

WATER AND SANITARY SEWER EVALUATION REPORT

MADISON PALMS APARTMENTS TITUSVILLE, FLORIDA

Prepared for:
TVC Development, Inc.
3030 Hartley Rd. Suite 310
Jacksonville, FL 32257

SEPTEMBER 29, 2020

CCEI PROJECT NO. 200826

Submitted by:



Consulting Civil Engineers Inc
3650 Bobbi Lane, Suite 119
Titusville FL 32780
CA No. 7522

Contact: Z. Sid Chehayeb, PE
Phone: (321) 269-9930
Email: info@cceifl.com



Consulting Civil Engineers Inc

September 29, 2020

TVC Development, Inc.
Attn: Eric Weller, Land Acquisition Specialist
3030 Hartley Rd. Suite 310
Jacksonville, FL 32257
Em: eweller@vestcor.com | Tel: 904-260-3030

RE: Water and Sanitary Sewer and Evaluation Report
Project Name: Madison Palms of Titusville
Location: South of the Southeast corner of Barna Ave. and Harrison St., Titusville, FL
Parcel ID: 22-35-16-00-00021.0-0000.00 & 22-35-16-00-00034.0-0000.00

Dear Mr. Weller,

Consulting Civil Engineers, Inc. (CCEI) has completed a preliminary evaluation of the water and sanitary sewer available to the above-referenced site located within the City of Titusville, Brevard County, Florida. We conducted our investigation as authorized in our Professional Services Agreement. The evaluation was performed based on information obtained through the City of Titusville Utility Atlas, our knowledge of the site, and previous plans prepared by our office. Additionally, we conducted a site visit to verify our findings. The following report and conceptual plan presents the results of our exploration and our interpretation of our findings.

We appreciate the opportunity to have worked with you on this project and look forward to a continued association. Feel free to contact us if you have any questions or if we may further assist you as your plans proceed.

Sincerely yours,
Consulting Civil Engineers, Inc.

A handwritten signature in blue ink, appearing to read "Zohair", is written over a blue circular stamp or seal.

Zohair (Sid) Chehayeb, PE
Project Manager

WATER AND SANITARY SEWER EVALUATION REPORT

Madison Palms Apartments

PROJECT DESCRIPTION

This site lies within Section 16, Township 22 South, Range 35 East, located in the City of Titusville, Brevard County, Florida; more specifically, it is south of Harrison Street, north of Turnesa Drive and along the west side of Barna Avenue. The total project area is 8.58 acres.

The attached Conceptual Plan (EXHIBIT 2) depicts eight (8) new buildings including a clubhouse, and the associated paved parking and drive aisles. The plan also shows the surrounding city and private utility systems, and a schematic layout of the possible collection and distribution system. The documentation provided within this report addresses the parameters of the water and sanitary sewer and the associated infrastructure improvements.

WATER AND SEWER JURISDICTION

The Jurisdictional Government Agencies are:

- City of Titusville
- Florida Department of Environmental Protection

EXISTING CONDITIONS

The site is currently undeveloped with scrub and densely wooded areas.

Based upon our site visit and previous surveyed conditions, water and sanitary sewer are available through the City of Titusville utilities and are within the proximity of the site. See the City and Private Utilities (EXHIBIT 1).

PROPOSED CONDITIONS

Potable Water System

There is an existing 16-inch city water line on the east side of Barna Avenue. A search of records indicates that even though the size of the line is quite large, the available pressure is relatively low. Its suitability for fire protection purposes without the use of a booster pump system will need to be evaluated once more details of the proposed development are known.

In terms of a connection point to this main, while a connection may be possible at the proposed entrance drive of the apartment complex, it may be best to propose the connection instead to the northeast corner of the site. This location appears to have fewer construction obstacles. It may also allow sufficient space for the placement of any required equipment such as a system-wide back flow preventer should the Client prefer to have a one-meter private system.

Our domestic water demand calculations indicate that the apartment complex will generate a peak hourly rate of approximately 78 gallons per minute. Please see City Water and Sewer Demand Calculations (EXHIBIT 3), which were based on requirements from the City's Water Resources Department. A looped (around the project's interior) 8-inch diameter pipe can satisfy this requirement.

It should also be noted that depending on fire flow calculations, the tie-in and/or looped pipe may need to be increased to a 10-inch diameter. A number of variables will determine the final sizing of the water system for fire flows. They include the existing main pressure, booster pump if any, lengths of pipes,

types of building construction, the presence or absence of fire suppression systems, as well as sizes of and proximity of other buildings.

Regardless of the diameter of the connection pipe, because of the amount of traffic on Barna Avenue, the City will most likely not allow this connection to be constructed via the open-trench method. Thus, the connection may need to be accomplished by tunneling, either via bore-and-jack method or by directional drilling method.

Sanitary Sewer System

Based upon 112 apartments with an average of two bedrooms each, the average daily sewer flow is estimated to be approximately 21,000 gallons. The peak hourly flow would be approximately 60 gallons per minute.

There is an existing sanitary sewer manhole on Barna Avenue at the southeast corner of the site. It is the first manhole in the system that flows to the south. Being the first manhole in this line, it is relatively shallow. Examination of available survey plans reveal that the invert elevation is 21.40 NGVD 1929, or about elevation 20.0 NAVD 88. A possible connection to this manhole by a gravity system alone appears to be highly unlikely, unless the apartment site and its finished floors were significantly elevated.

Another gravity option might be an existing sewer line connection in the Spanish Oaks community and a lot that lies between it and the proposed Madison Palms Apartments. The referenced lot, which abuts Madison Palms, has an unused "U" shaped road off Demaret Drive that contains a clay sewer line, which connects to the City system on Demaret Drive. With an invert elevation of approximately 17.8' and an appropriate finished floor elevation, a gravity connection may be possible. The referenced lot, formerly named the Demaret Drive Development, and Harrison Oaks (HO) now the proposed Madison Palms, were both previous condominium projects, which were proposed by two different developers in 2006/7. CCEI was the Engineer of Record for Civil Site design for both projects. In that, design the section of sewer in this "U" shaped road was being removed and the then proposed sanitary sewer was to be connected to a lower invert in Demaret Drive. Obtaining access to either of this sewer outfall would require either obtaining easement or outright purchase of this parcel.

If neither option is possible or desirable, then a lift station will more than likely be required for the Madison Palms development. There may be two options for a lift station discharge: there is a 3-inch force main along the east side of Barna Avenue but it is a private system. Our 4" line teeing into a 3" also makes it unlikely that approval would be granted by the City.

The other and more likely discharge would be into City manhole 40-97. It should be noted the City requires that if a force main discharges directly into a manhole that the manhole be retrofitted with a fiberglass liner. This lining requirement usually extends to the next downstream manhole. Please refer to the Concept Plan for a suggested location of the lift station and force main routing.

End of Evaluation Report

This Report and the attached Exhibits were prepared using available archived data and data received from other entities. CCEI is not responsible for the accuracy and/or reliability of said information.

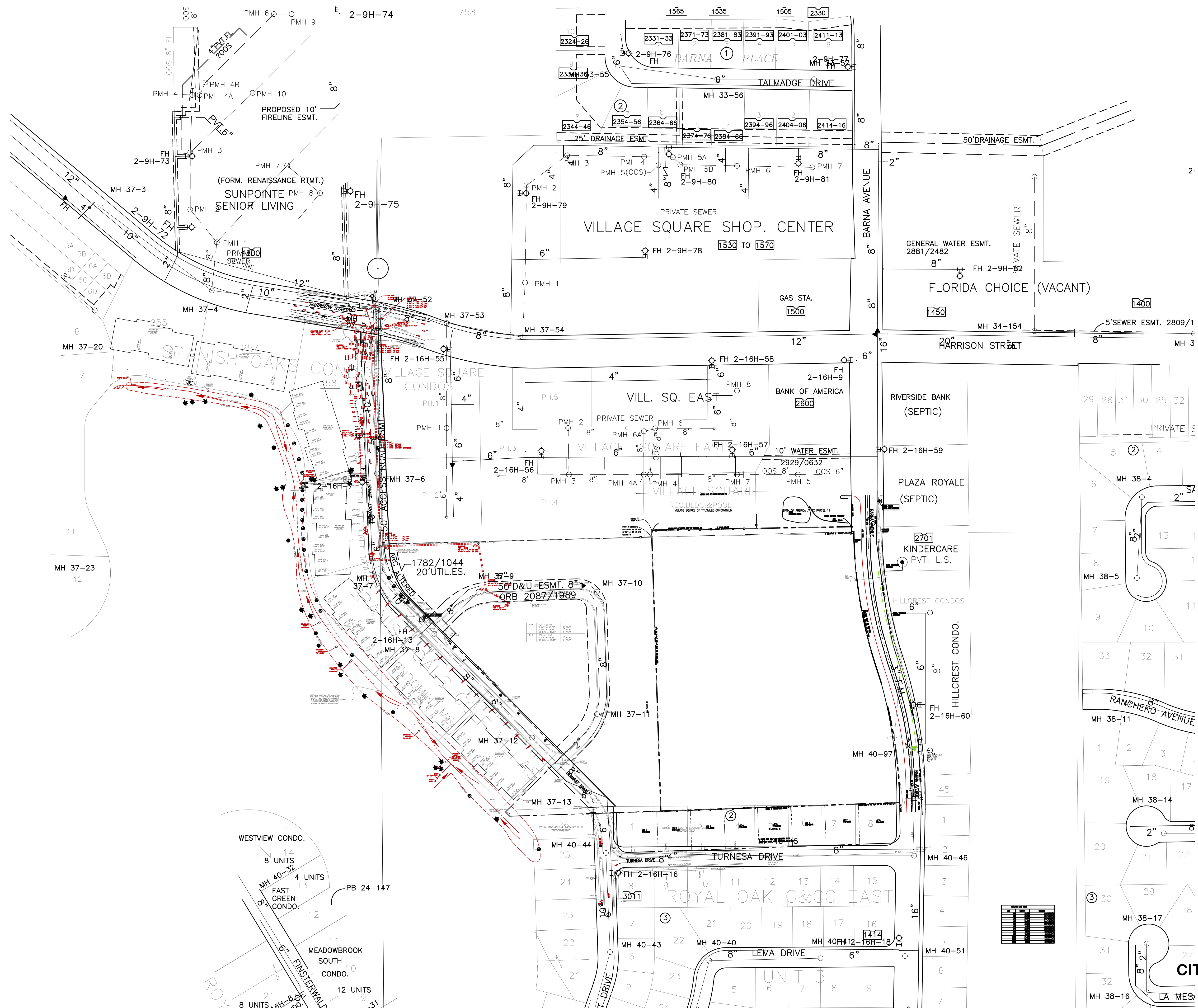
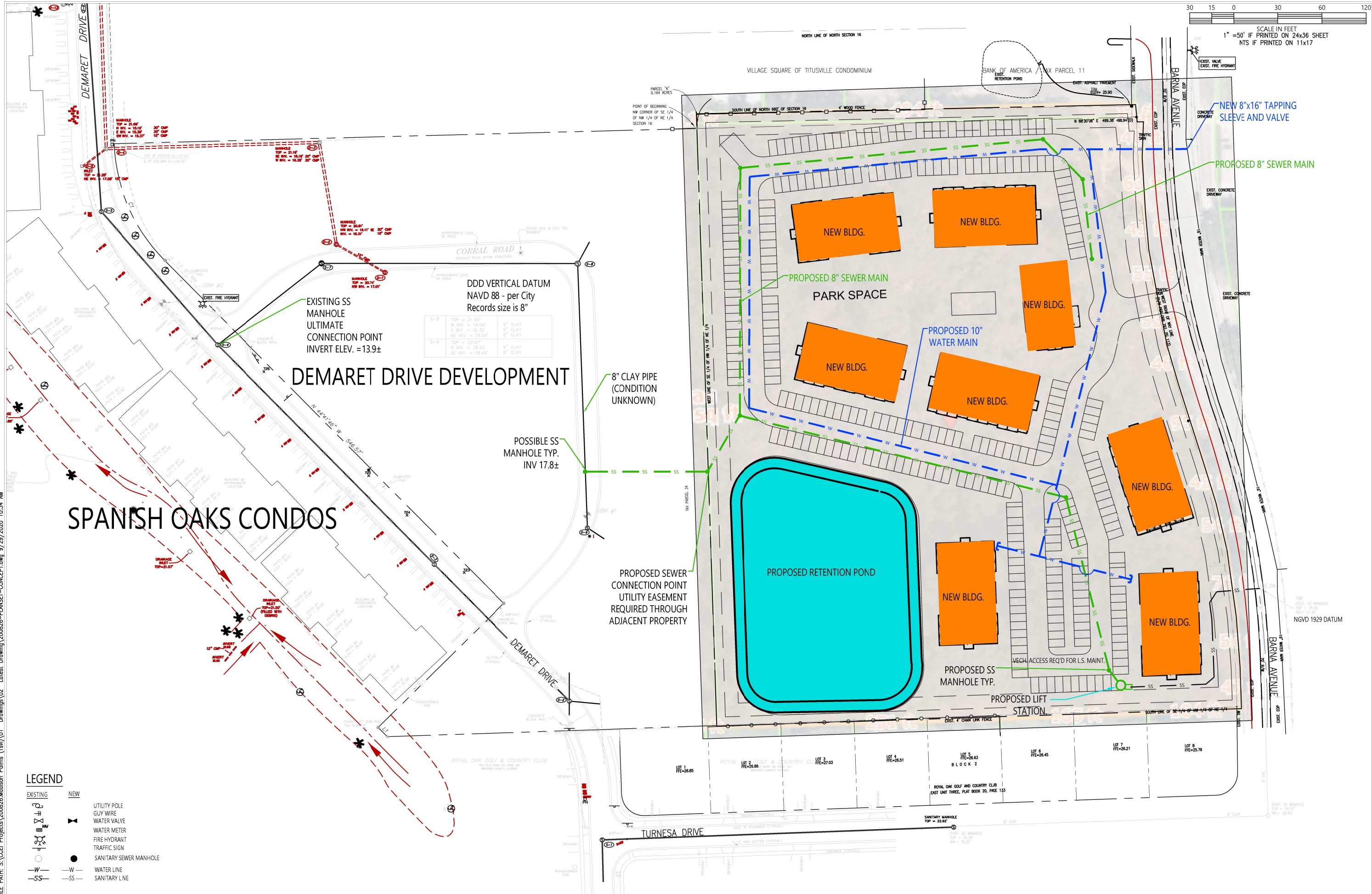


EXHIBIT 1
CITY OF TITUSVILLE
CITY AND PRIVATE UTILITIES

FILE PATH: S:\CCEI Projects\200826\Madison Palms (Tsw)\01 Drawings\02 Latest Drawing\200826-PLANSET-CONCEPT.dwg 9/29/2020 10:34 AM



CCEI
CONSULTING CIVIL
ENGINEERS, INC.
3650 BOBBY LANE SUITE 119
TITUSVILLE, FLORIDA 32780
PH: (321) 269-9930 INFO@CCEI.COM
CERT. AUTH. NO. 00097522

CCEI PROJECT No.
200826

ZOHER S. CHEHADEB, STATE OF FLORIDA,
PROFESSIONAL ENGINEER, LICENSE NO. 38577

**NOT FOR
CONSTRUCTION**

CONCEPTUAL PLAN

MADISON PALMS APARTMENTS
2800 BARNA AVENUE/ 2727 DEMARET DRIVE
TITUSVILLE, FLORIDA

SHEET NO.
EXHIBIT 2

CITY OF TITUSVILLE
WATER RESOURCES DEPARTMENT



**WATER DEMAND, METER SIZING, AND
SEWER DEMAND CALCULATIONS**

FOR

MADISON PALMS APARTMENTS

DATED 9/29/20

PRELIMINARY- NOT FOR CONSTRUCTION

CONSULTING CIVIL ENGINEERS, INC.

MADISON PALMS APARTMENTS
FLOW DETERMINATIONS FOR FDEP APPLICATIONS
AVERAGE DAILY FLOW (from LDR 63-133)

Page 2

ESTABLISHMENT	UNIT	FACTOR	NO. OF UNITS	TOTAL ERU'S
Residential				
Single-family Home	Per Unit	1.000		0.000
Duplex (1 or 2 bedrooms)	Per Unit	0.833		0.000
Duplex (3 or more bedrooms)	Per Unit	1.000		0.000
Multi-family (3 or more bedrooms)	Per Unit	1.000		0.000
Multi-family (2 bedrooms)	Per Unit	0.833	112.0	93.296
Multi-family (1 bedroom)	Per Unit	0.667		0.000
Multi-family (efficiency < 500 sq. ft.)	Per Unit	0.667		0.000
Mobile Home (3 or more bedrooms)	Per Unit	0.833		0.000
Mobile Home (1 or 2 bedrooms)	Per Unit	0.667		0.000
Commercial				
Auditorium	Per Seat	0.017		0.000
Barber/Beauty Shop	Per Opr. Sta.	0.300		0.000
Bowling Alley	Per Lane	0.333		0.000
Restaurant/Cafeteria	Per Seat	0.100		0.000
Restaurant (24 hours)	Per Seat	0.167		0.000
Restaurant ("fast food")	Per Seat	0.050		0.000
Bar/Cocktail Lounge	Per Seat	0.067		0.000
Hotel/Motel (not including food service, banquet/meeting rooms, & laundries)	Per Room	0.500		0.000
Laundry, Self-Service	Per Machine	2.000		0.000
Office Building (Add food service & retail space)	Per 1,000 sq. ft. gross	0.334		0.000
Service Station	Per Bay	1.000		0.000
	Add Per Wash Bay	3.200		0.000
	Add Per Toilet Room	1.000		0.000
Theater	Per Seat	0.017		0.000
Theater (Dinner)	Per Seat	0.067		0.000
Trailer Park (overnight)	Per Space	0.667		0.000
Dentist Office	Per Dentist	0.833		0.000
	Per Wet Chair	0.667		0.000
Doctor Office	Per Doctor	0.833		0.000
Church	Per Seat	0.017		0.000
Hospital	Per Bed	0.833		0.000
Nursing Home	Per Bed	0.417		0.000
Warehouse-Office	Use fixture units for warehouse area, see Office Building for ERU's in that area (Add for food service & other uses)			
Meeting and/or Banquet Rooms Total S.F./15 S.F./person = no. of seats, if not on plans	Per Seat	0.017		0.000
Automotive Repair & Maintenance Store	Per Bay (add remaining fixture units)	0.250		0.000
Retail Store/Self-Service Gas Pumps	Per Restroom (add remaining fixture units)	1.000		0.000
Extended Care Facilities	Per Efficiency	0.500		0.000
Convenience Store without Gas	Use Fixture Units			
Schools, Nursery, Elementary, Middle & High	Per Student	0.067		0.000

MADISON PALMS APARTMENTS
FLOW DETERMINATIONS FOR FDEP APPLICATIONS (Continued)
AVERAGE DAILY FLOW (from LDR 63-133)

Page 3

ESTABLISHMENT	UNIT	FACTOR	NO. OF UNITS	TOTAL ERU'S
Industrial Building (not including food service & non-domestic water flows)				
Without Showers	Per Employee	0.050		0.000
With Showers	Per Employee	0.117		0.000
Industrial Uses based on project specific basis	Show demand calcs. for approval			0.000
ERU COMBINED ERU's				
Combined Above ERU's =			93.296	
Fixture Units for Establishments (Uses) not listed in above tables =				
Additional ERU's Based on Remaining Unit Fixtures =				
Total Combined ERU's =			93.296	
Is Sanitary Sewer applicable to the project (enter Y or N)? =			Y	
Sewer Multiplier =			0.75	
AVERAGE DAILY FLOW (ADF)				
Water = ERU x 300 GPD			27,989 GPD	
Sewer = Water ADF * Sewer Multiplier =			20,992 GPD	
MAXIMIUM DAILY FLOW				
Water = 2 x ADF =			55,978 GPD	
Sewer = 2 x ADF =			41,983 GPD	
PEAK HOURLY FLOW				
Water = 4 x ADF =			77.7 gpm	
Peak Factor =			4.0	
Sewer = Peak Factor x ADF =			58.3 gpm	