

# **ATTACHMENT 2**

## **Stormwater Analysis**



March 30, 2015

Church Roberts  
Johnson Engineering, Inc.  
P.O. Box 1550  
Fort Myers, FL 33902-1550  
239-334-0046

**RE: *Coral Reef Commons  
Environmental Assessment and Habitat Conservation Plan  
Stormwater and Utility Overview***

Dear Mr. Roberts:

This document is a narrative of the proposed drainage system design intended to be incorporated by Johnson Engineering into the Habitat Conservation Plan for the Coral Reef Commons Project as required by the U.S. Fish and Wildlife Service.

This narrative consists of:

- A general overview of stormwater quality and quantity treatment system for the project.
- A general discussion of the overall site drainage.
- Miami-Dade County and Florida State code requirements for surface water management and water quality.
- A summary of domestic water supply for the project.
- A general discussion of groundwater conditions for the project site.

#### **Stormwater Quality/Quantity System Overview**

The Coral Reef Commons project consists of multiple commercial and residential parcels and connecting roadways with associated stormwater and landscaping improvements. The stormwater system is designed such that runoff from the development is collected in a series of catch basins and treated by underground exfiltration trench before staging in the parking lots and the Natural Forested Community (NFC) areas and percolating back into the groundwater by the exfiltration trench and open storage areas. The stormwater quality treatment required is the greater of 1 inch provided over the entire site area or 2.5 inches provided over the impervious area. The stormwater system is designed to retain the 5year-24hour storm event prior to usage of the NFC areas or parking lots per Miami-Dade Department of Regulatory and Economic Resources (DRER) criteria. Runoff volume for the 5year-24hour, 10year-24hour, 25year-72hour, and 100year-72hour storm events is attenuated through the use of exfiltration trench, soil storage and surface storage in the parking areas and NFC preserve areas. Note that while the NFC preserve areas provide storage volume for the site, they are to remain undisturbed. Spreader swales, baffles or other similar best management practices are used within the individual tracts and parcels to hydraulically connect the NFC preserve areas.

**Drainage Characteristics**

The existing property consists of a college research facility, roadways, disturbed and undisturbed forested areas. The site is within FEMA Zone X. Generally, the site has no outfall or existing stormwater treatment facilities, and therefore the rainfall within the site and NFCs percolates into the ground in the existing condition. A ridge around elevation 16-18 ft (NGVD) runs east-west through the center of the existing site, with lower elevations in the 7-10 ft (NGVD) range and a low point at the northwestern most portion of the property. The proposed site is similar to a bowl-shaped basin where runoff remains onsite and percolates into the ground via exfiltration trenches and NFC areas.

The Coral Reef Commons project site contains two forested Preserve Areas, each located on either side of SW 127<sup>th</sup> Avenue. Generally, stormwater drains towards each drainage area on either side of SW 127<sup>th</sup> Avenue. As further described below, for stormwater quality purposes, the stormwater runoff from the developed parcels will be treated within exfiltration trench prior to draining towards the Preserve Areas and then will percolates into the ground in a manner similar to the existing condition.

**Miami-Dade County Surface Water Management Requirements**

In Miami-Dade County, the surface water is managed by the Department of Regulatory and Economic Resources, Division of Environmental Resources Management (DRER/DERM). For the Coral Reef Commons project, the DERM required the stormwater management system to provide stormwater quality treatment volume for developed areas in the form of exfiltration trench for the 5year-24hour storm event prior to overflowing into the NFC preserve retention areas and percolating into the ground in a manner similar to the existing condition. Stormwater runoff, including 25year-72hour and 100year-72hour storm events, shall remain onsite, as Miami-Dade County does not allow offsite discharge.

**Florida State Code Surface Water Management Requirements**

For stormwater quality purposes, the South Florida Water Management District (SFWMD) requires treatment volume be provided for the greater of 1" over the entire site or 2.5' over the impervious surface of treatment volume. For stormwater quantity purposes, SFWMD requires the project to be designed for:

- within parking lots served by exfiltration systems, a design storm equivalent to the 5year-1hour storm event,
- building floors shall be at or above the 100 year flood elevations, also, the 100year-72hour storm event must be considered in determining elevations, and
- the discharge is limited such that all of the stormwater generated during a 100 year-72 hour storm event must be kept onsite.

**Domestic Water Supply**

The Miami-Dade Water and Sewer Department (MDWASD) provides potable water service to the project site. An existing 16" ductile iron water main within S.W. 127<sup>th</sup> Ave will serve as the primary connection point for the project's water system, with additional new 12" water main loops being provided for each phase of construction. The potable water is derived from one of the MDWASD supply wellfields and transported to the project site by pipe.

**Wastewater**

The MDWASD provides sanitary sewer service to the project area. A pump station exists onsite that serves the coast guard property to the east, the college onsite, and the naval base to the south, however it is outdated and will be replaced with this project. An existing sanitary gravity system feeds the existing pump station and it will also be replaced with a new gravity sanitary system. The MDWASD uses gravity collection systems, force main transmission lines, and regional and sub-regional lift stations to transport the sewer to either the Central or South District Wastewater Treatment Plant Reclamation Facility. The South District Wastewater Treatment Plant discharges reclaimed water to deep water injection wells. The Central District Wastewater Treatment Plant Reclamation Facility discharges reclaimed water to the Atlantic Ocean via an ocean outfall extending 18,800 feet into the Atlantic Ocean.

**Groundwater**

Based upon the Geotechnical Report by Tierra South Florida, the groundwater levels were measured between about 7 and 9 feet below the existing ground surface. Additionally, the groundwater is expected to, typically, fluctuate within about 2 ft from where it was encountered during the drilling operation (Tierra 2013).

A groundwater restriction is in place over a portion of the property. None of the groundwater will be used for domestic purposes. Residential Parcel A proposes a groundwater well for irrigation authorized under SFWMD Permit No. 13-05615-W. None of the commercial parcels will utilize the groundwater for irrigation. The design of the stormwater system is such that treated runoff generated by rainfall will infiltrate into the soil and recharge the groundwater as part of the exfiltration trench design.

Please contact me at (772) 794-4100 or [melibe.thomas@kimley-horn.com](mailto:melibe.thomas@kimley-horn.com) should you have any questions.

Sincerely,



Melibe S. Thomas, P.E.  
Vice President

## References

“Geotechnical Engineering Study Coral Reef Commons Miami, Florida” Tierra South Florida, 2765 Vista Parkway, Suite 10, West Palm Beach, Florida 33411. April 19, 2013.

“Phase II Environmental Site Assessment Report for Coral Reef Drive”. Professional Services Industries, Inc. 1748 33<sup>rd</sup> Street, Orlando Florida 32839. December 23, 2011.

“Miami Dade Water and Sewer Department 20-year Water Supply Facilities Work Plan (2014-2033)” Miami-Dade County. November 2014

“Environmental Resource Permit Applicant’s Handbook Volume II”, South Florida Water Management District, 3301 Gun Club Road, West Palm Beach, FL 33406, August 10, 2014.

Coral Reef Commons Miami-Dade County, Florida Drainage Summary, April 2013, Kimley-Horn and Associates, Inc. 24<sup>th</sup> Street, Suite 200 Vero Beach, Florida . 32960