

TECHNICAL MEMORANDUM

Index Number 417-64 – Twin Creeks RW Storage Tank and Booster PS – R

PREPARED FOR: JEA Capital Budget Planning

PREPARED BY: JEA Water/Wastewater System Planning (George Porter)

DATE: February 7, 2017 (revised 7/28/17)

Introduction

This Technical Memorandum (TM) is prepared for the construction of a reclaimed water storage tank and pump station. This TM identifies the site location, details the project needs, lists potential design and construction considerations along with providing a preliminary cost estimate and project schedule.

Project Description & Justification

Twin Creeks is a multi-use development planned to start major construction in 2017. The overall development will be a mix of different land uses including retail, office, hotel, single and multi-family residential and industrial. Construction will be phased over an estimated span of 15 years. The table below provides a summary of planned use within the development.

Land Use	Retail/Service	Office	Hotel	Single Family Residential	Multi-Family Residential	Flex Industrial
North of CR210 Total	989,000 SF	700,000 SF	120 rooms	1,250 units	1,030 units	1,950,000 SF
South of CR210 Total	TBD	TBD	TBD	1,400 units	TBD	TBD

Table Source: Prosser Master Development Plan dated 3/18/2015 and ETM Master Development Plan dated 6/8/2015

The Twin Creeks development falls within the southeast reclaimed water service area served by Blacks Ford, JCP, Mandarin and Arlington East wastewater treatment facilities (WWTFs). Reclaimed water is required for irrigation use as detailed in Appendix A of the JEA Rules and Regulations for Water, Sewer & Reclaimed Services.

This project includes a reclaimed water storage tank and pump station to store stored reclaimed water during off-peak hours and repump to the Twin Creeks development during peak demand periods.

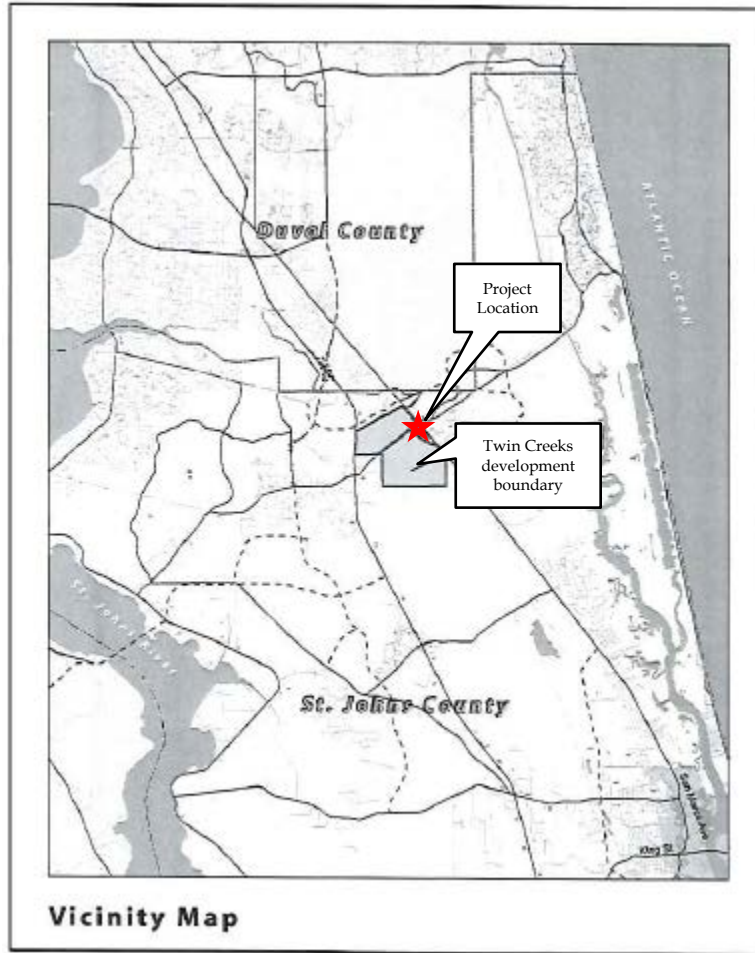
Figure 1 – Development Map

Figure Source: Prosser Master Development Plan dated 3/18/2015; a copy of the Master Development Plan can be found attached to this document.

Scope

For this project, two tanks (1.5 Mgal each, usable volume) are planned for the site with only one to be constructed in this project. The other 1.5 Mgal tank will be constructed at a later date. Pumps and an enclosure, fencing, a backup power generator, and an access road will also need to be constructed. Pumps and storage are to be designed with a two phased approach in mind. Phase 1 will support demand for half of the homes planned and build-out will support demand for all 2,650 homes.

In summary this project will be Phase 1 including three 1,500 gpm pumps and a 1.5 Mgal storage tank. In the future, Phase 2, a second 1.5 Mgal storage tank will be constructed and the total pumping capacity will be increased from 4,500 gpm to 7,000 gpm.

General Requirements

Tank sizing and pump design information provided in this TM is preliminary and must be verified. It is the project engineer's responsibility to design for both the tank volume and pumps based on current and projected demands. Demand data, along with any other required information, will be provided by the JEA Water/Wastewater System Planning group. Supporting calculations, signed and sealed, must be provided for review and approval.

General engineering design shall be in accordance with the following:

- JEA Water, Sewer and Reclaimed Water Design Guidelines
- JEA Rules & Regulations for Water, Sewer & Reclaimed Services
- JEA Water and Sewer Standards

Copies of these documents can be obtained at JEA.com.

Ground Storage Tank

The proposed storage tank is estimated to be 1.5 Mgal (usable volume) with room on the site to construct a future 1.5 Mgal storage tank (usable volume). Design considerations need to be made for future tank and piping along with the required offsets. Due to the current reclaimed water system configuration, the storage tank(s) must be sized to fulfill peak reclaimed water demands with no supplemental water supply. The tank(s) can only be filled during off-peak demand periods.

Pumps

This project will consist of three pumps with an estimated capacity of 1,500 GPM each. Piping and electrical, with a backup power generator, will need to be designed for the three pumps planned for this project with the allowance to add future pumps to provide a buildout delivery capacity of 7,000 GPM. A downstream pressure of 70 psi must be maintained (confirm this with JEA Water/Wastewater System Planning group).

Pump Enclosure

The pump enclosure will need to be sized for current and future needs, considering future pumps and electrical.

Controls

Control logic for the on-site pumps, tanks and off-site reclaimed water system valves are critical to successful operation of the overall reclaimed water delivery system. The engineer shall develop the control logic in consideration of the total reclaimed water delivery system with built in flexibility for future modifications.

Piping

Site piping shall be sized as needed to accommodate current and future needs. The engineering site plan should identify future routing of pipes and sizes so future expansion locations are clearly delineated. A 20-inch reclaimed water main will be installed under a separate contract to serve reclaimed water to this site from the east. A future project is planned to bring a 20-inch reclaimed water from the west also. Site piping must be designed to accommodate current and future piping connections in addition to delivery to the Twin Creeks development. Coordination with JEA and the Twin Creeks development engineer will be required to determine the location of external reclaimed water connections to the site.

Project Site

Figure 2 shows a conceptual site plan, to only be used as a general schematic for determining the initial site layout. The project engineer is responsible for determining the overall site dimensions based on a phased construction approach. The orientation of the pumps, piping and tank must be

configured to optimize maintenance and future site needs. A stabilized access road must be constructed to provide for future site access needs.

Site Location

The site is located at the existing Twin Creeks master pump station.

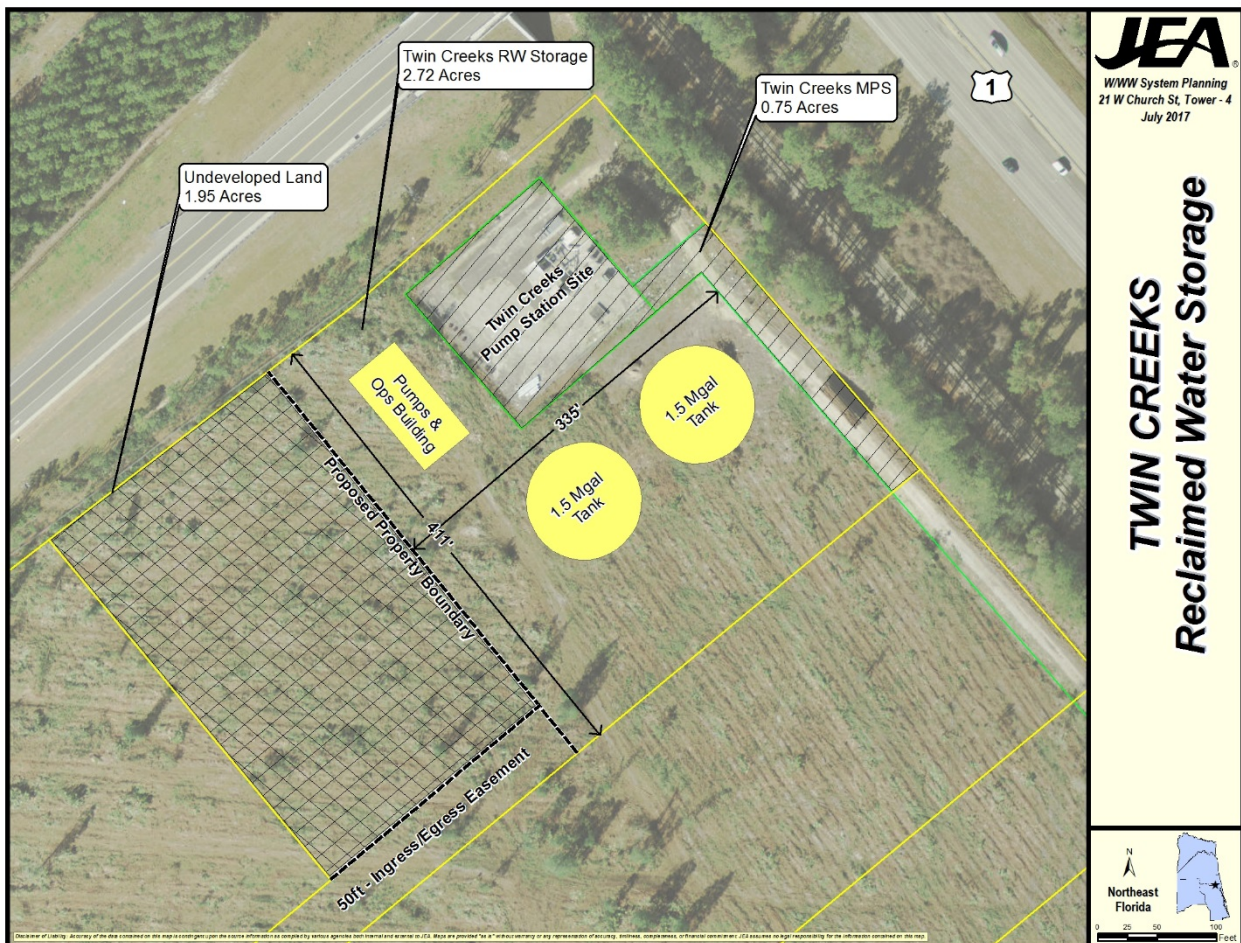
Conceptual Site Plan

Figure 2 conceptualizes a site plan for this project. The major components of the site include two 1.5 Mgal storage tanks (one planned, one future), a pump enclosure, additional land area for access, parking, stormwater requirements, etc. The location of the pumps and tanks is only for illustrative purposes, it is the responsibility of the project engineer to determine the most cost effective orientation of the site and internal structures.

Land Ownership/Real Estate

At the time of writing this TM, the property required for this project was in negotiation with the property owner. A final property boundary survey is required prior to starting design. Deed restrictions applicable to this property regarding structure height, landscape buffer and landscaping should be reviewed and included in the scope of this project. Access to this site is limited and should be evaluated prior to design.

Figure 2 - Conceptual Site Plan



Site Development Constraints

All planned improvements should be coordinated with the St Johns County Development Review Committee and any other authority requiring review.

Determine if there are any wetland impacts. If so, provide setbacks and buffers.

A protected tree survey should be acquired and a mitigation strategy planned.

Design structure elevations in consideration of surrounding elevations and the estimated 100 year flood staging.

Survey Requirements

Final design of the project should be based on field survey data including horizontal and vertical locations and identification of existing utilities, pavement, structures and drainage features within the project area limits. Project datum requirements should be confirmed prior to commencement of the survey. Right-of-way boundary limits and parcel ownership lines should be included on the survey as well as any vegetation deemed 'protected' by the governing jurisdictions. An environmental consultant should be engaged to determine the presence of jurisdictional wetlands and protected or listed species within the construction limits. Any wetland lines or significant habitat community limits should be flagged prior to survey commencement. The site should be surveyed for protected trees.

Anticipated Permits and Approvals

It is anticipated that permits and/or department approvals will be required by St Johns County Development Review, Florida Department of Environmental Protection, and the St. Johns River Water Management District. Other permits may be determined necessary during the design process and will be obtained by the engineer.

Method of Design and Construction

The methods of design and installation for the proposed tank, pumps and building may be by any means necessary in accordance with the latest edition of the JEA Water & Sewer Standards Manual as well as the applicable standards and requirements of the DEP, SJRWMD and St. Johns County.

Project Management & Delivery

Stage	Administered by:	Performed by:	Submittal to Capital Budget
Project Definition	WWSP	WWSP	PD
10% Schematic Design	PEC	External Contractor	
30% Conceptual Design	PEC	External Contractor	Trend
90% Detail Design	PEC	External Contractor	
100% Final Design	PEC	External Contractor	Trend
Bid	PEC	JEA Procurement	Trend
Construction	PEC	Contractor	

Project Schedule

Major activities are as follows:

- Engineer Selection
- Survey, Design & Permitting
- Procurement
- Construction & Closeout

		FY 2018											
List of Activities	Days	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18
RFP for Design	180												
PD Finalization	30												
Design	150												
		FY 2019											
List of Activities	Days	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19
Design	180												
Construction Bid Process	180												
		FY 2020											
List of Activities	Days	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
Construction/Startup	150												

Cost Estimate and Expenditure Forecast (Current \$)

The cost of this project is estimated as \$3,474,000. Cost estimate was performed in-house by Dennis Jones, reference estimate number WS17013-1.

ACTIVITY	FY2017	FY 2018	FY 2019	FY 2020
RFP/Design	\$25,000	\$275,000		
Design/Bid/Construction			\$2,280,000	
Construction				\$894,000

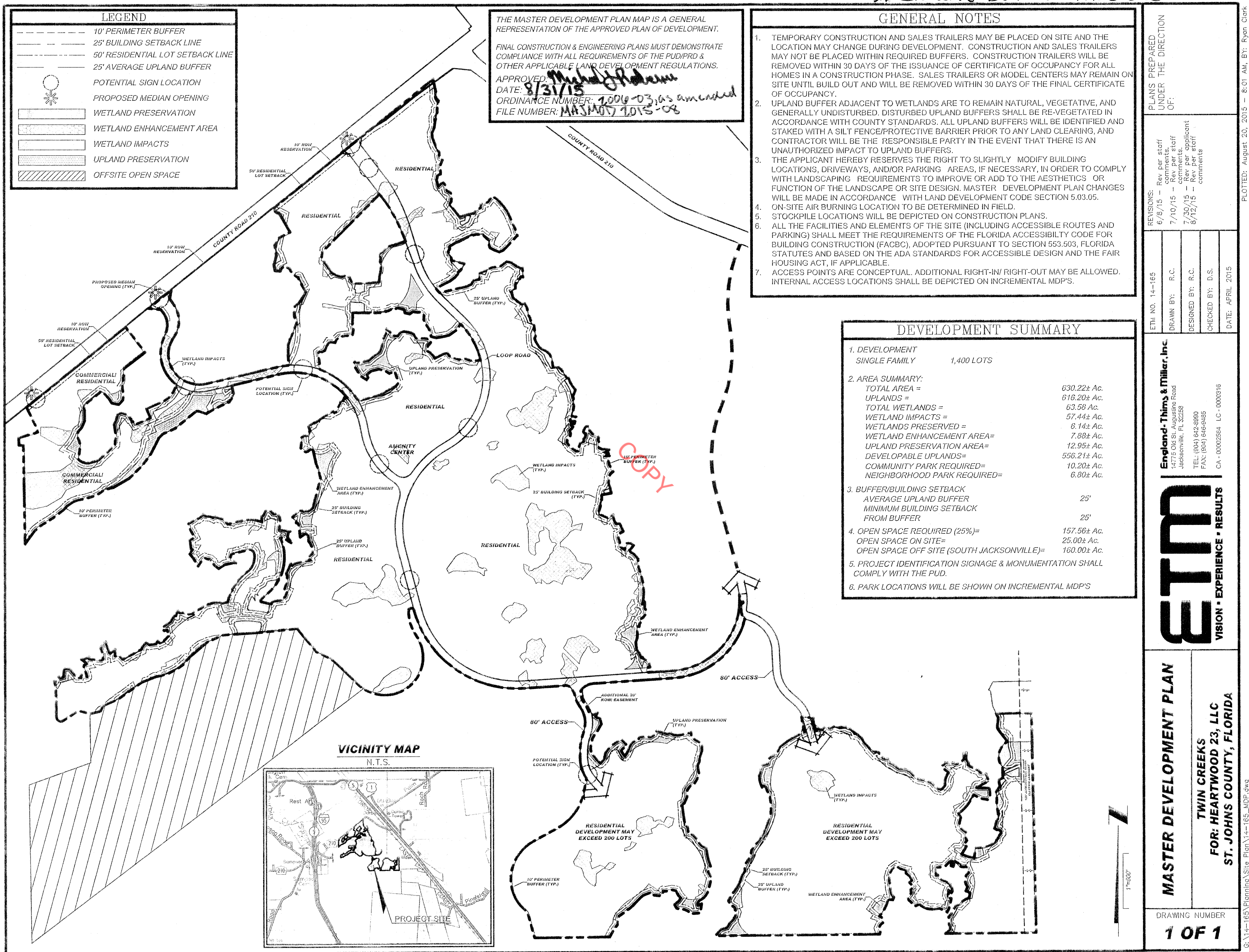
Risks

Land clearing for the Twin Creeks development is underway and reclaimed water is required for this development. A storage and delivery system will provide reliable service in the short and long term for not only this development but also the southern region of the JEA reclaimed water service area as future reclaimed water infrastructure is installed.

Revision History

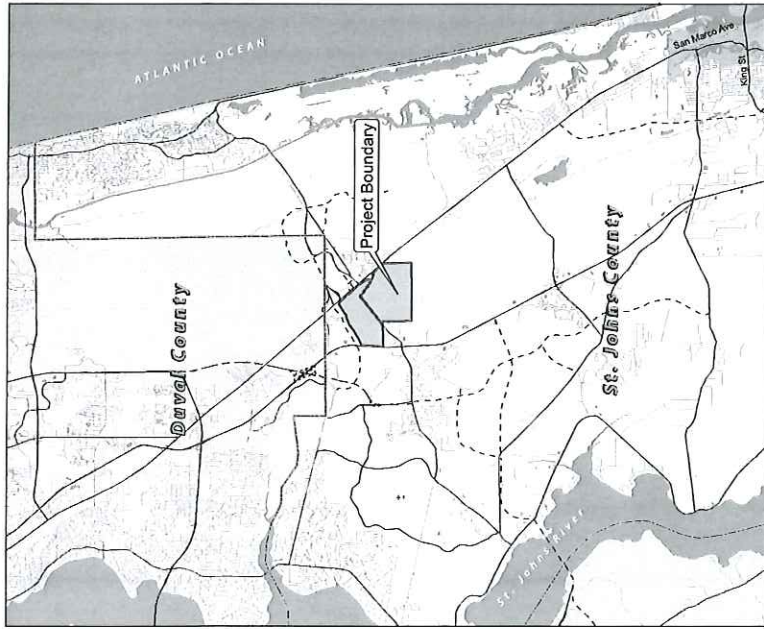
Name	Date	Version	Revision Notes
G. Porter	7/28/17	1	Increased storage tank volume from 1.0 to 1.5 Mgal

Appendix 1



General Notes

- 1) This map is based on preliminary information. Parcel configuration and circulation are subject to change based on final wetland surveys, permitting and final site planning and engineering. Roadway and associated wetland impacts are not depicted on this map. All acreages are conceptual estimates and subject to change based on final engineering.
- 2) Wetland areas are shown as generalized areas and are subject to final design, road crossings, final wetland surveys and permitting.
- 3) Conservation includes wetlands and uplands.
- 4) Recreation and parks are permitted in all residential parcels.
- 5) Minor Collector Roadways shall have minimum 5-foot wide sidewalks on both sides of the road. Local roadways shall have minimum 4-foot wide sidewalks on at least one side of the road.
- 6) Access points are conceptual and may or may not have traffic signals. Additional Right-in/Right-out may be allowed.



Vicinity Map

The Master Development Plan Map is a general representation of the approved plan of development. Final construction and engineering plans must demonstrate compliance with all requirements of the PUD/PRD and other applicable land development regulations.

APPROVED: _____
 DATE: _____
 ORDINANCE NUMBER: _____
 FILE NUMBER: _____



PROSSER

March 18, 2015
 111013.02

Phasing Summary

Land Use	Retail/Service	Office	Hotel	Single-Family Residential	Multi-Family Residential	Flex Industrial
Phase 1 (2014-2018)	600,000 SF	0	0	600 Units	500 Units	350,000 SF
Phase 2 (2019-2022)	0	350,000 SF	0	300 Units	0	750,000 SF
Phase 3 (2023-2027)	389,000 SF	350,000 SF	120 Rooms	350 Units	530 Units	850,000 SF
Total	989,000 SF	700,000 SF	120 Rooms	1,250 Units	1,030 Units	1,950,000 SF

NOTE: Amounts may be modified in accordance with Land Use Conversion matrix contained in Res. No. 2014-157

The Master Development Plan Map is a general representation of the approved plan of development. Final construction and engineering plans must demonstrate compliance with all requirements of the PUD/PRD and other applicable land development regulations.

APPROVED: _____
 DATE: _____
 ORDINANCE NUMBER: _____
 FILE NUMBER: _____

NEW TWIN CREEKS

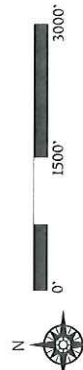
Master Development Plan (Sheet 2 of 6)

LEGEND

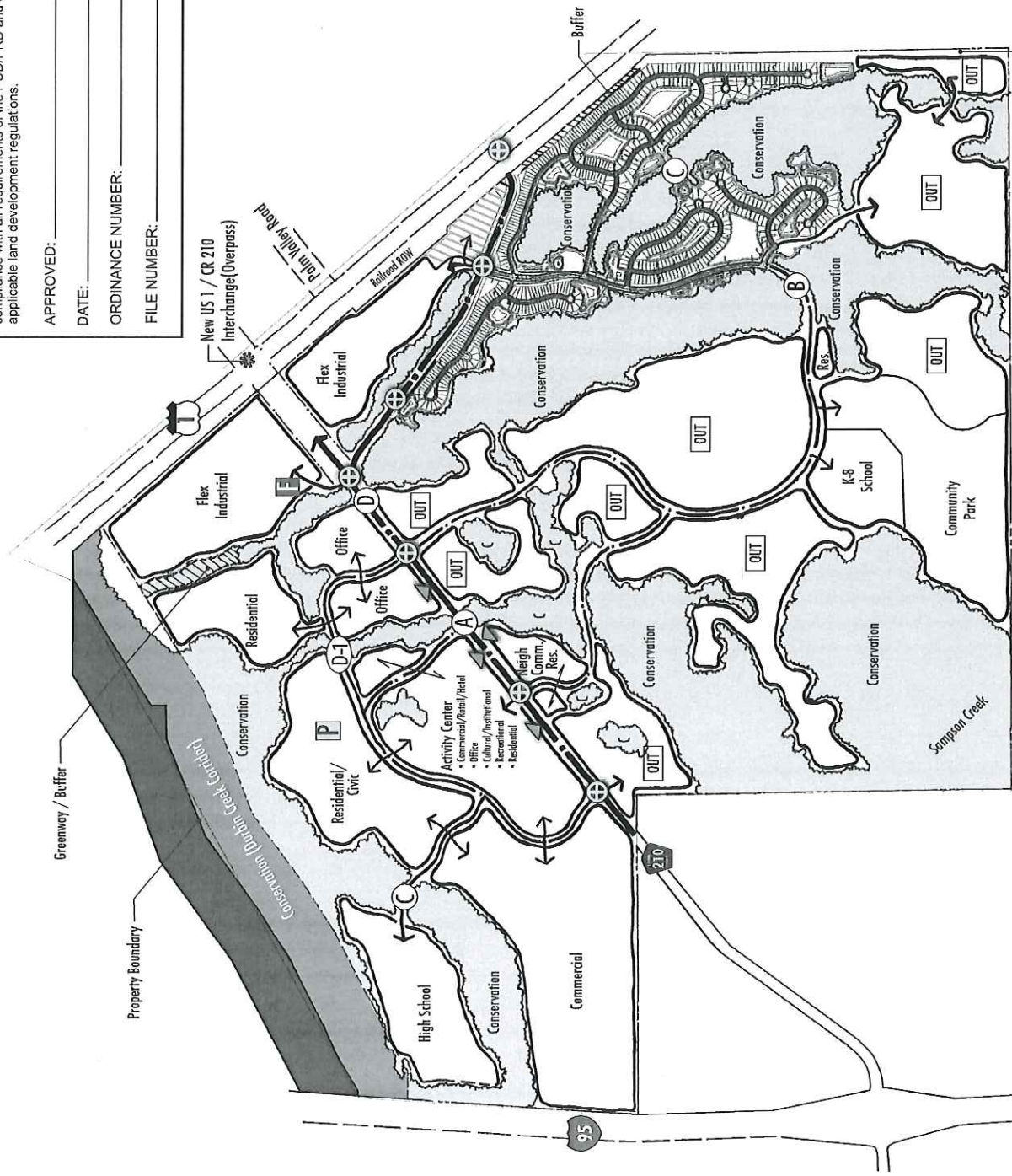
- Local Roadway
- Major Collector Roadway
- ⊕ Full Median Opening (See Note 6)
- ▲ Right-in/Right-out Driveway
- F Fire Station Site
- P Sandhill Habitat Preservation (1 Acre)
- Workforce Housing Site (13 Acres Outside MDP Boundary)
- OUT Not Part of this Master Development Plan
- A 6' x 16' Culvert Wildlife Crossing
- B 6' x 6' Large Mammal Crossing
- C AT-Grade Wildlife Crossing
- D 3' x 3' Small Mammal Crossing
- D-1 3' x 6' Small Mammal Crossing



PROSSER



March 18, 2016
111013.02



Overhead Powerline Easement (125')

[illegible]

SUBTENDING BY A GIVEN BEARING AND DISTANCE OF SOUTH 85° 12' 30" DEGREES 45' 12" EAST, 240.0 FEET; THENCE NORTH 67° 00' 00" DEGREES 51' 12" WEST, 11.25 FEET; THENCE NORTH 19° 00' 00" DEGREES 20' 22" WEST, 62.56 FEET; THENCE NORTH 59° 00' 00" DEGREES 57' 24" WEST, 51.43 FEET; THENCE SOUTH 6° 00' 00" DEGREES 45' 12" WEST, 16.42 FEET; THENCE SOUTH 34° 00' 00" DEGREES 44' 55" WEST, 53.3 FEET; THENCE NORTH 74° 00' 00" DEGREES 47' 24" WEST, 50.35 FEET; THENCE NORTH 64° 00' 00" DEGREES 20' 22" WEST, 57.31 FEET; THENCE SOUTH 33° 00' 00" DEGREES 27' 15" WEST, 19.47 FEET; THENCE NORTH 60° 00' 00" DEGREES 11° 45' EAST, 72.65 FEET; THENCE NORTH 64° 00' 00" DEGREES 42' 54" EAST, 87.61 FEET TO THE POINT OF BEGINNING.

The Master Development Plan Map is a general representation of the approved plan of development. Final construction and engineering plans must demonstrate compliance with all requirements of the PUD/PRD and other applicable land development regulations.

APPROVED: _____

DATE: _____

ORDINANCE NUMBER: _____

FILE NUMBER: _____



FALCON
COMMERCIAL DEVELOPMENT

Legal Description (con't.)

PORT OF JACKSON, MISSISSIPPI, CONTAINING 13.19 ACRES, MORE OR LESS, BEING THE SOUTH 1/4 OF SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

A PART OF SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

A PART OF SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

A PART OF SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

A PART OF SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

A PART OF SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

A PART OF SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

A PART OF SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

A PART OF SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

A PART OF SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

A PART OF SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SECTION 14, TOWNSHIP 3 NORTH, RANGE 2 EAST, ST. JOHNS COUNTY, ALABAMA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

NEW
TWIN CREEKS

Master Development Plan
(Sheet 6 of 6)

The Master Development Plan Map is a general representation of the approved plan of development. Final construction and engineering plans must demonstrate compliance with all requirements of the PUD/PRD and other applicable land development regulations.

APPROVED: _____
DATE: _____
ORDINANCE NUMBER: _____
FILE NUMBER: _____



PROSSER

March 18, 2013
110113.02

COPY

