WEST COCOA WASTEWATER IMPROVEMENTS
FACILITIES PLAN
BREVARD COUNTY, FLORIDA
FDEP SRF# WW05117

OCTOBER 2019

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Section 1 - Executive Summary

This facilities plan includes proposed improvements for Brevard County's West Cocoa wastewater collection and transmission system. It is being submitted in support of Brevard County's application to the State of Florida Clean Water State Revolving Fund (CWSRF) program which is administered through the Florida Department of Environmental Protection (FDEP). This planning document considers improvements to Brevard County's West Cocoa wastewater collection and transmission system including lift stations, force mains, and gravity mains which are aging infrastructure that require rehabilitation and/or replacement. Several of the existing lift stations were originally privately-owned and are now owned and maintained by the Brevard County Utility Services Department (BCUSD). Many of these lift stations are not in compliance with current Brevard County wastewater design standards since they were initially constructed and maintained as private facilities. Additionally, portions of force mains within this system include asbestos cement pipe (ACP). ACP pipe material is fragile, which increases the risk of pipe breaks in the system. ACP requires special procedures and equipment which make it difficult to repair in the event of failure. Furthermore, portions of gravity mains associated with this system include vitrified clay pipe (VCP) which is susceptible to cracking and general deterioration.

This plan includes review of the existing collection and transmission system including layout, capacity, and general specifications as described in Section 3, Existing Conditions. Existing LS W-01 is a regional master lift station for the drainage area bounded by I-95 to the west, South Burnett Road to the east, SR-520 (West King Street) to the north, and Pluckebaum Road to the south. The wastewater generated in the lift stations (LS) W-02, W-03, W-04, W-05, and W-06 service areas is pumped via the gravity sewer to LS W-01. Lift Station W-01 currently pumps wastewater from the entire LS W-01 drainage basin into LS W-15. Within the West Cocoa wastewater collection and transmission service area located west of I-95, LS W-10 pumps wastewater into LS W-07. Lift Station W-12 and a landfill sanitary lift station manifolds and pumps into LS W-20. Lift Stations W-07, W-08, W-20, and W-24 along with three small private lift stations manifold to pump wastewater into LS W-15. Lift Station W-15 pumps wastewater through a 14" DIP force main into LS W-09. Lift Station W-22 manifolds with the force main from LS W-09 and several other lift stations before discharging wastewater to the headworks at Brevard County's South Central Regional Wastewater Treatment Facility (WWTF). Existing conditions plan sheets for LS W-01, W-03, W-04, W-06, W-07, W-08, W-09, W-10, W-15, W-20, and W-22 are provided in Appendix A.

Review of environmental conditions is provided in Section 4, Environmental Considerations, including potential impacts to flood zones, threatened and endangered species, and historical resources. Based on the floodplain review, LS W-04 and W-09 are both currently located in U.S. Federal Emergency Management Agency (FEMA) delineated floodplains designated as "AE". AE designated floodplains have

a 1% chance of flooding on an annual basis, a.k.a. 100-year flood. Floodplain elevations and potential impacts to system components will be considered as part of final project design. Based on U.S. Fish and Wildlife Service review of potential impacts to threatened and endangered species associated with this project, no significant impacts are anticipated. Additionally, potential historical and archeological impacts were considered as part of this plan. Locations of proposed site activity were provided to the State of Florida Division of Historical Resources (DHR). Based on DHR review, there are no known archeological or historic sites that will be affected by this project. Documentation associated with environmental and historical review is provided in Appendix B.

Three proposed alternatives including no action, rehabilitation and/or replacement, and full replacement are considered and included within Section 5, Alternatives Analysis. The alternatives analysis is based on selection criteria including reliability, maintenance, future requirements, environmental considerations, land acquisition, capital costs, and present worth of operating costs. The goal of the alternatives analysis is to satisfy the future needs of the community, maximize environmental benefits, minimize adverse environmental impacts, and minimize costs. Based on cumulative scoring of the selection criteria factors, Alternative #2, rehabilitation and/or replacement is the recommended alternative. Cost analysis and criteria scoring spreadsheets are provided in Appendix C.

Based on the alternatives analysis, the recommended alternative is replacement and/or rehabilitation of existing lift stations as well as associated force mains and gravity mains as detailed in Section 6, Selected Alternative. The recommended alternative includes replacement of eight sanitary sewer lift stations, rehabilitation of two lift stations, abandonment of one lift station, replacement of approximately 11,000 feet of force main, and replacement of approximately 3,500 feet of gravity main. Refer to Table 1-1 for recommended actions associated with each lift station. Proposed system improvement plans are provided in Appendix D.

Additional considerations including project schedule, public participation, permitting, and project funding are discussed in Section 7, Implementation and Financial Planning. The proposed schedule anticipates project permitting and approvals including land acquisitions by June of 2020, project construction beginning in August of 2020, and project completion by April of 2023. In accordance with CWSRF requirements, a capital financing plan for this proposed project has been prepared under separate cover and is provided in Appendix E. Additional supporting documents as discussed in Section 7, Implementation and Financial Planning, are also provided in Appendix E.

Table 1-1 Recommended Actions

Lift Station	*Address (West Cocoa, FL)*	*Recommended Action*
W-01	519 B Way	Lift Station Replacement Nearby Force Main Rerouting (under I-95) and Manifolding into LS W-15 Force Main
W-02	4000 Lake Cir	Force Main Rerouting Gravity Main Replacement
W-03	406 Stowe Ln (relocation)	Lift Station Relocation Force Main Rerouting Gravity Main Rerouting
W-04	396 Robeson Road	Lift Station Replacement Nearby Force Main Rerouting
W-05	3756 Tomlin Drive	Force Main Rerouting
W-06	448 Stowe Lane	Lift Station Abandonment and Demolition Gravity Main Construction
W-07	110 Maplewood Blvd (relocation)	Lift Station Relocation Gravity Main Construction Force Main Rerouting
W-08	715 Friday Road	Lift Station Replacement Nearby Force Main Rerouting
W-09	2900 Silver Pines Drive	Lift Station Replacement Nearby Gravity Main Replacement (Proposed Master LS)
W-10	365 Maplewood Blvd	Lift Station Rehabilitation
W-15	700 Tucker Lane	Lift Station Replacement Nearby (Existing Master LS)
W-20	6201 Highway 520	Lift Station Replacement Nearby Influent Force Main Rerouting (under SR-520)
W-22	3260 Merrick Avenue	Lift Station Rehabilitation

Notes: Recommended actions based on alternatives analysis in Section 5 and selected alternative in Section 6 of this plan.

Section 2 - Introduction

2.1 General

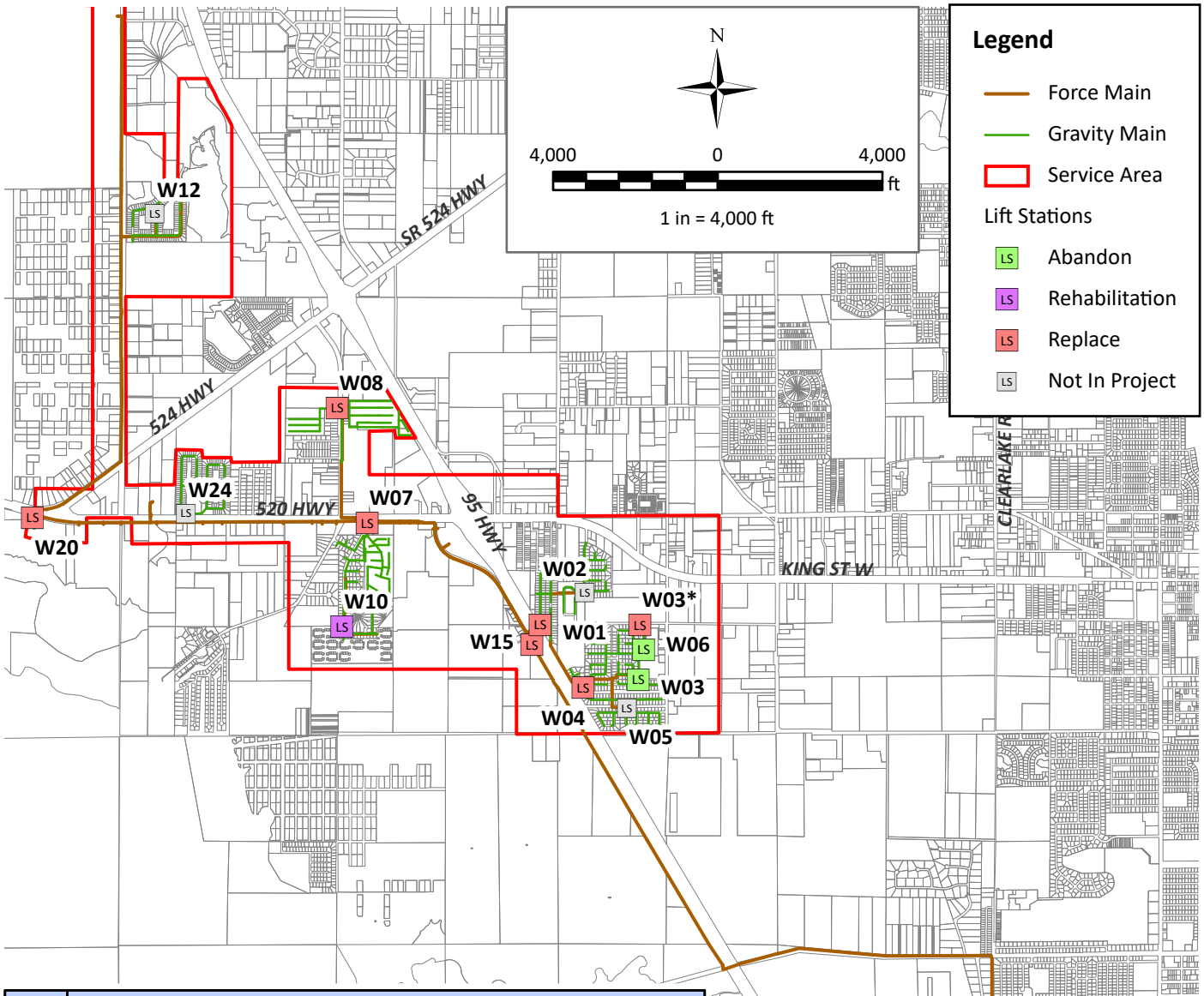
This document has been prepared to meet the planning requirements as set forth in F.A.C. 62-503.700(2) and 62-503.751 in accordance with the FDEP's CWSRF program. This program provides funding in the form of low-interest loans for municipal water and wastewater infrastructure projects. General requirements provided in this planning document prepared for the purpose of CWSRF program review include the following:

- Describe the project service area and existing facilities within the service area;
- Describe need or justification for the proposed project;
- Provide at least three planning alternatives;
- Provide review of environmental effects and benefits;
- Provide cost comparison and alternatives analysis;
- Select a proposed alternative and provide rationale for selection;
- Discuss the public participation process for the proposed project;
- Provide review of financial feasibility including a capital financing plan; and
- Provide a proposed schedule for implementing the proposed project.

2.2 Background

Brevard County, Florida provides wastewater services to residential and commercial customers throughout the County's service areas. The Brevard County South Central Regional Wastewater Treatment Facility (WWTF) provides wastewater treatment service to customers in the southwest regions of Brevard County. Areas served by this WWTF include: West Cocoa, Rockledge, Viera, Suntree, and Palm Shores.

The West Cocoa service area includes a wastewater collection and transmission system which is comprised of lift stations, force mains, and gravity mains with other sewer appurtenances. This plan considers improvements to West Cocoa wastewater lift stations and associated force main and gravity main sewer transmission lines. See Figure 2-1 for an overview of the West Cocoa service area and the associated wastewater collection/transmission system. Additionally, Table 2-1 provides locations including addresses and latitudes/longitudes of West Cocoa lift stations associated with this plan.



ID	Description of Work
W01	Lift station replacement nearby and force main rerouting to W-15 (under I-95)
W02	Force main rerouting and gravity replacement
W03	Lift station relocation and gravity main/force main rerouting
W03*	New W03 lift station
W04	Lift station replacement nearby and force main rerouting
W05	New force main only
W06	Lift station demolition/abandonment and gravity main construction
W07	Lift station relocation, force main rerouting, and gravity main construction
W08	Lift station replacement nearby and force main rerouting
W09	Lift station replacement nearby (proposed master LS) and gravity main replacement
W10	Rehabilitation of current lift station
W12	No proposed work
W15	Lift station replacement nearby (existing master LS)
W20	Lift station replacement nearby and influent force main rerouting (under SR-520)
W22	Rehabilitation of current lift station
W24	No proposed work

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West Cocoa Wastewater Collection System Overview
West Cocoa Wastewater Facilities Plan
Brevard County, Florida

PROJ. NO.: BRV017
DATE: 10/04/2019

FIGURE NO. 2-1

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Table 2-1 Lift Station Locations

Lift Station	Address (West Cocoa, FL)	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)
W-01	519 B Way	28°21'10.17"N	80°47'21.97"W
W-02	4000 Lake Cir (NE corner)	28°21'17.67"N	80°47'9.71"W
W-03	387 S Burnett Rd (existing)	28°20'56.86"N	80°46'55.24"W
W-03	406 Stowe Ln (NW corner, relocation)	28°21'9.79"N	80°46'54.62"W
W-04	396 Robeson Road	28°20'54.76"N	80°47'9.99"W
W-05	3756 Tomlin Drive	28°20'49.43"N	80°46'58.23"W
W-06	448 Stowe Lane	28°21'4.26"N	80°46'53.23"W
W-07	110 Maplewood Blvd (relocation)	28°21'31.18"N	80°48'9.66"W
W-08	715 Friday Road	28°22'2.83"N	80°48'16.82"W
W-09	2900 Silver Pines Drive	28°18'36.47"N	80°45'9.46"W
W-10	365 Maplewood Blvd	28°21'9.57"N	80°48'15.70"W
W-15	700 Tucker Lane	28°21'4.38"N	80°47'23.86"W
W-20	6201 Highway 520	28°21'36.16"N	80°49'39.29"W
W-22	3260 Merrick Avenue	28°18'15.50"N	80°44'45.13"W

Note: Latitude and Longitude data shown in table above is approximated based on Google Earth.

2.3 Purpose and Need

Brevard County is seeking funds for the construction of wastewater collection and transmission infrastructure improvements in West Cocoa through FDEP's CWSRF program. This program provides low-interest loans for planning, designing, and construction of pollution control facilities under 62-503 F.A.C. Brevard County is only seeking funding for the construction portion of this project. Therefore, the costs to acquire additional lands required under this project are not included.

The purpose of this planning document is to consider improvements to Brevard County's West Cocoa wastewater collection and transmission system including lift stations, force mains, gravity mains, and sewer appurtenances. These are aging infrastructure that require rehabilitation and/or replacement. Several of the lift stations were originally privately-owned and are now owned and maintained by the Brevard County Utility Services Department (BCUSD). Many of these lift stations do not comply with current Brevard County wastewater design standards since they were initially constructed and maintained as private facilities. Additionally, portions of force mains within this system include asbestos cement pipe

(ACP). ACP pipe material is fragile which increases the risk of pipe breaks during repairs in the system and requires special procedures and equipment which make ACP difficult to repair in the event of failure. Furthermore, portions of gravity mains associated with this system include vitrified clay pipe (VCP) which is susceptible to cracking and general deterioration due to age. Based on the needs described above, this planning document considers the following three proposed alternatives for the West Cocoa wastewater collection and transmission system:

- Proposed Alternative #1 - No Action
- Proposed Alternative #2 - Rehabilitation and/or Replacement of System Components
- Proposed Alternative #3 - Full Replacement of System Components

Alternatives analysis as required by FDEP's CWSRF program is provided for the above referenced proposed alternatives in Section 5, Alternatives Analysis, of this plan.

For proposed Alternatives #2 and #3, the flow configuration of the West Cocoa wastewater collection and transmission system is modified to improve the reliability of the overall system and to minimize the potential for sewer overflows. In the existing system configuration, lift stations (LS) W-02, W-03, W-04, W-05, and W-06 flow into LS W-01 which in turn flows into LS W-15. Similarly, all lift stations to the west side of I-95 namely LS W-07, W-08, W-10, W-12, W-20, W-22, and several private lift stations feed to LS W-15. Therefore, in the existing configuration, LS W-15 serves as a master pump station for the entire West Cocoa wastewater service area. Lift Station W-15 currently pumps all wastewater directly to Brevard County's South Central Regional WWTF through a manifold force main system with multiple lift stations including LS W-09 and W-22.

The existing LS W-15 does not have any tributary gravity sewer system. Normally, a gravity sewer system connected to the master lift station provides a storage volume in case of pump failure and other emergencies. Lift Station W-09 is a fairly deep lift station with a substantial length of gravity sewer. Moreover, there is adequate area of Brevard County owned property available adjacent to the LS W-09 site for lift station improvements. Therefore, Alternatives #2 and #3 propose LS W-09 as a master lift station for the entire West Cocoa regional wastewater system. Additionally, Alternatives #2 and #3 propose that LS W-15 no longer receives flow from LS W-01. Instead, the force main adjacent to LS W-15 manifolds with LS W-01 which discharges directly to LS W-09.

Section 3 - Existing Wastewater System

3.1 Existing Wastewater Collection and Transmission System

This section provides a summary of the existing West Cocoa wastewater collection and transmission system components including lift stations, force mains, gravity main, and other sewer appurtenances. Lift Station W-01 is a regional master lift station for drainage area bounded by I-95 to the west, South Burnett Road to the east, SR-520 (West King Street) to the north and the Pluckenbaum Road to the south. The wastewater generated in the LS W-02, W-03, W-04, W-05, and W-06 service areas is pumped into the gravity sewer tributary to LS W-01 as follows. Lift Station W-02 pumps wastewater into the gravity sewer tributary to LS W-01. Lift Station W-06 pumps wastewater into the gravity sewer tributary to LS W-03. Lift Stations W-03, W-04, and W-05 manifold together and pump into the LS W-01 gravity sewer. Lift Station W-01 pumps wastewater from the entire drainage basin discussed above into LS W-15.

Within the West Cocoa wastewater collection and transmission service area located west of I-95, LS W-10 pumps wastewater into the LS W-07 gravity sewer. Lift Station W-12 and a sanitary landfill lift station manifold and pump into LS W-20. Lift Stations W-07, W-08, W-20, and W-24 along with three small private lift stations manifold to pump wastewater into LS W-15. Lift Stations W-09, W-15, and W-22 manifold with multiple other lift stations into a regional force main which eventually discharges wastewater directly to Brevard County's South Central Regional WWTF.

3.1.1 Existing Lift Stations

This plan includes eleven West Cocoa wastewater lift stations that are in need of rehabilitation, replacement, or abandonment. Additionally, LS W-02 is only in need of force main and gravity main rerouting and replacement, and LS W-05 is only in need of force main rerouting.

The existing pumps in most of these lift stations are very old and many are no longer being manufactured by the respective manufacturers. Several lift stations associated with this project have aging non-submersible suction lift pumps. Availability of spare parts for many of these pumps is in question. The current Brevard County standards listed in "Criteria for Water & Sanitary Sewerage Systems within Brevard County (Revised January 2018)" require that "The standard sewage lift station shall be below ground submersible type". Thus, these non-submersible lift station pumps do not comply with the current Brevard County standards.

This section provides a summary of existing conditions associated with each lift station. See existing conditions figures in Appendix A which are associated with Brevard County's proposed improvement plans for the West Cocoa wastewater collection and transmission system.

- **Lift Station W-01**

  Lift Station W-01 is located at the intersection of Lincoln Road and B Way near Interstate I-95. The existing LS W-01 includes a concrete block pump house, wet well, and remote terminal unit (RTU) with associated antenna for data telemetry service. The pump house has two 7.5-HP suction lift Gorman-Rupp pumps, check valves, and gate valves for isolation. The pumps and the valves are very old and in need of replacement. Furthermore, since this lift station receives flow from LS W-02 through W-06 and some of these lift stations are prone to flooding. This lift station routinely needs a portable generator backup in case of power outages during heavy rainfall events. Adjacent property is available for lift station replacement. The suction lift pumping system does not meet the current BCUSD standards.

- **Lift Station W-03**

  Lift Station W-03 is located behind Friendship Primitive Baptist Church along South Burnett Road. The existing lift station is situated within an old concrete block pump house which includes a wet well and a dry-pit. Additionally, this station includes an RTU and associated antenna for data telemetry service. The lift station dry-pit houses two non-submersible 5-HP suction pumps, check valves, and gate valves. The electrical control panel is located outside to the south of the building. This lift station is located in a low-lying area and is subject to occasional flooding during heavy rainfall events; however, the current lift station is not located in a designated floodplain based on review of FEMA FIRM data. Due to periodic flooding, relocation of this lift station is recommended. The suction lift pumping system does not meet the current BCUSD standards.

- **Lift Station W-04**

  Lift Station W-04 is located along the east side of Robeson Rd. which is adjacent to the east right-of-way of I-95. The existing LS W-04 includes a wet well and two aboveground non-submersible Gorman-Rupp 3-HP suction pumps. These pumps are located on a concrete pad adjacent to the wet well. This station also includes an RTU and associated antenna for data telemetry service. Additionally, LS W-04 has an outdoor electrical control panel affixed to a concrete pad located south of the well wet. Adjacent property is available for lift station replacement. The suction lift pumping system does not meet the current BCUSD standards. Based on FEMA FIRM data, this lift station is located within a floodplain with an "AE" designation and 100-year base flood elevation of 17 feet. The existing lift

station top of wet well elevation is at 16.71 feet which is below the 100-year floodplain elevation. Therefore, design of the proposed replacement lift station for this location will include a top of wet well elevation above the FEMA designated base flood elevation of 17 feet.

- **Lift Station W-06**

  Lift Station W-06 is located within a residential community along the west side of Price Ave. The existing LS W-06 includes a concrete pump house which contains two existing Gorman-Rupp 3-HP aboveground suction lift non-submersible pumps. This station also includes an RTU and associated antenna for data telemetry service. Additionally, the concrete pump house includes an electrical control panel for pump operation. BCUSD has determined that this lift station is not necessary based on the proposed transmission system layout and therefore, recommends that this lift station be abandoned with the wastewater flow rerouted to the proposed LS W-03 location. The suction lift pumping system does not meet the current BCUSD standards.

- **Lift Station W-07**

  Lift Station W-07 is located within the southeast quadrant of the SR-520 and Cape Avenue intersection. The existing LS W-07 includes a wet well, dry pit with non-submersible pumps and valves, and outdoor electrical control panel. Lift station W-07 has two existing Gorman-Rupp 5-HP non-submersible pumps. This station also includes an RTU and associated antenna for data telemetry service. The wet well for this lift station is currently located within SR-520 right-of-way and therefore, relocation to a property located approximately 350 feet south of the existing location is recommended. The non-submersible pumping system does not meet the current BCUSD standards.

- **Lift Station W-08**

  Lift Station W-08 is located along the west side of Friday Rd. north of SR-520. Heavily vegetated property adjoins the lift station property to the west. The existing LS W-08 includes a concrete pump house with wet well and associated electrical control panel located within the pump house. This station also includes an RTU and associated antenna for data telemetry service. Lift station W-08 has two existing Gorman-Rupp 7.5-HP non-submersible suction lift pumps that are located within the concrete pump house. Adjacent property is available for lift station replacement. The suction lift pumping system does not meet the current BCUSD standards.

- **Lift Station W-09**

  Lift Station W-09 is located southwest of the intersection of Silver Pines Dr. and Martha Lee Ave. A stormwater management pond for the surrounding residential community adjoins the lift station property to the west. The existing LS W-09 includes a wet well, valve pit, and emergency generator. This station also includes an RTU and associated antenna for data telemetry service. Lift station W-09 has two existing ABS 48-HP submersible pumps located within the wet well. The lift station emergency generator is located within an adjacent concrete building. An associated aboveground storage tank for generator fuel is located to the south of the concrete generator building. Adjacent county-owned property is available for lift station replacement. Based on FEMA FIRM data, this lift station is located within a floodplain with an "AE" designation and 100-year floodplain elevation of 17 feet. The existing lift station top of wet well elevation is approximately 17 feet. The design of the proposed replacement lift station for this location will include a top of wet well elevation above the FEMA designated base flood elevation of 17 feet.

- **Lift Station W-10**

  Lift Station W-10 is located along the west side of Maplewood Blvd. within a residential community. The existing LS W-10 includes a wet well, valve pit, and an outdoor electrical control panel. This station also includes an RTU and associated antenna for data telemetry service. Lift station W-10 has two existing Hydromatic 3-HP submersible pumps located within the wet well. There is a short length of existing force main associated with W-10 which is 6-inches in diameter. The rest of the force main is 4-inch diameter. Due to the larger size, the velocity in this 6-inch force main is less than the desired minimum of 2 feet per second. As a result, there is substantial deposition in this portion of the force main which requires frequent maintenance including unclogging and clearing. The existing submersible pumps are very old and in need of repair.

- **Lift Station W-15**

  Lift Station W-15 is located along the west side of Tucker Ln. which is adjacent to the western I-95 right-of-way. The existing LS W-15 includes a wet well, valve pit, electrical control panel, emergency generator, and odor control system. This station also includes an RTU and associated antenna for data telemetry service. Lift station W-15 has two existing ABS 48-HP submersible pumps located within the wet well. The W-15 emergency generator is located within the concrete generator building and an associated aboveground outdoor storage tank for generator fuel is located east of the generator building. This existing master lift station which receives flow from multiple "upstream" lift stations does not have an associated gravity sewer to provide additional storage capacity in the event the existing wet well volume is exhausted. Adjacent property is available for lift station replacement.

- **Lift Station W-20**

  Lift Station W-20 is located along the south right-of-way of SR-520 approximately two miles west of I-95. The existing LS W-20 includes a wet well, valve pit, generator, electrical control panel, and emergency generator. This station also includes an RTU and associated antenna for data telemetry service. Lift Station W-20 has two existing FLYGT 30-HP submersible pumps located within the wet well. The W-20 emergency generator is located within the concrete generator building and an associated aboveground storage tank for generator fuel is located south of the generator building. The control panel for W-20 is affixed to the exterior of the generator building.

- **Lift Station W-22**

  Lift Station W-22 is located along the west side of Merrick Ave. within a residential community. The existing LS W-22 includes a wet well, valve pit, and an outdoor electrical control panel. This station also includes an RTU and associated antenna for data telemetry service. Lift Station W-22 has two existing ABS 22-HP submersible pumps located within the wet well.

3.1.2 Existing Force Mains

Existing force mains considered as part of this plan are generally associated with individual lift station locations; however, this plan also considers several portions of force mains as individual system elements between and in the vicinity of existing lift station locations. Due to age and type of force main piping material (i.e. ACP), approximately 11,000 L.F. of replacement and/or rerouted force main is considered as part of this plan. Appendix A provides force mains locations associated with individual lift stations. Appendix D provides force main locations (and proposed improvements) as individual system components.

3.1.3 Existing Gravity Mains

Existing gravity mains considered as part of this plan are associated with individual lift station locations; however, this plan also considers several portions of gravity mains as individual system elements. Due to age and type of gravity main piping material (i.e. VCP), approximately 3,500 L.F. of replacement and/or rerouted gravity main is considered as part of this plan. Appendix A provides gravity main locations associated with individual lift stations. Appendix D provides gravity main locations (and proposed improvements) as individual system components.

Section 4 - Environmental Considerations

4.1 Physiography

Brevard County has three (3) major physiographic regions: (1) the Atlantic Coastal Ridge/Coastal Zone; (2) the St. Johns Valley; and (3) the Barrier Islands. The St. Johns River Valley includes all of the area west of the Atlantic Coastal Ridge and covers approximately two thirds of the Brevard County mainland. Its most prominent feature is the St. Johns River which has its headwaters in south Brevard County and flows north the full length of the County, eventually discharging into the Atlantic Ocean near Jacksonville, Florida. The West Cocoa wastewater collection and transmission system considered in this plan exists within the St. Johns Valley portion of Brevard County.

4.2 Environmental Communities and Considerations

4.2.1 Coastal Communities

Natural vegetative resource communities in Brevard County include mangrove communities, pinewood communities, freshwater marshes, and deciduous communities. This plan generally includes "developed" properties and small areas, less than one acre, of pinewood and deciduous communities.

The pinewoods vegetative community is dominated by the slash pine and includes pine flatwoods. These trees form the highest layer of vegetation above the ground and the floor is usually covered by palmetto bushes. Threatened or endangered wildlife found in the pine flatwoods are the Gopher Frog, the Gopher Tortoise, the Scrub Jay and the Indigo Snake. In addition, nesting Bald Eagles and Osprey have been found in these communities.

The deciduous communities are characterized by pure or mixed stands of mature hardwood dominant trees. Historically, the upland forest or hardwood hammocks occupy the ridges. Today, small stands (less than 100 acres) are scattered throughout Brevard County. Vegetation consists of live oak, laurel oak, hickory trees and, if conditions are suitable, red cedar, cabbage palm, magnolia, and red bay. Threatened or endangered wildlife associated with these communities are the Indigo Snake, the Gopher Tortoise, and Osprey that nest in these areas.

Improved pasture sites are 75 to 95 percent open grasslands with a few scattered trees. Few native wildlife species inhabit these areas because of the lack of available food. Common varieties of birds, such as the house sparrow and starling, make up the majority of wildlife in these areas.

Terrestrial and aquatic communities are not anticipated to be affected by this plan due to the generally "developed" condition of the existing and proposed lift station locations. In the event threatened or endangered species are encountered during planning, design, or construction then further investigation and action may become necessary.

4.2.2 Climate

The climate in the Brevard County south central service area is characterized as humid sub-tropical. This classification includes long, relatively humid summers and mild winters. Precipitation is unevenly distributed with about sixty-five percent of the annual total falling from June through October, resulting from convective afternoon and evening thunderstorms. The remaining thirty-five percent of the precipitation occurs during the winter and spring and is usually associated with cool frontal systems which result in light rains over broad areas and longer periods of time.

Average daily maximum summer temperatures range in the low 90's with temperatures sometimes exceeding 95°F. Summer average daily minimums are in the range of 68°F to 71°F. During the coolest winter months of December and January, average daily maximums are in the low 70° range and average daily minimums in the 48° to 49° range. Prevailing winds are generally from the west. Wind speeds are usually between ten and fifteen miles per hour in the afternoon and five and ten miles per hour at night.

4.2.3 Historic or Archeological Sites

Potential historical and archeological impacts were considered as part of this project. Locations of proposed site activity were provided to the State of Florida Division of Historical Resources (DHR). Based on DHR review, there are no known archeological or historic sites that will be affected by this proposed project. See Appendix B for Florida Master Site File review performed by DHR for this project.

4.2.4 Floodplains

The Federal Emergency Management Agency (FEMA) has established flood plain locations throughout the country which are illustrated and maintained through Flood Insurance Rate Maps (FIRMs). Review of current FEMA FIRM floodplain locations was performed for this plan and illustrative figures which combine floodplain locations with lift station locations are provided in Appendix B. Based on this floodplain review, lift stations W-04 and W-09 both currently reside in FEMA delineated floodplains designated as "AE" which have a 1% chance of flooding on an annual basis, a.k.a. 100-year flood. The FEMA Base Flood Elevations (BFEs) listed for these "AE" floodplains are both Elevation 17.0' NAVD88. Floodplain elevations and

potential impacts to system components will be considered as part of final project design such that lift station components including electrical panels and tops of wet wells will be assigned elevations at least one foot above FEMA FIRM BFEs.

4.2.5 Threatened and Endangered Species

There are several mammals, birds, amphibians, and reptiles listed as endangered, threatened, or species of special concern that nest, breed, feed or winter in Brevard County. Appendix B provides a summary of wildlife in Brevard County with associated state and federal protection status based on the March 2018 Florida Natural Areas Inventory. Additionally, Appendix B includes U.S. Fish and Wildlife review of proposed activity locations. Based on these reviews, the proposed actions identified in this plan are not anticipated to have significant impact upon threatened or endangered species and associated habitats. In the event threatened or endangered species are encountered during planning, design, or construction then further investigation and action may become necessary.

Section 5 - Alternatives Analysis

5.1 Alternatives

Proposed alternatives described in this section include "no action", rehabilitation and/or replacement, and full replacement of West Cocoa wastewater collection and transmission system components. The alternatives analysis presented in this plan is generally consistent with Florida's SRFLP alternatives analysis standards. This alternatives analysis includes consideration of selection criteria including reliability, maintenance, future requirements and adequacy, environmental considerations, capital costs, and present worth of operating costs. The goal of the alternatives analysis is to quantify the future needs of the community, maximize environmental benefits, minimize adverse environmental effects, and minimize costs to the maximum practicable extent. The following section provides descriptions of the proposed alternatives and review of selection criteria.

5.1.1 Alternative #1 – No Action

The no action alternative for this plan includes the continuing operation and maintenance of existing West Cocoa wastewater collection and transmission system components. While this alternative may be feasible for short-term operation of the system, long-term issues exist including ongoing degradation of system components, non-conformance with Brevard County standards, and inadequacy for meeting anticipated population growth and ultimate build-out capacity.

5.1.2 Alternative #2 – Rehabilitation and/or Replacement

The rehabilitation and/or replacement alternative includes replacement of eight West Cocoa lift stations including LS W-01, W-03, W-04, W-07, W-08, W-09, W-15, W-20 and rehabilitation of two lift stations including LS W-10 and W-22. This alternative also includes abandonment of LS W-06. Additionally, this alternative includes replacement of aging force mains and gravity mains associated with proposed lift station improvements including the replacement of ACP and VCP which will be abandoned in place.

5.1.3 Alternative #3 – Full Replacement

The full replacement alternative is similar to Alternative #2 noted above with the primary difference being the replacement of two lift stations: LS W-10 and W-22. Based on Brevard County's assessment of the West Cocoa collection and transfer system, replacement of these remaining two lift stations is not a critical need for long-term system operation.

5.2 Selection Criteria

The following section provides a summary of selection criteria used for this alternatives analysis. Selection criteria include reliability, maintenance, future requirements, environmental considerations, capital costs, and present worth of operating costs.

5.2.1 Reliability

Reliability of system components to deliver sustained wastewater collection and transmission service for the surrounding community is considered as part of this alternatives analysis. Based on BCUSD review of existing system components, reliability concerns associated with the West Cocoa collection and transmission system are readily apparent. Reliability of existing system components is related to the age, condition, and design basis of the existing system.

5.2.2 Maintenance

The maintenance criterion is related to the cost and effort required by Brevard County to operate and maintain the West Cocoa collection and transfer system. Maintenance requirements of the existing system are anticipated to increase over time as system components continue to age and degrade.

5.2.3 Future Requirements

The future requirements criterion refers to the future needs of the surrounding community based on anticipated population growth. Brevard County's projections of population growth within the service area indicate that additional system capacity is warranted to satisfy long-term community wastewater service needs. BCUSD anticipates that most of the West Cocoa wastewater service area will reach build-out conditions within the next 20 years and therefore, proposed improvements as noted in Alternatives #2 and #3 are based on the ultimate build-out of the West Cocoa service area.

5.2.4 Environmental Considerations

The environmental considerations criterion considers both adverse effects and benefits. For proposed improvements, the potential environmental adverse effects are limited to small portions of undeveloped properties, less than one acre. Lift Stations W-01, W-03, W-07, and W-09 will be relocated to previously developed nearby sites and are not expected to have significant adverse environmental impacts. Lift stations proposed for nearby relocation to undeveloped properties include W-04, W-08, and W-15. Due to the small areal extent of disturbance associated with these lift station relocations, potential adverse environmental effects are considered negligible. Furthermore, potential adverse environmental effects

from remaining lift station rehabilitations and relocations efforts can be considered negligible due to the developed nature of surrounding properties.

Environmental benefits due to improvements to the West Cocoa wastewater collection and transmission system components include reduced risk of wastewater releases to the environment, i.e. wastewater leakage to surrounding groundwater and potential lift station overflows to surrounding properties and surface waters.

Section 4, Environmental Considerations, considers threatened and endangered species associated with this plan's proposed improvements. Based on the scope of proposed improvements within developed areas of Brevard County, significant impacts to threatened and endangered species and their associated habitats are not anticipated. Furthermore, significant adverse effects to human health or the environment of minority or low-income communities are not anticipated. Lastly, proposed improvements associated with this plan will mitigate potential adverse environmental effects from the existing system due to existing system leakage to groundwater and surface water flooding.

5.2.5 Land Acquisition

The land acquisition selection criterion considers availability of lands in close proximity to existing lift stations. While most of the existing lift stations considered for West Cocoa wastewater improvement have adjoining lands available for lift station replacement, several lift stations including W-07 require relocation to nearby sites and therefore, necessitate rerouting of associated force mains and gravity mains. Lift stations which are contemplated for rehabilitation in Alternative #2 including W-22, have limited available land in the immediate area of the existing lift stations.

5.2.6 Capital Costs and Present Worth of Operating Costs

Opinions of probable cost including capital costs and present worth analysis of operating costs were developed for each of the three alternatives associated with this plan. Estimated operating costs include power costs based on Brevard County 2017 operating cost data for the West Cocoa collection and transmission system. Alternative #1, No Action, does not include capital costs while Alternatives #2 and #3 both include substantial capital costs for lift station rehabilitation and/or replacement as well as force main and sewer main rerouting. Table 5-1 provides is a summary of the estimated costs for each alternative. Appendix C provides worksheets and details used to prepare the opinions of probable costs.

Table 5-1 Opinions of Probable Costs

Item	*Alternative #1 No Action*	*Alternative #2 Rehabilitation and/or Replacement*	*Alternative #3 Full Replacement*
Lift Station W-01	-	$849,000	$849,000
Lift Station W-03	-	$565,000	$565,000
Lift Station W-04	-	$523,000	$523,000
Lift Station W-06	-	$15,000	$15,000
Lift Station W-07	-	$534,000	$534,000
Lift Station W-08	-	$565,000	$565,000
Lift Station W-09	-	$2,027,000	$2,027,000
Lift Station W-10	-	$365,000	$447,000
Lift Station W-15	-	$1,143,000	$1,143,000
Lift Station W-20	-	$816,000	$816,000
Lift Station W-22	-	$394,000	$565,000
Linework	-	$2,288,700	$2,288,700
Paving and Restoration	-	$856,000	$856,000
Total Capital Costs (includes 10% contingency)	**-**	**$10,940,700**	**$11,193,700**
Present Worth (20 Years) of Operating Costs	$3,306,400	$3,433,200	$3,433,200
Total Capital and Operating Costs	**$3,306,400**	**$14,373,900**	**$14,626,900**

Note: Cost worksheets and details are provided in Appendix C. Present worth of operating costs based on 20-year projection.

5.3 Selection Rationale and Selected Alternative

Selection rationale is based on criteria including reliability, maintenance, future requirements, environmental considerations, land acquisition, capital costs, and present worth of operating costs associated with each alternative. Scoring is applied to each selection criterion based on qualitative and quantitative review of each alternative in a relative fashion such that a score of one represents minimal benefit, three represents moderate benefit, and five represents maximum benefit. Additionally, weighting factors are applied to each criterion, on a relative scale of one through five based on input from BCUSD and professional judgment. The individual scores for each alternative are then summed to provide a total score where the highest score represents the highest benefit. Table 5-2 shows the results of the criteria scoring.

5.3.1 Cost Effectiveness

Cost effectiveness was considered as part of this alternative analysis. The proposed system design process associated with Alternatives #2 and #3 will increase system efficiencies through pump selection, rerouting of system piping, and elimination of unnecessary system components including LS W-06. These efficiency improvements will result in reduced long-term maintenance costs while protecting the environment, increasing reliability, and satisfying future needs of the community. Capital and operating costs are noted with the selection scoring criteria as shown in Table 5-2.

5.3.2 Weighing Factors

Weighing factors have been assigned to each selection criterion based on discussions with BCUSD personnel and professional engineering judgement. The scale for the weighing factors has been selected as one through five with one representing least importance and five representing most importance. The capital costs criterion has been assigned the highest weighing factor of five due to the size and scope of the overall project. The environmental criterion has also been assigned the highest weighing factor of five due to potential adverse impacts in the event of existing system flooding and failures. The operating costs criterion has been assigned a weighting factor value of four indicating importance but not as much as capital costs or environmental considerations. Criteria including reliability, maintenance, future requirements, and land acquisition have been assigned weighing factors of three indicating their level of importance with respect to other criteria.

Table 5-2 Selection Criteria Scoring

Selection Criteria	*Weighting Factors*	*Alternative #1 No Action*	*Alternative #2 Rehabilitation and/or Replacement*	*Alternative #3 Full Replacement*
Reliability	3.0	1	5	5
Weighted Scores		3.0	15.0	15.0
Maintenance	3.0	1	5	5
Weighted Scores		3.5	15.0	15.0
Future Requirements	3.0	2	5	5
Weighted Scores		6.0	15.0	15.0
Environmental	5.0	2	4	3
Weighted Scores		10.0	20.0	20.0
Land Acquisition	3.0	5	3	2
Weighted Scores		15.0	9.0	6.0
Capital Costs	5.0	5	3	2
Weighted Scores		25.0	15.0	10.0
Operating Costs	4.0	4	3	3
Weighted Scores		16.0	12.0	12.0
Total Weighted Scores		78.0	101.0	88.0

Note: Selection criterion scoring, where 1 represents negative or minimal benefit, 3 represents median benefit, and 5 represents maximum benefit, is based on quantitative and qualitative review.

5.3.3 Criteria Scoring Rationale and Results

As shown in Table 5-2, scores of one through five have been assigned to each alternative criterion indicating the relative level of benefit associated with each criterion. The criteria scoring is based on review of the existing system, consideration of the proposed alternative, discussions with BCUSD personnel, and professional engineering judgement.

Based on the selection criteria scoring in Table 5-2 above, Alternatives #2 and #3 have higher selection criteria benefits than Alternative #1 which is the "no action" criteria. Alternative #1 was scored lower than Alternatives #2 and #3 for reliability, maintenance, future requirements based on proposed system improvements which are anticipated to increase reliability and reduce long-term maintenance

requirements. Additionally, system improvements associated with Alternatives #2 and #3 will satisfy future requirements due to anticipated population growth within the service area.

The environmental considerations discussed in Section 5.2.4 include both adverse environmental effects and benefits. While Alternatives #2 and #3 may have minor environmental impacts due to disturbance of small portions of undeveloped properties, these effects are outweighed by the benefits associated with system improvement including reduced potential for system leakage and overflow. Therefore, Alternative #1 "no action" was given the lowest score for environmental considerations. Alternative #3 was given a lower score for environmental considerations than Alternative #2 since Alternative #3 which includes full replacement of all lift stations would result in more disturbed land than Alternative #2 which includes rehabilitations of several existing lift stations.

The differentiating factors between Alternatives #2 and #3 include environmental considerations noted above, land acquisition, and capital costs. The need for additional land acquisition is lower for Alternative #2 compared to Alternative #3 due to the differences between rehabilitation and full replacement. Capital Cost is lower for Alternative #2 since replacement is only considered for eight of ten lift stations while replacement of all ten lift stations is considered for Alternative #3. The two lift stations designated for rehabilitation in Alternative #2 (LS W-10 and W-22) are considered to be in acceptable condition by BCUSD for future use. While the capital cost differences between Alternative #2 and Alternative #3 are not large when compared to the overall project cost associated with either Alternative #2 or #3, the potential benefits of upgrading the system from Alternative #2, rehabilitation and/or replacement, to Alternative #3, full replacement, are negligible and therefore, not worth the difference in costs between the alternatives. Differences in present worth of operating costs between Alternatives #2 and #3 over a twenty-year period are negligible.

Considering the cumulative scores of the selection criteria factors and the selection rationale provided in this section, Alternative #2, rehabilitation and/or replacement, is the recommended alternative. Details regarding system improvements associated with Alternative #2 are discussed in Section 6, Selected Alternative.

Section 6 - Selected Alternative

6.1 Proposed Wastewater Collection and Transmission System

Based on the analysis as detailed in Section 5, Alternatives Analysis, the rehabilitation and/or replacement Alternative #2 has been selected as the recommended alterative. This section provides details regarding proposed alternative improvements including lift station rehabilitation and/or replacement, force main rerouting, and gravity main rerouting. Refer to Appendix D for figures associated with proposed improvements for the selected alternative.

6.1.1 Proposed Lift Station Improvements

This section provides proposed lift station improvements associated with the selected Alternative #2, rehabilitation and/or replacement. Based on these proposed improvements, all lift stations in the West Cocoa service area will meet Brevard County standards and provide for future community demands.

- **Lift Station W-01**

  The project will replace the existing LS W-01 with a new triplex submersible pump lift station including a 10’ diameter precast wet well and aboveground valve pad. The replacement lift station will be located next to the existing lift station site. The proposed replacement area is already pre-developed and therefore, lift station replacement will not have adverse environmental impacts. Triplex pump arrangement will allow the lift station to operate over the wide range of flows and total dynamic heads expected for this application. A new 8” diameter PVC force main will be constructed to replace the existing ACP force main. A portion of the new 8” diameter force main will cross under I-95 using directional drilling technology. The proposed 8” force main will manifold into the 14” DIP force main downstream of LS W-15. The project also includes installation of a new electrical control panel, a SCADA system with RTU, and an emergency diesel-driven pump with an automatic transfer switch and integrated fuel tank.

  Adequate pre-developed Brevard County owned land is available to construct the proposed lift station adjacent to the existing lift station location. No additional land or easement is required for this location. The existing lift station can remain in service until the new lift station and force main are constructed. Therefore, bypassing of flows is not required.

- **Lift Station W-03**

  The existing LS W-03 location is susceptible to frequent flooding. Therefore, this project will relocate the lift station to the north on Parrish Road where the possibility of flooding is less likely. The new duplex submersible pump lift station will have an 8' diameter precast wet well and an aboveground valve pad. A new 4" PVC force main will be constructed for this lift station which will manifold with the 4" PVC force main from LS W-04 prior to discharging into the sewer system tributary to LS W-01. The existing LS W-03 will be abandoned and demolished. The project includes installation of a new electrical control panel and a SCADA system with RTU. The project also involves construction of gravity sewer to convey sewage from the existing LS W-03 location to the proposed LS W-03 location.

  The property for the proposed LS W-03 belongs to 4 Jays MHP, LLC. A 30' x 20' parcel will be required for the construction of this lift station. Brevard County land acquisition personnel have successfully negotiated the acquisition of this property. The existing lift station can remain in service until the new lift station and force main are constructed. Therefore, bypassing of flows is not required.

- **Lift Station W-04**

  Lift Station W-04 is a suction lift non-submersible station located on a triangular shaped lot owned by Brevard County. A 20-foot wide drainage and utility easement abuts the east property line. The proposed project will replace the existing LS W-04 with a duplex submersible pump lift station including an 8' diameter precast concrete wet well and aboveground valve pad. A new 4" PVC force main will be constructed for this lift station which will manifold with the 4" PVC force main from LS W-03 prior to discharging into the sewer system tributary to LS W-01. The existing LS W-04 will be abandoned and demolished. The project includes installation of a new electrical control panel and a SCADA system with RTU.

  The existing property does not have adequate area to allow construction of the proposed layout in conformance with the BCUSD standard criteria. The county maintains the area north of the lift station for maintenance access to the drainage easement and the ditch abutting the site. Brevard County land acquisition personnel have successfully negotiated the acquisition of the property immediately north of the existing lift station for the proposed lift station. After completion of the project, the county maintenance access to the drainage easement may be relocated to the existing site. The existing lift station can remain in service until the new lift station and force main are constructed. Therefore, bypassing of flows is not required.

- **Lift Station W-06**

  BCUSD recommends that LS W-06 be abandoned and demolished. The reason for LS W-06 abandonment is due to the proposed gravity sewer line associated with LS W-03 improvements constructed in the vicinity of the existing LS W-06 location. The new LS W-03 gravity sewer line provides the opportunity for the LS W-06 service area to be connected to a gravity system manhole which will ultimately convey wastewater to the new LS W-03 location. The existing LS W-06 wet well will be converted into a lined manhole and a new gravity sewer line will be extended to the new LS W-03 gravity sewer line. Additional property for the abandonment and demolition of LS W-06 is not needed; however, an easement will be needed for the new W-06 gravity sewer line.

- **Lift Station W-07**

  The proposed project will replace the existing LS W-07 with a duplex submersible pump lift station with an 8' diameter precast concrete wet well and aboveground valve pad. A new 6" PVC force main will be constructed for this lift station which will manifold with the 12" DIP force main from LS W-20 and also with 4" force main from LS W-08 prior to discharging into the manhole outside LS W-15. The project includes installation of a new electrical control panel and a SCADA system with RTU. The existing LS W-07 will be abandoned and demolished. The existing lift station can remain in service until the new lift station and force main are constructed. Therefore, bypassing of flows is not required.

  The existing property within SR-520 right-of-way does not have adequate area to allow construction of the proposed layout in conformance with the BCUSD standards. Brevard County land acquisition personnel have finalized negotiations with the landowner for acquiring a 30' x 30' lot at 110 Maplewood Blvd, for relocating LS W-07.

- **Lift Station W-08**

  The proposed project will replace the existing LS W-08 with a duplex submersible pump lift station with an 8' diameter precast concrete wet well and aboveground valve pad. A new 4" PVC force main will be constructed for this lift station which will manifold the 6" force main from LS W-07 with the 12" DIP force main from LS W-20 prior to discharging into the manhole outside LS W-15. The project includes installation of a new electrical control panel and a SCADA system with RTU. The existing LS W-08 will be abandoned and demolished. The existing lift station can remain in service until the new lift station and force main are constructed; therefore, bypassing of flows is not required.

  The existing property does not have adequate area to allow construction of the proposed layout in conformance with the BCUSD standard criteria. Brevard County owns a 17.3-acre lot adjacent to the

property. It is recommended that BCUSD designate a 30' x 30' portion of the adjacent Brevard County parcel for the construction of the new W-08 lift station.

- **Lift Station W-09**

  The proposed project will replace the existing LS W-09 with a triplex submersible pump lift station with a 20' x 12' x 32' deep rectangular cast-in-pace reinforced concrete wet well and an aboveground valve pad along with pumping equipment, appurtenances, valves, fittings and piping. A new 14" PVC force main will be constructed for this lift station which will connect to the existing 14" force main behind the lift station and manifold with the 6" PVC force main from LS W-22 prior to discharging into the series of larger force mains before discharging into the headworks structure at the Brevard County South Central Regional WWTF. The project also includes installation of a new electrical control panel, SCADA system with RTU, and an emergency diesel-driven pump with an automatic transfer switch and integrated fuel tank. The existing lift station can remain in service until the new lift station and force main are constructed; therefore, bypassing of flows is not required.

  The proposed location of the new LS W-09 is owned by Brevard County and therefore, land acquisition or easements will not be required. After the construction of this project is complete, LS W-09 will be the master lift station for all the wastewater associated with the West Cocoa service area.

- **Lift Station W-10**

  The proposed project will rehabilitate the existing LS W-10. The six-foot diameter precast concrete wet well will be cleaned and rehabilitated using BCUSD approved coatings such as Raven 405 or Mainstay products. The cover slab of the wet well will be replaced along with the dual leaf safety grating. The underground valve vault will be demolished and replaced with an aboveground concrete valve pad. The project includes installation of a new electrical control panel and a SCADA system with RTU.

  There is a short segment of 6" PVC force main between the valve vault and 4" PVC force main across the street. The velocity in this 6" force main segment is less than 2.0 fps. Based on Brevard County operations personnel, this lift station has occasional issues with force main clogging. Therefore, Brevard County proposes to replace the 6" segment of existing force main with 4" C900 PVC force main. Upon construction, the new 4" force main will have more than 2.5 fps velocity at 100 gpm.

Since this project involves rehabilitation of the lift station, additional property is not required. Bypassing of the existing lift station during rehabilitation of the wet well can be performed from the single tributary manhole across Maplewood Blvd.

- **Lift Station W-15**

  The proposed project will replace the existing LS W-15 with a triplex submersible pump lift station with a 12' diameter x 32' deep cylindrical precast concrete wet well and an aboveground valve pad along with pumping equipment, appurtenances, valves, fittings and piping. A new 14" PVC force main will be constructed for this lift station which will connect to the existing 14" force main on Tucker Lane. The new 8" PVC force main from LS W-01 will connect to the proposed 14" DIP force main just downstream from LS W-15. Then the proposed 14" force main will connect to the existing 14" force main which will route sewage flows to LS W-09. The project also includes installation of a new electrical control panel, SCADA system with RTU, and an emergency diesel-driven pump with an automatic transfer switch and integrated fuel tank. The existing LS W-15 will be abandoned and demolished. The existing lift station can remain in service until the new lift station and force main are constructed. Therefore, bypassing of flows is not required.

  The proposed location of the new LS W-15 is owned by Brevard County and therefore, land acquisition or easements will not be required. After construction of this project is complete, LS W-15 will only receive flows from wastewater generated west of I-95. Lift Station W-01 will no longer flow into LS W-15 but instead manifold with W-15 and discharge to the new master LS W-09 as previously discussed.

- **Lift Station W-20**

  The proposed project will replace the existing LS W-20 with a duplex submersible pump lift station with an 8' diameter precast concrete wet well and aboveground valve pad. The project includes installation of a new electrical control panel and a SCADA system with RTU. The existing LS W-20 will be abandoned and demolished. The existing lift station can remain in service until the new lift station and force main are constructed; therefore, bypassing of flows is not required.

  The proposed location of the new LS W-20 is owned by Brevard County and therefore, land acquisition or easements will not be required. Additional site improvements associated with lift station W-20 include construction of a new access drive to S.R.520.

- **Lift Station W-22**

  The proposed project will rehabilitate the existing LS W-22. The underground valve vault will be demolished and replaced with an aboveground concrete valve pad. The existing pumping equipment, appurtenances, piping, valves, and piping. The project includes installation of a new electrical control panel and a SCADA system with RTU.

  Since this project involves rehabilitation of the lift station only, additional property is not required. Bypassing of the lift station during the construction of the valve pad and replacement of pumping equipment can be performed from the existing manhole upstream of the wet well across Merrick Avenue.

Table 6-2 provides wastewater flow information for the lift stations with proposed pump replacements. Specifically, Table 6-2 indicates the lift station operating condition in gallons per day and total dynamic head based on Brevard County's anticipated maximum demand at "build-out" for the West Cocoa service area. The lift stations operating conditions shown in Table 6-2 were developed based on review of pump curves from three pump manufactures including Grundfos, Sulzer, and Xylem Flygt. For lift stations with maximum demand values less than 100 gpm, the minimum operating condition is 100 gpm in order to minimize sediment deposition within force main system piping.

Table 6-1 Lift Station Operating Conditions

Lift Station	*Lift Station Maximum Demand*	*Lift Station Operating Condition*
W-01	353 GPM	400 GPM @ 100 FT TDH ~ 2 PUMPS
W-03	135 GPM	175 GPM @ 75 FT TDH
W-04	41 GPM	120 GPM @ 38 FT TDH
W-07	188 GPM	235 GPM @ 40 FT TDH
W-08	94 GPM	105 GPM @ 68 FT TDH
W-09	1,938 GPM	2,100 GPM @ 160 FT TDH ~ 2 PUMPS
W-10	63 GPM	140 GPM @ 32 FT TDH
W-15	1,300 GPM	1,430 GPM @ 84 FT TDH ~ 2 PUMPS
W-20	833 GPM	1,075 GPM @ 65 FT TDH
W-22	260 GPM	310 GPM @ 141 FT TDH

Note: GPM is gallons per minute; TDH is Total Dynamic Head.

Figure 6-1 provides a conceptual layout of the proposed West Cocoa wastewater collection and transmission system indicating relative lift station locations, connects to wastewater conveyance piping, and directions of wastewater flows.

6.1.2 Proposed Force Main Improvements

This project also involves replacement of existing asbestos cement pipe (ACP) force mains with C900 PVC force mains for several lift stations, namely, LS W-01, W-02, W-03, W-04, W-05, and W-08. These force mains are designed to ensure that the minimum velocity is greater than 2.0 feet per second to prevent clogging. In addition, it's recommended that the lift station control system be designed such that on every fifth start of pump alternation, both pumps would operate simultaneously for duplex lift stations. This pump control scheme would generate higher velocity to flush out or dislodge any settled solids in the force main.

This project also involves replacement of an existing 10" force main flowing into LS W-20 from the Brevard County Solid Waste Transfer Station and LS W-12. This force main is connected to an existing manhole located within the southbound lanes of S.R. 520. The manhole top and the cover are paved over and the manhole is inaccessible. Therefore, Brevard County wants to abandon the force main segment located within the S.R. 520 right-of-way along with the gravity sewer segment and construct a new 10" PVC/ HDPE force main segment which connects directly to the manhole located within the LS W-20 site just upstream of the wet well. Various easements will be required for construction and operation of the proposed force main components of the system. Required easements will be acquired prior to the start construction.

6.1.3 Proposed Gravity Main Improvements

This project involves construction of gravity sewer lines in the area tributary to LS W-03 and W-06. The existing LS W-03 shall be abandoned and demolished. A new gravity sewer sub-system shall be constructed to convey the sewage flow currently flowing into the existing LS W-03 to the new LS W-03 location at Parrish Road. Similarly, LS W-06 shall be abandoned and demolished. The sewer flowing into this lift station will be connected to the new sewer sub-system mentioned above, so that this sewage flow gets conveyed to the new LS W-03. The project also involves replacement of some vitrified clay sewer in the areas tributary to LS W-02 and W-09. Since this is mainly a replacement of deteriorating VCP sewer, it will be replaced with PVC pipe of the same diameter. Various easements will be required for construction and operation of the proposed gravity main components of the system. Required easements will be acquired prior to the start construction.

* LIFT STATION W-03, W-07 RELOCATION

** EMERGENCY DIESEL PUMPS

LIFT STATION W-02, W-05, W-12, W-24 NO IMPROVEMENTS

LEGEND:

- PUMP STATION
- WASTEWATER CONVEYANCE
- PROPOSED WASTEWATER CONVEYANCE IMPROVEMENTS

INFRASTRUCTURE SOLUTION SERVICES
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www.InfrastructureSS.com

DRAWING TITLE: West Cocoa Wastewater Collection System Conceptual Layout

CLIENT: Brevard County Utility Services Department

PROJECT NO.: BRV017

DATE: 1/8/2019

FIGURE NO.: 6-1

Section 7 - Implementation and Financial Planning

7.1 Schedule

A preliminary schedule has been developed including the following:

- Submit all planning documentation to FDEP SRF by October 2019;
- Submit all design documentation, obtain permits, and acquire sites by June 2020;
- Start construction activity by August 2020; and
- Complete construction activity by April 2023.

7.2 Public Participation

An advertised public hearing will be held to encourage the public to learn about the proposed project and the capital financing plan, and to offer their comments. In addition to public notice of the hearing, interested parties will be notified of the hearing. Records of the public notice and the hearing will be retained for future reference.

7.3 Permitting

Permitting with Brevard County, Florida Department of Transportation (FDOT), and Florida Department of Environmental Protection (FDEP) will be required for the construction and subsequent operation of the proposed improvements to Brevard County's West Cocoa wastewater collection and transmission system. The following list provides details regarding anticipated permitting which will be completed prior to construction.

- **Brevard County** – Permitting is required for construction activities within Brevard County rights-of-way including directional drilling and open cuts associated with anticipated force main and gravity main installations. Right-of-Way permitting with Brevard County will be completed prior to the commencement of construction

- **FDOT** – Permitting is required for construction activities with FDOT rights-of-way including directional drilling and open cuts associated with anticipated force main and gravity main installations. An FDOT right-of-way application has been prepared and submitted for this project. FDOT has subsequently provided comments associated with the application. FDOT approval will be required prior to the commencement of construction.

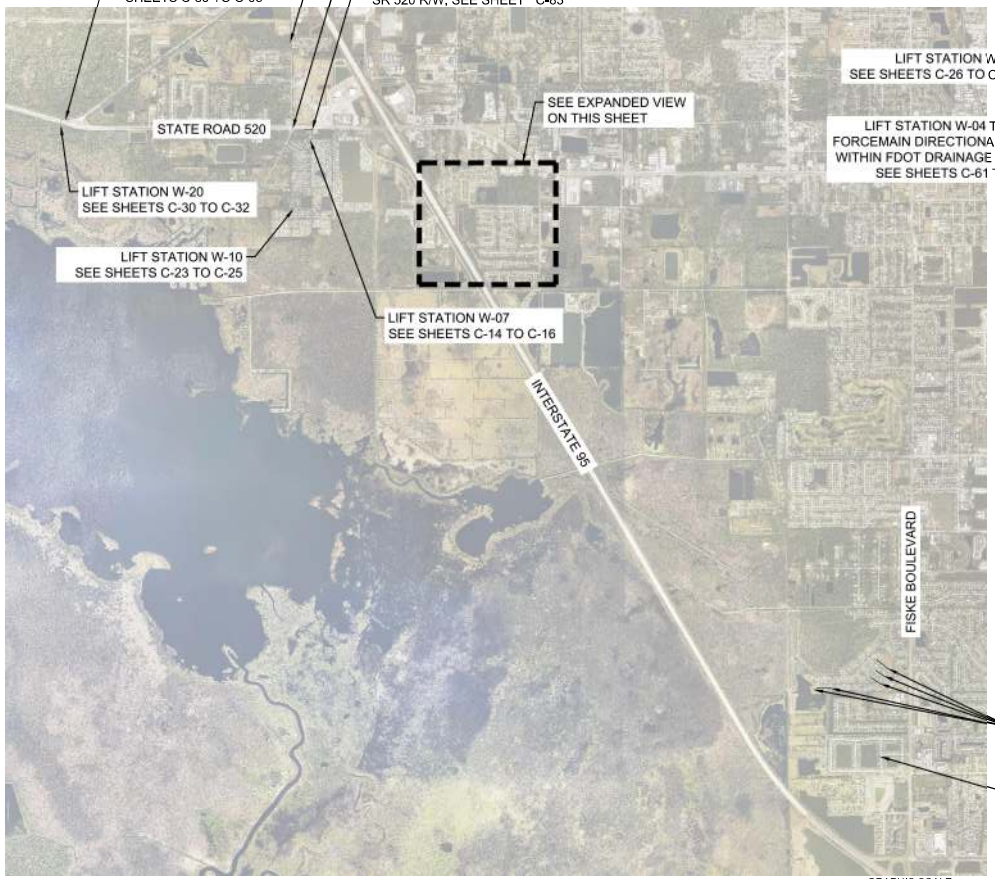
- **FDEP** – Permitting with FDEP is required for proposed wastewater collection and transmission system improvements. Two FDEP Notice of Intents (NOI) were prepared, one for the system east of I-95 and one for the system west of I-95, for inclusion under FDEP's general permit for wastewater collection and transmission system improvements. Copies of FDEP's acceptance of the NOI's are provided in Appendix E.

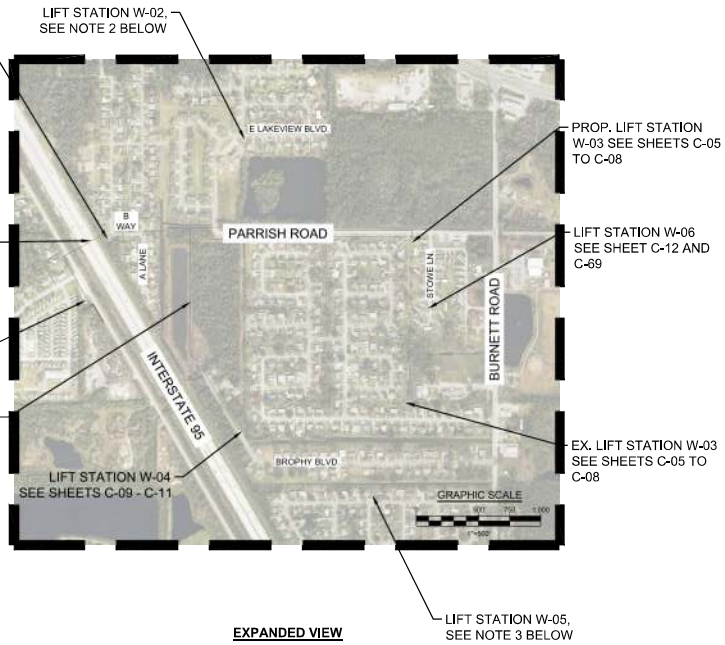
7.4 Funding

Brevard County is seeking funds for the construction of wastewater collection and transmission infrastructure improvements in West Cocoa through FDEP's CWSRF program. This program provides low-interest loans for planning, designing, and construction of pollution control facilities under 62-503 F.A.C. Brevard County is only seeking funding for the construction portion of this project. Therefore, the costs to acquire additional lands required under this project are not included. A capital financing plan has been prepared on behalf of Brevard County by Public Resources Management Group, Inc. to demonstrate Brevard County's ability to pay for potential CWSRF loans associated with this project and explain financial impacts due to the cost of system improvements. The capital financing plan is provided under separate cover in Appendix E.

Appendix A

Existing Conditions





EXPANDED VIEW

NOTES:

1. SEE SHEET C-41 TO C-44 FOR LIFT STATION W-01 PROPOSED FORCEMAIN PLAN.
2. SEE SHEET C-46 TO C-49 FOR LIFT STATION W-02 GRAVITY SEWER AND FORCEMAIN PLAN.
3. SEE SHEETS C-50 TO C-68 FOR NEW FORCEMAIN FOR LIFT STATIONS W-03, W-04 AND W-05.
4. SEE SHEET C-69 FOR LIFT STATION W-06 GRAVITY SEWER PLAN.
5. SEE SHEETS C-70 TO C-83 FOR NEW FORCEMAIN FROM LIFT STATION W-07 TO LIFT STATION W-08.
6. SEE SHEET C-84 TO C-88 FOR LIFT STATION W-09 GRAVITY SEWER PLAN.
7. SEE SHEET C-89 TO C-93 FOR LS W-20 INFLUENT FORCEMAIN PLAN.

ISS

Kiran Kulkarni, P.E. #78114

NO.	DATE:	DESCRIPTION REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: KEY MAP
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: MBH
SCALE: VARIES	CHKD. BY: KVK
DRAWING NO.: 05 of 105	
SHEET NO.: C-01	

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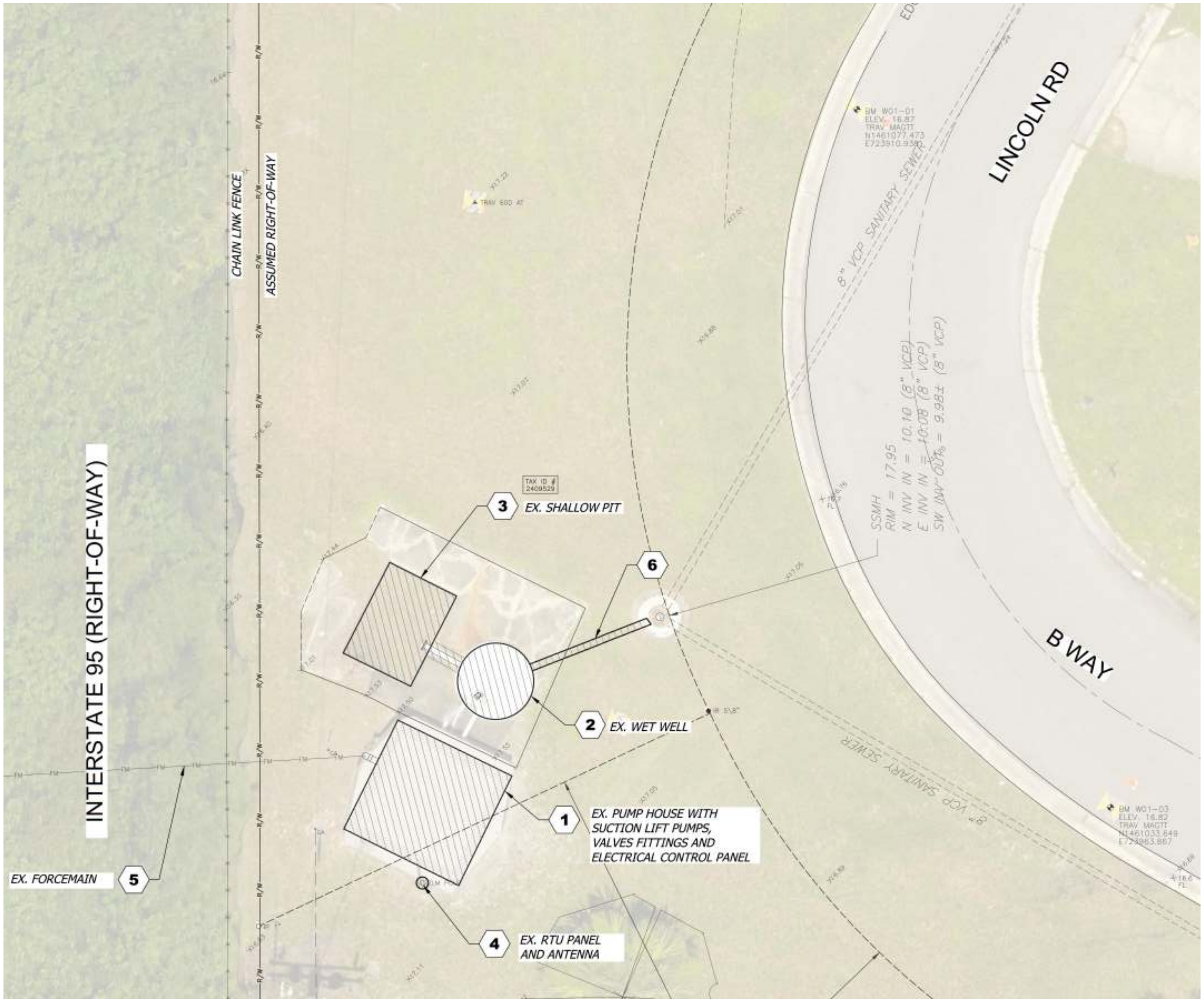

LOCATION MAP

DEMOLITION NOTES

1. Remove and salvage all pumping equipment, piping, valves, and fittings from the existing pump house. Demolish and dispose of the existing pump house structure including the slab. Fill the entire pump house area with clean soil. Compact to 95% modified proctor density. Stabilize with sod.
2. Remove and dispose of all piping, valves, and fittings from the existing wetwell. Remove and dispose of top slab and hatch and top three feet of the existing wetwell. Fill the entire wetwell with clean soil. Compact to 95% modified proctor density. Stabilize with sod.
3. Remove the iron curbing of the existing shallow pit. Fill with clean soil to grade and compact to 95% modified proctor density. Stabilize with sod.
4. Remove existing RTU panel with antenna and dispose of per the owner's instructions.
5. Plug, grout and abandon the existing force main which will not be used in the proposed system.
6. Plug, grout and abandon the existing gravity sewer as shown.

GRAPHIC SCALE
0 5 10
1"=5'

811 Know what's below. Call before you dig.

Kiran Kulkarni, P.E.
36114

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		REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
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Phone: (321) 622-4646

DRAWING TITLE: LS W-01 EXISTING CONDITION AND DEMOLITION PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: PKK
SCALE: 1" = 5'	CHKD. BY: KVK
DRAWING NO: 06 of 105	
SHEET NO. C-02	

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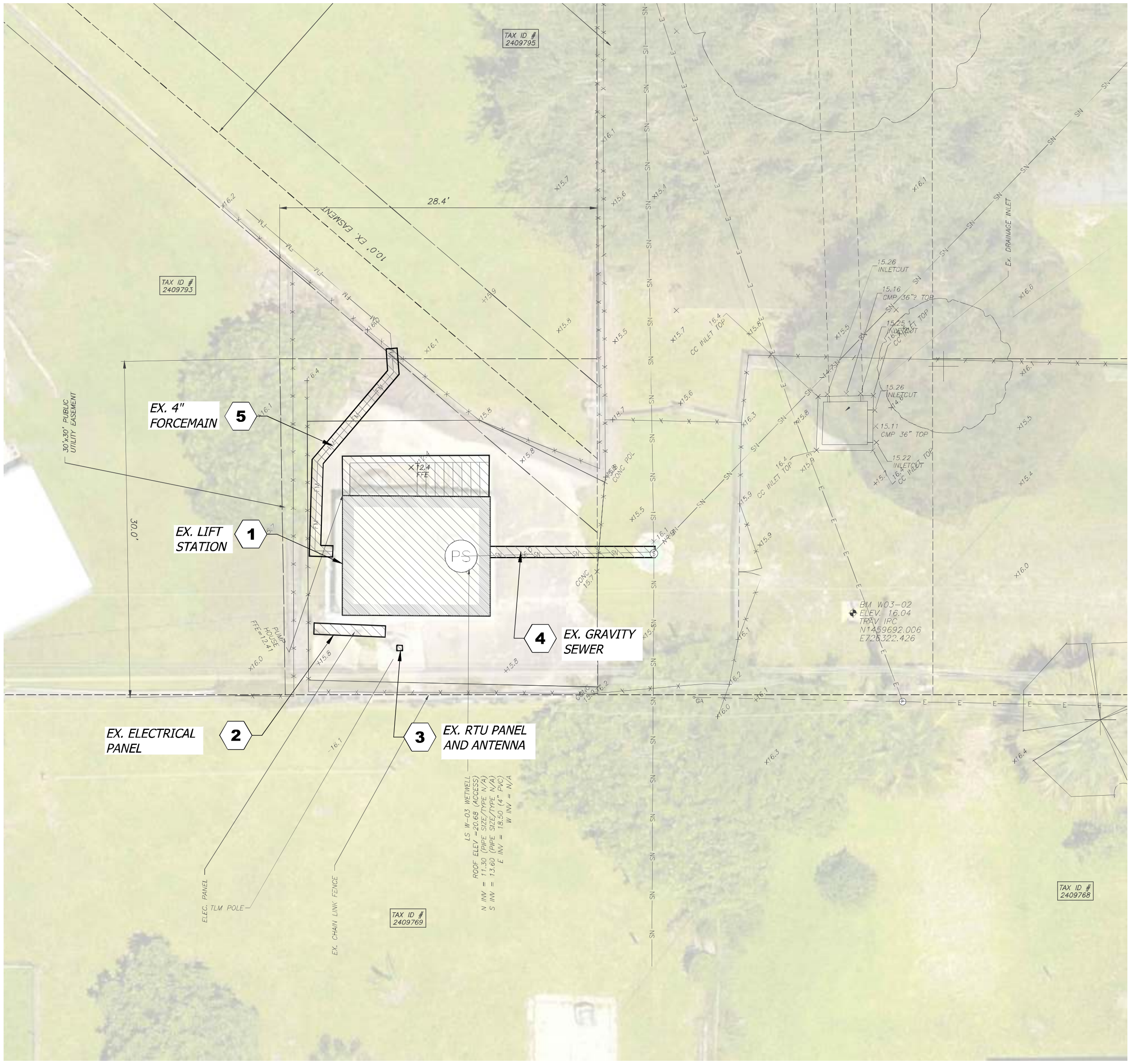

LOCATION MAP

DEMOLITION NOTES

1. Remove all pumping equipment, piping, valves and fittings from the existing pumphouse. Salvage or dispose of per the owner's instructions. Remove and dispose of the pump house structure from the top to 3 feet below grade. Fill entire pump house to grade with clean soil. Compact to 95% modified proctor density. Stabilize with sod.
2. Remove existing electrical panel and salvage or dispose of per the owner's instructions.
3. Remove existing RTU panel with antenna and salvage or dispose of per the owner's instructions.
4. Plug, grout and abandon the existing gravity sewer from the existing manhole to the existing wet well.
5. Remove existing 4" forcemain on the property and dispose of at authorized location. Plug the existing forcemain at the property line.

GRAPHIC SCALE

0 5 10

1"=5'

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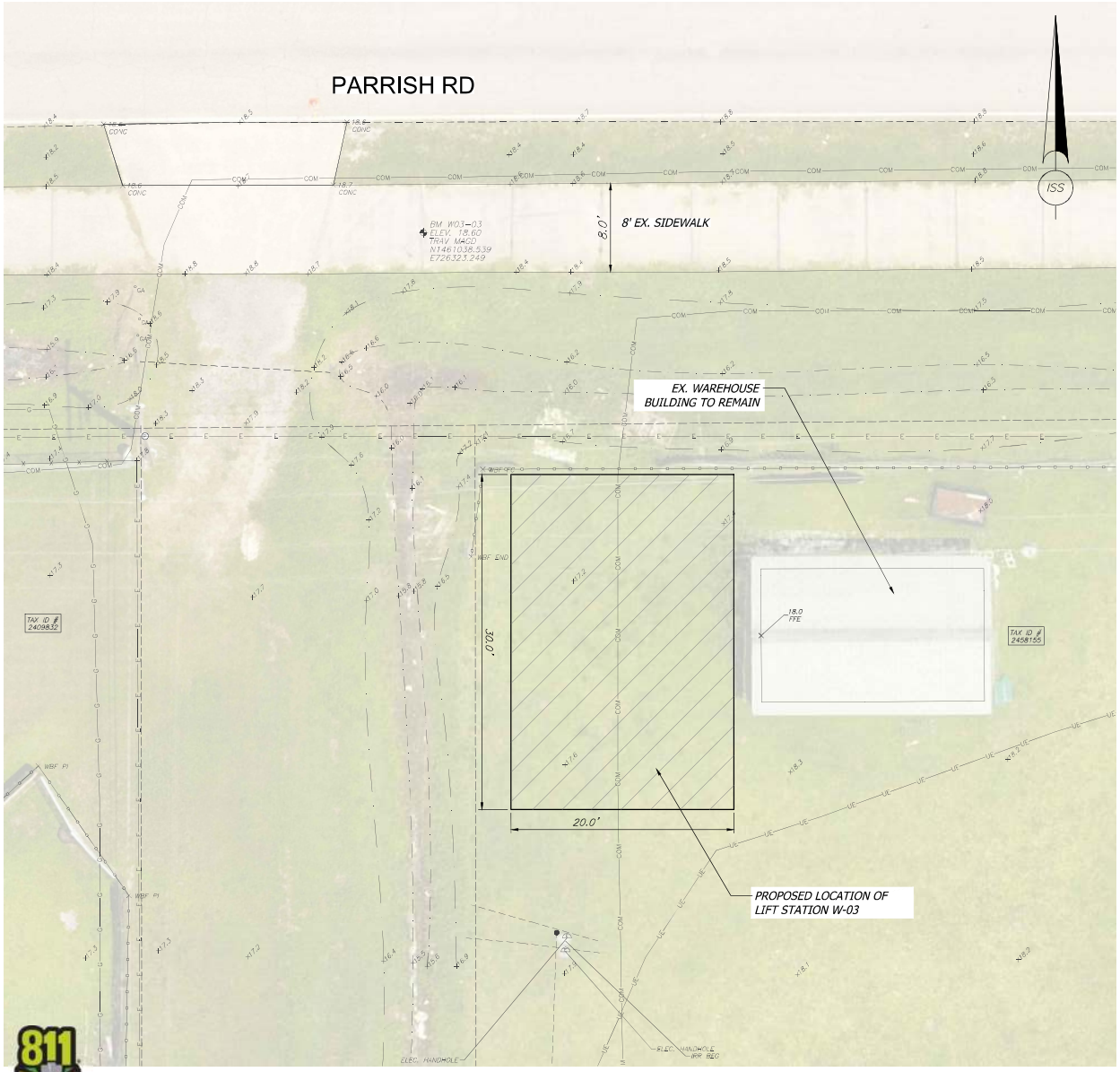
DRAWING TITLE: LS W-03 EXISTING CONDITION AND DEMOLITION
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: PKK
SCALE: 1" = 5'	CHKD. BY: KVK
DRAWING NO: 09 of 105	
SHEET NO. C-05	



LOCATION MAP

GRAPHIC SCALE

0 5 10

1"=5'

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		REVISIONS

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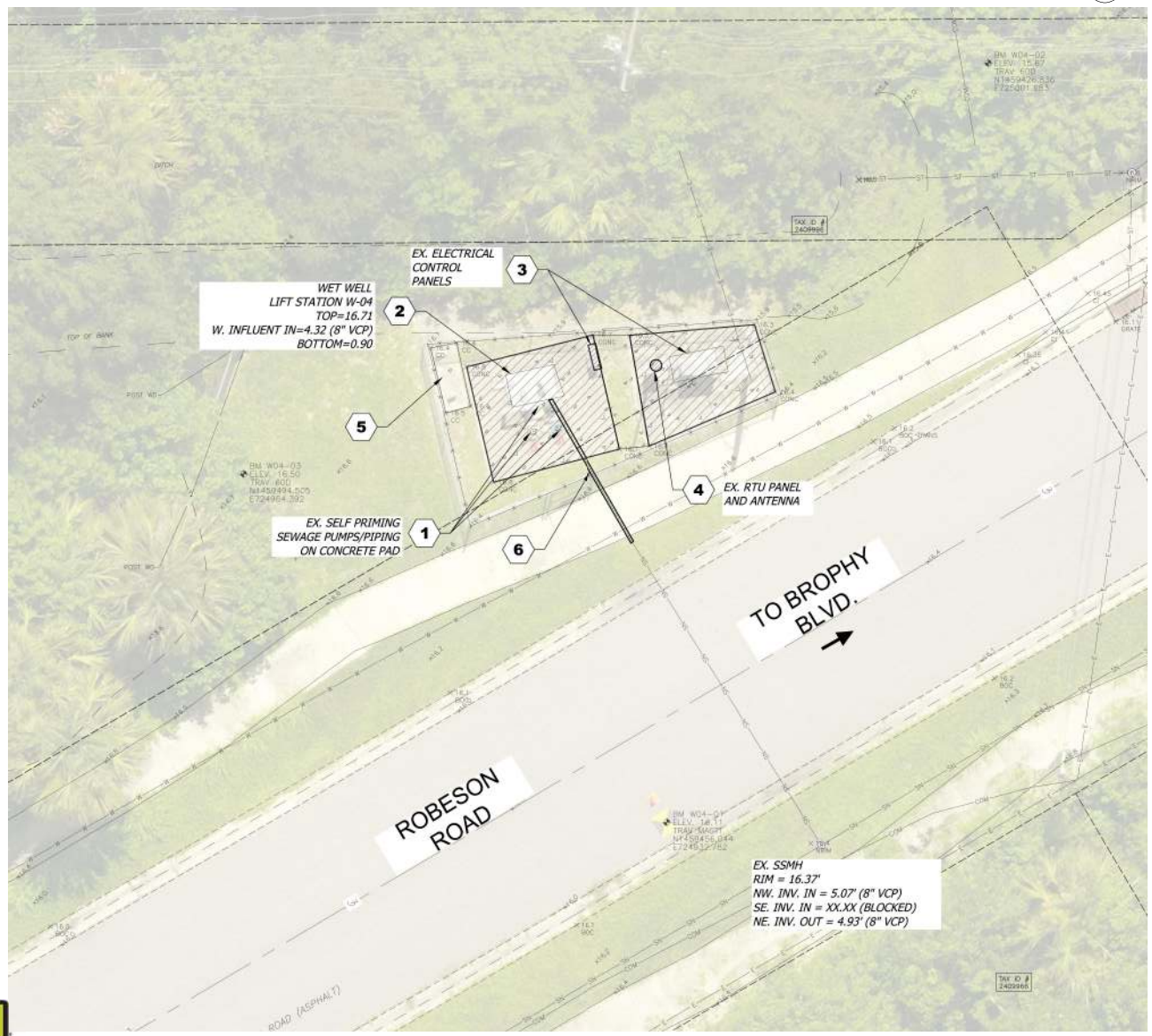
DRAWING TITLE:
PROPOSED LS W-03 EXISTING CONDITION PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT:
BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: PKK
SCALE: 1" = 5'	CHKD. BY: KVK
DRAWING NO.: 10 of 105	
SHEET NO.: C-06	



LOCATION MAP

DEMOLITION NOTES

1. Remove and salvage all pumping equipment, piping, valves, and fittings from the existing lift station pad. Remove and dispose of both concrete pads in their entirety.
2. Remove and dispose of all piping from the existing wetwell. Remove and dispose of the top hatch and top three feet of the existing wetwell wall. Fill the entire existing lift station with clean soil to grade, compact to 90% modified proctor density and stabilize with sod.
3. Remove all electrical panels and equipment from the lift station and deliver or dispose as per owner's instructions.
4. Remove existing RTU panel with antenna and dispose of per the owner's instructions.
5. Plug, grout and abandon the existing force main.
6. Plug, grout and abandon the existing gravity sewer from manhole to wetwell which will not be used in the proposed system.

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DRAWING TITLE:
LS W-04 EXISTING CONDITION AND DEMOLITION PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT:
BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: PKK
SCALE: 1" = 5'	CHKD. BY: KVK
DRAWING NO.: 13 of 105	
SHEET NO.: C-09	

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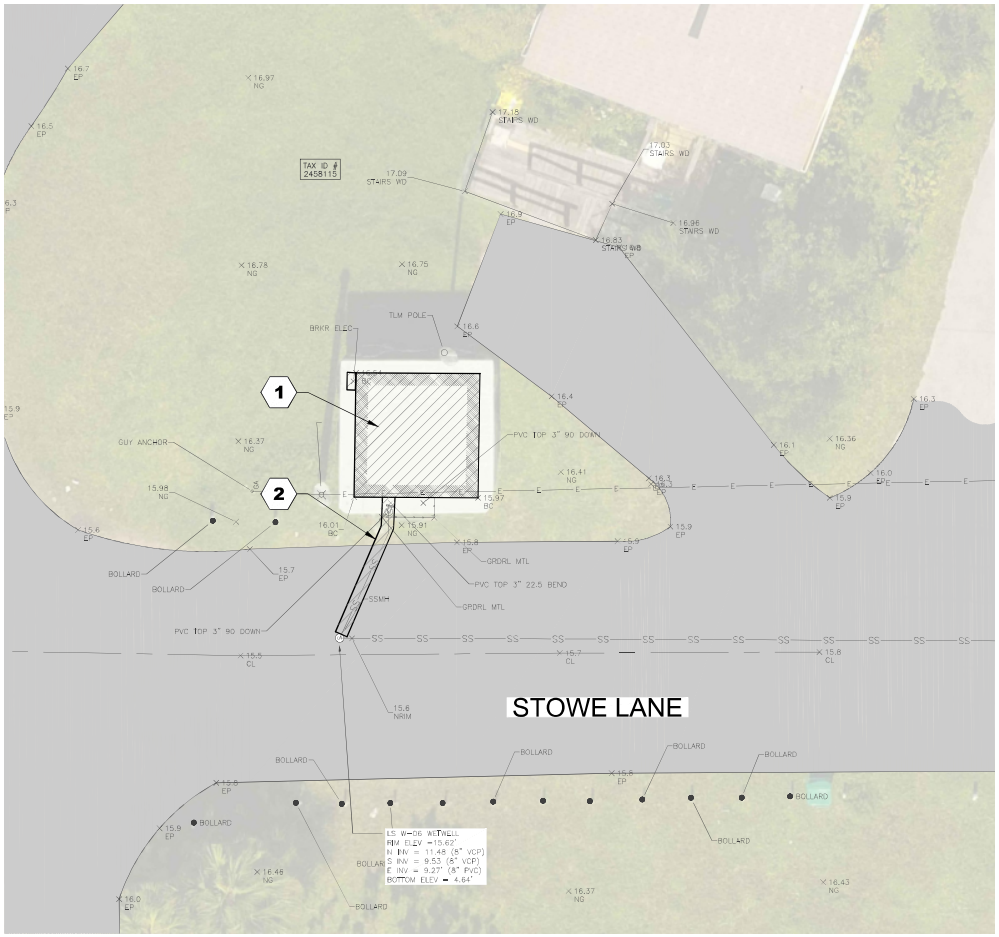

GRAPHIC SCALE

0 5 10

1"=5'

LOCATION MAP

DEMOLITION NOTES

1. Remove all pumping equipment, piping, valves, and fittings from the existing pump house. Salvage or dispose of per the Owner's instructions. Demolish and dispose of the existing pump house structure. Fill the entire pump house area with clean soil. Compact to 95% modified proctor density. Stabilize with sod.
2. Remove and salvage all piping, valves, and fittings from the existing wet well (manhole) and between the wet well and the pump house building. Deliver to the location specified by the owner.

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DRAWING TITLE: LS W-06 EXISTING CONDITION AND DEMOLITION PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: PKK
SCALE: 1" = 5'	CHKD. BY: KVK
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SHEET NO.: C-12	

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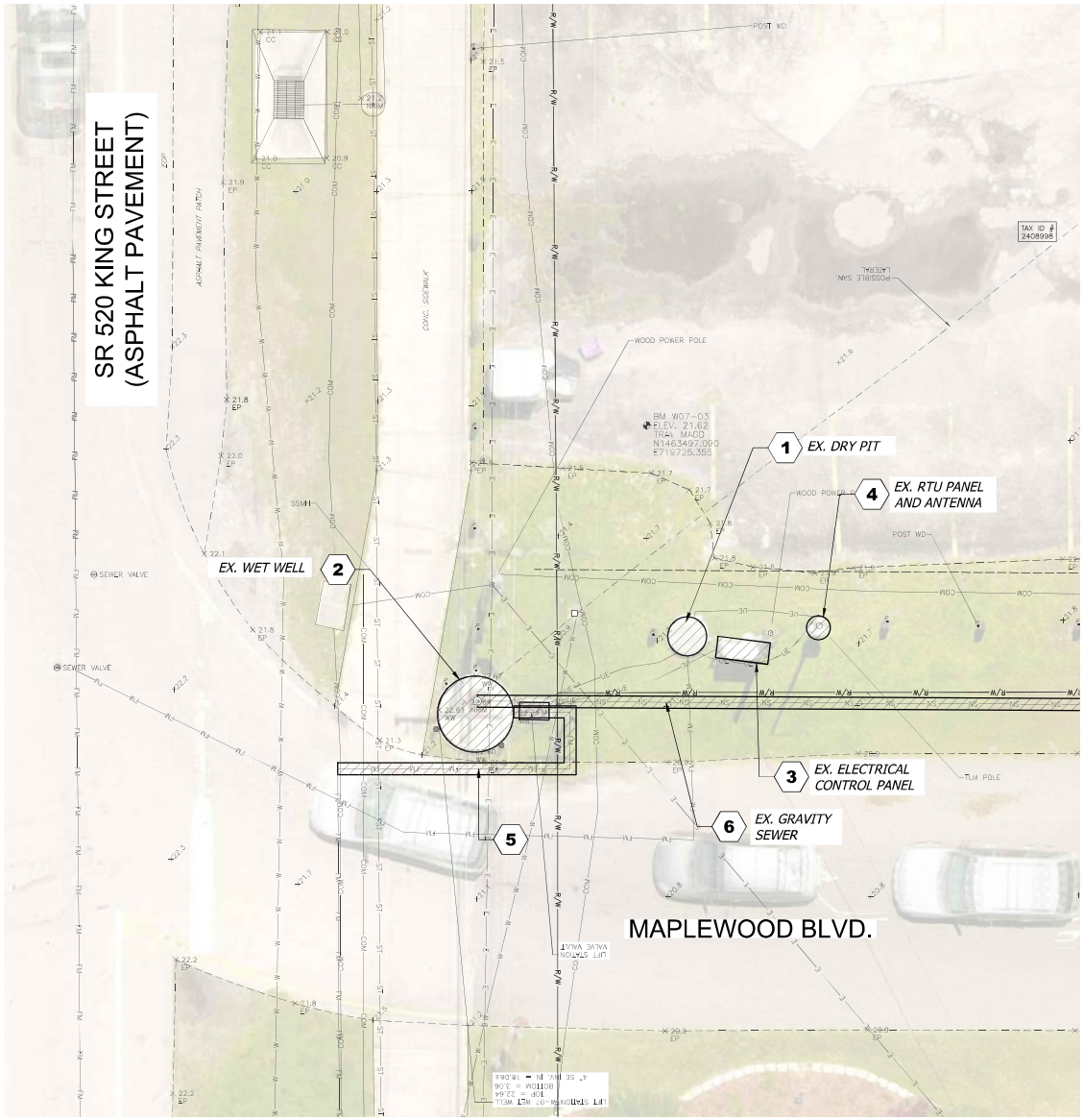

LOCATION MAP

DEMOLITION NOTES

1. Remove and salvage all pumping equipment, piping, valves, and fittings from the existing dry pit. Remove and dispose of top slab and top three feet of the existing dry pit. Fill the entire drypit with clean soil. Compact to 95% modified proctor density. Stabilize with sod. Remove and dispose of two bollards per the owner's instructions.
2. Remove and salvage all piping, valves, and fittings from the existing wetwell. Remove and dispose of top slab and the wetwell. Fill the entire wetwell with clean soil. Compact to 95% modified proctor density. Stabilize with sod.
3. Remove existing electrical panel and salvage or dispose of per the owner's instructions.
4. Remove existing RTU panel with antenna and salvage or dispose of per the owner's instructions.
5. Plug, grout and abandon the existing force main which will not be used in the proposed system.
6. Plug, grout and abandon the existing gravity sewer to the next upstream manhole.

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NO.	DATE:	DESCRIPTION REVISIONS

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DRAWING TITLE: EXISTING LS W-07 EXISTING CONDITION AND DEMOLITION PLAN
WEST COCOA WASTEWATER IMPROVEMENTS
CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.:	PROJ. MGR.
BRV017	KVK
DATE:	DRWN. BY:
12/15/17	PKK
SCALE:	CHKD. BY:
1" = 5'	KVK
DRAWING NO:	
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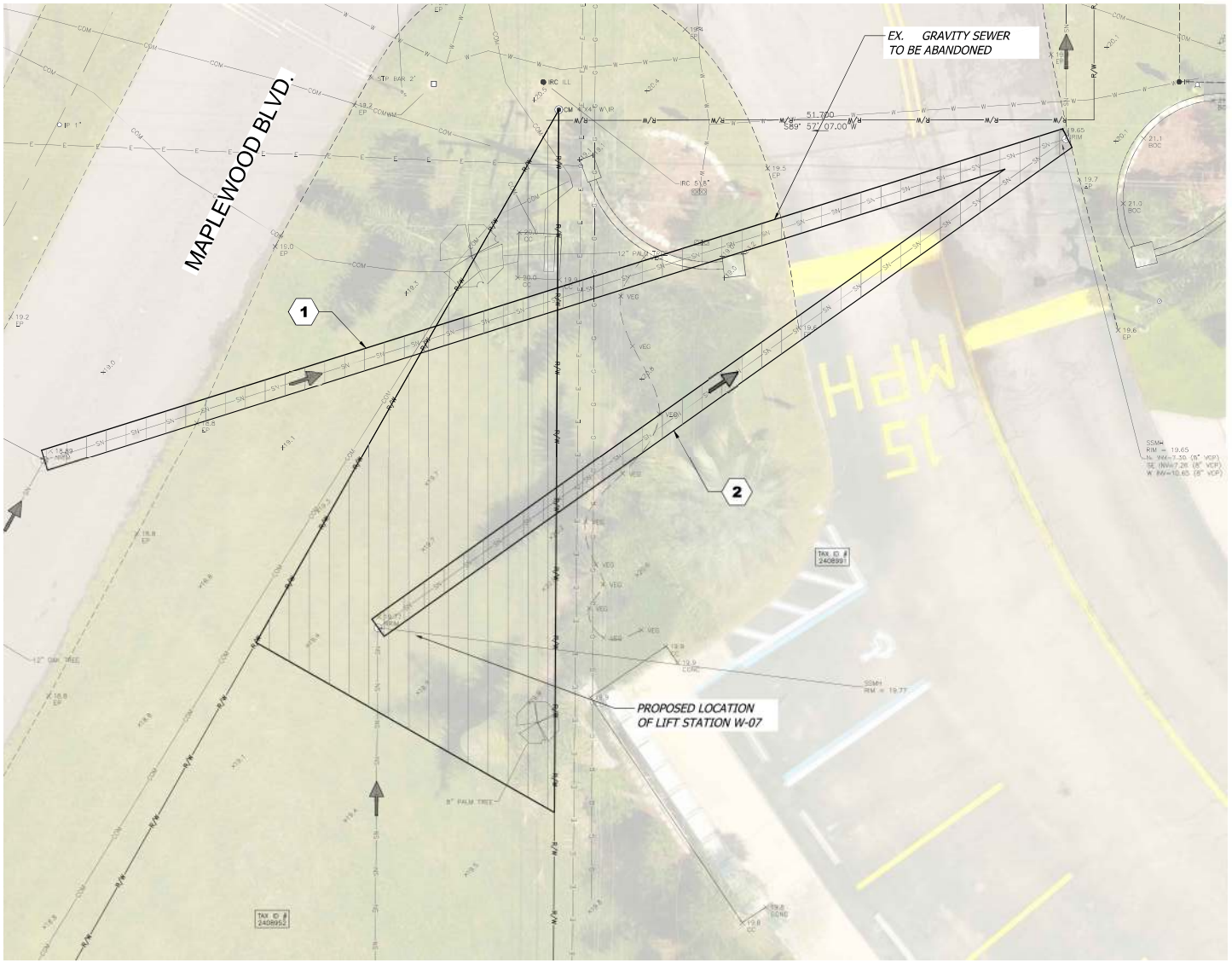

GRAPHIC SCALE

0 5 10
1"=5'

DEMOLITION NOTES:

1. Remove existing 8" gravity sewer flowing from southwest to northeast from Manhole to Manhole. This gravity sewer will be replaced with new 8" PVC gravity sewer flowing from northwest to southwest. (See item 11 on Sheet C-15).
2. Remove existing 8" gravity sewer.

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NO.	DATE:	DESCRIPTION REVISIONS

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DRAWING TITLE:
PROPOSED LS W-07 EXISTING CONDITION AND DEMOLITION PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT:
BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.:	PROJ. MGR.
BRV017	KVK
DATE:	DRWN. BY:
12/15/17	PKK
SCALE:	CHKD. BY:
1" = 5'	KVK
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18 of 105	
SHEET NO.:	
C-14	

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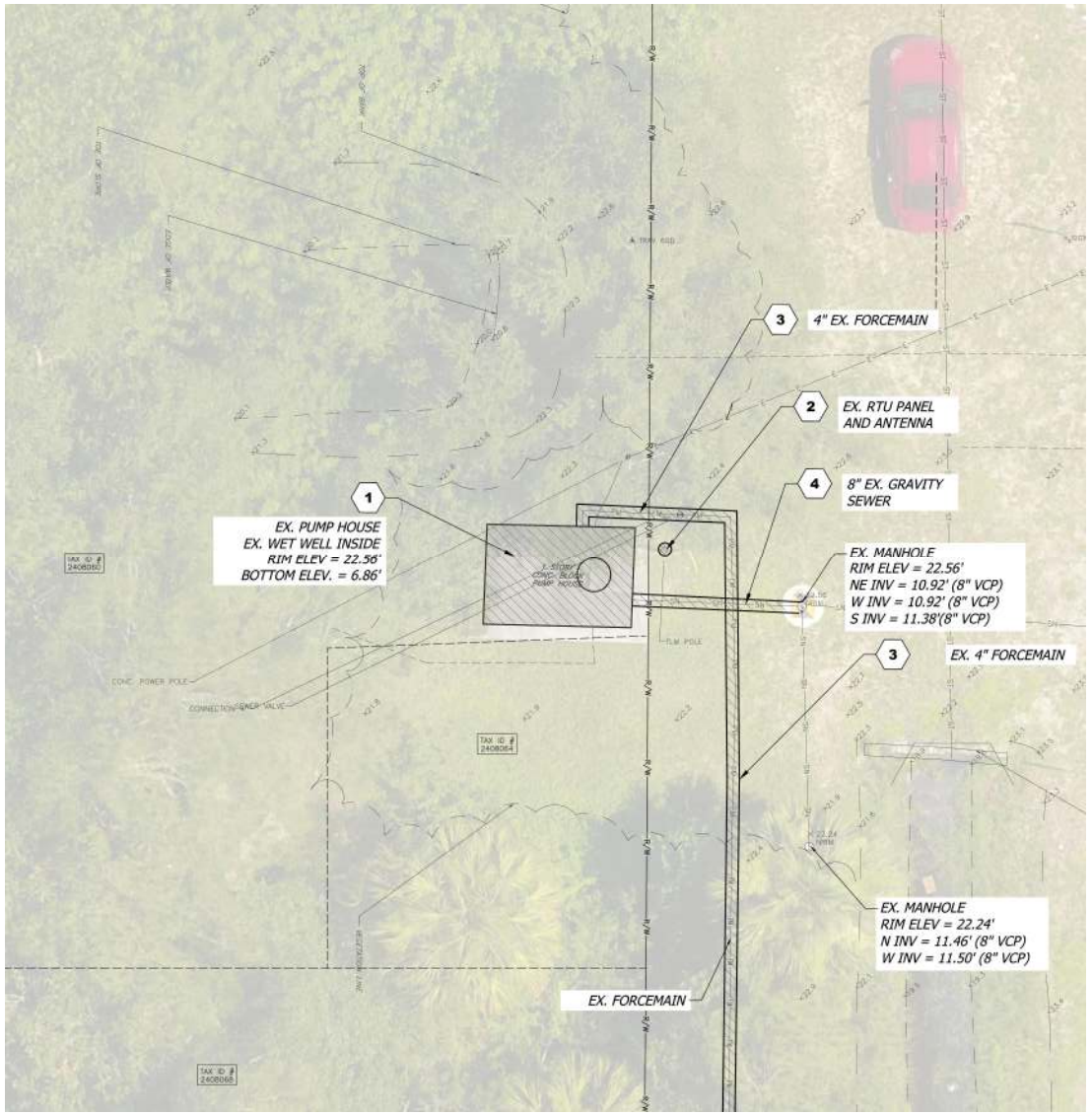

GRAPHIC SCALE

0 5 10

1"=5'

LOCATION MAP

DEMOLITION NOTES

1. Remove all pumping equipment, piping, valves, and fittings from the existing pump house and wetwell. Salvage or dispose of pumping equipment, piping, valves, and fittings per the Owner's instructions. Remove and dispose of pump house structure with slab and top three feet of the wetwell. Fill the entire wetwell with clean soil. Bring entire pump house area to grade with clean soil. Compact to 95% modified proctor density. Stabilize with sod.
2. Remove existing RTU panel with antenna and dispose of per the owner's instructions.
3. Remove the existing force main.
4. Remove the existing gravity sewer.

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DRAWING TITLE:
LS W-08 EXISTING CONDITION AND DEMOLITION PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT:
BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: PKK
SCALE: 1" = 5'	CHKD. BY: KVK
DRAWING NO.: 21 of 105	
SHEET NO.: C-17	

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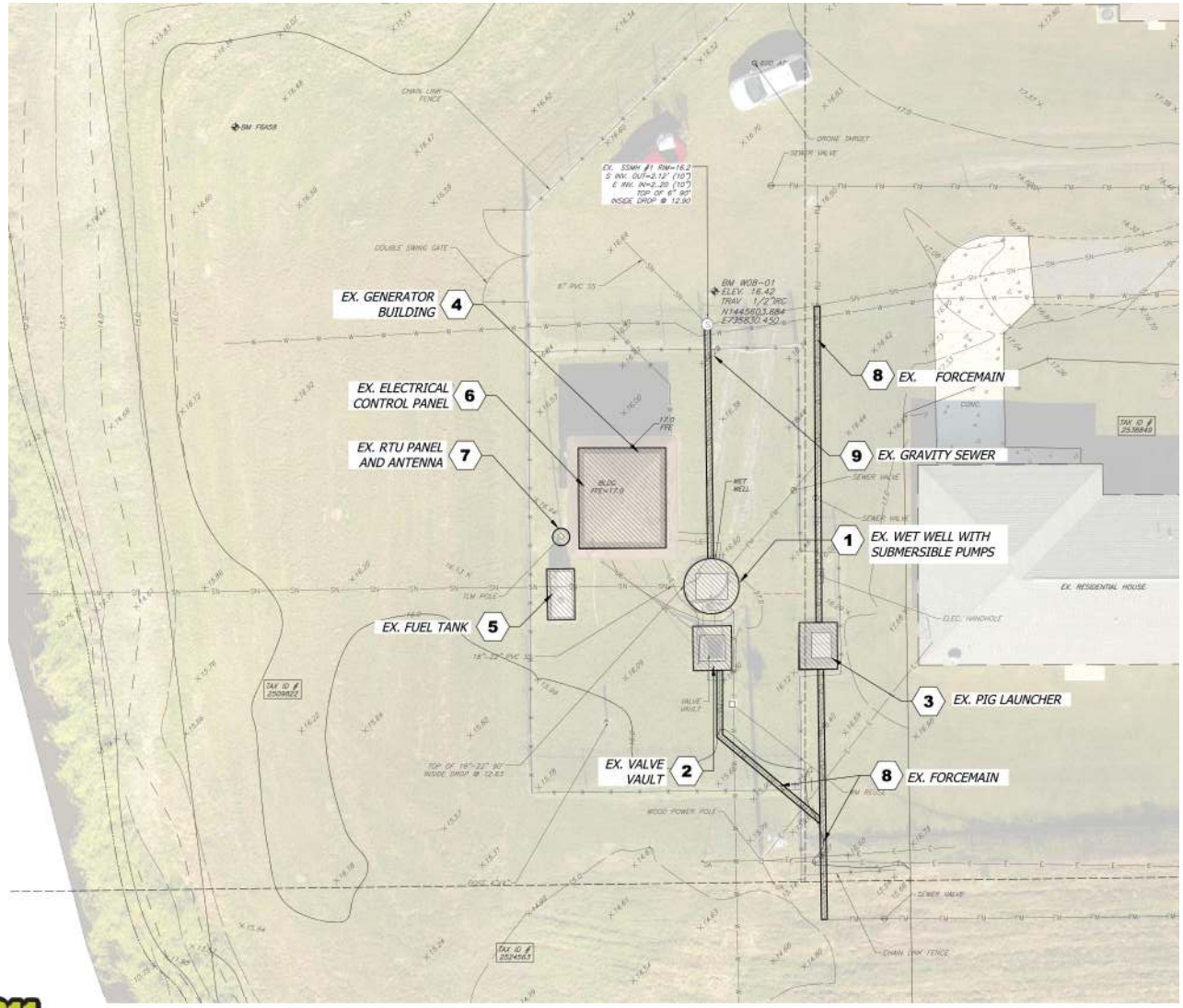

GRAPHIC SCALE

0 10 15 20

1"=10'

LOCATION MAP

DEMOLITION NOTES

1. Remove all pumping equipment, piping, valves, and fittings from the existing wetwell. Salvage or dispose of removed items per the Owner's instructions. Remove top slab and hatch and top three feet of the existing wetwell. Fill the entire wetwell with clean soil. Compact to 95% Modified Proctor density. Stabilize with sod.
2. Remove all piping, valves, and fittings from the existing valve vault. Salvage or dispose of removed items per the Owner's instructions. Remove top slab and top three feet of the existing valve vault. Fill the valve vault with clean soil. Compact to 95% Modified Proctor density. Stabilize with sod.
3. Remove and salvage all piping, valves, and fittings from the existing pig launcher vault. Salvage or dispose of removed items per the Owner's instructions. Demolish the pig launcher vault. Fill the pig launcher vault with clean soil. Compact to 95% Modified Proctor density. Stabilize with sod.
4. Remove and salvage the generator, electrical switchgear and panels from the existing generator building. Salvage or dispose of removed items per the Owner's instructions. Demolish and dispose of the existing generator building. Fill the generator building area with clean soil. Compact to 95% of Modified Proctor density. Stabilize with sod.
5. Remove the existing fuel tank and salvage or dispose of in accordance with the owner's instructions and state regulations.
6. Remove existing electrical panel and salvage or dispose of per the owner's instructions.
7. Remove existing RTU panel with antenna and salvage or dispose of per the owner's instructions.
8. Plug, grout and abandon the existing force main.
9. Plug, grout and abandon the existing gravity sewer.

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DRAWING TITLE:
LS W-09 EXISTING CONDITION AND DEMOLITION PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT:
BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.:	PROJ. MGR.
BRV017	KVK
DATE:	DRWN. BY:
12/15/17	PKK
SCALE:	CHKD. BY:
1" = 10'	KVK
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24 of 105	
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ISS

LOCATION MAP

NTS

DEMOLITION NOTES

1. Start lift station bypass by flow-through plug in the wetwell or the upstream manhole and pump into the existing 4" forcemain. Remove and salvage all pumping equipment, piping, valves, and fittings from the existing pump house and wetwell.
2. Remove all piping, valves, and fittings from the existing valve box. Salvage or dispose of the removed items per the Owner's instructions. Remove and dispose of top slab and top three feet of the valve vault. Fill the valve vault with clean soil. Compact to 95% modified proctor density. Stabilize with sod.
3. Remove existing electrical panel and salvage or dispose of per the owner's instructions.
4. Remove existing RTU panel with antenna and salvage or salvage or dispose of per the owner's instructions.
5. Plug, grout and abandon the existing 6" forcemain up to the 4" ex. forcemain going north .

GRAPHIC SCALE

0 5 10

1"=5'

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Kian Kalkani, P.E. # 76114

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DRAWING TITLE: LS W-10 EXISTING CONDITION AND DEMOLITION PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: PKK
SCALE: 1" = 5'	CHKD. BY: KVK
DRAWING NO.: 27 of 105	
SHEET NO.: C-23	

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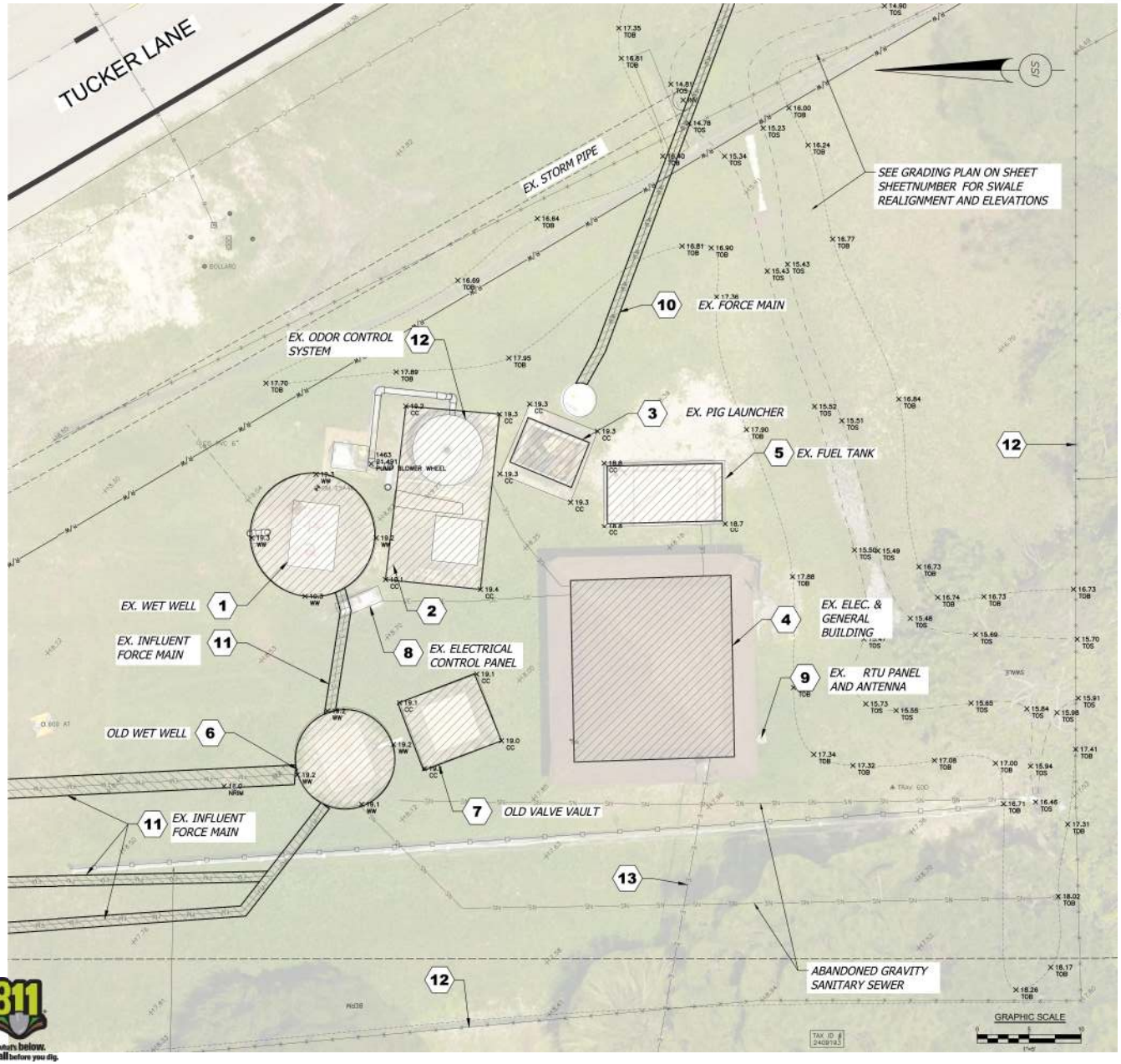

LOCATION MAP NTS

DEMOLITION NOTES

1. Remove all pumping equipment, piping, valves, and fittings from the existing wetwell. Salvage or dispose of per the Owner's instructions. Remove top slab and hatch and top three feet of the existing wetwell. Haul and dispose of the debris at an authorized location. Fill the entire wetwell with clean soil. Compact to 95% Modified Proctor density. Stabilize with sod.
2. Remove all piping, valves, and fittings from the existing valve vault. Deliver to the location specified by the owner. Salvage or dispose of per the Owner's instructions. Demolish existing valve vault. Haul and dispose of the debris at an authorized location. Fill the valve vault with clean soil. Compact to 95% Modified Proctor density. Stabilize with sod.
3. Remove all piping, valves, and fittings from the existing pig launcher vault. Salvage or dispose of per the Owner's instructions. Demolish the pig launcher vault. Haul and dispose of the debris at an authorized location. Fill the pig launcher vault with clean soil. Compact to 95% Modified Proctor density. Stabilize with sod.
4. Remove the generator, electrical switchgear and panels from the existing generator building. Salvage or dispose of per the Owner's instructions. Demolish the existing generator building including floor slab. Haul and dispose of the debris at an authorized location. Grade to the surrounding elevation as needed. Compact to 95% of Modified Proctor density. Stabilize with sod.
5. Remove the existing fuel tank in accordance with the Contract Documents. Salvage or dispose of per the Owner's instructions.
6. Remove all piping, valves, and fittings from the old wetwell used as a manhole. Salvage or dispose of per the Owner's instructions. Remove top slab and hatch and top three feet of the old wetwell. Haul and dispose of debris at an authorized location. Fill the entire wetwell with clean soil. Compact to 95% Modified Proctor density. Stabilize with sod.
7. Demolish the old valve vault. Haul and dispose of the debris at an authorized location. Remove top slab and top three feet of the old valve vault. Fill the valve vault with clean soil. Compact to 95% Modified Proctor density. Stabilize with sod.
8. Remove existing electrical panel and salvage or dispose of per the owner's instructions.
9. Remove existing RTU panel with antenna and salvage or dispose of per the owner's instructions.
10. Plug, grout and abandon the existing force mains from the existing pig launcher vault to the connection with the new 14" forcemain from the new lift station.
11. Plug, grout and abandon the influent forcemain and the piping between the old and existing wet wells. See sheet C-27 for the extent of abandonment.
12. Relocate existing Odor control system as shown on sheet C-27.
    Remove existing fence after completion of on-site demolition work is complete.
13. Remove aerial electrical service line to building.

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NO.	DATE:	DESCRIPTION
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Kian Kulkarni, P.E. # 78114

DRAWING TITLE: LS W-15 EXISTING CONDITION AND DEMOLITION PLAN WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: PKK
SCALE: 1" = 5'	CHKD. BY: KVK
DRAWING NO.: 30 of 105	
SHEET NO.: C-26	

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LOCATION MAP NTS

DEMOLITION NOTES

1. Remove all pumping equipment, piping, valves, and fittings from the existing wetwell. Salvage or dispose of the removed items per the Owner's instructions. Dispose of the hatch cover.
2. Remove all piping, valves, and fittings from the existing valve vault. Salvage or dispose of the removed items per the Owner's instructions. Remove and dispose of top slab and hatch and top three feet of the existing valve vault. Fill the valve vault with clean soil. Compact to 95% Modified Proctor density. Stabilize with sod.
3. Plug, grout and abandon the existing gravity sewer.
4. Remove the existing generator and all appurtenant equipment from the generator room. Salvage or dispose of the removed items per the Owner's instructions.

Kian Kulkarni, P.E. #78114

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		REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
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Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE:
LS W-20 EXISTING CONDITION AND DEMOLITION PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT:
BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: PKK
SCALE: 1" = 5'	CHKD. BY: KVK
DRAWING NO.: 34 of 105	
SHEET NO.: C-30	

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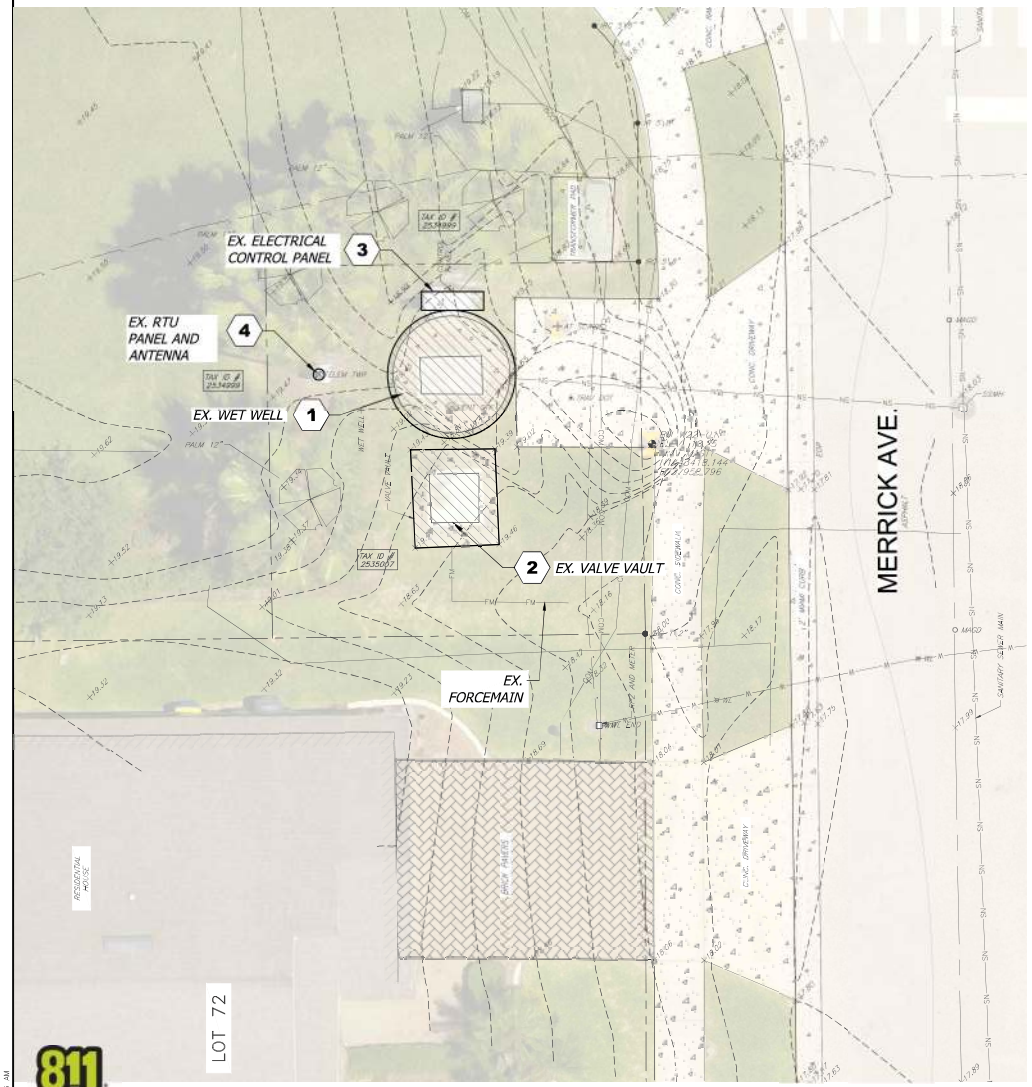


GRAPHIC SCALE

0 5 10

1"=5'

ISS

LOCATION MAP NTS

DEMOLITION NOTES

1. Start bypass of the lift station. Remove all pumping equipment, piping, valves, and fittings from the existing wetwell. Remove all piping, valves, and fittings from the existing valve vault. Salvage or dispose of removed items per the owner's instructions. Remove and dispose of top slab, hatch and top three feet of the existing valve vault. Fill the valve vault with clean soil. Compact to 95% Modified Proctor density. Stabilize with sod.
2. Remove existing electrical panel and salvage or dispose of per the owner's instructions.
3. Remove existing RTU panel with antenna and salvage or dispose of per the owner's instructions.

811 Know what's below. Call before you dig.

Kian Kulkarni, P.E. #78114

NO.	DATE:	DESCRIPTION
		REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

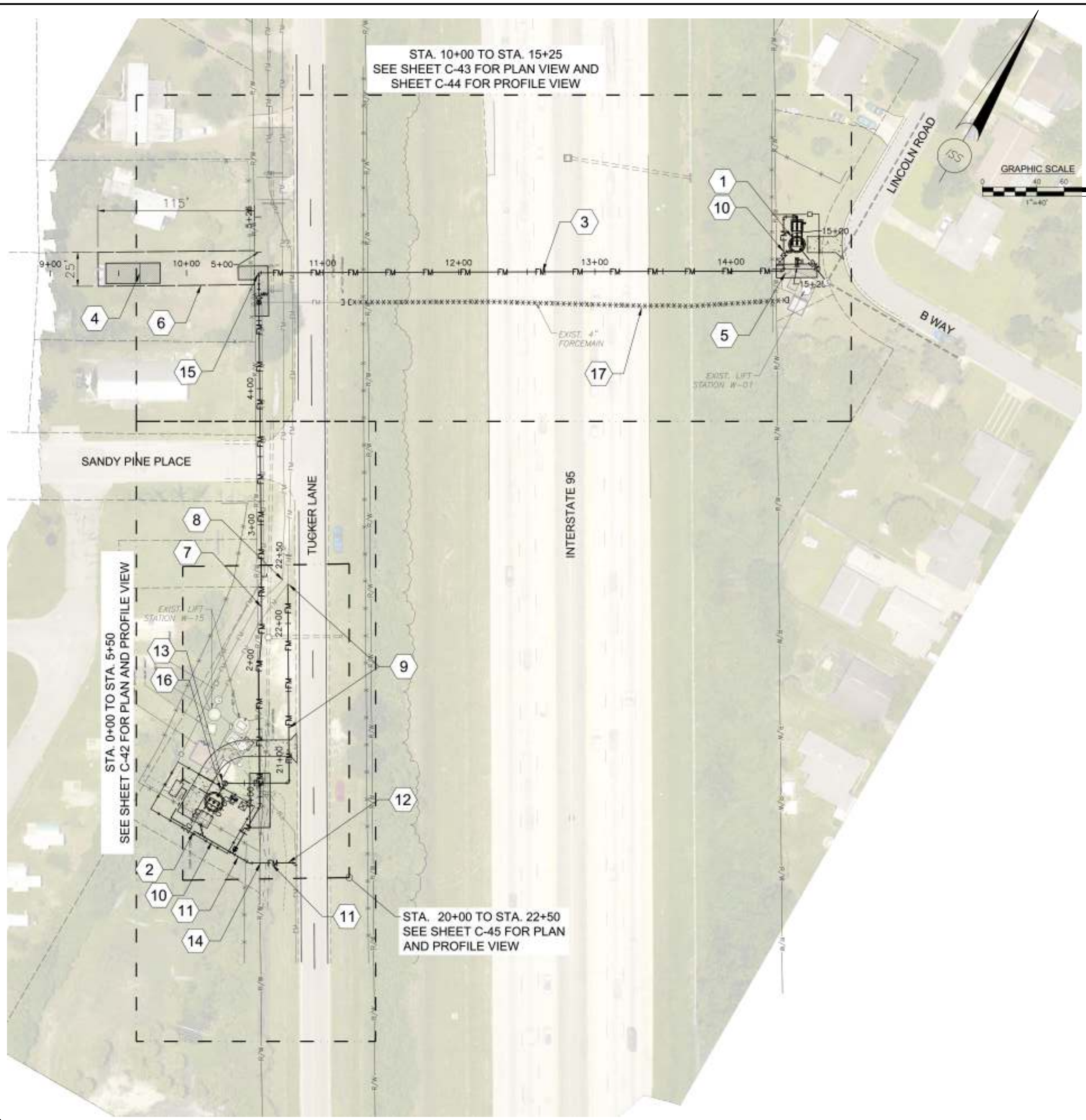
DRAWING TITLE: LS W-22 EXISTING CONDITION AND DEMOLITION PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: PKK
SCALE: 1" = 5'	CHKD. BY: KVK
DRAWING NO.: 37 of 105	
SHEET NO.: C-33	

6/7/2019 10:00:56 AM

Z:\PROJECTS\BRV Brevard County\BRV017 West Cocoa Wastewater Improvmts\Drawings\SS DWG\2 Eng\Final Dwg\W22-SITE.dwg



LS W-01 & LS W-15 Sewer FM Notes

1. Proposed LS W-01, see Sheets C-02 to C-04 for site specific details.
2. Proposed LS W-15, see Sheets C-26 to C-29 for site specific details.
3. Proposed 20"Ø PE-4710 horizontal directional drill (HDD) casing for proposed 8"Ø forcemain. See Sheet C-44 for profile
4. Horizontal directional drill (HDD) pilot entry point (towards east).
5. Horizontal directional drill (HDD) receiving pit (from west).
6. Proposed 25'x115' temporary construction easement for drilling rig unit staging area.
7. Proposed 8"Ø PE-4710 horizontal directional drill (HDD). See Sheet C-42 for profile.
8. Existing 8"Ø forcemain (Placed out of service).
9. Proposed 12"Ø C900 PVC forcemain. See Sheet C-45 for profile.
10. Proposed 8"Ø C900 PVC forcemain.
11. Proposed 14"Ø C900 DIP forcemain.
12. Connect proposed 14"Ø FM to existing 14"Ø FM.
13. Proposed sanitary sewer manhole. See Sheet C-27 for details.
14. Horizontal directional drill (HDD) pilot entry point (towards north).
15. Horizontal directional drill (HDD) receiving pit. (from south).
16. Proposed 8"Ø C900 gravity sewer to wet well, See Sheet C-27 for details.
17. Existing 4" forcemain to be cut, capped, and filled with excavatable flowable fill and placed out of service upon completion

PLAN NOTES:

1. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CROSSING UNDERGROUND UTILITIES, WHETHER SHOWN ON THE PLANS OR LOCATED BY THE UTILITY COMPANY. ALL UTILITIES WHICH INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PREFERABLY BEFORE COMMENCING CONSTRUCTION, IF POSSIBLE. ANY FEES ASSOCIATED WITH UTILITY RELOCATIONS SHALL BE BORNE IN ACCORDANCE WITH RESPECTIVE UTILITY COMPANY STANDARDS. IF IT IS REQUESTED THAT UTILITY COMPANIES MOVE THEIR PARTICULAR UTILITIES, ANY DELAY OR INCONVENIENCE CAUSED TO THE CONTRACTOR BY THE RELOCATION OF THE VARIOUS UTILITIES SHALL BE INCIDENTAL TO THE CONTRACT.
2. THE CONTRACTOR SHALL CONTACT THE FDOT REPRESENTATIVE IDENTIFIED ON THE FDOT UTILITY PERMIT A MINIMUM OF TWO (2) BUSINESS DAYS PRIOR TO STARTING WORK AND AGAIN IMMEDIATELY UPON COMPLETION OF WORK FOR ANY CONSTRUCTION WITHIN THE FDOT RIGHT-OF-WAY.
3. ANY INDIVIDUALS RESPONSIBLE FOR PLACEMENT OF MAINTENANCE OF TRAFFIC CONTROL SCHEMES AND DEVICES IN WORK ZONES ON THE FDOT R/W MUST HAVE PROPER TRAINING. WHILE ON THE JOBSITE, THE CONTRACTOR OR HIS EMPLOYEE RESPONSIBLE FOR TRAFFIC CONTROL SHALL CARRY EITHER AN FDOT MAINTENANCE OF TRAFFIC TRAINING CERTIFICATE, FROM AN FDOT MAINTENANCE OF TRAFFIC TRAINING PROVIDER, OR A CERTIFICATION FROM THE UTILITY OWNER STATING THE FOLLOWING: "[Employee's Name] has been properly trained to control traffic in accordance the UAM's traffic control requirements."
4. ALL DEWATERING COSTS ASSOCIATED WITH THE INSTALLATION AND CONSTRUCTION OF THE UNDERGROUND UTILITIES AS REFERENCED IN THESE PLANS SHALL BE INCLUDED AS PART OF THE CONSTRUCTION BID COSTS. THE CONTRACTOR SHALL SUBMIT FOR WATER USE PERMITS IF REQUIRED FOR DEWATERING ACTIVITIES.
5. THE CONTRACTOR SHALL PROVIDE SHORING FOR EXPOSED UTILITIES OR UTILITIES OR STRUCTURES ADJACENT TO UTILITY TRENCHES. SHORING FOR EXCAVATIONS EXCEEDING 25 FEET IN DEPTH MUST BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER AND IS THE CONTRACTORS RESPONSIBILITY.
6. STATE ROAD INTERSTATE 95 IS A LIMITED ACCESS HIGHWAY. ALL CONSTRUCTION WORK MUST BE DONE OUTSIDE THE I95 RIGHT-OF-WAY LIMITS INCLUDING ACCESSING THE DRILLING STAGING AREA AND THE DRILLING RECEIVING PIT AREA.
7. BACKFLOW PREVENTORS SHALL NOT BE INSTALLED INSIDE THE FDOT RIGHT-OF-WAY LIMITS.

DIRECTIONAL BORE NOTES:

1. THE CONTRACTOR SHALL COMPLY WITH FDOT DESIGN STANDARDS (LATEST EDITION) SECTION 120 FOR SITE EXCAVATION AND SECTION 555 FOR DIRECTIONAL BORING WITHIN THE FDOT RIGHT-OF-WAY.
2. ALL DIRECTIONAL BORE PATHS WITHIN THE FDOT RIGHT-OF-WAY MUST BE ACCURATELY RECORDED IN A BORE LOG AND SUBMITTED TO FDOT WITHIN SEVEN (7) DAYS OF THE COMPLETION OF EACH SUCCESSFUL OR FAILED BORE PATH. THE BORE LOG SUBMITTAL MUST COMPLY WITH THE FDOT UTILITY ACCOMMODATION MANUAL (LATEST EDITION) SECTION 3.16.9.
3. THE CONTRACTOR WILL CLEAN THE WORK SITE OF ALL EXCESS SLURRY OR SPOILS WITHIN 48 HOURS OF COMPLETING DIRECTIONAL BORE AND RESTORE THE WORK SITE TO PRE-DRILLING CONDITIONS.

811 Know what's **below.** **Call** before you dig.

Kiran Kulkarni, P.E. 36114

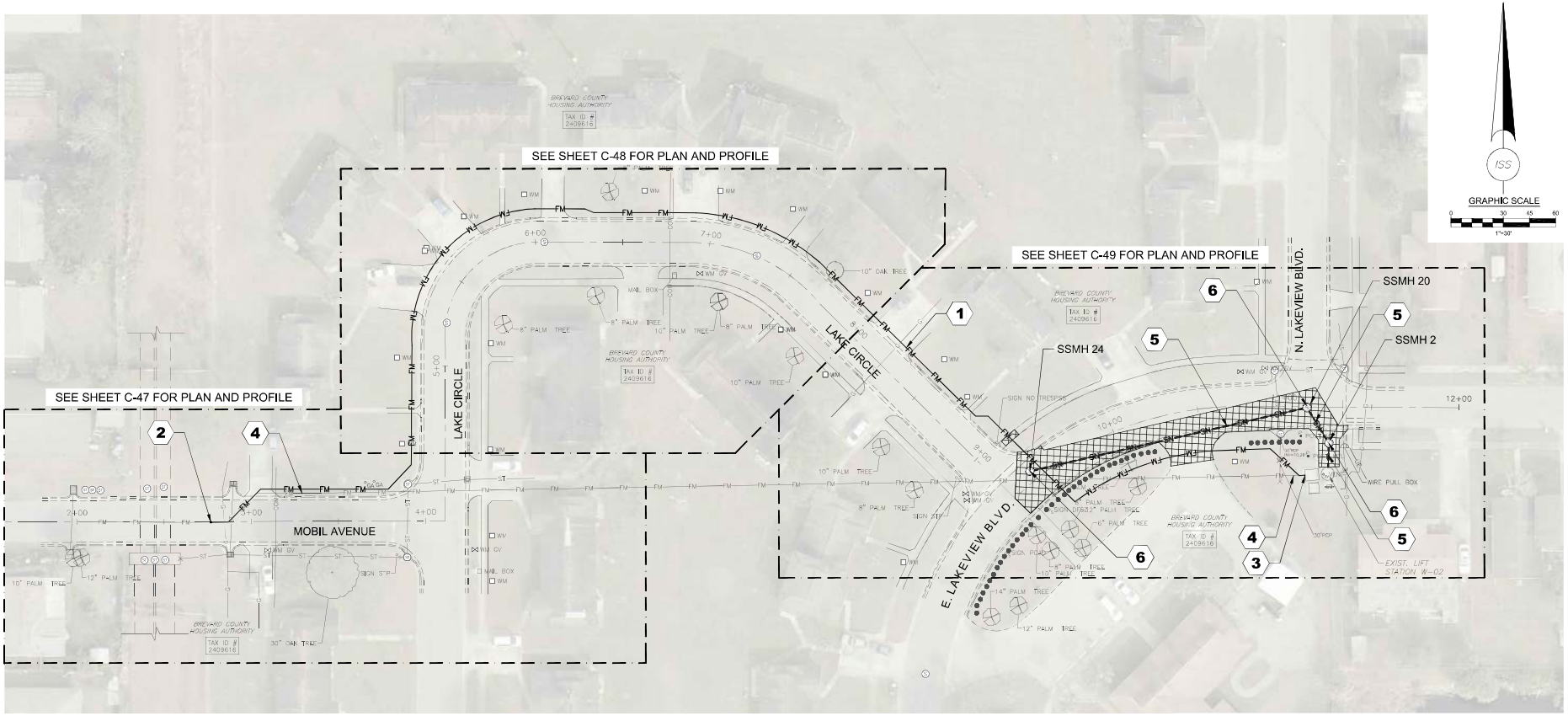
NO.	DATE:	DESCRIPTION
		REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: LS W-01 AND LS W-15 SEWER FORCEMAIN KEY PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: MBH
SCALE: 1" = 40'	CHKD. BY: KVK
DRAWING NO: 45 of 105	
SHEET NO. C-41	



LS W-02 Gravity Sewer and Forcemain Notes

1. Install total of 835 LF 6"Ø C900 PVC sanitary forcemain.
2. Connect proposed 6"Ø C900 PVC sanitary sewer forcemain to existing 6"Ø PVC/HDPE forcemain (replace to end of exist. 6"Ø ACP forcemain).
3. Connect proposed 6"Ø C900 PVC sanitary sewer forcemain to LS W-02 valve vault discharge piping.
4. Cut and cap existing 6"Ø ACP forcemain and fill with non-shrink grout.
5. Replace sanitary sewer gravity main from SSMH 2 to SSMH 24.
6. Replace existing sanitary sewer manholes SSMH 2, SSMH 20 and SSMH 24 and connect new and existing piping.

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Kiran Kulkarni, P.E. 38114

NO.	DATE:	DESCRIPTION: REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: LS W-02 GRAVITY SANITARY SEWER & FORCEMAIN KEY PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.	PROJ. MGR.
BRV017	KVK
DATE: 12/15/17	DRWN. BY: MBH
SCALE: 1" = 30'	CHKD. BY: KVK
DRAWING NO.: 50 OF 105	
SHEET NO.: C-46	

6/7/2018 10:11:34 AM

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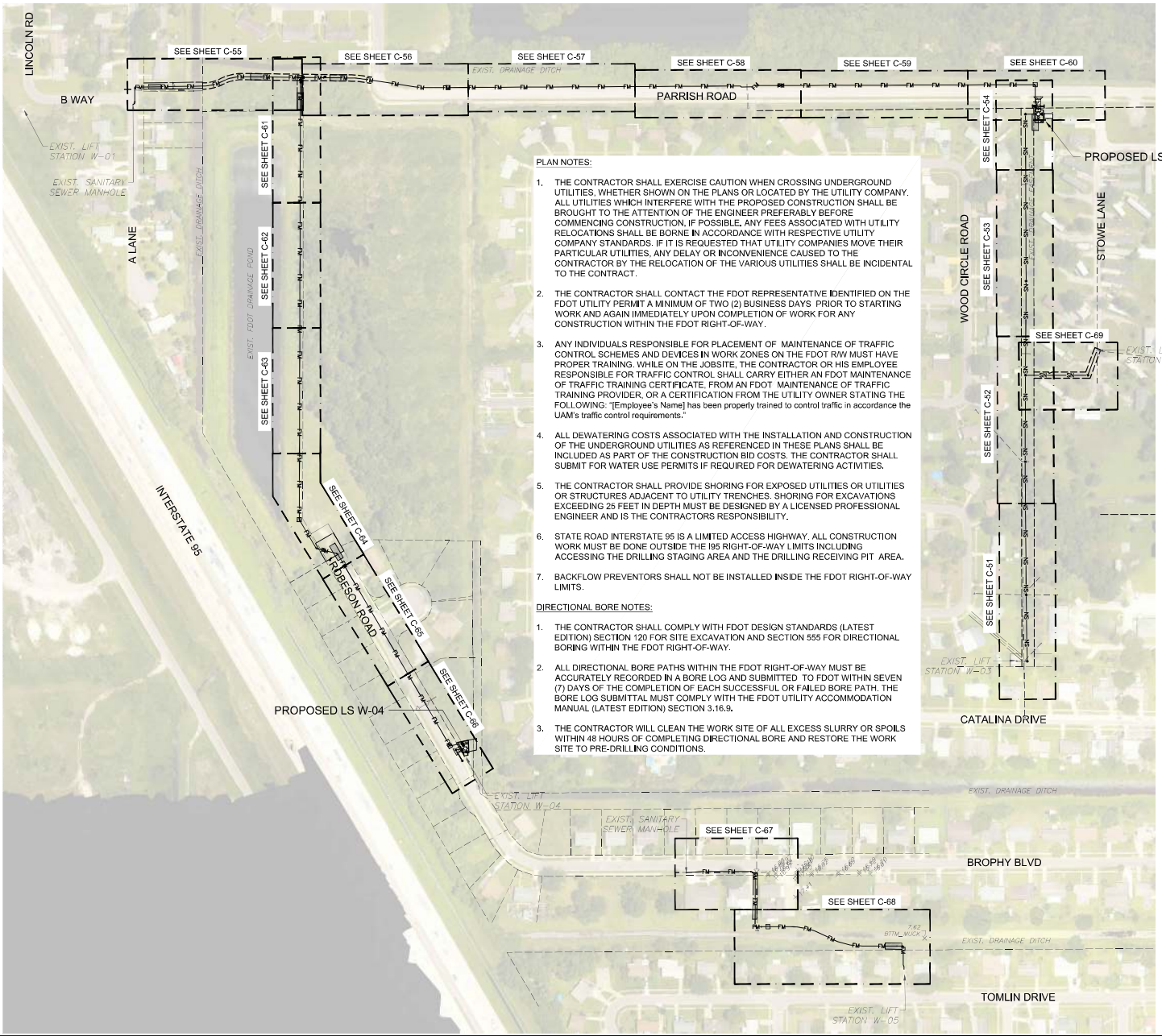

PLAN NOTES:

1. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CROSSING UNDERGROUND UTILITIES, WHETHER SHOWN ON THE PLANS OR LOCATED BY THE UTILITY COMPANY. ALL UTILITIES WHICH INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PREFERABLY BEFORE COMMENCING CONSTRUCTION, IF POSSIBLE. ANY FEES ASSOCIATED WITH UTILITY RELOCATIONS SHALL BE BORNE IN ACCORDANCE WITH RESPECTIVE UTILITY COMPANY STANDARDS. IF IT IS REQUESTED THAT UTILITY COMPANIES MOVE THEIR PARTICULAR UTILITIES, ANY DELAY OR INCONVENIENCE CAUSED TO THE CONTRACTOR BY THE RELOCATION OF THE VARIOUS UTILITIES SHALL BE INCIDENTAL TO THE CONTRACT.
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DIRECTIONAL BORE NOTES:

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3. THE CONTRACTOR WILL CLEAN THE WORK SITE OF ALL EXCESS SLURRY OR SPOILS WITHIN 48 HOURS OF COMPLETING DIRECTIONAL BORE AND RESTORE THE WORK SITE TO PRE-DRILLING CONDITIONS.

811 Know what's below. Call before you dig.

Kiran Kulkarni, P.E.
38114

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

NO.	DATE:	DESCRIPTION:
		REVISIONS

DRAWING TITLE: LS W-03, LS W-04, LS W-05 & LS W-06 KEY PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.	PROJ. MGR.
BRV017	KVK
DATE: 12/15/17	DRWN. BY: MBH
SCALE: 1" = 120'	CHKD. BY: KVK
DRAWING NO. 54 of 105	
SHEET NO. C-50	

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GRAPHIC SCALE

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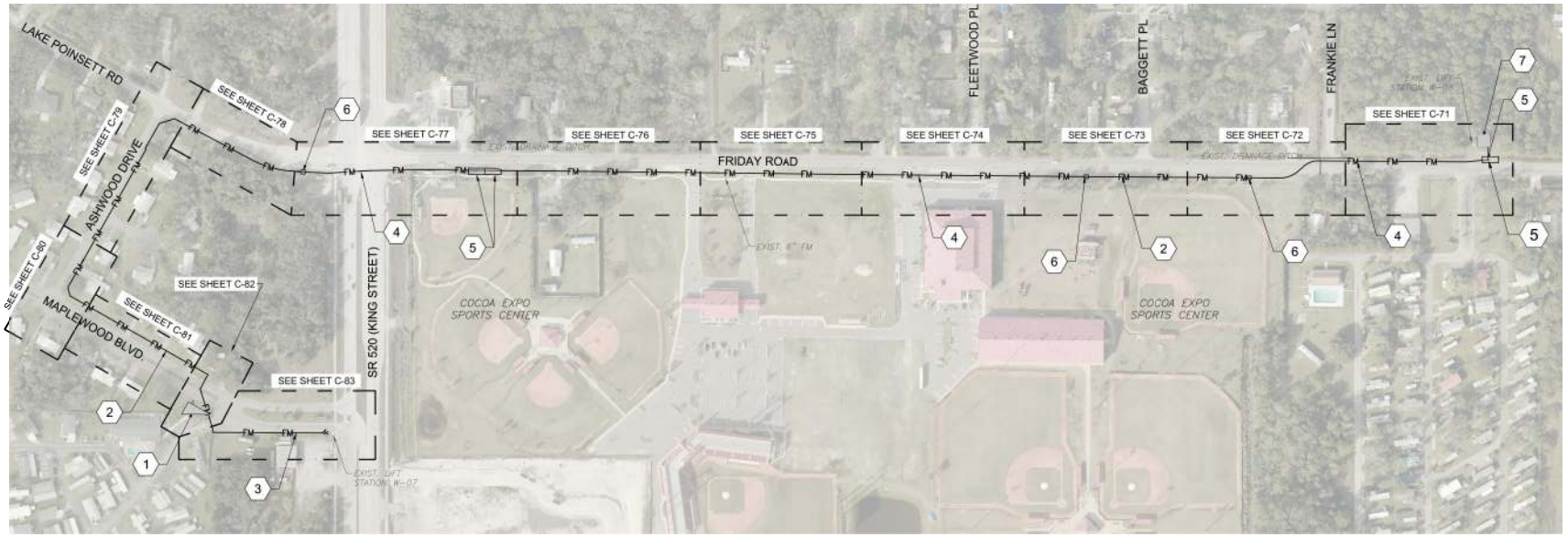
1"=140'



PLAN NOTES:

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2. THE CONTRACTOR SHALL CONTACT THE FDOT REPRESENTATIVE IDENTIFIED ON THE FDOT UTILITY PERMIT A MINIMUM OF TWO (2) BUSINESS DAYS PRIOR TO STARTING WORK AND AGAIN IMMEDIATELY UPON COMPLETION OF WORK FOR ANY CONSTRUCTION WITHIN THE FDOT RIGHT-OF-WAY.
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DIRECTIONAL BORE NOTES:

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3. THE CONTRACTOR WILL CLEAN THE WORK SITE OF ALL EXCESS SLURRY OR SPOILS WITHIN 48 HOURS OF COMPLETING DIRECTIONAL BORE AND RESTORE THE WORK SITE TO PRE-DRILLING CONDITIONS.

LS W-07 & LS W-08 Sewer Forcemain Key Plan Notes

1. Proposed Lift Station W-07 relocation. See Sheets C-13 to C-16 for site details.
2. Proposed 4"Ø C900 PVC sanitary forcemain from LS W-04.
3. Proposed 6"Ø C900 PVC sanitary forcemain.
4. Proposed 4"Ø PE-4710 horizontal directional drill (HDD).
5. Horizontal directional drill (HDD) pilot entry point (to North).
6. Horizontal directional drill (HDD) receiving pit (from South).
7. Proposed Lift Station W-08 relocation. See Sheets C-17 to C-19 for site details.

811 Know what's below. Call before you dig.

6/7/2018 10:16:14 AM

Z:\PROJECTS\BRV Brevard County\BRV017 West Cocoa Wastewater Improvmts\Drawings\ISS DWG\2 Eng\Final Dwg\BRV017-W-07 TO W-08 PLAN AND PROFILE.dwg

Kiran Kulkarni, P.E. 38114

NO.	DATE:	DESCRIPTION:
		REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: LS W-07 AND LS W-08 SANITARY FORCEMAIN KEY PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.:	PROJ. MGR.:
BRV017	KVK
DATE:	DRWN. BY:
12/15/17	MBH
SCALE:	CHKD. BY:
1" = 140'	KVK

DRAWING NO.: 74 of 105

SHEET NO.: C-70

LS W-09 Gravity Sewer Notes

1. Proposed LS W-09 relocation.
2. Proposed 8" PVC gravity sewer main.
3. Connect to existing manhole.

811 Know what's below. Call before you dig.

Kiran Kulkarni, P.E. 38114

NO.	DATE:	DESCRIPTION: REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: LS W-09 GRAVITY SANITARY SEWER KEY PLAN
WEST COCOA WASTEWATER IMPROVEMENTS
CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.:	PROJ. MGR.
BRV017	KVK
DATE:	DRWN. BY:
12/15/17	MBH
SCALE:	CHKD. BY:
1" = 100'	KVK
DRAWING NO.: 88 of 105	
SHEET NO.: C-84	

6/7/2019 10:18:12 AM

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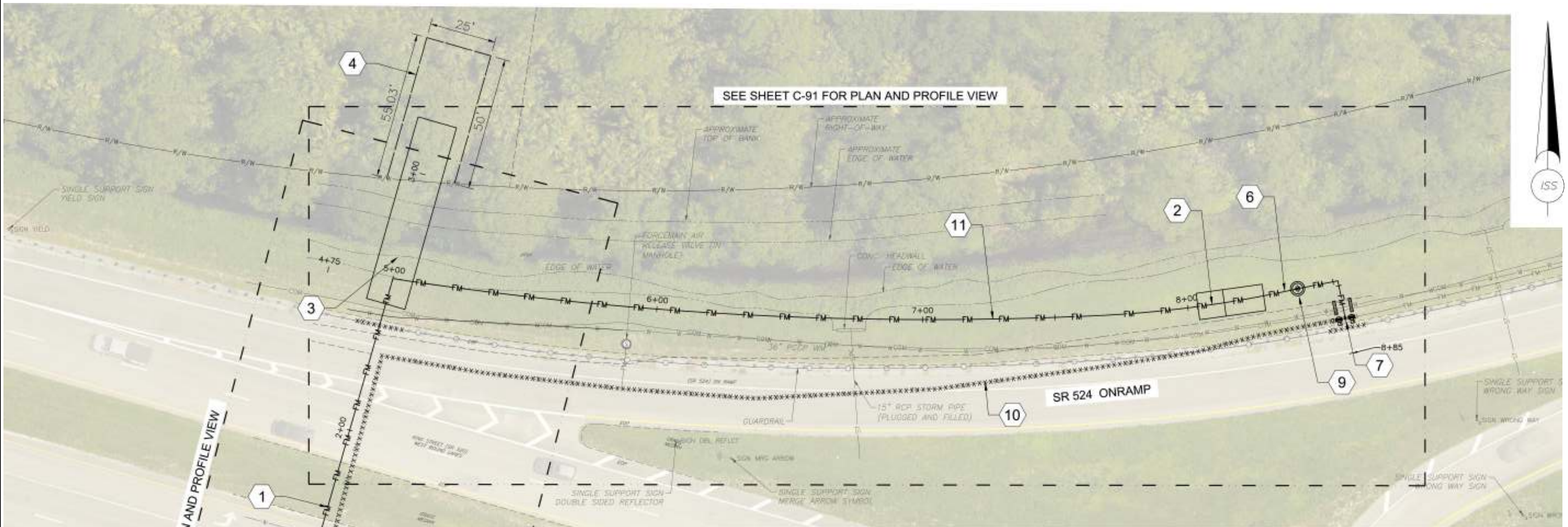

PLAN NOTES:

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3. ANY INDIVIDUALS RESPONSIBLE FOR PLACEMENT OF MAINTENANCE OF TRAFFIC CONTROL SCHEMES AND DEVICES IN WORK ZONES ON THE FDOT R/W MUST HAVE PROPER TRAINING. WHILE ON THE JOBSITE, THE CONTRACTOR OR HIS EMPLOYEE RESPONSIBLE FOR TRAFFIC CONTROL SHALL CARRY EITHER AN FDOT MAINTENANCE OF TRAFFIC TRAINING CERTIFICATE, FROM AN FDOT MAINTENANCE OF TRAFFIC TRAINING PROVIDER, OR A CERTIFICATION FROM THE UTILITY OWNER STATING THE FOLLOWING: "[Employee's Name] has been properly trained to control traffic in accordance the UAM's traffic control requirements."
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DIRECTIONAL BORE NOTES:

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GRAPHIC SCALE
0 20 30 40
1"=20'

LS W-20 Sewer FM Notes

1. Proposed 10"Ø HDPE PE-4710 forcemain horizontal directional drill under SR 520
2. Horizontal directional drill (HDD) pilot entry point
3. Horizontal directional drill (HDD) Receiving Pit.
4. Proposed Temporary construction easement.
5. Existing sanitary sewer manhole at LS W-20.
6. Proposed 10"Ø C900 PVC forcemain.
7. Connect to Existing 10"Ø forcemain. See Sheet C-93.
8. Existing Buried sanitary sewer manhole (SSMH)
9. Proposed Air Release Valve in 4'Ø Doghouse Manhole, see detail on Sheet C-37.
10. Existing 10" forcemain to be placed out of service. Cut, Cap and fill with excavatable flowable fill.
11. Proposed 10"Ø HDPE PE-4710 forcemain horizontal directional drill

Know what's below. Call before you dig.

Kiran Kulkarni, P.E. 36114

NO. | DATE: | DESCRIPTION
REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: LS W-20 SANITARY FORCEMAIN KEY PLAN
WEST COCOA WASTEWATER IMPROVEMENTS
CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: MBH
SCALE: 1" = 20'	CHKD. BY: KVK
DRAWING NO: 93 of 105	
SHEET NO. C-89	

6/7/2019 10:19:55 AM
Z:\PROJECTS\BRV Brevard County\BRV017 West Cocoa Wastewater Imprvmnts\Drawings\ISS DWG\2 Eng\Final Dwg\BRV017-W-20 FM PLAN AND PROFILE-OPTIONA.dwg

Appendix B

Environmental

This record search is for informational purposes only and does NOT constitute a project review. This search only identifies resources recorded at the Florida Master Site File and does NOT provide project approval from the Division of Historical Resources. Contact the Compliance and Review Section of the Division of Historical Resources at 850-245-6333 for project review information.

June 22, 2018

Florida Master Site File

David A. Myers
Infrastructure Solution Services,
Phone: (321) 622-4646
Email: dmyers@infrastructuress.com

In response to your inquiry of June 22nd 2018, the Florida Master Site File lists no previously reported cultural resources within the area indicated:

TRS: T24S, R35 E: Sections 26-28, 33-26 & T25S, R36 E: Section 17 within a 50-meter radius of the project locations shown on the corresponding maps.

When interpreting the results of our search, please consider the following information:

- **This search area may contain *unrecorded* archaeological sites, historical structures or other resources even if previously surveyed for cultural resources.**

- **Federal, state and local laws require formal environmental review for most projects. This search DOES NOT constitute such a review. If your project falls under these laws, you should contact the Compliance and Review Section of the Division of Historical Resources at 850-245-6333.**

Please do not hesitate to contact us if you have any questions regarding the results of this search.

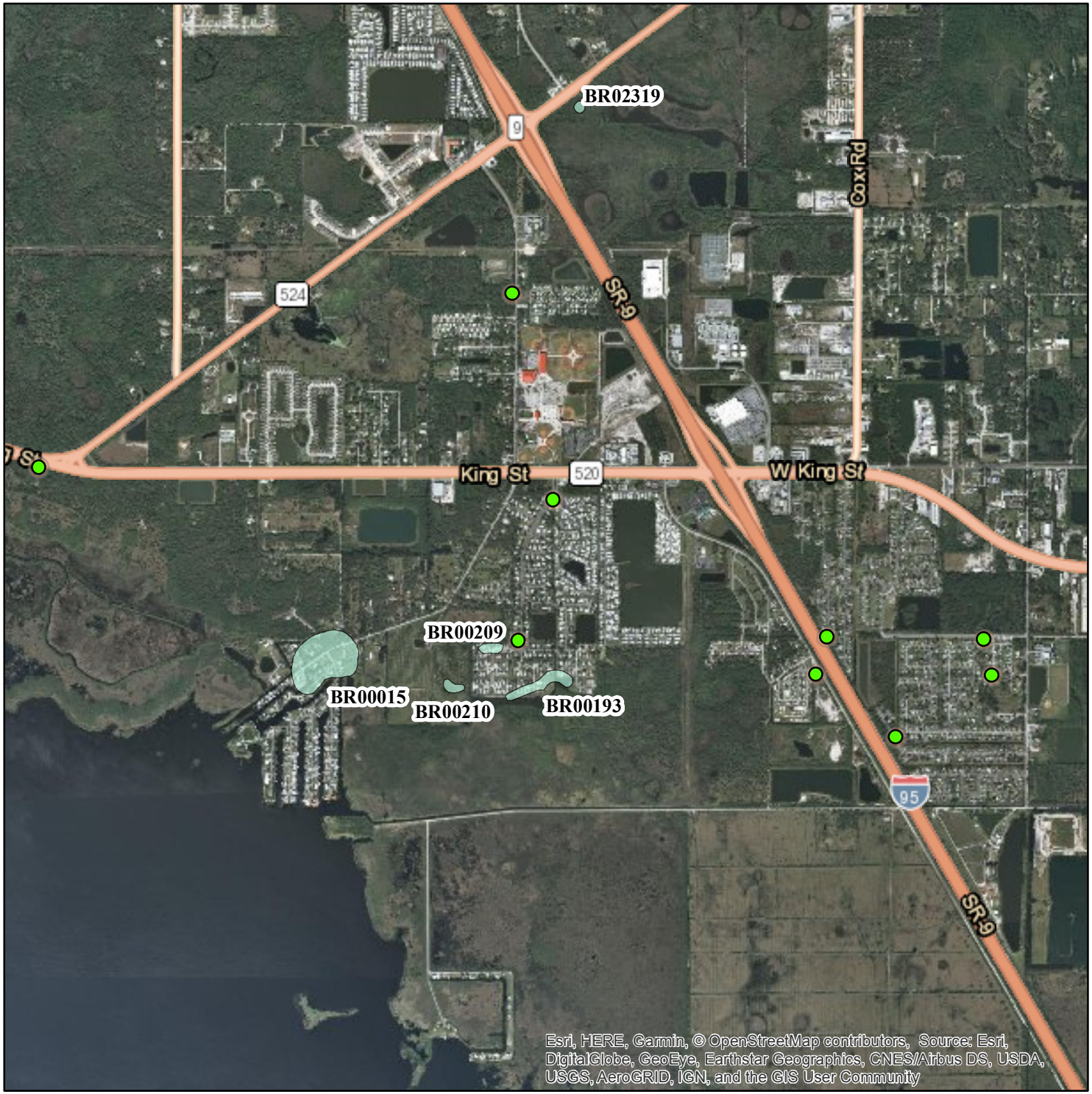
Sincerely,

Sam M. Wilford.
Archaeological Data Analyst
Florida Master Site File
Sam.Wilford@dos.myflorida.com

Florida Master Site File

Legend

- Search Radius (50-meters)
- Standing Structures
- Archaeological Sites
- Historic Bridges
- Historic Cemeteries
- National Register Listing
- Resource Groups



N

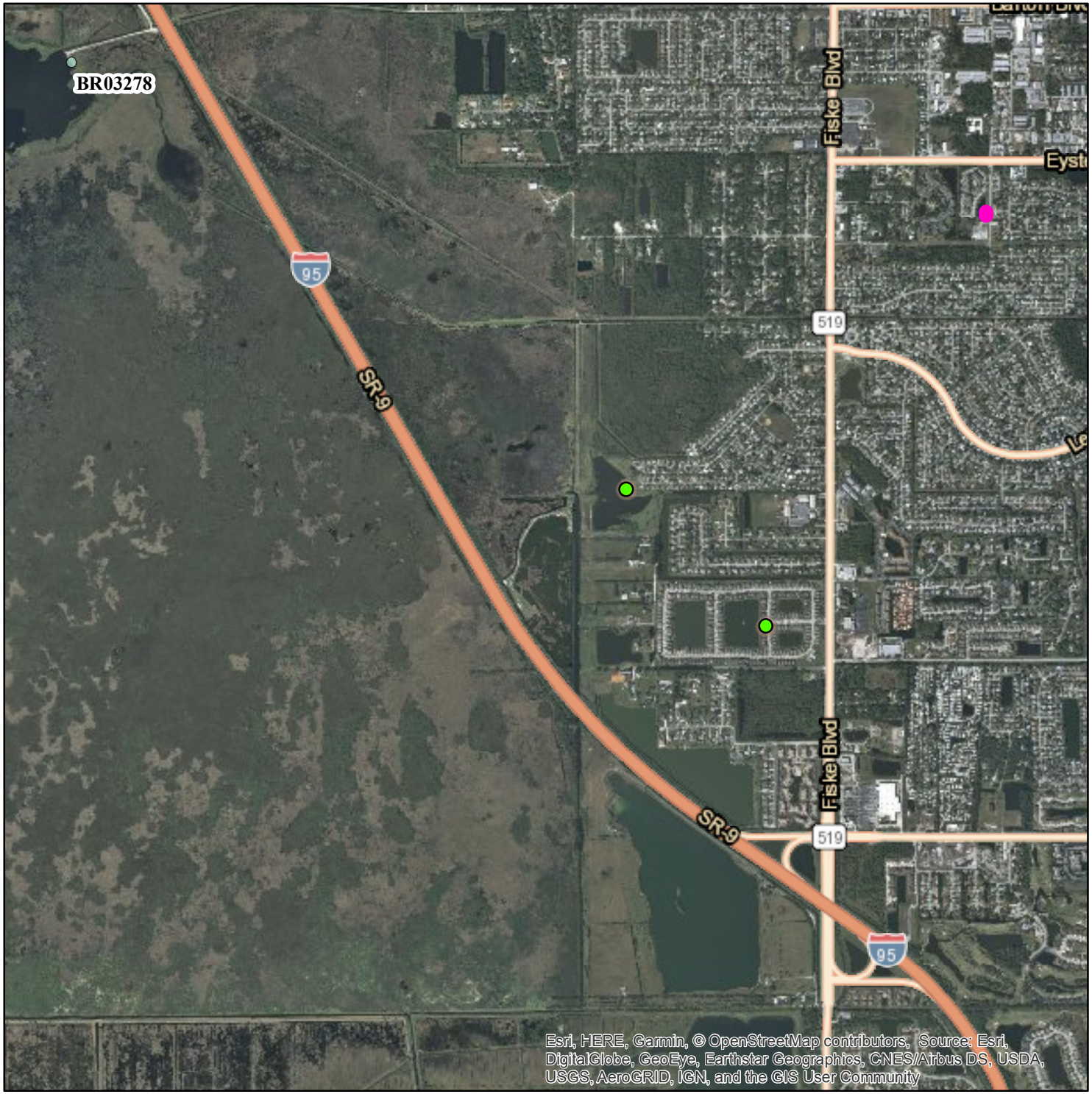
0 0.2 0.4 0.8 1.2 1.6 Miles

By S.Wilford

Florida Master Site File

Legend

- Search Radius (50-meters)
- Standing Structures
- Archaeological Sites
- Historic Bridges
- Historic Cemeteries
- National Register Listing
- Resource Groups



N

0 0.2 0.4 0.8 1.2 1.6 Miles

By S.Wilford

From: Baird, Tera
Sent: Friday, July 20, 2018 12:57 PM
To: David
Cc: kkulkarni@infrastructuress.com
Subject: 18-TA-0826 - Brevard County, FL Lift Station Improvements

Hi David -

Thanks for the description and locations of the 11 existing sanitary sewer lift stations and associated gravity mains and force mains.

Based on our records and the description of the project, the Service does not expect "take" as defined under Section 9 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Thanks for coordinating with us and for future reference, this project has been assigned the following tracking number: 04EF1000-2018-TA-0826.

On Fri, Jul 6, 2018 at 9:23 AM, David <dmyers@infrastructuress.com> wrote:

> Ms. Baird,
>
> Thanks for speaking with me this morning. As discussed, we are assisting Brevard County, FL with the improvement of 11 sanitary sewer lift stations and associated piping located in West Cocoa, FL. Brevard County is seeking State of Florida funding for the project through FDEP's State Revolving Fund (SRF) program. One the requirements of the SRF program is to coordinate with U.S. FWS for review of potential impacts to threatened and endangered species and associated habitats.
>
> The project includes replacement and rehabilitation of 11 existing sanitary sewer lift stations and associated gravity mains and force mains. I have attached an excel file with addresses and Lat./Long. for each lift station location. I've also attached a Google Earth KMZ file for quick location reference and an aerial overview sheet from the design plan set. Please let me know if you have any questions.
>
> Sincerely,
>
> David A. Myers, P.E.
>
> Infrastructures Solution Services

(321) 622-4646, ext. 110

--

Tera K. Baird
North Florida Ecological Services Office
U.S. Fish & Wildlife Service
7915 Baymeadows Way, Suite 200
Jacksonville, FL 32256-7517
TEL: 904.731.3196
FAX: 904.731.3045
www.fws.gov/northflorida

Summer Office Hours: M-F - 6:45 am - 3:15 pm
Thursday - Telework day

New projects should be submitted to: jaxregs@fws.gov

Source: http://fnai.org/bioticssearch.cfm Mar-18

Plants and Lichens EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Calamovilfa curtissii	Curtiss' sandgrass	G3	S3		T
Centrosema arenicola	sand butterfly pea	G2Q	S2		E
Chamaesyce cumulicola	sand-dune spurge	G2	S2		E
Conradina grandiflora	large-flowered rosemary	G3	S3		T
Dennstaedtia bipinnata	hay scented fern	G4	S1		E
Dicerandra thinicola	Titusville balm	G1Q	S1		E
Glandularia maritima	coastal vervain	G3	S3		E
Glandularia tampensis	Tampa vervain	G2	S2		E
Halophila johnsonii	Johnson's seagrass	G2	S2	T	E
Harrisia simpsonii	Simpson's prickly apple	G2	S2		N
Heliotropium gnaphalodes	sea rosemary	G4	S3		E
Lantana depressa var. floridana	Atlantic Coast Florida lantana	G2T1	S1		E
Lechea cernua	nodding pinweed	G3	S3		T
Lechea divaricata	pine pinweed	G2	S2		E
Nemastylis floridana	celestial lily	G2	S2		E
Nolina atopocarpa	Florida beargrass	G3	S3		T
Ophioglossum palmatum	hand fern	G4	S2		E
Pavonia spinifex	yellow hibiscus	G4G5	S2		N
Peperomia humilis	terrestrial peperomia	G5	S2		E

Pteroglossaspis ecristata	giant orchid	G2G3	S2		T
Tephrosia angustissima var. curtissii	coastal hoary-pea	G1T1	S1		E
Zephyranthes simpsonii	redmargin zephyrlily	G2G3	S2S3		T

Clams and Mussels EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Elliptio monroensis	St. Johns Elephantear	G2G3	S2S3		N
Villosa amygdala	Florida Rainbow	G3	S3		N

Snails and Allies EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Praticolella bakeri	Ridge Scrubsnail	G2G3	S2S3		N

Grasshoppers and EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Melanoplus indicifer	East Coast Scrub Grasshopper	G1	S1		N

Beetles EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Aethecerinus hornii	Horn's Aethecerinus Long-Horned Beetle	G2	S2		N
Aphodius aegrotus	Small Pocket Gopher Aphodius Beetle	G3G4	S3?		N
Aphodius laevigatus	Large Pocket Gopher Aphodius Beetle	G3G4	S3?		N
Ataenius wenzelii	An Ataenius Beetle	G3G5	S2S3		N

Diplotaxis rufa	Red Diplotaxis Beetle	G2G3	S2S3		N
Haroldiataenius saramari	Sand Pine Scrub Ataenius Beetle	G3G4	S3S4		N
Hypotrichia spissipes	Florida Hypotrichia Scarab Beetle	G3G4	S3S4		N
Peltotrupes profundus	Florida Deepdigger Scarab Beetle	G3	S3		N
Phyllophaga elizoria	Elizoria June Beetle	G2	S2		N
Phyllophaga elongata	Elongate June Beetle	G3	S3		N
Selonodon floridensis	Florida Cebrionid Beetle	G2G4	S2S4		N
Serica tantula	Little Silky June Beetle	G1?	S1?		N

Butterflies and Moths EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Appias drusilla	Florida White	G4G5	S1		N
Atrytonopsis loammi	Loammi Skipper	G1	S1		N
Callophrys gryneus sweadneri	Florida Olive Hairstreak	G5T2	S2		N
Euphyes berryi	Berry's Skipper	G2	S2		N
Euphyes dukesi calhouni	Calhoun's Skipper	G3T1	S1		N
Idia gopheri	Gopher Tortoise Noctuid Moth	G2G3	S2S3		N
Polites origenes	Crossline Skipper	G4G5	S3		N

Ants, Bees, and Wasps EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Colletes titusensis	A Cellophane bee	G1G2	S1S2		N

Fishes EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Acipenser oxyrinchus oxyrinchus	Atlantic Sturgeon	G3T3	S1	E	FE
Bairdiella sanctaeluciae	Striped Croaker	G5	S2	SC	N
Ctenogobius pseudofasciatus	Slashcheek Goby	G3G5	S1		N
Gobiomorus dormitor	Bigmouth Sleeper	G4	S2		N
Microphis brachyurus	Opossum Pipefish	G4G5	S2	SC	N
Rivulus marmoratus	Mangrove Rivulus	G4G5	S3	SC	N

Amphibians EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Lithobates capito	Gopher Frog	G3	S3		N

Reptiles EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Alligator mississippiensis	American Alligator	G5	S4	SAT	FT(S/A)
Caretta caretta	Loggerhead Sea Turtle	G3	S3	T	FT
Chelonia mydas	Green Sea Turtle	G3	S2S3	T	FT
Crotalus adamanteus	Eastern Diamondback Rattlesnake	G4	S3		N
Dermochelys coriacea	Leatherback Sea Turtle	G2	S2	E	FE
Drymarchon couperi	Eastern Indigo Snake	G3Q	S3	T	FT
Gopherus polyphemus	Gopher Tortoise	G3	S3	C	ST
Lampropeltis getula	Common Kingsnake	G5	S2S3		N

Lampropeltis occipitolineata	South Florida Mole Kingsnake	GNR	S1S2		N
Lepidochelys kempii	Kemp's Ridley Sea Turtle	G1	S1	E	FE
Pituophis melanoleucus	Pine Snake	G4	S3		ST
Sceloporus woodi	Florida Scrub Lizard	G2G3	S2S3		N

Birds EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Antigone canadensis pratensis	Florida Sandhill Crane	G5T2	S2		ST
Aphelocoma coerulescens	Florida Scrub-Jay	G2	S2	T	FT
Aramus guarauna	Limpkin	G5	S3		N
Ardea herodias occidentalis	Great White Heron	G5T2	S2		N
Athene cunicularia floridana	Florida Burrowing Owl	G4T3	S3		ST
Buteo brachyurus	Short-tailed Hawk	G4G5	S1		N
Caracara cheriway	Crested Caracara	G5	S2	T	FT
Charadrius melodus	Piping Plover	G3	S2	T	FT
Egretta caerulea	Little Blue Heron	G5	S4		ST
Egretta rufescens	Reddish Egret	G4	S2		ST
Egretta thula	Snowy Egret	G5	S3		N
Egretta tricolor	Tricolored Heron	G5	S4		ST
Elanoides forficatus	Swallow-tailed Kite	G5	S2		N
Elanus leucurus	White-tailed Kite	G5	S1		N
Eudocimus albus	White Ibis	G5	S4		N

Falco columbarius	Merlin	G5	S2		N
Falco peregrinus	Peregrine Falcon	G4	S2		N
Falco sparverius paulus	Southeastern American Kestrel	G5T4	S3		ST
Fregata magnificens	Magnificent Frigatebird	G5	S1		N
Haematopus palliatus	American Oystercatcher	G5	S2		ST
Haliaeetus leucocephalus	Bald Eagle	G5	S3		N
Hydroprogne caspia	Caspian Tern	G5	S2		N
Laterallus jamaicensis	Black Rail	G3G4	S2		N
Mycteria americana	Wood Stork	G4	S2	T	FT
Nyctanassa violacea	Yellow-crowned Night-heron	G5	S3		N
Nycticorax nycticorax	Black-crowned Night-heron	G5	S3		N
Pandion haliaetus	Osprey	G5	S3S4		SSC*
Peucaea aestivalis	Bachman's Sparrow	G3	S3		N
Picoides borealis	Red-cockaded Woodpecker	G3	S2	E	FE
Picoides villosus	Hairy Woodpecker	G5	S3		N
Platalea ajaja	Roseate Spoonbill	G5	S2		ST
Plegadis falcinellus	Glossy Ibis	G5	S3		N
Recurvirostra americana	American Avocet	G5	S2		N
Rynchops niger	Black Skimmer	G5	S3		ST
Setophaga discolor paludicola	Florida Prairie Warbler	G5T3	S3		N

Sternula antillarum	Least Tern	G4	S3		ST
Thalasseus maximus	Royal Tern	G5	S3		N
Thalasseus sandvicensis	Sandwich Tern	G5	S2		N
Vireo altiloquus	Black-whiskered Vireo	G5	S3		N

Mammals EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Corynorhinus rafinesquii	Rafinesque's Big-eared Bat	G3G4	S2		N
Eubalaena glacialis	North Atlantic Right Whale	G1	S1	E	FE
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3	S3		N
Neofiber alleni	Round-tailed Muskrat	G3	S3		N
Peromyscus polionotus niveiventris	Southeastern Beach Mouse	G5T1	S1	T	FT
Podomys floridanus	Florida Mouse	G3	S3		N
Sciurus niger shermani	Sherman's Fox Squirrel	G5T3	S3		SSC
Trichechus manatus	West Indian Manatee	G2	S2	T	FT
Ursus americanus floridanus	Florida Black Bear	G5T2	S2		N

Other Elements EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Bird Rookery		G5	SNR		N
Manatee Aggregation Site		GNR	SNR		N

Appendix C

Cost Analysis

PROJECT NAME: **Brevard County West Cocoa Wastewater Improvements SRF# WW05117**
PROJECT TYPE: **No Action - Alternative #1**
EVALUATION: **Present Worth Analysis**

Capital Cost	$ -
Present Worth (20 year)	$ 3,306,400
Total Cost	**$ 3,306,400**

UNIT COSTS

Electrical Power Unit Cost	$0.10	per kWh
Power per Year	402,989	kWh/yr
Annual Power Cost	$40,299	per yr
Annual O&M Cost	$85,000	per yr
BCUSD Overhead	30%	
Interest Rate	1.75%	
Term	20	yr
Inflation Rate	2.63%	

Schedule Year	Power Costs ($)	Operating Costs ($)	Overhead Costs ($)	Total Annual Cost ($)	Present Worth ($)	Amortized Capital Cost ($)	Total PW Cost ($)
2020	$ 40,299	$ 85,000	$ 25,500	$ 150,799	base year	base year	base year
2021	$ 41,359	$ 87,236	$ 26,171	$ 154,765	$ 152,200	$ -	$ 152,200
2022	$ 42,447	$ 89,530	$ 26,859	$ 158,835	$ 153,500	$ -	$ 153,500
2023	$ 43,563	$ 91,884	$ 27,565	$ 163,013	$ 154,800	$ -	$ 154,800
2024	$ 44,709	$ 94,301	$ 28,290	$ 167,300	$ 156,100	$ -	$ 156,100
2025	$ 45,884	$ 96,781	$ 29,034	$ 171,700	$ 157,500	$ -	$ 157,500
2026	$ 47,091	$ 99,326	$ 29,798	$ 176,216	$ 158,800	$ -	$ 158,800
2027	$ 48,330	$ 101,939	$ 30,582	$ 180,850	$ 160,200	$ -	$ 160,200
2028	$ 49,601	$ 104,620	$ 31,386	$ 185,606	$ 161,600	$ -	$ 161,600
2029	$ 50,905	$ 107,371	$ 32,211	$ 190,488	$ 163,000	$ -	$ 163,000
2030	$ 52,244	$ 110,195	$ 33,059	$ 195,498	$ 164,400	$ -	$ 164,400
2031	$ 53,618	$ 113,093	$ 33,928	$ 200,639	$ 165,800	$ -	$ 165,800
2032	$ 55,028	$ 116,068	$ 34,820	$ 205,916	$ 167,300	$ -	$ 167,300
2033	$ 56,475	$ 119,120	$ 35,736	$ 211,332	$ 168,700	$ -	$ 168,700
2034	$ 57,961	$ 122,253	$ 36,676	$ 216,890	$ 170,200	$ -	$ 170,200
2035	$ 59,485	$ 125,468	$ 37,640	$ 222,594	$ 171,600	$ -	$ 171,600
2036	$ 61,050	$ 128,768	$ 38,630	$ 228,448	$ 173,100	$ -	$ 173,100
2037	$ 62,655	$ 132,155	$ 39,646	$ 234,456	$ 174,600	$ -	$ 174,600
2038	$ 64,303	$ 135,630	$ 40,689	$ 240,622	$ 176,100	$ -	$ 176,100
2039	$ 65,994	$ 139,197	$ 41,759	$ 246,951	$ 177,700	$ -	$ 177,700
2040	$ 67,730	$ 142,858	$ 42,857	$ 253,446	$ 179,200	$ -	$ 179,200
				Totals	$ 3,306,400	$ -	$ 3,306,400

PROJECT NAME: **Brevard County West Cocoa Wastewater Improvements SRF# WW05117**
PROJECT TYPE: **Rehabilitation and Replacement - Alternative #2**
EVALUATION: **Present Worth Analysis**

Capital Cost	$ 10,940,700
Present Worth (20 year)	$ 3,433,200
Total Cost	**$ 14,373,900**

UNIT COSTS

Electrical Power Unit Cost	$0.10	per kWh
Power per Year	460,738	kWh/yr
Annual Power Cost	$46,074	per yr
Annual O&M Cost	$85,000	per yr
BCUSD Overhead	30%	
Interest Rate	1.75%	
Term	20	yr
Inflation Rate	2.63%	

Schedule Year	Power Costs ($)	Operating Costs ($)	Overhead Costs ($)	Total Annual Cost ($)	Present Worth ($)	Amortized Capital Cost ($)	Total PW Cost ($)
2020	$ 46,074	$ 85,000	$ 25,500	$ 156,574	base year	base year	base year
2021	$ 47,286	$ 87,236	$ 26,171	$ 160,692	$ 158,000	$ 653,064	$ 811,064
2022	$ 48,529	$ 89,530	$ 26,859	$ 164,918	$ 159,300	$ 653,064	$ 812,364
2023	$ 49,805	$ 91,884	$ 27,565	$ 169,255	$ 160,700	$ 653,064	$ 813,764
2024	$ 51,115	$ 94,301	$ 28,290	$ 173,707	$ 162,100	$ 653,064	$ 815,164
2025	$ 52,460	$ 96,781	$ 29,034	$ 178,275	$ 163,500	$ 653,064	$ 816,564
2026	$ 53,839	$ 99,326	$ 29,798	$ 182,964	$ 164,900	$ 653,064	$ 817,964
2027	$ 55,255	$ 101,939	$ 30,582	$ 187,776	$ 166,400	$ 653,064	$ 819,464
2028	$ 56,709	$ 104,620	$ 31,386	$ 192,714	$ 167,800	$ 653,064	$ 820,864
2029	$ 58,200	$ 107,371	$ 32,211	$ 197,783	$ 169,200	$ 653,064	$ 822,264
2030	$ 59,731	$ 110,195	$ 33,059	$ 202,984	$ 170,700	$ 653,064	$ 823,764
2031	$ 61,302	$ 113,093	$ 33,928	$ 208,323	$ 172,200	$ 653,064	$ 825,264
2032	$ 62,914	$ 116,068	$ 34,820	$ 213,802	$ 173,700	$ 653,064	$ 826,764
2033	$ 64,568	$ 119,120	$ 35,736	$ 219,425	$ 175,200	$ 653,064	$ 828,264
2034	$ 66,267	$ 122,253	$ 36,676	$ 225,196	$ 176,700	$ 653,064	$ 829,764
2035	$ 68,009	$ 125,468	$ 37,640	$ 231,118	$ 178,200	$ 653,064	$ 831,264
2036	$ 69,798	$ 128,768	$ 38,630	$ 237,197	$ 179,800	$ 653,064	$ 832,864
2037	$ 71,634	$ 132,155	$ 39,646	$ 243,435	$ 181,300	$ 653,064	$ 834,364
2038	$ 73,518	$ 135,630	$ 40,689	$ 249,837	$ 182,900	$ 653,064	$ 835,964
2039	$ 75,451	$ 139,197	$ 41,759	$ 256,408	$ 184,500	$ 653,064	$ 837,564
2040	$ 77,436	$ 142,858	$ 42,857	$ 263,151	$ 186,100	$ 653,064	$ 839,164
				Totals	$ 3,433,200	$ 13,061,276	$ 16,494,476

PROJECT NAME: **Brevard County West Cocoa Wastewater Improvements SRF# WW05117**
PROJECT TYPE: **Full Replacement - Alternative #3**
EVALUATION: **Present Worth Analysis**

Capital Cost	$ 11,193,700
Present Worth (20 year)	$ 3,433,200
Total Cost	**$ 14,626,900**

UNIT COSTS

Electrical Power Unit Cost	$0.10	per kWh
Power per Year	460,738	kWh/yr
Annual Power Cost	$46,074	per yr
Annual O&M Cost	$85,000	per yr
BCUSD Overhead	30%	
Interest Rate	1.75%	
Term	20	yr
Inflation Rate	2.63%	

Schedule Year	Power Costs ($)	Operating Costs ($)	Overhead Costs ($)	Total Annual Cost ($)	Present Worth ($)	Amortized Capital Cost ($)	Total PW Cost ($)
2020	$ 46,074	$ 85,000	$ 25,500	$ 156,574	base year	base year	base year
2021	$ 47,286	$ 87,236	$ 26,171	$ 160,692	$ 158,000	$ 668,166	$ 826,166
2022	$ 48,529	$ 89,530	$ 26,859	$ 164,918	$ 159,300	$ 668,166	$ 827,466
2023	$ 49,805	$ 91,884	$ 27,565	$ 169,255	$ 160,700	$ 668,166	$ 828,866
2024	$ 51,115	$ 94,301	$ 28,290	$ 173,707	$ 162,100	$ 668,166	$ 830,266
2025	$ 52,460	$ 96,781	$ 29,034	$ 178,275	$ 163,500	$ 668,166	$ 831,666
2026	$ 53,839	$ 99,326	$ 29,798	$ 182,964	$ 164,900	$ 668,166	$ 833,066
2027	$ 55,255	$ 101,939	$ 30,582	$ 187,776	$ 166,400	$ 668,166	$ 834,566
2028	$ 56,709	$ 104,620	$ 31,386	$ 192,714	$ 167,800	$ 668,166	$ 835,966
2029	$ 58,200	$ 107,371	$ 32,211	$ 197,783	$ 169,200	$ 668,166	$ 837,366
2030	$ 59,731	$ 110,195	$ 33,059	$ 202,984	$ 170,700	$ 668,166	$ 838,866
2031	$ 61,302	$ 113,093	$ 33,928	$ 208,323	$ 172,200	$ 668,166	$ 840,366
2032	$ 62,914	$ 116,068	$ 34,820	$ 213,802	$ 173,700	$ 668,166	$ 841,866
2033	$ 64,568	$ 119,120	$ 35,736	$ 219,425	$ 175,200	$ 668,166	$ 843,366
2034	$ 66,267	$ 122,253	$ 36,676	$ 225,196	$ 176,700	$ 668,166	$ 844,866
2035	$ 68,009	$ 125,468	$ 37,640	$ 231,118	$ 178,200	$ 668,166	$ 846,366
2036	$ 69,798	$ 128,768	$ 38,630	$ 237,197	$ 179,800	$ 668,166	$ 847,966
2037	$ 71,634	$ 132,155	$ 39,646	$ 243,435	$ 181,300	$ 668,166	$ 849,466
2038	$ 73,518	$ 135,630	$ 40,689	$ 249,837	$ 182,900	$ 668,166	$ 851,066
2039	$ 75,451	$ 139,197	$ 41,759	$ 256,408	$ 184,500	$ 668,166	$ 852,666
2040	$ 77,436	$ 142,858	$ 42,857	$ 263,151	$ 186,100	$ 668,166	$ 854,266
				Totals	$ 3,433,200	$ 13,363,313	$ 16,796,513

WEST COCOA WASTEWATER IMPROVEMENTS		
BREVARD COUNTY UTILITY SERVICES DEPARTMENT		
ALT. #2 - REHABILITATION and/or REPLACEMENT		
OPINION OF PROBABLE COSTS (SUMMARY)		
	DESCRIPTION	**AMOUNT**
1	Lift Station W-01 Replacement	$ 849,000
2	Lift Station W-03 Replacement	$ 565,000
3	Lift Station W-04 Replacement	$ 523,000
4	Lift Station W-06 Demolition	$ 15,000
5	Lift Station W-07 Replacement	$ 534,000
6	Lift Station W-08 Replacement	$ 565,000
7	Lift Station W-09 Replacement	$ 2,027,000
8	Lift Station W-10 Rehabilitation	$ 365,000
9	Lift Station W-15 Replacement	$ 1,143,000
10	Lift Station W-20 Rehabilitation	$ 816,000
11	Lift Station W-22 Rehabilitation	$ 394,000
12	Linework	$ 2,288,700
13	Paving and Restoration	$ 856,000
	Total Costs	**$ 10,940,700.00**

LS W-01 ~ ESTIMATE OF PROBABLE COST

ALT. #2 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	Wet Well Concrete	38	CY	$ 2,500.00	$ 95,000.00	25%	$ 118,800
	Valve Pad	1.3	CY	$ 1,250.00	$ 1,625.00	25%	$ 2,100
	HDPE Discharge Piping (4")	75	LF	$ 50.00	$ 3,750.00	30%	$ 4,900
	HDPE 90-Degree Bend (4")	3	EA	$ 337.50	$ 1,012.50	30%	$ 1,400
	Check Valves	3	EA	$ 1,712.50	$ 5,137.50	30%	$ 6,700
	Gate Valves	4	EA	$ 1,050.00	$ 4,200.00	30%	$ 5,500
	Camlock (6")	1	EA	$ 2,500.00	$ 2,500.00	30%	$ 3,300
	D.I.P. 90-Degree Bends (4")	9	EA	$ 337.50	$ 3,037.50	30%	$ 4,000
	Tees (4")	2	EA	$ 487.50	$ 975.00	30%	$ 1,300
	4" D.I.P.	20	LF	$ 31.25	$ 625.00	30%	$ 1,000
	Reducer (8" x 4" D.I.P.)	1	EA	$ 37.50	$ 37.50	30%	$ 1,000
	Drop Bowl	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	Pumping Equipment	1	LS	$ 125,000.00	$ 125,000.00	50%	$ 187,500
	Electrical System	1	LS	$ 62,500.00	$ 62,500.00	40%	$ 87,500
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	Emergency Diesel-Powered Pump	1	LS	$ 93,750.00	$ 93,750.00	40%	$ 131,300
	8" PVC C900 Gravity Sewer w/ Coring into Ex. MH	30	LF	$ 62.50	$ 1,875.00	30%	$ 2,500
	Ex. Manhole Rehab	14	SY	$ 75.00	$ 1,050.00	30%	$ 1,400
	Fencing	150	LF	$ 93.75	$ 14,062.50	25%	$ 17,600
	Grading/ Erosion Control	1	LS	$ 3,750.00	$ 3,750.00	25%	$ 4,700
	Demolish Building & Hauling and Disposal	1	LS	$ 18,750.00	$ 18,750.00	25%	$ 23,500
	Fill Ex. Wetwell with Suitable Soil	16	CY	$ 75.00	$ 1,200.00	25%	$ 1,500
							$ 653,800

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item			Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization		5%	1	LS	$32,690	$32,700
	Contractor Construction Markup		3%	1	LS	$19,614	$19,700
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$65,380	$65,400
						SUBTOTAL MISCELLANEOUS	**$117,800**
						SUBTOTAL PROJECT COSTS	**$771,600**
	Allowance		0%				**$0**
	Contingency		10%				**$77,200**
						PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST	**$849,000**

LS W-03 ~ ESTIMATE OF PROBABLE COST

ALT. #2 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	Wet Well Concrete	33	CY	$ 2,500.00	$ 82,500.00	25%	$ 103,200
	Valve Pad	0.4	CY	$ 1,250.00	$ 500.00	25%	$ 2,000
	Pipe Supports	2	EA	$ 312.50	$ 625.00	30%	$ 1,000
	HDPE Discharge Piping (4")	59	LF	$ 50.00	$ 2,950.00	30%	$ 3,900
	HDPE 90-Degree Bend (4")	2	EA	$ 337.50	$ 675.00	30%	$ 1,000
	Check Valves	2	EA	$ 1,712.50	$ 3,425.00	30%	$ 4,500
	Gate Valves (4")	3	EA	$ 1,050.00	$ 3,150.00	30%	$ 4,100
	Camlock (4")	1	EA	$ 2,500.00	$ 2,500.00	30%	$ 3,300
	D.I.P. 90-Degree Bends (4")	6	EA	$ 337.50	$ 2,025.00	30%	$ 2,700
	Tees (4")	1	EA	$ 487.50	$ 487.50	30%	$ 1,000
	4" D.I.P.	20	LF	$ 31.25	$ 625.00	30%	$ 1,000
	Drop Bowl	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	Pumping Equipment	1	LS	$ 62,500.00	$ 62,500.00	50%	$ 93,800
	Electrical System	1	LS	$ 62,500.00	$ 62,500.00	40%	$ 87,500
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	Fencing	90	LF	$ 93.75	$ 8,437.50	30%	$ 11,000
	Grading	1	LS	$ 6,250.00	$ 6,250.00	30%	$ 8,200
	Erosion Control	1	LS	$ 3,750.00	$ 3,750.00	30%	$ 4,900
	18" Concrete Endwalls	2	EA	$ 1,250.00	$ 2,500.00	30%	$ 3,300
	18" RCP Culvert Pipe	28	LF	$ 37.50	$ 1,050.00	30%	$ 1,400
	Demolish Building & Hauling and Disposal	1	LS	$ 31,250.00	$ 31,250.00	30%	$ 40,700
	Fill Ex. Wetwell with Suitable Soil	16	CY	$ 75.00	$ 1,200.00	30%	$ 1,600
	Retaining Wall	1	LS	$ 6,250.00	$ 6,250.00	30%	$ 8,200
							$ 434,600

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item			Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization		5%	1	LS	$21,730	$21,800
	Contractor Construction Markup		3%	1	LS	$13,038	$13,100
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$43,460	$43,500
					SUBTOTAL MISCELLANEOUS		**$78,400**
					SUBTOTAL PROJECT COSTS		**$513,000**
	Allowance		0%				**$0**
	Contingency		10%				**$51,300**
	PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST						**$565,000**

LS W-04 ~ ESTIMATE OF PROBABLE COST

ALT. #2 PROJECT SYSTEMS

Item	Quantity	Unit	Unit Price	Extension	Install	Cost
Wet Well Concrete	28	CY	$ 2,500.00	$ 70,000.00	25%	$ 87,500
Valve Pad	0.4	CY	$ 1,250.00	$ 500.00	25%	$ 2,000
Pipe Supports	2	EA	$ 312.50	$ 625.00	30%	$ 1,000
HDPE Discharge Piping (4")	49	LF	$ 50.00	$ 2,450.00	30%	$ 3,200
HDPE 90-Degree Bend (4")	2	EA	$ 337.50	$ 675.00	30%	$ 1,000
Check Valves	2	EA	$ 1,712.50	$ 3,425.00	30%	$ 4,500
Gate Valves (4")	3	EA	$ 1,050.00	$ 3,150.00	30%	$ 4,100
Camlock (4")	1	EA	$ 2,500.00	$ 2,500.00	30%	$ 3,300
D.I.P. 90-Degree Bends (4")	6	EA	$ 337.50	$ 2,025.00	30%	$ 2,700
Tees (4")	1	EA	$ 487.50	$ 487.50	30%	$ 1,000
4" D.I.P.	20	LF	$ 31.25	$ 625.00	30%	$ 1,000
Drop Bowl	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
Pumping Equipment	1	LS	$ 62,500.00	$ 62,500.00	50%	$ 93,800
Electrical System	1	LS	$ 62,500.00	$ 62,500.00	40%	$ 87,500
SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
8" PVC C900 Gravity Sewer w/ Coring into Ex. MH	41	LF	$ 62.50	$ 2,562.50	30%	$ 3,400
Doghouse Manhole	1	EA	$ 6,250.00	$ 6,250.00	30%	$ 8,200
Manhole	1	EA	$ 6,250.00	$ 6,250.00	30%	$ 8,200
Fencing	90	LF	$ 93.75	$ 8,437.50	25%	$ 10,600
Grading	1	LS	$ 6,250.00	$ 6,250.00	25%	$ 7,900
Erosion Control	1	LS	$ 3,750.00	$ 3,750.00	25%	$ 4,700
Demolish Cocrete Pad	1	LS	$ 12,500.00	$ 12,500.00	25%	$ 15,700
Fill Ex. Wetwell with Suitable Soil	16	CY	$ 75.00	$ 1,200.00	25%	$ 1,500
Clearing Wooded Area	2,000	SF	$ 1.25	$ 2,500.00	25%	$ 3,200
						$ 402,300

2 GENERAL CONDITIONS/ MISCELLANEOUS

Item		Quantity	Unit	Unit Cost	Item Cost
Mobilization & Demobilization	5%	1	LS	$20,115	$20,200
Contractor Construction Markup	3%	1	LS	$12,069	$12,100
Gen. Cond., Insurance, Bonding and Profit	10%	1	LS	$40,230	$40,300
Indemnification		0	LS	$100	$0
			SUBTOTAL MISCELLANEOUS		**$72,600**
			SUBTOTAL PROJECT COSTS		**$474,900**
Allowance	0%				**$0**
Contingency	10%				**$47,500**
		PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST			**$523,000**

LS W-07 ~ ESTIMATE OF PROBABLE COST

ALT. #2 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	Wet Well Concrete	27	CY	$ 2,500.00	$ 67,500.00	25%	$ 84,400
	Valve Pad	0.4	CY	$ 1,250.00	$ 500.00	25%	$ 2,000
	Pipe Supports	2	EA	$ 312.50	$ 625.00	30%	$ 1,000
	HDPE Discharge Piping (4")	47	LF	$ 50.00	$ 2,350.00	30%	$ 3,100
	HDPE 90-Degree Bend (4")	2	EA	$ 337.50	$ 675.00	30%	$ 2,000
	Check Valves	2	EA	$ 1,712.50	$ 3,425.00	30%	$ 4,500
	Gate Valves (4")	3	EA	$ 1,050.00	$ 3,150.00	30%	$ 4,100
	Camlock (4")	1	EA	$ 2,500.00	$ 2,500.00	30%	$ 3,300
	D.I.P. 90-Degree Bends (4")	6	EA	$ 337.50	$ 2,025.00	30%	$ 2,700
	Tees (4")	1	EA	$ 487.50	$ 487.50	30%	$ 2,000
	4" D.I.P.	20	LF	$ 31.25	$ 625.00	30%	$ 1,000
	Reducer (6" X 4" D.I.P.)	1	EA	$ 625.00	$ 625.00	30%	$ 2,000
	Drop Bowl	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	Pumping Equipment	1	LS	$ 62,500.00	$ 62,500.00	50%	$ 93,800
	Electrical System	1	LS	$ 62,500.00	$ 62,500.00	40%	$ 87,500
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	8" PVC C900 Gravity Sewer w/ Coring into Ex. MH	17	LF	$ 62.50	$ 1,062.50	30%	$ 2,000
	Doghouse Manhole	1	EA	$ 6,250.00	$ 6,250.00	30%	$ 8,200
	Manhole	1	EA	$ 6,250.00	$ 6,250.00	30%	$ 8,200
	Fencing	150	LF	$ 93.75	$ 14,062.50	25%	$ 17,600
	Grading	1	LS	$ 2,500.00	$ 2,500.00	25%	$ 3,200
	Erosion Control	1	LS	$ 3,750.00	$ 3,750.00	25%	$ 4,700
	Demolish Cocrete Pad	1	LS	$ 18,750.00	$ 18,750.00	25%	$ 23,500
	Fill Ex. Wetwell with Suitable Soil	16	CY	$ 75.00	$ 1,200.00	25%	$ 2,000
	Fill Dry-Pit with suitable soil	1	LS	$ 75.00	$ 75.00	25%	$ 2,000
							$ 411,100

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item			Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization		5%	1	LS	$20,555	$20,600
	Contractor Construction Markup		3%	1	LS	$12,333	$12,400
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$41,110	$41,200
						SUBTOTAL MISCELLANEOUS	**$74,200**
						SUBTOTAL PROJECT COSTS	**$485,300**
	Allowance		0%				**$0**
	Contingency		10%				**$48,600**
	PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST						**$534,000**

LS W-08 ~ ESTIMATE OF PROBABLE COST

ALT. #2 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	Wet Well Concrete	26	CY	$ 2,500.00	$ 65,000.00	25%	$ 81,300
	Valve Pad	0.4	CY	$ 1,250.00	$ 500.00	25%	$ 2,000
	Pipe Supports	2	EA	$ 312.50	$ 625.00	30%	$ 1,000
	HDPE Discharge Piping (4")	46	LF	$ 50.00	$ 2,300.00	30%	$ 3,000
	HDPE 90-Degree Bend (4")	2	EA	$ 337.50	$ 675.00	30%	$ 1,000
	Check Valves	2	EA	$ 1,712.50	$ 3,425.00	30%	$ 4,500
	Gate Valves (4")	3	EA	$ 1,050.00	$ 3,150.00	30%	$ 4,100
	Camlock (4")	1	EA	$ 2,500.00	$ 2,500.00	30%	$ 3,300
	D.I.P. 90-Degree Bends (4")	6	EA	$ 337.50	$ 2,025.00	30%	$ 2,700
	Tees (4")	1	EA	$ 487.50	$ 487.50	30%	$ 1,000
	4" D.I.P.	20	LF	$ 31.25	$ 625.00	30%	$ 1,000
	Drop Bowl	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	Pumping Equipment	1	LS	$ 62,500.00	$ 62,500.00	50%	$ 93,800
	Electrical System	1	LS	$ 62,500.00	$ 62,500.00	40%	$ 87,500
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	8" PVC C900 Gravity Sewer w/ Coring into Ex. MH	65	LF	$ 62.50	$ 4,062.50	30%	$ 5,300
	Ex. Manhole Rehab	14	SY	$ 75.00	$ 1,050.00	30%	$ 1,400
	Manhole	1	EA	$ 8,125.00	$ 8,125.00	30%	$ 10,600
	Fencing	110	LF	$ 93.75	$ 10,312.50	25%	$ 12,900
	Grading	1	LS	$ 25,000.00	$ 25,000.00	25%	$ 31,300
	Erosion Control	1	LS	$ 3,750.00	$ 3,750.00	25%	$ 4,700
	Clearing Wooded Area	3,500	SF	$ 2.50	$ 8,750.00	25%	$ 11,000
	Demolish PS Building	1	LS	$ 18,750.00	$ 18,750.00	25%	$ 23,500
	Fill Ex. Wetwell with Suitable Soil	16	CY	$ 75.00	$ 1,200.00	25%	$ 1,500
							$ 434,700

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item			Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization		5%	1	LS	$21,735	$21,800
	Contractor Construction Markup		3%	1	LS	$13,041	$13,100
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$43,470	$43,500
					SUBTOTAL MISCELLANEOUS		**$78,400**
					SUBTOTAL PROJECT COSTS		**$513,100**
	Allowance		0%				**$0**
	Contingency		10%				**$51,400**
	PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST						**$565,000**

LS W-09 ~ ESTIMATE OF PROBABLE COST							
ALT. #2	PROJECT SYSTEMS						
	Item	**Quantity**	**Unit**	**Unit Price**	**Extension**	**Install**	**Cost**
	Wet Well Concrete	111	CY	$ 2,812.50	$ 312,187.50	25%	$ 390,300
	Valve Pad Construction	13	CY	$ 1,250.00	$ 16,250.00	25%	$ 20,400
	HDPE Discharge Piping	127	LF	$ 87.50	$ 11,112.50	30%	$ 14,500
	HDPE 90-Degree Bend	3	EA	$ 1,250.00	$ 3,750.00	30%	$ 4,900
	Check Valves	3	EA	$ 4,062.50	$ 12,187.50	30%	$ 15,900
	Gate Valves (10")	4	EA	$ 1,912.50	$ 7,650.00	30%	$ 10,000
	Camlock (6")	1	EA	$ 3,125.00	$ 3,125.00	30%	$ 4,100
	D.I.P. 90-Degree Bends (10")	9	EA	$ 1,250.00	$ 11,250.00	30%	$ 14,700
	Tees (10")	2	EA	$ 4,050.00	$ 8,100.00	30%	$ 10,600
	10" D.I.P.	30	LF	$ 62.50	$ 1,875.00	30%	$ 2,500
	Reducer (14" X 10" D.I.P.)	1	EA	$ 750.00	$ 750.00	30%	$ 2,000
	Drop Bowl	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	Pumping Equipment	1	LS	$ 312,500.00	$ 312,500.00	50%	$ 468,800
	Flowmeter	1	LS	$ 12,500.00	$ 12,500.00	30%	$ 16,300
	Electrical System	1	LS	$ 62,500.00	$ 62,500.00	40%	$ 87,500
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	Emergency Diesel-Powered Pump	1	LS	$ 150,000.00	$ 150,000.00	25%	$ 187,500
	14" D.I.P. Force Main	200	LF	$ 93.75	$ 18,750.00	30%	$ 24,400
	14" D.I.P. 90-Degree Bend	1	EA	$ 3,887.50	$ 3,887.50	30%	$ 5,100
	14" D.I.P. 45-Degree Bends	2	EA	$ 3,412.50	$ 6,825.00	30%	$ 8,900
	8" PVC C900 Gravity Sewer w/ Coring into Ex. MH	100	LF	$ 62.50	$ 6,250.00	30%	$ 8,200
	Ex. Manhole Rehab	1	LS	$ 4,375.00	$ 4,375.00	25%	$ 5,500
	5' Dia. Manhole	1	EA	$ 10,625.00	$ 10,625.00	30%	$ 13,900
	Fencing	230	LF	$ 93.75	$ 21,562.50	25%	$ 27,000
	Grading	1	LS	$ 2,500.00	$ 2,500.00	25%	$ 3,200
	Erosion Control	1	LS	$ 6,250.00	$ 6,250.00	25%	$ 7,900
	Additional Sliding Gate for Rear Access	1	LS	$ 2,500.00	$ 2,500.00	25%	$ 3,200
	Odor Control System	1	LS	$ 62,500.00	$ 62,500.00	25%	$ 78,200
	Stormwater Pumping System	1	LS	$ 25,000.00	$ 25,000.00	25%	$ 31,300
	8" PVC Suction Pipe for Stromwater	56	LF	$ 62.50	$ 3,500.00	25%	$ 4,400
	Demolish PS Building & Valve Vault, Haul & Dispose	1	LS	$ 31,250.00	$ 31,250.00	25%	$ 39,100
	Fill Ex. Wetwell with Suitable Soil	51	CY	$ 75.00	$ 3,825.00	25%	$ 4,800
							$ 1,561,400
2	GENERAL CONDITIONS/ MISCELLANEOUS						
	Item			**Quantity**	**Unit**	**Unit Cost**	**Item Cost**
	Mobilization & Demobilization		5%	1	LS	$78,070	$78,100
	Contractor Construction Markup		3%	1	LS	$46,842	$46,900
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$156,140	$156,200
						SUBTOTAL MISCELLANEOUS	**$281,200**
						SUBTOTAL PROJECT COSTS	**$1,842,600**
	Allowance		0%				**$0**
	Contingency		10%				**$184,300**
						PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST	**$2,027,000**

LS W-10 ~ ESTIMATE OF PROBABLE COST							
ALT. #2	PROJECT SYSTEMS						
	Item	**Quantity**	**Unit**	**Unit Price**	**Extension**	**Install**	**Cost**
	Rehab Wet Well & Replace Cover with Hatch	576	SF	$ 75.00	$ 43,200.00	25%	$ 54,000
	Valve Pad Construction	0.4	CY	$ 1,250.00	$ 500.00	25%	$ 2,000
	HDPE Discharge Piping (4")	51	LF	$ 50.00	$ 2,550.00	30%	$ 3,400
	HDPE 90-Degree Bend (4")	2	EA	$ 337.50	$ 675.00	30%	$ 2,000
	Check Valves	2	EA	$ 1,712.50	$ 3,425.00	30%	$ 4,500
	Gate Valves (4")	3	EA	$ 1,050.00	$ 3,150.00	30%	$ 4,100
	Camlock (4")	1	EA	$ 2,500.00	$ 2,500.00	30%	$ 3,300
	D.I.P. 90-Degree Bends (4")	6	EA	$ 337.50	$ 2,025.00	30%	$ 2,700
	Tees (4")	1	EA	$ 487.50	$ 487.50	30%	$ 2,000
	4" D.I.P.	20	LF	$ 31.25	$ 625.00	30%	$ 900
	Drop Bowl	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	4" PVC C900 Force Main/ Connect to Ex. FM across the street	100	LF	$ 37.50	$ 3,750.00	30%	$ 4,900
	Pumping Equipment	1	LS	$ 62,500.00	$ 62,500.00	50%	$ 93,800
	Misc. Electrical	1	LS	$ 25,000.00	$ 25,000.00	40%	$ 35,000
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	Grading	1	LS	$ 2,500.00	$ 2,500.00	25%	$ 3,200
	Erosion Control	1	LS	$ 2,500.00	$ 2,500.00	25%	$ 3,200
	Bypass Pumping (100 gpm for 21 days)	1	LS	$ 12,500.00	$ 12,500.00	25%	$ 15,700
							$ 281,000

2	GENERAL CONDITIONS/ MISCELLANEOUS						
	Item			**Quantity**	**Unit**	**Unit Cost**	**Item Cost**
	Mobilization & Demobilization		5%	1	LS	$14,050	$14,100
	Contractor Construction Markup		3%	1	LS	$8,430	$8,500
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$28,100	$28,100
						SUBTOTAL MISCELLANEOUS	**$50,700**
						SUBTOTAL PROJECT COSTS	**$331,700**
	Allowance		0%				**$0**
	Contingency		10%				**$33,200**
						PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST	**$365,000**

LS W-15 ~ ESTIMATE OF PROBABLE COST

ALT. #2 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	Wet Well Concrete	53	CY	$ 2,500.00	$ 132,500.00	25%	$ 165,700
	Valve Pad Construction	1.3	CY	$ 1,250.00	$ 1,625.00	25%	$ 2,100
	HDPE Discharge Piping	90	LF	$ 68.75	$ 6,187.50	30%	$ 8,100
	HDPE 90-Degree Bend	3	EA	$ 1,050.00	$ 3,150.00	30%	$ 4,100
	Check Valves	3	EA	$ 3,337.50	$ 10,012.50	30%	$ 13,100
	Gate (8")	4	EA	$ 1,400.00	$ 5,600.00	30%	$ 7,300
	Camlock (6")	1	EA	$ 3,125.00	$ 3,125.00	30%	$ 4,100
	D.I.P. 90-Degree Bends (8")	9	EA	$ 1,050.00	$ 9,450.00	30%	$ 12,300
	Tees (8")	2	EA	$ 1,200.00	$ 2,400.00	30%	$ 3,200
	8" D.I.P.	30	LF	$ 50.00	$ 1,500.00	30%	$ 2,000
	Reducer (14" x 8")	1	EA	$ 2,050.00	$ 2,050.00	30%	$ 2,700
	Drop Bowl	1	LS	$ 1,875.00	$ 1,875.00	25%	$ 2,400
	Pumping Equipment	1	LS	$ 187,500.00	$ 187,500.00	50%	$ 281,300
	Flowmeter	1	LS	$ 12,500.00	$ 12,500.00	30%	$ 16,300
	Electrical System	1	LS	$ 62,500.00	$ 62,500.00	40%	$ 87,500
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	Emergency Diesel-Powered Pump	1	LS	$ 100,000.00	$ 100,000.00	25%	$ 125,000
	18" PVC C900 Gravity Sewer	12	LF	$ 93.75	$ 1,125.00	30%	$ 2,000
	Manhole	1	EA	$ 8,125.00	$ 8,125.00	30%	$ 10,600
	Fencing	210	LF	$ 93.75	$ 19,687.50	25%	$ 24,700
	Grading	1	LS	$ 12,500.00	$ 12,500.00	25%	$ 15,700
	Erosion Control	1	LS	$ 6,250.00	$ 6,250.00	25%	$ 7,900
	Demolish Elec/ Generator Building	1	LS	$ 12,500.00	$ 12,500.00	25%	$ 15,700
	Fill Ex. Wetwells with Suitable Soil	87	CY	$ 75.00	$ 6,525.00	25%	$ 8,200
	Relocate the Ex. Odor Control System	1	LS	$ 6,250.00	$ 6,250.00	25%	$ 7,900
	Cut, Cap & Fill w/Grout Ex. FM (12")	1	LS	$ 5,000.00	$ 5,000.00	25%	$ 6,300
							$ 880,000

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item			Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization		5%	1	LS	$44,000	$44,000
	Contractor Construction Markup		3%	1	LS	$26,400	$26,400
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$88,000	$88,000
						SUBTOTAL MISCELLANEOUS	**$158,400**
						SUBTOTAL PROJECT COSTS	**$1,038,400**
	Allowance		0%				**$0**
	Contingency		10%				**$103,900**
						PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST	**$1,143,000**

LS W-20 ~ ESTIMATE OF PROBABLE COST							
ALT. #3	PROJECT SYSTEMS						
	Item	**Quantity**	**Unit**	**Unit Price**	**Extension**	**Install**	**Cost**
	Wet Well Concrete	38	CY	$ 2,500.00	$ 95,000.00	25%	$ 118,800
	Valve Pad Construction	1.5	CY	$ 1,250.00	$ 1,875.00	25%	$ 2,400
	HDPE Discharge Piping	63	LF	$ 87.50	$ 5,512.50	30%	$ 7,200
	Check Valves	2	EA	$ 1,250.00	$ 2,500.00	30%	$ 3,300
	Check Valves (10")	2	EA	$ 4,062.50	$ 8,125.00	30%	$ 10,600
	Gate Valves (10")	3	EA	$ 2,025.00	$ 6,075.00	30%	$ 7,900
	Camlock (6")	1	EA	$ 2,500.00	$ 2,500.00	30%	$ 3,300
	D.I.P. 90-Degree Bends (10")	6	EA	$ 1,250.00	$ 7,500.00	30%	$ 9,800
	Tees (10")	1	EA	$ 1,787.50	$ 1,787.50	30%	$ 2,400
	10" D.I.P.	20	LF	$ 62.50	$ 1,250.00	30%	$ 1,700
	Reducer (12" X 10" D.I.P.)	1	EA	$ 1,712.50	$ 1,712.50	30%	$ 2,300
	Drop Bowl w/ Piping	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	Pumping Equipment w/ Hatches	1	LS	$ 125,000.00	$ 125,000.00	50%	$ 187,500
	Installation of Electrical Panels in the Electrical Building	1	LS	$ 37,500.00	$ 37,500.00	30%	$ 48,800
	Demolish Valve Vault & Fill w/ Suitable Soil	1	LS	$ 18,750.00	$ 18,750.00	30%	$ 24,400
	Bypass Pumping (300 gpm for 15 days)	1	LS	$ 12,500.00	$ 12,500.00	30%	$ 16,300
	Replace Flowmeter	1	LS	$ 10,000.00	$ 10,000.00	30%	$ 13,000
	Fill Ex. Wetwell with Suitable Soil	16	LS	$ 75.00	$ 1,200.00	25%	$ 1,500
	Fill	1000	CY	$ 31.25	$ 31,250.00	25%	$ 39,100
	Emergency Diesel-Powered Pump	1	LS	$ 93,750.00	$ 93,750.00	25%	$ 117,200
	Fencing	60	LF	$ 93.75	$ 5,625.00	25%	$ 7,100
							$ 628,000
2	GENERAL CONDITIONS/ MISCELLANEOUS						
	Item			**Quantity**	**Unit**	**Unit Cost**	**Item Cost**
	Mobilization & Demobilization		5%	1	LS	$31,400	$31,400
	Contractor Construction Markup		3%	1	LS	$18,840	$18,900
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$62,800	$62,800
						SUBTOTAL MISCELLANEOUS	**$113,100**
						SUBTOTAL PROJECT COSTS	**$741,100**
	Allowance		0%				**$0**
	Contingency		10%				**$74,200**
						PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST	**$816,000**

LS W-22 ~ ESTIMATE OF PROBABLE COST

ALT. #2 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	Valve Pad Construction	0.7	CY	$ 1,250.00	$ 875.00	25%	$ 2,000
	HDPE Discharge Piping (6")	56	LF	$ 50.00	$ 2,800.00	30%	$ 3,700
	HDPE 90-Degree Bend (6")	2	EA	$ 487.50	$ 975.00	30%	$ 1,300
	Check Valves	2	EA	$ 1,712.50	$ 3,425.00	30%	$ 4,500
	Gate Valves (6")	3	EA	$ 1,050.00	$ 3,150.00	30%	$ 4,100
	Camlock (6")	1	EA	$ 2,500.00	$ 2,500.00	30%	$ 3,300
	D.I.P. 90-Degree Bends (6")	6	EA	$ 487.50	$ 2,925.00	30%	$ 3,900
	Tees (6")	1	EA	$ 725.00	$ 725.00	30%	$ 1,000
	6" D.I.P.	20	LF	$ 37.50	$ 750.00	30%	$ 1,000
	Drop Bowl w/ Piping	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	Pumping Equipment	1	LS	$ 125,000.00	$ 125,000.00	50%	$ 187,500
	Misc. Electrical	1	LS	$ 25,000.00	$ 25,000.00	40%	$ 35,000
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	Erosion Control (Incl. Silt Fence)	1	LS	$ 1,250.00	$ 1,250.00	20%	$ 1,500
	Bypass Pumping (300 gpm for 7 days)	1	LS	$ 6,250.00	$ 6,250.00	20%	$ 7,500
							$ 303,000

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item			Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization		5%	1	LS	$15,150	$15,200
	Contractor Construction Markup		3%	1	LS	$9,090	$9,100
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$30,300	$30,300
						SUBTOTAL MISCELLANEOUS	**$54,600**
						SUBTOTAL PROJECT COSTS	**$357,600**
	Allowance		0%				**$0**
	Contingency		10%				**$35,800**
						PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST	**$394,000**

LINEWORK ~ ESTIMATE OF PROBABLE COST

ALT. #2 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	8" Gravity Sewer	3,800	LF	$ 87.50	$ 332,500.00	30%	$ 432,300
	10" Gravity Sewer	100	LF	$ 118.75	$ 11,875.00	30%	$ 15,500
	4" PVC FM	4,100	LF	$ 62.50	$ 256,250.00	30%	$ 333,200
	4" HDPE FM	4,700	LF	$ 62.50	$ 293,750.00	30%	$ 381,900
	6" PVC FM	1,400	LF	$ 75.00	$ 105,000.00	30%	$ 136,500
	6" HDPE FM	240	LF	$ 93.75	$ 22,500.00	30%	$ 29,300
	8" PVC FM	110	LF	$ 81.25	$ 8,937.50	30%	$ 11,700
	8" HDPE FM	370	LF	$ 106.25	$ 39,312.50	30%	$ 51,200
	10" PVC FM	80	LF	$ 93.75	$ 7,500.00	30%	$ 9,800
	10" HDPE FM	370	LF	$ 93.75	$ 34,687.50	30%	$ 45,100
	14" DIP FM	90	LF	$ 137.50	$ 12,375.00	30%	$ 16,100
	20" HDPE FM Casing	390	LF	$ 200.00	$ 78,000.00	30%	$ 101,400
	Air Release Valves	11	LS	$ 4,545.45	$ 50,000.00	30%	$ 65,000
	Valves and Fittings	1	LS	$ 85,831.25	$ 85,831.25	30%	$ 111,600
	Manholes	20	EA	$ 7,500.00	$ 150,000.00	30%	$ 195,000
	Bollards	4	EA	$ 750.00	$ 3,000.00	30%	$ 3,900
							$ 1,939,500

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item			Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization		5%	1	LS	$96,975	$97,000
	Contractor Construction Markup		3%	1	LS	$58,185	$58,200
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$193,950	$194,000
						SUBTOTAL MISCELLANEOUS	**$349,200**
						SUBTOTAL PROJECT COSTS	**$2,288,700**
	Allowance		0%				**$0**
	Contingency		10%				**$228,900**
						PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST	**$2,518,000**

PAVING and RESTORATION ~ ESTIMATE OF PROBABLE COST							
ALT. #2	PROJECT SYSTEMS						
	Item	**Quantity**	**Unit**	**Unit Price**	**Extension**	**Install**	**Cost**
	Asphalt Pavement and Limerock Base	3,800	SY	$ 47.30	$ 179,740.00	30%	$ 233,700
	Asphalt Surface Course	4,900	SY	$ 15.40	$ 75,460.00	30%	$ 98,100
	4" Thick Concrete Sidewalk	950	SY	$ 46.20	$ 43,890.00	30%	$ 57,100
	6" Thick Concrete Driveway	1,250	SY	$ 60.50	$ 75,625.00	30%	$ 98,400
	Curb and Gutter	1,600	LF	$ 27.50	$ 44,000.00	30%	$ 57,200
	Fill and Final Grading	1,250	CY	$ 22.00	$ 27,500.00	30%	$ 35,800
	Sod	11,000	SY	$ 5.50	$ 60,500.00	30%	$ 78,700
							$ 659,000
2	GENERAL CONDITIONS/ MISCELLANEOUS						
	Item			**Quantity**	**Unit**	**Unit Cost**	**Item Cost**
	Mobilization & Demobilization		5%	1	LS	$32,950	$33,000
	Contractor Construction Markup		3%	1	LS	$19,770	$19,800
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$65,900	$65,900
						SUBTOTAL MISCELLANEOUS	**$118,700**
						SUBTOTAL PROJECT COSTS	**$777,700**
	Allowance		0%				**$0**
	Contingency		10%				**$77,800**
						PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST	**$856,000**

WEST COCOA WASTEWATER IMPROVEMENTS		
BREVARD COUNTY UTILITY SERVICES DEPARTMENT		
ALT. #3 - FULL REPLACEMENT		
OPINION OF PROBABLE COSTS (SUMMARY)		
	DESCRIPTION	**AMOUNT**
1	Lift Station W-01 Replacement	$ 849,000
2	Lift Station W-03 Replacement	$ 565,000
3	Lift Station W-04 Replacement	$ 523,000
4	Lift Station W-06 Demolition	$ 15,000
5	Lift Station W-07 Replacement	$ 534,000
6	Lift Station W-08 Replacement	$ 565,000
7	Lift Station W-09 Replacement	$ 2,027,000
8	Lift Station W-10 Replacement	$ 447,000
9	Lift Station W-15 Replacement	$ 1,143,000
10	Lift Station W-20 Replacement	$ 816,000
11	Lift Station W-22 Replacement	$ 565,000
12	Linework	$ 2,288,700
13	Paving and Restoration	$ 856,000
	Total Costs	**$ 11,193,700.00**

LS W-01 ~ ESTIMATE OF PROBABLE COST

ALT. #3 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	Wet Well Concrete	38	CY	$ 2,500.00	$ 95,000.00	25%	$ 118,800
	Valve Pad	1.3	CY	$ 1,250.00	$ 1,625.00	25%	$ 2,100
	HDPE Discharge Piping (4")	75	LF	$ 50.00	$ 3,750.00	30%	$ 4,900
	HDPE 90-Degree Bend (4")	3	EA	$ 337.50	$ 1,012.50	30%	$ 1,400
	Check Valves	3	EA	$ 1,712.50	$ 5,137.50	30%	$ 6,700
	Gate Valves	4	EA	$ 1,050.00	$ 4,200.00	30%	$ 5,500
	Camlock (6")	1	EA	$ 2,500.00	$ 2,500.00	30%	$ 3,300
	D.I.P. 90-Degree Bends (4")	9	EA	$ 337.50	$ 3,037.50	30%	$ 4,000
	Tees (4")	2	EA	$ 487.50	$ 975.00	30%	$ 1,300
	4" D.I.P.	20	LF	$ 31.25	$ 625.00	30%	$ 1,000
	Reducer (8" x 4" D.I.P.)	1	EA	$ 37.50	$ 37.50	30%	$ 1,000
	Drop Bowl	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	Pumping Equipment	1	LS	$ 125,000.00	$ 125,000.00	50%	$ 187,500
	Electrical System	1	LS	$ 62,500.00	$ 62,500.00	40%	$ 87,500
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	Emergency Diesel-Powered Pump	1	LS	$ 93,750.00	$ 93,750.00	40%	$ 131,300
	8" PVC C900 Gravity Sewer w/ Coring into Ex. MH	30	LF	$ 62.50	$ 1,875.00	30%	$ 2,500
	Ex. Manhole Rehab	14	SY	$ 75.00	$ 1,050.00	30%	$ 1,400
	Fencing	150	LF	$ 93.75	$ 14,062.50	25%	$ 17,600
	Grading/ Erosion Control	1	LS	$ 3,750.00	$ 3,750.00	25%	$ 4,700
	Demolish Building & Hauling and Disposal	1	LS	$ 18,750.00	$ 18,750.00	25%	$ 23,500
	Fill Ex. Wetwell with Suitable Soil	16	CY	$ 75.00	$ 1,200.00	25%	$ 1,500
							$ 653,800

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item			Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization		5%	1	LS	$32,690	$32,700
	Contractor Construction Markup		3%	1	LS	$19,614	$19,700
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$65,380	$65,400
						SUBTOTAL MISCELLANEOUS	**$117,800**
						SUBTOTAL PROJECT COSTS	**$771,600**
	Allowance		0%				**$0**
	Contingency		10%				**$77,200**
						PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST	**$849,000**

LS W-03 ~ ESTIMATE OF PROBABLE COST

ALT. #3 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	Wet Well Concrete	33	CY	$ 2,500.00	$ 82,500.00	25%	$ 103,200
	Valve Pad	0.4	CY	$ 1,250.00	$ 500.00	25%	$ 2,000
	Pipe Supports	2	EA	$ 312.50	$ 625.00	30%	$ 1,000
	HDPE Discharge Piping (4")	59	LF	$ 50.00	$ 2,950.00	30%	$ 3,900
	HDPE 90-Degree Bend (4")	2	EA	$ 337.50	$ 675.00	30%	$ 1,000
	Check Valves	2	EA	$ 1,712.50	$ 3,425.00	30%	$ 4,500
	Gate Valves (4")	3	EA	$ 1,050.00	$ 3,150.00	30%	$ 4,100
	Camlock (4")	1	EA	$ 2,500.00	$ 2,500.00	30%	$ 3,300
	D.I.P. 90-Degree Bends (4")	6	EA	$ 337.50	$ 2,025.00	30%	$ 2,700
	Tees (4")	1	EA	$ 487.50	$ 487.50	30%	$ 1,000
	4" D.I.P.	20	LF	$ 31.25	$ 625.00	30%	$ 1,000
	Drop Bowl	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	Pumping Equipment	1	LS	$ 62,500.00	$ 62,500.00	50%	$ 93,800
	Electrical System	1	LS	$ 62,500.00	$ 62,500.00	40%	$ 87,500
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	Fencing	90	LF	$ 93.75	$ 8,437.50	30%	$ 11,000
	Grading	1	LS	$ 6,250.00	$ 6,250.00	30%	$ 8,200
	Erosion Control	1	LS	$ 3,750.00	$ 3,750.00	30%	$ 4,900
	18" Concrete Endwalls	2	EA	$ 1,250.00	$ 2,500.00	30%	$ 3,300
	18" RCP Culvert Pipe	28	LF	$ 37.50	$ 1,050.00	30%	$ 1,400
	Demolish Building & Hauling and Disposal	1	LS	$ 31,250.00	$ 31,250.00	30%	$ 40,700
	Fill Ex. Wetwell with Suitable Soil	16	CY	$ 75.00	$ 1,200.00	30%	$ 1,600
	Retaining Wall	1	LS	$ 6,250.00	$ 6,250.00	30%	$ 8,200
							$ 434,600

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item		Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization	5%	1	LS	$21,730	$21,800
	Contractor Construction Markup	3%	1	LS	$13,038	$13,100
	Gen. Cond., Insurance, Bonding and Profit	10%	1	LS	$43,460	$43,500
				SUBTOTAL MISCELLANEOUS		**$78,400**
				SUBTOTAL PROJECT COSTS		**$513,000**
	Allowance	0%				**$0**
	Contingency	10%				**$51,300**
	PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST					**$565,000**

LS W-04 ~ ESTIMATE OF PROBABLE COST

ALT. #3 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	Wet Well Concrete	28	CY	$ 2,500.00	$ 70,000.00	25%	$ 87,500
	Valve Pad	0.4	CY	$ 1,250.00	$ 500.00	25%	$ 2,000
	Pipe Supports	2	EA	$ 312.50	$ 625.00	30%	$ 1,000
	HDPE Discharge Piping (4")	49	LF	$ 50.00	$ 2,450.00	30%	$ 3,200
	HDPE 90-Degree Bend (4")	2	EA	$ 337.50	$ 675.00	30%	$ 1,000
	Check Valves	2	EA	$ 1,712.50	$ 3,425.00	30%	$ 4,500
	Gate Valves (4")	3	EA	$ 1,050.00	$ 3,150.00	30%	$ 4,100
	Camlock (4")	1	EA	$ 2,500.00	$ 2,500.00	30%	$ 3,300
	D.I.P. 90-Degree Bends (4")	6	EA	$ 337.50	$ 2,025.00	30%	$ 2,700
	Tees (4")	1	EA	$ 487.50	$ 487.50	30%	$ 1,000
	4" D.I.P.	20	LF	$ 31.25	$ 625.00	30%	$ 1,000
	Drop Bowl	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	Pumping Equipment	1	LS	$ 62,500.00	$ 62,500.00	50%	$ 93,800
	Electrical System	1	LS	$ 62,500.00	$ 62,500.00	40%	$ 87,500
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	8" PVC C900 Gravity Sewer w/ Coring into Ex. MH	41	LF	$ 62.50	$ 2,562.50	30%	$ 3,400
	Doghouse Manhole	1	EA	$ 6,250.00	$ 6,250.00	30%	$ 8,200
	Manhole	1	EA	$ 6,250.00	$ 6,250.00	30%	$ 8,200
	Fencing	90	LF	$ 93.75	$ 8,437.50	25%	$ 10,600
	Grading	1	LS	$ 6,250.00	$ 6,250.00	25%	$ 7,900
	Erosion Control	1	LS	$ 3,750.00	$ 3,750.00	25%	$ 4,700
	Demolish Cocrete Pad	1	LS	$ 12,500.00	$ 12,500.00	25%	$ 15,700
	Fill Ex. Wetwell with Suitable Soil	16	CY	$ 75.00	$ 1,200.00	25%	$ 1,500
	Clearing Wooded Area	2,000	SF	$ 1.25	$ 2,500.00	25%	$ 3,200
							$ 402,300

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item			Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization		5%	1	LS	$20,115	$20,200
	Contractor Construction Markup		3%	1	LS	$12,069	$12,100
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$40,230	$40,300
	Indemnification			0	LS	$100	$0
						SUBTOTAL MISCELLANEOUS	**$72,600**
						SUBTOTAL PROJECT COSTS	**$474,900**
	Allowance		0%				**$0**
	Contingency		10%				**$47,500**
						PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST	**$523,000**

LS W-07 ~ ESTIMATE OF PROBABLE COST

ALT. #3 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	Wet Well Concrete	27	CY	$ 2,500.00	$ 67,500.00	25%	$ 84,400
	Valve Pad	0.4	CY	$ 1,250.00	$ 500.00	25%	$ 2,000
	Pipe Supports	2	EA	$ 312.50	$ 625.00	30%	$ 1,000
	HDPE Discharge Piping (4")	47	LF	$ 50.00	$ 2,350.00	30%	$ 3,100
	HDPE 90-Degree Bend (4")	2	EA	$ 337.50	$ 675.00	30%	$ 2,000
	Check Valves	2	EA	$ 1,712.50	$ 3,425.00	30%	$ 4,500
	Gate Valves (4")	3	EA	$ 1,050.00	$ 3,150.00	30%	$ 4,100
	Camlock (4")	1	EA	$ 2,500.00	$ 2,500.00	30%	$ 3,300
	D.I.P. 90-Degree Bends (4")	6	EA	$ 337.50	$ 2,025.00	30%	$ 2,700
	Tees (4")	1	EA	$ 487.50	$ 487.50	30%	$ 2,000
	4" D.I.P.	20	LF	$ 31.25	$ 625.00	30%	$ 1,000
	Reducer (6" X 4" D.I.P.)	1	EA	$ 625.00	$ 625.00	30%	$ 2,000
	Drop Bowl	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	Pumping Equipment	1	LS	$ 62,500.00	$ 62,500.00	50%	$ 93,800
	Electrical System	1	LS	$ 62,500.00	$ 62,500.00	40%	$ 87,500
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	8" PVC C900 Gravity Sewer w/ Coring into Ex. MH	17	LF	$ 62.50	$ 1,062.50	30%	$ 2,000
	Doghouse Manhole	1	EA	$ 6,250.00	$ 6,250.00	30%	$ 8,200
	Manhole	1	EA	$ 6,250.00	$ 6,250.00	30%	$ 8,200
	Fencing	150	LF	$ 93.75	$ 14,062.50	25%	$ 17,600
	Grading	1	LS	$ 2,500.00	$ 2,500.00	25%	$ 3,200
	Erosion Control	1	LS	$ 3,750.00	$ 3,750.00	25%	$ 4,700
	Demolish Cocrete Pad	1	LS	$ 18,750.00	$ 18,750.00	25%	$ 23,500
	Fill Ex. Wetwell with Suitable Soil	16	CY	$ 75.00	$ 1,200.00	25%	$ 2,000
	Fill Dry-Pit with suitable soil	1	LS	$ 75.00	$ 75.00	25%	$ 2,000
							$ 411,100

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item		Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization	5%	1	LS	$20,555	$20,600
	Contractor Construction Markup	3%	1	LS	$12,333	$12,400
	Gen. Cond., Insurance, Bonding and Profit	10%	1	LS	$41,110	$41,200
				SUBTOTAL MISCELLANEOUS		**$74,200**
				SUBTOTAL PROJECT COSTS		**$485,300**
	Allowance	0%				**$0**
	Contingency	10%				**$48,600**
	PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST					**$534,000**

LS W-08 ~ ESTIMATE OF PROBABLE COST

ALT. #3 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	Wet Well Concrete	26	CY	$ 2,500.00	$ 65,000.00	25%	$ 81,300
	Valve Pad	0.4	CY	$ 1,250.00	$ 500.00	25%	$ 2,000
	Pipe Supports	2	EA	$ 312.50	$ 625.00	30%	$ 1,000
	HDPE Discharge Piping (4")	46	LF	$ 50.00	$ 2,300.00	30%	$ 3,000
	HDPE 90-Degree Bend (4")	2	EA	$ 337.50	$ 675.00	30%	$ 1,000
	Check Valves	2	EA	$ 1,712.50	$ 3,425.00	30%	$ 4,500
	Gate Valves (4")	3	EA	$ 1,050.00	$ 3,150.00	30%	$ 4,100
	Camlock (4")	1	EA	$ 2,500.00	$ 2,500.00	30%	$ 3,300
	D.I.P. 90-Degree Bends (4")	6	EA	$ 337.50	$ 2,025.00	30%	$ 2,700
	Tees (4")	1	EA	$ 487.50	$ 487.50	30%	$ 1,000
	4" D.I.P.	20	LF	$ 31.25	$ 625.00	30%	$ 1,000
	Drop Bowl	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	Pumping Equipment	1	LS	$ 62,500.00	$ 62,500.00	50%	$ 93,800
	Electrical System	1	LS	$ 62,500.00	$ 62,500.00	40%	$ 87,500
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	8" PVC C900 Gravity Sewer w/ Coring into Ex. MH	65	LF	$ 62.50	$ 4,062.50	30%	$ 5,300
	Ex. Manhole Rehab	14	SY	$ 75.00	$ 1,050.00	30%	$ 1,400
	Manhole	1	EA	$ 8,125.00	$ 8,125.00	30%	$ 10,600
	Fencing	110	LF	$ 93.75	$ 10,312.50	25%	$ 12,900
	Grading	1	LS	$ 25,000.00	$ 25,000.00	25%	$ 31,300
	Erosion Control	1	LS	$ 3,750.00	$ 3,750.00	25%	$ 4,700
	Clearing Wooded Area	3,500	SF	$ 2.50	$ 8,750.00	25%	$ 11,000
	Demolish PS Building	1	LS	$ 18,750.00	$ 18,750.00	25%	$ 23,500
	Fill Ex. Wetwell with Suitable Soil	16	CY	$ 75.00	$ 1,200.00	25%	$ 1,500
							$ 434,700

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item			Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization		5%	1	LS	$21,735	$21,800
	Contractor Construction Markup		3%	1	LS	$13,041	$13,100
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$43,470	$43,500
					SUBTOTAL MISCELLANEOUS		**$78,400**
					SUBTOTAL PROJECT COSTS		**$513,100**
	Allowance		0%				**$0**
	Contingency		10%				**$51,400**
	PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST						**$565,000**

LS W-09 ~ ESTIMATE OF PROBABLE COST

ALT. #3 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	Wet Well Concrete	111	CY	$ 2,812.50	$ 312,187.50	25%	$ 390,300
	Valve Pad Construction	13	CY	$ 1,250.00	$ 16,250.00	25%	$ 20,400
	HDPE Discharge Piping	127	LF	$ 87.50	$ 11,112.50	30%	$ 14,500
	HDPE 90-Degree Bend	3	EA	$ 1,250.00	$ 3,750.00	30%	$ 4,900
	Check Valves	3	EA	$ 4,062.50	$ 12,187.50	30%	$ 15,900
	Gate Valves (10")	4	EA	$ 1,912.50	$ 7,650.00	30%	$ 10,000
	Camlock (6")	1	EA	$ 3,125.00	$ 3,125.00	30%	$ 4,100
	D.I.P. 90-Degree Bends (10")	9	EA	$ 1,250.00	$ 11,250.00	30%	$ 14,700
	Tees (10")	2	EA	$ 4,050.00	$ 8,100.00	30%	$ 10,600
	10" D.I.P.	30	LF	$ 62.50	$ 1,875.00	30%	$ 2,500
	Reducer (14" X 10" D.I.P.)	1	EA	$ 750.00	$ 750.00	30%	$ 2,000
	Drop Bowl	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	Pumping Equipment	1	LS	$ 312,500.00	$ 312,500.00	50%	$ 468,800
	Flowmeter	1	LS	$ 12,500.00	$ 12,500.00	30%	$ 16,300
	Electrical System	1	LS	$ 62,500.00	$ 62,500.00	40%	$ 87,500
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	Emergency Diesel-Powered Pump	1	LS	$ 150,000.00	$ 150,000.00	25%	$ 187,500
	14" D.I.P. Force Main	200	LF	$ 93.75	$ 18,750.00	30%	$ 24,400
	14" D.I.P. 90-Degree Bend	1	EA	$ 3,887.50	$ 3,887.50	30%	$ 5,100
	14" D.I.P. 45-Degree Bends	2	EA	$ 3,412.50	$ 6,825.00	30%	$ 8,900
	8" PVC C900 Gravity Sewer w/ Coring into Ex. MH	100	LF	$ 62.50	$ 6,250.00	30%	$ 8,200
	Ex. Manhole Rehab	1	LS	$ 4,375.00	$ 4,375.00	25%	$ 5,500
	5' Dia. Manhole	1	EA	$ 10,625.00	$ 10,625.00	30%	$ 13,900
	Fencing	230	LF	$ 93.75	$ 21,562.50	25%	$ 27,000
	Grading	1	LS	$ 2,500.00	$ 2,500.00	25%	$ 3,200
	Erosion Control	1	LS	$ 6,250.00	$ 6,250.00	25%	$ 7,900
	Additional Sliding Gate for Rear Access	1	LS	$ 2,500.00	$ 2,500.00	25%	$ 3,200
	Odor Control System	1	LS	$ 62,500.00	$ 62,500.00	25%	$ 78,200
	Stormwater Pumping System	1	LS	$ 25,000.00	$ 25,000.00	25%	$ 31,300
	8" PVC Suction Pipe for Stromwater	56	LF	$ 62.50	$ 3,500.00	25%	$ 4,400
	Demolish PS Building & Valve Vault, Haul & Dispose	1	LS	$ 31,250.00	$ 31,250.00	25%	$ 39,100
	Fill Ex. Wetwell with Suitable Soil	51	CY	$ 75.00	$ 3,825.00	25%	$ 4,800
							$ 1,561,400

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item			Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization		5%	1	LS	$78,070	$78,100
	Contractor Construction Markup		3%	1	LS	$46,842	$46,900
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$156,140	$156,200
						SUBTOTAL MISCELLANEOUS	**$281,200**
						SUBTOTAL PROJECT COSTS	**$1,842,600**
	Allowance		0%				**$0**
	Contingency		10%				**$184,300**
						PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST	**$2,027,000**

LS W-10 ~ ESTIMATE OF PROBABLE COST

ALT. #3 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	Wet Well Concrete	26	CY	$ 2,812.50	$ 73,125.00	25%	$ 91,500
	Valve Pad Construction	0.4	CY	$ 1,250.00	$ 500.00	25%	$ 2,000
	HDPE Discharge Piping (4")	51	LF	$ 50.00	$ 2,550.00	30%	$ 3,400
	HDPE 90-Degree Bend (4")	2	EA	$ 337.50	$ 675.00	30%	$ 2,000
	Check Valves	2	EA	$ 1,712.50	$ 3,425.00	30%	$ 4,500
	Gate Valves (4")	3	EA	$ 1,050.00	$ 3,150.00	30%	$ 4,100
	Camlock (4")	1	EA	$ 2,500.00	$ 2,500.00	30%	$ 3,300
	D.I.P. 90-Degree Bends (4")	6	EA	$ 337.50	$ 2,025.00	30%	$ 2,700
	Tees (4")	1	EA	$ 487.50	$ 487.50	30%	$ 2,000
	4" D.I.P.	20	LF	$ 31.25	$ 625.00	30%	$ 900
	Drop Bowl	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	4" PVC C900 Force Main/ Connect to Ex. FM across the street	100	LF	$ 37.50	$ 3,750.00	30%	$ 4,900
	Pumping Equipment	1	LS	$ 62,500.00	$ 62,500.00	50%	$ 93,800
	Misc. Electrical	1	LS	$ 25,000.00	$ 25,000.00	40%	$ 35,000
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	Grading	1	LS	$ 2,500.00	$ 2,500.00	25%	$ 3,200
	Erosion Control	1	LS	$ 2,500.00	$ 2,500.00	25%	$ 3,200
	Bypass Pumping (100 gpm for 21 days)	1	LS	$ 12,500.00	$ 12,500.00	25%	$ 15,700
	Demolition, Hauling and Disposal	1	LS	$ 18,750.00	$ 18,750.00	25%	$ 23,500
	Fill Wetwell with Suitable Soil	16	CY	$ 75.00	$ 1,200.00	25%	$ 2,000
							$ 344,000

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item		Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization	5%	1	LS	$17,200	$17,200
	Contractor Construction Markup	3%	1	LS	$10,320	$10,400
	Gen. Cond., Insurance, Bonding and Profit	10%	1	LS	$34,400	$34,400
					SUBTOTAL MISCELLANEOUS	**$62,000**
					SUBTOTAL PROJECT COSTS	**$406,000**
	Allowance	0%				**$0**
	Contingency	10%				**$40,600**
					PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST	**$447,000**

LS W-15 ~ ESTIMATE OF PROBABLE COST

ALT. #3 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	Wet Well Concrete	53	CY	$ 2,500.00	$ 132,500.00	25%	$ 165,700
	Valve Pad Construction	1.3	CY	$ 1,250.00	$ 1,625.00	25%	$ 2,100
	HDPE Discharge Piping	90	LF	$ 68.75	$ 6,187.50	30%	$ 8,100
	HDPE 90-Degree Bend	3	EA	$ 1,050.00	$ 3,150.00	30%	$ 4,100
	Check Valves	3	EA	$ 3,337.50	$ 10,012.50	30%	$ 13,100
	Gate (8")	4	EA	$ 1,400.00	$ 5,600.00	30%	$ 7,300
	Camlock (6")	1	EA	$ 3,125.00	$ 3,125.00	30%	$ 4,100
	D.I.P. 90-Degree Bends (8")	9	EA	$ 1,050.00	$ 9,450.00	30%	$ 12,300
	Tees (8")	2	EA	$ 1,200.00	$ 2,400.00	30%	$ 3,200
	8" D.I.P.	30	LF	$ 50.00	$ 1,500.00	30%	$ 2,000
	Reducer (14" x 8")	1	EA	$ 2,050.00	$ 2,050.00	30%	$ 2,700
	Drop Bowl	1	LS	$ 1,875.00	$ 1,875.00	25%	$ 2,400
	Pumping Equipment	1	LS	$ 187,500.00	$ 187,500.00	50%	$ 281,300
	Flowmeter	1	LS	$ 12,500.00	$ 12,500.00	30%	$ 16,300
	Electrical System	1	LS	$ 62,500.00	$ 62,500.00	40%	$ 87,500
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	Emergency Diesel-Powered Pump	1	LS	$ 100,000.00	$ 100,000.00	25%	$ 125,000
	18" PVC C900 Gravity Sewer	12	LF	$ 93.75	$ 1,125.00	30%	$ 2,000
	Manhole	1	EA	$ 8,125.00	$ 8,125.00	30%	$ 10,600
	Fencing	210	LF	$ 93.75	$ 19,687.50	25%	$ 24,700
	Grading	1	LS	$ 12,500.00	$ 12,500.00	25%	$ 15,700
	Erosion Control	1	LS	$ 6,250.00	$ 6,250.00	25%	$ 7,900
	Demolish Elec/ Generator Building	1	LS	$ 12,500.00	$ 12,500.00	25%	$ 15,700
	Fill Ex. Wetwells with Suitable Soil	87	CY	$ 75.00	$ 6,525.00	25%	$ 8,200
	Relocate the Ex. Odor Control System	1	LS	$ 6,250.00	$ 6,250.00	25%	$ 7,900
	Cut, Cap & Fill w/Grout Ex. FM (12")	1	LS	$ 5,000.00	$ 5,000.00	25%	$ 6,300
							$ 880,000

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item		Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization	5%	1	LS	$44,000	$44,000
	Contractor Construction Markup	3%	1	LS	$26,400	$26,400
	Gen. Cond., Insurance, Bonding and Profit	10%	1	LS	$88,000	$88,000
				SUBTOTAL MISCELLANEOUS		**$158,400**
				SUBTOTAL PROJECT COSTS		**$1,038,400**
	Allowance	0%				**$0**
	Contingency	10%				**$103,900**
	PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST					**$1,143,000**

LS W-20 ~ ESTIMATE OF PROBABLE COST

ALT. #3 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	Wet Well Concrete	38	CY	$ 2,500.00	$ 95,000.00	25%	$ 118,800
	Valve Pad Construction	1.5	CY	$ 1,250.00	$ 1,875.00	25%	$ 2,400
	HDPE Discharge Piping	63	LF	$ 87.50	$ 5,512.50	30%	$ 7,200
	Check Valves	2	EA	$ 1,250.00	$ 2,500.00	30%	$ 3,300
	Check Valves (10")	2	EA	$ 4,062.50	$ 8,125.00	30%	$ 10,600
	Gate Valves (10")	3	EA	$ 2,025.00	$ 6,075.00	30%	$ 7,900
	Camlock (6")	1	EA	$ 2,500.00	$ 2,500.00	30%	$ 3,300
	D.I.P. 90-Degree Bends (10")	6	EA	$ 1,250.00	$ 7,500.00	30%	$ 9,800
	Tees (10")	1	EA	$ 1,787.50	$ 1,787.50	30%	$ 2,400
	10" D.I.P.	20	LF	$ 62.50	$ 1,250.00	30%	$ 1,700
	Reducer (12" X 10" D.I.P.)	1	EA	$ 1,712.50	$ 1,712.50	30%	$ 2,300
	Drop Bowl w/ Piping	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	Pumping Equipment w/ Hatches	1	LS	$ 125,000.00	$ 125,000.00	50%	$ 187,500
	Installation of Electrical Panels in the Electrical Building	1	LS	$ 37,500.00	$ 37,500.00	30%	$ 48,800
	Demolish Valve Vault & Fill w/ Suitable Soil	1	LS	$ 18,750.00	$ 18,750.00	30%	$ 24,400
	Bypass Pumping (300 gpm for 15 days)	1	LS	$ 12,500.00	$ 12,500.00	30%	$ 16,300
	Replace Flowmeter	1	LS	$ 10,000.00	$ 10,000.00	30%	$ 13,000
	Fill Ex. Wetwell with Suitable Soil	16	LS	$ 75.00	$ 1,200.00	25%	$ 1,500
	Fill	1000	CY	$ 31.25	$ 31,250.00	25%	$ 39,100
	Emergency Diesel-Powered Pump	1	LS	$ 93,750.00	$ 93,750.00	25%	$ 117,200
	Fencing	60	LF	$ 93.75	$ 5,625.00	25%	$ 7,100
							$ 628,000

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item			Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization		5%	1	LS	$31,400	$31,400
	Contractor Construction Markup		3%	1	LS	$18,840	$18,900
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$62,800	$62,800
						SUBTOTAL MISCELLANEOUS	**$113,100**
						SUBTOTAL PROJECT COSTS	**$741,100**
	Allowance		0%				**$0**
	Contingency		10%				**$74,200**
						PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST	**$816,000**

LS W-22 ~ ESTIMATE OF PROBABLE COST							
ALT. #3	PROJECT SYSTEMS						
	Item	**Quantity**	**Unit**	**Unit Price**	**Extension**	**Install**	**Cost**
	Wet Well Concrete	33	CY	$ 2,500.00	$ 82,500.00	25%	$ 103,200
	Valve Pad Construction	0.7	CY	$ 1,250.00	$ 875.00	25%	$ 2,000
	HDPE Discharge Piping (6")	56	LF	$ 50.00	$ 2,800.00	30%	$ 3,700
	HDPE 90-Degree Bend (6")	2	EA	$ 487.50	$ 975.00	30%	$ 1,300
	Check Valves	2	EA	$ 1,712.50	$ 3,425.00	30%	$ 4,500
	Gate Valves (6")	3	EA	$ 1,050.00	$ 3,150.00	30%	$ 4,100
	Camlock (6")	1	EA	$ 2,500.00	$ 2,500.00	30%	$ 3,300
	D.I.P. 90-Degree Bends (6")	6	EA	$ 487.50	$ 2,925.00	30%	$ 3,900
	Tees (6")	1	EA	$ 725.00	$ 725.00	30%	$ 1,000
	6" D.I.P.	20	LF	$ 37.50	$ 750.00	30%	$ 1,000
	Drop Bowl w/ Piping	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
	Pumping Equipment	1	LS	$ 125,000.00	$ 125,000.00	50%	$ 187,500
	Misc. Electrical	1	LS	$ 25,000.00	$ 25,000.00	40%	$ 35,000
	SCADA/ Telemetry	1	LS	$ 31,250.00	$ 31,250.00	40%	$ 43,800
	Erosion Control (Incl. Silt Fence)	1	LS	$ 1,250.00	$ 1,250.00	20%	$ 1,500
	Bypass Pumping (300 gpm for 7 days)	1	LS	$ 6,250.00	$ 6,250.00	20%	$ 7,500
	Demolition, Hauling and Disposal	1	LS	$ 18,750.00	$ 18,750.00	30%	$ 24,400
	Fill Ex. Wetwell with Suitable Soil	16	LS	$ 75.00	$ 1,200.00	30%	$ 1,600
	Demolish Sidewalk & Misc. Concrete	1	LS	$ 1,875.00	$ 1,875.00	30%	$ 2,500
							$ 435,000

2	GENERAL CONDITIONS/ MISCELLANEOUS						
	Item			**Quantity**	**Unit**	**Unit Cost**	**Item Cost**
	Mobilization & Demobilization		5%	1	LS	$21,750	$21,800
	Contractor Construction Markup		3%	1	LS	$13,050	$13,100
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$43,500	$43,500
						SUBTOTAL MISCELLANEOUS	**$78,400**
						SUBTOTAL PROJECT COSTS	**$513,400**
	Allowance		0%				**$0**
	Contingency		10%				**$51,400**
						PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST	**$565,000**

LINEWORK ~ ESTIMATE OF PROBABLE COST

ALT. #3 PROJECT SYSTEMS

	Item	Quantity	Unit	Unit Price	Extension	Install	Cost
	8" Gravity Sewer	3,800	LF	$ 87.50	$ 332,500.00	30%	$ 432,300
	10" Gravity Sewer	100	LF	$ 118.75	$ 11,875.00	30%	$ 15,500
	4" PVC FM	4,100	LF	$ 62.50	$ 256,250.00	30%	$ 333,200
	4" HDPE FM	4,700	LF	$ 62.50	$ 293,750.00	30%	$ 381,900
	6" PVC FM	1,400	LF	$ 75.00	$ 105,000.00	30%	$ 136,500
	6" HDPE FM	240	LF	$ 93.75	$ 22,500.00	30%	$ 29,300
	8" PVC FM	110	LF	$ 81.25	$ 8,937.50	30%	$ 11,700
	8" HDPE FM	370	LF	$ 106.25	$ 39,312.50	30%	$ 51,200
	10" PVC FM	80	LF	$ 93.75	$ 7,500.00	30%	$ 9,800
	10" HDPE FM	370	LF	$ 93.75	$ 34,687.50	30%	$ 45,100
	14" DIP FM	90	LF	$ 137.50	$ 12,375.00	30%	$ 16,100
	20" HDPE FM Casing	390	LF	$ 200.00	$ 78,000.00	30%	$ 101,400
	Air Release Valves	11	LS	$ 4,545.45	$ 50,000.00	30%	$ 65,000
	Valves and Fittings	1	LS	$ 85,831.25	$ 85,831.25	30%	$ 111,600
	Manholes	20	EA	$ 7,500.00	$ 150,000.00	30%	$ 195,000
	Bollards	4	EA	$ 750.00	$ 3,000.00	30%	$ 3,900
							$ 1,939,500

2 GENERAL CONDITIONS/ MISCELLANEOUS

	Item		Quantity	Unit	Unit Cost	Item Cost
	Mobilization & Demobilization	5%	1	LS	$96,975	$97,000
	Contractor Construction Markup	3%	1	LS	$58,185	$58,200
	Gen. Cond., Insurance, Bonding and Profit	10%	1	LS	$193,950	$194,000
				SUBTOTAL MISCELLANEOUS		**$349,200**
				SUBTOTAL PROJECT COSTS		**$2,288,700**
	Allowance	0%				**$0**
	Contingency	10%				**$228,900**
	PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST					**$2,518,000**

PAVING and RESTORATION ~ ESTIMATE OF PROBABLE COST							
ALT. #3	PROJECT SYSTEMS						
	Item	**Quantity**	**Unit**	**Unit Price**	**Extension**	**Install**	**Cost**
	Asphalt Pavement and Limerock Base	3,800	SY	$ 47.30	$ 179,740.00	30%	$ 233,700
	Asphalt Surface Course	4,900	SY	$ 15.40	$ 75,460.00	30%	$ 98,100
	4" Thick Concrete Sidewalk	950	SY	$ 46.20	$ 43,890.00	30%	$ 57,100
	6" Thick Concrete Driveway	1,250	SY	$ 60.50	$ 75,625.00	30%	$ 98,400
	Curb and Gutter	1,600	LF	$ 27.50	$ 44,000.00	30%	$ 57,200
	Fill and Final Grading	1,250	CY	$ 22.00	$ 27,500.00	30%	$ 35,800
	Sod	11,000	SY	$ 5.50	$ 60,500.00	30%	$ 78,700
							$ 659,000
2	GENERAL CONDITIONS/ MISCELLANEOUS						
	Item			**Quantity**	**Unit**	**Unit Cost**	**Item Cost**
	Mobilization & Demobilization		5%	1	LS	$32,950	$33,000
	Contractor Construction Markup		3%	1	LS	$19,770	$19,800
	Gen. Cond., Insurance, Bonding and Profit		10%	1	LS	$65,900	$65,900
						SUBTOTAL MISCELLANEOUS	**$118,700**
						SUBTOTAL PROJECT COSTS	**$777,700**
	Allowance		0%				**$0**
	Contingency		10%				**$77,800**
						PROJECT OPINION OF COMBINED TOTAL CONSTRUCTION COST	**$856,000**

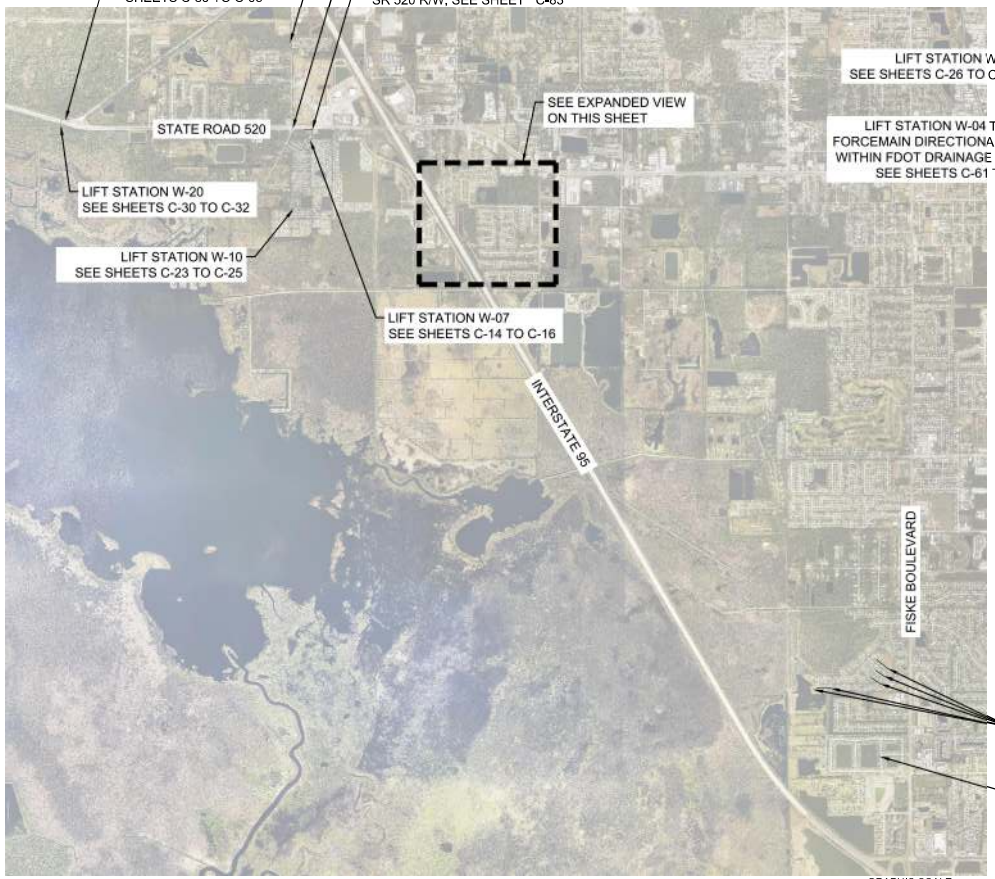
Brevard County West Cocoa Wastewater Facilities Plan
SRF# WW05117

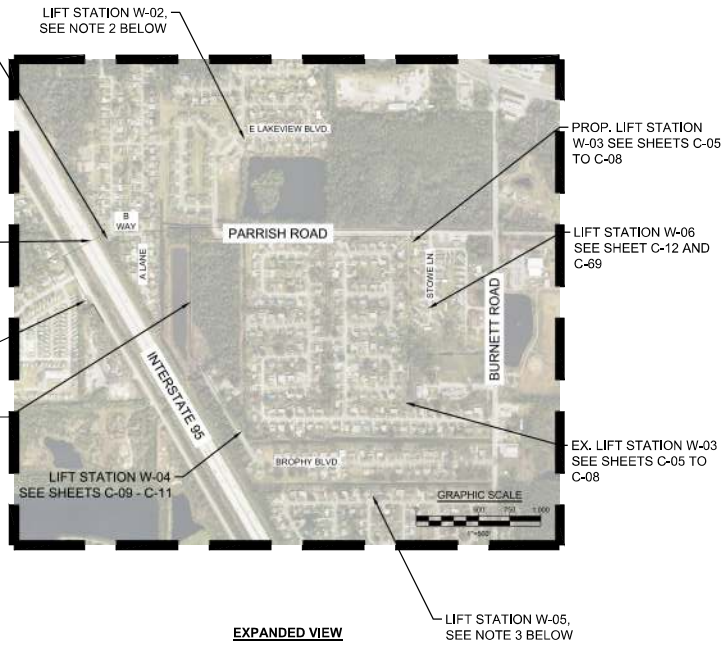
Labor and Vehicle Only
Labor, Vehicle and Extra Item

Work Order Number	Activity	Asset Type	ID	Repair Info	Repair Date	WO Cost	Sub-Totals	Sub-Totals ID
37326	M-Check	Sewer Lift Station	W01	STANDING	1/9/2017	$ 6,342.24		
38146	S-Repair	Sewer Lift Station	W01	REPAIR	3/27/2017	$ 158.32		
38151	S-Check & TS	Sewer Lift Station	W01	CF	3/28/2017	$ 79.04	$ 6,579.60	W01
37328	M-Check	Sewer Lift Station	W03	STANDING	1/9/2017	$ 5,794.88		
39027	C-Check & TS	Sewer Lift Station	W03	MISSING MH	7/21/2017	$ 143.10		
39463	C-Repair	Sewer Main	W03010	REPAIR	9/21/2017	$ 1,671.85		
38710	C-Clean Line	Sewer Main	W03013	GREASE	6/8/2017	$ 715.23	$ 8,325.06	W03
37329	M-Check	Sewer Lift Station	W04	STANDING	1/9/2017	$ 1,979.48		
37398	C-Check & TS	Sewer Lift Station	W04	MISCMAINT	1/17/2017	$ 60.86		
39953	C-Repair	Sewer Main	W04001	REPAIR	12/28/2017	$ 1,185.77		
39500	C-Repair	Sewer Main	W04004	SM-LEAK	9/29/2017	$ 2,042.86		
39562	C-Repair	Sewer Main	W04005	REPAIR	10/13/2017	$ 30,417.53	$ 35,686.50	W04
37331	M-Check	Sewer Lift Station	W06	STANDING	1/9/2017	$ 1,276.14		
39097	C-Clean Well	Sewer Lift Station	W06	GREASE	7/31/2017	$ 308.10	$ 1,584.24	W06
37332	M-Check	Sewer Lift Station	W07	STANDING	1/9/2017	$ 1,130.74	$ 1,130.74	W07
37333	M-Check	Sewer Lift Station	W08	STANDING	1/9/2017	$ 8,759.39		
38040	M-Check	Sewer Lift Station	W08	ALARM	3/13/2017	$ 125.09	$ 8,884.48	W08
37334	M-Check	Sewer Lift Station	W09	STANDING	1/9/2017	$ 8,800.41		
37833	C-Check & TS	Sewer Lift Station	W09	MISSING MH	3/2/2017	$ 81.15		
37985	C-Repair	Sewer Service Line	W090050063193	REPAIR	3/8/2017	$ 668.87		
39517	C-Check & TS	Sewer Service Line	W09005006FMH33	STOPPAGE	10/4/2017	$ 46.88		
37374	C-Locate	Sewer Main	W09026	GREASE	1/12/2017	$ 462.88		
38242	C-Locate	Sewer Service Line	W0903434A1334	LOCATE	4/7/2017	$ 81.15		
39787	C-Check & TS	Sewer Service Line	W090380412902	FM-LEAK	11/27/2017	$ 117.21		
37875	C-Repair	Sewer Manhole	W09048	MISSING MH	3/6/2017	$ 658.50	$ 10,917.05	W09
37335	M-Check	Sewer Lift Station	W10	STANDING	1/9/2017	$ 1,019.06	$ 1,019.06	W10
37337	M-Check	Sewer Lift Station	W15	STANDING	1/9/2017	$ 4,880.28		
38353	S-Install	Sewer Lift Station	W15	INSTALL	4/25/2017	$ 1,172.60		
38644	E-Check & TS	Sewer Lift Station	W15	INSPECTION	5/31/2017	$ 213.44	$ 6,266.32	W15
37338	M-Check	Sewer Lift Station	W20	STANDING	1/9/2017	$ 1,812.58		
39375	C-Check & TS	Sewer Lift Station	W20	STOPPAGE	9/5/2017	$ 81.77	$ 1,894.35	W20
37339	M-Check	Sewer Lift Station	W22	STANDING	1/9/2017	$ 549.02	$ 549.02	W22
					Total Yearly Cost	**$ 82,836.42**	**$ 82,836.42**	

Appendix D

Proposed Improvements





EXPANDED VIEW

NOTES:

1. SEE SHEET C-41 TO C-44 FOR LIFT STATION W-01 PROPOSED FORCEMAIN PLAN.
2. SEE SHEET C-46 TO C-49 FOR LIFT STATION W-02 GRAVITY SEWER AND FORCEMAIN PLAN.
3. SEE SHEETS C-50 TO C-68 FOR NEW FORCEMAIN FOR LIFT STATIONS W-03, W-04 AND W-05.
4. SEE SHEET C-69 FOR LIFT STATION W-06 GRAVITY SEWER PLAN.
5. SEE SHEETS C-70 TO C-83 FOR NEW FORCEMAIN FROM LIFT STATION W-07 TO LIFT STATION W-08.
6. SEE SHEET C-84 TO C-88 FOR LIFT STATION W-09 GRAVITY SEWER PLAN.
7. SEE SHEET C-89 TO C-93 FOR LS W-20 INFLUENT FORCEMAIN PLAN.

ISS

Kiran Kulkarni, P.E. #78114

NO.	DATE:	DESCRIPTION REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: KEY MAP
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: MBH
SCALE: VARIES	CHKD. BY: KVK
DRAWING NO.: 05 of 105	
SHEET NO.: C-01	

6/7/2018 10:42:35 AM
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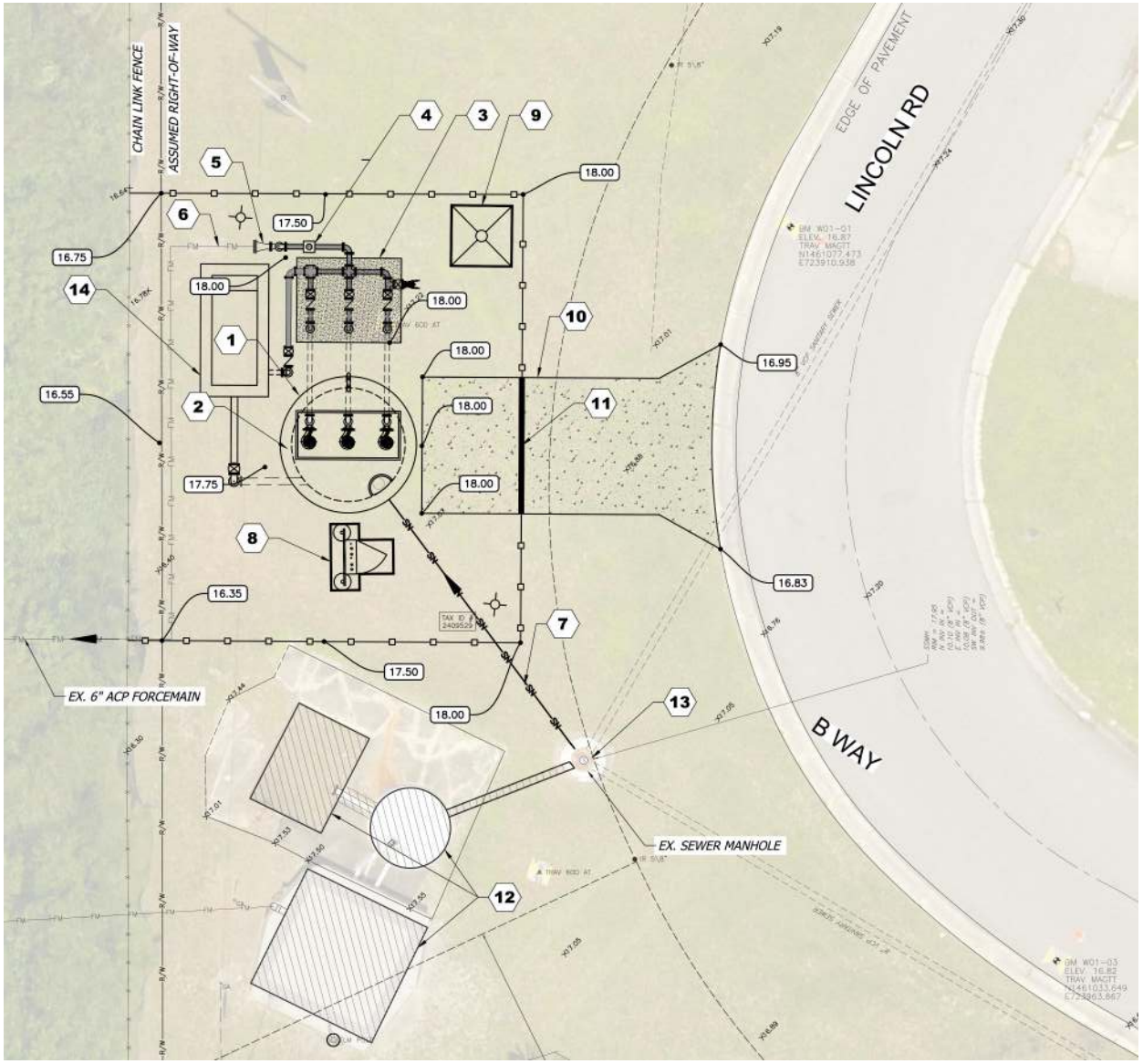

GRAPHIC SCALE

0 5 10

1"=5'

PROPOSED IMPROVEMENTS

1. Construct a new 10 foot diameter wetwell and install new pumps, base elbows, discharge piping, guide rails and other appurtenances in accordance with the details shown on Sheet C-04. Pumps shall be in accordance with the manufacturer's pump curve shown on Sheet C-04. Also comply with the requirements of the Brevard county lift station notes provided on Sheet C-38.
   Layout information:
   Wetwell Center: N 1461041.22 E 723887.04
   Influent Sewer Invert El. shall be as shown in the table on sheet C-04.
2. Install precast concrete wetwell cover. The cover shall include dual leaf fall protection grating. Top of cover slab shall be at elevation shown in the table on Sheet C-04.
3. Construct above ground 6" thick concrete valve pad (3,000 PSI w/ FIBERMIX). Install valve assembly in accordance with detail shown on Sheet C-04.
   Layout information:
   Northeast Corner - N 1461057.74 E 723882.78
   Southwest Corner - N 1461046.70 E 723878.53
4. Install 4" Magnetic flowmeter. Provide straight pipe without fittings, minimum 2 ft upstream and 1 ft down stream.
5. Install 8" X 4" D.I.P. reducer.
6. Install 8" PVC forcemain complying with AWWA C900, Pressure Class 150 and dimension ratio of DR18 with gasketed integral bell ends.
7. Install 30 lf 8" C900 PVC gravity sewer at 0.40% slope.
8. Install new electrical control panels per electrical drawings.
9. Install new rtu panel and 40' antenna per electrical drawings.
10. Construct 12-foot wide concrete driveway and apron with 6" thick 3,000 PSI FIBERMIX concrete. Provide 6" thick sub grade stabilized to 98% Modified Proctor density. Concrete apron shall match the existing grade. Refer to Exhibits 18 and 20 on Sheet C-36 for geometry and construction requirements. Refer to Brevard County Public Works Engineering Standard Development Notes on Sheets C-40.
11. Install 108 lf of new fence with 12' wide slide gate at the location shown. Fence shall be Type "B" in accordance with FDOT Index 802 and the slide gate shall be in accordance with FDOT Index 803.
12. For demolition notes see Sheet C-02.
13. Manhole shall be lined using Brevard county approved lining suppliers.
14. Install Emergency Diesel Pump with integral diesel storage tank on reinforced concrete pad with all suction and discharge piping, valves and fittings. See Structural drawings for the pad details and electrical drawings for the electrical and instrumentation details.

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NO.	DATE:	DESCRIPTION:
		REVISIONS

Kiran Kulkarni, P.E. #78114

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: LS W-01 SITE, GRADING AND EROSION CONTROL PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: PKK
SCALE: 1" = 5'	CHKD. BY: KVK
DRAWING NO.: 07 of 105	
SHEET NO.: C-03	

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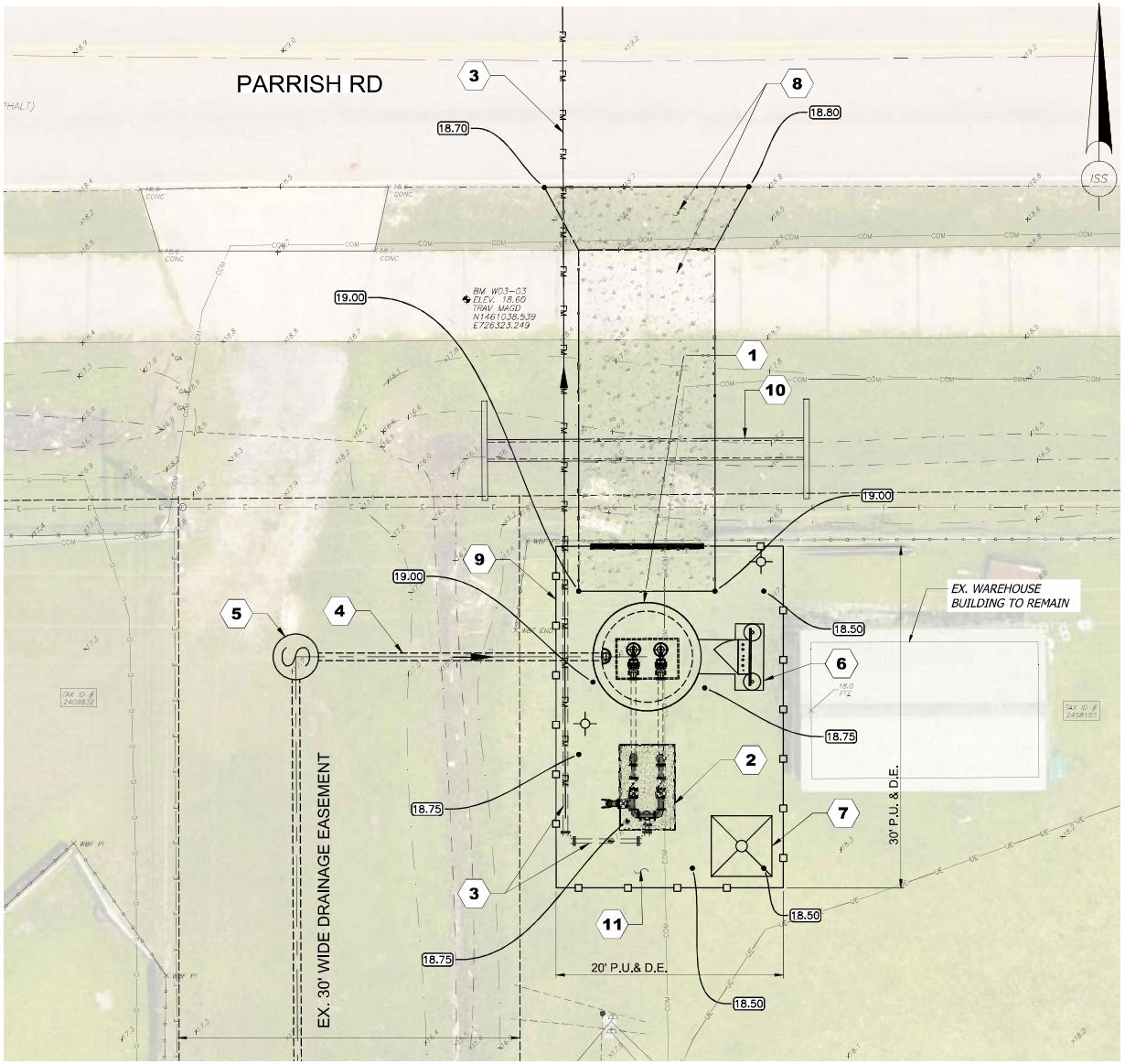

PROPOSED IMPROVEMENTS

1. Construct a new precast 8 feet diameter (inside dimension) reinforced concrete wetwell with cover slab. Install new pumps, base elbows, discharge piping, guide rails and other appurtenances in accordance with the detail shown on sheet C-08. Pumps shall be in accordance with the manufacturers' pump curves shown on Sheet C-08. Also comply with the requirements of the Brevard County lift station notes provided on Sheet C-38. The cover slab shall have hatches with dual leaf fall protection grating.
   Layout information:
   Wetwell Center - N 1461007.17 E 726339.13
   Influent Sewer Invert El. shall be as shown in the table on sheet C-08.
2. Construct above ground 6" thick concrete valve pad (3,000 PSI W/ FIBERMIX). Install valve assembly in accordance with detail shown on Sheet C-08.
   Layout information:
   Northeast Corner - N 1460999.41 E 726341.55
   Southwest Corner - N 1460991.98 E 726336.75
3. Install 4" PVC forcemain complying with AWWA C900, Pressure Class 150 and dimension ratio of DR18 with gasketed integral bell ends.
4. Install 27 lf 8" C900 PVC gravity sewer at 0.75% slope.
5. Install 5' diameter manhole. (See detail US-21 on Sheet C-37)
   Layout information: Center: N 1461007.16 E 726308.22
   Rim El.: 17.67
   East Invert (Out) El.: 0.78
   South Invert (In) El.: 0.88
   Manhole shall be lined using Brevard county approved lining suppliers.
6. Install new electrical control panels per electrical drawings.
7. Install new RTU panel and 30' antenna per electrical drawings.
8. Construct 12-foot wide concrete driveway and apron with 6" thick 3,000 PSI FIBERMIX concrete. Provide 6" thick sub grade stabilized to 98% Modified Proctor density. Concrete apron shall match the existing grade. Refer to Exhibits 18 and 20 on Sheet C-36 for geometry and construction requirements. Refer to Brevard County Public Works Engineering Standard Development Notes on Sheets C-40.
9. Install 100 lf of new fence with 10' wide slide gate at the location shown. Fence shall be Type "B" in accordance with FDOT Index 802 and the slide gate shall be in accordance with FDOT Index 803.
10. Install 28 L.F. of 18" Dia. CMP culvert with end walls on each side.
11. Grade entire lift station site to maintain existing drainage patterns. Grade west side of drive (along drainage easement) @ 3:1. Grade south and west side of lift station @4:1.

GRAPHIC SCALE
0 5 10
1"=5'

811 Know what's below. Call before you dig.

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Kiran Kulkarni, P.E. #39114

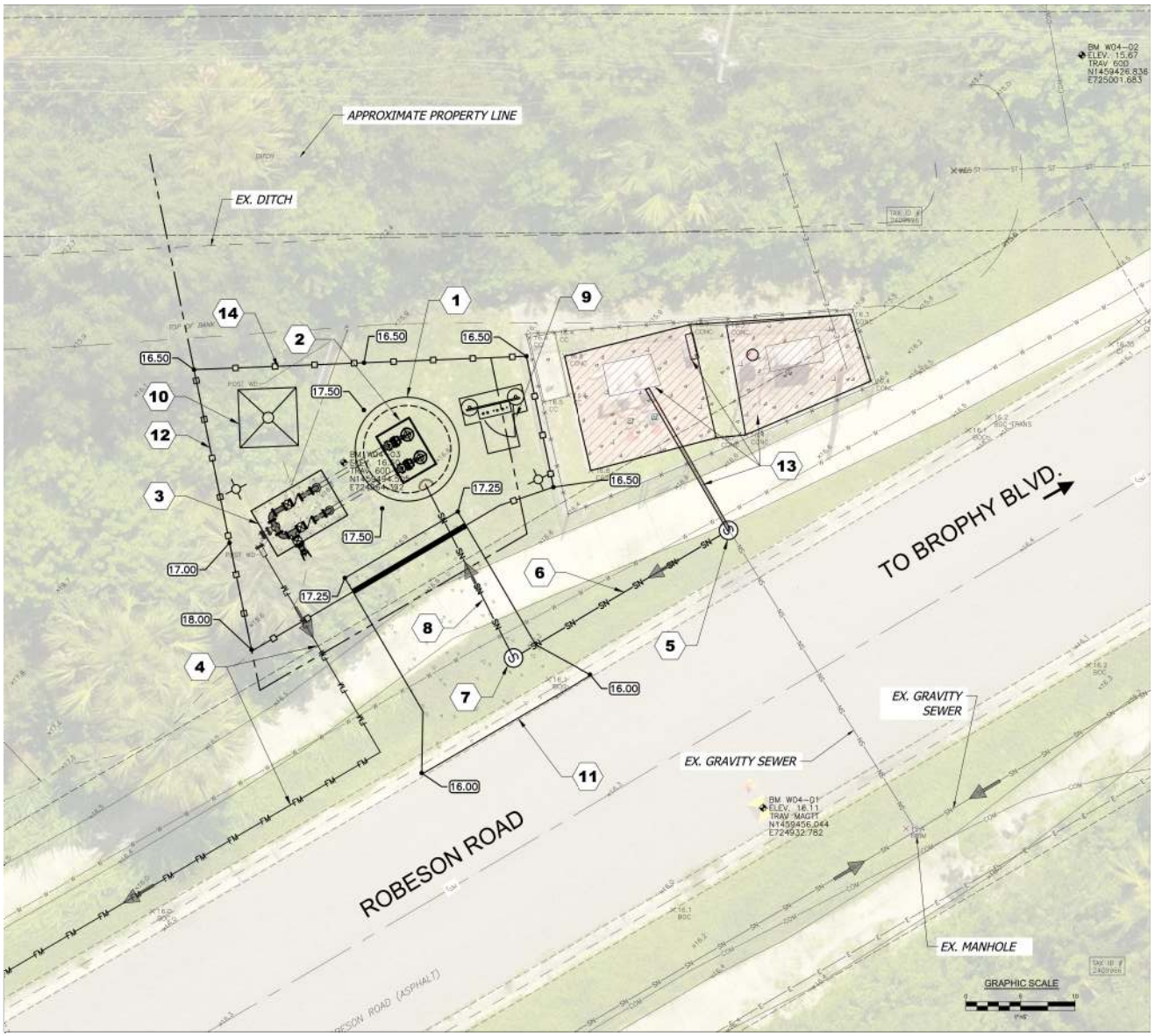
NO.	DATE:	DESCRIPTION
		REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE:
PROPOSED LS W-03 SITE, GRADING AND EROSION CONTROL PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT:
BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.:	PROJ. MGR.
BRV017	KVK
DATE:	DRWN. BY:
12/15/17	PKK
SCALE:	CHKD. BY:
1" = 5'	KVK
DRAWING NO:	
11 of 105	
SHEET NO.	
C-07	



PROPOSED IMPROVEMENTS

1. Construct a new 6-foot diameter wetwell and install new pumps, base elbows, discharge piping, guide rails and other appurtenances in accordance with the details shown on Sheet C-11. Pumps shall be in accordance with the manufacturers' pump curves shown on Sheet C-11. Also comply with the requirements of the Brevard county lift station notes provided on Sheet C-38.

   Layout information:

   Wet well center: N 1459488.70 E 724965.61

   Influent Sewer Invert El. shall be as shown in the table on sheet C-11.

2. Install precast concrete wetwell cover. The cover shall include dual leaf fall protection grating. Top of cover slab shall be at elevation shown in the table on Sheet C-11.
3. Construct above ground 6" thick concrete valve pad (3,000 psi w/ FIBERMIX). Install valve assembly in accordance with detail shown on Sheet C-11.

   Layout information:

   Northeast Corner - N 1459502.99 E 724959.96

   Southwest Corner - N 1459494.16 E 724959.57
4. Install 4" PVC forcemain complying with AWWA C900, Pressure Class 150 and dimension ratio of DR18 with gasketed integral bell ends.
5. Install 5' diameter doghouse manhole. (See detail US-26 ON Sheet C-37)

   Layout information:

   Center: N 1459459.21 E 724958.18

   Rim El.: 16.6

   Southwest Invert (In) Elevation (Ex.): 4.49±

   Northwest Invert (Out) Elevation: 4.30
6. Install 23 lf 8" C900 PVC gravity sewer at 0.40% slope.
7. Install 5' diameter manhole. (See detail US-21 on Sheet C-37)

   Layout information: Center: N 1459478.96 E 724946.50

   Rim El.: 16.10

   East Invert (Out) El.: 4.11

   Southwest Invert (In) El.: 4.21

   Manhole shall be lined using Brevard county approved lining suppliers.
8. Install 18 lf 8" C900 PVC gravity sewer at 0.40% slope.
9. Install new electrical control panels per electrical drawings.
10. Install new RTU panel and 40' antenna per electrical drawings.
11. Construct 12-foot wide concrete driveway and apron with 6" thick 3,000 PSI FIBERMIX concrete. Provide 6" thick sub grade stabilized to 98% Modified Proctor density. Concrete apron shall match the existing grade. Refer to Exhibits 18 and 20 on Sheet C-36 for geometry and construction requirements. Refer to Brevard County Public Works Engineering Standard Development Notes on Sheets C-40.
12. Install 98 lf of new fence with 12' wide slide gate at the location shown. Fence shall be Type "B" in accordance with FDOT Index 802 and the slide gate shall be in accordance with FDOT Index 803.
13. For demolition notes see Sheet C-09.
14. Proposed Lift Station Easement.

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NO.	DATE:	DESCRIPTION
		REVISIONS

Kian Kalkani, P.E. #78114

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE:
LS W-04 SITE, GRADING AND EROSION CONTROL PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT:
BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: PKK
SCALE: 1" = 5'	CHKD. BY: KVK
DRAWING NO.: 14 of 105	
SHEET NO.: C-10	

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GRAPHIC SCALE

0 5 10

1"=5'

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PROPOSED IMPROVEMENTS

1. Construct a new 8 foot diameter wetwell and install new pumps, base elbows, discharge piping, guide rails and other appurtenances in accordance with the details shown on sheet C-16. Pumps shall be in accordance with the manufacturers' pump curves shown on Sheet C-16. Also comply with the requirements of the Brevard County lift station notes provided on Sheet C-38.

   Layout information:

   Wet well center: N 1463167.17 E 719641.53

   Influent Sewer Invert El. shall be as shown in the table on sheet C-16.

2. Install precast concrete wetwell cover. The cover shall include dual leaf fall protection grating. Top of cover slab shall be at elevation shown in the table on Sheet C-16.

3. Construct above ground 6" thick concrete valve pad (3,000 PSI W/ FIBERMIX). Install valve assembly in accordance with detail shown on Sheet C-16.

   Layout information:

   Northeast Corner - N 1463179.21 E 719651.10

   Southwest Corner - N 1463175.13 E 719643.26

4. Install a 6" X 4" D.I.P. reducer.
5. Install 6" PVC forcemain complying with AWWA C900, Pressure Class 150 and dimension ratio of DR18 with gasketed integral bell ends.
6. SSMH #3. Install new 5' dia. manhole. See sheet C-83 for details.
7. Install new electrical control panels per electrical drawings.
8. Install new RTU panel and 40' antenna per electrical drawings.
9. Construct 12-foot wide concrete driveway and apron with 6" thick 3,000 PSI FIBERMIX concrete. Provide 6" thick sub grade stabilized to 98% Modified Proctor density. Concrete apron shall match the existing grade. Refer to Exhibits 18 and 20 on Sheet C-36 for geometry and construction requirements. Refer to Brevard County Public Works Engineering Standard Development Notes on Sheets C-40 .
10. Install 120 lf of new fence with 12' wide slide gate at the location shown. Fence shall be Type "B" in accordance with FDOT Index 802 and the slide gate shall be in accordance with FDOT Index 803.
11. Install 101 lf 8" PVC gravity sewer at 0.40% slope
12. SSMH #4. Install 5' diameter manhole (See detail US-21 on Sheet C-37)

    Rim El. 18.90 feet

    Northeast Invert (In) El. : 6.76

    Southwest Invert (In) Ex. El. : 10.99

    Southeast Invert (Out) El. : 6.66
13. Install 35 lf 8" C900 PVC gravity sewer at 0.40% slope.
14. SSMH # #5. Install 5' diameter manhole (See detail US-21 on Sheet C-37)

    Rim El. 19.75 feet

    Northwest Invert (In) El. : 6.52

    South Invert (In) Ex. El. : unknown

    Northeast Invert (Out) El. : 6.42
15. Install 18 lf 8" C900 PVC gravity sewer at 0.67% slope.
16. Proposed Lift Station easement.

Kiran Kulkarni, P.E. #70114

NO.	DATE:	DESCRIPTION REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE:
LS W-07 SITE, GRADING AND EROSION CONTROL PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT:
BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.:	PROJ. MGR.
BRV017	KVK
DATE:	DRWN. BY:
12/15/17	PKK
SCALE:	CHKD. BY:
1" = 5'	KVK
DRAWING NO.:	
19 of 105	
SHEET NO.:	
C-15	

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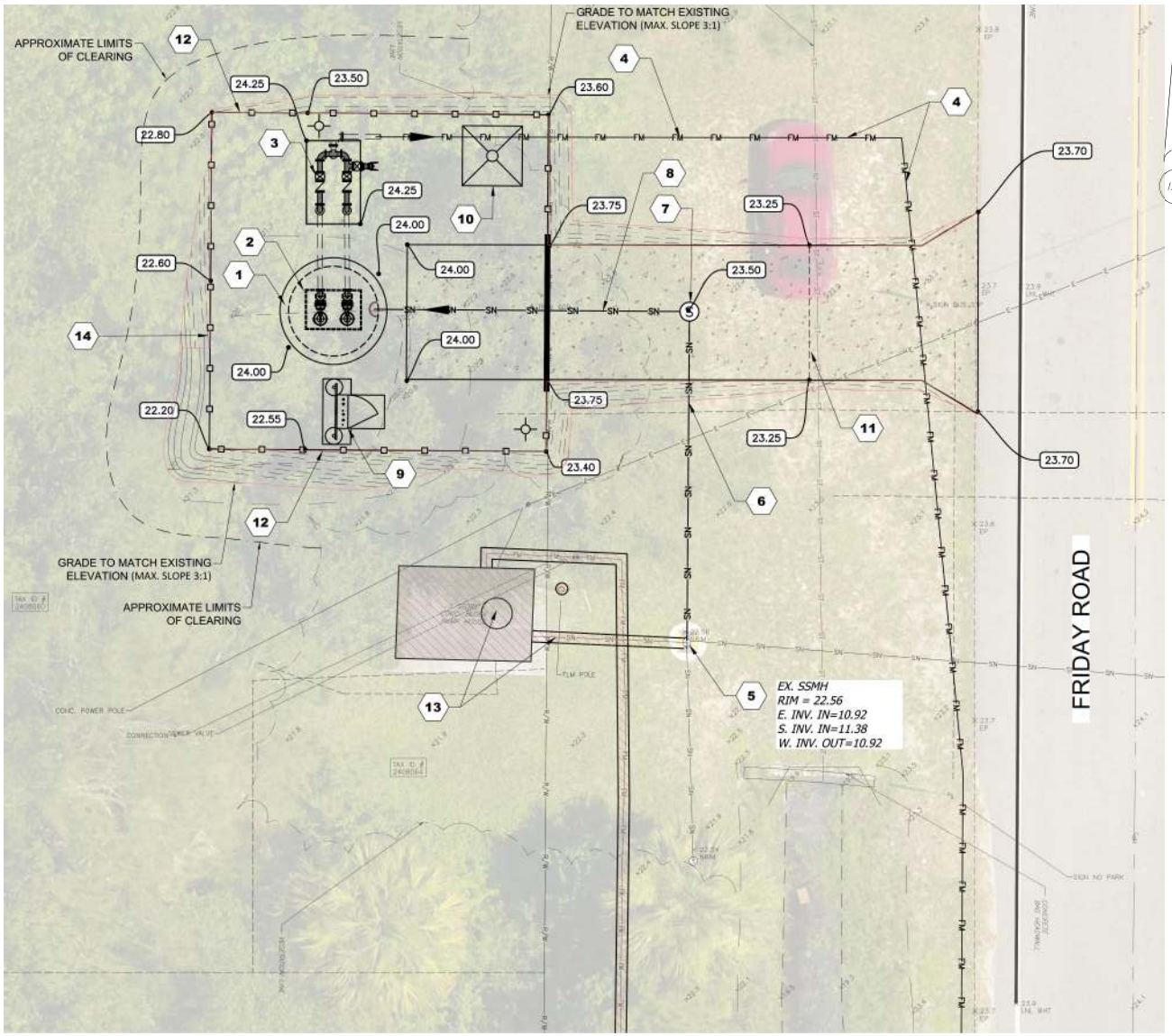

PROPOSED IMPROVEMENTS

1. Construct a new 8- foot diameter wetwell and install new pumps, base elbows, discharge piping, guide rails and other appurtenances in accordance with the details shown on Sheet C-19. Pumps shall be in accordance with the manufacturers' pump curves shown on Sheet C-19. Also comply with the requirements of the Brevard County lift station notes provided on Sheet C-38.

   Layout information:

   Wetwell Center: N 1466339.91 E 718978.06

   Influent Sewer Invert El. shall be as shown in the table on sheet C-19.

2. Install precast reinforce concrete wetwell cover. The cover shall include dual leaf fall protection grating. Top of the cover slab shall be at elevation shown in the table on Sheet C-19.

3. Construct above ground 6" thick concrete valve pad (3,000 PSI w/ FIBERMIX). Install valve assembly in accordance with detail shown on Sheet C-19.

   Layout information:

   Northeast Corner - N 1466355.10 E 718980.46

   Southwest Corner - N 1466347.68 E 718975.66

4. Install 4" PVC forcemain complying with AWWA C900, Pressure Class 150 and dimension ratio of DR18 with gasketed integral bell ends.

5. Core Drill N. Inv. Elev. @ 10.92. Clean and rehabilitate existing manhole including:

   A. Clean & prepare surface in accordance with coating manufacturer recommendations.

   B. Seal all openings with non-shrink grout to full wall thickness.

   C. Seal any water leaks with, mainstay ml-10 hydraulic cement mortar by Madewell Products Corp, Alpharetta, Ga, or equivalent product from Raven Lining System, Broken Arrow, Ok.

   D. Apply Mainstay ML-72 mortar by Madewell Products Corp, Alpharetta, Ga, or equivalent product from Raven Lining System, Broken Arrow, Ok.

   E. Apply Mainstay ML-5 epoxy by Madewell Products Corp, Alpharetta, Ga, or equivalent product from Raven Lining System, Broken Arrow, Ok.

   F. Replace manhole frame and cover.

6. Install 30 lf 8" C900 PVC gravity sewer at 0.40% slope with the north invert of the pipe at the manhole invert.

7. SSMH#1 Install 5' diameter manhole. (See detail US-21 on Sheet C-37)

   Layout information:

   Center: N 1466339.86 E 719009.83

   Rim El.: 23.50 feet

   West Invert (Out) El.: 10.67

   South Invert (In) El.: 10.77

   Manhole shall be lined using Brevard county approved lining suppliers.

8. Install 28 lf 8" C900 PVC gravity sewer at 0.40% slope connecting to the proposed wetwell.

9. Install new electrical control panels per electrical drawings.

10. Install new RTU panel and 40' antenna per electrical drawings.

11. Construct 12-foot wide concrete driveway and apron with 6" thick 3,000 PSI FIBERMIX concrete. Provide 6" thick sub grade stabilized to 98% Modified Proctor density. Concrete apron shall match the existing grade. Refer to Exhibits 18 and 20 on Sheet C-36 for geometry and construction requirements. Refer to Brevard County Public Works Engineering Standard Development Notes on Sheets C-40.

12. Install 110 lf of new fence with 12' wide slide gate at the location shown. Fence shall be Type "B" in accordance with FDOT Index 802 and the slide gate shall be in accordance with FDOT Index 803.

13. For demolition notes see Sheet C-17.

14. Proposed 30'x30' lift station easement.

LIFT STATION GRADING AND DRAINAGE GENERAL NOTES:

1. THE LIFT STATION SITE SHALL BE GRADED TO DIRECT STORMWATER RUN-OFF AWAY FROM ALL STRUCTURES, PADS, AND ELECTRICAL EQUIPMENT. ALL PAVED AND UNPAVED AREAS SHALL BE SLOPED TO PRECLUDE PONDING OF WATER.

GRAPHIC SCALE

0 5 10

1"=5'

811 Know what's below. Call before you dig.

Kian Kulkarni, P.E. #78114

NO.	DATE:	DESCRIPTION REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: LS W-08 SITE, GRADING AND EROSION CONTROL PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.:	PROJ. MGR.:
BRV017	KVK
DATE:	DRWN. BY:
12/15/17	PKK
SCALE:	CHKD. BY:
1" = 5'	KVK
DRAWING NO.:	
22 of 105	
SHEET NO.:	
C-18	

6/7/2018 10:47:27 AM

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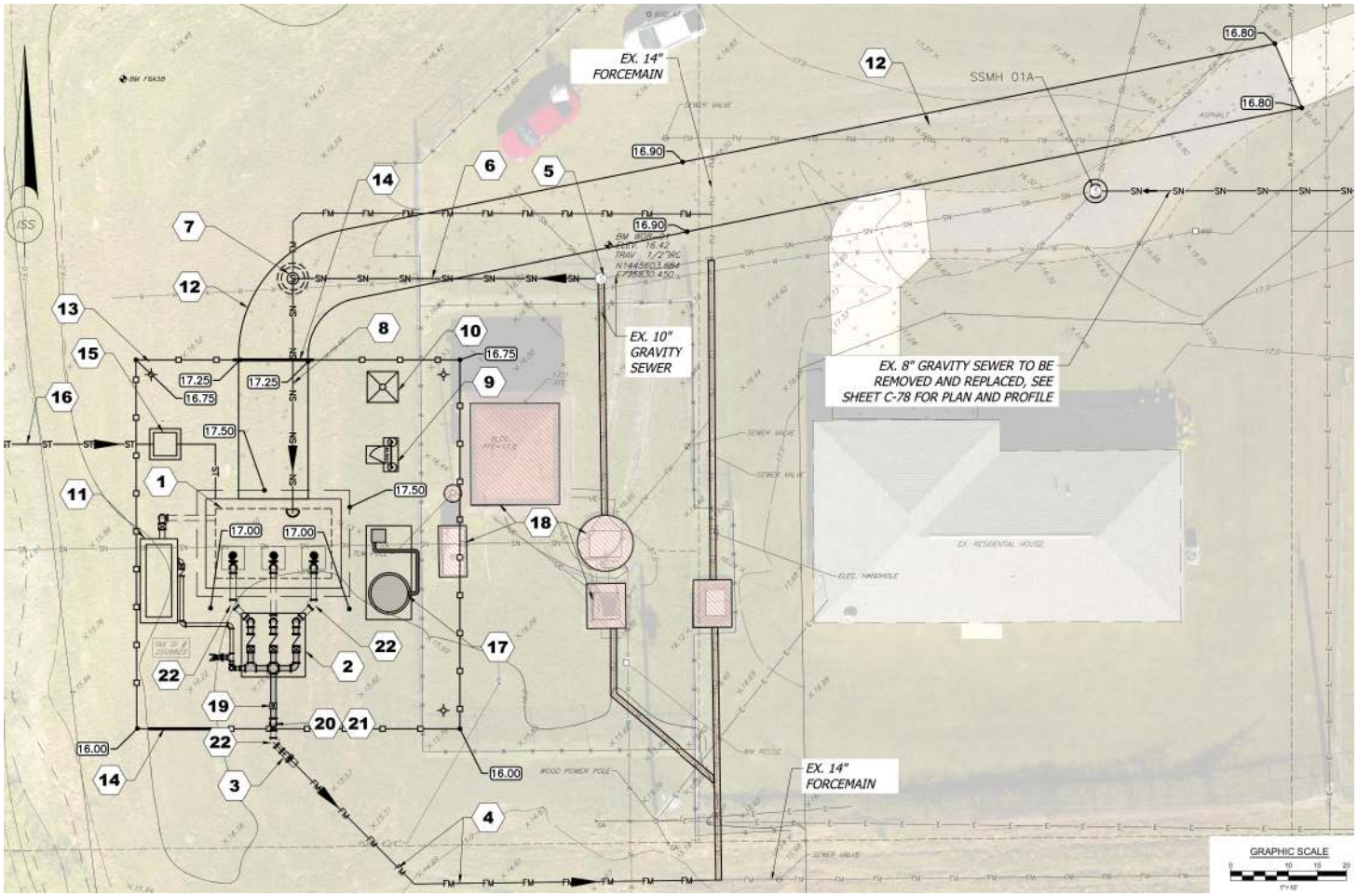

PROPOSED IMPROVEMENTS

1. Construct a new cast in place 20 feet x 12 feet (inside dimension) reinforced concrete wetwell with cover slab. Install new pumps, base elbows, discharge piping, guide rails and other appurtenances in accordance with the details shown on sheet C-22. Pumps shall be in accordance with the manufacturers' pump curves shown on Sheet C-22. Also comply with the requirements of the Brevard County lift station notes provided on Sheet C-38. See Structural sheets S-01 to S-03 for structural details of the reinforced concrete wetwell. The cover slab shall have hatches with dual leaf fall protection grating.

   Layout information:

   Northeast Corner - N 1445559.94 E 735784.27
   Southwest Corner - N 1445544.61 E 735760.94
   Influent Sewer Invert El. shall be as shown in the table on sheet C-22.

2. Construct above ground 6" thick concrete valve pad (3,000 PSI W/ FIBERMIX). Install valve assembly in accordance with detail shown on Sheet C-22.

   Layout information:

   Northeast Corner - N 1445540.28 E 735778.10

   Southwest Corner - N 1445529.28 E 735767.10

3. Install a 14" X 10" D.I.P. reducer.
4. Install new 14" D.I.P forcemain complying with AWWA C-151 and minimum Pressure Class 250. Connect to Ex. 14" Forcemain.
5. Clean and rehabilitate existing manhole including:

   Clean & prepare surface in accordance with coating manufacturer recommendations.

   Seal all openings with non-shrink grout to full wall thickness.

   Seal any water leaks with, mainstay ml-10 hydraulic cement mortar by Madewell Products Corp, Alpharetta, Ga, or or equivalent product from Raven Lining System, Broken Arrow, Ok.

   Apply Mainstay ML-72 mortar by Madewell Products Corp, Alpharetta, Ga, or equivalent product from Raven Lining System, Broken Arrow, Ok.

   Apply Mainstay ML-5 epoxy by Madewell Products Corp, Alpharetta, Ga, or equivalent product from Raven Lining System, Broken Arrow, Ok.

   Core manhole for the connection of the proposed downstream gravity sewer. (I.E. out at 2.12 feet)

6. Install 54 lf 12" C900 PVC gravity sewer at 0.40% slope with the east invert of the pipe at the manhole invert in item 5 above.
7. Install 5' diameter manhole. (See detail US-21 on Sheet C-37)

   Layout information:

   Center: N 1445597.92 E 735775.97

   Diameter: 5 feet

   Rim El.: 17.25 feet

   South Invert (Out) El.: 1.80

   East Invert (In) El.: 1.90

   Manhole shall be lined using Brevard County approved lining suppliers.

8. Install 42 lf 12" C900 PVC gravity sewer at 0.48% slope connecting to the proposed wetwell to the south.
9. Install new electrical control panels per electrical drawings.
10. Install new RTU panel and 30' antenna per electrical drawings.
11. Install new emergency diesel pump with integral fuel tank including all suction and discharge piping, valves and fittings. See structural drawings for reinforced concrete pad details and electrical drawings for electrical and instrumentation details.
12. Construct 12-foot wide concrete driveway and apron with 6" thick 3,000 PSI FIBERMIX concrete. Provide 6" thick sub grade stabilized to 98% Modified Proctor density. Concrete apron shall match the existing grade. Refer to Exhibits 18 and 20 on Sheet C-36 for geometry and construction requirements. Refer to Brevard County Public Works Engineering Standard Development Notes on Sheets C-40.
13. Install 225 lf of new fence with 10' wide slide gate at the location shown. Fence shall be Type "B" in accordance with FDOT Index 802 and the slide gate shall be in accordance with FDOT Index 803.
14. Install two 12' wide slide gates in accordance with FDOT Index 803.
15. Install new stormwater augmentation pump on reinforced concrete pad for supplemental water. See technical specifications for details. The system shall include lake & water level monitoring system.
16. Install 53 lf of 8" PVC suction line to pond for augmentation pump.
17. Install proposed Odor Control System.
18. Demolish existing lift station structures. See Sheet C-20 for details.
19. Install 10" magnetic flowmeter.
20. Install 10" 90° flanged above grade fitting (down)
21. Install 10" 90° MJ below grade fitting (up)
22. install 10" 45° MJ fitting

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Kiran Kulkarni, P.E. #39114

NO.	DATE:	DESCRIPTION
		REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: LS W-09 SITE, GRADING AND EROSION CONTROL PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: PKK
SCALE: 1" = 10'	CHKD. BY: KVK
DRAWING NO: 25 of 105	
SHEET NO.: C-21	

6/7/2019 10:48:13 AM

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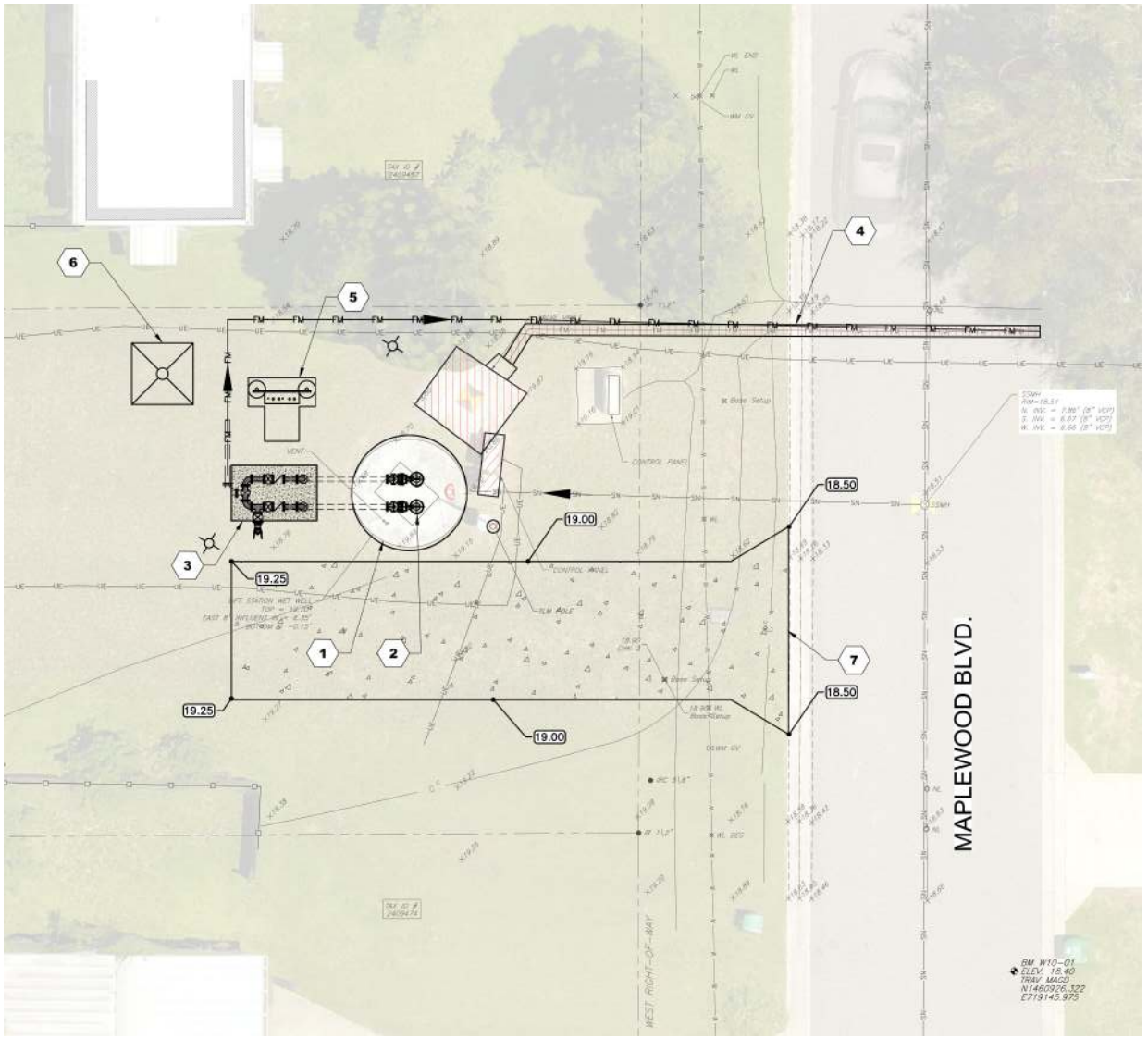

GRAPHIC SCALE

0 5 10

1"=5'

ISS

PROPOSED IMPROVEMENTS

1. Clean and rehabilitate existing 6' diameter wetwell including:
   - A. Clean & prepare surface in accordance with coating manufacturer recommendations.
   - B. Seal all openings with non-shrink grout to full wall thickness.
   - C. Seal any water leaks with, mainstay ml-10 hydraulic cement mortar by Madewell Products Corp, Alpharetta, Ga, or equivalent product from Raven Lining System, Broken Arrow, Ok.
   - D. Apply Mainstay ML-72 mortar by Madewell Products Corp, Alpharetta, Ga, or equivalent product from Raven Lining System, Broken Arrow, Ok.
   - E. Apply Mainstay ML-5 epoxy by Madewell Products Corp, Alpharetta, Ga, or equivalent product from Raven Lining System, Broken Arrow, Ok.
   - F. Install new precast concrete wetwell cover. The cover shall include dual leaf fall protection grating. Top of cover slab shall be at elevation shown in the table on Sheet C-25. The cover shall be as shown on Sheet C-25.
2. Install new pumps, base elbows, discharge piping, guide rails and other appurtenances in accordance with the details shown on Sheet C-25. Pumps shall be in accordance with the manufacturers' pump curves shown on Sheet C-25. Also comply with the requirements of the Brevard County lift station notes provided on Sheet C-38.
3. Construct above ground 6" thick concrete valve pad (3,000 PSI W/ FIBERMIX). Install valve assembly in accordance with detail shown on Sheet C-25.

   Layout information:

   Northeast Corner - N 1460970.22 E 719085.33

   Southwest Corner - N 1460965.42 E 719077.90
4. Replace the existing 6" PVC forcemain with a new 4" C900 PVC forcemain and connect to the existing 4" PVC forcemain across the street. The new forcemain shall comply with AWWA C900, Pressure Class 150 and dimension ratio of DR18 with gasketed integral bell ends.
5. Install new electrical control panels per electrical drawings.
6. Install new RTU panel and antenna per electrical drawings.
7. Construct 12-foot wide concrete driveway and apron with 6" thick 3,000 PSI FIBERMIX concrete. Provide 6" thick sub grade stabilized to 98% Modified Proctor density. Concrete apron shall match the existing grade. Refer to Exhibits 18 and 20 on Sheet C-36 for geometry and construction requirements. Refer to Brevard County Public Works Engineering Standard Development Notes on Sheets C-40.

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Kiran Kulkarni P.E. # 39114

NO.	DATE:	DESCRIPTION
		REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: LS W-10 SITE, GRADING AND EROSION CONTROL PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.	PROJ. MGR.
BRV017	KVK
DATE:	DRWN. BY:
12/15/17	PKK
SCALE:	CHKD. BY:
1" = 5'	KVK

DRAWING NO: 28 of 105

SHEET NO. C-24

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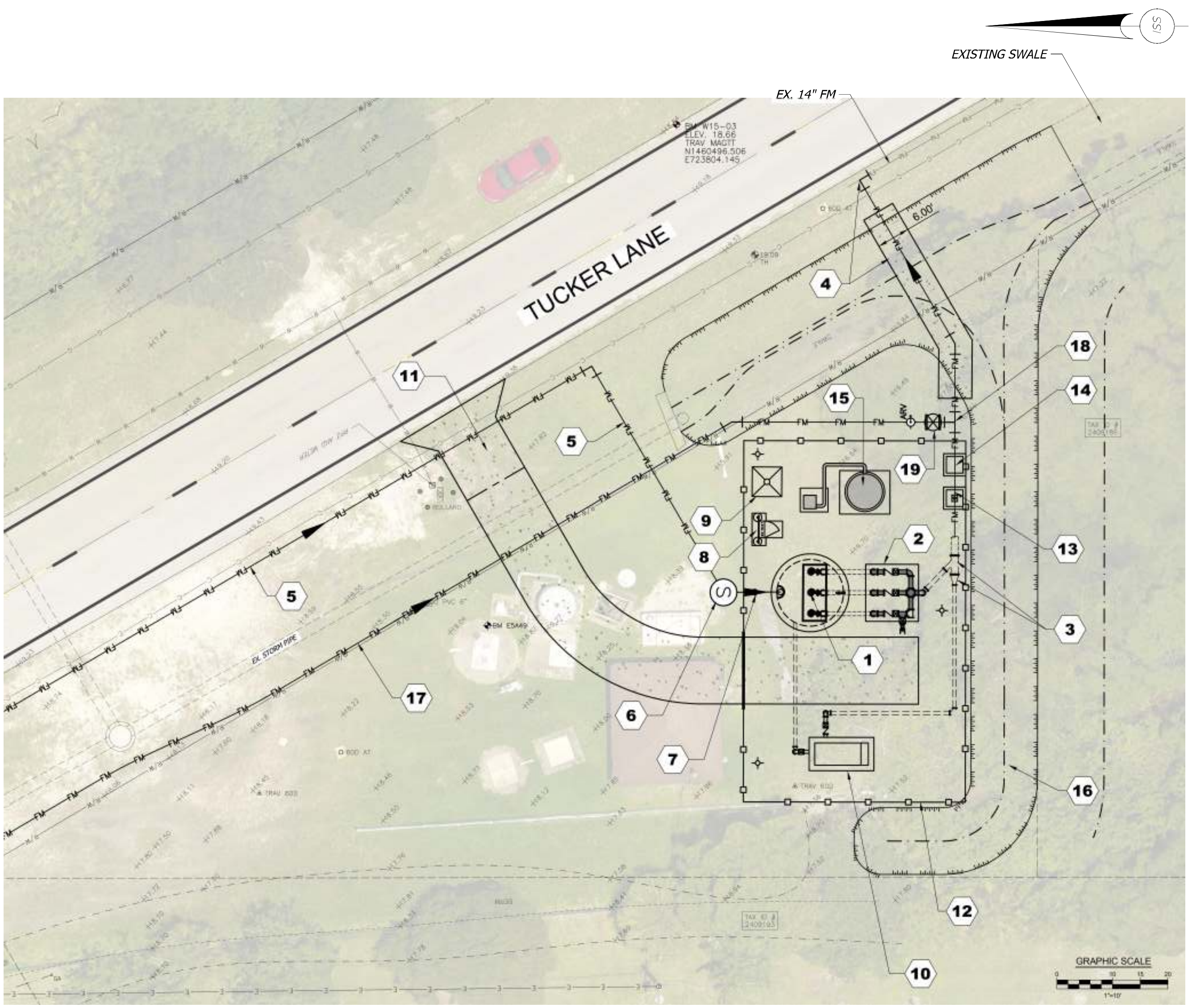


PROPOSED IMPROVEMENTS

1. Construct a new precast 12 feet diameter (inside dimension) reinforced concrete wetwell with cover slab. Install new pumps, base elbows, discharge piping, guide rails and other appurtenances in accordance with the details shown on sheet C-29. Pumps shall be in accordance with the manufacturers' pump curves shown on Sheet C-29. Also comply with the requirements of the Brevard County lift station notes provided on Sheet C-38. The cover slab shall have hatches with dual leaf fall protection grating.
   Layout information:
   Center - N 1460472.42 E 723719.93
   Influent Sewer Invert El. shall be as shown in the table on sheet C-29.
2. Construct above ground 6" thick concrete valve pad (3,000 PSI W/ FIBERMIX). Install valve assembly in accordance with detail shown on Sheet C-29.
   Layout information:
   Northeast Corner - N 1460462.41 E 723725.06
   Southwest Corner - N 1460452.91 E 723714.78
3. Install a 14" X 8" D.I.P. reducing wye and 8" X 6" D.I.P. reducer.
4. Install new 14" D.I.P discharge forcemain complying with AWWA C-151 and minimum Pressure Class 250. Deflect pipe under ditch with minimum 36" separation between top of pipe and bottom of ditch. Construct 6' WIDE concrete pad at bottom of ditch where pipe crosses. See Detail U-68 on Sheet C-28 for crossing requirements. Connect to Ex. 14" forcemain.
5. Proposed re-routed 12" D.I.P. forcemain from LS W-20; connect to the proposed manhole. The force main shall comply with AWWA C-151 and minimum Pressure Class 250.
6. Install 4' diameter manhole. (See detail US-21 on Sheet C-37)
   Layout information:
   Center: N 1460488.05 E 723720.01
   Rim El.: 19.50 feet
   South Invert (Out) El.: 11.80
   North Invert (In) El.: 12.40
   Manhole shall be lined using Brevard County approved lining suppliers.
7. Install 13 lf 18" C900 PVC gravity sewer at 1.0% slope with the east invert of the pipe at the manhole invert in item 6 above.
8. Install new electrical control panels per electrical drawings.
9. Install new 40' RTU panel and antenna per electrical drawings.
10. Install new emergency diesel pump with integral fuel tank on the reinforced concrete pad along with suction and discharge piping, valves and fittings. See structural drawings for details of the concrete pad and the electrical drawings for electrical and instrumentation details.
11. Construct 12-foot wide concrete driveway and apron with 6" thick 3,000 PSI FIBERMIX concrete. Provide 6" thick sub grade stabilized to 98% Modified Proctor density. Concrete apron shall match the existing grade. Refer to Exhibits 18 and 20 on Sheet C-36 for geometry and construction requirements. Refer to Brevard County Public Works engineering standard development notes on Sheets C-40.
12. Install 210 lf of new fence with 10' wide slide gate at the location shown. Fence shall be Type "B" in accordance with FDOT Index 802 and the slide gate shall be in accordance with FDOT Index 803.
13. Install flowmeter vault and 14" magnetic flowmeter with lockable aluminum hatch (See Sheet C-36 for flowmeter vault detail).
14. Install flowmeter calibration box.
15. Construct 4' x 5' and 8' x 9' concrete pad and relocate Odor control system.
16. Proposed swale re-alignment, see Sheet C-28 for grading.
17. Proposed forcemain from LS W-01, see Sheets C-41 to C-44.
18. Proposed 14"x14"x8" MJ Tee.
19. Proposed 8" Gate Valve.

Know what's below. Call before you dig.

Kiran Kulkarni, P.E.
36114

NO.	DATE:	DESCRIPTION
		REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: LS W-15 SITE PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.:	PROJ. MGR.:
BRV017	KVK
DATE:	DRWN. BY:
12/15/17	PKK
SCALE:	CHKD. BY:
1" = 10'	KVK

DRAWING NO: 31 of 105

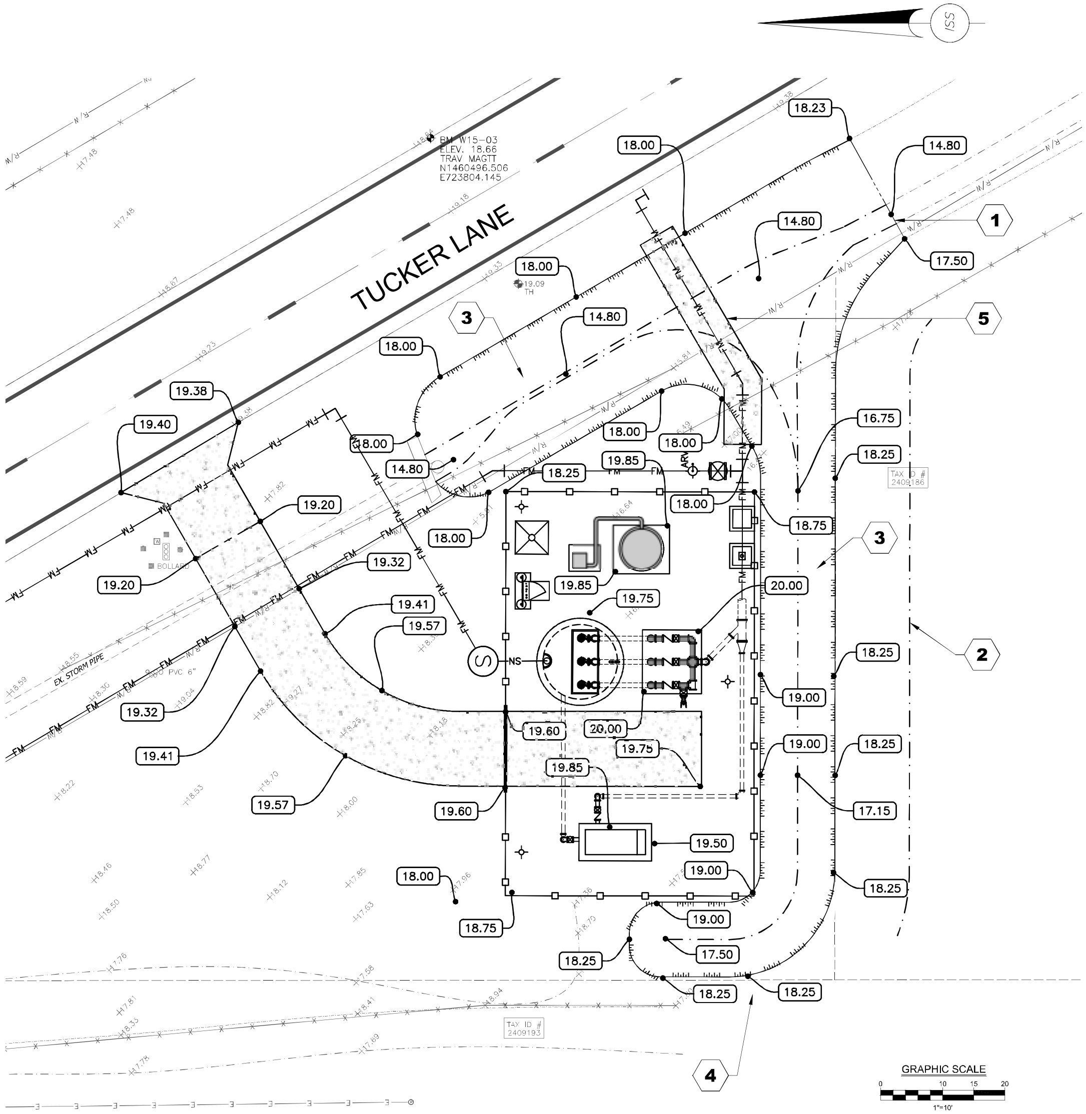
SHEET NO. C-27

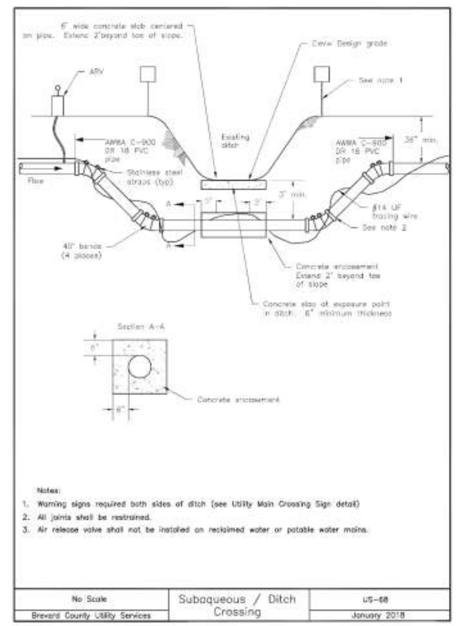
LIFT STATION GRADING AND DRAINAGE KEY NOTES:

1. Transition proposed swale to match existing swale alignment.
2. Limits of clearing. Slope top of bank to match existing grade on adjacent property
3. Grade area from top of bank to toe of slope with a uniform slope (Max. slope 3:1).
4. Grade area to provide positive drainage to proposed swale.
5. Concrete pad, top at Elev. 14.80±. See detail US-68 on this sheet.

LIFT STATION GRADING AND DRAINAGE GENERAL NOTES:

1. THE LIFT STATION SITE SHALL BE GRADED TO DIRECT STORMWATER RUN-OFF AWAY FROM ALL STRUCTURES, PADS, AND ELECTRICAL EQUIPMENT. ALL PAVED AND UNPAVED AREAS SHALL BE SLOPED TO PRECLUDE PONDING OF WATER.





Kiran Kulkarni, P.E. # 36114

NO.	DATE:	DESCRIPTION REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: LS W-15 GRADING AND EROSION CONTROL PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: PKK
SCALE: 1" = 10'	CHKD. BY: KVK
DRAWING NO: 32 of 105	
SHEET NO. C-28	

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PROPOSED IMPROVEMENTS

1. Install new pumps, base elbows, discharge piping, guide rails and other appurtenances in accordance with the details shown on sheet C-32. Pumps shall be in accordance with the manufacturers' pump curves shown on Sheet C-32. Also comply with the requirements of the Brevard county lift station notes provided on Sheet C-38. Replace the existing hatches in the wetwell cover slab with new hatches with dual leaf safety grating.
2. Construct above ground 6" thick 11' x 9' concrete valve pad (3,000 PSI W/ FIBERMIX). Install valve assembly in accordance with detail shown on Sheet C-32.

   Layout information:
   Northeast Corner - N 1463659.15 E 711615.90
   Southwest Corner - N 1463650.67 E 711604.83

   Connect two discharge pipes to the 12" header pipe via the ex. 12" x 8" Tees. Plug third 12" x 8" D.I. Tee at 8" end.
3. Replace ex. flowmeter (see specifications for detail)
4. Connect new 10" diameter C900 PVC force main to the existing manhole at an elevation max.two feet higher than the invert elevation of the manhole. Manhole shall be lined using Brevard county approved lining suppliers.
5. Replace electrical control panels in the building.
6. Ex. 12" x 8" D.I. Tees to remain.
7. Install 8" D.I. Plugs.
8. Install new emergency diesel pump with integral fuel tank on a reinforced concrete pad along with all suction and discharge piping, valves and fittings. See structural drawings for concrete pad details. See electrical plans for the electrical and instrumentation details.

GRAPHIC SCALE
0 5 10
1"=5'

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Kiran Kulkarni, P.E. #39114

NO.	DATE:	DESCRIPTION
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INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE:
LS W-20 SITE, GRADING AND EROSION CONTROL PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT:
BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.:	PROJ. MGR.
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DRAWING NO:
35 of 105

SHEET NO.
C-31

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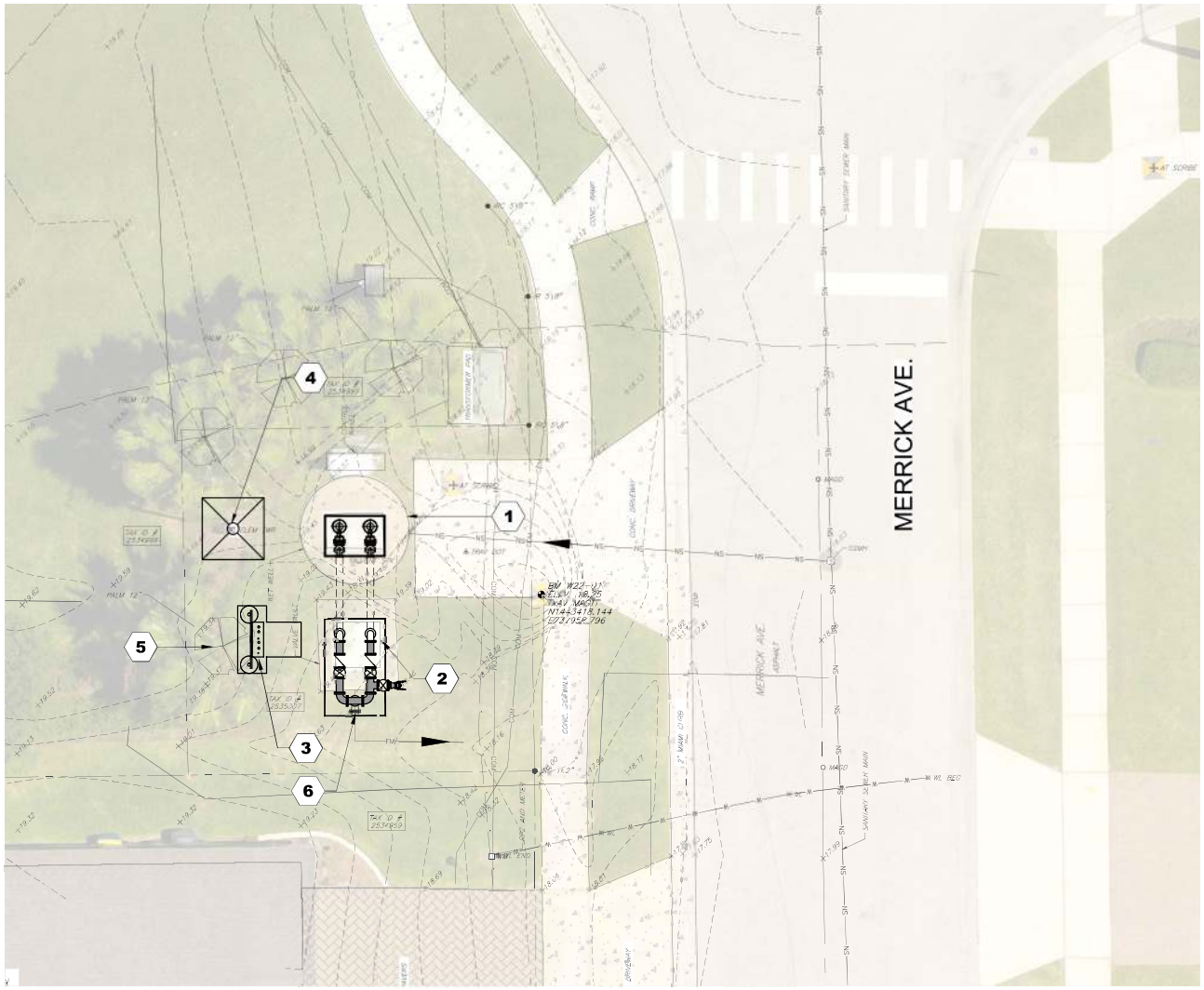

PROPOSED IMPROVEMENTS

1. Install new pumps, base elbows, discharge piping, guide rails and other appurtenances in accordance with the details shown on sheet C-36. Pumps shall be in accordance with the manufacturers' pump curves shown on Sheet C-35. Also comply with the requirements of the Brevard County lift station notes provided on Sheet C-36.
2. Construct above ground 6" thick concrete valve pad (3,000 PSI W/ FIBERMIX). Install valve assembly in accordance with detail shown on Sheet C-35. Match Existing grade.

   Layout information:

   Northeast Corner - N 1443416.03 E 737945.32

   Southwest Corner - N 1443407.66 E 737940.07

   Connect to the existing forcemain.
3. Install new electrical control panels per electrical drawings.
4. Install new RTU panel and 30' antenna per electrical drawings.
5. Relocate landscaping minimum 4 feet away from the proposed electrical panel.
6. Install new 6" D.I.P Forcemain. Connect to Ex. 6" Forcemain.

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NO.	DATE:	DESCRIPTION REVISIONS

Kiran Kulkarni, P.E. #75174

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE:
LS W-22 SITE, GRADING AND EROSION CONTROL PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT:
BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.:	PROJ. MGR.:
BRV017	KVK
DATE:	DRWN. BY:
12/15/17	PKK
SCALE:	CHKD. BY:
1" = 5'	KVK

DRAWING NO.: 38 of 105

SHEET NO.: C-34

6/7/2019 10:51:06 AM

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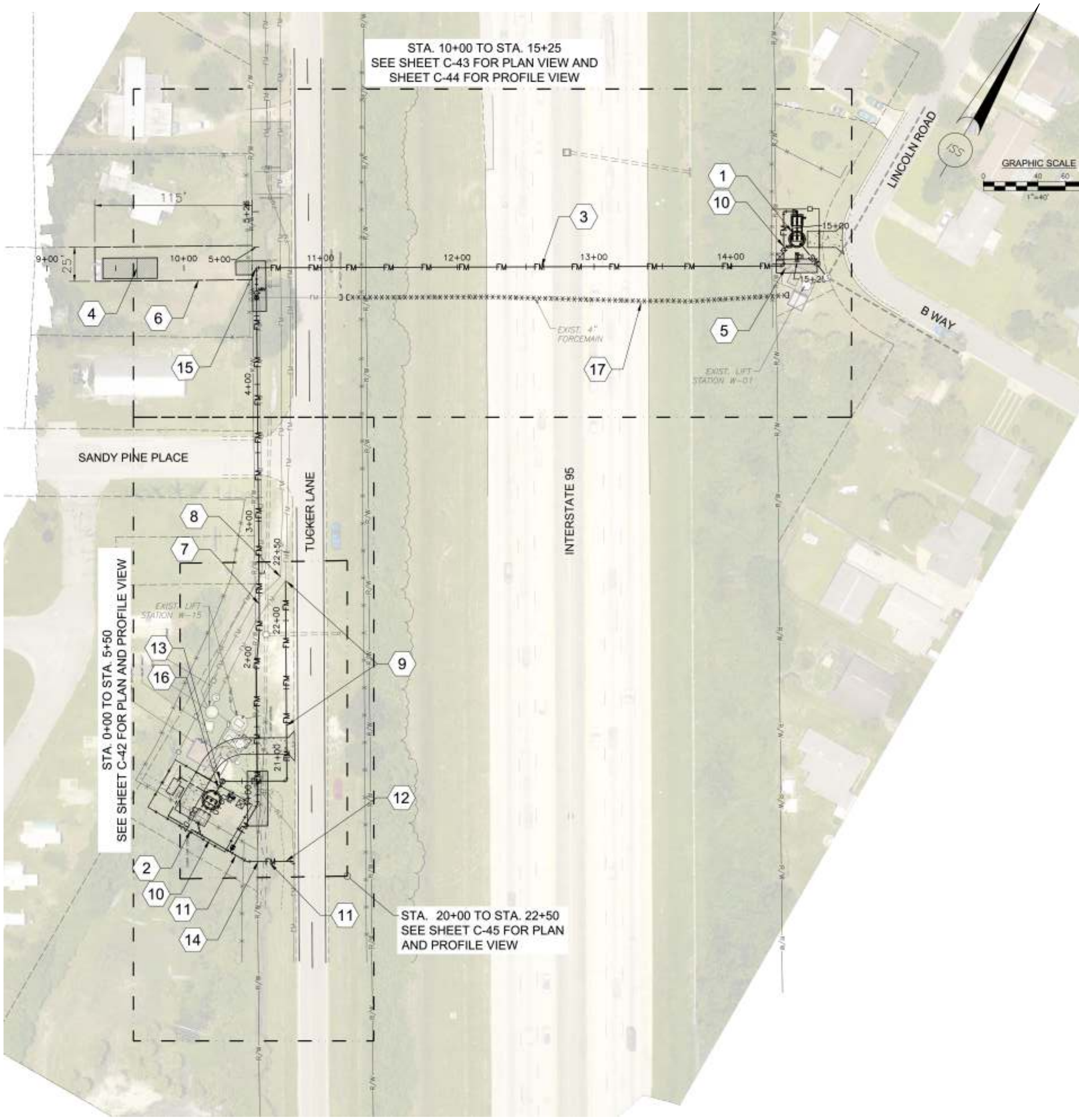

LS W-01 & LS W-15 Sewer FM Notes

1. Proposed LS W-01, see Sheets C-02 to C-04 for site specific details.
2. Proposed LS W-15, see Sheets C-26 to C-29 for site specific details.
3. Proposed 20"Ø PE-4710 horizontal directional drill (HDD) casing for proposed 8"Ø forcemain. See Sheet C-44 for profile
4. Horizontal directional drill (HDD) pilot entry point (towards east).
5. Horizontal directional drill (HDD) receiving pit (from west).
6. Proposed 25'x115' temporary construction easement for drilling rig unit staging area.
7. Proposed 8"Ø PE-4710 horizontal directional drill (HDD). See Sheet C-42 for profile.
8. Existing 8"Ø forcemain (Placed out of service).
9. Proposed 12"Ø C900 PVC forcemain. See Sheet C-45 for profile.
10. Proposed 8"Ø C900 PVC forcemain.
11. Proposed 14"Ø C900 DIP forcemain.
12. Connect proposed 14"Ø FM to existing 14"Ø FM.
13. Proposed sanitary sewer manhole. See Sheet C-27 for details.
14. Horizontal directional drill (HDD) pilot entry point (towards north).
15. Horizontal directional drill (HDD) receiving pit. (from south).
16. Proposed 8"Ø C900 gravity sewer to wet well, See Sheet C-27 for details.
17. Existing 4" forcemain to be cut, capped, and filled with excavatable flowable fill and placed out of service upon completion

PLAN NOTES:

1. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CROSSING UNDERGROUND UTILITIES, WHETHER SHOWN ON THE PLANS OR LOCATED BY THE UTILITY COMPANY. ALL UTILITIES WHICH INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PREFERABLY BEFORE COMMENCING CONSTRUCTION, IF POSSIBLE. ANY FEES ASSOCIATED WITH UTILITY RELOCATIONS SHALL BE BORNE IN ACCORDANCE WITH RESPECTIVE UTILITY COMPANY STANDARDS. IF IT IS REQUESTED THAT UTILITY COMPANIES MOVE THEIR PARTICULAR UTILITIES, ANY DELAY OR INCONVENIENCE CAUSED TO THE CONTRACTOR BY THE RELOCATION OF THE VARIOUS UTILITIES SHALL BE INCIDENTAL TO THE CONTRACT.
2. THE CONTRACTOR SHALL CONTACT THE FDOT REPRESENTATIVE IDENTIFIED ON THE FDOT UTILITY PERMIT A MINIMUM OF TWO (2) BUSINESS DAYS PRIOR TO STARTING WORK AND AGAIN IMMEDIATELY UPON COMPLETION OF WORK FOR ANY CONSTRUCTION WITHIN THE FDOT RIGHT-OF-WAY.
3. ANY INDIVIDUALS RESPONSIBLE FOR PLACEMENT OF MAINTENANCE OF TRAFFIC CONTROL SCHEMES AND DEVICES IN WORK ZONES ON THE FDOT R/W MUST HAVE PROPER TRAINING. WHILE ON THE JOBSITE, THE CONTRACTOR OR HIS EMPLOYEE RESPONSIBLE FOR TRAFFIC CONTROL SHALL CARRY EITHER AN FDOT MAINTENANCE OF TRAFFIC TRAINING CERTIFICATE, FROM AN FDOT MAINTENANCE OF TRAFFIC TRAINING PROVIDER, OR A CERTIFICATION FROM THE UTILITY OWNER STATING THE FOLLOWING: "[Employee's Name] has been properly trained to control traffic in accordance the UAM's traffic control requirements."
4. ALL DEWATERING COSTS ASSOCIATED WITH THE INSTALLATION AND CONSTRUCTION OF THE UNDERGROUND UTILITIES AS REFERENCED IN THESE PLANS SHALL BE INCLUDED AS PART OF THE CONSTRUCTION BID COSTS. THE CONTRACTOR SHALL SUBMIT FOR WATER USE PERMITS IF REQUIRED FOR DEWATERING ACTIVITIES.
5. THE CONTRACTOR SHALL PROVIDE SHORING FOR EXPOSED UTILITIES OR UTILITIES OR STRUCTURES ADJACENT TO UTILITY TRENCHES. SHORING FOR EXCAVATIONS EXCEEDING 25 FEET IN DEPTH MUST BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER AND IS THE CONTRACTORS RESPONSIBILITY.
6. STATE ROAD INTERSTATE 95 IS A LIMITED ACCESS HIGHWAY. ALL CONSTRUCTION WORK MUST BE DONE OUTSIDE THE I95 RIGHT-OF-WAY LIMITS INCLUDING ACCESSING THE DRILLING STAGING AREA AND THE DRILLING RECEIVING PIT AREA.
7. BACKFLOW PREVENTORS SHALL NOT BE INSTALLED INSIDE THE FDOT RIGHT-OF-WAY LIMITS.

DIRECTIONAL BORE NOTES:

1. THE CONTRACTOR SHALL COMPLY WITH FDOT DESIGN STANDARDS (LATEST EDITION) SECTION 120 FOR SITE EXCAVATION AND SECTION 555 FOR DIRECTIONAL BORING WITHIN THE FDOT RIGHT-OF-WAY.
2. ALL DIRECTIONAL BORE PATHS WITHIN THE FDOT RIGHT-OF-WAY MUST BE ACCURATELY RECORDED IN A BORE LOG AND SUBMITTED TO FDOT WITHIN SEVEN (7) DAYS OF THE COMPLETION OF EACH SUCCESSFUL OR FAILED BORE PATH. THE BORE LOG SUBMITTAL MUST COMPLY WITH THE FDOT UTILITY ACCOMMODATION MANUAL (LATEST EDITION) SECTION 3.16.9.
3. THE CONTRACTOR WILL CLEAN THE WORK SITE OF ALL EXCESS SLURRY OR SPOILS WITHIN 48 HOURS OF COMPLETING DIRECTIONAL BORE AND RESTORE THE WORK SITE TO PRE-DRILLING CONDITIONS.

Kiran Kulkarni, P.E.
36114

NO. | DATE: | DESCRIPTION
REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: LS W-01 AND LS W-15 SEWER FORCEMAIN KEY PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.:	PROJ. MGR.:
BRV017	KVK
DATE: 12/15/17	DRWN. BY: MBH
SCALE: 1" = 40'	CHKD. BY: KVK
DRAWING NO: 45 of 105	
SHEET NO.	C-41

6/7/2019 10:10:28 AM

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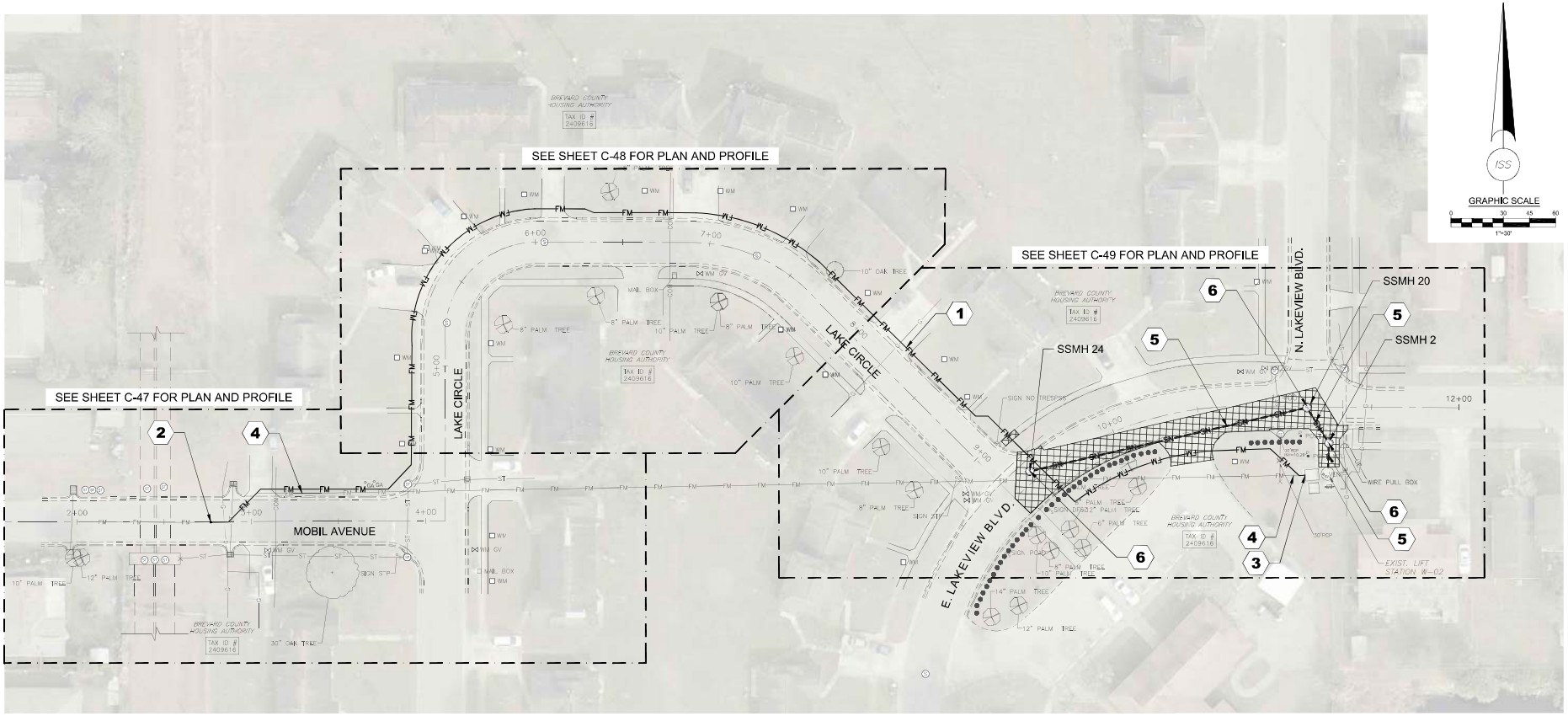

LS W-02 Gravity Sewer and Forcemain Notes

1. Install total of 835 LF 6"Ø C900 PVC sanitary forcemain.
2. Connect proposed 6"Ø C900 PVC sanitary sewer forcemain to existing 6"Ø PVC/HDPE forcemain (replace to end of exist. 6"Ø ACP forcemain).
3. Connect proposed 6"Ø C900 PVC sanitary sewer forcemain to LS W-02 valve vault discharge piping.
4. Cut and cap existing 6"Ø ACP forcemain and fill with non-shrink grout.
5. Replace sanitary sewer gravity main from SSMH 2 to SSMH 24.
6. Replace existing sanitary sewer manholes SSMH 2, SSMH 20 and SSMH 24 and connect new and existing piping.

811 Know what's below. Call before you dig.

Kiran Kulkarni, P.E. 38114

NO.	DATE:	DESCRIPTION: REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: LS W-02 GRAVITY SANITARY SEWER & FORCEMAIN KEY PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.	PROJ. MGR.
BRV017	KVK
DATE: 12/15/17	DRWN. BY: MBH
SCALE: 1" = 30'	CHKD. BY: KVK
DRAWING NO.: 50 OF 105	
SHEET NO.: C-46	

6/7/2018 10:11:34 AM

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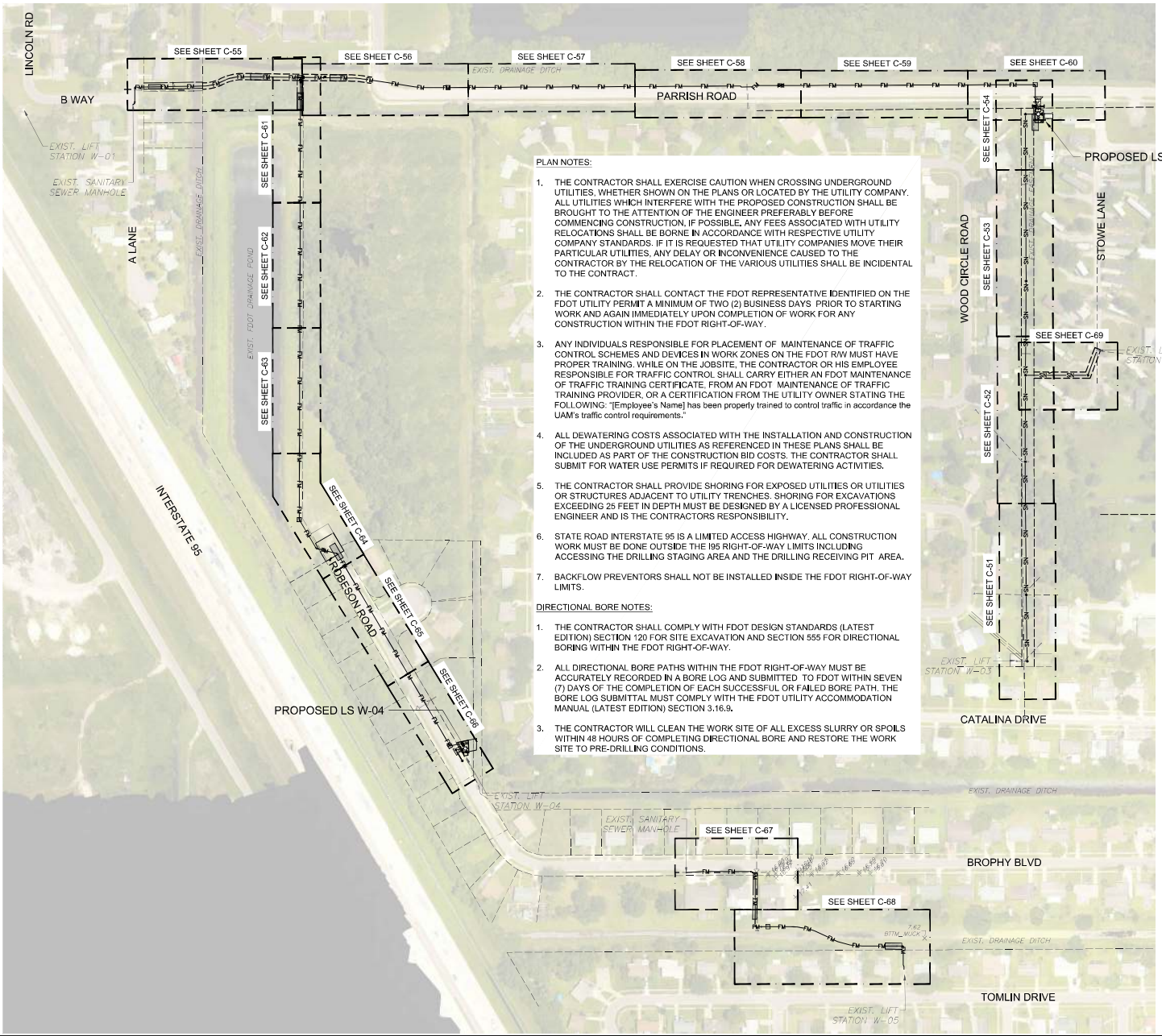

PLAN NOTES:

1. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CROSSING UNDERGROUND UTILITIES, WHETHER SHOWN ON THE PLANS OR LOCATED BY THE UTILITY COMPANY. ALL UTILITIES WHICH INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PREFERABLY BEFORE COMMENCING CONSTRUCTION, IF POSSIBLE. ANY FEES ASSOCIATED WITH UTILITY RELOCATIONS SHALL BE BORNE IN ACCORDANCE WITH RESPECTIVE UTILITY COMPANY STANDARDS. IF IT IS REQUESTED THAT UTILITY COMPANIES MOVE THEIR PARTICULAR UTILITIES, ANY DELAY OR INCONVENIENCE CAUSED TO THE CONTRACTOR BY THE RELOCATION OF THE VARIOUS UTILITIES SHALL BE INCIDENTAL TO THE CONTRACT.
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6. STATE ROAD INTERSTATE 95 IS A LIMITED ACCESS HIGHWAY. ALL CONSTRUCTION WORK MUST BE DONE OUTSIDE THE I95 RIGHT-OF-WAY LIMITS INCLUDING ACCESSING THE DRILLING STAGING AREA AND THE DRILLING RECEIVING PIT AREA.
7. BACKFLOW PREVENTORS SHALL NOT BE INSTALLED INSIDE THE FDOT RIGHT-OF-WAY LIMITS.

DIRECTIONAL BORE NOTES:

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811 Know what's below. Call before you dig.

Kiran Kulkarni, P.E.
38114

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

NO.	DATE:	DESCRIPTION:
		REVISIONS

DRAWING TITLE: LS W-03, LS W-04, LS W-05 & LS W-06 KEY PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.	PROJ. MGR.
BRV017	KVK
DATE: 12/15/17	DRWN. BY: MBH
SCALE: 1" = 120'	CHKD. BY: KVK
DRAWING NO. 54 of 105	
SHEET NO. C-50	

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GRAPHIC SCALE

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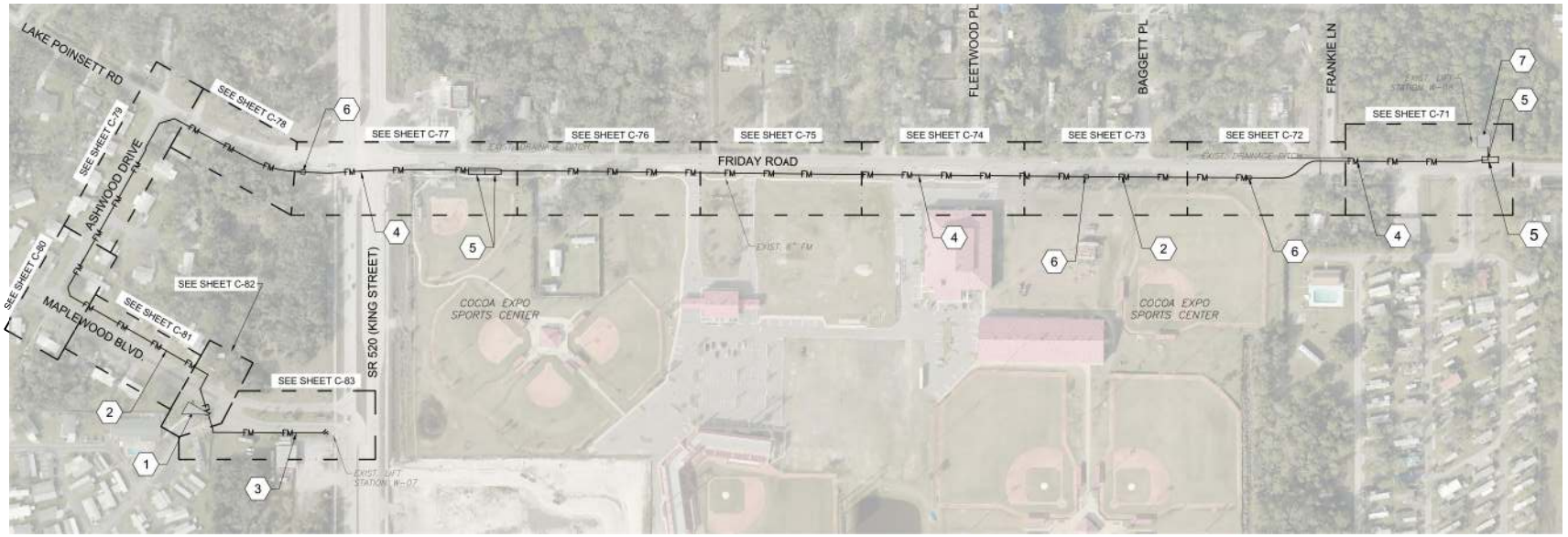
1"=140'



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LS W-07 & LS W-08 Sewer Forcemain Key Plan Notes

1. Proposed Lift Station W-07 relocation. See Sheets C-13 to C-16 for site details.
2. Proposed 4"Ø C900 PVC sanitary forcemain from LS W-04.
3. Proposed 6"Ø C900 PVC sanitary forcemain.
4. Proposed 4"Ø PE-4710 horizontal directional drill (HDD).
5. Horizontal directional drill (HDD) pilot entry point (to North).
6. Horizontal directional drill (HDD) receiving pit (from South).
7. Proposed Lift Station W-08 relocation. See Sheets C-17 to C-19 for site details.

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Kiran Kulkarni, P.E. 38114

NO.	DATE:	DESCRIPTION:
		REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: LS W-07 AND LS W-08 SANITARY FORCEMAIN KEY PLAN
WEST COCOA WASTEWATER IMPROVEMENTS

CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.:	PROJ. MGR.:
BRV017	KVK
DATE:	DRWN. BY:
12/15/17	MBH
SCALE:	CHKD. BY:
1" = 140'	KVK

DRAWING NO.: 74 of 105

SHEET NO.: C-70

LS W-09 Gravity Sewer Notes

1. Proposed LS W-09 relocation.
2. Proposed 8" PVC gravity sewer main.
3. Connect to existing manhole.

811 Know what's below. Call before you dig.

Kiran Kulkarni, P.E. 38114

NO.	DATE:	DESCRIPTION: REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: LS W-09 GRAVITY SANITARY SEWER KEY PLAN
WEST COCOA WASTEWATER IMPROVEMENTS
CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.:	PROJ. MGR.
BRV017	KVK
DATE:	DRWN. BY:
12/15/17	MBH
SCALE:	CHKD. BY:
1" = 100'	KVK
DRAWING NO.: 88 of 105	
SHEET NO.: C-84	

6/7/2019 10:18:12 AM

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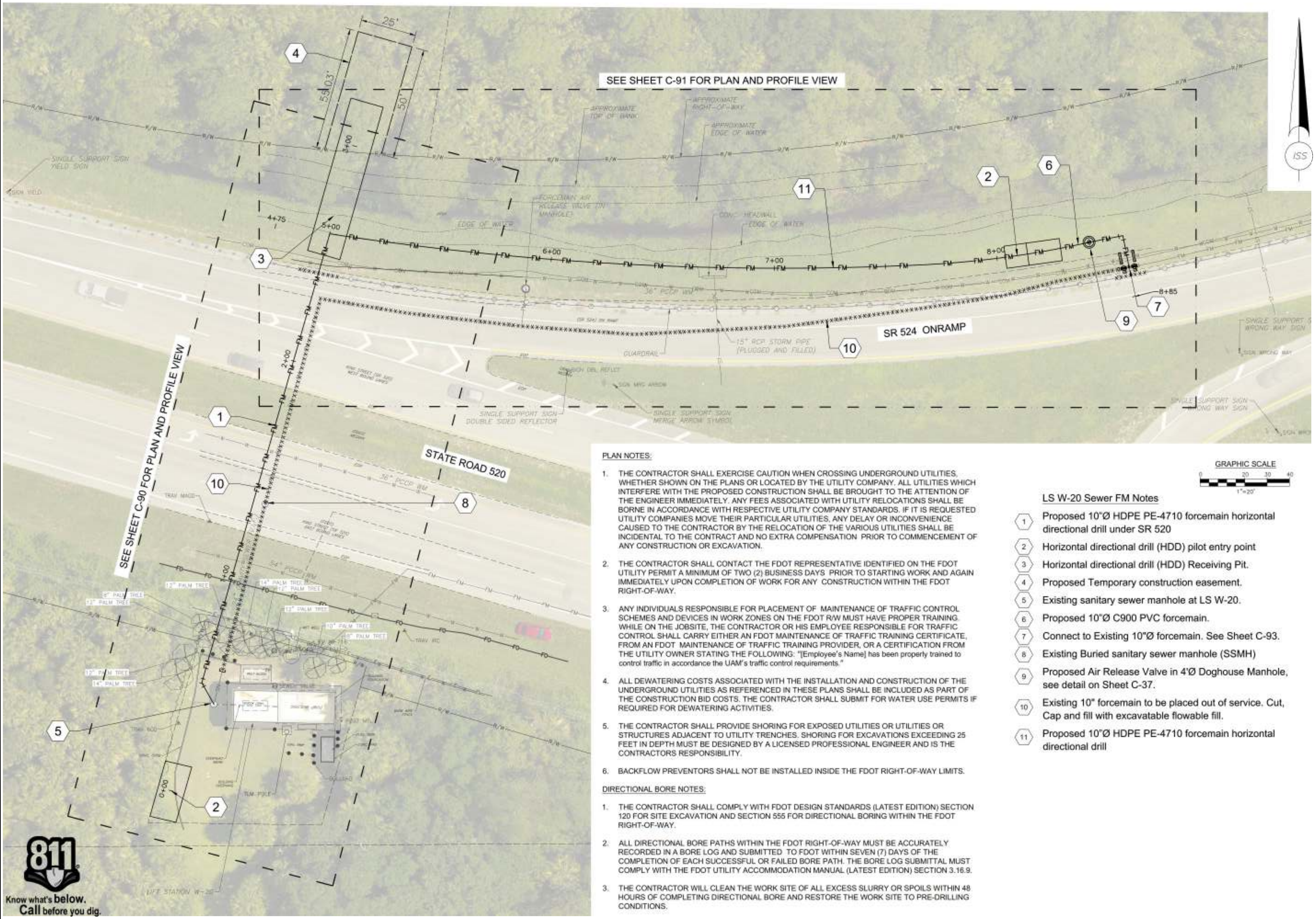

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LS W-20 Sewer FM Notes

1. Proposed 10"Ø HDPE PE-4710 forcemain horizontal directional drill under SR 520
2. Horizontal directional drill (HDD) pilot entry point
3. Horizontal directional drill (HDD) Receiving Pit.
4. Proposed Temporary construction easement.
5. Existing sanitary sewer manhole at LS W-20.
6. Proposed 10"Ø C900 PVC forcemain.
7. Connect to Existing 10"Ø forcemain. See Sheet C-93.
8. Existing Buried sanitary sewer manhole (SSMH)
9. Proposed Air Release Valve in 4'Ø Doghouse Manhole, see detail on Sheet C-37.
10. Existing 10" forcemain to be placed out of service. Cut, Cap and fill with excavatable flowable fill.
11. Proposed 10"Ø HDPE PE-4710 forcemain horizontal directional drill

Kiran Kulkarni, P.E. 36114

NO.	DATE:	DESCRIPTION
		REVISIONS

INFRASTRUCTURE SOLUTION SERVICES
7185 Murrell Road, Suite 101
Melbourne, Florida 32940
Phone: (321) 622-4646

DRAWING TITLE: LS W-20 SANITARY FORCEMAIN KEY PLAN
WEST COCOA WASTEWATER IMPROVEMENTS
CLIENT: BREVARD COUNTY UTILITY SERVICES DEPARTMENT

PROJECT NO.: BRV017	PROJ. MGR.: KVK
DATE: 12/15/17	DRWN. BY: MBH
SCALE: 1" = 20'	CHKD. BY: KVK
DRAWING NO: 93 of 105	
SHEET NO. C-89	

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Appendix E

Additional Planning Documents

Florida Department of Environmental Protection

REQUEST FOR INCLUSION ON THE CWSRF PRIORITY LIST

Clean Water State Revolving Fund Loan Program
3900 Commonwealth Blvd, MS 3505, Tallahassee, FL 32399-3000

Process to receive a State Revolving Fund (SRF) Loan. The Request for Inclusion (RFI) form, 62-503.900(1), lets us know that you are interested in obtaining a SRF loan. Each RFI will be assigned a project engineer to assist you throughout the SRF funding process. The information contained in the RFI is used to determine a priority score for your project; and the priority score is used to rank projects on the SRF priority list. Only projects ranked on the fundable portion of the priority list will receive consideration for a loan. Your project engineer will assist you in understanding all program requirements necessary before you are asked to submit a loan application, forms 62-503.900(2) or 62-503.900(3). Please note that project costs incurred before a SRF loan agreement is executed or an authorization to incur costs is provided are ineligible for reimbursement.

Project Number: _____
(Filled in by DEP)

Type of loan applying for: Planning ☐ Inflow/Infiltration Rehabilitation ☐ Design ☐ Construction ☒

1. Applicant's Name and Address

Project Sponsor: Brevard County Contact Person: James Helmer

2725 Judge Fran Jamieson Way
street address)

Melbourne (city) Brevard (county) FL (state) 32940 (zip code)

(321) 633-2091 (telephone) _____ (ext.) _____ (FAX) Elizabeth.Swanke@brevardfl.gov (email address)

Contact Person Address (if different): _____ (street address) _____ (city) _____ (state) _____ (zip code)

2. Name and Address of Applicant's Consultant (if any).

Firm: Infrastructure Solution Services (ISS) Contact Person: Brian Stahl

7185 Murrell Rd, Suite 101
(street address)

Melbourne (city) FL (state) 32940 (zip code)

(321) 622-4646 (telephone) _____ (ext.) _____ (FAX) bstahl@InfrastructureSS.com (email address)

3. Certification by Authorized Representative: I certify that this form and attachments have been completed by me or at my direction and that the information presented herein is, to the best of my knowledge, accurate.

Elizabeth.Swanke@brevardfl.gov
(email address) _____ (date)

James Helmer (name, typed) Utilities Director (title)

_____
(signature)

4. Eligible Projects.

a. Stormwater management facilities, such as detention/retention facilities, treatment facilities, etc. sponsored by a local government (eligible under Section 212 of the amended Clean Water Act).

b. Wastewater management facilities, such as sewers, pump stations, treatment plants, reuse facilities, sludge facilities, etc. sponsored by a local government (eligible under Section 212 of the amended Clean Water Act).

c. Nonpoint source pollution control best management practices for agriculture, silviculture, on-site treatment and disposal, wetlands, mining, marinas, brownfields or groundwater protection sponsored by any entity (eligible under Section 319 or 320 of the amended Clean Water Act).

5. Project Information (Please attach).

Describe the project, its location, the scope, why it's needed and the environmental benefit.

Attach maps showing system boundaries, existing and proposed service area, and project area.

6. Estimated Costs (Clean Water Act Section 212, 319, and 320).

a.	Planning and/or SSES	$0.00
b.	Design	$0.00
c.	Special Studies	$0.00
d.	*Eligible Land	$0.00
e.	Construction, Equipment, Materials, Demolition and Related Procurement	$10,000,000.00
f.	Construction Contingency (10% of Item e)	$1,000,000.00
g.	Technical Services during Construction	
h.	Sum of Items a. through g.	$11,000,000.00

*Funding shall be limited to the fair market value of the acreage of land necessary for and integral to the treatment process, including the zone of discharge. If additional land is purchased, the eligible amount shall be the acreage of land necessary for treatment divided by the total area purchased times the purchase price.

7. Project Schedule.

	(Month and Year)
Submit the planning or SSES documentation	08/30/18
Submit the design documents, obtain permits, and acquire sites (as necessary)	03/31/19
Start activity (such as construction or non-structural best management practice)	06/30/19
Complete activity (such as construction or non-structural best management practice)	03/31/22

8. Population

Population served by the system	10,000
Population to be served by the project	10,000

9. Project Priority

a. Baseline Priority Categorization.

Identify the category score(s) and construction costs(s) for which the project qualifies. The baseline priority score (BPS) shall be determined by prorating each component.

Project Component	Priority Points	Component Construction Cost
1. Eliminate a documented acute or chronic public health hazard. Examples: Elimination of failing septic tanks or failing package plants or elimination of sanitary sewer overflows.	500 points	_____
2. Implement a project included in, or to be implemented as a direct result of, an adopted Basin Management Action Plan or a Reasonable Assurance Plan approved pursuant to section 403.067, F.S.	450 points	_____
3. Protect surface or ground water by reducing a documented source of pollution, pollution reductions necessary to meet regulatory requirements, or repairs by local governments or on-site system management entities, under section 319 of the Act, that correct septic tank failures in springsheds of first-magnitude springs.	400 points	_____
4. Address a compliance problem documented in an enforcement action where the Department has issued a notice of violation or entered into a consent order with the project sponsor.	375 points	_____
5. Meet the criteria for Innovative/Alternative; correct excessive inflow/ infiltration, scheduled rehabilitation, replacement; repair described in an approved asset management plan; or reuse that replaces an existing or proposed demand on a water supply.	350 points	$11,000,000.00
6. Planning and design loans and rehabilitation, replacement or repair not included in an approved asset management plan.	340 points	_____
7. Projects that construct other reclaimed water systems or residuals reuse that do not meet the criteria of component 5. above.	300 points	_____
8. Ensure compliance with other enforceable standards or requirements.	200 points	_____
9. Timely submitted projects that otherwise meet the requirements of the Act.	100 points	_____

b. Restoration and Protection of Special Water Bodies.

In order to qualify for a base score multiplier, identify which of the water bodies listed below that the project will assist in restoring or protecting and reference the location in existing documentation where substantiating information may be found or attach other such substantiating information. If none are selected, the multiplier equals 1.0. If one or more are selected, the multiplier is 1.2.

A priority water body identified in an adopted Surface Water Improvement and Management (SWIM) Plan.	☒
A water body classified as Outstanding Florida Waters.	☒
A water body classified as Wild and Scenic Rivers.	☐
A water body located in a priority watershed established under the Unified Watershed Assessment Program.	☐

c. Projects that document any of the following shall have bonus points added to the priority score after the adjustment under paragraph (a) above, as indicated.

1. Elimination of Ocean Outfalls	15 points	☐
2. Projects that demonstrate consistency with a Water Resource Management plan	15 points	☐

Return the completed form to the State Revolving Fund Program, 3900 Commonwealth Blvd., MS 3505, Tallahassee, Florida, 32399-3000. The form may be scanned and emailed to SRF_Reporting@dep.state.fl.us or may be sent by FAX to (850) 245-2857.

CAPITAL FINANCING PLAN

Brevard County Utility Services Department
(Project Sponsor)
James Helmer, Utility Services Department Director
(Authorized Representative and Title)
Viera, FL 32940
(City, State, and Zip Code)

Elizabeth Swanke, Support Services Manager, 321-633-2092 X 52793
(Capital Financing Plan Contact, Title and Telephone Number)
2725 Judge Fran Jamieson Way, Bldg. A, Rm. 213
(Mailing Address)
Elizebeth.Swanke@brevardcounty.us
(Email Address)
Viera, FL 32940
(City, State, and Zip Code)

The Department needs to know about the financial capabilities of potential State Revolving Fund (SR applicants. Therefore, a financial capability demonstration (and certification is required well before th evaluation of the actual loan application.

The sources of revenues being dedicated to repayment of the SRF loan are Utility operating revenues
(Note: Projects pledging utility operating revenues should attach a copy of the existing /proposed rate ordinance)

Estimation of Proposed SRF Loan Debt Service

Capital Cost [1]	$	11,000,000
Loan Service Fee (2% of Capital Cost)	$	220,000
Subtotal	$	11,220,000
Capitalized Interest [2]	$	192,500
Total Cost to be Amortized (Rounded)	$	11,412,500
Interest Rate [3]		1.75%
Annual Debt Service	$	678,765
Annual Debt Service Including Coverage Factor [4]	$	780,580

Notes:
[1] Capital Cost = Allowance + Construction Cost (including a 10% contingency)
[2] Estimated based on linear draw of project amount over a 2 year construction period.
[3] Based on previous CFP interest rate submission. FY 18/19 Q2 reported CWSRF rate equals 1.08
[4] Coverage Factor is assumed at 1.15 recognizing that no impact fees are assumed within the Schedule of Revenue and Debt Service Coverage.

SCHEDULE OF EXISTING DEBT SERVICE AND DEBT EQUIVALENTS [1]

List annual debt service beginning two years before the anticipated loan agreement date and continuing at least fifteen fiscal years.
Use additional pages as necessary.

IDENTIFY EACH OBLIGATION

#1 Water & Wastewater Utility Revenue Bonds, Series 2014		#2 Clean Water State Revolving Fund Loan 2015 *Estimated*		#3 Clean Water State Revolving Fund Loan 2018 *Estimated*	
Coverage % [2]	**110%**	**Coverage %**	**115%**	**Coverage %**	**115%**
Revenue Pledge Lien Priority	**1st**	**Revenue Pledge Lien Priority**	**2nd**	**Revenue Pledge Lien Priority**	**2nd**
Insured (Yes/No)	**Yes**	**Insured (Yes/No)**	**N/A**	**Insured (Yes/No)**	**N/A**
#4		**#5**		**#5**	
Coverage %	**N/A**	**Coverage %**	**N/A**	**Coverage %**	**N/A**
Revenue Pledge Lien Priority					
Insured (Yes/No)	**N/A**	**Insured (Yes/No)**	**N/A**	**Insured (Yes/No)**	**N/A**

Fiscal Year	Annual Debt Service (Principal + Interest)						Total Non-SRF Debt Service w/coverage	Total SRF Debt Service w/ coverage
	1	#2 [3]	#3 [3]	#4	#5	#6	(Excludes Leases)	
2015	1,292,758						$1,422,034	$0
2016	1,475,881						$1,623,469	$0
2017	1,471,081						$1,618,189	$0
2018	1,471,231						$1,618,354	$0
2019	1,470,831	1,175,805					$1,617,914	$1,352,176
2020	1,474,631	2,351,610					$1,622,094	$2,704,352
2021	1,472,431	2,351,610	488,384				$1,619,674	$3,265,993
2022	1,473,681	2,351,610	488,384				$1,621,049	$3,265,993
2023	1,473,431	2,351,610	488,384				$1,620,774	$3,265,993
2024	1,471,681	2,351,610	488,384				$1,618,849	$3,265,993
2025	1,473,431	2,351,610	488,384				$1,620,774	$3,265,993
2026	1,473,431	2,351,610	488,384				$1,620,774	$3,265,993
2027	1,475,056	2,351,610	488,384				$1,622,562	$3,265,993
2028	1,472,406	2,351,610	488,384				$1,619,647	$3,265,993
2029	1,474,156	2,351,610	488,384				$1,621,572	$3,265,993
2030	1,475,156	2,351,610	488,384				$1,622,672	$3,265,993
2031	1,475,406	2,351,610	488,384				$1,622,947	$3,265,993
2032	1,472,781	2,351,610	488,384				$1,620,059	$3,265,993
2033	1,474,344	2,351,610	488,384				$1,621,778	$3,265,993
2034	1,473,800	2,351,610	488,384				$1,621,180	$3,265,993
2035	1,471,075	2,351,610	488,384				$1,618,183	$3,265,993
2036	1,472,650	2,351,610	488,384				$1,619,915	$3,265,993
2037	1,472,200	2,351,610	488,384				$1,619,420	$3,265,993
2038	1,474,725	2,351,610	488,384				$1,622,198	$3,265,993
2039	1,475,000	1,175,805	488,384				$1,622,500	$1,913,817
2040	1,473,025		488,384				$1,620,328	$561,642
2041	1,473,800						$1,621,180	$0
2042	1,473,400						$1,620,740	$0
2043	1,471,000						$1,618,100	$0
2044	1,471,600						$1,618,760	$0

Footnote:

[1] Reflects debt service schedules from outstanding bonds and active SRF loans. It should be noted that the projections contained herein do not reflect any additional debt service that may be contemplated or required to fund future capital pursuant to the County's Capital Improvement Plan.

[2] Pursuant to the Bond Resolution authorizing the issuance of the outstanding Water and Wastewater Revenue Bonds, Series 2014, the county must: a) generate sufficient Net Revenue equal to or greater than 110% of the annual debt service of the outstanding bonds; and b) generate sufficient Net Revenues plus impact fees equal to or greater than 120% of the annual debt service of the outstanding bonds. For purposes of the CFP we have assumed the senior lien coverage requirement at 110% in recognition that no impact fees were assumed in the projections contained in the *Schedule of Projected Revenues and Debt Coverage for Pledged Revenue.*

[3] Amounts shown reflect estimates and are subject to change based on completion of actual project cost and timing of completion.

SCHEDULE OF ACTUAL REVENUES AND DEBT COVERAGE FOR PLEDGED REVENUE

(Provide information for the two fiscal years preceding the anticipated date of the SRF loan agreement)

		FY 15-16 [1]	FY 16-17 [1]
(a)	Operating Revenues (Identify)		
	Charges for Service [2]	$32,247,922	$34,451,537
	Other Operating Revenue	$0	$0
(b)	Interest Income	$347,060	$308,037
(c)	Other Incomes or Revenues	$0	$0
(d)	Total Revenues	$32,594,982	$34,759,574
(e)	Operating Expenses (excluding interest on debt, depreciation and other non-cash items)	$19,804,187	$19,773,142
(f)	**Net Revenues (f = d - e)**	$12,790,795	$14,986,432
(g)	Debt Service (including coverage) Excluding SRF Loans [3]	$1,422,034	$1,623,469
(h)	Debt Service (including coverage) for Outstanding SRF Loans [3]	$0	$0
(i)	**Net Revenues After Debt Service (i = f - g - h)**	$11,368,761	$13,362,963

Source:

Notes:

[1] Unless otherwise noted, amounts shown are derived from the County's audited financial statements.

[2] The Board approved the following rate adjustments at the December 17, 2013 Public Hearing;

System	County Sewer Average Increase per Month	Mims Water Average Increase Per Month
FY 13/14 Rate Increase	$2.94 SEWER/9%	$1.80 WATER/9%
FY 14/15 Rate Increase	$2.14 SEWER/6%	$1.31 WATER/6%
FY 15/16 Rate Increase	$1.89 SEWER/5%	$1.16 WATER/5%
FY 16/17 Rate Increase	$1.98 SEWER/5%	$1.22 WATER/5%
FY 17/18 Rate Increase	$2.08 SEWER/5%	$1.28 WATER/5%
FY 2019 – 2023 Inflationary Index	2.5%	2.5%

[3] Amounts shown reflect debt service as noted in the prior *Schedule Of Debt Service And Debt Equivalents.*

SCHEDULE OF PROJECTED REVENUES AND DEBT COVERAGE FOR PLEDGED REVENUE

		2021	2022	2023	2024	2025
(a)	Operating Revenues Service Charges [1]	$39,543,000	$40,719,000	$41,930,000	$43,177,000	$44,462,000
(b)	Interest Income [2]	$135,400	$135,400	$135,400	$135,400	$135,400
(c)	Other Incomes or Revenues (Identify) [3]	$0	$0	$0	$0	$0
(d)	Total Revenues	$39,678,400	$40,854,400	$42,065,400	$43,312,400	$44,597,400
(e)	Operating Expenses (excluding interest on debt, depreciation and other non-cash items) [4]	$23,186,308	$23,990,413	$24,822,981	$25,685,041	$26,577,658
(f)	**Net Revenues (f = d - e)**	$16,492,092	$16,863,987	$17,242,419	$17,627,359	$18,019,742
(g)	Existing Debt Service on Non-SRF Projects (including coverage) [5]	$1,619,674	$1,621,049	$1,620,774	$1,618,849	$1,620,774
(h)	Existing SRF Loan Debt Service (including coverage)	$3,265,993	$3,265,993	$3,265,993	$3,265,993	$3,265,993
(i)	**Total Existing Debt Service (i = g + h)**	$4,885,667	$4,887,042	$4,886,767	$4,884,842	$4,886,767
(j)	Projected Debt Service on Non-SRF Future Projects (including coverage)	$0	$0	$0	$0	$0
(k)	Projected SRF Loan Debt Service (including coverage) [6]	$0	780,580	780,580	780,580	780,580
(l)	**Total Debt Service (Existing and Projected) (l = i + j + k)**	$4,885,667	$4,887,042	$4,886,767	$4,884,842	$4,886,767
(m)	**Net Revenues After Debt Service (m = f - l) [7]**	$11,606,425	$11,976,945	$12,355,651	$12,742,516	$13,132,975

Source:

Notes:

[1] Revenue projection above is comprised of a 2.5% rate index (adopted by the County) with an assumed 0.5% growth rate for a 3% total revenue increase per year. Revenue projections exclude impact fees.

[2] Includes interest income on unrestricted cash balances, which were assumed to be held constant during the forecast.

[3] Although excluded from the projections, the County recovered on average approximately $2.45 million in water and wastewater impact fees during the Fiscal Years 2016 and 2017. The County continues to charge new connections the impact fees.

[4] Amounts are based on the County's adopted budget for operating expenses for the Fiscal Year 2019 and escalated thereafter at an average annual factor of approximately 3.5%.

[5] Pursuant to the Bond Resolution authorizing the issuance of the outstanding Water and Wastewater Revenue Bonds, Series 2014, the county must: a) generate sufficient Net Revenue equal to or greater than 110% of the annual debt service of the outstanding bonds; and b) generate sufficient Net Revenues plus impact fees equal to or greater than 120% of the annual debt service of the outstanding bonds. For purposes of the CFP we have assumed the senior lien coverage requirement at 110% in recognition that no impact fees were assumed in the projections contained in the Schedule of Projected Revenues and Debt Coverage for Pledged Revenue.

[6] Amounts reflect the estimated annual debt service for the proposed SRF Loan.

[7] For the purposes of full disclosure, the County budgets and funds: a) transfers to the general fund associated with Payment in Lieu of Taxes and b) capital outlay for minor units of equipment and vehicles. The following provides a forecast of net revenues after such transfers and payments:

	2021	2022	2023	2024	2025
Net Revenues After Debt	$11,606,425	$11,976,945	$12,355,651	$12,742,516	$13,132,975
Less:					
Payment in Lieu of Taxes (PILOT)	1,551,662	1,551,662	1,551,662	1,551,662	1,551,662
Capital Outlay (Excludes Major Maintenance)	2,250,000	2,250,000	2,250,000	2,250,000	2,250,000
Net Available to Utility Reserve Fund	$7,804,763	$8,175,283	$8,553,989	$8,940,854	$9,331,313

CERTIFICATION

I, James Helmer, Utility Services Department Director, certify that I have reviewed the information included in the preceding capital financing plan worksheets, and to the best of my knowledge, this information accurately reflects the financial capability of Brevard County Utility Services Department, Local Government.

I further certify that Brevard County Utility Services Department, Local Government adequate construction, operation, and maintenance of the system, including this SRF project.

Signature

Date

FLORIDA DEPARTMENT OF Environmental Protection

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Noah Valenstein
Secretary

NOTIFICATION OF ACC TANC OF US OF A G NERAL P RMIT

RMITTEE:
Brevard County Utility Services Department
2725 Judge Fran Jamieson Way, Bldg A-213
Viera, FL 32940
James E. Helmer, Director, Utility Services Department
Email: Tammy.hurley@brevardcounty.us

PERMIT NUMBER:	0370802-001-DWC/CG
ISSUE DATE:	December 5, 2018
EXPIRATION DATE:	December 4, 2023
COUNTY:	Brevard
PROJECT NAME:	West Cocoa Wastewater System Improvements – East of I-95
CONNECTED TO:	BCUD South Central WWTP
FACILITY ID:	FL0102679

Dear Mr. Helmer:

This letter acknowledges receipt of your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System for the subject project. Our office received the Notice on November 19, 2018. The project includes various improvements to lift stations, force mains and gravity systems east of I-95.

This is to advise you that the Department does not object to your use of such General Permit.

Please note the attached requirements apply to your use of this General Permit for constructing the proposed domestic wastewater collection/transmission system.

You are further advised that the construction activity must conform to the description contained in your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System and that any deviation will subject the permittee to enforcement action and possible penalties.

Sincerely,

Randall Cunningham

Randall Cunningham
Engineering Specialist III

cc: Kiran V. Kulkarni, PE, Infrastructure Solution Services, Inc., kkulkarini@infrastructuress.com
Charles LeGros, DEP, Charles.LeGros@dep.state.fl.us
Randall Cunningham, DEP, randall.cunningham@dep.state.fl.us

REQUIREMEN FOR USE F E GENERAL PERMIT FOR DOME IC WASTEWATER COLLECTION/TRANSMISSION SYSTEMS:

1. This general permit is subject to the general permit conditions of Rule 62-4.540, F.A.C., as applicable. This rule is available at the Department's Internet site at: http://www.dep.state.fl.us/legal/Rules/shared/62-4/62-4.pdf [62-4.540]

2. This general permit does not relieve the permittee of the responsibility for obtaining a dredge and fill permit where it is required. [62-604.600(6)(b)1]

3. This general permit cannot be revised, except to transfer the permit. [62-604.600(6)(b)2]

4. This general permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project. [62-4.030]

5. Upon completion of construction of the collection/transmission system project, and before placing the facilities into operation for any purpose other than testing for leaks or testing equipment operation, the permittee shall submit to the Department's Central District Office Form 62-604.300(8)(b), Request for Approval to Place a Domestic Wastewater Collection/Transmission System into Operation. This form is available at the Department's Internet site at: http://www.dep.state.fl.us/water/wastewater/dom/dw-forms.htm. [62-604.700(2)]

   Please submit the entire clearance document package in electronic format to DEP_CD@dep.state.fl.us, with a copy to randall.cunningham@dep.state.fl.us. If the file is very large, you may post it to the Wastewater Electronic Applications folder on the following ftp site at:

   ftp://ftp.dep.state.fl.us/pub/wastewater/

   After posting the document, send an e-mail to DEP_CD@dep.state.fl.us, with a copy to randall.cunningham@dep.state.fl.us, alerting us that it has been posted. Any submitted drawings (should be sized 11" x 17") and the engineer of record's signed seal and dates on the required document must be legible for acceptance.

   For further clarification contact:
   Randall Cunningham, (407) 897-4152
   3319 Maguire Blvd, Suite 232
   Orlando, Florida 32803-3767

6. The new or modified collection/transmission facilities shall not be placed into service until the Department clears the project for use. [62-604.700(3)]

7. Abnormal events shall be reported to the Department's Central District Office in accordance with Rule 62-604.550, F.A.C. For unauthorized spills of wastewater in excess of 1000 gallons per incident, or where information indicates that public health or the environment may be endangered, oral reports shall be provided to the STATE WATCH OFFICE TOLL FREE NUMBER (800)320-0519 as soon as practical, but no later than 24 hours from the time the permittee or other designee becomes aware of the circumstances. Unauthorized releases or spills less than 1000 gallons per incident are to be reported orally to the Department's Central District Office within 24 hours from the time the permittee, or other designee becomes aware of the circumstances. [62-604.550]

FLORIDA DEPARTMENT OF
Environmental Protection

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James E. Helmer, Director, Utility Services Department
Email: Tammy.hurley@brevardcounty.us

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Sincerely,

Randall Cunningham

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