1 (First Watch and Offices) (29.06+1.15+3.27+21.43) GPM = 54.91 GPM

As shown in the calculations in the following section, the existing 8" gravity mains are adequately sized to handle the estimated wastewater flow generated by Proposed Building 1 and the existing buildings on-site.

3.2.2 Gravity Sewer Pipe Capacity

Using the Manning's formula to calculate the capacity of gravity sewer flowing half-full with a slope and a Manning's n-value of 0.013 yields the following capacities. Each run of gravity sewer was analyzed to confirm that the gravity sewer was adequately sized to handle incoming flows.

- Q = Discharge (cu. ft./sec.)
- A = Cross-sectional Area of Flow (sq. ft.) R = Hydraulic Radius (ft.)
- n = Coefficient of Roughness
- S = Slope of Pipe (ft./ft.)

Pipe Size	Area (sf)	Coefficient of	Hydraulic	Wetted	Slope	1/2 Full	1/2 Full
(ft)		Roughness (n)	Radius	Perimeter		Flow (cfs)	Flow (gpm)
6	0.098	0.013	0.125	0.785	0.0104	0.285	127.68
8	0.174	0.013	0.167	1.047	0.0040	0.382	171.3
10	0.273	0.013	0.208	1.308	0.0028	0.579	259.9
12	0.393	0.013	0.250	1.570	0.0022	0.835	374.7
15	0.613	0.013	0.313	1.963	0.0015	1.250	561.0